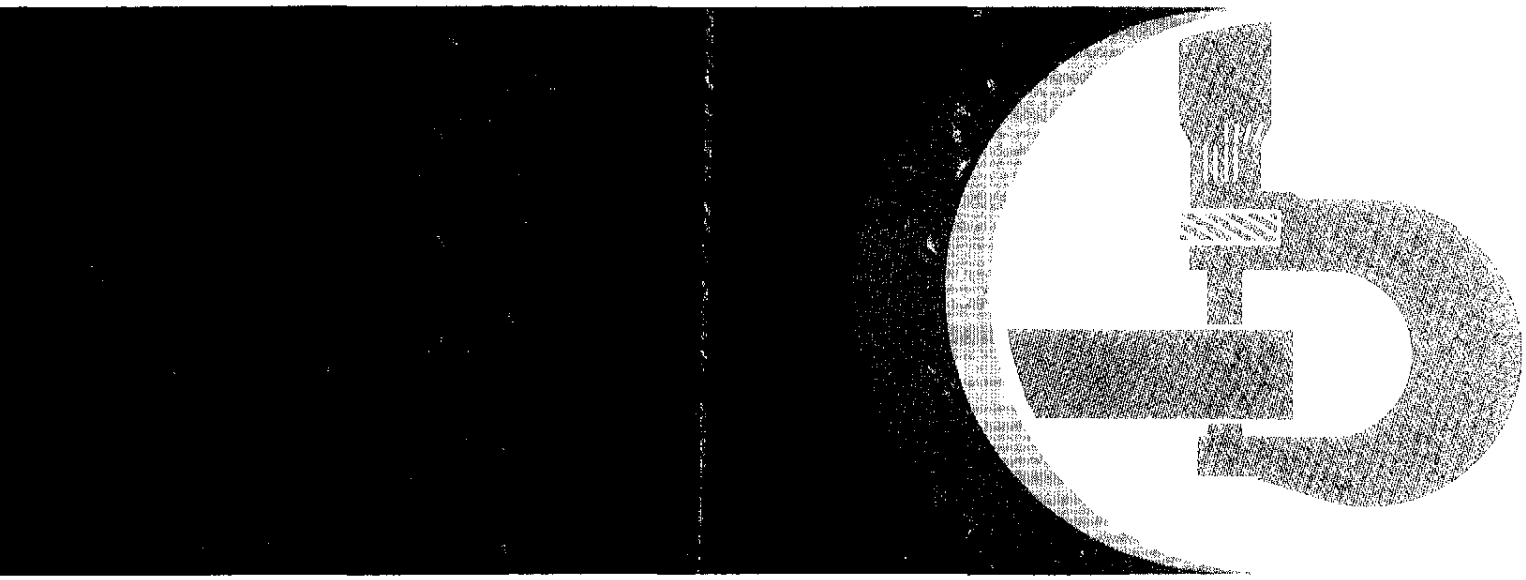
1350, 1550, 1750, 1850, 1850N, 1950, 1950N, 2250, 2450, 2650, 2650N, 2850, 3050, 3350 and 3650 Tractors



John Deere Werke Mannheim
TM4446
Printed in Germany (English)

Contents

1350 TO 3650 TRACTORS TECHNICAL MANUAL TM4446 (AUG-90)

SECTION CONTENTS IN GROUPS – OPERATION AND TESTS

INHALT-LB501AE-010490

SECTION CONTENTS IN GROUPS – OPERATION AND TESTS (CONTD.)

INHALT-LB502AE-010389

FX100002 19

FX100002 19-LB503AE-010389

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.

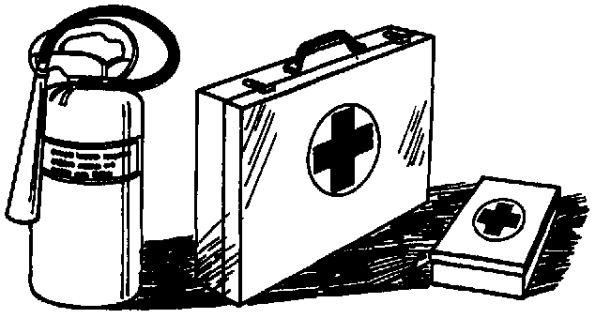
A68; N01;0000 19 S 05NOV82

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.

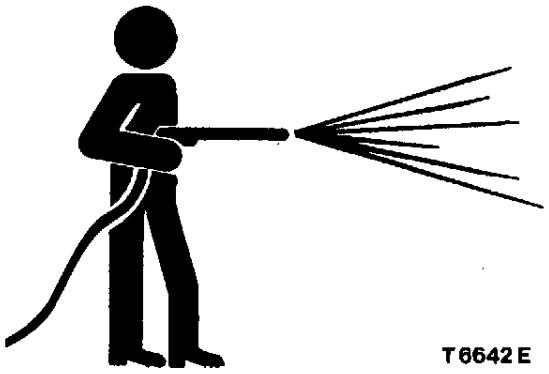


L 114 052

L114052;053;FIR2 19 15MAR89

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.



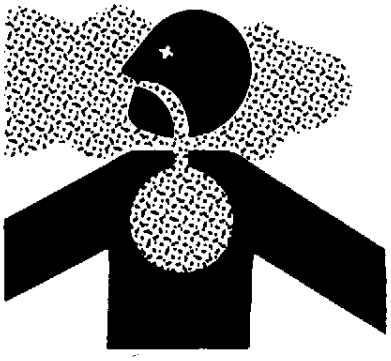
T6642 E

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.

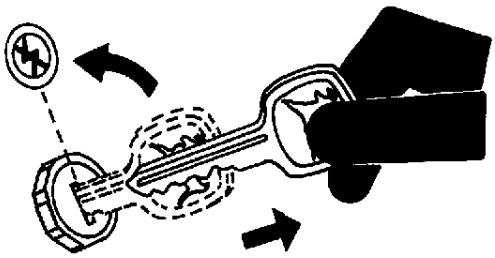


TS 220

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.



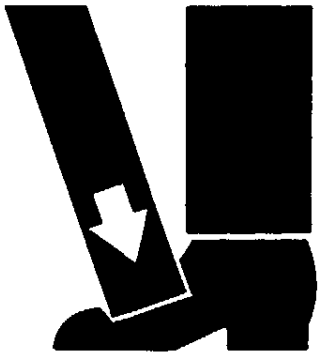
TS 230

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.



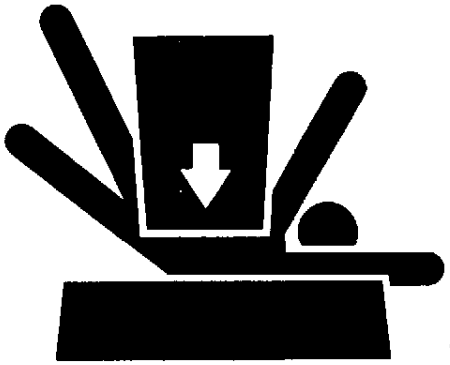
TS 226

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.

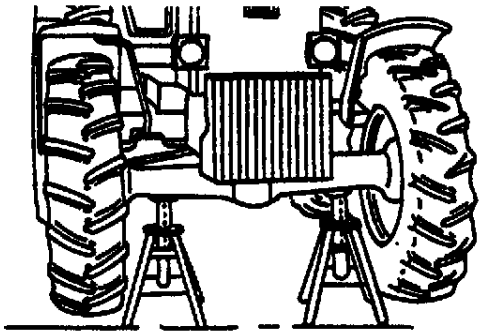


TS229

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.



L114050

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.

FXB 04001 UN

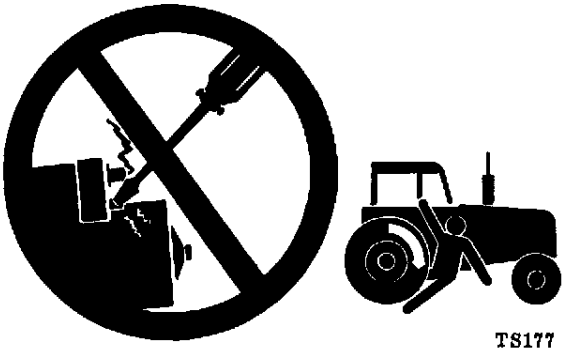
FXB04001UN,HYDRO1G 070290

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".



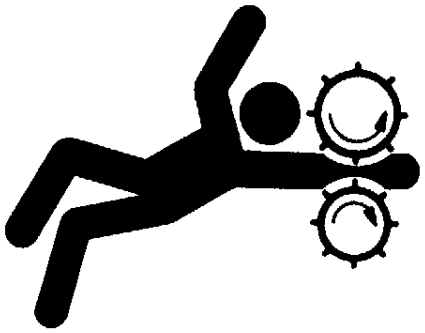
TS177

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.



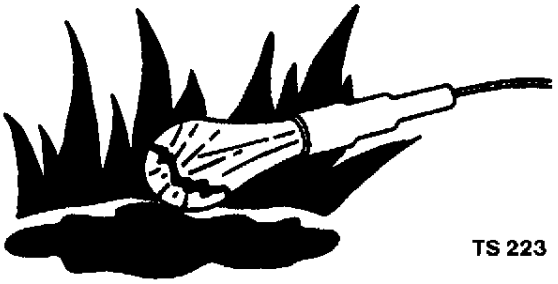
TS228

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 accidently 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

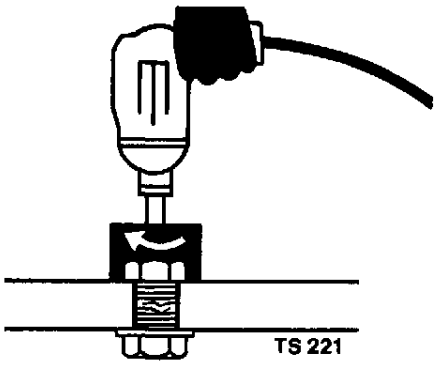
TS223;053;LIGHT 19 23FEB88

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.

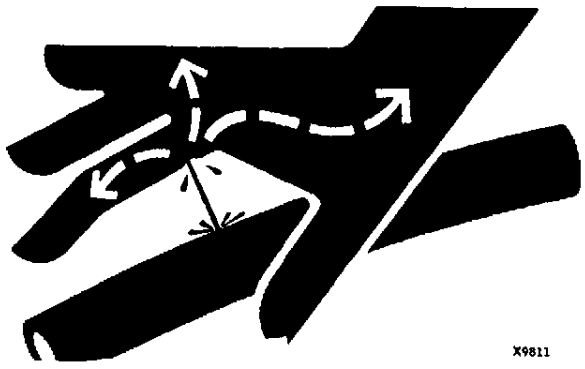
TS 227

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

TS 220

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.

TS220-ESPDAE-040690

AVOID HEATING NEAR PRESSURIZED FLUID LINES

TS 953

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 accidentially cut when heat goes beyond the immediate flame area. Install fire resisting guards to protect hoses or other materials.

TS953-ESPDAE-040690

AVOID HARMFUL ASBESTOS DUST

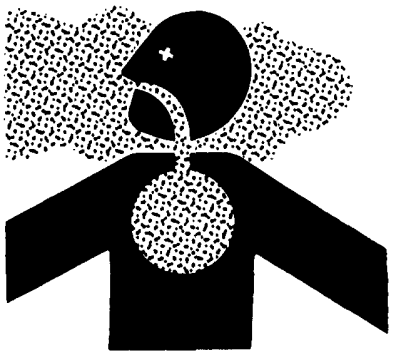
Avoid breathing dust that may be generated when handling components containing asbestos fibers. Inhaled asbestos fibers may cause lung cancer.

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

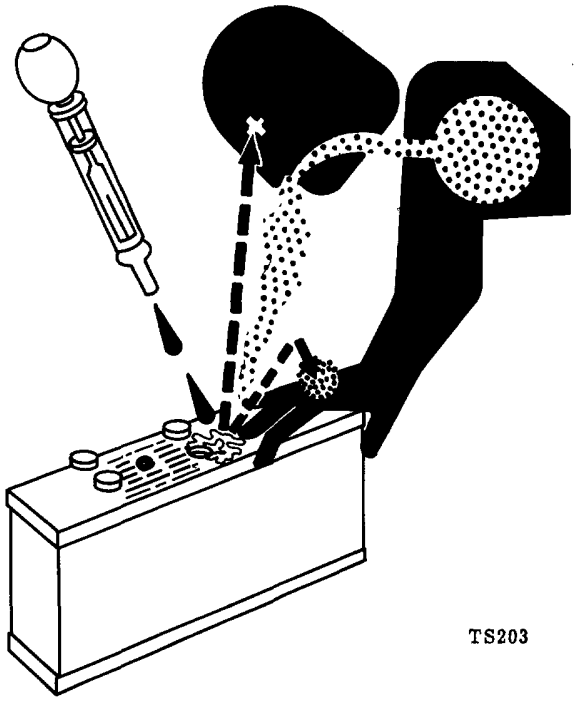
PREVENT ACID BURNS

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;053;SPARKS 19 28JUN88

SERVICE TIRES SAFELY

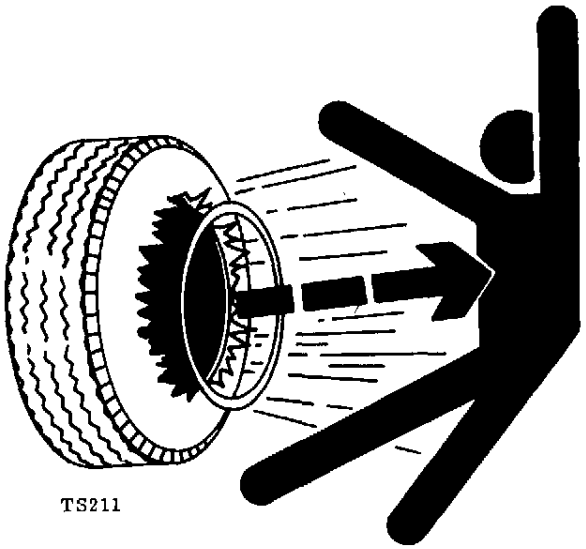
Explosive separation of a tire and rim parts can cause serious injury or death.

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.

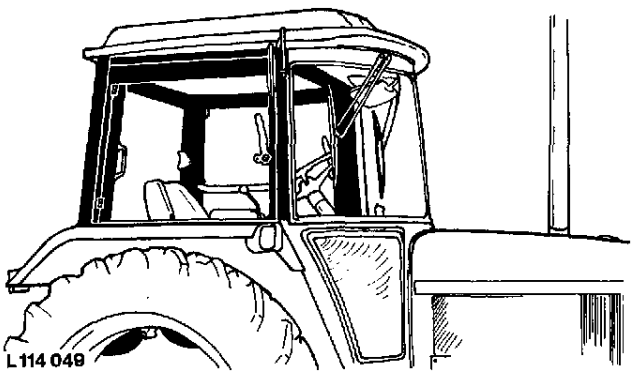


TS211;053;RIM 19 21DEC87

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.

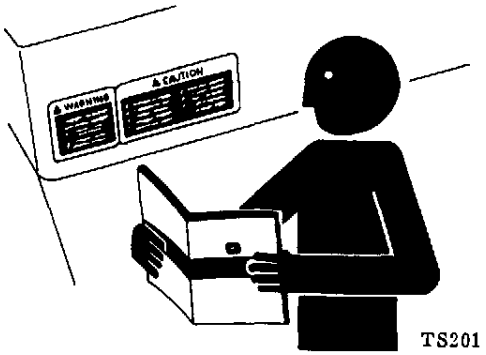
Protection offered by cab or ROPS is impaired if subjected to structural damage, is involved in an overturn incident or is altered in any way by welding, bending, drilling or cutting. A damaged cab or ROPS should be replaced, not reused.



L114049,053 ROPS 19 15MAR89

REPLACE SAFETY SIGNS

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



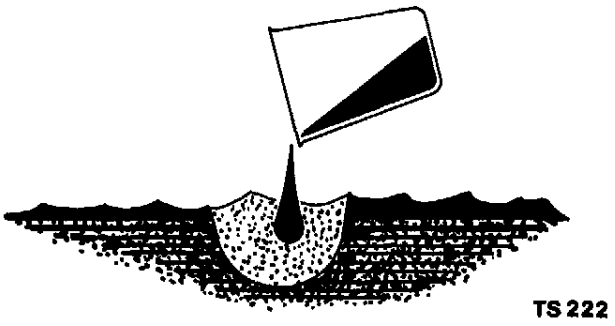
TS201;053;SIGNS1 19 22DEC87

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.



TS222-ESPDAE-140388

Section 220
ENGINE

NOTE: The engines for these tractors are covered by Technical Manual CTM3250 for 3179, 4239 and 6359 engines.

		1350	1550	1750	1850	1850N	1950	1950N	2250	2450	2650	2650N	2850	3050	3350	3650
05 – RADIATOR AND VISCOUS FAN DRIVE																
Specifications	05-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Description of radiator	05-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Function of radiator cap:																
– Tractors with expansion tank	05-2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
– Tractors without expansion tank	05-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Diagnosing malfunctions	05-3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Testing radiator cap (tractors without expansion tank)	05-4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Checking cooling system for leaks	05-5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Function of viscous fan drive	05-6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
10 – TESTS																
Preliminary engine testing	10-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Dynamometer test	10-1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

ENGINE-LB522001AE-010389

SPECIFICATIONS

Tractors Without Expansion Tank

Radiator cap pressure relief valve opens at a pressure of:	
– 3-cylinder tractors	40 to 50 kPa (0.4 to 0.5 bar; 6 to 7 psi)
– 4 and 6-cylinder engines	60 to 70 kPa (0.6 to 0.7 bar; 9 to 10 psi)

Tractors With Expansion Tank

Radiator cap pressure relief valve opens at a pressure of:	
– 1st stage, normal operation	60 kPa (0.6 bar; 9 psi)
– 2nd stage, should a malfunction occur	120 kPa (1.2 bar; 17 psi)

On All Tractors

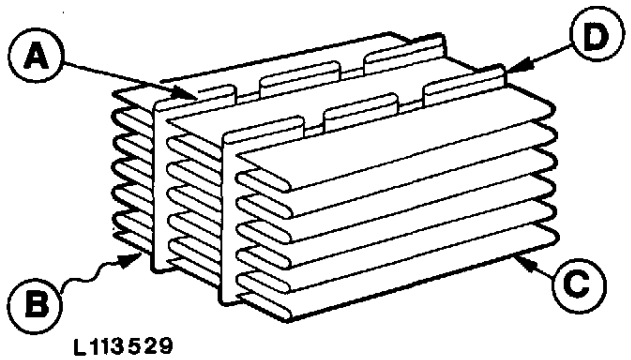
Cooling system test pressure	50 to 70 kPa (0.5 to 0.7 bar; 7 to 10 psi)

KUEHLER-LB522005AE-011087

DESCRIPTION OF RADIATOR

The engine radiator is of the conventional design with cooling tubes through which the coolant passes and soldered exterior fins.

The coolant in the cooling tubes is cooled by air (B) forced through the radiator core by the fan blades. Cooling surface of tubes is greatly increased by means of fins (C).

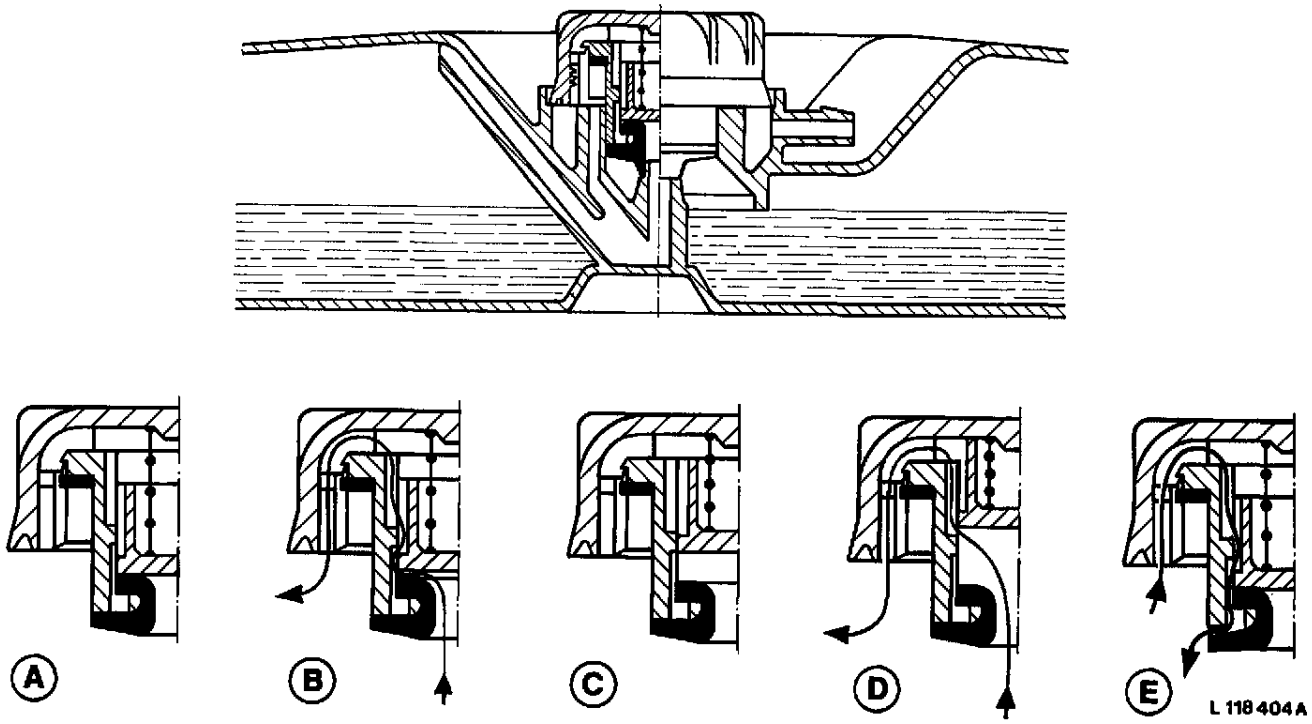


L113529

A–Coolant passage
B–Air
C–Fin
D–Tube

L113529-LA722005AE-020188

FUNCTION OF RADIATOR CAP
(Tractors With Expansion Tank)



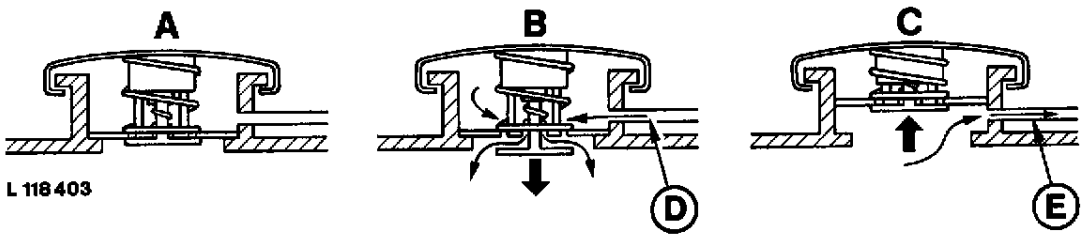
A–Pressure below 60 kPa (0.6 bar; 9 psi); pressure relief valve closed
B–Pressure between 60 kPa (0.6 bar; 9 psi) and 80 kPa (0.8 bar; 12 psi); pressure relief valve open
C–Pressure between 80 kPa (0.8 bar; 12 psi) and 120 kPa (1.2 bar; 17 psi); pressure relief valve closed
D–Pressure above 120 kPa (1.2 bar; 17 psi); pressure relief valve open
E–Pressure below 2 kPa (0.2 bar; 0.3 psi); vacuum valve open

Under normal operating conditions, there should be a build-up of pressure in the cooling system (see "A").
To prevent pressure becoming too high, pressure relief valve opens at a specified pressure (see "B").
This pressurized cooling system permits the engine to be operated at high temperatures without coolant boiling or loss of coolant due to evaporation. Higher operating temperatures are desirable for efficient combustion and for evaporating contaminants from the crankcase.

Should the engine become particularly warm, for example if the engine is shut off after operating under heavy load, the pressure relief valve closes and allows a higher pressure build-up and no loss of coolant (see "C").
Should pressure build-up continue (malfunction in system), pressure relief valve will open at a specified pressure in order to prevent damage due to excess pressure (see "D").
To prevent build-up of a vacuum which could occur in the system when the coolant cools, the vacuum valve opens (see "E").

L118404A-LB522005AE-010389

FUNCTION OF RADIATOR CAP (Tractors Without Expansion Tank)



L 118403

A–Valve closed
B–Vacuum valve open
C–Pressure relief valve open
D–Air
E–Overflow tube

The radiator filler neck has a bayonet-fitting cap which has a pressure relief valve and a vacuum valve.
The pressure relief valve (C) in the cap permits the escape of coolant or steam when the pressure reaches a certain level.
Vacuum valve (B) in the cap opens at a certain underpressure, thus preventing the build-up of a vacuum in the cooling system.

The pressure cooling system permits the engine to be operated at high temperatures without boiling the coolant or losing it by evaporation.
Higher operating temperatures are desirable for efficient combustion and for evaporating contami nants from the crankcase.

L118403-LB522005AE-011087

DIAGNOSING MALFUNCTIONS

ENGINE OVERHEATS

Slack fan belt
Dirty radiator or grille screens
Low coolant level
Low engine oil level
Improper operation
Defective cylinder head gasket
Fuel injection pump incorrectly timed
Defective thermostat(s)
Defective radiator cap
Defective water pump
Corrode coolant passages

LOW COOLANT LEVEL

Improper maintenance
Improper operation
Damaged radiator
Water pump seal leakage
Leakage
Defective radiator cap

KUEHLER-LA722005AE-000186