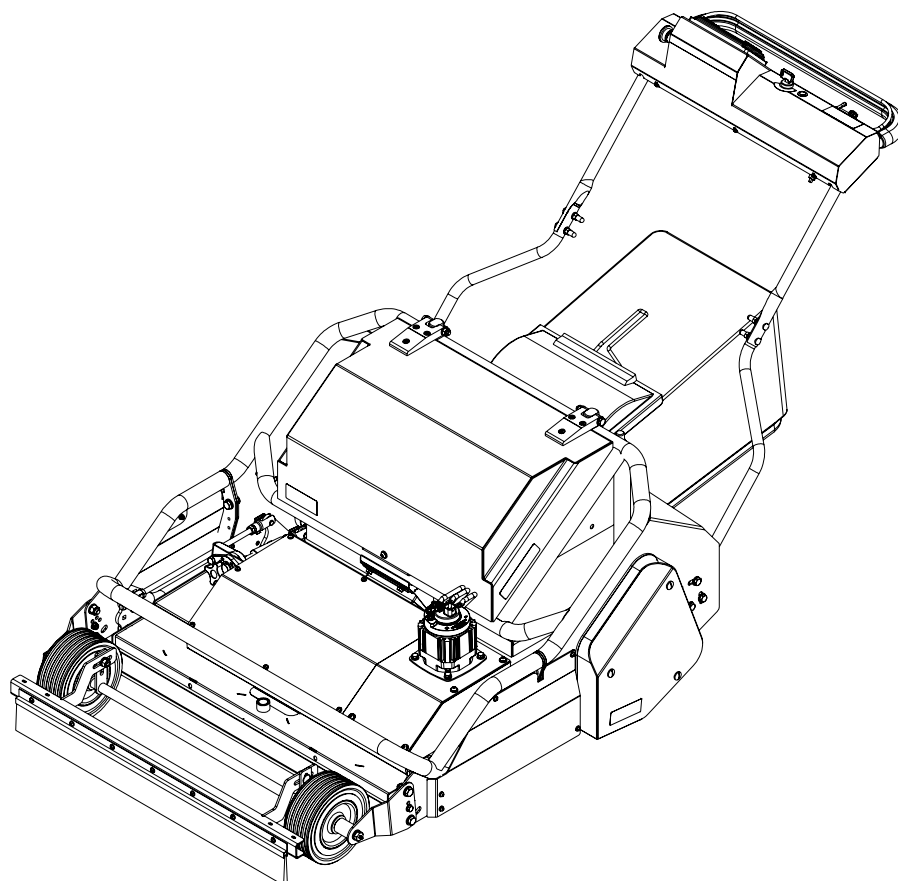




# ES-34R

## ELECTRIC ROTARY MOWER

### INSTRUCTION MANUAL



World class turf maintenance equipment

# EU DECLARATION OF CONFORMITY

**ES-34R Rotary 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, NB0026, Jan Olieslagerslaan 35, B-1800 Vilvoorde, Belgium

I the undersigned declare that this machine:-

Model	Cutting Width	Power	Measured Sound Power Level	Guaranteed Sound Power Level	Serial Number
ES-34R	860mm	InMotion 103 (Drive) InMotion 106 (Deck)	95dB Lwa	98dB Lwa	See product ID Range

Tested at:-

- Howardson Works

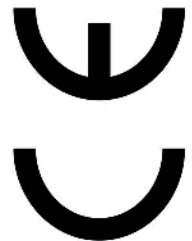
Complies with the applicable requirements of:-

- 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

**ES-34R Rotary 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:-**

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

I the undersigned declare that this machine:-

Model	Cutting Width	Power	Measured Sound Power Level	Guaranteed Sound Power Level	Serial Number
ES-34R	860mm	InMotion 103 (Drive) InMotion 106 (Deck)	95dB Lwa	98dB Lwa	See product ID Range

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- Howardson Works

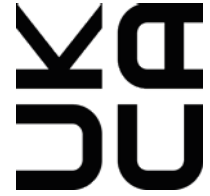
Complies with the applicable requirements of:-

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

Managing Director



Ian Howard



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

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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

<b>CHASSIS SERIAL NUMBER</b>	
<b>BATTERY SERIAL NUMBER</b>	
<b>ROLLER MOTOR SERIAL NUMBER</b>	
<b>CYLINDER MOTOR SERIAL NUMBER</b>	

**INTRODUCTION**

This operating manual is an essential tool to ensure the proper and safe operation of the ES-34R Electric Rotary Mower. This user manual contains important information regarding the safe, proper and efficient operation of the ES-34R. Adherence to this manual will help to avoid risk, lower repair costs and reduce downtimes while simultaneously increasing the service life of the ES-34R itself. The operating manual must always be available, and every person tasked with working on or with the ES-34R must read and follow the instructions. In the case of any difficulty, or if further information or advice is required, our Service Department is always at your call. In the interests of speed and accuracy of information please quote the serial numbers of the machine when making enquiries. For the machine, this is to be found on a plate attached to the side of the chassis. We suggest you write the numbers on the front page of this book.

**MACHINE DESCRIPTION**

A rotary cutting machine manufactured with 34" (86cm) cutting width this machine is run by a pair of 48V high efficiency brushless permanent magnet AC motors powered from an 111 Ah lithium ion battery. The rear roller and cutter are controlled independently via belt drives operated from the display screen on the upper handle bar. A mechanical parking brake is fitted for added safety when working around uneven ground, when applied this disengages drive to both motors for added safety. In the design of the machine, special attention has been given to the importance of easy service and maintenance with the construction based on a sectional assembly system. These are the Electrical Drive system, the Rear Roller Unit and the Front Roller Unit, each of which can be readily removed individually from the main Frame Chassis Unit.

**NOTICE OF COPYRIGHTS AND PROPERTY RIGHTS**

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- Only make this operating manual accessible to authorized persons.
- Only pass this operating manual to third parties after obtaining written permission from DENNIS.
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- Violations are punishable and subject to compensation of damages. DENNIS reserves the right to exercise any and all industrial property rights.



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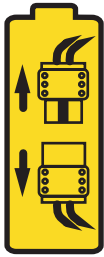
## READ THE INSTRUCTIONS.

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.

**CAUTION:-**



**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.

**DENNIS**

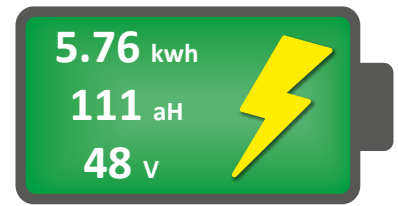
**sisis**

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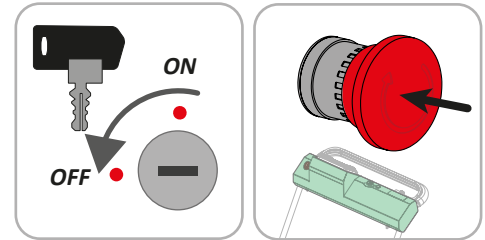
**KEY INFORMATION** – Lithium battery packs will self-discharge over extended periods of time without maintenance. Once lithium-ion cells discharge below a certain voltage they become unusable and must not be discharged further (*Deep Discharge state*). Regular monitoring and maintenance is essential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



### Recommendations to ensure maximum battery life:

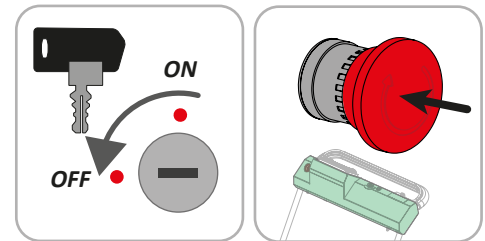
#### Leaving your mower for a few days

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



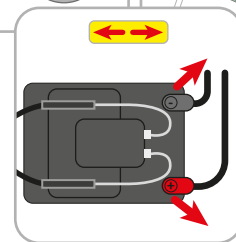
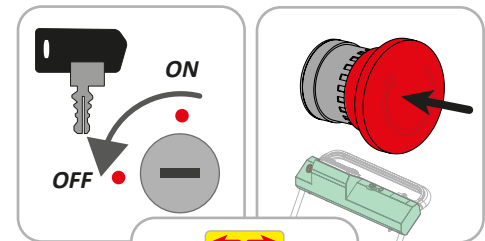
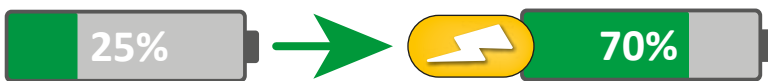
#### Leaving your mower stored for any extended period of time (>30 days)

- Never leave the mower with below 50% charge when stored
- Always turn the key off and press the E-Stop in
- Ideally disconnect the battery terminals from the top of the battery
- If left for more than 45 days, it is important that it is checked periodically and if necessary, charged to ensure that the voltage remains above 50.12V



#### Transporting your mower

- Never ship the mower with below 25% charge (50.12V)
- Charge mower to approx. 70% SOC for transport
- Always turn the key off and press the E-Stop in
- Always disconnect the terminals from the top of the battery

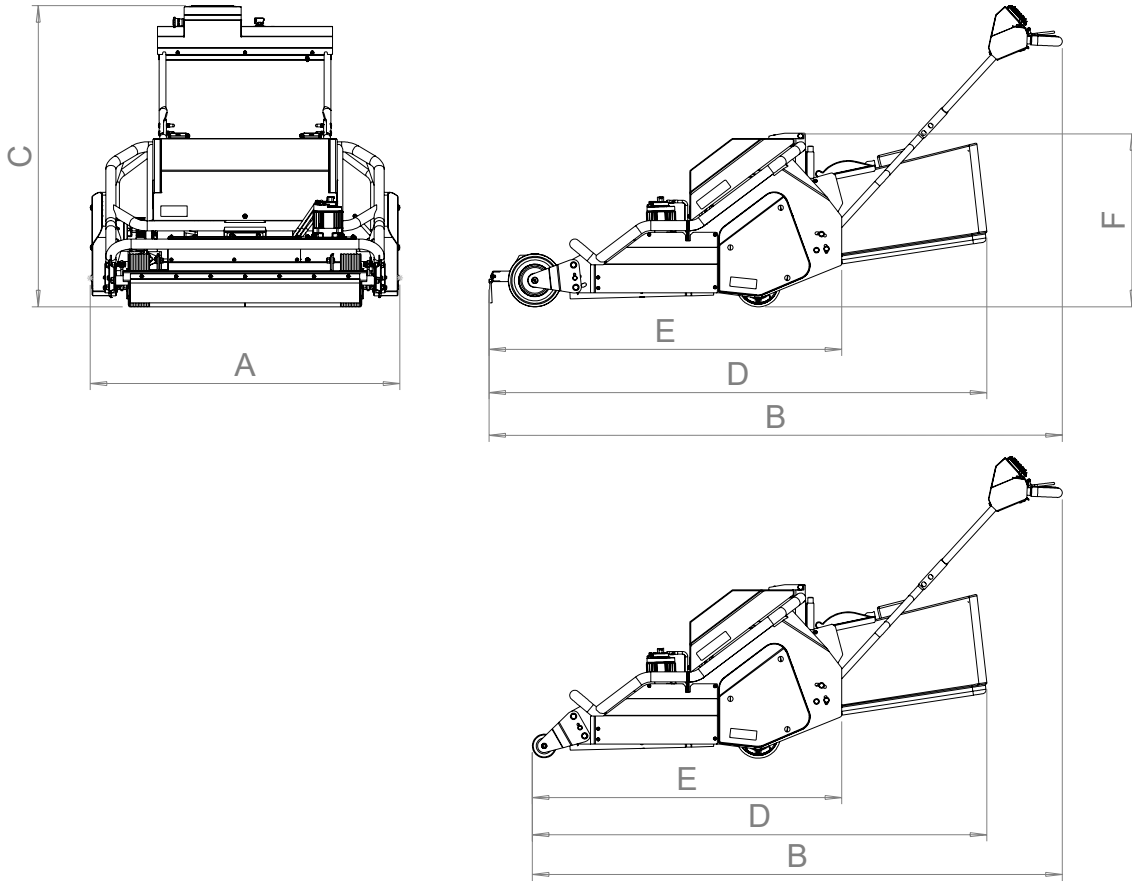


### RECOMMENDATIONS FROM BATTERY MANUFACTURER\*

Battery State of Charge (SOC)	Typ. Voltage	Until Deep Discharge
50%	51.24V	55Ah = 1.3 years
25%	50.12V	28Ah = 8.3 months
5%	46.9V	5.5Ah = 49 days
2%	45.92V	4.5Ah = 40 days
0%	44.1V	2Ah = 18 days
DEEP DISCHARGE	39.2V	0Ah = 0 days

\*Hyperdrive Modular Pack User Manual – HYP-131-MAN-Z-001

# ES-34R ROTARY MOWER TECHNICAL DATA



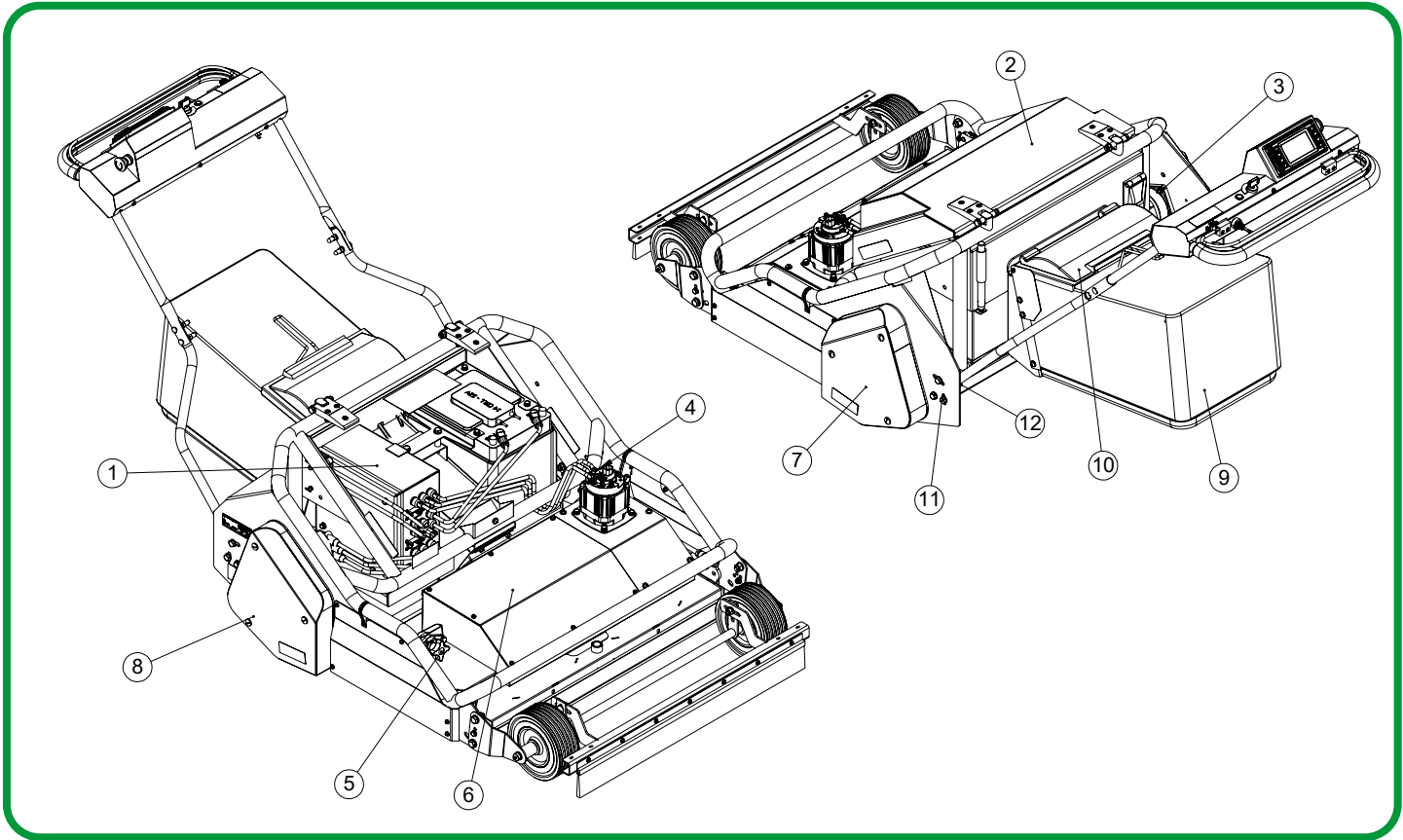
CONFIGURATION		WHEEL & BRUSH	ROLLER
<b>ES-34R DIMENSIONS</b>			
Cutting Width (mm)		860mm (34")	
Machine Width (mm) A		1168mm	
Machine Length <small>Inc handles</small> (mm) B		2164mm	2000mm
Machine Height <small>Inc Handles</small> (mm) C		1137mm	
Machine Length <small>Exc handles</small> (mm) D		1879mm	1715mm
Chassis Length <small>Exc Handles</small> (mm) E		1332mm	1168mm
Machine Height <small>Exc Handles</small> (mm) F		654mm	
Weight <small>Exc Cassette</small> (kg)		220kg	
<b>DRIVE SYSTEM</b>			
Roller Motor (W)		630	
Roller Drive System		Timing Belt	
Blade Motor (W)		1200	
Blade Drive System		Double Sided Timing Belt	
<b>ELECTRICAL SYSTEM</b>			
Battery Type		Lithium Ion	
System Voltage		48V	
Battery Capacity (Ah)		111	
Self Discharge @ 25 °C		< 2% per month	



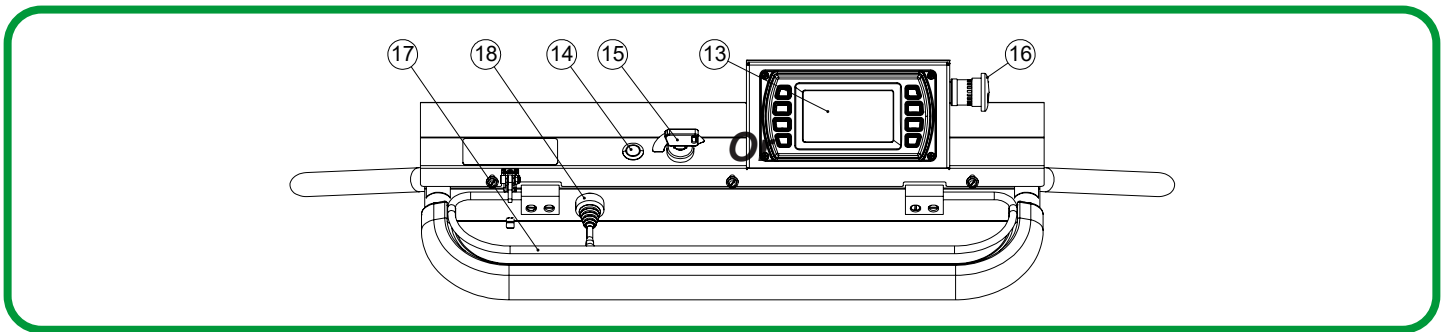
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# ES-34R ROTARY MOWER TECHNICAL DATA



No.	PART	No.	PART
1	Electrical Box	7	LH Belt Guard
2	Battery Cover	8	RH Belt Guard
3	Roller Motor	9	Grass Bag
4	Deck Motor	10	Grass Bag Cover
5	Deck Height Adjuster	11	Handlebar Adjuster
6	Deck	12	Parking Brake



No.	PART	No.	PART
13	Display Screen	16	Emergency Stop
14	Start Button	17	Deadmans Handle
15	Key Switch	18	Momentary Switch

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 drivemotor will engage. Releasing the handle during operation will cut power to both motors.
- To drive, depress the **DEADMANS HANDLE** and then move the **MOMENTARY LEVER**. The machine will go into Drive automatically and move forward. When the lever is moved to the left, the machine will return to Neutral when released. When moved to the right, the lever will latch in place until moved back.
- 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 deck motor 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.
- 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 motor 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:-**

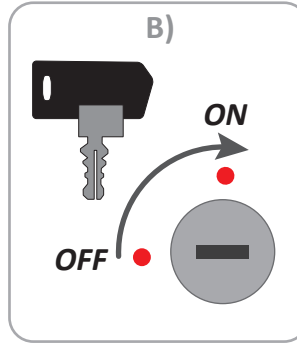
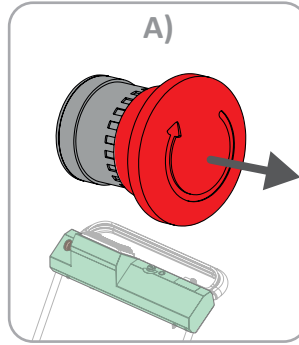
Pushing the mower, when not motor driven, should always be done in NEUTRAL to avoid damaging the internal motor brake.



# E-SERIES BASIC OPERATING

## KEY START

- A) Release **E-Stop**
- B) Key mower to 'ON' position on the barrel
- C) Push and Hold **START** button
- D) Listen for 'CLICK' from the electrical box
- E) Release button & wait for display screen to boot



## Cylinder START / STOP

When in DRIVE only

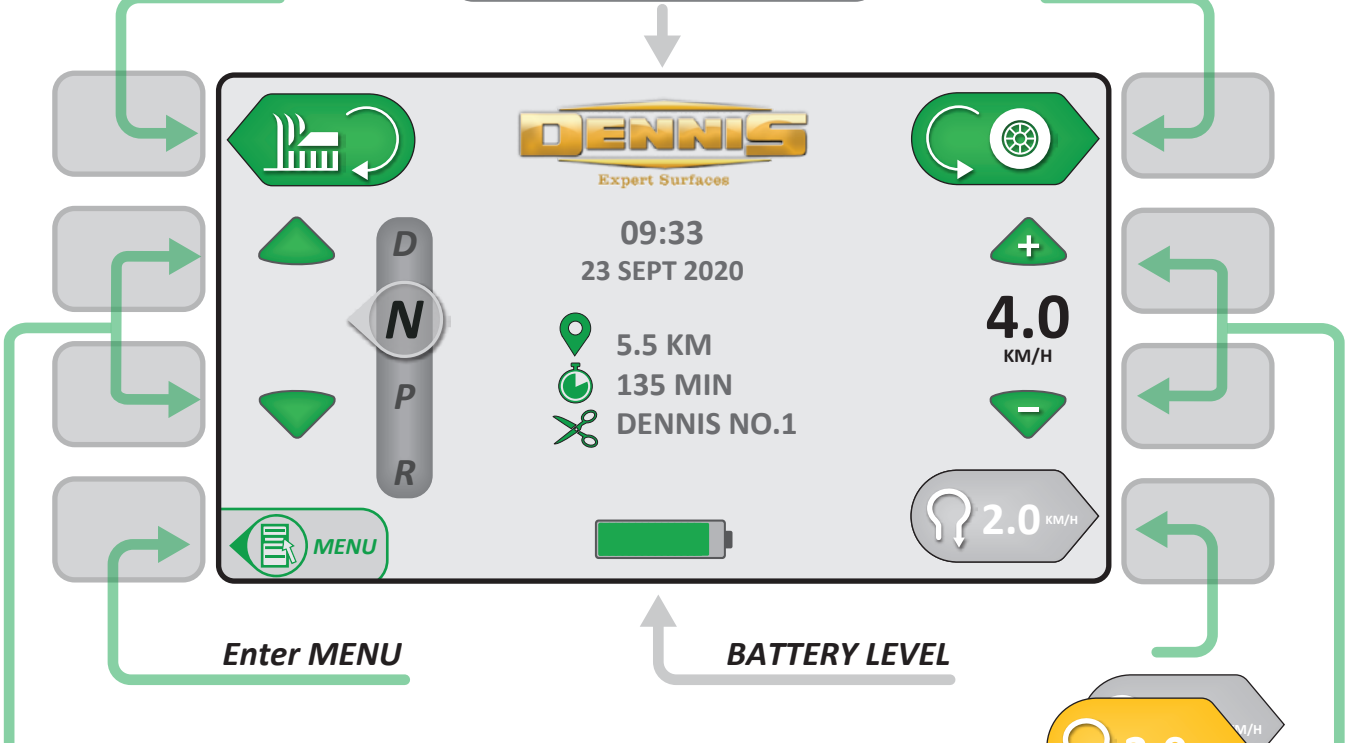


### TIME - DATE

- TRIP DISTANCE
- TRIP TIME
- SELECTED CLIP RATE or RPM

## Roller START / STOP

When in DRIVE or REVERSE



Enter MENU

BATTERY LEVEL



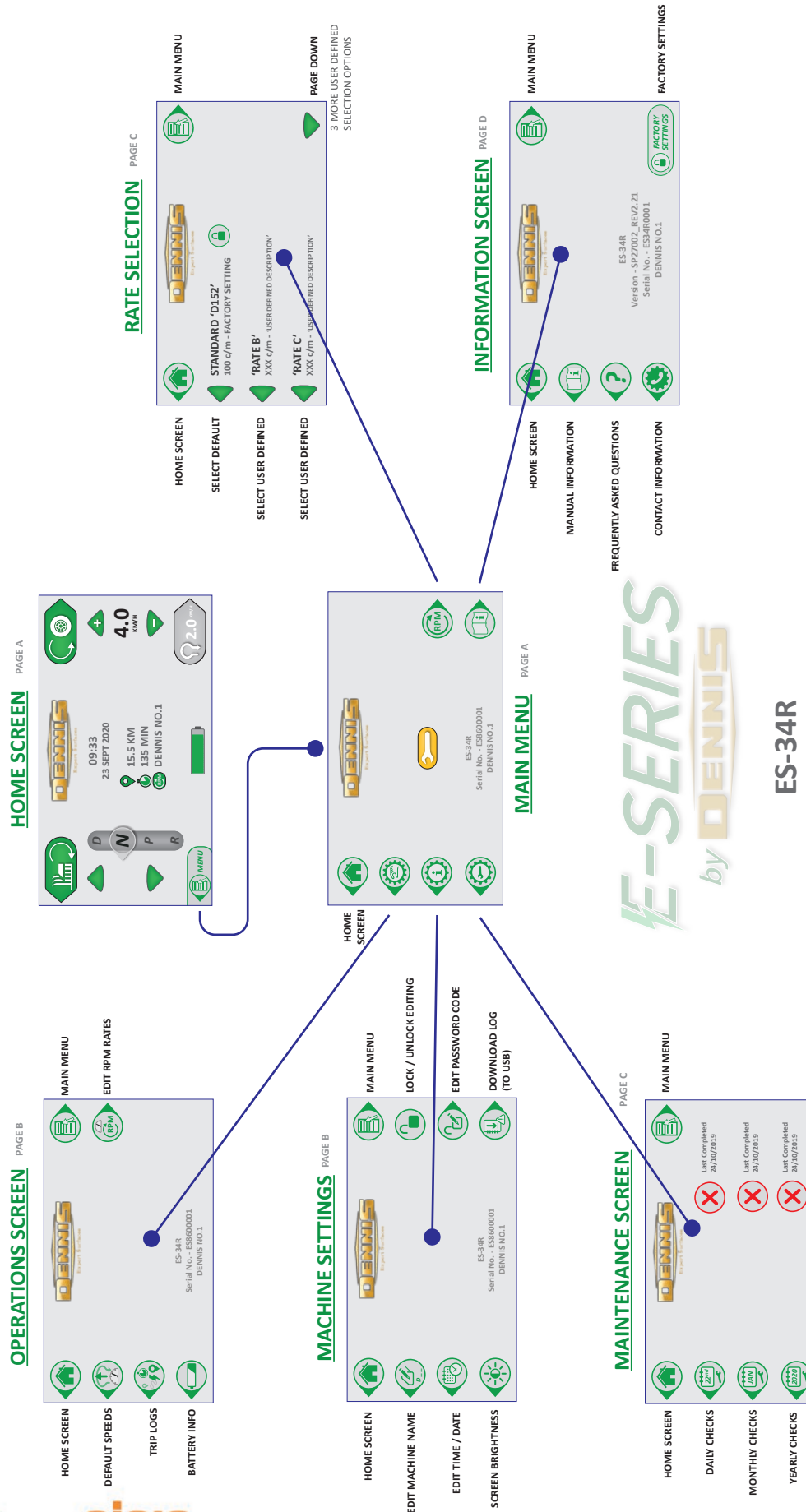
**Turning Speed**  
Turn ON / OFF

Increase / Decrease  
Forward Speed  
(0.1 increments)

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



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**E-SERIES**  
by DENNIS

**ES-34R**  
**ELECTRIC ROTARY MOWER**

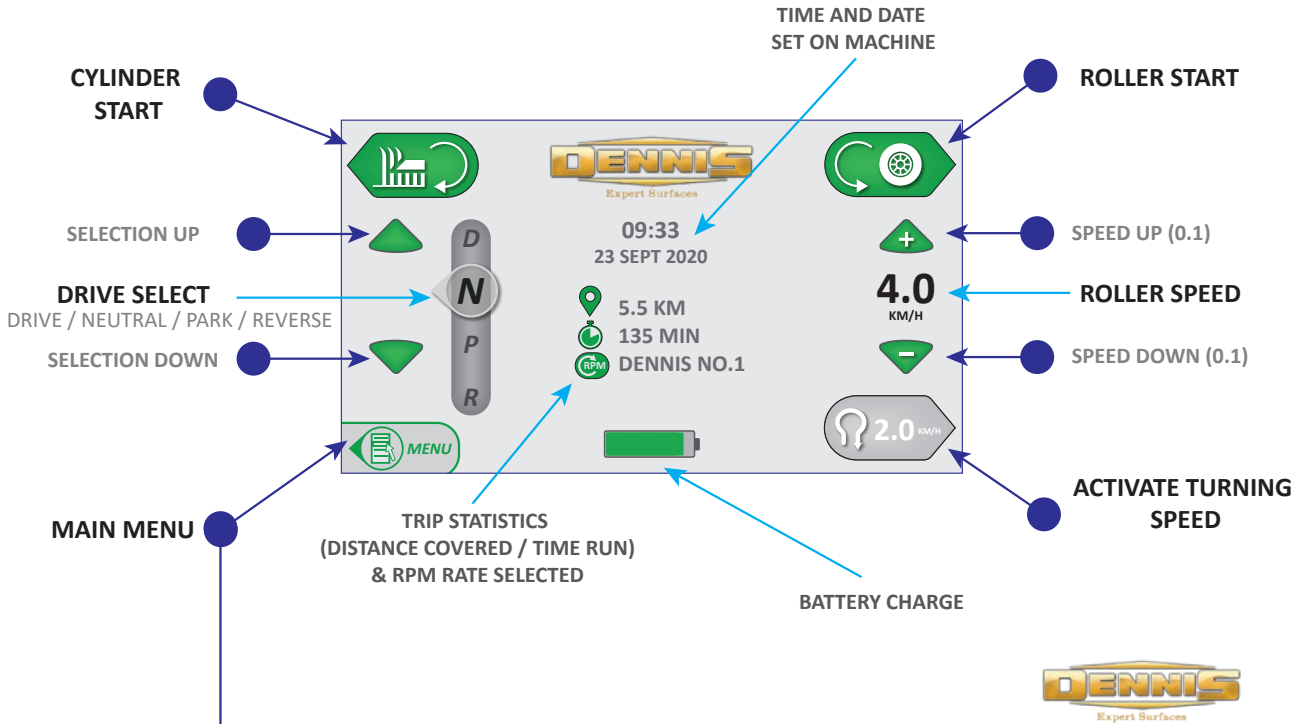
SP1902\_REV1 - 11/02/2021

**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).

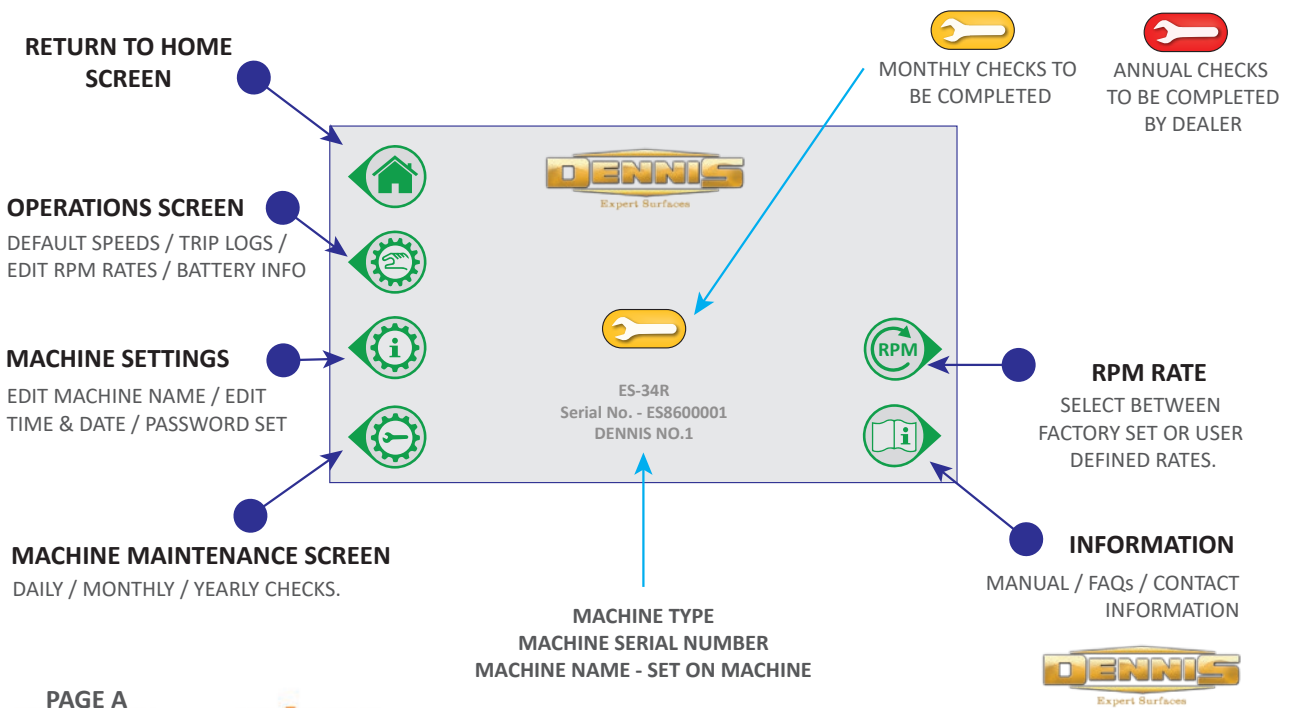


**MAIN MENU**



	<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).



PAGE A



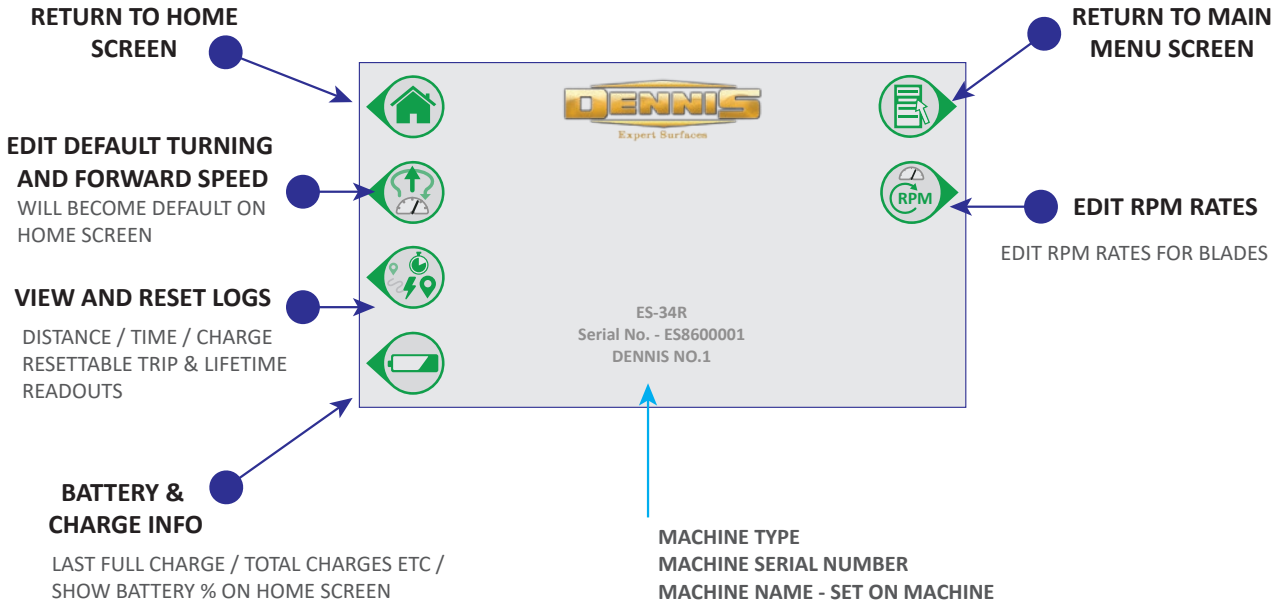
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**OPERATIONS SCREEN**



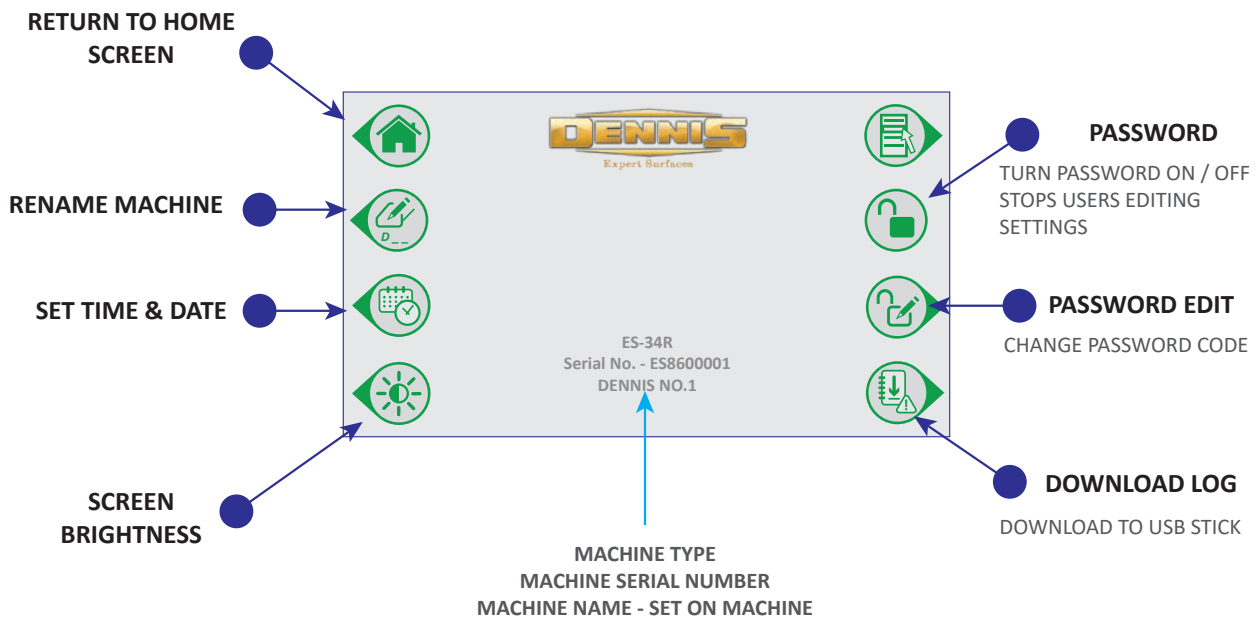
	<b>BUTTON SELECTION</b>
	<b>SCREEN INFO</b>



**MACHINE SETTINGS**



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



## MAINTENANCE SCREEN



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

MAINTENANCE SCREEN. SELECT AND SIGN OFF DAILY / WEEKLY & YEARLY CHECKS.

**RETURN TO HOME SCREEN**

**DAILY CHECKS**

GIVES LIST OF CHECKS. LOG AS COMPLETE ONCE DONE

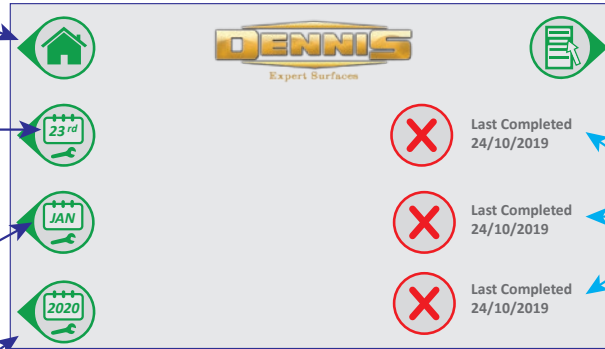
**MONTHLY CHECKS**

GIVES LIST OF CHECKS. LOG AS COMPLETE ONCE DONE

**ANNUAL CHECKS**

GIVES LIST OF CHECKS. LOG AS COMPLETE ONCE DONE

**RETURN TO MAIN MENU SCREEN**



LAST DATE COMPLETED. ARE CHECKS UP TO DATE

CLICK ON BOTTOM THIS SIDE TO SEE EXPANDED LOG LIST



## RATE SELECTION



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

SELECT YOUR CLIP RATE OR RPM DEPENDENT ON THE CASSETTE TYPE YOU HAVE SELECTED. WHEN CHOSEN IT WILL RETURN YOU TO HOME SCREEN READY TO OPERATE.

**RETURN TO HOME SCREEN**

**SELECT DEFAULT CLIP RATE**

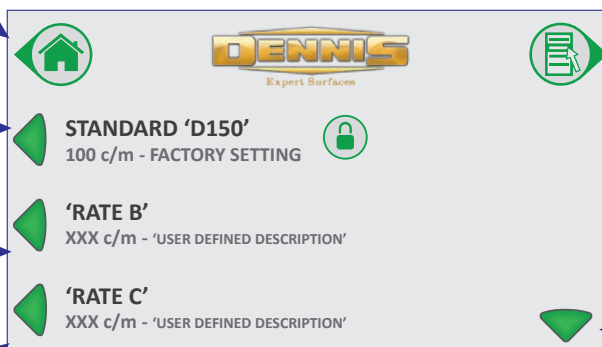
LOCKED FOR EDITING

**SELECT USER DEFINED CLIP RATE**

**SELECT USER DEFINED CLIP RATE**

**PAGE DOWN**

NEXT 3 USER DEFINED SELECTIONS



PAGE C



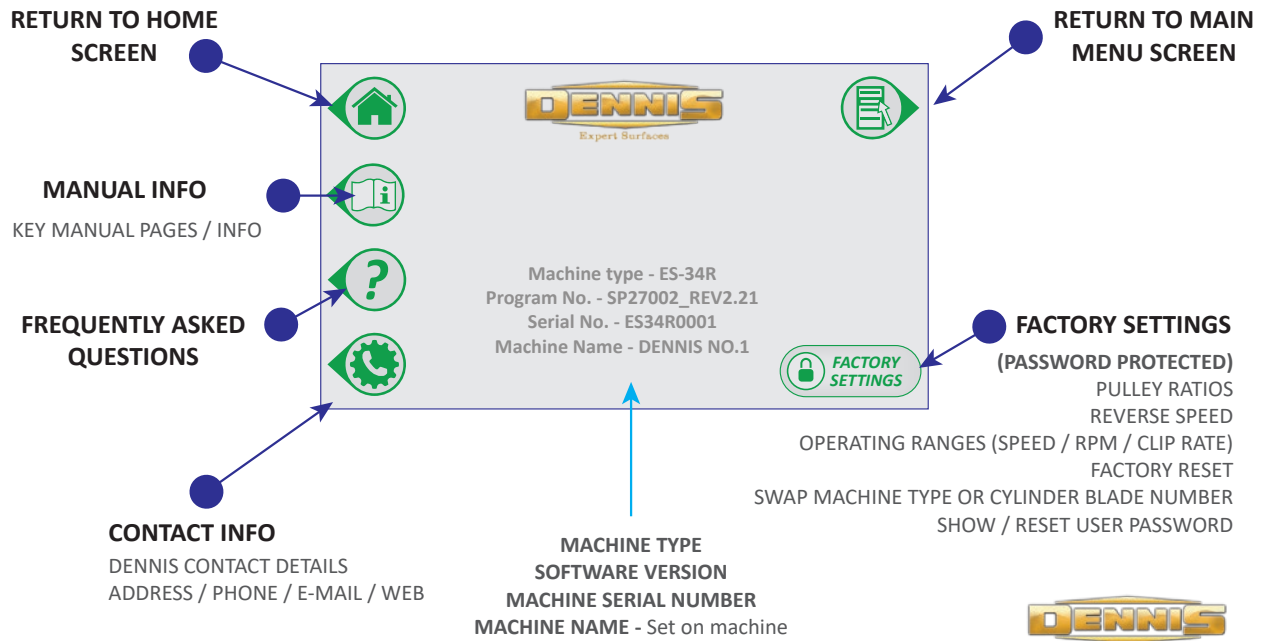
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**INFORMATION SCREEN**



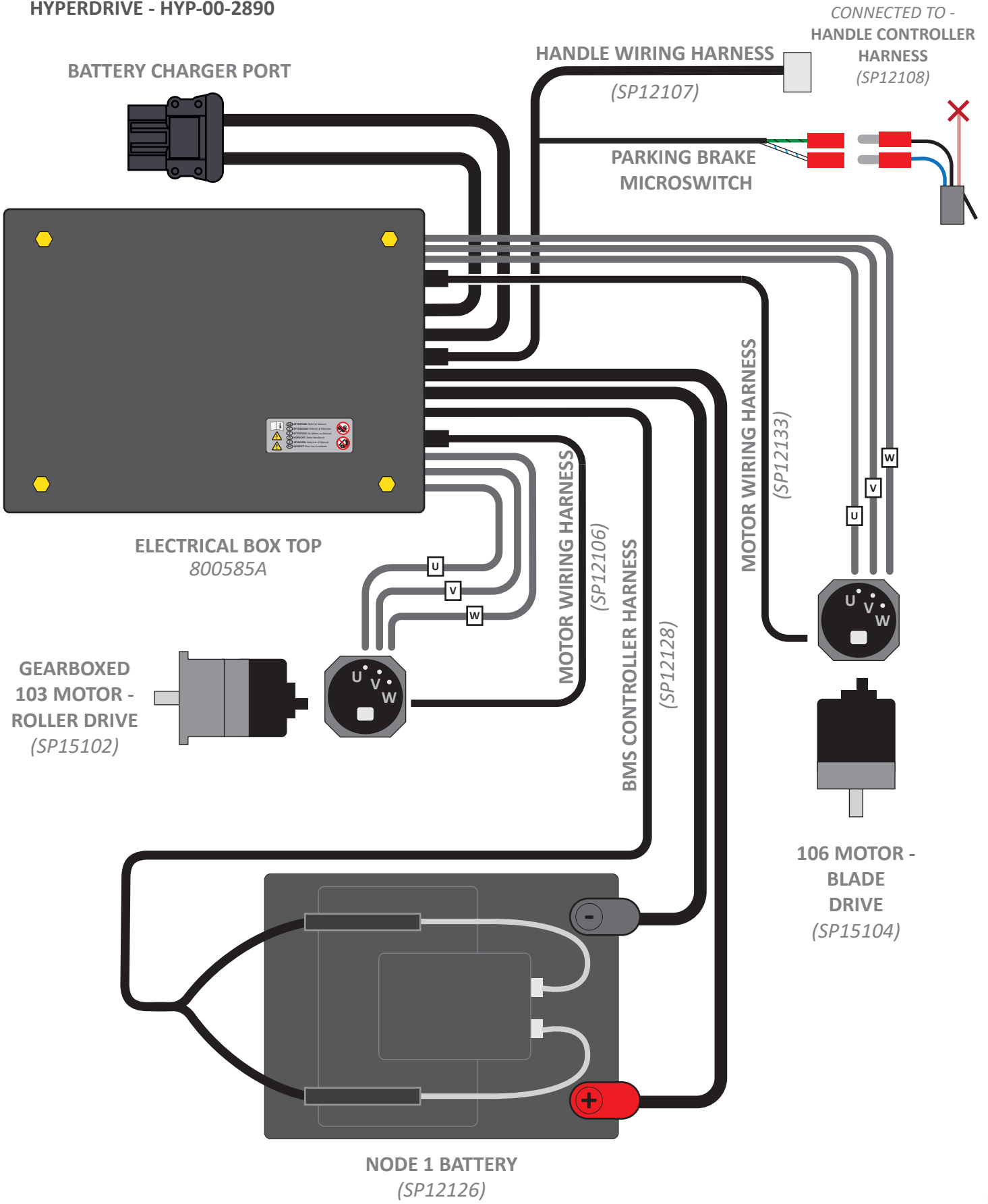
	<b>BUTTON SELECTION</b>
	<b>SCREEN INFO</b>

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



# ES-34R MACHINE WIRING

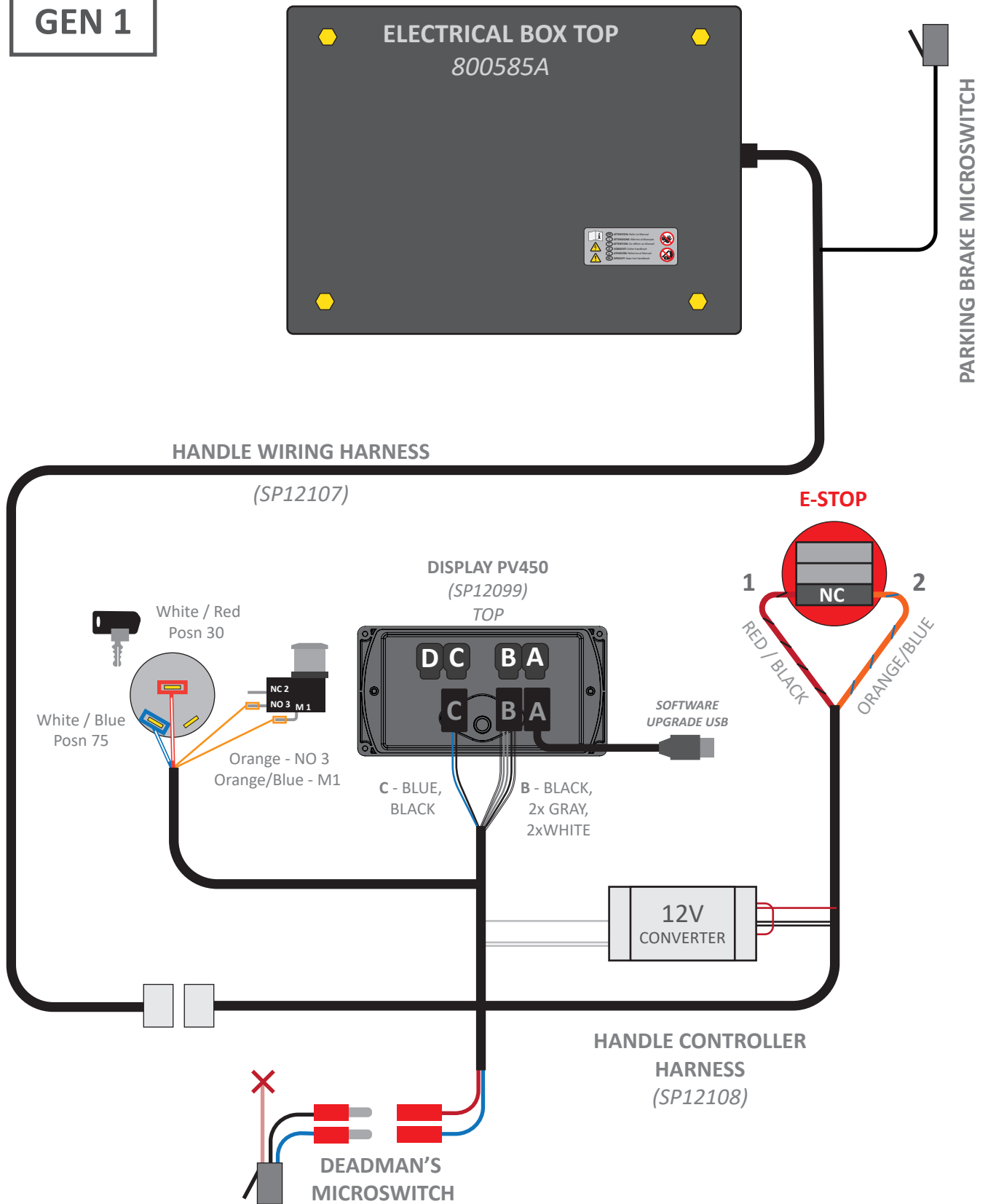
HYPERDRIVE - HYP-00-2890



# ES-34R MACHINE WIRING

HYPERDRIVE - HYP-00-2890

**GEN 1**



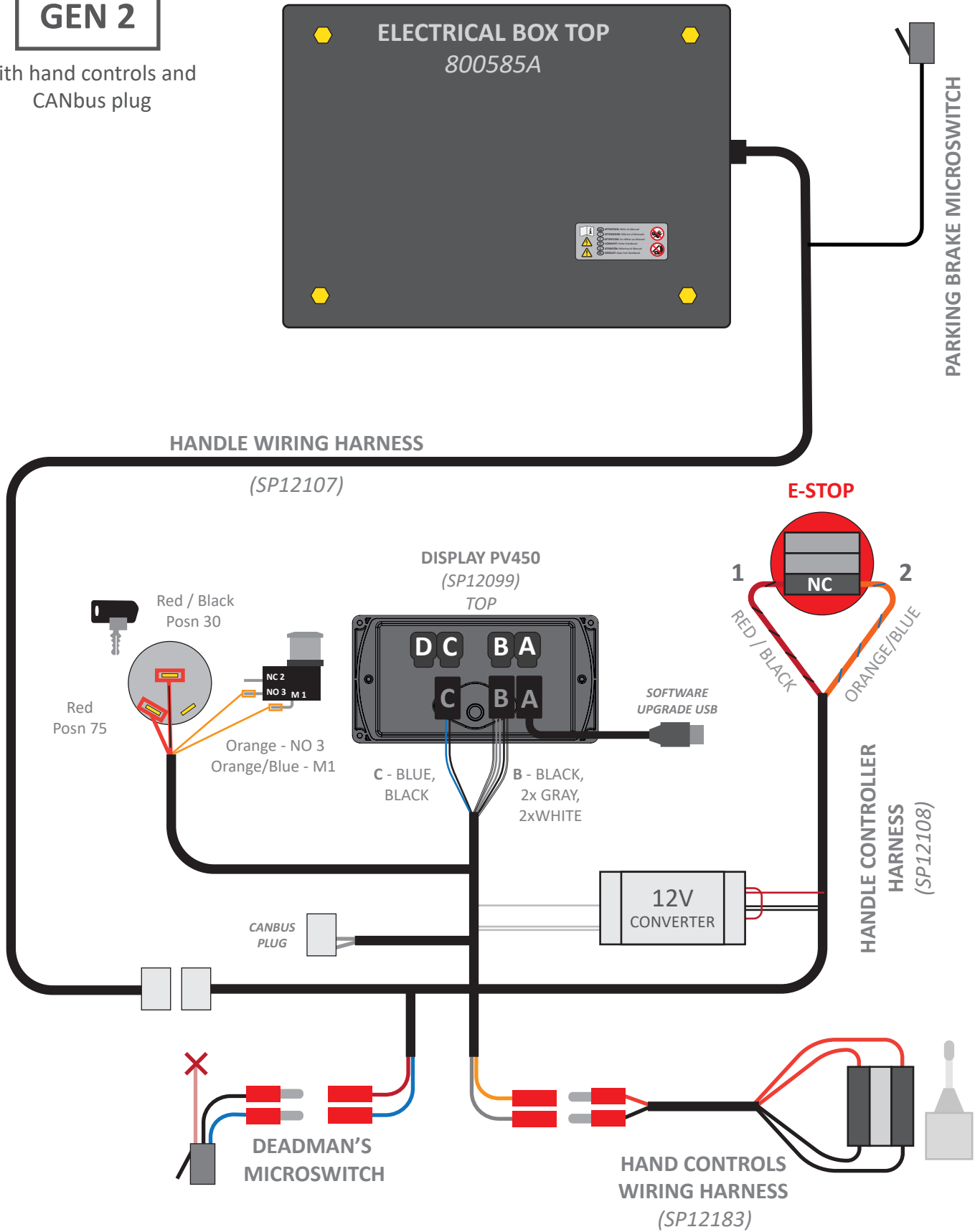


# ES-34R MACHINE WIRING

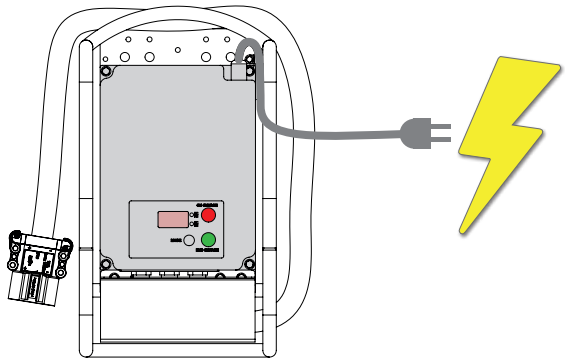
HYPERDRIVE - HYP-00-2890

**GEN 2**

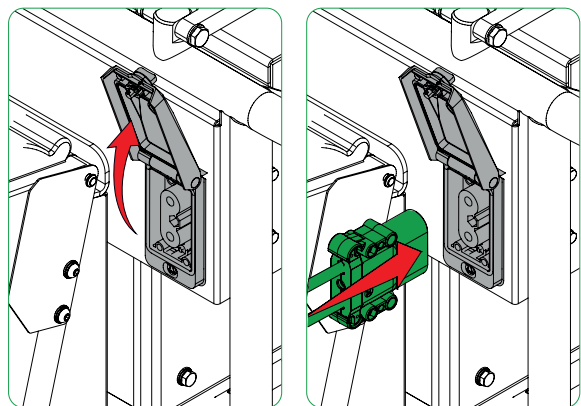
with hand controls and  
CANbus plug



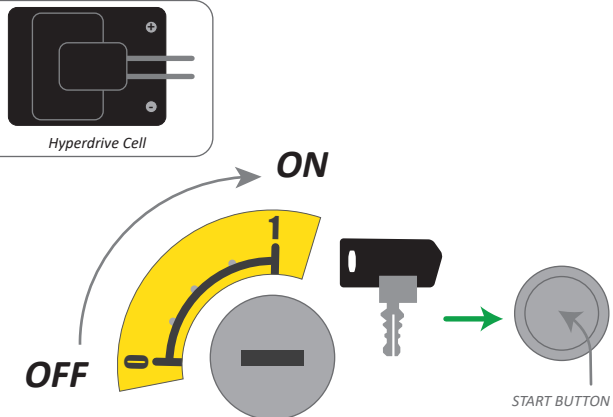
# ES-34R CHARGING INFO



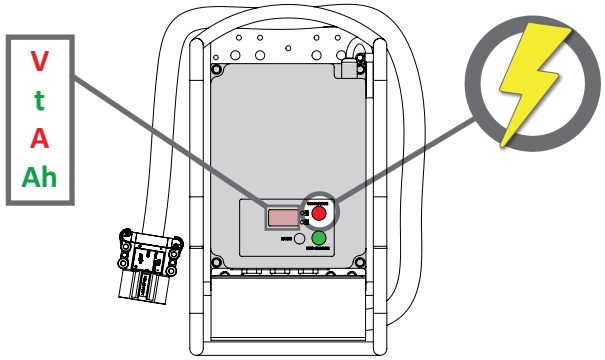
PLUG CHARGER (D153) INTO WALL/POWER SUPPLY. MAKE SURE DISPLAY/LIGHTS ARE ILLUMINATED TO BE SURE POWER IS LIVE TO CHARGER



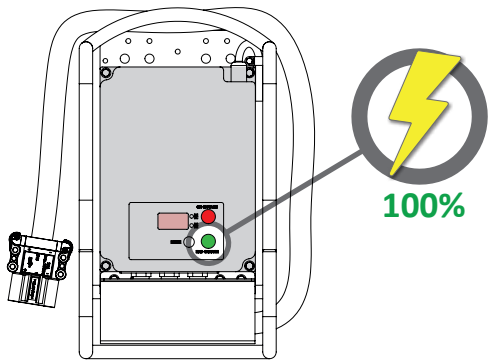
OPEN CHARGING COVER ON REAR OF MOWER CHASSIS AND CONNECT CHARGER INTO MOWER



KEY MACHINE TO ON POSITION, PUSH START BUTTON (LISTEN FOR 'CLICK'). DISPLAY SCREEN WILL SHOW THE MACHINE IS IN CHARGE MODE



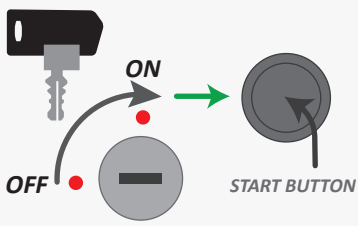
CHARGER SOLID LARGE RED LIGHT TO INDICATE CHARGING. (SCREEN WILL BE BLANK). DISPLAY ON CHARGER CYCLING BETWEEN VOLTAGE, CURRENT, TIME & AMP HOURS



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







# E-SERIES FAQs

How do I start my E-Series machine?

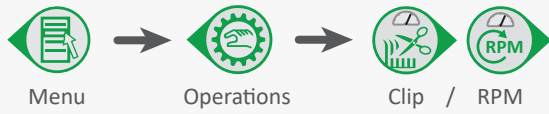


- Check E-Stop is released
- Key mower to 'ON' position on the barrel
- Push and hold **START** button
- Listen for 'CLICK' from the electrical box
- Release button & wait for display screen to boot

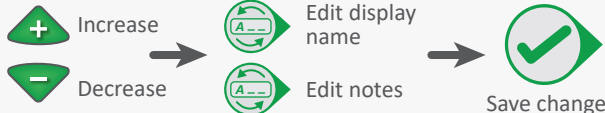
What do the 'Main Menu' icons mean?

 <p><b>Operations</b> Default speeds / Info / Edit Clip rates</p>	 <p><b>Cassette Select (860)</b> Select cassette type fitted</p>
 <p><b>Machine Settings</b> Password / Time &amp; Date / Screen Brightness</p>	 <p><b>Clip / RPM select</b> Select from default and user defined rates</p>
 <p><b>Maintenance</b> Daily / Monthly / Annual</p>	 <p><b>Information</b> Contact / Manual / FAQs</p>

How do I edit RPM & Clip Rates?

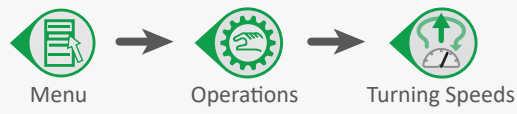


Menu → Operations → Clip / RPM




Increase / Decrease → Edit display name / Edit notes → Save changes

How do I edit the default Forward & Turning speed?



Menu → Operations → Turning Speeds



Turning 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**

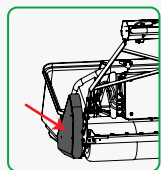
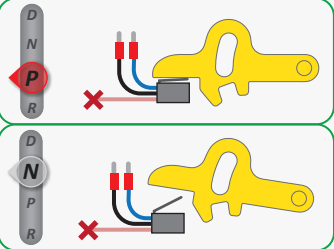
Password protecting your mower will stop unauthorised modification of values and setting while still allowing an operator to use the machines.

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

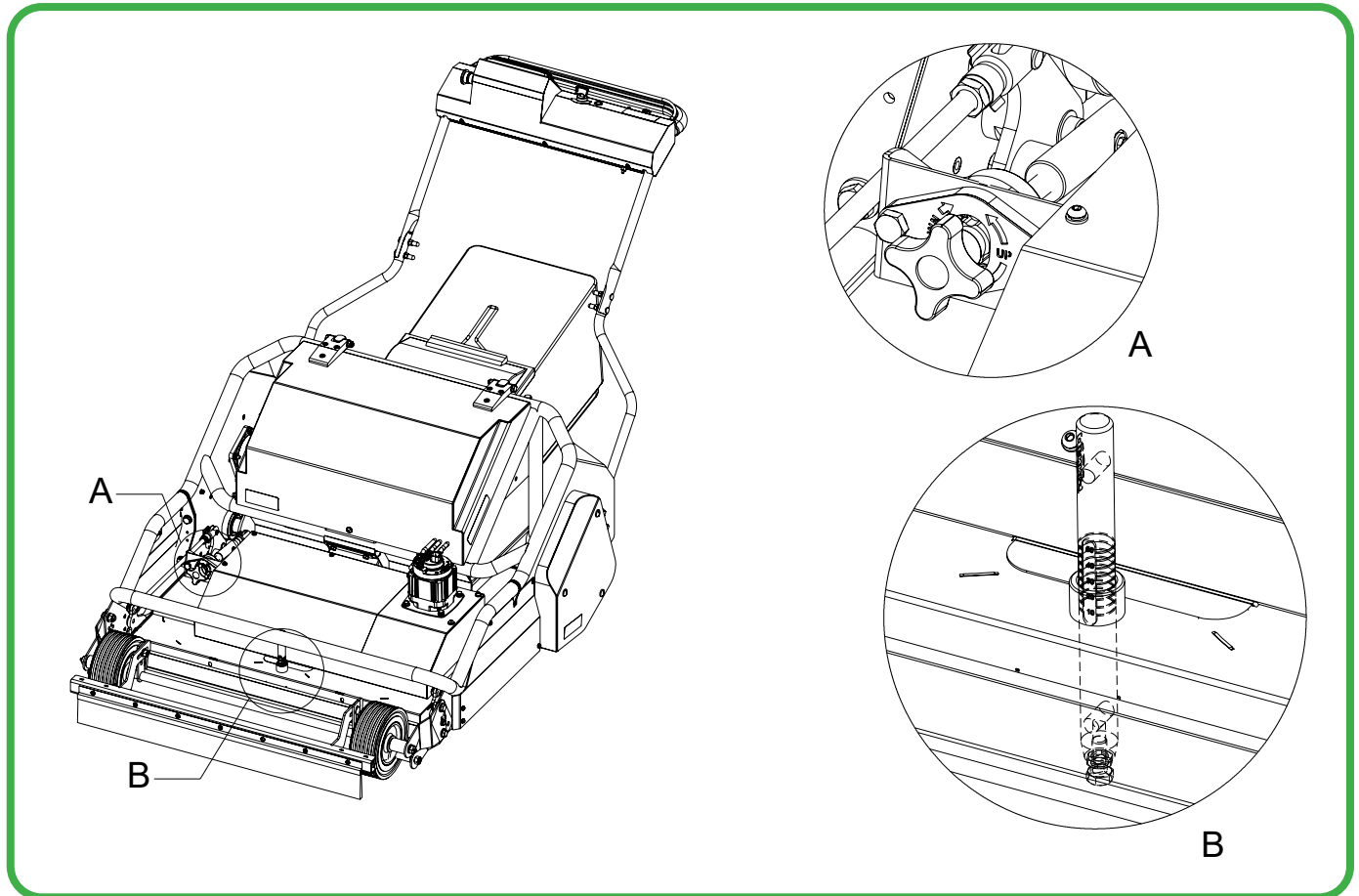


The 'Parking Brake' icon won't disengage?

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.



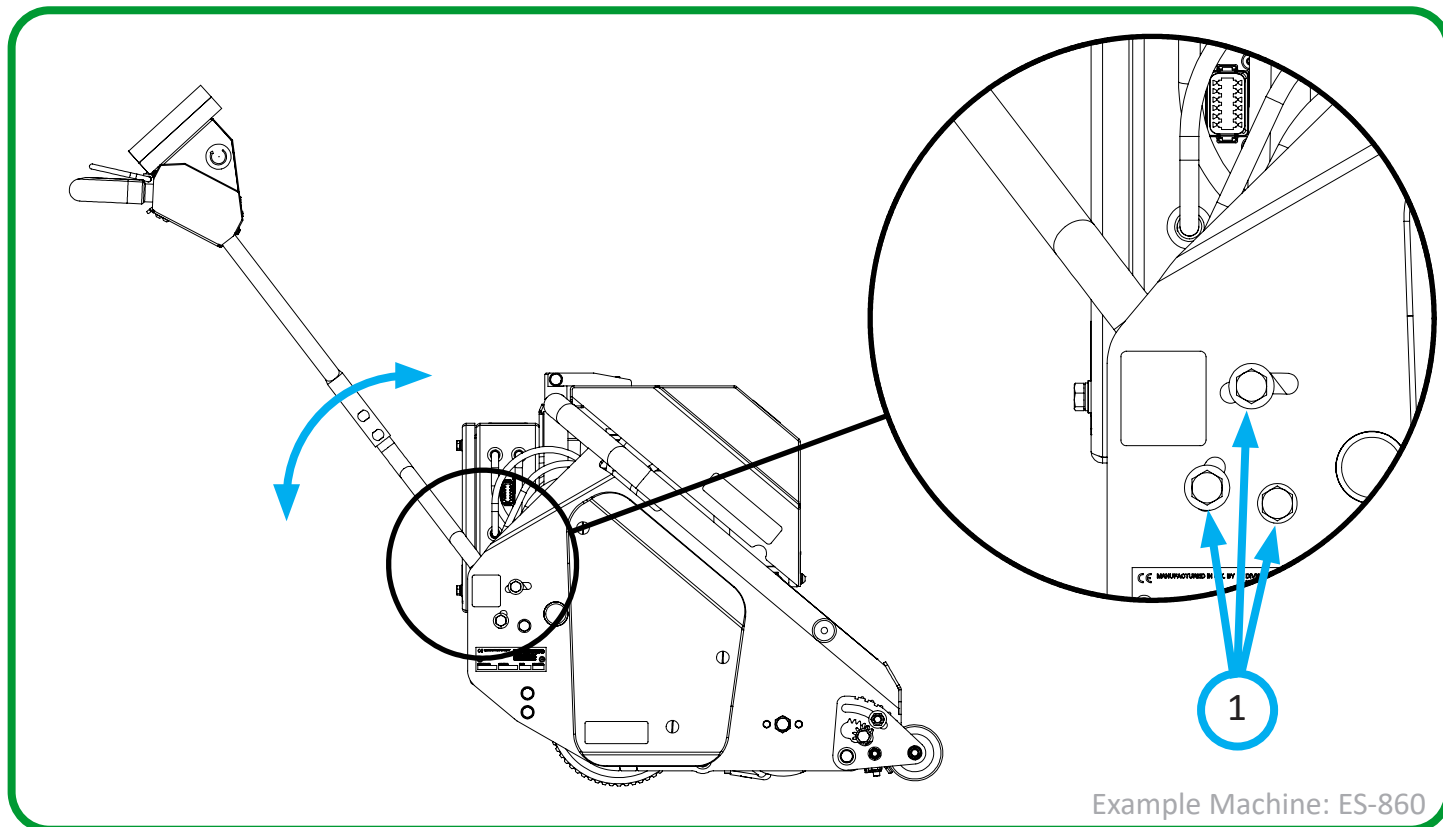
## SETTING FOR HEIGHT OF CUT

Always stop the engine before adjusting the height of cut. Failure to do this may result in serious injury. The length of grass after cutting depends on the height of the deck in relation to the ground.

### To set:

- Turn Hand knob on top deck (View A) to raise and lower deck height.
- Use calibrated depth guage (View B) to measure height of deck.

Remember height of cut is affected by moisture of turf, weight of machine and the thatch density. Different makes of machine cut at different heights. We suggest you set it to a couple of mm above your planned height and then come down in height by trial.



Example Machine: ES-860

## 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.

# E-SERIES BATTERY CARE

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.



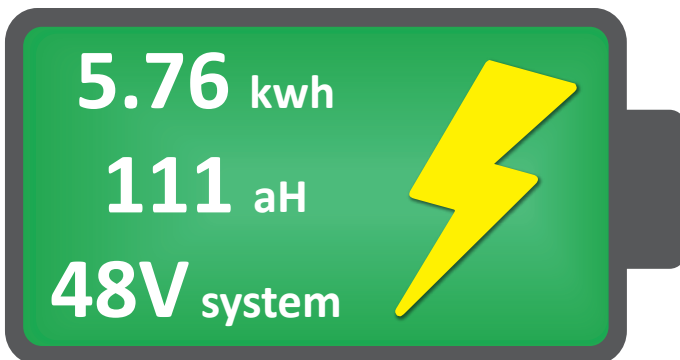
To avoid explosions or fire which can result in serious injury:

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:** SP12126

**BATTERY TYPE:** HYP-00-2890

**WEIGHT:** 37 Kg

**CHEMISTRY:**

MANGANESE LAMINATED LI-ION  
(LMNC)



**OPERATING TEMP. RANGE:**

CHARGE: -25°C TO +45°C

DISCHARGE: -25°C TO +60°C



**STORAGE CONDITIONS:**

TEMP.: -40°C TO +70°C

HUMIDITY: BELOW 75%

# E-SERIES BATTERY CARE

## LIMITED WARRANTY

>85% capacity for minimum 2000 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 Hyperdrive website for further details.

[www.hyperdriveinnovation.com/](http://www.hyperdriveinnovation.com/)

## RETURN OF BATTERIES AT END OF LIFE

Hyperdrive Innovation as a producer of Industrial batteries can take back batteries free of charge at the end of their designated life (<85% capacity). Please contact Hyperdrive for further information.

## RETURN OF BATTERIES WITH A POSSIBLE FAULT

Where batteries are not performing as expected please contact Hyperdrive for guidance.

## RETURN OF BATTERIES AFTER DAMAGE OR ABUSE

If batteries have been damaged / misused, the customer will be responsible for all costs and expenses relating to the disposal of such batteries. Please contact Hyperdrive for guidance.

## STANDARDS

EMC	Designed to meet: EN61000-6-2:2005 and EN61000-6-3:2007 + A1:2011
TRANSPORT	UN38.3 rev6 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.

### CUTTING TIMING 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.

## GRASSBAG

Blocked mesh will prevent the grass from entering the bag. Objects struck by the blades may be thrown through a torn or damaged grassbag, which can cause serious injury.



#### NOTE:-

ALWAYS REPLACE A DAMAGED OR WORN GRASSBAG

The grass bag tends to wear even in normal conditions of use. Regularly check that it is not frated or town. Replace a damaged bag only with a genuine Dennis replacement bag.



## LUBRICATION

PART	DETAIL	FREQUENCY
DECK HEIGHT ADJUSTMENT RODS	Apply a small quantity of copper grease of similar to the adjuster rods to prevent corrosion and ease adjustment.	6 Months
WHEEL BEARINGS	Two grease points on the bolts that hold the wheel axle. Apply on pump of grease to each.	1 Month
HEIGHT OF CUT SHAFT	Apply a small amount of grease through the grease nipple.	6 Months

## CLEANING

### Deck

Tild the machine backwards. Using a low pressure hose, wash all of the grass from around the deck and in the chute.

### Grassbag

Washing with high pressure water or steam jet will damage the bag.

To clean the bag, we recoment washing it under a low pressure water jet directed from the outside to the inside of the bag. The bag must be completely dry before being used again. If the bag is damp, it will become clogged very quickly.

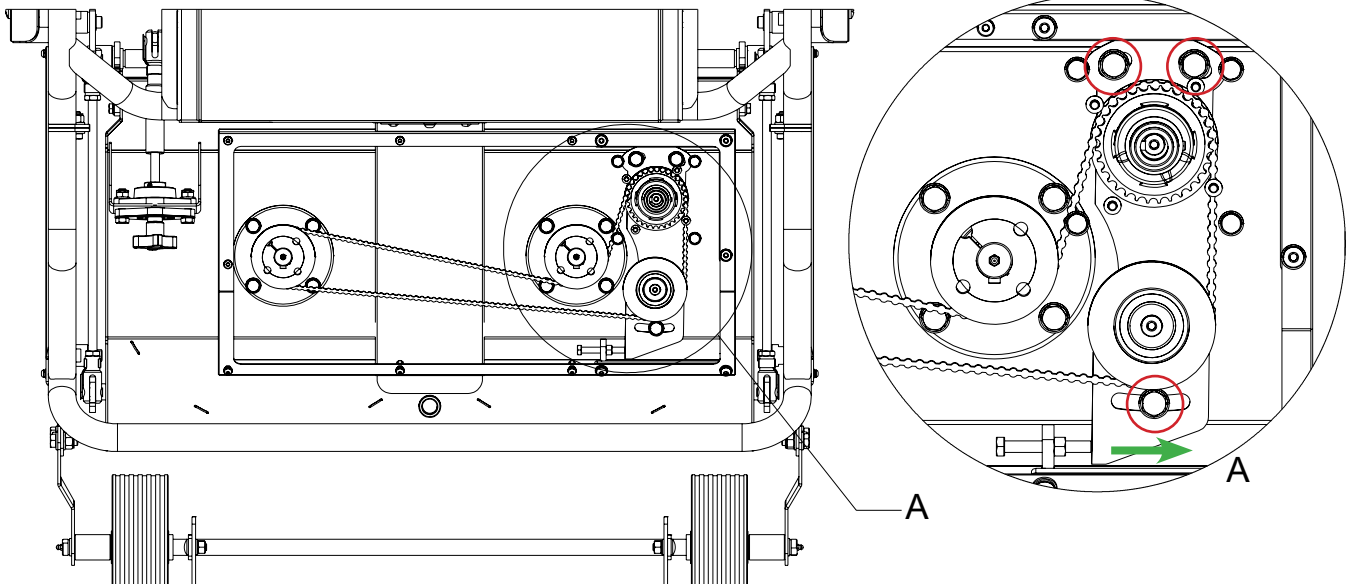


### NOTE:-

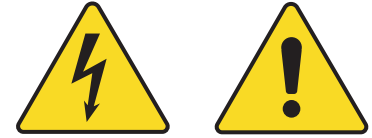
DO NOT USE POWER PRESSURE WASHERS TO CLEAN THE MOWER.

## DECK BELT ADJUSTMENT

To adjust the tension of the cutting belt, remove the deck cover and motor mount. Slacken the three bolts securing the tension assembly in position (circled) allowing the assembly to to be turned to set the tension in the direction of the arrow. Ensure the belt tension is correct as an incorrect tension will result in compromised battery lif and potentially cause damage to the machine.



## 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 please see 'E-Series Initial Connection' information sheet / paperwork attached to the mower (SP19028). Battery terminals will have been disconnected for transport.*

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

1. Check the E-Stop has been released on the side of the handle bars
2. Make sure the key has been fully inserted and turns freely into the 'ON' position
3. Make sure the 'START' button has been held for >3 seconds to give the electrical system on the machine time to engage
4. Check the handle harness plug connection into the electrical box
5. Check the battery terminals are connected (*mowers should be shipped with these disconnected*). The terminals are on top on the battery under the battery cover
6. Make sure there is no visible signs of damage on any of the battery cables. **NEVER TOUCH ANY EXPOSED WIRES!**
7. 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 'SP19031')
  - a) Check there is a green light on the 12V converter indicating power is getting to the handle bar
  - b) If there is no light on the converter check the white wiring harness plug is correctly connected
  - c) Check connections to START button C (Common) & NO (Normally Open) terminals to be connected
  - d) Check connections to E-Stop (wired into NC (Normally Closed) contact block)
  - e) Check connections to Key Switch (Position 30 & Position 75)
  - f) Check screen connections – plug positions B & C fitted the correct way around
8. Check the battery has not been fully drained. Plug the mower into the charger and power the machine on to see if the display starts up with the 'On Charge Screen'

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

## My screen powers on briefly then switches off

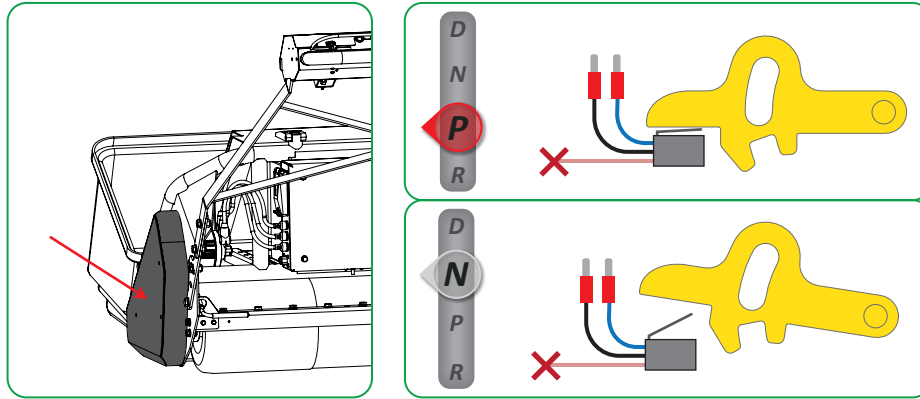
'Loading...' briefly shows on the screen then disappears.

- Make sure the START button is held in until you hear a 'click' from the electrical box. The button needs to be held for 2-3 seconds to engage the electrical system on the mower
- Check connections to START button. C (Common) & NO (Normally Open) terminals to be connected

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

The 'P' 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.

# E-SERIES ELECTRICAL TROUBLE SHOOTING



- Check the mechanical brake has been disengaged (handle on the lower left-hand side of the machine)
- Check the parking brake microswitch is being disengaged from the brake hammer under the left-hand side guard

## **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 is being held or fully released when attempting to operate
- Listen if you can hear the quiet 'click' of the microswitch operation under the handle bar console, if not the microswitch position might need repositioned on its bracket to correctly engage / disengage
- Check microswitch bullet connectors are attached under the handle bar console cover (Blue & Black wires on microswitch)
- Check continuity of the micro switch with a multimeter

## **My mower isn't charging**

*(also see 'Charging Info' in the mower manual or document SP19023)*

- Check charger is plugged in and receiving power. Lights and screen on charger should be illuminated
- Check charger is correctly plugged into mower
- Check E-stop is released and correct start sequence has been followed (holding START button until 'click')

Charger display and lights should be cycling through VOLTS / TIME / CURRENT / AMP HOURS to indicate that the mower is charging. The display will also show the state of charge on screen.

## **There are no lights on my charger / Lights are flashing on my charger**

No lights illuminating on the charge indicate the charger is not receiving power. Check the charger has been plugged in and check the condition of the fuse in the plug

The lights on the charge cycle between red and green when correctly charging the mower. This shows time on charge, voltage, current and amp hours being put into the mower battery

## 'BMS Comms' error showing on screen

**OR**

## My mower battery won't show charge (always showing empty)

- Check Battery Management System (BMS) cable is connected correctly
- Unplug the (BMS) cable from the battery and check the condition of the internal pins. Bent internal pins in the cable mean a replacement cable will be required

## 'Motor comms' error showing on screen

- Check motor cable connections going from electrical box into the motors
- Check all three power cables to each motor are connected and the letters on the wires match those on the motor (**U, V and U**)

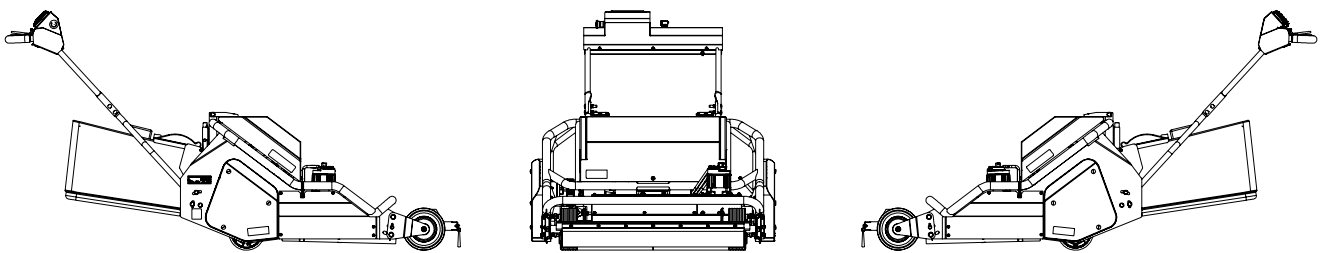
*If your problem isn't referenced on this document or you are still having problems please contact your dealer or Dennis Mowers directly.*



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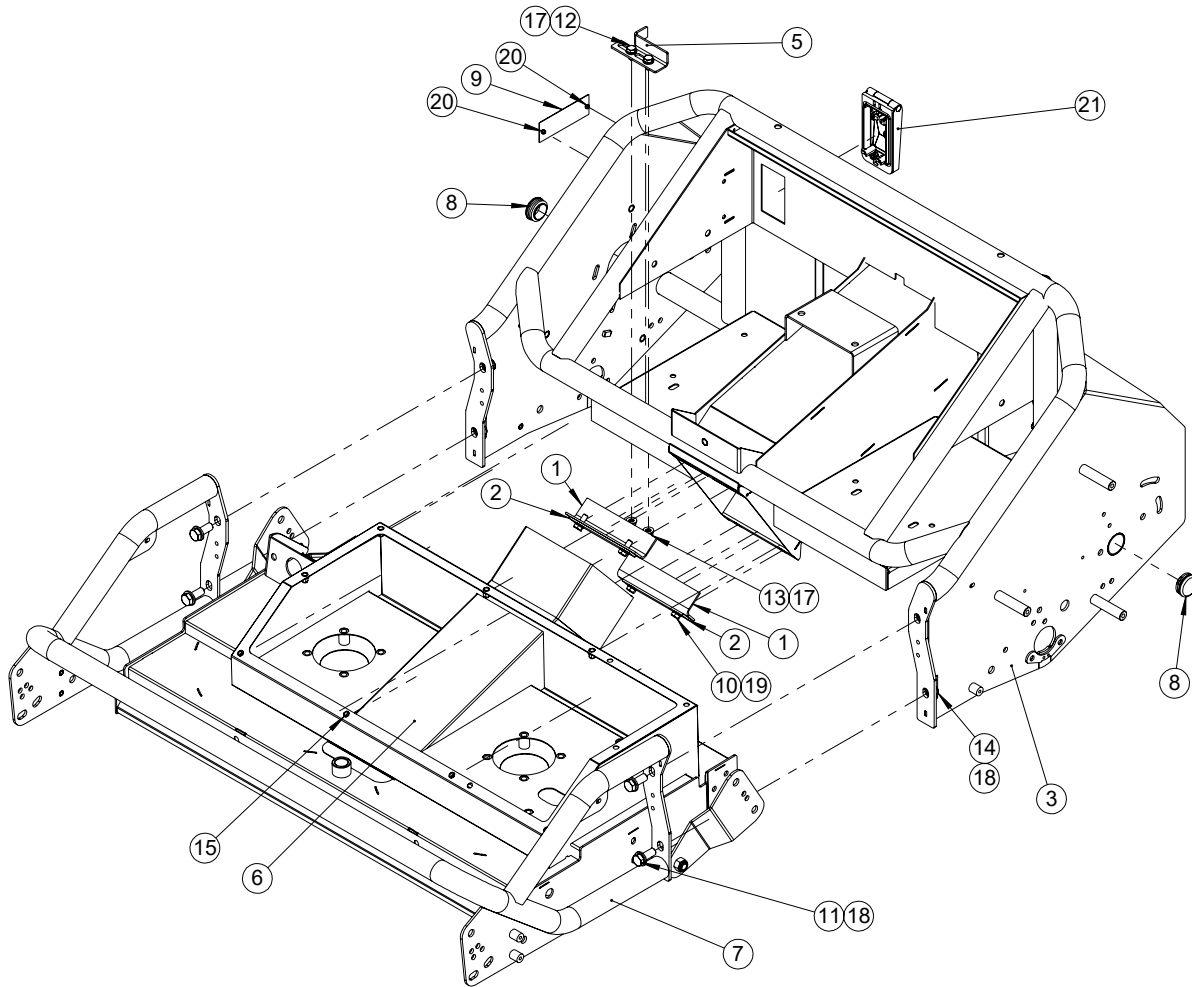
# PARTS BOOK

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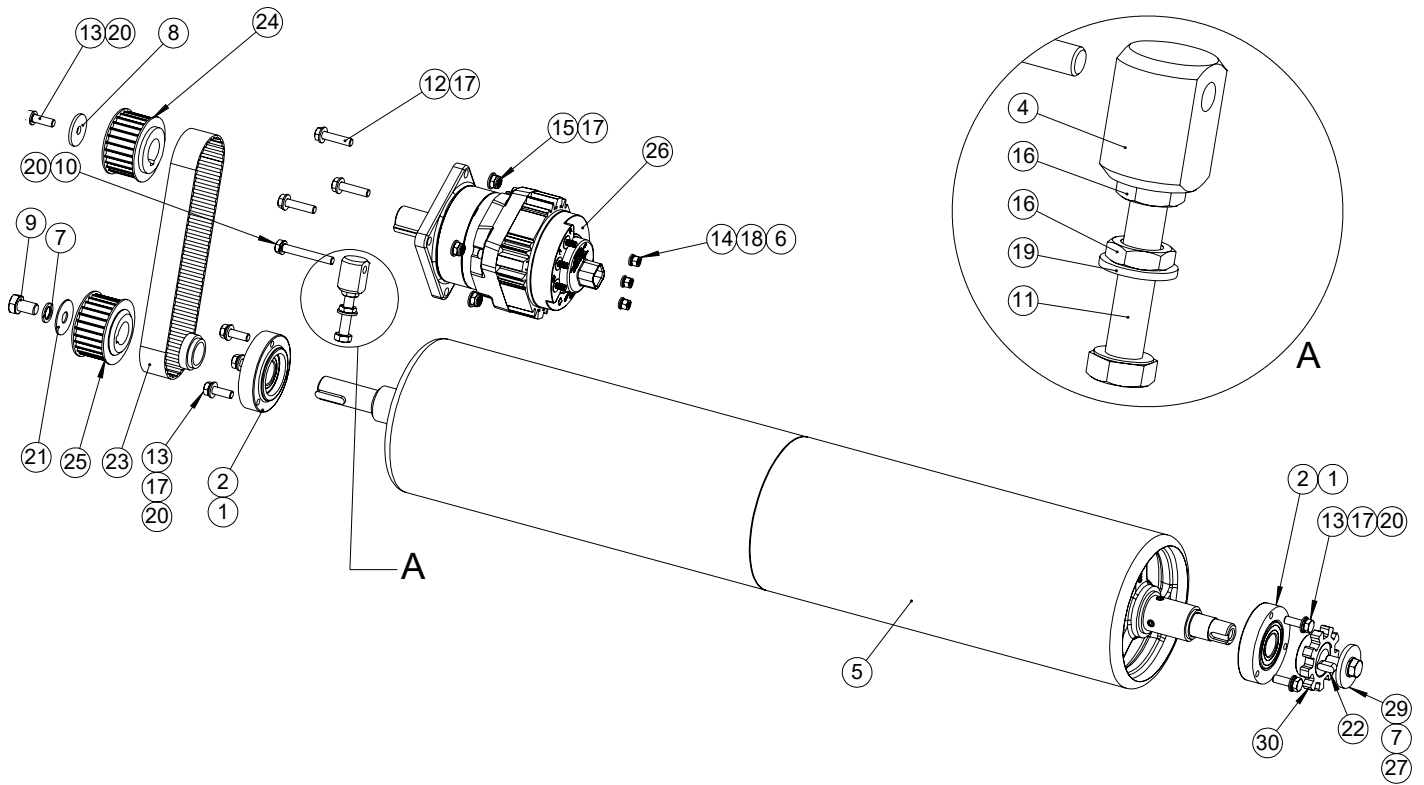
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# 1. CHASSIS



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	320048_REV0	DECK SEAL	2
2	320066_REV0	SEAL CLAMP	2
3	320330_REV4	ELECTRIC ROTARY CHASSIS	1
4	320385_REV2	COVER PLATE W.A.	2
5	320392_REV1	BATTERY CORNER BRACKET	1
6	320400_REV2	ROTARY TOP DECK CHASSIS	1
7	320430_REV1	ROTARY TOP DECK	1
8	BA0067_REV1	TUBE BUNG (C3137)	2
9	J20297_REV2	SERIAL NO PLATE (DENNIS)	1
10	SP01009_REV0	HEX SET SCREW M8 X 20	4
11	SP01065_REV0	HEX SET SCREW M12 X 30	4
12	SP01076_REV0	HEX SET SCREW M8 X 16	2
13	SP02006_REV0	NUT M8 NYLOC (T)	2
14	SP02010_REV0	NUT M12 NYLOC (T)	4
15	SP02042_REV0	RIVNUT HEX M6 (0.5-3.0) [NO HEAD]	7
16	SP02044_REV0	RIVNUT HEX M8 (0.5-3.0) [NO HEAD]	7
17	SP03008_REV0	WASHER M8 FORM A	4
18	SP03012_REV0	WASHER M12 FORM A	8
19	SP03029_REV0	WASHER M8 SPRING LOCK	4
20	SP05001_REV0	RIVET 4.8 X 10	2
21	SP12085_REV0	CHARGER COVER	1
22	800569_REV0	FRONT WHEEL ASSEMBLY	1

## 2. REAR DRIVE SYSTEM



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	
1	062662_REV1	BEARING 6205-2RS 3	2	
2	229104_REV1	LANDROLL BEARING HOUSING	2	
3	340034_REV0	ROLLER END SPACER	1	
4	370096_REV1	TENSIONER BLOCK	1	
5	800566_REV0	ELECTRIC ROTARY REAR ROLLER	1	
6	E1-1061_REV0	WASHER M6 SPRING	3	
7	E1-1065_REV0	WASHER M12 SPRING LOCK	2	
8	J209249_REV0	WASHER 9 X 35 X 3	1	
9	SP01021_REV0	HEX SET SCREW M12 X 20	1	
10	SP01023_REV0	HEX SET SCREW M8 X 60	1	
11	SP01031_REV0	HEX SET SCREW M10 X 50	1	
12	SP01036_REV0	HEX SET SCREW M8 X 35	3	
13	SP01045_REV0	HEX SET SCREW M8 X 25	7	
14	SP02003_REV0	NUT M6 STD	3	
15	SP02006_REV0	NUT M8 NYLOC (T)	4	
16	SP02013_REV0	NUT M10 LOCK (THIN)	2	
17	SP03008_REV0	WASHER M8 FORM A	13	
18	SP03010_REV0	WASHER M6 FORM A	3	
19	SP03011_REV0	WASHER M10 FORM A	1	
20	SP03029_REV0	WASHER M8 SPRING LOCK	8	
21	SP03040_REV0	WASHER M12 REPAIR	1	
22	SP10001_REV2	KEY 8 X 7 X 20 RD END	1	
23	SP11010_REV0	BELT HTD HP 600-8M-30	1	(> 09/2021)
24	SP11142_REV0	PULLEY 26-8M-30 6F FINISHED 26mm ID	1	(> 09/2021)
25	SP11143_REV0	PULLEY 26-8M-30 6F FINISHED 25 ID	1	(> 09/2021)
26	SP15102_REV0	ASM103A 48V MOTOR & GEARBOX	1	
27	SP01065_REV0	HEX SET SCREW M12 X 30	1	
28	370175_REV0	BRAKE BOSS	1	
29	370176_REV0	BRAKE WASHER	1	
30	320395_REV1	BRAKE DISC	1	

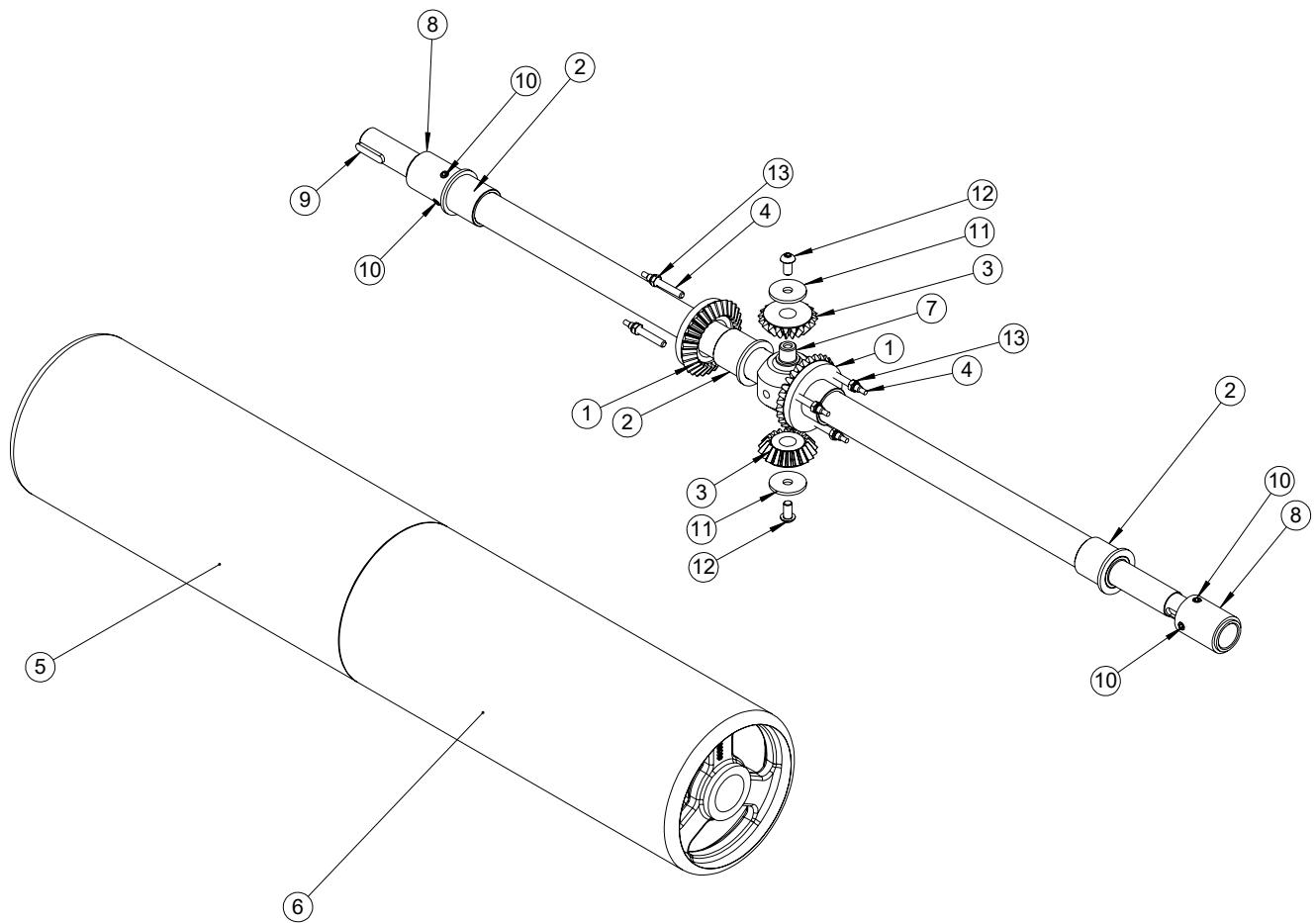
(<09/2021) 23 - SP11113 / 24 - SP11064 / 25 - SP11018



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### 3. REAR ROLLER ASSEMBLY

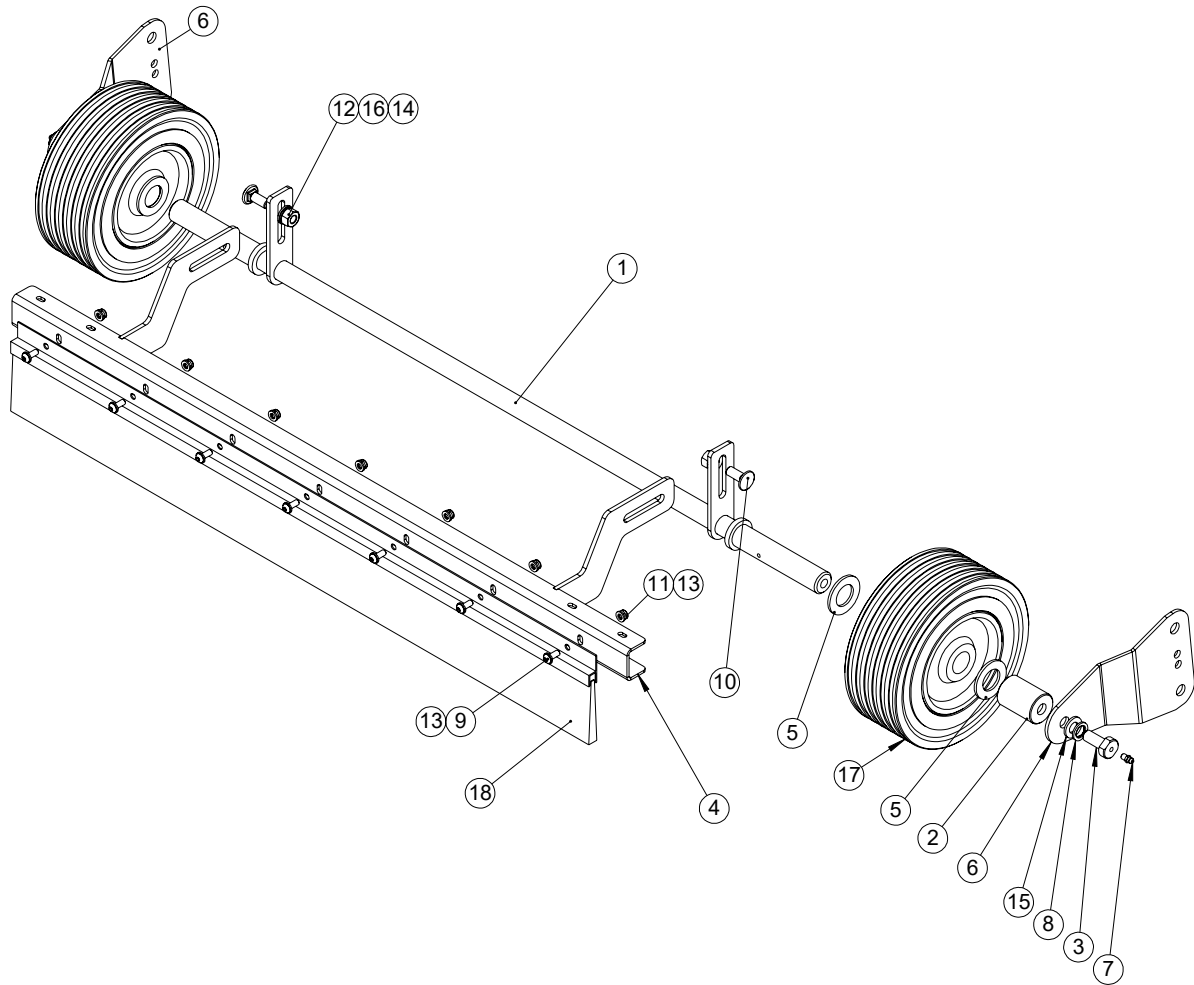


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	229022_REV1	30 TOOTH BEVEL GEAR	2
2	229023_REV1	BUSH AJ2024 - 1 1/2"	4
3	229025_REV2	BEVEL GEAR 20T	2
4	229118_REV3	GEAR STUD	6
5	320100_REV0	ROLLER L.H.	1
6	320120_REV0	ROLLER R.H.	1
7	320381_REV1	ROLLER SHAFT ASSY	1
8	320383_REV0	ROLLER LOCK SPACER	2
9	F21884_REV0	KEY 8 X 7 X 35	1
10	J20467_REV0	GRUB SCREW M8 X 8	4
11	J209249_REV0	WASHER 9 X 35 X 3	2
12	SP01048_REV0	BUTTON HEAD M8 X 16	2
13	SP02039_REV0	NUT 1/4" NYLOC (P)	6



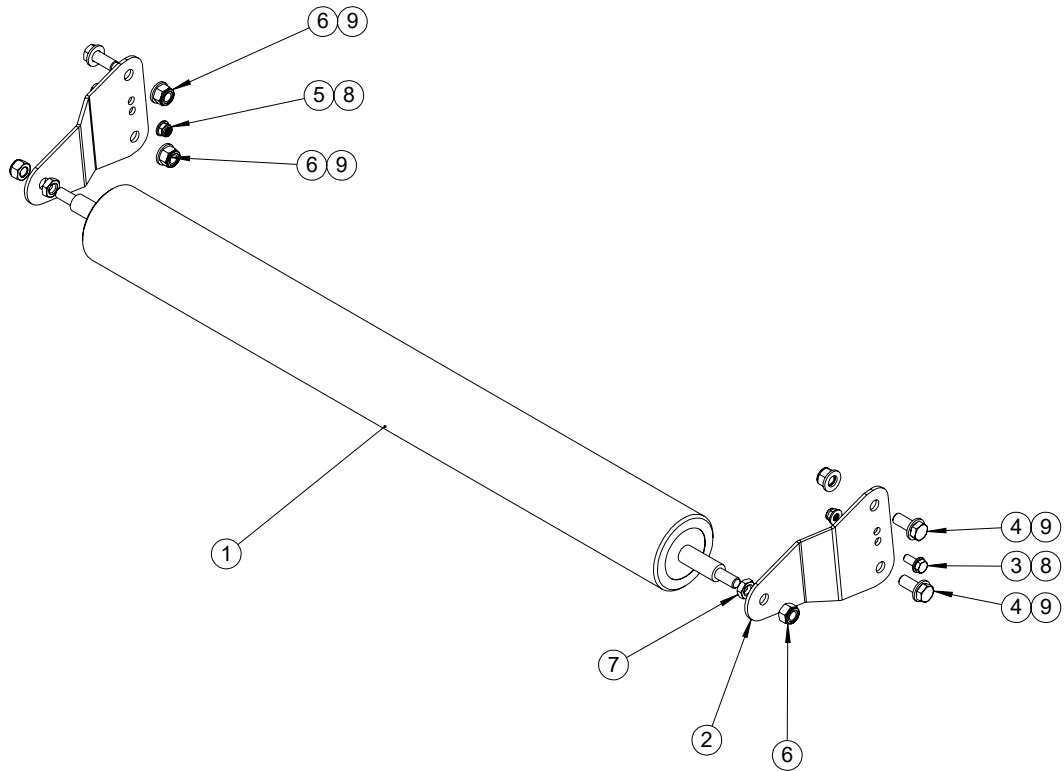
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## 4. FRONT WHEEL ASSEMBLY



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	320230_REV0	AXLE W.A. (FRONT)	1
2	320233_REV0	WHEEL SPACER	2
3	320235_REV0	BOLT M12 GREASE	2
4	320290_REV0	BRUSH BAR W.A.	1
5	320295_REV0	3mm WHEEL SHIM	4
6	320467_REV1	WHEEL MOUNT PLATE	2
7	D1947_REV1	GREASE NIPPLE M6	2
8	E1-1065_REV0	WASHER M12 SPRING LOCK	2
9	SP01019_REV0	BUTTON HEAD M6 X 16	7
10	SP01044_REV0	COACH BOLT M10 X 25	2
11	SP02004_REV0	NUT M6 NYLOC	7
12	SP02007_REV0	NUT M10 STD	2
13	SP03010_REV0	WASHER M6 FORM A	14
14	SP03011_REV0	WASHER M10 FORM A	2
15	SP03012_REV0	WASHER M12 FORM A	2
16	SP03034_REV0	WASHER M10 SPRING LOCK	2
17	SP09007_REV0	WHEEL 200 X 73 X 25.4	2
18	SP24016_REV0	BRUSH H SECTION 8MM (75)	1

# 5. FRONT ROLLER ASSEMBLY

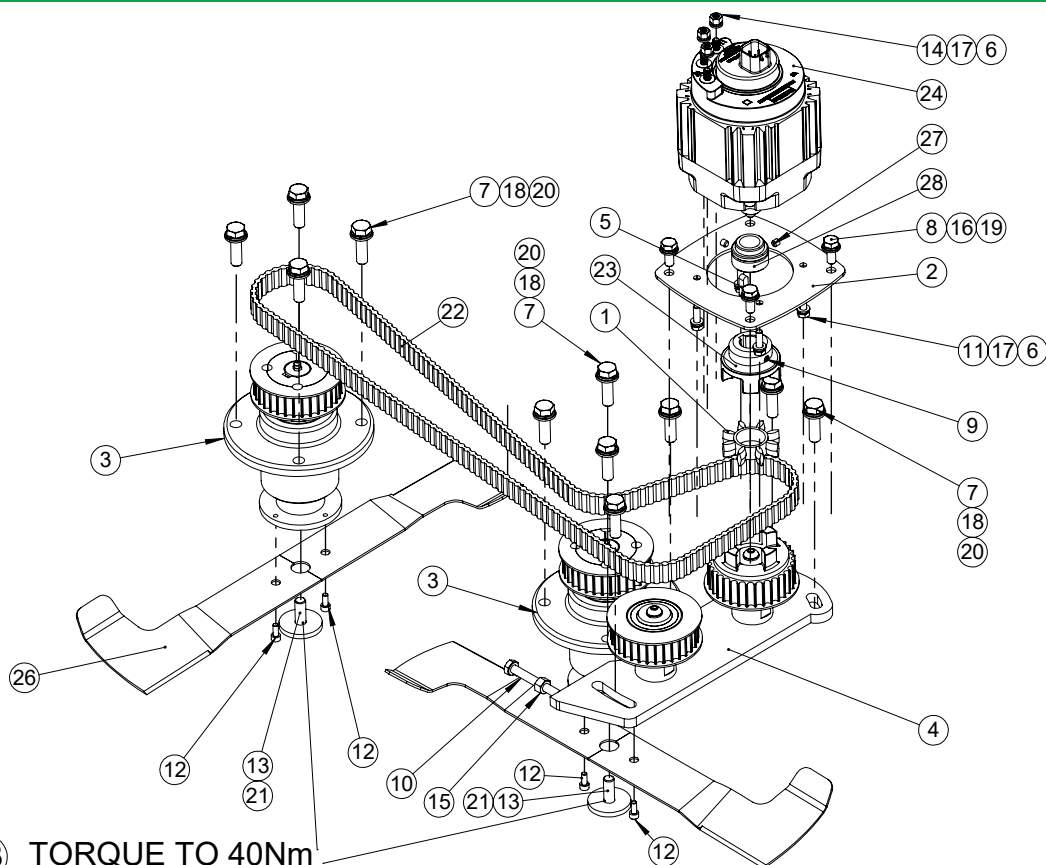


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	229233_REV1	FRONT ROLLER 34"	1
2	320467_REV1	WHEEL MOUNT PLATE	2
3	SP01009_REV0	HEX SET SCREW M8 X 20	2
4	SP01065_REV0	HEX SET SCREW M12 X 30	4
5	SP02006_REV0	NUT M8 NYLOC (T)	2
6	SP02010_REV0	NUT M12 NYLOC (T)	6
7	SP02014_REV0	NUT M12 LOCK (THIN)	2
8	SP03008_REV0	WASHER M8 FORM A	4
9	SP03012_REV0	WASHER M12 FORM A	8



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# 6. CUTTER DRIVE SYSTEM



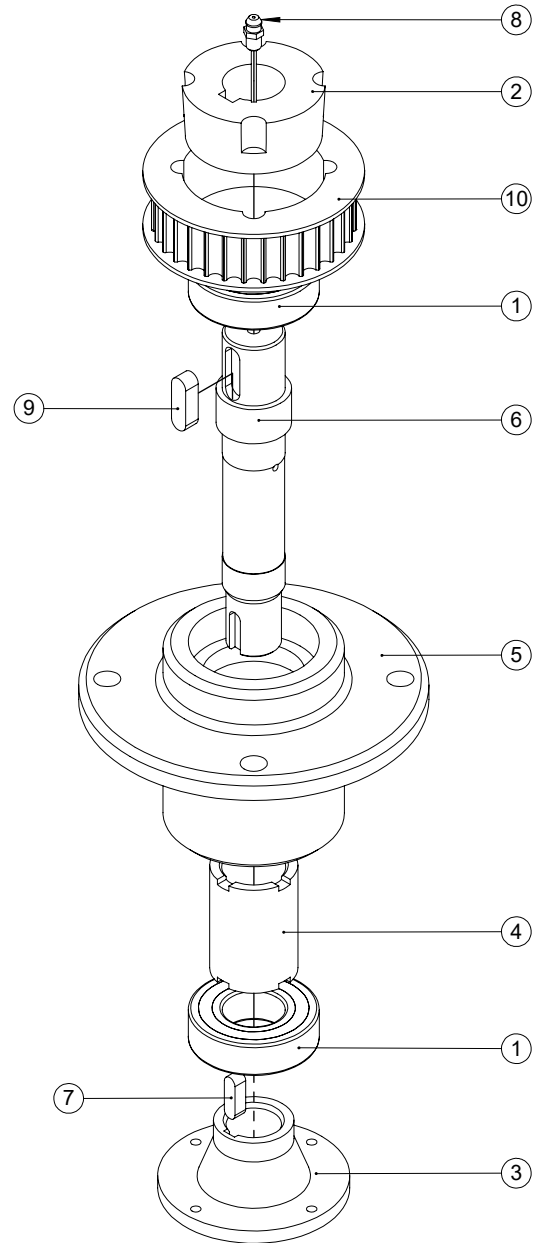
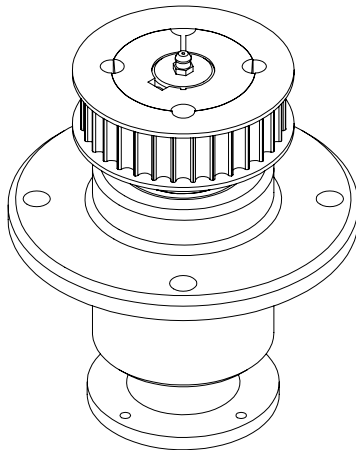
NOTE: ITEM 13 TORQUE TO 40Nm

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	228103_REV1	COUPLING ELEMENT	1
2	320449_REV0	DECK MOTOR MOUNT PLATE	1
3	800567_REV0	SPINDLE ASSEMBLY	2
4	800572_REV0	TENSION ADJUSTER ASSY	1
5	D8165_REV0	KEY PARALLEL 6 X 6 X 25	1
6	E1-1061_REV0	WASHER M6 SPRING	7
7	E1-1119_REV0	HEX SET SCREW M10 X 35	11
8	SP01009_REV0	HEX SET SCREW M8 X 20	4
9	SP01017_REV0	GRUB SCREW M6 X 12	1
10	SP01023_REV0	HEX SET SCREW M8 X 60	1
11	SP01028_REV0	HEX SET SCREW M6 X 20	4
12	SP01081_REV0	CAP HEAD M5 X 12	4
13	SP01105_REV0	HEX SET SCREW M10 X 30	2
14	SP02003_REV0	NUT M6 STD	3
15	SP02005_REV0	NUT M8 STD	1
16	SP03008_REV0	WASHER M8 FORM A	4
17	SP03010_REV0	WASHER M6 FORM A	7
18	SP03011_REV0	WASHER M10 FORM A	11
19	SP03029_REV0	WASHER M8 SPRING LOCK	4
20	SP03034_REV0	WASHER M10 SPRING LOCK	11
21	SP03037_REV0	WASHER 10.5 X 40 X 5	2
22	SP11090_REV0	DOUBLE SIDED OPTIMA 1520 8m 20	1
23	SP11094_REV0	COUPLING HALF (19mm)	1
24	SP15104_REV0	ASM106 48V MOTOR	1
25	SP22007A_REV0	BLADE ROTARY L.H.	1
26	SP22007B_REV0	BLADE ROTARY R.H.	1
27	D8068_REV0	GRUB SCREW M6 X 6	2
28	320540_REV0	ES-34R MOTOR SPACER	1



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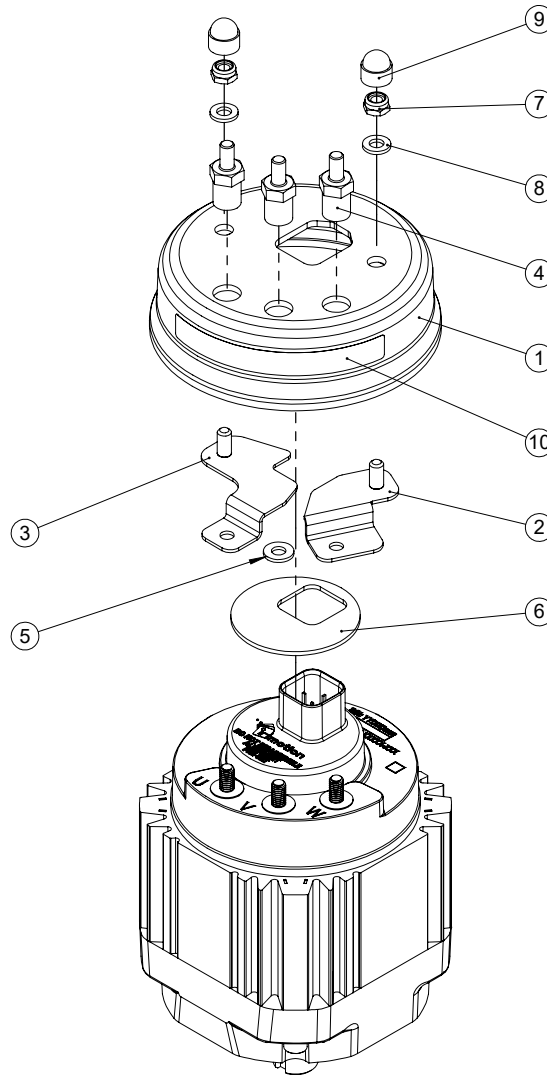
## 7. SPINDLE ASSEMBLY (PART 800567)



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	062662_REV1	BEARING 6205-2RS 3	2
2	228003_REV1	TAPERED BUSH 1610 - 25MM	1
3	320146_REV2	BLADE MOUNT BODY	1
4	320313_REVO	SPINDLE SPACER	1
5	320314_REVO	SPINDLE HOUSING	1
6	320315_REVO	SHAFT SPINDLE	1
7	BA1014_REVO	KEY 6 X 6 X 20 RD END	1
8	D1947_REV1	GREASE NIPPLE M6	1
9	F20684_REVO	KEY PARALLEL 8 X 7 X 25	1
10	SP11100_REVO	PULLEY 32-8M-20 6F TAPERLOCK	1

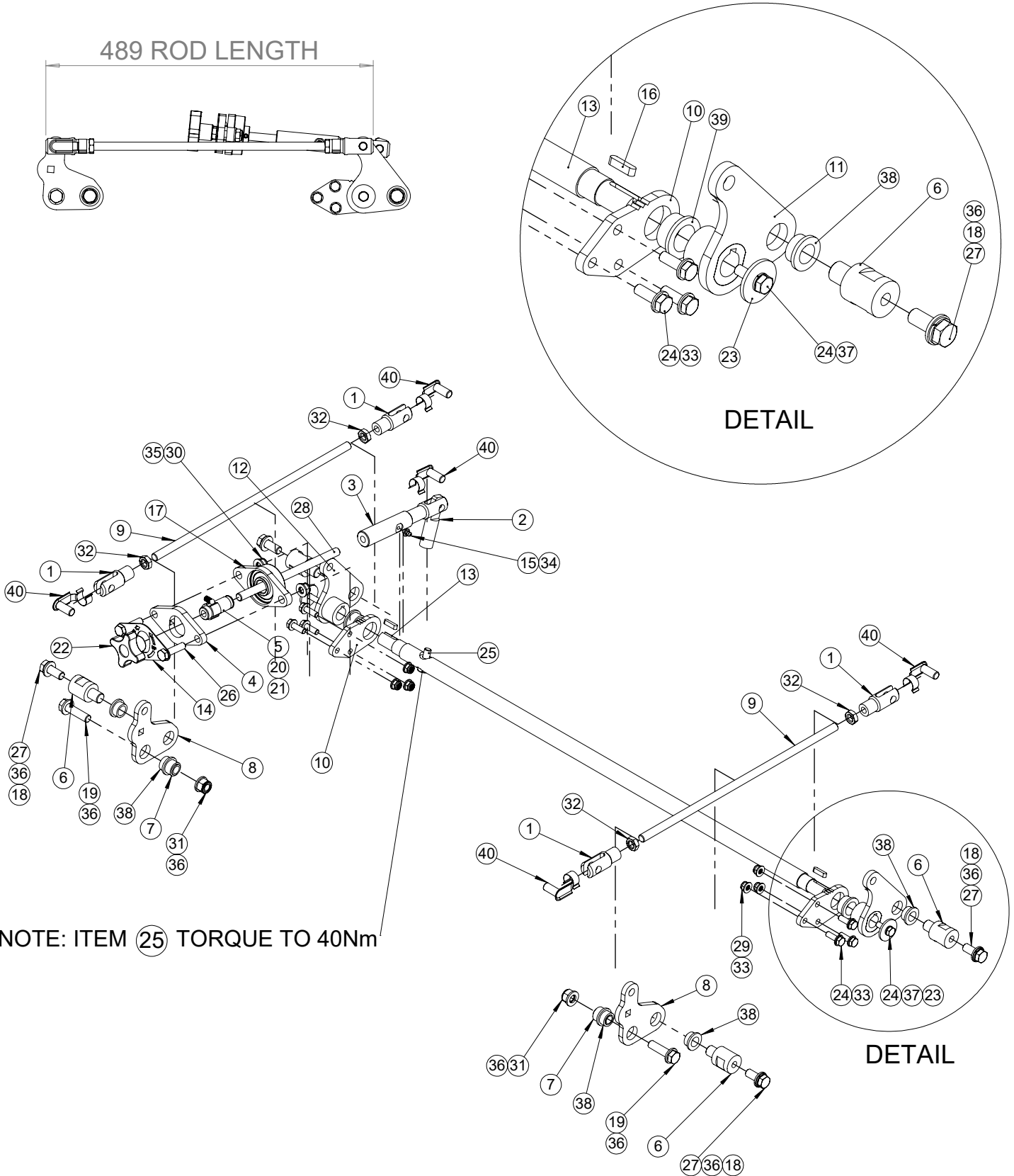


# 9. MOTOR COVER



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

# 10. HEIGHT ADJUSTMENT SYSTEM



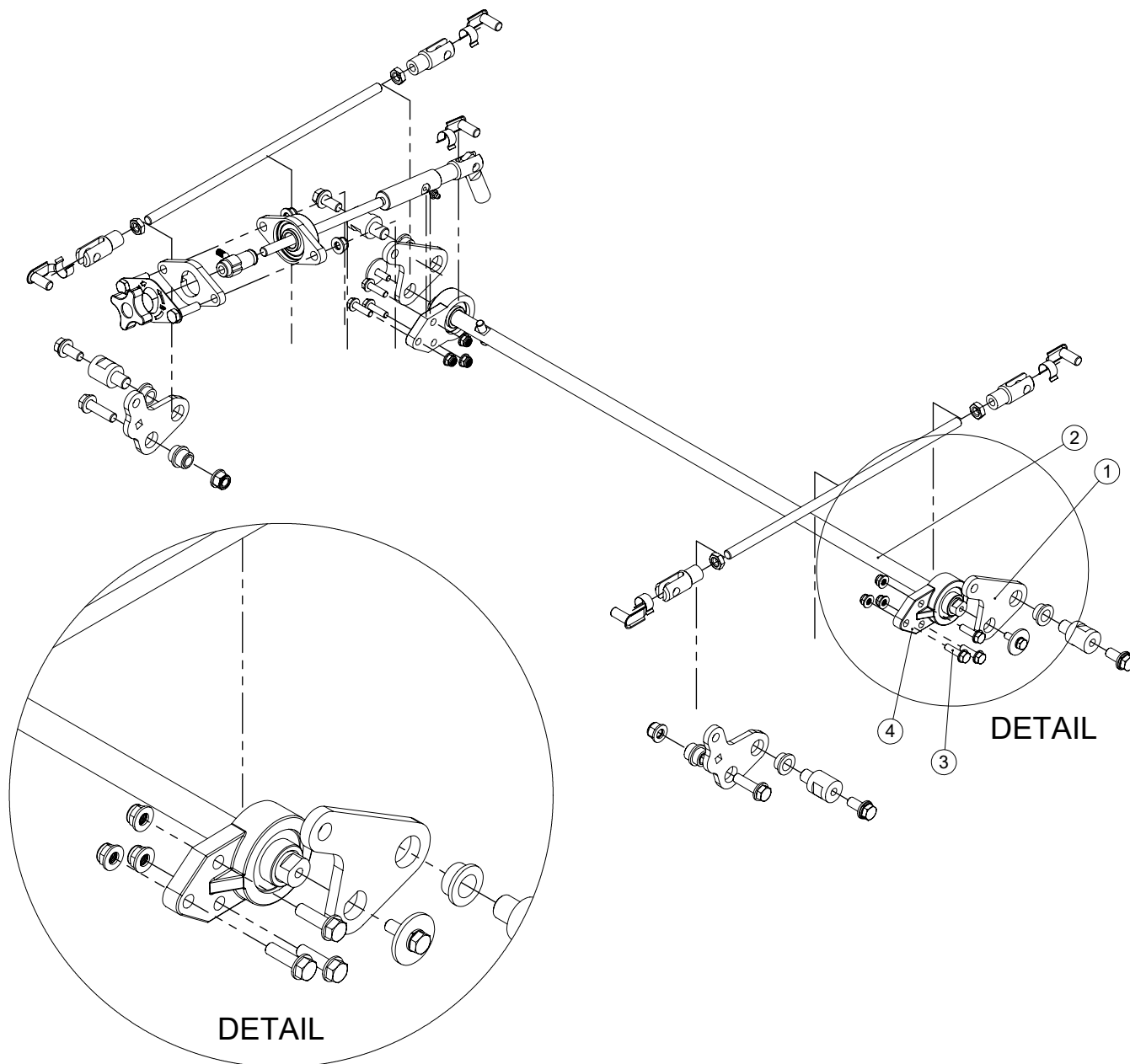
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ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	290048_REV0	BRACE END	4
2	290053_REV0	ROLLER TORSION ARM	1
3	320153_REV0	ADJUSTER BAR	1
4	320182_REV0	BLOCK INDEX	1
5	320189_REV0	BOSS INDEX	1
6	320344_REV0	DECK MOUNT BOSS	4
7	320427_REV0	DECK MOUNT BOSS	2
8	320438_REV1	FRONT LINK BRACKET	2
9	320439_REV0	ADJUSTER ROD	2
10	320535_REV0	1.5° PIVOT BLOCK	2
11	320527_REV0	WELDED PIVOT LH	1
12	320528_REV0	WELDED PIVOT RH	1
13	320538_REV0	25mm ROTARY TORSION BAR	1
14	320476_REV0	INDEX PLATE ELECTRIC	1
15	D1947_REV1	GREASE NIPPLE M6	1
16	D8165_REV0	KEY PARALLEL 6 X 6 X 25	2
17	D8299_REV1	BEARING UCFT204-20	1
18	E1-1065_REV0	WASHER M12 SPRING LOCK	4
19	E1-1157_REV0	HEX BOLT M12 X 45	2
20	J20525_REV0	STEEL BALL 8MM	1
21	J20526_REV1	SPRING	1
22	J209112_REV1	KNOB PLASTIC	1
23	J209249_REV0	WASHER 9 X 35 X 3	2
24	SP01045_REV0	HEX SET SCREW M8 X 25	8
25	SP01010_REV0	CAP HEAD M10 X 30 (LOW HD)	1
26	SP01020_REV0	HEX SET SCREW M10 X 40	2
27	SP01065_REV0	HEX SET SCREW M12 X 30	4
28	SP01163_REV0	ROD M12 X 210	1
29	SP02006_REV0	NUT M8 NYLOC (T)	6
30	SP02008_REV0	NUT M10 NYLOC (T)	2
31	SP02010_REV0	NUT M12 NYLOC (T)	2
32	SP02014_REV0	NUT M12 LOCK (THIN)	4
33	SP03008_REV0	WASHER M8 FORM A	12
34	SP03010_REV0	WASHER M6 FORM A	1
35	SP03011_REV0	WASHER M10 FORM A	2
36	SP03012_REV0	WASHER M12 FORM A	8
37	SP03029_REV0	WASHER M8 SPRING LOCK	2
38	SP06043_REV0	BEARING: AL162212	6
39	SP06051_REV0	AL2228-15 FLANGED BUSH	2
40	SP14020_REV0	CLEVIS CLIP M12 SHORT	5



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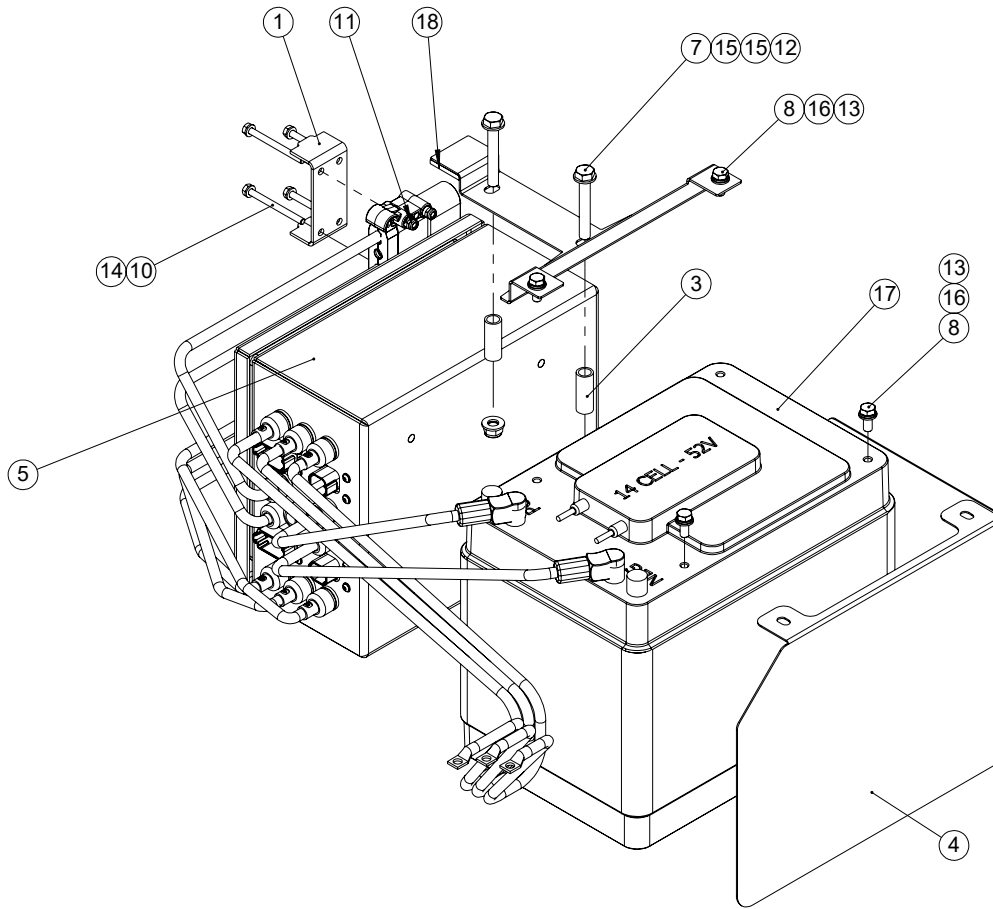
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	320437_REV0	REAR LINK BRACKET	2
2	320441_REV0	ELECTRIC ROTARY TORSION BAR	1
3	SP01005_REV0	HEX SET SCREW M8 X 30	6
4	SP06041_REV0	BEARING UCFB204-20	2



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ALTERNATE PARTS FOR PRE DECEMBER 2022. FOR ALL OTHER PART NUMBERS REFER TO MAIN PARTS LIST.

# 11. ELECTRICAL SYSTEM

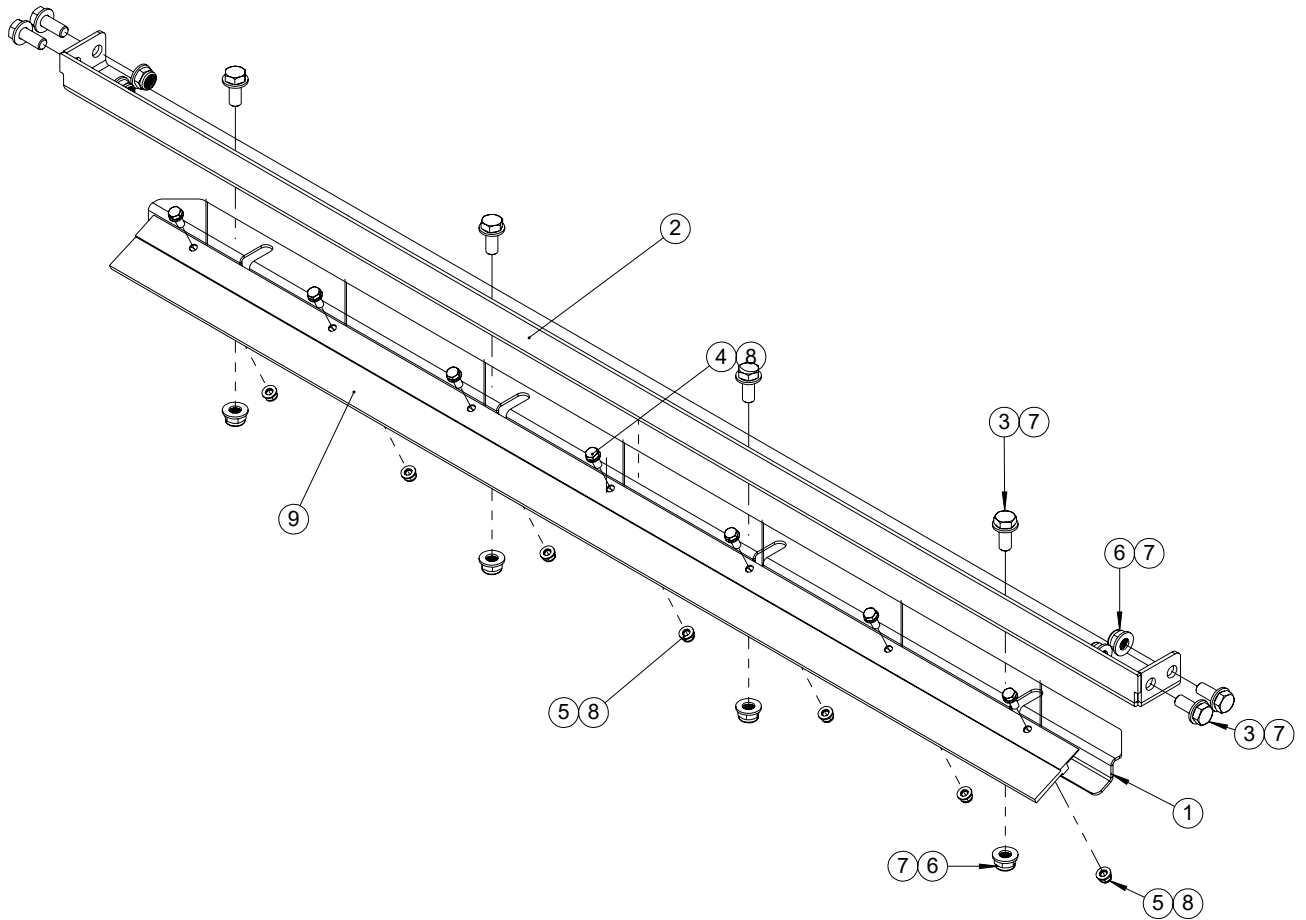


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	320353_REV0	CHARGER POINT MOUNT PLATE	1
2	320515_REV1	ES-34R BATTERY CLAMP FRAME	1
3	320517_REV0	ES-34R CLAMP SPACER	2
4	320518_REV0	ES-34R BATTERY GUARD	1
5	800585_REV5	ROTARY ELECTRIC BOX (HYP)	1
7	E1-1132_REV0	HEX BOLT M10 X 70	2
8	SP01009_REV0	HEX SET SCREW M8 X 20	4
9	SP01112_REV0	HEX SET SCREW M6 X 40	2
10	SP01181_REV0	HEX SET SCREW M6 X 60	2
11	SP02004_REV0	NUT M6 NYLOC	4
12	SP02008_REV0	NUT M10 NYLOC (T)	2
13	SP03008_REV0	WASHER M8 FORM A	4
14	SP03010_REV0	WASHER M6 FORM A	4
15	SP03011_REV0	WASHER M10 FORM A	4
16	SP03029_REV0	WASHER M8 SPRING LOCK	4
17	SP12126_REV0	HYPERDRIVE CELL - HYP-00-2890	1
18	SP17002-38_REV0	BLACK FOAM TAPE 20x5mm	2



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# 12. SCRAPER ASSEMBLY

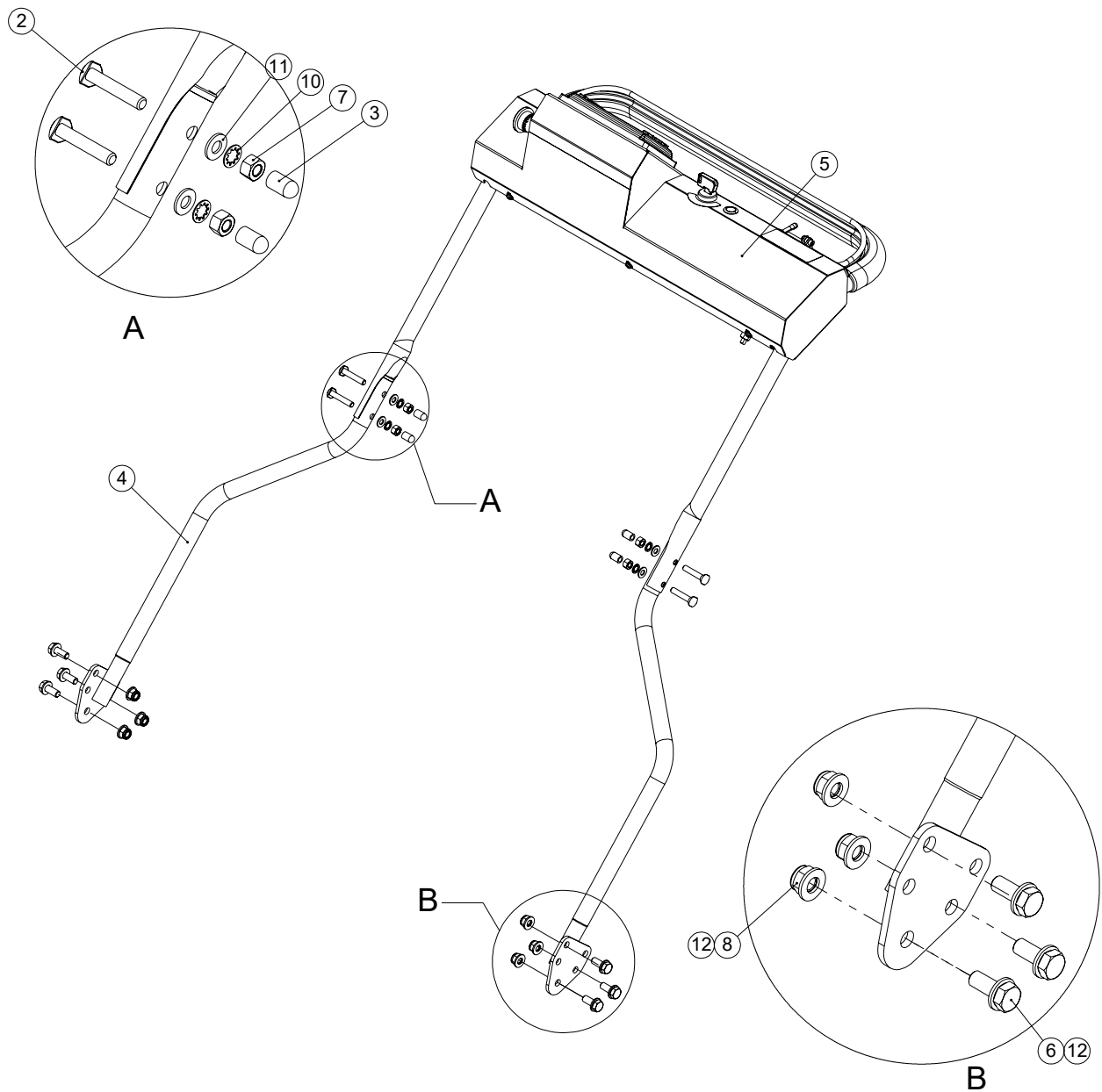


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	320065_REV0	SCRAPER BRUSH REAR ROLLER	1
2	320391_REV1	SCRAPER BRUSH BAR	1
3	SP01009_REV0	HEX SET SCREW M8 X 20	8
4	SP01074_REV0	HEX SET SCREW M5 X 12	7
5	SP02002_REV0	NUT M5 NYLOC (T)	7
6	SP02006_REV0	NUT M8 NYLOC (T)	8
7	SP03008_REV0	WASHER M8 FORM A	16
8	SP03009_REV0	WASHER M5 FORM A	14
9	SP24007_REV0	BRUSH H SECTION 4MM	1



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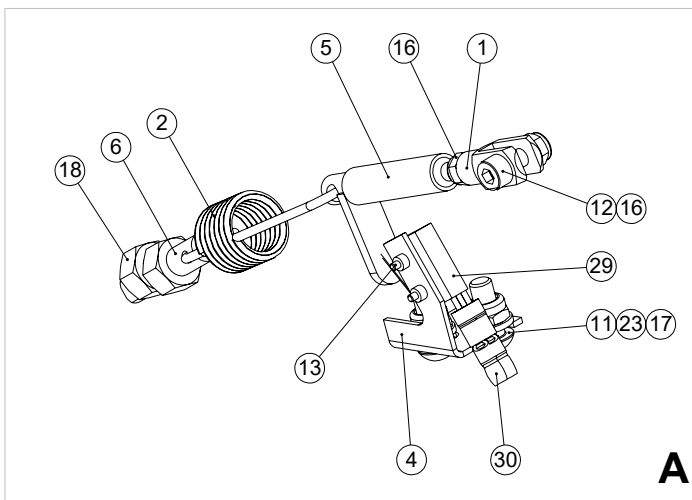
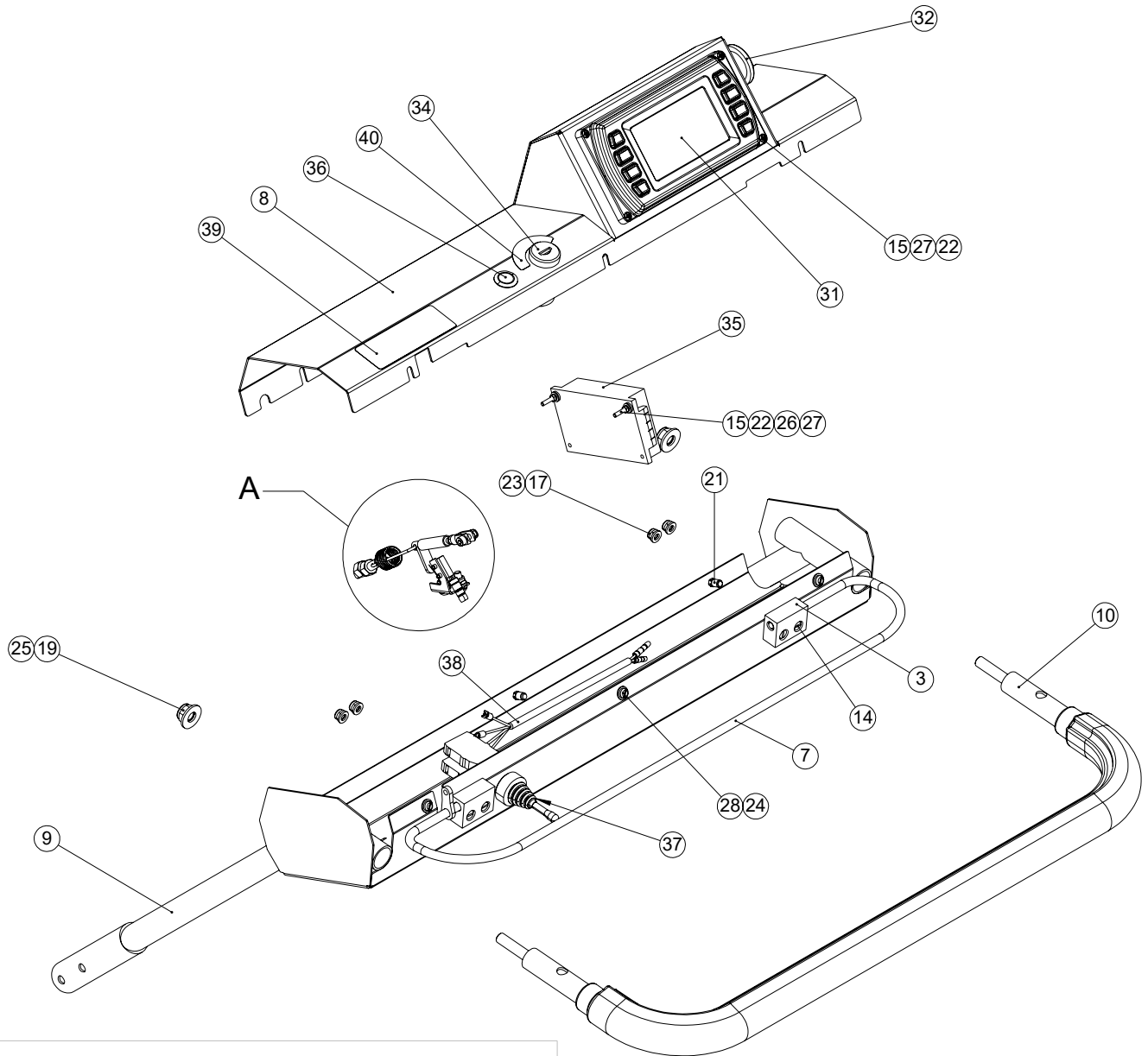
# 13. HANDLE ASSEMBLY



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	228024_REV1	1" TUBE BUNG	2
2	228093_REV0	BOLT SADDLE M8 X 43	4
3	228094_REV0	END TIP 5/16"	4
4	320510_REV2	ES-34R STD LOWER HANDLE TUBE W.A	2
5	800576_REV2	G SERIES UPPER HANDLEBAR ASSY	1
6	SP01035_REV0	HEX SET SCREW M10 X 25	6
7	SP02005_REV0	NUT M8 STD	4
8	SP02008_REV0	NUT M10 NYLOC (T)	6
9	SP03004_REV0	WASHER M8 TOOTHED	1
10	SP03004_REV0	WASHER M8 TOOTHED	3
11	SP03008_REV0	WASHER M8 FORM A	4
12	SP03011_REV0	WASHER M10 FORM A	12



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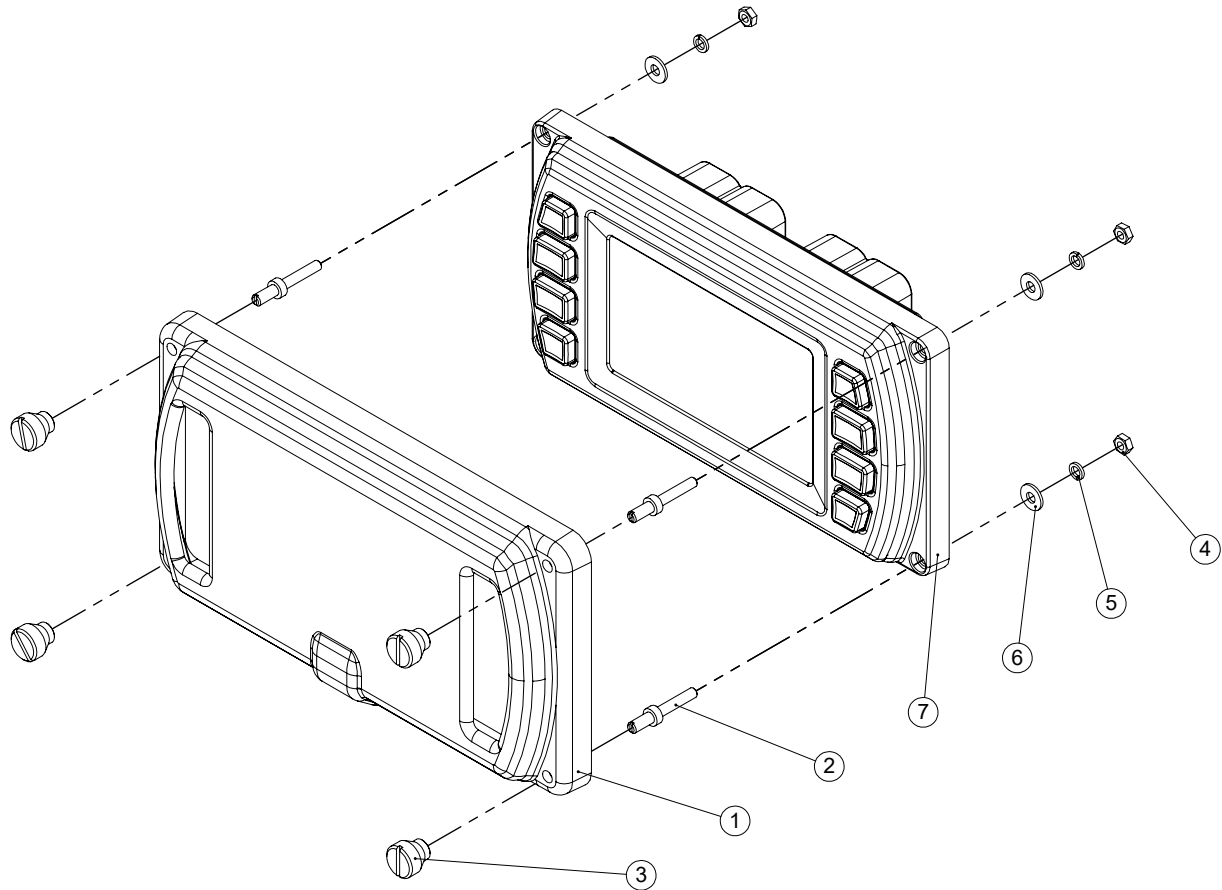


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	228020_REV1	CLEVIS GM5 (5MM)	1
2	229167_REV1	CLUTCH SPRING	1
3	229585_REV1	PIVOT BLOCK	2
4	229590_REV1	SAFETY SWITCH BRACKET	1
5	229595_REV2	SAFETY LEVER PLUNGER W.A.	1
6	229620_REV2	BOLT FOR SPRING	1
7	230180_REV0	SAFETY BAR W.A.	1
8	370110_REV3	CONSOLE COVER ES860 W/A	1
9	370191_REV0	E-SERIES HANDLE BODY W.A.	1
10	403596_REV0	HANDLE BAR ASSY	1
11	SP01019_REV0	BUTTON HEAD M6 X 16	2
12	SP01043_REV0	CAP HEAD M5 X 16	1
13	SP01070_REV0	CAP HEAD M2 X 12	2
14	SP01101_REV0	SCREW M6 X 25 SLOTTED	4
15	SP01178_REV0	M3.5 x 20 CHEESE HEAD	6
16	SP02002_REV0	NUT M5 NYLOC (T)	2
17	SP02004_REV0	NUT M6 NYLOC	6
18	SP02005_REV0	NUT M8 STD	2
19	SP02008_REV0	NUT M10 NYLOC (T)	2
20	SP02038_REV0	NUT M2 (BUSH)	2
21	SP02041_REV0	RIVNUT HEX M5 (0.5-3.0) [NO HEAD]	6
22	SP02073_REV0	M3.5 NUT STD	6
23	SP03010_REV0	WASHER M6 FORM A	6
24	SP03013_REV0	WASHER M5 FORM C	6
25	SP03016_REV0	WASHER M10 FORM C	2
26	SP03046_REV0	M3.5 SPRING WASHER	6
27	SP03047_REV0	WASHER M3.5 FORM A	8
28	SP04001_REV0	SCREW M5 X 16 SLOTTED	6
29	SP12007_REV0	MICRO SWITCH DC1C-C3LB	1
30	SP12014_REV0	ELECTRICAL CONNECTOR MALE BULLET (RED)	2
31	SP12099_REV0	DISPLAY PV450	1
32	SP12101_REV0	E-STOP	1
34	SP12102_REV1	KEY SWITCH (ON/OFF - 2 POS)	1
35	SP12127_REV2	HYP HANDLE CONTROLLER HARNESS (F42216)	1
36	SP12132_REV1	MOMENTARY PUSH SWITCH	1
37	SP12182_REV0	2 AXIS LATCHING JOYSTICK	1
38	SP12183_REV0	E-SERIES HAND CONTROLS WIRING HARNESS	1
39	SP18026-3_REV0	E-SERIES DECAL	1
40	SP18026-5_REV0	IGNITION DECAL	1



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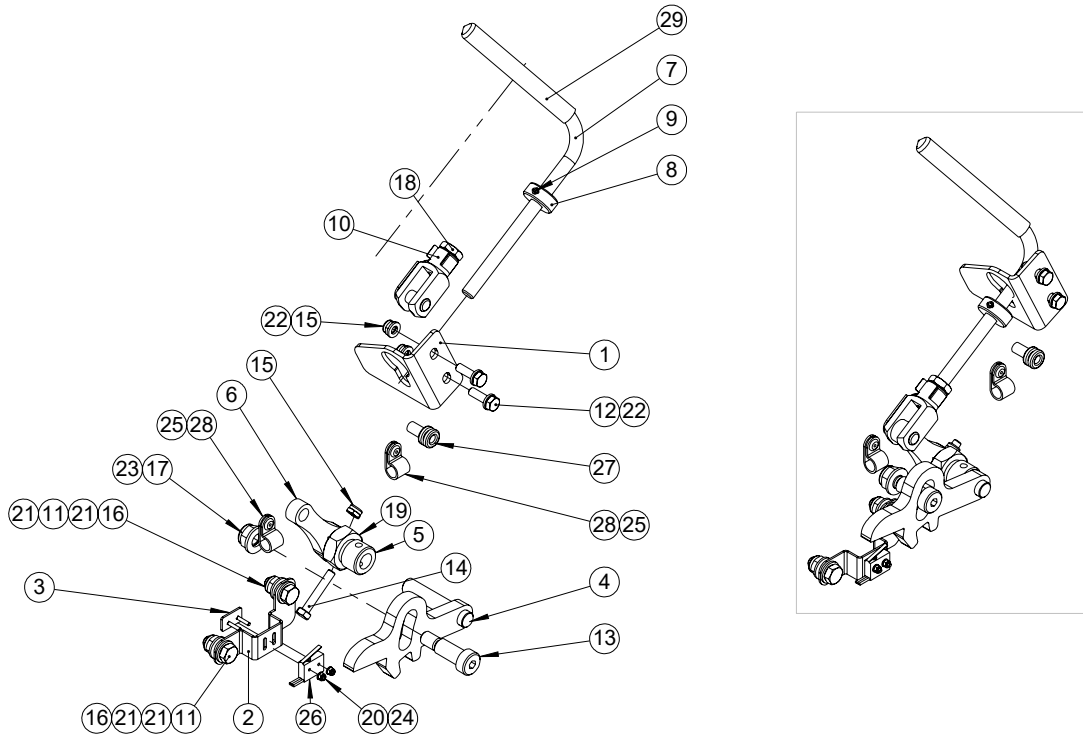
# 14. SCREEN PROTECTOR



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



# 15. BRAKE ASSEMBLY

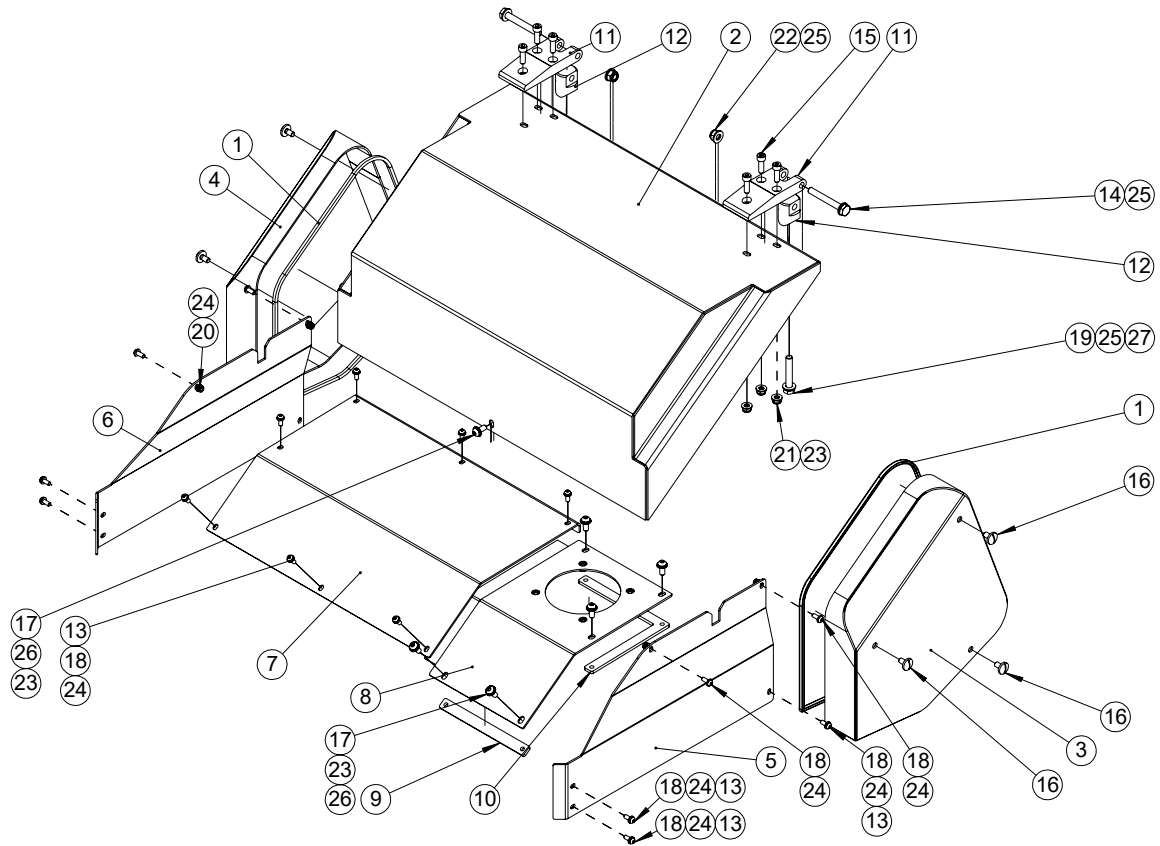


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	320452_REV0	PARKING BRAKE PLATE	1
2	320453_REV0	BRAKE SENSOR BRACKET	1
3	340135_REV0	MICROSWITCH MOUNT PLATE	1
4	340195_REV2	BRAKE HAMMER W.A.	1
5	340197_REV0	BRAKE BUSH	1
6	340200_REV2	BRAKE CLAMP	1
7	370141_REV0	BRAKE BAR	1
8	370142_REV0	BRAKE LOCK COLLAR	1
9	D8068_REV0	GRUB SCREW M6 X 6	2
10	HURM216_REV0	CLEVIS ASSY M10 SHORT	1
11	SP01009_REV0	HEX SET SCREW M8 X 20	2
12	SP01028_REV0	HEX SET SCREW M6 X 20	2
13	SP01029_REV0	SHOULDER BOLT 12 X 25 M10	1
14	SP01054_REV0	HEX SET SCREW M6 X 35	1
15	SP02004_REV0	NUT M6 NYLOC	3
16	SP02006_REV0	NUT M8 NYLOC (T)	2
17	SP02008_REV0	NUT M10 NYLOC (T)	1
18	SP02013_REV0	NUT M10 LOCK (THIN)	1
19	SP02034_REV0	NUT 3/4" UNF STD	1
20	SP02059_REV0	NUT M2.5 NYLOC (P)	2
21	SP03008_REV0	WASHER M8 FORM A	4
22	SP03010_REV0	WASHER M6 FORM A	4
23	SP03011_REV0	WASHER M10 FORM A	1
24	SP03039_REV0	WASHER M2.5 FORM A	2
25	SP05001_REV0	RIVET 4.8 X 10	2
26	SP12007_REV0	MICRO SWITCH DC1C-C3LB	1
27	SP12092_REV0	GROMMET EXTENDED 6MM	1
28	SP14019_REV0	P CLIP 10MM NYLON	2
29	SP14050_REV0	HANDLE GRIP (S&R - DG187) RED	1



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# 16. GUARDS

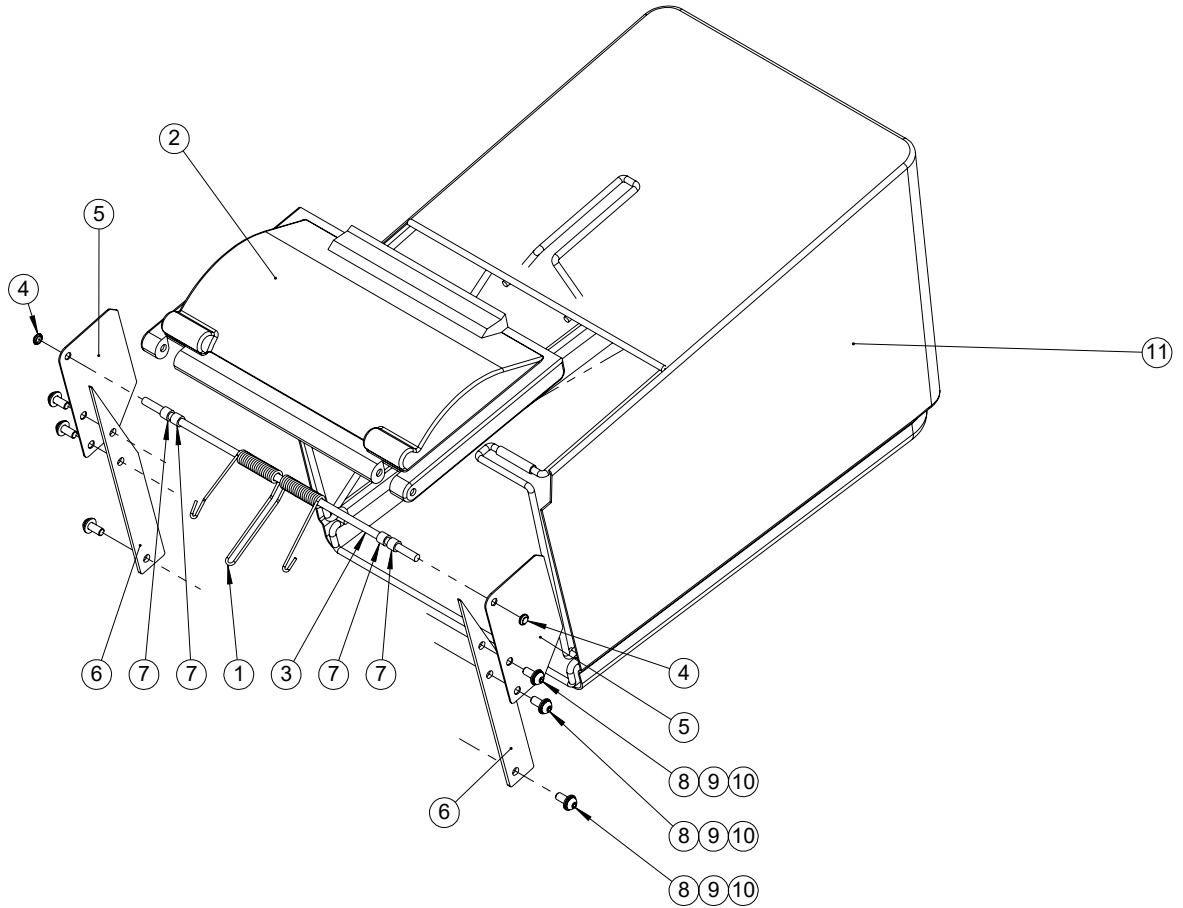


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	228031-1185_REV0	CHAIN CASE SEAL - 118.5cm	2
2	320355_REV2	BATTERY COVER W.A. (34R)	1
3	320370_REV1	SIDE GUARD WELDED ASSY LH	1
4	320375_REV1	SIDE GUARD WELDED ASSY RH	1
5	320397_REV1	CHASSIS SIDE PLATE LH	1
6	320398_REV1	CHASSIS SIDE PLATE RH	1
7	320447_REV1	DECK COVER PLATE	1
8	320448_REV1	DECK MOTOR MOUNT COVER W.A	1
9	320450_REV0	MOTOR MOUNT FRONT CLAMP	1
10	320451_REV0	MOTOR MOUNT REAR CLAMP	1
11	340155_REV0	BATTERY COVER HINGE	2
12	340156_REV0	HINGE PIVOT	2
13	E1-1061_REV0	WASHER M6 SPRING	13
14	SP01119_REV0	HEX BOLT M10 X 75 (8.8 HT)	2
15	F20384_REV1	CAP HEAD M8 X 25	6
16	J209074_REV1	BRAKE BAND COVER SCREW	6
17	SP01006_REV0	BUTTON HEAD M8 X 20	6
18	SP01019_REV0	BUTTON HEAD M6 X 16	17
19	SP01047_REV0	HEX SET SCREW M10 X 60	2
20	SP02004_REV0	NUT M6 NYLOC	4
21	SP02006_REV0	NUT M8 NYLOC (T)	6
22	SP02008_REV0	NUT M10 NYLOC (T)	2
23	SP03008_REV0	WASHER M8 FORM A	12
24	SP03010_REV0	WASHER M6 FORM A	21
25	SP03011_REV0	WASHER M10 FORM A	6
26	SP03029_REV0	WASHER M8 SPRING LOCK	6
27	SP03034_REV0	WASHER M10 SPRING LOCK	2



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# 17. GRASS BOX



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	320176_REV1	GRASSBAG SPRING	1
2	320177_REV0	GRASSBAG LID	1
3	320178_REV0	GRASSBAG PIVOT	1
4	320179_REV0	PIVOT BAR CLIP	2
5	320180_REV1	DEFLECTOR	2
6	320444_REV0	GRASSBAG SIDE PLATE	2
7	F21712_REV1	BUSH NYLON 1208 10	4
8	SP01006_REV0	BUTTON HEAD M8 X 20	6
9	SP03008_REV0	WASHER M8 FORM A	6
10	SP03029_REV0	WASHER M8 SPRING LOCK	6
11	320171_REV0	GRASSBAG COVER	1
12	320172_REV0	GRASSBOX FRAME	1



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