9R Tractors Repair (S. N. 015000—055999) and 9RX Tractors Repair (S. N. 800000—803999)

REPAIR TECHNICAL MANUAL

9370R, 9420R, 9470R, 9520R, 9570R, 9620R, 9470RX, 9520RX, 9570RX, 9620RX Tractors Repair

TM119519 26JAN21 (ENGLISH)

John Deere Waterloo Works
PRINTED IN U.S.A.

Introduction

Foreword

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

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 used to provide service information. The Repair Technical Manual tells how to repair the components. The Operation and Test Technical Manual helps you quickly identify the majority of failures.

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 and recommended tools, other material 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.

RX,TMIFC -19-03APR96-1/1

Dealer Predelivery Information Form

The John Deere Predelivery Form, when properly filled out and signed by dealer, verifies predelivery and delivery services were satisfactorily performed.

Because of the shipping factors involved, plus extra finishing touches necessary to promote customer satisfaction, there are certain predelivery services that must be performed by the dealer. These services are listed on the predelivery form with the tractor.

Perform all services listed and check each job off as it is completed. Fill form out completely and sign it.

OURX113,0000002 -19-18APR01-1/1

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Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Section 10
General Information

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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

Understand Signal Words

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.

TS187 —19—30SEP88

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

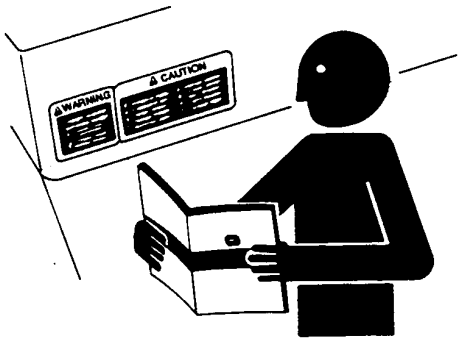
Follow Safety Instructions

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

Prevent Machine Runaway

Avoid possible injury or death from machinery runaway.

Do not start engine by shorting across starter terminals. Machine will start in gear if normal circuitry is bypassed.

NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission in neutral or park.

TS177 —UN—11JAN89

DX,BYPAS1 -19-29SEP98-1/1

Avoid Backover Accidents

Before moving machine, be sure that all persons are clear of machine path. Turn around and look directly for best visibility. Use a signal person when backing if view is obstructed or when in close quarters.

Do not rely on a camera to determine if personnel or obstacles are behind the machine. The system can be limited by many factors including maintenance practices, environmental conditions, and operating range.

PC10857XW —UN—15APR13

DX,AVOID,BACKOVER,ACCIDENTS -19-30AUG10-1/1

Handle Fluids Safely—Avoid Fires

When you work around fuel, do not smoke or work near heaters or other fire hazards.

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.

TS227 —UN—15APR13

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

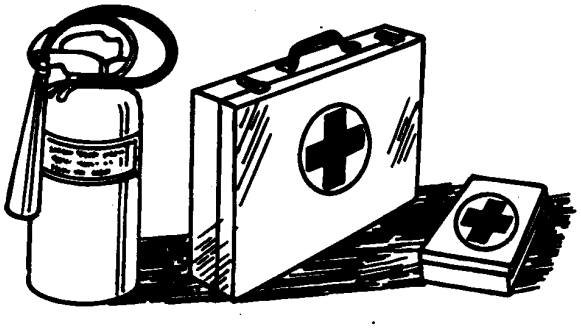
DX,SPARKS -19-03MAR93-1/1

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

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.

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:

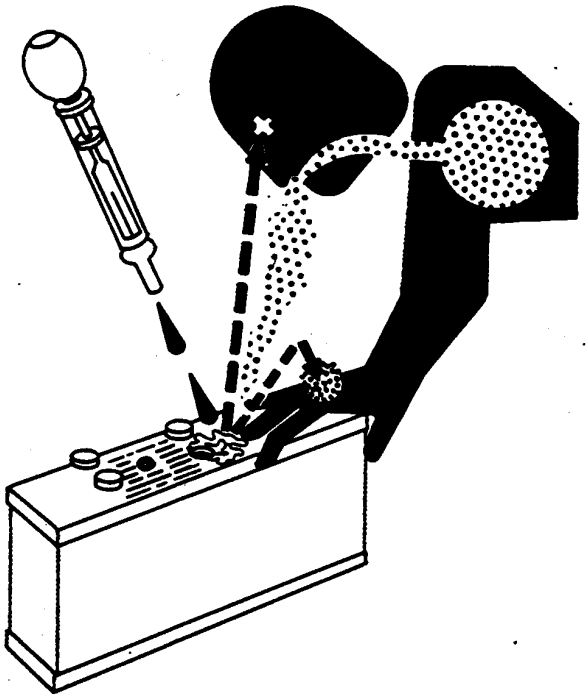
1. Flush skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush eyes with water for 15—30 minutes. Get medical attention immediately.

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.**

TS204 —UN—15APR13



TS203 —UN—23AUG88

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

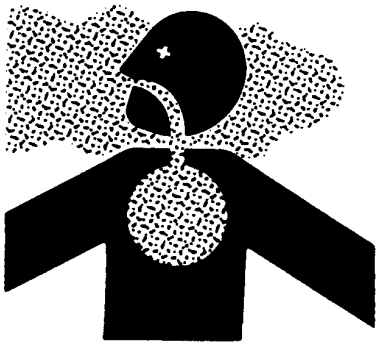
Handle Agricultural Chemicals Safely

Chemicals used in agricultural applications such as fungicides, herbicides, insecticides, pesticides, rodenticides, and fertilizers can be harmful to your health or the environment if not used carefully.

Always follow all label directions for effective, safe, and legal use of agricultural chemicals.

Reduce risk of exposure and injury:

- Wear appropriate personal protective equipment as recommended by the manufacturer. In the absence of manufacturer's instructions, follow these general guidelines:
  - Chemicals labeled **'Danger'**: Most toxic. Generally require use of goggles, respirator, gloves, and skin protection.
  - Chemicals labeled **'Warning'**: Less toxic. Generally require use of goggles, gloves, and skin protections.
  - Chemicals labeled **'Caution'**: Least toxic. Generally require use of gloves and skin protection.
- Avoid inhaling vapor, aerosol or dust.
- Always have soap, water, and towel available when working with chemicals. If chemical contacts skin, hands, or face, wash immediately with soap and water. If chemical gets into eyes, flush immediately with water.
- Wash hands and face after using chemicals and before eating, drinking, smoking, or urination.
- Do not smoke or eat while applying chemicals.
- After handling chemicals, always bathe or shower and change clothes. Wash clothing before wearing again.
- Seek medical attention immediately if illness occurs during or shortly after use of chemicals.
- Keep chemicals in original containers. Do not transfer chemicals to unmarked containers or to containers used for food or drink.



TS220 —UN—15APR13

A34471

A34471 —UN—11OCT88

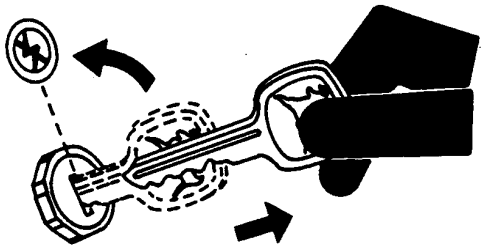
- Store chemicals in a secure, locked area away from human or livestock food. Keep children away.
- Always dispose of containers properly. Triple rinse empty containers and puncture or crush containers and dispose of properly.

DX,WW,CHEM01 -19-24AUG10-1/1

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

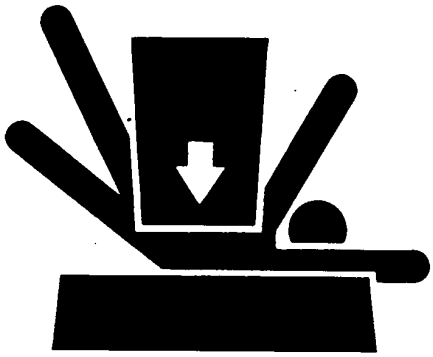
DX,PARK -19-04JUN90-1/1

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

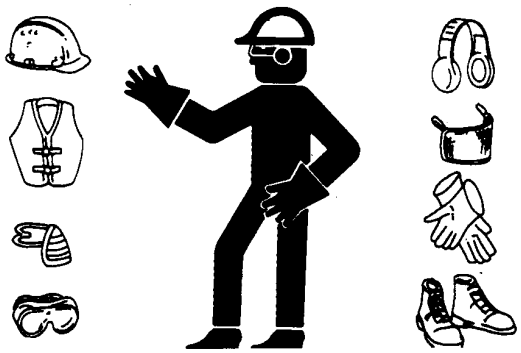
Wear Protective Clothing

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.



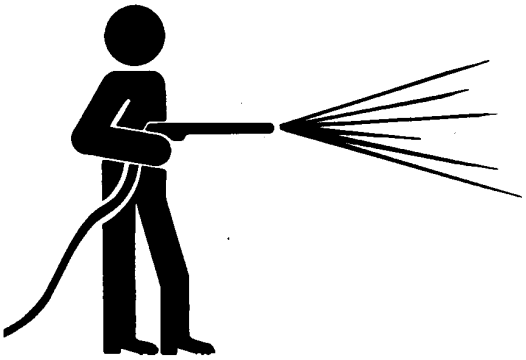
TS206 —UN—15APR13

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

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

Clean Vehicle of Hazardous Pesticides

CAUTION: During application of hazardous pesticides, pesticide residue can build up on the inside or outside of the vehicle. Clean vehicle according to use instructions of hazardous pesticides.

When exposed to hazardous pesticides, clean exterior and interior of vehicle daily to keep free of the accumulation of visible dirt and contamination.

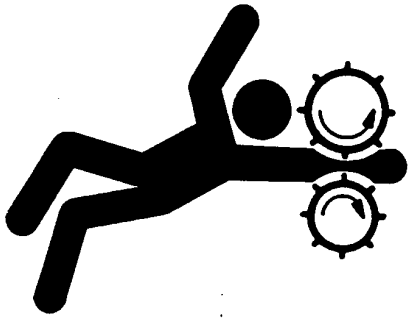
1. Sweep or vacuum the floor of cab.
2. Clean headliners and inside cowlings of cab.
3. Wash entire exterior of vehicle.
4. Dispose of any wash water with hazardous concentrations of active or non-active ingredients according to published regulations or directives.

DX,CABS2 -19-24JUL01-1/1

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

Stay Clear of Rotating Drivelines

Entanglement in rotating driveline can cause serious injury or death.

Keep all shields in place at all times. Make sure rotating shields turn freely.

Wear close-fitting clothing. Stop the engine and be sure that all rotating parts and drivelines are stopped before making adjustments, connections, or performing any type of service on engine or machine driven equipment.

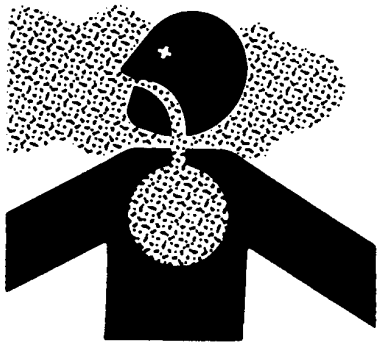
TS1644 —UN—22AUG95

DX,ROTATING -19-18AUG09-1/1

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.

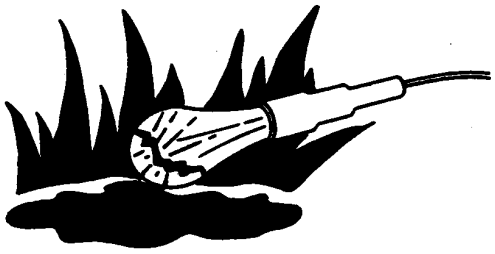


TS220 —UN—15APR13

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.

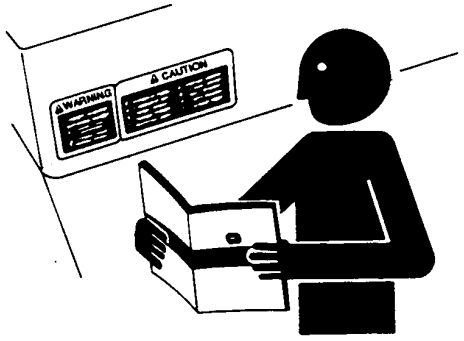


TS223 —UN—23AUG88

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.



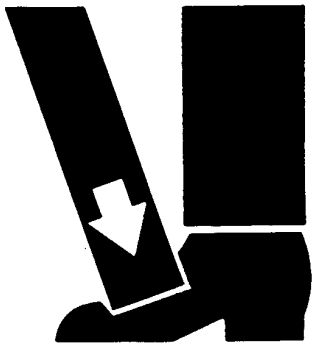
TS201 —UN—15APR13

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

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

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

Protect Against High Pressure Spray

Spray from high pressure nozzles can penetrate the skin and cause serious injury. Keep spray from contacting hands or body.

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

TS1343 —UN—18MAR92

DX,SPRAY -19-16APR92-1/1

Service Cooling System Safely

Explosive release of fluids from pressurized cooling system can cause serious burns.

Shut off engine. Only remove filler cap when cool enough to touch with bare hands. Slowly loosen cap to first stop to relieve pressure before removing completely.

TS281 —UN—15APR13

DX,WW,COOLING -19-19AUG09-1/1

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.

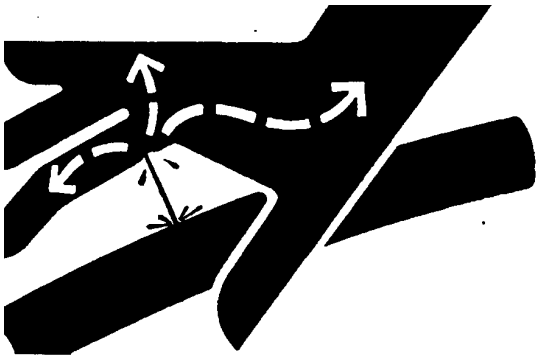
Replace worn or damaged hose assemblies immediately with John Deere approved replacement parts.

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

Remove Paint Before Welding or Heating

Avoid potentially toxic fumes and dust.

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

Remove paint before heating:

- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

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

TS220 —UN—15APR13

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

Dispose of paint and solvent properly.

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

Avoid Heating Near Pressurized Fluid Lines

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can accidentally burst when heat goes beyond the immediate flame area.

TS953 —UN—15MAY90

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

Handle Starting Fluid Safely

Starting fluid is highly flammable.

Keep all sparks and flame away when using it. Keep starting fluid away from batteries and cables.

To prevent accidental discharge when storing the pressurized can, keep the cap on the container, and store in a cool, protected location.

Do not incinerate or puncture a starting fluid container.

Do not use starting fluid on an engine equipped with glow plugs or an air intake heater.

TS1356 —UN—18MAR92

DX,FIRE3 -19-14MAR14-1/1

In Case of Fire

CAUTION: Avoid personal injury.

Stop machine immediately at the first sign of fire. Fire may be identified by the smell of smoke or sight of flames. Because fire grows and spreads rapidly, get off the machine immediately and move safely away from the fire. Do not return to the machine! The number one priority is safety.

Call the fire department. A portable fire extinguisher can put out a small fire or contain it until the fire department arrives; but portable extinguishers have limitations. Always put the safety of the operator and bystanders first. If attempting to extinguish a fire, keep your back to the wind with an unobstructed escape path so you can move away quickly if the fire cannot be extinguished.

Read the fire extinguisher instructions and become familiar with their location, parts, and operation before a fire starts. Local fire departments or fire equipment distributors may offer fire extinguisher training and recommendations.

If your extinguisher does not have instructions, follow these general guidelines:

TS227 —UN—15APR13

1. Pull the pin. Hold the extinguisher with the nozzle pointing away from you, and release the locking mechanism.
2. Aim low. Point the extinguisher at the base of the fire.
3. Squeeze the lever slowly and evenly.
4. Sweep the nozzle from side-to-side.

DX,FIRE4 -19-22AUG13-1/1

Avoid Static Electricity Risk When Refueling

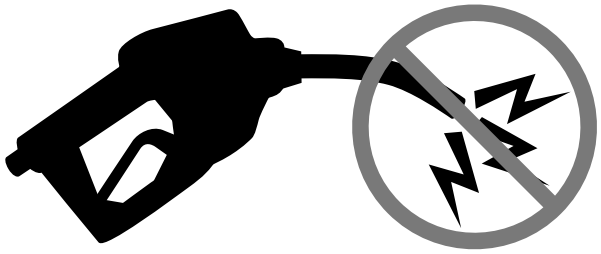
The removal of sulfur and other compounds in Ultra-Low Sulfur Diesel (ULSD) fuel decreases its conductivity and increases its ability to store a static charge.

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



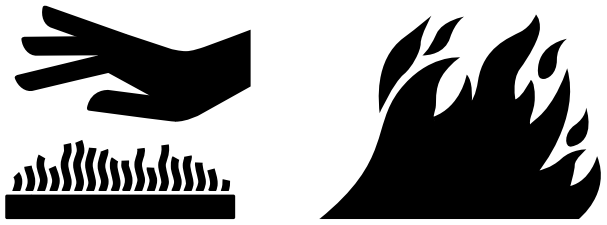
RG21992 —UN—21AUG13

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

Avoid Hot Exhaust

Servicing machine or attachments with engine running can result in serious personal injury. Avoid exposure and skin contact with hot exhaust gases and components.

Exhaust parts and streams become very hot during operation. Exhaust gases and components reach temperatures hot enough to burn people, ignite, or melt common materials.



RG17488 —UN—21AUG09

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

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.

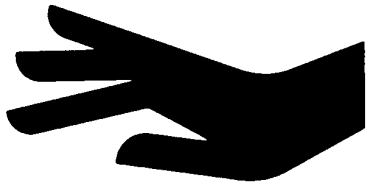
If service procedure requires engine to be running:

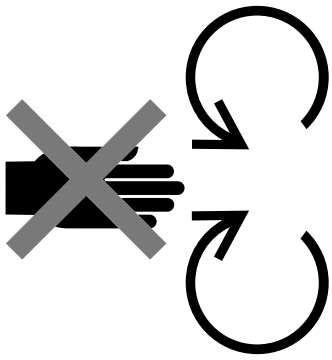
- Only engage power-driven parts required by service procedure
- Ensure that other people are clear of operator station and machine

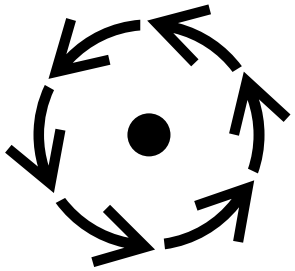
Keep hands, feet, and clothing away from power-driven parts.

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

TS271 —UN—23AUG88

TS1693 —UN—09DEC09

TS1695 —UN—07DEC09

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

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:

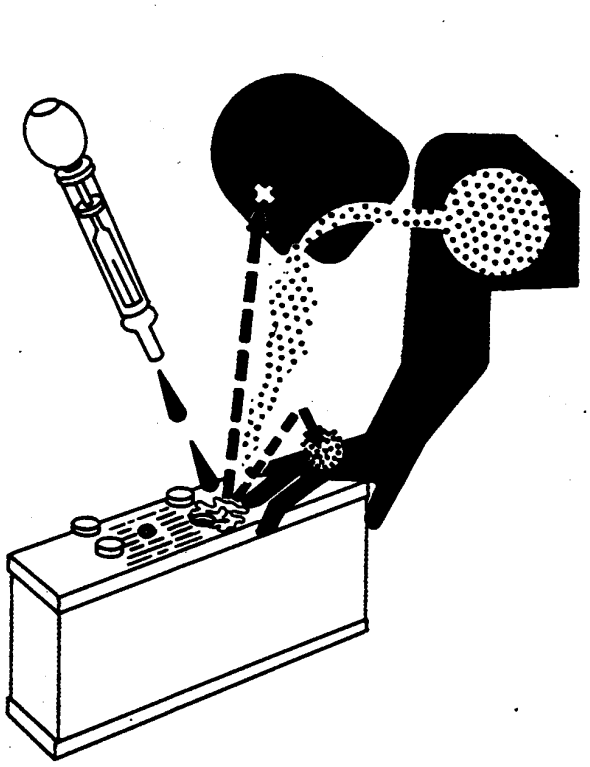
1. Filling batteries in a well-ventilated area.
2. Wearing eye protection and rubber gloves.
3. Avoiding breathing fumes when electrolyte is added.
4. Avoiding spilling or dripping electrolyte.
5. Use proper jump start procedure.

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

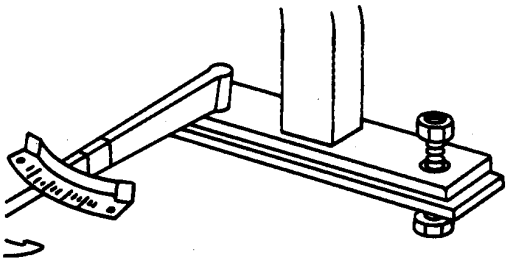
Keep ROPS Installed Properly

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

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

The seat is part of the ROPS safety zone. Replace only with John Deere seat approved for your tractor.

Any alteration of the ROPS must be approved by the manufacturer.

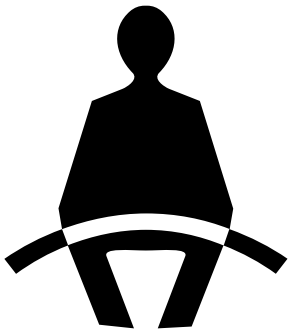


TS212 —UN—23AUG88

DX,ROPS3 -19-12OCT11-1/1

Instructional Seat

The instructional seat, if so equipped, has been provided only for training operators or diagnosing machine problems.



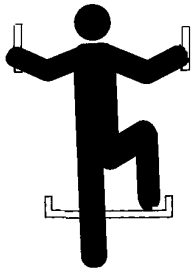
TS1730 —UN—24MAY13

DX,SEAT,NA -19-22AUG13-1/1

Use Steps and Handholds Correctly

Prevent falls by facing the machine when getting on and off. Maintain 3-point contact with steps, handholds, and handrails.

Use extra care when mud, snow, or moisture present slippery conditions. Keep steps clean and free of grease or oil. Never jump when exiting machine. Never mount or dismount a moving machine.

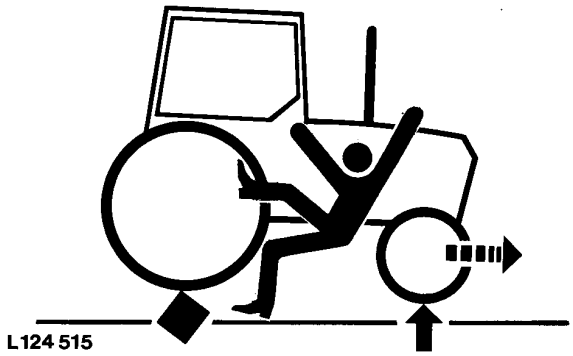


T133468 —UN—15APR13

DX,WW,MOUNT -19-12OCT11-1/1

Service Front-Wheel Drive Tractor Safely

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



L124515 —UN—06AUG94

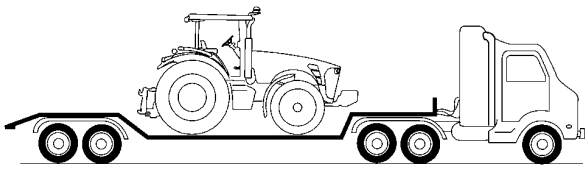
DX,WW,MFWD -19-19AUG09-1/1

Transport Tractor Safely

A disabled tractor is best transported on a flatbed carrier. Use chains to secure the tractor to the carrier. The axles and tractor frame are suitable attachment points.

Before transporting the tractor on a low-loader truck or flatbed rail wagon, make sure that the hood is secured over the tractor engine and that doors, roof hatch (if equipped) and windows are properly closed.

Never tow a tractor at a speed greater than 10 km/h (6 mph). An operator must steer and brake the tractor under tow.



RXA0103709 —UN—01JUL09

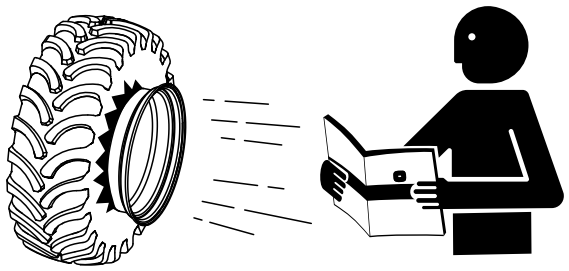
DX,WW,TRANSPORT -19-19AUG09-1/1

Follow Tire Recommendations

Keep your machine in proper working order.

Use only prescribed tire sizes with correct ratings and inflate to the pressure specified in this manual.

Use of other than prescribed tires may decrease stability, affect steering, result in premature tire failure, or cause other durability or safety issues.



H111235 —UN—13MAY14

DX,TIRE,INFO -19-19MAY14-1/1

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.

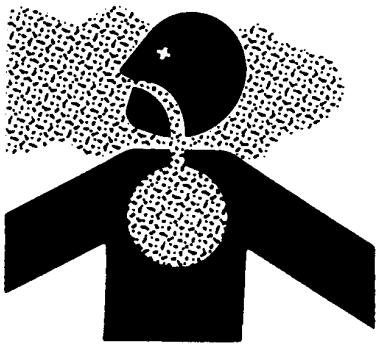
DX,WW,RIMS -19-28FEB17-1/1

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

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.

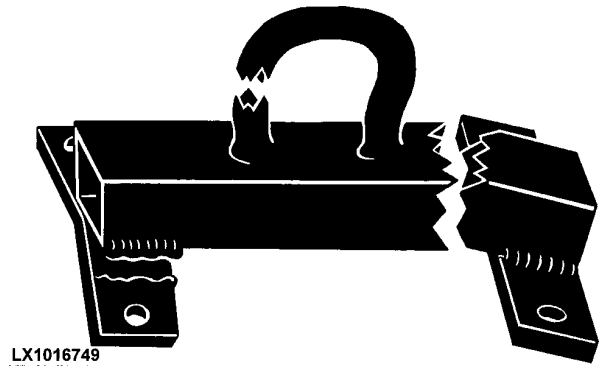
TS779 —UN—08NOV89

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.



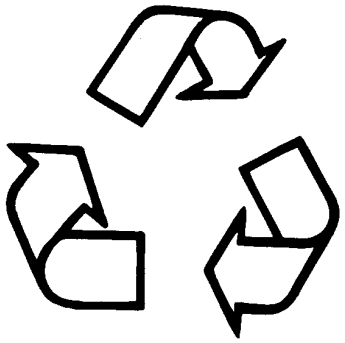
LX1016749 —UN—01JUL97

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

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.

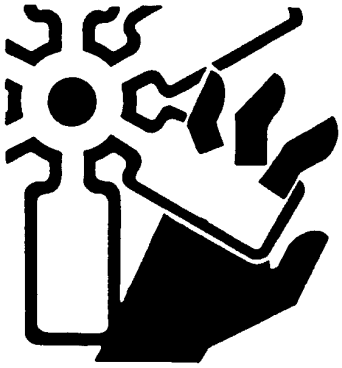
DX,DRAIN -19-01JUN15-1/1

Install All Guards

Rotating cooling system fans, belts, pulleys, and drives can cause serious injury.

Keep all guards in place at all times during engine operation.

Wear close-fitting clothes. Stop the engine and be sure fans, belts, pulleys, and drives are stopped before making adjustments, connections, or cleaning near fans and their drive components.



TS677 —UN—21SEP89

DX,GUARDS -19-18AUG09-1/1

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

List of References

Below is a list of all items within this group.

LN71218,0000470 -19-08MAY20-1/1

Trademarks

Trademarks	
AccuDepth™	Trademark of Deere and Company
ACS™	Trademark of Deere and Company
ActiveSeat™	Trademark of Deere and Company
AMBLYGON™	Trademark of Kluber Lubrication
AMPSEAL 16™	Trademark of Tyco Electronics
AutoLoad™	Trademark of Deere and Company
AutoPowr™	Trademark of Deere and Company
AutoPowr™/IVT™	Trademark of Deere and Company
AutoQuad™ II	Trademark of Deere and Company
AutoQuad™ PLUS	Trademark of Deere and Company
AutoTrac™	Trademark of Deere and Company
Avdel™	Trademark of Avdel UK Limited
Bio Hy-Guard™	Trademark of Deere and Company
Break-In™	Trademark of Deere and Company
Break-In PLUS™	Trademark of Deere and Company
CINCH™	Trademark of Cinch Inc.
ClimaTrak™	Trademark of Deere and Company
ComfortCommand™	Trademark of Deere and Company
ComfortGard™	Trademark of Deere and Company
ComfortGard Deluxe™	Trademark of Deere and Company
CommandARM™	Trademark of Deere and Company
CommandCenter™	Trademark of Deere and Company
CommandQuad™	Trademark of Deere and Company
CommandView™	Trademark of Deere and Company
COOL-GUARD™ II	Trademark of Deere and Company
CoolScan™	Trademark of Deere and Company
CPC™	Trademark of AMP Incorporated
Deere™	Trademark of Deere and Company
DEUTSCH™	Trademark of Deutsch Company
DURABUILT™	Trademark of Camoplast Inc.
Efficiency Manager™	Trademark of Deere and Company
FieldCruise™	Trademark of Deere and Company
Field Doc™	Trademark of Deere and Company
Field Office™	Trademark of Deere and Company
GreenStar™	Trademark of Deere and Company
HY-GARD™	Trademark of Deere and Company
HydraCushion™	Trademark of Deere and Company
ILS™	Trademark of Deere and Company
iPhone®	Trademark of Apple, Inc.
iPod®	Trademark of Apple, Inc.
iPod Touch®	Trademark of Apple, Inc.
iTEC™	Trademark of Deere and Company
iTEC™ Pro	Trademark of Deere and Company

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LN71218,0000474 -19-03MAR16-1/2

Trademarks	
IVT™	Trademark of Deere and Company
IVT Selector™	Trademark of Deere and Company
JDLink™	Trademark of Deere and Company
JDOffice™	Trademark of Deere and Company
John Deere™	Trademark of Deere and Company
Loctite™	Trademark of Henkel Corporation
MATE-N-LOC™	Trademark of AMP Incorporated
METRIMATE™	Trademark of AMP Incorporated
METRI-PACK™	Trademark of Delphi Packard Electric Systems
NEVER-SEEZ™	Trademark of Bostik-Findley Inc.
Oilscan™	Trademark of Deere and Company
Parallel Tracking™	Trademark of Deere and Company
PLUS-50™ II	Trademark of Deere and Company
PowrQuad™	Trademark of Deere and Company
PowrQuad™ PLUS	Trademark of Deere and Company
PowerTech™	Trademark of Deere and Company
PowerTech™ Plus	Trademark of Deere and Company
Power Zero™	Trademark of Deere and Company
QUICK METAL™	Trademark of Henkel Corporation
QuickTatch™	Trademark of Deere and Company
Row-Trak™	Trademark of Deere and Company
ServiceADVISOR™	Trademark of Deere and Company
SERVICEGARD™	Trademark of Deere and Company
StarFire™	Trademark of Deere and Company
StarFire™ iTC	Trademark of Deere and Company
STC™	Trademark of Eaton Corporation
StellarSupport™	Trademark of Deere and Company
SUMITOMO™	Trademark of Sumitomo Corporation
TEFLON™	Trademark of DuPont Co.
TIA™	Trademark of Deere and Company
TLS™	Trademark of Deere and Company
TLS™ Plus	Trademark of Deere and Company
TouchSet™	Trademark of Deere and Company
Tractor-Implement Automation™	Trademark of Deere and Company
Vari-Cool™	Trademark of Deere and Company
Weather Pack™	Trademark of Packard Electric
YAZAKI™	Trademark of Yazaki Corporation

LN71218,0000474 -19-03MAR16-2/2

Sealants and Adhesives Cross-Reference Chart

U.S. Part Number	Canadian Part Number	Color	Size	Description	LOCTITE® /Permatex Number
Bonding					
PM37513	PM38606	BLACK AND WHITE	4 g	Epoxy Adhesive	21425
PM37391	PM38615	CLEAR	2 g	Gel Super Glue	454
PM37532	—	BLACK	5 oz	Weatherstrip Adhesive	30540
—	PM38603	YELLOW	147 ml	Weatherstrip Adhesive	30537
Gasketing					
PM38655	PM38625	PURPLE	50 ml	Flexible Form-in-Place Gasket	515
—	PM38600	BROWN	118 ml	Liquid Gasket Maker	30524
PM37559	PM38600	BROWN	4 oz	General Purpose Gasket Dressing (Aviation Gasket Sealant)	30517
PM38657	PM38628	BLUE	50 ml	High-Flex Form-in-Place Gasket	17430
PM37463	PM37463	CLEAR	80 g	RTV Clear Silicone	59530
PM37521		CLEAR	30 g	RTV Clear Silicone	59575
—	PM38618	CLEAR	300 g	RTV Clear Silicone	
PM37465	PM38616	METALLIC BLUE	80 ml	Ultra Blue RTV Silicone	58730
(See Note)[a]	—	RED	—	LOCTITE Gasket Eliminator	518
—	(See Note)[b]	PURPLE	—	LOCTITE Gasket Eliminator	51813
PM37553	PM37553	BURGUNDY	16 oz	High Tack Gasket Dressing	30525
PM37555	PM38607	BURGUNDY	9 oz aerosol	Hi-Tack Gasket Sealant	30524
PM37469	PM38609	RED	80 g	Hi-Temp RTV Silicone	59630
PM37529	—	RED	7.25 aerosol	Hi-Temp RTV Silicone	30541
PM37512	PM37512	—	—	Flexible Flange Sealant	5900
PM37616	—	—	20 g Stick	Copper Anti-Seize Stick	—
PM37617	—	—	20 g Stick	Silver-Grade Anti-Seize Stick	—
TY24810	TY24810	—	12.5 aerosol	NEVER-SEEZ®	—
TY24811	TY24811	—	8 oz can with brush	NEVER-SEEZ®	—
H154379	—	GREEN		Sealant	—
Priming					
PM37509	PM38611	GREEN	4.5 oz	Cure Primer	7649
Retaining					
PM38651	PM38612	SILVER	50 ml	QUICK METAL®	660
PM37485	—	GREEN	36 ml	Maximum Strength	680

Continued on next page

LN71218,00008F0 -19-31MAR14-1/2

U.S. Part Number	Canadian Part Number	Color	Size	Description	LOCTITE® /Permatex Number
—	PM38626	GREEN	50 ml	Maximum Strength	62083
PM38652	—	GREEN	36 ml	High-Temperature	620
Thread Locking and Sealing					
PM38653	—	PURPLE	6 ml	Low Strength	222
—	PM38645	PURPLE	2 g	Superglue Instant Adhesive	22200
PM37418	PM38621	BLUE	6 ml	Medium Strength	242
PM37477	PM38622	BLUE	36 ml	Medium Strength	242
PM37643	—	BLUE	9 g Stick	Blue Stick Threadlocker (medium-strength)	—
PM37614	—	BLUE	19 g Stick	Blue Stick Threadlocker (medium-strength)	—
PM37615	—	—	19 g Stick	PST Thread Sealant Stick	—
PM37421	PM38623	RED	6 ml	High Strength	271 (usually red in color)
PM38654	PM38623	RED	36 ml	High Strength	271
—	PM38624	RED	50 ml	High Strength	27140
PM38656	PM38627	RED	36 ml	High Strength	277
PM37700	—	RED	19 g Stick	Red Stick Threadlocker (High-Strength)	—
PM37701	—	RED	9 g Stick	Red Stick Threadlocker (High-Strength)	—
PM37398	PM38613	WHITE	6 ml	Pipe Sealant with TEFLON®	592
PM37397	PM38613	WHITE	50 ml	Pipe Sealant with TEFLON	592

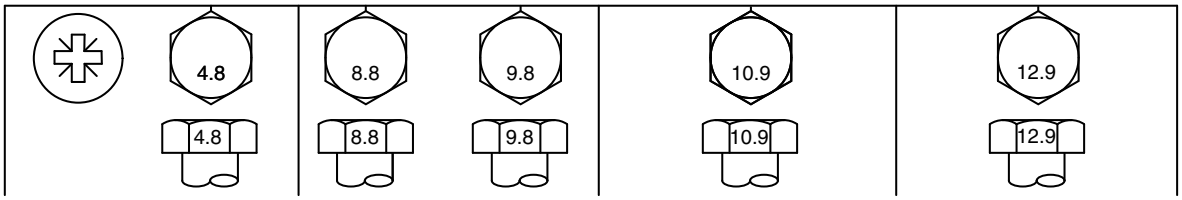
[a]*Recommend PM38657 in place of LOCTITE 518 for aluminum.*
[b]*Recommend PM38625 in place of LOCTITE 51813 for aluminum.*

LOCTITE is a trademark of Henkel Corporation
NEVER-SEEZ is a trademark of Emhart Chemical Group
QUICK METAL is a trademark of Henkel Corporation.
TEFLON is a trademark of Du Pont Co.

LN71218,00008F0 -19-31MAR14-2/2

Metric Bolt and Screw Torque Values

TS1742 —UN—31MAY18



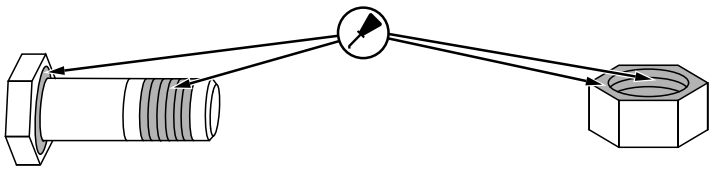
Bolt or Screw Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]		Hex Head[a]		Flange Head[b]	
	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in
M6	3.6	31.9	3.9	34.5	6.7	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

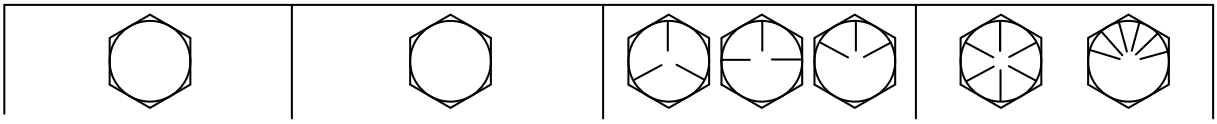


[a]Hex head column values are valid for ISO 4014 and ISO 4017 hex head, ISO 4162 hex socket head, and ISO 4032 hex nuts.
[b]Hex flange column values are valid for ASME B18.2.3.9M, ISO 4161, or EN 1665 hex flange products.

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

Unified Inch Bolt and Screw Torque Values

TS1671 —UN—01MAY03



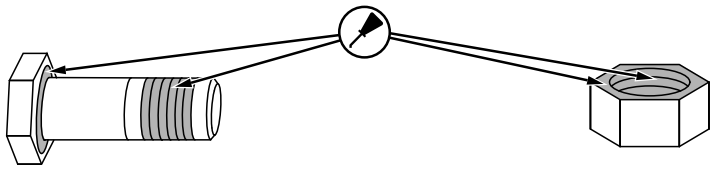
Bolt or Screw Size	SAE Grade 1[a]				SAE Grade 2[b]				SAE Grade 5, 5.1 or 5.2				SAE Grade 8 or 8.2			
	Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]		Hex Head[c]		Flange Head[d]	
	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in
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

Face Seal Fittings Assembly and Installation—All Pressure Applications

Face Seal O-Ring to Stud End Installation

1. Inspect the fitting surfaces. They must be free of dirt and/or defects.
2. Inspect the O-ring. It must be free of damage and/or defects.
3. Lubricate O-rings using system oil, and install into groove.
4. Push O-ring into groove so O-ring is not displaced during assembly.
5. Index angle fittings and tighten by hand pressing joint together to insure O-ring remains in place.
6. Tighten fitting or nut to torque value shown on the chart per dash size stamped on the fitting. DO NOT allow hoses to twist when tightening fittings.

Face Seal Adjustable Stud End O-Ring Installation

1. Back off lock nut (jam nut) and washer to full exposed turned down section of the fitting.
2. Install a thimble over the fitting threads to protect the O-ring from nicks.
3. Slide the O-ring over the thimble into the turned down section of the fitting.
4. Remove thimble.

Face Seal Straight Stud End O-Ring Installation

1. Install a thimble over the fitting threads to protect the O-ring from nicks.
2. Slide the O-ring over the thimble into the turned down section of the fitting.
3. Remove thimble.

Fitting Installation

1. Install fitting by hand until snug.
2. Position adjustable fittings by unscrewing the fitting no more than one turn.
3. Apply assembly torque per table.

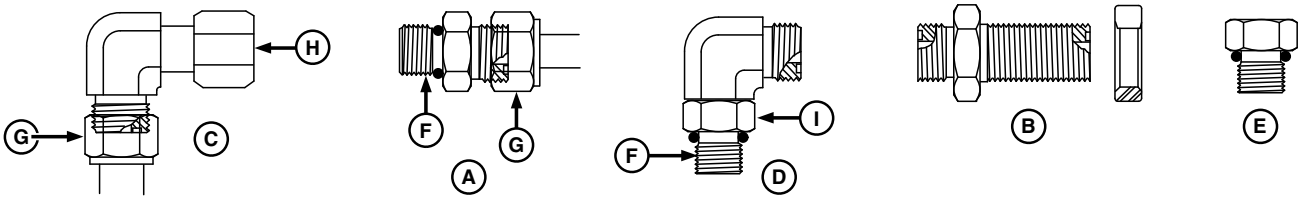
Assembly Torque

1. Use one wrench to hold the connector body and one wrench to tighten nut.
2. For a hydraulic hose, it may be necessary to use three wrenches to prevent twist; one on the connector body, one on the nut, and one on the body of the hose fitting.

OUO6435,0001557 -19-06APR15-1/1

Metric Face Seal And O-Ring Stud End Fitting Torque Chart—Standard Pressures

N79757 —UN—13FEB08



A—Straight Stud and Tube Nut
B—Bulkhead Union and Bulkhead Jam Nut
C—90° Swivel Elbow and Tube Nut
D—90° Adjustable Stud Elbow
E—Port Plug
F—Stud End
G—Tube Nut
H—Swivel Nut
I— Jam Nut

Metric Face Seal and O-Ring Stud End Fitting Torque Chart—Standard Pressure-Below 27.6 MPA (4,000 PSI)

Nominal Tube OD Hose ID				O-Ring Face Seal/ Tube Swivel Nut				Bulkhead Jam Nut Torque[A]			O-Ring Straight, Adjustable, and External Port Plug Stud Ends[A]						
Metric Tube OD	Inch Tube OD			Thread Size	Swivel Nut Hex Size	Tube Nut/Swivel Nut Torque		Jam Nut Hex Size	Jam Nut Torque		Thread Size	Straight Hex Size[B]	Adj Lock Nut Hex Size	Steel or Gray Iron Torque		Aluminum or Brass Torque[C]	
mm	Dash Size	in	mm	in	mm	N·m	lb-ft	mm	N·m	lb-ft	mm	mm	mm	N·m	lb-ft	N·m	lb-ft
4	-2	0.125	3.18	—	—	—	—	—	—	—	M8 X 1	12	12	8	6	5	4
5	-3	0.188	4.76	—	—	—	—	—	—	—	M10 X 1	14	14	15	11	10	7
6	-4	0.250	6.35	9/16-18	17	16	12	22	32	24	M12 X 1.5	17	17	25	18	17	12
8	-5	0.312	7.92	—	—	—	—	—	—	—	M14 X 1.5	19	19	40	30	27	20
10	-6	0.375	9.53	11/16-16	22	24	18	27	42	31	M16 X 1.5	22	22	45	33	30	22
12	-8	0.500	12.70	13/16-16	24	50	37	30	93	69	M18 X 1.5	24	24	50	37	33	25
16	-10	0.625	15.88	1-14	30	69	51	36	118	87	M22 X 1.5	27	27	69	51	46	34
20	-12	0.750	19.05	1-3/16-12	36	102	75	41	175	129	M27 X 2	32	32	100	74	67	49
22	-14	0.875	22.23	1-3/16-12	36	102	75	41	175	129	M30 X 2	36	36	130	96	87	64
25	-16	1.000	25.40	1-7/16-12	41	142	105	46	247	182	M33 X 2	41	41	160	118	107	79
28	—	—	—	—	—	—	—	—	—	—	M38 x 2	46	46	176	130	117	87
32	-20	1.250	31.75	1-11/16-12	50	190	140	50	328	242	M42 X 2	50	50	210	155	140	103
38	-24	1.500	38.10	2-12	60	217	160	60	374	276	M48 X 2	55	55	260	192	173	128
50	-32	2.000	50.80	—	—	—	—	—	—	—	M60 X 2	65	65	315	232	210	155

Continued on next page

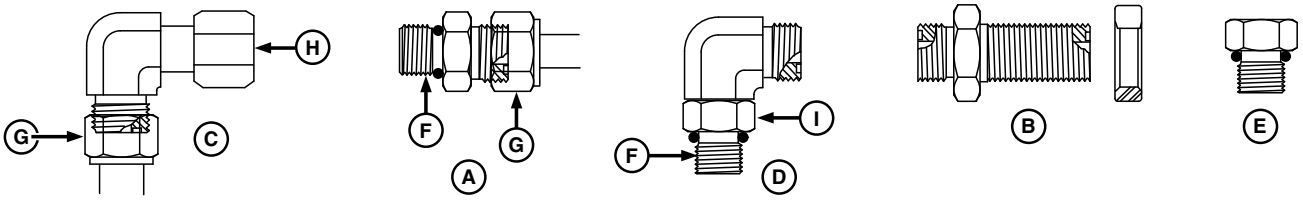
OUO6083,000005C -19-02JUL08-1/2

[A] Tolerance is +15%, minus 20% of mean tightening torque unless otherwise specified.
[B] The straight hex wrench sizes listed apply to connectors only and may not be the same as the corresponding plug of the same thread size.
[C] These torques were established using steel plated connectors in aluminum and brass.

OUO6083,000005C -19-02JUL08-2/2

Metric Face Seal and O-Ring Stud End Fitting Torque Chart—High Pressure Applications

N79757 —UN—13FEB08



A—Stud Straight and Tube Nut
B—Bulkhead Union and Bulkhead Lock Nut
C—90° Swivel Elbow and Tube Nut
D—90° Adjustable Stud Elbow
E—Port Plug
F—Stud End
G—Tube Nut
H—Swivel Nut
I— Lock Nut

Metric Face Seal and O-Ring Stud End Fitting Torque Chart—High Pressure-Above 27.6 MPA (4,000 PSI), Working Pressure-41.3 MPA (6,000 PSI)

Nominal Tube OD Hose ID				O-Ring Face Seal/ Tube Swivel Nut				Bulkhead Jam Nut Torque[A]			O-Ring Straight, Adjustable, and External Port Plug Stud Ends[A]				
Metric Tube OD	Inch Tube OD			Thread Size	Swivel Nut Hex Size	Tube Nut/Swivel Nut Torque		Jam Nut Hex Size	Jam Nut Torque		Thread Size	Straight Hex Size[B]	Adj Lock Nut Hex Size	Steel or Gray Iron Torque	
mm	Dash Size	in	mm	in	mm	N·m	lb-ft	mm	N·m	lb-ft	mm.	mm	mm	N·m	lb-ft
4	-2	0.125	3.18	—	—	—	—	—	—	—	M8 X 1	12	12	8	6
5	-3	0.188	4.76	—	—	—	—	—	—	—	M10 X 1	14	14	15	11
6	-4	0.250	6.35	9/16-18	17	24	18	22	32	24	M12 X 1.5	17	17	35	26
8	-5	0.312	7.92	—	—	—	—	—	—	—	M14 X 1.5	19	19	45	33
10	-6	0.375	9.53	11/16-16	22	37	27	27	42	31	M16 X 1.5	22	22	55	41
12	-8	0.500	12.70	13/16-16	24	63	46	30	93	69	M18 X 1.5	24	24	70	52
16	-10	0.625	15.88	1-14	30	103	76	36	118	87	M22 X 1.5	27	27	100	74
20	-12	0.750	19.05	1-3/16-12	36	152	112	41	175	129	M27 X 2	32	32	170	125
22	-14	0.875	22.23	1-3/16-12	36	152	112	41	175	129	M30 X 2	36	36	215	159
25	-16	1.000	25.40	1-7/16-12	41	214	158	46	247	182	M33 X 2	41	41	260	192
28	—	—	—	—	—	—	—	—	—	—	M38 x 2	46	46	320	236
32	-20	1.250	31.75	1-11/16-12	—	286	211	50	328	242	M42 X 2	50	50	360	266
38	-24	1.500	38.10	2-12	—	326	240	60	374	276	M48 X 2	55	55	420	310

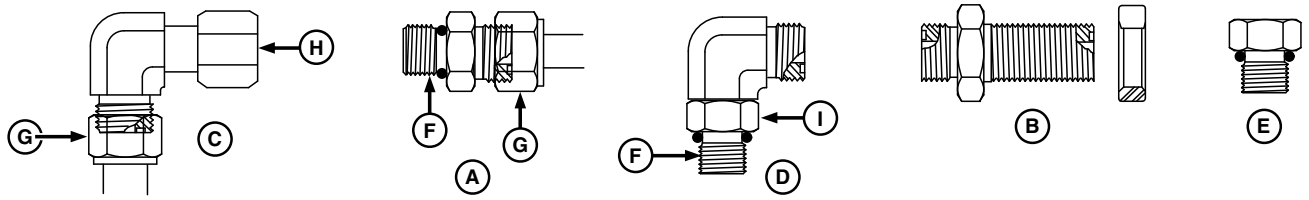
[A] Tolerance is +15%, minus 20% of mean tightening torque unless otherwise specified.

[B] The straight hex wrench sizes listed apply to connectors only and may not be the same as the corresponding plug of the same thread size.

OUO1073,00022E2 -19-29JAN08-1/1

SAE Face Seal and O-Ring Stud End Fitting Torque Chart—Standard Pressures

N79757 —UN—13FEB08



A—Stud Straight and Tube Nut
B—Bulkhead Union and Bulkhead Lock Nut
C—90° Swivel Elbow and Tube Nut
D—90° Adjustable Stud Elbow
E—Port Plug
F—Stud End
G—Tube Nut
H—Swivel Nut
I— Lock Nut

SAE Face Seal and O-Ring Stud End Fitting Torque Chart—Standard Pressure-Below 27.6 MPA (4,000 PSI)

Nominal Tube OD Hose ID				O-Ring Face Seal/ Tube Swivel Nut				Bulkhead Jam Nut Torque[A]			O-Ring Straight, Adjustable, and External Port Plug Stud Ends[A]						
Met-ric Tube OD	Inch Tube OD			Thread Size	Swivel Nut Hex Size	Tube Nut Swivel Nut Torque		Jam Nut Hex Size	Jam Nut Torque		Thread Size	Straight Hex Size[B]	Adj Lock Nut Hex Size	Steel or Gray Iron Torque		Aluminum or Brass Torque[C]	
mm	Da-sh Size	in	mm	in	in	N·m	lb-ft		N·m	lb-ft	in	in	in	N·m	lb-ft	N·m	lb-ft
5	-3	0.188	4.78	—	—	—	—	—	—	—	3/8-24	5/8	9/16	12	9	8	6
6	-4	0.250	6.35	9/16-18	11/16	16	12	13/16	32	24	7/16-20	5/8	5/8	16	12	11	8
8	-5	0.312	7.92	—	—	—	—	—	—	—	1/2-20	3/4	11/16	24	18	16	12
10	-6	0.375	9.53	11/16-16	13/16	24	18	1	42	31	9/16-18	3/4	3/4	37	27	25	18
12	-8	0.500	12.70	13/16-16	15/16	50	37	1-1/8	93	69	3/4-16	7/8	15/16	50	37	33	25
16	-10	0.625	15.88	1-14	1-1/8	69	51	1-5/16	118	87	7/8-14	1-1/16	1-1/16	69	51	46	34
20	-12	0.750	19.05	1-3/16-12	1-3/8	102	75	1-1/2	175	129	1-1/16-12	1-1/4	1-3/8	102	75	68	50
22	-14	0.875	22.23	1-3/16-12	—	102	75	—	175	129	1-3/16-12	1-3/8	1-1/2	122	90	81	60
25	-16	1.000	25.40	1-7/16-12	1-5/8	142	105	1-3/4	247	182	1-5/16-12	1-1/2	1-5/8	142	105	95	70
32	-20	1.25	31.75	1-11/16-12	1-7/8	190	140	2	328	242	1-5/8-12	1-3/4	1-7/8	190	140	127	93
38	-24	1.50	38.10	2-12	2-1/4	217	160	2-3/8	374	276	1-7/8-12	2-1/8	2-1/8	217	160	145	107
50.8	-32	2.000	50.80	—	—	—	—	—	—	—	2-1/2-12	2-3/4	2-3/4	311	229	207	153

[A] Tolerance is +15%, minus 20% of mean tightening torque unless otherwise specified.

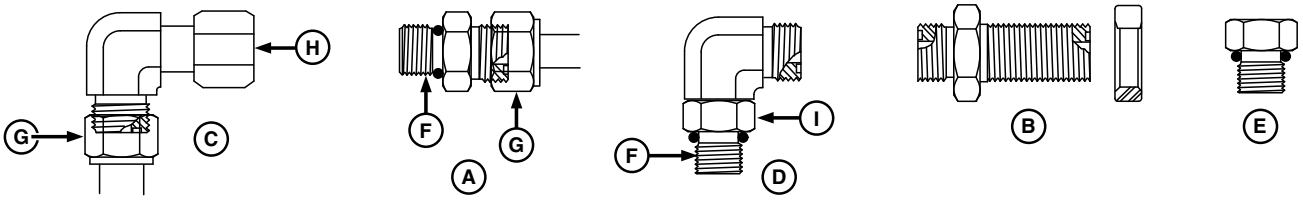
[B] The straight hex wrench sizes listed apply to connectors only and may not be the same as the corresponding plug of the same thread size.

[C] These torques were established using steel plated connectors in aluminum and brass.

OUO1073,00022DE -19-29AUG08-1/1

SAE Face Seal and O-Ring Stud End Fitting Torque Chart—High Pressure Applications

N79757 —UN—13FEB08



A—Stud Straight and Tube Nut
B—Bulkhead Union and Bulkhead Lock Nut
C—90° Swivel Elbow and Tube Nut
D—90° Adjustable Stud Elbow
E—Port Plug
F—Stud End
G—Tube Nut
H—Swivel Nut
I— Lock Nut

SAE Face Seal and O-Ring Stud End Fitting Torque Chart—High Pressure - Above 27.6 MPA (4,000 PSI), Working Pressure-41.3 MPA (6,000 PSI)

Nominal Tube OD Hose ID				O-Ring Face Seal/ Tube Swivel Nut				Bulkhead Jam Nut Torque[A]			O-Ring Straight, Adjustable, and External Port Plug Stud Ends[A]				
Metric Tube OD	Inch Tube OD			Thread Size	Swivel Nut Hex Size	Tube Nut/Swivel Nut Torque		Jam Nut Hex Size	Jam Nut Torque		Thread Size	Straight Hex Size[B]	Adj Lock Nut Hex Size	Steel or Gray Iron Torque	
mm	Dash Size	in	mm	in	in	N·m	lb-ft		N·m	lb-ft	in	in	in	N·m	lb-ft
5	-3	0.188	4.78	—	—	—	—	—	—	—	3/8-24	5/8	9/16	18	13
6	-4	0.250	6.35	9/16-18	11/16	24	18	13/16	32	24	7/16-20	5/8	5/8	24	18
8	-5	0.312	7.92	—	—	—	—	—	—	—	1/2-20	3/4	11/16	30	22
10	-6	0.375	9.53	11/16-16	13/16	37	27	1	42	31	9/16-18	3/4	3/4	37	27
12	-8	0.500	12.70	13/16-16	15/16	63	46	1-1/8	93	69	3/4-16	7/8	15/16	75	55
16	-10	0.625	15.88	1-14	1-1/8	103	76	1-5/16	118	87	7/8-14	1-1/16	1-1/16	103	76
20	-12	0.750	19.05	1-3/16-12	1-3/8	152	112	1-1/2	175	129	1-1/16-12	1-1/4	1-3/8	177	131
22	-14	0.875	22.23	1-3/16-12	—	152	112	—	175	129	1-3/16-12	1-3/8	1-1/2	231	170
25	-16	1.000	25.40	1-7/16-12	1-5/8	214	158	1-3/4	247	182	1-5/16-12	1-1/2	1-5/8	270	199
32	-20	1.25	31.75	1-11/16-12	1-7/8	286	211	2	328	242	1-5/8-12	1-3/4	1-7/8	286	211
38	-24	1.50	38.10	2-12	2-1/4	326	240	2-3/8	374	276	1-7/8-12	2-1/8	2-1/8	326	240

[A] Tolerance is +15%, minus 20% of mean tightening torque unless otherwise specified.

[B] The straight hex wrench sizes listed apply to connectors only and may not be the same as the corresponding plug of the same thread size.

OUO1073,00022E0 -19-18JAN08-1/1

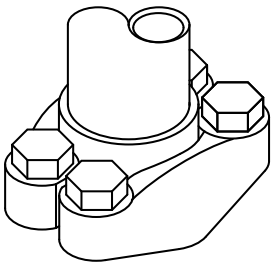
Four Bolt Flange Fittings Assembly and Installation—All Pressure Applications

1. Inspect the sealing surfaces for nicks or scratches, roughness or out-of-flat condition. Scratches cause leaks. Roughness causes seal wear. Out-of-flat causes seal extrusion. If these defects cannot be polished out, replace the component.
2. Install the correct O-ring (and back-up washer if required) into the groove using petroleum jelly to hold it in place.
3. For split flange; loosely assemble split flange halves, being sure that the split is centrally located and perpendicular to the port. Hand tighten cap screws to hold parts in place. Do not pinch O-ring.
4. For single piece flange; put hydraulic line in the center of the flange and install four cap screws. With the flange centrally located on the port, hand tighten cap screws to hold it in place. Do not pinch O-ring.
5. For both single piece flange and split flange, be sure the components are properly positioned and cap screws are hand tight. Tighten one cap screw, then tighten the diagonally opposite cap screw. Tighten the two remaining cap screws. Tighten all cap screws within the specified limits shown in the chart.

   DO NOT use air wrenches. DO NOT tighten one cap screw fully before tightening the others. DO NOT overtighten.

OUO6435,0001558 -19-17DEC01-1/1

SAE Four Bolt Flange Cap Screw Torque Values—Standard Pressure Applications



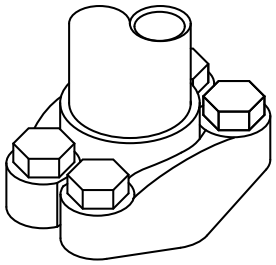
H70423 —UN—30NOV01

SAE Four Bolt Flange Cap Screw Torque Values—27,600 KPA (4,000 PSI) Pressure Applications					
		Torque			
		Newton Meters		Foot Pounds	
Nominal Flange Size	Screw Size[a,b]	Min	Max	Min	Max
1/2	5/16-18 UNC	20	31	15	23
3/4	3/8-16 UNC	28	54	21	40
1	3/8-16 UNC	37	54	27	40
1-1/4	7/16-14 UNC	47	85	35	63
1-1/2	1/2-13 UNC	62	131	46	97
2	1/2-13 UNC	73	131	54	97
2-1/2	1/2-13 UNC	107	131	79	97
3	5/8-11 UNC	187	264	138	195
3-1/2	5/8-11 UNC	158	264	117	195
4	5/8-11 UNC	158	264	117	195
5	5/8-11 UNC	158	264	117	195

[a] *JDM A17D, SAE Grade 5 or better cap screws with plated hardware.*
[b] *1.5.1.2 Lock washers are permissible but not recommended.*

OUO6435,0001549 -19-20NOV01-1/1

SAE Four Bolt Flange Cap Screw Torque Values—High Pressure Applications



H70423 —UN—30NOV01

SAE Four Bolt Flange Cap Screw Torque Values—41,400 KPA (6,000 PSI) Pressure Applications					
		Torque			
		Newton Meters		Foot Pounds	
Nominal Flange Size	Screw Size[a,b]	Min	Max	Min	Max
1/2	5/16-18 UNC	20	31	15	23
3/4	3/8-16 UNC	34	54	25	40
1	7/16-14 UNC	57	85	42	63
1-1/4	1/2-13 UNC	85	131	63	63
1-1/2	5/8-11 UNC	159	264	117	195
2	3/4-10 UNC	271	468	200	345

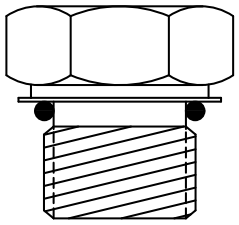
[a] *JDM A17D, SAE Grade 5 or better cap screws with plated hardware.*
[b] *1.5.1.2 Lock washers are permissible but not recommended.*

OUO6435,000154C -19-29NOV01-1/1

External Hexagon Port Plug Torque Chart

Port or Stud End Thread Size[a]	Torque +15%/-20%
M8 x 1	10 N·m (89 lb-in)
M10 x 1	17 N·m (150 lb-in)
M12 x 1.5	28 N·m (20.6 lb-ft)
M14 x 1.5	39 N·m (28.7 lb-ft)
M16 x 1.5	48 N·m (35.4 lb-ft)
M18 x 1.5	60 N·m (44.2 lb-ft)
M20 x 1.5	60 N·m (44.2 lb-ft)
M22 x 1.5	85 N·m (62.7 lb-ft)
M27 x 2	135 N·m (99.6 lb-ft)
M30 x 2	165 N·m (121.7 lb-ft)
M33 x 2	235 N·m (173.3 lb-ft)
M38 x 2	245 N·m (180.7 lb-ft)
M42 x 2	260 N·m (191.8 lb-ft)
M48 x 2	290 N·m (213.9 lb-ft)
M60 x 2	330 N·m (243.4 lb-ft)

[a] *Port to JDS-G173.1; stud end to JDS-G173.3.*



H70356 —UN—30NOV01

OUO6083,0000109 -19-24JUL08-1/1

Prevent Hydraulic System Contamination

IMPORTANT: Cleanliness is very important when working on the hydraulic system. Prevent contamination by assembling the cylinders, hoses, couplers, and valves in a clean area of the shop.

Leave protective caps on the fluid openings until ready to make the connection. When charging the system, use a tractor or other source that contains clean oil, free of abrasive materials. Keep couplers clean. Abrasive particles, like sand or metal fragments, can damage seals, barrels and pistons, causing internal leakage.

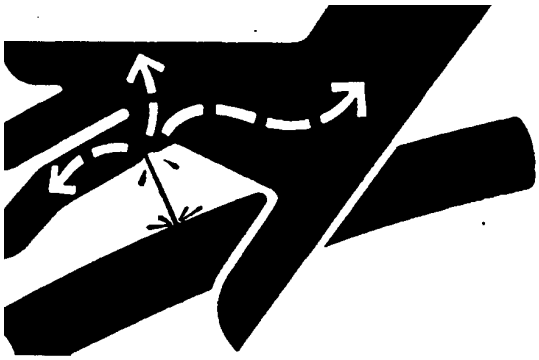
NX,T9005AE -19-10JUN08-1/1

Check Oil Lines and Fittings

CAUTION: Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury may call Deere & Company Medical Department in Moline, Illinois or other knowledgeable medical source.

Check all oil lines, hoses and fittings regularly for leaks or defects. Make sure all clamps are in position and tight.



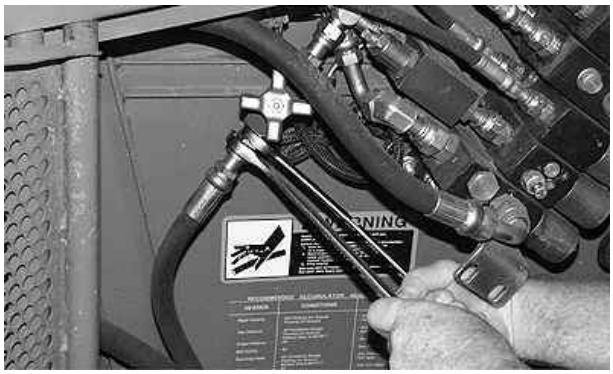
X9811 —UN—23AUG88

Make sure hoses are not twisted or touching machine parts which are moving. Replace damaged parts.

IMPORTANT: Tighten fittings as specified in torque chart.

OUO6083,00000FA -19-23JUL08-1/2

If necessary, use two wrenches to prevent hoses from twisting, bending or breaking tubing and fittings.



H58319 —UN—15JUN99

OUO6083,00000FA -19-23JUL08-2/2

Basic Electrical Component Handling / Precautions For Vehicles Equipped With Computer Controlled Systems

Electrical Precautions To Take:

Never disconnect the batteries while the key switch is running. Why: This can cause electrical voltage spikes that can damage electronic components.

Do not connect jumper cables while the key switch is on. Why: This can cause electrical voltage spikes that can damage electronic components.

Disconnect batteries prior to recharging (if possible). Why: Electrical loads in the machine can slow the recharging process. Battery chargers can cause electrical voltage spikes that can damage electronic components.

Never jump start the machine with a voltage higher than the machine is designed to operate on. Why: This can damage electronic components.

Do not connect or disconnect electrical connectors while the key switch is on or the machine is running. Why: This can cause computer system errors from interrupting a computer program while it is running and electrical voltage spikes that are produced can damage electronic components.

Do not apply power or ground to any component as a test unless specifically instructed to do so. Why: Connecting the wrong voltage to the wrong point of an electronic system can cause electronic component failures.

When welding on the machine, make sure to connect ground lead to the parts being welded. For maximum protection, disconnect all electronic controller connectors before welding. Why: High currents associated with welding can damage wiring harnesses that are involved in the ground path. Welding can also cause electrical voltage spikes that can damage electronic components.

AG,OUO6022,1696 -19-10OCT13-1/1

Identify Zinc-Flake Coated Fasteners

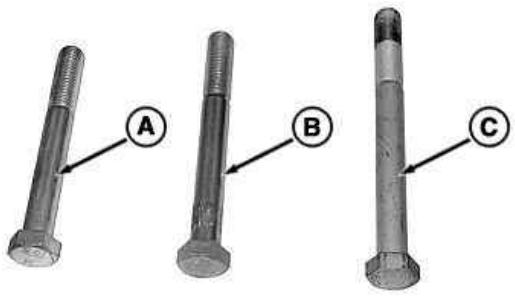
Standard cap screws (A) are a reflective silver color.

Zinc plated cap screws (B) are a reflective gold color.

Zinc-Flake Coated cap screws (C) are a dull silver color.

NOTE: Zinc-Flake Coated fasteners are tightened to lubricated specifications, unless otherwise noted. (See Torque Value Charts in this group.)

A—Standard Cap Screws
B—Zinc-plated Cap Screw
C—Zinc-Flake Cap Screw (16 mm and larger)

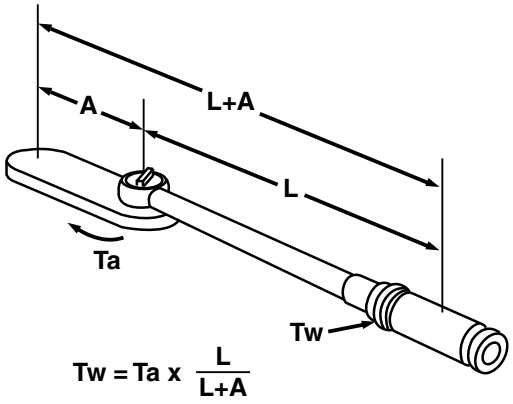


RXA0073812 —UN—03MAR04

OURX985,0000024 -19-25MAR04-1/1

Use Torque Wrench Adapter

Tw	=	Torque setting on the torque wrench
Ta	=	Torque actually being applied to the nut or cap screw
L	=	Length from the point of force (center of the wrench handle) to the center of head of torque wrench
A	=	Application distance from center of torque wrench head to the center of adapter



$$Tw = Ta \times \frac{L}{L+A}$$

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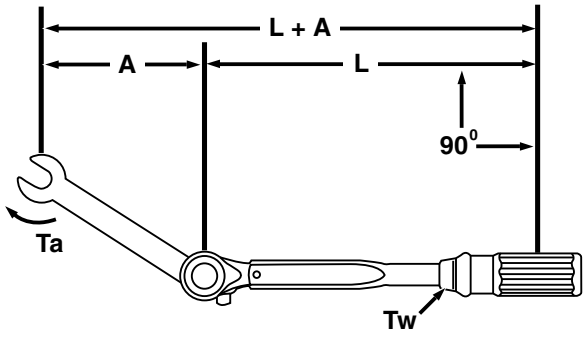

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OURX985,0000E03 -19-08OCT12-1/1

Servicing and Connecting Snap to Connect STC® Fittings

CAUTION: Do NOT disconnect STC fitting when under pressure. Failure to relieve pressure before disconnecting fitting may result in personal injury, damage to equipment or both.

NOTE: Snap to Connect fittings are used on steel lines, hose connections and come in a variety of sizes. JDG1885 Snap-to-Connect Release Tools (A) are designed as a spacer to move release ring (B) inward which releases retaining ring (C). JDG1885 STC tools can be purchased through SERVICEGARD.

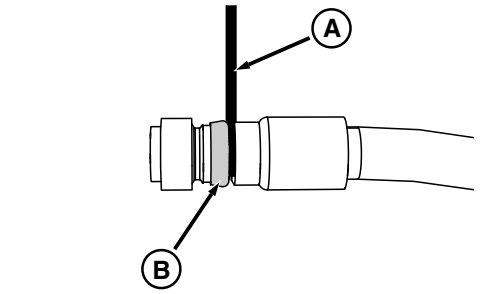
IMPORTANT: Do not use tool to pry fitting apart, it is used only as a spacer to move release ring (B) inward to release retaining ring (C).

1. **For disassembly perform the following:** Insert correct JDG1885 STC tool (A) between releasing ring (B) and fitting.
2. Remove hose or line pulling parallel from connector.

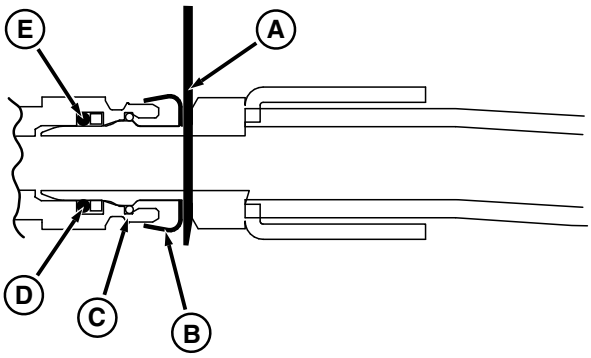
NOTE: If retaining ring, backup ring (D) or O-ring (E) are damaged, replace all three parts.

Before connecting Snap to Connect fitting:

1. Check mating surfaces for nicks, scratches or flat spots.
2. Check O-ring, backup ring and retaining ring for wear or damage. Replace as needed.
3. Ensure both female and male ends are clean and free of contaminates.
4. Push fitting connections parallel together until a definite snap and solid stop is felt.



RXA0075330 —UN—16JUN04



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A—JDG1885
B—Release Ring
C—Retaining Ring
D—Backup Ring
E—O-Ring

5. Pull parallel back on hose to ensure fitting connections are locked together.

AC20456,0000727 -19-17SEP14-1/1

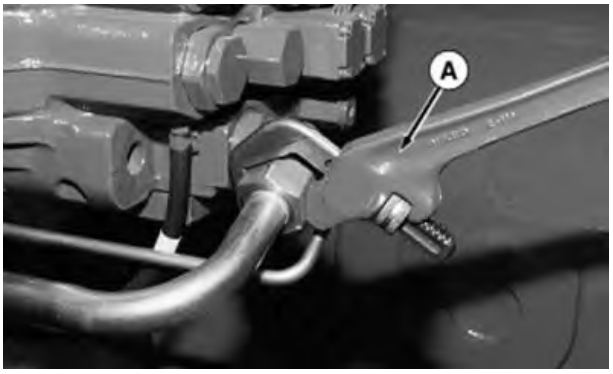
Use Special Wrench

CAUTION: Avoid injury from high-pressure leaks by relieving system pressure before disconnecting any hydraulic lines, fittings, or connectors.

NOTE: Open-end wrenches may work best in some locations.

Use JDG658 Special Hydraulic Wrench (A) when removing or installing hydraulic hoses using ORS® fittings.

A—JDG658 Wrench



RW25426 —UN—15MAY96

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LN71218,0000902 -19-04JUN14-1/1

Install Hydraulic Fittings

1. Inspect O-ring (A) for damage on all O-ring seal connectors and fittings.
2. Lubricate O-ring before installing connectors and fittings.
3. Torque fittings to specification. (See Metric Face Seal And O-Ring Stud End Fitting Torque Chart—Standard Pressures, Metric Face Seal and O-Ring Stud End Fitting Torque Chart—High Pressure Applications, SAE Face Seal and O-Ring Stud End Fitting Torque Chart—Standard Pressures and SAE Face Seal and O-Ring Stud End Fitting Torque Chart—High Pressure Applications in Section 10, Group 05.)

RW15638A —UN—30JUL98

A—O-Ring

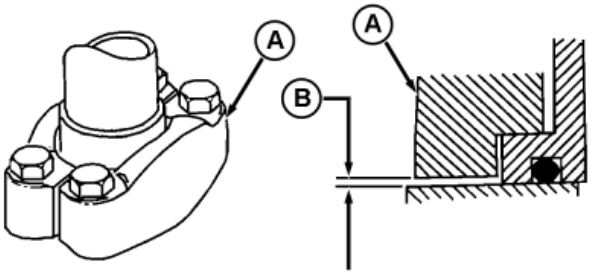
LN71218,0000903 -19-31MAR14-1/2

1. Install flange head connectors squarely against sealing surface.
2. Ensure line is centered in clamp and perpendicular to port.
3. Hand tighten cap screws.

NOTE: Tighten cap screws in a diagonal pattern.

4. Tighten flange clamps (A) to correct torque specification. (See SAE Four Bolt Flange Cap Screw Torque Values—Standard Pressure Applications and SAE Four Bolt Flange Cap Screw Torque Values—High Pressure Applications in Section 10, Group 10.)

   DO NOT overtighten flange clamps. Doing so can cause flanged head to distort allowing seal to extrude. Correctly installed clamps should provide a clearance (B) between clamp and fitting sealing surface of 0.25—0.8 mm (0.01—0.03 in).



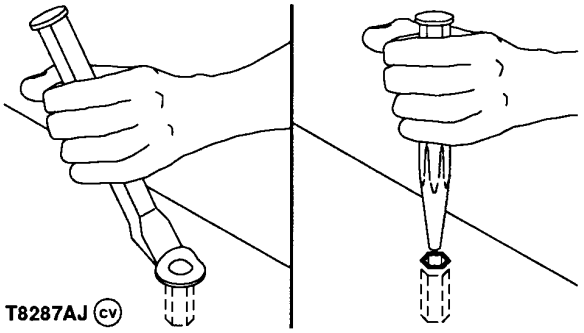
RW15637A —UN—30JUL98

A—Flange Clamps **B—Clearance**

LN71218,0000903 -19-31MAR14-2/2

Remove and Install Rivet Nut Fasteners

1. Remove flange of rivet nut using a hammer and chisel. Ensure not to damage surface under flange or hexagon hole.
2. Using a punch, remove threaded portion of fastener.



T8287AJ —UN—19JUL94

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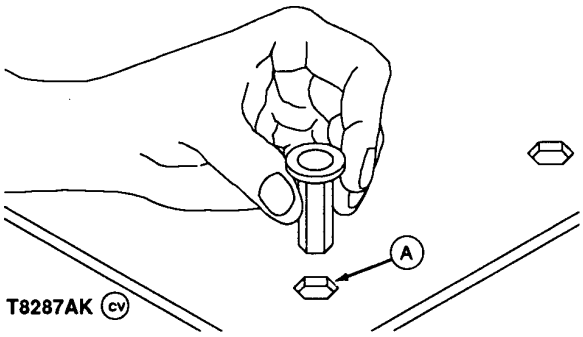
LN71218,0000471 -19-08JUL14-1/7

NOTE: Fasteners are color-coded to indicate nominal plate thickness for which fastener can be used.

3. Select correct tool and proper length fastener for thickness of material where fastener is installed.

RIVET NUT LENGTH SELECTION			
Material Thickness	**Special Tool**	**Size**	**Color Code**
3.8—7.9 mm (0.150—0.311 in)	JDG1295 M8 Rivnut Installer	M8	Yellow
7.9—11.1 mm (0.311—0.437 in)		M8	Black
11.1—14.3 mm (0.437—0.563 in)		M8	Silver
7.75—9.09 mm (0.305—0.358 in)	JDG894 Rivnut Installer	M10	Red
9.75—11.10 mm (0.384—0.437 in)		M10	Black
11.73—13.08 mm (0.462—0.515 in)		M10	Olive Drab

IMPORTANT: DO NOT force or drive fastener into hole. Fastener can be damaged and will not hold securely.



T8287AK —UN—17OCT94

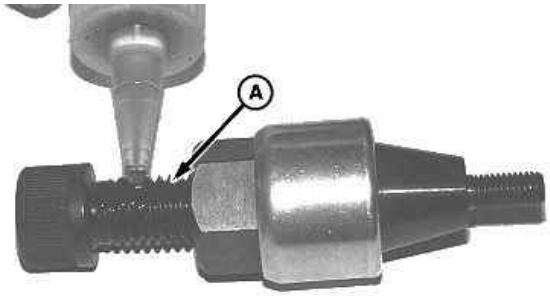
A—Hexagon Hole

4. Ensure new fastener fits easily into existing hexagon hole (A). If necessary, use a small file to clean edges of hole.

LN71218,0000471 -19-08JUL14-2/7

5. Lubricate threads (A) of rivet nut installer using a light oil.

A—Threads

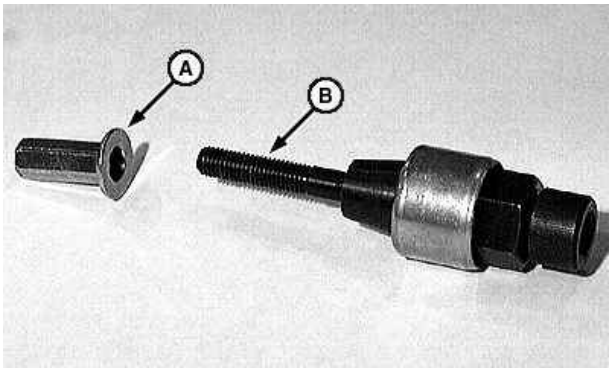


A50743 —UN—05NOV02

LN71218,0000471 -19-08JUL14-3/7

6. Screw head end of rivet nut (A) onto pull-up stud (B) of rivet nut installer, until all threads of rivet nut are engaged with stud.

A—Rivet Nut Head **B—Pull-Up Stud**



H54038 —UN—18FEB99

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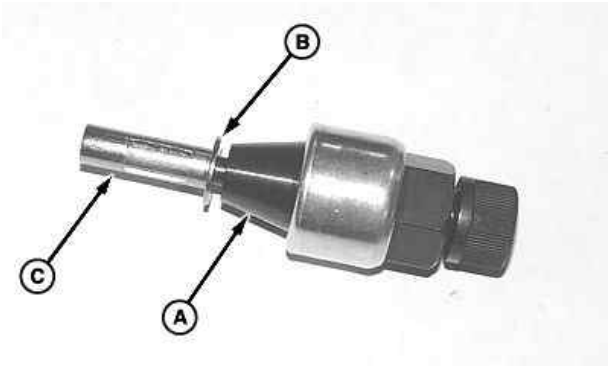
LN71218,0000471 -19-08JUL14-4/7

7. Rotate anvil (A) until tight against head (B) of rivet nut (C).

A—Anvil
B—Head
C—Rivet Nut



A50744 —UN—23OCT02

LN71218,0000471 -19-08JUL14-5/7

8. Position rivet nut and rivet nut installer (A) in hole with head of rivet nut tight to surface.

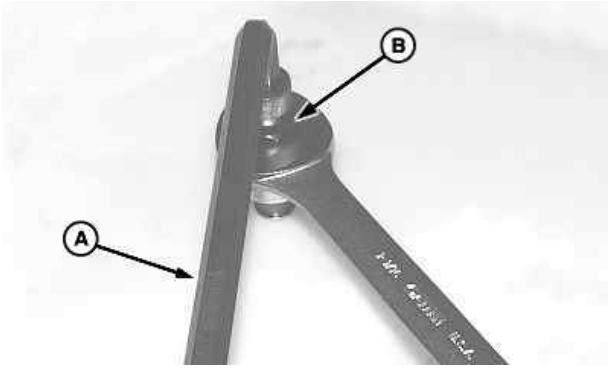
A—Rivet Nut Installer

A50745 —UN—23OCT02

LN71218,0000471 -19-08JUL14-6/7

9. Hold socket head stationary with wrench (A). Tighten hex nut (B) clockwise until firm resistance is felt.
10. Shoulder of rivet nut will collapse and hold tight.
11. Break hex nut loose with counterclockwise movement and remove both wrenches.
12. Remove tool by turning rivet nut installer counterclockwise.

A—Wrench
B—Hex Nut



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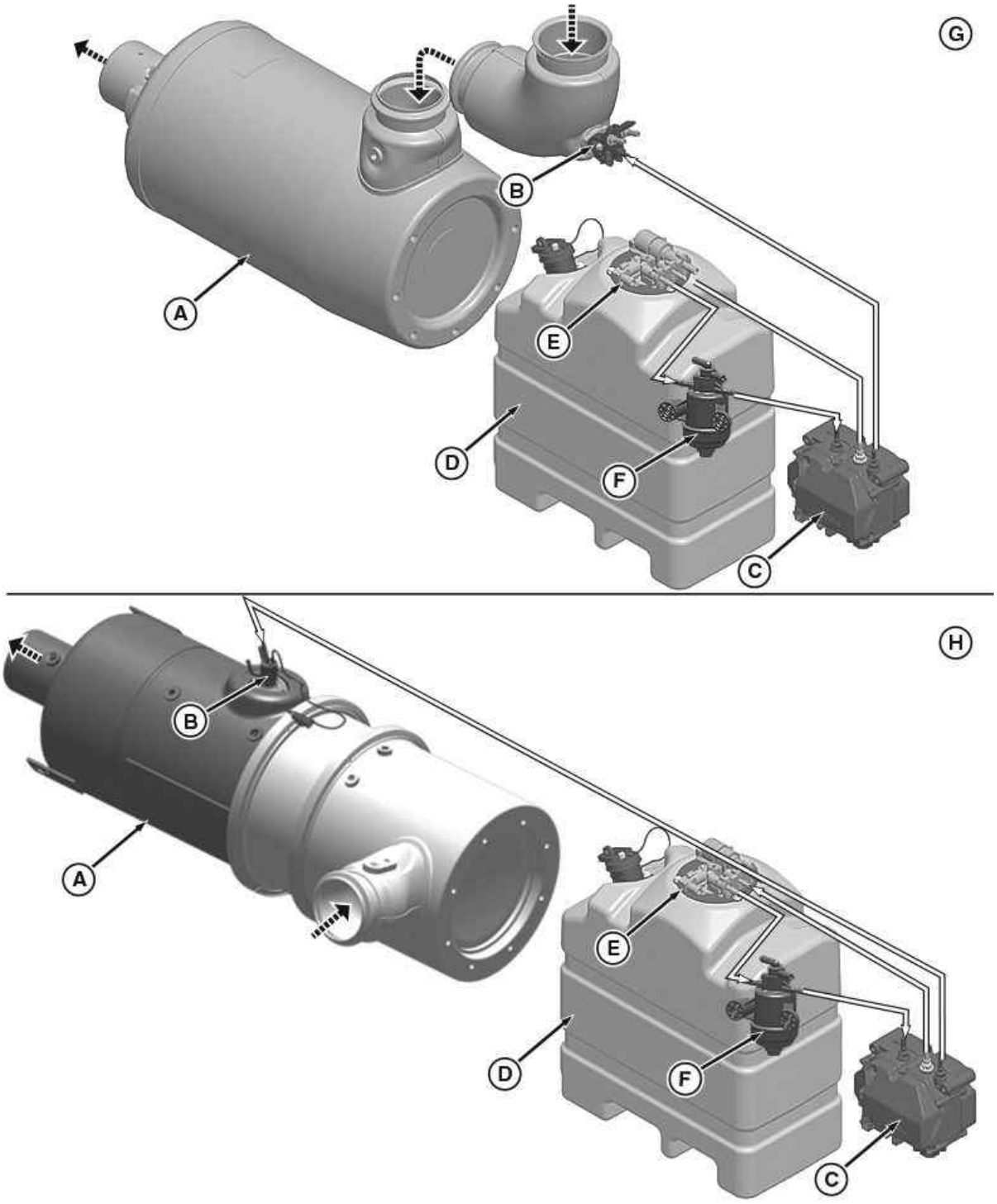
Selective Catalytic Reduction (SCR) System Overview



SCR System

A—SCR Catalyst
B—DEF Dosing Injector
C—DEF Dosing Unit
D—DEF Tank
E—DEF Tank Header Assembly
F—Inline DEF Filter (If Equipped)
G—Modular Canning Configuration
H—Inline Canning Configuration

Continued on next page

DX,SCR,OVERVIEW -19-30MAR20-1/2

IMPORTANT: Do not remove battery leads for at least 4 minutes after engine stops. The SCR system automatically purges itself of Diesel Exhaust Fluid (DEF) immediately after the engine is stopped. If adequate time is not allowed for lines to be purged, residual DEF can freeze and possibly damage components of the SCR system during cold-weather exposure.

In order to comply with national and local emission requirements, this engine series contains a Selective Catalytic Reduction (SCR) system. The main components of the SCR system include the SCR catalyst (A), DEF dosing injector (B), DEF dosing unit (C), DEF tank (D), and DEF tank header assembly (E). The SCR system is effective at reducing the nitrogen oxides (NOx) emissions. NOx is a major component of smog and acid rain.

During combustion, NOx molecules are formed in the exhaust. DEF is injected into the exhaust stream before the SCR catalyst. Through a chemical reaction in the SCR, NOx is converted into nitrogen and water.

Water vapor is a normal by-product of combustion. During cold-weather operation at low exhaust temperatures, this water vapor can condense and resemble white smoke from the exhaust. This will dissipate as operating temperature increases and the water is further vaporized. This situation is considered normal.

A DEF solution begins to crystallize and freeze at -11 °C (12 °F). With climate temperatures that can range much colder than this, DEF is expected to freeze in the DEF tank. For this reason, the DEF tank contains a heating element that provides rapid thawing of DEF upon start-up. The heating element cycles to maintain fluidity during operation as needed. DEF is not dosed upon initial start-up, therefore it is not necessary to have liquid DEF at cold start-up.

If DEF quality deteriorates and it is no longer within specifications, the engine can derate. DEF should be crystal clear with a light ammonia smell. If DEF appears cloudy, has a colored tint, or has a profound ammonia smell, it is likely not within specification.

DX,SCR,OVERVIEW -19-30MAR20-2/2

Restored Operation Option

NOTE: This is a European Union (EU) only option. Engine must have an EU only emission label. Option is not available for engine with EPA and EU emission label.

IMPORTANT: Operating the engine without emissions related derates could damage the aftertreatment system.

The Restored Operation Option enables a SCR equipped application to operate without emissions related derates for a specified time. After a final emission-related derate, the operator can activate the Restored Operation Option through the operator interface. Once activated, the engine can operate free of emissions-related derates for 30 minutes. The option can be activated three times, for a total of 90 minutes. To reset the Restored Operation Option for future use, the derate condition must be corrected.

DX,SCR,RESTORE,EU -19-07OCT14-1/1