

# **300D, 310D, and 315D Backhoe Loader Repair**

**REPAIR TECHNICAL MANUAL**  
**300D, 310D, and 315D Backhoe Loader**  
TM1497 13SEP18 (ENGLISH)


**Worldwide Construction  
And Forestry Division**  
PRINTED IN U.S.A.

# Introduction

## Foreword

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

Live with safety: Read the safety messages in the introduction of this manual and 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 potential for personal injury.

Technical manuals are divided in two parts: repair and operation and tests. Repair sections tell how to repair the components. Operation and tests sections help you identify the majority of routine failures quickly.

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.

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

Fundamental service information is available from other sources covering basic theory of operation, fundamentals of troubleshooting, general maintenance, and basic type of failures and their causes.

See DB1990 Service Publications Catalog to order a complete Technical Manual (TM) or a Technical Manual Section (TMS). A complete Repair manual includes the following sections:

- TMS149700 Manual includes:
  - Section 00 General Information
- TMS149701 Manual includes:
  - Section 01 Wheels
  - Section 02 Axles and Suspension Systems
  - Section 03 Transmission
  - Section 04 Engine
  - Section 05 Engine Auxiliary Systems
  - Section 06 Torque Converter
- TMS149709 Manual includes:
  - Section 09 Steering System
  - Section 10 Service Brakes
  - Section 11 Park Brake
- TMS149716 Manual includes:
  - Section 16 Electrical Systems
- TMS149717 Manual includes:
  - Section 17 Frame or Supporting Structure
  - Section 18 Operator's Station
  - Section 19 Sheet Metal and Styling
  - Section 20 Safety and Convenience
- TMS149721 Manual includes:
  - Section 21 Main Hydraulic System
  - Section 31 Loader
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*Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.*

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A John Deere ILLUSTRATION™ Manual  
Previous Editions  
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Group 3199—Dealer Fabricated Tools

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**Thanks very much for your reading,  
Want to get more information,  
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manual**

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click on it.**

**Have any questions please write to me:  
[admin@servicemanualperfect.com](mailto:admin@servicemanualperfect.com)**

*Contents*

### 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.



DX,FLAME -19-29SEP98-1/1

TS227 —UN—15APR13

### 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).



DX,SPARKS -19-03MAR93-1/1

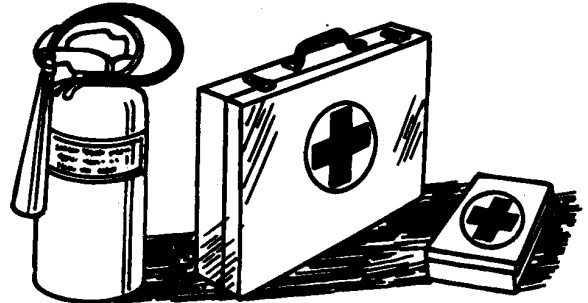
TS204 —UN—15APR13

### 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.



DX,FIRE2 -19-03MAR93-1/1

TS291 —UN—15APR13



## 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:

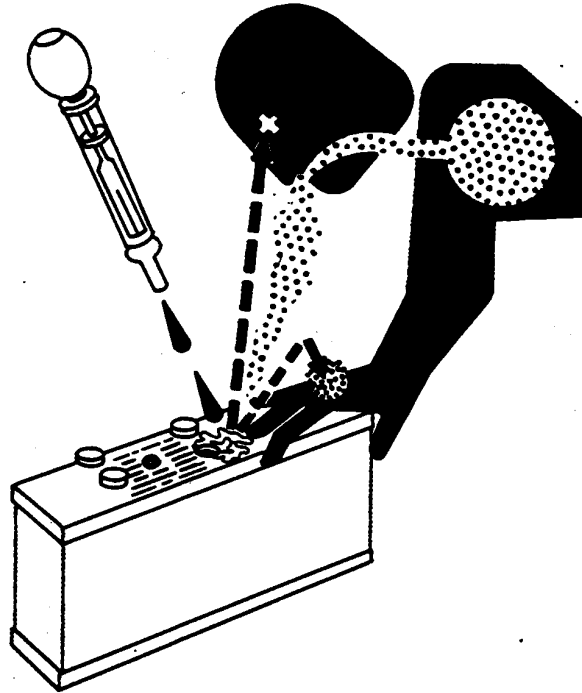
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

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 15—30 minutes. Get medical attention immediately.

If acid is swallowed:

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 quarts).
3. Get medical attention immediately.



TS203—UN—23AUG88

DX,POISON -19-21APR93-1/1

## Handle Chemical Products Safely

Direct exposure to hazardous chemicals can cause serious injury. Potentially hazardous chemicals used with John Deere equipment include such items as lubricants, coolants, paints, and adhesives.

A Material Safety Data Sheet (MSDS) provides specific details on chemical products: physical and health hazards, safety procedures, and emergency response techniques.

Check the MSDS before you start any job using a hazardous chemical. That way you will know exactly what the risks are and how to do the job safely. Then follow procedures and recommended equipment.

(See your John Deere dealer for MSDS's on chemical products used with John Deere equipment.)



TS1132—UN—15APR13

DX,MSDS,NA -19-03MAR93-1/1

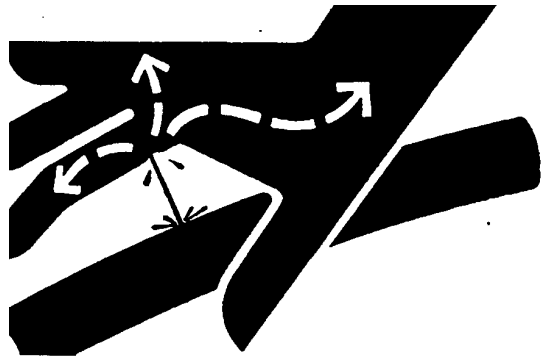
### Avoid High-Pressure Fluids

Escaping fluid under pressure can penetrate the skin causing serious injury.

Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.

Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A.



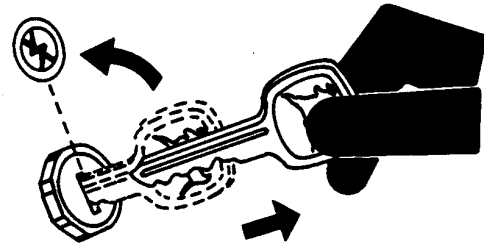
DX,FLUID -19-03MAR93-1/1

X9811 —UN—23AUG88

### 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.



DX,PARK -19-04JUN90-1/1

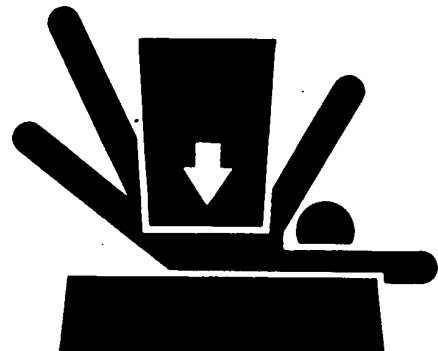
TS230 —UN—24MAY89

### 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. If left in a raised position, hydraulically supported devices can settle or leak down.

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.

When implements or attachments are used with a tractor, always follow safety precautions listed in the implement operator's manual.



DX,LOWER -19-17FEB99-1/1

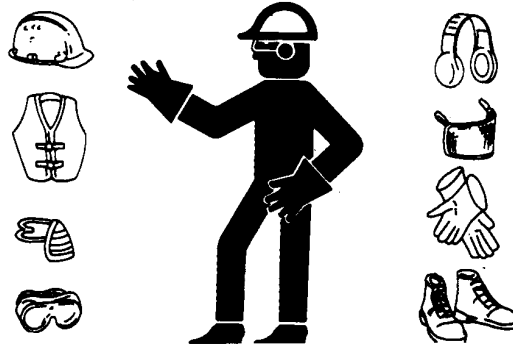
TS229 —UN—23AUG88

## Safety Information

### Wear Protective Clothing

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

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



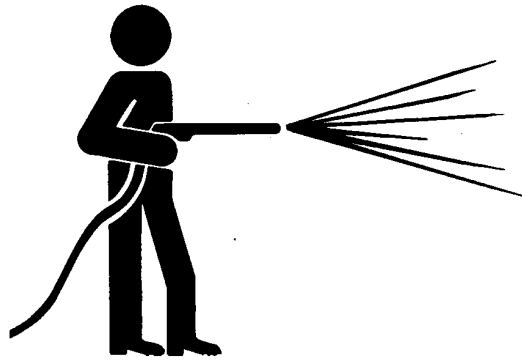
TS206 —UN—15APR13

DX,WEAR2 -19-03MAR93-1/1

### 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.



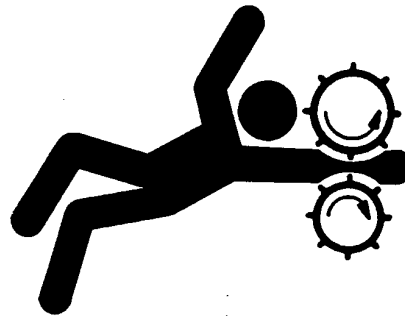
T6642EJ —UN—18OCT88

DX,CLEAN -19-04JUN90-1/1

### Service Machines 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 —UN—23AUG88

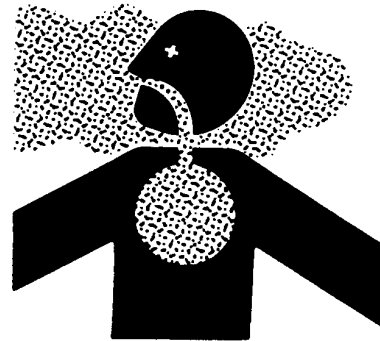
DX,LOOSE -19-04JUN90-1/1

## Safety Information

### 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

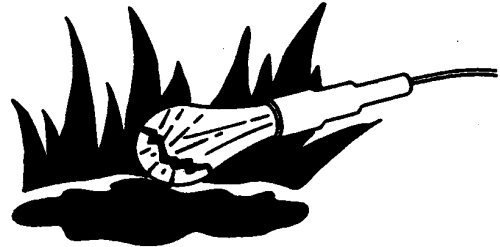


TS220 —UN—15APR13

DX,AIR -19-17FEB99-1/1

### Illuminate Work Area Safely

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.



TS223 —UN—23AUG88

DX,LIGHT -19-04JUN90-1/1

### Replace Safety Signs

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



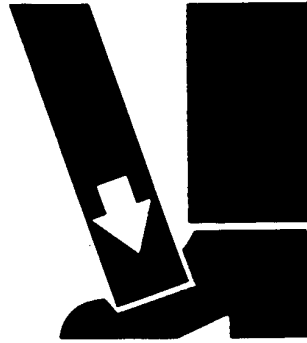
TS201 —UN—15APR13

DX,SIGNS1 -19-04JUN90-1/1

### 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.



TS226 —UN—23AUG88

DX,LIFT -19-04JUN90-1/1

### Remove Paint Before Welding or Heating

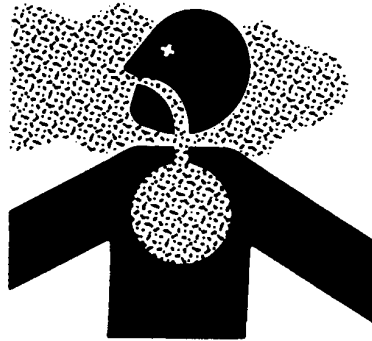
Avoid potentially toxic fumes and dust.

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.



TS220 —UN—15APR13

DX,PAINT -19-03MAR93-1/1

### 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 fluid lines or other flammable materials. Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area.



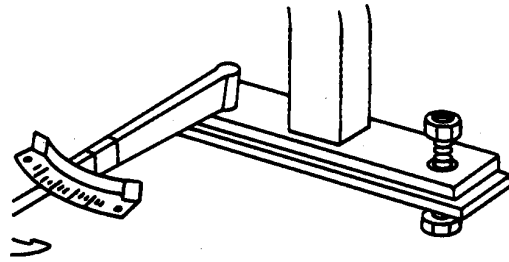
TS963 —UN—15MAY90

DX,TORCH -19-03MAR93-1/1

### Keep ROPS Installed Properly

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

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



TS212—UN—23AUG88

DX,ROPS3 -19-03MAR93-1/1

### Service Tires Safely

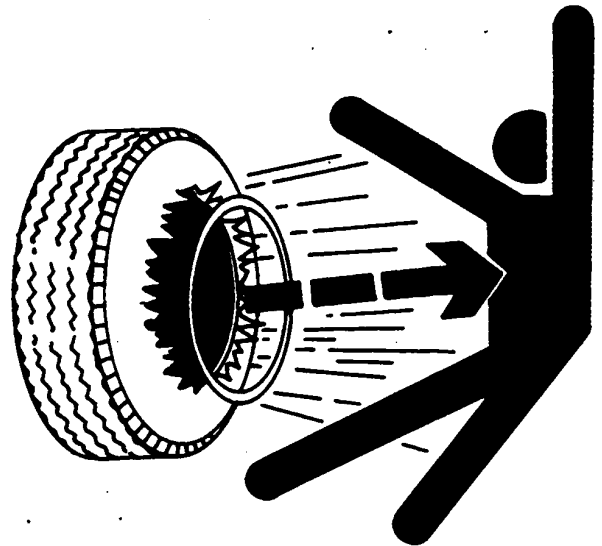
Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job.

Always maintain the correct tire pressure. Do not inflate the tires above the recommended pressure. Never weld or heat a wheel and tire assembly. The heat can cause an increase in air pressure resulting in a tire explosion. Welding can structurally weaken or deform the wheel.

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—UN—15APR13

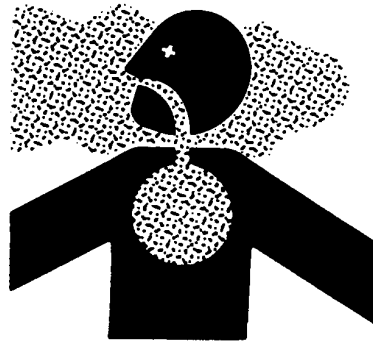
DX,RIM -19-24AUG90-1/1

### 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 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 material containing asbestos. When servicing, wear an approved respirator. A special vacuum cleaner is recommended to clean asbestos. If not available, apply a mist of oil or water on the material containing asbestos.



Keep bystanders away from the area.

DX,DUST -19-15MAR91-1/1

TS220 —UN—15APR13

### Practice Safe Maintenance

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

Never lubricate, service, or adjust 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.

On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.



DX,SERV -19-17FEB99-1/1

TS218 —UN—23AUG88

### Use Proper Tools

Use tools appropriate to the work. Makeshift tools and procedures can create safety hazards.

Use power tools only to loosen threaded parts and fasteners.

For loosening and tightening hardware, use the correct size tools. DO NOT use U.S. measurement tools on metric fasteners. Avoid bodily injury caused by slipping wrenches.

Use only service parts meeting John Deere specifications.



TS779 —UN—08NOV89

DX,REPAIR -19-17FEB99-1/1

### Dispose of Waste Properly

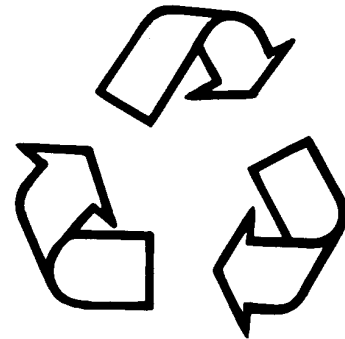
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

Use leakproof containers when draining fluids. Do not use food or beverage containers that may mislead someone into drinking from them.

Do not pour waste onto the ground, down a drain, or into any water source.

Air conditioning refrigerants escaping into the air can damage the Earth's atmosphere. Government regulations may require a certified air conditioning service center to recover and recycle used air conditioning refrigerants.

Inquire on the proper way to recycle or dispose of waste from your local environmental or recycling center, or from your John Deere dealer.



TS1133 —UN—15APR13

DX,DRAIN -19-03MAR93-1/1

### Live With Safety

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



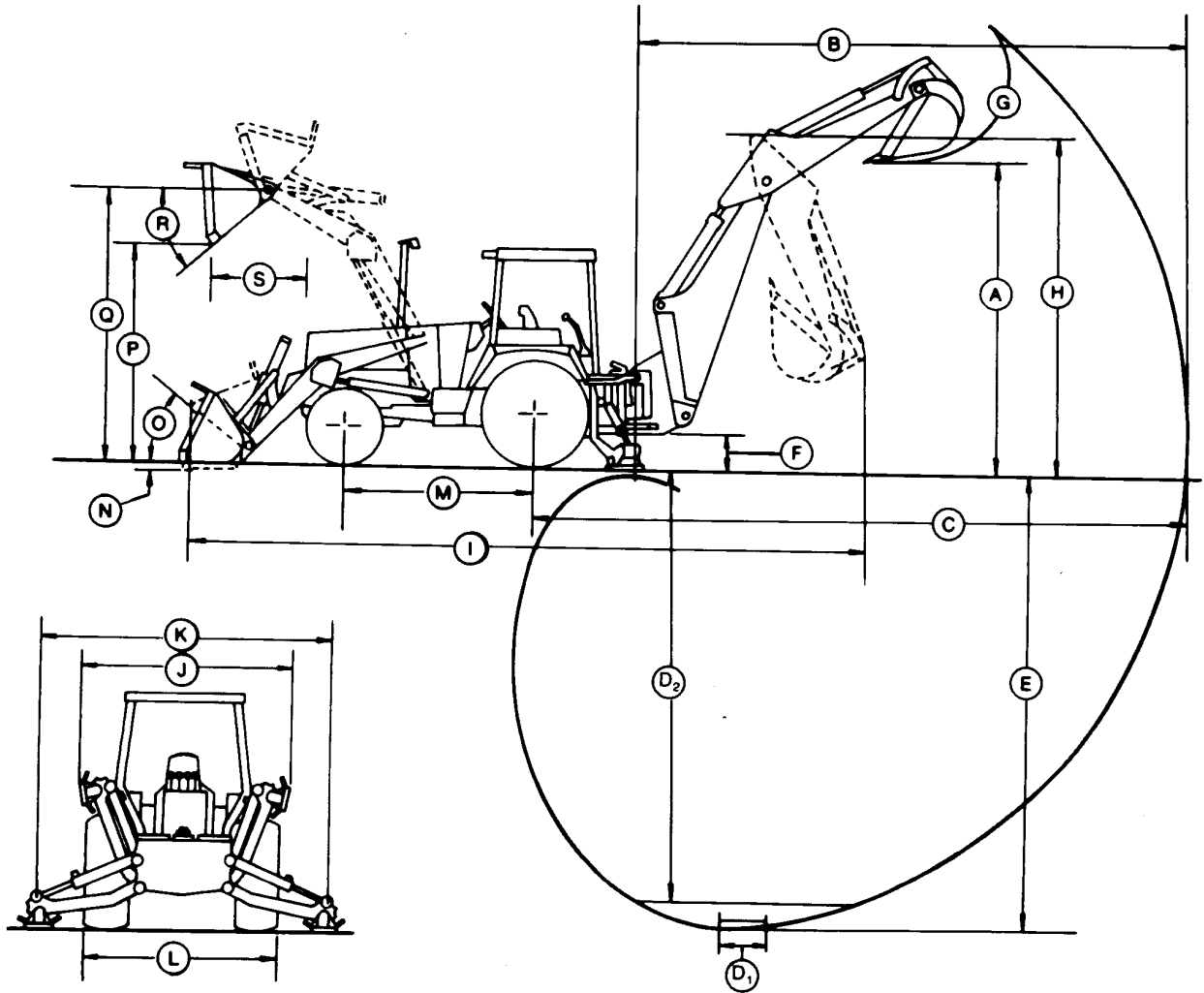
TS231 —19—07OCT88

DX,LIVE -19-25SEP92-1/1



*Safety Information*

300D Specifications



NOTE: Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with SAE Standards. Except where otherwise noted, these specifications are based on a standard machine with 16.9-24, 8PR, R4

rear tires; 11L-15, 8PR, F3 front tires with 75 percent  $\text{CaCl}_2$  fill;  $0.67 \text{ m}^3$  (.88 cu. yd.) loader bucket; 610 mm (24 in.) backhoe bucket; ROPS/FOPS; full fuel tank and 79 kg (175 lb) operator.

TX115DH1384 -19-26SEP91-1/1

T7412AL -UN-15NOV90

General Specifications

**300D Backhoe Loader**

Key:	Backhoe	Extendible Dipperstick	
		Retracted	Extended
A—Loading height, truck loading position	10 ft 9 in. (3.29 m)	11 ft 1 in. (3.37 m)	12 ft 9 in. (3.88 m)
B—Reach from center of swing mast	17 ft 3 in. (5.25 m)	17 ft 3 in. (5.25 m)	20 ft 10 in. (6.36 m)
C—Reach from center of rear axle	20 ft 7 in. (6.28 m)	20 ft 7 in. (6.28 m)	24 ft 3 in. (7.39 m)
D—Digging depth (SAE):			
(1) 2 ft (610 mm) flat bottom	13 ft 10 in. (4.21 m)	13 ft 10 in. (4.21 m)	17 ft 8 in. (5.38 m)
(2) 8 ft (2440 mm) flat bottom	12 ft 8 in. (3.87 m)	12 ft 8 in. (3.87 m)	16 ft 10 in. (5.13 m)
E—Maximum digging depth	14 ft (4.27 m)	14 ft (4.27 m)	17 ft 9 in. (5.41 m)
F—Ground clearance, minimum	13 in. (330 mm)	13 in. (330 mm)	13 in. (330 mm)
G—Bucket rotation	160° or 180°	160° or 180°	160° or 180°
H—Transport height	12 ft 0 in. (3.67 m)	12 ft 0 in. (3.67 m)	12 ft 0 in. (3.67 m)
I—Overall length, transport	22 ft 6 in. (6.85 m)	22 ft 6 in. (6.85 m)	22 ft 6 in. (6.85 m)
J—Stabilizer width, transport	7 ft 4 in. (2.23 m)	7 ft 4 in. (2.23 m)	7 ft 4 in. (2.23 m)
K—Stabilizer spread, operating	8 ft 11 in. (2.71 m)	8 ft 11 in. (2.71 m)	8 ft 11 in. (2.71 m)
L—Overall width (less loader bucket)	6 ft 11 in. (2.11 m)	6 ft 11 in. (2.11 m)	6 ft 11 in. (2.11 m)
Digging force, bucket cylinder (power dig position)	10225 lb (45.5 kN)	10250 lb (45.6 kN)	10225 lb (45.5 kN)
Digging force, crowd cylinder	5530 lb (24.6 kN)	5530 lb (24.6 kN)	3365 lb (15.0 kN)
Swing arc	180 degrees	180 degrees	180 degrees
Operator control	Two levers	Right foot treadle	Right foot treadle
Bucket positions	21° or 30° rollback	19° or 28° rollback	22° or 32° rollback
Stabilizer angle rearward	12°	12°	12°
Lifting capacity, maximum boom @ 65°	2700 lb (1225 kg)	2600 lb (1180 kg)	1550 lb (700 kg)

NOTE: Backhoe specifications are with 24-in. (610 mm) standard bucket.

Key:	Loader With 1.5 yd <sup>3</sup> (1.15 m <sup>3</sup> ) Bucket
M—Wheelbase	83 in. (2100 mm)
N—Dig below ground—bucket level	4 in. (100 mm)
O—Rollback at ground level	40°
P—Dump clearance, bucket at 40°	8 ft. 10 in. (2.69 m)
Q—Maximum height to bucket hinge pin	10 ft. 11 in. (3.33 m)
R—Maximum bucket dump angle	45°
S—Reach at full height, bucket at 40°	28 in. (711 mm)

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## General Specifications

### 300D Backhoe Loader (Continued)

*NOTE: (Specifications and design subject to change without notice. Wherever applicable, specifications are in accordance with ICED and SAE Standards.)*

Power	SAE
Net	60 hp (45 kW)

Engine:	
John Deere 4039D	
Rated power @ 2200rpm	60 SAE net hp (45 kW) 63 SAE gross hp (47 kW)
Cylinders	4
Displacement	239 cu. in. (3.91 L)
Maximum torque @ 1200 rpm	172 lb-ft (233 N-m)
Lubrication	Pressure system w/full-flow filter
Cooling	Pressurized w/thermostat and fixed bypass
Air cleaner	Dry
Electrical system	12-volt
Alternator	65 amps

Transmission:	
John Deere 4-speed helical gear, synchronized collar shift transmission with hydraulic reverser. Torque converter 11 in (280 mm) with 2.78:1 stall ratio.	

Travel Speeds:	Gear	Forward		Reverse	
		mph	km/h	mph	km/h
With Standard 16.9-24 rear and 11L-15 front tires	1	3.4	5.4	3.3	5.2
	2	5.7	9.2	5.6	9.0
	3	12.3	19.8	12.2	19.6
	4	22.4	36.1	22.3	35.9

Final Drives:	
Heavy-duty inboard mounted planetary. Evenly distributes axle shock loads over three oil cooled gears.	

Service Brakes:	
Manual hydraulic, applied with separate pedals; hydraulically equalized when both pedals are depressed. Wet disks and facings are fully enclosed and self-adjusting.	

Park Brake:	
Independent system, spring applied, hydraulically released, and controlled by an electric switch on the side console.	

Steering: Hydrostatic Power	
Non-powered axle curb turning radius	
(brakes applied)	12 ft 0 in. (3.67 m)
(without brakes)	13 ft 2 in. (4.00 m)
Bucket clearance circle	
(brakes applied)	32 ft 5 in. (9.89 m)
(without brakes)	34 ft 7 in. (10.55 m)
Steering wheel turns	
Stop to stop	2.2 to 2.9
Powered axle (MFWD) curb turning radius	
(brakes applied)	11 ft 9 in. (3.57 m)
(without brakes)	13 ft 5 in. (4.10 m)
Bucket clearance circle	
(brakes applied)	30 ft 9 in. (9.38 m)
(without brakes)	34 ft 3 in. (10.44 m)
Steering wheel turns	
Stop to stop	2.5

Hydraulic System: Open center	
Pressure setting	2700 psi (18 620 kPa)
Pump	Gear type
Flow @ 2200 rpm	24 gpm (91 L/min)
Filter, return oil	10 micron replaceable element

Tires:	
Front	11L-15, 8PR, F3
With MFWD	12-16.5, 8 PR
Rear	16.9—24 8PR, R4 17.5L—24 8PR, R4
With MFWD	16.9—24 8PR R4A

Transporting:	
SAE operating weight with ROPS	12,200 lb (5533 kg)
Cab adds	500 lb (227 kg)
MFWD w/tires adds	220 lb (100 kg)
Extendible dipperstick adds	360 lb (163 kg)
Optional front counterweight	370 lb (169 kg)
Optional front counterweight	770 lb (349 kg)

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General Specifications

**300D Backhoe Loader Buckets**

Loader:	Width mm (in.)	Heaped Capacity m <sup>3</sup> (Cu Yd)	Weight kg (lb)
General purpose	2057 (81)	0.67 (0.88)	249 (550)
	2340 (92)	0.76 (1.00)	367 (810)
Multi-purpose	2134 (84)	0.86 (1.12)	345 (760)

Backhoe:	Width mm (in.)	Heaped Capacity m <sup>3</sup> (Cu Yd)	Weight kg (lb)
Standard	305 (12)	0.07 (2.5)	111 (244)
	406 (16)	0.10 (3.6)	122 (268)
	457 (18)	0.12 (4.1)	126 (278)
	610 (24)	0.17 (6.0)	149 (328)
	762 (30)	0.22 (7.9)	165 (364)
	914 (36)	0.28 (10.0)	195 (439)
Heavy	305 (12)	0.07 (2.5)	117 (258)
Duty	457 (18)	0.14 (5.1)	137 (302)
	610 (24)	0.17 (6.0)	151 (334)
	610 (24)	0.21 (7.5)	158 (348)
Extra	457 (18)	0.14 (5.1)	164 (362)
Heavy	610 (24)	0.21 (7.5)	192 (424)
Duty	762 (30)	0.28 (10.0)	215 (474)

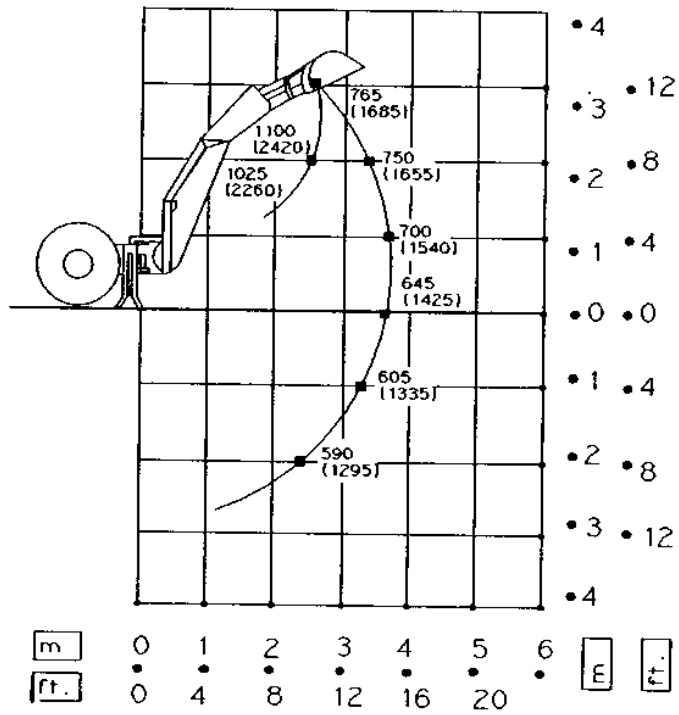
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**300D Backhoe Loader Drain And Refill Capacities**

	Metric	U.S.
Engine coolant	16 L	17 qt
Engine oil (including filter)	8.5 L	9 qt
Torque converter and reverser	7.5 L	8 qt
Transaxle		
(without MFWD)	21 L	22 qt
(with MFWD)	22 L	23 qt
Fuel tank		
Serial No. —802199	106 L	28 gal
Serial No. 802200—	129 L	34 gal
Hydraulic system reservoir	41.5 L	44 qt

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### 300D Backhoe Loader Lifting Capacities—KG (LB)



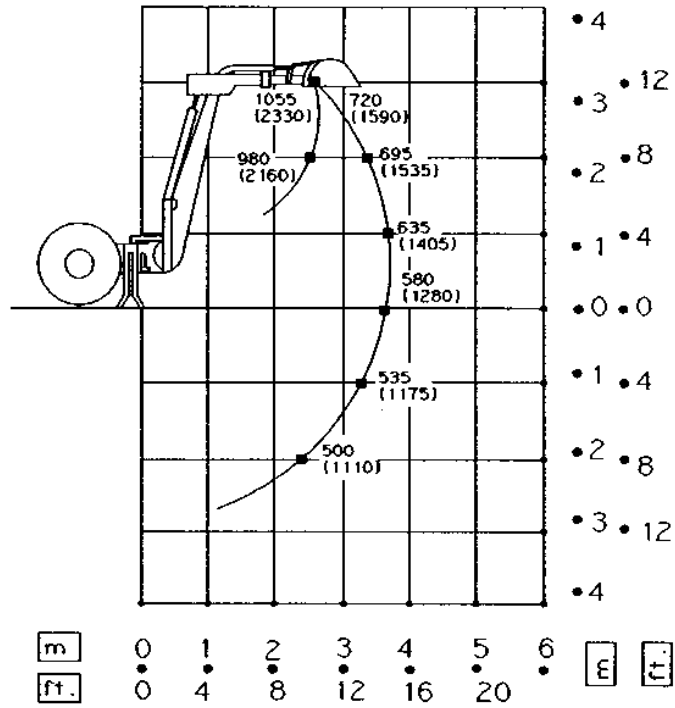
Lift Capacity, Backhoe With Standard Dipperstick Based On SAE J31 (Except With Loader Bucket On Ground)

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General Specifications



Lift Capacity, Backhoe With Extendible Dipperstick, Retracted Based On SAE J31 (Except With Loader Bucket On Ground)

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T7634AB—UN—18OCT91