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A Division of



NSP-5 Super Pusher



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Operation Manual

1425 Stagecoach Road

Shakopee, MN 55379

Phone: (952) 445.8295

Fax: (952) 445.0231

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Units and Parts Warranty

For one (1) year on parts and one (1) year on electrical components. NU*STAR will replace for the original purchaser, free of charge, any part or parts found upon examination by a factory authorized dealer of NU*STAR to be defective in material and/or workmanship.

All transportation charges on parts submitted for replacement under this warranty must be borne by the purchaser.

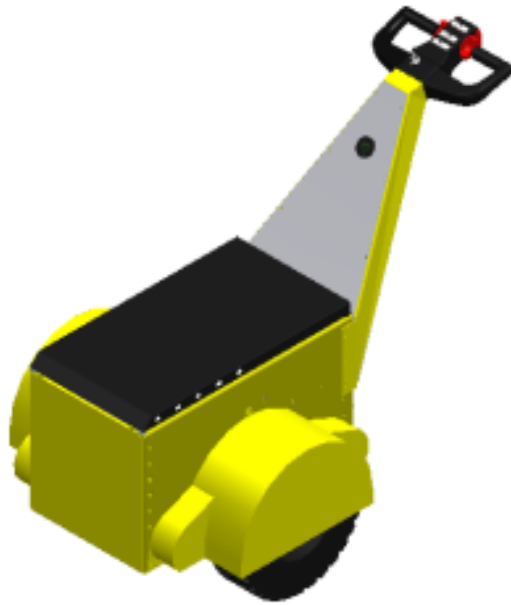
The seller shall in no event be liable for any consequential damages, or shall he be liable to the purchaser for loss, damage, or injury to persons or property or damages of any kind or nature occasioned by or arising out of the operation, use, misuse, noise, repair or replacement of the equipment.

NU-STAR NSP-5 SUPER PUSHER OPERATION AND SERVICE MANUAL

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IMPORTANT:
IT IS IMPERATIVE THAT THIS MANUAL IS STUDIED AND UNDERSTOOD BY PERSONS
INTENDING TO USE THIS EQUIPMENT



NU-STAR NSP-5 SUPER PUSHER

PRODUCT DESCRIPTION

The Nu-Star SUPER PUSHER is a pedestrian controlled 36V 1500W battery powered traction unit intended for pushing or pulling a variety of wheeled loads. Different “load” types are accommodated by the fitting of special attachments (see supplement).

NOTE: Due to safety and load considerations it is recommended that Nu-Star is consulted for specialist advice when defining the type of attachment.

DETAILS OF MANUFACTURE

SUPER PUSHER is manufactured in the USA by:

Nu-Star, Inc.
1425 Stagecoach Road
Shakopee, MN 55379

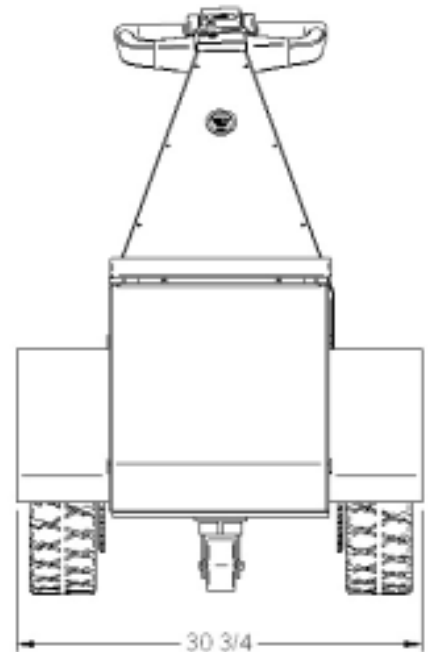
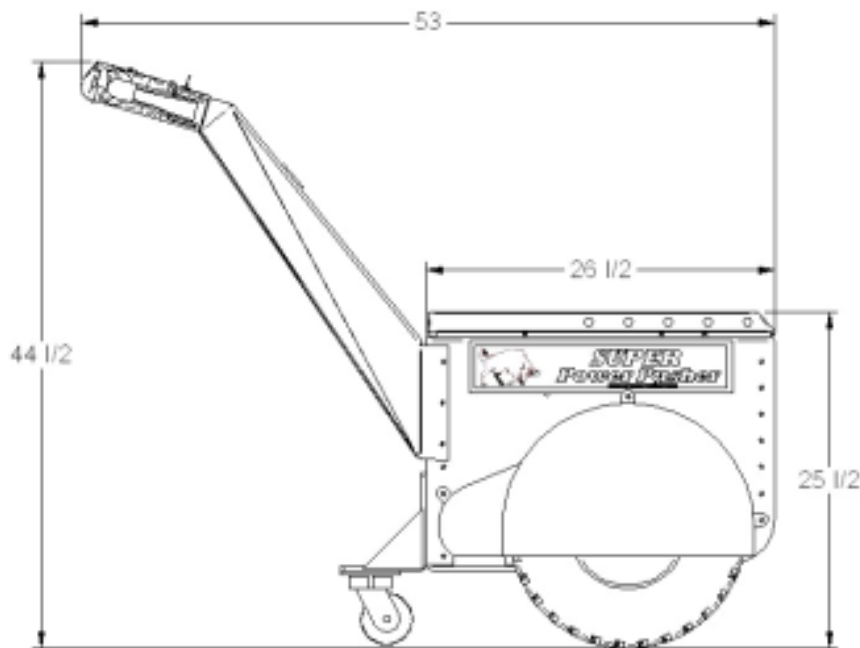
Telephone: 1-800-800-9274
Fax: 952-445-0231
E-mail: rblei@nustarinc.com

SPECIFICATIONS

Power Rating: 1500W

Motor: 36V DC 1500W

Dimensions: 30-3/4 in (W) x 53 in (L) x 44-1/2 in (H)



Weight: 870 lbs (without attachments)

IP Rating: 20

Max. Speed: 178 feet/min or 2 mph

Power Source: 3, Series connected, 12V lead acid batteries
(Group 31)

Charger: ProSport Model 43029
Input: 100-240 VAC; 50/60 Hz; 4.7A
Output: 20A Maximum Fully Distributed

SAFE OPERATION AND MAINTENANCE

This machine should only be operated by staff who have been trained in its use and are familiar with the controls, attachments and features.

Attention is drawn to supplements which refer to drawbar and pushing attachments. The supplement appropriate to attachments supplied with this machine is appended to the rear of this manual.

SUPER PUSHER is intended for pedestrian control.
Riding on SUPER PUSHER is not permitted.

Suitable for use in well illuminated areas only.

COMMISSIONING

Prior to use for the first time the machine should be visually inspected. Should any faults be noticed the machine must be returned to the manufacturer. It is recommended that the batteries are given an initial overnight charge.

HAZARDS

Although the batteries supplied with the machine are of a "sealed for life" type there is a small possibility that acid leakage may occur if the casings have been damaged. Use of protective clothing and eye protection is recommended when handling batteries. The energy levels that can be delivered by these batteries can cause fire. Metal objects must not be allowed to bridge the battery terminals. Explosive hydrogen gas may be liberated. Do not allow naked lights near to batteries.

MAINTENANCE – See separate section

The SUPER PUSHER contains few user-serviceable parts. User servicing is limited to tire inspection, drive chain tensioning/lubrication and battery exchange.

The machine should be returned to the manufacturer for any major repairs.

Safety: **Do not use this machine in explosive atmospheres.**

Ensure visibility. Use only in well-illuminated areas.

Keep metal objects away from battery terminals.

Remove batteries if machine is placed in storage.

Use protective clothing when handling batteries.

Ensure safe practices are employed if changing attachments.

MAINTENANCE & ROUTINE CHECKS

INSPECTION OF MECHANICAL PARTS

DAILY:

The machine should be given a brief visual inspection. Any defects noted should be rectified prior to use.

The handlebar control assembly includes a throttle return spring. Freedom of movement and return to center (off) position should be established prior to switching the machine on.

EVERY WEEK:

The “Belly switch” anti-trap function must be tested by moving the machine towards the operator and depressing the switch. The machine must move away from the operator and stop. No movement may then be possible until the machine has been re-set.

Note: This test must be performed with good clearance behind the operator.

PERIODIC:

The chain sprocket keyways of the “drive train” are liable to wear in normal use. These keys should be examined for wear and replaced if this becomes excessive. Examination should take place at a minimum of 6 months for the sprocket keyways**.

**This should take place during chain tension and lubrication work. Attempt to rotate the drive sprockets observing any movement relative to the spindle.

The hinged lid of the TRAILER MVOER HD allows access to batteries and the charger.

BATTERIES: Removal, replacement and re-charging

BATTERIES SHOULD ONLY BE REPLACED BY A SIMILAR TYPE.

Standard fitment is : (3x) 12V Group 31 Batteries

CAUTION! Each battery weighs approximately 68 lbs. Use safe lifting practice.

Lead Acid Batteries must be handled with care. Use protective clothing and eye protection when handling batteries.

Batteries under charge may liberate EXPLOSIVE HYDROGEN GAS.

Note: If batteries are to be charged in a dedicated charging area or room, a “NO SMOKING” sign should be displayed.

**Life expired batteries must be disposed of in an environmentally safe manner.
If in doubt, consult your local authorities regarding safe disposal.**

(SUPER PUSHER is fitted with a ProSport triple output battery charger. This is intended for connection to a 100-240 VAC supply.)

See separate section on the battery charger (p8).

FUSES

Fuses must only be replaced by the same type and rating.

Mains plug is fitted with a 3A fuse.
Battery charger output fuses are 15A

CHAIN ADJUSTMENT

Disconnect the batteries before commencing.

Chain adjustment is provided at the motor/gearbox; slacken the 3/8 inch bolts retaining the motor/gearbox and move the assembly until the maximum chain displacement is 1/2 inch at the center of the chain run.

Re-tighten the bolts to **62 Ft-Lbs.**

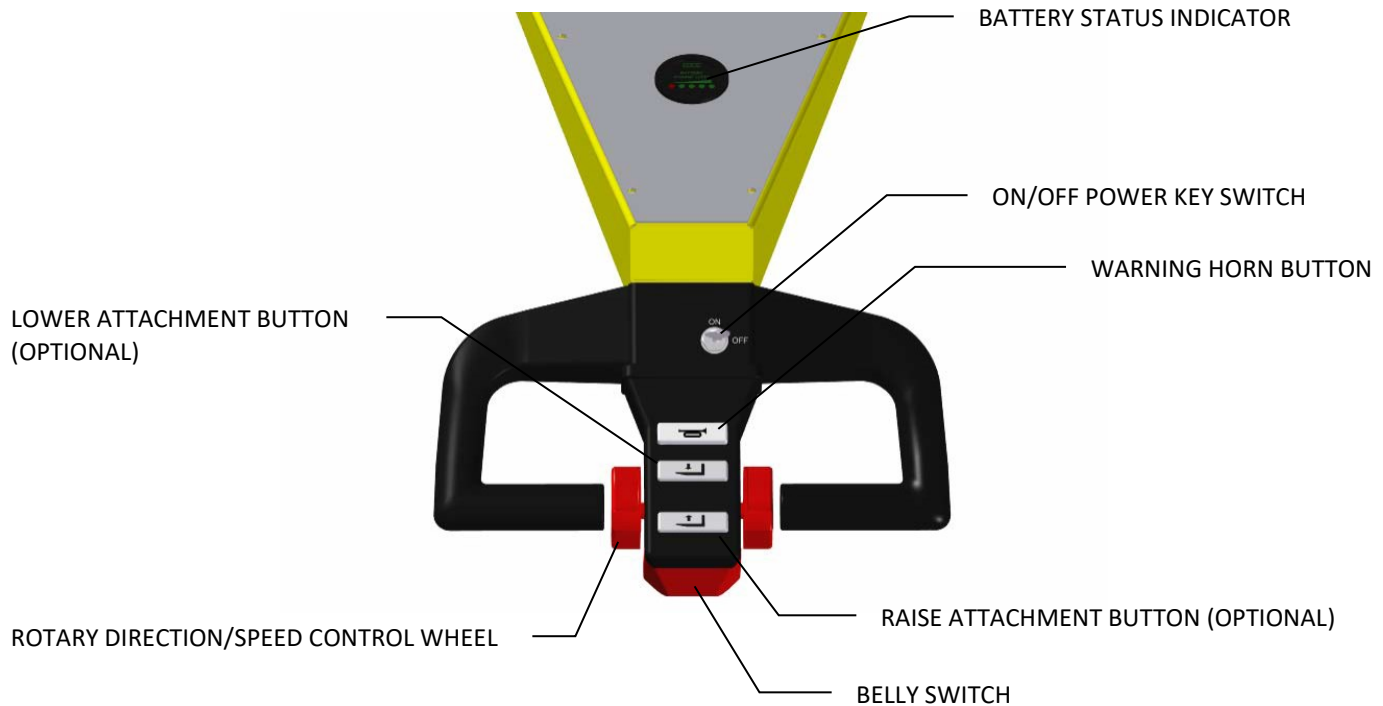
(Chain tension adjustment should be checked every six months.)

CLEANING

Avoid excessive penetration of the water into the handlebar control assembly and electronics.
Remove heavy soil with a soap/water solution.
Do not use pressure washers.

CONTROLS AND OPERATION

HANDLEBAR CONTROLS



MAIN DC POWER SWITCH

The Controller Power Keyswitch immediately in front of the handlebar assembly controls supply of power to the control electronics. This controller supply keyswitch must also be turned to the on position before the machine will function.

REMOVE THIS KEY IF THE MACHINE IS TO BE LEFT “OUT OF SERVICE”

Turn “off” while the machine is not being used.

ROTARY CONTROLS-SPEED & DIRECTION OF MOVEMENT

Forward and reverse movement of the SUPER PUSHER is controlled by the rotary thumbwheels positioned inboard of the handles. These are spring loaded to automatically return to the stop position. The thumbwheels are connected internally movement of either wheel will initiate movement.

Machine Speed is dependent on the amount of rotation.

Rotate the thumbwheel in a forward motion (away from the operator) to make the SUPER PUSHER move forward (away from the operator). Reverse rotation (towards operator) will make the SUPER PUSHER move backwards (towards the operator).

POWER INDICATOR and Low-Battery “lock-out” function

A 5 LED battery state indicator is fitted in the top handle plate. 3 green LEDs indicate full charge. A reduced number of LEDs lit through GREEN to RED indicate progressive discharge.

This indicator should illuminate once the power is turned on. The SUPER PUSHER can be used while yellow indication is shown.

Note: The electronic control unit fitted to the SUPER PUSHER contains a power saving timer. If the power switch has been turned on, but the machine has not been used for 25 minutes or more the circuit will shut down. To use the machine again the keyswitch must be turned OFF then ON again.

The keyswitch should be turned to the “off” position if machine is “in use” but with no demand.

ANTI-CRUSHING SAFETY FEATURE: (“BELLY SWITCH”)

A switch pad is fitted in the handlebar assembly facing the operator. Should the machine be reversing towards the operator, gentle depression of this switch will immediately cause the SUPER PUSHER to switch to a forward motion and **stop** when the switch pressure is removed.

This is to prevent the operator being accidentally crushed by the SUPER PUSHER and the load while reversing.

Note: The machine will stop permanently. It will be necessary to turn the power switch OFF and ON again before the machine will function normally if this feature has been activated.

AUDIBLE ALERT

SUPER PUSHER is fitted with an “automotive-type” electric horn for warning of approach. The horn switch is placed at the center/top of the handlebar assembly. Press to sound.

ANTI-RUNAWAY FEATURE

The controller fitted to the SUPER PUSHER is able to detect movement due to the “Back EMF” created by the DC motor. Should the voltage increase to a certain level the controller will apply an opposite voltage to stop the movement.

This occurs even when the power switch is OFF (or no batteries are fitted).

BATTERY CHARGING

The SUPER PUSHER is fitted with a ProSport model 43029 Triple-output battery charger intended for 100-240VAC; 50/60Hz operation. Charging this unit in any manner other than by the charger provided may result in serious damage.

Batteries supplied with the SUPER PUSHER are of a heavy-duty sealed valve regulated type. Life and performance depends upon keeping them charged at all times. They should not be stored in a discharged condition.

CHARGER



The above photograph shows the ProSport 43029 charger as installed in the SUPER PUSHER. The charger is located under the hinged lid of the battery compartment. In-line 15A fuses are fitted. Only use replacements of the same type and rating.

DO NOT ATTEMPT TO MOVE THE SUPER PUSHER WHILST “ON-CHARGE”

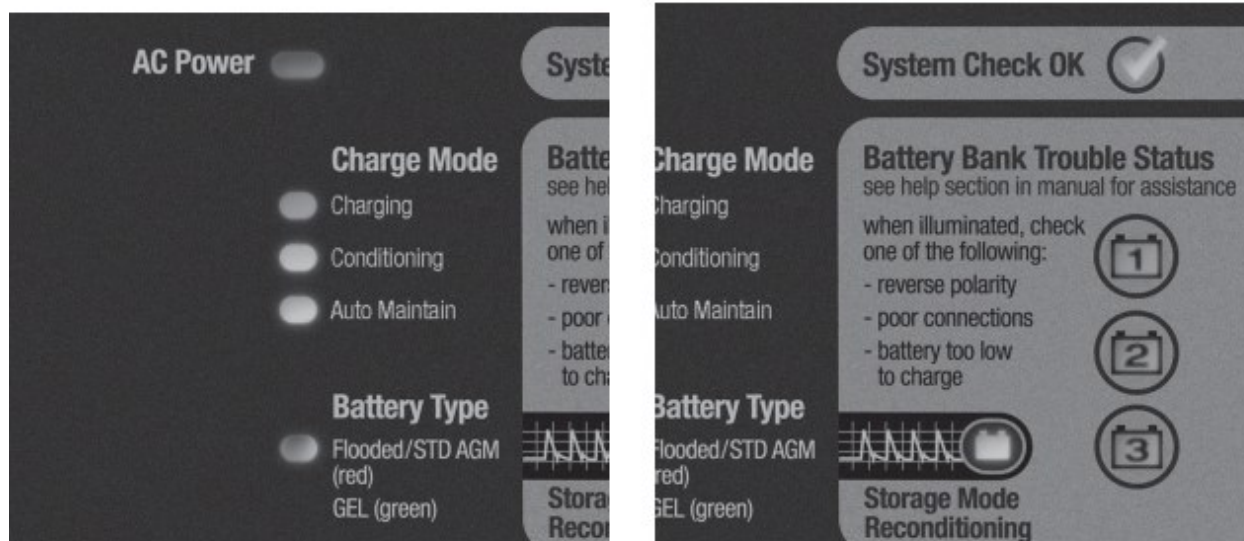
USE OF AN EARTH FAULT PROTECTED MAINS SUPPLY IS REQUIRED.

REPLACE FUSES ONLY WITH THE SAME TYPE AND RATING.

LED indicators are provided for all three 12V batteries, which are connected in series to supply the SUPER PUSHER with 36V. These batteries are individually connected to the three charger outputs.

The charger circuitry is designed to prevent overcharging.

ProSport LED Status Center - Operation and Display



ProSport includes 7 LEDs for operation status and up to 3 battery bank trouble LEDs depending on the model.

1. The blue AC power LED

Illuminates when AC power is applied

2. The battery type LED

Will illuminate red for standard Flooded (lead-acid)/AGM and green for GEL.

Note: The ProSport 20 Dual bank model includes an amber battery type LED for AGM HP (High Performance) battery type. Please read the battery manufacturer literature carefully and select the correct charge profile. Failure to do so may cause early battery failure.

3. The system check OK LED

After applying AC power the ProSport will self test and analyze all battery connections and batteries. If all checks are OK the green LED will illuminate. This can take up to 2 minutes.

4. The charge mode LEDs

Charging: Red LED will flash during the self test and battery test mode (approximately 1-2 minutes) and will be solid red during charging.

Conditioning: Amber LED illuminates during conditioning mode.

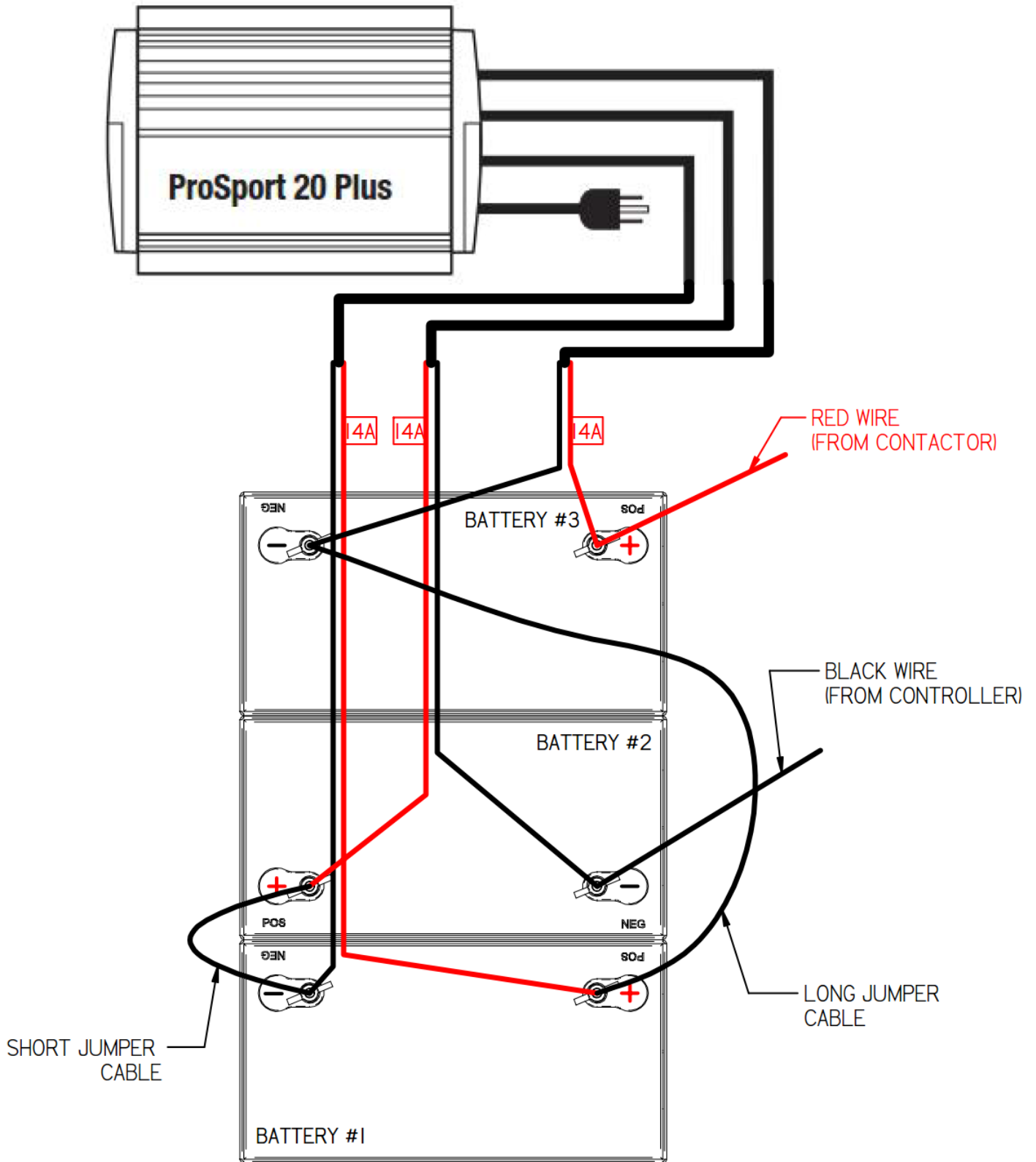
Auto Maintain: Green LED illuminates when batteries are fully charged and being automatically maintained until you are ready to use your boat.

Storage Recondition: Green LED fades in and out when performing a once a month storage recondition mode.

5. Battery bank trouble status LEDs

Red LEDs will illuminate indicating a wiring problem or fault at one of the batteries connected to the ProSport charger. Refer to separate charger manual for troubleshooting.

CONNECTING BATTERIES



INSTRUCTIONS FOR ACCESS TO MOTOR AND DRIVE

Consult the exploded drawings to identify parts referred to by (ITEM number)

- 1) Open the main body lid **(3)** and secure safely in the open position (or remove it).
- 2) Disconnect and remove all cables from the batteries, **first noting** their positions and fuses to ensure correct re-assembly.

CAUTION!

Each battery weighs approximately 68 lbs. Use safe lifting practices.

- 3) Remove the three batteries. Note: safe handling of batteries.
- 4) Remove the charger (3).
- 5) Remove the battery shelf plate **(22)**.

The motor/gearbox **(1)** will now be visible.

Chain adjustment is provided at the motor/gearbox.

- 6) Slacken the 3/8 inch bolts retaining the motor/gearbox and move the assembly until the maximum chain displacement is ½ inch at the center of the chain runs. Avoid un-equal chain tension.
- 7) Re-tighten the mounting retaining bolts to 62 Ft-Lbs.
- 8) Re-assemble parts in the reverse order to above ensuring all bolts/screws are tightened correctly with all washers re-fitted.
- 9) Re-fit the batteries ensuring the correct terminal/wire relationship. Do not all tools to bridge the battery terminals.

Note: If the drive chains are badly worn contact the manufacturer for replacements. Drive chains must be replaced as matched pairs.

REPLACEMENT PARTS

To order replacement parts or speak to someone in the parts department, call NU*STAR Inc. at 800-800-9274 or 952-445-8295.

Always give the following information when ordering parts:

1. Serial Number of the SUPER PUSHER
2. Part Number
3. Part Name
4. Quantity Desired

Do not use item numbers when ordering parts – always use PART NUMBERS.

All parts will be shipped C.O.D.

All warranted parts will have to be returned to a Factory Authorized Dealer or NU*STAR and if found to be defective in material and/or workmanship, the purchaser will be reimbursed for the cost of the part.

All transportation charges on parts submitted for replacement under the warranty are the responsibility of the purchaser.

ORDER PARTS HERE!



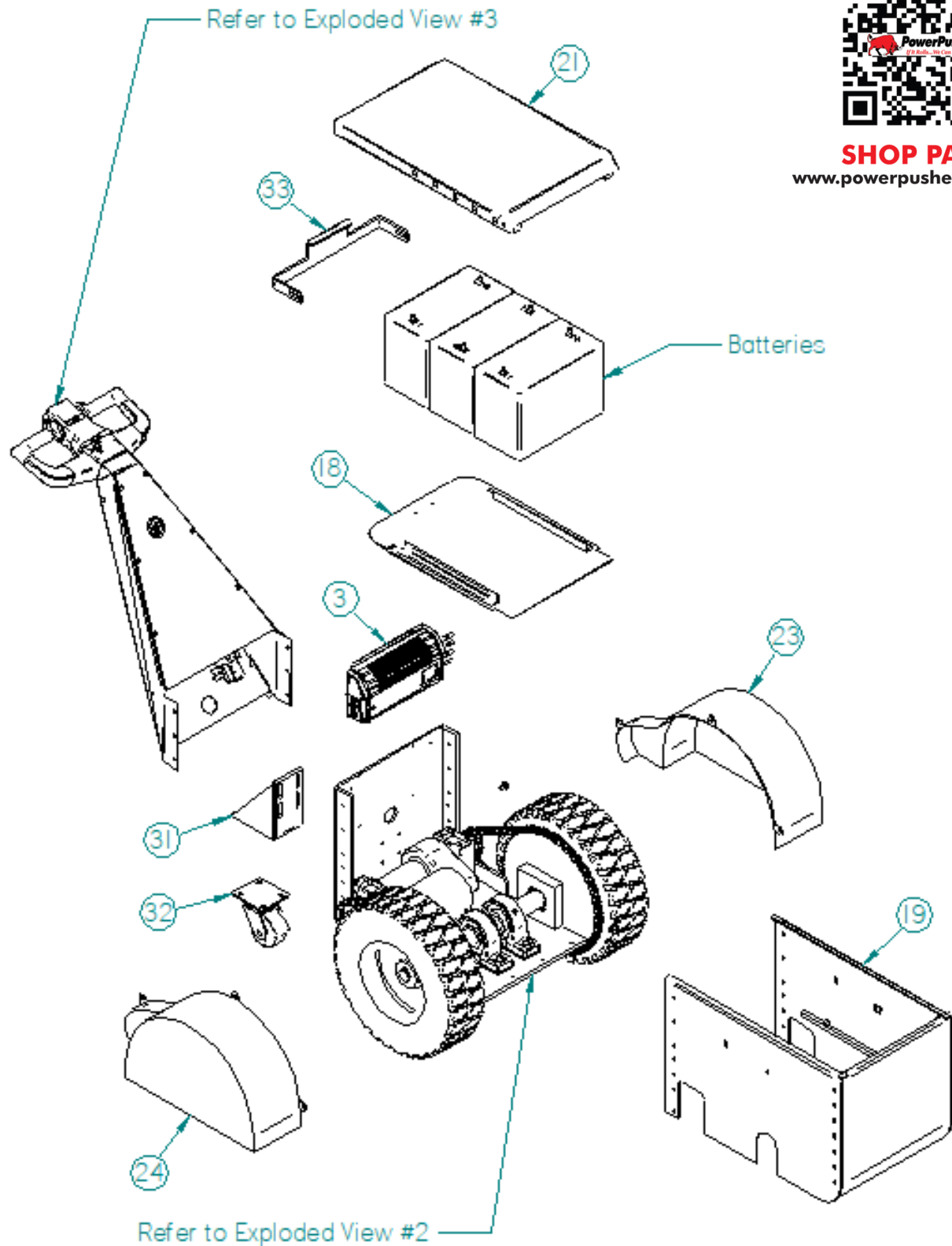
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PARTS LIST (refers to Exploded Views)

Callout	Description	Part Number	Quantity
1	Drive, Transaxle	502-001	1
2	Controller	502-029	1
3	Battery Charger	501-998	1
4	Contactor	502-018	1
5	Battery Status Indicator	500-097	1
6	Handset, CH2	MMBB000046	1
10	Bearing, Axle	502-005	2
11	Sprocket, Axle, 72T	502-206	2
12	Sprocket, Drive, 11T	303-065	2
13	Chain	500-002	2
14	Decal, SPP	502-010	2
16	Handle	502-117	1
17	Plate, Handle Top	502-118	1
18	Plate, Handle Bottom	502-119	1
19	Body, Front	502-103	1
20	Body, Rear	502-104	1
21	Cover, Top	502-105	1
22	Tray, Battery	502-106	1
23	Guard, Left Chain	502-307	1
24	Guard, Right Chain	502-308	1
26	Axle, Main	502-140	2
27	Key, Axle	502-132	4
30	Tire, 18"	500-135	2
31	Plate, Rear Caster	500-133	1
32	Caster, 4"	200306	1
33	Brace, Battery	502-126	1
34	Bearing, 2" Axle Support	502-139	2
35	Bearing Spacer	502-145	2
36	Fuse Holder	705043	1
37	1-1/2" External Retaining Ring	68027	4
38	80mm Internal Retaining Ring	35262	2
39	1-1/2" x 14ga Flat Washer	33475	2
40	7/8" External Retaining Ring	68017	2
41	Spacer, Transaxle, 7/8"	502-040	2
42	Spacer, Axle, 1-1/2"	502-151	2
43	7/8" Shaft Collar	500-160	2

Exploded View #1

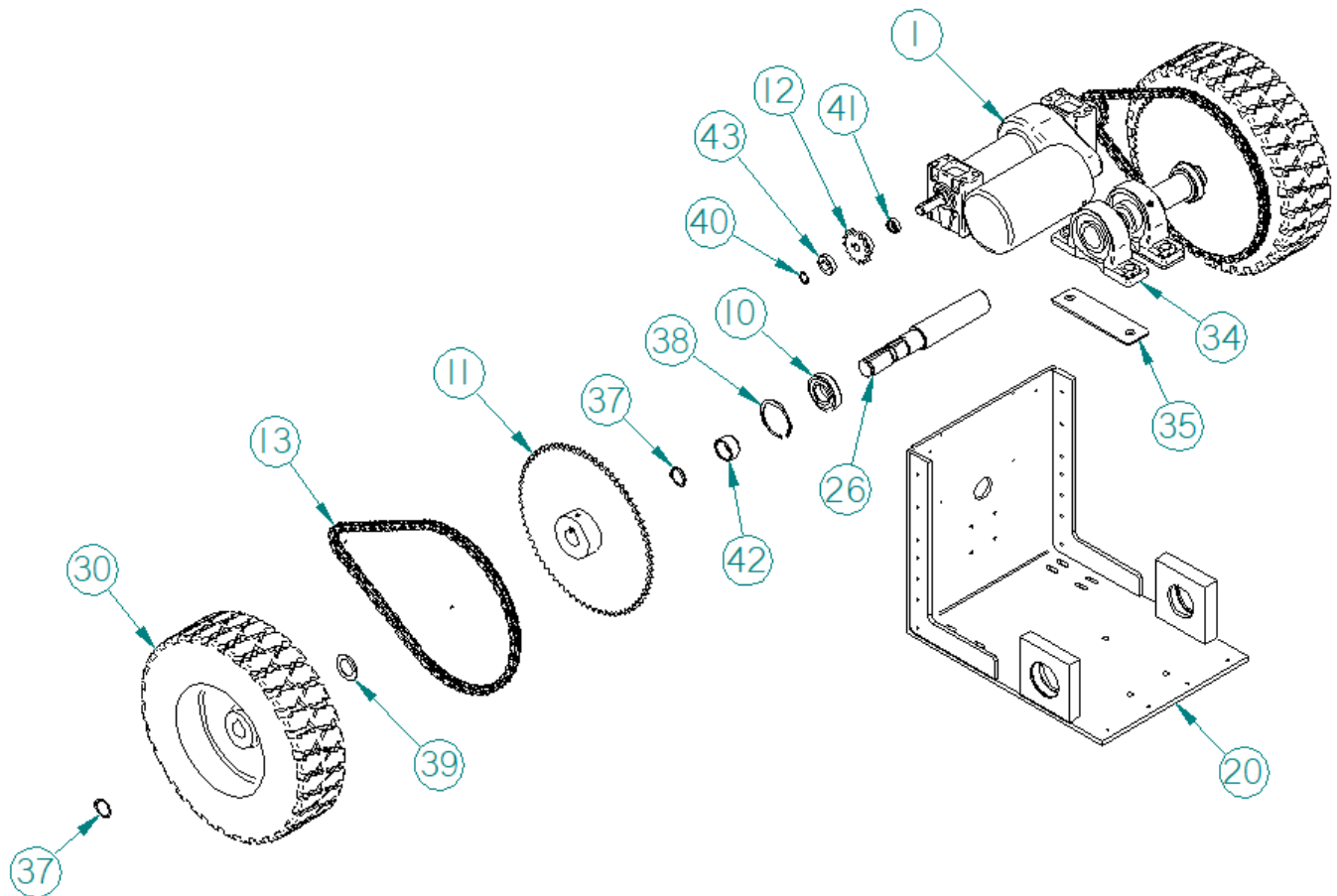


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Exploded View #2

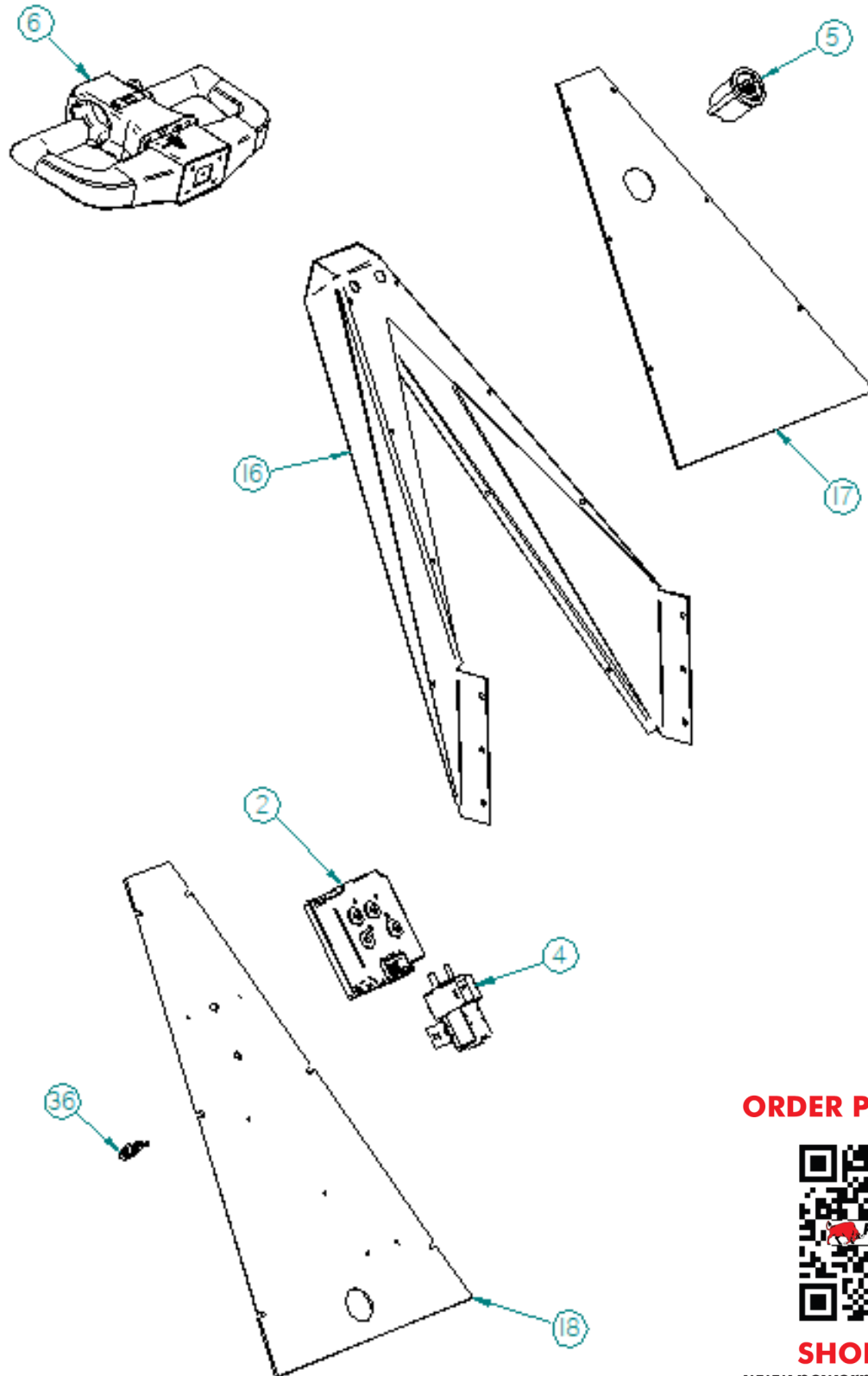


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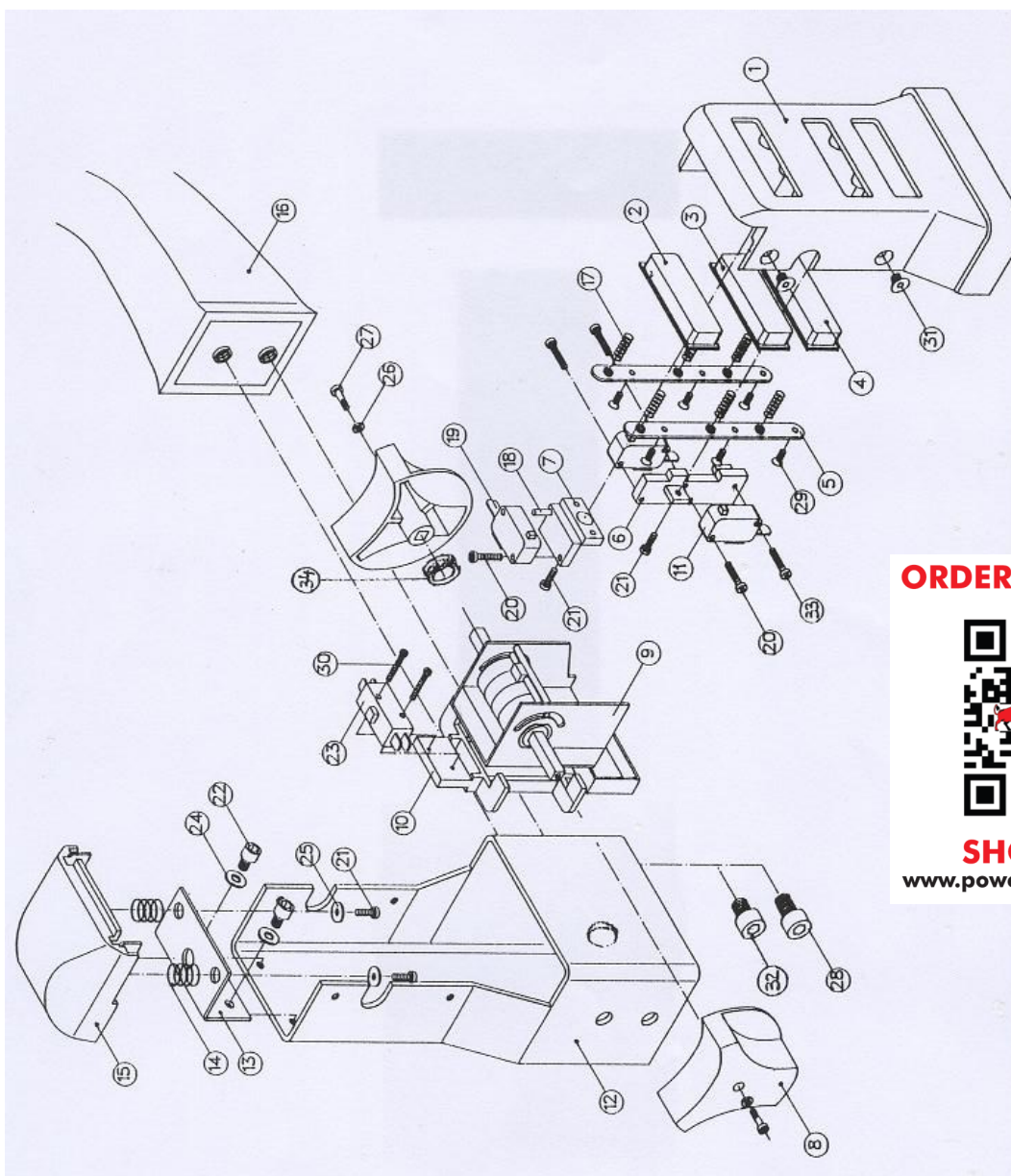
Exploded View #3



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Item	Part #	Description
1	400107	Tiller Head Housing, 1-Button
1a	400108	Tiller Head Housing, 3-Button
2	400109	Button UP
3	400110	Button DOWN
4	400111	Button HORN
5	400112	Spring Bracket UP/DOWN/HORN
6	400113	Bracket Switch DOWN/HORN
7	400114	Bracket Switch UP w/ Pin
8	400104	Red Butterfly Knob
9	400102	Throttle
10	400115	Throttle Support
11	400116	Microswitch DOWN/HORN
12	400133	Metal Chassis
13	400101	Emergency Support
14	400103	Emergency Spring
15	400100	Emergency Button
16	400134	Foam Rubber Handle
17	400118	Spring UP/DOWN/HORN
18	---	Pin for UP Switch D3
19	400117	Microswitch UP
20	400122	Screw 1412 KB 30x16
21	400105	Screw 1412 KB 30x10
22	400123	Screw CHC M5x6
23	400119	Emergency Microswitch
24	400124	Washer D:5*11*1
25	400106	Washer D:3*8*0.8
26	400125	Washer D:3
27	400128	Screw M3x12
28	400129	Screw M8x16
29	400127	Screw 1413 KB 30x10
30	400126	Screw 1412 KB 22x18
31	400131	Screw M5x6
32	400130	Screw M8x12
33	400132	Screw 1412 KB 30x14
34	400120	Bearing



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