Safety, Operation & Maintenance Manual

*Ransomes HR6010, Perkins 404D-22T*
*Jacobsen Euro HR6010, Perkins 404D-22T*

Series: EA
Product code: LHAM002

**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.
2.1 IMPORTANT

The Ransomes HR6010 is a Diesel engined self propelled Rotary mower. The hydraulic systems are for the traction drive, the cutting unit lift and the lower and cutting unit drives and steering.

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

This SAFETY AND OPERATORS MANUAL is part of the machine and must stay with the machine always. Suppliers of both original and used machines need to keep the documentation that comes with the machine.

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

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

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

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

Discard worn parts, taking note of the environmental result, use the systems available in the country where the machine is used. When the machine is at its end of life, there are guidelines in this manual for the removal of the machine from use.

Use only Ransomes Jacobsen Genuine spare parts to make sure that European conformity is controlled.

2006/42/EC
These instructions are the Original instructions confirmed by Ransomes Jacobsen Limited
2.2 PRODUCT IDENTIFICATION

A  Maximum front axle load in Kg (for machines being driven on the highway)
B  Gross weight (mass) in Kg
C  Maximum rear axle load in Kg (for machines being driven on the highway)
D  Power in Kw
E  Date code
F  Machine type (Designation)
G  Product code
H  Product name
J  Serial number

Location of Serial number plate

The serial number plate (A) is found on the chassis under the position for the operator seat.

Chassis Stamp

The Serial number and date code (B) are marked on the chassis under the seat plate

Engine Identification

Serial Plate

Location of Serial number plate

The engine serial number plate is found on the engine block. The label shows the engine group and serial number.

The engine serial number is also found stamped on the engine block.
ROPS Serial Plate

A  Weight of ROPS
B  Date Code
C  Standard Used
D  Part Number
E  Used on Product
F  Serial Number

ROPS Serial Plate Location

The ROPS serial plate (C) is located at the base of the front of the ROPS main beam.
2 INTRODUCTION

2.3 GUIDELINES FOR THE DISPOSAL OF SCRAP PRODUCTS

2.3.1 DURING SERVICE LIFE

Used oil, oil filters and engine coolant are hazardous materials. Recommended procedures must be followed 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 machine can cause in the local environment is controlled safely.

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

2.3.2 END OF SERVICE LIFE

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

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

Change the machinery records to show that the machine is not in service and is discarded. Supply this serial number to Ransomes Jacobsen Warranty Department to close their records.
2.4 PARTS MANUAL

In compliance with the ISO14001 standard, Ransomes Jacobsen Limited does not send a paper parts manual with every product.

To refer to a parts list for this mower you have four options:

1. Website – www.RansomesJacobsen.com. Select the “GENUINE PARTS” tab followed by the “ONLINE PARTS LOOK-UP” tab. You now have access to Parts drawings and lists to help with the identification of spare parts.


3. Complete the form included in the technical manual pack supplied with the machine for one of the two options below
   a. A disc that contains an electronic copy of the Parts Book.

2.5 KEY NUMBERS

Record the key numbers shown below:

Starter Switch: -

Diesel tank: -

Record the machine and engine numbers shown below:
The machine serial number is found on the registration plate and the engine serial number can be found on the rocker cover.

Machine Number: -

Engine Number: -
3.1 HOW TO OPERATE SAFELY

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 or Ransomes 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 persons 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 persons, including children or animals.

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

f Never carry passengers.

g Never allow persons 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 decals, guards, shields, deflectors or other protective devices fastened. **When you mow with a side discharge deck, DO NOT operate the cutting unit without the discharge chute installed.**

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 other persons 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 persons 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 persons or allow persons 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 (25 mm) 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 persons 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.

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.
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.

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.

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.

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.

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.

Carefully release the pressure from components with stored energy.

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.

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.

Keep the mower and the engine clean.

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

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

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

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

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.

Make sure that all latches are correctly fastened.
3.1.8 Important Safety Notes

⚠️ This safety alert symbol is used to alert you to 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. Also, the label can indicate work procedures that are not safe.

**IMPORTANT:**
Only drive the machine at road speed when you are on a highway. You must not select road speed on grass areas or rough roads and gravel tracks.

Some illustrations in this manual can show shields, guards or plates removed for clearness. This equipment must not be operated without these devices correctly fastened in position.

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**⚠️ WARNING**

The Interlock System on this mower prevents the starting of the mower unless a.) The parking brake is Engaged. b.) The mow switch is in the OFF position. c.) The traction pedal is in the Neutral position. d) The operator is in the seat. The system stops the engine when the operator leaves the seat a.) without the parking brake engaged or b.) the mow switch is not in the OFF position. NEVER operate the mower unless the Interlock System is working.

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**⚠️ WARNING**

1. Before leaving the operator’s position for any reason:
   a. Return traction pedal to the Neutral position.
   b. Disengage all drives.
   c. Lower all implements to the ground.
   d. Engage 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 machine.

3. Keep the area of operation clear of all persons and animals.


5. Never operate the equipment without a correctly fastened grass deflector in position.

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

If additional information or service is needed. Contact your Authorized Ransomes Jacobsen Dealer, who knows the latest methods to service this equipment and can give that service.
WARNING

California Proposition 65
Engine Exhaust, Some Of Its Constituents, And Some Vehicle Components Contain Or Release Chemicals
Known To The State Of California To Cause Cancer And Birth Defects Or Other Reproductive Harm.

WARNING

To Prevent Injury From The Hot Oil At High Pressure, Do Not Use Your Hands To Check For Oil Leaks. Make
Sure That You Use Paper Or Cardboard.
Release Of Hydraulic Fluid At High Pressure Has Enough Force To Enter Through The Skin. If The Fluid Enters
Through The Skin, The Fluid Must Be Surgically Removed Within Hours By A Specialist Doctor Or Gangrene
May Result.

WARNING

When The Machine Is Driven Off-Road, A Seat Belt Must Be Worn Only When A Rops Frame Is In Position.
This Warning Is Because A Seat Belt Must Be Worn With A Rops To Follow The Machinery Directive,
2006/42/EC Sections 3.2.2, Seating & 3.4.3, Rollover. (ANSI B71.4-2012 section 20.7)
Ransomes Jacobsen Limited Recommends That The Owner/User Of The Machine Completes A Local Risk
Assessment Of The Machine To Find Any Conditions That Do Not Follow This Rule. E.g. When You Drive The
Machine Next To Water Or On The Highway.

WARNING

Explosive Gases Are Released By Batteries. The Battery Contains Corrosive Acid And Supply An Electrical
Current That Is High Enough To Cause Burn Injuries To The Body.

WARNING

You Must Not Use This Machine To Tow Other Vehicles.

WARNING

Ear Protection Must Be Worn When You Operate Machines With
An Operator Ear Noise Level Of More Than 85 db(A) Leq.
Vibration Exposure Limits
Exposure limits are calculated as a combination of the vibration level (magnitude) of the tool and the Daily Exposure Time (Trigger Time). E.g. A product with 5m/s² vibration can be used up to 2 hours/day to reach the EAV and up to 8 hours/day to reach the ELV.

Exposure Action Value (EAV) - Daily vibration exposure A(8) = 2.5m/s²
Where daily vibration exposure A(8) is below 2.5m/s² the risk is relatively low and no action need be taken

Exposure Limit Value (ELV) - Daily Vibration Exposure A(8) = 5.0m/s²
If several tools are used the exposure values must be combined:
Total exposure is then the combined value of the activities

Never Mow If There Is A Risk Of Lightning Or You Hear Thunder. If You Are In The Middle Of Mowing, Stop In A Safe Place, Turn Off The Engine And Go Inside A Building.


### 4.1 ENGINE SPECIFICATION

<table>
<thead>
<tr>
<th>Manufacture</th>
<th>Perkins</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ransomes Model ID</td>
<td>404C-22T</td>
</tr>
<tr>
<td>Type</td>
<td>Vertical w/c 4T 4cyl Diesel</td>
</tr>
<tr>
<td>Family</td>
<td>AH3XL2.22N4T</td>
</tr>
<tr>
<td>Gross Intermittent Power</td>
<td>Perkins 45KW @ 2800 RPM,60.3 HP @ 3000rpm</td>
</tr>
<tr>
<td>Fuel System</td>
<td>Turbo injection diesel</td>
</tr>
<tr>
<td>Fuel Tank Capacity</td>
<td>64l 14 imp gall 17 US gal</td>
</tr>
<tr>
<td>Fuel Grade</td>
<td>No 2-D (ASTM D975) Diesel</td>
</tr>
</tbody>
</table>
4.2 DIMENSIONS & WEIGHTS

TURNING RADIUS 622mm - 660mm (+/-3mm)
GROUND CLEARANCE = 140mm
DIAMETER OF UNCUT GRASS = 406mm

<table>
<thead>
<tr>
<th>Specification</th>
<th>Dimensions/Weight</th>
<th>9' 8&quot; (295cm)</th>
<th>10' 7&quot; (323cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width of Cut</td>
<td>295cm (9' 8&quot;) Model</td>
<td>295 cm</td>
<td>116 in</td>
</tr>
<tr>
<td>Width of Cut</td>
<td>323cm (10' 7&quot;) Model</td>
<td>232 cm</td>
<td>92 in</td>
</tr>
<tr>
<td>Maximum width Transport at 25 mm (1 in) height of cut 295cm (9' 8&quot;) Model</td>
<td>167 cm</td>
<td>65.7 in</td>
<td></td>
</tr>
<tr>
<td>Maximum width Transport at 25 mm (1 in) height of cut 323cm (10' 7&quot;) Model</td>
<td>170 cm</td>
<td>67 in</td>
<td></td>
</tr>
<tr>
<td>Max Length Transport</td>
<td>319 cm</td>
<td>125.6 in</td>
<td></td>
</tr>
<tr>
<td>Overall height with ROPS up</td>
<td>193 cm</td>
<td>76 in</td>
<td></td>
</tr>
<tr>
<td>Overall height with ROPS up 295cm (9' 8&quot;) Model</td>
<td>129.5 cm</td>
<td>51 in</td>
<td></td>
</tr>
<tr>
<td>Overall height with ROPS up 323cm (10' 7&quot;) Model</td>
<td>145 cm</td>
<td>57 in</td>
<td></td>
</tr>
<tr>
<td>Overall height with cab, beacon up</td>
<td>233 cm</td>
<td>91.7 in</td>
<td></td>
</tr>
<tr>
<td>Overall height with cab beacon down</td>
<td>210 cm</td>
<td>83.1 in</td>
<td></td>
</tr>
<tr>
<td>Wheelbase</td>
<td>140 cm</td>
<td>55.1 in</td>
<td></td>
</tr>
<tr>
<td>Front Axle track</td>
<td>112.5 cm</td>
<td>44.3 in</td>
<td></td>
</tr>
<tr>
<td>Rear Axle Track</td>
<td>106 cm</td>
<td>41.7</td>
<td></td>
</tr>
<tr>
<td>Turning Radius Range min max</td>
<td>62.2 cm</td>
<td>24.5 in</td>
<td></td>
</tr>
<tr>
<td>Diameter Uncut Grass</td>
<td>40.6 cm</td>
<td>16 in</td>
<td></td>
</tr>
<tr>
<td>Ground Clearance</td>
<td>14 cm</td>
<td>5.5 in</td>
<td></td>
</tr>
<tr>
<td>Weight of machine, No Fuel, with ROPS 295cm (9' 8&quot;) Model</td>
<td>1848 kg</td>
<td>4075.5 lb</td>
<td></td>
</tr>
<tr>
<td>Weight of machine, No Fuel, with ROPS 323cm (10' 7&quot;) Model</td>
<td>1874 kg</td>
<td>4127.5 lb</td>
<td></td>
</tr>
<tr>
<td>Weight of machine, No Fuel, with cab 323cm (10' 7&quot;) with air conditioning</td>
<td>2028 kg</td>
<td>4461.5 lb</td>
<td></td>
</tr>
<tr>
<td>Weight of machine, No Fuel, with cab 323cm (10' 7&quot;) without air conditioning</td>
<td>1997 kg</td>
<td>4397.5 lb</td>
<td></td>
</tr>
<tr>
<td>Weight of 51 litre (17 US Gallons) of Diesel Fuel</td>
<td>54.5 kg</td>
<td>120lb</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Tyre Pressure</th>
<th>Product</th>
<th>Tyre Size</th>
<th>Tyre Type</th>
<th>Tyre Pressure</th>
<th>Tyre Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR6010</td>
<td>24 x 13.00 - 12 Maxxis Turfmaxx (Kevlar) tread pattern C-165s 4pr</td>
<td>20 psi</td>
<td>1.37 bar</td>
<td>Titan Turf Trac 6pr</td>
<td>14 - 20 psi</td>
</tr>
<tr>
<td></td>
<td>20 x 10.00 - 8 Maxxis Turfmaxx (Kevlar) tread pattern C-165s 4pr</td>
<td>20 - 22 psi</td>
<td>1.37 - 1.50 bar</td>
<td>Maxxis Turfmaxx (Kevlar) tread pattern C-165s 4pr</td>
<td>20 - 22 psi</td>
</tr>
</tbody>
</table>
4.3 MACHINE SPECIFICATION

Frame construction: Heavy duty formed steel chassis with box section frame rails.
Cutting unit drive: Fixed displacement hydraulic motors coupled to cutting means through drive belt.

Transmission: Full time 4-wheel drive. Direct coupled variable displacement pump to direct coupled 280cc front, 237cc rear wheel motors.

Speeds:
- Cutting: 0 - 7.45 mph FORWARD
- Transport: 0 - 13.67 mph FORWARD
- Reverse: 0 - 17.45 mph

Steering: Hydrostatic power steering, with adjustable tilt steering wheel.

Ground pressure: 14.22 psi

Brakes, Service: Positive hydrostatic braking.
- Parking: Fail safe, Oil immersed wet disc brakes.

Fuel Tank
- Capacity: 17 US gallons - 64L

Hydraulic Tank
- Capacity: 5 US gallons - 19L

Battery: Exide 065
4.4 VIBRATION LEVEL

The machine was tested for hand/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 machine was not moving.

The Machinery Safety Directive 2006/42/EC
By compliance to:
The Lawnmower Standard BS EN ISO 5395
Referenced to Hand/Arm: BS EN ISO20643:2008

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

The machine 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 machine 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)

<table>
<thead>
<tr>
<th>HR6010 Hand / Arm Acceleration Level</th>
<th>Series EA with ROPS</th>
<th>Series ## with Cab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. LH or RH Accelerations m/s²</td>
<td>Mean Value of X, Y, Z Aeq</td>
<td></td>
</tr>
<tr>
<td>1.03 ± 0.40</td>
<td>### ± 0.40</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HR6010 Whole Body Acceleration Level</th>
<th>Series EA with ROPS</th>
<th>Series ## with Cab</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. Weighted Acceleration m/s²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.9 ± 1.57</td>
<td>### ± 1.57</td>
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</tbody>
</table>
4.5  **NOISE EMISSIONS**

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

**The Machinery Safety Directive 2006/42/EC**
And
**Exposure Of Workers To The Risks Arising From Physical Agents (Noise) Directive 2003/10/EC**

By compliance to:
The Lawnmower Standard BS EN ISO 5395:2013
And
Sound Pressure Standard EN ISO 3746: 2010

**Measured Sound Pressure** 89.3 dB(A) ± 0.86 LWA

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

**The Machinery Safety Directive 2006/42/EC**
And
**Noise Emission In The Environment By Equipment For Use Outdoors Directive 2000/14/EC**

By compliance to:
Sound Power Standard EN ISO 3744:2010

**Measured Sound Power** 104 dB(A) ± 0.86 LWA

4.6  **SLOPES**

DO NOT USE ON SLOPES GREATER THAN 17° FOR CAB EQUIPED MODELS THE MAX SLOPE for ROPS IS 24°.

This slope was calculated using static stability measurements according to the requirements of BS EN ISO 5395.
4.7  CUTTER DECK SPECIFICATION

NOTE
These cutting units are made to cut grass of maximum height 100 mm down to the available height of cut range.

<table>
<thead>
<tr>
<th>Front Deck</th>
<th>152.4 cm (60 in) Deck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>198 kg (436.5 lb)</td>
</tr>
<tr>
<td>Construction</td>
<td>Heavy duty welded pressed steel construction</td>
</tr>
<tr>
<td>Blade Length</td>
<td>450mm (18 in)</td>
</tr>
<tr>
<td>Number of Blades</td>
<td>3</td>
</tr>
<tr>
<td>Blade tip speed</td>
<td>3532 m/min (11587 ft/min)</td>
</tr>
<tr>
<td>Width of Cut</td>
<td>152.4 cm (60 in)</td>
</tr>
<tr>
<td>Cut Height</td>
<td>25mm - 115mm</td>
</tr>
<tr>
<td>Anti Scalp Rollers</td>
<td>Three Front</td>
</tr>
<tr>
<td>Cut Adjustment Front</td>
<td>Castor wheels with spacers.</td>
</tr>
<tr>
<td>Cut Adjustment Rear</td>
<td>Multi-hole plates and pins.</td>
</tr>
<tr>
<td>Transmission</td>
<td>By hydraulic motor and Vee belt</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wing Deck</th>
<th>87.6 cm (34.5 in) Deck</th>
<th>102.6 cm (40.4 in) Deck</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>118 kg (260.1 lb)</td>
<td>130 kg (286.6 lb)</td>
</tr>
<tr>
<td>Construction</td>
<td>Heavy duty welded pressed steel construction</td>
<td></td>
</tr>
<tr>
<td>Blade Length</td>
<td>450mm (18 in)</td>
<td>525mm (21 in)</td>
</tr>
<tr>
<td>Number of Blades</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Blade tip speed</td>
<td>3532 m/min (11587 ft/min)</td>
<td>5028 m/min (16496 ft/min)</td>
</tr>
<tr>
<td>Width of Cut</td>
<td>87.6 cm (34.5 in)</td>
<td>102.6 cm (40.4 in)</td>
</tr>
<tr>
<td>Cut Height</td>
<td>25mm - 115mm</td>
<td></td>
</tr>
<tr>
<td>Anti Scalp Rollers</td>
<td>One Front</td>
<td></td>
</tr>
<tr>
<td>Cut Adjustment Rear</td>
<td>Castor wheels with spacers.</td>
<td></td>
</tr>
<tr>
<td>Cut Adjustment Front</td>
<td>Multi-hole plates and pins.</td>
<td></td>
</tr>
<tr>
<td>Transmission</td>
<td>By hydraulic motor and Vee belt</td>
<td></td>
</tr>
</tbody>
</table>

4.8  CUTTING PERFORMANCE

9ft 7in Model:  
7.9 Acre/hr @ 7.45 mph. 
3.2 H/hr @ 12kph

10ft 6in Model:  
8.64 Acre/hr @ 7.45 mph. 
3.5 H/hr @ 12kph

10% allowance is included for normal overlaps and turning at the end of each cut.
4.9 RECOMMENDED LUBRICANTS

Engine oil: Grades: 10W-30

Grease
Rear Axle: K NATE (RJL No. 4213860), or equivalent to MIL-G-23549C, 
MIL-G-2345C, DIN 51825, DIN 51818.

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

4.10 ACCESSORIES

Air Suspension Seat Kit
Kit number LMAC201
Signature of the person empowered to issue the declaration on behalf of the manufacturer, holds the technical documentation and is authorized to compile the technical file, and who is established in


Signature de la personne habilitée à prêter la déclaration au nom du fabricant, détient la documentation technique et est habilité à compiler le dossier technique, et qui est établi dans


Unterschrift der Person, die berechtigt ist, die Erklärung abzugeben, die die technische Dokumentation besitzt und berechtigt ist, den technischen Anhang zusammenzustellen, und die in der Gemeinschaft niedergelassen ist.


Podpis osoby poverenej vystavením vyhlásenia v mene výrobcu, ktorá má technickú dokumentáciu a je


Assinatura da pessoa com poderes para emitir a declaração em nome do fabricante, que possui a documentação técnica e que está estabelecida na Comunidade.


En ISO 3746:2010 (Sound Pressure)
EN 1033:1996 (Vibration H/A)
EN ISO 20643:2008 (Vibration H/A)
EN ISO 3726:2007 (Vibration H/A)
EN ISO 20643:2008 (Vibration H/A)
EN ISO 21299 (ROPS)
EN 20643:2008 (Vibration H/A)
EN ISO 21299 (ROPS)
5 DECALS

5.1 SAFETY DECALS

A903491  Read Operator’s Manual.
A903489  Keep a Safe Distance from the Machine.
A903492  Stay Clear of Hot Surfaces.
A903488  Do Not Open or Remove Safety Shields While the Engine is Running.
A903496  Caution Rotating Blades.
A903490  Do Not Remove Safety Shields While Engine is Running.
A911410  Danger of Explosion if the Battery Terminals are Short Circuited.
A911416  Maximum permit-able working slope.
A911434  Caution Diesel Fuel
2000643  Blade bolt installation. Fit conical washer as shown. See manual.
                      Fire Hazard: Remove debris from under seat plate
                      and in engine compartment.
                      Service/Maintenance: Stop engine, remove key and spark plug before performing service or maintenance.

5.2 INSTRUCTION DECALS

Description

A. Diesel Fuel
B. Hydraulic Oil
C. Jacking Point
D. Speed Limiter Position
E. Fwd./Rev Traction Pedal
F. Cutter Engage
G. Hydraulic Oil Filter
H. Parking Brake
I. Diff Lock Foot Switch
K. Pressure: Hydraulic Oil
L. Maximum Sound Power Level
M. Engine Rev’s
N. Air Filter End Cap Upright Decal
O. Various Safety and Lift/Lower Deck Control.
6.1 STARTER KEY SWITCH
The starter key (A) should be turned clockwise to the 'pre-heat' (No. 2) position to heat the glowplugs when the green warning lamp goes out, on warning lamp display module, turn the starter key clockwise to the 'start' (No. 3) position to start the engine. After starting, the key should be released and allowed to return automatically to the 'on' (No. 1) position for normal running.

6.2 THROTTLE CONTROL LEVER
The lever (B) should be moved away from the operator to increase the engine speed and towards the operator to decrease the engine speed.

**NOTE:** Engine should be used at full speed.

6.3 STEERING WHEEL RAKE ADJUSTMENT
The steering wheel is adjustable for rake. The clamping release knob (A) is situated on the side of the control console on the left hand side. To adjust turn the clamping knob anticlockwise to release and pivot the steering wheel backwards and forwards to obtain desired setting then lock in position by turning clamping knob clockwise.

6.4 TRACTION FOOT PEDAL
To move the machine forward press the front of the foot pedal (A). To reverse depress the rear of the foot pedal. When the pedal is released it will return to its neutral position.

6.5 SPEED LIMITER
The speed limiter (B) is operated by sliding the black knob to the right or left. When slid to the right the machine is limited to cutting speed, when slid to the left, transport speed is available. In transport mode, reverse is not available.

**IMPORTANT:** To enable mow engage the speed limiter must be in the cutting speed position. If cutting units are rotating, moving the speed limiter between the mow and transport positions will engage and disengage cylinder rotation.
6.6 TRANSPORT LATCHES
When transporting the machine ensure the cutting decks are raised and the transport latches (A) are engaged.

6.7 PARKING BRAKE
The parking brake (B) is engaged when the lever is moved toward the operator. The brake is fitted with a micro switch that senses brake position. The brake must be applied to start the machine, and when stopping and leaving the seat.

CAUTION:- The parking brake must not be applied whilst the vehicle is moving

6.8 DIFF LOCK CONTROL
The Diff lock (A) is operated by depressing the foot switch. When the foot switch is released the Diff Lock ceases to operate. The Diff Lock should only be used in severe situations, and should never be used on Tarmac or whilst steering
6.9 HYDRAULIC LIFT LEVERS

The cutting units can be raised and lowered by three control levers (A,B,C) situated on the right hand side of the operators seat and can be operated as follows:
Centre lever controls Centre Cutting Deck. (B)
Right hand lever controls R.H. Cutting Deck. (C)
Left hand lever controls L.H. Cutting Deck. (A)

NOTE: If any unit is raised out of work then lowered into work again the cylinder will not rotate until the mow foot switch is depressed.

To lift: Move the lever(s) backwards and hold in position until the units are at the required height.
To lower: Move the lever(s) fully forwards and release, the unit(s) will lower to ground level. DO NOT hold lever in forward position.
NOTE: The units will only lift and lower when the engine is running.
IMPORTANT: If, when cutting, a lift control lever is accidentally pulled back, the cutting units will not float over ground undulations until the lever is pushed fully.

6.10 CUTTING UNIT SWITCHES

To commence cutting ensure speed limiter is in mow position and the units have been lowered. Push bottom of the rocker switch (G) and depress foot switch (A) Push top of rocker switch to stop cutter unit rotation. (Cutting unit stop rotating automatically when raised.)
6 CONTROLS

6.11 INSTRUMENT PANEL

A. ENGINE PREHEAT INDICATOR LAMP
Colour green, on when the ignition switch is turned clockwise to the pre-heat position. Once the lamp goes out the engine can be started.

B. ENGINE TEMPERATURE GAUGE
Indicates current temperature of engine, whilst running.

C. HYDRAULIC OIL WARNING LAMP
Colour red, on when the hydraulic oil temperature reaches a preset level. If the lamp comes on bring the machine to a stop, disengage the cutting units, apply the parking brake and stop the engine. The lamp will also turn on when the charge filter is blocked.

D. CHARGING WARNING LAMP
Colour red, on when ignition is switched on and will go out when the engine is started. If the light comes on while the engine is running, the fan belt may be slipping or broken or a fault in the electrical system is indicated and should be investigated. STOP IMMEDIATELY.

E. ENGINE OIL PRESSURE WARNING LAMP
Colour red, on when the ignition is switched on, and will go out once the engine has started. If the light comes on while the engine is running - STOP IMMEDIATELY as this indicates that the engine oil pressure is too low. Check the level of oil in the sump and top up as necessary. Check the oil pressure sender switch. Continued operation may cause extensive damage to the engine.

F. FUEL GAUGE
Located to the left of the engine temperature gauge. Monitors fuel level.

G: PTO SWITCH
To commence cutting ensure the decks have been lowered. Push bottom of the rocker switch (A) and depress foot switch. Push top of rocker switch to stop cutter unit rotation. (Cutting units stop rotating automatically when raised.)

H: HEADLIGHT SWITCH
(Optional equipment) Push switch half way for running lights. Push down fully for headlights

I: HAZARD LIGHTS SWITCH
(Optional equipment) Push down for flashing hazard lights.

J: TURN SIGNAL LIGHTS SWITCH
(Optional equipment) -rotate switch handle counterclockwise for L.H. turn and clockwise for a R.H. turn.

K: HORN
(Optional equipment) Press switch to operate the horn.

L: ROTATING BEACON
(Optional equipment) Press the bottom half of the switch to activate the flashing beacon.

M: OVERHEAT WARNING LAMP
Colour red, off when the ignition is switched on and will remain off when engine is started. Will illuminate if the engine overheats (+105°C). If the light comes on while the engine is running and the alarm sounds, the cutting blades will stop - This indicates the engine has overheated. Reduce the engine speed to idle for five minutes before stopping. Allow the machine to cool before opening the engine compartment. Check air intakes and engine compartment are clear and free from debris. Check coolant level and top up as necessary.

NOTE: This switch can be used to test the overheat alarm system circuit is functioning correctly. While the Engine is running depress the switch and the light will illuminate to indicate the alarm circuit is working (The alarm will sound).
6.12 HOURMETER
Located on the left hand side of the steering tower, above the parking brake. (A) Records engine running hours.

6.13 OVER HEAT ALARM SYSTEM (For M/Cs Post-October 2006)
a) A biased switch (M) has been added to the control panel. This illuminates when the engine temperature reaches 105°C or when engine is running and the switch is depressed.
b) When illuminated and a continuous alarm will sound, the cutter decks will stop. If this occurs, reduce the engine speed to idle for five minutes before stopping to resolve the problem.

6.14 HORN
The horn is an audible alarm for the following situations:
a) Horn (A) sounds continuously-this indicates a high engine coolant temperature condition. If this occurs, turn off the engine immediately and resolve the problem.
b) Horn (A) sounds intermittently-this indicates a low engine oil pressure condition. If this occurs, turn

6.15 BONNET RELEASE KEY
Release bonnet by inserting key (A) into base of latch bracket.
7.1 DAILY INSPECTION

<table>
<thead>
<tr>
<th>CAUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE DAILY INSPECTION SHOULD BE PERFORMED ONLY WHEN THE ENGINE IS OFF AND ALL FLUIDS ARE COLD. LOWER IMPLEMENTS TO THE GROUND, ENGAGE PARKING BRAKE, STOP ENGINE AND REMOVE IGNITION KEY.</td>
</tr>
</tbody>
</table>

1. Perform a visual inspection of the entire unit, look for signs of wear, lose hardware and missing or damaged components. Check for fuel and oil leaks to ensure connections are tight and hoses and tubes are in good condition.

2. Check the fuel supply, radiator coolant level, crankcase oil level and air cleaner indicator. All fluids must be at the full mark with the engine cold.

3. Remove all grass debris from the machine.

4. Make sure all cutting units are adjusted to the same height of cut.

5. Check all tyres for proper inflation.

6. Test the operator presence and safety interlock system.

7. Remove all grass debris from the Pre-Cleaner.

7.2 TRAILER TIE DOWNS FOR REAR.

Two tie down loops are provided on the rear bumper to enable the machine to be securely attached to a trailer for transportation.
7.3 OPERATOR PRESENCE AND SAFETY INTERLOCK SYSTEM

1. The operator presence & safety interlock system prevents the engine from starting unless the parking brake is engaged, the mowing device is off and the operator is in the seat. The system also stops the engine if the operator leaves the seat with the mowing device engaged or the park brake not applied or the emergency brake valve lever is operated.

![WARNING]

Never operate the equipment with the operator presence & safety interlock system disengaged or malfunctioning. Do not disconnect or bypass any switch.

2. Perform each of the following tests to ensure the operator presence & safety interlock system is functioning properly. Stop the test and have the system inspected and repaired if any of the tests fail as listed below:

- The engine does start in test 1;
- The engine does not start during tests 2, 3;
- The engine continues to run during test 4.

3. Refer to the chart below for each test and follow the check tick marks across the chart. Shut engine off between each test.

Test 1: Represents normal starting procedure. The operator is seated, parking brake is engaged, the operator's feet are off the pedals and the mower engagement device is off. The engine should start.

Test 2: The engine must not start if the mower engage device is on.

Test 3: The engine must not start if the park brake is not applied.

Test 4: Start the engine in the normal manner, push speed governor into Cut position, engage mower switch on dash, engage cutting blades by depressing foot switch and lift your weight off the seat.

<table>
<thead>
<tr>
<th>Test</th>
<th>Operator Seated</th>
<th>Parking Brake Applied</th>
<th>Mow Engage Switch</th>
<th>Engine Starts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>✓</td>
<td>☀</td>
<td>✓</td>
<td>☀</td>
</tr>
</tbody>
</table>

- Lift your weight off the seat. The cutting units must stop rotating within seven (7) seconds.
7.4 OPERATING PROCEDURE

1. Under no circumstances should the engine be started without the operator seated on the tractor.

2. Do not operate tractor or attachments with loose, damaged or missing components. Whenever possible mow when grass is dry.

3. First mow in a test area to become thoroughly familiar with the operation of the tractor and control levers.

4. Study the area to determine the best and safest operating procedure. Consider the height of the grass, type of terrain, and condition of the surface. Each condition will require certain adjustments or precautions.

5. Never direct discharge of material toward bystanders, nor allow anyone near the machine while in operation. The owner/operator is responsible for injuries inflicted to bystanders and/or damage to their property.

6. Use discretion when mowing near gravel areas (roadway, parking areas, cart paths, etc.). Stones discharged from the implement may cause serious injuries to bystanders and/or damage the equipment.

7. Disengage the drive motors and raise the implements when crossing paths or roads. Look out for traffic.

8. Stop and inspect the equipment for damage immediately after striking an obstruction or if the machine begins to vibrate abnormally. Have the equipment repaired before resuming operation.

**WARNING**

Before you clean, adjust, or repair this equipment, always disengage all drives, lower implements to the ground, engage parking brake, stop engine and remove key from ignition switch to prevent injuries.
OPERATION OF THE MACHINE

Read the Safety Instructions.

BEFORE OPERATING FOR THE FIRST TIME

- Check and adjust tyre pressure, if necessary, see specifications.
- Add diesel fuel to tank if necessary.
- Check engine oil and top-up, if necessary.
- Check radiator coolant and top-up, if necessary (50% antifreeze solution).
- Make sure you understand the information contained in the preceding General Instructions and Instruments & Controls sections.

7.5 STARTING THE ENGINE

The following procedure is for starting cold engines.

1. Ensure the FWD/RVS pedal is in the neutral position, the speed limiter is in the transport position, the mow switch off, the parking brake is applied.
2. Turn the ignition switch to position No.2 and hold until the glow plug light goes off (5-10 sec.)
3. Turn ignition key fully clockwise to the start position and operate the starter motor until the engine starts (should only take a few seconds)
4. When the engine starts, release the key immediately and it will return to the RUN position.
5. If the engine does not start, preheat the glow plugs and try again.

NOTES:

- **Warm engine** - When the engine is warm because of surrounding temperature or recent operation, step No.2 of the cold engine starting procedure may be skipped (no need to preheat glow plugs).
- If the engine fails to start after two tries (with preheat if necessary), wait 20 seconds and try again.
- The starter motor should never be run continuously for longer than 30 seconds or it may fail.

7.6 DRIVING

- **Release brake** - Make sure the parking brake is released before attempting to go forward or reverse.
- **Forward** - Gently depress the top plate of the FWD/RVS foot pedal to reach desired ground speed.
- **Reverse** - Gently depress the bottom plate of the FWD/RVS foot pedal to reach desired ground speed.
- **To stop** - Gently return the FWD/RVS foot pedal to the neutral position.

NOTES:

- Use complete foot to operate both forward and reverse.
- Do not move pedal suddenly—always operate slowly and smoothly. Never move pedal violently from forward to reverse or vice versa.
- Always keep foot firmly on the foot pedal—a too relaxed foot control may result in a jerky motion.

9. Slow down and use extra care on hillsides. Read Section 3.7. Use caution when operating near drop off points.

10. Never use your hands to clean cutting units. Use a brush to remove grass clippings from blades. Blades are extremely sharp and can cause serious injuries.
7.7 MOWING
1. Lower the decks with the cutting unit lift control.
2. Ensure speed limiter is in mow position
3. Engage the cutting mechanism by pushing on the lower half of cutting unit switch and operating the floor mounted switch.
4. Release the parking brake and begin driving forward.

NOTE: Always set the throttle to full for mowing, even when the grass is heavy. When the engine is labouring, reduce forward speed by easing up on the FWD/RVS foot pedal.

7.8 TO STOP THE ENGINE
1. Disengage power to the cutting units with the cutting unit switch.
2. Remove foot from the FWD/REV pedal.
3. Set the parking brake.
4. Move the throttle control lever to the SLOW position.
5. Turn the ignition key to OFF.

7.9 PUSHING THE MACHINE WITH THE ENGINE STOPPED
1. To push, disengage the parking brake.
2. Turn Knob (A) located under the seat plate counter clockwise until marker on the top is fully out. Set the steering wheel so that the rear wheels are pointing straight ahead.
3. Under the LH front corner of the operator platform turn the emergency brake valve lever (B) towards the back of the machine.
4. Turn the steering wheel to the left until resistance can be detected. The machine is now ready to be pushed. If unable to move the machine apply further pressure to the steering wheel. Excessive force should never be used on the steering wheel. If the rear wheels start to turn too much force is being applied.
5. After pushing, return valve (B) and knob (A) to their previous positions.

WARNING
Cutting Unit Transport Latches are a Secondary Safety Device.

When Transporting the machine the Cutting units should be held in the Transport position on the Hydraulics with the Transport Latches Engaged.

1. Park the machine on level ground.
2. Whilst seated in the driving position With the engine at operating speed raise the cutting units fully by operating lift levers, return the lever to the neutral position.

DO NOT move the lever into the lower position.

3. Disengage drives, stop the engine and make sure all moving parts are stationary. Apply brakes and remove the starter key.

4. Transport latches can now be engaged or released.

Before releasing transport latches it is important that all cutting units are fully raised.
7.10 MOWING ON SLOPES
The mower has been designed for good traction and stability under normal mowing conditions. Use caution when operating on slopes, especially when the grass is wet. Wet grass reduces traction and steering control.

**WARNING**
To minimize the possibility of overturning, the safest method for operating on hills and terraces is to travel up and down the face of the slope (vertically), not across the face (horizontally). Avoid unnecessary turns, travel at reduced speeds, and stay alert for hidden hazards.

1. Always mow with the engine at full throttle, control forward speed using traction foot pedal to maintain proper cutting.
2. Use weight transfer control as required to improve weight distribution between decks and mower.
3. If the mower tends to slide or the tyres begin to mark the turf, angle mower into a less steep slope until traction is regained or tyre marking stops.
4. If mower continues to slide or mark the turf, the slope is too steep for safe operation. Do not make another attempt to climb, and back down slowly.
5. When descending a steep slope, always lower implements to the ground to reduce the risk of mower overturning.

Correct tyre pressure is essential for maximum traction. See Specification

**WARNING**
DO NOT USE ON SLOPES GREATER THAN 24°
17° FOR CAB EQUIPED MODELS

General slope of roadway embankment - 45°
Steepest grass area - 31°
Slope of average roof - 19-1/4°
2nd class highway maximum grade 4-1/2°
Toll road or freeway - 1-3/4°

Degrees are shown to the nearest 1/4°.
If it is necessary to mow across a short slope, ensure the right hand cutting unit is the lowest.

**WARNING**

When the machine is being used, whether cutting grass or not, on slopes, the ROPS frame should be deployed and the seat belt used.

This rationale is based on the fact that a seat belt must be worn with a ROPS to comply with the Machinery Directive 2006/42/EC sections 3.2.2, Seating & 3.4.3, Rollover

Ransomes Jacobsen Limited recommends that a local risk assessment is completed by the owner/user of the machine to determine the risks associated with working on slopes.

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How to calculate a slope

Tools:
- Spirit level 1 metre long.
- Tape measure.

With the spirit level (A) positioned horizontally measure the distance (C) with tape measure (B) Use the chart to calculate either the slope angle or the% grade D of the slope.
**SLOPE CALCULATION CHART**

<table>
<thead>
<tr>
<th>Use Either of these columns but not both</th>
<th>The result of what you are measuring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height 'C' in inches measured with a 1 yard horizontal edge ‘A’</td>
<td>Height 'C' in millimeters measured with a 1 metre horizontal edge ‘A’</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>4.8</td>
</tr>
<tr>
<td>6</td>
<td>100</td>
</tr>
<tr>
<td>7.5</td>
<td>150</td>
</tr>
<tr>
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<td>28</td>
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</tr>
<tr>
<td>29</td>
<td>725</td>
</tr>
<tr>
<td>30</td>
<td>750</td>
</tr>
<tr>
<td>31</td>
<td>775</td>
</tr>
<tr>
<td>32</td>
<td>800</td>
</tr>
<tr>
<td>33</td>
<td>825</td>
</tr>
<tr>
<td>34</td>
<td>850</td>
</tr>
<tr>
<td>35</td>
<td>875</td>
</tr>
<tr>
<td>36</td>
<td>900</td>
</tr>
</tbody>
</table>
7.11.1 TRANSPORTING ON A TRAILER OR FLATBED
The machine has hard-point tie-down loops front (A) and rear (B). Fasten the mower to the transport vehicle.

Make sure that all tie down straps are tight. Make sure that the decks are locked in the transport position. Check the fuel and hydraulic tank caps are tight. Make sure that no part of the mower can fall during transport.

Always follow the given maximum transport load weight for the vehicle used.

Do Not carry more than the maximum weight shown on the transport vehicle plate.

Read the safety and operation manual of the transport vehicle before you load.

Slinging
When slinging the mower, damage free clamps must be used, see the illustration, with an approved lift frame. Information is available at www.tipnlift.co.uk.

Jacking
The machine jack points indicated by the decal shown. Two for each axle on four wheel vehicles. Other axle types are different, check the Safety and Operations Manual for the safe jack points.
8.1 GENERAL INSTRUCTIONS FOR GRAMMER SEATS

Adjustments must not be made while driving.

- After removal of the backrest upholstery, the backrest frame must be supported, for example held in place, before the backrest adjuster is operated. If you fail to do so, there is a danger that the backrest frame may jerk forward and cause injury.
- Any changes to the series standard of the seat (for example fitting parts which are not original GRAMMER parts) may impair the safety standard to which it has been tested.
- Functions may be impaired, threatening your safety. For this reason, any changes in design of the seat must be approved by GRAMMER.

During the removal and installation of the driver’s seat, the corresponding instructions by the specific vehicle manufacturer must be strictly observed!

- Do not hold onto the covers for lifting the driver’s seat. If you do so anyway, there is an increased risk of injury due to loosening or breaking covers.
- Before you remove the driver’s seat, disconnect all plug-in connections between the seat and the vehicle supply network. When you replace the plug-in connectors, make sure they are tight to avoid ingress of dust and water.
- Seatbelts can be retrofitted to the driver’s seat. Seatbelts may only be fitted on the approval of the vehicle manufacturer, as they increase the load in the seat mounting area.
- Seatbelts must be fitted in accordance with specific national regulations and guidelines, and must be approved by GRAMMER.
- Retrofit fitted seatbelts must be fastened before driving.
- The seat belt must be replaced after an accident.
- Where seatbelts are fitted to the driver’s seat, the seat and seat mounting must be checked additionally by specialist personnel after an accident has occurred.
- Fasteners must be checked regularly for tight seat. If the seat wobbles there may be loose bolts or other faults.
- If you notice that the seat does not function correctly (for example a defective seat suspension; improper curvature of the lumbar support or damaged bellows), contact a specialist workshop immediately to arrange for repairs to be carried out.
- If you fail to do so, your health may be affected and the risk of accident increased.
- Before the vehicle is used, switches that might be in the seat (for shutting down mechanical equipment when the driver leaves his/her seat) must be checked for proper function.
- If malfunctions are detected, the vehicle must not be driven. – INCREASED RISK OF ACCIDENT –
- Loads must not be placed on seats with a built in switch, except for the driver’s weight during normal use, as the vehicle may otherwise start to move by itself. – INCREASED RISK OF ACCIDENT –
- If you take off the weight from the seat while driving, this will cause the vehicle to stop.
- Do not indent the bellows while there is load on the driver’s seat. – RISK OF CRUSHING –
- Make sure that the interior of drivers seat remains free of foreign particles or liquids.
- The driver’s seat is not watertight and must be protected against splashes of water!
- Any conversion or refitting work on a GRAMMER driver’s seat must be performed exclusively in authorised workshops by trained or suitably qualified personnel and in adherence with the applicable operating, maintenance and installation instructions and in compliance with all relevant national regulations.
- Improper installation and assembly bear the risk of personal injury or property damage and the proper function of the driver’s seat or mounted parts can no
8.1.2 SEAT MSG75 AIR SUSPENSION

WEIGHT ADJUSTMENT

The seat is adjusted for the driver’s weight by pulling or pressing the lever for seat weight adjustment and with the driver sitting on the seat.

The driver’s weight is adjusted correctly when the arrow is in the middle clear area of the viewing window.

Within this viewing area, the individual height can be adjusted to a minimum spring movement.

When the minimum/maximum weight adjustment has been reached, you can hear it reaching the upper or lower end stop.

To prevent damage to the health and material, the setting for the driver’s weight must be checked and adjusted individually before the vehicle is driven.

In order to avoid compressor damage during weight adjustment, the compressor must be operated no longer than 1 minute.

FORE/AFT ADJUSTMENT

The fore/aft adjustment is released by lifting the locking lever.

WARNING! Risk of accident!
Do not operate the locking lever while driving.

WARNING! Risk of crushing!
Only touch the lever at the indented grip, do not reach back under the lever.

After the adjustment, the locking lever must latch into the desired position with an audible click. It should not be possible to move the driver’s seat into another position when it is locked.

Do not lift the locking lever with your leg or calf.
BACKREST EXTENSION

The backrest extension can be individually adjusted by pulling it upwards or pushing it downwards over the various locking increments up the end stop.

To remove the backrest extension, pull it upwards over the end stop.

LUMBAR SUPPORT

The lumbar support increases both the seating comfort and the performance of the driver.

By turning the adjustment knob upwards, the curvature in the upper part of the backrest cushion can be adjusted. By turning the knob downwards, the curvature in the lower part of the backrest cushion can be adjusted.

0 = No curvature
1 = Max. curvature at the top
2 = Max. curvature at the bottom

ARMRESTS

The armrests can be folded up if required and the height individually adjusted.

To adjust the armrests for height, separate the round cap (see arrow) from the cover, loosen the hexagon nut (size 13 mm) behind it and adjust the armrests to the desired position (5-steps) and tighten the nut again.

Replace the cap onto the nut.
**ARMREST ADJUSTMENT**

The inclination of the armrests can be modified by turning the adjustment knob.

When turning the knob to the outside (+) the front part of the armrest will be lifted, when turning the knob to inside (-) it will be lowered.

**BACKREST ADJUSTMENT**

Moving the locking lever upwards loosens the notching of the backrest adjustment.

After the adjustment, the locking lever must latch into the desired position. It should not be possible to move the backrest into another position when it is locked.

For an ergonomic use the backrest can be adjusted in a range of −5 to +30 degrees (15 steps of 2.5 degrees each).

**MAINTENANCE**

Dirt can impair the function of the seat, so make sure you keep your seat clean!
Upholstery does not need to be removed from the seat frame for cleaning.

**Caution:** Take care with the backrest - it may jerk forward and cause injury!
When cleaning the backrest cushion the backrest must be held in place when operating the backrest lever.

**Attention:** Do not clean the seat with a pressure washer!
During cleaning the upholstery should not be soaked through.

Use a standard commercially available upholstery or plastic cleaning agent. Test first for compatibility on a small, concealed area.
8.1.3 SEAT MSG85 MECHANICAL SUSPENSION

The seat can be adjusted for operator's weight and leg reach to provide a comfortable position for operating the machine.

1. ADJUSTMENT FOR OPERATOR WEIGHT

To Adjust:
Rotate knob (A) to the right to increase the operator weight setting. Turn to the left to decrease the operator weight. The set weight is indicated on the yellow face dial next to the lever. Set at the correct weight of the operator before operation. Failure to do so will compromise the machine safety devices.

2. FORE AND AFT ADJUSTMENT

To Adjust:
The position of the adjusting lever is on the right hand side of the seat below the seat cushion (B). By moving the lever towards the seat, the seat can be slid backwards and forwards. When in the desired position release the lever to locate in one of the pre-set positions.

3. BACK REST ADJUSTMENT

The back rest has three preset positions

To Adjust:
The position of the release lever is on the left hand side of the seat back rest (C). Move the lever upwards to move the upper part of the back rest forward. Move the lever downwards to move the upper part of the back rest rearwards.

NOTE: The seat is fitted with a micro-switch to sense operator presence. When the machine is fitted with a ROPS frame or cab a lap belt is fitted and should be worn at all times.
8 ADJUSTMENTS

⚠️ DANGER ⚠️

When the machine is being used off road, whether cutting grass or not, the seat belt should only be worn when a ROPS frame is in place and deployed.

This rationale is based on the fact that a seat belt must be worn with a ROPS to comply with The Machinery Directive 98/37/EC sections 3.2.2, Seating & 3.4.3, Rollover.

Ransomes Jacobsen Limited recommends that a local risk assessment is completed by the owner/user of the machine to determine any exceptions to this seat belt wearing rule. e.g. use of the machine next to water or on the highway.
8.2 HEIGHT OF CUT ADJUSTMENT

The cutting height is determined by the position of the blades in relation to the caster wheels. Changes to this height are made at (4) points and can be made in any order. Make adjustment selections for each deck from the height of cut chart for that deck included in this section.

NOTES

- Cutting height must be set the same for all three decks.
- The actual height may vary slightly from the chart value because of tire pressure or condition.

HEIGHT OF CUT ADJUSTMENT (CENTRE DECK)

1. Raise the deck.
2. Remove the quick pin Q from the top of the caster wheel pivot spindle
3. Remove the caster wheel from caster support M.
4. Select either Position 1 or Position 2 for wheel mounting bracket. To change, remove (4) mounting bolts R, move to the alternate location and bolt in place.
5. Place the selected size and number of spacers below the caster support. Both A-size (6.5 mm) and B-size (12.5 mm) spacers are provided. Place the remaining spacers above the caster support.
6. Replace the quick pin.
7. Place pin P into the proper hole of bracket for the selected height of cut.

CENTER DECK HEIGHT OF CUT CHART

<table>
<thead>
<tr>
<th>1 - 2</th>
<th>S</th>
<th>H</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>A (1)</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>A (2)</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>B (1)</td>
<td>3</td>
<td>51</td>
</tr>
<tr>
<td></td>
<td>A (3)</td>
<td>3</td>
<td>57</td>
</tr>
<tr>
<td></td>
<td>B (2)</td>
<td>4</td>
<td>63</td>
</tr>
<tr>
<td></td>
<td>A (4) + B (3)</td>
<td>4</td>
<td>72</td>
</tr>
<tr>
<td>2</td>
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<td>5</td>
<td>76</td>
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<tr>
<td>2</td>
<td>A (1)</td>
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<td>83</td>
</tr>
<tr>
<td>2</td>
<td>B (1)</td>
<td>6</td>
<td>89</td>
</tr>
<tr>
<td>2</td>
<td>A (3) + B (2)</td>
<td>6</td>
<td>95</td>
</tr>
<tr>
<td>2</td>
<td>B (2)</td>
<td>7</td>
<td>102</td>
</tr>
<tr>
<td>2</td>
<td>A (4) + B (3)</td>
<td>7</td>
<td>109</td>
</tr>
<tr>
<td>2</td>
<td>B (3)</td>
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<td>114</td>
</tr>
<tr>
<td>2</td>
<td>A (4) + B (3)</td>
<td>8</td>
<td>121</td>
</tr>
</tbody>
</table>
HEIGHT OF CUT ADJUSTMENT (WING DECKS)

The cutting height is determined by the position of the blades in relation to the caster wheels. Changes to this height are made at (4) points and can be made in any order. Make selections for each adjustment below from the accompanying height of cut charts.

1. Raise the deck.
2. Remove the quick pin Q from the top of the caster wheel pivot spindle.
3. Remove the caster wheel from caster support M.
4. Select either Position 1 or Position 2 for wheel mounting bracket. To change, remove (4) mounting bolts R.
5. Place the selected size and number of spacers below the caster support. Both A-size (0.25in) and B-size (0.49in) spacers are provided. Place the remaining spacers above the caster support.
6. Replace the quick pin.
7. Place pin P into proper hole of front caster bracket for the selected height of cut.
8. Place chain pin T into the proper hole of chain adjustment bracket for the selected height of cut.
### WING DECK HEIGHT OF CUT CHARTS

<table>
<thead>
<tr>
<th>1 - 2</th>
<th>S</th>
<th>H</th>
<th>K</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>25</td>
</tr>
<tr>
<td>1</td>
<td>A</td>
<td>1</td>
<td>32</td>
</tr>
<tr>
<td>1</td>
<td>B</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>1</td>
<td>A + B</td>
<td>2</td>
<td>45</td>
</tr>
<tr>
<td>1</td>
<td>B</td>
<td>3</td>
<td>51</td>
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<tr>
<td>1</td>
<td>A + B</td>
<td>3</td>
<td>57</td>
</tr>
<tr>
<td>1</td>
<td>B</td>
<td>4</td>
<td>63</td>
</tr>
<tr>
<td>1</td>
<td>A + B</td>
<td>4</td>
<td>70</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>5</td>
<td>76</td>
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<td>2</td>
<td>A</td>
<td>5</td>
<td>82</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>6</td>
<td>89</td>
</tr>
<tr>
<td>2</td>
<td>A + B</td>
<td>6</td>
<td>95</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
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<td>102</td>
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<tr>
<td>2</td>
<td>A + B</td>
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<td>B</td>
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<td>114</td>
</tr>
<tr>
<td>2</td>
<td>A + B</td>
<td>8</td>
<td>121</td>
</tr>
</tbody>
</table>

### LEFT HAND DECK HEIGHT OF CUT CHART

### RIGHT HAND DECK HEIGHT OF CUT CHART
CUTTER DECK ADJUSTMENTS

8.3 CUTTER DECK BELT TENSION

Check all belts regularly during the first 5, 10 and 15 hours of operation, and then after every 50 hours of operation. If necessary adjust as follows:

CENTER DECK
1. Adjust belt tension to 1/2” (13 mm) deflection at 10 lbs (5 kg) force at the middle of the long rear span. If necessary, adjust as follows:
2. Loosen locking nut on adjustment bolt E.
3. Loosen (4) bolts G fastening the motor mounting plate to the cutter deck (3 visible in photo).
4. Turn adjustment bolt E until proper tension is obtained.
5. Retighten (4) bolts G and lock nut on adjustment bolt E.

WING DECKS
1. Adjust belt tension to 3/8” (10 mm) deflection at 10 lbs (5 kg) force at the middle of the long rear span. If necessary, adjust as follows:
2. Loosen locking nut on adjustment bolt L.
3. Loosen two bolts I fastening the idler plate to the cutter deck.
4. Turn adjustment bolt L until proper tension is obtained.
5. Retighten bolts I and lock nut on adjustment bolt L.
CUTTER DECK ADJUSTMENTS

8.4 BLADE SHARPENING & REMOVAL

When required, the cutter blades may be sharpened either by filing or grinding. It is essential that the balance of the blades are maintained.

NOTE: Always replace blades with original Ransomes blades, do not use another manufacturer's blades.

- Service the blades with the tractor turned off, and the decks securely supported.
- Do not overheat or weaken the blades.
- If blade becomes cracked or bent, replace with a new blade to ensure safe operation
- If lift portion of blade is worn thin replace with a new blade to ensure safe operation
- Place block of wood W between blade and deck baffle to prevent blade from turning during removal
- Keep hands clear of rotating blades

Removing Blades

1. Remove the nut N from the top of the blade spindle bolt
2. Remove the blade spindle bolt with the washer and blade.
3. Replace the blade, washer and blade spindle bolt.
4. Tighten to 97 Nm
8 ADJUSTMENTS

8.5 SPEED LIMITER
The transport and mow speeds are factory set and should not need altering.

NOTE: Ransomes Jacobsen cannot be held responsible for loss of performance or machine damage if these speeds are adjusted outside the speeds shown in the machine specification.

8.6 REAR WHEEL TOE-IN

The rear wheels should have 1/8" (3.2mm) toe-in from the front of the wheel to the back of the wheel. Adjust as follows:

1. Loosen locknuts N at balljoints near both rear wheels.
2. Rotate the tie rod O until wheels are correctly positioned. Adjust both tie rods an equal amount.
3. Re-tighten locknuts. The tires should then be 1/8" closer at the front than the rear.

Fig.16

8.7 ALTERNATOR

The fan belt is adjusted so that it can be deflected 5mm (0.2in) with a force of 5 kg (11 lbs) applied midway between the crankshaft and alternator pulley. (Fig.17) To adjust:

1. Loosen alternator bolts A.
2. Move the alternator to tighten or loosen fan belt.
3. Tighten bolts A.

Check belt tension and condition of belt every 250 hours.

Fig.17
### 9.1 LUBRICATION AND MAINTENANCE CHART

#### MAINTENANCE AND LUBRICATION CHART

<table>
<thead>
<tr>
<th>Interval</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>First 50 hours</td>
<td>• Change Engine Oil&lt;br&gt;• Check Fan Belt Tension</td>
</tr>
<tr>
<td>Daily 10 hours</td>
<td>• Check Engine Oil Level&lt;br&gt;• Check Safety Interlock System&lt;br&gt;• Check Engine Coolant Level&lt;br&gt;• Check Hydraulic Fluid Level&lt;br&gt;• Check Tyre Pressure&lt;br&gt;• Check Engine Bay for Debris</td>
</tr>
<tr>
<td>Every 50 hours Weekly</td>
<td>• Check for Loose Components&lt;br&gt;• Check for Hydraulic Leakes&lt;br&gt;• Check Fan Belt Tension&lt;br&gt;• Check Air Filter Tail Tell indicator</td>
</tr>
<tr>
<td>Every 250 hours</td>
<td>• Change Engine Oil &amp; Oil Filter</td>
</tr>
</tbody>
</table>
| End of season or Every 1000 hours | • Change Battery Condition<br>• Change Engine Oil & Oil Filter<br>• Change Air Filter Element *
• Replace Fuel Filters<br>• Change Hydraulic Oil & Filters<br>• Drain & Clean Fuel Tank<br>• Drain & Replace Engine Coolant |

Lubricate all Grease fittings with K NATE or equivalent Grease Weekly (See Chart)

* Check more often in dirty conditions

**IMPORTANT**
Refer to Engine Manufacturers Manual for Additional Engine Maintenance Procedures

#### FLUID REQUIREMENTS

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.6 Litres (2.8 US gals)</td>
<td>10W 30</td>
</tr>
<tr>
<td>37 Litres (9.7 US gals)</td>
<td>10W 30</td>
</tr>
<tr>
<td>5.5 Litres (1.45 US gals)</td>
<td>50% Anti-Freeze</td>
</tr>
<tr>
<td>64 Litres (17 US gals)</td>
<td>No 2-D (ASTMD975) Diesel</td>
</tr>
</tbody>
</table>
Lubricate every 40 working hours at arrows

1. Caster Pivot.
2. Wheel Bearing.
3. Lift Arm.
4. Rear Axle Pivot.
5. Stub Axle Pivot.
6. Steering Ball Joints.
7. Deck Pulley’s.
9.2 DAILY CHECKS

(Every 8 working hours)

Oil Level.
Check level of oil in sump. Remove dipstick (B) wipe and replace and check that oil is up to the maximum mark. Top up with 10W30 if necessary (A). It is important that this test is carried out with the engine cold and the vehicle parked on level ground.

Hydraulic Oil Level.
Check hydraulic oil level in tank. The level of oil should be maintained in the green mark, halfway between the red marks on the sight glass (C). Top up (D) with Shell Tellus 46 hydraulic oil or equivalent if necessary. The oil level should be checked cold with the machine parked on level ground.

IMPORTANT: Absolute cleanliness must be observed when filling the hydraulic tank. Oil must be filtered through a 25 micron filter before entering the hydraulic tank.

Cooling System.
Check coolant level in expansion tank the coolant level should be between the marks indicated on the expansion bottle. Top up if necessary using a 50% antifreeze solution.

Test the overheat alarm system. Depress the switch on the control panel while the engine is running, ensure the switch illuminates to indicate the alarm circuit is working correctly.

Air Filter.
If working in dusty conditions the air filter element should be examined and cleaned/replaced every 8 working hours (E).

Cleaning the air filter.
Remove loose dirt from element with compressed air working from the "clean" to "dirty" side.

Note: Compressed air must not exceed 6bar, with the nozzle 50mm away from element. The element should be replaced after 6 cleanings.

Transmission Pedal.
Check that the transmission pedal moves freely and...
Cooling System.
Check Bug Screen (F) Radiator & Oil cooler are all free from dust /debris and there is an uninterrupted air flow to the engine. The screen should be fitted with the mesh facing the front of the machine. Any debris should be removed with a soft hand brush.

**WARNING**

Before you remove or clean the bug screen, always disengage all drives, lower implements to the ground, engage parking brake, stop engine and remove key from ignition switch to prevent injuries.

Machine Maintenance.
Fire Hazard: Remove all debris from under the seat plate and from within the engine compartment. Area. (G)

PRE-CLEANER.
Check Pre-Cleaner is free from debris. This is by removing the Wing Nut & Washer from the top of the Pre-Cleaner. The Cover (A) & Bowl (B) can then be removed from the body, the Bowl (B) can then be cleaned out.
9.3 ENGINE
First 50 working hours and every 250 working hours.

Change Engine Oil.
(a) Warm up the engine first and then shut it off. Remove oil drain plug from the bottom of the crankcase and wipe it off.
(b) Replace the drain plug and fill engine with 10.6 litres of oil(with filter).

Fig.1 A Oil Fill, B Dipstick, C Oil fill

Change Engine Oil Filter (A)
(a) Remove single-unit cartridge (A)
(b) Clean area on crankcase.
(c) Apply thin coat of oil to cartridge gasket before installing.
(d) Tighten filter by hand only.
(e) Check for oil leaks around the cartridge gasket after engine is started.

9.4 MACHINE
Lubricate the following points. Weekly or every 50 working hours.

1. Lubricate the following with Shell Darina R2 grease. (Fig.3)
   (a) Lift arm pivots.
   (b) Rear Axle centre pivot.
   (c) Steering rams-inner pivots.
   (d) Steering ram rod end.
   (e) Steering Track Rod, Rod End.
   (f) Lift arm yoke pivots.
   (g) Belt pulleys.
   (h) Deck Castor wheels
9.5 MACHINE

1. Drain Oil reservoir by removing drain plug H on bottom of hydraulic oil reservoir.
2. Ensure that plug is clean and reinstall in tank.
3. Unscrew both filter elements G and discard.
4. Clean the rubber seal through which the filter elements pass.
5. Apply a thin film of oil to the seals of the new filters and install.
6. Remove plug K and add the recommended oil Fig 5) until the indicator on the oil level gauge J is centered in the green area of the gauge. Avoid operation in either red zone as insufficient oil could damage hydraulic components. Too much oil could lead to oil overflowing the reservoir as it heats up.
7. Reinstall plug K.
8. Start the tractor and allow to run at 1/4 throttle for approximately 5 minutes.
9. Allow oil to cool and recheck the oil level and adjust as required.

Hydraulic oil type requirements:
Shell Tellus 46

IMPORTANT: Absolute cleanliness must be observed when filling the hydraulic tank. Oil must be filtered through a 25 micron filter before entering the hydraulic tank.

Change Hydraulic Oil Filter (CHARGE) (Fig.6)
1. Wipe filter canister and housing to remove any dirt present.
2. Place a suitable drip tray under the filter.
3. Un-screw filter canister and remove the filter element and dispose of safely.
4. Replace with new filter element.
5. Coat the top outside lip of the filter canister with a thin film of oil and refit the filter canister.
6. Filter should be replaced before refilling hydraulic tank.
9.6 HYDRAULIC TEST PORTS

If any problems are experienced with the hydraulic system, service ports are provided to enable pressures to be checked. All tests, unless stated otherwise, should be carried out with the hydraulic oil at normal working temperature.

TEST PORTS (Fig.7,8,9):

1. Front Cutter Deck Pressure: 220 bar (3200 psi). (A(Fig.7)).
   Lift Pressure: 63.5 bar (920 psi). (B(Fig.7)).

2. RH & LH Cutter Deck Pressure: 210 bar (3045 psi). (A(Fig.8 & 9)).

3. FWD Transmission Pressure: 250 bar (3625 psi). (A(Fig.10)).

4. REV Transmission Pressure: 210 bar (3045 psi). (B(Fig.10)).

5. Charge Pressure: 15.8 - 19.3 bar (230-280 psi). (Either A or B(Fig.10))

NOTE: Any servicing of the hydraulic system must be carried out by trained service personnel.
9.7 ENGINE MAINTENANCE: Every 500 hrs

Fuel System:
Use Diesel fuel No.2-D (ASTM D975)

See engine manufacturer's manual for additional information.

Changing fuel filter (Fig.10)
1. Unscrew filter screw (A) from filter head.
2. Bleed air from system as described in section 5.5

Bleeding air from fuel system
1. Turn the ignition switch to the ON position (don't start engine)
2. Open air vent A onto top of fuel filter to allow air to escape.(Fig.10)
3. Retighten air vent.
4. Open air vent (A) on side of injector pump to allow air to escape.(Fig.11)
5. Retighten air vent
6. Turn ignition to OFF.
9.8 ENGINE MAINTENANCE

Cleaning the air filter.

To remove the cover, pull the yellow finger on the cover towards you. Take hold of the cover firmly and twist it to the left. Pull the cover towards you to open the housing. Remove old filter gently, then clean inside of the housing carefully. Remove loose dirt from element with compressed air working from the clean to dirty side, using compressed air max 6 bar, with nozzle 5cm from element. The element should be cleaned no more than 6 times. In any case we recommend replacing the main element once a year irrespective of how many times it has been cleaned.

**To close the cover reverse operation.**

**NOTE:** Extensive damage to engine can result from an inadequate air supply.

9.9 MACHINE MAINTENANCE

**Battery.**
Keep fluid levels above battery plates.

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**WARNING**

Wear eye protection when servicing battery.

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Other Regular Service.

- Verify proper operation of safety interlock switches (Neutral switch, Seat switch, etc.)
- Ensure nuts and bolts remain tight.
- Keep tyre pressure at 1kg/cm² (14psi).
- Follow the engine manufacturer’s maintenance recommendations.
- If a label becomes worn or removed, see the LABELS section of this manual or the tractor Parts Manual for replacement information.

**NOTE:** When washing machine with pressure spray washers or steam cleaners, avoid washing bearing areas because cleaning solutions might penetrate bearing seals and cause premature bearing failure.

**Storage**

- Store petrol or diesel fuel in an approved container in a cool dry place.
- Keep the machine and fuel containers in a locked storage place to prevent tampering and to keep children from playing with them.
- Do not store fuel or petrol/diesel fuel powered equipment in any closed area where heating appliances, pilot lights or any sort of open flame is present.
- Before storing, allow the engine to cool, and drain fuel completely from fuel tanks and containers.
- Maximum safety and best mowing results can only be expected if the mower is maintained and operated properly.

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**WARNING**

Battery posts, terminals and related accessories contain lead and lead compounds.

**WASH HANDS AFTER HANDLING**

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9.10 END OF SEASON or when required

1. Drain Oil reservoir by removing drain plug H on bottom of hydraulic oil reservoir.

2. Ensure that plug is clean and reinstall in tank.

3. Unscrew both filter elements G and discard.

4. Clean the rubber seal through which the filter elements pass.

5. Apply a thin film of oil to the seals of the new filters and install.

6. Remove plug K and add the recommended oil Fig 5) until the indicator on the oil level gauge J is centered in the green area of the gauge. Avoid operation in either red zone as insufficient oil could damage hydraulic components. Too much oil could lead to oil overflowing the reservoir as it heats up.

7. Reinstall plug K.

8. Start the tractor and allow to run at 1/4 throttle for approximately 5 minutes.

9. Allow oil to cool and recheck the oil level and adjust as required.

Hydraulic oil type requirements:

Shell Tellus 46

Change Hydraulic Oil Filter(Fig.6 Ref to pg 12)

1. Wipe filter canister and housing to remove any dirt present.

2. Place a suitable drip tray under the filter.

3. Un-screw filter canister and remove the filter element and dispose of safely.

4. Replace with new filter element.

5. Coat the top outside lip of the filter canister with a thin film of oil and refit the filter canister.

6. Filter should be replaced before refilling hydraulic tank.
10.1 GENERAL

The problem solving chart below lists basic problems that may occur during start-up and operation. For more detailed information regarding the hydraulic and electrical systems contact your area Jacobsen Distributor.

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Possible Causes</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine will not start.</td>
<td>1. Glow Plug has not timed out.</td>
<td>1. Reset ignition switch and allow glow plug to time out before cranking engine.</td>
</tr>
<tr>
<td></td>
<td>2. Battery low on charge or defective.</td>
<td>2. Inspect condition of battery and battery connections.</td>
</tr>
<tr>
<td></td>
<td>3. Fuel tank empty or fuel contaminated.</td>
<td>3. Fill tank with fresh fuel. Change filter, Bleed air from lines.</td>
</tr>
<tr>
<td></td>
<td>5. Defective Starter Relay.</td>
<td>5. Test and replace relay if neccessary.</td>
</tr>
<tr>
<td></td>
<td>6. Brake switch is not on.</td>
<td>6. Ensure brake switch is on.</td>
</tr>
<tr>
<td></td>
<td>7. Mow switch set to cut.</td>
<td>7. Set mow switch to off.</td>
</tr>
<tr>
<td></td>
<td>8. Transport pedal not in neutral</td>
<td>8. Remove foot from pedal, cheek pedal returns to the neutral position.</td>
</tr>
<tr>
<td>Engine hard to start or runs poorly.</td>
<td>1. Fuel tank empty or fuel contaminated.</td>
<td>1. Fill tank with fresh fuel. Change filter, Bleed air from lines.</td>
</tr>
<tr>
<td></td>
<td>2. Air Cleaner blocked or dirty.</td>
<td>2. Check air cleaner, replace as neccessary.</td>
</tr>
<tr>
<td>Engine Stops.</td>
<td>1. Fuel tank empty</td>
<td>1. Fill with fresh fuel and bleed lines</td>
</tr>
<tr>
<td></td>
<td>2. Interlocks not set before leaving operators seat</td>
<td>2. Ensure Parking Brake is on &amp; Mow switch is in the off position.</td>
</tr>
<tr>
<td>Engine Overheating.</td>
<td>1. Coolant level low</td>
<td>1. Inspect and add 50/50antifreeze solution if required.</td>
</tr>
<tr>
<td></td>
<td>2. Radiator air intake restricted</td>
<td>2. Clean wire mesh guard at radiatoor.</td>
</tr>
<tr>
<td></td>
<td>3. Waterpump/alternator belt or fan belt loose or broken.</td>
<td>3. Inspect waterpump/alternator belt and fan belt. Tighten if neccessary.</td>
</tr>
<tr>
<td>Battery not holding charge. Battery light on.</td>
<td>1. Loose or corroded battery terminals.</td>
<td>1. Inspect terminals, clean and tighten as required.</td>
</tr>
<tr>
<td></td>
<td>2. Low electrolyte level in battery.</td>
<td>2. Refill battery with distilled water</td>
</tr>
<tr>
<td></td>
<td>3. Alternator belt loose or broken.</td>
<td>3. Inspectwaterpump/alternator belt. Tighten if neccessary.</td>
</tr>
<tr>
<td>Decks cut unevenly. Poor quality of cut.</td>
<td>1. Cutting blades are worn.</td>
<td>1. Replace blades.</td>
</tr>
<tr>
<td></td>
<td>2. Engine speed too low.</td>
<td>2. Check engine speed, run engine at full throttle.</td>
</tr>
<tr>
<td></td>
<td>3. Cutter motors worn.</td>
<td>3. Check case drain leakage &amp; flow check cutting circuit.</td>
</tr>
<tr>
<td></td>
<td>5. Ground weight incorrectly adjusted</td>
<td>5. Adjust ground weight control valve until correct ground weight is achieved.</td>
</tr>
</tbody>
</table>
10.2 Quality of Cut problem Solving

It is recommended that a “test cut” be performed to evaluate the mower’s performance before beginning repairs.
An area should be available where “test cuts” can be made. This area should provide known and consistent turf conditions to allow accurate evaluation of the mower’s performance.
Another “test cut” should be performed after the completion of the repairs and/or adjustments to verify the mower’s performance.
Before performing a “test cut” to diagnose cut appearance and mower performance, the following items should be verified to ensure an accurate “test cut.”

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

NOTE: Arrow indicates direction of travel.
Washboarding is a cyclical pattern of varying cutting heights, resulting in a wave-like cut appearance. In most cases, the wave tip-to-tip distance is approximately 6—8 in. (15—20 cm). Color variation (light-to-dark) may also be noticed. This condition is usually caused by a rocking motion in the cutting unit(s). This condition is found mostly on mowers with multiple (suspended) cutting units. Washboarding may also be caused by variations in the turf.

10.2.1 Washboarding

<table>
<thead>
<tr>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mowing (ground) speed is too fast.</td>
<td>Reduce mowing (ground) speed.</td>
</tr>
<tr>
<td>Grass build-up on roller.</td>
<td>Clean the roller and scraper.</td>
</tr>
<tr>
<td>Roller is out of round.</td>
<td>Replace roller.</td>
</tr>
<tr>
<td>Mowing in the same direction.</td>
<td>Change mowing direction regularly.</td>
</tr>
<tr>
<td>Cutting units have too much or too little weight on them.</td>
<td>Use weight transfer switch to transfer weight on or off cutting units. (Refer to Parts &amp; Maintenance Manual.)</td>
</tr>
<tr>
<td>Insufficient engine speed, not set to specification.</td>
<td>Check/adjust engine speed. (Refer to Parts &amp; Maintenance Manual.)</td>
</tr>
<tr>
<td>Hydraulic system and/or rotary drive motor performance is reduced.</td>
<td>Check hydraulic system performance (pump output, motor operation, valve operation, relief valve settings, etc.).</td>
</tr>
</tbody>
</table>
10.2.2 Step Cutting

Step cutting occurs when grass is cut taller on one side of a cutting unit than the other or on one side of mower to the other. This is usually caused by mechanical wear or an incorrect roller or deck caster adjustment.

**NOTE:** Arrow indicates direction of travel.

<table>
<thead>
<tr>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOC (height-of-cut) settings are different from one side of a cutting unit to the other or from one cutting unit to another.</td>
<td>Check HOC adjustment of cutting units. (Refer to Parts &amp; Maintenance Manual.)</td>
</tr>
<tr>
<td>Worn roller bearings or deck caster wheels.</td>
<td>Check/replace roller bearings and/or deck caster wheels.</td>
</tr>
<tr>
<td>Cutting unit movement is restricted.</td>
<td>Check/remove cutting unit movement restriction.</td>
</tr>
<tr>
<td>Variations in turf density</td>
<td>Change mowing direction.</td>
</tr>
<tr>
<td>Machine ride height is uneven side to side.</td>
<td>Check/adjust proper tire inflation pressure. (Refer to Parts &amp; Maintenance Manual.)</td>
</tr>
<tr>
<td>Cutting unit height is uneven side to side.</td>
<td>Check/adjust for even mower weight distribution.</td>
</tr>
</tbody>
</table>
Scalping is a condition in which areas of grass are cut noticeably shorter than the surrounding areas, resulting in a light green or even brown patch. This is usually caused by an excessively low height-of-cut setting and/or uneven turf.

NOTE: Arrow indicates direction of travel.

<table>
<thead>
<tr>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOC (height-of-cut) settings are lower than normal.</td>
<td>Check and adjust the HOC settings. (Refer to Parts &amp; Maintenance Manual.)</td>
</tr>
<tr>
<td>Turf too uneven for the mower to follow.</td>
<td>Change mowing direction.</td>
</tr>
<tr>
<td>Cutting too much grass at one time.</td>
<td>Mow more often.</td>
</tr>
<tr>
<td>Mowing (ground) speed is too fast.</td>
<td>Reduce mowing (ground) speed.</td>
</tr>
</tbody>
</table>
10.2.4 Stragglers

Stragglers are scattered blades of uncut or poorly cut grass.

NOTE: Arrow indicates direction of travel.

<table>
<thead>
<tr>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dull cutting blade(s).</td>
<td>Sharpen blade(s). (Refer to Parts &amp; Maintenance Manual.)</td>
</tr>
<tr>
<td>Mowing (ground) speed is too fast.</td>
<td>Reduce mowing (ground) speed.</td>
</tr>
<tr>
<td>Grass is too tall.</td>
<td>Mow more often.</td>
</tr>
<tr>
<td>Mowing in the same direction.</td>
<td>Change mowing direction regularly.</td>
</tr>
</tbody>
</table>
10.2.5 Streaks

A streak is a line of uncut grass. This is usually caused by a damaged blade.

**NOTE:** Arrow indicates direction of travel.

<table>
<thead>
<tr>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damaged blade(s).</td>
<td>Replace blade(s).</td>
</tr>
<tr>
<td>Turning too aggressively. Cutting units don't overlap during turns or on side hills.</td>
<td>Turn less aggressively to allow cutting units to overlap. Change mowing direction or pattern on side hills.</td>
</tr>
<tr>
<td>Tire mats down grass before it is cut.</td>
<td>Check/adjust tire inflation pressure. (Refer to Parts &amp; Maintenance Manual.)</td>
</tr>
<tr>
<td>Wet grass is matted down before it is cut.</td>
<td>Cut when grass is dry.</td>
</tr>
</tbody>
</table>
10.2.6 Windrowing

Windrowing is the deposit of clippings concentrated at one end of cutting unit(s) or between cutting units, forming line(s) in the direction of travel.

NOTE: Arrow indicates direction of travel.

<table>
<thead>
<tr>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grass is too tall.</td>
<td>Mow more often.</td>
</tr>
<tr>
<td>Mowing while grass is wet.</td>
<td>Mow when grass is dry.</td>
</tr>
<tr>
<td>Grass built up on roller.</td>
<td>Clean rollers and scrapers.</td>
</tr>
<tr>
<td>Grass collecting on mower or cutting unit frame.</td>
<td>Clear cutting unit(s) discharge deflector.</td>
</tr>
</tbody>
</table>
10.2.7 Mismatched Cutting Units

Mismatched cutting units is a pattern of varying cutting heights, resulting in a stepped cut appearance, usually due to mismatched HOC (height-of-cut) adjustment from one cutting unit to another.

NOTE: Arrow indicates direction of travel.

<table>
<thead>
<tr>
<th>Probable Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>HOC inconsistent from one cutting unit to another.</td>
<td>Check/adjust HOC on cutting units to same height. (Refer to Parts &amp; Maintenance Manual.)</td>
</tr>
<tr>
<td>Difference in rotary cutting unit speeds.</td>
<td>Check operation of rotary cutting motor(s) and repair/replace as necessary.</td>
</tr>
<tr>
<td>Difference in mower ride height side to side.</td>
<td>Check/adjust tire inflation pressure. (Refer to Parts &amp; Maintenance Manual.)</td>
</tr>
<tr>
<td></td>
<td>Check/adjust for even mower weight distribution.</td>
</tr>
</tbody>
</table>
11.1 **FUSE POSITIONS**

**MAIN FUSES**
The main fuse panel is situated under the front of the engine bonnet.

- Fuse A - 40Amp Link Fuse - System Fuse.
- Fuse B - 40Amp Link Fuse - Glow Plug and Accessory Fuse.
- Fuse C - 40 Amp Cab Fuse.
- Relay D - Glow Plug Relay.

**SECONDARY FUSES**
The secondary fuse panel is situated under the front tower cover.

**FUSE BLOCK 1**
- Fuse A - 10Amp - Fuel pump/Alternator.
- Fuse B - 20Amp - Main Ignition.
- Fuse C - 10Amp - Horn.
- Fuse D - 10Amp - Glow Plug Relay.
- Fuse E - 10Amp - Beacon
- Fuse F - Spare.

**FUSE BLOCK 2**
- Fuse A - 20Amp - Accessory.
- Fuse B - 20Amp - Air Seat - Pre 2006.
- Fuse B - 10Amp - Air Seat - Post 2006.
- Fuse C - 20Amp - Heated Jacket - Pre 2006.
- Fuse D - Spare.
- Fuse E - Spare.
- Fuse F - Spare.

**FUSE BLOCK 3**
- Fuse A - 10Amp - LH Headlamp.
- Fuse B - 10Amp - RH Headlamp.
- Fuse C - 10Amp - RH Side Lights.
- Fuse D - 10Amp - LH Side Lights.
- Fuse E - 10Amp - Hazards.
- Fuse F - 10Amp - Indicators/Brake Lights
11.2 RELAY POSITIONS

Relays are situated under the front tower cover

Relay A - Start Relay
Relay B - RH Deck Relay
Relay C - Centre Deck Relay
Relay D - LH Deck Relay
Relay E - Cutter Control
Relay F - Horn Relay
Relay G - Alarm Relay
Relay H - Flasher Relay
Relay I - Seat Delay Relay
WARRANTY
Warranty is subject to specific terms and conditions, e.g. wearing parts, unapproved modifications, etc. are not included. For a full set of warranty conditions, contact your local dealer or distributor.

SERVICE
A network of authorised Sales and Service dealers has been established and these details are available from your supplier.

When service attention, or spares, are required for the machine, within or after the warranty period your supplier or any authorised dealer should be contacted. Always quote the registered serial number of the machine.

If any damage is apparent when delivery is made, report the details at once to the supplier of the machine.
Europe & Rest of The World Except North & South America

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