Workshop Service Manual

New Leader® L4258G4/L4330G4

North America
4205 River Green Parkway, Duluth GA 30096 USA

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NA
English

CALIFORNIA
Proposition 65 Warning

WARNING: Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, or other reproductive harm.

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

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1.1 Important safety information

Most accidents that involve product operation, maintenance and repair are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before an accident occurs. A person must be alert to potential hazards. This person must also have the necessary training, skills and tools to do these functions correctly.

Incorrect operation, lubrication, maintenance, or repair of this product can be dangerous and can result in injury or death.

Do not operate or do any lubrication, maintenance or repair on this product, until you read and understand the operation, lubrication, maintenance, and repair information.

Safety precautions and warnings are provided in this manual and on the product. If these hazard warnings are not heeded, bodily injury or death can occur to you or other persons.

AGCO cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this publication and on the product are, thus, not all-inclusive. If a tool, procedure, work method or operating technique that is not specifically recommended by AGCO is used, you must satisfy yourself that it is safe for you and others. You must make sure the product will not be damaged or made unsafe by the operation, lubrication, maintenance, or repair procedures that you choose.

The information, specifications, and illustrations in this publication are based on the information that was available at the time that the publication was written. The specifications, torques, pressures, measurements, adjustments, illustrations, and other items can change at any time. These changes can affect the service that is given to the product. Obtain the complete and most current information before you start any job. AGCO dealers have the most current information available.

WARNING:
When replacement parts are required for this product, AGCO recommends using replacement parts or parts with equivalent specifications including, but not limited to, physical dimensions, type, strength, and material. Failure to heed this warning can lead to premature failures, product damage, personal injury, or death.

1.1.1 Prepare for operation

Read and understand all operating instructions and precautions in this manual before operating or servicing the machine.

Make sure you know and understand the positions and operations of all controls. Make certain all controls are in neutral and the park brake is applied before starting the machine.

Make certain all people are well away from your area of work before starting and operating the machine. Check and learn all controls in an area clear of people and obstacles before starting your work. Be aware of the machine size and have enough space available to allow for operation. Never operate the machine at high speeds in crowded places.

Emphasize the importance of using correct procedures when working around and operating the machine. Do not let children or unqualified persons operate the machine. Keep others, especially children, away from your area of work. Do not permit others to ride on the machine.

Make sure the machine is in the proper operating condition as stated in the Operator Manual. Make sure the machine has the correct equipment required by local regulations.

1.1.2 A word to the operator

It is your responsibility to read and understand the safety section in this manual and the manual for all attachments before operating this machine. Remember you are the key to safety. Good safety practices not only protect you, but also the people around you.

Study the content in this manual and make the content a working part of your safety program. Keep in mind that this safety section is written only for this type of machine. Practice all other usual and customary safe working precautions, and above all remember - safety is your responsibility. You can prevent serious injury or death.

This safety section is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of your machine. This section also suggests possible ways of dealing with these situations. This section is not a replacement for other safety practices featured in other sections of this manual.

Personal injury or death may result if these precautions are not followed.

Learn how to operate the machine and how to use the controls properly.

Do not let anyone operate the machine without instruction and training.

For your personal safety and the personal safety of others, follow all safety precautions and instructions found in the manuals and on safety signs affixed to the machine and all attachments.

Use only approved attachments and equipment.

Make sure your machine has the correct equipment needed by the local regulations.

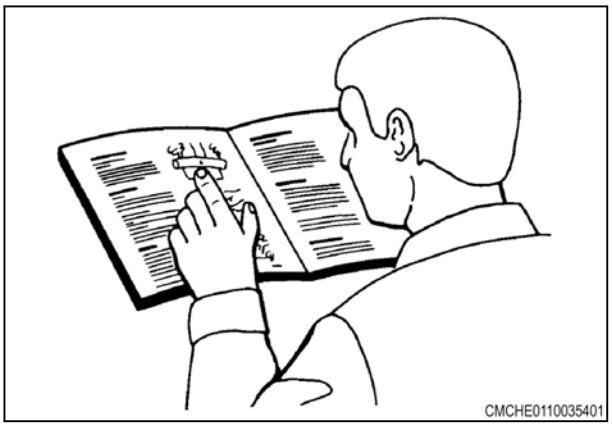


Fig. 1

WARNING:
An operator should not use alcohol or drugs which can affect their alertness or coordination. An operator on prescription or 'over the counter' drugs needs medical advice on whether or not they can properly operate machines.

CAUTION:
If any attachments used on this equipment have a separate Operator Manual, see that manual for other important safety information.

1.1.3 Safety alert symbol

The safety alert symbol means Attention! Become Alert! Your Safety Is Involved!

Look for the safety alert symbol both in this manual and on safety signs on this machine. The safety alert symbol will direct your attention to information that involves your safety and the safety of others.

Fig. 2

1.1.4 Informational messages

The words important and note are not related to personal safety, but are used to give additional information and tips for operating or servicing this equipment.

IMPORTANT: *Identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of the machine, process, or its surroundings*

NOTE: *Identifies points of particular interest for more efficient and convenient repair or operation.*

1.1.5 General hazard information

CAUTION:
Carefully read the operator's manual before operating the machine. See all instructions and safety rules when operating or doing maintenance.

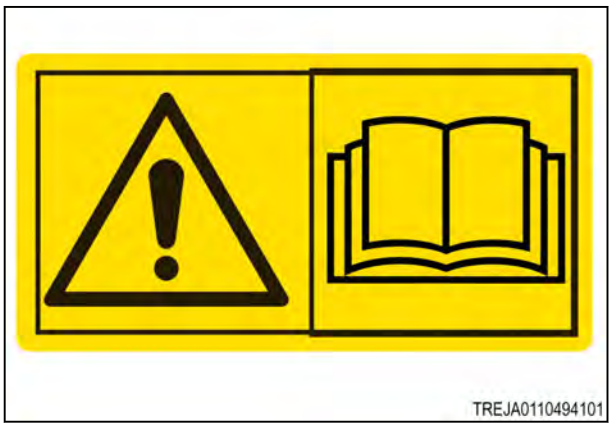


Fig. 3

Do not start the engine until the area is free of personnel. Honk the horn two times to alert others. This will help in avoiding personal injury because machine movement can occur.

Know the width of the equipment to keep correct clearance when operating the machine near fences or near boundary obstacles.

Wear a hard hat, protective glasses, and other protective equipment, as required.

Do not wear loose clothing or jewelry that can catch on controls or on other parts of the machine.

Make sure that all protective guards and all covers are attached in position on the machine.

Fig. 4

Keep the machine free from unwanted material. Remove debris, oil, tools, and other items from the deck, from walkways, and from steps.

Secure lunch boxes, tools, and other loose items that are not a part of the machine.

Know the appropriate work location hand signals and the personnel that are authorized to give the hand signals. Get hand signals from one person only.

Never put maintenance fluids into glass containers. Drain all liquids into an approved container.

Discard any drained fluids and discard any filter elements according to local regulations.

Use all cleaning solutions with precaution.

Report all necessary repairs.

Do not let untrained or not approved personnel on the machine.

Do not smoke when servicing an air conditioner. Also, do not smoke if refrigerant gas can be present. Inhaling the fumes that are released from a flame that contacts air conditioner refrigerant can cause bodily harm or death.

Inhaling gas from air conditioner refrigerant through a lighted cigarette can cause bodily harm or death.

Unless being instructed differently, complete the maintenance under the following conditions:

- Turn the battery disconnect switch to "off" position.
- The machine is parked on level ground.
- Implements are lowered to the ground.
- Transmission control lever is in the park position.
- The engine is stopped.
- The engine start switch is turned off and the switch key is removed.
- The machine has cooled down.

Any additional precautions must be observed based on the conditions and environment where the machine is being used.

1.1.6 Fire prevention and first aid

Be prepared for emergencies.

Keep a first aid kit handy for treatment of minor cuts and scratches.

Always carry one or more fire extinguishers of the correct type. Check fire extinguishers regularly as instructed by the manufacturer. Make sure fire extinguishers are properly charged and in operating condition.

Due to the nature of the crops this machine will operate in, the risk of fire is of concern. Use a water type fire extinguisher or other water source for a fire in crop.

For fires involving anything other than crop, such as oil or electrical components, use a dry chemical fire extinguisher with an ABC rating.

Mount fire extinguishers within easy reach of where fires can occur.

Frequently remove accumulated crop material from the machine and check for overheated components. Check the machine daily for any noises that are not normal. Such noises could indicate a failed component that can cause excess heat.

If any flame cutting, welding, or arc welding is to be done on the machine or attachments, make sure to clear any crop material or debris from around the area. Make sure the area below the work area is clear of any flammable material as falling molten metal or sparks can ignite the material.

If fire occurs stand upwind and away from smoke from the fire.

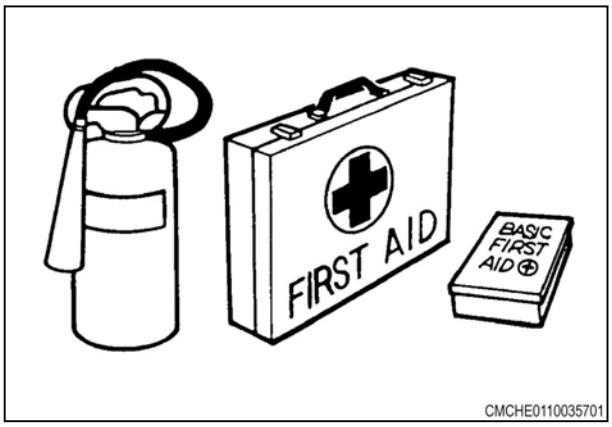


Fig. 5

Fig. 6

1.1.7 Maintenance safety

Fully clean the work area, the machine, systems, and components before starting a job. Dirty and greasy areas can create work hazards.

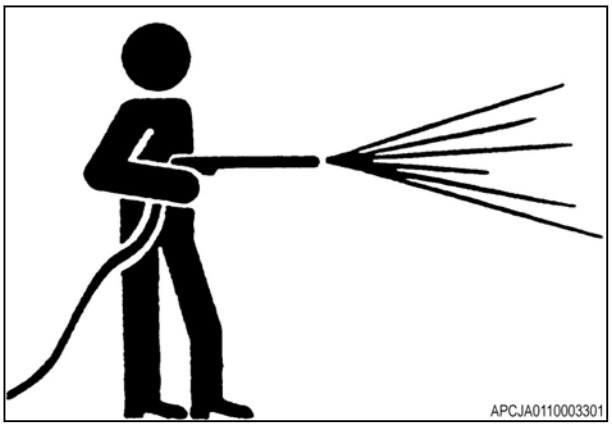


Fig. 7

Illuminate the working area correctly, adequately and safely.

Use correct safety lamps with wire safety cages. Exposed bulbs can ignite fluids.

Drain fluids in correct containers.

Never use beverage containers that can mislead and result in personnel drinking from them.

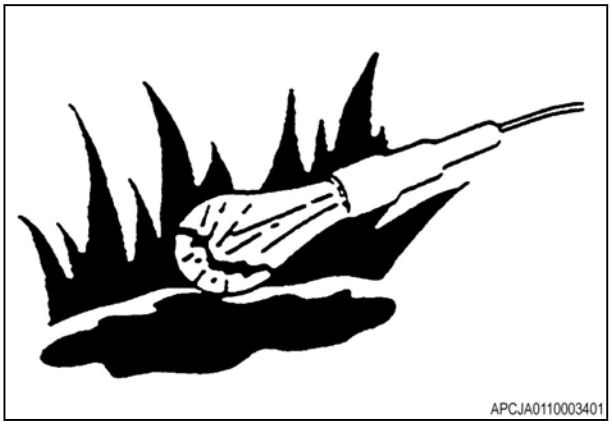


Fig. 8

Make-shift tools and procedures can create safety hazards. Use only the correct equipment and procedures.

Use power tools only to loosen threaded parts and fasteners.

Use only SAE tools with SAE fasteners and metric tools with metric fasteners.

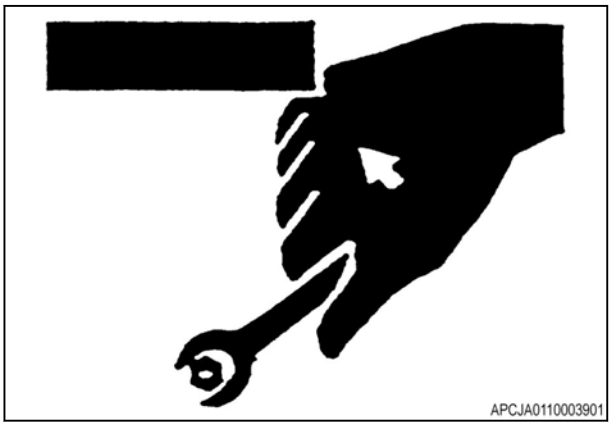


Fig. 9

Never support the machine on cinder blocks, hollow tiles or supports that can crumble.

Never work under a machine that is only supported by a jack.

Always use wheel chocks.

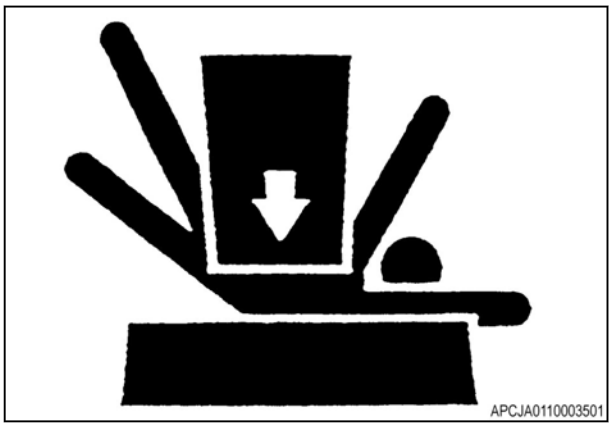


Fig. 10

Lifting incorrectly can cause injury or machine damage.

Follow the procedures recommended in the proper manual for removal and installation of components of this machine, systems or components.

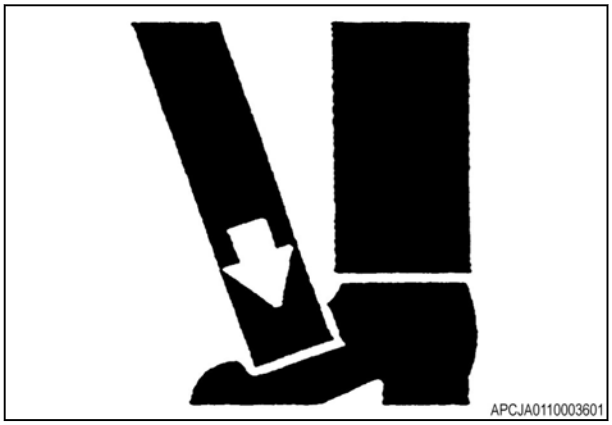


Fig. 11

Avoid High-Pressure Fluids

Releasing fluid or fluid leaking from the hydraulic system or the fuel injection system under high pressure can be very hard to see. The fluid can go into the skin causing serious injury.

Fluid injected into the skin must be surgically removed within a few hours. If not removed immediately, serious infection or reaction can develop. Go immediately to a doctor who knows about this type of injury.

The machine must be stopped and cooled before checking fluids. Use caution when removing radiator caps, plugs, grease fittings or pressure taps.

Never open pressure lines when they are under pressure. Release all pressure before doing maintenance or repairs on any pressurized system.

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

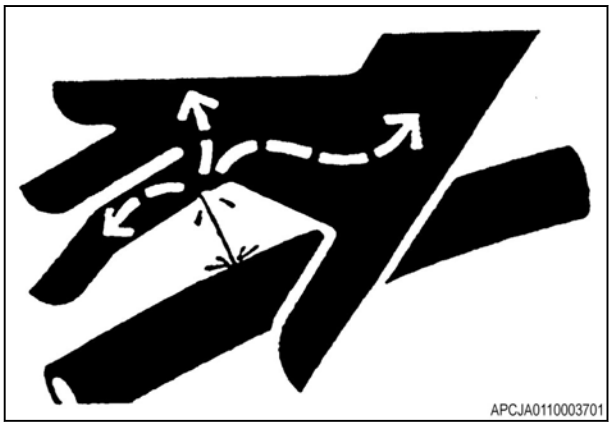


Fig. 12

When searching for leaks, use a piece of wood or cardboard. Protect hands and body from high pressure fluids. Do not use your hands.

Never open hydraulic lines or fuel lines when they are under pressure. Hydraulic fluid or diesel fuel under pressure can cut the skin, cause bad burns, eye injury, skin irritation, or gangrene.

If an accident does occur, get medical help immediately if any personnel are injured by hydraulic fluid or fuel.

Any fluid injected into the skin must be surgically removed within a few hours or gangrene can occur.

Doctors unfamiliar with this type of injury must refer to a knowledgeable medical source.

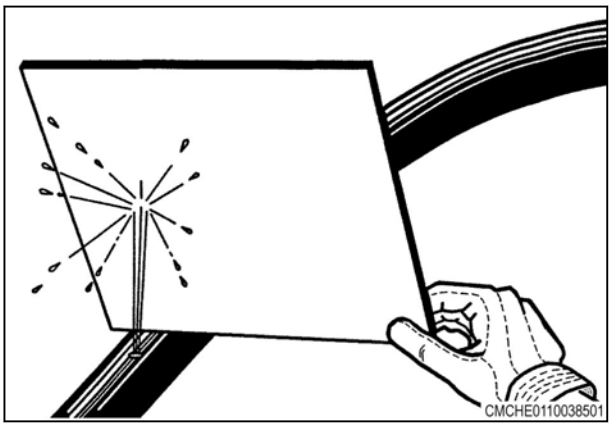


Fig. 13

Never heat by welding, soldering or using a torch near pressurized fluid lines or other flammable materials.

Pressurized lines can be accidentally cut when heat goes beyond the immediate flame area from torch cutting or arch welding.

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to personnel and bystanders.

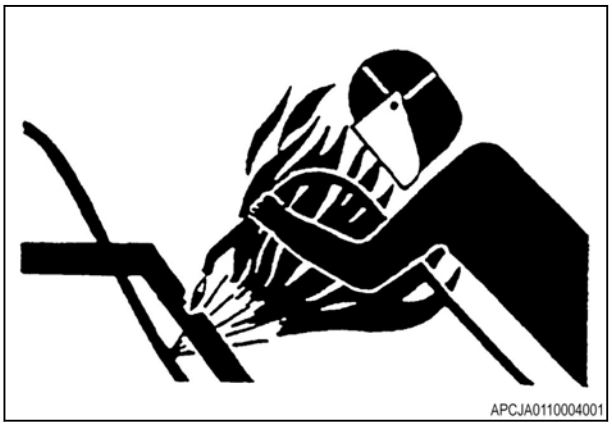


Fig. 14

Rapid release of fluids from pressurized cooling systems can cause serious burns.

Shut off the engine. Remove the filler cap only when the filler cap is cool enough to touch with bare hands. Slowly, loosen the filler cap to the first stop to relieve any pressure before removing the cap completely.

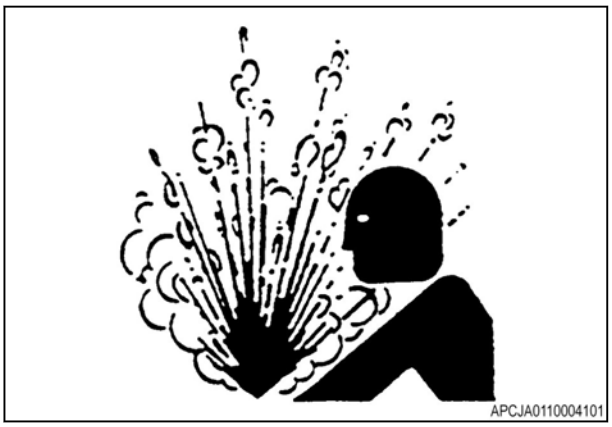


Fig. 15

Electrical storage batteries give off highly flammable hydrogen gas. Keep sparks and flames away from the battery.

Do not lay tools or other conductive materials on a battery.

Be careful when connecting booster cables to the machine. Electrical component damage or battery explosion can result if booster cables are not installed correctly.

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

If acid contacts eyes, skin or clothing, flush with water immediately. If eye contact occurs, flush with water for 15 minutes and seek medical attention immediately.

If swallowed, drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Battery posts, terminals and other battery parts contain lead and lead compounds. Wash hands carefully after handling a battery.

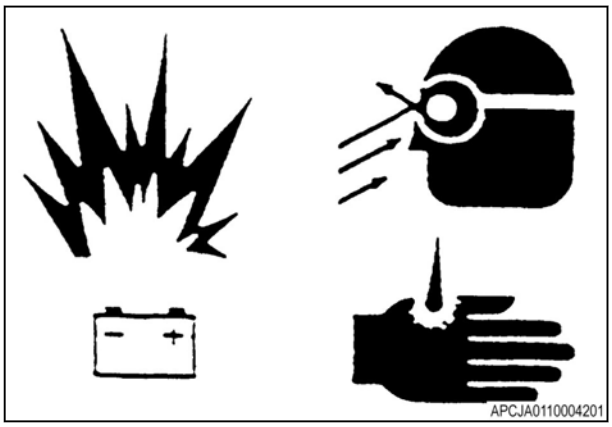


Fig. 16

Never weld on a wheel or rim that has a tire on it.

Never try to mount or remove a tire unless using the correct equipment. A tire safety cage, instructions, and training are necessary to do the work safely. Failure to follow the correct procedures when mounting a tire on a wheel or rim can cause an explosion and serious injury.

Tire repair procedures must be done by trained and approved personnel.

Before adding air to a tire, inspect the tire and wheel for any signs of damage. Do not attempt to fill if damage is noticed. Have trained and approved personnel make repairs immediately.

See additional instruction in the tire safety section.

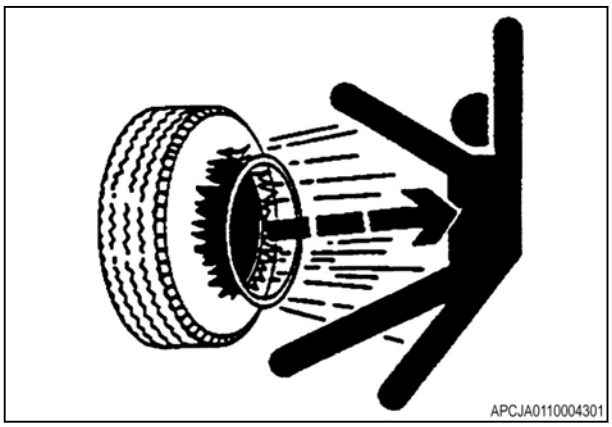


Fig. 17

Stay away from potentially toxic fumes and dust. Dangerous fumes can be generated when paint is heated by welding, soldering or using a torch.

Always work outside or in a well ventilated area. Discard paint and solvent correctly.

Always remove paint before welding or heating. Wear an approved respirator while sanding or grinding paint. Avoid breathing the dust.

If using solvent or paint stripper, remove the stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from the area. Let fumes disperse before welding or heating.

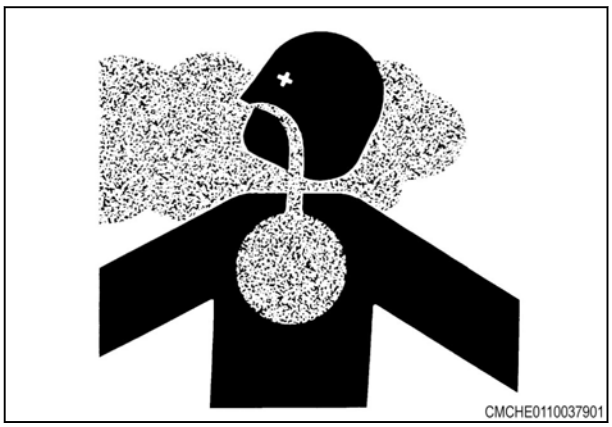


Fig. 18

1.1.8 Proper disposal of waste

Improper disposal of waste can pollute the environment and ecology. A few examples of potentially harmful equipment waste can include, but not limited to, items such as oil, fuel, coolant, brake fluid, filters, battery chemicals, tires, etc.

Use leak proof containers when draining fluids. Do not use food or beverage containers to collect waste fluids, as food or beverage container(s) may mislead someone into drinking from them.

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

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

Inquire with local environmental or recycling center on the proper way to recycle or dispose waste.

1.1.9 Support the machine correctly

Never support the machine on cinder blocks, hollow tiles or supports that can crumble.

Never work under a machine supported only by a jack. Use wheel chocks to prevent machine movement.

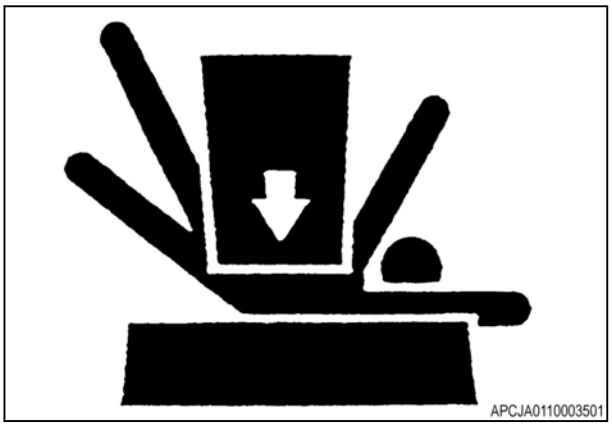


Fig. 19

1.1.10 Pressurized air

Air under pressure can cause personal injury. When pressurized air is used for cleaning, wear a protective face shield, protective clothing and protective shoes.

The maximum air pressure for cleaning purposes must be below 205 kPa (30 psi).

1.1.11 Cut and crushing prevention

Support the equipment correctly when performing work below the equipment. Do not rely on the hydraulic cylinders to hold up the equipment. An implement can fall if a control lever is moved or if a hydraulic line breaks.

Never start the machine engine by shorting across the starter solenoid terminals. Machine movement can occur causing runovers .

Never make adjustments while the machine is moving or while the engine is operating.

Whenever there are attachment control linkages, the clearance in the linkage area will change with movement of the attachment.

Stay clear of all rotating parts and all moving parts.

Keep objects away from moving fan blades. The fan blades will throw objects and the fan blades can cut.

Do not use a wire tow cable that is kinked or frayed. Wear gloves when touching wire cable.

When hitting a retainer pin, the retainer pin can fly out causing personal injury. Make sure that there are no people in the area when hitting a retainer pin. To prevent eye injury, wear protective glasses when hitting a retainer pin.

Chips or other debris can fly off objects when hitting the objects. Make sure that others are clear of the area before hitting any object.

1.1.12 Hydraulic safety

The machine uses high-pressure fluids for operation. If injured by escaping fluid, seek medical attention immediately.

- Make sure that all components in the hydraulic system are clean and in good condition, and connections are tightened properly.
- Immediately replace any worn, cut, abraded, flattened or crimped hoses and/or steel lines.
- Wear proper hand and eye protection when searching for a high-pressure leak.
- Use a piece of wood or cardboard as a backstop to isolate any leaks.
- Never use your fingers or hands to search for leaks.
- Relieve system pressure before loosening any hydraulic lines or connections. Use extra care when working on hydraulic circuits containing accumulators. High pressure can exist long after the machine is shut down.
- Loosen connections slowly, keeping hands and fingers clear of loosened fittings.
- Tighten connections securely before applying pressure.
- Escaping fluid under high pressure can be almost invisible but can penetrate the skin.
- Consult a doctor immediately if you sustain an injury by escaping fluids. Serious reactions can quickly result.
- Do not attempt any makeshift repairs to the hydraulic lines, fitting, or hoses by using tape, clamps, or cements. Such repairs will fail suddenly, creating a hazardous condition.

1.1.13 Chemical safety

DANGER:

Chemical safety hazard. Personal injury or death can occur. Wear manufacturer recommended personal protective equipment when handling hazardous chemicals. Potentially dangerous chemicals used with the equipment include items such as fuel, lubricants, coolant, hydraulic fluid, paints and adhesives in addition to the agricultural chemicals being applied.

Always wear approved protective equipment and clothing recommended by the chemical manufacturer.

Before reloading the machine, wear personal protective equipment as required by pesticide use instructions and the chemical manufacturer recommendations. Before entering the cab, remove protective equipment. Store protective equipment outside the cab in a closed box or another type of sealable container. Clean any shoes or boots to remove soil or other contaminants before entering the cab.

If dangerous chemicals come in contact with the body, wash immediately according to the chemical manufacturer's recommendations.

Never put nozzles, tips or other parts to lips to blow out trash or debris. Have spare tips available for replacement.

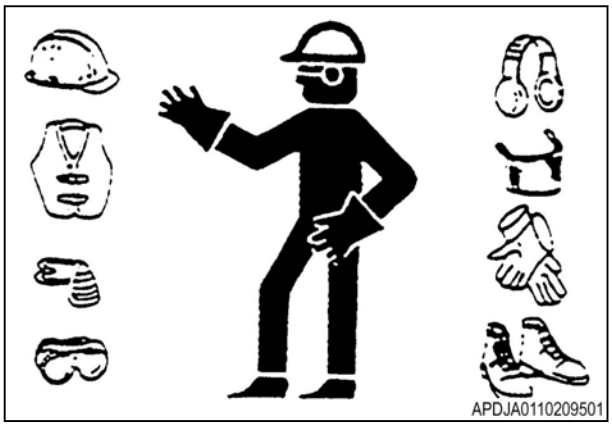


Fig. 20

Wear close fitting clothing and correct safety equipment required.

Wear applicable hearing protection such as earmuffs or earplugs to protect against loud noises.

Long exposure to high noise levels can cause hearing impairment.

Some cabs use filters that cannot remove dangerous chemicals.

Follow instructions given by the chemical manufacturer.

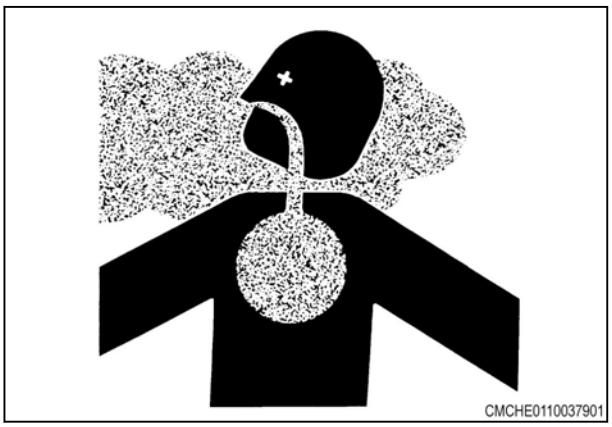


Fig. 21

Clean the machine of dangerous chemicals after use. During application, chemicals can build up on the inside and outside of the machine.

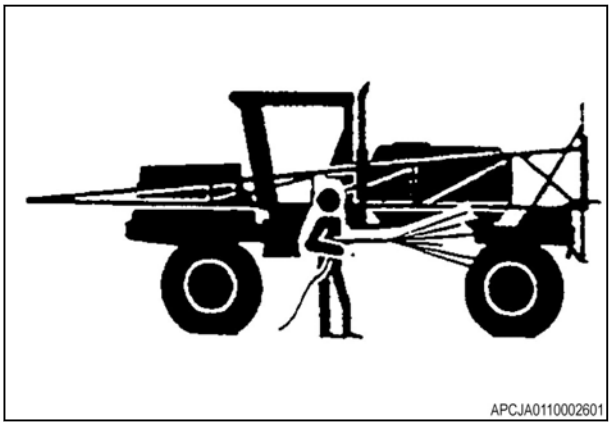


Fig. 22

DO NOT do maintenance on the machine until all chemicals have been fully flushed from the outside and the system has been flushed.

Select safe areas to fill, flush, calibrate and decontaminate the machine. Select an area where dangerous chemical will not drift or run off to contaminate people, animals, vegetation, or water supply.

Read all signs and product labels and follow instructions.

Wear approved hand, eye, and body protection recommended by the chemical manufacturer.

Do not inhale dust or fumes.

Never blow out trash or debris from nozzles, tips, or other parts which can contain left-over chemical with breath. Have spare tips or parts available for replacement.

If contact is made with chemicals or fertilizers, follow the correct treatment on the container.

Always wash hands before touching your face or mouth.

Get medical aid immediately if signs of illness, such as drowsiness or constant fatigue, occur during or recently after the use of dry or liquid agricultural chemicals or fertilizers.

The chemical manufacturer Material Safety Data Sheet (MSDS) provides specific instructions on dangerous chemical products: health hazards, safety procedures, and emergency response techniques.

Check the MSDS before starting any job using a dangerous chemical. Know exactly what the risks are and how to do the job safely. Follow the procedures and equipment recommendations.

See the chemical manufacturer for MSDSs on chemical products used with the equipment. MSDS information may be available at chemical manufacturer's website.

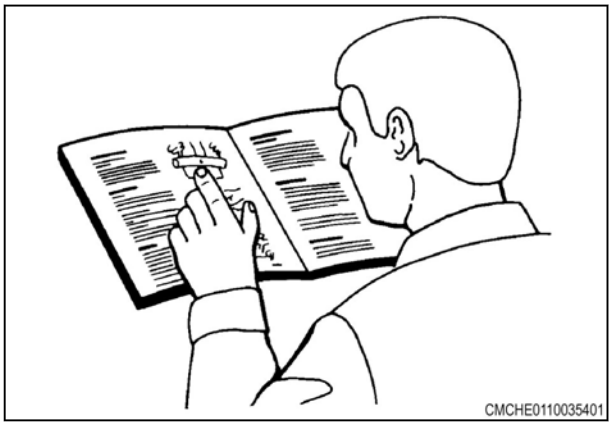


Fig. 23

Never apply chemicals when the wind exceeds the chemical manufacturer's recommendation. NEVER let chemicals touch the skin or eyes.

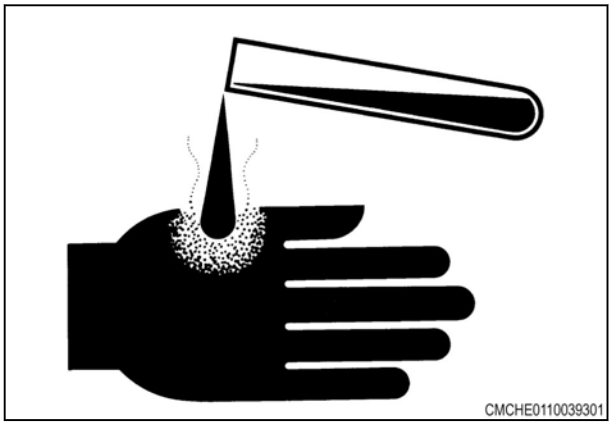


Fig. 24

1.1.14 Shield and guards

All shields and guards must be in the correct operating position and in good condition.

Do not open, remove, or reach around shields while the engine is operating. Entanglement in rotating belts and components can cause serious injury or death. Stay clear of rotating components.

Fig. 25

Do not operate the machine with the drive shaft shields open or removed. Entanglement in rotating drive shafts can cause serious injury or death. Stay clear of rotating components.

Make sure rotating guards turn freely.

Fig. 26

1.1.15 Modifications

Welding or altering chassis in any way such as adding implement towing hitches can cause damage or failure of components. Modifications not approved by AGCO void machine or system warranty.

1.1.16 High pressure leaks

Fluid leaking from the hydraulic system or the fuel injection system under high pressure can be very hard to see. The fluid can go into the skin causing serious injury.

Fluid injected into the skin must be surgically removed within a few hours. If not removed immediately, serious infection or reaction can develop. Go immediately to a doctor who knows about this type of injury.

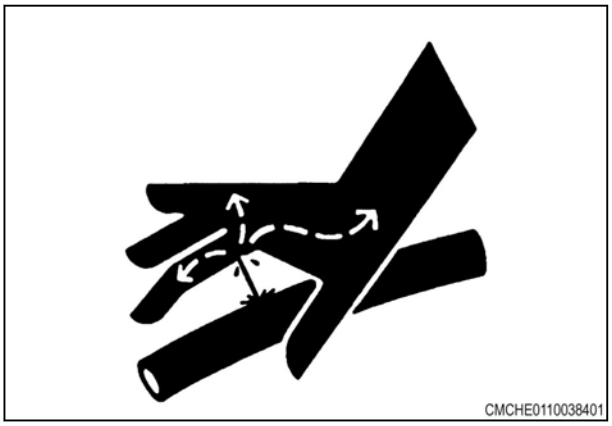


Fig. 27

Use a piece of cardboard or wood to search for possible leaks. Do not use your bare hand. Wear leather gloves for hand protection and safety goggles for eye protection.

Relieve all pressure before loosening any hydraulic lines. Relieve the pressure by lowering raised equipment, shutting off accumulator valve, if equipped, and shutting off the engine. Tighten all connections securely before applying pressure.

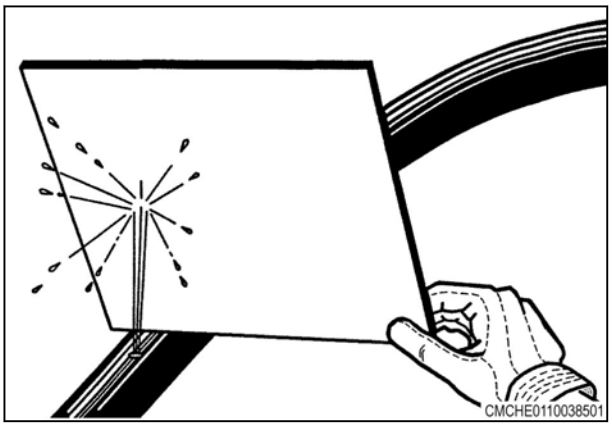


Fig. 28

1.1.17 Safety signs

WARNING:
Do not remove or obscure safety signs. Replace any safety signs that are not readable or are missing. Replacement signs are available from your dealer in the event of loss or damage. The actual location of the safety signs is illustrated at the end of this section.

Keep signs clean by wiping off regularly. Use a mild soap and water solution if necessary.

If parts have been replaced or a used machine has been purchased, make sure all safety signs are present and in the correct location and can be read. Illustrations of safety sign locations are located at the rear of this section.

Replace any safety signs that can not be read, are damaged, or are missing. Clean the machine surface thoroughly with a mild soap and water solution before replacing signs. Replacement safety signs are available from your dealer.

1.2 Tightening specifications

IMPORTANT:
Mismatched or incorrect fasteners can result in damage, malfunction, or personal injury. Take care to avoid mixing metric dimensioned fasteners and inch dimensioned fasteners.

Exceptions to these torque values are given in the Service Manual if necessary.

Prior to the installation of any hardware, make sure the components are in near new condition. Bolts and threads must not be worn or damaged. Threads must not have burrs or nicks. Hardware must be free of rust and corrosion. Clean the hardware with a noncorrosive cleaner.

Do not lubricate the fastener threads except for the rust preventive. The rust preventive should be applied by the supplier of that component for the purposes of shipping and storage. Other applications for lubricating components may also be specified in the Service Manual.

1.2.1 Constant torque hose clamp

Because of extreme temperature changes, the hose will heat set. Heat setting can cause the hose clamps to loosen. Loose hose clamps can cause leaks. There have been reports of component failures that have been caused by hose clamps that have loosened. The constant torque hose clamp will help prevent these failures.

The constant torque hose clamp is installed correctly under the following conditions:

- Screw tip (1) extends 6.35 mm (0.25 in) (A) beyond the housing.
- The Belleville springs are closed almost flat after the screw (2) is tightened to a torque of 11 Nm (8.1 lbf ft).

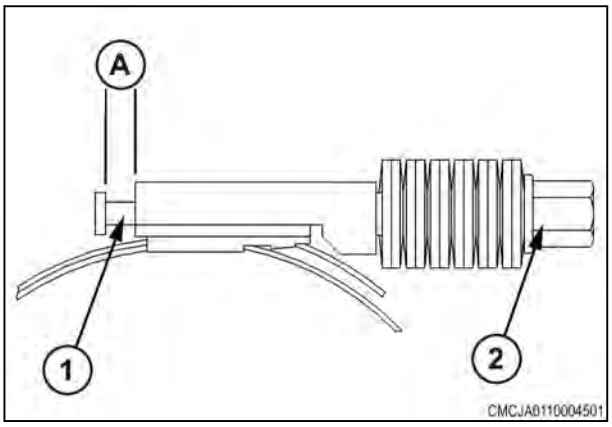


Fig. 29

1.2.2 Fastener tightening specifications

Assembly torque for metric fasteners

Standard			High		Low	
Thread size	Torque lbf ft	Torque Nm	Torque lbf ft	Torque Nm	Torque lbf ft	Torque Nm
M6 x 1	8 to 10	9 to 15	9 to 11	10 to 16	3.5 to 4.5	5 to 7
M8 x 1.25	19 to 23	21 to 35	20 to 24	23 to 37	10 to 12	12 to 18
M10 x 1.5	37 to 45	45 to 65	40 to 48	48 to 72	20 to 24	23 to 37
M12 x 1.75	67 to 83	80 to 120	72 to 88	85 to 125	31 to 39	40 to 60
M14 x 2	108 to 132	130 to 190	120 to 140	145 to 205	55 to 65	65 to 95
M16 x 2	160 to 190	200 to 280	180 to 220	230 to 310	80 to 100	105 to 145
M20 x 2.5	305 to 375	400 to 520	350 to 430	460 to 600	165 to 205	210 to 290

Standard			High		Low	
M24 x 3	530 to 650	700 to 900	600 to 730	800 to 1000	285 to 345	375 to 475
M30 x 3.5	1060 to 13000	1400 to 1800	1200 to 1460	1600 to 2000	565 to 685	750 to 950
M36 x 4	1800 to 2200	2400 to 3000	2055 to 2515	2750 to 3450	990 to 1210	1300 to 1700

Standard metric taperlock studs

Thread size	Torque lbf ft	Torque Nm
M6	6	8
M8	13	17
M10	26	35
M12	48	65
M16	80	110
M20	125	170
M24	300	400
M30	550	750
M36	880	1200

Assembly torque for inch fasteners

Standard			High		Low	
Thread size	Torque lbf ft	Torque Nm	Torque lbf ft	Torque Nm	Torque lbf ft	Torque Nm
1/4 - 20	8 to 10	9 to 15	9 to 11	10 to 16	3.5 to 4.5	5 to 7
5/16 - 18	16 to 20	19 to 31	18 to 22	21 to 35	9 to 11	10 to 16
3/8 - 16	31 to 39	38 to 56	36 to 44	40 to 60	16 to 20	19 to 31
7/16 - 14	45 to 55	55 to 85	54 to 66	65 to 95	27 to 33	32 to 48
1/2 - 13	67 to 83	85 to 125	81 to 99	100 to 140	40 to 50	48 to 72
9/16 - 12	110 to 130	130 to 190	117 to 143	145 to 205	55 to 65	70 to 100
5/8 - 11	145 to 175	175 to 255	160 to 190	200 to 280	75 to 95	95 to 135
3/4 - 10	245 to 305	320 to 420	290 to 350	370 to 490	135 to 165	160 to 240
7/8 - 9	410 to 510	540 to 700	470 to 570	610 to 790	215 to 265	285 to 365
1 - 8	590 to 730	800 to 1000	700 to 850	900 to 2200	335 to 405	435 to 565
1 1/8 - 7	860 to 1060	1150 to 1450	965 to 1175	1300 to 1600	465 to 565	610 to 790

Standard			High		Low	
Thread size	Torque lbf ft	Torque Nm	Torque lbf ft	Torque Nm	Torque lbf ft	Torque Nm
1 1/4 - 7	1190 to 1450	1600 to 2000	1395 to 1705	1850 to 2350	880 to 1070	875 to 1125
1 3/8 - 6	1600 to 1960	2100 to 2700	1790 to 2190	2400 to 3000	1185 to 1445	850 to 1150
1 1/2 - 5	2050 to 2510	2750 to 3450	2385 to 2915	3200 to 40000	1515 to 1845	1500 to 1900

Standard inch taperlock studs

Thread size	Torque lbf ft	Torque Nm
1/4	6	8
5/16	13	17
3/8	26	35
7/16	33	45
1/2	48	65
5/8	80	110
3/4	125	170
7/8	190	260
1	300	400
1 1/8	390	525
1 1/4	550	750
1 3/8	700	950
1 1/2	880	1200

1.2.3 Metric fasteners

This chart shows the assembly torque values for metric fasteners.

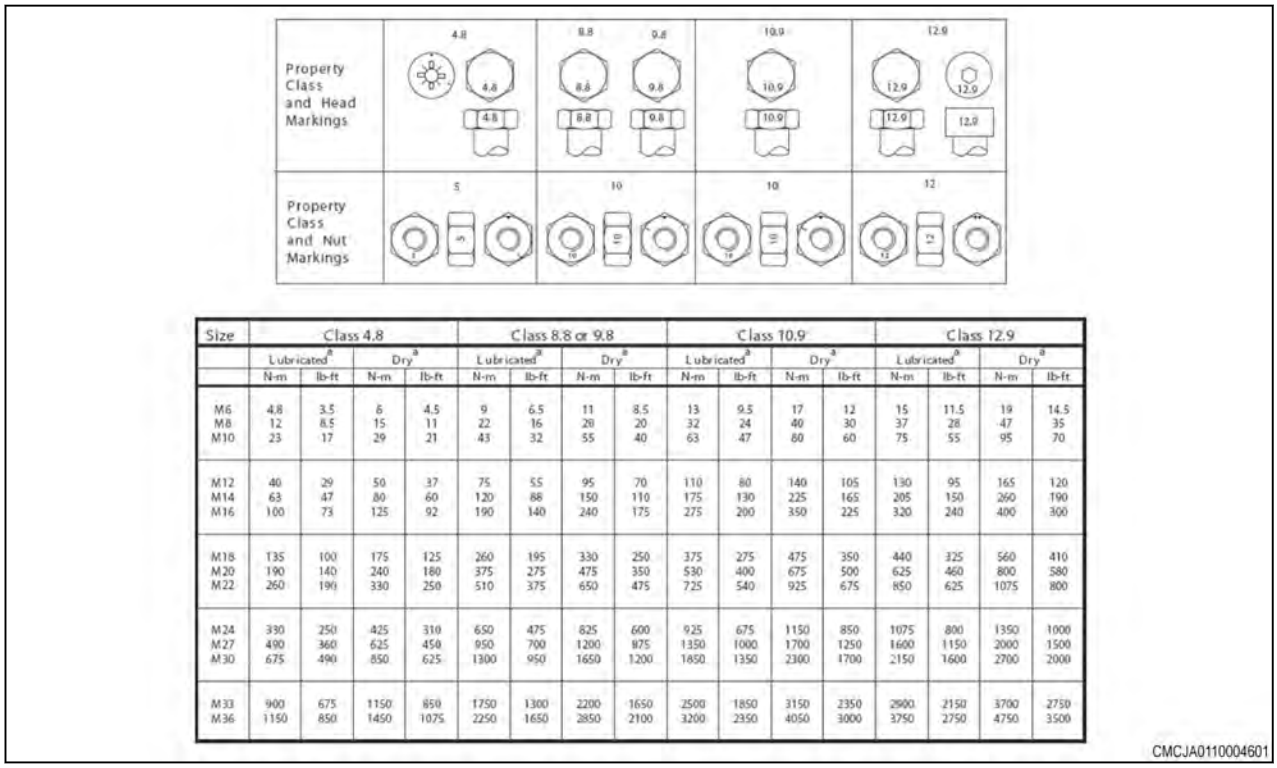
Standard			High		Low	
Thread Size	Pound Feet lbf ft	Newton Meters Nm	Pound Feet lbf ft	Newton Meters Nm	Pound Feet lbf ft	Newton Meters Nm
M6 x 1	8 to 10	9 to 15	9 to 11	10 to 16	3.5 to 4.5	5 to 7
M8 x 1.25	19 to 23	21 to 35	20 to 24	23 to 37	10 to 12	12 to 18
M10 x 1.5	37 to 45	45 to 65	40 to 48	48 to 72	20 to 24	23 to 37
M12 x 1.75	67 to 83	80 to 120	72 to 88	85 to 125	31 to 39	40 to 60
M14 x 2	108 to 132	130 to 190	120 to 140	145 to 205	55 to 65	65 to 95
M16 x 2	160 to 190	200 to 280	180 to 220	230 to 310	80 to 100	105 to 145
M20 x 2.5	305 to 375	400 to 520	350 to 430	460 to 600	165 to 205	210 to 290

Standard			High		Low	
Thread Size	Pound Feet lbf ft	Newton Meters Nm	Pound Feet lbf ft	Newton Meters Nm	Pound Feet lbf ft	Newton Meters Nm
M24 x 3	530 to 640	700 to 900	600 to 730	800 to 1000	285 to 345	375 to 475
M30 x 3.5	1060 to 1300	1400 to 1800	1200 to 1460	1600 to 2000	565 to 685	750 to 950
M36 x 4	1800 to 2200	2400 to 3000	2055 to 2515	2750 to 3450	990 to 1210	1300 to 1700

Standard taperlock studs

Thread Size	Pound Feet lbf ft	Newton Meters Nm
M6	6	8
M8	13	17
M10	26	35
M12	48	65
M16	80	110
M20	125	170
M24	300	400
M30	550	750
M36	880	1200

Metric bolt and cap screws



Size	Class 4.8				Class 8.8 or 9.8				Class 10.9				Class 12.9			
	Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]		Lubricated[a]		Dry[a]	
	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft	N-m	lb-ft
M6	4.8	3.5	6	4.5	9	6.5	11	8.5	13	9.5	17	12	15	11.5	19	14.5
M8	12	8.5	15	11	22	16	28	20	32	24	40	30	37	28	47	35
M10	23	17	29	21	43	32	55	40	63	47	80	60	75	55	95	70
M12	40	29	50	37	75	55	95	70	110	80	140	105	130	95	165	120
M14	63	47	80	60	120	88	150	110	175	130	225	165	205	150	260	190
M16	100	73	125	92	190	140	240	175	275	200	350	225	320	240	400	300
M18	135	100	175	125	260	195	330	250	375	275	475	350	440	325	560	410
M20	190	140	240	180	375	275	475	350	530	400	675	500	625	460	800	580
M22	260	190	330	250	510	375	650	475	725	540	925	675	850	625	1075	800
M24	330	250	425	310	650	475	825	600	925	675	1150	850	1075	800	1350	1000
M27	490	360	625	450	950	700	1200	875	1350	1000	1700	1250	1600	1150	2000	1500
M30	675	490	850	625	1300	950	1650	1200	1850	1350	2300	1700	2150	1600	2700	2000
M33	900	675	1150	850	1750	1300	2200	1650	2500	1850	3150	2350	2900	2150	3700	2750
M36	1150	850	1450	1075	2250	1650	2850	2100	3200	2350	4050	3000	3750	2750	4750	3500

Fig. 30

1.2.4 Inch fasteners

This chart shows the assembly torque values for inch fasteners.

Standard			High		Low	
Thread Size	Pound Feet lbf ft	Newton Meters Nm	Pound Feet lbf ft	Newton Meters Nm	Pound Feet lbf ft	Newton Meters Nm
1/4 - 20	8 to 10	9 to 15	9 to 11	10 to 16	3.5 to 4.5	5 to 7
5/16 - 18	16 to 20	21 to 31	18 to 22	21 to 35	9 to 11	10 to 16
3/8 - 16	31 to 39	38 to 56	36 to 44	40 to 60	16 to 20	19 to 31
7/16 - 14	45 to 55	65 to 85	54 to 66	65 to 95	27 to 33	32 to 48
1/2 - 13	67 to 83	85 to 125	81 to 99	100 to 140	40 to 50	48 to 72
9/16 - 12	110 to 130	130 to 190	117 to 143	145 to 205	55 to 65	70 to 100
5/8 - 11	145 to 175	175 to 255	160 to 190	200 to 280	75 to 95	95 to 135
3/4 - 10	245 to 305	320 to 420	290 to 350	370 to 490	135 to 165	160 to 240
7/8 - 9	410 to 510	540 to 700	470 to 570	610 to 790	215 to 265	285 to 365
1 - 8	590 to 730	800 to 1000	700 to 850	900 to 1200	335 to 405	435 to 565
1 1/8 - 7	860 to 1060	1150 to 1450	965 to 1175	1300 to 1600	465 to 565	610 to 790
1 1/4 - 7	1190 to 1450	1600 to 2000	1395 to 1705	1850 to 2350	880 to 1070	875 to 1125
1 3/8 - 6	1600 to 1960	2100 to 2700	1790 to 2190	2400 to 3000	1185 to 1445	1850 to 1150
1 1/2 - 5	2050 to 2510	2750 to 3450	2385 to 2915	3200 to 4000	1515 to 1845	1500 to 1900

Standard taperlock studs

Thread Size	Pound Feet lbf ft	Newton Meters Nm
1/4	6	8
5/16	13	17
3/8	26	35
7/16	33	45
1/2	48	65
5/8	80	110
3/4	125	170
7/8	190	260
1	300	400
1 1/8	390	525
1 1/4	550	750
1 3/8	700	950
1 1/2	880	1200

Four-bolt split flange

Make sure the sealing surfaces are free of burrs, damage, and scratches or any unwanted particles. Lubricate the O-ring. Set the flanges and the half clamps. Put the lock washers on the bolts and put the bolts through the half clamps. Hand tighten the bolts. Tighten the bolts in a cross sequence in small amounts to the torque amount for the series of flange.

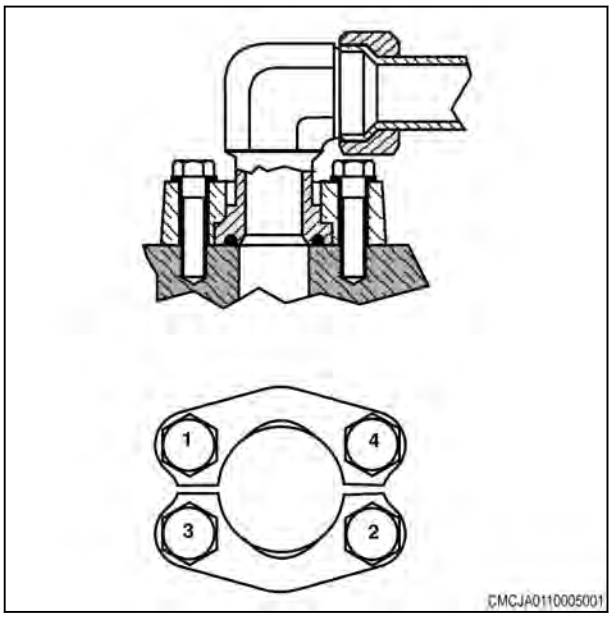


Fig. 31

Code 61 (3000 psi)				
Dash Size	Flange Size	Bolt Size	Torque	
			In. lbs.	ft. lbs.
12	3/4	3/8 -16	300 ± 50	25 ± 4.5
16	1	3/8 - 16	375 ± 50	31 ± 4.5
20	1 ¼	7/16 - 14	488 ± 62	41 ± 5
24	1 ½	1/2 - 13	625 ± 75	52 ± 6
32	2	1/2 - 13	725 ± 75	60 ± 6

Code 62 (6000 psi)				
Dash Size	Flange Size	Bolt Size	Torque	
			In. lbs.	ft. lbs.
12	3/4	3/8 -16	300 ± 50	30 ± 4.5
16	1	7/16 - 14	375 ± 50	46 ± 4.5
20	1 ¼	1/2 - 13	825 ± 75	69 ± 6
24	1 ½	5/8 - 11	1500±100	125 ± 8

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Fig. 32

Straight thread fittings

The straight thread hydraulic fittings require accurate tightening. Overtightening of the hydraulic fittings will damage the sealing surfaces and will require the replacement of the damaged parts.

Correct initial tightening depends on the mating parts to be connected. Continue as follows:

An adapter fitting (37° flare) connected to a double flare tube assembly. Tighten the fitting finger tight and wrench the fitting 1/2 turn (for single flare, 1/4 turn).

An adapter fitting (37° flare) connected to a hose. Tighten the fitting finger tight and wrench 1/4 turn.

An O-ring adapter fitting connected to a solid port: Tighten the fitting until the backup washer contacts the face of the boss after aligning the fitting.

Tighten after initial tightening, as in service work: Tighten both the tube and the hose connections finger tight and wrench 1/4 turn. O-ring fittings must be tightened as for initial assembly.

JIC SWIVEL NUTS (37° SEAT). The maximum recommended torque values for JIC (37° seat) swivel nuts, either swaged or brazed type, follow. Swivel nuts usually withstand this torque for a minimum of 15 repeated assemblies.

The torque required to seal female swivel fittings or hose couplings to a male connector depends on many variables. Fluid medium, pressure, surface finish, and so on are some of these variables. Use the following values only as a guide for the torque maximum values to apply to the fittings.

DASH SIZE	TUBE O. D. (REF)	TORQUE MAX		
		Nm	lbf in	lbf ft
-4	1/4	12	110	9
-5	5/16	20	180	15
-6	3/8	27	240	20
-8	1/2	40	360	30
-10	5/8	54	480	40
-12	3/4	95	840	70
-14	7/8	110	980	80
-16	1	120	1080	90
-20	1 1/4	160	1440	120
-24	1 1/2	180	1575	130
-32	2	400	3600	300
-40	2 1/2	540	4800	400
-48	3	680	6000	500

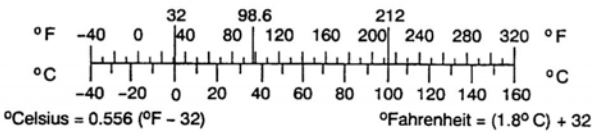
O-ring face seal (ORFS) fittings

ORFS Connectors, ORFS Hose Couplings, ORFS Plugs, and ORFS Tube Assembly Nut Torques						
Ref Nominal Tube OD			Standard Torque		High Pressure Drive Torque	
			Dynamic Assembly Torque	Dynamic Assembly Torque	Dynamic Assembly Torque	Dynamic Assembly Torque
mm	Inch	THD Size	Nm	lbf ft	Nm	lbf ft
6.35	0.25	9/16	25 +3	18 +2.5	31 +3	23 +2.5
9.52	0.375	11/16	40 +4	41 +3	50 +4	37 +3
12.7	0.5	13/16	55 +5	41 +4	69 +5	51 +4
15.88	0.625	1	86 +8	63 +6	108 +8	80 +6
19.05	0.75	1-3/16	125 +15	92 +11	156 +15	115 +11
25.4	1	1-7/16	165 +15	122 +11	206 +15	152 +11
31.75	1.25	1-11/16	200 +20	147 +15	250 +20	184 +15
38.1	1.5	2	245 +20	180 +15	306 +20	225 +15

1.2.5 Conversion table

	MULTIPLY:	BY:		To Get: MULTIPLY	BY:		To Get:
LINEAR	inches	x 25.4	=	millimeters (mm)	x 0.03937	=	inches
	feet	x 0.3048	=	meters (m)	x 3.281	=	feet
	yards	x 0.9144	=	meters (m)	x 1.0936	=	yards
	miles	x 1.6093	=	kilometers (km)	x 0.6214	=	miles
	inches	x 2.54	=	centimeters (cm)	x 0.3937	=	inches
	microinches	x 0.0254	=	micrometers (um)	x 39.37	=	microinches
AREA	$inches^2$	x 645.16	=	$millimeters^2$ (mm^2)	x 0.00155	=	$inches^2$
	$inches^2$	x 6.4516	=	$centimeters^2$ (cm^2)	x 0.155	=	$inches^2$
	$feet^2$	x 0.0929	=	$meters^2$ (m^2)	x 10.764	=	$feet^2$
	$yards^2$	x 0.8361	=	$meters^2$ (m^2)	x 1.196	=	$yards^2$
	acres	x 0.4047	=	$hectometers^2$ (hm^2)	x 2.471	=	acres
			=	hectares (ha)			
VOLUME	$inches^3$	x 16387	=	$millimeters^3$ (mm^3)	x 0.000061	=	$inches^3$
	$inches^3$	x 16.387	=	$centimeters^3$ (cm^3)	x 0.06102	=	$inches^3$
	$inches^3$	x 0.01639	=	liters	x 61.024	=	$inches^3$
	quarts	x 0.94635	=	liters	x 1.0567	=	quarts
	gallons	x 3.7854	=	liters	x 0.2642	=	gallons
	$feet^3$	x 28.317	=	liters	x 0.03531	=	$feet^3$
	$feet^3$	x 0.02832	=	$meters^3$ (m^3)	x 35.315	=	$feet^3$
	fluid oz.	x 29.57	=	milliliters (ml)	x 0.03381	=	fluid oz.
	$yards^3$	x 0.7646	=	$meters^3$ (m^3)	x 1.3080	=	$yards^3$
	teaspoons	x 4.929	=	milliliters (ml)	x 0.2029	=	teaspoons
	cups	x 0.2366	=	liters	x 4.227	=	cups
	bushel	x 35.239	=	liters	x 0.02838	=	bushels
	bushel	x 0.03524	=	$meters^3$ (m^3)	x 28.378	=	bushels
MASS	ounces (av)	x 28.35	=	grams (g)	x 0.03527	=	ounces (av)
	pounds (av)	x 0.4536	=	kilograms (kg)	x 2.2046	=	pounds (av)
	tons (2000 lbs)	x 907.18	=	kilograms (kg)	x 0.001102	=	tons (2000 lbs)
	tons (2000 lbs)	x .90718	=	metric tons(t)	x 1.1023	=	tons(2000 lbs)
	tons (long) (2240 lbs)	x 1016.05	=	kilograms (kg)	x .000984	=	tons (long) (2240 lbs)
FORCE	ounces - f (av)	x 0.278	=	newtons (N)	x 3.597	=	ounces - f (av)
	pounds - f (av)	x 4.488	=	newtons (N)	x 0.2248	=	pounds - f (av)
	kilograms - f	x 9.807	=	newtons (N)	x 0.10197	=	kilograms - f
PRESSURE OR STRESS	pounds/sq.in.	x 6.895	=	kilopascals (kPa)	x 0.145	=	pounds/sq. in.
	pounds/sq.in.	x 0.0689	=	bar	x 14.503	=	pounds/sq. in.
POWER	horsepower	x 0.746	=	kilowatts (kW)	x 1.34	=	horsepower
	ft-lbf/min.	x 0.0226	=	watts (W)	x 44.25	=	ft - lbf/min.
TORQUE	pound - inches	x 0.11298	=	newton-meters (N.m)	x 8.851	=	pound-inches
	pound - feet	x 1.3558	=	newton-meters (N.m)	x 0.7376	=	pound-feet
VELOCITY	miles/hour	x 1.6093	=	kilometers/hour (km/h)	x 0.6214	=	miles/hour
	feet/sec.	x 0.3048	=	meters/sec. (m/s)	x 3.281	=	feet/sec.
	kilometers/hr.	x 0.27778	=	meters/sec. (m/s)	x 3.600	=	kilometers/hr.
	miles/hours	x 0.4470	=	meters/sec. (m/s)	x 2.237	=	miles/hour

TEMPERATURE



°Celsius = 0.556 (°F – 32)

°Fahrenheit = (1.8° C) + 32

MetConv.doc

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Fig. 33

1.3 Service manual

WARNING:
Some pictures in the manual show the shields removed to permit a clearer view. Never operate the machine with any shields removed.

This service manual has been prepared with the latest service information available at publication. Read and understand the service manual carefully before doing any service on the machine.

Right-hand and left-hand, as used in this manual, are determined by facing the direction of machine travel when in use.

Photos, illustrations, and data used were current at the time of printing, due to possible production changes, the machine can vary slightly. The manufacturer reserves the right to redesign and change the machine as necessary without notification.

1.3.1 Units of measurement

Measurements are given in metric units followed by the equivalent in US units. Hardware sizes are given in millimeters for metric hardware and inches for US hardware.

1.3.2 Replacement parts

To receive prompt efficient service, remember to have the following information:

Correct part description and part number
Model number of the machine
Serial number of the machine

1.4 Lubrication and maintenance

1.4.1 Maintenance introduction

IMPORTANT:
Do maintenance procedures at regularly scheduled intervals. Failure to do regularly scheduled maintenance will cause damage to machine components or the engine. The maintenance schedule is a recommended guide for correct machine maintenance.

IMPORTANT:
When operating in normal conditions, do not change the schedule. When operating the machine in very hot, cold, dirty, or corrosive conditions, increase the frequency of service.

Use the hourmeter as a guide for maintenance intervals.

Maintenance intervals can be shown in both operating hours and time. Example: 10 Hours or Every day. Use the interval that comes first.

1.4.2 Lubricant filling reminders

Use only high-quality lubricants. Low quality lubricants reduce the service life of the machine and can cause component failures.

When a lubricant is specified, do not use a different lubricant.

Do not add a lubricant unless the lubricant is the same type and grade as the lubricant already in use. If the grade is not known or not available, replace the lubricant with new lubricant.

Keep all lubricants in clean containers and in an area that has protection from dust, dirt, water, and other contamination.

1.4.3 Lubricants and fluids

Lubrication

Use lithium based lubricant with a minimum melting point of 148 °C (300 °F). The grease must be NLGI number 2 consistency.

Transmission PTO			
Location	**Places**	**Method**	**Frequency**
Slip yoke	1	Grease gun	Weekly
Universal joint	2	Grease gun	Monthly

Hydraulic system			
Location	**Places**	**Method**	**Frequency**
Reservoir	1	Check daily; Change yearly	
Filter	1	Check daily; Change when indicated (Red)	