



John Deere
Electric 90
Mower

Operator's Manual
OM-M46367
Issue A2





Safety Precautions



MF 9280

This OPEI Seal certifies that your model of mower has been tested by an independent laboratory and that it complies with American National Standard B71.1-1968, "Safety Specification for Power Lawn Mowers."

! Improper use or maintenance of the Electric 90 Mower and its equipment on the part of an operator can still result in injury. To reduce this possibility, follow these safety suggestions.

Preparation

Do not allow anyone to operate your Electric 90 Mower without proper instructions.

Never allow children to operate mower.

Keep children and pets a safe distance away while mowing.

Know your controls. Read this manual carefully. Learn how to stop the traction drive and mower motors quickly in an emergency.

Make sure the lawn is clear of sticks, stones, wire and debris that could be thrown by the blades.

Set mower at highest cutting height when mowing rough ground or tall weeds.

Use care when operating mower on slopes or in wet grass.

Do not operate mower with guards removed.

Wear tight fitting clothes. Loose clothing may catch on controls.

Remove charging cord from wall receptacle before starting traction motor.

Operation

Give complete and undivided attention to the job at hand.

Never direct discharge of any material toward bystanders nor allow anyone near machine while it is in operation.

Disengage clutch and shift into neutral before starting traction drive motor.

To stop ground travel, depress both the brake and clutch pedals. The Electric 90 Mower will coast if only the clutch pedal is depressed.

Always stop ground travel before shifting gears.

Mow only in daylight or in good artificial light.

Do not allow passengers to ride on your mower.

Do not operate mower too close to a ditch or terrace. Stay alert for holes or other hidden hazards.

Shift to a lower gear to reduce speed on slopes and sharp turns. Prevent tipping or loss of control.

This machine is not for street or highway use. Watch for traffic when mowing near roadways.

Stop your Electric 90 after striking a solid object. Check for damage and make necessary repairs prior to restarting and operating.

Stop all motors, set the brake and remove the key whenever you leave the mower, even for a moment.

Use caution when towing heavy loads.

Maintenance and Storage

Disconnect a battery cable when working on the electrical system.

Frequently check all fasteners, guards, and parts. Built-in safety features are effective only if maintained.

Follow maintenance instructions in this manual. Have a competent serviceman inspect the mower each year.

Charge batteries in a ventilated area.

Keep shroud raised while charging batteries until timer returns to "OFF."

Keep flames away and avoid smoking while working around batteries to avoid fires or explosion.

Do not tip mower on end unless batteries are first removed from the mower. Acid could cause injury or machine damage.

Do not remove battery cover except to disconnect battery cables.

Do not service battery while recharging.



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To the Purchaser

Read this operator's manual before you start the motors. You will be able to do a better, safer job of mowing.

! This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and read carefully the message that follows.

The Electric 90 Mower is designed and manufactured to the traditionally high standards of John Deere. It has many quality features to bring you new mowing efficiency and convenience, as well as greater ease of operation and maintenance. If given proper care, your mower will give you long, efficient service.

The Electric 90 Mower has an electric traction drive motor to power the 3-speed transaxle. The mower is driven by two individual electric motors, one on each blade. Cutting width is 34 inches.

When in need of parts or major service, see your John Deere Consumer Products Dealer. For prompt, efficient service, give the dealer the mower serial number.

The mower serial number is located on the rear of the battery box.

Record the mower serial number in the space provided on page 17.

The warranty on this mower appears on your copy of the purchase order which you should have received from your dealer when you purchased the mower.

In addition to the warranty shown on the back of the purchase order, the batteries used in the Electric 90 Mower are warranted for a five year period. The batteries are warranted against defects for the first two years with a prorated charge for the last three years. This warranty does not apply if the unit is leased, used for hire, or commercial mowing.



M10533



DRIVE CLUTCH PEDAL

This pedal, located at the left of the steering console, is used to engage or disengage the transaxle drive for ground travel. When depressed, the drive is disengaged. The drive clutch pedal must be depressed when starting the tractor-motor used to drive the transaxle. Depressing the drive clutch pedal

MOWER DEPTH CONTROL

The mower depth control knob, located on the rear of the steering console, is used to preset mowing height. It is adjusted by turning the knob to the desired height. Turn the knob clockwise for higher mowing height and counter-clockwise for lower mowing height.

Mower Identification



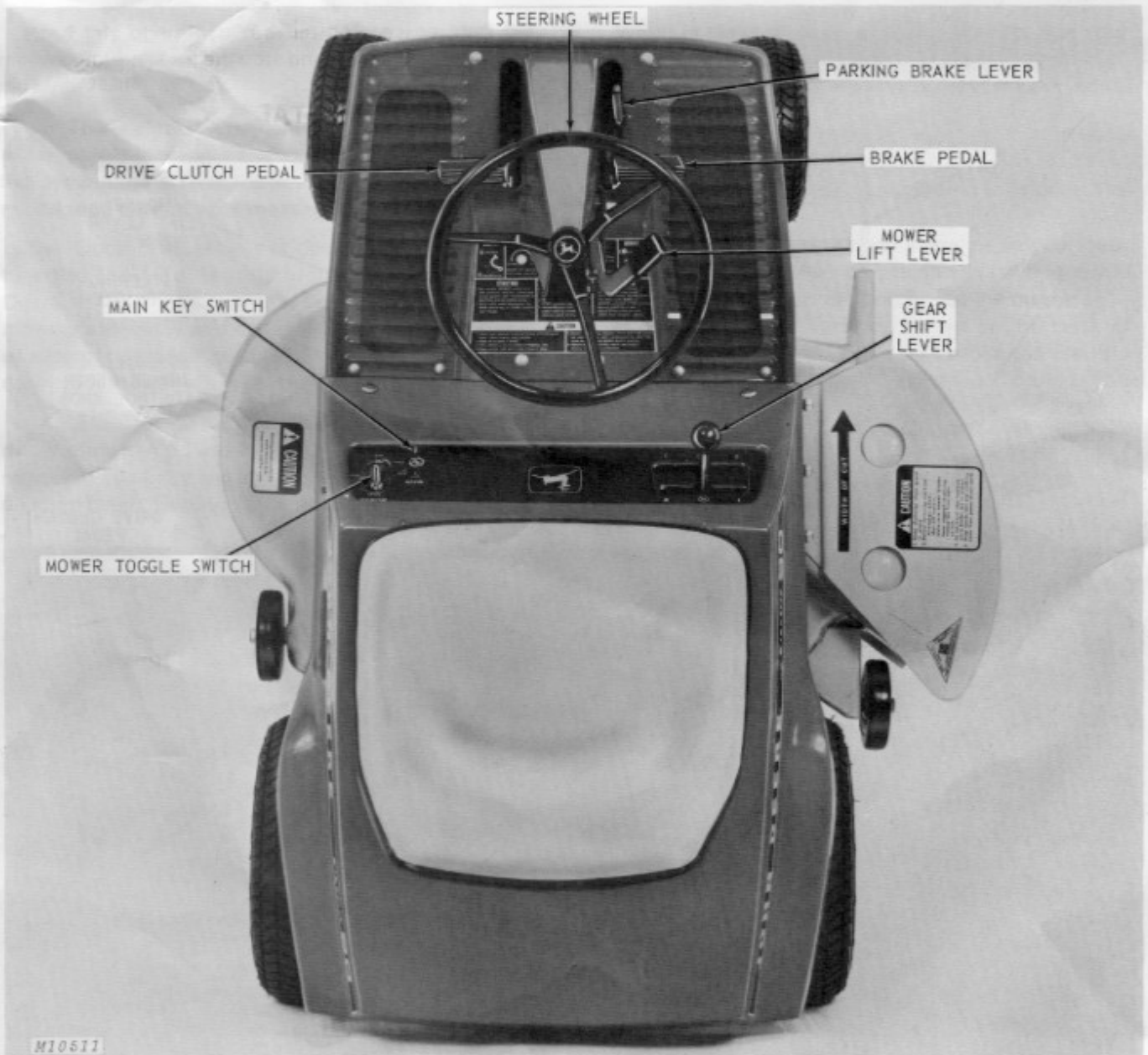
M10510

John Deere Electric 90 Mower



Controls

Mower Identification



DRIVE CLUTCH PEDAL

This pedal, located at the left of the steering console, is used to engage or disengage the transaxle drive for ground travel. When depressed, the drive is disengaged. The drive clutch pedal must be depressed when starting the traction motor used to drive the transaxle. Depressing the drive clutch pedal does not stop machine. The brake pedal must also be depressed to stop ground travel.

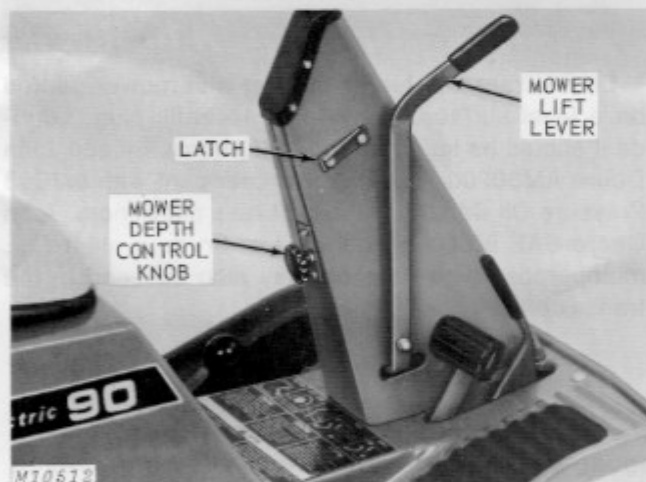
BRAKE PEDAL

This pedal, located at the right of the steering console is used to stop ground travel with the drive clutch pedal depressed.

PARKING BRAKE LEVER

This lever locks the brake pedal down for parking. To lock the brake, fully depress the brake pedal and move the lever forward. To release, depress brake pedal slightly and move lever to the rear.

MOWER LIFT LEVER



This lever is used to raise and lower the mower. The lever is placed behind the latch to lock the mower in the raised position.

With the mower completely lowered, the cutting height is approximately 1 inch. With the mower fully raised, the cutting height is approximately 4 inches.

MOWER DEPTH CONTROL KNOB

The mower depth control knob is located on the rear of the steering console. It is used to preset mower cutting height by limiting how far the mower can be lowered. Turn the knob clockwise for higher mower cutting height and counterclockwise for lower mower cutting height.

SWITCHES

The main key switch is used to start the traction drive motor and stop all motors. The mower toggle switch is used to start and stop the mower motors.

SAFETY-START SYSTEM

Your Electric 90 Mower is equipped with a safety-start switch on the clutch to prevent starting with the clutch engaged. The clutch pedal must be depressed before the traction motor will start.

The mower motor circuit is wired to prevent the mower motors from running unless the traction motor is running.

GEAR SHIFT LEVER

The gear shift lever, located at the front right-hand side of the seat pedestal, is used to obtain the desired speed and direction of ground travel. ALWAYS DEPRESS the drive clutch pedal and stop ground travel before moving the shift lever. There are 3 speeds for forward travel; one for reverse travel.



CAUTION: Do not attempt to shift on-the-go. Always stop ground travel before changing speeds or transaxle damage could result.



Before Starting Mower

The following operations should be performed prior to the initial operation of your Electric 90 Mower.

CHARGING BATTERIES

Charge the batteries as instructed on page 10.

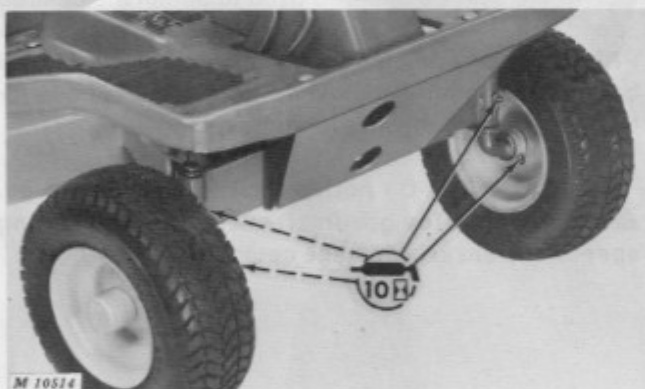
CHECKING TIRE PRESSURE

Check tire pressures with a low-pressure tire gauge. Inflate front tires to 8 psi; rear tires to 6 psi.

LEVELING MOWER

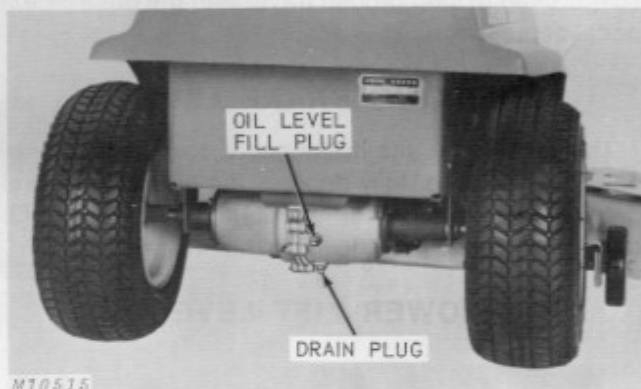
Level mower as instructed on page 12.

LUBRICATING GREASE FITTINGS



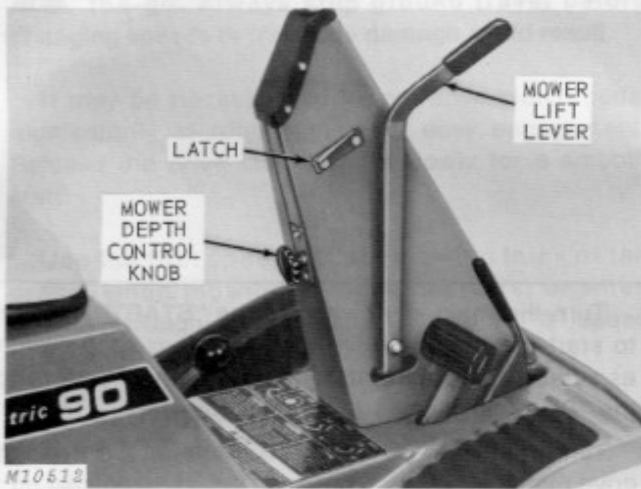
Lubricate the four grease fittings illustrated with John Deere Multi-Purpose Lubricant or an equivalent SAE multipurpose-type grease. Use either a hand grease gun or the John Deere Pisto-Luber with flexible hose (available from your John Deere Consumer Products dealer).

CHECKING TRANSAXLE LUBRICANT



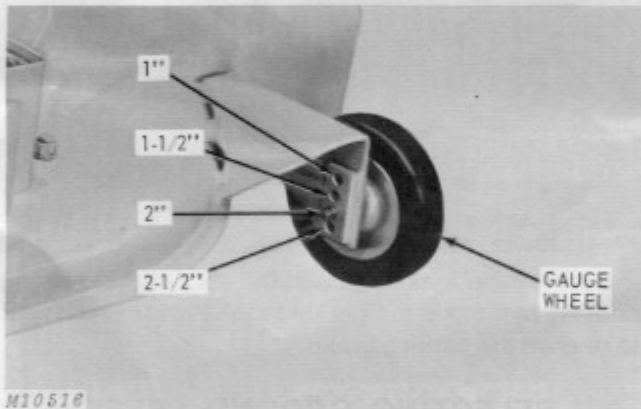
Check transaxle lubricant level with mower parked on a level surface. Remove oil level-fill plug. Lubricant should be level with hole. If necessary add John Deere AM30200 Transmission Lubricant with a JD93 Pressure Oil Can until lubricant runs out of hole. John Deere SAE 90 Gear Lubricant or an equivalent SCL multipurpose-type gear oil may also be used in the transaxle.

ADJUSTING CUTTING HEIGHT



Adjust cutting height on a hard flat surface.

Lower mower by releasing lift lever and set mower depth control knob to carry mower at the desired cutting height.



Adjust gauge wheels by removing cap screw and positioning cap screw in hole that places gauge wheels as close to ground as possible without touching. The gauge wheels are anti-scalp wheels only and should not carry the weight of the mower.

Both gauge wheels must be in the same position.

MOWING TIPS

Pick up and remove all rocks, wire, glass, sticks, toys and other such objects that may cause personal injury or damage to the mower.

Cutting grass at 2 or 2-1/2 inches is satisfactory for most turfgrasses. This will leave sufficient leaf area to give a neat appearing lawn.

Mow often enough so that only one-third of growth is removed at each cutting. This promotes dense growth which helps shade out weedy grasses.

Cutting less often produces dense clippings which should be removed.

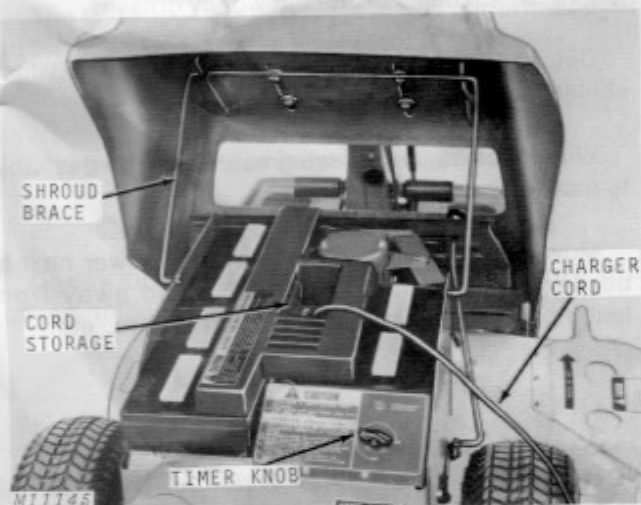
When mowing dense, tall grass, it may be desirable to mow only a partial swath.

Mow with the left-hand side of the mower next to borders so clippings are discharged away from fences, flower beds, sidewalks, driveways, etc.



Operation

UNPLUGGING CHARGER CORD



Unplug the charger cord and store it in the compartment between the batteries. Lower the shroud by pivoting the shroud brace to the rear.

OPERATING TRACTION DRIVE MOTOR

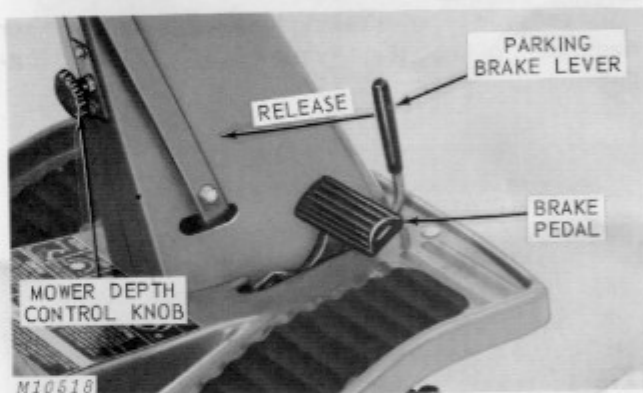


Depress the drive clutch pedal at the left of the steering console.

Turn the main key switch to the "START" position to start the traction drive motor. Release the switch as soon as the motor starts. The switch will return to the "RUN" position.

Turn the key to "OFF" position to stop the traction drive motor.

RELEASING PARKING BRAKE



Depress the brake pedal at the right of the steering console and move the parking brake lever to the rear to release the parking brake.

SELECTING GROUND SPEED



With drive clutch pedal depressed, shift transaxle to select speed and direction of travel desired. The shift quadrant has a horizontal "H" pattern with 3 forward speeds and one reverse.

CAUTION: Do not attempt to shift gears on-the-go. Always stop ground travel before changing speeds or transaxle damage could result.

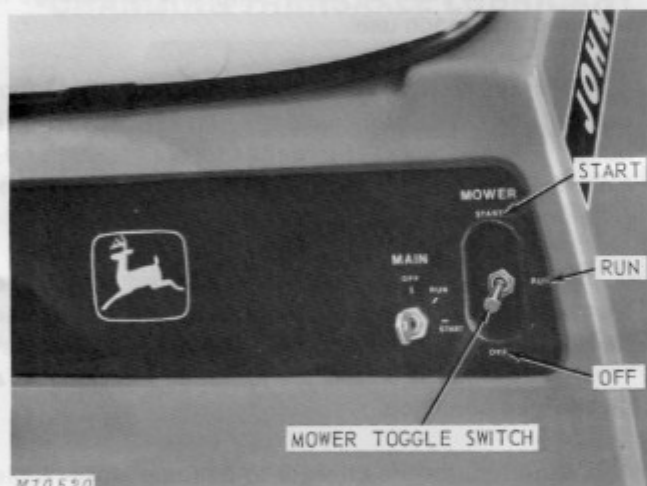
It may be necessary to let out drive clutch pedal momentarily to rotate gears for easy engagement. Release the drive clutch pedal slowly for a smooth start.

Use the first speed "1" for mowing thick or tall grass, when mowing in close quarters, or when ground is rough. Use second "2" or third "3" speed when mowing in open areas or thin grass.

CAUTION: Climb steep hills and terraces in first "1" speed to avoid need for gear changing on hillsides.

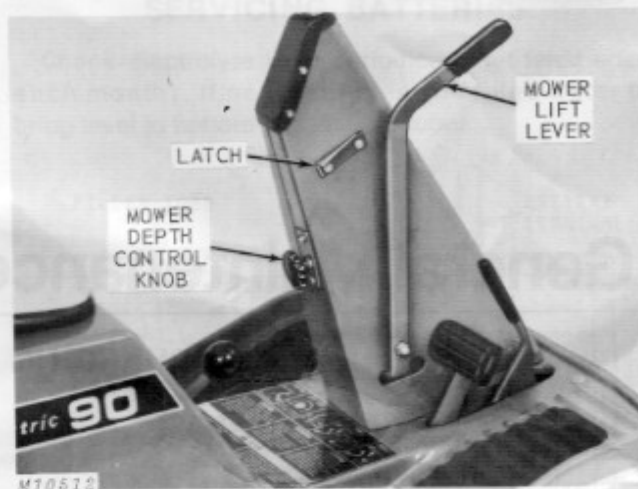
IMPORTANT: Always disengage and raise the mower when driving from one area to another.

OPERATING THE MOWER



After traction motor is running, raise mower toggle switch to the "START" position. Release switch after mower motors are running. The switch will return to the "RUN" position.

Move the switch to "OFF" position to stop mower motors. Turning the key switch to "OFF" position stops both mower and traction motors simultaneously.



Pull slightly back and outward on the mower lift lever to release it from the latch. The lever will move forward, lowering mower.

STOPPING THE MOWER

Fully depress drive clutch (left-hand pedal) and brake (right-hand pedal) to stop ground travel.

CAUTION: Depress BOTH the drive clutch pedal and the brake pedal at the same time. Depressing only the clutch or brake pedal will not stop the machine.

Always lock brake and remove key before leaving mower.

IMPORTANT: Place batteries on charge as instructed on next page when you have finished using your Electric 90 Mower. This will insure maximum battery life and provide a full charge for the next mowing.

TOWING LOADS

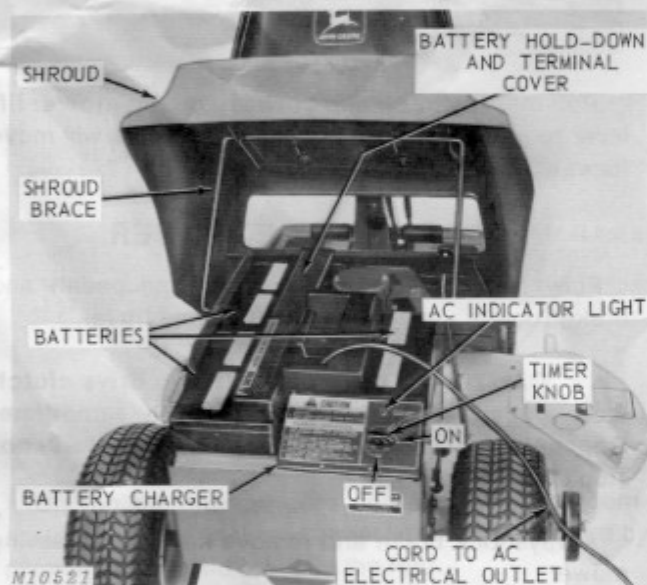
Use caution when towing heavy loads. Do not attempt to move loads in excess of the combined weight of the operator and the Electric 90 Mower.

Continuous towing of heavy loads can cause traction drive motor to overheat, which will trip thermal overload in motor. Allow motor to cool; then reduce load before proceeding.



General Maintenance

CHARGING THE BATTERIES



As soon as you finish using your John Deere Electric 90 Mower, place the batteries on charge. Raise the shroud and pivot the shroud brace forward.

CAUTION: Highly combustible hydrogen gas is vented from the batteries during the charging cycle. Keep the shroud raised while charging batteries until timer returns to "OFF". Charge batteries in a ventilated area. Keep flames away from batteries. Do not smoke around batteries.

To charge batteries, remove the charger cord from the storage compartment between the batteries and plug it into a grounded, alternating current (AC) outlet supplying at least 105 to 130 volts.

The red indicator light glows when electrical current is being supplied to the charger. If the light does not glow, check supply circuit for blown fuses, a tripped circuit breaker, or to see that a controlling wall switch is not in the "OFF" position.

Turn the timer knob clockwise to the "ON" position to start the charging cycle. The timer knob will rotate to "OFF" automatically, shutting the charger off when the batteries are fully charged.

NOTE: The timer knob does not start to rotate until the batteries have reached 80 percent of full charge. Because of this, it will take from 6 to 12 hours for the timer to rotate to "OFF" position, depending upon the condition of the batteries.

The charger also contains an automatic timer that turns the charger on once every 24 hours to permit a 12- to 15-minute boost charge. This keeps the batteries at full charge at all times. Only one full charge is required after each use.

NOTE: Should memory fail you, however (Did I turn on the timer last night or did I just plug it into the outlet?), reset timer. It is better to charge batteries twice, than let them remain in a discharged condition. Be sure to raise shroud.

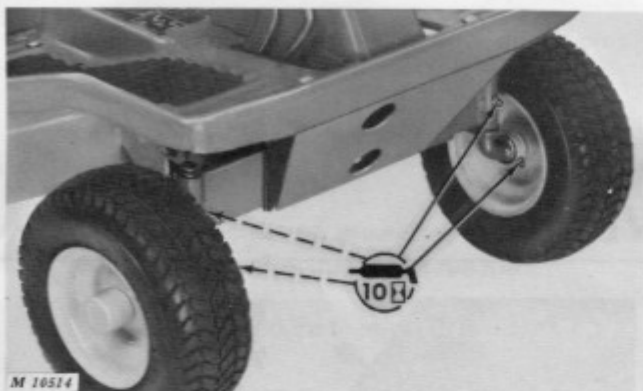
IMPORTANT: Keep the charger connected to a live electrical outlet whenever the machine is not in use . . . even during winter storage. Batteries can be severely damaged if stored for prolonged periods in a discharged condition.

It is normal for the charger to become warm while in operation. A thermostat within the charger prevents machine damage in the event the charger becomes too warm. The thermostat works much in the same manner as a circuit breaker. Keeping the shroud raised and the air passage in the battery cover open helps in cooling the charger.

The shroud does not have to be in the raised position after the initial charging cycle has been completed. The shroud may be lowered during the daily, automatic boost-charges.

CAUTION: Do not charge batteries with any other charger. Do not use the mower batteries to start other vehicles. Battery damage will result.

LUBRICATING GREASE FITTINGS



Lubricate the four grease fittings illustrated with John Deere Multi-Purpose Lubricant or an equivalent SAE multipurpose-type grease every 10 hours of operation. Use either a hand grease gun or the John Deere Pisto-Luber with flexible hose (available from your John Deere Consumer Products dealer).

CHANGING TRANSAXLE LUBRICANT



Every 200 hours or two years, whichever comes first, remove transaxle drain plug and drain all oil. Replace plug and add three 8-ounce cans of AM30200 Transmission Lubricant or its equivalent through oil-level fill hole.

John Deere SAE 90 Gear Lubricant or an equivalent SCL multipurpose-type gear oil can be used in the transaxle.

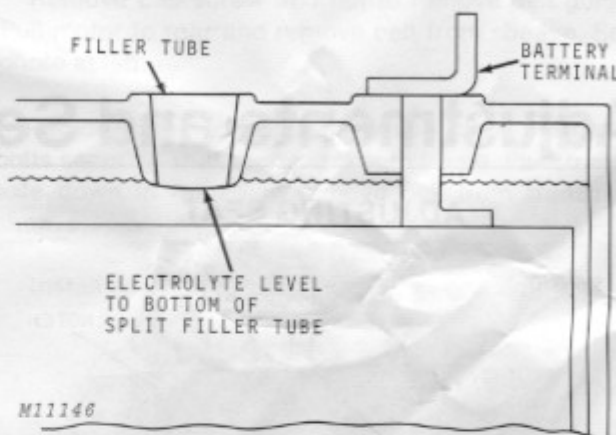
Check oil level periodically with mower parked on a level surface. Oil should be up to oil level-fill plug.

LUBRICATING STEERING MECHANISM

At the beginning of each mowing season lubricate steering wheel shaft bushings and steering gear pivot with oil.

SERVICING BATTERIES

Check electrolyte level periodically (at least once each month). If necessary, add distilled water to bring level to bottom of split filler tubes.



CAUTION: Battery electrolyte is poisonous and can be injurious to eyes, skin and clothing. Handle it carefully. If electrolyte is spilled, flush immediately with a solution of one part baking soda to four parts water.

Keep battery terminals clean and free of corrosion. Coat terminals with petroleum jelly. Keep connections tight to prevent arcing and pitting.

SERVICING MOWER BLADES

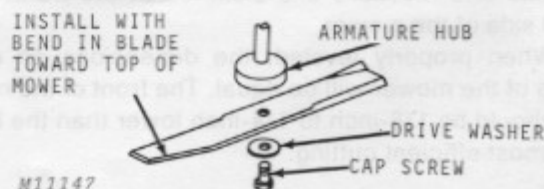
Keep blades sharp and in balance for uniform mowing with a minimum of power.

CAUTION: Turn key to 'OFF' and remove key from switch before removing blades.

Remove blades by removing cap screws and washers.

Sharpen blades leaving a 1/64-inch dull tip on the cutting edge. A razor-sharp cutting edge will roll over and dull more quickly. Maintain original bevel. Remove an equal amount of material from each end of the blade to maintain proper balance. Replace blade if extensively damaged or out of balance.

Excessive mower vibration indicates blades are out of balance or improperly installed.

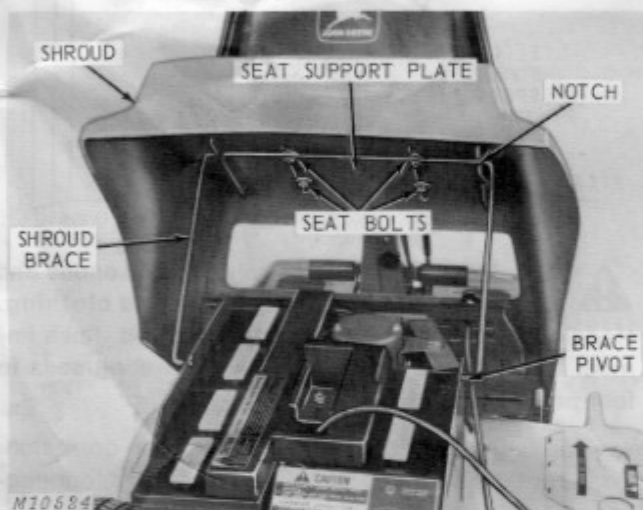


Install blades as illustrated. Tighten cap screws to 55 foot-pounds torque.



Adjustments and Service

ADJUSTING SEAT



The seat can be adjusted for operator comfort.

Raise the shroud and pivot shroud brace upward. Loosen the four cap screws securing the seat. Lower shroud and position seat to suit operator. Raise shroud and tighten four cap screws securely.

IMPORTANT: Be certain two positioning holes in seat support plate align with aligning buttons on shroud.

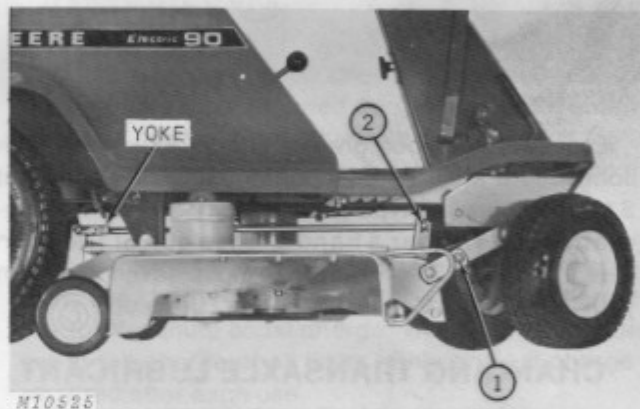
LEVELING MOWER

Park the mower on a flat surface such as a sidewalk or concrete driveway. Check to see that tires are inflated equally.

CAUTION: Turn key to "OFF" and remove key from switch before leveling mower.

With the mower in the raised position, measure the distance of each blade tip from the ground. Rotate the blades and measure this distance at the front, rear and side of the mower.

When properly leveled, the dimensions on each side of the mower will be equal. The front of the mower should be 1/8-inch to 1/4-inch lower than the back for most efficient cutting.



1. To adjust for side-to-side level, loosen bolt on right front draft arm and raise or lower mower deck until blades are level. Tighten nut firmly.

2. To adjust for rear-to-front pitch, pull cotter pin in rod and remove rod from bracket. Turn rod into yoke to raise rear of mower, or out of yoke to lower rear of mower.

REMOVING AND INSTALLING MOWER



To remove mower:

1. Lower mower with lift lever.
2. Raise shroud and disconnect both mower motors.
3. Pull spring-locking pin and remove drilled pin to disconnect lift cable yoke.

4. Pull spring-locking pin and remove drilled pin in rear draft link.

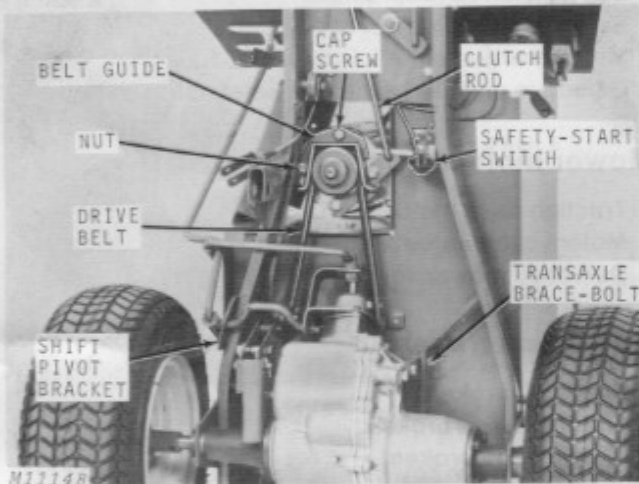
5. Pull spring-locking pins and remove drilled pins in front of machine.

6. Partially raise front of machine to remove mower.

CAUTION: Do not tip mower on end with batteries installed. Electrolyte will run out.

Reverse above procedure to install mower.

REPLACING SAFETY-START SWITCH



CAUTION: Do not tip mower on end with batteries installed. Electrolyte will run out.

1. Disconnect wires from switch terminals.
2. Remove two cap screws holding switch to bracket. Remove switch.

Reverse above procedure to install new switch. Be sure switch arm is in front of clutch rod.

NOTE: Adjust safety-start switch, using slots, to obtain full movement of switch arm when drive clutch pedal is depressed.

REPLACING DRIVE BELT

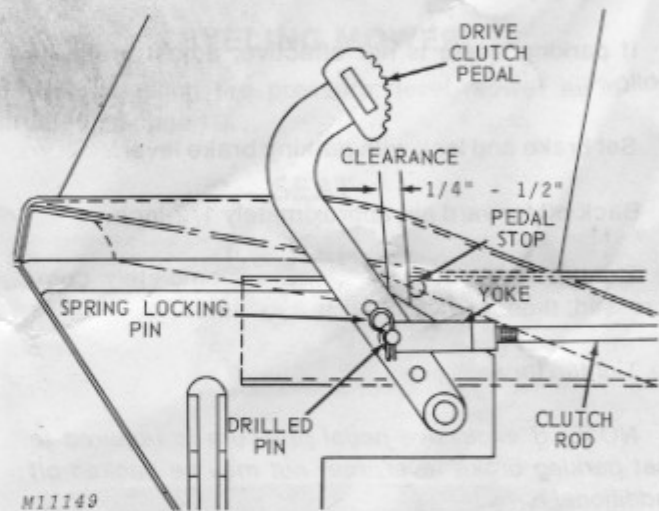
Remove mower, as instructed on page 12, to provide access.

Remove cap screw and nut to remove belt guide. Pull motor to rear and remove belt from sheave. See photo at left.

Remove bolt from transaxle brace and remove two bolts securing shift pivot bracket to frame. Pivot transaxle down in front and remove belt from transaxle sheave.

Install new belt by reversing above procedure.

ADJUSTING CLUTCH



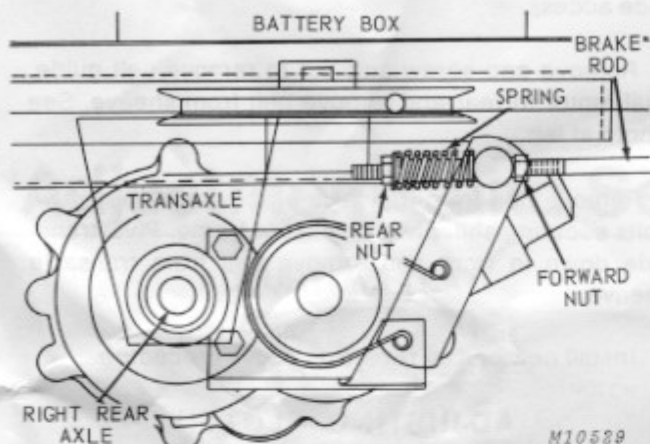
The drive clutch pedal should be adjusted to have 1/4 to 1/2-inch of clearance between the back edge of pedal and the pedal stop when in the "Engaged" position.

To adjust, remove the spring-locking pin and the drilled pin.

Turn the yoke off the clutch rod to increase clearance, and onto the clutch rod to decrease clearance.

Install the drilled pin in the center hole of clutch pedal and secure with spring-locking pin.

ADJUSTING BRAKE



If parking brake is not effective, adjust brake as follows:

Set brake and lock with parking brake lever.

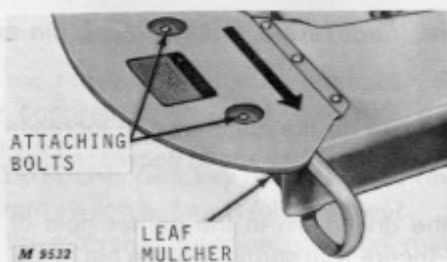
Back off forward nut approximately 1/2-inch.

Tighten rear nut until spring is completely compressed; then, back off four to five turns.

Tighten forward nut.

NOTE: If excessive pedal pressure is required to set parking brake lever, rear nut may be backed off additional turns.

ATTACHING LEAF MULCHER PLATE (Extra Equipment)



Install the leaf mulcher plate with 1/4 x 1/2-inch carriage bolts and 1/4-inch wing nuts.

STORAGE

Clean all dirt and grease from your Electric 90 Mower. Repaint chipped or rusted spots.

IMPORTANT: Leave battery charger connected to electrical outlet to maintain batteries at full charge. See page 10.

TROUBLE SHOOTING

Traction drive motor won't start

- Batteries discharged.
- Drive clutch not depressed.
- Safety-start switch out of adjustment.
- Motor overheated. Allow it to cool.*
- Defective main key switch or safety-start switch.

Mower motors won't start

- Traction drive motor not running.
- Motors overheated. Allow them to cool.*
- Defective mower solenoid.

No ground travel

- Drive belt broken.
- Clutch linkage broken.
- Shift linkage broken.

Batteries not recharged

- Charger not working.
- No power to charger.
- Defective batteries.

Uneven mowing

- Tires not inflated properly. See page 6.
- Mower not leveled properly. See page 12.
- Reduce ground speed on rough ground so mower does not bounce.

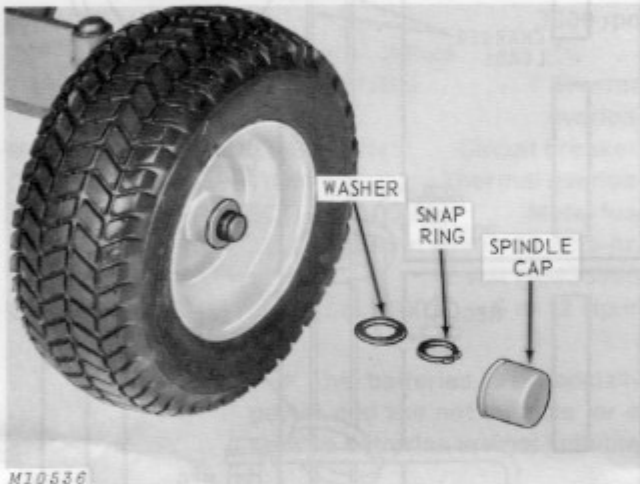
* Circuit breakers open when motors become overheated. Allow them to cool; then proceed under reduced speed or load.



ACTIVATING BATTERIES

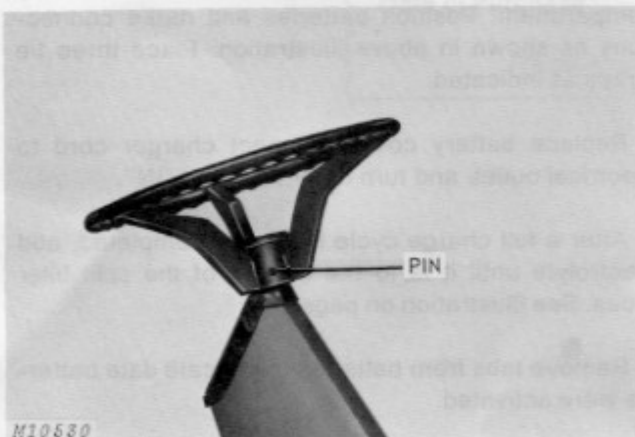
Assembly

FRONT WHEELS



- Block up front axle.
- Grease axle and install wheel with valve stem toward mower.
- Place washer on axle.
- Install snap ring with sharp edge outward.
- Press spindle cap over wheel hub.

STEERING WHEEL



- Remove pin from steering shaft.
- Install steering wheel on shaft and insert pin.

TIRE PRESSURE

Tires are over-inflated for shipping purposes.

Deflate tires to pressures shown:

Front	8 psi
Rear	6 psi

LEVELING MOWER

After adjusting tire pressure, level mower as instructed on page 12.

SEAT

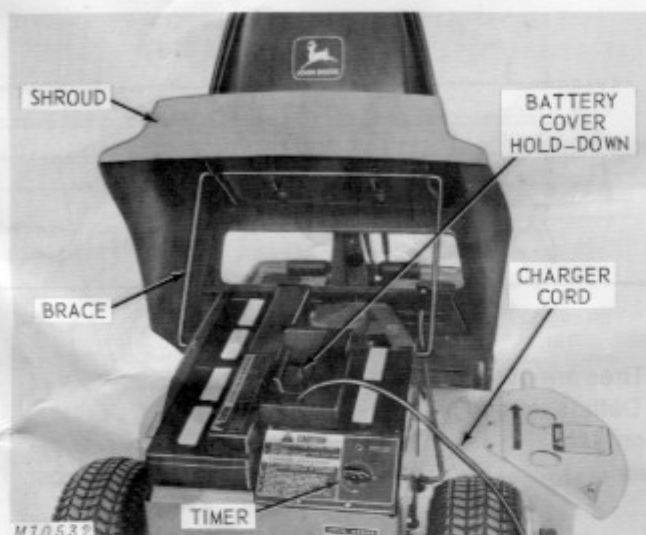


Remove and discard nuts on seat attaching cap screws.

Attach seat using washers between seat and shroud and under cap screw heads. Be certain two positioning holes in seat support plate align with aligning buttons on shroud.

Adjust seat in slots to suit operator before tightening cap screws.

ACTIVATING BATTERIES



Raise shroud and pivot brace forward to hold shroud in raised position. Remove charger cord from storage compartment.

Depress battery cover hold-down and turn 1/4-turn right or left to unhook hold-down from base. Lift off cover. Remove batteries from compartment.

IMPORTANT: Be sure to remove batteries before filling with electrolyte. This will prevent damage in case of acid spill.

Fill batteries with electrolyte until level is ONLY 1/4-inch above plates. DO NOT fill to proper level until after charging.

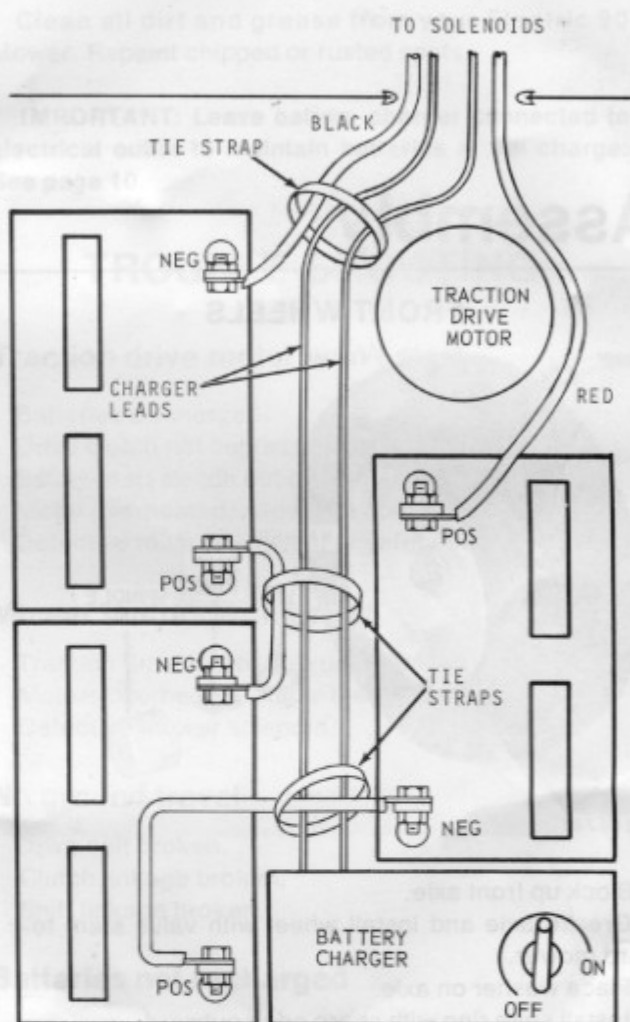


CAUTION: Battery electrolyte is poisonous and can be injurious to eyes and clothing. Handle it carefully. If spilled, clean with a solution of one part baking soda to four parts water.

Electrolyte is not furnished with the Electric 90 Mower. It is available from your Parts Depot in the following quantities:

Part No.	Description
4098522	5 gallons
4098532	6 quarts
409240	Hose for 5 gallon package

Use only battery grade sulfuric acid electrolyte with 1.265 specific gravity plus or minus 0.005 corrected to 80 degrees Fahrenheit.



M11161

Battery Wiring Diagram

Clean and dry batteries and install them in battery compartment. Position batteries and make connections as shown in above illustration. Place three tie straps as indicated.

Replace battery cover, connect charger cord to electrical outlet, and turn timer knob to "ON".

After a full charge cycle has been completed, add electrolyte until it is to the bottom of the split filler tubes. See illustration on page 11.

Remove tabs from batteries to indicate date batteries were activated.



Specifications

TRACTION MOTOR 2400 rpm
Permanent Magnet - 2 Pole
MOWER MOTORS (2) 3000 rpm
Permanent Magnet - 2 Pole
TRACTION MOTOR PROTECTION Thermal
overload
MOWER MOTOR PROTECTION Circuit breakers
CHARGER PROTECTION Thermal overload
ELECTRICAL PROTECTION, 100 AMP .. Metal fuse
BATTERIES* (3) John Deere 55 amp-hr.,
12 volt (AM33995)
CHARGING TIME 100% - 6 to 12 Hours

TRANSAXLE LUBRICANT SAE 90
AM30200 Lubricant
TRANSAXLE CAPACITY 24 oz.
TRANSAXLE 3 forward speeds;
1 reverse
BRAKE Band type on transaxle,
pedal operated

TIRE PRESSURES

Front - 11x4.00-5 8 psi
Rear - 16x6.50-8 6 psi

* The batteries are specially designed and constructed for motive power and are not suitable for engine starting service. Likewise, starter service batteries are not suitable for motive power service.

*(Specifications and design subject to
to change without notice.)*

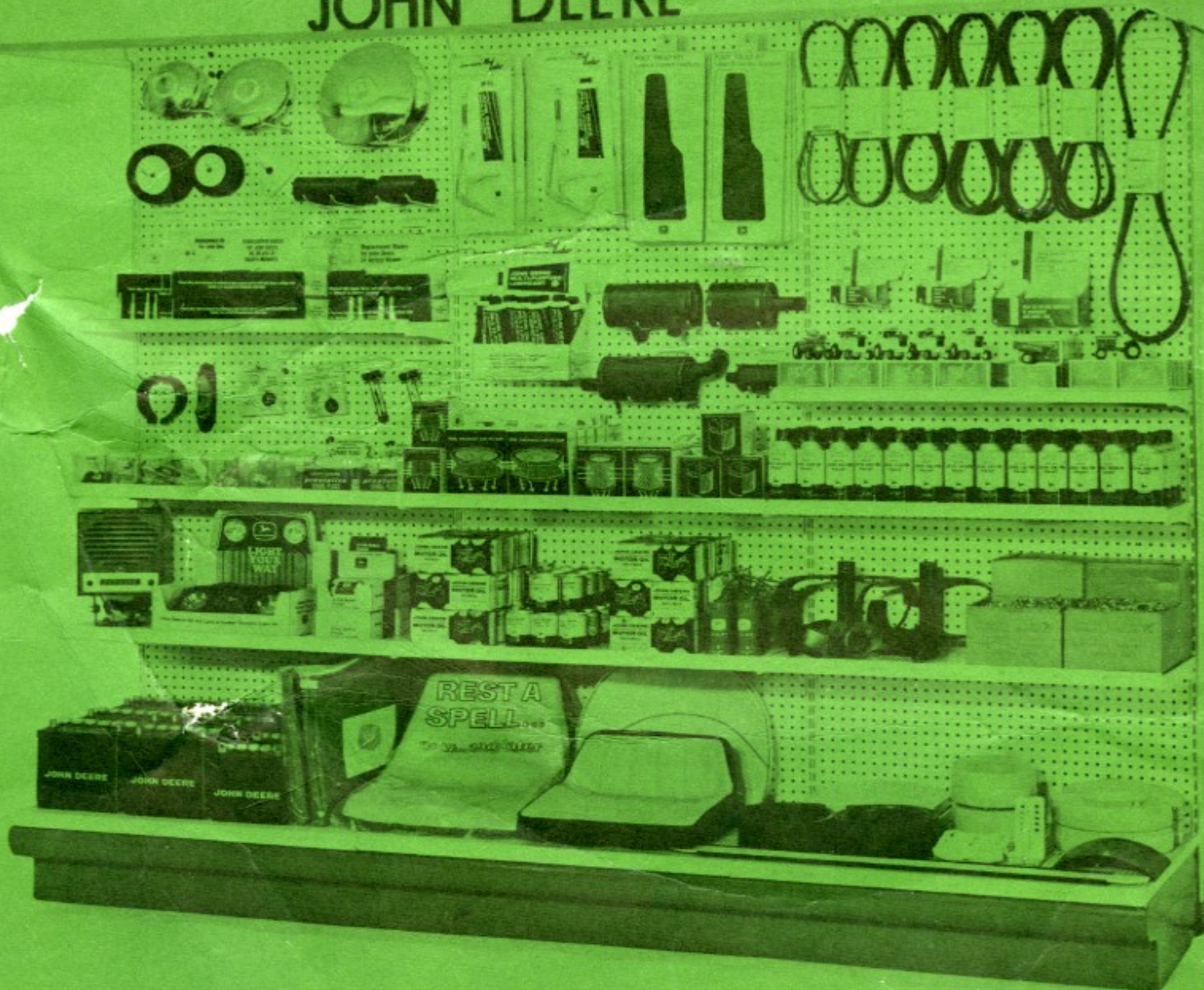
John Deere Electric 90 Mower

Mower Serial No. _____

Date of Purchase _____

(To be filled in by purchaser)

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Your John Deere Consumer Products dealer is ready to serve you with dependable parts and service. His well stocked shelves of Genuine John Deere Parts will keep your equipment on the go.

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