SERVICE MANUAL

Boomer™ 20
Boomer™ 25
Compact Tractor

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INTRODUCTION

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Foreword

This repair manual provides the technical information needed to properly service the NEW HOLLAND AGRICULTURE models Boomer 20 and 25 tractors. Use this manual in conjunction with the operator's manual for complete operation, adjustment, and maintenance information

On NEW HOLLAND AGRICULTURE equipment, left and right are determined by standing behind the unit, looking in the direction of travel.

Foreword

Soil, air, and water are vital factors of agriculture and life in general. When legislation does not yet rule the treatment of some of the substances required by advanced technology, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

NOTE: *The following are recommendations that may be of assistance:*

- Become acquainted with and ensure that you understand the relative legislation applicable to your country.
- Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, antifreeze, cleaning agents, etc., with regard to their effect on man and nature and how to safely store, use, and dispose of these substances.
- Agricultural consultants will, in many cases, be able to help you as well.

Helpful hints

- Avoid filling tanks using cans or inappropriate pressurized fuel delivery systems that may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of them 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 draining off used engine coolant mixtures, engine, gearbox and hydraulic oils, brake fluids, etc. Do not mix drained brake fluids or fuels with lubricants. Store them safely until they can be disposed of in a proper way to comply with local legislation and available resources.
- Modern coolant mixtures, i.e. antifreeze and other additives, should be replaced every two years. They should not be allowed to get into the soil, but should be collected and disposed of properly.
- Do not open the air-conditioning system yourself. It contains gases that should not be released into the atmosphere. Your NEW HOLLAND AGRICULTURE dealer or air conditioning specialist has a special extractor for this purpose and will have to recharge the system properly.
- Repair any leaks or defects in the engine cooling 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 as penetrating weld splatter may burn a hole or weaken them, allowing the loss of oils, coolant, etc.

International symbols

As a guide to the operation of the machine, various universal symbols have been utilized on the instruments, controls, switches, and fuse box. The symbols are shown below with an indication of their meaning.

- Thermostart starting aid
- Alternator charge
- Fuel level
- Automatic Fuel shut-off
- Engine speed (rev/min x 100)
- Hours recorded
- Engine oil pressure
- Engine coolant temperature
- Coolant level
- Tractor lights
- Headlamp main beam
- Headlamp dipped beam
- Work lamps
- Stop lamps
- Horn
- Radio
- KAM Keep alive memory
- Turn signals
- 1 Turn signals -one trailer
- 2 Turn signals -two trailers
- Front wind-screen wash/wipe
- Rear wind-screen wash/wipe
- Heater temp-erature control
- Heater fan
- Air conditioner
- Air filter blocked
- Parking brake
- Brake fluid level
- Trailer brake
- Roof beacon
- Warning ! Corrosive substance
- PTO
- N Transmission in neutral
- Creeper gears
- Slow or low setting
- Fast or high setting
- Ground speed
- Differential lock
- Rear axle oil tem-perature
- Transmission oil pressure
- FWD engaged
- FWD dis-engaged
- Warning!
- Hazard warning lights
- Variable control
- Pressurised! Open carefully
- Position Control
- Draft Control
- Accessory socket
- Implement socket
- %age slip
- Hitch raise (rear)
- Hitch lower (rear)
- Hitch height limit (rear)
- Hitch height limit (front)
- Hitch dis-abled
- Hydraulic and transmission filters
- Remote valve extend
- Remote valve retract
- Remote valve float
- Malfunction! See Operator's Manual
- Malfunction! (alter-native symbol)

Safety rules

BT09A213 1

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 and on machine decals, 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 which, if not avoided, will result in death or serious injury. The color associated with DANGER is RED.

⚠ WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury. The color associated with WARNING is ORANGE.

⚠ CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. The color associated with CAUTION is YELLOW.

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

Machine safety

NOTICE: *Notice indicates a situation which, if not avoided, could result in machine or property damage. The color associated with Notice is BLUE.*

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 which 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.

ACCIDENT PREVENTION

Most accidents or injuries that occur in workshops are the result of a non compliance to simple and fundamental safety regulations. For this reason, IN MOST CASES THESE ACCIDENTS CAN BE AVOIDED by foreseeing possible causes and consequently acting with the necessary caution and care.

Accidents may occur with all types of machines, regardless of how well the machine in question was designed and built.

A careful and informed service technician is the best guarantee against accidents.

Decisive awareness of the most basic safety rule is normally sufficient to avoid many serious accident.

⚠ WARNING

Unexpected machine movement!
Disengage power, shut down the tractor, and be sure that all moving parts have stopped before servicing, adjusting, cleaning, or unclogging the equipment.
Failure to comply could result in death or serious injury.

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⚠ WARNING

Pressurized system!
Never attempt to drain fluids or remove filters when the engine is running. Turn off the engine and relieve all pressure from pressurized systems before servicing the machine.
Failure to comply could result in death or serious injury.

W0905A

SAFETY REQUIREMENTS FOR FLUID POWER SYSTEMS AND COMPONENTS - HYDRAULICS (EUROPEAN STANDARD PR EM 982)

Flexible hose assemblies must not be constructed from hoses which have been previously used as part of a hose assembly.
Do not weld hydraulic piping.
When flexible hoses or piping are damaged, replace them immediately.
It is forbidden to modify a hydraulic accumulator by machining, welding or any other means.
Before removing hydraulic accumulators for servicing, the liquid pressure in the accumulators must be reduced to zero.
Pressure check on hydraulic accumulators shall be carried out by method recommended by the accumulator manufacturer.
Care must be taken not to exceed the maximum allowable pressure of the accumulator. After any check or adjustment there must be no leakage of gas.

SAFETY RULES

A careful operator is the best operator. Most accidents can be avoided by observing certain precautions. To help prevent accidents, read and take the following precautions before operating this tractor. Equipment should be operated only by those who are responsible and instructed to do so.

THE TRACTOR

1. Read the Operator's Manual carefully before using the tractor. Lack of operating knowledge can lead to accidents.
2. Use an approved roll bar and seat belt for safe operation. Overturning a tractor without a roll bar can result in death or injury. If your tractor is not equipped with a roll bar and seat belt, see your NEW HOLLAND AGRICULTURE Dealer.
3. Always use the seat belt. The only instance when the seat belt should not be used is if the roll bar has been removed from the tractor or folding ROPS is in down position.
4. If a front end loader is to be installed, always use a FOPS (Falling Object Protective Structure) canopy to avoid injury from falling objects.
5. Use the handholds and step plates when getting on and off the tractor to prevent falls. Keep steps and platform cleared of mud and debris.
6. Do not permit anyone but the operator to ride on the tractor. There is no safe place for extra riders.
7. Keep all safety decals clean of dirt and grime, and replace all missing, illegible, or damaged safety decals. See the list of decals in the Decal section of this manual.

SERVICING THE TRACTOR

1. The cooling system operates under pressure which is controlled by the radiator cap. It is dangerous to remove the cap while the system is hot. Always turn the cap slowly to the first stop and allow pressure to escape before removing the cap entirely.

2. Keep any type of open flame away from the tractor and do not smoke while refueling.Wait for the engine to cool before refueling.
3. Keep the tractor and equipment, particularly brakes and steering, maintained in a reliable and satisfactory condition to ensure your safety and comply with legal requirements.
4. Keep open flame or cold weather starting aids away from the battery to prevent fires or explosions. Use jumper cables according to instructions to prevent sparks which could cause explosion.
5. Stop the engine before performing any service on the tractor.
6. Escaping hydraulic/diesel fluid under pressure can penetrate the skin causing serious injury. If fluid is injected into the skin, obtain medical attention immediately or gangrene may result.
   - DO NOT use your hand to check for leaks.
   - Use a piece of cardboard or paper to search for leaks.
   - Stop the engine and relieve pressure before connecting or disconnecting lines.
   - Tighten all connections before starting the engine or pressurizing lines.
7. Do not modify or permit anyone else to modify or alter this tractor or any of its components or functions without first consulting a NEW HOLLAND AGRICULTURE Dealer.
8. The fuel oil in the injection system is under high pressure and can penetrate the skin. Unqualified persons should not remove or attempt to adjust a pump, injector, nozzle, or any other part of the fuel injection system. Failure to follow these instructions can result in serious injury.
9. Continuous long-term contact with used engine oil may cause skin cancer. Avoid prolonged contact with used engine oil.Wash skin promptly with soap and water.
10. Some components of your tractor, such as gaskets and friction surfaces (brake linings, clutch linings, etc.) may contain asbestos. Breathing asbestos dust is dangerous to your health. You are advised to have any maintenance or repair on such components carried out by an authorized NEW HOLLAND AGRICULTURE Dealer. However, if service operations are to be undertaken on parts that contain asbestos, the essential precautions listed below must be observed:
    - Work out of doors or in a well ventilated area.
    - Dust found on the tractor or produced during work on the tractor should be removed by extraction, not by blowing.
    - Dust waste should be dampened, placed in a sealed container, and marked to ensure safe disposal.
    - If any cutting, drilling, etc. is attempted on materials containing asbestos, the item should be dampened and only hand tools or low speed power tools used.

OPERATING THE TRACTOR

1. Before starting the tractor, apply the parking brake, place the PTO lever in the 'OFF' position, the lift control lever in the down position, the remote control valve levers in the neutral position, and the transmission in neutral.
2. Always sit in the tractor seat when starting the engine or operating controls. Do not start the engine or operate controls while standing beside the tractor.
3. Do not bypass the neutral start switches. Consult your NEW HOLLAND AGRICULTURE Dealer if your neutral start controls malfunction. Use jumper cables only in the recommended manner. Improper use can result in tractor runaway.
4. Avoid accidental contact with the gear shift lever while the engine is running, as this can cause unexpected tractor movement.
5. Before getting off the tractor, disengage the PTO, turn the engine off, and apply the parking brake. Never get off the tractor while it is in motion.
6. Do not park the tractor on a steep incline.
7. Do not operate the tractor engine in an enclosed building without adequate ventilation. Exhaust fumes can cause death or illness.
8. If the power steering or engine ceases operating, stop the tractor immediately.
9. Pull only from the drawbar or the lower link drawbar in the down position. Use only a drawbar pin that locks in place. Pulling from the tractor rear axle or any point above the axle may cause the tractor to upset.

10. 1If the front end of the tractor tends to rise when heavy implements are attached to the three-point hitch, install front end or front wheel weights. Do not operate the tractor with a light front end.
11. Always set the hydraulic selector lever in position control when attaching or transporting equipment. Ensure hydraulic couplers are properly mounted and will disconnect safely in case of accidental detachment of implement
12. Do not leave equipment in the raised position.
13. Use the flasher/turn signal lights and SMV signs when traveling on public roads both day and night (unless prohibited by law).
14. When operating at night, adjust lights to prevent blinding oncoming drivers.

DRIVING THE TRACTOR

1. Watch where you are going, especially at row ends, on roads, around trees and low hanging obstacles.
2. To avoid upsets, drive the tractor with care and at a safe speed. Use extra caution when operating over rough ground, when crossing ditches or slopes, and when turning corners.
3. To provide two-wheel braking, lock tractor brake pedals together when transporting on roads.
4. Do not coast or free wheel down hills. Use the same gear when going downhill as is used when going uphill.
5. Any towed vehicle with a total weight exceeding that of the towing tractor should be equipped with brakes for safe operation.
6. If the tractor becomes stuck or the tires become frozen to the ground, back up the tractor to prevent upset.
7. Always check overhead clearance, especially when transporting the tractor.
8. When operating at night, adjust lights to prevent blinding oncoming drivers.

OPERATING THE PTO

1. When operating PTO driven equipment, shut off the engine and wait until the PTO stops before getting off the tractor and disconnecting the equipment.
2. Do not wear loose clothing when operating the power take-off or when near rotating equipment.
3. When operating stationary PTO driven equipment, always place all gear shift levers in neutral position.
4. To avoid injury, do not clean, adjust, unclog, or service PTO driven equipment when the tractor engine is running.
5. Ensure the PTO master shield is installed at all times. Always replace the PTO shield cap when the PTO is not in use.

DIESEL FUEL

1. UNDER NO CIRCUMSTANCES should gasoline, alcohol, or blended fuels be added to diesel fuel. These combinations can create an increased fire or explosive hazard. Such blends are more explosive than pure gasoline in a closed container such as a fuel tank. DO NOT USE THESE BLENDS.
2. Never remove the fuel cap or refuel with the engine running or hot.
3. Do not smoke while refueling or when standing near fuel.
4. Maintain control of the fuel filler pipe nozzle when filling the tank.
5. Do not fill the fuel tank to capacity. Allow room for expansion.
6. Wipe up spilled fuel immediately.
7. Always tighten the fuel tank cap securely.
8. If the original fuel tank cap is lost, replace it with a NEW HOLLAND AGRICULTURE approved cap. A non-approved, proprietary cap may not be safe.
9. Keep equipment clean and properly maintained.
10. Do not drive equipment near open fires.
11. Never use fuel for cleaning purposes.
12. Arrange fuel purchases so that winter grade fuels are not held over and used in the spring.

SAFETY FRAME (ROPS)

Your NEW HOLLAND AGRICULTURE tractor is equipped with a safety frame. It must be maintained in a serviceable condition. Be careful when driving through doorways or working in confined spaces with low headroom.

UNDER NO CIRCUMSTANCES should you:

- Modify, drill, or alter the safety frame in any way. Doing so may render you liable to legal prosecution.
- Attempt to straighten or weld any part of the main frame or retaining brackets which have suffered damage. Doing so may weaken the structure and endanger your safety.
- Secure any parts on the main frame or attach your safety frame with anything other than the special high tensile bolts and nuts specified.
- Attach chains or ropes to the main frame for pulling purposes.
- Take unnecessary risks even though your safety frame affords you the maximum protection possible.

Basic instructions - 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 information in this manual is up-to-date at the date of the publication. It is the policy of the manufacturer for continuous improvement. Some information could not be updated due to modifications of a technical or commercial type, or changes to the laws and regulations of different countries.

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

Basic instructions - Shop and Assembly

SHIMMING

For each adjustment operation, select adjusting shims and measure 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 indicated on each shim.

ROTATING SHAFT SEALS

For correct rotating shaft seal installation, proceed as follows:

- before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes.
- thoroughly clean the shaft and check that the working surface on the shaft is not damaged.
- position the sealing lip facing the fluid; with hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will deviate the fluid towards the inner side of the seal.
- coat the sealing lip with a thin layer of lubricant (use oil rather than grease) and fill the gap between the sealing lip and the dust lip on double lip seals with grease.
- 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.
- whilst inserting the seal, check that it is perpendicular to the seat; once settled, make sure that it makes contact with the thrust element, if required.
- to prevent damaging the seal lip on the shaft, position a protective guard during installation operations.

O-RING SEALS

Lubricate the O-RING seals before inserting them in the seats, this will prevent them from overturning and twisting, which would jeopardise sealing efficiency.

SEALING COMPOUNDS

Apply one of the following sealing compounds on the mating surfaces when specified: SILMATE® RTV1473, or **LOCTITE® RTV 598** or **LOCTITE® INSTANT GASKET 587 BLUE**. Before applying the sealing compound, prepare the surfaces as directed on product container or as follows:

- remove any incrustations using a metal brush.
- thoroughly de-grease the surfaces using a locally approved cleaning agent such as safety solvent or brake parts cleaner.

SPARE PARTS

Only use "CNH Original Parts" or " NEW HOLLAND AGRICULTURE 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 AGRICULTURE Parts" can offer this guarantee.
When ordering spare parts, always provide the following information:

- machine model (commercial name) and serial number
- part number of the ordered part, which can be found in the "Microfiches" or the "Service Parts Catalogue", used for order processing

PROTECTING THE ELECTRONIC/ ELECTRICAL SYSTEMS DURING CHARGING OR WELDING

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

1. Never make or break any of the charging circuit connections, including the battery connections, when the engine is running.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the combine or on any header attached to the combine.
   - position the welder ground clamp as close to the welding area as possible
   - if welding in close proximity to a computer module, then the module should be removed from the combine
   - never allow welding cables to lay on, near or across any electrical wiring or electronic component while welding is in progress
4. Always disconnect the negative cable from the battery when charging the battery in the combine with a battery charger.

NOTICE: *If welding must be performed on the unit, either the combine or the header (if it is attached), the battery ground cable must be disconnected from the combine battery. The electronic monitoring system and charging system will be damaged if this is not done.*

Remove the battery ground cable. Reconnect the cable when welding is completed.

⚠ WARNING ⚠

Battery acid causes severe burns. Batteries contain sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote - EXTERNAL: flush with water. INTERNAL: drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetables oil. Call physician immediately. EYES: flush with water for 15 minutes and get prompt medical attention.

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TOOLS

The tools that NEW HOLLAND AGRICULTURE suggests and illustrate in this manual have been:

- specifically researched and designed for use with NEW HOLLAND AGRICULTURE machines
- essential for reliable repair operations
- accurately built and rigorously tested so as 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

NOTE: *The terms "front", "rear", "right-hand" and "left-hand" (when referred to different parts) are determined from the rear, facing in the direction of travel of the machine during operation.*

Basic instructions Hardware

General

Your tractor has been built using metric hardware.

NOTE: *Be sure to use the hardware specified when using tapped holes, as trying to install a metric bolt in an inch thread, or an inch bolt in a metric thread, will damage the thread.*

Certain hardware must be tightened to specific torque specifications. If specific torque specifications are not noted, tighten the hardware to the standard torque chart specification listed in this manual.

Plating

Hardware used on NEW HOLLAND AGRICULTURE balers is plated with zinc chromate (gold color). Gold colored hardware has different torquing requirements from unplated or zinc plated (silver color) hardware because of the difference in the coefficient of friction of the plating material. The torque charts in this manual list the correct specifications for gold, silver, and unplated bolts.

Nut Tightening

Whenever possible, the nut should be tightened, not the head of the bolt. When tightening using the bolt head, the clamp load can be lost because some of the torque applied twists the bolt instead of tensioning (stretching) it. The tension on the bolt is what holds the joint together.

Approximately 90% of the torque applied during assembly goes to overcoming friction between the parts. The other 10% is used to tension (stretch) the bolt. After assembly, the frictional forces disappear, which is the basis for the saying 'If it does not fail during assembly, it will not fail in service.' The bolt may later fail due to other factors, but not from being over tightened.

Locknuts

Most locknuts are coated with a special lubricant that is dry to the touch. Anytime a locknut is used, a lower than normal torque is required. Refer to the torque charts in this manual for specific values.

Jam Nuts

When using a jam nut to lock a regular nut, the jam nut should be installed first and tightened to one half the recommended torque, then held in place while installing a regular nut to the recommended torque.

Thread Lubrication

The addition of antiseize compound, Molykote, oil, graphite, or any other lubricant to a bolt decreases the friction between it and a nut. This makes it necessary to reduce the recommended torque to prevent over tensioning of the bolt. When using the torque charts in this manual, decrease the value by 20% whenever a lubricant is used.

Torque Specification Tables

Standard Bolt Hardware & Hydraulic Connector Torques, Specifications and Information

This specification establishes general torque values to be used in bolted joints for metric and inch hardware. This specification is assumed to apply unless another specification (standard or specified requirement) is indicated in the repair manual.

NOTE: These Standards do not include electrical or hydraulic components, they are referred to in their specific charts or tables.

INCH 'NON-FLANGED' HARDWARE AND LOCKNUTS {MINIMUM HARDWARE TIGHTENING TORQUES}

IN NEWTON-METERS (FOOT-POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS								
	SAE GRADE 2		SAE GRADE 5		SAE GRADE 8		LOCKNUTS	
Nominal Size	Unplated or Plated Silver	Plated w/ZnCr Gold	Unplated or Plated Silver	Plated w/ZnCr Gold	Unplated or Plated Silver	Plated w/ZnCr Gold	Gr.B w/Gr5 Bolt	Gr.C w/Gr8 Bolt
1/4	6.2 (55)*	8.1 (72)*	9.7 (86)*	13 (112)*	14 (121)*	18 (157)*	8.5 (75)*	12.2 (109)*
5/16	13 (115)*	17 (149)*	20 (178)*	26 (229)*	28 (21)	37 (27)	17.5 (155)*	25 (220)*
3/8	23 (17)	30 (22)	35 (26)	46 (34)	50 (37)	65 (48)	31 (23)	44 (33)
7/16	37 (27)	47 (35)	57 (42)	73 (54)	80 (59)	104 (77)	50 (37)	71 (53)
1/2	57 (42)	73 (54)	87 (64)	113 (83)	123 (91)	159 (117)	76 (56)	108 (80)
9/16	81 (60)	104 (77)	125 (92)	163 (120)	176 (130)	229 (169)	111 (82)	156 (115)
5/8	112 (83)	145 (107)	174 (128)	224 (165)	244 (180)	316 (233)	153 (113)	215 (159)
3/4	198 (146)	256 (189)	306 (226)	397 (293)	432 (319)	560 (413)	271 (200)	383 (282)
7/8	193 (142)	248 (183)	495 (365)	641 (473)	698 (515)	904 (667)	437 (323)	617 (455)
1	289 (213)	373 (275)	742 (547)	960 (708)	1048 (773)	1356 (1000)	654 (483)	924 (681)

NOTE: Torque values shown with * are inch pounds.

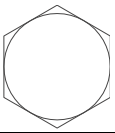
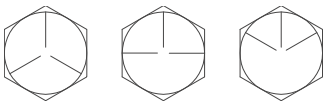
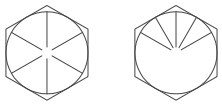
NOTICE: *Values shown on these charts are minimum hardware tightening torques unless otherwise stated.*

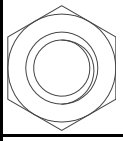
METRIC 'NON-FLANGED' HARDWARE AND LOCKNUTS {MINIMUM HARDWARE TIGHTENING TORQUES}

IN NEWTON-METERS (FOOT-POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS							
	CLASS 5.8		CLASS 8.8		CLASS 10.9		LOCK-NUTS
Nominal Size	Unplated	Plated w/ZnCr	Unplated	Plated w/ZnCr	Unplated	Plated w/ZnCr	Cl.8 w/Cl8.8 Bolt
M4	1.7 (15)*	2.2 (19)*	2.6 (23)*	3.4 (30)*	3.7 (33)*	4.8 (42)*	2.3 (20)*
M6	5.8 (51)*	7.6 (67)*	8.9 (79)*	12 (102)*	13 (115)*	17 (150)*	7.8 (69)*
M8	14 (124)*	18 (159)*	22 (195)*	28 (21)	31 (23)	40 (30)	19 (169)*
M10	28 (21)	36 (27)	43 (32)	56 (41)	61 (45)	79 (58)	38 (28)
M12	49 (36)	63 (46)	75 (55)	97 (72)	107 (79)	138 (102)	66 (49)
M16	121 (89)	158 (117)	186 (137)	240 (177)	266 (196)	344 (254)	164 (121)
M20	237 (175)	307 (226)	375 (277)	485 (358)	519 (383)	671 (495)	330 (243)
M24	411 (303)	531 (392)	648 (478)	839 (619)	897 (662)	1160 (855)	572 (422)

NOTE: Torque values shown with * are inch pounds.

SAE HARDWARE IDENTIFICATION CHART

Grade	1 or 2	5	8
SAE Markings for Bolts and Cap Screws			

SAE Markings for Hex Nuts			
Grade A-B-C Locknuts	**A (No Notches)**	**B (Three Marks)**	**C (Six Marks)**

METRIC HARDWARE IDENTIFICATION CHART

Class	**5.8**	**8.8**	**10.9**
			
Hex Cap Screw and Carriage Bolts	Located on the face or flat, on the cap of the bolt	Located on the face or flat, on the cap of the bolt	Located on the face or flat, on the cap of the bolt
Hex Nuts and Locknuts	Located on the face or flat of the nut	Located on the face or flat of the nut	Located on the face or flat of the nut

Metric cap screws and nuts are identified by the grade number stamped on the head of the cap screw or on the surface of the nuts. U.S. customary cap screws are identified by radial lines stamped on the head of the cap screw.

DEFINITIONS:

1. Break-Away Torque - Torque measured in the direction of tightening, the moment before the bolt/nut starts to turn.
2. Clamping Force - Force equal to the tension in the fastener that clamps the parts together.
3. Stabilized Torque - Torque measured on a joint that has had a settling time after fastener installation, and the torque is measured in the direction of tightening, the moment after the bolt/nut begins to turn.
4. Proof Load - Safe test load for fasteners, approximately 10% below the yield load.
5. Torque - Force on the wrench handle times the handle length.
6. Torque and Turn - Bolting method utilizing a torque sufficient to close the joint, followed by rotation of a specific angle to obtain the desired bolt stretch.
7. Torque to Yield - Bolting method that tightens the joint until 0.2% yield is detected. Generally requires a computer monitored tightening tool.
8. Target Torque - Torque specified by engineering, generally nominal torque.
9. Ultimate Load - Load when bolt failure occurs.
10. Yield Load - Load when 0.2% deformation occurs.

NOTE: Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original. When replacing cap screws, always use a cap screw of the same measurement and strength as the cap screw being replaced.

NOTE: Make sure the fasteners threads are clean, and that thread engagement is started. This will prevent them from failing when being tightened. Assure that joints that utilize threaded fasteners are properly tightened, and that they remain tight during the period of their intended usage.

NOTE: Tighten plastic insert or crimped steel-type lock nuts to approximately 50 % of table torque, applied to the nut, not the bolt head. Tighten toothed or serrated type lock nuts to their full torque value.

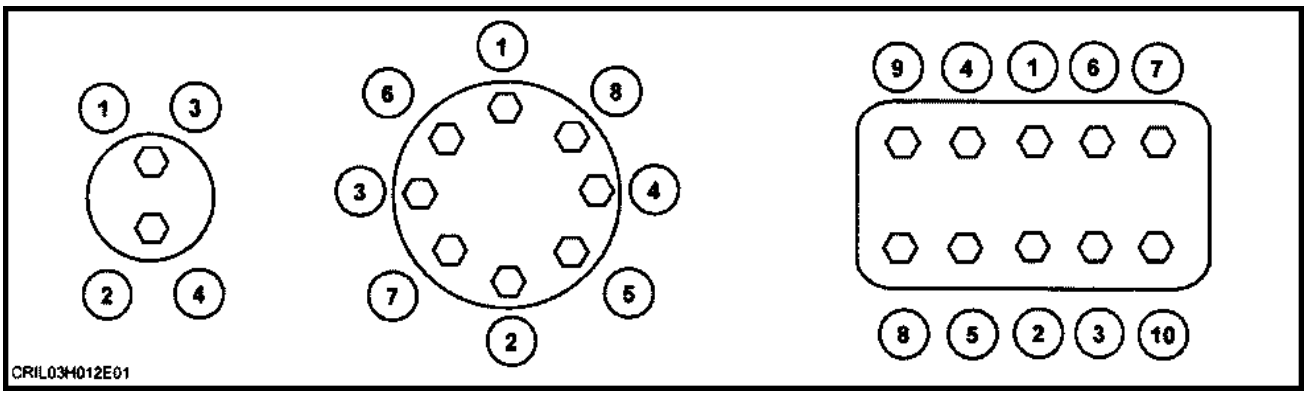
NOTE: Always use the torque values listed in the supplied charts in this section when values are not supplied in a procedure.

NOTE: DO NOT use these torque values when values are given in a specified procedure.

NOTE: Reuse of fasteners. Fasteners that have been tightened above yield point during assembly should not be reused after disassembly. They have been permanently deformed and the elastic range has been shifted closer to the ultimate tensile point.

NOTE: Torque and Turn is a recommended procedure for manufacturing and service when sophisticated tools are not available, especially for large diameter fasteners.

NOTE: Large diameter fasteners, unless specifically stated, should be tightened in sequence using the related torque chart below, at a low torque that is sufficient until the joint is closed. Each bolt is then rotated 90 degrees in sequence. Each bolt is then rotated another 90 degrees in sequence. The result is a clamp load above the yield point. This procedure results in a consistent clamp load. The fasteners should not be reused after disassembly.



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NOTE: Shown above is the suggested initial torque tightening sequences for general applications, tighten in sequence from item 1 through to the last item of hardware.

Hydraulic Hoses and Tubes

NOTE: Tightening the joint to the proper torque will keep it leak free, and prevent it from damaging the hose or fitting.

Always replace hoses and tubes with damaged cone ends or the end connections.
When installing a new hose, loosely connect each end and make sure the hose fits its desired location, without kinking or twisting, before tightening the connection. Tighten non-swivel end of hose first if applicable. Tighten the hose clamps enough to hold the hose without chafing but not so tight as to crush the ends.
Keep the hoses and tubes clear of moving parts and replace any hoses and fittings that have moved from their original positions over time. A hose with a chafed outer cover will allow moisture to get into the system. Concealed corrosion of the wire reinforcement will then occur along the hose length and result in hose failure.
Ballooning of the hose indicates internal leakage as the hose deteriorates. This condition can rapidly lead to hose failure.
Kinked, crushed, stretched or damaged hoses generally suffer internal structural damage that restricts fluid flow, reduces performance and ultimately causes the hose to fail.
Do not allow free moving, unsupported hoses or tubes to touch each other or related working surfaces. This causes chafing and reduces line life.

National Pipe Thread (NPT) Fittings

Before installing and tightening pipe fittings, clean the threads with a cleaning solvent or Loctite® brand cleaner. Apply the appropriate Loctite® brand sealant to all fittings including stainless steel, unless as otherwise stated. Generally Loctite® 567™ can be used for all fittings including stainless steel. Loctite® 565™ is used for most metal fittings. For high filtration/zero contamination systems use Loctite® 545™.

NPT PIPE FITTING TORQUE CHART

Thread Size	Torque (Maximum)
1/8" - 27	**13 Nm** (**10 lb ft**)
1/4" - 18	**16 Nm** (**12 lb ft**)
3/8" - 18	**22 Nm** (**16 lb ft**)
1/2" - 14	**41 Nm** (**30 lb ft**)
3/4" - 14	**54 Nm** (**40 lb ft**)

PIPE FITTING

Nom. SAE Dash Size	Thread Size	TFFT (Turns For Finger Tight)
-2	1/8 - 27	2.0 - 3.0
-4	1/4 - 18	2.0 - 3.0
-6	3/8 - 18	1.5 - 3.0
-8	1/2-14	2.0 - 3.0
-12	3/4 - 14	2.0 - 3.0
-16	1 - 11-1/2	1.5 - 2.5
-20	1-1/4 - 11-1/2	1.5 - 2.5
-24	1-1/2 - 11-1/2	1.5 - 2.5
-32	2 - 11-1/2	1.5 - 2.5

Apply sealant/lubricant to male pipe threads. The first two threads should be left uncovered to avoid system contamination. Screw pipe fitting into female pipe port to the finger tight position. Wrench tighten fitting to the appropriate turns from finger tight (TFFT) shown in table above, making sure the tube end of an elbow or tee fitting is aligned to receive incoming tube or hose fitting.

Installation of Adjustable Fittings in Straight Thread O Ring Bosses

1. Lubricate the O ring by coating it with light oil or petroleum jelly. Install the O ring in the groove adjacent to the metal backup washer which is assembled at the extreme end of the groove.
2. Install the fitting into the SAE straight thread boss until the metal backup washer contacts the face of the boss.
   NOTE: Do not over tighten and distort the metal backup washer.
3. Position the fitting by turning out (counter clockwise) up to a maximum of one turn. Holding the pad of the fitting with a wrench, tighten the locknut and washer against the face of the boss.
4. When hose ends or connectors are made of materials other than steel, different torque values may be required.

O RING BOSS END FITTING OR LOCK NUT

Nom. SAE Dash Size	Thread Size	Newton·meters	lb/in	lb/ft
-6	9/16 - 18	48 to 54	432 to 480	
-8	3/4 - 16	70 to 78	612 to 684	
-10	7/8 - 14	102 to 114		75 to 84
-12	1-1/16 - 12	142 to 160		105 to 117
-16	1-5/16 - 12	237 to 254		175 to 187

37 DEGREE FLARE FITTING (STEEL HYDRAULIC FITTINGS)

Nom. SAE Dash Size	Tube OD/Hose ID		Thread Size	Newton·meters	lb/in	lb/ft
-2			5/16 - 24	8 to 9	72 to 84	
-3			3/8 - 24	11 to 12	96 to 108	
-4	6.4 mm	1/4 inch	7/16 - 20	14 to 16	120 to 144	
-5	7.9 mm	5/16 inch	1/2 - 20	18 to 21	156 to 192	
-6	9.5 mm	3/8 inch	9/16 - 18	27 to 33	240 to 300	
-8	12.7 mm	1/2 inch	3/4 - 16	46 - 56	408 to 504	
-10	15.9 mm	5/8 inch	7/8 - 14	77 to 85	684 to 756	
-12	19.0 mm	3/4 inch	1-1/16 - 12	107 to 119		79 to 88
-14	22.2 mm	7/8 inch	1-3/16 -12	127 to 140		94 to 103
-16	25.4 mm	1.0 inch	1-5/16 - 12	131 to 156		97 to 117
-20	31.8 mm	1-1/4 inch	1-5/8 - 12	197 to 223		145 to 165
-24	38.1 mm	1-1/2 inch	1-7/8 - 12	312 to 338		230 to 250

37 DEGREE FITTINGS

TUBE NUTS FOR 37 DEGREE FLARED FITTINGS								O RING BOSS PLUGS ADJUSTABLE FITTING LOCKNUTS, SWIVEL JIC-37° SEATS			
				TORQUE				TORQUE			
Size	Tubing OD		Thread Size	Newton· Meters		Foot Pounds		Newton· Meters		Foot Pounds	
	mm	in.		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
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	53	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

These torques are not recommended for tubes of **12.7 mm** (**0.5 in**) OD and larger with wall thickness of **0.89 mm** (**0.035 in**) or less. The torque is specified for **0.89 mm** (**0.035 in**) wall tubes on each application individually. Before installing and torquing 37° flared fittings, clean the face of the flare and threads with a cleaning solvent or Loctite® brand cleaner, and apply hydraulic sealant Loctite® 569™ to the 37° flare and the threads. Install fitting, and torque to specified torque, loosen fitting and re-torque to specifications.

General specification

	Model Boomer 20-Hydrostatic	Model Boomer 25-Hydrostatic
ENGINE		
Type	Diesel	Diesel
Model	S3L	S3L2
Engine Gross Horsepower	**17 kW** (**23 Hp**)	**20 kW** (**27 Hp**)
Cylinders	4	4
Bore	**78 mm** (**3.07 in**)	**78 mm** (**3.07 in**)
Stroke	**78.5 mm** (**3.09 in**)	**92 mm** (**3.62 in**)
Displacement	**1.125 l** (**69 in³**)	**1.318 l** (**80 in³**)
Compression Ratio	22.0:1	20.0:1
Firing Order	1-3-2	1-3-2
Low Idle Speed	**970±30 RPM**	**970±30 RPM**
Maximum Speed:		
High Idle	**29000±20 RPM**	**2900±20 RPM**
Rated	**2700 RPM**	**2700 RPM**
Valve Clearance (Cold)		
Intake	**0.020 - 0.050 mm** (**0.0008 - 0.0020 in**)	**0.020 - 0.050 mm** (**0.0008 - 0.0020 in**)
Exhaust	**0.050 - 0.085 mm** (**0.0020 - 0.0033 in**)	**0.050 - 0.085 mm** (**0.0020 - 0.0033 in**)
CAPACITIES		
Fuel Tank	**25 l** (**6.6 US gal**)	**25 l** (**6.6 US gal**)
Cooling System	**3.8 l** (**1.0 US gal**)	**3.8 l** (**1.0 US gal**)
Engine Crankcase:		
With Filter	**4 l** (**1.10 US gal**)	**4 l** (**1.10 US gal**)
Rear Axle & Transmission (Includes Hydraulics)		
HST	**20 l** (**5.28 US gal**)	**20 l** (**5.28 US gal**)
Front Axle	**3 l** (**1 US gal**)	**3 l** (**1 US gal**)
COOLING SYSTEM		
Type	Pressurized Liquid with Recirculating Bypass	Pressurized Liquid with Recirculating Bypass
Water Pump:		
Type	Centrifugal	Centrifugal
Drive	V-Belt	V-Belt
Belt Deflection	**10 - 12 mm** (**0.39 - 0.47 in**) when **10 kg** (**22 lb**) pressure is applied midway between belt pulleys	**10 - 12 mm** (**0.39 - 0.47 in**) when **10 kg** (**22 lb**) pressure is applied midway between belt pulleys
Fan Diameter	**356 mm** (**14 in**)	**356 mm** (**14 in**)
Thermostat:		
Start to Open	**76.5 °C** (**170 °F**)	**76.5 °C** (**170 °F**)
Fully Open	**90 °C** (**194 °F**)	**90 °C** (**194 °F**)
Radiator Cap	**90 kPa** (**13 psi**)	**90 kPa** (**13 psi**)

	Model Boomer 20-Hydrostatic	Model Boomer 25-Hydrostatic
ELECTRICAL SYSTEM		
Alternator	**12 V**, Heavy Duty, **50 A**	**12 V**, Heavy Duty, **50 A**
Battery	**12 V**, w/ negative ground, 660 cca BCI Group 34	**12 V**, w/ negative ground, 660 cca BCI Group 34
Starting Motor	Solenoid Pre-Engaged Reduction	Solenoid Pre-Engaged Reduction
FUEL SYSTEM		
Fuel Type	Diesel	Diesel
Type of Fuel to Use if Above **4 °C** (**40 °F**)	No. 2-Diesel, Cetane Rating: Minimum 40	No. 2-Diesel, Cetane Rating: Minimum 40
Type of Fuel to Use if Below **4 °C** (**40 °F**)	No. 1-Diesel, Cetane Rating: Minimum 40	No. 1-Diesel, Cetane Rating: Minimum 40
Injection Pump:		
Type	In-Line	In-Line
Timing	**19 °** BTDC	**17 °** BTDC
BRAKES		
Type	Wet Disc	Wet Disc
2 Disc per Side	**223 mm** (**8.78 in**) x **174 mm** (**6.85 in**)	**223 mm** (**8.78 in**) x **174 mm** (**6.85 in**)
STEERING		
Type	Power	Power
Turns Lock-to-Lock:		
FWD	**3** L to R 3.30 R to L	**3** L to R 3.30 R to L
Front Wheel		
Toe-In	**0 - 5 mm** (**0 - 0.20 in**)	**0 - 5 mm** (**0 - 0.20 in**)
Turning Radius w/o Brakes:		
FWD	**2.5 m** (**8 ft**)Right turn **2.5 m** (**8 ft**) Left turn	**2.5 m** (**8 ft**)Right turn **2.5 m** (**8 ft**) Left turn
POWER TAKE-OFF		
Type	Independent	Independent
Shaft Size:		
Rear PTO	**35 mm** (**1.4 in**)	**35 mm** (**1.4 in**)
Mid PTO	**25.4 mm** (**1 in**)	**25.4 mm** (**1 in**)
Engine Speed for **540 RPM** Rear PTO Operation	**2603 RPM** (**2603 RPM**)	**2603 RPM** (**2603 RPM**) - HST Transmission
Engine Speed for **2000 RPM** Mid PTO operation	**2660 RPM** (**2660 RPM**)	**2660 RPM** (**2660 RPM**)
Horsepower PTO Observed	**12.9 kW** (**18 Hp**)	**15.1 kW** (**21 Hp**)
POWER TAKE-OFF		
Engine Speed for **2000 RPM** Mid PTO Operation	**2660 RPM** - HST	**2660 RPM** - HST
Direction of Rotation (As viewed from rear of tractor)		

	Model Boomer 20-Hydrostatic	Model Boomer 25-Hydrostatic
Rear PTO	Clockwise	Clockwise
Mid PTO	Clockwise	Clockwise
HYDRAULIC LIFT SYSTEM		
Type	Open Center	Open Center
Pump Type	Gear	Gear
Pump Capacity	**27. l** (**7 US gal**)	**27. l** (**7 US gal**)
System Relief Valve Setting	**14997 kPa** (**2175.1 psi**)	**14997 kPa** (**2175.1 psi**)
TRANSMISSION SPEEDS (HYDROSTATIC)		
	(**2700 RPM** Engine Rated Speed with 33 x 12–16.5 Rear tires	(**2700 RPM** Engine Rated Speed with 33 x 12–16.5 Rear tires
Gear Position:		
Low	**0 - 5.23 km/h** (**0 - 3.251 mph**)	**0 - 5.23 km/h** (**0 - 3.251 mph**)
High	**0 - 10.69 km/h** (**0 - 6.64 mph**)	**0 - 10.69 km/h** (**0 - 6.64 mph**)
Reverse Low	**0 - 5.23 km/h** (**0 - 3.25 mph**)	**0 - 5.23 km/h** (**0 - 3.25 mph**)
Reverse High	**0 - 10.69 km/h** (**0 - 6.64 mph**)	**0 - 10.69 km/h** (**0 - 6.64 mph**)
CAST IRON WEIGHTS		
Front End:		
With weight extension bracket installed	(5) weights @ **26 kg** (**60 lb**) each	(5) weights @ **26 kg** (**60 lb**) each
With weight extension bracket installed	Optional (3) weights @ **45 kg** (**100 lb**) each	Optional (3) weights @ **45 kg** (**100 lb**) each
Rear Wheel:		
R-4 Tires	(4) weights (2) per wheel @ **34 kg** (**75 lb**) each	(4) weights (2) per wheel @ **34 kg** (**75 lb**) each
Turf Tires	NA	NA
Ag. Tires	(4) weights (2) per wheel @ **48 kg** (**106 lb**) each	(4) weights (2) per wheel @ **48 kg** (**106 lb**) each
DRAWBARS		
Extendible	Standard	Standard
TIRES		
FRONT		
Turf:	23.5 x 8.5–12 4PR, R3	23.5 x 8.5–12 4PR, R3
Industrial:	23.5 x 8.5–12 4PR, R4	23.5 x 8.5–12 4PR, R4
REAR:		
Turf	33 x 12.00–16.5 4PR, R3	33 x 12.00–16.5 4PR, R3
Industrial	33 x 12.00–16.5, 4PR, R4	33 x 12.00–16.5, 4PR, R4
WHEEL BOLT TORQUES		
Front Wheel --- Disc-to-Hub:		

	Model Boomer 20- Hydrostatic	Model Boomer 25- Hydrostatic
FWD	**93 - 108 N·m** (**69 - 80 lb ft**)	**93 - 108 N·m** (**69 - 80 lb ft**)
Rear Wheel --- Disc-to Axle	**176 - 196 N·m** (**130 - 145 lb ft**)	**176 - 196 N·m** (**130 - 145 lb ft**)
ROPS ATTACHING BOLT TORQUES		
ROPS to Rear Axle	**85 N·m** (**63 lb ft**)	**85 N·m** (**63 lb ft**)
Seat Belt	**49 - 54 N·m** (**36 - 40 lb ft**)	**49 - 54 N·m** (**36 - 40 lb ft**)

General specification - Biodiesel Fuels

Fatty Acid Methyl Ester Biodiesel (Biodiesel Fuel) consists of a family of fuels derived from vegetable oils treated with methyl esters.

NOTICE: *Biodiesel Fuel blends are approved for your engine only if they comply with* ***EN14214*** *Specification Standards or* ***ASTM D6751****.*

NOTICE: *It is imperative that you check which blend is approved for your engine with your NEW HOLLAND AGRICULTURE dealer. Be aware that the use of Biodiesel Fuel that does not comply with the Standards mentioned above could lead to severe damage to the engine and fuel system of your machine. The use of fuels that are not approved may void NEW HOLLAND AGRICULTURE Warranty coverage.*

Biodiesel Fuel Usage Conditions

NOTICE: *The Biodiesel Fuel must meet the fuel Specification mentioned above.*

Biodiesel Fuel must be purchased from a trusted supplier that understands the product and maintains good fuel quality. Biodiesel Fuel must be pre-blended by the supplier. Mixing Biodiesel Fuels on-site can result incorrect mixture that can lead to problems with both engine and fuel system.

Engine performance is affected by the use of Biodiesel Fuel. There may be up to **12 %** reduction in power or torque depending on the blend used.

NOTICE: *DO NOT modify the engine and/or injection pump settings to recover the reduced performance.*

The reduced power must be accepted if using any Biodiesel Fuel blend.

Some modification may be required to allow your engine to run Biodiesel Fuel. Consult you dealer for complete information on these modifications.

Biodiesel Fuel has a higher cloud point than Diesel Fuel.

NOTICE: *The use of high Biodiesel Fuel blends are not recommended in cold weather conditions.*

With Biodiesel Fuels, it may be necessary to change the engine oil, engine oil filter and fuel filter elements more frequently than with Diesel Fuels. Biodiesel Fuel can remove rust and particles from the inside of on-site fuel storage tanks that would normally adhere to the sides of the tank. Like particle deposits that commonly occur with Diesel Fuel, these particles can become trapped by the machine fuel filters, causing blockage and shortening filter life. In cold weather, this is more likely to happen. Consult your NEW HOLLAND AGRICULTURE dealer for information on cold weather operation and proper maintenance intervals when using any Biodiesel Fuel blend.

When handling Biodiesel Fuel, care must be taken not to allow water into the fuel supply. Biodiesel Fuel will actually attract moisture from the atmosphere.

Fuel tanks must be kept as full as possible to limit the amount of air and water vapors in them. It may be necessary to drain the fuel filter water tap more frequently.

Potential oxidation and stability could be a problem with the fuel stored in the machine.

NOTICE: *Machines must not be stored for more than three months with Biodiesel Fuel blends in the fuel system.*

If long storage periods are necessary, the engine must run on Diesel Fuel for 20 hours to flush the Biodiesel Fuel out of the engine fuel system prior to storage.

NOTICE: *Biodiesel Fuel must not be stored in on-site storage tanks for more than three months.*

Any spillage of Biodiesel Fuel must be cleaned up immediately before it can cause damage to the environment and the paint finish of the machine.

Before using Biodiesel Fuel blends you should consult with your dealer to receive full information about the approved blend for your machine and any detailed conditions of its usage.

NOTICE: *Be aware that not fulfilling the requirements and conditions of Biodiesel Fuel usage will void your machine's NEW HOLLAND AGRICULTURE Warranty coverage.*

Dimension

	Model Boomer 20	Model Boomer 25
(1) - LENGTH:		
FWD:		
	2632 mm (103.6 in)	**2632 mm (103.6 in)**
(2) - WHEEL BASE:		
FWD	**2500 mm (98.4 in)**	**2500 mm (98.4 in)**
(3) - Top of ROPS - Folding:		
Turf Tires: 33x 12.00-16.5		
Up Position	**2161 mm (85.0 in)**	**2161 mm (85.0 in)**
Down Position	**1756 mm (69.1 in)**	**1756 mm (69.1 in)**
Ind. Tires: 12.00 x 16.5		
Up Position	**2173 mm (85.5 in)**	**2173 mm (85.5 in)**
Down Position	**1768x mm (69.6 in)**	**1768 mm (69.6 in)**
(4) - WIDTH:		
Rear Axle - Outside to Outside of tire:		
Turf Tires: 33x 12.00-16.5	**1255 mm (49.4 in)**	**1255 mm (49.4 in)**
Ind. Tires: 12.00 x 16.5	**1247 mm (49.1 in)**	**1247 mm (49.1 in)**
(5) - MINIMUM GROUND CLEARANCE (under drawbar support):		
Turf Tires: 33x 12.00-16.5	**201 mm (7.9 in)**	**201 mm (7.9 in)**
Ind. Tires: 12.00 x 16.5	**213 mm (8.4 in)**	**213 mm (8.4 in)**