
**2250, 2450, 2650,
2650N and 2850
Tractors**

**TECHNICAL MANUAL
2250, 2450, 2650, 2650N
and 2850 Tractors (Repair)**

TM4440 (JAN-91)

John Deere Werke Mannheim
European Edition
Printed in Germany

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Supplement (Jan-91) for Technical Manual TM4440

(2250 - 2850 Tractors)

Please insert the revised and new pages in the correct sequence in your Technical Manual, discarding the corresponding original pages which have been revised.



SUMMARY OF MOST IMPORTANT SPECIFICATIONS FOR 2250, 2450, 2650, 2650N and 2850 TRACTORS

NOTE: For further specifications, see relevant Technical Manual.

ENGINE

Valve clearance
(engine hot or cold):
Intake valves 0.35 mm (0.014 in.)
Exhaust valves 0.45 mm (0.018 in.)

Minimum engine oil pressure
at 800 rpm and normal operating
temperature 100 kPa
(1 bar; 14 psi)

Compression 2100 kPa
(21 bar; 300 psi)

Maximum difference in pressure
between cylinders 350 kPa
(3.5 bar; 50 psi)

Maximum blow-by at crankcase
vent tube 80 liter/kWh
(2.8 cu.ft./kWh)

Minimum pressure of turbocharger
in intake manifold at
rated engine speed 60 kPa
(0.6 bar; 9 psi)

Rocker arm shaft to cylinder head 50 Nm (35 ft-lb)
Cylinder head to cylinder block
(cap screws dipped in oil)

1st step 85 Nm (65 ft-lb)
2nd step 135 Nm (100 ft-lb)
3rd step +60°

Rocker cover to cylinder head 10 Nm (7 ft-lb)

Connecting rod cap screws
(dipped in oil) 65 to 75 Nm (50 to 55 ft-lb)

Main bearing caps to
cylinder block 120 Nm (85 ft-lb)

Flywheel to crankshaft 160 Nm (120 ft-lb)

Front axle carrier to engine
without increased lifting capacity 230 Nm (170 ft-lb)
with increased lifting capacity

- Cap screws 230 Nm (170 ft-lb)
- TORX screws 250 Nm (185 ft-lb)

Oil pan to front axle carrier 400 Nm (300 ft-lb)

Oil pan to clutch housing 230 Nm (170 ft-lb)

Clutch housing to engine 230 Nm (170 ft-lb)

Side frames to front axle carrier 230 Nm (170 ft-lb)

Side frames to flywheel housing 230 Nm (170 ft-lb)

FUEL INJECTION NOZZLES

Opening pressure of a new or re-
conditioned nozzle with new spring
- Engine without turbocharger 21700 to 22400 kPa
(217 to 224 bar;
3150 to 3250 psi)

- Engine with turbocharger 25100 to 25800 kPa
(251 to 258 bar;
3650 to 3750 psi)

Minimum opening pressure with
used nozzle
- Engine without turbocharger 20700 kPa
(207 bar; 3000 psi)

- Engine with turbocharger 24100 kPa
(241 bar; 3500 psi)

Maximum difference in
opening pressure 700 kPa
(7 bar; 100 psi)

Fuel injection nozzle to
cylinder head 30 Nm (23 ft-lb)

BATTERIES

Cold state testing current
- 55 Ah battery 255 amps.
- 66 Ah battery 300 amps.

ENGINE SINGLE-STAGE CLUTCH

Thickness of a new disk 10 mm (0.39 in.)

Wear limit 7 mm (0.26 in.)

Maximum permissible warpage
of clutch disk 0.5 mm (0.02 in.)

Flywheel to crankshaft 160 Nm (120 ft-lb)

Clutch to flywheel 50 Nm (35 ft-lb)

Clutch pedal free play
(mechanical clutch) 25 mm (approx. 1 in.)

ENGINE DUAL-STAGE CLUTCH

Thickness of a new disk
- Engine clutch 9.0 to 9.6 mm
(0.35 to 0.38 in.)

- PTO clutch 7.7 to 8.3 mm
(0.30 to 0.33 in.)

Wear limit of a clutch disk
- Engine clutch 6 mm (0.24 in.)
- PTO clutch 4.7 mm (0.18 in.)

Maximum permissible warpage
of clutch disk 0.5 mm (0.02 in.)

Flywheel to crankshaft 160 Nm (120 ft-lb)

Clutch to flywheel 50 Nm (35 ft-lb)

Clutch pedal free play 25 mm (approx. 1 in.)

HI-LO SHIFT UNIT

Operating pressure at 1500 rpm 1050 kPa
(10.5 bar; 150 psi)

Operating pressure of
automatic shift valve 500 to 700 kPa
(5 to 7 bar; 75 to 100 psi)

Hi-Lo shift unit to
clutch housing 50 Nm (35 ft-lb)



SUMMARY OF MOST IMPORTANT SPECIFICATIONS FOR 2250, 2450, 2650, 2650N and 2850 TRACTORS

SYNCHRONIZED TRANSMISSION

Differential Drive Shaft

Rolling drag torque with	
New bearings	0.75 to 1.5 Nm (6.5 to 13 in-lb)
Used bearings	0.4 to 0.75 Nm (3.5 to 6.5 in-lb)
Special hex. nut or special nut of differential drive shaft	140 Nm (100 ft-lb)

Range Shaft

Preload of taper roller bearings	0.05 to 0.10 mm (0.002 to 0.004 in.)
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Countershaft

Preload of transmission hollow drive shaft	0.05 to 0.10 mm (0.002 to 0.004 in.)
Rolling drag torque	1 to 2 Nm (9 to 18 in-lb)

End play of differential drive shaft	0.03 to 0.13 mm (0.001 to 0.005 in.)
---	---

Hex. nut of transmission hollow drive shaft	140 Nm (100 ft-lb)
Countershaft bearing quill	120 Nm (85 ft-lb)

Intermediate Shaft

Preload of bearings	0.05 to 0.10 mm (0.002 to 0.004 in.)
Grooved nut	140 Nm (100 ft-lb)
Clutch housing to transmission case	160 Nm (120 ft-lb)

COLLAR SHIFT TRANSMISSION

Differential Drive Shaft

Total thickness of shim pack to adjust cone point	0.5 mm (0.02 in.)
Maximum permissible end play before adjusting preload	0.05 mm (0.002 in.)
Dimension to be added to measured end play	0.15 mm (0.006 in.)
Preload of taper roller bearings	0.15 mm (0.006 in.)
Rolling drag torque with specified preload	0.6 to 1.7 Nm (5 to 15 in-lb)

Hex. nut of differential drive shaft	220 Nm (160 ft-lb)
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Transmission Drive Shaft

End play	0.10 to 0.15 mm (0.004 to 0.006 in.)
Transmission drive shaft bearing quill	50 Nm (35 ft-lb)

TRANSMISSION OIL PUMP

Minimum delivery of transmission
oil pump at 2000 rpm:

Oil temperature 40°C (100°F)	
– 2250 and 2450 without Hi-Lo	34 liters/min. (9 gpm)
– 2250 to 2850 with Hi-Lo and 2650 to 2850 without Hi-Lo	42 liters/min. (11 gpm)

Oil temperature 65°C (150°F)	
– 2250 and 2450 without Hi-Lo	30 liters/min. (8 gpm)
– 2250 to 2850 with Hi-Lo and 2650 to 2850 without Hi-Lo	38 liters/min. (10 gpm)

Minimum flow to hydraulic pump
at 2000 rpm with:

Oil temperature 40°C (100°F)	
– 2250 to 2850 without Hi-Lo	30 liters/min. (8 gpm)
– 2250 to 2850 with Hi-Lo and 2650 to 2850 without Hi-Lo	36 liters/min. (9.5 gpm)

Oil temperature 65°C (150°F)	
– 2250 and 2450 without Hi-Lo	26 liters/min. (7 gpm)
– 2250 to 2850 with Hi-Lo and 2650 to 2850 without Hi-Lo	32 liters/min. (8.5 gpm)

Transmission oil pump cap screws	55 Nm (40 ft-lb)
Transmission oil pump to clutch housing	55 Nm (40 ft-lb)

DIFFERENTIAL

Preload of taper roller bearings	0.05 to 0.13 mm (0.002 to 0.005 in.)
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Backlash between ring gear and differential drive shaft pinion	0.30 mm (0.012 in.)
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FINAL DRIVES

To measured rolling drag torque
of final drive housing (before
tightening 12-point screw) add:

Standard final drives	8 to 12.5 Nm (6 to 9 ft-lb)
Heavy-duty final drives	10 to 13.5 Nm (7.5 to 10 ft-lb)

Final drives to transmission case	120 Nm (85 ft-lb)
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SUMMARY OF MOST IMPORTANT SPECIFICATIONS FOR 2250, 2450, 2650, 2650N 2850 TRACTORS

INDEPENDENT PTO

Operating pressure at 1500 rpm	1050 kPa (10.5 bar; 150 psi)
Preload of taper roller bearings in bearing quill (at 540 rpm, heavy-duty type)	0.05 mm (0.002 in.)
Drive gear to clutch drum	75 Nm (55 ft-lb)
Bearing quill to transmission case	120 Nm (85 ft-lb)

CONTINUOUS RUNNING PTO

Preload of taper roller bearings in bearing quill (heavy-duty version)	0 to 0.05 mm (0 to 0.002 in.)
Bearing quill to transmission case	120 Nm (85 ft-lb)

FRONT PTO

Operating pressure at 1500 rpm	1050 kPa (10.5 bar; 150 psi)
Preload of taper roller bearings	0 to 0.05 mm (0 to 0.002 in.)
Front PTO to front axle carrier	400 Nm (300 ft-lb)

FRONT WHEEL DRIVE

Operating pressure at 1500 rpm	1050 kPa (10.5 bar; 150 psi)
Disk clutch slips at a torque of:	
2250, 2450, 2650 and 2650N	880 Nm (650 ft-lb)
2850	1000 Nm (740 ft-lb)
Front axle to front axle carrier	300 Nm (220 ft-lb)
Front axle axial play	0 to 0.5 mm (0 to 0.02 in.)
Universal-jointed drive shaft to drive hub	75 Nm (55 ft-lb)

HYDROSTATIC STEERING

Adjustment pressure of double-acting safety valves	21000 kPa (210 bar; 3050 psi)
Steering valve to steering column	50 Nm (35 ft-lb)

BRAKES

Return travel of pressure ring (within 15 seconds)	0.28 to 0.35 mm (0.011 to 0.014 in.)
Test pressure for leakage test of pressure ring	300 kPa (3 bar; 44 psi)
Maximum pressure drop within 10 seconds	10 kPa (0.1 bar; 1.5 psi)
Retraction pin assembly to pressure ring	15 Nm (11 ft-lb)

HYDRAULIC PUMPS

Pump stand-by pressure	19000 kPa (190 bar; 2760 psi)
Minimum delivery at 2000 rpm and 17000 kPa (170 bar; 2450 psi) operating pressure:	
12 cm ³ (0.7 cu.in.) pump	19 liters/min. (5 gpm)
23 cm ³ (1.4 cu.in.) pump	34 liters/min. (9 gpm)
40 cm ³ (2.4 cu.in.) pump	68 liters/min. (18 gpm)
Hydraulic pump to front axle carrier	120 Nm (85 ft-lb)

ROCKSHAFT

Opening pressure of pressure relief valve (with 100 mm; 3.94 in. diameter piston)	21000 to 23000 kPa (210 to 230 bar; 3050 to 3340 psi)
Opening pressure of thermal relief valve (with 92 mm; 3.67 in. diameter piston)	24200 to 31000 kPa (242 to 310 bar; 3500 to 4500 psi)
Rockshaft to transmission case	120 Nm (85 ft-lb)

Adjusting Load Control Arm

Turn in control arm adjusting screw until it contacts arm and then back off	1/3 to 1/2 a turn
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SUMMARY OF MOST IMPORTANT SPECIFICATIONS FOR 2250, 2450, 2650, 2650N and 2850 TRACTORS

Adjusting Valve Clearance

At commencement of lift, turn adjusting screw clockwise 1/4 turn

Control lever play between raising and lowering:

<i>With SG2 cab</i>	12 to 15 mm (0.5 to 0.6 in.)
<i>With MC1 cab</i>	
– Up to Tractor Serial No. 637 600L*	4 to 10 mm (0.16 to 0.4 in.)
– From Tractor Serial No. 637 601L*	12 to 15 mm (0.5 to 0.6 in.)
<i>Without cab*</i>	2 to 4 mm (0.08 to 0.16 in.)
<i>On narrow tread tractors</i>	3 to 6 mm (0.12 to 0.24 in.)

Adjusting Rockshaft Control Lever

With SG2 cab

Front edge of rockshaft control lever in position 7 to 7.5

With MC1 cab (up to Tractor Serial No. 637 600L)

Clearance from front end position to front edge of rockshaft control lever* 10 + 6 mm
(0.4 + 0.24 in.)

With MC1 cab (from Tractor Serial No. 637 601L)

Front edge of control lever in position 7 to 7.5

Without cab

Front edge of rockshaft control lever to front end of quadrant* 12 + 1/-2 mm
(0.47 + 0.04/-0.08 in.)

On narrow tread tractors

Front edge of rockshaft control lever to front edge of quadrant* 15 + 10/-5 mm
(0.6 + 0.4/-0.2 in.)

Adjusting commencement of lift with load control

With SG2 cab

Front edge of control lever in position 2 to 2.5

With MC1 cab (up to Tractor Serial No. 637 600L)

Clearance from rear end position to rear edge of rockshaft control lever* 45 + 6 mm
(1.8 + 0.24 in.)

With MC1 cab (from Tractor Serial No. 637 601L)

Front edge of control lever in position 2 to 2.5

Without cab

Rear edge of control lever to rear end of quadrant* 50 ± 3 mm
(2 ± 0.12 in.)

On narrow tread tractors

Clearance from rear end position to rear edge of rockshaft control lever* 90 + 10/-5 mm
(3.54 + 0.4/-0.2 in.)

* Measured at upper edge of quadrant

FRONT AXLE

Maximum permissible axial play of knuckle and spindle assy. in axle knee	0.76 mm (0.03 in.)
Front axle axial play	0 to 0.4 mm (0 to 0.015 in.)
Bearing pin to front axle carrier	100 Nm (75 ft-lb)
Axle knees to axle center	400 Nm (300 ft-lb)
Steering arm to knuckle and spindle assy.	
– Clamping screw	120 Nm (85 ft-lb)
– Cap screw	230 Nm (170 ft-lb)

FRONT WHEELS

Wheel hub to axle spindle	50 Nm (35 ft-lb)
Steel disk to rim	
– M16x120 attaching screws	250 Nm (180 ft-lb)
– M16x74 attaching screws	280 Nm (210 ft-lb)
Wheel rim to hub	
– <i>Without front wheel drive</i>	150 Nm (110 ft-lb)
– <i>With front wheel drive</i>	300 Nm (220 ft-lb)
Front wheel toe-in	
– <i>Without front wheel drive</i>	3 to 6 mm (1/8 to 1/4 in.)
– <i>With front wheel drive</i>	0 to 3 mm (0 to 1/8 in.)

REAR WHEELS

Flanged Rear Axle

Steel disk to rim	
– M16x120 attaching screws	250 Nm (185 ft-lb)
– M16x74 attaching screws	280 Nm (210 ft-lb)
– 9/16 in. attaching screws	200 Nm (145 ft-lb)
Cast disk to rim	230 Nm (170 ft-lb)
Rear wheels to rear axle	400 Nm (300 ft-lb)

Rack-and-Pinion Axle

Wheel hub to rim	230 Nm (170 ft-lb)
Pinion sleeve halves to wheel hub	215 Nm (160 ft-lb)
Sleeve attaching screws to wheel hub	400 Nm (300 ft-lb)

SG2 CAB

SG2 cab to mounting brackets or final drives	200 Nm (145 ft-lb)
Studs in final drive housings	35 Nm (25 ft-lb)

MC1 CAB

MC1 cab to mountings	245 Nm (180 ft-lb)
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2-POST ROLL-GUARD

Supports to final drives	230 Nm (170 ft-lb)
Supports to crossmember	230 Nm (170 ft-lb)

4-POST ROLL-GUARD

Roll-guard to fender	120 Nm (85 ft-lb)
Fender to final drive	230 Nm (170 ft-lb)

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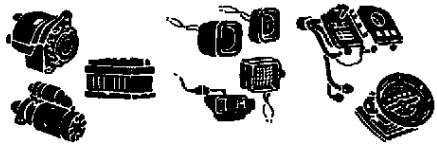

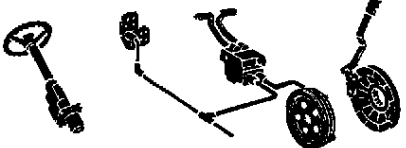



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FX 100006 19

FX100006 19-LB303AE-010490

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.



T 81389

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.

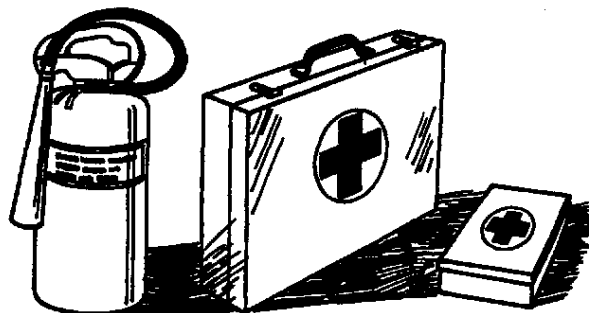
A68; N01,0000 19 S 05NOV82

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.



L 114 052

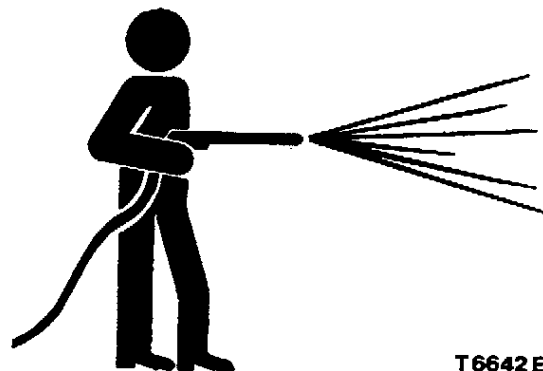
L114052;053;FIR2 19 15MAR89

Safety

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.



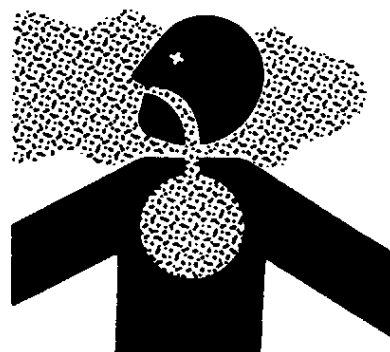
T 6642 E

T6642E;053;CLEAN 19 19JAN88

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.



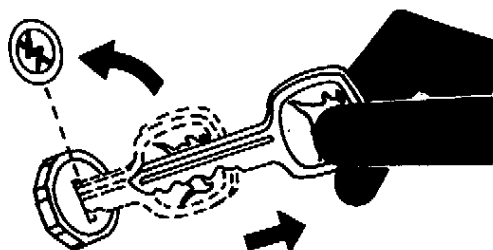
TS 220

TS220;053;AIR 19 05JAN88

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.



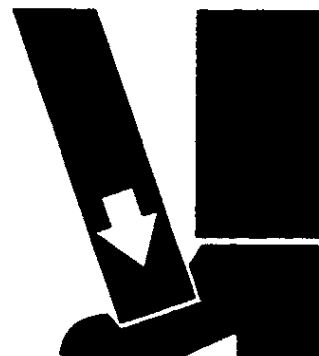
TS 230

TS230;053;PARK 19 05JAN88

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.



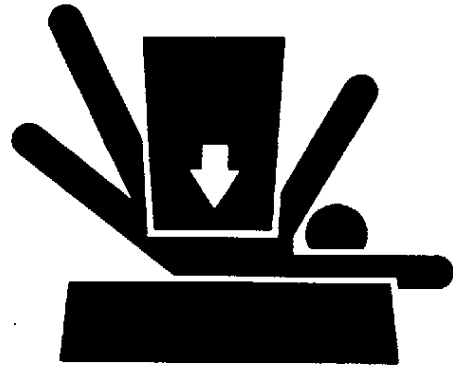
TS 226

TS226;053;LIFT 19 05JAN88

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.

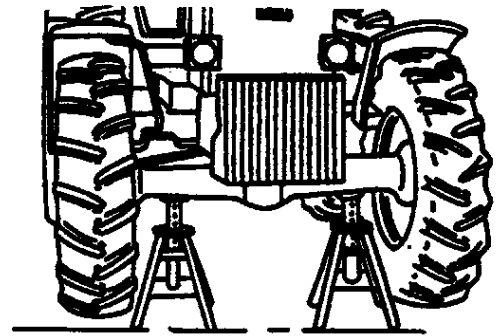


TS 229

TS229:053:LOWER 19 21DEC87

SERVICE FRONT-WHEEL DRIVE TRACTOR SAFELY

When servicing front-wheel drive tractor with the rear wheels supported off the ground and rotating wheels by engine power, always support front wheels in a similar manner. Loss of electrical power or transmission/hydraulic system pressure will engage the front driving wheels, pulling the rear wheels off the support if front wheels are not raised. Under these conditions, front drive wheels can engage even with switch in disengaged position.



L114 050

L114050-ESPDAE-140388

SERVICE HYDROSTATIC CREEPER TRANSMISSION SAFELY

Service work on the hydrostatic creeper transmission may be performed with the engine running only if front and rear wheels are raised and the tractor is safely supported.

Loss of electric power or transmission/hydraulic system pressure will engage hydrostatic creeper transmission, even if the toggle switch is in "OFF" position. Tractor could then start to move if wheels are in contact with the ground.



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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 ground. Start engine only from operator's seat, with the transmission in neutral or "Park".



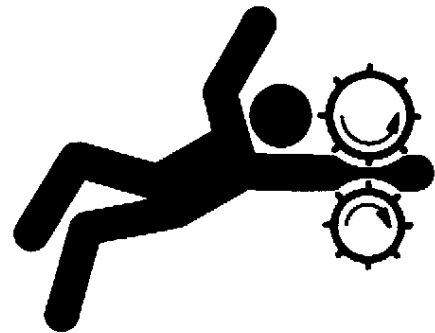
TS177

TS177;053;BYPAS1 19 21MAY85

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.

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.



TS 223

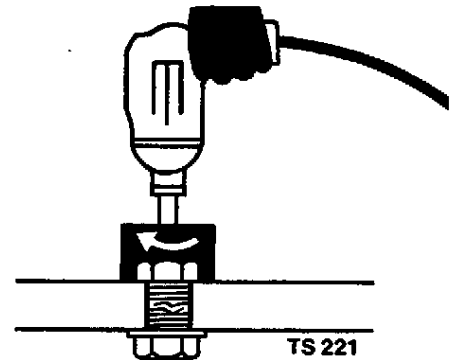
TS223;053;LIGHT 19 23FEB88

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

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.



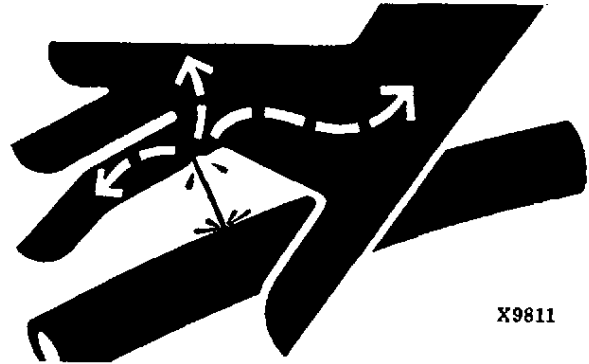
TS 227

TS227;053;FLAME 19 05JAN88

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

REMOVE PAINT BEFORE WELDING OR HEATING

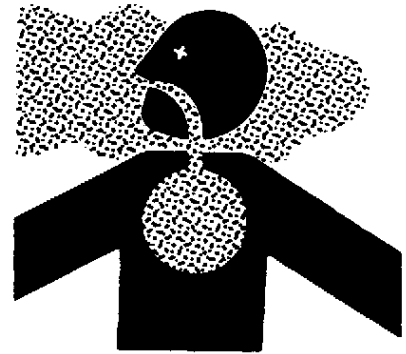
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Do all work outside or in a well ventilated area. Dispose of paint and solvent properly.

Remove paint before welding or heating:

- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.



TS 220

TS220-ESPD AE-040690

AVOID HEATING NEAR PRESSURIZED FLUID LINES

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized lines or other flammable materials.

Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area. Install fire resisting guards to protect hoses or other materials.



TS 953

TS953-ESPD AE-040690

AVOID HARMFUL ASBESTOS DUST

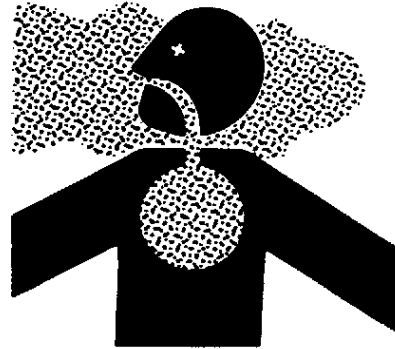
Avoid breathing dust that may be generated when handling components containing asbestos fibers. Inhaled asbestos fibers may cause lung cancer.

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

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:

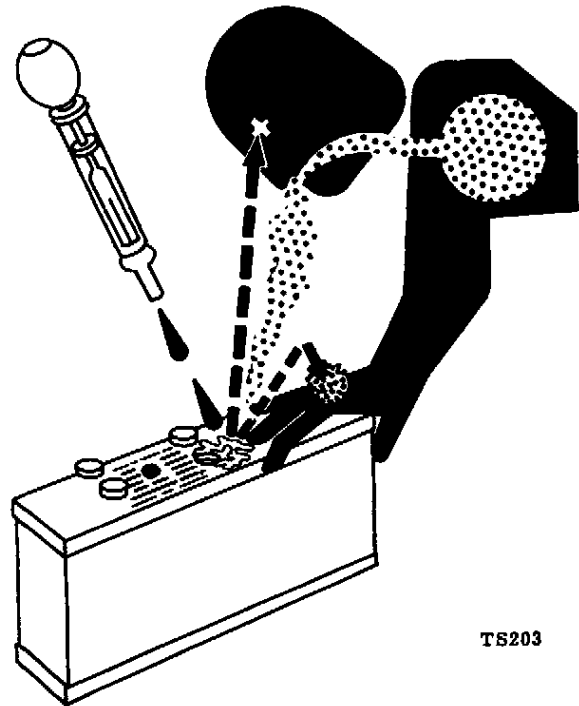
1. Filling the batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

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

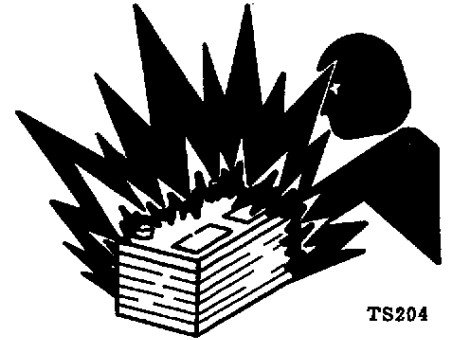
TS203,053;POISON 19 21DEC87

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

SERVICE TIRES SAFELY

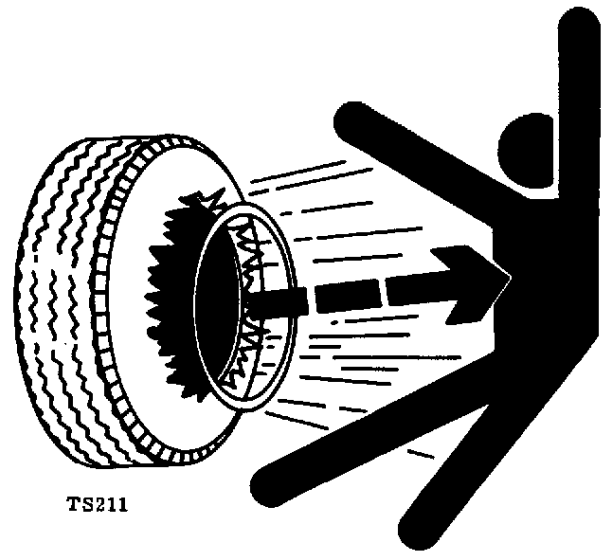
Explosive separation of a tire and rim parts can cause serious injury or death.

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.



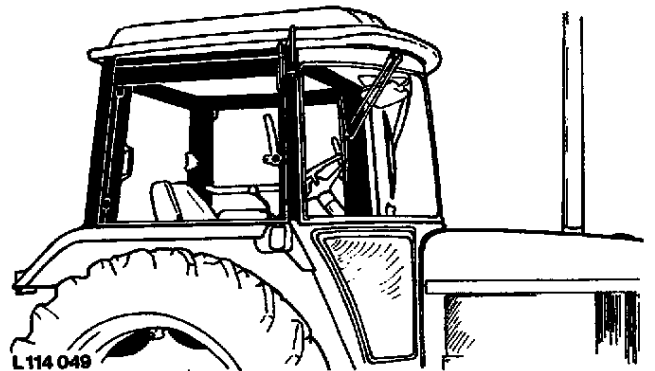
TS211

TS211;053;RIM 19 21DEC87

KEEP CAB/ROPS INSTALLED PROPERLY

Make certain all parts are reinstalled correctly if the cab or roll-over protective structure (ROPS) is loosened or removed for any reason. Tighten mounting bolts to specified torque.

Protection offered by cab or ROPS is impaired if subjected to structural damage, is involved in an overturn incident or is altered in any way by welding, bending, drilling or cutting. A damaged cab or ROPS should be replaced, not reused.



L114 049

L114049;053;ROPS 19 15MAR89