X-Series Combines Diagnostic Technical Manual

DIAGNOSTIC TECHNICAL MANUAL

X-Series Combines Diagnostic Technical Manual TM154419

TM154419 27JUL20 (ENGLISH)

For complete service information also see:

Repair Technical Manual..... TM154519

John Deere Harvester Works
LITHO 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.

DX,TMIFC -19-15APR14-1/1

Contents

Continued on next page

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.

Continued on next page

Section 210
General

Contents

Continued on next page

Recognize Safety Information

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

Follow recommended precautions and safe operating practices.

T81389 —UN—28JUN13

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

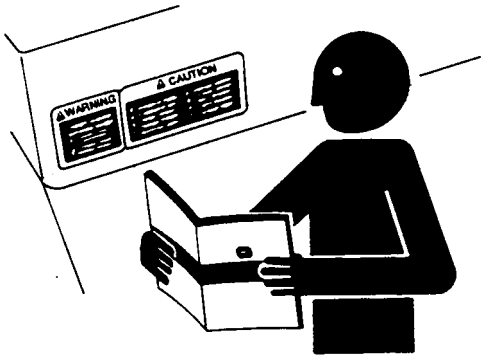
Follow Safety Instructions

Carefully read all safety messages in this manual and on your machine safety signs. Keep safety signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from your John Deere dealer.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.



TS201 —UN—15APR13

If you do not understand any part of this manual and need assistance, contact your John Deere dealer.

DX,READ -19-16JUN09-1/1

Service Tires Safely

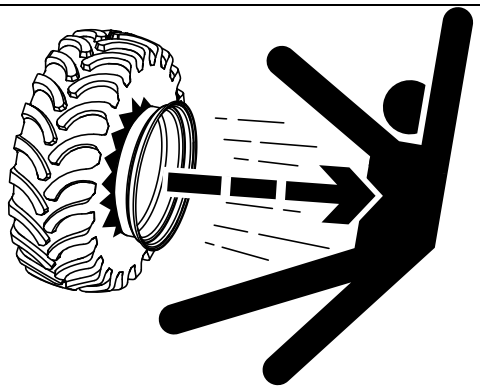
Explosive separation of a tire and rim parts can cause serious injury or death.

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.



RXA0103438 —UN—11JUN09

Wheels and tires are heavy. When handling wheels and tires use a safe lifting device or get an assistant to help lift, install, or remove.

DX,WW,RIMS -19-28FEB17-1/1

Understand Signal Words

TS187 —19—30SEP88

DANGER; The signal word DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING; The signal word WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION; The signal word CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. CAUTION may also be used to alert against unsafe practices associated with events which could lead to personal injury.

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards. DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

DX,SIGNAL -19-05OCT16-1/1

Remove Paint Before Welding or Heating

TS220 —UN—15APR13

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.

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

Handle Fluids Safely—Avoid Fires

TS227 —UN—15APR13

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

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—15APR13

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

Handling Batteries Safely

Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

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

Always remove grounded (-) battery clamp first and replace grounded clamp last.

Sulfuric acid in battery electrolyte is poisonous and strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

TS204 —UN—15APR13

Avoid hazards by:

- Filling batteries in a well-ventilated area
- Wearing eye protection and rubber gloves
- Avoiding use of air pressure to clean batteries
- Avoiding breathing fumes when electrolyte is added
- Avoiding spilling or dripping electrolyte
- Using correct battery booster or charger procedure.

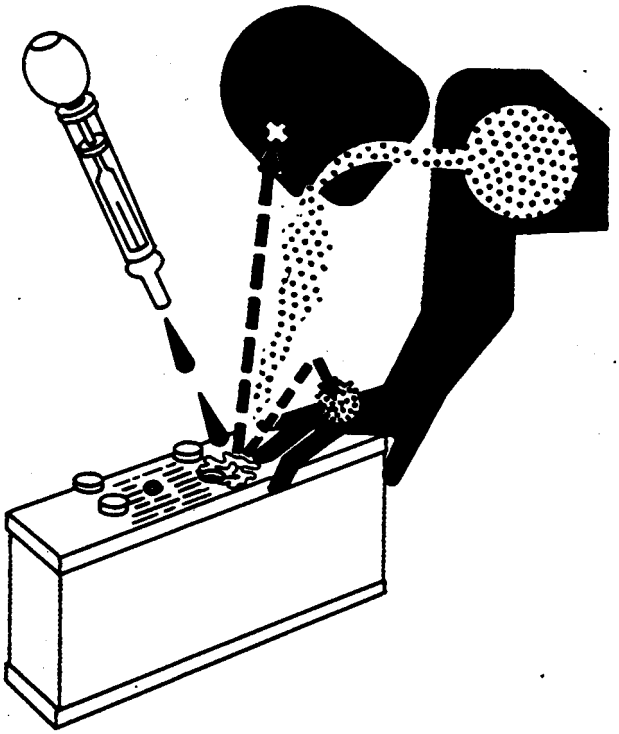
If acid is spilled on skin or in eyes:

1. Flush skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush 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 qt.).
3. Get medical attention immediately.

WARNING: Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. **Wash hands after handling.**



TS203 —UN—23AUG88

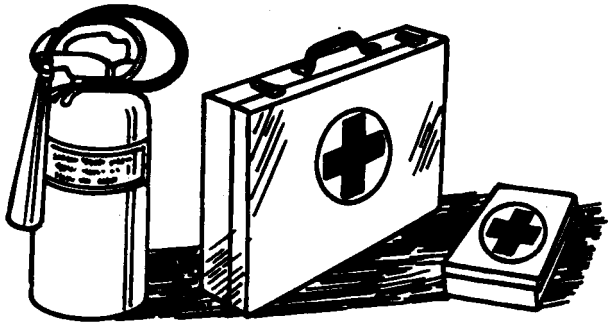
DX,WW,BATTERIES -19-02DEC10-1/1

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—15APR13

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:

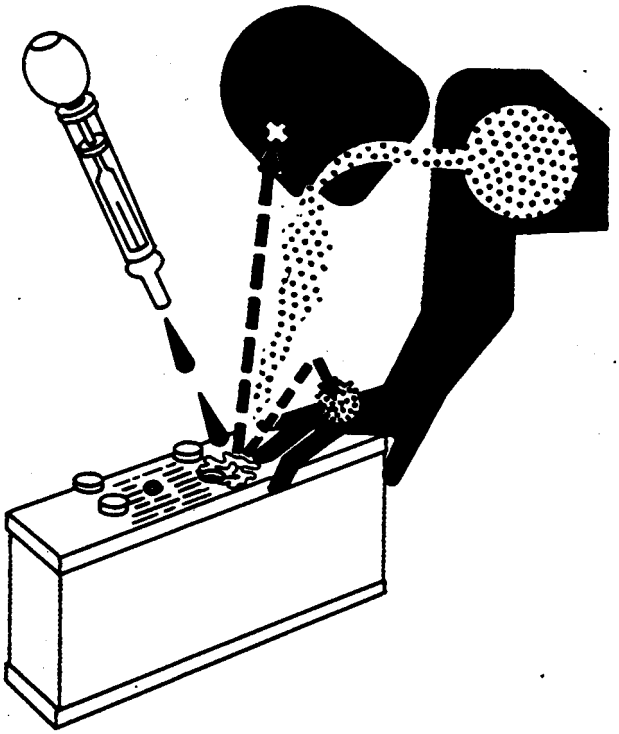
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

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

Avoid High-Pressure Fluids

Inspect hydraulic hoses periodically – at least once per year – for leakage, kinking, cuts, cracks, abrasion, blisters, corrosion, exposed wire braid or any other signs of wear or damage.

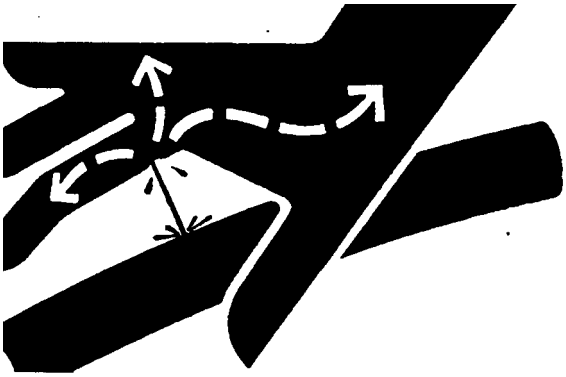
Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

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 -19-12OCT11-1/1

Service Accumulator Systems Safely

Escaping fluid or gas from pressurized hydraulic accumulator systems can cause serious injury. Extreme heat can cause the accumulator to burst, and pressurized lines can be accidentally cut. Do not weld or use a torch near a pressurized accumulator or pressurized line.

Relieve pressure from the hydraulic system before removing accumulator. Never attempt to relieve hydraulic system or accumulator pressure by loosening a fitting.

Accumulators cannot be repaired.

TS281 —UN—15APR13

DX,WW,ACCLA -19-15APR03-1/1

Wait Before Opening High-Pressure Fuel System

High-pressure fluid remaining in fuel lines can cause serious injury. Only technicians familiar with this type of system should perform repairs. Before disconnecting fuel lines, sensors, or any other components between the high-pressure fuel pump and nozzles on engines with High-Pressure Common Rail (HPCR) fuel system, confirm that the fuel pressure is relieved.

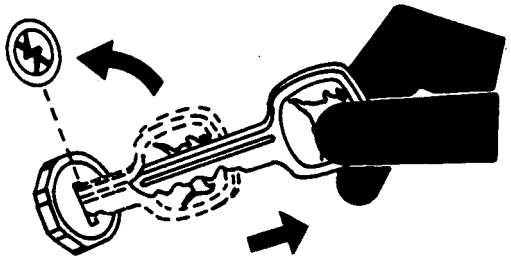
TS1343 —UN—18MAR92

DX,WW,HPCR2 -19-09SEP14-1/1

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

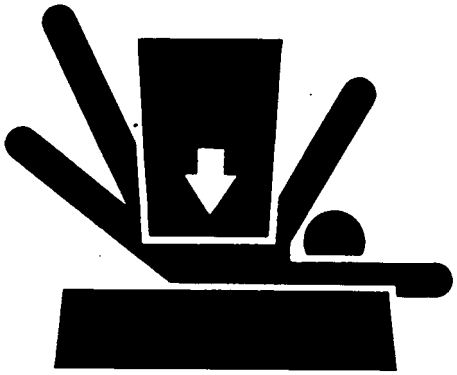
DX,PARK -19-04JUN90-1/1

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

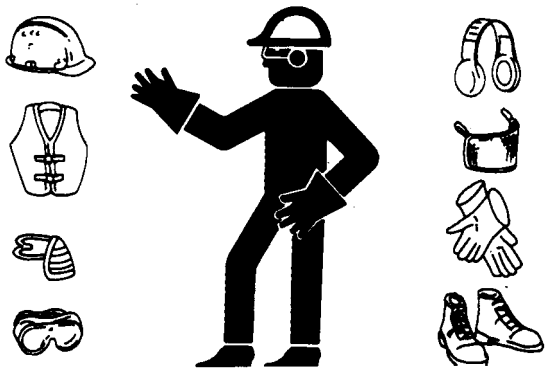
Wear Protective Clothing

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

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

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



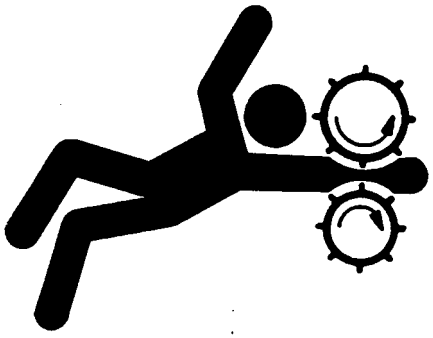
TS206 —UN—15APR13

DX,WEAR -19-10SEP90-1/1

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.

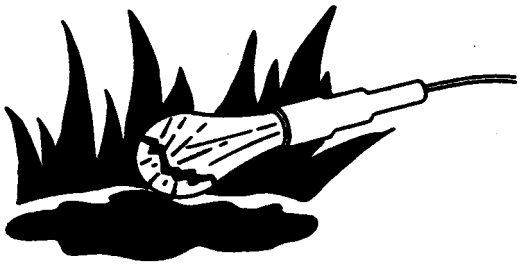
If you do not have an exhaust pipe extension, open the doors and get outside air into the area.

TS220 —UN—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.

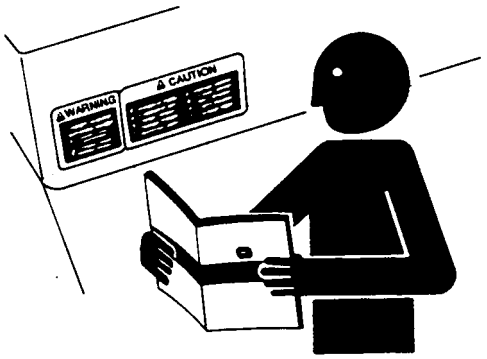


TS223 —UN—23AUG88

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.



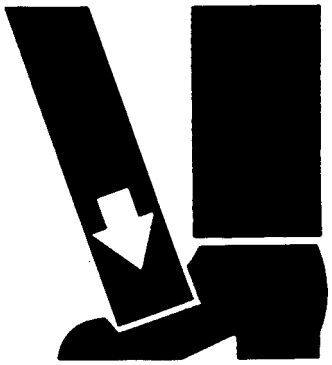
TS201 —UN—15APR13

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

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—15APR13

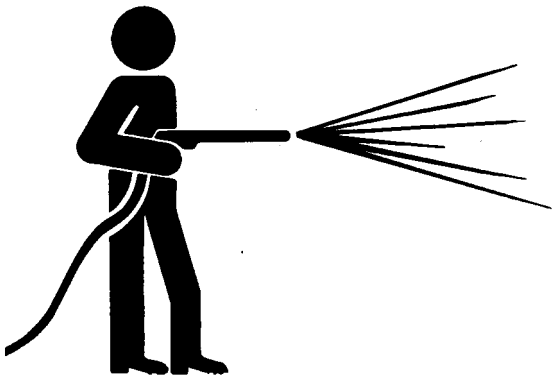
Keep bystanders away from the area.

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

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

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 away 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.

Falling while cleaning or working at height can cause serious injury. Use a ladder or platform to easily reach each location. Use sturdy and secure footholds and handholds.

TS218 —UN—23AUG88

DX,SERV -19-28FEB17-1/1

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.

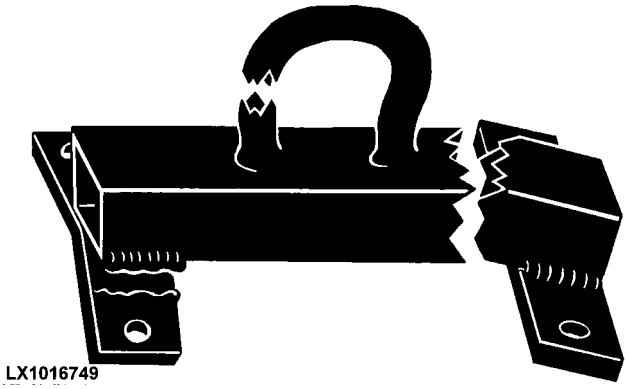
TS779 —UN—08NOV89

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

Construct Dealer-Made Tools Safely

Faulty or broken tools can result in serious injury. When constructing tools, use proper, quality materials, and good workmanship.

Do not weld tools unless you have the proper equipment and experience to perform the job.



LX1016749 —UN—01JUL97

DX,SAFE,TOOLS -19-10OCT97-1/1

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.

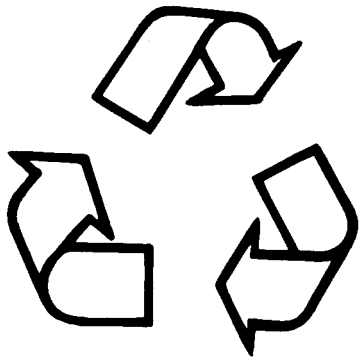
TS953 —UN—15MAY90

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

Decommissioning — Proper Recycling and Disposal of Fluids and Components

Safety and environmental stewardship measures must be taken into account when decommissioning a machine and/or component. These measures include the following:

- Use appropriate tools and personal protective equipment such as clothing, gloves, face shields or glasses, during the removal or handling of objects and materials.
- Follow instructions for specialized components.
- Release stored energy by lowering suspended machine elements, relaxing springs, disconnecting the battery or other electrical power, and releasing pressure in hydraulic components, accumulators, and other similar systems.
- Minimize exposure to components which may have residue from agricultural chemicals, such as fertilizers and pesticides. Handle and dispose of these components appropriately.
- Carefully drain engines, fuel tanks, radiators, hydraulic cylinders, reservoirs, and lines before recycling components. Use leak-proof containers when draining fluids. Do not use food or beverage containers.
- Do not pour waste fluids onto the ground, down a drain, or into any water source.
- Observe all national, state, and local laws, regulations, or ordinances governing the handling or disposal of waste fluids (example: oil, fuel, coolant, brake fluid);



TS1133 —UN—15APR13

filters; batteries; and, other substances or parts. Burning of flammable fluids or components in other than specially designed incinerators may be prohibited by law and could result in exposure to harmful fumes or ashes.

- Service and dispose of air conditioning systems appropriately. Government regulations may require a certified service center to recover and recycle air conditioning refrigerants which could damage the atmosphere if allowed to escape.
- Evaluate recycling options for tires, metal, plastic, glass, rubber, and electronic components which may be recyclable, in part or completely.
- Contact your local environmental or recycling center, or your John Deere dealer for information on the proper way to recycle or dispose of waste.

DX,DRAIN -19-01JUN15-1/1

Use Adequate Service Facilities

Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment.

Make sure the service area is adequately vented.

Periodically check the shop exhaust system for leakage. Engine exhaust gas is dangerous.

Be sure all electrical outlets and tools are properly grounded.

Use adequate light for the job at hand.

Service the machine on a level, hard-surfaced area.

Use lifting equipment and safety stands which have adequate strength for the job being performed.

HX,1401,1005,A -19-11DEC92-1/1

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

Servicing Electronic Control Units

IMPORTANT: Do not open control unit and do not clean with a high-pressure spray. Moisture, dirt, and other contaminants can cause permanent damage.

1. Control units are not repairable; replace only if indicated in the diagnostic procedure.
2. Since control units are the components LEAST likely to fail, isolate failure before replacing by completing the diagnostic procedure.
3. The wiring harness terminals and connectors for electronic control units are repairable.

IMPORTANT: If an electronic control unit is not programmed identical to the original control unit, misleading diagnostic messages and poor performance will occur.

4. Before putting back into service, verify that the control unit is programmed identical to the original control unit.

DX,WW,ECU01 -19-02OCT15-1/1

Welding Near Electronic Control Units

IMPORTANT: Do not jump-start engines with arc welding equipment. Currents and voltages are too high and may cause permanent damage.

1. Disconnect the negative (-) battery cable(s).
2. Disconnect the positive (+) battery cable(s).
3. Connect the positive and negative cables together. Do not attach to vehicle frame.
4. Clear or move any wiring harness sections away from welding area.
5. Connect welder ground close to welding point and away from control units.

TS953 —UN—15MAY90

6. After welding, reverse Steps 1—5.

DX,WW,ECU02 -19-14AUG09-1/1

Precautions for Welding

Remove paint before welding or heating (see Safety Section in this manual for more information on paint removal and high-pressure lines).

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

IMPORTANT: Welding on the engine is NOT ALLOWED. If welding must be performed on the machine, follow these precautions.

IMPORTANT: High currents or electrostatic discharge into electronic components from welding may cause permanent damage.

1. Remove paint from the area to be welded and ground cable clamp location.
2. Disconnect the negative (-) battery cable(s) or open battery (-) switch if equipped.

TS953 —UN—15MAY90

3. Disconnect the positive (+) battery cable(s) or open battery (+) switch if equipped.
4. Clear or move any wiring harness sections away from the welding area.
5. Welding on engine components is not allowed.
6. Never connect the welder ground to any engine component or engine driven components that may be connected to the engine.
7. After welding, reverse steps 2—3.

DX,WELDING,PRECAUTIONS -19-06DEC10-1/1

Clean Exhaust Filter Safely

During exhaust filter cleaning operations, the engine may run at elevated idle and hot temperatures for an extended period of time. Exhaust gases and exhaust filter components reach temperatures hot enough to burn people, or ignite or melt common materials.

Keep machine away from people, animals, or structures which may be susceptible to harm or damage from hot exhaust gases or components. Avoid potential fire or explosion hazards from flammable materials and vapors near the exhaust. Keep exhaust outlet away from people and anything that can melt, burn, or explode.

Closely monitor machine and surrounding area for smoldering debris during and after exhaust filter cleaning.

Adding fuel while an engine is running can create a fire or explosion hazard. Always stop engine before refueling machine and clean up any spilled fuel.

Always make sure that engine is stopped while hauling machine on a truck or trailer.

Contact with exhaust components while still hot can result in serious personal injury.

Avoid contact with these components until cooled to safe temperatures.

If service procedure requires engine to be running:

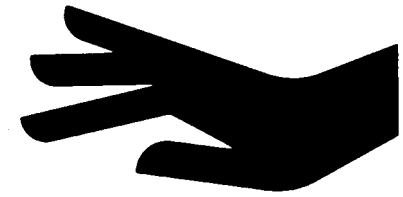
- Only engage power-driven parts required by service procedure
- Ensure that other people are clear of operator station and machine

Keep hands, feet, and clothing away from power-driven parts.

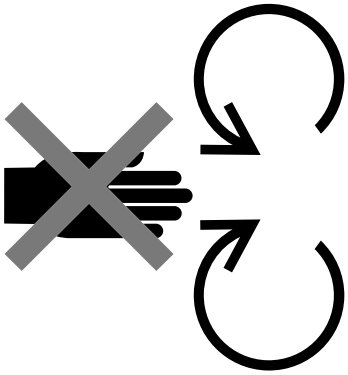
Always disable movement (neutral), set the parking brake or mechanism and disconnect power to attachments or tools before leaving the operator's station.

Shut off engine and remove key (if equipped) before leaving the machine unattended.

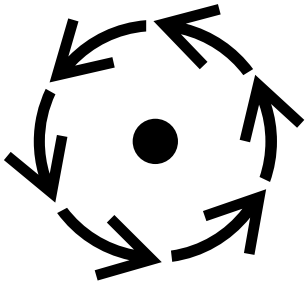
TS227 —UN—15APR13



TS1271 —UN—23AUG88



TS1693 —UN—09DEC09



TS1695 —UN—07DEC09

DX,EXHAUST,FILTER -19-12JAN11-1/1

Avoid Static Electricity Risk When Refueling

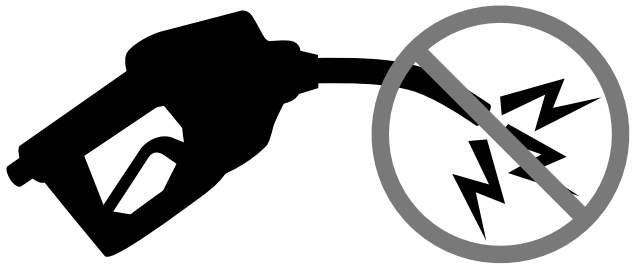
The removal of sulfur and other compounds in Ultra-Low Sulfur Diesel (ULSD) fuel decreases its conductivity and increases its ability to store a static charge.

Refineries may have treated the fuel with a static dissipating additive. However, there are many factors that can reduce the effectiveness of the additive over time.

Static charges can build up in ULSD fuel while it is flowing through fuel delivery systems. Static electricity discharge when combustible vapors are present could result in a fire or explosion.

Therefore, it is important to ensure that the entire system used to refuel your machine (fuel supply tank, transfer pump, transfer hose, nozzle, and others) is properly grounded and bonded. Consult with your fuel or fuel system supplier to ensure that the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

RG22142 —UN—17MAR14



RG21992 —UN—21AUG13

DX,FUEL,STATIC,ELEC -19-12JUL13-1/1

Interpreting Engine Serial Number

Each engine has a 13 digit John Deere engine serial number identifying the producing factory, engine model designation, and a 6 digit sequential number.

Engine Serial Number (A)

13.6 L Example (RG6136U123456)

RG ..... Factory Code Producing Engine

- RG..... Waterloo, Iowa, USA

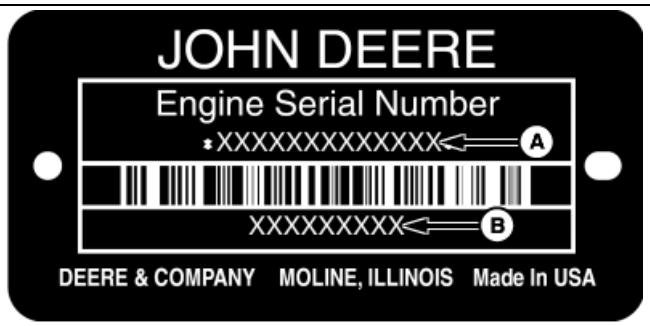
6136 ..... Number of Cylinders and Total Displacement

- 6136 ..... 6 Cylinders, 13.6 liters

U ..... Emission Certification

- B ..... Non-Certified
- C ..... Tier 1/Stage 1
- D ..... Tier 2/Stage II
- L ..... Tier 3/Stage III A
- R ..... Interim Tier 4/Stage III B
- U or V ..... Final Tier 4/Stage IV and Stage V

123456 ..... Engine Serial Number



H112201 —UN—06NOV14

Sample Engine Serial Number Plate

Engine Model Number (B)

13.6 L Example (6136HFC09)

6136 ..... Number of Cylinders and Total Displacement

- 6136 ..... 6 Cylinders, 13.6 liters

H ..... Engine Aspiration

- D ..... Naturally aspirated
- T ..... Turbocharged
- A ..... Turbocharged and aftercooled, air-to-coolant
- H ..... Turbocharged and aftercooled, air-to-air
- S ..... Turbocharged and aftercooled, air-to-sea water

F ..... User Type

- F ..... OEM (John Deere Power Systems
- XX ..... Other letters are used to identify John Deere Equipment manufacturing locations

C ..... Industrial

- C ..... Industrial
- G ..... Gen-Set

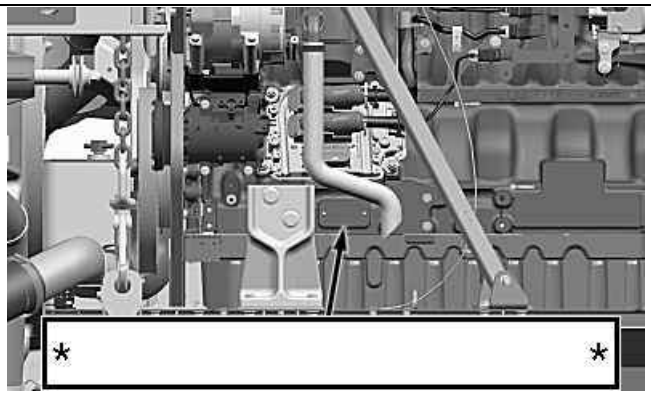
09 ..... Engine Configuration

- 09 ..... PSS (Series Turbochargers, DOC/DPF and SCR)
- 94 ..... PVX (Single VGT Turbocharger)
- 95 ..... PSX (Series Turbochargers and Aftertreatment)

RW67285,0004DD3 -19-06APR20-1/1

Engine Serial Number

Located on the front side of the engine.

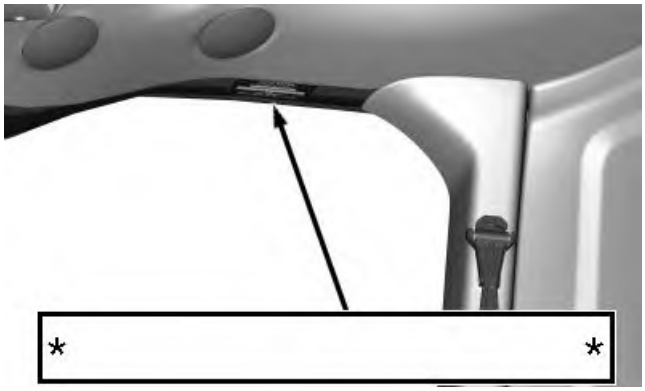


H127943 —UN—30OCT19

RW67285,0004DD4 -19-06APR20-1/1

Cab Serial Number

Located in the upper rear right-hand corner of the cab.

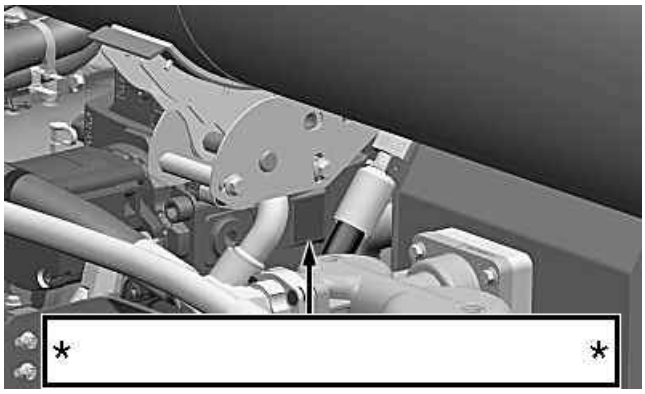


H121251 —UN—24APR17

RW67285,0004DD5 -19-06APR20-1/1

Hydrostatic Drive Pump

Located on the side of the hydrostatic drive pump.

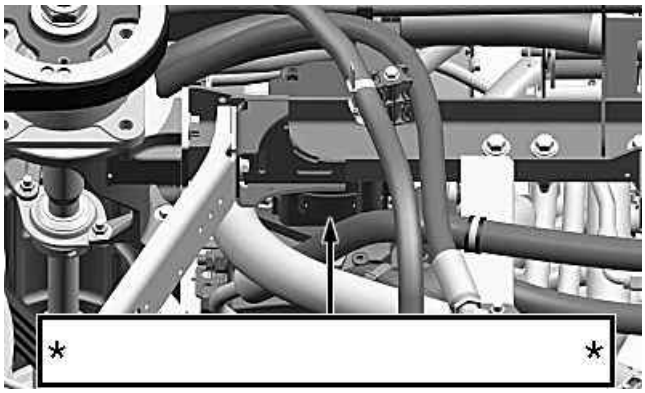


H127932 —UN—29OCT19

RW67285,0004DD6 -19-06APR20-1/1

Hydrostatic Drive Motor

Located on the bottom side of the hydrostatic drive motor.

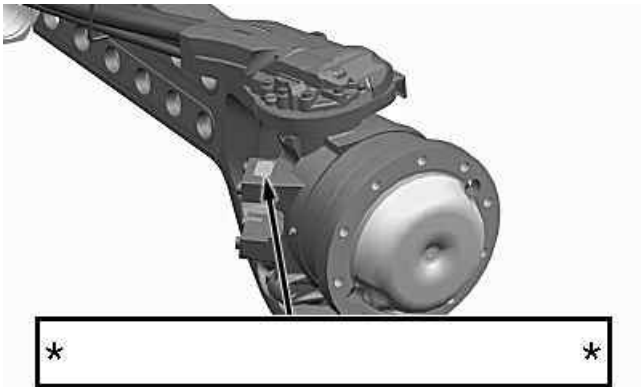


H127933 —UN—29OCT19

RW67285,0004DD7 -19-06APR20-1/1

Two Speed Four-Wheel Drive Motor

Located on the top side of the four-wheel drive motor.

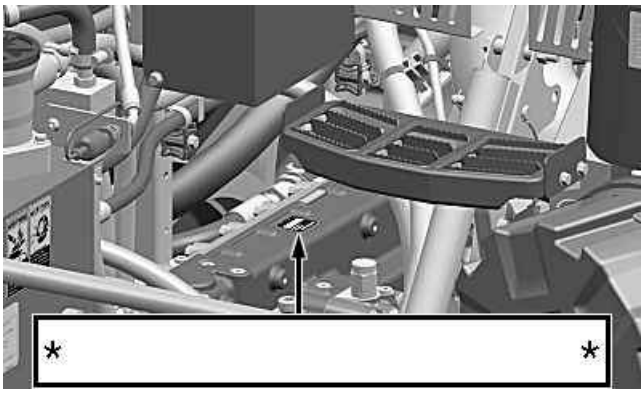


H127934 —UN—29OCT19

RW67285,0004DD8 -19-06APR20-1/1

Engine Gear Case

Located on the rear side of the engine gear case.

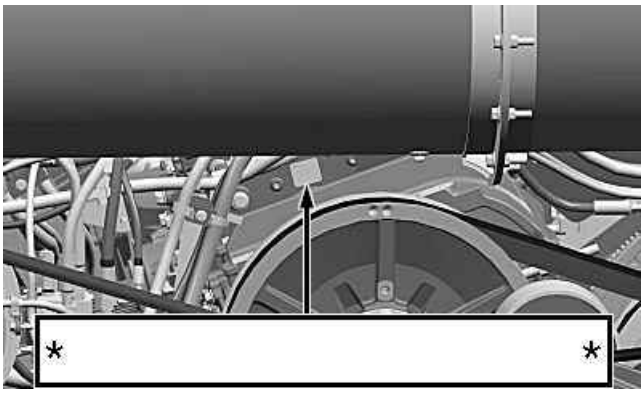


H127935 —UN—29OCT19

RW67285,0004DD9 -19-06APR20-1/1

Rotor Drive Gear Case

Located on the left-hand side of the rotor drive gear case.

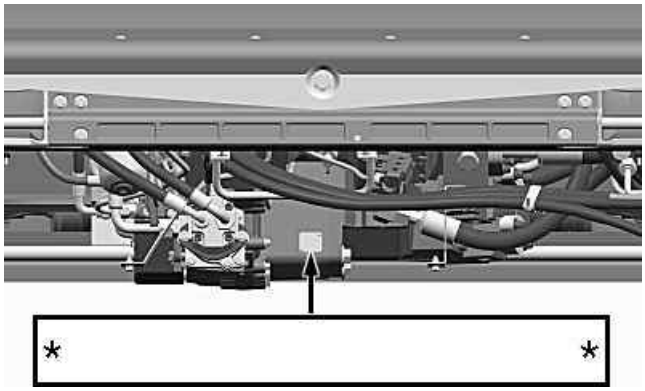


H127937 —UN—30OCT19

RW67285,0004DDA -19-06APR20-1/1

Transmission

Located on the front side of the transmission.

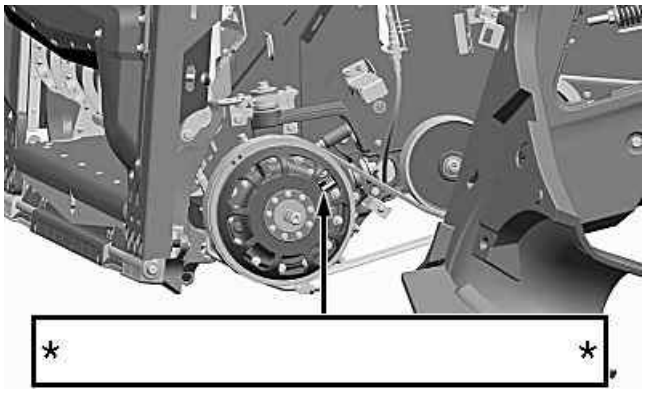


H127938 —UN—30OCT19

RW67285,0004DDB -19-06APR20-1/1

Feeder House Reverser

Located on the front of the feeder house reverser.

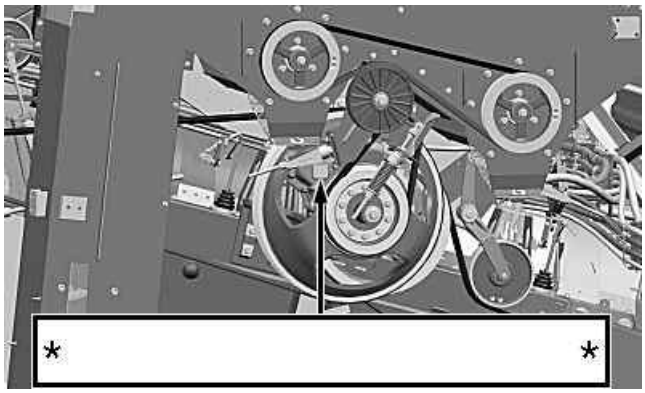


H127939 —UN—30OCT19

RW67285,0004DDC -19-06APR20-1/1

Feed Accelerator Gear Case

Located on the front of the feed accelerator gear case.

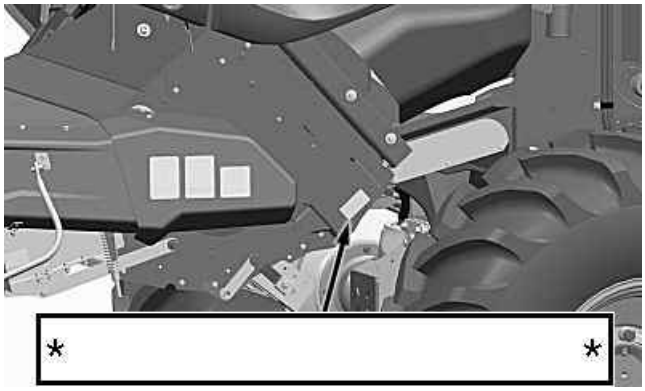


H127940 —UN—30OCT19

RW67285,0004DDD -19-06APR20-1/1

Chopper

Located on the left-hand side of the chopper.

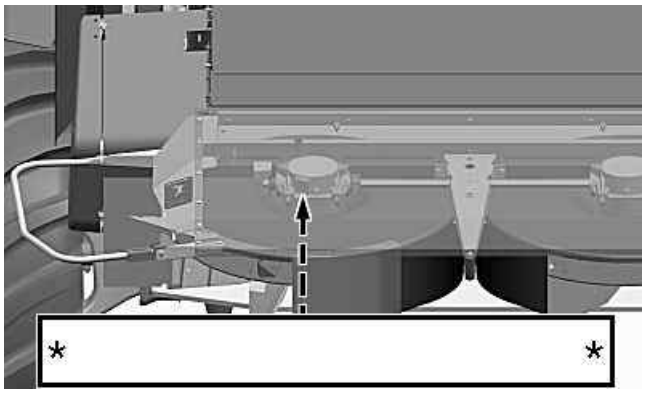


H127941 —UN—30OCT19

RW67285,0004DDE -19-06APR20-1/1

Spreader

Located on the left-hand inside of the spreader.



H127942 —UN—30OCT19

RW67285,0004DDF -19-06APR20-1/1

Operating Speeds

Speeds shown are average and can vary from machine to machine.

NOTE: Operating speed specifications and design subject to change without notice.

Engine Speeds		
Slow Speed	1200 rpm	
Medium Speed	1550 rpm	
High Speed	1900 rpm	
Separator Main Driver Speeds		
Slow Speed	1200 rpm	
Medium Speed	1550 rpm	
High Speed	1900 rpm	
Separator Speeds (Rotor Gear Case)	**Factory Belt Speed Ranges**	**Optimal Belt Life Speed Ranges[a]**
First Gear (Low Range)	300—520 rpm	300—450 rpm
Second Gear (Medium Range)	420—800 rpm	450—720 rpm
Third Gear (High Range)	720—1300 rpm	720—1300 rpm
Rethresher System Speed	904 rpm	
Feeder House Lower Shaft Speeds		
Fixed Speed (If Equipped)	520 rpm	
Variable Speed (If Equipped)	520—780 rpm	
Feed Accelerator Speeds (Standard Speed)		
1st Gear (Low Range)	440 rpm	
2nd Gear (High Range)	990 rpm	
Feed Accelerator Speeds (Optional Slow Speed)		
First Gear (Low Range)	310 rpm	
Second Gear (High Range)	700 rpm	
Discharge Beater Speed and Jackshaft Speed	1000 rpm	
Cleaning Shoe Speeds		
Standard Cleaning Fan Speed	570—1430 rpm	
Optional Slow Cleaning Fan Speed	350—800 rpm	
Shoe Drive Speed	292 rpm	
Elevator Speeds		
Clean Grain Elevator	415 rpm	
Clean Grain Loading Auger	432 rpm	
Tailings Elevator, Lower Auger	408 rpm	
Tailings Elevator, Upper Auger	408 rpm	
Unloading System Speeds (Separator Engaged)	**X9 1000 159 L/s (4.5 bu/s) Unload Rate**	**X9 1100 186 L/s (5.3 bu/s) Unload Rate**
Unloading System Countershaft	1721 rpm	1721 rpm
Unloading Auger Gearbox, Input Shaft	827 rpm	902 rpm
Unloading Vertical Auger	480 rpm	523 rpm

Continued on next page

Unloading System Speeds (Separator Engaged)	X9 1000 159 L/s (4.5 bu/s) Unload Rate	X9 1100 186 L/s (5.3 bu/s) Unload Rate
Unloading Outer Auger	480 rpm	523 rpm
Grain Tank Horizontal Augers (Front and Rear)	466 rpm	508 rpm
Chopper Speeds	**Fine Cut Chopper**	**Extra Fine Cut Chopper**
Chopper (Fixed Speed)	2400 rpm	3000 rpm
Chopper (Two-Speed)	1550/2400 rpm	1600/3000 rpm
Spreader Speeds	**Fine Cut Chopper (Spreader)**	**Extra Fine Cut Chopper (Spreader)**
Spreader (Fixed Speed)	**562 rpm**	**562 rpm**
Spreader (Two-Speed)	360/562 rpm	300/562 rpm

[a] *Staying within the optimal belt life speed ranges will increase the rotor variable belt life because the variable sheaves operate closer to a 1:1 ratio.*

RW67285,0004DB5 -19-06APR20-2/2

Specifications

NOTE: Specifications and design subject to change without notice.

Engine		
Make	John Deere	
Model	6136HX304 (13.6 L, Single Turbo, Tier 3/Stage IIIA) 6136HX303 (13.6 L, Series Turbos, Tier 3/Stage IIIA) 6136HX404 (13.6 L, Single Turbo, Final Tier 4) 6136HX403 (13.6 L, Series Turbos, Final Tier 4) 6136HX504 (13.6 L, Single Turbo, Stage V) 6136HX503 (13.6 L, Series Turbos, Stage V)	
Type	Six-Cylinder, In-Line, Valve-in-Head, Air-to-Air Aftercooled Diesel Turbocharged	
	X9 1000	**X9 1100**
Rated Power	410 kW (550 hp)	450 kW (603 hp)
Rated Speed	1900 rpm	1900 rpm
Power Boost at Rated Speed	40 kW (54 hp)	40 kW (54 hp)
Peak Power	470 kW (630 hp)	515 kW (690 hp)
Peak Power Speed (Rated Speed -200 rpm)	1700 rpm	
Displacement	13.6 L (830 in³)	
Firing Order	1-5-3-6-2-4	
Air Cleaner	Dry Type with Safety Element	

Continued on next page

Electrical System		
Battery Voltage	12 V	
Battery Terminal Grounded	Negative	
Alternator	330 A	
Transmission		
Speeds	ProDrive™ XL Transmission (Multi-Motor Transmission)	
Brakes		
Type	Multiple Wet Discs	
Feed Accelerator		
Number of Wings	40	
Separator Elements	**Left Rotor**	**Right Rotor**
Threshing Elements	15	15
Tines	26	26
Concave		
Number of Concaves	6 Coarse Grain 12 Small Grain	
Number of Bars Per Concave	23 Coarse Grain 19 Small Grain	
Separator	**Left Rotor**	**Right Rotor**
Number of Grates	4 Rows	4 Rows
Discharge Grate		
Number of Grates	1 Row	
Discharge Beater		
Number of Wings	60	
Grain Tank	**X9 1000**	**X9 1100**
Capacity	14 800 L (420 bu)	16 200 L (460 bu)
Peak Unloading Rate, 159 L/s (4.5 bu/s) Unload Rate	9540 L/min (270 bu/min)	Not Applicable
Peak Unloading Rate, 186 L/s (5.3 bu/s) Unload Rate	Not Applicable	11 160 L/min (318 bu/min)
Weight	**X9 1000**	**X9 1100**
Machine Weight [a]	27 000 kg (59 500 lb)	27 000 kg (59 500 lb)
Turning Radius [b]		
Rear Wheel Tread Width (Center-to-Center)	3.0—4.2 m (9 ft 10 in—13 ft 9 in)	
Turning Radius (0—2 Steering Stop Washers)	5.5—7.2 m (18 ft 0 in—23 ft 7 in)	
Capacities		
Fuel Tank		1250 L (330 gal)
Diesel Exhaust Fluid (DEF) Tank (Final Tier 4 and Stage V)		83 L (22 gal)
Cooling System with Heater (Tier 3/Stage IIIA)		68.6 L (72.5 qt)
Cooling System with Heater (Final Tier 4 and Stage V)		76.6 L (80.9 qt)
Engine Crankcase with Filter		57 L (60.23 qt) [c]
Final Drive (Per Unit)	Wheel Machines	8 L (8.46 qt)
	Track Machines	13.5 L (14.27 qt)
Loading Auger Gear Case (Fixed)		0.9 L (0.95 qt)
Loading Auger Gear Case (Pivoting)		0.9 L (0.95 qt)
Feed Accelerator Gear Case		2 L (2.11 qt)
Main Engine Gear Case		53 L (56 qt)

RW67285,0004DB6 -19-06APR20-2/2

Capacities		
Cleaning Fan Variable Speed Driven Bearing Cavity		0.1 L (0.11 qt)
Spreader Gear Case		0.75 L (0.79 qt)
Hydraulic/Hydrostatic Reservoir		91 L (96.16 qt)
Air Compressor (If Equipped)		
Reservoir Size	60 L (16 gal)	
Maximum Reservoir Pressure	827 kPa (8.27 bar) (120 psi)	
Air Compressor Flow	Slow Engine Speed	315 L/min (11.1 ft³/min)
	High Engine Speed	500 L/min (17.7 ft³/min)

[a]Weight is based on corn machine configuration with 1250 L (330 gal) of diesel fuel in the fuel tank, empty grain tank, with dual wheels, and no header attached.
[b]For detailed information on a specific configuration, please see your John Deere dealer.
[c]It is vital to maintain engine oil at correct levels. Always verify that oil level is at correct location on dipstick when servicing.

RW67285,0004DB6 -19-06APR20-3/2

Dimensions

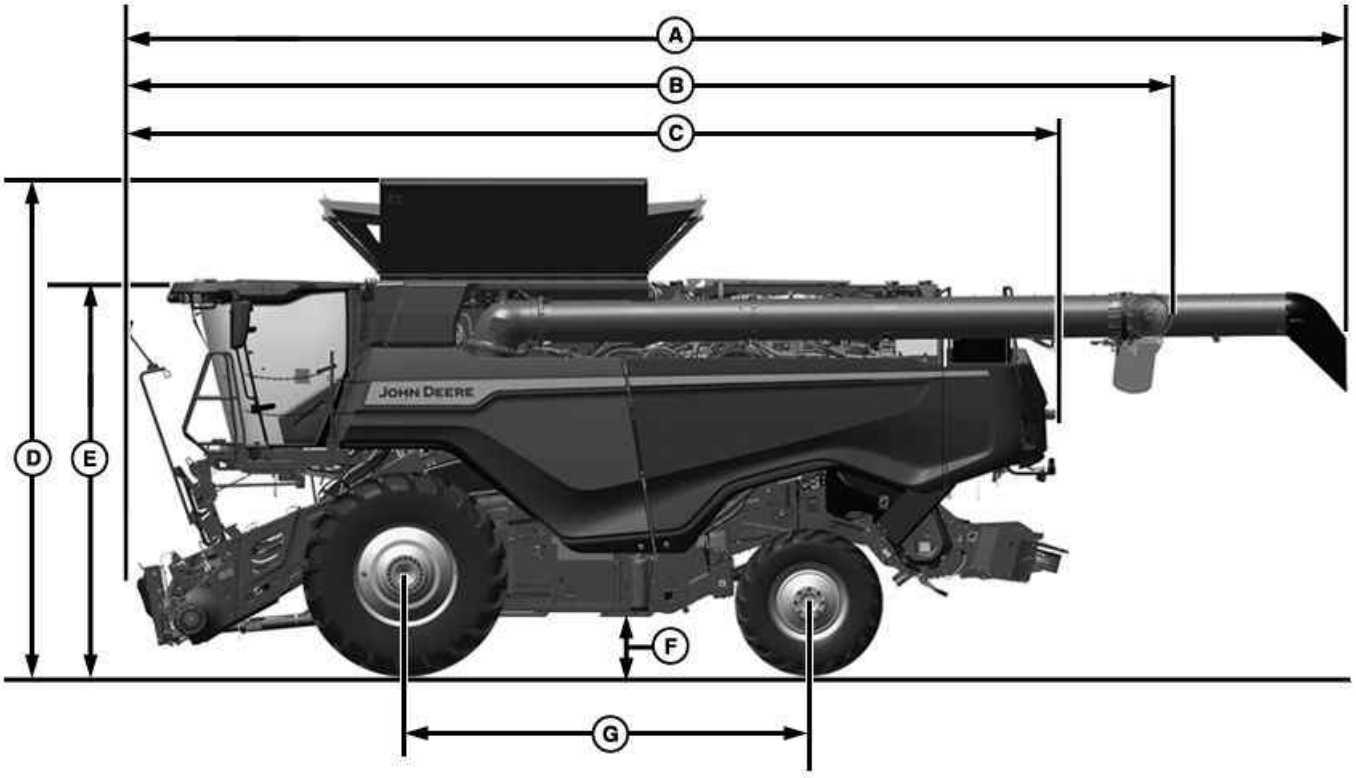
NOTE: Dimensions are approximate and subject to change without notice.

Legend	Dimension	
A	11.61 m (38 ft 1 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 11.76 m (38 ft 7 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 12.37 m (40 ft 7 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 13.13 m (43 ft 1 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
B	9.79 m (32 ft 4 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 9.79 m (32 ft 4 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 10.55 m (34 ft 7 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 11.31 m (37 ft 1 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
C	9.24 m (30 ft 4 in)	
D	4.82—4.96 m (15 ft 10 in—16 ft 3 in) with 14 800 L (420 bu) Covers 4.92—5.06 m (16 ft 2 in—16 ft 7 in) with 16 200 L (460 bu) Covers	
E	Top of Front Beacon Lights	Top of StarFire™ Receiver
	3.88—4.02 m (12 ft 9 in—13 ft 2 in)	3.90—4.04 m (12 ft 10 in—13 ft 3 in)
F	0.46—0.60 m (1 ft 6 in-—1 ft 11 in)	
G	4.10 m (13 ft 5 in)	
H	8.49 m (27 ft 10 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 8.63 m (28 ft 4 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 9.20 m (30 ft 2 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 9.91 m (32 ft 6 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
I	5.79—5.93 m (19 ft 0 in—19 ft 6 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 5.84—5.97 m (19 ft 2 in—19 ft 7 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 6.00—6.15 m (19 ft 8 in—20 ft 2 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 6.22—6.36 m (20 ft 5 in—20 ft 10 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
J	4.88—5.01 m (16 ft 0 in—16 ft 5 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 4.92—5.06 m (16 ft 2 in—16 ft 7 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 5.09—5.23 m (16 ft 8 in—17 ft 2 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 5.31—5.44 m (17 ft 5 in—17 ft 10 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
K [a]	5.07—5.21 m (16 ft 8 in—17 ft 1 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 5.11—5.25 m (16 ft 9 in—17 ft 3 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 5.29—5.42 m (17 ft 4 in—17 ft 9 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 5.50—5.64 m (18 ft 1 in—18 ft 8 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
L [b]	Front Tires	Rear Tires
	3.92—5.68 m (12 ft 10 in—18 ft 8 in)	3.83—4.92 m (12 ft 7 in—16 ft 2 in)

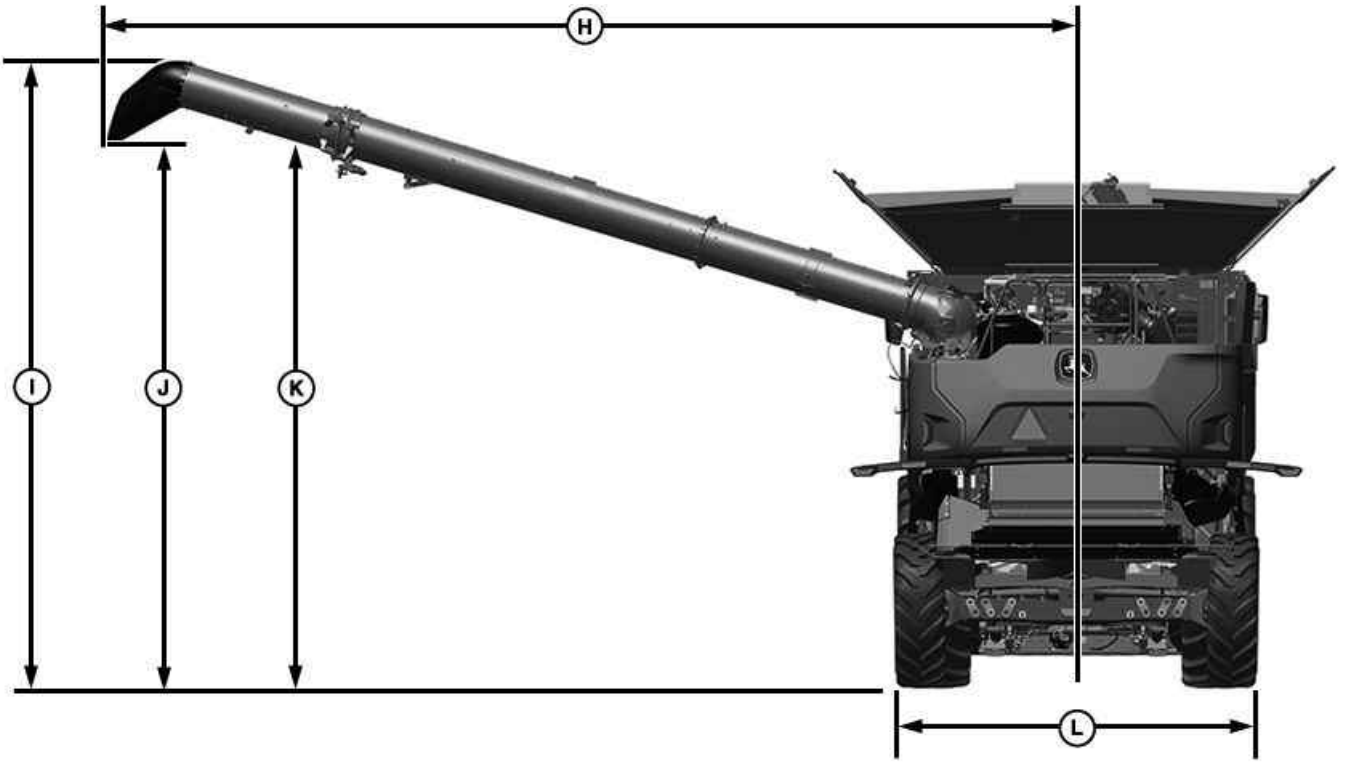
[a] Dimension is measured 1.22 m (4 ft) from the grain spill point. This represents the unloading auger when centered over the grain cart.
[b] Due to the different tire configurations, row spacings, axle configurations, wheel offsets, axle positions, and spindles types, machine widths vary. Measurements given in chart are for minimum and maximum widths. For more detailed width information, see your John Deere dealer.

RW67285,0004DB7 -19-06APR20-1/1

Dimension Reference Points



H128018 —UN—15NOV19



H128019 —UN—15NOV19

RW67285,0004DB8 -19-06APR20-1/1

CARB Non-road Emissions Control Warranty Statement—Compression Ignition

Emissions Control Warranty Statement 2019 through 2021

DXLOGOV1 —UN—28APR09

JOHN DEERE

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the “Emission Control Information” label located on the engine. If the engine is operated in the United States or Canada and the engine label states: “This engine complies with US EPA regulations for nonroad and stationary diesel engines”, or “This engine complies with US EPA regulations for stationary emergency diesel engines”, refer to the “U.S. and Canada Emission Control Warranty Statement.” If the engine is operated in California, and the engine label states: “This engine complies with US EPA and CARB regulations for nonroad diesel engines” also refer to the “California Emissions Control Warranty Statement.”

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emission-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2019 through 2021 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State’s stringent anti-smog standards. John Deere must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine was designed, built, and equipped so as to conform at the time of sale with all applicable regulations adopted by CARB and is free from defects in materials and workmanship which would cause the failure of a warranted part to be identical in all material respects to the part as described in John Deere's application for certification for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first for all engines rated at 19 kW and greater. In the absence of a device to measure hours of use, the engine shall be warranted for a period of five years.

EMISSIONS WARRANTY EXCLUSIONS:

John Deere may deny warranty claims for failures caused by the use of an add-on or modified part which has not been exempted by the CARB. A modified part is an aftermarket part intended to replace an original emission-related part which is not functionally identical in all respects and which in any way affects emissions. An add-on part is any aftermarket part which is not a modified part or a replacement part.

In no event will John Deere, any authorized engine distributor, dealer, or repair facility, or any company affiliated with John Deere be liable for incidental or consequential damage.

Continued on next page

DX,EMISSIONS,CARB -19-26AUG20-1/8

JOHN DEERE'S WARRANTY RESPONSIBILITY:

Where a warrantable condition exists, John Deere will repair or replace, as it elects, your off-road diesel engine at no cost to you, including diagnosis, parts or labor. Warranty coverage is subject to the limitations and exclusions set forth herein. The off-road diesel engine is warranted for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. The following are emissions-related parts:

Air Induction System

- Intake manifold
- Turbocharger
- Charge air cooler

Fuel Metering system

- Fuel injection system

Exhaust Gas Recirculation

- EGR valve

Catalyst or Thermal Reactor Systems

- Catalytic converter
- Exhaust manifold

Emission control labels

Particulate Controls

- Any device used to capture particulate emissions
- Any device used in the regeneration of the capturing system
- Enclosures and manifolding
- Smoke Puff Limiters

Positive Crankcase Ventilation (PCV) System

- PCV valve
- Oil filler cap

Advanced Oxides of Nitrogen (NOx) Controls

- NOx absorbers and catalysts

SCR systems and urea containers/dispensing systems

Miscellaneous Items used in Above Systems

- Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware

Any warranted emissions-related part scheduled for replacement as required maintenance is warranted by John Deere for the period of time prior to the first scheduled replacement point for the part. Any warranted emissions-related part not scheduled for replacement as required maintenance or scheduled only for regular inspection is warranted by John Deere for the stated warranty period.

OWNER'S WARRANTY RESPONSIBILITIES:

As the off-road diesel engine owner you are responsible for the performance of the required maintenance listed in your Operator’s Manual. John Deere recommends that the owner retain all receipts covering maintenance on the off-road diesel engine, but John Deere cannot deny warranty solely for the lack of receipts or for the owner’s failure to ensure the performance of all scheduled maintenance. However, as the off-road diesel engine owner, you should be aware that John Deere may deny you warranty coverage if your off-road diesel engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel may result in the engine no longer operating in compliance with applicable emissions requirements.

The owner is responsible for initiating the warranty process, and should present the machine to the nearest authorized John Deere dealer as soon as a problem is suspected. The warranty repairs should be completed by the authorized John Deere dealer as quickly as possible.

Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

Emission_CI_CARB (01Feb17)

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DX,EMISSIONS,CARB -19-26AUG20-2/8

Emissions Control Warranty Statement 2019 through 2021

DXLOGOV1 —UN—28APR09

JOHN DEERE

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the “Emission Control Information” label located on the engine. If the engine is operated in the United States or Canada and the engine label states: “This engine complies with US EPA regulations for nonroad and stationary diesel engines”, or “This engine complies with US EPA regulations for stationary emergency diesel engines”, refer to the “U.S. and Canada Emission Control Warranty Statement.” If the engine is operated in California, and the engine label states: “This engine complies with US EPA and CARB regulations for nonroad diesel engines” also refer to the “California Emissions Control Warranty Statement.”

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emission-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2019 through 2021 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State’s stringent anti-smog standards. John Deere must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine was designed, built, and equipped so as to conform at the time of sale with all applicable regulations adopted by CARB and is free from defects in materials and workmanship which would cause the failure of a warranted part to be identical in all material respects to the part as described in John Deere's application for certification for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first for all engines rated at 19 kW and greater. In the absence of a device to measure hours of use, the engine shall be warranted for a period of five years.

EMISSIONS WARRANTY EXCLUSIONS:

John Deere may deny warranty claims for failures caused by the use of an add-on or modified part which has not been exempted by the CARB. A modified part is an aftermarket part intended to replace an original emission-related part which is not functionally identical in all respects and which in any way affects emissions. An add-on part is any aftermarket part which is not a modified part or a replacement part.

In no event will John Deere, any authorized engine distributor, dealer, or repair facility, or any company affiliated with John Deere be liable for incidental or consequential damage.

RG29280 —UN—02FEB17

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DX,EMISSIONS,CARB -19-26AUG20-3/8

JOHN DEERE'S WARRANTY RESPONSIBILITY:

Where a warrantable condition exists, John Deere will repair or replace, as it elects, your off-road diesel engine at no cost to you, including diagnosis, parts or labor. Warranty coverage is subject to the limitations and exclusions set forth herein. The off-road diesel engine is warranted for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. The following are emissions-related parts:

Air Induction System

- Intake manifold
- Turbocharger
- Charge air cooler

Fuel Metering system

- Fuel injection system

Exhaust Gas Recirculation

- EGR valve

Catalyst or Thermal Reactor Systems

- Catalytic converter
- Exhaust manifold

Emission control labels

Particulate Controls

- Any device used to capture particulate emissions
- Any device used in the regeneration of the capturing system
- Enclosures and manifolding
- Smoke Puff Limiters

Positive Crankcase Ventilation (PCV) System

- PCV valve
- Oil filler cap

Advanced Oxides of Nitrogen (NOx) Controls

- NOx absorbers and catalysts

SCR systems and urea containers/dispensing systems

Miscellaneous Items used in Above Systems

- Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware

Any warranted emissions-related part scheduled for replacement as required maintenance is warranted by John Deere for the period of time prior to the first scheduled replacement point for the part. Any warranted emissions-related part not scheduled for replacement as required maintenance or scheduled only for regular inspection is warranted by John Deere for the stated warranty period.

OWNER'S WARRANTY RESPONSIBILITIES:

As the off-road diesel engine owner you are responsible for the performance of the required maintenance listed in your Operator's Manual. John Deere recommends that the owner retain all receipts covering maintenance on the off-road diesel engine, but John Deere cannot deny warranty solely for the lack of receipts or for the owner's failure to ensure the performance of all scheduled maintenance. However, as the off-road diesel engine owner, you should be aware that John Deere may deny you warranty coverage if your off-road diesel engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel may result in the engine no longer operating in compliance with applicable emissions requirements.

The owner is responsible for initiating the warranty process, and should present the machine to the nearest authorized John Deere dealer as soon as a problem is suspected. The warranty repairs should be completed by the authorized John Deere dealer as quickly as possible.

Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

Emission_CI_CARB (01Feb17)

RG29281 —UN—27FEB17

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DX,EMISSIONS,CARB -19-26AUG20-4/8

Emissions Control Warranty Statement 2022 through 2024

DXLOGOV1 —UN—28APR09

JOHN DEERE

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the “Emission Control Information” label located on the engine. If the engine is operated in the United States or Canada and the engine label states: “This engine complies with US EPA regulations for nonroad and stationary diesel engines”, or “This engine complies with US EPA regulations for stationary emergency diesel engines”, refer to the “U.S. and Canada Emission Control Warranty Statement.” If the engine is operated in California, and the engine label states: “This engine complies with US EPA and California regulations for nonroad/off-road diesel engines” also refer to the “California Emissions Control Warranty Statement.”

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emission-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2022 through 2024 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State’s stringent anti-smog standards. John Deere must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine was designed, built, and equipped so as to conform at the time of sale with all applicable regulations adopted by CARB. John Deere warrants that this engine is free from defects in materials and workmanship which would cause the failure of emissions warrantied parts to be identical in all material respects to the part as described in John Deere's application for certification for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. This applies to all engines rated at 19 kW and greater. In the absence of a device to measure hours of use, the engine shall be warranted for a period of five years.

EMISSIONS WARRANTY EXCLUSIONS:

John Deere may deny warranty claims for failures caused by the use of an add-on or modified part which has not been exempted by the CARB. A modified part is an aftermarket part intended to replace an original emission-related part which is not functionally identical in all respects and which in any way affects emissions. An add-on part is any aftermarket part which is not a modified part or a replacement part.

In no event will John Deere, any authorized engine distributor, dealer, or repair facility, or any company affiliated with John Deere be liable for incidental or consequential damage.

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DX,EMISSIONS,CARB -19-26AUG20-5/8

JOHN DEERE'S WARRANTY RESPONSIBILITY:

Where a warrantable condition exists, John Deere will repair or replace, as it elects, your off-road diesel engine at no cost to you, including diagnosis, parts or labor. Warranty coverage is subject to the limitations and exclusions set forth herein. The off-road diesel engine is warranted for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. The following are emissions-related parts:

Air Induction System

- Intake manifold
- Turbocharger
- Charge air cooler

Fuel Metering system

- Fuel injection system

Exhaust Gas Recirculation

- EGR valve

Catalyst or Thermal Reactor Systems

- Catalytic converter
- Exhaust manifold

Emission control labels

Particulate Controls

- Any device used to capture particulate emissions
- Any device used in the regeneration of the capturing system
- Enclosures and manifolding
- Smoke Puff Limiters

Positive Crankcase Ventilation (PCV) System

- PCV valve
- Oil filler cap

Advanced Oxides of Nitrogen (NOx) Controls

- NOx absorbers and catalysts

SCR systems and urea containers/dispensing systems

Miscellaneous Items used in Above Systems

- Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware

Any warranted emissions-related part scheduled for replacement as required maintenance is warranted by John Deere for the period of time prior to the first scheduled replacement point for the part. Any warranted emissions-related part not scheduled for replacement as required maintenance or scheduled only for regular inspection is warranted by John Deere for the stated warranty period.

OWNER'S WARRANTY RESPONSIBILITIES:

As the off-road diesel engine owner you are responsible for the performance of the required maintenance listed in your Operator’s Manual. John Deere recommends that the owner retain all receipts covering maintenance on the off-road diesel engine, but John Deere cannot deny warranty solely for the lack of receipts or for the owner’s failure to ensure the performance of all scheduled maintenance. However, as the off-road diesel engine owner, you should be aware that John Deere may deny you warranty coverage if your off-road diesel engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel may result in the engine no longer operating in compliance with applicable emissions requirements.

The owner is responsible for initiating the warranty process, and should present the machine to the nearest authorized John Deere dealer as soon as a problem is suspected. The warranty repairs should be completed by the authorized John Deere dealer as quickly as possible.

Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

Emission_CI_CARB (14Apr20)

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DX,EMISSIONS,CARB -19-26AUG20-6/8

Emissions Control Warranty Statement 2022 through 2024

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JOHN DEERE

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the "Emission Control Information" label located on the engine. If the engine is operated in the United States or Canada and the engine label states: "This engine complies with US EPA regulations for nonroad and stationary diesel engines", or "This engine complies with US EPA regulations for stationary emergency diesel engines", refer to the "U.S. and Canada Emission Control Warranty Statement." If the engine is operated in California, and the engine label states: "This engine complies with US EPA and California regulations for nonroad/off-road diesel engines" also refer to the "California Emissions Control Warranty Statement."

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emission-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

CALIFORNIA EMISSIONS CONTROL WARRANTY STATEMENT:

The California Air Resources Board (CARB) is pleased to explain the emission-control system warranty on 2022 through 2024 off-road diesel engines. In California, new off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. John Deere must warrant the emission control system on your engine for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your engine.

Your emission control system may include parts such as the fuel injection system and the air induction system. Also included may be hoses, belts, connectors and other emission-related assemblies.

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine was designed, built, and equipped so as to conform at the time of sale with all applicable regulations adopted by CARB. John Deere warrants that this engine is free from defects in materials and workmanship which would cause the failure of emissions warrantied parts to be identical in all material respects to the part as described in John Deere's application for certification for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. This applies to all engines rated at 19 kW and greater. In the absence of a device to measure hours of use, the engine shall be warranted for a period of five years.

EMISSIONS WARRANTY EXCLUSIONS:

John Deere may deny warranty claims for failures caused by the use of an add-on or modified part which has not been exempted by the CARB. A modified part is an aftermarket part intended to replace an original emission-related part which is not functionally identical in all respects and which in any way affects emissions. An add-on part is any aftermarket part which is not a modified part or a replacement part.

In no event will John Deere, any authorized engine distributor, dealer, or repair facility, or any company affiliated with John Deere be liable for incidental or consequential damage.

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DX,EMISSIONS,CARB -19-26AUG20-7/8

JOHN DEERE'S WARRANTY RESPONSIBILITY:

Where a warrantable condition exists, John Deere will repair or replace, as it elects, your off-road diesel engine at no cost to you, including diagnosis, parts or labor. Warranty coverage is subject to the limitations and exclusions set forth herein. The off-road diesel engine is warranted for a period of five years from the date the engine is delivered to an ultimate purchaser or 3,000 hours of operation, whichever occurs first. The following are emissions-related parts:

Air Induction System

- Intake manifold
- Turbocharger
- Charge air cooler

Fuel Metering system

- Fuel injection system

Exhaust Gas Recirculation

- EGR valve

Catalyst or Thermal Reactor Systems

- Catalytic converter
- Exhaust manifold

Emission control labels

Particulate Controls

- Any device used to capture particulate emissions
- Any device used in the regeneration of the capturing system
- Enclosures and manifolding
- Smoke Puff Limiters

Positive Crankcase Ventilation (PCV) System

- PCV valve
- Oil filler cap

Advanced Oxides of Nitrogen (NOx) Controls

- NOx absorbers and catalysts

SCR systems and urea containers/dispensing systems

Miscellaneous Items used in Above Systems

- Electronic control units, sensors, actuators, wiring harnesses, hoses, connectors, clamps, fittings, gasket, mounting hardware

Any warranted emissions-related part scheduled for replacement as required maintenance is warranted by John Deere for the period of time prior to the first scheduled replacement point for the part. Any warranted emissions-related part not scheduled for replacement as required maintenance or scheduled only for regular inspection is warranted by John Deere for the stated warranty period.

OWNER'S WARRANTY RESPONSIBILITIES:

As the off-road diesel engine owner you are responsible for the performance of the required maintenance listed in your Operator's Manual. John Deere recommends that the owner retain all receipts covering maintenance on the off-road diesel engine, but John Deere cannot deny warranty solely for the lack of receipts or for the owner's failure to ensure the performance of all scheduled maintenance. However, as the off-road diesel engine owner, you should be aware that John Deere may deny you warranty coverage if your off-road diesel engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel may result in the engine no longer operating in compliance with applicable emissions requirements.

The owner is responsible for initiating the warranty process, and should present the machine to the nearest authorized John Deere dealer as soon as a problem is suspected. The warranty repairs should be completed by the authorized John Deere dealer as quickly as possible.

Emissions regulations require the customer to bring the unit to an authorized servicing dealer when warranty service is required. As a result, John Deere is NOT liable for travel or mileage on emissions warranty service calls.

Emission_CI_CARB (14Apr20)

RG32759 —UN—19AUG20

DX,EMISSIONS,CARB -19-26AUG20-8/8

EPA Non-road Emissions Control Warranty Statement—Compression Ignition

DXLOGOV1 —UN—28APR09

JOHN DEERE

U.S. AND CANADA EMISSION CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the "Emissions Control Information" label located on the engine. If the engine is operated in the United States or Canada and the Emissions Control information label states: "This engine complies with US EPA regulations for nonroad and stationary diesel engines", or "This engine conforms to US EPA nonroad compression-ignition regulations", refer to the "U.S. and Canada Emission Control Warranty Statement." If the engine is operated in California, and the label states: "This engine complies with US EPA and CARB regulations for nonroad diesel engines", or "This engine conforms to US EPA and California nonroad compression-ignition emission regulations", also refer to the "California Emission Control Warranty Statement."

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emissions-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

JOHN DEERE'S WARRANTY RESPONSIBILITY

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine including all parts of its emission-control system was designed, built and equipped so as to conform at the time of the sale with Section 213 of the Clean Air Act and is free from defects in materials and workmanship which would cause the engine to fail to conform with applicable US EPA regulations for a period of five years from the date the engine is placed into service or 3,000 hours of operation, whichever first occurs.

Where a warrantable condition exists, John Deere will repair or replace, as it elects, any part or component with a defect in materials or workmanship that would increase the engine's emissions of any regulated pollutant within the stated warranty period at no cost to you, including expenses related to diagnosing and repairing or replacing emission-related parts. Warranty coverage is subject to the limitations and exclusions set forth herein. Emission- related components include engine parts developed to control emissions related to the following:

Air-Induction System
Fuel System
Ignition System
Exhaust Gas Recirculation Systems
Aftertreatment Devices
Crankcase Ventilation Valves
Sensors
Engine Electronic Control Units

EMISSION WARRANTY EXCLUSIONS

John Deere may deny warranty claims for malfunctions or failures caused by:

- Non-performance of maintenance requirements listed in the Operator's Manual
- The use of the engine/equipment in a manner for which it was not designed
- Abuse, neglect, improper maintenance or unapproved modifications or alterations
- Accidents for which it does not have responsibility or by acts of God

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel can harm the emissions control system of the engine/equipment and is not approved for use.

To the extent permitted by law John Deere is not liable for damage to other engine components caused by a failure of an emission-related part, unless otherwise covered by standard warranty.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. REMEDIES UNDER THIS WARRANTY ARE LIMITED TO THE PROVISIONS OF MATERIAL AND SERVICES AS SPECIFIED HEREIN. WHERE PERMITTED BY LAW, NEITHER JOHN DEERE NOR ANY AUTHORIZED JOHN DEERE ENGINE DISTRIBUTOR, DEALER, OR REPAIR FACILITY OR ANY COMPANY AFFILIATED WITH JOHN DEERE WILL BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Emission_CI_EPA (18Dec09)

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DX,EMISSIONS,EPA -19-12DEC12-1/2

JOHN DEERE

U.S. AND CANADA EMISSION CONTROL WARRANTY STATEMENT
YOUR WARRANTY RIGHTS AND OBLIGATIONS

To determine if the John Deere engine qualifies for the additional warranties set forth below, look for the "Emissions Control Information" label located on the engine. If the engine is operated in the United States or Canada and the Emissions Control information label states: "This engine complies with US EPA regulations for nonroad and stationary diesel engines", or "This engine conforms to US EPA nonroad compression-ignition regulations", refer to the "U.S. and Canada Emission Control Warranty Statement." If the engine is operated in California, and the label states: "This engine complies with US EPA and CARB regulations for nonroad diesel engines", or "This engine conforms to US EPA and California nonroad compression-ignition emission regulations", also refer to the "California Emission Control Warranty Statement."

Warranties stated on this certificate refer only to emissions-related parts and components of your engine. The complete engine warranty, less emissions-related parts and components, is provided separately. If you have any questions about your warranty rights and responsibilities, you should contact John Deere at 1-319-292-5400.

JOHN DEERE'S WARRANTY RESPONSIBILITY

John Deere warrants to the ultimate purchaser and each subsequent purchaser that this off-road diesel engine including all parts of its emission-control system was designed, built and equipped so as to conform at the time of the sale with Section 213 of the Clean Air Act and is free from defects in materials and workmanship which would cause the engine to fail to conform with applicable US EPA regulations for a period of five years from the date the engine is placed into service or 3,000 hours of operation, whichever first occurs.

Where a warrantable condition exists, John Deere will repair or replace, as it elects, any part or component with a defect in materials or workmanship that would increase the engine's emissions of any regulated pollutant within the stated warranty period at no cost to you, including expenses related to diagnosing and repairing or replacing emission-related parts. Warranty coverage is subject to the limitations and exclusions set forth herein. Emission- related components include engine parts developed to control emissions related to the following:

Air-Induction System
Fuel System
Ignition System
Exhaust Gas Recirculation Systems
Aftertreatment Devices
Crankcase Ventilation Valves
Sensors
Engine Electronic Control Units

EMISSION WARRANTY EXCLUSIONS

John Deere may deny warranty claims for malfunctions or failures caused by:

- Non-performance of maintenance requirements listed in the Operator's Manual
- The use of the engine/equipment in a manner for which it was not designed
- Abuse, neglect, improper maintenance or unapproved modifications or alterations
- Accidents for which it does not have responsibility or by acts of God

The off-road diesel engine is designed to operate on diesel fuel as specified in the Fuels, Lubricants and Coolants section in the Operators Manual. Use of any other fuel can harm the emissions control system of the engine/equipment and is not approved for use.

To the extent permitted by law John Deere is not liable for damage to other engine components caused by a failure of an emission-related part, unless otherwise covered by standard warranty.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. REMEDIES UNDER THIS WARRANTY ARE LIMITED TO THE PROVISIONS OF MATERIAL AND SERVICES AS SPECIFIED HEREIN. WHERE PERMITTED BY LAW, NEITHER JOHN DEERE NOR ANY AUTHORIZED JOHN DEERE ENGINE DISTRIBUTOR, DEALER, OR REPAIR FACILITY OR ANY COMPANY AFFILIATED WITH JOHN DEERE WILL BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

Emission_CI_EPA (18Dec09)

TS1721 —UN—15JUL13

DX,EMISSIONS,EPA -19-12DEC12-2/2

Limited Battery Warranty

NOTE: Applicable in North America only. For complete machine warranty, reference a copy of the John Deere warranty statement. Contact your John Deere dealer to obtain a copy.

To Secure Warranty Service

The purchaser must request warranty service from a John Deere dealer authorized to sell John Deere batteries, and present the battery to the dealer with the top cover plate codes intact.

Free Replacement

Any new battery which becomes unserviceable (not merely discharged) due to defects in material or workmanship within 90 days of purchase will be replaced free of charge. Installation costs will be covered by warranty if (1) the unserviceable battery was installed by a John Deere factory or dealer, (2) failure occurs within 90 days of purchase, and (3) the replacement battery is installed by a John Deere dealer.

Pro Rata Adjustment

Any new battery which becomes unserviceable (not merely discharged) due to defects in material or workmanship more than 90 days after purchase, but before the expiration of the applicable adjustment period, will be replaced upon payment of the battery's current list price less a pro rata credit for unused months of service. The applicable adjustment period is determined from the Warranty Code printed at the top of the battery and chart below. Installation costs are not covered by warranty after 90 days from the date of purchase.

This Warranty Does Not Cover

Breakage of the container, cover, or terminals.

Depreciation or damage caused by lack of reasonable and necessary maintenance or by improper maintenance.

Transportation, mailing, or service call charges for warranty service.

Limitation of Implied Warranties and Purchaser's Remedies

To the extent permitted by law, neither John Deere nor any company affiliated with it makes any warranties, representations or promises as to the quality, performance or freedom from defect of the products covered by this warranty. IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, TO THE EXTENT APPLICABLE, SHALL BE LIMITED IN DURATION TO THE APPLICABLE ADJUSTMENT PERIOD SET FORTH HERE. THE PURCHASER'S ONLY REMEDIES IN CONNECTION WITH THE BREACH OR PERFORMANCE OF ANY WARRANTY ON JOHN DEERE BATTERIES ARE THOSE SET FORTH HERE. IN NO EVENT WILL THE DEALER, JOHN DEERE OR ANY COMPANY AFFILIATED WITH JOHN DEERE BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. (Note: Some states do not allow limitations on how long an implied warranty lasts or the exclusion or limitation of incidental or consequential damages. So these limitations and exclusions may not apply to you.) This warranty gives you specific legal rights, and you may also have some rights which vary from state to state.

No Dealer Warranty

The selling dealer makes no warranty of it's own and the dealer has no authority to make any representation or promise on behalf of John Deere, or to modify the terms or limitations of this warranty in any way.

Pro Rata Months of Adjustment

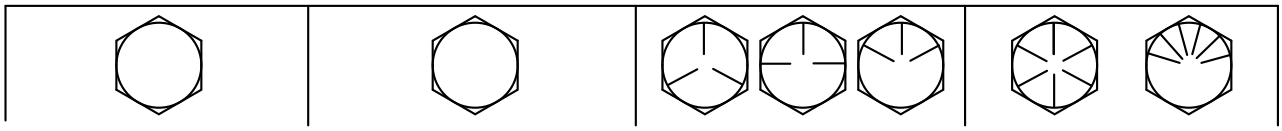
Warranty Code	Warranty Period
A	40 Months
B	36 Months
C	24 Months

NOTE: If your battery is not labeled with a warranty code, it is a warranty code "B".

DX,BATWAR,NA -19-16APR92-1/1

Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



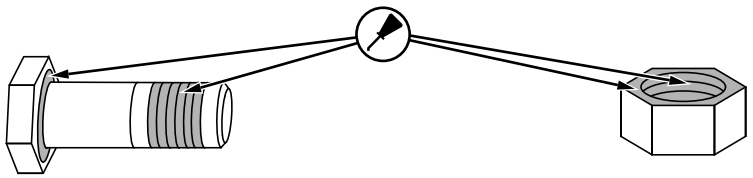
Bolt or Screw Size	SAE Grade 1[a]				SAE Grade 2[b]				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]	
	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in
1/4	3.1	27.3	3.2	28.4	5.1	45.5	5.3	47.3	7.9	70.2	8.3	73.1	11.2	99.2	11.6	103
													N·m	lb·ft	N·m	lb·ft
5/16	6.1	54.1	6.5	57.7	10.2	90.2	10.9	96.2	15.7	139	16.8	149	22.2	16.4	23.7	17.5
									N·m	lb·ft	N·m	lb·ft				
3/8	10.5	93.6	11.5	102	17.6	156	19.2	170	27.3	20.1	29.7	21.9	38.5	28.4	41.9	30.9
					N·m	lb·ft	N·m	lb·ft								
7/16	16.7	148	18.4	163	27.8	20.5	30.6	22.6	43	31.7	47.3	34.9	60.6	44.7	66.8	49.3
	N·m	lb·ft	N·m	lb·ft												
1/2	25.9	19.1	28.2	20.8	43.1	31.8	47	34.7	66.6	49.1	72.8	53.7	94	69.3	103	75.8
9/16	36.7	27.1	40.5	29.9	61.1	45.1	67.5	49.8	94.6	69.8	104	77	134	98.5	148	109
5/8	51	37.6	55.9	41.2	85	62.7	93.1	68.7	131	96.9	144	106	186	137	203	150
3/4	89.5	66	98	72.3	149	110	164	121	230	170	252	186	325	240	357	263
7/8	144	106	157	116	144	106	157	116	370	273	405	299	522	385	572	422
1	216	159	236	174	216	159	236	174	556	410	609	449	785	579	860	634
1-1/8	305	225	335	247	305	225	335	247	685	505	751	554	1110	819	1218	898
1-1/4	427	315	469	346	427	315	469	346	957	706	1051	775	1552	1145	1703	1256
1-3/8	564	416	618	456	564	416	618	456	1264	932	1386	1022	2050	1512	2248	1658
1-1/2	743	548	815	601	743	548	815	601	1665	1228	1826	1347	2699	1991	2962	2185

The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench.
DO NOT use these values if a different torque value or tightening procedure is given for a specific application.
For lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original.

- Make sure that fastener threads are clean.
- Apply a thin coat of Hy-Gard™ or equivalent oil under the head and on the threads of the fastener, as shown in the following image.
- Be conservative with the amount of oil to reduce the potential for hydraulic lockup in blind holes due to excessive oil.
- Properly start thread engagement.

TS1741 —UN—22MAY18

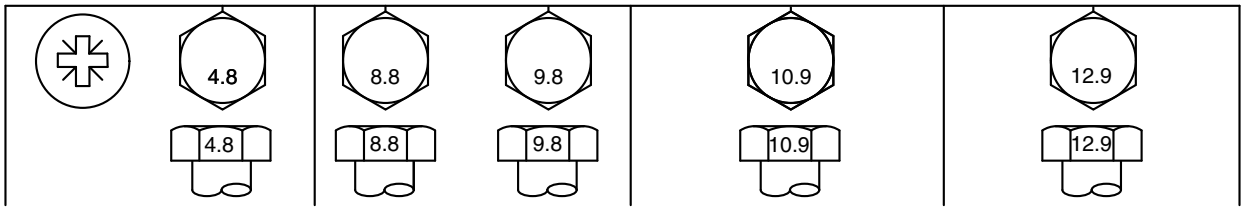


[a]Grade 1 applies for hex cap screws over 6 in (152 mm) long, and for all other types of bolts and screws of any length.
[b]Grade 2 applies for hex cap screws (not hex bolts) up to 6 in (152 mm) long.
[c]Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.
[d]Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

DX,TORQ1 -19-30MAY18-1/1

Metric Bolt and Screw Torque Values

TS1742 —UN—31MAY18



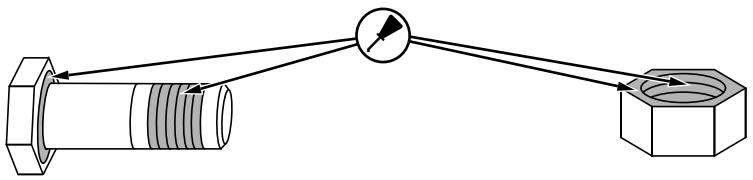
Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]	
	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in
M6	3.6	31.9	3.9	34.5	6.7	59.3	7.3	64.6	9.8	86.7	10.8	95.6	11.5	102	12.6	112
									N·m	lb·ft	N·m	lb·ft	N·m	lb·ft	N·m	lb·ft
M8	8.6	76.1	9.4	83.2	16.2	143	17.6	156	23.8	17.6	25.9	19.1	27.8	20.5	30.3	22.3
			N·m	lb·ft	N·m	lb·ft	N·m	lb·ft								
M10	16.9	150	18.4	13.6	31.9	23.5	34.7	25.6	46.8	34.5	51	37.6	55	40.6	60	44.3
	N·m	lb·ft														
M12	—	—	—	—	55	40.6	61	45	81	59.7	89	65.6	95	70.1	105	77.4
M14	—	—	—	—	87	64.2	96	70.8	128	94.4	141	104	150	111	165	122
M16	—	—	—	—	135	99.6	149	110	198	146	219	162	232	171	257	190
M18	—	—	—	—	193	142	214	158	275	203	304	224	322	245	356	263
M20	—	—	—	—	272	201	301	222	387	285	428	316	453	334	501	370
M22	—	—	—	—	365	263	405	299	520	384	576	425	608	448	674	497
M24	—	—	—	—	468	345	518	382	666	491	738	544	780	575	864	637
M27	—	—	—	—	683	504	758	559	973	718	1080	797	1139	840	1263	932
M30	—	—	—	—	932	687	1029	759	1327	979	1466	1081	1553	1145	1715	1265
M33	—	—	—	—	1258	928	1398	1031	1788	1319	1986	1465	2092	1543	2324	1714
M36	—	—	—	—	1617	1193	1789	1319	2303	1699	2548	1879	2695	1988	2982	2199

The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench.
DO NOT use these values if a different torque value or tightening procedure is given for a specific application.
For lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original.

- Make sure that fastener threads are clean.
- Apply a thin coat of Hy-Gard™ or equivalent oil under the head and on the threads of the fastener, as shown in the following image.
- Be conservative with the amount of oil to reduce the potential for hydraulic lockup in blind holes due to excessive oil.
- Properly start thread engagement.

TS1741 —UN—22MAY18



[a]Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.
[b]Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

DX,TORQ2 -19-30MAY18-1/1

Operating Speeds

Speeds shown are average and can vary from machine to machine.

NOTE: Operating speed specifications and design subject to change without notice.

Engine Speeds		
Slow Speed	1200 rpm	
Medium Speed	1550 rpm	
High Speed	1900 rpm	
Separator Main Driver Speeds		
Slow Speed	1200 rpm	
Medium Speed	1550 rpm	
High Speed	1900 rpm	
Separator Speeds (Rotor Gear Case)	**Factory Belt Speed Ranges**	**Optimal Belt Life Speed Ranges[a]**
First Gear (Low Range)	300—520 rpm	300—450 rpm
Second Gear (Medium Range)	420—800 rpm	450—720 rpm
Third Gear (High Range)	720—1300 rpm	720—1300 rpm
Rethresher System Speed	904 rpm	
Feeder House Lower Shaft Speeds		
Fixed Speed (If Equipped)	520 rpm	
Variable Speed (If Equipped)	520—780 rpm	
Feed Accelerator Speeds (Standard Speed)		
1st Gear (Low Range)	440 rpm	
2nd Gear (High Range)	990 rpm	
Feed Accelerator Speeds (Optional Slow Speed)		
First Gear (Low Range)	310 rpm	
Second Gear (High Range)	700 rpm	
Discharge Beater Speed and Jackshaft Speed	1000 rpm	
Cleaning Shoe Speeds		
Standard Cleaning Fan Speed	570—1430 rpm	
Optional Slow Cleaning Fan Speed	350—800 rpm	
Shoe Drive Speed	292 rpm	
Elevator Speeds		
Clean Grain Elevator	415 rpm	
Clean Grain Loading Auger	432 rpm	
Tailings Elevator, Lower Auger	408 rpm	
Tailings Elevator, Upper Auger	408 rpm	
Unloading System Speeds (Separator Engaged)	**X9 1000 159 L/s (4.5 bu/s) Unload Rate**	**X9 1100 186 L/s (5.3 bu/s) Unload Rate**
Unloading System Countershaft	1721 rpm	1721 rpm
Unloading Auger Gearbox, Input Shaft	827 rpm	902 rpm
Unloading Vertical Auger	480 rpm	523 rpm

Continued on next page

RW67285,0004DB9 -19-06APR20-1/2

Unloading System Speeds (Separator Engaged)	**X9 1000 159 L/s (4.5 bu/s) Unload Rate**	**X9 1100 186 L/s (5.3 bu/s) Unload Rate**
Unloading Outer Auger	480 rpm	523 rpm
Grain Tank Horizontal Augers (Front and Rear)	466 rpm	508 rpm
Chopper Speeds	**Fine Cut Chopper**	**Extra Fine Cut Chopper**
Chopper (Fixed Speed)	2400 rpm	3000 rpm
Chopper (Two-Speed)	1550/2400 rpm	1600/3000 rpm
Spreader Speeds	**Fine Cut Chopper (Spreader)**	**Extra Fine Cut Chopper (Spreader)**
Spreader (Fixed Speed)	**562 rpm**	**562 rpm**
Spreader (Two-Speed)	360/562 rpm	300/562 rpm

[a]*Staying within the optimal belt life speed ranges will increase the rotor variable belt life because the variable sheaves operate closer to a 1:1 ratio.*

RW67285,0004DB9 -19-06APR20-2/2

Specifications

NOTE: Specifications and design subject to change without notice.

Engine		
Make	John Deere	
Model	6136HX304 (13.6 L, Single Turbo, Tier 3/Stage IIIA) 6136HX303 (13.6 L, Series Turbos, Tier 3/Stage IIIA) 6136HX404 (13.6 L, Single Turbo, Final Tier 4) 6136HX403 (13.6 L, Series Turbos, Final Tier 4) 6136HX504 (13.6 L, Single Turbo, Stage V) 6136HX503 (13.6 L, Series Turbos, Stage V)	
Type	Six-Cylinder, In-Line, Valve-in-Head, Air-to-Air Aftercooled Diesel Turbocharged	
	X9 1000	**X9 1100**
Rated Power	410 kW (550 hp)	450 kW (603 hp)
Rated Speed	1900 rpm	1900 rpm
Power Boost at Rated Speed	40 kW (54 hp)	40 kW (54 hp)
Peak Power	470 kW (630 hp)	515 kW (690 hp)
Peak Power Speed (Rated Speed -200 rpm)	1700 rpm	
Displacement	13.6 L (830 in³)	
Firing Order	1-5-3-6-2-4	
Air Cleaner	Dry Type with Safety Element	

Continued on next page

Electrical System		
Battery Voltage	12 V	
Battery Terminal Grounded	Negative	
Alternator	330 A	
Transmission		
Speeds	ProDrive™ XL Transmission (Multi-Motor Transmission)	
Brakes		
Type	Multiple Wet Discs	
Feed Accelerator		
Number of Wings	40	
Separator Elements	**Left Rotor**	**Right Rotor**
Threshing Elements	15	15
Tines	26	26
Concave		
Number of Concaves	6 Coarse Grain 12 Small Grain	
Number of Bars Per Concave	23 Coarse Grain 19 Small Grain	
Separator	**Left Rotor**	**Right Rotor**
Number of Grates	4 Rows	4 Rows
Discharge Grate		
Number of Grates	1 Row	
Discharge Beater		
Number of Wings	60	
Grain Tank	**X9 1000**	**X9 1100**
Capacity	14 800 L (420 bu)	16 200 L (460 bu)
Peak Unloading Rate, 159 L/s (4.5 bu/s) Unload Rate	9540 L/min (270 bu/min)	Not Applicable
Peak Unloading Rate, 186 L/s (5.3 bu/s) Unload Rate	Not Applicable	11 160 L/min (318 bu/min)
Weight	**X9 1000**	**X9 1100**
Machine Weight [a]	27 000 kg (59 500 lb)	27 000 kg (59 500 lb)
Turning Radius [b]		
Rear Wheel Tread Width (Center-to-Center)	3.0—4.2 m (9 ft 10 in—13 ft 9 in)	
Turning Radius (0—2 Steering Stop Washers)	5.5—7.2 m (18 ft 0 in—23 ft 7 in)	
Capacities		
Fuel Tank		1250 L (330 gal)
Diesel Exhaust Fluid (DEF) Tank (Final Tier 4 and Stage V)		83 L (22 gal)
Cooling System with Heater (Tier 3/Stage IIIA)		68.6 L (72.5 qt)
Cooling System with Heater (Final Tier 4 and Stage V)		76.6 L (80.9 qt)
Engine Crankcase with Filter		57 L (60.23 qt) [c]
Final Drive (Per Unit)	Wheel Machines	8 L (8.46 qt)
	Track Machines	13.5 L (14.27 qt)
Loading Auger Gear Case (Fixed)		0.9 L (0.95 qt)
Loading Auger Gear Case (Pivoting)		0.9 L (0.95 qt)
Feed Accelerator Gear Case		2 L (2.11 qt)
Main Engine Gear Case		53 L (56 qt)

RW67285,0004DBA -19-06APR20-2/2

Capacities		
Cleaning Fan Variable Speed Driven Bearing Cavity		0.1 L (0.11 qt)
Spreader Gear Case		0.75 L (0.79 qt)
Hydraulic/Hydrostatic Reservoir		91 L (96.16 qt)
Air Compressor (If Equipped)		
Reservoir Size	60 L (16 gal)	
Maximum Reservoir Pressure	827 kPa (8.27 bar) (120 psi)	
Air Compressor Flow	Slow Engine Speed	315 L/min (11.1 ft³/min)
	High Engine Speed	500 L/min (17.7 ft³/min)

[a]Weight is based on corn machine configuration with 1250 L (330 gal) of diesel fuel in the fuel tank, empty grain tank, with dual wheels, and no header attached.
[b]For detailed information on a specific configuration, please see your John Deere dealer.
[c]It is vital to maintain engine oil at correct levels. Always verify that oil level is at correct location on dipstick when servicing.

RW67285,0004DBA -19-06APR20-3/2

Dimensions

NOTE: Dimensions are approximate and subject to change without notice.

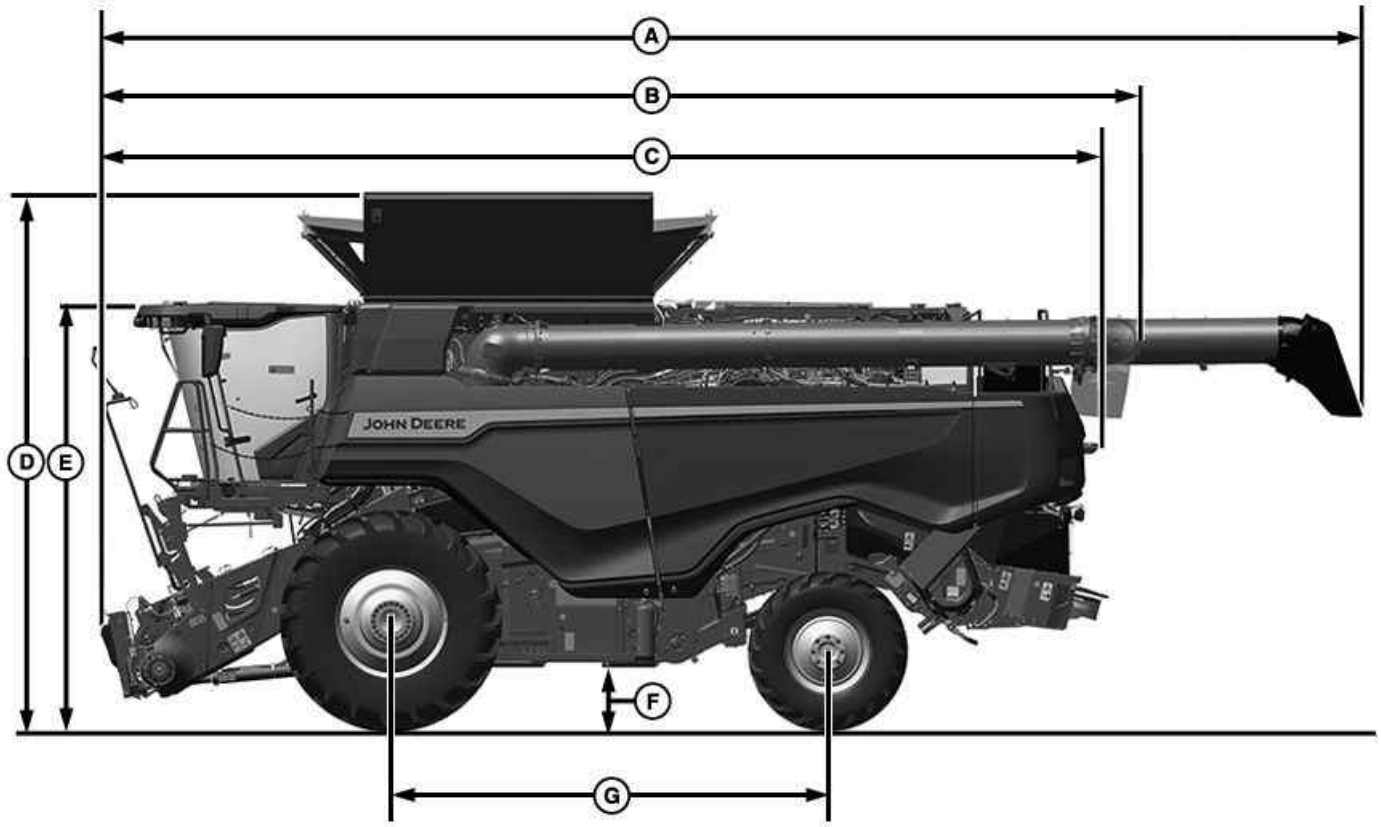
Legend	Dimension	
A	11.61 m (38 ft 1 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 11.76 m (38 ft 7 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 12.37 m (40 ft 7 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 13.13 m (43 ft 1 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
B	9.79 m (32 ft 4 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 9.79 m (32 ft 4 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 10.55 m (34 ft 7 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 11.31 m (37 ft 1 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
C	9.24 m (30 ft 4 in)	
D	4.82—4.96 m (15 ft 10 in—16 ft 3 in) with 14 800 L (420 bu) Covers 4.92—5.06 m (16 ft 2 in—16 ft 7 in) with 16 200 L (460 bu) Covers	
E	Top of Front Beacon Lights	Top of StarFire™ Receiver
	3.88—3.98 m (12 ft 9 in—13 ft 1 in)	3.90—4.00 m (12 ft 10 in—13 ft 2 in)
F	0.46—0.56 m (1 ft 6 in-—1 ft 10 in)	
G	4.10 m (13 ft 5 in)	
H	8.49 m (27 ft 10 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 8.63 m (28 ft 4 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 9.20 m (30 ft 2 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 9.91 m (32 ft 6 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
I	5.79—5.89 m (19 ft 0 in—19 ft 4 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 5.84—5.93 m (19 ft 2 in—19 ft 6 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 6.01—6.11 m (19 ft 9 in—20 ft 1 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 6.22—6.32 m (20 ft 5 in—20 ft 9 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
J	4.88—4.97 m (16 ft 0 in—16 ft 4 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 4.92—5.02 m (16 ft 2 in—16 ft 6 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 5.09—5.19 m (16 ft 8 in—17 ft 0 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 5.31—5.40 m (17 ft 5 in—17 ft 9 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
K [a]	5.07—5.17 m (16 ft 8 in—17 ft 0 in) with 7.9 m (26 ft 0 in) Power Fold Unloading Auger 5.11—5.21 m (16 ft 9 in—17 ft 1 in) with 8.2 m (26 ft 10 in) Power Fold Unloading Auger 5.29—5.38 m (17 ft 4 in—17 ft 8 in) with 8.7 m (28 ft 6 in) Power Fold Unloading Auger 5.50—5.60 m (18 ft 1 in—18 ft 5 in) with 9.4 m (30 ft 10 in) Power Fold Unloading Auger	
L [b]	Front Tires	Rear Tires
	3.49—4.82 m (11 ft 5 in—15 ft 10 in)	3.47—4.09 m (11 ft 5 in—13 ft 5 in)

[a] Dimension is measured 1.22 m (4 ft) from the grain spill point. This represents the unloading auger when centered over the grain cart.
[b] Due to the different tire configurations, row spacings, axle configurations, wheel offsets, axle positions, and spindles types, machine widths vary. Measurements given in chart are for minimum and maximum widths. For more detailed width information, see your John Deere dealer.

StarFire is a trademark of Deere & Company

RW67285,0004DBB -19-06APR20-1/1

Dimension Reference Points



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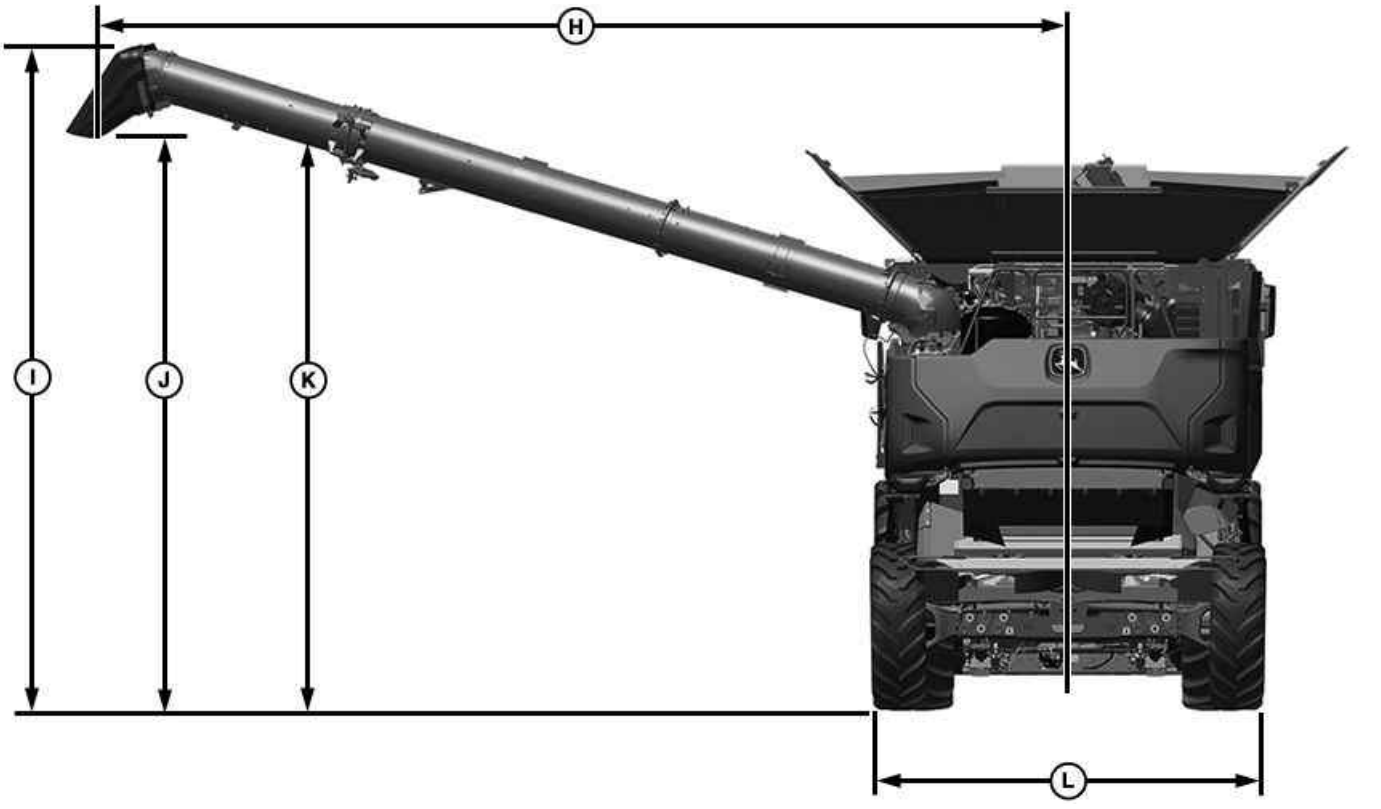

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RW67285,0004DBC -19-06APR20-1/1

Whole Body Vibration

The weighted root mean square acceleration to which the whole body is subjected to was less than 0.5 m/s^2 as measured on a representative machine during typical operations and analyzed in accordance with ISO 2631. During the same operations, the weighted root mean square hand-arm vibration was less than 2.5 m/s^2 when analyzed in accordance with ISO 5349. These acceleration values depend on the roughness of the ground, the speeds at which the combine is operated, the operator's experience, weight and driving habits.

RW67285,0004DBD -19-06APR20-1/1

Sound Level

The sound level inside the operator's cab ranges from 72.8 to 74.5 dB(A) as measured on multiple representative machines attached to a platform header and a corn header in accordance with ISO 4254-7:2017.

RW67285,0004DBE -19-06APR20-1/1

Safety Note Regarding the Subsequent Installation of Electrical and Electronic Appliances and/or Components

The machine is equipped with electronic components whose function may be influenced by electromagnetic radiation from other appliances. Such influences may be hazardous, so take the following safety instructions into account:

If electrical and electronic appliances are subsequently installed on the machine and connected to the on board system, the user must verify whether the installation affects the electronics or other components. This applies particularly to:

- Area counter
- Personal Computer
- GPS (Global Positioning System) receiver

In particular, subsequently installed electrical/electronic components must comply with the relevant edition of EMC Directive 89/336/EEC, and be CE marked.

If mobile communication systems (e.g. radio communication, telephone) are to be installed subsequently, the following extra requirements must be met:

- Only devices with an approval complying with the valid national regulation (i.e. BZT approval in Germany) shall be installed;
- The device shall be installed securely;
- Portable or mobile devices may be operated in the vehicle only if connected to a fixed outside antenna;
- Transmitters shall be installed separately from the vehicle's electronics;
- The antenna must be installed in a professional manner, with a good ground connection between the antenna and the vehicle ground.

Wiring, installation and maximum permissible current supply must be as stated in the installation instructions of the machine manufacturer.

RW67285,0004DBF -19-06APR20-1/1

EU Declaration of Conformity

Deere & Company
Moline, Illinois U.S.A.

The undersigned hereby declares that:

Machine Type: Combine

Model(s): X9 1000 and X9 1100

fulfill(s) all relevant provisions and essential requirements of the following directives:

DIRECTIVE	NUMBER	CERTIFICATION METHOD
Machinery Directive	2006/42/EC	Self certified
Electromagnetic Compatibility Directive (EMC)	2014/30/EU	Self certified

The product is in conformity with the following EMC standards and/or other normative documents:

ISO 14982:1998

CISPR 12

JDQ 203:2013

Name and address of the person in the European Community authorized to compile the technical construction file:

Brigitte Birk
John Deere GmbH & Co. KG
Mannheim Regional Center
John Deere Strasse 70
D-68163 Mannheim, Germany

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Place of Declaration: East Moline, Illinois, U.S.A.

Date of Declaration: October 31, 2020

Manufacturing Unit: John Deere Harvester Works, East Moline, Illinois, U.S.A.

Name: Craig Amann

Title: Global Director, Crop Harvesting Platform, Product Engineering, Ag and Turf Division

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CE

RW67285,0004DC0 -19-06APR20-1/1

Eurasian Economic Union

This information applies only to products which bear the EAC conformity mark of the Eurasian Economic Union member states.

Manufacturer:
Deere & Company, Moline, Illinois U.S.A.

Name of the authorized representative in the Eurasian Economic Union:
Limited Liability Company
“John Deere Rus”

Address of the authorized representative:
142050, Russia, Moscow region, Domodedovo district, Domodedovo, Beliye Stolbi micro district, vladenye “Warehouse 104”, Building 2

For technical support, contact your dealer.

EAC Marking

TS1738 —UN—26APR16

Date of manufacture is denoted by the product marking on or near the serial number plate.

DX,EAC -19-27APR16-1/1

Machine Design Life

This machine is designed and manufactured to provide a long life of productive operation, however actual attainable life depends on a number of factors including the severity of working conditions and completion of recommended maintenance. (See the Service section of this manual.)

Periodically inspect and review the machine in conjunction with your John Deere dealer. The review may result in recommendations for service, component repair, remanufacture or replacement, or, if at the end of life, that the machine be removed from operation. (See separate decommissioning section of this manual for information on disposal and recycling of machine components.)

No machine should be operated if safety-related components are missing or in need of service. All missing or damaged safety-related components, including safety signs, should be repaired or replaced before operating.

DX,MACH,DESIGN,LIFE -19-14SEP15-1/1

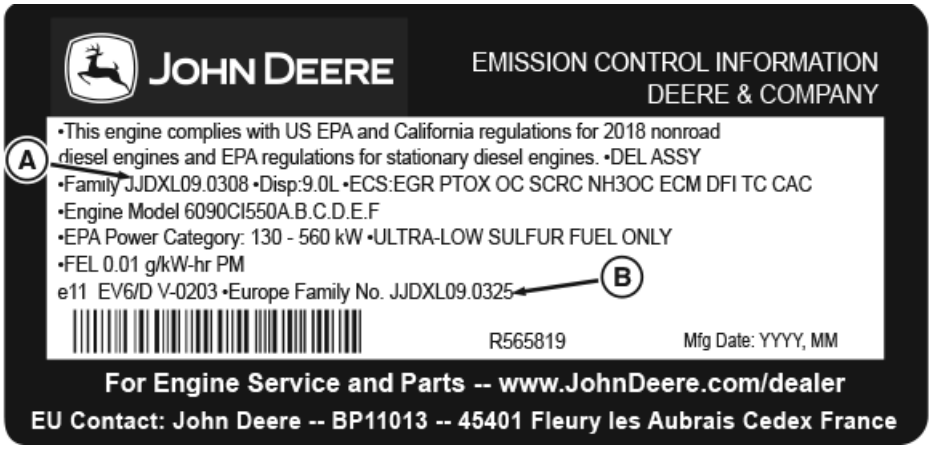
Fluorinated Greenhouse Gas

Air Conditioner System contains Fluorinated Greenhouse Gas (F-Gas)	
Type of F-Gas:	R-134a
F-Gas Mass (kg):	2.5
CO_2 Equivalent (tonnes):	3.6
Global Warming Potential (GWP):	1430

NOTE: Cab refrigerator (if equipped) contains approximately 0.040 kg of refrigerant.

RW67285,0004DC1 -19-06APR20-1/1

Carbon Dioxide Emissions (CO_2)



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Engine Emissions Label

A—Family **B—Europe Family**

NOTE: If your engine emissions label lists both a family number (A) and a Europe family number (B), reference the Europe family number using the chart.

NOTE: The first letter of the family number is not utilized for family identification on the chart.

To identify the carbon dioxide (CO_2) output, locate the engine emissions label. Find the appropriate family on the emissions label and reference the chart.

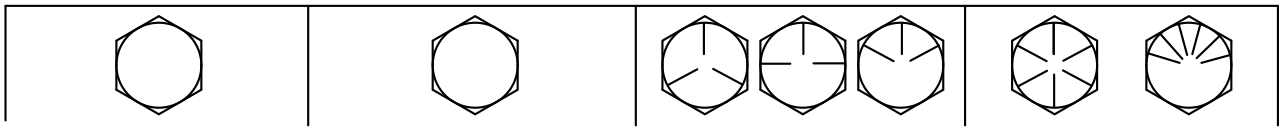
Emissions Label Family	CO_2 Result
_JDXL02.9323	952 g/kW-hr
_JDXL02.9327	784 g/kW-hr
_JDXL04.5337	819 g/kW-hr
_JDXL04.5338	682 g/kW-hr
_JDXL04.5304	1004 g/kW-hr
_JDXN04.5174	792 g/kW-hr
_JDXL06.8324	720 g/kW-hr
_JDXL06.8328	683 g/kW-hr
_JDXL06.8336	701 g/kW-hr
_JDXN06.8175	771 g/kW-hr
_JDXL09.0319	646 g/kW-hr
_JDXL09.0325	695 g/kW-hr
_JDXL09.0329	657 g/kW-hr
_JDXL13.5326	684 g/kW-hr
_JDXL13.6320	651 g/kW-hr
_JDXL13.6339	604 g/kW-hr

This CO_2 measurement results from testing over a fixed test cycle under laboratory conditions a(n) (parent) engine representative of the engine type (engine family) and shall not imply or express any guarantee of the performance of a particular engine.

DX,EMISSIONS,CO2 -19-23APR20-1/1

Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



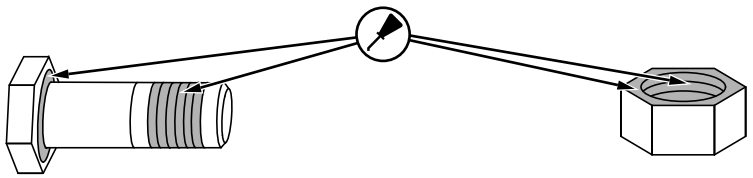
Bolt or Screw Size	SAE Grade 1[a]				SAE Grade 2[b]				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]	
	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in
1/4	3.1	27.3	3.2	28.4	5.1	45.5	5.3	47.3	7.9	70.2	8.3	73.1	11.2	99.2	11.6	103
													N·m	lb·ft	N·m	lb·ft
5/16	6.1	54.1	6.5	57.7	10.2	90.2	10.9	96.2	15.7	139	16.8	149	22.2	16.4	23.7	17.5
									N·m	lb·ft	N·m	lb·ft				
3/8	10.5	93.6	11.5	102	17.6	156	19.2	170	27.3	20.1	29.7	21.9	38.5	28.4	41.9	30.9
					N·m	lb·ft	N·m	lb·ft								
7/16	16.7	148	18.4	163	27.8	20.5	30.6	22.6	43	31.7	47.3	34.9	60.6	44.7	66.8	49.3
	N·m	lb·ft	N·m	lb·ft												
1/2	25.9	19.1	28.2	20.8	43.1	31.8	47	34.7	66.6	49.1	72.8	53.7	94	69.3	103	75.8
9/16	36.7	27.1	40.5	29.9	61.1	45.1	67.5	49.8	94.6	69.8	104	77	134	98.5	148	109
5/8	51	37.6	55.9	41.2	85	62.7	93.1	68.7	131	96.9	144	106	186	137	203	150
3/4	89.5	66	98	72.3	149	110	164	121	230	170	252	186	325	240	357	263
7/8	144	106	157	116	144	106	157	116	370	273	405	299	522	385	572	422
1	216	159	236	174	216	159	236	174	556	410	609	449	785	579	860	634
1-1/8	305	225	335	247	305	225	335	247	685	505	751	554	1110	819	1218	898
1-1/4	427	315	469	346	427	315	469	346	957	706	1051	775	1552	1145	1703	1256
1-3/8	564	416	618	456	564	416	618	456	1264	932	1386	1022	2050	1512	2248	1658
1-1/2	743	548	815	601	743	548	815	601	1665	1228	1826	1347	2699	1991	2962	2185

The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench.
DO NOT use these values if a different torque value or tightening procedure is given for a specific application.
For lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original.

- Make sure that fastener threads are clean.
- Apply a thin coat of Hy-Gard™ or equivalent oil under the head and on the threads of the fastener, as shown in the following image.
- Be conservative with the amount of oil to reduce the potential for hydraulic lockup in blind holes due to excessive oil.
- Properly start thread engagement.

TS1741 —UN—22MAY18

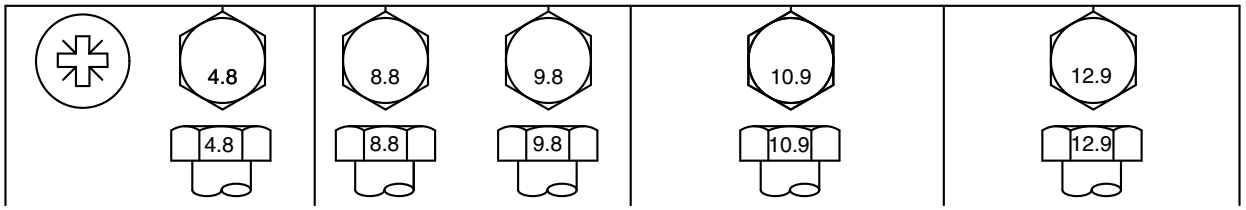


[a]Grade 1 applies for hex cap screws over 6 in (152 mm) long, and for all other types of bolts and screws of any length.
[b]Grade 2 applies for hex cap screws (not hex bolts) up to 6 in (152 mm) long.
[c]Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.
[d]Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

DX,TORQ1 -19-30MAY18-1/1

Metric Bolt and Screw Torque Values

TS1742 —UN—31MAY18



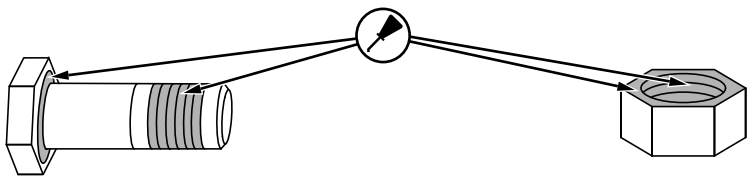
Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]	
	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in
M6	3.6	31.9	3.9	34.5	6.7	59.3	7.3	64.6	9.8	86.7	10.8	95.6	11.5	102	12.6	112
									N·m	lb·ft	N·m	lb·ft	N·m	lb·ft	N·m	lb·ft
M8	8.6	76.1	9.4	83.2	16.2	143	17.6	156	23.8	17.6	25.9	19.1	27.8	20.5	30.3	22.3
			N·m	lb·ft	N·m	lb·ft	N·m	lb·ft								
M10	16.9	150	18.4	13.6	31.9	23.5	34.7	25.6	46.8	34.5	51	37.6	55	40.6	60	44.3
	N·m	lb·ft														
M12	—	—	—	—	55	40.6	61	45	81	59.7	89	65.6	95	70.1	105	77.4
M14	—	—	—	—	87	64.2	96	70.8	128	94.4	141	104	150	111	165	122
M16	—	—	—	—	135	99.6	149	110	198	146	219	162	232	171	257	190
M18	—	—	—	—	193	142	214	158	275	203	304	224	322	245	356	263
M20	—	—	—	—	272	201	301	222	387	285	428	316	453	334	501	370
M22	—	—	—	—	365	263	405	299	520	384	576	425	608	448	674	497
M24	—	—	—	—	468	345	518	382	666	491	738	544	780	575	864	637
M27	—	—	—	—	683	504	758	559	973	718	1080	797	1139	840	1263	932
M30	—	—	—	—	932	687	1029	759	1327	979	1466	1081	1553	1145	1715	1265
M33	—	—	—	—	1258	928	1398	1031	1788	1319	1986	1465	2092	1543	2324	1714
M36	—	—	—	—	1617	1193	1789	1319	2303	1699	2548	1879	2695	1988	2982	2199

The nominal torque values listed are for general use only with the assumed wrenching accuracy of 20%, such as a manual torque wrench.
DO NOT use these values if a different torque value or tightening procedure is given for a specific application.
For lock nuts, for stainless steel fasteners, or for nuts on U-bolts, see the tightening instructions for the specific application.

Replace fasteners with the same or higher property class. If higher property class fasteners are used, tighten these to the strength of the original.

- Make sure that fastener threads are clean.
- Apply a thin coat of Hy-Gard™ or equivalent oil under the head and on the threads of the fastener, as shown in the following image.
- Be conservative with the amount of oil to reduce the potential for hydraulic lockup in blind holes due to excessive oil.
- Properly start thread engagement.

TS1741 —UN—22MAY18



[a]Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.
[b]Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

DX,TORQ2 -19-30MAY18-1/1

Troubleshooting

To prevent unnecessary loss of time and productivity, please use the following procedure as a guideline to handling machine issues.

1. Identify the system or systems that are not functioning properly.

   Many failures can present multiple symptoms.

   Identify all of the systems that are currently experiencing problems.

   Talk to the customer and or the operator, they may have some insight to what is going wrong.

   Find out if any 'do-it-yourself' service was performed. Customer additions to the machine or attempted self service can sometimes be the primary cause of the problem.

2. Pick the most critical system that is not working and diagnose it first.

   Diagnosing and resolving the most critical system failure first may solve problems occurring with other systems.

3. Use Service ADVISOR as your diagnostic support and information delivery tool for the system you have selected.

   Make sure you are using the latest data. Choose the correct machine model and serial number range if applicable.

4. Understand the operation of the system that you have selected.

   Today's systems interact or are dependent on many other systems to provide our product's unique capabilities.

   Be careful of normal abnormal operation usually caused by improper operation, improper settings, conditions, and so on.

   Avoid mistakes caused by improperly operating something or skipping a required step for proper operation. Refer to the Operator's Manual or Diagnostic Theory of Operation for help.

5. Run the diagnostic routine for the system that you selected.

   Do all the things that the diagnostic routine asks you to do in the order they are presented.

6. Confirm that proper operation of the system has been fully restored.

7. Confirm the proper operation of the other systems that were not working properly.

   If there are still problems, go back to step 2 and pick the next most critical system and run the list again.

HX05709,0006024 -19-12JAN09-1/1

Section 211
Diagnostic Trouble Codes

Contents

Continued on next page

Continued on next page

Continued on next page

Continued on next page

Continued on next page

Continued on next page

Continued on next page

Continued on next page

Continued on next page

Continued on next page

Continued on next page

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Continued on next page

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