676404-Rev C

JACOBSEN

Safety, Operation, & Maintenance Manual

Super Light Fairway Mower

068021-F513 – SLF530, Kubota® D1105-E4B, 3WD, Smooth Tires
068021-G515 – SLF530, Kubota® D1105-E4B, 4WD, Smooth Tires

⚠ WARNING

Warning: If incorrectly used, this machine can cause severe injury. Those who use and maintain this machine should be trained in its proper use, warned of its dangers, and must read the entire manual before attempting to set up, operate, adjust, or service the machine.

GB

When Performance Matters.™

1 CONTENTS

FOREWORD

This manual contains adjustment, maintenance, and troubleshooting instructions for your new Jacobsen machine. This manual should be stored with the equipment for reference during operation.

Before you operate your machine, you and each operator you employ should read the manual carefully in its entirety. By following the safety, operating and maintenance instructions, you will prolong the life of your equipment and maintain its maximum efficiency.

If additional information is needed, contact your Jacobsen Dealer.

SERVICE SUPPORT MATERIAL

Part No.	Description
676404	Safety, Operation & Maintenance Manual
676403	Parts Manual
4304579	Kubota D1105-E4B Engine Parts Manual

Part No.	Description
673831	Service Manual

CALIFORNIA PROPOSITION 65

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

Contents

1 INTRODUCTION

1.1 IMPORTANT

The SLF530 with a Diesel engine is a self propelled reel mower with hydraulic systems to power the traction drive, the cutting unit lift and lower, the cutting unit drives and the steering.

IMPORTANT: Do the maintenance indicated in this manual to make sure that the quality of cut is kept at a high level.

This Manual is part of the machine and must stay with the machine always. The suppliers of new, or used, machines need to keep this documentation and supply the owners with a copy.

You must use the machine to cut grass only and not for any other purpose. Compliance with the conditions of operation, service and repair specified by the manufacturer, are understood to be part of the correct use.

ALL operators **MUST** read through this manual and understand the Safety Instructions, controls, lubrication and maintenance procedures.

Make sure that you obey all safety and road traffic regulations.

You must not make any changes to the machine that are not approved by the manufacturer. This type of change can release the manufacturer from the liability for any damage or injury.

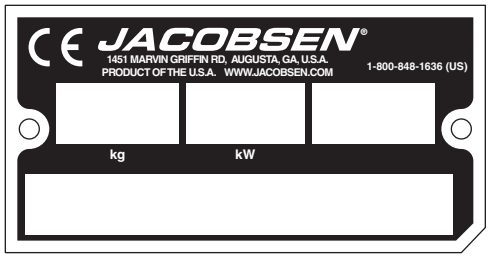
Discard worn parts in accordance with all local environment protection regulations. Use the local systems available in the country where the machine is used, for these recycled materials. When the machine is at its end of life, there are guidelines in this manual for the removal of the machine from use.

Use only Jacobsen Genuine spare parts to meet the machine type approval regulations specified by the European Union.

2006/42/EC

These instructions are the Original instructions confirmed by Jacobsen

1.2 PRODUCT IDENTIFICATION



Mower Serial number plate

AGross weight (Kg)

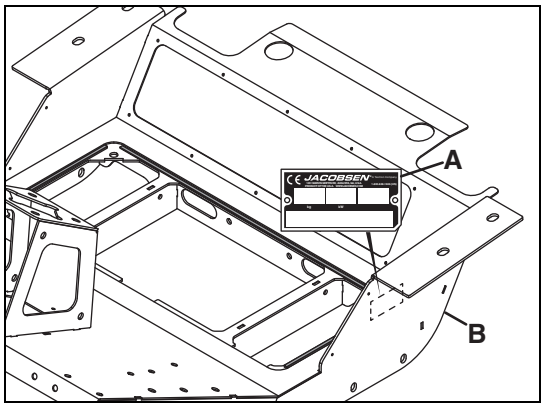
BEngine Power (Kw)

CDate code

DProduct number and Serial number

Location of Mower Serial number plate

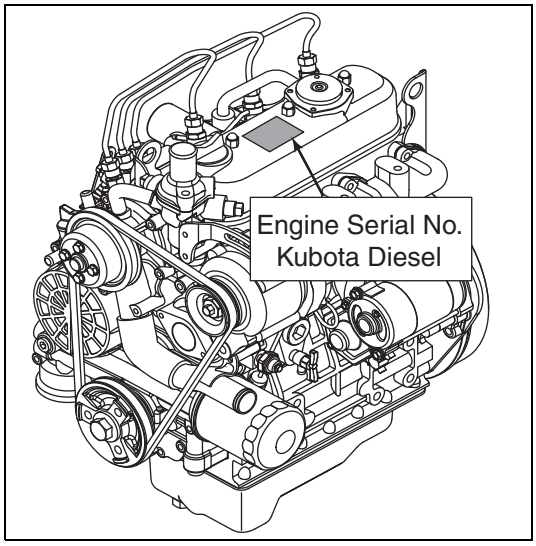
The serial number plate (A) is found on the left side wall of the operator platform. (B).



Engine Identification

The engine serial number is found on the top of the valve cover. The label shows the engine group and serial number

The engine serial number is also found on the engine block.



1.3 KEY NUMBERS

Record the mower and the engine serial numbers.

The serial numbers are found on the serial plates and the engine serial number is on the rocker cover.

Machine Serial Number: . . . . . .

Engine Serial Number: . . . . . .

1.4 PARTS MANUAL

To refer to the parts list for this mower you have two options:

1. Website – www.jacobsen.com. Select the “ONLINE PARTS LOOK-UP” tab. These pages will show the parts list and the line drawings you need to help with the identification of spare parts.
2. Website – www.jacobsen.com. Select the “MANUALS” tab. You have the option to view or “Download” a PDF version of the parts manual.

1 INTRODUCTION

1.5 GUIDELINES FOR THE DISPOSAL OF SCRAP PRODUCTS

1.5.1 DURING SERVICE LIFE

All the used fluids and parts must be controlled as hazardous materials. Recommended procedures must be followed for their safe removal.

If a fluid leak occurs, contain the spill to make sure that the leak does not flow into the ground or drainage system. Follow the regulations in force to make sure that leaks are controlled.

The maintenance procedures in this manual make sure that the damage that the machine can cause in the local environment is controlled.

When the machine completes its full service life, the following actions must be taken.

1.5.2 END OF SERVICE LIFE

These guidelines must be used with applicable Health, Safety and Environmental laws. Always use the approved local waste disposal and agencies for recycled materials.

- Park the machine in an applicable area to use all of the necessary lifting equipment.
- Use correct tools and Personal Protective Equipment (PPE) and take instruction from the technical manuals applicable to the machine.
- Remove and store correctly
  1. Batteries
  2. Fuel
  3. Engine coolant
  4. Oils
- Read the Technical Manual before you begin to disassemble the machine. Plan the disassembly, give attention to parts that are in a state of mechanical pressure or contain stored energy e.g springs.
- Items that continue to have a service life must be separated and returned to the local dealer.
- Items that are worn must be separated into the material groups and removed according to the agencies for the recycled materials that are available. Common examples.
  - Steel
  - Non ferrous metals
    - Aluminum
    - Brass
    - Copper
  - Plastic materials
    - Identified
    - Can be recycled
    - Can not be recycled
    - Not identified
  - Rubber
  - Electrical and Electronic Components
- Some parts are not easily separated e.g. Hydraulic hoses. These materials must be added to the “General discarded materials” area.
- Do not burn discarded materials.

Change the machinery records to show that the machine is not in operation and is discarded. Supply this serial number to The Jacobsen Warranty Department to close their records.

2.1 HOW TO OPERATE SAFELY

WARNING

EQUIPMENT OPERATED INCORRECTLY OR WITHOUT TRAINING CAN BE DANGEROUS.

Know the location and correct operation of controls. Operators without experience must receive instruction from a person trained in the correct operation of the equipment before being allowed to operate the mower.

Only use parts, accessories and attachments approved by Jacobsen.

2.1.1 SAFE OPERATION

a Read the Operator's Manual and other training material. If the operator or technician can not read this manual, the owner is responsible to describe this material to the operators and technicians. Manuals in additional languages may be available on the Jacobsen or RansomesJacobsen website.

a Read all of the instructions for this mower carefully. Know the controls and the correct operation of the equipment.

b Children or other people who do not understand these instructions must not use the mower. The local regulations can limit the age of the operator.

c Never use a mower near bystanders, including children or animals.

d Remember that the operator or owner is responsible for accidents or hazards that occur to other people or their property.

e Never carry passengers.

f Never allow anyone to operate or service the mower or its attachments without correct instructions.

g Do not operate equipment while tired, sick or after you use alcohol or drugs.

2.1.2 PREPARATION

a When you operate the mower, wear correct clothing, slip resistant work shoes or boots, work gloves, hard hat, safety glasses and hearing protection. Long hair, loose clothing or jewelry can be caught in moving parts.

b Do not operate the equipment with the Interlock System disconnected or the system does not operate correctly. Do not disconnect or prevent the operation of any switch.

c Never operate equipment that is not in correct order or without labels, guards, shields, deflectors or other protective devices fastened.

d Inspect the mower before you operate the mower. Check the tire pressure, engine oil level, the radiator coolant level and the air cleaner indicator. Fuel is flammable. Use caution when you add the fuel to the mower.

e Operate the mower in daylight or in good artificial light. Use caution when you operate the mower during bad weather. Never operate the mower with lightning in the area.

f Inspect the area to select the accessories and attachments that are needed to correctly and safely do the job. Only use parts, accessories and attachments approved by Jacobsen.

g Be careful of holes in the terrain and other hazards that are not visible.

h Inspect the area where the equipment is operated. Remove all objects you can find before you operate. Be careful of obstructions above the ground (low tree limbs, electrical wires) and also underground obstacles (sprinklers, pipes, tree roots). Enter a new area carefully. Look for possible hazards.

i Inspect the cutting system before you start the mower. Make sure the blades are free to rotate. When you rotate one blade, other blades can rotate.

2.1.3 OPERATION

a Never operate the engine without enough ventilation or in an enclosed area. The carbon monoxide in the exhaust fumes can increase to dangerous levels.

b Never carry passengers. Keep bystanders or animals away from the mower.

c Disengage all drives and engage the parking brake before you start the engine. Only start the engine with the operator in the seat. Never start the engine with anyone standing near the mower.

d Keep your legs, arms and body inside the operator compartment while the mower is in operation. Keep your hands and feet away from the cutting units.

e Do not use on the slopes greater than the safe slope limit for the equipment.

f To guard against over turning or loss of control:

– Operate the mower up and down on the face of slopes (vertically), but not across the face (horizontally).

– Do not start or stop suddenly on slopes.

– Decrease the speed when you operate on slopes or when you must turn. Use caution when you change direction. Turf condition can change the mower stability.

– Use caution when you operate the mower near drop-offs, ditches or embankments.

– Be careful of holes in the terrain and other hazards that are not visible.

g When you drive in the reverse direction, look behind you and down to make sure the path is clear. Do not operate the cutting units when you drive in the reverse direction.

h Use caution when you go near corners, trees or other objects that can prevent a clear view.

i Equipment must meet the current regulations to be driven on the public roads.

j Before you move across or operate on the paths or roads, turn off the mow switch, lift the mowers and travel at decreased speed. Look for traffic.

k Stop the blades when the mower is on any surface that is not grass.

l Do not release the cut grass in the direction of bystanders or allow bystanders near the mower while in operation.

m Do not operate the mower with damaged guards or without safety devices in position.

n Do not change the engine governor setting or over-speed the engine. Never change or tamper with adjusters that are closed with a seal for the engine speed control.

o Before you leave the operator compartment, for any reason:

– Disengage all the drives and lower attachments to the ground.

– Engage the parking brake.

– Stop the engine and remove the key.

p When you hit an object or mower starts to cause the vibration that is not normal, inspect the mower for damage and make repairs.

q Decrease the throttle setting before you stop the engine.

r Do not use this equipment for uses that the mower was not made for.

2.1.4 ROPS

a The ROPS is a safety device. Always use the seat belt when you operate a mower equipped with a ROPS. Make sure the seat belt can be released quickly in an emergency.

b Only operate the mower with the ROPS in the folded position on flat and level surfaces when necessary. Do not operate the mower with the ROPS in the folded position on slopes, near sharp edges or near water. There is no roll over protection with the ROPS in the folded position.

c Check for clearance before you drive below objects. Do not contact tree branches, electrical wires or other objects with the ROPS.

d Do not use the seat belt with the ROPS in the folded position.

e Inspect the ROPS for damage. Keep the ROPS hardware fastened.

f Do not weld, drill, change or bend the ROPS. Replace a damaged ROPS. Do not try to correct a damaged ROPS.

g Do not remove the ROPS from the mower.

h Jacobsen must approve any changes to the ROPS.

2.1.5 SAFE HANDLING OF FUELS

a The fuel and the fuel vapors are flammable. Use caution when you add fuel to the mower. The fuel vapors can cause an explosion.

b Never use containers that are not approved to keep or transfer fuel.

c Never keep the mower or fuel containers near an open flame or any device that can cause the ignition of fuel or fuel vapors.

d Never fill the fuel containers inside a vehicle or on a truck or trailer with a plastic liner. Always put the fuel container on the ground away from your vehicle before you fill the container.

e Refuel the mower before you start the engine. Never remove the fuel cap or add fuel to the mower when the engine is in operation or while the engine is hot.

f Refuel outdoors only and do not smoke when you add fuel. Extinguish all types of ignition.

g The fuel nozzle must touch the rim of the fuel tank when you add fuel to the mower. Do not use a device to lock the fuel nozzle in the open position.

h Do not over fill the fuel tank. Leave at least 1 inch (2.5 cm) below the filler neck.

i Always tighten the fuel tank cap and container cap after you add fuel.

j If the fuel spills on your clothing, change your clothing immediately.

2.1.6 MAINTENANCE AND STORAGE

a Before you clean, adjust or repair this equipment, push mow switch to the OFF position, lower the cutting unit to the ground, engage the parking brake, stop the engine and remove the key.

b Make sure the mower is parked on a solid and level surface.

c Never work on a mower that is lifted only by a jack. Always use jack stands.

d Never allow anyone to service the mower or its attachments without correct instructions.

e When the mower is parked, put into storage or left without an operator, lower the cutting device unless a positive mechanical lock is used.

f When you put the mower on a trailer or put the mower in storage, close the fuel valve. Do not keep fuel near flames or drain the fuel inside a building.

g Disconnect the battery before you service the mower. Always disconnect the negative battery cable before the positive battery cable. Always connect the positive battery cable before the negative battery cable.

h Charge the battery in an area with good airflow. The battery can release hydrogen gas that is explosive. To prevent an explosion, keep any device that can cause sparks or flames away from the battery.

i Disconnect the battery charger from the power supply before you connect or disconnect the battery charger to the battery. Wear protective clothing and use insulated tools when you service the battery.

j Be careful and wear gloves when you check or service the cutting unit blades. Replace any damaged blades, do not try to correct a damaged blade.

k Keep your hands and feet away from parts that move. Do not adjust the mower with the engine in operation, unless the adjustment needs the engine in operation.

l Carefully release the pressure from components with stored energy.

m To prevent injury from hot, high pressure oil, never use your hands to check for oil leaks. Use the paper or cardboard to find leaks.

n The hydraulic fluid pressure can have enough force to enter your skin. If hydraulic fluid has entered your skin, a doctor must remove the hydraulic fluid surgically within a few hours or gangrene can occur.

o When you service the hydraulic system, make sure the hydraulic fittings, tubes and hoses are tightened to the correct torque. Make sure the hydraulic system is in good condition before you start the engine.

p Keep the mower and the engine clean.

q Allow the engine to become cool before storage and always remove the ignition key.

r Keep all nuts, bolts and screws tight to make sure the equipment is in safe condition.

s Replace worn or damaged parts for safety. Replace damaged or worn labels. Only use parts, accessories and attachments approved by Jacobsen.

t To decrease the fire hazard, remove grass and other materials that burn from around the engine, muffler, battery tray and fuel tank area.

u Disconnect the battery and controller connectors before you weld on this mower.

2.1.7 WHEN YOU PUT THE MOWER ON A TRAILER

a Be careful when you load or unload the mower on a trailer. Trailer must be wider than the mower and can carry the weight of the mower.

b Use a trailer with a full-width ramp to load or unload the mower.

c Use straps, chains, cables or ropes to fasten the mower to the trailer. Both front and rear straps must be sent down and toward sides of trailer.

d Make sure that all latches are correctly fastened.

2.1.8 IMPORTANT SAFETY NOTES

This safety alert symbol gives a warning of possible hazards.

DANGER - Indicates a dangerous condition that WILL cause death or injury unless it is prevented.

WARNING - Indicates a dangerous condition that CAN cause death or injury unless it is prevented.

CAUTION - Indicates a dangerous condition that can cause injury and property damage unless it is prevented. The label can indicate work procedures that are not safe.

NOTICE - Indicates a condition that can cause damage to the property unless it is prevented. The label can indicate work procedures that are not safe.

Some illustrations in this manual show the shields, guards or plates, removed. Do not operate this equipment without these devices correctly fastened in position.

WARNING

The Interlock System on this mower prevents the operation of the mower unless:

a The parking brake is engaged.

b The mow switch is in the OFF position.

c The traction pedal is in the Neutral position.

The system will stop the engine if the operator leaves the seat without:

a The parking brake engaged.

b The mow switch in the OFF position.

NEVER operate the mower unless the Interlock System operates correctly.

WARNING

1. Before you leave the operator position, for any reason:
   a. Return the traction pedal to Neutral.
   b. Disengage all drives.
   c. Lower the mowers to the ground.
   d. Engage the parking brake.
   e. Stop the engine and remove the ignition key.
2. Keep your hands, feet and clothing away from moving parts. Wait for all movement to stop before you clean, adjust or service the mower.
3. Keep persons and animals away from the area of operation.
4. Never carry passengers.
5. Never operate the equipment without a correctly fastened grass deflector in position.

By following all instructions in this manual, you increase the life of your machine and keep its maximum performance. Adjustments and maintenance must always be done by an approved technician.

If additional information or if service is needed, contact your Authorized Jacobsen Dealer. Your Dealer knows the current methods to service this equipment.

⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

⚠ WARNING

To prevent injury from the hot oil at high pressure, do not use your hands to check for oil leaks. make sure that you use paper or cardboard.

Release of hydraulic fluid at high pressure has enough force to enter through the skin. if the fluid enters through the skin, the fluid must be surgically removed within hours by a specialist doctor or gangrene may result.

⚠ WARNING

When the machine is driven off-road, a seat belt must be worn at all times.

This warning is because a seat belt must be worn with a ROPS to follow the Machinery Directive,

2006/42/EC Sections 3.2.2, Seating & 3.4.3, Rollover. (ANSI B71.4-2012 section 20.7)

Jacobsen recommends that the owner/user of the machine completes a local risk assessment of the machine to find any conditions that do not follow this rule. e.g. when you drive the machine next to water or on the highway.

⚠ WARNING

Explosive gases are released by batteries. The battery contains corrosive acid and supplies an electrical current that is high enough to cause burn injuries to the body.

⚠ WARNING

You must not use this machine to tow other mowers or vehicles.

⚠ WARNING

Ear protection must be worn when you operate machines with an operator ear noise level of more than 85 db(a) leq.

⚠ WARNING

Vibration Exposure Limits

Exposure limits are calculated as a combination of the vibration level (magnitude) of the tool and the Daily Exposure Time (Trigger Time). E.g. A product with 5m/s² vibration can be used up to 2 hours/day to reach the EAV and up to 8 hours/day to reach the ELV.

Exposure Action Value (EAV) - Daily vibration exposure A(8) = 2.5m/s²

Where daily vibration exposure A(8) is below 2.5m/s² the risk is relatively low and no action need be taken

Exposure Limit Value (ELV) - Daily Vibration Exposure A(8) = 5.0m/s²

If several tools are used the exposure values must be combined:

Total exposure is then the combined value of the activities

⚠ WARNING

Never mow if there is a risk of lightning or when you hear thunder. If you are in the middle of mowing, stop in a safe place, turn off the engine and go inside a building.

⚠ CAUTION

When you do any welding on the machine, the battery, controller and display units must be disconnected before you start. You must not open the controller. If the controller is opened, this can cancel all of the warranties and can cause the failure of the machine.

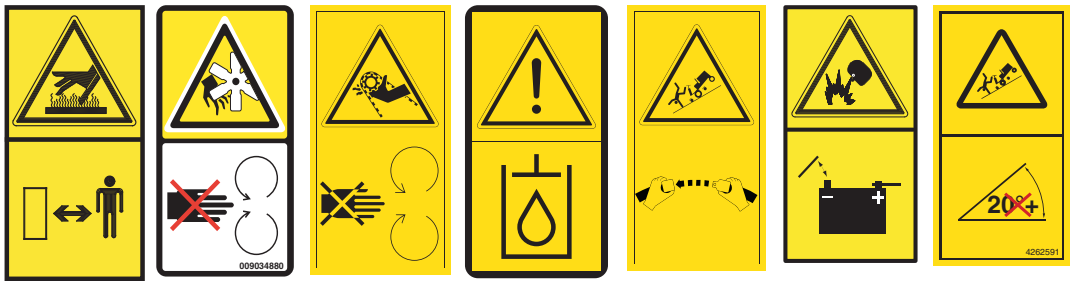
⚠ CAUTION

Personal Protective Equipment (PPE), For example safety glasses, leather work shoes or boots, a hard hat, leather work gloves and ear protection must be used after the owner/user completes a local risk assessment of the mower, to prevent injury.

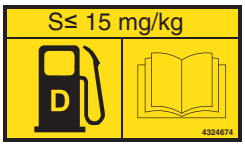
Training in all manual operations must be given by an approved person before the machine is used the first time.

3 LABELS

3.1 SAFETY LABELS



A B C D E F G



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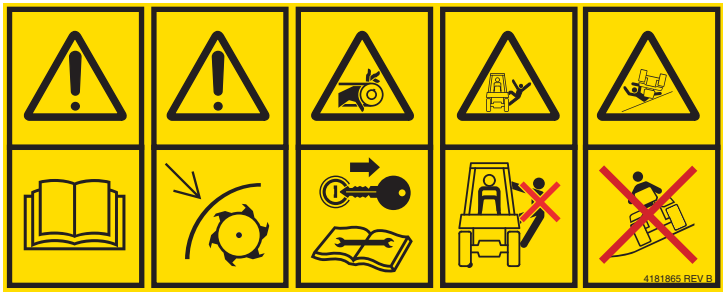
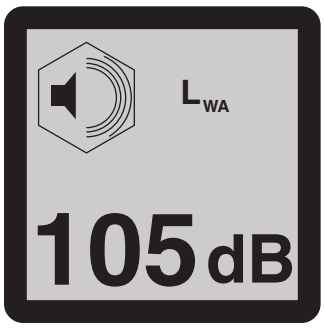


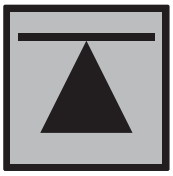
J

A	009034920	Caution, Stay Away From Hot Surfaces.
B	009034880	Caution, Fan blade, do not open or remove the safety shields while the engine is in operation.
C	009034900	Caution, Drive belt, do not remove the safety shields while the engine is in operation.
D	4164860	Caution, Hydraulic Oil
E	009114380	Caution, Fasten seat belt
F	009114100	Caution, Battery
G	4262591	Warning, 20° Slope
H	4324674	Caution, Low Sulfur Diesel Fuel.
J	4181865	Warning, Mower
	–	Read the manual. Do not allow persons without training to use the mower.
	–	Keep the shields in position and hardware fastened.
	–	Keep your hands, feet and clothing away from moving parts.
	–	Before you clean, adjust or repair this equipment, disengage all drives, engage the parking brake and stop the engine.
	–	Never carry passengers.
	–	When mower is in operation, keep persons and animals away.

3.2 INSTRUCTION LABELS



A

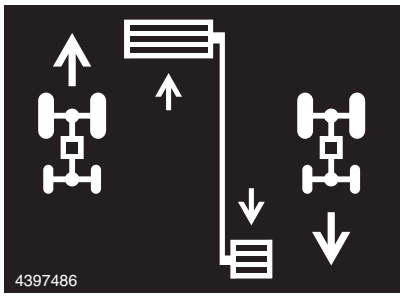


B

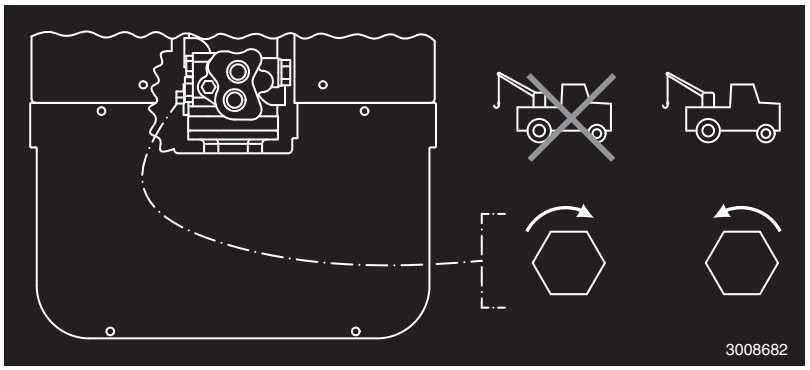
C

D

G



E



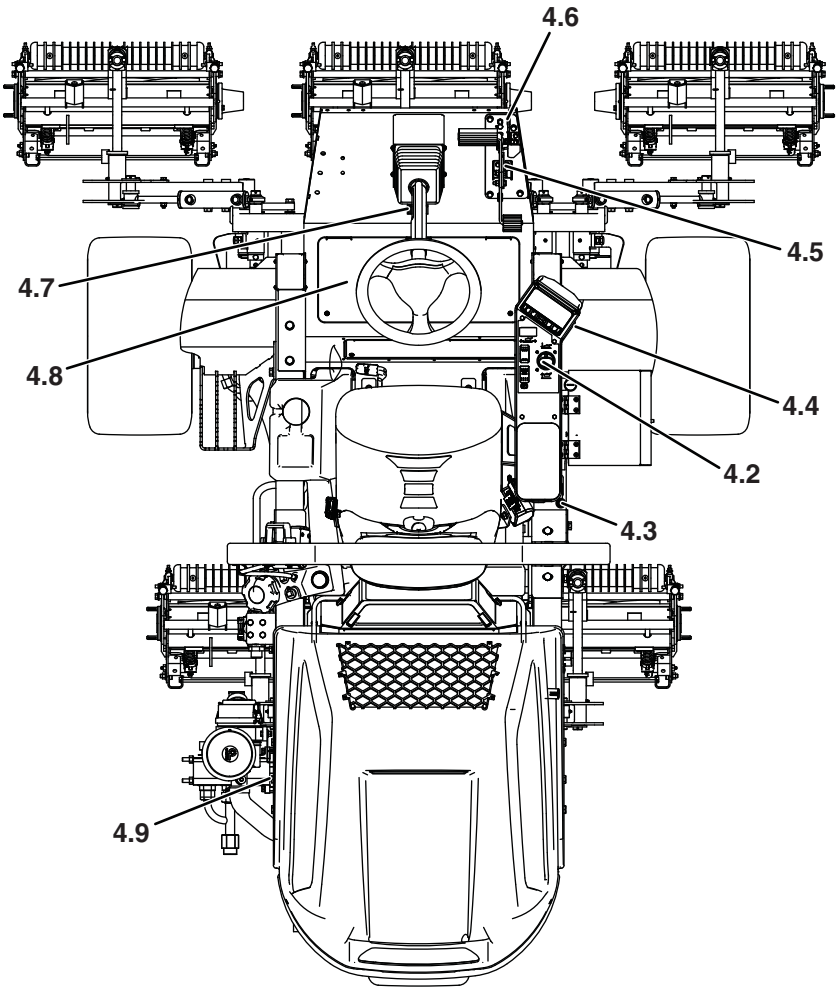
F

Description

A	009034770	Guaranteed Sound Power Level
B	4397046	Jacking Point
C	673581	Tire Pressure
D	4164580	Lubrication Point
E	4397486	Traction Pedal
F	3008682	Tow Valve
G	838363	Throttle

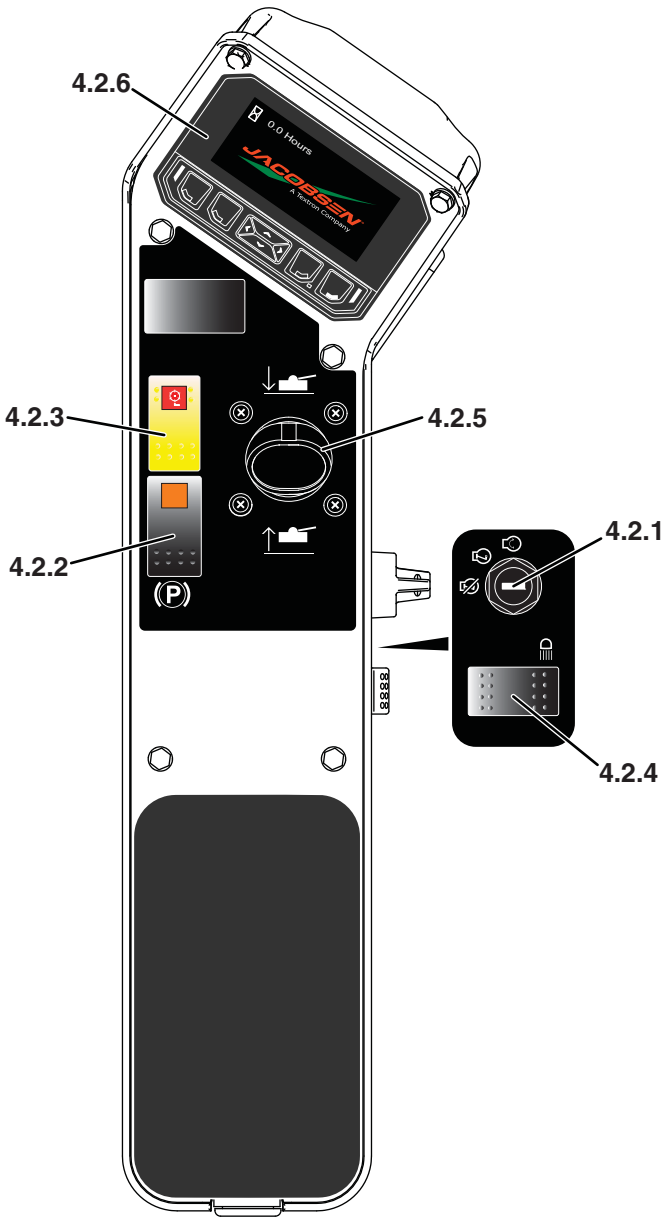
4 CONTROLS

4.1 OPERATOR COMPARTMENT



4.2 - Control Panel
4.3 - Throttle Control
4.4 - Armrest Adjuster
4.5 - Traction Pedal
4.6 - Mow Speed Lever
4.7 - Steering Tilt Lever
4.8 - Brake Valve (Under Floorboard)
4.9 - Tow Valve

4.2 CONTROL PANEL



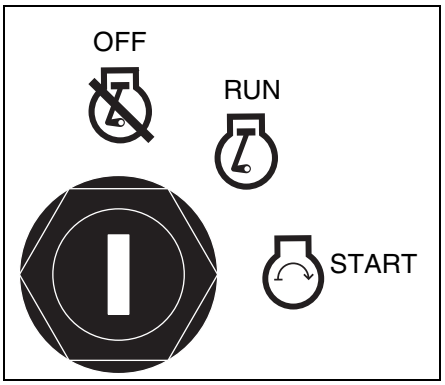
4.2.1 - Key Switch
4.2.2 - Parking Brake Switch
4.2.3 - Mow Switch
4.2.4 - Light Switch (Optional)
4.2.5 - Lift/Lower Joystick
4.2.6 - Visual Display

4.2.1 KEY SWITCH

Turn the key switch to the 'START' position to start the engine. When the engine starts, release the key and allow to return automatically to the 'RUN' position.'

To stop the engine, turn the key to the 'OFF' position.

NOTE. There can be a time delay before the engine starts, it depends on the engine temperature while the glow plugs operate automatically.



4.2.2 PARKING BRAKE SWITCH

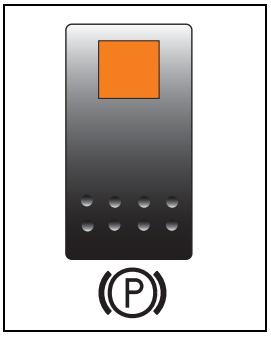
Move the orange button back and press the front of the switch to engage the parking brake.

When the engine is stopped, the parking brake is applied with the switch in both the ON and OFF position.

To release the parking brake, press the rear of the switch.

The parking brake icon (P) is displayed on the visual display screen when engaged.

DO NOT apply the brake while the machine is in motion.



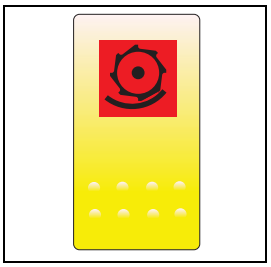
4.2.3 MOW SWITCH

The mow switch engages cutter rotation.

To cut grass, push the front of the switch and move the joystick forward to lower the cutting units. When the switch is in the ON position, the red LED on the switch is illuminated.

To stop the drive to the cutting units, press the rear of the mow switch.

When lifted out of work or the operator leaves the seat, cutting units rotation is stopped.

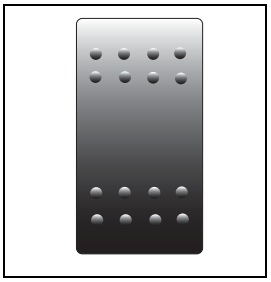


4.2.4 LIGHT SWITCH

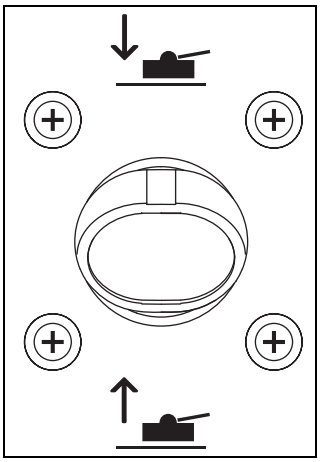
Turns the work lights ON and OFF..

Push the top of the switch to turn the lights ON.

Push the bottom of the switch to turn the lights OFF.



4.2.5 LIFT/LOWER JOYSTICK



The lift/lower joystick controls the lift and lower operation of the cutting units. The lift/lower joystick operates in One-Touch or manual mode. Push the lift/lower joystick to lower the cutting units or pull the lift/lower joystick to lift the cutting units.

The One-Touch or manual mode is set on the display.

Manual Mode - When One-Touch is disabled, the cutting units will lift or lower only while the lift/lower joystick is pulled or pushed.

One-Touch Mode - With One-Touch enabled and the mow switch is in the ON position, push and release the lift/lower joystick to lower the cutting units to the ground and start the reel. Pull and release the lift/lower joystick to completely lift the cutting units and stop the reels.

4.2.6 VISUAL DISPLAY

The visual display is activated when the key switch is turned to the ‘RUN’ position.

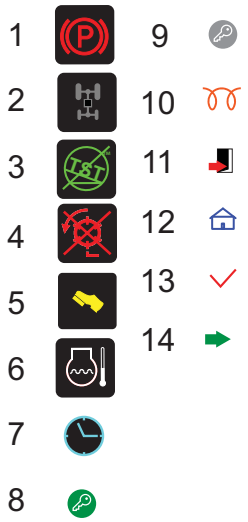
4.2.6.1 STARTUP SCREEN

When the key switch is turned to the ‘RUN’ position, this screen is shown for two seconds.

The hour meter will show total hours of engine operation.

4.2.6.2 WARNING / SERVICE SCREEN

After the startup screen the warning screen is visible for three seconds. If there is no input needed, the main screen will become visible. If a fault condition has occurred during the previous start, a pop up screen will become visible over the top of the warning screen. The operator must confirm the fault before they can move to the main screen.



ICONS

1.	Parking Brake Engaged
2.	4WD
3.	TST Not Installed or not active
4.	Cutter Switch Indicator (Indicates mow switch in ON position and mow speed lever is in MOW position)
5.	Foot Pedal Warning (Flashes if not in neutral position on start up)
6.	Engine Temperature Indicator (Below bar graph)
7.	Time
8.	Key in START position
9.	Key not in START position
10.	Glow Plug Active
11.	Back
12.	Home
13.	Select
14.	Menu item to be selected.

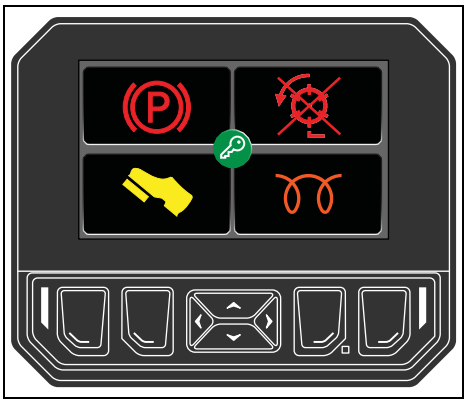
4.2.6.3 FIRST SCREEN

This screen shows the position of the interlock switches, the 4WD is not active and coolant temperature indicator.

The engine temperature gauge is on the right side. The color will be green with engine temperature below 203° F (95° C). The color will be orange with the engine temperature between 203° F (95° C) and 220° F (104° C). The color will be red with the engine temperature above 220° F (104° C).

4.2.6.4 ENGINE START

When the key switch is turned to the start position and the interlocks are set, this screen is shown.



To start the engine, the parking brake switch must be in the ON position, the mow switch must be in the OFF position and the foot pedal must be in the Neutral position.

4.2.6.5 THE ENGINE WILL NOT START

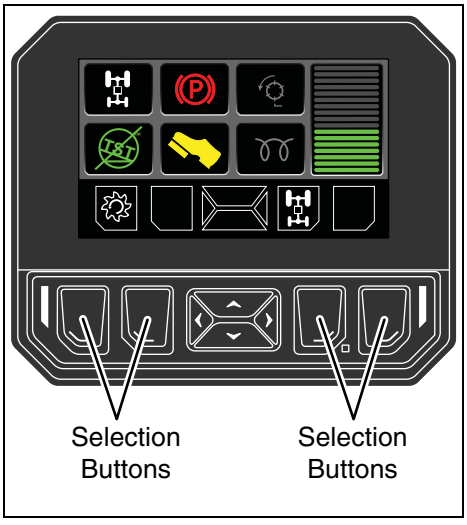
When the ignition key is turned to the start position and the interlocks are not set, this screen is shown.

- The parking brake switch is not in the ON position. The icon will flash red and gray.
- The mow switch is not in the OFF position. The icon will flash red and gray.
- The foot pedal is not in the Neutral position. The icon will flash yellow and gray.

The engine will not start until all the items in the list are correct.

4.2.6.6 TASKBAR POP-UP MENU

When the first screen is shown on the display, press any of the selection buttons to display the Taskbar Pop-Up Menu.



With the reels active, press the first selection button to active the Debris Clear. This will stop the reels for three seconds, operate the reels in the reverse direction for three seconds, stop the reel for three seconds and operate the reels in the normal direction.

To engage 4WD, press any of the selection buttons to display the Taskbar Pop-Up Menu and press the third button from the left. The 4WD icon will turn on and 4WD will be active when driving in the forward direction.

To disengage 4WD, press any of the selection buttons to display the Taskbar Pop-Up Menu and press the third selection button from the left. The 4WD icon will turn off and the mower will be set to 2WD. The mower will also be in 2WD if the ignition key is turned to the OFF position and the mower is restarted.

4.2.6.7 MAIN MENU

When the first screen is shown on the display, press the LEFT or RIGHT arrow keys to access the main menu.

4.2.6.8 MENU NAVIGATION

When the first screen is shown on the display, press the LEFT or RIGHT arrow keys to access the main menu.

Use the UP and DOWN arrow keys to move the selection arrow up or down the list.

Press the select button to select menu item indicated by the arrow.

Press the back button to return to the previous screen.

Press the home button to return to the first screen.

The main menu has Language, Clock, Display Settings, Vehicle Settings (Requires PIN), Service and Backlap.

4.2.6.9 LANGUAGE

Press the LEFT or RIGHT arrow keys to display the main menu.

Use the UP and DOWN arrow keys until the green arrow is next to Language. Press the select button to select Language.

Use the UP and DOWN arrow keys until the green arrow is next to the needed language.

Press the select button to select the language.

Press the back button to return to previous menu.

4.2.6.10 CLOCK

Press the LEFT or RIGHT arrow keys to display the main menu.

Use the UP and DOWN arrow keys until the green arrow is next to Clock. Press the select button to select Clock.

The ✓ is moved with the UP and DOWN arrow keys to select, date, time or date format.

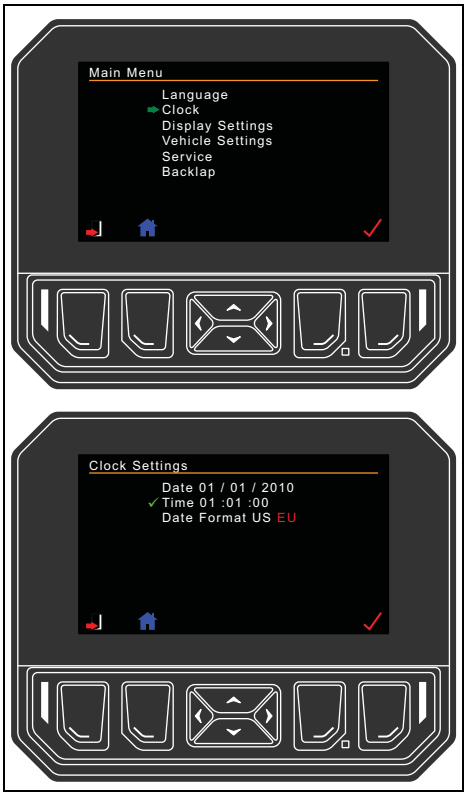
The button accepts the option that has the ✓.

Use the UP and DOWN arrow keys to increase or decrease the value.

Use the LEFT or RIGHT arrow keys to move between fields.

Press the select button to set.

Press the button to return to previous menu.



4.2.6.11 DISPLAY SETTINGS

Press the LEFT or RIGHT arrow keys to display the main menu.

Use the UP and DOWN arrow keys until the green arrow is next to Display Settings. Press the select button to select Display Settings.

Press the select button to set.

Press the button to return to previous menu.

4.2.6.12 VEHICLE SETTINGS MENU

Press the LEFT or RIGHT arrow keys to display the main menu.

Use the UP and DOWN arrow keys until the green arrow is next to Vehicle Settings. Press the select button to select Vehicle Settings.

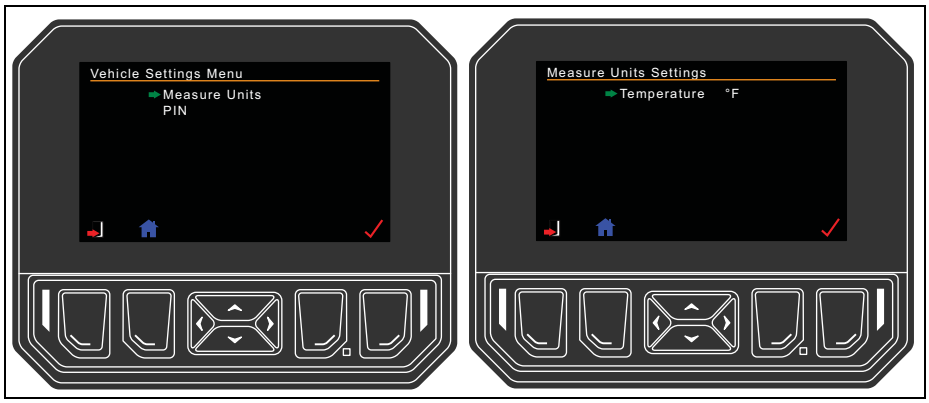
The vehicle settings menu has the Measure Units and PIN.

4.2.6.13 MEASURE UNITS

Navigate to the Vehicle Settings Menu.

Use the UP and DOWN arrow keys until the green arrow is next to Measure Units. Press the select button to select Measure Units.

Use the arrow keys to change the unit of measure. The temperature unit of measure can be set to either °C (Celsius) or °F (Fahrenheit).



4.2.6.14 ENTER PIN

Start the engine. Navigate to the Vehicle Settings Menu.

Use the UP and DOWN arrow keys until the green arrow is next to PIN. Press the select button to select PIN.

Use the arrow keys to highlight the correct number. Press the select button to enter the number and to advance to the next position. Repeat until all four numbers of the pin have been entered.

Highlight the C and press the select button to clear the previous number.

If the correct PIN number has been entered the PIN menu will be on the display.

The initial PIN number is 1001

Notice: Managers are advised to change the PIN to stop the machine parameters being changed.

4.2.6.15 SERVICE MENU

Press the LEFT or RIGHT arrow keys to display the main menu.

Use the UP and DOWN arrow keys until the green arrow is next to Service. Press the select button ✓ to select Service.

The Service Menu has the Fault Log, Time Until Service, Vehicle Status and I/O Diagnostics.

4.2.6.16 FAULT LOG

Navigate to the Service Menu.

Use the UP and DOWN arrow keys until the green arrow is next to Fault Log. Press the select button to select Fault Log.

The last 50 “Faults” that the controller finds are recorded. When 50 faults are recorded, the fault that next occurs will write over the oldest fault.

The Engine, records the engine shut downs because of overheat or loss of oil pressure.

The Service, records hydraulic by-pass fault and missed service.

Press the button to select, press the UP and DOWN arrow keys to move the green arrow. The errors will move with the last error at the top of the screen.

Select the fault log to be accessed and accept to show the details.

These details show the date and time of the fault.

Press the back button to return to previous menu.

4.2.6.17 TIME UNTIL SERVICE

Navigate to the Service Menu.

Use the UP and DOWN arrow keys until the green arrow is next to Time Until Service. Press the select button to select Time Until Service.

Press the back button to return to previous menu.

To reset the service hours, access the Pin Menu and select Reset Service Hours.

4.2.6.18 VEHICLE STATUS

Start the engine. Navigate to the Service Menu.

Use the UP and DOWN arrow keys until the green arrow is next to Vehicle Status. Press the select button to select Vehicle Status.

The first screen of the vehicle status shows the battery voltage and the engine coolant temperature.

The second screen of the vehicle status shows the software revisions of the MCU controller and display.

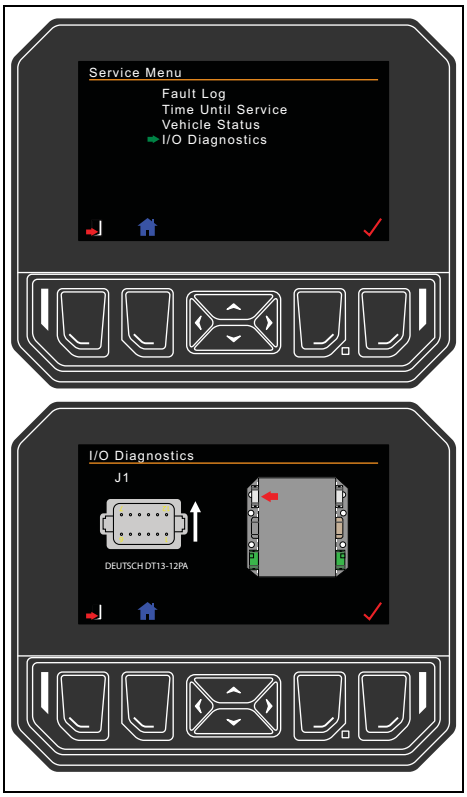
Press the back button to return to previous menu.

4.2.6.19 I/O DIAGNOSTICS

Start the engine. Navigate to the Service Menu.

Use the UP and DOWN arrow keys until the green arrow is next to I/O Diagnostics. Press the select button to select I/O Diagnostics.

Use the UP and DOWN arrow keys until the red arrow is next to connector you want to check the status of. Press the select button to select the connector.



4.2.6.20 CONNECTOR J1

This screen shows the status of the J1 connector circuits.

Press the left side button to return to I/O diagnostics menu.

Values are shown for illustration purposes only.

4.2.6.21 CONNECTOR J2

This screen shows the status of the J2 connector circuits.

Press the left side button to return to I/O diagnostics menu.

Values are shown for illustration purposes only.

4.2.6.22 CONNECTOR J3

This screen shows the status of the J3 connector circuits.

Press the left side button to return to I/O diagnostics menu.

Values are shown for illustration purposes only.

4.2.6.23 CONNECTOR J4

This screen shows the status of the J4 connector circuits.

Press the left side button to return to I/O diagnostics menu.

Values are shown for illustration purposes only.

4.2.6.24 CONNECTOR J5

This screen shows the status of the J5 connector circuits.

Press the left side button to return to I/O diagnostics menu.

Values are shown for illustration purposes only.

4.2.6.25 CONNECTOR J6

This screen shows the status of the J6 connector circuits.

Press the left side button to return to I/O diagnostics menu.

Values are shown for illustration purposes only.

4.2.6.26 BACKLAP

See Section 8.17 for the instructions to backlap the reels.

4.2.6.27 ONE TOUCH

Navigate to the PIN Menu. **See 4.2.6.14**

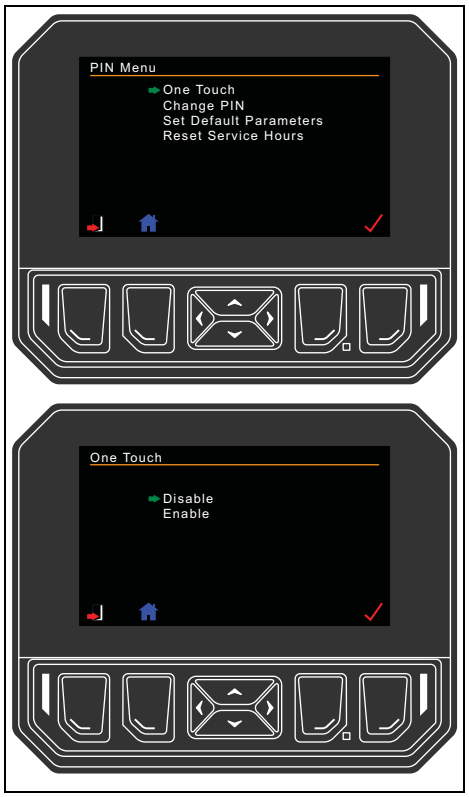
Use the UP and DOWN arrow keys until the green arrow is next to One Touch. Press the select button to select One Touch.

Use the UP and DOWN arrow keys until the green arrow is next to Enable or Disable. Press the select button to accept.

Disable - The cutting units lift or lower only while the lift/lower joystick is pushed or pulled.

Enable - Joystick is pressed and released to lower the cutting units or to lift the cutting units.

Press the back button to return to previous menu.



4.2.6.28 CHANGE PIN

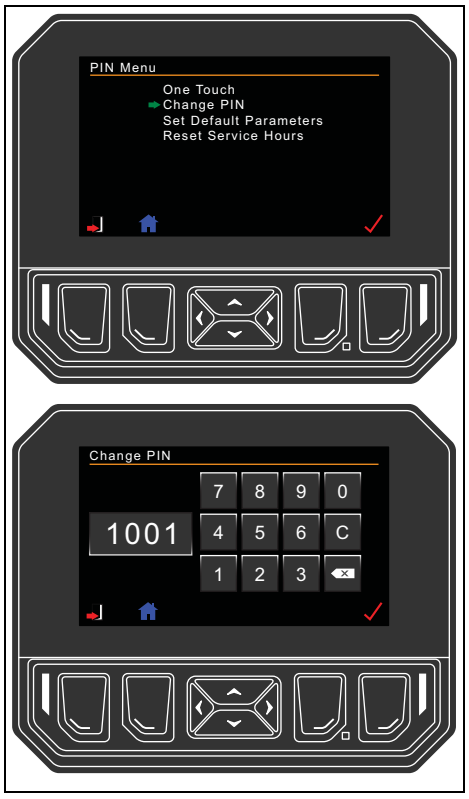
Navigate to the PIN Menu.**See 4.2.6.14**

Use the UP and DOWN arrow keys until the green arrow is next to Change PIN. Press the select button to select Change Pin.

Use the arrow keys to highlight the new correct number. Press the select button to enter the number and to advance to the next position. Repeat until all four numbers of the pin have been entered.

Select . To accept.

Press the back button to return to previous menu.



4.2.6.29 SET DEFAULT PARAMETERS

Navigate to the PIN Menu. **See 4.2.6.14**

Use the UP and DOWN arrow keys until the green arrow is next to Set Default Parameters. Press the select button to select Set Default Parameters.

Press the select button to reset the mower to default parameters.

Press the back button to return to previous menu.

4.2.6.30 RESET SERVICE HOURS

Navigate to the PIN Menu. **See 4.2.6.14**

Use the UP and DOWN arrow keys until the green arrow is next to Set Default Parameters. Press the select button to select Reset Service Hours.

Press the select button to reset the service hours.

Press the back button to return to previous menu.

WARNINGS

NOTICE

The number in the top right of the screen indicates the total number of current faults recorded. If more than one fault, it will cycle all current faults.

4.2.6.31 WARNING OIL-PRESSURE FAULT

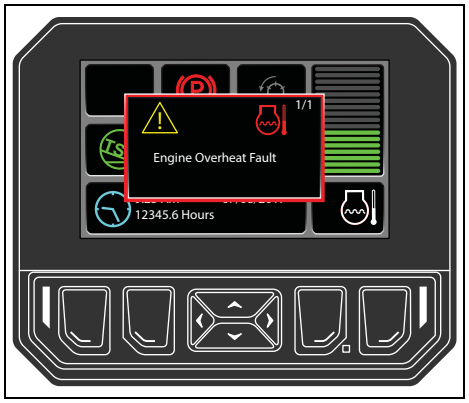
When this screen is shown, the engine oil pressure has decreased below the normal level. If this happens during operation, Stop the engine and check the oil level. Top up if necessary. If the problem persists consult your service dealer.

4.2.6.32 WARNING ENGINE OVERHEAT

When this screen is shown, the engine temperature has risen above the normal levels.

Park the machine in a safe area disengage cutting units, set engine to idle to allow engine temperature to decrease prior to switching off the engine.

Clean the radiator and screens of all grass and debris.



4.2.6.33 WARNING CAN TIMEOUT

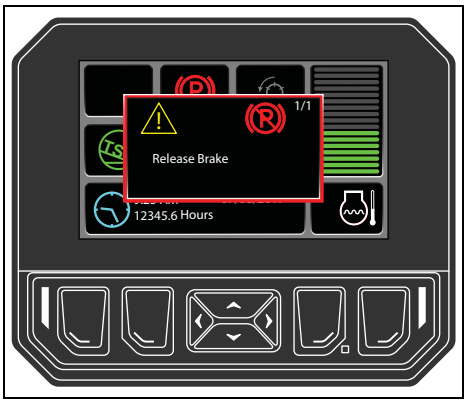
This screen is shown if there is no CAN communication from the MCU for 3 seconds.

Stop the machine as soon as possible and contact your service dealer. Check the armrest and controller harness connections.

4.2.6.34 WARNING RELEASE BRAKE

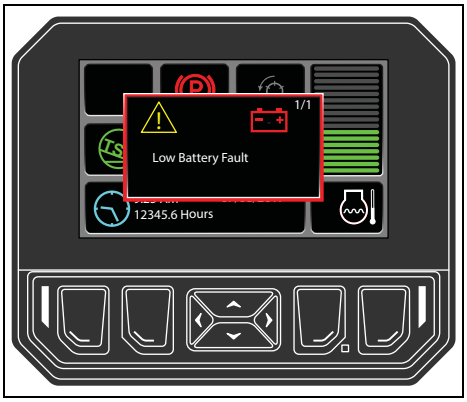
When this screen is shown, the traction pedal was pressed with the parking brake engaged.

Disengage the parking brake before the traction pedal is pressed.



4.2.6.35 WARNING BATTERY FAULT

When this screen is shown, the battery is below 10.5V for 30 seconds.



4.2.6.36 WARNING SERVICE NEEDED

When this screen is shown, scheduled maintenance is required.

4.2.6.37 WARNING CONTROLLER I/O FAULT

When this screen is shown, there is a controller I/O fault.

Go to I/O Diagnostics for solenoid identification. **See Section 4.2.6.19**

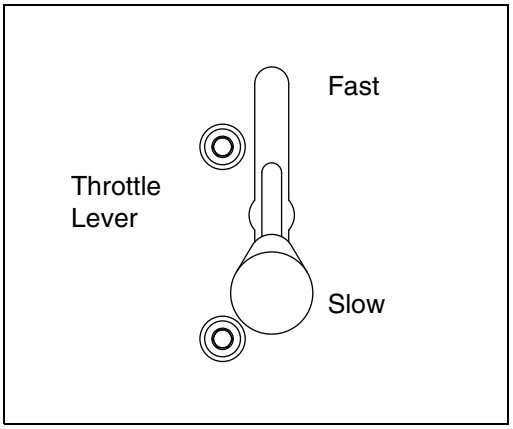
Glow Relay Fault (J5-8)
Start Relay Fault (J1-6)
Fuel Hold Fault (J2-6)
Fuel Pull Fault (J6-1)
Park Brake Solenoid Fault (J2-5)
Lower Solenoid Fault (J2-1)
Lift Solenoid Fault (J2-3)
Mow Solenoid Fault (J5-2)
Backlap Solenoid Fault (J6-3)
Fan Output Fault (J2-4)
4WD Relay Fault (J5-7)

4.3 THROTTLE LEVER

The throttle lever controls the engine speed. Always operate the mower at full throttle during normal operation.

Push the throttle lever toward the front of the mower to increase engine speed.

Pull the throttle lever toward the rear of the mower to decrease engine speed.



4.4 ARMREST ADJUSTER

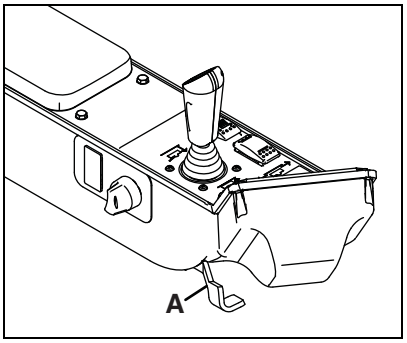
The armrest adjuster is found on the right side under the Armrest.

- Lift up on the adjuster lever and slide the armrest in the forward or rearward direction. Release the adjuster lever to set the adjustment.

⚠ CAUTION

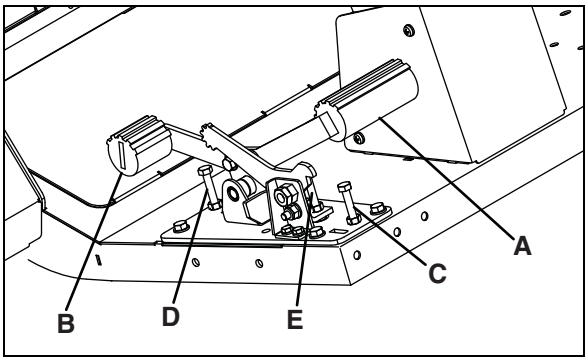
To prevent injury or property damage, do not adjust the armrest position while the mower is in motion.

See Section 7.4 for armrest height and angle adjustments.



4.5 TRACTION PEDAL

The traction pedal is found on the right side of the footplate.

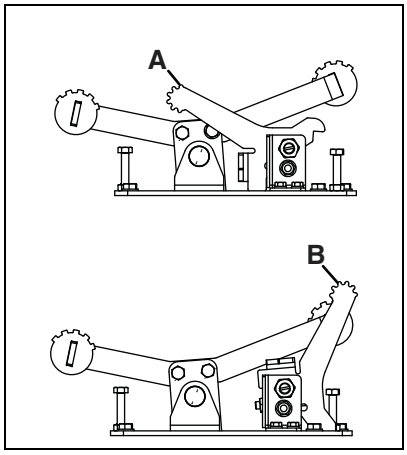


- Carefully press the top (A) of the foot pedal to reach the forward speed that you need.
- To stop - Carefully return the foot pedal to the Neutral position.
- To move in the reverse direction press the bottom (B) of the foot pedal.

There are adjustable stops for the forward transport speed (C) and for the reverse speed (D). When the mow speed lever is in the Mow Position, the pedal will contact the mow speed stop (E)

4.6 MOW SPEED LEVER

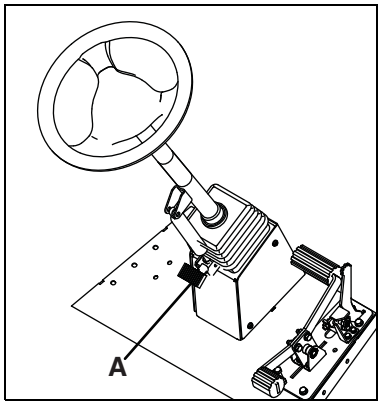
The mow speed lever is used to limit the forward speed while mowing.



- When you mow, rotate the mow speed stop lever to mow position (A) so the traction pedal contacts the stop when the traction pedal is pressed. The mow speed stop can be adjusted to set specific mow speeds.
- To travel at full speed, rotate the mow speed lever to transport position (B).

4.7 STEERING TILT CONTROL

While you hold the steering wheel, press the small foot pedal (A) at the base of the steering column.

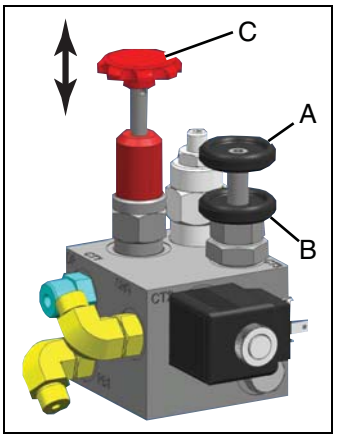


Tilt the column backward or forward to the correct position. Release the small foot pedal to lock the steering column in position.

⚠ CAUTION

To prevent injury or property damage, do not adjust the steering tilt control position while the mower is in motion.

4.8 PARKING BRAKE RELEASE VALVE

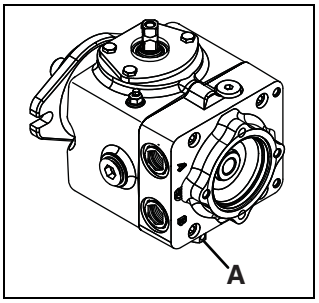


The Parking Brake Release Valve is situated under the operator platform, on the left hand side of chassis plate. The Parking Brake Release Valve is used to release the parking brake when the engine is not in operation.

To release the parking brake, loosen lock wheel (B) and rotate hand wheel (A) to the right (Clockwise) until it reaches the internal stop. Operate the hand pump until there is enough pressure to release the brakes in the wheel motors (50 to 60 strokes will give approximately 90 seconds of brake release. To reapply the parking brake, rotate hand wheel (A) to the left (Counter-Clockwise) until it reaches the internal stop. Tighten lock wheel (B).

This method of brake release is to recover the vehicle a short distance only and should be carried out on level ground.

4.9 TOW VALVE



The Tow valve is situated on the bottom of the transmission pump.

1. To push the machine, disengage the parking brake, **See Section 4.8**
2. Turn screw (A) located on the rear side of the transmission pump three complete turns counterclockwise. Set the steering wheel so that the rear wheels are pointing straight ahead.
3. After pushing the machine, reapply the parking brake. **See Section 4.8**
4. Rotate screw (A) on the pump three complete turns clockwise to return the pump to normal operation.

⚠ WARNING

THE FREE WHEEL FACILITY IS FOR RECOVERY PURPOSES ONLY.

Do not tow the machine for more than a few meters, or allow the machine to free wheel down slopes even when unloading down ramps.

5.1 DAILY INSPECTION

⚠ CAUTION

The inspection must be done each day when the engine is turned off and all fluids are cold. Lower the cutting units to the ground, engage the parking brake, stop the engine and remove the ignition key.

Do a visual inspection of the mower. Look for indications of wear or loose hardware. Look for any components that are not included on the mower or damaged components. Check for fuel and oil leaks to make sure the connections are tight. Make sure that all hoses and tubes are in good condition.

Check the fuel supply, radiator coolant level, crankcase oil level and air cleaner indicator. When the engine is cold, all fluids must be at the full level mark.

Check the radiator fins for dirt or grass. Clean with compressed air as required before you operate the mower.

Make sure all cutting units are adjusted to the same cutting height. **See Section 7.10**

Check all tires for the correct pressure. **See Section 8.1**

Test the interlock system. **See Section 5.2**

5.2 INTERLOCK SYSTEM

The Interlock System prevents the engine from starting unless the parking brake switch is in the ON position, the traction pedal is in the NEUTRAL position and the mow switch is in the OFF position. The system stops the engine if the operator leaves the seat with the mow switch in the ON position, traction pedal out of the NEUTRAL position or the parking brake switch in the OFF position. The engine will stop if the traction pedal is pressed with parking brake switch in the ON position.

⚠ WARNING

Do not operate the equipment with the Interlock System disconnected or if the system does not operate correctly. Do not disconnect or prevent the operation of any switch.

Do each of these tests to make sure the Interlock System operates correctly. If any of the tests fail, stop the test and have the system inspected and repaired as shown below:

- The engine does not start during test 1
- The engine does start during tests 2, 3 and 4
- The engine continues to run during tests 5 and 6

Refer to the chart below for each test and follow the check (✔) marks across the chart. Turn off the engine between each test.

TEST 1: The test shows the normal engine start procedure. The operator is in the seat, parking brake switch is in the ON position, the traction pedal is in the NEUTRAL position and the mow switch is in the OFF position. The engine will start.

TEST 2: The engine must not start if the mow switch is in the ON position.

TEST 3: The engine must not start if the parking brake switch is in the OFF position.

TEST 4: The engine must not start if the traction pedal is out of the NEUTRAL position.

TEST 5: Start the engine with the normal procedure. Turn on the mow switch and lift your weight off the seat. The engine must stop. The cutting unit reels must not rotate after seven (7) seconds.

TEST 6: Start the engine with the normal procedure. Turn off the parking brake switch and lift your weight off the seat. The engine must stop. The cutting unit reels must not rotate after seven (7) seconds.

Test	Operator Seated		Mow Switch OFF		Parking Brake Switch ON		Traction Pedal in Neutral		Engine Starts	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
1	✔		✔		✔		✔		✔	
2	✔			✔	✔		✔			✔
3	✔		✔			✔	✔			✔
4	✔		✔		✔			✔		✔
5	✔	★	✔	★	✔		✔		★	
6	✔	★	✔		✔	★	✔		★	
★ Start the engine with the normal procedure, move position of the switch and lift your weight off the seat. The engine must stop immediately and the cutting unit reels must not rotate after seven (7) seconds.										

5.3 OPERATING PROCEDURE

⚠ WARNING

This mower has a Roll Over Protection Structure (ROPS). Always wear the seat belt with the ROPS.

If the mower is over turning, hold the steering wheel. Do not try to move off the mower or leave the seat.

⚠ CAUTION

To prevent injury, always wear the safety glasses, leather work shoes or boots, a hard hat and ear protection.

1. Always start the engine with the operator in the seat, never while next to the mower. Never start the engine with people near the mower.
2. Never operate the engine without enough ventilation or in an enclosed area. The carbon monoxide in the exhaust fumes can increase to dangerous levels.
3. Keep your hands and feet away from moving parts and the cutting units. When possible, do not adjust the mower with the engine started.
4. Do not operate the mower with loose or damaged components. All components must be correctly fastened to the mower. Mow when the grass is dry to get the best results.
5. First cut in a test area so that you completely understand the operation of the tractor and controls.
6. Inspect the area to find the safest procedure for the mower. Check the height of the grass, the type of terrain and the conditions of the surface. Each condition needs the correct adjustments and precautions.
7. Do not release the cut grass in the direction of people or allow people near the mower while in operation. The owner and operator are responsible for injuries caused to people near the mower and any damage to their property.

⚠ CAUTION

Remove all objects you can find before you operate the mower. Carefully enter a new area and always operate at speeds that allow you to control the mower safely.

8. Be careful when you operate near gravel areas (roads, parking areas, cart paths). Stones released from the equipment can cause injuries to people and cause damage to the equipment.
9. When you are not mowing grass, always turn off the mow switch.
10. Before you move across or operate on paths or roads, turn off the mow switch, lift the cutting units and travel at decreased speed. Look for traffic.
11. When you hit an object or a vibration starts that is not normal, inspect the mower for damage and make repairs.

⚠ WARNING

Before you clean, adjust or repair this equipment, always turn off the mow switch, lower the cutting units to the ground, turn on the parking brake switch, stop the engine and remove the ignition key.

12. Travel at decreased speed and be careful when you operate on the slopes or near sharp edges.
13. When you drive in the reverse direction, look behind you and down to make sure the path is clear. Use caution when you go near corners, trees or other objects that can prevent a clear view.
14. Never use your hands to clean the cutting units. Use a brush to remove the grass clippings from the reels. The reel blades are sharp and can cause injuries.

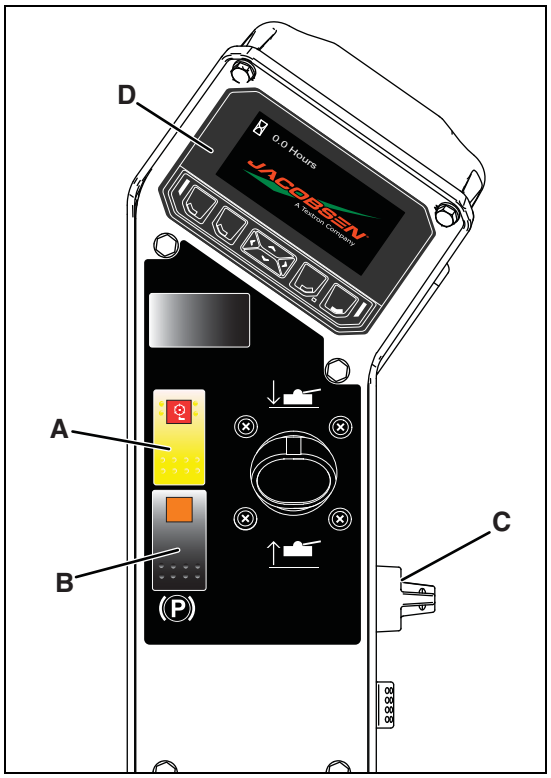
5.4 STARTING THE ENGINE

Start the engine with the operator in the seat, the mow switch (A) in the OFF position and the parking brake switch (B) in the ON position. Remove your foot from the traction pedal. Always wear the seat belt.

Set the throttle lever to half throttle.

Turn the ignition switch (C) to the RUN position. The display (D) will turn on.

Turn the ignition switch to the START position. Release the key when the engine starts. Allow 30 seconds between start tries to allow the starter motor to become cool.



NOTICE

Do not hold the ignition switch in the START position for more than 10 seconds. After 10 seconds, the start circuit is disabled. Turn the ignition switch to the OFF position to set the start circuit again.

NOTE. There can be a time delay before the engine starts, it depends on the engine temperature while the glow plugs operate automatically.

When the engine starts, all of the warning lights will turn off. Allow the engine to become warm before you operate the engine at full throttle.

5.5 TO STOP THE ENGINE

To stop and park the mower in normal conditions:

1. Turn the mow switch to the OFF position. Drive the mower to a flat and level area to park the mower.
2. Remove your foot from the traction pedal.
3. Lower the cutting units to the ground. Turn the parking brake switch to the ON position.
4. Place the throttle lever to low idle.
5. Turn the ignition switch to the OFF position and remove the key before you leave the operator seat.

If an emergency occurs and you must park the mower in the area of operation, follow the guidelines set by the grounds manager. If the mower is parked on a slope, chock or block the wheels.

5.6 DRIVING

Read and follow all safety instructions contained in this manual when you drive the mower. When you operate in the reverse direction, look behind you to make sure you have a clear path.

IMPORTANT: Equipment must meet the current regulations to be driven on the public roads.

Push the mow switch to the OFF position and lift the cutting units to the transport position.

5.7 MOWING SPEED

The cutting quality is improved at speeds lower than the transport speed of the mower. A mow speed of 6-7 mph (9.6-11.2 km/hr) is set at the factory and is correct for most conditions. The local turf conditions may need a different speed. If an adjustment is needed, **See Section 7.6**.

5.8 MOWING

⚠ WARNING

To prevent injuries, when the reels rotate, keep your hands, feet and clothing away from the cutting unit.

NEVER use your hands to clean the cutting units. Use a brush to remove grass from the reels. The reel blades can be sharp and can cause injury.

To mow:

1. Move the parking brake switch to the OFF position and set the mow switch to the ON position. Always mow with the engine at full throttle.
2. Push and release the joystick. The cutting units will lower to the ground. When the cutting units are lowered, the reels will start turning.
3. To lift the cutting units, pull and release the joystick with the mower moving forward. The cutting units will lift to the crosscut position and the reels will stop. To lift the cutting units to the transport position, pull and hold the joystick until the cutting units are completely lifted.

NOTICE

To prevent damage to the reel and the bedknife, never operate the cutting units when you are not mowing grass.

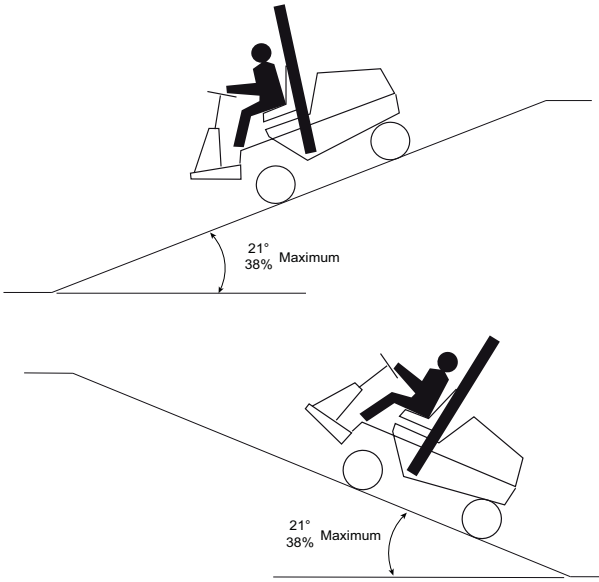
Friction and heat will develop between the reel and bedknife and damage the cutting edge.

To remove or install grass catchers:

1. Set the mow switch in the OFF position, lower the cutting units to the ground, put the parking brake switch in the ON position and stop the engine.
2. Tilt the grass catcher body and move the grass catcher off or on the lift yoke.

5.9 MOWING ON SLOPES

The mower is made to have good traction and to have good balance. Operate the mower with caution when you drive on a gradient. If you drive on wet grass, the traction and steering control of the mower are decreased.



⚠ WARNING

To make sure that the mower does not turn over, the safest method to drive on a slope is to drive vertically. You must not drive across the face horizontally. Travel at a slow speed and do not make the turns that are not necessary.

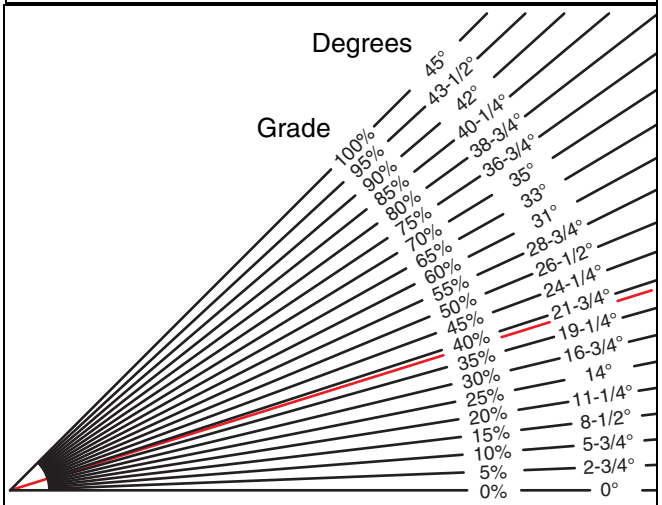
Keep the cutting units lowered when you operate on the slopes.

⚠ CAUTION

Do not operate the mower on the slopes greater than 21° or a 38% slope.

1. Always cut the grass with the engine at full throttle. Control the forward speed with the traction pedal to keep the correct performance.
2. Activate the traction control to improve the weight distribution between the cutting units and the mower.
3. If the mower slips or the tires damage the turf the slope angle is too large to safely operate the mower.
4. If the mower continues to move to the side and damages the turf, the slope is at an angle that is not safe. Do not continue to drive toward the top of the slope. Carefully drive toward the bottom of the slope.
5. When you drive toward the bottom of a slope with a high angle, lower the cutting units to the ground. This procedure makes sure the mower does not turn upside down.
6. Correct tire pressure is necessary for maximum traction.

   Front - 10 psi (0.69 BAR)
   Rear - 10 psi (0.69 BAR)

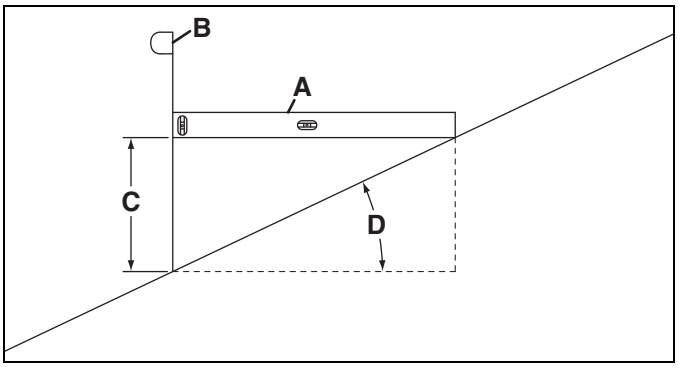


General slope of roadway embankment - 45°
Steepest Grass Area - 31°
Slope of the average roof - 19-1/4°
2nd Class highway maximum grade 4-1/2°
Toll road or freeway - 1-3/4°

How to calculate a slope:

Tools Required:
Level **(A)**, either 1 yard, or 1 meter long.
Tape measure **(B)**.

Use the level **(A)** and position it horizontally to measure the distance **(C)** with tape measure **(B)**. Use the chart to calculate the slope angle or the percentage grade of the slope **(D)**.



Height (C)		Result (D)	
Inches with 1 Yard Level (A)	**Millimeters with 1 Meter Level (A)**	**Slope in Degrees**	**Slope Grade %**
3		4.8	8.3
	100	5.7	10.0
	150	8.5	15
6		9.5	16.7
	200	11.3	20.0
7.5		11.8	20.8
	225	12.7	22.5
9	250	14	25.0
	275	15.4	27.5
10		15.5	27.8
	300	16.7	30.0
11		17.0	30.6
	325	18.0	32.5
12		18.4	33.3
	350	19.3	35.0
13		19.9	36.1
	375	20.6	37.5
14		21.3	38.9
	400	21.8	40.0
15		22.6	41.7
	425	23.0	42.5
16		24	44.4
	475	25.4	47.5
18	500	26.6	50.0
20		29.1	55.6
	600	31.0	60.0
25		34.8	69.4
	800	38.7	80.0
30		39.8	83.3
	900	42.0	90
36	1000	45.0	100

5.10 TOWING THE MOWER

If the mower has a problem and can not drive to the service area, open the bypass valve and load the mower on a trailer. If a trailer is not available, tow the mower at a slow speed for short distances. **See Section 4.8 and 4.9.**

Be careful when you load or unload the mower on the trailer. Fasten the mower to the trailer to prevent mower movement on the trailer.

Always follow any recommendations for maximum trailer weights given in your towing vehicle's handbook.

IMPORTANT

Use the chart in the specification section 12.2 to calculate the total weight of your machine configuration.

Do Not exceed the maximum gross weight shown on the trailer plate.

Always read the trailer manufacturer's and towing vehicle manufacturer's handbooks before towing.

If the trailer is moved on the highway, inflate the tires to the maximum pressure recorded on the tire before you fasten the mower to the trailer. Decrease the tire pressure after the mower is removed from the trailer.

Open the tow valve before you tow the mower. The bypass valve lets the mower be moved without the engine started and to prevent possible damage to hydraulic components. **See Section 4.9**

Release the brakes to allow the mower to be moved. **See Section 4.8**

Before towing, make sure the cutting units are lifted. If the cutting units can not be lifted, remove the cutting units from the mower.

NOTICE

When you tow the mower, do not drive more than 2 mph (3.2 km/hr). Jacobsen recommends that you do not tow the mower for long distances.

When the mower gets to the service area, close the tow valve completely and set the brake valve for normal operation. **See Section 4.8 and 4.9.**

5.11 TO REMOVE A BLOCKAGE FROM CUTTING UNITS

1. Stop and lift the cutter units before you move the machine to level ground.
2. Turn off the engine and remove the ignition key.
3. Wear the personal protective equipment that is applicable for this work, for example eye protection, gloves and correct footwear. Use Bat (4184540), to remove the blockage.
4. Check the reel blades and bedknife for damage and replace if necessary.
5. Start the engine and run the cutter units to check for correct operation.

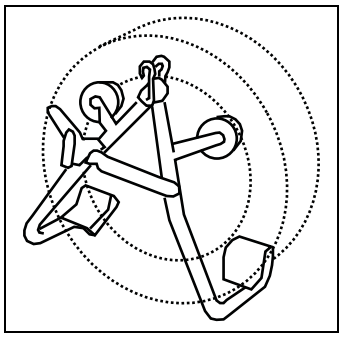
⚠ WARNING

To reduce the risk of injury and infection from foreign objects always use the Bat (4184540) and heavy duty leather gloves to remove a blockage from cutting unit.

6.1 SLINGING AND JACKING THE MACHINE

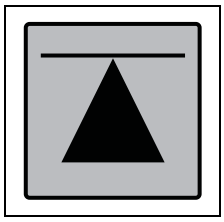
Slinging

When slinging the machine a set of four damage free wheel clamps must be used, similar to the one shown, in conjunction with a certified lifting frame.



Jacking points

There are jack points indicated on the machine, one (3WD Option) or two (4WD Option) on the rear axle and two on the front axle. This decal indicates the correct lift points.



7 ADJUSTMENTS

7.1 GENERAL PRECAUTIONS

WARNING

Before you clean, adjust or repair this equipment, move the mow switch to the OFF position, lower front and rear cutting units to the ground, turn on the parking brake switch, stop the engine and remove the key.

Make sure the mower is parked on a solid and level surface. Never work on a mower that is lifted only by the jack. Always use the jack stands.

A qualified technician must always make the adjustments and do the maintenance. If the correct adjustments can not be made, contact your Jacobsen Dealer.

Inspect the equipment according to the maintenance schedule and keep complete records.

a Keep the equipment clean.
b Keep all moving parts correctly adjusted and lubricated.
c Replace worn or damaged parts before you operate the mower.
d Keep all fluids at the correct level.
e Keep the shields in position and all hardware tight.
f Keep the tires correctly inflated.
g When you make the adjustments or repairs, do not wear jewelry or loose fitting clothing.

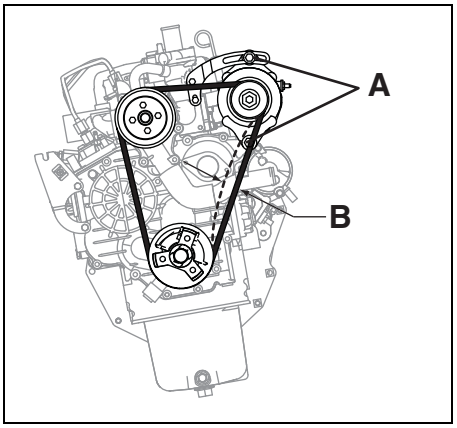
Refer to the illustrations in the Parts Manual for the removal and assembly of parts.

When you discard hazardous materials (batteries, lubricants, fuel, anti-freeze), follow your local, state or federal-recommended procedures.

7.2 ALTERNATOR BELT

Check And Adjust The Alternator Belt:

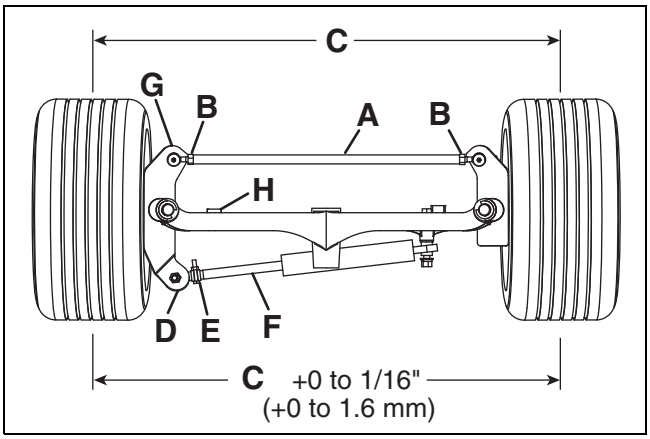
The alternator belt tension is adjusted to prevent the stress on the alternator bearings and to prevent movement on the alternator pulley. Check the belt tension at the center of the belt between crank shaft and alternator pulleys. A deflection of 9/32 to 11/32 in. (7 to 9 mm) is needed at the center (B) with a load of 22 lbs (10kgf/98N) for a new belt.



To adjust belt tension:

1. Loosen the alternator bolt (A) and the pivot bolt below the alternator.
2. Move the alternator to tighten or loosen the belt tension.
3. Tighten the bolts.

7.3 STEERING SHAFT ADJUSTMENT



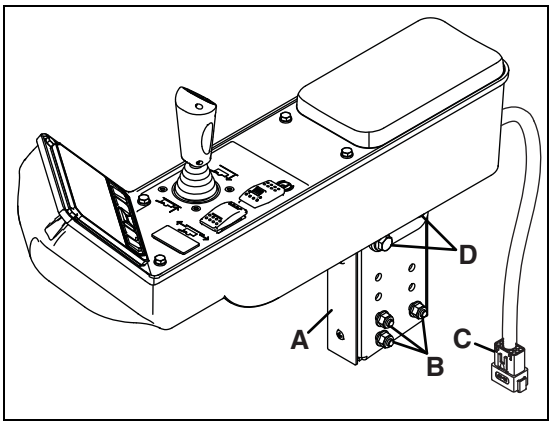
The rear axle must be adjusted for 1/16 inch (1.6 mm) toe-in.

1. Turn the rear wheels to the straight position.
2. Loosen the jam nuts (B) on both ends of the tie rod (A).
3. Rotate the tie rod (A) to get the correct toe-in (C). the Toe-in must not be more than +1/16 inch (+ 1.6 mm).
4. Tighten the jam nuts (B).

After the tie rod is adjusted, adjust the steering cylinder ball joint (D).

1. Start the engine and turn the steering wheel to the left until the steering cylinder is fully extended. Stop the engine.
2. Loosen the ball joint clamp hardware (E).
3. Rotate the steering cylinder shaft (F) in or out of the ball joint (D) until there is 5/16 inch (8 mm) clearance between the steering arm (G) and the axle stop (H).
4. Tighten the clamp hardware (E).

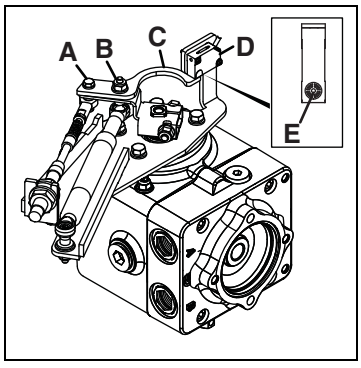
7.4 ARMREST ADJUSTMENT



The armrest has three available height settings and can tilt for the operator.

1. Stop the engine and remove the key.
2. Remove the hardware cover (A).
3. Remove the armrest hardware (B) from the bracket on the right side of the seat.
4. Lift or lower the armrest as needed until another set of holes in the armrest bracket align with the seat bracket. Install the armrest hardware (B).
5. To adjust the armrest angle, loosen screws (D) and lift or lower the front of the armrest. Tighten the screws after the adjustment.
6. Install the hardware cover (A).
7. After you adjust the armrest, check the armrest wire harness connector (C) for a tight connection to the mower harness.

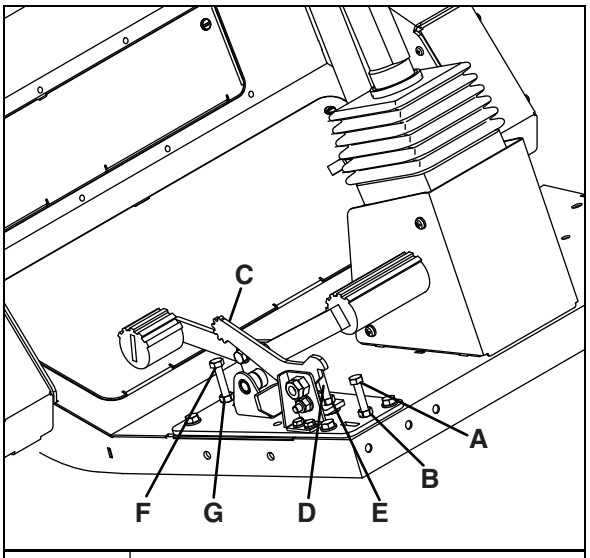
7.5 NEUTRAL SWITCH ADJUSTMENT



The mower has a proximity switch (D) located on the traction pump, which signals the controller when the traction pedal is in the Neutral position. The proximity switch has a red LED to signal when the switch contacts are closed.

1. Turn the ignition switch to the RUN position to provide power to the neutral switch (D). Do not start the engine.
2. Adjust the neutral switch (D) as required to get an 1/8 to 3/16 in. (0.3 to 0.5 cm) air gap between the switch and the switch arm.
3. Loosen the traction cable hardware (A) and the damper hardware (B). Adjust the switch arm (C) until bracket is centered under the sensing area (E) of the switch (D). The switch contacts will close and the red LED will turn on. Tighten hardware (A and B).

7.6 TRACTION PEDAL STOPS



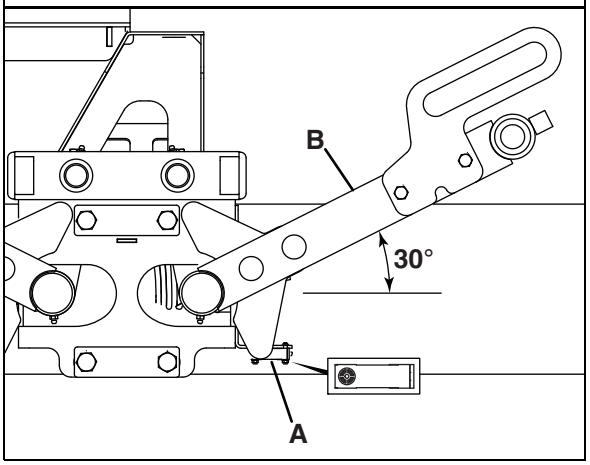
The traction pedal has three pedal stops to limit the speed of the mower.

The forward transport speed stop (A) is used to set the maximum transport speed. Make sure the mow speed lever (C) is in the transport position. Loosen nut (B) and adjust the stop to set the desired speed. Tighten the nut.

The forward mow speed stop (D) is used to set the maximum mow speed. Rotate the mow speed lever (C) to the mow position. Loosen nut (E) and adjust the stop to set the desired speed. Tighten the nut.

The reverse speed stop (F) is used to set the maximum transport speed. Loosen nut (G) and adjust the stop to set the desired speed.

7.7 FRONT REEL LIMIT SWITCH



The mower has a proximity switch (A), which signals the controller to turn off the reels. The switch is installed on the mower frame behind the center lift arm. If the reels continue to rotate when lifted or do not rotate when lowered, inspect the switch. Adjust or replace the switch as required. The proximity switch has a red LED to signal when the switch contacts are closed.

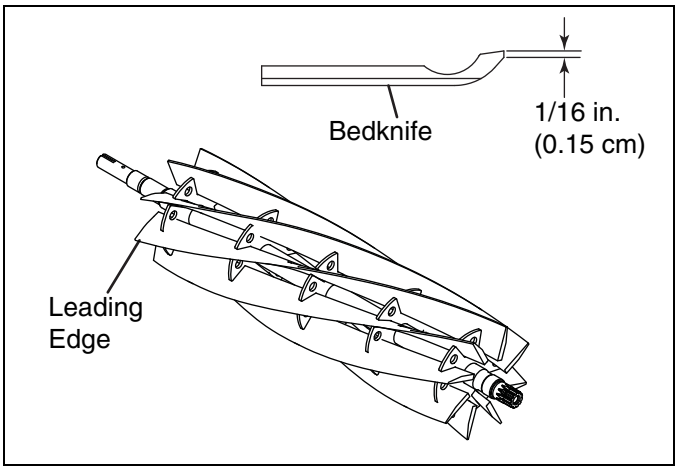
To adjust switch:

1. Park the mower on a flat and level surface.
2. Remove the cutting unit from the center lift arm.
3. Turn the ignition switch to the RUN position to activate the controller. Do not run the reels or start the engine.
4. Adjust the lift arm switch (A) as required to get an 1/8 to 3/16 in. (0.3 to 0.5 cm) air gap between the switch and the lift arm.
5. Lift the arm with your hand until the lift arm (B) is at a 30° angle.
6. With the lift arm at 30°, adjust the lift arm switch (A), until the switch contacts close and the red LED turns on. Fasten the switch in this position.
7. Start the engine and make sure that the reels turn off when lifted.

NOTICE

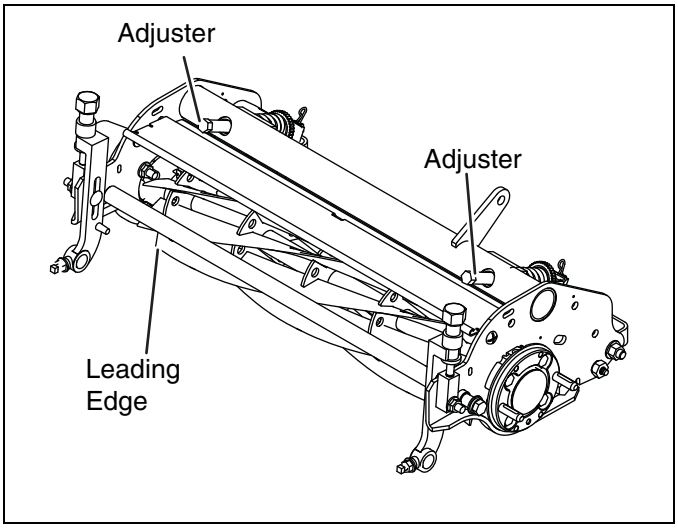
The proximity switch sets the point where the reels stop rotation. The reels will lift to a position more than 30°.

7.8 BEDKNIFE-TO-REEL



1. Check the reel bearings for end play or radial play.
2. Inspect the reel blades and the bedknife to make sure of good sharp edges without bends or surface damage.
   a. The leading edge of the reel blades must be sharp, without rough edges and show no indications of becoming blunt.
   b. The bedknife and the bedknife backing must be correctly tightened. The bedknife must be straight and sharp.
   c. A flat surface of at least a minimum of 1/16 in. (0.15 cm) must be on the front face of the bedknife. Use a standard flat file to prepare the bedknife.
3. If backlapping can not correct wear or damage to the reel or bedknife, use a grinder to correct the surfaces.
4. Correct reel-to-bedknife adjustment is very important. A gap of 0.001 to 0.003 in. (0.0025 to 0.0076 cm) must be kept across the full length of the reel and bedknife.
5. The reel must be parallel to the bedknife. An incorrectly adjusted reel will lose its sharp edges and can cause damage to the reel and bedknife.
6. Grass conditions can change the adjustment.
   a. Dry conditions will need a wider gap to prevent temperature increase and damage to the reel and bedknife.
   b. High quality grass with a good moisture amount will need a closer gap (near zero).

7.9 BEDKNIFE ADJUSTMENT



1. Read Section 7.8 before you adjust the reel.
2. Start the adjustment at the leading end of the reel, followed by the trailing end. *The leading end of the reel blade is the end which moves over the bedknife first during normal reel rotation.*
3. Use the adjusters, to adjust the gap. Rotate the adjusters to the right side to close the gap. Each click of the adjuster moves the bedknife 0.001 in. (0.0025 cm) closer to the reel.
   a. Put a 0.001 - 0.003 in. (0.0025 - 0.0075 cm) feeler gauge or shim between the reel blade and the bedknife. Do not turn the reel.
   b. Adjust the trailing end of the reel to the same gap in a same method then inspect the adjustment at the leading end.
   c. When the reel is correctly adjusted to the bedknife, the reel will rotate freely. When a piece of newspaper is held at 90° to an adjusted bedknife, you can cut a piece of newspaper, along the full length of the reel.

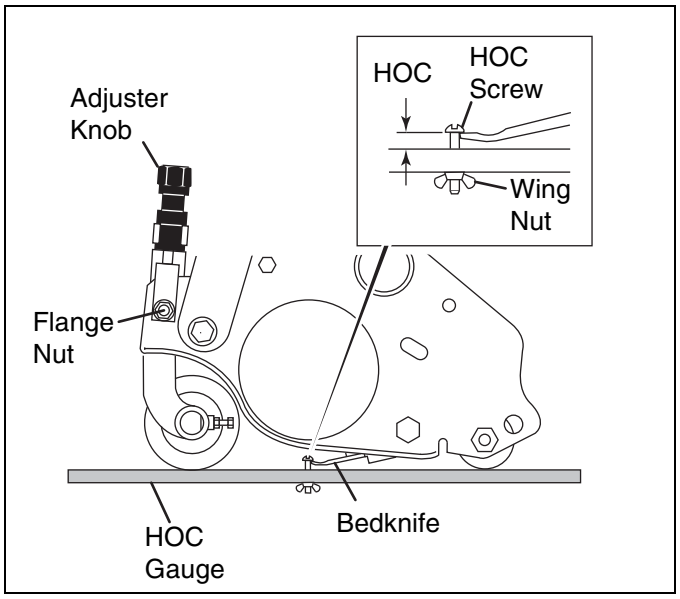
NOTICE

Avoid excessive tightening or serious damage may result to bedknife and reel blades. Reels must turn freely.

7.10 CUTTING HEIGHT

Note: *Always make the reel-to-bedknife adjustment before you adjust the height of cut.* ***See Sections 7.8 and 7.9.***

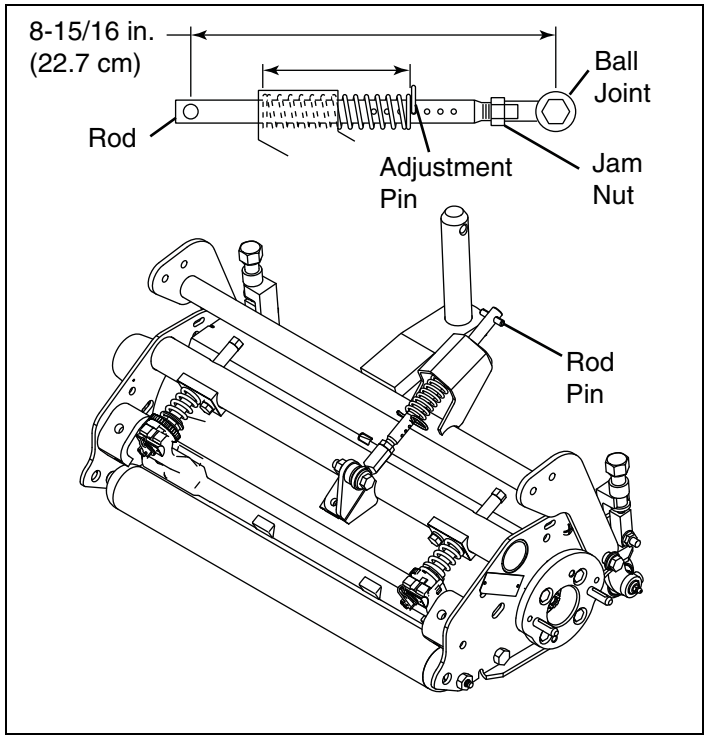
1. Lift the cutting units to the transport position. Set the parking brake switch in the ON position, stop the engine and remove the key from the ignition switch.
2. Set the height of cut (HOC) on the HOC gauge.
   a Measure the distance between the bottom of the HOC screw head and the gauge surface.
   b Adjust the HOC screw to get the correct height then tighten the wing nut.
3. Loosen the flange nuts on the front roller brackets to allow the adjuster to lift or lower the roller.
4. Put the HOC gauge across the bottom of the front and rear rollers at one end of roller.
5. Move the head of the HOC screw over the bedknife. Rotate the adjuster knob to close the gap between the screw head and bedknife.
   Repeat Steps 4 and 5 on the opposite end of the reel. Complete the adjustment to one end before you adjust the opposite end.
6. Tighten the flange nuts and recheck each end.



7.11 DOWN PRESSURE

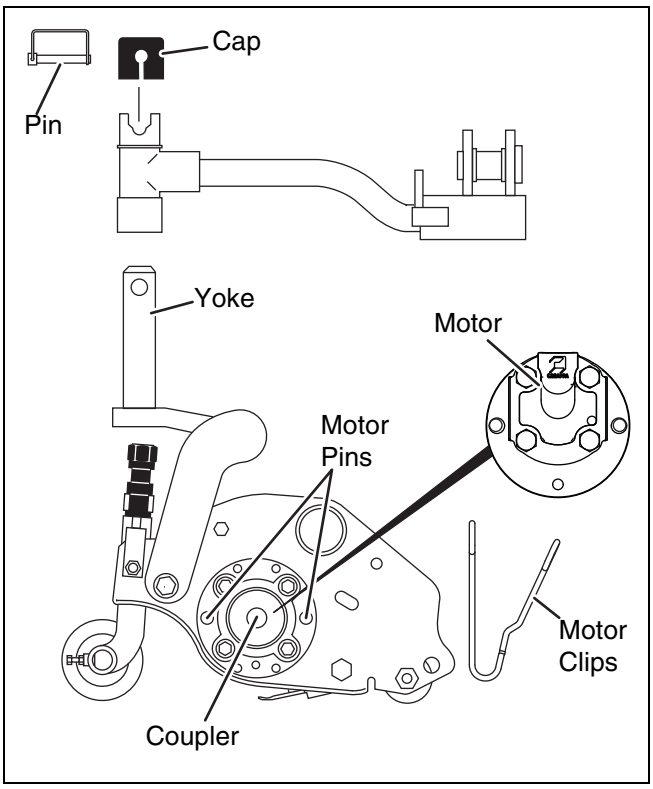
Each reel is has a down pressure spring. Down pressure improves the cutting quality by contact between the reel and ground. Check and adjust the down pressure any time the HOC is changed or to improve the cut for the best performance.

1. Lift the reels to the transport position. Put the adjustment pin in 4th hole from ball joint. Lower the reels onto a flat surface before you measure the down pressure.
2. Set the distance between the ball joint center and the rod pin center to 8-15/16 in. ± 1/16 in. (22.7 mm ± 0.2 cm). To adjust the length, loosen the jam nut and rotate the rod into or out of the ball joint.
3. Measure length of spring as shown on all 5 reels. Record the shortest spring dimension. Adjust the ball joint to get the other springs to the same dimension ± 1/16 in. (0.2 cm). The rod pin must be horizontal, then tighten the jam nut.
4. To adjust the down pressure, move the adjustment pin one hole toward the spring to increase the down pressure on the rear roller. Move the adjustment pin one hole away from the spring to decrease the down pressure on the rear roller.



7.12 FLASH ATTACH™

Installing Cutting units



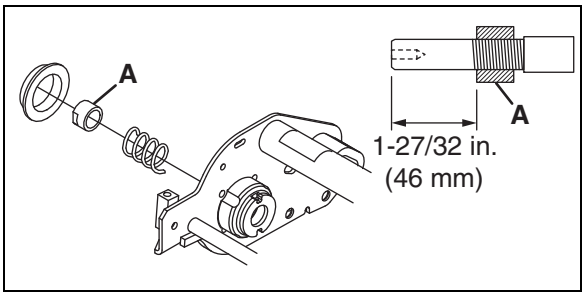
1. Place each cutting unit in front of the lift arm. Raise the lift arm and place the cutting unit so that the yoke is aligned to the swivel housing. Carefully lower the lift arm on the yoke. Install the pin through the hole in the yoke and fasten the retaining clip. Install the cap on the swivel housing.
2. Clean the motor splines and the coupler. Apply grease to the female splines on the coupler. Completely clean the motor mounting surface. Move the motor into bearing housing. Install two motor clips into pins to lock the motor in position. The loops on the motor clips must be toward the motor.
3. Lift the reels and install the down pressure adjustment pins. If the HOC has not changed, set pins in same position when the reels were removed. **See Section 7.11**

Removing Cutting Units

1. Lower the reels to the ground and remove the down pressure adjustment pins. Make note of where springs are set. **See Section 7.11**
2. Remove the motor clips and pull the motor away from cutting unit.
3. Carefully secure the motor and its hoses away from the cutting unit. To prevent contamination and damage to components, cover or cap off the bearing housing cavity.
4. Remove the cap on the swivel housing. Release the retaining clip from the pin. Remove the pin.
5. Lift the lift arm until the cutting unit can be removed.

7.13 REEL BEARING

Any end play or radial play indicates bad bearings, a weak tension spring, or a backed-off nut.



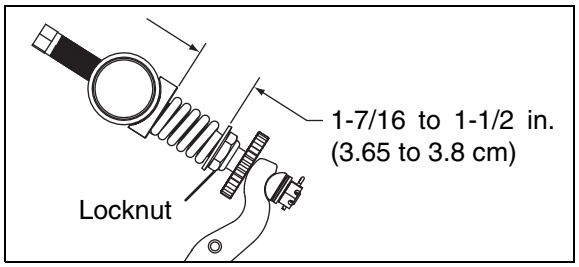
1. Check the bearing housing mounting hardware. Tighten or replace components as required. Carefully clean the reel shaft threads with a degreaser.
2. Apply a medium strength grade of Loctite to nut (A).
3. Thread the nut (A) onto the reel shaft until the nut is 1-27/32 in. (4.6 cm) from the end of the reel shaft.
4. Fill the reel bearing housings with NLGI - Grade O grease after adjusting spring.

7.14 BEDKNIFE ADJUSTER SPRING

For correct operation, the bedknife adjuster spring must be compressed to 1-7/16 to 1-1/2 in. (3.65 to 3.8 cm).

To adjust the spring compression, loosen or tighten the locknut to get a distance of 1-7/16 to 1-1/2 in. (3.65 to 3.8 cm).

After you adjust the spring, check the reel to bedknife adjustment.

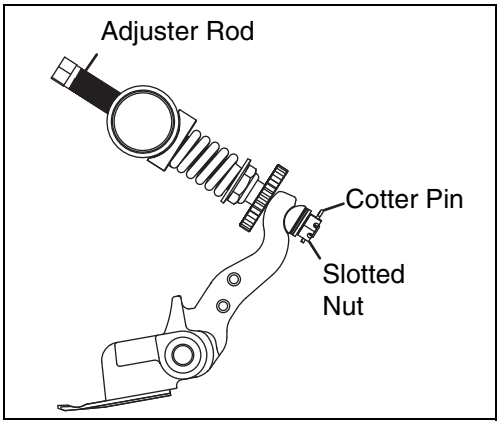


7.15 BEDKNIFE ADJUSTER TENSION

Remove the cotter pin. Completely loosen then tighten the slotted nut to remove the clearance (no end play) between components. Continue to tighten the nut until next slot in nut aligns to the hole in the bedknife adjuster rod. Install a new cotter pin.

Check the torque needed to rotate the adjuster rod. Torque must be less than 24 in. lb. (2 ft. lb.) (2.7 Nm).

After you adjust the nut, check the reel to bedknife adjustment.



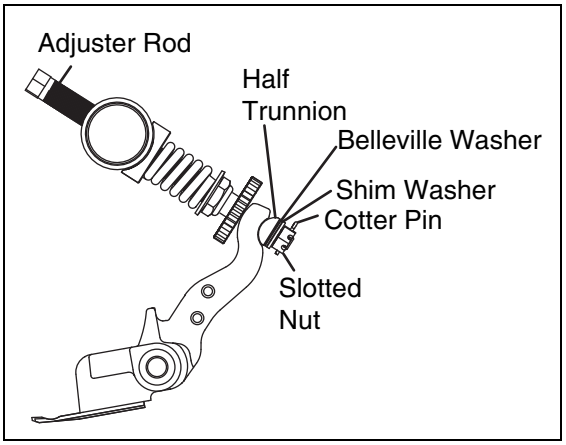
NOTICE

When you tighten the slotted nut more than necessary, the bedknife adjuster rod will be difficult to adjust.

7.16 GRINDING THE BEDKNIFE

Lower the bedknife out of the reel for grinding without completely removing the bedknife assembly.

1. Remove the cotter pin, slotted nut, Belleville washer, shim washer **(If needed)** and half trunnion from both ends of the reel.
5. Press down on the adjuster end of the rod to rotate other end of the adjuster out of the bedknife finger.
6. Rotate the bedknife backing to access the reel and bedknife.
7. After you grind the reel and bedknife, assemble the bedknife using reverse order of removal. Check the adjustment of bedknife adjuster tension **(See Section 7.15)**, and the reel to bedknife adjustment **(See Section 7.9)**.



7.17 TORQUE SPECIFICATION

NOTICE

The torque values included in these charts are approximate and are for reference only. Use these torque values at your risk. Jacobsen is not responsible for any loss, claim or damage caused by these charts. **Always use caution with torque values.**

Jacobsen uses Grade 5 (Inch) and Grade 8.8 (Metric) Plated bolts, unless a note is given. Always check the marks on the head of the bolts for the bolt grade. For tightening plated bolts, use the value given for lubricated.

SIZE	UNITS	 GRADE 5		 GRADE 8		SIZE	UNITS	 GRADE 5		 GRADE 8	
		Lubricated	**Dry**	**Lubricated**	**Dry**			**Lubri-cated**	**Dry**	**Lubri-cated**	**Dry**
#6-32	in-lb (Nm)	–	20 (2.3)	–	–	7/16-14	ft-lb (Nm)	37 (50.1)	50 (67.8)	53 (71.8)	70 (94.9)
#8-32	in-lb (Nm)	–	24 (2.7)	–	30 (3.4)	7/16-20	ft-lb (Nm)	42 (56.9)	55 (74.6)	59 (80.0)	78 (105)
#10-24	in-lb (Nm)	–	35 (4.0)	–	45 (5.1)	1/2-13	ft-lb (Nm)	57 (77.2)	75 (101)	80 (108)	107 (145)
#10-32	in-lb (Nm)	–	40 (4.5)	–	50 (5.7)	1/2-20	ft-lb (Nm)	64 (86.7)	85 (115)	90 (122)	120 (162)
#12-24	in-lb (Nm)	–	50 (5.7)	–	65 (7.3)	9/16-12	ft-lb (Nm)	82 (111)	109 (148)	115 (156)	154 (209)
1/4-20	in-lb (Nm)	75 (8.4)	100 (11.3)	107 (12.1)	143 (16.1)	9/16-18	ft-lb (Nm)	92 (124)	122 (165)	129 (174)	172 (233)
1/4-28	in-lb (Nm)	85 (9.6)	115 (13.0)	120 (13.5)	163 (18.4)	5/8-11	ft-lb (Nm)	113 (153)	151 (204)	159 (215)	211 (286)
5/16-18	in-lb (Nm)	157 (17.7)	210 (23.7)	220 (24.8)	305 (34.4)	5/8-18	ft-lb (Nm)	128 (173)	170 (230)	180 (244)	240 (325)
5/16-24	in-lb (Nm)	173 (19.5)	230 (26.0)	245 (27.6)	325 (36.7)	3/4-10	ft-lb (Nm)	200 (271)	266 (360)	282 (382)	376 (509)
3/8-16	ft-lb (Nm)	23 (31.1)	31 (42.0)	32 (43.3)	44 (59.6)	3/4-16	ft-lb (Nm)	223 (302)	298 404	315 (427)	420 (569)
3/8-24	ft-lb (Nm)	26 (35.2)	35 (47.4)	37 (50.1)	50 (67.8)	7/8-14	ft-lb (Nm)	355 (481)	473 (641)	500 (678)	668 (905)

SIZE	UNITS	 4.6		 8.8		 10.9		 12.9		Non Critical Fasteners into Aluminum
		Lubricated	**Dry**	**Lubricated**	**Dry**	**Lubricated**	**Dry**	**Lubricated**	**Dry**	
M4	Nm (in-lb)	–	–	–	–	–	–	3.83 (34)	5.11 (45)	2.0 (18)
M5	Nm (in-lb)	1.80 (16)	2.40 (21)	4.63 (41)	6.18 (54)	6.63 (59)	8.84 (78)	7.75 (68)	10.3 (910	4.0 (35)
M6	Nm (in-lb)	3.05 (27)	4.07 (36)	7.87 (69)	10.5 (93)	11.3 (102)	15.0 (133)	13.2 (117)	17.6 (156)	6.8 (60)
M8	Nm (in-lb)	7.41 (65)	9.98 (88)	19.1 (69)	25.5 (226)	27.3 (241)	36.5 (323)	32.0 (283)	42.6 (377)	17.0 (150)
M10	Nm (ft-lb)	14.7 (11)	19.6 (14)	37.8 (29)	50.5 (37)	54.1 (40)	72.2 (53)	63.3 (46)	84.4 (62)	33.9 (25)
M12	Nm (ft-lb)	25.6 (19)	34.1 (25)	66.0 (48)	88.0 (65)	94.5 (70)	125 (92)	110 (81)	147 (108)	61.0 (45)
M14	Nm (ft-lb)	40.8 (30)	54.3 (40)	105 (77)	140 (103)	150 (110)	200 (147)	175 (129)	234 (172)	94.9 (70)

8 MAINTENANCE AND LUBRICATION

8.1 MAINTENANCE AND LUBRICATION CHARTS

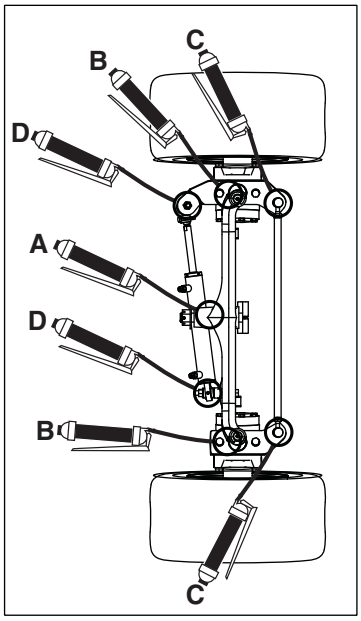
Machine Service Interval Chart		
Interval	Item	Section
First 50 hours	• Change the Engine oil • Change the engine oil filter • Change the Hydraulic Filter Elements	8.7
Each day 10 hours	• Check Safety Interlock System • Check engine oil level • Check engine coolant Level • Check air filter service indicator • Check the Hydraulic Fluid Level • Check the fuel level • Check tire Pressure • Check Engine Bay for Dirt • Clean radiator screens	6.2 8.6 8.17 8.22
Each week Every 50 hours	• Check for Loose Components • Check for Hydraulic Leaks • Check tire air pressures	8.12 8.20 3.1.8
Every 100 hours	• Check alternator belt tension • Clean the fuel filter	
Every 200 Hours	• Change the engine oil • Change the engine oil filter • Check radiator hoses • Check intake air hoses@ • Check hydraulic hoses and tubes • Check muffler and exhaust	
Every 400 Hours	• Change the fuel filter	
Every 500 Hours	• Change the alternator belt	
End of season Every 1000 hours	• Check Battery Condition • Change the Hydraulic Oil and Filters • Change the air filter element@	8.12 8.6
Every 800 Hours	• Check valve clearance	
Every 1500 Hours	• Check injection nozzle pressure@	
Every 3000 Hours	• Check injection pump • Check injection timing	
Every 2 Years	• Change engine coolant • Change radiator hoses and clamps • Change fuel hoses and clamps@ • Change intake air hoses@	
The items listed above (@ marked) are registered as emission related critical parts by Kubota in the U.S.EPA non road emission regulation. As the engine owner you are responsible for the performance of the required maintenance on the engine according to the above instruction. Please see Warranty Statement for detail. **Refer to Engine Manufacturers Manual for the Complete Engine Maintenance Procedures**		

Fluid Requirements				
	Quantity			Type
Engine Oil (with filter)	5.1 liters	1.12 Imp gals	1.35 US gals	10-30W (see specification below)
Hydraulic Oil (with filter)	28.4 liters	6.2 Imp gals	7.5 US gals	Total Equivis ZS46 (ISO VG 46)
Radiator Coolant	7.6 liters	1.67 Imp gals	2.0 US gals	50% Anti-Freeze
Fuel	28.7 liters	6.3 Imp gals	7.6 US gals	#2-D (ASTM D975) Diesel

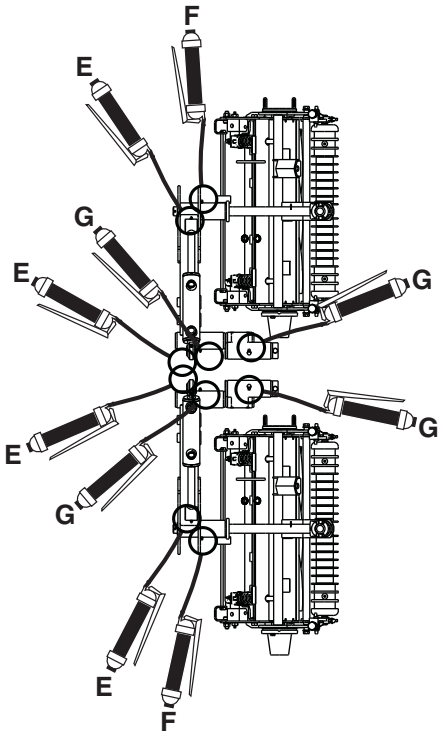
Engine oil: Must be to A.P.I. Classification CF grade.	
TEMPERATURE	VISCOSITY
Above 25°C (77°F)	SAE30 or SAE10W-30 or 10W-40
0°C to 25°C (32°F to 77°F)	SAE20 or SAE10W-30 or 10W-40
Below 0°C (32°F)	SAE10W or SAE10W-30 or SAE10W-40

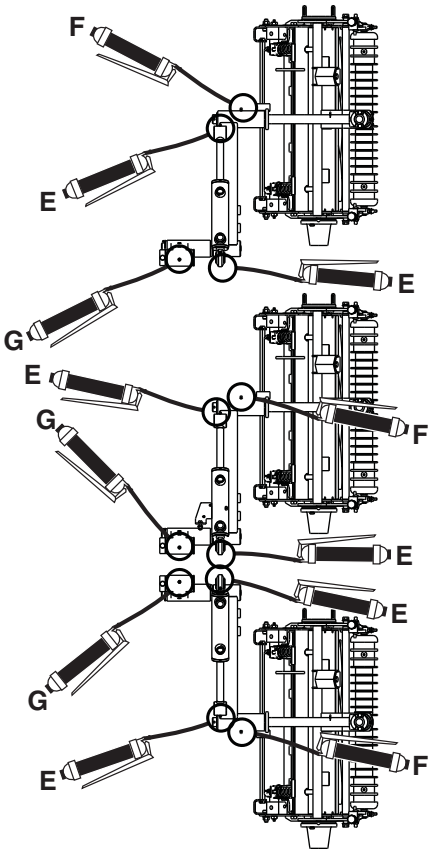
TIRE PRESSURE						
Product	Front Wheel			Rear Wheel		
	Tire Size	Tire Type	Tire Pressure	Tire Size	Tire Type	Tire Pressure
3WD, Smooth Tire	22 x 12.00 - 12	Smooth 4pr	0.69bar (10 psi)	22 x 12.00 - 12	Smooth 4pr	0.69bar (10 psi)
4WD, Smooth Tire	22 x 12.00 - 12	Smooth 4pr	0.69bar (10 psi)	20.00 x 10.00 - 10	Smooth 2pr	0.69bar (10 psi)

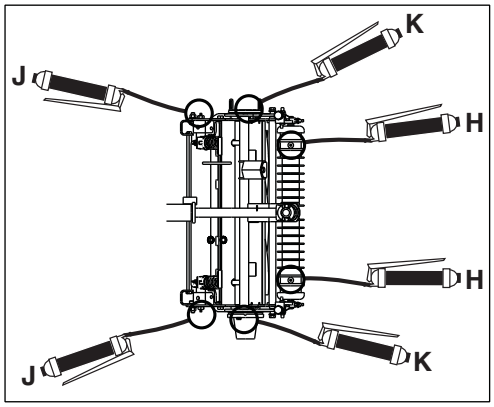
Lubrication Points (Grease Every 50 Hours)	
A. Steering axle pivot (4WD Option Only)	F. Lift Arm Pivot (5)
B. Motor mount pivot (2) (4WD Option Only)	G. Spring Arm Pivot (10)
C. Tie Rod Ball Joints (2) (4WD Option Only)	H. Front Roller (10)
D. Steering Cylinder Ball Joints (2) (4WD Option Only)	J. Rear Roller (10)
E. Lift Cylinders (10)	K. Bearing Housing



4WD Option Only







Reel Mower X5

8.2 GENERAL PRECAUTIONS

⚠ WARNING

Before you clean, adjust or repair this equipment, push mow switch to the OFF position, lower cutting units to the ground, turn on the parking brake switch, stop the engine and remove the key. Make sure the mower is parked on a solid and level surface. Never work on a mower that is lifted only by the jack. Always use the jack stands.

A qualified technician must always make the adjustments and do the maintenance. If the correct adjustments can not be made, contact your Jacobsen Dealer.

Inspect the equipment according to the maintenance schedule and keep complete records.

a Keep the equipment clean.

b Keep all moving parts correctly adjusted and lubricated.

c Replace worn or damaged parts before you operate the mower.

d Keep all fluids at the correct level.

e Keep the shields in position and all hardware tight.

f Keep the tires correctly inflated.

When you make the adjustments or repairs, do not wear jewelry or loose fitting clothing.

Refer to the illustrations in the Parts Manual for the removal and assembly of parts.

When you discard hazardous materials (batteries, lubricants, fuel, anti-freeze), follow your local, state or federal-recommended procedures.

NOTICE

Only use the tool attached to the key ring to open the engine hood catches.

8.3 ENGINE

IMPORTANT - The mower includes a separate Engine Manual prepared by the engine manufacturer. Read the Engine Manual and know the operation and maintenance of the engine. When you follow the engine manufacturer instructions, you will make sure of the maximum service life of the engine. Replacement engine manuals are available from the engine manufacturer. The operation and maintenance during the first 50 hours of a new engine can make a difference to the performance and life of the engine.

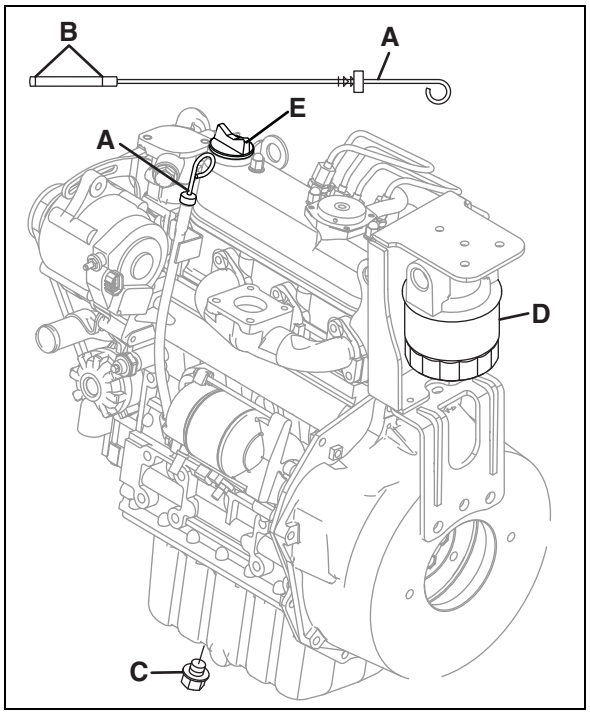
During the first 50 hours of operation, Jacobsen recommends the following.

- Allow the engine to reach a temperature of at least 60° C (140° F) before operation at full load.
- Check the engine oil level two times each day. Higher than normal oil use can occur during the first 50 hours.
- Change the engine oil and oil filter after the first 50 hours of operation.
- Check the alternator belt.
- Refer to the Engine manual for specified maintenance intervals. If the injection pump, injectors or the fuel system need service, contact your Jacobsen Dealer.

NOTICE

The mower operates and cuts correctly at the preset governor setting. Do not change the engine governor setting or over speed the engine.

8.4 ENGINE LUBRICATION



Check Engine Oil Level

Check the engine oil level before you start or at least five minutes after you stop the engine.

a Park the machine on level ground, remove the dipstick (A), clean with a cloth and replace in position.

b Remove the dipstick (A) again and check the oil level. The oil must be between the two level indicators (B) on the dipstick.

Change Engine Oil

a Start the engine to increase the temperature, then turn off the engine. Remove the oil drain plug (C) from the bottom of the crankcase and clean with a cloth.

b Drain the engine oil into a container.

c Replace the drain plug (C) and fill the engine with the correct quantity and grade of oil through the filler (E).

Change Engine Oil Filter

a Remove the oil filter cartridge (D).

b Let the engine oil flow into a container.

c Clean area on the crankcase.

d Apply a thin layer of oil to cartridge gasket before you install the filter.

e Only use your hand to tighten the filter cartridge (D).

f Check for oil leaks around the cartridge gasket after the engine is started.

⚠ CAUTION

Engine oil can damage your skin. use gloves. If engine oil touches your skin, clean the area immediately.

⚠ CAUTION

Discard engine oil in accordance with local regulations

8.5 ENGINE COOLANT

⚠ WARNING

To prevent injury from the hot-engine coolant or steam, never remove the expansion tank cap with the engine in operation. Stop the engine and wait until the radiator is cool. When radiator is cool, use caution to remove the expansion tank cap.

⚠ CAUTION

Do not put cold coolant mixture into a hot radiator. Do not operate the engine without a correct coolant mixture. Install the radiator cap correctly.

Check coolant level each day. The radiator must be full and the expansion tank must be at the cold mark.

Drain and fill the cooling system each year. Empty and clean the expansion tank.

Mix clean water with anti-freeze for the coldest ambient temperature. Read and follow the instructions on the anti-freeze container and the Engine manual.

Keep the radiator and hydraulic oil cooler air passages clean. Do not use water to clean the fins. Only use low pressure compressed air to clean radiator.

⚠ CAUTION

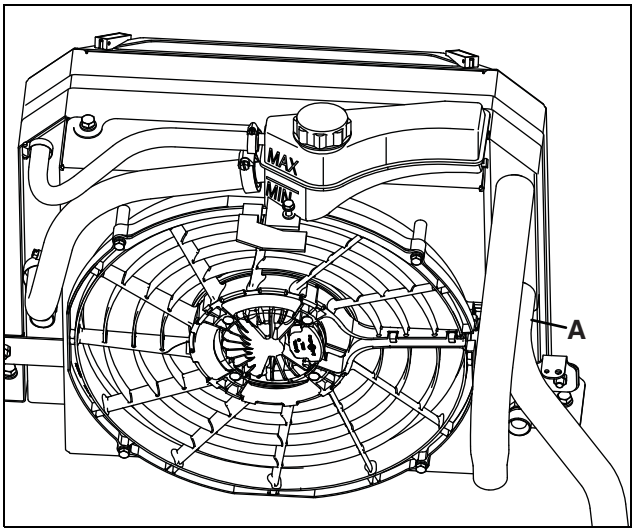
Stop engine and remove the key before pressure washing. Do not use a pressure washer near the instrument panel or engine radiator to prevent damage.

Check and tighten the engine fan belt (see maintenance chart) and replace the belt (see maintenance chart). Replace the clamps and hoses (see maintenance chart).

Have your Jacobsen Dealer check the cooling system if you need to add coolant more than one time a month or you add more than a liter of coolant at a time.

Check The Engine Coolant Level

1. The level of coolant in a cold expansion tank must be between the MIN and MAX indicators.



⚠ WARNING

To prevent injury from the hot-engine coolant or steam, never remove the expansion tank cap with the engine in operation. Stop the engine and wait until the radiator is cool. When radiator is cool, use caution to remove the expansion tank cap.

2. If you need to fill the tank, remove the expansion tank cap and fill with the correct anti-freeze mixture (**See Section 8.1**).
3. Replace the plastic cap.

How To Change Coolant

1. To drain coolant, remove the bottom hose (A) from the radiator. Drain the engine coolant into a container.
2. Connect the bottom hose (A) to the radiator. Make sure all the hose clamps are tight.
3. Fill the cooling system with the correct anti-freeze mixture (**See Section 8.1**). Fill system through the expansion tank.
4. The level of coolant in a cold expansion tank must be between the MIN and MAX indicators.
5. Run the engine for approximately 5 minutes or until the thermostat opens.
6. Check the level of coolant in expansion tank. Fill the tank if more coolant is needed.

⚠ CAUTION

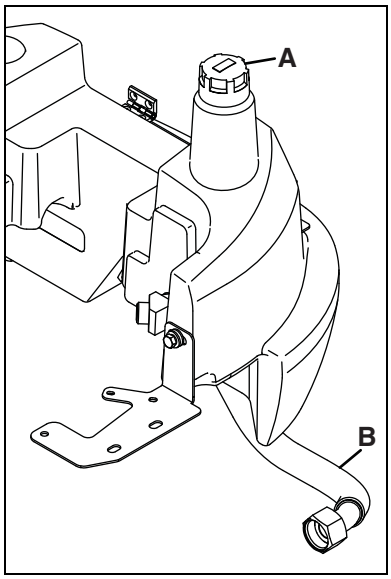
Anti-freeze can damage your skin. Use gloves when you use anti-freeze. If anti-freeze touches your skin, clean the area immediately.

⚠ CAUTION

Discard anti-freeze in accordance with local safety regulations.

8.6 HYDRAULIC SYSTEM

Drain and replace the hydraulic oil if one of the following occur.



- Hydraulic component failure.
- Water or foam in the hydraulic fluid.
- The hydraulic fluid has a rancid odor (indication of high heat).
- When required by maintenance schedule.

Always replace the hydraulic filter when you replace the hydraulic fluid.

Change The Hydraulic Oil

a Clean the area around the oil cap to prevent entry of dirt into the hydraulic system.

b Disconnect the hose (B) from the gear pump. Allow the oil to drain into a container.

c After the oil has drained, reinstall the hose and fill the tank with hydraulic fluid through filler (A).

d Start the engine and remove the air from the hydraulic system. Operate all mower functions for 5 minutes to remove the air and to balance the hydraulic fluid level.

e When all air is removed from the hydraulic-fluid, check the level, add hydraulic fluid to the tank to the recommended level.

IMPORTANT

If you open the closed hydraulic transmission circuit, you need to fill the circuit with oil before the circuit is used again. When you fill the hydraulic tank, use only clean oil. The hydraulic oil must go through a 10 micron filter before the oil enters the tank.

⚠ CAUTION

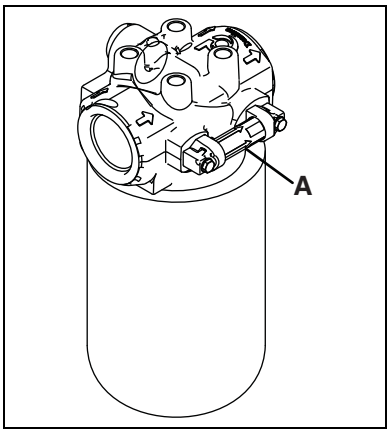
Hydraulic oil can damage your skin. Use gloves when you use hydraulic oil. If hydraulic oil touches your skin, clean the area immediately.

⚠ CAUTION

Discard used hydraulic oil in accordance with local safety regulations.

8.7 HYDRAULIC FILTER

The hydraulic system is protected by one 10 micron filter. A 25 psi (1.7 BAR) visual indicator (A) is on the side of the filter head to indicate when service is needed.



When you replace the filter:

a Fill the new filter with hydraulic fluid and lubricate the filter O-ring with hydraulic fluid before you install the new filter. Tighten the filter with your hand.

b Operate the engine at idle speed for five minutes to remove the air from the hydraulic system.

c Stop the engine and check the level of hydraulic fluid in the tank. Add the hydraulic fluid to the Full mark on the dipstick.

⚠ CAUTION

Hydraulic oil can damage your skin. Use gloves when you use hydraulic oil. If hydraulic oil touches your skin, clean the area immediately.

⚠ CAUTION

Discard used hydraulic oil in accordance with local safety regulations.

8.8 HYDRAULIC HOSES

⚠ WARNING

To prevent injury from the hot, high pressure oil, never use your hands to check for oil leaks. Use paper or cardboard to find leaks.

The hydraulic fluid pressure can have enough force to enter your skin. If hydraulic fluid has entered your skin, a doctor must remove the hydraulic fluid surgically within a few hours or gangrene can occur.

Always lower the cutting units to the ground, disengage all drives, engage parking brake, stop the engine and remove the key before you inspect or disconnect hydraulic lines or hoses.

Check visible hoses and tubes each day. Look for wet hoses or oil marks. Replace worn or damaged hoses and tubes before you operate the mower.

The replacement tube or hoses must follow the same path as the original hose. Do not move the clamps, brackets and cable-ties to a new location.

Completely inspect all tubes, hoses and connections in accordance with the maintenance chart.

IMPORTANT: If the hydraulic fluid becomes dirty, damage to the hydraulic system can occur. Before you disconnect any hydraulic component, clean the area around the fittings and the ends of the hoses to stop the entry of dirt into the system.

Before you disconnect any hydraulic component, tag or mark the location of each hose then clean the area around the fittings.

To stop the entry of dirt into the system when you disconnect the component, be prepared to assemble plugs or caps to the ends of hoses and open ports. Clean any hydraulic fluid that spills.

Make sure “O” rings are clean and hose fittings are correctly installed before you tighten.

Prevent hose twist. Twisted hoses can cause the hose connections to loosen as the hose moves while you operate the mower and can cause oil leaks.

Hydraulic hoses that are twisted or have sharp bends can decrease the oil flow and cause damage to the hoses. The decreased oil flow can cause system problems and increase the temperature of the hydraulic fluid.

8.9 FUEL

Diesel fuel is flammable. Use caution when you add fuel to the mower. Only use an approved container. The spout on the container must fit inside the fuel filler neck. Never use the containers that are not approved to keep or transfer fuel.

⚠ WARNING

Refuel the mower before you start the engine. Never remove the fuel cap or add fuel to the mower while the engine is in operation or while the engine is hot.

Refuel outdoors only and do not smoke when you add fuel.

If fuel spills, do not try to start the engine until fuel vapors have dissipated. Do not allow sparks, open flame or other ignition sources in the area until fuel vapors have dissipated.

Never keep fuel containers near an open flame or any device that can cause the ignition of fuel or fuel vapors.

Always tighten the fuel tank cap and container cap after you add fuel.

Fill the fuel tank to 1 inch (2.5 cm) below the filler neck.

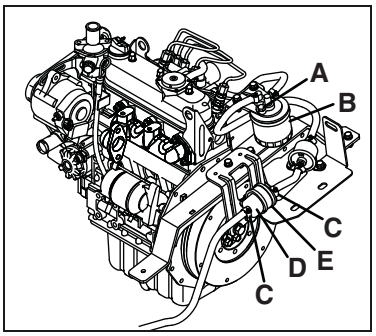
Use clean low or ultra low sulfur Diesel fuel to the recommended specification. The use of Diesel fuel additives is not recommended. If fuel additives are used, the fuel additives must be approved for use in the engine type used in your machine. Refer to the engine manual for additional information.

Check fuel hoses and clamps at service interval (see chart). Replace the fuel hoses and clamps at first indication of wear or damage.

Store fuel according to your local, state or federal regulations.

Fuel System

Use Diesel to ASTM D975 (Ultra Low Sulfur)



To Replace the fuel filters

a Stop the engine.

b Open the air valve (A) at the top of the filter (B) to release system pressure.

c Remove fuel filter cartridge (B). Clean any fuel that spills.

d Assemble new filter cartridge to the filter base. Tighten the cartridge with your hand.

e Loosen hose clamps (C). Loosen filter clamp (E) and replace pre-filter (D).

f Bleed air from the fuel system.

How To Bleed The Air From The Fuel System

After the fuel filters are replaced or the fuel hoses are disconnected, bleed the air from the fuel system.

a Open the air vent at the top of the filter.

b Turn the ignition switch to the RUN position, but do not start the engine. Operate the fuel pump until air bubbles at filter vent stop and fuel starts to spill. Close the air vent. Clean any fuel that spills.

c Start the engine. The engine will remove any air remaining in the fuel hoses.

⚠ CAUTION

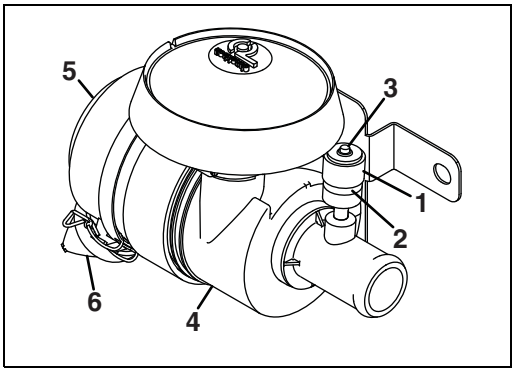
The diesel fuel can damage your skin. Use gloves when you use diesel fuel. If diesel fuel touches your skin, clean the area immediately.

⚠ CAUTION

Discard diesel fuel in accordance with local safety regulations

8.10 AIR CLEANER

Check the service indicator (1) each day. If the red band becomes visible in the window (2), replace the filter element.



Only remove the filter element when replacement is required. Removal of the filter that is not necessary increases the risk of dust and other particles to enter the engine.

When service is needed, first clean the outside of the filter housing (4), then remove the filter element carefully.

Clean the inside of the filter housing. Make sure dust and other particles do not get into the engine inlet hose.

Inspect the new element. Do not use a damaged element and never use an incorrect element.

Install the filter element. Make sure the element seats correctly. Press the button (3) to set the service indicator.

Install the cap (5) onto the filter housing (4). Make sure the cap seals around the filter housing. The dust valve (6) on the cap must be at the bottom of the filter. Fasten the cap with the two clips.

Check the air filter hose for wear or damage. Make sure the hose clamps are tight and hold the hose in position.

8.11 BATTERY

Before you service the battery, make sure the ignition switch is in the OFF position and the key is removed.

⚠ CAUTION

When you service the battery, always use tools with insulation, wear protective glasses and protective clothing.

Discard used batteries in accordance with your local regulations.

⚠ WARNING

The battery contains corrosive acid. Prevent contact with the battery acid.

Always wash your hands after you service a battery.

⚠ WARNING

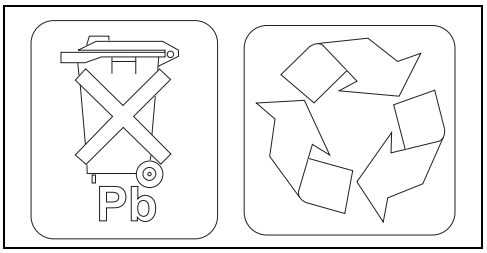
The battery posts, battery terminals and related accessories contain lead and lead compounds, chemicals know to the State of California to cause cancer and other reproductive harm.

Tighten the battery cables on the battery terminals. To prevent corrosion, apply a layer of silicone dielectric grease to battery terminals and ends of cables. Keep the vent caps and battery terminal covers in position.

Before you do any welding operation on the mower, always disconnect the battery cables from the battery and the connectors from the controllers.

Confirm the battery polarity before you connect or you disconnect the battery cables.

When you remove the battery, always disconnect the negative (BLACK) battery cable before the positive (RED) battery cable.



When you install the battery, always connect the positive (RED) battery cable before the negative (BLACK) battery cable.

Jump-Starting the Mower

a Before you try to jump-start the mower, check the condition of the drained battery.

b Connect the positive (+) battery terminal of the charged battery to positive battery terminal of the drained battery.

c Connect the negative (–) battery terminal of the charged battery to frame of vehicle with the drained battery.

⚠ WARNING

The battery can release hydrogen gas that is explosive. To decrease the risk of an explosion, prevent sparks near the battery. Always connect the negative jumper cable to the frame of the mower with the drained battery.

d When the cables are connected, start the engine on the vehicle with the good battery, then start the mower.

8.12 CHARGE THE BATTERY

WARNING

Charge the battery in an area with good airflow. The battery can release hydrogen gas that is explosive. To prevent an explosion, keep any device that can cause sparks or flames away from the battery.

When the battery charger is turned on, to prevent injury, stay away from the battery. A battery that is damaged can cause an explosion.

Read the battery charger manual for specific instructions on the operation of the charger.

When possible, remove the battery from the mower before you charge the battery. If the battery is not sealed, check and make sure the level of the electrolyte is above the plates in all of the cells.

Make sure the battery charger is turned OFF, then connect the battery charger to the battery terminals as specified in the battery charger manual.

Always turn OFF the battery charger before you disconnect the battery charger from the battery terminals.

8.13 ENGINE EXHAUST

WARNING

The exhaust fumes contain carbon monoxide. The carbon monoxide in the exhaust fumes can increase to dangerous levels. To protect you from carbon monoxide poisoning, inspect the complete exhaust system every month and replace damaged components immediately.

NEVER operate the engine without enough ventilation.

The temperature of the exhaust components can be greater than 300° F (149° C). To prevent the burns, do not touch a hot exhaust system.

CALIFORNIA PROPOSITION 65

WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.

If you sense a change in the color or sound of the exhaust, stop the engine immediately. Identify the problem and have the system repaired.

Torque all exhaust manifold hardware equally. Tighten or replace the exhaust clamps.

8.14 TIRES

Keep the tires correctly inflated to increase tire life. Inspect the tread wear.

Check the tire pressure each day, while the tires are cool. Use an accurate low-pressure tire gauge.

Keep tires inflated at the correct pressure (**See Section 8.1**)

⚠ CAUTION

DO NOT try to put a tire on a rim unless you have the correct training, tools and experience. Incorrect mounting can cause an explosion which can cause injury.

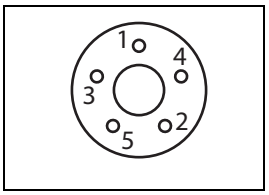
8.15 WHEEL MOUNTING PROCEDURE

⚠ WARNING

Make sure the mower is parked on a solid and level surface. Never work on a mower that is supported only by the jack. Always use jack stands.

If only the front or rear of the mower is lifted, put the chocks in front of and behind the wheels that are not lifted.

Remove dirt, grease and oil from the stud threads. Do not lubricate threads.



Put the wheel on the hub. Inspect the wheel to make sure of full contact between surface of wheel and hub.

Tighten all hardware with your fingers, then torque hardware in the order shown. When possible, tighten nuts in the top position.

Check and torque hardware each day until torque is kept at 85-95 ft.lb. (115-128Nm).

8.16 ROPS

A Roll Over Protective Structure (ROPS) is included with this mower. Inspect the ROPS weekly for loose hardware or damage.

⚠ CAUTION

Keep the ROPS hardware correctly tightened. Do not do any welding operations, drill, change or bend the ROPS. Replace a damaged ROPS. Do not try to correct a damaged ROPS.

Inspect the seat, seat belt, ROPS mounting hardware and ROPS frame for damage in accordance with maintenance chart. Replace all damaged parts immediately. All replacement parts for the ROPS must be as specified in the Parts Manual.

Check and torque all ROPS hardware in accordance with maintenance chart.

⚠ DANGER

In off road or transport mode, the seat belt must always be worn. The ROPS frame must be in the position for operation. This instruction is given to meet:

The machinery directive, 2006/42/EC Sections 3.2.2, Seating & 3.4.3, Rollover.

Jacobsen recommends that the owner/operator of the machine complete a local risk assessment on the machine to find any conditions that do not follow this rule.

8.17 BACKLAP

Start the engine. Press the LEFT arrow key to display the main menu.

Use the UP and DOWN arrow keys to until the green arrow is next to Backlap.

Press the select button ✓ to select Backlap

Select Debris Clear to clear a blockage in the reels. This will stop the reels for three seconds, operate the reels in the reverse direction for three seconds, stop the reel for three seconds and operate the reels in the normal direction.

Select Backlap Stationary to start backlap.

Use the UP and Down arrow keys to increase or decrease the backlap timer. Press the select button. Backlap timer can be set from 1 and 20 minutes in 1 minute increments.

The parking brake switch must be in the ON position, the traction pedal must be in the Neutral position, the cutting units must be lowered and the mow switch must be in the ON position.

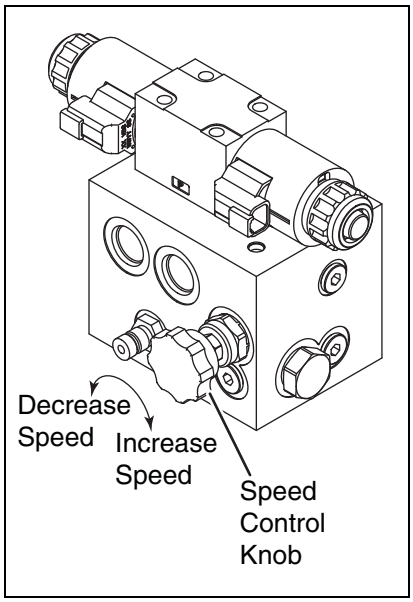
The reels will start to operate in the reverse direction and the backlap timer will start. Press the back, home or select buttons to cancel backlap.

Both the front and rear reel valves contain an adjustable valve to control the speed of the reels. The front reel valve controls the front three reels. The rear reel valve controls the two rear reels. Turn the speed control knob to the left to decrease the reel speed. Repeat for both valves.

Apply lapping compound, with a long handle brush, along the full length of the reel.

When the reels are honed, carefully and completely wash off the remaining mixture.

Repeat the full procedure on the other reels.



8.18 CARE AND CLEANING

Clean the mower and cutting units after each use. To prevent damage to the engine, do not wash the mower with the engine in operation. When possible, clean the mower with compressed air.

NOTICE

Do not wash any part of the mower that is hot. Use cold water and automotive cleaners.

⚠ CAUTION

Do not use high pressure water or air to clean radiator fins. Do not pressure wash engine.

Use clean water to wash your equipment.

NOTICE

To use salt water or drain water is known to cause rust and corrosion of metal parts and can cause damage or failure. This damage is not included by the factory warranty.

Do not spray water at the instrument panel, ignition switch, controller or other electrical components. Do not spray water at bearing housings and seals.

Clean all plastic or rubber parts with a weak soap solution or use commercially available rubber cleaners.

To keep the original high polish of the plastic parts, wax with a good grade one-step cleaner and wax combination product.

Repair damaged metal surfaces and use Jacobsen touch-up paint. Apply wax to the equipment for maximum paint protection.

⚠ CAUTION

To prevent fire, clean grass clippings and dirt from the cutting units, drives, engine and exhaust components.

⚠ WARNING

Never use your hands to clean cutting units. Use a brush to remove grass clippings from the cutting units. The reel blades are sharp and can cause injuries.

8.19 MOWER STORAGE

General

- Clean the mower and lubricate. Repair and paint damaged or open metal.
- Inspect the mower, tighten all hardware, replace worn or damaged components.
- Drain and fill the radiator.
- Clean the tires
- When the vehicle is not being used for an extended period, the tire pressures must be increased. Inflate to the maximum rating on the tire wall to make sure that flat spots do not occur. Decrease the tire pressure before the vehicle is put into operation.
- Keep the mower and all accessories clean, dry and protected from the elements. Never keep the mower near an open flame or spark which can cause ignition of the fuel or fuel vapors.
- When a label is damaged or removed from the machine, make sure that the label is replaced. See the Decals section of this manual or the Parts Manual.

Battery

- Remove, clean and keep the battery in the upright position on a surface that is not metal in a cool dry location. To prevent increased battery discharge, do not keep the battery on a metal surface.
- Check and charge the battery every 60 to 90 days.
- Keep the battery in a cool dry location. To decrease the self discharge rate, the temperature must not be more than 80° F (27° C) or less than 20° F (-7° C).

Engine

- While the engine is warm, remove the drain plugs, drain the oil from the crankcase and change the oil filter. Install the drain plugs. Tighten the drain plugs to 22 ft. Lb. (30 Nm). Fill the engine with correct amount of oil
- Clean the outside surface of the engine. Paint bare metal or apply a thin layer of rust preventative oil.

Cutting Units

- Completely clean the cutting units. Repair and paint any damaged or bare metal surfaces.
- Lubricate all grease fittings and friction points.
- Apply a thin layer of rust preventative oil to the sharpened edges of the reel blades and bedknives.

⚠ CAUTION

The reel blades and bedkives can have sharp edges. To prevent injury, wear leather gloves and use caution when you service or hold the reels.

After Storage

- Check and install the battery. If necessary, charge the battery.
- Check or service the fuel filter and air cleaner
- Check the radiator coolant level.
- Check the level of engine oil and hydraulic fluid.
- Fill the fuel tank with fuel. Bleed the fuel system.
- Make sure the tires are correctly inflated.
- Remove all oil from the reel blades and bedknives. Adjust the cutting height.
- Start the engine at 1/2 throttle. Allow the engine to become warm and lubricated.

⚠ WARNING

Never operate the engine without enough ventilation or in an enclosed area. The carbon monoxide in the exhaust fumes can increase to dangerous levels.

9 PROBLEM SOLVING

9.1 ENGINE PROBLEM SOLVING

The Engine is difficult to start	
Cause	**Action**
The fuel is thick and does not flow.	Check the fuel tank and fuel filter.
	Remove any contamination from the fuel system.
	Clean the fuel filter with kerosene.
Air or water mixed in fuel	The fuel system is a pressure type. Air in the system will cause a problem. Bleed the Fuel System.
	To get correct fuel injection pressure, check carefully for loose fuel line couplings and loose cap nut.
	Loosen the joint bolt stop, fuel filter and air vent screws of fuel injection pump to remove all the air in the fuel system.
The Engine oil becomes thick in cold weather and engine cranks slowly.	Change the grade of oil according to the average temperature.
The Battery is discharged and the engine will not crank	Charge the battery.
	In the winter, always remove the battery from the machine. Keep the battery charged and store in a dry, safe environment.

Loss of Power	
Cause	**Action**
No fuel.	Check the fuel system.
Moving parts at more than operating temperature.	Check lubricating oil system.
	Make sure that the lubricating oil filter flow is not decreased.
	A dirty filter element can cause loss of lubrication. Change the filter element.
The air cleaner is dirty	Replace the filter element every 100 hours of operation.
Injection pump wear	Use the correct grade of fuel. Low grade fuel will cause the fuel pump to wear. Only use the specified Diesel fuel.

The Engine stops	
Cause	**Action**
There is no Fuel	Check the fuel tank and fill with fuel.
	Check the fuel system for air leaks.
Bad Nozzle	If necessary, replace the nozzle.
Moving parts at more than operating temperature. Not enough lubrication.	Check amount of engine oil with oil level gauge.
	Check lubricating oil system.
	The oil filter cartridge must be replaced at every second oil change.

Dirty Smoke or carbon increase on the Exhaust	
Cause	**Action**
Wrong fuel	Only use Diesel fuel specified in specification section.
Bad Nozzle	If necessary, replace the nozzle.

Engine must be stopped immediately	
Cause	**Action**
The color of the exhaust turns dark.	Check the fuel system and the fuel injection nozzle.
The bearings are at more than operating temperature.	Check the lubricating system.

Engine Temperature above Safe Maximum.	
Cause	**Action**
Engine oil low.	Check oil level. Fill to specified level.
The fan is not operating correctly.	Check the fan fuse and relay. Make sure fan connector is tightly connected.
Coolant low.	Fill to the specified level.
The Anti-freeze solution is too strong.	Add clean water only or change to coolant of the correct ratio.
The radiator screen or radiator fins are dirty.	Clean screen or fin carefully.
The radiator or coolant lines are dirty	Clean or replace the radiator and parts.
The fan, radiator or radiator cap has defects.	Replace the parts.
The Thermostat has defects.	Check the thermostat and replace if necessary.
The Temperature gauge or sensor has defects.	Check the temperature with thermometer and replace if necessary.
Engine is operated at more than maximum load.	Decrease the load.
Head gasket has defects or water leakage.	Replace the parts.
Incorrect fuel used	Use specified fuel.

10 QUALITY OF CUT

10.1 QUALITY OF CUT PROBLEM SOLVING

Make a “test cut” to check the performance of the mower before you start the repairs.

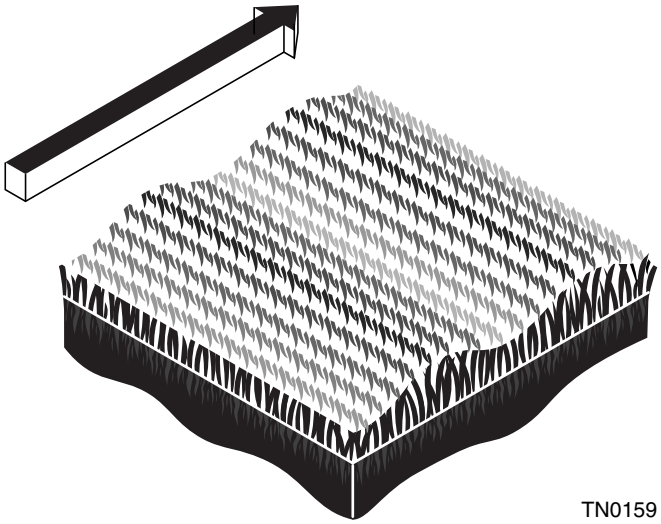
This area must have turf conditions that are known and do not change across the area. This type of area allows an accurate inspection of the perfomance of the mower to be made.

Another “test cut” must be done after the repairs or adjustments to confirm the mower’s performance.

Before you do a “test cut” to show the appearance and performance of the mower, the following items must be confirmed. These items make sure that the “test cut” is accurate.

1. Cut (Ground) Speed
2. Reel Blade Sharpness
3. Height-of-Cut (HOC)
4. Roller and Roller Bearing Condition
5. Cutting Unit Speed

10.2 WASHBOARDING



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NOTE: Arrow indicates direction of travel.

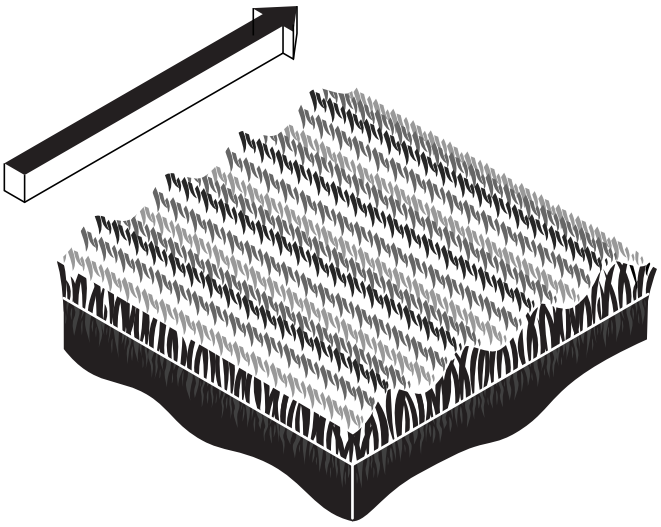
Washboarding is a repeated pattern of different cutting heights, that causes an appearance that is like a wave. In most cases, the wave tip-to-tip distance is approximately 6—8 in. (15—20 cm). A change in the color (from light-to-dark) is also seen.

The cause of this condition can be a movement from side -to-side in the cutting units (s). This condition is found on mowers with cutting units held under the mower, but other cause can give the same result.

Another cause of Washboarding is differences in the type of turf.

Probable Cause	Remedy
The cut (ground) speed is higher than normal.	Reduce the cut (ground) speed.
Grass attaches on roller.	Clean the roller and scraper.
The roller is out of round.	Replace the roller.
Cut in the same direction.	Change the direction of cut more frequently.
The Turf Groomer was used during the cleanup pass.	Only use the Turf Groomer in a straight line.
Not enough engine speed, engine speed is not set to specification.	Check/adjust the engine speed.

10.3 MARCELLING

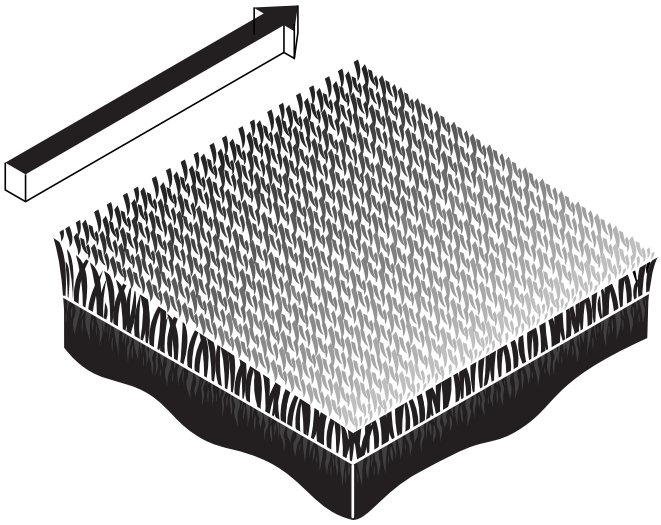


Marcelling is a repeated pattern of different cutting heights, that causes an appearance that is like a wave. In most cases, the wave tip-to-tip distance is 2 in. (5 cm) or less.

NOTE: Arrow indicates direction of travel.

Probable Cause	Remedy
The cut (ground) speed is higher than normal.	Reduce the cut (ground) speed.
The HOC (height-of-cut) settings is too low for the turf conditions.	Check HOC adjustment of cutting units.
The cutting reel diameter is worn.	Check the cutting reel diameter and replace if necessary.

10.4 STEP CUTTING



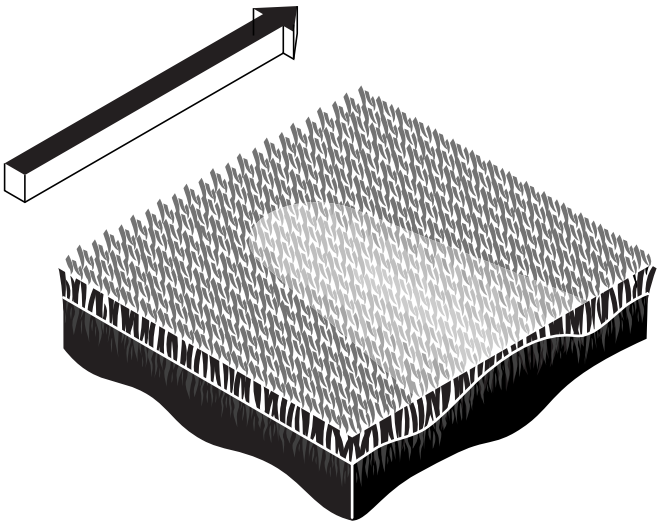
NOTE: Arrow indicates direction of travel.

Step cutting occurs when grass is cut higher on one side of a cutting unit than the other side. Step cutting can occur when one cutting unit is higher than another cutting unit.

The wear of mechanical parts or an incorrect roller adjustment can cause step cutting.

Probable Cause	Remedy
HOC (height-of-cut) settings are different from one side of a cutting unit to the other side or from one cutting unit to another unit.	Check HOC adjustment of cutting units.
Worn front roller bearings.	Check and replace the bearings in the roller.
The reel-to-bedknife adjustment is different from one side of a cutting unit to the other side or from one cutting unit to another unit	Check the reel-to-bedknife adjustment.
The cutting unit movement is prevented.	Check and remove the cutting unit movement obstruction.
Differences in turf density	Change the direction of cut.
Mower ride height is uneven side to side.	Check and adjust tire inflation pressure.

10.5 SCALPING

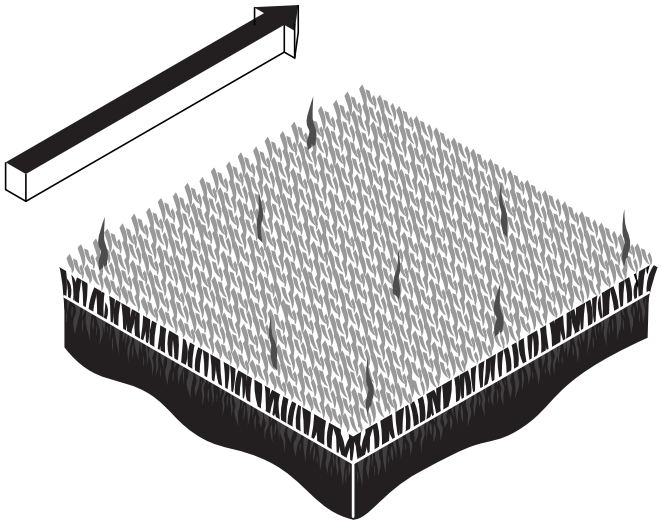


NOTE: Arrow indicates direction of travel.

Scalping is a condition in which areas of grass are cut shorter than the adjacent areas. The area can be light green or brown. A low HOC setting or turf that is not level can cause scalping.

Probable Cause	Remedy
HOC (height-of-cut) settings are lower than normal.	Check and adjust the HOC settings.
The reel-to-bedknife adjustment is different from one side of a cutting unit to the other side or from one cutting unit to another unit	Check the reel-to-bedknife adjustment.
Turf is not level and the mower can not follow the turf.	Change the direction of cut.
Grass is higher than the cutting unit capacity.	Cut the grass more frequently.
Cut (ground) speed is higher than the mower can cut.	Reduce the cut (ground) speed.

10.6 STRAGGLERS

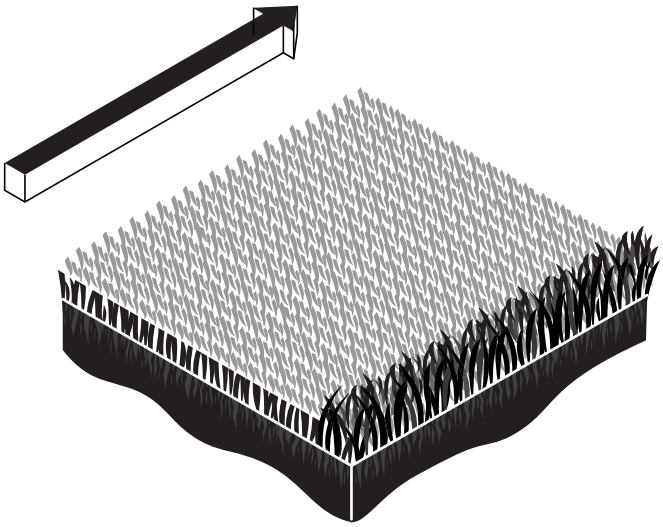


Stragglers are separated blades of grass that are not cut, or are cut incorrectly.

NOTE: Arrow indicates direction of travel.

Probable Cause	Remedy
Edge of the cutting blade(s) are not sharp.	Backlap or grind the reels.
The bedknife is not adjusted correctly.	Check the reel-to-bedknife adjustment.
Cut (ground) speed is higher than normal	Reduce the cut (ground) speed.
The grass is higher than the level at which the mower can cut correctly.	Cut the grass more frequently.
Cut in the same direction.	Change the direction of cut more frequently.
Damage to the reel or bedknife.	Grind, sharpen or replace the reel blades and bedknife as needed.

10.7 STREAKS

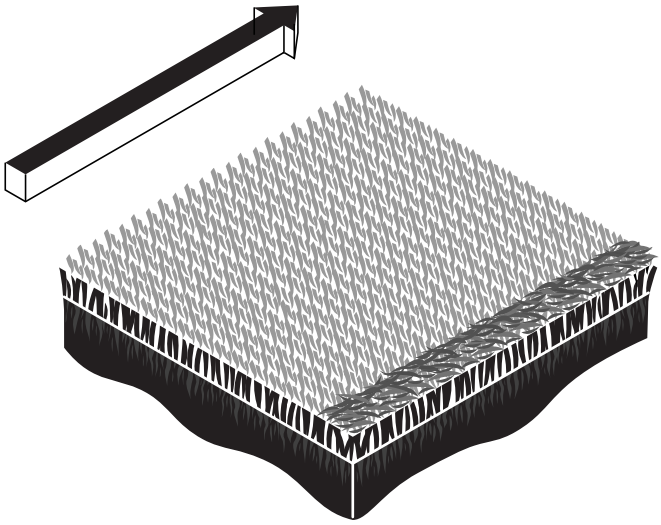


NOTE: Arrow indicates direction of travel.

A streak is a line of grass that is not cut. The cause of a streak can be a damaged reel or bedknife.

Probable Cause	Remedy
The bedknife is damaged.	Replace the bedknife.
The reel is damaged or is not worn equally.	Inspect the reel. Replace the reel as needed.
Loose or missing bedknife screws	Check and tighten the loose bedknife screws. Replace any missing screws.
The mower turns at a rate that is faster than the mower can turn and cut correctly. The cutting units do not overlap around turns or on side hills.	Turn at a speed that will allow the cutting units to overlap. Change the direction of cut or pattern on the side hills.
The tires compresses the grass before the grass is cut.	Check and adjust the tire inflation pressure.
The mower compresses the wet grass before the grass is cut.	Cut the grass when grass is dry.

10.8 WINDROWING

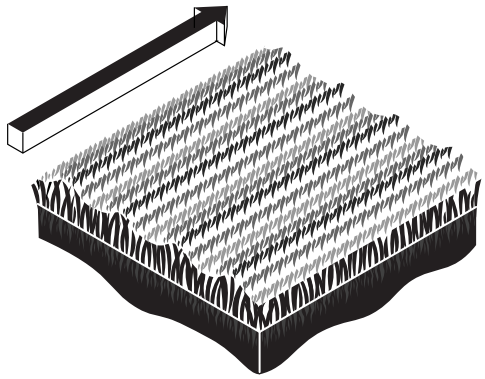


Windrowing is the deposit of clippings increased at one end of cutting unit(s) or between cutting units. Windrowing can make a line in the direction of travel.

NOTE: Arrow indicates direction of travel.

Probable Cause	Remedy
The grass is higher than the level at which the mower can cut correctly.	Cut the grass more frequently.
Mowing the grass while grass is wet.	Cut when grass is dry.
Grass attaches to the roller.	Clean the rollers and scrapers.
Grass collecting on the bedknife.	Check the reel-to-bedknife adjustment.

10.9 RIFLING OR TRAMLINING



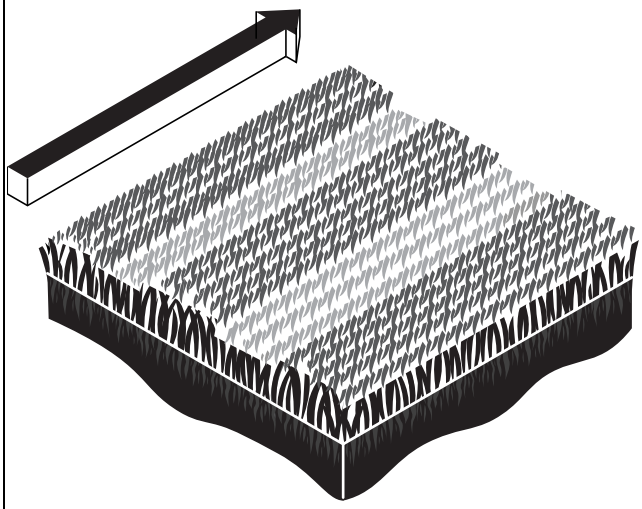
NOTE: Arrow indicates direction of travel.

Rifling or tramlining is a pattern of different cutting heights that gives the grass an appearance like a wave. This appearance is normally caused by heavy contact points across a reel and bedknife.

Probable Cause	Remedy
The reel is damaged or is not worn equally.	Check and adjust the HOC on cutting units to same height.
Loose, missing or over-torqued bedknife screws	Install, replace or tighten the bedknife screws to the correct torque.
Cut (ground) speed is higher than normal	Reduce the cut (ground) speed.

10 QUALITY OF CUT

10.10 MISMATCHED CUTTING UNITS

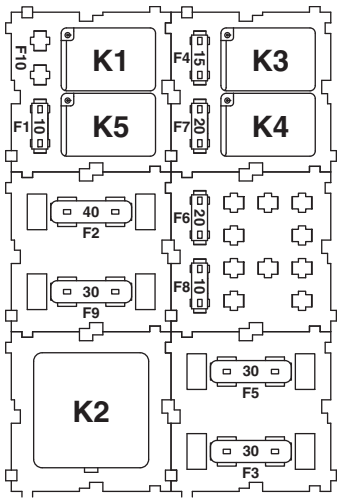


NOTE: Arrow indicates direction of travel.

Mismatched cutting units is a pattern of different cutting heights, that gives the grass a stepped cut appearance. This appearance is normally caused by a mismatched HOC (height-of-cut) adjustment from one cutting unit to another unit.

Probable Cause	Remedy
HOC is different from one cutting unit to another unit.	Check and adjust the HOC on cutting units to same height.
Difference in mower ride height side to side.	Check and adjust the tire inflation pressure.

11.1 FUSE AND RELAY/COMPONENT IDENTIFICATION



FUSES

FUSE HOLDER 1		
Fuse	Rating	Protected Circuits
F1	10A	12 Volt Accessory Outlet
F2	40A	Glow Plug Relay
F3	30A	Ignition Relay
F4	15A	Hot to Key Switch and Display
F5	30A	Fan
F6	20A	Hot to Machine Control Unit
F7	20A	Hot to Machine Control Unit
F8	10A	Air Ride Seat
F9	30A	Starter Relay
F10*		

Relays

Relay	Rating	Circuits
K1	Micro	Ignition Relay
K2	40A	Glow Plug Relay
K3	Micro	Start Relay
K4	Micro	Fan Relay
K5	Micro	4WD Relay

⚠ WARNING

To prevent injury to the operator or damage to the mower, never replace a fuse with a higher amperage rating fuse.

Never bypass fuses. Fire damage may result.

NOTICE

For proper operation of the SLF530 mower, do not insert a fuse in the F10 location. Placing a fuse in the F10 location will select the wrong program in the mower controllers.

12 SPECIFICATIONS

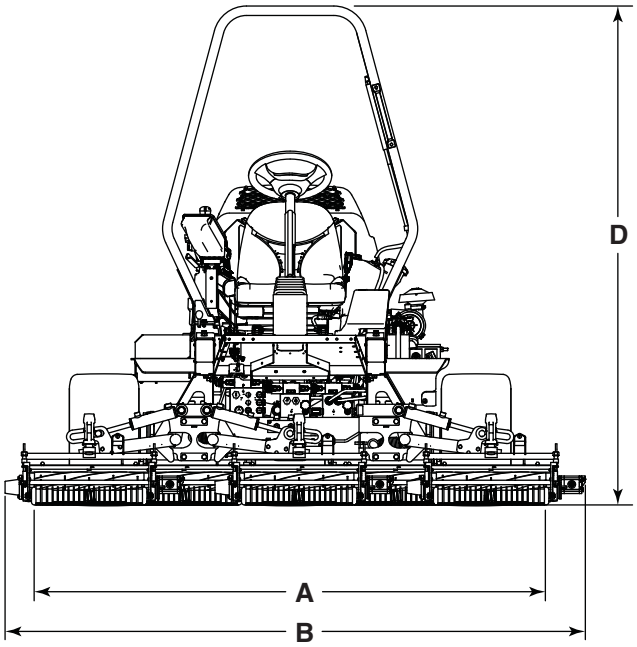
12.1 ENGINE SPECIFICATION

Model:	D1105-E4B
Type:	Vertical, water-cooled, 4-cycle diesel engine
Number of Cylinders	3
Bore and Stroke	78 mm x 78.4 mm (3.07 in. x 3.09 in.)
Total Displacement	1.123 liters (68.53 cu.in.)
Combustion Type	Indirect Injection
SAE Net Intermittent kW / rpm H.P. (SAEJ1349) (HP / rpm)	18.5 kW @ 3000 rpm (24.8 HP @ 3000 rpm)
Maximum Torque / Rotating Speed	71.5 N-m / min (2200 rpm) 52.7 ft-lb / min (2200 rpm)
Maximum Bare Speed:	3000 ± 50 rpm (No load)
Idle Speed:	1650 ± 25 rpm
Firing order	1-2-3
Direction of Rotation	Counter-clockwise (viewed from flywheel side)
Compression Ratio	24:1
Fuel:	Diesel to BS EN590 or ASTM D975 (Ultra Low Sulfur)
Lubrication (API Class)	CF
Dimensions (length x width x height)	497.8 mm x 396.0 mm x 608.7 mm (19.60 in. x 15.59 in. x 23.96 in.)
Dry Weight (BB Spec.)	93.0 kg (205 lbs)
Starter motor	12V, 1.2kW
Generator	12V, 40 Amp

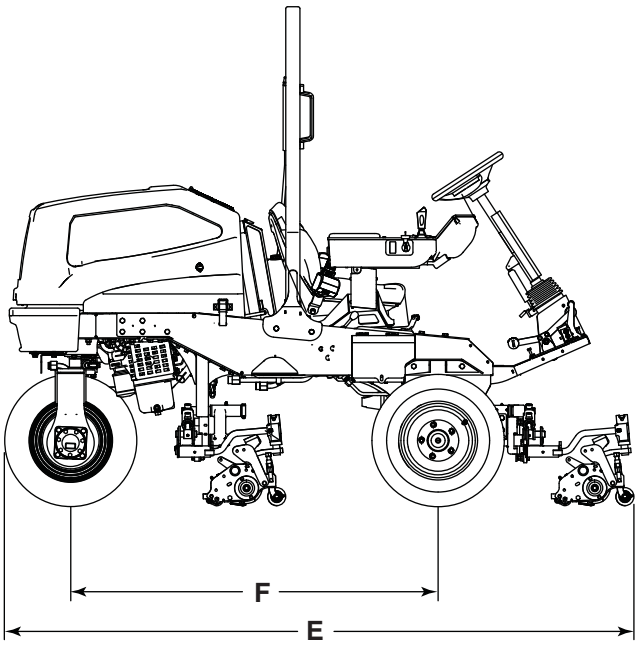
12.2 DIMENSIONS & WEIGHTS

A	Width Of Cut	203 cm	82 in.
B	Overall Width	246 cm	96.7 in.
C	Maximum Width Transport With Cutting Units Raised	233 cm	91.8 in.
D	Maximum Height With ROPS	211 cm	83.2 in.
E	Total Length (3WD Option)	266 cm	104.9 in.
E	Total Length (4WD Option)	264 cm	104.1 in.
F	Wheel Base (3WD Option)	156 cm	61.3 in.
F	Wheel Base (4WD Option)	157 cm	62.0
G	Wheel Track Front	138 cm	54.5 in.
H	Wheel Track Rear (4WD Option)	113 cm	44.3 in.
	Ground Clearance	5.08 cm	2 in.
	Turning Circle, Curb to Curb (outside tire to outside tire) in Transport 3WD Option (Left/Right Turn)	569/531 cm	224/209 in.
	Turning Circle, Curb to Curb (outside tire to outside tire) in Transport 4WD Option (Left/Right Turn	485/505 cm	191/199 in.
	Uncut Turning Circle 3WD Option	173 cm	68 in.
	Uncut Turning Circle 4WD Option	89 cm	35 in.
	Weight Of SLF530 Machine With ROPS, 3WD Option No Reels And Fuel Tank Empty	867 kg	1912 lb.
	Weight Of SLF530 Machine With ROPS, 4WD Option No Reels And Fuel Tank Empty	931 kg	2052 lb.
	Maximum Front Axle Loading	771 kg	1699 lb.
	Maximum Rear Axle Loading 3WD Option	351 kg	773 lb.
	Maximum Rear Axle Loading 4WD Option	410 kg	903 lb.
	Weight Of Reel (5 Required)	45 kg	99 lb.
	Weight Of 28.7 Liters (7.6 US Gallons) Of Diesel Fuel	24.65 Kg.	54.3 lb.

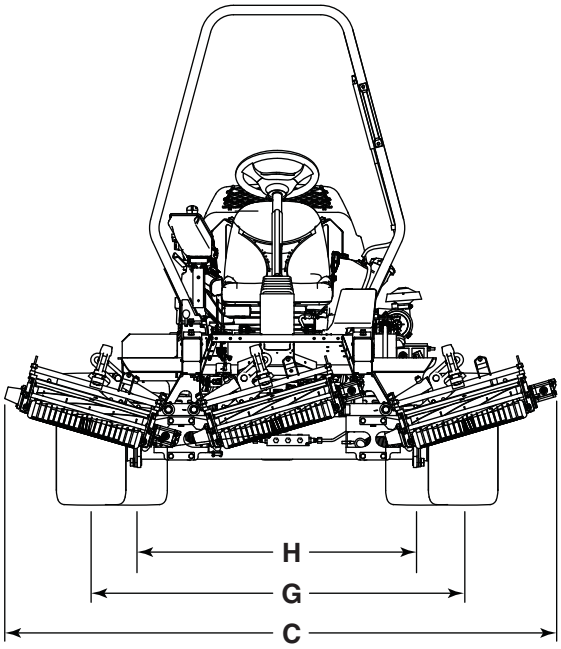
3WD Option Cutting Units Lowered
Front View



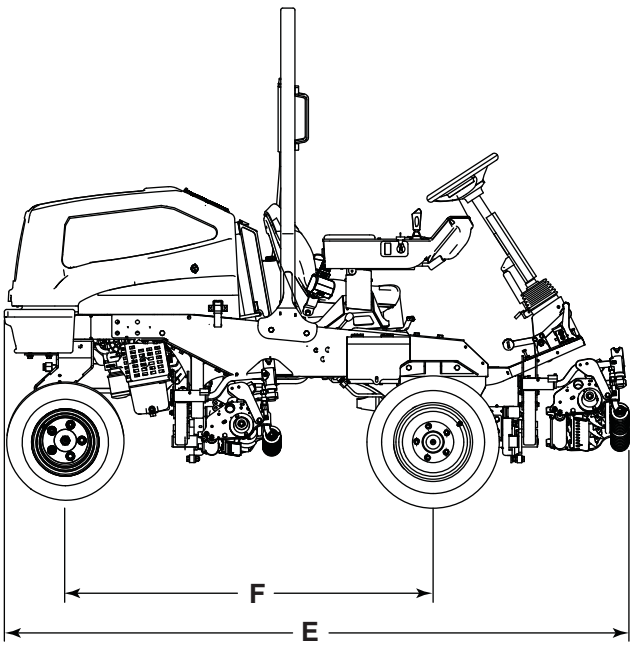
3WD Option Cutting Units Lowered
Right Side View



4WD Option Cutting Units Lifted
Front View



4WD Option Cutting Units Lifted
Right Side View



12.3 MACHINE SPECIFICATION

Frame construction: Heavy duty steel chassis with formed steel frame rails.

Cutting Unit Drive: SLF530, Five individual hydraulic motors.

3WD Transmission: Hydrostatic closed loop parallel series system. Variable displacement piston pump. Front high torque fixed displacement piston wheel motors. Full time auto 3WD forward. 2WD in reverse.

4WD Transmission: Hydrostatic closed loop parallel cross flow 4 wheel drive system. Variable displacement piston pump. Front high torque fixed displacement piston wheel motors. 2WD forward in transport mode, 2WD and on demand 4WD in mow mode. 2WD only in reverse

Speeds:

Cutting: 0 - 10 km/h (0 - 6.2 mph) Forward

Transport: 0 - 14 km/h (0 - 8.7 mph) Forward

Reverse: 0 - 6 km/h (0 - 3.7 mph)

Steering: Hydrostatic powered steering.

Ground pressure: Depends on the tire pressures and the accessories installed.

Brakes: Hydrostatic braking with wet disc parking brakes on the front wheels.

Battery: 12V, 425 CCA, 45 Amp Hours Capacity, SAE Large Posts

Mower Lift/Lower: Hydraulic Double Acting Cylinders

Hydraulic Tank Capacity: 28.4 liters (6.2 U.S. Gallon)

12.4 HYDRAULIC SPECIFICATION

Circuit Description	Flow @3000 rpm engine speed Liters/Minute (US Gallon/Minute)	Relief Valve Pressure BAR (PSI)
Forward Traction Circuit	105 (27.7)	280 (4060)
Reverse Traction Circuit	105 (27.7)	280 (4060)
Charge Pressure	19.17 (5.1)	14 (200)
Cutting Units	19.17 (5.1)	153 (2200) in Reel Valve
Steering and Lift	19.17 (5.1)	140 (2030)
Lower	19.17 (5.1)	31 (450)

12.5 VIBRATION

The machine was tested for hand and arm vibration levels. The operator was in the normal position to drive the vehicle, with two hands on the steering mechanism. The engine was in operation and the cutting device was in rotation. No drive was engaged.

The Machinery Safety Directive 2006/42/EC
By compliance to:
The Lawnmower Standard BS EN ISO5395-3:2013
Referenced to Hand/Arm: BS EN ISO20643:2008

Information Supplied for Physical Agents Directive 2002/44/EC
By reference to:
Hand/Arm Standards: BS EN ISO 5349-1 (2001)
BS EN ISO 5349-2 (2002)

Hand / Arm Acceleration Level	SLF530
	Maximum Accelerations m/s²
	1.3 ± 0.4

Whole-body vibration measurement was carried out with the machine traveling in a straight line at a speed close to 6 km/h on a flat horizontal level surface. The height of cut was set at the lowest position and the cutting means engaged.

Each reading shall be obtained from a signal time suitable
The Machinery Safety Directive 2006/42/EC
By compliance to:
Whole Body EN1032:2003

Information Supplied for Physical Agents Directive 2002/44/EC
By reference to:
Whole Body Standards BS EN ISO 2631-1 (1997)

Whole Body Acceleration Level	SLF530
	Maximum.Acceleration m/s²
	0.6 ± 1.57

12.6 NOISE

When the machine was tested for sound pressure (Operator Ear).

The Machinery Safety Directive 2006/42/EC
And
Exposure Of Workers To The Risks Arising From Physical Agents (Noise) Directive 2003/10/EC
By compliance to:
The Lawnmower Standard BS EN ISO 5395:2013
And
Sound Pressure Standard EN ISO 3746: 2010

SLF530 3WD: Measured Sound Pressure 89.6 dB(A) ± 1.24 Leq
SLF530 4WD: Measured Sound Pressure 88.7 dB(A) ± 1.24 Leq

When the machine was tested for sound power (Noise in the Environment).

The Machinery Safety Directive 2006/42/EC
And
Noise Emission In The Environment By Equipment For Use Outdoors
Directive 2000/14/EC
By compliance to:
Sound Power Standard EN ISO 3744:2010

Measured Sound Power 102 dB(A) ± 1.24 LWA
SLF530 3WD: Measured Sound Pressure 101.6 dB(A) ± 1.24 LWA
SLF530 4WD: Measured Sound Pressure 100.9 dB(A) ± 1.24 LWA

12.7 SLOPES

DO NOT USE ON SLOPES GREATER THAN 21°. The slope was calculated using static stability measurements according to the requirements of BS EN ISO 5395:2013

12.8 CUTTING PERFORMANCE

208 cm (82 in.) width of cut:

1.82 hectares/hr. At 9.66 kph.

4.5 acres / at 6 mph

(10% allowance is included for normal overlaps and turning at the end of each cut).

12 SPECIFICATIONS

12.9 CUTTER DECK SPECIFICATION

Product (2 LH Reels and 3 RH Reels Required)	62298 (LH) / 62859 (RH) Reel Cutting Unit	62299 (LH) / 62860 (RH) Reel Cutting Unit
Number of Reel Blades	8	11
Reel Cutting Width	45.7 cm (18 inch)	
Height of Cut	7.6 mm - 18 mm (0.30 inch - 0.70 inch)	
Height of Cut Adjustment	Lift or lower front roller with adjustment knobs on the ends of reel.	
Transmission	By Hydraulic motor to drive side of reel.	

12.10 RECOMMENDED LUBRICANTS

Grease:

For rear axle: K NATE (RJL No. 4213860), or equivalent to MIL-G-23549C, MIL-G-2345C, DIN 51 825, DIN 51 818

All other applications: Shell Darina R2 lithium based grease or equivalent.

12.11 ACCESSORIES

Reels:
8 Blade 18 inch Left Hand Reel (Right Front and Right Rear Positions) Kit number 62298
8 Blade 18 inch Right Hand Reel (Center, Left Front and Left Rear Positions) Kit number 62859
11 Blade 18 inch Left Hand Reel (Right Front and Right Rear Positions) Kit number 62299
11 Blade 18 inch Right Hand Reel (Center, Left Front and Left Rear Positions) Kit number 62860

Front Rollers:
Ø76 mm (3 inch) Grooved Front Roller with Scraper Kit number 67925
Ø55 mm (2-3/16 inch) Solid Front Roller with Scraper Kit number 68626
Ø55 mm (2-3/16 inch) Grooved Front Roller Kit number 68616

Rear Rollers:
Ø55 mm (2-3/16 inch) Full Width Solid Rear Roller with Scraper Kit number 68674
Ø51 mm (2 inch) Narrow Width Hollow Smooth Tube Rear Roller with Scraper Kit number 4420310

Vertical Mower
Left Hand Verticutter Kit number 67155
Right Hand Verticutter Kit number 67156

Turf Groomer
Left Hand Reel (Used on 62298 and 62299 reels) Kit number 67161
Right Hand Reel (Used on 62859 and 62860 reels) Kit number 67162

Bi-Directional Groomer/Brush
Left Hand Reel Bi-Directional Drive (Used on 62298 and 62299 reels) Kit number 62938
Right Hand Reel Bi-Directional Drive (Used on 62859 and 62860 reels) Kit number 62939
18” Bi-Directional Groomer 1/4” Spacing Kit number 62907
18” Bi-Directional Groomer 1/2” Spacing Kit number 62940
18” Bi-Directional Stiff Bristle Brush Kit number 62915
18” Bi-Directional Medium Bristle Brush Kit number 62916
18” Bi-Directional Soft Bristle Brush Kit number 62917
18” Front Grooved Roller 1/4” Spacing Kit number 62930
18” Front Grooved Roller 1/2” Spacing Kit number 62941
18” Solid Front Roller Kit number 62931

Powered Rear Roller Brush
Kit number 67929

Bat (for clearing blockages) 4184540

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