300D, 310D, 315D Backhoe Loader Operation and Test

TECHNICAL MANUAL

TM1496 06OCT11 (ENGLISH)

For complete service information also see:

300D, 310D, 315D Backhoe Loaders Repair (Complete)	TM1497
300D, 310D, 315D Backhoe Loaders Operation and Test (Complete)	TM1496
Series 300 3179, 4239, 6359, 4276, and 6414 Diesel Engine	CTM4
6059 Engine	CTM8
Alternators and Starting Motors	CTM77
6068 Engine	CTM104
120 Series Hydraulic Cylinders	CTM114319
Specifications Manual	SP458

Worldwide Construction And Forestry Division
LITHO IN U.S.A.

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 Operation and Test manual includes the following sections:

- TMS14969000
  Section 9000 General Information
- TMS14969005
  Section 9005 Operational Checkout Procedure
  Section 9010 Engine
- TMS14969015
  Section 9015 Electrical System
- TMS14969020
  Section 9020 Power Train
- TMS14969025
  Section 9025 Hydraulics
- TMS14969031
  Section 9031 Heating and Air Conditioning

TX,1496,RR4512 -19-20JUN94-1/1

Contents

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.

Section 9000
General Information

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.

TS227 —UN—23AUG88

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

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 —UN—23AUG88

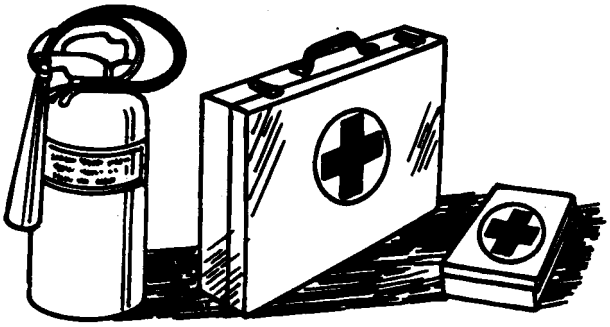
DX,SPARKS -19-03MAR93-1/1

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.



TS291 —UN—23AUG88

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

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:

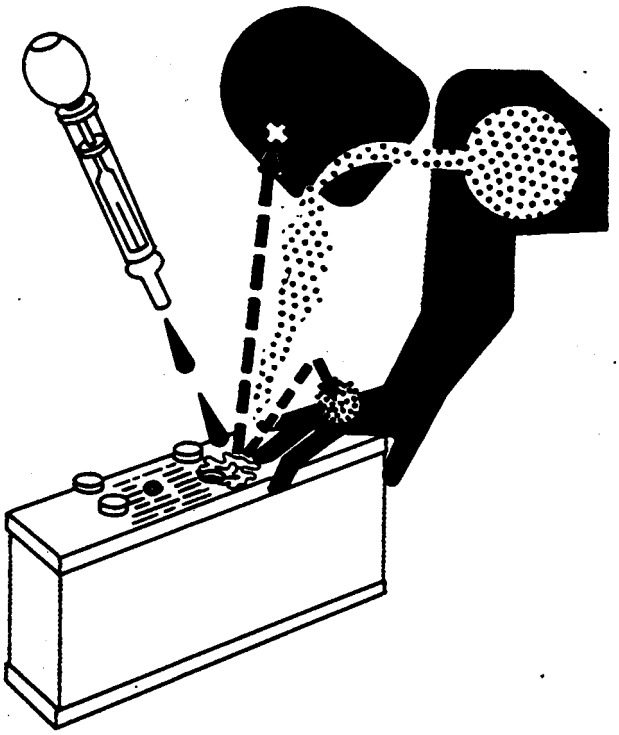
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

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—26NOV90

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

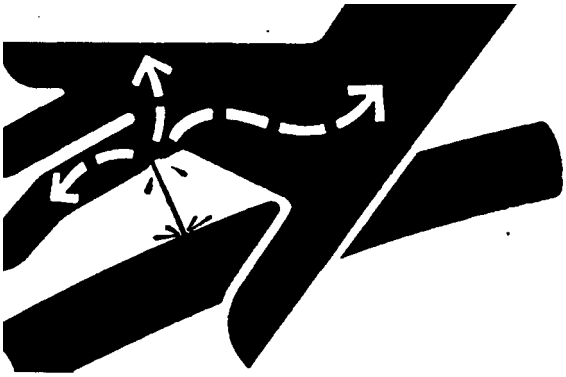
Avoid High-Pressure Fluids

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 in English from Deere & Company Medical Department in Moline, Illinois, U.S.A., by calling 1-800-822-8262 or +1 309-748-5636.



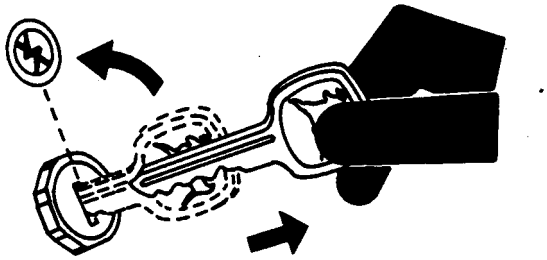
X9811 —UN—23AUG88

DX,FLUID -19-20AUG09-1/1

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.



TS230 —UN—24MAY89

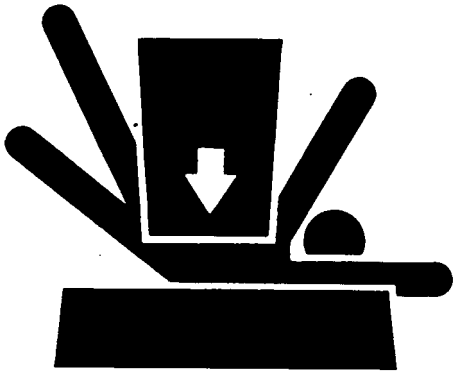
DX,PARK -19-04JUN90-1/1

Support Machine Properly

Always lower the attachment or implement to the ground before you work on the machine. If the work requires that the machine or attachment be lifted, provide secure support for them. 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 machine, always follow safety precautions listed in the implement or attachment operator's manual.



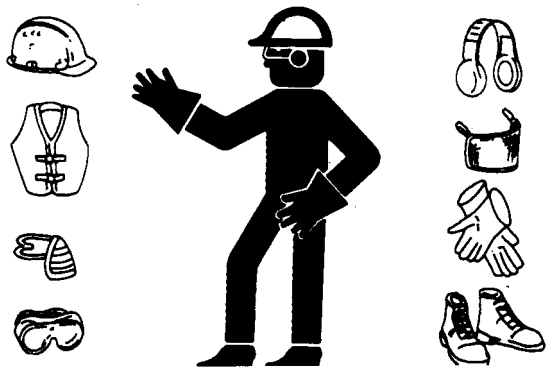
TS229 —UN—23AUG88

DX,LOWER -19-24FEB00-1/1

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.



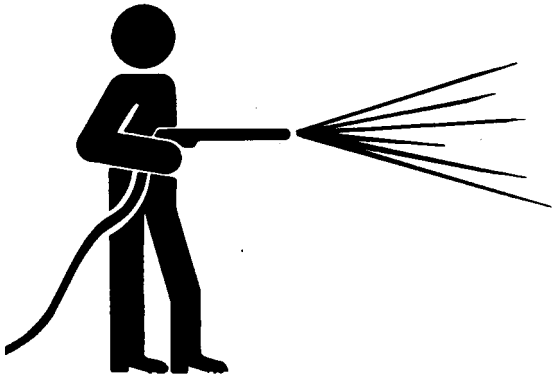
TS206 —UN—23AUG88

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.



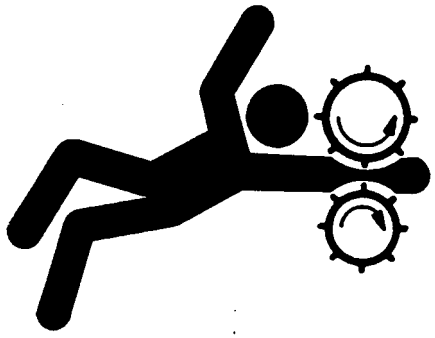
T6642EJ —UN—18OCT88

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

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.

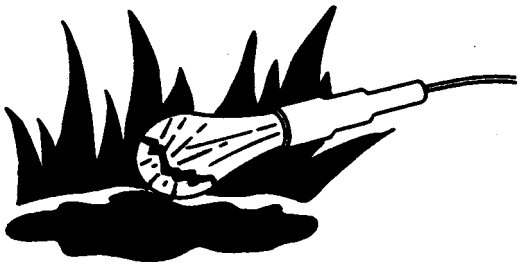
If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

TS220 —UN—23AUG88

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.

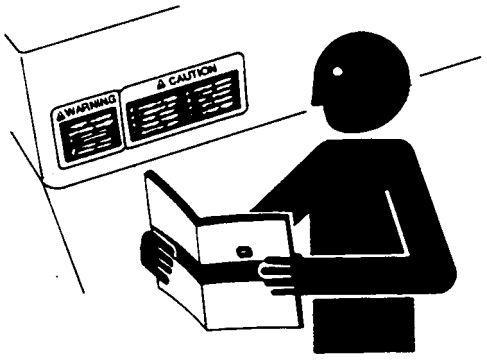


TS223 —UN—23AUG88

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.



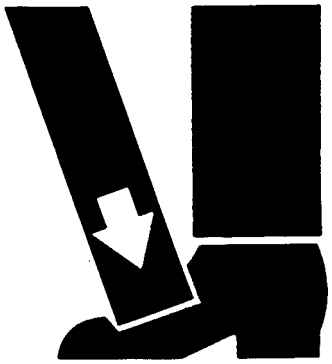
TS201 —UN—23AUG88

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

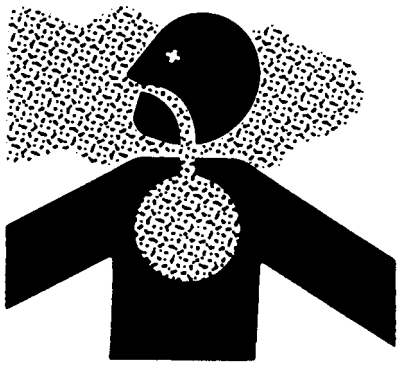
Avoid potentially toxic fumes and dust.

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

Remove paint before heating:

- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- 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.

Do not use a chlorinated solvent in areas where welding will take place.



TS220 —UN—23AUG88

Do all work in an area that is well ventilated to carry toxic fumes and dust away.

Dispose of paint and solvent properly.

DX,PAINT -19-24JUL02-1/1

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 accidentally burst when heat goes beyond the immediate flame area.

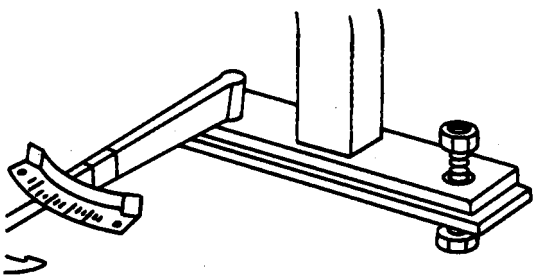
TS953 —UN—15MAY90

DX,TORCH -19-10DEC04-1/1

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

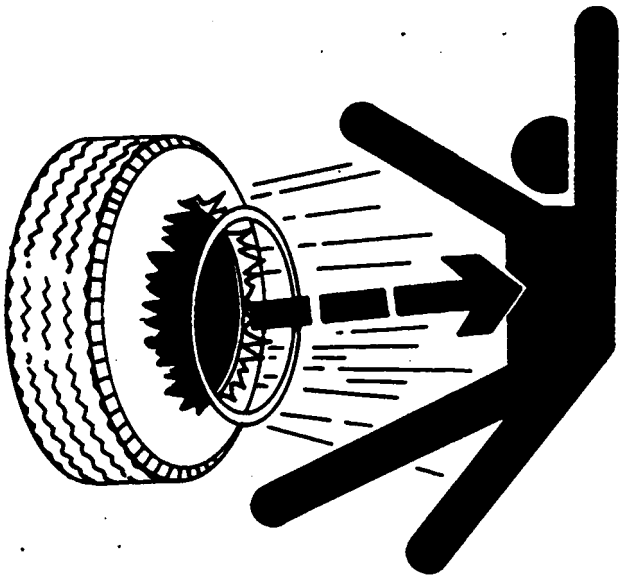
Explosive separation of a tire and rim parts can cause serious injury or death.

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—23AUG88

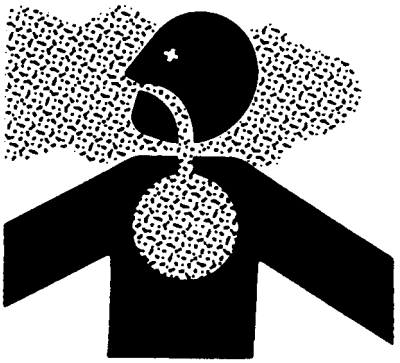
DX,RIM -19-24AUG90-1/1

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.



TS220 —UN—23AUG88

Keep bystanders away from the area.

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

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.

TS218 —UN—23AUG88

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

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

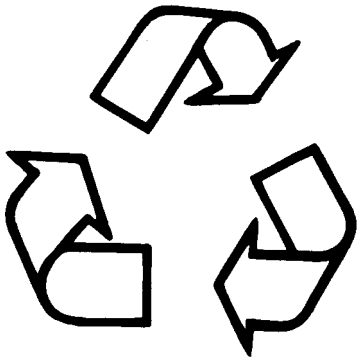
Improperly disposing of waste can threaten the environment and ecology. Potentially harmful waste used with John Deere equipment include such items as oil, fuel, coolant, brake fluid, filters, and batteries.

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—26NOV90

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

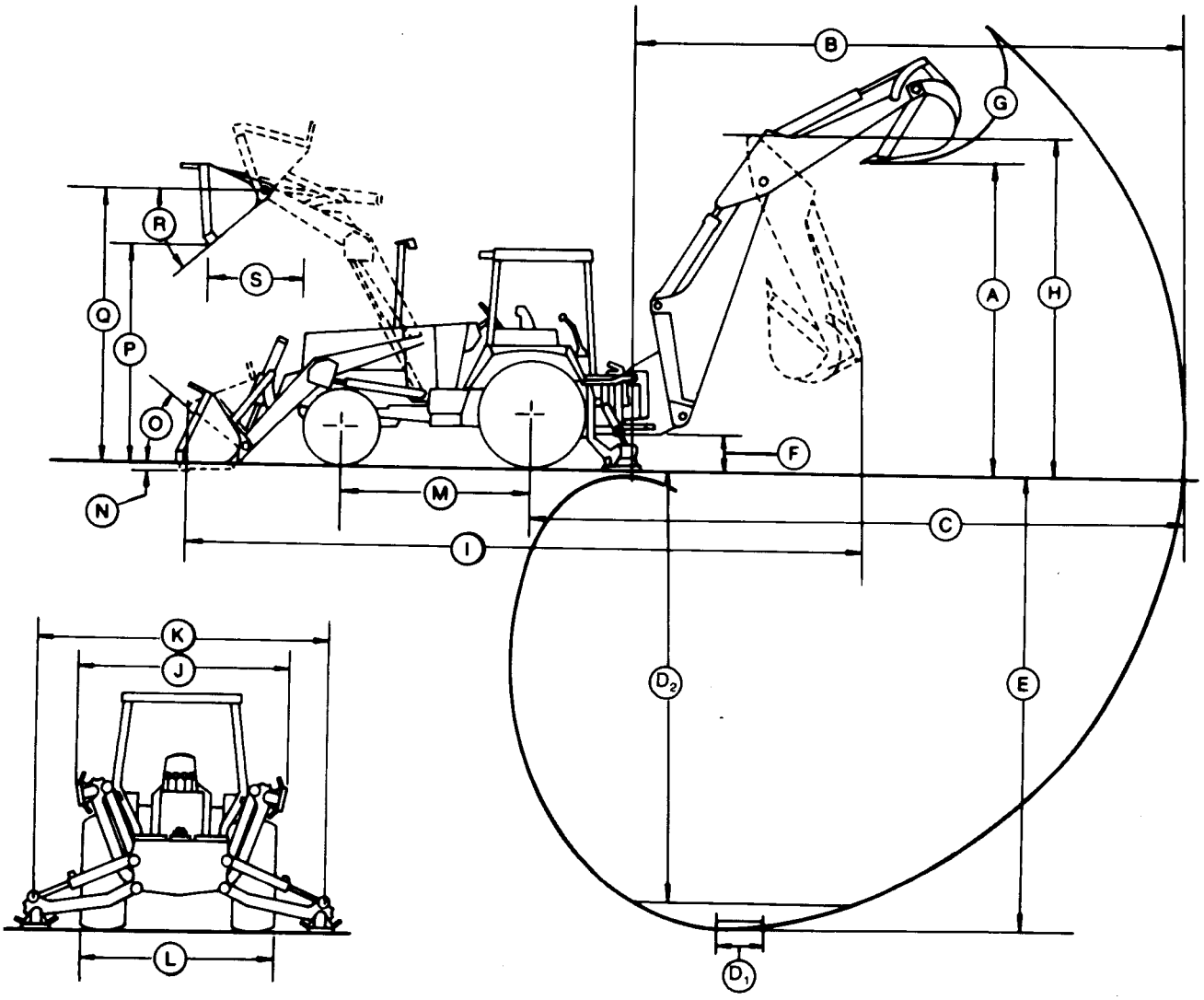
Live With Safety

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

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 $CaCl_2$ fill; 0.67 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

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 kg)
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 ^{3}(1.15 m ^{3}) 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)

TX,115,DH1385 -19-17APR93-1/1

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)

TX,115,DH1388 -19-22JUL99-1/1

300D Backhoe Loader Buckets

Loader:	Width mm (in.)	Heaped Capacity m ^{3}(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 ^{3}(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)

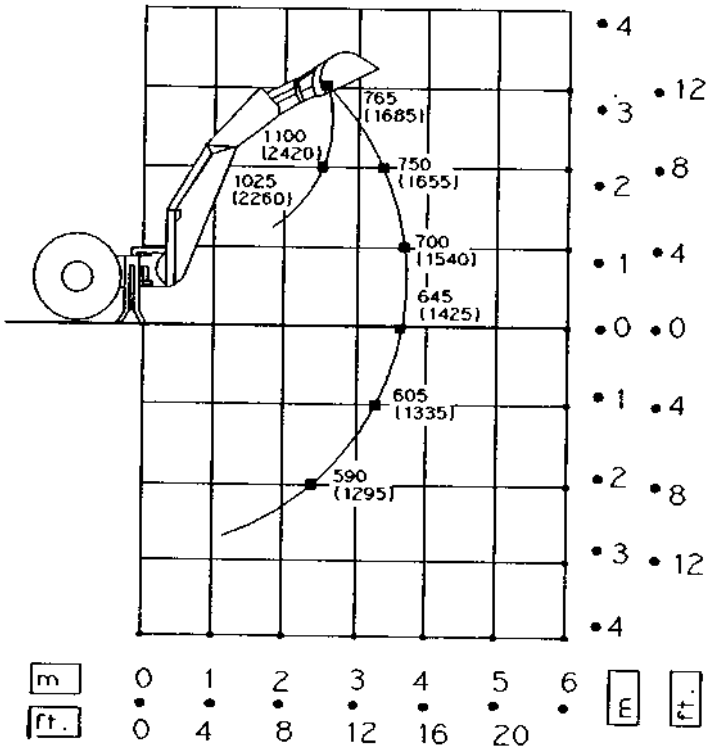
TX,115,DH1386 -19-17APR93-1/1

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

TX,115,DH1387 -19-12OCT94-1/1

300D Backhoe Loader Lifting Capacities—KG (LB)

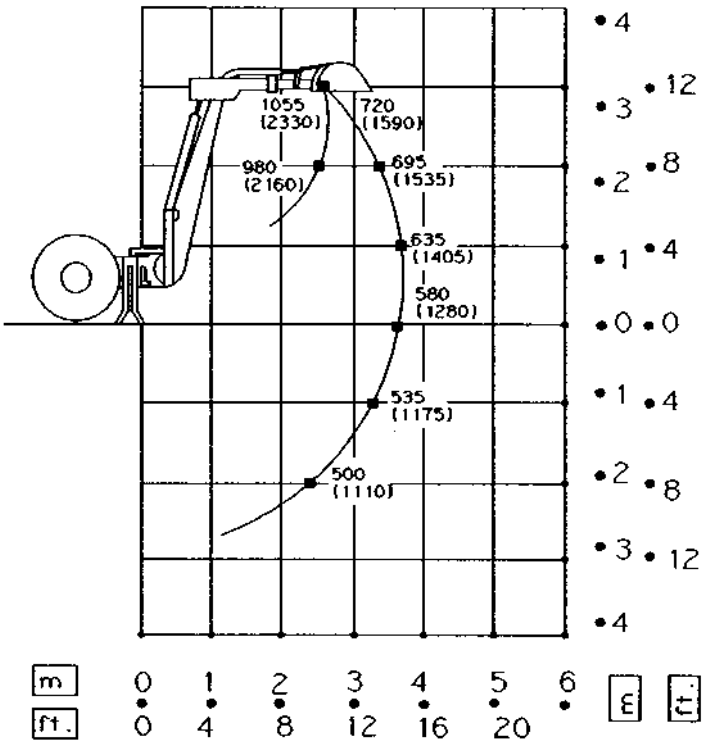


T7634AA —UN—18OCT91

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

Continued on next page

TX,115,DH1390 -19-29OCT91-1/3



T7634AB —UN—18OCT91

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

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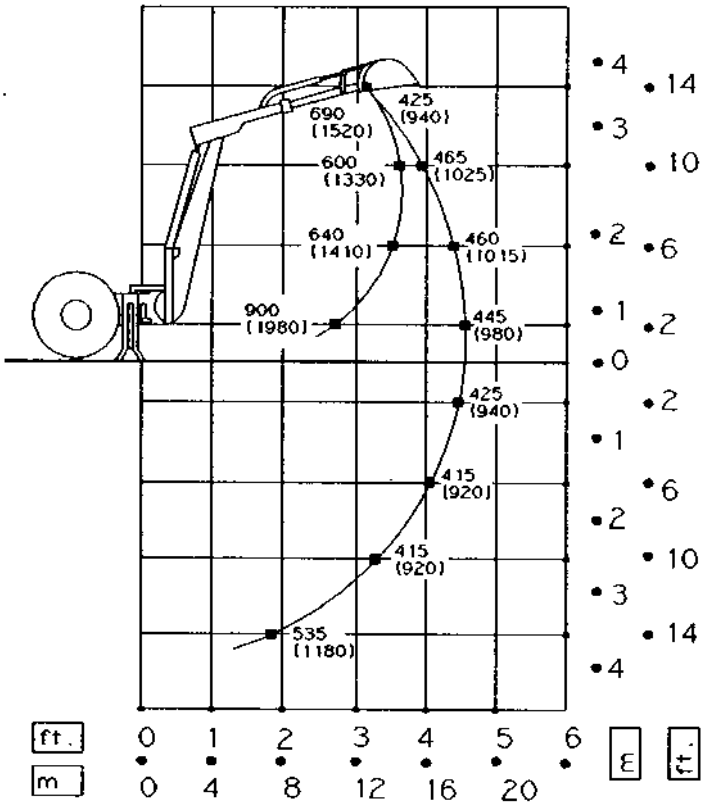
TX,115,DH1390 -19-29OCT91-2/3



T7634AC —UN—18OCT91

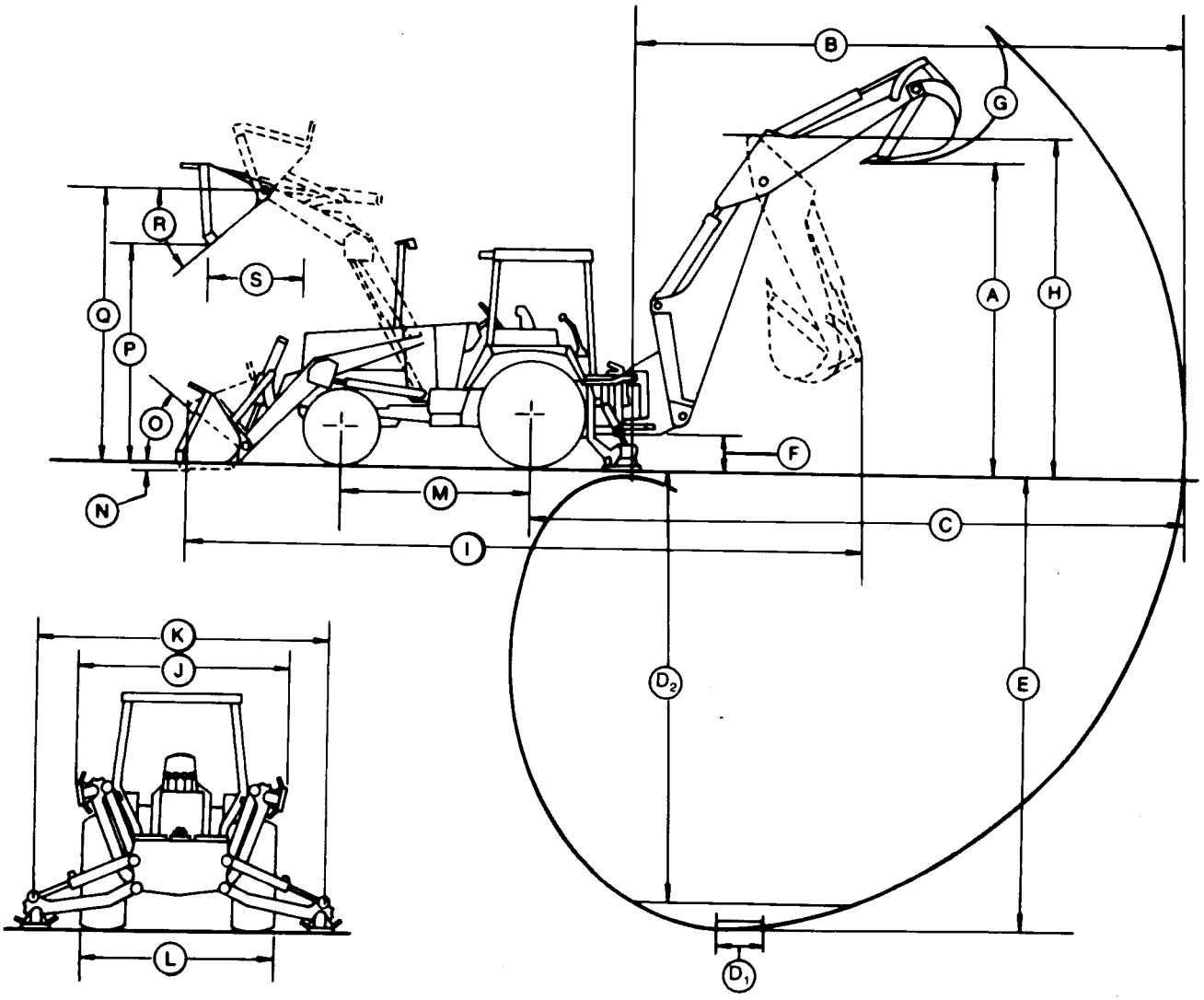
Lift Capacity, Backhoe With Extendible Dipperstick, Extended Based On SAE J31 (Except With Loader Bucket On Ground)

Lifting capacity ratings are made with bucket hinge pin, loader bucket, and stabilizers on firm, level ground. Lift capacities are hydraulically limited. Lifting capacities are 87 percent of the maximum lift over any point on the swing arc and do not exceed 75 percent of the tipping load. Angle between boom and ground is 65 degrees. Machine is equipped with 610 mm (24 in.) standard bucket, standard or extendible dipperstick and standard equipment.

NOTE: Loader bucket on ground significantly improves side stability, therefore improving lift capacity to the side. Lift capacity over the rear is not affected.

TX,115,DH1390 -19-29OCT91-3/3

310D Specifications



T7412AL —UN—15NOV90

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 17.5L-24, 10PR, R4 rear tires; 11L-15, 8PR, F3 front tires with 75 percent $CaCl_2$ fill; 0.76 m^3 (1.0 cu. yd.) loader bucket; 610 mm (24 in.) backhoe bucket; ROPS/FOPS; full fuel tank and 79 kg (175 lb) operator.

TX,115,DH1393 -19-26SEP91-1/1

310D Backhoe Loader

Key:	Backhoe	Extendible Dipperstick	
		Retracted	Extended
A—Loading height, truck loading position	11 ft 4 in. (3.45 m)	11 ft 8 in. (3.55 m)	13 ft 11 in. (4.24 m)
B—Reach from center of swing mast	17 ft 7 in. (5.36 m)	17 ft 7 in. (5.36 m)	21 ft 3 in. (6.47 m)
C—Reach from center of rear axle	21 ft 0 in. (6.40 m)	21 ft 0 in. (6.40 m)	24 ft 7 in. (7.50 m)
D—Digging depth (SAE):			
(1) 2 ft (610 mm) flat bottom	14 ft 4 in. (4.37 m)	14 ft 4 in. (4.37 m)	18 ft 2 in. (5.53 m)
(2) 8 ft (2440 mm) flat bottom	13 ft 2 in. (4.02 m)	13 ft 2 in. (4.02 m)	17 ft 4 in. (5.28 m)
E—Maximum digging depth	14 ft 6 in. (4.42 m)	14 ft 6 in. (4.42 m)	18 ft 3 in. (5.56 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 2 in. (3.72 m)	12 ft 2 in. (3.72 m)
I—Overall length, transport	22 ft 7 in. (6.88 m)	22 ft 7 in. (6.88 m)	22 ft 7 in. (6.88 m)
J—Stabilizer width, transport	7 ft 0 in. (2.12 m)	7 ft 0 in. (2.12 m)	7 ft 0 in. (2.12 m)
K—Stabilizer spread, operating	10 ft 0 in.(3.05 m)	10 ft 0 in. (3.05 m)	10 ft 0 in. (3.05 m)
L—Overall width (less loader bucket)	7 ft 1 in. (2.15 m)	7 ft 1 in. (2.15 m)	7 ft 1 in. (2.15 m)
Digging force, bucket cylinder (power dig position)	11570 lb (51.5 kN)	11530 lb (51.3 kN)	11530 lb (51.3 kg)
Digging force, crowd cylinder	6650 lb (29.6 kN)	6700 lb (29.8 kN)	4550 lb (20.2 kN)
Swing arc	180 degrees	180 degrees	180 degrees
Operator control	Two levers	Right foot treadle	Right foot treadle
Bucket positions	12° or 21° rollback	8° or 17° rollback	13° or 21° rollback
Stabilizer angle rearward	13°	13°	13°
Lifting capacity, maximum boom @ 65°	4600 lb (2087 kg)	4400 lb (1996 kg)	2700 lb (1225 kg)

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

Key:	Loader With 1.5 yd ^{3}(1.15 m ^{3}) 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. 10 in. (3.30 m)
R—Maximum bucket dump angle	45°
S—Reach at full height, bucket at 40°	28 in. (711 mm)

TX,115,DH1394 -19-17APR93-1/1

310D Backhoe Loader (Continued)

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

Engine:	
John Deere 4039D and 4039T	
Rated power @ 2200 rpm (Naturally aspirated)	SAE net 67 hp (50 kW)
Rated power @ 2200 rpm (Turbocharged)	SAE net 72 hp (53.7 kW)
Cylinders	4
Displacement	239 cu. in. (3.91 L)
Torque rise at 1200 rpm	
with turbocharger	25%
without turbocharger	20%
Lubrication	Pressure system w/full-flow filter
Cooling	Pressurized w/thermostat and fixed bypass
Air cleaner	Dry
Electrical system	12-volt
Alternator	78 amps

Transmission:
John Deere 4-speed helical gear, synchronized collar shift transmission with hydraulic reverser. Torque converter 11 in. (280 mm) with 2.83:1 stall ratio.

		Forward		Reverse	
Travel Speeds:	**Gear**	**mph**	**km/h**	**mph**	**km/h**
With Standard 17.5L-24 rear and 11L-15 front tires	1	3.3	5.3	3.0	4.8
	2	5.7	9.2	5.1	8.2
	3	12.3	19.8	11.1	17.9
	4	22.4	36.1	20.2	32.5
With MFWD and required 19.5L-24 rear and 12-16.5 front tires	1	3.4	5.5	3.1	5.0
	2	5.9	9.5	5.3	8.5
	3	12.6	20.3	11.3	18.2
	4	23.0	37.0	20.7	33.3

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)	11 ft 9 in. (3.57 m)
(without brakes)	13 ft 3 in. (4.04 m)
Bucket clearance circle	
(brakes applied)	31 ft 6 in. (9.61 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)	10 ft 11 in. (3.34 m)
(without brakes)	13 ft 8 in. (4.17 m)
Bucket clearance circle	
(brakes applied)	29 ft 9 in. (9.07 m)
(without brakes)	35 ft 3 in. (10.74 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	35 gpm (133 L/min)
Filter, return oil	10 micron replaceable element

Tires:	
Front	11L-15, 8PR, F3 11L-16, 12PR, F3
With MFWD	12-16.5, 8PR 14-17.5, 8PR, NHS
Rear	16.9-24 8PR, R4 17.5L-24 10PR, R4 19.5L-24, 8PR R4
With MFWD	19.5-24 8PR R4 21L-24, 10 PR R4

TX,115,DH1397 -19-22JUL99-1/1

310D Buckets

Loader:	Width In. (mm)	Heaped Capacity Cu. Yd. (m^3)	Weight lb (kg)
General Purpose	92 (2340)	1.00 (0.76)	760 (345)
	92 (2340)	1.30 (1.00)	800 (363)
Long Lip Multi-purpose	89 (2270)	1.25 (0.96)	750 (340)
	92 (2340)	1.25 (0.96)	1560 (708)

Backhoe:	Width In. (mm)	Heaped Capacity Cu. Ft. (m^3)	Weight lb (kg)
Standard	12 (305)	2.5 (0.07)	244 (111)
	16 (406)	3.6 (0.10)	268 (122)
	18 (457)	5.1 (0.14)	322 (146)
	24 (610)	7.5 (0.21)	370 (168)
	30 (762)	10.0 (0.28)	410 (186)
	36 (914)	9.9 (0.28)	430 (195)
	36 (914)	14.5 (0.41)	556 (252)
Heavy	12 (305)	2.5 (0.07)	258 (117)
Duty	18 (457)	5.1 (0.14)	334 (151)
	24 (610)	7.5 (0.21)	396 (180)
	24 (610)	8.8 (0.25)	476 (216)
	30 (762)	10.0 (0.28)	444 (201)
	36 (914)	10.0 (0.28)	480 (217)
Extra	18 (457)	5.1 (0.14)	362 (164)
Heavy	24 (610)	7.5 (0.21)	424 (192)
Duty	30 (762)	10.0 (0.28)	474 (215)

Transporting:	
SAE operating weight with ROPS	13,600 lb (6169 kg)
Cab added	500 lb (227 kg)
MFWD w/tires added	220 lb (100 kg)
Extendible dipperstick	430 lb (195 kg)
Optional front counterweight	770 lb (349 kg)
Optional front counterweight	200 lb (91 kg)

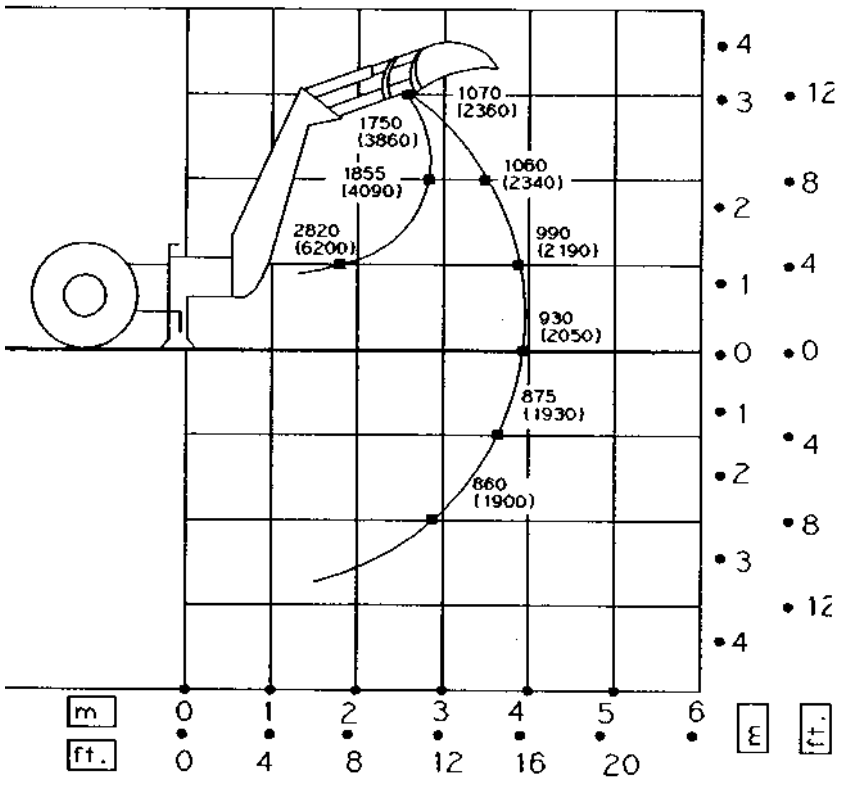
TX,115,DH1395 -19-17APR93-1/1

310D 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

TX,115,DH1396 -19-12OCT94-1/1

310D 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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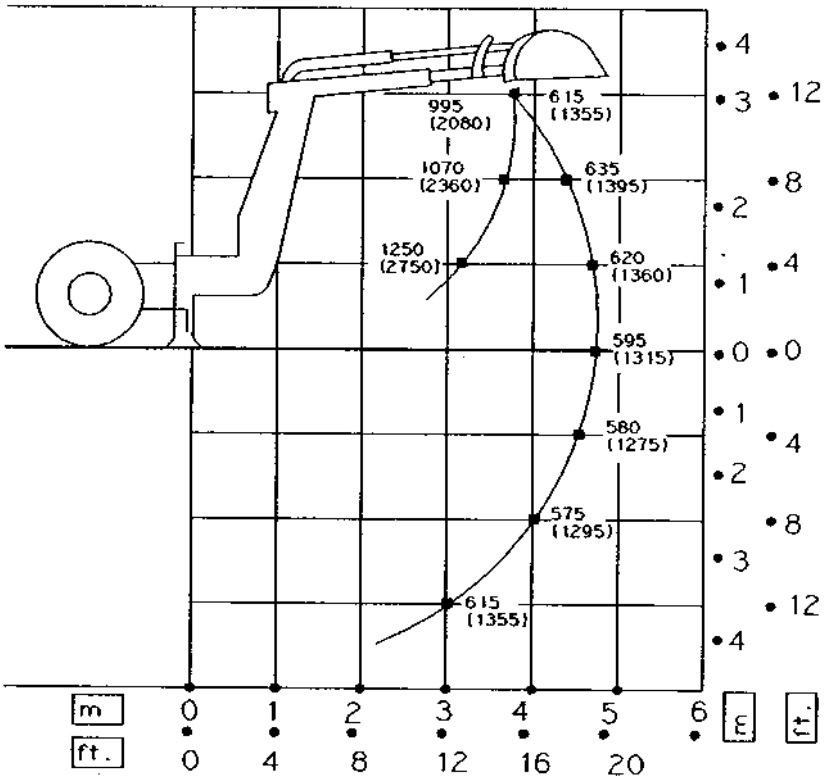
TX,115,DH1398 -19-29OCT91-1/3



T7634AE —UN—18OCT91

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

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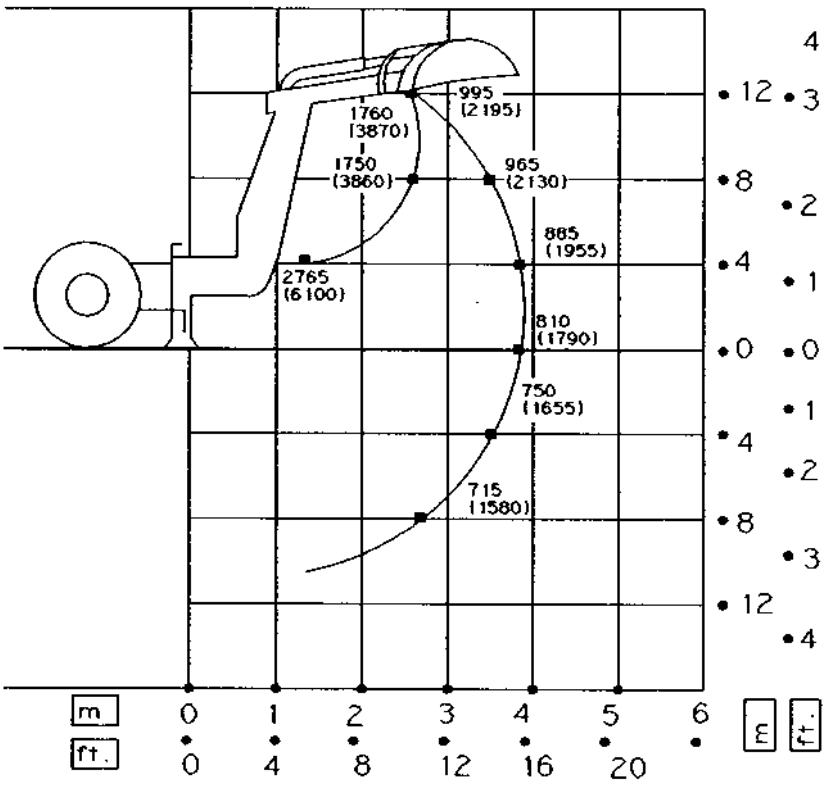
TX,115,DH1398 -19-29OCT91-2/3



T7634AF —UN—18OCT91

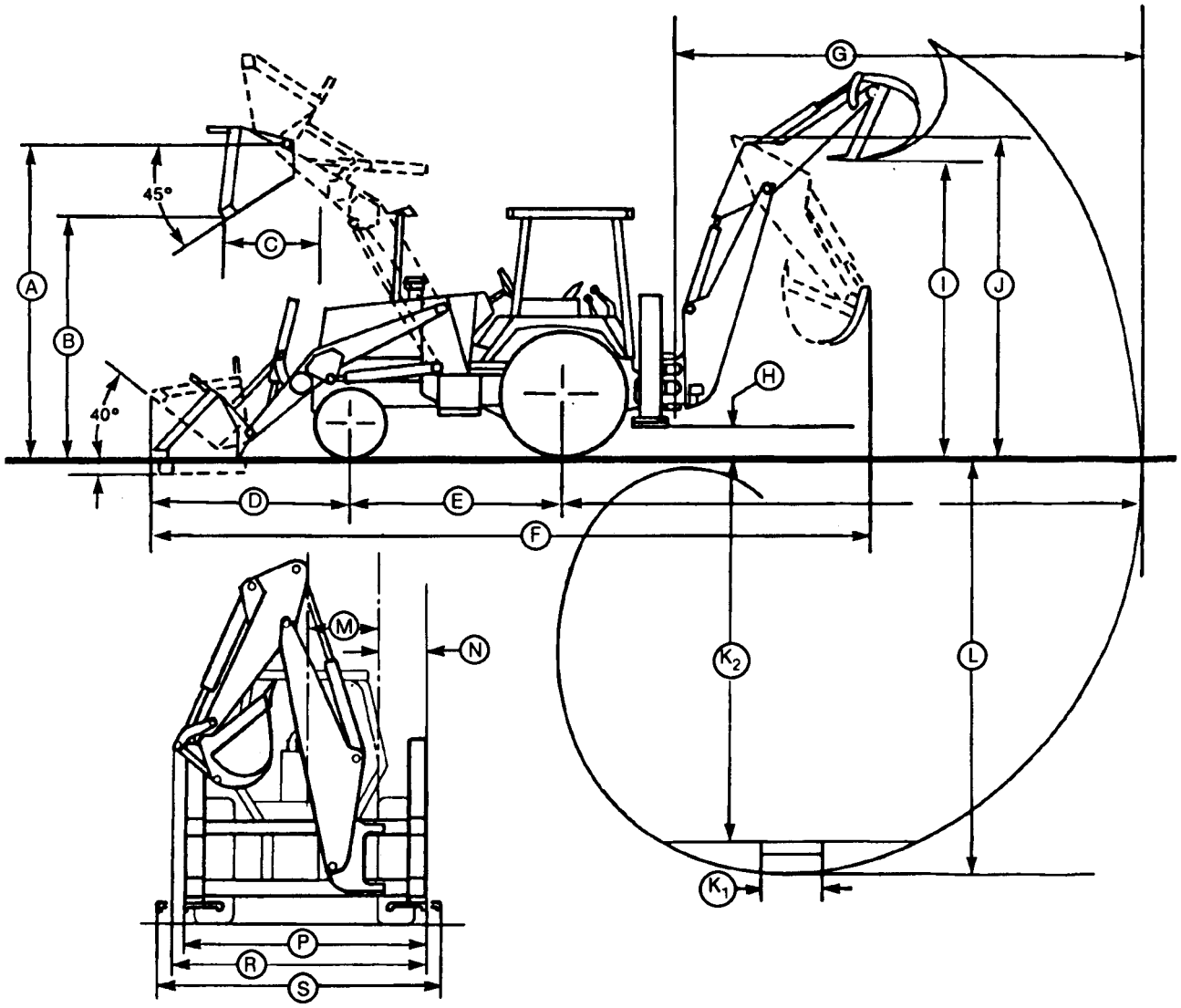
Lift Capacity, Backhoe With Extendible Dipperstick, Retracted Based On SAE J31 (Except With Loader Bucket On Ground)

Lifting capacity ratings are made with bucket hinge pin, loader bucket, and stabilizers on firm, level ground. Lift capacities are hydraulically limited. Lifting capacities are 87 percent of the maximum lift over any point on the swing arc and do not exceed 75 percent of the tipping load. Angle between boom and ground is 65 degrees. Machine is equipped with 610 mm (24 in.) standard bucket, standard or extendible dipperstick and standard equipment.

NOTE: Loader bucket on ground significantly improves side stability, therefore improving lift capacity to the side. Lift capacity over the rear is not affected.

TX,115,DH1398 -19-29OCT91-3/3

315D Specifications



T7181BG CV

T7181BG —UN—30NOV89

TX,115,DH1611 -19-01DEC90-1/1

315D Sideshift Backhoe Loader

Key:	
A	10 ft 11 in. (3.33 m)
B	8 ft 11.5 in. (2.73 m)
C	28 in. (711 mm)
D	72.4 in. (1839 mm)
E	82.7 in. (2100 mm)

Key:	Backhoe	Extendable Dipperstick	
		Retracted	Extended
F-Overall length, transport	18 ft 6 in. (5.63 m)	18 ft 6 in. (5.63 m)	18 ft 6 in. (5.63 m)
G-Reach from center of swing mast	17 ft 9 in. (5.32 m)	17 ft 10 in. (5.44 m)	21 ft 4 in. (6.41 m)
H-Ground clearance, minimum	13.8 in. (350 mm)	13.8 in. (350 mm)	13.8 in. (350 mm)
I-Loading height, truck loading position	11 ft 7 in. (3.53 m)	12 ft 0 in. (3.66 m)	14 ft 2 in. (4.24 m)
J-Transport height	12 ft 3 in. (3.73 m)	12 ft 5 in. (3.78 m)	12 ft 5 in. (3.78 m)
K-Digging depth (SAE)			
(1) 2 ft (610 mm) flat bottom	13 ft 11.5 in. (4.25 m)	13 ft 11.5 in. (4.25 m)	17 ft 9.5 in. (5.42 m)
(2) 8 ft (2440 mm) flat bottom	12 ft 9 in. (3.89 m)	12 ft 9 in. (3.89 m)	16 ft 10 in. (5.13 m)
L-Maximum digging depth	14 ft 1 in. (4.29 m)	14 ft 1 in. (4.29 m)	18 ft 0 in. (5.49 m)
M-Side shift from tractor centerline	23.5 in. (597 mm)	23.5 in. (597 mm)	23.5 in. (597 mm)
N-Wall to swing centerline	20.6 in. (523 mm)	20.6 in. (523 mm)	20.6 in. (523 mm)
P-Stabilizer width-pads turned in	88.2 in. (2240 mm)	88.2 in. (2240 mm)	88.2 in. (2240 mm)
R-Overall width (less loader bucket)	97.6 in. (2480 mm)	97.6 in. (2480 mm)	97.6 in. (2480 mm)
S-Stabilizer width-pads turned out	103.5 in. (2630 mm)	103.5 in. (2630 mm)	103.5 in. (2630 mm)
Digging force, bucket cylinder (power dig position)	11570 lb (51.5 kN)	11530 lb (51.3 kN)	11530 lb (51.3 kg)
Digging force, crowd cylinder	6650 lb (29.6 kN)	6700 lb (29.8 kN)	4550 lb (20.2 kN)
Swing arc	180 degrees	180 degrees	180 degrees
Operator control	Two levers	Right foot treadle	Right foot treadle
Bucket positions	12° or 21° rollback	8° or 17° rollback	13° or 21° rollback
Lifting capacity, maximum boom @ 65°	4600 lb (2087 kg)	4400 lb (1996 kg)	2700 lb (1225 kg)

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

TX,115,DH1612 -19-17APR93-1/1

315D Sideshift 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	67 hp (50 kW)

Engine:	
John Deere 4039T	
Cylinders	4
Displacement	239 cu. in. (3.91 L)
Maximum torque @ 1200 rpm	215 lb-ft (292 N·m)
Lubrication	Pressure system w/full-flow filter
Cooling	Pressurized w/thermostat and fixed bypass
Air cleaner	Dry
Electrical system	12-volt
Alternator	78 amps
Transmission:	
John Deere 4-speed helical gear, synchronized collar shift transmission with hydraulic reverser.	

Travel Speeds:	Gear	Forward		Reverse	
		mph	km/h	mph	km/h
With Standard 17.5L-24 rear and 11L-15 front tires	1	3.3	5.3	3.0	4.8
	2	5.7	9.2	5.1	8.2
	3	12.3	19.8	11.1	17.9
	4	22.4	36.1	20.2	32.5

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)	11 ft 9 in. (3.57 m)
(without brakes)	13 ft 3 in. (4.04 m)
Bucket clearance circle	
(brakes applied)	31 ft 6 in. (9.61 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)	10 ft 11 in. (3.34 m)
(without brakes)	13 ft 8 in. (4.17 m)
Bucket clearance circle	
(brakes applied)	29 ft 9 in. (9.07 m)
(without brakes)	35 ft 3 in. (10.74 m)
Steering wheel turns	
Stop to stop	

Hydraulic System:Open center	
Pressure setting	2700 psi (18 620 kPa)
Pump	Gear type
Flow @ 2200 rpm	35 gpm (133 L/min)
Filter, return oil	10 micron replaceable element

Tires:	
Front	14 x 17.5, 10PR NHS 10.5/80 x 18, 10PR, I-3 11L-16, 12PR, F3
Rear	16.9 X 28 8PR R4

Transporting:	
SAE operating weight with ROPS	14,000 lb (6350 kg)

TX,115,DH1613 -19-22JUL99-1/1

315D Buckets

Loader:	Width In. (mm)	Struck Capacity Cu. Yd. (m^3)	Heaped Capacity Cu. Yd. (m^3)
General Purpose	92 (2340)	0.88 (0.67)	1.0 (0.76)
	92 (2340)	1.07 (0.88)	1.3 (1.00)
Long Lip	89.4 (2270)	1.05	1.25

Backhoe:	Width In. (mm)	Struck Capacity Cu. Ft. (m^3)	Capacity Cu. Ft. (m^3)
Standard	12 (305)	2.6 (0.07)	3.0 (0.08)
	16 (406)	3.7 (0.10)	4.5 (0.13)
	18 (457)	4.2 (0.12)	5.1 (0.14)
	24 (610)	5.9 (0.17)	7.5 (0.21)
	24 (610)	7.2 (0.20)	8.8 (0.25)
	30 (762)	7.5(0.21)	10.0 (0.28)
	36 (914)	7.5 (0.21)	10.0 (0.28)
	36 (914)	11.2 (0.32)	14.5(0.41)

TX,115,DH1614 -19-13DEC90-1/1

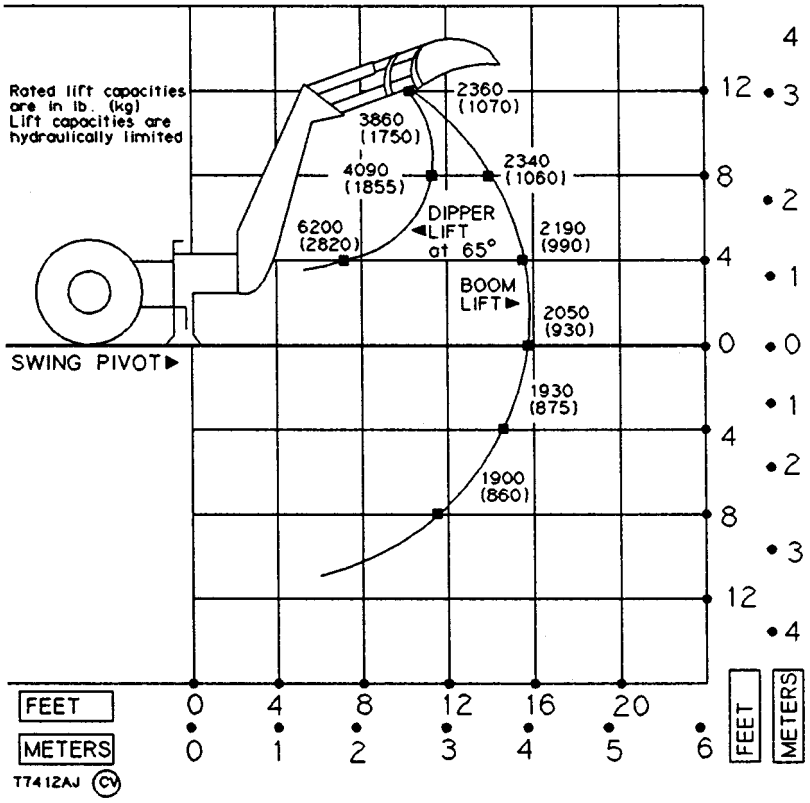
315D Sideshift Backhoe Loader Drain And Refill Capacities

	U.S.	Metric
Engine coolant	17 qt	16 L
Engine oil (including filter)	9 qt	8.5 L
Torque converter and reverser	8 qt	7.6 L
Transaxle		
(without MFWD)	22 qt	23 L
(with MFWD)	23 qt	24 L
Fuel tank	28 gal	106 L
Hydraulic reservoir	11 gal	41.5 L
MFWD Planetary	1.1 qt	1 L

TX,115,DH1615 -19-24FEB96-1/1

315D Lift Capacity—LB (KG)

Backhoe With Standard Dipperstick



T7412AJ —19—27NOV90

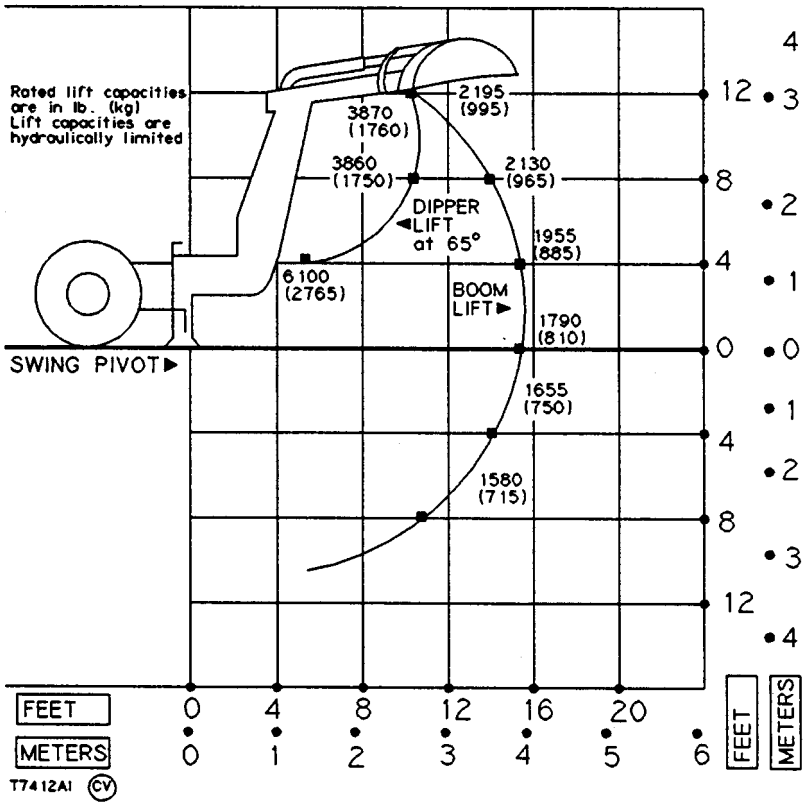
Lifting capacity ratings are made with bucket hinge pin, loader bucket and stabilizers on firm, level ground. Lifting capacities are 87 percent of the maximum lift over any point on the swing arc and do not exceed 75 percent of the tipping load. Angle between boom and ground is 65 degrees. Machine is equipped with 24 in. (610 mm) standard bucket, standard or extendible dipperstick, and standard equipment. Backhoe in center position.

NOTE: Loader bucket on ground significantly improves side stability, therefore improving lift capacity to the side. Lift capacity over the rear is not affected.

Continued on next page

TX115DH1620 -19-11JAN91-1/3

Backhoe With Extendible Dipperstick, Retracted



T7412AI —19—27NOV90

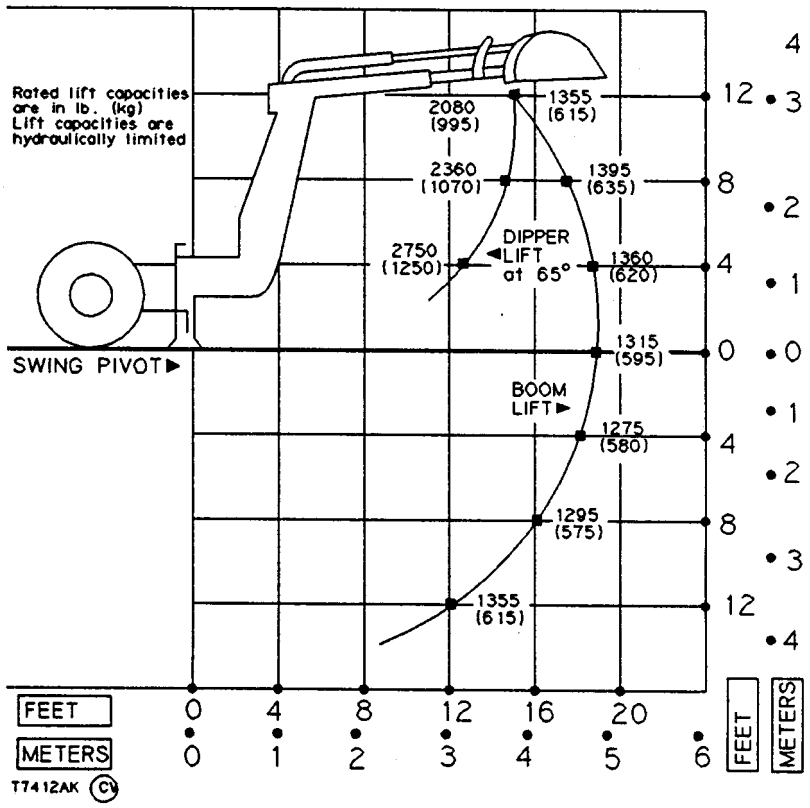
Lifting capacity ratings are made with bucket hinge pin, loader bucket and stabilizers on firm, level ground. Lifting capacities are 87 percent of the maximum lift over any point on the swing arc and do not exceed 75 percent of the tipping load. Angle between boom and ground is 65 degrees. Machine is equipped with 24 in. (610 mm) standard bucket, standard or extendible dipperstick, and standard equipment. Backhoe in center position.

NOTE: Loader bucket on ground significantly improves side stability, therefore improving lift capacity to the side. Lift capacity over the rear is not affected.

Continued on next page

TX115DH1620 -19-11JAN91-2/3

Backhoe With Extendible Dipperstick, Extended



T7412AK —19—27NOV90

Lifting capacity ratings are made with bucket hinge pin, loader bucket and stabilizers on firm, level ground. Lifting capacities are 87 percent of the maximum lift over any point on the swing arc and do not exceed 75 percent of the tipping load. Angle between boom and ground is 65 degrees. Machine is equipped with 24 in. (610 mm) standard bucket, standard or extendible dipperstick, and standard equipment. Backhoe in center position.

NOTE: Loader bucket on ground significantly improves side stability, therefore improving lift capacity to the side. Lift capacity over the rear is not affected.

TX115DH1620 -19-11JAN91-3/3

Hardware Torque Specifications

Check cap screws and nuts to be sure they are tight. If hardware is loose, tighten to torque shown on the following charts unless a special torque is specified.

TX,90,FF1225 -19-15MAR93-1/1

Checking Wheel Fasteners

Tighten wheel cap screws and fasteners.

Front Axle—Specification

Standard Axle—Torque.....136 +20 -27 N·m (100 +15 -20 lb-ft)
MFWD Axle—Torque.....300 +110 -40 N·m (221 +81 -29 lb-ft)

Rear Axle—Specification

Standard Axle—Torque.....575 +170 -115 N·m (425 +125 -85 lb-ft)

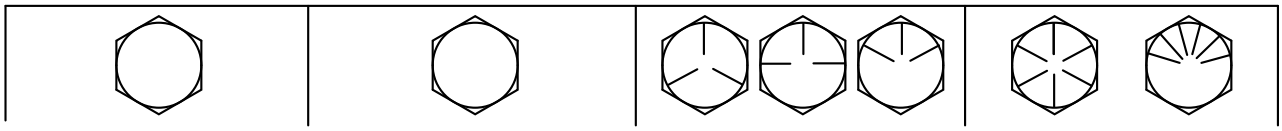
T6000AU —UN—18OCT88

T87507 —UN—21OCT88

TX,90,DH1383 -19-09DEC93-1/1

Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



Bolt or Screw Size	SAE Grade 1				SAE Grade 2[a]				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Lubricated[b]		Dry[c]		Lubricated[b]		Dry[c]		Lubricated[b]		Dry[c]		Lubricated[b]		Dry[c]	
	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.	N·m	lb.-in.
1/4	3.7	33	4.7	42	6	53	7.5	66	9.5	84	12	106	13.5	120	17	150
													N·m	lb.-ft.	N·m	lb.-ft.
5/16	7.7	68	9.8	86	12	106	15.5	137	19.5	172	25	221	28	20.5	35	26
									N·m	lb.-ft.	N·m	lb.-ft.				
3/8	13.5	120	17.5	155	22	194	27	240	35	26	44	32.5	49	36	63	46
			N·m	lb.-ft.	N·m	lb.-ft.	N·m	lb.-ft.								
7/16	22	194	28	20.5	35	26	44	32.5	56	41	70	52	80	59	100	74
	N·m	lb.-ft.														
1/2	34	25	42	31	53	39	67	49	85	63	110	80	120	88	155	115
9/16	48	35.5	60	45	76	56	95	70	125	92	155	115	175	130	220	165
5/8	67	49	85	63	105	77	135	100	170	125	215	160	240	175	305	225
3/4	120	88	150	110	190	140	240	175	300	220	380	280	425	315	540	400
7/8	190	140	240	175	190	140	240	175	490	360	615	455	690	510	870	640
1	285	210	360	265	285	210	360	265	730	540	920	680	1030	760	1300	960
1-1/8	400	300	510	375	400	300	510	375	910	670	1150	850	1450	1075	1850	1350
1-1/4	570	420	725	535	570	420	725	535	1280	945	1630	1200	2050	1500	2600	1920
1-3/8	750	550	950	700	750	550	950	700	1700	1250	2140	1580	2700	2000	3400	2500
1-1/2	990	730	1250	930	990	730	1250	930	2250	1650	2850	2100	3600	2650	4550	3350

Torque values listed are for general use only, based on the strength of the bolt or screw. DO NOT use these values if a different torque value or tightening procedure is given for a specific application. For plastic insert or crimped steel type lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application. Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

Replace fasteners with the same or higher grade. If higher grade fasteners are used, tighten these to the strength of the original. Make sure fastener threads are clean and that you properly start thread engagement. When possible, lubricate plain or zinc plated fasteners other than lock nuts, wheel bolts or wheel nuts, unless different instructions are given for the specific application.

[a]Grade 2 applies for hex cap screws (not hex bolts) up to 6 in. (152 mm) long. Grade 1 applies for hex cap screws over 6 in. (152 mm) long, and for all other types of bolts and screws of any length.

[b]"Lubricated" means coated with a lubricant such as engine oil, fasteners with phosphate and oil coatings, or 7/8 in. and larger fasteners with JDM F13C, F13F or F13J zinc flake coating.

[c]"Dry" means plain or zinc plated without any lubrication, or 1/4 to 3/4 in. fasteners with JDM F13B, F13E or F13H zinc flake coating.

DX,TORQ1 -19-12JAN11-1/1

Additional Metric Cap Screw Torque Values

CAUTION: Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

Check tightness of cap screws periodically. Torque values listed are for general use only. Do not use these values if a different torque value or tightening procedure is listed for a specific application.

Shear bolts are designed to fail under predetermined loads. Always replace shear bolts with identical grade.

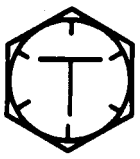
Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fastener threads are clean and you properly start thread engagement. This will prevent them from failing when tightening.

Tighten cap screws having lock nuts to approximately 50 percent of amount shown in chart.

METRIC CAP SCREW TORQUE VALUES[a]						
	T-Bolt		H-Bolt		M-Bolt	
Nominal Dia	N·m	lb-ft	N·m	lb-ft	N·m	lb-ft
8	29	21	20	15	10	7
10	63	46	45	33	20	15
12	108	80	88	65	34	25
14	176	130	137	101	54	40
16	265	195	206	152	78	58
18	392	289	294	217	118	87
20	539	398	392	289	167	125
22	735	542	539	398	216	159
24	931	687	686	506	274	202
27	1372	1012	1029	759	392	289
30	1911	1410	1421	1049	539	398
33	2548	1890	1911	1410	735	542
36	3136	2314	2401	1772	931	687

[a] *Torque tolerance is ±10%.*



T6873AA

T6873AA —UN—18OCT88

T6873AB

T6873AB —UN—18OCT88

T6873AC

T6873AC —UN—18OCT88

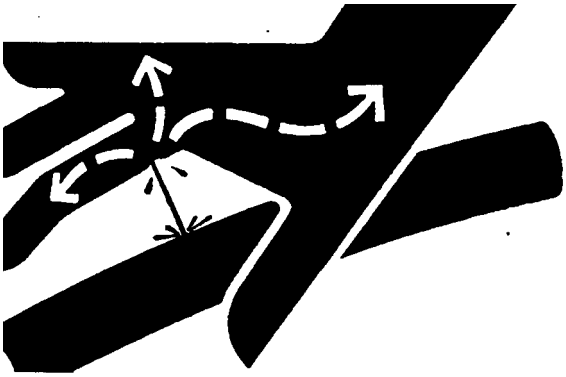
04T,90,M170 -19-29SEP99-1/1

Check Oil Lines And Fittings

CAUTION: 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 may call the Deere & Company Medical Department in Moline, Illinois, or other knowledgeable medical source.

Check all oil lines, hoses, and fittings regularly for leaks or damage. Make sure all clamps are in position and tight. Make sure hoses are not twisted or touching moving machine parts. If abrasion or wear occurs, replace immediately.



X9811 —UN—23AUG88

Tubing with dents may cause the oil to overheat. If you find tubing with dents, install new tubing immediately.

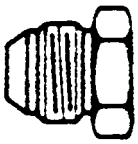
IMPORTANT: Tighten fittings as specified in torque chart.

When you tighten connections, use two wrenches to prevent bending or breaking tubing and fittings.

TX,90,DH1559 -19-01AUG94-1/1

Service Recommendations for 37° Flare and 30° Cone Seat Connectors

1. Inspect flare and flare seat. They must be free of dirt or obvious defects.
2. Defects in tube flare cannot be repaired. Overtightening a defective flared fitting will not stop leaks.
3. Align tube with fitting before attempting to start nut.
4. Lubricate male threads with hydraulic fluid or petroleum jelly.
5. Index angle fittings and tighten by hand.
6. Tighten fitting or nut to torque value shown on torque chart. Do not allow hoses to twist when tightening fittings.



T6234AC —UN—18OCT88

STRAIGHT FITTING OR SPECIAL NUT TORQUE CHART		
Thread Size	**N·m**	**lb-ft**
3/8 - 24 UNF	8	6
7/16 - 20 UNF	12	9
1/2 - 20 UNF	16	12
9/16 - 18 UNF	24	18
3/4 - 16 UNF	46	34
7/8 - 14 UNF	62	46
1-1/16 - 12 UN	102	75
1-3/16 - 12 UN	122	90
1-5/16 - 12 UN	142	105
1-5/8 - 12	190	140
1-7/8 - 12 UN	217	160

NOTE: Torque tolerance is ± 10%.

T82,BHMA,EL -19-29SEP99-1/1