



Autonomous Mower Tango E5



OPERATOR'S MANUAL

Autonomous Mower Tango E5

OMSAU13581 ISSUE A4 (ENGLISH)

SABO Maschinenfabrik GmbH

European Version
Printed in U.S.A.



Introduction

Thank You for Purchasing a John Deere Product

We appreciate having you as a customer and wish you many years of safe and satisfied use of your machine.

Using Your Operator's Manual

This manual is an important part of your machine and should remain with the machine when you sell it.

Reading your operator's manual will help you and others avoid personal injury or damage to the machine. Information given in this manual will provide the operator with the safest and most effective use of the machine. Knowing how to operate this machine safely and correctly will allow you to train others who may operate this machine.

This manual and safety signs on your machine may also be available in other languages (see your authorized dealer to order).

Sections in your operator's manual are placed in a specific order to help you understand all the safety messages and learn the controls so you can operate this machine safely. You can also use this manual to answer any specific operating or servicing questions. A convenient index located at the end of this book will help you to find needed information quickly.

The machine shown in this manual may differ slightly from your machine, but will be similar enough to help you understand our instructions.

RIGHT-HAND and LEFT-HAND sides are determined by facing in the direction the machine will travel when going forward. When you see a broken line (-----), the item referred to is hidden from view.

Before delivering this machine, your dealer performed a predelivery inspection to ensure best performance.

Machine Use

This machine and charging station are designed solely for use in customary lawn mowing and light grounds care operations. Use in any other way is considered as contrary to the intended use.

The manufacturer accepts no liability for damage or injury resulting from this misuse, and these risks must be borne solely by the user. Compliance with and strict adherence to the conditions of operation, service and repair as specified by the manufacturer also constitute essential elements for the intended use.

This machine and charging station should be operated, serviced and repaired only by persons familiar with all its particular characteristics and acquainted with the relevant safety rules (accident prevention). The accident prevention regulations, all other generally recognized

regulations on safety and occupational medicine and the road traffic regulations must be observed at all times.

Any arbitrary modifications carried out on this machine will relieve the manufacturer of all liability for any resulting damage or injury and invalidates the CE conformity.

Special Messages

Your manual contains special messages to bring attention to potential safety concerns, machine damage as well as helpful operating and servicing information. Please read all the information carefully to avoid injury and machine damage.

 **CAUTION: Avoid injury! This symbol and text highlight potential hazards or death to the operator or bystanders that may occur if the hazards or procedures are ignored.**

IMPORTANT: Avoid damage! This text is used to tell the operator of actions or conditions that might result in damage to the machine.

NOTE: General information is given throughout the manual that may help the operator in the operation or service of the machine.

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Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

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Product Identification

Record Identification Numbers

If you need to contact an Authorized Service Center for information on servicing, always provide the product model and identification numbers.

You will need to locate the identification numbers for the product. Record the information in the spaces provided below.



MXAL47259—UN—16APR13

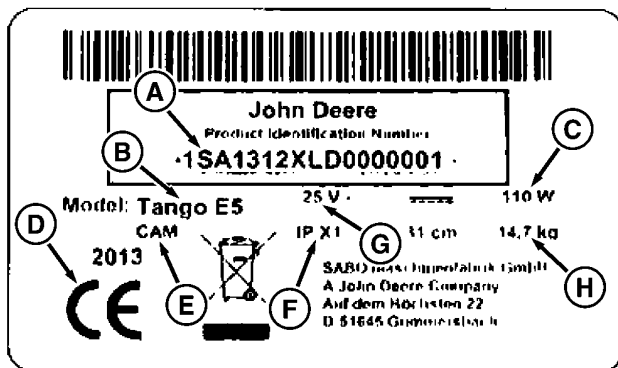
DATE OF PURCHASE:

DEALER NAME:

DEALER PHONE:

PRODUCT IDENTIFICATION NUMBER (A):

Type or Serial Number Plate Information



MXT008043—UN—13AUG13

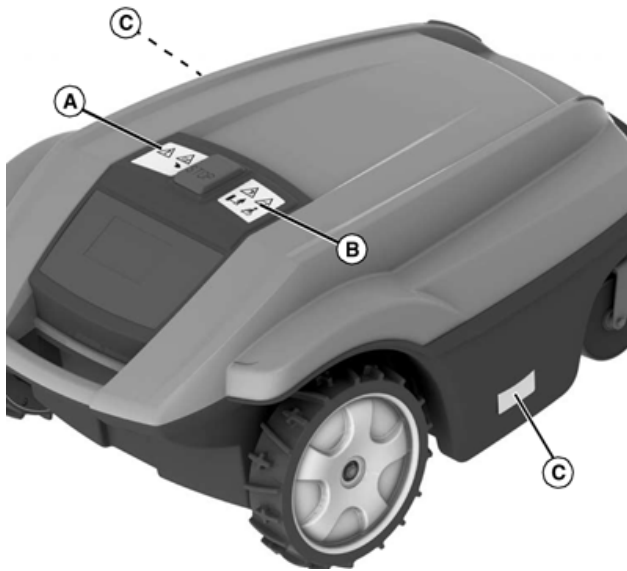
Part Number (A)	SA1312
Description (B)	Tango E5
Power (C)	110W
CE Symbol (D)	Ce2.pcx
Product Type (E)	Consumer Autonomous Mower (CAM)
	robotic battery powered electrical rotary lawn mower

Product Identification

Water Spray (F)	IPx1
Voltage (G)	25 V-
Net Weight (H)	14.7 kg (32.4 lb.)
Total Weight	31 kg (66.4 lb.)

Safety Labels

Safety Label Locations



MXAL47260—UN—16APR13

Use label number to locate complete text of safety label message following this illustration.

- A —READ OPERATORS MANUAL BEFORE SERVICING SAU11722
- B —KEEP A SAFE DISTANCE, NO RIDERS SAU12032
- C —AVOID DANGER FROM ROTATING BLADE SAU12007

Understanding The No-Text Machine Safety Labels

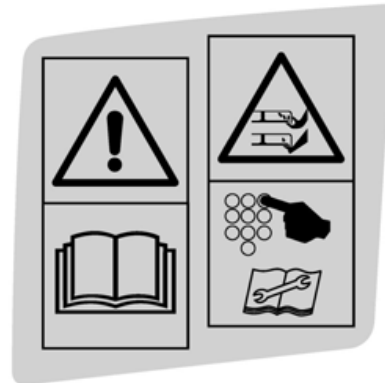


TCT005498—UN—11SEP12

At several important places on this machine safety signs are affixed intended to signify potential danger. The hazard is identified by a pictorial in a warning triangle. An adjacent pictorial provides information how to avoid personal injury. These safety signs, their placement on the machine and a brief explanatory text are shown in this Safety section.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

READ OPERATORS MANUAL BEFORE SERVICING



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- Read user instructions before operating the machine.
- Press down on Stop button and push main switch to OFF position before working on or lifting the machine.

KEEP A SAFE DISTANCE, NO RIDERS

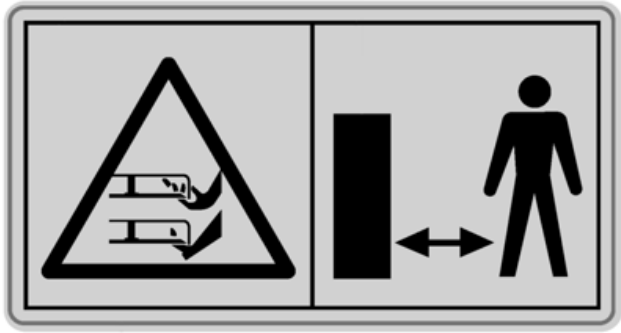


MXAL47262—UN—16APR13

- Keep a safe distance from the machine when operating.
- Do not ride on the machine.

Safety Labels

AVOID DANGER FROM ROTATING BLADE



MXAL47263—UN—16APR13

- Keep a safe distance from the machine when operating.

Safety

Training

- Find manuals online at DealerNet for SABO products, or Service ADVISOR™ for John Deere products.
- Read the instructions carefully. Be familiar with the controls and the proper use of the equipment.
- Never allow children or people unfamiliar with these instructions to use the mower. Local regulations can restrict the age of the operator.
- Never mow while people, especially children, or pets are nearby without supervision.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.

Operation

- This mower is designed for mowing lawns. Any other use is not permitted. Using it for any other purposes may be dangerous or damage the machine, and will invalidate the warranty.
- Never allow **children**, persons with reduced physical, sensory, or mental capabilities or lack of experience and knowledge, or people unfamiliar with these instructions to use the machine. Local regulations may restrict the age of the operator.
- Keep a safe distance from the machine when it is operating.
- Never allow children or animals to attempt to ride on the mower. Do not place objects on top of the mower during operation.
- Do not mow on excessively steep slopes.
- Do not operate sprinkler systems at the same time the mower is operating.
- Start mower operation according to instructions and with feet well away from the blades.
- Do not put hands or feet near or under rotating parts.
- Always check to be sure the main switch is in the OFF position before you transport the mower.
- Push down on the Stop button and push the main switch to the OFF position:
 - Before checking, cleaning, or working on the mower;
 - After striking a foreign object. Inspect the mower for damage and make repairs before restarting and operating the equipment;
 - If the mower starts to vibrate. Immediately check for cause. Turn the mower off at the main power switch. Remove any debris and restart. If vibration remains, turn the mower off and return mower to dealership for servicing.
- Read, understand and follow all instructions in the manual and on the mower before starting.

- Inspect mower before you operate. Repair or replace damaged, badly worn, or missing parts. Make any necessary adjustments before you operate.
- Do not operate the mower if the safety systems are not working. Contact your dealer for service.
- Do not allow children in the mowing area without supervision.
- Be aware of scheduled mow times. Check the system date and time on your mower regularly. Adjust the time for changes in local time.
- Use only accessories approved by the manufacturer of the mower.
- Do not use the machine in explosion protected areas.

Maintenance and Storage

- Do not attempt to remove mower battery or blades. Contact your dealer for service and replacement.
- Check to be sure the main switch is in the OFF position before transporting the mower. Lift the mower by the handle and turn the machine so the mower blades are facing away from your body.
- Allow the mower to cool before storing in any enclosure.
- Replace worn or damaged parts for safety.
- Never allow untrained personnel to service mower. Understand service procedure before doing work.
- Use care when checking blades. Wrap the blades or wear gloves, and use caution when servicing them. Contact your dealer for blade replacement.
- Keep hands, feet, clothing, jewelry and long hair away from moving parts.
- Keep all parts in good working condition and all hardware tightened. Replace all worn or damaged decals.
- Edges of charging station plates may be sharp. Always wear gloves whenever touching or working near charging station plates.

Checking Mowing Area

- Clear the mowing area of objects that might be thrown or damaged. Check to be certain no ropes or wires are loose in the mowing area. If mower boundary wire is installed above ground it must be flat on the ground so it will not be picked up by the mower running blade. Ropes or wires in the mower running blade could injure legs or feet.
- Keep people and pets out of the mowing area.
- Study the mowing area. Do not mow after heavy rains, or other yard condition changing events.

Safety

Stopping Safely

1. If mower is operating, approach from behind. Mower may change its direction as you approach. Be aware of any obstacles mower may contact and change its direction as you approach.
2. Push down on Stop button on top of mower.
3. Push the main switch to the OFF position.

Rotating Blades are Dangerous - Protect Children and Prevent Accidents

- Children are often attracted to lawn-mowing machines and mowing activity. Keep children away from the mower when it is operating.
- Schedule mowing times for when children are least likely to be in the area.
- Use Go Home Mode to send the mower home until the next scheduled day if children will be in the area.
- Never allow a child or an untrained person to operate the mower.
- Do not touch blades while power switch is ON position.
- Do not touch rotating blades.

Wear Appropriate Clothing

- Always wear eye protection when working with the mower.
- Wear close fitting clothing and safety equipment appropriate for the job.
- While working with the mower, always wear substantial footwear and long trousers. Stay clear of the mower when barefoot or wearing open sandals.

Electrical Hazards

- If the mower stops in water contact your dealer. The dealer must disconnect the mower battery before moving the machine.
- Avoid further damage by contacting your dealer before attempting to move the mower if it becomes damaged by impact, entering water or other accidents.
- Install the charging station power supply in an indoor location.
- Only use the charging station and charging station power supply which comes with your mower to charge the mower.
- Check the charging station power supply regularly for wear or damage. Contact your dealer for replacement.
- Do not attempt to remove the mower battery.
- Connect the charging station power supply to a power source which conforms with local standards and regulations. Consult an electrician. Dealer installation of

charging station and initial mower setup is strongly recommended.

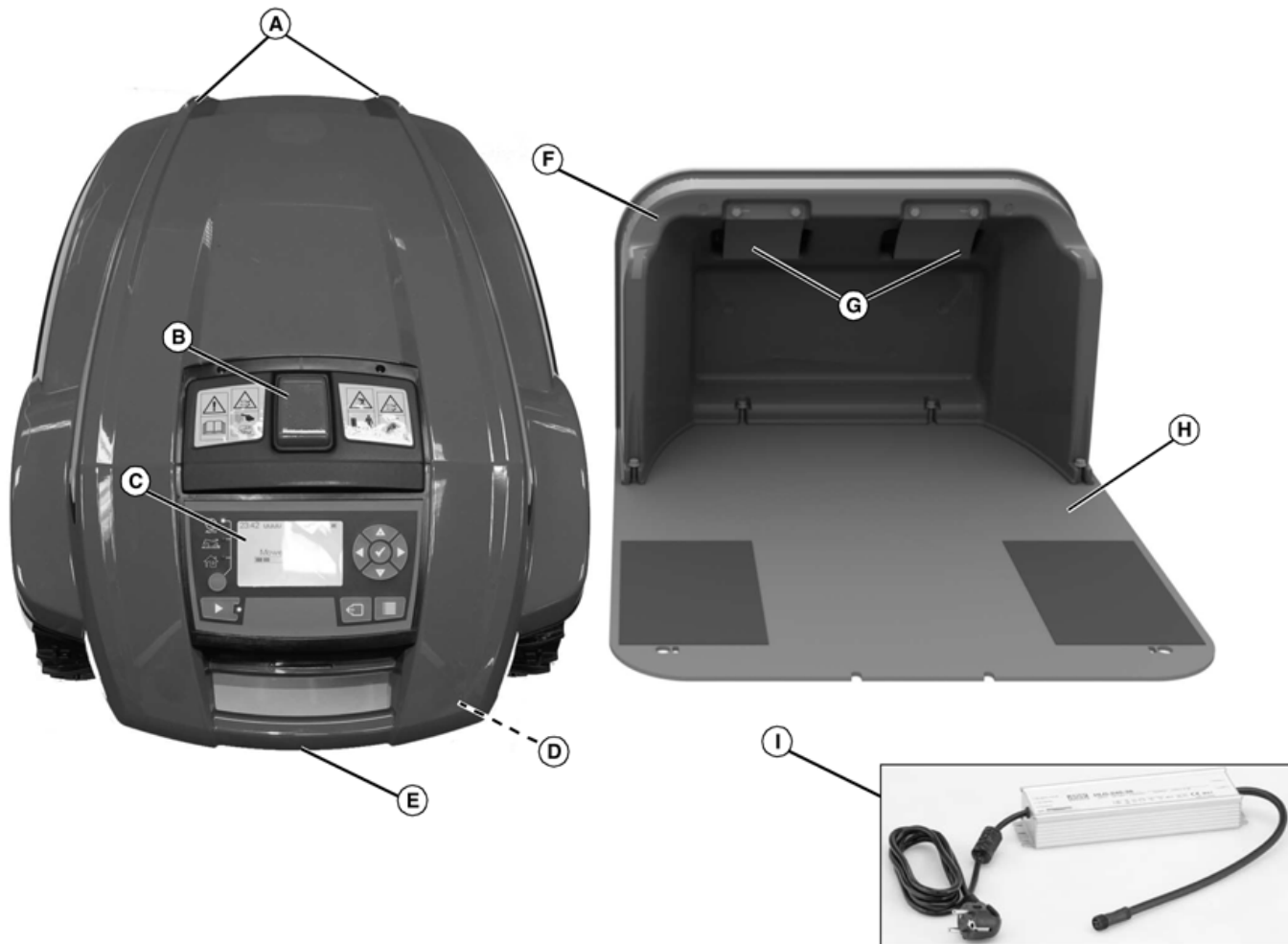
Handling Waste Product and Chemicals

Waste products, such as batteries, can harm the environment and people:

- See your local Recycling Center or authorized dealer to learn how to recycle or get rid of waste products.
- See your local Recycling Center or authorized dealer to learn how to put your mower out of service at the end of the mower's service life.
- All Waste Electrical and Electronic Equipment (WEEE) Directive requirements must be met **as well as** any requirements included in battery safety sheets at the end of this Operator's Manual.

Operating Controls

Controls and Features



MXAL47264—UN—16APR13

A — Charging Contacts
B — Stop Button
C — User Interface
D — Main Switch
E — Handle

F — Charging Station
G — Charging Contacts
H — Charging Pad
I — Charging Station Power Supply

Operating

Operating Checklist

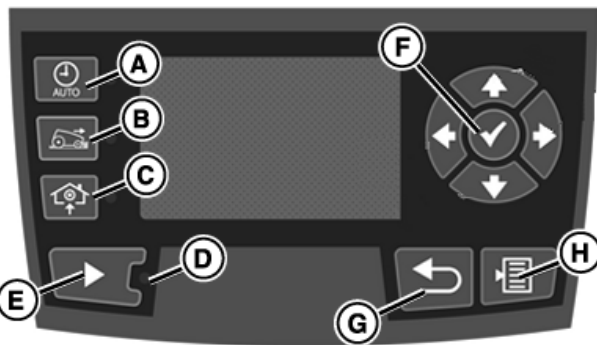
Before First Use

- ☐ Use a conventional lawn mower to cut grass to normal maintenance height.
- ☐ Test safety systems.
- ☐ Check mowing area within boundary wire for any objects which the mower could pass over and strike with the blade. Remove objects.

Monthly

- ☐ Test safety systems.
- ☐ Check mowing area within boundary wire for any objects which the mower could pass over and strike with the blade as conditions require. Remove objects.
- ☐ Check wire boundaries for breaks. If wire is installed below ground, check boundary for digging or trenching.
- ☐ Inspect the charging contacts on the mower and the charging station and wipe clean if needed.
- ☐ Check machine and blades for any damage.

Using the Control Panel



MXT009764—UN—06JAN14

A - Mow on Schedule (AUTO) Button

This light will be solid green when the mower is in Mow on Schedule Operating Mode.

B - Mow Now Button

This light will be solid green when the mower is in Mow Now Operating Mode.

C - Go Home Button

This light will be solid green when the mower is in Go Home Operating Mode.

D - Run LED

This light will be solid green when:

- The mower is actively mowing with the blades turning.
- The mower is seeking the charging station and the blades are not turning.

- The mower is in the charging station and is not charging because it is waiting on the schedule.

This light will be flashing green when the Stop button is pressed and the mower has paused mowing.

This light will be flashing red when the mower has detected a condition and stopped itself.

E - Start Button

Push this button to start mower operation in the selected mode.

F - Enter Button

Push this button to save or confirm selections.

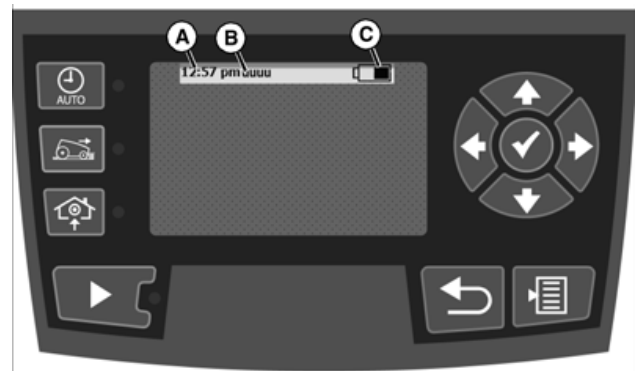
G - Back Button

Push this button to go back or undo an entry.

H - Menu Button

Push this button to access the user interface menu.

User Interface Display Information



MXAL47266—UN—16APR13

A - Time

Mower displays current time.

B - Boundary Sensor Location Indicator

Indicates whether all four boundary sensors are in (i), out (o) or unknown (u).

C - Battery Charge Icon

Graphic representation of battery charge remaining.

Machine Sounds

The mower will make sounds as operator feedback:

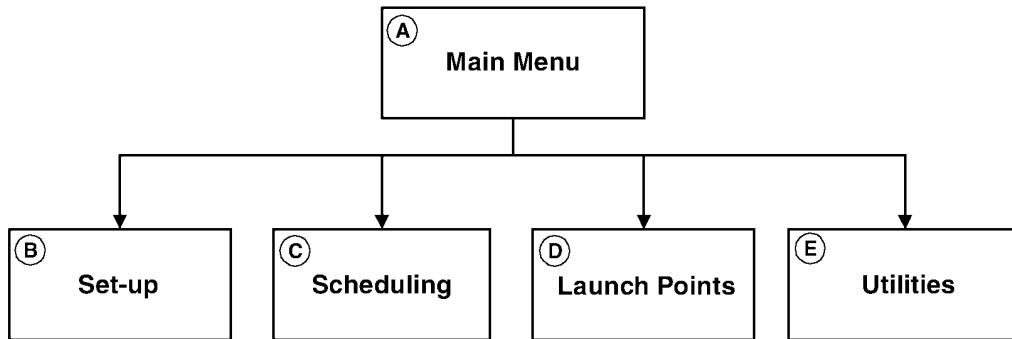
- When mower is turned ON or OFF.
- When programming is complete.
- When mower is faulted.
- Every time a user interface button is pushed.
- When the mower starts to move.

Operating

- When the mower blade is going to turn on.
- Refer to local requirements for when the machine may be allowed to run based on noise requirements.

User Interface Menus

Main Menu

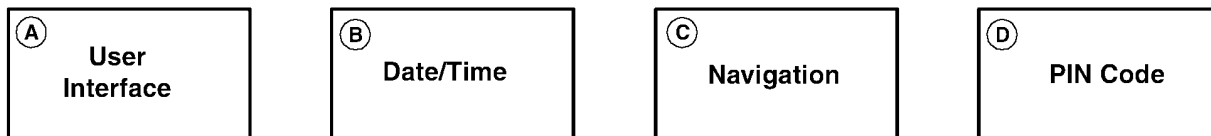


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A — Main Menu
B — Set-up
C — Scheduling

D — Launch Points
E — Utilities

Set-up Menu

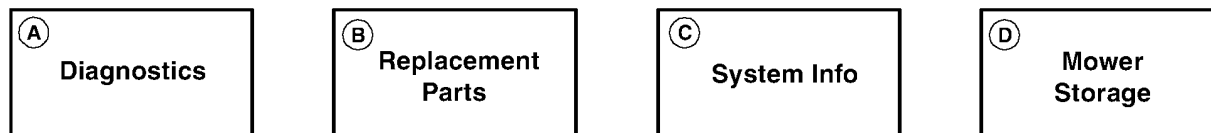


MXAL47268—UN—16APR13

A — User Interface
B — Date/Time

C — Navigation
D — PIN Code

Utilities Menu



MXAL47269—UN—16APR13

A — Diagnostics
B — Replacement Parts

C — System Info
D — Mower Storag

Operating

Launch Points Menu



MXAL47270—UN—16APR13

A — Calibrate
B — Settings

C — Frequency

Testing Safety Systems

The safety systems installed on your machine should be checked monthly, after servicing, or when a fault occurs. Be sure you have read the machine operator manual and are completely familiar with the operation of the machine before performing these safety system checks.

Use the following checkout procedures to check for normal operation of machine.

If there is a malfunction during one of these procedures, do not operate machine. **See your authorized dealer for service.**

Perform these tests in a clear open area. Keep bystanders away.

Testing Stop Button Function

1. Push main switch to OFF position.
2. Position mower within boundary wire area.
3. Push main switch to ON position.
4. Start mower operation in Mow Now Mode.
5. When the mower starts moving, push down on the Stop button.

Result: The mower and the blades will stop. The Run LED light will be flashing green.

If the mower or the blades continue to run, **see your authorized dealer for service.**

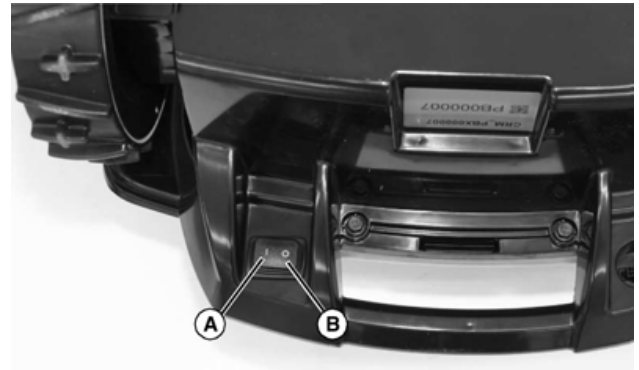
Testing Handle Presence Function

1. Push main switch to OFF position.
2. Position mower within boundary wire area.
3. Push main switch to ON position.
4. Start mower operation in Mow Now Mode.
5. After the mower is moving and the blade starts, grasp the mower handle for at least five seconds.

Result: The mower and the blades will stop. The user interface display will show fault code information.

If the mower drive or blade continue to operate, immediately turn the main power switch OFF. **See your authorized dealer for service.**

Starting and Stopping the Mower



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Mower shown upside down.

Starting Mower

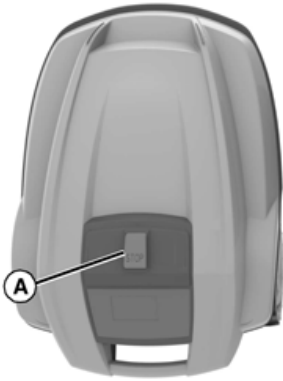
1. Push the main switch to the ON (A) position.

Stopping Mower

1. Push down on the Stop button.
2. Push the main switch to the OFF (B) position.

Operating

Emergency Stopping



MXAL47272—UN—16APR13

Push down on the Stop button (A):

- Mower will stop.
- Blades will stop.
- Run LED light will be flashing green.

Using PIN Code

The default PIN code (0 0 0 0) can be used.

PIN code entry is required after the main switch is moved to ON position.

The product should be set to a user defined PIN code to protect the mower from being manipulated by unauthorized persons.

Entering PIN Code

1. Position mower within boundary wire area.
2. Push main switch to ON position.
3. Mower will Initialize.
 - User interface display will read Mower Initializing.
 - The Run LED light will flash red.
4. User interface display will read Enter Current PIN Code.
 - a. Push Left and Right Arrow buttons to move blinking cursor through PIN code fields.
 - b. Push Up and Down Arrow buttons to scroll through and select a value in each field.
 - c. Set PIN code to 0 0 0 0.
5. Push Enter to Save PIN code.

Valid PIN Code:

 - a. User interface display will read PIN Code Valid.
 - b. User interface display will read MOWER PAUSED.
 - c. The Run LED light will flash green.

Invalid PIN Code:

 - a. User interface display will read PIN Code Invalid.
 - b. Enter PIN code and push Enter button.

- c. After three attempts, the system will time out for 10 minutes before you can enter PIN code again.
- d. Contact your dealer if you are unable to enter valid PIN code.

Operating the Mower

The autonomous mower is programmed to mow grass within a boundary wire area. The autonomous mower moves into and out of a charging station which powers the autonomous mower battery.

The autonomous mower is contained by a boundary wire that surrounds the perimeter of the mowing area and may be used to keep the autonomous mower out of areas within the mowing area. The autonomous mower will bounce off the boundary wire and obstacles within the boundary area. A second wire, a guide loop, directs the autonomous mower to the charging station.

Dealer installation of boundary wires and charging station, and initial autonomous mower setup is recommended.

Separate mowing areas from any open water with a physical barrier.

The autonomous mower is designed to mow on an optimized schedule within an area to keep the grass at a desired height. Grass should be mowed to the desired height using a conventional mower before installation of the autonomous mower to maintain that height.

Machine adjustments to compensate for slopes may result in the machine following a curved path in some condition. This does not affect area coverage performance.

The autonomous mower can operate during rain. Boundary wire should be installed to keep the autonomous mower out of any areas prone to flooding or swampiness if the autonomous mower might be operating during or soon after rain.

A safety awareness message appears at the user interface during start up and other periodic times during use. This message will clear itself. To interact with the mower during normal mowing, press the stop button and clear the safety message.

Mowing schedules are programmed using the user interface. There are three operating modes: Mow on Schedule (AUTO), Mow Now and Go Home.

Schedule Mowing

Schedule mowing when children and pets will not be around the area.

The mower should not run when irrigation is running. This is to protect sprinkler heads, eliminate pressured water on the mower, and increase traction while mowing. Allow time for grass to dry after irrigation before mowing.

Operating

For lawn health and longer machine life, schedule the mower to run no longer than required. Dealer installation will provide optimal schedule.

If the mower is scheduled for two blocks of time, it will mow both times.

1. Position mower within boundary wire area.
2. Push main switch to ON position.
3. Mower will initialize.
 - User interface display will read Mower Initializing.
 - The Run LED light will flash green.
4. User interface display will read Enter Current PIN Code.
5. Enter PIN code and push Enter to Save PIN code.
 - User interface will display informational message.

NOTE: The mower will default to the last Mow on Schedule (AUTO) Mode program used. Push Start to begin operating with the default.

6. Push button next to desired mode to select Mow on Schedule (AUTO), Mow Now or Go Home.
7. Push Enter to choose selected option. Selected options will have bold text as you scroll through them.

Mow on Schedule (AUTO) Mode

Up to three schedules can be programmed into Mow on Schedule (AUTO) Mode (See Programming Mow on Schedule Mode).

1. Push button next to Schedule (AUTO) mode.
2. Push Start and mower will begin operating or go home if mowing is not scheduled. If mower is in charging station, it will stay there if mowing is not scheduled for that time.

Mow Now Mode

In Mow Now Mode, the mower will operate for up to 60 minutes or less if charging is required. Use this mode to mow inside separate boundary areas which do not have charging stations.

1. Push Go Mow Now mode button to select an option:
 - Charge Station Area if mower can access a charging station.
 - No Charge Station if mower cannot access a charging station because station is in a separate area.
2. Push Start and mower will begin operating.

Go Home Mode

Use Go Home Mode to send the mower to the charging station if children, pets or persons unfamiliar with the mower will be in the operating area. There are two options under Go Home Now.

1. Push Go Home mode to select an option.

- Use Go Home Mode to send the mower to the charging station and resume mowing on the next scheduled day.
- Use Go Home Mode to Go Home/Stay Home until the user elects to go back on schedule.

2. Push Start to send mower home to charging station.

Programming Mow On Schedule Mode

1. Push Menu.
 - User interface display will read Main Menu, with Setup, Scheduling, Launch Points and Utilities options.
2. Push Up and Down Arrows to select Scheduling and push Enter.
 - User interface display will read Schedule 1, Schedule 2 and Schedule 3.
3. Push Up and Down Arrows to select the Schedule you want to program and push Enter.
 - User interface display will read Schedule_ followed by three lines to activate days of the week and schedule two mow times per day.
4. Push Left and Right Arrows to move blinking cursor to first day of week you want to schedule a mow time for, and push Enter to activate that day.
 - The letter for an activated day will be bold.

For easier programming use the ALL and ALT settings:

 - ALL Scheduling is for all days of the week.
 - ALT Scheduling is for alternate days of the week (Monday, Wednesday, Friday and Saturday).
5. Push Enter to move down to second line (T1) and set the time to mow on the activated day.
 - a. Push Up and Down Arrows to scroll through the hours. The schedule is a 24 hour clock.
 - b. Push Right Arrow to move blinking cursor to minutes position, and push Up and Down Arrows to scroll through 15 minute increments and select the time.
 - c. Set mowing start time and end time.
 - d. For serial numbers beginning 1SA1318 (MOWiT) or 1SA1312 (TANGO): when the battery becomes almost completely discharged (showing fault F20), it goes into standby mode. The realtime clock is powered for at least 24 hours.
6. Push Enter to move down to third line (T2) and repeat to set a second time to mow on that day.
 - If you do not want to set a second time, leave or return the third line default to None.
7. Push Enter to move back to the first line to activate additional days of the week and schedule mow times for those days.

Operating

8. Push Back to Save mow times and repeat from beginning to program two additional Schedules if needed.

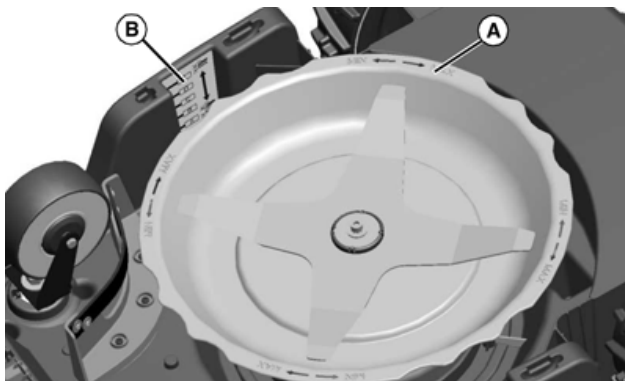
Adjusting Cutting Height

CAUTION: Rotating blades are dangerous. Before adjusting or servicing mower:

- Push down on Stop button and push main switch to OFF position. Confirm user interface and all LED's are off.
- Always wear gloves when working near blades.

Mower blade cutting height can be adjusted from 19 mm (0.75 in.) to 102 mm (4 in.) in 14 mm (0.55 in.) increments.

1. Push down on the Stop button.
2. Push the main switch to the OFF position.
3. Place a soft cloth on a work surface to protect the mower, and turn the mower on its side with the main switch on the top.



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4. Grasp the blade shield (A) and rotate to adjust cutting height.
 - Rotate blade shield clockwise to raise blade height.
 - Rotate blade shield counter clockwise to lower blade height.
5. Rotate the blade shield to the desired height shown on the height of cut label on the mower.
6. Adjust cutting height to a detent position to hold selected cutting height.

The height adjust label (B) is provided as a guide to the approximate cut height. The edge of the blade shield should align with letters when it is adjusted to a detent position. See following table for approximate height settings. The lowest two detent positions occur below the bottom of the label.

Position	Height
A	102 mm (4.0 in.)
B	88 mm (3.5 in.)
C	74 mm (3.0 in.)
D	60 mm (2.4 in.)
E	46 mm (1.8 in.)

Using Fault Codes

If something causes the mower to stop operating, a fault with a code will be displayed on the user interface. You can clear most faults; others may indicate service is required by your dealer.

See TROUBLESHOOTING in on-line extended manual for instructions on responding to fault codes.

Viewing Fault Codes

The user interface display will read Mower Fault followed by a fault code number with a description.

The most recent faults can also be viewed using the Diagnostics Menu (See Using Utilities Menu on User Interface).

Clearing Fault Codes

Push Enter to clear faults after viewing them on the user interface display.

Follow instructions in Using Utilities Menu on User Interface to delete faults viewed using the Diagnostics Menu.

Transporting Mower

1. Push main switch to OFF position.



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2. Lift mower by handle and turn to position as shown with mower blades facing away from your body.

Transporting in Vehicle

Secure the machine on or in the transporting vehicle so that the machine cannot move. Use approved load restraints such as tie down straps. Tie down straps are belt bands made of synthetic fibres, and incorporate hook ends

Operating

and a tightening device. Approved tie down straps will have a label with load rating information and important details regarding application and use.

When the machine main power switch is off, the drive wheels are free to rotate. For loaded goods that can roll, it is recommended to use direct strapping with four tie downs. Secure the machine on its wheels so that it does not move during transportation.

If the rear wheels do move, the user interface will blink on and sounds (only for serial numbers beginning 1SA1112 (Tango) and 1SA1118 (MOWiT)) will occur.

Do not leave the mower in a vehicle with excessive heat.

Service

Cleaning the Mower

⚠ CAUTION: Rotating blades are dangerous. Before adjusting or servicing mower:

- Push down on Stop button and push main switch to OFF position. Confirm user interface and all LED's are off.
- Always wear gloves when working near blades.

IMPORTANT: Do not use high pressure spray or running water on the mower. This may result in damage to electrical components.

Do not wash mower handle. Water may get into vents on handle and damage mower.

1. Place mower on a flat surface and push main switch to the OFF position. (See Stopping Safely in the Safety Section.)
2. Let machine cool if it has been operating in hot conditions. If any moisture is suspected to be on top of the blade shield or in the mower, do not tilt mower or turn mower over, but allow the mower to rest on its wheels until fully dry.
3. Turn mower onto its side with blades facing outward, away from your body.
4. Clean the blades with a brush and damp cloth.
5. Clean the underside of the mower with a soft bristle brush or cloth as needed for your mowing conditions.
6. Return the mower to upright, operating position.

IMPORTANT: Improper care of machine plastic surfaces can damage that surface:

- Do not wipe plastic surfaces when they are dry. Dry wiping will result in minor surface scratches. Use a damp, soft cloth.
 - Use a soft, clean cloth.
 - Do not use abrasive materials, such as polishing compounds, anywhere on mower.
7. Use mild soap to clean plastic surfaces. Wipe off with a damp cloth.
 8. Wipe off with a soft cloth to bring out lustre.
 9. Clean the charging station and charging contacts with a damp cloth.

Servicing the Mower Blades

⚠ CAUTION: Rotating blades are dangerous. Before adjusting or servicing mower:

- Push down on Stop button and push main switch to OFF position. Confirm user interface and all LED's are off.
- Always wear gloves when working near blades.

Do not attempt to remove or sharpen blades. Contact your dealer for blade replacement.

Checking Mower Blade Condition

1. Stop machine safely. (See Stopping Safely in the Safety Section.)
2. Let machine cool if it has been operating in hot conditions.
3. Turn mower onto its side with blades facing outward, away from your body.
4. Inspect blades for wear or damage.
5. Contact your dealer for replacement.

Servicing the Battery

Do not attempt to remove battery from mower.

Contact your dealer for battery service or replacement.

Preparing for Winter Storage

NOTE: Dealer service is recommended at the end of the mowing season before storing the machine.

It is important to prepare the machine for storage to extend battery life. Mower date and time information will be lost.

1. Remove mower from charging station.
2. Discharge the battery state of charge to 40-60% by mowing or charging.
3. Use the Utilities menu to put the mower in Mower Storage mode. Check to be sure the main switch is moved to the OFF position.
4. Clean the mower and the charging station.
5. Store mower and charging station components separate from each other in a dry, dust-free area out of the reach of children. Do not store mower in the charging station.
6. Check the resistance levels of the boundary and guide loop wires with a multi-meter at the end of each mowing season and at the beginning of the following

Service

mowing season for any changes to resistance.
Contact your dealer if you note any changes.

Service Miscellaneous

Fact Sheet for Product Safety

Manual for Lithium-Ion Battery for Autonomous Mower

The version for Germany is based on German applicable law.

Device Data	
Designation:	Autonomous Mower MOWIT 500 F / TANGO E5
Article ID:	SA1318 / SA1312
Manufacturer:	SABO-Maschinenfabrik GmbH A John Deere Company Auf dem Hoechsten 22 D - 51645 Gummersbach Tel.: + 49 2261 704-0 Fax.: + 49 2261 704 104 e-Mail: post@sabo-online.de Homepage: www.sabo-online.com
Battery Data	
Trade Name:	7S3P ICR18650-HA1 mit PCB 73SP INR-18650-13L mit PCB Lithium-Ion Manganese Battery, rechargeable
Application Area:	Li-Ion Rechargeable battery for autonomous mower (Mowit / Tango)
Article ID:	SAA10822
Manufacturer:	Batterien-Montage-Zentrum Am Sportplatz 28-30 D-63791 Karlstein am Main
Technical data:	- Nominal voltage: DC 25,2V - Nominal capacity: 3,9 Ah - Nominal energy: 98,28 Wh - Optimal performance: + 0 to + 60°C - Weight: 1000g - Number / cell type: INR18650-13L - Number / cell type: ICR 18650HA1
Equipment classification / Legal basis:	The battery is subject to the following regulations in Germany: - The Equipment and Product Safety Act (GPSG) on Consumer Products and Technical Work Equipment - The legal requirements based on the Dangerous Goods Act - The legal requirements based on the Battery Act
Certificates / Features / Standards:	CE Labeling: The battery is currently not subject to any regulation requiring CE labeling. Safety Requirements: The battery was tested and certified pursuant to The UN MANUAL of TESTS and CRITERIA, PART III; SUB-SECTION 38.3. The Lithium-Ion Battery complies with the regulations of the EU.

Potential Dangers
Safety Indications for Handling the Battery: - Do not open, take apart, solder or drop the battery. - Protect the battery from a short circuit - risk of explosion! - Protect the battery from rain, do not immerse in liquids - risk of short circuit. - Protect the battery from direct sun light, heat, and fire. - Never throw the battery in a fire - risk of explosion! - Do not use a defect, leaking, or deformed battery. - Please use only John Deere, SABO, original batteries. When using other batteries, risk of serious injury exists. In this case, John Deere, SABO, does not assume any liability. Mower warranty is void if a battery other than a John Deere or SABO battery is used.

Service Miscellaneous

- Battery fragile - take care with handling.
- Protect the lithium-ion battery from microwaves and high pressure.
- The battery must be protected against shocks. During transportation, it must be secured,. Transported according to regulations. See below.
- In the event battery produces smoke, Make sure the battery is well ventilated.- breathing in smoke may have transitory adverse effects.
- Do not use any battery that does not look normal (deformation, abnormal smell, etc.).
- Use the battery only for the original purpose provided.
- If the power supply cable is damaged, the complete power supply must be returned to the dealership where it was bought.
- When damaged, battery contents may seep out. Do not touch.
- Contact may cause skin irritation, burns, and chemical burns.
- Do not breathe any vapors that may be generated or are released.



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Measures

First-Aid Measures:

If the electrolyte or its vapors are released:

- **Contact with the skin:** wash the skin parts involved with plenty of water and soap, consult a physician if the irritation persists.
- **Contact with the eyes:** rinse with plenty of clean water for at least 15 minutes without rubbing the eyes, and consult a physician.
- **Inhalation:** Immediately move to fresh air and oxygen, and consult a physician.
- **Ingestion:** If the electrolyte is ingested, consult a physician immediately.

Medical information: Hazardous materials are:

Cells containing electrolytes with an alkaline corrosive effect

(Lithium salt in organic solvents) with Li-, Ni- and Co/LiMn oxide cathode, however no Li-metal or lithium alloys.

Measures for accidental release:

Contain leaking electrolyte liquids with sand and collect in a suitable container. Wear protective clothing:

- Gas mask for organic gases
- Safety glasses
- Gloves

The battery removed immediately from the perimeter of the fire!

Dispose of as dangerous waste in a special waste collection site according to national regulations (Disposal Code EAK: 16 06 05 or 20 01 34).

Measures for Fire-fighting:

In case of fire:

Stay away from gases that may be released. Watch the wind direction. If possible, without running any danger, remove the batteries away from the area of the fire. If the danger situation is not clear, extinguish only with metal fire extinguisher, class D. When fighting the fire, only approach the fire with protective clothing and an independent protective breathing apparatus. After the fire is successfully brought under control, the area must be monitored in general (fire watch) and must be cleared by skilled and appropriately equipped personnel. Fire residue must be secured in an orderly fashion and disposed of.

After the successful fire fighting:

Is the area to monitor general (fire watch) and clearance by trained and appropriately equipped personnel, fire residues must be properly secure and disposed.

Handling and Storage

Use and treatment of lithium-ion battery for the autonomous mower:

Under normal use the battery should not cause exposure to hazardous substances.

Under normal use no environmental damage should occur.

The battery must be disposed of separately after use because it contains dangerous chemicals. See "Disposal".

- Charge the battery only in the charging accessories that are recommended by the manufacturer. A charger that is suitable for a particular type of batteries can create a fire hazard if it is used with other batteries.
- Use only the designated battery into the mower. The use of other batteries can cause injury or fire.

Service Miscellaneous

- Keep the unused battery away from paper clips, coins, keys, nails, screws or other small metal objects that could cause a bridging of the contacts. A short circuit between the battery contacts can result in burns or fire.
- When used incorrectly, liquid can leak from the battery. Avoid contact with it. In case of accidental contact, rinse with water. When the liquid comes into your eyes, you also take medical help. Leaking fluid can cause skin irritation or burns.
- Avoid accidental activation. Make sure the power switch is turned off position before inserting a battery. The insertion of the battery to the switched mower can cause accidents.
- Do not open the battery. There is a danger of a short circuit.
- Protect the battery from heat, for example, against continuous sunlight, and fire. There is danger of explosion.
- In case of damage and improper use of the battery can escape fumes. Go to fresh air and seek for medical attention. The vapors can irritate the respiratory tract.
- Defective batteries can leak fluid and wet the adjacent items. Check the affected parts. Clean it or replace it if necessary.
- The battery should be operated within a temperature range between -5 to 30 degrees Celsius (23 to 86 degrees Fahrenheit). If the battery for a week, temperatures over 55 degrees Celsius (131 degrees Fahrenheit) is exposed, it can cause a loss of capacity of 1 to 4 percent.
- Over time, the capacity of the battery falls. If half of the face values is reached, the battery should be replaced.

Caution!

Wrong handling may cause an explosion or cause a fire! Store the battery outside the reach of children.

For service or repair, please contact a specialized John Deere, SABO dealer.

For maintenance or repair, please contact John Deere or SABO dealer.

Storage:

- Storage temperature range: -20 to 25 degrees Celsius (-4 to 77 degrees Fahrenheit).
- The manufacturer recommends storage at 10 degrees Celsius (50 degrees Fahrenheit) at a loading level of 30 to 50 percent for best battery life. A compromise between accelerated aging and self-discharge.
- The battery must be stored in a dry, well-ventilated room.
- Air humidity range: 0 to 85 percent.
- Do not use the battery, and do not store the battery, near a source of heat (> 98 degrees Celsius / 208 degrees Fahrenheit).
- The lithium-ion battery should be charged every six months to about 40 to 60 percent. These are determined by the self-discharge-rate the cell and the quiescent current of the circuit board. When delivered, the lithium-ion battery has an approximate charge of 30 percent.
- The lithium-ion battery should not be discharged when stored below 18.5 volts.

Handling and Storage

Specific Use:

- The lithium-ion battery is only intended for use for the autonomous mower and may be used only for this purpose.
- John Deere SABO and accept no liability for damages which were caused by improper use.
- Please use only John Deere or SABO original parts. John Deere and SABO assume no liability for damages caused by the use of foreign parts and accessories were created.

Read all warnings and instructions.

Failure to follow safety warnings and instructions can cause electric shock, fire and / or serious injury.

Function battery charge:

- Do not leave the mower sitting against the charge station with the power button off. The battery can be damaged. The battery is sent partially charged. Fully charge the battery of your mower before first use. The lithium-ion battery can be recharged at any time, without shortening the life span. An interruption of the charging process does not damage the battery.

Deep Discharge Protection:

The lithium-ion battery is protected by a protection circuit against deep discharge. When the mower is put in a storage mode. The battery will be in a sleep mode. The mower will not turn on when the power switch is in the "on" position. To wake up the mower spin the rear wheel and place quickly on the charging station.

Transport

- The battery is in accordance with UN Manual ST/SG/AC.10/11/Rev.3 Part III, Subpart 38.3 test. It has an effective protection against internal overpressure and short circuit and facilities to prevent violence breaking and dangerous reverse flow.

Meanwhile, despite the battery must be protected from shocks during shipping and are additionally secured against movement.

- Generally, lithium-ion batteries are classified as dangerous goods and have the transportation and packaging requirements according to the dangerous goods law.

Transport of the battery according UN 3480/3481. Since the nominal energy is not greater than 100Wh, the battery must not be sent as dangerous good.

Service Miscellaneous

- The autonomous mower battery is not restricted per PI965.

Transportation as per dangerous goods regulations:

Transportation by road / by rail / by ship / by air (ADR / RID / IMDG / IATA)

Battery (alone): UN 3480 LITHIUM ION BATTERY, KI.9, II

- **ADR/RID**

Packaging regulations: P903, P903a, P903b

Special regulations: 188, 230, 310, 348, 636, 661

- **IMDG**

Packaging regulations: P903

Special regulations: 188, 230, 310, 348, 957

- **IATA**

Packaging regulations: PI 965 Teil II max. 1 Batterie pro Versandstück

Special regulations: A51, A88, A99, A154, A164, A183

Battery (packaged in autonomous mower): UN3481 LITHIUM ION BATTERIES, CONTAINED IN EQUIPMENT, KI.9, II

- **ADR/RID not regulated per ADR**

Packaging regulations:

Special regulations: not regulated to SV188 if max. 2 batteries included

- **IMDG**

Packaging regulations:

Special regulations: to SV 188 not regulated if max. 2 batteries included

- **IATA**

Packaging regulations: PI 967 Part II max. 1 contained battery

Special regulations: A48, A99, A154, A164, A181

Web adresse for internet dangerous information:

e-Mail: dangood@iata.org

Customer Information dangerous goods: +1 (514) 390 6770

Website: www.iata.org/dangerousgoods

Information about ADR and RID:

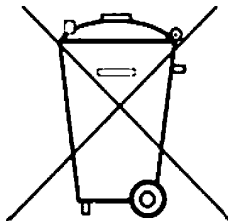
e-Mail: info@balzer-online.de

Helpline: 08001718900

Website: www.balzer-online.de

Take-back obligations/Disposal

Based on the Battery Act manufacturers assume the cost of collection, processing, and recycling of equipment, batteries and accumulators.



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For this purpose, batteries must be disposed of in the collection systems established according to national law. Joint disposal with municipal solid waste is not permitted; the waste must be separated by type of battery, which is symbolized by the symbol of the crossed-out garbage bin.

After the end of the batteries life-cycle, return the battery free of charge for disposal to your John Deere or SABO dealer or give it to a corresponding public collection point (in Germany, for example, the collection sites of the GRS - the Common Return System for Batteries), so that the battery may be disposed according to the waste and dangerous goods regulations.

IMPORTANT: Only discharged batteries without voltage on the external contacts can be dropped off. If they are only partially discharged, they must be secured against short circuit before being returned (stable cardboard packaging, ideal: original cardboard packaging).

Only for EU countries:

According to the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment and its implementation into national law, Li-Ion powered device must be collected separately and fed to environmentally friendly recycling system.

According to the Directive 91/157/EEC, used batteries must be recycled.

For Germany:

GRS

Common Foundation

Return system batteries

Heidenkampsweg 44

Service Miscellaneous

D 20097 Hamburg
Phone: +49 (40) 23 77 88
E-Mail: info@GRS-Batterien.de
subject to change

Miscellaneous

Independent laboratory tests have demonstrated that the battery's housing does not contain PAK and that the electrical components correspond to the requirements regarding Restriction on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (Directive 2002/95/EC of 1/27/2003) (no Hg, Cd, Pb, or Cr).

If a lithium-ion battery visually damaged or it seems to be a defect of the battery (no function in a short time), also other emergency, call +49 (1715441333).

The data on this fact sheet are not guaranteed product properties, but information for the user. They are issued based on the best knowledge of the regulations currently in effect. Status as of 4/2011

Specifications

Autonomous Mower

Software Version	4.1 ^a
Weight	14.7 kg (32.3 lb)
Power Supply Input	120/230 volts AC, 50/60 Hz
AC Power Input to Power Supply	110 W
Charging Station/Mower Voltage Input	36 volts DC
Battery	Lithium Ion, 25.2 volt, 98.28 watt-hour
Typical Charging Time	80 Minutes
Running Time (Typical)	60 Minutes
Mowing System	4 Sided Blade
Blade Motor Speed	2600 RPM
Blade Motor	60 watt brushless
Traction Motors	46 watts brushless @ 40 output RPM
Cutting Height	19 - 102 mm (3/4 - 4 in.)
Cutting Width	31 cm (12.2 in.)
Working Capacity	Up to 1800 sq. m. (19,375 sq. ft.)
Maximum Boundary Wire Length	350 m (1147.5 ft.)
Maximum Incline Inside Working Area	36%
Maximum Incline Near Boundary Wire	10%
Theft Protection	PIN code
A Weighted Emission Sound Power (Determined in accordance with EN 60335-2-107)	69 dB(A)
Measurement Uncertainty (In accordance with EN ISO4871)	3 dB(A)
A Weighted Emission Sound Pressure (Determined in accordance with EN 60335-2-107)	58 dB(A)
Measurement Uncertainty (In accordance with EN ISO4871)	3 dB(A)

^aIn case your product was updated with the latest software version, you can find this in the menu.

Dimensions:

Length	79 cm (31.1 in.)
Width	53 cm (21 in.)
Height	36 cm (14 in.)

Declaration of Conformity

EC Declaration of Conformity

Deere & Company
Moline, Illinois U.S.A.

The person named below declares that

Machine Type:	Consumer Autonomous Mower (CAM) Robotic battery powered electrical rotary lawn mower
Model:	Tango E5
Serial Number:	SA1312

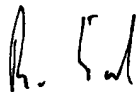
fulfills all relevant provisions and essential requirements of the following directives:

DIRECTIVE	NUMBER	CERTIFICATION METHOD
Machinery Directive	2006/42/EC	Self-Certification
Electromagnetic Compatibility Directive	2004/108/EC	TUV Rheinland of North America 762 Park Avenue Youngsville, NC 27596
RoHS Directive	2012-09-EC	Self-Certification

Name and address of the person in the community authorized to compile the technical construction file:

Brigitte Birk
John Deere GmbH & Co. KG
Mannheim Regional Center
John Deere Strasse 70
D-68163 Mannheim, Germany

Signed:



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Place of declaration: Gummersbach, Germany
Date of declaration: January 11, 2013
Manufacturing unit: SABO-Maschinenfabrik GmbH

Name: Reinhard Frank
Title: European Standards Coordinator

Service Statement

John Deere Parts



MXAL41923—UN—18FEB13

We help minimize downtime by putting genuine John Deere parts in your hands in a hurry.

That's why we maintain a large and varied inventory - to stay a jump ahead of your needs.

Prompt Service



MXAL41926—UN—18FEB13

Our goal is to provide prompt, efficient care when you want it and where you want it.

We can make repairs at your place or at ours, depending on the circumstances: see us, depend on us.

JOHN DEERE SERVICE SUPERIORITY: We'll be around when you need us.

The Right Tools



MXAL41924—UN—18FEB13

Precision tools and testing equipment enable our Service Department to locate and correct troubles quickly...to save you time and money.

Well-Trained Technicians



MXAL41925—UN—18FEB13

School is never out for John Deere service technicians.

Training schools are held regularly to be sure our personnel know your equipment and how to maintain it.

Result? - Experience you can count on!

Notes
