

**170, 175,  
180 and 185  
Lawn Tractors**

(Serial No. 595,001— )



**OPERATOR'S  
MANUAL**



**John Deere Horicon Works  
OM-M78999 Issue Jun 88**

LITHO IN U.S.A.

# Introduction

**Thank you** for purchasing a John Deere product.

**Read this manual** carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage.

**This manual should be considered** a permanent part of your machine and should remain with the machine when you sell it.

**Measurements** in this manual are U.S. customary units and their metric equivalents.

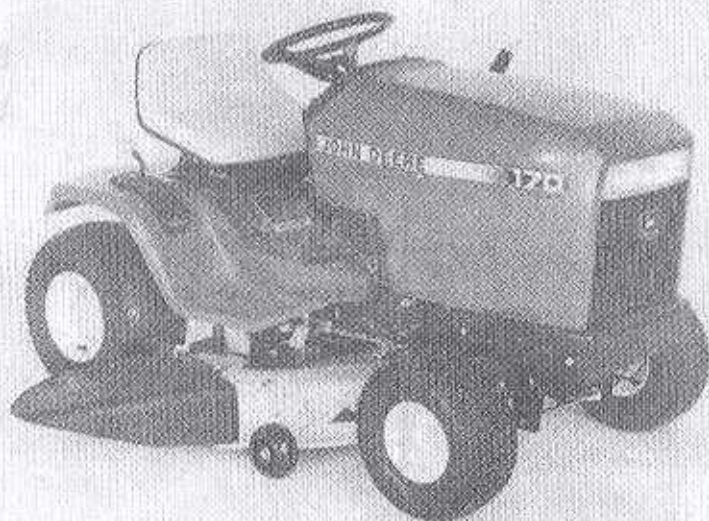
**Right-hand and left-hand** sides are determined by facing in the direction of forward travel.

**Write identification numbers** in the Specifications section. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts. If this manual is kept on the machine, also file the identification numbers in a secure place off the machine.

**Warranty** is provided as part of John Deere's support program for customers who operate and maintain their equipment as described in this manual. The warranty is explained on the warranty certificate which you should have received from your dealer.

This warranty provides you the assurance that John Deere will back its products where defects appear within the warranty period. In some circumstances, John Deere also provides field improvements, often without charge to the customer, even if the product is out of warranty. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied. Setting fuel delivery above specifications or otherwise overpowering machines will result in such action.

**The tire manufacturer's** warranty supplied with your machine may not apply outside the U.S.



*All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication. The right is reserved to make changes at any time without notice.*

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A98;M61127;M11;M78099-1FC 130488

M99;1FC 1. 9/23/88

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# Safety

## OPEI CERTIFICATION

This OPEI Label on your mower indicates that this model has been certified by an independent laboratory for compliance with American National Standard B-71.1 - 1986, "Safety Specifications" for Power Lawn Mowers, Lawn and Garden Tractors and Lawn Tractors.

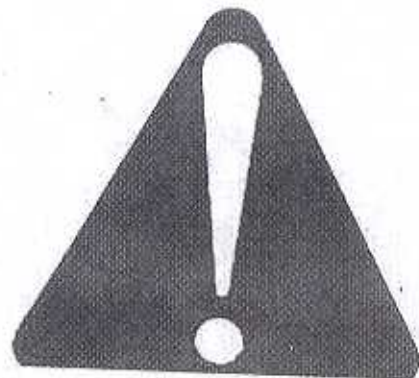


AB6/T52NR 053/CERT1 226

## RECOGNIZE SAFETY INFORMATION

This is the safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.



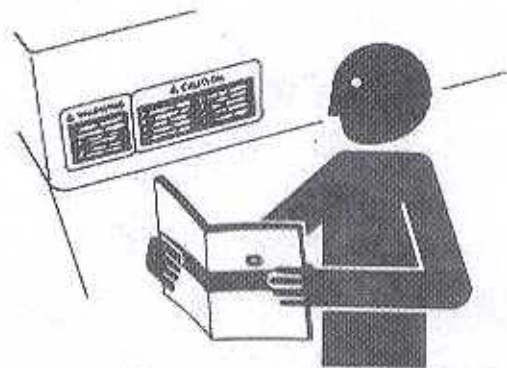
AB6/T81389 053/ALERT 16268

## FOLLOW SAFETY INSTRUCTIONS

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.



AB6/T5201 053/READ 230882

## UNDERSTAND SIGNAL WORDS

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

Safety signs with signal word DANGER or WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.



AB6/T5187 053/SIGNAL 071085



## KEEP RIDERS OFF MACHINE

Only allow the operator on the machine. Keep riders off.

Riders on machine are subject to injury such as being struck by foreign objects and being thrown off of the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.



A86;1S213 053;RIDER 160687

## PROTECT CHILDREN

Keep children and others away when you operate machine.

**BEFORE YOU BACK UP:**

- Stop the PTO.
- Look behind tractor for children.

Do not let children operate tractor.

Never carry children. Do not let children ride on tractor, mower, or any attachment.



A08;M41274 M21;SAS -D 080987

## AVOID TIPPING

Do not drive where machine could slip or tip.

Stay alert for holes, rocks, and roots in the terrain, and other hidden hazards. Keep away from drop-offs.

Slow down before you make a sharp turn.

Use care when pulling loads or using heavy equipment.

- Use only approved drawbar hitch points.
- Limit loads to those you can safely control.
- Use counterweights or wheel weights when suggested in this operator's manual.

Reduce speed and exercise extreme caution on slopes and in sharp turns to prevent tipping or loss of control. Be especially cautious when changing direction on slopes.

Do not stop or start suddenly when going uphill or downhill.

If machine stops going up hill.

- Stop the PTO.
- Back down slowly.



A98;P41275 M21;SAS -D 080987



## PARK TRACTOR SAFELY

To park tractor safely:

1. Move shift lever in "N" (Neutral) position.
2. Disengage PTO'S.
3. Lower equipment to the ground.
4. Engage park brake.
5. Stop the engine.
6. Remove key.

Before you leave the operator's seat, wait for engine and attachment parts to stop moving.



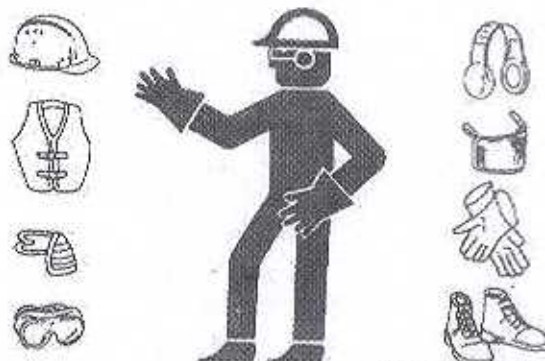
A98/M41273 M21/SA5 -B1 200907

## WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.



A06/TS206 053/WEAR 330487

## HANDLE FUEL SAFELY—AVOID FIRES

Handle fuel with care: it is highly flammable. Do not refuel the machine while smoking or when near open flame or sparks.

Always stop engine before refueling machine. Fill fuel tank outdoors.

Prevent fires by keeping machine clean of accumulated trash, grease, and debris. Always clean up spilled fuel.



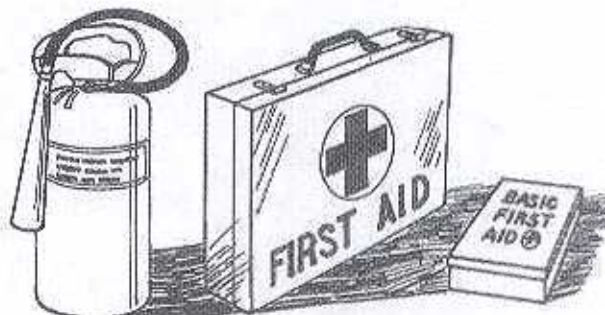
A06/TS202 053/FIRE1 230487

## PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



A06/TS186 053/FIRE2 060285



## PRACTICE SAFE MAINTENANCE

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate or service machine while it is moving. Keep hands, feet, and clothing from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

Disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.



AB675218 Q53/SERV 211287





## READ SAFETY SIGNS CAREFULLY

Carefully read and follow all safety signs.

Danger signs identify the most serious hazards.

Keep safety signs in good condition. Replace any missing or damaged safety signs. Signs are attached to machine near specific hazard areas.



*Top, Left-Side of Mower Deck*



*Top, Right-Side of Mower Deck Near Chute*

A98;M30614 M30613 M23;SAS -A2 060603



A97;M61202 M21;SAS -A3 060608



Caution signs call attention to safety messages in this manual.

# CAUTION

## TO AVOID INJURY

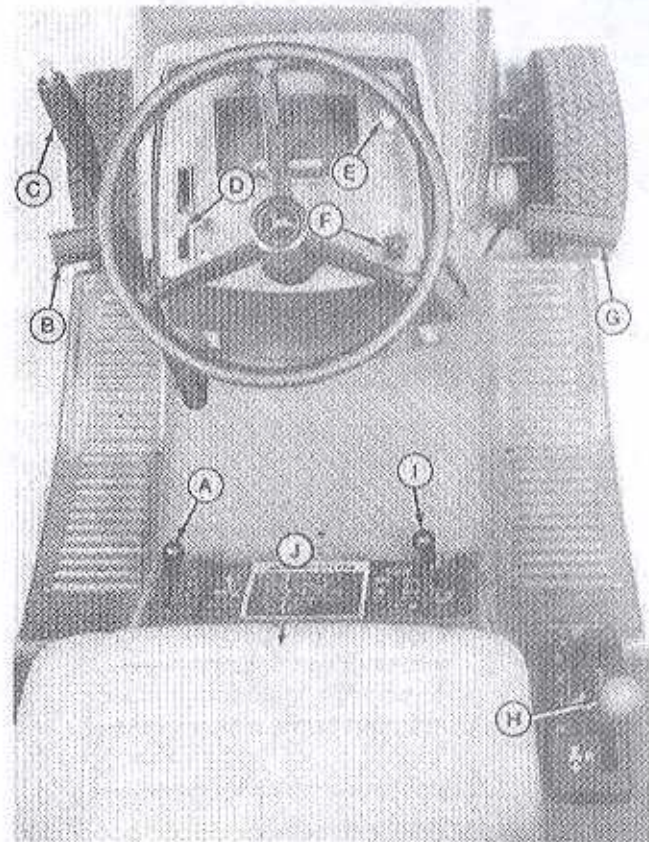
- READ OPERATOR'S MANUAL
- KNOW LOCATION AND FUNCTION OF CONTROLS
- KEEP SAFETY DEVICES (GUARDS, SWITCHES) IN PLACE AND WORKING
- NEVER CARRY CHILDREN
- LOOK BEHIND BEFORE BACKING
- KEEP CHILDREN AND OTHERS AWAY WHEN OPERATING MACHINE
- STOP ENGINE BEFORE PLACING HANDS OR FEET NEAR POWER DRIVEN PARTS
- DO NOT DRIVE WHERE MACHINE COULD SLIP OR TIP
- IF MACHINE STOPS, GOING UP HILL, SHUT OFF PTO AND BACK DOWN SLOWLY
- WHEN LEAVING MACHINE:
  - STOP ENGINE
  - SET PARK BRAKE
  - REMOVE KEY

*Safety Sign on Tractor  
in Front of Seat*

A99, M38364 N21, SAS - A1 020457

# Controls

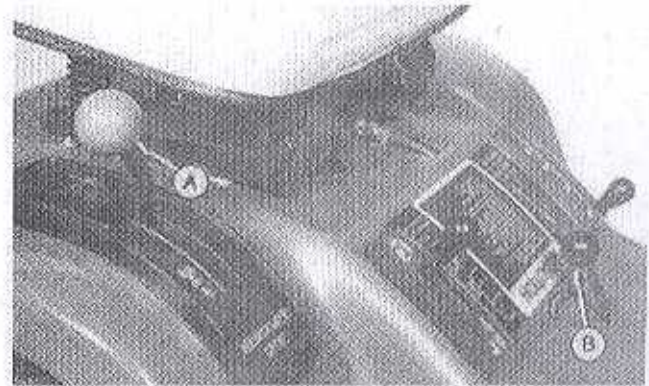
- A—Down-Stop Lever
- B—Clutch Pedal on 170 and 180 Tractors
- C—Lift Lever
- D—Throttle Lever
- E—PTO Switch
- F—Key Switch
- G—Brake Pedal
- H—Gear Shift Lever on 170 and 180 Tractors
- I—Park Brake Knob
- J—Fuel Shut-Off Valve



A98;M40456 M21;CTS -A1 120488

## TRANSMISSION CONTROL LEVERS ON 175 TRACTORS

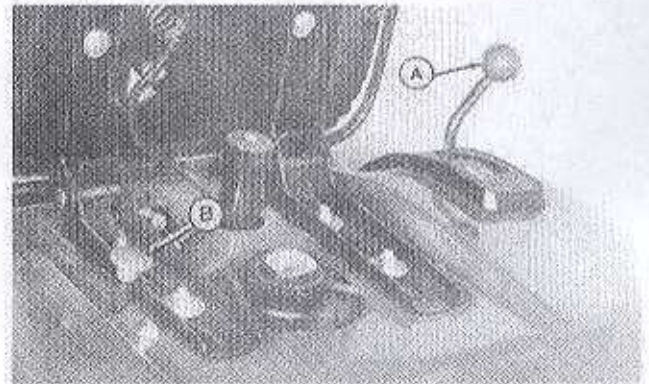
- A—Hydrostatic Transmission Shift Lever
- B—Tow Disconnect Lever



A98;M38597 M21;CTS -A2 220488

## TRANSMISSION CONTROL LEVERS ON 185 TRACTOR

- A—Hydrostatic Transmission Shift Lever
- B—Tow Disconnect Lever

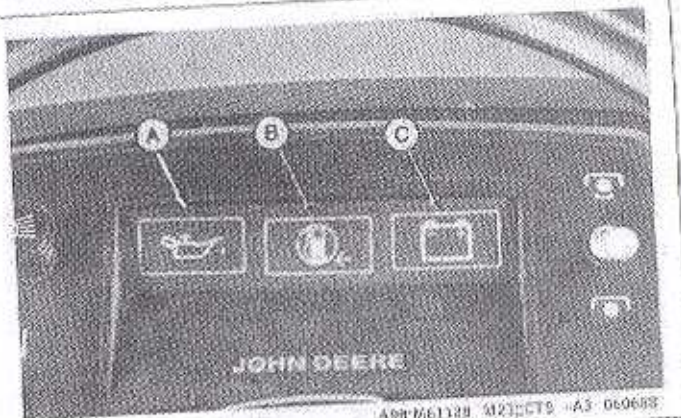


A98;M40204 M21;CTS -B1 030487

## INDICATOR LIGHTS

*NOTE: Only the low-fuel indicator (B) is used on the 170 and 175 Tractors. Model 180 and 185 Tractors are equipped with all three lights.*

- A—Engine Oil Pressure
- B—Low-Fuel
- C—Battery Discharge

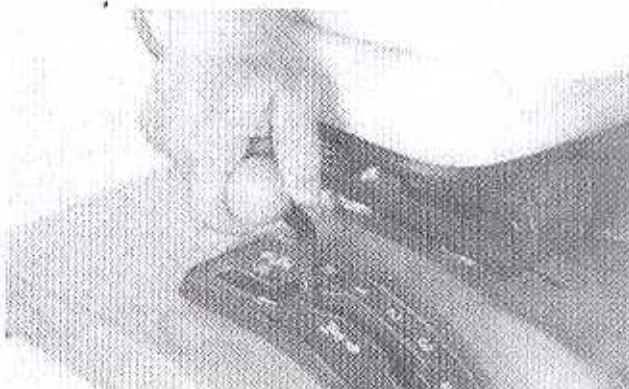
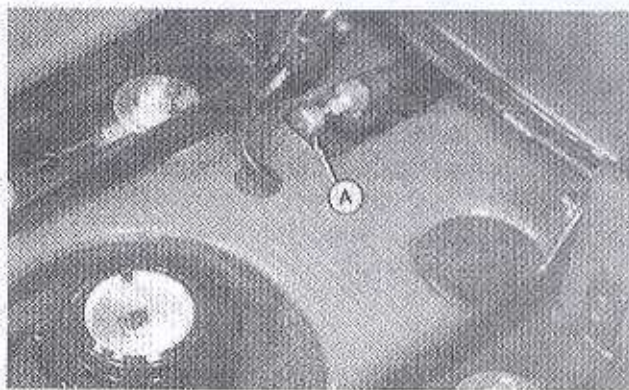


# Operating the Engine

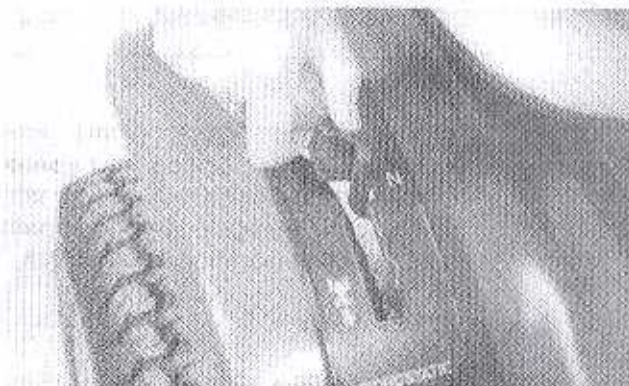
## STARTING THE ENGINE

**CAUTION:** Start engine **ONLY** outdoors or in a well-ventilated place. Exhaust fumes are dangerous.

1. Lift seat.
2. Turn knob counterclockwise to open fuel shut-off valve (A).
3. Move transmission shift lever to N (neutral) position.



*Gear Selector Tractor*



*Hydrostatic Tractor*

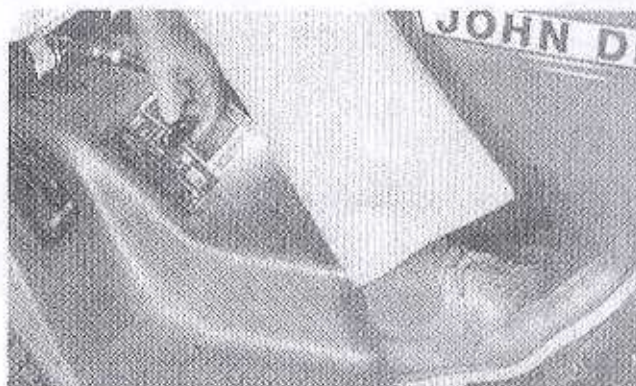
A98/M38560 M38509 M32821 M21,0ES -A 200486

**NOTE:** You cannot move hydrostatic control lever out of N position when park brake is locked.

4. Lock the park brake:
  - a. Push down pedal(s).
  - b. Move park brake knob to P position.
  - c. Release pedal(s). Pedal(s) should stay down.

To start engine, you must:

—push brake pedal down all the way on a hydrostatic tractor.



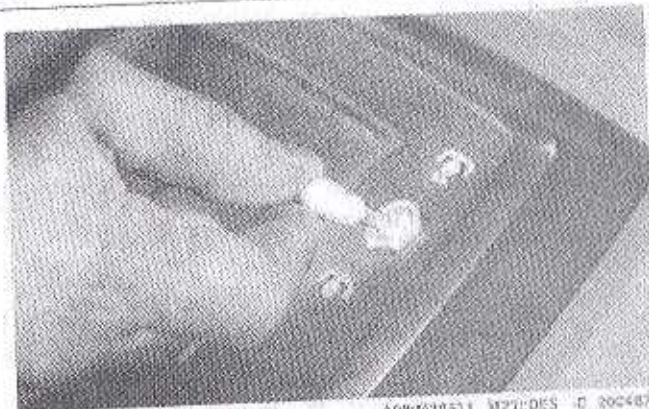
A98/M38510 M21,0ES -B 200487

## Operating the Engine

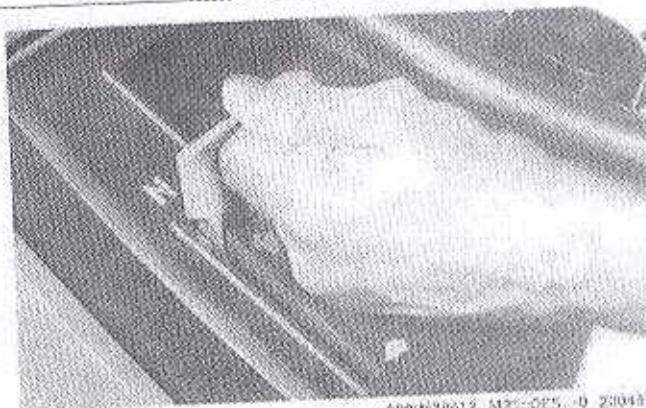
**NOTE:** Your tractor has a neutral start safety switch. Engine will not start unless:

- PTO switch is OFF.
- Transmission shift lever is in N (neutral) position.
- Brake pedal is down all the way on a hydrostatic tractor.

Move PTO switch lever to OFF position.



Move throttle lever to choke position if engine is cold. Put throttle at half-speed position if engine is warm.

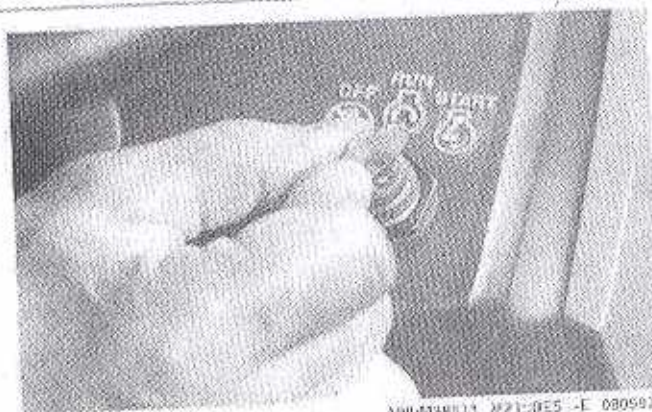


**IMPORTANT:** Do not operate starter more than 20 seconds at a time or you may damage it. If engine does not start, wait 2 minutes before you try again. If engine will not start, see Troubleshooting section.

7. Turn key to START position.

8. When engine starts, release key to RUN position.

9. Move throttle lever to half-speed position.



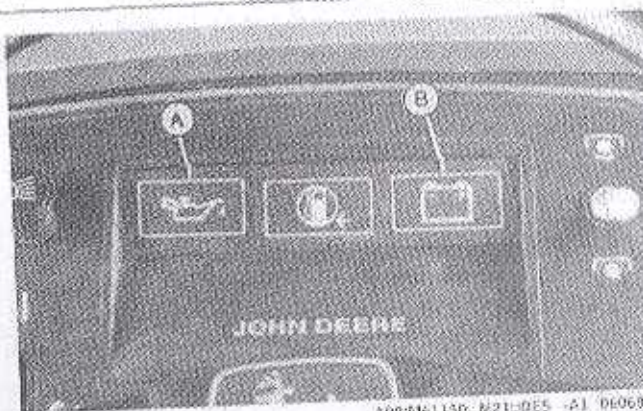
## CHECKING INDICATOR LIGHTS ON 180 AND 185 TRACTORS

After engine starts:

A. Oil pressure (A) indicator should go out within 5 seconds.

B. Battery discharge indicator (B) should go out within 10 seconds. If not, move throttle lever to 3/4 position.

If indicator lights stay on longer than given time, stop engine. Find and correct problem.



## WARMING AND IDLING ENGINE

### Warming Engine

Run engine at half speed for 2 to 3 minutes.

### Idling Engine

1. The engine is air-cooled and needs a large volume of air to keep cool. Keep grille, louvers, and screen on top of engine clean.

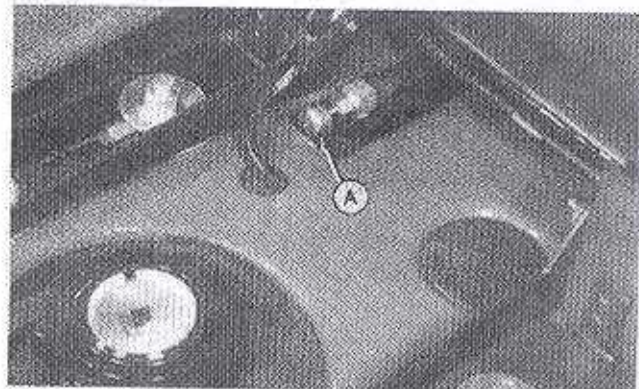
2. Avoid unnecessary engine idling.

**IMPORTANT:** Always run engine at maximum speed when mowing to prevent battery discharging.

M21:0ES -G 200817

## STOPPING ENGINE

1. Move throttle lever down to SLOW position. Let engine idle before you stop it.
2. Turn key to OFF position.
3. Remove key.
4. Lock park brake.
5. Lift seat.
6. Turn knob clockwise to close fuel shut-off valve (A).



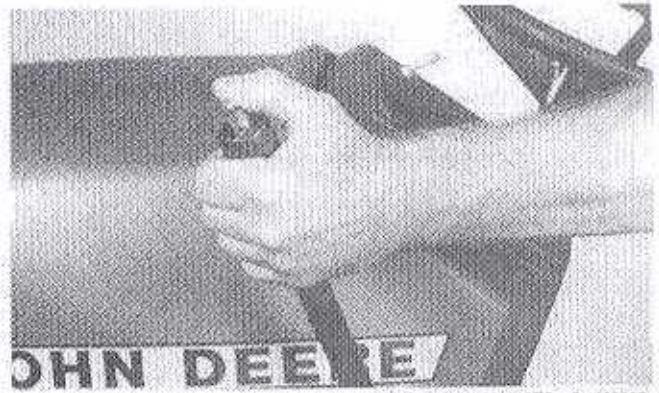
A98:038560 M21:0ES -H 030407

# Driving the Tractor

## OPERATING LIFT LEVER

1. Push down and hold button with thumb.
2. Move lever forward to lower mower.
3. Pull lever back to raise mower.
4. Release button to lock lever in position.

**IMPORTANT:** Insect repellent spray may damage painted surfaces. Do not spray insect repellent near tractor.



A99/M38602 M21;DTS -B 221627

## USING PARK BRAKE

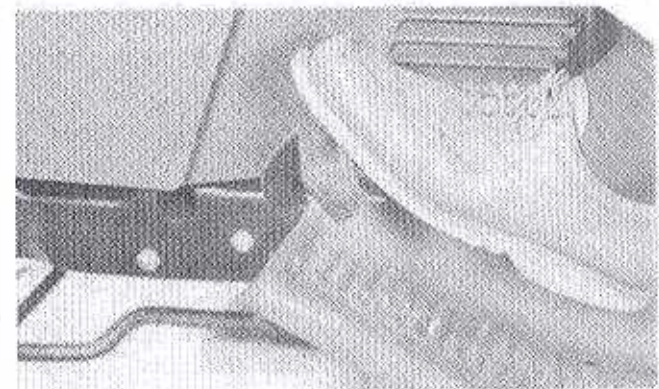
### Locking Brake

1. Move park brake knob into long slot.
2. Push down brake pedal (all tractors) and clutch pedal on gear selector tractors.
3. Release pedal(s). Pedal(s) should stay down.



### Unlocking Brake

1. Push down and hold pedal(s).
2. Move park brake knob into short slot.
3. Release pedal(s).



*Park Brake Knob and Brake Pedal (upper)*

*Clutch Pedal (lower)*


A99/M38510 M36517 M21;DTS C 106605



## USING HYDROSTATIC TRANSMISSION

### Moving Forward

1. Move shift lever forward slowly.
2. The tractor will move faster as you push lever farther forward.

 **CAUTION:** Look behind tractor to be sure area is clear.

### Moving in Reverse

1. Move shift lever to N (neutral) position to stop tractor.
2. Move shift lever into R (reverse) position slowly.
3. The tractor will move faster in reverse as you move the lever farther to the rear.



ARRM32977 M21,DT5 D 241185


## USING GEAR TRANSMISSION

### Moving Forward

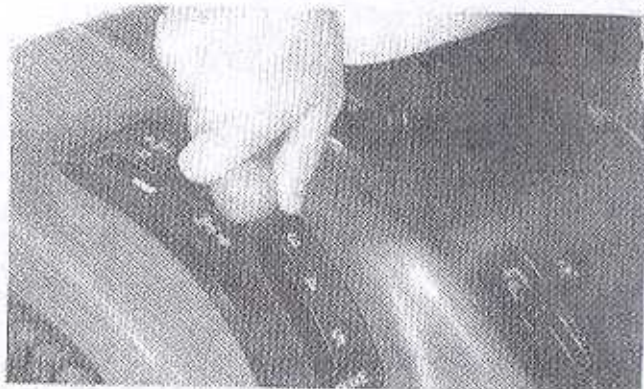
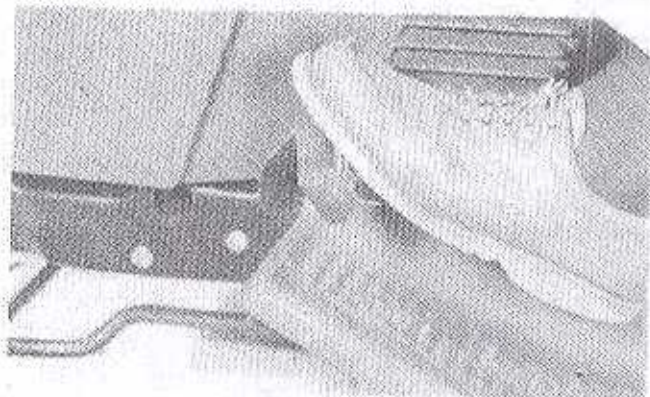
1. Push down clutch pedal.
2. Move shift lever to desired gear.
3. Release pedal slowly.

**IMPORTANT:** You do not have to stop tractor to shift on the go but, do not shift on the go when tractor is under extreme load. To shift on the go, follow steps 1, 2, and 3 above.

### Moving in Reverse

 **CAUTION:** Look behind tractor to be sure area is clear.

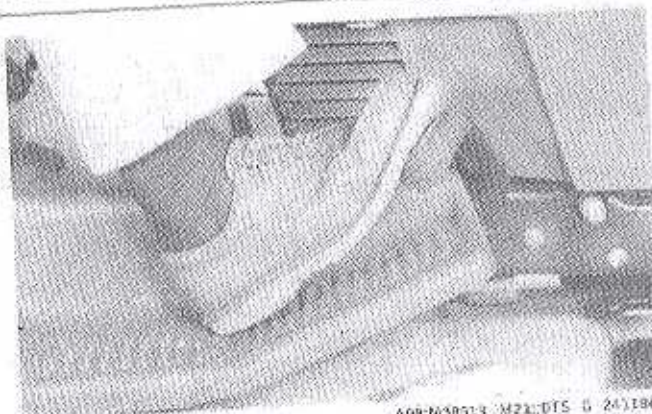
1. Push clutch pedal all the way down to stop tractor.
2. Move shift lever to R (reverse) position.
3. Release clutch pedal slowly.



ARRM328517 M38518 M21,DT5 -E1 030467

### STOPPING THE GEAR TRACTOR

Push down clutch pedal and brake pedal (shown).  
Move transmission shift lever to N (neutral) position.



### STOPPING HYDROSTATIC TRACTOR

**CAUTION:** The tractor may creep forward or back while in the neutral position when the parking brake is not locked. Move transmission lever forward or back in the neutral slot area to stop the tractor from creeping. If tractor continues to creep, see your John Deere dealer.

Move shift lever to N (neutral) position.  
Lock parking brake.



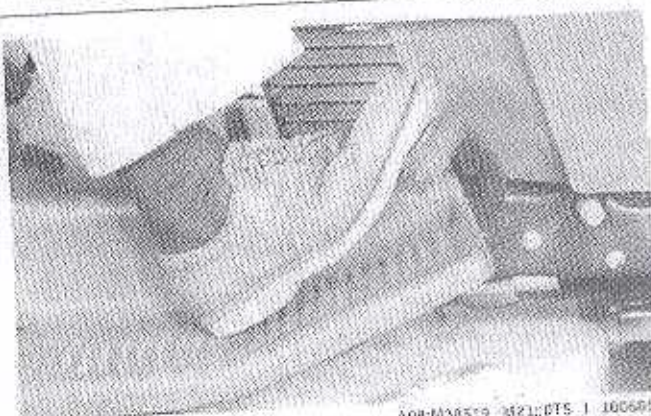
### EMERGENCY STOPPING

For Selector Tractor

Push down clutch pedal and brake pedal (shown).

For Hydrostatic Tractor

Push down brake pedal. Transmission shift lever should return to N (neutral) position.



# Operating the Mower

## OPERATE MOWER SAFELY

Only allow the operator on the machine. Keep riders off.

Riders on machine are subject to injury such as being struck by foreign objects and being thrown off of the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.

Learn how to operate tractor and mower correctly.

Check: all parts should be in good condition and fastened in place.

Wear hard shoes or boots and clothing that is not loose.

Clear the mowing area of objects that might be picked up and thrown.

Clear the mowing area of people and pets.

Test drive the area with PTO switch in "OFF" position and mower in down position.

Trim low-hanging branches to prevent eye injuries.

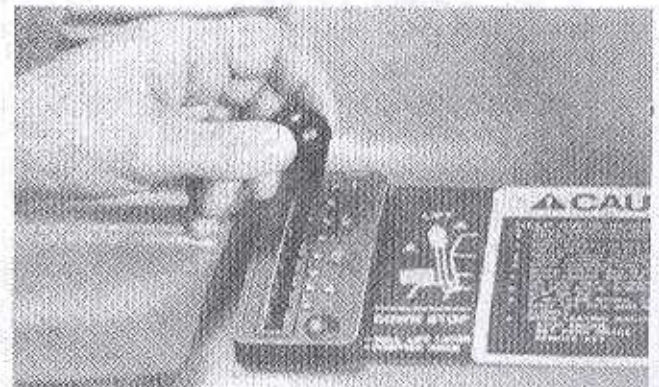
Wear fairly tight clothing . . . and safety equipment.

M21;DMS TM 200487

## ADJUSTING CUTTING HEIGHT

Cutting height can be adjusted from 25 to 100 mm (1 to 4 in.) 38-inch mowers and 38 to 100 mm (1-1/2 to 4 in.) for 46-inch mower.

1. Raise mower to full height.
2. Move down stop lever to desired cutting height. Release lever.
3. Lower mower to cutting height. Mower will be at this cutting height each time you lower it.



A96;M28529; M21;DMS -A6 130488

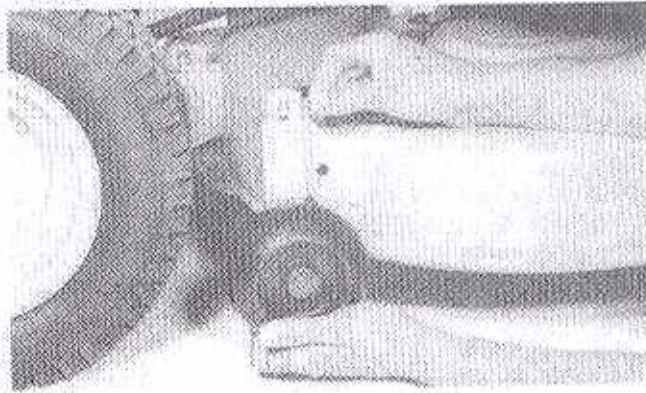
## ADJUSTING MOWER WHEELS

- CAUTION:** Before you adjust wheels:
- Stop engine.
  - Remove ignition key.
  - Wait for blades to stop.

**IMPORTANT:** The mower wheels must not ride on the ground to support mower weight.

Adjust wheels each time you change cutting height.

1. Check tractor tire pressure. Inflate tires equally. (See Checking Tire Pressure in Service/25-Hours Section.)
2. Remove spring locking pin (A) and drilled pin (B) from each wheel.
3. Move lift lever forward to lower mower to desired cutting height.
4. Adjust wheels until wheels are approximately 6 mm (1/4 in.) from the ground.
5. Install drilled pins (B) in nearest hole. Fasten pins with spring locking pins (A).



**WHEEL ADJUSTMENT**

	90 mm — 0 — (3 1/2 in)
	75 mm — 0 — (3 in)
	65 mm — 0 — (2 1/2 in)
	50 mm — 0 — (2 in)
	40 mm — 0 — (1 1/2 in)

- Adjust wheels to desired cutting height
- Set depth control to support mower weight with mower wheels suspended 6 mm (1/4 in) above ground

A98743910 M31563 M21,DM5 -A7 130488

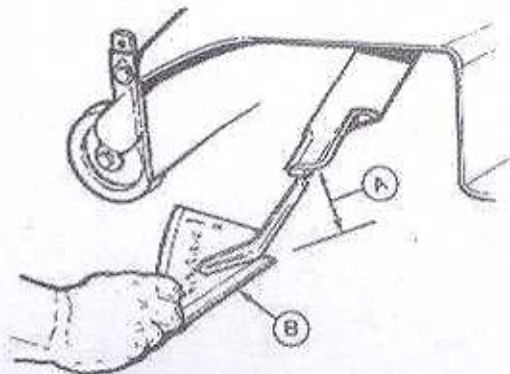
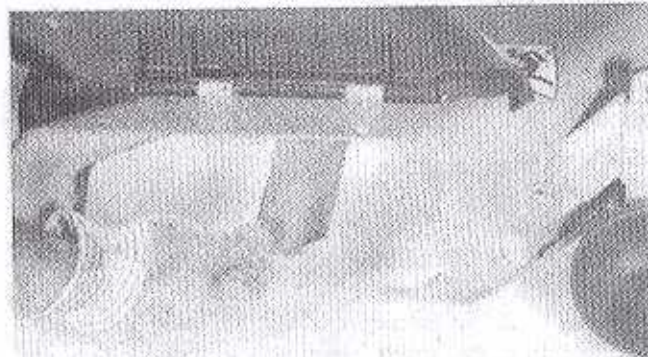
## ADJUSTING MOWER LEVEL SIDE-TO-SIDE

- CAUTION:** Before you adjust mower, stop engine and remove ignition key.

1. Park tractor on a hard, level surface.
2. CHECK: Tire pressures must be correct. (See Checking Tire Pressure in Service/25-Hours Section.)
3. Adjust cutting height to 50 mm (2 in.).
4. Turn left blade by hand parallel to tractor axle. Hold drive belt and turn right blade parallel to axle.

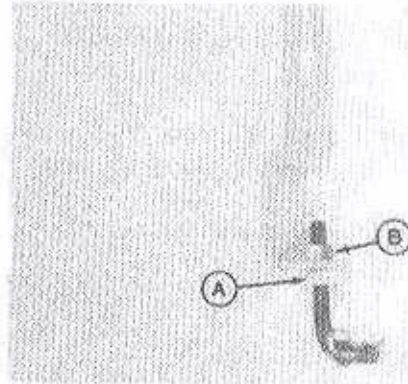
*NOTE: A convenient leveling gauge (B) is available from your John Deere dealer. Order Part No. TY15272.*

5. Measure from each outside blade tip (A) to the level surface. The difference between measurements must not be more than 3 mm (1/8 in.).



A987440234 M40161 M21,DM5 -A1 130488

6. Lift strap (shown) is on left side of mower
7. Loosen lower nut (A).
8. Turn top nut (B) clockwise to raise left side of mower. Turn nut counterclockwise to lower left side.
9. Tighten lower nut.

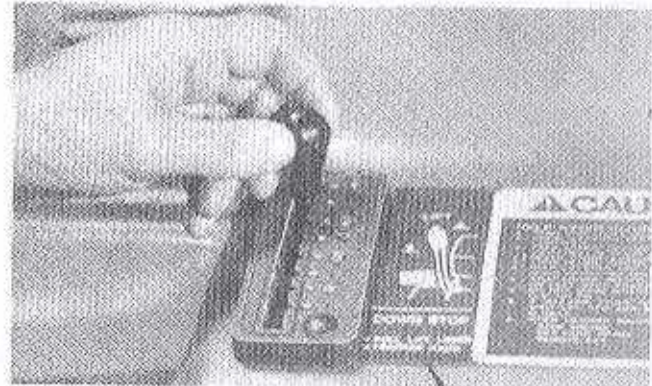


A98;M38616 M21;OMS 3 000427

### ADJUSTING MOWER LEVEL FRONT-TO-REAR

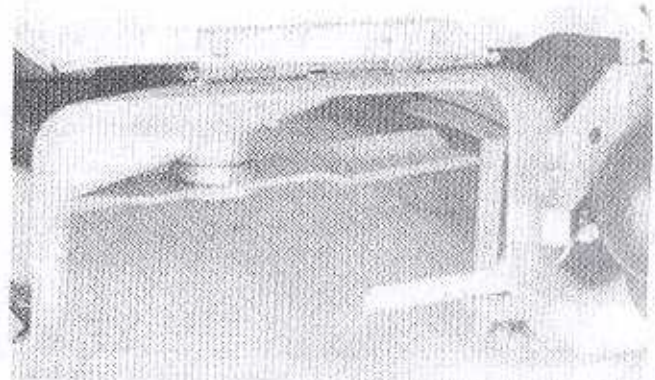
**CAUTION:** Before you adjust mower, stop engine and remove ignition key.

1. Park tractor on a hard, level surface.
2. CHECK: Tire pressure must be correct. (See Checking Tire Pressure in Service/25 Hours section.)
3. Adjust cutting height to 50 mm (2 in.).



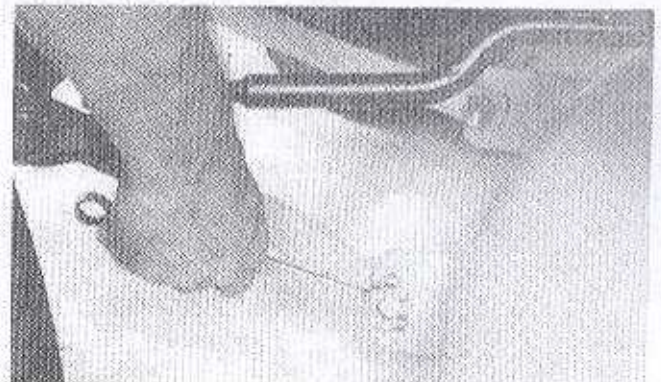
A98;M38520 M21;OMS All 000458

4. Turn left blade by hand so a blade tip points straight forward.
5. Hold drive belt and turn right blade straight forward.
6. Measure from each outside blade tip to the level surface. The front blade tips must be 3 to 6 mm (1/8 to 1/4 in.) lower than rear blade tips.



A98;M35912 M21;OMS -A2 120928

7. To level 38-in. mower:
  - a. Loosen cap screws on both draft arms.



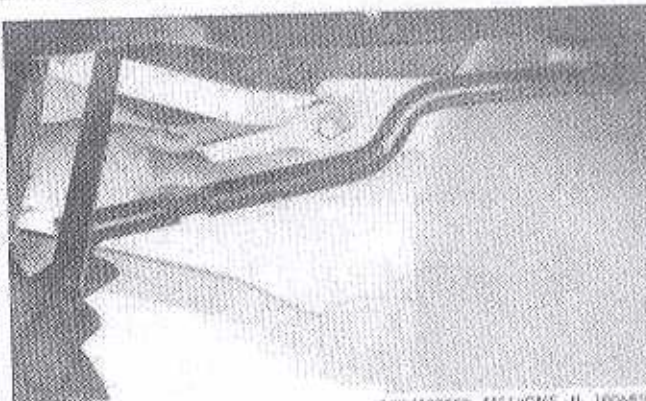
A98;M32851 M21;OMS -A3 120489

## Operating the Mower

Turn both draft arm adjusters equally until adjustment is correct. (See Step 6.)

If adjustment cannot be made, move draft arms to a different hole in mower deck and follow steps 6 and 7.

Tighten cap screws after adjustment is made.



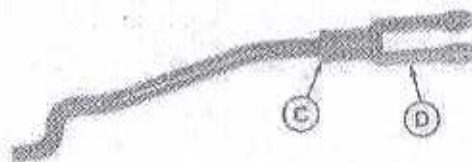
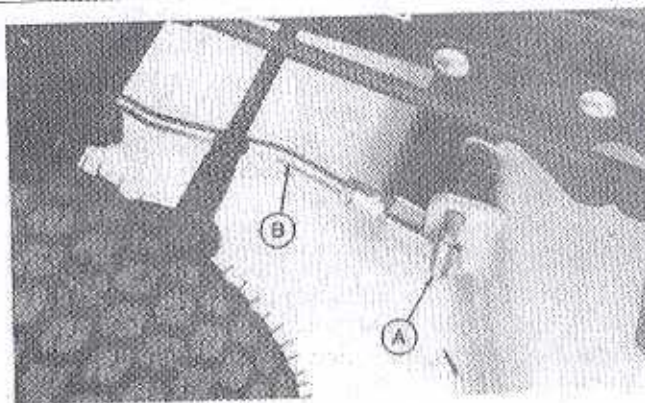
A98M32652 M21:OMS H 100483

### 1. To level 46-in. mower:

a. Pull J-pins (A) to remove front draft arms (B).

b. Loosen nut (C). Turn yokes (D) equally to lift or lower front of mower deck.

c. Install draft arms, check level. After adjustment is made, tighten nuts (C) against yokes.



342,84175 IM4196 M21:OMS -A4 125488

## ENGAGING MOWER

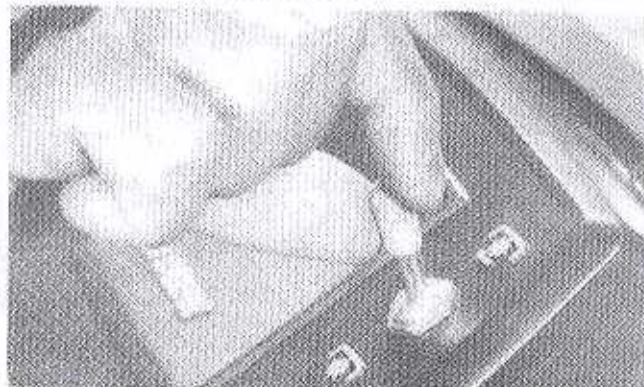
1. Start engine.
2. Move throttle lever to one-fourth speed position.
3. Lower mower to cutting height.



A98M38602 M21:OMS J 151286

**IMPORTANT:** To prevent clutch damage, do not engage PTO with throttle in FAST position.

4. Pull out and push up on PTO switch to move to ON position. Move PTO switch to the ON position to engage mower.



A98,M38523 M21;OMS K 241165

5. Move throttle lever to FAST position.

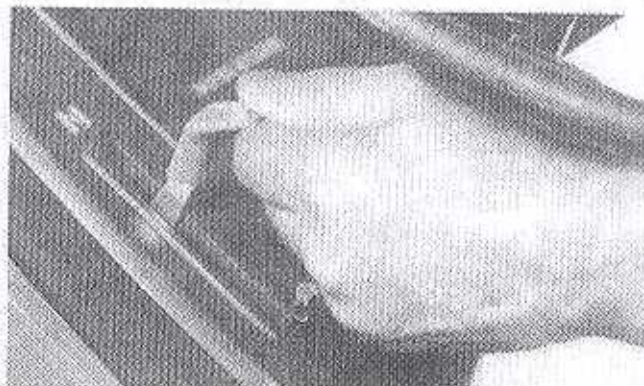
**IMPORTANT:** Running engine at slower than wide open throttle will discharge the battery.

6. Unlock park brake.



**CAUTION:** Clear the area before you mow.

7. Move hydrostatic lever forward slowly OR move gear shift lever to a lower gear. Release clutch pedal slowly.



A98,M38499 M21;OMS -L 030487

## MOWING TIPS

1. Mow only at full throttle.

2. Mow at a safe travel speed.

3. Mow grass only when it is dry.

4. Slow down:

—when you mow on slopes.

—before you make a turn.

—when you mow close to buildings or trees.

Use slow travel speed for:

1. Trimming.
2. Working in close quarters.
3. Mowing tall grass.

Use faster travel speeds for:

1. Normal mowing on level ground.
2. Driving between mowing jobs.

Clean mower deck:

Clean under mower deck and drive belt area with scraper or brush.

M21;OMS -Z1 030487

## STOPPING MOWER



**CAUTION:** Stop engine. Wait until blades stop before you leave operator's seat.


Move PTO switch down to OFF position at any time while you are mowing to stop the mower.

If you hit an object with mower while mowing, stop mower and engine immediately. Inspect mower for damage.



A98,M38511 M21;OMS -M 030487

## DISMOUNTING TO INSPECT OR UNPLUG MOWER

 **CAUTION:** Follow steps below before you leave tractor.

1. Stop tractor.
2. Put PTO switch lever in OFF position.
3. Lower mower to ground.

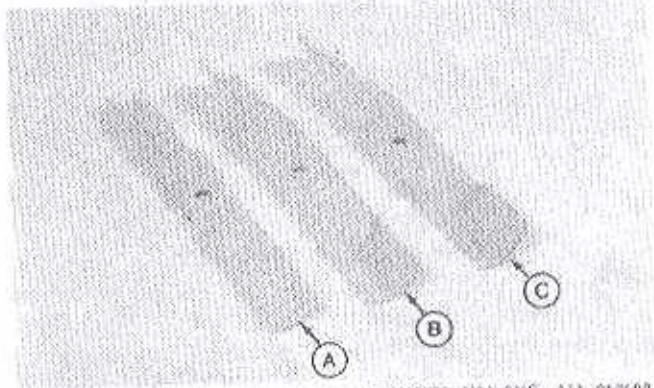
4. Lock park brake.
5. Stop engine.
6. Remove key.
7. Wait for mower blades to stop.

**NOTE:** If engine and mower are running, engine and mower must stop when you get off the operator's seat.

M21;DMS -R 030497

## USING CORRECT BLADES—(38 INCH MOWER ONLY)

1. Low-lift blades—for dusty or dirty conditions, not for bagging.
2. Medium-lift blades—standard blade for use without bagger. Also good to use if you bag an average stand of grass regularly.
3. High-lift blades—for cutting and bagging thick, tall grass and/or leaves.



A98;A39427 M21;DMS -A11 060608

## MOWING FOR A BETTER LAWN

Cut grass only when it is dry. Wet grass may plug mower and leave a trail of grass clumps.

Mow grass often. Short grass clippings will decay quickly.

Run engine at wide open throttle for optimum cut quality.

Cutting grass too short may kill grass and let weeds grow easily.

Keep blades sharp. A dull blade will tear grass. Tips of grass will then turn brown.

Slow travel speed (not engine speed) before you make a turn. Short, fast turns may scuff the ground and pull grass out by the roots.

M21;DMS -U1 230487

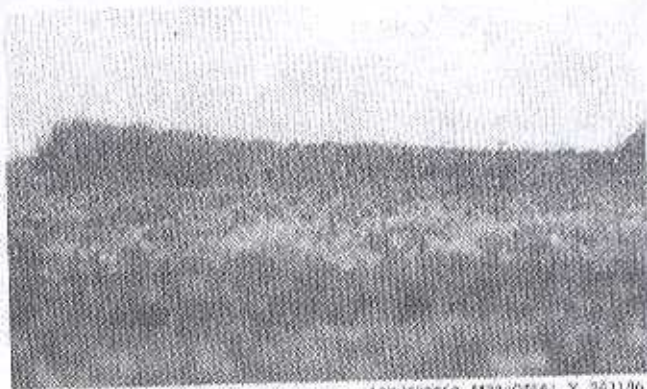
## PREVENTING UNEVEN CUT

Check adjustment of mower wheels. (See Adjusting Wheels in this section.) Check tire pressure.

Check mower level. (See Adjusting Mower level ... in this section.)

Slow down before you make a turn.

Keep mower blades sharp.



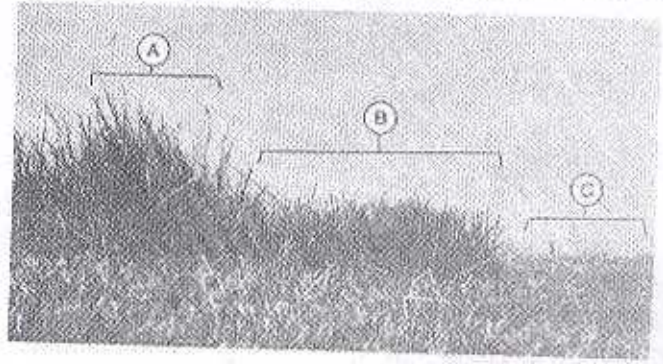
A97;M32659 M23;DMSA1 Y 241136



## MOWING TALL GRASS

### First Method

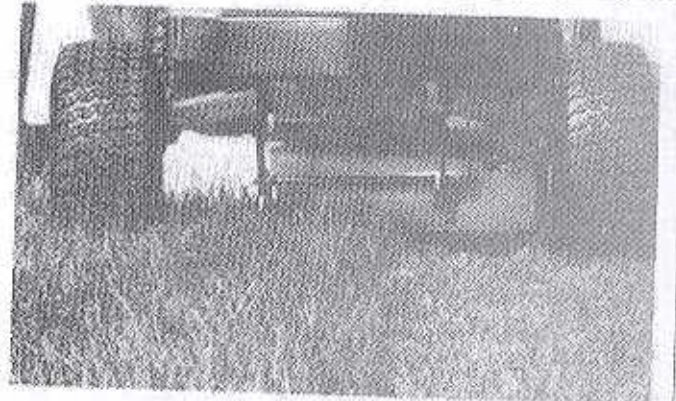
1. Adjust cutting height of mower to mow tall grass (A) to half height (B).
2. Before second pass adjust cutting height so you can mow at desired height (C).



A99/M27156 M21:0685 U-100689

### Second Method

1. Mow at desired height at slow travel speed, full width OR
2. Mow at desired height using only half of cutting width.



A99/M32858 M21:0685 P-100685

## OPERATING OPTIONAL BAGGING ATTACHMENT SAFELY

Read CAUTION and WARNING safety signs attached to hopper top, bags, and chute.

1. Stop mower and tractor engine before you remove or install grass bags or chute.
2. Do not operate on steep slopes.
3. Do not change ground travel speed when you operate on inclines.
4. Do not operate uphill with grass bags full of leaves or clippings.
5. Do not leave grass or leaves in bags overnight. Do not store tractor with grass or leaves in bags.



### CAUTION

- Bag is subject to wear and deterioration.
- Check bag frequently, replace when necessary
- Use a John Deere bag or equivalent to comply with safety specifications.



### WARNING

**Do not operate mower without grass bag attached.**



### WARNING

**OBJECTS MAY BE THROWN FROM MOWER**

- Do not open catcher while blades are turning
- Shut off engine before removing or installing bag
- Operate mower with complete bagging attachment in place

A38;M40436 M21;OMS -V. 030497

## MOWING AND BAGGING TIPS

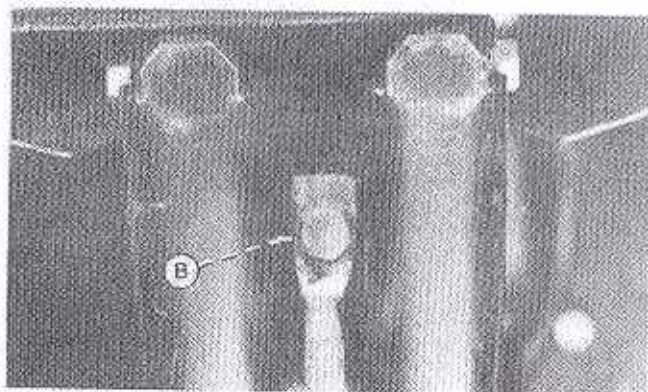
1. Mow and bag grass when it is dry and not too tall or dense.
2. Operate tractor at a slow travel speed and engine at maximum speed.
3. Keep mower deck, bagging chute, hopper top screen, and bags clean.
4. Install correct blade(s). (See Using Correct Blade(s) in this section.
5. Operate mower in the higher cutting positions to permit maximum air flow. Mow grass twice if it is longer than normal.
6. Empty the bags often to prevent plugging.
7. Put plastic garbage bags inside cloth bags to facilitate disposal of grass or leaves.

M21;OMS -W 030467

## REMOVING AND EMPTYING BAGS

1. Pull down rubber latch (A) to remove it from retainer.
2. Raise hopper top.

**NOTE:** There should be 1-in. (25.4 mm) stretch in latch when connecting to retainer. If necessary, raise hopper top and remove bags to adjust retainer for correct latch stretch. Place flat washers between retainer and bag holder in position (B) to attain proper stretch.

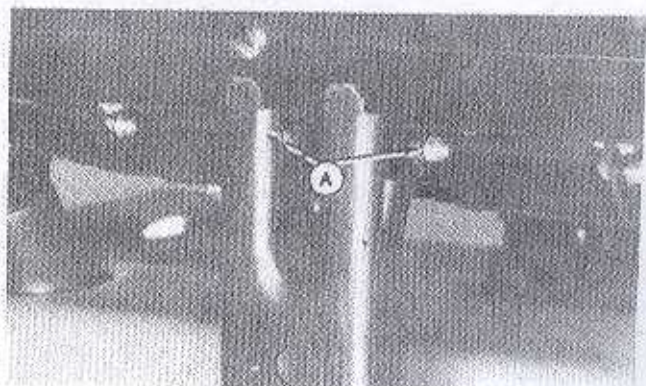


A9R/M40437 M40438 M21,0M5 X 243188

3. Grasp bag support frame and lift bag off post hanger.

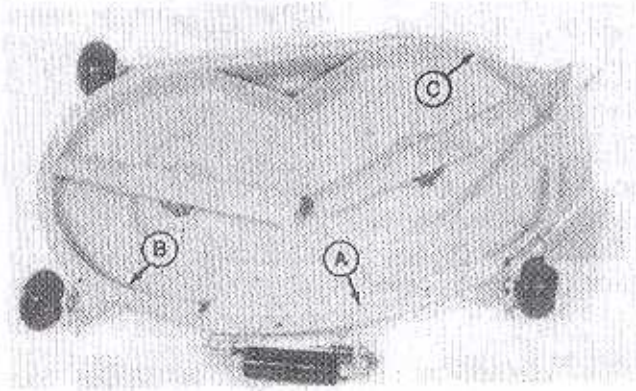
**NOTE:** If hopper top will not stay up when opened, tighten nuts (A) on two hinge bolts that attach hopper top to support post. Do not overtighten nuts or hopper top will be difficult to open and close.

4. Grasp cord on bottom of bag to empty bag.



A9R/M40437 M40438 M21,0M5 X 243188

**BAGGING WITH BOLT-ON LIP SECTIONS (38-INCH MOWER ONLY)**



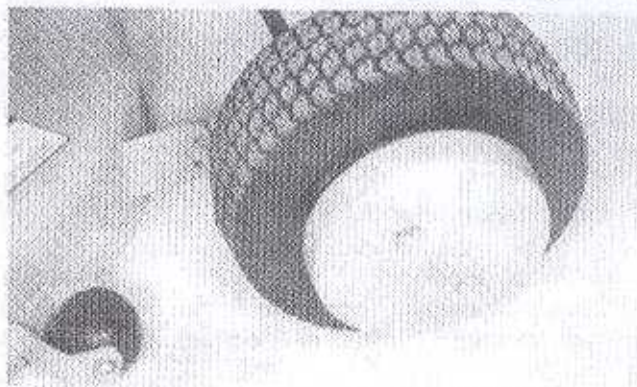
**A—Front Lip Section  
B—Side Lip Section  
C—Rear Lip Section**

	<b>Front Lip Section (Standard)</b>	<b>Side Lip Section (Optional)</b>	<b>Rear Lip Section (Optional)</b>
<b>Features</b>	<p>Reduces material blown out right front corner of deck.</p> <p>Helps keep engine and operator clean.</p> <p>Prevents leaves from blowing away from deck.</p> <p>Increases air flow from mower to bags.</p>	<p>Reduces material blown out left front corner of deck.</p> <p>Helps keep engine and operator clean.</p> <p>Eliminates material blown out on left side of deck when mowing along sidewalks and roadsides.</p>	<p>Creates vacuum effect that sweeps lawn clean.</p>
<b>Recommended</b>	<p>Leave in place at all times.</p>	<p>Used with medium or high lift blades when bagging in dry, dusty conditions.</p>	<p>When bagging leaves, pine cones and needles, sticks and loose bark, or after thatching.</p>
<b>Not Recommended</b>		<p>When mowing long, lush or thick grass where poor cut quality is a problem.</p> <p>Not required with low lift blades.</p>	<p>When mowing long, lush or thick grass where poor cut quality is a problem.</p> <p>Not required when side discharging.</p>

### USING FRONT WEIGHTS

**CAUTION:** Tractor weights improve stability in most slope operations. Add front weights for better front-end stability and steering.

Install front weights for better stability and steering control when you use equipment such as the rear-mounted grass bagger or dumpcart. A front weight weighs 18 kg (40 lb). See your John Deere dealer for weights.

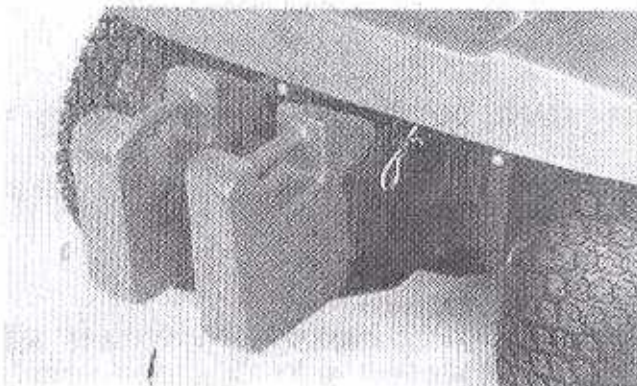


A93;B32651 M21;OMS -A10 120486

### USING REAR WEIGHTS

Use rear weights to reduce rear wheel slip and to improve braking when equipment such as snowblower or front blade is installed. Remove rear weights to use drawbar.

A rear weight weighs 18 kg (40 lb). See your John Deere dealer for weights.



A90;M61331 M21;OMS -A5 120488

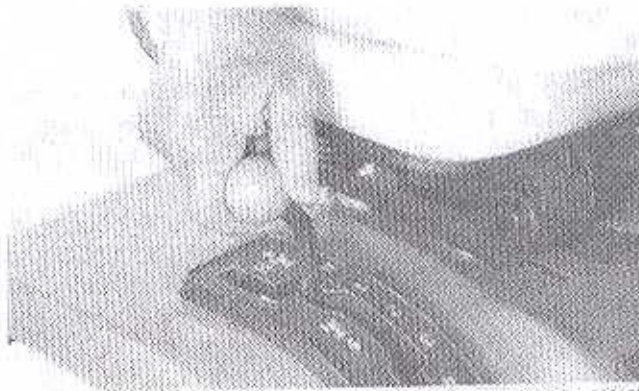
# Transporting

## PUSHING MODEL 170 OR 180 TRACTOR

**IMPORTANT: DO NOT** tow tractor behind any other vehicle.

To move tractor when engine is off:

1. Unlock park brake.
2. Move shift lever to N position.
3. Push tractor by hand to desired location.



A98/M38509 M21/TPS -A1 120468

## PUSHING MODEL 175 TRACTOR

**IMPORTANT: DO NOT** tow tractor behind any other vehicle.

To move tractor when engine is off:

1. Unlock park brake.
2. Move shift lever to N position.
3. Move and hold tow disconnect lever (shown) in direction of arrow while you push tractor.



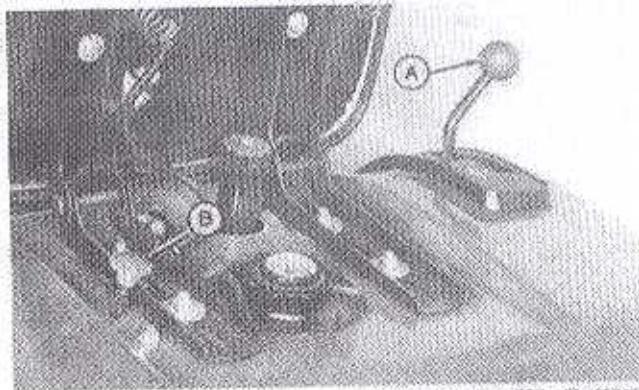
A98/M38601 M21/TPS -A2 120468

## PUSHING MODEL 185 TRACTOR

**IMPORTANT: DO NOT** tow tractor behind any other vehicle.

To move tractor when engine is stopped:

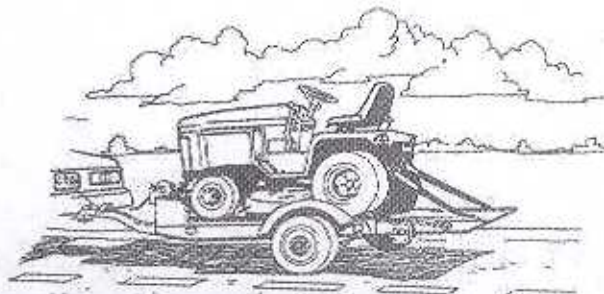
1. Unlock park brake.
2. Move shift lever (A) to N position.
3. Push down on tow disconnect control (B) while you push tractor.



A98/M40684 M21/TPS -B1 030667

## TRANSPORTING

1. Do not tow lawn tractor.
2. Use a heavy-duty trailer to transport your lawn tractor.
3. Lower mower to trailer deck. Lock park brake.
4. Be sure trailer has all the necessary lights and signs required by law.
5. Fasten the lawn tractor to the trailer with straps, chains, or cables.



A98/M34229 M21/TPS -C 151296

# Fuels and Lubricants

## FUEL



**CAUTION:** Handle fuel carefully. Always stop engine before refueling. Fill fuel tank outdoors. If engine is hot, let engine cool several minutes before you add fuel. Do not smoke while you fill fuel tank or service fuel system. Fill fuel tank only to bottom of filler neck.



**IMPORTANT:** DO NOT mix oil with gasoline.

Unleaded fuel is recommended. Regular leaded gasoline with an anti-knock index of 87 or higher may be used. Unleaded fuel burns cleaner and leaves less harmful engine deposits in combustion chamber.

Use of gasohol is acceptable as long as the ethyl alcohol blend does not exceed 10 per cent. Unleaded gasohol is preferred over leaded gasohol.

Fuel tank capacity is 9.5 L (2.5 gal).

Lift seat. Fill fuel tank at end of each day's operation. This helps to keep condensation out of fuel tank.

A90,T5185 M21,FLS -A1 120408

## HYDROSTATIC TRANSMISSION OIL

SAE 30 engine oil with an API Classification of SE, CC, or CD is recommended in the 165 and 175 tractor transmission. SAE 10W30 engine oil with an API classification of SE, CC, or CD is recommended in 185 tractor transmission.

**IMPORTANT:** To prevent contamination in hydraulic system, DO NOT drain or change hydrostatic transmission fluid.

M21,FLS -B 010987

## ENGINE OIL

Use oil viscosity based on the expected air temperature range during the period between oil changes.

John Deere PLUS-4 engine oil is recommended.

Other oils may be used if they meet the requirements of API Service Classification SF or SE.

Oils meeting Military Specification MIL-L-46167A may be used as arctic oils.

### Temperature Limits

Arctic Oil	.....	—55 to —10° C (—67 to —8° F)
SAE 5W30	.....	—35 to +10° C (—31 to +50° F)
SAE 10W	.....	—20 to +10° C (—4 to +50° F)
SAE 10W30	.....	—20 to +30° C (—4 to +86° F)
SAE 10W40	.....	—20 to +40° C (—4 to +104° F)
SAE 30	.....	0 to +50° C (+32 to +122° F)

M21JFLS -A2 120488

## GREASE

John Deere Multipurpose Grease is recommended. If other greases are used, use:

- SAE Multipurpose Grease.
- SAE Multipurpose Grease containing 3 to 5 per cent molybdenum disulfide.

At temperatures below -30°C (-22°F), use arctic greases such as those meeting Military Specification MIL-G-10924C.

M21JFLS -A3 140488

## DIFFERENTIAL OIL

SAE 90 oil is recommended in all except 185 tractor differential. SAE 10W30 engine oil with an API classification of SE, CC, or CD is recommended in the 185 tractor differential. DO NOT mix oils of different viscosities.

**IMPORTANT: DO NOT put SAE 90 oil in the hydrostatic transmission.**

M21JFLS -B3 260487



# Troubleshooting

## ENGINE

Symptom	Problem	Solution
Engine will not start.	Fuel shut-off valve closed.	Open fuel shut-off valve.
	Brake not pushed down. PTO switch in "ON" position.	Push down brake. Put PTO switch in "OFF" position.
	Spark plug wire loose or disconnected.	Connect spark plug wire.
	Transmission lever out of N position and brake pedal not pushed down	Put transmission lever in neutral and push down brake pedal.
Engine hard to start.	Carburetor dirty. Faulty spark plug. Loose or corroded electrical connections.	See your John Deere dealer. Replace spark plug. Clean and tighten connections.
	Stale fuel.	Drain and fill fuel tank.
Engine misses under load.	Faulty spark plug.	Replace spark plug.
	Stale fuel.	Drain and fill fuel tank.
Engine vapor locks.	Fuel tank vent plugged. Dirt in fuel filter.	Clean fuel tank vent. See your John Deere dealer.
Engine runs unevenly.	Cooling fins plugged	Clean engine cooling fins
	Loose electrical connections. Choke or throttle cable sticking.	Tighten electrical connections. Lubricate cable.
Engine overheats.	Air cleaner element plugged.	Clean or replace element.
	Engine air intake screen plugged.	Clean air intake screen.
	Cooling fins plugged.	Clean cooling fins.
	Engine oil low.	Add oil.
	Engine operated too long at slow idle speed.	Operate engine with throttle lever in "FAST" position.
Engine will not idle.	Spark plug not gapped correctly.	Check spark plug gap.
Engine backfires.	Faulty spark plug.	Replace spark plug.
	Faulty spark plug.	Replace spark plug.
Engine knocks.	Stale or low octane fuel.	Drain and refill fuel tank.
	Engine overloaded.	Reduce load on engine.
	Low engine speed.	Run engine at wide open throttle.

**ENGINE-Continued**

Symptom	Problem	Solution
Engine loses power.	Engine overheating.	See Engine Overheats in this section.
	Too much oil in engine.	Drain oil to correct level.
	Dirty air cleaner Faulty spark plug.	Clean air cleaner element. Replace spark plug.

M21;TSS -3 200487

**TRACTOR**

Symptom	Problem	Solution
Tractor vibrates too much	Attachment drive belts worn or damaged. Dirt on drive sheaves.	Replace belts Clean sheaves and belts with a damp cloth.
Tractor will not move with engine running.	Parking brake locked. Transmission hydraulic oil level low. Cold weather.	Unlock parking brake.  Add oil. Allow engine to warm several minutes.
Tractor moves with engine running and hydrostatic control lever in neutral.	Linkage out of adjustment.	See your John Deere dealer.

M21;TSS -4 200487

**ELECTRICAL**

Symptom	Problem	Solution
<b>Starter does not work or will not turn engine.</b>	Brake pedal not down. Hydrostatic control lever engaged. PTO switch in "ON" position. Battery terminals corroded.	Depress brake pedal. Move lever to "N" position. Move switch down to "OFF" position. Clean battery terminals.
<b>Battery will not charge.</b>	Dead cell in battery. Low engine speed or excessive idling.	Replace battery. Always run engine at wide open throttle when mowing

IA21:TS5 -5 20082

**MOWER**

Symptom	Problem	Solution
Discharge chute plugged.	Belt installed incorrectly. Grass too wet. Grass too long.  Engine rpm too low.	Change belt installation. Wait for grass to dry. Raise cutting height and cut grass twice. Mow at full throttle.
Patches of grass uncut.	Travel speed too fast. Engine rpm too low.	Slow down. Mow at full throttle.
Belt slipping.	Debris in sheaves. Worn belt.	Clean sheaves. Replace belt.
Too much vibration.	Debris on mower deck or in sheaves. Damaged drive belt. Damaged sheaves or sheaves out of alignment. Blades out of balance.	Clean mower deck and sheaves. Replace drive belt. Replace sheaves. See your John Deere dealer. Have blades balanced.
Blades scalping grass.	Cutting too low. Turning speed too fast. Ridges in terrain. Rough or uneven terrain. Mower wheels not adjusted correctly. Low tire pressure. Bent blade(s).	Raise cutting height. Reduce speed on turns. Change mowing pattern. Adjust mower wheels.  Adjust mower wheels. Add air to tire. Replace blade(s).
Uneven cut.	Mower not level. Travel speed too fast. Blades dull. Mower wheels not adjusted correctly. Tire pressure.	Level mower. Slow down. Have blades sharpened.  Adjust mower wheels. Check tire pressure.
Mower loads down tractor.	Engine rpm too low. Travel speed too fast. Debris wrapped around mower spindles. Bagging blades on mower.	Mow at full throttle. Slow down.  Clean mower. Install regular blades.

# Service

## BREAK-IN

Change engine oil and filter (if equipped) after first 5 hours of operation.

## BEFORE EACH USE

Check engine oil level.

Clean air intake screen(s).

## 10-HOURS

Lubricate front wheel spindles.

## 25-HOURS

**IMPORTANT:** When you operate tractor in extremely dusty or dirty conditions, perform the services listed below every 10 to 12 operating hours.

Change engine oil—engine without oil filter.

Check tire pressure.

Check and clean precleaner and air cleaner element.

Check battery electrolyte level.

Check transmission oil level—475 and 185 Tractors.

Check safety systems.

Grease 38-inch mower spindles.

## 50-HOURS

Change engine oil—engine without oil filter.

## 100-HOURS

Change engine oil and filter—engine with oil filter.

Check spark plug.

## YEARLY

Check transmission oil level—175 tractor.

Check differential oil level—175 and 185 Tractors.

Change engine oil and filter.

Clean battery.

Clean engine fins.

Check condition of fuel lines.

## HYDROSTATIC TRANSMISSION SERVICE

The hydrostatic transmission does not require any type of service other than checking the oil level. DO NOT change the transmission oil, otherwise damage will occur and your warranty will be void. See your John Deere dealer if transmission malfunctions.

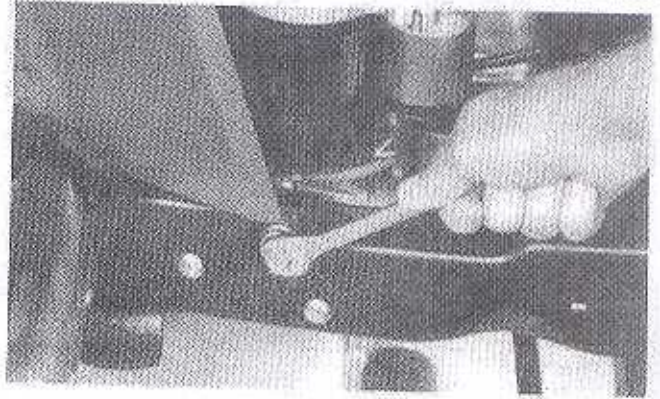
M2105ES -A1-063689



### CHANGING ENGINE OIL—ENGINE WITHOUT OIL FILTER—50 HOURS

*NOTE: Change engine oil after first 5 hours of operation. After that, change oil every 50 hours under normal conditions or every 8 hours under extremely dusty conditions.*

1. Run engine to warm the oil.
2. Stop engine and remove ignition key.
3. Park tractor on level surface.
4. Remove drain cap to drain oil. Use two wrenches to prevent drain pipe from coming out of engine block.
5. Install drain cap.
6. Remove dipstick.
7. Add oil specified in Fuels and Lubricants section.



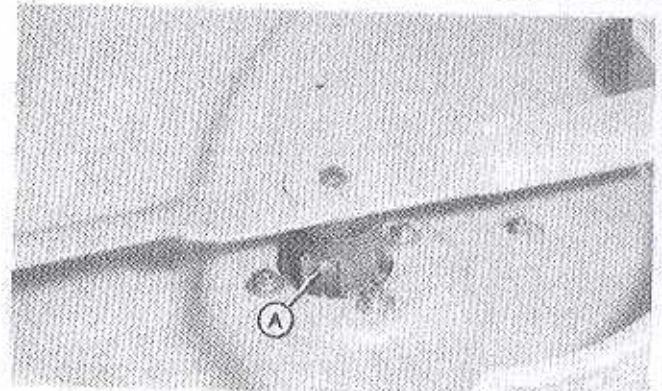
Tractor	Engine Oil
170, 175 . . . . .	1.3 L (2.8 pt)
180, 185 . . . . .	1.6 L (3.5 pt)

8. Install dipstick.

A98/M38526 M21;SES -A2 06089

### LUBRICATING 38-INCH MOWER BLADE SPINDLES—25 HOURS

Lubricate spindles with one or two shots of John Deere Multi-Purpose grease or equivalent.



A78/M39926 M21;SES -B1 03087

### CHECKING TIRE PRESSURE—25 HOURS

Check tires for damage.

Check tire pressure with an accurate gauge.

Level mower after you check tire pressure. (See Adjusting Mower Level in Operating the Mower section.)

#### TIRE PRESSURE SPECIFICATION

Tire Size	Pressure
<b>Front:</b>	
15 x 6.00-6 . . . . .	70 kPa (0.70 bar)(10 psi)
<b>Rear:</b>	
18 x 8.50-8 . . . . .	60 kPa (0.55 bar)(8 psi)
20 x 10.00-8 . . . . .	40—70 kPa (0.40—0.70 bar) (6—10 psi)

M21;SES -A3 06086

### CHECKING AND CLEANING PRECLEANER AND AIR CLEANER ELEMENT—25 HOURS

*NOTE: If you operate tractor in dusty conditions, replace element more often.*

1. Lift hood.
2. Remove air cleaner cover.

180 Tractor



A98/M32839 M21;SES -A4 120406

3. Check: If precleaner is dirty, remove it from paper element.

4. Check: If paper element is dirty, tap it gently on your hand to remove dust. If element is very dirty, install a new element.

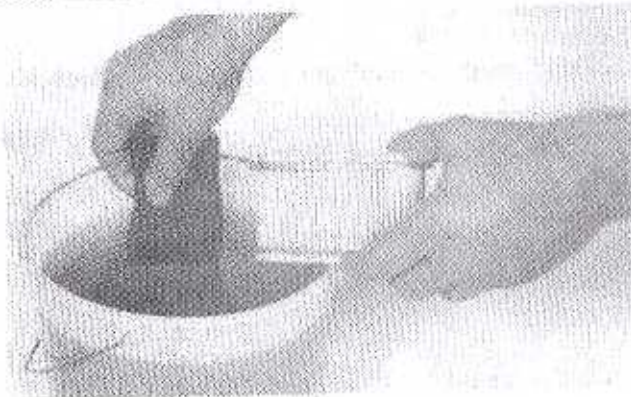
*NOTE: If precleaner or paper element has a break or is damaged, replace it.*

5. If precleaner is dirty, wash it in a solution of warm water and liquid detergent. DO NOT wash paper element.

6. Rinse precleaner.

7. Squeeze excess water from precleaner.

8. Allow precleaner to air dry.



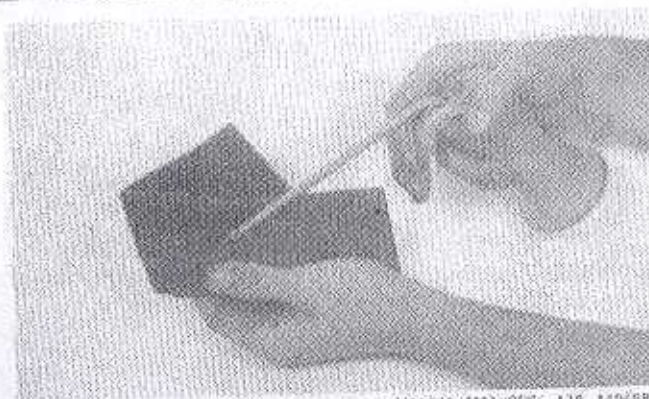
A98/M32840 M21;SES -A5 120408

9. Put approximately 30 ml. (1 oz) of clean engine oil on precleaner. squeeze precleaner to distribute oil evenly.

10. Install precleaner on paper element.

11. Install element.

12. Install cover. Lower hood.



A98/M32841 M21;SES -A16 140489



## AVOID ACID BURNS

Sulfuric acid in battery electrolyte is **poisonous**. It is strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

Avoid the hazard by:

1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.

If you spill acid on yourself:

1. Flush your skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush your eyes with water for 10-15 minutes. Get medical attention immediately.

If acid is swallowed:

1. Drink large amounts of water or milk.
2. Then drink milk of magnesia, beaten eggs, or vegetable oil.
3. Get medical attention immediately.

M21;SES -L1 060487

## CHECKING ELECTROLYTE LEVEL—25 HOURS



**CAUTION:** Keep sparks and flames away from battery. **DO NOT** smoke when checking electrolyte level.

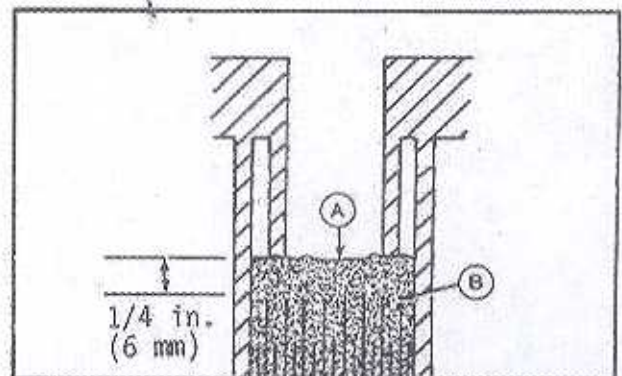
1. Lift hood.
2. Remove battery caps.



A5R:M38543 M21;SES -M 060397

**IMPORTANT:** **DO NOT** fill cells to the bottom of the filler neck. Electrolyte can overflow when battery is charged and cause damage.

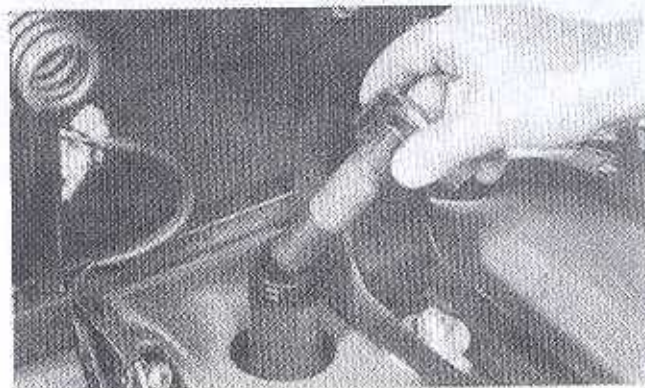
3. Electrolyte (A) should be 1/4 in. (6 mm) above plates (B).
4. If necessary, add distilled water.
5. Install caps.
6. Lower hood.



SA4;M39771 M21;SES -M1 050387

### CHECKING TRANSMISSION OIL LEVEL—175 TRACTORS—25 HOURS

**IMPORTANT: DO NOT** change the transmission oil, or your warranty will be void. See your John Deere dealer for any transmission service other than checking oil level.



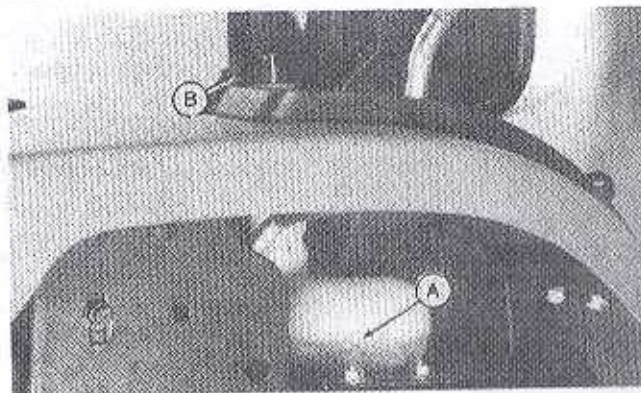
1. Park tractor on level surface.
2. Check transmission oil level when engine is cold.
3. Clean area around cap. Remove cap.
4. Oil level should be just above screen, in bottom of reservoir, or 139.7 mm (5.5 in.) from top of reservoir fill tube.
5. If oil level is low, add enough oil to bring oil level to just above screen. (See Fuels and Lubricants section for correct oil.)
6. Install and tighten cap.
7. Start engine.
8. Operate tractor forward and in reverse several times.
9. Park tractor on level surface. Stop engine.
10. Check oil level again.

A98/M40345 M21:SES -A6 12/08R

### CHECK TRANSMISSION OIL LEVEL—185 TRACTOR—25 HOURS

**IMPORTANT: DO NOT** change the transmission oil. Otherwise your warranty will be void. See your John Deere dealer for any transmission service other than checking oil level.

1. Park tractor on a level surface.
2. Check transmission oil level when transmission is cold.
3. Look under right side of fender deck above tire to see OIL LEVEL line (A) on reservoir. Oil should be up to OIL LEVEL line.
4. If oil is low, clean area around cap (B).
5. Remove cap and add oil to bring it up to OIL LEVEL line. DO NOT overfill. (See Fuels and Lubricants section for correct oil.)
6. Install and tighten cap.



A99/M41364 M21:SES -I 09/08Z

## TESTING SAFETY SYSTEMS—25 HOURS

**CAUTION:** If tractor does not pass a test, do not operate tractor. See your John Deere dealer.

1. Check operation of indicator lights.

Turn key to RUN position.

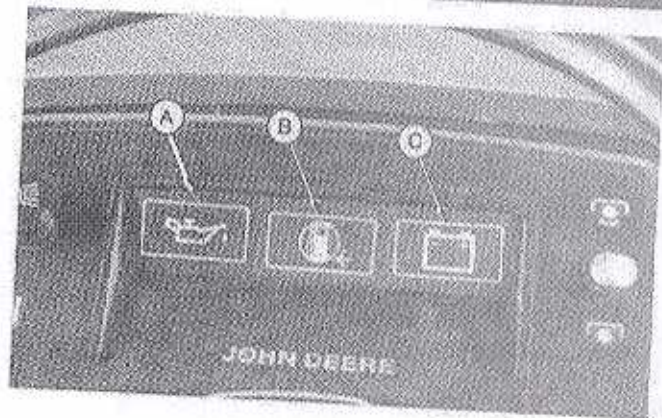
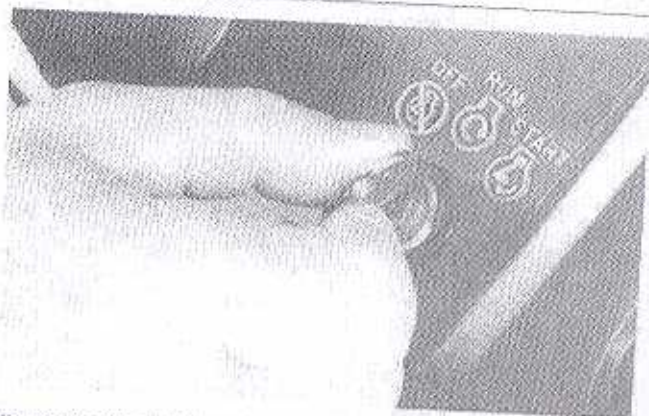
**LOOK:** Indicator lights (A and C) must light on tractors so equipped.

On tractors so equipped, low-fuel indicator (B) will not light unless fuel is low.

If one indicator does not light, see Replacing Indicator Light Bulb in Service/As Necessary section.

If new indicator does not light or no indicators work, see your John Deere dealer.

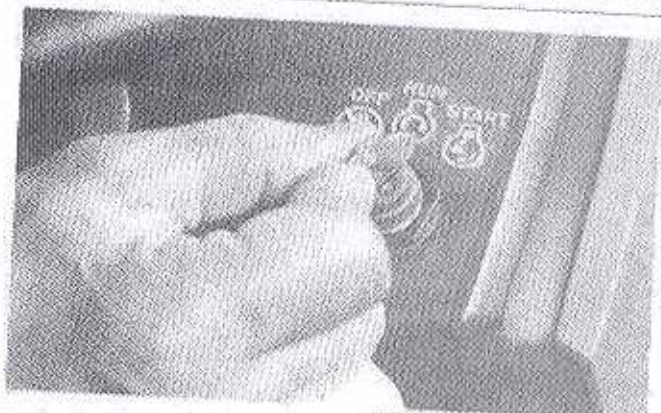
A—Engine Oil Pressure  
B—Low-Fuel Indicator  
C—Battery Discharge



A98.M38560 M5112P M21:SES -AT 060648

### FIRST TEST

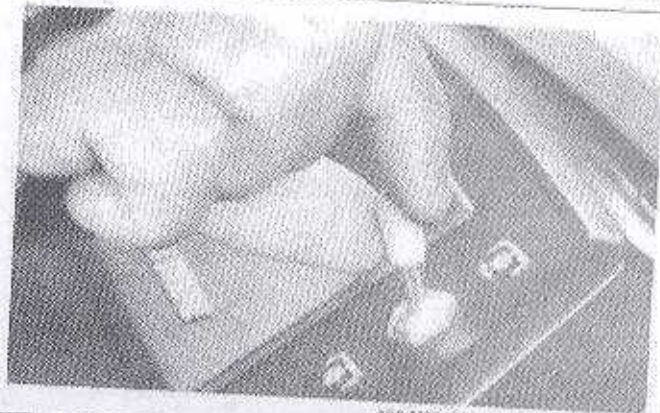
1. Lock park brake.
2. Hydrostatic transmission equipped tractors: push brake pedal down all the way.
3. Move transmission shift lever out of N (neutral) position.
4. Turn key to START position.
5. Engine must not crank.



A98.M38561 M21:SES Q 151286

### SECOND TEST

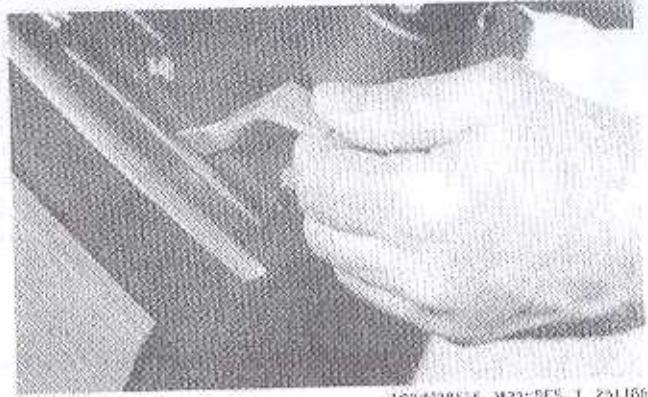
1. Put transmission shift lever in N (neutral) position.
2. Hydrostatic tractor: Push brake pedal down all the way.
3. Put PTO switch lever in ON position.
4. Turn key to START position.
5. Engine must not crank.



A98.M38521 M21:SES R 251186

### THIRD TEST

1. Run engine at one-third throttle.
2. Put PTO switch lever in ON position.
3. Stand up. Do not get off tractor.
4. After 1/2 second, engine should begin to die.

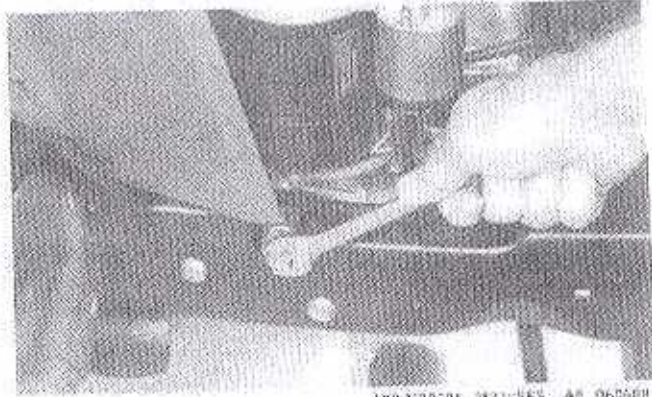


A98M38515 M21;SES 1 254166

### CHANGING ENGINE OIL—ENGINE WITH OIL FILTER—100 HOURS

See Changing Engine Oil on page 35 for correct procedure.

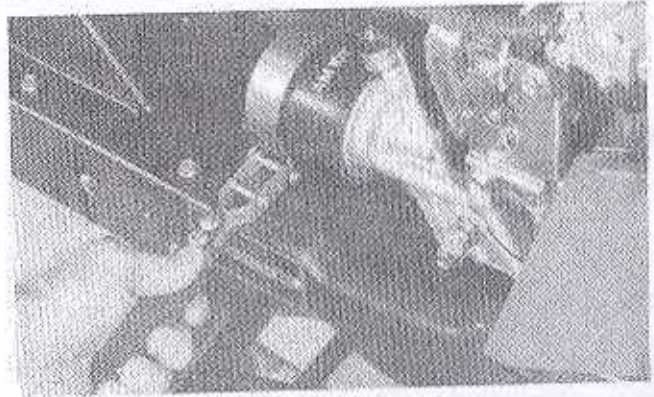
Tractor	Engine Oil with Filter
170, 175	1.7 L (3.8 pt)
180, 185	2 L (4.4 pt)



A99M38525 M21;SES -AB 960601

### CHANGING ENGINE OIL FILTER—100 HOURS

1. Stop engine and remove ignition key.
2. Turn filter counterclockwise to remove it.
3. Apply a film of clean engine oil on seal of new filter.
4. Install filter. Turn filter until seal contacts mounting surface. Then turn filter BY HAND 1/2 turn more.
5. Run engine at slow speed 2 minutes. Check for leaks around filter.
6. Stop engine and wait a couple of minutes. Check oil level. Add oil only to FULL mark on dipstick.
7. Install and tighten dipstick. Lower hood.



AM107423 - JohnDeere  
 DL3410 - Defense  
 PH4967 - Fram

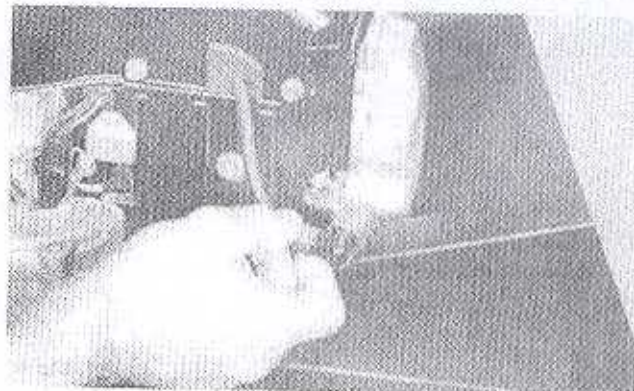
A98M38544 M21;SES -AG 100489

### CHECKING SPARK PLUG—100 HOURS



**CAUTION:** Before you remove spark plug:  
Stop engine.  
Wait until engine is cool.

1. Lift hood.
2. Disconnect spark plug wire.



A9C/M3854F M21/SES -W 050107

3. Remove spark plug.
4. Clean spark plug carefully with a wire brush.
5. Inspect spark plug for:
  - Cracked porcelain
  - Pitted or damaged electrodes
  - Other wear or damage

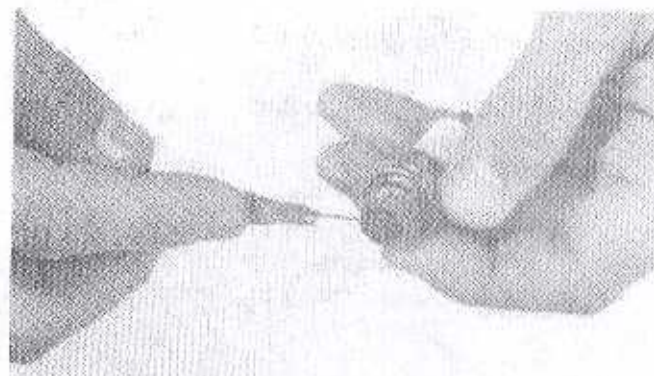
*NOTE: In Canada, replace spark plug with resistor plug only.*

6. Replace spark plug as necessary.



A18/M3854E M7L/SES X 100635

7. Check plug gap with a wire feeler gauge.
8. Gap must be 0.76 mm (0.030 in.).
9. To change gap move the outer electrode.
10. Install and tighten spark plug. If you have a torque wrench, tighten plug to 20 N·m (15 lb-ft).
11. Connect spark plug wire.
12. Lower hood.



A9C/M3290G M2L/ES A20 100408

### CHECKING DIFFERENTIAL OIL FOR 175 TRACTORS—100 HOURS

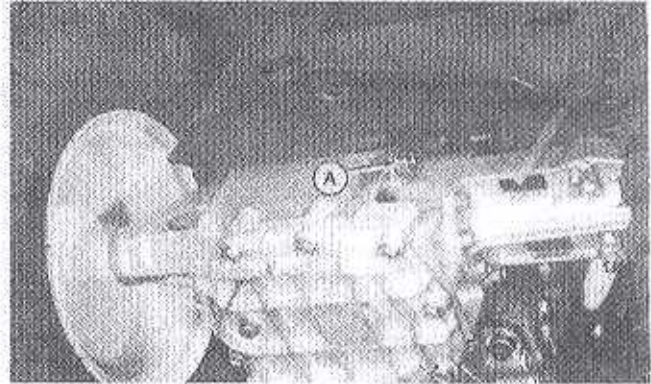
1. Lock park brake.
2. Remove mower. (See Removing Mower in Service/As Necessary section.)
3. Clean the area around differential drain plug.
4. Remove check plug.
5. FEEL: Oil should be a short distance below plug hole.
6. If oil level is low, add SAE 90 oil until you can feel oil.
7. Install and tighten check plug.



A9C/M2095 M21/SES -A10 120030

### CHECKING DIFFERENTIAL OIL FOR 185 TRACTOR—100 HOURS

1. Lock park brake.
2. Clean the area around differential check plug (A).
3. Remove check plug. Oil level should be up to check plug hole.
4. If oil level is low, add SAE 10W30 engine oil until oil flows from check plug hole.
5. Install and tighten check plug (A).



A98/M40005 M21,SE5 -Z4 010987

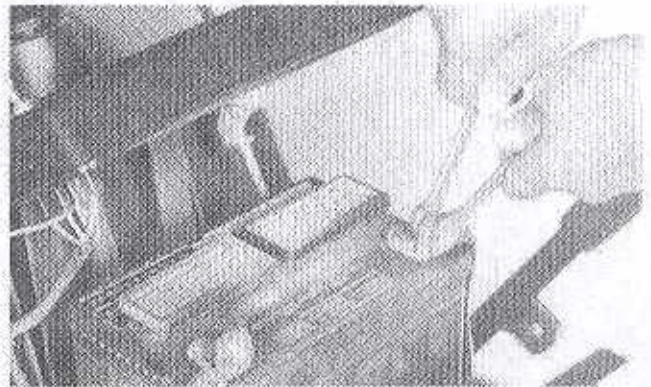
### CLEANING BATTERY—YEARLY

**⚠ CAUTION:** Gas given off by batteries is explosive. Keep sparks and flames away from batteries.

1. Loosen wing nuts to remove hold-down.
2. Remove negative (black) cable from battery first.
3. Remove positive (red) cable.
4. If battery is very dirty, remove battery.
5. Clean battery, battery terminals, cable ends, hold-down cover, battery box, and other parts with a solution of 1 part baking soda to 4 parts water. KEEP solution out of battery cells.
6. Rinse all parts with clean water. Let dry.
7. Install battery.
8. Check cell cap to be sure vent holes are open.
9. Connect positive (red) cable to battery first, then negative (black) cable.
10. Apply petroleum jelly on battery terminals to help prevent corrosion.
11. Install battery hold-down. Tighten wing nuts.



A98/M38547 M21,SE5 -AA 060487



A98/M38549 M21,SE5 -AB 050487

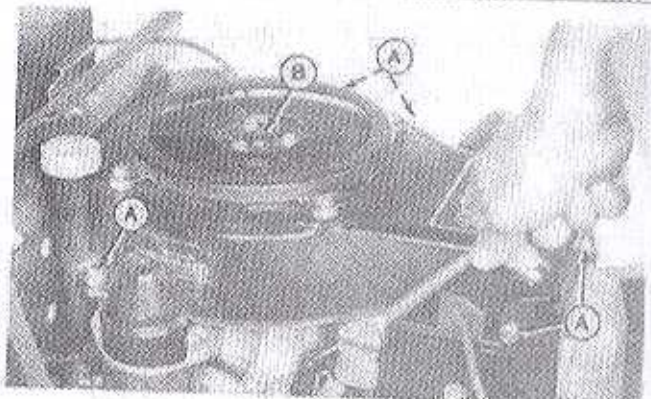
### CLEANING ENGINE FINS—YEARLY

1. Lift hood.
2. Disconnect spark plug wire.
3. Remove air cleaner assembly. Cover air intake with a clean rag to prevent dirt from entering engine.



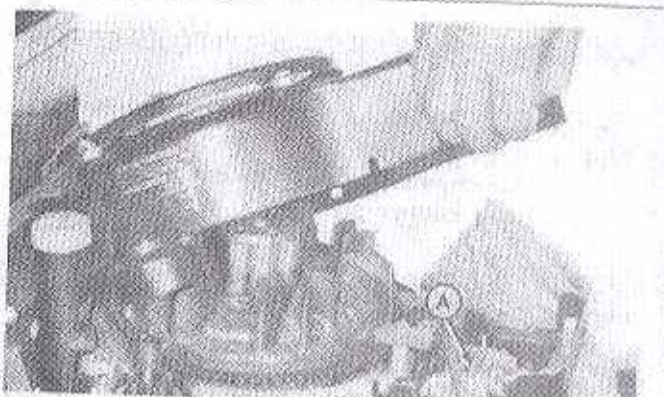
A98M38551 M21:SES -4E 06497

4. Remove six cap screws (A) and three screws (B).



A98M38552 M21:SES AF 100585

5. Lift front of shroud. Use a brush or compressed air to clean fins (A) on top and sides of engine.



A98M38553 M21:SES AG 100685

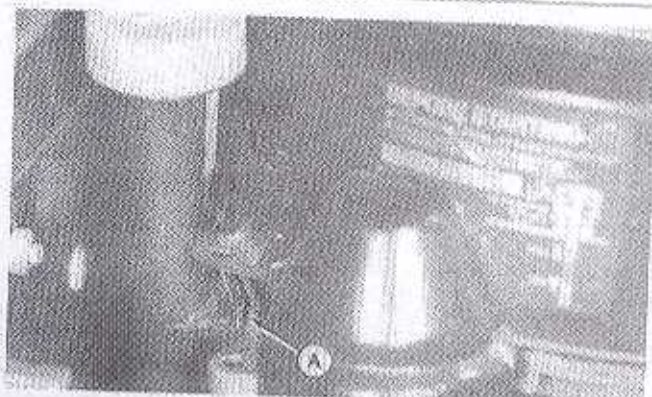
6. Lower shroud. Lip (A) on dipstick bracket must be inside shroud.

7. Install screws in top and sides of engine.

8. Install air cleaner.

9. Connect spark plug wire.

10. Lower hood.

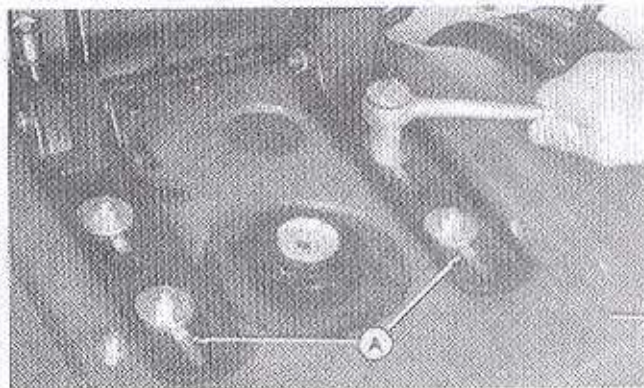


A98M38554 M21:SES AH 100685

## ADJUSTING SEAT—AS NECESSARY

1. Lift seat.
2. Loosen four nuts.
3. Slide seat forward or to rear to desired position.

**NOTE:** Do not adjust seat so seat springs sit on ball heads. An additional 19 mm (3/4 in.) of rear travel can be attained if a rear bagger is not used. Rotate rear washers (A) between seat bracket and fender deck 180° so tab on washer is forward.



4. Tighten nuts.

A9B0440146 WZC/SES -A21 140189

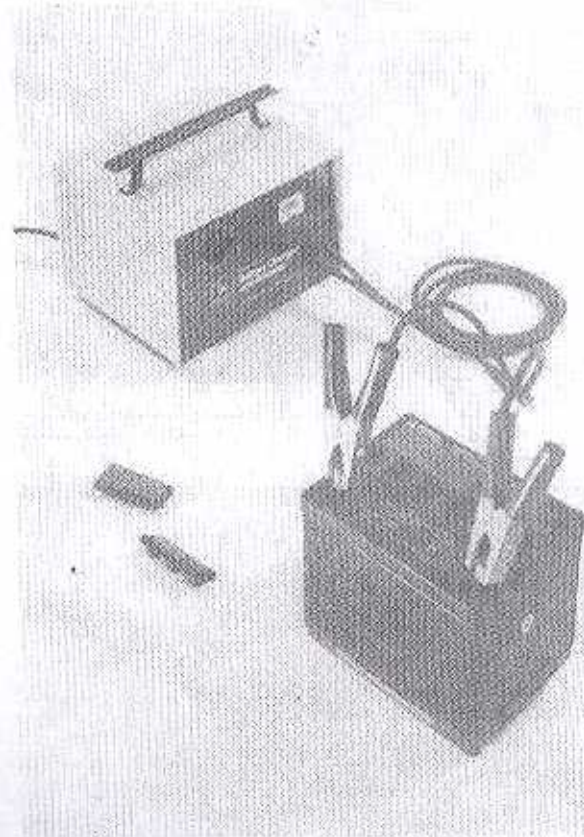
## CHARGING BATTERY—AS NECESSARY

**CAUTION:** Do not charge a frozen battery. Battery gas can explode. Keep cigarettes, sparks, and flames away from battery. Remove cell caps before charging.

1. Remove and clean battery. (See Checking and Cleaning Battery in this section.)
2. Check electrolyte level. (See Checking Battery Electrolyte Level in Service/25-Hours section.)
3. Leave cell caps off battery while you charge it.

**CAUTION:** Before you connect or disconnect charger cables to battery, unplug charger cord.

4. Connect positive (+) charge cable to positive (+) battery terminal.
5. Connect negative (–) charge cable to negative (–) battery terminal.
6. Plug in charger cord.
7. If battery needs complete charging, charge at 15 amps for 10 minutes or at 7 amps for 30 minutes.
8. Unplug charger cord. Remove charger cables.
9. Install battery cell caps. Install battery.



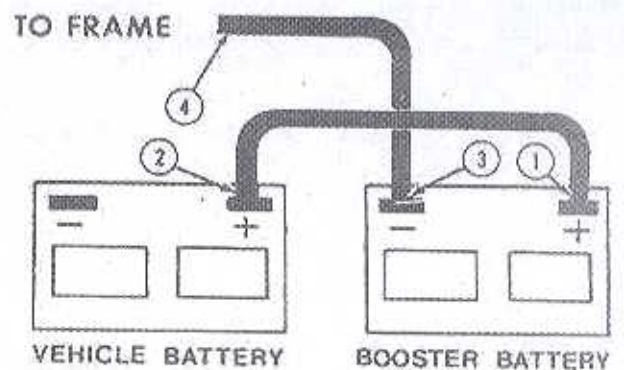
3A5-M33907 M21/SES -A11 050987



## USING BOOSTER BATTERY

- CAUTION:** Battery gas is explosive:  
 —DO NOT smoke while you charge battery.  
 Keep all flames and sparks away.  
 —DO NOT charge a frozen battery.  
 —DO NOT connect booster battery negative (–) cable to starting vehicle negative (–) terminal.

Connect cables in order shown. Connect booster negative (–) cable to starting vehicle frame away from battery.



SAS/M40672 M22:SES X 0630HV

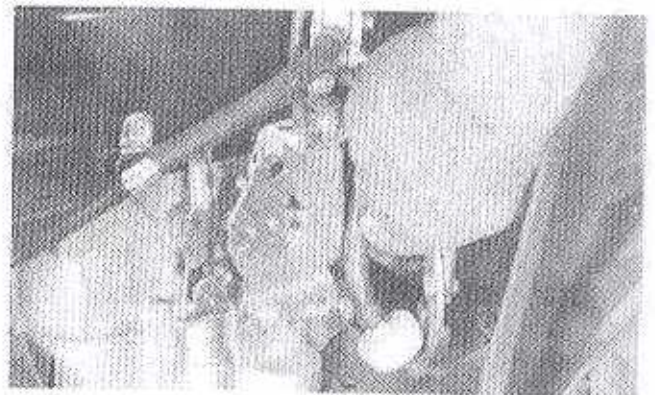
## REPLACING FUEL FILTER—AS NECESSARY

- CAUTION:** Keep cigarettes, sparks, and flames away from fuel system. Make sure engine is cool to touch.

1. Park tractor on level surface. Lift hood.

- CAUTION:** Wait until fuel is low before you replace fuel filter—OR be prepared to drain fuel into a safe container when you disconnect hose.

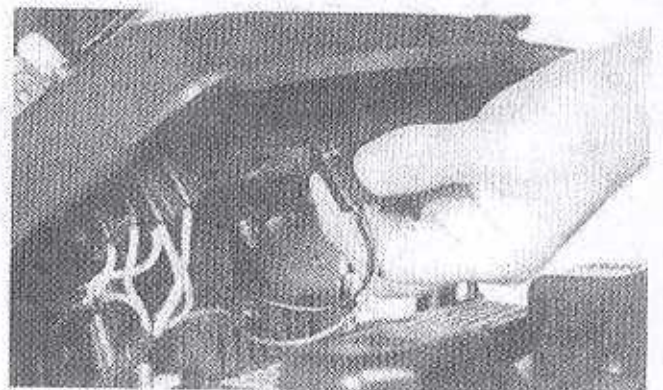
- Let engine cool.
- Slide hose clamps away from filter.
- Disconnect hoses from filter.
- Connect hoses to new filter.
- Install clamps.
- Lower hood.



A98:M38556 M21:SES -AL 063487

## REPLACING INDICATOR LIGHT BULB—AS NECESSARY

- Lift hood.
- Turn indicator bulb 1/8 turn counterclockwise to remove it.
- Pull bulb from socket.
- Push new bulb into socket.
- Install socket.
- Lower hood.



A98:M38625 M21:SES -AO 209487

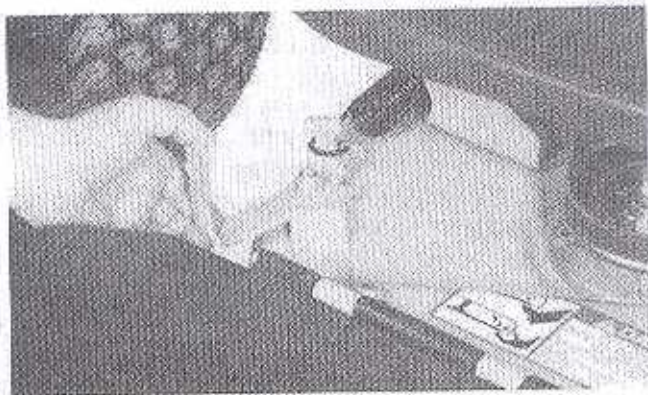
## REPLACING MOWER DRIVE BELT—38 AND 46—INCH MOWERS—AS NECESSARY

**CAUTION:** Stop engine and remove ignition key. Wait for all moving parts to stop.

1. Stop engine and remove key.
2. Lower mower to the ground.

*NOTE:* 38—inch mower illustrated.

3. Move belt tension lever out to release belt tension.

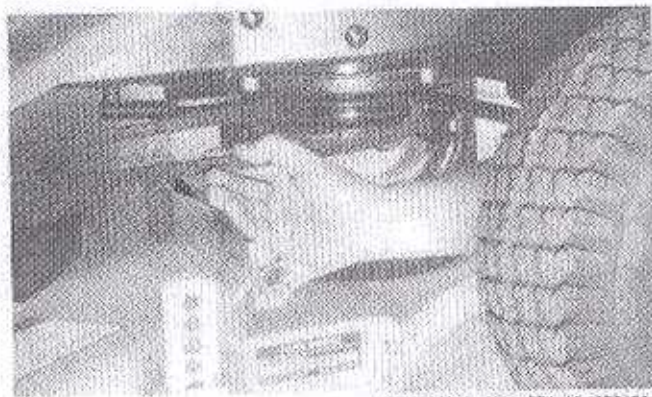


A98/M39929 M23/SES -A24 060685

4. Remove drive belt from engine drive sheave and rear sheave.

5. Clean belt with a clean cloth. **DO NOT** use parts cleaning solvents or belt dressing; they soften belt and shorten belt life.

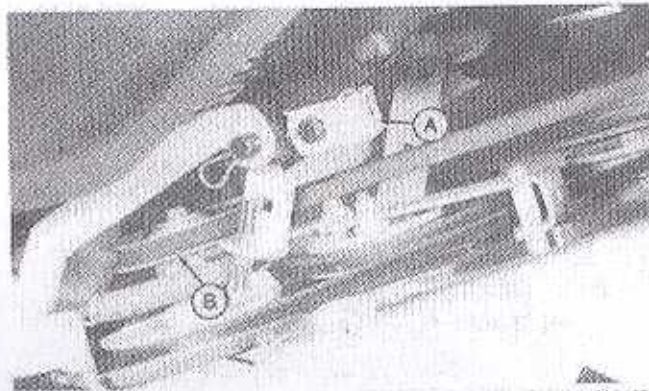
6. Inspect belt for wear or damage; replace as necessary.



A98/M32342 M21/SEJ 65 270485

**CAUTION:** Keep fingers away from spring. Use a pry bar.

7. Use a pry bar to push down on lift assist spring bracket (A) to loosen spring.
8. Install drive belt (B) on rear sheave and then on engine sheave.
9. Move belt tension lever in as far as it will go.
10. Use a pry bar to push lift assist spring bracket (A) up as shown to tighten spring.

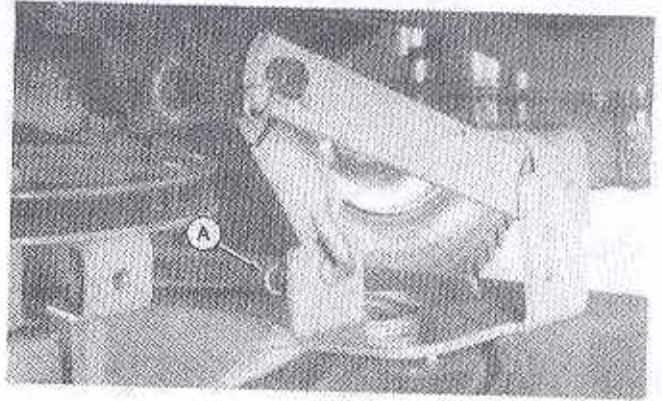


A98/M40456 M23/SES -A25 060685

## REMOVING 38-INCH MOWER—AS NECESSARY

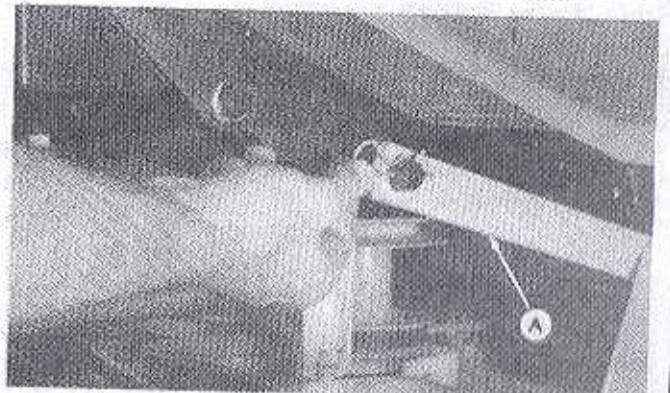
**CAUTION:** Stop engine and remove ignition key. Wait for all moving parts to stop.

1. Stop engine and remove key.
2. Lower mower to the ground.
3. Remove mower drive belt. (See Replacing Mower Drive Belt in this section.)
4. Remove spring locking pin (A) and pull lift strap from brackets on both sides of mower. Move lift strap out of way of mower deck.



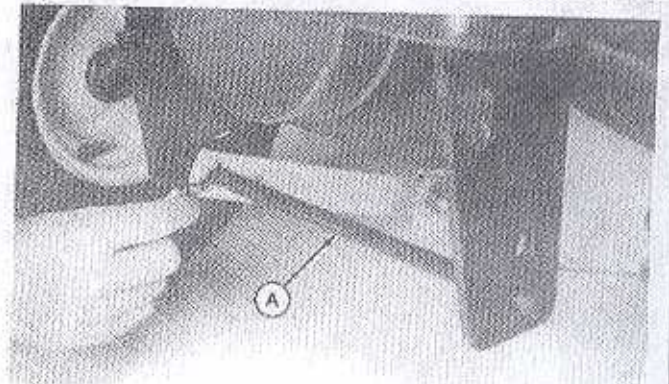
A98;M39016 M21;SES -All 120466

5. Remove spring locking pins and pull rear draft arms (A) (both sides) from their mounting.



A59;M32944 M21;SEJ 69 270483

6. Remove both spring locking pins and remove draft rod (A).



A98;M32965 M21;SEJ 70 270483

7. Turn front wheels to extreme left.
8. Slide mower deck out from right-side of tractor.



A98.M39991 M21;SES 01 290585

### INSTALLING 38-INCH MOWER—AS NECESSARY

*NOTE: See REMOVING, 38-inch mower for illustrations.*

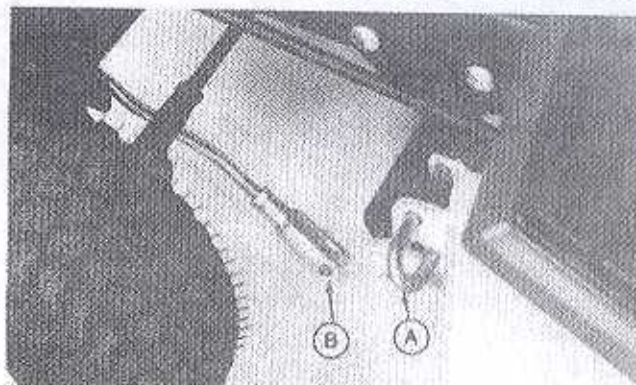
1. Turn tractor front wheels to extreme left.
2. Push mower under tractor from right side.
3. Connect mower front draft arms to tractor mounting brackets with rod and spring locking pins.
4. Connect rear draft arms and lift straps. Fasten with spring locking pins.
5. Install mower drive belt.

*Pin to inside of deck*

## REMOVING 46-INCH MOWER—AS NECESSARY

**CAUTION:** Stop engine and remove ignition key. Wait for all moving parts to stop.

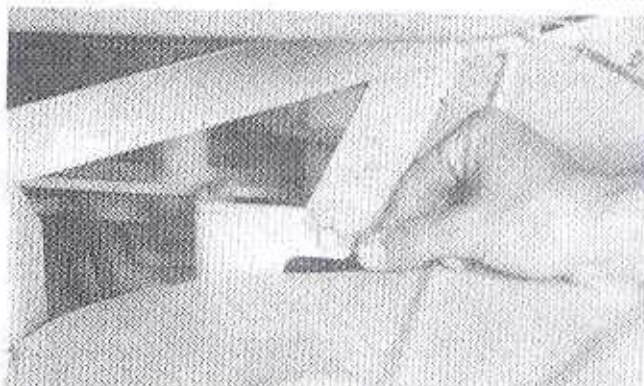
1. Stop engine and remove key.
2. Lower mower to the ground.
3. Remove mower drive belt. (See Replacing Mower Drive Belt in this section.)
4. Pull out on locking pins (A) and remove draft rods (B).



JA2/M31294 M21;SES -A13 120486

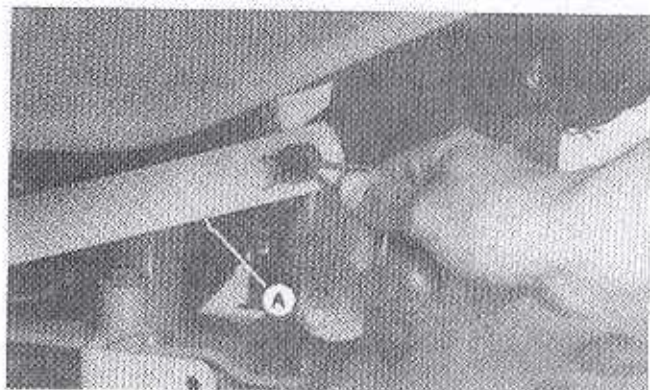
5. Remove spring locking pins from both lift straps. **DO NOT** remove lift straps from brackets at this time.

6. Use lift lever to lower mower to ground. On each side lift mower slightly with one hand and pull lift strap from bracket with the other.



A98/M32949 M21;SES -A14 120486

7. Remove spring locking pins and pull rear draft arms (A) from their mounting.



A98/M32950 M21;SES -A15 120488

8. Turn front wheels to the extreme left.
9. Slide mower deck out from right-side of tractor.



A98/M32951 M21;SES -A16 120488

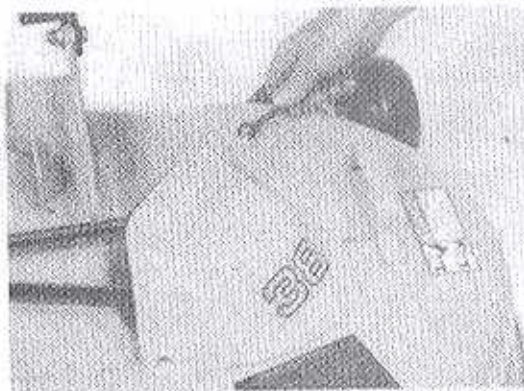
### INSTALLING 46-INCH MOWER DECK—AS NECESSARY

1. Turn tractor front wheels to extreme left.
2. Push mower under tractor from right side.
3. Connect rear draft arms and fasten with spring locking pins.
4. Hold lift lever in the down position and connect lift arms. Fasten with spring locking pins.
5. Install front draft arm assembly with rod and spring locking pins.
6. Install drive belt.

W21;5E5 -P1 200487

### REPLACING MOWER DECK BELT FOR 38-INCH MOWER—AS NECESSARY

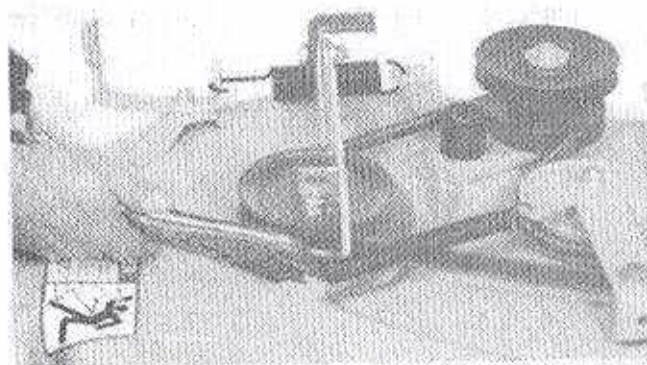
1. Remove mower deck. (See Removing and Installing 38-in. Mower Deck in this section.)
2. Remove belt guard cover.



A59;629932 M21;5E5 -A17 120486

**CAUTION:** Use a locking pliers and wear eye protection to disconnect idler spring.

3. Disconnect idler spring.



A59;629933 M21;5E5 -E3 201126

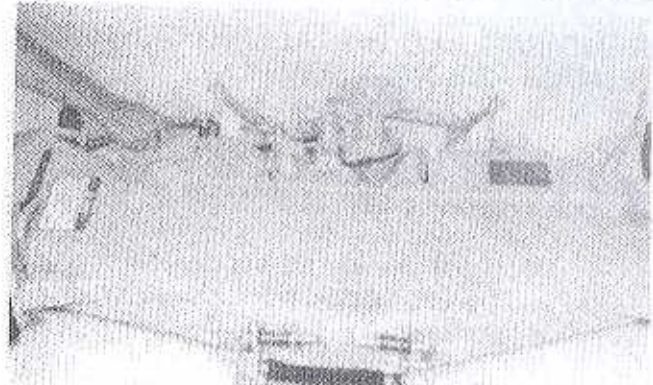
4. Remove mower belt.
5. Clean and inspect belt for damage. DO NOT clean belt using parts cleaning solvent or belt dressing; they soften belt and shorten belt life.
6. Clean upper mower deck and sheaves.
7. Install mower belt, connect idler spring, install belt guard cover, and install mower. Never run mower without belt guard cover.



A59;639934 W21;5E5 -P6 201126

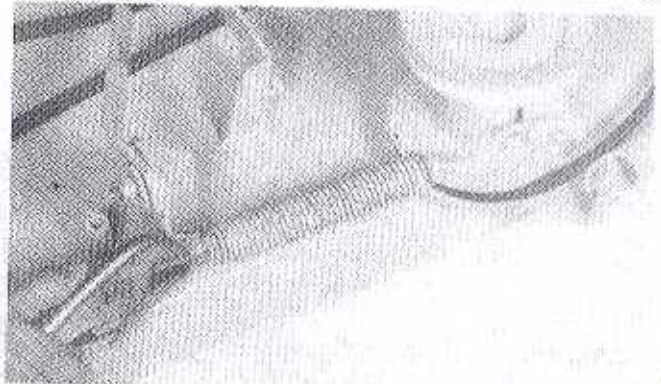
### REPLACING MOWER DECK BELT FOR 46-INCH MOWER—AS NECESSARY

1. Remove mower deck. (See Removing and Installing 46-in. Mower Deck in this section.)
2. Remove three nuts, two cap screws, and washers to remove belt guard cover.



A98M32959 M21;SE5 F2A 36087

3. Disconnect idler spring.



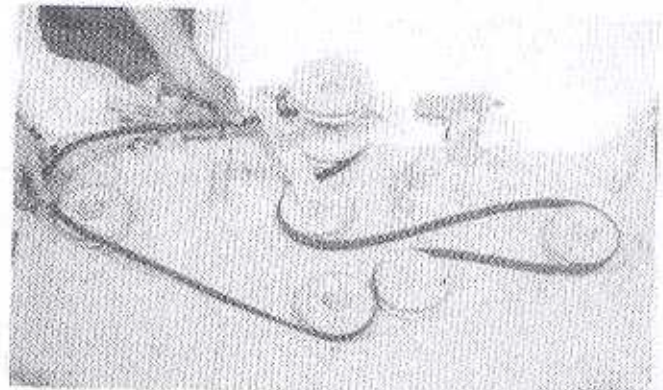
A98M32960 M21;SE1 80 27085

4. Remove mower belt.

5. Clean and inspect belt for damage. **DO NOT** clean belt using parts cleaning solvent or belt dressing; they soften belt and shorten belt life.

6. Clean upper mower deck and sheaves.

7. Install mower belt, connect idler spring, install belt guard cover, and install mower.

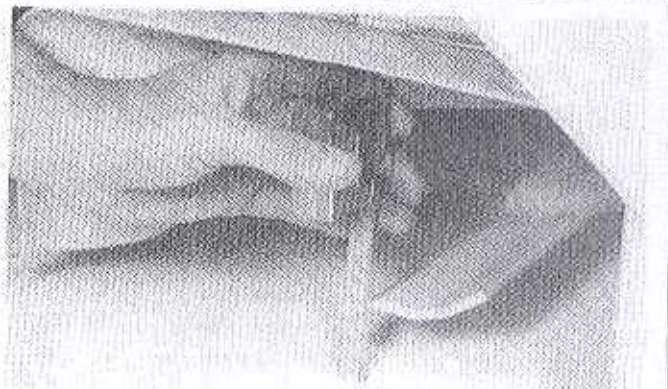


A98M32961 M21;SE1 81 120503

### CHECKING MOWER BLADES—AS NECESSARY

To check for a bent blade:

1. Lower mower. Measure distance between blade tip and flat ground surface.
2. Turn blade 180 degrees. Measure distance between other blade tip and flat ground surface.
3. If the distance between the two distances is more than 3 mm (1/8 in.), install a new blade.



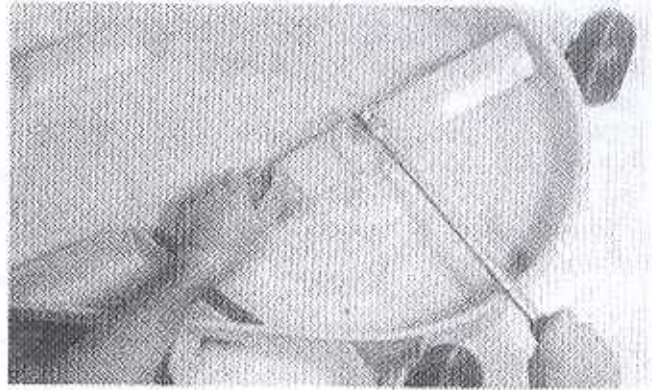
A98M32967 M21;SE5 A22 140488

## REMOVING AND INSTALLING MOWER BLADES—AS NECESSARY

1. Raise mower to full height.
2. Put a block under each side of mower.

**⚠ CAUTION:** Mower blades may be sharp. When you handle blades, wear gloves or wrap a rag around blade.

3. Remove bolt, washer and blade.
4. If a blade is dull, have it sharpened and balanced.
5. If a blade is damaged, install a new blade.
6. Install blade. Fasten it with washer and bolt.
7. Tighten bolt to 75 N·m (55 lb-ft).



A90/M32962 M21;SE5 -AP3 14048B



# Storage

## STORING THE TRACTOR

**IMPORTANT:** Gasoline storage stabilizer should always be used when storing the tractor to prevent carburetor varnishing and partial plugging of carburetor jets. Either of these conditions can cause the engine to run lean and result in piston seizure and engine failure.

1. Put TY6295 John Deere Gasoline Storage Stabilizer or an equivalent in fuel tank. Follow directions on the can.
2. Run engine for at least 10 minutes to make sure stabilizer gets into the carburetor.
3. Change engine oil when engine is warm. (See changing Engine Oil in Service/25 and 50-Hours section.)
4. Repair worn or damaged parts. Install new parts if necessary.
5. Service the air cleaner.
6. Lubricate all grease points.
7. Wash the tractor.

*NOTE: Start engine and engage PTO. Run engine for a couple of minutes to remove water. Stop engine.*

8. Clean the engine and the area around it. Remove oil, grease, and dirt.
9. Apply paint to areas that need it to prevent rust.



**CAUTION: Store battery where children cannot reach it.**

10. Remove the battery. Clean it. Check the electrolyte level. Charge the battery. Store battery in a cool, dry place to preserve battery life.
11. Store the tractor in a dry, protected place. If you store tractor outside, put a waterproof cover over it.
12. Put blocks or stands under tractor to take weight off tires. Let 1/3 of air out of tires.
13. Clean belts with a damp rag. Loosen transmission drive belt.
14. Close fuel shut-off valve under seat.
15. Remove and clean mower.
16. Check mower belts.
17. Remove and sharpen mower blades.

M21:STS -A 200487

## REMOVING TRACTOR FROM STORAGE

1. Check tire pressure.
2. Remove blocks or supports from under tractor.
3. Remove and clean spark plug. Adjust gap.
4. Check battery electrolyte level. Charge battery if necessary. Install battery.
5. Tighten transmission drive belt.
6. Lubricate all grease points.
7. Make sure shields and guards are in place.

8. Check oil level:

- Engine oil on all tractors.
- Differential and transmission oil on 175 and 185 Tractors.



**CAUTION: Start engine ONLY in a well-ventilated place.**

9. Open fuel shut-off valve.
10. Fill fuel tank with fresh, clean fuel.
11. Run engine 5 minutes before you put engine under load.

M21:STS -A1 120488

# Assembly

## ACTIVATE BATTERY

**IMPORTANT:** Battery must be removed from tractor to prevent damage from spilled electrolyte.

1. Remove battery. (See Cleaning Battery in Service/Yearly section.)

**CAUTION:** Battery acid is a poison and can cause burns. Avoid contact with skin, eyes and clothes. When you work around battery, protect eyes and face from battery fluid.

2. Use only battery-grade sulfuric acid electrolyte with 1.265 specific gravity.

3. Remove battery cell caps.

4. Slowly add electrolyte (A) until plates (B) are just covered. DO NOT fill to bottom ledge of filler tube.

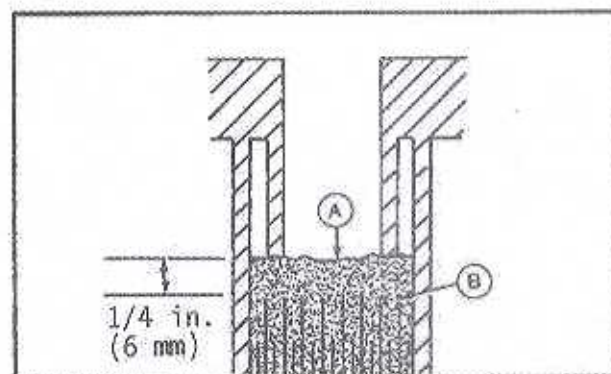
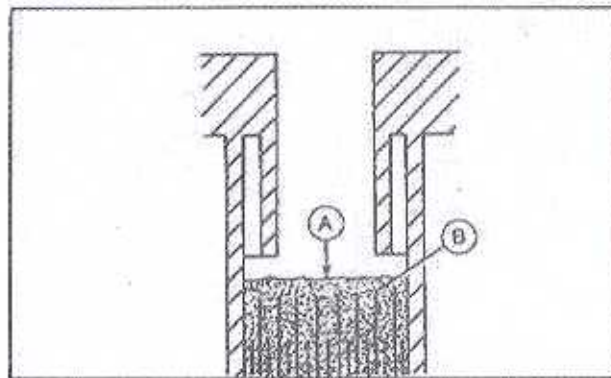
**CAUTION:** Battery gases can explode. Keep cigarettes, sparks and flames away from battery. Provide adequate ventilation.

5. Charge battery at 14 amps for 10 minutes or at 7 amps for 30 minutes. Do not overcharge.

6. If electrolyte bubbles excessively, reduce charging rate. At full charge, electrolyte should have a specific gravity reading of 1.265 at 27°C (80°F).

7. After charging, add electrolyte (A) until level is 6 mm (1/4 in.) above plates (B). Do not fill to bottom ledge of filler tube.

8. Install battery cell caps.



A98/M3977; M3977; M21;AYS -A2 140168

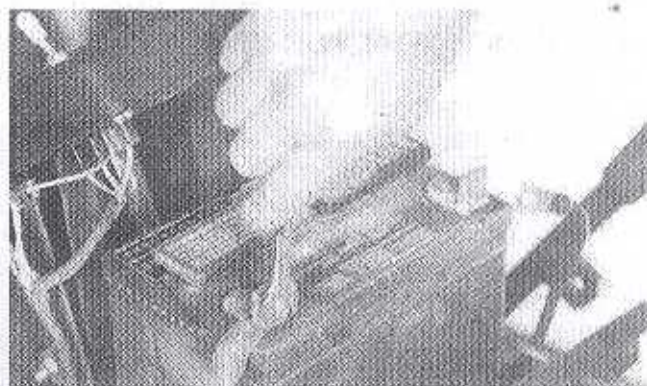
9. Install battery.

**CAUTION:** To prevent short circuits, connect the positive battery cable first, then the negative cable.

10. Connect positive battery cable to positive (+) terminal.

11. Connect negative battery cable to negative terminal.

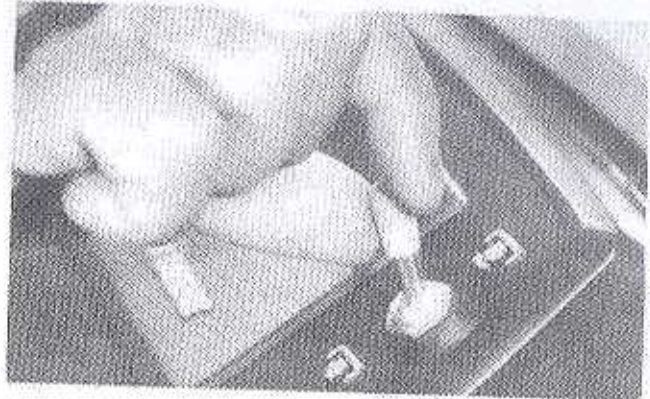
12. Install hold-down. Tighten wing nuts.



A98/M2850; M21;AYS -G 150497

### BREAK-IN ELECTRIC PTO CLUTCH

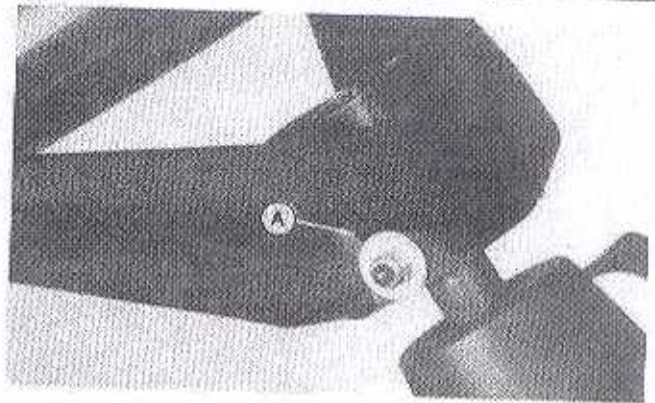
1. Start the engine.
2. Move throttle lever to the halfway position.
3. Turn PTO switch on and off 8 to 10 times in 4 to 5-second intervals at no load.



A98/M3523 M21:AYS D 100685

### INSTALL STEERING WHEEL

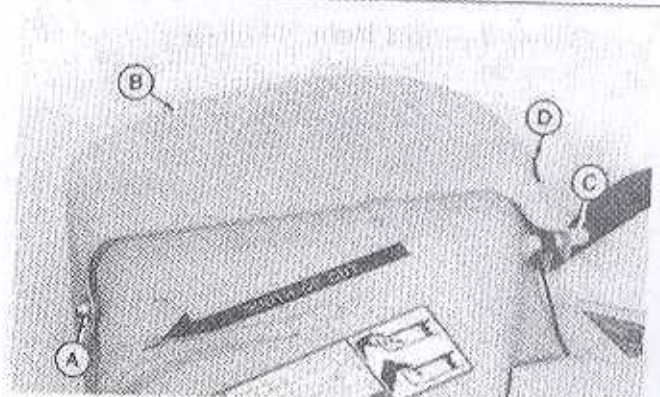
1. Put front wheels in straight forward position.
2. Put John Deere NEVER-SEEZ<sup>®</sup> Lubricant or equivalent on splines of steering shaft.  
*NEVER-SEEZ is a trademark of the Never-Seez Corp.*
3. Install steering wheel with John Deere logo in upright position.
4. Install shoulder bolt from left side of steering wheel. Drive bolt in until head of bolt contacts steering wheel.
5. Install washer and nut over slot (A) on right side of steering wheel.
6. Tighten locknut until snug. Do not tighten locknut to pull washer or head of bolt into steering wheel.
7. Remove tie strap securing steering drag link to frame on front left-hand side of tractor.



A98/M35016 M21:AYS -A1 060586

### INSTALL 46-INCH MOWER DISCHARGE CHUTE

1. Remove tape holding chute (B) up.
2. Remove and save nut and washer (A).
3. Install chute over stud (C) with end of spring (D) through hole in chute.
4. Fasten front of chute with nut and washer (A). Tighten nut only enough to hold chute in place. Chute must be able to move up and down.



A98/M41046 M21:AYS -E1 181087

# Specifications

## TRACTOR SPECIFICATIONS

	180/185	170/175
<b>Kawasaki Engine</b>		
Model	FC540V	FC420V
Horsepower	17	14
Cylinders	1	1
Full throttle, no load	3350 rpm	3350 rpm
Slow idle, no load	1400 rpm	1400 rpm
<b>Spark Plug</b>		
Type	Champion RN11YC	NGK-BPR5ES Champion RN11YC
Gap	0.64 mm (0.025 in.)	0.64 mm (0.025 in.)
<b>Capacities</b>		
Fuel tank	9.5 L (2.2 gal)	9.5 L (2.2 gal)
Engine oil, without filter	1.6 L (3.4 pt)	1.3 L (2.8 pt)
Engine oil, with filter	1.9 L (4 pt)	1.54 L (3.25 pt)
Approximate weight	180 with 38-in. mower: 254 kg (565 lb) 180 with 46-in. mower: 270 kg (600 lb) 185 with 38-in. mower: 266 kg (590 lb) 185 with 46-in. mower: 281 kg (625 lb)	236 kg (525 lb)

M21:SPS -A1 060608

## Travel Speeds at 3400 rpm for Tractors with Gear Transmission

Gear	170 Tractor	180 Tractors
First	2.2 km/h (1.4 mph)	2.4 km/h (1.5 mph)
Second	3.5 km/h (2.2 mph)	3.8 km/h (2.4 mph)
Third	5.3 km/h (3.3 mph)	5.6 km/h (3.5 mph)
Fourth	6.7 km/h (4.2 mph)	7.2 km/h (4.5 mph)
Fifth	7.9 km/h (4.9 mph)	8.5 km/h (5.3 mph)
Reverse	3.7 km/h (2.3 mph)	3.9 km/h (2.4 mph)

## Travel Speeds at 3400 rpm for Tractors with Hydrostatic Transmission

Travel Speeds—±8 km/h (1/2 mph)  
 Forward—0 to 8 km/h (0 to 5 mph)  
 Reverse—0 to 4 km/h (0 to 2-1/2 mph)

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

M21:SPS -A2 060608

### MOWER SPECIFICATIONS

Item	38-Inch	48-Inch
Rotary Cutting Blades	Rotary Two	Rotary Three
Blade Length	496 mm (19.5 in.)	407 mm (16 in.)
Cutting Width	965 mm (38 in.)	1170 mm (46 in.)
Cutting Height	25.4 to 102 mm (1.00 to 4.00 in.)	38 to 102 mm (1.5 to 4.00 in.)

*Specifications and design subject to change without notice.*

M21,SP5 A7 120480

### RECORDING PRODUCT IDENTIFICATION NUMBER

Write your tractor's 13-digit product identification number (PIN) below.

Your John Deere dealer needs this number when you order parts.

Product Identification Number \_\_\_\_\_



A98,M38597 M21,SP5 B 100635

### RECORDING ENGINE SERIAL NUMBER

Write your engine serial number below.

Your John Deere dealer needs this number when you order parts.

Engine Serial Number \_\_\_\_\_



A98,M38600 M21,SP5 D 100685

**SERVICE PARTS FREQUENTLY USED**

Description	Part No.
Spark Plug (170, 175, 180, 185 Tractors)	AM70122
Air Filter Element(170, 175, 180, 185 Tractors)	M70128
Fuel Filter	AM38708
Battery	TY6109
Oil Filter	AM101054
Drive Belt (175, 185 Tractors)	M89832
Primary Mower Drive Belt (with 38-inch Mower)	M82734
Primary Mower Drive Belt (with 46-inch Mower)	M91147
Secondary Mower Drive Belt (with 38-inch Mower)	M82462
Secondary Mower Drive Belt (with 46-inch Mower)	M84136
Blades, 38-Inch Mower Low Lift	AM100946
Blade, 38-Inch Medium Lift	AM100945
Blade, 38-Inch High Lift	AM100991
Blade, 46-Inch Mower	AM31100

NGK-BP5ES AC-R44XLS

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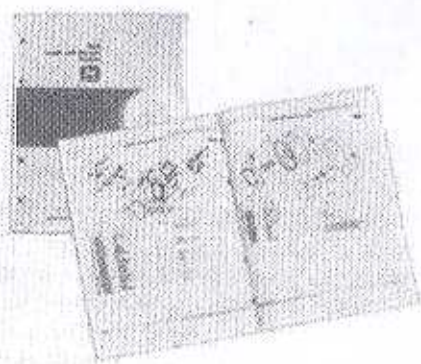
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# John Deere Service Literature Available

## PARTS CATALOG

The parts catalog lists service parts available for your machine with exploded view illustrations to help you identify the correct parts. It is also useful in assembling and disassembling.

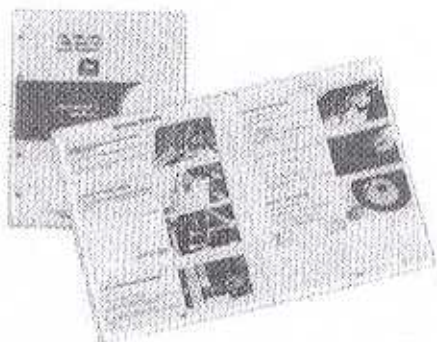


AR6.TS189 053/PARTS 271185

## OPERATOR'S MANUAL

The operator's manual provides safety, operating, maintenance, and service information about John Deere machines.

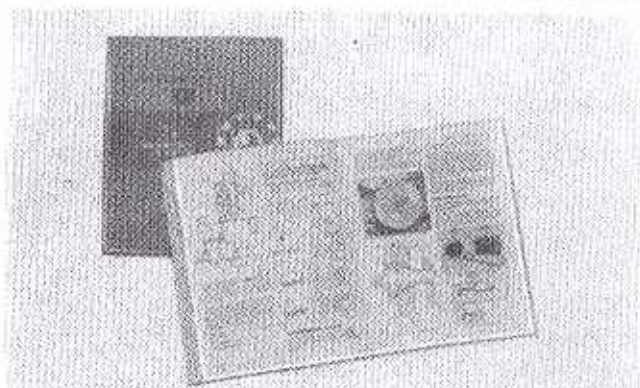
An extra copy of the operator's manual is important if the copy furnished with your machine is misplaced.



AR6.TS190 053/OM 271185

## FUNDAMENTALS OF SERVICE MANUALS

These basic manuals cover most makes and types of machines. FOS manuals tell you how to *service* machines. Each manual starts with basic theory and is fully illustrated with colorful diagrams and photographs. Both the "whys" and "hows" of adjustments and repairs are covered in this reference library.

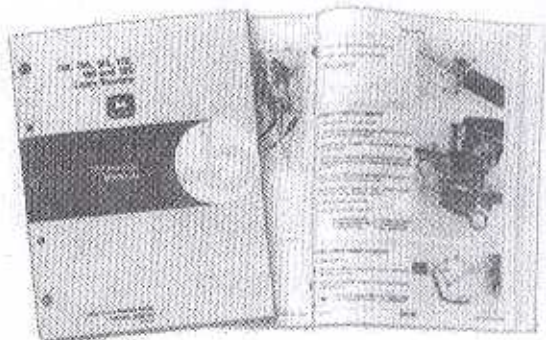


AR6.TS193 053/FOS 271185

## TECHNICAL AND SERVICE MANUALS

Technical and service manuals are service guides for your machine. Included in the manual are specifications, diagnosis, and adjustments. Also illustrations of assembly and disassembly procedures, hydraulic oil flows, and wiring diagrams.

Component technical manuals are required for some products. These supplemental manuals cover specific components.



AR6.TS224 053/1M 213287

John Deere Service Literature Available

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FOS Manual—Power Trains	FCP-81101B	9.70	X	==
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Industrial Product Publications	CPC-1852	No Charge		

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 SP-317 Jan-88



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John Deere takes pride in providing superior service. We'll be around when you need us. To help minimize downtime, we maintain a large and varied parts inventory. Precision tools and testing equipment enable our dealers to locate and correct troubles quickly. We hold regular training schools for dealer service

technicians so they know your equipment and how to maintain it. Our goal is to provide prompt, efficient service through competent dealers. To locate the dealer nearest you, contact the John Deere sales branch in the area in which you live. (See map below.)

### Sales Branch

1. JOHN DEERE COMPANY  
701 Georgeville Road  
Columbus, OH 43228  
614-275-1500

2. JOHN DEERE COMPANY  
2001 Deere Dr.  
Conyers, GA 30208  
404-922-7040

3. JOHN DEERE COMPANY  
10850 Hines Boulevard  
Dallas, TX 75220-2635  
214-352-1701

4. JOHN DEERE COMPANY  
3210 East 85th Street  
Southeast Station  
Kansas City, MO 64132-2586  
816-361-4000

5. JOHN DEERE COMPANY  
2001 West 94th Street  
Bloomington, MN 55431-2311  
612-887-6200

6. JOHN DEERE COMPANY  
South Service Road at Hunter  
Grimsby, Ontario, Canada L3M 4H5  
416-945-9281

