ELECTRICAL SYSTEM INFORMATION FOR LAWN & GARDEN PRODUCT
20 & 22” BATTERY INFORMATION

GENERAL INFORMATION (COURTESY OF HAWKER ENERGY PRODUCTS INC.)

The battery used on the 20 & 22 inch walk-behind is a Sealed-Lead Battery which utilizes cells made of a pure lead-tin material. These types of batteries are classified as “non-spillable wet electric storage batteries” and may be shipped as such. (Figure 13)

Overcharging and undercharging can both decrease battery life. Undercharging is more detrimental to a battery and decreases battery life more quickly than overcharging. When using the charger supplied with the battery, charge for 12–16 hours after every mowing to maintain optimum battery performance.

A Constant Volt Charger is recommended for Hawker Batteries.

As a general rule of thumb, charge the battery to 105–110% of the capacity used on the discharge. To guarantee a complete and adequate recharge, 1.05–1.10 ampere-hours (Ah) should be returned to the battery for every 1 Ah that is discharged.

Heat is the major cause of battery deterioration. For every 13–18°F increase above 77°F ambient temperature, the expected life of the battery goes down by 50%. As the temperature rises, electrochemical activity within the battery increases and the life is shortened.

Hydrogen gas generation is reduced by the use of the pure lead-tin material. But, some Hydrogen will escape, especially in an overcharge situation. So, DO NOT CHARGE in a closed container. Our battery cover is not considered a sealed container.

If the terminals of the battery are short circuited, an extremely high instantaneous current will be generated. These large currents will cause serious injury or damage. DO NOT SHORT CIRCUIT THE BATTERIES ACROSS THE NEGATIVE AND POSITIVE TERMINALS.

Batteries of different capacities, age, or make should not be mixed within the same system.

STORAGE

The battery should be charged prior to storage and charged again before being put back into use. The battery may be stored with the unit. These batteries are rated to −40°F and at that temperature it will retain its charge much better than at room temperature.
REMOVAL/NORMAL RECHARGING

1. Disconnect wiring harness. (Figure 14)
2. Push quick release and remove battery case.
3. Attach charger to battery. (Figure 15)
4. Plug charger to an electrical outlet.
5. Charge for 12–16 hours.
6. Disconnect charger from outlet and wall.
7. Attach battery case to handle.
8. Connect wiring harness to battery.

NOTE: Do Not leave the charger connected to the battery if the charger is not plugged to a wall outlet. The charger will drain the battery.

BATTERY TEST PROCEDURE (COURTESY OF HAWKER ENERGY PRODUCTS INC.)

Procedure:

1. Disconnect battery from charger, wire harness, or any other circuit. If battery has just been charged, voltage may be artificially inflated and should be allowed to "rest" for at least 4 hours in order for voltage to stabilize.
2. Check open circuit voltage (OVC) at the connector. A fully charged battery should have a minimum OVC of 12.84 volts. If reading falls below this number, charge overnight with a known reliable charger. (See NOTE below)
3. Repeat Step #1 above, then re–check OVC. If voltage has not recovered at all from original reading, replace battery. An older battery may not reach 12.84 volts, but still may start the mower with no problem.
4. Whether the battery is placed back into service or replaced, advise the end–user that the battery should always be charged after use. Although it may still start the mower, the energy used to start it needs to be replenished to keep the battery at a high state of charge.

NOTE ON “Known reliable Charger”: This refers to any charger that has a minimum 1.5 amps available and charges at a constant voltage of between 14.7 and 15.0 volts. If the charger’s output is less than 13.5 volts, it will not fully recharge the battery. For constant volt chargers, there is no current limit. A 6–amp or 10–amp charger or even more is acceptable to use, but a minimum of 1–amp is required if the battery is discharged quite a bit.

FOR MORE INFORMATION ON BATTERIES, CONTACT:

HAWKER ENERGY PRODUCTS INC.
617 North Ridgeview Drive
Warrensburg, MO 64093–9301, USA
Telephone: (660) 429–2165
Fax: (660) 429–6397
Website: www.hepi.com
TRACTOR BATTERY INFORMATION

GENERAL INFORMATION

WARNING: Batteries produce explosive gases. Keep cigarettes, flames and sparks away from batteries at all times. Protect your eyes at all times. Never lean over a battery when jump starting or performing other maintenance.

Remove and replace any battery that has evidence of cracks in the case or cover. If the battery is leaking, place the battery in a plastic bag and take to a proper recycling plant.

Check the Batteries Charging State

There are two (2) types of “wet–cell” batteries. (1) Maintenance Free and (2) Serviceable Batteries which have removable vent caps.

(1) Maintenance Free Batteries are only free from servicing in that you do not need to add water. Yet, the amount of acid or electrolyte may deplete due to excessive heat or improper regulator settings. Use a Voltmeter to check the Charging Status of the battery. Re–charge if necessary. Never open these types of batteries.

(2) Serviceable Batteries require maintenance service each year. To check to see if this type of battery is good, measure the Open Circuit Voltage with a Voltmeter or take a Specific Gravity reading of the Electrolyte with a Hydrometer. If the circuit reading is below 12.4 volts or the Specific Gravity reading is below 1.225 SG, charge the battery. If the electrolyte levels are too low for a Hydrometer reading add water to the cells.

NOTE: If water is added to a battery, make sure you run the engine to charge the battery so the acid and water will mix. This is especially important in cold weather as the water in the battery can freeze.

Fill the battery cells with clear, odorless drinking water. Distilled water is preferred, especially if the water in your area has a high iron content. Fill each cell until the level is to the bottom of the vent well in (Figure 17). DO NOT OVERFILL. Overfilling a battery will cause the acid to bubble out the vent caps corrode the metal part and damage the belts.

Load Testing The Battery

Follow–up the hydrometer or open circuit voltage test with an adjustable load test to make sure the battery has enough electrical charge. Follow the instructions on the tester. If the battery keeps a minimum voltage of 9.6 for 30 seconds while under load, the battery is in good condition. If not, recharge and test again. If it fails a second time replace the battery.
Battery Charging Tips

- Charge the battery if the circuit reading is below 12.4 volts or the Specific Gravity reading from a hydrometer is below 1.225 SG or the load test is below 9.6 volts.
- Keep vent caps in place when charging battery.
- DO NOT CHARGE FOR MORE THAN 48 HOURS.
- If the hydrometer readings or voltage readings have not improved after two hours, stop charging the battery. Any further charging will damage the battery.
- If a battery will not come to full charge (1.260 SG or 12.6 Volts), replace the battery.
- If the battery case feels hot, reduce or temporarily stop the charging process.
- NEVER try to charge a frozen battery. Let the battery warm–up to room temperature first.
- NEVER trickle–charge a battery for more than 48 hours.

Jump Starting The Battery

Accidents happen! Always shield your eyes and face when working around batteries. Make sure the vent caps are pushed in completely and cover with a damp cloth. Use a good quality set of booster cables and proceed as follows:

1. Connect the RED cable to the positive (+) post of the weak battery.
2. Connect the other end of the same red cable to the positive (+) post of a good battery.
3. Connect the BLACK cable to the negative (–) post of the good battery.
4. Next, connect the other end of the BLACK cable to a GROUNDED metal part of the engine of tractor frame.
5. Start both engines and remove the cables in reverse order from above. Remove and discard the damp cloths from each battery.

FIGURE 18: JUMP STARTING HOOK–UP

<table>
<thead>
<tr>
<th>BATTERY VOLTAGE</th>
<th>STATE OF CHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.6</td>
<td>100%</td>
</tr>
<tr>
<td>12.4</td>
<td>75%</td>
</tr>
<tr>
<td>12.2</td>
<td>50%</td>
</tr>
<tr>
<td>12.0</td>
<td>25%</td>
</tr>
<tr>
<td>11.8</td>
<td>0%</td>
</tr>
</tbody>
</table>
TESTING THE SOLENOID

When the engine of a riding mower will not turn over, there are a few possible reasons for this outside of the engine itself. One reason is the battery does not have sufficient charge (refer to pages 54–55 for charging information). Another reason is a problem with the Wiring Harness/Operator Presence System (refer to pages 56–64 for troubleshooting information). Finally, the last possible reason is a bad solenoid. The test procedure below will determine if the solenoid is good or bad.

1. At the solenoid, disconnect the cable lead that runs from the solenoid to the starter.

2. With a multi-meter, check the battery for sufficient charge. It should read between 12.6 and 12.4 open circuit voltage. If the reading is less than 12.4, then charge the battery before proceeding. For the solenoid to work properly, it needs a minimum of 8.5VDC during cranking.

3. If the battery has sufficient charge, then check the solenoid’s coil resistance. To check the resistance, disconnect the lead that goes to the primary terminal. Check the resistance between the primary terminal and the base of the solenoid. If there is no resistance between those two points, then the coil of the solenoid is either burnt or one or both coil leads are broken. At this point, the solenoid should be replaced.

4. If there is resistance between the coils, then see if the solenoid will click. Using a lead wire with clips, connect one end of the lead wire to the positive post of the battery and the other end of the lead to the solenoid primary terminal. (Figure 20)

5. If the solenoid does not click, then check the ground between the solenoid and the frame. With the first lead wire still connected, attach another test lead to the negative post of the battery and attach it to the base of the solenoid. If the solenoid clicks, then there is a grounding problem. Remove the solenoid and sand away any rust or paint build-up that may be interfering with the ground. If the solenoid still does not click, then it is safe to assume that the solenoid is bad. Remove and replace with a good solenoid. (Figure 20)

6. If the ground is good and the solenoid clicks, it does not necessarily mean that the solenoid is good. A continuity check must be made across the top two terminals while the solenoid is energized. (Figure 20)

7. If the solenoid has continuity across the terminals, then the solenoid is good. If there is no continuity across the terminals, then the solenoid is bad. Remove and replace with a good solenoid.

NOTE: Coil resistance should be approximately between 3.46–3.96 Ohms.

FIGURE 19: CHECK COIL RESISTANCE

FIGURE 20: CHECK GROUND & CONTINUITY BETWEEN THE TERMINALS
INTRODUCTION

The four DIAGNOSTIC CHARTS contained in this section are intended to assist the technician in diagnosing electrical issues with MURRAY riding mowers. Most of the wiring and components described in the charts are common to riding mowers MURRAY has produced since 1970. However, the seat switches and double pole switches utilized in the operator presence circuits apply to products produced since 1987.

The charts begin with instructing the technician to conduct a thorough visual check. Next, the three most common electrical issues are diagnosed step by step. The charts are titled as follows:

1. THE VISUAL CHECK

2. THE BLOWN FUSE

3. GOOD FUSE / NO CRANK

4. ENGINE CRANKS / NO START

Please note that the term “NO CRANK” describes a situation where the engine starter will not engage. The term “NO START” describes a situation where the starter is engaged and turning the engine flywheel; however, the engine will not start and run.

This information was first intended to be used with the MURRAY ELECTRICAL VIDEO VOLUME II. This video is available under Part Number S–4005. In the video, there are screen dialogue boxes which appear that will refer you to a chart number and section in the DIAGNOSTIC CHARTS from this book to follow along.

Finally, notice on the charts that you are occasionally referred to numbers at certain points (e.g., DIAGNOSTIC CHART 2, Section A, “SEE 3”). The details of the twelve number references on the charts are described on the next two pages.

We hope that this section helps you to diagnose, troubleshoot, and repair any electrical system problems that you are attempting to solve.
At selected points in the DIAGNOSTIC CHARTS, you will be instructed to “See” a particular number. Listed below are details of the twelve numbers referenced in the charts.

1. **FUSE**
   1. Never install a fuse with a higher than recommended amperage rating.
   2. Make certain the fuse is fully inserted into the holder.

2. **WIRING HARNESS**
   1. Inspect all wires for breaks, damaged insulation, loose and/or corroded connections.
   2. Using the wiring schematic, check the routing of wires to components and connectors.
   3. Repair or replace the wiring harness if damaged or defective.

3. **KEY SWITCH**
   1. Although they are sometimes very similar in appearance externally, the internal circuitry does differ between different part numbers of key switches.
   2. Always refer to the Illustrated Parts Lists (IPL) for the correct part number.
   3. Refer to the wiring schematic for information on the routing of wires to and from the key switch.

4. **ALTERNATOR**
   Always refer to the engine manufacturer’s servicing information for alternator testing procedures.

5. **FUEL SOLENOID**
   1. This electrically actuated component controls fuel flow in the injection pump.
   2. An interruption of power supplied to the solenoid will shut off the fuel supply.
   3. Always refer to the specific engine manufacturer’s servicing information for fuel solenoid testing procedures.
6. **BATTERY**

1. Make sure the ground cable of the battery is firmly attached to the frame of the riding mower and the electrical connection is free of paint and corrosion.

2. Check the OPEN CIRCUIT VOLTAGE of the battery. Use the chart below to determine the state of charge of the battery.

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</tr>
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<td>11.8</td>
<td>0%</td>
</tr>
</tbody>
</table>

3. Charge the battery per the recommendations on the battery labeling.

4. Always follow the OPEN CIRCUIT VOLTAGE test with an adjustable load test to determine if the battery has adequate electrical performance.

7. **STARTER**

1. Paint and dirt between the base of the engine and the frame will result in a poor grounding of the starter.

2. Always refer to the engine manufacturer’s servicing information for starter testing procedures.

8. **SOLENOID**

* CAUTION !*

When testing the solenoid, always make certain that the blades are disengaged and the motion drive is in neutral. In addition, thoroughly inspect the mower for debris and / or fuel that could be ignited by electrical sparks.

When performing the test described in (b.) below, the engine starter and battery terminals must be disconnected from the solenoid. Failure to do so will damage your continuity tester or VOM.

1. Paint and dirt between the metal base of the solenoid and the frame will result in a poor grounding of the solenoid.

2. The solenoid is energized through current flow in the primary wire. The solenoid can be tested by jumping a wire from the positive post of the battery to the primary post on the solenoid. A clicking noise indicates that the solenoid has engaged. A continuity check across the engine starter and battery terminals on the solenoid with the solenoid energized will confirm this assumption. However, the performance of the solenoid under starter load conditions could remain in question. Refer to the solenoid test procedure found elsewhere in this section.
REFERENCE NUMBERS

9. PTO SWITCH
   1. All PTO switches (since 1987) are double pole single throw (DPST).
   2. The normally open (NO) set of poles are utilized in the solenoid primary circuit.
   3. The normally closed (NC) set of poles are utilized in the operator presence circuit.

10. CLUTCH SWITCH
   1. Depending on the application, this switch could be a DPST or a single pole single throw (SPST). For example, the year 2000 rail frame tractor utilizes a DPST while the same year rear engine rider is equipped with a SPST clutch switch.
   2. The NO set of poles are utilized in the solenoid primary circuit.
   3. If so equipped, the NC set of poles are utilized in the operator presence circuit.

11. IGNITION COIL

Always refer to the engine manufacturer’s servicing information for ignition coil testing procedures.

12. SEAT SWITCH
   1. This switch is SPST; the poles are NC.
   2. The wiring harness connector for this switch is a special terminal connector. The connecting wires inside the terminal connector short circuit internally when disconnected. The short is opened when the connector is installed to the seat switch. By shorting internally when the terminal connector is disconnected the system fails safe should the seat switch be disconnected.
THE VISUAL CHECK

A
1. Disengage PTO
2. Depress Clutch / Lock Parking Brake
3. Turn Key Switch to START

B
CRANKS

C
NO CRANKS

IF NO START
GO TO ENGINE CRANKS / NO START SECTION

1. Visually check Battery Connections
2. Visually check Wiring Harness

D
NOT OK

E
CRANKS

F
NO CRANKS

IF NO START
GO TO ENGINE CRANKS / NO START SECTION

G
OK

H
GOOD FUSE

I
BLOWN FUSE

VISUALLY CHECK FUSE

GO TO GOOD FUSE / NO CRANK SECTION

GO TO BLOWN FUSE SECTION

REINSTALL FUSE
**BLOWN FUSE**

1. Ignition Key Switch connection
2. Wiring Harness Connections to ENGINE
3. Solenoid Primary Wire

**DISCONNECT:**

1. Reconnect Ignition Key Switch Connector
2. Cycle Key Switch and return to OFF

**INSTALL NEW FUSE**

**A**

**SEE 1**

**B**

**FUSE BLOWS**

**C**

**GOOD FUSE**

**SEE 2**

1. Reconnect Charging System Connector

**D**

**SEE 2**

**E**

**GOOD FUSE**

**SEE 2**

**F**

**FUSE BLOWS**

**SEE 2**

**G**

**GOOD FUSE**

**SEE 2**

**H**

**YES**

**I**

**FUSE BLOWS**

**SEE 2**

**J**

**NO**

**K**

**GOOD FUSE**

**SEE 2**

**GO TO GOOD FUSE / NO CRANK SECTION**
GOOD FUSE / NO CRANK

A
1. Disconnect Spark Plug
2. Drive System in NEUTRAL

CHECK BATTERY

SEE 6

B
BATTERY LOW
Charge & Load Test

BATTERY LOW
Remove and Replace

C
BATTERY OK
Turn Key Switch to START

D
SOLENOID ENGAGES “CLICKING”

SEE 8

SEE 7

E
SOLENOID NOT ENGAGING

1. Check Solenoid Primary Wire
2. Turn Key Switch to START

F
CRANKING

SEE 8

G
NOT CRANKING

1. Reconnect Spark Plug
2. Turn Key Switch to START

IF NO START, GO TO ENGINE CRANKS / NO START SECTION

H
NOT CRANKING
Replace Solenoid

I
CRANKING

Remove Jumper Wire

SEE 9 / SEE 10
SWITCHES BAD

1. Replace Spark Plug
2. Turn Key Switch to START

CRANKING

1. Replace Spark Plug
2. Turn Key Switch to START

NO CRANKING

1. Check for correct Switch
2. Check continuity in START Position

KEY SWITCH BAD

1. Replace Key Switch
2. Turn Key Switch to START

NO CRANKING

1. Reconnect Spark Plug
2. Turn Key Switch to START

PROBLEM SOLVED

IF NO START GO TO ENGINE CRANKS / NO START SECTION

START

NO START

IF NO START GO TO ENGINE CRANKS / NO START SECTION
ENGINE CRANKS / NO START

A

TRACTORS WITH SHIFT LEVER LOCATED AT CENTER CONSOLE

B

REAR ENGINE RIDER

C

RAIL FRAME TRACTOR

D

Occurs Seat while Cranking Engine

START

NO START

BEGIN MOWING

1. Disconnect Engine Kill Wire or Engine Kill / Fuel Solenoid Connection
2. Turn Key Switch to ON

Check Continuity of Engine Kill Wire to Ground

E

CONTINUITY

NO CONTINUITY

SEE 5

G

EQUIPPED WITH FUEL SOLENOID

NOT EQUIPPED WITH FUEL SOLENOID

J

1. Reconnect Engine Kill Wire or Engine Kill Wire / Fuel Solenoid Connection
2. Turn Key Switch to START

H

START

NO START

PROBLEM SOLVED

K

FOR FURTHER TROUBLESHOOTING INFORMATION REFER TO ENGINE MFG. SERVICE INFO.
# TABLE OF CONTENTS–ELECTRICAL SCHEMATICS

## ELECTRICAL WIRING SCHEMATICS

### 2002 & PREVIOUS HARNESSSES

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</table>

### 2003 HARNESSSES W / 6–PIN ENGINE CONNECTORS

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<td>139</td>
</tr>
<tr>
<td>MAIN HARNESS: 250X122</td>
<td>140</td>
</tr>
</tbody>
</table>
ELECTRICAL WIRING SCHEMATICS

MAIN HARNESS: 250X50
LIGHT HARNESS: 250X40

WIRING DIAGRAM FOR:
30, 38, 40" PAN FRAME 1995–2000
AC/DC SYSTEM

IGNITION SWITCH
OFF  M+G
RUN 1  X+L
RUN 2  ----- START  B+I

92377

24273

PTO SWITCH DISENGAGED
SEAT SWITCH DISENGAGED

SEAT SWITCH UNOCCUPIED

91031
ELECTRICAL WIRING SCHEMATICS

MAIN HARNESS: 250X62
LIGHT HARNESS: 250X40

WIRING DIAGRAM FOR:
46, 52" GT 1995–1998
OPPOSED TWIN

IGNITION SWITCH

<table>
<thead>
<tr>
<th>OFF</th>
<th>M+G</th>
</tr>
</thead>
<tbody>
<tr>
<td>RUN 1</td>
<td>X+L</td>
</tr>
<tr>
<td>RUN 2</td>
<td></td>
</tr>
<tr>
<td>START</td>
<td>B+S</td>
</tr>
</tbody>
</table>

HEADLIGHT HARNESS: 250X40

SEAT SWITCH CONNECTOR

PTO SWITCH DISENGAGED

SEAT SWITCH UNOCCUPIED

BATTERY

24x30

BLACK

GRAPHIC REPRESENTATION OF IGNITION SWITCH (SHOWN IN OFF POSITION)

S–1612

S–1612

SEAT SWITCH
MAIN HARNESS: 250X63
LIGHT HARNESS: 250X40

WIRING DIAGRAM FOR:
46, 52" GT 1996–1998
18, 20 HP KOLNER; 20, 22 HP B&S
ELECTRICAL WIRING SCHEMATICS

MAIN HARNESS: 250X84
WIRING DIAGRAM FOR:
REAR ENGINE RIDER
WITHOUT LIGHTS

<table>
<thead>
<tr>
<th>IGNITION SWITCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFF M+G</td>
</tr>
<tr>
<td>RUN1 B+L</td>
</tr>
<tr>
<td>RUN2 ----</td>
</tr>
<tr>
<td>START B+S</td>
</tr>
</tbody>
</table>

S–1612
125
MAIN HARNESS: 250X85
WIRING DIAGRAM FOR:
REAR ENGINE RIDER
WITH LIGHTS

SEAT SWITCH
CONNECTOR
SEAT SWITCH
UNOCCUPIED

SPARK PLUG
ARMATURE
STATOR
DIODE
RED DC OUTPUT
STARTER

SOLENOID 94613
15 AMP FUSE

BATTERY

CLUTCH BRAKE SWITCH DISENGAGED (PEDAL UP)

PTO SWITCH DISENGAGED

HEADLIGHT

IGNITION SWITCH VIEWED FROM BACK

GRAPHIC REPRESENTATION OF IGNITION SWITCH (SHOWN IN OFF POSITION)
MAIN HARNESS: 250X86
SEAT HARNESS: 250X67
LIGHT HARNESS: 250X92
WIRING DIAGRAM FOR:
38, 40, 42, 46” LT 1997–2001
SINGLE CYLINDER
WITHOUT AFTERFIRE SOLENOID

IGNITION SWITCH
OFF M+G
RUN 1 X+L
RUN 2 -----
START B+S
NOTE: 250X86 & 250X90 ARE AVAILABLE AS PART NUMBER 776170
ELECTRICAL WIRING SCHEMATICS

MAIN HARNESS: 250X87
SEAT HARNESS: 250X67; LIGHT HARNESS: 250X92

WIRING HARNESS FOR:
38, 40, 42, 46" LT SINGLE CYLINDER 1997–2001;
WITH AFTERFIRE SOLENOID

FACTORY TEST CONNECTION ONLY
This Connector is NOT Used on the Tractor Assembly

HEADLIGHT HARNESS 250x92

SEAT SWITCH CONNECTOR

SEAT SWITCH (SEAT UNOCCUPIED)

IGNITION SWITCH VIEWED FROM BACK

92556

94136
PTO SWITCH DISENGAGED

94159

ORANGE

Y

S

G

B

M

VIOLET

BLACK

RED

YELLLOW

WHITE

RED DC OUTPUT

BLACK AC OUTPUT

STARTER

IGNITION SWITCH

OFF M+G+L
RUN 1 B+L A+Y
RUN 2 B+L
START B+L+S

38, 40, 42, 46" LT SINGLE CYLINDER 1997–2001;
WITH AFTERFIRE SOLENOID
MAIN HARNESS: 250X88
WIRING HARNESS FOR:
38" PAN FRAME 1998–2000
EXPORT
WITHOUT HEADLIGHTS
DC ONLY

IGNITION SWITCH
OFF M+G
RUN1 B+L
RUN2 -----
START B+S
ELECTRICAL WIRING SCHEMATICS

MAIN HARNESS: 250X89
LIGHT: 250X40
WIRING HARNESS FOR:
38" PAN FRAME 1998–2000
EXPORT
WITH HEADLIGHTS
DC ONLY

SEAT SWITCH CONNECTOR
SEAT SWITCH UNOCCUPIED
24273
PTO SWITCH DISENGAGED
24273
CLUTCH BRAKE SWITCH DISENGAGED (PEDAL UP)

91031
SEAT SWITCH

91846
IGNITION SWITCH

OFF M+G
RUN1 B+L
RUN2 -----
START B+S
ELECTRICAL WIRING SCHEMATICS

IGNITION SWITCH
- OFF M+G
- RUN1 B+L
- START B+S

SEAT SWITCH CONNECTOR

MAIN HARNESS: 250X103
WIRING HARNESS FOR:
30” MID-ENGINE RIDER 2001 EXPORT

EXPORT WIRING HARNESS FOR:
MAIN HARNESS: 250X103

SEAT SWITCH

GRAPHIC REPRESENTATION OF IGNITION SWITCH (SHOWN IN OFF POSITION)

NO CLUTCH BRAKE SWITCH DISENGAGED (PEDAL UP)

15 AMP FUSE

SOLENOID 94613

24x24 RED

SPARK PLUG

ARMATURE

DIODE

RED DC OUTPUT

STARTER

TEST PORT

PTO SWITCH DISENGAGED PTO OFF

15 AMP FUSE

MID-ENGINE RIDER 2001 EXPORT
ELECTRICAL WIRING SCHEMATICS

MAIN HARNESS: 250X112
LIGHT: 250X92; SEAT: 250X67
WIRING HARNESS FOR:
40, 42, 46" LT RAIL FRAME
2003 EXPORT
WITH AFTERFIRE SOLENOID

IGNITION SWITCH
OFF M+G+L
RUN 1 B+L A+Y
RUN 2 B+L
START B+L+S

HEADLIGHT HARNESS 250x92

GRAPHIC REPRESENTATION OF IGNITION SWITCH (SHOWN IN OFF POSITION)
Factory Test Connection Only
This Connector is NOT Used on the Tractor Assembly

SEAT SWITCH (SEAT UNOCCUPIED)

PTO SWITCH DISENGAGED

1001575

15 AMP FUSE

STATOR

DIODE

DC OUTPUT

92556

IGNITION SWITCH VIEWED FROM BACK

94613

SOLENOID

ARMATURE

SPARK PLUG

AC OUTPUT

STARTER

24x31

GRAY

ORANGE

RED

VIOLET

BLANK

BLACK

RED

ORANGE

24x32

21075

VIOLET

ORANGE

250x67

SEAT SWITCH HARNESS

94159

NC

YELLOW

RED

250X112

LIGHT: 250X92; SEAT: 250X67

2003 EXPORT

WITH AFTERFIRE SOLENOID
ELECTRICAL WIRING SCHEMATICS

S–1612

30" MID–ENGINE RIDER
2003 DOMESTIC & EXPORT

MAIN HARNESS: 250X115
WIRING HARNESS FOR:
30" MID–ENGINE RIDER
2003 DOMESTIC & EXPORT

IGNITION SWITCH
OFF M+G
RUN1 B+L
START B+S

IGNITION SWITCH VIEWED FROM BACK

GRAPHIC REPRESENTATION OF IGNITION SWITCH (SHOWN IN OFF POSITION)

CLUTCH BRAKE SWITCH DISENGAGED (PEDAL UP)

SOLENOID
94613

DIODE

STARTER

DC OUTPUT

SPARK PLUG

ARMATURE

15 AMP FUSE

BATTERY
92739

94159

SEAT SWITCH UNOCCUPIED

TEST PORT

PTO SWITCH DISENGAGED

PTO OFF

1001575

1401149

1001575

MAIN HARNESS: 250X115
WIRING HARNESS FOR:
30" MID–ENGINE RIDER
2003 DOMESTIC & EXPORT

S–1612
ELECTRICAL WIRING SCHEMATICS

MAIN HARNESS: 250X116
LIGHT: 250X92; SEAT: 250X67
WIRING HARNESS FOR:
38, 40" LT RAIL FRAME
2003
WITHOUT AFTERFIRE SOLENOID
ELECTRICAL WIRING SCHEMATICS

MAIN HARNESS: 250X117
LIGHT: 250X92; SEAT: 250X67
WIRING HARNESS FOR:
40, 42, 46" LT RAIL FRAME
46" GT RAIL FRAME
2003
WITH AFTERFIRE SOLENOID
ELECTRICAL WIRING SCHEMATICS

MAIN HARNESS: 250X122
LIGHT: 250X92
WIRING HARNESS FOR:
38” LT PAN FRAME
2003

GRAPHIC REPRESENTATION OF IGNITION SWITCH (SHOWN IN OFF POSITION)

24x30
BLACK
21075

94159
SEAT SWITCH
SEAT SWITCH UNOCCUPIED

NC
NC

PTO SWITCH DISENGAGED

24273

24273
NO
CLUTCH BRAKE SWITCH DISENGAGED (PEDAL UP)

24x29

15 AMP FUSE

VIOLET

YELLOW

2003

WIRING HARNESS FOR:

MAIN HARNESS: 250X122
LIGHT: 250X92
WIRING HARNESS FOR:
38” LT PAN FRAME
2003