PipeLine Machinery

WEBM1000
March 2012

# Operation and Maintenance Manual

## 72H Pipelayer

**PLR1-Up**

# Important Safety Information

Most accidents that involve product operation, maintenance and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards. This person should also have the necessary training, skills and tools to perform these functions properly.

**Improper operation, lubrication, maintenance or repair of this product can be dangerous and could result in injury or death.**

**Do not operate or perform any lubrication, maintenance or repair on this product, until you have read and understood the operation, lubrication, maintenance and repair information.**

Safety precautions and warnings are provided in this manual and on the product. If these hazard warnings are not heeded, bodily injury or death could occur to you or to other persons.

The hazards are identified by the “Safety Alert Symbol” and followed by a “Signal Word” such as “DANGER”, “WARNING” or “CAUTION”. The Safety Alert “WARNING” label is shown below.

The meaning of this safety alert symbol is as follows:

**Attention! Become Alert! Your Safety is Involved.**

The message that appears under the warning explains the hazard and can be either written or pictorially presented.

A non-exhaustive list of operations that may cause product damage are identified by “NOTICE” labels on the product and in this publication.

**Caterpillar cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are, therefore, not all inclusive. You must not use this product in any manner different from that considered by this manual without first satisfying yourself that you have considered all safety rules and precautions applicable to the operation of the product in the location of use, including site-specific rules and precautions applicable to the worksite. If a tool, procedure, work method or operating technique that is not specifically recommended by Caterpillar is used, you must satisfy yourself that it is safe for you and for others. You should also ensure that the product will not be damaged or become unsafe by the operation, lubrication, maintenance or repair procedures that you intend to use.**

The information, specifications, and illustrations in this publication are on the basis of information that was available at the time that the publication was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service that is given to the product. Obtain the complete and most current information before you start any job. Cat dealers have the most current information available.

**⚠ WARNING**

**When replacement parts are required for this product Caterpillar recommends using Cat replacement parts or parts with equivalent specifications including, but not limited to, physical dimensions, type, strength and material.**

**Failure to heed this warning can lead to premature failures, product damage, personal injury or death.**

**In the United States, the maintenance, replacement, or repair of the emission control devices and systems may be performed by any repair establishment or individual of the owner's choosing.**

# Table of Contents

# Foreword

## Literature Information

This manual should be stored in the operator's compartment in the literature holder or seat back literature storage area.

This manual contains safety information, operation instructions, transportation information, lubrication information and maintenance information.

The information contained in the section entitled “Pipelayer Attachment Kit” of this manual is limited to the pipelayer attachment and specific modifications made to the tractor unit. Refer to the section entitled “D6T LGP (OEM)” for complete information regarding the tractor unit.

Some photographs or illustrations in this publication show details or attachments that can be different from your machine. Guards and covers might have been removed for illustrative purposes.

Continuing improvement and advancement of product design might have caused changes to your machine which are not included in this publication. The latest version of this publication is available for downloaded from the internet at www.plmcat.com. Read, study and keep this manual with the machine.

Whenever a question arises regarding your machine, or this publication, please consult PipeLine Machinery International for the latest available information.

## Machine Description

The sideboom equipment is attached to a Caterpillar D6T LGP tractor. The primary use of this machine is for petroleum-product pipeline-construction in the 20" to 30" (510 to 765 mm) pipeline range.

The operator should read, understand, and follow both the tractor and the pipelayer operating and maintenance instructions. The operator must comply with all pipelayer procedures, regulations, and safety precautions.

This equipment is to be operated by qualified personnel only.

The daily service/inspection procedure should be performed before start-up.

Operate all pipelayer controls with no load, until familiar with machine operation.

**Note:** Refer to the Caterpillar operation manual for detailed information on the specific operation of the tractor unit

## Safety

The section entitled “Pipelayer Attachment Kit” of this manual contains a safety section, and the section entitled “D6T LGP (OEM)” contains a safety section. The safety sections list basic safety precautions. In addition, these sections identifie the text and locations of warning signs and labels used on the machine.

Read and understand the basic precautions listed in the safety sections before operating or performing lubrication, maintenance and repair on this machine.

## Operation

The section entitled “Pipelayer Attachment Kit” of this manual contains an operation section, and the section entitled “D6T LGP (OEM)” contains an operation section. The operation sections are references for the new operator and a refresher for the experienced operator. These sections include a discussion of gauges, switches, machine controls, attachment controls, transportation and towing information.

Photographs and illustrations guide the operator through correct procedures of checking, starting, operating and stopping the machine.

Operating techniques outlined in this publication are basic. Skill and techniques develop as the operator gains knowledge of the machine and its capabilities.

## Maintenance

The section entitled “Pipelayer Attachment Kit” of this manual contains a maintenance section, and the section entitled “D6T LGP (OEM)” contains a maintenance section. The maintenance sections are guides to equipment care. The Maintenance Interval Schedules (MIS) list the items to be maintained at a specific service interval. Items without specific intervals are listed under the "When Required" service interval. The Maintenance Interval Schedules liststhe page number for the step-by-step instructions required to accomplish the scheduled maintenance. Use the Maintenance Interval Schedules as an index or "one safe source" for all maintenance procedures.

### Maintenance Intervals

Use the service hour meter to determine servicing intervals. Calendar intervals shown (daily, weekly, monthly, etc.) can be used instead of service hour meter intervals if they provide more convenient servicing schedules and approximate the indicated service hour meter reading. Recommended service should always be performed at the interval that occurs first.

Under extremely severe, dusty or wet operating conditions, more frequent lubrication than is specified in the maintenance intervals chart might be necessary.

Perform service on items at multiples of the original requirement. For example, at every 500 service hours or 3 months, also service those items listed under every 250 service hours or monthly and every 10 service hours or daily.

## 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.

Battery posts, terminals and related accessories contain lead and lead compounds. **Wash hands after handling.**

## Certified Engine Maintenance

Proper maintenance and repair is essential to keep the engine and machine systems operating correctly. As the heavy duty off-road diesel engine owner, you are responsible for the performance of the required maintenance listed in the Owner Manual, Operation and Maintenance Manual, and Service Manual.

It is prohibited for any person engaged in the business of repairing, servicing, selling, leasing, or trading engines or machines to remove, alter, or render inoperative any emission related device or element of design installed on or in an engine or machine that is in compliance with the regulations (40 CFR Part 89). Certain elements of the machine and engine such as the exhaust system, fuel system, electrical system, intake air system and cooling system may be emission related and should not be altered unless approved by Caterpillar.

## Machine Capacity

Additional attachments or modifications may exceed machine design capacity which can adversely affect performance characteristics. Included would be stability and system certifications such as brakes, steering, and rollover protective structures (ROPS). Contact your Caterpillar dealer for further information.

## Caterpillar Product Identification Number

Effective First Quarter 2001 the Caterpillar Product Identification Number (PIN) has changed from 8 to 17 characters. In an effort to provide uniform equipment identification, Caterpillar and other construction equipment manufacturers are moving to comply with the latest version of the product identification numbering standard. Non-road machine PINs are defined by ISO 10261. The new PIN format will apply to all Caterpillar machines and generator sets. The PIN plates and frame marking will display the 17 character PIN. The new format will look like the following:

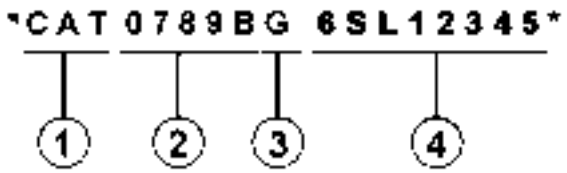



Illustration 1

Where:

1. Caterpillar's World Manufacturing Code (characters 1-3)

2. Machine Descriptor (characters 4-8)

3. Check Character (character 9)

4. Machine Indicator Section (MIS) or Product Sequence Number (characters 10-17). These were previously referred to as the Serial Number.

Machines and generator sets produced before First Quarter 2001 will maintain their 8 character PIN format. Components such as engines, transmissions, axles, etc. and work tools will continue to use an 8 character Serial Number (S/N).

# Safety Section (D6T LGP (OEM))

## Safety Messages

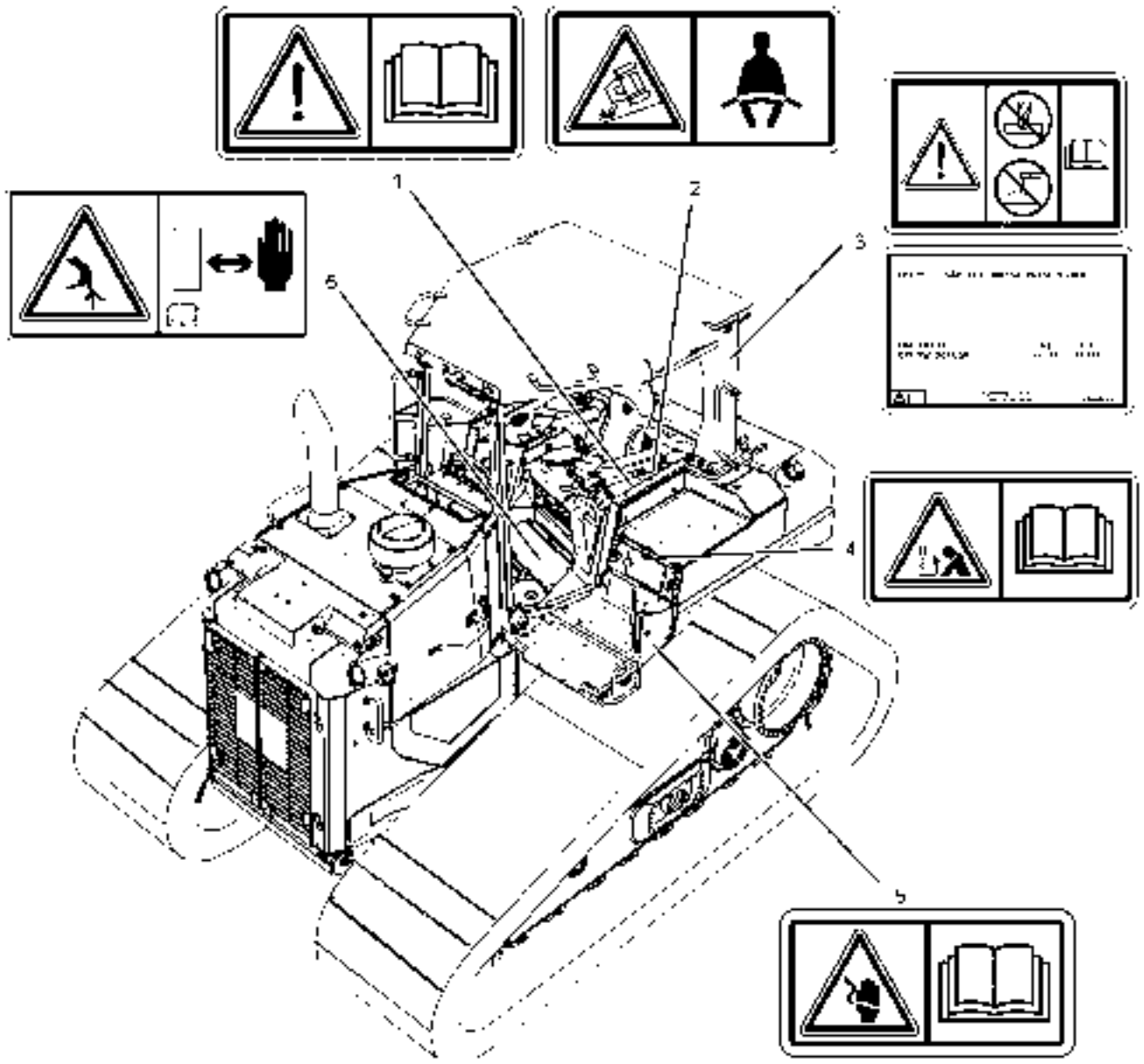



Illustration 2

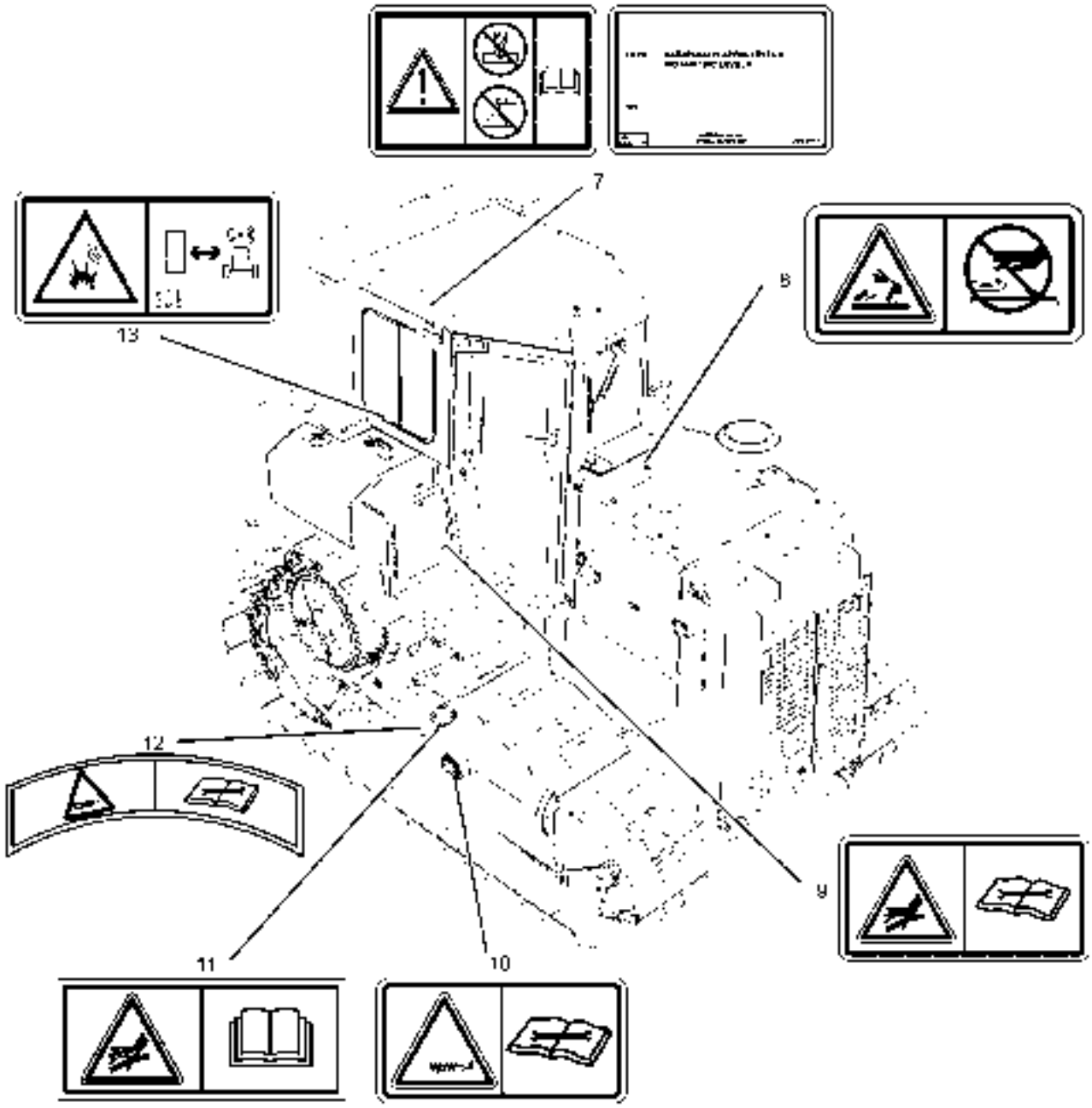



Illustration 3

There are several specific safety messages on this machine. The exact location of the hazards and the description of the hazards are reviewed in this section. Become familiarized with all safety messages.

Make sure that all of the safety messages are legible. Clean the safety messages or replace the safety messages if you cannot read the words. Replace the illustrations if the illustrations are not visible. When you clean the safety messages, use a cloth, water, and soap. Do not use solvent, gasoline, or other harsh chemicals to clean the safety messages. Solvents, gasoline, or harsh chemicals could loosen the adhesive that secures the safety message. Loose adhesive will allow the safety message to fall.

Replace any safety message that is damaged or missing. If a safety message is attached to a part of the machine that is replaced, install a safety message on the replacement part. Any Caterpillar dealer can provide new safety messages.

## Do Not Operate 1

Safety message (1) is positioned on the upper ledge of the left-hand console of the operator station.

**⚠ WARNING**

**Do not operate or work on this equipment unless you have read and understand the instructions and warnings in the Operation and Maintenance Manual. Failure to follow the instructions or heed the warnings could result in injury or death. Contact any Cat dealer for replacement manuals. Proper care is your responsibility.**

## Seat Belt (2)

Safety message (2) is located on the right console to the right of the dozer control.

**⚠ WARNING**

**A seat belt should be worn at all times during machine operation to prevent serious injury or death in the event of an accident or machine overturn. Failure to wear a seat belt during machine operation may result in serious injury or death.**

## Do Not Weld on the ROPS (3)

Safety message (3) is positioned on the vertical support of the outside left ROPS post.

**⚠ WARNING**

**Structural damage, an overturn, modification, alteration, or improper repair can impair this structure's protection capability thereby voiding this certification. Do not weld on or drill holes in the structure. This will void the certification. Consult your Cat dealer to determine this structure's limitations without voiding its certification.**

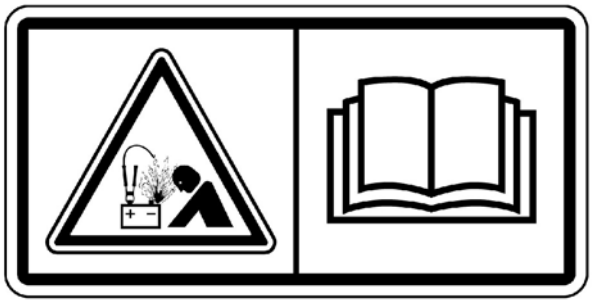
This machine has been certified to the standards that are listed on the certification plate. The maximum mass of the machine, which includes the operator and the attachments without a payload, should not exceed the mass on the certification plate.

A typical example of the certification plate is shown above.

Refer to Operation and Maintenance Manual, “Guards (Operator Protection)” for more information.

## Improper Connections for Jump Start Cables (4)

Safety message (4) is located on the bottom side of the battery box cover.

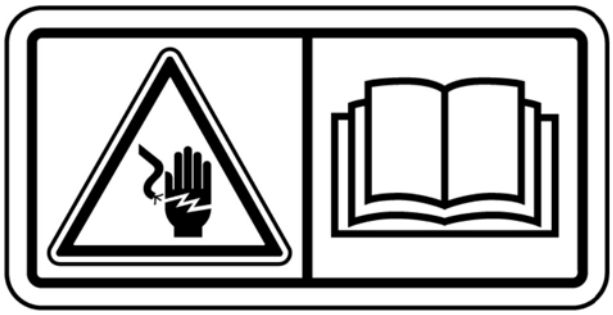


**WARNING**

**Explosion Hazard! Improper jumper cable connections can cause an explosion resulting in serious injury or death. Batteries may be located in separate compartments. Refer to the Operation and Maintenance Manual for the correct jump starting procedure.**

## Electrical Shock Hazard (5)

Safety message (5) is located on the inside of the fuse panel door that is inside the battery box on the left side of the machine.

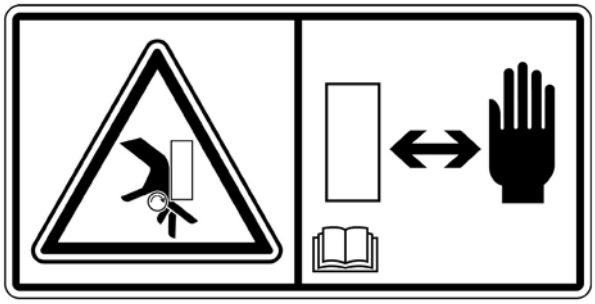


**WARNING**

**WARNING! Shock/Electrocution Hazard! Read and understand the instructions and warnings in the Operation and Maintenance Manual. Failure to follow the instructions or heed the warnings could cause serious injury or death.**

## Rotating Shaft (6)

This safety message (6) is located on top of the guard which is covering the drive shaft for the PTO pump. The film is visible by removing the floorplate of the cab.



**⚠ WARNING**

**Rotatins shaft pinch hazard. The shaft under this cover is rotating anytime the engine is running. Contact with a rotating shaft could cause injury or death. Keep hands away.**

## Do Not Weld on the FOPS (7)

Safety message (7) is positioned on the right side of the cab roof.

**⚠ WARNING**

**Structural damage, an overturn, modification, alteration, or improper repair can impair this structure's protection capability thereby voiding this certification. Do not weld on or drill holes in the structure. This will void the certification. Consult your Cat dealer to determine this structure's limitations without voiding its certification.**

This machine has been certified to the standards that are listed on the certification plate. The maximum mass of the machine, which includes the operator and the attachments without a payload, should not exceed the mass on the certification plate.

A typical example of the certification plate is shown above.

Refer to Operation and Maintenance Manual, “Guards (Operator Protection)” for more information.

## Hot Fluid Under Pressure (8)

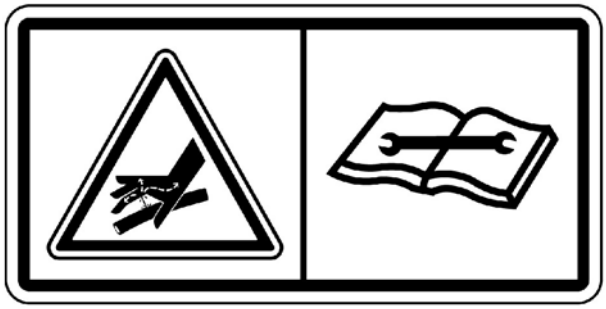
Safety message (8) is located on the bottom side of the radiator access cover.

**⚠ WARNING**

**Pressurized system! Hot coolant can cause serious burns, injury or death. To open the cooling system filler cap, stop the engine and wait until the cooling system components are cool. Loosen the cooling system pressure cap slowly in order to relieve the pressure. Read and understand the Operation and Maintenance Manual before performing any cooling system maintenance.**

## Hydraulic System Accumulator (9)

Safety message (9) is located inside the enclosure on the right-hand platform.

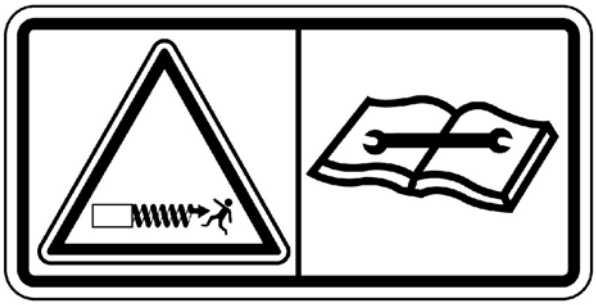


**⚠ WARNING**

**Hydraulic accumulator contains gas and oil under high pressure. Improper removal or repair procedures could cause severe injury. To remove or repair, instructions in the service manual must be followed. Special equipment is required for testing and charging.**

## High Pressure Recoil Spring (10)

Safety message (9) is located inside the cover for the twister resister on both track roller frames.

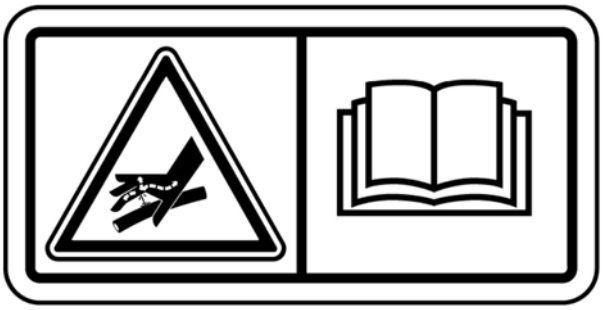


**⚠ WARNING**

**Recoil spring force, if not relieved, can result in personal injury or death. Relieve spring force before removing the threaded retainer, performing repairs on the recoil spring housing, or removing the recoil spring. Consult a Caterpillar dealer for disassembly instructions.**

## High Pressure Cylinder (11)

Safety message (11) is located on the access cover on both track roller frames.



**⚠ WARNING**

**Personal injury or death can result from grease under pressure.**

**Grease coming out of the relief valve under pressure can penetrate the body causing injury or death.**

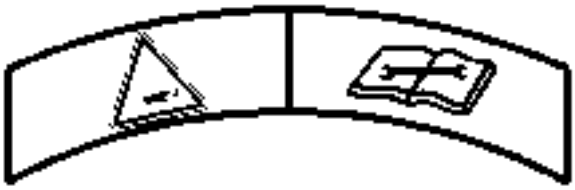
**Do not watch the relief valve to see if grease is escaping. Watch the track or track adjustment cylinder to see if the track is being loosened.**

**Loosen the relief valve one turn only.**

**If track does not loosen, close the relief valve and contact your Caterpillar dealer.**

## Compressed Recoil Spring (12)

Safety message (12) is located inside both track roller frames. The safety message is located on the front frame of the rear track roller frame.



**⚠ WARNING**

**Personal injury or death can result from a compressed recoil spring being released suddenly using incorrect disassembly procedures.**

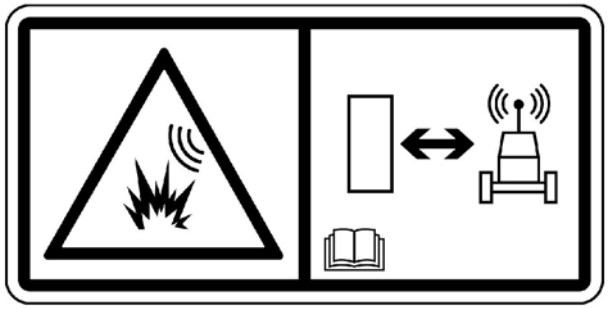
**A recoil spring that is still held in compression can result in the recoil spring being released unexpectedly with extreme force which could cause serious injury or death.**

**Make sure that the correct disassembly procedure is used, if a front track roller frame that has a crack in the parent metal or weld connection (or a tubular section that has separated from the front of the frame assembly) when the recoil spring is still held in compression.**

**Refer to Special Instruction, SMHS8273 which contains the disassembly procedure that must be used to decrease the possibility of injury while performing service on the track roller frame.**

## Product Link (13)

Safety message (13) is located on the console to the right of the operator seat. Refer to Operation and Maintenance Manual, SEBU7351 " Product Link" for information about this service tool.



**⚠ WARNING**

**This machine is equipped with a Caterpillar Product Link communication device. When electric/electronic detonators are used, this communication device should be deactivated within 12 m (40 ft) of a blast site, or within the distance mandated under applicable legal requirements. Failure to do so could cause interference with blasting operations and result in serious injury or death.**

# Additional Messages

There are several specific messages on this machine. The exact location of the hazards and the description of the hazards are reviewed in this section. Become familiarized with all messages.

Make sure that all of the messages are legible. Clean the messages or replace the messages if you cannot read the words. Replace the illustrations if the illustrations are not legible. When you clean the messages, use a cloth, water, and soap. Do not use solvent, gasoline, or other harsh chemicals to clean the messages. Solvents, gasoline, or harsh chemicals could loosen the adhesive that secures the message. Loose adhesive will allow the message to fall.

Replace any message that is damaged, or missing. If a message is attached to a part that is replaced, install a message on the replacement part. Any Cat dealer can provide new messages.

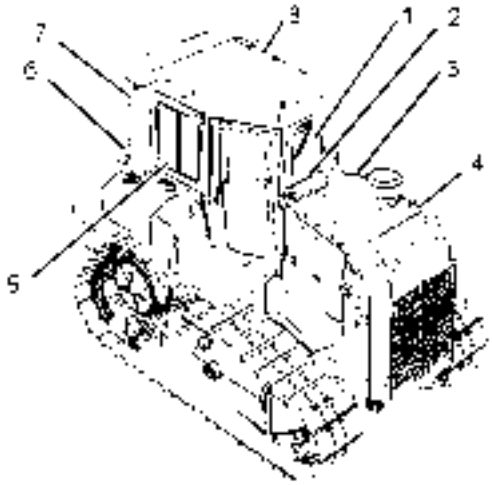



Illustration 4

**Steering Control (1)**

This message is located on the left side console outward from the differential steering control.

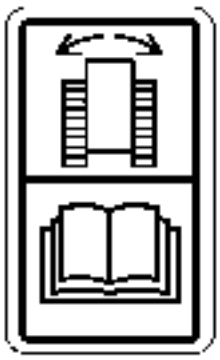


Illustration 5

NOTICE

When the steering lever is moved with the transmission in NEUTRAL or in gear, and the engine is running, the machine will turn. Engage the steering control lock by engaging the parking brake in order to prevent machine movement.

**Air Conditioner (2)**

This message is located in the cab on the left side of the instrument panel, if equipped.

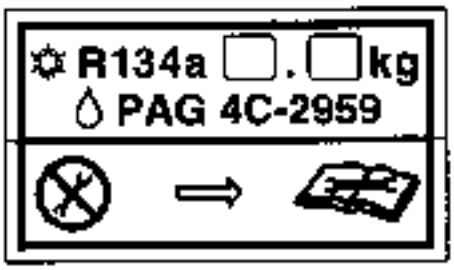



Illustration 6

This message for the air conditioner has the appropriate information for the following services: the air conditioner lubricant, the refrigerant charge and the refrigerant capacity. Also, this safety message instructs the usage of the proper safety information.

Follow instruction in order to avoid engine damage.

**Air Cleaner (3)**

This message is located on the cover of the air cleaner.

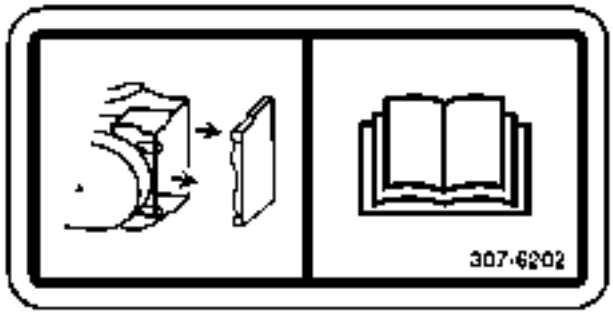



Illustration 7

To avoid engine damage, use only Caterpillar radial seal air filters as replacement filters. Refer to the following topics for correct replacement instructions:

- Operation and Maintenance Manual, “Engine Air Filter Primary Element - Clean/Replace”
- Operation and Maintenance Manual, “Engine Air Filter Secondary Element - Replace”

**Required Engine Oil (4)**

This message is located on the engine oil filler tube.

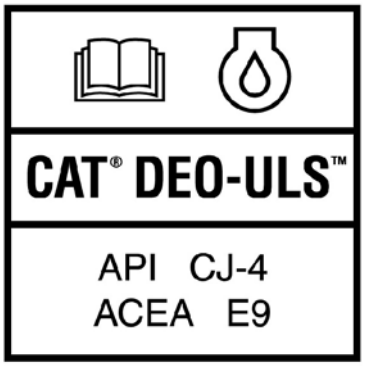



Illustration 8

Refer to Operation and Maintenance Manual, “Lubricant Viscosities”.

The engine must be shut off before any maintenance is performed. Use a wand in order to clean debris from the fan and baffle assembly.

**Product Link (5)**

This message is located beneath the left window inside the cab.

Illustration 9

The Product Link System is a communication device that transmits information regarding the machine back to Caterpillar and Caterpillar dealers and customers. All logged events and diagnostic codes that are available to the Caterpillar Electronic Technician (ET) on the CAT data link can be sent to the receiving station. Information can also be sent to the Product Link System. The information is used to improve Caterpillar products and Caterpillar services.

The Product Link is also available in cellular format.

Refer to Operation and Maintenance Manual, “Product Link” for more information.

**Reference:** See Operation and Maintenance Manual, “Maintenance Interval Schedule” for all maintenance recommendations.

**Diesel Fuel Requirements (6)**

One of the following messages is located next to the fuel filler cap.

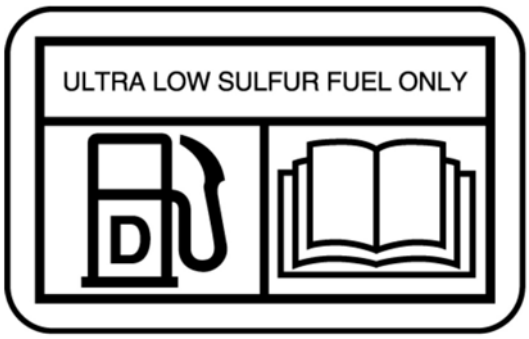



Illustration 10

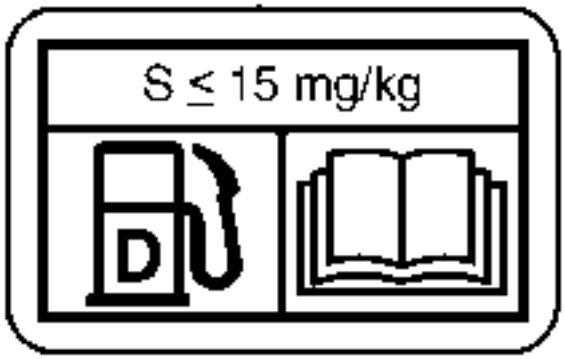



Illustration 11

Use only Ultralow Sulfur Diesel (ULSD) fuel.

**Note:** In Europe, diesel fuels that are identified as meeting “European Standard EN590:2004” requirements for ≤ 10 ppm sulfur fuel (typically referred to as “sulfur-free”) generally meet Cat requirements for ULSD fuel.

Refer to Operation and Maintenance Manual, “Lubricant Viscosities” for more information.

**FCC Compliance (7)**

This message is located on the product link module on the back right ROPS of the cab.

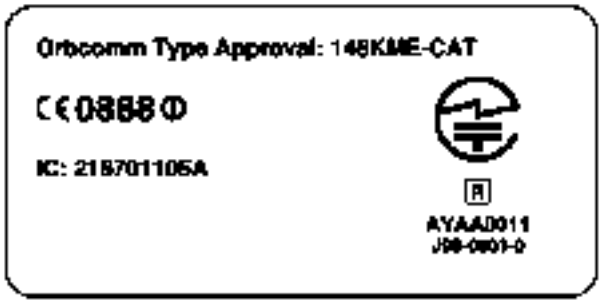



Illustration 12

Consult your Cat dealer with any questions that concern the operation of the Product Link in a specific country.

**“No Weld/No Drill” (8)**

This message is located on the left-hand ROPS post.

Illustration 13

# General Hazard Information


Illustration 14

Attach a “Do Not Operate” warning tag or a similar warning tag to the start switch or to the controls. Attach the warning tag before you service the equipment or before you repair the equipment. These warning tags (Special Instruction, SEHS7332) are available from your Cat dealer.

**⚠ WARNING**

**Operating the machine while distracted can result in the loss of machine control. Use extreme caution when using any device while operating the machine. Operating the machine while distracted can result in personal injury or death.**

Know the width of your equipment in order to maintain proper clearance when you operate the equipment near fences or near boundary obstacles.

Be aware of high voltage power lines and power cables that are buried. If the machine comes in contact with these hazards, serious injury or death may occur from electrocution.

Illustration 15

Wear a hard hat, protective glasses, and other protective equipment, as required.

Do not wear loose clothing or jewelry that can snag on controls or on other parts of the equipment.

Make sure that all protective guards and all covers are secured in place on the equipment.

Keep the equipment free from foreign material. Remove debris, oil, tools, and other items from the deck, from walkways, and from steps.

Secure all loose items such as lunch boxes, tools, and other items that are not a part of the equipment.

Know the appropriate work site hand signals and the personnel that are authorized to give the hand signals. Accept hand signals from one person only.

Do not smoke when you service an air conditioner. Also, do not smoke if refrigerant gas may be present. Inhaling the fumes that are released from a flame that contacts air conditioner refrigerant can cause bodily harm or death. Inhaling gas from air conditioner refrigerant through a lighted cigarette can cause bodily harm or death.

Never put maintenance fluids into glass containers. Drain all liquids into a suitable container.

Obey all local regulations for the disposal of liquids.

Use all cleaning solutions with care. Report all necessary repairs.

Do not allow unauthorized personnel on the equipment.

Unless you are instructed otherwise, perform maintenance with the equipment in the servicing position. Refer to Operation and Maintenance Manual, for the procedure for placing the equipment in the servicing position.

When you perform maintenance above ground level, use appropriate devices such as ladders or man lift machines. If equipped, use the machine anchorage points and use approved fall arrest harnesses and lanyards.

## Pressurized Air and Water

Pressurized air and/or water can cause debris and/or hot water to be blown out. The debris and/or hot water could result in personal injury.

When pressurized air and/or pressurized water is used for cleaning, wear protective clothing, protective shoes, and eye protection. Eye protection includes goggles or a protective face shield.

The maximum air pressure for cleaning purposes must be reduced to 205 kPa (30 psi) when the nozzle is deadheaded and the nozzle is used with an effective chip deflector and personal protective equipment. The maximum water pressure for cleaning purposes must be below 275 kPa (40 psi).

## Trapped Pressure

Pressure can be trapped in a hydraulic system. Releasing trapped pressure can cause sudden machine movement or attachment movement. Use caution if you disconnect hydraulic lines or fittings. High-pressure oil that is released can cause a hose to whip. High-pressure oil that is released can cause oil to spray. Fluid penetration can cause serious injury and possible death.

## Fluid Penetration

Pressure can be trapped in the hydraulic circuit long after the engine has been stopped. The pressure can cause hydraulic fluid or items such as pipe plugs to escape rapidly if the pressure is not relieved correctly.

Do not remove any hydraulic components or parts until pressure has been relieved or personal injury may occur. Do not disassemble any hydraulic components or parts until pressure has been relieved or personal injury may occur. Refer to the Service Manual for any procedures that are required to relieve the hydraulic pressure.

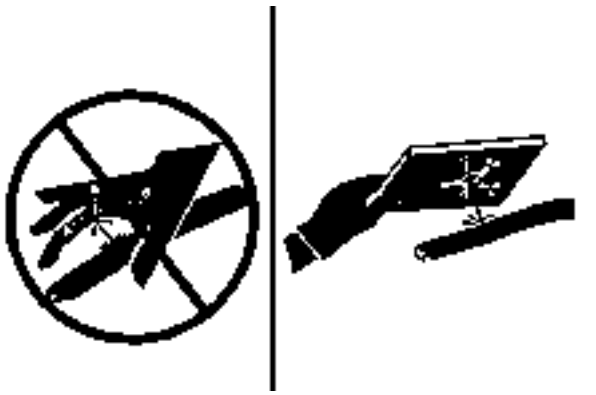


Illustration 16

Always use a board or cardboard when you check for a leak. Leaking fluid that is under pressure can penetrate body tissue. Fluid penetration can cause serious injury and possible death. A pin hole leak can cause severe injury. If fluid is injected into your skin, you must get treatment immediately. Seek treatment from a doctor that is familiar with this type of injury.

## Containing Fluid Spillage

Care must be taken in order to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting, and repair of the equipment. Prepare to collect the fluid with suitable containers before opening any compartment or disassembling any component that contains fluids.

Refer to Special Publication, NENG2500, “Caterpillar Dealer Service Tool Catalog” for the following items:

- Tools that are suitable for collecting fluids and equipment that is suitable for collecting fluids
- Tools that are suitable for containing fluids and equipment that is suitable for containing fluids

Obey all local regulations for the disposal of liquids.

## Inhalation

Illustration 17

### Exhaust

Use caution. Exhaust fumes can be hazardous to your health. If you operate the machine in an enclosed area, adequate ventilation is necessary.

### Asbestos Information

Cat equipment and replacement parts that are shipped from Caterpillar are asbestos free. Caterpillar recommends the use of only genuine Cat replacement parts. Use the following guidelines when you handle any replacement parts that contain asbestos or when you handle asbestos debris.

Use caution. Avoid inhaling dust that might be generated when you handle components that contain asbestos fibers. Inhaling this dust can be hazardous to your health. The components that may contain asbestos fibers are brake pads, brake bands, lining material, clutch plates, and some gaskets. The asbestos that is used in these components is bound in a resin or sealed in some way. Normal handling is not hazardous unless airborne dust that contains asbestos is generated.

If dust that may contain asbestos is present, there are several guidelines that should be followed:

- Never use compressed air for cleaning.
- Avoid brushing materials that contain asbestos.
- Avoid grinding materials that contain asbestos.
- Use a wet method in order to clean up asbestos materials.
- A vacuum cleaner that is equipped with a high efficiency particulate air filter (HEPA) can also be used.
- Use exhaust ventilation on permanent machining jobs.
- Wear an approved respirator if there is no other way to control the dust.
- Comply with applicable rules and regulations for the work place. In the United States, use Occupational Safety and Health Administration (OSHA) requirements. These OSHA requirements can be found in “29 CFR 1910.1001”.
- Obey environmental regulations for the disposal of asbestos.
- Stay away from areas that might have asbestos particles in the air.

## Dispose of Waste Properly

Illustration 18

Improperly disposing of waste can threaten the environment. Potentially harmful fluids should be disposed of according to local regulations.

Always use leakproof containers when you drain fluids. Do not pour waste onto the ground, down a drain, or into any source of water.

# Crushing Prevention and Cutting Prevention

Support the equipment properly before you perform any work or maintenance beneath that equipment. Do not depend on the hydraulic cylinders to hold up the equipment. Equipment can fall if a control is moved, or if a hydraulic line breaks.

Do not work beneath the cab of the machine unless the cab is properly supported.

Unless you are instructed otherwise, never attempt adjustments while the machine is moving or while the engine is running.

Never jump across the starter solenoid terminals in order to start the engine. Unexpected machine movement could result.

Whenever there are equipment control linkages the clearance in the linkage area will change with the movement of the equipment or the machine. Stay clear of areas that may have a sudden change in clearance with machine movement or equipment movement.

Stay clear of all rotating and moving parts.

If it is necessary to remove guards in order to perform maintenance, always install the guards after the maintenance is performed.

Keep objects away from moving fan blades. The fan blade will throw objects or cut objects.

Do not use a kinked wire cable or a frayed wire cable. Wear gloves when you handle wire cable.

When you strike a retainer pin with force, the retainer pin can fly out. The loose retainer pin can injure personnel. Make sure that the area is clear of people when you strike a retainer pin. To avoid injury to your eyes, wear protective glasses when you strike a retainer pin.

Chips or other debris can fly off an object when you strike the object. Make sure that no one can be injured by flying debris before striking any object.

# Burn Prevention

Do not touch any part of an operating engine. Allow machine systems to cool before any maintenance is performed. Relieve all pressure in the air system, in the oil system, in the lubrication system, in the fuel system, or in the cooling system before any lines, fittings, or related items are disconnected.

## Exhaust Gas Recirculation Cooler

The exhaust gas recirculation (EGR) cooler may contain a small amount of sulfuric acid. The use of fuel with sulfur levels greater than 15 ppm may increase the amount of sulfuric acid that is formed. The sulfuric acid may spill from the EGR cooler during service of the engine. The sulfuric acid will burn the eyes, skin, and clothing on contact. Always wear eye shields, rubber gloves, and protective clothing when you may come in contact with fluids that may spill from the EGR cooler. If fluid contacts the eyes, immediately flush with water and seek medical help.

## Coolant

When the engine is at operating temperature, the engine coolant is hot. The coolant is also under pressure. The radiator and all lines to the heaters or to the engine contain hot coolant.

Any contact with hot coolant or with steam can cause severe burns. Allow cooling system components to cool before the cooling system is drained.

Check the coolant level only after the engine has been stopped.

Ensure that the filler cap is cool before removing the filler cap. The filler cap must be cool enough to touch with a bare hand. Remove the filler cap slowly in order to relieve pressure.

Cooling system conditioner contains alkali. Alkali can cause personal injury. Do not allow alkali to contact the skin, the eyes, or the mouth.

## Oils

Hot oil and hot components can cause personal injury. Do not allow hot oil to contact the skin. Also, do not allow hot components to contact the skin.

Remove the hydraulic tank filler cap only after the engine has been stopped. The filler cap must be cool enough to touch with a bare hand. Follow the standard procedure in this manual in order to remove the hydraulic tank filler cap.

## Batteries

Electrolyte is an acid. Electrolyte can cause personal injury. Do not allow electrolyte to contact the skin or the eyes. Always wear protective glasses for servicing batteries. Wash hands after touching the batteries and connectors. Use of gloves is recommended.

# Fire Prevention and Explosion Prevention

Illustration 19

## Regeneration

The exhaust gas temperatures during regeneration will be elevated. Follow proper fire prevention instructions and use the disable regeneration function when appropriate.

## General

All fuels, most lubricants, and some coolant mixtures are flammable.

To minimize the risk of fire or explosion, the following actions are recommended.

Always perform a Walk-Around Inspection, which may help you identify a fire hazard. Do not operate a machine when a fire hazard exists. Contact your dealer for service.

Understand the use of the primary exit and alternative exit on the machine. Refer to Operation and Maintenance Manual, “Alternative Exit”.

Do not operate a machine with a fluid leak. Repair leaks and clean up fluids before resuming machine operation. Fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire. A fire may cause personal injury or death.

Remove flammable material such as leaves, twigs, papers, trash, and so on. These items may accumulate in the engine compartment or around other hot areas and hot parts on the machine.

Keep the access doors to major machine compartments closed and access doors in working condition in order to permit the use of fire suppression equipment, in case a fire should occur.

Clean all accumulations of flammable materials such as fuel, oil, and debris from the machine.

Do not operate the machine near any flame.

Keep shields in place. Exhaust shields (if equipped) protect hot exhaust components from oil spray or fuel spray in a break in a line, in a hose, or in a seal. Exhaust shields must be installed correctly.

Do not weld or flame cut on tanks or lines that contain flammable fluids or flammable material. Empty and purge the lines and tanks. Then clean the lines and tanks with a nonflammable solvent prior to welding or flame cutting. Ensure that the components are properly grounded in order to avoid unwanted arcs.

Dust that is generated from repairing nonmetallic hoods or fenders may be flammable and/or explosive. Repair such components in a ventilated area away from open flames or sparks. Use suitable Personal Protection Equipment (PPE).

Inspect all lines and hoses for wear or deterioration. Replace damaged lines and hoses. The lines and the hoses should have adequate support and secure clamps. Tighten all connections to the recommended torque. Damage to the protective cover or insulation may provide fuel for fires.

Store fuels and lubricants in properly marked containers away from unauthorized personnel. Store oily rags and flammable materials in protective containers. Do not smoke in areas that are used for storing flammable materials.

Illustration 20

Use caution when you are fueling a machine. Do not smoke while you are fueling a machine. Do not fuel a machine near open flames or sparks. Always stop the engine before fueling. Fill the fuel tank outdoors. Properly clean areas of spillage.

Never store flammable fluids in the operator compartment of the machine.

## Battery and Battery Cables

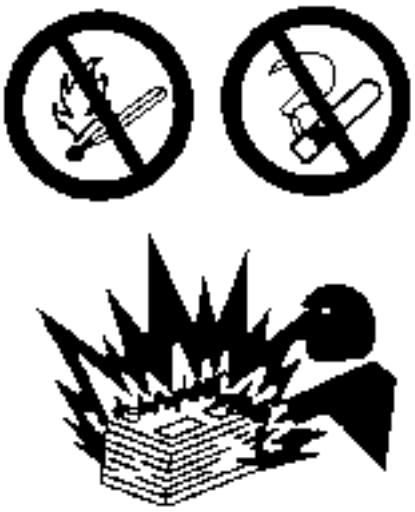


Illustration 21

The following actions are recommended to minimize the risk of fire or an explosion related to the battery.

Do not operate a machine if battery cables or related parts show signs of wear or damage. Contact your dealer for service.

Follow safe procedures for engine starting with jump-start cables. Improper jumper cable connections can cause an explosion that may result in injury. Refer to Operation and Maintenance Manual, “Engine Starting with Jump Start Cables” for specific instructions.

Do not charge a frozen battery. This action may cause an explosion.

Gases from a battery can explode. Keep any open flames or sparks away from the top of a battery. Do not smoke in battery charging areas.

Never check the battery charge by placing a metal object across the terminal posts. Use a voltmeter in order to check the battery charge.

Daily inspect battery cables that are in areas that are visible. Inspect cables, clips, straps, and other restraints for damage. Replace any damaged parts. Check for signs of the following, which can occur over time due to use and environmental factors:

- Fraying
- Abrasion
- Cracking
- Discoloration
- Cuts on the insulation of the cable
- Fouling
- Corroded terminals, damaged terminals, and loose terminals

Replace damaged battery cable(s) and replace any related parts. Eliminate any fouling, which may have caused insulation failure or related component damage or wear. Ensure that all components are reinstalled correctly.

An exposed wire on the battery cable may cause a short to ground if the exposed area comes into contact with a grounded surface. A battery cable short produces heat from the battery current, which may be a fire hazard.

An exposed wire on the ground cable between the battery and the disconnect switch may cause the disconnect switch to be bypassed if the exposed area comes into contact with a grounded surface. This action may result in an unsafe condition for servicing the machine. Repair components or replace components before servicing the machine.

**⚠ WARNING**

**Fire on a machine can result in personal injury or death. Exposed battery cables that come into contact with a grounded connection can result in fires. Replace cables and related parts that show signs of wear or damage. Contact your Cat dealer.**

## Wiring

Check electrical wires daily. If any of the following conditions exist, replace parts before you operate the machine.

- Fraying
- Signs of abrasion or wear

- Cracking
- Discoloration
- Cuts on insulation
- Other damage

Make sure that all clamps, guards, clips, and straps are reinstalled correctly. This actioin will help to prevent vibration, rubbing against other parts, and excessive heat during machine operation.

Attaching electrical wiring to hoses and tubes that contain flammable fluids or combustible fluids should be avoided.

Consult your Cat dealer for repair or for replacement parts.

Keep wiring and electrical connections free of debris.

## Lines, Tubes, and Hoses

Do not bend high-pressure lines. Do not strike high-pressure lines. Do not install any lines that are bent or damaged. Use the appropriate backup wrenches in order to tighten all connections to the recommended torque.

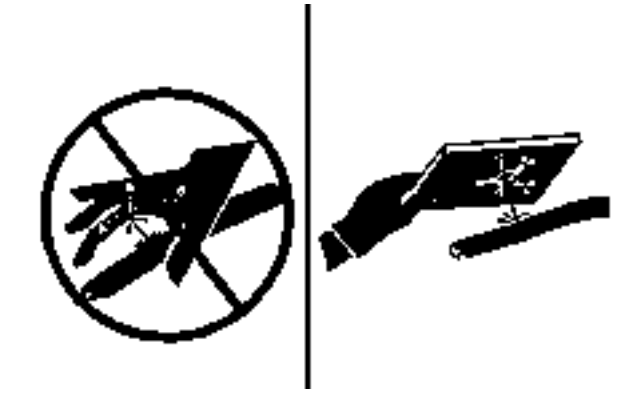


Illustration 22

Check lines, tubes, and hoses carefully. Wear Personal Protection Equipment (PPE) in order to check for leaks. Always use a board or cardboard when you check for a leak. Leaking fluid that is under pressure can penetrate body tissue. Fluid penetration can cause serious injury and possible death. A pin hole leak can cause severe injury. If fluid is injected into your skin, you must get treatment immediately. Seek treatment from a doctor that is familiar with this type of injury.

Replace the affected parts if any of the following conditions are present:

- End fittings are damaged or leaking.
- Outer coverings are chafed or cut.
- Wires are exposed.
- Outer coverings are swelling or ballooning.
- Flexible parts of the hoses are kinked.
- Outer covers have exposed embedded armoring.
- End fittings are displaced.

Make sure that all clamps, guards, and heat shields are installed correctly. During machine operation, this action will help to prevent vibration, rubbing against other parts, excessive heat, and failure of lines, tubes, and hoses.

Do not operate a machine when a fire hazard exists. Repair any lines that are corroded, loose, or damaged. Leaks may provide fuel for fires. Consult your Cat dealer for repair or for replacement parts. Use genuine Cat parts or the equivalent, for capabilities of both the pressure limit and temperature limit.

## Ether

Ether (if equipped) is commonly used in cold-weather applications. Ether is flammable and poisonous.

Follow the correct cold engine starting procedures. Refer to the section in the Operation and Maintenance Manual, with the label “Engine Starting”.

Do not spray ether manually into an engine if the machine is equipped with a thermal starting aid for cold weather starting.

Use ether in ventilated areas. Do not smoke while you are replacing an ether cylinder or while you are using an ether spray.

Do not store ether cylinders in living areas or in the operator compartment of a machine. Do not store ether cylinders in direct sunlight or in temperatures above 49° C (120.2° F). Keep ether cylinders away from open flames or sparks.

Dispose of used ether cylinders properly. Do not puncture an ether cylinder. Keep ether cylinders away from unauthorized personnel.

## Fire Extinguisher

As an additional safety measure, keep a fire extinguisher on the machine.

Be familiar with the operation of the fire extinguisher. Inspect the fire extinguisher and service the fire extinguisher regularly. Follow the recommendations on the instruction plate.

Consider installation of an aftermarket Fire Suppression System, if the application and working conditions warrant the installation.

# Fire Safety

**Note:** Locate secondary exits and how to use the secondary exits before you operate the machine.

**Note:** Locate fire extinguishers and how to use a fire extinguisher before you operate the machine.

If you find that you are involved in a machine fire, your safety and that of others on site is the top priority. The following actions should only be performed if the actions do not present a danger or risk to you and any nearby people. At all times you should assess the risk of personal injury and move away to a safe distance as soon as you feel unsafe.

Move the machine away from nearby combustible material such as fuel/oil stations, structures, trash, mulch and timber.

Lower any implements and turn off the engine as soon as possible. If you leave the engine running, the engine will continue to feed a fire. The fire will be fed from any damaged hoses that are attached to the engine or pumps.

If possible, turn the battery disconnect switch to the OFF position. Disconnecting the battery will remove the ignition source in the event of an electrical short. Disconnecting the battery will eliminate a second ignition source if electrical wiring is damaged by the fire, resulting in a short circuit.

Notify emergency personnel of the fire and your location.

If your machine is equipped with a fire suppression system, follow the manufacturers procedure for activating the system.

**Note:** Fire suppression systems need to be regularly inspected by qualified personnel. You must be trained to operate the fire suppression system.

Use the on-board fire extinguisher and use the following procedure:

1. Pull the pin.
2. Aim the extinguisher or nozzle at the base of the fire.
3. Squeeze the handle and release the extinguishing agent.
4. Sweep the extinguisher from side to side across the base of the fire until the fire is out.

Remember, if you are unable to do anything else, shut off the machine before exiting. By shutting off the machine, fuels will not continue to be pumped into the fire.

If the fire grows out of control, be aware of the following risks:

- Tires on wheeled machines pose a risk of explosion as tires burn. Hot shrapnel and debris can be thrown great distances in an explosion.
- Tanks, accumulators, hoses, and fittings can rupture in a fire, spraying fuels and shrapnel over a large area.
- Remember that nearly all of the fluids on the machine are flammable, including coolant and oils. Additionally, plastics, rubbers, fabrics, and resins in fiberglass panels are also flammable.

# Fire Extinguisher Location

Make sure that a fire extinguisher is available. Be familiar with the operation of the fire extinguisher. Inspect the fire extinguisher and service the fire extinguisher. Obey the recommendations on the instruction plate.

Mount the fire extinguisher in the accepted location per local regulations.

If your machine is equipped with a ROPS structure, strap the mounting plate to the ROPS in order to mount the fire extinguisher. If the weight of the fire extinguisher exceeds 4.5 kg (10 lb), mount the fire extinguisher near the bottom of the ROPS. Do not mount the fire extinguisher at the upper one-third area of the ROPS.

Do not weld the ROPS structure in order to install the fire extinguisher. Also, do not drill holes in the ROPS structure in order to mount the fire extinguisher on the ROPS.

Consult your Cat dealer for the proper procedure for mounting the fire extinguisher.

# Track Information

Track adjusting systems use either grease or oil under high pressure to keep the track under tension.

Grease or oil under high pressure coming out of the relief valve can penetrate the body causing injury or death. Do not watch the relief valve to see if grease or oil is escaping. Watch the track or track adjustment cylinder to see if the track is being loosened.

The pins and bushings in a dry track pin joint can become very hot. It is possible to burn the fingers if there is more than brief contact with these components.

# Electrical Storm Injury Prevention

When lightning is striking in the vicinity of the machine, the operator should never attempt the following procedures:

- Mount the machine.
- Dismount the machine.

If you are in the operator's station during an electrical storm, stay in the operator's station. If you are on the ground during an electrical storm, stay away from the vicinity of the machine.

# Before Starting Engine

Start the engine only from the operator's compartment. Do not short across the battery terminals and do not short across the batteries. Bypassing the engine neutral start system can damage the electrical system.

Inspect the condition of the seat belt and mounting hardware. Replace any damaged parts or worn parts. Regardless of appearance, replace the seat belt after three years of use. Do not use an extension for a seat belt on a retractable seat belt.

Adjust the seat so that full pedal travel can be achieved. Make sure that the operator's back is against the back of the seat.

Make sure that the machine is equipped with a lighting system that is adequate for the job conditions. Make sure that all lights are working properly. Before you start the engine or before you move the machine, make sure that no one is working on the machine, working underneath the machine or working close to the machine. Make sure that the area is free of personnel.

# Engine Starting

If a warning tag is attached to the start switch or attached to the controls, do not start the engine. Also, do not move any controls.

Move all hydraulic controls to the HOLD position before starting the engine. Move the direction control (switch) to NEUTRAL.

Engage the parking brake switch.

Diesel engine exhaust contains products of combustion. These products can be harmful to your health. Always start the engine and always operate the engine in a ventilated area. If you are in an enclosed area, vent the exhaust to the outside.

Check for the presence of bystanders or maintenance personnel. Ensure that all personnel are clear of the machine.

Briefly sound the horn before you start the engine.

# Before Operation

Clear all personnel from the machine and from the area.

Remove all obstacles from the path of the machine. Beware of hazards such as wires, ditches, etc.

Be sure that all windows are clean. Secure the doors and the windows in either the open position or the shut position.

Adjust the rearview mirrors (if equipped) for best vision close to the machine. Make sure that the machine horn, the backup alarm (if equipped) and all other warning devices are working properly.

**Reference:** Refer to Operation and Maintenance Manual, “Daily Inspection” in this manual.

Fasten the seat belt securely.

# Visibility Information

Before you start the machine, perform a walk-around inspection in order to ensure that there are no hazards around the machine.

While the machine is in operation, constantly survey the area around the machine in order to identify potential hazards as hazards become visible around the machine.

Your machine may be equipped with visual aids. Some examples of visual aids are Closed Circuit Television (CCTV) and mirrors. Before operating the machine, ensure that the visual aids are in proper working condition and that the visual aids are clean. Adjust the visual aids using the procedures that are located in this Operation and Maintenance Manual,. If equipped, the Work Area Vision System shall be adjusted according to Operation and Maintenance Manual, SEBU8157 “Work Area Vision System”.

It may not be possible to provide direct visibility on large machines to all areas around the machine. Appropriate job site organization is required in order to minimize hazards that are caused by restricted visibility. Job site organization is a collection of rules and procedures that coordinates machines and people that work together in the same area. Examples of job site organization include the following:

- Safety instructions
- Controlled patterns of machine movement and vehicle movement
- Workers that direct traffic to move when it is safe
- Restricted areas
- Operator training
- Warning symbols or warning signs on machines or on vehicles
- A system of communication
- Communication between workers and operators prior to approaching the machine

Modifications of the machine configuration by the user that result in a restriction of visibility shall be evaluated.

# Restricted Visibility (If Equipped)

The size and the configuration of this machine may result in areas that cannot be seen when the operator is seated. Illustration 23 provides an approximate visual indication of areas of significant restricted visibility. Illustration 23 indicates restricted visibility areas at ground level inside a radius of 12 m (40 ft) from the operator on a machine without the use of optional visual aids. This illustration does not provide areas of restricted visibility for distances outside a radius of 12 m (40 ft).

This machine may be equipped with optional visual aids that may provide visibility to some areas with restricted visibility. Refer to this Operation and Maintenance Manual, “Mirror” for more information on additional visibility. If your machine is equipped with cameras, refer to this Operation and Maintenance Manual, “Camera” for more information on additional visibility. For areas that are not covered by the optional visual aids, the job site organization must be utilized to minimize hazards of this restricted visibility. See Operation and Maintenance Manual, “Visibility Information” for more information regarding job site organization.

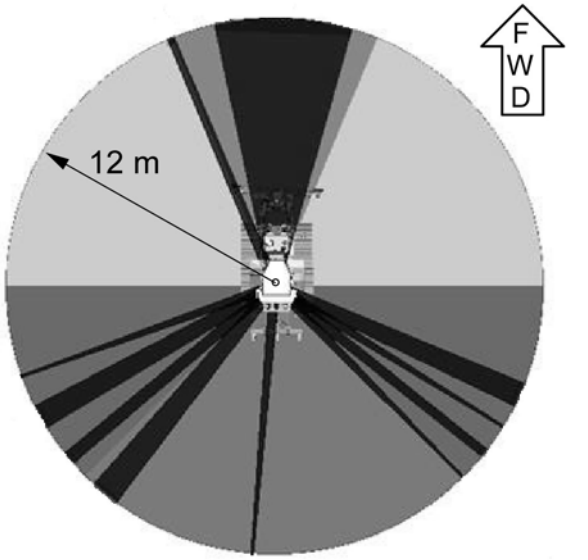



Illustration 23

Top view of the Track-Type Tractor machine

**Note:** The shaded areas indicate the approximate location of areas with significant restricted visibility.

# Operation

## Machine Operating Temperature Range

The standard machine configuration is intended for use within an ambient temperature range of –40 °C (–40 °F) to 50 °C (122 °F). Special configurations for different ambient temperatures may be available. Consult your Caterpillar dealer for additional information on special configurations of your machine.

## Machine Operation

Only operate the machine while you are in a seat. The seat belt must be fastened while you operate the machine. Only operate the controls while the engine is running.

Before you move the machine, make sure that no one will be endangered.

Check for proper operation of all controls and protective devices while you operate the machine slowly in an open area.

Do not allow riders on the machine unless the machine has the following equipment:

- additional seat

- additional seat belt
- Roll over Protective Structure (ROPS)

Never use the work tool as a work platform.

Report any needed repairs that were noted during operation.

Do not go close to the edge of a cliff, an excavation, or an overhang.

If the machine begins to sideslip, perform the following procedure:

- Discard the load.
- Turn the machine downhill.

Be careful to avoid any condition which could cause the machine to tip. The machine can tip when you work on hills, banks, and slopes. Also, the machine can tip when you cross ditches, ridges, or other obstacles.

Whenever possible, operate the machine up the slopes and down the slopes. Avoid operating the machine across the slope, when possible.

Keep the machine under control. Do not overload the machine beyond capacity.

Be sure that the towing eyes and towing devices are adequate.

Towing eyes and towing devices should only be used to recover the machine.

Connect trailing equipment to a drawbar or to a hitch only.

When you maneuver the machine to connect equipment, be sure that there are no personnel between the machine and trailing equipment. Block the hitch of the trailing equipment in order to align the equipment with the drawbar.

Never straddle a wire cable or allow other personnel to straddle a wire cable.

When you maneuver to connect the equipment, make sure that no personnel are between the machine and trailing equipment. Block the hitch of the trailing equipment in order to align the equipment with the drawbar.

Know the maximum dimensions of your machine.

Always keep the Rollover Protective Structure (ROPS) installed during machine operation.

### Lifting Capacities

Maintain control of the machine. Do not overload the machine beyond the machine capacity. Ensure that the correct load chart is referenced. Loads must be within the capabilities of the machine. Lifting capacity decreases as the load is moved further from the machine.

Use lifting slings that are approved and use lifting slings that are load tested. Also, all wire ropes or chains must be properly maintained. The wire ropes and chains must meet local regulations. You must know the load carrying capacity of these devices and you must know the correct use of these devices.

## Limitations on Lifting Loads That Exceed the Working Range

Do not load the boom beyond the maximum load capacity. See Operation and Maintenance Manual, “Lifting Capacities” for the load capacity of the boom.

When the load capacity is exceeded, refer to “American National Standards A.N.S.I. B3014”.

Also, follow the procedures that are listed below:

- Inspect the wire cable for defects prior to the lift operation.
- Inspect the wire cable for defects after the lift operation.
- Do not exceed the load capacity of the boom.
- The load must be handled safely in order to minimize tipping effects.
- The lift operation and the inspections must be made under controlled conditions by an authorized person.

## Electrical Power Lines

**⚠ WARNING**

**Serious injury or death by electrocution can result if the machine or attachments are not kept the proper distance from electrical power lines.**

Use the following charts in order to determine the safe distance from high voltage wires during these conditions:

- machine operation
- machine transportation

Table 1

| When Operating Near High Voltage Power Lines | |
|---|---|
| **Normal Voltage (Phase to Phase)** | **Minimum Clearance Required** |
| 0 Volts to 50 kVolts | 3.05 Meters (10 Feet) |
| Over 50 kVolts to 200 kVolts | 4.60 Meters (15 Feet) |
| Over 200 kVolts to 350 kVolts | 6.10 Meters (20 Feet) |
| Over 350 kVolts to 500 kVolts | 7.62 Meters (25 Feet) |
| Over 500 kVolts to 750 kVolts | 10.67 Meters (35 Feet) |
| Over 750 kVolts to 1000 kVolts | 13.72 Meters (45 Feet) |

| While In Transit Near High Voltage Power Lines | |
|---|---|
| **Normal Voltage (Phase to Phase)** | **Minimum Clearance Required** |
| 0 Volts to .75 kVolts | 1.22 Meters (4 Feet) |
| Over .75 kVolts to 50 kVolts | 1.83 Meters (6 Feet) |
| Over 50 kVolts to 345 kVolts | 3.05 Meters (10 Feet) |
| Over 345 kVolts to 750 kVolts | 6.10 Meters (20 Feet) |
| Over 750 kVolts to 1000 kVolts | 7.62 Meters (25 Feet) |

# Parking

Park on a level surface. If you must park on a grade, use blocks to prevent the machine from rolling.

Apply the service brake in order to stop the machine. Move the transmission control lever to NEUTRAL position and move the engine speed switch to the LOW IDLE position. Engage the parking brake.

Lower the boom to the ground and fully retract the counterweight.

Turn the engine start switch key to OFF position and remove the key.

Turn the key for the battery disconnect switch to the OFF position. Remove the key when you exit the machine for an extended period of time.

Turning the battery disconnect switch to the OFF position will provide the following benefits:

- Prevent battery discharge that is caused by a battery short circuit.
- Prevent battery discharge that is caused by some of the components.
- Prevent battery discharge that is caused by vandalism.

# Slope Operation

Machines that are operating safely in various applications depend on these criteria: the machine model, configuration, machine maintenance, operating speed of the machine, conditions of the terrain, fluid levels and tire inflation pressures. The most important criteria are the skill and judgment of the operator.

A well trained operator that follows the instructions in the Operation and Maintenance Manual, has the greatest impact on stability. Operator training provides a person with the following abilities: observation of working and environmental conditions, feel for the machine, identification of potential hazards and operating the machine safely by making appropriate decisions.

When you work on side hills and when you work on slopes, consider the following important points:

Speed of travel – At higher speeds, forces of inertia tend to make the machine less stable.

Roughness of terrain or surface – The machine may be less stable with uneven terrain.

Direction of travel – Avoid operating the machine across the slope. When possible, operate the machine up the slopes and operate the machine down the slopes. Place the heaviest end of the machine uphill when you are working on an incline.

Mounted equipment – Balance of the machine may be impeded by the following components: equipment that is mounted on the machine, machine configuration, weights and counterweights.

Nature of surface – Ground that has been newly filled with earth may collapse from the weight of the machine.

Surface material – Rocks and moisture of the surface material may drastically affect the machine's traction and machine's stability. Rocky surfaces may promote side slipping of the machine.

Slippage due to excessive loads – This may cause downhill tracks or downhill tires to dig into the ground, which will increase the angle of the machine.

Width of tracks or tires – Narrower tracks or narrower tires further increase the digging into the ground which causes the machine to be less stable.

Implements attached to the drawbar – This may decrease the weight on the uphill tracks. This may also decrease the weight on the uphill tires. The decreased weight will cause the machine to be less stable.

Height of the working load of the machine – When the working loads are in higher positions, the stability of the machine is reduced.

Operated equipment – Be aware of performance features of the equipment in operation and the effects on machine stability.

Operating techniques – Keep all attachments or pulled loads low to the ground for optimum stability.

Machine systems have limitations on slopes – Slopes can affect the proper function and operation of the various machine systems. These machine systems are needed for machine control.

**Note:** Safe operation on steep slopes may require special machine maintenance. Excellent skill of the operator and proper equipment for specific applications are also required. Consult the Operation and Maintenance Manual, sections for the proper fluid level requirements and intended machine use.

# Engine Stopping

Do not stop the engine immediately after the machine has been operated under load. This can cause overheating and accelerated wear of engine components.

After the machine is parked and the parking brake is engaged, allow the engine to run for two minutes before shutdown. This allows hot areas of the engine to cool gradually.

# Equipment Lowering with Engine Stopped

Before lowering any equipment with the engine stopped, clear the area around the equipment of all personnel. The procedure to use will vary with the type of equipment to be lowered. Keep in mind most systems use a high pressure fluid or air to raise or lower equipment. The procedure will cause high pressure air, hydraulic, or some other media to be released in order to lower the equipment. Wear appropriate personal protective equipment and follow the established procedure in the Operation and Maintenance Manual, “Equipment Lowering with Engine Stopped” in the Operation Section of the manual.

# Sound Information and Vibration Information

## Sound Level Information

The operator Equivalent Sound Pressure Level (Leq) is 81 dB(A) when “ANSI/SAE J1166 OCT 98” is used to measure the value for an enclosed cab. This proceeding is a work cycle sound exposure level. The cab was properly installed and maintained. The test was conducted with the cab doors and the cab windows closed.

Hearing protection may be needed when the machine is operated with an open operator station for extended periods or in a noisy environment. Hearing protection may be needed when the machine is operated with a cab that is not properly maintained or when the doors and windows are open for extended periods or in a noisy environment.

The average exterior sound pressure level is 86 dB(A) when the “SAE J88Apr95 - Constant Speed Moving Test” procedure is used to measure the value for the standard machine. The measurement was conducted under the following conditions: distance of 15 m (49.2 ft) and “the machine moving forward in an intermediate gear ratio”.

## Sound Level Information for Machines in European Union Countries and in Countries that Adopt the “EU Directives”

The dynamic operator sound pressure level is 79 dB(A) when “ISO 6396:1992” is used to measure the value for an enclosed cab. The cab was properly installed and maintained. The test was conducted with the cab doors and the cab windows closed.

# “The European Union Physical Agents (Vibration) Directive 2002/44/EC”

## Vibration Data for Track-Type Tractors

### Information Concerning Hand/Arm Vibration Level

When the machine is operated according to the intended use, the hand/arm vibration of this machine is below 2.5 meter per second squared.

### Information Concerning Whole Body Vibration Level

This section provides vibration data and a method for estimating the vibration level for track-type tractors.

**Note:** Vibration levels are influenced by many different parameters. Many items are listed below.

- Operator training, behavior, mode and stress
- Job site organization, preparation, environment, weather and material
- Machine type, quality of the seat, quality of the suspension system, attachments and condition of the equipment

It is not possible to get precise vibration levels for this machine. The expected vibration levels can be estimated with the information in Table 3 in order to calculate the daily vibration exposure. A simple evaluation of the machine application can be used.

Estimate the vibration levels for the three vibration directions. For typical operating conditions, use the average vibration levels as the estimated level. With an experienced operator and smooth terrain, subtract the Scenario Factors from the average vibration level in order to obtain the estimated vibration level. For aggressive operations and severe terrain, add the Scenario Factors to the average vibration level in order to obtain the estimated vibration level.

**Note:** All vibration levels are in meter per second squared.

Table 2

| "ISO Reference Table A - Equivalent vibration levels of whole body vibration emission for earthmoving equipment." | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Machine Type** | **Typical Operating Activity** | **Vibration Levels** | | | **Scenario Factors** | | |
| | | **X axis** | **Y axis** | **Z axis** | **X axis** | **Y axis** | **Z axis** |
| Track-Type Tractors | dozing | 0,74 | 0,58 | 0,70 | 0,31 | 0,25 | 0,31 |
| | ripping | 1,25 | 1,19 | 1,02 | 0,40 | 0,41 | 0,28 |
| | transfer | 0,87 | 0,80 | 0,97 | 0,43 | 0,40 | 0,34 |

Table 3

| "ISO Reference Table A - Equivalent vibration levels of whole body vibration emission for earthmoving equipment." | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Machine Type** | **Typical Operating Activity** | **Vibration Levels** | | | **Scenario Factors** | | |
| | | **X axis** | **Y axis** | **Z axis** | **X axis** | **Y axis** | **Z axis** |
| Pipelayers(1) | work cycle | 0,21 | 0,23 | 0,24 | 0,09 | 0,11 | 0,14 |

(1) If equipped

**Note:** Refer to "ISO/TR 25398 Mechanical Vibration - Guideline for the assessment of exposure to whole body vibration of ride on operated earthmoving machines" for more information about vibration. This publication uses data that is measured by international institutes, organizations and manufacturers. This document provides information about the whole body exposure of operators of earthmoving equipment. Refer to Operation and Maintenance Manual, SEBU8257, "The European Union Physical Agents (Vibration) Directive 2002/44/EC" for more information about machine vibration levels.

The Caterpillar suspension seat meets the criteria of "ISO 7096". This represents vertical vibration level under severe operating conditions. This seat is tested with the input "spectral class EM6". The seat has a transmissibility factor of "SEAT<0.7".

The whole body vibration level of the machine varies. There is a range of values. The low value is 0.5 meter per second squared. The machine meets the short term level for the design of the seat in "ISO 7096". The value is 1.61 meter per second squared for this machine.

### Guidelines for Reducing Vibration Levels on Earthmoving Equipment

Properly adjust machines. Properly maintain machines. Operate machines smoothly. Maintain the conditions of the terrain. The following guidelines can help reduce the whole body vibration level:

1. Use the right type and size of machine, equipment, and attachments.
2. Maintain machines according to the manufacturer's recommendations.
   a. Tire pressures
   b. Brake and steering systems
   c. Controls, hydraulic system and linkages
3. Keep the terrain in good condition.
   a. Remove any large rocks or obstacles.
   b. Fill any ditches and holes.
   c. Provide machines and schedule time in order to maintain the conditions of the terrain.
4. Use a seat that meets "ISO 7096". Keep the seat maintained and adjusted.
   a. Adjust the seat and suspension for the weight and the size of the operator.
   b. Inspect and maintain the seat suspension and adjustment mechanisms.
5. Perform the following operations smoothly.
   a. Steer
   b. Brake
   c. Accelerate.
   d. Shift the gears.
6. Move the attachments smoothly.
7. Adjust the machine speed and the route in order to minimize the vibration level.
   a. Drive around obstacles and rough terrain.

**b.** Slow down when it is necessary to go over rough terrain.

**8.** Minimize vibrations for a long work cycle or a long travel distance.

**a.** Use machines that are equipped with suspension systems.

**b.** Use the ride control system on Track-Type Tractors.

**c.** If no ride control system is available, reduce speed in order to prevent bounce.

**d.** Haul the machines between workplaces.

**9.** Less operator comfort may be caused by other risk factors. The following guidelines can be effective in order to provide better operator comfort:

**a.** Adjust the seat and adjust the controls in order to achieve good posture.

**b.** Adjust the mirrors in order to minimize twisted posture.

**c.** Provide breaks in order to reduce long periods of sitting.

**d.** Avoid jumping from the cab.

**e.** Minimize repeated handling of loads and lifting of loads.

**f.** Minimize any shocks and impacts during sports and leisure activities.

## Sources

The vibration information and calculation procedure is based on “ISO/TR 25398 Mechanical Vibration - Guideline for the assessment of exposure to whole body vibration of ride on operated earthmoving machines”. Harmonized data is measured by international institutes, organizations and manufacturers.

This literature provides information about assessing the whole body vibration exposure of operators of earthmoving equipment. The method is based on measured vibration emission under real working conditions for all machines.

You should check the original directive. This document summarizes part of the content of the applicable law. This document is not meant to substitute the original sources. Other parts of these documents are based on information from the United Kingdom Health and Safety Executive.

Refer to Operation and Maintenance Manual, SEBU8257, “The European Union Physical Agents (Vibration) Directive 2002/44/EC” for more information about vibration.

Consult your local Caterpillar dealer for more information about machine features that minimize vibration levels. Consult your local Caterpillar dealer about safe machine operation.

Use the following web site in order to find your local dealer:

Caterpillar, Inc.
www.cat.com

# Operator Station

Any modifications to the inside of the operator station should not project into the operator space or into the space for the companion seat (if equipped). The addition of a radio, fire extinguisher, and other equipment must be installed so that the defined operator space and the space for the companion seat (if equipped) is maintained. Any item that is brought into the cab should not project into the defined operator space or the space for the companion seat (if equipped). A lunch box or other loose items must be secured. Objects must not pose an impact hazard in rough terrain or in the event of a rollover.

# Guards (Operator Protection)

There are different types of guards that are used to protect the operator. The machine and the machine application determines the type of guard that should be used.

A daily inspection of the guards is required in order to check for structures that are bent, cracked or loose. Never operate a machine with a damaged structure.

The operator becomes exposed to a hazardous situation if the machine is used improperly or if poor operating techniques are used. This situation can occur even though a machine is equipped with an appropriate protective guard. Follow the established operating procedures that are recommended for your machine.

## Rollover Protective Structure (ROPS), Falling Object Protective Structure (FOPS) or Tip Over Protection Structure (TOPS)

The ROPS/FOPS Structure (if equipped) on your machine is specifically designed, tested and certified for that machine. Any alteration or any modification to the ROPS/FOPS Structure could weaken the structure. This places the operator into an unprotected environment. Modifications or attachments that cause the machine to exceed the weight that is stamped on the certification plate also place the operator into an unprotected environment. Excessive weight may inhibit the brake performance, the steering performance and the ROPS. The protection that is offered by the ROPS/FOPS Structure will be impaired if the ROPS/FOPS Structure has structural damage. Damage to the structure can be caused by an overturn, a falling object, a collision, etc.

Do not mount items (fire extinguishers, first aid kits, work lights, etc) by welding brackets to the ROPS/FOPS Structure or by drilling holes in the ROPS/FOPS Structure. Welding brackets or drilling holes in the ROPS/FOPS Structures can weaken the structures. Consult your Caterpillar dealer for mounting guidelines.

The Tip Over Protection Structure (TOPS) is another type of guard that is used on mini hydraulic excavators. This structure protects the operator in the event of a tipover. The same guidelines for the inspection, the maintenance and the modification of the ROPS/FOPS Structure are required for the Tip Over Protection Structure.

## Other Guards (If Equipped)

Protection from flying objects and/or falling objects is required for special applications. Logging applications and demolition applications are two examples that require special protection.

A front guard needs to be installed when a work tool that creates flying objects is used. Mesh front guards that are approved by Caterpillar or polycarbonate front guards that are approved by Caterpillar are available for machines with a cab or an open canopy. On machines that are equipped with cabs, the windows should also be closed. Safety glasses are recommended when flying hazards exist for machines with cabs and machines with open canopies.

If the work material extends above the cab, top guards and front guards should be used. Typical examples of this type of application are listed below:

- Demolition applications
- Rock quarries
- Forestry products

Additional guards may be required for specific applications or work tools. The Operation and Maintenance Manual for your machine or your work tool will provide specific requirements for the guards. Consult your Caterpillar dealer for additional information.

# Product Information Section (D6T LGP (OEM))

# General Information

## Specifications

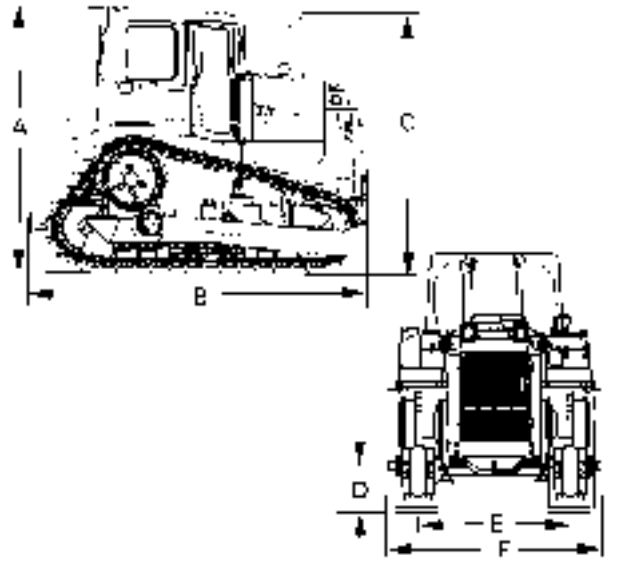



Illustration 24

The basic machine specifications are listed below.

Table 4

| D6T Track-Type Tractor | |
|---|---|
| | LGP |
| Engine Power | 200 hp std |
| Engine (Make and Model) | Caterpillar C9.3 |
| Engine Displacement | 9.3 L (567 $in^3$) |
| Engine Rated Speed | 2010 RPM(1)(2) |
| Engine (No. of Cylinders) | 6 |
| Height (Top of ROPS) (A) | 3233 mm (127.3 inch) |
| Length of the Machine(3) (B) | 4089 mm (161.0 inch) |
| Height to Top of Exhaust Stack(C) | 3193 mm (125.7 inch) |
| Ground Clearance (D) | 396 mm (15.6 inch) |
| Track Gauge (E) | 2286 mm (90.0 inch) |
| Width Over Trunnions (F)(4) | 3479 mm (137.0 inch) |
| Height of the Drawbar | 511 mm (20.1 inch) |
| Width of Track Shoe | 660 mm (26 inch) |
| Length of Track on Ground | 3243 mm (127.7 inch) |
| Shipping Weight(5) | 19527 kg (43050 lb) |
| Drawbar (Length) | 165 mm (6.5 inch) |

(1) NACD Engine Rated Speed (North America)
(2) Non-NACD Engine Rated Speed is 1920 RPM
(3) The length of the machine is measured from the front of the machine to the end of the drawbar. Add 145 mm (5.7 inch) for long drawbar assembly.
(4) VPAT trunnions are attached at the case and frame.
(5) The weight includes the machine and the following items: 10% tank of fuel, all lubricants, coolant, hydraulic controls, the rops/fops structure and and the standard track.

## Restrictions to Application and Configuration

Maximum approved operating weight is 29484 kg (65000 lb).

Maximum towing force of a drawbar is 320 kN (71940 lb).

Maximum vertical load for a drawbar is 137 kN (30800 lb).

The capability of the brake is equal to the ROPS capability of 29484 kg (65000 lb) when the slope is less than 45 degrees.

To obtain the proper lubrication, a maximum slope should not exceed a grade of 100 percent or 45 degrees.

**Reference:** See “Slope Operation” in this manual for more information.

Do not use the machine in explosive environments.

Special attachments and operating instructions are required for waste handling applications, forestry applications, and other custom configurations.

# Identification Information

## Plate Locations and Film Locations

The Product Identification Number (PIN) will be used to identify a powered machine that is designed for an operator to ride.

Caterpillar products such as engines, transmissions, and major attachments that are not designed for an operator to ride are identified by Serial Numbers.

For quick reference, record the identification numbers in the spaces that are provided below the illustration.

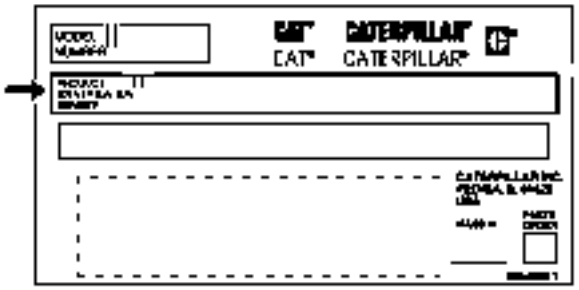



Illustration 25

The PIN plate is attached to the ROPS mounting pad on the transmission.

Machine PIN _____

Year of Manufacture _____

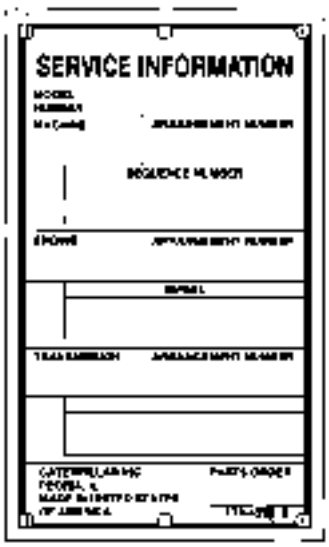



Illustration 26

The Service Information Number Plate is located inside the cab on the left side of the dash.

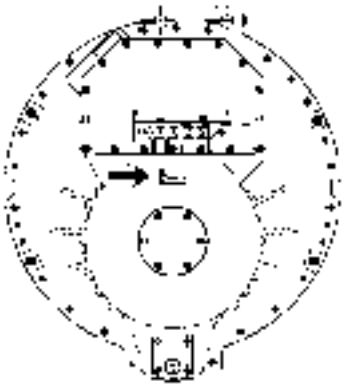


Illustration 27

Transmission Serial Number _____

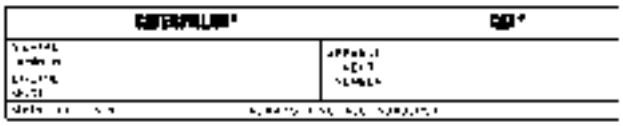


Illustration 28

The Serial Number Plate is located on the left side of the cylinder block near the rear of the engine.

The following information is stamped on the Serial Number Plate: engine serial number, model and arrangement number.

Engine Serial Number _____

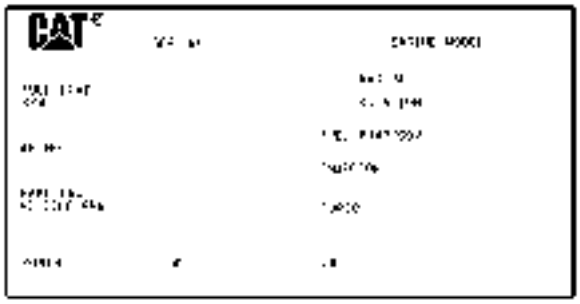


Illustration 29

The Information Plate is on the engine valve cover. The following information is stamped on the Information Plate: engine maximum altitude, horsepower, high idle, full load rpm, fuel settings and other information.

The serial number plate for the dozer blade is attached to the back side of the dozer, if equipped.

# Certification

## CE Mark

This plate is positioned on the PIN plate on the left side of the front frame.

For machines that are compliant to “2006/42/EC”, the following information is stamped onto the “CE” plate.

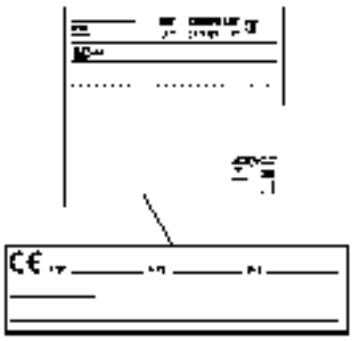


Illustration 30

CE plate

For quick reference, record this information in the spaces that are provided below.

- Engine Power of primary engine (kW) _
- Engine Power for additional engine (kW) (if equipped) _
- Typical operating weight of machine for European market (kg) _
- Year of construction _
- Machine Type _

For machines that are compliant to “1998/37/EC”, the following information is stamped onto the “CE” plate.

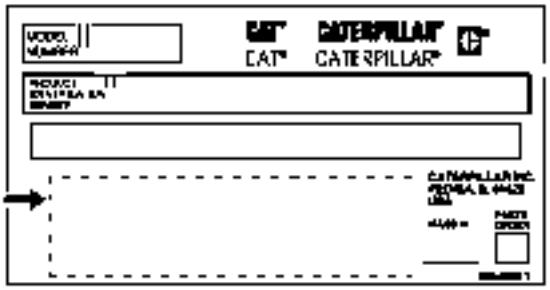


Illustration 31

For quick reference, record this information in the spaces that are provided below.

- Engine Power of primary engine (kW) _
- Typical operating weight of machine for European market (kg) _
- Year _

## Structure certification (ROPS)

**⚠ WARNING**

**Structural damage, an overturn, modification, alteration, or improper repair can impair this structure's protection capability thereby voiding this certification. Do not weld on or drill holes in the structure. This will void the certification. Consult your Cat dealer to determine this structure's limitations without voiding its certification.**

The protective structure certification is located on the outside of the left post.

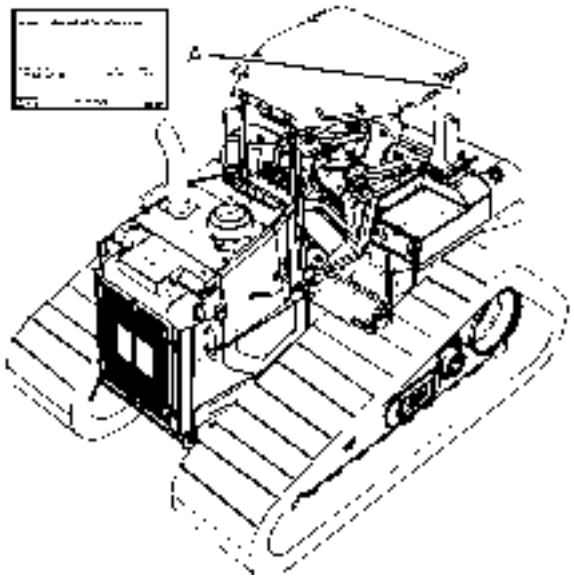


Illustration 32
(A) Film on ROPS support assembly

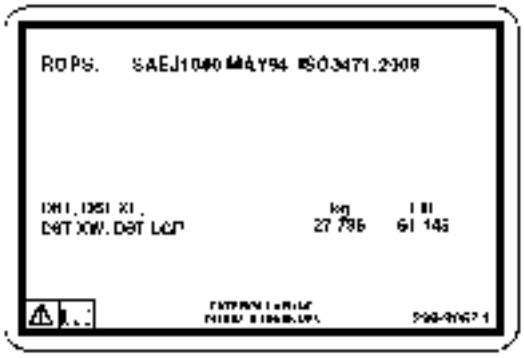



Illustration 33

**⚠ WARNING**

**Structural damage, an overturn, modification, alteration, or improper repair, can impair this structure's protective capability thereby voiding this certification. Do not weld on or drill holes in the structure. Consult a Caterpillar dealer to determine this structure's limitations without voiding its certification.**

This machine has been certified to the standards that are listed on the certification plate. The maximum mass of the machine, which includes the operator and the attachments without payload, should not exceed the mass on the certification plate.

Refer to Operation and Maintenance Manual, “Guards (Operator Protection)” for more information.

## ISO Symbols (Model Usage)

The following list contains all of the ISO Symbols that appear in this publication.

On or Start –

Off or Stop –

Electrical Disconnect Switch – Engine On

Engine – Start

Ether Starting Aid – Engine Starting Aid

Battery – Charging Condition

Fuel Level Indicator –

Parking Brake –

Implement Control Shutoff –

Engine – Failure/Malfunction

Transmission – Failure/Malfunction

Braking System – Failure/Malfunction

Engine Filter Element Indicator –

Transmission Filter Indicator –

Engine Oil – Pressure

Engine Oil Temperature –

Engine Coolant – Temperature

Torque Converter Oil – Temperature

Hydraulic Oil – Temperature

Engine Service –

Engine – RPM

Ripper –

Rear Work Light –

Panel Lights Switch –

Flood Lights –

Front Work Light –

Horn –

Backup Alarm –

Seat Back Angle Adjustment –

Seat Adjustment – Fore and Aft

Seat Adjustment – Height

Lumbar Support – Adjustment

Transmission – Forward

Transmission – Reverse

Transmission – Neutral

Ripper – Hold

Winch – Spool-In

Winch – Brake (Neutral)

Winch – Brake Off

Winch – Free Spool

Winch – Spool Out

Fuses –

Alternator –

Power Train ECM –

Engine ECM –

Blower Motor –

Panel Test Switch –

Window Washer –

Regeneration Active (indicator) –

Regeneration Disabled (indicator) –

Diesel Particulate Filter (DPF - indicator) –

Force Regeneration (switch) –

Disable Regeneration (switch) –

# Declaration of Conformity

Table 5

An EC Declaration of Conformity document was provided with the machine if it was manufactured to comply with specific requirements for the European Union. In order to determine the details of the applicable Directives, review the complete EC Declaration of Conformity provided with the machine. The extract shown below from an EC Declaration of Conformity for machines that are declared compliant to “2006/42/EC” applies only to those machines originally “CE” marked by the manufacturer listed and which have not since been modified**.**

**EC DECLARATION OF CONFORMITY OF MACHINERY**

**Manufacturer:** Caterpillar Inc., 100 N.E. Adams Street, Peoria, IL 61629 USA

**Person authorized to compile the Technical File and to communicate relevant part (s) of the Technical File to the Authorities of European Union Member States on request:**

Standards & Regulations Manager,Caterpillar France S.A.S 40,
Avenue Leon-Blum, B.P. 55, 38041 Grenoble Cedex 9, France

**I, the undersigned, _____, hearby certify that hte construction equipment specified hearunder**

Description: Generic Denomination: Earthmoving Equipment

Function: Steel track dozer

Model/Type: D6T2

Serial Number:

Commercial Name: Caterpillar

Fulfills all the relevant provisions of hte following Directives

| Directives | Notified Body | Document No. |
|---|---|---|
| 2006/42/EC | | |
| 2000/14/EC amended by 2005/88/EC, Note (1) | | |
| 2004/108/EC | | |

Note (1) Annex -_____ Guaranteed Sound Power Level -_____dB (A)
Representative Equipment Type Sound Power Level -_____dB (A)
Engine Power per ____-____ kW Rated engine speed - _____ rpm
Technical Documentation accessible through person listed above authorized to compile the Technical File

**Done at:** **Signature**

**Date:** **Name/Position**

**Note:** The above information was correct as of August 2011, but may be subject to change, please refer to the individual declaration of conformity issued with the machine for exact details.

# Emissions Certification Film

**Note:** This information is pertinent in the United States, in Canada and in Europe.

Consult your Cat dealer for an Emission Control Warranty Statement.

This label is located on the engine.

# Operation Section (D6T LGP (OEM))

# Before Operation

## Mounting and Dismounting

Illustration 34

Typical example

Mount the machine and dismount the machine only at locations that have steps and/or handholds. Before you mount the machine, clean the steps and the handholds. Inspect the steps and handholds. Make all necessary repairs.

Face the machine whenever you get on the machine and whenever you get off the machine.

Maintain a three-point contact with the steps and with the handholds.

**Note:** Three-point contact can be 2 feet and one hand. Three-point contact can also be 1 foot and two hands.

Do not mount a moving machine. Do not dismount a moving machine. Never jump off the machine. Do not carry tools or supplies when you try to mount the machine or when you try to dismount the machine. Use a hand line to pull equipment onto the platform. Do not use any controls as handholds when you enter the operator compartment or when you exit the operator compartment.

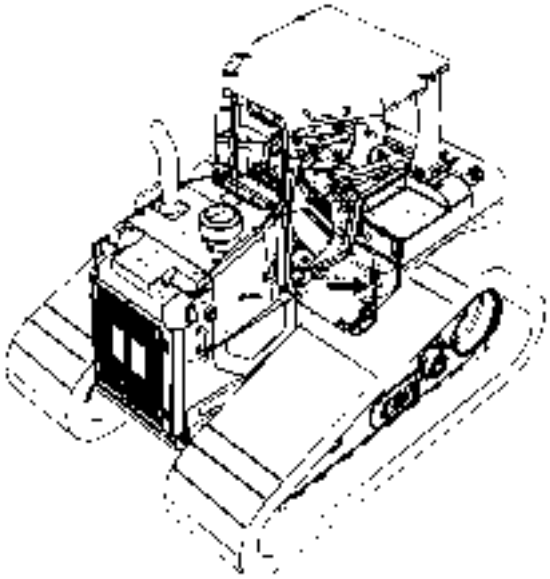


Illustration 35

Location of the ground level service center

After daylight hours end or in periods of darkness, use the platform access lighting . This light illuminates the entrance way to the cab. Open the access door to the ground level service center.

Illustration 36

Ground level service center

Access Lighting – Use the toggle switch for the lighting in order to mount the machine.

**Note:** When the switch in the ground level service center is activated, the lights remain on for 10 minutes. The time limit of the lights is programmable in the Monitoring System Display with “Machine Setup” in the Settings Menu. Toggling the switch a second time will deactivate the lights. The toggling of the switch will also turn off the lights if the lights were activated from the cab while exiting the machine.

**Delayed Lighting Mode**

Enable this function by leaving the Forward ROPS lights in the ON position before turning the machine keyswitch to the OFF position. The lights will remain ON for a configured amount of time (10 minute default). Use the access lighting switch to turn OFF the lights, if necessary.

# Daily Inspection

For maximum service life of the machine, perform a thorough walk-around inspection before you mount the machine and before you start the engine.

Inspect the area around the machine and under the machine. Look for loose bolts, trash buildup, oil leaks, coolant leaks, broken parts, or worn parts.

Inspect the tracks, track roller frames, idlers, and rollers for oil leaks, and excessive wear.

Do not operate the machine until all necessary repairs have been made.

**Note:** Watch closely for leaks. If you observe a leak, find the source of the leak and correct the leak. If you suspect a leak or if you observe a leak, check the fluid levels more frequently.

Inspect the condition of the work tool and of the hydraulic components. Sound the horn.

Check all oil levels, coolant levels, and fuel levels.

Daily, perform all of the procedures that are applicable to your machine:

- Operation and Maintenance Manual, “Backup Alarm - Test”
- Operation and Maintenance Manual, “Brakes, Indicators, and Gauges - Test”
- Operation and Maintenance Manual, “Cooling System Coolant Level - Check”
- Operation and Maintenance Manual, “Engine Air Precleaner - Clean”
- Operation and Maintenance Manual, “Engine Oil Level - Check”
- Operation and Maintenance Manual, “Fuel System Water Separator - Drain”
- Operation and Maintenance Manual, “Hydraulic System Oil Level - Check”
- Operation and Maintenance Manual, “Seat Belt - Inspect”
- Operation and Maintenance Manual, “Transmission System Oil Level - Check”
- Operation and Maintenance Manual, “Winch Oil Level - Check”

## Tool Storage Area

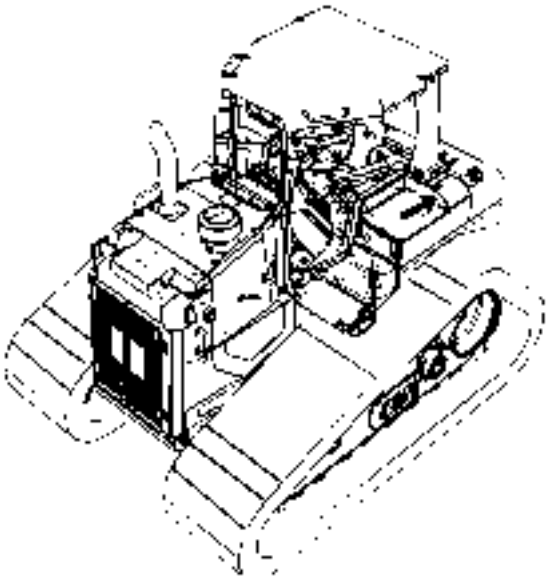


Illustration 37

The tool storage area is located above the left fender. The storage box is directly in front of the fuel tank filler cap.

# Machine Operation

## Seat

### Adjusting the Seat

The operator's seat that is provided with this machine is in compliance with the appropriate class of “ISO 7096”.

**Note:** Adjust the seat for a new operator or at the beginning of each shift.

The operator should be seated against the seat backrest. Adjust the seat so that the operator is allowed full travel of the pedals.

#### Adjusting the Fore and Aft Position of the Seat

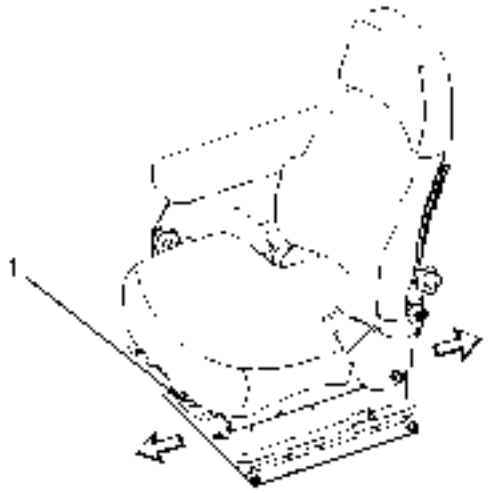



Illustration 38

Fore and Aft Adjustment (1) – Pull up fore and aft lever (1). This will move the seat forward or this will move the seat back to the desired position. Release lever (1) in order to lock the seat in place.

#### Adjusting the Angle of the Back of the Seat

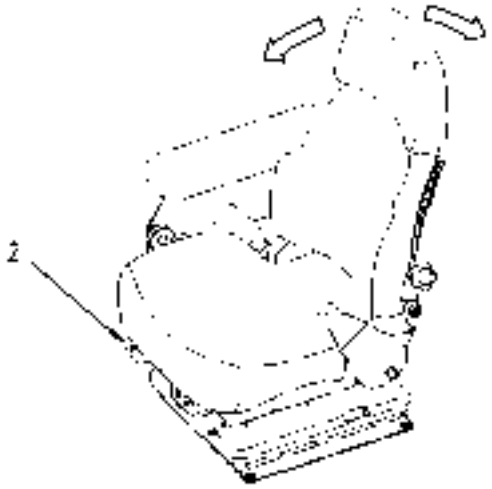



Illustration 39

Back Angle Adjustment (2) – Lift lever (2) and allow the seat back to tilt forward. Push the front of the backrest in order to tilt the seat backward. Release lever (2) at the desired position.

#### Adjusting the Bottom Seat Cushion

The bottom seat cushion has two positions.


Illustration 40

The bottom seat cushion is shown in the lower or the flattest position.

The bottom seat cushion is in the lower or the flattest position when the end of the rod is in the bottom of the groove in bracket (3). Pull forward and pull upward on the bottom seat cushion in order to change the position of the bottom seat cushion back to the upper position.


Illustration 41

The bottom seat cushion is shown in the upper position or the angled position.

The bottom seat cushion is in the upper position or the angled position when the end of the rod is in the top of the groove in bracket (3). Pull forward and push down on the bottom seat cushion in order to change the position of the bottom seat cushion back to the lower position.

## Adjusting the Height of the Seat

### Seats with Mechanical Suspension


Illustration 42

Adjustment of the Seat Height (4) – Pull up on height adjustment lever (4) and pull up on the seat in order to raise the height of the seat. Pull up on height adjustment lever (4) and push down on the seat in order to lower the height of the seat.

### Seats with Air Suspension and Toggle Switch

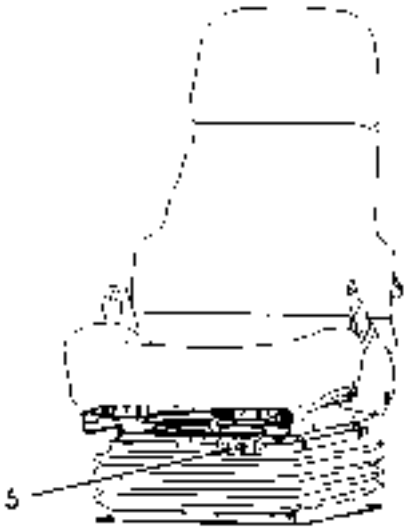



Illustration 43

Adjustment of the Seat Height (5) – Remove the weight from the seat. Hold toggle switch (5) upwardin order to raise the seat. Hold toggle switch (5) downward in order to lower the seat. Release the toggle switch at the preferred height.

### Seats with Air Suspension and Air Valve Knob

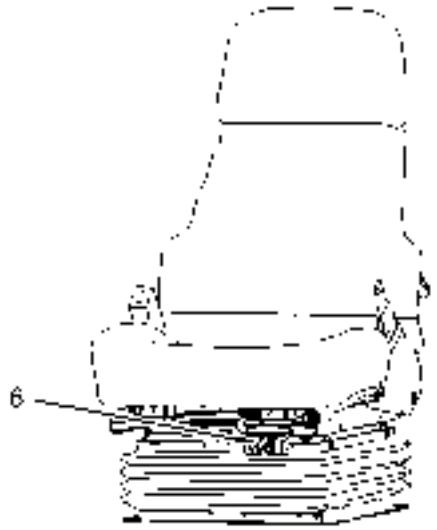



Illustration 44

Adjustment of the Seat Height (6) – Push in on the air valve knob (6) in order to raise the height of the seat. Pull out on the air valve knob (6) in order to lower the height of the seat.

## Weight Adjustment

### Seats with Mechanical Suspension

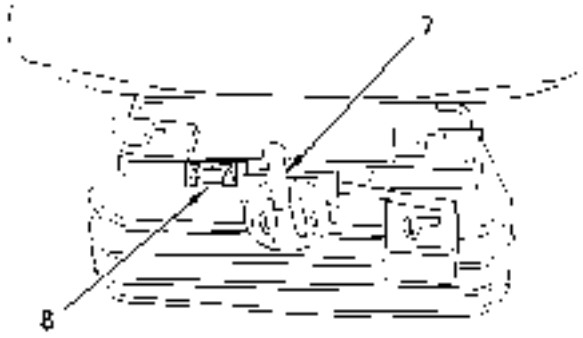



Illustration 45

Weight Adjustment (7) – Rotate knob (7) and observe gauge (8) in order to obtain the proper adjustment for the weight of the operator.

### Seats With Air Suspension

The weight adjustment is automatically controlled by adjusting the height of the seat. Observe the gauge on the front of the seat suspension (if equipped) in order to obtain the proper adjustment for the weight of the operator.

## Adjusting the Lumbar Support

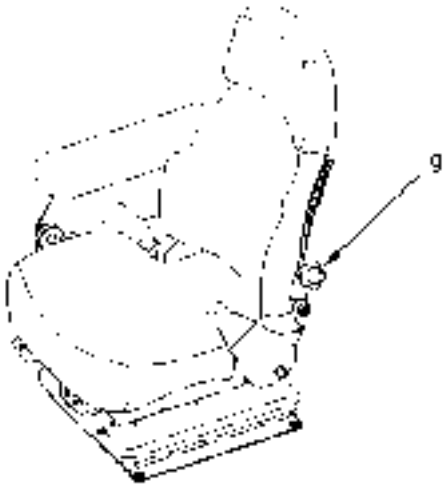



Illustration 46

Adjustment for the Lumbar Support (9) – Rotate the knob (9) clockwise in order to increase support for the lower back. Rotate the knob (9) counterclockwise in order to decrease support for the lower back.

## Extension for the Back of the Seat (if equipped)


Illustration 47

Extension for the Back of the Seat (10) – Lift up on extension (10) in order to remove the extension. **When you install extension (10) push the extension all the way downward. The extension should touch the top of the seat.**

## Seat Belt

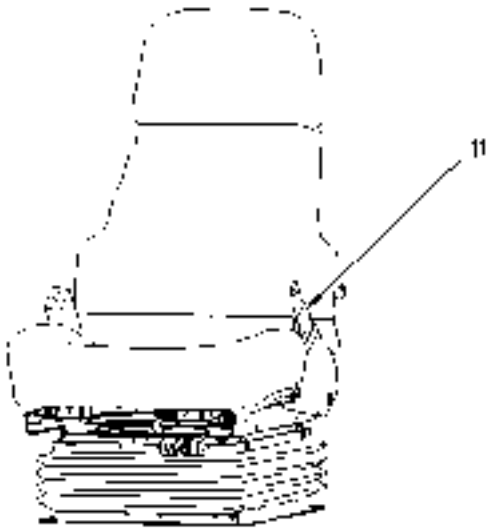



Illustration 48

Retractable Seat Belt (11) – When the seat has been adjusted to fit the operator, secure retractable seat belt (11).

## Storage for the Operation and Maintenance Manual

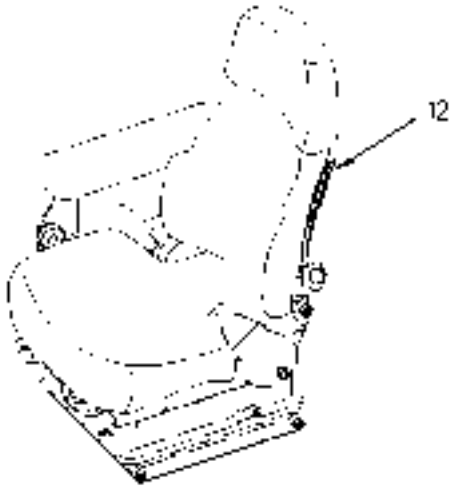



Illustration 49

The Operation and Maintenance Manual, should be stored and secured in the seat storage area (12).

# Seat Belt

**Note:** This machine was equipped with a seat belt when the machine was shipped from Caterpillar. At the time of installation, the seat belt and the instructions for installation of the seat belt meet the SAE J386 and ISO 6683 standards. Consult your Cat dealer for all replacement parts.

Always check the condition of the seat belt and the condition of the mounting hardware before you operate the machine.

## Seat Belt Adjustment for Non-Retractable Seat Belts

Adjust both ends of the seat belt. The seat belt should be snug but comfortable.

### Lengthening the Seat Belt

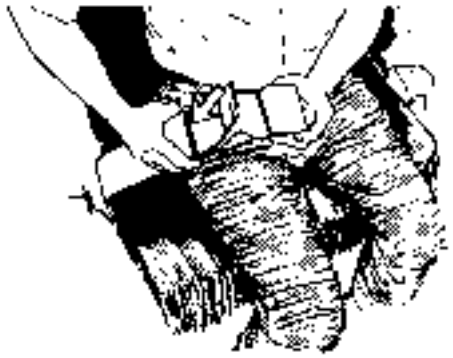


Illustration 50

**1.** Unfasten the seat belt.


Illustration 51

**2.** To remove the slack in outer loop (1), rotate buckle (2). This will free the lock bar. This permits the seat belt to move through the buckle.

**3.** Remove the slack from the outer belt loop by pulling on the buckle.

**4.** Loosen the other half of the seat belt in the same manner. If the seat belt does not fit snugly with the buckle in the center, readjust the seat belt.

### Shortening the Seat Belt

Illustration 52

**1.** Fasten the seat belt. Pull out on the outer belt loop in order to tighten the seat belt.

**2.** Adjust the other half of the seat belt in the same manner.

**3.** If the seat belt does not fit snugly with the buckle in the center, readjust the seat belt.

### Fastening The Seat Belt


Illustration 53

Fasten the seat belt catch (3) into the buckle (2). Make sure that the seat belt is placed low across the lap of the operator.

### Releasing The Seat Belt

Illustration 54

Pull up on the release lever. This will release the seat belt.

## Seat Belt Adjustment for Retractable Seat Belts

### Fastening The Seat Belt

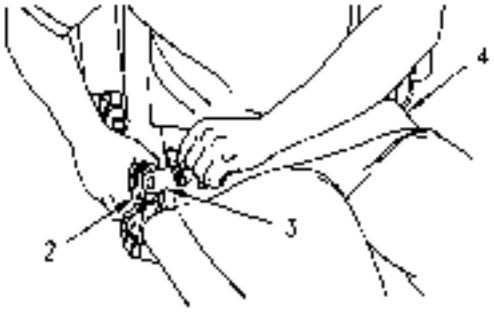



Illustration 55

Pull seat belt (4) out of the retractor in a continuous motion.

Fasten seat belt catch (3) into buckle (2). Make sure that the seat belt is placed low across the lap of the operator.

The retractor will adjust the belt length and the retractor will lock in place. The comfort ride sleeve will allow the operator to have limited movement.

### Releasing The Seat Belt

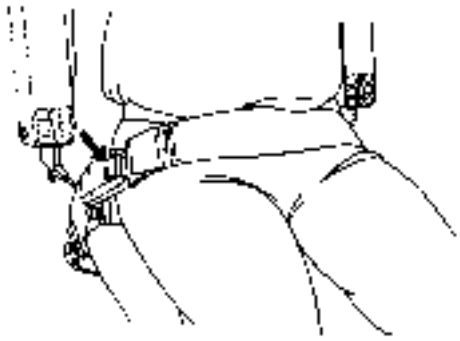


Illustration 56

Push the release button on the buckle in order to release the seat belt. The seat belt will automatically retract into the retractor.

## Extension of the Seat Belt

**⚠ WARNING**

**When using retractable seat belts, do not use seat belt extensions, or personal injury or death can result.**

**The retractor system may or may not lock up depending on the length of the extension and the size of the person. If the retractor does not lock up, the seat belt will not retain the person.**

Longer, non-retractable seat belts and extensions for the non-retractable seat belts are available.

Caterpillar requires only non-retractable seat belts to be used with a seat belt extension.

Consult your Cat dealer for longer seat belts and for information on extending the seat belts.

# Operator Controls

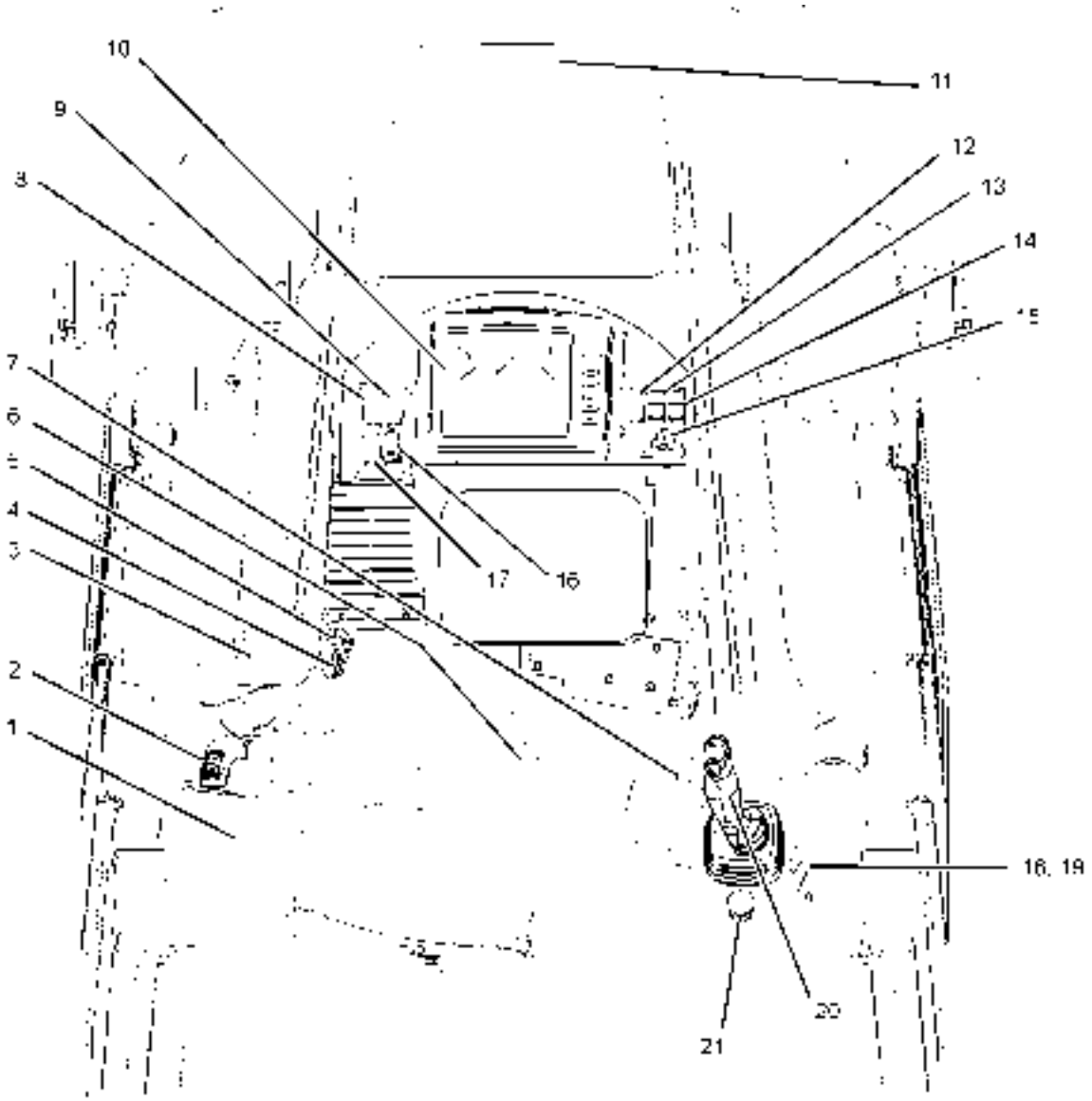



Illustration 57

(1) Adjustable armrests
(2) Parking brake control
(3) Differential steering control
(4) Transmission direction selector
(5) Speed range selector
(6) Service brake
(7) Decelerator pedal
(8) Front work lights
(9) Rear work lights
(10) Gauges and indicators
(11) Mirror
(12) MVP switch
(13) Autoshift switch
(14) Auto kickdown switch
(15) Engine start switch
(16) Regeneration switch
(17) Engine fan reverse switch
(18) Throttle control switch
(19) Hydraulic lockout control
(20) Joystick control
(21) Horn

## Adjustable Armrests (1)

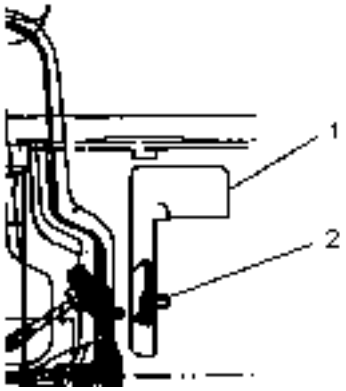



Illustration 58

Use the following procedure in order to adjust the left armrest, if necessary.

**1.** Loosen the two bolts (2).

**2.** Move armrest (1) to the desired height.

**3.** Tighten the bolts (2).

## Parking Brake Control (2)

NOTICE
Do not engage the parking brake while the machine is moving unless an emergency exists.

The use of the parking brake as a service brake in regular operation causes severe damage to the parking brake system.

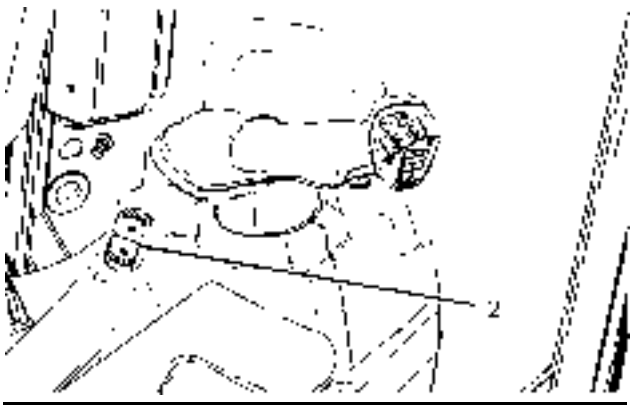



Illustration 59

Parking Brake (2) – Use this switch to engage the parking brake and lock the transmission in the NEUTRAL position. When the parking brake switch is engaged, the parking brake indicator on the dashboard will light and the machine should not move. After the parking brake switch is disengaged, the parking brake indicator on the dashboard turns off. A direction is ready to be chosen. Do not use the parking brake to stop the machine.

Engaged – Push switch (2) away from the operator in order to engage the parking brake. The steering control is electronically locked. Also, the transmission controls are electrically disabled. The transmission will be locked in NEUTRAL.

Disengaged – Push switch (2) toward the operator in order to disengage the parking brake.

## Differential Steering Control (3)

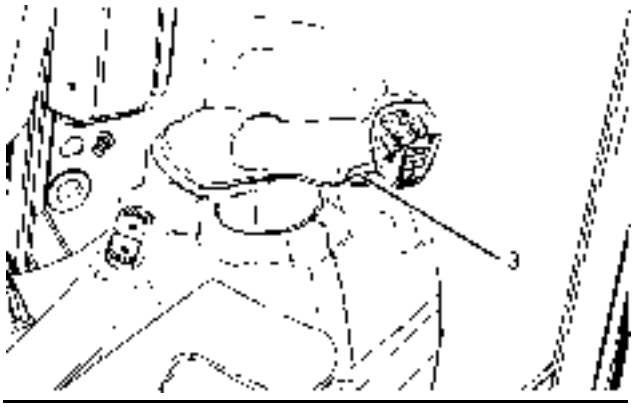



Illustration 60

Steering control lever (3) allows the steering system and the transmission system to be simultaneously controlled. Push down on parking brake switch (2) in order to disengage the parking brake and allow movement of the steering and transmission controls. The steering lever is electronically locked by the parking brake. The transmission controls are electronically disabled.

### Steering Control

The machine can be steered with the power train in the NEUTRAL position.

NOTICE
When the steering lever is moved with the transmission in NEUTRAL or in gear, and the engine is running, the machine will turn. Engage the steering control lock by engaging the parking brake in order to prevent machine movement.

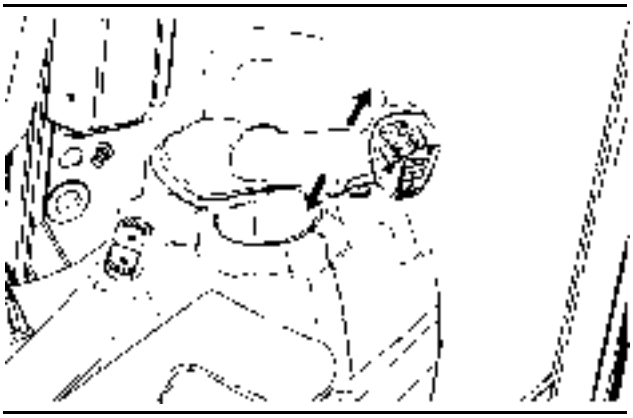


Illustration 61

When the machine is moving forward, push the steering control forward for a left turn. When the machine is moving forward, pull the steering control backward for a right turn. When you move the steering control farther in either direction, the machine will turn faster.

When the machine is moving backward, push the steering control forward for a right turn. When the machine is moving backward, pull the steering control backward for a left turn. When you move the steering control farther in either direction, the machine will turn faster.

To pivot the machine in the clockwise direction, place the power train in NEUTRAL and pull the steering control backward toward the operator.

In order to pivot the machine in the counterclockwise direction, place the power train in NEUTRAL and push the steering control forward.

Table 6

| Machine travel | Movement of steering control | Machine direction (turn) |
|---|---|---|
| FORWARD | PUSH | LEFT |
| FORWARD | PULL | RIGHT |
| REVERSE | PULL | LEFT |
| REVERSE | PUSH | RIGHT |
| NEUTRAL | PUSH | LEFT |
| NEUTRAL | PULL | RIGHT |

# Transmission Control (4)

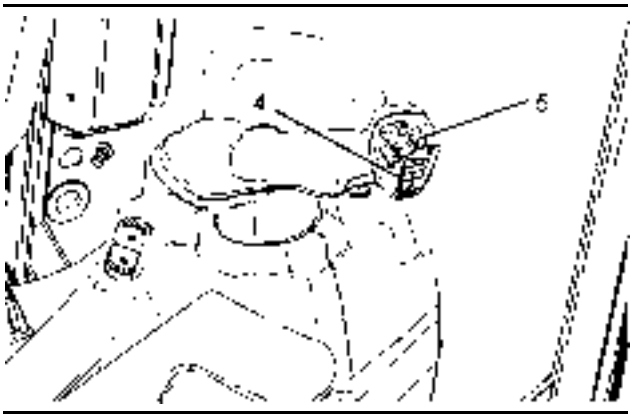



Illustration 62

## Direction Control Switch (4)

Use direction control switch (4) in order to change the direction of the machine.


Forward – Push direction control switch (4) in order to change the direction of the machine to FORWARD.


Neutral – Move direction control switch (4) to the center position in order to move the machine into NEUTRAL.


Reverse – Push direction control switch (4) in order to change the direction of the machine to REVERSE.

## Speed Control (5)

LOW – Roll thumb wheel (5) to the left when a lower gear is desired.

**Note:** Thumb wheel (5) allows gear changes via the incremental rotation of the wheel.

HIGH – Roll thumb wheel (5) to the right when a higher gear is desired.

The changes in gear selection will show in the monitoring system display when this information is requested.

When MVP is ON, the following five gears are available in each direction.

- 1.5
- 2.0
- 2.5
- 3.0

- 3.5

If MVP is OFF, then the following three speeds are available in each direction.

- 1
- 2
- 3

## Service Brake Control (6)

Push down on the brake pedal in order to apply the service brakes. Use pedal (6) for slowing the machine and for stopping the machine. Use the service brakes on a downgrade in order to prevent overspeed. The service brakes are especially needed when you change directions on a steep slope.

Release pedal (6) in order to allow the machine to move. Release pedal (6) in order to increase the ground speed.

## Decelerator Pedal (7)

Engine speed may also be reduced below the maximum operating speed by pushing down on the decelerator pedal. Push down on pedal (7) in order to override the throttle control. This action will reduce the engine speed. Use pedal (7) in order to reduce engine speed for directional shifts. Also, use pedal (7) in order to reduce engine speed when you maneuver in tight locations.

**Note:** The sensitivity of the decelerator pedal changes according to the setting of the throttle switch. At partial throttle settings, the modulation of the pedal is increased. This increase in modulation allows more precise control of the engine speed.

## Light Switches (8, 9)

Front Work Lights (8) – This switch is a three- position switch. The positions are: OFF, front work lights, and the front work lights with ROPS lights.

Rear Work Lights (9) – Move the switch to this position in order to turn on the rear work lights.

## Gauges and Indicators (10)

### Monitoring System Display


Illustration 63

Main menu display

(A) Speed and direction
(B) Main menu
(C) Display menu
(D) Left / Up and Right / Down button
(E) OK button
(F) Back to the previous screen
(G) Return to operator menu
(H) Return to main menu
(J) Backlight adjustment

The monitoring system display is located in gauge and instrument module (11) of the front console. The monitoring system display communicates with the machine electronic control modules, sensors, and the instrument module. The monitoring system display provides various machine information to the operator and the service technician.

Items (A), (B), and (C) on the screen display system data at all times.

Some functions of the monitoring system display are password protected. Refer to Operation and Maintenance Manual, “Monitoring System” for more information.

### Duration Timer (Lighting)

When “Machine Setup” of Monitoring System Display (C) is in use, select “Lighting Timer Duration”. Then, select the amount of duration time for the lights in order to remain on.

## Mirror (11)

The operator will adjust the rear view mirror in order to get the best visibility. Adjust the mirror before you operate the machine and after operators change.

# Speed Range Control

## MVP Switch (12), If Equipped

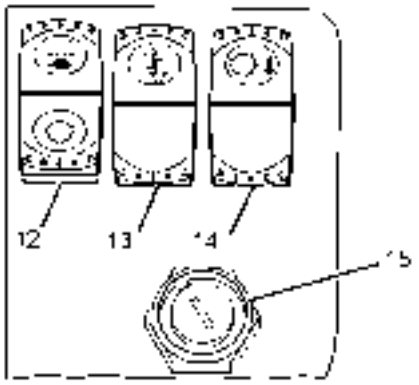



Illustration 64

(12) MVP switch
(13) Bidirectional switch (Autoshift)
(14) Auto kickdown switch
(15) Engine start switch

Multi-Velocity Program, If Equipped – MVP (12)

Your machine is equipped with one of two versions of speed ranges. The first option is MVP that activates the configuration of five speed ranges. Press the top part of the switch (12) in order to activate the five speed range. The second option is MVP OFFand the three speed ranges. Press the bottom part of the switch (12) in order to activate the three speed range.

The five speed ranges that are provided by MVP allow the operator to find the best match between the following items: machine speed, application, ground conditions and skill of the operator.

The operation of the five speed range is indicated on the display with the following designations: “1.5”, “2.0”, “2.5”, “3.0” and “3.5”. The display also indicates “F” for FORWARD, “N” for NEUTRAL, and “R” for REVERSE. The “2.0” speed range is a limited version (ground speed) of the “2.5” speed range. For “2.0”, the engine speed is reduced below high idle in order to limit ground speed. There is no loss of power operating in the “2.0” range when power is compared to the “2.5” range. The same condition is true for the “3.0” speed range and the “3.5” speed range.

The operation of the three speed range is indicated on the display with the following designations: “1”, “2” and “3”. The display also indicates “F” for FORWARD, “N” for NEUTRAL, and “R” for REVERSE.

## Bidirectional Shift Mode (13)

Autoshift Mode – The bidirectional shift function allows the operator to preset the FORWARD and the REVERSE gear for directional changes and shifts out of NEUTRAL.

Bidirectional shifting can be selected with switch (13). The selected mode is shown on the digital display window. Three different modes can be selected by the operator by toggling this switch.

**Note:** When the bidirectional shift mode is activated and the transmission direction selector is in the NEUTRAL position, the digital display window shows N only.

Whenever a directional shift or shifting from neutral occurs, the transmission shifts to the selected gear for that direction by the active mode. If the machine is operating in the third gear forward with the autoshift mode at 1F-2R and a directional shift is requested, the machine will shift directly from third gear forward to second reverse gear. If another directional shift is requested, the machine will shift from second reverse gear to first gear forward.

When the machine powers up and the autoshift function is previously enabled, the mode selection always begins in the default OFF mode.

Bidirectional Shift (13) – The bidirectional autoshift function allows selection from two fixed settings and one configurable setting.

Table 7

| Autoshift Mode(1) | | |
|---|---|---|
| | 1F-3.0R(2) | |
| | 1F-2R | |
| | 2F-2R | |
| | OFF | |

(1) Active setting
(2) Configurable setting in the monitoring system display

For the best results, change the options with the transmission in NEUTRAL.

1F-3.0RConfigurable setting – This active setting can be configured with the “Monitoring System Display” for use in directional shift mode with first speed forward to reduced Eco Reverse .

1F-2R – This setting is the active setting when first speed forward to second reverse speed is the directional shift mode.

2F-2R – This setting is the active setting when second speed forward to second reverse speed is the directional shift mode.

The lights will display the desired mode. For the best results, change the options with the transmission in NEUTRAL. If the autoshift functions are not desired, the machine can be operated in the manual mode. The modes of the autoshift function are listed sequentially in the next topic.

### Setting the Bidirectional Autoshift with Monitoring System Display

Use the “Message Display” on the instrument module in order to set the configurable setting and the installation status.

Table 8

| MVP Active Setting | MVP Inactive Setting |
|---|---|
| 1.5F-3.0R(1) | 1F-3.0R(1) |
| 1F-3R(2) | 1F-3R(2) |

(1) Configurable setting when the Eco Reverse Mode is ON.
(2) Setting when the Eco Reverse Mode is OFF.

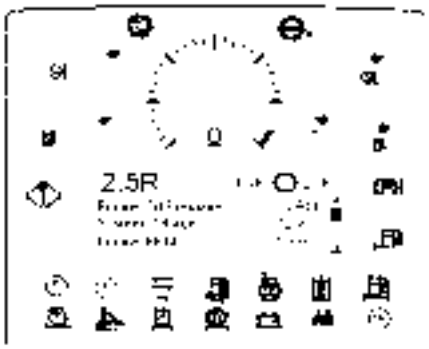



Illustration 65

The configurable setting for the autoshift function will be adjusted through the “Settings” menu in the Message Display. The diagram below shows the location of Bidirectional settings for Autoshift mode in the Message Display.

## Onboard Display

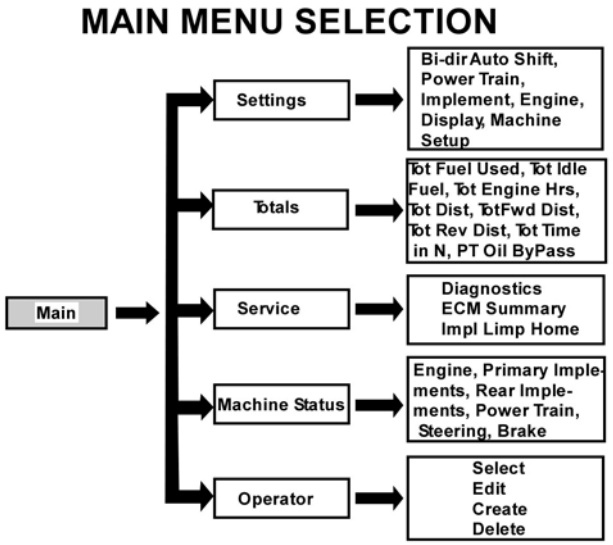



Illustration 66

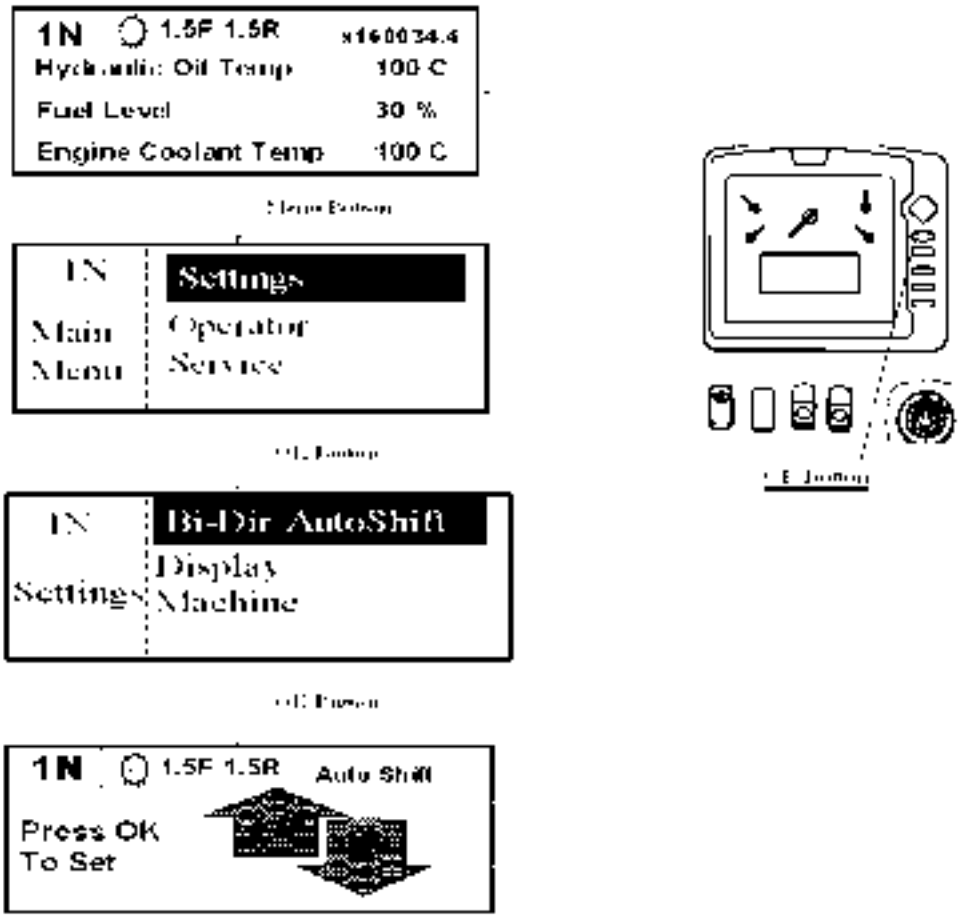



Illustration 67

Typical information panels of the “Message Display”

## SETTINGS MENU

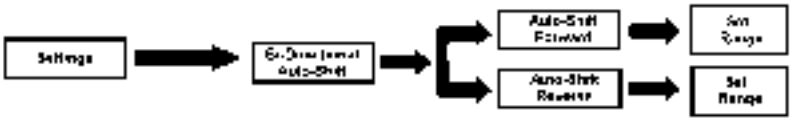



Illustration 68

For the complete list of options in the “Settings Menu”, see “Monitoring System” in this manual.

Selecting the bidirectional Autoshift function will take the user directly to the interface for the bidirectional Autoshift modes. The interface will have up arrows and down arrows in the lower right section of the LCD screen. The up arrow will represent the forward gear and the down arrow will represent the reverse gear. The following text is displayed on the LCD screen: and “Press OK to Set”. The LCD will display the following information from left to right: and gear and lever positioncurrent “Bidirectional Autoshift” settings and “Autoshift” text. A screen that is an example of the interface for the “Bidirectional Autoshift” is shown in illustration 68.

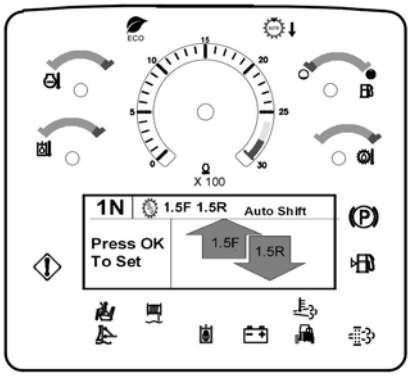



Illustration 69

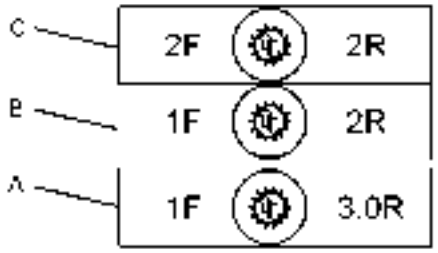



Illustration 70

First speed forward to third reverse directional shift mode (Configurable setting) (A) – Push button (13) once for the autoshift function. A directional shift to the FORWARD position will always shift to the first physical gear (or operator configured gear). A directional shift to the REVERSE position will always shift to the third physical gear (or operator configured gear). This mode allows a direct shift from the FIRST SPEED FORWARD position to the THIRD SPEED REVERSE position. With the transmission in the NEUTRAL position, the display for the transmission indicates “N”. Speed shifting is manual. Use the thumb roller for upshift requests and downshift requests. When MVP is active, the autoshift mode “1.5F-3.0R” is active (or the operator-selected mode is active).

First speed forward to second reverse directional shift mode (fixed setting) (B) – Push the button for the autoshift function (13) twice. When you shift the transmission to the FORWARD position, the transmission will always shift into the first physical gear. When you shift the transmission to the REVERSE position, the transmission will always shift into the second physical gear. The speed shift mechanism is manual. Use the buttons in order to upshift or use the buttons in order to downshift. When MVP is active, the autoshift mode “2.5F-2.5R” is active.

Second speed forward to second reverse directional shift mode (fixed setting) (C) – Push the button for autoshift function (13) three times. When you shift the transmission to the FORWARD position, the transmission will always shift into the second physical gear. When you shift the transmission to the REVERSE position, the transmission will always shift into the second physical gear.

Use the autoshift button on the dash to cycle through the three autoshift modes and the ON/OFF. The switch cycles in order from the top setting to the bottom setting in the table below.

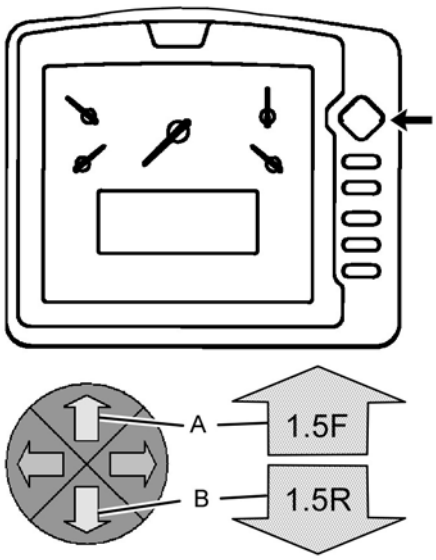



Illustration 71

Bidirectional Keypad

(A) Arrow that adjusts the FORWARD gear
(B) Arrow that adjusts the REVERSE gear

The “Message Display” on the instrument module changes with a hand control keypad with up/down arrow keys. The arrow keys will be used to adjust the “Bidirectional Autoshift” settings. The up arrow will adjust the forward gear in the up arrow on the LCD screen. The down arrow will adjust the reverse gear in the down arrow on the LCD screen.

The “Message Display” on the instrument module with the hand control keypad will scroll through a set of gears. The scrolling feature for gears will be cyclical. The diagrams below show the scrolling feature for gears for MVP Active status and MVP Inactive status.

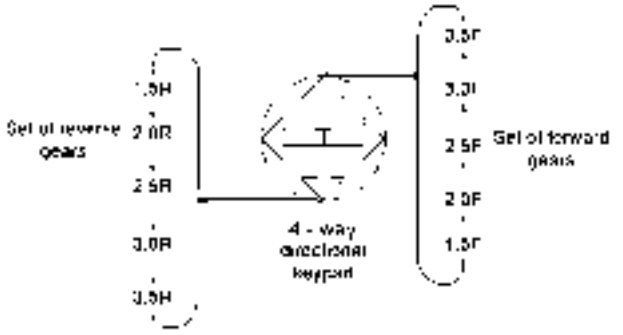



Illustration 72

Scrolling feature with an MVP active status

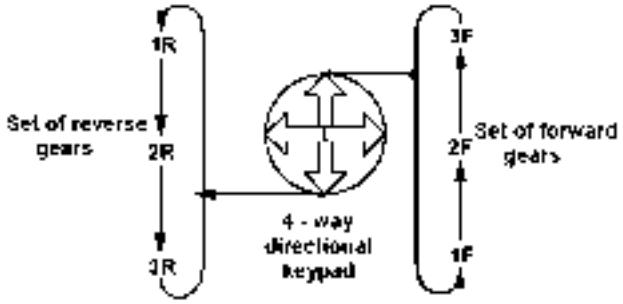



Illustration 73

Scrolling feature with MVP inactive status

## Auto Kickdown Mode (14)

Auto Kickdown – This feature provides the operator with an auto kickdown mode of operation. Once the feature has been activated by the operator, the transmission will automatically downshift to a lower speed range when a significant load increase is detected. Once the load on the machine has been reduced, the operator can return to the desired speed range by manually upshifting. The auto kickdown will only downshift the transmission. The feature will not automatically upshift the transmission. The auto kickdown functions in FORWARD and REVERSE speed range.

To activate the auto kickdown mode of operation, push switch (14) that is located on the right side of the dashboard. An indicator light on the upper display module will illuminate when the auto kickdown is active. When the machine is started, the transmission is in the previously selected mode. If you start up the machine, and the auto kickdown is not selected, push switch (17). If the auto kickdown is active, the light is illuminated. In order to achieve the best results, select the auto kickdown with the transmission in NEUTRAL. If the autoshift function is not desired, the machine can be operated in the manual mode.

Autokickdown mode selection is done using the setting screen in the monitoring system display (message module).

The auto kickdown can be used in the following modes:

**Manual shift in Auto Kickdown Mode.** Automatic auto kickdown mode allows the transmission to downshift automatically. After a manual upshift, the auto kickdown is prevented for 2 seconds. The operator can make manual shifts at any time.

**Auto Kickdown OFF.** Push switch (14) and release switch (14) until the auto kickdown indicator is off. The manual shift mode is active if no autoshift indicators are on.

**Auto Kickdown LOW.** This mode utilizes the low shifting points.

**Auto Kickdown MEDIUM.** This mode utilizes the middle shifting points.

**Auto Kickdown HIGH.** This mode utilizes higher downshift points. The higher downshift points result in a quicker response as load is applied.

## Engine Start Switch (15)

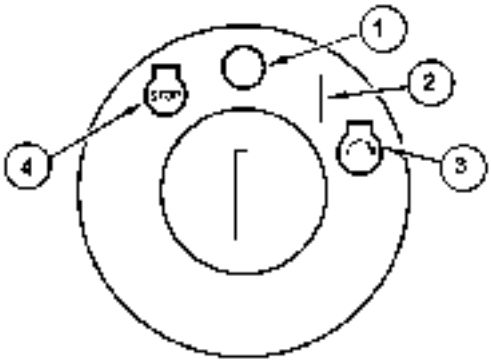



Illustration 74

OFF (1) – Inserting the engine start switch key and removing the key must only be done from the OFF position. In the OFF position, there is no power to most electrical circuits in the cab. The cab lights, the panel lights, the tail lights, and the dome light are operational even when the start switch is in the OFF position.

Turn the start switch key to the OFF position in order to stop the engine.

ON (2) – Turn the start switch key clockwise to the ON position in order to activate all cab circuits.

START (3) – Turn the start switch key clockwise to the START position in order to crank the engine. Release the key after the engine starts. The key will return to the ON position.

Emergency Shutdown Override (4) – Turn the engine start switch key to this position. This position overrides the delayed engine shutdown or the key off regeneration in an emergency. The engine shuts down without delay.


Illustration 75

"Warning category 2s" displays for 15 seconds after the engine shutdown occurred. (The action lamp flashes.)

**Note:** The engine can be restarted at the discretion of the operator for the allowance of system cooling.

## Regeneration Switch (16)

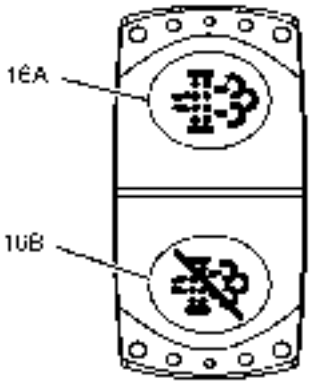



Illustration 76

ARD disable switch

The MIDDLE position of the regeneration switch is the default position for automatic regeneration.

(16A) Enable the aftertreatment regeneration device system. Press top of the switch and hold for 2 seconds.
(16B) Disable the aftertreatment regeneration device system. Press the bottom of the switch and hold for 2 seconds.

Illustration 77

Soot level indicator

The soot level threshold to enable a manual regeneration is 15%. Push the top of regeneration switch (16) for a manual regeneration. Then, the high exhaust system temperature indicator (HEST lamp) illuminates during the regeneration cycle. The high exhaust system temperature indicator (HEST lamp) will deactivate when the regeneration cycle is completed.

### Regeneration Indicators

DPF – DPF lamp indicates when a regeneration cycle is needed. This indicator will illuminate when the soot level reaches 90%. This lamp turns off during an active regeneration.

High Exhaust System Temperature – HEST lamp indicates that a regeneration cycle using the Aftertreatment Regeneration Device (ARD) is active.

Regeneration Disabled – The display will indicate when a regeneration cycle is disabled.

**Reference:** See Operation and Maintenance Manual, “Diesel Particulate Filter Regeneration” for additional information.

## Engine Fan Reverse Switch (17) (If equipped)

If the machine is equipped with the reverse fan function (attachment), the fan can reverse the direction of air flow from forward to the rearward direction. This function enables the fan to purge debris from the radiator, aftercooler cores, and engine access doors. The purge cycle will begin automatically when the purge interval expires or the purge cycle can begin manually with a switch(17) on the left dash.

Reversing Fan Control (17) – In order to initiate the fan purge cycle, press fan control switch (17) while the machine is in NEUTRAL and the parking brake is released or when the machine is in REVERSE. In order to initiate the continuous purge cycle, press fan control switch (17) while the machine is in NEUTRAL and the parking brake is ON and hold for 3 seconds. The fan will remain in a continuous purge cycle until the switch is pressed again or the parking brake is released.

The setting range for the duration of the fan purge cycle is 5 - 60 seconds. The setting range for fan purge interval is 5 - 120 minutes.

If the purge interval expires, a purge cycle will begin when the track-type tractor is in a REVERSE gear or in NEUTRAL and the parking brake is released. If the purge interval expires and the track-type tractor is in a FORWARD gear, starting a purge cycle is prevented. If the purge interval expires and the track-type tractor is in NEUTRAL with the parking brake engaged, starting a purge cycle is prevented. A purge cycle is prohibited until there is a shift into REVERSE gear or the parking brake is released in NEUTRAL.

If the purge button is manually depressed, a purge cycle will begin when the track-type tractor is in a REVERSE gear or in NEUTRAL and the parking brake is released. If the purge button is manually depressed, the request for a purge cycle will be ignored when the track-type tractor is in a FORWARD gear or in NEUTRAL and the parking brake is engaged.

When a purge cycle is in progress and the cancellation of the purge cycle is set to OFF, the indicator light for the reverse fan function in monitoring system display (10) will light. After a purge cycle begins, the purge cycle is canceled if there is a shift to forward gear.

When a purge cycle begins and the cancellation of the Purge Cycle is set to ON, the purge cycle will stop automatically once the machine is put into FORWARD gear. If the cancellation of the Purge Cycle occurs after 15 seconds of purge time, the purge interval timer is kept at zero. Then, the system is able to purge the cooling system and the purge cycle starts automatically at the next time. After three successive attempts fail to complete more than 15 seconds of purge time, the purge interval timer is reset to the purge interval.

The purge interval timer is reset upon full completion of every purge cycle regardless of an automatic start or manual start. The reverse fan function is disabled when the hydraulic oil temperature is below 0 °C (32 °F). The fan purge cycle will not operate when the engine coolant temperature equals 109° C (228.2° F) or the engine coolant exceeds that temperature.

## Throttle Control Switch (18)

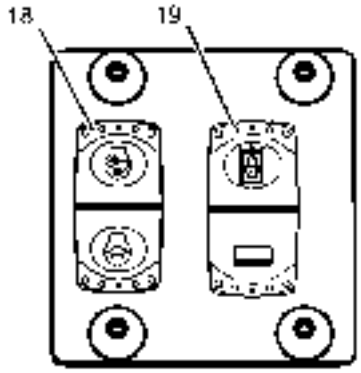



Illustration 78

Throttle control switch (18) is located on the right-hand console.

High Idle – For high idle, press the throttle control switch on the top of switch(18), if equipped. The engine speed immediately moves to high idle. Your machine has a high idle engine speed of 2000 rpm.

Low Idle – For low idle, press the throttle control switch on the bottom of the switch(18). The engine speed immediately moves to low idle.

Engine speed may also be reduced by pushing down on decelerator pedal (7).

Set the maximum operating speed at a point less than high idle in one of the following manners:

1. Set the engine speed to high idle. Push the decelerator pedal until the desired speed is reached.
2. When this desired speed is reached, push the top of switch (18) and hold for 2 seconds. This movement will electronically set the engine speed as the maximum operating speed.
3. The decelerator will function normally in order to reduce engine speeds below this maximum speed.
4. In order to return to high idle as maximum speed, press the top part of switch (18).

An optional method performs in the following manner.

1. Press and hold the top of throttle switch (18) for 2 seconds.
   a. The engine speed will ramp up until the switch is released.
   b. The engine speed will ramp up until the high idle point is reached.
2. Press and hold the bottom of throttle switch (18) for 2 seconds.
   a. The engine speed will ramp down until the switch is released or the low idle speed is reached.

## Hydraulic Lockout Control (19)

**Note:** Disengage the locking tab on the switch to use the hydraulic lockout control.

The hydraulic lockout control is designed to deactivate the control levers. Press the top of switch (19) to the lock position in order to deactivate the control levers. Deactivate the control levers before you exit the seat or before you service the machine. The control levers should always be deactivated when the machine is left unattended. Press the bottom of switch (19) to the unlocked position in order to activate the control levers.

## Joystick Control (20)

### Lift Control

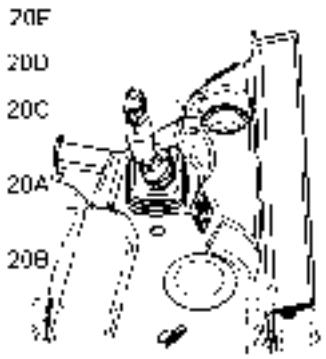



Illustration 79

HOLD (20A) – The lever will return to the HOLD position when you release the lever from the RAISE position or from the LOWER position. Also, the movement of the bulldozer blade stops in the up and down direction.

RAISE (22B) – Pull back on the lever in order to raise the blade. Faster movement of the lever increases the moving speed of the blade. Releasing the lever will return the lever to the HOLD position.

LOWER (22C) – Push the lever forward in order to lower the blade. Faster movement of the lever increases the moving speed of the blade. Releasing the lever will return the lever to the HOLD position.

QUICK DROP (22D) – Push the lever beyond the Lower position to activate the blade quick-drop function. The blade will be allowed to drop to the ground. Releasing the lever returns the lever to the HOLD position.

FLOAT (22E) – Push the lever forward past the detent in order to activate the blade FLOAT function. The float function is not deactivated when the lever is released into the NEUTRAL position. When in float, the blade moves up and down with the ground contour. Float will be deactivated if the lever is moved through the NEUTRAL position to the RAISE position or the LOWER position.

**Note:** The control moves through the quick drop range as you go from the LOWER position to the FLOAT position.

**Note:** Hydraulic lockout control (24) is designed to deactivate the control levers. Disengage the locking tab on the switch to use the hydraulic lockout control. Press the top switch (24) to the lock position in order to deactivate the control levers. The action indicator for the attachment control will ensure that the control is locked. Deactivate the control levers before you exit the seat or before you service the machine. The control levers should always be deactivated when the machine is left unattended.

**Reference:** You may lower the attachments after you stop the engine. Refer to Operation and Maintenance Manual, “Equipment Lowering with Engine Stopped” for more information.

### Tilt Control

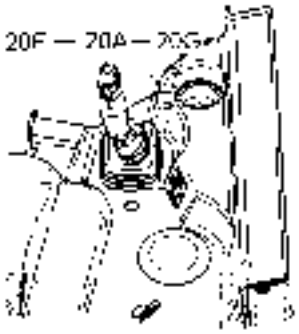



Illustration 80

Hold (20A) – When you release the lever, the lever returns to the HOLD position. The movement of the bulldozer blade stops in the TILT direction.

Tilt Left (20F) – Pull the tilt lever toward the left in order to lower the left side of the bulldozer blade. Faster movement of the lever increases the moving speed of the blade. Releasing the lever will return the lever to the HOLD position.

Tilt Right (20G) – Push the tilt lever toward the right in order to lower the right side of the bulldozer blade. Faster movement of the lever increases the moving speed of the blade. Releasing the lever will return the lever to the HOLD position.

## Horn (21)

Horn – Push the knob downward in order to sound the horn. Use the horn to alert the personnel. Use the horn to signal the personnel.

## Additional Operator Controls

### Ground Level Service Center

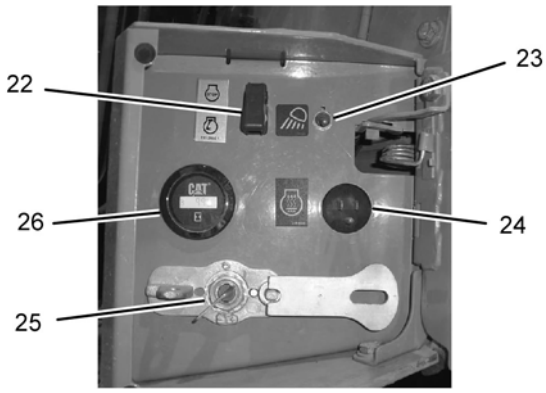



Illustration 81

#### Secondary Engine Shutdown (22)

Engine Stop – Move the toggle switch to this position in order to stop the engine from ground level.

Engine Run – With the toggle switch in this position the machine engine continues to operate.

#### Access Light (23)

Platform Access Lighting – Use this toggle switch to operate the access lighting when mounting the machine.

**Note:** When the switch in the ground level service center is activated, the lights remain on for 10 minutes. The time limit of the lights is programmable. Toggling the switch a second time will deactivate the lights. The toggling of the switch will also turn off the lights if the lights were activated from the cab while exiting the machine.

#### Delayed Lighting Mode

This function is enabled by leaving the lights in the ON position before turning the machine keyswitch to the OFF position. The lights will stay on for a configured amount of time to light the machine for safe exit. The default is 10 minutes. The lights may be turned off using the ground level “Access Lighting” switch.

#### Jacket Water Heater (24)

Engine Starting Aid – Use this outlet to operate the engine coolant heater, if equipped.

### Battery Disconnect Switch (25)

NOTICE
Never move the battery disconnect switch to the OFF position while the engine is operating. Serious damage to the electrical system could result.

On – Insert the key, and turn the key clockwise in order to activate the electrical system. The switch must be ON before you start the engine.

Off – Turn the key counterclockwise in order to shut off the entire electrical system.

See “Battery Disconnect Switch” in this manual for more information.

#### Service Hour Meter (26)

Elapsed Operating Hours – Use the service hour meter to determine the service hour maintenance intervals, if equipped.

# Diesel Particulate Filter Regeneration

## Regeneration

Regeneration is the removal of soot from the Diesel Particulate Filter (DPF). The Caterpillar Regeneration System (CRS) is used to regenerate the DPF. The DPF traps both soot and ash. The ash is removed through a cleaning process. Refer to Operation and Maintenance Manual, “Diesel Particulate Filter - Clean” for more information on the service of the DPF.

## Regeneration Indicators

Regeneration Active – This indicator will illuminate in order to show that the CRS is active. This indicator shows that elevated emission temperatures are possible. This indicator will turn off when regeneration is complete.

DPF – This indicator will illuminate in order to show that a regeneration is needed. This indicator will illuminate when the soot level reaches 90%.

Regeneration Disabled – This indicator will illuminate in order to show that a regeneration has been disabled.

## Regeneration Switch

Force Regeneration – Press in the top of the switch for 2 seconds in order to begin regeneration.

Disable Regeneration – Press in the bottom of the switch for 2 seconds in order to disable regeneration.

**Note:** The MIDDLE position of the regeneration switch is the default position for automatic regeneration.

**Note:** You may return to normal operation at any point during a regeneration.

**Note:** To re-enable automatic regeneration, cycle the engine start switch key or press and hold down the force regeneration switch for 2 seconds. If the soot level is above 15%, regeneration will begin if the machine is at low idle and is parked.

**Note:** If the engine start switch key is cycled while the regeneration system is disabled through the disable regeneration switch, press and hold the disable regeneration switch for 2 seconds to reinitiate the disable regeneration.

## Soot Level Monitoring

Illustration 82

The soot level monitor indicates the level of soot that has accumulated within the DPF. The five marks on the monitor represent a percentage of soot within the DPF. The first mark indicates 0% soot level. The second mark indicates 25% soot level. The middle mark indicates 50% soot level. The fourth mark indicates 75% soot level. The last mark indicates 100% soot level. The soot level monitor can be used to optimize DPF regenerations based upon the work cycle of your machine. If machine conditions do not allow for an automatic regeneration, a manual regeneration should be performed before the soot level gauge indicates 100%.

## Modes of Regeneration

**Automatic:** The engine ECM uses multiple inputs from the engine and the machine to determine the best time to perform an automatic regeneration. Automatic regenerations can take place throughout the operating cycle of the engine. The regeneration active indicator will be illuminated when a regeneration is being performed. Interruptions of the regeneration are acceptable. If a regeneration is in progress and needs to be stopped for any reason, it is permissible to press the disable regeneration switch or turn off the engine.

**Note:** Automatic adjustments of engine speed may be noticed during automatic regenerations. If a regeneration is taking place and the engine is taken to low idle, the engine speed may remain elevated in order to maintain the regeneration.

**Note:** If an automatic regeneration is started while the engine is at low idle and the machine is taken back to work, this may stop the regeneration. The engine ECM will continue to monitor inputs to determine the best time to restart the regeneration.

**Manual:** A manual regeneration is initiated by pressing the force regeneration switch. A manual regeneration is allowed when the soot level is equal to or greater than 15%. The machine must be stationary, the parking brake must be applied, and the engine must be at low idle in order to perform a manual regeneration.

**Disabled:** When the regeneration system is in disabled mode, automatic regenerations will not be performed.

## Regeneration System Warning Indicators

Illustration 83

Indicator will illuminate when DPF soot load is greater than 90%

**Regeneration should be performed as soon as possible. Machine operation may not allow an automatic regeneration to take place. A manual regeneration should be performed as soon as possible.**

Indicator will turn off once DPF regeneration has started.

**Note:** In some situations, the DPF indicator may stay illuminated when the soot load is below 90%. The illuminated DPF indicator indicates that a complete regeneration has **not** been performed. A complete regeneration is when the soot level is reduced to 0%. If the DPF indicator stays illuminated, perform a regeneration without interruption until the soot level is reduced to 0%. A complete regeneration will reset the DPF indicator.

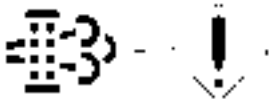


Illustration 84

If the amount of soot collected in the DPF has reached a level that a regeneration is **required**, the DPF indicator and an action lamp will illuminate. Stop the machine and apply the parking brake. With the engine at low idle, initiate a manual regeneration. Engine power will be slightly derated if the machine continues to operate.

Illustration 85

After a certain period, if no action is taken to regenerate an action alarm will activate. After 5 minutes with the action alarm active, the engine will automatically be taken to low idle.

A manual regeneration is required at this time. A complete regeneration will unlock the forced low idle speed. Cycling the engine start switch key will unlock the forced low idle speed.

Once the engine has been in the forced low idle strategy for approximately 10 minutes, regeneration will be locked out. At this time, a regeneration can only be done through Caterpillar Electronic Technician (ET), by an authorized Cat dealer.

After a certain amount of time, engine will automatically shut down. Engine can be restarted but will only run for 30 seconds before shutting down again.

Finally, if the engine is still allowed to run through multiple forced engine shutdowns, all types of regenerations are locked out. The DPF must be replaced. Consult your local Cat dealer if the DPF needs to be replaced.

## Key Off Regeneration

The use of the Key Off Regeneration feature and the Delayed Engine Shutdown feature allows the engine to run for a time when the engine start switch is turned to the OFF position. The key may be removed.

**Note:** There may be regulations that define the requirements for the operator and/or support personnel to be present when the engine is running.

**⚠ WARNING**

**Leaving the machine unattended when the engine is running may result in personal injury or death. Before leaving the machine operator station, neutralize the transmission, apply the parking brake, lower work tools to the ground, and deactivate all work tools.**

Refer to Operation and Maintenance Manual, “Parking” for more information.

**Note:** Leaving the machine unattended when the engine is running may also result in property damage in the event of a malfunction.

Key off regeneration allows for regeneration when the engine start switch key has been removed. To begin a key off regeneration, the soot level must be between 15% and 100% on the soot level monitor and/or a regeneration is in progress. The following steps outline the procedure of a key off regeneration:

1. Turn the engine start switch to the OFF position.
2. The engine will continue to run for 15 seconds. During this 15 second interval, if a regeneration is desired, press and hold the force regeneration switch for 2 seconds.

**Note:** If a regeneration is not desired, the machine will initiate the delayed engine shutdown.

3. The key off regeneration will activate and the key off regeneration will last for up to 15 minutes.

**Note:** If at anytime the regeneration needs to be stopped, press and hold the disable regeneration switch.

4. Once the key off regeneration is complete, the machine will initiate the delayed engine shutdown.
5. The delayed engine shutdown will last for 5 minutes.
6. After the delayed engine shutdown has been completed, the engine will shut down.

## Delayed Engine Shutdown

The Delayed Engine Shutdown allows the engine to run for a time after the engine start switch is turned to the OFF position to cool the engine and the machine system components. The engine start switch key may be removed.

**Note:** There may be regulations that define the requirements for the operator and/or support personnel to be present when the engine is running.

**⚠ WARNING**

**Leaving the machine unattended when the engine is running may result in personal injury or death. Before leaving the machine operator station, neutralize the transmission, apply the parking brake, lower work tools to the ground, and deactivate all work tools.**

Refer to Operation and Maintenance Manual, “Parking” for more information.

**Note:** Leaving the machine unattended when the engine is running may result in property damage in the event of a malfunction.

Turn the engine start switch to the OFF position.

Delayed Engine Shutdown – The delayed engine shutdown indicator will illuminate or the following text will be displayed, **ENGINE COOLDOWN ACTIVE**.

Delayed engine shutdown will run for a minimum of 30 seconds and will continue to run until the engine and machine system components are cooled. The maximum run time is 10 minutes,

**Note:** To override delayed engine shutdown and stop the engine, turn the engine start switch to the STOP position. Overriding delayed engine shutdown may reduce engine and machine system component life. A warning message and/or audible alarm will be initiated and a fault code will be logged for improper engine shutdown.

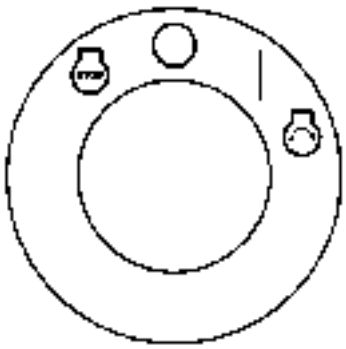


Illustration 86

**Note:** At any time during a delayed engine shutdown, the engine start switch may be turned to the ON position. The machine may be placed back into service.

# Monitoring System

The monitoring system informs the operator of the status of the machine systems. The monitoring system informs the operator of problems or of an impending problem.

## Functional Test

When the engine key start switch is turned ON, the monitoring system will conduct a self test. The self test consists of the following characteristics: full sweep of the gauge needles from the minimum position to the maximum position, activation of all indicators and activation of the audible alarm for level three warnings for one second. The operator must observe the self test to verify that the monitoring system is working properly.

The self testing feature verifies that the modules of the monitoring system are properly operating.

The operator must observe the outputs in order to determine if the modules are operating properly. This self testing feature is 3 seconds long.

**⚠ WARNING**

**If the action alarm does not sound during this test or machine monitoring displays are not functioning, do not operate the machine until the cause has been corrected. Machine operation with faulty action alarms or displays could result in injury or death as any Warning Category 3 notifications will not be relayed to the operator.**

During the self test, all status indicators light.

- The action light stays illuminated.
- The action alarm sounds once.

The monitoring panel is then in the normal operating mode.

## Action Lamp

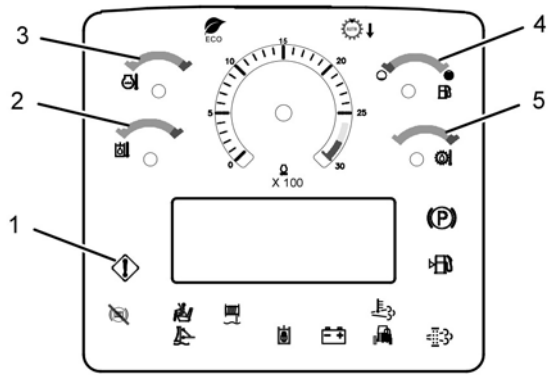



Illustration 87

Monitoring system display

Action Lamp (1) – There are two action lamps. One action lamp (1) is on the gauge cluster. The other action lamp is located on the right console. The rearward action lamp is viewed when the operator is facing rearward.

## Gauges

Hydraulic Oil Temperature (2) – The gauge indicates the temperature of the hydraulic oil in the hydraulic oil sump for the steering and implement circuits. If the gauge needle enters the red zone, the hydraulic system oil is approaching 95° C (203° F). The monitoring system display will display a warning. If necessary, reduce the load that is on the machine until the hydraulic oil temperature decreases.

Engine Coolant Temperature (3) – The water temperature regulator regulates the coolant temperatures. If the gauge needle just enters the red zone, the coolant temperature is 112 °C (234 °F). Increased temperatures will sound the warning alarm. Continued operation of the machine during the sounding of the warning alarm or the gauge needle in the red zone may damage the engine. Stop the machine in a safe place and investigate the cause.

Fuel Level (4) – The fuel level gauge indicates the amount of fuel that remains in the fuel tank. A gauge needle in the red zone indicates a low fuel level. (This proceeding indicates a remaining fuel level of approximately 10 percent.)

NOTICE

Running out of fuel can cause engine damage. Do not continue to operate the machine when critically low on fuel.

Torque Converter Oil Temperature (5) – This gauge indicates the temperature of the oil in the torque converter. If the gauge needle reaches the red zone, increased temperatures will sound the warning alarm. Continued operation of the machine during the sounding of the warning alarm or the gauge needle in the red zone may damage the transmission and or the torque converter. Reduce the load that is on the machine until the torque converter oil temperature decreases.

# Status Indicators

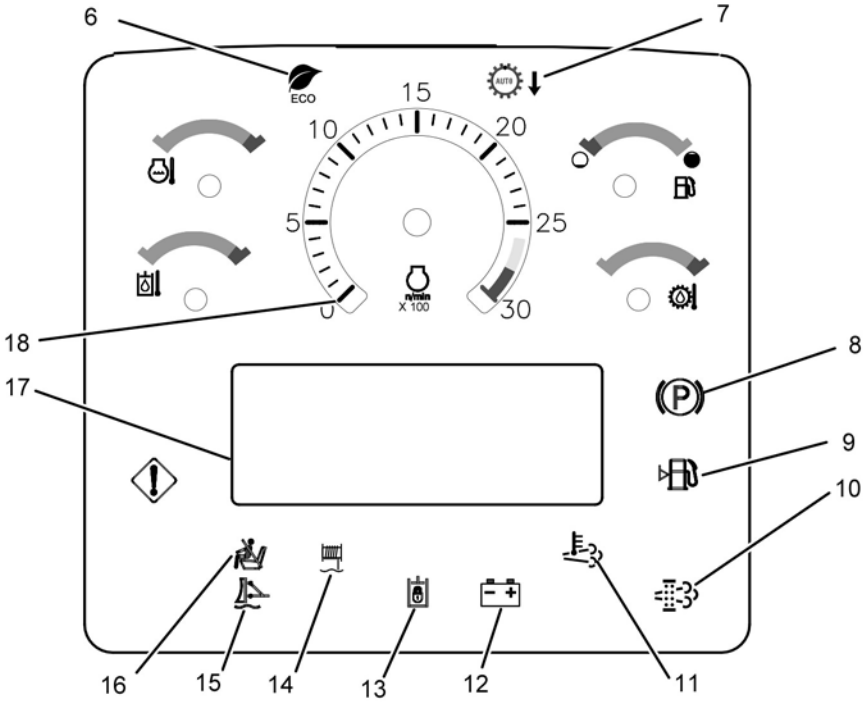



Illustration 88

Eco Reverse Mode (reverse travel) (6) – This indicator is illuminated when the fuel economy mode is active during reverse travel in the unlocked third gear.

Auto kickdown (7) – This indicator is illuminated when the auto kickdown mode is active.

Parking Brake (8) – This status indicator indicates that the parking brake is engaged. If this indicator is illuminated, disengage the parking brake before attempting to move the machine.

Fuel Level (9) – This status indicator is illuminated when the fuel level is low.

DPF Filter (10) – This indicator illuminates when the amount of soot that is collected in the DPF is above 90%.

High Temperature Indicator Lamp (11) – An illuminated HEST lamp shows that the aftertreatment regeneration device ( ARD) is active.

Battery Charging (12) – This indicator is illuminated when the charging system is not OK.

Implement Lockout (13) – This indicator is illuminated when the implement lockout switch is activated.

Winch Freespool (14) – This indicator indicates that the freespool mechanism is latched and active.

Float (15) – This status indicator is illuminated when the float mode is active.

## Operator Seat (16)

The Operator is Not in Seat (16) – This status indicator is illuminated when the engine is running and the operator leaves the seat unoccupied.

### Operator in Seat (Sensor)

The sensor unit that is mounted under the operator seat prevents movement of the machine or implements if the operator is out of the seat.

When the sensor unit indicates that an operator is present in the seat, the Machine ECM will enable specific system operation. The operation of the travel system of the machine and the implement control system is now active.

**Note:** When the machine is moving and the operator raises from the seat, the electric power train systems and the implement operation will not shut down until the machine is stopped.

After the machine is stopped, the Machine ECM will again require the sensor unit to indicate that an operator is in the seat. This seating of the operator must occur before the travel and implement systems will be enabled.

**Note:** The parking brake will not disengage and the implements will not respond unless the operator is seated.

### Digital Display Window (17)

See “Monitoring System Display” in this section for more information on the digital display window.

### Tachometer (18)

The following range marks for engine speed are displayed on the tachometer (18): White zone, Yellow zone and Red zone.

Engine Speed (White zone) – 0 - 2300 RPM

Engine Overspeed (Yellow zone) – “2300 RPM - 2600 RPM” is a visual warning. This zone indicates that the machine is approaching the maximum recommended speed. The monitoring system display will display a level ii warning above 2600 RPM.

Engine Overspeed (Red zone) – +2600 RPM is a visual warning that the engine is overspeeding. Both the alert indicator and the action lamp flash. The monitoring system display will display a level III warning above 3000 RPM.

Do not allow the engine to exceed 2900 rpm. Severe engine damage may result.

## Warning Categories

The operator will be warned of immediate problems with a machine system or impending problems with a machine system by digital display window.

The monitoring system display provides three warning categories. The first category requires only operator awareness. The second warning category informs the operator of the machine that the operator should change machine operation. The third warning category states that the machine must be shut down immediately.

The monitoring system display will show a text message for the current highest level active event.

Table 9

| WARNING OPERATION | | | | | |
|---|---|---|---|---|---|
| | Status Indicators (1) | | | | |
| Warning Category | "Action Lamp Flashes" | "Action Alarm Sounds " | Monitoring System Display | "Operator Action Required" | "Possible Result "(2) |
| 1 | | | X(3) | No immediate action is required. The system needs attention soon. | No machine damage occurs. Minor reductions in machine performance may occur. |
| 2 | X (4) | | X | Change machine operation or perform maintenance to the system. | Severe damage to components can occur. |
| 3 | X (5) | X (6) | X | Immediately perform a safe engine shutdown.(7) | Injury to the operator or severe damage to components can occur. |

(1) The active status indicators are marked with an X.
(2) This is the possible result, if the operator takes no action.
(3) Some level I warnings will be logged only.
(4) The front action lamp flashes amber. The rear action lamp flashes red.
(5) Both action lamps flash red.
(6) The action alarm sounds.
(7) Engine overspeed does not require engine shutdown. Engine overspeed requires applying the travel control pedal in order to reduce the track speed immediately. This action reduces the engine speed immediately.

If a fault indication occurs, the message will override any screen that was displayed on the monitoring system display. For example, a steering malfunction is indicated on the message display. The message display prompts the operator with the Limp Home Mode (screen) in order to continue to move the machine with limited operation to a safe place.

**Reference:** See Systems Operation, KENR8246, "D7E Track-Type Tractor Monitoring System " for more information.

## Monitoring System Display

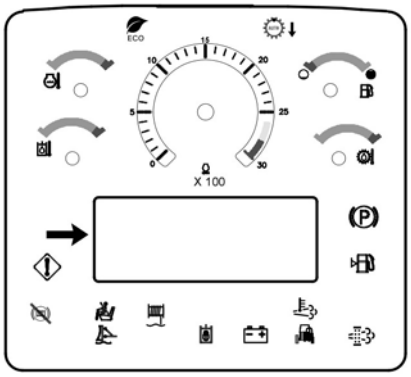


Illustration 89

The monitoring system display is located in the front operator console.

The monitoring system display monitors the machine operations, diagnostic events, and modes of operation. The monitoring system display is used to change the preferred operator inputs and operation parameters. This exercise allows additional means for the operator to increase machine efficiency.

Monitor alert indicator – The monitoring system display indicates a detected fault by the monitoring system.

If a fault indication occurs, the message will override any screen that was displayed on the monitoring system display.

**Note:** You may snooze the fault display from the screen by pushing the OK button.

### Display Readout

The digital display window provides readouts for the Monitoring System Display.

# “Performance” Screens

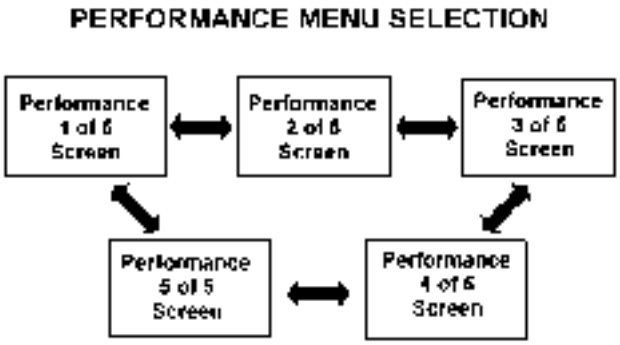



Illustration 90

The “Performance” screens allow the operator or the technician to view five pages of information. These pages of information monitor critical data from the machine systems during machine operation. This information can only be viewed. The “Performance” menu uses five screens for the real-time monitoring of the following information:

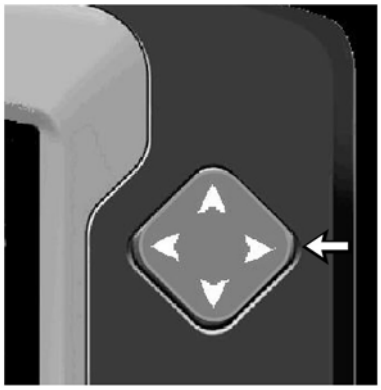


Illustration 91

The  up/down arrow buttons switch the page from one screen to another screen.

The page that displays “Performance 1 of 5” screen is the default setting after the operator preference is completed. ( Key ON).

Table 10

| “Performance” Screen 1 of 5 | |
|---|---|
| **Description** | **Units** |
| DPF Soot level | 25, 50, 75, 100%(1) |

(1) Bar scale

Table 11

| “Performance” Screen 2 of 5 | | | |
|---|---|---|---|
| **Description** | **Value** | **Status** | **Units** |
| Regen mode (control mode) | Disabled, Manual, Automatic | Inactive | Status |
| Regen mode ( ARD status)(1) | Active | Active | Status |
| Machine hours | XXXXXX.X | | Hours |
| Remaining Fuel Level | XXX | | % |

(1) Aftertreatment regeneration device system

Table 12

| “Performance” Screen 3 of 5 | |
|---|---|
| **Description** | **Units** |
| Engine Oil Pressure | kPa or psi |
| System Voltage | V |
| Engine Speed | RPM |

Table 13

| “Performance” Screen 4 of 5 | |
|---|---|
| **Description** | **Units** |
| Engine Coolant Temperature | °C or °F |
| Hydraulic Oil Temperature | °C or °F |
| TC Oil Temperature | °C or °F |

Table 14

| “Performance” Screen 5 of 5 | |
|---|---|
| **Description** | **Units** |
| Engine Load Factor | % |
| Fuel Consumption | L or Gal |
| Air Filter Restriction | kPa or IN-$H^2O$ |

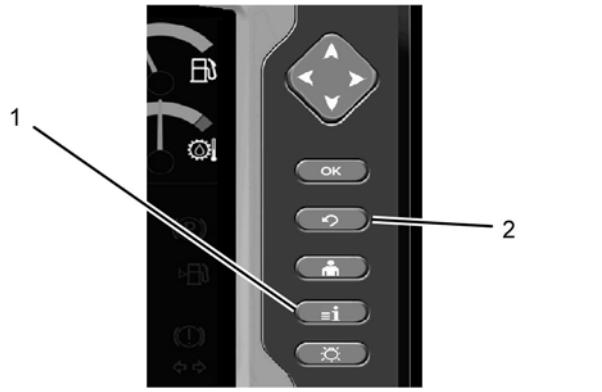



Illustration 92

**Note:** The “Main Menu” can be displayed from any screen by pressing Main button (1).

Press back button (2) the required number of times in order to return to the “Performance” screen.

Service Hour Meter – This display indicates the total operating hours of the engine. Use the display in order to determine the service hour maintenance intervals.

## Engine Monitoring Mode

The monitoring system display interfaces with the engine ECM. Also, this interaction displays the emissions data of the present engine operating state. The information about the engine aftertreatment system is displayed.


Illustration 93

“Performance 1of 5”

Soot level ( DPF filter) – The soot level of the aftertreatment regeneration device ( ARD) displays the level of active soot.


Illustration 94

The aftertreatment regeneration device system is set to the automatic regeneration mode.

**Reference:** See Operation and Maintenance Manual, “Diesel Particulate Filter Regeneration” for additional information on aftertreatment regeneration.

### Delayed Engine Shut Down

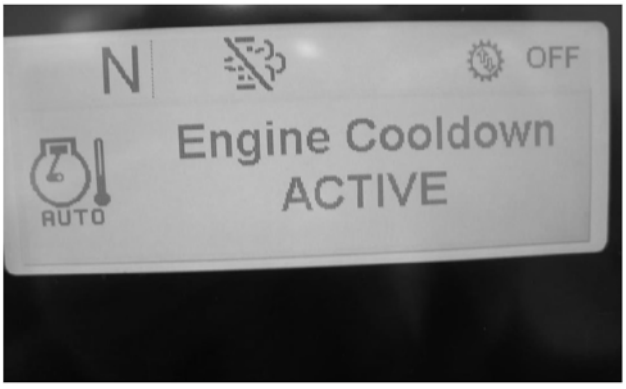



Illustration 95

This message display alerts the operator that an engine cooldown is active. The engine key start switch is in the OFF position.

### Emergency Shutdown Override


Illustration 96

This message alerts the operator that a hot engine shutdown has occurred. The engine key start switch is in the fourth position. A level III warning is active for 15 seconds after the engine shutdown.

**Note:** The operator may allow the engine system to cool by restarting.

## Engine Idle Shutdown

This function shuts down the engine after the operator is not operating the machine for a configured time. This function does shut down other electrical systems, such as the A/C (air conditioning), lights, and others that are powered by the main power relay. This function can be enabled or disabled by using the onboard display.

**Note:** Engine Idle Shutdown may be required for local regulations.

The Engine Idle Shutdown (EIS) shuts down the engine if the following conditions are met:

- The parking brake is applied or the transmission is in neutral.
- The service brake is released.
- The throttle pedal is released.
- The implement controls are not active.

At 20 seconds before the engine shuts down the control limits engine speed to 1000 rpm and turns on the action lamp and action alarm. An operator can move one of the controls in order to cancel a shutdown. Using the service brake pedal to cancel a shutdown is the recommended option for the operator.

# Display Module


Illustration 97

(A) Gear and Direction
(B) Menu option
(C) Display menu
(D) “Four way” button
(E) OK button
(F) Back to previous screen
(G) Operator menu
(H) Return to main menu
(J) Backlight adjustment

Requested gear (A) – This display area shows the requested gear and the current direction of the machine.

Menu Option (B) – This display area shows the selected menu.

Display Menu (C) – This display area shows the numerous menus and submenus in order to navigate from one screen to another screen. Also, this display area depends on the menu or the submenu that is selected. Then the display will show the information in the system, system status, and operator warnings.

Five buttons on the right of the Monitoring System Display are the user interface. Use the buttons for the following purposes: navigation, selection menu and data information

Left Button (Up/Down) (D) – This button is used for the following purposes: navigation, data information and a decrease in a setting value.

Right Down (Up/Down) (D) – This button is used for the following purposes: navigation, data information and an increase in a setting value.

OK (E) – This button is used to make selections on the screen . Also, use this button to confirm a password entry or use the button to save an

operator profile.

Back button (F) – This button is used to return to the previous screen.

Navigate to operator menu (G) – This button is used to return to the operator menu.

Return to main menu (H) – This button is used to return to the main menu.

Use the arrow buttons to highlight the desired selection in order to navigate through the menus and submenus. Then press the OK button. Also, use the arrow buttons to highlight a mode or parameter setting. Then, press the OK button in order to select that option.

**Note:** When the diagnostic message is acknowledged, a predetermined length of time passes before the message screen will appear on the monitoring system display again. This interval is dependent upon the severity of the warning level. Consult the appropriate warning category for the proper instruction.

After all screens with warning messages are acknowledged, the first performance monitor screen will appear. This screen is the default screen.

### Machine Start-up

Upon starting the machine (key ON), the Monitoring System will perform a self test. The first preliminary screen asks the operator to select a name from the saved profiles. Press the OK button, in a timely manner in order to use the active set of customer preferences. If no setting is accepted as “OK” or if “Default” is selected, then the ECM default settings will remain.

## Main Menu

As many as five items are available for setup.

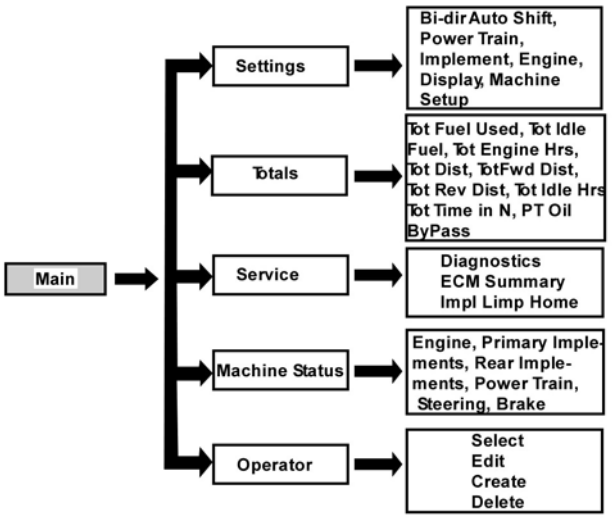



Illustration 98

## Menu for the Operator Profile

Access the Operator Profile (menu) by pressing the button for the operator menu. Also, you may navigate to the Operator Profile (menu) by pressing the following buttons: Menu button, Operator.

### Operator Profile


Illustration 99

The “Operator Profile” menu option is entered by selecting “Operator” from the “Main” menu. Press the up arrow button or the down arrow button until “Operator” is highlighted. Then press the “OK” button.

**Note:** The “Main Menu” can be displayed from any screen by pressing the Main Menu button.

The following explains the usage of each menu option.

"Select" Profile – This option allows the selection of a saved profile and the associated settings. The operator is given this option in order to edit the settings. (See Illustration 100.)

"Edit" Profile – This option allows the operator to edit the settings of the active operator profile. Press the "OK" button in order to edit the settings for the currently selected profile. When all settings have been modified, select the "EXIT" button and press the "OK" button in order to save the settings.

"Create"Profile – This option defines a profile name. When this step is completed, the "Settings" screen for the operator profile is displayed. Now, the operator can edit the settings. When the new profile is exited, the settings are saved to the Profile. As many as 20 operator profiles may be entered.

"Delete" Profile – The operator can delete an existing profile. Highlight the profile that will be deleted. Then press the "OK" button in order to delete that profile.

**Note:** The selected profile must be inactive in order to delete the profile.

## Using Operator Preferences

Upon the next restart, the user will be prompted to recall a saved profile. Press the "OK" button within 15 seconds in order to recall the profile settings. If 15 seconds pass by the start-up, no profile settings are applied.

If the message display fails to apply any settings included in the operator profile, a message communicating 'Operator XXXXX Settings Error' will be displayed. Where XXXXX is the name of the profile being applied.

The following information indicates the typical procedure for start-ups, if the operator has saved a set of preferences by "Name".

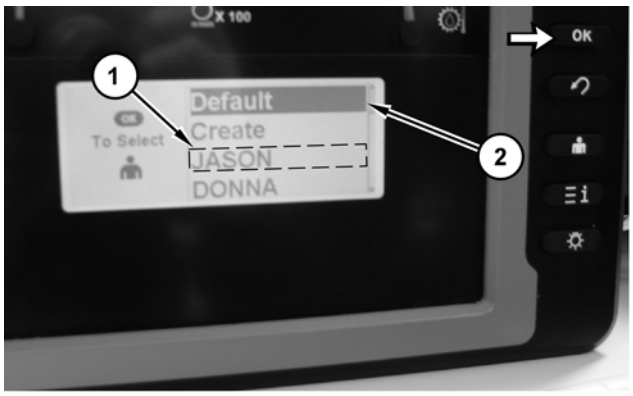



Illustration 100

1. Turn the key ON. Highlight the "Name" (1) in order to use the saved preferences. Then, press the "OK" button. If you do not select the "Name" (1) within 15 seconds, no profile setting will activate.

**Note:** The "Default" profile name (2) is a selection that allows the most appropriate settings for the machine and the recent working conditions.

2. You have now selected the Operator Profile with the set of preferences that was previously saved.

# “Settings” Menu

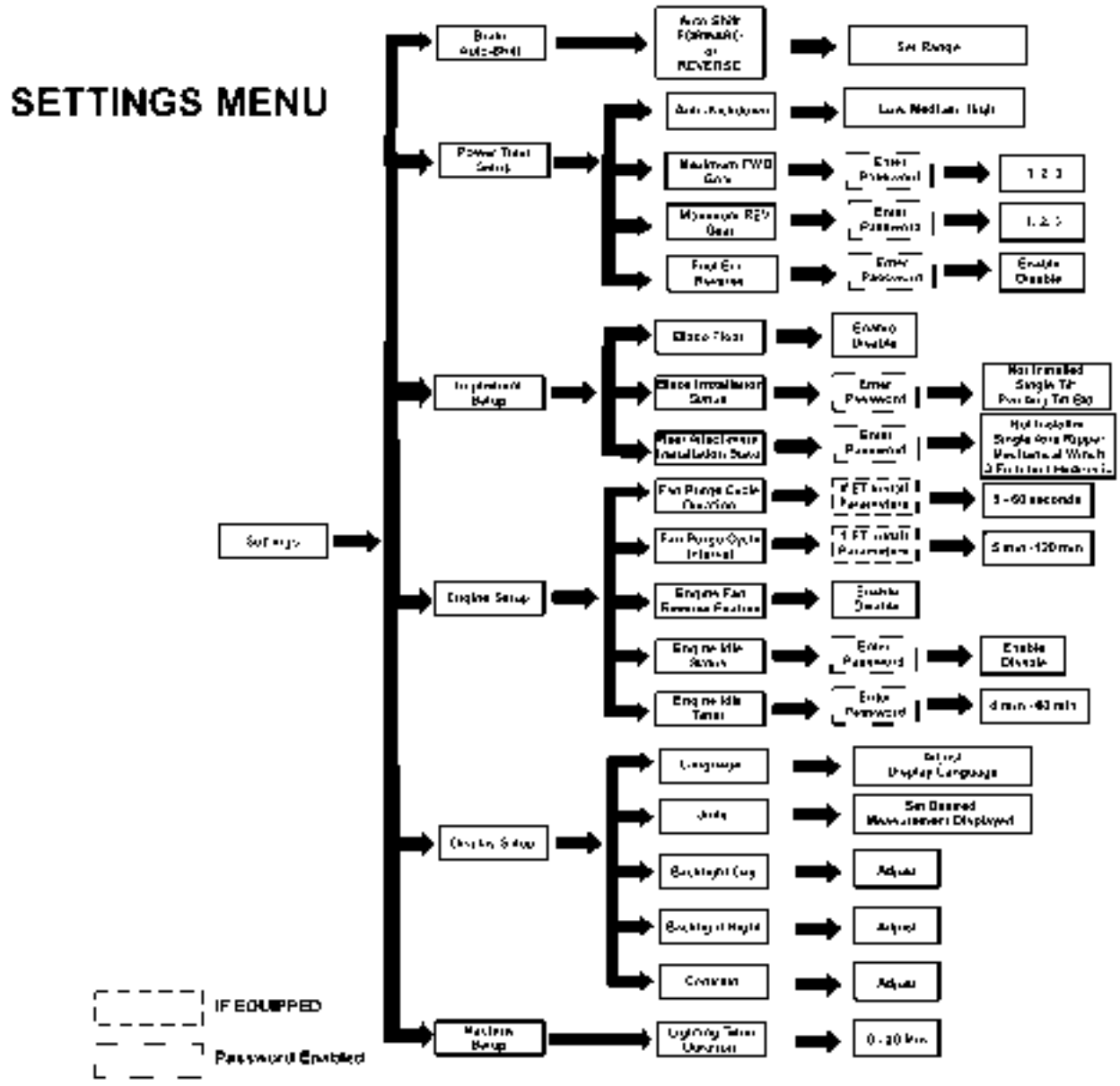



Illustration 101

The “Settings” menu allows the user to adjust parameters for the following categories:

- Bidirectional shift
- Power train operation
- Implement operation
- Engine operation
- Monitoring System Display
- Machine operation

Operating conditions, preferences of the operator and requirements for efficient operation inform the operator that adjustments to the parameters are needed. The setup of the machine determines the display of variable parameters.

The “Settings” menu option is entered by selecting “Settings” from the main menu. Press the “UP” arrow button or the “DOWN” arrow button until “Settings” is highlighted in order to select the “Settings” menu. Then press the “OK” button. Refer to Illustration 103.

**Note:** Press the main menu button in order to display the “Main Menu”.


Illustration 102

The following screen will now be displayed.


Illustration 103

The “Settings” menu has six categories with adjustable parameters that are listed above. The six categories are “Bidirectional Shift”, “Power Train”, “Implement”, “Engine”, “Display Setup”, and “Machine Setup”.

To adjust to the associated parameters, press the “UP” arrow button or the “DOWN” arrow button until the desired category is highlighted. Then press the “OK” button in order to access the parameters in that category. From this point, follow the screen prompts in order to adjust to the available parameters.

## Password Entry Screen

Some of the Settings are password protected. The display will bring up the password screen automatically when a password is needed. Once a password has been entered, the display will remember this password and not ask for one again until the next key cycle.


Illustration 104

Passwerd entry screen

The password length can be from 1 to 5 numbers. When entering the password any leading zero's can be ignored. For example if the password is 123 then the password would be entered into the 5-digit entry screen as 1, 2, 3, with the remaining 2 right most spaces left blank. Pressing the OK key submits the entered password. Contact your Cat dealer if you do not know what the password is for your machine or you would like the password changed.

## Power Train Settings

Auto Kickdown – If a significant increase in machine load is detected, this function automatically downshifts the transmission. This function works in forward and reverse gears.

“Maximum Forward Gear” – This selection sets the maximum gear that the machine travels in the forward direction.

“Maximum Reverse Gear” – This selection sets the maximum gear that the machine travels in the reverse direction.

Eco Reverse Mode – Select this mode in order to activate the Eco Reverse mode during reverse travel in third gear.

**Note:** Bidirectional shift can be used to shift to Eco Reverse 3rd reverse automatically.

## Implement Settings

All the parameters in this category relate to the operator preferences for the work tool operational modes. The following parameters may be adjusted:

Blade Float – Enabled, disabled

Blade Installation Status – Not installed, Single tilt, Power Angle Tilt Blade

Rear Attachment Installation Status (if equipped) – Not installed, Single axis ripper, three-function hydraulic

## Display Settings

From the “Display Setup” menu, use the arrow buttons to highlight the desired parameter. Then press the “OK” button. This exercise will allow access to that parameter screen. Then follow the screen prompts in order to adjust the parameter. All the parameters in this category relate to the operator preferences in regard to the monitoring system display. The following parameters may be adjusted:

Language – Select a language.

Units – Select one of the following options: Metric, English and “Imperial”

Display Backlight – Select the amount of brightness for the digital display window.

Contrast – Select the desired degree of contrast for the digital display window.

## Machine Settings

From the “Machine Setting” menu, use the arrow buttons to highlight the desired parameter. Then press the “OK” button. This exercise will allow access to that parameter screen. Then follow the screen prompts in order to adjust the parameter.

Duration Timer (Lighting) – Select the amount of duration time for the lights to remain on.