

# **Parts & Maintenance Manual**

**Sand Scorpion™**

88006, 2WD Electric Sand Scorpion

# To Order Parts

---

1. Write your **full** name and **complete** address on the order.
2. Explain where and how to make shipment.
3. Give product number, name and serial number that is stamped on the name plate or serial plate located on the left rear frame of your product.
4. Order by the quantity desired, the part number, and description of the part as given in the parts list.
5. Send or bring the order to an authorized Textron Turf Care And Specialty Products Dealer.
6. Inspect all shipments on receipt. If any parts are damaged or missing, file a claim with the carrier before accepting.
7. Do not return material without a letter of explanation, listing the parts being returned. Transportation charges must be prepaid.

**Use of other than Textron Turf Care And Specialty Products authorized parts and accessories will void the warranty.**

## Table of Contents

<b>1 Safety</b>		<b>5 Maintenance</b>	
1.1 Operating Safety .....	4	5.1 General .....	19
1.2 Important Safety Notes .....	5	5.2 Maintenance and Lubrication Schedule .....	19
<b>2 Specifications</b>		5.3 Tires .....	20
2.1 Product Identification .....	6	5.4 Care & Cleaning .....	20
2.2 Tractor .....	6	5.5 Electrical System .....	20
2.3 Electrical System & Batteries .....	6	5.6 Storage .....	21
2.4 Weights and Dimensions .....	6	<b>6 Troubleshooting</b>	
2.5 Torque Requirements .....	7	6.1 Traction Control System (TCS) .....	22
2.6 Accessories .....	7	<b>7 Lubrication</b>	
2.7 Support Literature .....	7	7.1 General .....	24
<b>3 Adjustments</b>		7.2 Rear Axle .....	24
3.1 General .....	8	<b>8 Parts Catalog</b>	
3.1 Parking/Service Brake .....	8	8.1 Table Of Contents .....	25
3.2 Brake Switch .....	9		
3.3 Forward/Reverse Switch .....	9		
3.5 Torque Specification .....	10		
<b>4 Batteries</b>			
4.1 Safety .....	11		
4.2 General .....	11		
4.3 Maintenance .....	12		
4.4 Electrolyte level and water .....	12		
4.7 Cleaning Batteries .....	13		
4.9 Battery Installation .....	14		
4.11 Battery Charging .....	14		
4.12 Troubleshooting .....	15		
4.13 Hydrometer .....	15		
4.15 Prolonged Storage .....	17		
4.17 Charger Installation .....	17		
4.18 Replacing Battery Tray .....	18		

# Suggested Stocking Guide

To Keep your Equipment fully operational and productive, Textron Turf Care And Specialty Products suggests you maintain a stock of the more commonly used maintenance items. We have included part numbers for additional support materials and training aids.

To order any of the following material:

1. Write your full name and complete address on your order form.
2. Explain where and how to make shipment:
  - UPS
  - Overnight
  - Regular Mail
  - 2nd Day
3. Order by the quantity desired, the part number, and the description of the part.
4. Send or bring the order to your authorized Textron Turf Care and Specialty Products Dealer.

## Service Parts

Qty.	Part No.	Description	Qty.	Part No.	Description
	3007341	Fuse, 20 Amp		363642	Fuse, 10 Amp
	558015	Ignition Key Switch		5002575	Head Light Bulb

## Service Support Material

Qty.	Part No.	Description
	3007811	Safety & Operation Manual
	3007812	Parts & Maintenance
	5002908	Video, Operator Training

Qty.	Description
	Service Manual

## How To Use This Manual

### Abbreviations

**N/S** - Not serviced separately, can only be obtained by ordering main component or kit.

**AR** -Variable quantity or measurement is required to obtain correct adjustment.

**Symbols** such as ●, next to the item number, indicate that a note exists which contain additional information important in ordering that part.

### Bulleted Items

Bulleted items indicate component parts that are included as part of an assembly or another component. These parts can be ordered separately or as part of the main component.

Item	Part No.	Qty	Description	Serial Numbers/Notes
● 1	123456	1	Mount, Valve	<i>Indicates a piece part</i>
2	789012	1	Valve, Lift	<i>Includes Items 2 and 3</i>
3	345678	1	• Handle	<i>Serviced part included with Item 2</i>
4	N/S	1	• Seal Kit	<i>Non serviced part included with Item 2</i>
5	901234	1	Screw, 1/4-20 x 2" Hex Head	

# 1 SAFETY

---

## 1.1 OPERATING SAFETY

---

### WARNING

#### **EQUIPMENT OPERATED IMPROPERLY OR BY UNTRAINED PERSONNEL CAN BE DANGEROUS.**

Familiarize yourself with the location and proper use of all controls. Inexperienced operator's should receive instruction from someone familiar with the equipment before being allowed to operate the machine.

1. Safety is dependent upon the awareness, concern and prudence of those who operate or service the equipment. Never allow minors to operate any equipment.
2. It is your responsibility to read this manual and all publications associated with this equipment (Safety and Operation Manual, engine manual, accessories and attachments). If the operator can not read English it is the owner's responsibility to explain the material contained in this manual to them.
3. Learn the proper use of the machine, the location and purpose of all the controls and gauges before you operate the equipment. Working with unfamiliar equipment can lead to accidents.
4. Never allow anyone to operate or service the machine or its attachments without proper training and instructions; or while under the influence of alcohol or drugs.
5. Wear all the necessary protective clothing and personal safety devices to protect your head, eyes, ears hands and feet. Operate the machine only in daylight or in good artificial light.
6. Inspect the area where the equipment will be used. Pick up all the debris you can find before operating. Beware of overhead obstructions (low tree limbs, electrical wires, etc.) and also underground obstacles (sprinklers, pipes, tree roots, etc.) Enter a new area cautiously. Stay alert for hidden hazards.
7. Never direct discharge of material toward bystanders, nor allow anyone near the machine while in operation. The owner/operator can prevent and is responsible for injuries inflicted to themselves, to bystanders and damage to property.
8. Never operate equipment that is not in perfect working order or is without decals, guards, shields, discharge deflectors or other protective devices securely fastened in place.
9. Never disconnect or bypass any switch.
10. Engage parking brake before starting unit. Start the unit only when sitting in operator's seat, never while standing beside the unit.
11. Equipment must comply with the latest federal, state, and local requirements when driven or transported on public roads.
12. Operate the machine up and down the face of the slopes (vertically), not across the face (horizontally).
13. To prevent tipping or loss of control, do not start or stop suddenly; reduce speed when making sharp turns. Use caution when changing direction on slopes.
14. Always use the seat belt when operating tractors equipped with a ROPS.  
*Never use a seat belt when operating tractors without a ROPS.*
15. Keep legs, arms and body inside the seating compartment while the vehicle is in motion.

***This machine is to be operated and maintained as specified in this manual and is intended for the professional maintenance of specialized turf grasses. It is not intended for use on rough terrain or long grasses.***

## 1.2 IMPORTANT SAFETY NOTES



This safety alert symbol is used to alert you to potential hazards.

**DANGER** - Indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.

**WARNING** - Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.

**CAUTION** - Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury and property damage. It may also be used to alert against unsafe practices.

*For pictorial clarity, some illustrations in this manual may show shields, guards or plates open or removed. Under no circumstances should this equipment be operated without these devices securely fastened in place*



### WARNING

The operator back-up system on this tractor prevents the tractor from starting unless the brake lever is engaged and traction pedal is in neutral. The system will stop the unit if the operator leaves the seat without engaging the parking brake.

NEVER operate tractor unless the operator back-up system is working.



### WARNING

1. Before leaving the operator's position for any reason:
  - a. Return traction pedal to neutral.
  - b. Lower all implements to the ground.
  - c. Engage parking brake.
  - d. Stop unit and remove the ignition key.
2. Keep hands, feet, and clothing away from moving parts. Wait for all movement to stop before you clean, adjust or service the machine.
3. Keep the area of operation clear of all bystanders and pets.
4. Never carry passengers, unless a seat is provided for them.
5. Never operate mowing equipment without the discharge deflector securely fastened in place.

By following all instructions in this manual, you will prolong the life of your machine and maintain its maximum efficiency. Adjustments and maintenance should always be performed by a qualified technician.

If additional information or service is needed, contact your Authorized Textron Turf Care And Specialty Products Dealer who is kept informed of the latest methods to service this equipment and can provide prompt and efficient service. **Use of other than original or authorized Textron Turf Care And Specialty Products parts and Accessories will void the warranty.**

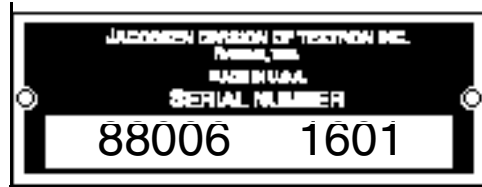
## 2 SPECIFICATIONS

### 2.1 PRODUCT IDENTIFICATION

88006..... Sand Scorpion™ Electric  
Includes seat and battery tray.  
Does not include batteries.

Serial Number .....An identification plate, listing the  
serial number, is attached to the  
frame of the tractor.

Product	EEC Sound Power	Sound Pressure Level Operator Ear	Vibration m/s <sup>2</sup>	
			Arms	Body
88006	<70 dB(A)	<90 dB(A)	0.7	0.4



TR001

Always provide the serial number of the unit when ordering replacement parts or requesting service information

### 2.2 TRACTOR

Tires..... 2-ply pneumatic tubeless  
Tire Pressure ..... 10-12 psi (69 - 83 kPa)  
Wheels..... 22 x 11 x 10  
Service Brakes ..... Automotive type drum  
Parking Brakes ..... Attached to service brake linkage, pedal mounted lock

Frame .....Welded steel construction  
High Speed.....0 to 10 mph (0 to 6 kph)  
Low Speed .....0 to 4 mph (0 to 2.5 kph)  
Reverse Speed.....0 to 4 mph (0 to 2.5 kph)  
Traction Drive .....2.0 hp, 48V electric motor, solid state controller

### 2.3 ELECTRICAL SYSTEM & BATTERIES

For optimum range and performance use batteries that equal or exceed the Amp/hr rating listed.

Recommended Battery Sizes:

System Voltage..... 48 Volt DC  
Batteries ..... Six, 8 volt, deep cycle

Length in. (mm)	Width in. (mm)	Height in. (mm)	Trojan P/N	Weight lbs. (kg)	Rating Amp/Hr	Volts	Qty Req'd
10-3/8 (264)	7-1/8 (181)	11-13/16 (284)	T-875	62	165	8	6

**(USE ONLY 8 VOLT BATTERIES)**

### 2.4 WEIGHTS AND DIMENSIONS

#### Dimensions:

	Inches	(mm)
Length - Tractor only .....	63	(1600)
Height - Top of Steering Wheel .....	52	(1320)
Wheel Base .....	42.5	(1080)
Width - (across wheels) .....	58	(1473)
Tread Width .....	48	(1219)
Rake Width		
Maximum .....	78	(1981)
Minimum .....	74	(1880)
Turning Radius		
To Centerline of Tractor .....	30	(762)

#### Weight:

	Lbs.	(kg)
Working weight - less rake .....	1030	(470)
with T875 batteries		
Battery tray and Batteries.....	410	(186)
with T875 batteries		
Rake Attachment.....	75	(34)

## 2.5 TORQUE REQUIREMENTS

---

Standard Jacobsen torque specifications for Grade 5 coarse hardware.

Size (Inches)	Torque (Ft/Lb)	Torque (Nm)
1/4	9.5 - 10.8	12.9 - 14.7
5/16	19.5 - 21.7	26.5 - 29.4
3/8	35 - 40	47.2 - 54
1/2	80 - 95	108 - 128
5/8	160 - 185	216 - 249

## 2.6 ACCESSORIES

---

Contact your Jacobsen Dealer for a complete listing of accessories and attachments.

Battery Tray ..... 88017  
(Includes lifting sling and wiring)  
Rake..... 88014

Air Blow Gun..... JAC5098  
Touch-up Paint (12 oz. spray) ..... 554598

## 2.7 SUPPORT LITERATURE

---

Contact your Jacobsen Dealer for a complete listing of literature.

Operator's Manual  
Parts Catalog

# 3 ADJUSTMENTS

## 3.1 GENERAL

### WARNING

To prevent injury, lower implements to the ground, disengage all drives, engage parking brake, turn off power, remove key from switch and disconnect power connector before making any adjustments or performing maintenance.

Make sure the tractor is parked on a solid and level surface. Never work on a tractor that is supported only by the jack. Always use jack stands.

If only the front or rear of the tractor is raised, place chocks in front of and behind the wheels that are not raised.

1. Adjustments and maintenance should always be performed by a qualified technician. If proper

adjustment cannot be made, contact an authorized Textron Turf Care And Specialty Products Dealer.

2. Replace, do not adjust, worn or damaged components.
3. Long hair, jewelry or loose fitting clothing may get tangled in moving parts.

### CAUTION

Be careful to prevent entrapment of the hands and fingers between moving and fixed components of the machine.

4. Do not change governor settings or overspeed the engine.

## 3.1 PARKING/SERVICE BRAKE

Inspect brakes linings:

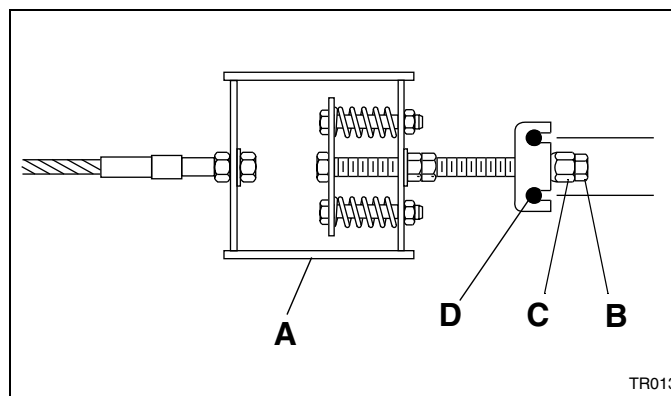
- whenever wheels are pulled,
- if tractor creeps on hills with parking brake applied,
- there is a noticeable increase in stopping distance.

The brakes used on this tractor are self-adjusting. To adjust, apply brakes while operating in reverse. If brakes linings look good but brakes cannot be self-adjusted, it may be necessary to adjust brake cable. If linings or brake drums appear worn, they should be replaced by an experienced service technician.

### To adjust brake cable:

1. Raise tractor and support axle using jack stands or blocks so that back wheels are slightly raised off the ground. Block front wheel to make sure unit can't roll.
2. Raise hood and remove battery tray to access brake pull assembly (A).
3. Back off jam nut (B).
4. With the brake pedal all the way up (disengaged) turn in adjusting nut (C) and spin wheels slowly by hand until you feel brakes engage and wheels begin to bind.
5. Back off adjuster nut slightly until wheels again turn freely.
6. Tighten jam nut to lock adjustment in place.
7. Check that plugs (D) are in place in slotted holes on equalizer bracket.

Before returning unit to operation, drive tractor in a flat, open area and check operation of brakes to make sure they are operating correctly. Check parking brake to make sure it engages properly and prevents the tractor from rolling downhill.



TR013

Figure 3B



## 3.2 BRAKE SWITCH

The brake pedal is equipped with a proximity switch. This switch closes when the brake is engaged. If the operator leaves the seat without engaging the brake the switch remains open and will automatically shut the power off.

The switch consists of two pieces, a stationary sensor (**J**) and a magnet (**K**) that pivots with the brake pedal. A faulty or loose switch can prevent the unit from starting.

For correct operation, adjust air gap (**I**) between magnet and sensor to 1/16" - 3/32" (1.5 - 2 mm).

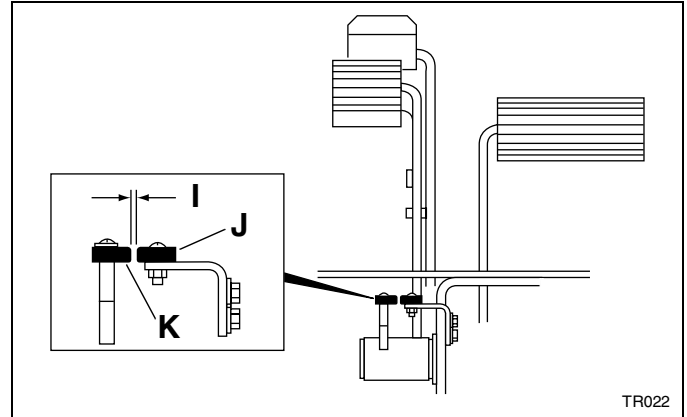


Figure 3C

## 3.3 FORWARD/REVERSE SWITCH (neutral adjustment)

If error codes “-02” or “-03” occur repeatedly the forward/reverse switch for the traction controller could be out of adjustment.

### WARNING

Turn power off, remove key and disconnect the battery connector before inspecting or working on or near the electrical system.

#### To adjust forward/reverse switch:

1. Lift hood and remove top cover from electrical box.
2. Operate forward/reverse pedals and check that cable linkage is operating smoothly. If cable is binding, or linkage is bent or damaged, contact an authorized Jacobsen Dealer for repairs.
3. Remove screw (**E**) holding cable end to forward/reverse switch lever.
4. Back off nut (**F**) which secures rod end (**H**) to cable.
5. With the cable disconnected, the switch lever (**G**) should return to its neutral position. Adjust rod end on cable so it aligns directly with hole in lever.

**Note:** If the alignment appears correct but the error code continues to occur, the forward/reverse switch may be faulty. Contact an authorized Jacobsen Dealer for repairs.

6. Tighten jam nut to secure adjustment and reconnect rod end to switch lever.
7. Start tractor and check that unit starts and operates correctly.

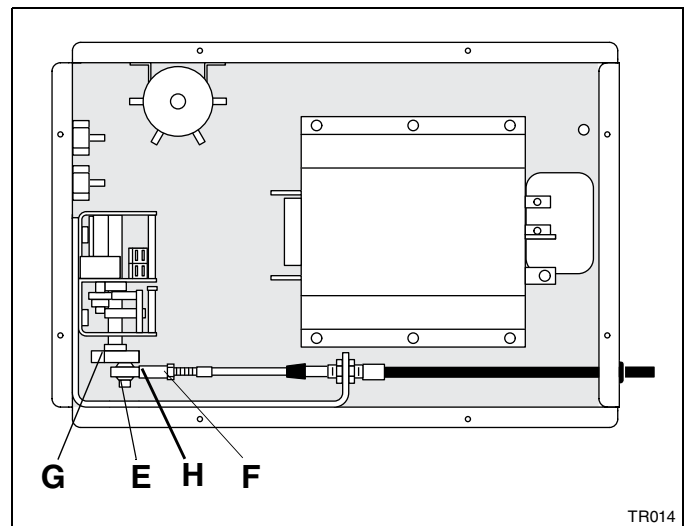


Figure 3D



### 3 ADJUSTMENTS



#### 3.5 TORQUE SPECIFICATION






### CAUTION

All torque values included in these charts are approximate and are for reference only. Use of these torque values is at your sole risk. Textron Turf Care And Specialty Products is not responsible for any loss, claim, or damage arising from the use of these charts. **Extreme caution should always be used when using any torque value.**

Textron Turf Care And Specialty Products uses Grade 5 bolts as standard, unless otherwise noted.

AMERICAN NATIONAL STANDARD FASTENERS			
SIZE	UNITS	 GRADE 5	 GRADE 8
#6-32	in-lbs (Nm)	20 (2.3)	—
#8-32	in-lbs (Nm)	24 (2.7)	30 (3.4)
#10-24	in-lbs (Nm)	35 (4.0)	45 (5.1)
#10-32	in-lbs (Nm)	40 (4.5)	50 (5.7)
#12-24	in-lbs (Nm)	50 (5.7)	65 (7.3)
1/4-20	in-lbs (Nm)	95 (10.7)	125 (14.1)
1/4-28	in-lbs (Nm)	95 (10.7)	150 (17.0)
5/16-18	in-lbs (Nm)	200 (22.6)	270 (30.5)
5/16-24	in-lbs (Nm)	240 (27.1)	300 (33.9)
3/8-16	ft-lbs (Nm)	30 (40.7)	40 (54.2)
3/8-24	ft-lbs (Nm)	35 (47.5)	45 (61.0)

AMERICAN NATIONAL STANDARD FASTENERS			
SIZE	UNITS	 GRADE 5	 GRADE 8
7/16-14	ft-lbs (Nm)	50 (67.8)	65 (88.1)
7/16-20	ft-lbs (Nm)	55 (74.6)	70 (94.9)
1/2-13	ft-lbs (Nm)	75 (101.7)	100 (135.6)
1/2-20	ft-lbs (Nm)	85 (115.3)	110 (149.2)
9/16-12	ft-lbs (Nm)	105 (142.4)	135 (183.1)
9/16-18	ft-lbs (Nm)	115 (155.9)	150 (203.4)
5/8-11	ft-lbs (Nm)	150 (203.4)	195 (264.4)
5/8-18	ft-lbs (Nm)	160 (217.0)	210 (284.8)
3/4-10	ft-lbs (Nm)	170 (230.5)	220 (298.3)
3/4-16	ft-lbs (Nm)	175 (237.3)	225 (305.1)
7/8-14	ft-lbs (Nm)	300 (406.8)	400 (542.4)


METRIC FASTENERS							
SIZE	UNITS	 4.8	 5.8	 8.8	 10.9	 12.9	Non Critical Fasteners into Aluminum
M4	Nm (in-lbs)	1.2 (11)	1.7 (15)	2.9 (26)	4.1 (36)	5.0 (44)	2.0 (18)
M5	Nm (in-lbs)	2.5 (22)	3.2 (28)	5.8 (51)	8.1 (72)	9.7 (86)	4.0 (35)
M6	Nm (in-lbs)	4.3 (38)	5.7 (50)	9.9 (88)	14.0 (124)	16.5 (146)	6.8 (60)
M8	Nm (in-lbs)	10.5 (93)	13.6 (120)	24.4 (216)	33.9 (300)	40.7 (360)	17.0 (150)
M10	Nm (ft-lbs)	21.7 (16)	27.1 (20)	47.5 (35)	66.4 (49)	81.4 (60)	33.9 (25)
M12	Nm (ft-lbs)	36.6 (27)	47.5 (35)	82.7 (61)	116.6 (86)	139.7 (103)	61.0 (45)
M14	Nm (ft-lbs)	58.3 (43)	76.4 (55)	131.5 (97)	184.4 (136)	219.7 (162)	94.9 (70)

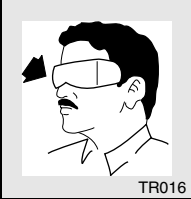
## 4.1 SAFETY

Batteries contain dilute sulfuric acid which can result in severe burns.

Hydrogen gas is formed within a battery during the charging cycle. Hydrogen in concentrations of 4% and higher are explosive and can be ignited by open flame or an electrical spark. A battery explosion will cause sulfuric acid and battery components to be thrown over a large area with considerable force.

Always observe the following warnings when working on or near batteries:

 **WARNING**



TR016

The electrolyte in a storage battery is a dilute acid which can cause severe burns to the skin and eyes. Treat all electrolyte spills to the body and eyes with extended flushing with clear water. Contact a physician immediately. Always wear a safety shield or approved safety goggles when adding water or charging batteries.


Hydrogen is explosive in concentrations as low as 4% and is generated in the charging cycle of electric vehicles. Because it is lighter than air, it will collect in the ceiling of buildings necessitating proper ventilation. Air exchanges of 5 changes per hour is considered the minimum requirement.

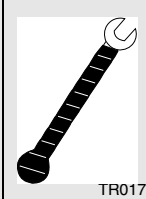
Never smoke around batteries.

Never charge batteries in an area that has open flame or electrical equipment that could cause an electrical arc.

Be sure that the key switch is off and all electrical accessories are turned off before starting work on vehicle.

Remove all jewelry (watches, ring etc.)

 **WARNING**



TR017

Wrap wrenches with vinyl tape to prevent the possibility of a dropped wrench from 'shorting out' a battery, which could result in an explosion and severe personal injury.

Use care not to tip batteries when removing or installing them; spilled electrolyte can cause burns and damage.

Electrolyte spills should be neutralized with a solution of 1/4 cup (59.1ml) of sodium bicarbonate (baking soda) dissolved in 1-1/2 gallons (5.7 liters) of water and flushed with water.

Overfilling a battery could result in electrolyte being expelled from the battery during the charging cycle. Electrolyte may cause personal injury, damage to the vehicle or damage to the storage facility.

Overfilling the batteries will void the vehicle and battery warranties.

Never disconnect a circuit under load at a battery terminal.

Wear appropriate protective clothing when working with batteries. Electrolyte can cause severe burns to the eyes, skin and clothing.

Batteries are heavy. Use proper lifting techniques when moving them. Always lift the battery with a commercially available battery lifting device

## 4.2 GENERAL

Temperature is important when conducting tests on a battery and test results must be corrected to compensate for temperature differences.

As a battery ages, it still performs adequately except that its **capacity** is diminished. Capacity describes the time that a battery can continue to provide its design amperes from a full charge.

The batteries most commonly used in golf and utility vehicles are lead acid.

A battery has a maximum life, therefore good maintenance is designed to maximize the **available** life and reduce the factors that can reduce the life of the battery.

# 4 BATTERIES

## 4.3 MAINTENANCE

### Tool List

- Insulated wrench, 9/16"
- Insulated wrench, 1/2"
- Battery carrier
- Hydrometer

### WARNING

Never attach a battery charger to a vehicle that is to be unattended. A charger failure could cause damage to the vehicle batteries and result in extreme overheating.

### Before charging batteries

Inspect the connector housing of the battery charger and vehicle connector housing for dirt or debris.

Charge the batteries daily after use.

### Monthly

1. Inspect all wiring for frayed wire, loose connections, corrosion or deterioration of insulation.
2. Check that the electrolyte level is correct and add suitable water as required.
3. Clean the batteries and cable terminals.

### WARNING

Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. **Wash your hands after handling.**

## 4.4 ELECTROLYTE LEVEL AND WATER

The correct level of the electrolyte is **at least 1/2"** (13 mm) above the plates in each cell.

### CAUTION

Do not overfill batteries

A battery being charged will 'gas', with the majority of the gassing taking place at the end of the charging cycle. This gas is hydrogen which is lighter than air. Water and sulfuric acid droplets will be carried out of the battery vents by the hydrogen gas; however, this loss is minimal. If the battery electrolyte level is too high, the electrolyte will block the vent tube and the gas will **force** it out of the vent tube and battery cap. The water will evaporate but the sulfuric acid will remain where it can damage vehicle components. Sulfuric acid loss will weaken the concentration of acid within the electrolyte and reduce the life of the battery.

This level will leave approximately 1/4" - 3/8" (6 - 10 mm) of space between the electrolyte and the vent tube. The electrolyte level is important since **any portion** of the plates exposed to air will be ruined beyond repair. Of equal importance is too much water which will result in electrolyte being forced out of the battery due to gassing and the increase in volume of the electrolyte that results from the charging cycle.

Over the life of the battery, a considerable amount of water is consumed. It is important the water used be pure and free of contaminants that could reduce the life of the battery by reducing the chemical reaction. The water

must be distilled or purified by an efficient filtration system. Water that is not distilled should be analyzed and if required, filtration installed to permit the water to meet the requirements of the water purity table.

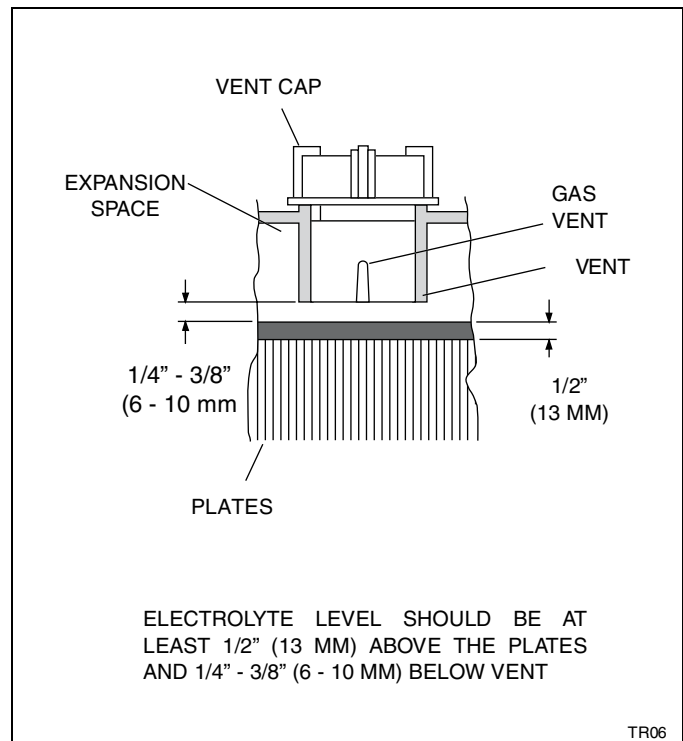


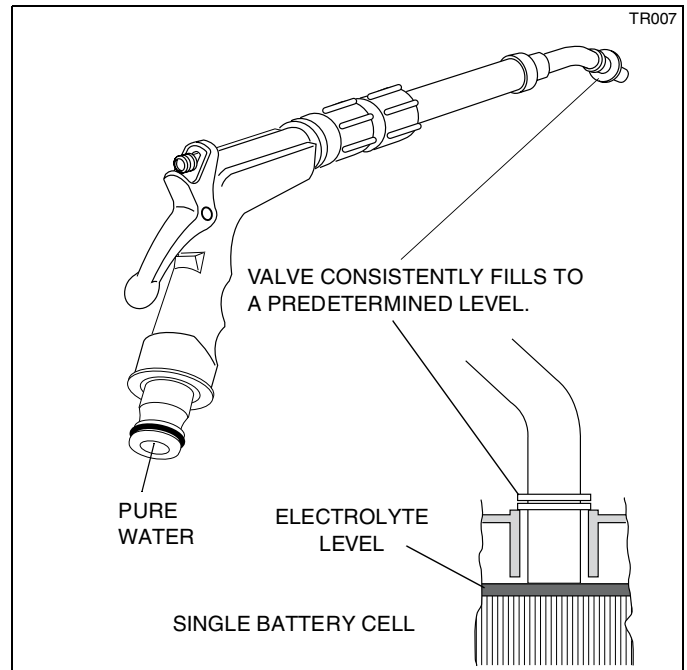
Figure 4E

**Water Purity Table**

Impurity	Parts per million
Color	Clear
Suspended	Trace
Total Solids	100
Calcium & Magnesium Oxides	40
Iron	5
Ammonia	8
Organic & Volatile Matter	50
Nitrites	5
Nitrates	10
Chloride	5

Even if the water is colorless, odorless, tasteless and fit for drinking, the water should be analyzed to see that it does not exceed the impurity levels specified in the table above.

Automatic watering devices such as the one shown can be used with an approved water source. These watering devices are **fast and accurate** to use and maintain the correct electrolyte level within the battery cells.



**Figure 4F**

## 4.7 CLEANING BATTERIES

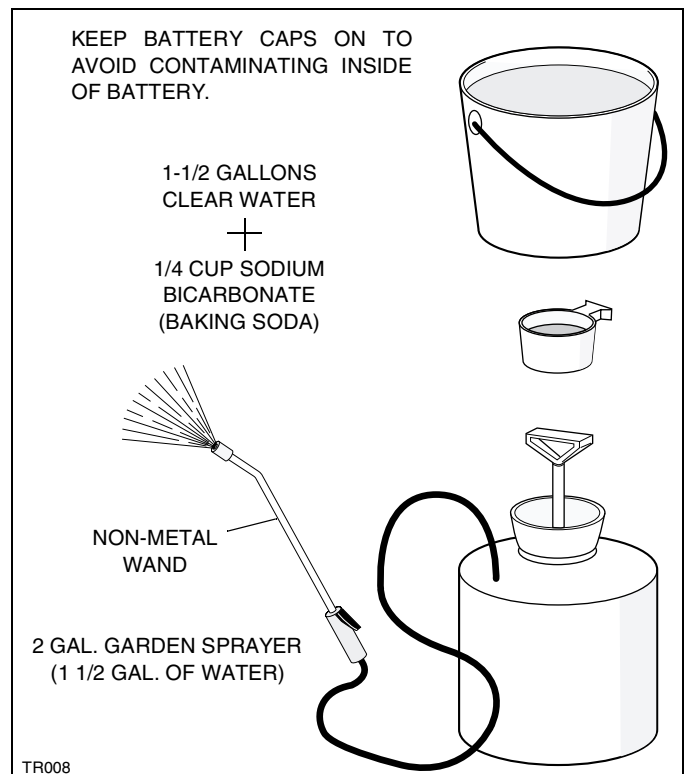
When cleaning the batteries, do not use a water hose without first spraying with a solution of sodium bicarbonate (baking soda) and water to neutralize any acid deposits.

Use of a water hose without first neutralizing any acid, will move acid from the top of the batteries to another area of the vehicle or storage facility where it will attack the metal structure or the concrete/asphalt floor. After hosing down the batteries, a residue will be left on the batteries which is conductive and will contribute to the discharge of the batteries.

The correct cleaning technique is to spray the top and sides of the batteries with a solution of sodium bicarbonate (baking soda) and water. This solution is best applied with a garden type sprayer equipped with a **non metallic spray wand**. The solution should consist of 1/4 cup (59.1 ml) of sodium bicarbonate (baking soda) mixed with 1-1/2 gallons (5.7 l) of clear water. In addition to the batteries, special attention should be paid to metallic components adjacent to the batteries which should also be sprayed with the sodium bicarbonate (baking soda) solution.

Allow the solution to sit for at least three minutes; use a soft bristle brush or cloth to wipe the tops of the batteries in order to remove any residue that could cause the self discharge of the battery. Rinse the entire area with low

pressure clear water. Cleaning should take place once a month or more often under extreme conditions.



**Figure 4H**

## 4 BATTERIES

### 4.9 BATTERY INSTALLATION

If the batteries have been cleaned and any acid in the battery rack area neutralized, no corrosion to the battery racks or surrounding area should be present. Any corrosion found should be immediately removed with a putty knife and a wire brush. The area should be washed with a solution of sodium bicarbonate (baking soda) and water and thoroughly dried before priming and painting with a corrosion resistant paint.

The batteries should be placed into the battery racks and the battery hold downs (**Views A & B**) tightened snugly to prevent movement, but not tight enough to cause distortion of the battery cases.

Inspect all wires and terminals. Clean any corrosion from the battery terminals or the wire terminals with a solution of sodium bicarbonate (baking soda) and brush clean if required.

Use care to connect the battery wires as shown in Figure 4J and tighten the battery post hardware securely. Protect the battery terminals and battery wire terminals with a commercially available protective coating.

Refer to Section 2.3 for battery specifications.

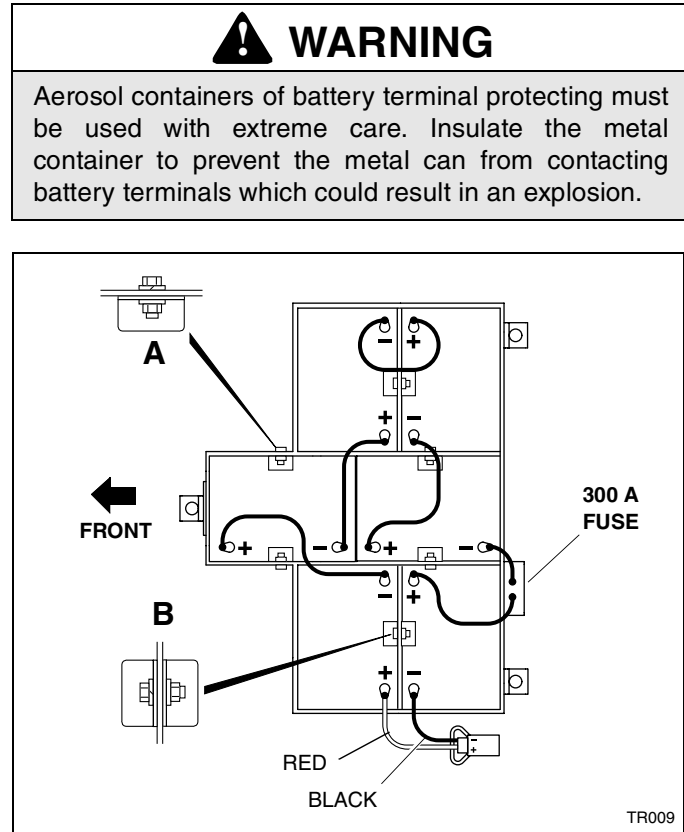
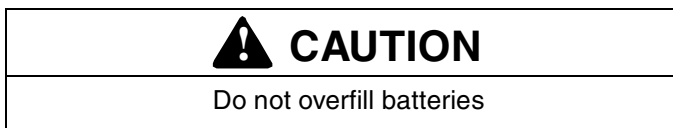


Figure 4J

### 4.11 BATTERY CHARGING

The battery charger is designed to fully charge the battery set. If the batteries are severely deep cycled, some automatic battery chargers contain an electronic module that may not activate and the battery charger will not function. Automatic chargers will determine the correct duration of charge to the battery set and will shut off when the battery set is fully charged. Always refer to the instructions of the specific charger used.

Before charging, the following should be observed:



The electrolyte level in all cells must be at the recommended level and cover the plates.

The charging must take place in an area that is well ventilated and capable of removing the hydrogen gas that is generated by the charging process. A **minimum** of five air exchanges per hour is recommended.

The charging connector components are in good condition and free from dirt or debris.

The charger connector is fully inserted into the vehicle receptacle.

The charger connector/cord set is protected from damage and is located in an area to prevent injury that may result from personnel running over or tripping over the cord set.

The charger is automatically turned off during the connect/disconnect cycle and therefore no electrical arc is generated at the DC plug/receptacle contacts.

#### AC Voltage

Battery charger output is directly related to the input voltage. If multiple vehicles are receiving an incomplete charge in a normally adequate time period, low AC voltage could be the cause and the power company should be consulted.

## 4.12 TROUBLESHOOTING

In general, troubleshooting will be done for two distinct reasons. First, a battery that performs poorly and outside of the manufacturer's specification should be identified in order to replace it under the terms of the manufacturer's warranty. Different manufacturers have different requirements. Consult with the battery manufacturer for specific requirements.

The second reason is to determine why the tractor does not perform adequately. Performance problems may result in a tractor that runs slowly or in a tractor that is unable to operate as long as it previously did.

A new battery must **mature** before it will develop its maximum capacity. Maturing may take up to 100 charge/

discharge cycles. The older a battery gets, the lower the capacity. The only way to determine the capacity of a battery is to perform a load test using a discharged machine.

A cost effective way to identify a poorly performing battery is to use a hydrometer to identify a battery in a set with a lower than normal specific gravity. Once the particular cell or cells that are the problem are identified, the suspect battery can be removed and replaced. At this point there is nothing that can be done to salvage the battery; however, the individual battery should be replaced with one of the same brand, type and approximate age that is known to be good.

## 4.13 HYDROMETER

Hydrometers are used to test the state of charge of a battery cell. This is performed by measuring the density of the electrolyte, which is accomplished by measuring the specific gravity of the electrolyte. The greater the concentration of sulfuric acid, the more dense the electrolyte becomes. The higher the density, the higher the state of charge.



### WARNING

Never insert a metal thermometer into a battery. Use a hydrometer with a built in thermometer that is designed for testing batteries.

Specific gravity is the measurement of a liquid that is compared to a baseline. The baseline is water which is assigned a base number of 1.000.

The concentration of sulfuric acid to water in a new battery is 1.280 which means that the electrolyte weighs 1.280 times the weight of the same volume of water.

A **fully charged** battery will test at 1.275 - 1.280 while a **discharged battery** will read in the 1.140 range.

**Note:** Do not perform a hydrometer test on a battery that has just been watered. The battery must go through at least one charge and discharge cycle in order to permit the water to adequately mix with the electrolyte.

The temperature of the electrolyte is important since the hydrometer reading must be corrected to 80° F (26.7° C). High quality hydrometers are equipped with an internal thermometer that will measure the temperature of the electrolyte and will include a conversion scale to correct the float reading. It is important to recognize that the

electrolyte temperature is significantly different from the ambient temperature if the vehicle has been operated.

### Using a Hydrometer (Figure 4N)

1. Draw electrolyte into the hydrometer several times to permit the thermometer to adjust to the electrolyte temperature and note the reading. Examine the color of the electrolyte. A brown or gray coloration indicates a problem with the battery and is a sign that the battery is nearing the end of its life.
2. Draw the minimum quantity of electrolyte into the hydrometer to permit the float (**B**) to float freely without contacting the top or bottom of the cylinder (**E**).
3. Hold the hydrometer in a vertical position at eye level and note the reading where the electrolyte meets the scale on the float.
4. Add or subtract four points (.004) to the reading for every 10° F (6° C) above or below 80° F (27° C). See **Examples 1 and 2**. Adjust the reading to conform with the electrolyte temperature.
5. E.g. If the reading indicates a specific gravity of 1.250 and the electrolyte temperature is 90° F (32° C), **add** four points to the 1.250 which gives a corrected reading of 1.254. Similarly if the temperature was 70° F (21° C), **subtract** four points from the 1.250 to give a corrected reading of 1.246.

# 4 BATTERIES

6. Test each cell and note the readings (corrected to 80° F or 27° C). A variation of fifty points between any two cell readings (example 1.250 - 1.200) indicates a problem with the low reading cell(s).
7. As a battery ages the specific gravity of the electrolyte will decrease at full charge. This is not a reason to replace the battery, providing all cells are within fifty points of each other.
8. Since the hydrometer test is in response to a vehicle exhibiting a performance problem, the vehicle should be recharged and the test repeated. If the results indicate a weak cell, the battery or batteries should be removed and replaced with one of the same brand, type and approximate age that is known to be good.

## Temperature Correction for Hydrometer Readings

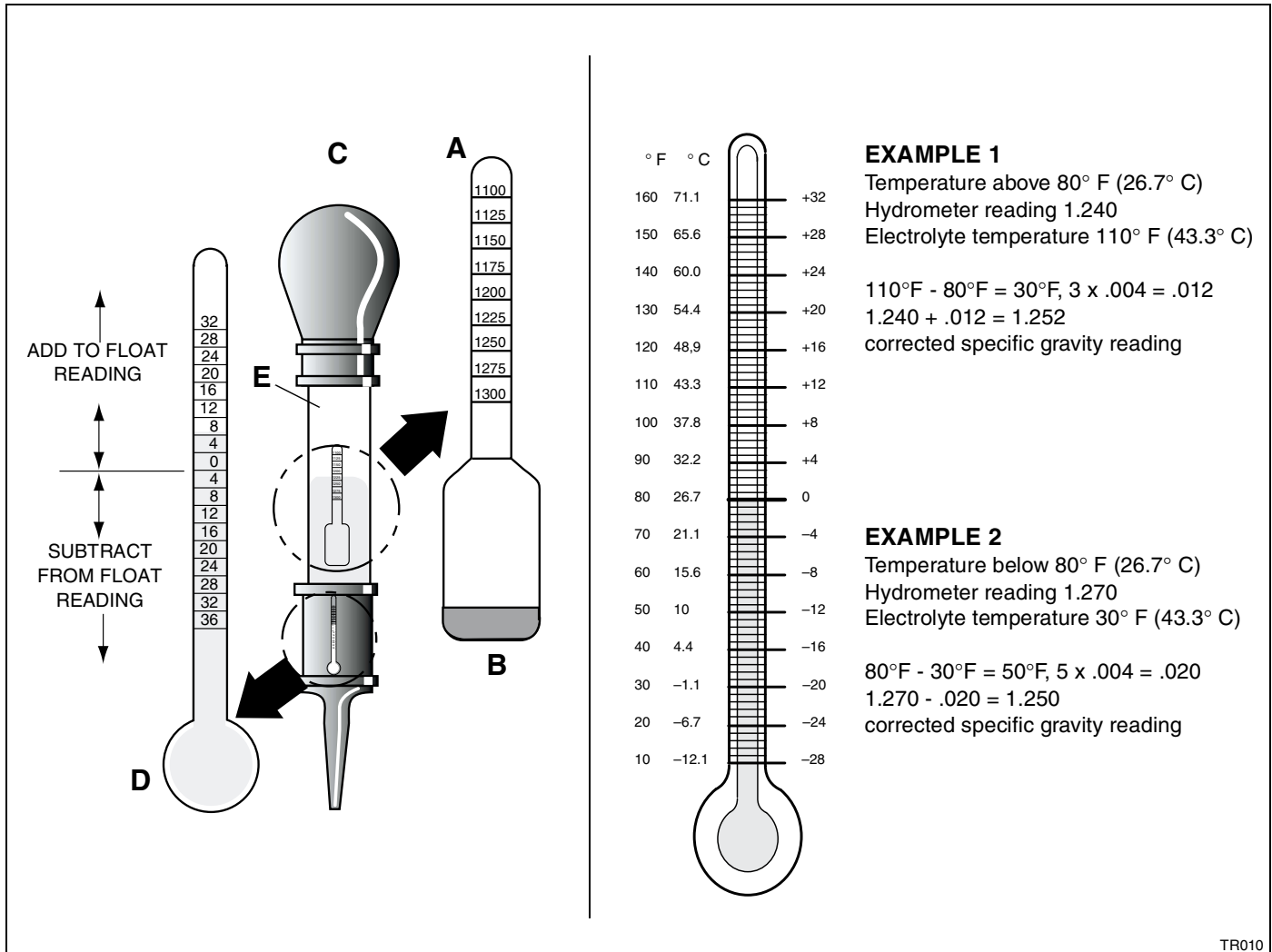


Figure 4N



## 4.15 PROLONGED STORAGE

During periods of storage, the batteries will need attention to keep them maintained and prevent discharge.

In high temperatures the chemical reaction is faster, while low temperatures cause the chemical reaction to slow down. A vehicle that is stored at 90° F (32° C) will lose .002 of specific gravity each day. If a fully charged battery has a specific gravity of 1.275, and the battery is allowed to sit unused, it will become partially discharged. When it reaches 1.240 which it will do in less than twenty days, it should be recharged.

If a battery is left in a discharged state, sulfation takes place on and within the plates. This condition is not reversible and will cause permanent damage to the battery. In order to prevent damage, the battery should be recharged. A hydrometer can be used to determine the specific gravity and therefore the state of charge of a battery.

In winter conditions, the battery must be fully charged to prevent the possibility of freezing. A fully charged battery will not freeze in the most severe of winter climates. Although the chemical reaction is slowed in cold temperatures, the battery must be stored fully charged, and disconnected from any circuit that could discharge the battery. Disconnect the charging plug from the vehicle receptacle. The batteries must be cleaned and all deposits neutralized and removed from the battery case

to prevent self discharge. The batteries should be tested or recharged at thirty day intervals.

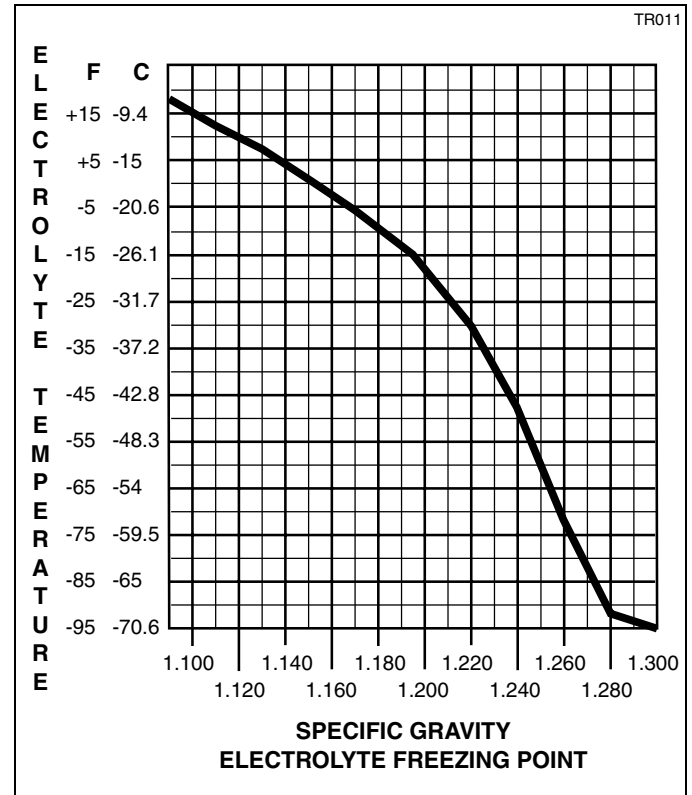


Figure 4P

## 4.17 CHARGER INSTALLATION

### WARNING

Portable chargers should be mounted on a platform above the ground, or in such a manner as to permit the maximum air flow underneath and around the charger. If the charger is mounted such that sufficient air flow is prevented from entering the louvers, overheating may result which could cause serious damage to the charger and potential for fire

Install all chargers in accordance with the manufacturers instructions.

If the charger is operated in an outdoor location, rain and sun protection must be provided.

In portable applications, the charging (DC) cord is equipped with a polarized connector which fits into a matching receptacle on the vehicle.

The power (AC) cord is equipped with an appropriate plug. If the charger is equipped with a grounding plug, do not attempt to defeat its functionality.

### WARNING

An ungrounded electrical device may become a physical hazard that could result in an electrical shock or electrocution

**Note:** If your vehicle is to be charged with a non-standard charger, refer to the instructions supplied with the charger.

## 4 BATTERIES

### 4.18 REPLACING BATTERY TRAY

The battery tray is designed to be easily lifted out and replaced. This allows the tractor to quickly return to service should the batteries become discharged or fail. Replacement battery trays are available as an accessory and include a lifting yoke. See Section 2.6

#### WARNING

When replacing battery tray use the lifting yoke supplied with tray. This yoke is specifically designed to safely attach to and lift the battery tray.

**Never** lift an unbalanced tray, where one or more batteries have been removed. The battery weight must be distributed evenly to prevent the tray from tipping.

Use a suitable lifting device with enough weight bearing capacity to lift the combined weight of the tray and batteries. See Section 2.3.

#### To remove battery tray:

1. Park tractor on a solid, level area.
2. Set parking brake and remove key from switch.
3. Disconnect battery connector, tilt steering wheel all the way up and open hood.
4. Pull lock pins **(D)** from rear corners of tray.
5. Attach lifting yoke as shown .

**Important:** The two matching lifting straps **(C)** must be attached to the two lifting points at the rear of the battery tray as shown.

6. Attach lifting device to central lifting eye **(A)** on yoke. Lift slowly until tray clears tractor.
7. Reverse procedure to install tray. Be sure tray is completely seated on frame and lock pins **(D)** are installed.

Refer to Section 2.3 for battery specifications.

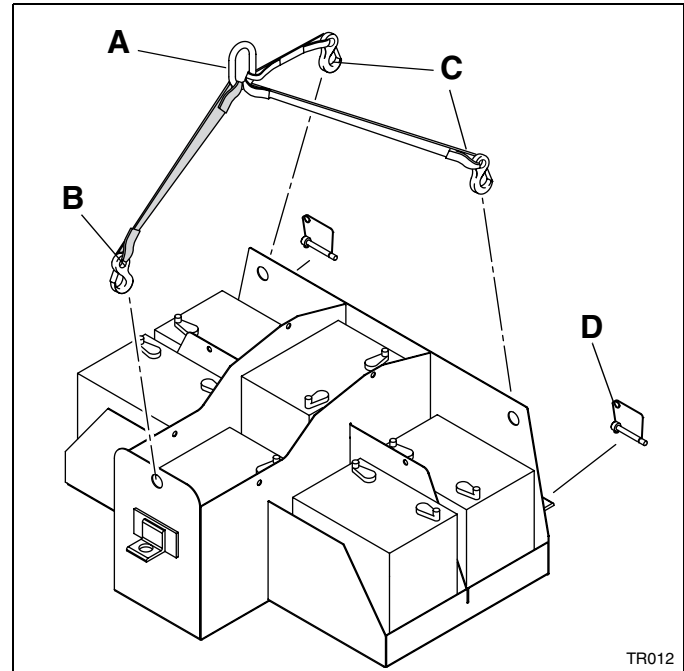


Figure 4S

## 5.1 GENERAL

 **WARNING**

To prevent injury, lower implements to the ground, disengage all drives, engage parking brake, turn off power, remove key from switch and disconnect power connector before making any adjustments or performing maintenance.

Make sure the tractor is parked on a solid and level surface. Never work on a tractor that is supported only by the jack. Always use jack stands.

1. Adjustment and maintenance should always be performed by a qualified technician. If proper adjustments cannot be made, contact an Authorized Textron Turf Care And Specialty Products Dealer.
  2. Inspect the equipment on a regular basis, establish a maintenance schedule and keep detailed records.
    - a. Keep the equipment clean.
  - b. Keep all moving parts properly adjusted and lubricated.
  - c. Replace worn or damaged parts before operating the machine.
  - d. Keep all fluids at their proper levels.
  - e. Keep shields in place and all hardware securely fastened.
  - f. Keep tires properly inflated.
3. Long hair, jewelry or loose fitting clothing may get tangled in moving parts.
  4. Use the illustrations in the Parts Catalog as reference for the disassembly and reassembly of components.
  5. Recycle or dispose of all hazardous materials (batteries, fuel, lubricants, anti-freeze, etc.) according to local, state or federal regulations.

**Figure 5A**

## 5.2 MAINTENANCE AND LUBRICATION SCHEDULE

**Recommended Inspection and Lubrication Intervals**

	Every 8 Hours	Every 25 Hours	Every 50 Hours	Every 100 Hours	Every 250 Hours	Every 500 Hours	Yearly	See Section	Lubricant Type
Batteries	I			C-I				4.4, 4.7	
Parking Brakes		I-A			A			3.1	
Grease Fittings			L					7.1	II
Steering Chain			I-L					7.1	IV
Tires	I-A							5.3	
Wheel Bearings							A-L		I
Rear Axle							I	7.2	III

**A - Add or Adjust    C - Clean    I - Inspect    L - Lubricate    R - Replace**

- I Pack bearings with NLGI Grade 2 (Service Class GB)
- II Manual grease gun with NLGI Grade 2 (Service Class LB).
- III SAE 30W Heavy Duty Engine Oil
- IV Light lubricant

## 5 MAINTENANCE

---

### 5.3 TIRES

---

Keep tires properly inflated to prolong tire life and maintain proper traction. Check inflation pressure while the tires are cool. Inspect tread wear. Check tire pressure with an accurate, low pressure tire gauge.

Keep inflation pressure between 10-12 psi - (69-83 kPa)

#### Mounting Wheels



#### WARNING

Make sure the tractor is parked on a solid and level surface. Never work on a tractor that is supported only by the jack. Always use jack stands.

If only the front or rear of the tractor is raised, place chocks in front of and behind the wheels that are not raised.

1. Remove dirt, grease and oil from bolt threads. Do not lubricate threads.
2. Position wheel on hub and inspect to insure full contact between the mounting surface (seat pads) of wheel and mounting surface of hub or brake drum.
3. Start all wheel bolts but do not tighten.
4. Finger tighten top nut, then rotate wheel so that the opposite nut is at the top and finger tighten. Finger tighten remaining nuts in (criss-cross) order; always tighten nuts in top position. Finish mounting wheel by tightening nuts with torque wrench to 65-85 ft. lbs. (88-115 Nm).



**CAUTION:** *Unless you have the proper training, tools and experience, DO NOT attempt to mount a tire on a rim. Improper mounting can produce an explosion which may result in serious injury.*

### 5.4 CARE & CLEANING

---

1. Clean the tractor and implements after each use. Keep the equipment clean.
2. Clean all plastic or rubber trim with a mild soap solution or use commercially available vinyl/rubber cleaners.
3. Repair damaged metal surfaces and use Jacobsen touch-up paint. Wax the vehicle for maximum paint protection.



**CAUTION:** *Do not use high pressure spray or steam. Never spray water directly on the control panel or directly at electrical components, bearing housings and seals. Use compressed air to remove sand and dirt from these areas.*

### 5.5 ELECTRICAL SYSTEM

---



#### WARNING

Always turn power off, remove key and disconnect battery connector before inspecting or working on the electrical system.

**NEVER** operate equipment with the operator back-up system disconnected or malfunctioning.

3. Make certain all terminals and connections are kept clean and properly secured.
4. Keep the wire harness and all individual wires away from moving parts to prevent any type of damage.
5. Charge and check batteries daily. See Unit 5 for battery maintenance

1. Check the operator back-up system and fuses regularly.
2. If the operator back-up does not function properly or the problem cannot be corrected, contact an Authorized Jacobsen Distributor.

## 5.6 STORAGE

---

Lubricate then wash the tractor thoroughly. Repair and paint damaged or exposed metal. Inspect the tractor, tighten all hardware, replace worn or damaged components.

Clean the tires thoroughly and store the tractor so that the load is off the tires. If the tractor is not on jack stands, check the tires at regular intervals and reinflate as necessary.

Keep the machine and all its accessories clean, dry and protected from the elements during storage.

During periods of storage, the batteries need to be maintained to prevent them from discharging. See Section 4.15

### **After Storage**

Check electrolyte (Section 4.4), clean and charge batteries. Make certain that the tires are properly inflated.

## 6 TROUBLESHOOTING

### 6.1 TRACTION CONTROL SYSTEM (TCS)

The Traction Control System (TCS) is designed to protect the electrical components of the traction and battery systems. An error code is displayed when a fault condition occurs.

**In most instances the traction controls on the tractor will cease to operate when an error condition occurs.**

In some cases resetting the TCS will allow the tractor to be restarted and operation resumed. If an error code continues to occur after resetting the TCS, the tractor should be shut down and returned to a service area for inspection.

Error conditions caused by an electrical problem should be inspected and repaired by an experienced mechanic familiar with the electrical system of this machine.

Code	Possible Cause	Action
-01	Attempting to operate tractor after getting up from seat.	Reset Power Switch.
-02	1. Forward pedal pressed while turning power on. 2. Forward/reverse switch faulty or out of adjustment.	Remove foot from pedals while starting. Inspect and adjust switch.
-03	1. Reverse pedal pressed while turning power on. 2. Forward/reverse switch faulty or out of adjustment.	Remove foot from pedals while starting. Inspect and adjust switch.
-04	Parking brake not engaged while turning power on.	Engage parking brake before starting
-06	Forward/reverse switch defective.	Return to maintenance area for service.
-07	Accelerator input misadjusted or defective.	Return to maintenance area for service.
-08	Accelerator input misadjusted or defective.	Return to maintenance area for service.
-09	Forward/reverse switch defective.	Return to maintenance area for service.
-15	Batteries discharged or defective.	Return machine to service area. Inspect condition of batteries (Section 4.12). Replace or recharge.
-16	1. Batteries overcharged. 2. Incorrect batteries used.	Return to maintenance area for service. Check that maximum battery voltage is less than 57.6 VDC
-23	1. Motor field current high on start-up in the reverse direction. 2. Brakes adjusted too tight. 3. Defective traction controller.	Return to maintenance area for service.
-24	1. Motor field current high on start-up in the forward direction. 2. Brakes adjusted too tight. 3. Defective traction controller.	Return to maintenance area for service.
Code	Possible Cause	Action

<b>- 27</b>	<ol style="list-style-type: none"><li>1. Severely discharged or dead battery.</li><li>2. Battery connections faulty.</li><li>3. Defective traction controller</li></ol>	Return machine to service area. Test and inspect all batteries and all battery connections
<b>- 41</b>	Traction control system overheating.	Set parking brake and allow unit to cool for several minutes. Restart tractor. Check brake adjustment.
<b>- 42</b>	Machine rolling forward or backward and opposite direction is selected.	Stop machine, set parking brake and restart machine.
<b>- 43</b>	Defective traction controller.	Return to maintenance area for service.
<b>- 44</b>	Defective traction controller.	Return to maintenance area for service.
<b>- 45</b>	Defective traction controller.	Return to maintenance area for service.
<b>- 46</b>	<ol style="list-style-type: none"><li>1. Short circuit from motor armature to tractor frame.</li><li>2. Defective controller.</li></ol>	Return to maintenance area for service.
<b>- 49</b>	Defective traction controller.	Return to maintenance area for service.
<b>- 51</b>	<ol style="list-style-type: none"><li>1. Control fuse open.</li><li>2. Defective traction controller.</li></ol>	Return to maintenance area for service.
<b>- 57</b>	Defective traction controller.	Return to maintenance area for service.
<b>- 76</b>	<ol style="list-style-type: none"><li>1. Battery connector unplugged while traveling down hill. (Regenerative braking cycle)</li><li>2. Battery plug connection making poor contact.</li><li>3. Main power fuse open.</li></ol>	Return to maintenance area for service.

# 7 LUBRICATION

## 7.1 GENERAL

### **! WARNING !**

Before you clean, adjust, or repair this equipment, disengage all drives, lower implements to the ground, engage parking brake, and remove key from switch to prevent injuries.

Periodically apply a small amount of lithium based grease to the seat runners.

For smooth operation of all levers, pivot points and other friction points that are not listed apply several drops of SAE 30 oil every 50 hours or as required.

**Note:** Do not lubricate or grease rake attachment.

### Lube Points

Lubricate pivot points listed every 50 hours. Use grease that meets or exceeds NLGI Grade LB specifications.

## 7.2 REAR AXLE

Check oil level in rear axle gear box once a year. Oil should be level with bottom of fill plug as shown **(K)**.

Use only SAE 30W heavy duty engine oil.

Capacity 10-12 oz.

Always clean the grease fitting before and after lubricating. Apply grease with a manual grease gun and fill slowly until grease begins to seep out. Do not use compressed air guns.

1. Rake Actuator- top and bottom
2. Forward/reverse pedal pivot
3. Brake pedal pivot
4. Upper steering shaft
5. Steering fork
6. Lower steering shaft

### Steering Chain

Spray chain lightly every 50 hours using a light lubricant, such as WD 40.

Do not use grease or heavy chain lube.

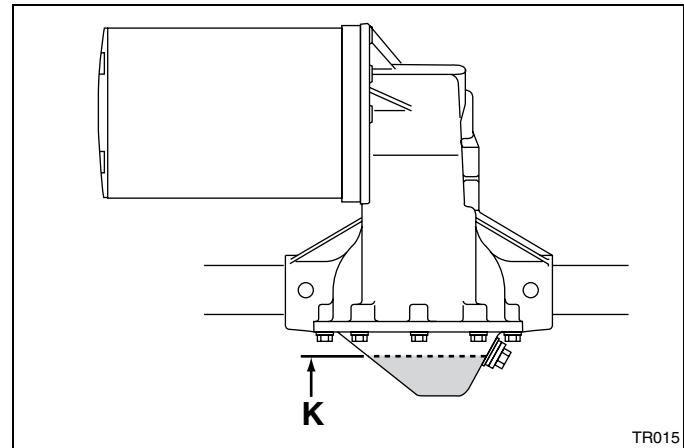


Figure 7A



**8.1 TABLE OF CONTENTS**

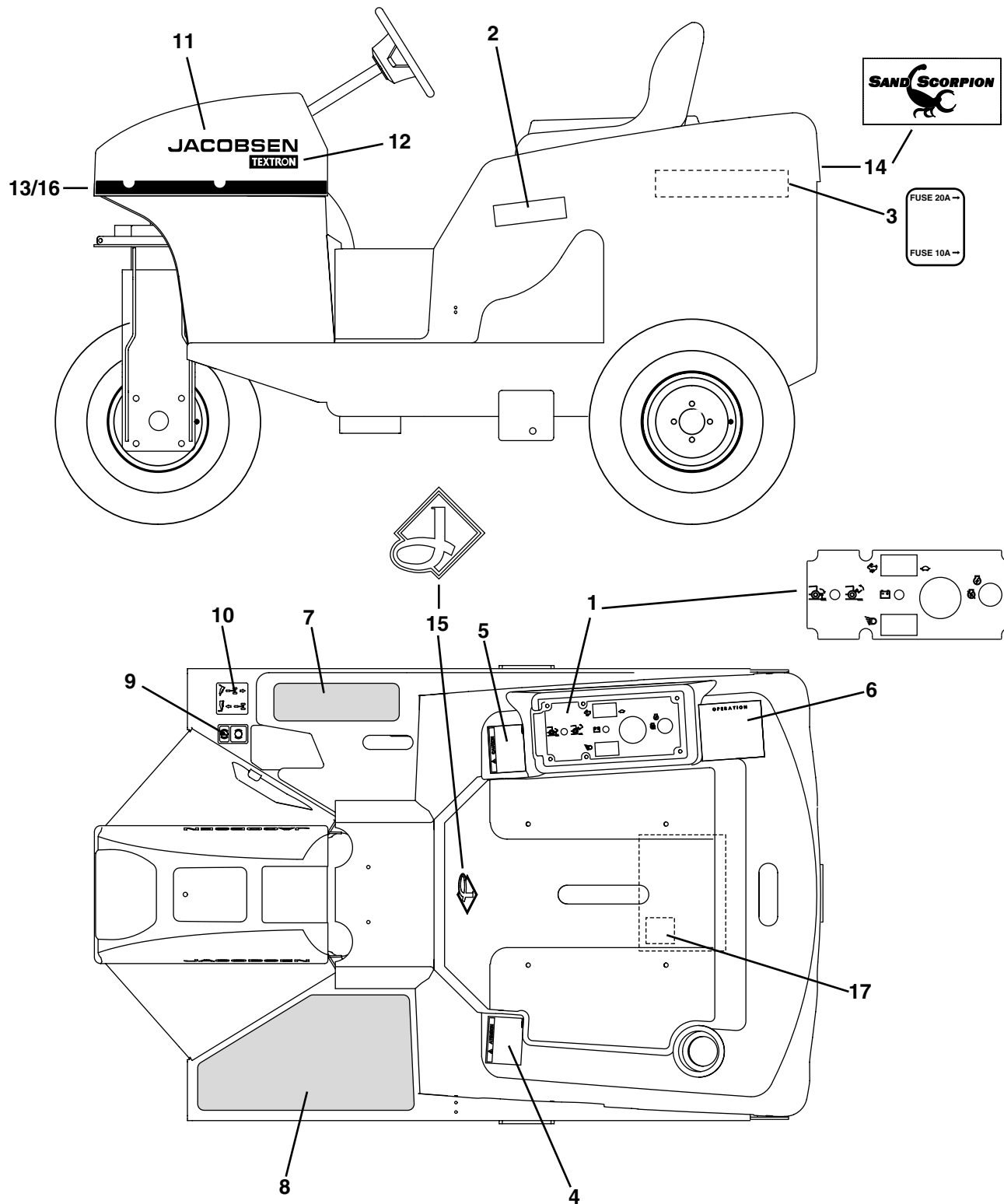
---

1.1 .....	Decals .....	26	13.1 .....	Lift Actuator.....	47
2.1 .....	Hood.....	28	14.1 .....	Electrical Box .....	48
3.1 .....	Instrument Panel.....	30	15.1 .....	Electrical Routing .....	50
4.1 .....	Seat Assembly .....	31	16.1 .....	Electrical Cables .....	52
5.1 .....	Accelerator Pedal.....	32	17.1 .....	Trap Rake.....	54
6.1 .....	Brake Pedals .....	34	18.1 .....	Brake Assemblies .....	56
7.1 .....	Brake Cables .....	36	19.1 .....	Battery Tray Cables .....	57
8.1 .....	Frame .....	38	20.1 .....	Drive Axle .....	58
9.1 .....	Lower Steering .....	40	21.1 .....	Traction Motor.....	60
10.1 .....	Upper Steering .....	42	22.1 .....	Electrical Schematic.....	61
11.1 .....	Traction Drive .....	44			
12.1 .....	Lift Bail.....	46			

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 1.1 Decals



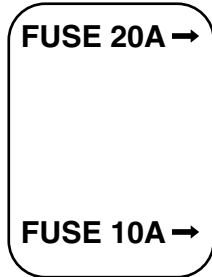
# ELECTRIC SAND SCORPION

2

**⚠ CAUTION**

To prevent fires and explosions from batteries:  
Keep flames and sparks away from batteries and provide ventilation during charging. Do not short across batteries; use insulated tools.  
Battery acid can cause severe injury to eyes and skin.

3



6

**OPERATION**

READ MANUAL BEFORE OPERATING  
MANUALS AVAILABLE FROM: JACOBSEN/TEXTRON, RACINE, WI.

To Start	To Drive / Transport	To Rake
1. Parking Brake...On 2. Accelerator ...Neutral 3. Turn Key Switch. Power light on.	1. Parking Brake ...Off 2. Raise Implement. 3. Set HI/LO switch to HI. 4. Depress the front of the traction control for desired Speed.	1. Transport to work area. 2. Lower attachment. 3. Set HI/LO switch to LO. 4. Depress the front of the traction control for desired speed.
To Stop	Specifications	
1. Remove foot from accelerator and apply brake. 2. Set parking brake. 3. Turn key switch to off position and remove key.	Operating weight .....468 kgs. 1030 Lbs.	

**⚠ CAUTION**

Do not tow more than 500 lbs. or put more than 200 lbs. vertical load on hitch.  
Enter and exit sand bunkers at their flattest point.  
Avoid sharp turns, quick starts and sudden reverse to forward motion, especially on hills.

4

**⚠ ATENCION**

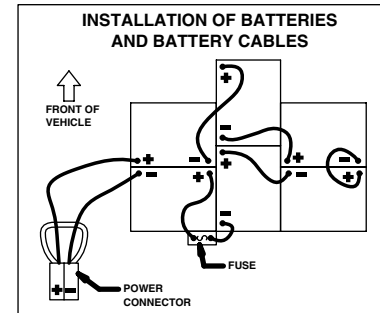
1. Lea el manual del operador antes de hacer funcionar la maquina.
2. Mantenga los escudos en su lugar y la tornilleria bien apretada.
3. Antes de vaciar los recolectores, o de limpiar, ajustar o reparar esta maquina, desengrane los mandos, aplique el freno de estacionamiento, desconecte la llave de contacto y desconecte el conector de alimentacion.
4. Mantenga las manos, los pies y la ropa lejos de las piezas en movimiento.
5. Nunca lleve pasajeros a menos que la maquina tenga un asiento para tal fin.
6. Si no comprende ingles, solicite a otra persona que le lea y le explique en contenido de las etiquetas y manuales.

5

**⚠ CAUTION**

1. Read operators manual before operating machine.
2. Keep all shields in place and hardware securely tightened.
3. Disengage all drives, set parking brake, turn key switch off and disconnect power connector before emptying catchers, cleaning, adjusting or repairing the machine.
4. Keep hands, feet and clothing away from power driven parts.
5. Do not ride on or carry passengers unless a seat is provided.

17



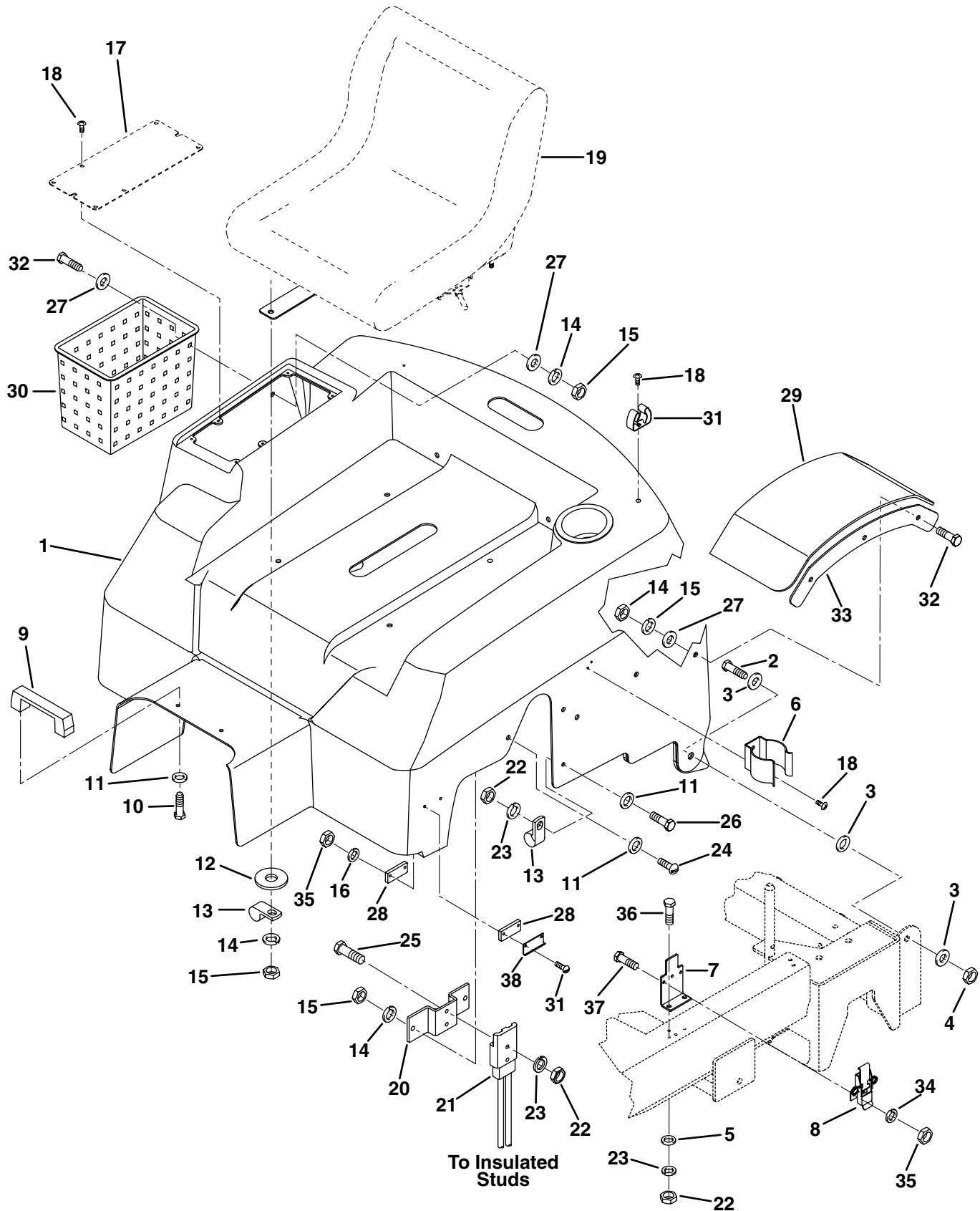
Item	Part No.	Qty	Description	Serial Numbers / Notes
1	3007733	1	Decal, Control Panel	
2	3004978	1	Decal, Battery Caution	
3	3009056	1	Decal, Fuses	
4	3004999	1	Decal, Spanish Caution	
5	3004998	1	Decal, Caution	
6	3007690	1	Decal, Operating Instructions	
7	3007878	1	Pad, Right Foot	
8	3007879	1	Pad, Left Foot	
9	3007056	1	Decal, Brake	
10	3007863	1	Decal, Accelerator	
11	3007503	2	Decal, Jacobsen	
12	3007512	2	Decal, Textron	
13	3007871	1	Decal, Left Stripe	
14	3010228	1	Decal, Sand Scorpion	
15	3007129	1	Emblem, Diamond J	
16	3007887	1	Decal, Right Stripe	
17	3007883	1	Decal, Battery Cable Routing	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 2.1 Hood



# ELECTRIC SAND SCORPION

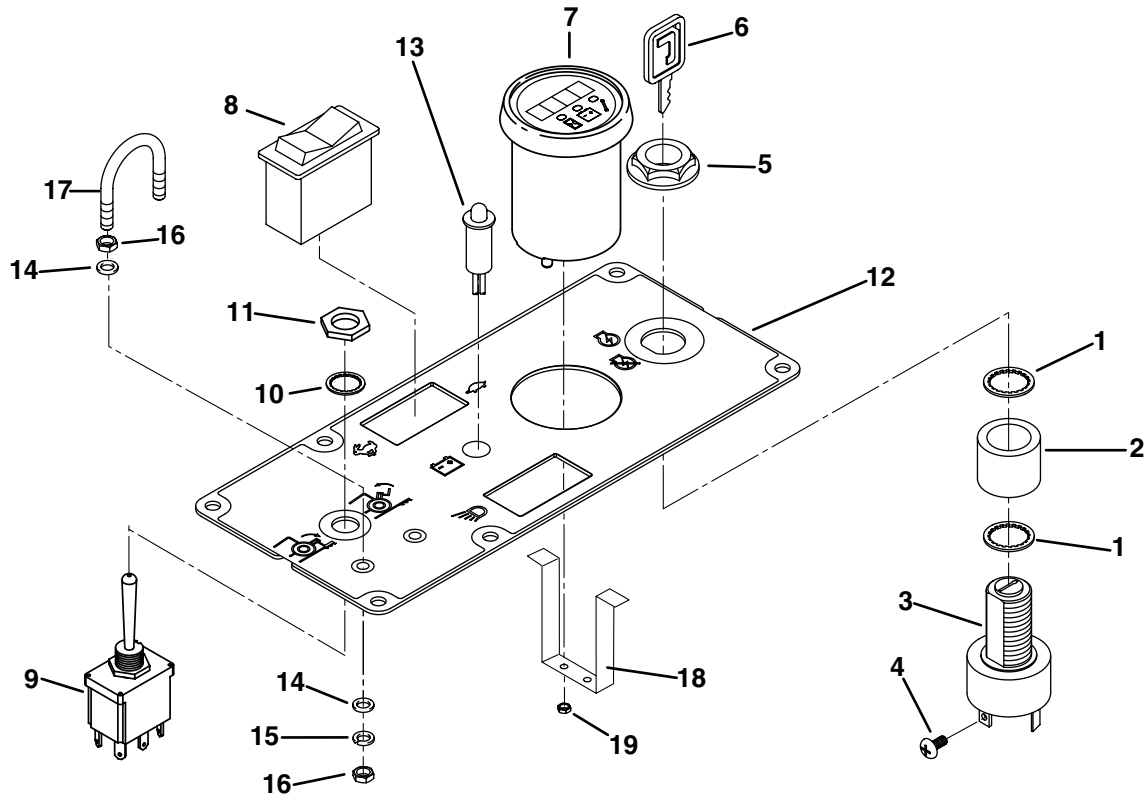
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	5002900	1	Hood	
	3004496	1	• Cup Holder	
2	400410	2	Screw, 1/2-13 x 1-3/4" Hex Head	
3	452012	6	Flat Washer, 1/2	
4	444758	2	Nut, 1/2-13 Hex Grip	
5	452004	4	Flat Washer, 1/4	
6	3008610	1	Clamp, Battery Cable	
7	3009753	2	Bracket, Latch, Hood	
8	163955	1	Latch, Tension	
9	1003391	1	Handle, Grab	
10	N/S	2	• Screw, M6 x 32mm	
11	452004	5	Flat Washer, 1/4	
12	319755	4	Flat Washer	
13	354080	3	Clamp, 1/2" I.D.	
14	446134	15	Lockwasher, 5/16	
15	443106	15	Nut, 5/16-18 Hex	
16	444306	8	Nut, #8-32 Hex	
17	-		Instrument Panel	For Breakdown See Illustration 3.1
18	416909	10	Screw, #10 x 1/2 C/R Pan Head	
19	-		Seat Assembly	For Breakdown See Illustration 4.1
20	3007598	1	Bracket, Cable Mount	
21	1003572	1	Battery Connector (Tractor Side)	
22	443102	3	Nut, 1/4-20 Hex	
23	446128	3	Lockwasher, 1/4	
24	404068	2	Screw, 5/16-18 x 3/4" Truss Head	
25	400114	2	Screw, 1/4-20 x 1-1/4" Hex Head	
26	400110	1	Screw, 1/4-20 x 7/8" Hex Head	
27	452006	12	Flat Washer, 5/16	
28	3009156	4	Plate, Latch, Hood	
29	3008121	2	Fender	
30	3008603	1	Basket	
31	3008369	2	Holder, Rake	
32	400190	8	Screw, 5/16-18 x 1-1/4" Hex Head	
33	3008589	2	Plate, Fender	
34	446112	8	Lockwasher, #8	
35	444306	2	Nut, #8 Hex	
36	400108	4	Screw, 1/4-20 x 3/4" Hex Head	
37	403528	6	Screw, 1/8-32 x 3/4" Hex Head	
38	N/S	2	Clip	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

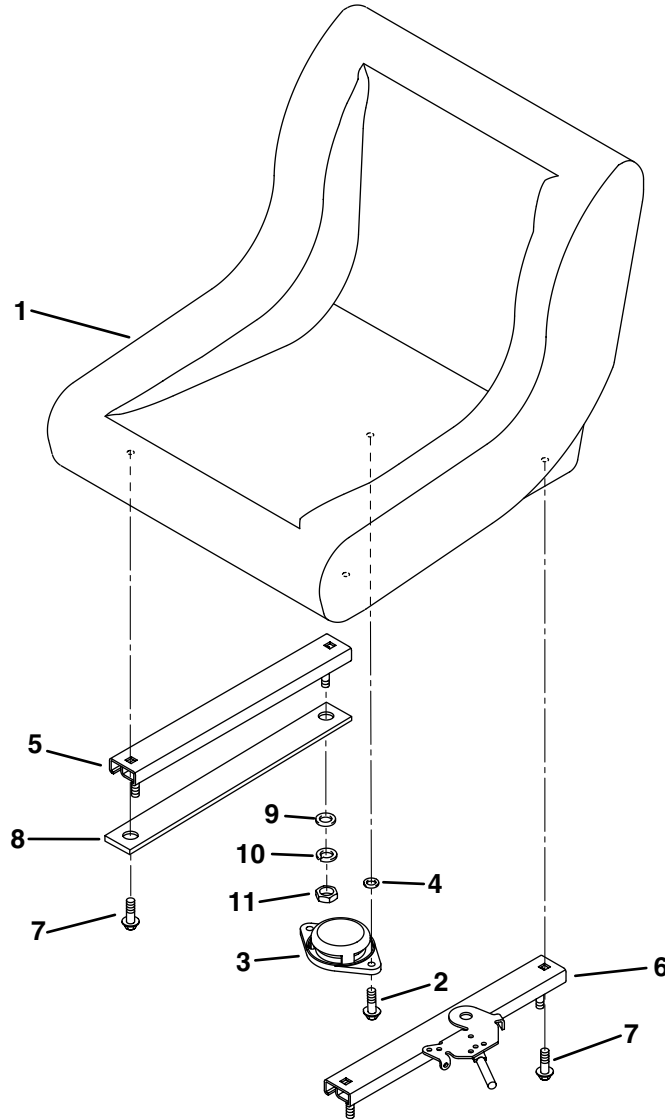
## 3.1 Instrument Panel



Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	3004392	2	Lockwasher, 13/16 Internal Tooth	
2	3004746	1	Spacer, Key Switch	
3	132857	1	Switch, Key	
4	409951	1	• Screw, #8-32 x 3/8" Truss Head	
5	558037	2	• Nut, 13/16-20 Black Nylon Face	
6	558015	1	• Ignition Key	
7	3003954	1	Gauge, BDI	
8	3006436	2	Switch, Panel	
9	1003481	1	Switch, Toggle	
10	N/S	1	• Lockwasher	
11	N/S	1	• Nut	
12	3006637	1	Panel, Instrument	
13	3003547	1	Light, Battery Indicator	
14	452006	4	Flat Washer, 1/4	
15	446134	2	Lockwasher, 5/16	
16	443106	4	Nut, 5/16-18	
17	362469	1	U Bolt	
18	N/S	1	Bracket	
19	N/S	2	Nut	

> Change from previous revision

## 4.1 Seat Assembly



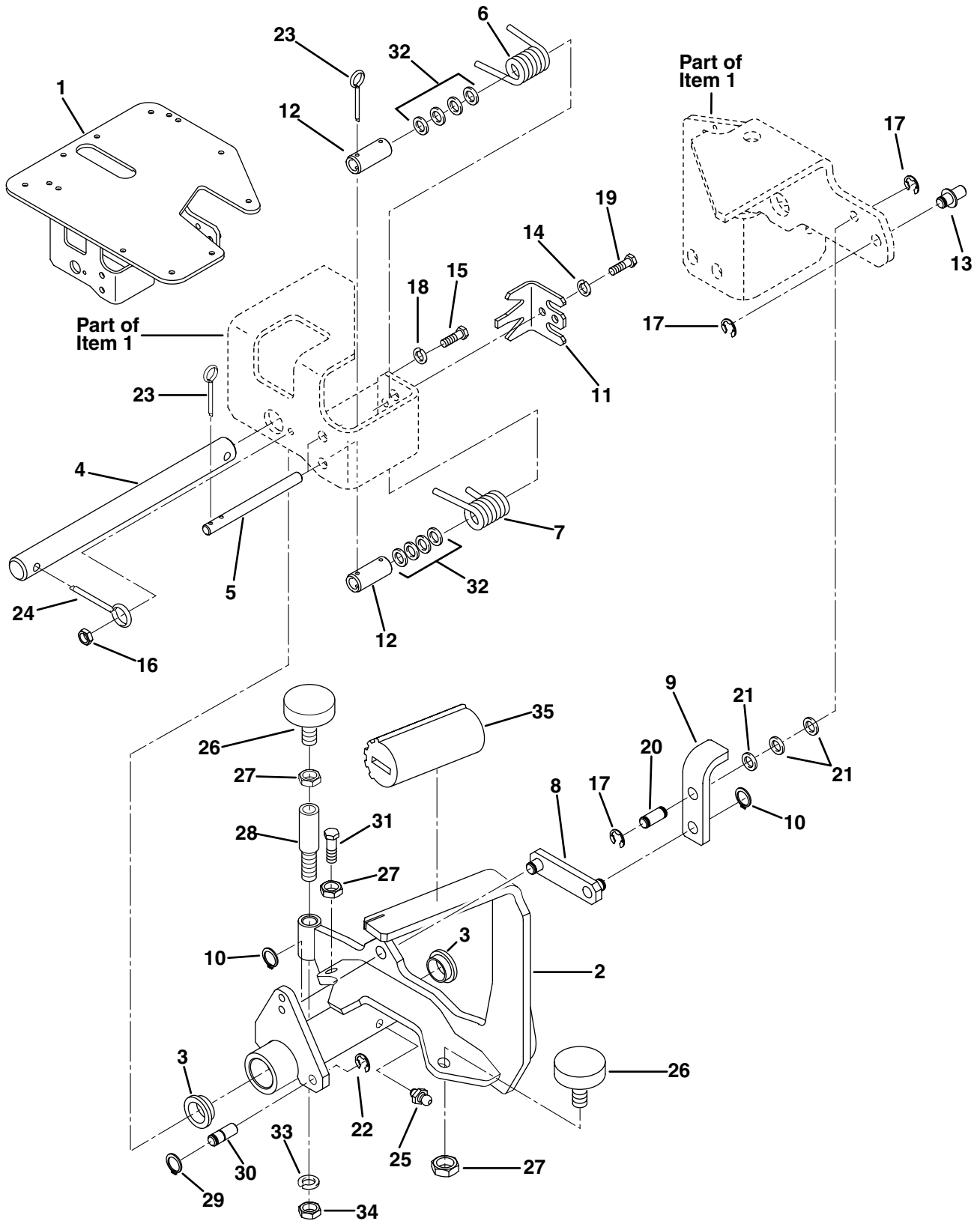
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	1003282	1	Seat, 15" Plastic Back	
2	409708	2	• Screw, 1/4-14 x 5/8" Thread Form	
3	554390	1	• Seat Switch (Normally Open)	
4	453023	2	• Flat Washer, 1/4	
5	3006988	1	Adjuster, Slave	
6	3006991	1	Adjuster, Latching	
7	3005291	4	Screw, M8-1.25 x 16mm Hex	
8	3009074	2	Plate, Seat	
9	319755	4	Flat Washer	
10	446134	4	Lockwasher, 5/16	
11	443106	4	Nut, 5/16-18 Hex	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 5.1 Accelerator Pedal





# ELECTRIC SAND SCORPION

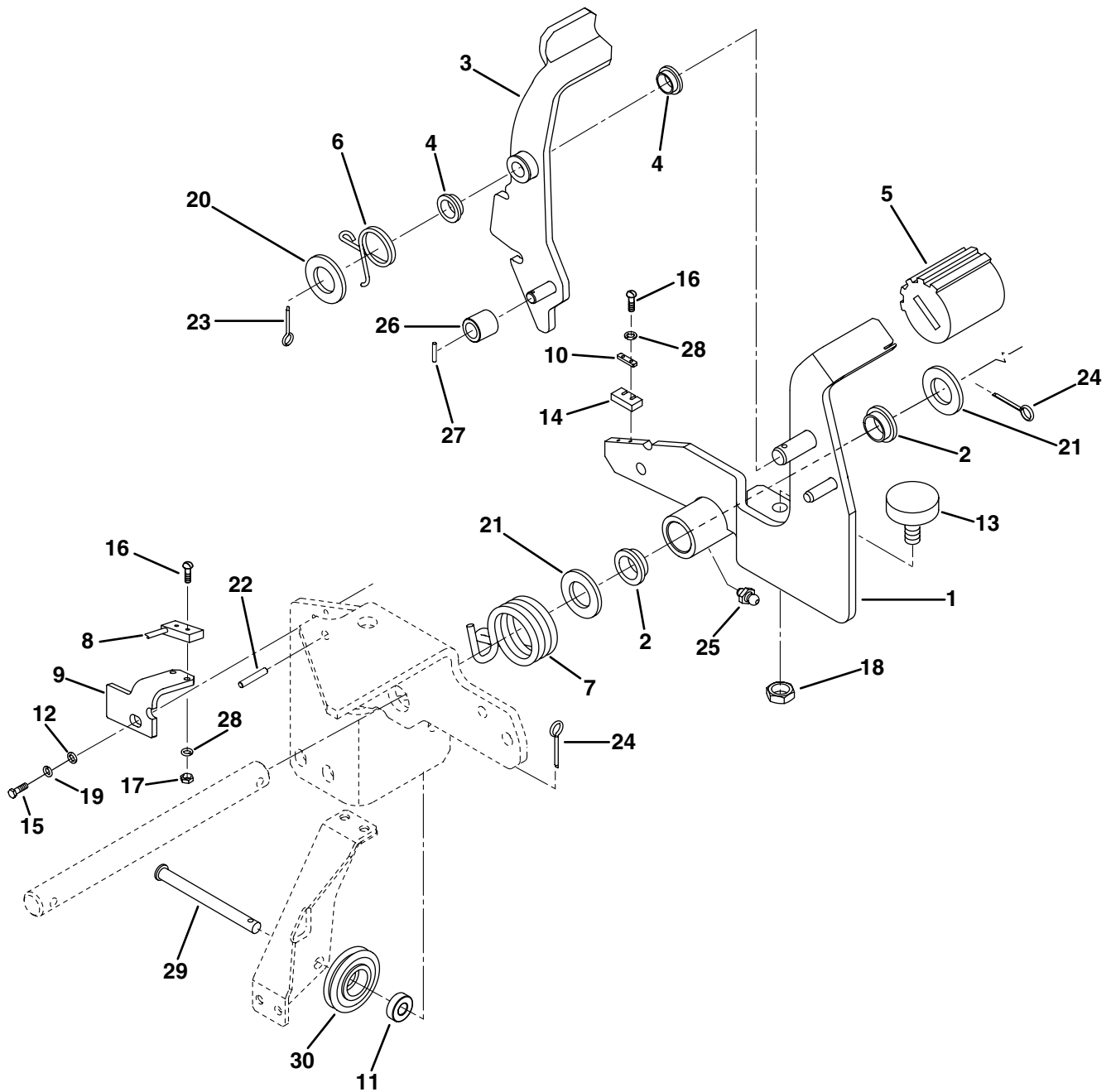
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	1003112	1	Cover, Pedal	
2	1003117	1	Pedal, Traction	
3	352726	2	• Bushing	
4	3006750	1	Shaft, Main	
5	3006785	2	Mandrel, Spring	
6	3006941	1	Spring, L.H. Torsion	
7	3006942	1	Spring, R.H. Torsion	
8	1003923	1	Link, Top	
9	3007627	1	Link, Kick Out	
10	3008690	2	Retaining Ring, 3/8	
11	3007629	1	Plate, Centering	
12	3007637	2	Tube, Spacer	
13	3009597	1	Pin, Parking Brake Latch	
14	403578	2	Screw, #10-24 x 1" Hex Head	
15	403741	1	Screw, #8-32 x 5/8" Hex Head	
16	444306	1	Nut, #8-32 Hex	
17	3008492	3	Retaining Ring, 3/8 Ext. Bowed	
18	446110	1	Lockwasher, #8	
19	446116	4	Lockwasher, #10	
20	3008495	1	Pivot Pin, Main Kickout	
21	453011	3	Flat Washer, 3/8	
22	3008493	1	Retaining Ring, 5/16 Ext. Bowed	
23	460022	2	Cotter Pin, 3/32 x 1-3/4"	
24	460050	1	Cotter Pin, 3/16 x 1-1/4"	
25	471226	1	Grease Fitting, Straight, 1/4	
26	354989	2	Stop, Rubber	
27	443112	3	Nut, 3/8-24 Hex	
28	3009023	1	Riser, Reverse Pedal	
29	3008527	1	Retaining Ring, 5/16 Truarc	
30	3008497	1	Pin, Centering Stop	
31	443110	1	Nut, 3/8-16 Hex	
32	453009	8	Flat Washer, 5/16	
33	446142	1	Lockwasher, 3/8 Heavy	
34	400302	1	Screw, 3/8-24 x 1-1/2" Hex Head	
35	3003475	1	Grip, Pedal	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 6.1 Brake Pedals



# ELECTRIC SAND SCORPION

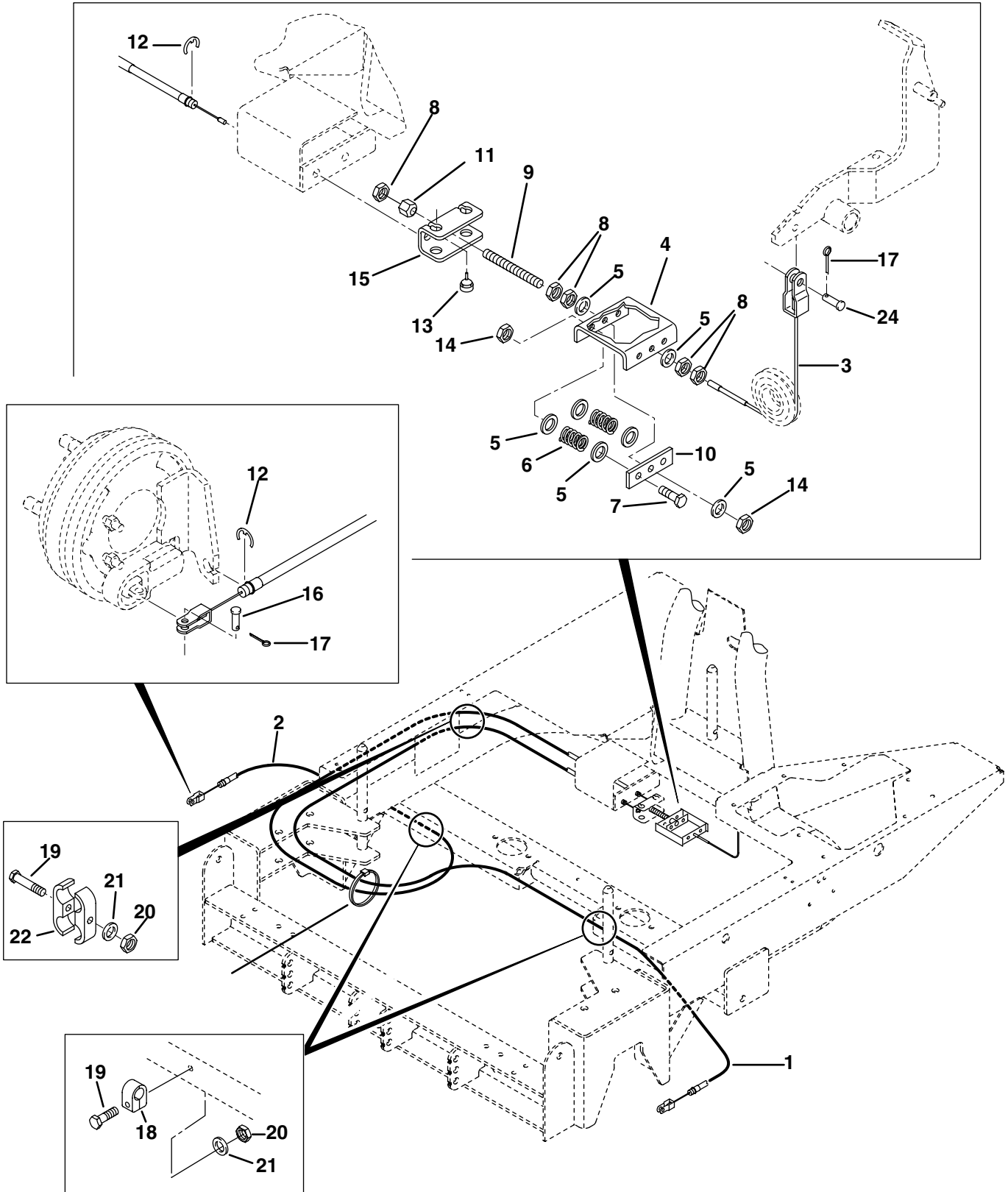
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	1003121	1	Pedal, Brake	
2	352726	2	• Bushing	
3	1003122	1	Pedal, Parking Brake	
4	352936	2	• Bushing	
5	3003474	1	Grip, Pedal	
6	3003561	1	Spring, Torsion	
7	3003602	1	Spring, Torsion	
8	3003955	1	Switch, Reed	
9	3006757	1	Bracket, Sensor	
10	3007638	1	Plate, Sensor	
11	344545	1	Bearing, Auger	
12	452002	2	Flat Washer #10	
13	354989	1	Stop, Rubber	
14	367037	1	Magnet	
15	403744	2	Screw, #10-24 x 1/2" Hex Head	
16	403766	4	Screw, #4-40 x 3/4" Pan Head Brass	
17	444302	2	Nut, #4-40 Hex	
18	443112	2	Nut, 3/8-24 Hex	
19	446116	2	Lockwasher, #10	
20	452012	1	Flat Washer, 1/2	
21	453022	2	Flat Washer, 3/4	
22	461169	1	Groove Pin, 5/32 x 3/4"	
23	460030	1	Cotter Pin, 1/8 x 1-1/4"	
24	460050	2	Cotter Pin, 3/16 x 1-1/4"	
25	471226	2	Grease Fitting	
26	3008040	1	Sleeve, Brake Release	
27	461352	1	Roll Pin, 3/32 x 3/4"	
28	446102	2	Lockwasher, #4	
29	461475	1	Clevis Pin, 1/2 x 2"	
30	3003143	1	Pulley	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 7.1 Brake Cables



RE-7

# ELECTRIC SAND SCORPION

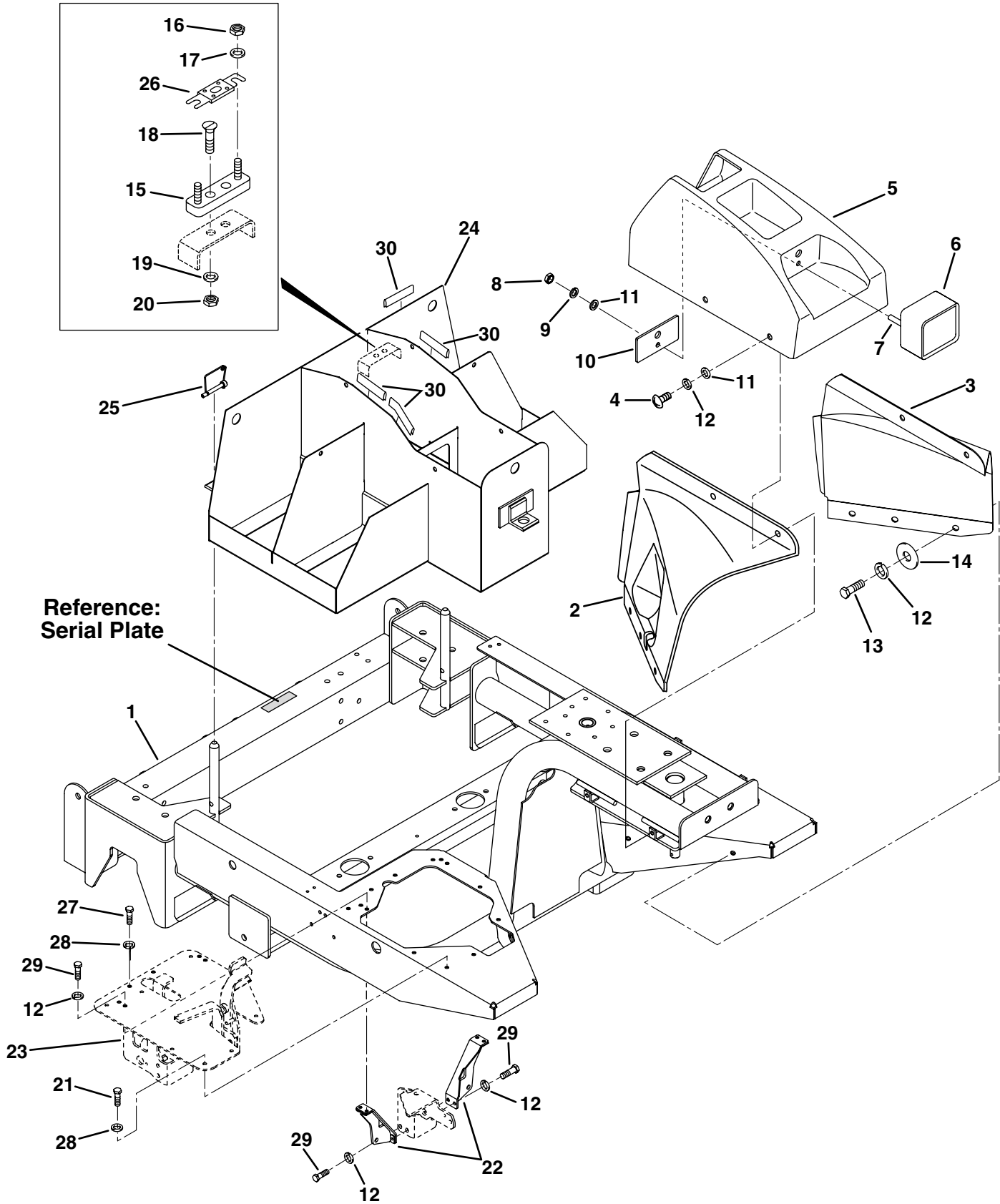
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	2811578	1	Cable, Long Brake	
2	2811579	1	Cable, Short Brake	
3	3007856	1	Cable, Pull	
4	3010134	1	Frame, Equalizer	
5	453009	8	Flat Washer, 5/16	
6	351956	2	Spring, Compression	
7	400234	2	Screw, 5/16-24 x 2" Hex Head	
8	443108	7	Nut, 5/16-24 Hex	
9	3007855	1	Rod, 5/16-24 x 4-3/4" Threaded	
10	3007854	1	Plate, Float	
11	3003382	1	Nut, 5/16-24 Spherical	
12	458440	4	Retaining E-Ring, 1/2 Truarc	
13	5002171	2	Bumper, Brake	
14	444754	3	Nut, 5/16-24 Center Lock	
15	5002286	1	Bracket, Equalizer	
16	461493	2	Clevis Pin, 5/16 x 3/4"	
17	460014	3	Cotter Pin, 3/32 x 3/4"	
18	3008305	2	Clamp	
19	400116	3	Screw, 1/4-20 x 1-1/2" Hex Head	
20	444708	3	Locknut, 1/4-20 Center	
21	453023	3	Flat Washer, 1/4	
22	364741	1	Clamp, Double	
23	473144	1	Tie Wrap	
24	461453	1	Clevis Pin, 5/16 x 1"	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 8.1 Frame



# ELECTRIC SAND SCORPION

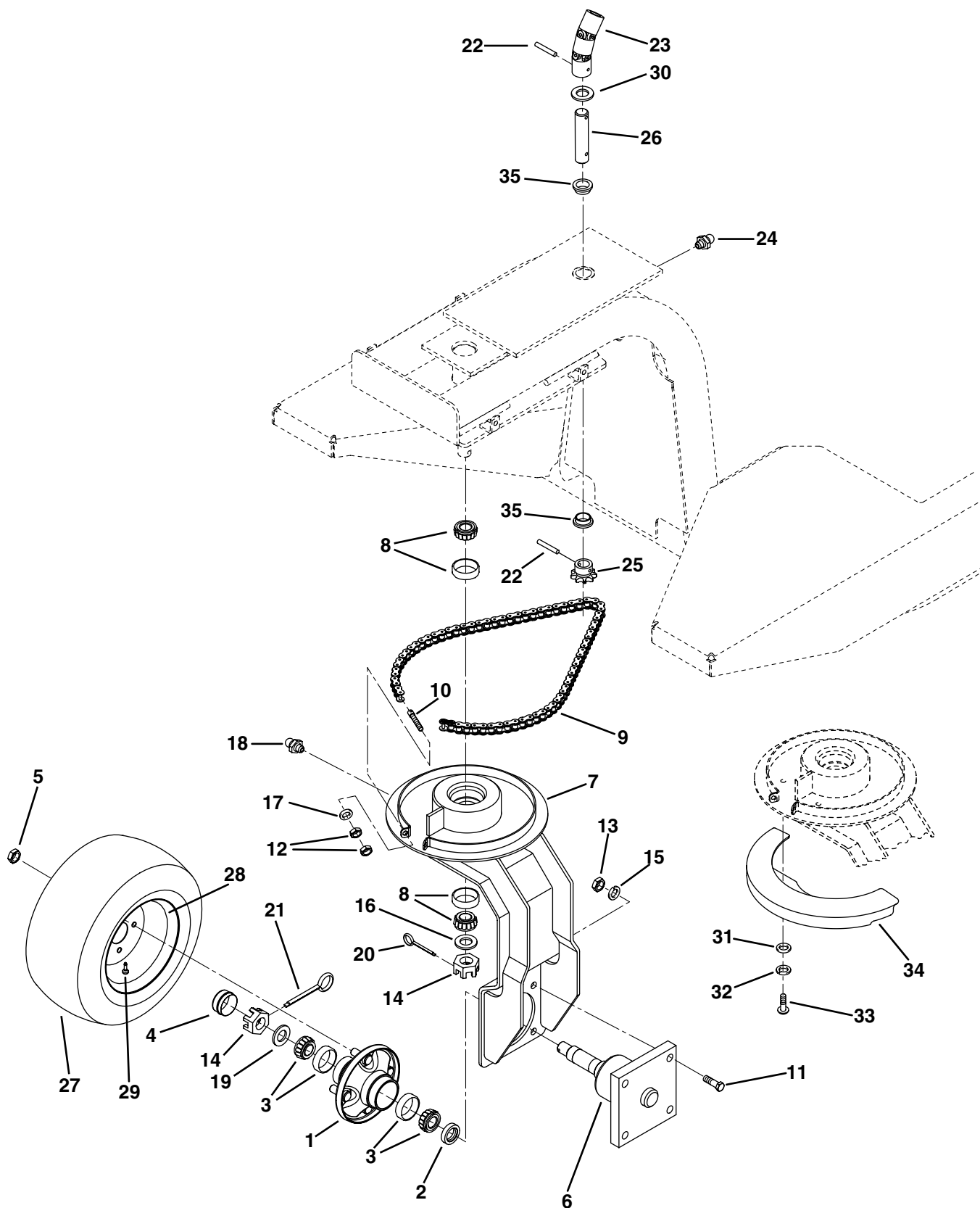
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	1002456	1	Frame	
2	3007118	1	Cover, Right Front	
3	3007119	1	Cover, Left Front	
4	404072	4	Screw, 5/16-18 x 1" Truss Head	
5	3007107	1	Cover, Upper	
6	3002932	1	Head Light, 48 Volt	
	5002575	1	• Bulb	
7	440082	1	• Carriage Bolt, 5/16-18 x 1"	
8	443106	1	• Nut, 5/16-18 Hex	
9	446136	1	• Lockwasher, 5/16 Heavy	
10	3007358	1	Plate, Light Support	
11	452006	5	Flat Washer, 5/16	
12	446134	6	Lockwasher, 5/16	
13	400184	6	Screw, 5/16-18 x 3/4" Hex Head	
14	319755	6	Flat Washer	
15	1001836	1	Block, Fuse	
16	444754	2	• Locknut, 5/16-24 Hex	
17	452006	2	• Flat Washer, 5/16	
18	402482	2	Screw, #10-24 x 1" Slotted Flat Head	
19	446118	2	Lockwasher, #10 Heavy	
20	444310	2	Nut, #10-24 Hex	
21	400108	2	Screw, 1/4-20 x 3/4" Hex Head	
22	1003698	2	Pedal Support Bracket	
23	-		Pedal Assembly	See Illustrations 5.1 and 6.1
24	1002461	1	Battery Tray	
25	3005435	2	Pin, Spring Lock	
26	3003951	1	Fuse, 300 Amp	
27	400112	3	Screw, 1/4-20 x 1" Hex Head	
28	446130	9	Lockwasher, 1/4 Heavy	
29	400188	6	Screw, 5/16-18 x 1" Hex Head	
30	952770	4	Bulk Moulding Strips	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 9.1 Lower Steering



RE-8



# ELECTRIC SAND SCORPION

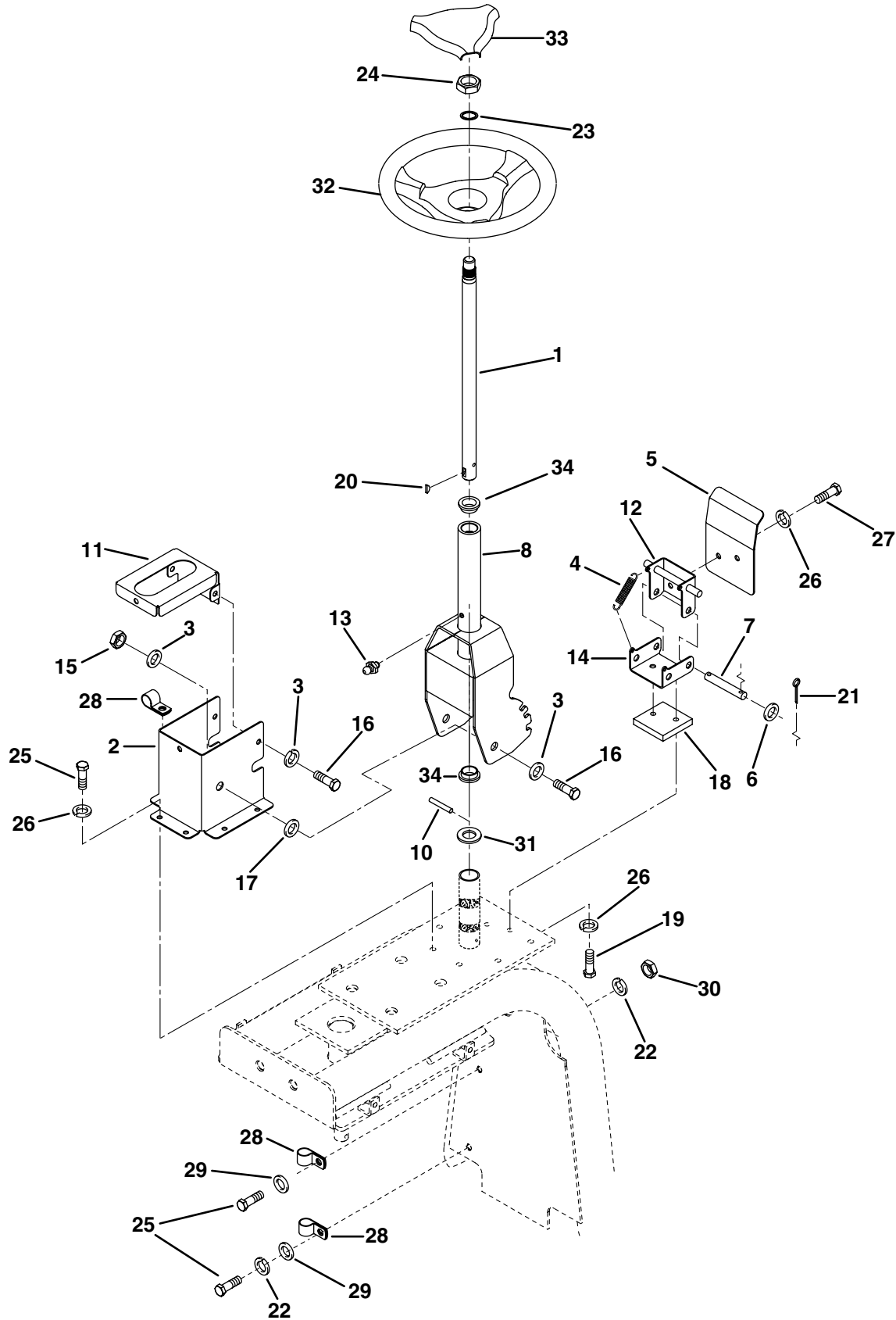
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	5002910	1	Hub	
2	554329	1	• Seal, 1.25 I.D.	
3	500596	2	• Bearing, Cup and Cone	
4	545692	1	• Dust Cap	
5	354807	4	• Nut, 1/2-20 Lug	
6	1002576	1	Spindle	
7	1002577	1	Fork, Front Steering	
8	5002916	2	Bearing, Cup and Cone	
9	3005763	1	Chain-#40 1/2" Pitch	
	470502	2	• Connecting Link	
10	3005764	2	Rod, Chain Adjust	
11	400412	4	Screw, 1/2-13 x 2" Hex Head	
12	443106	4	Nut, 5/16-18 Hex	
13	443118	4	Nut, 1/2-13 Hex	
14	445676	2	Nut, 3/4-16 Slotted Hex	
15	446152	4	Lockwasher, 1/2	
16	452018	1	Flat Washer, 3/4	
17	453009	2	Flat Washer, 5/16	
18	471231	1	Grease Fitting, 1/8	
19	453022	1	Flat Washer, 3/4	
20	460052	1	Cotter Pin, 3/16 x 1-1/2"	
21	460054	1	Cotter Pin, 3/16 x 1-3/4"	
22	461385	2	Roll Pin, 3/16 x 1-1/4"	
23	1001441	1	U-Joint	
24	471214	1	Grease Fitting, 1/4-28	
25	361808	1	Sprocket, 9 Tooth	
26	3005557	1	Shaft, Lower Steering	
27	5002777	1	Tire	
28	3008134	1	Wheel	
29	360111	1	Inflation Valve	
30	455048	1	Flat Washer, 3/4	
31	452004	2	Flat Washer, 1/4	
32	446128	2	Lockwasher, 1/4	
33	400108	2	Screw, 1/4-20 z 3/4" Hex Head	
34	3009131	1	Cover, Chain	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 10.1 Upper Steering



RE-9

# ELECTRIC SAND SCORPION

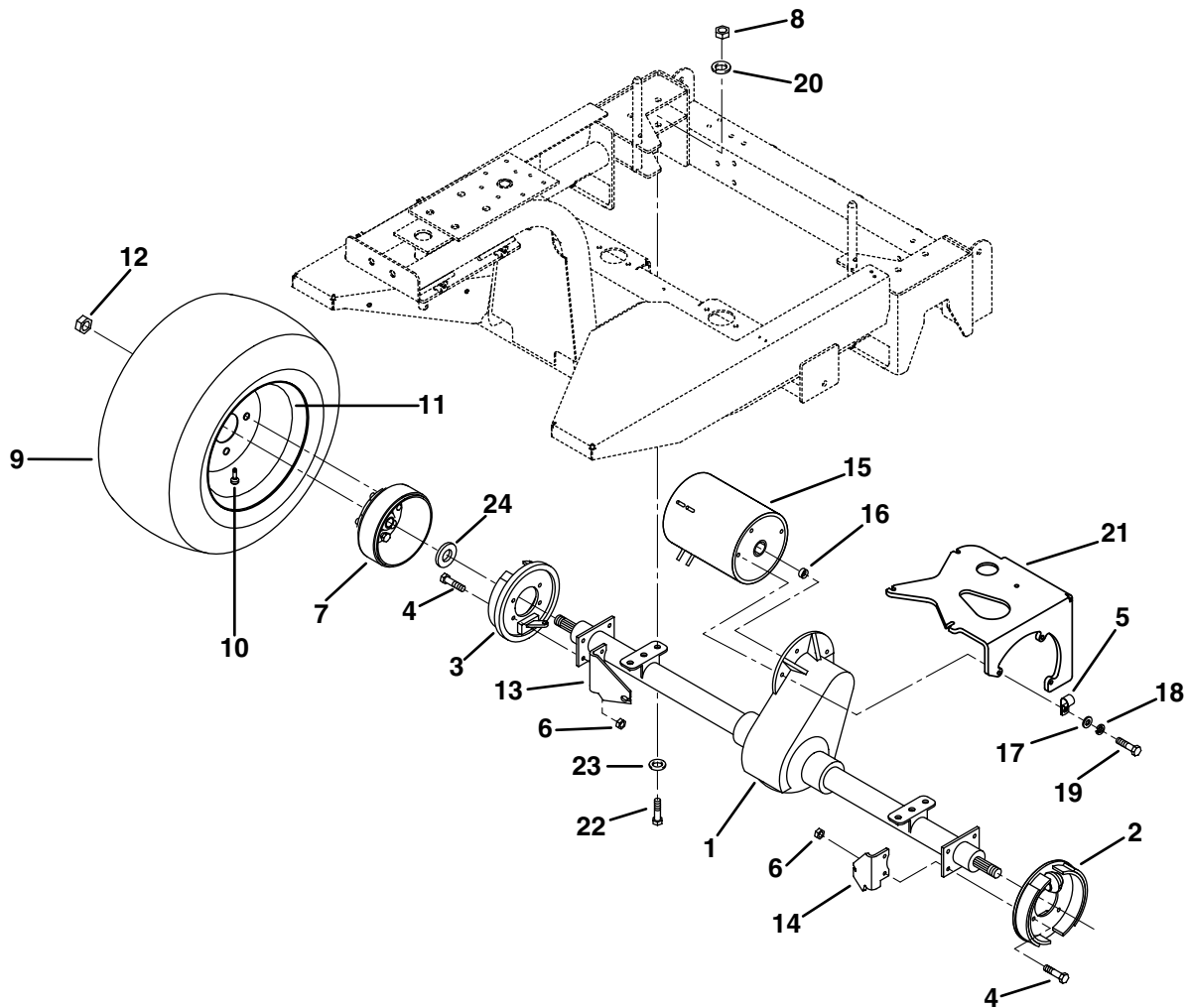
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	3005574	1	Shaft, Upper Steering	
2	3005556	1	Mount, Housing	
3	453017	4	Flat Washer, 1/2	
4	3005562	2	Spring, Adjustment Lock	
5	3005564	1	Plate, Handle Adjustment	
6	453011	2	Flat Washer, 3/8	
7	3005565	1	Pin, Adjustment Bracket	
8	1002573	1	Steering, Shaft	
9	352726	2	• Bushing	
10	461385	1	Roll Pin, 3/16 x 1-1/4"	
11	1002701	1	Mount, Tower	
12	1002726	1	Lever	
13	471214	1	Grease Fitting	
14	1002728	1	Latch, Steering	
15	444814	2	Nut, 1/2-13 Hex Flex Lock	
16	400406	2	Screw, 1/2-13 x 1-1/4" Hex Head	
17	452012	2	Flat Washer, 1/2	
18	3005345	1	Spacer, Stop	
19	400112	2	Screw, 1/4-20 x 1" Hex Head	
20	463017	1	Key, Woodruff #9	
21	460014	2	Cotter Pin, 3/32 x 3/4"	
22	446128	2	Lockwasher, 1/4	
23	447224	1	Lockwasher, 5/8 Internal	
24	443828	1	Nut, 5/8-18 Hex Jam	
25	400108	6	Screw, 1/4-20 x 3/4" Hex Head	
26	446130	13	Lockwasher, 1/4 Heavy	
27	400104	2	Screw, 1/4-20 x 1/2" Hex Head	
28	354081	3	Clamp, 3/8 I.D.	
29	452004	2	Flat Washer, 1/4	
30	443102	1	Nut, 1/4-20 Hex	
31	455048	2	Flat Washer, 3/4	
32	2811364	1	Steering Wheel	
33	2811365	1	• Cap, Steering Wheel	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 11.1 Traction Drive



# ELECTRIC SAND SCORPION

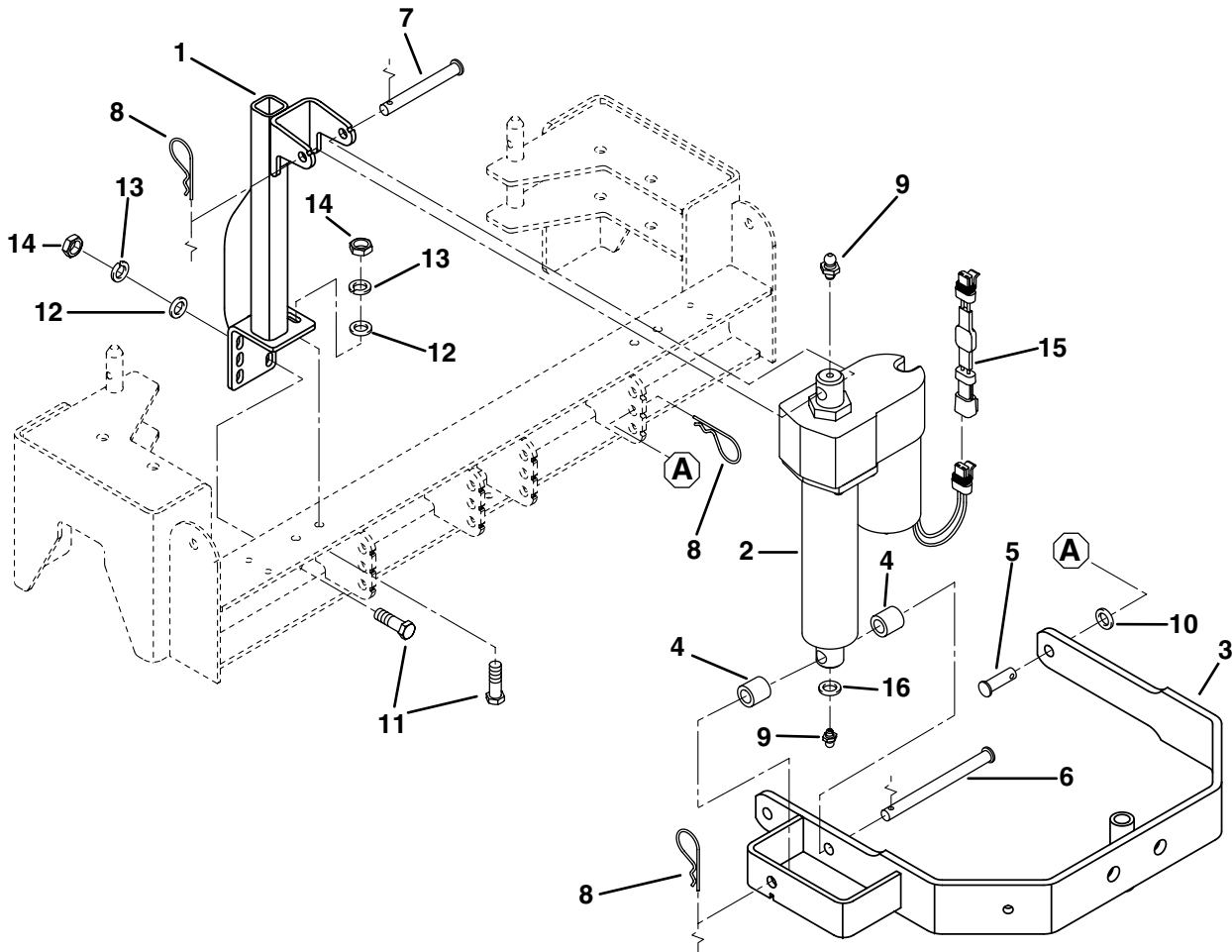
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	1001339	1	Axle with Pads	See 20.1
2	-	1	L.H. Brake Assembly	See 18.1
3	-	1	R.H. Brake Assembly	See 18.1
4	400226	8	Screw, 5/16-24 x 1" Hex Head	
5	3004721	1	Clamp, 1/2" I.D. "J"	
6	444754	8	Nut, 5/16-24 Center Lock	
7	557307	2	Brake Drum	See 18.1
8	443114	4	Nut, 7/16-14 Hex	
9	5002777	2	Tire	
10	3008134	2	Wheel	
11	360111	2	Inflation Valve	
12	354807	8	Nut, 1/2-20 Lug	
13	3003374	1	Bracket, R.H. Brake Cable	
14	3003375	1	Bracket, L.H Brake Cable	
15	3003196	1	Motor, Traction	
16	556261	1	Bumper, Spline	
17	452004	3	Flat Washer, 1/4	
18	446130	3	Lockwasher, 1/4 Heavy	
19	400116	3	Screw, 1/4-20 x 1-1/2" Hex Head	
20	446148	4	Lockwasher, 7/16 Heavy	
21	3006716	1	Bracket, Electric Box	
22	400336	4	Screw, 7/16-14 x 1-1/4" Hex Head	
23	453013	4	Flat Washer, 7/16	
24	556255	2	Washer, Special	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 12.1 Lift Bail

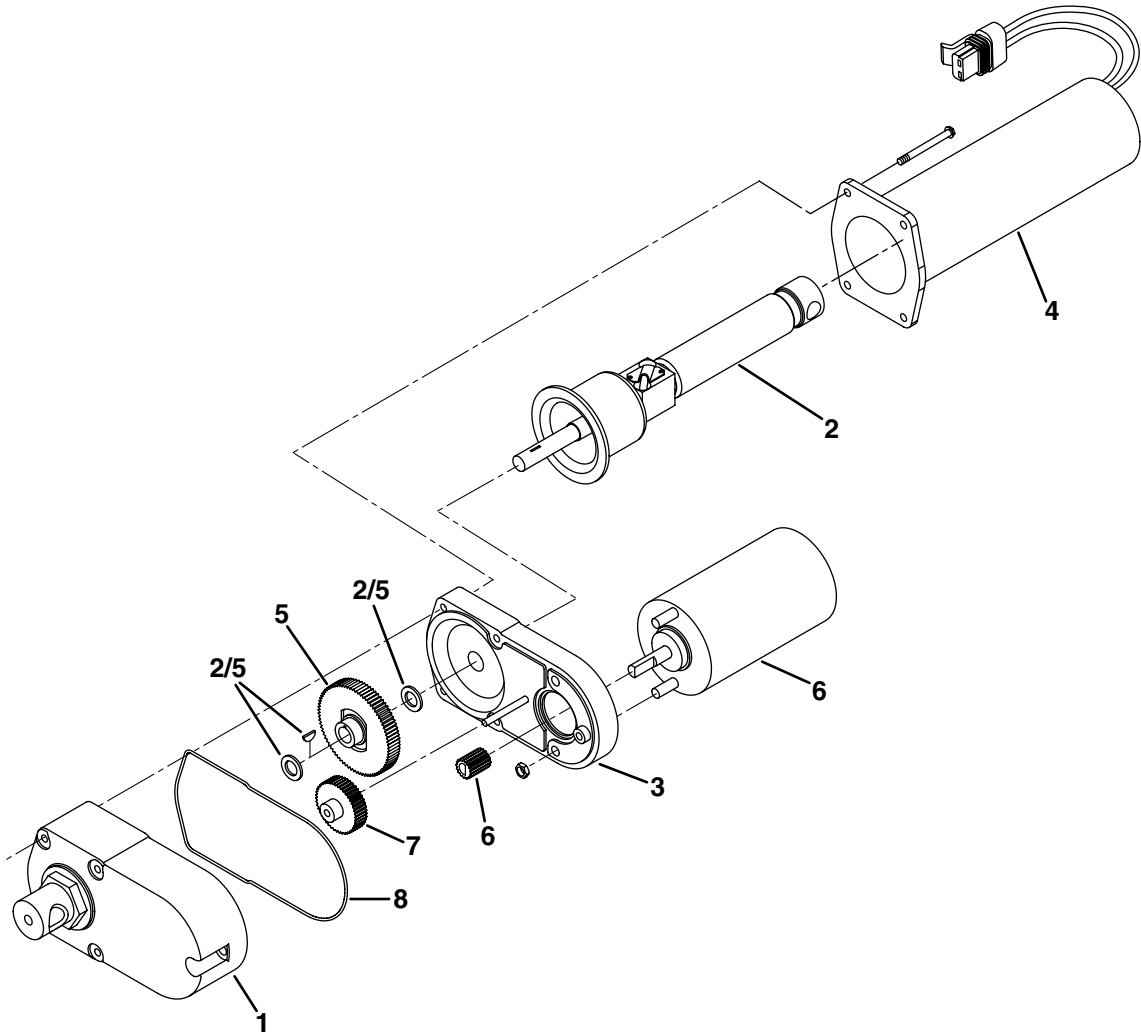


Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	1002972	1	Tower, Actuator	
2	1003393	1	Actuator, Electric	
3	1002971	1	Bail, Hitch	
4	3006808	2	Spacer	
5	3007561	2	Clevis Pin, 1/2 x 1"	
6	3007562	1	Clevis Pin, 1/2 x 4"	
7	3000439	1	Clevis Pin, 1/2 x 3-3/4"	
8	460335	4	Hairpin	
9	471214	2	Grease Fitting	
10	453017	2	Flat Washer, 1/2	
11	400264	4	Screw, 3/8-16 x 1-1/4" Hex Head	
12	453011	4	Flat Washer, 3/8	
13	446140	4	Lockwasher, 3/8	
14	443110	4	Nut, 3/8-16 Hex	
15	1003822	1	Snubber, Actuator	
16	446130	1	Lockwasher, 1/4 Heavy	

> Change from previous revision

## 13.1 Lift Actuator

Part Number 1003393



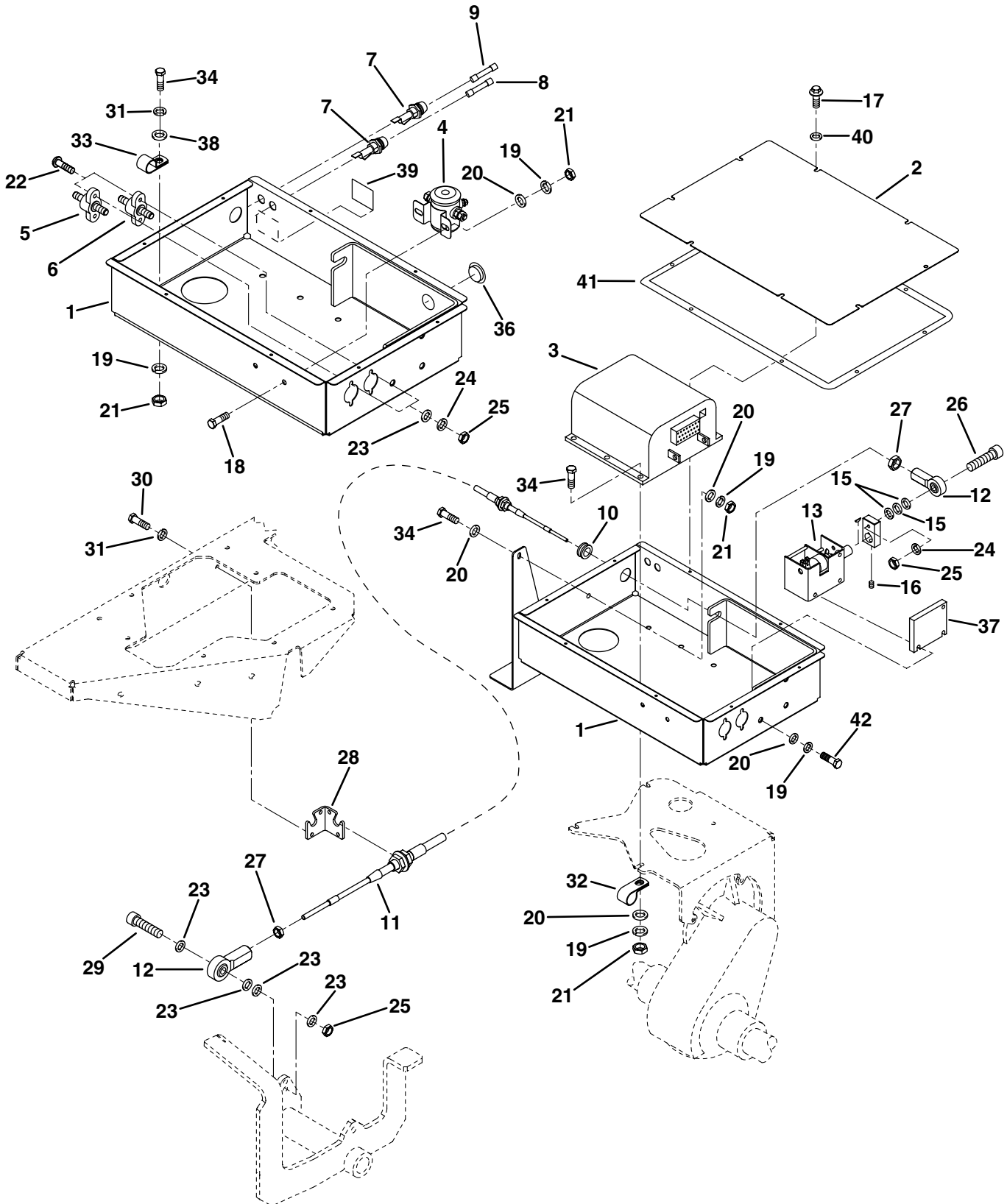
Item	Part No.	Qty.	Description	Serial Numbers/Description
1	5003042	1	Rear Housing Kit	
2	5003043	1	Screw and Brake Kit	
3	5003049	1	Front Housing Assembly	
4	5003044	1	Cover Tube Kit	
5	5003050	1	Clutch Kit	
6	5003048	1	Motor Kit	
7	5003051	1	Intermediate Gear Kit	
8	5002998	1	Gasket Kit	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 14.1 Electrical Box



RE-12

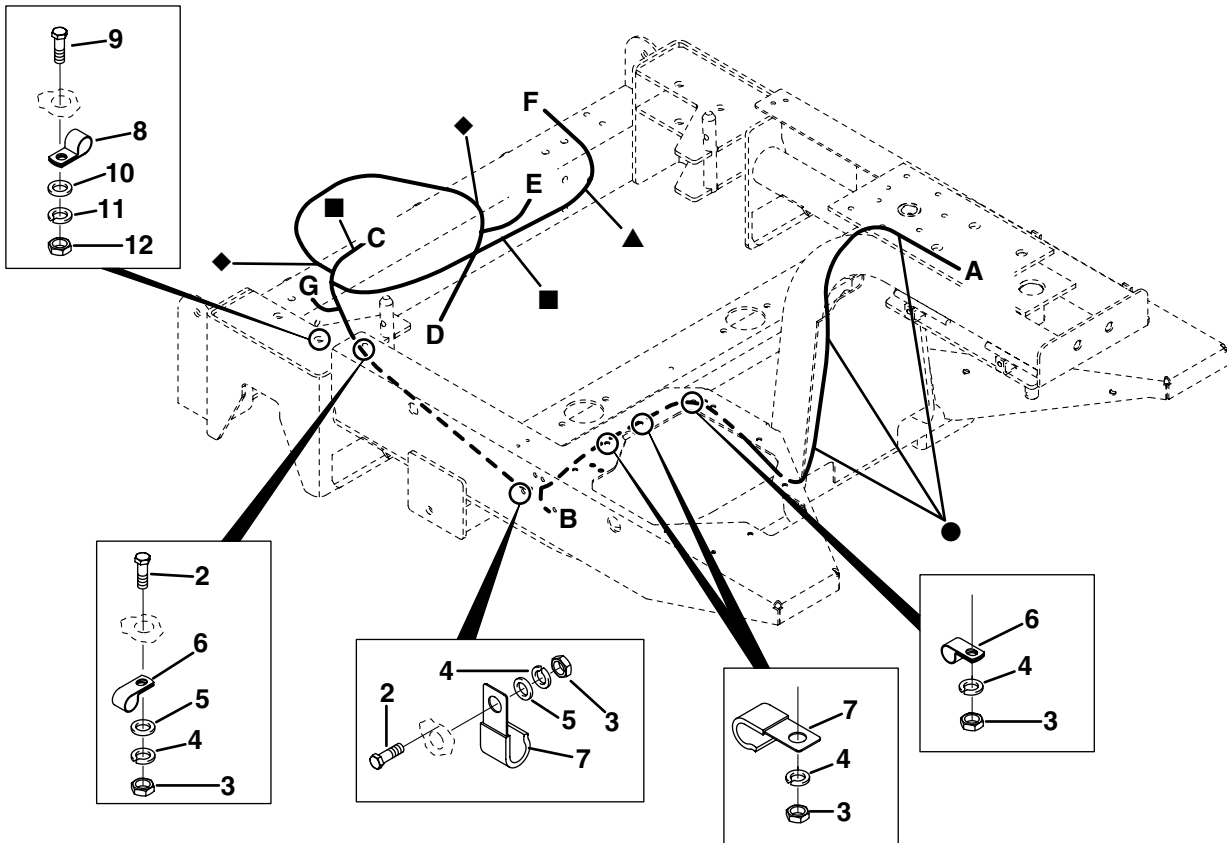


# ELECTRIC SAND SCORPION

Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	1003407	1	Box, Electrical	
2	3007328	1	Cover, Electrical Box	
3	3009133	1	Traction Controller	
4	3002936	1	Solenoid, 48V DC SPST	
5	3004061	1	Stud, Insulated Black	
6	3004062	1	Stud, Insulated Red	
7	3004520	2	Holder, Fuse	
8	3007341	1	Fuse, 20A 250V	
9	363642	1	Fuse, 10A	
10	366984	1	Grommet	
11	1003408	1	Cable, Traction Control	
12	3007574	2	Rod End, Female #10-32	
13	3006324	1	Switch, Forward/Reverse	
14	463001	1	• Key, Woodruff #3	
15	3006764	1	Lever	
16	415510	1	Screw, 1/4-20 x 1/4 Socket Head Set	
17	408889	8	Screw, #10-24 x 5/8" Thread Cutting	
18	400106	2	Screw, 1/4-20 x 5/8" Hex Head	
19	446130	13	Lockwasher, 1/4 Heavy	
20	453023	17	Flat Washer, 1/4	
21	443102	11	Nut, 1/4 Hex	
22	402118	4	Screw, #10-24 x 1/2" Round Head	
23	452002	11	Flat Washer, #10	
24	446118	5	Lockwasher, #10 Heavy	
25	444310	6	Nut, #10-24 Hex	
26	434019	1	Screw, #10-24 x 1-1/2" Socket Head	
27	444312	1	Nut, #10-32 Hex	
28	1003502	1	Bracket, Cable Support	
29	434034	1	Screw, #10-24 x 1" Socket Head	
30	400108	2	Screw, 1/4-20 x 3/4" Hex Head	
31	446128	3	Lockwasher, 1/4	
32	354081	1	Clamp, 3/8" I.D.	
33	354080	1	Clamp, 1" I.D.	
34	400112	12	Screw, 1/4-20 x 1" Hex Head	
35	3008739	1	Bracket, Box Support	
36	364646	1	Plug, Plastic	
37	3008539	1	Plate, Spacer	
38	452004	1	Flat Washer, 1/4	
39	3009056	1	Decal, Fuse	
40	453004	12	Flat Washer, #8	
41	3004129	1	Gasket, Neoprene	
42	400112	3	Screw, 1/4-20 x 1" Hex Head	

> Change from previous revision

## 15.1 Electrical Routing



### Connections

A - Head Light

B - Brake Switch

C - Electrical Box

D - Instrument Panel

E - Seat Switch

F - Actuator

G - Tachometer

●■◆▲ - Attach to Tractor Using Clamp  
in Location Indicated

# ELECTRIC SAND SCORPION

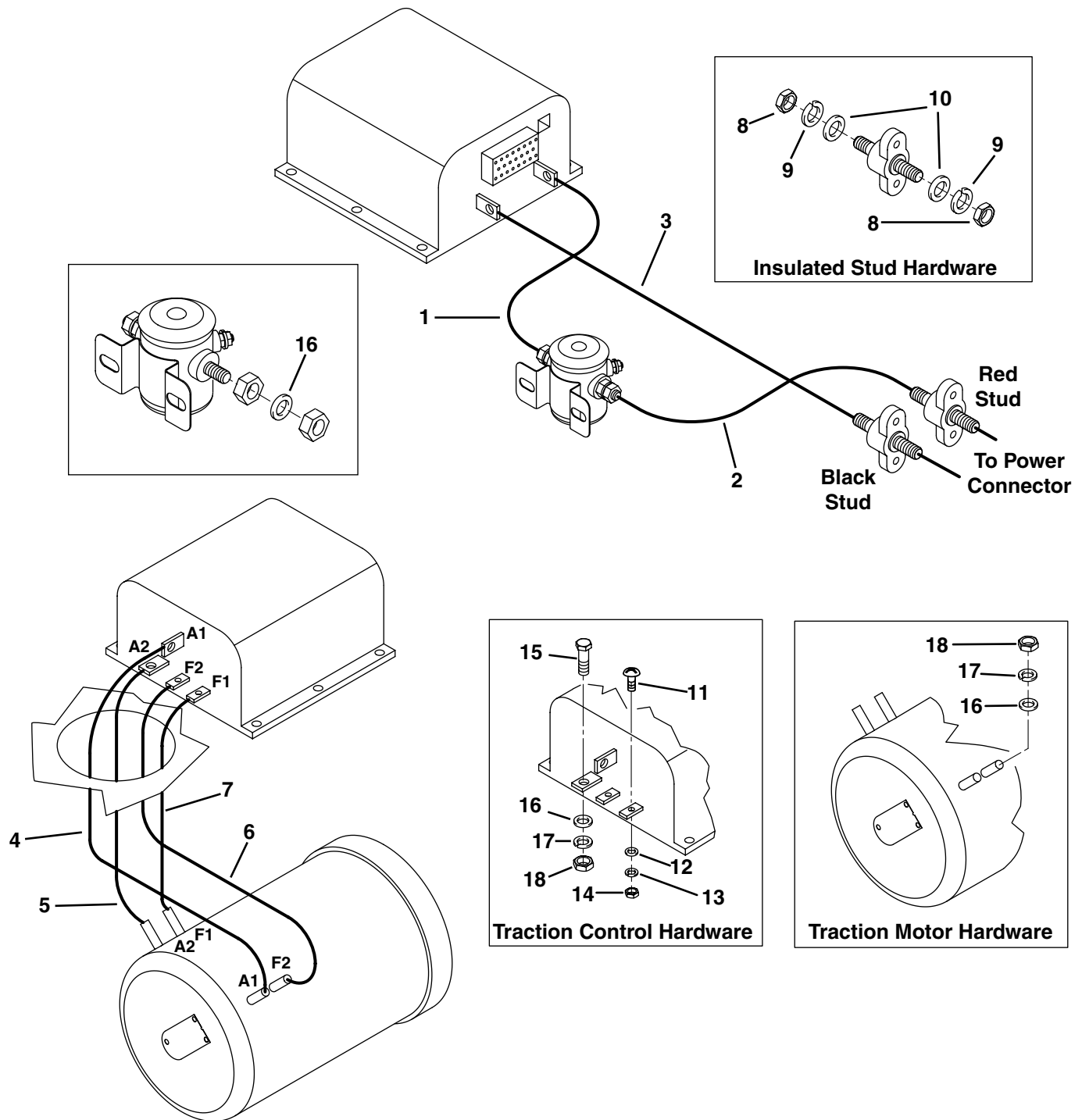
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	1003132	1	Wire Harness	
2	400108	4	Screw, 1/4-20 x 3/4" Hex Head	
3	443102	6	Nut, 1/4-20 Hex	
4	446128	6	Lockwasher, 1/4	
5	452004	5	Flat Washer, 1/4	
6	354081	5	Clamp, 3/8" I.D. "P"	
7	3004721	3	Clamp, 1/2" I.D. "J"	
8	3003773	1	Clamp, 1/4" I.D. "P"	
9	400188	1	Screw, 5/16-18 x 1" Hex Head	
10	453009	1	Flat Washer, 5/16	
11	446136	1	Lockwasher, 5/16 Heavy	
12	443106	1	Nut, 5/16-18 Hex	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 16.1 Electrical Cables



# ELECTRIC SAND SCORPION

Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	3007725	1	Cable, Solenoid to Controller	
2	3004172	1	Cable, Red Stud to Solenoid	
3	3007724	1	Cable, Black Stud to Controller	
4	3007727	1	Cable, Controller A1 to Motor A1	
5	3007728	1	Cable, Controller A2 to Motor A2	
6	3007729	1	Cable, Controller F2 to Motor F2	
7	3007730	1	Cable, Controller F1 to Motor F1	
8	443110	4	Nut, 3/8-16 Hex	
9	446140	4	Lockwasher, 3/8	
10	453011	4	Flat Washer, 3/8	
11	403912	2	Screw, #10-24 x 5/8" Truss Head	
12	452002	2	Flat Washer, #10	
13	446116	2	Lockwasher, #10	
14	444310	2	Nut, #10-24 Hex	
15	400182	4	Screw, 5/16-18 x 5/8" Hex Head	
16	453009	10	Flat Washer, 5/16	
17	446136	8	Lockwasher, 5/16 Heavy	
18	443106	8	Nut, 5/16-18 Hex	

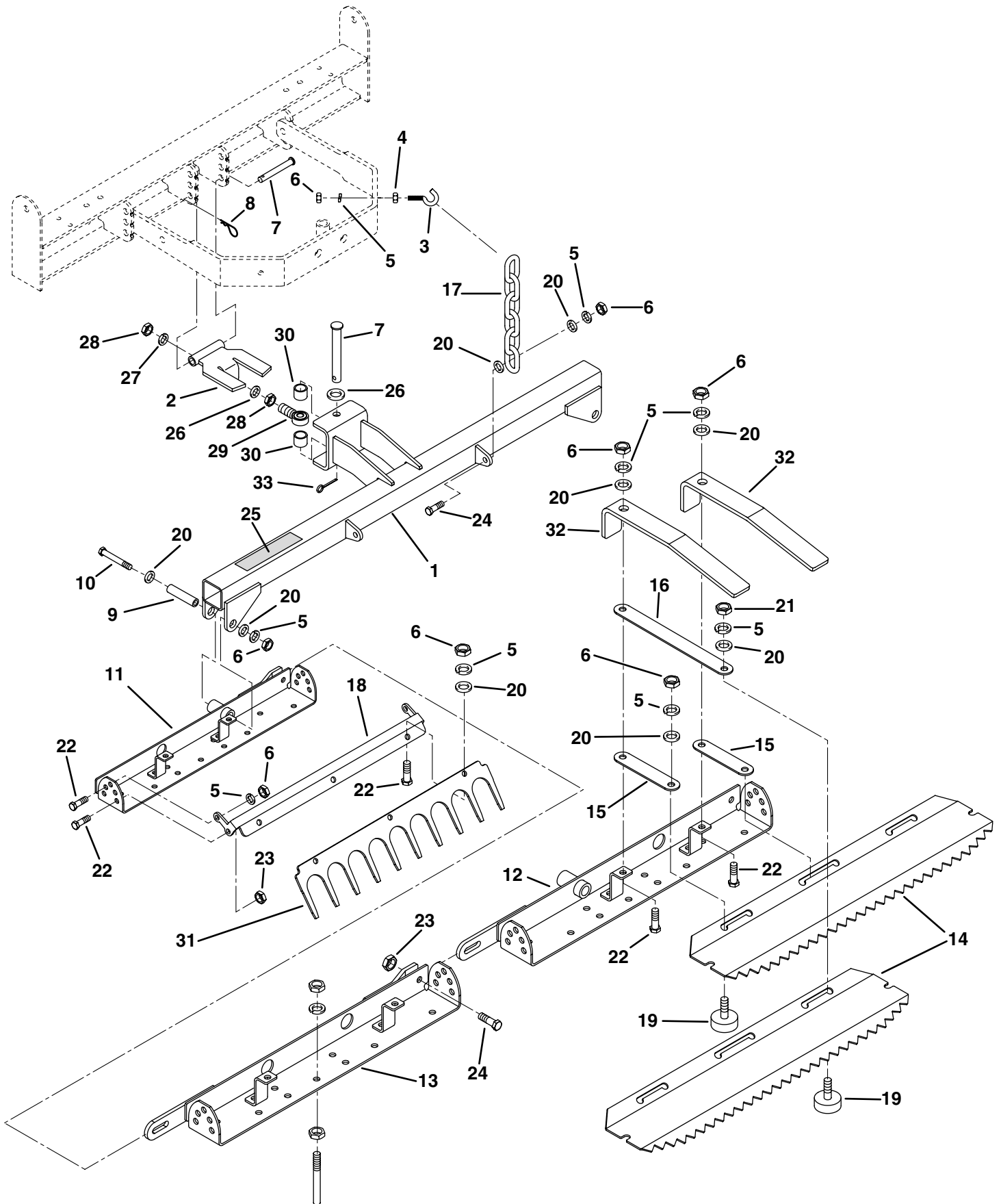
> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 17.1 Trap Rake

Product Number 88014



# ELECTRIC SAND SCORPION

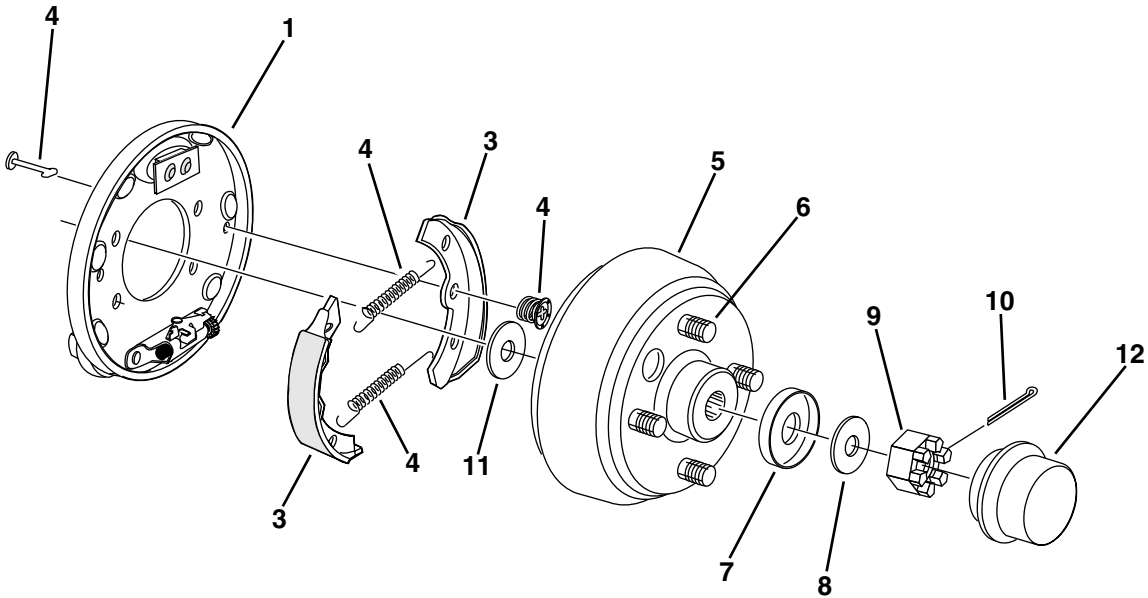
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	1002881	1	Bar Assembly	
2	1004164	1	Hitch	
3	551061	2	Hook Bolt	
4	443810	2	Nut, 3/8-16 Hex Jam	
5	446142	37	Lockwasher, 3/8 Heavy	
6	443110	27	Nut, 3/8-16 Hex	
7	3007562	2	Pin, 1/2 x 4" Clevis	
8	460335	1	Pin, 1/8 x 2-3/8" Hair	
9	3007652	2	Bushing, Rake Pivot	
10	401028	2	Screw, 3/8-16 x 3-1/4" Hex Head	
11	1003514	1	Section, Left Rake	
12	1003515	1	Section, Right Rake	
13	1003516	1	Section, Center Rake	
14	3006181	5	Rake, Finish	
15	3006178	6	Strap, Short	
16	3006177	4	Strap, Long	
17	3006375	2	Chain, Rake Lift	
18	3009018	3	Rake, Adjustable	
19	354989	10	Stop, Rubber	
20	452008	33	Flat Washer, 3/8	
21	443112	10	Nut, 3/8-24 Hex	
22	400260	21	Screw, 3/8-16 x 7/8" Hex Head	
23	444762	8	Locknut, 3/8-16 Center	
24	400264	10	Screw, 3/8-16 x 1-1/4" Hex Head	
25	3007502	1	Decal, Jacobsen	
26	452012	2	Flat Washer, 1/2	
27	446154	1	Lockwasher, 1/2 Heavy	
28	443820	2	Nut, 1/2-20 Hex Jam	
29	365104	1	Rod End	
30	352781	2	Tube, Spacer	
31	3009019	3	Rake, Adjustable	
32	3009192	6	Bar, Anti-Flip	
33	460038	1	Cotter Pin	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 18.1 Brake Assemblies

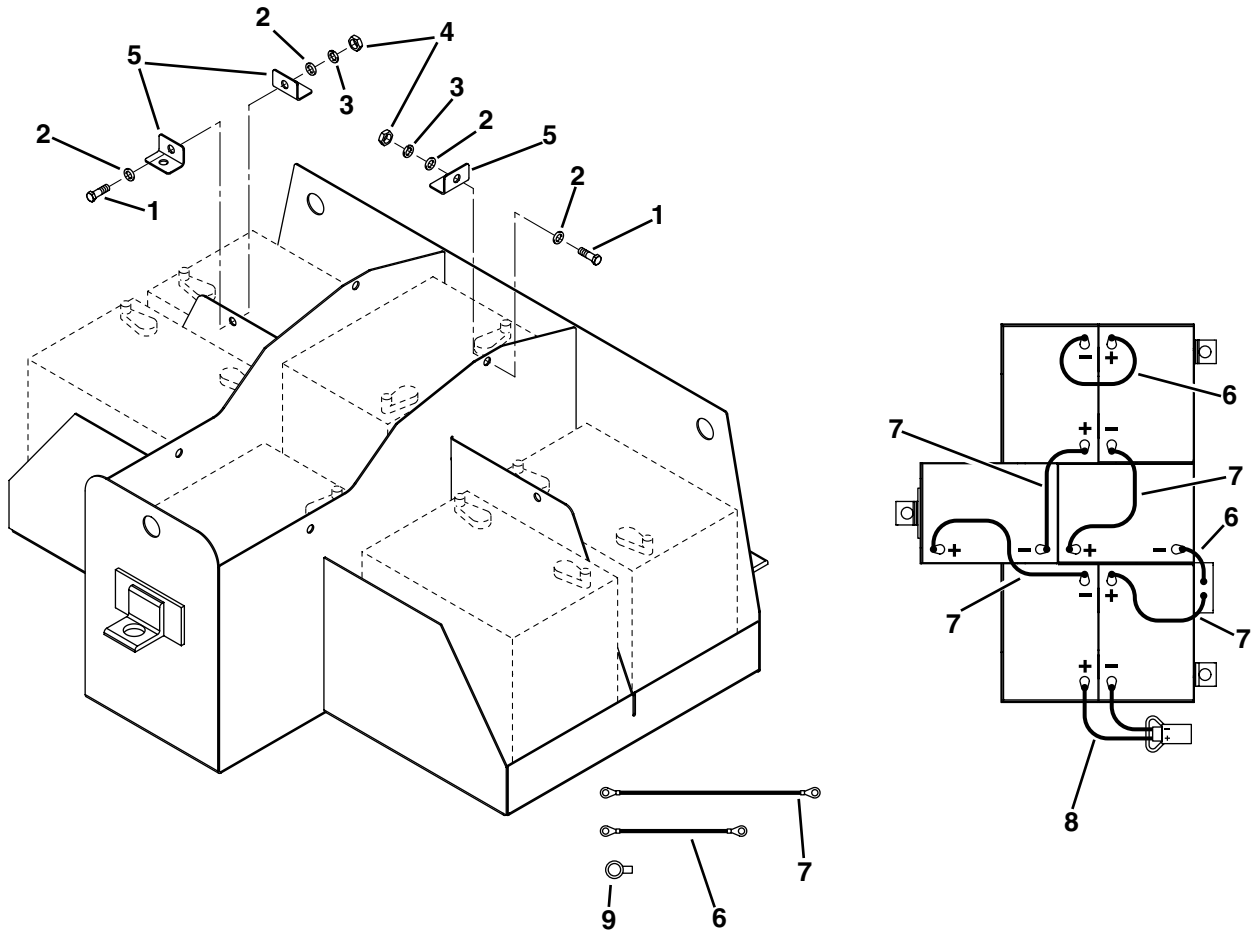


Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	3008510	1	L.H. Brake Assembly	
2	3008509	1	R.H. Brake Assembly	
3	5002428	1	Shoe Kit	
4	5002429	1	Spring Kit	
5	557307	2	Brake Drum	
6	549730	4	Bolt, 1/2-20 Lug	
7	556262	2	Cap, Spindle Adapter	
8	556256	2	Washer, Brake Drum	
9	445672	2	Nut, 5/8-18 Slotted Hex	
10	460032	2	Cotter Pin, 1/8 x 1-1/2"	
11	556255	2	Washer, 1-5/32 O.D. x 25/32 I.D.	
12	3003373	2	Dust Cap	

> Change from previous revision



## 19.1 Battery Tray Cables



Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	400110	8	Screw, 1/4-20 x 7/8" Hex Head	
2	453023	16	Flat Washer, 1/4	
3	446128	8	Lockwasher, 1/4	
4	443102	8	Nut, 1/4-20 Hex	
5	3007237	8	Hold Down, Battery	
6	3007774	2	Cable, 6-7/8" Battery	
7	3007773	4	Cable, 11-3/8" Battery	
8	1003552	1	Battery Connector (Tray Side)	
9	3007772	12	Terminal Cover	

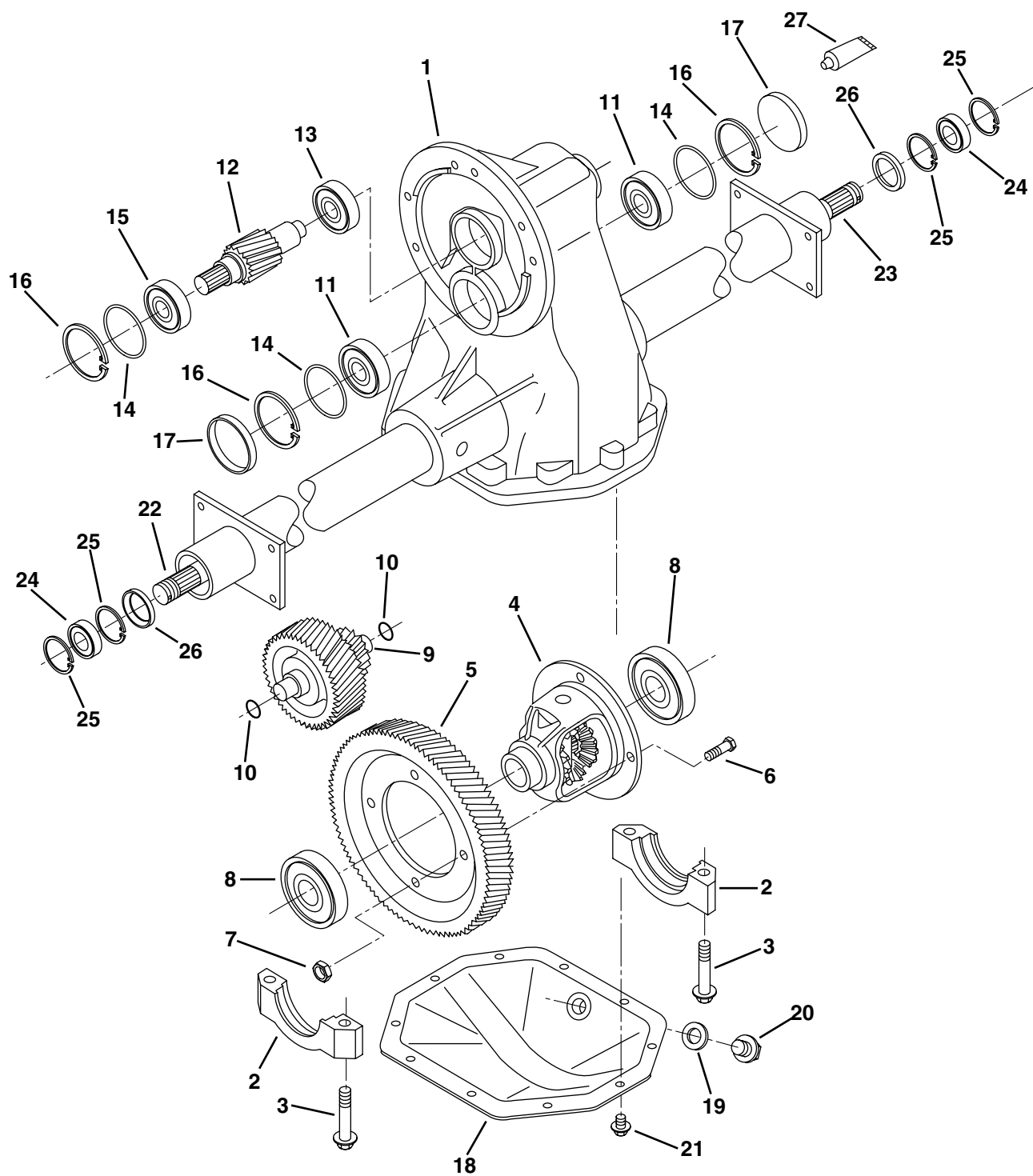
> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 20.1 Drive Axle

Part Number 1001339



# ELECTRIC SAND SCORPION

Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	5003016	1	Housing Service Assembly	
2	N/S	2	Bearing Cap	
3	5003001	4	Bolt, Bearing Cap	
4	5003000	1	Differential Case Assembly	
5	N/S	1	Gear, Output	Included in Kit B
6	5003023	4	Cap Screw	
7	5003024	4	Nut, Lock	
8	5003008	2	Bearing, Ball	Included in Kit C
9	N/S	1	Intermediate Gear Shaft	Included in Kit B
10	5003005	2	"O" Ring	
11	5003007	2	Bearing, Ball	Included in Kit C
12	N/S	1	Input Gear Shaft	Included in Kit B and D
13	5003006	1	Bearing, Ball	Included in Kit C
14	5003004	3	"O" Ring	
15	5003003	1	Bearing, Ball	Included in Kit C
16	5003002	3	Snap Ring	
17	N/S	2	Plug, Cup	Included in Kit A
18	5003012	1	Cover, Carrier	
19	5003021	1	Washer, Flat	
20	5003015	1	Plug, Fill	
21	5003022	10	Screw, Cover Plate	
22	5003011	1	Shaft, L.H. Axle	
23	5003010	1	Shaft, R.H. Axle	
24	5003009	2	Bearing, Ball	
25	5003013	4	Snap Ring	
26	5003014	2	Seal, Oil	
27	N/S	1	Tube, Sealant	Included in Kit A
A	5003019	1	Intermediate Gear Seal Kit	Includes Items 17 and 27
B	5003018	1	Gear Set	Includes Items 5, 9 and 12
C	5003017	1	Bearing Kit	Includes Items 8, 11, 13 and 15
D	5003020	1	Input Gear Kit	Includes Item 12

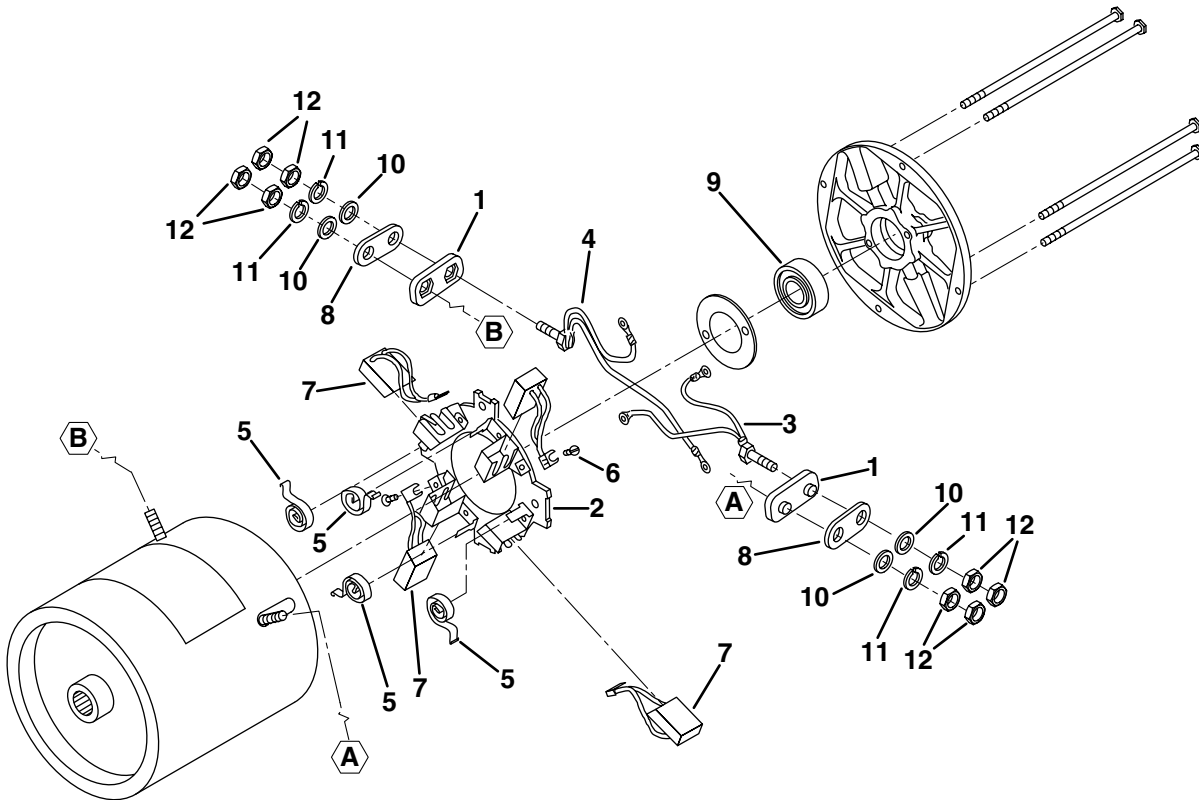
> Change from previous revision

# ELECTRIC SAND SCORPION

## 21.1 Traction Motor

Serial No. 1601 and Up

Part Number 3003196



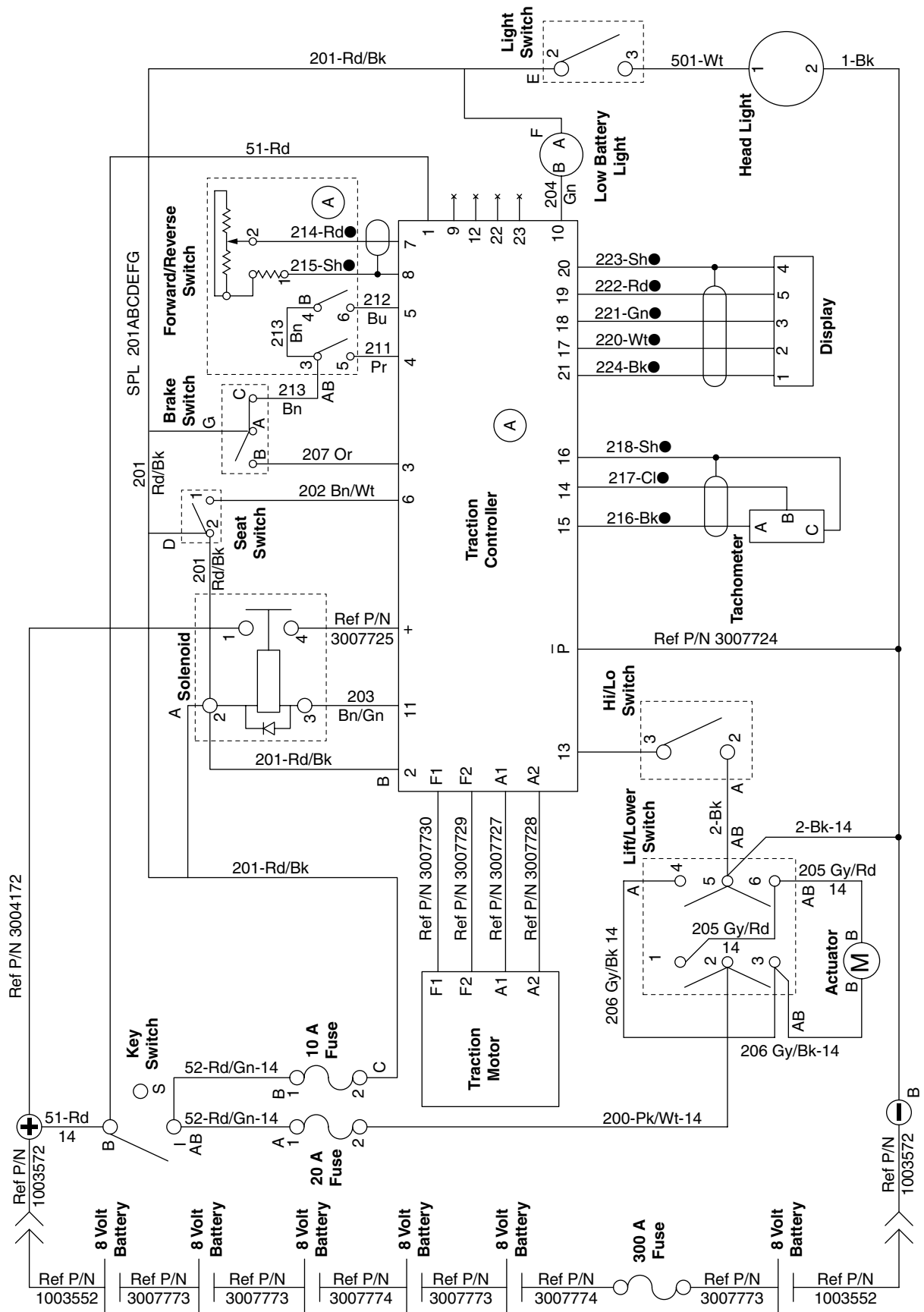
Item	Part No.	Qty.	Description	Serial Numbers/Notes
1	5002973	2	Insulating Bushing	
2	5002974	1	Brush Mechanism	
3		1	Crossover and Terminal A2	
4		1	Crossover and Terminal A1	
5		4	Spring, Brush	
6		4	Screw, Brush Terminal	
7		4	Brush	
8	5002975	2	Insulating Bushing	
9	5002976	1	Bearing	
10	453009	4	Flat Washer, 5/16	
11	446136	4	Lockwasher, 5/16 Heavy	
12	443106	8	Nut, 5/16-18 Hex	

> Change from previous revision

# ELECTRIC SAND SCORPION

Serial No. 1601 and Up

## 22.1 Electrical Schematic



# INDEX

1001339.....	45	3003951.....	39	3007562.....	46, 55	3009753.....	29
1001441.....	41	3003954.....	30	3007574.....	49	3010134.....	37
1001836.....	39	3003955.....	35	3007598.....	29	3010228.....	27
1002456.....	39	3004061.....	49	3007627.....	33	319755.....	29, 31, 39
1002461.....	39	3004062.....	49	3007629.....	33	344545.....	35
1002573.....	43	3004129.....	49	3007637.....	33	351956.....	37
1002576.....	41	3004172.....	53	3007638.....	35	352726.....	33, 35
1002577.....	41	3004392.....	30	3007652.....	55	352781.....	55
1002701.....	43	3004496.....	29	3007690.....	27	352936.....	35
1002726.....	43	3004520.....	49	3007724.....	53	354080.....	29, 49
1002728.....	43	3004721.....	45, 51	3007725.....	53	354081.....	43, 49, 51
1002881.....	55	3004746.....	30	3007727.....	53	354807.....	41, 45
1002971.....	46	3004978.....	27	3007728.....	53	354989.....	33, 35, 55
1002972.....	46	3004998.....	27	3007729.....	53	360111.....	41, 45
1003112.....	33	3004999.....	27	3007730.....	53	361808.....	41
1003117.....	33	3005291.....	31	3007734.....	27	362469.....	30
1003121.....	35	3005345.....	43	3007772.....	57	363642.....	49
1003122.....	35	3005435.....	39	3007773.....	57	364646.....	49
1003132.....	51	3005556.....	43	3007774.....	57	364741.....	37
1003282.....	31	3005557.....	41	3007854.....	37	365104.....	55
1003391.....	29	3005562.....	43	3007855.....	37	366984.....	49
1003393.....	46	3005564.....	43	3007856.....	37	367037.....	35
1003407.....	49	3005565.....	43	3007863.....	27	5002171.....	37
1003408.....	49	3005574.....	43	3007871.....	27	5002286.....	37
1003481.....	30	3005763.....	41	3007878.....	27	5002428.....	56
1003502.....	49	3005764.....	41	3007879.....	27	5002429.....	56
1003514.....	55	3006177.....	55	3007883.....	27	5002575.....	39
1003515.....	55	3006178.....	55	3007887.....	27	5002777.....	41, 45
1003516.....	55	3006181.....	55	3008040.....	35	5002900.....	29
1003552.....	57	3006324.....	49	3008121.....	29	5002910.....	41
1003572.....	29	3006375.....	55	3008134.....	41, 45	5002916.....	41
1003698.....	39	3006436.....	30	3008305.....	37	5002973.....	60
1003822.....	46	3006637.....	30	3008369.....	29	5002974.....	60
1003923.....	33	3006716.....	45	3008492.....	33	5002975.....	60
1004164.....	55	3006750.....	33	3008493.....	33	5002976.....	60
132857.....	30	3006757.....	35	3008495.....	33	5002998.....	47
163955.....	29	3006764.....	49	3008497.....	33	5003000.....	59
2811364.....	43	3006785.....	33	3008509.....	56	5003001.....	59
2811365.....	43	3006808.....	46	3008510.....	56	5003002.....	59
2811578.....	37	3006941.....	33	3008527.....	33	5003003.....	59
2811579.....	37	3006942.....	33	3008539.....	49	5003004.....	59
3000439.....	46	3006988.....	31	3008589.....	29	5003005.....	59
3002932.....	39	3006991.....	31	3008603.....	29	5003006.....	59
3002936.....	49	3007056.....	27	3008610.....	29	5003007.....	59
3003143.....	35	3007107.....	39	3008690.....	33	5003008.....	59
3003196.....	45	3007118.....	39	3008739.....	49	5003009.....	59
3003373.....	56	3007119.....	39	3009018.....	55	5003010.....	59
3003374.....	45	3007129.....	27	3009019.....	55	5003011.....	59
3003375.....	45	3007237.....	57	3009023.....	33	5003012.....	59
3003382.....	37	3007328.....	49	3009056.....	27, 49	5003013.....	59
3003474.....	35	3007341.....	49	3009074.....	31	5003014.....	59
3003475.....	33	3007358.....	39	3009131.....	41	5003015.....	59
3003547.....	30	3007502.....	55	3009133.....	49	5003016.....	59
3003561.....	35	3007503.....	27	3009156.....	29	5003017.....	59
3003602.....	35	3007512.....	27	3009192.....	55	5003018.....	59
3003773.....	51	3007561.....	46	3009597.....	33	5003019.....	59

# INDEX

---

5003020.....	59
5003021.....	59
5003022.....	59
5003023.....	59
5003024.....	59
5003042.....	47
5003043.....	47
5003044.....	47
5003048.....	47
5003049.....	47
5003050.....	47
5003051.....	47
500596.....	41
545692.....	41
549730.....	56
551061.....	55
554329.....	41
554390.....	31
556255.....	45, 56
556256.....	56
556261.....	45
556262.....	56
557307.....	45, 56
558015.....	30
558037.....	30
952770.....	39

