



KENWORTH

Operator's Manual

T2000

**Do not remove this manual from vehicle.
Before operating vehicle study this manual carefully.
Read and understand all Warnings, Cautions, and Notes.**



Need Help? Give Us a Call - 24 Hours a Day

1-800-KW-ASSIST

(1-800-592-7747)

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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.

Kenworth reserves the right to discontinue, change specifications, or change the design of its vehicles at any time without notice and without incurring any obligation.

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INTRODUCTION

How to Use This Manual

This Operator's Manual contains useful information for the safe and efficient operation of your Kenworth T2000. It also provides information on maintaining your vehicle in the best condition, with an outline for performing safety checks and basic preventive maintenance inspections.

Your Kenworth T2000 Operator's Manual is divided into six major sections. We recommend that you read these sections from beginning to end. By reading the manual, you will have an understanding of how to properly operate the vehicle. In the 'Driving' section you will find general information. As you read through the section and become familiar with the basics, more specific information about operating the vehicle is presented.

You should also become familiar with the "Maintenance" section, especially the "Maintenance Schedule and Lubrication" section. See [Maintenance Schedule and Lubrication, on page 5-11](#).

There may be times when you need to take this manual out of your vehicle. If you do, please be sure to return it to the cab when you are finished using it. This will ensure the next time you need it or when you pass the vehicle on to the next driver, it will be there.

Your Kenworth T2000 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.

All information contained in this manual is based on the latest production information available at the time of publication. Kenworth Truck Company reserves the right to make changes at any time without notice.

Safety Signals

A number of alerting messages are in this manual. Please read and follow them. They are there for your protection and information. These messages can help you avoid injury to yourself, your passengers, and help prevent costly damage to the vehicle.

Key symbols and “signal words” are used to indicate what kind of message is going to follow. Pay special attention to instructions prefaced by symbols and signal words “WARNING”, “CAUTION”, or “NOTE”. Please do not ignore any of these alerts.

WARNING



WARNING: When you see this symbol & word, the message that follows is especially vital. This signals something that can cause injury or death. This message will tell you what the hazard is, what can happen if you don't heed the warning, and how to avoid it.

Example:



WARNING: Do not carry additional fuel containers in your vehicle. Fuel containers, either full or empty, may leak, explode, and cause or feed a fire. Do not carry extra fuel containers, even empty ones are dangerous. Failure to comply may result in personal injury, death, equipment or property damage.

CAUTION



CAUTION: This symbol & word signals something that could damage your vehicle. And you might receive an injury, too.

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.

NOTE



NOTE: Gives you information we feel you would like to have. It could have to do with care of your vehicle or with driving more efficiently.

Example:



NOTE: Pumping the accelerator will not assist in starting the engine.

Please take the time to read these messages when you see them, and remember:

WARNING! Something that could injure you.

CAUTION: Something that could cause injury to you or damage to your vehicle.

NOTE: Useful information.

Vehicle Safety

Make sure your Kenworth T2000 is in top working condition before heading out on the road, it is the responsible driver's duty to do so. Inspect the vehicle according to the [Driver's Check List beginning on page 1-29](#).



WARNING: Do not drink and drive. Your reflexes, perceptions, and judgment can be affected by even a small amount of alcohol. You could have a serious or even fatal accident, if you drive after drinking. Please do not drink and drive or ride with a driver who has been drinking. Failure to comply may result in personal injury, death, equipment or property damage.

Please remember, this manual is not a training manual. It cannot tell you

everything you need to know about driving your Kenworth vehicle. For that you need a good training program or truck driving school. If you have not been trained, get the proper training before you drive. Only qualified drivers should drive this vehicle.

Every new Kenworth vehicle is designed to conform to all Federal Motor Vehicle Safety Standards applicable at the time of manufacture. However, even with these safety features, continued safe and reliable operation depends greatly upon regular vehicle maintenance. The vehicle must be operated within the range of its mechanical capabilities and the limits of its load ratings. (See the Tire and Rim Weight Ratings label on the driver's door edge.) This vehicle is not approved for off-road operation.

INTRODUCTION

1

How to Find What You Want

There are several tools built into this manual to help you find what you need quickly and easily. First is the Contents. Located at the front of the manual, this lists the main subjects covered and gives page numbers where you can find these subjects. Use the Contents to find information on a large subject like Operating the Transmission.

Cross-references also help you get the information you need. If some other part of the manual contains further information on the subject you are reading about, a cross-reference will refer you to another page, for example: See page 75, for more information on Safety Restraint Belts.

Finally, you will find a helpful Index in the back of the manual, listing subjects alphabetically. For example, if you want information on brakes, just look under Brakes in the Index. You will

find the pages where brakes or related topics are discussed.



WARNING: Do not attempt repair work without sufficient training, service manuals, and the proper tools. You could be injured, or you could make your vehicle unsafe. Do only those tasks you are fully qualified to do. Failure to comply may result in personal injury, death, equipment or property damage.

A Special Word About Repairs

This is not a repair or workshop manual. Your Kenworth Dealer is the best place to have your Kenworth T2000 repaired. You can find Kenworth dealers all over the country with the equipment and trained personnel to get you back on the road quickly and to keep you there.

Your Kenworth T2000 is a complex machine. Anyone attempting repairs on it needs good mechanical training, proper specifications, and proper tools. If you are sure you meet these qualifications, then you can probably perform some repairs yourself. But if you are not an experienced mechanic, or do not have the right equipment or training, please leave the repairs to an authorized service facility. They are the ones equipped to do the job safely and correctly.

Finally, you will find a helpful Index in the back of this manual, listing subjects alphabetically. For example, if you want information on brakes, just look under Brakes in the Index. You will find the pages where brakes or related topics are discussed.

Preventive Maintenance

The Maintenance section in this manual contains general service information for the operator, such as: lubrication points, making adjustments, and other helpful service information. This is summary information only, used for general maintenance of major components installed on your Kenworth T2000. For detailed service information see your Kenworth Shop Manual.

When it comes time for major service work, your Kenworth Dealer will need vehicle and component information. To help you gather this vehicle information, see [Vehicle Identification, on page 6-4](#), This section explains vehicle identification and provides space to record model and serial numbers of major components installed on your vehicle.

Additional Sources of Information

Installed Equipment - Operator's Manuals

Major component suppliers to Kenworth also supply operation manuals specific to their products. Additional manuals and other pieces of literature are included in the glove compartment literature set. Look for information on products such as the engine, drivers seat, transmission, axles, tires, and radio. If you are missing these pieces of literature, ask your Kenworth Dealer for copies.

Truck Driver's Handbook

Your set of glove compartment literature also contains a copy of the Truck Driver's Handbook, published by the American Trucking Association (ATA). Refer to it for important information on driving your Kenworth T2000.

Driver's Safety Information Video

Your new Kenworth was also provided with a video tape entitled Important Driver's Safety Information. This tape demonstrates and explains several safety features of this vehicle. Review it regularly as a reminder of the these items.

Other Sources

Another place to learn more about trucking is from local truck driving schools. Contact one near you to learn about courses they offer.

Federal and state agencies such as the department of licensing also have information you can ask for. The Interstate Commerce Commission can give you information about regulations governing transportation across state lines. Regulations that differ from state to state can be found at various agencies in state governments.

California Proposition 65 Warning

- Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.
- Other chemicals in this vehicle are also known to the State of California to cause cancer, birth defects or other reproductive harm.
- Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

Data Recorder

California Vehicle Code - Section 9951- Disclosure of Recording Device

Your vehicle may be equipped with one or more recording devices commonly referred to as “event data recorders (EDR)” or “sensing and diagnostic modules (SDM)”. If you are involved in an accident, the device(s) may have the ability to record vehicle data that occurred just prior to and/or during the accident. For additional information on your rights associated with the use of this data, contact

- the California Department of Motor Vehicles - Licensing Operations Division
– or –
- http://www.dmv.ca.gov/pubs/vctop/d03_6/vc9951.htm

SEATS AND RESTRAINTS

Introduction

This section covers the operation and safe use of your Kenworth T2000 seats. For further information on features and adjustment of the seat, see the manufacturer's Service and Operation Manual included with the vehicle.

Seat Adjustment



WARNING: Do not adjust the driver's seat while the vehicle is moving. The seat could move suddenly and unexpectedly and can cause the driver to lose control of the vehicle. Make all adjustments to the seat while the vehicle is stopped. Failure to comply may result in personal injury, death, equipment or property damage.

- ***After adjusting the seat and before driving off, always check to ensure that the seat is firmly latched in position.***

Standard Driver's Seat

The standard driver's seat can be adjusted forward and rearward as well as up and down. The seat back angle can also be adjusted. These three movements are each controlled by

levers located either beneath or at the sides of the seat.

Driver's Seat with Air Suspension



WARNING: Before driving or riding in vehicle, ensure that there is adequate head clearance at maximum upward travel of seat. Injury may occur if head clearance is not adequate. Failure to comply may result in personal injury or death.

Reclining Seats

- Make sure the sleeper curtain is tied back.
- Raise the seat all the way up so that the seat will tilt back and completely clear objects behind you.



WARNING: Do not drive or ride with your seat back in the reclined position. You could be injured by sliding under

the seat belts in a collision. Failure to comply may result in personal injury or death.

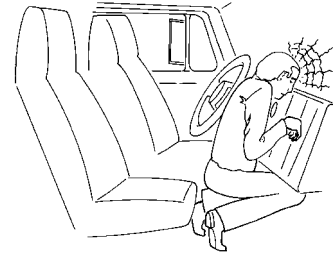
Safety Restraint Belts

Safety belts have proven to be the single most effective means available for reducing the potential for either injury or death in motor vehicle accidents. Therefore, read the following instructions and always observe user warnings pertaining to safety belts.



WARNING: Do not drive vehicle without your seat belt and your riders belts fastened. Riding without a safety belt properly fastened can lead to injury or death in an emergency. Unbelted riders could be thrown into the windshield or other parts of the cab or could be thrown out of the cab. They could strike another person. Injuries can be much worse when riders are unbelted. Always fasten your seat belt

and be sure anyone riding with you does the same. Failure to comply may result in personal injury or death.



Unbelted Person in Crash

Lap/Shoulder Belt

The combination lap-shoulder belt is equipped with a locking mechanism. The system adjusts automatically to a person's size and movements as long as the pull on the belt is slow.

Hard braking or a collision locks the belt. The belt will also lock when driving up or down a steep hill or in a sharp curve.

To fasten the belt:

1. Grasp the belt tongue.
2. Pull belt in a continuous slow motion across your chest and lap.
3. Insert belt tongue into buckle on inboard side of seat.
4. Push down until the tongue is securely locked with an audible click. Pull belt to check for proper fastening.
 - Pull shoulder section to make sure belt fits snugly across the chest.

- The shoulder belt must be positioned over the shoulder, it must never rest against the neck.
- Belts should fit snugly across the pelvis and chest. Make sure any slack is wound up on the retractor.

To unfasten the belt:

- Push in the release button on the buckle. The belt will spring out of the buckle.
- To release a locked belt, lean back to take the body pressure off of the belt.
- To store a lap-shoulder belt, allow the belt to wind up on the retractor by guiding the belt tongue until the belt comes to a stop.

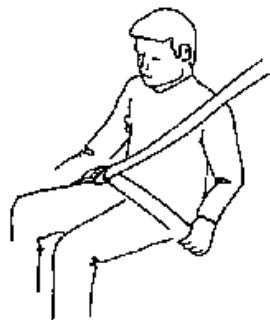
- The lap belt should be worn as low and tight on the hips as possible. Make sure any slack is taken up by the belt mechanism.
- The shoulder belt should fit snugly across your body. It should be positioned midway over the shoulder (that is next to the door); it should never rest against your neck.

Proper Safety Belt Adjustment

Your combination lap-shoulder belt may need adjustment. Adjust safety belts properly.

Safety Restraint Belts

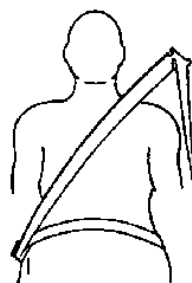
Lap Belt



Correct



Incorrect (too high on hips)

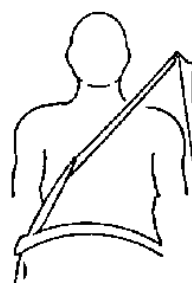


Correct (over arm)

Shoulder Belt



Incorrect (under arm)



Incorrect (twisted)

- Be sure, also, that your belt is not too loose. A loose belt could allow you to slide under it in an accident, and that could bring the belt up around your abdomen.
- Ensure that you do not twist the belt in the process of putting it on. A twisted belt will not work as well to protect you.



WARNING: Always wear your seat belt low over your pelvic bones. Failure to comply may result in personal injury or death.

- You can be injured if your belt is buckled too high. In a crash, it would apply force to your abdomen, not your pelvic bones. This can result in internal injuries.

- Do not drive with your seat belt loose. A too-loose seat belt can allow you to fall too far forward, possibly causing head and neck injuries. You could strike the wheel or the windshield. Adjust your belt so that there is no more than 1 in. (25mm) of slack.



WARNING: Do not wear the shoulder part of belt under your arm or otherwise out of

position. In a crash your body would move too far forward, increasing the chance of head and neck injury. Also, the belt would apply too much force to the ribs, which are not as strong as your shoulder bones, and could cause you to suffer internal injuries. Wear the shoulder belt over your shoulder (see [Safety Restraint Belts on page 1-13](#)). Failure to comply may result in personal injury or death.



WARNING: Do not twist the belt in the process of putting it on. A twisted belt will not work as well to protect you. In a crash, the full width of the belt would not be protecting you. A twisted belt could cut into your body and cause injuries. Straighten the belt before buckling it. If you are unable to wear it without

twisting it, have your dealer or service person repair it as soon as possible. Failure to comply may result in personal injury or death.

Safety Restraint Tips

- Anyone riding in your vehicle should wear a seat belt. A responsible operator sees to it that everyone in the vehicle rides safely and that means with a seat belt.
- Do not strap in more than one person with each belt.
- Do not wear a belt over rigid or breakable objects in or on your clothing, such as eye glasses, pens, keys, etc., as these may cause injury in an accident.
- Several layers of heavy clothing may interfere with proper positioning of belts and reduce the overall effectiveness of the system.
- Keep belt buckles free of any obstruction that may prevent secure locking.
- Damaged or worn belts in the cab or sleeper, subjected to excessive stretch forces from crashes, cuts or tears, or normal wear, must be replaced, they may not protect you if you have an accident.
- If belts show damage to any part of assembly, such as webbing, bindings, buckles or retractors, they must be replaced.
- Do not allow safety belts to become damaged by getting caught in door or seat hardware, or rubbing against sharp objects.
- The belts must be kept clean or the retractors may not work properly.
- Never bleach or dye seat belts: chemicals can weaken them. Do, however, keep them clean by following the care label on the belts. Let them dry completely before allowing them to retract.

- Make sure the belt of the unoccupied passenger seat is fully wound up on its retractor, so that the belt tongue is in its stowed position. This reduces the possibility of the tongue becoming a striking object in case of a sudden stop.
- Do not modify or disassemble the seat belts in your vehicle. They will not be available to keep you and your passengers safe.
- If any seat belt is not working properly, see an authorized Kenworth Dealer for repair or replacement.

Tether Belts

Tether belts are installed on suspension seats. They help secure the seat to the floor to restrain it in case of a sudden stop or an accident.

Fixed Tethers

If your Kenworth T2000 has been equipped with fixed length tethers, no manual adjustment is required. The same inspection and replacement guidelines should be used as stated in [Safety Restraint System - Inspection on page 5-56](#).



WARNING: Do not remove, modify, or replace the tether belt system with a different tether system. A failed or missing tether belt could allow the seat base to fully extend in the event of an accident. Failure to comply may result in personal injury or death.



WARNING: Failure to adjust tether belts properly can cause excessive movement of the seat in an accident. Tether belts should be adjusted so that they are taut

when the seat is in its most upward and forward position. Failure to comply may result in personal injury or death.



WARNING: Before driving or riding in a vehicle, ensure that there is adequate head clearance at maximum upward travel of seat. Shorten the tether belt as necessary to provide adequate head clearance. Injury or death may occur if head clearance is not adequate.

Tether Adjustment

- Make sure that the tether belt is attached to the cab floor and seat frame. It should be routed through the buckle on each side.
- Often the attachments are made using a split-type hook. Make sure both halves of the hook are around the anchor bracket.
- To lengthen the tether, turn the buckle to a right angle to the webbing. Then pull the buckle. To shorten the tether, pull on the strap.

Sleeper Restraint System

For Kenworth T2000 cabs equipped with a sleeper, be sure to use the lower bunk restraint devices. Your vehicle may have belts which either are over the bunk or cover the opening. Of course, you do not need to use a restraint if you sleep in a parked vehicle. But anyone using the sleeper while the truck is in motion should be restrained in a safety device.



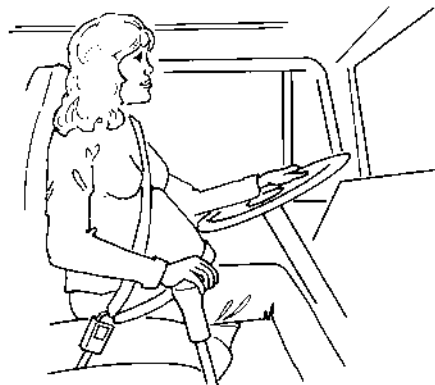
WARNING: Be sure the restraint system is used when anyone is occupying the sleeper while the vehicle is moving. In an accident, an unrestrained person lying in a sleeper bunk could be injured or killed. He or she could be thrown from the bunk.

- Be sure no one ever rides in the upper bunk. That person would be thrown out in an accident and could be injured.

See [Sleeper Bunk on page 4-90](#), for more information.

During Pregnancy

Pregnant women should always wear combination lap/shoulder belts. The lap belt portion must be worn snugly and as low as possible across the pelvis. To avoid pressure on the abdomen, the belt must never pass over the waist. Sometimes pregnant women worry that in a crash the seat belt could hurt the baby. But if a woman wears her belt properly, low over her pelvis, below her abdomen, the belt will not harm the baby, even in a crash. And remember, the best way to keep an unborn baby safe is to keep the mother safe.



Pregnant Woman with Belt Properly Worn

1

Belt Damage and Repair

Damaged belts in the cab must be replaced. Belts that have been stretched, cut, or worn out may not protect you in an accident.

If any seat belt is not working properly, see an Authorized Service Center for repair or replacement.

For further information on seat belts and seat belt maintenance, see [Safety Restraint System - Inspection on page 5-56](#).

START-UP

Introduction

The following section covers start-up procedures for getting your Kenworth T2000 ready for the road.

Door Lock and Keys

Doors can be locked from the inside by using the lock button. Close the door then push the button down to lock. Doors automatically unlock when you open them from inside, and can be locked from the outside with the key only.

As standard equipment, two keys are provided for the doors and ignition. When necessary, additional locks and keys are provided for storage compartments.



WARNING: To lessen the chance and/or severity of personal injury in case of an accident, always lock the doors while driving. Along with using the lap/shoulder belts properly, locking the doors helps prevent occupants from being thrown from the vehicle. Failure to

comply may result in personal injury or death.

To lock or unlock the doors from outside the cab:

- Insert the key in the door lock.
- Turn the key toward the rear door frame to lock; forward to unlock.

Remote Keyless Entry Optional

This vehicle may be equipped with a Remote Keyless Entry (RKE) system that adds security and convenience to your Kenworth truck. The system will lock or unlock the drivers door and passengers door with the key fob and alert you with parking lights when the selected doors are locked or unlocked. The system includes two key fobs that provide secure rolling code technology that prevents someone from recording the entry signal.

FCC ID: L2C0031T IC: 3432A-0031T

FCC ID: L2C0032R IC: 3432A-0032R

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation.



NOTE: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The term "IC:" before the radio certification number only signifies that Industry Canada technical specifications were met.

Operation

To Unlock The Drivers Door

Press the UNLOCK button once. The driver's door will unlock and the parking lights will come on for 40 seconds.

To Unlock The Passengers Door

Press the UNLOCK button once and press again within 5 seconds. The passenger door will unlock.

To Lock Both Doors

Press the LOCK button. The doors will lock and the parking lights will come on for 2 seconds. If the doors are open they will not lock.



NOTE: If this system is retrofit on trucks built before March 2002, doors may lock when open.

The range of the RKE system should be approximately 30 feet. This will be reduced if it is operated close to other RF sources such as TV/radio transmitters and cell towers.

Batteries

The key fob uses one CR2032, 3V battery. Batteries should last approximately three years, depending on use. Consistently reduced range is an indicator that the battery needs replacement. Batteries are available at most discount, hardware and drug stores.

To Replace The Battery

1. Remove rear cover from key fob.
2. Remove the battery.
3. Install new battery.
4. Reinstall cover.
5. Synchronize the key fob.

Synchronization

The key fob may need to be synchronized to the truck when the battery is replaced, or when the key fob has not been used for an extended period time.

To Synchronize A Key Fob

1. Hold the key fob near the glove box.



NOTE: The receiver is located behind the glove box.

2. Press and hold both the Lock and Unlock buttons at the same time for approximately 7 seconds.
 - ° When the key fob is resynchronized the doors will lock, then immediately unlock.
 - ° If the fob fails to synchronize, it could be programmed to a different truck or could have failed.

See [Remote Keyless Entry Programming on page 5-79](#), for programming instructions.

Cab and Frame Access

The following cab and frame entry/exit procedure recommendations were prepared with personal safety foremost in mind.



WARNING: Do not jump out of the cab or get into the cab without proper caution. You could slip or fall, possibly suffering a injury or death. You could slip and fall if the steps are wet or icy, or if you step in fuel, oil, or grease.

To help avoid personal injury due to a slip or fall:

- Always face the vehicle when accessing or leaving the cab or frame access area.
- Use three points of contact (two feet one hand or one foot two hands) to grip the steps or handholds whenever possible and look where you are going.

- Use even more care when steps and handholds (or footwear) are wet, coated with ice, snow, mud, oil, fuel, or grease.



WARNING: Do not step on vehicle components without anti-skid surfaces or use components not designed for entry-and-exit use. You could fall and injure or kill yourself if you step onto a slippery surface. For example:

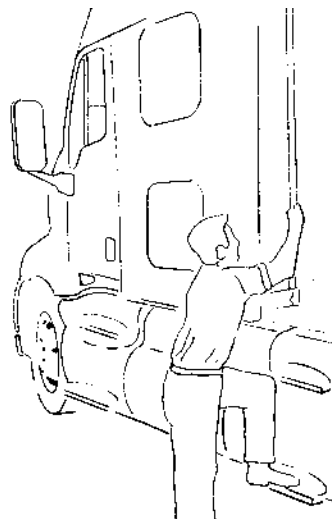
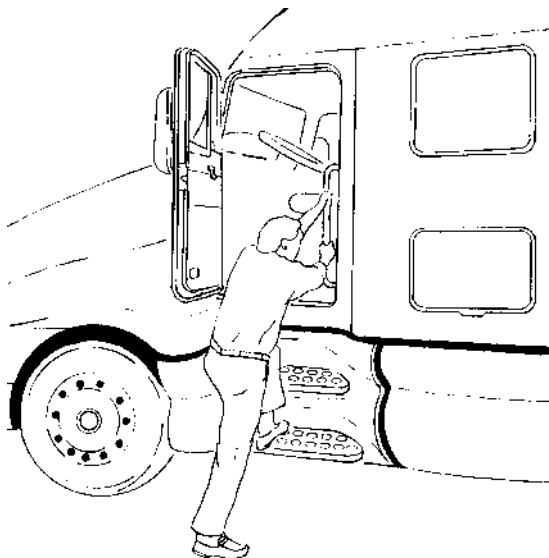
- ***Do not step onto the surface of a fuel tank. A fuel tank is not a step. The tank surface can get very slippery, and you might not be able to prevent a fall. Use only the steps and handholds provided, not chain hooks, quarter fenders, etc.***
- ***Do not climb onto and off the deck plate, use steps and grab handle***

provided. If there is no deck plate, or if proper steps and grab handles are not provided, do

not climb onto the area behind the cab.

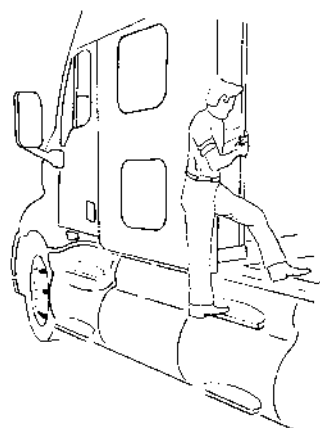
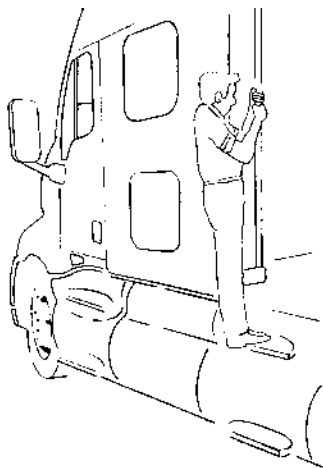
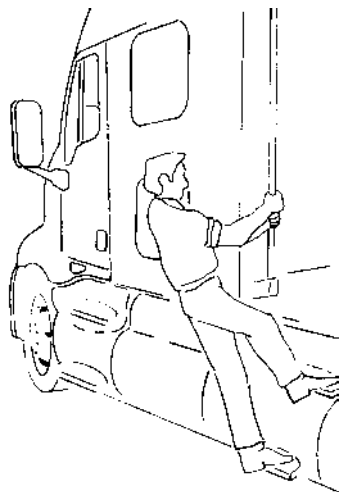
- *Keep steps clean. Clean any fuel, oil, or grease off*

the steps before entering the cab or accessing the deck plate.



Hold handles as you step up on the frame/deck plate.

1



Remember: Hold handle(s) as you step up. Always maintain three points of contact as you access and leave the deck plate area, hands on the grab handle and your feet on the steps.



WARNING: Always reinstall steps before entering the cab or accessing the deck plate. Without steps you could slip and fall. Failure to comply may result in personal injury or death.

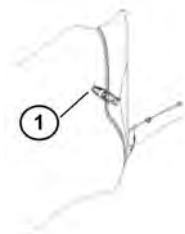


NOTE: Any alteration (adding bulkheads, headache racks, tool boxes, etc.) behind the cab or sleeper that affects the utilization of grab handles, deck plates or frame access steps installed by Kenworth must

comply with Federal Motor Carrier Safety Regulation 399.

Hood Latch and Tilt

The hood is locked in position by two external latches. These latches serve as hold downs and keep the hood from opening unexpectedly.



- 1 Hood Latch: pull out to release

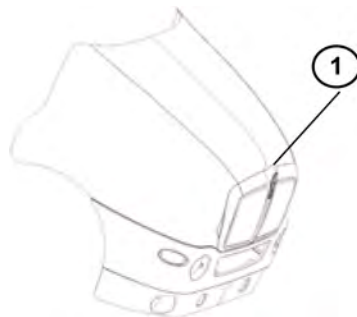


CAUTION: Before opening hood, remove Recovery (Tow) Hitches from frame if installed. Because the bumper and hood are connected and they move together when the hood is

opened, the Vehicle Recovery Hitches must be removed before opening the hood. Failure to comply may result in equipment or property damage.

- If not removed prior to opening hood, the hood/bumper assembly will be damaged. See [Vehicle Recovery Guidelines on page 2-14](#) for details on installing and removing Recovery Hitches.

To open the hood, pull on the KW emblem on the front of the hood. Tilt the hood forward until it stops. The Kenworth T2000 tilt-assist cylinders makes opening the hood easy and does not require you to use your foot on the bumper to create added leverage.



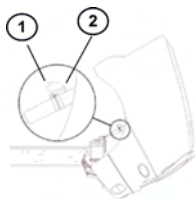
- 1 Pull hood open here.

START-UP

1

Hood Lock

After opening the hood, check to see that the hood is locked open by ensuring that the lock lever on the right hand tilt assist cylinder is lowered as shown, see Locking Hood Open.



Locking Hood Open

- 1 Unlocked (Up) Position
- 2 Locked (Down) Position

With the lever in the down position, the Hood Lock keeps the hood from closing unexpectedly. If the Hood Lock malfunctions, have it repaired by an Authorized Service Center or Kenworth Dealer.

- To close the hood, you must first lift the lever up to UNLOCK the

Hood Lock. After lowering the hood, fasten the Hood Latches on each side of the hood.



WARNING: If the hood falls, anyone under it could be injured or killed. Always lock the hood in its open position any time anyone gets under the hood for any reason.

- Never work under the hood unless the hood is securely locked.
- The hood could hurt someone that is in the way of its descent. Before lowering the hood, be sure no objects or people are in the way.



WARNING: If the hood is not latched securely, it could open during operation and cause an accident. Be sure the hood is latched securely before moving the vehicle.

Failure to comply may result in personal injury, death, or equipment damage.

Safe Vehicle Operation

For your safety, as well as those around you, be a responsible driver:

- If you drink, do not drive.
- Do not drive if you are tired, ill, or under emotional stress.

Much has gone into the manufacturing of your Kenworth T2000, including advanced engineering techniques, rigid quality control, and demanding inspections. These manufacturing processes will be enhanced by you, the safe driver, who observes the following:

- knows and understands how to operate the vehicle and all its controls
- maintains the vehicle properly
- uses driving skills wisely

For more information, refer to Department of Transportation Regulation 392.7, which states that

interstate commercial motor vehicles are not to be driven unless the driver is sure that certain parts and accessories are in working order.



WARNING: Do not drink and drive. Your reflexes, perceptions, and judgment can be affected by even a small amount of alcohol. You could have a serious or even fatal accident, if you drive after drinking. Please do not drink and drive or ride with a driver who has been drinking.

- ***The use of alcohol, drugs, and certain medications will seriously impair perception, reactions, and driving ability. These circumstances can substantially increase the risk of an accident. Failure to comply may result in personal injury or death.***

Vehicle Loading

Compare your vehicle's load capacity with the total load you are carrying. If adjustments need to be made, make them, do not drive an overloaded vehicle. If you are overloaded or your load has shifted, your vehicle may be unsafe to drive.



- WARNING: Do not exceed the specified load rating. Overloading can result in loss of vehicle control, either by causing component failures or by affecting vehicle handling. Exceeding load ratings can also shorten the service life of the vehicle. Failure to comply may result in personal injury or death.***
- **The components of your vehicle are designed to provide satisfactory service if the vehicle is not loaded in excess of either the gross vehicle**

weight rating (GVWR), or the maximum front and rear gross axle weight ratings (GAWRs). (Axle weight ratings are listed on the driver's door edge.)

On the following page are some definitions of weight you should know:

Table 1 Example of Weight Distribution

			
CHASSIS AND TRAILER CAPACITIES (lb./kg)			
	Front Axle	Rear Axle(s)	Trailer Axles
Chassis/ Trailer (unloaded)	9,500 (4,309)	7,000 (3,175)	7,000 (3,175)
Payload	2,500 (1,134)	27,000 (12,247)	27,000 (12,247)
Gross (GAWR)	12,000 (5,443)	34,000 (15,422)	34,000 (15,422)
GCW	80,000 (36,287)		
These weights do not apply to all chassis. True calculations must be made with actual component weight capacities.			

GVWR: is the Gross Vehicle Weight Rating. This is the MAXIMUM WEIGHT your vehicle is allowed to carry, including the weight of the empty vehicle, loading platform, occupants, fuel, and any load. Never exceed the GVWR of your vehicle.

GCW: is the actual combined weight, or Gross Combination Weight (GCW), of your vehicle and its load: tractor, plus trailer(s), plus cargo.

GAWR: is the Gross Axle Weight Rating. This is the total weight that one axle is designed to transmit to the ground. You will find this number listed on the driver's door edge.

Load Distribution: be sure any load you carry is distributed so that no axle has to support more than its GAWR.



WARNING: An unevenly distributed load or a load too heavy over one axle can affect

the braking and handling of your vehicle, which could result in an accident. Even if your load is under the legal limits, be sure it is distributed evenly. Failure to comply may result in personal injury, death, equipment or property damage.

Emergency Equipment

It is good practice to carry an emergency equipment kit in your vehicle. One day, if you have a roadside emergency, you will be glad the following items are with you:

- window scraper
- snow brush
- container or bag
- emergency light
- triangles
- small shovel
- first aid kit
- fire extinguisher
- vehicle recovery hitches (see [Vehicle Recovery Guidelines on page 2-14](#) for details).

Driver's Check List

To keep your Kenworth T2000 in top shape and maintain a high level of safety for you, your passengers, and your load, make a thorough inspection every day before you drive. You will save maintenance time later, and the safety checks could help prevent a serious accident. Please remember, too, that Federal Motor Carrier Safety Regulation 392.7 requires a pre-trip inspection and so do commercial trucking companies.

You are not expected to become a professional mechanic. The purpose of your inspections is to find anything that might interfere with the safe and efficient transportation of yourself, any passengers, and your load. If you do find something wrong and cannot fix it yourself, have an authorized Kenworth Dealer or qualified mechanic repair your vehicle right away.

The following operations are to be performed by the driver. Performing these checks and following the maintenance procedures in this manual will help keep your Kenworth T2000 running properly.

Approaching Your Vehicle

- Check the overall appearance and condition. Are windows, mirrors, and lights clean and unobstructed?
- Check beneath the vehicle. Are there signs of fuel, oil, or water leaks?
- Check for damaged, loose, or missing parts. Are there parts showing signs of excessive wear or lack of lubrication? Have a qualified mechanic examine any questionable items and repair them without delay.
- Check your load. Is it secured properly?

Daily Checks

Engine Compartment Checks - Daily

1. Engine Fluid Levels - add more if necessary.
 - Engine oil
 - Coolant (check while engine is cold)
 - Power steering fluid level
2. Engine Belt - check tension and condition of belts. This is important to ensure proper air compressor and engine operation.
 - Measure the belt tension at the longest span of the belt. See [Accessory Drive Belts on page 5-85](#) for further information on checking belt tension.



NOTE: Deflection should be one belt thickness for each foot distance between the pulley centers.

- If breaks or tears are found, the belt should be replaced before operating the vehicle.

3. Fuel Filter/Water Separator Draining - check and drain. Depending on the fuel storage facility, more frequent draining may be required.
4. Windshield washer reservoir fluid level - fill if necessary.
5. Battery Cables - check the condition of the battery and alternator cables for signs of chafing or rubbing. Make sure that all clamps (straps) holding the cables are present and in good working order.
6. Hood closed before entering cab. Is it latched properly?

Chassis and Cab Checks - Daily

Before entering the cab and operating the vehicle, check the following equipment for proper maintenance:

1. Lights - do headlights, turn signals, emergency flashers, and exterior lamps function and are they clean and adjusted properly?
2. Windows and Mirrors - are they clean and adjusted properly?
3. Tires and Wheels - are they inflated properly? Are all wheel cap nuts in place and torqued properly - tighten if necessary. Check front wheel bearing oil levels. Inspect all tires and wheels for damage - correct if found.
4. Suspension - check for loose or missing fasteners. Check damage to springs or other suspension parts.
5. Brake Components - check lines, linkages, chambers, parking and service brake operation.
6. Air System - are there leaks?
 - Air Tanks - drain water from all air tanks. Make sure the drain cocks are closed. This procedure is also required for

air suspension tanks equipped with automatic drain valves.

- For further details See [Using the Brake System on page 4-29](#).
7. Steps and Handholds - check for worn surfaces and loose or missing fasteners.
 8. Fluid Tanks - check underneath the vehicle for signs of fluid leaks. If any are found, correct before operating the vehicle.
 9. Fuel Tank Caps - are they secure?



WARNING: Diesel fuel in the presence of an ignition source (such as a cigarette) could cause an explosion. A mixture of gasoline or alcohol with diesel fuel increases this risk of explosion. Failure to comply may result in personal injury, death, equipment or property damage.

- **Do not remove a fuel tank cap near an open flame.**
- **Use only the fuel and/or additives recommended for your engine.**
- **See [Refueling on page 4-89](#), for more information.**

10. Trailer Connections (Tractor) - are they secure and the lines clear? If they are not being used, are they stored properly?
 - Is the trailer spare wheel secure and inflated?
 - Is the landing gear up and the handle secured?
11. Check the fifth wheel. Is the kingpin locked?
 - Is the sliding fifth wheel locked?

Cab Interior - Daily

1. Seat - adjust the seat for easy reach of controls.
2. Seat Belts - fasten and adjust safety restraint belts.
3. Sleeper Restraints - check and inspect condition.
4. Steering Column - adjust for easy reach.
5. Mirrors - check and readjust mirrors if necessary.
6. Lights - turn ignition key to the ON position and check for warning lights and buzzer. Check operation of turn signals and emergency lights.
7. Instruments - check all instruments.
8. Windshield - check operation of windshield wipers and washers.
9. Horn - check operation of horn.
10. Sleeper and Luggage Compartment - all loose items stowed securely. Is the fire extinguisher fully charged? Is your

road emergency kit complete?
Compartments closed?

11. Fuel - check fuel. Is there enough fuel?



NOTE: The above items (Engine Compartment, Chassis and Cab, and Prestart Checks) should be checked daily, as a minimum. They are in addition to, not in place of Federal Motor Carrier Safety Regulations. These regulations may be purchased by writing to: Superintendent of Documents U.S. Government Printing Office Washington, DC 20402

Weekly Operations

1. Battery - check battery and terminals.
2. Wheel Cap Nuts - are they all in place and torqued properly - tighten if necessary. See [Wheel Cap Nut Torque on page 5-124](#).
3. Other Controls and Wiring - check for condition and adjustment
4. Steering Components - check pitman arm, draglink, and power steering hoses, etc., for loose, broken, or missing parts.
5. Other Engine Compartment Checks
 - Check condition and fastening of engine belt, hoses, clamps, and radiator.
 - Check the air cleaner, muffler, and exhaust pipes. Are they tight and secure?
 - After Engine Warm-up
 - Automatic Transmission - check fluid level in the

automatic transmission oil (if equipped).

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VEHICLE RECOVERY AND SPRING BRAKES

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WHAT TO DO IF...

You Need Roadside Assistance



Call toll-FREE 1-800-KW-ASSIST (1-800-592-7747) to talk to someone at the PACCAR Customer Center.

- Open 24-7-365 days a year
- They can help you get roadside assistance.
- They have a custom mapping system which locates Kenworth & Peterbilt Dealers and Independent Service Providers (ISPs) near you and lists types of services offered, hours of operation and contact information.
- They can assist with jump and pull starts, tires, trailers, fines and permits, chains, towing, hazardous clean-up, out of fuel (roadside),

mechanical repairs and preventive maintenance services.

- They have bilingual agents and access to a translation service to ensure quality assistance for customers who speak any language.
- They can't answer your warranty questions but can get you in contact with a Kenworth dealer who can.
- The PACCAR Customer Center service is FREE even if you don't drive a Kenworth.

Low Air Alarm Turns On

This alarm sound is active when either the Primary or Secondary Low Air Warning lamp is active and the engine RPM is above 300. This occurs when the primary or secondary air pressure drops below 65 psi, and stays active until it increases above 66.5 psi.



WARNING: If the air pressure falls below 60 psi (414 kPa) the spring brakes may stop the vehicle abruptly, which could cause an accident resulting in personal injury or death. Observe the red warning lamps on the gauges. If one comes on, do not continue to drive the vehicle until it has been properly repaired or serviced.

What you should do:

1. Slow down carefully.
2. Move a safe distance off the road and stop.

3. Place the transmission in neutral (park with automatic transmissions, if equipped) and set the parking brake. (Refer to [Parking Brake Valve on page 3-74](#) and [OPERATING THE TRANSMISSION on page 4-78](#), for transmission shifting and parking brake information.)
4. Turn OFF the engine.
5. Turn ON the emergency flasher and use other warning devices to alert other motorists.

If the light and alarm do not turn off at startup, do not try to drive the vehicle until the problem is found and fixed. (Refer to [USING THE BRAKE SYSTEM on page 4-29](#), for more brake information.)

Stop Engine Lamp Turns On



Stop Engine Lamp - If the Stop Engine warning lamp illuminates, it means you have a serious engine system problem.



WARNING: *This should be considered an emergency. You should stop the vehicle as safely as possible and turn OFF the ignition. The vehicle must be serviced and the problem corrected before driving again. Failure to do so may cause severe engine or DPF damage, or cause an accident which may result in personal injury or death*

Engine Oil Pressure Lamp Turns On



Engine Oil Pressure Gauge - It is important to maintain oil pressure within acceptable limits. If oil pressure drops below the minimum psi a Red Warning Lamp on the oil pressure gauge and the Stop Engine Lamp will come ON.



CAUTION: *Continuing to operate your vehicle with insufficient oil pressure may cause severe engine damage or cause an accident which may result in equipment or property damage.*

- *If the oil pressure fails to rise within 10 seconds after the engine starts, stop the engine and determine the cause.*
- *Check the engine manufacturer's manual*

for the correct oil pressure ranges for your vehicle's engine.

- *If the oil pressure suddenly drops, or the audible alarm and engine oil pressure warning light come on while driving, do the following:*
 1. *Slow down carefully.*
 2. *Move a safe distance off the road and stop.*
 3. *Place the transmission in park and set the parking brake. (See [Parking Brake Valve on page 3-74](#) and [OPERATING THE TRANSMISSION on page 4-78](#), for transmission shifting and parking brake information.)*
 4. *Turn OFF the engine.*
 5. *Turn ON the emergency flasher and use other*

warning devices to alert other motorists.

6. *Wait a few minutes to allow oil to drain into the engine oil pan, and then check the oil level. (See [Oil Level Check on page 5-83](#), for details on checking oil level.)*
7. *Add oil if necessary. If the problem persists, contact an authorized Kenworth dealer as soon as possible.*

Check Engine Lamp Turns On



Check Engine Lamp - Turns on when a problem exists, but the vehicle can still be safely driven. Vehicle should be serviced to correct the problem but the situation should not be considered an emergency.

Engine is Overheating

The cooling system may overheat if the coolant level is below normal or if there is sudden loss of coolant, such as a split hose. The system may also temporarily overheat during severe operating conditions such as:

- Climbing a long hill on a hot day
- Stopping after high-speed driving

If either one of the above occurs, **DO NOT TURN OFF THE ENGINE** unless:

a) the Low Water warning device indicates a loss of coolant, **b)** the Red Warning lamp (on the gauge) and Check Engine lamp comes ON, **c)** the Buzzer sounds showing an overheat condition, or **d)** if you have any other reason to suspect the engine may be overheating - follow these steps.

1. Reduce engine speed and stop. When stopped, place the transmission in Neutral and set the parking brake. (See [Parking Brake Valve on page](#)

[3-74](#) and [OPERATING THE TRANSMISSION on page 4-78](#), for transmission shifting and parking brake information.) Keep the engine running.

2. Check to ensure the Oil Pressure Gauge reads normal. (See the [“Engine Oil Pressure Gauge,” on page 3-49](#), for further information.)
3. Make sure the engine fan is turning by switching the Engine Fan Switch from AUTO to MAN (Manual).
4. Increase the engine speed to about one-half of full operating speed, or 1,100 to 1,200 rpm, maximum.
5. Return the engine speed to normal idle after 2 or 3 minutes.
6. Monitor the engine temperature. After the temperature returns to normal, allow the engine to idle 3 to 5 minutes before shutting it off. This allows the engine to cool gradually and uniformly.

7. If overheating came from severe operating conditions, the temperature should have cooled by this time. If it has not, stop the engine and let it cool before checking to see if the coolant is low.

For further information on engine temperature and operating engines properly, see the Engine Operation and Maintenance Manual and “Operating the Engine,” page 101. Check the coolant level after each trip when the engine has cooled. The coolant level should be visible within the sight gauge (glass level indicator) on the surge tank—add coolant if necessary. See [Topping Up on page 5-63](#), for instructions on checking and filling the coolant expansion tank.



WARNING: To reduce the chance of personal injury, vehicle damage and/or

death from overheated engines, which can result in a fire, never leave the engine idling without an alert driver present. If the engine should overheat, as indicated by the engine coolant temperature light, immediate action is required to correct the condition. Continued unattended operation of the engine, even for a short time, may result in serious engine damage or a fire.



WARNING: Do not remove the radiator fill cap while the engine is hot. Scalding steam and fluid under pressure may escape. You could be badly burned. Failure to comply may result in personal injury or death.

- **Wait until the coolant temperature is below 122° F (50° C).**

- **Protect face, hands, and arms by covering the cap with a large, thick rag to protect against escaping fluid and steam.**
- **Carefully and slowly turn the cap one-quarter of a turn or until it reaches the first stop—allowing excess pressure to escape—push down and turn for final removal.**

Fuse or Relay Blows

Fuses and relays are located in the Central Electrical Panel and the following:

- Mega Fuse (150 A): in battery box
- Maxi Fuse (for Clean Power): in battery box
- Starter Relay: in cab
- Fuse Panel: behind glovebox

Fuse Inspection And Replacement



WARNING: Do not replace a fuse with a fuse of a higher rating. Doing so may damage the electrical system and cause a fire. Failure to comply may result in personal injury, death, equipment or property damage.



CAUTION: Before replacing a fuse, turn OFF all lights and accessories and remove the ignition key to avoid damaging the electrical system.



CAUTION: Never patch fuses with tin foil or wire. This may cause serious damage elsewhere in the electrical circuit, and it may cause a fire.



CAUTION: If a circuit keeps blowing fuses, have the electrical system inspected for a short circuit or overload by an authorized Kenworth dealer as soon as possible. Failure to do so could cause serious damage to the electrical system and/or vehicle.



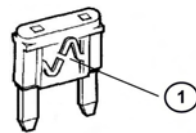
NOTE: If a fuse of the same rating is not available, a fuse of a lower rating may be temporarily substituted. You can also use a fuse from a circuit you can do temporarily without (for example an accessory circuit or radio).

See the Kenworth Shop Manual for instructions on fuse replacement.

All the electrical circuits have fuses to protect them from a short circuit or overload. If something electrical on your chassis stops working, the first

thing you should check for is a blown fuse.

1. Turn OFF all lights and accessories and remove the ignition key to avoid damaging the electrical system.
2. Determine from the chart on the fuse panel which fuse controls that component.
3. Remove that fuse and see if it is blown.



1 Blown

If it is blown, replace it with a fuse of the same rating.



CAUTION: When replacing a failed circuit breaker, always use a Kenworth approved circuit breaker with a current

rating equal to or less than the circuit breaker being replaced. Kenworth only approves the use of Type II modified reset circuit breakers. NEVER use a Type I (automatic reset) or Type III (manual reset) circuit breaker. A fuse with a current rating equal to or less than the circuit breaker being replaced can also be used.

JUMP STARTING VEHICLES

Jump Starting Vehicles

Because of the various battery installations and optional electrical systems, Kenworth does not recommend that you attempt to jump start your vehicle. If you have a battery problem, it is best to contact a Kenworth Dealer or a reputable towing service.

However, if your battery is discharged (dead), you may be able to start it by using energy from a good battery in another vehicle. This is termed jump starting. Be sure to follow the precautions and instructions below.



WARNING: Batteries contain acid that can burn and gasses that can explode. Ignoring safety procedures may result in personal injury,

death, equipment or property damage.



WARNING: Never jump start a battery near fire, flames, or electrical sparks. Batteries generate explosive gases that could explode. Keep sparks, flame, and lighted cigarettes away from batteries. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Never remove or tamper with battery caps. Ignoring this could allow battery acid to contact eyes, skin, fabrics, or painted surfaces. Failure to comply may result in personal injury, death, equipment or property damage.

- Be careful that metal tools (or any metal in contact with the

positive terminal) do not contact the positive battery terminal and any other metal on the vehicle at the same time. Remove metal jewelry and avoid leaning over the battery.

- If metal jewelry or other metal comes in contact with electrical circuits, a short circuit may occur causing you to be injured, as well as electrical system failure and damage to the vehicle.

To Jump Start Your Vehicle



WARNING: *The voltage of the booster battery must have a 12 volt rating and the capacity of the booster battery should not be lower than that of the discharged battery. Use of batteries of different voltage or substantially different capacity rating may cause an explosion. Failure to comply may result in personal injury, death, equipment or property damage.*



CAUTION: *Applying a higher voltage booster battery will cause expensive damage to sensitive electronic components, such as relays, and the radio. Failure to comply may result in equipment damage.*

- Improper hook-up of jumper cables or not following these

procedures can damage the alternator or cause serious damage to both vehicles.



WARNING: *To avoid personal injury and damage to the vehicle, heed all warnings and instructions of the jumper cable manufacturer.*

- The jumper cables must be long enough so that the vehicles do not touch.

Preparing the vehicles:

1. Position the two vehicles together, but do not allow them to touch.
2. Turn OFF all lights, heater, radio, and any other accessory on both vehicles.
3. Set the parking brakes: pull out the Yellow button located on the dash.
4. Shift the transmission into park position or neutral for manual transmissions. (See [OPERATING THE TRANSMISSION](#) on page 4-78 and [Parking Brake Valve](#) on page 3-74, for transmission shifting and parking brake information.)
5. If either vehicle is equipped with battery disconnects ensure they are in the "OFF" position prior to connecting the two vehicles.

Connect the batteries:

1. Attach one end of a jumper cable to the **positive (+)** terminal of the discharged (dead) battery. This will have a large **red +** or **P** on the battery case, post, or clamp.
2. Attach the other end of the same cable to the **positive (+)** terminal of the good (booster) battery.
3. Attach the remaining jumper cable **FIRST** to the **negative (-)** terminal (**black or N**) of the good battery.
4. Attach the other end of the negative cable to a bare metal part not bolted to the engine block.

IMPORTANT: Always connect positive (+) to positive (+) and negative (-) to negative (-).

5. If either vehicle is equipped with battery disconnects, ensure that they are in the **"ON"** position.
6. Start the engine:
 - Start the vehicle that has the good battery first. Let it run for 5 minutes.

- Then start the vehicle that has the discharged (dead) battery. If the engine fails to start, do not continue to crank the starter but contact the nearest authorized Kenworth Dealer.

Remove jumper cables:



WARNING: When *disconnecting jumper cables, make sure they do not get caught in any moving parts in the engine compartment. You could be injured.*

- Reverse the above procedure exactly when removing the jumper cables. With engine running, disconnect jumper cables from both vehicles in the exact reverse order (Steps 4-1), making sure to first remove the negative cable from the vehicle with the discharged battery.

VEHICLE RECOVERY AND SPRING BRAKES

Vehicle Recovery And Spring Brakes

Your Kenworth T2000 is equipped with removable Recovery Hitches, designed for short distance recovery purposes only. Use only the provided hitches, according the following instructions. When using this connection, do not transport your vehicle over long distances. (If your vehicle does not have the proper hitches, contact your Kenworth Dealer.)

If your vehicle must be recovered, disconnect the driveline at the rear U-joint, and remove or support the rearmost section of the driveline. This is necessary because if the transmission is driven by the driveshaft (rear wheels on the ground), no lubricant will reach the gears and

bearings, causing damage to the transmission.



CAUTION: Remove the driveline and axle shafts or lift the driving wheels off the ground before towing the vehicle. See [Driver Controlled Main Differential Lock on page 4-68](#). All lubricating and clutch application oil pressure is provided by an engine-driven pump, which will not work when the engine is stopped. You could seriously damage your vehicle by towing it with the driveline connected and the drive wheels on the ground.

Worse, when vehicles are towed, either by wrecker or piggyback, the lubricant in the top front of the drive axle will drain to the rear. This will leave the top components dry. The resulting friction may damage them.

Always remove the main driveshaft and axle shafts before towing your vehicle.



NOTE: For additional information concerning heavy duty truck recovery, see *Truck Maintenance Council Recommended Practice #602-A Front Towing Devices For Trucks and Tractors, Recommended Practice #602-B Recovery Attachment Points For Trucks, Tractors, and Combination Vehicles Recommended Practice #626 Heavy Duty Truck Towing Procedures*.

Copies of these can be obtained from the following address:

The Maintenance Council
American Trucking Association Inc.
2200 Mill Rd. Alexandria, VA 22314
(703) 838-1763

Vehicle Recovery Guidelines

To prevent possible damage:

2



CAUTION: Because the bumper and hood are connected and they move together when the hood is opened, the hood must be closed to install Recovery Hitches and cannot be opened with hitches in place. If recovery hitches are not removed prior to opening hood, the bumper/hood assembly will be damaged.

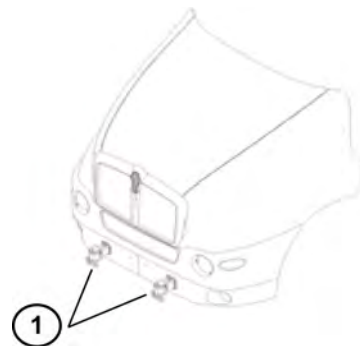
- Use proper towing equipment to prevent damage to the vehicle.



CAUTION: Connect only to the Recovery Hitches, see [Vehicle Recovery Guidelines on page 2-14](#). Connections to other structural parts

could damage the vehicle. Do not attach to bumpers or brackets. Use only equipment designed for this purpose. Failure to comply may result in equipment damage.

- See the following references:
 - [Recovery Hitch Capacities on page 2-16](#).
 - [Recovery Rigging on page 2-17](#).
 - [Driver Controlled Main Differential Lock on page 4-68](#).
- Use a safety chain system.
- Disconnect driveline.
- Follow state/provincial and local laws that apply to vehicles in tow.
- Do not tow vehicles at speeds in excess of 55 mph (90 km/h).



- 1 Recovery Hitch Assemblies
 - Hood must be closed to install hitches.
 - Remove hitches before opening hood.

Recovery Hitch Connection

Specially designed hitches are required to recover your Kenworth T2000. The recovery hitches attach to the frame with a special bolt and nut. The nut is permanently installed in the front frame bracket, so no separate nuts are required to attach the hitch. See [Recovery Hitch Assembly on page 2-15](#).

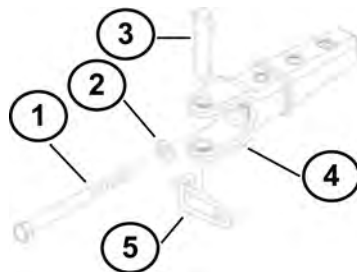
Two hitch assemblies, made up of the following parts, are required for the proper recovery of your vehicle: hitch, hitch bolt, washer, clevis pin, and safety pin. The hitch, bolt, and clevis pins are specifically designed for the Kenworth T2000 and should not be substituted. When installed properly, the hitch and clevis pin provide a secure connection for recovery purposes only.



WARNING: Do not use parts from other trucks or sources to repair or replace the hitch

assembly. When recovering vehicle, if the wrong parts are used, breakage may occur causing injury or damage to your vehicle. The hitch, bolt, and clevis pin are made of high-strength steel designed for vehicle recovery, use only the parts provided.

- If your vehicle is not equipped with the proper recovery hitch assembly, contact an authorized Kenworth Dealer to obtain the proper equipment.
- The recovery hitch assemblies are typically stored on or near the left frame access steps. Optional locations may be used depending on vehicle configurations.
- A securing nut can be used to secure hitch in storage position, but is not required for installation.



Recovery Hitch Assembly

- | | |
|---|--|
| 1 | Hitch Bolt |
| 2 | Hard Washer |
| 3 | Clevis Pin: made of high-strength steel. Do not use pins from other trucks or sources. |
| 4 | Hitch Casting |
| 5 | Safety Pin |

Hitch Installation

Use the following procedure to install the Vehicle Recovery Hitches.

1. Check square sockets behind lower bumper for obstructions, clear if necessary.
2. Close hood if open. With clevis pins removed, insert hitches through bumper and into frame socket.
3. Install Hitch Bolt (7/8-9 UNC x 12-" Grade 8) and washer into permanent nut.
4. Tighten Hitch Bolt to 50-100 lb-ft. (68-136 Nm.) torque. The Hitch Bolt requires a 1-5/16" socket wrench (the same size as wheel nuts for hub-piloted wheels).
5. Reinstall Clevis and Safety Pins.
6. After recovered vehicle reaches destination, remove hitches and store all parts in the space provided: near the rear frame

access, left side. (Optional locations may be used.)

7. Be sure to remove hitches before opening the hood.

Recovery Hitch Capacities

The maximum rated loads for vehicle recovery varies depending on the direction or angle of pull. These capacities are listed in the table below and are for the two hitches working together, simultaneously.

Table 2 Hitch Capacities

DIRECTION OF PULL	MAXIMUM CAPACITY (LB.) *
Directly Forward	80,000
Directly Vertical or Horizontally to the Side	14,600
45 in any Direction	20,000
* Both hitches pulled simultaneously.	



CAUTION: Recovery pull maximums assume the tow rigging evenly distributes the load between both recovery hitches. See examples in Recovery Rigging for details.

Serious damage to the vehicle may occur if rigging is not connected properly.

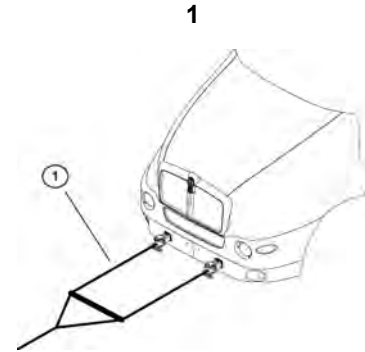


CAUTION: When recovering ditched or bogged vehicles, stay well below Maximum Capacities. Even at loads below maximum, the physical strain of recovering a vehicle could damage axles, suspensions, fifth wheels, etc.

Recovery Rigging

To connect to the Kenworth T2000, follow the suggested rigging methods below.

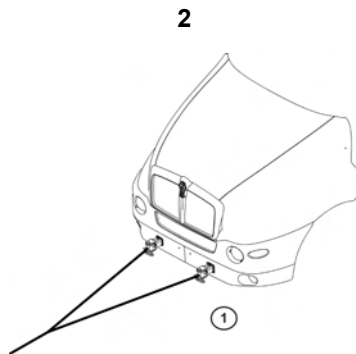
- Use a double chain or cable setup that distributes the load equally to both hitches. See 1 or 2 in Recovery Rigging.
- Never loop a single chain or cable through both hitches (3).
- Use a spreader or equalizer bar to distribute the load on both hitches (1).
- If no spreader bar is available, connect the main tow chain or cable no closer than 6 ft. from the vehicle (2).



PREFERRED

1 Spreader Bar or Equalizer

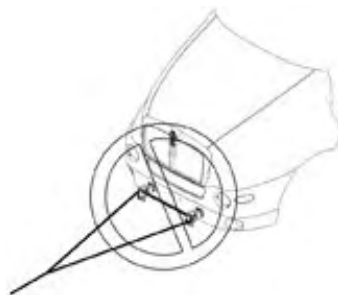
2



ACCEPTABLE

1 Minimum 6 FT.

3



NEVER

Returning Vehicle to Service

You will have to add lubricant to prevent damage after your vehicle has been towed.

1. Into the pinion cage, add 1 pint (.47 liter) of lubricant.
2. Into the inter-axle differential, add 2 pints (.94 liter) of approved lubricant.
3. [See Rear Axle Lubrication on page 5-112.](#)
4. After adding the specified type and amount of lubricant, drive the vehicle. It should be unloaded. Drive 1 to 2 miles (1.5 to 3 km) at a speed lower than 25 mph (40 km/h). This will thoroughly circulate the lubricant through the assembly.

Spring Brakes - Manual Release

In order to tow a vehicle, if there is insufficient air to release the parking brake, the spring brakes can be manually released.



WARNING: Do not drive vehicle with malfunctioning brakes. If one of the brake circuits should become inoperative, braking distances will increase substantially and handling characteristics while braking will be affected. You could lose control of your vehicle or cause an accident. Have it towed to the nearest dealer or qualified repair facility for repair. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Do not disassemble a spring brake chamber. These chambers contain a powerful spring that is compressed. Sudden release of this spring may result in personal injury or death.

- Do not operate a vehicle when the spring brakes have been manually released. Driving a vehicle after its spring brakes are manually released is extremely dangerous. The brakes may not function. Failure

to comply may result in personal injury, death, equipment or property damage.

- *Releasing the spring brakes on an unsecured vehicle could lead to an accident. The vehicle could roll, which may result in personal injury, death, equipment or property damage. Always secure the vehicle with wheel chocks, chains, or other safe means to prevent rolling before manually releasing the spring brakes.*

To move a vehicle immobilized by the spring brakes due to loss of air pressure in the brake system, perform the following procedure:

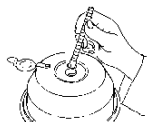
VEHICLE RECOVERY AND SPRING BRAKES

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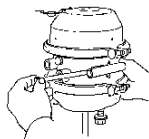
2



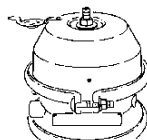
1. Remove the cap from the spring chamber.



2. Remove the release stud assembly from the side pocket, and remove the release nut and washer from the release stud.

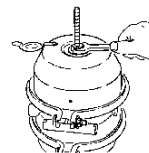


3. Slide out the release stud.



4. Insert the release stud through the opening in the spring chamber where the cap was removed. Insert it into the pressure plate. Turn the release stud 1/4 turn clockwise in the pressure plate. This secures the cross pin into the cross pin area of the pressure plate and locks it into the manual release position.

5. Assemble the release stud washer and nut on the release stud.



6. With a wrench, turn the release stud assembly nut until the compression spring is 90-95 percent caged. While doing this, check to make sure the push rod (adapter push rod or service push rod) is retracting. Do not over-torque the release stud assembly. (S-Cam type maximum: 50 ft-lb, Wedge type maximum: 30 ft-lb.) The spring brake is now mechanically released.

Freeing the Vehicle from Sand, Mud, Snow and Ice

If the vehicle gets stuck in sand, mud, snow, or ice:

- Move the gearshift lever or selector from First to Reverse.
- Apply light pressure on the accelerator pedal while the transmission is in gear.
- Remove your foot from the accelerator while shifting.
- Do not race the engine.
- For best traction and safety, avoid spinning the wheels.



WARNING: Do not spin the wheels faster than 35 mph (55 km/h). Spinning a tire at speedometer readings faster than 35 mph (55km/h) can be dangerous. Tires can explode from spinning too fast. Under some conditions, a tire may be spinning at a speed twice that shown on the

speedometer. Any resulting tire explosion could cause injury or death to a bystander or passenger, as well as extensive vehicle damage: including tire, transmission and/or rear axle malfunction.

Comply with the following instructions to avoid transmission damage:

- Always start vehicle in motion with the shift lever in first gear.
- Be sure that transmission is fully engaged in gear before releasing the clutch pedal (manual only).
- Do not shift into reverse while the vehicle is moving.
- Do not permit the vehicle to be towed for long distances without removing the driveshaft.

Tire Chains

If you need tire chains, install them on both sides of the driving axle.



CAUTION: Chains on the tires of only one tandem axle can damage the driveline U-joints and the interaxle differential. Repairs could be costly and time-consuming. Failure to comply may result in equipment damage.

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ACCESSORIES

Radio

As an option, your vehicle has either an AM/FM Stereo Receiver or AM/FM Stereo with Cassette Player or CD.

For instructions on how to operate your particular radio, see the manufacturer's Radio Operating Instructions.

Cigarette Lighter



NOTE: *The cigarette lighter will operate with the ignition key in either the OFF, ACC (accessory), or ON position.*

To operate, push in on the knob end of the lighter. After a few moments, the lighter will automatically pop out, glowing hot and ready to use. After use, insert the lighter back into the socket without pushing all the way in.

The socket of the cigarette lighter may be used to operate 12 volt, 15 ampere appliances, such as a hand spotlight or small vacuum cleaner.



WARNING: *Do not exceed the voltage/ampere capacity of the cigarette lighter. It could result in a fire. Follow all warnings and instructions in the operator's manual for the appliance you are using. Failure to comply*

may result in personal injury, death, equipment or property damage.

Ashtray

To open, pull on the upper side of the panel. To close, push against the panel.



WARNING: Do not place paper or other combustible substances in an ashtray, it could cause a fire. Keep all burnable materials, besides smoking materials, out of the ashtray. Failure to comply may result in personal injury, death, equipment or property damage.

Air Operated Horns

Your Kenworth T2000 is equipped with air horns. To operate, pull on the lanyard extending from the overhead header panel. Your vehicle may also have an electric horn.

Cab Storage

Glove Compartment

A glove compartment is provided to store important documents, the vehicle literature set (including this Operator's Manual) and other related materials. It is accessed by pushing the knob on the front.

To close, push the cover up and press to latch it.



WARNING: Do not drive with the glove compartment open, it can be dangerous. In an accident or sudden stop, you or a passenger could be thrown against the cover and be injured. To reduce the risk of personal injury during an accident or sudden stop, keep the glove compartment closed when the vehicle is in motion.

Interior Compartments

You can choose from a variety of interior storage options to store your personal supplies or small tools:

- center console
- map pocket
- overhead storage compartments
- records holder, behind seat



WARNING: *Do not carry loose objects in your cab, it can be dangerous. In a sudden stop, or even going over a bump in the road, they could fly through the air and strike you or a passenger. You could be injured or even killed. Secure all loose objects in the cab before moving the vehicle. Carry any heavy objects such as luggage in the exterior storage compartment and close it securely.*

Appliances

If your Kenworth T2000 is equipped with a television, refrigerator, or other appliance, be sure they are compatible with your vehicle's electrical system. And secure them in the cab so they cannot come loose in a sudden stop.



WARNING: *In a sudden stop or collision a heavy object in your cab could strike you or anyone with you. You could be injured or even killed. Secure any appliance (such as a refrigerator, radio, or TV) you add to your cab.*

HEATING AND AIR CONDITIONING

Introduction

Your Kenworth T2000 heating and air conditioning system is controlled from two control units, the Cab Control unit and the Sleeper Control unit. Each control maintains separate temperature settings, one for the cab and another for the sleeper.

Precautions



WARNING: Do not drive with visibility reduced by fog, condensation, or frost on the windshield. Your view may be obscured, which may result in personal injury, death, equipment or property damage. For clear visibility and safe driving it is extremely important for you to follow the instructions pertaining to the function and use of the ventilation/heating and defogging/defrosting system. If in doubt, consult your dealer. Maximum heating output and fast defrosting can be obtained only after the engine has reached operating temperature.



WARNING: The air conditioning system is under pressure. If not serviced

properly, it could explode and may result in personal injury, death or property damage to your vehicle. Any servicing that requires depressurizing and recharging the air conditioning system must be conducted by a qualified technician with the right facilities to do the job.



WARNING: Excessive heat may cause the pressurized components of the air conditioning system to explode. Never weld, solder, steam clean, or use a blow torch near any part of the air conditioning system. Failure to comply may result in personal injury, death, equipment or property damage.

- If a refrigerant leak develops in the presence of excessive heat or an open flame, hazardous

gases may be generated. These gases may cause unconsciousness or death. If you become aware of a refrigerant leak on your vehicle have your system serviced immediately and observe the following precautions:

- Stay away from the hot engine until the exhaust manifold has cooled.
- Do not permit any open flame in the area. Even a match or a cigarette lighter may generate a hazardous quantity of poisonous gas.
- Do not smoke in the area. Inhaling gaseous refrigerant through a cigarette may cause violent illness.



WARNING: Exhaust fumes from the engine contain carbon monoxide, a colorless and odorless gas. Do not breathe the engine exhaust



gas. A poorly maintained, damaged or corroded exhaust system can allow carbon monoxide to enter the cab or sleeper. Entry of carbon monoxide into the cab is also possible from other vehicles nearby. Failure to properly maintain your vehicle could cause carbon monoxide to enter the cab/sleeper, resulting in illness or death.

WARNING: Never idle your vehicle for prolonged periods of time if you sense that exhaust fumes are entering the cab or sleeper. Investigate the cause of the fumes and correct it as soon as possible. If the vehicle must be driven under these conditions, drive only with the windows open. Failure to repair the source of the exhaust fumes may result in personal injury,



NOTE: Keep the engine exhaust system and the vehicles cab/sleeper ventilation system properly maintained. It is recommended that the vehicles exhaust system and cab/sleeper be inspected:

- By a competent technician every 15,000 miles
- Whenever a change is noticed in the sound of the exhaust system
- Whenever the exhaust system, underbody, cab or sleeper is damaged



NOTE: To allow for proper operation of the vehicle ventilation system, keep the inlet grille at the base of the windshield clear of snow, ice, leaves and other obstructions at all times.



CAUTION: Do not stay in the vehicle with the engine running or idling for more than 10 minutes with the vehicle's Heater and A/C ventilation system in **RECIRC** or at **LOW FAN SPEED**. Even with the ventilation system on, running the engine while parked or stopped for prolonged periods of time is not recommended.



NOTE: When idling for short periods of time:

- Set the heating or cooling system to Heat or A/C
- Set the fan to Medium or High speed



Set the controls to FRESH AIR



NOTE: If you are required to idle your vehicle for long periods of time, install an auxiliary heater

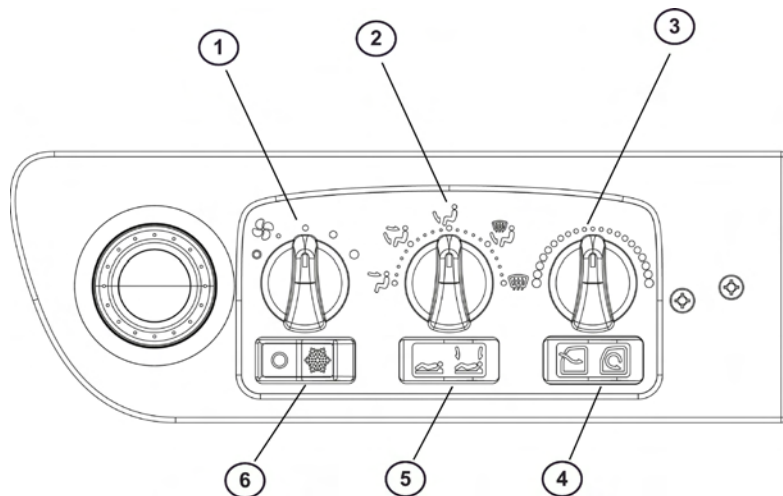
or automatic idle control. These auxiliary devices can reduce fuel consumption and save you money.



NOTE: If you are parked next to idling vehicles, move your vehicle or do not stay in your vehicle for prolonged periods of time.

Cab Controls

The Cab Heater - A/C Controls regulate cab temperature independently of the sleeper.



Cab Heater - A/C Controls

- 1 Fan
- 2 Air Flow
- 3 Temperature
- 4 Fresh Air/Recirculate
- 5 Sleeper Control
- 6 Air Conditioner

What Each Control Does



Fan Control Dial

Turning this dial clockwise from the OFF position turns the fan ON and increases the fan speed.

Air Flow Control Dial

This dial directs the air flow through 5 primary sets of vents:



Dash Vents



Dash and Floor Vents



Floor Vents



Floor and *Defrost Vents



*Defrost Vents

*Fresh air and air conditioning are automatically turned ON. As the dial is turned away from a primary position, the system directs an increasing amount of air flow towards the next primary position.

3

Temperature Control Dial

Turn this dial clockwise for heat, counterclockwise for cool.



Air Conditioner Switch

This switch turns the air conditioner On and Off.



NOTE: Fan Control Dial must also be in the ON position for A/C to be on.



Fresh Air/Recirculation Switch

This switch controls the source of the air flowing into the heater and air conditioner unit



Fresh Air mode = Air comes from outside the cab.



Recirculation mode = Air comes from inside the cab.

How To Use The System

The engine must be running for the heater and air conditioner to generate hot and cold air.

To Cool

There are 2 ways to cool:

a) using cool outside air

b) using air conditioning

a) Outside air is cooler than the inside air:

1.) Push the Fresh Air/Recirculation Switch



to the Fresh Air mode.

2.) Turn ON the Fan Control Dial



to the desired fan speed.

3.) Turn the Air Flow Control Dial



to Dash Vents.

b) To cool using air conditioning:

1.) Turn ON the Air Conditioning Switch.



2.) Push the Fresh Air/Recirculate Switch



to the Fresh Air mode.

3.) Turn ON the Fan Control Dial



to the desired fan speed.

4.) Turn the Air Flow Control Dial



to Dash Vents.

5.) Adjust the Temperature Control Dial counterclockwise until the air temperature feels comfortable.

To Heat

1.) Turn ON the Fan Control Dial



to the desired fan speed.

2.) Turn the Air Flow Control Dial



to Floor Vents.

3.) Adjust the Temperature Control Dial clockwise until the air temperature feels comfortable.

To Dehumidify

1.) Push the Fresh Air/Recirculate Switch  to the Fresh Air mode.

2.) Turn ON the Air Conditioning Switch.



3.) Turn ON the Fan Control Dial  to the desired fan speed.

4.) Adjust the Temperature Control Dial until the air temperature feels comfortable.

The air conditioner removes moisture from the air while the heater heats the air.

To Defog and Defrost the Windshield

1.) Turn the Fan Control Dial  clockwise to the highest fan speed.

2.) Turn the Air Flow Control Dial  to Defrost Vents.

Fresh air and air conditioning are automatically turned ON.

3.) Adjust the Temperature Control Dial clockwise to full heat.



CAUTION: During extreme cold weather, do not blow hot defroster air onto cold windshields. This could crack the glass. Turn the Air Flow Control Dial to Defrost and adjust the fan speed accordingly while the engine warms. If the engine is already warm, move the Temperature Control Dial to cool, then gradually increase the temperature when you see that the windshield is starting to warm up. Failure to comply may result in equipment damage.

Sleeper Heater - A/C Controls

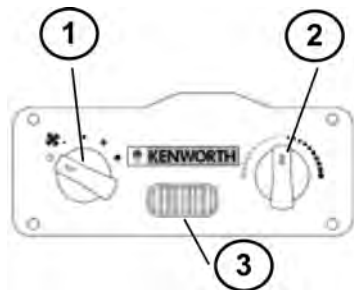
 **NOTE:** On the Cab Control Unit, the Sleeper Control Switch



must be pressed to turn ON power to the Sleeper Control Unit. In addition, if air conditioning is requested in the sleeper, The Fan Control Dial



on the Cab Control Unit must be in one of the ON positions and the air conditioner switch must be turned ON.



Sleeper Control Unit

- 1 Fan
- 2 Temperature
- 3 Temperature Sensor

What Each Control Does



Fan Control Dial

Turning this dial clockwise from the O OFF position turns the fan ON and increases the fan speed.

Temperature Control Dial

The temperature for the sleeper is controlled automatically. The Temperature Control Dial is not keyed to specific temperatures. Turning this dial counterclockwise means cooler than it is now. Clockwise means warmer than it is now. Once the desired temperature is reached, the system will maintain it automatically.

For air conditioning, on the Cab Control Unit, turn ON the Sleeper Control Switch,



turn ON the air conditioning Switch



and turn ON the Fan Control Dial



to one of the ON positions.

Temperature Sensor

This sensor compares the temperature in the sleeper to the temperature that has been requested on the Sleeper Temperature Control Dial.

Do not block the Temperature Sensor. See [Sleeper Heater - A/C Controls on page 3-13](#).

Allow time for the system to adjust sleeper air temperature before resetting the Temperature Control Dial.

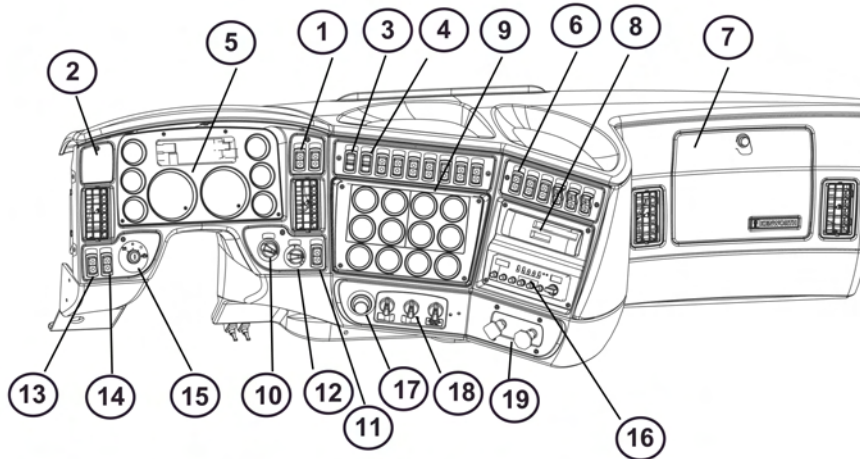
INSTRUMENTATION

Introduction

This section explains the location and function of the various instruments and controls on your vehicle.

The Instrument Panel

Please remember that each Kenworth is custom made. Your instrument panel may not look exactly like the one in the illustration below. Described below are the most common instruments and controls available.



- 1 Fuel Heater Switch
- 2 Indicator Module (optional without Airbag; standard with Airbag/SRS system)
- 3 Headlight Switch
- 4 Marker Light Switch
- 5 A-Panel
- 6 Regeneration Switch
- 7 Central Electrical Panel (CEP) (located below glove compartment)
- 8 Optional Radio
- 9 B-Panel
- 10 Dimmer Switch
- 11 Engine Fan
- 12 Wiper Switch
- 13 Dome Light Switch
- 14 Flood Lamp Switch
- 15 Ignition Key Switch
- 16 Optional CB Radio
- 17 Menu Control Switch
- 18 Heater - Air Conditioner Control
- 19 Combination Tractor/Trailer Brake Control Valves

PTO Dash Mounted Air Switch Operation

Your Kenworth vehicle may be equipped with a dash mounted air switch that controls PTO engagement/disengagement. The following information describes how the PTO is controlled by the switch.

Description of PTO Switch and Warning Lamp Functionality

- When the operator activates the switch for the PTO, the status indicator lamp (located on the switch) will immediately illuminate even though PTO engagement may not have occurred.



NOTE: Do not drive vehicle with PTO engaged.



NOTE: Actual PTO engagement/disengagement may be delayed momentarily since it is controlled by the air system and mechanical movement.



CAUTION: Increasing engine RPM before the PTO is actually engaged could prevent the PTO from engaging and/or cause PTO damage.



PTO Switch Symbol

- If the PTO is engaged and the operator turns the switch OFF, the PTO status indicator lamp (located on the switch) will go out immediately even though PTO disengagement may not have occurred.

Alarms, Warning Tones and Visual Indicator Lights

Introduction

Your vehicles dash and instrumentation uses various methods to indicate to you the status of various systems, or that one or more of your vehicles systems may be malfunctioning. The method to communicate or alert you of a particular condition is by:

- Audible alarm tone
- Audible warning tone
- Indicator light(s)

In some cases, you may have both an alarm or warning tone accompanied by an indicator light(s).



WARNING: Do not ignore any type of tone or lights. These signals tell you that something is malfunctioning on your vehicle and provide you an indication of what

system is affected. It could be a failure of an important system, such as the brakes, which could lead to an accident and may result in personal injury, death, equipment or property damage.

INSTRUMENTATION

Audible Alarms, Warnings and Indicators

The standard instrument cluster generates three distinct audible tones or sounds.

1. Alarm tone
2. Warning tone
3. Turn signal/hazard sound

The three tones are described below.

A. Alarm Tone

- Series of clear bell tones, repeated at a rate of **100** tones per minute.
- Indicates that something is seriously wrong with the vehicle that should be considered an emergency.



WARNING: Do not ignore an alarm tone. You should visually determine what system is affected by glancing at your gauges and indicator lights, then begin to slow your vehicle down to a stop as safely as possible. Turn off your ignition and take appropriate action. The vehicle must be serviced and the problem corrected before driving the vehicle again. Failure to obey an Alarm tone may result in personal injury, death, equipment or property damage.

The Alarm tone is activated under the following conditions.

Stop Engine Alarm



Stop Engine Alarm

This alarm sound is active when the Stop Engine light is active (turned on by the engine). Examples of the conditions that would cause the alarm to sound are low oil pressure or high engine coolant temperature.

Primary or Secondary Low Air Warning Alarm

(1) Primary or Secondary Low Air Warning Alarm

Primary

(2)

Secondary

This alarm sound is active when either the Primary or Secondary Low Air Warning lamp is active and the engine RPM is above 300. This occurs when the primary or secondary air pressure drops below 65 psi, and stays active until it increases above 66.5 psi.

Engine Oil Pressure Alarm



Engine Oil Pressure Alarm

This alarm sound is active when the Engine Oil Pressure light is active (turned on by the engine).

Park Brake Alarm

Park Brake Alarm

With the park brake not set and the door open, the Alarm tone is activated for approximately 4.5 minutes and park brake warning light will blink.

B. Warning tone (similar to the Alarm tone)

- Series of clear bell tones, repeated at a rate of 60 tones per minute.
- Sounds when a problem exists, but the vehicle can still be safely driven. Service the vehicle to correct the problem but the situation should not be considered an emergency.



CAUTION: If a warning tone sounds, determine the system affected by glancing at your indicator lights. The warning tone indicates a problem exists, but the vehicle can still be safely driven. Service the vehicle at your earliest convenience to correct the problem, but the situation should not be considered an emergency.

The Warning tone is activated under the following conditions.

During the Instrumentation Power On Self Test (POST) - Two bell tones sound when the ignition is turned on.

All gauges, indicators and warning lights will turn on for a power-on self test. All gauge pointers will momentarily move to the maximum limit, stay there for a short time, then move back to the zero position. Additionally, all indicator and warning lights will turn on together, then off together. Several different audible warnings will also be activated twice without break.

Fifth Wheel Slide Warning



Fifth Wheel Slide Warning

Light is active (turned on by the optional switch on the dash).

Low Coolant Level Warning



Low Coolant Level Warning

Light is active (turned on by the engine), and engine is running (RPM above 300).

C. Turn Signal/Hazard Sound

- Generates a tic-toc sound, similar to a sound and function of a mechanical flasher.
- Sounds anytime the turn signal or hazard switch is turned On.



NOTE: If the vehicle turn signals and turn signal indicators in the dash gauge cluster ever begin flashing at an accelerated rate (115 cycles per minute) when the turn signal lever is in the OFF (center) position, or when a Right/Left turn has been selected, the problem may be related to a failed turn signal switch or turn signal module. In either case, the problem is not a failed bulb. Contact your nearest authorized Kenworth Dealer to have the problem corrected as soon as possible.

What You Should Do

If there is a warning sound or one of the warning lights come on while driving, do the following:

1. Slow down carefully.
2. Move a safe distance off the road and stop.
3. Set the parking brake.
(Refer to [OPERATING THE TRANSMISSION on page 4-78](#) and [Parking Brake Valve on page 3-74](#), in the Operator's Manual.)
4. If the engine is overheating do not turn it off, see [Over Heating Engine on page 3-48](#); otherwise, for other conditions turn the engine OFF.
5. Turn on the emergency flasher and use other warning devices to alert other motorists.

Warning Light/Indicator Symbols

The following is a list of Warning Light/Indicator Symbols. Reading left to right, the table header identifies:

- the symbol name

- the appearance of the symbol
- the symbol color when it is illuminated
- whether the symbol is standard (STD) or optional (OPT)
- the page number to refer to for additional information

Symbols are listed by major component sections.

Example: Engine, and then in alphabetical order.

3

Table 3 Warning Light/Indicator Symbols

Symbol Name	Symbol	Color	Std	Opt	Page
1. Anti-Lock Brake System (ABS)		Yellow	•		on page 3-25
2. Anti-Lock Brake System (ABS), Trailer		Yellow	•		on page 3-26
3. Axle, Traction Control		Yellow		•	on page 3-27
4. Diesel Particulate Filter (DPF)		Yellow	•		on page 3-27
5. Engine BrakeSaver or Transmission Retarder		Yellow		•	on page 3-28

Symbol Name	Symbol	Color	Std	Opt	Page
6. Engine, Check Engine		Yellow	•		on page 3-28
7. Engine, Ether Start		Green		•	on page 3-28
8. Engine, Fan		Green	•		on page 3-29
9. Engine, Heater		Yellow		•	on page 3-29
10. Engine, Low Coolant Level		Yellow	•		on page 3-29
11. Engine, Overspeed		Red		•	on page 3-30
12. Engine, Retarder (Brake)		Green		•	on page 3-30
13. Engine, Stop Engine		Red	•		on page 3-30
14. Engine, Wait To Start		Yellow		•	on page 3-31

Symbol Name	Symbol	Color	Std	Opt	Page
15. High Exhaust System Temperature		Yellow	•		on page 3-31
16. Lights, High Beam		Blue	•		on page 3-31
17. Message Waiting		Green		•	on page 3-32
18. Park Brake		Red	•		on page 3-32
19. Seat Belt, Fasten		Red	•		on page 3-32
20. Transmission, Oil Temperature High		Yellow		•	on page 3-33

Symbol Name	Symbol	Color	Std	Opt	Page
21. Turn Signal, Left		Green	•		on page 3-33
22. Turn Signal, Right		Green	•		on page 3-33

Anti-Lock Brake System (ABS)

1. Anti-Lock Brake System (ABS)

A. It illuminates during the power-on test when the ignition is turned ON. It turns off after a few seconds if no system problems are detected.



CAUTION: If the ABS Warning Lamp does not illuminate during the power-on test there may be a problem with the light or wiring. You should have this checked as soon as possible. Failure to comply

may result in equipment or property damage.

B. If it turns on and stays on at any other time it is indicating that a problem exists with the ABS. This should be checked by a Kenworth dealer as soon as possible. See [Anti-Lock Braking System on page 4-40](#) of Operator's Manual for more information.



NOTE: After servicing the ABS, the lamp stays on after the power-on test. This indicates that the ABS wheel sensors have not been checked by the ABS. As soon as the vehicle

is driven at speeds above 4 mph (6km/h) the lamp turns off, indicating that the wheel sensors have been checked by the ABS.

Anti-Lock Brake System (ABS), Trailer



2. Anti-Lock Brake System (ABS), Trailer

A. It illuminates during the power-on test when the ignition is turned ON. It turns off after a few seconds if no system problems are detected. The bulb self-test is performed whenever the ignition is turned ON, regardless of whether you have Trailer ABS. If a Trailer ABS system is detected, the lamp will turn off after a few seconds if no system problems are detected.

B. If it turns on at any other time it is indicating that a problem exists with the PLC trailer ABS. This should be checked by a Kenworth dealer as soon as possible. Refer to Trailer ABS in [Anti-lock Braking System on page 4-40](#) in the Operator's Manual for more information.

C. If your tractor and trailer have the "Special Trailer ABS (Without PLC) Option", (Refer to Special Trailer ABS (Without PLC) Option, [Anti-lock Braking System on page 4-40](#) in the Operator's Manual for more information.) this lamp will turn on when the trailer ABS has a system problem. This should be checked by a Kenworth dealer as soon as possible. The Trailer ABS Warning Lamp will not turn on for the power-on test when connected to these types of trailers.



CAUTION: If the Trailer ABS Warning Lamp does not turn on during the power-on test there may be a problem with the light or wiring. You should have this checked as soon as possible.



NOTE: Tractors/Trucks and trailers built after 3/1/01 must be able to turn on an In-Cab

Trailer ABS Warning Lamp (per U.S. FMVSS121). The industry chose Power Line Communication (PLC) as the standard method to turn it on. Refer to Trailer ABS in [Anti-lock Braking System on page 4-40](#), in the Operator's Manual for more information.



NOTE: The Trailer ABS Warning Lamp will not turn on when connected to trailers with ABS (but without PLC) powered through the primary 7-way trailer light line. Use the lamp on the drivers side of the trailer to identify trailer ABS problems.



NOTE: For doubles or triples, the lamp does not distinguish between trailers. An ABS problem in any of the trailers will activate the Trailer ABS Warning Lamp.

Axle, Traction Control



3. Axle, Traction Control (ATC or Automatic Traction Control)

A. Illuminates during the power-on test when the ignition is turned ON. It turns off after a few seconds if no system problems are detected. If an ATC problem is detected, the ATC Warning lamp will turn on and stay on.

B. Flashes when the ATC is regulating wheel spin. See [Anti-lock Braking System on page 4-40](#) of Operator's Manual for more information.

C. If your vehicle has the optional Deep Snow & Mud Function Switch feature, the ATC Warning Lamp flashes slowly during deep snow and mud mode engagement to alert you that the feature is active (see Deep Snow and Mud Switch (option), in the [Anti-lock Braking System on page 4-40](#) of the Operator's Manual for more

information). When in this mode, it will flash more rapidly whenever the ATC system is limiting wheel slippage.



NOTE: For vehicles equipped with Electronic Stability Program, please refer to Bendix ABS Operator's Manual, included in your glove box informational packet.

Diesel Particulate Filter (DPF)



4. Diesel Particulate Filter (DPF)

Illuminates when diesel particulate filter needs regeneration (controlled by engine ECM). This warning lamp will also illuminate when regeneration operation is disabled. Refer to the Engine Manufacturers Operator Manual for additional information. Also [DPF Regeneration on page 4-24](#)

Engine BrakeSaver or Transmission Retarder



5. Engine BrakeSaver or Transmission Retarder

Illuminates when BrakeSaver (export only) or Transmission Retarder is active. In some cases, the Check Engine lamp will activate in conjunction with the High Exhaust Temperature and Diesel Particulate Filter (DPF) Warning Lights.

Engine, Check Engine



6. Engine, Check Engine

Illuminates when a problem exists, but the vehicle can still be safely driven. Vehicle should be serviced to correct the problem but the situation should not be considered an emergency.

Engine, Ether Start



7. Engine, Ether Start

Illuminates when ether start switch is on.

Engine, Fan



8. Engine, Fan

Illuminates when fan is active.

Engine, Heater



9. Engine, Heater

Illuminates when Engine Heater switch is on.

Engine, Low Coolant Level



10. Engine, Low Coolant Level

Illuminates and an audible warning tone will sound when coolant level in the radiator is critically low.



CAUTION: The vehicle must be serviced to correct the problem but the situation should not be considered an emergency.

Engine, Overspeed



11. Engine, Overspeed

Illuminates when engine RPM is exceeded (Allison Transmissions).

Engine, Retarder (Brake)



12. Engine, Retarder (Brake)

Illuminates when the engine retarder (compression brake, BrakeSaver (export only), or exhaust brake) is active.

Engine, Stop Engine



13. Engine, Stop Engine

Illuminates and an audible alarm tone will sound when a major engine system problem exists.



WARNING: This should be considered an emergency. You should stop the vehicle as safely as possible and turn OFF the ignition. The vehicle must be serviced and the problem corrected before driving again. Failure to do so may cause severe engine damage or cause an accident which may result in personal injury or death.

Engine, Wait To Start



14. Engine, Wait To Start

Illuminates when engine grid heater is on (Cummins ISB and ISC engines).

High Exhaust System Temperature



15. High Exhaust System Temperature

Illuminates when exhaust temperature is high (controlled by engine ECM). Refer to the Engine Manufacturers Operator Manual when regeneration operation is disabled. Also [Notification of High Exhaust System Temperature on page 4-20](#)

Lights, High Beam



16. Lights, High Beam

Illuminates when the high beams are on.

Message Waiting



17. Message Waiting

Illuminates with telematic equipped messaging.

Park Brake



18. Park Brake

Illuminates when parking brakes are applied.

Seat Belt, Fasten



19. Seat Belt, Fasten

Illuminates for 5 seconds whenever the ignition key is turned on, then it turns off. The warning lamp may also come on if the driver seat belt is not fastened (if the vehicle was ordered with a seat belt warning light option.)

Transmission, Oil Temperature High



20. Transmission, Oil Temperature High

Illuminates when transmission lubricant temperature is too high.



CAUTION: This should be considered an emergency. You should stop the vehicle as safely as possible and turn OFF the ignition. The vehicle must be serviced and the problem corrected before driving again. Failure to do so may cause severe transmission damage.

Turn Signal, Left



21. Turn Signal, Left

Blinks when the left turn signal is operating.

Turn Signal, Right

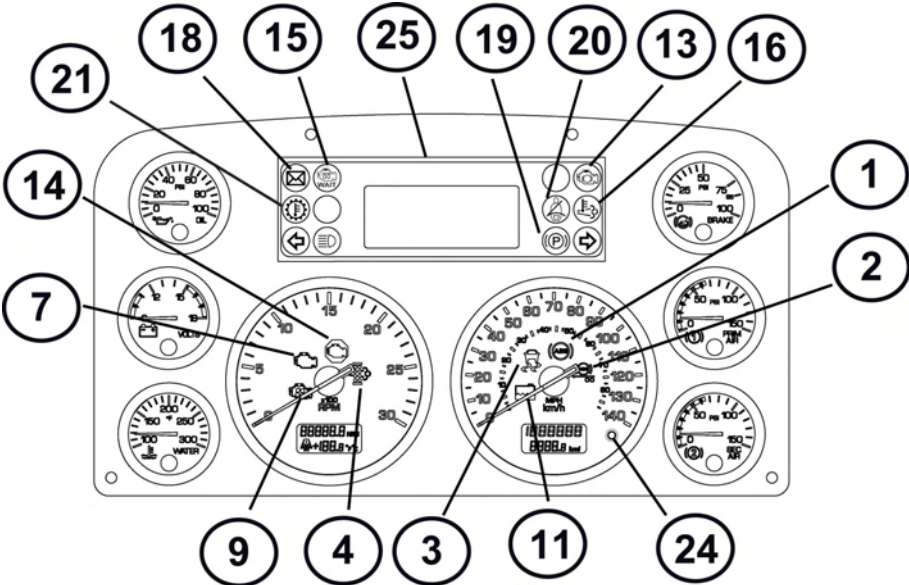


22. Turn Signal, Right

Blinks when the right turn signal is operating.

Gauges and Displays

A - Panel



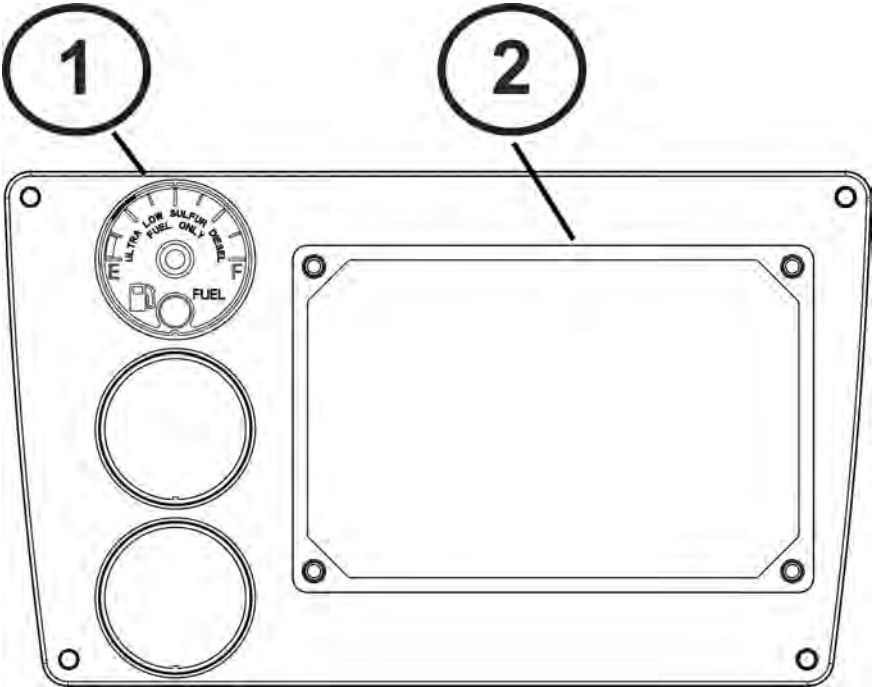
- 1 Anti-Lock Brakes (ABS)
- 2 Trailer Anti-Lock Brakes (ABS)
- 3 Traction Control
- 4 Diesel Particulate Filter (DPF)
- 7 Check Engine
- 9 Engine Fan
- 11 Low Coolant level
- 13 Engine Retarder (Brake)
- 14 Stop Engine
- 15 Wait To Start
- 16 High Exhaust System Temperature
- 18 Message Waiting
- 19 Park Brake
- 20 Fasten Seat Belt
- 21 Trans. Oil Temperature High
- 24 Trip Odometer Reset Button
- 25 Multi-Function Display

warning light indicators will be inoperable unless that option was specified with the vehicle. See the [Warning Light/Indicator Symbols on page 3-22](#), for a complete list of standard and optional warning light indicators.



NOTE: *Your vehicle includes both standard and optional warning lights in the instrument cluster display. Some optional*

B - Panel



1 Fuel Level Gauge

2 Optional Data Display

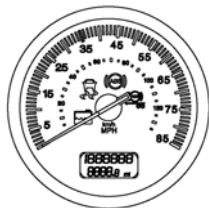
In its most basic form, the B - Panel contains a Fuel Level Gauge. The remaining gauge positions shown can accept any of the optional gauges (listed below) in any location.

Optional Gauges

The following gauges are optional on the B - panel:

- Air Cleaner, Restriction
- Air Suspension
- Ammeter
- Fuel Filter, Restriction
- Forward Axle Temperature
- Pyrometer
- Rear Axle Temperature
- Transmission Oil Temperature

Speedometer



The Speedometer indicates the vehicle speed in miles per hour (mph) and in kilometers per hour (km/h). The Speedometer cluster also includes several warning and indicator lamps (see [Alarms, Warning Tones and Visual Indicator Lights on page 3-16](#)) and an Odometer and Trip Meter.

Odometer/Trip Meter



- 1 Odometer
- 2 Trip Meter

The LCD display in the lower part of the speedometer contains the Odometer and Trip Meter.

The odometer displays the distance your vehicle has traveled. It will display in miles on an English cluster or in kilometers on a metric cluster. The maximum distance that can be shown on the odometer is 999,999 before it rolls over to zero.

The trip odometer displays how far the vehicle has gone on a particular trip. The trip odometer will display in miles on an English cluster or in kilometers on a metric cluster, in one tenth divisions. The maximum distance that

can be shown on the trip odometer is 9999.9 before it rolls over to zero.



NOTE: Pressing the trip odometer reset button 4 times in less than 4 seconds will change the odometer units from miles (mi) to kilometers (km).

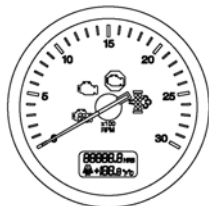
3

To reset the trip odometer, press and hold the button on the cluster. The numbers will reset to 0 and begin to count new miles/km traveled.



NOTE: The Odometer/Trip Meter comes on when the door is opened and when the ignition key is in the ACC or ON position. The Odometer/Trip Meter will remain on for 3 seconds after the door is closed or the ignition switch is turned off. This allows driver and service personnel to read the odometer without ignition switch being turned on.

Tachometer

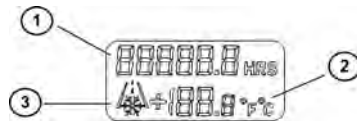


The Tachometer measures the engine speed in revolutions per minute (RPM). The Tachometer cluster also includes several warning and indicator lamps (see [Alarms, Warning Tones and Visual Indicator Lights on page 3-16](#)) and an Engine Hour Meter and Outside Temperature Display.

Watching the tachometer is important to driving efficiently. It will let you match driving speed and gear selection to the operating range of your engine. If the engine speed gets too high, you can select a higher gear to lower the RPM's. If the engine speed drops

too low, you can select a lower gear to raise the RPM's. Refer to [MORE DRIVING TIPS AND TECHNIQUES on page 4-5](#) for further instructions on driving techniques and using the tachometer. To avoid engine damage, do not let the pointer exceed maximum governed speed. See your Engine Operation and Maintenance Manual for RPM recommendations.

Engine Hours/Outside Air Temperature



- 1 Hour Meter
- 2 Outside Air Temperature
- 3 Snowflake Symbol

The LCD display in the lower part of the tachometer contains the Engine Hour Meter and the Outside Air Temperature display.

The engine hour meter will display the total number of hours the engine has been running. The maximum hours that can be shown are 99999.9 before the meter rolls over to zero.

The Outside Air Temperature (OAT) will display the temperature outside

the vehicle. The temperature can be displayed from -40° to 158° in Fahrenheit or -40° to 70° Celsius.

The display will also alert the driver when the outside temperature approaches freezing (32° F. or 0° C) by displaying a snowflake symbol. The symbol will turn on when the temperature drops below 34° F or 11° C and flash for the first 3 seconds, then stay on until the temperature goes above 37° F or 28° C.

The OATs units (Fahrenheit or Celsius) can be changed by pressing the reset button on the cluster 4 times in less than 4 seconds.

i *NOTE: The OAT will come on when the door is open and when the ignition key is in the ACC or ON position. The OAT display will turn off when the ignition switch is turned off.*

i *NOTE: The OAT uses a sensor (located at the bottom of the drivers side mirror assembly) to measure outside air temperature only. It is not capable of displaying the temperature of the road surface on either the temperature display or the snowflake icon. Additionally, the OAT reading may be affected by exposure to direct sunlight.*

Gauges

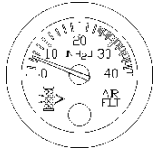
Table 4 Gauges Symbol

Symbol Name	Symbol	Std	Opt	Page
1. Air Filter Restriction Pressure			•	on page 3-43
2. Ammeter			•	on page 3-43
3. Axle, Drive Oil Temperature	Front Rear Center (Tridem) 		•	on page 3-44
4. Axle, Pusher Air Pressure, #1, #2, #3	 		•	on page 3-44
5. Axle, Tag Air Pressure			•	on page 3-45
6. Brake, Application Air Pressure		•		on page 3-45
7. BrakeSaver, Application Air Pressure (Export vehicles only)			•	on page 3-46
8. BrakeSaver, Oil Temperature (Export vehicles only)			•	on page 3-46

Symbol Name	Symbol	Std	Opt	Page
9. Engine, Coolant Temperature		•		on page 3-46
10. Engine, Oil Pressure		•		on page 3-49
11. Engine, Oil Temperature			•	on page 3-50
12. Engine, Pyrometer (Export vehicles only)			•	on page 3-50
13. Fuel Filter Restriction Pressure			•	on page 3-51
14. Fuel Level, Primary and Secondary (if equipped)	Primary Secondary 	•	•	on page 3-51
15. General Air Pressure #1, #2	#1 #2 		•	on page 3-52
16. General Oil Temperature			•	on page 3-52
17. Manifold Pressure (Boost)			•	on page 3-53
18. Primary and Secondary Air Pressure	Primary (①) Secondary (②)	•		on page 3-53

Symbol Name	Symbol	Std	Opt	Page
19. Suspension Load Air Pressure, #1, #2			•	on page 3-55
20. Tractor Brake Application Air Pressure			•	on page 3-55
21. Trailer Brake Application Air Pressure			•	on page 3-56
22. Trailer Air Tank Air Pressure			•	on page 3-56
23. Transfer Case Oil Temperature			•	on page 3-56
24. Transmission Oil Temperature, Main			•	on page 3-57
25. Transmission Oil Temperature, Auxiliary			•	on page 3-57
26. Transmission Retarder Oil Temperature			•	on page 3-57
27. Voltmeter		•		on page 3-58

1. Air Filter Restriction Pressure



The Air Filter Restriction Pressure gauge indicates the condition of the engine air cleaner and is measured by inches of water (H₂O). A clean filter should register 7 in. H₂O (may vary with system design) and a filter whose life is over will register approximately 25 in. H₂O.



CAUTION: Continued operation with the Air Filter Restriction Gauge reading 25 in. H₂O may cause damage to the engine. Inspect the filter and replace if necessary. Holes in the paper element render an air cleaner useless and may cause the Air Filter Restriction Gauge to give a

false reading, whether the element is clogged or not. Replace the element if it is damaged. Failure to comply may result in equipment damage.

2. Ammeter



The ammeter tells you whether your vehicles electrical system is in balance and operating normally. If not, it may be drawing power from the alternator (positive reading) or from the batteries (negative reading).

Under normal conditions the ammeter will read nearly zero. If it begins to read noticeably above or below the zero balance, have the system checked out immediately. If you do not, you could have a roadside breakdown.

3. Axle, Drive Oil Temperature



Front Drive Axle



Rear Drive Axle



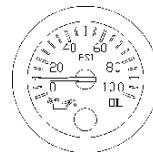
Center Drive Axle (for Tridem Axle configuration)

The Drive Axle Oil Temperature gauges (front, rear, and center) indicate the

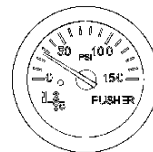
temperature of the lubricant in your vehicles axles. These temperatures will vary with the kind of load you are carrying and the driving conditions you encounter.

i *NOTE: Very high temperatures signal a need to have the axle(s) lubrication checked.*

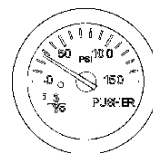
4. Axle, Pusher Air Pressure



Pusher Axle #1



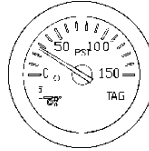
Pusher Axle #2



Pusher Axle #3

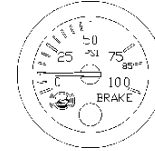
The Pusher Axle Air Pressure gauge(s) indicate the air pressure in the pusher axle(s) suspension air bags.

5. Axle, Tag Air Pressure



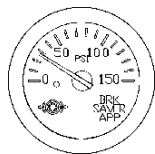
The Tag Axle Air Pressure gauge indicates the amount of air pressure in the tag axle suspension air bags.

6. Brake, Application Air Pressure



The Brake Application air gauge indicates how much air pressure is being applied from the foot brake valve or trailer brake hand valve to the air brakes.

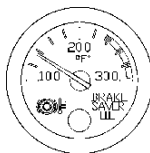
7. BrakeSaver, Application Air Pressure (Export vehicles only)



3

The BrakeSaver Application Air Pressure gauge indicates the amount of air pressure applied to the BrakeSaver hand control valve.

8. BrakeSaver, Oil Temperature (Export vehicles only)

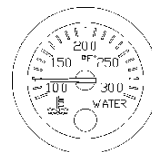


The BrakeSaver Oil Temperature gauge indicates the temperature in the BrakeSaver. If the oil temperature exceeds the maximum limits, a red warning lamp in the gauge will turn on.



CAUTION: This should be considered an emergency. You should stop the vehicle as safely as possible and turn OFF the ignition. The vehicle must be serviced and the problem corrected before driving again. Failure to do so may cause severe BrakeSaver damage.

9. Engine, Coolant Temperature



The Engine Coolant (water) Temperature gauge indicates the temperature of the engine coolant.

If the coolant temperature exceeds the maximum limits, a red warning lamp in the gauge will turn on and an audible warning will sound. If the coolant temperature continues to rise, the Check Engine and/or Stop Engine lights will also come on.



CAUTION: This should be considered an emergency. You should stop the vehicle as safely as possible and turn OFF the ignition. The

vehicle must be serviced and the problem corrected before driving again. Failure to do so may cause severe engine damage.

Under normal operating conditions the water temperature gauge should register between 165° and 205° F (74° and 90° C). Under certain conditions, somewhat higher temperatures may be acceptable. The maximum allowable temperature is 220° F (104° C) with the cooling system pressurized, except for certain engines. Check the engine manual to be sure.

Overheating Engine

The cooling system may overheat if the coolant level is below normal or if there is sudden loss of coolant, such as a split hose. The system may also temporarily overheat during severe operating conditions such as:

- Climbing a long hill on a hot day
- Stopping after high-speed driving



NOTE: *If one of the following occurs, DO NOT TURN OFF THE ENGINE unless: a) the Low Water warning device indicates a loss of coolant, b) the Red Warning lamp (on the gauge) and Check Engine lamp comes ON, c) the Audible Warning or Audible Alarm sounds showing an overheat condition, or d) if you have any other reason to suspect the engine may be overheating, follow these steps.*

1. Reduce engine speed or stop. When stopped, place the transmission in Neutral and set the parking brake. (Refer to [Parking Brake Valve on page 3-74](#) and [Putting the Vehicle in Motion on page 4-79](#)) Keep the engine running.
2. Check to ensure the Oil Pressure Gauge reads normal. (See the Engine Oil Pressure in [Gauges and Displays on page 3-34](#), for further information.)
3. Make sure the engine fan is turned on by switching the Engine Fan Switch from AUTO to MAN (Manual).
4. Increase the engine speed to about one-half of full operating speed, or 1,100 to 1,200 RPM, maximum.
5. Return the engine speed to normal idle after 2 or 3 minutes.
6. Monitor the engine temperature. After the temperature returns to

normal, allow the engine to idle 3 to 5 minutes before shutting it off. This allows the engine to cool gradually and uniformly.

7. If overheating came from severe operating conditions, the temperature should have cooled by this time. If it has not, stop the engine and let it cool before checking to see if the coolant is low.

For further information on engine temperature and operating engines properly, see [OPERATING THE ENGINE on page 4-51](#). Check the coolant level after each trip when the engine has cooled. The coolant level should be visible within the sight gauge (glass level indicator) on the surge tank, add coolant if necessary. Refer to [Topping Up on page 5-63](#), for instructions on checking and filling the coolant expansion tank.



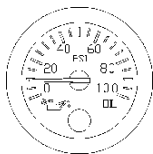
WARNING: *To reduce the chance of death, personal injury, and/or vehicle damage from overheated engines, which can result in a fire, never leave the engine idling without an alert driver present. If the engine should overheat, as indicated by the engine coolant temperature light, immediate action is required to correct the condition. Continued unattended operation of the engine, even for a short time, may result in serious engine damage or a fire.*



WARNING: *Do not remove the radiator fill cap while the engine is hot. Scalding steam and fluid under pressure may escape and cause personal injury or death. You could be badly burned.*

- **Wait until the coolant temperature is below 122° F (50° C).**
- **Protect face, hands, and arms by covering the cap with a large, thick rag to protect against escaping fluid and steam.**
- **Carefully and slowly turn the cap one-quarter of a turn or until it reaches the first stop, allowing excess pressure to escape push down and turn for final removal.**

10. Engine, Oil Pressure



It is important to maintain oil pressure within acceptable limits. If oil pressure drops below the minimum psi a red warning light in the gauge will turn on, the Stop Engine light will come on and an audible alarm tone will sound.

For further information on engine oil and normal operating pressures, see the Engine Operation and Maintenance Manual.



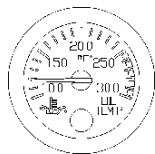
CAUTION: Continuing to operate your vehicle with insufficient oil pressure will cause serious engine damage.

- *If the oil pressure fails to rise within 10 seconds after the engine starts, stop the engine and determine the cause.*
- *Check the engine manufacturer's manual for the correct oil pressure ranges for your vehicle's engine.*
- *If the oil pressure suddenly drops, or the audible alarm and engine oil pressure warning light come on while driving, do the following:*
 1. *Slow down carefully.*
 2. *Move a safe distance off the road and stop.*
 3. *Place the transmission in park and set the parking brake. (Refer to [Parking Brake Valve on page 3-74](#) and [OPERATING THE TRANSMISSION on page 4-78](#), for transmission shifting and parking brake information.)*

4. *Turn OFF the engine.*
5. *Turn ON the emergency flasher and use other warning devices to alert other motorists.*
6. *Wait a few minutes to allow oil to drain into the engine oil pan, and then check the oil level. (Refer to [Oil Level Check on page 5-83](#) for details on checking oil level.)*
7. *Add oil if necessary. If the problem persists, contact an authorized Kenworth Dealer.*

For further information on engine gauges and operating your engine properly, refer to [ENGINE MAINTENANCE on page 5-82](#).

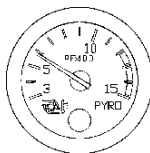
11. Engine, Oil Temperature



3

The Engine Oil Temperature gauge indicates the engine oil temperature. If the oil temperature exceeds the maximum limits, a red warning light in the gauge will turn on. Do not exceed maximum engine oil temperature recommended by the engine manufacturer. See the Engine Operation and Maintenance Manual for details.

12. Engine, Pyrometer (Export vehicles only)



The Pyrometer Gauge indicates engine exhaust gas temperature. Since it responds almost immediately to changes in exhaust gas temperature, the pyrometer is an excellent indicator of engine output. Monitor it in conjunction with the tachometer and manifold pressure gauge. The pyrometer can be a useful aid to operating your truck more efficiently and avoiding sudden changes in engine operating temperature.

See the Engine Operation and Maintenance Manual for maximum temperature recommendations.

To establish or test for the best operating (exhaust) temperatures on your vehicle, follow the procedure below:

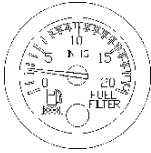
Climb a grade at maximum operating RPM and full throttle for one minute. Record the pyrometer reading at the end of this time. Then ease up on the throttle.

Subtract 200°F (110°C) from the recorded temperature reading. The result is the optimum operating temperature.

This procedure is also useful as an occasional check of engine condition. Any large variation in the maximum temperature reading may be an early indication of possible engine problems.

Different size injectors or changes in altitude may affect engine operating temperatures.

13. Fuel Filter Restriction Pressure

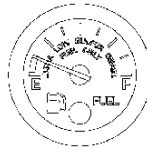


This gauge tells you the condition of the fuel filter by indicating the restriction from the fuel filter to the fuel pump. The restriction is measured by inches of mercury (Hg). Check the engine manual for proper restriction. Replace the filter with an approved filter only. Do not substitute the wrong micron element.

i *NOTE: The maximum allowable restriction could vary according to the type or make of engine. Consult the engine manufacturers manual or engine dealer for fuel restriction specifications.*

14. Fuel Level Gauge

The Fuel Gauge indicates the total (approximate) amount of fuel in the fuel tanks. Besides empty and full, the gauge also indicates 1/4, 1/2, and 3/4 of total fuel capacity. It is connected directly to a fuel level sensor inside the fuel tank.



Fuel Gauge

A Low Level Indicator is also provided. When the fuel level drops below about 1/8 of a tank, a red warning lamp on the gauge turns ON. When fuel level rises above 1/8 of a tank, the lamp turns OFF. The lamp is not controlled by the engine's Electronic Control Unit, and therefore the buzzer will not sound if fuel level is low.



NOTE: Kenworth manufactures vehicles that are built with different fuel systems and draw tube locations. Because of this and the amount of road crown, it is recommended that you do not operate your vehicle with less than one-quarter of your truck's fuel capacity. Allowing the fuel level to go below one-quarter of capacity could result in the lack of fuel to keep the engine running. In addition, you will want to keep the fuel tanks at least half-full to reduce condensation of moisture in the tanks. This moisture can damage the engine.



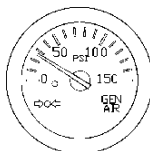
WARNING: Do not carry fuel containers or any container used to store combustible liquids. Failure to comply may result in personal injury, death, equipment or property damage.



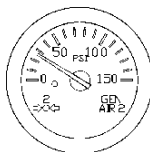
WARNING: Do not remove a fuel tank cap near an open flame. Fuel vapors may be hot and combustible and can cause an explosion or fire. Failure to comply may result in personal injury, death, equipment or property damage.

Refer to [Refueling on page 4-89](#), for more information.

15. General Air Pressure #1, #2



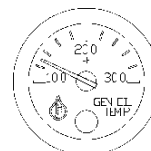
General Air Pressure #1



General Air Pressure #2

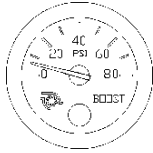
The General Air Pressure gauge(s) are used for customer installed component applications.

16. General Oil Temperature



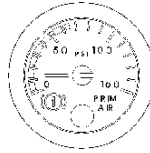
The General Oil Temperature gauge(s) are used for customer installed component applications.

17. Manifold Pressure (Turbo Boost)

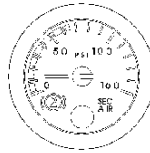


The Manifold Pressure Gauge indicates the power your vehicles engine is putting out by showing the amount of turbo boost. If the pressure indicated by the manifold pressure gauge goes down, there may be something wrong with the engine. Have it checked by a qualified service person.

18. Primary and Secondary Air Pressure



Primary Air Pressure



Secondary Air Pressure

The Primary Air Pressure gauge indicates pressure in the rear braking system. The Secondary gauge indicates pressure in the front braking system. Each gauge indicates the amount of air pressure in each system in pounds per square inch (psi).

On vehicles equipped with metric air pressure gauges, the gauge face plate includes a kPa (major) scale and psi (minor) scale.



NOTE: Be sure the air pressure registers more than 100 psi in both service systems before you move the vehicle.



NOTE: If the pressure in either or both circuits falls below 65 psi, a red warning light in the gauge will turn on and an audible alarm tone will sound when the engine is running.



WARNING: If the air pressure falls below 60 psi (414 kPa) the spring brakes may stop the vehicle abruptly, which could cause an accident resulting in personal injury or death. Observe the red warning lamps on the gauges. If one comes on, do not

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continue to drive the vehicle until it has been properly repaired or serviced.

- *If the light and alarm do not turn off at start-up, do not try to drive the vehicle until the problem is found and fixed.*

WARNING: The air pressure warning light and the audible alarm tone indicate a dangerous situation: there is not enough air pressure in the air tanks for repeated braking and the brake system has failed. Without the use of your service brakes your spring brakes could suddenly apply causing a wheel lock-up, loss of control, or over-take by following vehicles. This may cause an accident resulting in personal injury or death.

- *Bring the vehicle to a safe stop right away, while*

you still have control of the vehicle. Follow the procedure below:

Air Loss Emergency Procedure

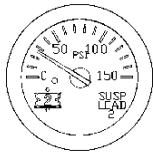
1. Slow down carefully.
2. Move a safe distance off the road and stop.
3. Place the transmission in neutral (park with automatic transmissions, if equipped) and set the parking brake. (Refer to [Parking Brake Valve on page 3-74](#) and [OPERATING THE TRANSMISSION on page 4-78](#), for transmission shifting and parking brake information.)
4. Turn OFF the engine.
5. Turn ON the emergency flasher and use other warning devices to alert other motorists.

If the light and alarm do not turn off at startup, do not try to drive the vehicle until the problem is found and fixed. (Refer to [USING THE BRAKE SYSTEM on page 4-29](#), for more brake information.)

19. Suspension Load Air Pressure, #1, #2



Suspension Load Air Pressure #1



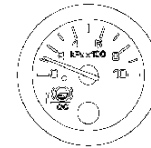
Suspension Load Air Pressure #2

The Suspension Load Air Pressure gauge indicates the amount of air pressure in the air suspension air bags.

When the vehicle is equipped with a second Suspension Load Air pressure gauge, the #1 gauge indicates the

air pressure in the drivers side air bags. The #2 gauge indicates the air pressure in the passengers side air bags.

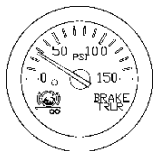
20. Tractor Brake Application Air Pressure



The Tractor Brake Application Air Pressure gauge indicates the amount of air pressure applied to the tractor brakes.

i *NOTE: This gauge will be included when the Trailer Brake Application Air Pressure gauge is ordered.*

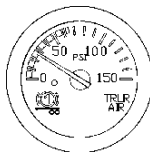
21. Trailer Brake Application Air Pressure



3

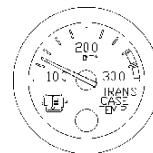
The Trailer Brake Application Air Pressure gauge indicates the amount of air pressure applied to the trailer brakes during brake foot valve and/or hand brake control valve applications.

22. Trailer Air Tank Air Pressure



The Trailer Air Tank Air Pressure gauge indicates the amount of air pressure in the trailer brake air tank.

23. Transfer Case Oil Temperature



The Transfer Case Oil Temperature gauge indicates the temperature of the oil in the transfer case. If the oil temperature exceeds maximum limits, a red warning light in the gauge will turn on. Do not exceed maximum oil temperature recommended by the manufacturer. See the transfer case Operation and Maintenance Manual for details.

24. Transmission Oil Temperature, Main



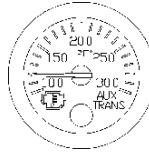
The Main Transmission Oil Temperature Gauge indicates the temperature of the oil in the transmission.



NOTE: Watch this gauge to know when the transmission is overheating.

Do not exceed maximum oil temperature recommended by the manufacturer. See the transmission Operation and Maintenance Manual for details.

25. Transmission Oil Temperature, Auxiliary



The Auxiliary Transmission Oil Temperature gauge indicates the temperature of the oil in the auxiliary transmission.



NOTE: Watch this gauge to know when the transmission is overheating.

Do not exceed maximum oil temperature recommended by the manufacturer. See the transmission Operation and Maintenance Manual for details.

26. Transmission Retarder Oil Temperature



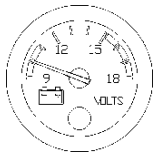
The Transmission Retarder Oil Temperature gauge indicates the temperature of the oil in the transmission retarder.



NOTE: Watch this gauge to know when the transmission is overheating.

Do not exceed maximum oil temperature recommended by the manufacturer. See the transmission Operation and Maintenance Manual for details.

27. Voltmeter



The Voltmeter displays the battery voltage. Normally, it should show 12 to 14V (volts). A red warning light in the gauge turns on when an out of range condition exists.

i *NOTE: Even with a healthy charge/start system, the voltmeter may fall well below 12V during engine cranking. If voltage drops below 12V and stays there, have the electrical system checked.*

Multi-Function Display (Optional)

The Multi-Function Display is an electronic display option that integrates various vehicle system information in one display, located above the primary instrument cluster. The display allows the driver to easily access important vehicle information in addition to providing several convenience features. The Multi-Function Display includes the following features:

- Fuel Economy Display
- Engine RPM Sweet Spot Display
- Trip Information Display
- Truck Information Display
- On-Board Diagnostic Display
- Ignition Timer
- Clock with Alarm
- Transmission Gear Display (automated transmissions only)
- Settings Screen

Multi-Function Display Functionality & Menu Navigation (If Equipped)

i *NOTE: Some Multi-Function Display functions are only accessible when the vehicle is parked. Other functions are accessible while the vehicle is moving or when parked. Refer to the following table for additional information on when specific functions can be reviewed.*

Table 5 Multi-Function Display Function Accessibility

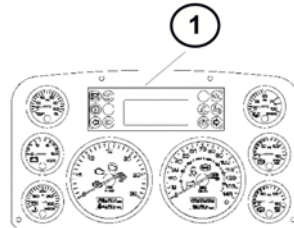
Multi-Function Displays	Accessible while Driving	Accessible while Parked
Fuel Economy	Yes	Yes
RPM Detail	Yes	Yes
Ignition Timer	No	Yes

Multi-Function Displays	Accessible while Driving	Accessible while Parked
Trip Information	Yes	Yes
Truck Information	No	Yes
Diagnostic Display	No	Yes
Transmission Display	Yes	Yes
Clock Display	Yes	Yes
Setting Menu	No	Yes

The Multi-Function Display, located above the primary instrument cluster will display important vehicle information through a constant monitor of systems. The display will turn on whenever one of the following are activated:

- Ignition key is in ON or ACC positions
- Ignition timer is ON (active)
- MCS button is pushed (independent of ignition key switch position)
- Clock alarm sounds

- Driver or passenger door is opened
- Hazard warning lamp switch is ON



1 Multi-Function Display



WARNING: Do not look at the Multi-Function Display for prolonged periods while the vehicle is moving. Only glance at the monitor briefly while driving. Failure to do so can result in the driver not being attentive to the vehicles road position, which could lead to an accident involving

personal injury, death or vehicle damage.

Right Hand Status Bar and Definitions



Cruise Control Active - Icon will indicate when cruise control is active. Icon looks like a clock dial face.



Alarm On Indicator - The right hand status bar is equipped with a clock warning bell. If the alarm has been set, the bell will be displayed with no animation. When the alarm is active, the bell shows animation.



Gear Display - On automatic transmissions only, the right-hand status bar will indicate the present gear of the transmission.

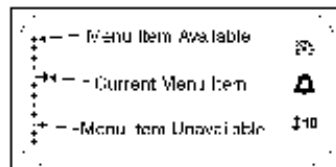


NOTE: The small gear display will only be displayed in the right-hand status bar if the operator has not selected the Transmission Display. If the Transmission Display is selected, a larger gear icon and

the current gear number the operator has selected will be displayed while driving. See [Transmission Display on page 3-64](#), for additional information.

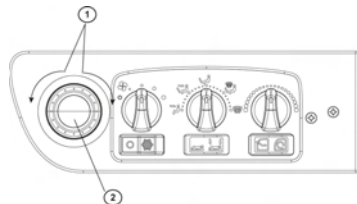
Left Hand Menu Bar

The left hand menu bar (menu bullets) gives a status of which menu you are currently on. Move through bullets by scrolling the MCS Right (Down) or Left (Up).



Left Hand Menu Bar

The MCS is located on the lower center panel of the dash next to the HVAC controls.



Lower center panel, next to HVAC controls

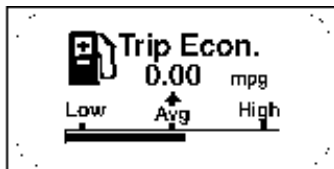
- 1 Scroll through the menu screens by rotating the MCS
- 2 Select a menu item by pressing the MCS

The Multi-Function Display is equipped with several Menu Screens. The bullets in the "Left Hand Menu Bar" allow access to each item by rotating the MCS right or left to the desired selection (bullet). Some screens require the MCS to be pressed to access Submenu information. Below are the menu items and the information available within each menu selections.

Menu Screens

A. Blank Screen - No information or graphics displayed.

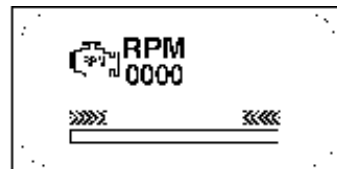
B. Fuel Economy (Accessible while parked and driving)



Fuel Economy

1. **Bar graph** - Indicates instantaneous fuel economy.
2. **Trip Econ.** - Indicates trip fuel economy.

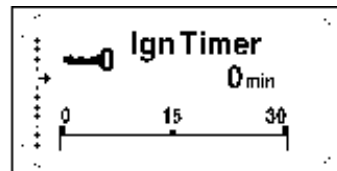
C. RPM Detail (Accessible while parked and driving)



RPM

RPM reading of actual engine RPM. Engine RPM within the bar graph chevrons (in range zone) indicates the engine is operating in the most efficient RPM range.

D. Ignition Timer (Accessible while parked only)



Ignition Timer

Ignition timer is set from this menu. To set the timer, push the MCS on

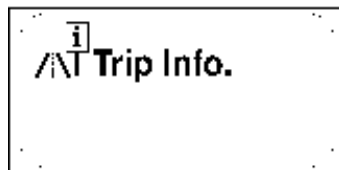
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the ignition timer menu (bullet). Then rotate the MCS to the desired time (0 - 30 minutes). After the time expires, the vehicles ignition (switched) power will be shut off (if the ignition key is in the OFF position).

E. Trip Information (Accessible while parked and driving)

i *NOTE: When accessing the trip information menu, push the MCS on this menu (bullet). To exit, push the MCS again. To reset the trip values, press the Trip Odometer Reset Button on the main gauge instrument cluster.*



Trip Information

Trip Info (submenu):

Instant Info

1. Trip Economy (Accessible when driving) - Indicates trip fuel economy.
2. Average Speed (Accessible when driving) - Indicates trip average speed.

Trip Result

1. Trip Distance - Indicates total trip distance
2. Trip Engine Hours - Indicates total trip engine hours

Idle Info

1. Trip Engine Hours - Indicates total trip engine hours
2. Trip Idle Percentage (%) - Indicates total trip idle percentage

PTO Info

1. PTO Hours - Indicates total vehicle PTO operation hours

2. PTO Trip Hours - Indicates total trip PTO operation hours. To reset the Trip Values, press the Trip Odometer Reset Button on the main gauge instrument cluster.
3. PTO Trip % - Indicates total trip PTO percentage
4. PTO Trip Fuel - Indicates total trip PTO fuel
5. PTO Trip Economy - Indicates total trip PTO economy

i *NOTE: Display functions for PTO hours, PTO Trip Hours and PTO Trip Percentage will only be available if supported by the engine installed. If the truck has a factory-installed PTO, these fields will appear in the Trip Information screen. If the engine does not support the data, dashes will be shown.*

F. Truck Information (Accessible only while parked)



NOTE: Only available truck information will be shown (i.e., manual transmissions do not have a software version).



NOTE: When accessing the truck information menu, push the MCS on this menu (bullet). To exit, push the MCS again.



Truck Information

Truck Info (submenu):

Chassis Info

1. Chassis Number
2. Fleet ID Number
3. CECU Software Version

Engine Info

1. Engine Make
2. Engine Model
3. Engine Software Version
4. Governed Speed Limit

Transmission Info (Automated Transmissions only)

1. Transmission Make
2. Transmission Model
3. Transmission Software Version

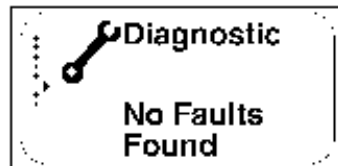
ABS Info

1. ABS Make
2. ABS Model
3. ABS Software Version

G. Diagnostic Display (Accessible only while parked)



NOTE: Faults Found will only be active if a red or yellow warning lamp is illuminated and additional information is available.



Diagnostic Display

The diagnostic display menu (bullet) will indicate a fault that is present. While on this menu item the display will either indicate "No Faults Found" or "Faults Found". If "Faults Found" is active, pushing the MCS on this menu item will show "Exit", "Engine", "Transmission", "ABS", "Truck", "Soot Filter". Exit will take you back to the diagnostic menu bullet and clicking on any of the other items will display an active vehicle diagnostic message.

H. Transmission Display (Automated Transmissions only - Accessible while parked and driving)



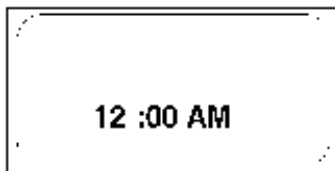
NOTE: Refer to the *Automated Transmission Operator's Manual* for complete description of arrow symbols.



Transmission Display

Shows gear number that coincides with the current transmission gear selected.

I. Clock Display (Accessible while parked and driving)



Clock Display

Shows Local or Home time as selected by the driver. The time can also be set to show 12 hour time (AM/PM) or 24 hour time (military). Refer to the Settings Menu section for additional information covering clock/alarm and formatting options.

J. Settings Menu (Accessible only while parked)

The Settings menu screen allows the driver to view and/or change the following menu items:

- Clock Display Format 12 Hour (AM/PM) or 24 Hour (military)
- Clock Home/Local Time
- Clock Alarm ON/OFF
- Clock Local Time (Set)
- Clock Alarm Time (Set)
- Units Standard or Metric
- Language English, Spanish or French
- Exit



Settings Menu

To Set Clock Display Format:

1. When in the settings menu, scroll through the list of menu items to "Format".
2. Press the MCS to display either 12 hour (AM/PM) or 24 hour (military time).



Clock Display Format

To Set Clock Home/Local Time:

1. Scroll through the list of menu items to Time: Home or Local. Press the MCS to toggle between Home or Local time.



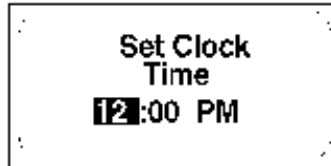
Clock Home/Local Time

2. To change the selected time (Home or Local), rotate the MCS to the Settings screen. Press the MCS to select it.
3. When in the menu settings, scroll through the list of menu items to Set Clock Time (for home time) or Set Local Time. Press the MCS to select it.



Set Clock Time

4. Rotate the MCS to change the hour. Press the MCS. Rotate the MCS again to change the minutes. Press the MCS to set the new time.



Set Hour/Minutes

5. To exit the screen, rotate the MCS to Exit, then press the MCS.



Exit

To Set Alarm Time:

1. Rotate the MCS to the "Settings" menu. Press the MCS.
2. When in the Settings menu, scroll through the list of menu items to "Set Alarm Time". Press the MCS to select it.



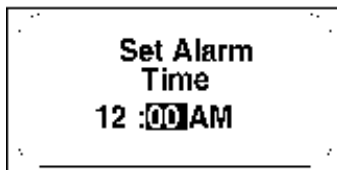
Set Alarm Time

3. Rotate the MCS to change the hour. Press the MCS. Rotate the MCS again

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to change the minutes. Press the MCS to set the new alarm time.

4. To exit the screen, rotate the MCS to Exit, then press the MCS.



Set Alarm Hour/Minutes

To Turn Alarm ON/OFF:

1. Rotate the MCS to the "Settings" menu. Press the MCS.
2. When in the setting menu, scroll through the list of menu items to "Alarm".
3. Press the MCS to turn the alarm ON or OFF.



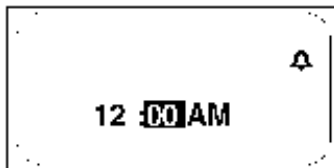
NOTE: Unless there is a loss of battery power, the display will always maintain

the last screen from key off after the key is turned back to the on position and the POST cycle completes.

4. To exit the screen, rotate the MCS to Exit, then press the MCS.



NOTE: A bell icon appears in the clock display when the alarm has been set to ON.



Alarm "On"

To Set Standard or Metric Units:

1. Rotate the MCS to the "Settings" menu. Press the MCS.
2. When in the Settings menu, scroll through the list of menu items to "Units". Press the MCS to display

either Standard or Metric units. Refer to [Engine Hours/Outside Air Temperature on page 3-39](#), for another method to change units.

To Set Language:

1. Rotate the MCS knob to the "Settings" menu. Press the MCS.
2. When in the Settings menu, scroll through the list of menu items to "Language". Press the MCS to display either English, Spanish or French.

Kenworth GPS Navigation System

Your vehicle may be equipped with a Kenworth GPS Navigation System manufactured by Lowrance Electronics, Inc. This System is a Global Positioning Satellite (GPS) linked computer. It receives input from multiple sources to pinpoint your precise location. Read and understand this section of the manual and the Lowrance Operation Instructions Manual (equipped with your vehicle) and observe all Warnings, Cautions and Notes below before using the system.



WARNING: When a GPS unit is used in a vehicle, the vehicle operator is solely responsible for operating the vehicle in a safe manner. Vehicle Operator's must maintain full surveillance of all pertinent driving

conditions at all times. An accident or collision resulting in damage to property, personal injury or death could occur if the operator of a GPS-equipped vehicle fails to pay full attention to travel conditions and vehicle operation while the vehicle is in motion.



WARNING: Do not follow route suggestions, if you are unfamiliar with the legal weight and height restrictions of the route. Be familiar with the route the system is recommending prior to proceeding. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Do not look at the monitor for prolonged periods while the vehicle



is moving. Only glance at the monitor briefly while driving. Failure to do so can result in the driver not being attentive to the vehicle's road position, which could lead to an accident and may result in personal injury, death, equipment or property damage.

WARNING: Do not program the Navigation System while driving. Always stop your vehicle when programming or changing the settings on the Navigation System. Programming the system while driving can cause you to take your eyes off the road, which could result in an accident. Failure to comply may result in personal injury, death, equipment or property damage.



CAUTION: Do not use the Navigation System to route you to emergency services. Not all emergency services are in the map database. Use your judgment and ask for directions in these situations. Do not rely on the Navigation System to route you to the closest emergency service.



NOTE: Regardless of how and where the navigation system directs you, it is your responsibility to operate the vehicle in a safe and legal manner.



NOTE: Ensure the volume level of all audio devices is set to a level that still allows you to hear outside traffic and emergency vehicles.



NOTE: There may be situations where the Navigation System displays the vehicle's position

erroneously. Use your own driving judgment in these situations. Refer to the Lowrance Operation Instructions Manual for additional information.



NOTE: The map database is the most current available at the time of production. The database is designed to provide you with route suggestions and does not take into account the relative safety of a suggested route or of factors that may affect the time required to reach your destination. Refer to the Lowrance Operation Instructions Manual for additional information.

Care Of The Display Screen

From time to time it may be necessary to clean the display screen. To clean the screen, dampen a clean, soft, lint-free cloth with water only. A mild glass cleaner **that does not contain alcohol or ammonia** may also be used. Cleaners that contain alcohol and/or ammonia will eventually dry-out, crack and "yellow" the screen. Wipe the screen gently back and forth. You can also use a commercial cleaner especially designed for LCD screens.

Screen Display On / Off

1. Press and hold the POWER/LIGHT button for approximately 1 second.
2. After the display has been turned on, the following Warning/Informational screen will appear:
3. After reading the information, touch the  in the upper right corner of the screen with your finger indicating you acknowledge and understand the information. The MENU screen will automatically appear next.
4. To turn the system off, press and hold the POWER/LIGHT button for 3 seconds.

Warning/Informational Screen


WARNING

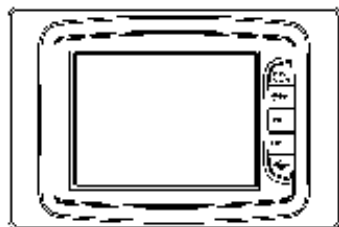
Do not let this device distract you while driving. Always concentrate on your driving. Distractions could cause an accident resulting in injuries to you or others.

IMPORTANT
Disclaimer: Map data may be inaccurate and navigation routes may not be available for larger size vehicles.
Regardless of how and where the navigation system directs you, it is your responsibility to operate the vehicle in a safe and legal manner.

Note: Before using this system, read the Owners Manual and learn how it operates. Some functions of this system will not operate when the truck is moving.

Brightness Adjustment

The display has 3 preset backlight levels. To cycle through them, repeatedly press the POWER/LIGHT button.



Kenworth GPS Navigation Display

Operation

For detailed information covering operation, refer to the Lowrance Operation Instructions Manual included with your vehicle). For technical, return, or repair questions, contact Lowrance Customer Service Dept. at 800-324-1356 (Canada).

Disclaimer For Kenworth GPS Navigation System

Kenworth Truck Company is not responsible for erroneous map data, misrouting or any downtime or other damages associated with or arising out of the use of the Navigation System.

SWITCHES

Headlight Switch



Headlights on the Kenworth T2000 are controlled by a three-position (rocker-type) switch located above the B-panel instruments. The switch controls the following lights:

- The first position (depressed down) is the OFF position.
- The second position (center) turns ON the instrument panel lights, parking lights, tail lights, side and fender lights.
- The third position (depressed up) turns ON the headlights and second-position lights remain on.

For High Beam operation see [High Beam on page 3-79](#).

Marker Lights



A separate switch next to the headlight switch turns on the marker lights for both the cab and trailer. These are the five amber lights on top of the cab, front trailer lights, and red rear truck/trailer lights.



NOTE: An interrupt switch for the trailer marker lights is mounted on the end of the turn signal lever.

Daytime Running Lights

On vehicles equipped with the Daytime Running Light (DRL) system, the low beam headlights are turned ON automatically at reduced brightness (to conserve headlamp life). When the DRL system is activated, only the headlights are illuminated, all other exterior lights will be off.

Three controls (or conditions) will affect whether the system is ON or OFF:

- headlight (master) switch
- engine cranking
- parking brake

If the headlight switch is turned OFF, the DRL system engages automatically after the engine starts and you release the parking brake. If the headlight switch is ON, the DRL system is overridden, and headlights operate normally. Also, during engine cranking the DRL is temporarily turned off.



WARNING: Do not use daytime running lights (DRL) during periods of darkness or reduced visibility. Do not use DRL as a substitute for headlights or other lights during operations that require lighting of your vehicle. Failure to comply may result in personal injury, death, equipment or property damage.

Windshield Wipers/Washer



Your Kenworth T2000 is equipped with a two speed, intermittent windshield wiper. A four-position rotary wiper switch (located on the dash, to the right of the steering column), operates the windshield wipers and washer.



NOTE: The ignition key must be turned to ON or ACC for the wiper/washer switch to operate.

Windshield Wiper Control

POSITION	MODE
0	OFF
1	Intermittent Range: long to short delay
2	Low Speed
3	Wiper/washer (push in)

Turn knob clockwise to change wiper mode. The first position after OFF (0) is intermittent delay (1). As you turn the knob further to the right, intermittent delay decreases until the knob comes to the low speed (continuous) setting (2), then high wiper speed (3).

The final option (4) activates the washer cycle. To wash the windshield, push knob IN and release. Hold knob IN to extend washing cycle. After one to three wipes (depending on how long you hold the switch in) the wipers will shut off automatically.

The windshield washer reservoir is located inside the engine compartment near the radiator on the right hand

side. See [Washer Reservoir on page 5-60](#). Check the windshield washing fluid level daily. If necessary, fill to top.



WARNING: *Do not drive with worn or dirty wiper blades. They can reduce visibility, making driving hazardous. Clean blades regularly to remove road film and wax build-up. Use an alcohol based cleaning solution and a lint-free cloth, and wipe along the blades.*



CAUTION: *If the electric pump is operated for a long period (more than 15 seconds) with a dry reservoir, the pump rotor may be damaged.*

Clean all inside and outside windows regularly. Use an alcohol- based cleaning solution and wipe dry with either a lintfree or a chamois cloth. Avoid running the wiper blades over a

dry windshield to prevent scratching the glass. Spray on washer fluid first. A scratched windshield will reduce visibility.

Ignition Key Switch

The ignition key switch (located to the left of the steering column) has four positions: ACC (Accessories), OFF, ON, and START.

OFF: In this position all accessories are OFF (except those listed below) and you can remove the key.

- The following lights and accessories have power when the key is in the OFF position:
 - brake lights
 - emergency hazard flasher
 - dome and courtesy lamps (on doors)
 - electric horn
 - cigarette lighter
 - tail lights
 - marker lamps
 - headlights
 - radio station memory
 - instrument lights

- auxiliary power
- multi-function display memory



NOTE: In the OFF position, fuel is cut off by a solenoid valve.

ACC (Accessory): With the key in this position you can play the radio, defrost mirrors (if equipped with mirror heat) or use other accessories.

ON: In the ON position all circuits are energized. Panel warning lights will light and the buzzer will sound until (1) the engine is started, (2) normal oil operating pressure is reached, and (3) air brake system pressure is above 64 psi (441 kPa). In this position, the ignition key cannot be removed.

START: Turn the key to this position to start your engine: it energizes the starter and retracts the solenoid valve to allow fuel supply to the engine. Release the key after the engine has

started. If your Kenworth T2000 is equipped with the optional push button starter switch, use it to engage the starter. For complete engine starting procedures, see [OPERATING THE ENGINE on page 4-51](#).

Parking Brake Valve

Before you leave the cab:

1. Apply all parking brakes. Pull out the Yellow Parking Brake Control knob (1) located on the dash. The Red (octagon-shaped) Trailer Air Supply Control knob will automatically pop out. (An optional dash warning light will indicate when the brake is on.)

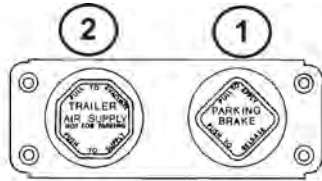


WARNING: Do not leave the cab without applying the parking brake. The truck could roll and may result in personal injury, death, equipment or property damage. Always apply the parking brake before you leave the cab.

2. Shift the transmission into park. (See [OPERATING THE TRANSMISSION on page 4-78](#) and [Parking Brake Valve on page](#)

3-74, for transmission shifting and parking brake information.)

3. Turn the key to OFF.
4. Remove the key



Combination (Tractor/Trailer) Parking Brake Control Valves

- 1 Parking Brake Control (Yellow)
- 2 Trailer Air Supply Control (Red)



WARNING: Do not pull out the parking brake valve while the vehicle is moving. Stopping with the parking brake controls can cause a sudden wheel lock-up, loss

of control, or over-take by following vehicles. Doing so may result in personal injury, death, equipment or property damage.

See [Using the Brake System on page 4-29](#) for more information.

Dash Panel (Dimmer) Switch



NOTE: The Headlight Switch must be in one of two ON positions for the panel lights to operate.



The Dimmer Switch (located to the right and below the A-panel) adjusts the brightness of the instrument panel lights.

Turning the Dimmer Switch control knob to the right will brighten the instrument panel lamps.

Turning the knob to the left will dim the lights.

Dome Lights



The dome light is controlled by a three position Dome Switch located on the left side of the instrument panel.

3

The center position turns on the under dash lights; the up position turns on the dome lights and under dash lights remain on.



NOTE: The dome light and courtesy lamps on doors are automatically activated when you open the door.

Fog Lights Switch



If your vehicle has fog lights, a Fog Light Switch on the control panel is used to turn them ON or OFF. When fog lights are ON, the dash and tail lamps also come on. Fog lights are automatically turned off when your high-beam headlights are ON.



NOTE: Across the U.S.A. and Canada, State/Provincial requirements vary as to when high beams and fog lights can and cannot be used together. Some states allow only four lights to be used together, while some allow more. How your lights are arranged will affect whether you can operate headlights and fog lights concurrently, always comply with the state requirements where you are driving.

Low Voltage Disconnect

If your vehicle is equipped with a Low Voltage Disconnect (LVD) feature, the LVD module is located behind the center dash panel.

Purpose

The LVD may increase battery life and prevent unnecessary jump start conditions by ensuring that an unattended load does not deplete the battery charge to a level that will prevent you from starting your vehicle.

Operation

The LVD will disconnect non-vital battery loads when battery voltage drops below 12.3V for 3 minutes and the key switch is in the ACC or OFF position. During the last 2 minutes the LVD will emit a slow audible beep. 30 seconds before disconnecting loads the alarm will change to a fast beep. Turning the key switch to the ON position at anytime will reconnect loads disconnected by the LVD.

See an authorized Kenworth Dealer if the LVD fails to reconnect loads during normal operation.

Circuits Disconnected By LVD

- Refrigerator
- Cigarette Lighter
- Dome Lamps
- Bunk Lamps
- Accessory Power Wells
- Reading Lamps



NOTE: All LVD circuits are color-coded blue on the central electrical panel cover label.



WARNING: Do not use any LVD controlled circuits to power electronic engine controls, ABS circuits, or safety/work-related lighting. Before adding any device to the vehicle's electrical system, consult your nearest authorized Kenworth Dealer or read the contents of TMC RP-136. Failure to comply may result in personal injury, death, equipment or property damage.



NOTE: The determination of what circuits/loads that were connected to the LVD was based upon the recommendation from The Maintenance Council (TMC) of the American Trucking Association. To review the recommended practice, see TMC RP-136.

Optional Switches and Controls

For further information on optional equipment and controls refer to the original equipment manufacturer's operating instructions.

STEERING COLUMN

Introduction

This section covers the standard steering column controls and mirror operation. Depending on how your Kenworth T2000 is configured, some or all of these features are installed on your vehicle.

Turn Signal/High Beam Switch



NOTE: The ignition key must be turned to ON for the signal/switch to operate.

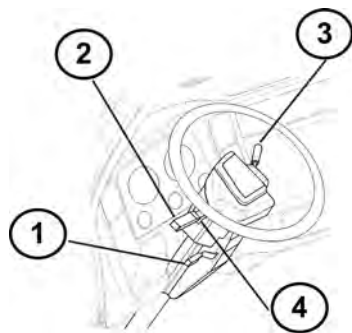
The lever-action turn signal/high beam switch is located on the left side of the steering column. In addition, mounted on the turn signal lever is a trailer marker light Interrupter Switch. Each time a turn indicator is activated the buzzer emits a short beep.

Turn Signals

- To signal a right turn, push the lever forward (clockwise).
- To signal a left turn, pull the lever back (counterclockwise).



NOTE: An interrupt switch for the trailer marker lights is mounted on the end of the turn signal lever. When activated, only the trailer marker lights flash (not the cab marker lights).



Steering Column Controls

- 1 Tilt Steering Column Lever (optional)
- 2 Turn Signal Lever
- 3 Trailer Brake Hand Valve (optional)
- 4 Emergency Flasher Switch Tab



WARNING: After you complete a turn, shut the system off by returning the lever to the OFF (center) position. The switch's lever

action is NOT self-canceling. Failure to shut off a turn signal could confuse other drivers and result in an injury accident. An indicator light in the instrument panel will flash until the turn signal is turned off.

High Beam



NOTE: The headlights must be ON for the high beam switch to operate.

- To switch your headlights to lower or higher beam, gently pull the turn signal lever, toward the steering wheel, until you hear the switch click and the beam changes. The blue indicator light in the instrument panel will be ON when the high beam is being used.
- To return to previous beam: pull the lever towards the steering wheel again.
- To momentarily flash your headlights, gently pull the turn signal lever toward the steering wheel until the headlights flash (before you feel or hear the switch click), then release the lever.

Emergency Flasher Switch

The four-way Emergency Flasher switch is on the turn signal body, just below the turn signal lever. The emergency flasher makes all four turn signals (front and rear) flash simultaneously. The flasher works independently of the ignition switch. You should always use the flasher if the vehicle is disabled or parked under emergency conditions.

- To operate the emergency flasher, pull the switch tab out.
- The flasher is **NOT** self-cancelling. To turn off, activate left or right turn signal.



WARNING: Use your Hazard Flasher Warning System any time you have to stop off the road or on the side of the road, day or night. A hard to see vehicle can result in an accident. Another vehicle could run into you if you

do not set your flashers. Always move the vehicle a safe distance off the road when stalled or stopped for repairs. Failure to comply may result in personal injury, death, equipment or property damage.

- ***Your disabled vehicle can be dangerous for you and others. The hot exhaust system could ignite dry grass, brush, spilled fuel, or other material that can cause fires. Do not park or operate your vehicle in areas where the hot exhaust system could cause a fire.***

Trailer Brake Hand Valve

This hand valve, mounted on the steering wheel column, provides air pressure to apply the trailer brakes only. It operates independently of the foot treadle valve. See [Using the Brake System on page 4-29](#), for more instructions on proper use of the Trailer Brake Hand Valve.

STEERING COLUMN

Adjustable Tilt/Telescoping Column

The Adjustable Tilt/Telescoping Column is an option on your Kenworth T2000. Depending on your vehicle's configuration, you may have a Tilt/Telescoping steering column, Tilt only, or neither. The tilt feature allows forward and rearward movement of the wheel. The telescoping feature allows you to move the wheel up and down. To activate these features, locate the Tilt-Telescoping Lever on the left side of the steering column.



WARNING: Do not adjust the Tilt-Telescoping Steering Wheel while the vehicle is in motion, it could cause loss of control. You would not be able to steer properly and could have an accident. Make all adjustments to the steering column while the vehicle is stopped. Failure to comply

may result in personal injury, death, equipment or property damage.

To tilt the wheel:

- PUSH this lever down. Move the steering wheel to the desired angle, then release the lever to lock in the correct position.

To raise or lower the (Telescoping) wheel:

- PULL the lever up. Push or pull the wheel to the desired height, then release the lever to lock the wheel at the correct height.

Horn

Your Kenworth T2000 is equipped with air horns. To operate, pull on the lanyard extending from the overhead header panel. Your vehicle may also have an electric horn. To sound the electric horn, press the button in the center of the steering wheel, which is the standard location for electric horns (optional horn locations may be requested).

SmartWheel Control System



CAUTION: Under no circumstances should you attempt to service the steering wheel, clockspring, airbag (if equipped) or any of the electrical wiring in the multiplex system, or any steering components (steering column, steering driveline or steering gear). Tampering with these components may result in an inoperable multiplex/airbag system.



WARNING: If vehicle is equipped with an SRS airbag, tampering with steering wheel and components may damage the airbag system or cause an inadvertent airbag deployment. Failure to comply may result in personal

injury, death, equipment or property damage.

As an option, your Kenworth T2000 may come equipped with a SmartWheel Control System. The SmartWheel includes push-button switches that control the following:

- Horn
- Engine Retarder
- Cruise Control
- Headlights (flash)
- Marker Lights (flash)



- 1 Headlights Flash
- 2 Marker Lights Flash
- 3 Engine Retarder
- 4 Horn
- 5 Cruise Control

Operating the System

A. Horn

Depressing the bottom center bar activates the electric horn.

B. Engine Retarder

• To Activate:

To activate the desired engine retarder setting:

Press  for LOW.

Press  for MEDIUM.

Press  for HIGH.



NOTE: Your engine may only have 2 engine retarder settings, LOW and HIGH.

• To Turn Off:

Press  for OFF.



WARNING: The service brakes must be used in an emergency. The engine or retarder alone might not stop you fast enough to prevent an accident. Relying only on the engine retarder, may result in personal injury, death, equipment or property damage. The engine retarder is NOT intended as the primary brake for the vehicle, nor is it an emergency brake. The engine retarder only helps the service brakes by using engine pressure to slow the drivetrain. Use the service brakes for quick stops.



WARNING: Do not operate the engine retarder when driving/operating your vehicle bobtail or with a loaded or unloaded trailer on road surfaces with poor traction (wet, icy, or snow covered

roads) or in heavy traffic. Braking caused by the normal operation of the engine retarder could cause you to lose control of the vehicle and may result in personal injury, death, equipment or property damage.

C. Cruise Control



WARNING: Do not operate the cruise control when operating on road surfaces with poor traction (wet, icy, or snow covered roads) or in heavy traffic. Accelerations caused by the normal operation of the cruise control could cause you to lose control of the vehicle resulting in an injury accident.



NOTE: Cruise control functions and features may vary depending upon which engine

is installed in your vehicle. For specific instructions on operating the cruise control, see the Engine Operation and Maintenance Manual.

- **To Turn On:**

Press the ON button.

- **To Turn Off:**

Press the OFF button. Any previous speed settings are cleared.

- **To Set:**

The cruise control must be ON. Maintain a steady speed and press the SET button. The cruise control is now set for the speed you were driving when you pressed the SET button.



NOTE: NOTE: Trucks with Detroit Diesel and Cummins engines will coast* when the SET button is held down. Caterpillar engines will accelerate* until the SET

button is released. The cruise control will hold this new speed.

- **To Disengage:**

Lightly press the brake pedal. When disengaged, the vehicle speed will no longer be controlled by the cruise control.

- **To Resume:**

Press the RES button. If a speed was previously set, the vehicle will return to that speed and remain there.



NOTE: Trucks with Detroit Diesel and Cummins engines will accelerate when the RES button is held down. Caterpillar engines will coast* until the RES button is released. The cruise control will hold this new speed.*

- *The engines may be reprogrammed to*

the opposite setting, i.e., SET/ACCEL and RES/COAST or SET/COAST and RES/ACCEL. To have the engine reprogrammed, see your authorized Kenworth Dealer.

D. Headlight/Marker Lamp Flash

- **Headlight Flash:**

Press

to flash on the headlights if they are off, or blink off if they are on while the button is held down. This feature works with the headlight switch on the dash in either position.

- **Marker Lamp Flash:**

Press

to flash on the marker lamps if they are off, or blink off if they are on while the button is held down. This feature works with the marker lamp switch on the dash in either position. The button controls the trailer marker lamps (and the tractor marker lamps if they are on the same switch).

MIRRORS

Mirrors

Your vehicle comes equipped with two outside rear view mirrors that enable you to see to the sides and behind your vehicle. Be sure both mirrors are adjusted properly before you begin driving.

- To provide good visibility, adjust the mirror so the side of your vehicle appears in the inboard part of the mirror.



WARNING: *Convex mirrors can distort images and make objects appear smaller and farther away than they really are. You could have an accident if you are too close to another vehicle or other object. Keep plenty of space between your vehicle and others when you turn or change lanes. Remember that*

other objects are closer than they may appear.

Heated Mirrors



Your Kenworth T2000 has heated mirrors. Mirror heat is controlled by the control panel switch labelled MIRROR HEAT, located on the Accessories Switch Panel. To defrost mirrors in cold weather, turn the mirror heat switch to ON.

You can keep the mirror heat on to ensure they stay free of ice or condensation. They automatically adjust to the temperature outside, providing the right amount of heat to keep them clear.

Power Mirrors

Your Kenworth T2000 has power mirrors. A power mirror switch controls both the right and left outside mirrors. The switch is located on the drivers door.

3

To adjust mirrors:

- Push to R (right) or L (left) to select which mirror you want to adjust. Next push the arrow that points toward the direction you want to move the mirror.



NOTE: The power mirror switch does not control the adjustment of the convex mirrors.

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DRIVING TIPS AND TECHNIQUES

Introduction

This section covers additional driving tips and techniques on how to drive your Kenworth T2000 more efficiently. For further information on driving techniques, read the American Trucking Association's (ATA) Truck Driver's Handbook. It will give you more tips on starting, shifting, and driving your Kenworth T2000 Series vehicle.

Coasting

- Do not coast with the transmission in neutral or with the clutch pedal depressed.



WARNING: Do not coast with the transmission in neutral or with the clutch pedal depressed, it is a dangerous practice. Without the use of the retarding power of the drivetrain, your vehicle can reach dangerous speeds. At very high speeds you may not be able to put the transmission in any gear. At high speeds you could seriously damage your vehicle or cause an accident when you put the transmission in gear. The engine speed could exceed the maximum governed speed and cause a serious accident due to mechanical failures. Failure to comply

may result in personal injury, death, equipment or property damage.

Besides being illegal and dangerous, coasting is also expensive. It causes premature failure or damage to the clutch and transmission and overloads the brake system.

Coasting with the transmission in neutral also prevents proper transmission component lubrication. During coasting the transmission is driven by the rear wheels, and the countershaft gear (which lubricates the transmission components by oil splash) will only be turning at idle speed.

Descending a Grade



WARNING: Do not hold the brake pedal down too long or too often while going down a steep or long grade. This could cause the brakes to overheat and reduce their effectiveness. As a result, the vehicle will not slow down at the usual rate. To reduce the risk of personal injury and/or an accident, before going down a steep or long grade, reduce speed and shift the transmission into a lower gear to help control your vehicle speed. Failure to follow procedures for proper downhill operation could result in loss of vehicle control and may result in personal injury, death, equipment or property damage.

Economical Driving

The following section includes recommendations for best engine performance and economy:

Engine Overspeed - RPM

- Operate the engine within the optimum engine RPM range and do not allow the RPM's to exceed the maximum governed speed. See your Engine Operation and Maintenance manual for information regarding engine RPM.
- When the engine is used as a brake to control vehicle speed (e.g., while driving down a grade), do not allow the engine RPM to exceed maximum governed speed.
- Under normal load and road conditions operate the engine in the lower end of the range.



NOTE: Often these recommendations are secondary to maintaining an adequate and safe speed relative to the surrounding traffic and road conditions.



CAUTION: To avoid engine damage, do not let the engine RPM go beyond the maximum governed RPM valve damage could result if overspeed conditions occur.

Use of Tachometer

The tachometer is an instrument that aids in obtaining the best performance of the engine and manual transmission, serving as a guide for shifting gears. Refer to the Engine Operation and Maintenance manual for optimum engine RPM.

- If the engine RPM moves beyond the maximum governed speed, indicating an overspeed condition, apply the service brake or shift to a higher gear to bring engine RPM within the optimum speed range.
- When driving downhill: shift to a lower gear, use the engine brake (if so equipped), and use the service brake, keeping the engine speed below 2,100 RPM.

When the engine speed reaches its maximum governed speed, the injection pump governor cuts off fuel to the engine. However, the governor has no control over the engine RPM

when it is being driven by the vehicle's transmission, for example, on steep downgrades. Apply service brakes or shift to a higher gear.

Fuel economy and engine performance are also directly related to driving habits:

- The best results in trip time and fuel economy are obtained while driving the vehicle at a steady speed.
- Shift into higher or lower gears (or apply the service brake) to keep engine RPM near the lower end of the optimum operating range.
- Avoid rapid acceleration and braking.

Fuel - Excess Consumption

The vehicle's fuel consumption is connected to three important factors: maintenance, driving habits, and general condition of the road, traffic conditions, and vehicle load.

Maintenance

Proper maintenance will keep the vehicle running like new even after long periods of use. The driver must perform the daily and weekly checks of the vehicle.

Maintenance factors affecting fuel consumption:

- air and/or fuel filters partially clogged
- engine valves out of adjustment
- injection pump improperly synchronized
- injection nozzles defective or uncalibrated
- improperly inflated tires
- wheel bearings improperly adjusted
- clutch improperly adjusted or worn (slipping)
- fuel leaks

Driving Habits

Wrong driving habits must be corrected and the recommendations on economic driving should be followed.

Driving factors affecting fuel consumption:

- excessive speed and unnecessary fast acceleration
- long periods of idling
- driving with foot resting on the (manual transmission) clutch pedal

General Condition

Other factors affecting fuel consumption are related to loads and type of roads on which the vehicle operates. It is not always possible to choose the most adequate road, but it must be kept in mind that the ideal road is the one that allows a steady speed in high gear, without requiring frequent braking and acceleration.

The following general conditions can affect fuel consumption:

- overload
- unbalanced load
- very high load
- inadequate roads
- traffic conditions

Safe Driving



NOTE: The following recommendations are merely informative and do not cover all safety precautions. Safe driving is, above all, the responsibility of the driver.

The safe operation of a vehicle is not just following the established traffic rules, but should also include: maintaining the vehicle in good mechanical condition, and proper operation of the engine, transmission, and brakes.

The following guidelines will help you to drive the vehicle safely:

- Make a thorough inspection of the vehicle, daily and weekly. See [Driver's Check List on page 1-29](#).
- Ensure that windows, mirrors, and lights are clean.
- Check all tires for damage and correct inflation pressure.
- Adjust the seat to a comfortable driving position, for easy access to pedals and vehicle controls.
- Adjust rear view mirrors.
- Always use the safety belts.
- Do not exceed the GVWR.
- Proportionally distribute loads on the frame.
- Always keep the brakes adjusted and in proper condition. See [Checks and Adjustments on page 5-47](#).
- Obey speed limits and all traffic signals.



WARNING: Do not exceed the specified load rating. Overloading can result in loss of vehicle control and personal injury, either by causing component failures or by affecting vehicle handling. Exceeding load ratings can also shorten the service life of the vehicle. Failure to comply may result in personal injury, death, equipment or property damage.

- When driving downhill, select one gear lower than the up-hill gear. And use the brakes properly, do not ride them.
- Do not exceed maximum governed speed (as specified in the Engine Operation and Maintenance Manual).

- The components of your vehicle are designed to provide

satisfactory service if the vehicle is not loaded in excess of either the gross vehicle weight rating (GVWR), or the maximum front and rear gross axle weight ratings (GAWRs). (Axle weight ratings are listed on the driver's door edge.)



NOTE: For your safety and the safety of others, follow routine and periodic maintenance schedules for all components on your vehicle. See [Table 15, Maintenance Schedule on page 5-17](#).

Cruise Control



The cruise control is operated by two switches on the dash panel. The first switch is the master ON/OFF switch. The second switch allows you to set the desired speed or RESUME the desired speed after the cruise control function has been interrupted.



WARNING: Do not operate the cruise control when operating on road surfaces with poor traction (wet, icy, or snow covered roads) or in heavy traffic. Accelerations caused by the normal operation of the cruise control could cause you to lose control of the vehicle and may result in personal injury, death, equipment or property damage.



NOTE: Cruise control functions and features may vary depending upon which engine is installed in your Kenworth T2000. For specific instructions on operating the cruise control, see the Engine Operation and Maintenance Manual.



NOTE: Cruise Control will not function until the operator has depressed both the service brake pedal and the clutch pedal at least one time after each start-up. For vehicles with automated transmissions and no clutch pedal, only the service brake pedal needs to be depressed.

Air Suspension Height/Air Pressure



Your vehicle may have an air suspension and a deflation switch which allows the air in the suspension to be exhausted from a switch on the dash. The normal purpose of this feature is to allow you to lower the vehicle for loading. On tractors, the deflate switch allows you to lower the fifth wheel to slide under a trailer.

A guard on the switch prevents you from accidentally deflating the suspension.



WARNING: Do not operate the Air Suspension Deflate Switch (Dump Valve) while driving. Sudden deflation while your vehicle is moving can affect handling and

control and could lead to an accident. Use this switch only when your vehicle is not moving. Failure to comply may result in personal injury, death, equipment or property damage.



CAUTION: *Operating a vehicle with air suspension bags either overinflated or under-inflated may cause damage to driveline components. If a vehicle must be operated under such conditions, do not exceed 5 mph (8 km/h). Failure to comply may result in equipment damage.*

Suspension Air Pressure Gauge

The Suspension Air Pressure gauge (option), see [Optional Gauges on page 3-55](#), which indicates the amount of air pressure in the air suspension springs in pounds per square inch (psi). Air pressure in the spring is related to the rear axle load. The greater the rear axle load, the greater the air pressure in the air bags. Therefore, the air pressure displayed will vary, depending upon the rear axle load.

Driving with Deflated Air Springs

If an air spring ruptures, there will be enough air pressure to drive the vehicle to a safe stop off the highway to investigate the problem.



WARNING: *Do not drive with ruptured air springs. The air loss can cause the spring brakes to apply. This allows your brakes to drag and may burn up the linings, which could lead to an accident. Do not continue to operate the vehicle in this condition. Failure to comply may result in personal injury, death, equipment or property damage.*

To get to a repair facility, do the following:

1. Remove the height control link connected to the axle and to the suspension air valve control arm. This will cause the air valve control arm to center in the closed position.
2. The air system can then be pumped up to normal pressure for continued operation.



WARNING: Low air pressure could make brakes unsafe for driving by not providing sufficient air brake application pressure in an emergency, which could lead to an accident. Before driving the vehicle, make sure the air pressure pumps up to over 100 psi for normal brake operation. If it does not reach 100 psi, do not try to move the vehicle. Failure to comply may result in personal injury,

death, equipment or property damage.

Fifth Wheel

The following applies to tractor configurations:



WARNING: Ensure that all fifth wheel maintenance, adjustments, and rebuilding are done only by a qualified mechanic. An improperly maintained fifth wheel can cause a trailer to separate from a tractor. This could lead to a serious accident. Failure to comply may result in personal injury, death, equipment or property damage.

Your Kenworth T2000 is equipped with either a Fixed or an Air-Controlled Sliding Fifth Wheel. Either type should self lock when a trailer king pin trips the locking dogs as the tractor is backed under a trailer.

Fifth Wheel Jaw Lock

To unlock the fifth wheel lock:

- Pull out on the lever (usually located on the left-hand side of the fifth wheel) until it remains in an over center position.

Hook Up:

- After connecting your tractor to the trailer, always inspect the jaws to be sure they have locked on the kingpin before driving.

Air-Controlled Sliding Fifth Wheel



Vehicles having an air-controlled sliding fifth wheel have a fifth wheel slider lock controlled by a switch on the accessory switch panel. To operate this type of lock, move the switch to the appropriate position. By placing the switch in the UNLOCK position, you can slide the fifth wheel to various positions to adjust weight distribution. There is a guard on this switch to protect you against accidentally activating or releasing the lock.



WARNING: Do not move the fifth wheel while the tractor-trailer is in motion. Your load could shift suddenly, causing you to lose control of the vehicle, which can result in an accident. Never operate the vehicle with the switch in the

UNLOCK position. Always inspect the fifth wheel after you lock the switch to be sure the fifth wheel lock is engaged. Failure to comply may result in personal injury, death, equipment or property damage.

Fifth Wheel Lubrication

- Frequently operate and lubricate movable or sliding fifth wheels to prevent corrosion.



CAUTION: Both the fifth wheel plate and the slide tracks (if a slider) should be cleaned and lubricated periodically to ensure smooth turning and sliding action. Failure to keep these surfaces lubricated can lead to frame or driveline damage.

See [Frame and Fifth Wheel](#) on page 5-91, for maintenance information.

OPERATING THE AFTER-TREATMENT SYSTEM

OPERATING THE AFTER-TREATMENT SYSTEM

After-Treatment System Description



NOTE: The emission warning lamps and emission switch functions described below supersede those listed in the Engine manufacturer's Operator and Maintenance manual. For additional Emissions After-treatment information specific to your engine, see the Engine manufacturer's Operation and Maintenance Manual supplied in your vehicle. All other lamp and switch functionality described in the manual are still valid.

have an exhaust After-Treatment System (ATS) which includes a Diesel Particulate Filter (DPF), Regeneration Switch and warning lights. The DPF will trap soot from the engine exhaust gases. The ATS will periodically clean (regenerate) the DPF.

Controlling the Regeneration Process

Your vehicle is equipped with either a two-position or three-position Regeneration Switch, mounted on the dash.

If equipped with a two-position Regeneration Switch, the driver can initiate a Parked Regeneration when certain operating conditions are suitable for regeneration, however, you will NOT be able to Stop a regeneration if the ATS has initiated one automatically. Refer to "Parked Regeneration" [on page 4-25](#).

If your vehicle is equipped with a three-position Regeneration Switch, the driver can control the regeneration by overriding the ATS when certain operating conditions are not suitable for regeneration. Refer to "Stop an Automatic or Parked Regeneration" [on page 4-27](#).

In order to meet 2007 EPA engine emission requirements, vehicles will



WARNING: *If you operate in environments that contain explosive vapors or flammable materials, look to see if your vehicle's Regeneration Switch is equipped with a STOP function. The STOP function must be activated prior to entering the above environment(s) to prevent automatic engine regeneration from occurring, which could cause an explosion or fire. Failure to equip your vehicle with the proper switch (function) or failing to activate the STOP function before entering a combustible environment may cause an explosion or fire that could lead to equipment damage, personal injury or death.*



NOTE: *To obtain a Regeneration Switch with a STOP function, contact your nearest authorized Kenworth dealer to obtain the proper switch and reprogramming of your engine's ECU.*

Two-Position Regeneration Switch



Two-Position Regeneration Switch
(Typical)



NOTE: Refer to "DPF Regeneration" [on page 4-24](#) for instructions on how to start or stop a ATS regeneration (three-position switch only).

Start

Depressing the button in the START direction for at least 4 - 8 seconds will initiate a parked regeneration.

OPERATING THE AFTER-TREATMENT SYSTEM

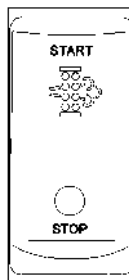
Center



*NOTE: During normal vehicle driving, the regeneration switch **must** be in the CENTER position.*

CENTER is the normal position of the switch. Unless you are manually initiating a parked regeneration or intentionally stopping a regeneration, the switch should be in this position. Placing the switch in the center position will allow an automatic regeneration to occur if conditions allow.

Three-Position Regeneration Switch



Three-Position Regeneration Switch

Start

Depressing the button in the START direction for at least 4 - 8 seconds will initiate a parked regeneration.

Center



*NOTE: During normal vehicle driving, the regeneration switch **must** be in the CENTER position.*

CENTER is the normal position of the switch. Unless you are manually initiating a parked regeneration or intentionally stopping a regeneration, the switch should be in this position. Placing the switch in the center position will allow an automatic regeneration to occur if conditions allow.

Stop

When STOP is pressed the system will not regenerate under any conditions.



CAUTION: Do not leave the switch in the STOP position unless you need to cancel or stop a regeneration. Running the engine with the switch in the STOP position could eventually cause the engine to derate.

After-Treatment System Warning Lights

ATS specific warning lights and indicator symbols are located on the right dash panel.



Diesel Particulate
Filter (DPF) Warning
Light Symbol



High Exhaust System
Temperature (HEST)
Warning Light Symbol

Functionality / Notification Information

The ATS will regenerate the DPF by using hot exhaust gases normally generated by the engine. This typically occurs during highway operation. This is referred to as a "Passive" Regeneration and is transparent to the operation of the vehicle.

Occasionally, the exhaust gases are too cool for passive regeneration. When this occurs, the ATS will regenerate the DPF by increasing the exhaust temperature. This is referred to as an "Automatic" Regeneration and is also transparent to the operation of vehicle. An Automatic Regeneration event typically lasts 30 minutes. During and shortly after the event, the exhaust gases from the DPF may reach temperatures in excess of 650° C (1200° F). See the information in the table below on probable causes and recommended actions related to the

warning lights and indicator symbols of the ATS.

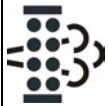
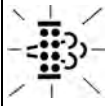
The ATS may not be able to regenerate the DPF when the vehicle is driven at extended low speeds or with frequent start and stops. In such cases, warning lights and indicator symbols will alert the operator to take action. The operator should be aware of whether the lights are on alone or in combination with others. The following table will describe each warning light(s) and what actions are needed from the operator.

OPERATING THE AFTER-TREATMENT SYSTEM

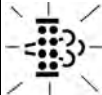
Notification of High Exhaust System Temperature:

Exhaust System Warnings	Operator Actions
4  HEST lamp is on steady The High Exhaust Temperature (HEST) warning lamp will illuminate, regardless of ATS status, as your vehicle slows below 5 mph / 8 kph to warn the driver when the vehicle's exhaust outlet temperature is elevated (at least 450° C / 842° F). This will typically occur when: An Automatic or Parked Regeneration is in processn is in process or During normal vehicle operation when engine is under high or heavy loading.	Follow all warnings listed below. Use the STOP function of the Regeneration Switch if the situation requires. Follow the instructions described under "Stop an Automatic or Parked Regeneration" on page 4-27.  WARNING: Temperatures of the exhaust pipes and at the outlets of the exhaust system during and shortly after a regeneration event will be elevated. If the High Exhaust System Temperature (HEST) warning lamp is on: • <i>Do not park in an area of combustible vapors or materials. You must keep combustibles at least five (5) feet away from the exhaust (outlet) steam (as it exits the tail pipe) while the HEST light is illuminated. Always park your vehicle outside. Failure to do so could ignite an explosion or harm bystanders which could result in injury.</i> • <i>Do not park in an area where people are close by. You must keep combustibles at least five (5) feet away from the exhaust outlet while the HEST light is illuminated. Failure to do so could result in injury.</i> • <i>The exhaust piping, diesel particulate filter (DPF) or tail pipe temperature becomes elevated during engine operation or any regeneration event and can cause burns to the skin. Allow adequate cooling time before working on or near any part of the exhaust system.</i>

OPERATING THE AFTER-TREATMENT SYSTEM

Exhaust System Warnings	Operator Actions
1st Level Warning  DPF lamp is on steady The DPF warning lamp will illuminate when the soot level in the DPF is above the desired level and needs to be regenerated.	The DPF requires regeneration soon. Follow the instructions described under "DPF Regeneration". on page 4-24  <i>NOTE: If you ignore the warning lamp and do not initiate regeneration at the soonest, safest possible time, the DPF will become increasingly clogged with soot and can lead to engine shutdown.</i>
2nd Level Warning  DPF flashes once every second The DPF warning lamp will begin to flash when the soot level in the DPF continues to stay above the desired level and requires regeneration. The engine may eventually derate power if action is not taken soon.	Regenerate the DPF as soon as safely possible. Follow the instructions described under "DPF Regeneration". on page 4-24  CAUTION: <i>If you do not initiate regeneration after the DPF warning lamp begins to flash, you only have a short time before the Check Engine lamp will illuminate and the engine will go into a protection mode and derate power.</i>

OPERATING THE AFTER-TREATMENT SYSTEM

Exhaust System Warnings	Operator Actions
3rd Level Warning  DPF lamp flashes  Check Engine lamp is on The DPF warning lamp will continue to flash and the Check Engine lamp will come on when the soot level in the DPF continues to stay above the desired level. The DPF requires immediate regeneration. The engine will derate power if action is not taken.	Regenerate the DPF immediately. Follow the instructions described under "DPF Regeneration". on page 4-24  CAUTION: <i>If you do not initiate regeneration after the DPF warning lamp begins to flash and the Check Engine lamp is on, you only have a short time before the Stop Engine lamp will illuminate and the engine will automatically begin to shutdown.</i>

OPERATING THE AFTER-TREATMENT SYSTEM

Exhaust System Warnings	Operator Actions
4th Level Warning (Caterpillar Engines Only) DPF lamp flashes Check Engine lamp is on Stop Engine lamp flashes When all three warning lights are on, it is an indication that the soot level in the DPF is now at full capacity. At this level warning, regeneration cannot be performed and the engine will begin a shutdown sequence.	At this point, you CANNOT regenerate the DPF and the engine will begin a shutdown sequence. WARNING: <i>If the Stop Engine warning lamp illuminates, it means you have a serious engine system problem. This should be considered an emergency. You should stop the vehicle as safely as possible and turn OFF the ignition. The vehicle must be serviced and the problem corrected before driving again. Failure to comply may result in personal injury, death, equipment or property damage.</i> NOTE: <i>The engine shutdown sequence is engine specific; therefore to learn how this system works on your vehicle, refer to the Engine Manufacturer's Operation and Maintenance Manual supplied with your vehicle.</i>

OPERATING THE AFTER-TREATMENT SYSTEM

Exhaust System Warnings	Operator Actions
4th Level Warning (Cummins / PACCAR Engines Only)  Stop Engine lamp is on When the Stop Engine warning lamp is on, it is an indication that the soot level in the DPF is now at full capacity. At this level warning, regeneration cannot be performed and the engine will begin a shutdown sequence.	At this point, you CANNOT regenerate the DPF and the engine will begin a shutdown sequence.  WARNING: If the Stop Engine warning lamp illuminates, it means you have a serious engine system problem. This should be considered an emergency. You should stop the vehicle as safely as possible and turn OFF the ignition. The vehicle must be serviced and the problem corrected before driving again. Failure to comply may result in personal injury, death, equipment or property damage.  NOTE: The engine shutdown sequence is engine specific; therefore to learn how this system works on your vehicle, refer to the Engine Manufacturer's Operation and Maintenance Manual supplied with your vehicle.

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DPF Regeneration

Carefully read the following instructions to regenerate the DPF. If you have any problems or difficulties contact your nearest Kenworth dealer for assistance.

The ATS needs conditions typically found in highway driving to regenerate the DPF. If the DPF warning lamp is illuminated, the easiest option is to

help the ATS by proceeding to the nearest highway.

- Select a highway that has a posted legal speed of more than 35 mph.
- Drive your vehicle until the DPF light goes off. This may take 30 - 45 minutes of speeds greater than 20 mph (32 kph).

If your operation or planned route in the immediate future limits your ability to reach highway speeds, proceed

to the next section titled Parked Regeneration.

Parked Regeneration

In very limited applications or operations the DPF must be regenerated by initiating a Parked Regeneration. Follow these seven steps to initiate a Parked Regeneration:

1. Pull the vehicle over to a safe location.
2. Ensure no one is in the immediate vicinity to the tail pipe.
3. Maintain a minimum of 5 feet of clearance to any combustible materials from the edge and top of the vehicle.



WARNING: *Parking the vehicle too close to any combustible materials or vapors may start a fire, ignite an explosion or burn someone standing close by. Before pushing the Regeneration switch on the dash, walk around your vehicle and ensure*

you have at least five (5) feet clearance from the sides and top of your vehicle to any combustibles. Ensure no one is in the immediate vicinity to the tailpipe. Failure to comply could ignite a fire or cause an explosion, resulting in personal injury, death, equipment or property damage.



WARNING: *Never initiate a regeneration in a closed building or enclosure. Always park your vehicle outside and ensure no one is in the immediate vicinity. Failure to comply could ignite a fire or cause an explosion, resulting in personal injury, death, equipment or property damage.*



NOTE: *Typical operation areas or materials that can contain explosive vapors, flammable materials or people in close proximity of the vehicle are*

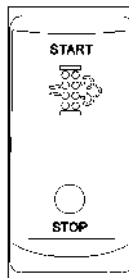
- Fuel depots
- Grain elevators
- Dry grass, leaves or trees
- Transfer refuse stations/dumps
- Parking lots
- Load/unload terminals



NOTE: *While the list above may appear comprehensive, it is your responsibility to take the necessary precautions and be aware of your surroundings and ensure that no combustibles (materials or vapors) or bystanders are close*

by before initiating a regeneration.

4. Verify that the following conditions are met before proceeding. A Parked Regeneration will not initiate if any of these conditions are not met.
 - Parking brake is applied / set
 - Engine is at low idle
 - No throttle, brake or clutch applied
 - PTO is disengaged
 - Transmission is in neutral
 - Cruise control switch is off
 - Engine brake switch is off
5. Get out and walk all around vehicle to ensure that the vehicle is at least 5 feet away from all combustible materials and no one is in the immediate vicinity.
6. Climb back into the vehicle.
7. Push the Regeneration (START) Switch located on the dash for at least 4 - 8 seconds to initiate a Parked Regeneration.



Regeneration Switch

i *NOTE: Acknowledgment that a Parked Regeneration has initiated will vary by engine. The most predominant acknowledgement to you will be an increase in engine RPM and overall engine noise.*

i *NOTE: A Parked Regeneration may take 30 or more seconds to initiate as the ATS system conducts various self-checks to verify all the system*

requirements have been met.

i *NOTE: A Parked Regeneration will only initiate if the DPF warning lamp is illuminated or flashing.*

If you are unable to initiate a Parked regeneration and the DPF warning lamp is illuminated, contact your nearest Kenworth dealer for assistance.

Stop an Automatic or Parked Regeneration



NOTE: The information in this section only applies to vehicles equipped with a three-position Engine Regeneration Switch with a STOP position.

If an Automatic or Parked Regeneration is in process and you want the regeneration to stop, OR you want to prevent a regeneration from occurring, your vehicle is equipped with a switch that can STOP an Automatic or Parked Regeneration. Since Automatic Regenerations can occur at any time with this engine, you must depress the STOP portion of the Regeneration Switch ANYTIME you plan to drive your vehicle into a building, enclosure or area where the activation of a regeneration is not allowed. If the regeneration does not stop, turn the vehicle ignition OFF.



WARNING: Never allow an Automatic regeneration to automatically start while inside a building such as a service bay, shop or building of any kind. Any time you are parking your vehicle inside a building or enclosure, ALWAYS press the Regeneration (STOP) switch prior to entering the building. Failure to comply could ignite a fire or cause an explosion, resulting in personal injury, death, equipment or property damage.



WARNING: Never initiate a Parked Regeneration in a closed building or enclosure. Always park your vehicle outside. Failure to comply could ignite a fire or cause an explosion, resulting in personal injury, death,

equipment or property damage.



WARNING: If you operate in environments that contain explosive vapors or flammable materials, look to see if your vehicle's Regeneration Switch is equipped with a STOP function. The STOP function must be activated prior to entering the above environment(s) to prevent automatic engine regeneration from occurring, which could cause an explosion or fire. Failure to equip your vehicle with the proper switch (function) or failing to activate the STOP function before entering a combustible environment may cause an explosion or fire that could lead to

OPERATING THE AFTER-TREATMENT SYSTEM

***equipment damage, personal
injury or death.***

OPERATING THE BRAKE SYSTEM

Introduction

The operation of the vehicle's braking system and many vehicle accessories depends upon the storage and application of a high-pressure air supply.

This air brake system is of the dual circuit type: it has a circuit for the front wheels, a separate circuit for the rear wheels, and one for the trailer (tractors only). The system is supplied by an engine-driven compressor. The vehicle's compressor takes outside air and compresses it, usually to 100-130 psi (690-896 kPa). The compressor air then goes to the air tanks to be stored until needed.

When you operate your air brakes, the stored compressed air flows into the chambers where it is used to apply

your truck and trailer brakes. That is why, when you push down on the brake pedal, you do not feel the same amount of pressure on the pedal that you do when you apply the brakes on your car. All you are doing on your truck is opening an air valve to allow air to flow into the brake chambers.



WARNING: The brake system is a critical vehicle safety system. For the safety of you and others around you, have the vehicle submitted for periodic preventive maintenance checks as well as having any suspected problems immediately checked by an authorized Kenworth Dealer. Failure to properly maintain your brake system can lead to serious accidents. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Never drive your vehicle with the parking brake applied. Always release the parking brakes prior to moving the vehicle. Failure to disengage the parking brakes prior to moving your vehicle could result in excessive heat buildup in the brake system, resulting in a fire. Failure to comply may result in personal injury, death, equipment or property damage.



NOTE: Today's diesel electronic engines have significant torque and startability power at low RPM. Combinations of engine speed and available torque may over-power the vehicle's parking brakes.

Air Supply System

Contamination of the air supply system is the major cause of problems in air-operated components such as brake valves and suspension height control valves. To keep contaminants to the lowest possible level, follow all maintenance procedures.

Air Dryer

Bendix AD-IS Series Air Dryers

Your Kenworth vehicle may be equipped with a Bendix AD-IS series air dryer. Any air dryer replacement should be made with an identical component.



WARNING: If a different air dryer brand or model is installed on the vehicle other than what was originally installed, it could cause the air system to not perform correctly unless the full air system design is reviewed and modifications made to comply with Federal Motor Vehicle Safety Standards (FMVSS) 121 - Air Brake Systems. Failure to abide by this warning and maintain compliance to FMVSS 121 could cause loss of vehicle

control and may lead to personal injury or death.



NOTE: The AD-IS Series air dryer has incorporated into its design various components that have typically been installed separately on the vehicle (see below for components/ areas affected).

- Pressure protection valves
- Safety valve
- Governor and plumbing
- Plumbing of the front and rear service air tanks
- Plumbing to accessory systems

These components are required to meet the Federal Motor Vehicle Safety Standards (FMVSS 121 - Air Brake Systems). As the Warning above states, any other type of air dryer installed in the place of an AD-IS Series will require

changes, modifications, and/or additions to your vehicle's air system to maintain compliance with FMVSS 121. Kenworth strongly recommends that if the air dryer is changed from an AD-IS series, you consult your nearest authorized Kenworth dealer.

Brake Operation



WARNING: *Do not drive through water deep enough to wet brake components, as it may cause the brakes to work less efficiently than normal. The vehicle's stopping distance may be longer than expected, and the vehicle may pull to the left or right when brakes are applied, which could contribute to an accident. Failure to comply may result in personal injury, death, equipment or property damage.*

To rectify this condition, check the rear and both sides of the vehicle for clear traffic, then apply the brakes gently, releasing and gently reapplying until the brakes dry out, restoring normal operation. Always check brakes after driving through deep water to help

reduce the possibility of personal injury or an accident.

Front Brake System

When the brake pedal is depressed, the front circuit portion of the treadle valve delivers air from the front service air tank to the front axle brake chambers via a quick-release valve.

Simultaneously (on full truck configurations), air is also supplied to the modulating valve control port. In the event of a rear service circuit failure, the modulating valve will exhaust air from the spring brake chambers, applying the spring brakes in proportion to the front circuit application.

Rear Brake System

When the brake pedal is depressed, the rear circuit portion of the treadle valve delivers air from the rear service air tank to the service brake relay valve control port. The relay valve then delivers air directly from the rear service air tank to the rear brake chambers in proportion to the treadle pressure.

On tractors without ABS, the relay valve is part of the BP-R1 brake valve, which automatically proportions the drive axle brake application pressure when driving bobtail (without a trailer connected). The proportioning BP-R1 brake valve allows full use of the steer axle (front) brakes and reduces the chance that the drive axle brakes will lockup. The bobtail brake proportioning system is automatically turned off when a trailer is connected.

Brake Application Air Gauge

The Brake Application Air gauge will show you how much air pressure is being applied from the foot brake valve or trailer brake hand valve to the air brakes. It is a mechanical gauge which is connected to the brake valve.



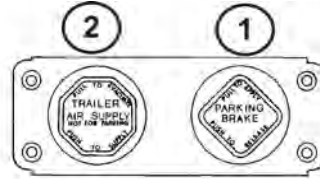
Brake Application Gauge (psi)

Using the Parking Brake

The yellow diamond-shaped knob on the dash controls the truck/tractor parking brakes. These are spring brakes that you activate by releasing air pressure from their chambers. When they are not in use, air pressure compresses the springs and releases the brakes. Pulling the valve OUT applies the parking brake, which exhausts air from the chambers and allows the springs to extend and apply the brakes.



WARNING: Do not leave the cab without applying the parking brake. The truck could roll and cause an accident. Always apply the parking brake before you leave the cab. Failure to comply may result in personal injury, death, equipment or property damage.



Combination (Tractor/Trailer) Parking Brake Control Valves

- 1 Parking Brake Control (Yellow)
- 2 Trailer Air Supply Control (Red)

Before you leave the cab:

1. Apply all parking brakes. Pull out the **Yellow** Parking Brake Control knob (1) located on the dash. The **Red** (octagon-shaped) Trailer Air Supply Control knob on tractors will automatically pop out. (An optional dash warning light will indicate when the brake is ON.)
2. Shift the transmission into PARK position:
 - manual transmission, select First or Reverse gear.
 - automatic transmission, select Neutral.
3. Turn the key to OFF.
4. Remove the key.



WARNING: Do not pull out the parking brake valve while the vehicle is moving. Stopping with the parking brake controls can cause a sudden wheel lock-up, loss of control, or over-take by following vehicles. Failure to

comply may result in personal injury, death, equipment or property damage.

The parking brakes act on the rear wheels only. They are spring-applied, with air pressure used to release them. Release air is supplied by both the front and rear circuit air tanks through a double check valve.

To release the truck or tractor parking brakes ONLY:

- Push IN the **Yellow** knob on the dash. Your trailer will remain parked.
- Below 60 psi (414 kPa) the **Yellow** parking brake valve remains OUT (ON position). If air pressure is not restored above 60 psi (414 kPa), the knob will automatically return to the OUT position if you attempt to push it in. See [Primary and Secondary Air Pressure on page 3-53](#).

To release the trailer brakes ONLY:

- Push IN the **Red** knob on the dash. The truck or tractor will remain parked.

To release the full combination of brakes:

- Push IN **BOTH** knobs on the dash.
- In the event that air pressure is reduced below a safe level: the low air warning light will come on first; if air pressure continues to drop, the parking brake valve will pop OUT, automatically applying the spring brakes.



CAUTION: Do not try to put the vehicle in motion before pressure in the system reaches 100 psi (689 kPa) because the wheels are locked by the spring brake action. Failure to comply may result in equipment damage.

- Unnecessary stress and possible brake malfunction could occur if the vehicle is forced to move before the air system reaches 100 psi (689 kPa).



WARNING: If the air pressure falls below 60 psi (414 kPa) the spring brakes may stop the vehicle abruptly, which could result in an accident. Observe the red warning lamps on the gauges. If one comes on, do not continue to drive the vehicle until it has been properly repaired or serviced. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Do not use the trailer hand brake or service brakes to park and hold an unattended vehicle, use the parking brakes. Because service brakes work with air pressure, these brakes could slowly release. Your vehicle could roll, causing a serious accident. Never rely on the service brakes to hold

a parked vehicle. Failure to comply may result in personal injury, death, equipment or property damage.

Tractor/Trailer Air Supply Valve

Initial Charge

The red octagon knob controls the air supply to the trailer. With the system completely discharged, both the **Red** (trailer air supply) and the **Yellow** (parking brake) knobs are OUT; thus, tractor and the trailer parking (spring) brakes are applied.

- this point it will remain in, charging the trailer system and releasing only the trailer brakes.
4. The **Yellow** knob will remain OUT (tractor brakes ON).

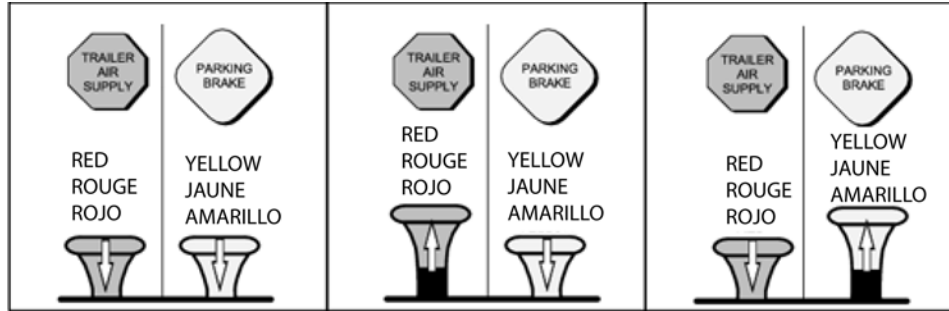
Normal Run Position

- The **Yellow** knob (system park) may now be pushed IN, which will supply air to the tractor spring brakes, releasing them.

4

To supply air to the trailer system and release the trailer parking brakes:

1. Allow the tractor air system pressure to build up to operating level.
2. When system pressure reaches 50 psi (345 kPa) the **Red** knob may be pushed IN.
3. Hold the Red knob IN by hand until the trailer air pressure builds to a pre-set level, about 45 psi. At



Trailer Park or Emergency Brake Application Only

If you ever have a failure or disconnect the air supply hose to the trailer, the trailer parking brakes will set. The **Red** knob will automatically pop OUT and seal off the tractor air tanks to protect the tractor air system pressure.

To apply the trailer brakes only:

Pull OUT the **Red** knob. This will exhaust air from the trailer supply line, causing the tractor protection valve to close and the trailer spring brakes to

apply. The trailer is now in emergency or park. This mode would be used to uncouple from the trailer and during bobtail operation (running without a trailer connected).



WARNING: Do not use the trailer hand brake or service brakes to park and hold an unattended vehicle, use the parking brakes. Because service brakes work with air pressure, these brakes could slowly release. Your vehicle could roll, causing a

serious accident. Never rely on the service brakes to hold a parked vehicle. Failure to comply may result in personal injury, death, equipment or property damage.

System Park Tractor

- With both knobs pushed in for normal operating modes, the parking brakes of both the tractor and the trailer may be applied by pulling the **Yellow** knob OUT. This will exhaust the air from the tractor spring brakes, and simultaneously cause the **Red** knob to pop OUT, which will apply the trailer brakes. This complies with the FMVSS 121 requirement that one control should apply all the parking brakes on the vehicle.

Trailer Charge

- If both knobs are OUT (combination vehicle is parked), and it is desired to recharge the trailer, the **Red** knob may be pushed IN repressurizing the trailer supply line. The tractor will remain parked. For more information on air supply pressure requirements, see [Initial Charge on page 4-36](#).

Brake Safety and Emergency



WARNING: Do not operate the vehicle in the event of a malfunction in any air circuit. The vehicle should not be operated until the system is repaired and both braking circuits, including all pneumatic and mechanical components, are working properly. Loss of system air can cause the service brakes to not function resulting in the sudden application of the spring brakes causing wheel lock-up, loss of control, or overtake by following vehicles. Failure to comply may result in personal injury, death, equipment or property damage.

If pressure is lost in the tractor front or rear circuit, the check valves isolate the unaffected circuit, allowing this

circuit to continue normal operation. The trailer brakes are still functional.

- If air pressure is lost in the trailer supply/park circuit, and the pressure drops below 60 psi (414 kPa), the trailer spring brakes are automatically applied, and the tractor air pressure circuits are unaffected.
- If air pressure is lost in the trailer brake service circuit, and the pressure in the tractor front and rear circuits drops below 60 psi (414 kPa), the tractor and trailer spring brakes are automatically applied.

Emergency Braking



WARNING: Unless you have an anti-lock braking system (ABS), always avoid completely depressing the service brake pedal, if possible, even during emergency braking. Depressing the brake pedal too aggressively can cause the wheels to lock, which can lead to an uncontrolled skid and can result in an accident. Failure to comply may result in personal injury, death, equipment or property damage.

For Non-ABS Vehicles: to stop your vehicle in an emergency, vary the service brake application pressure to provide maximum braking force without locking the wheels. Use engine compression to assist the service brakes by not depressing the clutch

pedal until the engine reaches idle speed.

Overheated Brakes

Under normal braking conditions, the energy generated will bring the internal brake drum temperature to about 500° F (260° C). This is well within the safe zone: the maximum safe temperature of lining for drum type brakes is usually about 800° F (427° C).

If service brakes are used for emergency braking, used improperly, or for prolonged periods, internal brake drum temperatures may exceed 800° F (427° C). Such brake overheating may be detected by a burning smell or smoke coming from a drum. If this occurs, you should immediately stop and check for cracked brake drums or lining fires. If neither exists, continue driving and resume a slow speed as soon as possible to cool the brakes. If the vehicle was to remain stopped, the heat transfer could destroy the linings and distort the brake drum.

To prevent drums from distortion while they cool down:

- Park the vehicle on level surface and block the wheels.
- Release the parking brake and allow the brakes to cool down. See [Parking Brake Valve on page 3-74](#).

Anti-Lock Braking System

ABS Anti-Lock Brake System

North American on-highway Kenworths have anti-lock braking system (ABS) as standard equipment. The ABS reduces the possibility of wheel lock-up during hard braking. If a wheel is about to lock during braking, the ABS will automatically adjust air pressure to the brake chambers on the appropriate wheel(s) to prevent wheel lock-up. The ABS is automatically turned on when the ignition switch is turned on. See [Anti-Lock Brake System \(ABS\) on page 3-25](#).



WARNING: Do not rely on an anti-lock brake system that is functioning improperly. You could lose control of the vehicle resulting in a severe accident and personal injury. If your ABS lamp goes on while you are driving or stays on after the power-on

test, your anti-lock system might not be working. The ABS may not function in an emergency. You will still have conventional brakes, but not anti-lock brakes. If the lamp indicates a problem, have the ABS checked. Failure to comply may result in personal injury, death, equipment or property damage.



NOTE: Important Safety Reminders

- **ABS does not reduce the time or distance it takes to stop the vehicle,** it only helps with steering control during braking. You should always maintain a safe following distance from other vehicles.
- **ABS will not prevent a skid that results from changing direction abruptly,** such as trying

to take a corner too fast or making a sudden lane change. Always drive at a safe, prudent speed for the road and weather conditions.

- **ABS cannot prevent a loss of stability.** Always steer moderately when you are braking hard. Severe or sharp steering wheel movement can still cause your vehicle to veer into oncoming traffic or off the road.

Bendix Anti-Lock Brake System With ATC & ESP Stability System

For vehicles equipped with Electronic Stability Program, please refer to Bendix ABS Operator's Manual, included in your glove box informational packet. Additionally, there will be a temporary warning label applied to the dash when the vehicle is first delivered. This label should be removed and permanently be applied to a visible location inside the cab.



WARNING: If this chassis is equipped with an electronic stability system (ESP) and is modified (e.g. adding or removing an axle, converting from a truck to a tractor, converting from a tractor to a truck, changing the body, lengthening of the wheelbase and/or frame, relocating frame components, or modifying pneumatic or electrical

ABS/ESP harnesses) the ESP must be disabled by a qualified technician. If you have any questions, contact your authorized Kenworth Dealer. Failure to comply may result in personal injury, death, equipment or property damage.

Wheel Spin Control (option)

Your ABS may have the optional Acceleration Slip Regulation (ASR)/Automatic Traction Control (ATC) feature. This feature is monitored by a wheel spin control ASR Warning Lamp. See the appropriate vehicle section in this manual for details. This feature helps improve traction when vehicles are on slippery surfaces by reducing drive wheel overspin. Wheel spin control works automatically in two different ways:

- If a drive wheel starts to spin, wheel spin control applies air pressure to brake the wheel. This transfers engine torque to the wheels with better traction.
- If all drive wheels spin, wheel spin control reduces engine torque to provide improved traction.

Wheel spin control turns itself on and off, you do not have to select this feature. If drive wheels spin during

acceleration, the ASR Warning Lamp comes on, indicating wheel spin control is active.

Do not allow the ASR Warning Lamp to remain on continuously for an extended length of time. Extended, continuous use of the ASR/ATC can cause overheating of the drive wheel brakes.

Deep Snow and Mud Switch (option)

A deep snow and mud switch is included with Wheel Spin Control. The Deep Snow and Mud feature is helpful during acceleration. This function increases available traction on extra soft surfaces like snow, mud or gravel, by slightly increasing the permissible wheel spin. When this function is in use, the ASR Warning Lamp blinks continuously.

Trailer ABS

Power Line Communication (PLC)

North American on-highway Kenworths are equipped with a separate electrical circuit to power the anti-lock brake system (ABS) on towed vehicle(s). In most cases, the ABS power will be supplied through the Auxiliary circuit on the primary 7- way trailer light line connector. If the vehicle was manufactured with a switchable Auxiliary circuit for trailer accessories, an additional 7-way connector would have been provided for trailer ABS power. In either case, the ABS power line on the tractor/truck will be PLC equipped.



CAUTION: Do not splice into the non-switchable Auxiliary circuit on the primary 7-way trailer light line. Doing so may cause the trailer ABS to malfunction. This circuit is dedicated for trailer ABS

power. To add a switchable auxiliary circuit, contact a Kenworth Dealership.

Tractors/Trucks and trailers built after 3/1/01 must be able to turn on an In-Cab Trailer ABS Warning Lamp (per U.S. FMVSS121). The industry chose Power Line Communication (PLC) as the standard method to turn it on.



NOTE: Trailers not equipped with PLC can not turn on the In-Cab Trailer ABS Warning Lamp. (There is one option that is an exception to this rule. See Special Trailer ABS (Without PLC) Option in the [Anti-lock Braking System](#) section on page 4-40 for details.)



NOTE: For doubles or triples, the lamp does not distinguish between trailers. An ABS problem in any of the trailers will activate the Trailer ABS Warning Lamp.



NOTE: If you change the intended service in anyway (i.e. number of axles, multiple trailers, add switchable trailer accessories, etc.) from the date the vehicle was manufactured, you should contact your trailer manufacturer and/or trailer anti-lock brake manufacturer to determine if the power available at the 7-way trailer light line is adequate. Failure to do so might result in insufficient power to the trailer ABS system which may affect its operation.



CAUTION: The center pin of the 7-way trailer light line may be constantly powered for ABS. Make sure it will not accidentally turn on trailer equipment.

Special Trailer ABS (Without PLC) Option

If a trailer does not have PLC, **but** it does have ABS that is powered through an optional second trailer connector (ISO 3731) and that trailer ABS is designed to control the Trailer ABS Warning Lamp in the cab **and** the tractor has been ordered with the option to turn on this lamp for these types of trailers, **then** this lamp will turn on when that trailer ABS has a system problem. This should be checked by a Kenworth Dealer as soon as possible. The Trailer ABS Warning Lamp will not turn on for the power-on test when connected to these types of trailers.



NOTE: Very few trailers built before 3/1/01 have this option. Trailers built after 3/1/01 are built with PLC technology.

Trailer Brake Hand Valve

This hand valve provides air pressure to apply the trailer brakes only. It operates independently of the foot treadle valve.

To operate the trailer brake hand valve:

- Pull down on the lever under the right side of the steering wheel. See [Steering Column And Mirrors on page 3-79](#).
- The valve is self-returning. When pressure is removed from the valve lever, it will return to the OFF position.



NOTE: The trailer brake is not to be used as a substitute for the service brakes. Using this brake frequently, instead of using the foot brake, will cause the trailer brakes to wear out sooner.



WARNING: Do not use the trailer hand brake or service brakes to park and hold an unattended vehicle, use the parking brakes. Because service brakes work with air pressure, these brakes could slowly release. Your

vehicle could roll, causing a serious accident. Never rely on the service brakes to hold a parked vehicle. Failure to comply may result in personal injury, death, equipment or property damage.

Driving Bobtail or With an Unloaded Trailer



NOTE: The following information is applicable only to tractor configurations.

Do not use the engine retarder (such as an exhaust brake) to slow the vehicle down when you are bobtailing or pulling an empty trailer.



WARNING: Do not use an engine retarder when you are driving bobtail or with an unloaded trailer. Using engine retarders while bobtailing or with an unloaded trailer can cause a wheel lockup resulting in less control and/or jackknife. The trailer may not load the rear tractor tires enough to provide necessary traction. When you are bobtail or unloaded, you can have a serious accident

if your wheels lock suddenly during braking. Failure to comply may result in personal injury, death, equipment or property damage.

Bobtail Brake Proportioning System

When a trailer is not connected, the drive axle brake application pressure will automatically be limited by the proportioning system.

The brake proportioning system regulates the application pressure to the rear drive axle. To provide equivalent braking power, tractors (driven bobtail and without ABS) will require greater brake pedal application than other types of vehicles not equipped with a proportioning system.

On tractors that do not have anti-lock brake systems (ABS) a bobtail brake proportioning system is installed. When a trailer is not connected (bobtail mode), the brake application pressure (on the rear drive axle) will automatically be limited by the proportioning system.

Engine Retarders



WARNING: The service brakes must be used in an emergency. The engine or retarder alone might not stop you fast enough to prevent an accident. Do not rely only on the engine retarder. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: The engine retarder is NOT intended as the primary brake for the vehicle, nor is it an emergency brake. The engine retarder only helps the service brakes by using pressure to slow the drivetrain. Use the service brakes for quick stops. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Do not operate the engine retarder when driving/operating your vehicle bobtail or with a loaded or unloaded trailer on road surfaces with poor traction (wet, icy, or snow covered roads) or in heavy traffic. Braking caused by the normal operation of the engine retarder could cause you to lose control of the vehicle resulting in an accident. Failure to comply may result in personal injury, death, equipment or property damage.



NOTE: The exhaust brake and engine brake are two types of engine retarders. See your Engine Operation and Maintenance Manual and Engine Retarder or Engine Brake Operation Manual for

further details on using these types of engine retarders.

A variety of engine retarders or exhaust brakes may be installed (as an option) to create a braking effect on the drive wheels. These devices use your engine's power to slow your vehicle down. Because they can help keep your vehicle's brakes from overheating, they save wear and tear on the service brakes. However, the retarder is not an emergency brake.

Ideally (on normal road surfaces), you should slow your vehicle with the retarder (where permitted by law) and use the service brakes only for stopping completely. Operating this way will greatly prolong the life of the brakes.

Exhaust Brake

With the exhaust brake switch ON, the brake automatically creates its braking effect when you remove your foot from the accelerator pedal.

The brake switch is located on the accessory dash panel. It controls whether the brake is ON (ready to slow the vehicle down) or OFF (no braking action).

- Do not use the engine retarder (such as an exhaust brake) to slow the vehicle down when you are bobtailing or pulling an empty trailer. See Engine Brakes for further details.
- Make sure the brake is OFF before starting the engine.
- After the engine is started, warmed up, and you are ready to get under way, turn the exhaust brake switch ON for added braking effect.



WARNING: *Do not use the engine retarder when operating on road surfaces with poor traction (such as wet, icy, or snow covered roads or gravel). Retarders can cause the wheels to skid on a slippery surface. You could lose control of the vehicle and/or jackknife if the wheels begin to skid, resulting in an accident. Failure to comply may result in personal injury, death, equipment or property damage.*

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If your vehicle is equipped with anti-lock brakes (ABS), the operation of the exhaust brake (if turned ON) will be controlled by the ABS. For further details on how to use the exhaust brake, see the exhaust brake manufacturers Owner's Manual.

Engine Brakes

Three types of engine retarders commonly installed on Kenworth vehicles are: the Jacobs Engine Brake, PacBrake, or the C-Brake by Jacobs, depending on engine type. See your Engine Operation and Maintenance Manual or Brake Operation Manual for further details on using these types of engine retarders.



- Two switches on the dash panel control this type of engine retarder. A master switch turns the system ON or OFF. A second switch (located next to the master switch) controls the braking effect. This switch allows you to choose progressively stronger retardation to slow the vehicle down.

three-speed system, you can select LOW (1), MEDIUM (2), or HIGH (3) retarding.

Your vehicle has either a two-speed or a three-speed system. If your vehicle has the two-speed system, you can select FULL or HALF. If it has the

Brake Components

The following is a brief description of the air/brake system. It is intended to supply you with general information on how the system works. For complete information see the Kenworth Shop Manual.

Compressor: supplies air to the system. System pressure is controlled by the governor.

Governor: controls the air pressure in the system by actuating the compressor discharge mechanism. Its cut-out pressure is 115 to 125 psi (793 to 862 kPa). Its preset cut-in pressure is set to between 13 to 25 psi (90 to 172 kPa) below the cut-out pressure setting (cut-out and cut-in interval is not adjustable).

Safety Valve: installed on the supply air tank outlet. It should vent off at 150 psi (1034 kPa) permitting air to escape.

Air Dryer: collects and removes moisture and contaminants from the air as it travels from the compressor to the wet tank.

Compressed Air Tanks: The wet tank receives air from the air dryer and cools it somewhat, allowing moisture to condense for draining. Relatively dry air is then supplied to the two service air tanks for distribution to their respective brake circuits. The service air tanks are isolated from each other by check valves.

Dual Service Brake Treadle Valve: delivers air to the two service brake circuits.

Double Check Valve: directs the higher air pressure from either the rear (primary) or front (secondary) service air tank to the modulating valve.

Modulating Valve (SR-1): used only on full trucks, not tractors, performs four functions:

- Limits spring brake hold-off air pressure delivered to the spring brake chambers.
- Provides a quick release of air pressure from the spring brake chambers to speed spring brake application.
- Modulates spring brake application in proportion to front service application in the event of a rear service failure.
- Prevents compounding of service and spring applications.

Quick-Release Valve: speeds the release of air from the brake chambers. When air is released, the air in the brake chambers is exhausted at the quick-release valve, rather than exhausting back through the treadle valve.

Single Check Valve: allows air flow in one direction only.

Parking Brake Valve: Yellow diamond-shaped knob. It controls the application and release of the parking (spring) brakes of truck or tractor-trailer combinations or of the tractor alone. If the air system is being charged from zero pressure, the parking brake valve will not hold in the release position until the system pressure exceeds 60 psi (414 kPa), which is the pressure required to override the load of this valve's plunger return spring.

air if supply air pressure drops below 60 psi (414 kPa).

Tractor Protection Valve: The functions of this valve are to (1) receive all pneumatic signals pertinent to the operation of the trailer brake system, (2) transmit these signals to the trailer, and (3) protect the tractor air supply in case of separation of the air lines connecting the tractor to the trailer.

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Trailer Supply Valve: The Red octagonal-shaped knob protects the tractor system; it functions in conjunction with the parking brake valve (yellow). The trailer supply valve is responsible for synchronizing the tractor and trailer parking and emergency brakes. If the air system is being charged from zero pressure, the trailer supply valve will not hold in the applied position until the system pressure exceeds 50 psi (345 kPa). It automatically pops out and exhausts

OPERATING THE ENGINE

Introduction

For detailed information on starting and operating the engine, refer to the Engine Operation and Maintenance Manual provided with your Kenworth T2000.

Because each vehicle is custom-equipped, all engine operation instructions presented in this section are general. You will want to consult the engine manual to find out details about your vehicle's specific engine needs. You may need to use a slightly different procedure from the one outlined here.

Also, read the American Trucking Association's (ATA) Truck Driver's Handbook. It will give you tips on starting, shifting, and driving your vehicle.

This section includes instructions for both Normal Temperature starting and Cold Weather starting. The engine type (brand) and size determines what type of cold weather starting aid is installed in your vehicle. Refer to your Engine Operation and Maintenance Manual to learn what precautions you should take before starting the engine. Many new electronic engines cannot use ether or other starting fluids. These engines are equipped with a flame-start air intake heating system. See [Starting Procedure - Cold Weather](#) on page 4-54.



WARNING: Do not use ether or starting fluid in conjunction with flame-start air intake heating systems. Flame-start systems use an open flame inside the manifold to heat the air/fuel mixture for cold weather starting. If ether is also used with flame-start, the air/fuel will ignite inside

the manifold, which could cause an explosion. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Do not start or let the engine run in an enclosed, unventilated area. Exhaust fumes from the engine contain carbon monoxide, a colorless and odorless gas. Carbon monoxide can be fatal if inhaled.

- **Do not park or operate the vehicle in areas where the hot exhaust system may come in contact with dry grass, brush, spilled fuel or other material that can cause a fire.**

Starting Procedure Normal Temperature

Use the following procedure to start your Kenworth T2000 when outside temperatures are at or ABOVE normal starting temperatures. Check the Engine Operation and Maintenance Manual for starting temperatures.

1. Set the parking brake.



NOTE: For Detroit Diesel engines, when any one of the following is true, oil should be applied to the turbocharger oil inlet port: (1) if the engine has not been started for more than 25 days; or (2), the outside temperature is very cold; or (3), the oil filter has been changed.

- With an oil can, squirt approximately one-half cup (120 ml) of clean, specified engine oil

into the turbocharger oil inlet port. This will keep the turbocharger bearings lubricated until the engine oil pressure gets up to normal.

2. Insert key into ignition key switch.
3. Disable (or turn OFF) the following systems prior to starting the engine: the exhaust brake, dual-speed rear axle (put in LOW), and block heater (if equipped).
4. Disengage transmission: place shift lever in the Neutral position.
5. Disengage (depress) the clutch (with manual transmission).
6. Turn the ignition switch to the ON position. For normal temperatures, no accelerator advance is necessary. See Use of Accelerator below. If the WAIT TO START indicator lamp activates to ON, wait until the indicator lamp cycles to OFF (approximately 60 seconds) before attempting to start

the engine. (For each engine and ambient temperatures, warm-up cycles will vary.)

7. Turn the ignition switch to the START position to engage the starter. Crank the engine until it starts. If the engine does not start within 30 seconds, release the key.
 - If your Kenworth T2000 is equipped with the optional push button starter switch, use it to engage the starter.

Use of Accelerator

- For mild to warm temperatures above 60° F (16° C) keep your foot OFF the accelerator pedal while cranking. If the engine does not start after 5 seconds, apply full throttle while cranking.
- For below normal starting temperatures fully depress the accelerator (throttle) pedal after engaging the starter.



NOTE: Pumping the accelerator will not assist in starting the engine.



CAUTION: To help avoid overtaxing the starter motor or batteries, or causing engine damage, follow the recommendations listed below:

- Do not engage starter for more than 30 seconds at a time.
- Wait 2 minutes between each attempt to start the engine. This

allows the starter motor to cool and time for the batteries to regain power.

- If the engine fails to start after a couple of tries, there could be a malfunction with the engine or other related system. Make any adjustments or repairs necessary before trying to start the engine again.



NOTE: Some starters are equipped with overcrank protection. Check the Engine Operation and Maintenance Manual for details.

When the engine starts:

- Watch the oil pressure gauge. Oil pressure should rise within 15 seconds after the engine starts. If the oil pressure does not rise, stop the engine. Find what is wrong before restarting. Check the Engine Operation and Maintenance Manual for the right oil pressure for your vehicle's engine. In most engines, idle pressure should be about 15 psi.



CAUTION: Never operate the starter motor while the engine is running. The starter and flywheel gears could clash or jam. Failure to comply may result in equipment damage.

- Wait until normal engine oil pressure registers on the gauge before idling or accelerating the engine beyond 1,000 RPM.
- Watch the primary and secondary air pressure gauges. They should both register 100 psi (689 kPa)

before releasing the spring brake and moving the vehicle. Also, check the alarm system for any type of faults and correct them before moving the vehicle.



CAUTION: *Do not try to put the vehicle in motion before pressure in the air system reaches 100 psi (689 kPa) because the wheels will still be locked by the spring brake action. Failure to comply may result in equipment damage.*

- **Unnecessary stress and possible brake malfunction could occur if the vehicle is forced to move before the air system reaches 100 psi (689 kPa).**

Starting Procedure - Cold Weather

In addition to the previous Normal Starting Procedures, use these Cold Weather Starting guidelines when the air temperature falls below a certain temperature. Check your Engine Operation and Maintenance Manual for further details on when cold weather starting aids are needed.

Using special cold-starting equipment will help the engine start easier. And in cold weather, fast engine starting helps relieve the loads on the electrical system and cranking motor. If you follow these few simple guidelines, you will extend the service life of your vehicle's engine:

- Keep the electrical system in top condition.
- Use the best quality and recommended grade of fuel (see Engine Operation and Maintenance Manual).

- Use the recommended engine lubricating oil.
- As stated in the Normal Starting Procedures, when temperatures are below normal, fully depress the accelerator pedal after engaging the starter.

Engine Block Heater (Option)

To preheat the engine before starting, plug the optional engine block heater into a properly grounded AC electrical source. Do not start the engine with the heater plugged in.



WARNING: Engine block heaters can cause fires resulting in personal injury and/or property damage if not properly maintained and operated. Regularly inspect the engine block heater wiring and connector for damaged or frayed wires. Do not use the heater if there are any signs of problems. Contact your authorized Kenworth Dealer or the manufacturer of the heater if you are in need of repairs or information.



CAUTION: Always unplug heater before starting the engine. Damage to the

cooling system could occur if the heater is not turned OFF (unplugged).

Depending on engine make, when the temperature falls below -10° F (-24° C), the block heater is required.

- Use a solution of half ethylene glycol antifreeze and half water for best heater performance. Do not exceed 65 percent concentration of antifreeze, as a shortened heater life will result. See [COOLING SYSTEM on page 5-61](#), for more information.
- After servicing the cooling system, operate the vehicle for a day or two before using the heater. Trapped air inside the engine needs time to escape.

Engine Warm-Up and Idling

The purpose of engine warm-up is to allow an oil film to be established between pistons, shafts, and bearings while your engine gradually reaches operating temperature.

Warm-Up Procedure

1. After you have started the engine, idle the engine at approximately 600 RPM while you check vital engine systems:
 - oil pressure
 - air pressure
 - alternator output
2. Before placing engine under a load, continue warm-up with the engine at 900 to 1,000 RPM for 3 to 5 minutes.

When a cold engine is started, increase the engine speed (RPM) slowly to be sure adequate lubrication is available to the bearings and to allow the oil pressure to stabilize. In extremely cold temperatures, you may have to increase idle speed.



NOTE: In colder climates where the temperatures are often below freezing, sufficient warm-up for

turbocharged engines is especially important. Chilled external oil lines leading to the turbocharger will slow the oil flow until the oil warms, reducing oil available for the bearings. Watch the engine oil temperature or pressure gauge for a warming trend before increasing engine idle speed (RPM).

3. Continue the engine warm-up until the coolant temperature reaches at least 130° F (54° C). At this temperature, you can use partial throttle. Wait until the coolant temperature is at least 160° F (71° C) before operating at full throttle. See [Transmission Warm-Up on page 4-78](#).



WARNING: Exhaust fumes from the engine contain carbon monoxide, a colorless and odorless gas. Do not

breathe the engine exhaust gas. A poorly maintained, damaged or corroded exhaust system can allow carbon monoxide to enter the cab or sleeper. Entry of carbon monoxide into the cab is also possible from other vehicles nearby. Failure to properly maintain your vehicle could cause carbon monoxide to enter the cab/sleeper and cause illness or death.



CAUTION: Never idle your vehicle for prolonged periods of time if you sense that exhaust fumes are entering the cab or sleeper. Investigate the cause of the fumes and correct it as soon as possible. If the vehicle must be driven under these conditions, drive only with the windows open. Failure to repair the source of

the exhaust fumes may lead to personal harm.



NOTE: Keep the engine exhaust system and the vehicles cab/sleeper ventilation system properly maintained. It is recommended that the vehicles exhaust system and cab/sleeper be inspected:

- *By a competent technician every 15,000 miles*
- *Whenever a change is noticed in the sound of the exhaust system*
- *Whenever the exhaust system, underbody, cab or sleeper is damaged*



NOTE: Do not stay in the vehicle with the engine running or idling for more than 10 minutes with the vehicles Heater and A/C ventilation system in RECIRC or a LOW fan speed. Even with the ventilation system On,

running the engine while parked or stopped for longer periods of time is not recommended. See Heater/Air Conditioning Operating Instructions for system setting instructions.



NOTE: If other vehicles are parked next to you idling, move your vehicle or do not stay in your vehicle for prolonged periods of time

Engine Oil Temperature Gauge

The Engine Oil Temperature gauge, see [Engine Oil Temperature gauge on page 3-50](#), indicates engine oil temperature. Do not exceed maximum engine oil temperature recommended by the engine manufacturer. See the Engine Operation and Maintenance Manual for details.

Idling the Engine

Under most circumstances, idling your engine for long periods merely wastes fuel. In severe Arctic weather conditions, however, you may need longer idling to be sure all parts of your engine are fully lubricated.



CAUTION: Do not allow your engine to idle, at low RPM's (400-600 RPM), longer than five minutes. Long periods of idling after the engine has reached operating temperatures can decrease engine temperature and cause gummed piston rings, clogged injectors, and possible engine damage from lack of lubrication. The normal torsional vibrations generated can also cause transmission wear.

- During the time it takes you to drink a cup of coffee, your

engine can cool as much as 60° F (33° C) below normal operating temperature. To keep the engine warm during a short break, turn it off. Do not allow your engine to idle longer than five minutes.

California Air Resource Board (CARB) Certification

To comply with CARB emissions requirements your vehicle will either have the Certified Clean Idle label or an Engine Shutdown System (ESS). Some vehicles, however, are exempt from these requirements because of their configurations (for example: fire truck service).

Certified Clean Idle Label

Your vehicle may have either of these labels affixed to the vehicle to identify that its engine meets the strict low exhaust emission regulations instituted by the state of California (and other states that have chosen to adopt CARB emissions requirements). Trucks with this type of engine will not require an Engine Shutdown System and will be allowed to idle continuously.

It is important that you do not remove or deface this label. Do not block it from view. Please contact your authorized dealership if you need to replace this label. The dealership will be able to help you to determine whether or not your vehicle's engine may be a candidate for a Certified Clean Idle label if it did not already have the label.

If you have a Cummins engine, your label will look like the following image.



If you have a CAT engine, your label will look like the following image.



Engine Shutdown System (ESS)

If the vehicle's engine does not meet the low exhaust emission standard it will have an Engine Shutdown System (ESS) to meet limited idle regulations implemented by CARB and some additional states. These regulations require that the engine have an automatic system to restrict the idle time on certain vehicles.

An Engine Shutdown System will shut down the engine after 5 minutes if the vehicle idles with the park brake set and the transmission in 'neutral' or 'park'. The ESS will also allow the vehicle 15 minutes of idle time if the driver does not set the park brake and shifts the transmission to 'neutral' or 'park'. The ESS, however, will not shut down the engine if the engine is operating in Power Take Off (PTO) mode, if the engine coolant is below 60° Fahrenheit, or if the engine is performing a parked regeneration.

The check engine light will alert you when the ESS shutdown timer reaches the last 30 seconds before the engine shuts down. The last 30 seconds prior to engine shutdown is the only time the driver may reset the idle time by pressing on the accelerator.

More detailed information may be available in the Engine Operator's Manual provided with your vehicle.

Engine Fan Control



The engine fan can be turned ON using a switch that is mounted on the accessory switch panel. This lets you set the fan to manual or automatic operation.

- With the ignition key turned ON and the fan switch in the MANUAL position, the engine fan will be ON regardless of engine temperature.
- With the engine fan switch in the AUTO position, the engine fan will automatically turn ON when any one of the following conditions occur: 1) the engine coolant temperature reaches 200° F (93° C) approximately, 2) the heater/air conditioning (HVAC) system is turned ON or has reached a set pressure point, or 3) the Engine Control Unit detects that air intake temperature, oil temperature, or

compression brake usage requires it.



WARNING: Do not work on or near the fan with the engine running. Anyone near the engine fan when it turns on could be injured. If it is set at **MANUAL**, the fan will turn on any time the ignition key switch is turned to the **ON** position. In **AUTO**, it could engage suddenly without warning. Before turning on the ignition or switching from **AUTO** to **MANUAL**, be sure no workers are near the fan.



CAUTION: The fan or equipment near it could be damaged if the fan turns on suddenly when you do not expect it. Keep all tools and equipment away from the fan.



NOTE: Do not operate the engine fan in the MANUAL position for extended periods of time. The fan hub was designed for intermittent operation. Sustained operation will shorten the fan hub's service life as well as reduce fuel economy.

Engine Control Display

Your Kenworth T2000 may come with an optional Engine and Driver Information Display. This instrument records information on engine diagnostics, scheduled maintenance, driving conditions, and general trip information. The specific features of your display may vary depending on engine make. For complete information on the display see the engine manufacturer's manual.

Engine Shutdown System

This system is an option with each engine. The engine shutdown system continually monitors oil pressure and engine temperature. If either condition changes beyond the normal range of oil pressure or temperature readings, the engine shuts down automatically, sounding the alarm and turning a warning light on. The buzzer will sound continuously as long as Stop Engine indicator is on.

After the engine starts, and until oil pressure reaches normal operating pressures, a warning alarm will sound. As soon as oil pressure increases, the buzzer turns off automatically. If the engine shuts down automatically or if the buzzer and light turn on while the engine is running, have your engine serviced at an authorized Kenworth Dealer.

Each shutdown system is engine specific; therefore to learn how

this system works on your vehicle, you should consult the engine manufacturer's manual.

Exhaust Temperature (Pyrometer) Gauge

The Pyrometer Gauge (option), see [Pyrometer Gauge on page 3-50](#), indicates engine exhaust gas temperature. Because it responds almost immediately to changes in exhaust gas temperature, the pyrometer is an excellent indicator of engine output. Monitor it in conjunction with the Tachometer and Turbo Boost (manifold pressure) gauges. The pyrometer can be a useful aid to operating your truck more efficiently and avoiding sudden changes in engine operating temperature.

See the Engine Operation and Maintenance Manual for maximum temperature recommendations.

To establish or test for the best operating (exhaust) temperatures on your vehicle, follow the procedure below:

- Climb a grade at maximum operating RPM and full throttle for one minute. Record the pyrometer reading at the end of this time. Then ease up on the throttle.
- Subtract 200° F (110° C) from the recorded temperature reading. The result is the optimum operating temperature.

This procedure is also useful as an occasional check of engine condition. Any large variation in the maximum temperature reading may be an early indication of possible engine problems.



NOTE: Different size injectors or changes in altitude may affect engine operating temperatures.

Level Cruising

If the pyrometer indicates excessive temperature while cruising, ease up slightly on the throttle. On a smooth, level road, you should not lose RPM and speed. The pyrometer should indicate a drop in temperature.

If RPM and speed begin to drop and the temperature remains high, shift down one gear to maintain speed and allow the temperature to stabilize. But if the pyrometer indicates consistently low temperature, shift up one gear and watch the pyrometer.

Turbo Boost Gauge

The Turbo Boost (Manifold Pressure) Gauge, see [Manifold Pressure \(Turbo Boost\) on page 3-53](#), indicates the power your vehicle's engine is putting out by showing the amount of turbo boost. If the pressure indicated by the manifold pressure gauge goes down, there may be something wrong with the engine. Have it checked by a qualified service person. See the Engine Operation and Maintenance Manual for details.

Fuel Filter Restriction Gauge

The Fuel Filter Restriction Gauge (option), tells you the condition of the fuel filter by indicating the restriction from the fuel filter to the fuel pump. The restriction is measured by inches of mercury (Hg). Check the Engine Operation and Maintenance Manual for proper restriction. Replace the filter with an approved filter only. Do not substitute the wrong micron element.

 **NOTE:** *The maximum allowable restriction could vary according to the type or make of engine. Consult the engine manufacturer's manual or engine dealer for fuel restriction specifications.*

OPERATING THE ENGINE

Air Cleaner Restriction Gauge

The Air Cleaner Restriction Gauge (option), see [Air Cleaner Restriction Gauge on page 5-43](#), indicates the condition of the engine air cleaner and is measured by inches of water (H₂O). A clean filter should register 7 in. (H₂O) (although it may vary with system design); a used filter (one whose life is over) will register approximately 25 in. (H₂O). See the Engine Operation and Maintenance Manual for details.



CAUTION: Operating the engine with the Air Filter Restriction Gauge reading 25 in. (H₂O) may cause damage to the engine. Inspect the filter and replace if necessary. Holes in the paper element render an air cleaner useless and may cause the Air Filter Restriction Gauge to give a false reading, whether the

element is clogged or not. Replace the element if it is damaged. Failure to comply may result in equipment damage.

Ammeter

Your ammeter (option) tells you whether your vehicle's electrical system is in balance and operating normally. If not, it may be drawing power from the alternator (positive reading) or from the batteries (negative reading).



NOTE: Under normal conditions the ammeter will read nearly zero. If it begins to read noticeably above or below the zero balance point, have the system checked out immediately. If you do not, you could have a roadside breakdown.

OPERATING THE REAR/DRIVE AXLE

Introduction

This section covers the operation of your Rear/Drive Axle. These instructions apply to the most common features of drive axles. Refer to the manufacturers instructions for further information on the operation of your axle.

Inter-Axle Differential Lock



The inter-axle differential allows each axle to turn independently, which relieves stress on the rear axles and reduces tire wear. A switch on the accessory switch panel locks the inter-axle differentials, which gives you better traction for slippery surfaces. You will notice that the switch has a guard to protect you from activating it accidentally.

When to Use the Differential Lock

In the LOCK position, an air operated clutch positively locks both sets of axles together, providing greater traction on slippery road surfaces; however, steering around corners and on dry pavement is more difficult. Continuous operation on a paved, dry surface stresses the tandem axles, possibly causing internal damage.

Only use this feature when driving on surfaces with poor traction, such as heavy mud or snow, or loose gravel. And do not use it when going downhill or at speeds greater than 25 mph (40 km/h).

Lock the differential when you encounter road conditions such as these:

- Ice or snow, with or without tire chains.
- Dirt roads.

OPERATING THE REAR/DRIVE AXLE

- Loose sand, mud, or other off-road conditions.



WARNING: Do not put the differential lock in the LOCK position while the wheels are spinning freely (slipping), you could lose control of the vehicle or cause axle damage. Switch to LOCK only when the wheels are not spinning. Failure to comply may result in personal injury, death, equipment or property damage.

- Look ahead for wet, muddy, or icy patches on the road, stop your vehicle and switch to LOCK ahead of time.



WARNING: Do not operate the vehicle on dry pavement with the differential locked, this could lead to an accident. On dry pavement, you will not be able to steer well

with the differential locked. Lock the differential only when operating on surfaces with poor traction, such as wet, slippery roads or loose gravel. Failure to comply may result in personal injury, death, equipment or property damage.

Inter-Axle Differential Lock Operation



WARNING: Do not use the differential lock during downhill operation or at speeds above 25 mph (40 km/h). When it is engaged under these conditions, your vehicle will exhibit understeer handling characteristics. This understeer condition will cause your vehicle to not turn as quickly and more steering effort will be required, which can cause an accident. Failure to comply may result in personal injury, death, equipment or property damage.



Understeer Condition

- 1 Turning Radius When Unlocked (Disengaged)
- 2 Turning Radius When Locked (Engaged)

To LOCK the inter-axle differential:

1. Anticipate when you might need increased traction, slow down to a steady speed under 25 mph (40 km/h) or stop the vehicle. Do not lock the differential while going down steep grades or traveling faster than 25 mph, or while wheels are spinning or traction is minimal; lock the differential before you encounter these conditions.
2. Put the inter-axle differential lock switch in the LOCK position. A

light on the switch will turn on, indicating that the differential is locked (engaged).

3. If you LOCK or UNLOCK the differential while moving, let up momentarily on the accelerator pedal to relieve torque on the gearing and allow full engagement of the clutch (mechanism that locks the wheels).



NOTE: The Meritor main differential lock or Dana Spicer wheel differential lock is controlled by the switch labelled **WHEEL DIFFERENTIAL**. By moving the switch you can LOCK or UNLOCK the main differential when the vehicle is moving or stopped.



NOTE: If your vehicle has an automatic transmission, it may be necessary to

shift the transmission to the Neutral position momentarily to allow the main differential lock splines to fully engage or disengage.

4. Drive the vehicle through the poor traction area, keeping your speed under 25 mph (40 km/h).

To UNLOCK the inter-axle differential:

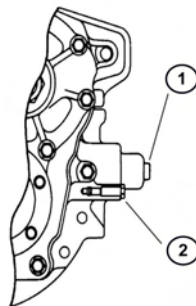
1. When you reach dry pavement or better road conditions where the differential lock is not needed, switch the differential lock to UNLOCK.
2. Let up momentarily on the accelerator pedal to relieve torque and allow the clutch to disengage.
3. When you unlock the differential, normal vehicle handling will resume and the light on the switch will turn off.

Driver Controlled Main Differential Lock

If your Kenworth T2000 has a Meritor axle with a Driver Controlled Main Differential Lock, install the caging bolt before removing the axles for towing. Installation of the caging bolt prevents damage by locking internal axle components in position. Use the procedure below to lock the Meritor differential.

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1. Remove the air line.
2. Remove the caging bolt from its storage hole.
3. Screw the caging bolt all the way into the air line hole. This locks the differential by pushing a piston into lock position.



Driver Controlled Main Differential Lock

- 1 Air Line - Remove to Install Caging Bolt
- 2 Caging Bolt Storage Location

Dual Range (Two-Speed) Rear Axle

Your vehicle may be equipped with a two-speed or dual range axle (option). You can select two rear axle ratios for operating under heavy loads or rough terrain as well as for over the road hauling.

The Low Range provides maximum torque for hauling heavy loads or traveling over rough terrain. The High Range is a faster ratio for highway speeds and general over the road conditions. A switch on the accessory switch panel controls the Dual Range Rear Axle. You will notice that the switch has a guard to protect you from activating it accidentally. Always park your vehicle with the range selector in LOW.

Dual Range Axle Operation

Important tips on operating a Dual Range Axle with Interaxle Differential:

1. Shift the axle with the inter-axle differential in the unlocked position only.
2. When you are driving with poor traction, lock the differential. When you have the differential locked, drive with the axle in LOW range only.
3. When you are driving on a surface with good traction, keep the interaxle differential unlocked. You can drive with the axle in the LOW or HIGH range.
4. Always UNLOCK the inter-axle differential before shifting the axle speed range.



CAUTION: If you shift the axle range with the inter-axle differential in LOCK, you could seriously damage the axles. Never shift the axle

range with the differential locked.

Starting-Up

1. Unlock the inter-axle differential before starting.
2. Put the Range Selector in the LOW range. Shift the transmission to start the vehicle moving.
3. When you are driving on rough terrain and secondary roads, or under a very heavy load, keep the axle in the LOW range. Shift the transmission to maintain proper road speed.



WARNING: Never shift the axle when moving down hill. Engine driveline disengagement may occur, eliminating engine retardation and allowing the wheels to spin faster than the current speed of the engine. This may require severe braking to slow the vehicle down and can result in an accident. Failure to comply may result in personal injury, death,

equipment or property damage.

Proper shifting of the axle depends on the synchronization of engine/driveline and wheel speed. When you shift the axle, the connection between the engine and wheels is momentarily disengaged while the gearing is synchronized. Normally when the axle is shifted the speed of the engine, axle, and wheels adjust, allowing for proper gear engagement.



CAUTION: To avoid damaging your vehicle shift the axle at **slower travel speeds until you are used to driving with a dual range axle.**

LOW to HIGH (Cruising)

When you go from rough terrain to highway driving, shift the axle to the HIGH range following this procedure:

1. Be sure the differential is **UNLOCKED.**
2. Maintain your vehicle speed (accelerator depressed) and move the Range Selector lever to **HIGH.**
3. Keep driving with the accelerator depressed until you want the axle to shift.
4. To make the axle shift, release the accelerator until the axle shifts. You are now in the HIGH axle range for highway speeds. Shift the transmission normally to reach your desired cruising speed.

When going down hill the wheels will not slow down, but will tend to speed up, which makes gear synchronization almost impossible. As a result, the axle is neither in HIGH nor LOW range and all engine/driveline retardation is lost. Without engine retardation it is more difficult to slow the vehicle down and greater stress is put on the brake system.

HIGH to LOW (Rough Terrain)

If you need to downshift the axle for more power or you are driving on rough terrain:

1. Maintain your vehicle speed (accelerator depressed) and move the Range Selector lever to **LOW**.
2. Keep driving with the accelerator depressed until you want the axle to downshift.
3. To make the axle downshift, release and depress the accelerator quickly to increase the engine RPM. The axle will shift to LOW range.
4. You are now in the LOW axle range for rough terrain and heavy loads. Shift the transmission normally to maintain the desired speed.

Auxiliary Axles - Pusher and/or Tag

Adjustable auxiliary axles can add to the productivity of your vehicle. It is important to recognize that when adjustable auxiliary axles are not deployed while the vehicle is carrying a load, excessive loads may be forced onto other vehicle components (frame, axles, suspension, brakes, steering, tires, etc.). This overload condition may reduce the service life of these vehicle components. Acceptable service life is maintained through careful operation, proper maintenance and proper adherence to the vehicles and auxiliary axle manufacturers operating limits.

If your vehicle is equipped with factory-installed pusher or tag axle(s), or you have a third-party (i.e. body-builder) install these axles, it is your responsibility to ensure that the axle lift controls or air-dump valve (if

equipped) are calibrated prior to putting the vehicle into service. The reason for doing this important calibration is to obtain the proper axle load distribution for the entire vehicles axles. As with the entire vehicles axles, the pusher or tag axle load cannot exceed the certified GAWR and/or the legal load limit of the axle assembly and its related components.

There are three types of pusher or tag axles:

- Liftable/steerable (axle lift calibration required)
- Liftable/non-steerable (axle lift calibration required)
- Non-liftable (some suspensions require dump valve calibration)

Functionality of Auxiliary Axles installed by Kenworth

- Any liftable steerable auxiliary axles installed by Kenworth will raise when the parking brake is engaged.
- Any liftable steerable auxiliary axles installed by Kenworth will raise when the vehicle is placed into reverse.
- Liftable/non-steerable axles do not raise when parking brake is engaged or if vehicle is in reverse.

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WARNING: Do not operate or park the vehicle with auxiliary axles in the down/loaded position when vehicle is unladen, or is being unloaded. Raise or dump air into driver-controlled auxiliary axle(s) prior to unloading vehicle. Failure to do so can result in loss of vehicle control or rollaway that may result in personal

injury, death, equipment or property damage.



CAUTION: Never exceed the manufacturers assigned gross axle weight ratings (GAWR) of each axle when the auxiliary axles are downloaded. Never exceed the manufacturers creep ratings when operating with a load when the auxiliary axles are unloaded. Refer to your vehicles compliance decals located on the LH doorjamb for the maximum allowable load for each axle. Exceeding the specified weight rating of any axle can cause equipment damage.



NOTE: Axle Creep Ratings are assigned by the axle manufacturer and are based on axle model and intended service of the vehicle. To find out what

the allowable creep rating is for your vehicle, contact the nearest authorized Kenworth Dealer or axle representative.

Axle Creep Rating Definition**Creep Ratings**

Low speed, off-highway (work site) axle loads, which exceed the standard gross axle weight rating (GAWR) of a particular axle.

Operator's using vehicles equipped with liftable auxiliary axles must consider creep ratings when any liftable axle is unloaded or in the raised position. Liftable auxiliary axles should only be raised (or unloaded) to improve maneuverability in an off-road use or when vehicle is unloaded.



NOTE: Axle Creep ratings **MUST NOT** be exceeded.

Contact your Kenworth Dealer or axle manufacturer to determine what the creep rating is for your particular axle(s) and configuration. Creep ratings are generally limited to the following:

- Tandem rear axles only
- Straight trucks only
- Maximum spring mount centers per axle manufacturers specifications
- Maximum tire static loaded radius (SLR) per axle manufacturers specifications



CAUTION: Always lower the axles as soon as possible after receiving a load. Never exceed 5 miles per hour when driving with a load with the auxiliary axle(s) raised/unloaded. Failure to lower the axle(s) can overload the frame and remaining axles, and could cause equipment damage.



WARNING: Never operate the vehicle with more pressure in the lift axles than is necessary to carry the load, as determined by

the calibration procedure described. Failure to do so can result in loss of traction and stability at the steer and/or drive axles and can result in increased braking distance which could cause loss of vehicle control resulting in an accident. Failure to comply may result in personal injury, death, equipment or property damage.



CAUTION: Do not modify the air system and/or control functionality on a factory installed auxiliary axle(s). Modifying the factory operation of the pusher and/or tag axle(s) will void your warranty, and can cause equipment damage.

OPERATING THE REAR/DRIVE AXLE



CAUTION: *A change in tire size on either the auxiliary axles or the drive/steer axles can change the calibration of the auxiliary axles. If tires are installed with a different loaded radius, the calibration procedure must be repeated. Failure to do so can cause equipment damage.*

Liftable/Steerable or Liftable/Non-Steerable Pusher and/or Tag Axle Calibration Procedure

Below are some general instructions on how to adjust and calibrate the air control valve for the auxiliary axles to obtain the proper load distribution of the axle(s). For additional operating and maintenance instructions, see the pusher or tag suspension manufacturer literature in the glovebox or contact them directly.



NOTE: *This procedure must be performed prior to placing the vehicle into service.*

desired load or load range is achieved, document the pressure-to-load ratio or setting for future use.

Setting the Pressure-to-Load Ratio

To obtain the desired axle load distribution, you must correlate the suspension air gauge pressure to the actual axle load by scaling the axle weight(s) and adjusting the pressure to obtain the desired load. Once the

General Calibration Guidelines

These instructions are general in nature. For more specific instructions, review the pusher or tag suspension manufacturers maintenance manual or contact the nearest authorized dealer.



NOTE: Perform this procedure at or near a weight scale. Procedure can be performed while parked on the weight scale if scale is available.

1. Park loaded vehicle on level surface with wheels blocked.
2. Release vehicles spring brakes. (Do not release for Lifiable/Non-Steerable pusher or tag axles).
3. Lower the pusher/tag axles with the axle lift control flip valve. (For some non-lifiable axles, inflate air suspension).
4. Adjust the amount of load on each axle by turning the pressure regulator clockwise to increase

the load or counterclockwise to decrease the load. (The suspension manufacturer may publish pre-established Pressure-to- Load Ratio Pressure Settings to assist you in achieving an estimated ground load).

5. After setting the pressure to obtain the desired axle load, verify proper ground loading with the weight scale.



NOTE: Exceeding local, state or federal weight limits may result in citations. Contact your local commercial weight enforcement office for limits in your area.

Operation guidelines



NOTE: Steerable-pusher and/or tag axle(s) will raise when the transmission is shifted into reverse or when the parking brakes are applied.

Maximizing Drive Axle Traction (Tractors & Trucks)

Adjust the pressure regulator control knob to a lower pressure until desired traction is obtained. By reducing air pressure at pusher or tag axle, load will be transferred to drive axles. Do not overload drive axles.

Coupling To A Loaded Trailer

Inflate air springs of the auxiliary axles to the desired pressure after coupling to a loaded trailer while still maintaining proper traction of the drive axles.

Unloading Operation

Always deflate air springs of the auxiliary axles before attempting to unload vehicle. This allows maximum traction of the drive axles to control the vehicle.

Non-liftable (Non-steerable) Axles

Some suspensions require dump valve calibration.

Example: Neway dead axles do not lift, but the air can be dumped out of them to unload them when empty. Air pressure is controlled via an adjustable regulator. These axles need to be calibrated for load.

Contact your authorized Kenworth Dealer or axle/suspension manufacturer for dump valve calibration procedures.

Drive Axle Temperature Gauge

Optional Axle Temperature gauges may be installed on your Kenworth T2000. See [Drive Axle Temperature Gauge on page 3-44](#). One or two gauges, either a set of two (one for each drive axle) or one for both forward and rear axles, indicate the lubricant temperature in each drive axle. The temperatures indicated will vary with the kind of load you are carrying and the driving conditions you encounter. Very high temperatures signal a need to have the axle lubrication checked. Maximum axle temperature may vary, depending upon the axle type and lubricant used. For information on axle temperature ranges, see the Drive Axle Operation Manual.



CAUTION: Driving with very hot temperatures in the rear drive axles can cause serious damage to axle bearings

and seals. Have the axle lubrication checked if you notice a sign of overheating. Failure to comply may result in equipment damage.

OPERATING THE TRANSMISSION

Introduction

Your Kenworth T2000 is equipped with either a manual or automatic transmission with special features and gearing to meet your particular needs. It is important for you, the driver, to understand how your particular transmission is operated. To do this, you have two sources: this Operator's Manual and the transmission manufacturer's Driver/Operator's Instruction Manual. Because of the wide variety of different transmissions installed in Kenworth T2000 vehicles, operating procedures for your particular transmission are not included in this manual; therefore, you should read and understand both manuals. Read the general guidelines and instructions that follow and read the specific instructions contained

in the transmission manufacturer's Driver/Operator's Instruction Manual.

You will find a shift pattern diagram in the cab. Check to be sure you know the correct sequence for your particular transmission.

Transmission Warm-Up

In cold weather (below 32° F (0° C)), you may find shifting sluggish when you first start up. Transmission warm-up is especially important at this time, but it is always a good idea to warm-up your transmission before starting out on the road. To warm-up the transmission, follow these procedures.

To warm-up the transmission lubricating oil during engine warm-up, with a single transmission (manual and automatic):

1. Put the transmission in Neutral.
2. Release the clutch pedal (manual only) and operate the transmission in neutral for 3 to 5 minutes prior to operating the transmission in either forward or reverse range.
3. If you have a two-transmission combination:
 - ° Put the main transmission in gear.

- ° Put the auxiliary transmission in Neutral. This will allow the transmission countershaft to turn, agitating the oil and warming it.

Operating Manual Transmissions

You will find a shift pattern diagram in the cab. Check to be sure you know the sequence for your particular transmission.

Putting the Vehicle in Motion

After making sure the vehicle's oil and air pressure are correct and all other parts and systems are in proper working condition:

1. Fully depress the clutch pedal (for manual transmission) until the clutch brake makes contact (see Clutch Brake and Travel, below). The contact will occur at about 1 inch or less from the floorboard.
 - ° The total stroke of the clutch pedal is about 10 inches. The first 1-½ inches is free travel. After the free travel comes the release stroke, which is the part that fully releases the clutch. The last 1 inch engages the clutch brake.
 - ° Always start out in a low gear. Starting in higher gears, even with a light load, will cause a very jumpy start and excessive wear.



CAUTION: Always use first gear or a low speed range to start the vehicle in motion. The use of a higher gear or speed range forces undue strain on the engine, clutch, other transmission components, and may cause damage.

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2. Evaluate the road surface conditions and terrain your vehicle is on. Select a gear low enough to let your vehicle start forward with the throttle at idle.
3. Push the parking brake valve handle (Yellow) against the dash panel to release the brakes.
4. Release the clutch pedal (manual only), then gradually accelerate to permit smooth starting,
5. Do not allow your vehicle to roll (even a little) in the opposite direction during clutch

engagement. If you need to start up on an incline, apply your service brakes before you release the parking brake. Then release your service brakes as you engage the clutch and apply throttle.

For further instructions on operating your transmission, see the transmission manufacturer's Driver/Operator's Instruction Manual.

If you have a misaligned gear condition in your vehicle's transmission and cannot start, gradually release the clutch, allowing the drive gear teeth to line up properly. Then the drive gear can roll enough to allow the teeth to line up properly and complete the shift.

The best engine performance and maximum economy is obtained if gears are properly selected. This efficiency is achieved by always selecting gears within optimum engine RPM, which is where maximum torque and power

are obtained. For further information, see [MORE DRIVING TIPS AND TECHNIQUES](#) on page 4-5.

Shifting Gears in a New Vehicle

Shift carefully in a new vehicle. The transmission may be a little stiff at first. Avoid gear clashing, by closely following these procedures.

When you are operating a new vehicle or one that has been exposed to cold weather, you want the transmission lubricant (fluid) to circulate and coat the contacting surfaces of the gears. Metal contacting metal in moving parts may seriously damage your transmission, do not drive in one gear for long periods of time until the transmission lubricant has a chance to coat all contacting surfaces. Carefully observe the free travel in the clutch for the first few hundred miles. As the clutch lining wears and high spots get worn smooth, you will get less free travel.

Clutch Brake and Travel

The clutch brake is used for stopping transmission gears, allowing you to easily shift into first gear or reverse without grinding gears. Approximately the last one inch of clutch pedal travel activates the clutch brake.

- To apply the clutch brake (while the vehicle is stopped) fully depress the clutch pedal to the floorboard to stop the gears. With the throttle at idle, select first gear then release the clutch pedal to let the vehicle start forward, until the clutch is fully engaged. See the manufacturer's Driver/Operator's Instruction Manual for further details.

If the transmission has a butt-tooth condition and you cannot engage a gear, gradually release the clutch. Then the drive gear can roll enough to allow the teeth to line up properly and complete the shift.

During Normal Driving

If you want to shift directly into any gear other than first or reverse, depress the clutch pedal only far enough to release the clutch. Pushing the clutch to the floor applies the clutch brake and could cause gear hang-up.



CAUTION: Be careful not to apply the clutch brake while the vehicle is moving. The purpose of the clutch brake is to stop the transmission so that you can shift into a starting gear without grinding gears. Applying the clutch brake when the vehicle is moving causes a braking effect on the drivetrain and shortens the service life of the clutch brake.

Double Clutching

Whether you are upshifting or downshifting, it is best to double clutch. Double clutching is easier on the transmission and on the engine, helping your vehicle match engine speed with driveline speed and achieving clash-free shifts.

To double clutch:

1. Push the clutch pedal down to disengage the clutch.
2. Move the gear shift lever to neutral.
3. Release the pedal to engage the clutch. This lets you control the RPM of the mainshaft gears, allowing you to match the RPM of the mainshaft gears to those of the output shaft.
 - Upshifts: let the engine and gears slow down to the RPM required for the next gear.

- Downshifts: press accelerator, increase engine and gear speed to the RPM required in the lower gear.
4. Now quickly press the pedal to disengage the clutch and move the gear shift lever to the next gear speed position.
 5. Release the pedal to engage the clutch.

More Transmission Tips

Riding the Clutch

The clutch is not a footrest. Do not drive with your foot resting on the clutch pedal. It will allow your clutch to slip, causing excessive heat and wear, damage could result.

Release Bearing Wear

When you must idle your engine for any period of time, shift your transmission to neutral and disengage the clutch (take your foot OFF of the pedal). This helps prevent unnecessary wear to your clutch release bearing, and it is less tiring for you, too.

Clutch Adjustment

Inspect manual clutches according to the manufacturer's recommendations. Regular maintenance should be followed to maintain correct clutch adjustment. Have your dealer's Service Department perform any adjustment necessary.

use proper coordination between shift lever and clutch.

Tips

- Always use the clutch when making upshifts or downshifts.
- Always select a starting gear that will provide sufficient gear reduction for the load and terrain.
- Never downshift when the vehicle is moving too fast.
- Never slam or jerk the shift lever to complete gear engagement.
- Never coast with the transmission in neutral and the clutch disengaged.
- To provide smooth gear engagements while shifting,

Transmission Oil Temperature Gauge

The Transmission Temperature Gauge (option), see [Transmission Oil Temperature Gauge on page 3-57](#), indicates the temperature of the oil in the transmission. Watch this gauge to know when the transmission is overheating: if it is, have it checked by an authorized service representative.

Operating Automatic Transmissions

An automatic transmission makes shifting much easier, of course. But because your truck pulls a heavy load, it is important to use it efficiently. For correct automatic transmission operation, see the manufacturer's Driver/Operator's Instruction Manual.



WARNING: *If your vehicle has a Freedomline transmission, be aware that it can roll backwards when stopped on a hill or grade, or when starting from a stop on a hill or grade. Failure to comply may result in personal injury, death, equipment or property damage. Observe the following guidelines:*

- *When stopped on a hill or grade, press the brake pedal.*



- *When starting from a stop on a hill or grade, quickly remove your foot from the brake pedal and firmly press on the accelerator pedal.*
 - On most automatic transmissions there is no PARK position, so you will need to apply the parking brake before leaving the cab. See [Using the Parking Brake on page 4-33](#).
- WARNING:** *Do not leave the cab without applying the parking brake. The truck could roll and cause an accident. Always apply the parking brake before you leave the cab. Failure to comply may result in personal injury, death, equipment or property damage.*

Automatic Transmission Retarder

If your transmission is equipped with this option, it will act like a brake to slow your vehicle without using the brakes. Take your foot off the throttle and operate the retarder switch.

When full retarder effect is not needed, you can apply it intermittently (OFF and ON) to cause gradual or partial slowing. Continuous application of the retarder will cause the hydraulic fluid temperature to rise. Intermittent application will help prevent overheating.



WARNING: *The service brakes must be used in an emergency. The retarder alone might not stop you fast enough to prevent an accident. Relying only on the retarder may result in personal injury, death,*

equipment or property damage.

- ***The retarder is NOT intended as the primary brake for the vehicle, nor is it an emergency brake. The retarder only helps the service brakes by using pressure to slow the drivetrain. Use the service brakes for quick stops.***



WARNING: *Do not use the retarder when operating on road surfaces with poor traction (such as wet, icy, or snow covered roads or gravel). Retarders can cause the wheels to skid on a slippery surface. You could lose control of the vehicle and/or jackknife if the wheels begin to skid, resulting in an accident. Failure to comply may result in personal injury,*

death, equipment or property damage.

Auxiliary Transmissions

If you have an auxiliary transmission installed on your Kenworth T2000, see the transmission manufacturer's Driver/Operator's Instruction Manual to learn how to operate it correctly.

SHUT-DOWN

Introduction

After you have parked in a safe place check your vehicle to make sure it will be ready for the next trip. To make sure your vehicle is ready to go after a long stop (such as overnight), please follow the suggestions below. Your vehicle will be easier to get going when you are ready, and it will be safer for everyone who might be around it.

Please remember, too, that in some states it is illegal to leave the engine running and the vehicle unattended.

Final Stopping Procedures

1. Set the parking brake before leaving the driver's seat.

To hold your vehicle while it is parked, DO NOT rely on the following:

- air brakes
- hand control valve for trailer brakes
- engine compression

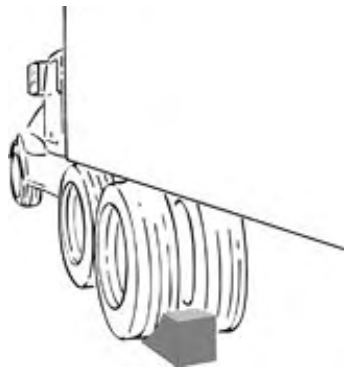
Always use your parking brakes!



WARNING: Do not use the trailer hand brake or service brakes to park and hold an unattended vehicle, use the parking brakes. Because service brakes work with air pressure, these brakes could slowly release. Your vehicle could roll,

causing a serious accident. Always set the parking brakes. Never rely on the service brakes to hold a parked vehicle. Failure to comply may result in personal injury, death, equipment or property damage.

2. If you must park on a steep grade, always block the wheels.
3. Drain water from the air tanks.
4. While the engine and air supply system are still warm, drain moisture from the air tanks. Open the tank drains just enough to drain the moisture. Do not deplete the entire air supply.
5. Secure the vehicle, close all the windows, and lock all doors.



4

Blocked Wheels

Before Stopping the Engine

Do not shut off the engine immediately. A hot engine stores a great amount of heat and it does not cool down immediately after you shut it off. Always cool the engine down before shutting it off. You will greatly increase its service life.

Idle the engine at 1,000 RPM for five minutes. Then low idle for thirty seconds before shutdown. This will allow circulating coolant and lubricating oil to carry away heat from the cylinder head, valves, pistons, cylinder liners, turbocharger, and bearings. This way you can prevent engine damage that may result from uneven cooling.

Turbocharger

This cooling-down practice is especially important for a turbocharged engine. The turbocharger on your vehicle contains bearings and seals that are subjected to hot exhaust gases. While the engine is operating, heat is carried away by circulating oil. If you stop the engine suddenly after a hard run, the temperature of the turbocharger could rise to as much as 100° F (55° C) above the temperature reached during operation. A sudden rise in temperature like this could cause the bearings to seize or the oil seals to loosen.

Refueling

Air inside the fuel tanks allows water to condense in the tank. To prevent this condensation while the vehicle is parked for extended periods of time, fill the tanks to 95 percent of capacity. Never fill to more than 95 percent capacity as this provides room for expansion resulting from temperature extremes. When refueling, add approximately the same amount to each fuel tank on vehicles with more than one tank.



WARNING: Do not carry additional fuel containers in your vehicle. Fuel containers, either full or empty, may leak, explode, and cause or feed a fire. Do not carry extra fuel containers, even empty ones are dangerous. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Diesel fuel in the presence of an ignition source (such as a cigarette) could cause an explosion. A mixture of gasoline or alcohol with diesel fuel increases this risk of explosion. Failure to comply may result in personal injury, death, equipment or property damage.

- Do not remove a fuel tank cap near an open flame.
- Use only the fuel and/or additives recommended for your engine.

Specification: Use only Ultra Low Sulfur Diesel (ULSD) Fuel, as recommended by engine manufacturers. If you need further information on fuel specifications, consult the Engine Operation and Maintenance Manual.

Location of Fuel Shut-Off Valves

If your vehicle is equipped with shut-off valves for the take-off and return lines, they are located on the fuel lines entering the top of the fuel tank. Fuel shut-off valves for the fuel crossover line are on the bottom of the fuel tank, at the crossover line connection.

SHUT-DOWN

Sleeper Bunk

If your vehicle has an upper and lower bunk, the upper bunk can be folded up out of the way to provide you with more dressing area in the sleeper cab. The lower bunk has storage underneath it to stow your luggage and other belongings.



WARNING: Always keep the lower bunk in its down (latched) position while the vehicle is moving. If left open, stored items could become loose during an accident and strike you. Failure to comply may result in personal injury or death.

- Before you move the vehicle, check to be sure the lower bunk is latched securely.

To Lower Upper Bunk: pull on the lanyard in the upper left corner of the bunk to release the bunk. This will free

it from the anchored position and allow you to lower the bunk.

To Raise Upper Bunk: fold the upper bunk up and push it against the retaining latch until you hear a click. Pull on the bunk to be sure it is latched securely.



WARNING: Be sure the latch that holds the upper bunk in the folded position is working properly so the bunk will not fall down. If the bunk falls, you could be injured.

- Be sure to stow away all loose belongings before you move your vehicle. And do not store objects on the bunks, they could cause damage or injury in an accident.



WARNING: Be sure the restraint system is used when anyone is occupying the sleeper while the vehicle is



moving. In an accident, an unrestrained person lying in a sleeper bunk could be injured. He or she could be thrown from the bunk.

WARNING: Be sure no one ever rides in the upper bunk. That person could be thrown out in an accident and could be injured. Do not use the upper bunk while you are moving. Failure to comply may result in personal injury or death.

Sleeper Occupant Restraint

The sleeper restraint is stored in a compartment on the rear sleeper cab wall.



WARNING: *Failure to properly use the sleeper restraint when an individual is located in the sleeper bunk and the vehicle is moving can result in injury or death.*

To Fasten the Sleeper Restraint

1. Locate the tenting straps on each side of the sleeper restraint and attach them to the buckle-latch plate located on the sides of the sleeper cab (above the lower bunk mattress).
2. Enter the sleeper bunk, and attach the latch plates (on the forward edge of the sleeper restraint) to the buckles on the forward edge of the bunk.
3. Start with the buckle nearest to your feet and progress to the buckle near your head.
4. Adjust the tenting straps to the desired tension.



NOTE: *For partial stowage of the sleeper restraint the tenting straps may remain attached and the front buckles released. This allows entrance and exit to and from the sleeper bunk.*

5. For complete stowage, disconnect all buckles and replace the restraint into the stowage compartment. See [Sleeper Restraint System on page 1-16](#), for more information on cab/seat restraint systems.

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PREVENTIVE MAINTENANCE

Introduction

This section will help you keep your Kenworth T2000 in good running condition. There are a number of checks you can do, and you may be able to do some of the service work yourself. But please, let your Kenworth Dealer do any work you do not have the tools or skill to perform. Authorized service mechanics are trained in the proper technical and safety procedures to maintain your Kenworth T2000 correctly.

Good driving practices, daily and weekly driver maintenance inspections, and periodic service inspections by an authorized Kenworth Dealer, will help keep your Kenworth T2000 in good working order and provide many years of dependable service.



WARNING: It is dangerous to work on a vehicle without the right know-how and proper tools. You could be injured, cause damage to the vehicle, or make your vehicle unsafe to drive. Do only work you know you are fully able to do, and for which you have the right tools.

Safety Precautions

- Before attempting any procedures in the engine compartment, stop the engine and let it cool down. Hot components can burn skin on contact.
- Be alert and cautious around the engine at all times while the engine is running.
- If work has to be done with the engine running, always (1) set the parking brake, (2) chock the wheels, and (3) ensure that the shift lever or selector is in Neutral.
- Exercise extreme caution to prevent neckties, jewelry, long hair, or loose clothing from getting caught in the fan blades or any other moving engine parts.
- Disconnect the battery ground strap whenever you work on the fuel system or the electrical

system. When you work around fuel, do not smoke or work near heaters or other fire hazards. Keep an approved fire extinguisher handy.

- **Always support the vehicle with appropriate safety stands if it is necessary to work underneath the vehicle. A jack is not adequate for this purpose.**
- **When working underneath the vehicle without appropriate safety stands but with the wheels on the ground (not supported), make sure that (1) the vehicle is on hard level ground, (2) the parking brake is applied, (3) all wheels are chocked (front and rear) and (4) the engine cannot be started. Remove the ignition key.**
- **Never start or let the engine run in an enclosed, unventilated area. Exhaust fumes from the engine contain carbon monoxide, a colorless and**

odorless gas. Carbon monoxide can be fatal if inhaled.

Incomplete or improper servicing may cause problems in the operation of the vehicle. If in doubt about any servicing, have it done by your authorized Kenworth Dealer. Improper maintenance during the warranty period may also affect the warranty coverage.

Modifying your vehicle can make it unsafe. Some modifications can affect your vehicle's electrical system, stability, or other important functions. Before modifying your vehicle, check with your Kenworth Dealer to make sure it can be done safely and correctly.

Environmental Protection and Material Hazards

Some of the ingredients in engine oil, hydraulic oil, transmission and axle oil, engine coolant, diesel fuel, air conditioning refrigerant (R-134a and PAG oil), batteries, etc., may contaminate the environment if spilled or not disposed of properly. Non-compliance with environmental regulations can result in fines and/or jail terms. Contact your local government agency for information concerning proper disposal.



WARNING: This vehicle contains material known by the State of California to cause cancer and/or birth defects or other reproductive harm. This warning requirement is mandated by California law (Proposition 65) and does not result from any change in the

manner in which Kenworth Truck Company vehicles are manufactured.



CAUTION: *Handle lubricants carefully. Vehicle lubricants (oil and grease) can be poisonous and cause sickness. They can also damage the paint on the vehicle.*

MAINTENANCE SCHEDULE AND LUBRICATION

MAINTENANCE SCHEDULE AND LUBRICATION

Introduction

The following section summarizes preventive maintenance and lubrication requirements for the maintenance of your Kenworth T2000. For specific maintenance procedures and complete lubrication instructions of specific components consult the Kenworth Shop Manual and manufacturer's service manuals. These manuals are available for a minimal charge from your Kenworth Dealer or direct from the component manufacturer. In addition, supporting manuals and literature are included in the glove compartment of your Kenworth T2000.

Preventive Maintenance Intervals and Schedule

Your preventive maintenance program begins with daily checks you perform. See [Driver's Check List on page 1-29](#). If your Kenworth T2000 is serviced regularly, you can avoid many large, expensive, and time-consuming repairs, as well as ensuring many years of safe and smooth operation. Also, be advised that neglect of recommended service may in some cases void your vehicle's warranty. So, for your safety and life of your vehicle, please follow [Table 15, Maintenance Schedule on page 5-17](#). But remember, there may be maintenance operations that demands skills and equipment you do not have. If so, please take your Kenworth T2000 to an expert mechanic, for your safety and your vehicle's performance.



WARNING: It can be dangerous to attempt maintenance work without sufficient training, service manuals, and the proper tools. You could be injured, or you could make your vehicle unsafe. Do only those tasks you are fully trained and equipped to do.

In severe operating conditions such as mining, logging, or earth moving, you will need to perform maintenance checks and services more frequently. Other severe operating conditions to be aware of are: where the vehicle is consistently operated under conditions of extreme temperature; conditions where heavy loads are being hauled; and contaminated environments, or steep grades. Consult the component manufacturer's maintenance manuals for further information on maintenance procedures specific to these conditions.

MAINTENANCE SCHEDULE AND LUBRICATION

Maintenance And Lubrication Intervals

The following (Table 6, Recommended Lubrication Intervals) shows service intervals for Kenworth T2000s with and without Extended Service Intervals

(ESI). Vehicles built with standard Non-ESI components need to be serviced according to the first column (Non-ESI intervals). All intervals shown are for normal and heavy-duty operations.



NOTE: Different lubricants or service intervals than those listed below may be required.

Table 6 Recommended Lubrication Intervals

ITEM	NON-ESI	ESI	COMMENTS
Hood Pivot	None	None	
Front Brake Camshaft	10,000-15,000	250,000	Synthetic Grease With Special Fittings
Front Brake Camshaft	120,000		With LMS
Tie-Rod Ends	10,000-15,000	25,000	
Power Steering Reservoir			
- Check Fluid Level	10,000-15,000	25,000	
- Change Fluid & Filter	60,000	60,000	2 Times/Year (After Summer & Winter)
Drag Link	10,000-15,000	25,000	
Steering Gear Box	None	None	
Steering U-joints	10,000-15,000	25,000	
Steering Slip Joint	10,000-15,000	25,000	
Brake Treadle	10,000-15,000	25,000	
Clutch Pedal Shaft	None	None	
Main and Aux. Transmission			Kenworth Is Standard With Synthetic Lube (mineral gear lube optional)
- Check Fluid Level			See Transmission Manufacturers Specifications and Recommendations
- Drain and Refill			- Contact Your Kenworth Dealer For Preventive Maintenance Specifications/Schedule
Rear Wheel Bearings - Standard	100,000	As Required	

MAINTENANCE SCHEDULE AND LUBRICATION

ITEM	NON-ESI	ESI	COMMENTS
Rear Wheel Bearings - LMS	3 year/350,000		If no oil leaks, then no need for service prior to 3 year/350,000
Rear Axle - Check Fluid Level - (Rear Axle) Drain, Flush, Refill			Kenworth Is Standard With Synthetic Lube (mineral gear lube optional) See Axle Manufacturers Specifications and Recommendations - Contact Your Kenworth Dealer For Preventive Maintenance Specifications/Schedule
Rear Brake Camshafts	10,000-15,000	250,000	Synthetic Grease With Special Fittings
Rear Brake Camshafts	120,000		With LMS
Fifth Wheel	10,000-15,000	25,000	40 to 60K For Adjustment
Spring Pins	10,000-15,000	None	With Rubber Bushed Pins - No Service
Front & Rear Slack Adjusters	10,000-15,000	250,000	Synthetic Grease With Special Fittings
King Pins	10,000-15,000	25,000	
Front Wheel Bearings - Standard	100,000	As Required	
Front Wheel Bearings - LMS	3 year/350,000		If no oil leaks, then no need for service prior to 3 year/350,000
Engine Lubricating Oil - Check Fluid Level - Change Oil	Daily Trip Check 10,000-15,000	Daily Trip Check 25,000	See Engine Manufacturers Recommendations Must Meet Engine Manufacturers Specifications
Spring Shackle Pins	10,000-15,000	None	No Service With Rubber Bushed Spring Pins
Clutch Linkage	10,000-15,000	25,000	
Clutch Release Bearing	10,000-15,000	25,000	Extended Grease Fittings
Clutch Cross Shaft	10,000-15,000	25,000	Extended Grease Fittings
Door Weatherstrip	100,000 or As Required	As Required	
Lock Cylinders	100,000 or As Required	As Required	
Door Hinges	100,000 or As Required	As Required	Teflon Bushing

MAINTENANCE SCHEDULE AND LUBRICATION

ITEM	NON-ESI		ESI	COMMENTS
Door Latches and Striker Plate	100,000 or As Required		As Required	
Driveshaft (all) Center Bearing	See Table 7 and 8.		See Table 7 and 8.	
	None		None	
Suspension	Per Specifications		None	
AG380	None		None	No Lube Required
AG400	None		None	No Lube Required
Chalmers				See Suspension Manufacturers Specifications & Recommendations - Contact Your Kenworth Dealer For Preventive Maintenance Specifications/Schedule
Hendrickson				
Neway				
Reyco				

For additional Cooling System Maintenance and Schedule information see [Cooling System Maintenance and Schedule on page 5-62](#). For additional Air System Scheduled Maintenance information see [Air System Scheduled Maintenance on page 5-36](#).

MAINTENANCE SCHEDULE AND LUBRICATION

Table 7 Spicer Driveshaft Lubrication Intervals*

SERIES	CITY	ON-HWY	LINEHAUL	ON/OFF-HWY
10-Series (1480 thru 1810 & SPL-90) Slip member also requires lubrication.	5,000/8,000 MI (8,000/12,800Km) or 3 Months (whichever comes first)	10,000/15,000 MI (16,000/24,000Km) or 3 Months (whichever comes first)	10,000/15,000 MI (16,000/24,000Km) or 3 Months (whichever comes first)	5,000/8,000 MI (8,000/12,800Km) or 3 Months (whichever comes first)
Spicer Life Series® - Medium Duty (SPL-55, 70 & 100) Booted & permanently lubricated slip member.	25,000 MI 40,000 Km or 6 Months (whichever comes first)	25,000 MI 40,000 Km or 6 Months (whichever comes first)	25,000 MI 40,000 Km or 6 Months (whichever comes first)	25,000 MI 40,000 Km or 6 Months (whichever comes first)
Spicer Life Series® - Heavy Duty (SPL-140, 140HD, 170, 170HD, 250 & 250HD) Standard Spicer Life Series u-joint Booted & permanently lubricated slip member.	25,000 MI 40,000 Km or 6 Months (whichever comes first)	100,000 MI 160,000 Km or 6 Months (whichever comes first)	100,000 MI 160,000 Km or 6 Months (whichever comes first)	25,000 MI 40,000 Km or 6 Months

* Spicer Driveshaft Division recommends re-lubrication with Chevron Ultra-Duty EP-2 or a compatible grease meeting N.L.G.I. Grade 2 specifications with an operating range of +325F/+163C to -10F/-23C.

** Spicer Life XL u-joints are best identified by the rubber seal guards (a soft, pliable boot) fitted to the bearing cups. Spicer Life XL u-joints have a plastic zerk cover attached prior to the required initial 350,000 mile re-lubrication. Standard Spicer Life Series u-joints have a hard plastic slinger fitted to the bearing cups.

City is defined as all applications that require a minimum of 90% of operation time within the city limits.

On-Highway is defined as all applications requiring less than 10% of operating time on gravel, dirt or unpaved roads.

Linehaul is defined as 100% of operation time on smooth concrete or asphalt.

On/Off-Highway is defined as all applications operating primarily on paved roads, but requiring more than 10% of operating time on gravel, dirt or unpaved roads.

MAINTENANCE SCHEDULE AND LUBRICATION

Table 8 XL Lubrication Cycles

SERIES	CITY	ON-HWY	LINEHAUL	ON/OFF-HWY
SPICER LIFE XL - FIRST LUBRICATION CYCLE*				
SPICER LIFE XL** - HEAVY DUTY (SPL-140XL, 170XL & 250XL) Extended Lubrication u-joints. Booted & permanently lubricated slip member. After initial miles (kilometers) or time is reached, the plastic grease zerk cover must be removed and the joints re-lubricated.	100,000 MI 160,000 Km or 1 year (whichever comes first)	350,000 MI 560,000 Km or 3 years (whichever comes first)	350,000 MI 560,000 Km or 3 years (whichever comes first)	100,000 MI 160,000 Km or 1 year (whichever comes first)
SPICER LIFE XL - RE-LUBRICATION CYCLE*				

MAINTENANCE SCHEDULE AND LUBRICATION

SERIES	CITY	ON-HWY	LINEHAUL	ON/OFF-HWY
SPICER LIFE XL** - HEAVY DUTY (SPL-140XL, 170XL & 250XL) Extended Lubrication u-joints. Booted & permanently lubricated slip member. After initial miles (kilometers) or time is reached, the plastic grease zerk cover must be removed and the joints re-lubricated.	25,000 MI 40,000 Km or 6 Months (whichever comes first)	100,000 MI 160,000 Km or 6 Months (whichever comes first)	100,000 MI 160,000 Km or 6 Months (whichever comes first)	25,000 MI 40,000 Km or 6 Months (whichever comes first)

* Spicer Driveshaft Division recommends re-lubrication with Chevron Ultra-Duty EP-2 or a compatible grease meeting N.L.G.I. Grade 2 specifications with an operating range of +325F/+163C to -10F/-23C.

** Spicer Life XL u-joints are best identified by the rubber seal guards (a soft, pliable boot) fitted to the bearing cups. Spicer Life XL u-joints have a plastic zerk cover attached prior to the required initial 350,000 mile re-lubrication. Standard Spicer Life Series u-joints have a hard plastic slinger fitted to the bearing cups.

City is defined as all applications that require a minimum of 90% of operation time within the city limits.

On-Highway is defined as all applications requiring less than 10% of operating time on gravel, dirt or unpaved roads.

Linehaul is defined as 100% of operation time on smooth concrete or asphalt.

On/Off-Highway is defined as all applications operating primarily on paved roads, but requiring more than 10% of operating time on gravel, dirt or unpaved roads.

5

Maintenance Schedule

Depending on the service package built into your Kenworth T2000, use [Table 15, Maintenance Schedule on page 5-17](#), as a guide to plan service work for Non-ESI and ESI vehicles.

Be sure and follow the frequency recommendations for your vehicle.



NOTE: If a scheduled service interval is shaded, skip to the next interval. The frequency of each service operation is

identified by open (non-shaded areas).

MAINTENANCE SCHEDULE AND LUBRICATION

TABLE KEY

A	Part Of Federal Annual Inspection Every 120,000 miles/192,000 km
I	Inspect
R	Replace
G2	Synthetic Lube Required - 500,000 Drain

Table 9 Maintenance Schedule

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
INITIAL DRIVE-IN	A	B	C	D		A	B	E	F	G	
Clutch Brake Operation		I	I	I			I	I	I	I	
Clutch Pedal Free Travel inches		I	I	I			I	I	I	I	
Glass for Cracks or Chips	I	I	I	A		I	I	I	A	A	
Door Window Operation											
Interior Lights											Replace As Required
Interior Appearance:/Condition:											Check For Tears, Stains, Wear
Seats	I	I	I	I		I	I	I	I	I	
Floor Mats	I	I	I	I		I	I	I	I	I	
Door Panels	I	I	I	I		I	I	I	I	I	
Headliner	I	I	I	I		I	I	I	I	I	
Sleeper	I	I	I	I		I	I	I	I	I	
Dash	I	I	I	I		I	I	I	I	I	
Covers	I	I	I	I		I	I	I	I	I	

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Wiper Operation	I	I	I	A		I	I	I	A	A	
Wiper Blade Condition	I	I	I	A		I	I	I	A	A	
Horns (Electric and Air)	I	I	I	A		I	I	I	A	A	
Mirrors	I	I	I	A		I	I	I	A	A	
SAFETY EQUIPMENT	A	B	C	D		A	B	E	F	G	
Drain Water from Air Tanks	I	I	I	I		I	I	I	I	I	Daily
Air Tank Check Valve	I	I	I	A		I	I	I	A	A	
Emergency Operation of Spring Brakes	I	I	I	A		I	I	I	A	A	
Air Press. Build-up time: _____ min.			I	A				I	A	A	
Governed Air Pressure: _____ psi			I	A				I	A	A	
Air Press. Drop-Brakes not Applied: _____			I	A				I	A	A	
Air Press. Drop-Brakes Applied: _____			I	A				I	A	A	
Fire Extinguisher Charge											Replace or Recharge Per Extinguisher Manufacturer Recommendations
Flare Kit/Reflectors				A					A	A	
CIRCLE INSPECTION	A	B	C	D		A	B	E	F	G	
Physical Damage:											
Exterior Sheet Metal	I	I	I	I		I	I	I	I	I	
Grille and Radiator	I	I	I	I		I	I	I	I	I	

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Trailer Light Cord and Connectors	I	I	I	A		I	I	I	A	A	
Air Lines and Gladhands	I	I	I	A		I	I	I	A	A	
5th Wheel Mounting and Condition	I	I	I	A		I	I	I	A	A	
Pintle - Hook/Eye Condition	I	I	I	A		I	I	I	A	A	
Headlights - High and Low Beams	I	I	I	A		I	I	I	A	A	
Road Lights	I	I	I	A		I	I	I	A	A	
Marker Lights	I	I	I	A		I	I	I	A	A	
Turn Signals	I	I	I	A		I	I	I	A	A	
Emergency Flasher	I	I	I	A		I	I	I	A	A	
Brake Lights	I	I	I	A		I	I	I	A	A	
Backup/Loading Lights	I	I	I	A		I	I	I	A	A	
License Plates: Permits and Mounting	I	I	I	A		I	I	I	A	A	
Mud Flaps/Serviceable	I	I	I	A		I	I	I	A	A	
Fuel Tank Mounting	I	I	I	A		I	I	I	A	A	
Exhaust System-Condition and Mounting Bolts	I	I	I	A		I	I	I	A	A	
Frame Fastener Torque:			I	A					A	A	See Table Key on page 5-17 .
Lubricate: Door Hinges and Latches			I	I					I	I	
Body Mounts (Straight Truck Only)			I	I					I	I	

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Body Sides and Roof Panels (Straight trucks)											
Cab and Sleeper Air Suspension Mounts											See Manufacturers Recommendations
Hood: Hold Down Latches											Replace If Damaged
Safety Lock											Replace As Required
Front Pivot Assembly											
ENGINE SERVICE	A	B	C	D		A	B	E	F	G	
Engine Oil - Change											See Engine Manufacturers Operator Manual provided with this chassis
Engine Oil Level											
Oil Filters											
Fuel Filters											
Drain Water from Fuel System											
Engine Tune-up											
Cooling: Check Supplemental Additive/Conditioner to Manufacturer Specifications _____ %											
Coolant Level									A	A	
Coolant Protection: _____ degrees											

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Pressure Test		I	I	I			I	I	I	I	Check At Time Of Coolant Replacement
Replace Water Filter				R					R	R	New Release At 100-120K - Per Engine Filter Manufacturer Recommendations
Hose Condition and Connections		I	I	I			I	I	I	I	
Radiator Mounting			I	I					I	I	
Fan Shroud			I	I					I	I	
Fan Assembly and Idler Pulley			I	I					I	I	No Service Required on ESI Units
Check Water Pump for Leaks/Play			I	I							
Radiator - Exterior Condition											Once every 240,000 Miles/384 000 km
Replace Engine Coolant				R					R	R	Fill as Required - Extended Drain Per Manufacturer Specifications. Once every 240,000 Miles/384 000 km
Air Cleaner:				R					R	R	Replace Annually/Air Cleaner Restriction: Replace If Greater Than 20
Contaminant Accumulation			I	I				I	I	I	Check Every 15,000 Miles (24,000 km) in Dirty Conditions

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Air Cleaner Restriction ____ (replace if greater than 20)		I	I	I			I	I	I	I	
Vacuator Valve-Operation & Condition			I	I				I	I	I	
Mounting Bolts			I	I				I	I	I	
Leaks			I	I				I	I	I	
Interference			I	I				I	I	I	
Hose Condition and Connections		I	I	I			I	I	I	I	Check For Leaks and Cracking
Power Steering - Reservoir Level	I	I	I	I		I	I	I	I	I	
Power Steering Fluid - Replace			R	R					R	R	Service 2 Times Per Year - 60,000 Mile Intervals
Power Steering Filter - Replace			R	R					R	R	See Table Key on page 5-17
Drive Belt Condition and Adjustment		I	I	I			I	I	I	I	
Air Conditioner Compressor Mounting			I	I				I	I	I	
Cold Start Aids		I	I	I			I	I	I	I	
Governor and Pump Security Seals OK				A					A	A	
High Idle: _____ RPM				A					A	A	
Emergency Shutdown		I	I	I			I	I	I	I	
Vibration Damper Condition			I	I				I	I	I	

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Cranking System:		I	I	I			I	I	I	I	
Check Harness/Cables For Loose Connections, Chafing, Broken Retention Clips Starter Draw: _____ volts				A					A	A	
Alternator/Charging System:		I	I	I			I	I	I	I	
Check Harness/Cables For Loose Connections, Chafing, Broken Retention Clips Output Voltage: _____ volts			I	A					A	A	
Exhaust System	I										Check for leaks and proper support.
Flexible Pipe											Replace exhaust flex pipe(s) and CGI flex pipe(s) every 150,000 miles/241,400km.
Diesel Particulate Filter (DPF)											See Engine Manufacturer's Operator Manual provided with this chassis.
UNDER VEHICLE	A	B	C	D		A	B	E	F	G	
Steering Components Condition:	I	I	I	I		I	I	I	I	I	
Steering Gear			I	A				I	A	A	
Steering Shaft Splines and Joint(s)	I	I	I	A		I	I	I	A	A	

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Pitman Arm		I	I	A			I	I	A	A	
Drag Link		I	I	A			I	I	A	A	
Steering Arms		I	I	A			I	I	A	A	
Tie Rod Arms		I	I	A			I	I	A	A	
Tie Rod Ends		I	I	A			I	I	A	A	
Radius Rods/Torque Arms		I	I	A			I	I	A	A	
Chassis Frame Cracks or Breaks	I	I	I	A		I	I	I	A	A	
Spring Shackles and Hanger Brackets			I	A							No Service Required on ESI Units
Spring Pins		I	I	A							No Service Required on ESI Units
King Pin Wear				I					I	I	
Steering Axle Wheel Bearing - End Play Adjustment and Inspection	I	I	I	I		I	I	I	I	I	350,000 Miles With LMS Outer Ends • No Leak - No Service
Front Hub Lubricant Level		I	I	A			I	I	A	A	
Spring Leaves			I	A				I	A	A	
Air Springs (AG130)			I	A				I	A	A	

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
U-Bolt and Suspension Fastener Torque											Tighten U-bolts after the first 500 miles (800 km). Rear suspension fasteners: re-torque after first 2,000 miles (3218 km). See Table Key on page 5-17 .
Rear Suspension Components - Condition											For Kenworth Non-Proprietary Suspensions, See your Kenworth Dealer For Preventive Maintenance Specifications/Schedule
Track/Torque Rods											
Suspension Brackets & Welds - Cracks											
Springs, Hangers & Shackles											
Walking Beams											
Bushings - Worn											
Air Springs & Mounts											
Lubrication											
Suspension Air Fittings - Leaks											
Leaks:											
Coolant											
Engine Oil				A							
Power Steering									A	A	
Fuel									A	A	
Transmission											
Axles											

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Inner and Outer Hub Seals											
Engine and Transmission Mounts											
Drivelines - U-joints and Slip Yokes											
Rear Axle Lubricant Level											
Rear Axle Lubricant Flush & Refill											Non ESI - 250,000 Miles/ESI - 500,000 Miles. See Table Key on page 5-17 .
Rear Axle Breathers - Clear											
Tractor Protection Valve Breakaway Test											
Brake Chamber Mounting Bolt Torque				A					A	A	
Brake Hoses for Cracks and Chafing				A					A	A	
Adjust Brakes				A					A	A	
Front & Rear Brake Camshaft Tube Lubrication				A					A	A	Synthetic Grease Required - Special Fitting
Clutch Pedal Shaft											No Service Required on ESI Units
Clutch Linkage											
Suspension Air Fittings											
Clutch Release Bearing				A					A	A	Required Extended Fittings

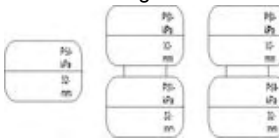
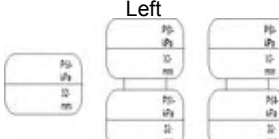
MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Driveline Center Bearing			I	I							No Service Required on ESI Units
Automatic Slack Adjusters	I	I	I	I		I	I	I	I	I	Standard (non LMS)
Automatic Slack Adjusters				I					I	I	With LMS, Synthetic Lube Required - Special Fitting
Brakes: Lining Remaining (replace as required)		I	I	A			I	I	A	A	
RF _____											
RRF _____											
RRR _____											
LF _____											
LRF _____											
LRR _____											
Drum Condition:			I	A				I	A	A	
RF _____											
RRF _____											
RRR _____											
LF _____											
LRF _____											
LRR _____											
Chassis Lubrication											
Transmission Lubricant Level											See Transmission Manufacturers Specifications and Recommendations Supplied With Vehicle.

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Transmission Lubricant and Filter Change				A							Synthetic Lube Required - 500,000 Drain.
Rear Axle Lubricant Change				A							Synthetic Lube Required - 500,000 Drain.
Front Hub Lubricant Change				A							Synthetic Lube Required - 500,000 Drain.
BATTERIES	A	B	C	D		A	B	E	F	G	
Check Harness/Cables For Loose Connections, Chafing, Broken Retention Clips		I	I	I			I	I	I	I	
Signs of Over-Charging			I	I				I	I	I	
Remove Corrosion and Seal Terminals			I	I				I	I	I	
Hold-down and Box - Mounting Bolts			I	I				I	I	I	
Load Test Batteries				A					A	A	
Sealed Type - Condition:	I	I	I	I		I	I	I	I	I	
(Color of charge indicator for each battery)	I	I	I	I		I	I	I	I	I	
1 _____ 2 _____ 3 _____ 4 _____			I	I				I	I	I	
TIRES AND WHEELS	A	B	C	D		A	B	E	F	G	
Missing Valve Caps and Stem Locks	I	I	I	I		I	I	I	I	I	
Cracks or Loose Wheel lugs	I	I	I	A		I	I	I	A	A	

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Tandem Mating											
Irregular Wear				A					A	A	
Tire Pressure (Record below)											
Remaining Tread (Record below)				A					A	A	
Tires & Wheels Inspection				A					A	A	
Right 											
Left 											
Air Pressure Adjusted to:											
ALIGNMENT	A	B	C	D		A	B	E	F	G	
Toe-in: _____ in (mm)											

MAINTENANCE SCHEDULE AND LUBRICATION

OPERATION \ FREQUENCY	NON-ESI UNITS					ESI UNITS					COMMENTS
	7,500 mi 12,000 km	15,000 mi 24,000 km	60,000 mi 96,000 km	120,000 mi 193,000 km Annually		7,500 mi 12,000 km Monthly	15,000 mi 24,000 km	25,000 mi 40,000 km	125,000 mi 201,000 km	250,000 mi 402,000 km	
Caster: L _____ R											
Rear Axle Alignment				A					A	A	
ROAD TEST	A	B	C	D		A	B	E	F	G	
Steering/Steering Play											
Shifting											
Brakes											
Engine Operation (noises, surging, black smoke)											
Throttle Linkage											
Jake Brake Operation											
Seat Belts											
Air Seat Operation											
Cab Heater											
Air Conditioner											
Instruments and Gauges:											
Speedometer/odometer											
Tachometer											
Oil Pressure											
Engine Temperature											
Illumination											
SRS Warning											
ABS Warning											
Low Brake Pressure Warning Devices				A					A	A	

Lubrication Specifications

You will find a complete Engine Lubrication Service Guide in the Engine Operation and Maintenance Manual. There, the engine manufacturer explains more fully all the maintenance operations you and a qualified service mechanic will need. And please remember: one key to keeping your Kenworth T2000 running at top economy and in prolonging its life is proper lubrication servicing. Neglecting this essential aspect of vehicle care can cost time and money in the long run.

Below you will find basic information needed to perform routine vehicle lubrication. Of course you will want to schedule service more frequently if operating in severe conditions such as extreme heat or cold, with very heavy loads, off-road, etc. For any special service requirements, consult your service manuals and your

lubricant supplier. The component manufacturer's specification and requirements take precedence over other specifications.



CAUTION: Handle lubricants carefully. Vehicle lubricants (oil and grease) can be poisonous and cause sickness. They can also damage the paint on the vehicle.



CAUTION: Do not mix different types of lubricants. Mixing lubricants (oil and grease) of different brands or types could damage vehicle components; therefore, drain (or remove) old lubricants from the unit before refilling it.

- **When switching between types of lubricants, thoroughly drain all areas of the component.**

Oil Reservoirs

For oil reservoirs with side filler plugs (transmissions, axles, steering gear boxes, transfer cases, etc.), the oil must be level with the filler opening.



NOTE: Use care when checking the oil level with a finger. Just because you can reach the oil level with a finger, does not mean the oil level is correct.



NOTE: Factory oil level may be above this level because it is measured as a volume and not as a specific oil level. This is acceptable to the axle manufacturers; however, refill should be per the Proper Oil Level as shown in the figure below.

MAINTENANCE SCHEDULE AND LUBRICATION

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- 1 Improper Oil Level
- 2 Proper Oil Level

Lubrication Chart

The following lubrication specifications (Table 10) are for an ambient operating temperature range of -15° to 100° F (-26° to 38° C). For extreme

temperature operations, consult the component manufacturer's manuals.

Table 10 Recommended Lubrication Types * Non-ESI Units

COMPONENTS	RECOMMENDED LUBRICANT
Power Steering Gear	ATF Dexron® II
Manual Steering Gear	SAE 80W-90 CP gear oil, MIL-L-2105D, API GL5.
Driveline U-Joints Slip-Joint Splines Hood Pivots Fan Drive Fifth Wheel Components Clutch Pedal Shaft Clutch Linkage Other chassis grease fittings not covered below.	EP chassis grease, lithium 12-hydroxystearate or lithium complex base, NLGI 2.
Wheel Bearings-Non Driving Axles Including Steerable Pushers and Tag Axles	OIL LUBRICATED: SAE 80W-90 EP gear oil, MIL-L-2105D, API GL5; or SAE 50 Synthetic Transmission Oil (CD50). GREASE LUBRICATED: EP chassis grease, lithium 12-hydroxystearate or lithium complex base, NLGI 2.
Wheel Bearings-Non Steerable Pushers and Tag Axles	OIL LUBRICATED: SAE 80W-90EP gear oil, MIL-L-2105D, API GL5; or SAE 75W-90 Synthetic Oil GREASE LUBRICATED: EP chassis grease, lithium 12-hydroxystearate or lithium complex base, NLGI 2.
Suspension Fittings (other than threaded pins & bushings)	EP chassis grease, lithium 12-hydroxystearate or lithium complex base, NLGI 2.

MAINTENANCE SCHEDULE AND LUBRICATION

COMPONENTS	RECOMMENDED LUBRICANT
Steering Axle: Grease Fittings on Steering Arm; Tie Rod Ends; Drag Link; King Pins	EP chassis grease, lithium 12-hydroxystearate base, NLGI 2.
Deviations from the above list of lubricants should be based on specifications published in the component manufacturer's manuals or otherwise approved by the manufacturer. For ESI units, see the Kenworth Shop Manual or the component manufacturer's manuals.	
Clutch Release Bearing (remove inspection plate for access); Driveshaft Center Bearing	High temperature ball bearing grease. Chevron SRI Mobil Grease HP, Texaco Multifax 2, or equivalent.
Manual Slack Adjusters	EP chassis grease, lithium 12-hydroxystearate base, NLGI 2.
*ESI units may require different lubricants for some components. See Maintenance Schedule on page 5-17 .	
Automatic Slack Adjusters; Wedge Brake Components; Disc Brake Caliper	High temperature EP grease; Texaco Thermotex EP-1, Shell Darina EP-1, Mobilith AW-1, Meritor 0-616A, or equivalent.
Cam Brake Camshaft Splines; Disc Brake Shaft Splines and Slide Pin Retainers; Brake Clevis Pins	Anti-seize type grease, Meritor specification 0-637.
Brake Camshaft Bushings	EP Chassis grease, lithium 12-hydroxystearate base, NLGI 2.  CAUTION: Do not contaminate brake linings with grease.
Steering Shaft Grease Fittings	EP chassis grease, lithium 12-hydroxystearate base, NLGI 2.
Brake Treadle Hinge and Roller	Engine oil
Lock Cylinders	Lock lubricant.
Door Hinges	Not required - Teflon bushings
Door Latches & Striker Plates	Polyethylene grease stick.
Door Weatherstrip	Silicone lubricant.
Axle U-Bolt Threads	Chevron Zinc Lubrication anti-seize compound is recommended; or use EP chassis grease, lithium 12-hydroxystearate or lithium complex base, NLGI 2
Hub-piloted Aluminum Wheels	Coat the wheel pilot or hub pads with Freylube #3 lubricant (light colored) or Chevron Zinc lube. Do not get lubricant on the face of the wheel or the hub.
Other Items	Use manufacturers manuals.

MAINTENANCE SCHEDULE AND LUBRICATION

COMPONENTS	RECOMMENDED LUBRICANT
*ESI units may require different lubricants for some components. See Maintenance Schedule on page 5-17 .	
Deviations from the above list of lubricants should be based on specifications published in the component manufacturer's manuals or otherwise approved by the manufacturer.	
For ESI units, see the Kenworth Shop Manual or the component manufacturer's manuals.	

AIR SYSTEM

Introduction



WARNING: Prior to the removal of any air system component, always block and hold the vehicle by a secure means other than the vehicle's own brakes. Depleting air system pressure may cause vehicle to roll unexpectedly resulting in an accident. Keep hands away from chamber push rods and slack adjusters, they may apply as system pressure drops. Failure to comply may result in personal injury, death, equipment or property damage.

- Never connect or disconnect a hose or line containing air pressure. It may whip as air escapes. Never remove a component or pipe plug unless

you are certain all system pressure has been depleted.

- Never exceed recommended air pressure and always wear safety glasses when working with air pressure. Never look into air jets or direct them at anyone.
- Never attempt to disassemble a component until you have read and understood recommended procedures. Some components contain powerful springs and injury or death can result if not properly disassembled. Use only proper tools and observe all precautions pertaining to the use of those tools.



WARNING: Do not release the parking brake or attempt to move the vehicle until air pressure in both circuits is at least 100 psi (690 kPa), the level required for normal brake operation. Failure to

comply may result in personal injury, death, equipment or property damage.

- Do not use the trailer hand brake control to hold vehicle while parked. This control utilizes air pressure for brake application. Because acceptable air leakage levels cause all truck air systems to gradually lose pressure, vehicle rollaway could occur, resulting in an accident, injuries or death.
- Always apply the tractor and trailer parking brakes when the vehicle is unattended.

Contamination of the air supply system is the major cause of problems in air-operated components such as brake valves, wiper motors, and suspension height control valves. To keep contaminants to the lowest possible level, follow these maintenance procedures.

Scheduled Maintenance

Use the following table, to schedule service operations and air system tests.

Table 11 Air System Scheduled Maintenance

TEST	MAXIMUM INTERVALS				
	EACH WEEK	EACH MONTH (10,000 mi) (16,000 km)	THREE MONTHS (25,000 mi) (40,000 km)	SIX MONTHS (50,000 mi) (80,000 km)	ANNUALLY (100,000 mi) (160,000 km)
Air Compressor			•		
Air Governor			•		
System Leakage	•				
Dual Air Brake Treadle Valve			• — or — •		
Hand Operated Trailer Brake Valve			• — or — •		
Tractor Parking Valve			•		
Parking Brake Valve			•		
Trailer Air Supply			•		
Tractor Protection Valves					•
Relay Valve					•
Spring Brake Inversion Valve					•
Automatic Limiting Valve					•
Single Check Valves				•	
Double Check Valves	•				
Stop Light Switch				•	
Low Pressure Wig Wag	•				
Low Pressure Switch		•			
Automatic Drain Valve		•			

TEST	MAXIMUM INTERVALS				
	EACH WEEK	EACH MONTH (10,000 mi) (16,000 km)	THREE MONTHS (25,000 mi) (40,000 km)	SIX MONTHS (50,000 mi) (80,000 km)	ANNUALLY (100,000 mi) (160,000 km)
Safety Valve			•		
Quick Release Valve					•
Manual Drain Valve				•	

Air System Function Test

Scheduled maintenance should be performed on the Kenworth T2000s air system, as outlined in the Kenworth Shop Manual and Table 11. In addition, perform an Air System Function Test at least every 3 months or if there is any indication of a potential problem.

Air Tanks

The supply and service air tanks are located on the right frame. To eject moisture from the air system tanks, pull the line which is connected to the moisture ejection valve. Continue pulling until the air comes out free of water.

Daily: The supply and service air tanks, must be drained on a daily basis. Operate air devices daily to circulate lubricants within the unit.

Periodically: Clean filter screens ahead of the valves by removing the screens and soaking them in solvent. Blow them dry with pressurized air before reinstalling them.



WARNING: If the supply and service air tanks are not drained at the recommended frequency, water could enter the air lines and valves. This could cause corrosion or blockage, which could compromise the brake system safety and potentially cause an accident. Failure to comply may result in personal injury, death, equipment or property damage.

To drain air tanks, it is not necessary for you to remove the air tank cover. But if you need to access the air tanks, follow the procedure below.

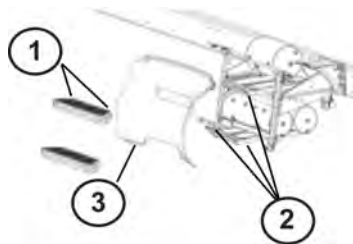
AIR SYSTEM

Access to Air Tanks

1. Remove steps by removing 2 bolts from each step.
2. Remove 4 bolts and washers from forward fairing.

Replacing Parts Removed for Access

1. Install fairing and install 4 bolts. Torque to 67 lb-ft (8 9 Nm).
2. Install steps by installing 2 bolts in each step. Torque to 2432 lb-ft (3343 Nm).



Air Tank Location - Right Frame Rail

- 1 Step Bolts (4)
- 2 Captured Nuts (4) on Step Struts
- 3 Forward Fairing

- Replace worn seals in valves and air motors as they are needed. Your Kenworth Dealer carries rebuild kits for most units.

5



WARNING: Fairings not installed properly could come loose and cause other motorists to have an accident. It is important that fairings be installed properly. Failure to comply may result in personal injury, death, equipment or property damage.



CAUTION: Do not use penetrating oil, brake fluid, or wax-based oils in the air system. These fluids may cause severe damage to air system components.

- Maintain the air compressor to prevent excessive oil bypass. See the Kenworth Shop Manual for maintenance details.

Air Gauges and Air Leaks

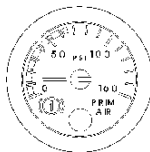
Your Kenworth T2000 comes with two separate air pressure gauges for two separate systems, Primary and Secondary: the Primary gauge indicates pressure in the rear braking system; the Secondary gauge indicates pressure in the front braking system. Each gauge indicates the amount of air pressure in pounds per square inch (psi).



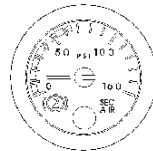
WARNING: Do not operate the vehicle if leakage in the air system is detected. Conduct the following procedure and contact an authorized Kenworth Dealer (or any other properly equipped service center) if a leak is detected. Failure to check the brakes or follow these procedures could cause a system failure, increasing the risk of an accident and

may result in personal injury, death, equipment or property damage.

If the light and alarm do not turn off at start-up, do not try to drive the vehicle until the problem is found and fixed. If the pressure in either or both systems is too low for normal brake operation, i.e., the pointer of one gauge falls below 60 psi (414 kPa), a warning light on the gauge will glow and the audible alarm will sound.



Primary Air Pressure Gauge



Secondary Air Pressure Gauge

Follow the procedure below to check the compressed air system for leaks:

1. Periodically, or after maintenance or replacement of air system components:
2. Build up air pressure in the system to the governor cutout point or until 120 psi (827 kPa) is reached.
3. Stop the engine and release the service brakes.
4. Without applying the brake pedal, observe the rate of air pressure drop. This rate should not exceed 2.0 psi (14 kPa) per minute.
5. Start the engine and build up the air pressure again.

AIR SYSTEM

6. Stop the engine, and apply the brakes fully. Apply the brake pedal and hold it down for five minutes. The pressure drop should not exceed 3.0 psi (21 kPa) per minute.
7. If you detect excessive leakage (air pressure loss greater than 3.0 psi after five minutes of brake application), a leakage test should be made at the air line connections and at all air brake control units. These tests should determine where air is escaping.

Air Compressor

Operation

All compressors, regardless of make or model, run continuously while the engine is running. System pressure is controlled by the governor. The governor acts in conjunction with the unloading mechanism in the compressor cylinder block to start and stop compression of air. The compressor is unloaded when the system pressure reaches 120 psi (827 kPa) and compression is reestablished when system pressure falls to 100 psi (690 kPa).

Preventive Maintenance

The following service checks are provided for your information only and should be performed by a certified mechanic. Contact your Kenworth Dealer or consult the Kenworth Shop Manual and the engine manufacturer's Maintenance Manual for further information on servicing air compressors.

After completing any repairs to the air system, always test for air leaks, and check the brakes for safe operation before putting the vehicle in service.

According to Table 11, [Air System Scheduled Maintenance on page 5-36](#):

- Inspect compressor air filter element, if so equipped, and replace element if clogged. Check compressor mounting and drive for alignment and belt tension. Adjust if necessary.
- Remove compressor discharge valve cap nuts and check for

presence of excessive carbon. If excessive carbon is found, clean or replace the compressor cylinder head. Also, check compressor discharge line for carbon, and clean or replace the discharge line if necessary.

- Disassemble compressor and thoroughly clean and inspect all parts. Repair or replace all worn or damaged parts, or replace compressor with a factory exchange unit.



CAUTION: When draining the engine cooling system is required, to prevent damage from freezing, the compressor must also be drained at the cylinder head and block. Engine damage could occur if the cooling system is not periodically drained and maintained. See [Cooling System on page 5-61](#), and the

Kenworth Shop Manual for further information.

Air Dryer

The function of the air dryer is to collect and remove air system contaminants in solid, liquid and vapor form before they enter the brake system. It provides clean, dry air to the components of the brake system, which increases the life of the system and reduces maintenance costs. Daily manual draining of the air tanks is eliminated.



NOTE: Because no two vehicles operate under identical conditions, maintenance and maintenance intervals will vary. Experience is a valuable guide in determining the best maintenance interval for any one particular operation.

Every 900 operating hours or 25,000 miles or every three (3) months check for moisture in the air brake system by opening air tanks, drain cocks, or valves and checking for presence of water.



NOTE: A small amount of oil in the system may be normal and should not, in itself, be considered a reason to replace the desiccant cartridge. Oil stained desiccant can function adequately.

A tablespoon of water found in the air tank would point to the need for a desiccant cartridge change. However, the following conditions can also cause water accumulation and should be considered before replacing the desiccant cartridge.

- Air usage is exceptionally high and not normal for a highway vehicle. This may be due to accessory air demands or some unusual air requirement that does not allow the compressor to load and unload (compressing and non-compressing cycle) in a normal fashion or it may be due to excessive leaks in the air system.

- In areas where more than a 30° F (17° C) range of temperature occurs in one day, small amounts of water can accumulate in the air brake system due to condensation. Under these conditions, the presence of small amounts of moisture is normal and should not be considered as an indication that the dryer is not performing properly.
- An outside air source has been used to charge the air system. This air did not pass through the drying bed.

Overhaul

Maintenance intervals typical for on-highway operation would be 2 - 3 years, 350,000 miles or 10,800 hours.

Maintenance intervals typical for high duty cycle usage such as transit bus, refuse hauler, dump truck, cement mixers and off-highway operation would be 1 year, 100,000 miles or 3,600 hours.



NOTE: Review the warranty policy before performing any maintenance procedures. An extended warranty may be voided if unauthorized maintenance is performed during this period.

Air Intake System

Engine heat, vibration, and age combine to loosen air intake connections and cause cracks in the tubing and elbows. Leaks in the intake system allow abrasive dust to enter the engine and quickly cause expensive damage. During your daily walk-around inspection, carefully check all tubing, elbows, clamps supports and fasteners for condition and tightness.

- Under normal operating conditions, Kenworth recommends complete disassembly and cleaning of the air intake system at each 25,000 mile (40,000 km). Under severe operating conditions, the disassembly and cleaning should be more frequent. Replace any defective parts. With the possible exception of mounting brackets, do not repair defective parts.

- Check the Charge-Air-Cooler for air leaks annually. The air leaks can be caused by cracked tubes or header. For service see your authorized Kenworth Dealer.

Turbocharger

- When servicing the air intake and exhaust systems on a turbocharged engine, check the items listed below.



WARNING: Do not operate engine with turbocharger intake piping disconnected. A suction is created when the engine is running. This suction could draw your hand or anything else near it into the impeller fan. You could be injured. Always keep the intake piping connected when you will be running the engine.

Lubricating System: Check the oil lines, housing, and connections. Look for leaks, damage, or deterioration. Leaks could mean you have damaged oil lines or oil seals.

AIR SYSTEM

Manifold: With the engine operating, check for leaking manifold or flange gaskets.

High Frequency Vibration: Vibration may indicate turbo rotor imbalance. Have your Kenworth Dealer investigate this immediately. If you detect any deficiencies, take the vehicle to an authorized Kenworth Dealer for servicing. Delay could lead to severe and expensive damage to your vehicle.

Air Cleaners and Filter Replacement

The following service information is basic to all air cleaner makes and models. Service the filter elements when the (option) locks in the extreme High position. Have the element serviced at an authorized Kenworth Dealer. Paper elements require care and proper handling, because they are critical to engine service life.

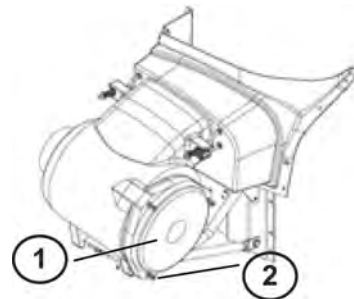
Service the air cleaner periodically. If the vehicle operates in areas with heavy dust, maintenance should be more frequent. Follow the instructions below to remove the air filter.

To remove air cleaner element: remove thumbscrews around air cleaner housing end cap.

- Remove air cleaner end cap.
- Remove air cleaner element.

To install air cleaner element: slide air cleaner element into housing.

- Install air cleaner end cap.
- Install thumbscrews around air cleaner housing end cap.



Air Cleaner

- 1 End Cap
- 2 Thumbscrews (3)

i **NOTE:** Air cleaner is internally sealed by a radial seal around Inlet tube of air cleaner element. For further information on servicing the air cleaner, see the Kenworth Shop Manual.

BRAKE SYSTEM

Introduction

To operate your vehicle safely, you need some understanding of its brake systems. Brake adjustment and brake balance must be set carefully to allow equal stopping forces at all wheels. Tires are also a very important part of the whole system. How fast you can stop depends on how much friction there is between the road and your tires.

All of the following areas are interrelated and must conform to original specifications:

- tire size
- cam radius
- wedge angle
- drum radius
- brake linings
- brake chambers
- slack adjusters



CAUTION: The air brake system of this vehicle was configured for ONE of the following operations, tractor or truck, and complies with the respective portions of FMVSS 121. A tractor shall not be operated or configured as a truck, nor shall a truck be operated or configured as a tractor without significant modifications to the air brake system in order to retain compliance with FMVSS 121. Contact your Kenworth dealer for instructions.

Once a brake system is set to specifications, changing any one of its components or any combination of components may cause the system not to work as well. All parts have to work together to perform as they should.

Because your brake system is air operated, see the following section

[Air System on page 5-35](#) for more information on checking your brakes.

Any replacement components in the brake system should be the same or better than the original components. Any changes from the original specifications can affect the performance of the entire system.



WARNING: Do not use any replacement part in the brake system unless it conforms exactly to original specifications. A nonconforming part in your vehicle's brake system could cause a malfunction resulting in an injury accident. Sizes and types are so related to one another that a seemingly unimportant change in one may result in a change in how well the brakes work for you on the road. If parts do not

work together properly, you could lose control of your vehicle, which could cause a serious accident. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: *Do not work on the brake system without the parking brake set and wheels chocked securely. If the vehicle is not secured to prevent uncontrolled vehicle movement, it could roll and may result in personal injury, death, equipment or property damage.*

- Use wood blocks (4 in. X 4 in. or larger) against the front and rear surfaces of the tires. Be sure the vehicle cannot move.

Lubrication

Cam-actuated brake components such as anchor pins and brake camshafts are subjected to high temperatures, and must be lubricated with non-melting, water resistant brake grease meeting R-S Specification 0-616 (NLGI-Grade 1).

- Lubricate according to Table 6, [Recommended Lubrication Intervals on page 5-11](#).



WARNING: *Do not apply too much lubricant to brake components, lubricate sparingly. Excessive amounts of lubricant could contaminate brake linings, which could reduce brake effectiveness and cause an accident. Failure to comply may result in personal injury, death, equipment or property damage.*

Brake and Slack Adjuster Lubrication

According to the interval, pressure lubricate the slack adjuster and brake camshaft (bracket/tube). Two grease fittings are provided for both the slack adjuster and camshaft bracket/tube.

- Use standard chassis lubricant (meeting No. 1 grade high temperature, water proof specifications).
- Do not use moly-disulfide loaded grease or oil (they may shorten the service life of the slack adjuster).
- Do not use pressure-release grease fittings when lubricating the slack adjuster.

Checks and Adjustments

All vehicle Operator's should check the brakes regularly. Always adjust the brakes when they are cool.

- Park the vehicle on a level surface and block the wheels before attempting any brake checks or adjustments.

Brake Linings



WARNING: Do not use brake linings with a thickness below the specified minimum. Such linings will have lining rivets exposed that can damage the brake drum and reduce brake efficiency, which could cause an accident or system failure. Failure to comply may result in personal injury, death, equipment or property damage.

- Brake linings should be inspected by a qualified mechanic at an authorized Kenworth Dealer for wear. See Table 9, [Maintenance Schedule on page 5-17](#). In severe service applications inspect the linings more frequently.



NOTE: Depending on your vehicles service package (ESI or Non-ESI), brake service requirements will vary. See

your Kenworth Shop Manual for further information.

Automatic Slack Adjusters

Your Kenworth T2000 is equipped with automatic brake (slack) adjusters.



WARNING: Do not work on the brake system without the parking brake set and/or the wheels chocked securely. If the vehicle is not secured to prevent uncontrolled vehicle movement, it could roll and may result in personal injury, death, equipment or property damage.

- Use wood blocks (4 in. X 4 in. or larger) against the front and rear surfaces of the tires. Be sure the vehicle cannot move.

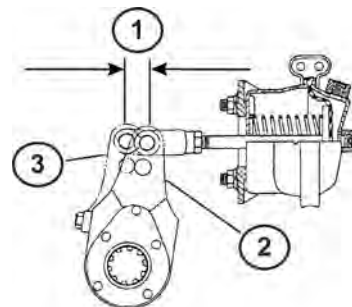
Periodically, brake adjustment should be checked using the following procedure:

1. Check brakes when the temperature of the service brake linings are cool and the system air pressure at 100 psi (690 kPa) minimum.



NOTE: Chock the tires before proceeding.

2. Release the parking brakes to allow the slack adjusters to retract.
3. Measure the retracted pushrod length from the face of the brake chamber to the center of the pushrod pin.
4. Apply 80 to 90 psi brake application and measure the same distance.
5. The difference is the pushrod travel distance (applied stroke).
6. Verify that the result is within the correct range. See the following Brake Adjuster Stroke table for acceptable limits.



Measuring Pushrod Travel

- | | |
|---|--|
| 1 | Short as Possible Without Brakes Dragging "Applied Stroke" |
| 2 | Released Position |
| 3 | Applied Position |



WARNING: Automatic slack adjusters should not be manually adjusted to correct excessive pushrod travel/stroke. Excessive

pushrod travel indicates a problem in either the automatic slack adjuster itself, the adjuster installation or with related foundation brake components. Improperly adjusting the slack adjuster(s) could reduce brake effectiveness and lead to an accident. Failure to comply may result in personal injury, death, equipment or property damage.

Correctly installed and functioning automatic slack adjusters will produce the pushrod travel for each chamber type listed in the following table.

Table 12 Brake Adjuster Stroke

80-90 PSI (552 - 621 KPA) BRAKE APPLICATION		
AIR CHAMBER TYPE (Size)	BRAKE	PUSHROD TRAVEL (Applied Stroke)

20-24	Front	1 to 1-3/4 in. (25-44mm)
16	Front	3/4 in. to 1-1/2 in. (19-38mm)
30	Rear	1-1/2 to 2 in. (38-51mm)

- If the pushrod travel exceeds the above specifications, have your Kenworth dealer inspect the slack adjuster and all other brake related components for excessive wear and/or damage. Replace components that are damaged or show signs of excessive wear.

i **NOTE:** The automatic brake adjuster alone does not ensure proper brake operation. Inspect all brake components. All brake components work together and must be checked periodically to ensure the brake system works properly. See the "Kenworth Shop Manual" for more information on brake maintenance.

Anti-Lock Braking System (ABS)

Below are some general notes on your Kenworth T2000 anti-lock braking system. For detailed service information, see the Kenworth Shop Manual. All service work should be performed by a qualified technician at an authorized Kenworth Dealer. The foundation brake system must be in proper working order to ensure the best ABS performance.



CAUTION: Before welding anywhere on the vehicle, detach the ABS Electronic Control Unit (ECU) connector and all other electronic control units. Failure to comply may result in equipment damage.



CAUTION: Never detach the ECU connector with the ignition turned on. Failure

to comply may result in equipment damage.



NOTE: Check ABS wiring harnesses and piping periodically for chafing or other problems. No regular maintenance is required on the ABS components.



NOTE: During wheel balancing, dyno testing, or any time the ignition is on with part of the ABS disconnected, a failure code will be recorded. Consult with your authorized Kenworth Dealer for information on clearing the failure code.

If, due to operating conditions, a brake application causes either wheel on the same axle to begin skidding, wheel speed sensors immediately signal the anti-lock controller in the modulator assembly. The controller responds instantly by signaling the solenoids in the modulator which activate the air

valves, reducing application pressure as needed to prevent the wheels from locking up. If this over-riding correction is effective, application pressure is allowed to build up to the original input.

Any malfunction of the anti-lock system on one or more axles will cause the system to fail-safe, and the panel-mounted amber warning light will come on, indicating both a malfunction, and automatic shut-down of the system. If the air system is intact (indicated by the pressure gauges), the service brakes will continue to function normally, but without benefit of the anti-lock feature.



NOTE: If one wheel on any driven axle continues to slip or spin for approximately 4 seconds, this will cause the anti-lock controller for that axle to go into the fail-safe mode, and the warning light will give a shutdown signal.

- In this case, the anti-lock system can be turned back on, and the warning light extinguished, by turning the key switch OFF and ON, after the vehicle has been brought to a full stop. When the key switch is turned back on, the warning light will illuminate and remain on for 3 to 5 seconds. This is a built-in function test of the warning light.*



WARNING: Do not attempt to recycle the anti-lock system by turning the key switch OFF and ON until the vehicle has been brought to a full stop and the parking brakes set. Failure to do so could adversely affect steering and braking control, and may result in loss of vehicle control and an accident. Failure to comply may result

in personal injury, death, equipment or property damage.



WARNING: *Do not operate the vehicle in the event of a malfunction in any air circuit. Such a malfunction may prevent the brake system from operating properly, and could result in an injury accident. The vehicle should not be operated until the system is repaired and both braking circuits, including all pneumatic and mechanical components, are working properly. Failure to comply may result in personal injury, death, equipment or property damage.*

CAB MAINTENANCE

Introduction

This truck brings new cab technology to the heavy truck industry by using modular aluminum and composite structural and exterior components:



CAUTION: Do not drill holes in the floor. The floor of the Kenworth T2000 is made of composite/balsa, which is sealed to keep moisture from penetrating the core. Any holes drilled into the floor will allow moisture to enter the balsa core and eventually degrade the structure.

The design and materials are lightweight, strong, noncorrosive, and provide an extremely quiet occupant environment. However, these new materials and construction methods require different repair processes as

well as some new tools and equipment to perform satisfactory repairs. Some materials and processes have been developed over the years as the automobile industry has moved towards lightweight but strong unibody construction using bonded aluminum, steel, and composite panels and frame members. Other repair processes have been developed specifically for the Kenworth T2000.

For repair procedures, refer to the Kenworth T2000 Collision Repair Manual, available from your Kenworth Dealer.

Exterior Maintenance

Painted Surfaces

- Wash painted surfaces frequently to remove grime and caustic deposits which may stain the finish. See [Cleaning, Protecting, and Weather Stripping on page 5-54](#).

Chrome and Aluminum Surfaces

To prevent rust, keep chromed parts clean and protected with wax at all times, especially in winter conditions where the roads are salted.

- If necessary, use a commercial chrome cleaner to remove light rust.
- Chrome surfaces are best cleaned with fresh water. Wipe dry to preserve their luster. A commercial chrome cleaner will remove light rust. After cleaning, wax flat surfaces and apply a thin coat of rust preventive lubricant around bolts or other fasteners.
- Clean aluminum wheels and bumpers with warm water. Tar remover will get rid of heavy deposits of road grime. To prevent spotting, wipe aluminum surfaces dry after washing.
- Under corrosive conditions, such as driving on salted roads, clean aluminum parts with steam or high

pressure water from a hose. A mild soap solution will help. Rinse thoroughly.

Stainless Steel

Even high quality stainless steel parts can rust under prolonged exposure to salt water, especially when the salt-laden moisture is held against the metal surface by road grime. It is, therefore, important to frequently clean salty moisture and grime from stainless steel surfaces.

- If surface rust is encountered, wash the surface and use a commercial polishing compound to clean off the rust, followed by a coating of wax (do not apply wax to hot parts, such as exhaust pipes).
- Never use steel wool when cleaning stainless steel because minute particles of the steel wool can embed in the surface of the stainless steel and cause rust staining.

Cleaning, Protecting and Weather Stripping

Frequent washings of the vehicle are required to remove grime and contaminants that can stain and oxidize paint and accelerate corrosion of plated and polished metal surfaces.

Waxing offers added protection against staining and oxidation. But to allow enough time for your truck's finish to cure, wait about 30 days after the date of manufacture before waxing. Do not apply wax in the hot sun and do not friction burn the paint with a buffing machine.

Occasionally spray weather-stripping on doors and windows with silicone compound to help preserve resiliency. This is especially useful in freezing weather to prevent doors and windows from sticking shut with ice.

Vehicle Cleaning

Precautions



WARNING: Handle cleaning agents carefully. Cleaning agents may be poisonous. Keep them out of the reach of children.

- Observe all caution labels.
 - Always read directions on the container before using any product.
 - Do not use any solution that can damage the body paint.
 - Most chemical cleaners are concentrates which require dilution.
 - Only use spot removing fluids in well ventilated areas.
 - Do not use gasoline, kerosene, naphtha, nail polish remover or other volatile cleaning fluids. They may be toxic, flammable or hazardous in other ways.
- Do not clean the underside of chassis, fenders wheel covers, etc. without protecting your hands and arms. You may cut yourself on sharp-edged metal parts.
 - Moisture, ice, and road salt on brakes may affect braking efficiency. Test the brakes carefully after each vehicle wash.
 - Any vehicle is subjected to deterioration from industrial fumes, ice, snow, corrosive road salt, etc., to name just a few causes. A well-cared-for vehicle can look like new many years later. Regular and correct care will contribute to maintaining the beauty and the value of your vehicle.

Your Kenworth Dealer has a number of vehicle-care products and can advise you on which ones to use for cleaning the exterior and interior of your vehicle.



CAUTION: Do not aim the water jet directly at door locks or latch. Tape the key holes to prevent water from seeping into the lock cylinders. Water in lock cylinders should be removed with compressed air. To prevent locks from freezing in the winter, squirt glycerin or lock deicer into the lock cylinders.

Washing the Exterior

1. Begin by spraying water over the dry surface to remove all loose dirt before applying the car wash and wax solution.

Do not wash the vehicle in direct sunshine.

Do not spray water directly into the cab/sleeper vents.

2. Using soapy water, wash the vehicle with a clean soft cloth or a soft brush made for automotive cleaning.

Use cool or warm water and a mild, household type soap. Strong industrial detergents and cleaning agents are not recommended.

Do not use stiff brushes, paper towels, steel wool, or abrasive cleaning compounds because they will scratch painted, plated, and polished metal surfaces.

3. Rinse surfaces frequently while washing to flush away dirt that

might scratch the finishes during the washing operation.

4. Wipe everything dry with a chamois to avoid water spots.
To prevent water spotting, dry off the cosmetic surfaces with a clean cloth or chamois.
5. Remove road tar with an automotive type tar remover or mineral spirits.
6. After cleaning and drying, apply a quality automotive wax.



NOTE: To allow enough time for your truck's finish to cure, wait at least thirty days after the date of manufacture before waxing.

- Do not apply wax in the hot sun.
- Never dust off dry surfaces with a cloth because it will scratch the finishes.

Cleaning the Chassis

- Hose dirt and grime from the entire chassis. Then, if an oil leak develops, you will be able to detect it easier.
- Corrosive materials used for ice and snow removal and dust control can collect on the underbody. If these materials are not removed, accelerated corrosion (rust) can occur on underbody parts such as fuel lines, frames, floor pan, and exhaust system, even though they have been provided with corrosion protection.

At least every spring, flush these materials from the under body with plain water. Be sure to clean any area where mud and other debris can collect. Sediment packed in closed areas of the frame should be loosened before being flushed. If desired, your Kenworth Dealer can do this service for you.

Cleaning Interior Vinyl and Upholstery

- Wipe vinyl upholstery and lining with a good commercial upholstery cleaner. Do not use acetone or lacquer thinner.
- Clean fabric upholstery with upholstery shampoo specially formulated for this purpose. Follow instructions on the container.

Safety Restraint System - Inspection

The seat belt system, including webbing, buckles, latches, and mounting hardware, endures heavy use in heavy-duty vehicles, much more than seat belt systems in passenger cars. All users should be aware of the factors contributing to this heavy use and reduced belt life.



WARNING: Failure to properly inspect and maintain restraint systems can lead to injury or loss of life. Without periodic inspection and maintenance to detect unsafe conditions, seat restraint components can wear out or not protect you in an accident.

Factors contributing to reduced seat belt life:

- High mileage heavy trucks, often accumulate mileage in excess of

500,000 total miles (800,000 km) during the vehicle lifetime. This is much greater than a typical passenger car, which frequently will not exceed 125,000 total miles (200,000 km).

- Seat and cab movement in trucks, there is almost constant movement of the belt due to ride characteristics and seat design. The constant movement of the belt inside the restraint hardware and the potential for the belt to come in contact with the cab and other vehicle parts, contributes to the wear of the entire system.
- Environmental conditions, such as dirt and ultraviolet rays from the sun, will reduce the life of the seat belt system.

Due to these factors, the three-point safety belt system installed in your vehicle requires thorough inspection every 20,000 miles (32,000 km). If the vehicle is exposed to severe

environmental or working conditions, more frequent inspections may be necessary.

Any seat belt system that shows cuts, fraying, extreme or unusual wear, significant discoloration due to UV (ultraviolet) exposure, abrasion to the seat belt webbing, or damage to the buckle, latch plate, retractor hardware or any other obvious problem should be replaced immediately, regardless of mileage.



WARNING: It is important to remember that any time a vehicle is involved in an accident, the entire seat belt system must be replaced. Unexposed damage caused by the stress of an accident could prevent the system from functioning properly the next time it is needed. Failure to comply may result in personal injury or death.

Inspection Guidelines

Follow these guidelines when inspecting for cuts, fraying, extreme or unusual wear of the webbing, and damage to the buckle, retractor, hardware, or other factors. Damage to these areas indicates that belt system replacement is necessary.



WARNING: Replace the entire belt system (retractor and buckle side) if replacement of any one part is necessary. Unexposed damage to one or more components could prevent the system from functioning properly the next time it is needed. Failure to comply may result in personal injury or death.

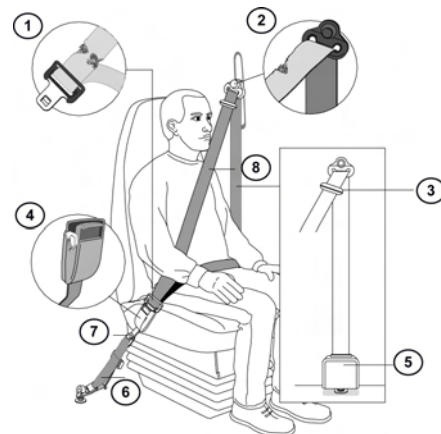
1. Check the web wear in the system. The webbing must be closely examined to determine if it is coming into contact with any sharp or rough surfaces on the seat or

other parts of the cab interior. These areas are typical places where the web will experience cutting or abrasion. Cuts, fraying, or excessive wear would indicate the need for replacement of the seat belt system.

2. The pillar web guide (D-loop) is the area where almost constant movement of the seat belt webbing occurs because of relative movement between the seat and cab.
3. Check the Comfort Clip (Not on T2000) for cracks or possible damage and check for proper operation.
4. Check buckle and latch for proper operation and to determine if latch plate is worn, deformed, or damaged.
5. Inspect the retractor web storage device, which is mounted on the floor of the vehicle, for damage. The retractor is the heart of the

occupant restraint system and can often be damaged if abused, even unintentionally. Check operation to ensure that it is not locked up and that it spools out and retracts webbing properly.

6. If tethers are used, be sure they are properly attached to the seat and, if adjustable, that they are adjusted in accordance with installation instructions. Tethers must also be inspected for web wear and proper tightness of mounting hardware.
7. Mounting hardware should be evaluated for corrosion, and for tightness of bolts and nuts.
8. Check web in areas exposed to ultraviolet rays from the sun. If the color of the web in these areas is gray to light brown, the physical strength of the web may have deteriorated due to exposure to the sun's ultraviolet rays. Replace the system.



Seat Belt Inspection Points

- 1 Web cut or frayed or extremely worn at latch area.
- 2 Web cut or frayed at D-loop web guide.
- 3 Comfort Clip (except T2000) cracked or damaged.
- 4 Buckle casting broken.

- 5 Retractor Web Storage for damage. (located behind trim panel)
- 6 Tethers for web wear and proper tightness of mounting hardware.
- 7 Mounting hardware for corrosion, proper tightness of bolts and nuts.
- 8 Web for deterioration, due to exposure to the sun



WARNING: Failure to adjust tether belts properly can cause excessive movement of the seat in an accident. Tether belts should be adjusted so that they are taut when the seat is in its most upward and forward position. Failure to comply may result in personal injury or death.

Once the need for replacement of the seat belt has been determined, be certain it is only replaced with

an authorized PACCAR Parts replacement seat belt.

If the inspection indicates that any part of the seat belt system requires replacement, the entire system must be replaced. An installation guide is attached to every replacement belt. Utilize the proper guide for your type of seat, and follow the instructions very closely. It is vitally important that all components be reinstalled in the same position as the original components that were removed and that the fasteners be torqued to specification. This will maintain the design integrity of the mounting points for the seat belt assembly. Contact your Authorized Kenworth Dealer if you have any questions concerning seat belt replacement.

Windshield Wiper/Washer

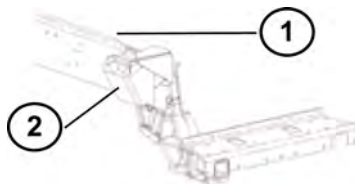
The windshield wiper system is maintenance free. Check wiper blades annually or every 60,000 miles (96,000 km). Anco wiper blades are recommended. See [Windshield Wipers/Washer on page 3-72](#), for more information.

Washer Reservoir



WARNING: Do not use antifreeze or engine coolant in the windshield washer reservoir, damage to seals and other components will result.

Daily: check reservoir water level, located in the engine compartment near the radiator on the right hand side. If necessary, refill to the proper level.



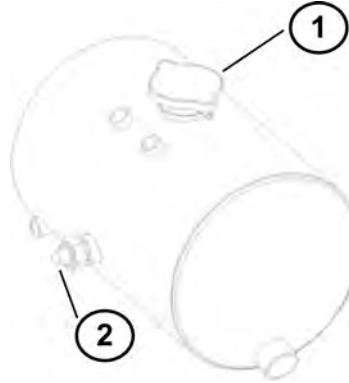
Washer Reservoir

- 1 Right Frame Rail
- 2 Washer Reservoir

COOLING SYSTEM

Introduction

Kenworth Trucks are standard with Air-to-Air cooling systems. These cooling systems incorporate a radiator to cool engine jacket water, a Charge Air Cooler to cool turbo-charged engine intake air, and a refrigerant condenser to provide cab air conditioning.



Cooling System Expansion Tank

- | | |
|---|---------------------------|
| 1 | Fill |
| 2 | Coolant Level Sight Gauge |

Table 13 Cooling System Maintenance and Schedule

DAILY or as REQUIRED	15,000 MILES (24,000 km)	SPRING and FALL (BIANNUAL)
With the engine off and temperature cool:  WARNING: Do not remove the radiator cap on a hot engine. It can cause scalding coolant to spray out and you could be burned. If the engine has been operated within the last 30 minutes, be very careful in removing the radiator cap. 1. Inspect coolant level. 2. Inspect fan belts and condition of coolant hoses. 3. Inspect for coolant leaks at the following locations with the engine running.  WARNING: Do not work on the fan with the engine running. The engine fan can engage at any time without warning. Anyone near the fan when it turns on could be injured. Before turning on the ignition be sure that no one is near the fan. a. Heater and radiator hoses. b. Radiator tanks and core. c. Water pump input shaft (at pulley).	With the engine off and temperature cool: 1. Check and adjust fan belt tension. 2. Check antifreeze concentration and coolant level. 3. Recharge coolant conditioner, if necessary. 4. Inspect coolant hoses and hose clamps for tightness. 5. Check for secure radiator supports and brackets. 6. Clean debris from heat exchanger core fins and radiator/Charge Air Cooler/condenser cores.	Clean Cooling System. 1. Inspect and replace spongy or deteriorated coolant hoses. 2. Inspect and replace worn or deteriorated fan belts.
 NOTE: If Long Life Coolant (LLC) antifreeze is used, recharge at 150,000 miles/241,000 km; replace at 300,000 miles/483,000 km. Be sure different types of coolant are not mixed. Stay with the same coolant until a complete Replacement is performed.		

Topping Up

Check the coolant level after each trip when the engine has cooled. The coolant level should be visible within the sight gauge (glass level indicator) on the surge tank. Add coolant as necessary (see [Adding Coolant on page 5-64](#)).

With the engine cold, top up with premixed coolant. Add the coolant through the pressure cap neck on the surge tank. The surge tank is located on the firewall, right side.

With the engine cold, the coolant level should be at the full cold coolant level. Use caution not to overfill the system with coolant. An overfilled cooling system will cause loss of coolant through the radiator cap as the coolant expands during heating. Replacement or makeup coolant should have the same antifreeze concentration and corrosion inhibitor content as

the original coolant in the cooling system. Never add 100% antifreeze to the cooling system. Always dilute anti-freeze to the correct concentration based on freeze protection prior to adding it to the cooling system. Adding or using 100% antifreeze in a cooling system may result in cooling system plugging and overheating problems.



NOTE: If frequent topping up is necessary and there are not visible signs of coolant leaks when the engine is cold, check for leaks with the engine operating at normal operating temperature.



WARNING: Do not remove the radiator cap on a hot engine. It can cause scalding coolant to spray out and you could be burned. If the engine has been operated within the last 30 minutes, be very careful in removing the radiator cap.

- **Protect face, hands, and arms against escaping fluid and steam by covering the cap with a large, thick rag.**
- Carefully and slowly turn cap (on expansion surge tank) one quarter of a turn to allow excess pressure to escape before completely removing cap. If you see any steam or coolant escaping, do not even try to remove it until the radiator cools down. If you see nothing escaping, still remove the cap very slowly and carefully. Be ready to back off if any steam or coolant begins to escape.



WARNING: Handle coolant and antifreeze carefully. Ethylene glycol antifreeze is poisonous. Store in original fluid container only, and always keep out of reach of children.

- **Also, never remove the cap on the surge tank**

while the engine is still hot. Wait until the coolant temperature is below 120° F (50° C). Scalding steam and fluid under pressure may escape and cause personal injuries.



WARNING: *Do not work on the fan with the engine running. The engine fan can engage at any time without warning. Anyone near the fan when it turns on could be injured. Before turning on the ignition, be sure that no one is near the fan.*

Adding Coolant

A mixture of water and low silicate antifreeze should be used for coolant. Water must be clean and free of corrosive and scale-forming chemicals. Drinking water may not be good for your vehicle. New vehicles come premixed with antifreeze and corrosion inhibitor. Be sure different types of coolant are not mixed. Stay with the same coolant until a complete Replacement is performed.



NOTE: *Excess coolant may result in overflow, loss of antifreeze, and reduced corrosion protection. For a cold engine, the proper coolant level is 1 in. below the radiator cap seal. For normal operating temperatures, coolant should be even with the radiator cap seal.*

Coolant Conditioner

A variety of test methods are available for measuring coolant conditioner levels. Test strips provide convenient and consistent results with minimal training. Other test methods can be used when appropriate training is provided. The actual test (i.e. test strips, etc.) and coolant conditioner maintenance schedule should be done in accordance with the actual coolant conditioner manufacturer recommendations.

The coolant conditioner should be recharged according to Table 6, [Recommended Lubrication Intervals on page 5-11](#), unless otherwise specified in the Engine Manufacturers Maintenance Manual. See the Kenworth Shop Manual for more information.

Antifreeze Mixture

The maximum efficient Low Silicate Ethylene Glycol antifreeze concentration for extended low temperature operation is 68% glycol by volume. Exceeding this 68% limit reduces freeze protection. Table 14, (Antifreeze Protection - Ethylene Glycol) shows the temperature protection provided by low silicate ethylene glycol antifreeze in relation to the proportion mixed with water. Note that 100% antifreeze is no more effective than a 30% mixture.

Refer to Table 14, (Antifreeze Protection - Ethylene Glycol) for specific antifreeze freeze point protection. To avoid possible overheating in hot weather, do not use Low Silicate Antifreeze concentrations greater than 50% glycol by volume unless freeze protection below -34° F (-36° C) is also required.



NOTE: Avoid using a hydrometer for measuring freeze point. Hydrometers have poor accuracy. Use a Glycol Refractometer for checking antifreeze protection.

A 50/50 mixture (50% water and 50% low silicate antifreeze) is best for year-round normal operation. This will normally protect your engine from freezing and boil-over.

Table 14 Antifreeze Protection - Ethylene Glycol

ETHYLENE GLYCOL ANTIFREEZE % by VOLUME	TEMPERATURE PROTECTION	
	°C	°F
0	0	32
10	-4	24
20	-9	16
30	-15	4
40	-24	-12
50	-36	-34
60	-47	-63
68	-68	-92

ETHYLENE GLYCOL ANTIFREEZE % by VOLUME	TEMPERATURE PROTECTION	
	°C	°F
70	-65	-85
80	-49	-57
90	-35	-31
100	-35	4

Always use low silicate antifreeze with water. Premix the coolant to maintain the correct proportion of antifreeze and water. This will ensure the right mixture of coolant conditioner chemicals. Install only enough low silicate antifreeze to provide the required protection against freezing.



NOTE: If Long Life Coolant (LLC) antifreeze is used, recharge at 150,000 miles/241,000 km.; replace at 300,000 miles/483,000 km.

- Be sure different types of coolant are not mixed. Stay with the same coolant until a complete Replacement is performed.



CAUTION: Never install 100% antifreeze for top-up coolant. Failure to comply may result in equipment damage. The maximum efficient Low Silicate Ethylene Glycol antifreeze concentration for extended low temperature operation is 68% glycol by volume. Exceeding this 68% limit reduces freeze protection.

In an emergency, if the radiator becomes filled with water known to contain gypsum, sulfur, or chlorine, follow the below procedure:

- Drain the cooling system as soon as possible
- Flush the system
- Replace the filters
- Refill with premixed coolant. Consult the Kenworth Shop Manual for the correct filters to install.

Additives

If you add supplemental coolant additives to the radiator, maintain them at the recommended levels. Read the label carefully. Too much additive could harm your vehicle.

Approved additives help neutralize the water's harmful effects on your vehicle's cooling system. Ask your dealer to recommend the best ones for you.

- Do not add rust inhibitors, radiator sealants, or water pump lubricants containing soluble oil to the coolant. These additives can cause the anti-corrosion chemicals not to work.
- If the cooling system in your truck has a treated spin-on water filter, install the service filter on all B or E scheduled service intervals. See [Table 15, Maintenance Schedule on page 5-17](#). For more detailed recommendations check with your

Kenworth Dealer or check the manufacturer's Engine Operation and Maintenance Manual.

- Antifreeze solutions containing anti-leak additives will quickly restrict the water filter. If this happens, the filter will not work. So stay away from anti-leak additives.



CAUTION: Do not add inhibitor if the engine has a Dry Charge Additive (DCA4) water filter cartridge containing corrosion inhibitor, engine damage from over concentration of silicates may occur.

- The water filter cartridge containing DCA4 inhibitor must be periodically changed. Refer to the Engine Operation and Maintenance Manual for details.



CAUTION: Do not mix inhibitor types. Improper mixing of coolant may damage the engine.

- For coolant conditioner recharge intervals see the Engine Operation and Maintenance Manual or the Kenworth Shop Manual.

Change and Refilling

The coolant must be changed periodically. When draining coolant, capture old coolant and dispose of it properly.

Refilling

To refill the cooling system, follow the recommendations below:

1. Before refilling be sure the radiator and engine block drains are closed.
2. Move the heater control to maximum heat position.
3. Remove the surge tank pressure cap.
4. Through the surge tank, fill the system with premixed coolant. Pour it in a steady flow until the radiator is full.
5. Start the engine and idle it at low RPM.
6. Complete the filling as quickly as possible. Idle the engine until it reaches normal operating temperature.
7. Fill the radiator as necessary to raise the coolant level to the proper level.

8. Replace the surge tank pressure cap.

You may find the coolant level is not up to the correct level soon after you have filled the radiator. This may be because all the trapped air in the system has not yet been purged. It takes a little time for all the air to leave the system after you fill the radiator.

For further details on coolant, coolant capacities, water filters, and antifreeze mixture see the Engine Operation and Maintenance Manual (supplied with the vehicle) and the Kenworth Shop Manual.

Radiator Cap



CAUTION: When replacing the radiator cap always use one with the correct rated pressure. Failure to do so could cause engine or cooling system damage.

All radiator caps are marked with the rated pressure (psi) of the cap.

Engine (Block) Heater



WARNING: Do not use the heater if there are any signs of problems. Engine block heaters can cause fires resulting in personal injury, death, equipment or property damage if not properly maintained and operated. Regularly inspect the engine block heater wiring and connector for damaged or frayed wires. Contact your authorized Kenworth Dealer or the manufacturer of the heater if you are in need of repairs or information. Failure to comply may result in personal injury, death, equipment or property damage.



CAUTION: Always unplug the block heater before starting your engine. Damage to the

***cooling system could occur if
not turned OFF (unplugged).***

Use a solution of half ethylene glycol antifreeze and half water for best heater performance. Do not use more than 65 percent concentration of antifreeze, as a shortened heater life will result.

After servicing the cooling system, operate the vehicle for a day or two before using the heater. Trapped air inside the engine needs time to escape.

ELECTRICAL

Electrical System



WARNING: *Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.*



CAUTION: *Do not modify or improperly repair the vehicles electrical system or power distribution box. All electrical repairs should be performed by an authorized Kenworth dealer. Improper repair or modifications will void your warranty and/or cause serious damage to your vehicle.*

Fuses And Relays

Fuses and relays are located in the Central Electrical Panel, between the Air Conditioner ducts, and the following:

- Mega Fuse (150A for cab power): in battery box
- Mini Fuse (for engine and electronic transmission): in battery box
- Starter Relay: on the starter
- Fuses and Relays: in the Central Electrical Panel, between the Air Conditioner ducts, and the following:

Fuse Inspection And Replacement



WARNING: *Do not replace a fuse with a fuse of a higher rating. Doing so may damage the electrical system and cause a fire. Failure to comply may result in personal injury, death, equipment or property damage.*



CAUTION: *Before replacing a fuse, turn OFF all lights and accessories and remove the ignition key to avoid damaging the electrical system.*



CAUTION: *Never patch fuses with tin foil or wire. This may cause serious damage elsewhere in the electrical circuit, and it may cause a fire.*



CAUTION: *If a circuit keeps blowing fuses, have the electrical system inspected for a short circuit or overload by an authorized Kenworth dealer as soon as possible. Failure to do so could cause serious damage to the electrical system and/or vehicle.*



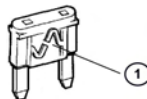
NOTE: *If a fuse of the same rating is not available, a fuse of a lower rating may be temporarily substituted. You can also use a fuse from a circuit you can do temporarily without (for example an accessory circuit or radio).*

See the Kenworth Shop Manual for instructions on fuse replacement.

All the electrical circuits have fuses to protect them from a short circuit or overload. If something electrical on your chassis stops working, the first

thing you should check for is a blown fuse.

1. Turn OFF all lights and accessories and remove the ignition key to avoid damaging the electrical system.
2. Determine from the chart on the fuse panel which fuse controls that component.
3. Remove that fuse and see if it is blown.



If it is blown, replace it with a fuse of the same rating.

1 Blown

Adding Electrical Options



WARNING: *Do not add a fuse with a rating higher than 30 amps. Doing so may damage the electrical system and cause a fire. Failure to comply may result in personal injury, death, equipment or property damage.*



CAUTION: *Follow all manufacturers' circuit protection recommendations for the components and wires being added. Failure to comply may result in equipment damage.*



NOTE: *If you are unfamiliar with proper electrical repair practices and procedures, see your authorized Kenworth dealer for assistance.*

Ten spare circuits are located on the CEP: 3 spare battery circuits, 4 spare

accessory circuits, and 3 spare ignition circuits. Each is a dedicated spare with it's own Mini or Maxi fuse.



NOTE: Easy addition of circuits is provided by plug-in connectors that have a ground and a power wire.

For proper electrical system performance, refer to a wiring diagram for your chassis before adding electrical options.

Central Electric Panel

Description

The Central Electric Panel (CEP) is the power distribution system for the entire vehicle **except the engine and, if equipped, the electronic transmission**. Access to the CEP is gained by lifting out the glove compartment.



NOTE: The light that illuminates the glove compartment also illuminates the CEP for ease of service.



The Central Electrical Panel is below the glove compartment. For details

of fuse and relay positions, a chart is provided on the inside of the panel cover.



NOTE: The CEP consists of fuse modules that accept 2-way connectors, which act as power points for possible future harnesses and for dealer add-ins.

Batteries

Battery Access

The vehicle is originally equipped with three or four batteries. Replacement batteries must meet the following specifications: maintenance-free, group 31 size, threaded stud, 12V/ 650 cold cranking ampere (CCA), and 160 minutes of reserve capacity.

The battery compartment is located on the left side of the vehicle, under the cab access steps.

1. Remove steps by removing 2 bolts from each step.
2. Remove 4 bolts and washers from forward fairing.
3. Remove 2 bolts (A) from step strut.
4. Remove battery cover for access.

Replacing Parts Removed for Access

1. Replace battery cover.
2. Install 2 bolts in step strut. Torque to 24-32 lb-ft (33-43 Nm).
3. Install fairing and install 4 bolts. Torque to 6-7 lb-ft (8-9 Nm).
4. Install steps by installing 2 bolts in each step. Torque to 24-32 lb-ft (33-43 Nm).



WARNING: Always reinstall the steps before entering the cab. Without the steps you could slip and fall, resulting in possible injury to yourself.

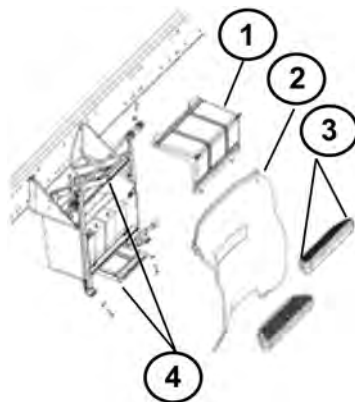


WARNING: Fairings not installed properly could come loose and cause other motorists to have an injury accident. It is important that fairings be installed properly. Failure to comply may result in personal injury,



death, equipment or property damage.

WARNING: Before attempting any work on the batteries or electrical system, remove all jewelry. If metal jewelry or other metal comes in contact with electrical circuits, a short circuit may occur causing you to be injured, as well as electrical system failure and damage.



Battery Access Assembly

5

- 1 Battery Cover
- 2 Forward Fairing
- 3 Step Bolts (4)
- 4 Captured Nuts (4) on Step Struts

Removing and Installing Batteries:

1. Be sure all switches on the vehicle are turned OFF.
2. Disconnect negative ground cable first.
3. Disconnect positive cable.
4. Unscrew bolt of holding plate with open end wrench.

2. Reconnect positive cable.
3. Reconnect ground (negative) ground cable.

i *NOTE: Always dispose of automotive batteries in a safe and responsible manner. Contact your authorized Kenworth dealer for disposal standards. Call your local authorized recycling center for information on recycling automotive batteries.*

Follow the procedure below to reinstall batteries on the vehicle:

i *NOTE: Make sure to reconnect the ground (negative) cable last.*

1. Place batteries in vehicle and tighten bolt of holding plate.

Battery Care

Regular attention to the charging system will help prolong the service life of the batteries. Here are some common causes of battery failure:

Overcharge: this condition results from improper voltage regulator adjustment. It results in overheating of the battery, warped plates, and evaporation of electrolyte.

Undercharge: the voltage regulator is malfunctioning, the drive belt is slipping, or your vehicle has undergone long periods of standing idle or short distance driving. These conditions result in battery plates becoming covered with a hard coating.

Vibration: loose battery hold-downs may cause battery plate failure.

Short Circuits: these discharge the battery by draining electricity.

Dirty or Loose Connections:

improper connections may stop the flow of electrical power to and from the battery.

Battery Charging

Except for using small trickle charges (as explained in [Slow Battery Charging on page 5-75](#)) to maintain battery condition, you should have your vehicle's batteries charged by a qualified service facility.



WARNING: Batteries can injure you severely. They contain acid, produce poisonous and explosive gases, and supply levels of electric current high enough to cause burns. A spark or flame near a battery on charge may cause it to explode with great force. Never remove or tamper with the battery caps. Failure to comply may result in personal injury, death, equipment or property damage.

To help reduce the risk of personal injuries, follow these guidelines carefully when recharging a battery:

- Before attempting any service in the electrical installation, disconnect the battery negative cable.
- Allow no sparks or open flame anywhere near the charging area.
- Charge a battery only in a well-ventilated area, such as outdoors or in a fully open garage which contains no pilot lights or other flames. Gases generated during the charging process must be allowed to escape.
- Always make sure the battery charger is OFF before connecting or disconnecting the cable clamps.
- To avoid short circuits, damage to the vehicle, or personal injury, never place metal tools or jumper cables on the battery or nearby. Metal that accidentally comes in contact with the positive battery

terminal or any other metal on the vehicle (that is in contact with the positive terminal), could cause a short circuit or an explosion.

Charging Reminders

- Use protective eyewear.
- Keep all batteries away from children.
- Never reverse battery poles.
- Never attempt to place the vehicle in motion, or run the engine with batteries disconnected.
- Keep the battery clean and dry.
- Look for any signs of damage.
- Battery terminals should not be coated with improper grease. Use petroleum jelly or commercially available, noncorrosive, nonconductive terminal coatings.
- Never use a fast charger as a booster to start the engine. This can seriously damage sensitive electronic components such as relays, radio, etc., as well as the battery charger. Fast charging a battery is dangerous and should only be attempted by

a competent mechanic with the proper equipment.

Slow Battery Charging



NOTE: Follow the instructions that come with your battery charger.

- It is not necessary to remove the battery from the compartment.



WARNING: Charger cables must be connected positive to positive (+ to +) and negative to negative (- to -). If connected improperly, batteries could explode. Failure to comply may result in personal injury, death, equipment or property damage.

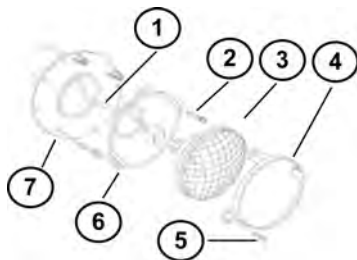
- Always make sure the battery charger is OFF before connecting or disconnecting the cable clamps. To reduce the danger of explosions and resulting personal injury, do not connect or disconnect charger

cables while the charger is operating.

1. Disconnect the battery cables.
2. Connect charger cables.
3. Start charging the battery at a rate not over 6 amperes. Normally, a battery should be charged at no more than 10 percent of its rated capacity.
4. After charging, turn OFF charger and disconnect charger cables.

Headlight Replacement

Follow the steps below to remove the headlight from the lamp assembly:



Headlight Assembly

- 1 Cable Assembly
- 2 Aiming Screws
- 3 Light Bulb
- 4 Retaining Ring
- 5 Screws (3)
- 6 Nest
- 7 Housing

1. Remove retaining ring screws (3) and retaining ring.
2. Remove bulb from assembly and disconnect wiring harness.

3. Reconnect wiring harness to replacement bulb.
4. Place bulb back in nest, insuring that the bulb is seated correctly.
5. Remount retaining ring and screws.

Electrical and Alternator Precautions

Take the following precautions to avoid burning out alternator diodes:

- Do not start the engine with alternator disconnected (connections removed) from the circuit.
- Before welding, disconnect all electronic connections to the vehicle batteries.
- Remove battery power cable and insulate it from the vehicle.
- Do not run the engine with the batteries disconnected.
- Do not disconnect the battery cables or alternator connection cables with the engine running.
- Never turn the ignition switch from the ON position to the START position with the engine running.
- When charging the battery (installed in the vehicle) disconnect the battery cables.

- Do not reverse the cables of the alternator, starter motor, or battery.
- Do not polarize the alternator. The alternator should not be polarized like a generator. To ensure correct polarity, use a test lamp or a voltmeter.

Remote Keyless Entry Programming

Programming

The system is pre-programmed but may need to be reprogrammed if a key fob or receiver is replaced.

To program RKE system

1. Locate all key fobs that you wish to program to the truck (maximum of 4).
2. Remove the rear cover of each key fob for 30 seconds.
3. Reinstall the cover.
4. Remove the glove box.
5. Connect the programming jumper to place the system in the programming mode.
6. Hold the key fob near the receiver.
7. Press and hold both the Lock and Unlock buttons at the same time for approximately 13 seconds.
8. Repeat Steps 6 and 7 above for the remaining key fobs.

9. Disconnect the jumper when all key fobs are programmed.
10. Reinstall the glove box.

Jumper



NOTE: The jumper is located inside the glove box cutout, on the left side near the firewall and RKE receiver. Upon connection of the jumper, the RKE system will indicate that it is in a programming mode by locking and then unlocking the doors. All previously stored key fob programming will be erased.

Troubleshooting

Refer to the table that follows.
Match the Symptoms on the chart to
determine a possible Cause.

Example: If the Lock function doesn't
work on the key fob or the switch,
the possible cause is that relay B has
failed.

Contact your Kenworth dealer for
further information.

Symptoms							
Fob				Switch			
Number of fobs that work				Y = works N = doesn't work			
Lock	Unlock Pass	Unlock Driver	Marker Light	Lock	Unlock Pass	Unlock Driver	Cause
0	0	0	0	N	N	N	Fuse
0	0	0	0	N	N	N	Connection at IP and relay harnesses
0	0	0	0	Y	Y	N	Connection at receiver
0	0	0	0	Y	Y	N	Receiver failed
0	0	0	0	Y	Y	Y	Receiver failed
0	0	0	0	Y	Y	Y	System not programmed
0	0	0	0	Y	Y	Y	System left in program mode
0	0	0	0	Y	Y	Y	Interference from other RF sources
1	1	1	1	Y	Y	Y	Fob/Transmitter failed
1	1	1	1	Y	Y	Y	Fob/Transmitter battery dead
1	1	1	1	Y	Y	Y	Fob/Transmitter lost sync
1	1	1	1	Y	Y	Y	Fob/ Transmitter not programmed
0	0	0	2	N	N	N	All relays missing on relay harness
2	2	2	2	N	Y	Y	Relay A missing/failed
0	0	0	2	N	N	N	Relay B missing
0	2	2	2	N	Y	Y	Relay B failed

Symptoms							
Fob				Switch			
Number of fobs that work				Y = works N = doesn't work			
Lock	Unlock Pass	Unlock Driver	Marker Light	Lock	Unlock Pass	Unlock Driver	Cause
2	2	2	2	Y	N	N	Relay C missing/failed
0	0	0	2	N	N	N	Relay D missing
2	0	2	2	Y	N	Y	Relay D failed
2	2	2	0	Y	Y	Y	Connection at adapter and relay harnesses
2	2	2	0	Y	Y	Y	Connection at fog light switch

ENGINE

ENGINE

Engine Maintenance



WARNING: Exhaust fumes from the engine contain carbon monoxide, a colorless and odorless gas. Do not breathe the engine exhaust gas. A poorly maintained, damaged or corroded exhaust system can allow carbon monoxide to enter the cab or sleeper. Entry of carbon monoxide into the cab is also possible from other vehicles nearby. Failure to properly maintain your vehicle could cause carbon monoxide to enter the cab/sleeper and cause illness or death.



WARNING: Never idle your vehicle for prolonged periods of time if you sense that exhaust fumes are entering

the cab or sleeper. Investigate the cause of the fumes and correct it as soon as possible. If the vehicle must be driven under these conditions, drive only with the windows open. Failure to repair the source of the exhaust fumes may result in personal injury, death, equipment or property damage.



NOTE: Keep the engine exhaust system and the vehicles cab/sleeper ventilation system properly maintained. It is recommended that the vehicles exhaust system and cab/sleeper be inspected:

- By a competent technician every 15,000 miles
- Whenever a change is noticed in the sound of the exhaust system

- Whenever the exhaust system, underbody, cab or sleeper is damaged

Engine Lubrication

Refer to the engine manufacturer's Engine Operation and Maintenance Manual supplied with your vehicle for information about draining and refilling engine oil, engine crank case capacity, engine oil type, and changing oil filters, etc.



WARNING: Hot engine oil can be dangerous. You could be burned. Let the engine oil cool down before changing it.

Oil Level Check

- To check the engine oil level, park the vehicle on level ground and wait 5 minutes after shutting the engine OFF. This allows time for the oil to drain to the oil pan.
- Remove the dipstick and wipe it off with a clean, lint-free rag.
- Reinsert the dipstick all the way in and pull it out again to check oil level. Correct oil level is between the low (L) and high (H) marks on the dipstick.

Pipe and Hose Clamps

Use the following table for torque specifications to check pipe and hose clamps.

Table 15 Pipe and Hose Clamp Torque Values

APPLICATION	APPROVED CLAMP	TORQUE	
		Nm	ln. - lb.
Radiator & Heat Exchanger Hoses	Constant-Torque CT-L	10.2-12.5	90-110
Heater Hoses	Constant Tension	not required	not required
Air Intake Pipes	Hi-Torque HTM-L	11.3-14.2	100-125
Plastic Air Intake Pipes	Constant- Torque CT-L	4.5	40 (maximum)
Charge Air Intake Hoses	Flex Seal 667	7.9-11.3	70-100
	B9296	6-7	50-60
Fuel, Oil & Water Heat Exchangers (for hoses less than 9/16 diameter)	Miniature 3600L	1.1-1.7	10-15

Fuel System

Please follow these recommendations when you are changing your fuel filters or strainer elements. Your vehicle's engine will run better and last longer if you do. See the engine manufacturer's recommendations for proper water and micron requirements.

Installing Fuel Filters

When removing filters, cover any electrical equipment and wiring that might get soaked with fuel. Diesel fuel may permanently damage electrical insulation.

When installing spin-on (throwaway) filters:

1. Pre-fill filter with fuel.
2. Moisten gasket with diesel fuel
3. Hand tighten them only to 1/2 - 2/3 turn after gasket contact.

Mechanical tightening of these filters may distort or crack the filter head.

- When replacing a fuel filter element, do not use a substitute. Install only filter elements designed for fuel filtration. First clean and inspect the shell. Then insert the new element and fill the container at least 2/3 full of clean fuel before installing the shell.



NOTE: To expel air from density-type strainer elements, soak them in clean fuel before installing them.

- Throw away old gaskets. Replace them with new ones to ensure a positive seal.
- Position the shell and gasket properly. Then tighten the cover nut or bolt just enough to prevent fuel leakage.
- After starting the engine, check for leaks around the filter.

Filter Draining

1. Check fuel filter/water separator daily. Check with engine OFF. Depending on the fuel storage facility, more frequent draining may be required.
2. Open drain valve (by hand only): turn valve screw counter clockwise approximately 1- to 2 turns until draining occurs. Drain filter sump of water until clear fuel is visible.
3. If entrapped water exceeds sump volume, you can either:
4. Close valve and run engine until smooth idle is established, then repeat drain procedures.
5. Remove filter from mounting head, completely drain all fluid, and reassemble filter assembly. Be sure to follow new filter assembly instructions.
6. Close drain valve by turning valve screw clockwise approximately 1- to 2 turns.



CAUTION: Do not overtighten the valve. Over tightening can damage the threads.

Belt Installation

Follow the instructions below to install an accessory drive belt:

1. Loosen the pulley bracket(s) and shorten the distance between the pulley centers. Install the new belt without forcing it. Do not roll or pry the belt over the pulley.
2. Check the pulley alignment and adjustment if necessary. Pulley misalignment must not be more than 1/16 in. (1.5 mm) for each 12 in. (300 mm) of belt free span. Belt free span is measured between pulley centers.
3. Check the riding depth. Belt riding depth should not vary more than 1/16 in. (1.5 mm) on matched belt sets.
4. Check that the belt does not ride on the bottom of the pulley groove, and that the outside edge of the belt does not stick out more than

1/16 in. (1.5 mm) beyond the outside edge of the pulley.

For details on adjusting belt tension see the Engine Operation and Maintenance Manual included with your Kenworth T2000.

Accessory Drive Belts

You can extend the reliability and service life of your vehicle's drive belts with proper attention to installation, adjustment, and maintenance. Neglect could cause belt failure. The result could be the loss of the electrical or air system as well as possible engine damage from overheating. So, it is a good idea to check the belts frequently and replace them as soon as you detect trouble.

Engine Fan

Thermatic (Clutch) Type Fan



WARNING: Do not work on the fan with the engine running. The engine fan can engage at any time without warning. Anyone near the fan when it turns on could be injured. Before turning on the ignition, be sure that no one is near the fan.

To Check the Fan:

- Check the fan assembly mounting bolts for tightness. Inspect the blades for damage.
- Check the clutch operation by starting the engine when it is cold. Then idle it at about 800 RPM. Listen for air leaks.
- Check that the fan is not working while the engine is warming. When the clutch engages, note the reading on the vehicle's panel

mounted coolant temperature gauge. If the fan clutch engages at low engine temperature or cycles on and off more frequently than it should (receives false signals), have the problem corrected at an authorized Kenworth Dealer.

Fan Drive and Blade

Fan Blade Clearance: Around the fan shroud, the recommended distance is 1 in. (25 mm) from front edge of any fan blade-to-radiator side member. Minimum clearance is 3/4 in. (19 mm).

- Rear edge of any blade must be no closer than 3/8 in. (9 mm) to the nearest engine component. If this cannot be obtained, the fan spacer or fan is not correct.
- The leading edge of any fan blade must be 1 in. (25 mm) from the inside edge of the shroud.

Exhaust System

The exhaust system is part of the noise control system. Periodically check the exhaust for wear and loose or missing parts. For details see [Noise and Emission Control on page 5-101](#).

ENGINE

Diesel Particulate Filters

Your Kenworth is equipped with a diesel particulate filter (DPF) to control emissions and reduce noise. The DPF traps the black diesel particulates (soot) in a filter that normally exit the exhaust system into the environment. As the filter becomes loaded with soot, it becomes more restrictive and requires the Exhaust Regeneration System (ERS) to clean or “regenerate” the DPF. A filter regeneration requires extra air and/or fuel to be injected into the exhaust stream before the DPF to elevate the internal DPF temperature and burn off the soot trapped in the filter. Regeneration length and frequency depend on driving techniques and ambient conditions in which the truck is driven.



WARNING: *The exhaust piping and diesel particulate filter (DPF) becomes extremely hot during engine*

operation and can cause burns to the skin and could ignite clothing. Allow adequate cooling time before working on or near any part of the exhaust system. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: *If your vehicle becomes disabled, the hot exhaust system could ignite dry grass, brush, spilled fuel, or other material that can cause fires. Do not park or operate your vehicle in areas where the hot exhaust system could cause a fire. Keep combustible materials at least 5 feet away from the exhaust tailpipe, piping and sides of the vehicle. Failure to do so could cause a fire, and may result in personal*



injury, death, equipment or property damage.

CAUTION: *This truck is equipped with a diesel particulate filter (DPF) in order to meet both noise and exhaust emission requirements. Removal or tampering with the DPF will reduce engine performance, illuminate a dashboard warning light, and potentially cause serious engine damage. Also, tampering or removing the DPF is against the rules that are established by the U.S. EPA. The DPF may only be replaced with an approved part.*

Operating a Vehicle with DPF Technology

Proper operation, driving techniques and maintenance are key factors in obtaining the maximum service life of the DPF and reducing the frequency of regeneration events. The exhaust system is designed to allow for some "passive" regeneration, requiring no additional fuel or air in certain conditions including high engine load or high ambient temperature. An active regeneration, using fuel or air injected into the exhaust stream, is not always necessary. Frequent active regeneration will decrease fuel mileage and shorten the life of the DPF. Some ways to avoid frequent active regeneration are to avoid excessive idling or extended low-load periods and avoid extremely cold temperatures.



CAUTION: The diesel particulate filter and exhaust pipes are extremely hot

during normal operation. Use caution when routing electrical lines, air hoses, or any piping near the diesel particulate filter.

Allow adequate clearance to prevent melting. Appropriate distances for customer installed components would be:

- ***3 inches, shielded***
- ***8 inches, unshielded***

Failure to meet these requirements may lead to equipment damage or fire.



NOTE: Excessive idling or extended low-load periods produce too little heat to allow passive regeneration.



NOTE: Operating the engine in extremely cold conditions, dissipating heat through the walls of the DPF before passive

regeneration can take place also increases the need for active regenerations.

All Models

Proper operation, driving techniques and maintenance are key factors in obtaining the maximum service life of the muffler and/or converter. Some precautions should be taken if the engine is equipped with a muffler and converter. Avoid excess idling. Excessive idling or extended low load periods can cause the muffler and converter to plug. A plugged muffler and converter will lead to an increase in exhaust back pressure. Operating the engine in extremely cold conditions can cause the muffler and converter to plug sooner. Use the procedure below to clean out the muffler and converter if extended idle periods or extended low load periods are required.

1. Operate the engine at rated conditions for five to fifteen minutes.
2. Contact an authorized Engine Service Center, if the engine continues to run at low power

or the engine does not respond properly.

Multi-Function Message Display

The Multi-function Display will display diagnostic messages that are intended to alert you that trouble may be developing in one of the systems, do not ignore these messages, they are important indicators that your vehicle should be serviced immediately.

See your Kenworth Dealer or the Kenworth Shop Manual for trouble shooting and diagnostic information.

FRAME AND FIFTH WHEEL

Fifth Wheel Maintenance



WARNING: Do not cut, splice or weld frame rails or drill through the top or bottom flanges of the rails. These operations could affect frame rail strength leading to a failure resulting in an accident. Rail failures resulting from such modifications are not warrantable. Failure to comply may result in personal injury, death, equipment or property damage.

Painting

Do not electrostatically paint your truck or any component on your truck without first removing all of the electronic components from the truck. It is not possible to list all of the electronics that could be affected, but a few examples include the alternator, engine Electronic Control Unit (ECU), transmission ECU, ABS ECU, navigation devices, diagnostic devices, and monitoring devices.

Frame Fastener Torque Requirements

- Tighten all frame fasteners with a torque wrench. Torque specifications apply to the following fasteners with lightly lubricated threads.



NOTE: Whenever possible, torque all frame fasteners on the nut end, not the bolt head.

FRAME AND FIFTH WHEEL

Table 16 Standard Grade 8 UNF or UNC and Metric

FASTENER SIZE	TORQUE *	
	Nm	LbFt
5/16	22-30	16-22
3/8	41-54	30-40
7/16	75-88	55-65
1/2	109-122	80-90
9/16	156-190	115-140
5/8	224-265	165-195
3/4	394-462	290-340
7/8	517-626	380-460
1	952-1129	700-830
1-1/8	1346-1591	990-1170
1-1/4	1877-2217	1380-1630
METRIC WITH NYLON INSERT NUTS		
M5	8-12	6-9
M6	9-15	7-11
M8	23-31	17-23
M10	33-43	24-32
M12	75-101	55-75
M16	163-217	120-160
M20	352-460	260-340

* ESNA Style Lock Nut, with nylon insert.
Lubricate nylon insert nut lightly with SAE 20/30 oil.

Fifth Wheel Maintenance

Proper preventive maintenance is essential to trouble-free service and safe operation of the fifth wheel.

Every 2 Months or 25,000 Miles:

- Refer to specific manufacturer's literature for any special instructions.
- Steam clean the fifth wheel.
- Check lock guard operation using a commercial lock tester.
- Clean and oil all moving parts.
- Lubricate the following parts with a lithium-base grease.
- Lock mechanism
- All grease fittings (especially those which grease the top surface of the fifth wheel).
- Check for missing or loose nuts and bolts in the fifth wheel and mounting brackets. Retighten loose bolts to correct torque. Replace missing or damaged bolts.

Every 6 Months or 50,000 Miles:

- Refer to specific manufacturer's literature for any special instructions.
- Remove fifth wheel from vehicle. Refer to the Kenworth Shop Manual, Fifth Wheel Removal.
- Steam clean the fifth wheel and mounting brackets.
- Check all moving parts for excessive wear or damage. Replace all worn or broken parts.
- Complete two-month service procedure.
- Install fifth wheel. Refer to the Kenworth Shop Manual, Fifth Wheel Installation.

Sliding Fifth Wheels

- Lubricate bearing surface of support bracket through the grease fittings on the side of the fifth wheel plate. Use a water resistant lithium-base grease.



NOTE: The plate must be lifted up slightly to relieve the weight of the bracket while applying grease.

FRONT AXLE AND SUSPENSION

Axle Lubrication

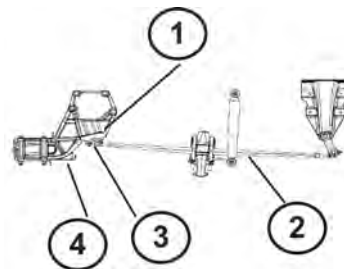
- Change bearing lubrication when seals are replaced, or brakes are relined. See Table 6, [Recommended Lubrication Intervals on page 5-11](#).
- Thoroughly clean hubs and bearings with solvent and a stiff bristle brush, then dry and inspect components for wear or damage. Re-lubricate with approved axle lubricant.

Kingpin Lubrication

- Lubricate with approved lubricant. Lubricate knuckle thrust bearings, knuckle pins, and tie rod ends. See Table 6, [Recommended Lubrication Intervals on page 5-11](#). Lack of lubrication causes premature wear and hard steering. Lubrication schedule may be shortened if necessary.

Suspension Lubrication

The standard T2000 front suspension has a nominal capacity of 12,000 lb. (5443 kg). The taperleaf spring is attached by either: threaded pins, pins and roller bearings, or rubber bushed pins.



Front Suspension

- 1 Front Spring Drive Pin
- 2 Taperleaf Springs
- 3 Front Spring Drive Pin Cap
- 4 Jack Stand Location

- Pressure lubricate spring pins and shackle link pins according to Table 6, [Recommended](#)

Lubrication Intervals on page 5-11, using EP chassis lube with 12-Hydroxy Lithium Stearate Base NLGI-2 with 3% molybdenum additive (e.g. Mobil-grease EP or equal).

- Rubber Bushed Pins do not require lubrication.



NOTE: The grease fitting for the front drive pins faces inboard to prevent interference with the draglink.

- At regular intervals, the spring leaves may be lubricated with a rust-inhibiting oil applied with a spray gun or brush.
- Depending on your suspension, lubricate all spring pins until grease flows out of both ends of the bushing. Look for signs of rust or water in the flushed grease. If a pin will not accept grease, it should be removed, cleaned, and inspected.



CAUTION: Do not spray the suspension with chemical products or mineral oil; it can cause damage to the bushings.

Inspection

- For all vehicles, mandatory maintenance procedures include retightening all U-bolts and inspecting the suspension for loose fasteners, abnormal wear, or damage. However, even with proper maintenance, the service life of leaf springs is affected by many factors, such as: fatigue, vehicle gross weight, type of load, road conditions, and vehicle speed.
- Check for cracks, wear marks, splits, or other defects on the surface of the spring. Defective parts must be replaced. Because repaired springs cannot be fully restored to their original service life, replace the complete assembly if cracks or other defects are detected.
- Visually inspect shock absorbers and rubber bushings. See the Kenworth Shop Manual for further

information on servicing the front suspension.

Wheel Alignment

For driving safety and comfort, and to prolong the life of your vehicle, it is important to have wheels correctly aligned. Check tire wear frequently. Uneven tire wear is a sign that the wheels may be misaligned.

If you see uneven wear, take your vehicle to a Kenworth Dealer familiar with aligning wheels on Kenworth vehicles.

U-Bolt Torque

It is important that U-bolts remain tight. Severe use of your vehicle will cause them to loosen faster. But all vehicles need to have their U-bolts checked and tightened regularly. Be sure someone with the proper training and the right tools checks and tightens the U-bolts on your Kenworth T2000.

New springs can settle in after service, relieving the tension on the U-bolts. Loose U-bolts can cause leaf spring breakage, axle misalignment, hard steering and abnormal tire wear.

- All vehicles should have suspension U-bolts tightened after the first 500 miles (800 km) of operation. And re-torque the front spring pinch bolts and shackle pinch bolts. See the Kenworth Shop Manual for torque values.



WARNING: Do not operate the vehicle if the U-bolts are not properly tightened. Loose

U-bolts will cause the axle to not be properly secured to the suspension, which could cause loss of vehicle control and an accident. Loose U-bolts can also cause uneven tire wear and poor alignment. Failure to comply may result in personal injury, death, equipment or property damage.

U-bolts are difficult to tighten unless you have the right equipment. If you cannot tighten them correctly yourself, be sure to have them checked and tightened regularly by an authorized mechanic.

Tighten U-bolt nuts to the specified torque value with the vehicle loaded to its normal gross weight. The following torque values apply to U-bolts and nuts with clean threads lubricated with Chevron zinc lubricant (SAE 20 or 30 oils acceptable but not preferred).



WARNING: Do not replace U-bolts and nuts with common U-bolts or standard nuts. These parts are critical to vehicle safety. If the wrong U-bolts or nuts are used, the axle could loosen or separate from the vehicle and cause a serious accident. Use only U-bolts and nuts of SAE Grade 8 specification or better. Failure to comply may result in personal injury, death, equipment or property damage.

Table 17 Front Spring Suspension U-Bolts, Grade 8

U-BOLT SIZE DIAMETER (Inch Dimensions)	TORQUE	
	Nm	Lb-Ft
1-1/4	1890-2120	1390-1560
1-1/2	3130-3860	2300-2840

U-BOLT SIZE DIAMETER (Inch Dimensions)	TORQUE	
	Nm	Lb-Ft
3/4	333-408	245-300
7/8	598-734	440-540
1	925-1060	680-780
1-1/8	1470-1660	1080-1220

HEATER AND AIR CONDITIONER

Introduction

The combination heater-air conditioner provides comfort for those in the cab through accurate control of the cab environment in all weather conditions. Regular attention to the items below will help you keep the heater-air conditioner unit running well.

i *NOTE: Keep the vehicles ventilation system, engine exhaust system and cab/sleeper joints properly maintained. It is recommended that the vehicles exhaust system and cab/sleeper be serviced as follows:*

- Inspected by a competent technician every 15,000 miles
- Whenever a change is noticed in the sound of the exhaust system

- Whenever the exhaust system, underbody, cab or sleeper is damaged

i *NOTE: To allow for proper operation of the vehicle ventilation system, proceed as follows:*

- Keep the inlet grille at the base of the windshield clear of snow, ice, leaves and other obstructions at all times.
- Keep the exhaust pipe area clear to help reduce the buildup of exhaust gas under the vehicle.

Special Precautions



WARNING: *Excessive heat may cause the pressurized components of the air conditioning system to explode. Never weld, solder, steam clean, or use a blow torch near any part of the air conditioning system. Failure to comply may result in personal injury, death, equipment or property damage.*

- If a refrigerant leak develops in the presence of excessive heat or an open flame, hazardous gases may be generated. These gases may cause unconsciousness or death. If you become aware of a refrigerant leak on your vehicle have your system service immediately and observe the following precautions:

- Stay away from the hot engine until the exhaust manifold has cooled.
- Do not permit any open flame in the area. Even a match or a cigarette lighter may generate a hazardous quantity of poisonous gas.
- Do not smoke in the area. Inhaling gaseous refrigerant through a cigarette may cause violent illness.

Heater

- Check all heater controls for full-range operation.
- Check hoses, connections, and heater core for condition and leaks.
- Check the drain tube of the fresh air inlet for trapped water before assuming that there is a leak in the heating system. If the heater core is leaking, a reliable radiator shop should be able to repair it.
- Check the heater core for debris blocking the air flow. If the blower and air controls are functioning properly, yet the heater is not operating properly, the heater core or the hot water valves may be clogged or closed. Clean the heater core if necessary. If the condition persists, take the vehicle to a Kenworth Dealer for proper heater service or repair.



CAUTION: During extreme cold weather, do not blow hot defroster air onto cold windshields. This could crack the glass. Turn the air direction lever to Defrost and adjust the fan speed accordingly while the engine warms. If the engine is already warm, move the temperature selector to Cool, then gradually increase the temperature when you see that the windshield is starting to warm-up.

Air Conditioner



WARNING: *The air conditioning system is under pressure. If not handled properly during servicing, it could explode. Any servicing that requires depressurizing and recharging the air conditioning system must be conducted by a qualified technician with the right facilities to do the job. Failure to comply may result in personal injury, death, equipment or property damage.*

- Check the compressor and drive clutch for noise and vibration. If you find problems, have the system checked thoroughly. A malfunctioning clutch usually indicates trouble elsewhere in the system.
- Check the evaporator core, filter, and condenser core for debris

restricting air flow. Clean if necessary. Small particles may be removed with compressed air blown through the core in the opposite direction of normal air flow.



WARNING: *Wear eye protection any time you blow compressed air. Small particles blown by compressed air could injure your eyes.*

- Check the compressor belt for condition and proper tension.
- Check all hoses for kinks, deterioration, chafing, and leaks. Adjust kinked or chafing hoses to eliminate restrictions and prevent further wear.
- Check all components and connections for refrigerant leaks. If you discover a leak, do not try to tighten a connection. Tightening a connection may cause a worse

leak. Have a qualified technician correct the problem.



NOTE: *A leaking evaporator or condenser core cannot be repaired; it must be replaced.*

Have the air conditioning system fully serviced annually by your Kenworth Dealer. Qualified service technicians will have to evacuate and recharge the system.

NOISE AND EMISSION CONTROL

Noise Emission Warranty

Kenworth Truck Company warrants to the first person who purchases this vehicle (for purposes other than resale) and to each subsequent purchaser: that this vehicle, as manufactured by Kenworth Truck Company, was designed, built and equipped to conform, at the time it left Kenworth's control, with all applicable U.S. EPA Noise Control Regulations.

This warranty covers this vehicle as designed, built and equipped by Kenworth, and is not limited to any particular part, component or system of the vehicle manufactured by Kenworth. Defects in design, assembly or in any part, component or system of the vehicle as manufactured by Kenworth, which at the time it left Kenworth's control caused noise emissions

to exceed Federal standards, are covered by this warranty for the life of the vehicle.

Tampering with Noise Control System

Federal law prohibits the following acts or the causing thereof:

1. The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or
2. The use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below:

Air Intake System

- Removing or rendering inoperative the air cleaner/silencers or intake piping.

Engine Cooling System

- Removing or rendering inoperative the fan clutch.
- Removing the fan shroud.

Engine

- Removing or rendering engine speed governor inoperative so as to allow engine speed to exceed manufacturer's specifications.
- Modifying ECU parameters.

Exhaust System

- Removing or rendering inoperative exhaust system components.

Fuel System

- Removing or rendering engine speed governor inoperative, allowing engine speed to exceed manufacturer's specifications.

- Removing of air signal attenuator on engines equipped with this device.

Inner Fender Shields and Cab Skirts

- Removing shield or skirts.
- Cutting away parts of shields, skirts or damaged or loose portions of shields or skirts.

Noise Insulating Blankets

- Removing noise insulators from engine block or from around the oil pan.
- Cutting holes in, or cutting away part of noise insulators.
- Removing hood-mounted noise insulation.

Inspection and Maintenance Instructions

The following instructions are based on inspection of the noise control system at regular intervals as indicated in the [Noise Control System Maintenance Log on page 5-108](#).

If, during periodic inspection and maintenance of other systems and components, it is found that parts of the noise control system require attention, we recommend that those parts be inspected at more frequent intervals to assure adequate maintenance and performance.

Air Intake System

- Do all checks and maintenance procedures listed in this manual under Engine Air Intake System and Air Cleaner. See [Air Dryer on page 4-30](#).
- Check the induction tubing, elbow connections, clamps, brackets, and fasteners for deterioration, cracks, and security.
- If you find an air leak anywhere between the air cleaner and the engine, repair that leak immediately.



CAUTION: Air leaks cause excessive noise and may result in serious damage to the engine. If you do not repair them the engine damage will not be covered by your warranty. Repair all air leaks as soon as you find them.

Engine Mounted Noise Insulators

- Check condition. Is the insulator secure? How you do this will depend on the method of attaching the noise insulators on the engine and around the oil pan (bolts, snap fasteners, or straps). Tighten loose fasteners and repair or replace any worn or damaged fasteners.
- Check insulators around fasteners and stress points, especially where they may be affected by engine vibration. Repair any cracked or damaged mounting points. Use suitable reinforcing plates to ensure that the insulators will remain in position.

Exhaust System

- Check for exhaust leaks, which would indicate a leaking manifold gasket; replace gasket if necessary.
- Check cap screws for tightness, including those at the flanges. Refer to the engine manufacturer's service manual for proper tightening sequence and torque values.

Joins and Clamps

- Check for leaks, and tighten as necessary. Check for deterioration or dents in pipes and clamps which could allow exhaust to escape.

Piping

- Check exhaust piping for rust, corrosion, or damage. Replace deteriorated piping before holes appear. If piping is perforated at any point, temporary patching or lagging is acceptable until you can have permanent repairs made. On turbocharged engines, check joints at flanges and mounting brackets for tightness.

Diesel Particulate Filters (DPF)

- Check diesel particulate filter (DPF), clamps, and mounting brackets. Tighten if necessary. Inspect diesel particulate filter (DPF) for signs of rust or corrosion.
- Check internal baffling. You can do this by listening for rattling sounds while tapping on the diesel particulate filter (DPF) with a rubber mallet or revving the engine up and down through its normal operating range.

Mufflers

- Check muffler, clamps, and mounting brackets. Tighten if necessary. Inspect muffler for signs of rust or corrosion.
- Check internal baffling. You can do this by listening for rattling sounds while tapping the muffler with a rubber mallet or revving the engine up and down through its normal operating range.

Exhaust Tail Pipe

- Check the mounting. Tighten as necessary. The miter cut at the tip of the pipe must be facing the rear of the vehicle. Do not modify the end of the pipe in any way.

Engine Fan and Shroud



WARNING: Do not work on the fan with the engine running. The engine fan can engage at any time without warning. Anyone near the fan when it turns on could be injured. Before turning on the ignition, be sure that no one is near the fan.

- Check all fasteners for tightness. Check for stress cracks in the shroud. Make sure the shroud is adjusted so that it does not touch the fan blades.
- Check to verify that the fan is disengaged (not turning) with the engine running at normal operating temperatures (from cold to the point that the fan engages).
- Check fan blade mounting bolts. Inspect fan blades to be sure they are not cracked or bent. If problems exist, refer to the Cooling System section in the

Kenworth Shop Manual for detailed maintenance instructions.

Transmission and Driveline

- Substituting a different main transmission or driveline components, other than design-specified units, may result in increased vehicle noise emission.

Hood Insulation Blanket

- Check all fasteners for condition and security. Repair or replace any broken or defective fasteners.

Blanket

- Check for chafing or tears. Patch it if necessary. Find the cause of the damage. If any component or accessory is causing wear or damage and cannot be relocated, put reinforcing pads on the blanket at the site of wear.

Inner Fender Shields and Cab Skirts

- Check all fasteners, especially the self-tapping hex head screws. Are they secure? Remove and replace any loose rivets.

Shields and Skirts

- Check shields and skirts for cracks at mounting and stress points. Check fender shields for tire marks, worn spots, or damage from objects thrown from tire treads. You can repair cracked or damaged fiberglass fender shields with fiberglass and resin.
- If you find damage at a fastening point, you can gain additional strength by installing a suitable reinforcing plate. This plate should be drilled to accept a rivet and laminated to the shield with fiberglass and resin.
- Check cab skirts, sills, and brackets for overall condition and repair them as necessary. Damaged rubber fender shields or cab skirting cannot be repaired. You will need to replace it.



NOTE: Your Kenworth Dealer can perform all of these checks and repairs or replacements.

Noise Control System - Maintenance Log

To ensure your Kenworth T2000's noise control requirements are maintained, record maintenance

checks. Use the following log sheet and retain copies of documents regarding maintenance services performed and parts replaced on the vehicle.

Table 18 Noise Control System - Maintenance Log

Component	Recommended Interval (Miles)	Date & R.O. No.	Repair Facility & Location	Work Performed	Date & R.O. No.	Repair Facility & Location	Work Performed
Exhaust System Routing Integrity	25,000						
Muffler Internal Baffles	250,000						
Shutters Shrouds	25,000						
Hood Insulation Blanket	10,000						
Engine Mounted Hose Insulators Fasteners	10,000						
Inner Fender Shields	50,000						
Cab Skirts Fasteners	50,000						
Air Intake System Integrity Element	5,000						
Clutch Type Fan Drive	10,000						

REAR AXLE AND SUSPENSION

General Maintenance



WARNING: Do not work on the vehicle without the parking brake set and wheels chocked securely. If the vehicle is not secured to prevent uncontrolled vehicle movement, it could roll and may result in personal injury, death, equipment or property damage.

- Use wood blocks (4 in. X 4 in. or larger) against the front and rear surfaces of the tires. Be sure the vehicle cannot move.

Your vehicle's suspension, by design, requires a minimal amount of maintenance. However, suspensions in over-the-road operations require

periodic inspection to ensure trouble-free performance.



WARNING: Do not operate the vehicle if the U-bolts are not properly tightened. Loose U-bolts will cause the axle to not be properly secured to the suspension, which could cause loss of vehicle control and an accident. Loose U-bolts can also cause uneven tire wear and poor alignment. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Failure to maintain the specified torque values or to replace worn parts can cause component system failure, possibly resulting in an accident. Improperly tightened (loose) suspension U-bolts can lead

to unsafe vehicle conditions, including: hard steering, axle misalignment, spring breakage or abnormal tire wear. See [Front Spring Suspension U-bolts on page 5-97](#) for proper torque specifications. Failure to comply may result in personal injury, death, equipment or property damage.



CAUTION: Do not spray the suspension with chemical products or mineral oil; it can cause damage to the bushings.



NOTE: Failure to follow these recommendations could void warranty. See the Kenworth Shop Manual for further information on servicing the rear suspension.

Visual Inspection

For all vehicles, mandatory maintenance procedures include retightening of U-bolts and complete inspection. However, even with proper maintenance, many factors affect the service life of springs and suspension components, such as: fatigue, vehicle gross weight, type of load, road conditions and vehicle speed.

It is important that U-bolts remain tight. Severe use of your vehicle can cause them to loosen faster. But all vehicles need to have their U-bolts checked and tightened regularly. Be sure someone with the proper training and the right tools checks and tightens the U-bolts on your Kenworth T2000.

- After the first 500 miles (800 km) of operation, inspect the suspension periodically, as noted below:
- Visually check for loose or missing fasteners, cracks in hanger or axle connection brackets.

- Check that springs are centered in hangers and in good condition.
- Check for cracks, wear marks, splits, or other defects on the surface of the spring.
- Replace defective parts. Because repaired springs cannot be fully restored to their original service life, replace the complete assembly if cracks or other defects are detected.
- After replacement of any part or discovery of loose components, check the torque of all fasteners.
- New springs settle-in after the vehicle's initial service, causing the U-bolts to become loose.

Rear Suspension Fasteners

To maintain the performance of the air suspension, check fastener torque values after the first 2,000 miles (3218 km) of service and every 60,000 miles (96,000 km) thereafter.

Torque recommendations apply to fasteners supplied and installed by Kenworth. The values listed in Table 19 and Table 20 below, are for cadmium plated or phosphate and oil fasteners only. See the Kenworth Shop Manual for complete details on Suspension Maintenance.

U-bolts are difficult to tighten unless you have the right equipment. If you cannot tighten them correctly yourself, be sure to have them checked and tightened regularly by an authorized mechanic.

U-Bolt Torque



NOTE: To ensure an accurate torque reading, use properly maintained and calibrated torque wrenches.

- *Clean the nut and bolt. No dirt, grit, or rust should be present.*



WARNING: Do not operate the vehicle if the U-bolts are not properly tightened. Loose U-bolts will cause the axle to not be properly secured to the suspension, which could cause loss of vehicle control and an accident. Loose U-bolts can also cause uneven tire wear and poor alignment. Failure to comply may result in personal injury, death, equipment or property damage.



NOTE: Torque all fasteners on the nut end.

Table 19 Rear Suspension Fasteners (Metric & Standard)

SIZE/TYPE	TORQUE**	
	Nm	LbFt
M16 nylon-insert nuts	163-217	120-160
M20 nylon-insert nuts	352-460	260-340
M20 all-metal lock nuts	427-475	315-350
1/2 in. nut	109-122	80-90
3/4 in. nut	394-462	290-340
1-1/4 in. nut	1877-2217	1380-1630

* Torque requirements apply to Kenworth proprietary suspensions. All other suspensions must refer and adhere to original manufacturers shop manual.
 **See Kenworth Master Shop Manual for fasteners with unique torque requirements.

Table 20 Rear Suspension U-Bolts, Grade 8 (lubricated*)

U-BOLT SIZE DIAMETER THREAD	TORQUE**	
	Nm	LbFt
3/4	333-408	245-300
7/8	598-734	440-540
1	925-1060	680-780
1-1/8	1470-1660	1080-1220
1-1/4	1890-2120	1390-1560
1-1/2	3130-3860	2300-2840

*Chevron Zinc Lubricant or SAE 20/30 oil should be used on U-Bolt threads

- Load the vehicle to its normal gross weight before tightening U-bolts. Loading the vehicle ensures proper adjustment of the U-bolt and spring assembly.



WARNING: Do not replace U-bolts and nuts with common U-bolts or standard nuts. These parts are critical to vehicle safety. If the wrong U-bolts or nuts are used, the axle could loosen or separate from the vehicle and

cause a serious accident. Use only U-bolts and nuts of SAE Grade 8 specification or better. Failure to comply may result in personal injury, death, equipment or property damage.

Rear Axle Lubrication

- Check oil level with the vehicle parked on level ground and the fluid warm. The level should be even with the bottom of the filler hole.



CAUTION: Do not mix lubricants of different grades; although, mixing different brands of the same grade lubricant (meeting MILL2105C), is acceptable. Lubricants of different grades are not compatible and could damage the axle.



NOTE: In all cases, lubricant supplier assumes full responsibility for the performance of their product, and for product and patent liability.

Dealer. See the Kenworth Shop Manual and the axle manufacturer's Service Manual for further information on servicing drive axles.

For recommended types and brands of lubricants, contact your Kenworth

Dana Spicer and Fabco

No initial drain is required on Dana Spicer axles that are factory filled with an Dana Spicer-approved synthetic lubricant.

- Petroleum-based lubricants must be drained within the first 5,000 miles (8000 km) if converting to an approved synthetic lubricant.

Initial Change: See Table 6, [Recommended Lubrication Intervals on page 5-11](#) for standard rear axle service intervals. Change mineral-based lubricant in other Dana Spicer and Fabco axle assemblies (new or rebuilt) within the first 3,000 to 5,000 miles (4800 to 8000 km).

- For petroleum-based axles, use lubricants meeting MIL L2105C/D grade specifications or approved synthetic lubrication. Do not use oil additives.

All Vehicles with Dana Spicer and Fabco Axles: See Table 6,

[Recommended Lubrication Intervals on page 5-11](#). Contact your Kenworth Dealer for approved synthetic lubricant brands.

- Dana Spicer Axles with synthetic lubrication and Out Runner Seals: drain, flush, and refill at 500,000 miles/804,000 km.

Axle Housing Breather Vent

- Check and clean the axle housing breather vent at each oil level check.

Meritor

See Meritor Lubrication Maintenance Manual (MM1).

Clark

Initial Change: See Table 6, [Recommended Lubrication Intervals on page 5-11](#). Change standard lubricant in Clark axle assemblies within the first 3,000 to 5,000 miles (4800 to 8000 km).

All Vehicles with Clark Axles: Check Clark axles every 5,000 miles (8,000 km).

- Change lubricant every 25,000 miles (40,000 km) thereafter or yearly whichever occurs first.
- Change every 2,500 hours of operation thereafter or yearly whichever occurs first.

Rear Axle Alignment

Continual road shock and load stresses may force the rear axles out of alignment. If you detect rapid tire wear on the rear axles, you may have misaligned axles. If you suspect rapid tire wear, have your rear axle alignment checked and adjusted by a Kenworth Dealer.

In addition to pre-delivery inspections, suspension alignment should be checked when any one of the following conditions exist:

- Discovery of loose suspension fasteners. (Loose, defined as any torque below the recommended torque value.)
- Discovery of elongated holes in a suspension component.
- Bushing replacement.
- Excessive or abnormal tire wear.

STEERING AND DRIVELINE

Power Steering

Oil (under low pressure) provides the power to operate the steering gear. It also serves to lubricate moving parts and remove heat. A loss of steering efficiency will occur if too much heat builds up in the system.



WARNING: Do not operate the vehicle if the steering system is not working properly. You could lose control of your vehicle if the steering system is not in good working condition, which could result in a serious accident. For driving safety, visually check the steering gear and components. Frequent checks are important for driving safety, especially after traveling over rough

roads. Failure to comply may result in personal injury, death, equipment or property damage.



NOTE: If the steering feels unbalanced from side-to-side while turning, check for the following possible causes:

- *unequal tire pressures*
- *vehicle overloaded or unevenly distributed load*
- *wheels out of alignment*
- *wheel bearings improperly adjusted*

If you cannot correct the problem, check with an authorized Kenworth Dealer.

The Kenworth T2000 is equipped with integral power steering. The system includes an engine-driven fluid pump, a fluid reservoir, the steering gear, and connecting hoses. Because of the hydraulic power assist, little effort

is required to turn the steering wheel. When no input is applied through the steering wheel, the steering gear will return to the neutral position. If, for any reason, the power assist system goes out, steering the vehicle is still possible, yet it will require much greater effort.

Visually check the following parts:

- **Crosstube:** Is it straight?
- **Draglink tube clamp:** Check for looseness or interference.
- **Ball joints and steering U-joints:** Check for looseness.
- **Steering wheel for excessive free-play.** Check the simplest probable causes first:
 - unequal tire pressures
 - loose cap nuts
 - bent crosstube
 - lack of lubrication
- If these checks do not reveal the problem, or if you correct them and still have a steering problem,

take your truck to an authorized Kenworth Dealer for evaluation.

Fluid Level and Refill

Have the power steering fluid and filters changed at an authorized Kenworth Dealer.

- Check and completely change the fluid level according to Table 6, [Recommended Lubrication Intervals on page 5-11](#). Use the following procedure:



NOTE: Before removing reservoir cover, wipe outside of cover so that no dirt can fall into the reservoir.

- Maximum/Minimum level is indicated on the reservoir. These same levels are also indicated by two lines on the dipstick in the reservoir.
- There are two ways to check whether the power steering fluid is at its proper level. Both checks are with the engine NOT running.

1. If you check the fluid with the engine and steering system COLD, the fluid level should be at/or above the Minimum indicator level and should generally not exceed the middle point between Maximum and Minimum level indicators.
2. If you check the fluid with the engine and steering system WARM, the fluid should NOT exceed the Maximum level indicator and should generally not drop below the middle point between the Maximum and Minimum level indicators.

Fluid Refill

The following recommendations are for general purpose steering systems, commonly installed on Kenworth T2000 vehicles. For your vehicles particular steering fluid recommendations, see the Kenworth Shop Manual.

- For normal temperatures, use Automatic Transmission Fluid (ATF) Type E or F or Dexron® II.
- For cold temperatures of -22° F (-30° C) and above use ATF Type A.
- For extremely cold temperatures between -22° F (-30° C) and -40° F (-40° C) use ATF Type B.

Steering Driveline

The following are common torque specifications for most drivelines. For your particular driveline, see the Kenworth Shop Manual.

- Torque on U-joint pinch bolt and nut (7/16 in.) 74–81Nm (55 to 60 ft-lb), lubricated.
- Torque on Pitman arm clamp bolt and nut (3/4 in.): 406–433Nm (300 to 320 ft-lb), lubricated.
- For off-highway vehicles, tighten the U-bolts after the first day or two of operation. Then check weekly.



WARNING: *If this chassis is equipped with an electronic stability system (ESP) and any part of the steering system (e.g. linkage, steering driveline, column, front-end alignment, etc) is repaired, removed, or disassembled in any way, or if the steering*

angle sensor is replaced, the steering angle sensor must be recalibrated. Failure to do so could cause loss of vehicle control. Any repairs or adjustments to any part of the steering system must be performed by an authorized Kenworth Dealer. Failure to comply may result in personal injury, death, equipment or property damage. Failure to comply may result in personal injury, death, equipment or property damage.

Driveshaft

The slip joints and universal joints of the drive shaft should be lubricated periodically.

- Use a good quality lithium-soap-base or equivalent extreme pressure (E.P.) grease: NLGI Grade 2.

For Towing Guidelines and Returning a Towed Vehicle to Service see [Vehicle Recovery Guidelines on page 2-14](#).

U-Joints

- The slip joints and universal joints of the drive shaft should be lubricated according to Table 6, [Recommended Lubrication Intervals on page 5-11](#).

Use a good quality lithium-soap-base or equivalent extreme pressure (E.P.) grease: NLGI Grade 2.



WARNING: Improper lubrication of U-joints can cause them to fail prematurely. The driveshaft could separate from the vehicle and result in an accident. Make sure lubricant is purged at all four ends of each U-joint and loosen caps if necessary. Also, regularly inspect U-joints for excessive wear or movement, and repair or replace as necessary. Failure to comply may result in personal injury,

death, equipment or property damage.

TIRES AND WHEELS

Introduction

Keeping the tires in good condition is essential to the safe, efficient operation of your Kenworth T2000. Regular, frequent inspection and the right care will give you the assurance of safe and reliable tire operation.

General Safety Requirements



WARNING: Use only original equipment manufactured (OEM) components. Use of non-original equipment could cause wheel breakage and wheel separation from vehicle, which could result in an accident. Each mounting system is engineered only for use with its correct mating part. Be sure that properly matched components are used for each type of mounting. The comparison chart, [Comparing Hub-piloted and Ball-seat Wheels on page 5-129](#), illustrates the differences between parts used in hub-piloted mount and ball seat mount applications. Only OEM supplied hub-piloted or ball-seat mounted wheels

may be used on this vehicle. Failure to comply may result in personal injury, death, equipment or property damage.

- If you are not fully qualified and not equipped with the proper tools and equipment, do not attempt to raise the vehicle or remove or install the damaged tire and wheel assembly. Obtain expert help. A person can be injured and/or damage can result from using the wrong service methods. Truck tires and wheels should be serviced only by trained personnel using proper equipment. Do not reinflate a tire that has been run flat or is low on air without first removing the tire from the rim and inspecting for damage.
- Follow OSHA regulations per section 1910.177.
- Do not exceed the speed rating of tires. Exceeding the speed

rating may result in sudden tire failure and loss of vehicle control.

- Follow all warnings and cautions contained within the tire and wheel manufacturers literature.
- Only properly trained personnel should service tire and rim assemblies.

Speed Restricted Tires



WARNING: This vehicle may be equipped with speed restricted tires. Check each tires sidewall for maximum rated speed. Vehicle should not be operated at sustained speed in excess of maximum rated speed. Failure to comply with these speed restrictions could cause sudden tire failure which may result in personal injury, death, equipment or property damage.

Tire Inspection and Replacement

Visually inspect your tires frequently for any abnormal conditions such as scrapes, bulges, and uneven wear. This must be done immediately after known or suspected contact with an object in the road, with a pothole, road irregularity or after severe braking. Refer these conditions to an Authorized Tire Service Center for repair or replacement. Never drive on a tire if such conditions appear.

If the tire looks under-inflated, stand off to the side and check for damage to the wheel assembly. This can be done by visually comparing the wheel in question to other wheels on the vehicle. For dual wheel assemblies, check between the wheels for damage. If any damage is found, or you suspect damage, do not attempt further repair. Call for expert tire service.

Tire Inflation and Loading

Low pressure is a tire's worst enemy. under-inflation allows tires to flex improperly, causing high temperatures to build up. Heat causes early tire damage such as flex break, radial cracks, and ply separation. And low pressure may affect control of your vehicle, especially at the front wheels.



WARNING: Do not operate vehicle with under-inflated tires. The extra heat caused by under-inflation can cause sudden tire failure such as a tire fire or blow out. Low pressure may affect control at the front wheels, which could result in an accident. Keep your tires inflated to the manufacturer's recommended air pressure. Failure to comply may result in personal injury, death,

equipment or property damage.

Tire Inflation

Most tire wear problems are caused by under-inflation as the result of slow leaks. So you will want to check tire pressure regularly. Give the tires a visual test every day, and check inflation with a gauge every week.

When checking tire pressure, inspect each tire for damage to sidewalls, cuts, cracks, uneven wear, rocks between dual wheels (tires), etc. If a tire appears under-inflated, check for damage to the wheel assembly. Do not forget to check between dual wheels. If you find wheel damage, have an expert tire service repair it.



WARNING: Do not repair damaged tires unless you are fully qualified and equipped to do so. Wheel and tire assemblies cannot be worked on without proper tools and equipment, such as: safety cages or restraining devices.

Have all tire repairs performed by an expert. And stand away from the tire assembly while the expert is working. Failure to comply may result in personal injury or death.



CAUTION: Pressure should be checked when the tires are cool. Warm or hot tires cause pressure buildup and will give you an inaccurate reading. So never deflate a warm tire to the specified pressure. Failure to comply may result in equipment damage.

5

Under-inflated tires will adversely affect the operation of the vehicle and tires:

- making steering difficult
- causing extra strain on the tire sidewalls

- reducing the tread life of tires due to the high temperatures generated from excess flexing of the tire
- Inflate tires to the manufacturer's cold air pressure specification molded into the tire side wall.

Lower tire pressure does not give you more traction on ice or snow. under-inflation actually reduces traction and steering control. See the tire manufacturer's Drivers Handbook for more information on proper operation and use of tires.

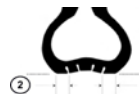
1



TREAD CONTACT WITH ROAD

Proper-Inflation: the correct profile for full contact with the road.

2



TREAD CONTACT WITH ROAD

Under-Inflation: causes abnormal tire deflection, which builds up excessive heat, running the risk of failure. It also causes irregular wear.

3



TREAD CONTACT WITH ROAD

Over-Inflation: reduces the tread contact area with the road surface, concentrating all of the vehicle weight on the center of the tread. This causes premature wear of the tire.

- Too much air pressure reduces the tire tread contact area and results in rapid wear in the center of the tire. It also causes tires to run hard and makes them more vulnerable

to impact and other road hazard damage.



WARNING: Over-inflated tires can cause accidents. They wear more quickly than properly inflated tires and are more subject to punctures, cracks, and other damage. They could fail and cause you to lose control of your vehicle resulting in an accident. Be sure all tires are inflated correctly according to the manufacturer's recommendations. Failure to comply may result in personal injury, death, equipment or property damage.

If over-inflation is noted during travel, do not deflate tires. The increased pressure is caused by temperature build-up during operation. This condition has been taken into account during manufacturing of the tires.

Allow tires to cool, then recheck and adjust if necessary.

Tire Loading



WARNING: Do not exceed the load rating of your tires (molded on the side wall of your tire) or the maximum vehicle load rating, whichever is less. Overloading could result in premature tire failure causing you to lose control of your vehicle and result in an accident. The maximum vehicle load rating (GVWR) is found on the Tire and Rim Data label on the driver's door. Failure to comply may result in personal injury, death, equipment or property damage.

Overloading your vehicle is as damaging to the tires as under-inflation. It significantly affects the expected life (total mileage of a tire). The following chart shows how neglect or

deliberate abuse can affect the life of your vehicle's tires.

Table 21 Effect of Load Pressure on Tire Life

Vehicle Load	Normal	20% Over	40% Over	60% Over	80% Over	100% Over
Tire Pressure	Normal	20% Low	30% Low	35% Low	45% Low	55% Low
Expected Total Tire Mileage	Normal	70%	50%	40%	30%	25%

Wheel Mounting and Fastening

After the vehicle travels about 50 to 100 miles (80 to 160 km), wheel mountings seat in and will lose some initial torque. Check hub/wheel mountings after this initial period and retighten.

Wheel Cap Nut Torque

At the first scheduled lube interval, have all wheel cap nuts torqued to their specified value. See Table 22, [Wheel Cap Nut Torque on page 5-124](#). After that, check wheel cap nuts at least once a week. Contact an authorized Kenworth Dealer for information on the proper installation procedure for the wheels on your truck. This is a job you may not be able to do yourself. You need the right torquing equipment to do it.



WARNING: *Never use oil or grease on studs or nuts; improper torque readings will result, which could cause*

improper wheel clamping and could lead to a wheel failure resulting in an accident. Failure to comply may result in personal injury, death, equipment or property damage.

Wheel Bearing Adjustment

For safe, reliable operation and adequate service life, your wheel bearings must be adjusted properly at the recommended intervals. See [Table 15, Maintenance Schedule on page 5-17](#) and [Steering Axle Wheel Bearing - End Play Adjustment and Inspection on page 5-17](#). Contact your authorized Kenworth Dealer to make sure the wheel bearings are properly adjusted.

Table 22 Wheel Cap Nut Torque

WHEEL & NUT CONFIGURATION	STUD SIZE	TORQUE FOR INNER & OUTER CAP NUTS & RIM CLAMP NUTS	
		N.m	LbFt
Steel or Aluminum Disc-Type Wheel; Double Cap Nut Mounting; Standard 7/8 Radius Ball Seat	3/4-16	610-680	450-500
	1-1/8-16	610-680	450-500
Heavy-Duty Steel Disc-Type Wheel; Double Cap Nut Mounting; 1-3/16 Radius Ball Seat:	15/16-12	1020-1220	750-900
	1-1/8-16	1020-1220	750-900
	1-15/16-12	1020-1220	750-900
Hub-Piloted Disc-Type Wheel w/Two Piece Flanged Cap Nuts: Steel or Aluminum Wheel	M22-1.5	610-680	450-500
Stud Backnuts (when used)	3/4-16	240-270	175-200
	1-14	240-410	175-300
Cast Wheel w/Demountable Rim	5/8-11 Front & Rear	220-270	160-200
	3/4-10 Front & Rear	270-350	200-260
Heavy-Duty Cast Wheel w/Demountable Rim:	1-8	585-640	430-470
	1-12	585-640	430-470
	1-14	585-640	430-470
Meritor or Clark Demountable Rims on Planetary Axles	3/4-10	270-305	200-225

Threads should be clean and dry. Do not lubricate wheel nuts or studs.

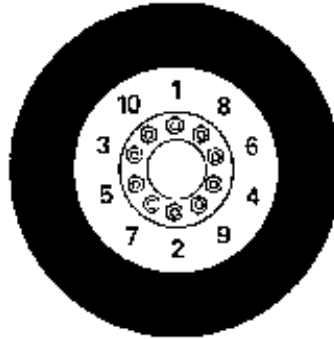
Proper Torque and Sequence

Proper wheel torque can best be obtained on level ground. Install lug nuts and finger-tighten in the numerical sequence as shown below, see [Crisscross Tightening Sequence](#)

[for Disc Wheels on page 5-127](#). This procedure will ensure that the wheel is drawn evenly against the hub. Torque each nut to the torque value listed in Table 22, Wheel Cap Nut Torque.



WARNING: Tighten wheel cap nuts properly. If they are not tightened properly, wheel nuts could eventually cause the wheel to become loose, to fail, and/or to come off while the vehicle is moving, possibly causing loss of control and may result in personal injury, death, equipment or property damage.



Crisscross Tightening Sequence for Disc Wheels

Disc Wheels



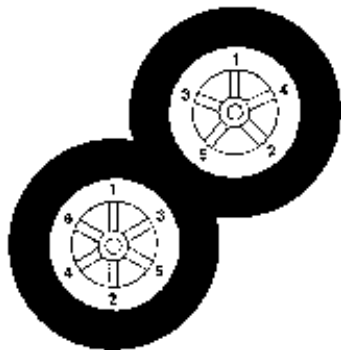
WARNING: Use the correct components and tools when working on wheels. Grooves in the wheel disc or other damage to the disc can weaken the wheel and cause it to eventually come off. This could cause you to lose control of your vehicle, and may result in an accident. Failure to comply may result in personal injury, death, equipment or property damage.

The end of the wheel wrench must be smooth. Burrs on the end of the wrench can tear grooves in the disc. These grooves may lead to cracks in the disc, and can cause it to fail.

TIRES AND WHEELS

Demounted Rims

To check the torque on demountable rims, follow the crisscross sequence shown below. See Table 22, [Wheel Cap Nut Torque on page 5-124](#) for proper torque specifications.



Crisscross Tightening Sequence for Demounted Rims



WARNING: Improperly mounting and demounting tire and rim assemblies is

dangerous. Failure to observe proper precautions could cause the tire-rim assembly to burst explosively. See the wheel manufacturer's literature for the proper way to mount and demount your tires and rims. Follow their precautions exactly. Failure to comply may result in personal injury, death, equipment or property damage.

Comparing Hub Piloted and Ball Seat Parts



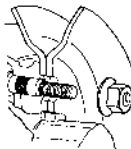
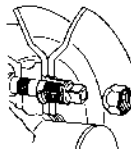
WARNING: Do not mismatch wheel components.

Equipment that does not exactly match original specifications or that is mismatched could cause the wheels to break and separate from the vehicle. The resulting accident could be very serious. Each mounting system is engineered for use only with its correct mating part. Be sure properly matched components are used for each type of mounting. Failure to comply may result in personal injury, death, equipment or property damage.

The following comparison (Table 23, Comparing Hub-piloted and Ball-seat Wheels), shows the difference

between parts used in hub pilot mount and ball seat mount applications.

Table 23 Comparing Hub-piloted and Ball-seat Wheels

HUB-PILOTED MOUNT	BALLSEAT MOUNT
	
Hub, Drum, and Stud Assembly	
Hub-piloted mountings use M22 x 1.5 metric threads (about 7/8 in. diameter). The stud stands out at least 1.94 in. beyond the brake drum. All studs are right-hand threads. Pilot bosses (machined surfaces) on the hub, fit tightly to the wheel center bore.	Ball-seat (stud-piloted) mountings use 3/4x16 or 1-1/8x16 threads. The dual mounting studs provide 1.30 in. 1.44 in. standout. Right-hand and left-hand threads are required. Inner and outer wheel nuts center the wheels by seating against wheel ball seats.
Wheels	
Hub-piloted wheels have stud holes reamed straight through (no ball seats). Center bore diameter is 8-21/32 in.	Ball-seat wheels have spherical chamfers machined on each stud hole. Center bore diameter is 8-23/32 in.
Wheel Nuts	
Hub-piloted wheel nuts have a hex body and a flange for clamping against wheel face. Hex size is 1-5/16 in. (33 mm).	Ball-seat inner and outer wheel nuts mate with spherical chamfers on wheels. The inner nut has 13/16 in. square end. The outer nut has a 1-1/2 in. hex.

Tire Replacement

Front: replace front tires when less than 4/32 in. of tread depth remains. Check depth at three places equally spaced around the tire.

Drive Axles or Trailers: replace tires on drive axles when less than 2/32 in. of tread depth remains in any major groove. Check depth at three places equally spaced around the tire.



WARNING: Do not install regrooved or reinforcement-repaired tires on steering axles. They could fail unexpectedly and cause

you to lose control of your vehicle resulting in an accident. Failure to comply may result in personal injury, death, equipment or property damage.



WARNING: Do not replace original equipment tires with load ratings less than the original tires. Doing so could lead to unintentional overloading of the tire, which could cause a failure resulting in loss of vehicle control and an accident. Failure to comply may result in personal injury, death, equipment or property damage.



NOTE: To prolong the tires' life and make them safer, have their radial and lateral run-out checked at your Kenworth Dealer. And of course have

the tires balanced any time you change a tire.

Matching Tires

Be sure to buy matched tires for your vehicle, especially on the rear axles. Mismatched tires can cause stress between axles and cause the temperature of the axle lubricant to get too hot. Matched tires will help the driveline last longer and will give you better tire mileage.



WARNING: Do not mismatch tires, it can be dangerous. Never mix tires of different design such as steel belted radials and bias ply tires, etc. Mixing tire types and sizes will adversely affect the road-holding ability of both types of tires and can lead to loss of vehicle control. Failure to comply may result in personal injury, death, equipment or property damage.

Make sure, too, that you use the right size tires on each wheel. Some trucks require different sizes on front and rear wheels. For safety, always use the recommended size and type of tires.

TRANSMISSION AND CLUTCH

Introduction

Follow the below procedures to ensure parts are properly lubricated:

- Maintain oil level, check it regularly
- Change oil regularly
- Use the correct grade and type of oil
- Buy oil from a reputable dealer

All Transmissions

Initial Change: drain and replace according to Table 6, [Recommended Lubrication Intervals on page 5-11](#); for some transmissions this may not be required.

Oil Change

Change fluid according to change procedures specified in the Transmission Service Manual. Use the recommended types of oil as specified in the Operation and Service Manual (included with vehicle). Select from the appropriate lubricant for varying ambient (outside air) temperatures.

Transmission Lubricants



CAUTION: When adding oil, types and brands of oil should not be intermixed because of possible incompatibility, which could decrease the effectiveness of the lubrication or cause component failure.

Manual Transmission

Manual transmissions are designed so that the internal parts operate in a bath of oil circulated by the motion of gears and shafts.

Service Intervals

For recommended types and brands of all lubricants, see the transmission manufacturer's Service Manual and Table 6, [Recommended Lubrication Intervals on page 5-11](#).

Standard Transmission Oil Level



NOTE: The vehicle must be parked on level ground. See the Transmission Operator's Manual for information on checking the transmission oil level.

Automatic Transmissions

Service Intervals

Check daily with engine idling. See Table 6, [Recommended Lubrication Intervals on page 5-11](#) for service intervals.

Automatic Transmission Oil Level



NOTE: The vehicle must be parked on level ground.

See the Transmission Operator's Manual for information on checking the transmission oil level.

Clutch System Introduction

Free pedal is the distance the clutch pedal moves by applying only slight pressure. During free pedal the release yoke in the transmission moves until its bearing pads contact the release bearing. This movement of the release yoke is called free travel. Thus, free pedal and free travel are directly related to each other.

As the clutch pedal is depressed further, with harder pressure, the release yoke moves the release bearing away from the engine. This causes the clutch plate to release from the driven disks in the clutch. This is called release travel. And finally, as the pedal is pushed to the last 1/2 to 1 inch of travel, the release bearing contacts and engages the clutch brake. This is called clutch brake squeeze. When the clutch wears, the release bearing gradually moves toward the engine, decreasing free pedal and free travel.

When all free pedal and free travel are gone, the clutch requires adjustment.

The clutch is adjusted by turning an adjustment ring that is built into the clutch. When the ring is turned, the release bearing moves back toward the transmission, restoring free pedal and clutch free travel. Under normal clutch wear this is the only adjustment needed. Do not attempt to change any other component. See the Kenworth Shop Manual for details.

Clutch Linkage

In addition to the following service recommendations, see the Kenworth Shop Manual for clutch information. Have your authorized Kenworth Dealer service the clutch according to the clutch manufacturer's service guidelines.

- The Kenworth T2000 is equipped with a rod and lever mechanical clutch linkage. Lubricate each pivot point on the clutch linkage.

Clutch Adjustment - Normal Wear

See the clutch manufacturer's Service Manual for the proper adjustment procedures.



NOTE: This procedure is all that is required for normal clutch adjustment. Adjustment of any other components is not required.

External Linkage Adjustment

1. Adjust clutch to clutch manufacturer's specification.
2. Verify 1/8 in. free travel (distance the release yoke moves before the release yoke bearing pads contact the release bearing).
3. Verify free pedal of 1 in. (44 mm $\pm$ 6 mm).

CONSUMER INFORMATION AND VEHICLE IDENTIFICATION

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CONSUMER INFORMATION AND VEHICLE IDENTIFICATION

Introduction



WARNING: This vehicle contains material known by the State of California to cause cancer and/or birth defects or other reproductive harm. This warning requirement is mandated by California law (Proposition 65) and does not result from any change in the manner in which Kenworth trucks are manufactured.

Reporting Safety Defects

United States

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Kenworth Truck Company.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot get involved in individual problems between you, your Kenworth Dealer, and Kenworth Truck Company.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at 1-800-424-9393 (366-0123 in Washington, D.C.) or write to: Administrator, NHTSA, 400 Seventh

Street, S.W., Washington, D.C. 20590. You can also get other information about auto safety from the Hotline.

Canada

Canadian customers who wish to report a safety-related defect to Transport Canada, Defect Investigations and Recalls, may telephone the toll free hotline 1-800-333-0510, or contact Transport Canada by mail at: Transport Canada, ASFAD, Place de Ville Tower C, 330 Sparks Street, Ottawa ON K1A 0N5.

For additional road safety information, please visit the Road Safety website at:

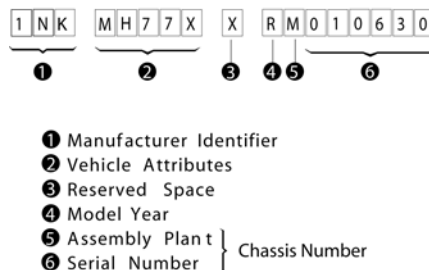
<http://www.tc.gc.ca/roadsafety/menu.htm>

CONSUMER INFORMATION AND VEHICLE IDENTIFICATION

Vehicle Identification

All Kenworth vehicles are identified by a 17-digit Vehicle Identification Number (VIN). This unique numeral and letter combination identifies the manufacturer, the model year it was built, and other vehicle attributes. The VIN is in compliance with Federal Motor Vehicle Safety Standard 49 CFR 567 Certification or Canadian Motor Vehicle Safety Standard 115-Vehicle Identification Number. As an example, the model year and assembly plant are designated by a letter in the tenth and eleventh character positions (see 4 and 5 below).

SAMPLE VIN



Vehicle Identification Number (VIN)

- The Chassis/Serial Number refers to the last seven characters of the VIN, including the assembly plant designator (eleventh character position) and a six-digit serial number. This number will allow your Kenworth Dealer to identify your vehicle. You will be asked for this number when you bring your vehicle in for service.

VIN Locations

The VIN is on the driver's side, either on the latching edge of the cab door or on the cab door frame above the hinge. It is also marked on the Tire, Rim, and Weight Rating Data Label, located on the driver's door edge.

CONSUMER INFORMATION AND VEHICLE IDENTIFICATION

Chassis Number Locations

The chassis/serial number is shown in six places:

- Right frame rail, top flange, about 3 ft. from the front end
- Cab back, left-hand rear panel, lower edge
- Tire, Rim, and Weight Rating Data label (truck)
- Components and Weights label
- Noise Emission label
- Paint Identification label

Glider Kit Identification

Glider kits are identified by the plant code, a six-digit serial number, and the designation GL as shown below:

EXAMPLE: R 654321 GL

Assembly Plant Code

F = KENMEX

M = Ste. Therese

R = Renton

J = Chillicothe

S = Seattle

Table 24 Model Year Designations

CODE	YEAR
T	1996
V	1997
W	1998
X	1999
Y	2000
1	2001
2	2002
3	2003
4	2004
5	2005
6	2006
7	2007
8	2008
9	2009
10	2010

CONSUMER INFORMATION AND VEHICLE IDENTIFICATION

Certification Labels

Vehicle information and specifications for your Kenworth T2000 are documented on labels. As noted below, each label contains specific information pertaining to vehicle capacities and specifications that you should be aware of.

Components and Weights Label

The Components and Weights Label is located on either the driver's side door edge for truck/tractors, or on the door frame for trucks. It includes chassis weight and gross weight, plus model and serial numbers for the vehicle, engine, transmission, and axles.

Tire and Rim Data Label

The Tire And Rim Data Label is located on the driver's side door edge, below the door latch. It contains the following information:

- GVWR - Gross Vehicle Weight Rating
- GAWR FRONT and REAR - Gross Axle Weight Ratings for Front and Rear Axle
- TIRE/RIM SIZES AND INFLATION PRESSURES - Tire/Rim Sizes and Cold Pressure Minimums
- CHASSIS NUMBER



WARNING: Do not exceed the specified load rating. Overloading can result in loss of vehicle control and personal injury, either by causing component failures or by affecting vehicle handling. Exceeding load ratings can also shorten the service life of the vehicle.

The components of your vehicle are designed to provide satisfactory service if the vehicle is not loaded in excess of either the gross vehicle weight rating (GVWR), or the maximum front and rear gross axle weight ratings (GAWRs). (Axle weight ratings are listed on the driver's door edge.)



NOTE: GVW is the TOTAL SCALE WEIGHT the vehicle is designed to carry. This includes the weight of the empty vehicle, loading platform, occupants, fuel, and any load.

Noise Emission Label

The Noise Emission Label is located in the drivers side door frame. It contains information regarding U.S. noise emission regulations, chassis number, and date of manufacture.

Paint Identification Label

The Paint Identification Label contains the paint colors used by the factory to paint your vehicle. It lists frame, wheels, cab interior and exterior colors. This label is located next to the Noise Emission Label on the steering column support.

CONSUMER INFORMATION AND VEHICLE IDENTIFICATION

Federal Safety Standard Certification Label

The NHTSA regulations require a label certifying compliance with Federal Safety Standard, for United States and U.S. Territories, be affixed to each motor vehicle and prescribe where such label may be located. This certification label, which indicates the date of manufacture and other pertinent information, is located on the driver's side door frame.

Component Identification

Each of the major components on your vehicle has an identification label or tag. For easy reference, record component numbers such as, model, serial, and assembly number. See the Vehicle Component Register (last page of this manual).

Engine: For further information, please refer to the Engine Operation and Maintenance Manual.

Transmission: For both manual and automatic transmissions, the identification number is stamped on a tag affixed to the right rear side of the transmission case.

Clutch: Enclosed in clutch housing. Location depends on manufacturer.

Steer Axle: The front axle serial number is stamped on a plate located on the center of the axle beam.

Drive Axles: The drive axle numbering system includes three labels or stamps:

1. **Axle Specification Number**, usually stamped on the right rear side of the axle housing. This number identifies the complete axle.
2. **Axle Housing Number Tag**, usually located on the left forward side of the housing arm. This tag identifies the axle housing.
3. **Axle Differential Carrier Identification**, usually located on the top side of the differential carrier. The following information is either stamped, or marked with a metal tag: Model No., Production Assembly No., Serial No., Gear Ratio, and Part Number.

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