



# **E-SERIES**

## **ES-22 & ES-22U**

### **INSTRUCTION MANUAL**



World class turf maintenance equipment

## EU DECLARATION OF CONFORMITY

### E-SERIES Cylinder Mower powered by Electric Motors

#### Manufacturer:-

- Howardson Ltd, Howardson Works, Kirk Langley, Derby, DE6 4NJ. UK

#### Owner of Technical Document:-

- Mr I.D. Howard, Howardson Ltd, Howardson Works Kirk Langley, Derby, DE6 4NJ, UK

#### Notified Body:-

- Vincotte, Jan Olieslagerslaan 35, B-1800 Vilvoorde, Belgium

I the undersigned declare that this machine:-

Model	Cutting Width	Power (Honda)	Measured Sound Power Level	Guaranteed Sound Power Level	Serial Number
ES-22	22" 560mm	InMotion 103 (Drive) Inmotion 106 (Cylinder)	87dB Lwa	90dB Lwa	See product ID Range
ES-22U	22" 560mm	InMotion 103 (Drive) Inmotion 106 (Cylinder)	87dB Lwa	90dB Lwa	See product ID Range

Tested at:-

- Howardson Works

Complies with the applicable requirements of:-

- Machine Directive 2006/42/EC
- Noise Directive 2000/14/EC (Annex VI Procedure 1)

Managing Director



Ian Howard



Ashbourne Road, Kirk Langley, Derbyshire, DE6 4NJ, England  
Tel: +44 (0) 1332 824 777

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## UK DECLARATION OF CONFORMITY

### E-SERIES Cylinder Mower powered by Electric Motors

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#### Notified Body:-

- AnP Certification Ltd, NB8500, 2 Parkfield Street, Rusholme, Manchester, M14 4PN, UK

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Tested at:-

- Howardson Works

Complies with the applicable requirements of:-

- Supply of Machinery (Safety) Regulations 2008
- Noise Emission in the Environment by Equipment for use Outdoors Regulations 2001

Managing Director



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## SERIAL NUMBERS



NOTE:- MAKE A NOTE OF THE SERIAL NUMBER OF YOUR MACHINE AND ALWAYS QUOTE IT IN ANY COMMUNICATION WITH PERSONNEL AT DENNIS

CHASSIS  
SERIAL NUMBER

BATTERY  
SERIAL NUMBER

ROLLER MOTOR  
SERIAL NUMBER

CYLINDER MOTOR  
SERIAL NUMBER


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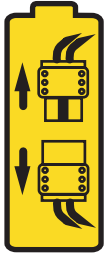
**CAUTION:-**

## READ THE INSTRUCTIONS.

We want you to obtain the best performance from this machine. If you have any difficulty in carrying out the following instructions please contact your local DENNIS dealer.



**48V**



### NEVER

- Carry out adjustments whilst the machine is running.
- Allow any unauthorised person to handle machines, in any way, at any time.
- Open or attempt any work inside the electrical box. Opening the box will void the warranty.
- Replace any electrical components or motors with non OEM parts.
- Attempt to charge the machine from any non OEM charger.
- Operate mower if electrical wires are damaged or bare cable is exposed.

### ALWAYS

- Read the operating instructions carefully and understand the controls before commencing work.
- Use safety guards and make sure they are correctly fitted in position. They are supplied for your protection.
- Before starting work always visually check machine for damage or wear to parts.
- Look behind before starting to reverse and watch out for children or pedestrians.
- Respect powered machines. Always keep hands and feet clear of moving parts and remember that brushes and rollers can continue to rotate even after the power unit is switched off.
- Switch off the power and disconnect the battery before servicing or making repairs.
- Never lift or carry a machine whilst any parts are moving.

## TRAINING

- 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 or insurance may restrict the age of the operator.
- Never mow while people, especially children, or pets are near by.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to the other people or their property.

## PREPERATION

- Thoroughly inspect where the equipment is to be used and remove all stones, sticks, wire, bones and other foreign objects.
- Before using the machine always inspect the safety devices, including the emergency cut-off switch, as well as checking the blades for excessive wear or damage. Replace if necessary.
- While mowing always wear substantial footwear and long trousers. Do not operate the mower barefoot or in open sandals.
- In dry, dusty or windy conditions it may be necessary to wear eye protection to protect your eyes from flying debris.

## OPERATION

- Do not operate the machine when tired, ill, under the influence of drugs or alcohol.
- Mow only in daylight or good artificial light.
- Avoid operating the machine in wet grass where feasible.
- Always be sure of your footing on slopes.
- Walk. Never run.
- Walk across the face of slopes, never up and down.
- Exercise extreme care on slopes, especially when changing direction.
- Do not mow steep slopes.
- Use extreme caution when reversing or pulling the machine towards you.
- Stop the blades and tilt the mower back on the rear roller when crossing surfaces other than grass or when transporting between areas to be mown.
- Never operate the mower with defective guards or shields or without safety devices, for example without the grassbox in place.
- Do not put hands or feet near the under rotating parts. Keep clear of the discharge opening at all times.
- Never pick up or carry the mower while the motors are running.

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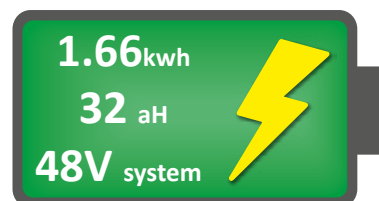
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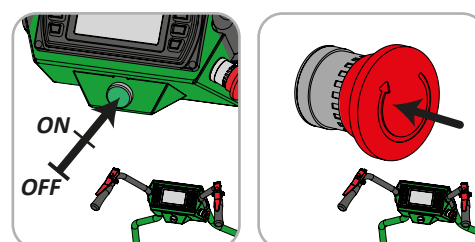
**KEY INFORMATION** – Lithium battery packs will self-discharge over extended periods of time without maintenance. Once lithium-ion cells discharge below a certain voltage they become unusable and must not be discharged further (*Deep Discharge state*). Regular monitoring and maintenance is essential for long storage or idle periods. Dennis will not be held responsible for damage due to neglect.



## Recommendations to ensure maximum battery life:

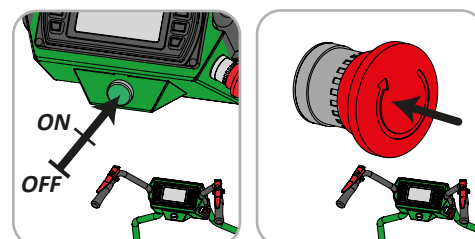
### Leaving your mower for a few days

- Never leave the battery unit below 15% charge when stored
- Always turn the key off and press the E-Stop in



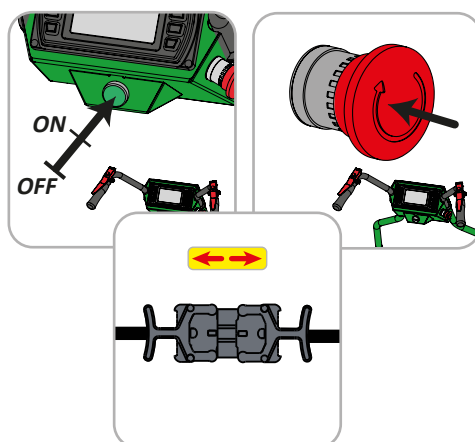
### Leaving your mower stored for any extended period of time (>30 days)

- Never leave the battery unit with below 50% charge when stored
- Always turn the key off and press the E-Stop in
- Ideally disconnect the battery unit plug from the electrical box
- If left for more than 45 days, it is important that it is checked periodically and if necessary charged.

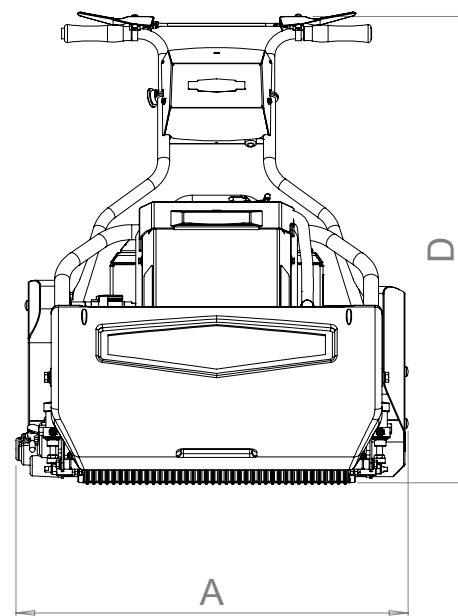
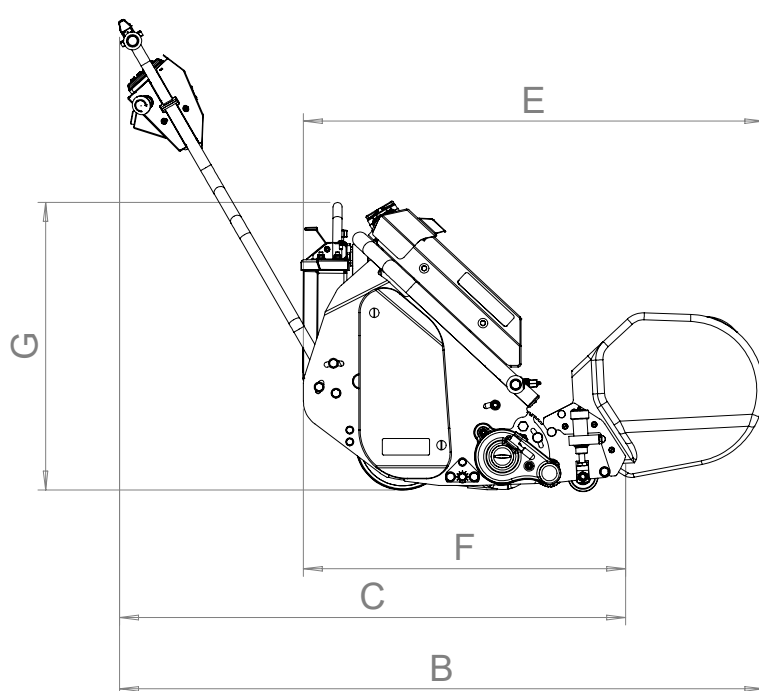


### Transporting your mower

- Never ship the mower with below 25% charge
- Charge mower to approx. 70% SOC for transport
- Always turn the key off and press the E-Stop in
- Always disconnect the battery unit from the electrical box

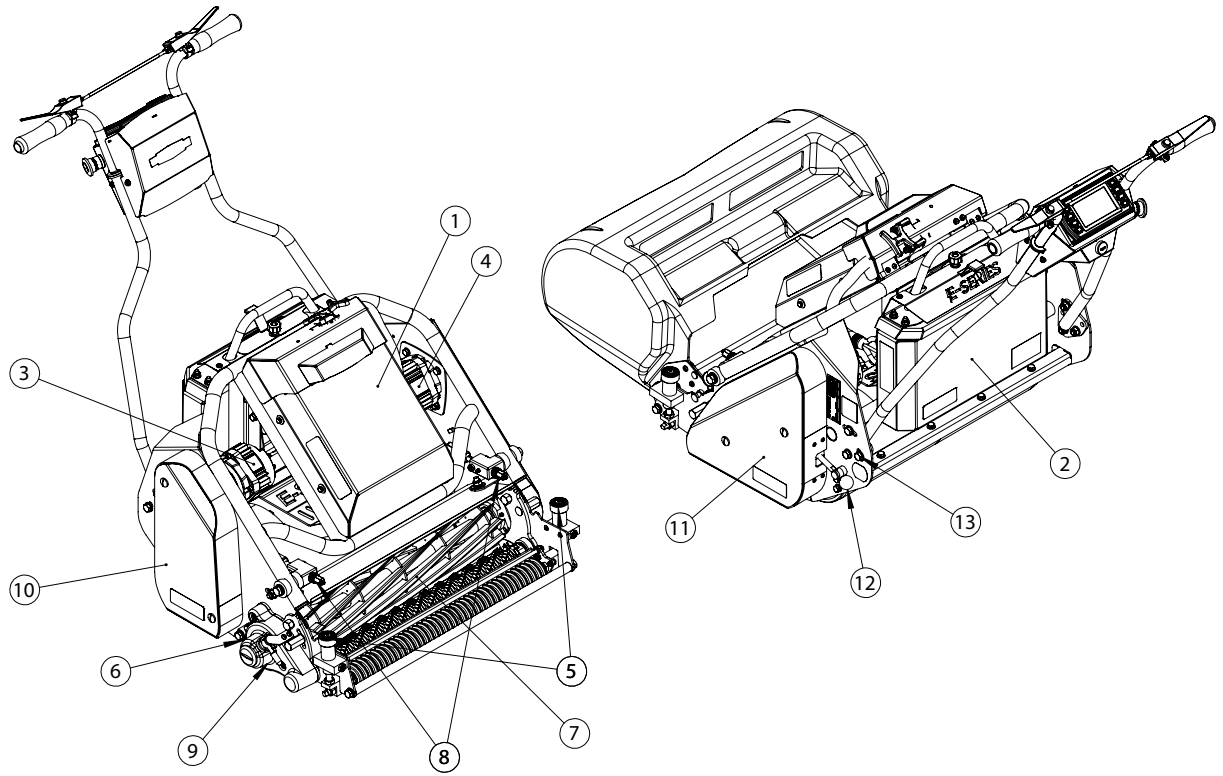


# ES-22 CYLINDER MOWER TECHNICAL DATA

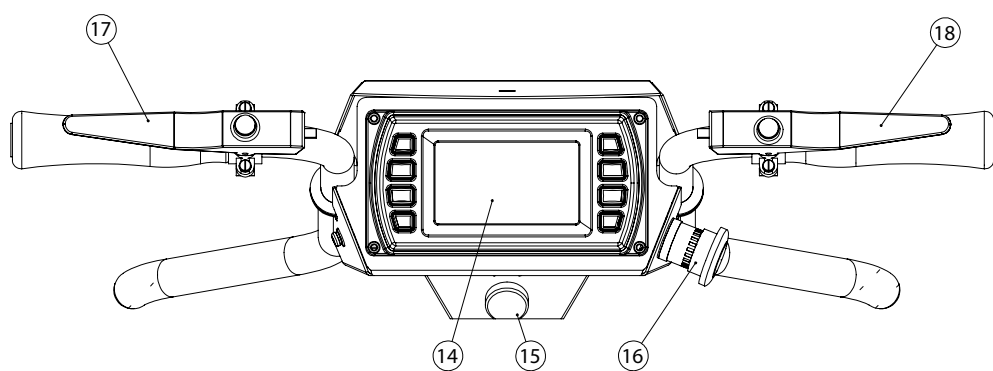


	ES-22	ES-22U
<b>DIMENSIONS</b>		
Cutting Width (mm)	560	560
Machine Width (mm) <b>A</b>	810	830
Machine Length <small>Inc handles</small> (mm) <b>B</b>	1265	1313
Chassis Length <small>Inc handles</small> (mm) <b>C</b>	936	984
Machine Height <small>Inc Handles</small> (mm) <b>D</b>	1020	1020
Machine Length <small>Exc handles</small> (mm) <b>E</b>	927	975
Chassis Length <small>Exc Handles</small> (mm) <b>F</b>	601	649
Machine Height <small>Exc Handles</small> (mm) <b>G</b>	608.5	608.5
Weight <small>Exc Cassette</small> (kg)	138kg	140kg
<b>DRIVE SYSTEM</b>		
Roller Motor (W)	630	
Roller Drive System	Timing Belt	
Cylinder Motor (W)	1200	
Cylinder Drive System	Belt	
<b>ELECTRICAL SYSTEM</b>		
Battery Type	Lithium Ion	
System Voltage	48V	
Battery Capacity (Ah)	32	
Self Discharge @ 25 °C	< 2% per month	

# ES-22 CYLINDER MOWER TECHNICAL DATA



No.	PART	No.	PART
1	Electrical Box	8	Sheer Blade Adjustment Bolts
2	Battery	9	Groomer Assembly
3	Roller Motor	10	RH Belt Guard
4	Cylinder Motor	11	LH Belt Guard
5	Front Roller Height Adjuster	12	Parking Brake
6	Cylinder Alignment Bolt	13	Handlebar Adjuster
7	Cylinder		



No.	PART	No.	PART
14	Display Screen	17	LH Handle - Deadmans Handle
15	Start Button	18	RH Handle - Throttle
16	Emergency Stop		

# V150 MOWER BASIC CONTROLS

FOR THE LOCATION OF CONTROLS AND COMPONENTS REFER TO 'TECHNICAL DATA' PAGES. BE FAMILIAR WITH THE CONTROLS AND THE PROPER USE OF THE EQUIPMENT BEFORE STARTING.

## SWITCHING THE MOWER ON/OFF

- Ensure the **EMERGENCY STOP** button is released before switching the mower on. It will not start otherwise.
- The **KEY SWITCH** controls power to the electrical components and can be used to switch the machine ON.
- To turn the mower OFF, turn the **KEY SWITCH** to the OFF position or hit the **EMERGENCY STOP** button.

## MOVING OFF/STOPPING

- The **DEADMANS HANDLE** is an operator presence control. This must be depressed before the drive and motor will engage. Releasing the handle during operation will cut power to both motors.
- To drive, depress the **DEADMANS HANDLE** and then the **THROTTLE**. The machine will go into Drive automatically and move forward. When released, the machine will return to Neutral.
- To reverse, select reverse on the display and then depress the **DEADMANS HANDLE**, and then **THROTTLE**. In reverse, the machine will not return to Neutral.

## CYLINDER OFF/ON

- The **DEADMANS HANDLE** is an operator presence control. This must be depressed before the drive cylinder motors will engage. Releasing the handle during operation will cut power to both motors.
- Press the **CYLINDER ON/OFF** button on the display to activate the cylinder.
- For Variable RPM modes, the cylinder will spin up to a nominal speed. It will adjust in line with the roller speed clip rate once the throttle is depressed.
- For Fixed RPM modes, the cylinder will spin up to the set speed immediately
- When the **DEADMANS HANDLE** is released, the cylinder drive will disengage. It will not re-engage until the **CYLINDER ON/OFF** button is pressed again.
- The cylinder will not engage while the machine is in reverse or neutral.
- The machine can also be controlled using the integrated display screen buttons.

## MECHANICAL PARKING BRAKE

- The machine has a mechanical parking brake located on the side guard to be used when the machine is not in use.
- This applies a mechanical brake to the rear roller. It is only to be engaged when the machine is stationary, it is **NOT** to stop the machine.
- Latch the brake lever below the brake boss to engage and swing back above the brake boss to disengage (**TECHNICAL DATA, ITEM 11**).
- The display will automatically display **PARK** on the gear selection icon when the brake is engaged.
- The brake must be disengaged before the gear selection can be changed by the operator.



### **NOTE:-**

The mechanical parking brake is engaged. This must be disengaged to allow the mower display to be set to drive or reverse.

### **NOTE:-**

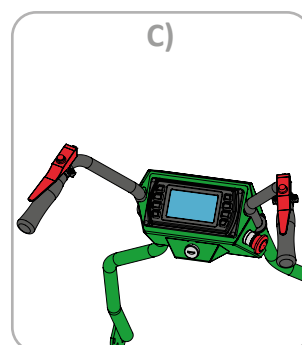
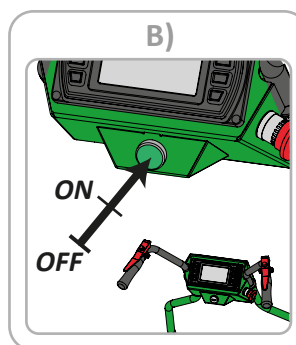
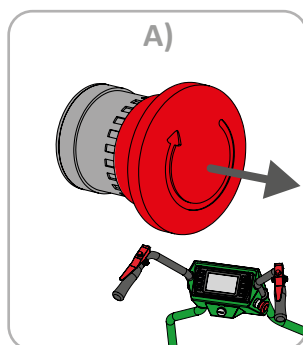
Pushing the mower, when not motor driven, should always be done in NEUTRAL to avoid damaging the internal motor brake.

# V150 SERIES BASIC OPERATING DISPLAY

**E-SERIES**  
by **DENNIS**

## KEY START

- Release **E-Stop**
- Press Start Button into latched in ON position
- Wait for display screen to boot



**Cylinder ON / OFF**  
When in **DRIVE** only



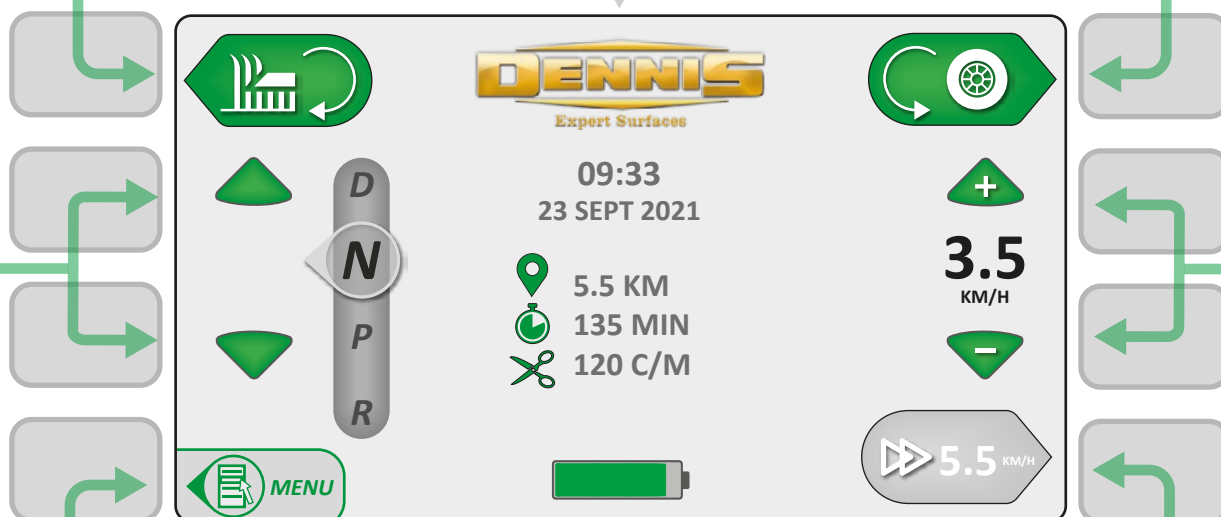
**TIME - DATE**

TRIP DISTANCE

TRIP TIME

SELECTED CLIP RATE or RPM

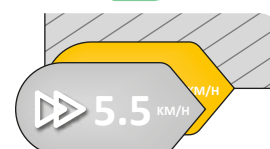
**Roller ON / OFF**  
When in **DRIVE** or **REVERSE**  
(Control from button or hand controls)



Enter **MENU**

**BATTERY LEVEL**

	<b>DRIVE</b> - Roller direction forwards
	<b>NEUTRAL</b> - Free rolling
	<b>PARK</b> - Mechanical parking brake is on
	<b>REVERSE</b> - Roller direction backwards



**Transport Speed**  
Turn **ON / OFF**

Increase / Decrease  
Forward Speed  
(0.1 increments)

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# V150 CYLINDER MOWER DISPLAY GUIDE

**E-SERIES**  
by **DENNIS**

## OPERATIONS SCREEN

PAGE A

**HOME SCREEN**

**MAIN MENU**

**EDIT CLIP RATES**

**EDIT RPM RATES**

**TRIP LOGS**

**BATTERY INFO**

ES-20  
Serial No. - ES2000001  
DENNIS NO.1

## MACHINE SETTINGS

PAGE B

**HOME SCREEN**

**EDIT MACHINE NAME**

**EDIT TIME / DATE**

**SCREEN BRIGHTNESS**

**MAIN MENU**

**LOCK / UNLOCK EDITING**

**EDIT PASSWORD CODE**

**DOWNLOAD LOG (TO USB)**

ES-20  
Serial No. - ES2000001  
DENNIS NO.1

## MAINTENANCE SCREEN

PAGE C

**HOME SCREEN**

**DAILY CHECKS**

**MONTHLY CHECKS**

**YEARLY CHECKS**

**MAIN MENU**

Last Completed 24/10/2019

Last Completed 24/10/2019

Last Completed 24/10/2019



BACK LAPPING IN  
MONTHLY CHECKS



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## RATE SELECTION

PAGE C

**HOME SCREEN**

**SELECT DEFAULT**

**SELECT USER DEFINED**

**SELECT USER DEFINED**

**MAIN MENU**

'RATE 120 C/M'  
120 C/m - FACTORY SETTING

'RATE B'  
XXX C/m - 'USER DEFINED DESCRIPTION'

'RATE C'  
XXX C/m - 'USER DEFINED DESCRIPTION'

3 MORE USER DEFINED  
SELECTION OPTIONS

## INFORMATION SCREEN

PAGE D

**HOME SCREEN**

**MANUAL INFORMATION**

**FREQUENTLY ASKED QUESTIONS**

**CONTACT INFORMATION**

**MAIN MENU**

ES-20  
Version - SP27002\_REV2.Z1  
Serial No. - ES2000001  
DENNIS NO.1

**FACTORY SETTINGS**

# ES-20/ES-22/ES-22U/ES-24/ES-26 ELECTRIC CYLINDER MOWER

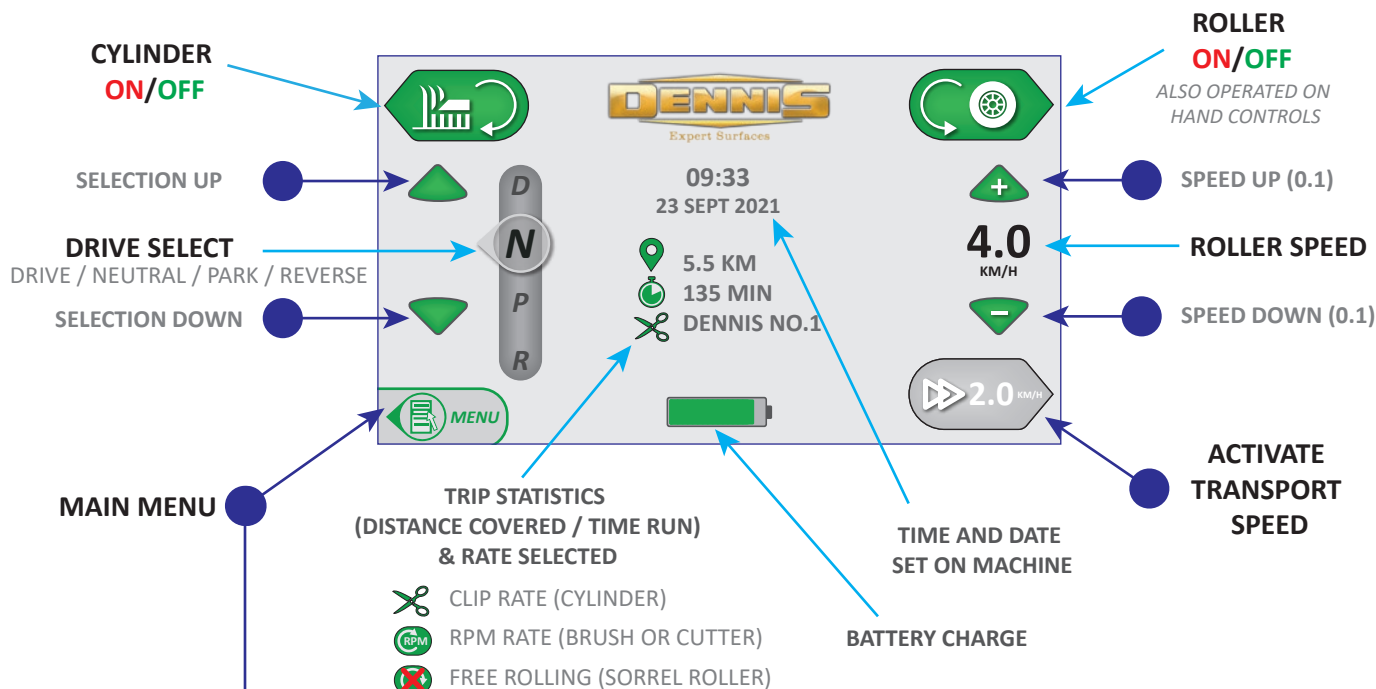


## HOME SCREEN



	<b>BUTTON SELECTION</b>
	<b>SCREEN INFO</b>

OPERATING SCREEN FOR MOWER. ALWAYS AN OPTION ON OTHER SCREENS TO GET STRAIGHT BACK TO THIS SCREEN (TOP LEFT ICON).

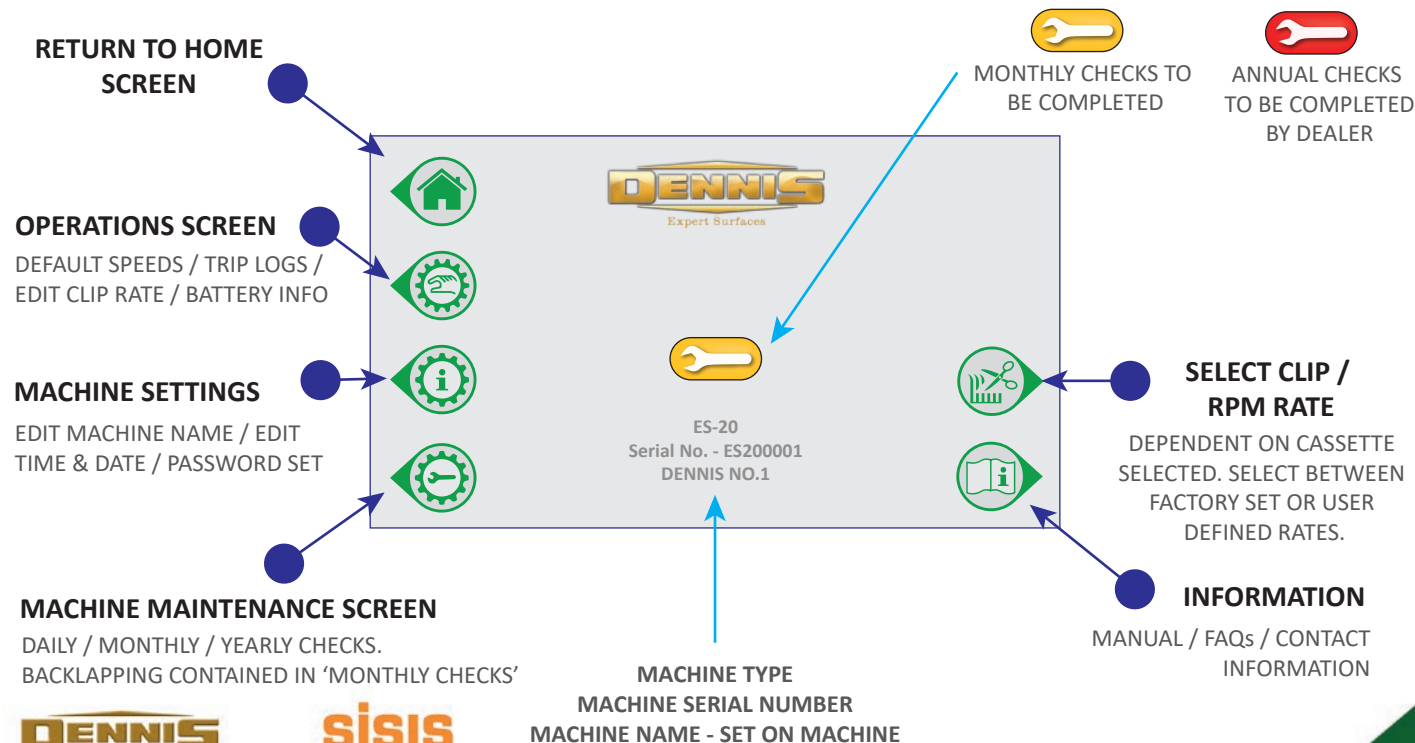


## MAIN MENU



	<b>BUTTON SELECTION</b>
	<b>SCREEN INFO</b>

MAIN MENU SCREEN. ALWAYS AN OPTION ON OTHER SCREENS TO GET STRAIGHT BACK TO THIS SCREEN (TOP RIGHT ICON).



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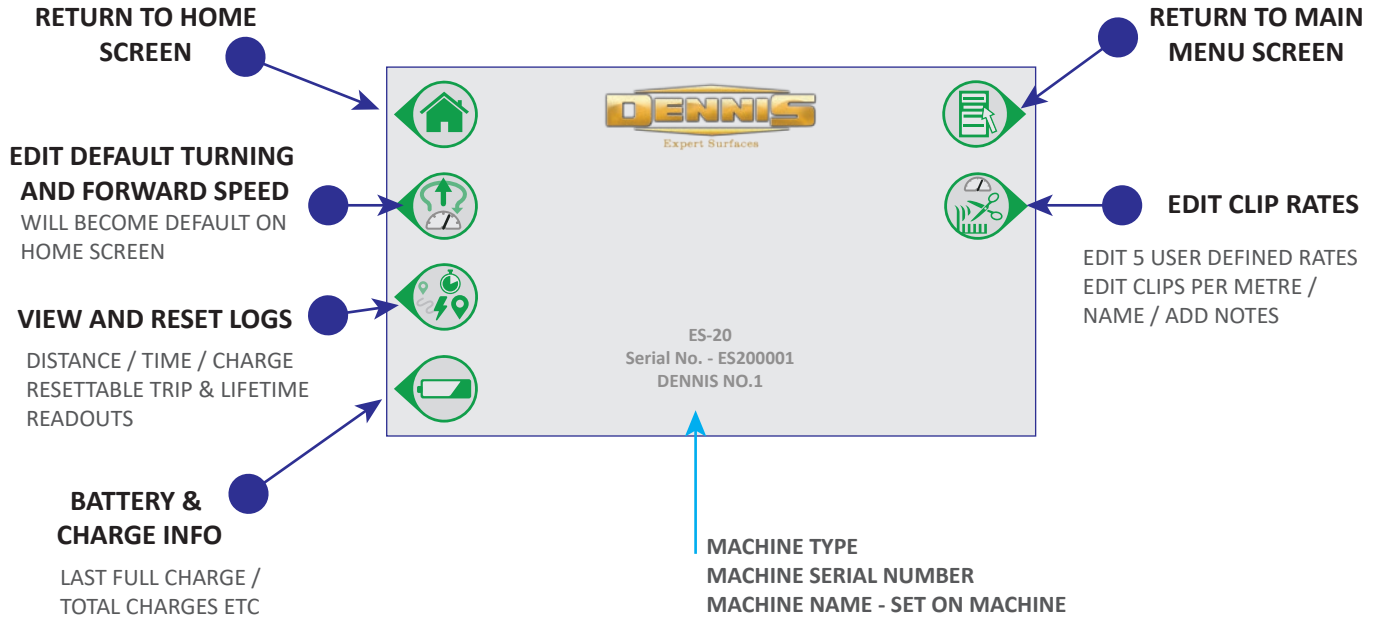
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## OPERATIONS SCREEN



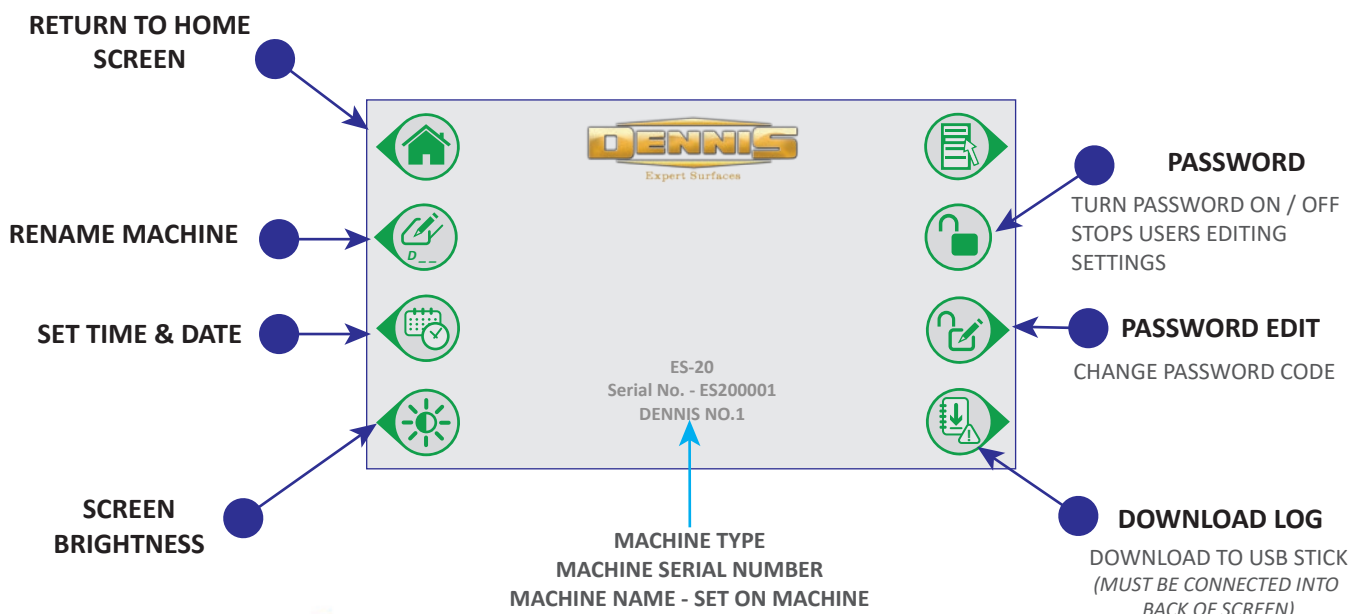
	<b>BUTTON SELECTION</b>
	<b>SCREEN INFO</b>



## MACHINE SETTINGS



	<b>BUTTON SELECTION</b>
	<b>SCREEN INFO</b>



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## MAINTENANCE SCREEN



	<b>BUTTON SELECTION</b>
	<b>SCREEN INFO</b>

MAINTENANCE SCREEN. SELECT AND SIGN OFF DAILY / WEEKLY & YEARLY CHECKS. BACKLAPPING (REVERSE CYLINDER) IN MONTHLY CHECKS.

**RETURN TO HOME SCREEN**

**RETURN TO MAIN MENU SCREEN**

### DAILY CHECKS

GIVES LIST OF CHECKS. LOG AS COMPLETE ONCE DONE

### MONTHLY CHECKS

GIVES LIST OF CHECKS. LOG AS COMPLETE ONCE DONE

### ANNUAL CHECKS

GIVES LIST OF CHECKS. LOG AS COMPLETE ONCE DONE



LAST DATE COMPLETED. ARE CHECKS UP TO DATE

CLICK ON BOTTOM THIS SIDE TO SEE EXPANDED LOG LIST

## CLIP RATE SELECTION



	<b>BUTTON SELECTION</b>
	<b>SCREEN INFO</b>

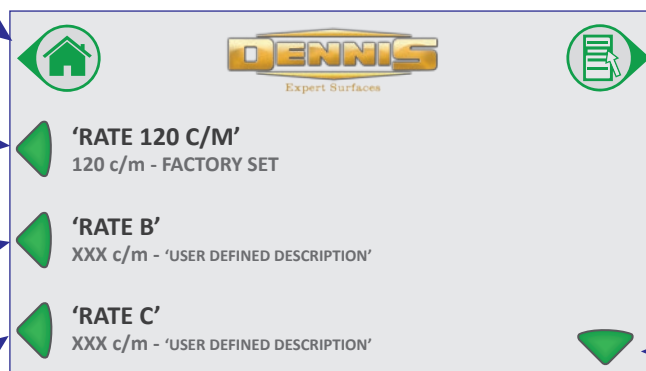
SELECT YOUR CLIP RATE, WHEN CHOSEN IT WILL RETURN YOU TO HOME SCREEN READY TO OPERATE. CLIP RATE MAINTAINED EVEN WHEN SPEED ALTERED.

**RETURN TO HOME SCREEN**

**SELECT DEFAULT CLIP RATE**

**SELECT USER DEFINED CLIP RATE**

**SELECT USER DEFINED CLIP RATE**



**PAGE DOWN**

NEXT 3 USER DEFINED SELECTIONS







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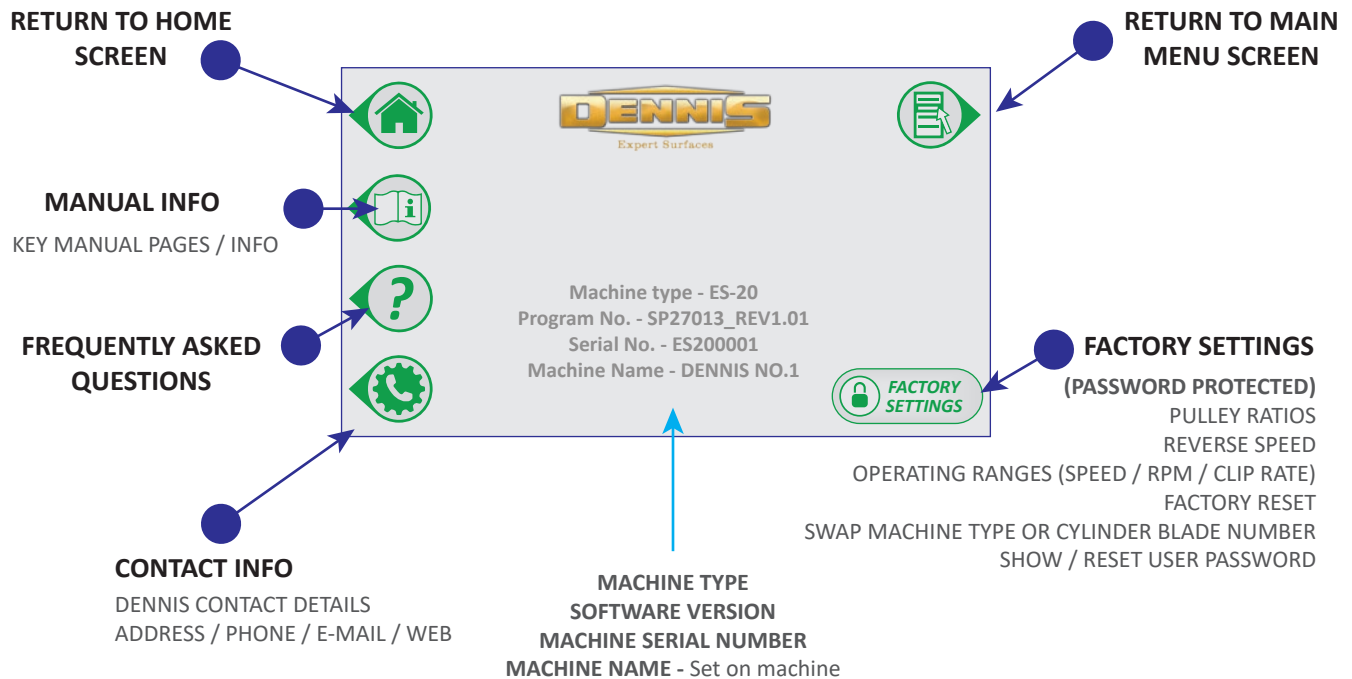
SP19092\_REV0

## INFORMATION SCREEN

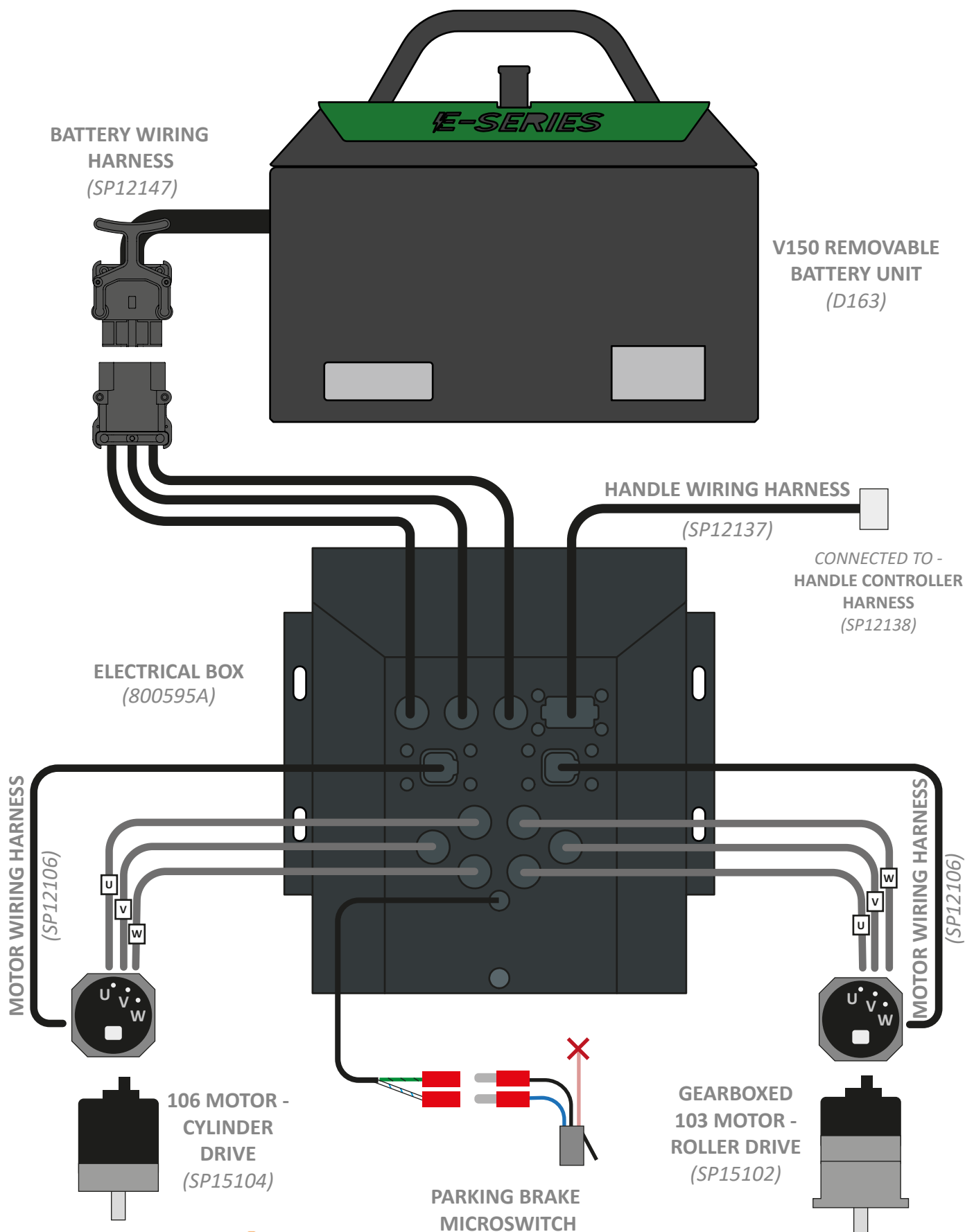


		<b>BUTTON SELECTION</b>
		<b>SCREEN INFO</b>

INFORMATION SCREEN. VIEW SELECT MANUAL PAGES, FREQUENTLY ASKED QUESTIONS AND DENNIS CONTACT DETAILS.



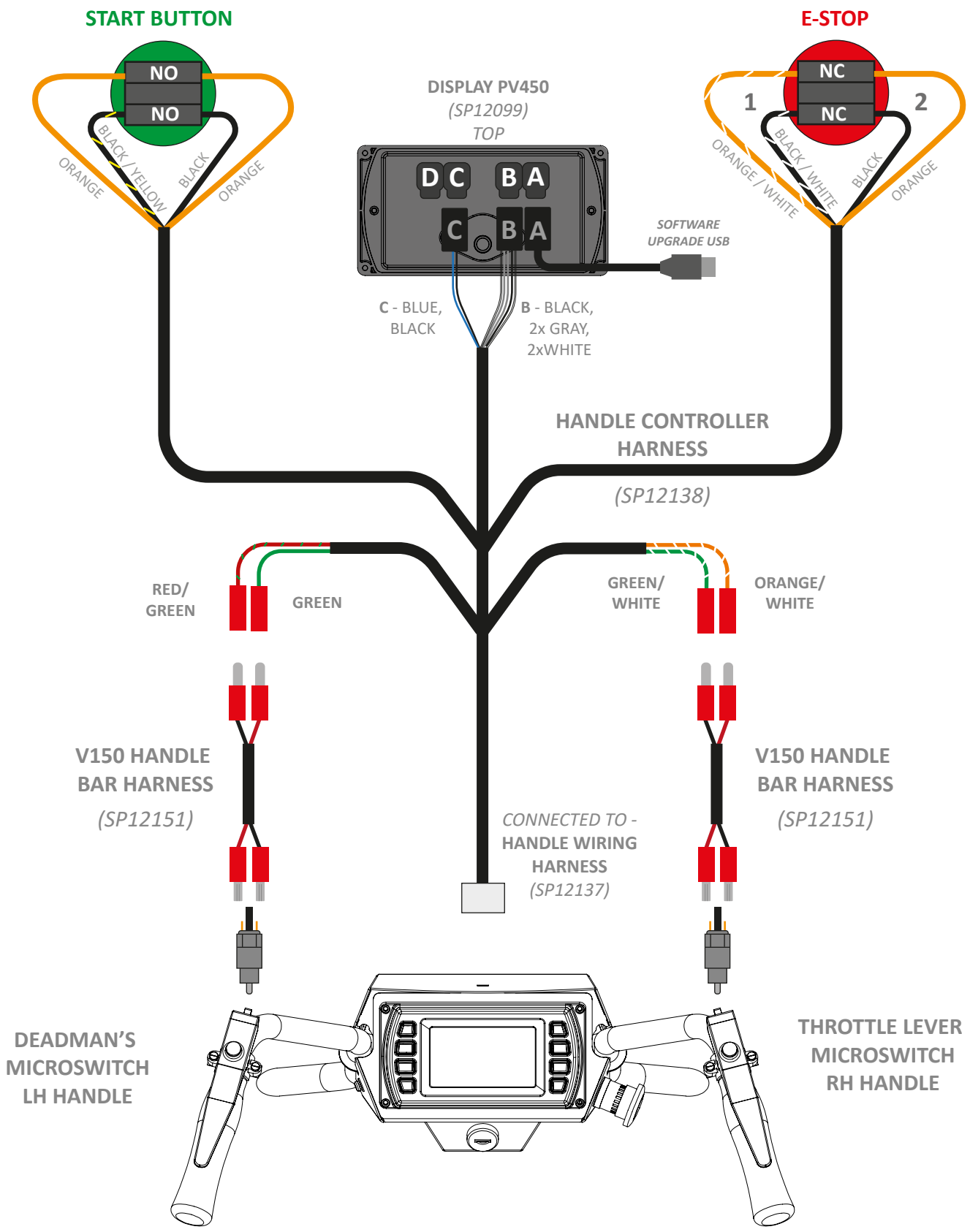
# E-SERIES V150 MACHINE WIRING



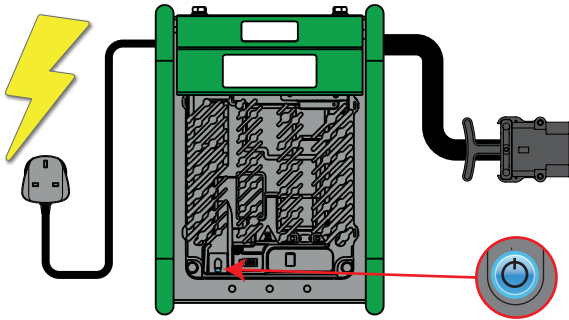
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SP19053\_REV1 - 06/07/2022

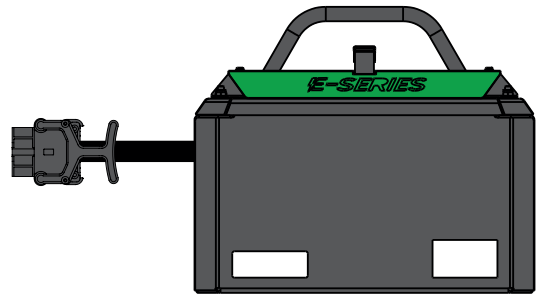
# E-SERIES V150 MACHINE WIRING



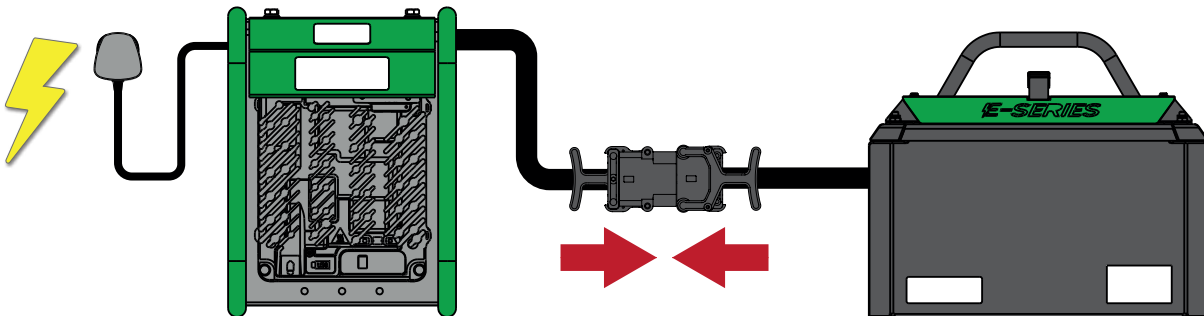




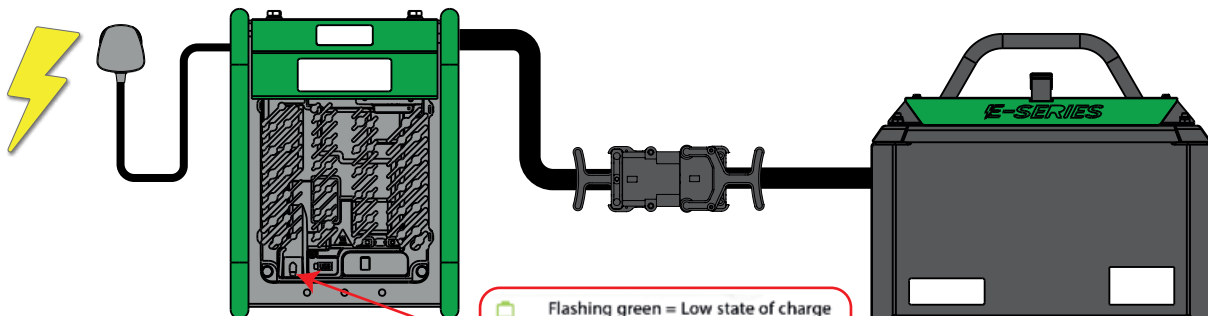
PLUG CHARGER (D164) INTO WALL/POWER SUPPLY. MAKE SURE BLUE DISPLAY LIGHTS IS ILLUMINATED TO BE SURE POWER IS LIVE TO CHARGER



DISCONNECT BATTERY (D163) FROM MOWER. BATTERY CAN REMAIN FITTED TO MOWER OR COMPLETELY REMOVED.



CONNECT BATTERY TO CHARGER USING SOCKET.

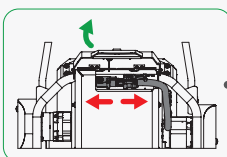


Flashing green = Low state of charge  
Solid green = High state of charge  
Flashing green = High state of charge  
Solid green = Charge completed

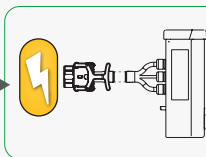
SOLID GREEN LIGHT WHEN FULLY CHARGED. CHARGER CAN BE REMOVED AND RECONNECTED TO MACHINE.  
(SAFE TO REMOVE CHARGER AT ANY TIME DURING CHARGE)

## E-SERIES V150 FAQs

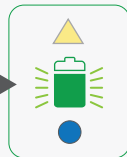
How do I charge my mower?



Lift charger cover & disconnect battery



Plug battery into charger



BLUE - Power Battery icon flashing to indicate charging

KEY ICONS - MAIN MENU SCREEN



### Operations

Default speeds / Info / Edit Clip rates



### Machine Settings

Password / Time & Date / Screen Brightness



### Maintenance

Daily / Monthly / Annual



### Cassette Select

Select cassette type fitted, ES-510, ES-610 only



### Clip / RPM select

Select from default and user defined rates



### Information

Contact / Manual / FAQs

How do I edit RPM & Clip Rates?



Menu



Operations



Clip / RPM



Increase



Edit display name



Decrease



Edit notes



Save changes

How do I edit the default Forward & Transport speed?



Menu



Operations



Speed Settings



Transport



Forward



Increase



Decrease



Save changes

How do I backlap my cylinder?



Menu



Maintenance



Monthly



**START / STOP icon - Run cylinder in reverse direction. Set at 120 rpm**

**WARNING! NEVER PUT ANY BODY PART NEAR AN OPERATIONAL CYLINDER**

Why does 'Daily Checks' show on start up?



The 'Daily Checks' screen will show on start up each day until the operator confirms they have completed the daily checks required before initial operation.

Once checks have been completed they can be registered as complete (tick icon), which will log the date on the checks register.



Confirm checks have been completed and can be logged



Log List

View completed log list. Available for DAILY, MONTHLY & ANNUAL checks

What is the default password?



**DEFAULT PASSWORD - 1 1 1 1**



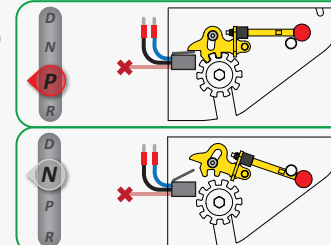
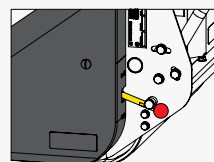
Password protecting your mower will stop unauthorised modification of values and setting while still allowing an operator to use the machines.

Contact Dennis or your dealer if you have changed and forgotten your password. They can talk you through resetting your password.



The 'Parking Brake' icon won't disengage?

Parking brake microswitch stuck 'ON' in closed position. (image right) Check hammer is disengaging.



FAQ section also available within the 'Information' section



-> 'FAQ'



on the mower display screen.

# V150 CYLINDER HEIGHT OF CUT ADJUSTMENT

**E-SERIES**  
by **DENNIS**



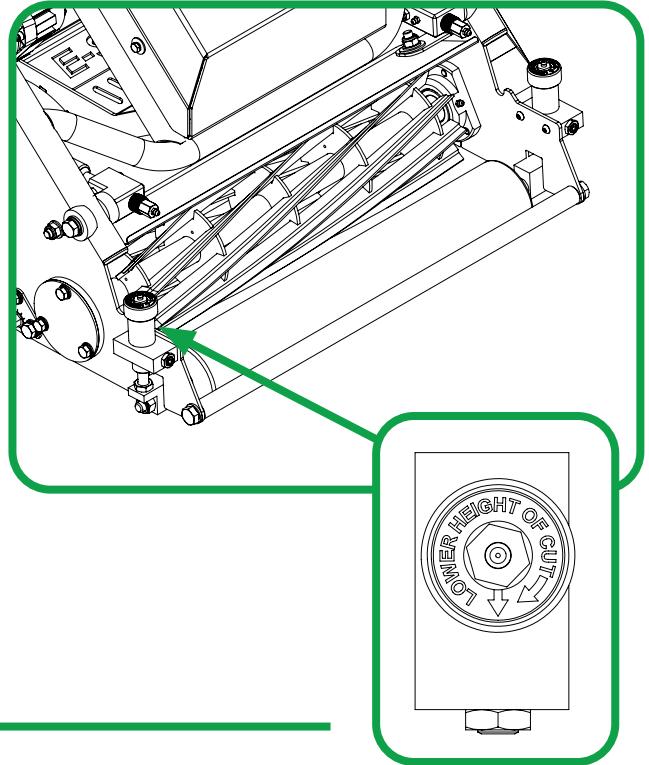
**WARNING:-** Always switch the machine off before adjusting the height of cut. Failure to do this may result in serious injury.

## Setting for Height of Cut:

The length of grass after cutting depends on the setting of the front roller in relation to the main frame of the machine.

## To Adjust:

Turning the height of cut adjuster raises and lowers the front roller on the machine. It uses a click system to allow easy adjustment of the front roller position. Each click represents a change of 0.5mm (0.020"). The roller is set to be equal on leaving the factory so when the arrows point forward on both decals the roller is level.

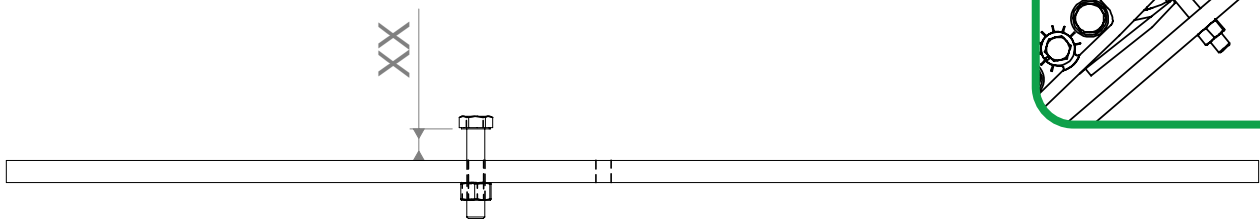
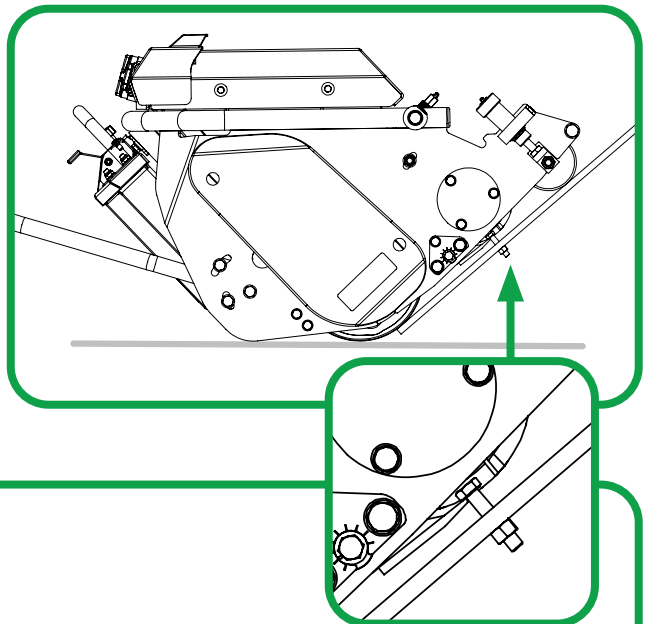


To accurately check the height of cut and that the machine is level on dedicated cylinder machines, the setting bar can be used (229524). Place the bar between the front and rear rollers, resting the underside of the bolt head on the lip of the shear blade.

A ruler can be used to set the setting bar to the correct position. You are measuring the distance between the bar and the underside of the set screw. ('XX' in the image below)

Remember height of cut is affected by moisture of turf, weight of machine and the thatch density. Different models of machine cut at different heights when set to the same position with the setting bar. We suggest you set the machine slightly above your planned height and then come down in height by trial.

Always check height of cut/operation with the setting bar provided. Check in two positions i.e. one at either end of the cylinder. Failure to do this could result in an uneven cut.



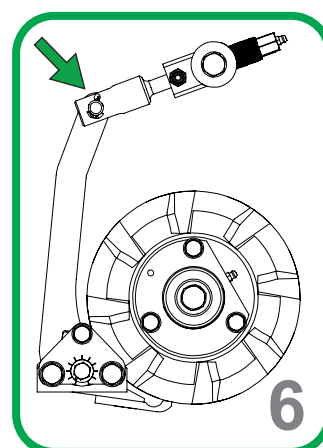
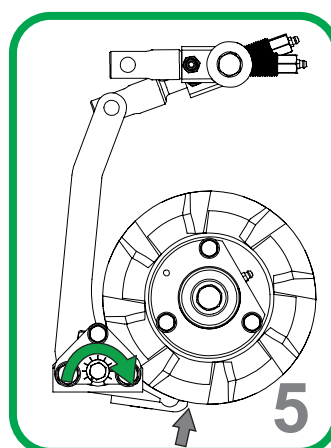
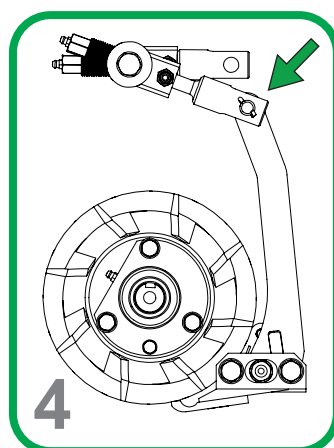
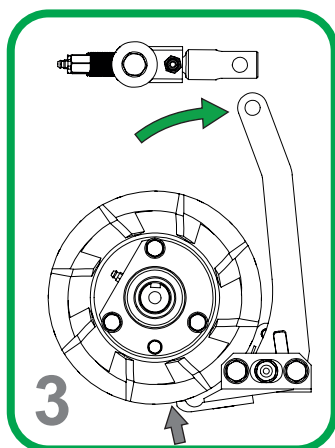
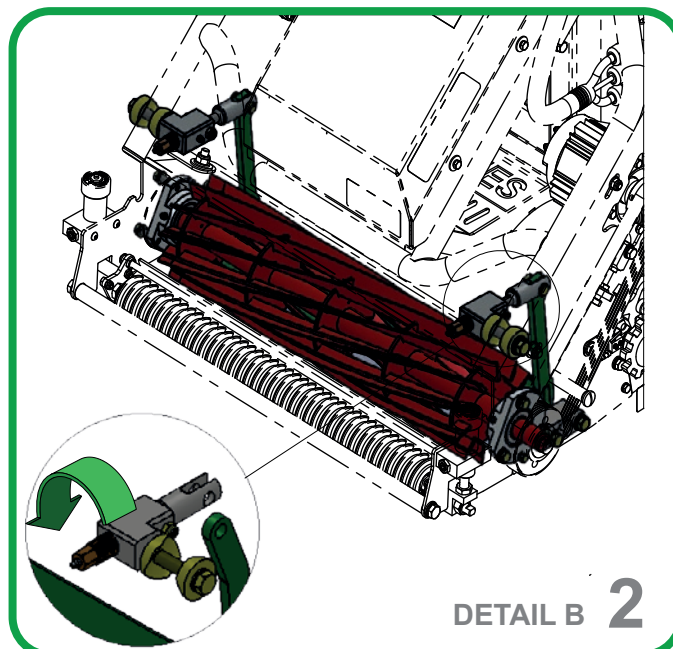
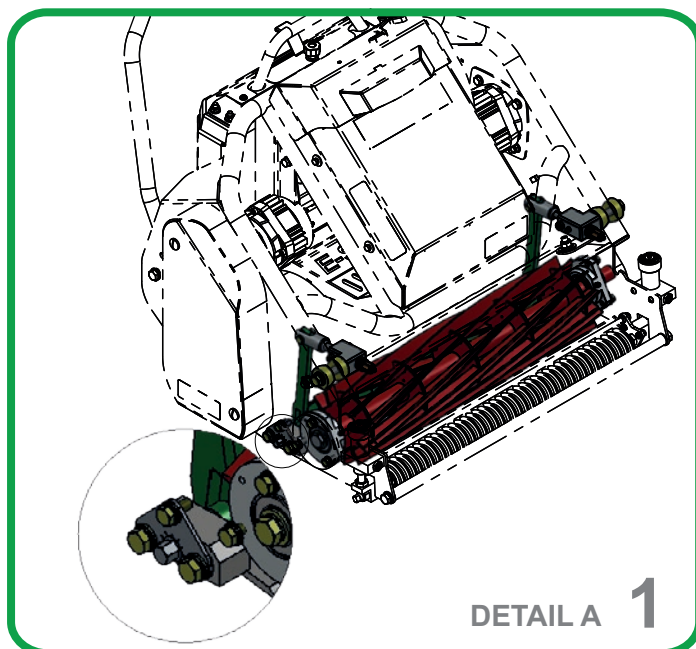
**DENNIS**

**sisis**

World class turf maintenance equipment

SP19093\_REV0

# V150 CYLINDER SHEAR BLADE SETTING



1: Ensure access to left hand side of machine, as facing the machine from the front.

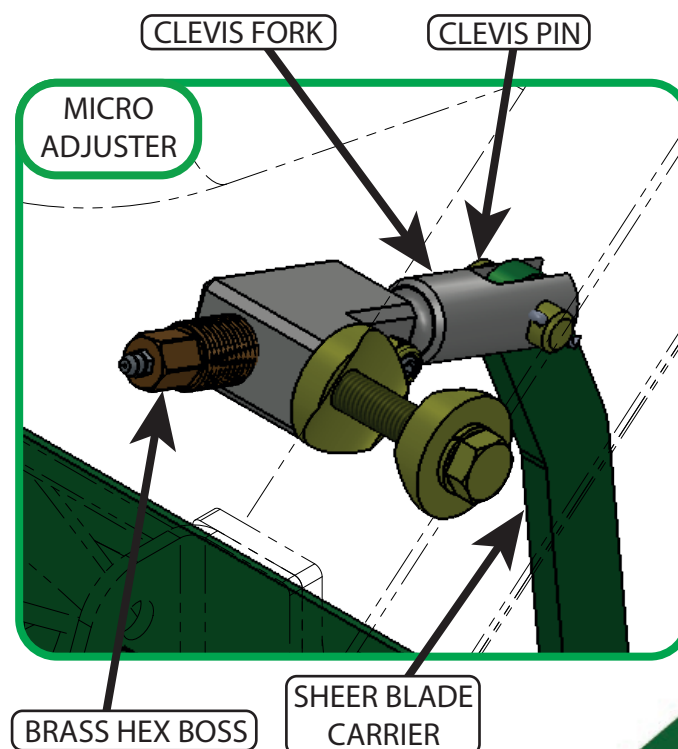
2: Wind brass hex bosses back as far as possible in both micro adjusters, anti-clockwise using a 15mm spanner.

3: Push right hand pivot arm of shear blade carrier back, so that the shear blade touches the cylinder.

4: Wind clevis fork out until it can be fitted to the shear blade carrier, and then fit the clevis pin and secure with the split pin. Do not wind brass hex boss.

5: Turn Cam Bolt on the left of the machine (Detail A) so that the shear blade touches the cylinder.

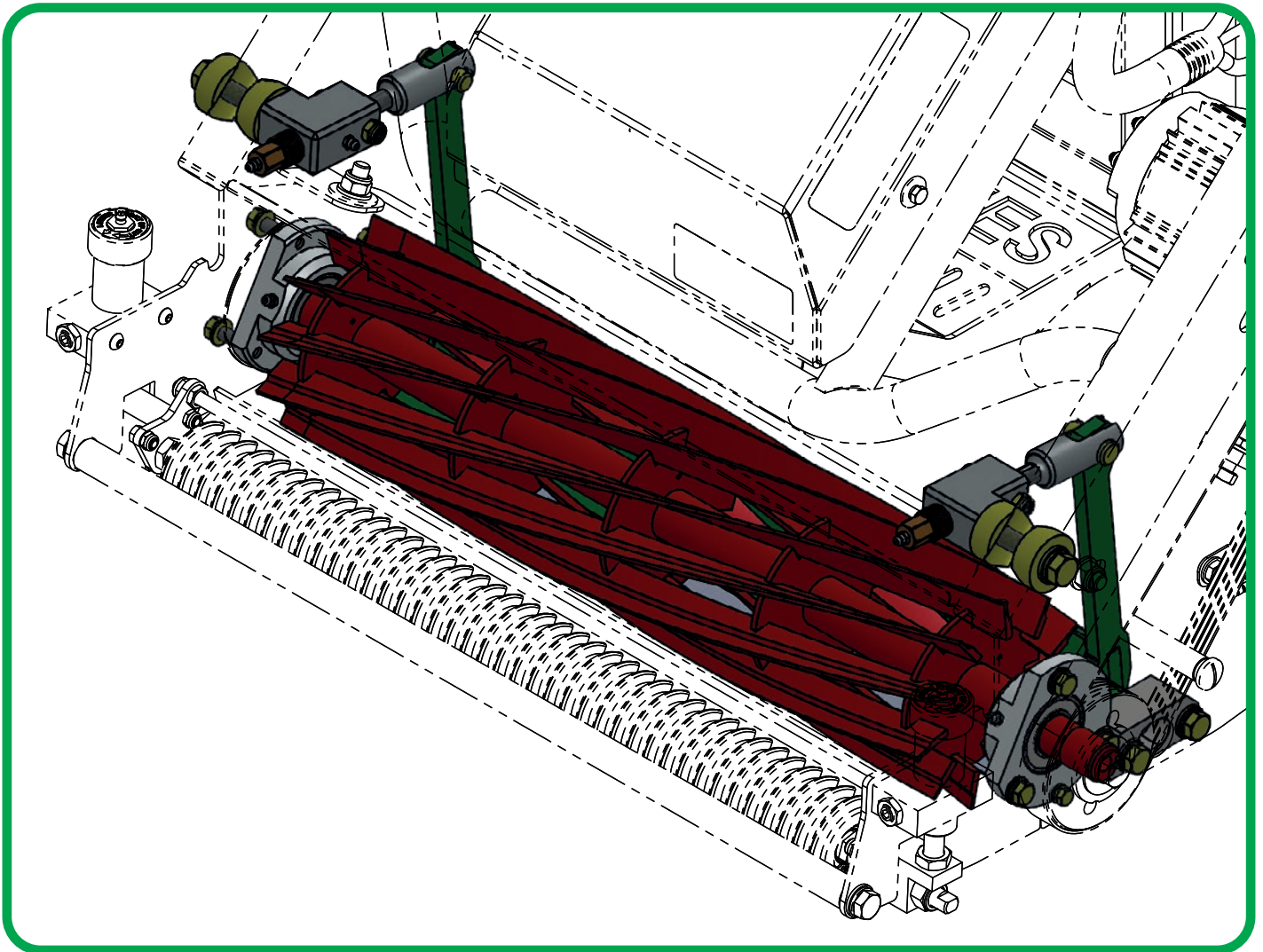
6: Wind clevis fork out until it can be fitted to the shear blade carrier, and then fit the clevis pin and secure with the split pin. Do not wind brass hex boss.





# V150 CYLINDER SHEAR BLADE SETTING

**E-SERIES**  
by **DENNIS**



Shear Blade position is adjusted using Micro Adjuster System. To adjust:

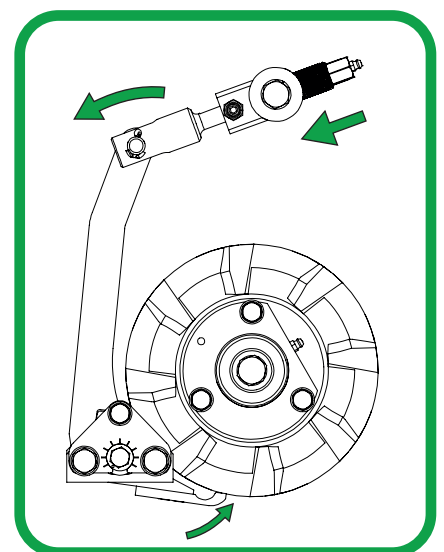
1: Rotate Brass Hex Bolt using a 15mm Spanner. Clockwise moves the shear blade closer.

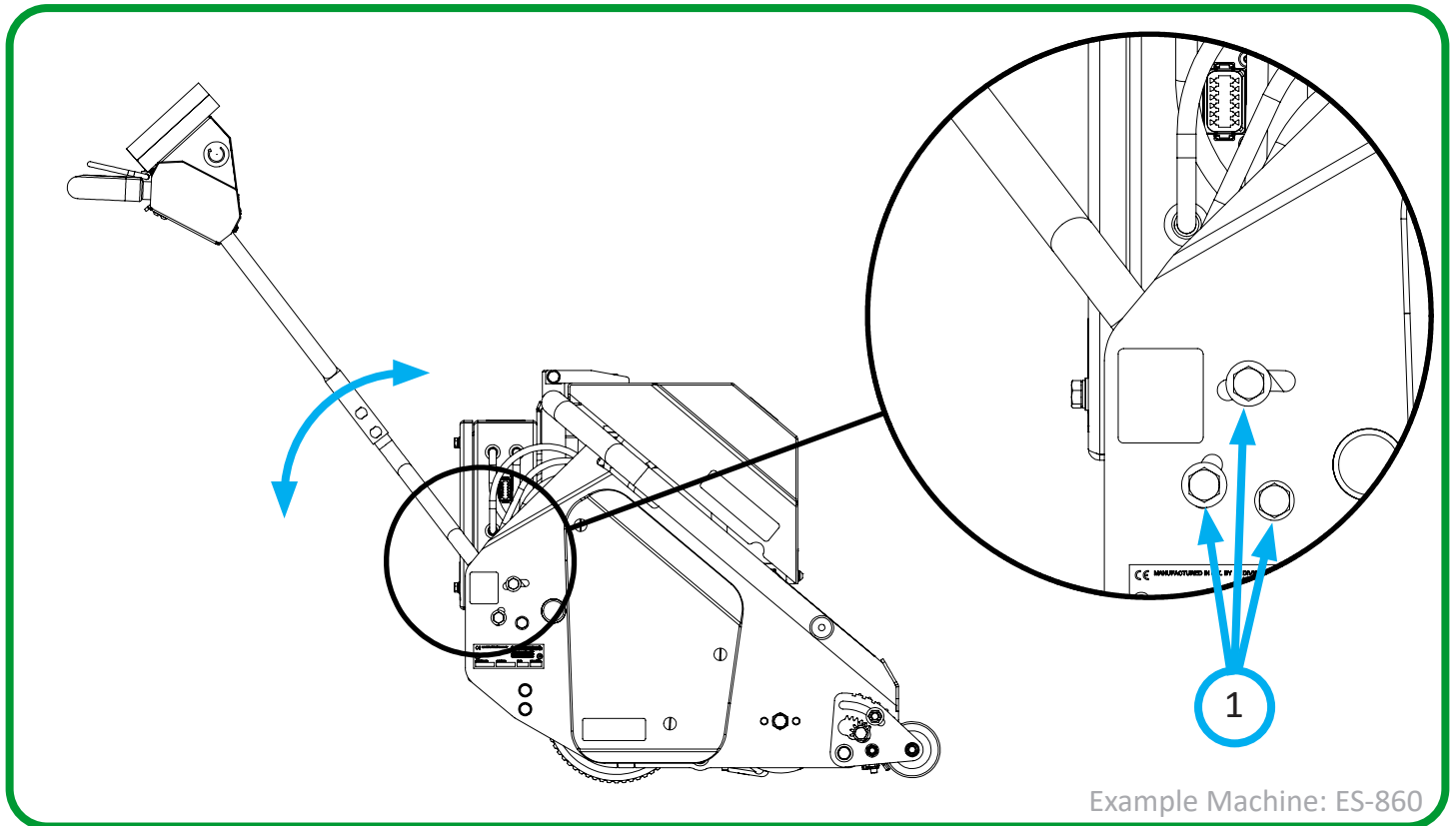
- Each click of the adjuster moves the shear blade 0.003mm (3microns).
- 30 clicks (One full revolution) will move the shear blade 0.1mm.
- 9 clicks will move the shear blade 1 thousandth of an inch.

2: Check the setting using thin paper along the length of the cylinder.

3: Adjust until it cuts along the whole length.

4: Do not set the cylinder hard to the bottom blade. This will cause excessive wear of both components and increase fuel consumption.





## HANDLEBAR ADJUSTMENT

The handlebar height adjustment is similar on all Dennis E-Series Mowers, G-Series Mowers and Rotary Mowers.

### To set:

- Ensure machine is switched off.
- Slacken 6-off lock nuts (Item 1) [17mm spanner].
- Raise / lower the handle bar to the desired position.
- When set, tighten the nuts (Item 1).



Ensure all nuts are correctly tightened before use.



No hazards occur during the normal operation of a Battery as it is described in the instructions for use that are provided with the Battery. Battery modules are electrical devices that must be handled and used with care. Improper use or handling could lead to electrical leakage, electrolyte leakage, overheating, smoke, fire, and serious injury. Smoke and debris from a module fire may contain hazardous dust, fumes, and corrosive gases, such as Hydrogen Fluoride.



## HIGH VOLTAGE INSIDE

The inside of the battery is high voltage.

Do not attempt to disassemble or repair. Electric shock may occur!

Avoid contacting the batteries and fluid with eyes, skin or clothes. In the event of a spill, flush with water and seek medical help immediately.

Keep children and unauthorised personnel away from this unit.



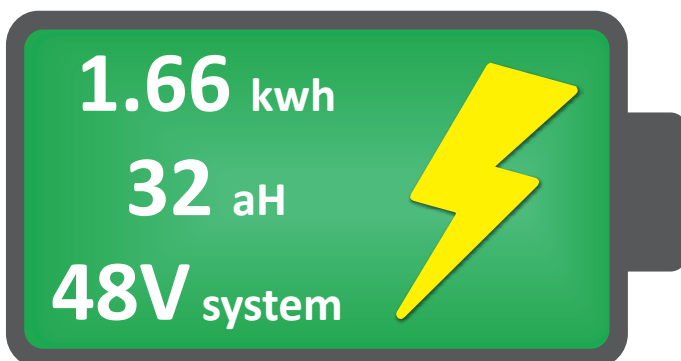
To avoid explosions or fire which can result in serious injury:

Do NOT immerse in water or allow condensation to occur within the unit.

Do NOT touch with wet hands.

Do NOT expose to fire or open flame.

Do NOT strike or puncture the battery or its housing.



**PART NUMBER Inc CASE: D163**

**PART NUMBER Exc CASE: SP12130**

**BATTERY TYPE: VAR-EB-48**

**WEIGHT: 16 Kg**

## CHEMISTRY:

MANGANESE LAMINATED LI-ION  
(LMNC)



## OPERATING TEMP. RANGE:

CHARGE: 0°C TO +45°C

DISCHARGE: -20°C TO +55°C



## STORAGE CONDITIONS:

-20°C TO +45°C (1 to 3 months)

-20°C TO +24°C (1 year)

HUMIDITY: BELOW 85%

# E-SERIES V150 BATTERY CARE

## LIMITED WARRANTY

>80% capacity for minimum 1200 cycles when cycled to 100% DoD at 50A at a cell temperature of 25°C. Deviation from these conditions will be assessed on a case by case basis. See Varta website for further details.

[www.varta-ag.com/en/](http://www.varta-ag.com/en/)

## STANDARDS

IEC

62133-2:2017

TRANSPORT

UN38.3 rev5 including impact and vibration testing

OTHER

RoHS directive and WEEE directive



# RoHS

## GENERAL INSPECTION

### ROLLER TIMING BELT

Check timing belt condition for wear or damage. Also check the belt tension is correct.

### CYLINDER MULTI V BELT

Check timing belt condition for wear or damage and check tension on belt. Over tension will put excessive strain on the belt and bearings. Under tension will lead to slip, poor performance and cause rapid wear.

### DRIVE & CYLINDER MOTORS

Check condition of outer motor casing for damage. Check power cables from the electrical box fitted securely and nuts tightened.

### LITHIUM BATTERY

Visibly check the condition of the outer casing for damage and any sign of damage on cables and plug. **NEVER USE A MOWER WITH A DAMAGED BATTERY!**

### ELECTRICAL HARNESSES

Check cables are not split or damaged and plug connections are all fitted correctly. Damaged cables should be replaced before the machine is next operated.



#### NOTE:-

NEVER USE A MOWER WITH A DAMAGED BATTERY OR ELECTRICAL BOX. IF IN ANY DOUBT CONTACT YOUR DEALER OR DENNIS DIRECT.



**48V**

#### NOTE:-

NEVER ATTEMPT ANY ELECTRICAL WORK. ANY ATTEMPT WILL VOID THE WARRANTY!

## BLADES

Blades must be inspected weekly for wear or damage. This can be observed as impact (dents), material cracking and excessive thinning.

Replace worn or damaged blades.



#### NOTE:-

WORN OR DAMAGED BLADGES CAN BE DANGEROUS, RESULTING IN SERIOUS INJURY OR DEATH OF THE OPERATOR OR BYSTANDERS

Note: Using non-genuine parts could result in non-compliance with safety standards and may invalidate your warranty. For details of blades and Torque settings refer to the **PARTS BOOK** of your machine.

## LUBRICATION

PART	DETAIL	FREQUENCY
FRONT ROLLER ADJUSTERS	Apply a small quantity of copper grease or similar to the adjuster studs to prevent corrosion and ease adjustment.	2 Months
SHEAR BLADE MICRO ADJUSTERS	Two grease points located on each adjuster. Apply grease to prevent corrosion and ease adjustment.	2 Months
CYLINDER BEARING HOUSING	Grease points located on each housing. Apply grease to prevent corrosion and ease adjustment.	2 Months

## CLEANING

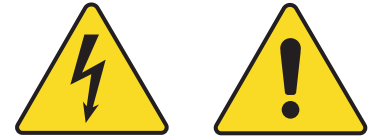
Tilt the machine backwards. Using a low pressure hose, wash all the grass from around the cassette and in the roller.



#### NOTE:-

DO NOT USE POWER PRESSURE WASHERS TO CLEAN THE MOWER.

## **My mower won't switch on**



Nothing happens when I try and start my mower. The screen doesn't attempt to boot.

If this is a brand-new machine the battery will have been disconnected and the E-Stop pressed for shipping.

Follow the check list below point by point until the issue is resolved –

1. Check your battery unit is connected and plugged into the mower correctly
  2. Check the E-Stop has been released on the side of the handle bars
  3. Make sure the key has been fully inserted and turns freely into the 'ON' position
  4. Check the handle harness plug connection into the electrical box (behind the battery)
  5. Make sure there is no visible signs of damage on any of the battery cables. NEVER TOUCH ANY EXPOSED WIRES!
  6. Open handle bar console cover to trouble shoot the wiring connection. NEVER TOUCH ANY CONNECTIONS without the E-Stop pressed and the white harness connector plug disconnected! (Refer to manual or INFO sheet 'SP19053')
- Check the connection between the Handle Wiring Harness & Console Wiring Harness (large white 12 pin plug). Also check all pins in both halves of the plug are in good condition and all sit at the same level in the plug
  - Check connections to E-Stop (wired into NC (Normally Closed) contact block)
  - Check connections to Key Switch (Position 30 & Position 75)
  - Check screen connections – plug positions B & C fitted the correct way around
7. Check the battery has not been fully drained. Plug the battery unit into the charger and make sure the charger shows charge is being put into the battery.
  8. If the battery doesn't seem to be charging, at this stage, check that the physical battery is 'awake'. Remove the handle and top of the battery box and hold down (3-5 seconds) the power button on the top of the battery unit until it flashes green.

*If the problem persists, please contact your dealer or Dennis directly*

## **My screen powers on briefly then switches off**

'Loading...' briefly shows on the screen then disappears.

- Check the state of charge of the battery unit. Place the battery unit on charge

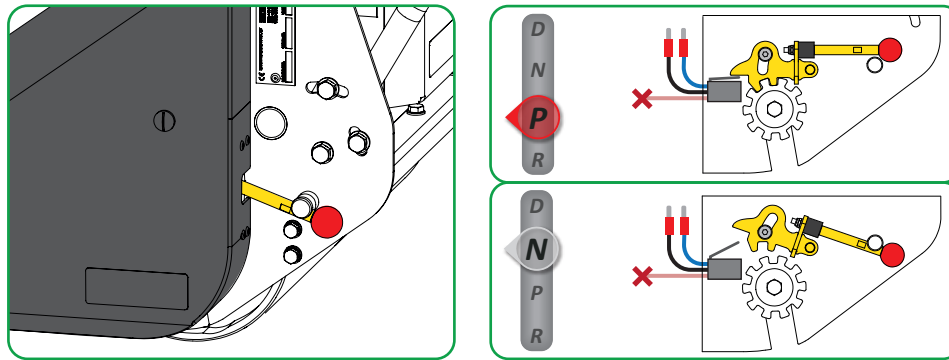
## **My mower won't operate and displays a 'PLEASE HOLD DEADMAN HANDLE' message**

**OR**

## **My mower doesn't disengage when I release the bail bar**

- Check the bail bar handle is being held or fully released when attempting to operate
- Check the switch in the handle assembly is fully screwed into the housing
- Check microswitch bullet connectors are attached under the handle bar console cover and the spade connectors are attached to the back of the handle
- Check the continuity across the micro switch with a multimeter

Check the same connections on the opposite handle if you are having trouble with the mower roller drive operation



## The on screen 'Parking Brake' icon won't disengage

The 'P' (Park) on gear selection is stuck on and I can't put my mower into Drive or Reverse. This means the mechanical parking is engaged, the icon will automatically switch to 'N' (Neutral) when the brake is fully disengaged.

- Check the mechanical brake has been disengaged (handle on the lower left-hand side of the machine). The brake bar should be retained below the stop
- Check the parking brake microswitch is being disengaged from the brake hammer under the left-hand side guard. Remove the side guard to see
- Check the continuity across the micro switch with a multimeter

## There are no lights on my charger

See documentation SP19069 for more information about charging the battery units.

No BLUE power light illuminating on the charger indicates that the charger is not receiving power. Check the charger has been plugged in to a working power socket and check the condition of the fuse in the plug

The battery light will be illuminated green when a connected battery is charging.

## 'Motor Comms' or 'Cylinder Comms' error displayed on screen

One of the motors is not communicating with the system as expected.

- Check motor cable connections going from electrical box into the motors on both sides
- Check all three power cables to each motor are connected and the letters on the wires match those on the motor (U, V and W)
- Check the Handle Wiring Harness is correctly connected into the electrical box
- Check the connection between the Handle Wiring Harness & Console Wiring Harness (large white 12 pin plug). Also check all pins in both halves of the plug are in good condition and all sit at the same level in the plug

*If your problem isn't referenced on this document or you are still having problems, please contact your dealer or Dennis Mowers directly*



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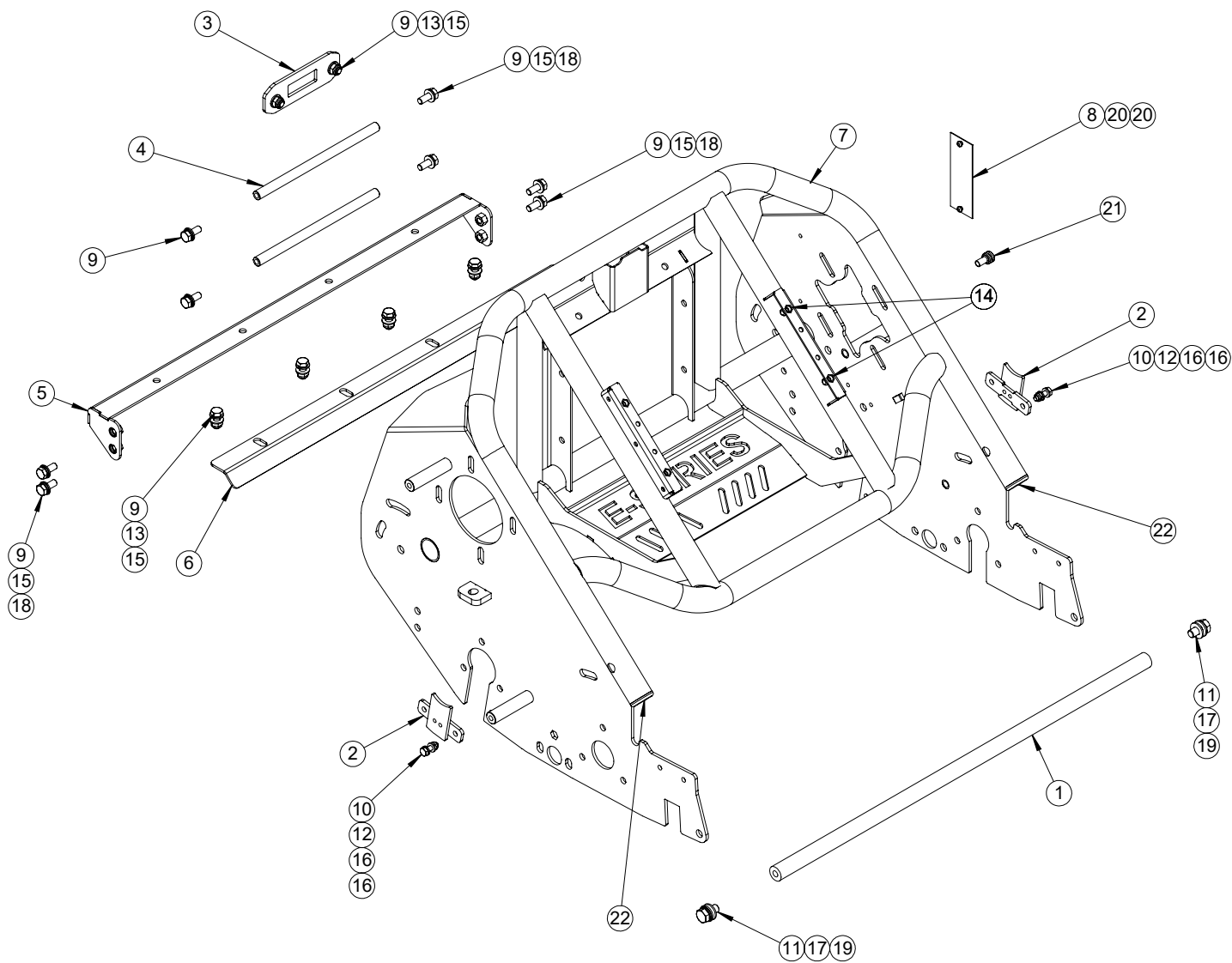


## PARTS LIST

ES-22 CYLINDER MOWER CHASSIS	30
ES-22U CYLINDER MOWER CHASSIS	32
REAR ROLLER ASSEMBLY	34
ROLLER DRIVE ASSEMBLY	36
ES-22 CYLINDER ASSEMBLY	37
ES-22U CYLINDER ASSEMBLY	38
CYLINDER DRIVE ASSEMBLY	40
BRAKE ASSEMBLY	41
SHEAR BLADE CARRIER ASSEMBLY	42
SHEAR BLADE ASSEMBLY	43
HANDLEBAR ASSEMBLY	44
FRONT ROLLER	46
ELECTRICAL	47
GUARDS	48
BATTERY	50
DECALS	52
GRASSBOX	53

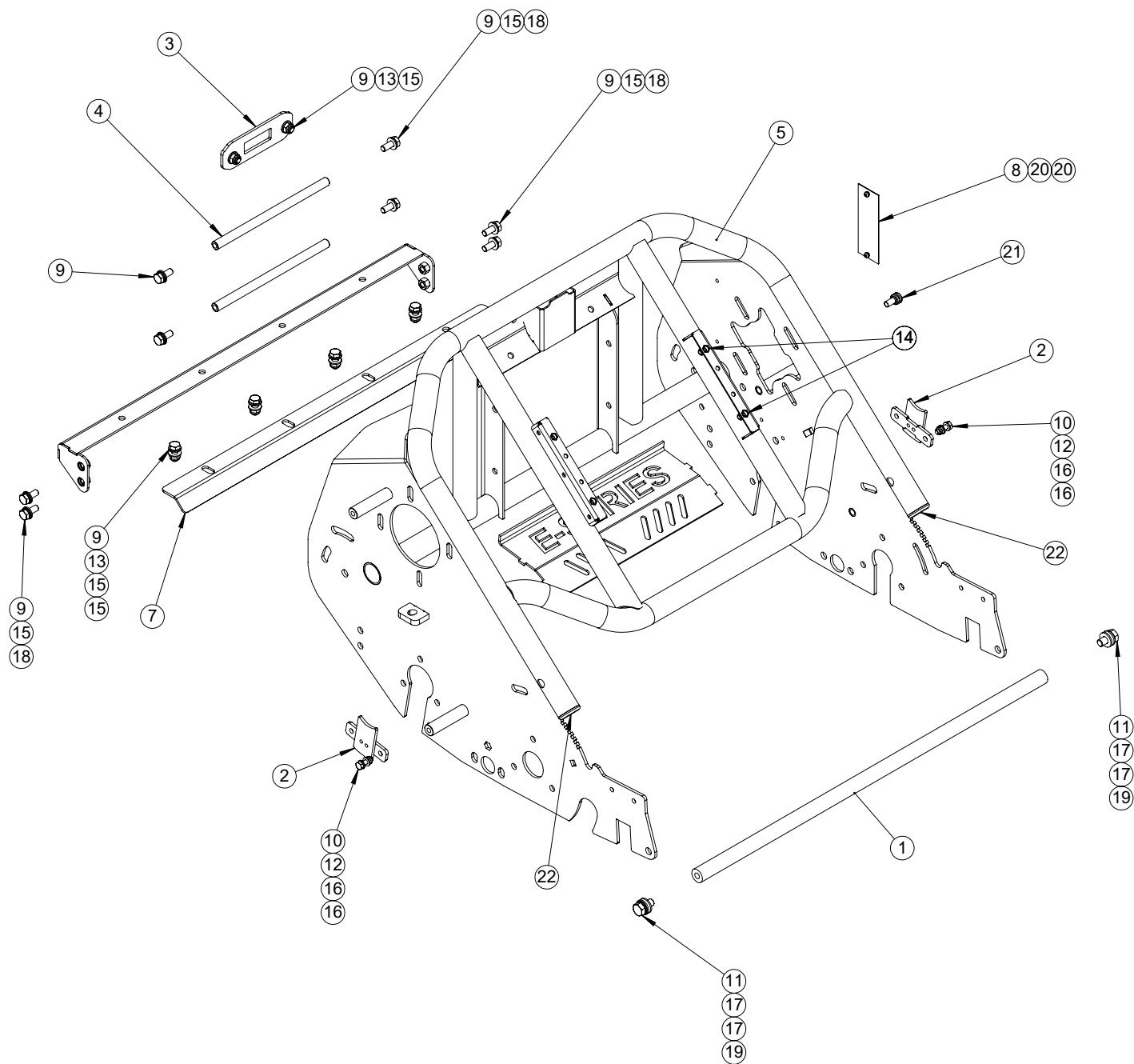


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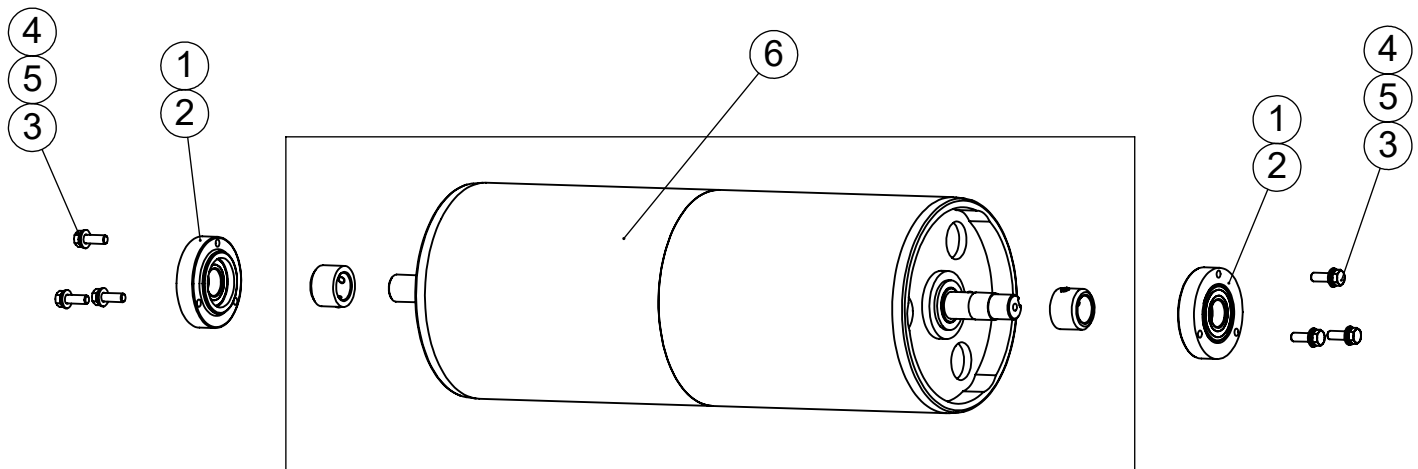


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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	240039_REV0	TIE BAR FRONT 22"	1
2	390020_REV0	CHASSIS COVER W/A	2
3	390071_REV0	LATCH PLATE	1
4	390072_REV0	MOUNTING BAR	2
5	390215_REV0	SCRAPER BAR W.A.	1
6	390217_REV0	22" SCRAPER BRACKET	1
7	390300_REV0	CHASSIS 22" ELECTRIC W.A.	1
8	J20297_REV2	SERIAL NO PLATE (DENNIS)	1
9	SP01009_REV0	HEX SET SCREW M8 X 20	14
10	SP01028_REV0	HEX SET SCREW M6 X 20	2
11	SP01034_REV0	HEX SET SCREW M10 X 20	2
12	SP02004_REV0	NUT M6 NYLOC	2
13	SP02006_REV0	NUT M8 NYLOC (T)	6
14	SP02042_REV0	RIVNUT HEX M6 (0.5-3.0) [NO HEAD]	4
15	SP03008_REV0	WASHER M8 FORM A	20
16	SP03010_REV0	WASHER M6 FORM A	4
17	SP03011_REV0	WASHER M10 FORM A	4
18	SP03029_REV0	WASHER M8 SPRING LOCK	8
19	SP03034_REV0	WASHER M10 SPRING LOCK	2
20	SP05001_REV0	RIVET 4.8 X 10	2
21	SP12092_REV0	GROMMET EXTENDED 6MM	1
22	SP14051_REV0	TUBE INSERT	2



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	240039_REV0	TIE BAR FRONT 22"	1
2	390020_REV0	CHASSIS COVER W/A	2
3	390071_REV0	LATCH PLATE	1
4	390072_REV0	MOUNTING BAR	2
5	390200_REV0	CHASSIS 22" (U) ELECTRIC W.A.	1
6	390215_REV0	SCRAPER BAR W.A.	1
7	390217_REV0	22" SCRAPER BRACKET	1
8	J20297_REV2	SERIAL NO PLATE (DENNIS)	1
9	SP01009_REV0	HEX SET SCREW M8 X 20	14
10	SP01028_REV0	HEX SET SCREW M6 X 20	2
11	SP01034_REV0	HEX SET SCREW M10 X 20	2
12	SP02004_REV0	NUT M6 NYLOC	2
13	SP02006_REV0	NUT M8 NYLOC (T)	6
14	SP02042_REV0	RIVNUT HEX M6 (0.5-3.0) [NO HEAD]	4
15	SP03008_REV0	WASHER M8 FORM A	20
16	SP03010_REV0	WASHER M6 FORM A	4
17	SP03011_REV0	WASHER M10 FORM A	4
18	SP03029_REV0	WASHER M8 SPRING LOCK	8
19	SP03034_REV0	WASHER M10 SPRING LOCK	2
20	SP05001_REV0	RIVET 4.8 X 10	2
21	SP12092_REV0	GROMMET EXTENDED 6MM	1
22	SP14051_REV0	TUBE INSERT	2



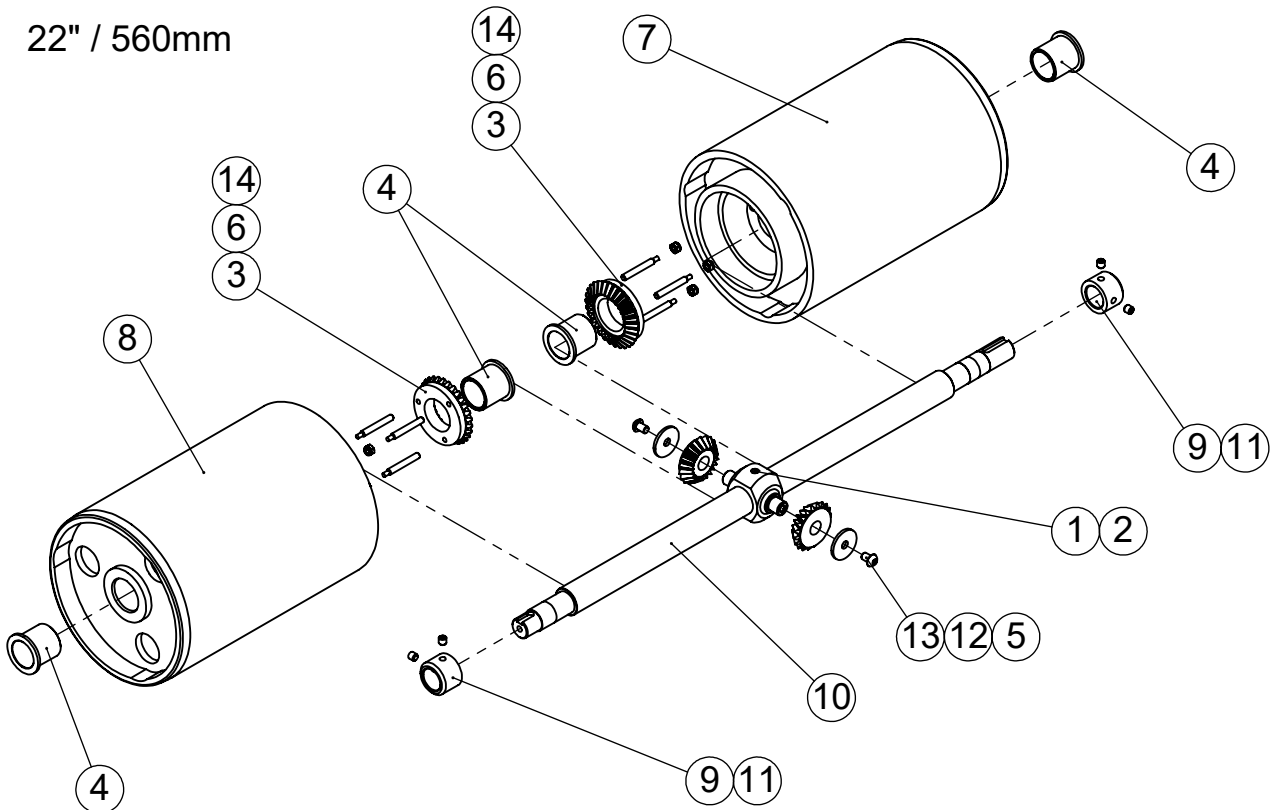
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	062662_REV1	BEARING 6205-2RS 3	2
2	229104_REV1	LANDROLL BEARING HOUSING	2
3	SP01045_REV0	HEX SET SCREW M8 X 25	6
4	SP03008_REV0	WASHER M8 FORM A	6
5	SP03029_REV0	WASHER M8 SPRING LOCK	6

ITEM NO.	MACHINE	PART NUMBER	DESCRIPTION	QTY.
6	ES-510 / ES-20 / ES-VTT20	800600_REV0	REAR ROLLER ASSY 20"	1
6	ES-22 / ES-22U	800640_REV0	REAR ROLLER ASSY 22"	1
6	ES-610 / ES-24	800645_REV0	REAR ROLLER ASSY 24"	1
6	ES-26	800652_REV0	REAR ROLLER ASSY 26"	1

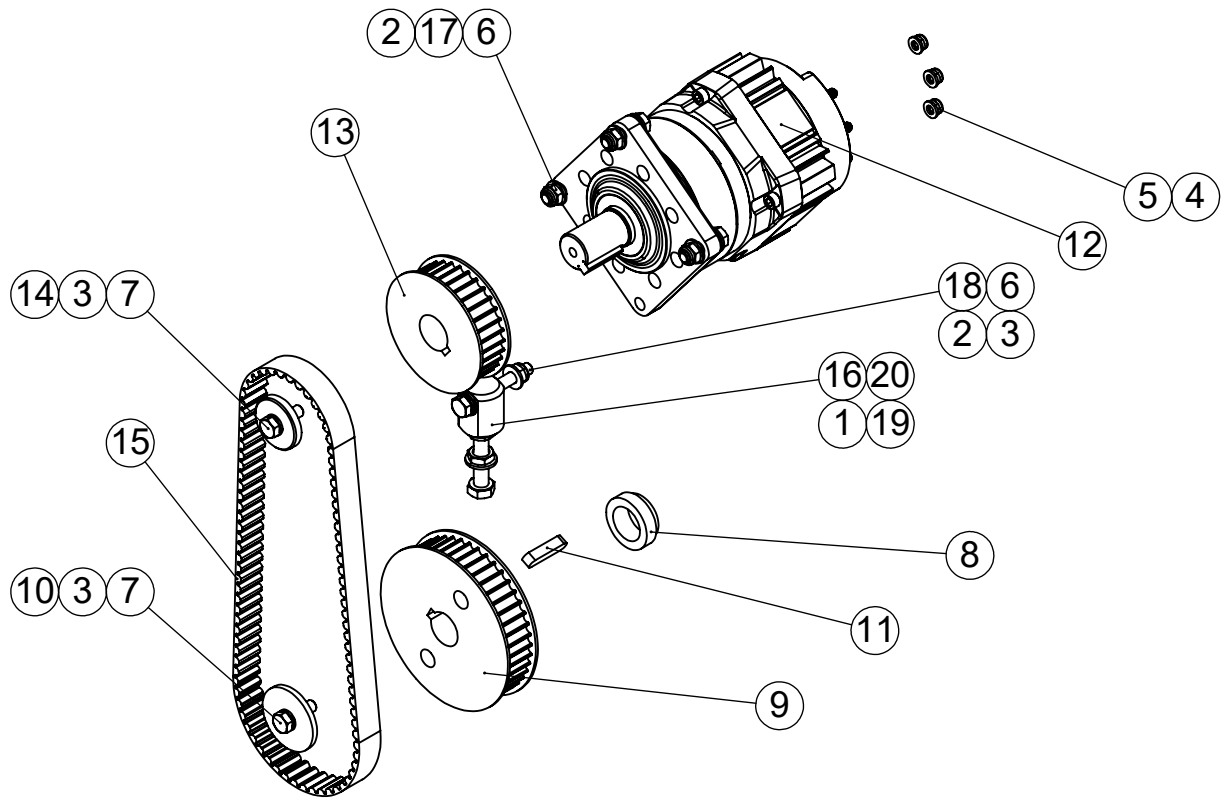


# REAR ROLLER ASSEMBLY

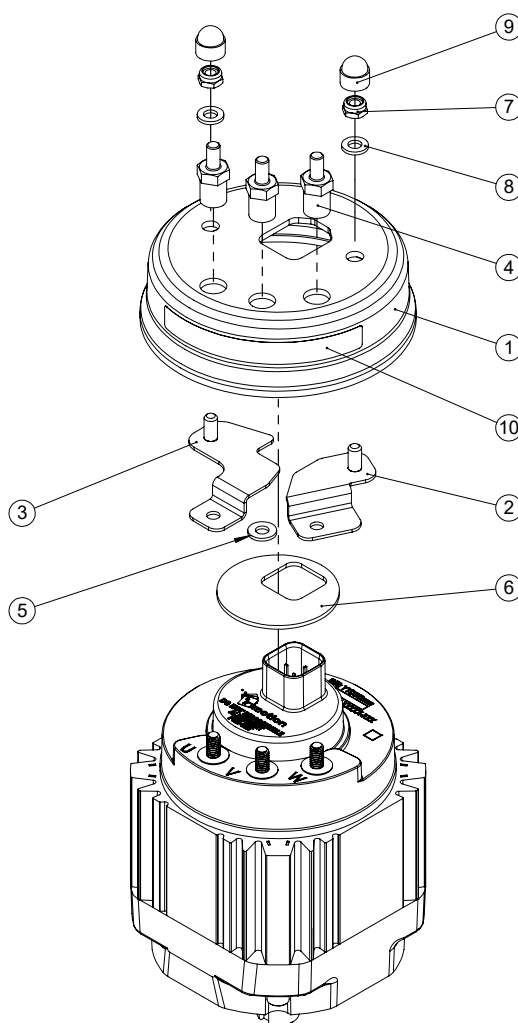
22" / 560mm



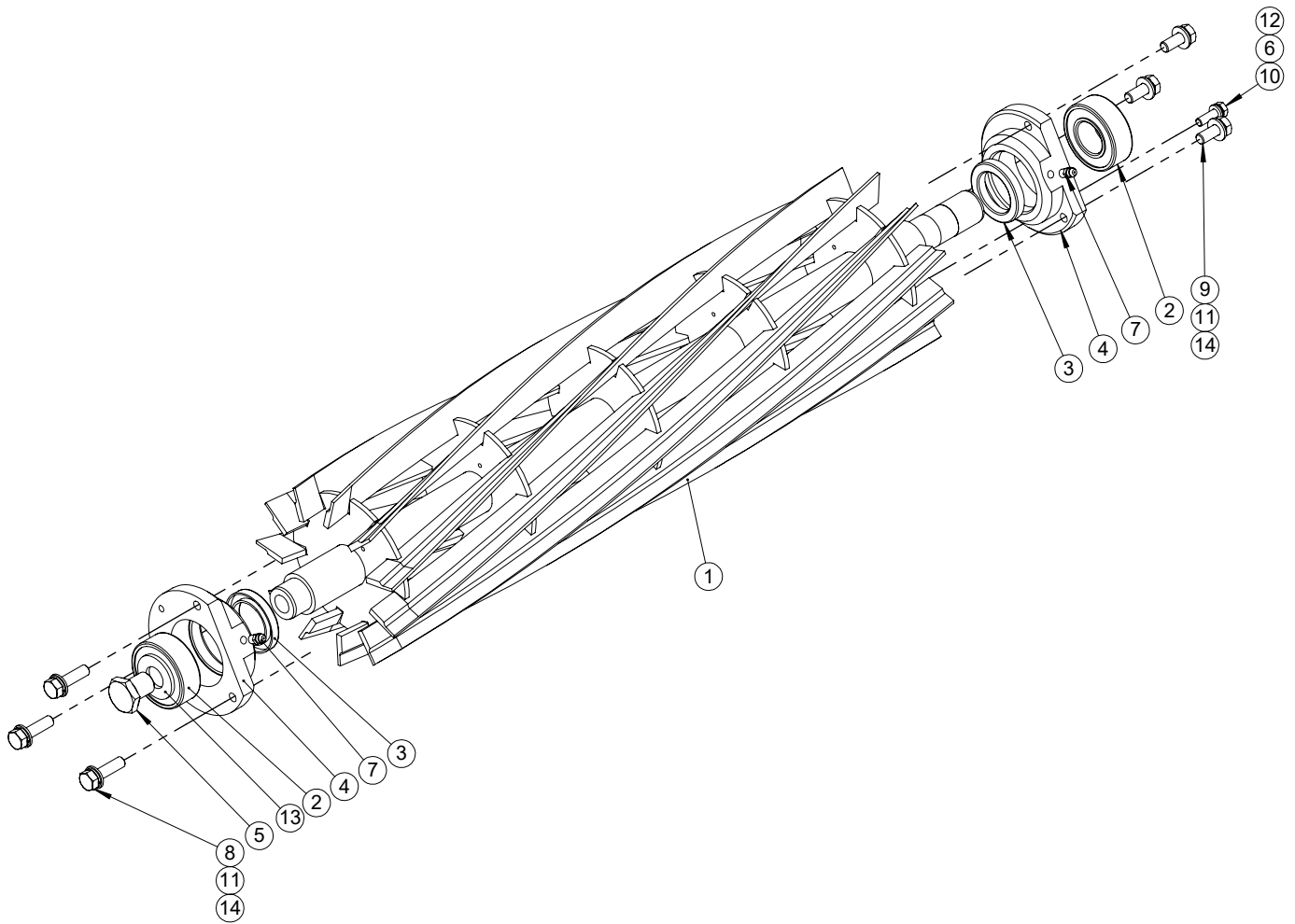
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	228054_REV0	SPIROL PIN (M8 X 50)	1
2	229020_REV1	TRUNNION	1
3	229022_REV1	30 TOOTH BEVEL GEAR	2
4	229023_REV1	BUSH AJ2024 - 1 1/2"	4
5	229025_REV2	BEVEL GEAR 20T	2
6	229118_REV3	GEAR STUD	6
7	229363_REV4	ROLLER 22" SMOOTH R.H.	1
8	229364_REV4	ROLLER 22" SMOOTH L.H.	1
9	390043_REV0	ROLLER LOCK SPACER	2
10	390225_REVB	REAR ROLLER SHAFT 22"	1
11	J20467_REV0	GRUB SCREW M8 X 8	4
12	J209249_REV0	WASHER 9 X 35 X 3	2
13	SP01012_REV0	BUTTON HEAD M8 X 12	2
14	SP02039_REV0	NUT 1/4" NYLOC (P)	6



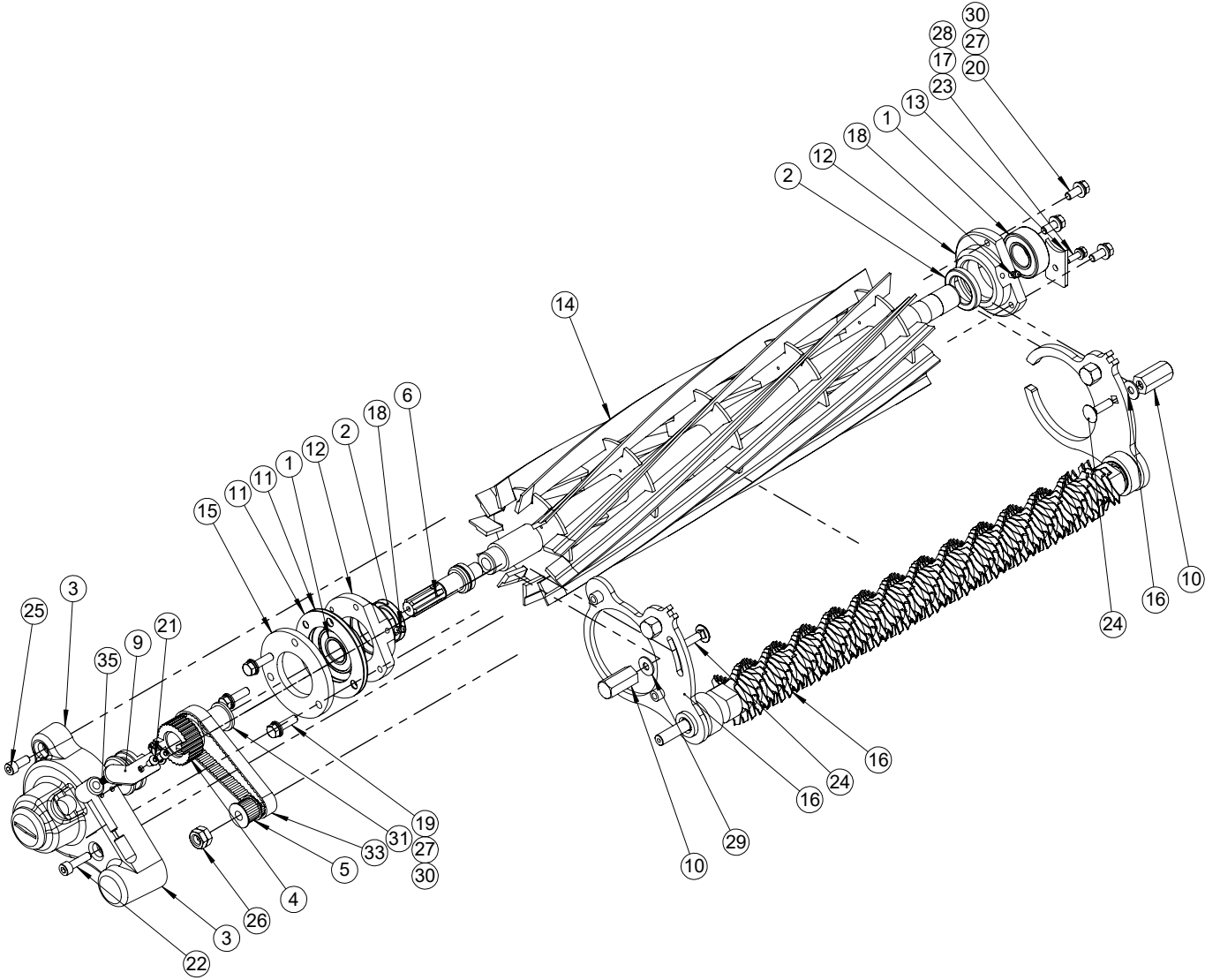
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SP03011_REV0	WASHER M10 FORM A	1
2	SP03008_REV0	WASHER M8 FORM A	8
3	SP03029_REV0	WASHER M8 SPRING LOCK	3
4	SP03010_REV0	WASHER M6 FORM A	3
5	SP02004_REV0	NUT M6 NYLOC	3
6	SP02006_REV0	NUT M8 NYLOC (T)	4
7	SP01045_REV0	HEX SET SCREW M8 X 25	2
8	340034_REV0	ROLLER END SPACER	1
9	240020_REV1	PULLEY 44-8M-20 6F FINISHED	1
10	390046_REV0	BRAKE WASHER	1
11	F21884_REV0	KEY 8 X 7 X 35	1
12	SP15102_REV0	ASM103A 48V MOTOR & GEARBOX	1
13	SP11096_REV0	32-8M-20 6F MACHINED 26DIA	1
14	340037_REV0	PULLEY RETAINER	1
15	SP11097_REV0	BELT OMEGA 760-8M-20	1
16	370096_REV0	TENSIONER BLOCK	1
17	SP01005_REV0	HEX SET SCREW M8 X 30	3
18	SP01023_REV0	HEX SET SCREW M8 X 60	1
19	SP01047_REV0	HEX SET SCREW M10 X 60	1
20	SP02013_REV0	NUT M10 LOCK (THIN)	2



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	370400_REV0	ASM MOTOR BACK SHELL	1
2	370401_REV0	ASM MOTOR CLIP - A	1
3	370402_REV0	ASM MOTOR CLIP - B	1
4	370407_REV0	MOTOR STUD	3
5	370408_REV0	MOTOR STUD SPACER	1
6	370409_REV0	MOTOR COMPRESSION PAD	1
7	SP02004_REV0	NUT M6 NYLOC	2
8	SP03010_REV0	WASHER M6 FORM A	2
9	SP14058_REV0	NUT COVER CAP M6 (10mm AF)	2
10	SP18050_REV0	U, V, W MOTOR COVER DECAL	1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	390230_REV0	CYLINDER 11 BLADE 22" (140)	1
2	228029_REV1	BEARING 2205 2RS	2
3	229701_REV1	OIL SEAL 32 X 47 X 7	2
4	340104_REV0	BEARING HOUSING CYLINDER	2
5	390212_REV0	BOLT M16 L.H.	1
6	E1-1061_REV0	WASHER M6 SPRING	1
7	J20064_REV0	GREASE NIPPLE 1/4" UNF	2
8	SP01005_REV0	HEX SET SCREW M8 X 30	3
9	SP01009_REV0	HEX SET SCREW M8 X 20	3
10	SP01028_REV0	HEX SET SCREW M6 X 20	1
11	SP03008_REV0	WASHER M8 FORM A	6
12	SP03010_REV0	WASHER M6 FORM A	1
13	SP03021_REV0	WASHER M16 FORM C	1
14	SP03029_REV0	WASHER M8 SPRING LOCK	6



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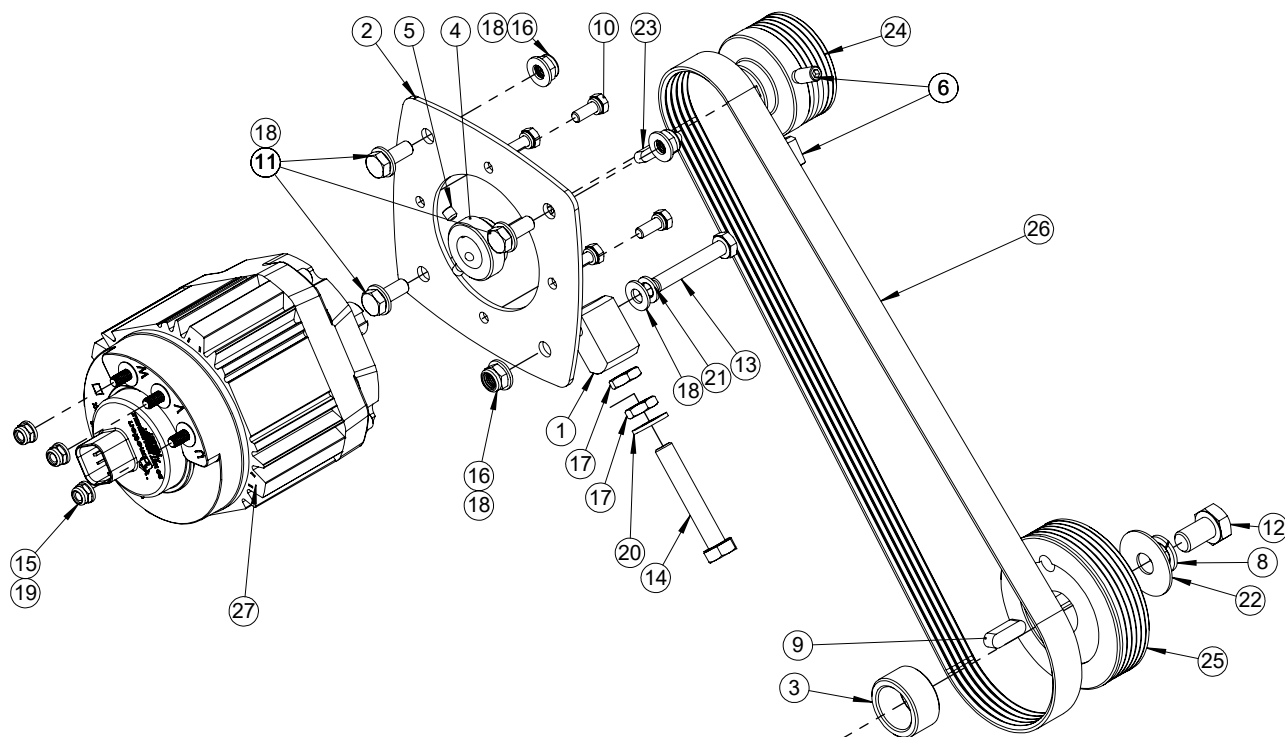
# ES-22U CYLINDER ASSEMBLY

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	228029_REV1	BEARING 2205 2RS	2
2	229701_REV1	OIL SEAL 32 X 47 X 7	2
3	240110_REV1	GROOMER DRIVE	1
4	240111_REV0	PULLEY 30-5M-25 FINISHED	1
5	240112_REV0	PULLEY 15-5M-15 FINISHED	1
6	390258_REV0	GROOMER DRIVE (ES)	1
7	240114_REV0	GROOMER ACTUATOR	1
8	240117_REV0	GROOMER ACTUATOR PIN ASSY	1
9	240119_REV0	GROOMER SPRING PLATE	1
10	240133_REV0	GROOMER NUT	2
11	340032_REV0	BEARING SPACER	2
12	340104_REV0	BEARING HOUSING CYLINDER	2
13	390210_REV0	ES CHASSIS INFILL	1
14	390230_REV0	CYLINDER 11 BLADE 22" (140)	1
15	390253_REV0	GROOMER PIVOT SPACER	1
16	800642_REV0	ES-22 GROOMER ASSY	1
17	E1-1061_REV0	WASHER M6 SPRING	1
18	J20064_REV0	GREASE NIPPLE 1/4" UNF	2
19	SP01005_REV0	HEX SET SCREW M8 X 30	3
20	SP01009_REV0	HEX SET SCREW M8 X 20	3
21	SP01016_REV0	BUTTON HEAD M6 X 12	2
22	SP01025_REV0	CAP HEAD M8 X 30	1
23	SP01028_REV0	HEX SET SCREW M6 X 20	1
24	SP01038_REV0	COACH BOLT M8 X 30 (8.8 HT)	2
25	SP01049_REV0	CAP HEAD M8 X 20	1
26	SP02014_REV0	NUT M12 LOCK (THIN)	2
27	SP03008_REV0	WASHER M8 FORM A	6
28	SP03010_REV0	WASHER M6 FORM A	1
29	SP03015_REV0	WASHER M8 FORM C	2
30	SP03029_REV0	WASHER M8 SPRING LOCK	6
31	SP06006_REV0	BUSH AL2026 - 25	1
32	SP07006_REV0	CIRCLIP D1400 - 20	1
33	SP11014_REV1	BELT OMEGA 325-5M-15	1
34	SP14003_REV0	SLEEVE PLASTIC 7.95MM X 25.4	1
35	J20526_REV1	SPRING	1



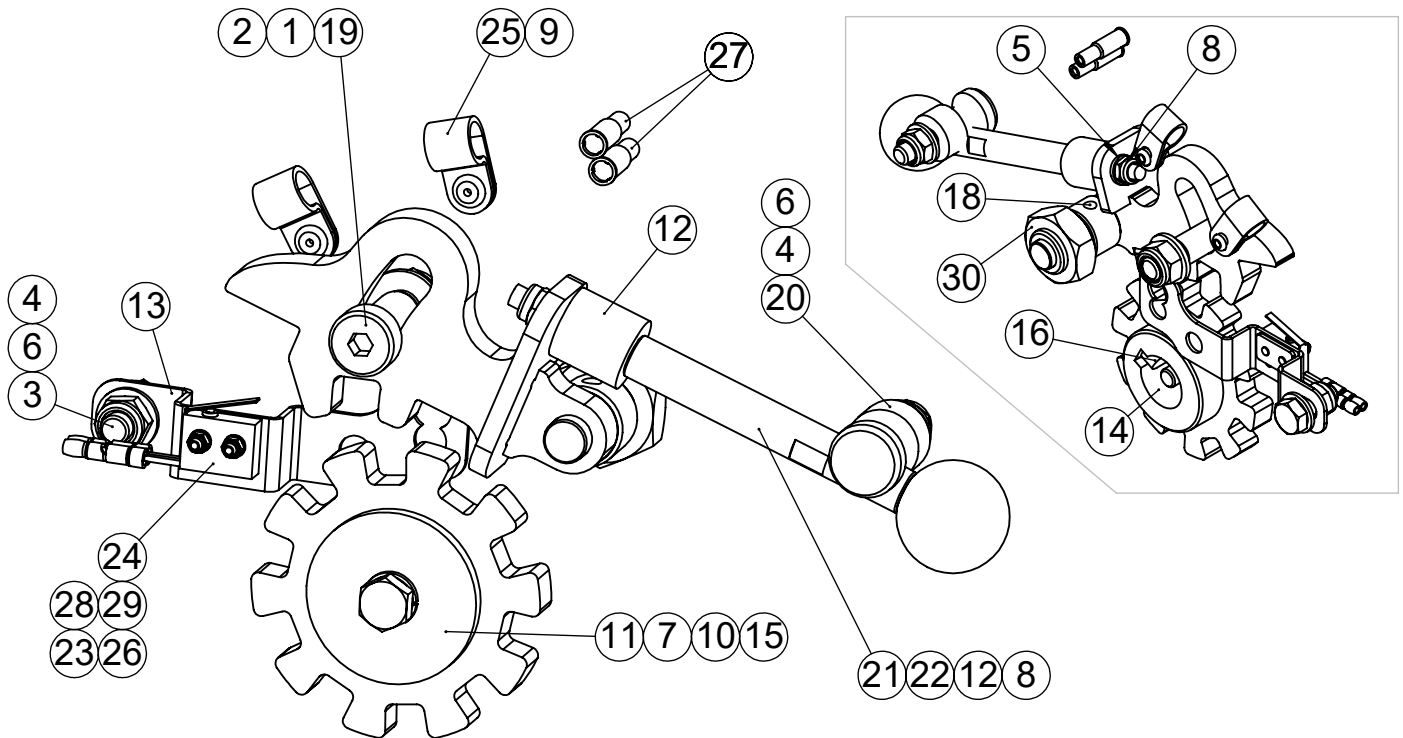
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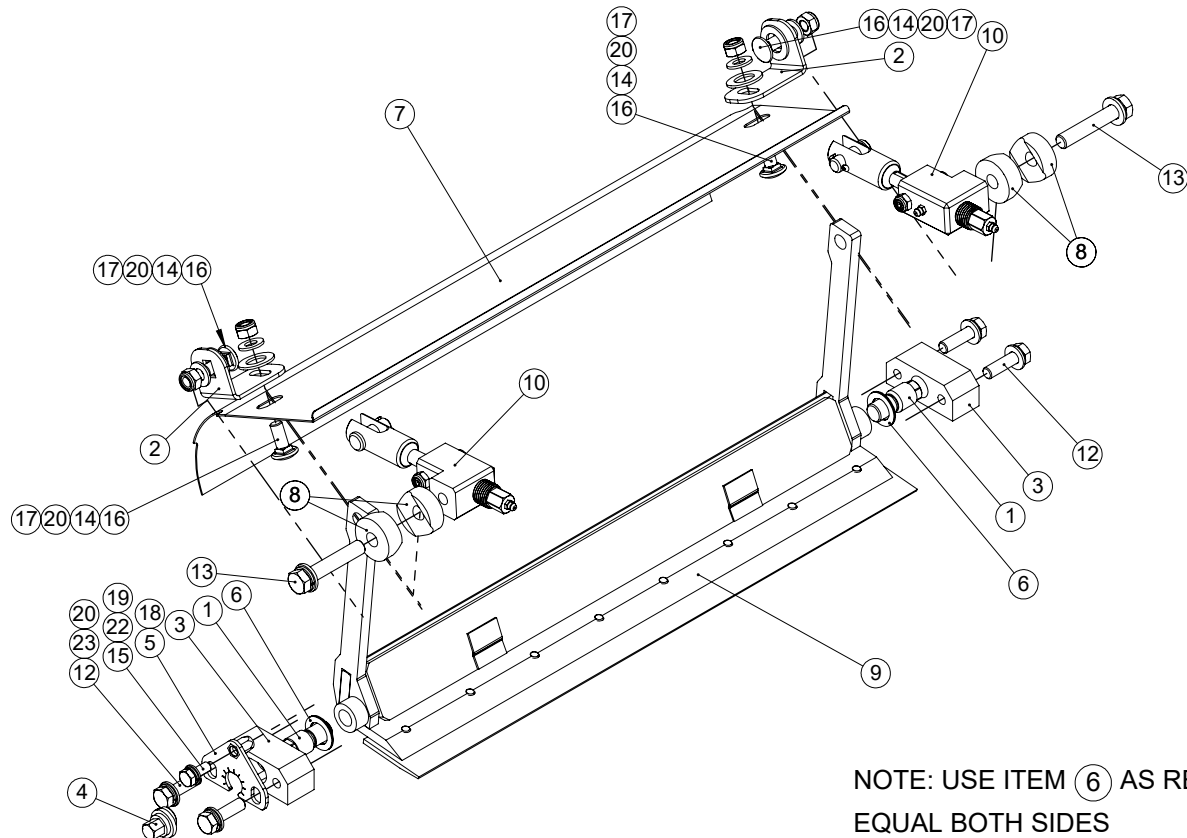
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	370096_REV0	TENSIONER BLOCK	1
2	370135_REV0	MOTOR PLATE	1
3	380105_REV0	PULLEY SPACER (CYL)	1
4	390045_REV0	V150 MOTOR SPACER	1
5	D8068_REV0	GRUB SCREW M6 X 6	2
6	D8154_REV1	GRUB SCREW M8 X 16	2
7	E1-1061_REV0	WASHER M6 SPRING	4
8	E1-1065_REV0	WASHER M12 SPRING LOCK	1
9	F20684_REV0	KEY PARALLEL 8 X 7 X 25	1
10	SP01008_REV0	HEX SET SCREW M6 X 16	4
11	SP01009_REV0	HEX SET SCREW M8 X 20	3
12	SP01021_REV0	HEX SET SCREW M12 X 20	1
13	SP01022_REV0	HEX SET SCREW M8 X 50	1
14	SP01047_REV0	HEX SET SCREW M10 X 60	1
15	SP02004_REV0	NUT M6 NYLOC	3
16	SP02006_REV0	NUT M8 NYLOC (T)	4
17	SP02013_REV0	NUT M10 LOCK (THIN)	2
18	SP03008_REV0	WASHER M8 FORM A	8
19	SP03010_REV0	WASHER M6 FORM A	3
20	SP03011_REV0	WASHER M10 FORM A	1
21	SP03029_REV0	WASHER M8 SPRING LOCK	1
22	SP03040_REV0	WASHER M12 REPAIR	1
23	SP10005_REV0	KEY 6 X 6 X 30 RD END	1
24	SP11067_REV1	PULLEY DIA 60 PK 5 RIB	1
25	SP11126_REV0	CYLINDER DRIVE PULLEY	1
26	SP11146_REV0	BELT RIBBED 5PK 875	1
27	SP15104_REV0	ASM106 48V MOTOR	1

# BRAKE ASSEMBLY



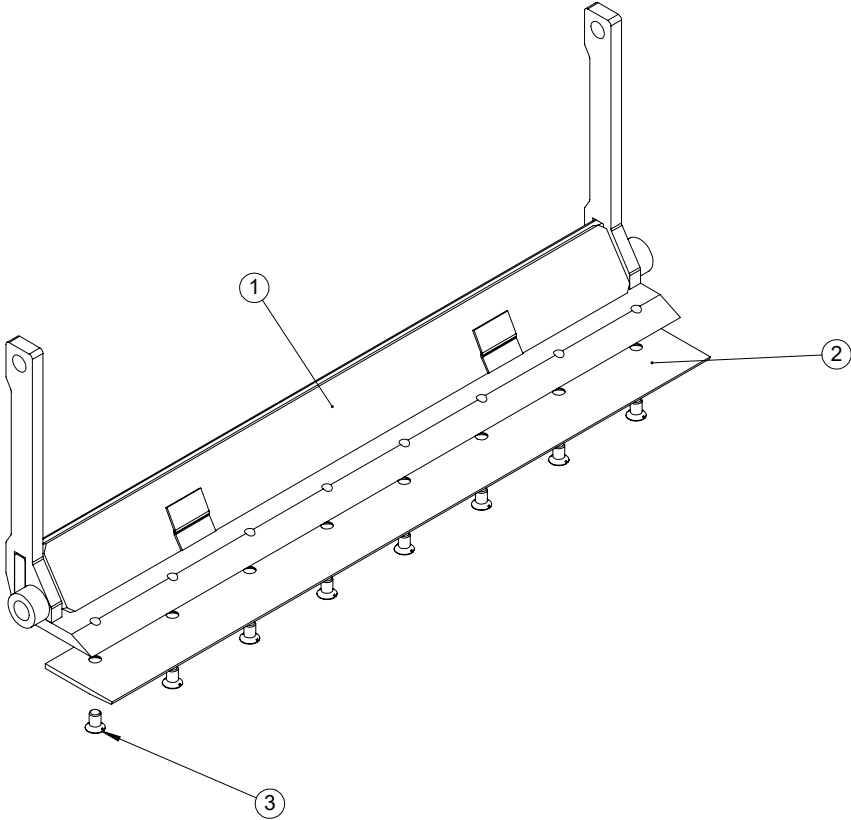
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	SP03011_REV0	WASHER M10 FORM A	1
2	SP02008_REV0	NUT M10 NYLOC (T)	1
3	SP01009_REV0	HEX SET SCREW M8 X 20	1
4	SP03008_REV0	WASHER M8 FORM A	3
5	SP03010_REV0	WASHER M6 FORM A	1
6	SP02006_REV0	NUT M8 NYLOC (T)	2
7	SP03029_REV0	WASHER M8 SPRING LOCK	1
8	SP02004_REV0	NUT M6 NYLOC	1
9	SP05001_REV0	RIVET 4.8 X 10	2
10	SP01045_REV0	HEX SET SCREW M8 X 25	1
11	390046_REV0	BRAKE WASHER	1
12	SP14053_REV0	AV BUSH	1
13	340189_REV1	BRAKE SENSOR BRACKET	1
14	370175_REV0	BRAKE BOSS	1
15	340185_REV1	BRAKE DISC	1
16	SP10001_REV2	KEY 8 X 7 X 20 RD END	1
17	390110_REV0	BRAKE HAMMER W.A.	1
18	340197_REV0	BRAKE BUSH	1
19	SP01029_REV0	SHOULDER BOLT 12 X 25 M10	1
20	240183_REV0	BRAKE RETAINER	1
21	390115_REV0	BRAKE BAR	1
22	J20017_REV1	KNOB - RED	1
23	340135_REV0	MICROSWITCH MOUNT PLATE	1
24	SP12007_REV0	MICRO SWITCH DC1C-C3LB	1
25	SP14019_REV0	P CLIP 10MM NYLON	2
26	SP12014_REV0	ELECTRICAL CONNECTOR MALE BULLET (RED)	2
27	SP12015_REV0	ELECTRICAL CONNECTOR FEMALE BULLET (RED)	2
28	SP03039_REV0	WASHER M2.5 FORM A	2
29	SP02059_REV0	NUT M2.5 NYLOC (P)	2
30	SP02034_REV0	NUT 3/4" UNF STD	1

# SHEAR BLADE CARRIER ASSEMBLY

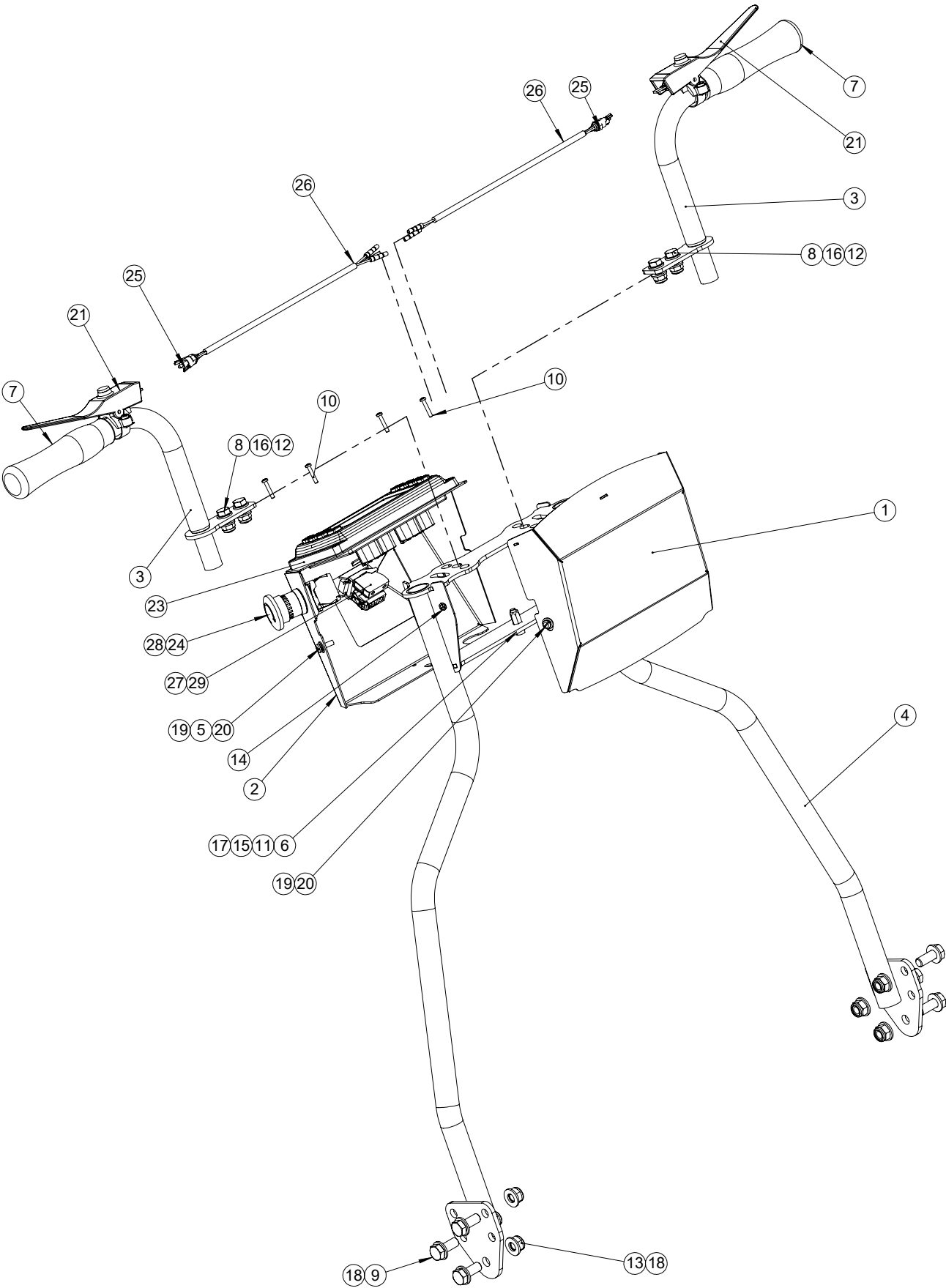


NOTE: USE ITEM (6) AS REQUIRED,  
EQUAL BOTH SIDES

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	230699_REV1	PIVOT BOLT	2
2	340051_REV0	DEFLECTOR BRACKET	2
3	340075_REV1	PIVOT BLOCK	2
4	340076_REV1	PIVOT CAM	1
5	340077_REV0	RETAINING PLATE	1
6	340078_REV0	PIVOT SHIM	SEE NOTE
7	390235_REV0	22" DEFLECTOR (140)	1
8	390247_REV0	SADDLE WASHER (31.8)	4
9	800643_REV0	ES-22 SHEAR BLADE CARRIER ASSY	1
10	800675_REV0	MICRO ADJUSTER ASSY	2
11	E1-1065_REV0	WASHER M12 SPRING LOCK	2
12	E1-1119_REV0	HEX SET SCREW M10 X 35	4
13	E1-1162_REV0	HEX BOLT M12 X 65	2
14	J209012_REV0	WASHER M16 FORM B	4
15	SP01009_REV0	HEX SET SCREW M8 X 20	1
16	SP01044_REV0	COACH BOLT M10 X 25	4
17	SP02008_REV0	NUT M10 NYLOC (T)	4
18	SP02045_REV0	RIVNUT HEX M8 (4.0-6.0) [NO HEAD]	1
19	SP03008_REV0	WASHER M8 FORM A	1
20	SP03011_REV0	WASHER M10 FORM A	8
21	SP03012_REV0	WASHER M12 FORM A	2
22	SP03029_REV0	WASHER M8 SPRING LOCK	1
23	SP03034_REV0	WASHER M10 SPRING LOCK	4

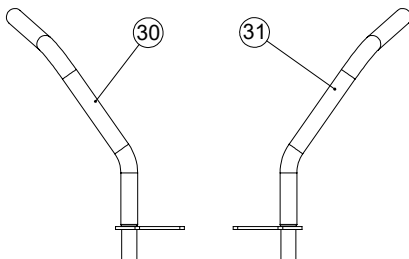


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	390240_REV0	ES-22 SHEAR BLADE CARRIER ASSY	1
2	390239_REV0	ES-22 SHEARBLADE	1
3	J20032_REV1	SCREW 5/16" X 1/2" BSW	8



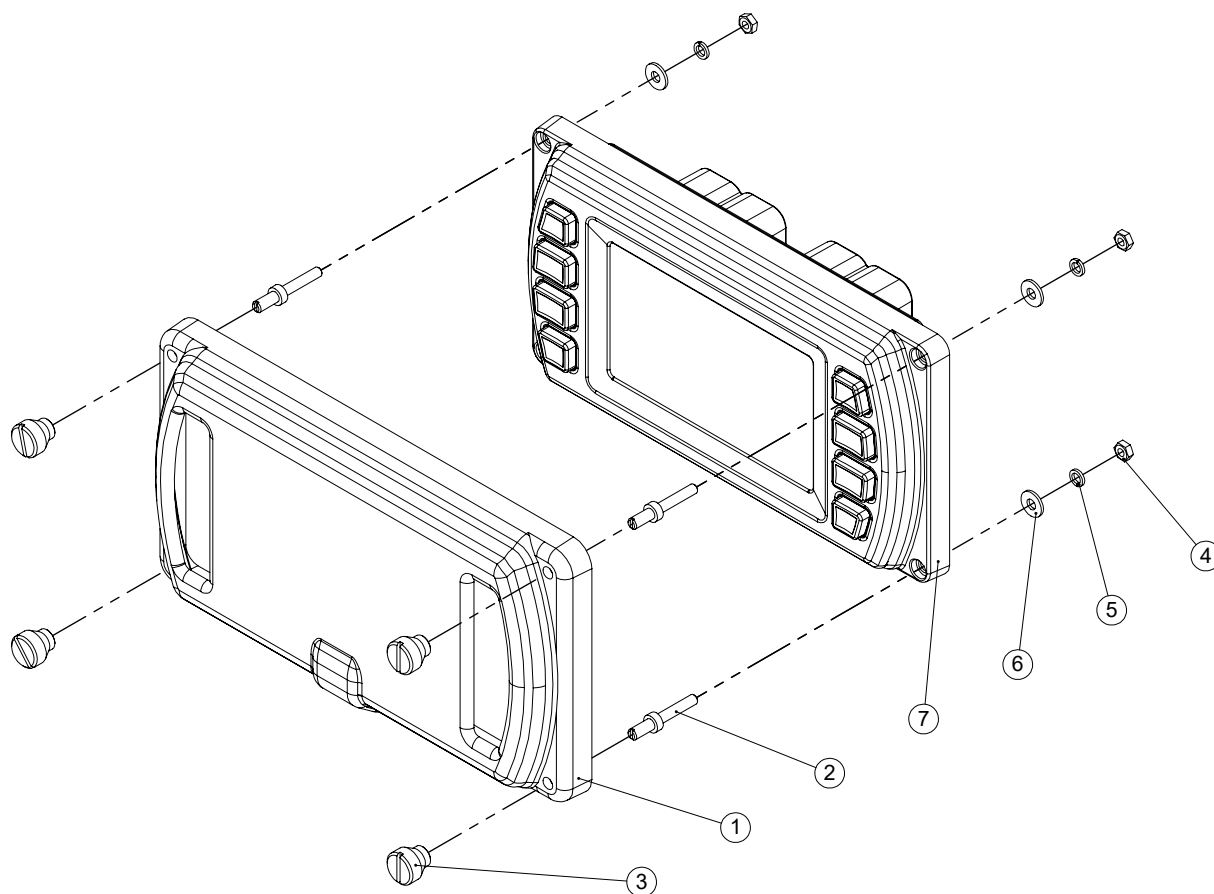
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	390086_REV0	TOP CONSOLE W/A	1
2	390090_REV1	BOTTOM CONSOLE W/A	1
3	390100_REV0	T HANDLE W/A	2
4	390260_REV0	22" LOWER HANDLES W/A	1
5	E1-1060_REV0	M5 SPRING WASHER	4
6	E1-1061_REV0	WASHER M6 SPRING	1
7	J20107_REV0	HANDLE GRIP RUBBER	2
8	SP01009_REV0	HEX SET SCREW M8 X 20	4
9	SP01035_REV0	HEX SET SCREW M10 X 25	6
10	SP01178_REV0	M3.5 x 20 CHEESE HEAD	4
11	SP01101_REV0	SCREW M6 X 25 SLOTTED	1
12	SP02006_REV0	NUT M8 NYLOC (T)	4
13	SP02008_REV0	NUT M10 NYLOC (T)	6
14	SP02041_REV0	RIVNUT HEX M5 (0.5-3.0) [NO HEAD]	4
15	SP02043_REV0	RIVNUT HEX M6 (4.0-6.0) [NO HEAD]	1
16	SP03008_REV0	WASHER M8 FORM A	8
17	SP03010_REV0	WASHER M6 FORM A	1
18	SP03011_REV0	WASHER M10 FORM A	12
19	SP03013_REV0	WASHER M5 FORM C	4
20	SP04001_REV0	SCREW M5 X 16 SLOTTED	4
21	SP12010_REV0	DEADMAN LEVER	2
22	SP12080_REV0	CABLE GLAND 12MM	1
23	SP12099_REV0	DISPLAY PV450	1
24	SP12101_REV0	E-STOP	1
25	SP12142_REV0	DEADMAN SWITCH (0028555)	2
26	SP12151_REV0	V150 HANDLE BAR HARNESS CABLE	2
27	SP12186_REV0	ROUND GREEN PUSH BUTTON HEAD	1
28	SP12187_REV0	XB4 SERIES, SINGLE CONTACT BLOCK, 1 NC	1
29	SP12189_REV0	XB4 CONTACT BLOCK - 2NO - ZD4PA103	1

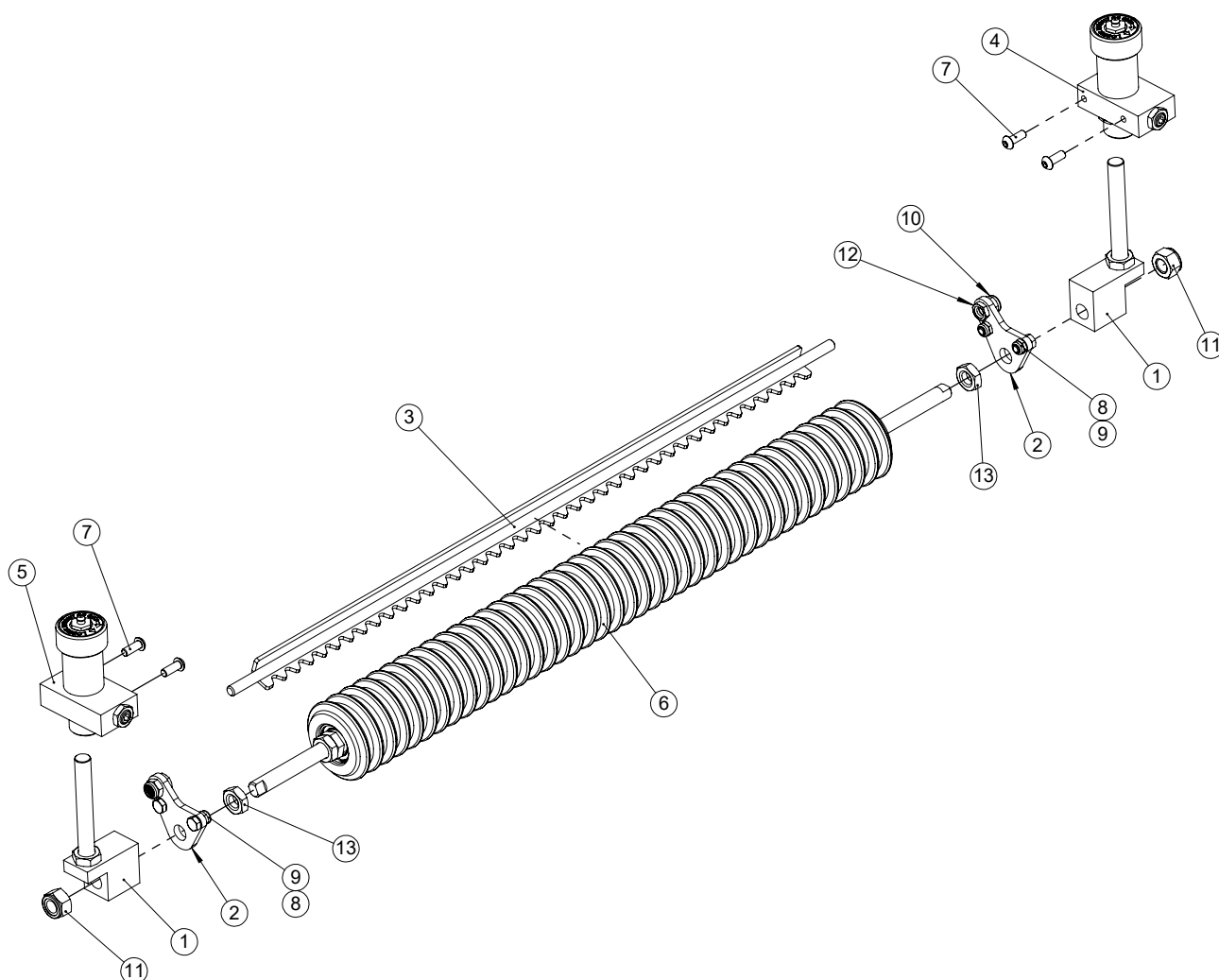


WHEELBARROW STYLE HANDLES AS ALTERNATIVE TO ITEM 4			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY
30	390105_REV0	RH BARROW HANDLE W/A	1
31	390106_REV0	LH BARROW HANDLE W/A	1

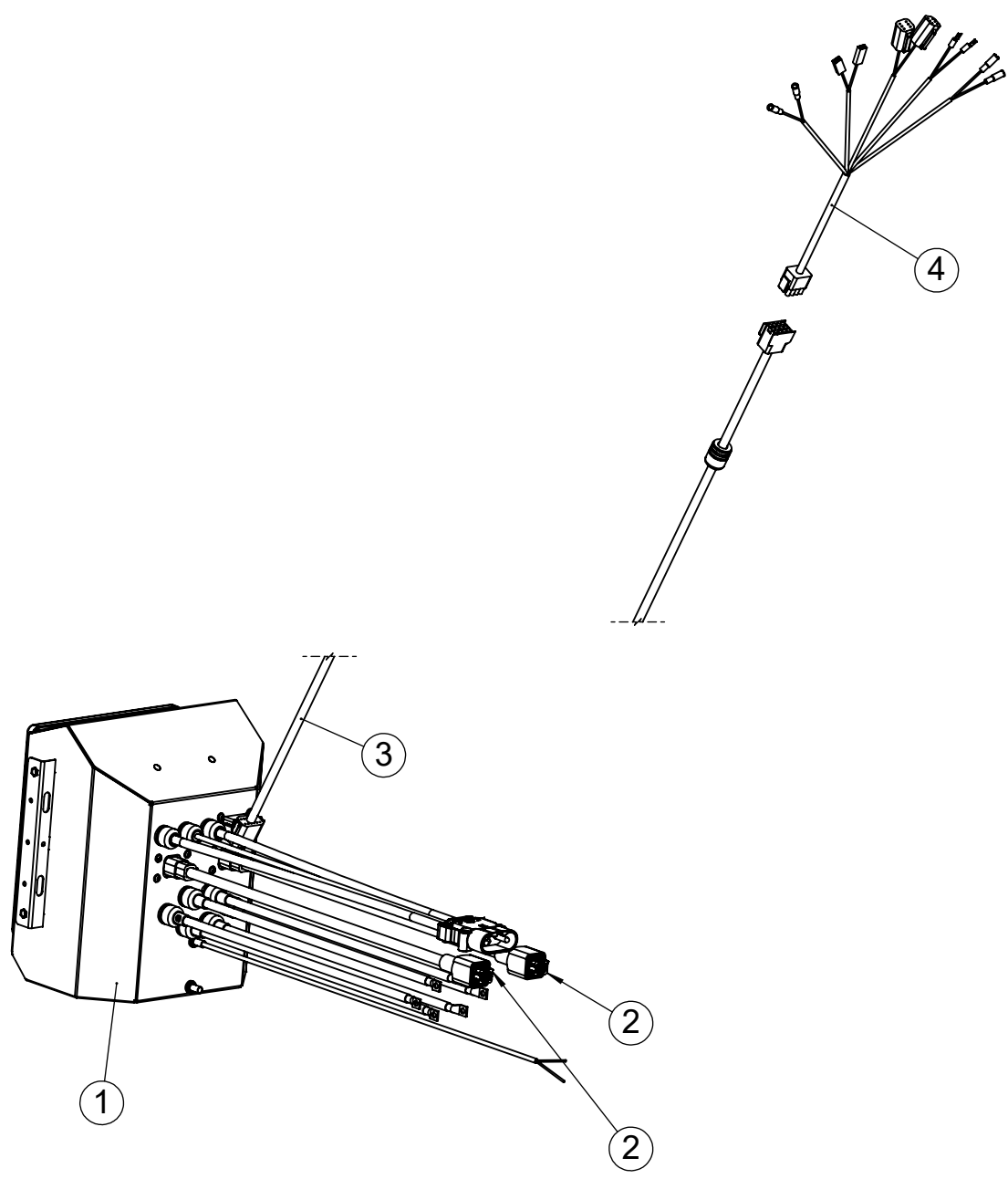




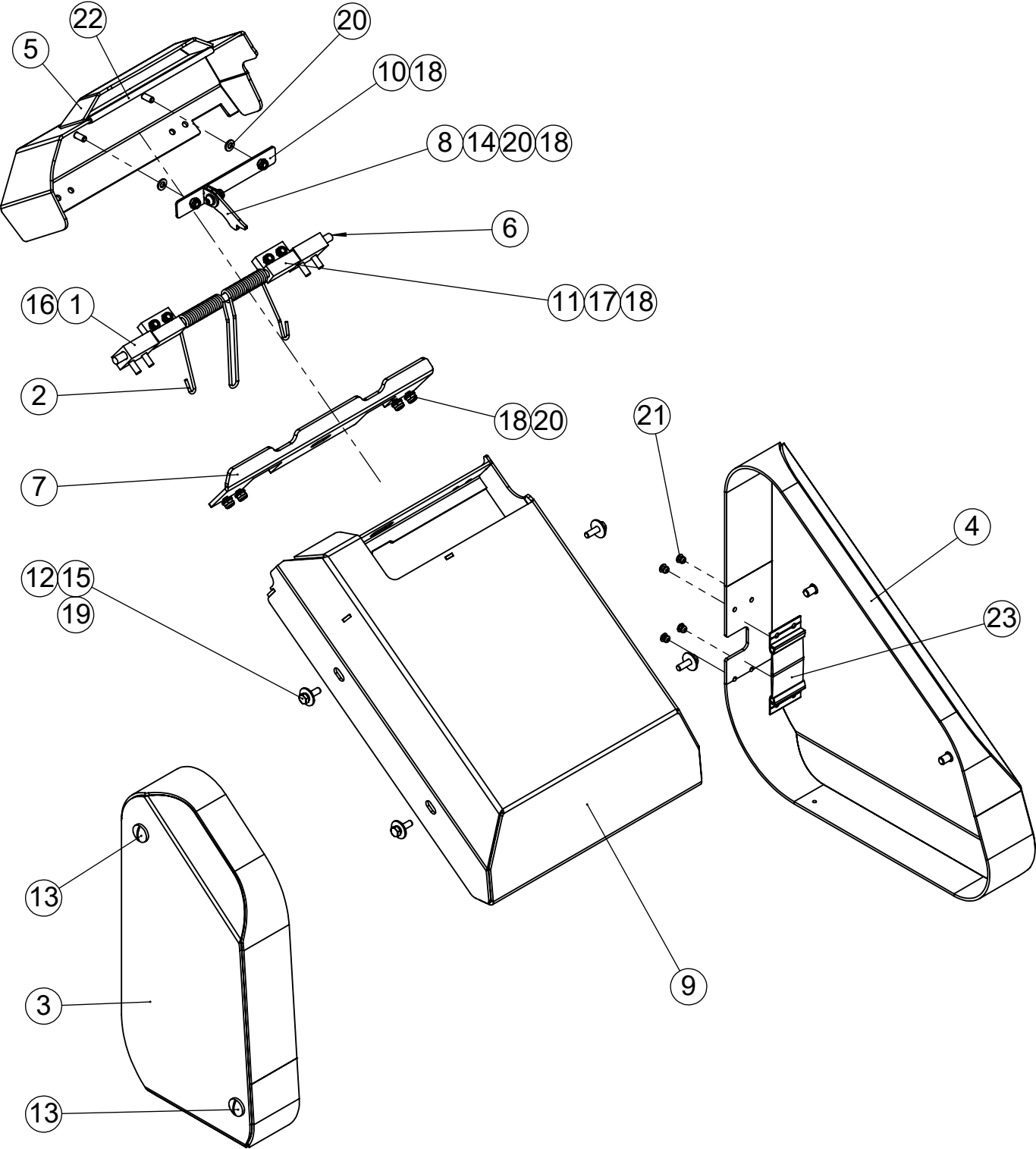
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	390450_REV0	VAC FORMED SCREEN PROTECTOR	1
2	390451_REV0	SCREEN PROTECTOR STUD	4
3	390452_REV0	SCREEN PROTECTOR NUT	4
4	SP02073_REV0	M3.5 NUT STD	4
5	SP03046_REV0	M3.5 SPRING WASHER	4
6	SP03047_REV0	WASHER M3.5 FORM A	4
7	SP12099_REV0	DISPLAY PV450	1



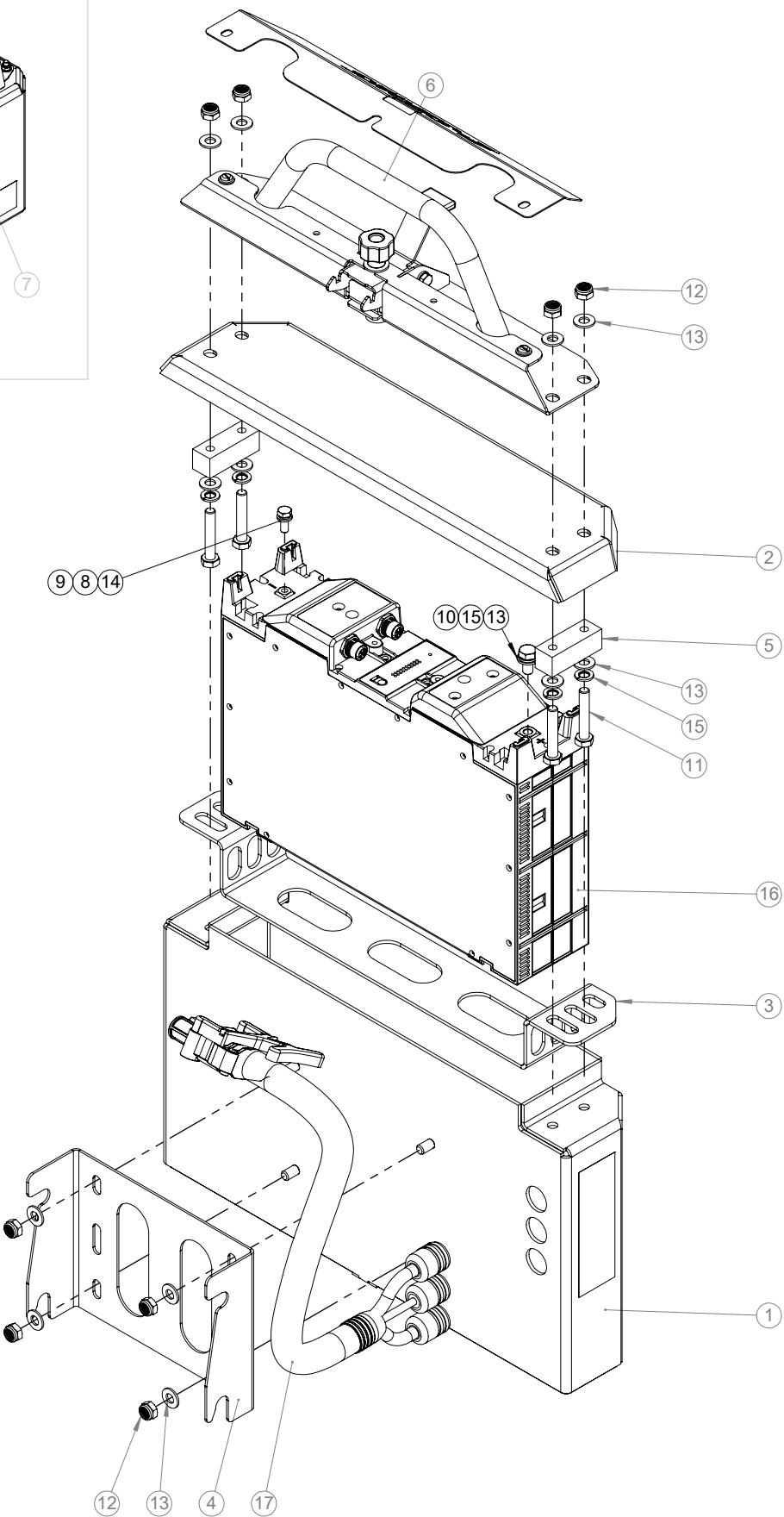
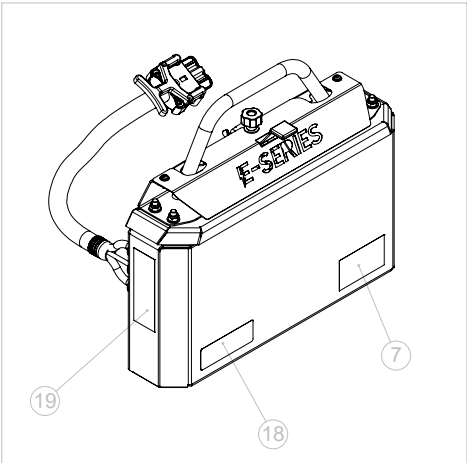
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	240105_REV0	ROLLER END BLOCK ASSY	2
2	240269_REV0	SCRAPER RETAINING PLATE	2
3	240270_REV0	SCRAPER BAR 22"	1
4	800148_REV1	CLICK HEIGHT ADJUSTER L.H.	1
5	800149_REV1	CLICK HEIGHT ADJUSTER R.H.	1
6	800214_REV0	WEILLE ROLLER 22" RAZOR	1
7	SP01019_REV0	BUTTON HEAD M6 X 16	4
8	SP01088_REV1	HEX SET SCREW M6 X 12	4
9	SP02004_REV0	NUT M6 NYLOC	4
10	SP02006_REV0	NUT M8 NYLOC (T)	2
11	SP02010_REV0	NUT M12 NYLOC (T)	2
12	SP02012_REV0	NUT M8 LOCK (THIN)	2
13	SP02014_REV0	NUT M12 LOCK (THIN)	2



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	800595A_REV0	V150 ELECTRICAL BOX (EFZ48143A)	1
2	SP12136_REV0	V150 MOTOR WIRING HARNESS (F42293)	2
3	SP12137_REV0	V150 HANDLE WIRING HARNESS (F4222)	1
4	SP12138_REV0	V150 HANDLE CONTROL HARNESS (F42263)	1

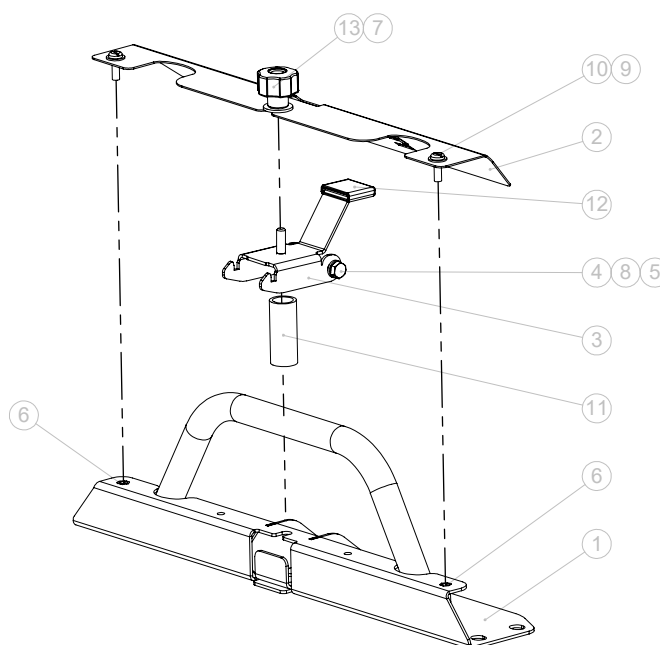


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	229585_REV1	PIVOT BLOCK	2
2	320176_REV1	GRASSBAG SPRING	1
3	390031_REV0	RH SIDE GUARD (DRIVE)	1
4	390032_REV0	FT SIDE GUARD LH (CYLINDER)	1
5	390120_REV0	UPPER COVER W/A	1
6	390125_REV0	LID PIVOT	1
7	390139_REV0	HINGE BRACKET	1
8	390141_REV0	LATCH PLATE	1
9	390145_REV0	LOWER COVER W/A	1
10	390150_REV0	SPRING CLAMP PLATE W/A	1
11	390155_REV0	PIVOT BLOCK	2
12	E1-1061_REV0	WASHER M6 SPRING	4
13	J209074_REV1	BRAKE BAND COVER SCREW	4
14	SP01019_REV0	BUTTON HEAD M6 X 16	1
15	SP01028_REV0	HEX SET SCREW M6 X 20	4
16	SP01101_REV0	SCREW M6 X 25 SLOTTED	4
17	SP01184_REV0	SCREW M6 X 20 SLOTTED	4
18	SP02004_REV0	NUT M6 NYLOC	11
19	SP03007_REV0	WASHER M6 X 20	4
20	SP03010_REV0	WASHER M6 FORM A	12
21	SP05001_REV0	RIVET 4.8 X 10	4
22	SP14054-175_REV0	PVC BLACK EDGE STRIP (175mm)	1
23	SP14055_REV0	BRUSH STRIP & EXTRUSION	2



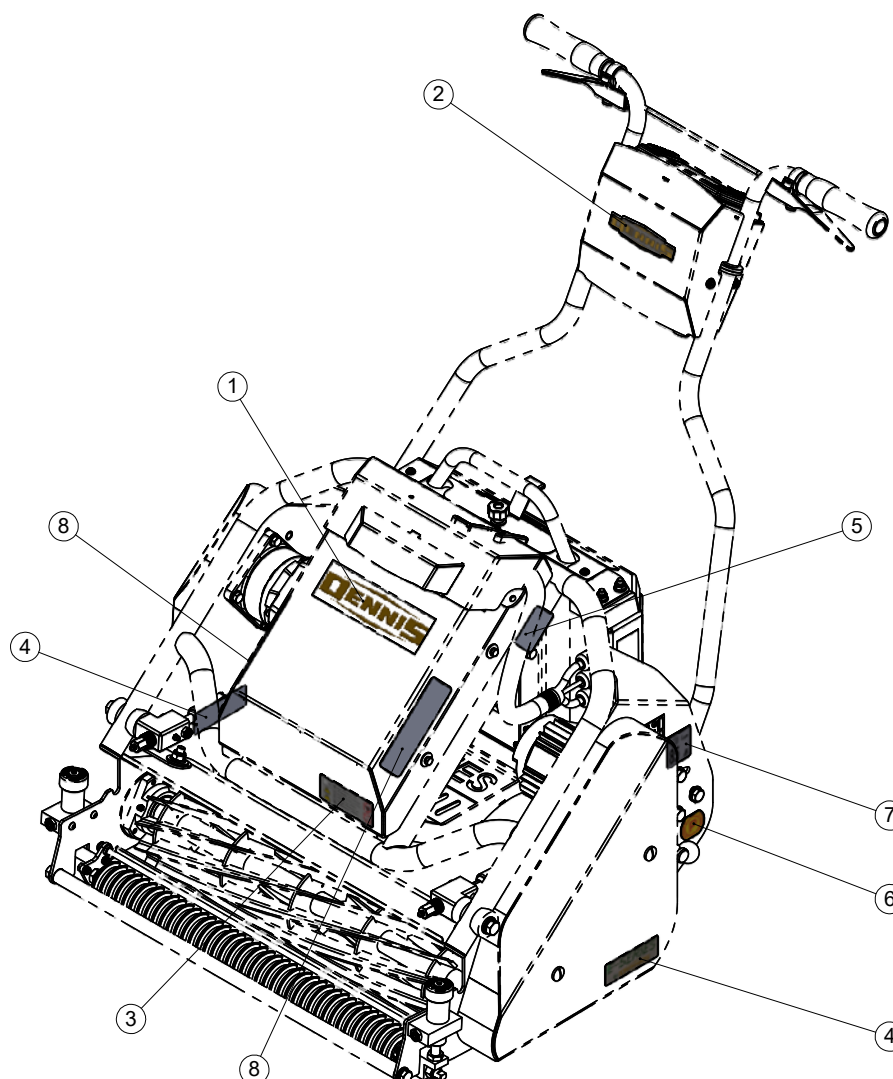


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	390049_REV0	VARTA BATTERY BOX W/A	1
2	390051_REV0	VARTA BATTERY LID	1
3	390052_REV0	VARTA BATTERY BRACKET	1
4	390053_REV0	BATTERY MOUNT PLATE	1
5	390065_REV0	FIXING BLOCK	2
6	800603_REV0	BATTERY HANDLE ASM	1
7	B32903_REV0	DECAL UNION JACK	1
8	E1-1061_REV0	WASHER M6 SPRING	1
9	SP01008_REV0	HEX SET SCREW M6 X 16	1
10	SP01076_REV0	HEX SET SCREW M8 X 16	1
11	SP01113_REV0	HEX SET SCREW M8 X 45	4
12	SP02006_REV0	NUT M8 NYLOC (T)	8
13	SP03008_REV0	WASHER M8 FORM A	13
14	SP03010_REV0	WASHER M6 FORM A	1
15	SP03029_REV0	WASHER M8 SPRING LOCK	5
16	SP12130_REV0	VARTA CELL	1
17	SP12147_REV0	VARTA BATTERY HARNESS	1
18	SP18026-3_REV0	E-SERIES DECAL	1
19	SP18026-4_REV0	BATTERY DISCONNECT DECAL	1

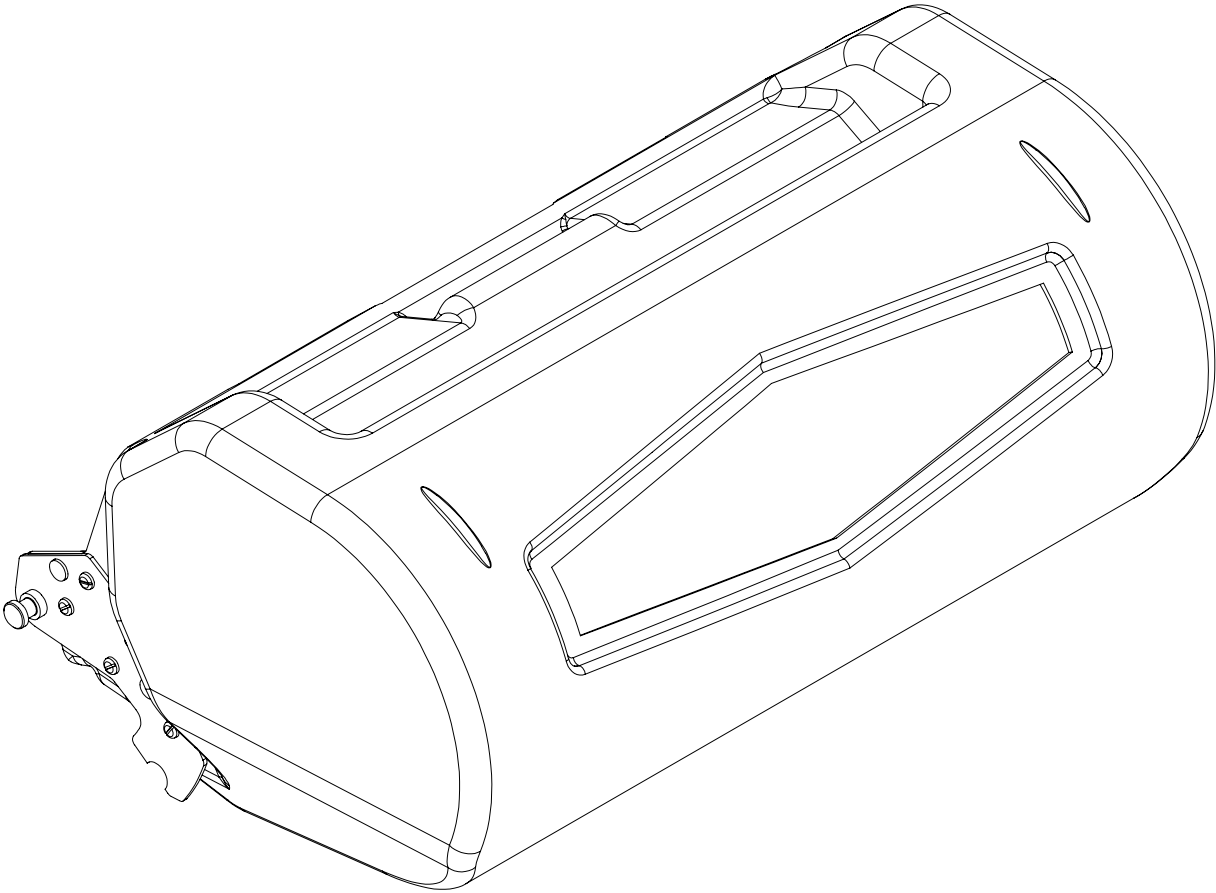


SP16021\_REV0

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	390055_REV0	HANDLE W/A	1
2	390064_REV0	HANDLE COVER	1
3	390068_REV0	LATCH ASSEMBLY	1
4	F22110_REV1	HEX SET SCREW M6 X 60	1
5	SP02004_REV0	NUT M6 NYLOC	1
6	SP02041_REV0	RIVNUT HEX M5 (0.5-3.0) [NO HEAD]	2
7	SP03007_REV0	WASHER M6 X 20	1
8	SP03010_REV0	WASHER M6 FORM A	2
9	SP03013_REV0	WASHER M5 FORM C	2
10	SP04001_REV0	SCREW M5 X 16 SLOTTED	2
11	SP13003_REV0	SPRING LC-080J-5	1
12	SP14052_REV0	FLAT SLEEVE PVC (ID25x3-L25) BLACK	1
13	SP14056_REV0	M6 MULTI LOBE CLAMPING KNOB	1



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	B32902_REV2	DECAL DENNIS 200 X 50 (LARGE)	1
2	J20362_REV2	DECAL DENNIS 120 X 30 (SMALL)	1
3	SP18026-2_REV0	WARNING DECAL	1
4	SP18026-3_REV0	E-SERIES DECAL	2
5	SP18026-6_REV0	BATTERY DECAL	1
6	SP18026_REV0	E-SERIES DECAL SET	1
7	SP18036_REV0	LWA 85 dB DECAL	1
8	SP18039_REV0	ES-22 DECAL	2



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	800216_REV0	22" GRASSBOX ASSY (RAZOR)	1



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# **E-SERIES** by **DENNIS**

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