

Service Textbook

Electric 96 Mower

STB-223M 1975



SERVICE SUPERIORITY



To those service technicians dedicated to superior service . . .

This book contains the latest in factory service information. The material has been written and illustrated through the efforts of the Factory Service Training Department and various Engineering personnel.

The total value of this book will be determined by the amount of knowledge you gain from it and how you use it as a reference in the future. No matter how great the book or who the author is, if the book is not read, the contents will be of absolutely no value. Because you are interested in learning, there is no doubt that this book will be of great value to you.

This book is designed as a study book, reference book, and notebook. Use it for all three purposes. Take it home and, in your leisure hours, read it again. Refer to it time and again.

You are a vital part of a technical group representing John Deere service throughout the country. The modern, complex equipment of our time requires professional attention which only you can render. The role you play that provides **superior service** to the customer is serving many purposes.

Consider how you affect prospective customers who buy new machines — Consider how you affect repeat purchases by the old, reliable, satisfied customer — Consider how you can be the direct cause of a customer going elsewhere to purchase competitive machines — Consider the fact that few people have the keen technical ability to perform service tasks which you are qualified to do — Consider the role you play on-the-scene to develop your country and a major part of the rest of the world.

This is your book, intended to provide you with a little more knowledge to meet your job challenge with greater ease. Remember — you are a professional person rendering not just service but superior service — John Deere Service!!!

	THIS BOOK BELONGS TO:	
lame		
ddress		

CONTENTS

SERIAL NUMBERS	3
SPECIFICATIONS	5
ATTACHMENTS	7
CONTROLS	9
ELECTRICAL SYSTEM SERVICE	11

This text covers the adjustments and testing for the Model 96 Mower. In addition, use earlier text STB-150M on the 90 Mower as a supplement to cover the basic systems which are common to both electric mowers.

SERIAL NUMBERS

SPROFFICATIONS

STATISMOATA

CONTROLS

Engine enno personnel. The acrat value of the book will be referenced by the second of the engine on the first of The acrat value of the book will be referenced by the second of the se

A Marchine in tearning, pullifill include the particle of the particle of the second second second second in the second s

pare a vital part of a technical group representing John Levin service formyliset or usery. The modern, complex equipment of our dispersion requires professional attention a sich apparatus render, ties role not sley that between models as sector as received to the out former a page teamy purposes.

enelles now you allock and not live cultimers on a loss not a tracking of Grasiles for the content appeal to roke to by the site and a strack see that it is not a first or — Continer have by the content of the cont

perser one ementations entitles on the part
seu noullos at 3 euro A 22 es Montant
a sa to vott 60 est no Montant at 10 est solice
noullo exercise stead entropy on the montant

SERIAL NUMBERS



SLIDE NO. 1 — Electric 96 Riding Mower

INTRODUCTION

The **Electric 96 Mower** is new to the John Deere Grounds Care line for 1975. The cutting width is 34 inches.

SERIAL NU	MBERS				
Model	Shipping Bundle	Ordering Code	Beginning Serial No.		
96 (Complete)	BM15861	2151M	A096D030001M		
96 (less Mower)	BM15862	2152M	A096D030001M		

NOTES	
RESPONDED TO THE RESPON	
Please in 1971 a bloom	- Louisous
Pleasup St. Richard Manager	T ON THUS
SERIAL NUMBERS	иопредентин
SERIAL NUMBERS	
SERIAL NUMBERS	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	иопредентин
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.
SERIAL NUMBERS Chipping Ordaning Deglaning Model Bundle Code Serial No.	MOITOUGORTHI O ent.s. one et ven. a sewoll 81 ontoel3 ent.

SPECIFICATIONS

DIMENSIONS AND WEIGHT	MOWER MOTORS
Wheelbase40 in.	Number2
Tread	Type Permanent-magnet, 2-pole
Front22 in.	Voltage36 volts DC
Rear25 in.	Speed
Height	Continuous horsepower
Length52½ in.	Peak horsepower
Width (incl. mower)43 in.	Protectionthermostats
Weight (approx. curb weight)475 lbs.	Amperage draw15 amps. max.
Tires (pneumatic)	(no load — with mower blades)
Front	
Rear16 x 16.50	TRANSAXLE
Tire Pressure	Capabilities 3 forward speeds,
Front — 11 x 4.00 - 5 8 psi	1 reverse speed
Rear — 16 x 6.50 - 8 6 psi	Maximum ground speeds 1st gear — 1.4 mph
	2nd gear — 2.8 mph
BATTERIES	3rd gear — 4.2 mph
Number used3	Reverse — 2.1 mph
Weight (each, dry)	Transaxle lubricant SAE 90 (AM30200)
Voltage12 volts	(or equivalent)
TypeJohn Deere 55	Transaxle capacity
ampere-hour AM35175 motive-type, lead-acid batteries specifically	ClutchV-belt from traction motor to transaxle
designed to give long cycle life	BRAKES
and withstand deep charging.	Typedisk on transaxle
Electrical protection100 AMP metal fuse	Lockhand operated parking lock
Electrical protection	
CHARGER (Ferro Resonant)	STEERING
Charge capacity100% replacement,	Typegear reduction
6 to 12 hours;	Ratio
80% replacement, 5 hours	
Line voltage100/125 volt AC household current	MOWER
Temperature range recharge	Width of cut
capability 0 to 100° F.	Lift pedestal-mounted, lever-spring assisted
Charger protectionAC and DC fuses	Height of cut 1 to 4 in. above ground
	Blades 2, direct-motor driven
TRACTION MOWER	
Type Permanent-magnet, 2-pole	
Voltage36 volts	
Speed	
Continuous horsepower	
Peak horsepower	
Protectionthermostat	
Amperage draw7.5 amps. max.	
(Neutral slutch angegod)	



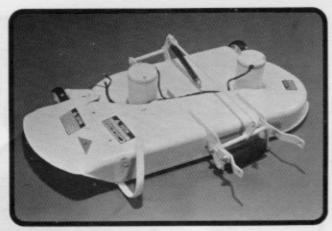
(Neutral - clutch engaged)

NOTES

	Unitalis Office Strutorialists
asonai/	Windlines Action
Type Permanent Epole	DECO
MSQCS (Birphy) (Birching Color)	the second secon
hesis	25 19
	Height 27 In.
	A STATE OF THE STA
THE RESERVE OF THE PROPERTY OF	Width final mowers.
atalogmed)	reliant to the second of the second s
cam again the common and again again again	
	00 F x F1
TO THE PARTY OF TH	03.81 X 3T
TRANSAKLE	GCOT A SACTOR OF THE SACTOR OF
The state of the s	10-8 8-00-x-11 Inch
bands satisfer !	121 8
Name 1 - may let sheeds brook more xem	10 Line and a contract of the
April 6.9 Service Print	BATTERIES
dio quat 4.2 mph	Total redmin
man 1-5 - paravaid to the second of the seco	the second secon
(Biographic Land Control of Contr	Tolland Co.
Mills William 101	STATE OF THE PROPERTY OF THE P
state of the second of the sec	# 23 mass and another and a second service of 94VI
- and of colonic contract much thousand display	THE WATER STREET, STRE
	villetificace selletted bide-basi
BRAKES	etti seyo grad avip of banglade
	Contract - Quality and Still to Land
Verif pre-stag believed o broad	ses internigues and and a second seco
DHR2010	(inercost and i) medicals
Project reduction age.	harde capacity
	SHOOM STIEF BY
1 has a service of the service of th	amount & distance states with
	wighted bloodsation (A Rev 201001) apelloy and
REWOLE	The yoffeet 120 125 voll AC household covers enumerature conge recharge
NEWONE Name of the	emperaura range recharge
REWOLE WAITS OF COMMENT	emperature range recharge
REWOLE Bis to think brown words niket F has to have to	emperaura range recharge
REWOLE WAITS OF COMMENT	emperature range recharge
REWOLE Bio to draw to be to draw to be to	emperature range recharge
REWOLE Bio to draw to be to draw to be to	emperature range recharge
REWOLE Bio to draw to be to draw to be to	emperature range recharge
REWOLE Bio to draw to be to draw to be to	Emperature carge recharge Description AC and DC hases Description and DC hases The CTION and DC hases The CTION and DC hases Year CTION and DC hases The CTION and DC hases Year CTION and DC hases The CTION and DC
REWOLE Bio to draw to be to draw to be to	The regard to the Common training trainin
REWOLE Bio to draw to be to draw to be to	The regard to the Common training trainin
REWOLE Bio to draw to be to draw to be to	Temperature cargo recharge Te
REWOLE Bio to draw to be to draw to be to	Designation of the Character of the Control of the
REWOLE Bio to draw to be to draw to be to	Temperature cargo recharge Te
REWOLE Bio to draw to be to draw to be to	Designation of the Character of the Control of the
REWOLE Bio to draw to be to draw to be to	Designation of the Character of the Control of the
REWOLE Bio to draw to be to draw to be to	Designation of the Character of the Control of the
REWOLE Bio to draw to be to draw to be to	Temper manage recharge AC and DC tupos Temper manage accounts The manage accounts The manage accounts accounts accounts The manage accounts account accounts account accounts account accounts accounts accounts accounts accounts account accounts accounts accounts account accounts account account accounts account account accounts account accounts account account accounts account accounts account account accounts account
REWOLE Bio to draw to be to draw to be to	Temper manage recharge AC and DC tupos Temper manage accounts The manage accounts The manage accounts accounts accounts The manage accounts account accounts account accounts account accounts accounts accounts accounts accounts account accounts accounts accounts account accounts account account accounts account account accounts account accounts account account accounts account accounts account account accounts account
REWOLE Bio to draw to be to draw to be to	Temper manage recharge AC and DC tupos Temper manage accounts The manage accounts The manage accounts accounts accounts The manage accounts account accounts account accounts account accounts accounts accounts accounts accounts account accounts accounts accounts account accounts account account accounts account account accounts account accounts account account accounts account accounts account account accounts account
REWOLE Bio to draw to be to draw to be to	Designation of the Character of the Control of the
REWOLE Bio to draw to be to draw to be to	Designation and the color of th
REWOLE Bio to draw to be to draw to be to	Designation and the color of th

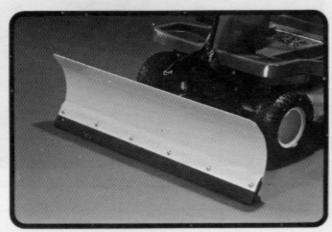
ATTACHMENTS

34" MOWER WITH MOTORS (BM15715) Available for Electric 96 shipped without mower.



SLIDE NO. 2 - 34" Mower Deck

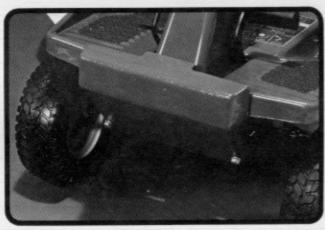
38 SNOW BLADE (BM15759)
The 38 blade is available for light snow removal.



SLIDE NO. 3 - 38" Snow Blade

FRONT-END WEIGHT KIT (AM36030)

If needed, a 45 pound front-end weight is available.

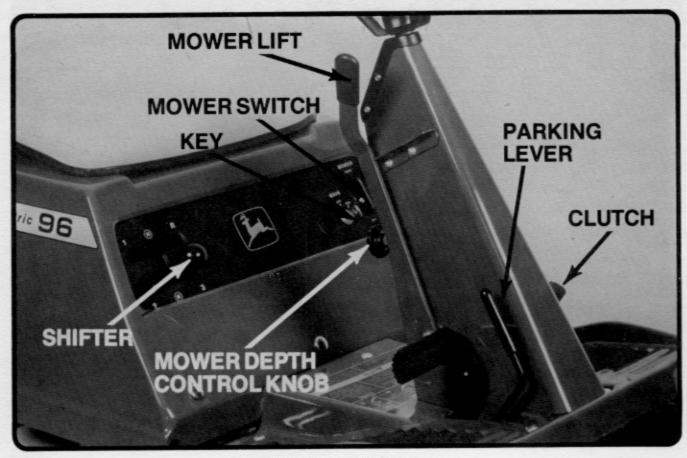


SLIDE NO. 4 - Front-end Weight



NOTES

	CHECKMAN DESTON HERE DERIVERS
	B BAIOW BLADE FOATSTEIN
	lavomat work trigo to eldslievs a spald 46 ed7.
The such ends to be a long story of the such as the such as	
TO ADDRESS THE TOTAL PROPERTY OF THE PERSON	
	(BEOMETICAL TOTAL THOUSAND CONTRACTORS)
	Militian of Algibir Dro Inest bridge Ak a Darson M
Service of the servic	



SLIDE NO. 5 - Rider Controls

SHIFT LEVER

The shift quadrant has a horizontal "H" pattern with 3 forward speeds and 1 reverse.

MOWER LIFT LEVER

The mower height can be pre-set at height desired. The height is regulated by the mower depth control knob.

PARKING BRAKE

The parking brake is engaged by depressing the brake pedal and moving the parking lever forward.

OPERATION

STARTING TRACTION MOTOR

To start traction motor, shift the transaxle to neutral and press down on the shift lever to activate the neutral start switch. Turn the main key switch.

STARTING MOWER MOTOR

Mower motor can only be engaged while the traction motor is running. To start, raise mower toggle to "start" position. Release switch after mower motors are running.

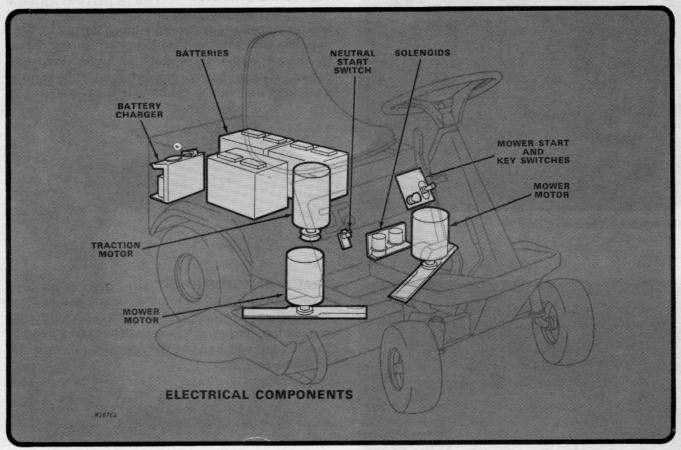


NOTES

And the state of t	
	The company of the co
	图 19 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
THE RESIDENCE AND ADDRESS OF A STATE OF A ST	
Side: Continue	F=2 GH 30 H8
	the shift quedrant has a horsental "H" patiern with
	Souper I bas alloogs mound s
	\$202 F231 02W0B
	hericeb topian at the pre great at height desired.
	the height is regulated by the mower depth coin-
	BAKEB DIKINGAR
	the parking trake is engaged by depressing the
	arake pedat and moving the parking lever torward.
	MOLIARION
	STARTING TRACTION MOTOR
	Terthier of sivespiert oil; \$150 votore a storet hote of
	and press frown on the shift lever to activate the
	reutral start synch, rum the main key switch.
	STARTING MOWER MOTOR
	Mover make can any be engaged willia the trace
	Joh motor is running. To start, raise mower toggle. lo start position, Raiseae switch after mower.
	AND THE PROPERTY OF THE PARTY O
	pallieur si maran



ELECTRICAL SYSTEM



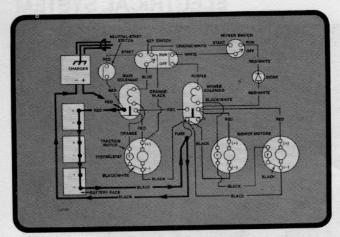
SLIDE NO. 6 — Electrical Components

GENERAL INFORMATION

The electrical system of the Electric 96 Mower uses two 36-volt DC motors for mower blades and a 36-volt DC traction motor. Permanent magnet motors are combined with magnetic solenoid switches to provide maximum power output with minimum current usage. All motors are protected by thermostats.

Power for the motors is supplied by three 12-volt, deep-cycle, motive-type lead acid batteries connected in series. These batteries are designed to provide an acceptable reserve of electrical power during the operational time period.

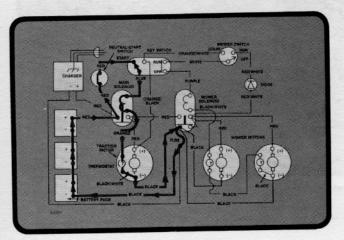
A ferro resonant battery charger is used for controlled recharging of the battery pack. Battery charging is automatic and self-controlled after initial setting of the timer control knob.



SLIDE NO. 7 — Charging Circuit

CHARGING CIRCUIT

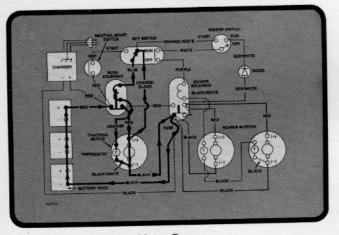
Recharging the batteries is accomplished by forcing electric current through the batteries in the opposite direction of normal battery current flow. Because the charger voltage is higher than the battery voltage, current flows through the battery pack from the positive terminal to the negative.



SLIDE NO. 8 - Traction Motor Start

TRACTION MOTOR START

To start the traction motor, the current passes from the positive (+) terminal of the battery pack through the neutral start switch, key switch, main solenoid, thermostat, and back to the negative (-) terminal of the battery pack.



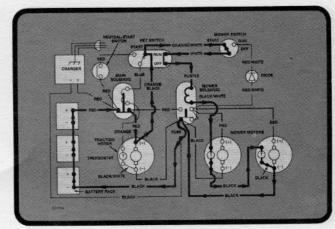
SLIDE NO. 9 — Traction Motor Run

TRACTION MOTOR RUN

Once the main solenoid is engaged, current will flow from the battery pack through the traction motor. The neutral start circuit is also dropped once the solenoid engages.

MOWER MOTOR START

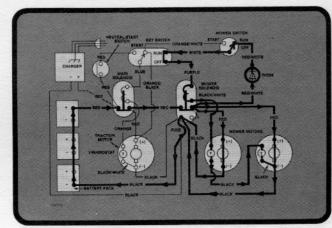
After the traction motor has been started, the mower motors may be energized. For clarity, the traction motor circuit has been omitted from mower start circuit. Current flows from the main solenoid through the key switch and mower switch to energize the mower solenoid.



SLIDE NO. 10 - Mower Motor Start

MOWER MOTOR RUN

The mower solenoid completes the circuit from the main solenoid through the mower motors back to the batteries. The solenoid is held in the closed position by current shunted from the mower solenoid itself.



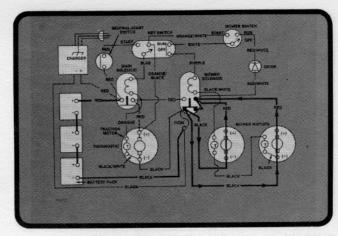
SLIDE NO. 11 - Mower Motor Run

MOWER MOTOR STOP

Turning the key to the "off" position cuts current flow to the hold-in windings of the main and mower solenoids. This causes both solenoids to open and shut down the system.

To stop the mower blades quickly, the mower solenoid is designed to route electrical energy through a stop resistor.

This reverses the current flow through the mower motor armatures, thereby applying a magnetic breaking action to the armature and blades.



SLIDE NO. 12 — Mower Motor Stop



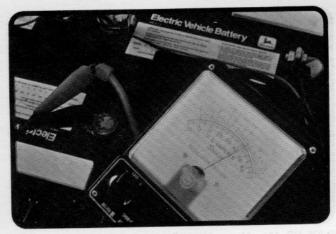


SLIDE NO. 13 — Battery Package Voltage

DIAGNOSING AND TESTING

BATTERY PACK VOLTAGE

Connect a voltmeter to the positive (+) and negative (-) posts of the battery pack. Meter should show a nominal 36 volts DC.



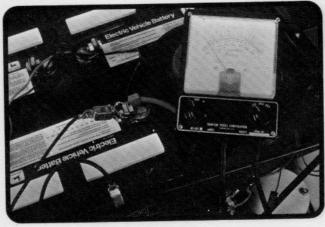
SLIDE NO. 14 — Amperage Draw Test

AMPERAGE DRAW TESTS

Connect an ammeter between the positive cable and the battery pack. Check the traction motor with the transmission in neutral, clutch engaged.

Maximum draw is 7.5 amps.

Check the mower motors on a concrete surface. Blades should be installed. Maximum current draw is 15 amps.



SLIDE NO. 15 - Hot Frame Test

HOT FRAME TEST

Connect voltmeter to the positive terminal and the mower frame. Voltage should read "0". If a reading is obtained, look for a short or ground in the system. Note electrolyte spillage can also cause a reading. Be sure compartment and batteries are clean.

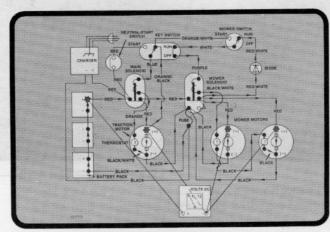
VOLTAGE DROP TESTS

The purpose of this check is to isolate excess resistance (voltage drop) in the system. If excess voltage is found, check all terminals back to the battery with the meter to isolate the resistance.

NOTE: Keep feet and hands clear of the mower blades when conducting these tests.

POSITIVE VOLTAGE DROP TEST

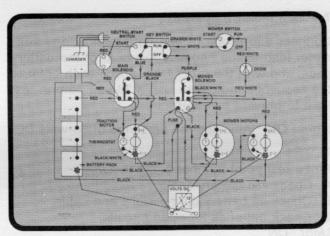
Connect positive lead from voltmeter to positive post of battery pack. Connect negative lead to positive terminal of each motor. Voltmeter must read between 0 and 0.5 volts with all motors running.



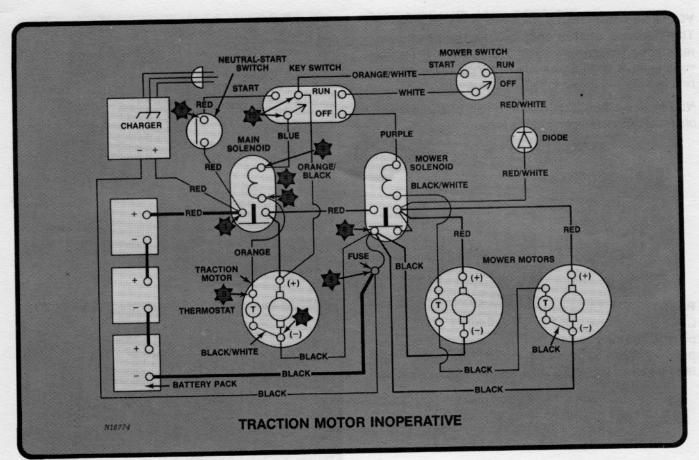
SLIDE NO. 16 - Positive Voltage Drop

NEGATIVE VOLTAGE DROP TEST

Connect negative lead from voltmeter to negative post of battery pack, and positive lead to the negative terminal of each motor. Voltmeter must read between 0 and 0.5 volts with all motors running.



SLIDE NO. 17 - Negative Voltage Drop



SLIDE NO. 18 — Test Points — Traction Motor Inoperative

CIRCUIT TESTS

Traction Motor Inoperative

Connect one probe of test light lead or one voltmeter lead to the negative (-) post of the battery pack, and with the other lead, probe each point in the sequence indicated. Use a 36-volt bulb in test light to prevent bulb burnout.

Light "ON" indicates the presence of 36-volts DC.

TEST 1

Probe test point number 1. Light "OFF"

- A. Check red battery cable.
- B. Check all battery connections and cable.
- C. Check batteries for open circuits. Light "ON"

A. Go to test 2.

Probe test point number 2. Light should come "ON" with shift lever held down in neutral. Light should go "OFF" with shift lever up in neutral. Go to test 3.

NOTE: If the above conditions are not present, test as follows:

- A. Test red wire and connections from main solenoid to neutral-start switch.
- B. Test neutral-start switch.
- C. Test red wire from neutral-start switch to key switch.

TEST 3

TEST 2

Probe test point number 3. Light should come "ON" with shift lever held down in neutral and key switch in "START" position. Go to test 4. Light "OFF"

A. Test key switch.

B. Test blue wire from key switch to solenoid.

TEST 4

Disconnect orange wire from main solenoid terminal. Probe solenoid terminal (4) with key switch in "START" position and shift lever held down in neutral.

A. Light "ON" verifies solenoid coil continuity. If light is "OFF," replace solenoid.

- B. Light "ON". Proceed as follows: Reconnect orange wire to solenoid, hold shift lever down in neutral and activate key switch to "START" position. Listen for audible pull-in of solenoid. If it does not click, remove and test solenoid. Replace as necessary.
- C. If click is heard, go to test 5.

IMPORTANT: For tests 5 through 9, key switch must be "OFF". Change test light lead from negative (-) to positive (+) terminal of battery pack.

TEST 5

Probe test point number 5.

Light "OFF"

A. Test heavy black battery lead wire for ground. Light "ON"

A. Go to test 6.

TEST 6

Probe test point number 6.

Light "OFF"

A. Check fuse.

Light "ON"

A. Go to test 7.

TEST 7

Probe test point number 7.

Light "OFF"

A. Test heavy black wire to motor.

Light "ON"

A. Go to test 8.

TEST 8

Probe test point number 8.

Light "OFF"

A. Test thermostat for open circuit.

B. Test thermostat wires and connections.

Light "ON"

A. Go to test 9.

TEST 9

Probe test point number 9.

Light "OFF"

A. Test orange wire and connections.

Light "ON"

A. End of circuitry test.

NOTE: If traction motor starts but will not continue to run, make test 10.

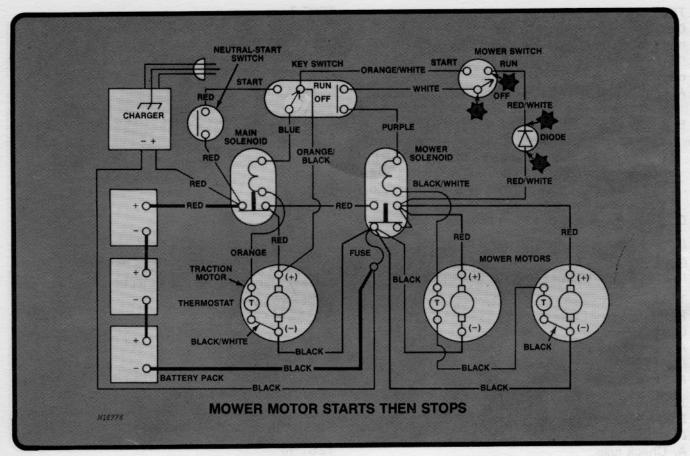
IMPORTANT: Change test lead to negative (-) terminal of battery pack and probe test point number 10 with shift lever held down in neutral and key switch in "START" position.

TEST 10

Light "OFF"

- A. Test key switch for continuity between orange/ white and blue wire terminals with key switch in "RUN" position.
- B. Test orange/black wire.

NOTE: If motor still does not run, disassemble and test motor.



SLIDE NO. 19 — Test Points — Mower Motor Inoperative

MOWER MOTORS INOPERATIVE

Connect one probe of test light lead or one voltmeter lead to the negative (-) post on the battery pack, and with the other lead, probe each point in the sequence indicated.

NOTE: Traction motor must be operating for testing mower motors. Activate mower switch to "START" for test 1 through 5 only.

TEST 1

Probe test point number 1.

Light "OFF"

A. Test orange/white wire, orange/black wire, and heavy red wire.

Light "ON"

A. Go to test 2.

TEST 2

Probe test point number 2.

Light "OFF"

A. Test white wire and mower switch.

Light "ON"

A. Go to test 3.

TEST 3

Probe test point number 3.

Light "OFF"

A. Test key switch and replace if necessary.

Light "ON"

A. Go to test 4.

TEST 4

Probe test point number 4.

Light "OFF"

A. Test purple wire and connections.

Light "ON"

A. Go to test 5.

TEST 5

Disconnect black/white wire from mower solenoid terminal. Probe solenoid terminal 5.

A. Light "ON," verifies solenoid coil continuity. If light is "OFF", replace solenoid.

- B. Light "ON". Proceed as follows: Reconnect black/white wire to solenoid and activate mower switch to "START" position. Listen for audible pull-in of solenoid. If it does not click, remove and test solenoid. Replace as necessary.
- C. If click is heard, go to test 6.

NOTE: Change test light lead from negative (-) to positive (+) post of battery pack before proceeding with test 6. Stop traction motor.

TEST 6

Probe test point number 6.

Light "OFF"

A. Test black wire and motor harness coupler. Light "ON"

A. Go to test 7.

TEST 7

Probe test point number 7.

Light "OFF"

A. Check thermostat in left-hand mower motor.

Light "ON"

A. Go to test 8.

TEST 8

Probe test point number 8.

Light "OFF"

A. Check thermostat in right-hand mower motor. Light "ON"

A. Go to test 9.

TEST 9

Probe test point number 9.

Light "OFF"

A. Check black/white wire.

Light "ON"

A. Go to test 10.

TEST 10

Start traction motor and move mower switch to "START" position. Connect test light leads across right-hand mower motor terminals 10.

Light "OFF"

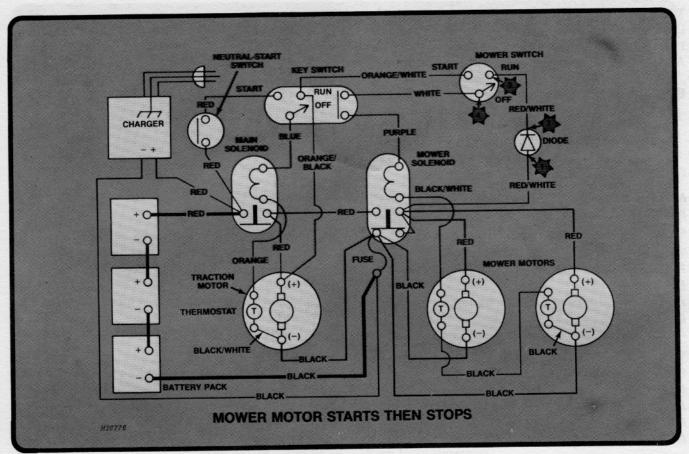
A. Check heavy red wire from mower solenoid to motor.

Light "ON"

A. End of tests.

NOTE: If voltmeter test reveals 36-volts DC at motor terminals and motor will not operate, remove motor and test armature and brushes. Repair or replace components as necessary.

Repeat test No. 10 for the left-hand mower motor.



SLIDE NO. 20 — Test Points — Mower Motor Starts Then Stops

MOWER MOTOR STARTS, THEN STOPS

These tests may be performed with either a DC voltmeter or a probe test light.

NOTE: If mower motors start and will not continue to run, one of the following conditions exist:

- 1. Diode is open
- 2. Mower switch is defective.

NOTE: Start traction motor and move mower switch to "START" position. Connect test lead to negative (-) post of battery pack.

TEST 1

Probe test point number 1.

Light "OFF"

A. Test red/white wire from mower solenoid to diode. Light "ON"

A. Go to test 2.

TEST 2

Probe test point number 2.

Light "OFF"

A. Replace diode.

Light "ON"

A. Go to test 3.

TEST 3

Probe test point number 3.

Light "OFF"

A. Test red/white wire from diode to mower switch.

Light "ON"

A. Go to test 4.

TEST 4

Probe test point number 4.

Light "OFF"

A. Test mower switch.

Light "ON"

A. End of test.

BATTERY CHARGER

The new ferro resonant battery charger is superior to the old reactance-limited unit because it will maintain a more constant voltage to the batteries when the power supply voltage varies. The charger has two charging rates. When the charger is plugged in, the storage circuit is supplying approximately .05 amps to maintain the batteries. A charging rate of 1.5-8 amps is used to charge the batteries.

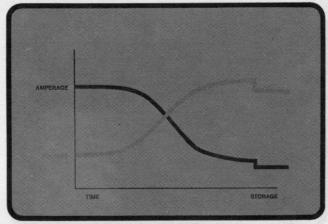


SLIDE NO. 21 - Battery Charger

PERFORMANCE CURVE

At the beginning of the battery charge, resistance is low. Low battery resistance causes high amperage and low voltage.

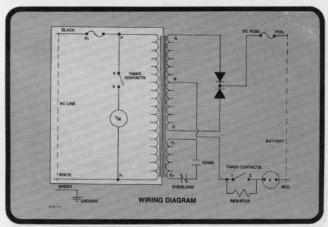
As the battery charges, resistance and voltage increase and amperage tapers off. Voltage will continue to rise and amperage drop until the charger switches to the "storage" position. The added resistance in the charger causes both voltage and amperage to drop. This constant charge maintains the batteries at peak charge.



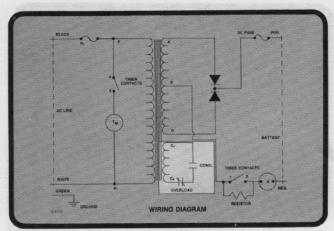
SLIDE NO. 22 - Performance Curve

AC COIL

When the charger is connected to a power source, alternating current flows through the fuse and coil windings. An alternating magnetic field is induced into the coil core. The timing motor operates when contacts 4 and 5 are closed.



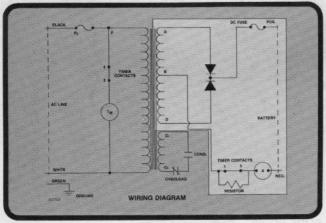
SLIDE NO. 23 - AC Coil



SLIDE NO. 24 - Resonant Circuit

FERRO RESONANT CIRCUIT

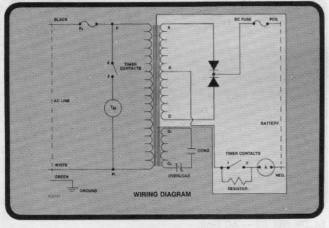
The ferro resonant circuit tunes the magnetic impulses in the coil core. This regulates the DC output under various power supply voltages.



SLIDE NO. 25 — Secondary Circuit — Charge

SECONDARY CIRCUIT-CHARGE

Two secondary coils convert the magnetic energy into an alternating voltage. This AC voltage is rectified by the diodes. When timer contacts 1 and 3 are closed, full charger output is directed to the batteries.



SLIDE NO. 26 - Secondary Circuit - Storage

SECONDARY CIRCUIT-STORAGE

With the timer in storage position, contacts 1 and 3 are open. All charger outure must pass through the line resistor. The increased resistance reduces charger output to approximately .05 amps.

TROUBLE SHOOTING OF CHARGER

If charger fails to charge, check the following:

- 1. AC power source.
- 2. Physical charger damage.
- 3. Both the AC and DC fuses.
- 4. Timer terminals 1 and 3 for continuity.
- 5. All connections for cleanliness and tightness.
- 6. Ammeter continuity.
- 7. DC polarity red lead is positive.

If charger fails to produce full charging current (approximately 8 amps), check the following:

- 1. All connections for cleanliness and tightness.
- 2. Transformer damage.
- 3. Defective capacitor.
- 4. Defective diodes.
- 5. Timer terminals 1 and 3 for continuity.

NOTE: Batteries that are close to fully charged will cause low charger output.

If timer fails to return to storage position, check the following:

- 1. AC power source.
- 2. AC fuse.
- 3. All charger terminals.

If battery fails to fully charge batteries overnight, check the following:

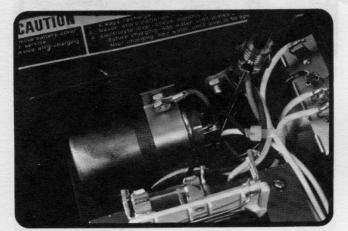
- 1. AC power source.
- 2. AC and DC fuses.
- 3. Batteries for defective cells.



SLIDE NO. 27 - DC Fuse

CHARGER COMPONENT CHECK-OUT

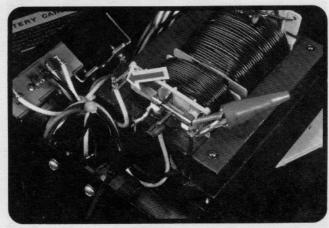
A volt ohmmeter is necessary to check charger components. Always disconnect both AC and DC power sources before using ohmmeter. Always disconnect AC power source and short capacitor before handling capacitor terminals. Check points are lettered or numbered for ease of service.



SLIDE NO. 28 - Short Capacitor

CHECKING TRANSFORMER

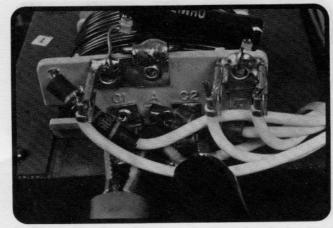
Disconnect AC power supply. Short capacitor terminals with an insulated screwdriver and disconnect one of the capacitor leads. Reconnect power supply. Turn timer to the "on" position.



SLIDE NO. 29 - Test Points, AC Fuse

Points P_1 to P_2 and P_1 to F should both indicate the AC power supply voltage. This shows the AC fuse is good.

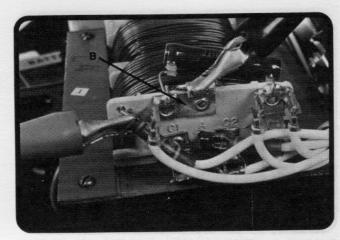
The resonant winding is checked from C_1 to C_2 . The reading should be approximately 300 volts AC.



SLIDE NO. 30 — Test Points, Resonant Winding

The secondary windings are checked at points A to B and B to D. Both readings should be approximately 34 volts AC. Voltage from A to D should be approximately 68 volts AC.

A defective transformer will not give the proper voltage readings.

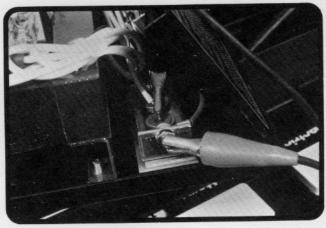


SLIDE NO. 31 — Test Points, Secondary Windings

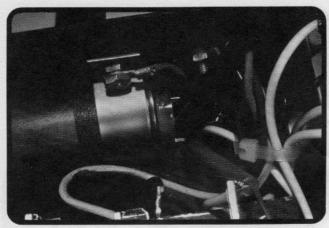
CHECKING DIODES

The diodes rectify the AC voltage by allowing current to flow in one direction only. Check with the AC power supply disconnected.

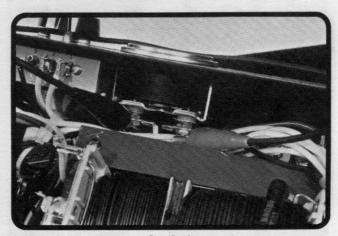
Place ohmmeter probes across the diode. Reverse probes. Meter should show continuity in one direction but not the other. Check remaining diode. Replace if defective.



SLIDE NO. 32 - Test Points, Diodes



SLIDE NO. 33 — Capacitor Test



SLIDE NO. 34 — Ammeter Continuity

CHECKING CAPACITOR

With the power disconnected, short the capacitor terminals. Use an ohmmeter to check the capacitor as follows:

- 1. Disconnect a capacitor lead.
- With the meter set on the RX 10,000 scale, touch probes to the capacitor terminals. Meter should deflect and return to the original position. It may be necessary to reverse meter leads to obtain deflection.
- If meter deflects but does not return, the capacitor is shorted and should be replaced.
- If meter does not deflect in either position, the capacitor is open and should be replaced.

CHECKING AMMETER

With the AC power supply disconnected, the ammeter should show continuity when checked with an ohmmeter.

CHECKING TIMER

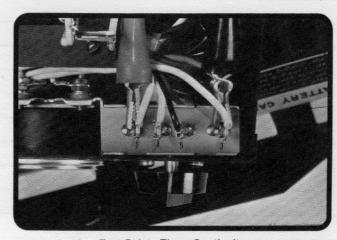


The timer is checked by connecting the power source and turning charger on. After a one hour period, check timer. If timer has failed to move, it is defective.



SLIDE NO. 35 — Timer Check

Use an ohmmeter to check continuity through terminals 1 and 3 when the timer is in the "on" position. Disconnect power supply for this test.



SLIDE NO. 36 — Test Points Timer Continuity

	NOTES	
	adfornithment of hales	in all the minus of T
	chook limagethi lavas, bas	behog tuon ano
	to the control of appropriation to	A A CONTROL OF THE PARTY
	2. With the meter set on the	
	Action probes to the Sabi	
	the second has positioned to may be	Madeshally to rec
	the state of the s	
	the capacitor is shorted as	ed also lid ha to
	200 places	
2000 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1		
THE REAL PROPERTY OF THE PROPE	Essen AEA, paradores 18 ocurs 1	ad sheets to re-
	The drawer winning tools of the set of the s	C Sons Field State
	ty to the same and the same and the	
	The smaller senult show employed	
And the second of the second o		
THE SECOND PROPERTY OF SECOND		

