

SERVICE MANUAL

H9870 / H9880

Bale Wagon

Part number 47918070

English

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47918070 02/12/2015

Link Product / Engine

Product	Market Product	Engine
H9870	North America	F4GE9684
H9880	North America	F4GE9684

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INTRODUCTION

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Foreword - Important notice regarding equipment servicing

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The manufacturer reserves the right to make improvements in design and changes in specifications at any time without notice and without incurring any obligation to install them on units previously sold. Specifications, descriptions, and illustrative material herein are as accurate as known at time of publication but are subject to change without notice.

In case of questions, refer to your NEW HOLLAND Sales and Service Networks.

Safety rules

Personal safety



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules

General safety rules

Use caution when you operate the machine on slopes. Raised equipment, full tanks and other loads will change the center of gravity of the machine. The machine can tip or roll over when near ditches and embankments or uneven surfaces.

Never permit anyone other than the operator to ride on the machine.

Never operate the machine under the influence of alcohol or drugs, or while you are otherwise impaired.

Pay attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety.

Hydraulic oil or diesel fuel leaking under pressure can penetrate the skin, causing serious injury or infection.

- DO NOT use your hand to check for leaks. Use a piece of cardboard or paper.
- Stop the engine, remove the key, and relieve the pressure before you connect or disconnect fluid lines.
- Make sure that all components are in good condition. Tighten all connections before you start the engine or pressurize the system.
- If hydraulic fluid or diesel fuel penetrates the skin, seek medical attention immediately.
- Continuous long term contact with hydraulic fluid may cause skin cancer. Avoid long term contact and wash the skin promptly with soap and water.

Keep clear of moving parts. Loose clothing, jewelry, watches, long hair, and other loose or hanging items can become entangled in moving parts.

Wear protective equipment when appropriate.

DO NOT attempt to remove material from any part of the machine while it is being operated or while components are in motion.

Make sure that all guards and shields are in good condition and properly installed before you operate the machine. Never operate the machine with shields removed. Always close access doors or panels before you operate the machine.

Dirty or slippery steps, ladders, walkways, and platforms can cause falls. Make sure these surfaces remain clean and clear of debris.

A person or pet within the operating area of a machine can be struck or crushed by the machine or its equipment. DO NOT allow anyone to enter the work area.

Raised equipment and/or loads can fall unexpectedly and crush persons underneath. Never allow anyone to enter the area underneath raised equipment during operation.

Never operate the engine in enclosed spaces as harmful exhaust gases may build up.

Before you start the machine, be sure that all controls are in neutral or park lock position.

Start the engine only from the operator's seat. If you bypass the safety start switch, the engine can start with the transmission in gear. Do not connect or short across terminals on the starter solenoid. Attach jumper cables as described in the manual. Starting in gear may cause death or serious injury.

Always keep windows, mirrors, all lighting, and Slow-Moving Vehicle (SMV) emblem clean to provide the best possible visibility while you operate the machine.

Operate controls only when seated in the operator's seat, except for those controls expressly intended for use from other locations.

Before you leave the machine:

1. Park the machine on a firm, level surface.
2. Put all controls in neutral or park lock position.
3. Engage the parking brake. Use wheel chocks if required.
4. Lower all hydraulic equipment — Implements, header, etc.
5. Turn off the engine and remove the key.

When, due to exceptional circumstances, you would decide to keep the engine running after you leave the operator's station, then you must follow these precautions:

1. Bring the engine to low idle speed.
2. Disengage all drive systems.

3. **⚠ WARNING**

**Some components may continue to run down after disengaging drive systems.
Make sure all drive systems are fully disengaged.
Failure to comply could result in death or serious injury.**

W0113A

Shift the transmission into neutral.

4. Apply the parking brake.

⚠ General maintenance safety ⚠

Keep the area used for servicing the machine clean and dry. Clean up spilled fluids.

Service the machine on a firm, level surface.

Install guards and shields after you service the machine.

Close all access doors and install all panels after servicing the machine.

Do not attempt to clean, lubricate, clear obstructions, or make adjustments to the machine while it is in motion or while the engine is running.

Always make sure that working area is clear of tools, parts, other persons and pets before you start operating the machine.

Unsupported hydraulic cylinders can lose pressure and drop the equipment, causing a crushing hazard. Do not leave equipment in a raised position while parked or during service, unless the equipment is securely supported.

Jack or lift the machine only at jack or lift points indicated in this manual.

Incorrect towing procedures can cause accidents. When you tow a disabled machine follow the procedure in this manual. Use only rigid tow bars.

Stop the engine, remove the key, and relieve pressure before you connect or disconnect fluid lines.

Stop the engine and remove the key before you connect or disconnect electrical connections.

Scalding can result from incorrect removal of coolant caps. Cooling systems operate under pressure. Hot coolant can spray out if you remove a cap while the system is hot. Allow the system to cool before you remove the cap. When you remove the cap, turn it slowly to allow pressure to escape before you completely remove the cap.

Replace damaged or worn tubes, hoses, electrical wiring, etc.

The engine, transmission, exhaust components, and hydraulic lines may become hot during operation. Take care when you service such components. Allow surfaces to cool before you handle or disconnect hot components. Wear protective equipment when appropriate.

When welding, follow the instructions in the manual. Always disconnect the battery before you weld on the machine. Always wash your hands after you handle battery components.

Wheels and tires

Make sure that tires are correctly inflated. Do not exceed any recommended load or pressure. Follow the instructions in the manual for proper tire inflation.

Tires are heavy. Handling tires without proper equipment could cause death or serious injury.

Never weld on a wheel with a tire installed. Always remove the tire completely from the wheel prior to welding.

Always have a qualified tire technician service the tires and wheels. If a tire has lost all pressure, take the tire and wheel to a tire shop or your dealer for service. Explosive separation of the tire can cause serious injury.

DO NOT weld to a wheel or rim until the tire is completely removed. Inflated tires can generate a gas mixture with the air that can be ignited by high temperatures from welding procedures performed on the wheel or rim. Removing the air or loosening the tire on the rim (breaking the bead) will NOT eliminate the hazard. This condition can exist whether tires are inflated or deflated. The tire MUST be completely removed from the wheel or rim prior to welding the wheel or rim.

Driving on public roads and general transportation safety

Comply with local laws and regulations.

Use appropriate lighting to meet local regulations.

Make sure that the SMV emblem is visible.

Make sure that the brake pedal latch is engaged. You must lock brake pedals together for road travel.

Lift implements and attachments high enough above ground to prevent accidental contact with road.

When you transport equipment or a machine on a transport trailer, make sure that it is properly secured. Be sure the SMV on the equipment or machine is covered while being transported on a trailer.

Be aware of overhead structures or power lines and make sure that the machine and/or attachments can pass safely under.

Travel speed should be such that you maintain complete control and machine stability at all times.

Slow down and signal before turning.

Pull over to allow faster traffic to pass.

Fire and explosion prevention

Fuel or oil that is leaked or spilled on hot surfaces or electrical components can cause a fire.

Crop materials, trash, debris, bird nests, or flammable material can ignite on hot surfaces.

Always have a fire extinguisher on or near the machine.

Make sure that the fire extinguisher(s) is maintained and serviced according to the manufacturer's instructions.

At least once each day and at the end of the day, remove all trash and debris from the machine especially around hot components such as the engine, transmission, exhaust, battery, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

At least once each day, remove debris accumulation around moving components such as bearings, pulleys, belts, gears, cleaning fans, etc. More frequent cleaning of your machine may be necessary depending on the operating environment and conditions.

Inspect the electrical system for loose connections and frayed insulation. Repair or replace loose or damaged parts.

Do not store oily rags or other flammable material on the machine.

Do not weld or flame cut any items that contain flammable material. Clean items thoroughly with non-flammable solvents before welding or flame-cutting.

Do not expose the machine to flames, burning brush, or explosives.

Promptly investigate any unusual smells or odors that may occur during operation of the machine.

⚠ General battery safety ⚠

Always wear eye protection when you work with batteries.

Do not create sparks or have open flame near a battery.

Ventilate the area when you charge a battery or use a battery in an enclosed area.

Disconnect the negative (-) terminal first and reconnect the negative (-) terminal last.

When you weld on the machine, disconnect both terminals of the battery.

Do not weld, grind, or smoke near a battery.

When you use auxiliary batteries or connect jumper cables to start the engine, use the procedure shown in the operator's manual. Do not short across terminals.

Follow the manufacturer's instructions when you store and handle batteries.

Battery post, terminals, and related accessories contain lead and lead compounds. Wash hands after handling. This is a California Proposition 65 warning.

Battery acid causes burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes, or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Keep out of reach of children and other unauthorized persons.

⚠ Operator presence system ⚠

Your machine is equipped with an operator presence system to prevent the use of some features while the operator is not in the operator's seat.

Never disconnect or bypass the operator presence system.

If the operator presence system is inoperable, then it must be repaired.

⚠ Reflectors and warning lights ⚠

You must use flashing amber warning lights when you operate equipment on public roads.

⚠ Seat belts ⚠

Seat belts must be worn at all times.

Seat belt inspection and maintenance:

- Keep seat belts in good condition.
- Keep sharp edges and items than can cause damage away from the belts.
- Periodically check belts, buckles, retractors, tethers, slack take-up system, and mounting bolts for damage and wear.
- Replace all parts that have damage or wear.
- Replace belts that have cuts that can make the belt weak.

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- Check that bolts are tight on the seat bracket or mounting.
- If the belt is attached to the seat, make sure that the seat or seat brackets are mounted securely.
- Keep seat belts clean and dry.
- Clean belts only with soap solution and warm water.
- Do not use bleach or dye on the belts because this can make the belts weak.

Operator protective structure

Your machine is equipped with an operator protective structure, such as: a Roll Over Protective Structure (ROPS), Falling Objects Protective Structure (FOPS), or a cab with a ROPS. A ROPS may be a can frame or a two-posted or four-posted structure used for the protection of the operator to minimize the possibility of serious injury. The mounting structure and fasteners forming the mounting connection with the machine are part of the ROPS.

The protective structure is a special safety component of your machine.

DO NOT attach any device to the protective structure for pulling purposes. DO NOT drill holes to the protective structure.

The protective structure and interconnecting components are a certified system. Any damage, fire, corrosion, or modification will weaken the structure and reduce your protection. If this occurs, THE PROTECTIVE STRUCTURE MUST BE REPLACED so that it will provide the same protection as a new protective structure. Contact your dealer for protective structure inspection and replacement.

After an accident, fire, tip over, or roll over, the following MUST be performed by a qualified technician before returning the machine to field or job-site operations:

- The protective structure MUST BE REPLACED.
- The mounting or suspension for the protective structure, operator's seat and suspension, seat belts and mounting components, and wiring within the operator's protective system MUST be carefully inspected for damage.
- All damaged parts MUST BE REPLACED.

DO NOT WELD, DRILL HOLES, ATTEMPT TO STRAIGHTEN, OR REPAIR THE PROTECTIVE STRUCTURE. MODIFICATION IN ANY WAY CAN REDUCE THE STRUCTURAL INTEGRITY OF THE STRUCTURE, WHICH COULD CAUSE DEATH OR SERIOUS INJURY IN THE EVENT OF FIRE, TIP OVER, ROLL OVER, COLLISION, OR ACCIDENT.

Seat belts are part of your protective system and must be worn at all times. The operator must be held to the seat inside the frame in order for the protective system to work.

Air-conditioning system

The air-conditioning system is under high pressure. Do not disconnect any lines. The release of high pressure can cause serious injury.

The air-conditioning system contains gases that are harmful to the environment when released into the atmosphere. Do not attempt to service or repair the system.

Only trained service technicians can service, repair, or recharge the air-conditioning system.

Backup alarm system

Personal Protective Equipment (PPE)

Wear Personal Protective Equipment (PPE) such as hard hat, eye protection, heavy gloves, hearing protection, protective clothing, etc.

Do Not Operate tag

Before you start servicing the machine, attach a 'Do Not Operate' warning tag to the machine in an area that will be visible.

Hazardous chemicals

If you are exposed to or come in contact with hazardous chemicals you can be seriously injured. The fluids, lubricants, paints, adhesives, coolant, etc. required for the function of your machine can be hazardous. They may be attractive and harmful to domestic animals as well as humans.

Material Safety Data Sheets (MSDS) provide information about the chemical substances within a product, safe handling and storage procedures, first aid measures, and procedures to take in the event of a spill or accidental release. MSDS are available from your dealer.

Before you service your machine check the MSDS for each lubricant, fluid, etc. used in this machine. This information indicates the associated risks and will help you service the machine safely. Follow the information in the MSDS, and on manufacturer containers, as well as the information in this manual, when you service the machine.

Dispose of all fluids, filters, and containers in an environmentally safe manner according to local laws and regulations. Check with local environmental and recycling centers or your dealer for correct disposal information.

Store fluids and filters in accordance with local laws and regulations. Use only appropriate containers for the storage of chemicals or petrochemical substances.

Keep out of reach of children or other unauthorized persons.

Applied chemicals require additional precautions. Obtain complete information from the manufacturer or distributor of the chemicals before you use them.

Utility safety

When digging or using ground-engaging equipment, be aware of buried cables and other services. Contact your local utilities or authorities, as appropriate, to determine the locations of services.

Make sure that the machine has sufficient clearance to pass in all directions. Pay special attention to overhead power lines and hanging obstacles. High voltage lines may require significant clearance for safety. Contact local authorities or utilities to obtain safe clearance distances from high voltage power lines.

Retract raised or extended components, if necessary. Remove or lower radio antennas or other accessories. Should a contact between the machine and an electric power source occur, the following precautions must be taken:

- Stop the machine movement immediately.
- Apply the parking brake, stop the engine, and remove the key.
- Check if you can safely leave the cab or your actual position without contact with electrical wires. If not, stay in your position and call for help. If you can leave your position without touching lines, jump clear of the machine to make sure that you do not make contact with the ground and the machine at the same time.
- Do not permit anyone to touch the machine until power has been shut off to the power lines.

Electrical storm safety

Do not operate machine during an electrical storm.

If you are on the ground during an electrical storm, stay away from machinery and equipment. Seek shelter in a permanent, protected structure.

If an electrical storm should strike during operation, remain in the cab. Do not leave the cab or operator's platform. Do not make contact with the ground or objects outside the machine.

Mounting and dismounting

Mount and dismount the machine only at designated locations that have handholds, steps, and/or ladders.

Do not jump off of the machine.

Make sure that steps, ladders, and platforms remain clean and clear of debris and foreign substances. Injury may result from slippery surfaces.

Face the machine when you mount and dismount the machine.

Maintain a three-point contact with steps, ladders, and handholds.

Never mount or dismount from a moving machine.

Do not use the steering wheel or other controls or accessories as handholds when you enter or exit the cab or operator's platform.

⚠ Working at heights ⚠

When the normal use and maintenance of the machine requires you to work at heights:

- Correctly use installed steps, ladders, and railings.
- Never use ladders, steps, or railings while the machine is moving.
- Do not stand on surfaces that are not designated as steps or platforms.

Do not use the machine as a lift, ladder, or platform for working at heights.

⚠ Lifting and overhead loads ⚠

Never use loader buckets, forks, etc. or other lifting, handling, or digging equipment to lift persons.

Do not use raised equipment as a work platform.

Know the full area of movement of the machine and equipment and do not enter or permit anyone to enter the area of movement while the machine is in operation.

Never enter or permit anyone to enter the area underneath raised equipment. Equipment and/or loads can fall unexpectedly and crush persons underneath it.

Do not leave equipment in raised position while parked or during service, unless securely supported. Hydraulic cylinders must be mechanically locked or supported if they are left in a raised position for service or access.

Loader buckets, forks, etc. or other lifting, handling, or digging equipment and its load will change the center of gravity of the machine. This can cause the machine to tip on slopes or uneven ground.

Load items can fall off the loader bucket or lifting equipment and crush the operator. Care must be taken when lifting a load. Use proper lifting equipment.

Do not lift load higher than necessary. Lower loads to transport. Remember to leave appropriate clearance to the ground and other obstacles.

Equipment and associated loads can block visibility and cause an accident. Do not operate with insufficient visibility.

Safety rules - Ecology and the environment

Soil, air, and water quality is important for all industries and life in general. When legislation does not yet rule the treatment of some of the substances that advanced technology requires, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

Familiarize yourself with the relative legislation applicable to your country, and make sure that you understand this legislation. Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, anti-freeze, cleaning agents, etc., with regard to the effect of these substances on man and nature and how to safely store, use, and dispose of these substances.

Helpful hints

- Avoid the use of cans or other inappropriate pressurized fuel delivery systems to fill tanks. Such delivery systems may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of these products contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when you drain fluids such as used engine coolant mixtures, engine oil, hydraulic fluid, brake fluid, etc. Do not mix drained brake fluids or fuels with lubricants. Store all drained fluids safely until you can dispose of the fluids in a proper way that complies with all local legislation and available resources.
- Do not allow coolant mixtures to get into the soil. Collect and dispose of coolant mixtures properly.
- The air-conditioning system contains gases that should not be released into the atmosphere. Consult an air-conditioning specialist or use a special extractor to recharge the system properly.
- Repair any leaks or defects in the engine cooling system or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding. Penetrating weld splatter may burn a hole or weaken hoses, allowing the loss of oils, coolant, etc.

Battery recycling

Batteries and electric accumulators contain several substances that can have a harmful effect on the environment if the batteries are not properly recycled after use. Improper disposal of batteries can contaminate the soil, groundwater, and waterways. NEW HOLLAND strongly recommends that you return all used batteries to a NEW HOLLAND dealer, who will dispose of the used batteries or recycle the used batteries properly. In some countries, this is a legal requirement.



Mandatory battery recycling

NOTE: The following requirements are mandatory in Brazil.

Batteries are made of lead plates and a sulfuric acid solution. Because batteries contain heavy metals such as lead, CONAMA Resolution 401/2008 requires you to return all used batteries to the battery dealer when you replace any batteries. Do not dispose of batteries in your household garbage.

Points of sale are obliged to:

- Accept the return of your used batteries
- Store the returned batteries in a suitable location
- Send the returned batteries to the battery manufacturer for recycling

Torque – Minimum tightening torques for normal assembly

NOTE: In the metric tables, nominal sizes M4 through M8 hardware torque specifications are shown as a Newton meters (pound-inches) numerical value.

Nominal sizes M10 through M24 hardware torque specifications are shown as a Newton meters (pound-feet) numerical value.

Metric non-flanged hardware

Plain (PLN) an unplated hardware finish with residual manufacturing oils

Zinc-dichromate (ZND) – a yellow colored chemical plating formula yellow applied to the hardware

Nominal size	Class (CL) 8.8 bolt and Class (CL) 8 nut	Class (CL) 10.9 bolt and Class (CL) 10 nut	Locknut CL 8 w/CL 8.8 bolt	Locknut CL 10 w/CL 10.9 bolt
	PLN and ZND	PLN and ZND	ZND	ZND
	N·m (lb in)	N·m (lb in)	N·m (lb in)	N·m (lb in)
M4	2.9 (26)	4.2 (37)	2 (18)	2.9 (26)
M5	5.9 (52)	8.5 (75)	4 (36)	5.8 (51)
M6	10.1 (89)	14.5 (128)	6.8 (60)	10 (89)
M8	24.5 (217)	35.1 (311)	17 (151)	24 (212)
	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)
M10	48.7 (36)	69.5 (90)	33 (25)	48 (35)
M12	85 (63)	121 (67)	58 (43)	83 (61)
M14	135 (100)	193 (142)	92 (68)	132 (97)
M16	210 (155)	301 (222)	143 (106)	205 (151)
M18	299 (221)	414 (305)	203 (150)	281 (207)
M20	425 (313)	587 (433)	290 (214)	400 (295)
M24	735 (542)	1016 (749)	501 (370)	693 (510)

Metric flanged hardware

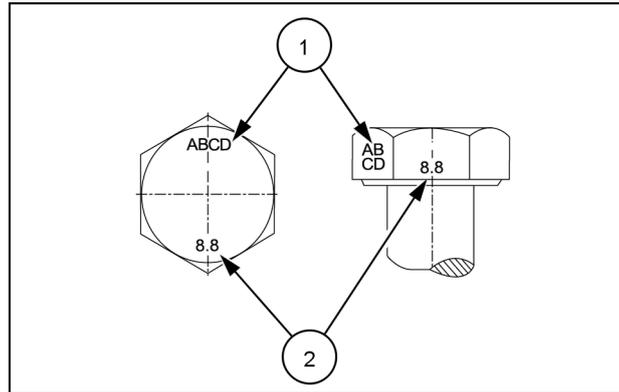
Plain (PLN) – an unplated hardware finish with residual manufacturing oils

Zinc-dichromate (ZND) – a yellow colored chemical plating formula yellow applied to the hardware

Nominal size	Class (CL) 8.8 bolt and Class (CL) 8 nut	Class (CL) 10.9 bolt and Class (CL) 10 nut	Locknut CL 8 w/CL 8.8 bolt	Locknut CL 10 w/CL 10.9 bolt
	PLN and ZND	PLN and ZND	ZND	ZND
	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)
M4	3.2 (28)	4.6 (41)	2.2 (19)	3.1 (27)
M5	6.5 (58)	9.4 (83)	4.4 (39)	6.4 (57)
M6	11.1 (98)	15.9 (141)	7.5 (66)	11 (96)
M8	27 (239)	39 (345)	18 (163)	27 (240)
	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)
M10	53.6 (40)	76.5 (56)	37 (27)	53 (39)
M12	93 (69)	134 (98)	63 (47)	91 (67)
M14	148 (109)	213 (157)	101 (75)	145 (107)
M16	231 (171)	331 (244)	158 (116)	226 (167)
M18	329 (243)	455 (336)	223 (165)	309 (228)
M20	467 (345)	645 (476)	318 (235)	440 (325)
M24	809 (597)	1118 (824)	552 (407)	

Identification markings

Metric hex head, flange hex head and carriage bolts, Classes (CL) 5.6 and upward

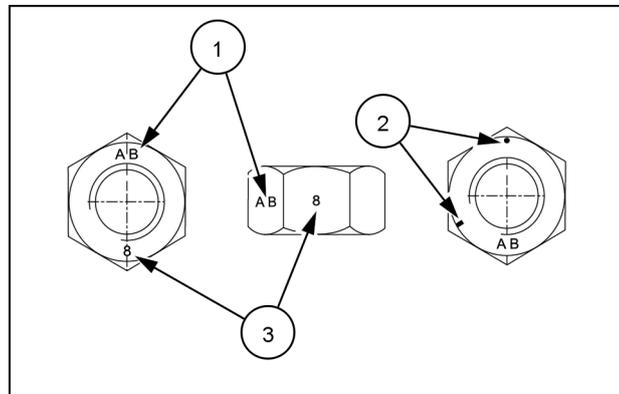


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Metric bolt identification markings

- 1. Manufacturer's identification
- 2. Property class

Metric hex nuts and locknuts, Classes (CL) 05 and upward



NHIL14RB00663AA 2

Metric hex nut identification markings

- (1) – Manufacturer's identification
- (3) – Property class
- (2) – Clockwise type markings indicate property class and may include manufacturer identification (if applied), Example: property marks **240** ° apart (shown) at the eight o'clock position indicate a Class 8 property, and marks **300** ° apart at the ten o'clock position indicate a Class 10 property.

INTRODUCTION

NOTE: In the Imperial units tables, the nominal sizes, **1/4 (0.25) in (inch)** and **5/16 (0.3125) in (inch)** hardware torque specifications are shown as a Newton meters (pound-inches) numerical value.
Nominal sizes **3/8 (0.375) in (inch)** through **1 (1.0) in (inch)** hardware torque specifications are shown as a Newton meters (pound-feet) numerical value.

Inch non-flanged hardware

Plain (PLN) – an unplated hardware finish with residual manufacturing oils

Zinc-dichromate (ZND) – a yellow colored chemical plating formula yellow applied to the hardware

Nominal size	SAE Grade (GR) 5 bolt and nut	SAE Grade (GR) 8 bolt and nut	Flange locknut GR F w/ GR 5 bolt	Flange locknut GR G w/ GR 8 bolt
	PLN and ZND	PLN and ZND	ZND	ZND
	N·m (lb in)	N·m (lb in)	N·m (lb in)	N·m (lb in)
1/4 (0.25) in	11 (97)	16 (142)	8.5 (75)	12.2 (109)
5/16 (0.3125) in	23 (204)	32 (283)	17.5 (155)	25 (220)
	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)
3/8 (0.375) in	40 (30)	57 (42)	31 (23)	44 (33)
7/16 (0.4375) in	65 (48)	91 (67)	50 (37)	71 (53)
1/2 (0.50) in	98 (73)	139 (103)	76 (56)	108 (80)
9/16 (0.5625) in	142 (105)	201 (148)	111 (82)	156 (115)
5/8 (0.625) in	196 (145)	277 (204)	153 (113)	215 (159)
3/4 (0.75) in	348 (257)	491 (362)	271 (200)	383 (282)
7/8 (0.875) in	561 (413)	791 (584)	437 (323)	617 (455)
1 (1.0) in	841 (620)	1187 (875)	654 (483)	924 (681)

Inch flanged hardware

Plain (PLN) – an unplated hardware finish with residual manufacturing oils

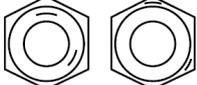
Zinc-dichromate (ZND) – a yellow colored chemical plating formula yellow applied to the hardware

Nominal size	SAE Grade (GR) 5 bolt and nut	SAE Grade (GR) 8 bolt and nut	Flange locknut GR F w/ GR 5 bolt	Flange locknut GR G w/ GR 8 bolt
	PLN and ZND	PLN and ZND	ZND	ZND
	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)
1/4 (0.25) in	12 (106)	17 (150)	8 (71)	12 (106)
5/16 (0.3125) in	25 (221)	35 (310)	17 (150)	24 (212)
	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)	N·m (lb ft)
3/8 (0.375) in	44 (33)	63 (46)	30 (22)	43 (32)
7/16 (0.4375) in	71 (52)	100 (74)	48 (35)	68 (50)
1/2 (0.50) in	108 (90)	153 (113)	74 (55)	104 (77)
9/16 (0.5625) in	156 (115)	221 (163)	106 (78)	157 (116)
5/8 (0.625) in	216 (159)	304 (225)	147 (108)	207 (153)
3/4 (0.75) in	383 (282)	541 (399)	261 (193)	369 (272)
7/8 (0.875) in	617 (455)	871 (642)	421 (311)	594 (438)
1 (1.0) in	925 (682)	1305 (963)	631 (465)	890 (656)

Identification marking

Grades of inch bolts and free-spinning nuts

SAE (J995) bolt head and nut grade identification

Grade identification marking	Grade Marking description
	<p>Grade 2 No line marks</p>
	<p>Grade 5 Three line marks</p>
	<p>Grade 8 Six line marks</p>
	<p>Grade 2 No circumferential line marks</p>
	<p>Grade 5 Two circumferential line marks located 120° apart</p>
	<p>Grade 2 Two circumferential line marks located 60° apart</p>
	<p>Grade 2 No circumferential line marks</p>
	<p>Grade 5 Two circumferential line marks located 120° apart</p>
	<p>Grade 8 Two circumferential line marks located 60° apart</p>

Grades of inch prevailing torque locknuts, all metal (three common marking methods)

On prevailing torque locknuts, the grade of nut is identified by one of three different sets of markings that denote the strength level and manufacturer.

Common prevailing torque locknut grade identification markings

Grade identification marking	Grade Marking description
	<p>Grade A No marks</p>
	<p>Grade B (hex nut) and Grade F (flange nut) Three raised or indented dot marks (Marks do not have to be in corners.)</p>
	<p>Grade C (hex nut) and Grade F (flange nut) Six raised or indented dot marks (Marks do not have to be in corners.)</p>
	<p>Grade A No letter mark on side flat</p>
	<p>Grade B Letter B on side flat</p>
	<p>Grade C Letter C on side flat</p>
	<p>Grade A No notches</p>
	<p>Grade B One circumferential notch on all six corners</p>
	<p>Grade C Two circumferential notches on all six corners</p>

Torque – Standard torque data for hydraulics

Installation of adjustable fittings in straight thread O-ring bosses

NOTICE: O-ring boss fittings can be used multiple times. Always inspect the O-ring for damage and lubricate the O-ring with clean hydraulic oil or petroleum jelly at installation. Damaged O-rings will cause leakage and affect performance.

Nonadjustable O-ring boss fittings

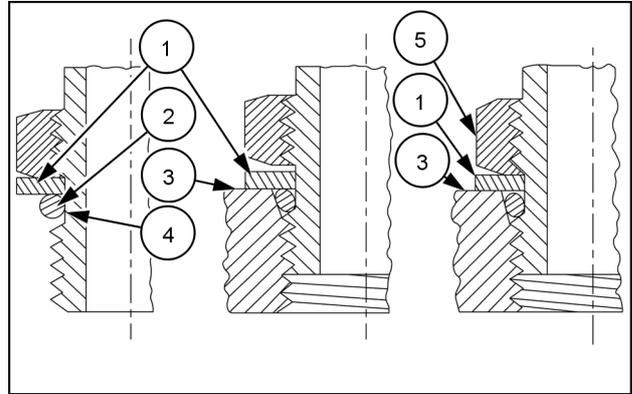
1. Inspect the components and make sure the port, O-ring, sealing surfaces, and threads are clean, and free of damage.
2. Install the O-ring if needed. Take special care not to cut the O-ring on the threads.

NOTE: Apply electrical tape over the threads to prevent O-ring damage if installing the O-ring, and then remove the tape.

3. Lubricate the threads and O-ring with clean hydraulic oil or petroleum jelly.
4. Install the O-ring (2) in the groove (4) adjacent to the metal backup washer (1) which is assembled at the extreme end of the groove.
5. Install the fitting into the **SAE** straight thread boss and hand tighten until the metal backup washer (1) contacts the face of the boss (3).

NOTICE: Do not over tighten and distort the metal backup washer.

6. Using the proper size wrenches, holding the head end of the fitting with a wrench, and then torque the locknut (5) and washer (1) against the face of the boss (3) to the proper specified torque value.



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Adjustable (swivel) O-ring boss fittings

1. Inspect the components and make sure the port, O-ring, sealing surfaces, and threads are clean, and free of damage.
2. Install the O-ring if needed. Take special care not to cut the O-ring on the threads.

NOTE: Apply electrical tape over the threads to prevent O-ring damage if installing the O-ring, and then remove the tape.

3. Lubricate the threads and O-ring with clean hydraulic oil or petroleum jelly.
4. Install the O-ring (2) in the groove (4) adjacent to the metal backup washer which is assembled at the extreme end of the groove.
5. Completely back-off the locknut (5) and washer (1) .
6. Install the fitting into the **SAE** straight thread boss and hand tighten until the metal backup washer (1) contacts the face of the boss (3).

NOTICE: Do not over tighten and distort the metal backup washer.

7. Position the fitting as needed by turning the head of the fitting counterclockwise up to a maximum of one turn.
8. Using the proper size wrenches, hold the head end of the fitting with a wrench, and then torque the locknut (5) and washer (1) against the face of the boss (3) to the proper specified torque value.

Standard torque data for hydraulic tubes and fittings

NOTICE: These torques are not recommended for tubes of **12.7 mm (1/2 in)** Outer Diameter (OD) and larger with wall thickness of **0.889 mm (0.035 in)** or less. The torque is specified for **0.889 mm (0.035 in)** wall tubes on each application individually.

NOTE: Acronyms in the following table, Joint Industry Council (JIC), Outer Diameter (OD).

Tube nuts for 37 ° flared fittings				O-ring boss plugs, adjustable fitting locknuts, swivel JIC – 37 ° seats
Size	Tubing OD mm (in)	Thread size	Torque N·m (lb ft)	Torque N·m (lb ft)
4	6.4 (1/4)	7/16–20	12 – 16 (9 – 12)	8 – 14 (6 – 10)
5	7.9 (5/16)	1/2–20	16 – 20 (12 – 15)	14 – 20 (10 – 15)
6	9.5 (3/8)	9/16–18	29 – 33 (21 – 24)	20 – 27 (15 – 20)
8	12.7 (1/2)	3/4–16	47 – 54 (35 – 40)	34 – 41 (25 – 30)
10	15.9 (5/8)	7/8–14	72 – 79 (53 – 58)	47 – 54 (35 – 40)
12	19.1 (3/4)	1-1/16–12	104 – 111 (77 – 82)	81 – 95 (60 – 70)
14	22.2 (7/8)	1-3/16–12	122 – 136 (90 – 100)	95 – 109 (70 – 80)
16	25.4 (1)	1-5/16–12	149 – 163 (110 – 120)	108 – 122 (80 – 90)
20	31.8 (1-1/4)	1-5/8–12	190 – 204 (140 – 150)	129 – 158 (95 – 115)
24	38.1 (1-1/2)	1-7/8–12	217 – 237 (160 – 175)	163 – 190 (120 – 140)
32	50.8 (2)	2-1/2–12	305 – 325 (225 – 240)	339 – 407 (250 – 300)

Installing and torquing 37 ° flared fittings;

1. Clean the face of the flare and threads with **LOCTITE® ODC-FREE CLEANER AND DEGREASER** cleaning solvent or equivalent cleaning solvent.
2. Allow the cleaning the cleaning solvent to completely dry before application sealant.
3. Apply **LOCTITE® 569™** hydraulic sealant to the 37 ° flare and the threads.
4. Install the fitting, and then torque to the specified torque.
5. Loosen the fitting, and then torque once more to the specified torque.

Pipe thread fitting torque

Thread Size (inch)	Torque (Maximum) N·m (lb ft)
1/8–27	13 (10)
1/4–18	16 (12)
3/8–18	22 (16)
1/2–14	41 (30)
3/4–14	54 (40)

Before installing and torquing pipe fittings;

1. Clean the threads with **LOCTITE® ODC-FREE CLEANER AND DEGREASER** cleaning solvent or an equivalent cleaning solvent.
2. Allow the cleaning the cleaning solvent to completely dry before application sealant.
3. Apply **LOCTITE® 567™ PST PIPE SEALANT** for all fittings, including stainless steel or **LOCTITE® 565™ PST** sealant for most other metal fittings.

NOTICE: For high filtration/zero contamination systems use **LOCTITE® 545™** sealant.

Basic instructions - Shop and assembly

Shimming

For each adjustment operation, select adjusting shims and measure the adjusting shims individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value shown on each shim.

Rotating shaft seals

For correct rotating shaft seal installation, proceed as follows:

1. Before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes.
2. Thoroughly clean the shaft and check that the working surface on the shaft is not damaged.
3. Position the sealing lip facing the fluid.

NOTE: *With hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will move the fluid towards the inner side of the seal.*

4. Coat the sealing lip with a thin layer of lubricant (use oil rather than grease). Fill the gap between the sealing lip and the dust lip on double lip seals with grease.
5. Insert the seal in its seat and press down using a flat punch or seal installation tool. Do not tap the seal with a hammer or mallet.
6. While you insert the seal, check that the seal is perpendicular to the seat. When the seal settles, make sure that the seal makes contact with the thrust element, if required.
7. To prevent damage to the seal lip on the shaft, position a protective guard during installation operations.

O-ring seals

Lubricate the O-ring seals before you insert them in the seats. This will prevent the O-ring seals from overturning and twisting, which would jeopardize sealing efficiency.

Sealing compounds

Apply a sealing compound on the mating surfaces when specified by the procedure. Before you apply the sealing compound, prepare the surfaces as directed by the product container.

Spare parts

Only use CNH Original Parts or NEW HOLLAND Original Parts.

Only genuine spare parts guarantee the same quality, duration, and safety as original parts, as they are the same parts that are assembled during standard production. Only CNH Original Parts or NEW HOLLAND Original Parts can offer this guarantee.

When ordering spare parts, always provide the following information:

- Machine model (commercial name) and Product Identification Number (PIN)
- Part number of the ordered part, which can be found in the parts catalog

Protecting the electronic and/or electrical systems during charging and welding

To avoid damage to the electronic and/or electrical systems, always observe the following practices:

1. Never make or break any of the charging circuit connections when the engine is running, including the battery connections.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the machine or on any machine attachment.
 - Position the welder ground clamp as close to the welding area as possible.
 - If you weld in close proximity to a computer module, then you should remove the module from the machine.
 - Never allow welding cables to lie on, near, or across any electrical wiring or electronic component while you weld.
4. Always disconnect the negative cable from the battery when charging the battery in the machine with a battery charger.

NOTICE: *If you must weld on the unit, you must disconnect the battery ground cable from the machine battery. The electronic monitoring system and charging system will be damaged if this is not done.*

5. Remove the battery ground cable. Reconnect the cable when you complete welding.

WARNING

Battery acid causes burns. Batteries contain sulfuric acid.

Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately. Failure to comply could result in death or serious injury.

W0111A

Special tools

The special tools that NEW HOLLAND suggests and illustrate in this manual have been specifically researched and designed for use with NEW HOLLAND machines. The special tools are essential for reliable repair operations. The special tools are accurately built and rigorously tested to offer efficient and long-lasting operation.

By using these tools, repair personnel will benefit from:

- Operating in optimal technical conditions
- Obtaining the best results
- Saving time and effort
- Working in safe conditions

General specification

The specifications on the following pages are given for your information and guidance. Our policy is one of continuous improvement. The right to change specifications or equipment at any time without notice is reserved. All data in this manual is subject to production variations. Dimensions and weights are approximate.

General dimensions

	H9870	H9880
Overall length	953 cm (375 in)	953 cm (375 in)
Overall width		
Loader raised, stabilizers off	302 cm (119 in)	285 cm (112 in)
Loader raised, stabilizers at widest position	345 cm (136 in)	322 cm (127 in)
Loader down, stabilizers at widest position	417 cm (164 in)	371 cm (146 in)
Overall height	447 cm (176 in)	447 cm (176 in)
Top of stabilizers	429 cm (169 in)	429 cm (169 in)
Clearance needed to unload	14 in x 18 in: 513 cm (202 in)	16 in x 18 in: 533 cm (210 in)
Ground clearance		
Front axle	24 cm (9-5/8 in)	24 cm (9-5/8 in)
Transmission	25 cm (10 in)	25 cm (10 in)
Track width (center to center)		
Front	206 cm (80.25 in)	206 cm (80.25 in)
Rear	183 cm (72 in)	183 cm (72 in)
Wheel base	447 cm (176 in)	447 cm (176 in)

Weight

	H9870	H9880
Total with fuel, oil, and coolant	7498 kg (16,530 lb)	7275 kg (16,040 lb)
Approximate loaded weight	14,071 kg (31,020 lb)	12,297 kg (27,110 lb)
Weight box (optional)	48 kg (106 lb) empty, 275 kg (600 lb) full	48 kg (106 lb) empty, 275 kg (600 lb) full
Maximum allowable Gross Vehicle Weight (GVW)	14,515 kg (32,000 lb)	14,515 kg (32,000 lb)

Engine

Maximum power at rated speed	129 kW (175 Hp)
Rated speed	2300 RPM
Peak torque	765 N·m (564 lb ft) at 1300 RPM
Low idle speed	Crankshaft: 800 +/- 50 RPM
High idle speed	Crankshaft: 2550 +/- 25 RPM
Aspiration	Turbocharged & after-cooled
Number of cylinders	Six
Bore	104 mm (4.1 in)
Stroke	132 mm (5.2 in)
Displacement	6.7 l (408.9 in ³)
Compression ratio	17.5:1
Firing order	1-5-3-6-2-4
Valve clearance	
Intake	0.25 +/- 0.05 mm (0.01 +/- 0.002 in)
Exhaust	0.50 +/- 0.05 mm (0.02 +/- 0.002 in)

Sample of manual. Download All 1839 pages at:

<https://www.arepairmanual.com/downloads/new-holland-h9870-h9880-bale-wagon-service-repair-manual/>