

# 4435, 4435 Hydro Combines



## TECHNICAL MANUAL 4435, 4435 Hydro Combines

TM4464 (01MAY91) English

John Deere Werke Zweibrücken  
TM4464 (01MAY91)

LITHO IN U.S.A.  
ENGLISH





## FOREWORD

This manual is written for experienced technicians. Essential tools required for performing certain service operations are identified in this manual and are recommended for use.

Live with safety: Read the safety messages on the first pages of this manual as well as the cautions presented throughout the text of the manual.



**This is the safety alert symbol. When you see this symbol on the machine or in this manual, be alert to the risk of personal injury.**

Information is organized in groups for the various components requiring service instruction. At the beginning of each group are summary listings of all applicable essential tools, service equipment and tools, other materials needed to do the job, service parts kits, specifications, wear tolerances and torque values.

Binders, binder labels and tab sets can be ordered by John Deere dealers direct from the John Deere Distribution Service Center.

This manual is part of a total product support program.

### **FOS Manuals – Reference**

#### **Technical Manuals – Machine service**

#### **Component Technical Manuals – Component service**

*Fundamentals of Service (FOS) Manuals* cover basic theory of operation, fundamentals of troubleshooting, general maintenance and the basic types of failures and their causes. FOS Manuals are for the training of new personnel and for reference by experienced technicians.

*Technical Manuals* are concise guides for specific machines. Technical Manuals are on-the-job guides containing only the vital information needed for diagnosis, analysis, testing and repair.

*Component Technical Manuals* are concise service guides for specific components. Component technical manuals are written as stand-alone manuals covering multiple machine applications.

# 4435, 4435 HYDRO COMBINES TECHNICAL MANUAL TM4464 (MARCH-90)

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

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™ = John Deere trademark

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## INTRODUCTION

This manual is part of a total service support program.

### FOS MANUALS – REFERENCE

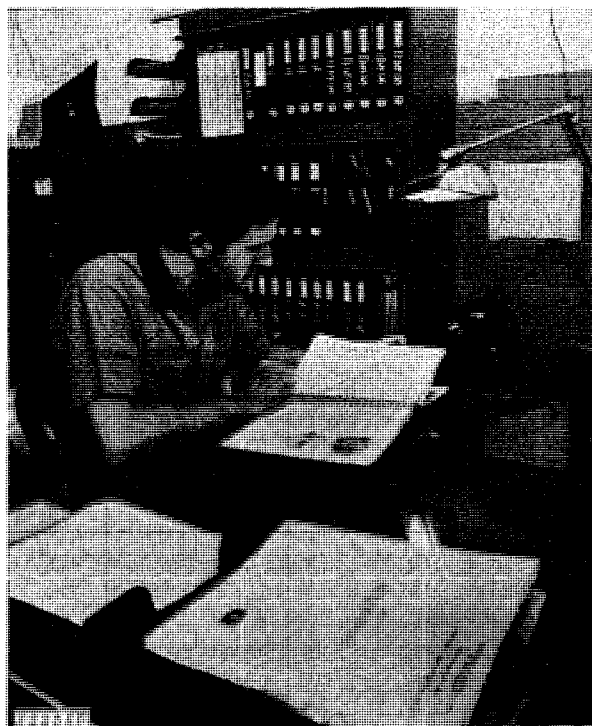
Fundamentals of Service (FOS) Manuals cover basic theory of operation, fundamentals of troubleshooting, general maintenance, basic types of failures and their causes. FOS Manuals are for training new personnel and for reference by experienced technicians.

### TECHNICAL MANUALS – MACHINE SERVICE

Technical Manuals are concise service guides for specific machines. Technical Manuals are on-the-job guides containing only the vital information needed by an experienced technician.

### COMPONENT MANUALS – COMPONENT SERVICE

Component Technical Manuals are concise service guides for specific components. Component technical manuals are written as stand-alone manuals covering multiple machine applications.



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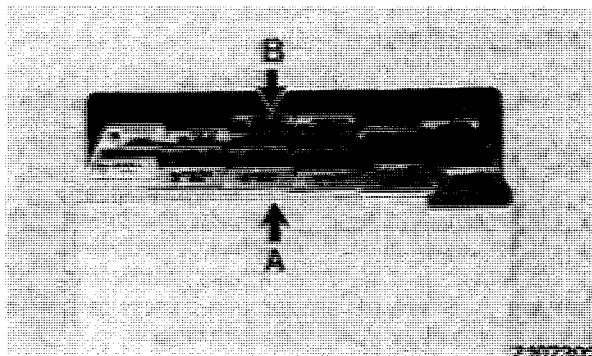
## TECHNICAL MANUAL TABS

### INTRODUCTION

To fully utilize this manual, you must understand how it is organized. Only two tab colors are used – green and yellow, each representing a different type of information. Spend a minute reading this now and save many minutes of searching later.

**A-Green tabs**

**B-Yellow tabs**



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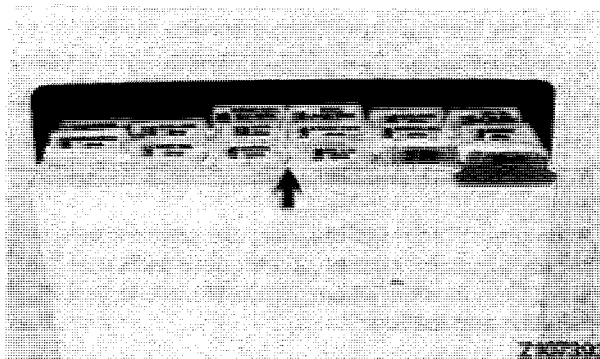
## GREEN TAB SECTIONS

The green tab sections are REPAIR sections, telling you how to repair components of the various systems.

Repair of a component includes:

- Removal from machine (if necessary)
- Disassembly
- Inspection
- Replacement of parts
- Assembly
- Adjustment
- Installation on machine (if necessary)

The numbers, used for the repair (green tab) sections, are part of an overall service publication numbering system. The numbers identify the same sections in the parts catalog, flat rate manual, service information bulletins and service training courses.



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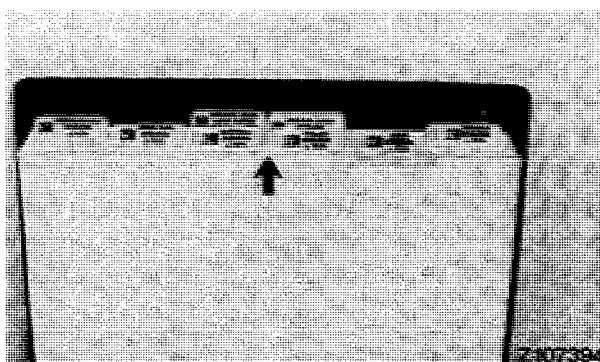
## YELLOW TAB SECTIONS

Each yellow tab section contains information on:

- System Operation
- System Tests

System operation explains how the system and its components work.

System tests tell you how to test the system and diagnose the problem.



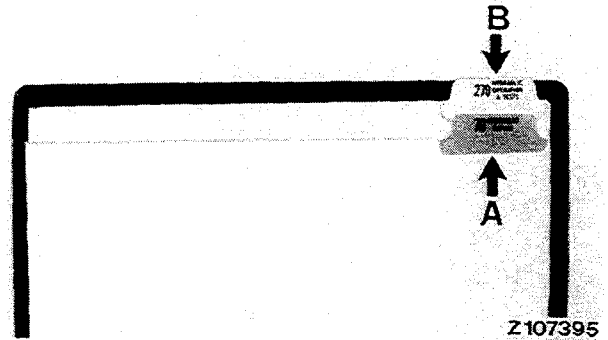
Z107394-Z1304AE-011085

### TAB POSITIONS

Each green tab and its corresponding yellow tab have the same tab position. This helps you to quickly locate the related information.

**A-Green tab**  
- Section 70  
- Hydraulic Repair

**B-Yellow tab**  
- Section 270  
- Hydraulic System  
Operation/Tests



### THREE-STEP PROCEDURE

Use the following three-step procedure to locate the desired information.

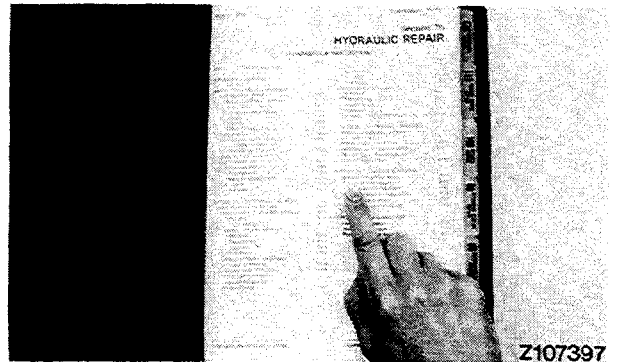
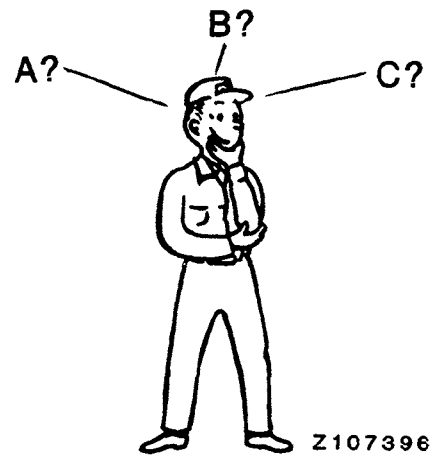
1. Determine the type of information you need: Is it?

- A - Repair
- B - Operation
- C - Tests

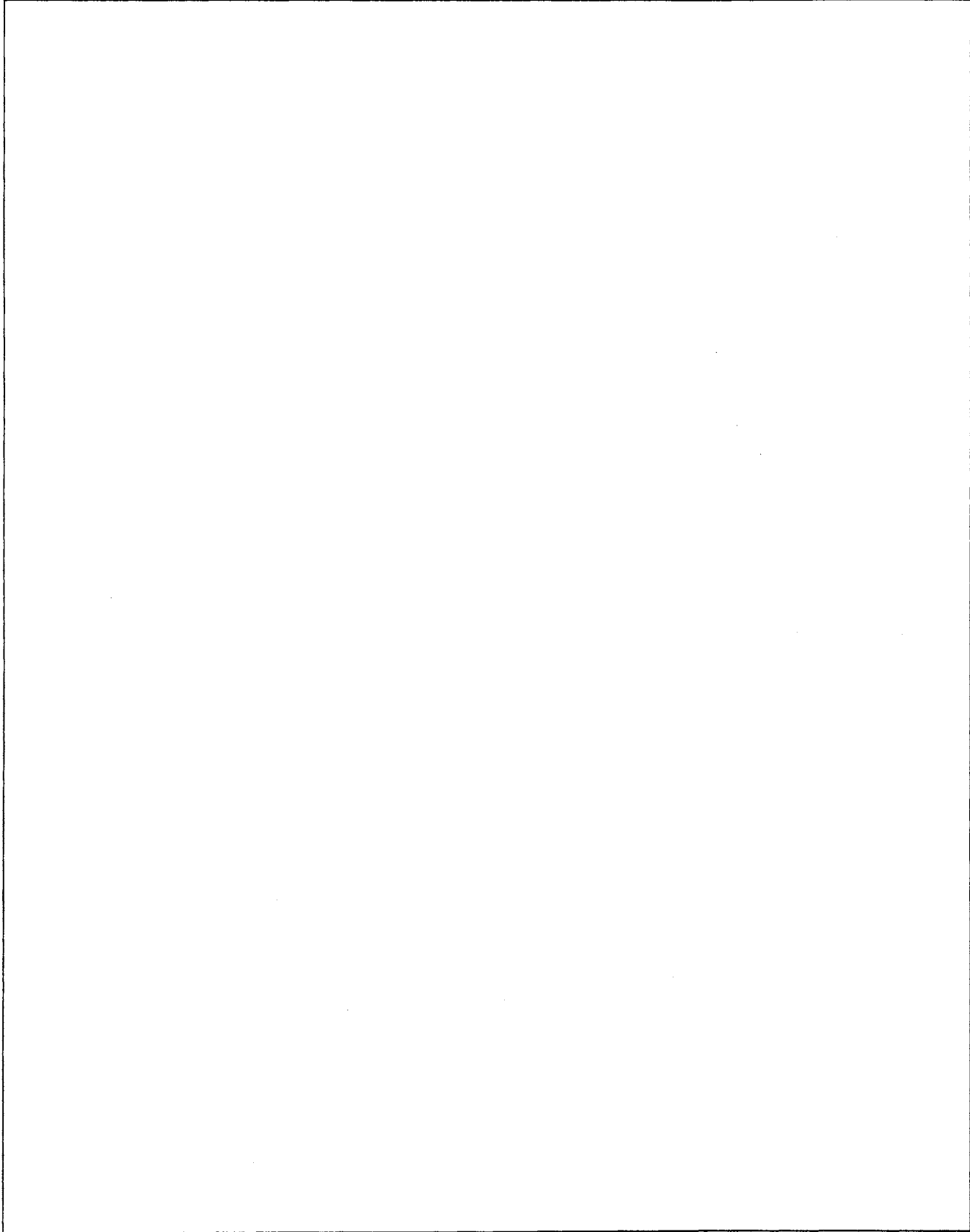
2. Go to the appropriate section tab:

- Green - for Repair
- Yellow - for Operation or Tests

3. Use the Table of Contents on the first page of each section to locate the information.



*Introduction*





**SAFETY AND YOU**

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



T81389;053:TMSAFE 19 07OCT85

**IMPORTANT**

The IMPORTANT message identifies potential problems which may cause consequential damage to machine. Following recommended procedure will instruct technician how to avoid problem.

A68;N01:0000 19 U 05NOV82

**NOTES**

The word NOTE is followed by a statement that identifies a qualification or exception to a previous statement. A "NOTE" may also identify nice-to-know information pertinent to, but not directly related to previous statement.

A68: N01:0000 19 V 05NOV82



## OBSERVE SAFETY RULES

Avoid loose clothing that can catch in moving parts and put you out of work.

Wear your safety glasses while on the job.

Avoid working on equipment with the engine running. If it is necessary to make checks with the engine running, **ALWAYS USE TWO PEOPLE** – with the operator, at the controls, able to see the person doing the checking. Also, put the transmission in neutral, set the brake, and apply safety locks provided. **KEEP HANDS AWAY FROM MOVING PARTS.**

Keep transmission and brake control units properly adjusted at all times. Before making adjustments, stop engine.

Before removing any housing covers, stop engine. Take all objects from your pockets which could fall into the opened housings. Don't let adjusting wrenches fall into opened housings.

Don't attempt to check belt tension while the engine is running.

Don't adjust the fuel system while the machine is in motion.

Before repairing the electrical system, or performing a major overhaul, make sure the batteries are disconnected.

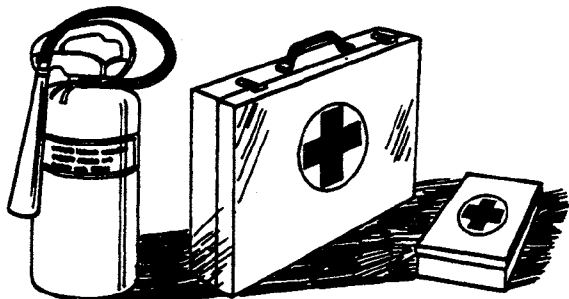
A68; N01:0000 19 S 05NOV82

## 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.



L114 052

L114052:053;FIR2 19 15MAR89



## HANDLE FLUIDS SAFELY – AVOID FIRES

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease and debris.

Do not store oily rags; they can ignite and burn spontaneously.



TS 227

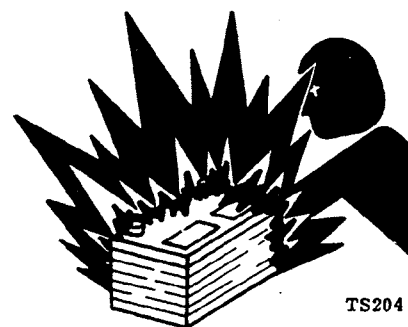
TS227;053;FLAME 19 05JAN88

## PREVENT BATTERY EXPLOSIONS

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).



TS204

TS204;053;SPARKS 19 28JUN88

## PREVENT 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:

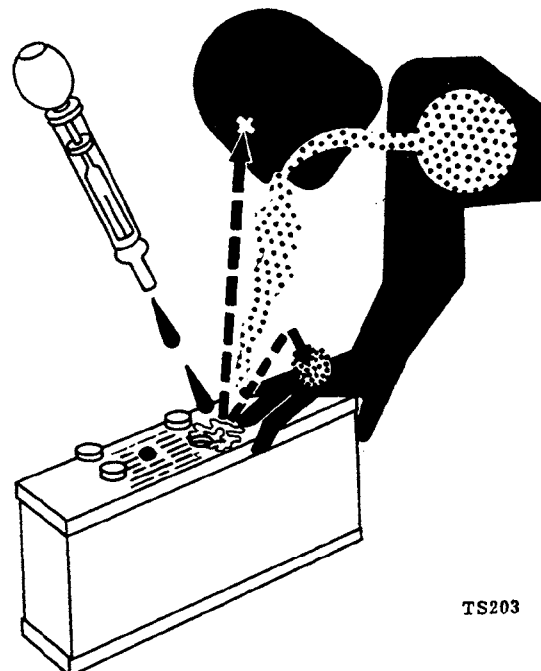
1. Filling the batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

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.



TS203

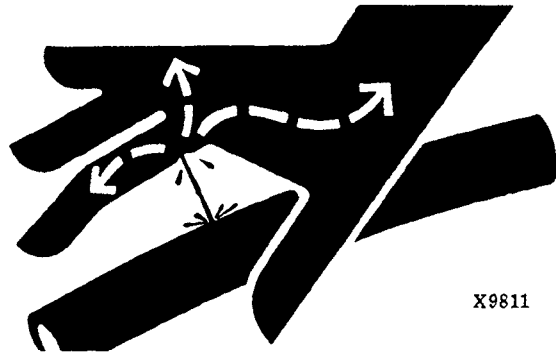
TS203053;POISON 19 21DEC87



## AVOID HIGH-PRESSURE FLUIDS

Escaping fluid (fuel or hydraulic oil) under pressure can penetrate the skin causing serious injury. Relieve pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Keep hands and body away from pinholes and nozzles which eject fluids under high pressure. Use a piece of cardboard to search for leaks.

If ANY fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this type of injury, or gangrene may result.



X9811

X9811:053:FLUID 19 18SEP87

## AVOID HARMFUL ASBESTOS DUST

Avoid breathing dust that may be generated when handling components containing asbestos fibers. Inhaled asbestos fibers may cause lung cancer.

Components in John Deere products that may contain asbestos fibers are brake pads, brake band and lining assemblies, clutch plates and some gaskets. The asbestos used in these components is usually found in a resin or sealed in some way. Normal handling is not hazardous as long as airborne dust containing asbestos is not generated.

Avoid creating dust. Never use compressed air for cleaning. Avoid brushing or grinding of asbestos-containing materials. When servicing, wear an approved respirator. A special vacuum cleaner is recommended to clean asbestos. If not available, wet the asbestos-containing materials with a mist of oil or water.

Keep bystanders away from the area.

Please note designations on spare parts.



TS 220



L 114 051

TS220,L114051:053:DUST 19 14APR88



### WORK IN VENTILATED AREA

Engine exhaust fumes can cause sickness or death. If it is necessary to run an engine in an enclosed area, remove the exhaust fumes from the area with an exhaust pipe extension.

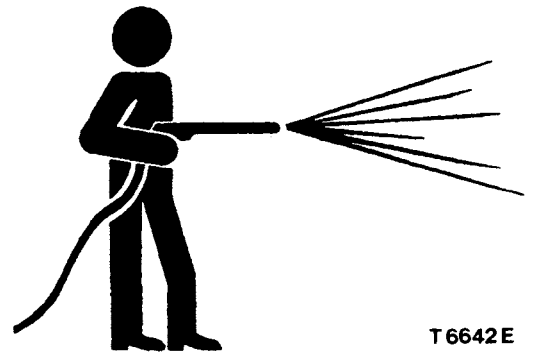
If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

TS220:053;AIR 19 05JAN88

### WORK IN CLEAN AREA

Before starting a job:

- Clean work area and machine.
- Make sure you have all necessary tools to do your job.
- Have the right parts on hand.
- Read all instructions thoroughly; do not attempt shortcuts.



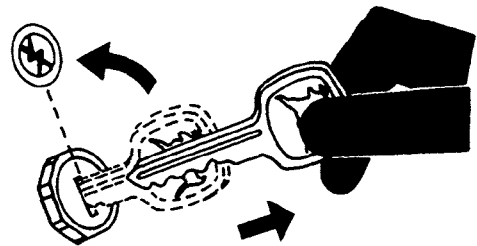
T 6642 E

T6642E:053;CLEAN 19 19JAN88

### PARK MACHINE SAFELY

Before working on the machine:

- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.
- Hang a "DO NOT OPERATE" tag in operator station.



TS 230

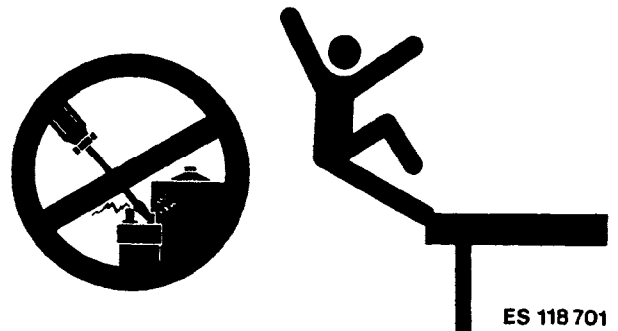
TS230:053;PARK 19 05JAN88

### PREVENT MACHINE RUNAWAY

Avoid possible injury or death from a machine runaway.

Do not start the engine by shorting across starter terminals. Machine will start in gear if normal circuitry is bypassed.

NEVER start engine while standing on service platform. Start engine only from operator's seat with transmission in neutral.



ES 118 701

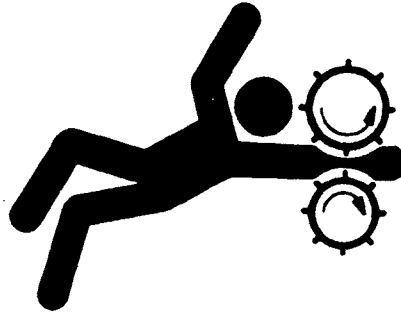
ES118701-ESPDAE-270588



## SERVICE MACHINE SAFELY

Tie long hair behind your head. Do not wear a necktie, scarf, loose clothing or necklace when you work near machine tools or moving parts. If these items were to get caught, severe injury could result.

Remove rings and other jewelry to prevent electrical shorts and entanglement in moving parts.

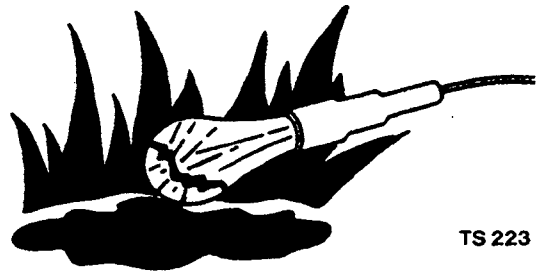


TS228

TS228;053;LOOSE 19 21DEC87

## UNDERSTAND CORRECT SERVICE

Illuminate your work area adequately but safely. Use a portable safety light for working inside or under the machine. Make sure the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.



TS 223

Catch draining fuel, oil, or other fluids into suitable containers. Do not use food or beverage containers that may mislead someone into drinking from them. Wipe up spills at once.

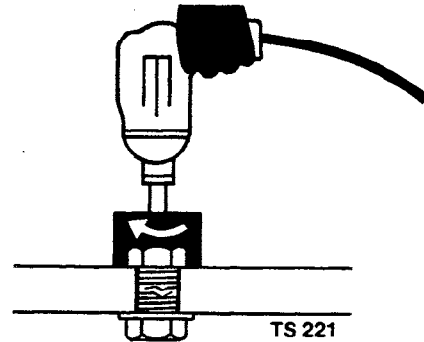
TS223;053;LIGHT 19 23FEB88

## USE TOOLS PROPERLY

Use tools appropriate to the work. Makeshift tools, parts, and procedures will not make good repairs.

Use pneumatic and electric tools only to loosen threaded parts and fasteners. Never use such tools to tighten fasteners, especially on light alloy parts.

Use only replacement parts meeting John Deere specifications.



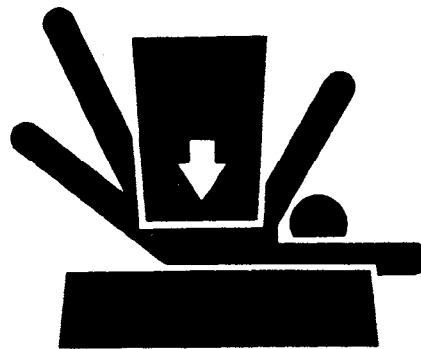
TS 221

TS221;053;REPAIR 19 21DEC87

## SUPPORT MACHINE PROPERLY

Always lower the attachment or implement to the ground before you work on the machine. If you must work on a lifted machine or attachment, securely support the machine or attachment.

Do not support the machine on cinder blocks, hollow tiles or props that may crumble under continuous load. Do not work under a machine that is supported solely by a jack. Follow recommended procedures in this manual.



TS 229

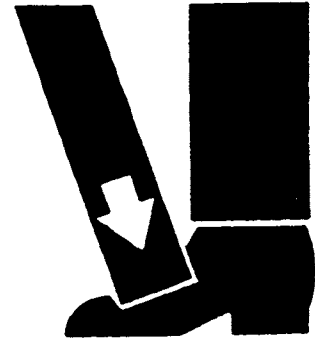
TS229;053;LOWER 19 21DEC87



### USE PROPER LIFTING EQUIPMENT

Lifting heavy components incorrectly can cause severe injury or machine damage.

Follow recommended procedure for removal and installation of components in the manual.



TS 226

TS226:053;LIFT 19 05JAN88

### SERVICE TIRES SAFELY

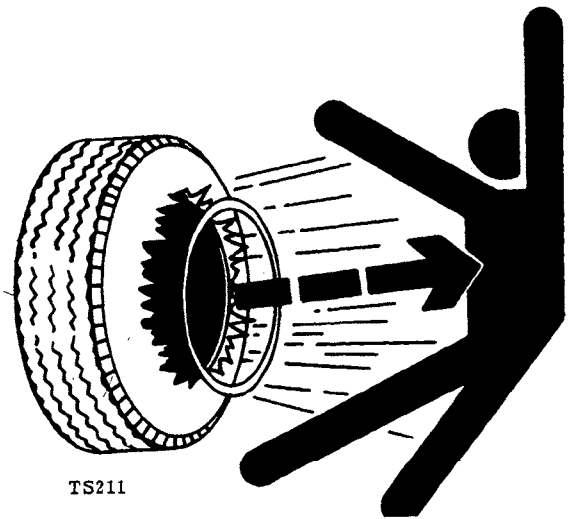
Explosive separation of a tire and rim parts can cause serious injury or death.

Only attempt to mount a tire if you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate tires above the recommended pressure.

When inflating tires, use a clip-on chuck and extension hose long enough to allow you to stand to one side and NOT in front of or over the tire assembly. Use a safety cage if available.

Check wheels for low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

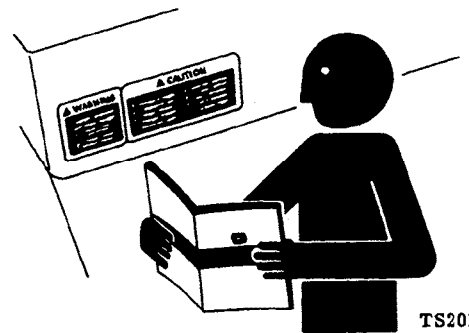


TS211

TS211:053;RIM 19 21DEC87

### REPLACE SAFETY SIGNS

Replace missing or damaged safety signs. See the machine operator's manual for correct safety sign placement.



TS201

TS201:053;SIGNS1 19 22DEC87

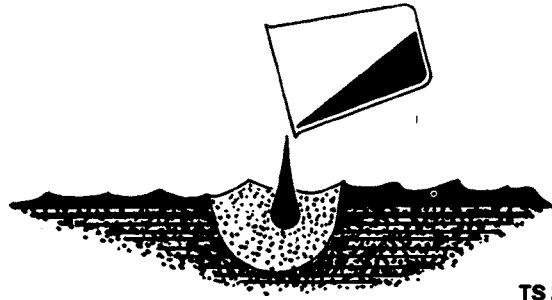


## OBSERVE ENVIRONMENTAL PROTECTION REGULATIONS

Be mindful of the environment and ecology.

Before draining any fluids, find out the correct way of disposing of them.

Observe the relevant environmental protection regulations when disposing of oil, fuel, coolant, brake fluid, filters and batteries.



TS 222

TS222-ESPDAE-140388

## LIVE WITH SAFETY

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.



TS231;053;LIVE 19 05JAN88



## Section 10 GENERAL

### CONTENTS OF THIS SECTION

#### GROUP 05 – SPECIFICATIONS

		4435	4435Hy
Specifications .....	10-05-1	x	x
Dimensions .....	10-05-6	x	x
Serial number plates .....	10-05-8	x	x
Standard torques .....	10-05-10	x	x
Metric and inch threads .....	10-05-12	x	x

#### GROUP 10 – DIAGNOSING AND TESTING PROCEDURES

Troubleshooting .....	10-10-1	x	x
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#### GROUP 15 – CLAMPING RING BEARINGS

Bearings – general .....	10-15-1	x	x
Install – clamping ring bearings with sheet metal housing .....	10-15-2	x	x
Install – clamping ring bearings with cast iron housing .....	10-15-3	x	x

#### GROUP 20 – DRIVE BELTS

Examples of unusual belt wear .....	10-20-3	x	x
Belt pulley inspection .....	10-20-3	x	x
Belt installation .....	10-20-4	x	x

#### GROUP 25 – DRIVE CHAINS

Drive chains .....	10-25-1	x	x
Safety links .....	10-25-2	x	x
Chains with O-ring seals .....	10-25-3	x	x

INHA-Z15101AE-111189

*General*

**SPECIFICATIONS**

**ENGINE**

Make .....	JOHN DEERE
Model (4435) .....	6359 DZ 004
Model (4435 Hydro) .....	6359 TZ 003
Displacement .....	5880 cm <sup>3</sup> (359 cu.in.)
Number of cylinders .....	6
Bore .....	106.5 mm (4.2 in.)
Stroke .....	110 mm (4.33 in.)
Power (4435) .....	82 kW (110 hp) (according to ISO 2288)
Power (4435 Hydro) .....	92 kW (124 hp) (according to ISO 2288)
Compression ratio (4435) .....	17.8 to 1
Compression ratio (4435 Hydro) .....	16.8 to 1
Minimum compression at starter cranking speed (180 rpm) .....	2400 kPa (24 bar; 342 psi)
Flywheel torque at 1400 rpm (4435) .....	364 Nm (272 ft-lb)
Flywheel torque at 1500 rpm (4435 Hydro) .....	420 Nm (300 ft-lb)
Full load speed .....	2500 rpm
Slow idle speed .....	1200 to 1300 rpm
Fast idle speed .....	2675 to 2725 rpm
Firing order .....	1 - 5 - 3 - 6 - 2 - 4
Type of lubrication .....	Gear pump force feed
Valve clearance (cold or hot):	
- Intake valves .....	0.35 mm (0.014 in.)
- Exhaust valves .....	0.45 mm (0.018 in.)
Make of injection pump .....	STANDADYNET <sup>TM</sup> DB2 RE 12323
Injection nozzles .....	STANDADYNET <sup>TM</sup> Four-Hole
Opening pressure of a new injection nozzle (4435) .....	22100 kPa (221 bar; 3200 psi)
Opening pressure of a new injection nozzle (4435 Hydro) .....	25500 kPa (255 bar; 3700 psi)

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