Jake

A SIGNATURE CUT, TRUSTED FOR OVER 100 YEARS

JACOBSEN

SAFETY, OPERATION & MAINTENANCE MANUAL

LF Series - Lightweight Fairway Mower

LF550 / LF570 – 2WD & 4WD

KUBOTA D1803-M-DI-E3B
BAU / DDF / DDG Series

KUBOTA D1803-CR-E5B
BAV / BAY / BAW / CAA Series

KUBOTA V2403-M-DI-E3B
DGL / DGQ Series

KUBOTA V2403-CR-E5B
CAD / CAE Series

KUBOTA V1505-CR-TE5
DCU / DCV / DCW / DCY Series

⚠ WARNING

WARNING: If incorrectly used this machine can cause severe injury. Those who use and maintain this machine must 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
United Kingdom

RJL AHCC

4358526-E

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

Qty.	Part No.	Description
	4358526	Safety & Operation Manual
	4358527	Parts Manual
		Video, Operator Training

Qty.	Part No.	Description
	4299117	T4F/Stage 5 Engine Parts Manual
	4358529	T4I Diesel Engine Parts Manual
	TBD	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

2 INTRODUCTION

2.1 IMPORTANT

The Jacobsen LF550 / LF570 with a Diesel engine is a self propelled fairway mower. The hydraulic systems are for the traction drive, steering, lift - lower and the cutting unit drive.

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

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

This SAFETY, OPERATION AND MAINTENANCE MANUAL is part of the mower and must stay with the mower always. Suppliers of both original and used mowers need to keep the documentation that comes with the mower.

You must use the mower to cut the grass and not for any other purpose. Compliance with the conditions or 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 mower that the manufacturer does not approve. This type of change can release the manufacturer from the liability for any damage or injury.

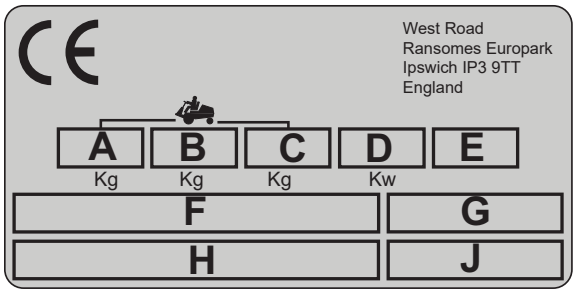
When you discard worn parts, know the environmental result and use the systems available in the country where the mower is used. When the mower is at its end of life, there are guidelines in this manual for the removal of the mower from use.

Use only Jacobsen approved parts.

2006/42/EC
The instructions recorded here are the original instructions confirmed by Jacobsen.

2.2 PRODUCT IDENTIFICATION TEST

Mower Serial number plate



A Maximum Front Axle Load in Kg

B Gross vehicle Weight in Kg

C Maximum Rear Axle Load in Kg

D Power in kw

E Date code

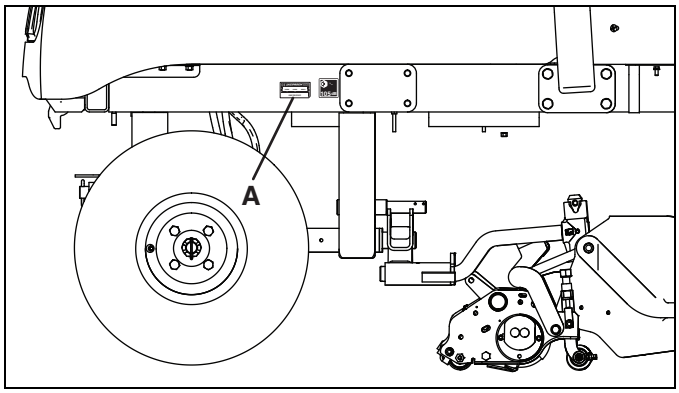
F Machine type (Designation)

G Product code

H Product name

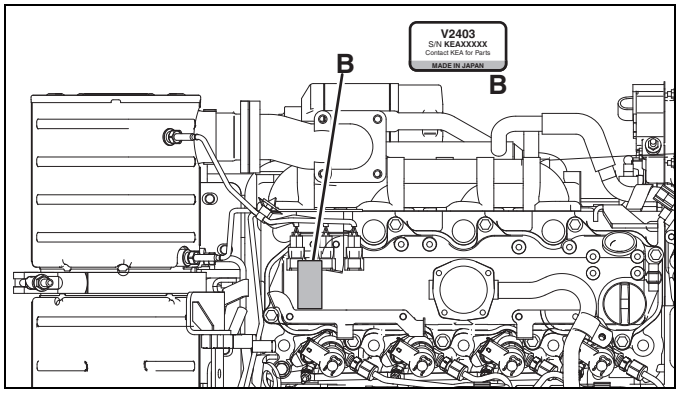
J Serial Number

Location of Mower Serial number plate



The serial number plate **(A)** is found on the right side frame rail behind the rear cutting units.

Engine Serial Number



The engine serial number is found on the top of the valve cover toward the front of the mower. Label shows the engine group and serial number.

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

2.3 SERIAL NUMBERS

Record the mower and engine numbers shown below:

Mower Number:_____

Engine Number:_____

2.4 GUIDELINES FOR THE DISPOSAL OF SCRAP PRODUCTS

2.4.1 DURING SERVICE LIFE

The used oil, oil filters and engine coolant are hazardous materials. Follow the recommended procedures for their safe removal.

If a fluid leaks, contain the spill to make sure that the leak does not flow into the ground or drainage system. Follow the local laws to make sure that leaks are controlled safely.

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

Take these actions after the mower complete its full service life.

2.4.2 END OF SERVICE LIFE

Use these guidelines with applicable Health, Safety and Environmental laws. Always use the approved local waste disposal and agencies for recycled materials.

- Park the mower in a location to use all of the necessary lifting equipment.
- Use the correct tools and Personal Protective Equipment (PPE) and take instruction from the technical manuals applicable to the mower.
- Remove and keep correctly
  1. Batteries
  2. Fuel
  3. Engine coolant
  4. Oils
- Disassemble the structure of the mower and refer to the technical manuals. Give attention to parts that have mechanical pressure or tension applied to the part in the mower, including springs.
- Separate items that continue to have service life and returned to storage.
- Separate items that are worn into the material groups and removed according to the agencies for the recycled materials that are available. Common types are as shown:
  - Steel
  - Non ferrous metals
    - Aluminum
    - Brass
    - Copper
  - Plastic Materials
    - Identified
    - Can be recycled
    - Can not be recycled
    - Not Identified
  - Rubber
  - Electrical and Electronic Components
- Add items that can not be easily separated into different materials to the “General discarded materials” area.
- Do not burn the discarded materials

Change the mower records to show that the mower is not in service and is discarded. Supply this serial number to Jacobsen Warranty Department to close their records.

3.1 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 another person that knows the correct operation of the equipment before you operate the mower.

Only use parts, accessories and attachments approved by Jacobsen.

3.1.1 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 website.

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

c 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.

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

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

f Never carry passengers.

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

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

3.1.2 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.

3.1.3 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 PTO 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.

3.1.4 ROPS

a The ROPS is a safety device. Keep the ROPS in the vertical and locked position. Always use the seat belt when you operate the mower. 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.

3.1.5 SAFE HANDLING OF FUELS

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

b Never use the 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. When the engine is in operation or while the engine is hot, never remove the fuel cap or add fuel to the mower.

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.

3.1.6 MAINTENANCE AND STORAGE

a Before you clean, adjust or repair this equipment, push PTO 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 the jack. Always use the 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 the 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 materials that burn from the engine, muffler, battery tray and fuel tank area.

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

3.1.7 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 full-width ramp to load or unload the mower on a trailer.

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.

3.1.8 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 engine from starting unless a.) The parking brake switch is in the ON position. b.) The PTO switch is in the OFF position and 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 switch in the ON position and
b.) the PTO 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 bystanders 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.

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

4 SPECIFICATIONS

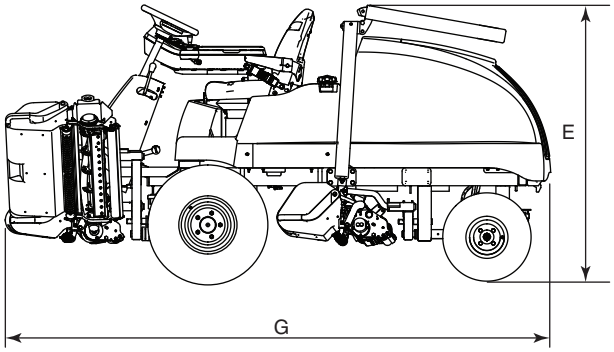
4.1 ENGINE SPECIFICATIONS

Make	Kubota				
	Tier 4 Interim (T4I) Engine		Tier 4 Final/Stage V (T4F/Stage 5) Engines		
Model	D1803-M-DI-E3B	V2403-M-DI-E3B	D1803-DICR-E4B	V2403-DICR-E4B/E5B	V1505-CR-TE5
Type	Four cycle, liquid cooled, Diesel				
Number of Cylinders	3	4	3	4	4
Bore and Stroke	3.43 in. (8.7 cm) x 4.03 in. (10.24 cm)				3.07 in (78mm) X 3.09 in (78.4mm)
Total Displacement	111.43 in^3 (1.826 l)	148.5 in^3 (2.434 l)	111.43 in^3 (1.826 l)	148.5 in^3 (2.434 l)	94.14 in^3 (1.498 l)
Combustion System	Direct Injection		Common Rail Direct Injection		
Intake System	Naturally Aspirated				Turbo
Gross Intermittent Power	35.5 hp (26.5 kw) @ 2700 RPM	48.9 hp (36.5kw) @2700 RPM	37.5 hp (28 kW) @ 2700 rpm	50.2 hp (37.4 kW) @ 2700 rpm	44.9hp (33.0 kW) @ 3000 rpm
Torque	83.1 ft.lb. (112.7 Nm) @ 1600 rpm	114.5 ft.Lb. (155.2 Nm) @1600 rpm	85.4 ft.Lb. (115.8 Nm) @1600 rpm	117.9 ft.Lb. (159.8 Nm) @1600 rpm	87.5 ft.Lb. (118.6 Nm) @2000 rpm
Maximum Speed	2920 ± 50 rpm (No Load)	2920 ± 50 rpm (No Load)	2950 ± 50 rpm (No Load)	2950 ± 50 rpm (No Load)	3220 ± 50 rpm (No Load)
Low Idle	1300 ± 25 rpm (No Load)	1100 ± 50 rpm (No Load)	1300 ± 25 rpm (No Load)	1000 ± 50 rpm (No Load)	1050 ± 50 rpm (No Load)
Rotation	Counter-clockwise viewed at flywheel				
Fuel	#2 Low or ultra-low sulfur Diesel Fuel				
Injection Pump	Bosch MD type mini pump				
Engine Oil (API Class)	CJ-4				CJ-4 / CK-4
Oil Pan Capacity	5.5 quart (5.2 l)	7.5 quart (7.1 l)	5.5 quart (5.2 l)	7.5 quart (7.1 l)	5.3 quart (5 l)
Starter	12 Volt, 2 kW				1.2kW
Alternator	12 Volt, 45 Amp				
Dry Weight	332.9 lb. (151 kg)	405.7 lb. (184 kg)	408 lb. (185 kg)	487 lb. (221 kg)	341.7 lb. (173 kg)
Dimensions (Length x Width x Height)	22.7 x 19.6 x 26.9 in. (57.6 x 49.9 x 68.4 cm)	26.4 x 19.6 x 26.9 in. (67.1 x 49.9 x 68.4 cm)	29.3 x 20 x 28.4 in. (74.4 x 50.7 x 72.1 cm)	34.2 x 20.4 x 28.4 in. (86.9 x 51.7 x 72.1 cm)	31 x 17.9 x 27.2 in. (78.7 x 45.5 x 69.1cm)
Emission Regulation	EPA Tier 4 Interim EU Stage IIIA		EPA Tier 4 Final/ EU Stage 5		

4.2 DIMENSIONS AND WEIGHTS

	LF550 / LF570
A - Width of Cut	100 inch (254.0 cm)
B - Maximum Width	115 inch (292.1 cm)
C - Transport Width	87 inch (220.9 cm)
D - Height ROPS frame in the vertical position	88 inch (223.5 cm)
E - Height ROPS frame folded	61 inch (155.2 cm)
F - Total length cutting with grass catchers	120 inch (304.8 cm)
G - Total length transport	120 inch (304.8 cm)
H - Wheel Base	62 inch (157.5 cm)
J - Front Wheel Track	72 inch (182.9 cm)
K - Rear Wheel Track	43 inch (109.2 cm)
L - Maximum Height Canopy	93 inch (236.2 cm)
Weight of unit, hydraulic and fuel tanks filled, reels lifted. Tier 4 Interim D1803 Engine	LF550 2WD: 2946 lb. (1336 kg) LF550 4WD: 3277 lb. (1486 kg) LF570 2WD: 3036 lb. (1377 kg) LF570 4WD: 3367 lb. (1527 kg)
Weight of unit, hydraulic and fuel tanks filled, reels lifted. Tier 4 Final D1803 Engine	LF550 2WD: 3036 lb. (1377 kg) LF550 4WD: 3367 lb. (1527 kg) LF570 2WD: 3126 lb. (1418 kg) LF570 4WD: 3457 lb. (1568 kg)
Weight of unit, hydraulic and fuel tanks filled, reels lifted. Tier 4 Interim V2403 Engine	LF550 2WD: 3192 lb. (1448 kg) LF550 4WD: 3523 lb. (1598 kg) LF570 2WD: 3282 lb. (1489 kg) LF570 4WD: 3698 lb. (1677 kg)
Weight of unit, hydraulic and fuel tanks filled, reels lifted. Tier 4 Final & Stage 5 V2403 Engine	LF550 2WD: 3282 lb. (1489 kg) LF550 4WD: 3613 lb. (1639 kg) LF570 2WD: 3372 lb. (1530 kg) LF570 4WD: 3788 lb. (1718 kg)
Weight of fuel in tank	122 lb. (55 kg)

Tire Specifications					
Front Wheel			Rear Wheel		
Tire Size	Type	Tire Pressure	Tire Size	Type	Tire Pressure
26.5 x 14-12	Ultra Chevron 4 Ply	12 psi (0.83 BAR)	20 x 10-8	Grassmaster 4 Ply	12 psi (0.83 BAR)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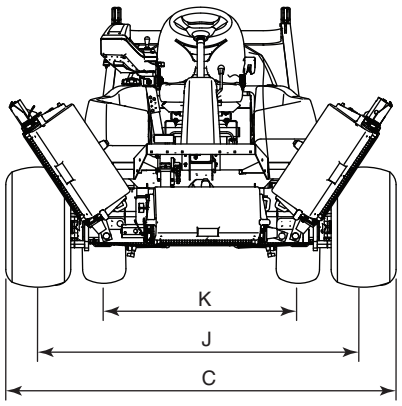
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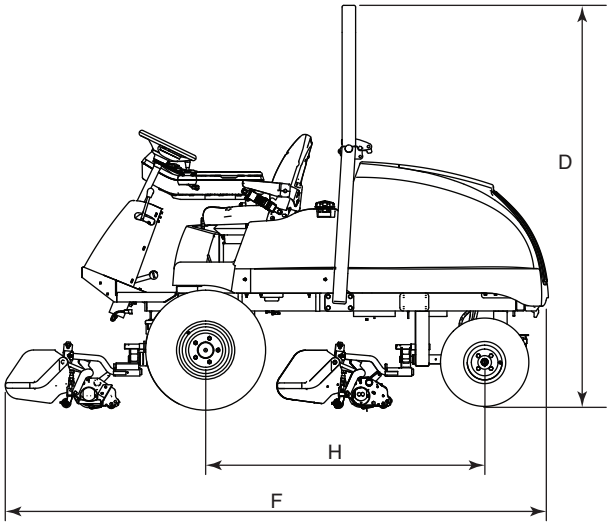
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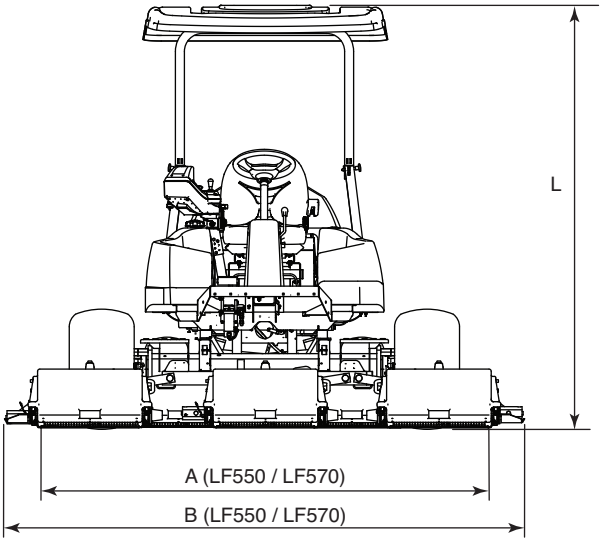
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A (LF550 / LF570)
B (LF550 / LF570)

4.3 MOWER SPECIFICATION

Battery: 12V, 600 CCA, Group BCI 24

Service Brake: Dynamic braking through the traction circuit

Parking Brake: Integrated in wheel motor, hydraulic release

Fuel Tank: 17 U.S. Gallons (65 l)

Hydraulic Tank: 14 U.S. Gallons (53 l)

Hydraulic Fluid: GreensCare 68

Return Filter: 10 Micron, 30 psi (2.06 BAR) crack bypass

Charge Filter: 10 Micron, 30 psi (2.06 BAR crack bypass

Hydraulic Cooling: Side by side combined hydraulic oil cooler and engine coolant radiator

Steering: Hydrostatic power steering, with adjustable steering wheel

2WD Traction Drive: Parallel system in the forward and reverse direction. Variable displacement hydraulic pump to 24.3 in^3 (398 cc) front wheel motors.

4WD Traction Drive: SureTrac™ 4WD parallel-cross-series system in the forward direction. 2WD in the reverse direction. Variable displacement hydraulic pump to 24.3 in^3 (398 cc) front wheel motors and 18.3 in^3 (300 cc) rear wheel motors.

LF550 Cutting Unit Drive: 0.72 in^3 (11.8 cc) hydraulic motors connected to the cutting unit

LF570 Cutting Unit Drive: 1.01 in^3 (16.5 cc) hydraulic motors connected to the cutting unit

Mow Speed: 0-8 mph (0-13 kph)

Transport Speed: 0-12 mph (0-19.3 kph)

Reverse Speed: 0-5 mph (0-8.1 kph)

LF550 / LF570 Cutting Performance: 5.7 acres/hr. (2.32 hectares/hr) @7 mph (11.25 km/hr)

4.4 HYDRAULIC SPECIFICATION

Circuit Description	Flow @2800 rpm engine speed US Gallons/Minute (Liters/Minute)	Relief Valve Pressure psi (BAR)
Forward Traction Circuit	34.06 (128.9)	3625 (250)
Reverse Traction Circuit	34.06 (128.9)	3625 (250)
Charge Pressure	6.8 (25.7)	315 (21.7)
Mowers	6.8 (25.7)	1167 (80.5) in Reel Motors
Steering and Lift/Lower	6.8 (25.7)	1450 (100)

4.5 VIBRATION LEVEL

The mower 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, while the mower was not moving.

The Machinery Safety Directive 2006/42/EC
By compliance to:
The Lawnmower Standard BS EN ISO 5395-3
Referenced to Hand/Arm: BS EN ISO 20643:2008

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 (2001)

Hand/Arm Acceleration Level	Maximum Left Hand or Right Hand Accelerations m/s^2
	Mean Value of X, Y, Z Aeq
68019	3.44 ± 0.6

The mower was tested for Whole Body vibration levels. The operator was in the normal position to drive the vehicle, with two hands on the steering mechanism. The cutting device was in rotation with the mower driven in a straight line at 6 Km/hr on a level and cut lawn.

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	Maximum Seat Pad Accelerations m/s^2
	Mean Value of X, Y, Z Aeq
68019	0.42 ± 0.056

NOISE LEVEL

The mower was tested for Noise emission levels in accordance with The Machinery Safety Directive 2006/42/EC, Physical Agents Directive 2003/10/EC and Noise Emission In The Environment By Equipment For Use Outdoors Directive 2000/14/EC

Measured Sound power level:

Jacobsen LF570 104 dB(A) ± 1.24 LWA V2403 Engine Speed 2839 rpm

Jacobsen LF570 104 dB(A) ± 1.24 LWA D1803 Engine Speed 2859 rpm

Jacobsen LF550 103 dB(A) ± 1.24 LWA V1505 Engine Speed 2946 rpm

Measured Sound Pressure level:

Jacobsen LF570 87dB(A) ± 1.24 Leq V2403 Engine Speed 2839 rpm (Representing worse case configuration)

4.6 SLOPES

DO NOT USE ON SLOPES GREATER THAN 18.3°. The 18.3° slope was calculated with static stability measurements according to the requirements of BS EN ISO 5395-3.

4.7 CUTTING UNIT SPECIFICATION

	LF550 / LF570
Blade Length	22 in. (55.9 cm)
Number of cutting units	5
LF550 Height of cut	3/8 to 3/4 in. (0.95 to 1.9 cm)
LF570 Height of cut	3/8 to 1-1/8 in. (0.95 to 2.9 cm
Height of cut adjustment	Lift or lower front roller with adjustment knobs on the ends of reel.

4.8 RECOMMENDED LUBRICANTS

Engine Oil:

Must meet MIL-L-46152 or API Classification grades CJ-4

Temperature	Viscosity
Above 77° F (25° C)	SAE 30 or SAE 10W-30 or SAE 10W-40
32° to 77° F (0° to 25° C)	SAE 20 or SAE 10W-30 or SAE 10W-40
Below 32° F (0° C)	SAE 10W or SAE 10W-30 or SAE 10W-40

Hydraulic Fluid:

The standard hydraulic fluid is GreensCare™ 68.

GreensCare™ 68 Plus and SAE 10W-30 (MIL-L-46152 or API Classification grades SG, SF/CC, CD) are alternative fluids.

NOTICE

Use of SAE 10W-30 oil will compromise all biodegradable properties of the hydraulic system. Flushing the hydraulic system with GreensCare Bio-Flush will be required to switch back to GreensCare 68 or GreensCare 68 Plus.

Grease:

Texaco Starplex 2EP Moly (NLGI Grade 2-EP Lithium Complex Grease containing Molybdenum Disulfide) or equivalent

4.9 ACCESSORIES

4.9.1 LF550/LF570 CUTTING UNITS

Left Hand 7 Blade Reel 62839 (3 Required)
Right Hand 7 Blade Reel 62840 (2 Required)
Left Hand 9 Blade Reel 62855 (3 Required)
Right Hand 9 Blade Reel 62856 (2 Required)
Left Hand Vertical Mower 67894 (3 Required)
Right Hand Vertical Mower 67895 (2 Required)

4.9.2 LF570/LF570 CUTTING UNITS

11 Blade Reel 67986 (5 Required)
9 Blade Reel 67987 (5 Required)
Vertical Mower 67854 (5 Required)

4.9.3 22 IN. (55.9 CM) FRONT ROLLERS

Ø 2 in. (5.1 cm) Grooved Steel Disk	68527
Ø 2 in. (5.1 cm) Light Solid Tube with Scraper	68530
Ø 2 in. (5.1 cm) Heavy Solid Tube with Scraper	68641
Ø 2-3/16 in. (5.5 cm) Grooved Machined Steel	68613
Ø 2-3/16 in. (5.5 cm) Grooved Machined Aluminum	68614
Ø 2-1/4 in. (5.7 cm) Grooved Segmented Aluminum	68673
Ø 3 in. (7.6 cm) Grooved Steel	123268
Scraper for 123268 roller	391202 or 3006263

4.9.4 REAR ROLLERS

Ø 2 in. (5.1 cm) 22 in. (55.9 cm) Rear Roller	1004990
Ø 2 in. (5.1 cm) 22 in. (55.9 cm) Rear Roller	1000770
Ø 2-1/2 in. (6.3 cm) 20 in. (50.8 cm) Rear Roller	5003687
Ø 2-1/2 in. (6.3 cm) 22 in. (55.9 cm) Rear Roller	1003728
Ø 2-1/2 in. (6.3 cm) 24 in. (61.0 cm) Rear Roller	1002446

4.9.5 LF550/LF570 REEL ACCESSORIES

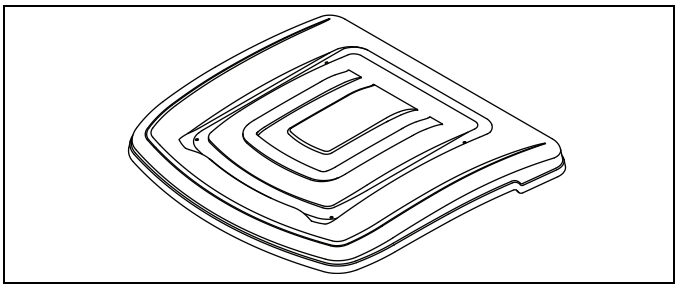
Grass Catcher (5 Required)	67891
Powered Rear Roller Brush (5 Required)	62820
RH Turf Groomer 1/4 in. Spacing (2 Required)	67911
LH Turf Groomer 1/4 in. Spacing (3 Required)	67912
RH Turf Groomer 1/2 in. Spacing (2 Required)	67913
LH Turf Groomer 1/2 in. Spacing (3 Required))	67914
High Height of Cut (1-3/16 in. (3 cm)) Kit	67917

4.9.6 LF550/LF570 REEL ACCESSORIES

Grass Catcher (5 Required)	67891
RH Catcher Mounting Kit (3 Required)	67919
LH Catcher Mounting Kit (2 Required)	67920
Powered Rear Roller Brush (5 Required)	62821
Heavy Duty Rear Roller Scraper	4239802 (Requires 62821)
RH Turf Groomer 1/2 in. Spacing (2 Required)	67989
LH Turf Groomer 1/2 in. Spacing (3 Required)	67988
High Height of Cut (1-9/16 in. (4 cm))	4113920
Reel/Vertical Mower Lift Yoke	1003361

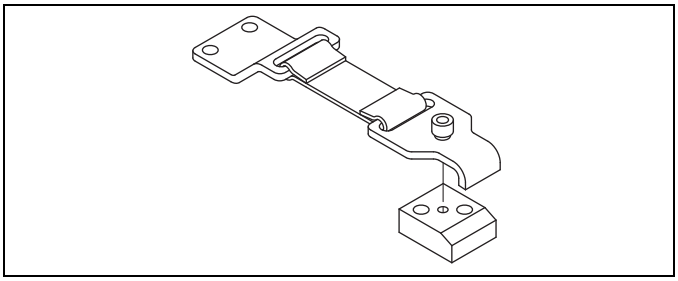
4.9.7 CANOPY / SUN SHADE

Product number 68127



4.9.8 HOOD LOCKING LATCH

Kit Number 1004049



4.9.9 BALL CAGE

Factory Installed: 4265200

Dealer Installed: 4265199

4.9.10 LED LIGHT KIT

LED Light Kit (One Light) : 4238642

4.10 SUPPORT LITERATURE

Contact your Jacobsen Dealer for a complete listing of literature available for your mower.

Safety, Operation, & Maintenance Manual: 4358526

Mower Parts Manual: 4358527

Tier 4 Final / Stage 5 D1803 / V2403 Engine Parts Manual: 4299117

Tier 4 Interim Engine Parts Manual: 4358529

Service & Repair Manual: TBD

5 LABELS

5.1 SAFETY LABELS

Understand the purpose of these labels. The labels are important to the safe operation of the mower. REPLACE THE DAMAGED labels IMMEDIATELY.

DANGER

To prevent injury while you do work on the battery:

1. Connect the negative (BLACK) wire after the positive (RED) wire. Remove the negative (BLACK) wire before the positive (RED) wire.
2. Keep sparks and flames away from the battery. Prevent the contact with the battery acid.

To prevent injury while you attach the jumper cables to the battery:

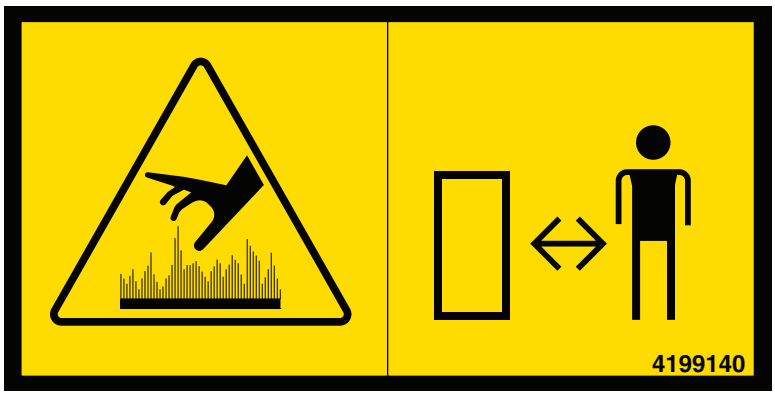
1. Connect the positive (+) battery terminal of the charged battery to positive battery terminal of drained battery.
2. Connect the negative (ï) battery terminal of the charged battery to frame of vehicle with drained battery.

WARNING

The engine coolant is under pressure. To prevent injury, do not remove the radiator cap on a hot radiator.

WARNING

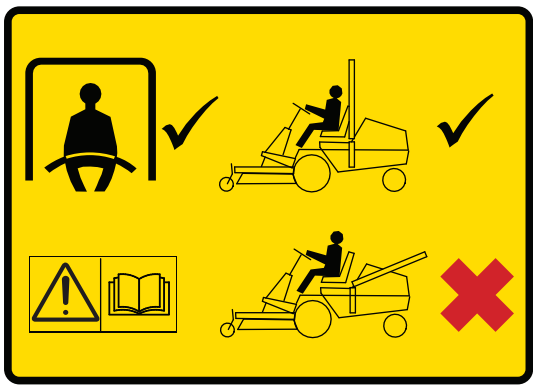
To prevent injury, do not touch the muffler or muffler shield. The muffler temperatures can be more than 150° F (66°C).



WARNING

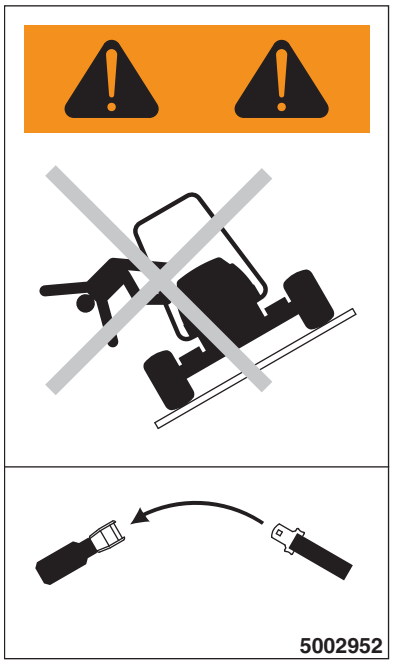
Always use the seat belt with the ROPS frame in the vertical and locked position.

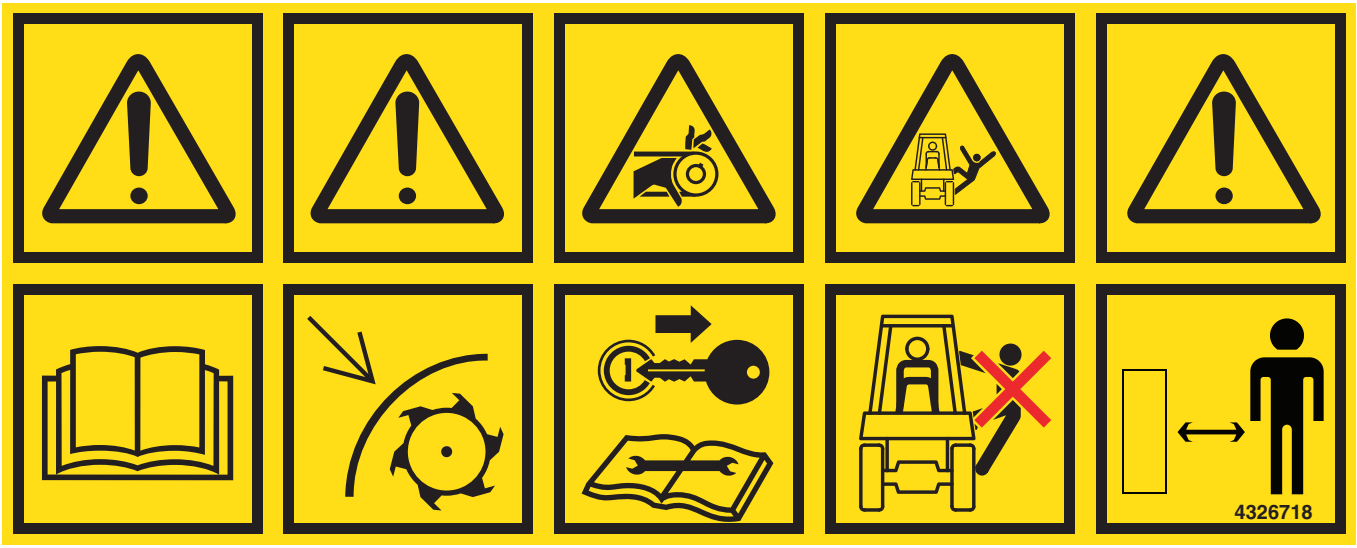
Never use the seat belt with the ROPS in the folded position.



Read the Manual.WARNING

Always use the seat belt with the ROPS frame in the vertical and locked position.





WARNING

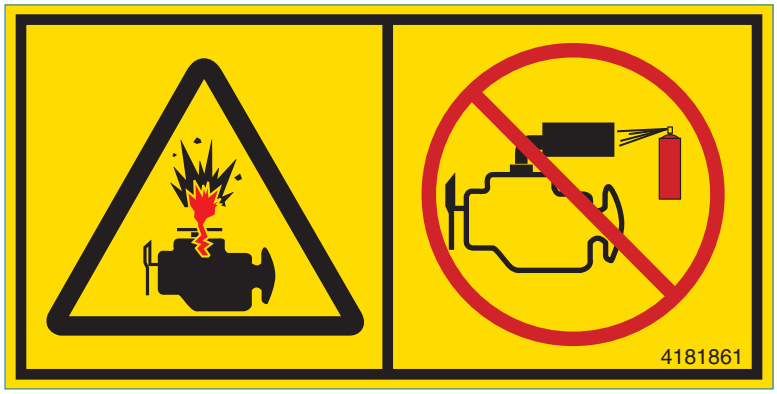
- Read the manual. Do not allow anyone without training to use the mower.
- Keep the shields in position and hardware fastened.
- Keep your hands, feet and clothing away from moving parts.
- Before you clean, adjust or repair this equipment, disengage all drives, engage the parking brake and stop the engine.
- Never carry passengers.
- When mower is in operation, keep bystanders and animals away.

5 LABELS

NOTICE

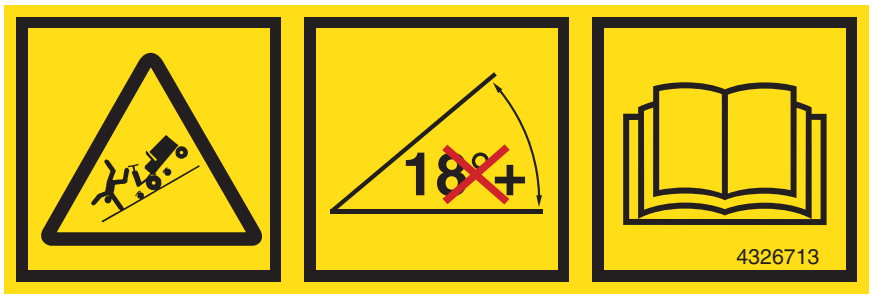
DO NOT USE START ASSIST FLUIDS

Start assist fluids in the air intake system can be explosive or cause an engine condition that is not controlled and can cause engine damage.



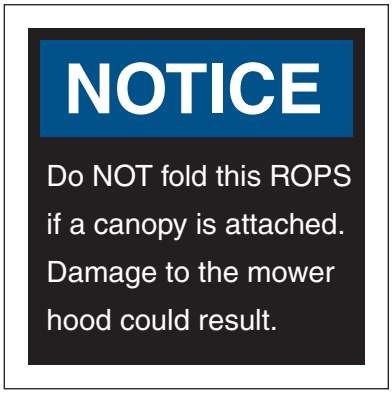
WARNING

Do not use on slopes greater than 18°



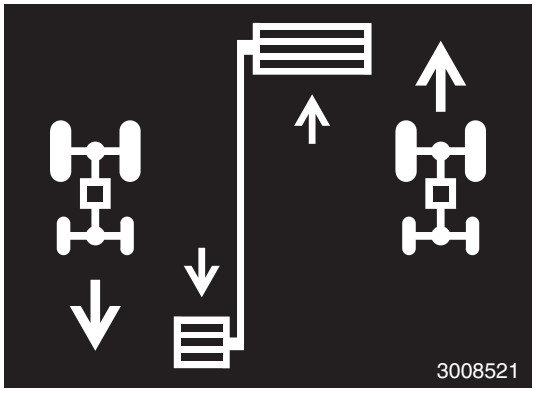
WARNING

To prevent injury when you fold the ROPS, use caution to prevent your fingers broken or pinched between moving and rigid parts of the ROPS.



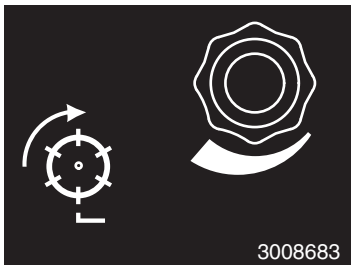
5.2 INSTRUCTION LABELS

Traction pedal operation

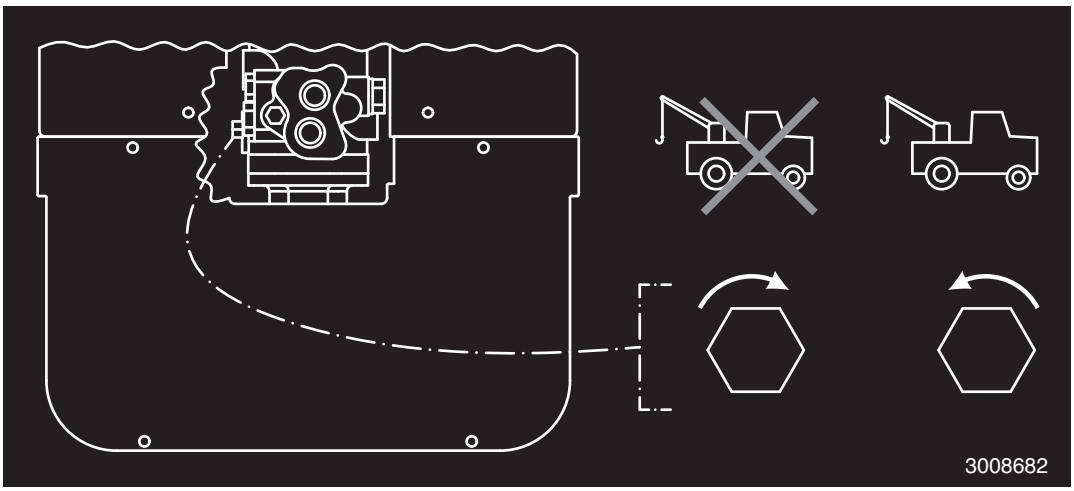


Backlap Label

Rotate knob to set backlap speed.

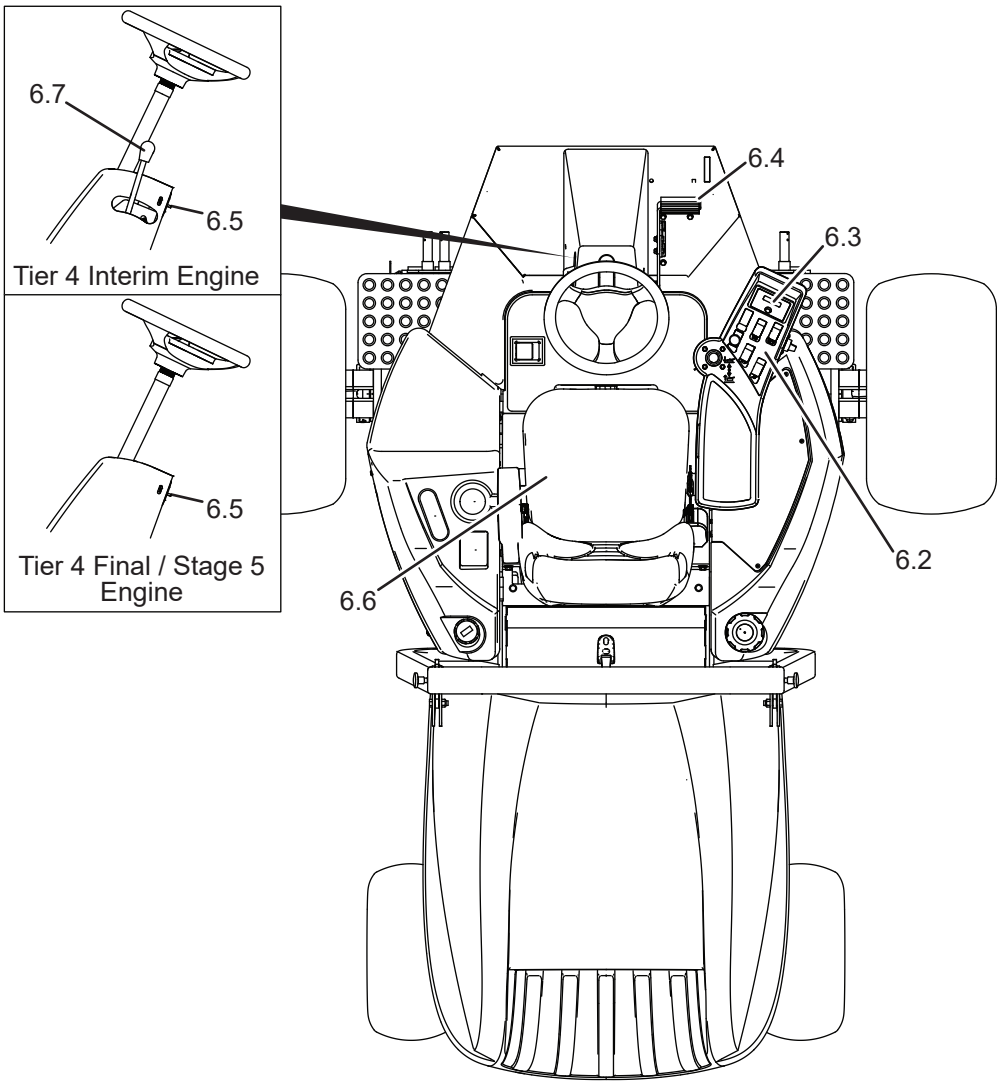


Tow valve operation

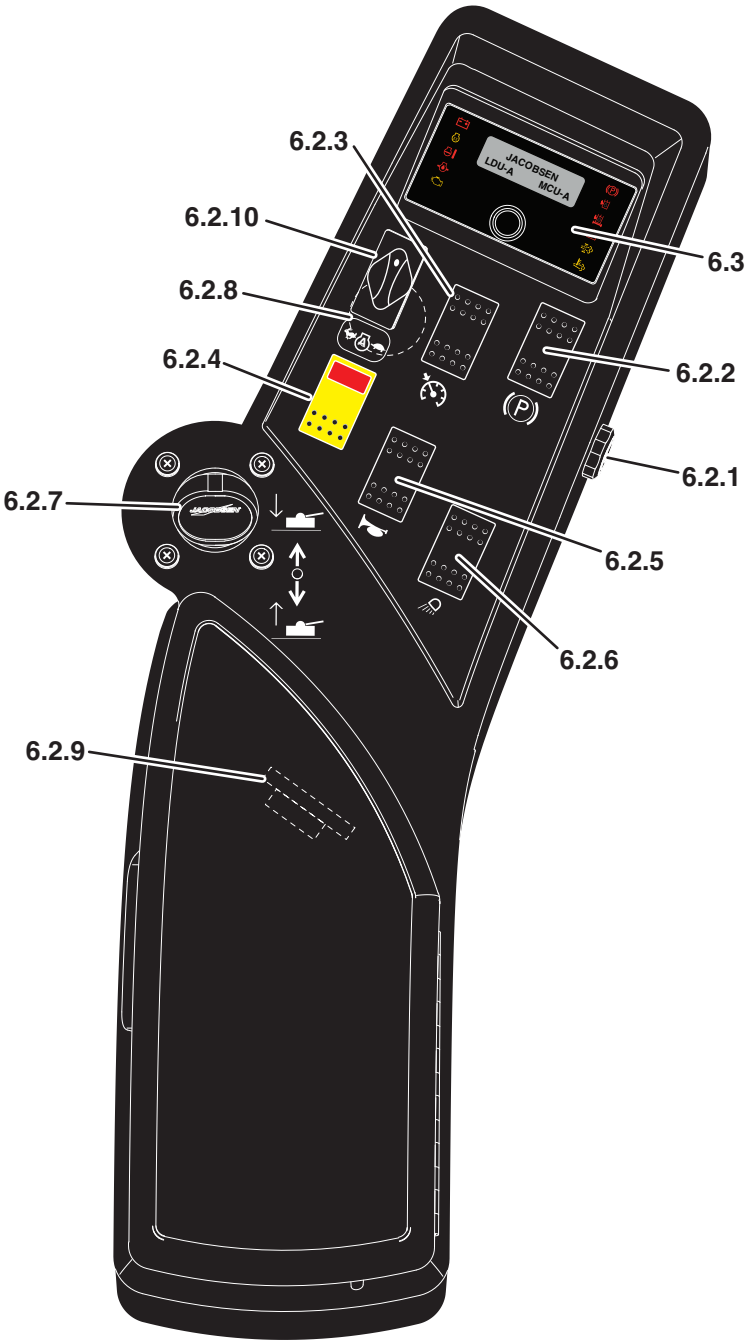


6 CONTROLS

6.1 OPERATOR COMPARTMENT

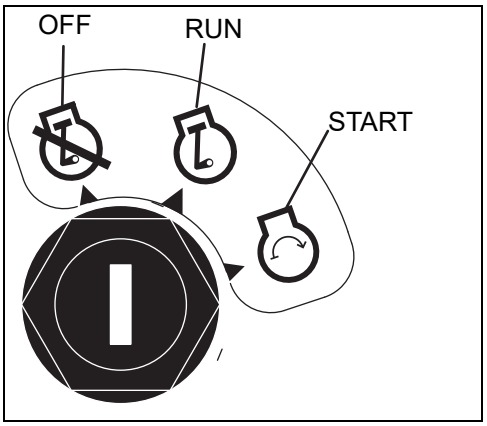


6.2 ARMREST



6.2.1 IGNITION SWITCH

The ignition switch has three positions, OFF, RUN and START. In the RUN position, the controller program is active and input and output circuits are monitored.

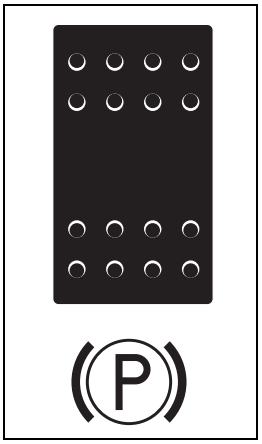


6.2.2 PARKING BRAKE SWITCH

To engage the parking brake, press the front of the switch. Parking brake light on LDU **(See 6.2.9)** will turn on. Operation of the cutting units operation is disabled with the parking brake engaged.

To disengage parking brake, press the rear part the switch. The parking brake light will turn off.

NOTE: *Engine will not start with the parking brake switch in the OFF position.*

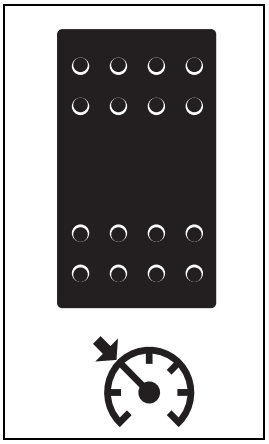


6.2.3 CRUISE CONTROL SWITCH

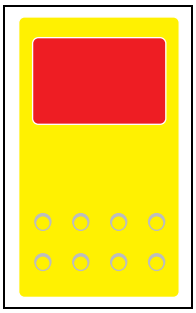
The cruise control switch controls the operation of the cruise control system.

To engage the cruise control, press the traction pedal, push the orange lock forward and press the front of the switch.

To disengage the cruise control, press the rear part of the cruise control switch, press the rear part of the parking brake switch or turn the ignition switch to the OFF position.



6.2.4 PTO SWITCH

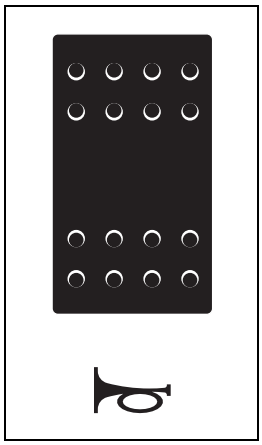


The PTO switch is a 2-position switch to engage and to disengage the cutting units. The PTO switch must be in the OFF position to start the engine.

Press the front part of the switch to move the switch to the ON position. When the PTO switch is in the ON position, the light in the switch is on, the cutting units are engaged and the joystick is set to automatic mode. When the cutting units are lowered, the reels will start to turn when forward travel starts. When the cutting units are lifted or forward movement stops, the reels will stop.

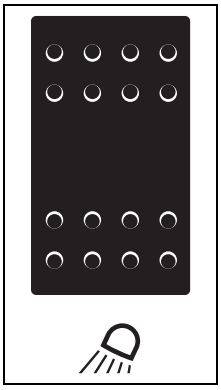
Press the rear part of the switch to move the switch to the OFF position.

6.2.5 HORN SWITCH



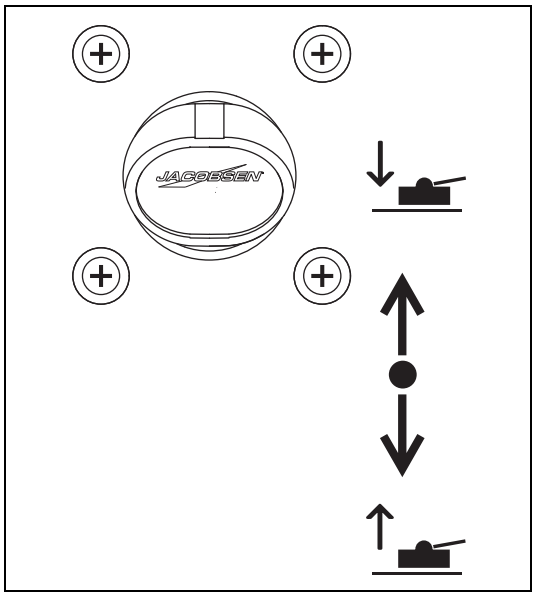
Press the front of the switch to use the horn.

6.2.6 LIGHT SWITCH



The light switch controls the operation of the headlights. Press the front part of the switch to turn on the headlights. Press the rear part of the switch to turn off the headlights.

6.2.7 JOYSTICK



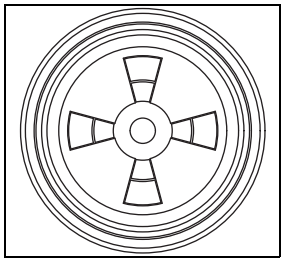
The joystick controls the cutting units lift and lower. The joystick operates in automatic or manual mode. Push the joystick to lower the cutting units or pull the joystick to lift the cutting units.

Manual Mode - Set the PTO switch in the OFF (down) position to set the joystick in manual mode. When in manual mode, cutting units lift or lower only while pressure is applied to the joystick.

Automatic Mode - Set the PTO switch in the ON position to set the joystick in automatic mode. Push and release the joystick to lower the cutting units to the ground and the cutting unit reels will start to turn when forward motion starts. Pull and release the joystick to lift the cutting units to the crosscut position and the cutting unit reels will stop. To lift the cutting units to the transport position, pull and hold the joystick until cutting units are completely lifted.

When forward movement is stopped, the reels will stop. When forward motion is started again, push and release the joystick to restart the reels.

6.2.8 ALARM

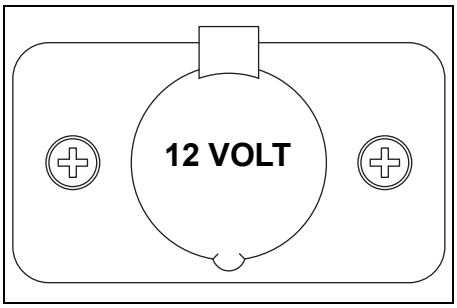


The alarm located below the armrest indicates the condition of the mower or to get the attention of the operator and bystanders near the area of operation. These conditions will cause the alarm to sound:

- The temperature of engine coolant is more than 230° F (110° C)
- The hydraulic fluid level is low
- The engine oil pressure is less than 7 psi (0.48 BAR)
- The horn switch is in the ON position.
- The water separator needs to be serviced.
- The alarm will sound for one second when the mower is started.
- A fault sensed by the controllers. The fault message is shown on the LDU.

6.2.9 12 VOLT ACCESSORY OUTLET

The 12 Volt accessory outlet found inside the armrest storage tray supplies power to 12 Volt accessories. Only use the 12 Volt outlet with the engine started to prevent a drained battery.



⚠ CAUTION

The 12 Volt accessory outlet is protected by a 10-Amp fuse. Do not use attachments with a power rating greater than 120 watts.

To prevent the risk of burns or fire, do not replace the 10-Amp fuse with a fuse with a greater amperage rating.

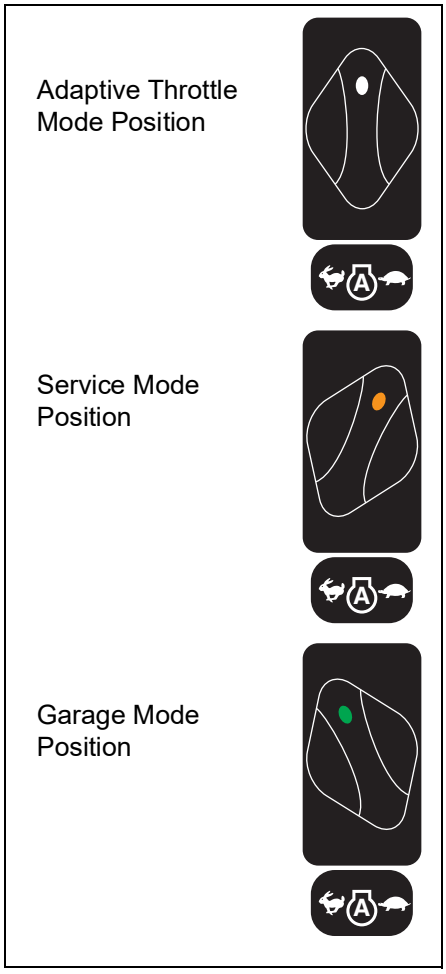
6.2.10 ADAPTIVE THROTTLE SWITCH (T4F/STAGE 5 ONLY)

The adaptive throttle switch controls the operation of the throttle system. The adaptive throttle switch has three positions.

Adaptive Throttle Mode: Rotate the switch knob to the center position to operate the mower in adaptive throttle mode. As the load on the engine increases or decreases, the controller will adjust the throttle as needed. When the switch is in adaptive throttle mode, the LED on the switch will illuminate white.

Service Mode: Rotate the switch knob to the right position to operate the mower in service mode. The controller operates the engine at full throttle. When the switch is in service mode, the LED on the switch will illuminate amber.

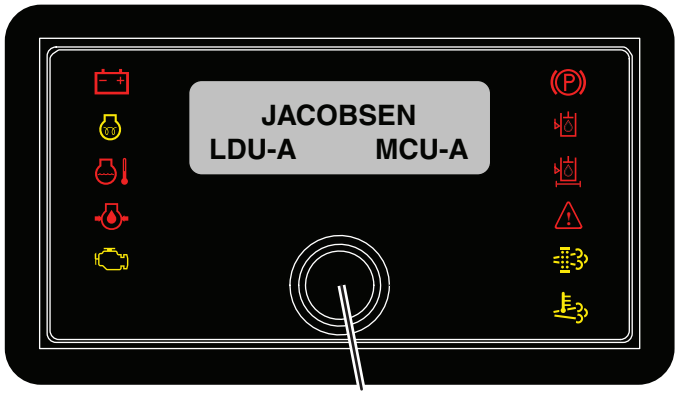
Garage Mode: Rotate the switch knob to the left position to operate the mower in garage mode. The controller operates the engine at 30% throttle. When the switch is in garage mode, the LED on the switch will illuminate green.



6.3 LDU

The LCD Display Unit (LDU) shows the current values for the operation of the mower, has indicator lights and sounds audible warnings. The LDU operates in one of two modes, Operator Mode (Normal Operation) and Maintenance Mode. The use of Maintenance Mode needs a four digit pin number. See Section 9.2 for instructions to access the Maintenance mode and additional LDU information..

Press the LDU button to move through the display list in Operator Mode.



6.3.1 LDU INDICATOR LIGHTS

The LDU indicator lights supply the following information:

The red battery light indicates that the alternator output is not the correct voltage. Return the mower to the service area. Inspect the battery and the alternator.

The yellow glow plug light indicates the glow plugs are active. Do not turn the ignition switch to the start position until the glow plug light turns off.

The red coolant-temperature light indicates that coolant temperature is more than 230° F (110° C). Immediately stop the engine. Remove the tree leaves, grass clippings and other objects that can decrease air flow through the rear screen and the radiator. If the engine continues to run hot, return mower to the service area.

WARNING

The engine coolant is under pressure. To prevent injury, do not remove the radiator cap on a hot radiator.

The red engine oil-pressure light indicates engine oil pressure is less than 7 psi (0.48 BAR). Immediately stop the engine and inspect the oil level in the engine. If the oil-pressure light stays illuminated with the oil at the correct level, stop the engine and tow the mower to the service area. NEVER operate the engine with the oil-pressure light illuminated or engine damage can occur.

The yellow check engine light indicates that the engine controller sensed a problem. Connect a CAN diagnosis tool or the Kubota Diagmaster tool to identify problem. When the check engine light is illuminated, the DPF Regen cycle will not start.

The red parking brake light indicates that the parking brake switch is in the ON position. Do not press the traction pedal with light illuminated.

The red hydraulic-level light indicates a low-fluid level in the hydraulic tank. Immediately stop the engine. Visually inspect the mower for indications of leaks around connections, hoses and hydraulic components. Return the mower to the service area for maintenance.

WARNING

The hydraulic fluid is under pressure. To prevent injury, do not use your hands to find hydraulic leaks, use paper or cardboard. Allow the hydraulic fluid to become cool before you check the fluid level or you add fluid to the hydraulic tank.

The red hydraulic filter light indicates that the hydraulic filter must be replaced. Return the mower to the service area and replace the filter.

The red fault light indicates the controller system has sensed a fault. See fault message shown on the LDU.

When a Parked Regen cycle is necessary, the yellow Regen Request light will flash. During a Parked Regen cycle, the Regen Request light will illuminate. When a Tier 4 Interim engine is installed, this light will not operate.

The yellow high-exhaust temperature light indicates that an Active or Parked Regen cycle is active and a high exhaust temperature is sensed. When a Tier 4 Interim engine is installed, this light will not operate.

6.3.2 ALARM SCREENS

There are six alarm screen displays to tell the operator or technician of a problem that must be corrected.

LOW OIL PRESSURE

When the engine oil pressure is less than 7 psi (0.48 BAR), the **Low Oil Pressure** screen is shown on the LDU. The horn will activate, the reels will stop and lift to full up position and the engine oil-pressure light illuminates. Immediately stop the engine. Inspect the oil level in the engine.

HYDRAULIC OIL FILTER

When the hydraulic oil filters need to be replaced, the **Hydraulic Oil Filter** screen is shown on the LDU. The reels will stop and lift to full up position. Return the mower to the service area and replace the filters.

HIGH ENGINE TEMPERATURE

When the coolant temperature is greater than 230° F (110° C), the **High Engine Temperature** screen is shown on the LDU. The horn will activate, the reels will stop and lift to full up position and the coolant-temperature light illuminates. Immediately stop the engine. Remove leaves and grass clippings that can decrease the air flow through the rear screen and the radiator.

LOW BATTERY VOLTAGE

When the system voltage is less than 12 Volts DC, the **Low Battery Voltage** screen is shown on the LDU. If the screen does not turn off when the engine starts or the battery light is illuminated, check the alternator and the battery.

LOW HYDRAULIC FLUID LEVEL

When the hydraulic fluid level in tank is low, the **Low Hydraulic Fluid Level** screen is shown on the LDU. The horn will activate, the reels will stop and lift to full up position and the hydraulic fluid level light illuminates. Visually inspect the mower for indications of leaks around connections, hoses and hydraulic components.

PEDAL AND BRAKE ON

When the traction pedal is pressed in the forward or reverse direction with the parking brake switch engaged, the **Pedal and Brake On** screen is shown on the LDU. The horn will activate. Return the traction pedal to the Neutral position and disengage the parking brake switch before you drive the mower.

6.3.3 FAULT SCREENS

When a problem is sensed with the indicated circuit, the fault screens are shown on the LDU.

GLOW PLUG FAULT	**BRAKE RELEASE FAULT**
MOW SOLENOID FAULT	**BACKLAP SOLENOID FAULT**
LIFT SOLENOID FAULT	**LOWER SOLENOID FAULT**
EDC COIL FAULT	**STARTER RELAY FAULT**
TEMP SENSOR OUT OF RANGE	**PEDAL OUT OF RANGE**
CAN COMM ERROR	**WATER IN FUEL**

6.3.4 OPERATOR MODE

The Operator mode is used by the operator to see the engine hours of operation, and inhibit the Active DPF Regen cycle (T4F/Stage 5 Only). The Cruise Active or Backlap Mode screens are shown when the conditions are met.

When the ignition switch is turned to the RUN position, the horn will activate and all indicator lights will illuminate for one second. The start screen that shows the LDU and MCU software level is shown for five seconds.

If no faults or alerts are sensed after the engine is started, the **ENGINE HOURS** screen will be shown on the LDU. Press the LDU button to move to the next screen.

T4F/Stage 5 Engines Only: To inhibit the Active DPF Regen cycle, push the LDU button until the **INHIBIT REGEN** screen is shown on the LDU. Press the joystick forward to toggle between NO and YES. Press the LDU button to prevent the DPF Regen cycle. The **REGEN INHIBITED** screen is shown on the LDU until the key switch is turned to the OFF position.

NOTICE

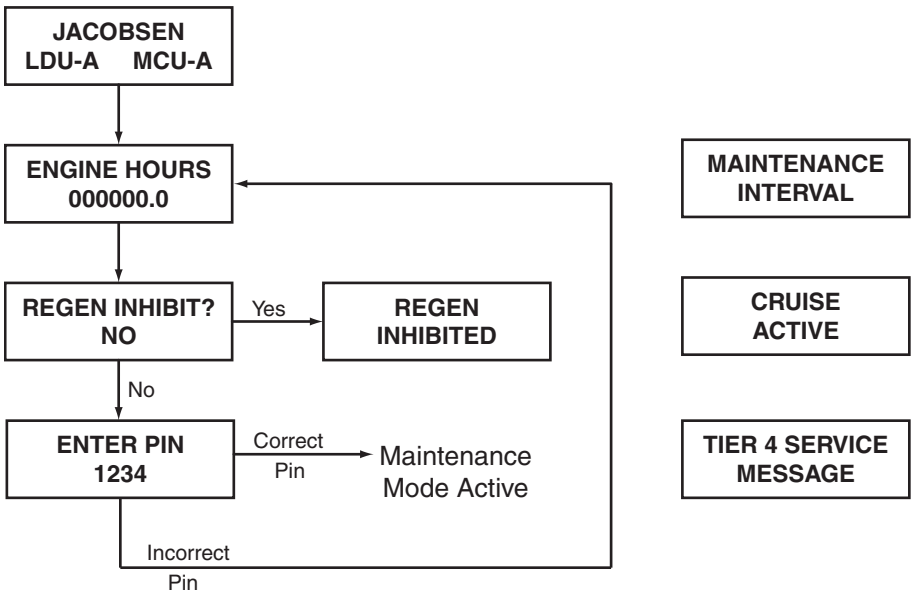
If the DPF Regen cycle is prevented for too long of a period, a blockage of the DPF can occur. If a blockage of the DPF has occurred, an authorized Kubota Engine Service Center must clean the DPF before the mower is used.

When each 50 hour interval is reached, the **MAINTENANCE INTERVAL** screen is shown on the LDU each time the mower is started. Press the LDU button to clear the screen. **See Section 9.2.7** to reset the maintenance interval.

When the optional cruise control kit is installed and the cruise control switch is in the ON position, the **CRUISE ACTIVE** screen is shown on the LDU.

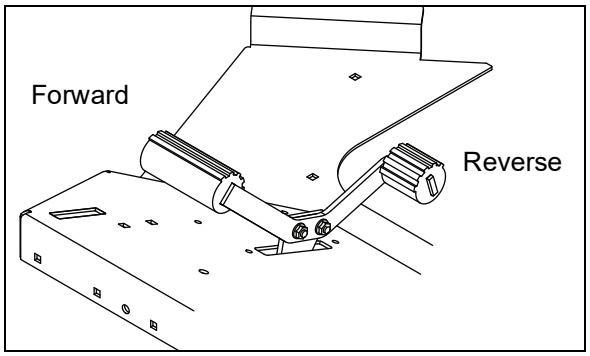
T4F/Stage 5 Engines Only: When the **TIER 4 SERVICE MESSAGE** screen is shown on the LDU, a Parked Regen cycle is required. **See Section 9.11**.

To enter Maintenance Mode, press the LDU button until the **ENTER PIN** screen is shown on the LDU. Use the joystick to change the numbers and the LDU button to move to the next number. When the correct pin is entered, Maintenance Mode is active. **See Section 9.2** for Maintenance Mode.



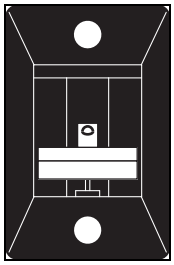
6.4 TRACTION PEDAL

The traction pedal controls the movement of the mower. Press the front of the pedal to move in the forward direction. Press the rear part of the pedal to move in the reverse direction. When traction pedal is not pressed, the pedal will return to the NEUTRAL position.



6.5 STEERING WHEEL TILT ADJUSTMENT

The steering wheel angle is adjustable. Lift the lever and move the steering wheel backward or forward to get the correct setting. Release the lever to set the position of the steering wheel.



⚠ CAUTION

To prevent injuries, DO NOT adjust the steering wheel while you operate the mower. Only adjust the steering wheel with the mower stopped and the parking brake engaged.

6.6 SEAT CONTROLS

The mower has two different seat options.

6.6.1 STANDARD SEAT CONTROLS

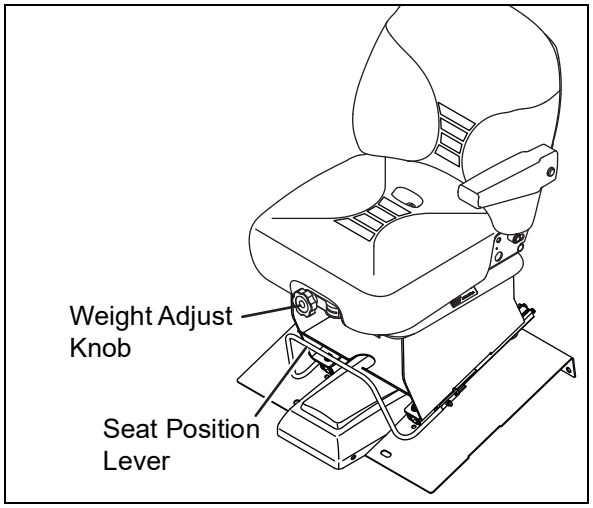
The seat has two controls to adjust for the operator.

⚠ WARNING

To prevent injuries, DO NOT adjust the seat while you operate the mower. Only adjust the seat with the mower stopped and parking brake engaged.

Lift the seat position lever and move the seat backward or forward. Release the lever to set the adjustment. Make sure the seat is locked in position before you operate the mower.

Rotate the knob to the correct position for the weight of the operator.

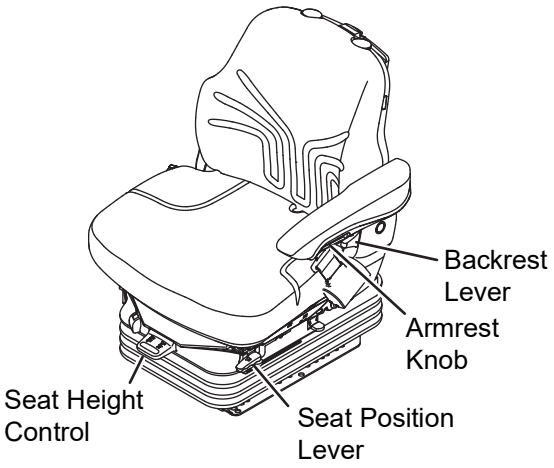


6.6.2 PREMIUM SEAT CONTROLS

The seat has four controls to adjust for the operator.

⚠ WARNING

To prevent injuries, DO NOT adjust the seat while you operate the mower. Only adjust the seat with the mower stopped and parking brake engaged.



The seat height control adjusts the height of the seat. To lift the seat, lift the seat height lever. To lower the seat, push the seat height lever down. Release the lever to set the adjustment.

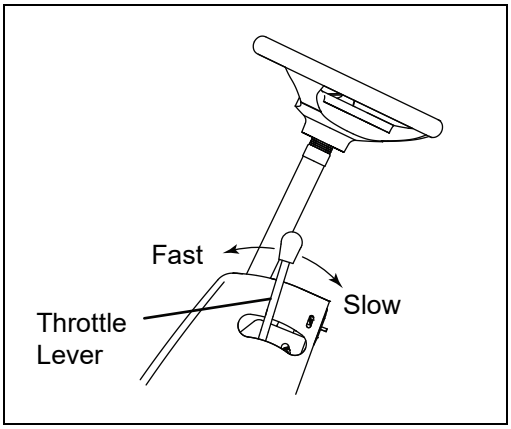
Lift the seat position lever and move the seat backward or forward. Release the lever to set the adjustment. Make sure the seat is locked in position before you operate the mower.

Lift the backrest lever to adjust the angle of the backrest. Release the lever to set the adjustment. Make sure the seat is locked in position before you operate the mower.

Rotate the armrest knob to adjust the angle of the armrest.

6.7 THROTTLE LEVER (T4I ENGINES ONLY)

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



7 OPERATION

7.1 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.

Check all tires for the correct pressure.

Test the interlock system.

7.2 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 PTO switch is in the OFF position. The system stops the engine if the operator leaves the seat with the PTO switch in the ON position, traction pedal out of the NEUTRAL position or the parking brake switch in the OFF position.

⚠ WARNING

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.

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 (4) 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 PTO switch is in the OFF position. The engine will start.

TEST 2: The engine must not start if the PTO 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 PTO 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		PTO 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.

7.3 OPERATING PROCEDURE

⚠ WARNING

This mower has a folding Roll Over Protection Structure (ROPS). Always wear the seat belt with the ROPS frame in the vertical and locked position. Never wear the seat belt with the ROPS in the folded position.

If the mower is over turning and the ROPS is in the vertical and locked position, 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 anyone standing 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 other people or allow bystanders near the mower while in operation. The owner and operator are responsible for injuries caused to bystanders 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 to gravel areas (roads, parking areas, cart paths). Stones released from the equipment can cause injuries to bystanders and cause damage to the equipment.
9. When you are not mowing grass, always turn off the PTO switch.
10. Before you move across or operate on the paths or roads, turn off the PTO switch, lift the cutting units and travel at decreased speed. Look for traffic.
11. When you hit an object or mower starts to cause vibration 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 PTO 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.

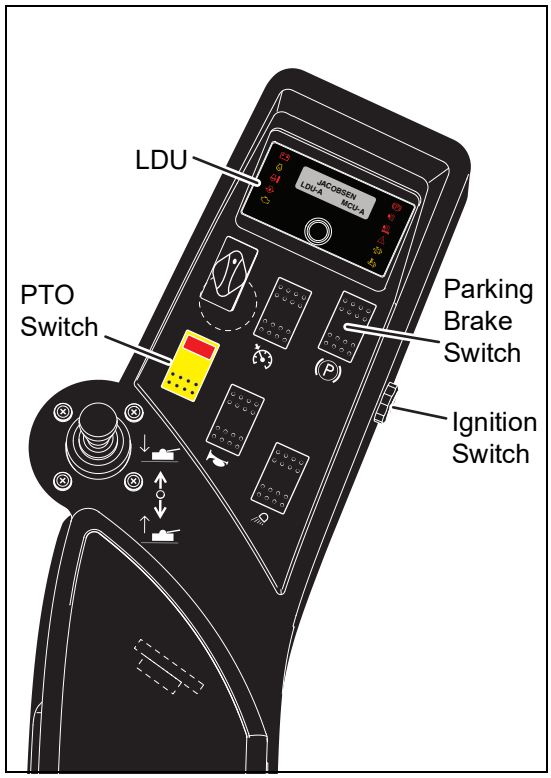
7.4 STARTING THE ENGINE

Start the engine with the operator in the seat, the PTO switch in the OFF position and the parking brake switch in the ON position. Remove your foot from the traction pedal. Always wear the seat belt with the ROPS frame in the vertical and locked position. Never wear the seat belt with the ROPS in the folded position.

Tier 4 Interim Engine: Set the throttle lever to half throttle.

Turn the ignition switch to the RUN position. The horn will activate and the warning lights on the LDU will illuminate for one second. Make sure that the warning lights are illuminated.

When the glow plug light turns off, immediately 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.

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.

7.5 TO STOP THE ENGINE

To stop and park the mower in normal conditions:

1. Turn the PTO 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. 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.

7.6 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 PTO switch to the OFF position and lift the cutting units to the transport position.

7.7 MOWING SPEED

The cutting quality is improved at speeds lower than the transport speed of the mower. A mow speed of 7 mph (11 km/hr) is set at the factory and is correct for most conditions. The local turf conditions can need a different speed. If an adjustment is needed, **See Section 9.2.1**.

7.8 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. Set the PTO switch to the ON position. When the PTO switch is in the ON position, the joystick is set to automatic mode. 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.

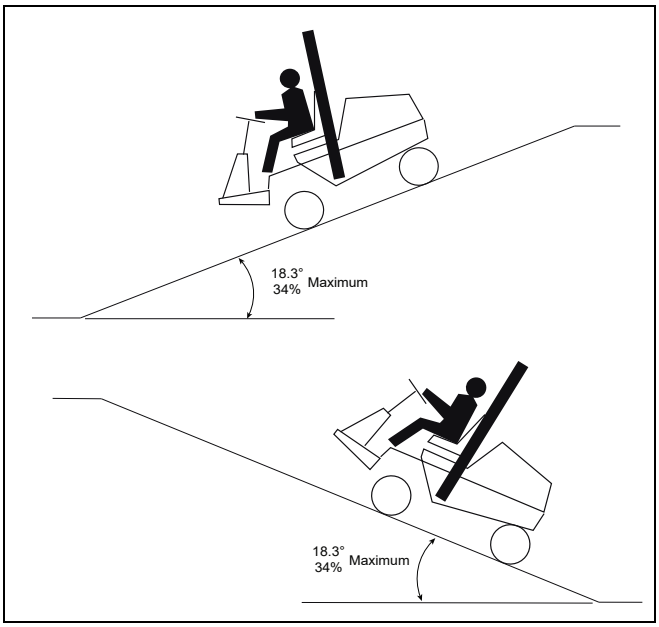
Friction and heat will develop between the reel and bedknife and damage the cutting edge.

To remove or install grass catchers:

1. Set the PTO switch in the OFF (Down) 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.

7.9 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 is decreased.



⚠ WARNING

When you operate on the slopes, lock the ROPS frame in the vertical position and the seat belt fastened. Do not operate on the slopes with the ROPS in the folded position.

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.

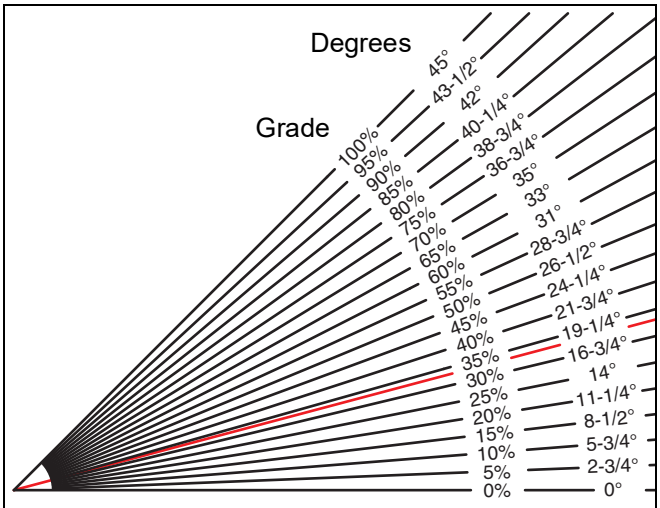
Check for hazards on the road that are not visible to the drivers. Keep the cutting units lowered when you operate on the slopes.

⚠ CAUTION

Do not operate the mower on the slopes greater than 18° or a 33% 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 moves to the side or the tires damage the turf, drive the mower on a slope with a decreased angle.
4. If the mower continues to move to the side and damage 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 - 12 psi (0.83 BAR)
   Rear - 12 psi (0.83 BAR)

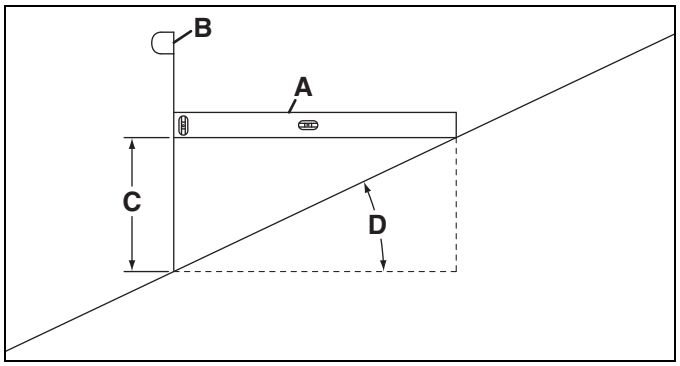


General slope of roadway embankment - 45°Steepest Grass Area - 31°
Slope of the average roof - 19-1/4°
2nd Class highway maximum grade 4-1/2°
Toll road or freeway - 1-3/4°

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

7.10 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.

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

If the trailer is moved on the highway, close the fuel shutoff valve and 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.

Remove the pump cover and open the bypass 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.

The bypass valve is found on the side of the traction pump below the operator seat. To open the valve, use a wrench or put a small screwdriver into the hole in the valve stem. Turn the valve two full turns (720°).

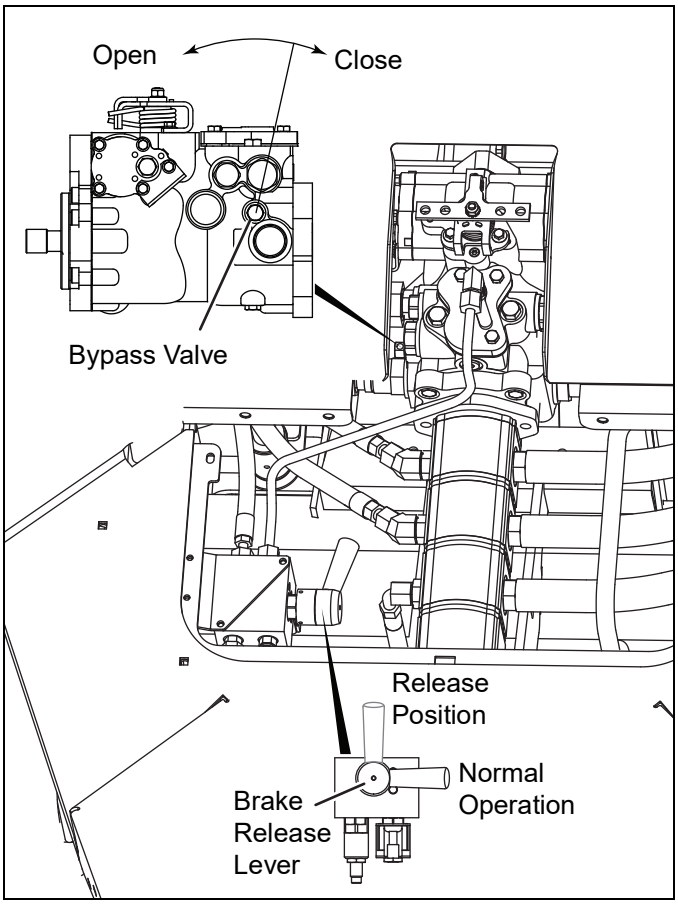
Remove the floorboard panel. Rotate the brake release lever to the released position. To release the brakes, turn the steering wheel to the right until you feel resistance.

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 bypass valve completely, rotate the brake release lever to the normal operation position and install covers.



8 MAINTENANCE AND LUBRICATION CHARTS

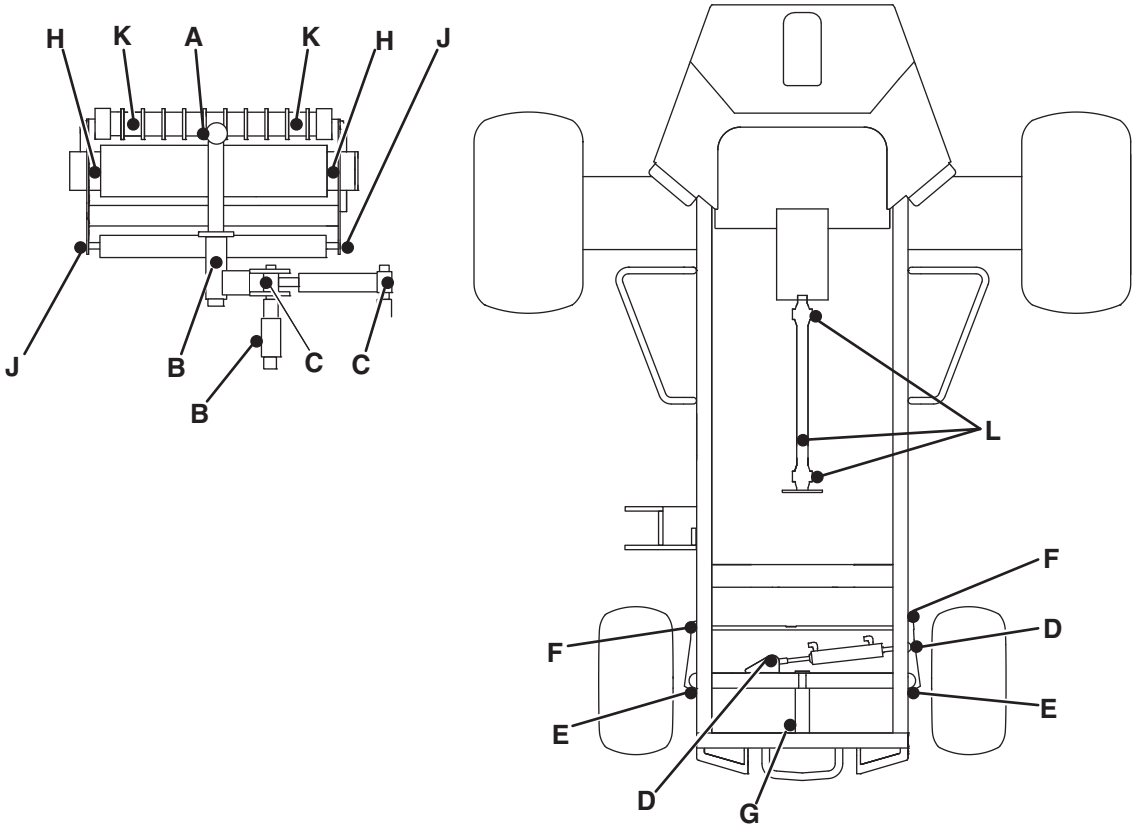
8.1 MAINTENANCE CHART

Mower Service Interval Chart		
Interval	**Item**	**Section**
First 50 Hours	• Replace engine oil • Replace engine oil filter • Replace hydraulic oil filter • Check steering system • Check electrical wiring • Check fan belt tension	**See Section 9.4** **See Section 9.4** **See Section 9.14** **See Section 10.3** **See Section 9.20** **See Section 10.2**
Each day (10 Hours)	• Check Safety Interlock System • Check engine oil level • Check engine coolant level • Check hydraulic fluid level • Check tire pressure • Clean radiator and screens	**See Section 7.2** **See Section 9.4** **See Section 9.13** **See Section 9.15**
Each week (50 Hours)	• Lubricate all mower grease fittings • Check fuel lines and fittings • Check for loose components	**See Section 8.2** **See Section 9.6**
Each Two weeks (100 Hours)	• Check air filter • Check fan belt tension • Drain water from fuel system • Lubricate all reel grease fittings	**See Section 9.5** **See Section 10.2** **See Section 9.7** **See Section 8.2**
Each month (250 Hours)	• Inspect hydraulic hoses and tubes • Check engine exhaust system • Check steering system • Check electrical wiring • Lubricate reel motor coupler splines	**See Section 9.12** **See Section 9.10** **See Section 10.3** **See Section 9.20**
Each two months (400 Hours	• Replace engine oil and filter • Replace fuel filter	**See Section 9.4** **See Section 9.7**
Each 500 hours	• Replace fan belt • Replace hydraulic oil and filter. (500 hours or yearly, whichever comes first)	**See Section 10.2** **See Section 9.13**
Yearly	• Replace air filter • Replace radiator antifreeze • Lubricate wheel bearings (2WD Units)	**See Section 9.5** **See Section 9.17**

50 Hour Grease Fittings
A - Mower Pivot (1 per cutting unit)
B - Lift Arm Pivot (2 per cutting unit)
C - Lift Cylinders (2 per cutting unit)
D - Steering Cylinder (2)
E - Steering pivot (2)
F - Steering ball joint (2)
G - Rear Axle Pivot

100 Hour Grease Fitting
H - Reel Bearing Cavity (2 per cutting unit)
J - Rear Roller (2 per cutting unit)
K - Front Roller (2 per cutting unit)
L - Drive shaft (3)

8.2 LUBRICATION CHART



8.3 FLUID REQUIREMENTS

Fluid Requirements		
	Quantity	**Type**
Engine Oil with Filter V2403	7.5 Quart (7.1 liter)	10W-30 API Classification CJ-4
Engine Oil with Filter D1803	5.5 Quart (5.2 liter)	10W-30 API Classification CJ-4
Engine Oil with Filter V1505	5.3 Quart (5 liter)	10W-30 API Classification CJ-4
Hydraulic Oil with Filter	14 U.S. Gallon (53 liter)	GreensCare 68 (Standard) GreensCare 68 Plus (Optional) 10W-30 (Optional)
Radiator Coolant	8 Quart (7.6 liter)	50/50 Ethylene Glycol Based Anti-Freeze/Water
Fuel	17 U.S. Gallon (64.4 liter)	#2 Ultra Low Sulfur Diesel

9 MAINTENANCE

9.1 GENERAL PRECAUTIONS

⚠ WARNING

Before you clean, adjust or repair this equipment, push PTO 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 do adjustments and 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 adjustments or repairs, do not wear jewelry or loose fitting clothing.

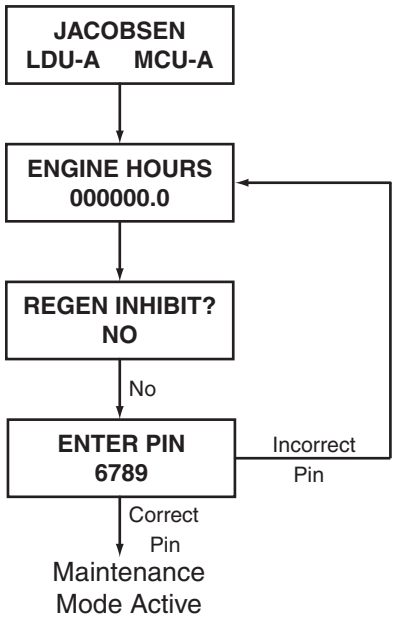
Refer to the illustrations in the Parts Manual for the removal and assembly of parts.

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

9.2 MAINTENANCE MODE

Maintenance Mode is used by the course manager to set and adjust the values for the mower. The screens available in Maintenance Mode:

- Calibrate pedal
- Set max mow speed
- Set travel speed
- Enable/Disable Cruise Control
- Traction Mode On/Off
- Switch Status
- Regen Request
- Backlap Enable
- Maintenance Reset
- English/Metric Units
- Exit Maintenance Mode



To enter Maintenance Mode, turn the ignition switch to the RUN position. Press the LDU button until the **ENTER PIN?** screen is shown on the LDU. Use the joystick to increase or decrease and the LDU button to enter the digits for the Maintenance Mode pin.

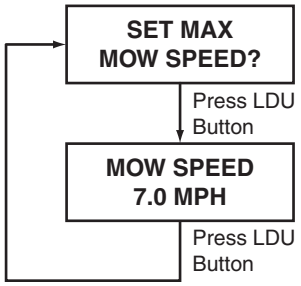
NOTE: *The PIN for Maintenance Mode is **6789**. Operator must be on the seat, the parking brake switch in the ON position, the mow switch in the OFF position and the traction pedal in the Neutral position to enter Maintenance Mode.*

NOTE: *The Maintenance Mode PIN can be changed to a different number. Contact your Jacobsen Dealer or Jacobsen Technical Support at (1-800-848-1636 Option 2) for instructions.*

9.2.1 MAXIMUM MOW SPEED

To set the maximum mow speed, press forward or backward on the joystick until the **SET MAX MOW SPEED?** screen is shown on the LDU. Press the LDU button to enter the set mode. Press backward on the joystick to increase or press forward on the joystick to decrease the maximum mow speed. Press the LDU button to set the speed.

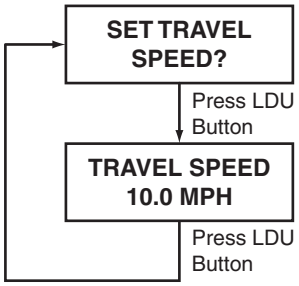
The maximum mow speed is adjustable between 3 and 10.6 mph (4.8 and 12.8 km/hr) in 0.2 mph (0.3 km/hr) steps. The maximum mow speed is set at 7 mph (11.3 km/hr) at the factory.



9.2.2 TRAVEL SPEED

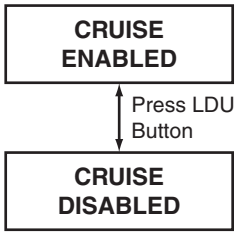
To set the maximum travel speed, press forward or backward on the joystick until the **SET TRAVEL SPEED?** screen is shown on the LDU. Press the LDU button to enter the set mode. Press backward on the joystick to increase or press forward on the joystick to decrease the maximum travel speed. Press the LDU button to set the speed.

The maximum travel speed is adjustable between 3 and 10.6 mph (4.8 and 17.1 km/hr) in 0.2 mph (0.3 km/hr) steps. The maximum travel speed is set at 10 mph (16.1 km/hr) at the factory.



9.2.3 CRUISE CONTROL

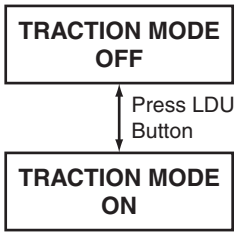
To enable or disable the cruise control function, press forward or backward on the joystick until one of the Cruise Control screens is shown on the LDU. Press the LDU button to toggle between **CRUISE ENABLED** and **CRUISE DISABLED** screens.



9.2.4 TRACTION MODE:

To set the traction mode, press forward or backward on the joystick until one of the traction configuration setting screens is shown on the LDU. Press the LDU button to toggle between **TRACTION MODE ON** and **TRACTION MODE OFF** screens.

When **TRACTION MODE ON** is selected, the mower will accelerate and decelerate at a slower rate.



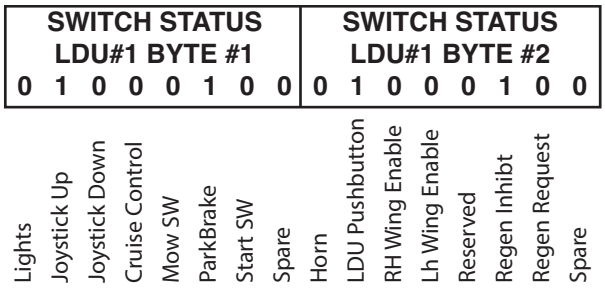
9.2.5 REGEN REQUEST (T4F/STAGE 5 ENGINE ONLY)

Used to start a Parked Regen cycle. See Section 9.11 for instructions.

9.2.6 SWITCH STATUS

Shows the current switch settings to identify a possible problem with the switch. A status of 0 indicates the switch is in the OFF position. A status of 1 indicates the switch is in the ON position. Check the wires and operation of any switch that does not show the correct status.

The Switch status is displayed two screens LDU BYTE 1 and LDU BYTE2. To toggle between the screens press the LDU button. Each screen displays 8 numbers, these correspond to the following switches:



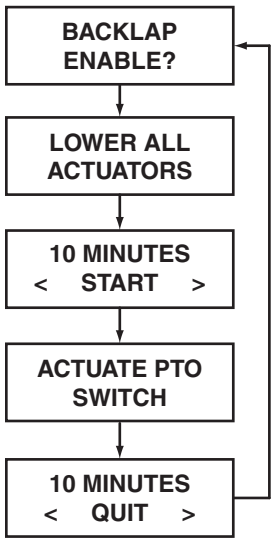
9.2.7 MAINTENANCE INTERVAL RESET

The Maintenance Timer Reset will prevent the MAINTENACE INTERVAL screen to be shown on the LDU until the next maintenance interval is reached. The maintenance interval is set for each 50 hour interval (50, 100, 150 etc).

To reset the maintenance interval, press forward or backward on the joystick until the **MAINT FLAG RESET** screen is shown on the LDU. Press the LDU button to reset the maintenance interval.

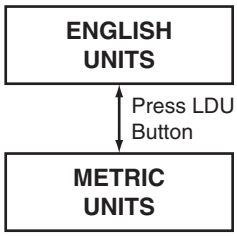
9.2.8 BACKLAP REQUEST

The backlap request screens are used to backlap the reels. **See Section 9.19** for the backlap procedure.



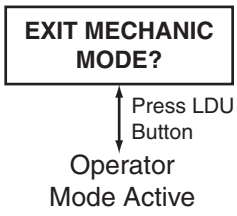
9.2.9 DISPLAY UNITS

To set the units shown on the LDU, press forward or backward on the joystick until the units setting screen is shown on the LDU. Press the LDU button to toggle between **ENGLISH UNITS** or **METRIC UNITS** screens.



9.2.10 EXIT MAINTENANCE MODE

To exit Maintenance Mode, press forward or backward on the joystick until the **EXIT MECHANIC MODE?** screen is shown on the LDU. Press the LDU button to exit Maintenance Mode.



9.3 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. The 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 140° F (60° C) 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 fan 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

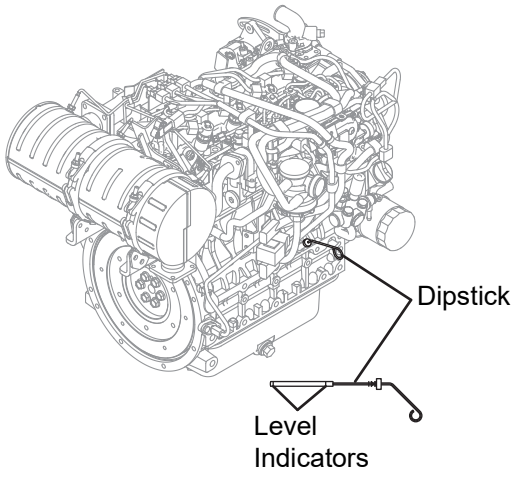
The mower operates and cuts correctly at the preset governor setting. Do not change the engine governor setting or over speed the engine.

9.4 ENGINE OIL

Check engine oil level

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

a Park the mower on a level surface.
b Remove the dipstick, clean the dipstick with a cloth and replace in position.
c Remove the dipstick and check the oil level. The oil level must be between the two level indicators on the dipstick.

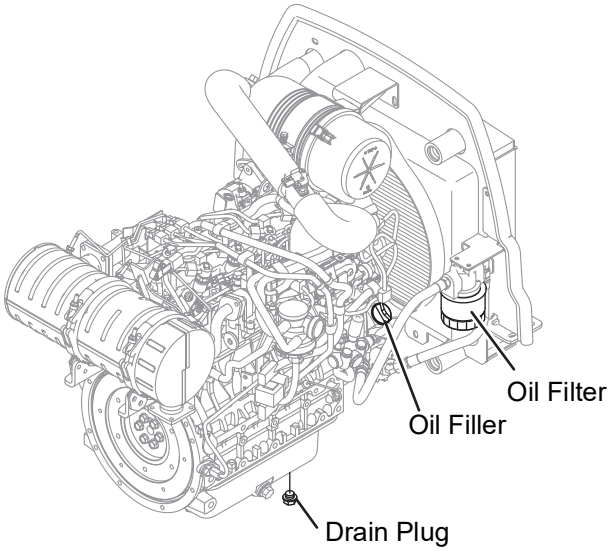


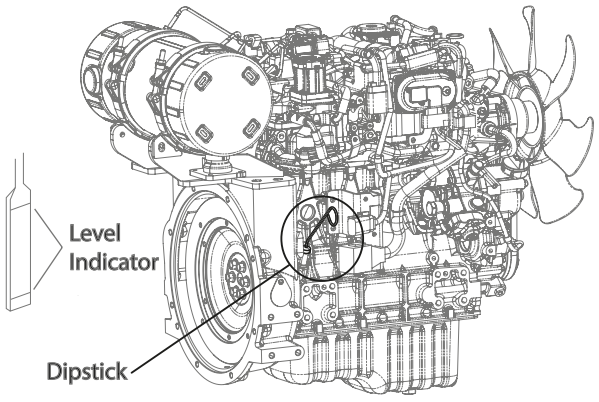
Change Engine Oil

a Start the engine to increase the temperature, then stop the engine.
b Remove the drain plug from the bottom of the crankcase and clean with a cloth.
c Drain the engine oil into a container.
d Replace the drain plug and fill the engine with the correct quantity and grade of oil through the filler.

Change Engine Oil Filter

a Remove the oil filter.
b Let the engine oil flow into a container.
c Clean the filter area on the remote filter head.
d Apply a thin layer of oil to the gasket on new filter. Install the oil filter.
e Only use your hand to tighten the filter.
f Start the engine and check around the oil filter gasket for leaks.
g Stop the engine and check the engine oil level.





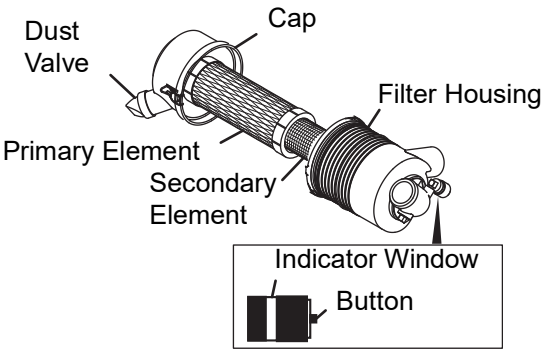
⚠ CAUTION

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

Discard used engine oil as shown in local regulations.

9.5 ENGINE AIR FILTER

Check the service indicator each day. If the red band become visible in the window, replace the filter elements.



Do not remove the elements to inspect or clean. 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, then remove the old elements 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 elements. Do not use a damaged element and never use an incorrect element.

Assemble the secondary and primary filter elements. Make sure the elements seat correctly. Press the button to set the service indicator.

Assemble the cap to the filter housing. Make sure the cap seals around the filter housing. The dust valve on the cap must be at the bottom of the filter. Fasten the cap with the two clips.

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

9.6 FUEL

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

⚠ WARNING

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

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

If the fuel spills, do not try to start the engine, but move the mower away from the area. Until fuel vapors are removed, do not allow sparks, open flame or other types of ignition.

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.

Do not use a nozzle lock open device.

If fuel spills on your clothing, change your clothing immediately

Fill the fuel tank to less than 1 inch (2.5 cm) below the filler neck. Use clean No. 2 ultra low sulfur Diesel fuel with a minimum Cetane Rating of 45. Use of Diesel fuel additives are not recommended. If fuel additives are used, the fuel additives must be approved for use in DPF systems. Refer to the engine manual for additional information.

Check fuel hoses and clamps every 50 hours. Replace fuel hoses and clamps at first indication of wear or damage.

Keep fuel according to your local, state or federal regulations and instructions from your fuel supplier.

Never allow the tank to become empty. The level of fuel is shown on the combination gauge.

9.7 FUEL SYSTEM

Water Separator (T4F/Stage 5 Engine Only)

If the water is not removed from the fuel, damage to the fuel-injection system can occur. When the **WATER IN FUEL** screen is shown on the LDU or every 100 hours, drain the water from the water separator.

a Stop the engine. Open the air vent at the top of water separator.

b Open the drain valve at the bottom of the water separator and drain the water. Water will drain before the fuel. When fuel drains from the valve, close the valve.

c Press and release the hand pump until air bubbles at separator air vent stop and fuel starts to spill. Close the vent. Clean any fuel that spills.

Fuel Filter

Replace the fuel filter every 400 hours.

a Stop the engine.

b Open the air valve at the top of the filter to release system pressure.

c Remove fuel filter cartridge. Clean any fuel that spills.

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

e Bleed air from the fuel system.

How To Bleed The Air From The Fuel System

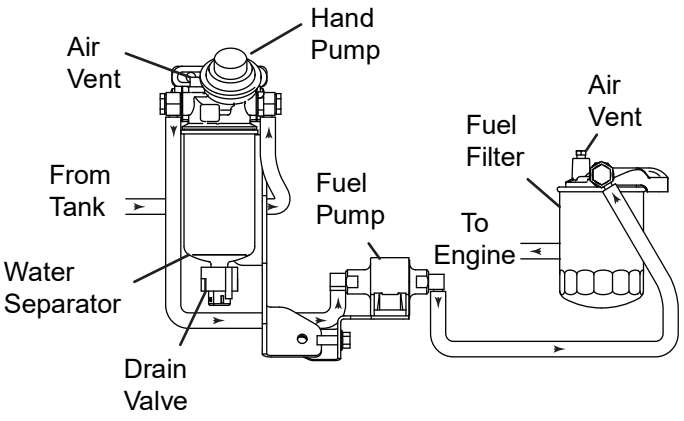
After water is drained from the fuel system, fuel filter cartridge is replaced or the fuel hoses are replaced, bleed the air from the fuel system.

a **T4F/Stage 5 Engines:** Open the air vent at the top of the water separator. Press and release the hand pump until air bubbles at separator air vent stop and fuel starts to spill. Close the vent. Clean any fuel that spills.

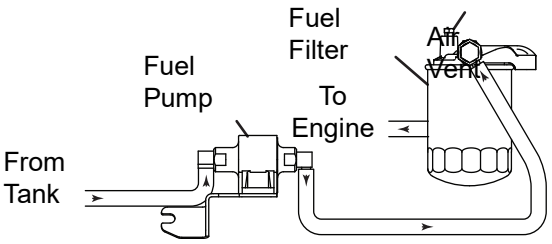
b Open the air vent on the fuel filter. Turn the ignition switch to the RUN position, but do not start the engine. Operate the fuel pump until air bubbles at filter vent stop and fuel starts to spill. Close the air vent. Clean any fuel that spills.

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

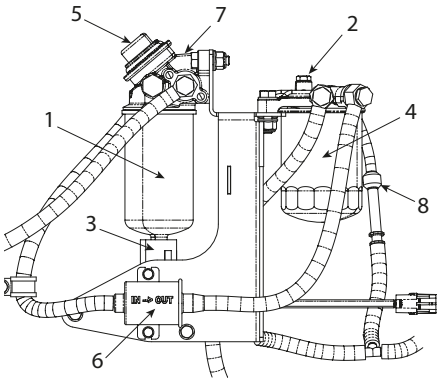
Tier 4 Final & Stage Engine Fuel Routing



Tier 4 Interim Engine Fuel Routing



V1505 TE5 Engine Fuel Routing



1 Water Separator
2 Air Vent
3 Drain Valve
4 Fuel Filter
5 Priming Pump
6 Fuel Pump
7 Air Vent
8 Check Valve

⚠ CAUTION

The Diesel fuel can damage your skin. Use gloves when you use Diesel fuel. If the fuel touches your skin, clean the area immediately. Discard used Diesel fuel as shown in local regulations.

9.8 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 the tools with insulation, wear protective glasses and protective clothing.

Discard used batteries as shown in your local regulations.

⚠ WARNING

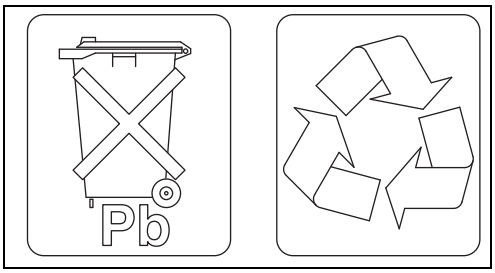
The battery contains corrosive acid. Prevent contact with the battery acid.

Always wash your hands after you service a battery.

⚠ WARNING

The battery posts, battery terminals and related accessories contain lead and lead compounds, chemicals known 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 install the battery, always connect the positive (RED) battery cable before the negative (BLACK) battery cable.

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

9.9 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 specified 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.

9.10 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.

T4I Engines: The exhaust system has the exhaust manifold, muffler and exhaust pipes.

T4F/Stage 5 Engines: The exhaust system has the exhaust manifold, Diesel Particulate Filter (DPF) and exhaust pipes. Refer to Section 6.3.4 and 9.11 for the operation and the Engine Manual for information about the DPF system.

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.

9.11 DIESEL PARTICULATE FILTER (T4F/STAGE 5 ENGINES ONLY)

During the operation of the mower, the level of particle material will increase in the Diesel Particulate Filter (DPF) system. The periodic Regen of the DPF system is needed to remove particle material. During an Active or Parked Regen, the engine will use more fuel. The DPF system operates in one of four states.

⚠ WARNING

During Active or Parked Regen, the temperature of the exhaust components can be more than 1150° F (625° C). To prevent burns, do not touch a hot exhaust system and do not stand or reach into exhaust gas area from exhaust pipe outlet. To prevent fires, make sure the engine area is kept clean and the grass clippings are not near exhaust components.

Make sure the exhaust gas from the exhaust pipe is not blocked and there is enough space between the exhaust pipe and objects. Park the mower on concrete or gravel during Parked Regen. During Active or Parked Regen exhaust gas from the exhaust pipe can cause turf damage or fire.

Passive Regen State - The engine operates in the Passive Regen state during normal engine operation. The exhaust temperature can be more than 572° F (300° C).

Inhibit Regen State - When the Regen Inhibit is selected on the LDU, engine can not enter the Active or Parked Regen states. Inhibit Regen does not prevent the Passive Regen. If the fuel tank is near empty, select the Regen Inhibit on the LDU until the fuel tank is filled.

Active Regen State - When the level of particle material reach a certain point, the engine will enter Active Regen state. Operation of the mower is not changed. The exhaust temperature can be more than 1150° F (625° C) during Active Regen. The high exhaust temperatures during Active Regen will illuminate the High Exhaust Temperature light.

Parked Regen State - When a Parked Regen is needed, the Regen Request light will flash and the Tier 4 Service Message screen is shown on the LDU. Park the mower on concrete or gravel to prevent damage to the turf.

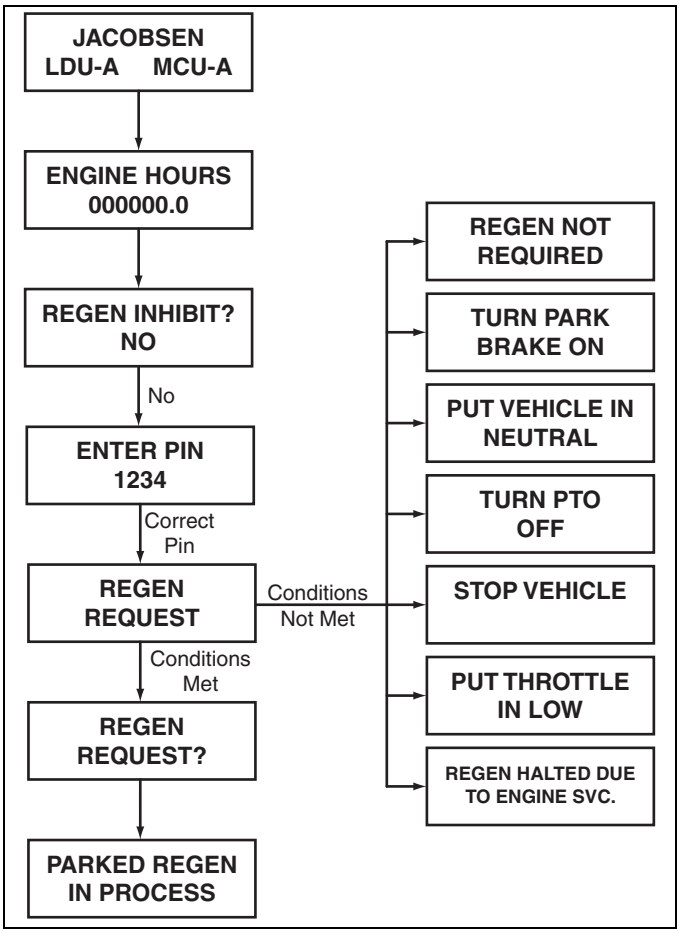
If the **REGEN INHIBITED** is selected on the LDU, Turn the ignition switch to the Off position and restart the engine.

Enter Maintenance mode (**See Section 9.2**). Press the joystick forward or backward until the **REGEN REQUEST** screen is shown on the LDU. Press the LDU button. The parking brake switch must be on, the traction pedal must be in the neutral position, the PTO switch must be in the OFF position and the adaptive throttle switch in the Garage Mode position. The LDU will show a instruction screen if conditions are not met. If the condition shown is not corrected in 5 seconds, the Regen request will be canceled.

When the **REGEN REQUEST?** screen is shown on the LDU, press the LDU button to start the Parked Regen Cycle. During the Parked Regen cycle, the **PARKED REGEN IN PROCESS** screen is shown on the LDU.

During the Parked Regen, the Regen Request light will illuminate. When high-exhaust temperatures are sensed during Parked Regen, the High-Exhaust Temperature light will illuminate. Do not disengage the parking brake, stop the engine or move the mower during the Parked Regen.

If the **REGEN HALTED DUE TO ENGINE SVC** screen is shown on the LDU, the Parked Regen cycle must be started using the Kubota Diagmaster service tool.



A Regen cycle that is not completed will move the engine through six different levels of control.

Level 0 - Normal operation of mower with Passive Regen. When particles reach the Active Regen level, the engine controller will change to Level 1. When the engine controller is at Level 0, the Active and Parked Regen is disabled.

Level 1 - Engine will enter Active Regen state unless the **REGEN INHIBITED** screen is shown on the LDU. Normal Active Regen is completed in approximately 20 minutes. If the particle material level does not decrease to the Passive Regen level in 30 minutes (1800 seconds), the engine controller will change to Level 2. When the engine controller is at Level 1, the Parked Regen is disabled

Level 2 - Regen Request light will flash. Engine will enter Active Regen state unless the **REGEN INHIBITED** screen is shown on the LDU. When the mower is parked and the parking brake is engaged, the Parked Regen state is available. If the engine is operated at Level 2 without a Regen for approximately 1 to 1-1/2 hours, the engine controller will change to Level 3.

Level 3 - Regen Request light will flash and the check engine light is illuminated. The engine power output is decreased and Active Regen is disabled. When the mower is parked and the parking brake is engaged, the Parked Regen state is available. If the engine is operated at Level 3 without a Regen for approximately 1 to 1-1/2 hours, the engine controller will change to Level 4.

Level 4 - High Exhaust Temperature Light will flash and the check engine light is illuminated. The engine power output is decreased significantly. Active and Parked Regen is disabled. The Kubota Diagmaster tool is needed to start a Regen. If the engine is operated at level 4 without a Regen for approximately 1 to 1-1/2 hours, the engine controller will change to Level 5.

Level 5 - High Exhaust Temperature light will flash quickly and the check engine light is illuminated. The engine power output is decreased significantly. An authorized Kubota Engine Service Center must clean the DPF before the mower is used.

9.12 HYDRAULIC HOSES

⚠ WARNING

To prevent injury from the hot, high pressure oil, never use your hands to check for oil leaks. Use the 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 be sent in 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 every 250 hours.

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 prevent dirt to enter the system.

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

To prevent dirt to enter the hydraulic 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 the hoses from twisting. 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.

9.13 HYDRAULIC FLUID

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

- Component failure
- Water or foam is in the hydraulic fluid
- The hydraulic fluid has a rancid odor (indication of high heat)
- Every 500 hours or each year, which is the first to occur.

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

a Clean the area around the oil cap and drain plug to prevent dirt to enter the hydraulic system.

b Remove the drain plug from the bottom of the tank.

c After the oil has drained, install the drain plug and fill the tank with hydraulic fluid.

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 the oil-level has balanced and the air is removed, add fluid to the tank to the Full-mark on the dipstick

9.14 HYDRAULIC FILTER

The hydraulic system is protected by two 10 micron filters. Flow through the filter is monitored while you operate the mower. When the difference in hydraulic pressure across the filter is greater than 16 to 20 psi (1.1 to 1.4 BAR), the hydraulic oil filter warning light on the LDU will illuminate. To make sure continued protection of the hydraulic system, replace filter as soon as possible after light illuminates.

NOTICE

During cold weather, the oil filter warning light can illuminate until the hydraulic fluid becomes warm. Wait until the oil becomes warm and the warning light turn off before you operate the mower.

When you replace the filter, -

a Fill the new filter with hydraulic fluid and lubricate the filter O-ring with hydraulic fluid before you assemble 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. The oil-level light can illuminate and the horn can activate during the five minutes.

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.

9.15 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 to 12 psi (0.86 BAR).

⚠ 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.

9.16 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 behind the mower is lifted, put the chocks in front of and behind the wheels that are not lifted.

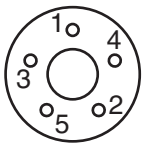
Remove dirt, grease and oil from the stud threads. Do not lubricate threads.

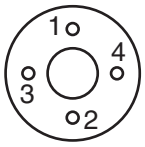
Put the wheel on the hub. Inspect the wheel to make sure of full contact between surface of wheel and hub.

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).

Front Wheel Torque Order





Rear Wheel Torque Order

9.17 RADIATOR

WARNING

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

CAUTION

Do not put cold water 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 recovery bottle must be at the cold mark.

Drain and fill the cooling system each year. Empty and clean the recovery bottle.

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

Keep the radiator, engine oil cooler and hydraulic oil cooler air passages clean. Use compressed air (maximum of 30 psi (2 BAR)) to clean the fins. Open the panel under the radiator to allow dirt and other particles to fall from the frame.

Check and tighten the engine fan belt every 100 hours and replace the belt every 500 hours. Replace the clamps and hoses every two years.

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 quart of coolant at a time.

9.18 FOLDING ROPS

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

⚠ CAUTION

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

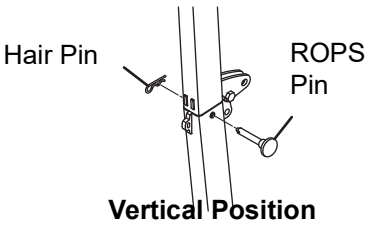
Every 400 hours, inspect the seat, seat belt, ROPS mounting hardware and ROPS frame for damage. Replace all damaged parts immediately. All replacement parts for the ROPS must be as specified in the Parts Manual.

Check and torque all ROPS hardware every 100 hours.

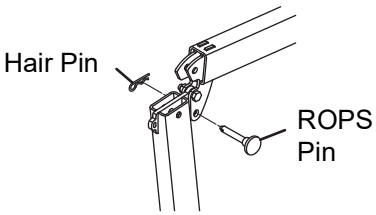
Only operate the mower with the ROPS in the folded position on flat and level surfaces. Do not operate the mower with the ROPS in the folded position on the slopes, near sharp edges or near water. **There is no roll over protection with the ROPS in the folded position.**

Folding the ROPS.

a Remove the hair pin and ROPS pin from both sides of the ROPS.
b Fold the ROPS toward the mower hood.
c Assemble the ROPS pin and hair pin to lock the ROPS in the folded position. **Never** wear the seat belt with the ROPS in the folded position.



Vertical Position



Folded Position

⚠ WARNING

To prevent injury when you fold the ROPS, use caution to prevent your fingers crushed between moving and rigid parts of the ROPS.

Always wear the set belt with the ROPS frame in the vertical and locked position.

Never wear the seat belt with the ROPS in the folded position.

NOTICE

To prevent damage to the ROPS or the mower hood, do not operate the mower without the ROPS frame locked in the vertical or folded position.

9.19 TO BACKLAP THE REELS

WARNING

To prevent injury, keep hands, feet and clothing away from rotating reels.

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

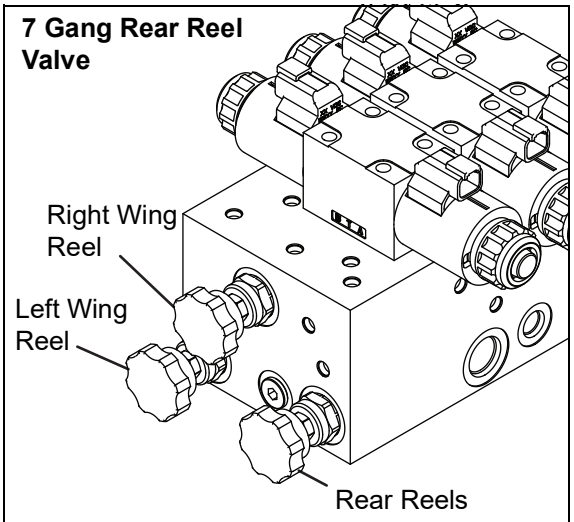
Check the reel and the bedknife to determine if backlapping or grinding will restore the cutting edge.

If wear or damage is beyond the point where the cutting edges can be corrected by the lapping process, they must be reground.

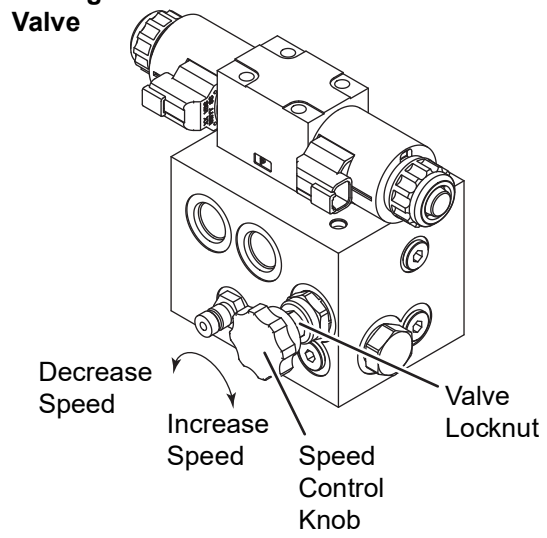
To backlap:

1. Lower the reels to the ground, set the PTO switch in the OFF position, set the parking brake in the ON position and stop the engine.
2. Loosen the valve locknut at the valve stem on the front and rear reel valves.
3. Start the engine and set the throttle to the slow position.
4. Enter Maintenance mode (**See Section 9.2**). Press the joystick forward or backward until the **BACKLAP ENABLE?** screen is shown on the LDU. Press the LDU button.
5. If the seven gang option is installed, press both buttons on the top of the joystick.
6. If any of the reels are lifted, the **LOWER ALL ACTUATORS** screen is shown on the LDU. You must exit maintenance mode and lower all the reels to the ground. Enter maintenance mode and restart the backlap request.
7. The **10 MINUTES < START >** screen is shown on the LDU. Use the joystick to adjust the timer. Press the LDU button.
8. The **ACTUATE PTO SWITCH** screen is shown on the LDU. Move the PTO switch to the ON position. The reels will start to rotate in the reverse direction.
9. The **XX MINUTES < QUIT >** screen is shown on the LDU. When the LDU button is pressed, or the backlap timer is at 0 minutes, the reels will stop.
10. Both of the reel valves contain an adjustable valve(s) to control the speed of the reels. Turn the valve to the left to decrease the reel speed. Repeat for both valves.
11. After the desired speed is set, tighten the locknut to set the adjustment.
12. Apply lapping compound, with a long handle brush, along the full length of the reel.
13. When the reels are honed, carefully and completely wash off the remaining mixture.
14. Repeat the full procedure on the other reels.
15. Repeat the backlap procedure if additional time is needed.

7 Gang Rear Reel Valve



Front Reel Valve and 5 Gang Rear Reel Valve



Important: The speed control valves limit reverse speed only. Once the desired reverse speed has been set the valves can remain in this position for normal mowing. If full reverse speed is needed, for instance during operation of vertical mowers, the valve can be fully closed (turn clockwise).

9 MAINTENANCE

9.20 ELECTRICAL SYSTEM

⚠ CAUTION

Always turn the ignition switch to the off position and remove the negative (BLACK) battery cable before you inspect or service the electrical system.

General precautions to decrease electrical problems are -

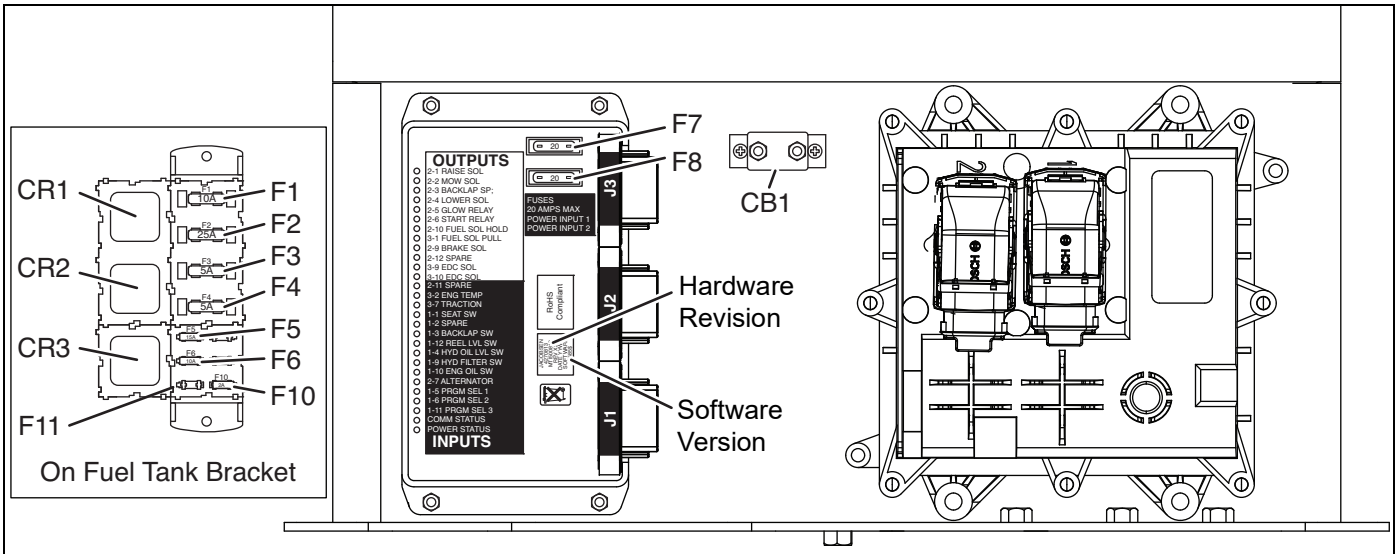
- Make sure that all the connections are clean and correctly fastened.
- Check the interlock system, fuses and circuit breakers at normal intervals. If the interlock system does not operate correctly and you can not correct the problem, contact an authorized Jacobsen Dealer.
- Keep the wiring harness away from hot surfaces and moving parts.
- Make sure the seat switch wiring harness is connected to the mower wiring harness.
- Check the battery and the alternator.
- Do not wash or pressure spray around electrical connections and components.

The electrical system is monitored and controlled by the controller found behind the operator compartment. The controller has 28 light emitting diodes (LED) that can help to correct electrical system problems.

T4F/Stage 5 Engines: A circuit breaker, eight fuses and three relays found near the controllers and on the fuel tank are used to protect the mower circuits.

NOTICE

For factory help with controller problems, give the hardware revision and software version found on the controller. The replacement controllers with higher revision levels will be compatible.



CB1 - 50 Amp Circuit Breaker

CR1 - Main Relay
CR2 - Glow Plug Relay
CR3 - Starter Relay

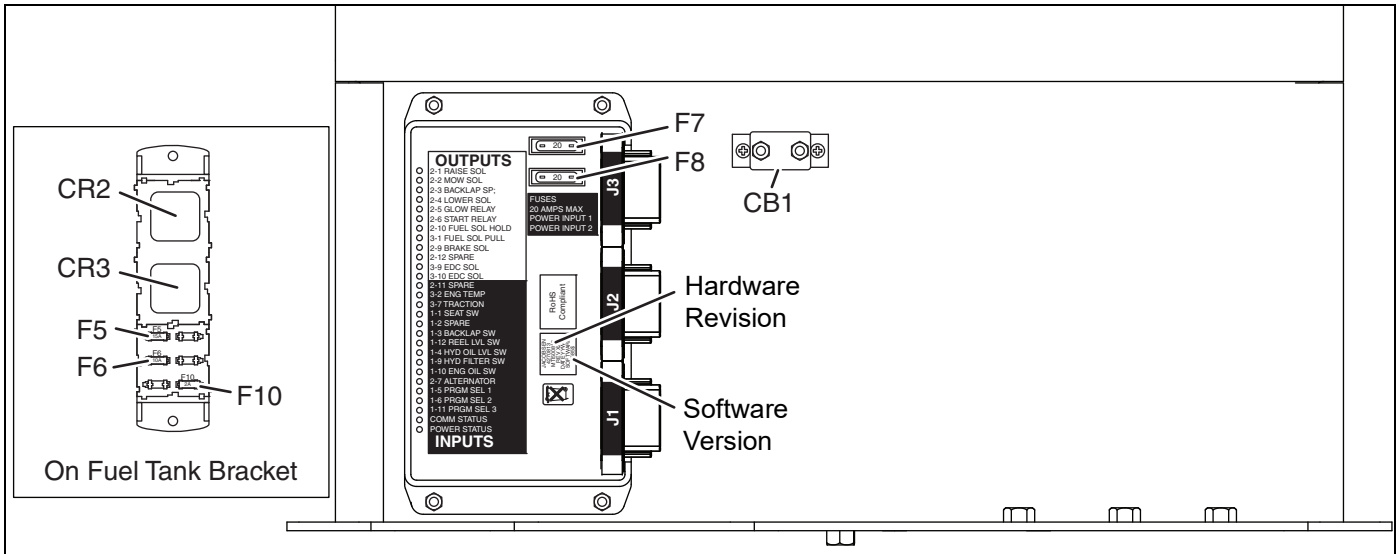
F1 - 10 Amp Fuse - ECU +12V
F2 - 25 Amp Fuse - Main Relay
F3 - 5 Amp Fuse - ECU Start
F4 - 5 Amp Fuse - EGR
F5 - 15 Amp Fuse - Air Ride Seat
F6 - 10 Amp Fuse - LDU

F7 - 20 Amp Fuse - Ignition
F8 - 20 Amp Fuse - Lights
F10 - 2 Amp Fuse - Cruise Disable
F11 - 5 Amp Fuse - EGR

T4I Engines: A circuit breaker, five fuses and two relays found by the controllers and on the fuel tank are used to protect the mower circuits.

NOTICE

For factory help with controller problems, give the hardware revision and software version found on the controller. The replacement controllers with higher revision levels will be compatible.



CB1 - 50 Amp Circuit Breaker

CR2 - Glow Plug Relay
CR3 - Starter Relay

F5 - 15 Amp Fuse - Air Ride Seat
F6 - 10 Amp Fuse - LDU
F7 - 20 Amp Fuse - Ignition
F8 - 20 Amp Fuse - Lights
F10 - 2 Amp Fuse - Cruise Disable

9.21 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. Do not use high-pressure spray or steam. Use the cold water and automotive cleaners.

Use compressed air to clean the engine and the 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.

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 fiberglass parts, wax with a good grade of one-step cleaner wax.

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 reels. The reel blades are sharp and can cause injuries.

9.22 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 and keep the mower so that the load is not on the tires. If the mower is not on the jack stands, check tires at normal intervals and add air when needed.
- 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.

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 plug, drain the oil from the crankcase and change the oil filter. Install the drain plug and fill the engine with oil. Torque the drain plugs to 22 ft. Lb. (30 Nm).
- Clean the outside surface of the engine. Paint bare metal or apply a thin layer of rust preventative oil.
- Add a fuel conditioner or biocide to prevent the fuel to become a gel or bacteria in the fuel. See your fuel supplier for instructions. Drain water from water separator.

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 and bedknife.

⚠ CAUTION

The cutting unit reels can have sharp edges. To prevent injury, use caution when you service or hold the blade.

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 reels. 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.

10 ADJUSTMENTS

10.1 GENERAL PRECAUTIONS

⚠ WARNING

Before you clean, adjust or repair this equipment, push PTO 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 do adjustments and 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.

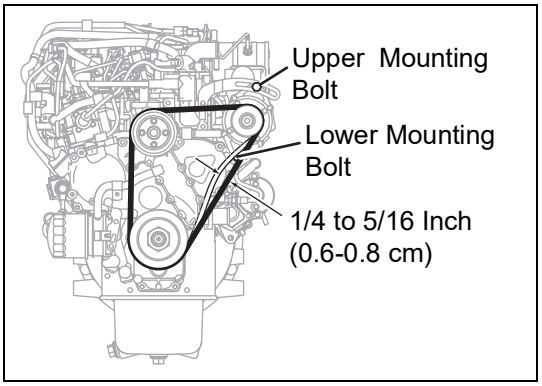
When you discard hazardous materials (batteries, lubricants, fuel, anti-freeze), follow your local, state or federal-recommended procedures.

10.2 ENGINE FAN BELT

Inspect and adjust a new belt after the first ten hours of operation. Check the belt every 100 hours after the first 10 hours.

Adjust the alternator position so that the belt moves 1/4 to 5/16 inch (0.6 to 0.8 cm) with a 20 lb. (89 N) push at the center point between pulleys. Refer to the Engine manual.

If the belt tension is not correct, loosen the alternator mounting bolts and adjust the alternator until the correct belt tension is set. Tighten the alternator mounting bolts.



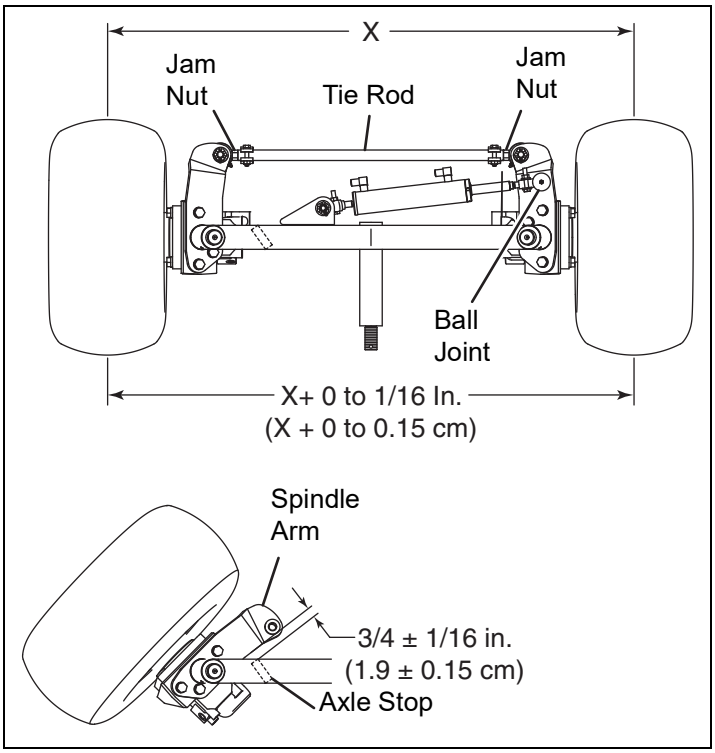
10.3 STEERING ADJUSTMENT

Steering Toe-In Adjustment

a Turn the rear wheels to the straight position.
b Loosen the jam nuts on both ends of the tie rod.
c Rotate the tie rod to get the correct toe-in. the Toe-in must not be more than +1/16 inch (+ 0.15 cm).
d Tighten the jam nuts.

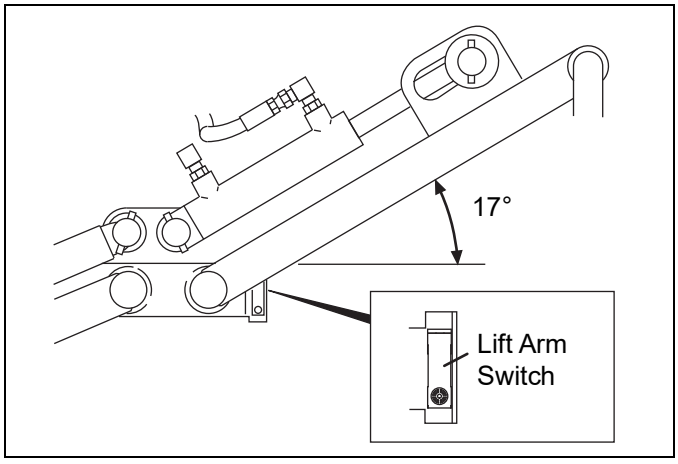
Steering Stop Adjustment

When the toe-in is adjusted, turn the steering wheel to the left to extend the steering cylinder rod. When the steering cylinder rod is completely extended, the steering spindle arm must be 3/4 ± 1/16 inch (1.9 ± 0.15 cm) from the axle stop. Turn the steering cylinder rod into or out of the ball joint to adjust the steering stop position.



10.4 FRONT REEL LIMIT SWITCH

The mower has a proximity switch, which signals the controller to turn off the reels. The switch is installed on the mower frame behind the left side 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.



To adjust switch:

1. Park the mower on a flat and level surface.
2. Remove the cutting unit from the 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 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 is at a 17° angle.
6. With the lift arm at 17°, adjust the lift arm switch, until the switch contacts close. Fasten the switch in this position.
7. Start the engine and make sure that the reels turn off when lifted.

NOTICE

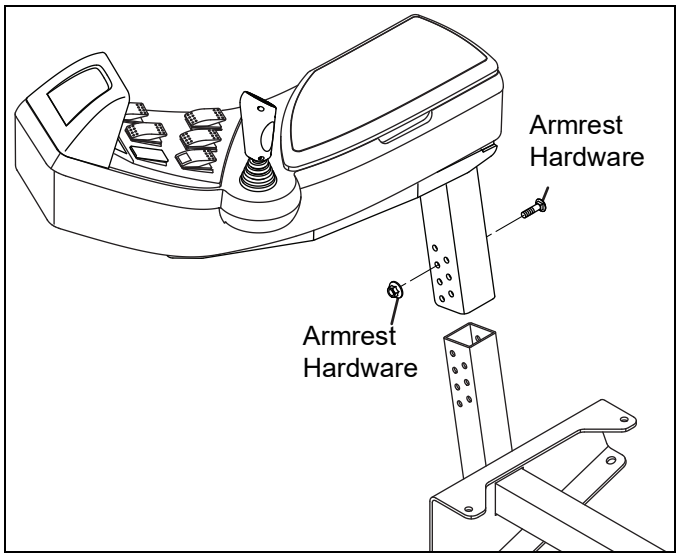
The proximity switch sets the point where the reels stop rotation. The reels will lift to a position more than 17 °.

10.5 ARMREST HEIGHT ADJUSTMENT

The armrest has four available height settings for the operator.

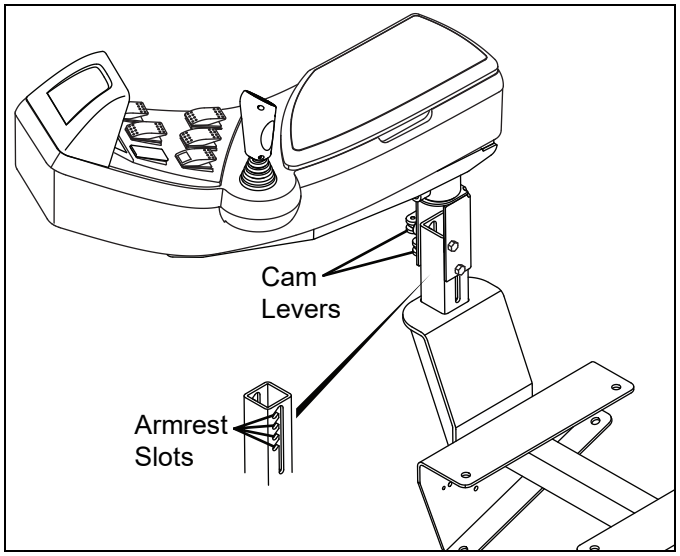
To adjust standard seat armrest height:

1. Stop the engine and remove the key.
2. Remove the armrest hardware from the bracket on the right side of the seat.
3. Lift or lower the armrest as needed until another set of holes in the armrest bracket align with the seat bracket. Assemble the armrest hardware.
4. When you adjust the height, check the wiring harness connector for a tight connection to the mower harness.



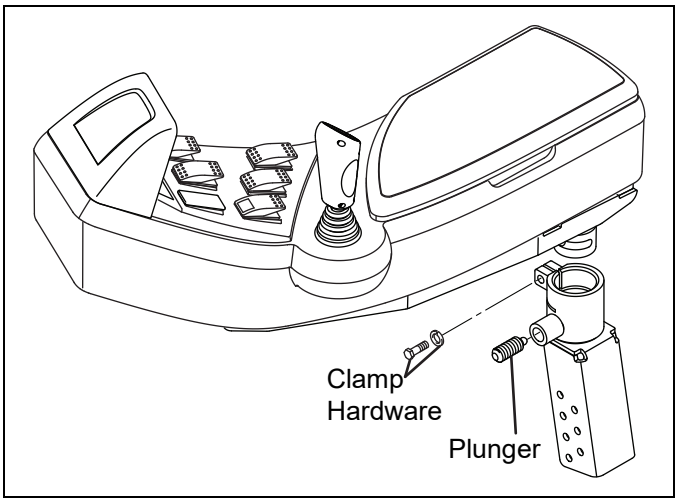
To adjust premium seat armrest height:

1. Stop the engine and remove the key.
2. Release the cam levers on the right side of the seat.
3. Move the armrest toward the rear of the mower. Lift or lower the armrest until the upper bolt is in the necessary slot in the seat bracket. Tighten the cam levers.
4. When you adjust the height, check the wiring harness connector for a tight connection to the mower harness.



10.6 ARMREST PIVOT

1. Adjust the plunger as required so that the plunger button stops the armrest at both ends of armrest pivot slots. The plunger body must not contact the armrest pivot. Do not use the plunger to increase the pivot tension.
2. Adjust the clamp hardware to get 2 to 6 lbs. (9 to 26.7 N) of force needed at the visor end of the armrest to move the armrest. Do not over-tighten the pivot hardware or leave loose.



10.7 BEDKNIFE-TO-REEL

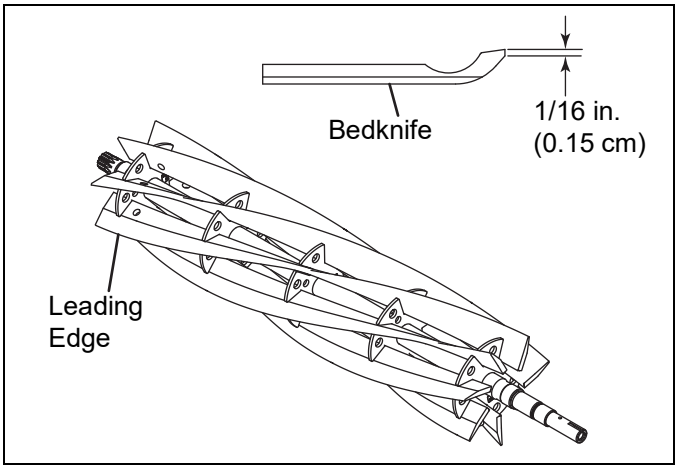
1. Check the reel bearings for end play or radial play.
2. Inspect the reel blades and the bedknife to make sure of good sharp edges without bends or surface damage.

a The leading edge of the reel blades must be sharp, without rough edges and show no indications of become 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).

10.8 BEDKNIFE ADJUSTMENT

1. Read Section 10.7 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 blades is that 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.

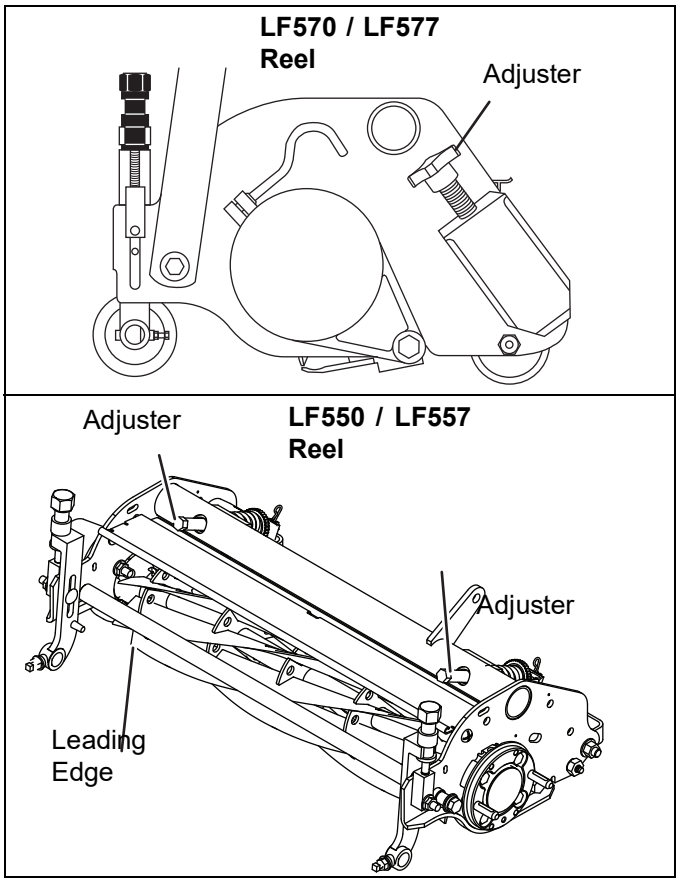
a Put a 0.001 - 0.003 in. (0.0025 - 0.0075 cm) feeler gauge or shim between the reel blade and the bedknife. Do not turn the reel.

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 90Áto 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.



10.9 CUTTING HEIGHT

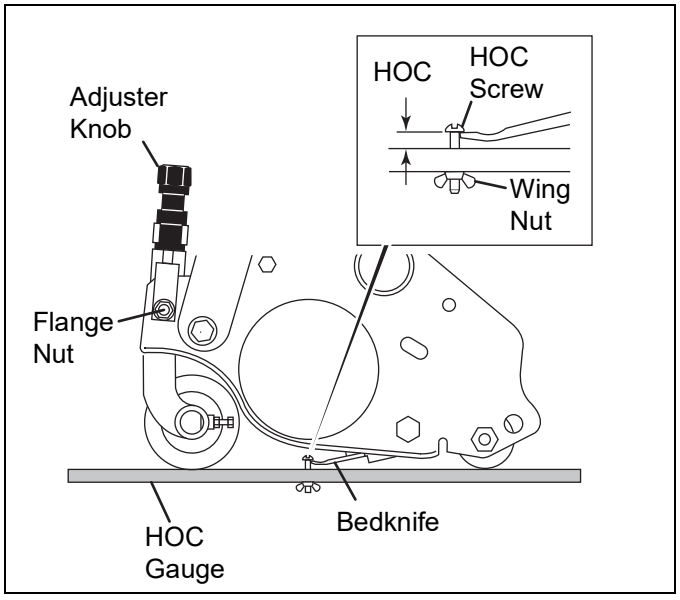
Note: *Always make the reel-to-bedknife adjustment before you adjust the height of cut.* ***See Sections 10.7 and 10.8.***

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.

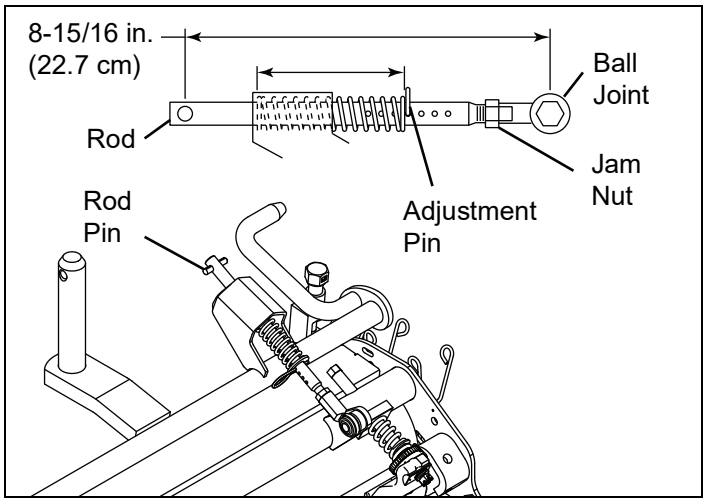
b Adjust the HOC screw to get the correct height then tighten the wing nut.

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.



10.10 DOWN PRESSURE

Each reel 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 on 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.

10.11 FLASH ATTACH™

Installing Cutting units

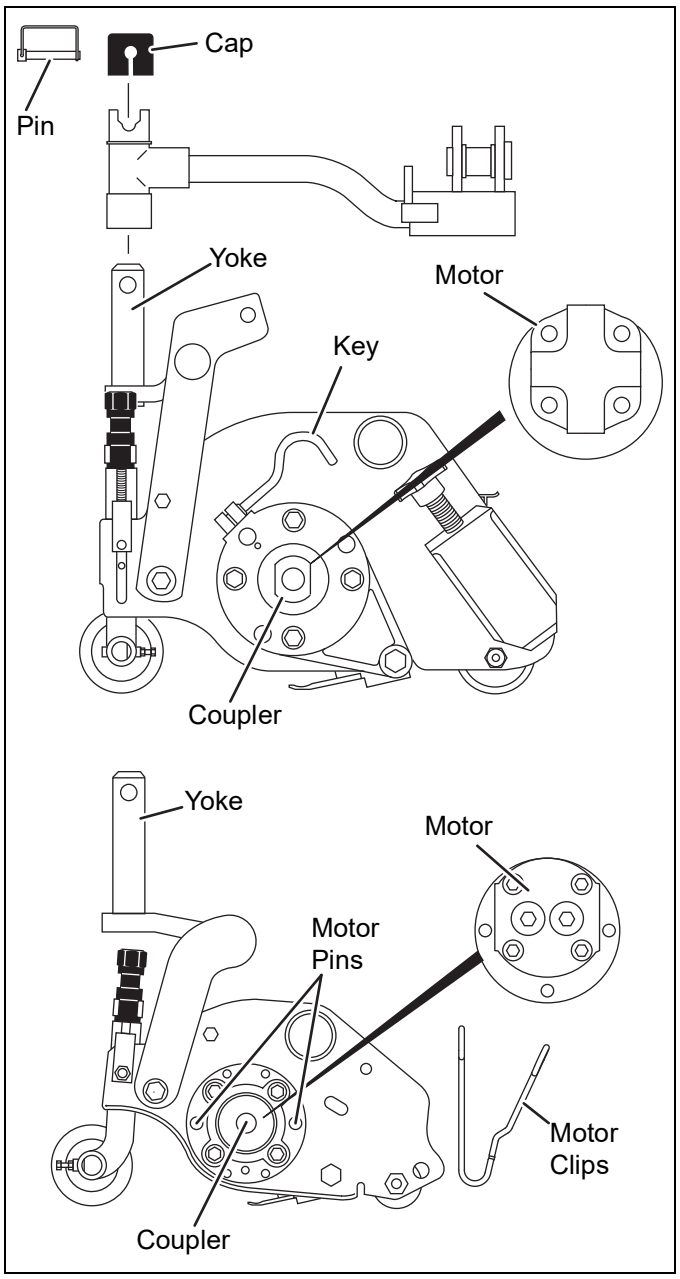
1. Put each cutting unit in front of the lift arm. Lift the lift arm and put the cutting unit so that the yoke is aligned to the swivel housing. Carefully lower the lift arm on the yoke. Install pin through the hole in the yoke and fasten the retaining clip. Install the cap on the swivel housing.
2. **LF570 Cutting Units -** Clean the motor splines and the coupler. Apply grease to the female spline on the reel. Completely clean the motor mounting surface. Move the motor into bearing housing. Tighten the key on bearing housing to lock the motor in position.

   LF550 Cutting Units - 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 10.10**

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 10.10**
2. **LF570 Cutting Units** - Loosen the key on the bearing housing. Pull the motor away from cutting unit

   LF550 Cutting Units - Remove the motor clips and pull the motor away from cutting unit.
3. Carefully put 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 swivel housing. Release the retaining clip from the pin. Remove the pin.
5. Lift the lift arm until the cutting unit can be removed.

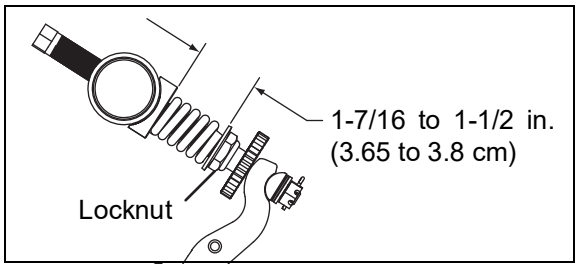


10.12 BEDKNIFE ADJUSTER SPRING

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.

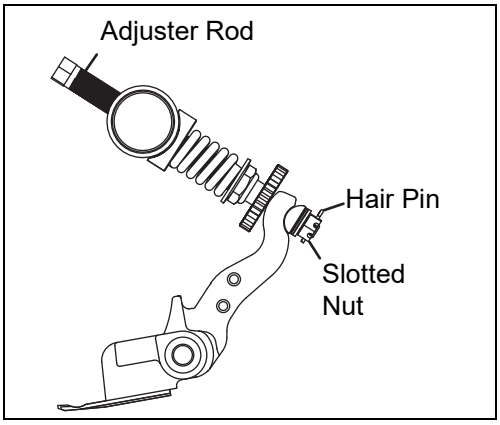


10.13 BEDKNIFE ADJUSTER TENSION

Remove the hair 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 the hair 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

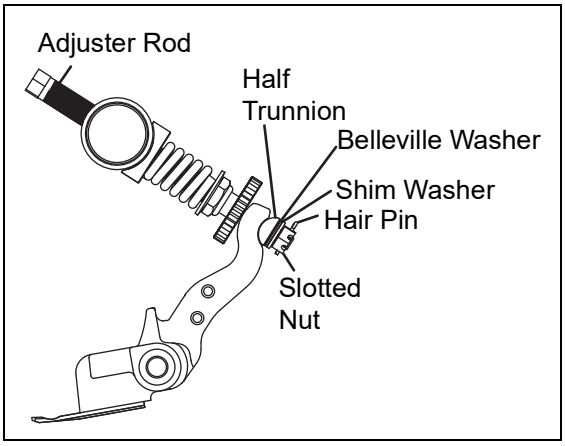
When you tighten the slotted nut more than necessary, the bedknife adjuster rod will be difficult to adjust.

10.14 GRINDING THE BEDKNIFE

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

1. Remove the hair pin, slotted nut, Belleville washer, shim washer **(If needed)** and half trunnion from both ends of the reel.

6. Press down on the adjuster end of the rod to rotate other end of the adjuster out of the bedknife finger.
7. Rotate the bedknife backing to access the reel and bedknife.
8. After you grind the reel and bedknife, assemble the bedknife using reverse order of removal. Check the adjustment of bedknife adjuster tension **(See Section 10.13)**, and the reel to bedknife adjustment **(See Section 10.8)**.



10.15 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)

11.1 GENERAL

The problem solution chart lists basic problems that can occur during start and operation of the mower. For complete information about the hydraulic and electrical systems, contact your Jacobsen Dealer.

Problem	Possible Cause	Action
Engine will not start	1. Parking brake switch OFF, traction pedal out of neutral or PTO switch ON.	1. Check the interlock and start procedure.
	2. The glow plug has not timed out.	2. Set the ignition switch and wait until glow plug light on combination gauge to turn off before you start the engine.
	3. Battery low on charge or has defects.	3. Inspect the battery condition and connections.
	4. Fuel tank empty or dirty. Water in the fuel, air in fuel lines.	4. Fill the tank with clean fuel. Change the fuel filter. Drain water from water separator. Bleed the fuel system.
	5. Fuse blown	5. Replace the fuse
	6. Relay has defects.	6. Test and replace the relay
	7. Traction pedal has defects.	7. Test and replace the traction pedal.
Engine is difficult to start or engine runs rough	1. Level of fuel is low, fuel or fuel filter not clean.	1. Fill with clean fuel. Change fuel filter. Drain water from water separator, bleed fuel system.
	2. Air cleaner dirty	2. Inspect and replace air filter.
	3. Injectors, fuel pump.	3. See the Engine Manual.
	4. Engine Problem	4. See the Engine Manual.
Engine Stops	1. Fuel tank empty.	1. Fill with clean fuel and bleed the fuel system.
	2. The interlocks not set before you leave the seat	2. Turn the parking brake ON and turn the PTO switch OFF before you leave the seat.
The engine temperature more than 230° F (110° C).	1. Level of coolant is low	1. Inspect and add coolant
	2. Air intake decreased.	2. Clean air intake at radiator.
	3. Engine fan belt loose or broken.	3. Tighten or replace the belt.
The battery does not hold a charge. The battery light is illuminated.	1. Loose battery cables or corrosion on the battery terminals.	1. Inspect and clean battery terminals, Tighten battery cables.
	2. Low electrolyte.	2. Fill the battery.
	3. Engine fan belt loose or broken.	3. Tighten or replace the belt.
	4. Alternator has defects.	4. See the Engine Manual.
	5. Battery has a dead cell.	5. Load test the battery.
Cutting units cut at different levels.	1. Height of Cut not adjusted correctly.	1. Inspect height of cut adjustment.
	2. Engine speed below specification.	2. Check the engine speed. Run the engine at full throttle.
	3. Mow speed not adjusted for the turf conditions	3. Adjust the mow speed for best cut.

11.2 CONTROLLER

The Mower Controller is a solid state device that monitors and controls the electrical functions of the mower. The controller receives the input signals from switches and sensors in the mower. The controller sends the output signals to operate relays, solenoids and warning lights. The controller controls and sets the timers and includes logic to control some mower functions.

NOTICE

For factory help with controller problems, give the hardware revision and software version found on the controller. The replacement controllers with higher revision levels will be compatible.

Each input and output signal is shown by Light Emitting Diodes (LED) found on the front of the controller. A closed input switch indicates an active circuit and will illuminate the related LED. An open switch indicates a circuit that is not active and will turn off the related LED. When the LED is illuminated, the output circuit is active.

Some controller outputs need a group of conditions set before the controller sends the output signal.
For example, to send the output to start the engine, all of these conditions must be true.

- The PTO switch is in the OFF position. (LED OFF)
- The parking brake switch is in the on position. (LED ON)
- The traction pedal is in the Neutral Position. (LED ON)
- The ignition switch is turned to the START position. (LED ON)

When you use the controller to find a solution to a mower problem, always make sure that the ignition power status LED is illuminated. This LED indicates that the controller is active. The controller needs a minimum of 6 volts to operate.

Test each circuit and check for the LED to illuminate when you activate or adjust the switch. If an input LED does not illuminate, a not active condition is indicated. A not active condition could be caused by a blown fuse, a defective switch or bad electrical connections. Not all of the switches are found on the instrument panel. Refer to the Parts Manual to find switch locations.

12.1 QUALITY OF CUT PROBLEM SOLVING

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

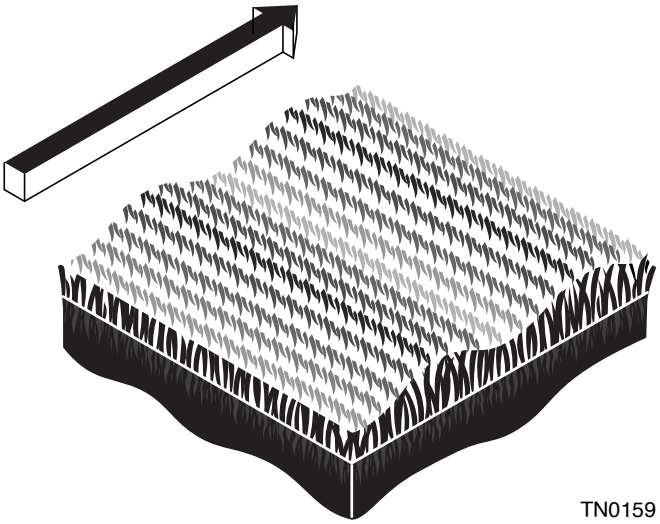
This area must have turf conditions that are known and do not change across the area. This type of area allows an accurate inspection of the perfomance of the mower to be made.

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. Blade Sharpness
3. Height-of-Cut (HOC)
4. Roller and Roller Bearing Condition
5. Blade Speed

12.2 WASHBOARDING



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NOTE: Arrow indicates direction of travel.

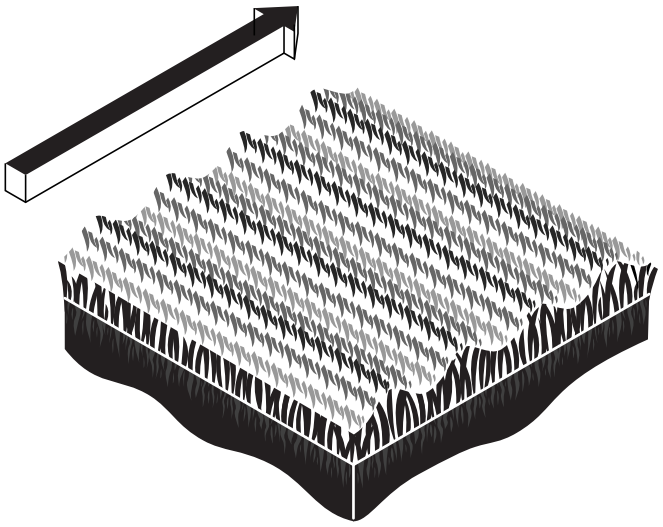
Washboarding is a repeated pattern of different cutting heights, that causes an appearance that is like a wave. In most cases, the wave tip-to-tip distance is approximately 6—8 in. (15—20 cm). A change in the color (from light-to-dark) is also seen.

This 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.

12.3 MARCELLING

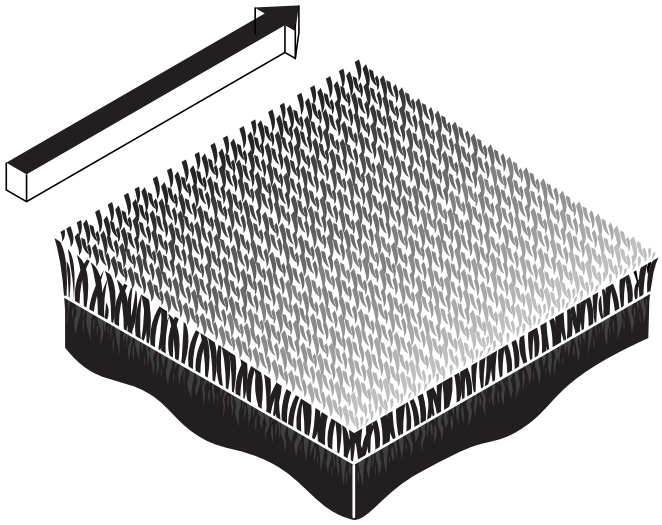


Marcelling is a repeated pattern of different cutting heights, that causes an appearance that is like a wave. In most cases, the wave tip-to-tip distance is 2 in. (5 cm) or less.

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.

12.4 STEP CUTTING



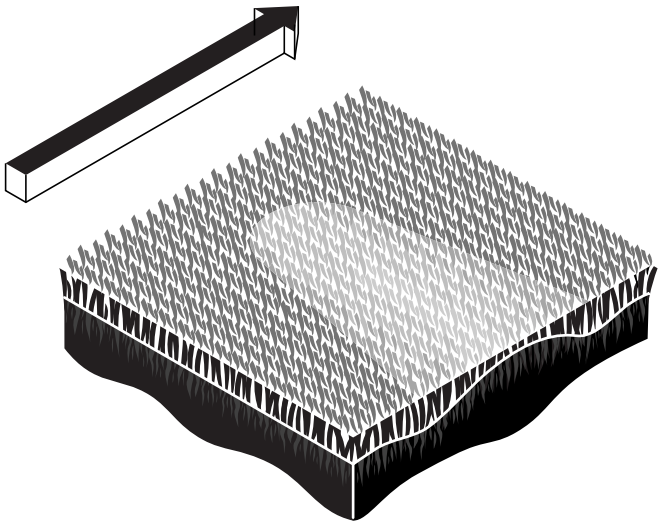
NOTE: Arrow indicates direction of travel.

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.

12.5 SCALPING

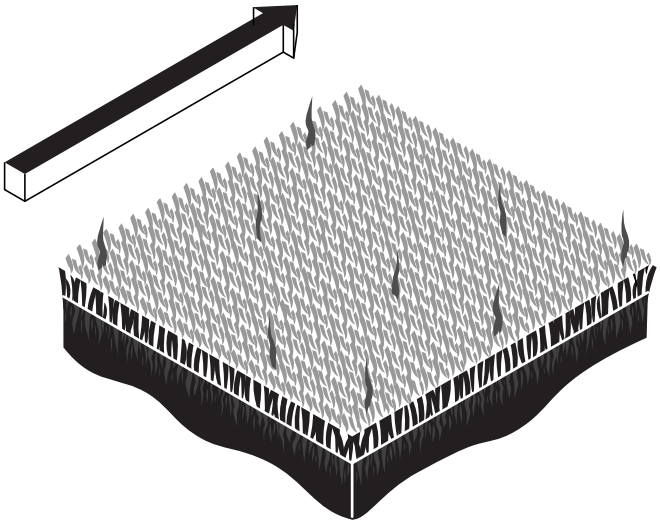


NOTE: Arrow indicates direction of travel.

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.

12.6 STRAGGLERS



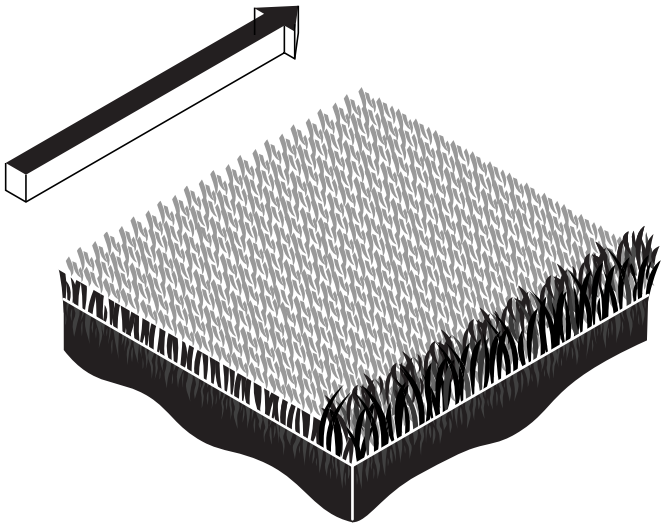
Stragglers are separated blades of grass that are not cut, or are cut incorrectly.

NOTE: Arrow indicates direction of travel.

Probable Cause	Remedy
Edge of the cutting blade(s) are not sharp.	Sharpen the blade(s).
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.

12 QUALITY OF CUT

12.7 STREAKS

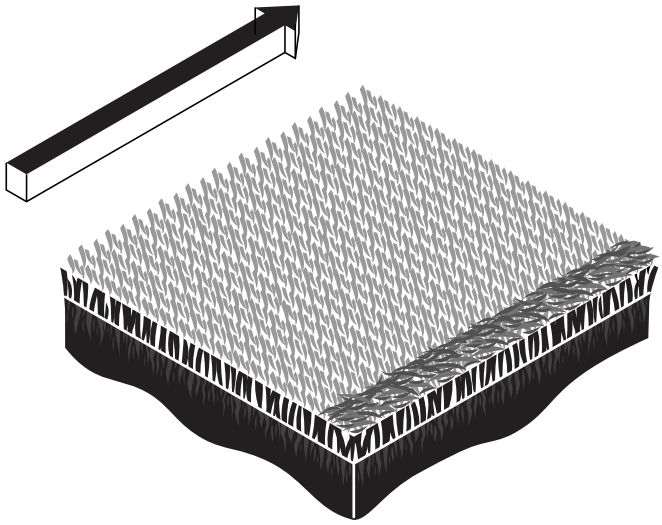


A streak is a line of grass that is not cut. The cause of a streak can be a damaged blade.

NOTE: Arrow indicates direction of travel.

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.

12.8 WINDROWING

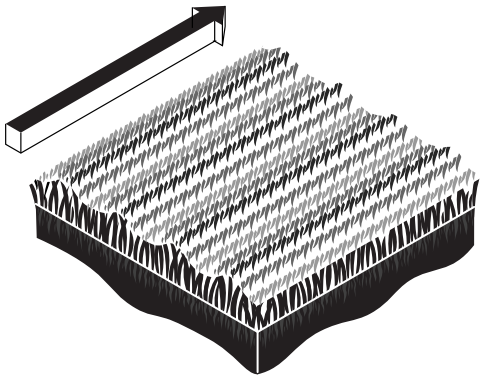


Windrowing is the deposit of clippings increased at one end of cutting unit(s) or between cutting units. Windrowing can make a line in the direction of travel.

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.

12.9 RIFLING OR TRAMLINING

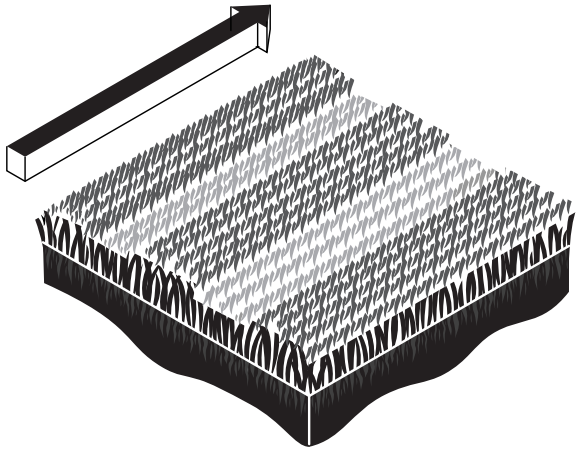


NOTE: Arrow indicates direction of travel.

Rifling or tramlining is a pattern of different cutting heights that gives the grass an appearance like a wave. This appearance is normally because of 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.

12.10 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 because of 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.

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