Operator's Manual

Roller

RD 27-100
RD 27-120

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Manufacturer

Wacker Neuson Production Americas LLC

N92W15000 Anthony Avenue

Menomonee Falls, WI 53051 U.S.A.

Tel: (262) 255-0500 · Fax: (262) 255-0550 · Tel: (800) 770-0957

www.wackerneuson.com

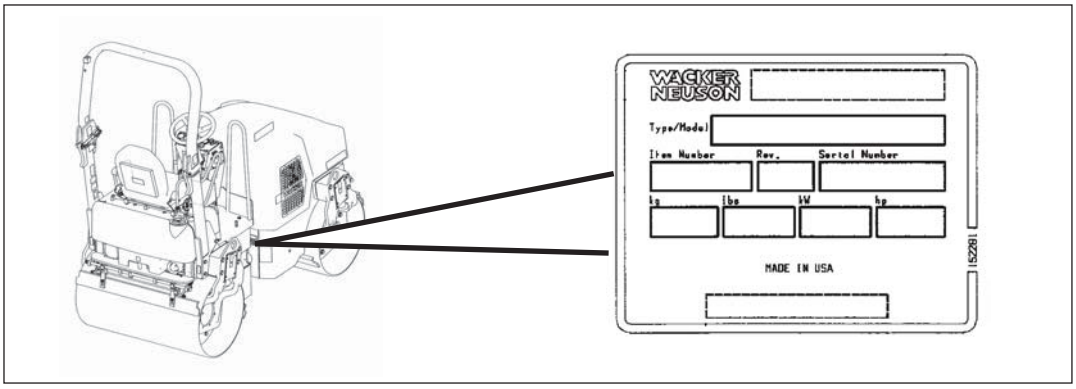
Original instructions

This Operator's Manual presents the original instructions. The original language of this Operator's Manual is American English.

Foreword

Machines covered in this manual

Machine	Item Number
RD 27-100	0620393 0620395 0620508 0620510 0620512 5200009322
RD 27-120	0620396 0620394 0620509 0620511 0620513 5200009323



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Machine identification

A nameplate listing the model number, item number, revision number, and serial number is attached to this machine. The location of the nameplate is shown above.

Serial number (S/N)

For future reference, record the serial number in the space provided below. You will need the serial number when requesting parts or service for this machine.

Serial Number:

Machine documentation

- Keep a copy of the Operator's Manual with the machine at all times.
- Use the separate Parts Book supplied with the machine to order replacement parts.
- Refer to the separate Repair Manual for detailed instructions on servicing and repairing the machine.
- If you are missing any of these documents, please contact Wacker Neuson Corporation to order a replacement or visit www.wackerneuson.com.
- When ordering parts or requesting service information, be prepared to provide the machine model number, item number, revision number, and serial number.

Expectations for information in this manual

- This manual provides information and procedures to safely operate and maintain the above Wacker Neuson model(s). For your own safety and to reduce the risk of injury, carefully read, understand, and observe all instructions described in this manual.
- Wacker Neuson Corporation expressly reserves the right to make technical modifications, even without notice, which improve the performance or safety standards of its machines.
- The information contained in this manual is based on machines manufactured up until the time of publication. Wacker Neuson Corporation reserves the right to change any portion of this information without notice.

Copyright notice

CALIFORNIA Proposition 65 Warning:

Engine exhaust, some of its constituents, and certain vehicle components, contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Laws pertaining to spark arresters

NOTICE: State Health Safety Codes and Public Resources Codes specify that in certain locations spark arresters be used on internal combustion engines that use hydrocarbon fuels. A spark arrester is a device designed to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose. In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

Trademarks

All trademarks referenced in this manual are the property of their respective owners.

EC Declaration of Conformity

Manufacturer

Wacker Neuson Production Americas LLC, N92W15000 Anthony Avenue, Menomonee Falls, Wisconsin 53051 USA

Product

Product	RD 27-100, RD 27-120
Product category	Dual drum, ride-on roller
Product function	To compact soil and asphalt
Item number	0620393, 0620508, 0620510, 0620512, 0620394, 0620509, 0620511, 0620513
Net installed power	24,4 kW
Measured sound power level	104 dB(A)
Guaranteed sound power level	106 dB(A)

Conformity Assessment Procedure

According to ANNEX VI

Notified Body

Établissement Public à Caractère Industriel et Commercial, Laboratoires de Trappes, 29, avenue Roger Hennequin - 78197 Trappes Cedex

Directives and Standards

We hereby declare that this product meets and complies with the relevant regulations and requirements of the following directives and standards:

2006/42/EC, 2000/14/EC, 2004/108/EC, EN 500-1, EN 500-4

Authorized Person for Technical Documents

Axel Häret, Wacker Neuson Produktion GmbH & Co. KG, Preußenstraße 41, 80809 München

Menomonee Falls, WI, USA, 04.06.13

William Lahner
Managing Director

Dan Domanski
Technical Director

Paul Sina
Manager, Product Engineering

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Original Declaration of Conformity

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1 Safety Information

1.1 Signal Words Found in this Manual

This manual contains DANGER, WARNING, CAUTION, *NOTICE,* and NOTE signal words which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.

This is the safety alert symbol. It is used to alert you to potential personal hazards.

- ▶ Obey all safety messages that follow this symbol.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

- ▶ To avoid death or serious injury from this type of hazard, obey all safety messages that follow this signal word.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

- ▶ To avoid possible death or serious injury from this type of hazard, obey all safety messages that follow this signal word.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

- ▶ To avoid possible minor or moderate injury from this type of hazard, obey all safety messages that follow this signal word.

NOTICE: Used without the safety alert symbol, NOTICE indicates a situation which, if not avoided, could result in property damage.

Note: *A Note contains additional information important to a procedure.*

1.2 Machine Description and Intended Use

This machine is a dual drum, ride-on roller. The Wacker Neuson Ride-On Roller consists of an articulated frame onto which is mounted a gasoline or diesel engine, a fuel tank, a hydraulic tank, a water tank, a hydrostatic drive system, two steel drums containing internal eccentric weights, and an operator's platform with a ROPS (Roll Over Protective Structure). The engine powers the hydraulic systems that provide machine movement and drum vibration. The vibrating drums smooth and compact the work surface as the machine moves. Machine speed, direction, and vibration are controlled by the operator from the operator's seat on the platform.

The machine is designed as a lightweight roller to be used in the compaction of sublayers and finish layers of asphalt on roads, driveways, parking lots, and other types of asphalt-covered surfaces.

This machine has been designed and built strictly for the intended use described above. Using the machine for any other purpose could permanently damage the machine or seriously injure the operator or other persons in the area. Machine damage caused by misuse is not covered under warranty.

The following are some examples of misuse:

- Using the machine as a ladder, support, or work surface
- Using the machine to carry or transport passengers or equipment
- Using the machine to tow other machines
- Using the machine to spray liquids other than water (i.e., diesel fuel on asphalt)
- Operating the machine outside of factory specifications.
- Operating the machine in a manner inconsistent with all warnings found on the machine and in the Operator's Manual.

This machine has been designed and built in accordance with the latest global safety standards. It has been carefully engineered to eliminate hazards as far as practicable and to increase operator safety through protective guards and labeling. However, some risks may remain even after protective measures have been taken. They are called residual risks. On this machine, they may include exposure to:

- Heat, noise, exhaust, and carbon monoxide from the engine
- Burns from hot hydraulic fluid
- Fire hazards from improper refueling techniques
- Fuel and its fumes
- Personal injury from improper lifting techniques
- Crushing hazards from improper operation (feet, legs, or arms extending outside of the operator work station) and for other persons in the work zone
- Line of sight blockage by the ROPS

To protect yourself and others, make sure you thoroughly read and understand the safety information presented in this manual before operating the machine.

1.3 Safety Guidelines for Operating the Machine

Operator qualifications

Only trained personnel are permitted to start, operate, and shut down the machine. They also must meet the following qualifications:

- have received instruction on how to properly use the machine
- are familiar with required safety devices

The machine must not be accessed or operated by:

- children
- people impaired by alcohol or drugs

Personal Protective Equipment (PPE)

Wear the following Personal Protective Equipment (PPE) while operating this machine:

- Close-fitting work clothes that do not hinder movement
- Safety glasses with side shields
- Hearing protection
- Safety-toed footwear

Operator training

Before operating the machine:

- Read and understand the operating instructions contained in all manuals delivered with the machine.
- Familiarize yourself with the location and proper use of all controls and safety devices.
- Contact Wacker Neuson for additional training if necessary.

When operating this machine:

- Do not allow improperly trained people to operate the machine. People operating the machine must be familiar with the potential risks and hazards associated with it.

Machine's safety devices

- Disengage and stow the locking bar for the articulated steering joint before operating the machine. The machine cannot be steered when the locking bar is engaged.
- Check that all controls are functioning properly immediately after start-up!

To ensure safe operation of the machine:

- Do not operate the machine if any safety devices or guards are missing or inoperative.
- Do not operate the machine unless all controls operate correctly.
- Do not modify or defeat safety devices.
- Do not use accessories or attachments that are not recommended by Wacker Neuson. Damage to equipment and injury to the user or others may result.

Safe operating practices

When operating this machine:

- Always remain seated and wear the seat belt at all times while operating the machine.
- Remain aware of changing positions and the movement of other equipment and personnel on the job site.
- Be sure that all other persons are at a safe distance from the machine. Stop the machine if people step into the working area of the machine.
- Remain aware of changing surface conditions, for example, uneven ground, hills, trench edges, soft or coarse material. Be sure that the surface is stable enough to support the weight of the machine and that there is no chance of the machine sliding, falling, or tipping.
- Remain aware of the machine's moving parts. Keep hands, feet, and loose clothing away from the machine's moving parts.
- Wear protective clothing appropriate to the job site when operating the machine.
- Wear safety glasses when operating this machine.
- Store the machine properly when it is not being used. The machine should be stored in a clean, dry location out of the reach of children.

When operating this machine:

- Do not drive off curbs or other uneven surfaces that will result in jarring impacts to the machine and operator.
- Do not touch the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.
- Do not allow anyone to ride on any part of the machine. Passengers can be seriously injured or killed from falls, tip-overs, or roll-over incidents.
- Do not leave the machine running unattended.
- Do not operate a machine in need of repair.
- Do not attempt to start the machine while standing alongside it. Only start the engine when seated in the driver's seat and with the forward/reverse control in the neutral position.
- Do not operate a machine when its fuel cap is loose or missing.
- Do not use a cellphone or send text messages while operating this machine.
- Do not operate the machine with unapproved accessories or attachments.
- Do not transport the machine while it is running.

1.4 Safety Guidelines while Using Internal Combustion Engines

WARNING
Internal combustion engines present special hazards during operation and fueling. Failure to follow the warnings and safety standards could result in severe injury or death.

- ▶ Read and follow the warning instructions in the engine owner's manual and the safety guidelines below.

DANGER
Exhaust gas from the engine contains carbon monoxide, a deadly poison. Exposure to carbon monoxide can kill you in minutes.

- ▶ NEVER operate the machine inside an enclosed area, such as a tunnel, unless adequate ventilation is provided through such items as exhaust fans or hoses.

Operating safety

When running the engine:

- Keep the area around exhaust pipe free of flammable materials.
- Check the fuel lines and the fuel tank for leaks and cracks before starting the engine. Do not run the machine if fuel leaks are present or the fuel lines are loose.

When running the engine:

- Do not smoke while operating the machine.
- Do not run the engine near sparks or open flames.
- Do not touch the engine or muffler while the engine is running or immediately after it has been turned off.
- Do not operate a machine when its fuel cap is loose or missing.
- Do not start the engine if fuel has spilled or a fuel odor is present. Move the machine away from the spill and wipe the machine dry before starting.

Refueling safety

When refueling the engine:

- Clean up any spilled fuel immediately.
- Refill the fuel tank in a well-ventilated area.
- Reinstall the fuel tank cap after refueling.
- Do not smoke.
- Do not refuel a hot or running engine.
- Do not refuel the engine near sparks or open flames.
- Use suitable tools for refueling (for example, a fuel hose or funnel).
- Do not refuel if the machine is positioned in a truck fitted with a plastic bed liner. Static electricity can ignite the fuel or fuel vapors.

1.5 Guidelines for Service Safety

WARNING

A poorly maintained ained machine can become a safety hazard! In order for the machine to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.

► ALWAYS do periodic maintenance as recommended in the Operator's Manual.

Personal Protective Equipment (PPE)

Wear the following Personal Protective Equipment (PPE) while servicing or maintaining this machine:

- Close-fitting work clothes that do not hinder movement
- Safety glasses with side shields
- Hearing protection
- Safety-toed footwear

In addition, before servicing or maintaining the machine:

- Tie back long hair.
- Remove all jewelry (including rings).

Precautions

- To reduce the risk of personal injury, read and understand the service procedures before performing any service to the machine.
- Some service procedures require that the machine's battery be disconnected.
- All adjustments and repairs MUST be completed before operation. NEVER operate the machine with a known problem or deficiency! All repairs and adjustments should be completed by a qualified technician.
- Stop the engine before servicing the machine. If the engine has electric start, disconnect the negative terminal on the battery.
- Secure the articulated steering joint using the locking bar before lifting, jacking, and servicing the machine. Machine halves could swing together unexpectedly and cause a serious injury.

Accessories, safety devices, and modifications

- Do not modify, weld, or drill safety frames (ROPS) fitted as original equipment.
- Do not loosen or remove bolts.
- Do not weld, drill, or modify a broken safety frame.
- Do not modify the machine without the express written approval of the manufacturer.

Replacing parts and labels

- Replace worn or damaged components.
- When replacement parts are required for this machine, use only Wacker Neuson replacement parts or those parts equivalent to the original in all types of specifications, such as physical dimensions, type, strength, and material.
- Never use or attempt to repair a damaged safety belt or ROPS. Replace these components before operating the machine.
- Replace all missing and hard-to-read labels. Labels provide important operating instructions and warn of dangers and hazards.
- Check all external fasteners at regular intervals.

Lifting and transporting

When lifting the machine:

- Make sure slings, chains, hooks, ramps, jacks and other types of lifting devices are attached securely and have enough weight-bearing capacity to lift or hold the machine safely.
- Remain aware of the location of other people when lifting the machine.

To reduce the possibility of injury:

- Do not stand under the machine while it is being hoisted or moved.
- Do not get onto the machine while it is being hoisted or moved.

Cleaning and servicing the machine

While cleaning or servicing the machine:

- Keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire.
- Keep the machine clean and labels legible.
- Keep hands, feet, and loose clothing away from moving parts.

While cleaning or servicing the machine:

- Do not remove air cleaner cover, paper element, or precleaner while engine is running.
- Do not attempt to open the radiator cap while the machine is running or before the engine has cooled down. Severe burns may result!
- Do not attempt to clean or service the machine while it is running. Rotating parts can cause severe injury.
- Do not use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive.
- Do not tip the machine for cleaning or for any other reason.

WARNING

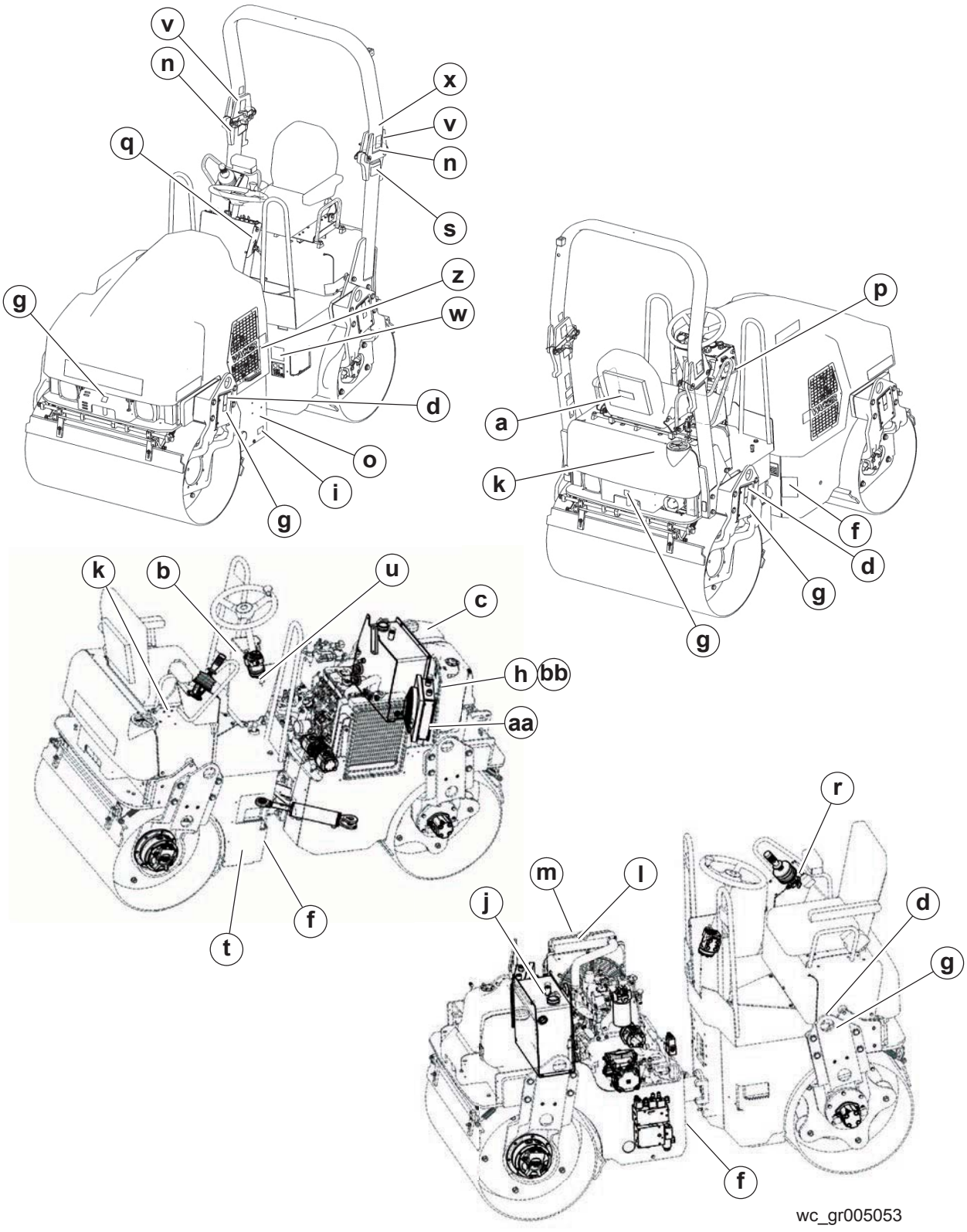
Possibility of injury. Hydraulic fluid under pressure can penetrate the skin, cause burns, blind, or create other potentially dangerous hazards.

- ▶ Set all controls to neutral, turn the engine off, and allow fluids to cool before loosening hydraulic fittings or attaching test gauges.
- ▶ Do not open hydraulic lines or loosen hydraulic connections when the engine is running.
- ▶ Before dismantling hydraulic connectors or hoses, ensure that all pressure has been bled from the circuit.
- ▶ Fluid leaks from small holes are often practically invisible. DO NOT use your bare hands to check for leaks. Check for leaks using a piece of cardboard or wood.
- ▶ Always make sure hose connections have been reconnected back to the correct fitting. Failure to do so may result in damage to the machine and/or injury to person on or near the machine.

- Always replace safety devices and guards after completing repairs and maintenance.
- Before you start the machine, ensure that all tools have been removed from the machine and that replacement parts and adjusters are firmly tightened.

2 Labels

2.1 Label Locations



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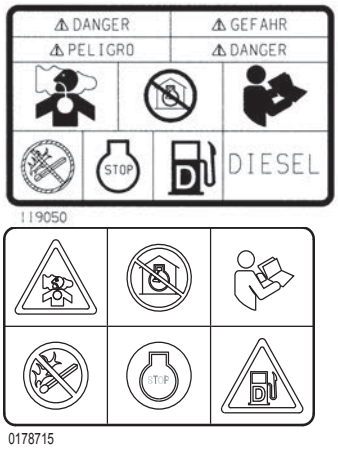
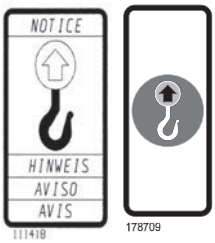
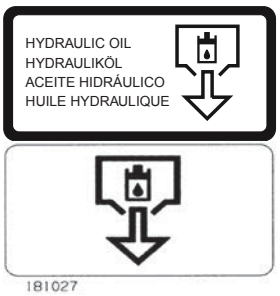
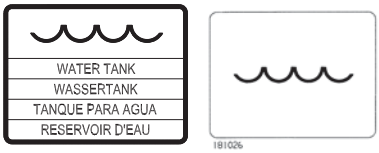
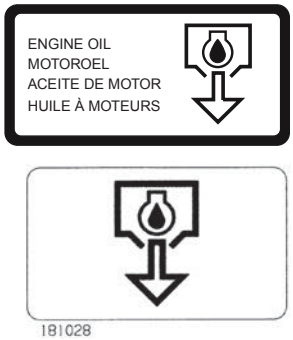
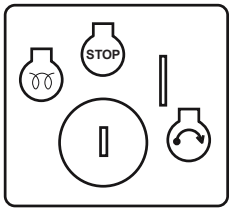
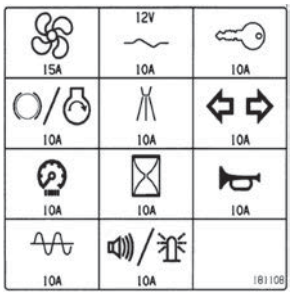
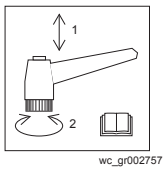
2.2 Label Meanings

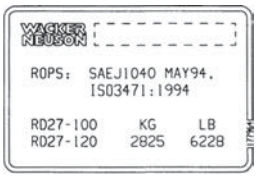
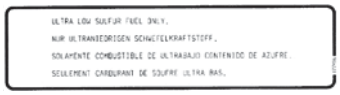
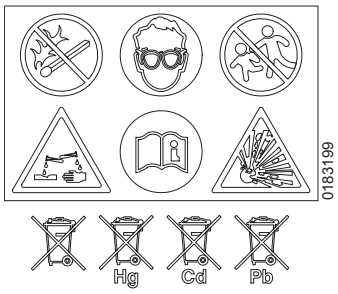
a		Operator's Manual must be stored on machine. Replacement Operator's Manual can be ordered through your local Wacker Neuson distributor.
b		DANGER! Read and understand the supplied Operator's Manuals before operating this machine. Failure to do so increases the risk of injury to yourself and others. Do not run the machine indoors or in an enclosed area without adequate ventilation. Engine exhaust contains carbon monoxide. This is a poison you cannot see or smell. Exposure to carbon monoxide can cause loss of consciousness and CAN KILL YOU IN MINUTES. To reduce the risk of hearing loss, wear hearing protection when operating this machine. Always wear seat belt when operating the machine. Never operate the machine sideways on slopes.

c		DANGER Asphyxiation hazard. Do not run the machine indoors or in an enclosed area without adequate ventilation. Read the Operator's Manual for instructions. No sparks, flames, or burning objects near machine. Stop the engine before adding fuel. Use only diesel fuel.
d		NOTICE Lifting point
f		WARNING Avoid crushing area.
g		Tie-down point
h		WARNING Disconnect battery before servicing. Read Repair Manual. Explosion hazard. Batteries can emit explosive hydrogen gas. Keep all sparks and flames away from the battery.

i		Hydraulic oil drain
j		Hydraulic oil reservoir fill.
k		Water tank fill
l		WARNING Pinching hazard. Rotating machinery.
m		WARNING Pressurized contents. Do not open when hot!

n		WARNING Avoid crushing area.
o		Engine oil drain
p		Key switch positions. Power to glowplugs. Engine stopped (OFF). Engine ON. Power to starter motor.
q		Throttle lever positions. High speed. Low speed.
r		Vibration activation and deactivation switch. Forward/reverse lever positions.

s		WARNING Do not drill or weld the ROPS. Read the Operator's Manual.
t		WARNING Avoid crushing area. Articulated steering joint locking location. Lock the articulated steering joint before servicing the machine. Read Repair Manual.
u		Fuse identifications.
v		Tighten screw to reduce vibration. Read Operator's Manual.
w		Guaranteed sound power level in dB(A)

x		ROPS certification label
y		Biodegradable hydraulic oil reservoir fill (if equipped)
z		Ultra low sulfur fuel only
aa		WARNING Explosion hazard. Do not use evaporative starting fluids such as ether on this engine. The engine is equipped with a cold starting aid. Using evaporative starting fluids can cause an explosion which can cause engine damage, personal injury, or death. Read and follow the engine starting instructions in this Operator's Manual.
bb		WARNING ■ Keep all sparks and open flames away from the battery. ■ Wear eye protection. ■ Keep away from children. ■ Battery acid is poisonous and corrosive. ■ Read the Operator's Manual. ■ Explosion hazard. Dispose of waste batteries in accordance with local environmental regulations. Battery contains mercury (Hg), cadmium (Cd), or lead (Pb).

3 Lifting and Transporting

3.1 Lifting the Machine

Prerequisites

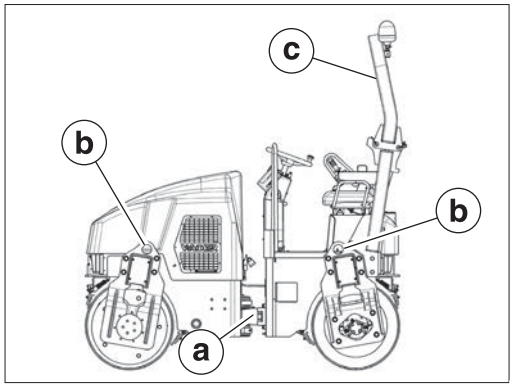
- Lifting equipment (crane or hoist) capable of supporting 2722 kgs. (6000 lbs.)
- Four lifting hooks and chains capable of supporting 2722 kgs. (6000 lbs.)

WARNING
Crushing hazard. You may be crushed if the lifting devices fail.
- ▶ Never stand under, or get onto, the machine while it is being lifted or moved.
- ▶ Use only the designated lifting points to lift the machine.

Procedure

Follow the procedure below to lift the machine.

1. Stop the engine.
2. Engage the parking brake.
3. Lock the articulated steering joint **(a)**.



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4. Attach one lifting chain to each of the four lifting eyes **(b)** on the machine (two per side) using hooks or shackles.
5. Attach the other end of the chains to the lifting equipment.
6. Lift the machine as necessary.

CAUTION
Crushing / machine damage hazards. The Roll Over Protection Structure (ROPS) **(c)** is intended strictly to protect the operator during a rollover or tip-over incident. The ROPS must not be used to lift the machine.
- ▶ Use only the designated lifting eyes to lift the machine**.**

3.2 Tying Down/Transporting the Machine

Prerequisites

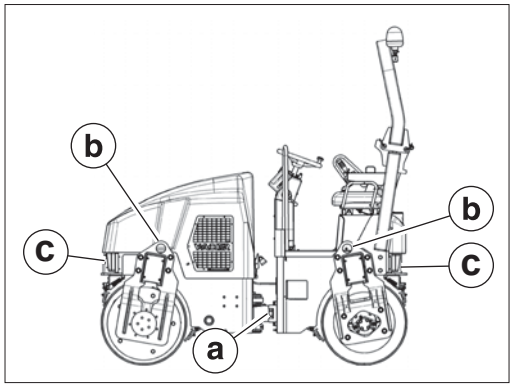
- Engine shut down
- Parking brake ON

Procedure

Follow the procedure below to tie down the machine.

1. Make sure that the transport vehicle is capable of handling the weight and size of the machine. See *Technical Data* for dimensions and operating weight.

2. Lock the articulated steering joint **(a)**.



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3. Attach steel ropes or chains to each of the four tie down eyes **(b)** on the machine (two per side) and the two tie down bars **(c)** on the front and rear of the machine.

4. Attach the other end of the chains to an appropriate vehicle capable of handling the weight of the machine.

Note: *The transmission is normally braked when the diesel engine is off, or when the hydraulic system is not functioning, unless there is a fault and/or the parking brakes have been manually disabled.*

NOTICE: Do not position ropes or chains across the machine frame or the articulated joint when tying down the machine. Damage to the machine may occur.

NOTICE: Do not completely compress the shock mounts when tying down the machine. Damage to the shock mounts may occur.

NOTICE: Do not leave the machine tied down for extended periods of time (except when transporting). Damage to the shock mounts may occur.

4 Operation

4.1 Preparing the Machine for First Use

1. Make sure all loose packaging materials have been removed from the machine.
2. Check the machine and its components for damage. If there is visible damage, do not operate the machine! Contact your Wacker Neuson dealer immediately for assistance.
3. Take inventory of all items included with the machine and verify that all loose components and fasteners are accounted for.
4. Attach component parts not already attached.
5. Add fluids as needed and applicable, including fuel, engine oil, and battery acid.
6. Move the machine to its operating location.

4.2 Position of the Operator

Safe and efficient use of this machine is the operator's responsibility. Full control of the machine is not possible unless the operator maintains the proper working position at all times.

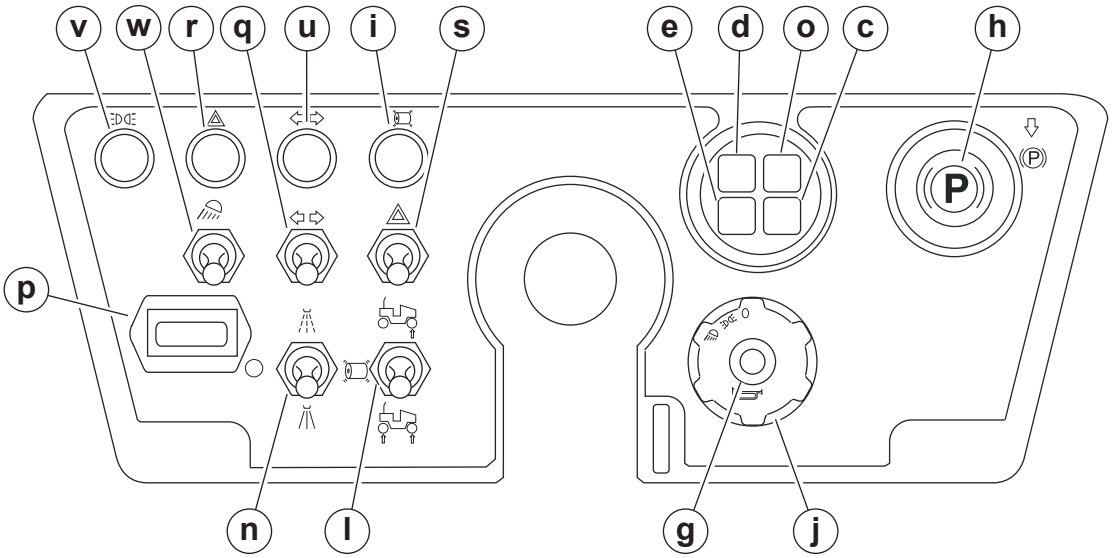
While operating this machine, the operator must:

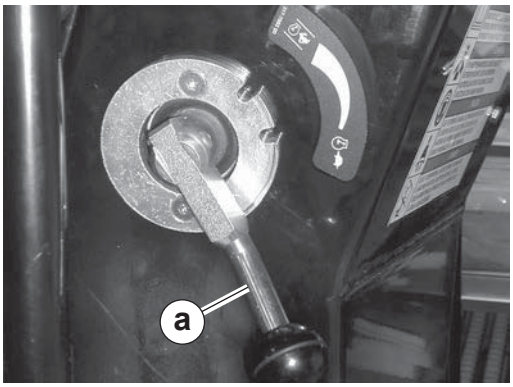
- be seated in the operator's seat facing forward
- wear the seat belt, properly adjusted and latched
- have both feet on the control deck
- have one hand on the steering wheel at all times
- have the other hand free to operate the controls as needed

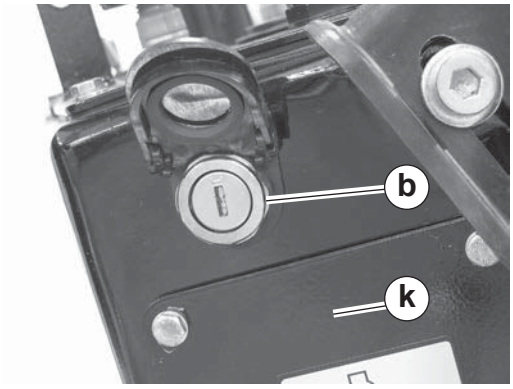
4.3 Operation & Maintenance Locations

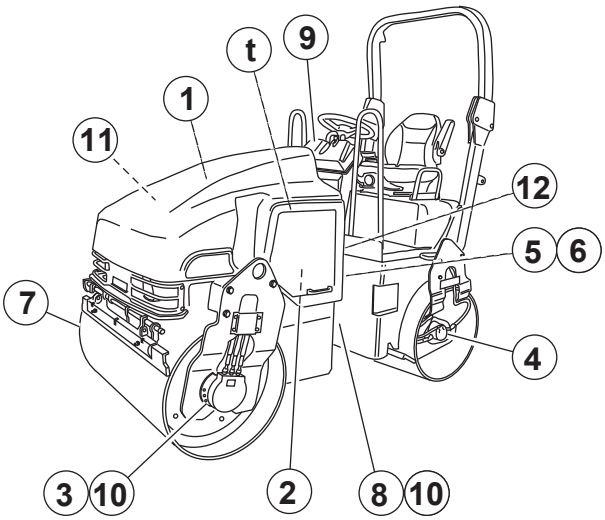
Ref.	Description	Ref.	Description
a	Throttle lever	l	Vibration mode switch
b	Ignition key block	m	Vibration ON/OFF switch
c	Alternator warning light	n	Water pump switch
d	Engine oil pressure warning light	o	Engine temperature warning light
e	Hydraulic oil temperature warning light	p	Hour meter
f	Forward-reverse lever	q	Turn signal switch
g	Horn	r	Flashers ON warning light
h	Parking brake warning light and control	s	Flasher activation switch
i	Vibration-on warning light	t	Flow divider switch (if equipped)
j	Light switch	u	Turn signal indicator
k	Fuse box	v	Lights ON indicator
--	--	w	Light switch

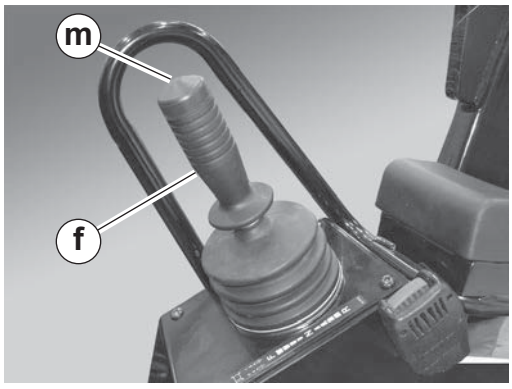
Ref.	Description	Ref.	Description
1	Diesel engine	7	Front exciter hydraulic motor
2	Hydraulic transmission pump	8	Rear hydraulic transmission motor
3	Front hydraulic transmission motor	9	Servo steering
4	Rear exciter hydraulic motor	10	Brake
5	Exciter hydraulic pump	11	Oil cooler
6	Steering hydraulic pump	12	Electric water pump











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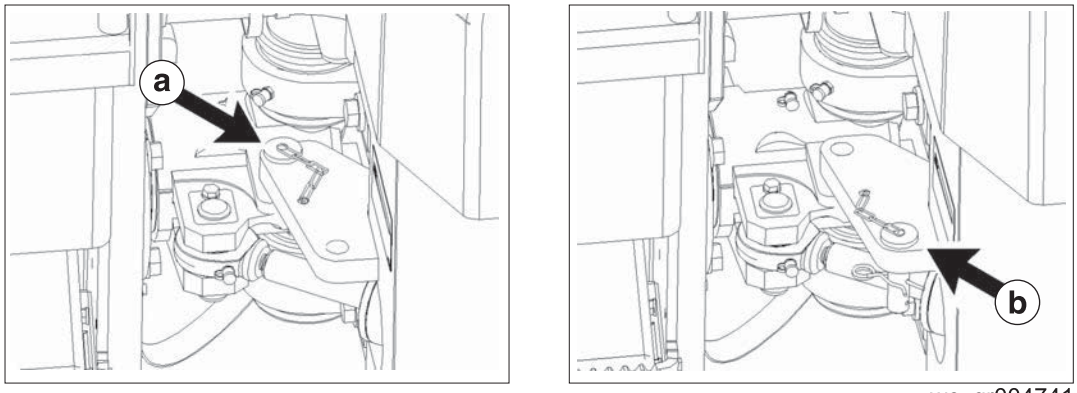
4.4 Unlocking/Locking the Articulated Joint

Locking

Install the articulated steering joint pin in the LOCKED position **(a)** before you lift the machine, transport the machine, or perform maintenance near the center of the machine.



wc_gr004741

Unlocking

Install the articulated steering joint pin in the UNLOCKED position **(b)** before you operate the machine.

NOTICE: Attempting to steer the machine with the articulated steering joint pin in the locked position may destroy the steering cylinder and locking mechanism.

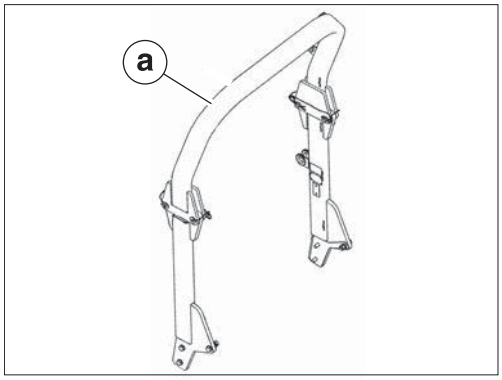
4.5 Using the Roll Over Protection Structure (ROPS)

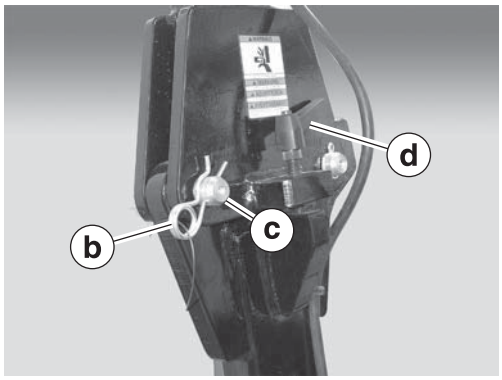
Background The machine is equipped with a Roll Over Protection Structure (ROPS). The ROPS is designed to protect the operator in a rollover accident.

WARNING
Crushing hazard. You may be crushed if the machine rolls over.
- ▶ Never use the machine without the ROPS in place.

Positioning Follow the procedure below to position the ROPS in the upright position.

1. Support the ROPS **(a)** using a crane and suitable rigging capable of supporting 70 kg (155 lbs.).





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2. Remove the safety pin **(b)** and pull out the locking pin **(c)**.
3. Lift the ROPS into the upright position.
4. Insert the locking pin and secure it with the safety pin.
5. Tighten the adjusting screw **(d)** as needed to reduce vibration.

Keep the ROPS in the extended (upright) position when using the roller.

WARNING
Crushing / machine damage hazards. The ROPS is intended strictly to protect the operator during a rollover or tip-over incident and must not be used to lift the machine.
- ▶ Use only the designated lifting eyes to lift the machine. See *Lifting the Machine*.

WARNING
Personal injury hazard. The ROPS is not a handhold for passengers. Passengers can be seriously injured or killed from falls, tip-overs, or roll-over incidents.
- ▶ Do not allow anyone to ride on any part of the machine.

Checking

Each month, check:

the torque on all of the screws holding the ROPS in place

the ROPS frame for rust, cracks, and any other damage

Rules for re-installing

When reinstalling the ROPS:

- Use the original nuts and bolts.
- Use oil to lubricate the bolts before installing the ROPS.
- Tighten the bolts to the specified torques.

NOTICE: Do not weld or drill into the ROPS. Drilling or welding on the ROPS will nullify the ROPS certification.

4.6 Installing the Rotating Beacon

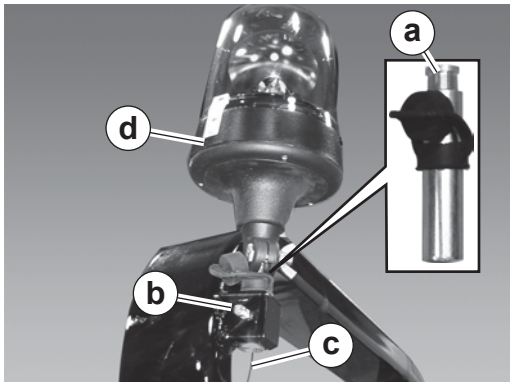
Background

The rotating beacon illuminates and rotates when the key switch is in the ON position.

Procedure

Follow the procedure below to install the beacon.

1. Thread the power wire **(c)** through the light staff and fix it to the upper connector.



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2. Insert the connector into the light staff.
3. Insert the light staff assembly **(a)** into the left side of the machine ROPS and tighten the set screw **(b)**.
4. Slide the rotating beacon **(d)** onto the light staff.

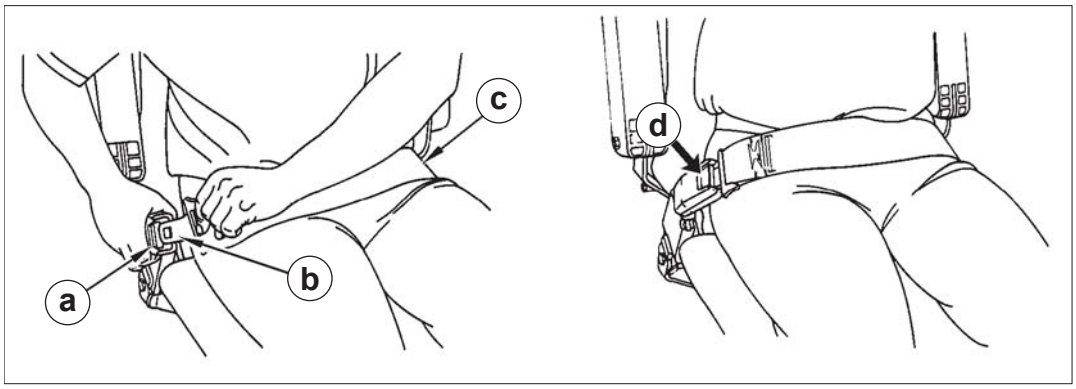
4.7 Using the Seat Belt

Precautions Always use the seat belt when operating the machine.

Replace the seat belt every three years.

To use To use the seat belt:

1. Pull seat belt **(c)** out of the retractor in a continuous motion.



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2. Fasten seat belt catch **(b)** into buckle **(a)**.
3. Position the seat belt low across the lap of the operator. The retractor will adjust the belt length and the retractor will lock in place.
4. Push the release button **(d)** on the buckle in order to release the seat belt. The seat belt will automatically retract into the retractor.

4.8 Adjusting the Seat

Background Adjust the seat position and tension (firmness) according to working conditions and operator's weight.

To adjust The seat can be adjusted in three ways:

Tension	Use knob **(a)** for adjusting seat tension. Turn from a minimum of 60 kg to a maximum of 120 kg (132 lb–264 lb).
Front to back	Use lever **(b)** to adjust the front-to-back distance from the driving controls.
Side to side (optional)	Use pin **(c)** to set one of the three side-to-side position placement holes (if so equipped).

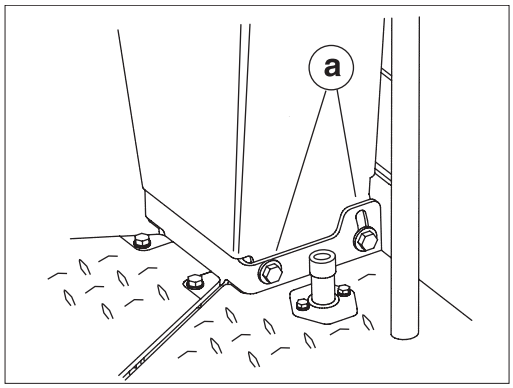
wc_gr002234

4.9 Adjusting the Steering Column

Background Adjust the angle of the steering column according to working conditions and the operator's height and personal preference.

To adjust The angle of the steering column can be adjusted as follows:

1. Loosen the four mounting bolts **(a)** at the base of the steering column.



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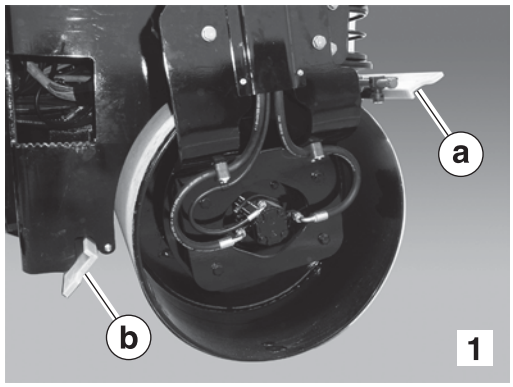
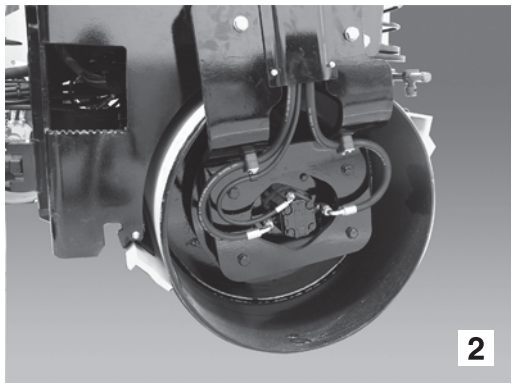
2. Pivot the steering column forward or backward as desired.
3. Once the desired angle has been reached, re-tighten the mounting bolts.

4.10 Positioning the Scraper Bars

Prerequisites
- Machine shut down
- Parking brake engaged

Positions Each drum has two scrapers **(a**, **b)**. They may be set in the travel position (1) or the scraping position (2).





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4.11 Using the Anti-Vandalism Protection Devices

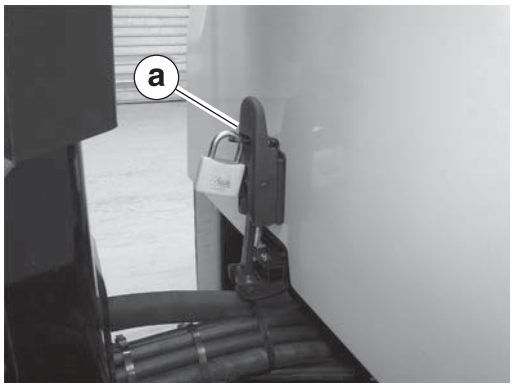
Background Parts of the machine may be subject to theft or vandalism when the machine is unattended. These parts can be locked to prevent unauthorized access or use.

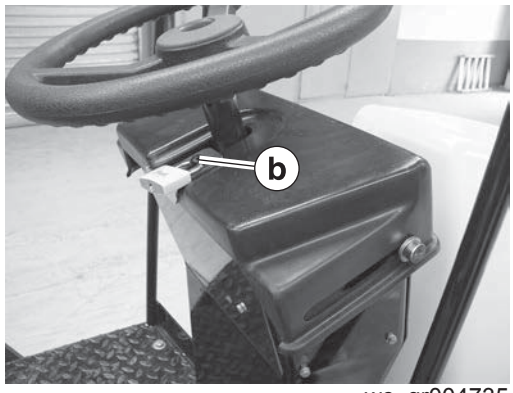
Lockable parts include:

- Engine cover
- Control console cover
- Operator's Manual holder

Procedure Follow the procedure below to lock the machine.

1. Close the engine cover and attach a padlock to the fastener **(a)**.





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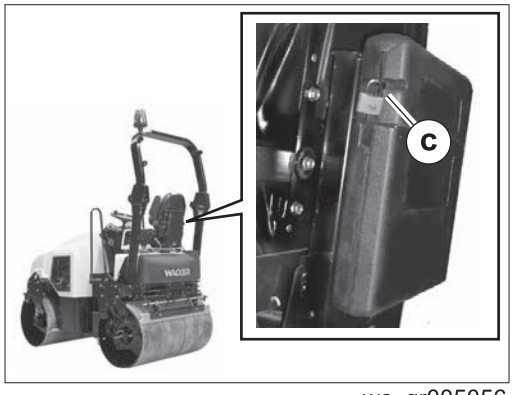
2. Slide the control console cover over the console and attach a padlock to the fastener **(b)**.
3. Close the Operator's Manual holder lid and attach a padlock to the fastener **(c)**.



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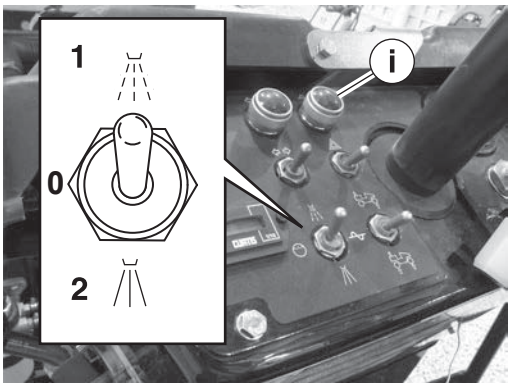
Note: *Padlocks are supplied with the machine as standard.*

4.12 Using the Water Spray System

Switch positions

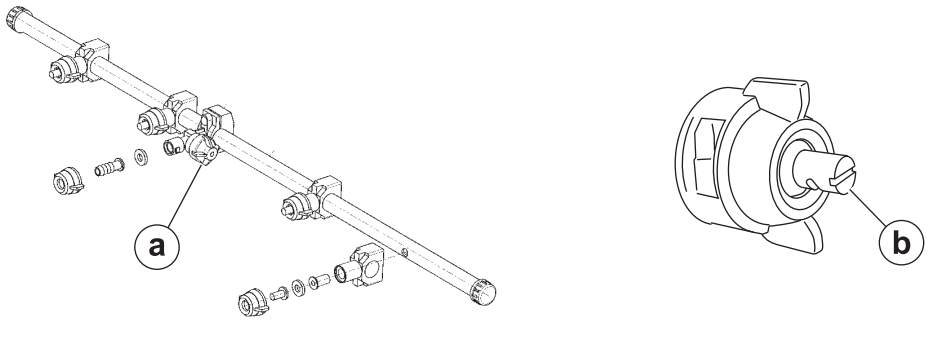
Water from the tank is fed to the spray nozzles by an electric pump. The switch controls the water pump motor. The switch has three positions:

Position 1: activates the intermittent water spray		 wc_gr004749
Mid position (0): turns off the water spray system		
Position 2: activates the continuous water spray		

Guidelines when using

When using the water spray system:

- Check that the tank is full of water.
- Use only clean water. Dirty water, even when filtered, can clog the system.
- Keep the water system clean and well maintained. See *Maintenance* Section.
- If spray does not begin immediately when the system is turned on, it may be necessary to bleed air from the water lines. Opening the diaphragm valve **(a)** while the system is running will force air out of the lines. Close the diaphragm valve when water begins to spray through the nozzles.



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Adjusting

To adjust the angle of spray:

Insert a screwdriver into the nozzle **(b)** and adjust the angle as desired.

Note: *Ensure that water spray covers entire length of drum.*

Draining

During winter, or when temperatures drop below 0°C (32°F), drain the water spray system. See section *Draining the Water Spray System.*

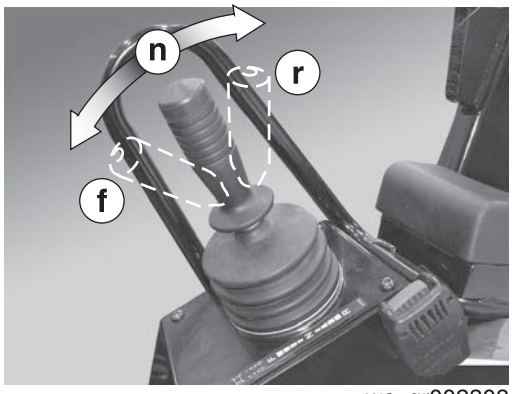
4.13 Using the Forward/Reverse Lever

Background

Both roller drums are driven. An infinitely variable displacement pump and hydrostatic transmission drive the hydraulic motors fitted to each drum. The machine moves forward or reverse by using the forward/reverse lever located to the side of the driver's seat.

Travel direction

Move the forward/reverse lever into FORWARD **(f)** or REVERSE **(r)** according to the direction of travel desired.



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To change direction of travel from FORWARD to REVERSE or vice versa:

1. Move the forward/reverse lever to the "N" NEUTRAL position **(n)**.
2. Allow the machine to come to a complete stop.
3. Move the forward/reverse lever in the direction desired.

Note: *In order to comply with safety standards, the machine has a device which only enables starting of the engine when the forward/reverse lever is in the neutral position.*

Travel speed

- Travel speed varies from "ZERO" to a permitted maximum of 10 kph (6.2 mph).
- The farther forward or reverse the forward/reverse lever is positioned, the faster the roller will travel.
- Travel speed is the same in both FORWARD and REVERSE.

Note: *When negotiating slopes, keep the forward/reverse lever at minimum travel speed.*

Braking

The forward/reverse lever can be used as an engine brake. Shifting the forward/reverse lever to the neutral position stops the machine.

Operator present system

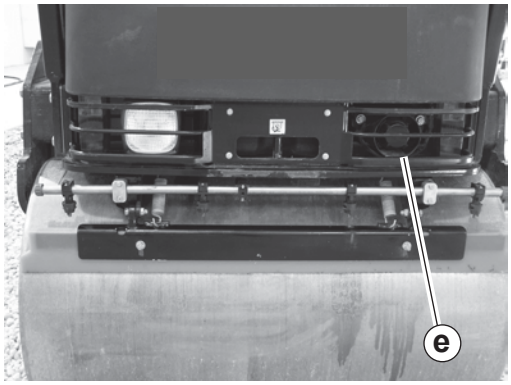
The machine is equipped with an operator present system. The system prevents the machine from moving forward or reverse unless the operator is seated. The operator should remain seated at all times.

4.14 Backup Alarm

Location The backup alarm **(e)** is located on the rear of the machine.

Operation Start the engine and move the forward-reverse lever to the reverse position. The backup alarm should sound immediately. The backup alarm will continue to sound until the forward-reverse lever is moved to the neutral position or to the forward position.

If the backup alarm does not sound, make the necessary repairs before using the roller.



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4.15 Using the Flow Divider (if equipped)

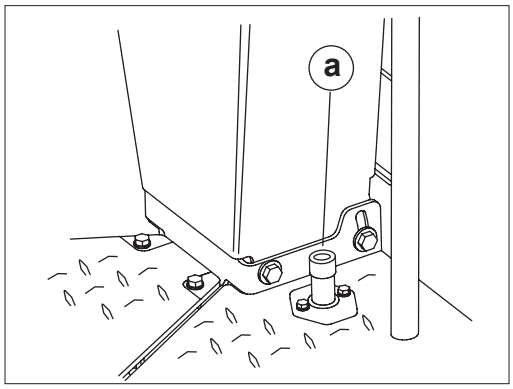
Background

This machine may be equipped with an optional flow divider. Non-uniform soil conditions, such as a combination of loose sandy material and large particles, may cause the drums to rotate at unequal speeds. This may impede machine movement. When activated, the flow divider equalizes the flow of hydraulic oil traveling to each drive motor so that movement can be re-established.

Flow divider switch

The activation switch for the flow divider is foot-operated. Follow the procedure below to activate the flow divider.

1. Locate the activation switch **(a)** on the operator's platform to the right of the steering column.



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2. Press the activation switch once to turn the flow divider system on.
3. Press the activation switch again to turn the flow divider off.

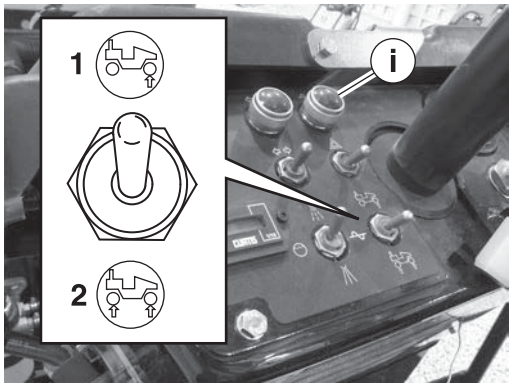
NOTICE: The flow divider is designed for intermittent use only. Continuous use of the flow divider will cause the hydraulic oil to become overheated, possibly damaging the hydraulic system. Only use the flow divider if necessary to re-establish machine movement.

4.16 Using the Vibration System

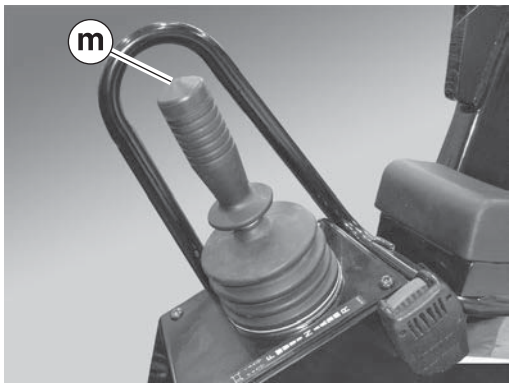
Background

The machine has an exciter on each drum. The exciters are driven by gear-type hydraulic motors. The exciter motors are fed by a fixed-displacement, gear-type hydraulic pump.

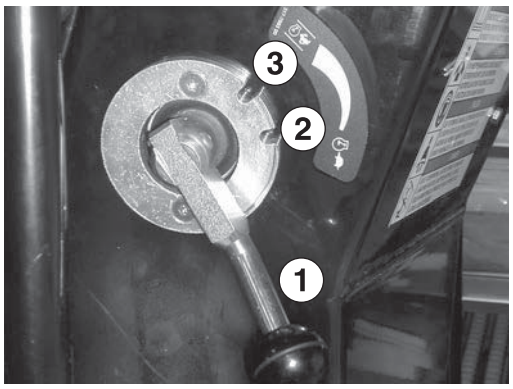
Vibration mode switch

Position 1: vibration of front drum only. Position 2: vibration of both drums. When the switch is activated in Position 1 or Position 2, the light **(i)** on the control panel illuminates.	 wc_gr004739

Vibration ON-OFF switch

To start vibration, press button **(m)**. To stop vibration, press button **(m)** again. ***NOTICE:*** Do not leave the vibration running when the vehicle is to remain stationary for some time. Leaving the exciter on for a prolonged period when the machine is stationary may damage the exciter. **Note:** *Vibration will not run when the forward/reverse control is in NEUTRAL.*	 wc_gr004740

Frequency

Position 1: Use when starting or shutting down the engine. Position 2: Use for approximately 55 Hz of vibration. Position 3: Use for approximately 66 Hz of vibration. **Note:** *Always use Position 2 or Position 3 when operating the machine.*	 wc_gr004738

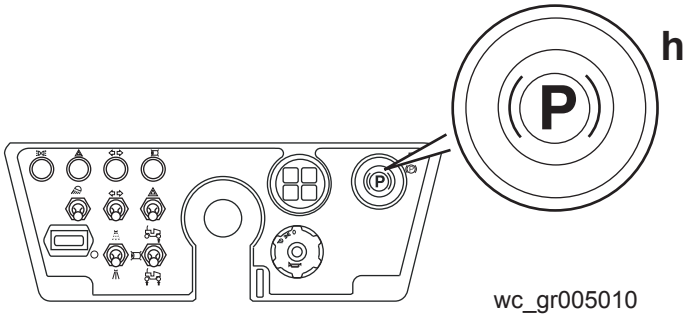
4.17 Using the Parking Brakes

Background

To aid in holding the machine in a stopped position (parked), there is a mechanical parking brake on each drum drive motor. The mechanical parking brakes are spring-activated and hydraulically released (SAHR) type brakes.

The parking brakes are applied when any of the following conditions exist:

- The parking brake push button **(h)** is pressed.
- The engine is switched off.
- The operator leaves the seat.
- There is a fault in the hydraulic system.



Engaging and releasing

Pushing the button engages the parking brakes.

The “Brakes On” warning light (P) illuminates when the button is pressed.

Pulling the button up allows the release of the parking brakes.

Note: *All of the following conditions must be met for the parking brakes to release:*

- The engine must be running.
- The forward/reverse lever must be in the neutral position.
- The operator must be seated.

Emergency use

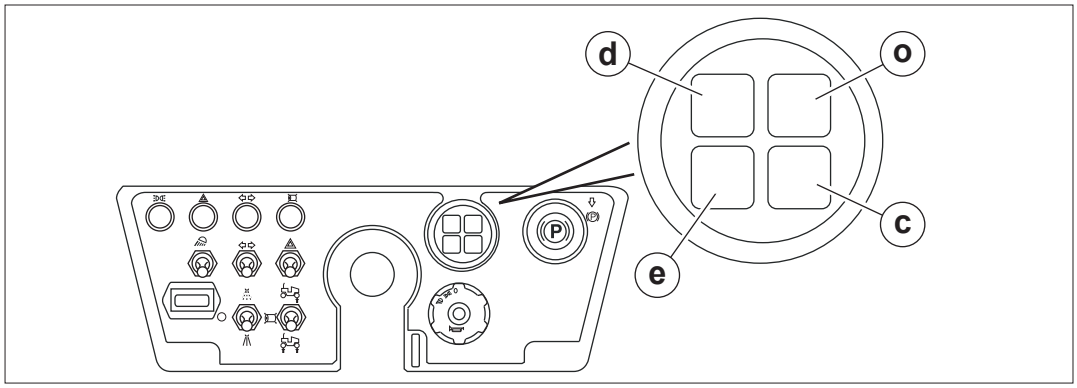
NOTICE: Do not use the parking brakes to stop the machine during normal operating conditions. Using the parking brake while the machine is moving may damage the drive motors.

Only use the parking brakes to stop the machine during an emergency condition. For example:

- During failure of the main hydraulic braking system (no braking action when the forward/reverse lever is moved to the neutral position)
- During a runaway condition traveling down a slope

4.18 Warning Lights

Warning light	Description	Action Required
Engine oil pressure 	This light **(d)** illuminates when the key switch is in the ON position; it goes out once the engine has started, if engine oil pressure is OK.	Turn off the engine immediately if this light illuminates when the engine is running. Check: Engine oil level Engine oil viscosity
Engine high temperature 	This light **(o)** illuminates when the engine is overheating.	Turn off the engine immediately if this light illuminates. Check: Engine coolant level
Alternator 	This light **(c)** illuminates when the key switch is in the ON position; it goes out once the engine has started, if the charging system is OK.	Turn off the engine immediately if this light illuminates while the engine is running. Check: Alternator belt
Hydraulic oil temperature 	This light **(e)** illuminates when the hydraulic oil is too hot.	Turn off the engine immediately if this light illuminates. Check: Hydraulic oil level Hydraulic oil viscosity



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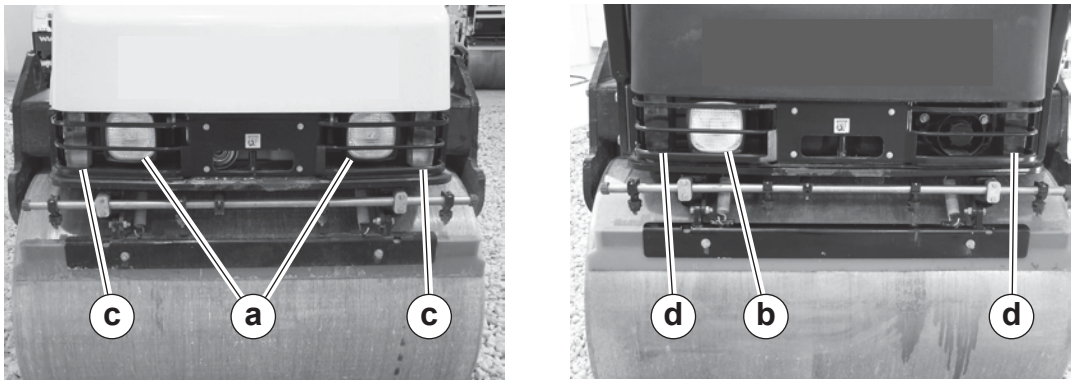
4.19 Using the Lights and Horn

Background

The rotary switch on the control panel controls power to the machine's lights.

Identifying the lights

- Headlights **(a)**
- Working light **(b)**
- Front turn signal lights / roading lights **(c)**
- Rear turn signal lights / roading lights **(d)**



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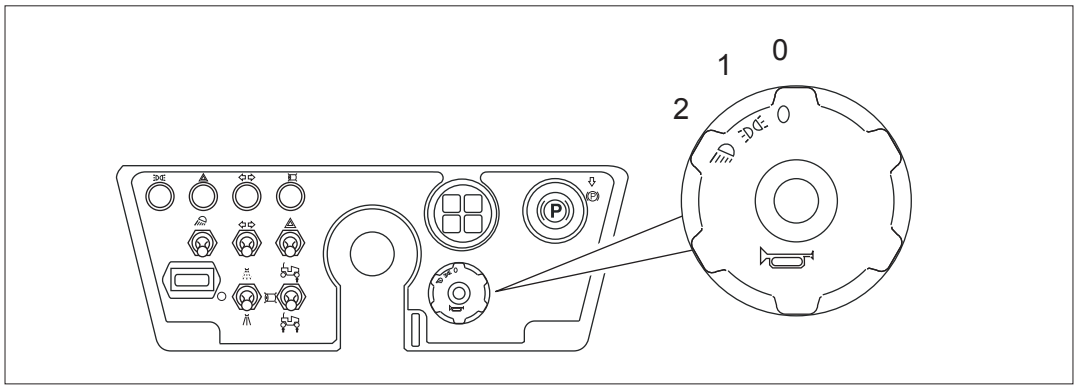
Operating the lights and horn

- Position 0: all lights off
- Position 1: headlights and roading lights ON
- Position 2: headlights, roading lights, and work lights ON
- Press the center of the switch to sound the horn.



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WARNING

Collision hazard. Failure to use all available lights when working in the dark or in bad visibility may increase the possibility of colliding with nearby people, vehicles, or stationary objects.

- ▶ Use all available lights when working in the dark or in bad visibility.
- ▶ Replace broken lamps immediately.

4.20 Machine Stability

WARNING
Crushing hazards. Certain job site conditions or operating practices may adversely affect machine stability.

▶ Follow the instructions below to reduce the risk of tipping or falling incidents.

Surface conditions

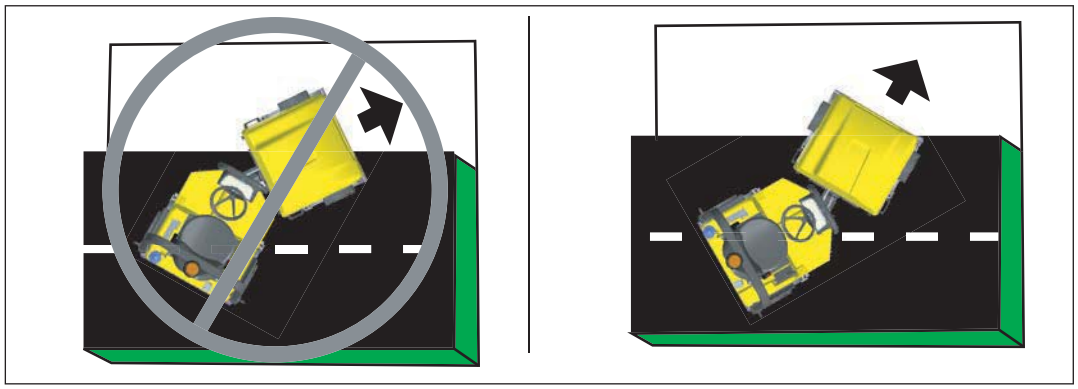
Pay attention to changing surface conditions while operating the machine. Adjust speed and travel direction as necessary to maintain safe operation.

- Machine stability and traction may be severely reduced when operating on uneven or rough terrain, rocky soils, or wet or loosely packed surface material.
- The machine may suddenly tip, sink, or fall when moved onto surfaces that have been newly filled with earth.

Steering angle

An articulated roller is more likely to tip when moving off an elevated surface if the machine is turned away from the edge.

- As shown in the illustration on the right, always turn the machine toward the edge when moving off an elevated surface.



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Travel speed

A fast moving machine is more likely to tip or fall over while making turns or changing direction.

- Reduce travel speed before turning the machine.

Drum overhang

The machine can tip suddenly if more than half of the drum width extends beyond the edge of the elevated surface.

- Reduce travel speed and watch the drum position carefully when operating along the edge of an elevated surface.
- Keep as much of the drum on the elevated surface as possible.

Vibrating on a compacted surface

Activating the vibratory system on a fully compacted surface may cause the drums to rebound and momentarily lose contact with the ground. If this occurs while the machine is on an incline, the machine may slide.

- If the drums rebound on the compacted surface, reduce vibration speed or stop vibration entirely.

4.21 Operating on Slopes

Background

When operating on slopes or hills, special care must be taken to reduce the risk of personal injury or damage to the machine.

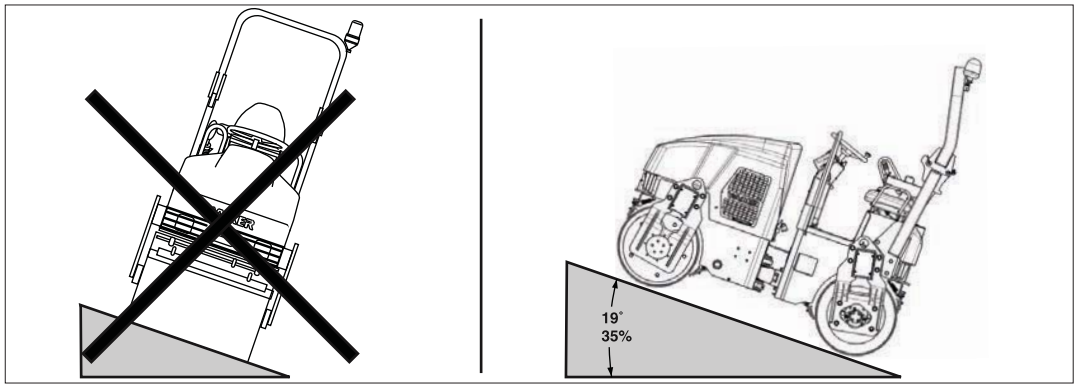
Procedure

Always operate the machine up and down slopes rather than from side to side. For safe operation and for protection of the engine, continuous duty use should be restricted to slopes of 19° (35% grade) or less.

WARNING

Crushing hazard. Never operate the machine sideways on slopes. The machine may tip or roll over even on stable ground.

- ▶ Operate the machine straight up and down slopes.



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Surface conditions

Pay attention to changing surface conditions while operating the machine. Adjust speed and travel direction as necessary to maintain safe operation.

- Machine stability and traction may be severely reduced when operating on uneven or rough terrain, rocky soils, or wet or loosely packed surface material.
- The machine may suddenly tip, sink, or fall when moved onto surfaces that have been newly filled with earth.

4.22 Preliminary Checks

Prerequisites Machine on a flat, level surface

Before starting

Before starting the machine, check the following items:

- Engine coolant level
- Engine oil level
- Engine air filter indicator
- Hydraulic oil level
- Diesel fuel level
- Condition of oil cooler and radiator cooling fins
- Water level in tank

NOTICE: Top off the lubricating and hydraulic oil levels using products with the grades and specifications shown in the “Lubricants” table found in the Technical Data chapter of this Operator’s Manual. When doing so, use clean containers, funnels, etc., to avoid contamination.

Before operating

Before operating the machine:

- Unlock the articulated joint.
- Adjust drum scraper position.
- Check the machine for fluid leaks. Repair them before operating.
- Check the work area for obstructions. Remove all obstructions.
- Check that all handles, steps, and platforms are free of dirt, snow, grease, fuel, or anything else which might endanger operator safety.
- Allow the engine to warm up according to the following schedule:

Ambient Temperature	Time (min.)
Above 0°C (32°F)	15
Below 0°C (32°F)	30*

** More time may be required if hydraulic controls are sluggish.*

4.23 Mounting and Dismounting the Machine

When climbing on and off the machine, maintain a three-point contact with the steps and the handholds.

Three-point contact can be:

- two feet and one hand
- one foot and two hands

NOTICE: Never use the control lever when mounting or dismounting the machine. Use only the designated hand holds on the ROPS and on the control column.

4.24 Starting the Engine

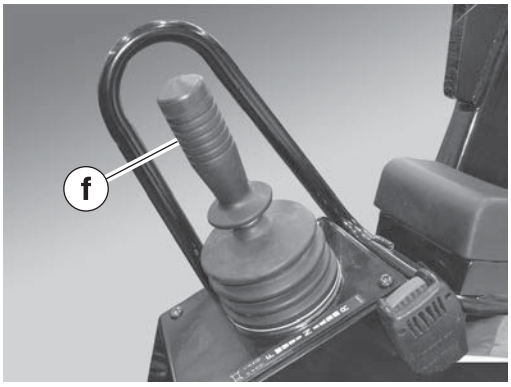
DANGER
Asphyxiation hazard. Engine exhaust contains carbon monoxide which CAN KILL YOU IN MINUTES. This is a poison that you cannot see or smell.

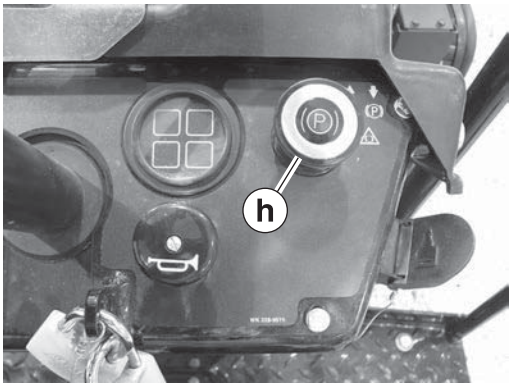
- ▶ Do not start the engine in enclosed spaces.

Procedure

Follow the procedure below to start the engine.

1. Sit down in the operator's seat and fasten the seat belt.
2. Move the forward/reverse **(f)** lever to the NEUTRAL position.





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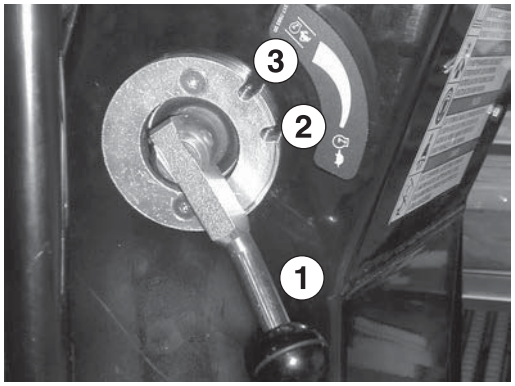
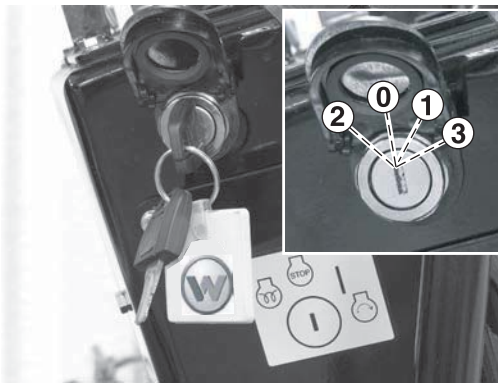
3. Push the parking brake push button **(h)** to engage the parking brake.
4. Move the throttle to the LOW position **(1)**.





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5. Turn the starting key to POSITION 1. Check for power to the control panel. The oil pressure and alternator lights should illuminate.
6. Turn the starting key to POSITION 2 and hold it there for approximately 15 seconds to supply power to the glow plugs. In warmer weather the time period may be reduced.
7. Immediately after powering the glow plugs, turn the key to POSITION 3 to crank the engine. When the engine fires, release the starting key to avoid straining the starter motor.

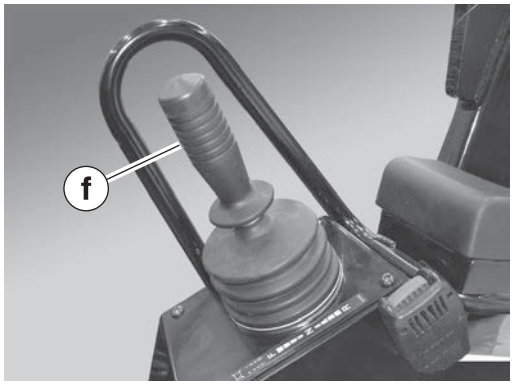
NOTICE: Do not crank the engine for periods longer than 30 seconds. Turn the key back to OFF and wait 15 seconds before cranking the engine again.

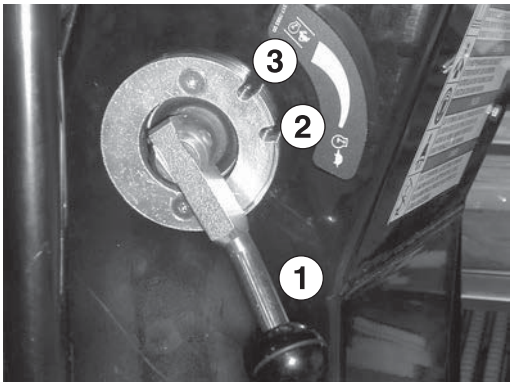
4.25 Stopping the Engine

Prerequisites Flat surface with a suitable load-bearing capacity

Procedure Follow the procedure below to stop the engine.

1. Stop the machine on a flat surface with a suitable load bearing capacity.
2. Move the forward/reverse **(f)** lever to the NEUTRAL position.





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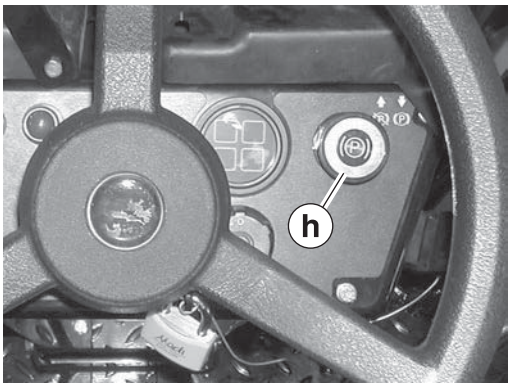
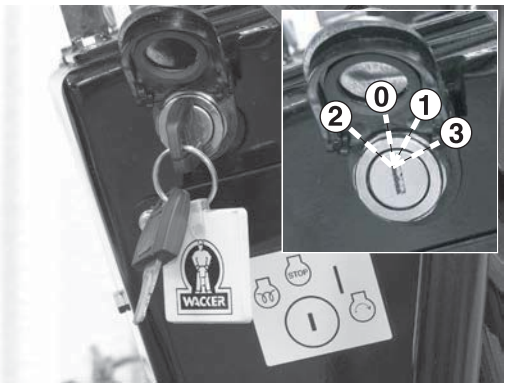
3. Move the throttle lever to the LOW position **(1)**.

NOTICE: Do not stop the engine suddenly after a lengthy period of running under heavy loading. Allow the engine to run at low idling speed for a few minutes before stopping it. This avoids a sudden drop in engine temperature when the engine is stopped.

4. Push the parking brake push button **(h)**.





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5. Turn the key switch to POSITION 0 (OFF).
6. Remove the starting key before you leave the operator's seat.
7. Chock the drums if the machine must be parked on a slope.

CAUTION
Obstruction hazard.

- ▶ Mark the machine with signs, lights, and other identification if the machine poses an obstacle to traffic when parked.

4.26 Understanding the Operator Present System

Background The machine is equipped with an operator present system. This system prevents machine movement if the operator is not seated in the operator's seat. The system includes the seat switch and the neutral switch.

Operation If the machine stops during operation, take the following steps to resume operation:

1. Sit in the operator's seat.
2. Return the forward/reverse lever to the NEUTRAL position.
3. Operate the machine as normal.

Note: *The seat switch is activated by operator weight when seated. Adjust the seat tension so that the operator's weight activates the seat switch. See section "Adjusting the Seat."*

4.27 Emergency Shutdown Procedure

If a breakdown/accident occurs while the machine is operating, follow the procedure below.

1. Stop the engine.
2. Allow the engine and exhaust system to cool.
3. Using appropriate equipment, return the machine to an upright position if tipped over.
4. Contact rental yard or machine owner.

Notes:

5 Maintenance

5.1 Periodic Maintenance Schedule

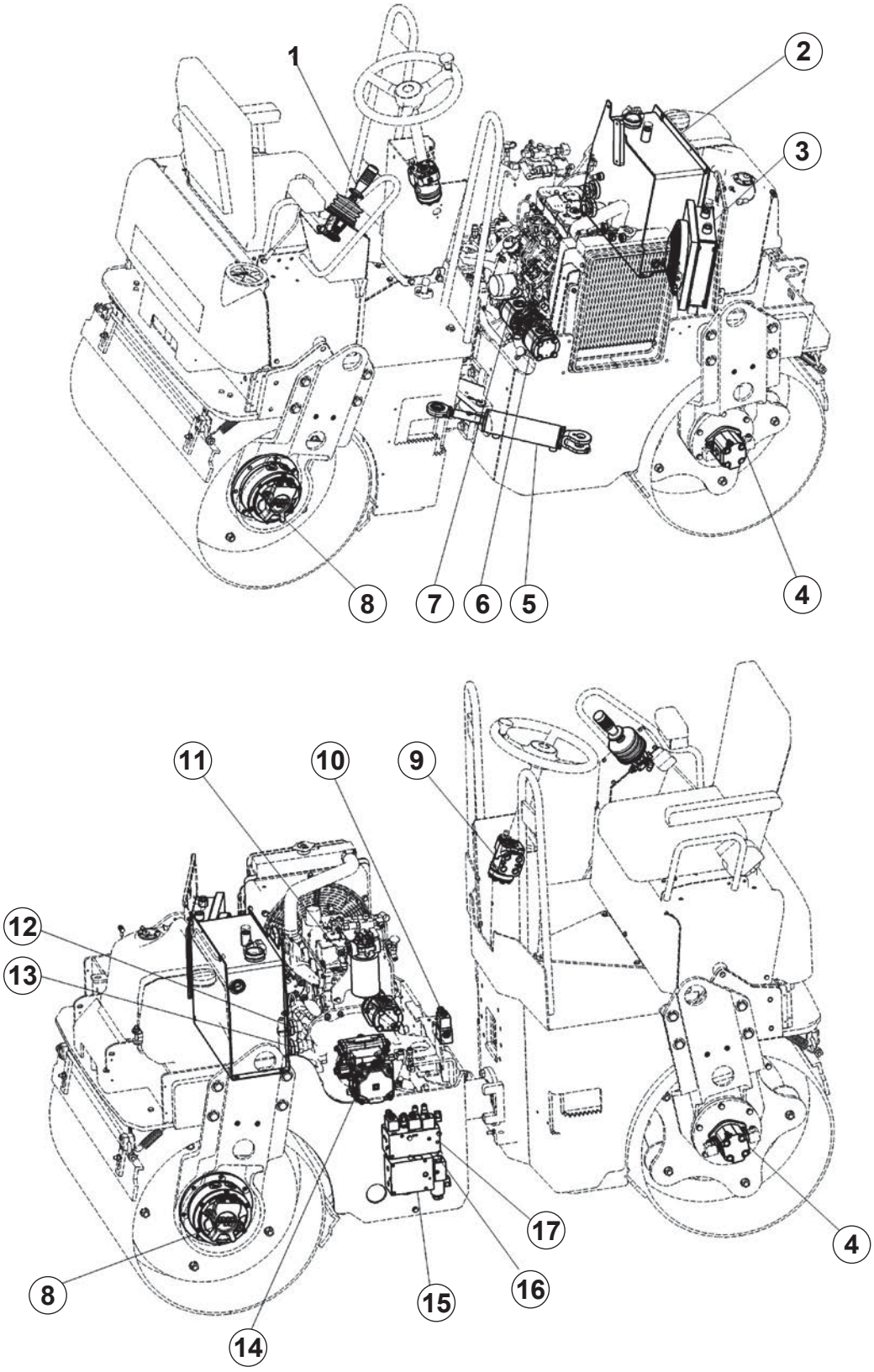
Tasks designated with check marks may be performed by the operator. Tasks designated with square bullet points require special training and equipment.

		Interval* (hours of service)						
		(10)	(100)	(250)	(500)	(1000)	(3000)	(12,000)
Item	**Task**	Daily	2 weeks	3 months	Yearly	2 years	3 years	6 years
Air cleaner	Clean	✓						
Backup alarm	Test	✓						
Engine coolant level	Check	✓						
Engine oil level	Check	✓						
Fuel level	Check	✓						
Hydraulic oil level	Check	✓						
Neutral switch	Test	✓						
Scrapers	Check	✓						
Seat belt	Inspect	✓						
Spray nozzles	Clean	✓						
Spray system filter	Clean	✓						
External hardware	Check		✓					
Fuel system water separator	Clean/ Drain		✓					
Fuel tank	Drain water/ sediment		✓					
Throttle control	Lubricate		✓					
Water tank strainer	Clean		✓					
Alternator belt	Check			✓				
Articulated steering joint	Lubricate			✓				
Steering cylinder	Lubricate			✓				
Braking system	Test				✓			
Engine oil and filter	Change				✓			

Item	Task	Interval* (hours of service)						
		(10) Daily	(100) 2 weeks	(250) 3 months	(500) Yearly	(1000) 2 years	(3000) 3 years	(12,000) 6 years
Exciter shaft bearings	Re-pack				■			
Fuel system water separator element	Replace				✓			
Fuel tank cap and strainer	Clean				✓			
Hydraulic oil filter**	Change				✓			
Radiator/hydraulic oil cooler	Clean				✓			
Shock mounts	Check				✓			
Battery	Check					✓		
Control lever tension	Adjust					✓		
Engine: mounting bolts, valve lash, cylinder head bolts, exhaust system	Inspect					✓		
Hydraulic oil	Change					✓		
Hydraulic tank breather	Replace					✓		
Hydraulic tank strainer	Clean					✓		
Radiator filler cap	Clean					✓		
ROPS and mounting hardware	Inspect/ torque					✓		
Engine water pump	Check						✓	
Fuel injector	Test						✓	
Cooling system coolant	Change							■
Temperature regulator	Replace							■

** Use whichever comes first, calendar time or service hours.*
*** Change after the first 100 hours.*

5.2 Major Component Locations



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5.3 Major Components

Ref.	Description	Ref.	Description
1	Forward/reverse lever	10	Seat switch solenoid
2	Hydraulic tank	11	Hydraulic oil filter
3	Oil cooler	12	Suction strainer
4	Front vibration motor	13	Suction strainer
5	Steering cylinder	14	Drive pump
6	Steering pump	15	Flow divider
7	Vibration pump	16	Flow divider solenoid
8	Hydraulic motor	17	Vibration manifold
9	Steering valve	-	---

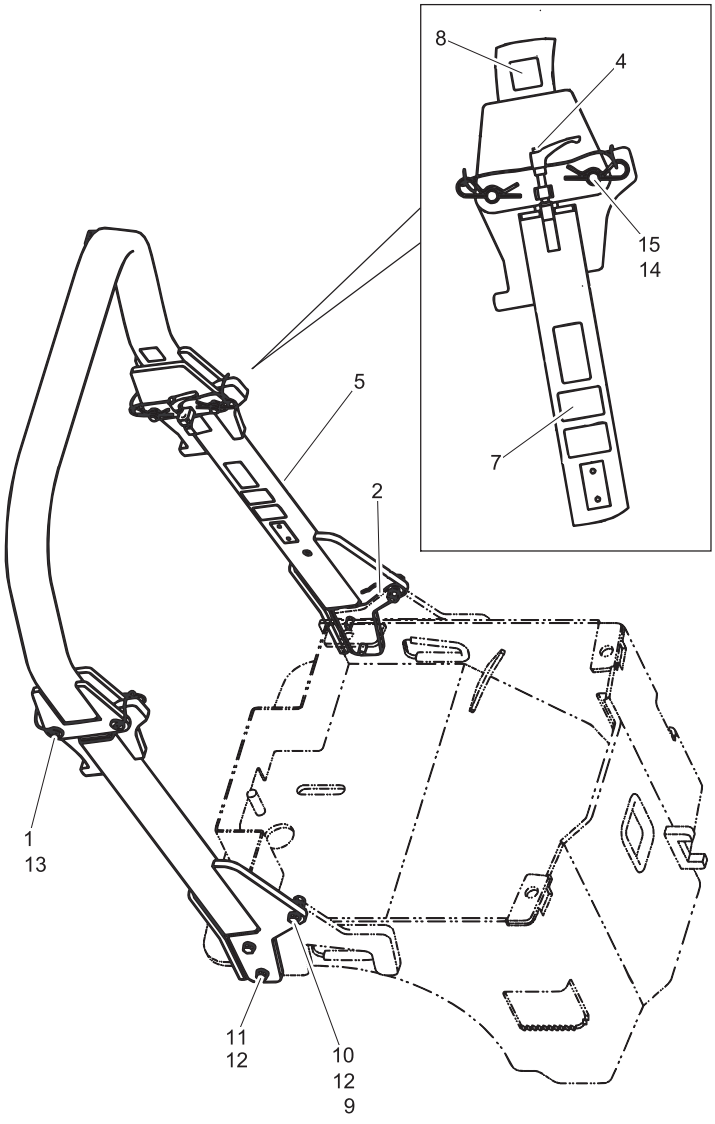
5.4 Safety-Related Spare Parts

Overview

This machine is equipped with several features to enhance operator safety. These include the ROPS, the seat belt, and the Operator Presence switch. For your convenience, we have provided the following diagrams and lists of replacement parts for these safety-related features.

For a complete list of spare parts for this machine, contact your Wacker Neuson dealer or visit www.wackerneuson.com.

ROPS diagram



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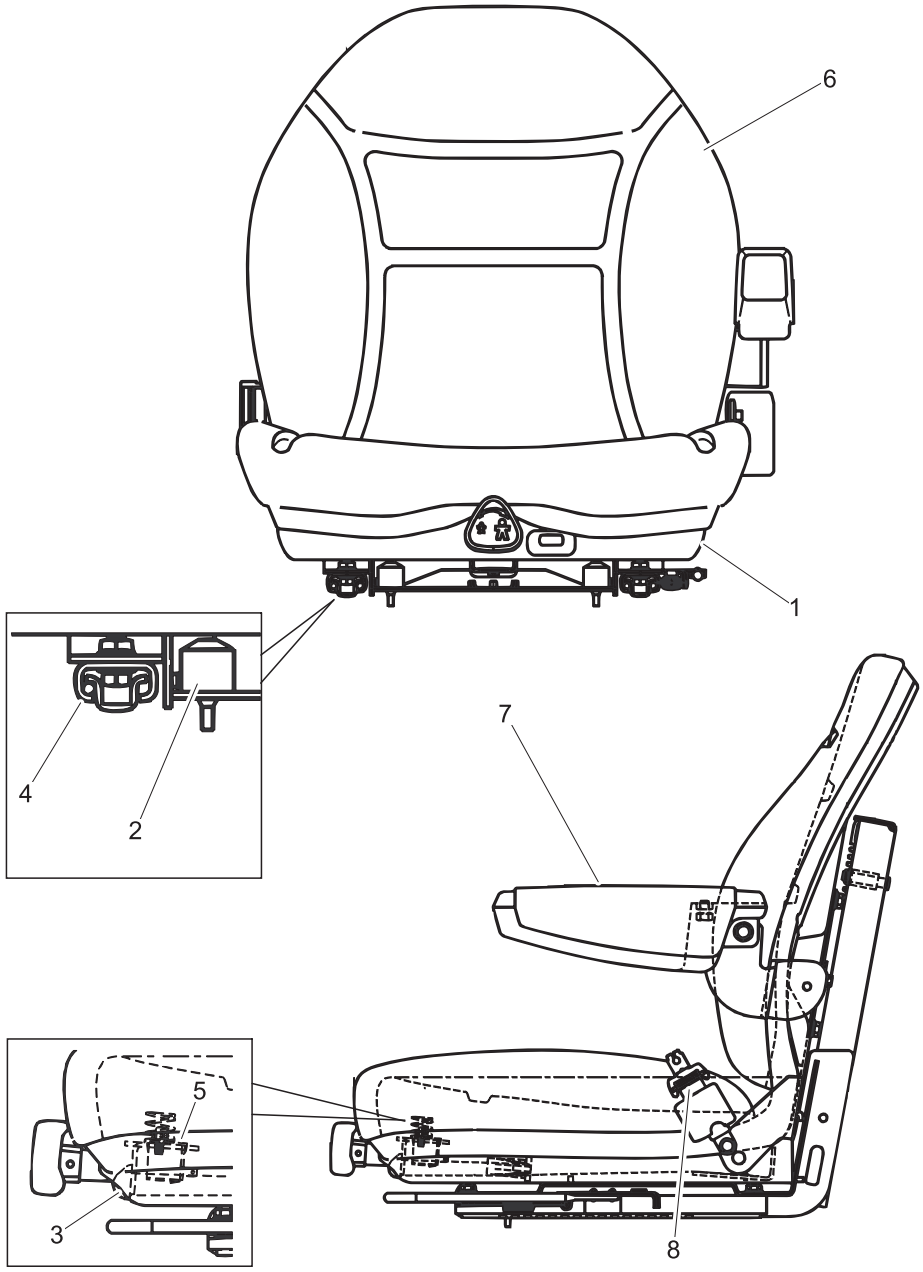
ROPS parts list

Ref.	Part No.	Qty.	Description	Measurement
1	0161542	4	Screw	
2	0161617	2	Shim	
4	0162243	2	Control lever	
5	0174257	1	ROPS frame	
7	0161769	1	Label—warning	
8	0162357	2	Label	
9	0162007	2	Nut	M16 x 2
10	0162011	2	Bolt	M16 x 2
11	0162017	4	Bolt	M16 x 2 x 50
12	0162059	8	Washer	
13	0161850	2	Cable	
14	0161940	4	Pin	
15	0162247	4	Clevis pin	

Seat assembly diagram



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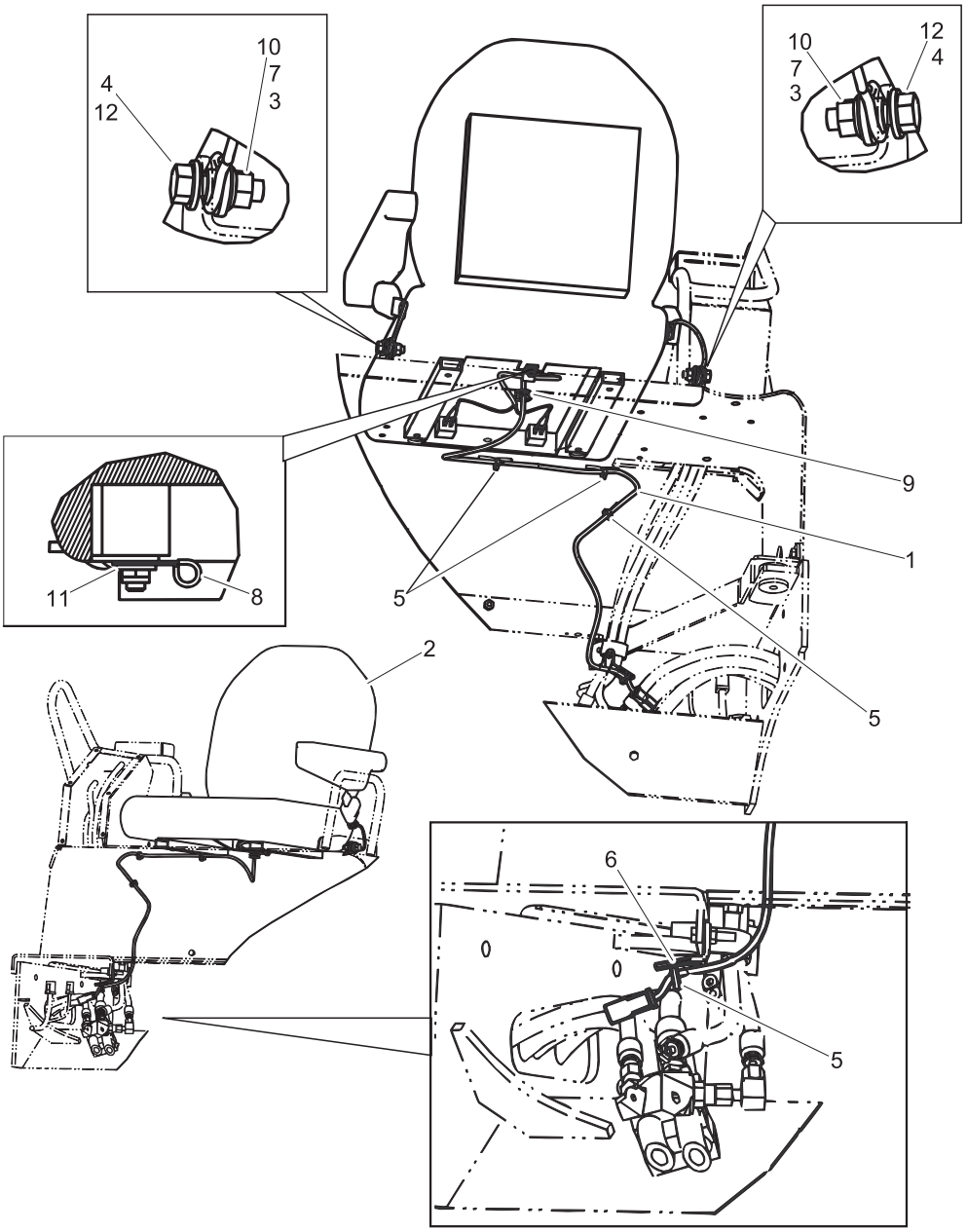
Seat assembly parts list

Ref.	Part No.	Qty.	Description	Measurement
1	0161620	1	Skirt replacement kit	
2	0161621	1	Seat slide kit	
3	0161622	1	Indicator kit	
4	0161744	1	Adjustable seat kit	
5	0161853	1	Seat switch kit	
6	0161855	1	Seat	
7	0161854	1	Arm rest kit	
8	0161856	1	Seat belt kit	

Seat switch diagram



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Seat switch parts list

Ref.	Part No.	Qty.	Description	Measurement
1	0162359	1	Wiring harness, seat	
2	0161998	1	Seat assembly	
3	0174165	2	Spacer	
4	0174181	2	Bolt	7/16-20
5	0161879	4	Strap—mounting	
6	0174353	1	Clip	
7	0161903	2	Washer	
8	0161925	1	Cable clip	
9	0174405	1	Grommet	
10	0174406	2	Lock nut	7/16-20
11	0162006	1	Washer	
12	0162023	2	Washer	

5.5 Maintaining the Seat and Seat Belt

Background

In order for the seat and seat belt to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary. Poorly maintained equipment can become a safety hazard!

Maintaining the seat and seat belt

- Keep the seat clean. Dirt, dust, or harsh chemicals can damage the upholstery. Repair holes or tears immediately.
- If necessary, clean the seat belt with a mild soap solution. Do not use chemical cleaners, as they will damage the fabric.
- Replace the seat belt immediately if it becomes worn or damaged. Otherwise, replace the seat belt every three years.
- Periodically test the operation of the seat tension knob and the front-to-back lever. Repair or replace worn or malfunctioning components.
- If the seat does not move smoothly during adjustment, apply a small amount of standard bearing grease (such as Shell Alvania® RL2 or equivalent) to the rails.

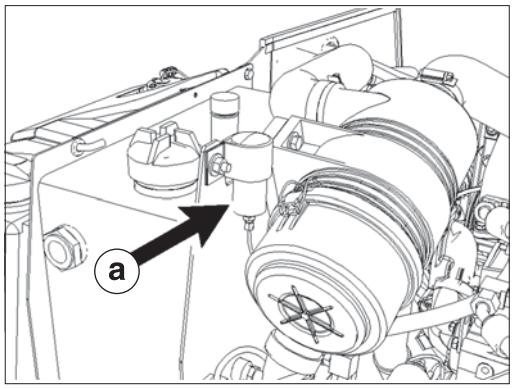
5.6 Checking the Air Filter Indicator

Prerequisites
- Engine running
- Parking brake on

When
Every 10 hours of service or daily

Procedure
Follow the procedure below to check the air filter indicator.

1. Open the engine compartment.
2. Start the engine.
3. Place the throttle lever in the HIGH idle position.
4. Locate the air filter indicator **(a)**.



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If the yellow piston in the air filter indicator enters the red zone, clean the air cleaner/air filters.

5. Turn off the engine.

5.7 Cleaning the Air Cleaner and Primary Air Filter Element

Prerequisites

- Machine shut down
- Source of clean, dry, and low-pressure (less than 207 kpA (30 psi)) compressed air

Background

The air intake system is equipped with a filter indicator **(a)**, which indicates when a filter change is required. The primary air filter element can be cleaned and reused up to six times; after that it must be replaced.

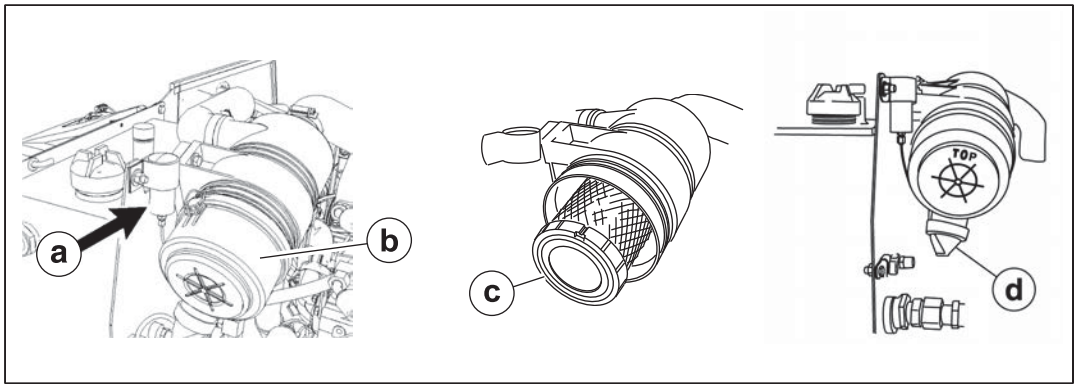
Procedure

Follow the procedure below to clean the primary air filter element.

WARNING
Fire hazard.

- ▶ Never use gasoline or low flash-point solvents for cleaning the air filter.

1. Remove the cover **(b)** from the air filter housing.



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2. Remove the primary air filter element **(c)** from the air filter housing.
3. Clean inside of the air filter housing.
4. Clean the primary air filter element with low-pressure (207 kpA (30 psi)) compressed air. Blow the air through the primary air filter element from the inside to the outside.
5. Hold the primary air filter element up to the light or pass a lamp through the middle to check the condition of the element.

NOTICE:

- Do not re-use a damaged primary air filter element. Replace it even if damage is very slight.
- Do not tap or strike the primary air filter element to clean it.
- Do not wash the primary air filter element.

6. Re-install the primary air filter element **(c)**.
7. Reassemble the cover **(b)**, positioning the breather **(d)** so that it is not obstructed.
8. Push the black rubber button (several times if need be) on top of the filter indicator to reset it.

5.8 Changing the Air Filter Elements

Prerequisites

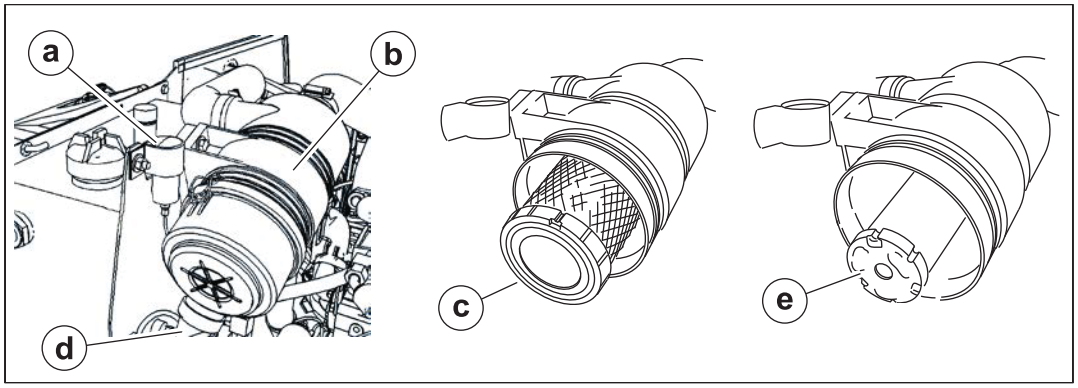
- Machine shut down
- New primary air filter element
- New secondary air filter element if required

NOTICE: Do not use the air filters as a starting aid (e.g., ether) intake.

Primary filter element

Follow the procedure below to change the primary air filter element.

1. Remove the cover **(b)** from the air filter housing.



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2. Remove the primary air filter element **(c)**.
3. Clean the inside of the air filter housing.
4. Install the new primary air filter element.
5. Replace the cover. Position it so that the breather **(d)** is not obstructed.
6. Reset the filter indicator **(a)**.

Secondary filter element

Follow the procedure below to change the secondary air filter element.

Note: *Change the secondary air filter element **(e)** every third time the primary air filter element is changed.*

1. Remove the cover **(b)** from the air filter housing.
2. Remove the primary air filter element **(c)**.
3. Remove the secondary air filter element.
4. Cover the intake port and clean inside of the air filter housing.

NOTICE: Do not allow dirt to get into the engine intake port. Damage to the engine will result.

5. Remove the cover from the intake port and install the new secondary air filter element.

NOTICE: The secondary filter element has two rubber seals—one wider than the other. Make sure to insert the end with the narrow seal. Damage to the engine will result if the filter element is inserted incorrectly.

This procedure continues on the next page.

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6. Install the new primary air filter element.
7. Replace the cover **(b)**. Position it so that the breather **(d)** is not obstructed.
8. Reset the filter indicator **(a)**.

5.9 Testing the Backup Alarm

Background The backup alarm is located on the rear of the machine.

When Every 10 hours of service or daily

Testing Procedure Follow the procedure below to test the backup alarm.

1. Turn the starting key to POSITION 1.
2. Move the forward/reverse lever to the reverse position.

The backup alarm should sound immediately. The backup alarm will continue to sound until the forward/reverse lever is moved to the NEUTRAL position or to the FORWARD position.

NOTICE: If the backup alarm does not sound, make the necessary repairs before using the machine.

5.10 Checking the Engine Coolant Level

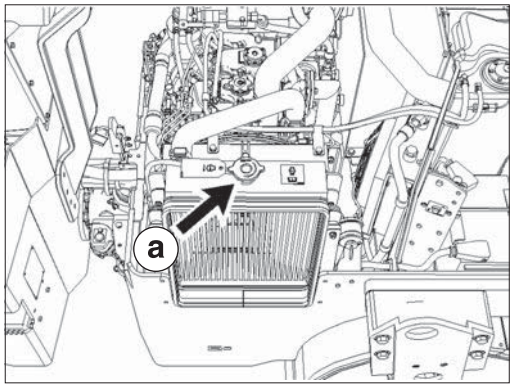
Prerequisites
- Machine shut down
- Engine cool

When Every 10 hours of service or daily

Procedure Follow the procedure below to check the engine coolant level.

WARNING
Burn hazard. Engine coolant is hot and under pressure at operating temperature. It can cause severe personal injury.
- ▶ Check the coolant level only after the engine has been shut down and is cool.

1. Open the engine compartment.
2. Open the radiator filler cap **(a)** slowly in order to relieve the pressure. Remove the filler cap after the pressure has been released.



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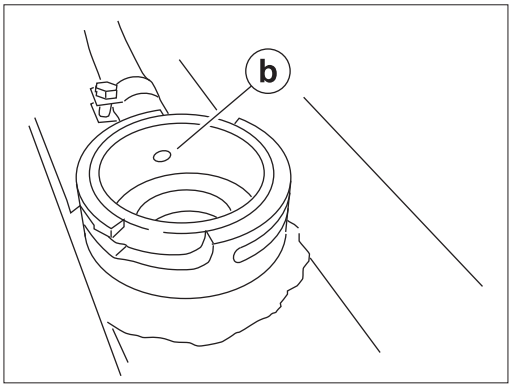

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CAUTION
Burn hazard. Coolant can contain alkali.
- ▶ Avoid coolant contact with skin and eyes.

3. Maintain the coolant level to 2.54 cm (1 in.) below the shoulder inside the fill pipe.
4. Make sure that the coolant overflow hole **(b)** is clean and the overflow tube is securely attached.
5. Inspect the radiator filler cap and filler cap seal for damage. Clean the radiator filler cap or replace it if necessary.
6. Re-install the radiator filler cap.

5.11 Checking the Engine Oil

Prerequisites

- Park the machine on a level surface
- Shut down the machine
- Apply the parking brake

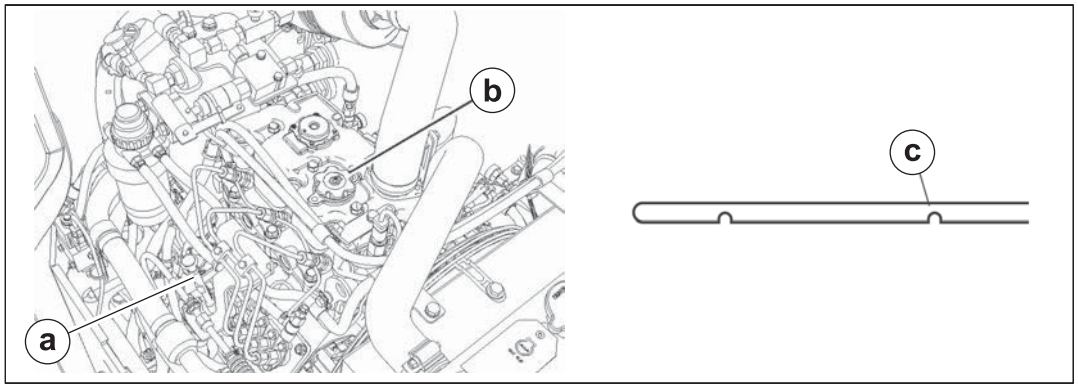
When

Every 10 hours of service or daily

Procedure

Follow the procedure below to check the engine oil.

1. Clean around the dipstick **(a)**.
2. Extract the dipstick and check the oil level. Maintain the oil level between the two notches on the dipstick. When full, the oil level will reach notch **(c).**



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3. Remove the oil filler cap **(b)** and add oil as needed.

NOTICE: Do not overfill the machine with oil. Overfilling the engine with oil may lead to excessively high operating temperatures.

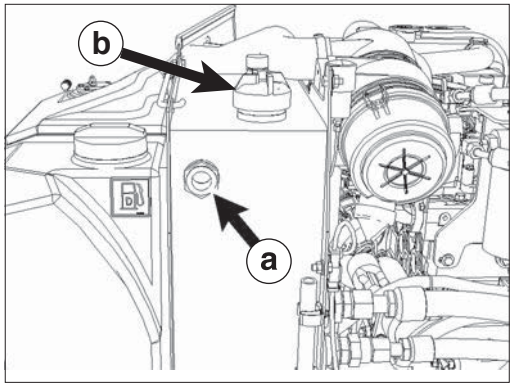
5.12 Checking Hydraulic Oil Level

Prerequisites
- Machine shut down
- Hydraulic oil warm

When Every 10 hours of service or daily

Procedure Follow the procedure below to check the hydraulic oil level.

1. Open the engine compartment.



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2. Observe the hydraulic oil level through the sight gauge **(a)**.
3. If the oil level is low, open the reservoir cap **(b)** and fill the hydraulic oil to the mark on the sight gauge.

5.13 Checking the Neutral Switch

Requirement Parking brake engaged

When Every 10 hours of service or daily

Procedure Follow the procedure below to check the neutral switch.

WARNING
Crush hazard. The machine may lurch forward if the neutral switch is out of adjustment while making this test.
- ▶ Be sure the area is clear of all personnel and equipment before making this test.

1. Turn off the engine.
2. Engage the parking brake.
3. Move the forward/reverse lever to the FORWARD position.
4. Hold the engine start switch in the START position.
5. Slowly move the forward/reverse lever toward the NEUTRAL position.
- If the engine starts before the forward/reverse lever reaches the NEUTRAL position, the neutral switch must be adjusted. Refer to the Repair Manual.

- If the engine starts only when the forward/reverse lever is in the NEUTRAL position, the neutral switch is OK.

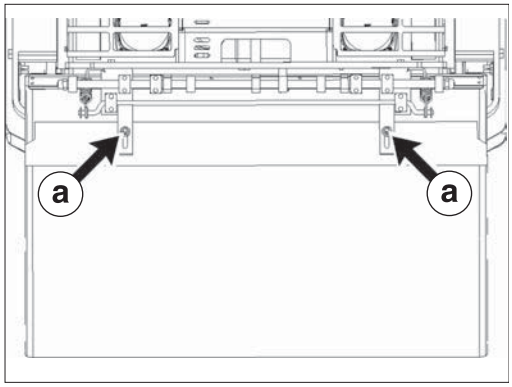
5.14 Adjusting the Scraper Bars

Prerequisites
- Machine shut down
- Parking brake engaged

When
Every 10 hours of service or daily

Procedure
Follow the procedure below to adjust the scraper bars.

1. Loosen the bolts **(a)**.



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2. Adjust the scraper so that it touches the drum along its entire length.
3. Tighten the bolts.

5.15 Inspecting the Seat Belt

Requirments

- Machine shut down
- Parking brake engaged

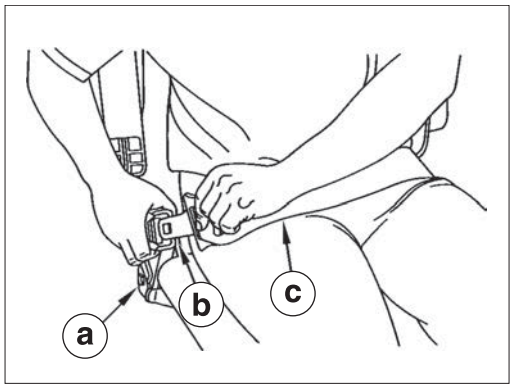
When

Daily, before starting the machine.

Procedure

Follow the procedure below to inspect the seat belt.

1. Check the seat belt mounting hardware **(a)** for wear and damage. Replace damaged hardware.



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2. Check the buckle **(b)** for wear and damage. Replace the seat belt if the buckle is damaged.
3. Inspect the seat belt **(c)** for wear and damage. Replace the seat belt if it is damaged.

Note: *Replace the seat belt every three years even if none of the components show visible wear or damage.*

5.16 Cleaning the Water Spray Nozzles

Prerequisites

- Machine shut down
- Clean, nonflammable solvent

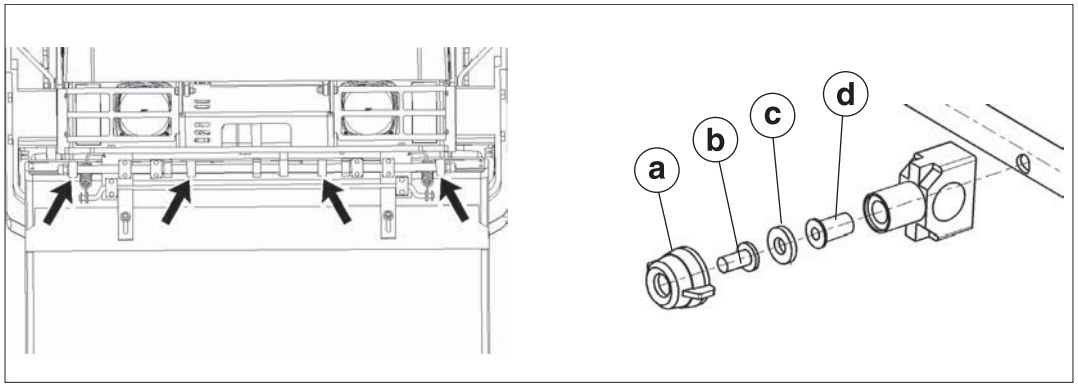
When

Every 10 hours of service or daily

Procedure

Follow the procedure below to clean the water spray nozzles.

1. Locate the water spray nozzles.



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2. Remove the cap **(a)**.
3. Remove the nozzle **(b)**.
4. Remove the rubber washer **(c)**.
5. Remove the screen assembly **(d)**.
6. Clean the nozzle **(b)** and the screen assembly **(d)** in a clean, nonflammable solvent.
7. Reassemble the components.

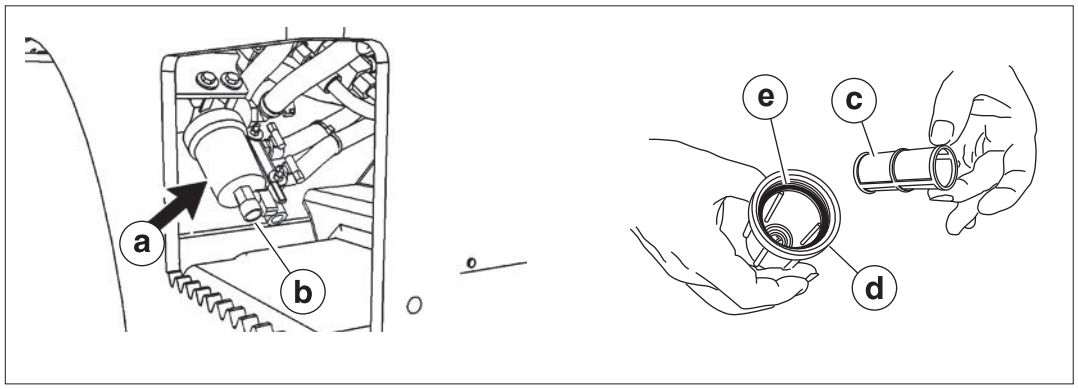
5.17 Cleaning the Water Spray System Filter

Prerequisites
- Machine shut down
- Water spray system shutoff valve in closed position

When
Every 10 hours of service or daily

Procedure
Follow the procedure below to clean the water spray system filter.

1. Locate the water spray system filter assembly **(a)** inside the step on the right side of the machine.



wc_gr004791

2. Open the drain valve **(b)**.
3. Unscrew and remove the filter bowl **(d)**.
4. Remove the filter **(c)**.
5. Clean the filter with water or compressed air.
6. Clean the filter bowl with water or compressed air.
7. Check the condition of the sealing gasket **(e)** and replace it if necessary.
8. Re-install the filter into the filter bowl, pressing down firmly to seat it in place.
9. Re-install the filter bowl.
10. Close the drain valve.

5.18 Cleaning and Changing the Fuel Filter/Water Separator

Prerequisites

- Machine shut down
- New filter

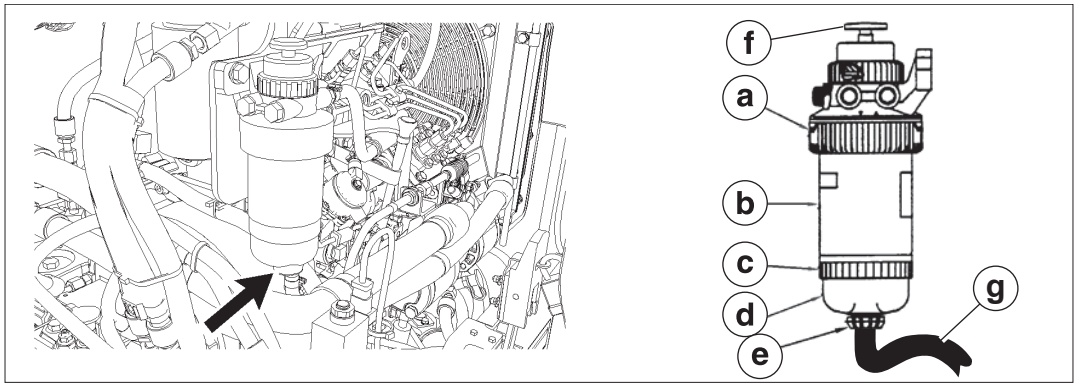
When

Drain every 100 hours; change element every 500 hours

Draining water separator

Follow the procedure below to drain the fuel/water separator.

1. Open the engine compartment.
2. Position the rubber drain tube **(g)** so that it will drain into a receptacle outside of the engine compartment.



wc_gr004755

3. Turn valve **(e)** counterclockwise to open the valve, and drain the water and the sediment into a suitable container.

Note: *Collect, store and dispose of all used fluids in accordance with current environmental protection regulations.*

4. Close the valve.

Changing element

To change the fuel filter element:

1. Drain the fuel filter/water separator as stated above.
2. Hold the bowl **(d)** while you loosen the collar **(c)**. Remove the bowl and the collar **(c)**.
3. Loosen the collar **(a)** and remove the fuel filter element **(b)**.

Note: *Dispose of used filters according to environmental protection regulations.*

4. Clean the parts. Inspect the parts for damage. Replace damaged parts.
5. Clean the filter mounting base. Remove all of the old seal.
6. Apply a light coat of diesel fuel to the seal of the new filter element.
7. Install the new filter element and tighten by hand. Tighten the collar **(a)**.
8. Install the bowl **(d)** and tighten the collar **(c)**.
9. Pump the plunger **(f)** approximately three times to fill the fuel filter/water separator with fuel.
10. Start the engine and check the fuel system for leaks.

5.19 Priming the Fuel System

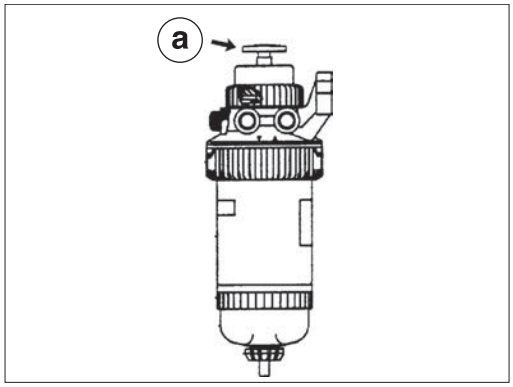
Prerequisites

- Machine shut down
- Engine cool

Procedure

Follow the procedure below to prime the fuel system.

1. Open the engine compartment.
2. Locate the fuel filter/water separator.



wc_gr004760

3. Push the plunger **(a)** to fill the filter element with fuel. Pump the plunger approximately three times until resistance is felt. This indicates the filter element is full of fuel.
4. Attempt to start the engine.

Continue priming if:

- The engine does not start.
- The engine starts but misfires.
- The engine starts but emits smoke.

If the engine runs roughly, continue to run the engine at low idle until the engine runs smoothly.

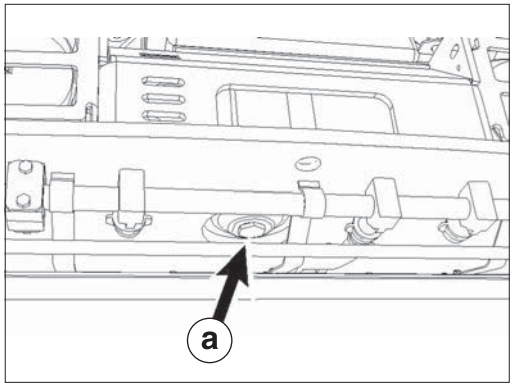
5.20 Draining Water and Sediment from the Fuel Tank

Prerequisites
- Machine shut down
- Suitable container

When
Every 100 hours of service or every 2 weeks

Procedure
Follow the procedure below to drain water and sediment from the fuel tank.

1. Locate the drain plug **(a)** under the front center of the machine.



wc_gr004784

2. Remove the drain plug and allow water and sediment to drain into a suitable container.

Note: *Collect, store and dispose of all used fluids in accordance with current environmental protection regulations.*

3. Re-install the drain plug.

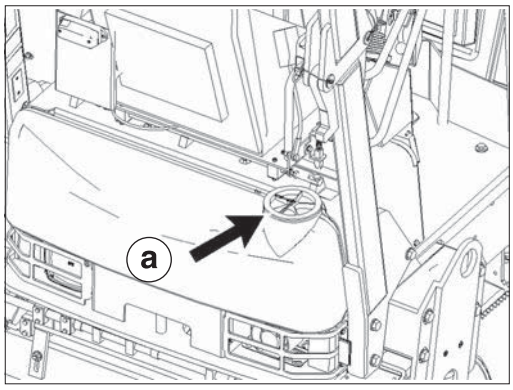
5.21 Cleaning the Water Tank Strainer

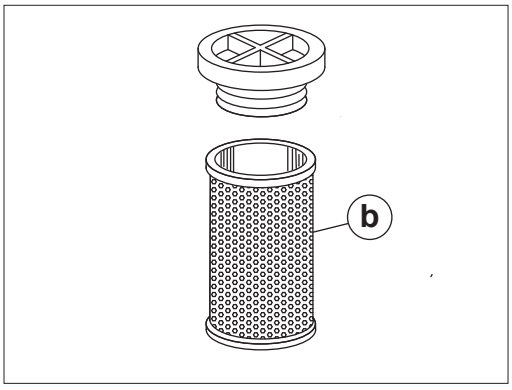
Prerequisites Machine shut down

When Every 100 hours of service or every 2 weeks

Procedure Follow the procedure below to clean the water tank strainer.

1. Remove the filler cap **(a)**.





wc_gr004792

2. Remove the water tank strainer **(b).**
3. Clean the filler cap with clean water or compressed air.
4. Clean the water tank strainer with clean water or compressed air.
5. Re-install the water tank strainer.
6. Re-install the filler cap.

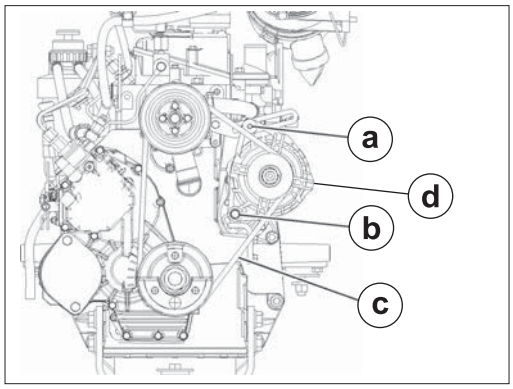
5.22 Adjusting Alternator Belt Tension

Prerequisites
- Machine shut down
- Engine cool

When
Every 250 hours of service or every 3 months

Procedure
Follow the procedure below to inspect the alternator belt.

1. Open the engine compartment.
2. Remove the fan guard and shroud.
3. Apply 110 N (25 lbs.) of force to the belt **(c)** midway between the pulleys. Correctly adjusted belts will deflect 13–19 mm (1/2–3/4 in.).
4. To adjust the belt, loosen mounting bolts **(a)** and **(b)**.



wc_gr004762

5. Move the alternator **(d)** to adjust the tension.
6. Tighten the mounting bolts **(a)** and **(b)** when the tension is correct. Torque mounting bolt **(b)** to 45–55 Nm (33–41 ft.lbs.).

Note: *When installing a new belt, check and adjust the belt tension after the first 30 minutes of operation.*

7. Re-install the fan guard and shroud.

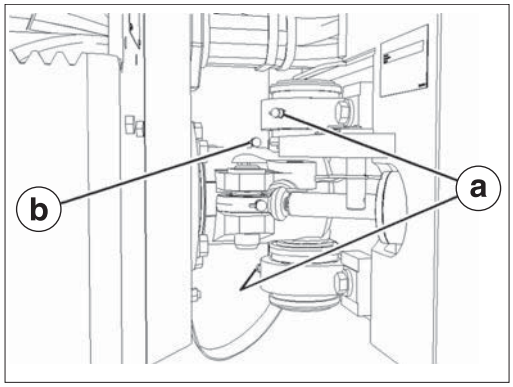
5.23 Lubricating the Articulated Steering Joint

Prerequisites
- Grease gun
- Machine shut down

When
Every 250 hours of service or every 3 months

Procedure
Follow the procedure below to lubricate the articulated steering joint.

1. Clean the fitting caps.



wc_gr004767

2. Clean the articulated steering joint fittings **(a)**.
3. Lubricate the articulated steering joint fittings with ten strokes from a grease gun.
4. Lubricate the oscillation bearing **(b)** until grease flows out of the casting.
5. Re-install the fitting caps.

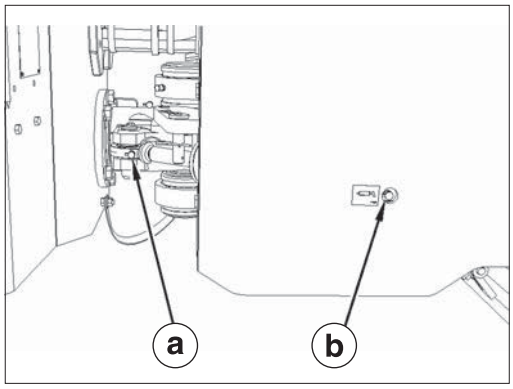
5.24 Lubricating the Steering Cylinder

Prerequisites
- Machine shut down
- Grease gun

When
Every 250 hours of service or every 3 months

Procedure
Follow the procedure below to lubricate the steering cylinder.

One end **(a)** of the steering cylinder is located in the pivot area. The other end **(b)** is located on the right side of the engine compartment.



wc_gr004786

1. Clean the fittings.
2. Lubricate the fittings with a grease gun.

5.25 Testing the Brake System

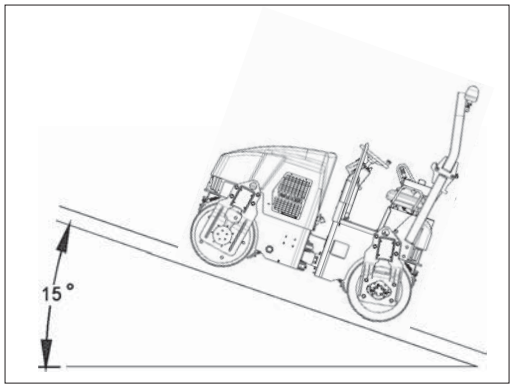
Prerequisites 15° slope

When Every 500 hours of service or yearly

Precaution Use this test to determine if the parking brake is functioning on the specified slope. This test is not intended to measure the maximum brake holding effort.

Procedure Follow the procedure below to test the braking system.

1. Position the machine on a 15° slope as shown.



wc_gr004766

2. With the engine running, place the throttle control into the LOW IDLE position and the forward/reverse control lever in the NEUTRAL position.
3. Engage the parking brake. The machine should not move.

If the machine moves, consult Wacker Neuson Service.

5.26 Changing the Engine Oil and Filter

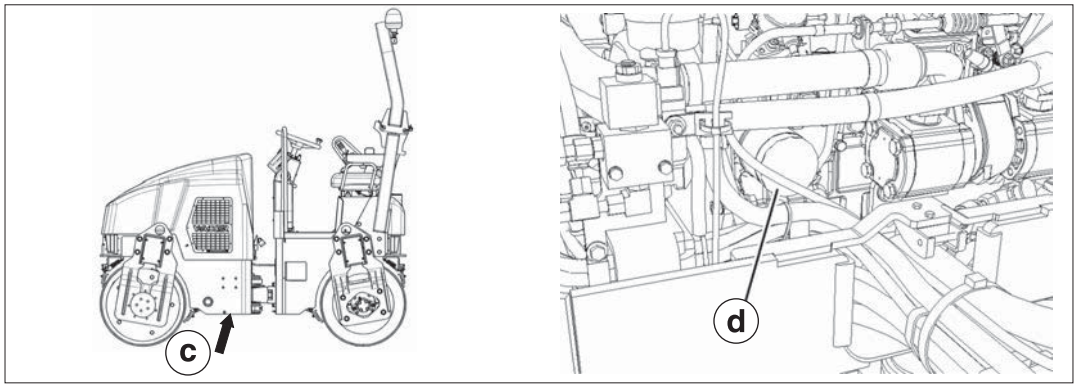
Prerequisites
- Engine warm
- 15W40 engine oil and new filter

When Every 500 hours of service or yearly

Procedure Follow the procedure below to change the engine oil.

WARNING
Burn hazard. Hot oil draining from the engine can burn.
- ▶ Do not touch the hot oil.

1. Open the engine hood.
2. Locate the engine oil drain hose **(c)** below the frame and place a suitable container beneath it.



wc_gr004758

3. Open the drain valve beneath the filter cartridge **(d)** and drain off the used oil.
Note: *Collect, store and dispose of all used oil and filters in accordance with current environmental protection regulations.*
4. Unscrew the filter cartridge **(d)** and remove it.
5. Clean the filter housing base.
6. Apply a thin coat of engine oil to the seal of the new oil filter.
7. Install the new filter cartridge and tighten by hand. When the seal contacts the base, tighten the filter cartridge an additional 3/4 turn.
8. Remove the oil filler cap and pour in the required amount of oil.

NOTICE: Always use the correct oil type. Do not use oil brands or grades which are not recommended.

9. Clean the oil filler cap, then re-install it.
10. Start and run the engine for a few minutes.
11. Check the oil pressure and the filter seal.

This procedure continues on the next page.

Continued from the previous page.

12. Stop the engine and make the following checks:
- Check the oil level and top off if necessary.
- Check the new filter for leaks.

5.27 Cleaning the Fuel Tank Cap and Fuel Strainer

Prerequisites
- Machine shut down
- Clean, nonflammable solvent

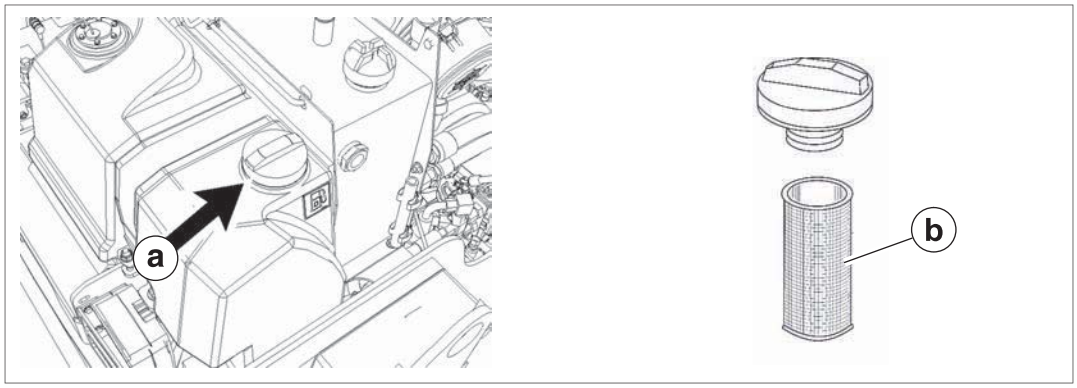
When

Every 500 hours of service or yearly

Procedure

Follow the procedure below to clean the fuel tank cap and fuel strainer.

1. Open the engine compartment.
2. Remove the fuel tank cap **(a)**.



wc_gr004783

3. Remove the fuel strainer **(b)**.
4. Wash the fuel strainer in nonflammable solvent. Dry it with compressed air.
5. Inspect both the fuel tank cap and the fuel strainer for damage. Replace the fuel tank cap or the fuel strainer if either is damaged.

5.28 Changing the Hydraulic Oil Filter

Prerequisites

- Hydraulic oil filter
- Strap-type wrench
- Suitable container
- Machine parked on a flat, level surface

When

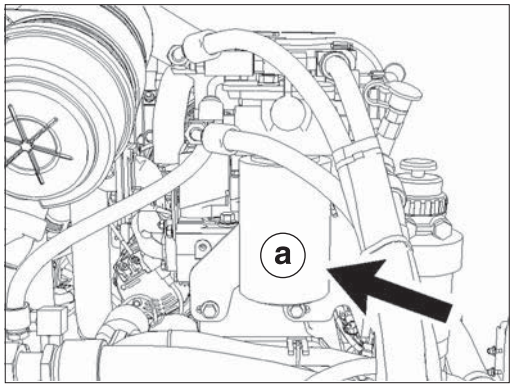
Every 500 hours of service or yearly

Procedure

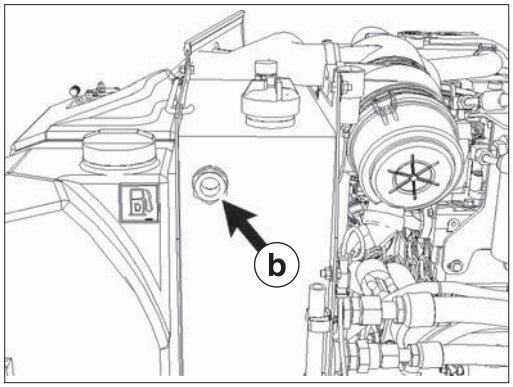
Follow the procedure below to change the hydraulic oil.

Note: *Take care to keep the hydraulic oil and the hydraulic system clean. Dirty hydraulic oil will reduce component performance and shorten component service life.*

1. Open the engine compartment.
2. Locate the hydraulic oil filter **(a)**.



wc_gr004778



wc_gr004779

3. Clean the area around the hydraulic oil filter.
4. Remove the hydraulic oil filter with a strap-type wrench.

Note: *Collect, store and dispose of all used oil and filters in accordance with current environmental protection regulations.*

5. Clean the filter housing base. Remove any existing gasket material.
6. Apply a light coat of hydraulic oil to the gasket on the new hydraulic oil filter.
7. Screw the new hydraulic oil filter on by hand. When the seal contacts the base, tighten the filter element an additional 3/4 turn.
8. Check the hydraulic oil level **(b)** and add hydraulic oil as needed.
9. Check the hydraulic oil level again the next day, or after the machine has been run and allowed to cool down.

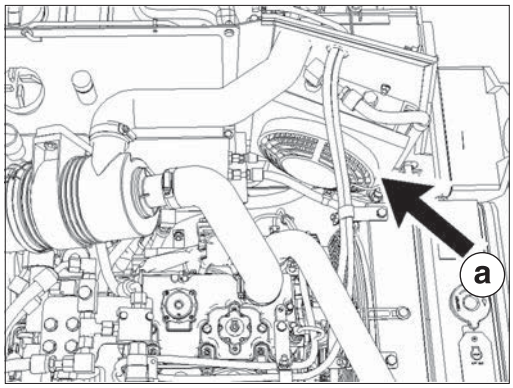
5.29 Cleaning the Hydraulic Oil Cooler

Prerequisites
- Machine shut down
- Parking brake engaged

When
Every 500 hours of service or yearly

Procedure
Follow the procedure below to clean the hydraulic oil cooler.

1. Open the engine compartment.
2. Locate the hydraulic oil cooler **(a)**.



wc_gr004775

3. Clean the hydraulic oil cooler using compressed air.
4. Close the engine compartment.

5.30 Disconnecting/Connecting the Battery

WARNING
Explosion hazard. Batteries can emit explosive hydrogen gas.
- ▶ Keep all sparks and flames away from the battery.
- ▶ Do not short-circuit battery posts.

WARNING
Battery fluid is poisonous and corrosive.
- ▶ In the event of ingestion or contact with skin or eyes, seek medical attention immediately.

Dispose of dead batteries in accordance with local environmental regulations.

Disconnecting

To disconnect the battery:

1. Stop the machine and shut down the engine.
2. Place all electrical switches in the OFF position.
3. Disconnect the negative battery cable from the battery.
4. Disconnect the positive battery cable from the battery.

Connecting

To connect the battery:

1. Connect the positive battery cable to the battery.
2. Connect the negative battery cable to the battery.

Maintaining

- Keep battery terminals clean and connections tight.
- When necessary, tighten the cables and grease the cable clamps with petroleum jelly.
- Maintain the battery at full charge to improve cold weather starting.

Precautions

Observe the following precautions to prevent serious damage to the electrical system:

- Do not disconnect the battery while the machine is running.
- Do not attempt to run the machine without a battery.
- Do not attempt to jump-start a machine.
- In the event that the machine has a dead battery, either replace the battery with a fully charged battery or charge the battery using an appropriate battery charger.

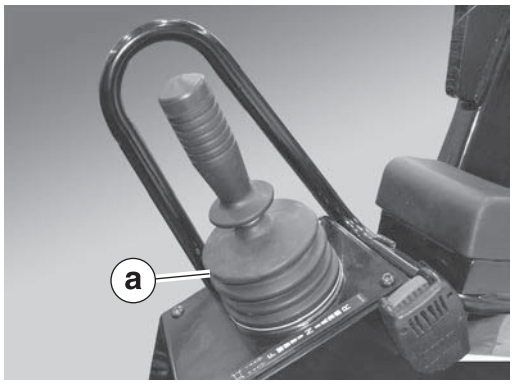
5.31 Adjusting the Forward/Reverse Lever

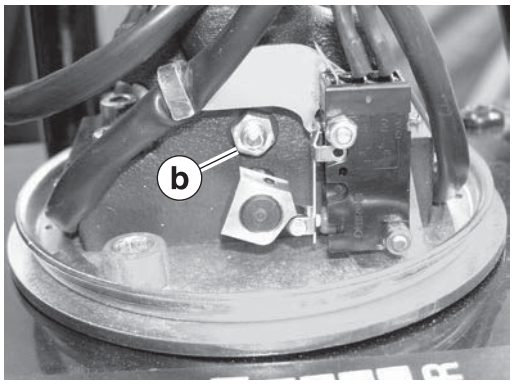
Prerequisites
- Machine shut down
- Parking brake engaged

When
Every 1000 hours of service or yearly

Procedure
Follow the procedure below to adjust the tension (i.e., the amount of force required to move) of the forward/reverse lever.

1. Lift up the boot **(a)** of the forward/reverse lever to expose the mechanism.





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2. Loosen the lock nut **(b)**.
3. Adjust the Allen screw until the desired firmness of the forward/reverse lever is reached, then tighten the lock nut.
4. Reposition the boot.

5.32 Changing the Hydraulic Oil

Prerequisites

- Hydraulic oil
- Suitable container
- Machine parked on a flat, level surface

When

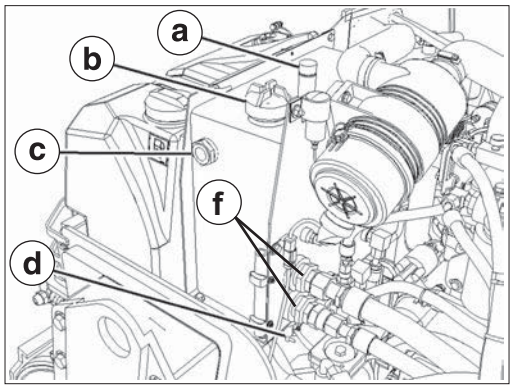
Every 1000 hours of service or yearly

Draining

Follow the procedure below to drain the hydraulic oil tank.

Note: *Take care to keep the hydraulic oil and the hydraulic system clean. Dirty hydraulic oil will reduce component performance and shorten component service life.*

1. Open the engine compartment.
2. Remove the hydraulic tank filler cap **(b).**



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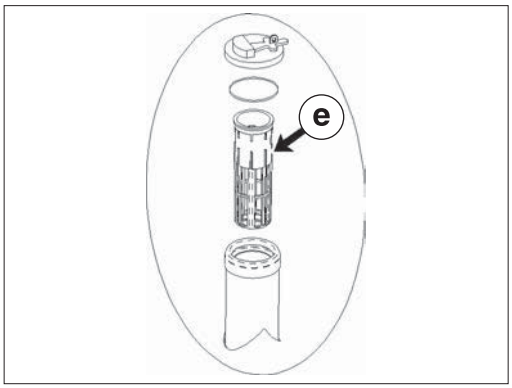


wc_gr004780

3. Remove the screen **(e)** from the hydraulic tank filler tube. Clean the screen with clean, nonflammable solvent.
4. Wash the hydraulic tank filler cap and the hydraulic tank filler tube with clean, nonflammable solvent.
5. Check the condition of the breather **(a)**. See section *Checking and Cleaning the Hydraulic Tank Breather*. If the O-ring is in good condition, clean and re-install the breather.
6. Locate the hydraulic hose drain tube connected to the hydraulic drain valve **(d)**.
7. Drain the hydraulic oil into a suitable container.

Note: *Collect, store and dispose of all used oil and filters in accordance with current environmental protection regulations.*

Filling

Follow the procedure below to fill the hydraulic oil tank.

1. Remove the two suction strainers **(f)** inside the hydraulic tank.
2. Install two new suction strainers into the hydraulic tank.
3. Close the hydraulic drain valve **(d)**.
4. Install the screen **(e)** into the filler tube.

This procedure continues on the next page.

Continued from the previous page.

5. Refill the hydraulic tank with clean, filtered hydraulic oil.
6. Check the hydraulic oil level using the sight gauge **(c)**.
7. Re-install the hydraulic tank filler cap **(b)**.

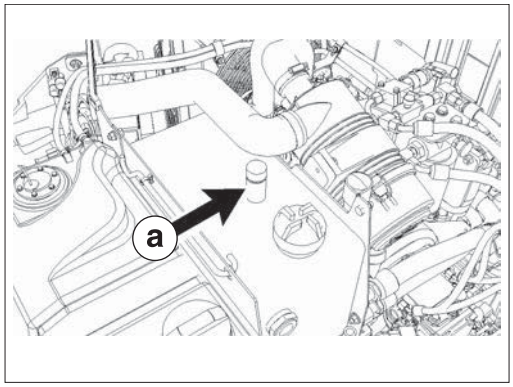
5.33 Checking and Cleaning the Hydraulic Tank Breather

Prerequisites
- Machine shut down
- Clean, nonflammable solvent

When
Every 1000 hours of service or yearly

Procedure
Follow the procedure below to clean the hydraulic tank breather **(a)**.

1. Open the engine compartment.



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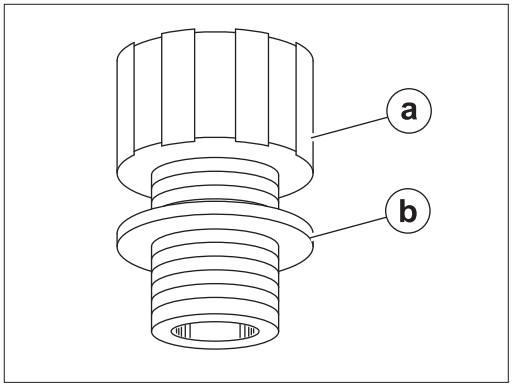


wc_gr004993

2. Remove the breather from the hydraulic tank.
3. Clean the breather with clean, nonflammable solvent.
4. Check the condition of the O-ring **(b)**. If the O-ring is deteriorated, replace the breather.
5. If the O-ring is in good condition, dry the breather with compressed air.
6. Re-install the breather.

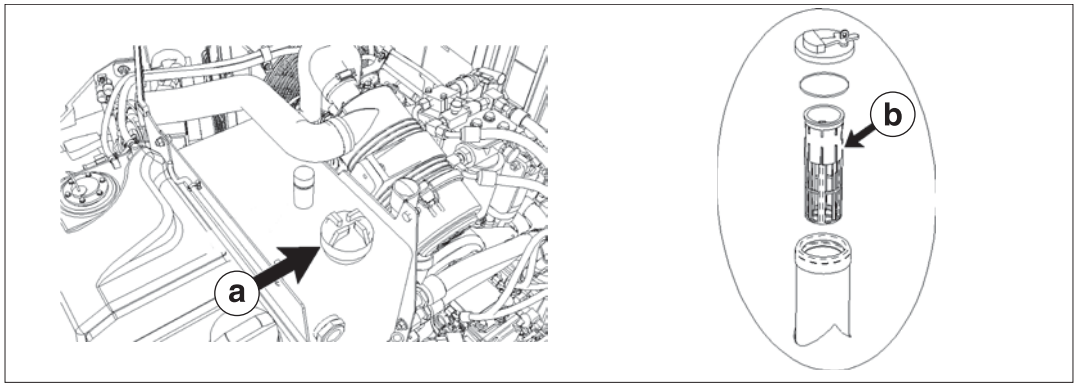
5.34 Cleaning the Hydraulic Oil Strainer

Prerequisites
- Machine shut down
- Clean, nonflammable solvent

When
Every 1000 hours of service or yearly

Procedure
Follow the procedure below to clean the hydraulic oil strainer.

1. Open the engine compartment.
2. Remove the hydraulic tank filler cap **(a)**.



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3. Remove the hydraulic oil strainer **(b)**.
4. Wash the hydraulic oil strainer in nonflammable solvent. Dry it with compressed air.
5. Re-install the hydraulic oil strainer and the hydraulic tank filler cap.

5.35 Cleaning the Radiator Filler Cap

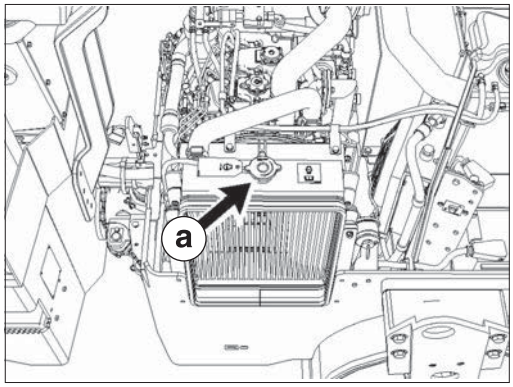
Prerequisites
- Machine shut down
- Engine cool

When
Every 1000 hours of service or yearly

Procedure
Follow the procedure below to clean the radiator filler cap.

WARNING
Burn hazard. At operating temperature engine coolant is hot and under pressure. It can cause severe personal injury.
- ▶ Remove the radiator filler cap only after the engine has been shut down and is cool.

1. Open the engine compartment.
2. Remove the radiator filler cap **(a)** slowly to relieve pressure.



wc_gr004796

CAUTION
Burn hazard. Coolant can contain alkali.
- ▶ Avoid coolant contact with skin and eyes.

3. Clean the radiator filler cap with a clean cloth.
4. Inspect the radiator filler cap for damage. Replace it if it is damaged.
5. Re-install the radiator filler cap.

5.36 Checking the Engine Water Pump

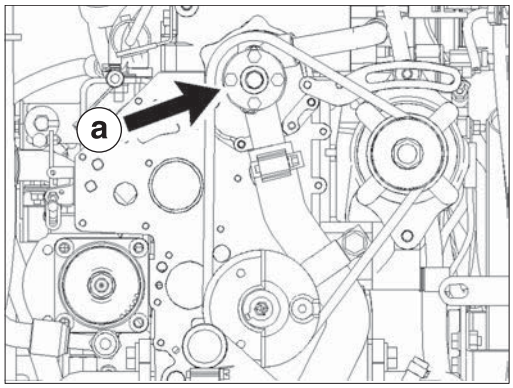
Prerequisites
- Machine shut down
- Engine cool

When
Every 3000 hours of service or 2 years

Background
If the water pump fails, the engine will overheat which can cause:
- Cracks in the cylinder head
- Piston seizure

Procedure
Follow the procedure below to check the engine water pump.

1. Open the engine compartment.
2. Remove the fan guard and shroud.
3. Locate the water pump **(a)**.



wc_gr004759

4. Visually inspect the water pump for leaks.

If	Then
Leaks are found,	replace all seals.
There is an excessive leakage of coolant,	replace the engine water pump.

5. Replace the fan cover and shroud.

5.37 Changing the Cooling System Coolant

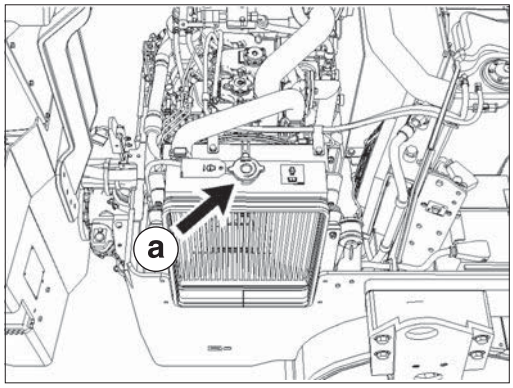
Prerequisites
- Machine shut down
- Engine cool

When
Every 12,000 hours of service or 6 years

Draining
Follow the procedure below to drain the cooling system coolant.

WARNING
Burn hazard. At operating temperature, engine coolant is hot and under pressure. It can cause severe personal injury.
- ▶ Check the coolant level only after the engine has been shut down and is cool.

1. Open the engine compartment.
2. Open the radiator filler cap **(a)** slowly in order to relieve the pressure. Remove the filler cap after the pressure has been released.



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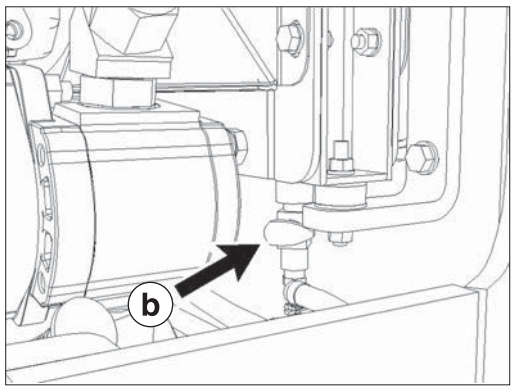


wc_gr004771

3. Place a suitable container underneath the machine.
4. Open the drain valve **(b)** on the bottom of the radiator and allow the coolant to drain through the attached hose into a suitable container.

Cleaning
Follow the procedure below to clean the cooling system.

1. Close the radiator drain valve.
2. Fill the coolant system with clean water and 6–10% coolant system cleaner.
3. Install the radiator filler cap.
4. Start the engine. Run the engine for 90 minutes.
5. Stop the engine. Allow the cooling system to completely cool.
6. Open the radiator filler cap.
7. Place a suitable container underneath the machine.
8. Open the drain valve **(b)** on the bottom of the radiator and allow the cleaner to drain into a suitable container.

Note: *Collect, store and dispose of all used coolant in accordance with current environmental protection regulations.*

9. Flush the cooling system with water until the draining water is transparent.

Filling

Follow the procedure below to fill the cooling system.

1. Close the radiator drain valve.
2. Add the recommended amount of coolant to the radiator.
3. Start the engine.
4. Leave the radiator fill cap off until the thermostat opens and the coolant level stabilizes.
5. Maintain the coolant level to 2.54 cm (1 in.) below the shoulder of the fill pipe.
6. Inspect the radiator filler cap and filler cap seal for damage. Clean the radiator filler cap or replace it if necessary.
7. Re-install the radiator filler cap.

5.38 Replacing the Water Temperature Regulator

Prerequisites
- Machine shut down
- Engine cool

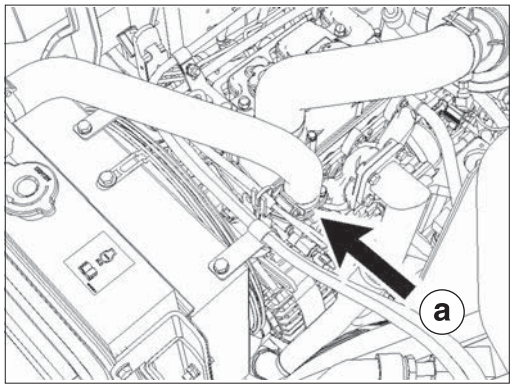
When
Every 3000 hours of service or every 2 years

Procedure
Follow the procedure below to replace the water temperature regulator.

WARNING
Burn hazard. At operating temperature, engine coolant is hot and under pressure. It can cause severe personal injury.
- ▶ Check the coolant level only after the engine has been shut down and is cool.

Removal
Follow the procedure below to remove the water temperature regulator.

1. Open the engine compartment.
2. Drain and clean the engine cooling system. See section *Changing the Cooling System Coolant*. The water temperature regulator should be replaced while the coolant system is completely drained.
3. Remove the housing **(a)** for the water temperature regulator.



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4. Remove the gasket and remove the water temperature regulator.

Installation
Follow the procedure below to install the water temperature regulator.

Note: *Water temperature regulators may be reused if they are within test specifications, are not damaged, and are free of excessive deposit buildup.*

1. Install a new water temperature regulator and install a new gasket.

NOTICE: If the water temperature regulator is installed incorrectly, it will cause the engine to overheat.

2. Install the housing for the water temperature regulator.
3. Add coolant to the radiator. See section *Changing the Cooling System Coolant.*
4. Install the radiator filler cap.

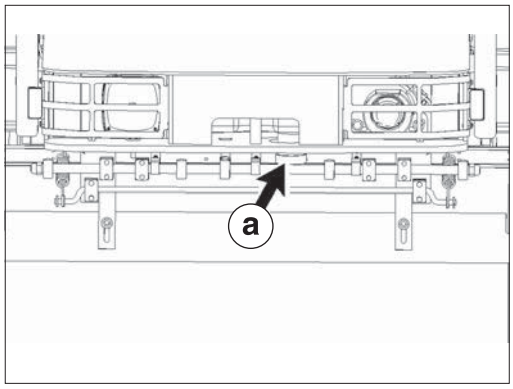
5.39 Draining the Water Spray System

Prerequisites
- Machine shut down
- Parking brake engaged

When
Prior to working in freezing conditions.

Procedure
Follow the procedure below to drain the water tank.

1. Remove the water tank filler cap.
2. Remove the water tank drain plug **(a)** and drain the water.



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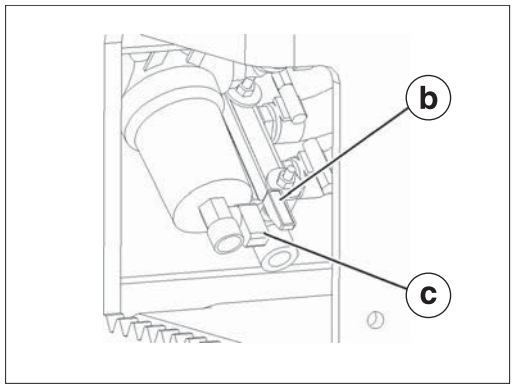

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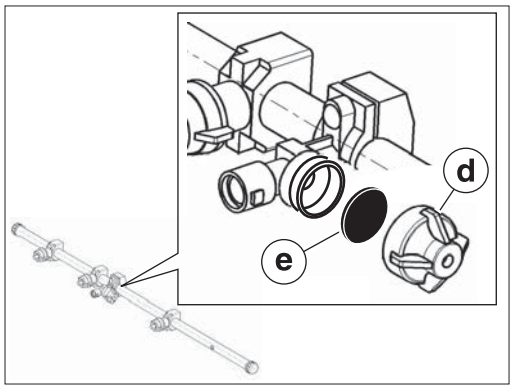
3. Open the drain valves **(b** and **c)** located within the machine frame to drain the water.
4. When the water is drained, turn on the water pump for 30 seconds to drain the water pump.
5. Remove the cap **(d)** and diaphragm **(e)** from the diaphragm valve.



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6. Remove the caps from the ends of the spray bars to drain the spray bars. If desired, blow compressed air through the bars to dry them.
7. Re-install the caps to the spray bars.
8. Re-assemble the diaphragm valve.
9. Close the drain valves.
10. Re-install the water tank drain plug.

5.40 Towing the Machine

Prerequisites

- Second machine of greater size and rigid towing equipment, or
- Two machines of equal size to towed machine if non-rigid towing equipment is being used
- Shielding for all machines being used

Note: *The strength of the towing line or the tow bar should be at least 150 percent of the gross weight of the towing machine.*

Limitations

The following limitations must be followed:

- Limit towing to emergency situations only
- Limit towing to short distances
- Limit towing speed to 2 km/h (1.2 mph)
- Limit tow line angle to 30°

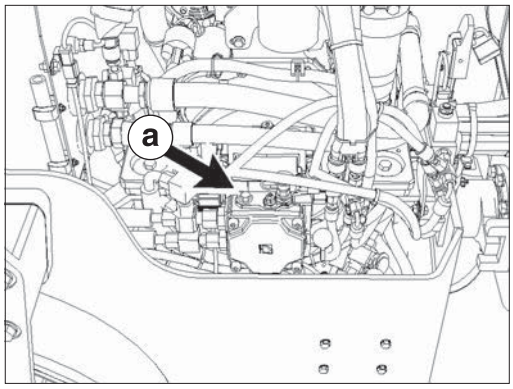
Procedure

Follow the procedure below to tow the machine.

Note: *If the engine runs and the steering system and/or braking system functions, an operator may be allowed to ride on and steer the machine being towed. In all other cases, do not ride on the machine when it is being towed.*

1. Attach shielding to the machines to protect the operators if the towing equipment breaks.
2. Block the drums so that the machine cannot move.
3. Open the engine compartment.
4. Release the parking brakes. See section *Manually Releasing the Parking Brakes*.
5. Turn the bypass valve **(a)** two full turns in the counterclockwise direction.

Note: *Do not turn the bypass valve farther than two turns. When the bypass valve is turned farther than two turns, oil will leak past the bypass valve.*



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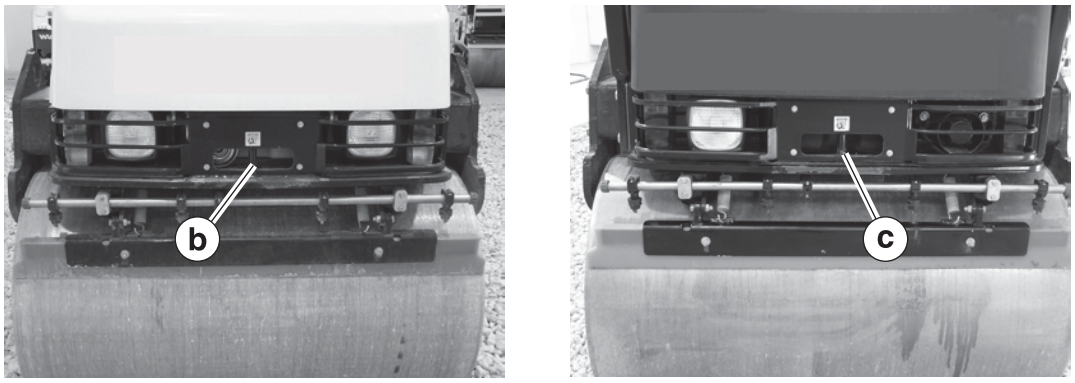
6. Connect the tow lines at the tie down bars **(b** and **c)**.



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7. Attach tow lines to the towing machine.
8. Remove the blocks from the drums.
9. Tow the machine as needed.
10. Once the machine is at the desired location, block the drums.
11. Close the bypass valve by turning it two full turns in the clockwise direction.
12. Disconnect the tow lines.

5.41 Manually Releasing the Parking Brakes

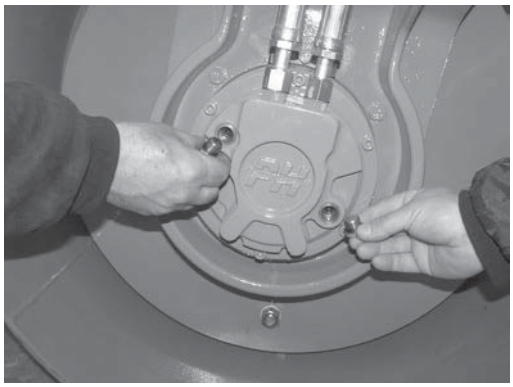
Requirments

- Machine shut down
- Blocks

Procedure

Follow the procedure below to manually release the parking brakes.

1. Block the drums to prevent the machine from moving.
2. Remove the two plugs from each drive motor.



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3. Insert an Allen wrench into the drive motor and engage the screw. Depress the spring inside the drive motor with the screw and turn the screw until it catches. Repeat for the second screw of the drive motor.

NOTICE: Do not use power tools to turn the screws. Damage to the drive motor may result.

4. Turn the screws in equal amounts until the springs are fully depressed.
5. Turn the screws approximately an additional 120° until the brakes are released.
6. Repeat the procedure for the opposite drive motor.

5.42 Troubleshooting

Problem / Symptom	Reason	Remedy
Engine does not start	Empty fuel tank	Refill fuel tank.
	Wrong type of fuel	Drain tank, change fuel filter, and refill with the proper fuel.
	Old fuel	Drain tank, change fuel filter, and refill with fresh fuel.
	Fuel system not primed	Prime the fuel system.
	Fuel filter restricted or plugged	Replace fuel filter.
	Battery connections are loose or corroded, or battery is dead.	Check battery connections or replace battery as needed.
	Plugged air cleaner or filter elements	Clean air cleaner or replace filter elements.
	Defective starter motor	Repair or replace.
	Inoperative fuel solenoids on engine	Repair or replace.
	Inoperative starter relay	Repair or replace.
	Loose or broken electrical connections	Check connections and tighten or repair as needed.
Engine stops by itself	Empty fuel tank	Refill fuel tank.
	Clogged fuel filter	Clean or replace.
	Loose or broken fuel lines	Check connections and tighten or repair as needed.
No vibration	Defective switch or poor connection	Check components and tighten or repair as needed.
	Damaged or disconnected solenoid on vibration valve	Reconnect or repair solenoid.
	Damaged exciter assembly	Repair the assembly.
	Damaged or broken exciter motor coupling	Repair or replace.
	Damaged exciter motor	Repair or replace.
	Damaged exciter pump	Repair or replace.
	Damaged exciter bearings	Repair or replace.

Problem / Symptom	Reason	Remedy
No travel, or travel only in one direction	Sheared pin on forward/ reverse control	Replace pin.
	Loose or broken control cable	Tighten or replace.
	Damaged drive motor	Repair or replace.
	Damaged drive pump	Repair or replace.
	Defective relief valve(s)	Repair or replace.
No steering	Damaged steering cylinder	Repair or replace.
	Damaged steering unit	Repair or replace.
	Stuck or damaged steering relief valve	Repair or replace.
	Articulating joint pin is in the LOCKED position.	Install the articulating joint pin in the UNLOCKED position.
Water leaking from spray nozzles when machine is shut off	One or both of the diaphragm valves is not completely closed.	Close the diaphragm valve(s) completely.
	The diaphragm is worn.	Replace the diaphragm.

6 Technical Data

6.1 Engine

Engine Power Rating

Engine power rating per ISO/TR 14396. Actual power output may vary due to conditions of specific use.

Item No.		RD 27-100 RD 27-120
Engine		
Engine make		Perkins
Engine model		403D-15
Engine type		Liquid-cooled diesel
Max. rated power @ 2800 rpm	kW (Hp)	24.4 (32.7)
Displacement	cm^3 (in^3)	1500 (91.5)
Starter	type/V/kW	Electric / 12 / 2.7
Alternator	Volts/Amp	12V / 55A
Operating speeds	rpm	2470/2800
Valve clearance—cold intake and exhaust	mm (in.)	0.2 (0.078)
Air cleaner	type	Dual element
Battery	V / rating ccA cA	12 / 100 Amp-hour 650 @ -17°C (0°F) 820 @ 0°C (32°F)
Engine oil capacity	L (qt)	6 (6.3)
Fuel	type	Clean, filtered diesel
Fuel tank capacity	L (gal)	51 (13.5)
Fuel consumption @ 2450 rpm @ 3000 rpm	L (gal)/hr	6.9 (1.8) 7.6 (2.0)
Coolant capacity	L (gal)	6 (1.6)

6.2 Roller

Item No.		RD 27-100	RD 27-120
Roller			
Operating weight	kg (lb)	2617 (5770)	2824 (6226)
Dry weight	kg (lb)	2375 (5236)	2582 (5692)
Drum width	mm (in.)	1000 (39.4)	1200 (47.2)
Drum diameter	mm (in.)	700 (27.6)	700 (27.6)
Water tank capacity	L (gal)	150 (39.6)	150 (39.6)
Outside turning radius	m (ft)	3.64 (11.94)	3.74 (12.27)
Travel Speed .....@ 2470 rpm .....@ 2800 rpm	km/hr (mph)	 0–8.1 (0–5.0) 0–10.0 (0–6.2)	 0–8.1 (0–5.0) 0–10.0 (0–6.2)
Vibration frequency	Hz (vpm)	55 or 66 (3300 or 3960)	55 or 66 (3300 or 3960)
Machine operating temperature range	°C (°F)	–40 to 50 (–40 to 122)	

6.3 Lubrication

Item No.		RD 27-100 RD 27-120
Lubrication		
Engine crankcase	type L (qt)	API CG 4 Multigrade 4.5–6 (4.8–6.3)
Hydraulic system (standard hydraulic oil)	type L (gal)	API CG 4 / API CF 26 (6.9)
Hydraulic system (biodegradable oil option)	type L (gal)	Panolin HLP Synth VG46 or equivalent 26 (6.9)
Articulated steering joint	type quantity	Shell Alvania RL2 10 shots with a hand-held grease gun
Cylinder bearings	type quantity	Shell Alvania RL2 As needed

6.4 Sound Measurements

The operating sound level, measured per the requirements of Appendix 1, Paragraph 1.7.4.f of the EC-Machine Regulations, is:

- the guaranteed sound power level (L_{WA}) = 106 dB(A).
- the sound pressure level at operator's location (L_{pA}) = 88.0 dB (A).

This sound value was determined according to ISO 6394:1998 for the sound power level (L_{WA}).

6.5 Measurements of Operator Exposure to Vibration

The operator of this machine should expect to be exposed to vibration levels listed below when using the machine in performance of its normally intended function:

- Hand/arm vibration levels do not exceed 2.5 m/s^2. This is the representative value of the weighted root mean square **(rms)** acceleration to which the hands and arms are subjected. The weighted **rms** value measured according to ISO 5349-1 is 1.28 m/s^2.
- Whole body vibration levels do not exceed 0.5 m/s^2. This is the representative value of the root mean square **(rms)** acceleration to which the whole body is subjected. The weighted **rms** value measured according to ISO 2631-1 is 0.27 m/s^2.

The results are compliant to the limit and action vibration values (hand/arm and whole body) as specified in European directive 2002/44/EC.

Vibration Uncertainties

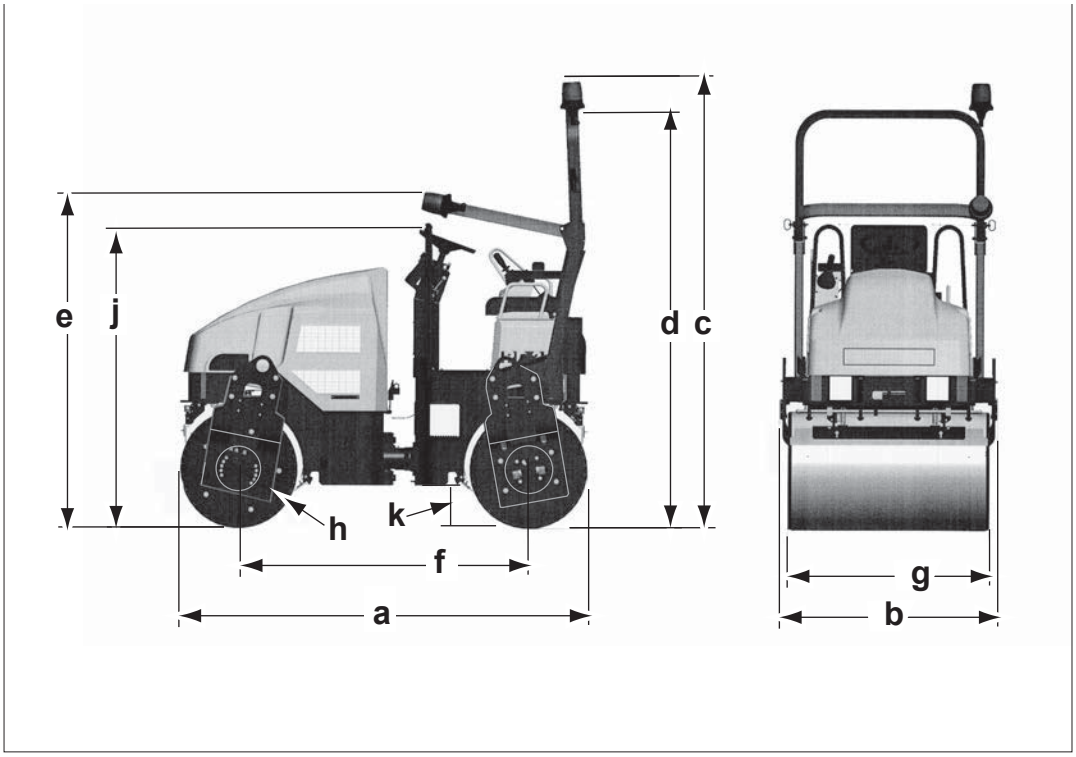
Hand-transmitted vibration was measured per ISO 5349-1. This measurement includes an uncertainty of 1.5 m/sec^2.

Whole body vibration was measured per ISO 2631-1. This measurement includes an uncertainty of 0.3 m/sec^2.

6.6 Dimensions

See graphic: wc_gr004619

	RD 27-100	RD 27-120
Ref.	Dimension mm (inches)	
a	2500 (98.4)	
b	1105 (43.5)	1305 (51.4)
c	2775 (109.3)	
d	2680 (105.5)—EU version	
e	2000 (78.7)	
f	1800 (70.9)	
g	1000 (39.4)	1200 (47.2)
h	Ø700 (27.5)	
j	1800 (70.9)	
k	262 (10.3)	



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ROLLER COMPACTOR

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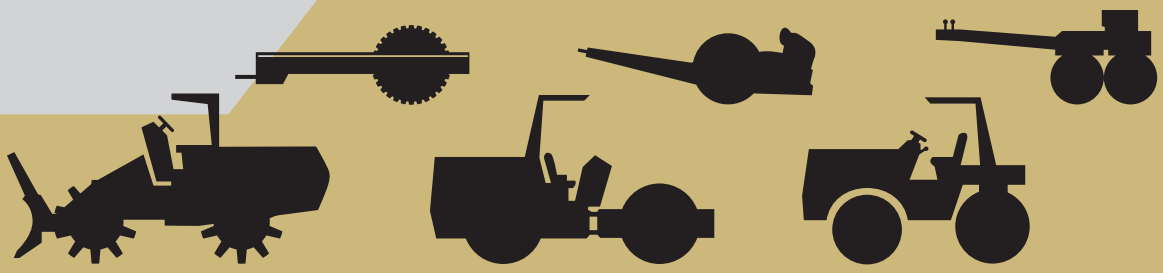
ASSOCIATION OF AEM EQUIPMENT MANUFACTURERS

SAFETY MANUAL

FOR OPERATING AND MAINTENANCE PERSONNEL



SAFETY ALERT SYMBOL

This Safety Alert Symbol means ATTENTION is involved!

The Safety Alert Symbol identifies important safety messages on machines, safety signs, in manuals, or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

Why is SAFETY important to YOU?

3 BIG REASONS:

- **Accidents KILL or DISABLE**
- **Accidents COST**
- **Accidents CAN BE AVOIDED**

Revised 6/02, 9/04

WORD OF EXPLANATION

The following is a partial list of reference material on safe operating practices:

U.S. Department of Labor publishes safety and health regulations and standards under the authority of the Occupational Safety and Health Act for the general construction and mining industries. Its address is: U.S. Department of Labor, 200 Constitution Avenue, NW, Washington, DC 20210.

SAE - Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096, publishes a list, "Operator Precautions," SAE J153 MAY, 1987.

Association of Equipment Manufacturers, 111 East Wisconsin Avenue, Milwaukee, WI USA 53202, publishes the Roller Compactor Safety Manual and other safety-related material.

WORD OF EXPLANATION

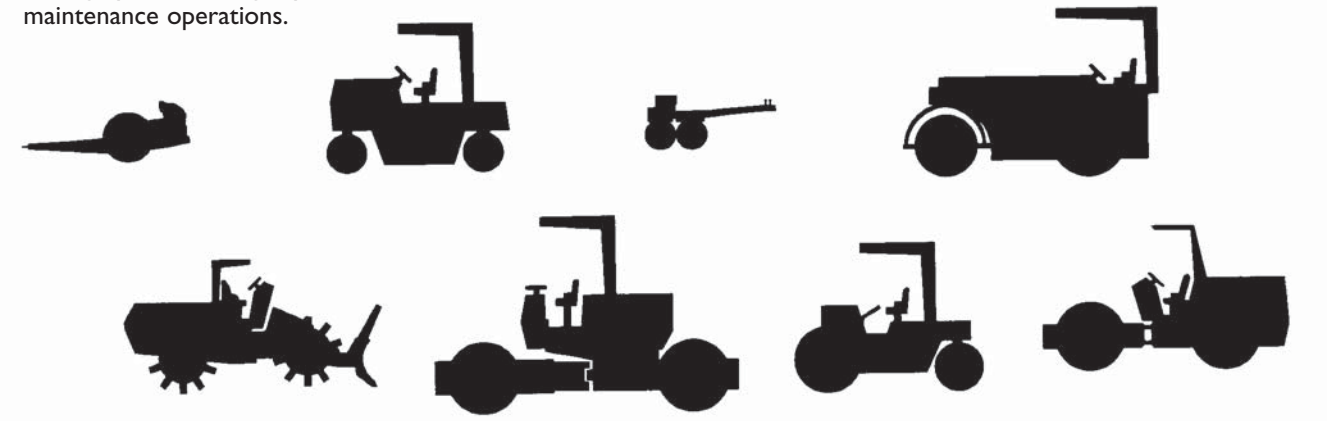
This Safety Manual covers many different types of roller compactors … including steel wheel rollers, vibratory rollers, rubber-tired rollers, segmented pad/sheepsfoot soil compactors and landfill compactors. These may be either self-propelled ride-on, walk-behind or towed rollers. They may be used for the compaction of asphalt, soil, landfill or other materials. Excluded from coverage are vibratory plates and hand rammers.

Regardless of which machine you operate, it is YOUR responsibility to study and understand this Safety Manual, and to see that a copy remains with your machine. The manual begins with your "safety homework," takes you step-by-step through your working day, and ends with maintenance operations.

Manufacturers produce machines with many built-in safety features. Employers provide accident prevention programs. Yet, the ultimate responsibility to operate and maintain your machine with the skill, care and knowledge essential for safety is YOURS.

Do not operate your machine until you have been trained in the use of all operating controls and understand the handling characteristics of the machine.

REMEMBER — SAFETY … YOURS AND THAT OF THOSE AROUND YOU … IS UP TO YOU!



FOREWORD

This safety manual is intended to point out some of the basic situations which may be encountered during the normal operation and maintenance of your machine, and to suggest possible ways of dealing with these conditions.

Additional precautions may be necessary, depending on application, machine type, configuration and attachments used, and conditions at the work-site or in the maintenance area. The manufacturer has no direct control over machine application, operation, inspection, lubrication or maintenance. Therefore, it is your responsibility to use good safe practices in these areas.

The information provided in this manual supplements the specific information about your machine that is contained in the manufacturer's manual(s). Other information which may affect the safe operation of your machine may be contained on safety signs, or in insurance requirements, employer's safety programs, safety codes, local, state/provincial and federal laws, rules and regulations.

If you do not understand any of this information, or if errors or contradictions seem to exist, consult with your supervisor before operating your machine.

IMPORTANT: If you do not have the manufacturer's manual(s) for your particular machine, get a replacement manual from your employer, equipment dealer, or manufacturer of your machine. Keep this safety manual and the manufacturer's manual(s) with your machine.

Unauthorized modifications of machines create hazards. Machines should not be modified or altered unless prior approval is obtained from the manufacturer.

It is your responsibility to read and understand this safety manual and the manufacturer's manual(s) before operating your machine. This safety manual takes you step-by-step through your working day.

Remember that **YOU are the key to safety.** Good safety practices not only protect you but also protect the people around you. Study this manual and the manufacturer's manual(s) for your specific machine. Make them a working part of your safety program. Keep in mind that this safety manual is written for only this type of machine. Practice all other usual and customary safe working precautions, and above all — (FIG. 1)

REMEMBER — SAFETY IS UP TO YOU

YOU CAN PREVENT SERIOUS INJURY OR DEATH

FIG. 1

FOLLOW A SAFETY PROGRAM

KNOW THE RULES

Every employer is concerned about safety. Safe operation and proper maintenance of your machine can prevent accidents. KNOW the rules — LIVE by them. (FIG. 2)

When starting work at a new site, check with the designated safety coordinator for specific safety instructions. DON'T LEARN SAFETY THE HARD WAY.

Know the meaning of all hand signals, signal flags, signs and markings.

Know the traffic rules used at the work site. Know who the signal person is; watch and obey their signals.

Know where the fire extinguishers and first aid kits are kept and how to use them. Know where to get proper aid and assistance when needed.

Use common sense to avoid accidents. If an accident does occur, be prepared to react to it quickly and effectively. NEVER PANIC.

Know how to use the emergency communications system to summon help when necessary.

FIG. 2

KNOW WHAT IT IS?

Consult your supervisor for specific instructions on a job, and the personal safety equipment required. For instance, you may need:

- Hard Hat
- Safety Shoes
- Eye Protection
- Face Protection
- Heavy Gloves
- Reflector Vests
- Hearing Protection
- Respirators

Do not wear loose clothing or any accessory — flopping cuffs, untied shoelaces, dangling neckties and scarves, rings, wrist watches, or other jewelry — that can catch on protruding or moving parts or controls. Long hair should be securely bound to prevent entanglement with moving parts. (FIG. 3)

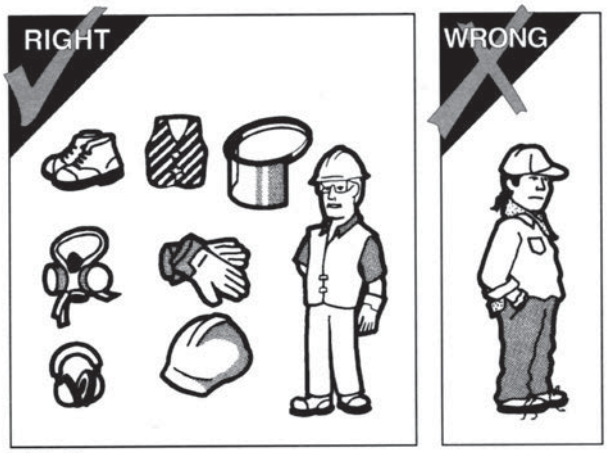


FIG. 3

FOLLOW A SAFETY PROGRAM

BE ALERT!

Know where to get assistance. Know how to use a first aid kit and fire extinguisher or fire suppression system. (FIG. 4)

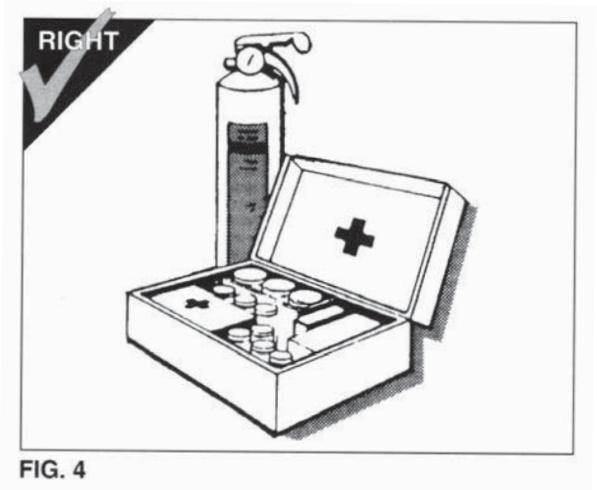


FIG. 4

BE AWARE!

Take advantage of training programs offered.

Safety programs require that one person at each jobsite be assigned the overall responsibility and authority for safety. Know who that person is, and COMMUNICATE.

Know what the jobsite rules are, and FOLLOW THE RULES. Be safety conscious, responsible and reliable. Think about safety BEFORE something happens.

Report unsafe conditions to a supervisor immediately!

BE CAREFUL!

Human error is caused by many factors: carelessness, fatigue, overload, preoccupation, incompatibility between operator and the machine, drugs, and alcohol to name a few. Eliminate these factors BEFORE accidents occur. Damage to the machine can be fixed in a short period of time, but injury, or death has a lasting effect.

FOR YOUR SAFETY AND SAFETY OF OTHERS, ENCOURAGE YOUR FELLOW WORKERS TO ACT SAFELY.

LEARN TO BE SAFE

READ the operator's manual. If one has not been provided, GET ONE AND STUDY IT BEFORE OPERATING THE MACHINE. If you have any questions contact the manufacturer.

Know the positions and understand the functions of all controls before attempting to operate a machine. Know the meaning of all identification symbols on your controls and gauges. (FIG. 5)

Know the location of the emergency shut-down control if the machine is so equipped.

Know the capabilities and limitations of the machine … such as speed, breaking and steering.

Know the operational and transport dimensions of your machine to avoid inadvertently hitting something during operation or transporting.

Carefully read and follow the instructions on all safety signs on the machine. Keep safety signs in good condition. Replace missing or damaged safety signs.

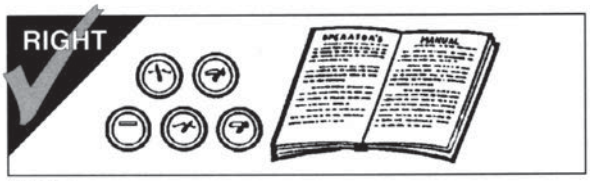


FIG. 5

NEVER operate a machine which is new to you without first being instructed in its proper operation.

CHECK IT OUT!

Always conduct a pre-shift inspection before operating any machine. Know what safety devices your machine is equipped with … and see that each item is securely in place and in operating condition. (FIG. 6)

For example:

- Safety Blocks and Locks
- Other Locking Devices
- Lights
- Alarms
- Horn
- Guards and Shields
- Shut-Down Devices
- First Aid Kit
- Fire Extinguishers

FIG. 6

PREPARE FOR SAFE OPERATION

TIRES

Inspect pneumatic tires (if so equipped) for damage, wear, and proper inflation. Never operate with over-inflated or under-inflated tires. (FIG. 7)

Check that all wheel lug nuts are present and tight.

NEVER START OR OPERATE A MACHINE KNOWN OR SUSPECTED TO BE DEFECTIVE OR MALFUNCTIONING.

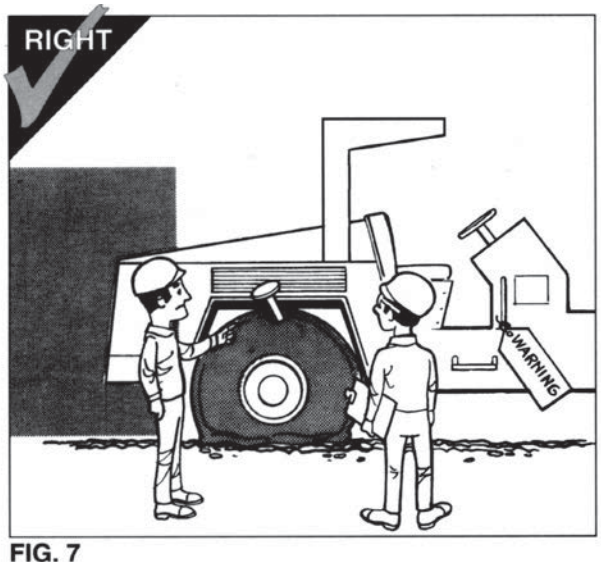


FIG. 7

KNOW YOUR MACHINE

Never operate a machine for which you are not trained or qualified.

Familiarize yourself with pedals, controls and instruments – their locations and function.

To handle controls without slipping, wipe them clean of oil and grease.

Remove tools, supplies and other materials from the working areas and machine walkways – and keep these areas free of trash.

Make sure the items you do carry are not loose or in the way.

ARE REPAIRS MADE?

If your daily check uncovers any item that needs attention – repair, replacement, or adjustment – report it to your supervisor and tag the machine on the start switch and/or other appropriate, prominent location. A minor malfunction could be a sign of a more serious problem if the machine is operated.

FIRE PREVENTION

Never allow flammable fluids or materials to contact hot surfaces.

Never refuel:

- When engine is running
- While smoking
- Near open flames or sparks
- In poorly ventilated area

Never overfill fuel tank or fluid reservoirs. Clean up spills immediately.

Replace fuel cap securely after filling.

Check for fuel, oil and hydraulic fluid leaks. Replace worn or damaged hoses/tubes. After repairs are made, clean the machine before you operate it.

Inspect electrical wiring for worn or damaged insulation. Install new wiring if wires are damaged.

Because ether or other starting fluids are flammable, do not smoke when using them. Always follow the instructions on the container and in the operator's manual for your machine. (See page 19.)

Batteries produce explosive gases. Keep open flame or sparks away. See the manufacturer's instructions when servicing the batteries, when using jumper cables or when using a battery charger. (See pages 36 and 37.)

Remove all trash or debris from the machine. Make sure that oily rags or other flammable material are not stored on the machine. (FIG. 8)

FIG. 8

PREPARE FOR SAFE OPERATION

PREPARING TO ROAD THE MACHINE

Know what conditions you will likely encounter:

- Insufficient clearances
- Traffic congestion
- Type of surface
- Steep grades
- Restricted visibility

Determine appropriate warnings to be used. (FIG. 9) Know whether you will need to be escorted.

If the machine is to travel on a road or highway, refer to the manufacturer's manual(s) for instructions. Become familiar with local laws and ordinances affecting driving on highways. Use "slow moving vehicle" emblem. Make sure flags, lights, and warning signs are in place.

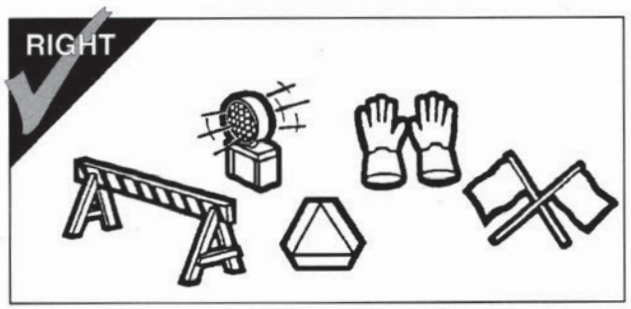


FIG. 9

Select the proper gear before negotiating steep grades. (FIG. 10)

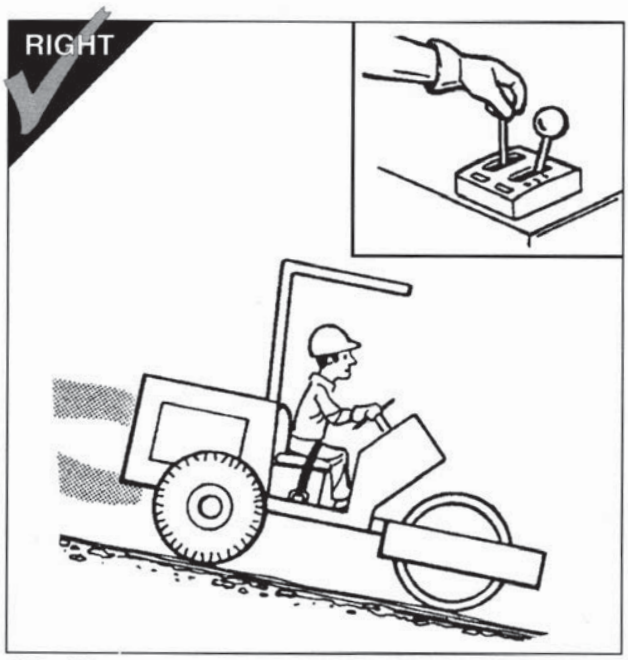


FIG. 10

Before starting, carefully inspect your machine for any evidence of physical damage such as cracking, bending or deformation of plates or welds. Check for cracking or flaking of paint, which may indicate an excessive strain or dangerous crack in the material below. Check for loose, broken or missing parts such as Roll-Over Protective Structure (ROPS) support brackets, vibration isolators, and nuts and bolts. If potentially serious problems are found, do not operate the machine until appropriate repairs are completed.

Check the level of all fluids … brake, transmission, power steering, engine coolant, hydraulic system, and others. Fill low reservoirs only to the proper level.

Check the various systems (hydraulic, cooling, etc.) for leaks. (FIG. 11) Inspect all plugs, filler caps and fittings for tell-tale signs of leaks. ALWAYS use a flashlight or shielded trouble light when checking … Never an open flame. Repair any leaks, or have them repaired by authorized service personnel. (See pages 28 through 42 for additional service cautions.)

Check the fuel level and, if low, fill the tank with the proper grade of clean fuel before extended operation (following the instructions on page 34).

A stalled or faltering engine can result in a real hazard when operating on grades, in traffic or in heavily congested areas.

NEVER smoke when checking fuel level or refueling.

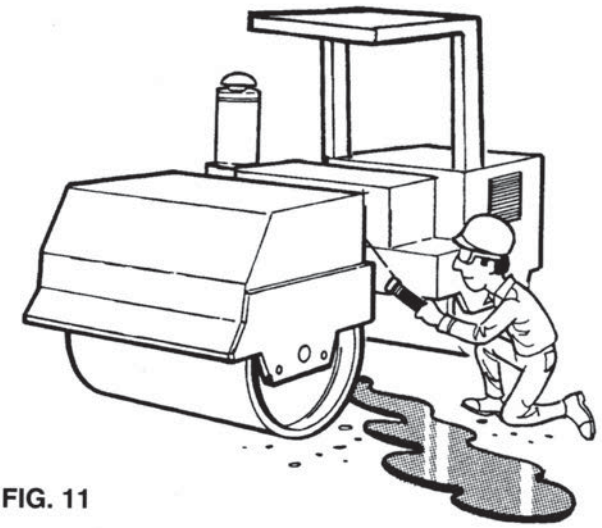


FIG. 11

PREPARE FOR SAFE OPERATION

BE SURE THE WORK AREA IS SAFE

Before beginning operation, thoroughly check the area for any unusual conditions that could be dangerous. (FIG. 12) Check for hidden holes, drop-offs or overhead obstacles that could be dangerous. Check the clearance under overhead power and phone lines. LOOK UP AS WELL AS DOWN.

Be observant of other workmen, bystanders and other machines in the area. Be especially careful if trenches, lightpoles, tiles, buildings, etc. are within the effective range of a vibratory compactor. IMPROPER OPERATION COULD RESULT IN DAMAGE OR INJURY.

Remember, the danger of sliding and/or tipping on steep slopes is always present … regardless of how heavy or "stable" your machine may appear to be. When operating under these conditions, the use of ROPS and seat belts reduces the hazard to operating personnel.

FIG. 12

Walk around your machine once more just prior to mounting it – checking for people and objects that might be in the way – then MOUNT PROPERLY USING STEPS AND HANDHOLDS PROVIDED.

Always use seat belts if your machine is equipped with a ROPS.

Just before starting, check all controls … such as forward and reverse, steering, transmission and throttle to be sure they are in the correct start-up position. (FIG. 13) The parking brake should be applied during the start-up operation.

Check for proper functioning of all operating and shut-down controls.

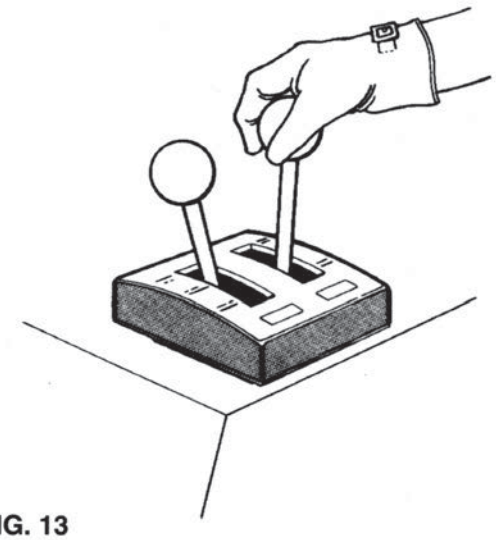


FIG. 13

START CORRECTLY

Know the PROPER starting procedure for your machine. Follow the manufacturer's operation manual … to the letter.

Then, start your engine.

IMMEDIATELY AFTER STARTING THE ENGINE …

- Observe gauges, instruments, and warning lights to ensure that they are functioning and their readings are within the normal operating range. (FIG. 14)
- Be sure work area is safe for test operation of the various controls and attachments.
- Operate all controls: make certain they operate properly, and "feel" right. Accustom yourself to the "feel" of your machine.
- Listen for any unusual noises; smell for any unusual odors; look for any signs of trouble.
- Check all warning and safety devices and indicators.
- If safety-related defects or malfunctions are detected, shut down the machine. Correct it, or notify your supervisor. DO NOT OPERATE UNTIL CORRECTED.

Check operation of service and parking brakes on level ground if possible.

Check service brakes (including hydrostatic brakes, if so equipped) in both forward and reverse operation (FIG. 15) ACCORDING TO THE MANUFACTURERS INSTRUCTIONS.

If an unsafe condition cannot be remedied immediately, notify your supervisor and tag the machine on the start switch and/or other appropriate, prominent location. (See page 28 for Lockout/Tagout procedure.) No machine should be operated if any part is not in safe operating condition. Make certain that any unsafe condition has been satisfactorily remedied.

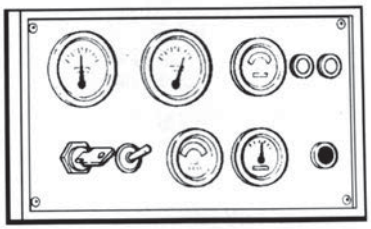


FIG. 14

FIG. 15

COLD WEATHER OPERATION

Consult the engine manufacturer's operation manual for proper cold weather starting procedure.

When using cold weather starting aids, be sure to follow the engine manufacturer's instructions. (FIG. 16)

After starting, operate all systems slowly and gently until properly warmed up.

FIG. 16

BOOSTER CABLE INSTRUCTIONS

1. Connect positive (+) cable to positive post of discharged battery.
2. Connect other end of same cable to same marked post of booster battery.
3. Connect negative (-) cable to other post of booster battery.
4. Make final connection on stalled vehicle away from battery, either on vehicle frame or engine block.
5. Start vehicle and remove cables in reverse order of connection.

WORK SAFELY

REMEMBER THESE RULES

When roading or operating a machine, always stay in the operator's station. NEVER mount or dismount a machine that is moving. Maintain control of your machine at all times.

ALWAYS operate your machine slowly until fully familiarized with it's operation.

Constantly check your total work area for potential hazards.

Never JUMP on or off your machine. Use the steps and handholds provided to mount or dismount safely. Maintain three point contact when mounting or dismounting.(FIG. 17)

- Never use controls or levers as hand holds.
- Never jump off the machine.

Look, listen and smell for possible malfunctions. If malfunctioning controls or erratic operation are detected, correct or report them immediately. DO NOT OPERATE THE MACHINE UNTIL CORRECTED.

Prevent asphyxiation. If you must operate in a building or other enclosed area, or if your machine is equipped with an enclosed cab, be certain there is adequate ventilation.

Use extra care when refueling. (See page 34 for special precautions.)

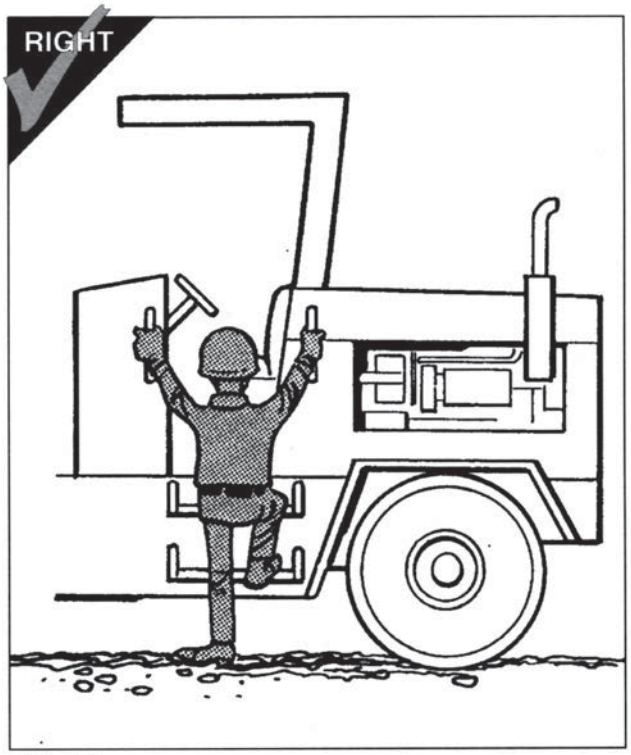


FIG. 17

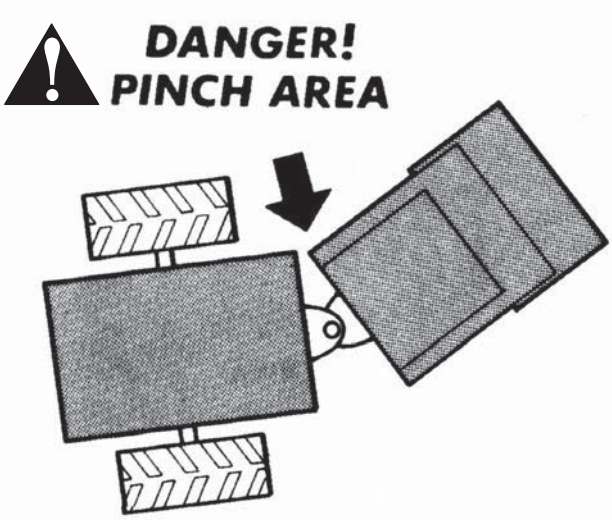


FIG. 18

For maximum safety on machines with more than one operator's position, operate from the position giving the greatest visibility of potential hazards.

NEVER allow unqualified or unauthorized personnel to operate your machine.

NEVER allow other personnel to ride on your machine unless appropriate seating is provided … and then only if authorized to do so.

NEVER abuse your machine. Misuse or abuse can cause an accident.

NEVER enter or place any part of your body in the "hinge area" or other "pinch" areas of an articulated machine while the engine is running, or when there is any chance another person might start the machine. (FIG. 18)

Give the right-of-way to loaded equipment on haul roads. Maintain a safe distance from personnel, motor vehicles and other machines.

Your safety, and the safety of those around you, is determined by the care and judgment YOU use while operating your machine.

WORKING ON SLOPES

When working on slopes, avoid sidehill travel whenever possible … rather operate up and down the slope. (FIG. 19 & 20) Remember the danger of sliding and/or tipping on steep slopes is always present … regardless of how heavy or "stable" your machine may appear to be.

ALWAYS use seat belts IF your machine is equipped with a ROPS.

NEVER allow the engine or machine to overspeed.

When climbing or descending steep grades, ALWAYS select the proper gear BEFORE starting on the slope, to assure adequate power or engine breaking.

If your machine has a gear shift, select a low gear. If your machine has a hydrostatic drive, the speed control should be in the slow travel position, close to neutral … NEVER in the fully displaced position.

On machines that have a gear shift AND a hydrostatic control, BOTH controls must be in their slow travel position.

ALWAYS be sure that manually operated gear type transmissions are fully engaged BEFORE starting onto a grade. DO NOT attempt to change the gear selection while traveling on a grade. See the manufacturer's manual for specific instructions.

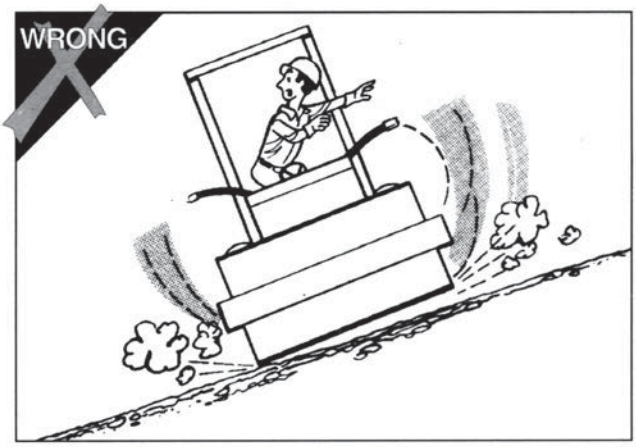


FIG. 19

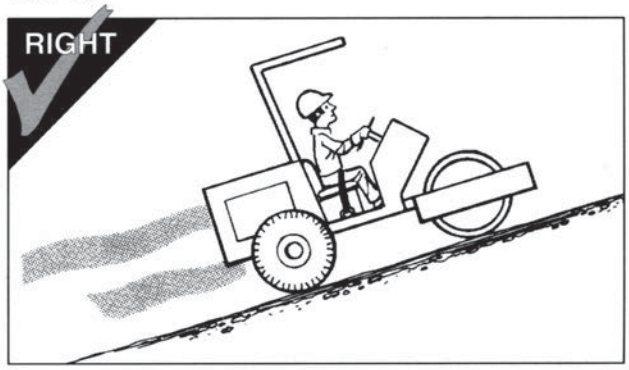


FIG. 20

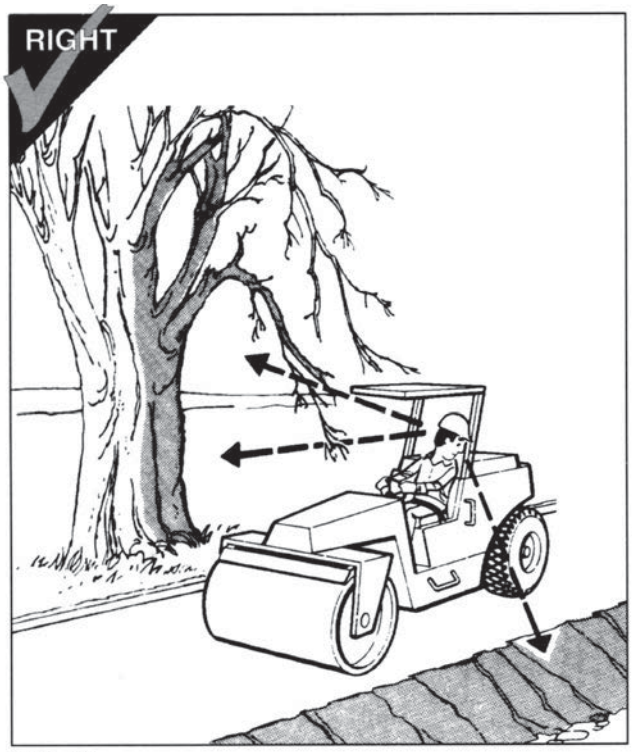


FIG. 21

Avoid operating your machine too close to an overhang, deep ditch or hole. If your machine inadvertently gets close to a tipping condition or drop-off, STOP and get off the machine after applying the parking brake … plan your moves carefully before proceeding. Reversal is often the best move.

Be alert to potential caving edges, falling rocks and slides.

Check for overhead obstacles that could be dangerous. LOOK UP AS WELL AS DOWN. (FIG. 21)

Be alert to obstacles and excessively rough terrain. Back away from them and go around.

Always travel slowly over rough terrain and hillsides. Maintain a speed consistent with the working conditions.

WORK SAFELY

When traveling on a public road, obey all traffic regulations and be sure that the proper clearance flags, lights and warning signs … such as the "slow moving vehicle" emblem … are used. (FIG. 22)

NEVER speed … and NEVER coast in neutral.

When roading the machine know your approximate stopping distance at any given speed.

NEVER turn corners at excessively high speeds. (FIG. 23)

Always look in all directions before reversing your direction of travel.

Use EXTRA caution when working in close quarters or when traveling through congested areas. Courtesy pays off.

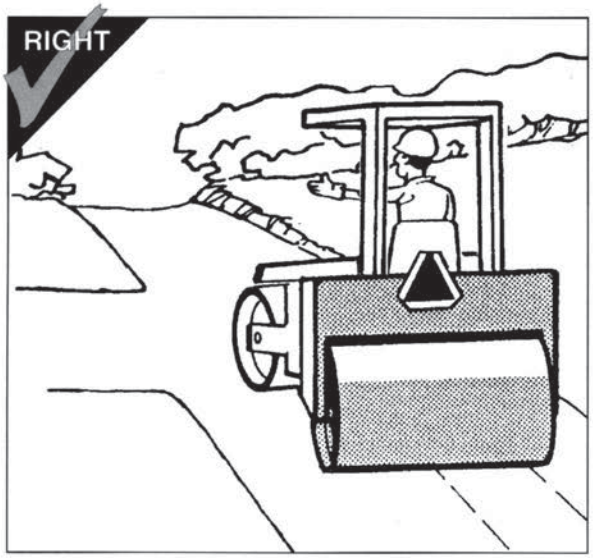


FIG. 22

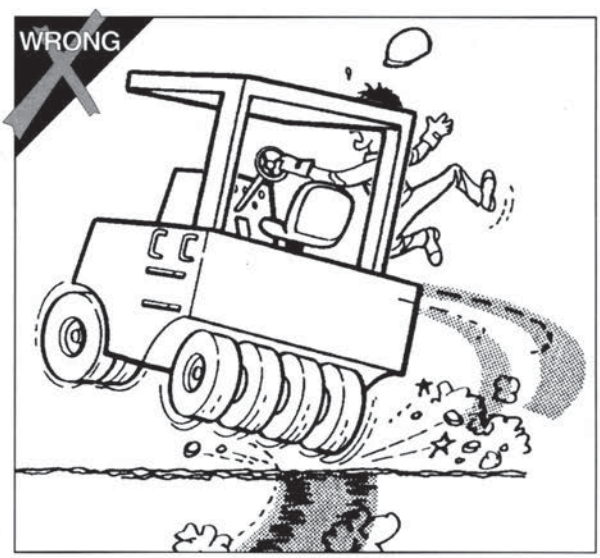


FIG. 23

PARK SAFELY

Park in an off the road area, out of traffic, or as instructed. If necessary to park in a traffic lane, use the appropriate flags, barriers, flares, lights and warning signals. Provide advance warning signals in the traffic lane to warn approaching traffic.

Park on level ground whenever possible. (FIG. 25) When not possible, position the machine at right angles to the slope. Make sure the machine is on a firm footing, and that there is no danger of sliding. Do NOT leave your machine until you are sure it is safely blocked in both directions and parking brakes firmly applied. (FIG. 24)

Lower the blade and all other hydraulically operated attachments (if so equipped) to the ground.

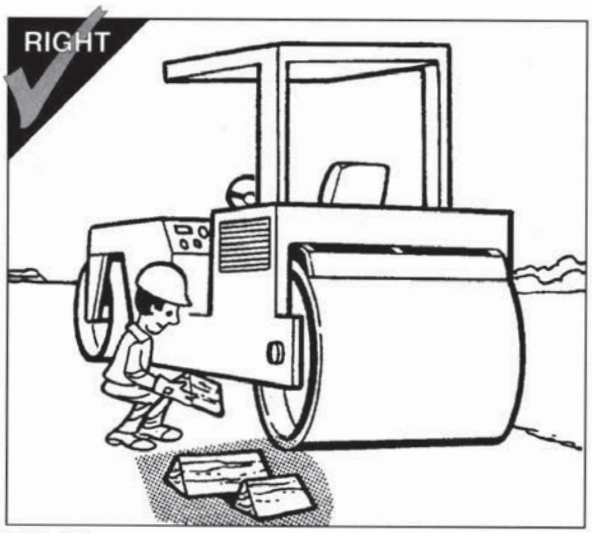


FIG. 24

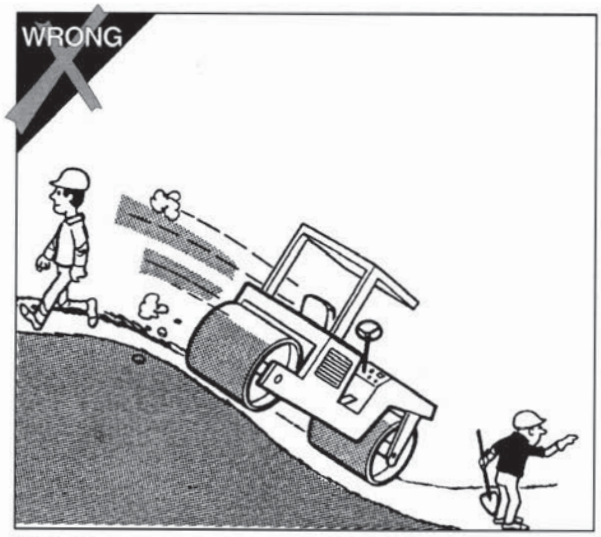


FIG. 25

PARK AND SHUT DOWN SAFELY

SHUT DOWN PROPERLY

Know the proper shut-down procedure for your machine. As with the starting procedure, this varies with the type and model of machine.

Follow the manufacturer's operation manual for YOUR machine. Remove the key(s) to prevent unauthorized starting and movement, and position and lock any antivandalism devices.

DISMOUNT PROPERLY

NEVER dismount from your machine until it is fully stopped and the engine is shut off.

NEVER jump off your machine. (FIG. 26) After stopping, use the steps and handholds provided to dismount safely. Maintain three point contact when dismounting.

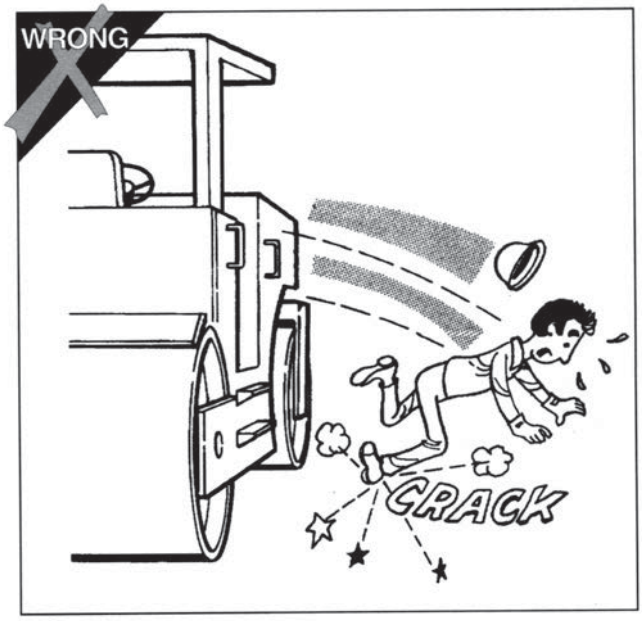


FIG. 26

Loading and unloading machines always involves potential hazards. EXTREME CAUTION SHOULD BE USED.

Know the correct loading and unloading procedures for your machine.

All machines are not loaded and unloaded the same way. The procedures recommended by the manufacturer should always be followed.

Several precautions are applicable to all machines:

- NEVER load or unload machine by yourself.
- Keep all non-essential personnel clear of loading and unloading area.
- Load and unload on a level surface.
- ALWAYS use ramps of adequate size and strength. Be sure ramps are sufficiently wide, and long enough to provide a safe loading slope.
- NEVER use ramps that are cracked, damaged, or of questionable strength. (FIG. 27)
- Be sure that the ramps are securely positioned and fastened, and that the two sides are at the same level as one another.
- The ramp surface must provide adequate traction. Be sure the surface is clean and free of grease, oil, ice, and loose material.
- The hauling vehicle should be blocked to prevent movement during loading or unloading of the machine.
- For proper tie-down instructions, see the manufacturer's manual.

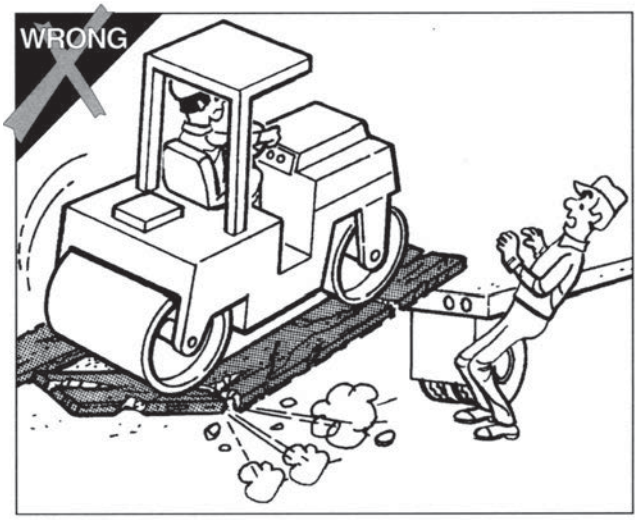


FIG. 27

TRANSPORTING SAFELY

GENERAL

When towing a machine on a trailer, or a machine equipped with "portability or transport wheels", ALWAYS use a hauling vehicle of sufficient weight, horsepower and braking capacity to maintain proper control.

NEVER attempt to tow a trailer or machine if the hitching devices are of insufficient or questionable capacity, improperly matched in size or shape, or positioned at improper heights.

When towing a machine equipped with portability or transport wheels, ALWAYS follow the manufacturer's towing instructions.

BEFORE TOWING

When connecting a trailer to a hauling vehicle, block under the trailer's tongue before attempting to make the connection. NEVER attempt to lift heavy tongues or move heavy trailers by hand. NEVER get any part of your body under the tongue when hitching or unhitching.

ALWAYS make sure the hitch is properly and securely locked.

ALWAYS use safety chains between the hauling vehicle and tailer or towed machine. Be sure the chains are properly and securely connected … at BOTH ends. Cross the chains under the tongue when connecting to the hauling vehicle.

ALWAYS make sure electrical and other connections between the hauling vehicle and trailer or towed machine are properly and securely made. After connecting, check the lights for proper operation. If the towed trailer or machine is equipped with brakes operable from the hauling vehicle, check to make sure they are operating properly.

ALWAYS be sure the portability or transport wheels, on machines so equipped, are LOCKED in the lowered position.

Check ALL tires for proper pressure, excessive or abnormal wear, and potentially dangerous cuts, bruises or bulges. Have any problems corrected before proceeding.

TOWING

ALWAYS use EXTRA care when towing a trailer or machine… when maneuvering in tight places, when backing (visibility is reduced, and jackknifing must be avoided), and when towing on steep grades.

Know and obey all local, state and federal laws and regulations.

NEVER travel at speeds above those recommended by the manufacturer.

NEVER allow anyone to ride on a trailer or towed machine. (FIG. 28)

When necessary to disconnect and park a trailer or towed machine, ALWAYS select a location that is level and, if possible, one where children are unlikely to be present. BEFORE disconnecting a trailer, chock the front AND rear of the wheels, and block under the tongue.

See pages 23 through 24 for parking, shut-down procedures and roading machine for transport.

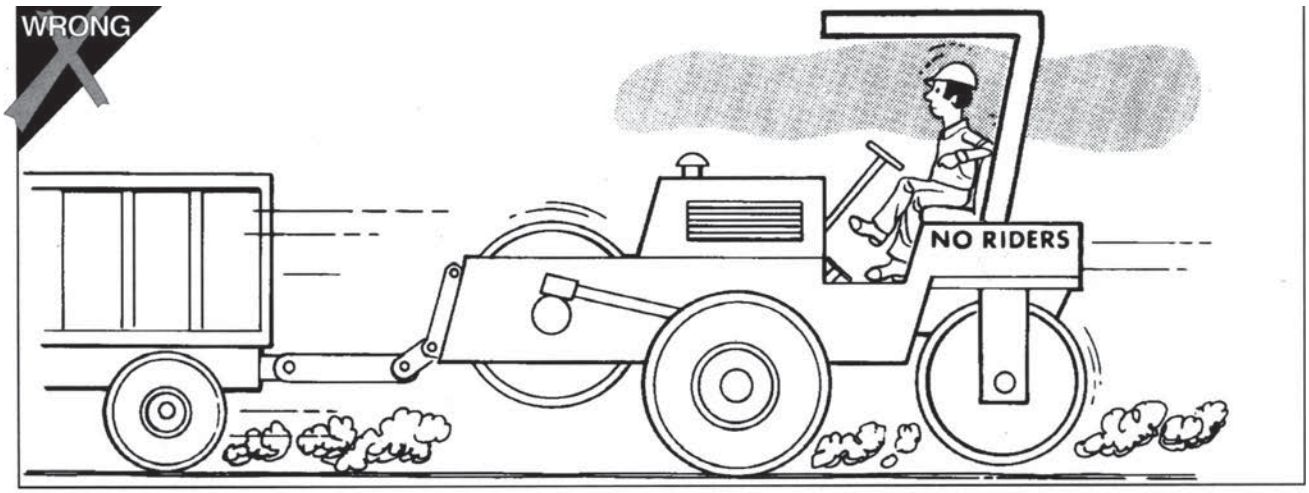


FIG. 28

PERFORM MAINTENANCE SAFELY

GENERAL

Maintenance work can be **hazardous** if not done in a careful manner. All personnel should realize the hazards and strictly follow safe practices.

NEVER perform any work on the equipment unless authorized to do so. (FIG. 29) Before performing any maintenance or repair work, consult the Instruction Manual. Follow the manufacturer's recommended procedures.

BEFORE any maintenance work is begun, review LOCKOUT/TAGOUT procedures. LOCKOUT controls and/or energy source and place a warning label to alert workers of shutdown.

PRIOR to removal of LOCKOUT/TAGOUT, the equipment must be fully operational and all personnel accounted for. Except in cases of emergency, the removal of the LOCKOUT/ TAGOUT should be done by the initiating person prior to the return to start-up.

BEFORE doing any major work, or work on the electrical system, disconnect the batteries.

REPLACE all missing or broken guards and panels.

USE proper nonflammable cleaning solvents. Follow solvent manufacturer's instructions.

ALWAYS remove all flammable materials in the vicinity of welding and/or burning operations.

BURNING OR WELDING in the vicinity of acoustical material may release hazardous fumes.

FIG. 29

CLOTHING AND PERSONAL PROTECTIVE ITEMS

Keep hands and clothing well away from engine fan and moving parts while engine is running.

ALWAYS wear appropriate safety glasses, goggles or face shield when working. (FIG. 30) Proper eye protection can keep flying particles from grinding, drilling or hammering operations, or fluids such as fuel, solvents, lubricants and brake fluids, from damaging your eyes. Normal glasses do NOT provide adequate protection.

ALWAYS wear a hard hat and safety shoes. (FIG. 30) ALWAYS wear hearing protectors when exposed to high noise levels for extended periods. ALWAYS wear a respirator when painting or exposed to dusty conditions. ALWAYS keep your pockets free of loose objects which can fall out and drop into machinery. (FIG. 31) Heavy gloves should be worn for many operations.

FIG. 30

FIG. 31

EXHAUST FUMES

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, use an exhaust pipe extension. If you do not have an exhaust pipe extension, be positive the area is adequately ventilated. (FIG. 32)

FIG. 32

HEAVY PARTS

Handle tools and heavy parts sensibly – with regard for yourself and other persons. Lower items – don't throw or drop them.

ALWAYS use proper hoisting equipment for lifting heavy loads.

PERFORM MAINTENANCE SAFELY

- Keep machine in proper adjustment at all times. Serious injury could result if adjustments are neglected.
- Whenever possible, AVOID working on a machine with the engine running. If the engine must be run to make checks or adjustments, put the transmission in neutral, set the parking brake and chock the drum and wheels securely ... front and rear ... to prevent movement in either direction.
- Personnel can be caught by moving parts when the **guards are removed** for access in making repairs. A repair or maintenance job is not complete until guards, plates and other safety devices have been replaced.
- NEVER put your fingers in open gears or reach through the spokes of a gear.
- Before working on the fuel system, close the fuel shut-off valve. NEVER smoke or use open flames near the machine while working on the fuel system.
- **Remove and store** all tools before resuming operation.
- Before working in the pivot or "pinch" area of an articulated machine, securely attach the steering frame lock to prevent the machine from turning. (FIG. 33) Enter this area only when necessary.
- Connect any other safety locks provided before proceeding with the work.

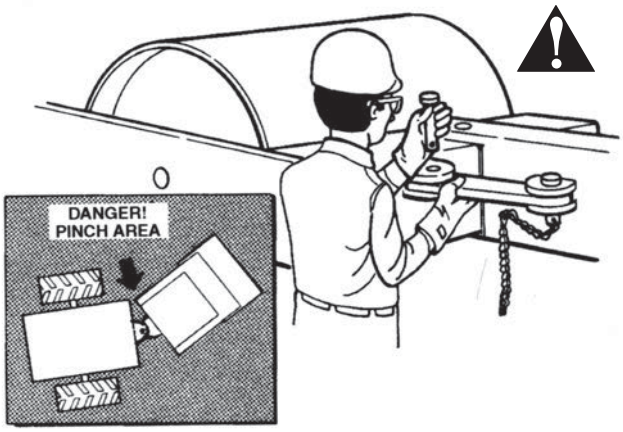


FIG. 33

Before beginning welding or burning operations, drain fuel lines and tank and move all flammable material to a safe distance, and be certain a fire extinguisher is readily available. When welding fuel tanks, either gasoline OR diesel, ALWAYS drain the tank, fill with water, and leave cap off during the welding operation.

All guards, plates and other safety devices must be properly replaced before the machine is returned to service or serious injury to you or other personnel may result.

AVOID burning or welding near acoustical material whenever possible, as **hazardous** fumes may be released. If unavoidable, make sure the area is adequately ventilated, and that a fire extinguisher is ready available.

ALWAYS use authorized replacement parts that meet the machine manufacturer's specifications.

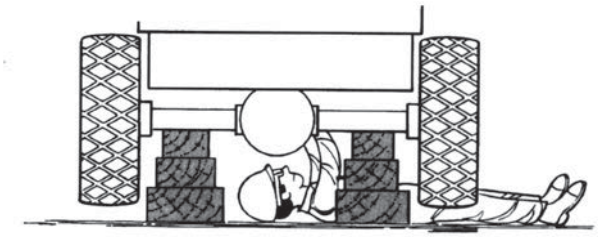


FIG. 34

JACKING AND BLOCKING

ALWAYS lower all movable attachments to the ground or to their lowest position before servicing a machine.

If a machine must be raised for servicing or repairs, ALWAYS block the machine securely. Use axle stands or other rigid supports of ample capacity. NEVER rely solely on the jacks for support. If necessary to work under a machine, be absolutely certain it is adequately supported. (FIG. 34)

WARNING: Never use concrete blocks for supports. They can collapse under even light loads.

When jacking up a machine, use a SUITABLE jack, placed in the proper position, on a solid foundation.

Before working on a machine, chock the drum and wheels securely … front and rear … in such a manner as to prevent movement in EITHER direction. Securely attach the steering frame lock to prevent the machine from turning.

PERFORM MAINTENANCE SAFELY

FIRE PREVENTION

Whenever possible use a nonflammable solvent to clean parts. Do not use gasoline or other fluids that give off harmful vapors.

If flammable fluids, such as diesel fuel, must be used, extinguish open flames or sparks and do not smoke.

Store dangerous fluids in a suitable place, in approved containers which are clearly marked. NEVER smoke in areas where flammable fluids are used or stored. (FIG. 35)

Use proper nonflammable cleaning solvents. Follow solvent manufacturer's instructions for use.

Always remove all flammable material in the vicinity of welding and/or burning operations.

ALWAYS keep the floor in the work area clean and dry. Oily, greasy floors can easily lead to falls. Wet spots, especially near electrical equipment, can be hazardous. (FIG. 35)

Know where fire extinguishers are kept – how they operate – and for what type of fire they are intended.

Check readiness of any fire detectors and fire suppression systems.

FIG. 35

FIRE PREVENTION CHECKLIST (FIG. 36)

- Remove debris such as rags, coal dust, oil, leaves, pine needles.
- Check and repair fuel and hydraulic leaks.
- Check and repair damaged wiring.
- Prevent hose and electrical wire harness abrasion.
- Tighten loose clamps and fittings.
- Secure loose wiring.
- Make sure guards and protective covers are in place.
- Make sure fire extinguisher is available and operable.

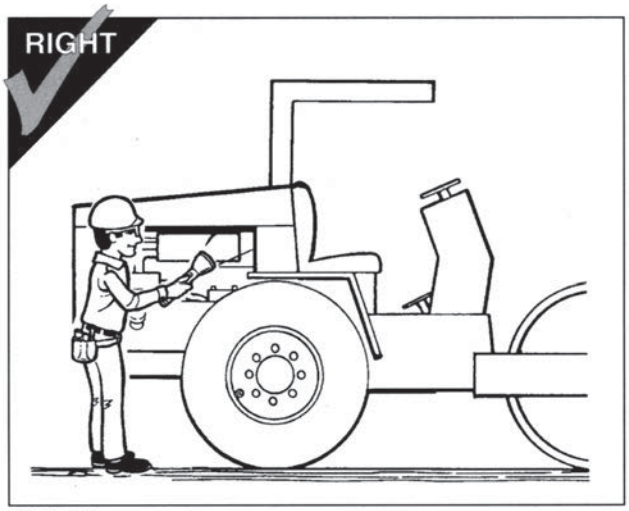


FIG. 36

PERFORM MAINTENANCE SAFELY

REFUELING (FIG. 37)

Precautions

When refueling, the following precautions must be followed:

- Add proper type and grade of fuel only when machine is not running and machine is parked with no one in the cab.
- Fuel in a well-ventilated area.
- Turn off all electrical switches.
- Turn off cab heaters.
- Open lights, lighted smoking materials, flames, or spark producing devices shall be kept at a safe distance while refueling.
- Keep fuel nozzle in contact with tank being filled, or provide a ground to prevent static sparks from igniting fuel.
- Do not spill fuel on hot surfaces.
- Any spillage shall be cleaned immediately.
- Do not start engine until fuel cap is secured to the fuel tank and people are clear of the machine.
- ALWAYS make sure fuel, oil, hydraulic fluid and water are added to their proper tanks.

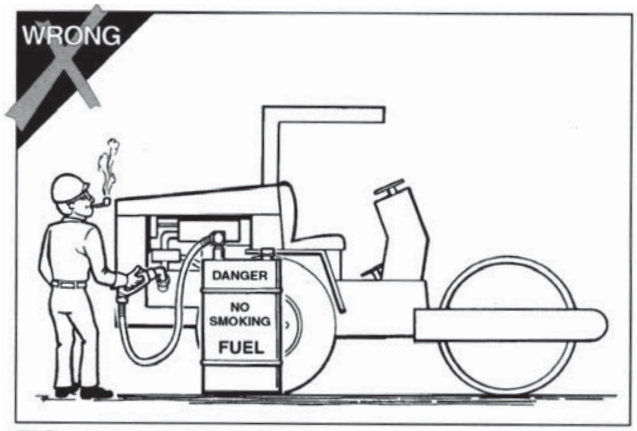


FIG. 37

SERVICING COOLING SYSTEM

When checking coolant level:

- Stop the engine and let the engine and radiator cool before checking. (FIG. 38)

If an overheated engine requires a shutdown:

- **Wait for the radiator to cool.** The hot pressurized coolant can cause burn injuries. Never add coolant to an overheated system.
- **Overheating is a symptom of trouble.** Stop the engine and have the trouble corrected before serious damage occurs.
- If it is necessary to check an overheated engine use a heavy cloth, gloves, heavy clothing and safety glasses or goggles to protect yourself. Stand to the side, turn your face away, and slightly loosen the cap. Wait until the sound stops before removing the cap.

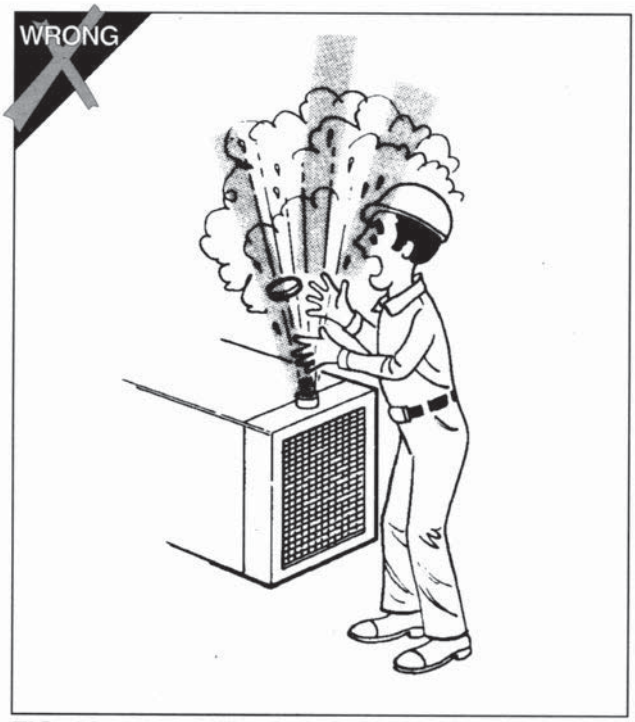


FIG. 38

PERFORM MAINTENANCE SAFELY

SERVICING BATTERIES

Always wear safety glasses and gloves when working with batteries.

Before removing a battery, turn off all electrical equipment, then disconnect the negative (-) battery cable first. Before installing a battery, turn off all electrical equipment, then connect the positive (+) battery cable first.

To prevent sparking at the posts when using a battery charger, always turn the charger off or disconnect it from its power source before connecting or disconnecting charger leads to battery posts. Caps on all cells should be left on and the vent caps would be covered with a wet cloth.

Do not short across the battery terminals. The spark **could** ignite the gases.

BOOSTER CABLE INSTRUCTIONS (FIG. 39)

1. Connect positive (+) cable to positive post of discharged battery.
2. Connect other end of same cable to same marked post of booster battery.
3. Connect negative (-) cable to other post of booster battery.
4. Make final connection on stalled vehicle away from battery, either on vehicle frame or engine block.
5. Start vehicle and remove cables in reverse order of connection.

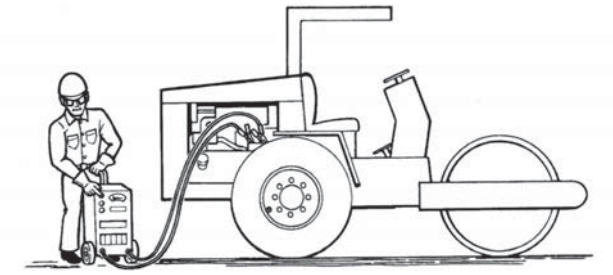


FIG. 39

BATTERY SERVICING

To prevent a battery explosion: (Fig. 40)

- **Maintain** the electrolyte at the recommended level. Check level frequently. Add distilled water to batteries only before starting up, never when shutting down. With electrolyte at the proper level, less space is available for gases to accumulate in the battery.
- **Use a flashlight** to check the electrolyte level. Never use a flame. (Fig. 41)
- **Do not short** across the battery terminals. The spark could ignite the gases.

Battery acid will **burn skin**, eat holes in clothing, and may **cause blindness** if splashed into eyes. If you spill acid on yourself flush skin immediately with lots of water. Apply baking soda to help neutralize the acid. If acids gets in your eyes, flush immediately with large amounts of water and seek proper medical treatment immediately.

When servicing batteries, remember that a lead-acid storage battery generates (when charging or discharging) hydrogen and oxygen – a very explosive mixture. A spark of flame could ignite these gases.

FIG. 40

FIG. 41

PERFORM MAINTENANCE SAFELY

HYDRAULIC SYSTEMS

NOTE: Hydraulic Systems have "special features". Some of the features affecting your safety are listed below.

Pressure can be maintained in hydraulic and air circuits long after the engine has been shut down. This pressure can cause hydraulic fluid or items such as pipe plugs to "shoot out" at high speed if pressure is not released correctly. **Release system pressure** before attempting to make adjustments or repairs.

Consult the manufacturer's instructions for correct procedure.

Before disconnecting **hydraulic fluid** lines, be sure you:

- Shut off engine.
- Always release any air pressure (supercharge) on the hydraulic reservoir.
- Move pedals and control levers repeatedly through their operating ranges to relieve all pressures.

Pressurized hydraulic fluid can penetrate the skin and **cause serious injury**. Therefore, be sure all connections are tight and that lines, pipes, and hoses are in good condition before starting the engine.

Fluid escaping from a small hole can be almost invisible. Use a piece of cardboard or wood, instead of your hands, to search for suspected leaks. (FIG. 42)

FIG. 42

HYDRAULIC SYSTEMS (CONT'D)

If you are struck by escaping **hydraulic fluid under pressure**, serious injury can occur if proper medical treatment is not administered immediately.

During operation, hydraulic fluid and air in an **unvented hydraulic tank** becomes heated and will tend to expand. This will raise the pressure inside an unvented hydraulic tank. If the filler cap is removed rapidly, the pressure in the tank can force the oil out of the tank very rapidly. **The hydraulic fluid may be very hot and may cause severe burns.** Always relieve tank pressure before removing the cap completely. Consult the manufacturer's instructions for the correct procedure.

When adding fluid to any system, be sure to use the fluid recommended by the manufacturer. Certain fluids, when mixed, may destroy seals causing loss of control and possible personal injury.

Keep hydraulic relief valve settings set to the manufacturer's recommendations. **Excessive pressures** could result in structural or hydraulic failures. Low pressure could result in loss of control. Either condition could cause **personal injury or death**.

Be sure the engine is stopped and machine is properly locked out and controls tagged, before working on a machine. Only run engine when it is essential, as in the case of pressure adjustments, lubrication, or tests. Follow the manufacturer's recommendations when making adjustments. Never resume operation until satisfactory adjustments have been made. **The operator must** follow the mechanic's instructions when adjustments are being made or machine is being serviced.

TIRE INSPECTION

Recommended air pressure **must be maintained** in every tire. Daily checks assure that inflation is correct. If your periodic check discloses a tire that is continuously losing air, a leak is indicated and must be repaired. (FIG. 43)

During your pressure checks, also inspect for:

- Objects wedged between or embedded in tires.
- Missing valve caps and wheel lugs.
- Cuts, tears, and breaks that may need repair.
- Abnormal or uneven wear.
- Damaged or poor fitting rim or rim flanges.
- Projecting body hardware, loose fender bolts, spring clips – anything that could contact a tire.

Do not burn or weld on wheels or rims.

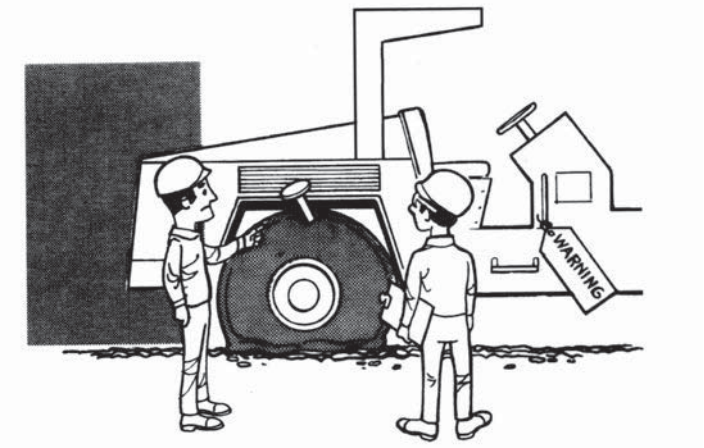


FIG. 43

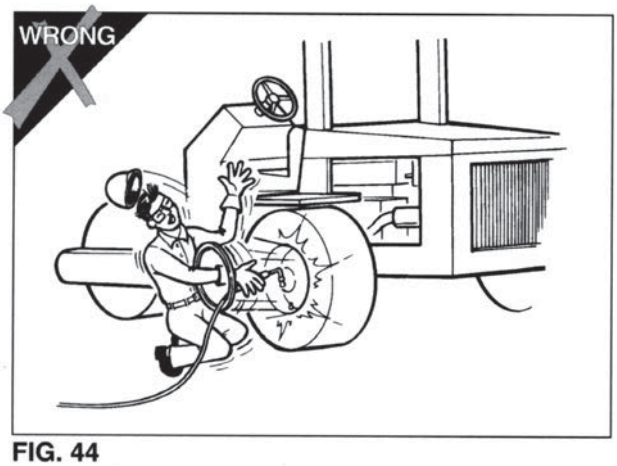


FIG. 44

PNEUMATIC TIRES

Changing tires or adding air can be a hazardous business. Special tools and procedures are required for changing off-highway tires.

Explosion and separation of a tire and/or rim parts can cause serious injury or death. (FIG. 44) Always follow the manufacturer's recommendations or see your tire supplier.

TIRE PRESSURE

Check tire pressure before starting operation. An air pressure rise during operation is normal and should NOT be reduced. Overloads or over-speeds may produce increased tire pressures due to heat. Never bleed tires. Reduce your load – or speed – or stop until tires cool.

ADD AIR

From a distance – with air chuck clipped on the tire valve – and with extension hose that permits you to stand behind tread. (FIG. 45) Always use a tire cage or equivalent for protection.

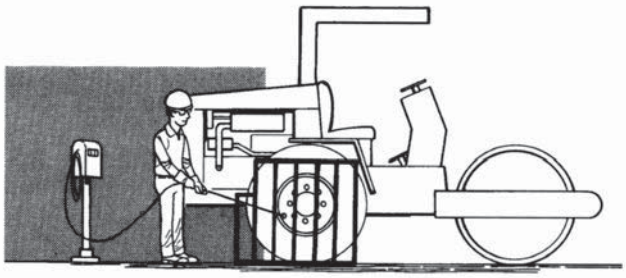


FIG. 45

PERFORM MAINTENANCE SAFELY

ROPS (Roll-Over Protective Structures)

Periodically inspect ROPS for cracks and loose mounting hardware.

Replace all missing, deteriorated or worn rubber parts.

If it becomes necessary to remove a ROPS, reinstall it only on the same machine, in its original position. (FIG. 46)

NEVER alter the ROPS in any way without the written approval of the manufacturer.

NEVER cut holes in or weld on ROPS without the manufacturer's approval.

NEVER attempt to repair a damaged ROPS – it must be replaced with a new unit, approved for that machine.

Periodically inspect seat belts for wear, tear, deterioration or excessive dirt. Replace them if necessary.

AIR CONDITIONERS

NEVER attempt to weld on or near air conditioners. Poisonous gas may be formed when refrigerant gas is exposed to a flame or excessive heat.

Maintenance and repair of air conditioners … except for very minor repairs or servicing … must be done only by an experienced air conditioner or refrigeration technician. (FIG. 47)

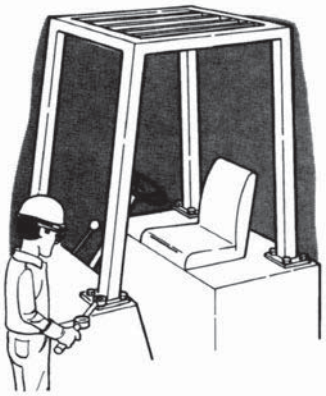


FIG. 46

FIG. 47

PARKING AND TRANSPORTING

ALWAYS select a level area to park in and, if possible, one where children are unlikely to be present. ALWAYS chock the front AND rear of the roller … even if leaving the machine unattended for short periods.

ALWAYS use EXTRA care when towing a roller … when maneuvering in tight places, when backing (visibility is reduced, and jackknifing must be avoided), and when operating on grades. NEVER operate a towed roller on steep grades or side slopes, as the possibility of tipping or loss of control is greater when towing a roller.

NEVER allow anyone to ride on a towed roller. And, unless absolutely necessary, never permit anyone in the "pinch" area between the towing vehicle and the towed roller.

When necessary to disconnect and park a towed roller, ALWAYS select a location which is level and, if possible, one where children are unlikely to be present. BEFORE disconnecting, ALWAYS chock the front AND rear of the roll, and block under the tongue.

Extreme care should be exercised when loading or unloading a walk-behind roller. It is generally best to stand behind and to one side rather than directly behind a machine being propelled up or down a ramp.

If the roller is designed to hang from the tailgate of a vehicle when being transported, ALWAYS be certain the hook brackets meet the roller manufacturer's specifications.

Special precautions must also be exercised when loading or unloading, transporting or servicing a towed roller. Consult your manufacturer's manual for specific details.

SPECIAL OPERATING AND MAINTENANCE PRECAUTIONS

FOR TOWED ROLLERS

Most general safety precautions covered earlier in this manual are also applicable to towed roller operation. Many other SPECIAL precautions must, however, be taken. Study your manufacturer's manual(s) relative to special considerations when towing. If you have questions or concerns, consult the manufacturer or your dealer.

ALWAYS use a tow tractor of sufficient weight, drawbar horsepower and braking capacity to properly control the towed roller. Proper weight balance and distribution is also essential.

ALWAYS block under the tongue of the towed roller BEFORE attempting to connect it to the towing vehicles or machine. NEVER attempt to lift heavy tongues or move towed rollers by hand. NEVER get any part of your body under the tongue when hitching or unhitching.

ALWAYS make sure the hitch pin is of the proper size, and securely locked in place before towing. (FIG. 48) If safety chains are provided, make sure they are properly and securely connected … at BOTH ends. Cross the chains under the tongue when connecting to the towing vehicle. If electrical or hydraulic connections are required, make sure the connections are properly and securely made.

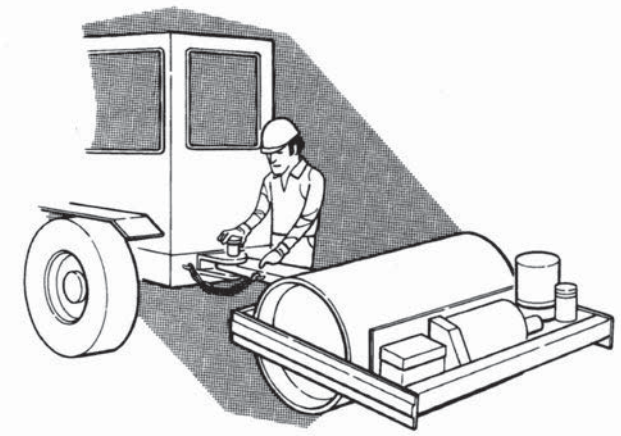


FIG. 48

FOR LANDFILL COMPACTORS

General

Operators of landfill compactors should carefully handle fill materials that could be picked up and thrown by the wheels, become lodged in the machine, or that are highly flammable.

Frequent checks should be made for wire, cable or other material wound around the axle members. Remove them immediately.

Travel with the blade as low as possible.

Maintain good operator visibility – keep all mesh and windows free of accumulated materials that reduce visibility.

When parking the machine, ALWAYS lower the blade.

FIRE PROTECTION

Maintain fire extinguishers and fire protective systems in good working order. ALWAYS recharge extinguishers, or replace with a fully charged unit immediately after use.

Check for, and remove, any waste material accumulation above belly pans and behind protective doors and grills. Accumulations are a fire hazard. (FIG. 49)

FIG. 49

SPECIAL OPERATING AND MAINTENANCE PRECAUTIONS

FOR WALK-BEHIND ROLLERS

Start-Up

NEVER attempt to operate a walk-behind roller before being thoroughly familiar with the manufacturer's operating instructions. If you have any questions or uncertainty, consult the manufacturer and/or his dealer BEFORE attempting to operate it.

ALWAYS follow the manufacturer's instructions for starting the engine. All controls MUST be in the correct position BEFORE attempting to start the engine (for example, the shift lever must be in neutral).

Starting fluid is NOT recommended when hand starting an engine. The engine may kick back.

OPERATION

When operating a walk-behind roller, ALWAYS exercise extreme care to avoid having your feet or clothing caught under the dolly wheels or roll. When possible, stand behind and to one side of the machine rather than directly behind it. Particular care must be exercised when operating near obstructions, on slippery surfaces, grades and side slopes. (ALWAYS wear slip resistant safety shoes or boots.)

NEVER ride on a walk-behind roller unless it is designed to accommodate riders and an appropriate seat is provided.

NEVER attempt to shift on a grade if the roller has a mechanical transmission.

NEVER operate a walk-behind roller in unshored trenches or near steep, unsupported banks. The vibrations could cause a cave-in.

Uneven grades can cause the handle to raise or lower unexpectedly, striking the unwary operator. (FIG. 50)

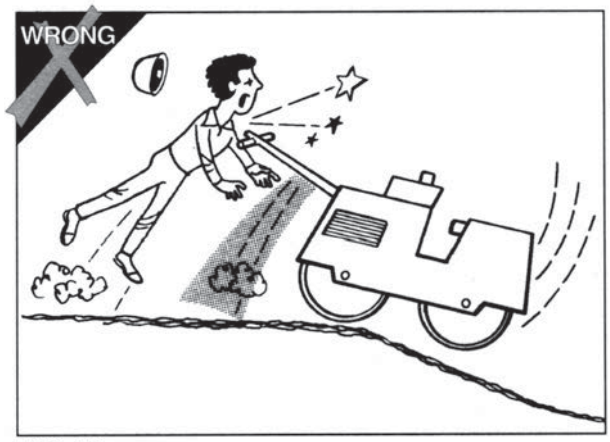


FIG. 50

Do you understand this AEM SAFETY MANUAL AND ITEMS SUCH AS …

- Your safety program?
- Your machine manufacturer's manual(s)?
- Proper clothing and personal safety equipment?
- Your machine's controls, warning signs and devices, and safety equipment?
- How to properly inspect, mount, and start your machine?
- How to check your machine for proper operation?
- Your work area and any special hazards that may exist?
- Proper operating procedures?
- Proper parking, shutdown, and dismounting procedures?
- Proper maintenance procedures?
- Proper loading and unloading procedures for transporting?
- Under what conditions you should not operate your machine?

If you do not understand any of these items, consult with your supervisor BEFORE operating your machine!

A FINAL WORD TO THE USER

Remember that YOU are the key to safety. Good safety practices not only protect you but protect the people around you.

You have read this safety manual and the manufacturer's manual(s) for your specific machine. Make them a working part of your safety program. Keep in mind that this safety manual is written for only this type of machine.

Practice all other usual and customary safe working precautions, and above all –

REMEMBER
SAFETY IS UP TO YOU

YOU CAN PREVENT SERIOUS INJURY OR DEATH

This manual is another in a series on the safe operation of machinery published by AEM.
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FORM RC-80-3

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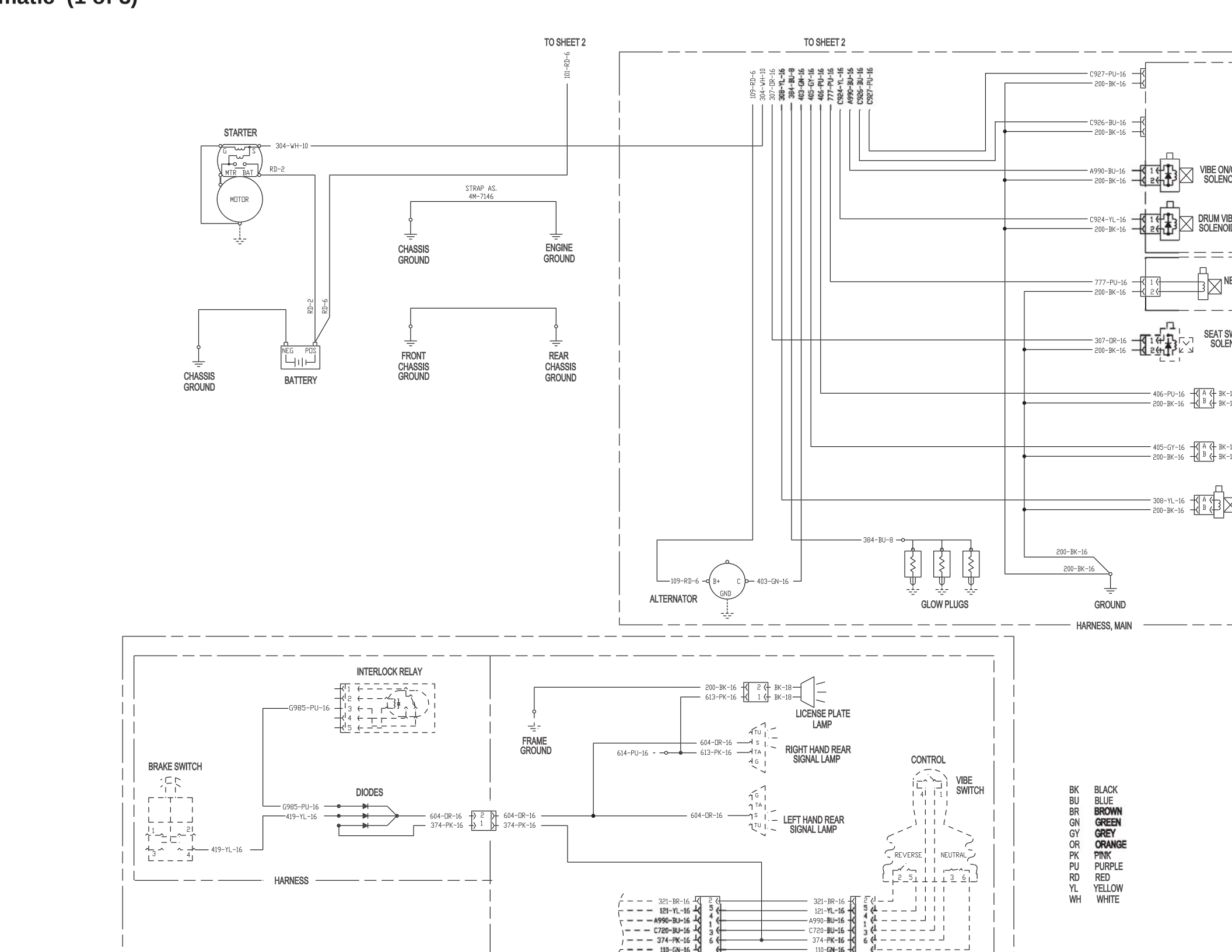
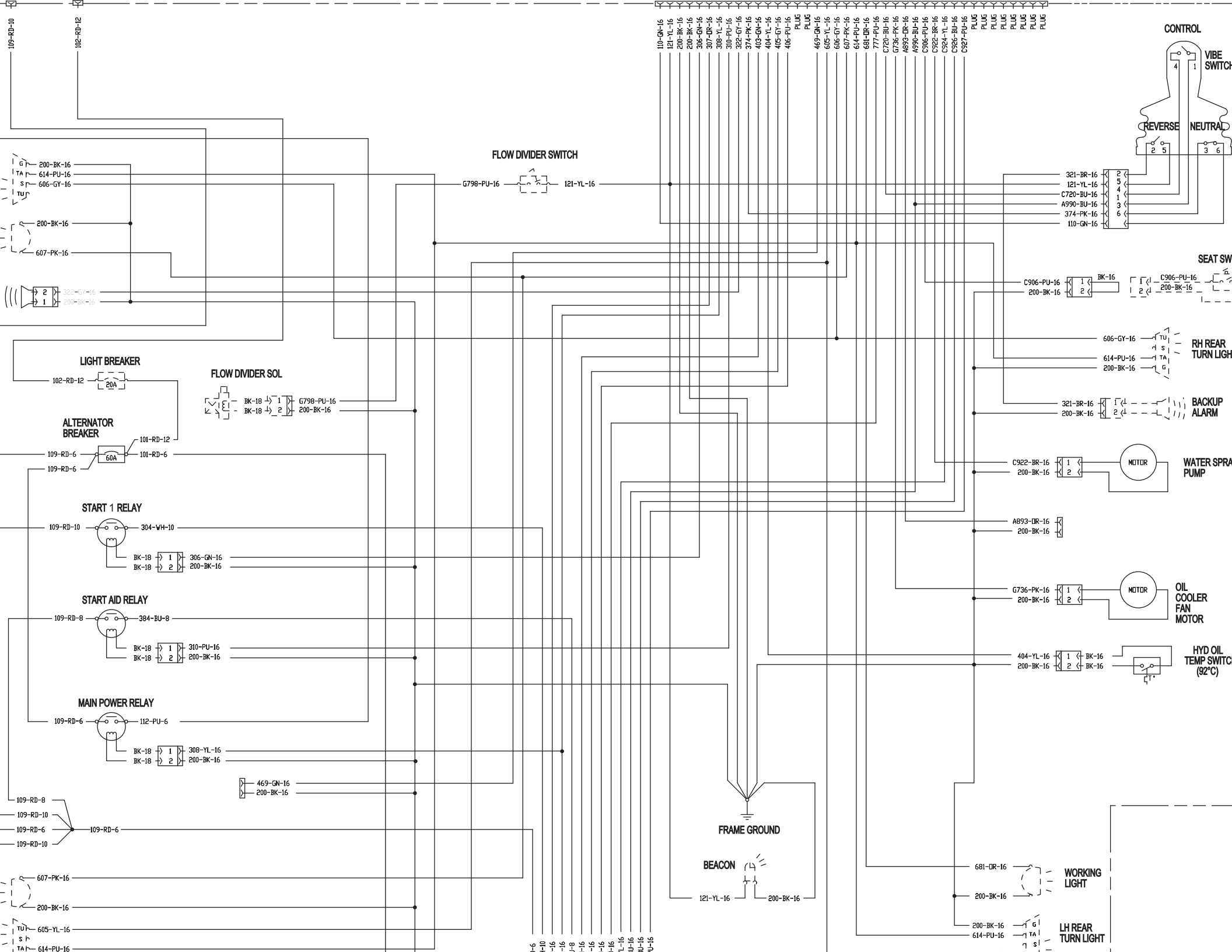
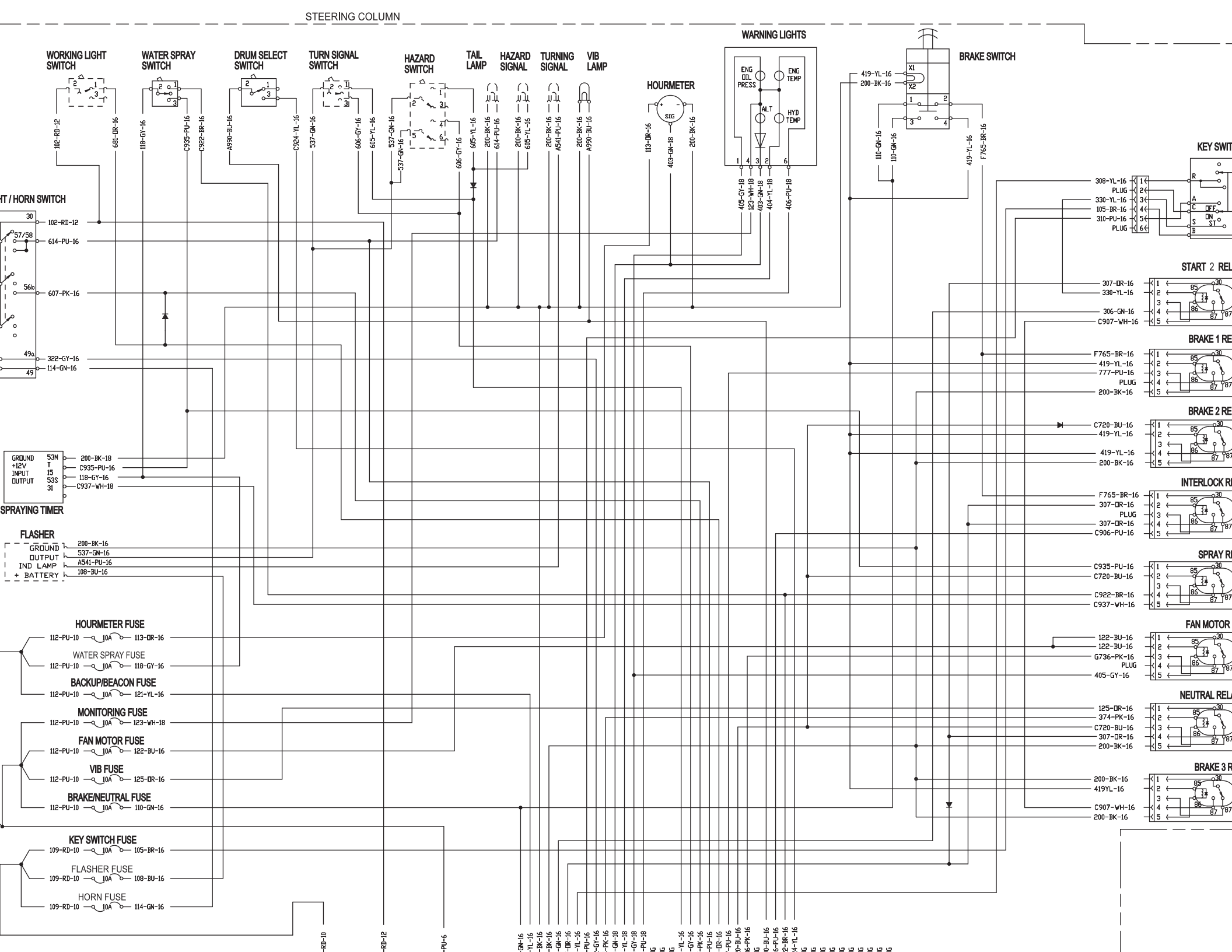
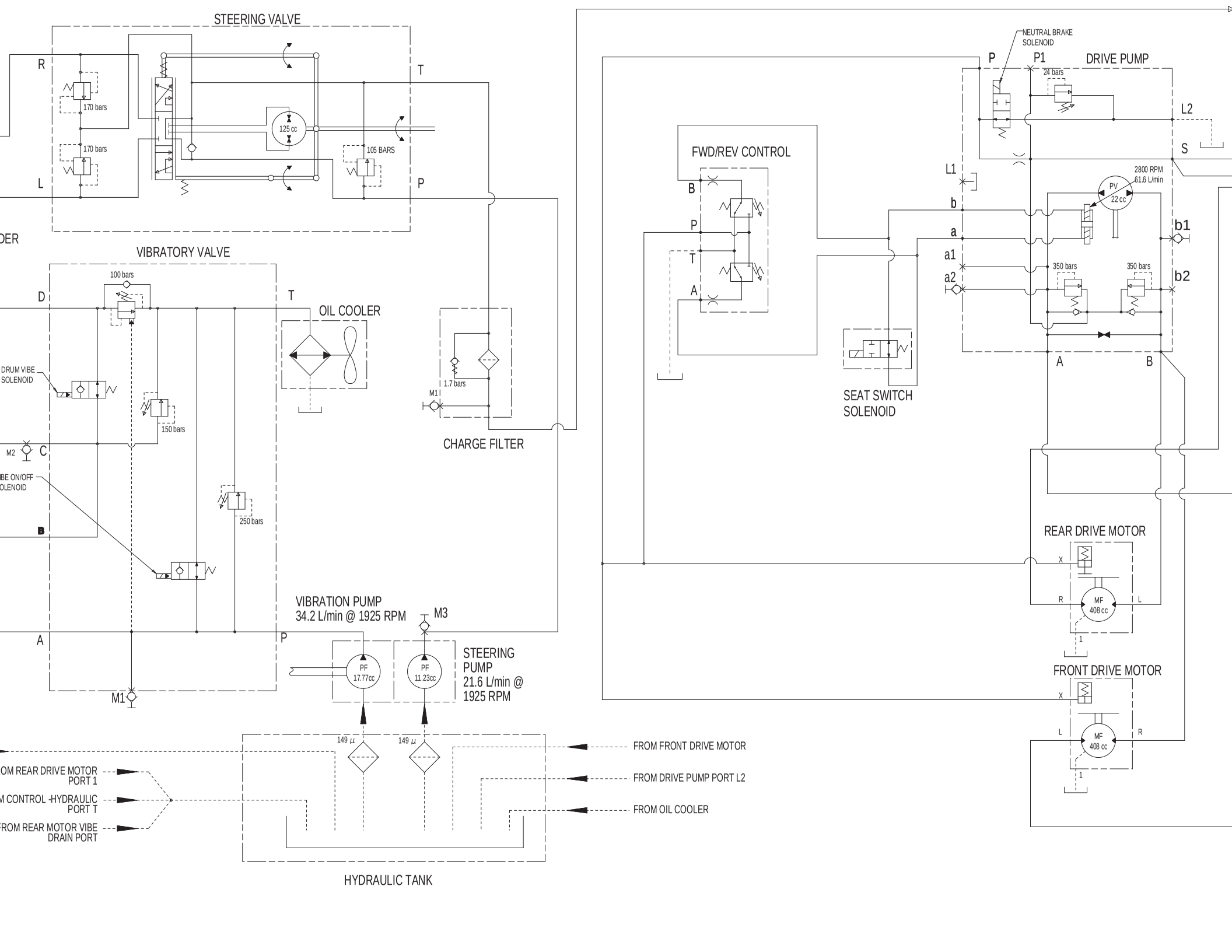
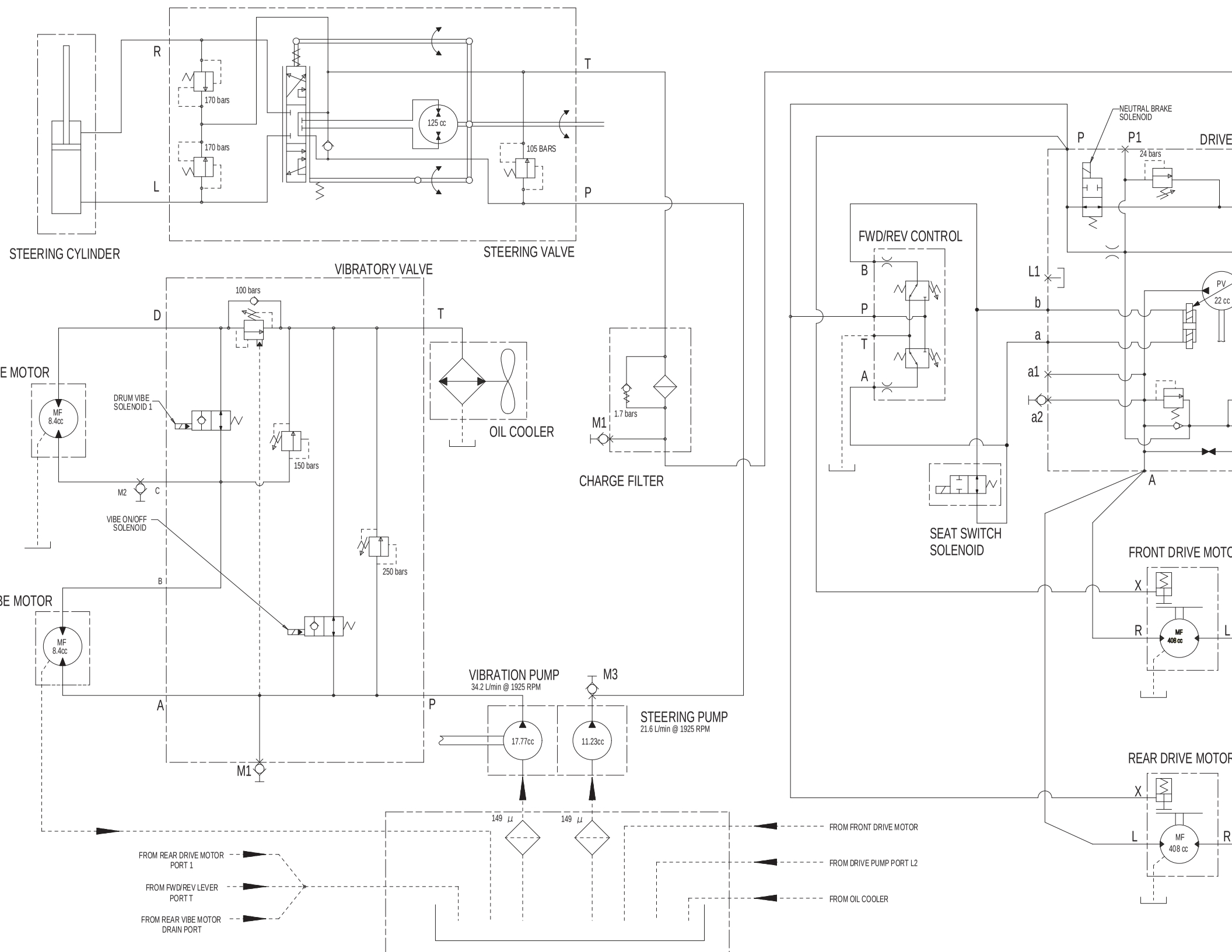

TO SHEET 2
TO SHEET 2
101-RD-6
STARTER
304-WH-10
RD-2
MTR BAT
MOTOR
STRAP AS.
4M-7146
CHASSIS GROUND
ENGINE GROUND
RD-2
RD-6
NEG POS
BATTERY
CHASSIS GROUND
FRONT CHASSIS GROUND
REAR CHASSIS GROUND
109-RD-6
304-WH-10
307-DR-16
308-YL-16
384-BU-8
403-GN-16
405-GY-16
406-PU-16
777-PU-16
C924-YL-16
A990-BU-16
C926-BU-16
C927-PU-16
C927-PU-16
200-BK-16
C926-BU-16
200-BK-16
A990-BU-16
200-BK-16
VIBE ON/
SOLENO
C924-YL-16
200-BK-16
DRUM VIB
SOLENOI
777-PU-16
200-BK-16
NE
307-DR-16
200-BK-16
SEAT SW
SOLEN
406-PU-16
200-BK-16
405-GY-16
200-BK-16
308-YL-16
200-BK-16
384-BU-8
109-RD-6
B+
C
GND
403-GN-16
ALTERNATOR
GLOW PLUGS
200-BK-16
200-BK-16
GROUND
HARNESS, MAIN
INTERLOCK RELAY
G985-PU-16
BRAKE SWITCH
DIODES
G985-PU-16
419-YL-16
419-YL-16
604-DR-16
374-PK-16
604-DR-16
374-PK-16
HARNESS
FRAME GROUND
200-BK-16
613-PK-16
BK-18
BK-18
LICENSE PLATE LAMP
614-PU-16
604-DR-16
613-PK-16
RIGHT HAND REAR SIGNAL LAMP
604-DR-16
LEFT HAND REAR SIGNAL LAMP
CONTROL
VIBE SWITCH
REVERSE
NEUTRAL
321-BR-16
121-YL-16
A990-BU-16
C720-BU-16
374-PK-16
110-GN-16
321-BR-16
121-YL-16
A990-BU-16
C720-BU-16
374-PK-16
110-GN-16
BK BLACK
BU BLUE
BR BROWN
GN GREEN
GY GREY
OR ORANGE
PK PINK
PU PURPLE
RD RED
YL YELLOW
WH WHITE


109-RD-10
102-RD-12
110-GN-16
121-YL-16
200-BK-16
306-GN-16
307-DR-16
308-YL-16
310-PU-16
322-GY-16
374-PK-16
403-GN-16
404-YL-16
405-GY-16
406-PU-16
PLUG
469-GN-16
605-YL-16
606-GY-16
607-PK-16
614-PU-16
681-DR-16
777-PU-16
C720-BU-16
G736-PK-16
A893-DR-16
A990-BU-16
C906-PU-16
C922-BR-16
C924-YL-16
C926-BU-16
C927-PU-16
CONTROL
VIBE SWITCH
REVERSE
NEUTRAL
FLOW DIVIDER SWITCH
G798-PU-16
321-BR-16
SEAT SW
LIGHT BREAKER
20A
FLOW DIVIDER SOL
BK-18
ALTERNATOR BREAKER
60A
101-RD-12
101-RD-6
RH REAR TURN LIGH
BACKUP ALARM
MOTOR
WATER SPRA PUMP
START 1 RELAY
304-WH-10
START AID RELAY
384-BU-8
MAIN POWER RELAY
112-PU-6
OIL COOLER FAN MOTOR
HYD OIL TEMP SWITC (92°C)
FRAME GROUND
BEACON
WORKING LIGHT
LH REAR TURN LIGHT


STEERING COLUMN
WORKING LIGHT SWITCH
WATER SPRAY SWITCH
DRUM SELECT SWITCH
TURN SIGNAL SWITCH
HAZARD SWITCH
TAIL LAMP
HAZARD SIGNAL
TURNING SIGNAL
VIB LAMP
HOURMETER
WARNING LIGHTS
ENG OIL PRESS
ENG TEMP
ALT
HYD TEMP
BRAKE SWITCH
HT / HORN SWITCH
SPRAYING TIMER
GROUND
+12V INPUT
OUTPUT
FLASHER
GROUND
OUTPUT
IND LAMP
+ BATTERY
HOURMETER FUSE
WATER SPRAY FUSE
BACKUP/BEACON FUSE
MONITORING FUSE
FAN MOTOR FUSE
VIB FUSE
BRAKE/NEUTRAL FUSE
KEY SWITCH FUSE
FLASHER FUSE
HORN FUSE
KEY SWIT
START 2 REL
BRAKE 1 RE
BRAKE 2 RE
INTERLOCK RI
SPRAY RI
FAN MOTOR
NEUTRAL REL
BRAKE 3 R
PLUG


STEERING VALVE
R
L
T
P
170 bars
170 bars
125 cc
105 BARS
VIBRATORY VALVE
100 bars
D
T
C
A
B
M1
M2
150 bars
250 bars
DRUM VIBE SOLENOID
OIL COOLER
1.7 bars
CHARGE FILTER
VIBRATION PUMP
34.2 L/min @ 1925 RPM
M3
PF 17.77cc
PF 11.23cc
STEERING PUMP
21.6 L/min @ 1925 RPM
149 µ
149 µ
FROM REAR DRIVE MOTOR PORT 1
M CONTROL -HYDRAULIC PORT T
FROM REAR MOTOR VIBE DRAIN PORT
FROM FRONT DRIVE MOTOR
FROM DRIVE PUMP PORT L2
FROM OIL COOLER
HYDRAULIC TANK
FWD/REV CONTROL
B
P
T
A
SEAT SWITCH SOLENOID
NEUTRAL BRAKE SOLENOID
P
P1
DRIVE PUMP
24 bars
L2
S
L1
b
a
a1
a2
2800 RPM
61.6 L/min
PV
22 cc
b1
b2
350 bars
350 bars
A
B
REAR DRIVE MOTOR
X
R
L
MF
408 cc
1
FRONT DRIVE MOTOR
X
L
R
MF
408 cc
1


STEERING CYLINDER
R
L
170 bars
170 bars
125 cc
105 BARS
T
P
STEERING VALVE
VIBRATORY VALVE
100 bars
D
T
E MOTOR
MF
8.4cc
DRUM VIBE
SOLENOID 1
150 bars
OIL COOLER
M2
C
VIBE ON/OFF
SOLENOID
250 bars
B
BE MOTOR
MF
8.4cc
A
P
M1
1.7 bars
M1
CHARGE FILTER
VIBRATION PUMP
34.2 L/min @ 1925 RPM
M3
STEERING PUMP
21.6 L/min @ 1925 RPM
17.77cc
11.23cc
149 µ
149 µ
FROM REAR DRIVE MOTOR
PORT 1
FROM FWD/REV LEVER
PORT T
FROM REAR VIBE MOTOR
DRAIN PORT
FROM FRONT DRIVE MOTOR
FROM DRIVE PUMP PORT L2
FROM OIL COOLER
FWD/REV CONTROL
B
P
T
A
SEAT SWITCH
SOLENOID
NEUTRAL BRAKE
SOLENOID
P
P1
DRIVE
24 bars
L1
b
a
a1
a2
PV
22 cc
A
FRONT DRIVE MOTO
X
R
MF
408 cc
L
REAR DRIVE MOTOR
X
L
MF
408 cc
R

Important: For spare parts information, please see your Wacker Neuson Dealer, or visit the Wacker Neuson website at http://www.wackerneuson.com/.

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Važno : Za rezervne dijelove obratite se svom Wacker Neuson prodavaču ili posjetite mrežne stranice tvrtke Wacker Neuson: http://www.wackerneuson.com/.

Önemli : Yedek parça bilgileri için Wacker Neuson Bayinize bakın veya Wacker Neuson web sitesini ziyaret edin. http://www.wackerneuson.com/

重要 交換部品の情報については、ワッカーノイソンディーラーにお問い合わせ頂くか、ワッカーノイソンウェブサイト http://www.wackerneuson.com/ をご覧ください。

重要 有关备件信息，请咨询您的威克诺森经销商或访问威克诺森网站：http://www.wackerneuson.com/。

Important : Pentru informaţii referitoare la piesele de schimb, vă rugăm să vă adresaţi distribuitorului Wacker Neuson sau să vizitaţi site-ul web Wacker Neuson la adresa http://www.wackerneuson.com/.

Важно : За информация относно резервни части, моля, обърнете се към местния дилър на Wacker Neuson или посетете уебсайта на Wacker Neuson на адрес http://www.wackerneuson.com/.

Wacker Neuson Produktion GmbH & Co. KG, Preußenstraße 41, D-80809 München,
Tel.: +49-(0)89-3 54 02-0 Fax: +49 - (0)89-3 54 02-390
Wacker Neuson Production Americas LLC, N92W15000 Anthony Ave., Menomonee Falls, WI. 53051
Tel.: (262) 255-0500 Fax: (262) 255-0550 Tel.: (800) 770-0957
Wacker Neuson Limited - Room 1701–03 & 1717–20, 17/F. Tower 1, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hongkong. Tel: (852) 3605 5360, Fax: (852) 2758 0032