OPERATOR'S MANUAL

L213 L220
L216 L230
L218
Tier 4
200 Series Skid Steer Loader

C238
Tier 4
200 Series Compact Track Loader

Part number 47407744
1st edition English
March 2014

NEW HOLLAND CONSTRUCTION

NEW HOLLAND CONSTRUCTION

F35464A.006.web.2014.02.17.

CNH INDUSTRIAL AMERICA, LLC
700, State Street – 53404 Racine, Wisconsin – U.S.A.

"EC" DECLARATION OF CONFORMITY

The undersigned declare that the machine described below has been designed and manufactured in compliance with the following European Directives, as amended, and the regulations transposing them into national laws:

1. 2006/42/EC "Safety of machinery"

1.1 European Harmonised standards under which conformity is declared: **EN 474-1:2006+A4:2013; EN 474-3:2006+A1:2009**

1.2 Main safety components installed and supplied with the machine	Yes	No
1.2.1 Falling Object Protective Structure (F.O.P.S.)	☒	☐
1.2.3 Roll Over Protective Structure (R.O.P.S.)	☒	☐
1.2.7 ###	☐	☒

1.4 Name and address of the person authorised to compile the technical file:
XXXXXXXXXX

2. 2000/14/EC "Noise emission"

2.1 Conformity assessment procedure followed: Annex XXXXXXXXXX

2.2 Name and address of the Notified Body involved: XXXXXXXXXX

2.3 Measured sound power level LWA (ref. 1 pW): 0 dB(A)

2.4 Guaranteed sound power level LWA (ref. 1 pW): 0 dB(A)

2.5 Engine power (as defined by ISO 14396): 0 kW

2.6 Holder of the technical documentation: XXXXXXXXXX

3. 2004/108/EC "Electromagnetic compatibility"

3.1 European Harmonised standards under which conformity is declared: **EN 13309:2010**

4. Other applicable Directive/s: ###

5. Manufacturer: CNH INDUSTRIAL AMERICA, LLC

6. Category: Loader (tracked)

7. Type: -

8. Serial n°:

9. EC Representative: CNH INDUSTRIAL ITALIA S.p.A.
Via Plava, 80 – 10135 Torino – Italia

Wichita, Kansas (U.S.A.)

Signature
(Name and Function)

2 - SAFETY INFORMATION

Signal word definitions

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.

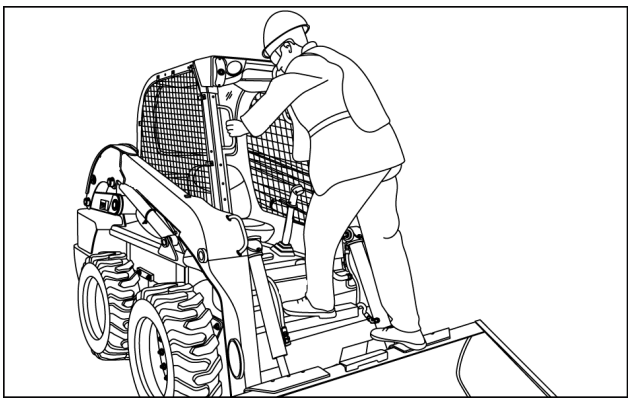
Information

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.

Before exiting the skid steer:

1. Lower the lift arm and or attachments to the ground. If the operator must exit the skid steer with a raised lift arm always engage the lift arm lock pin(s) / support strut and rest the lift arm on the lock pin(s) / support strut.
2. Stop the engine. The parking brake is automatically set.
3. Remove the seat belt.



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⚠ WARNING

Fall hazard!
Jumping on or off the machine could cause an injury. Always face the machine, use the handrails and steps, and get on or off slowly. Maintain a three-point contact to avoid falling: both hands on the handrails and one foot on the step, or one hand on the handrail and both feet on the steps.
Failure to comply could result in death or serious injury.

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To exit the skid steer, always face the machine and use the grab handles with at least three points of contact for support, and step onto the lift arm step or bucket step, then onto the ground.

Seatbelt

The seat belt is an important part of your ROPS. You must wear the seat belt at all times when you operate the machine.

Before you operate this machine, always make sure that the ROPS and operator's seat belt are correctly installed.

Welding on the machine

⚠ DANGER

Improper operation or service of this machine can result in an accident.
Any unauthorized modifications made to this machine can have serious consequences. Consult an authorized dealer on changes, additions, or modifications that may be required for this machine. Do not make any unauthorized modifications.
Failure to comply will result in death or serious injury.

D0030A

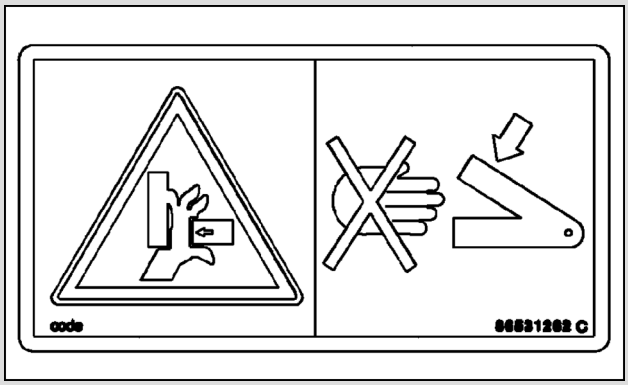
Whenever carrying out a welding operation on the machine as authorized by the manufacturer and in accordance with manufacturer’s instructions, disconnect the batteries, disconnect the ECU, disconnect the alternator B+ and D+ terminal wires, and connect the welding apparatus ground cable to the component on which the welding operation is to be performed.

Always connect the welding apparatus to the same structure that is being welded.

Never connect the welding apparatus ground to a component of the hydraulic system.

WARNING
Avoid pinch area. Keep clear of moving parts. Keep bystanders clear of the skid steer when operating unless the lift arm is down on the ground or the lift arm is resting on the lift arm lock and engine is off. Never extend any part of the body outside of the operators area. Failure to comply will result in death or serious injury.

Quantity: 2
86531262



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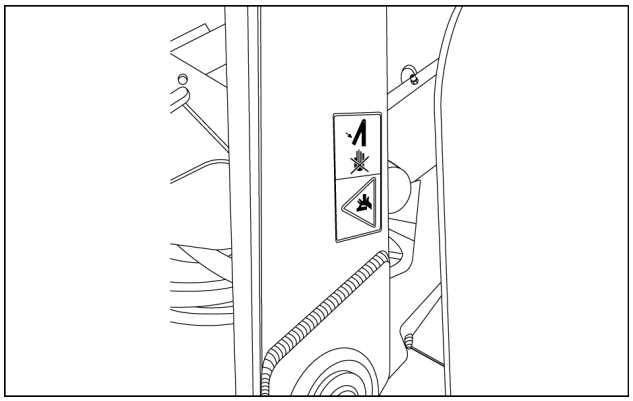
Located on the left side of the boom where it rests against the lift arm support pin.



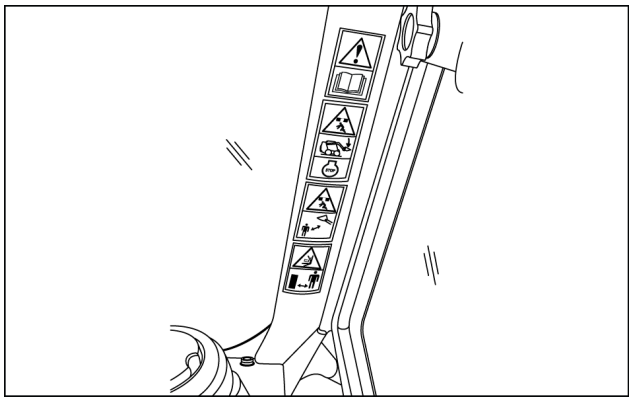
931002316 9

WARNING
Read Operator's manual. Crush hazard. Keep others away. Not a manlift.
CRUSH HAZARD
Before leaving seat:
Lower lift arm or engage lift arm lock pin or strut.
STOP engine.
Move loader controls to check for loader movement.
Failure to comply will result in death or serious injury.

Quantity: 1
84367418_A

84367418_A 10

Located under the right hand side of the instrument cluster.



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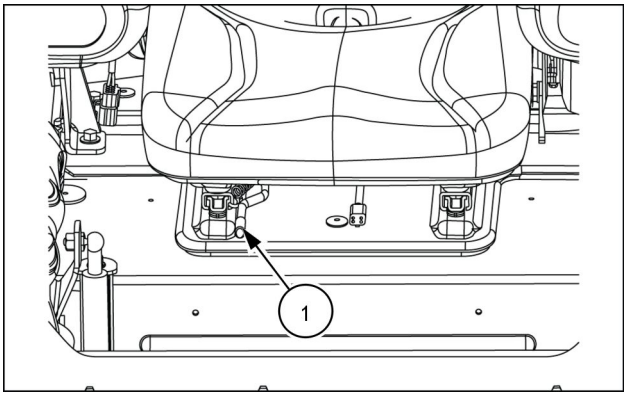
OPERATOR'S SEAT

Standard seat

The standard seat is adjustable fore and aft using adjustment lever **(1)**.



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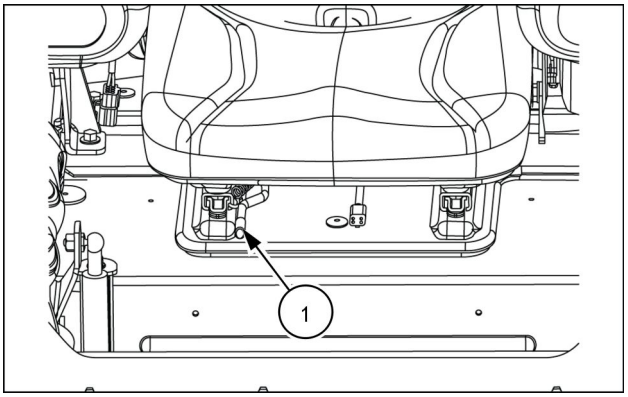
Mechanical suspension seat

The mechanical suspension seat is adjustable fore and aft using adjustment lever **(1)**.



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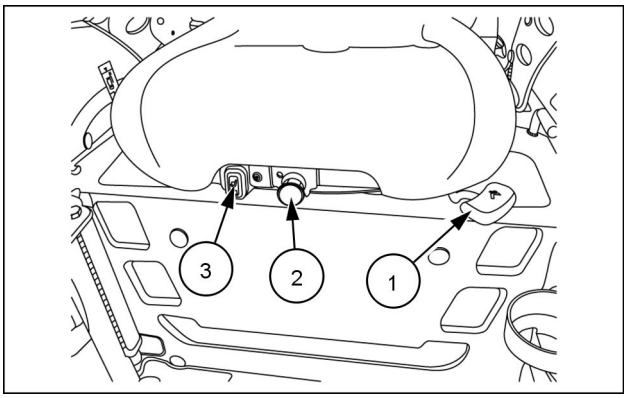
Air seat

The air seat is adjustable fore and aft using adjustment lever **(1)**, and has a weight adjustment system that uses an air pressure adjustment switch **(2)** that can be activated for heavier operators. Push to release pressure, for lighter operators and pull to add air pressure for heavier operators. This seat is also equipped with a heating element that is controlled by switch **(3)**.



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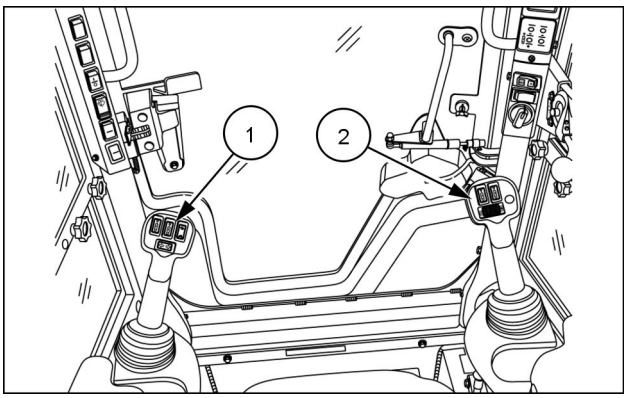
Moving the machine

Push both the left hand control lever **(1)** and the right hand control lever **(2)** forward, from neutral, to move the machine forward. Pull both of the control levers rearward, from neutral, to move the machine in the reverse direction. Move the control levers forward a short distance for maximum power and slow speed. Move the control levers completely forward for maximum speed.

Move both control levers to NEUTRAL to stop movement of the machine.



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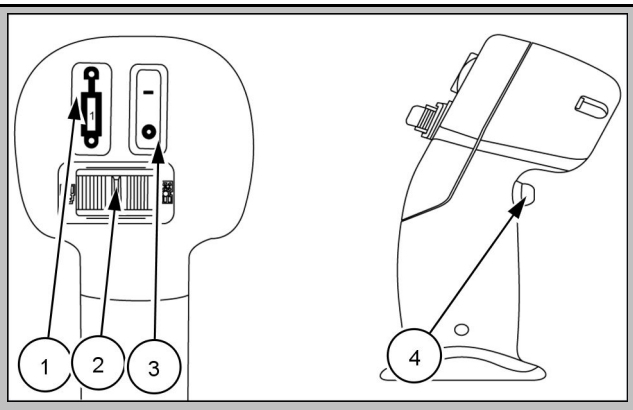
Level 300 (no 2nd aux)

Right side
(1) Multi func #1
(2) Proportional aux
(3)Multi func #4
(4) Glide ride



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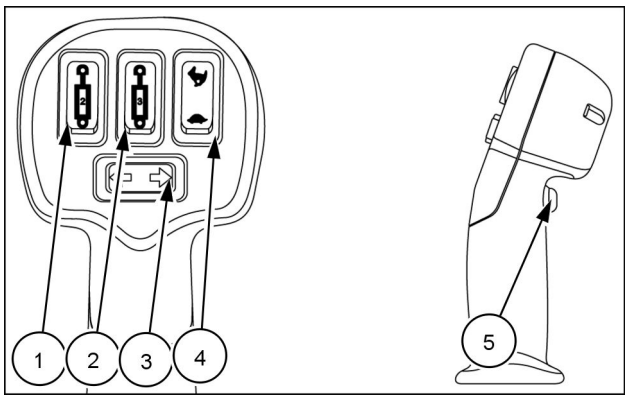
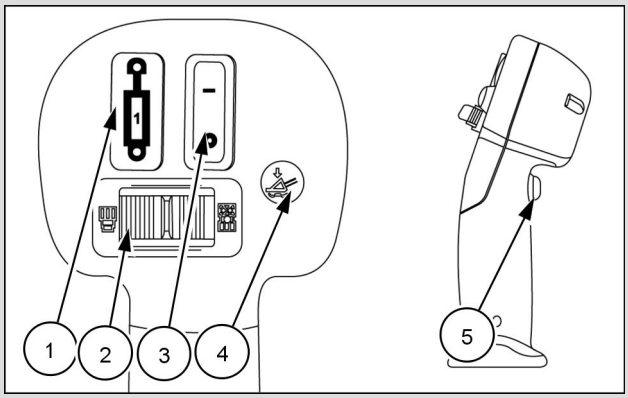
Left side
(1) Multi func #2
(2) Multi func #3
(3) Turn signal
(4) 2 speed
(5) Horn



93109409 **8**

Level 350 (no 2nd aux)

Right side
(1) Multi func #1
(2) Proportional aux
(3) Multi func #4
(4) Float
(5) Glide ride



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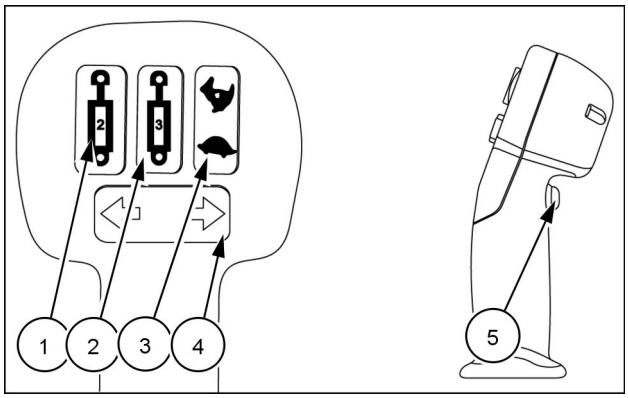
Left side
(1) Multi func #2
(2) Multi func #3
(3) 2 Speed
(4) Turn signal
(5) Horn.



93109411 **10**

(12)	AUXILIARY HYDRAULIC INTERLOCK OVERRIDE:
	When an operator leaves the seat, oil flow to an attachment will normally be halted via direct hydraulic flow cutoff. Depress this button and leave the seat within 30 seconds to defeat this interlock. Small red indicator lamp below the switch illuminates when the interlock is DEFEATED. **NOTE:** This button is used for user code lock and unlock.

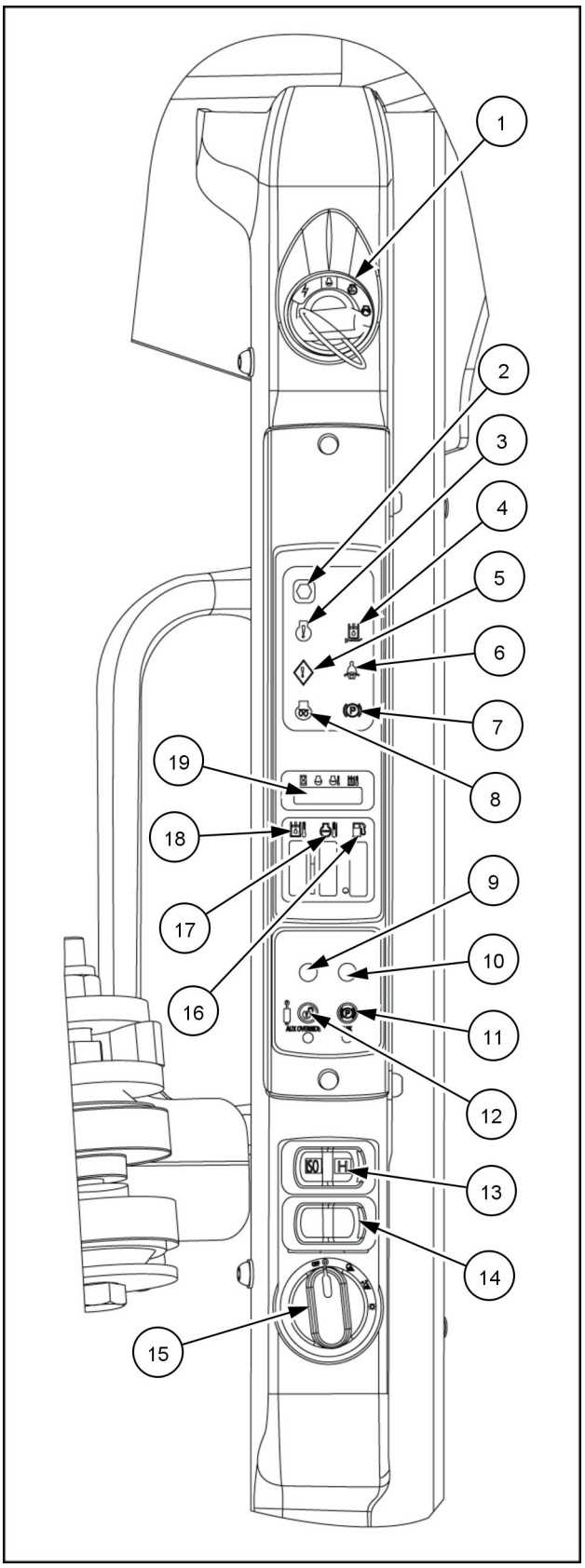
(13)	**H / ISO** control pattern selector, if equipped
	This selects the drive pattern type of hand control operation. Read the proper steps listed in this chapter to activate.

(14)	PARK BRAKE SWITCH
	Press the **PARK BRAKE** switch to activate or deactivate the parking brake. The park symbol on the instrument panel will illuminate red when the parking brake is on. The other hydraulic functions remain active when the parking brake is on.

(15)	WORK LIGHTS
	This knob controls the external working lights and road lights.

(16)	FUEL GAUGE:
	The fuel gauge consists of a series of bars that indicate the level of fuel in the fuel tank. When all 8 bars are visible the fuel tank is full. Bottom bar flashing indicates approximately 1 gal of fuel remaining.

(17)	ENGINE COOLANT TEMPERATURE BAR GRAPH:
	This bar graph indicates the relative temperature of the engine coolant from **0 - 110 °C** (**32 - 230 °F**). If the coolant temperature goes above **110 °C** (**230 °F**), all 8 bars will display, the backlighting will flash, and the audible alarm will sound.



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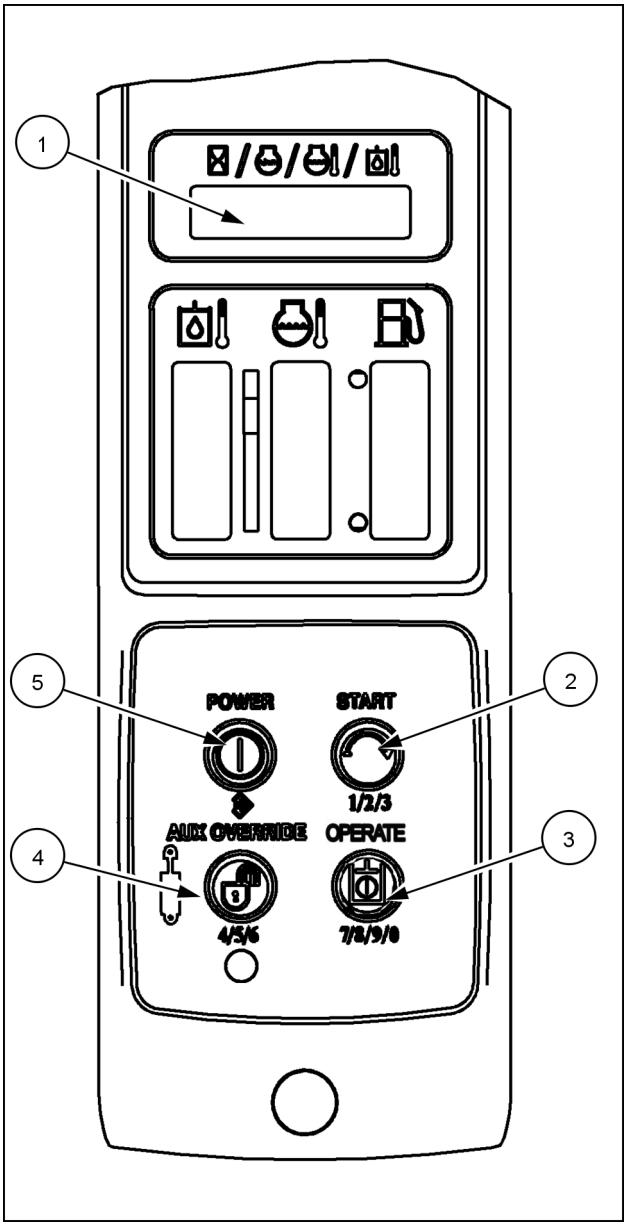
Setting controllability for Electro–Hydraulic (EH)

NOTE: *These settings can be activated using the Easy Electro-Hydraulic (EZ-EH) menu custom settings* ***SP-C*** *and* ***CR-C****.*

All changes must be made with the engine in the off position and the electronics asleep.

1. Before sitting in the seat, press and hold the **AUX OVERRIDE** button **(4)** and the **OPERATE** button **(3)** at the same time for five to seven seconds until “Setup” **(1)** appears in the display. After seeing setup in the display, you may sit in the operator’s seat and make changes.
2. Press the **START** button **(2)** to scroll between the different menus until **EH (1)** appears on the display.
3. Press the **POWER** button **(5)** to enter the next menu.
4. Press the **START** button **(2)** to scroll to the setting selection you want to adjust **(Speed: Drive, Lift,** or **Tilt)** or **(CTLR: Drive** or **L-ARM)**, then press the **POWER** button **(5)** to save the entry. For **DFLT**, press the **POWER** button **(5)** to save the settings back to the factory default settings. The default settings are shown in tables for each model on the following pages.

   NOTE: *Use the* ***AUX OVERRIDE*** *button* ***(4)*** *when you want to go up a level.*
5. Press the **START** button **(2)** to scroll to the desired speed level **(High, Med-2, Med-1,** or **Low)** or **(DRV1, DRV2,** or **DRV3)** or **(LDR1, LDR2,** or **LDR3)**, then press the **POWER** button **(5)** to save the entry.
6. After you have saved your selection; the monitor will revert back to step 3 so you can make another adjustment. If no other adjustments are needed, use the **AUX OVERRRIDE** button **(4)** to exit the machine function menu. You will now be in the main “Setup” menu; use the **START** button **(2)** to scroll to **EXIT** and then push the **POWER** button **(5)** again to exit the setup menu.
7. Leave the operator’s seat for ten seconds before trying to start the unit.



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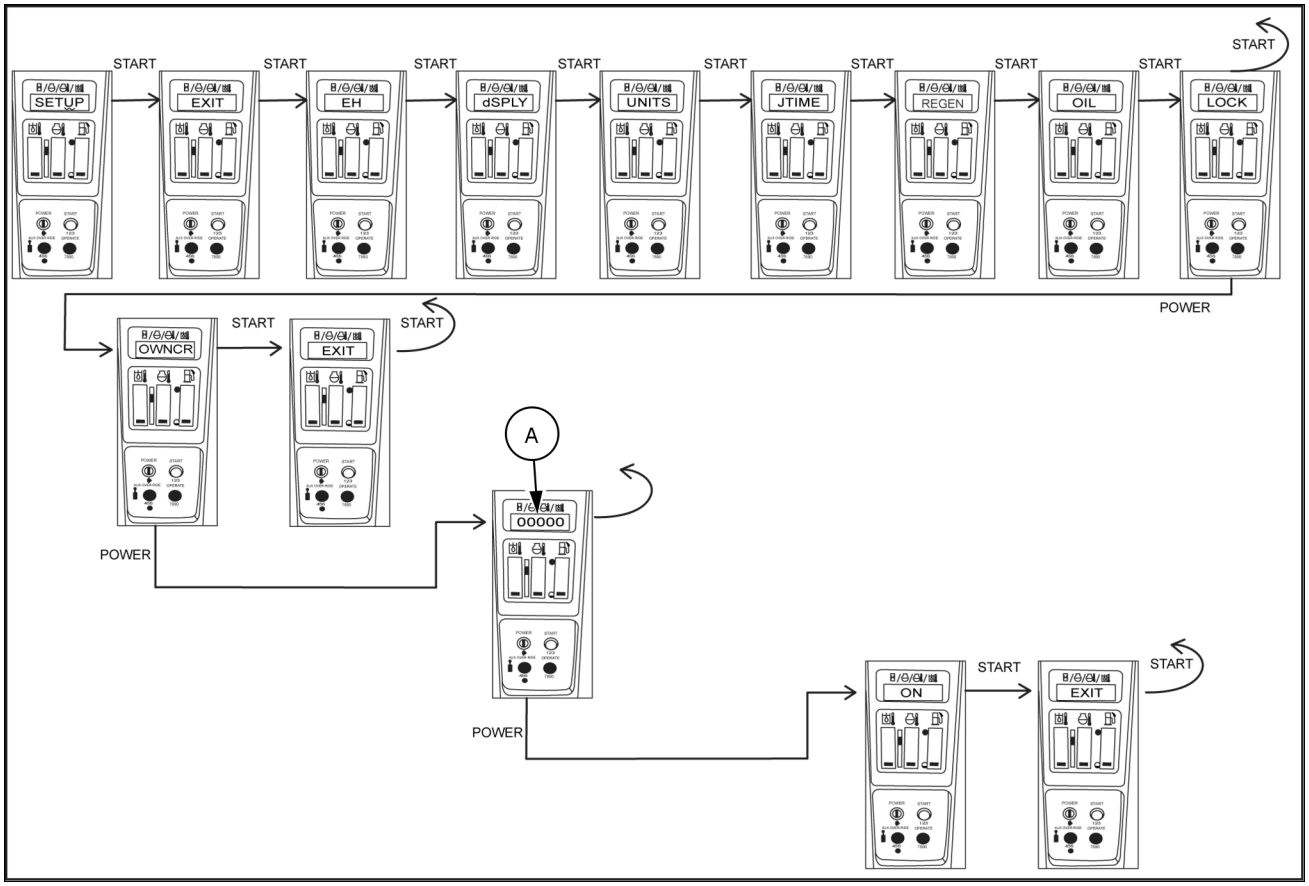
If no owner code has been created

1. If you decide you do not want to create a code, enter all 0s **(A)**, you will return to **OWNCR**.



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4 - OPERATING INSTRUCTIONS

COMMISSIONING THE UNIT

Operating Instructions

Before each operating period, it is the responsibility of the operator to confirm that the machine is safe and serviced.

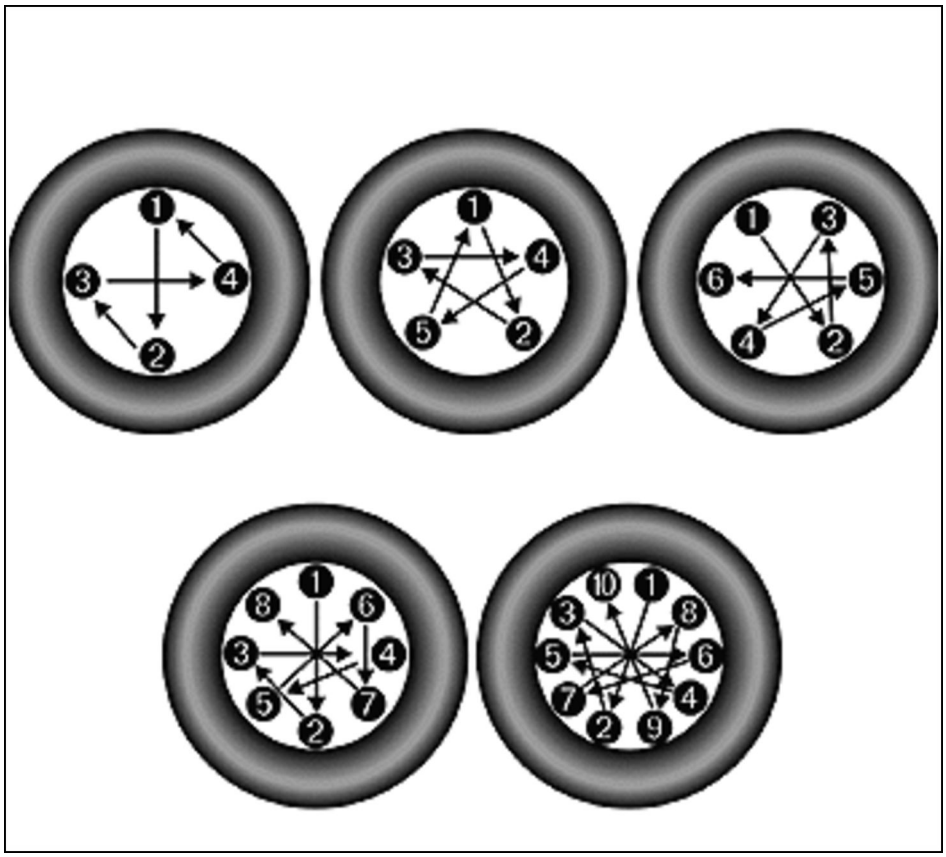
During the first 20 hours of operation, make sure to do the following:

1. If possible, operate the engine at intermittent heavy loads and engine speeds for this period to ensure proper engine break-in.
2. Keep the engine at normal operating temperature.
3. Do not run the engine at idle speeds for long periods of time.
4. During the first 20 hour break-in period, check the oil level at approximately one hour intervals. Oil consumption may be higher during the initial break-in period.
5. It is recommended that the operator run the engine at full throttle when operating conditions permit.

Wheel bolts

If the machine is new or if a wheel is removed for service, check and tighten the wheel bolts every 2 hours of operation until they remain tight. If the machine is equipped with stamped center wheels, the lug nuts will be tapered. Tighten each lug nut to a torque of **162.7 - 196.6 N·m** (**120 - 145 lb ft**).

If the machine is equipped with solid center wheels, the lug nuts will be flanged. Tighten each lug nut to a torque of, **189.8 - 223.7 N·m** (**140 - 165 lb ft**).



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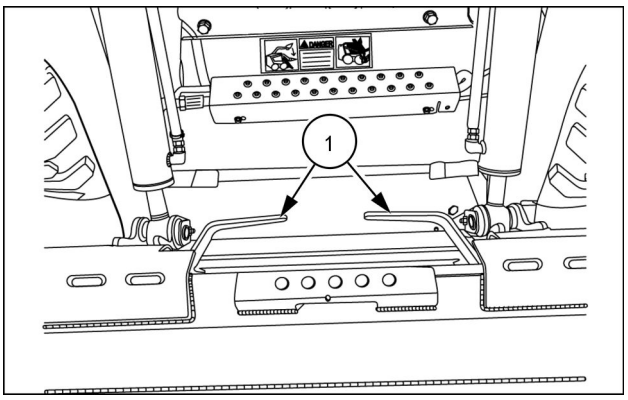
1. Set the engine speed at the desired throttle setting. Control the machine ground speed with the control handles. When the job site conditions permit, the throttle should be set at full throttle.

   NOTE: *The minimum throttle setting should be* ***1400 to 1500 RPM*** *for acceptable control.*

2. If you are a new operator, always operate the machine in an open area at a reduced machine ground speed until you get a feel for the controls. Move the control handles slowly and smoothly to avoid machine bouncing. If the machine starts to bounce, bring the control handles back to the neutral position.
3. Keep all machine and loader movements smooth and the work cycle as short as possible. More work will be accomplished in a shorter time with a smooth, short work cycle.
4. Keep the work site as smooth and level as possible.
5. Use the correct tires for the job site conditions. Contact your dealer for tire options.

3. Raise and curl the coupler until the back surface of the attachment comes to rest flat against the front surface of the coupler.
4. When the attachment is fully supported, lower the lift arm until the lift arm is completely down on the loader stops.
5. Roll the bucket or attachment out, stopping with the bucket edge just off the ground.
6. Turn off the engine, unfasten seat belt, and exit the operator's compartment.
7. Push the two latch handles **(1)** down over center to engage the lock pins into the retaining tabs on the attachment to secure the attachment to the coupler.
8. Raise the attachment and slowly roll the bucket or attachment out. Make a visual inspection of the lock pins **(2)** engagement in the attachment lower tab slots.

- If the attachment is not properly secured to the coupler , lower the lift arm and repeat the mounting procedure.
- Before using the attachment, the operator must operate it through its full range of motion and confirm that the attachment is secure and safe.



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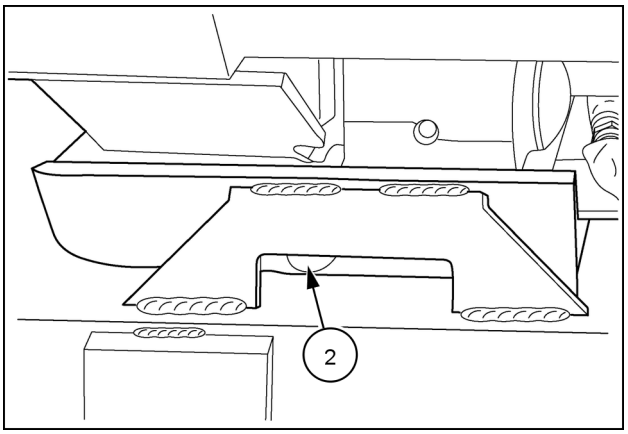

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Removing the attachment

1. Lower the attachment to the ground, stop the engine, confirm that the parking brake is set and exit the skid steer.
2. Pull the latching handles up to the unlatched position to release the pins from the lower attachment tabs.

NOTICE: *Be sure the latch handles are fully raised.*

3. Fasten your seat belt, start the skid steer and release the emergency brake.
4. Tilt the attachment forward so that the front edge is resting on the ground.
5. Continue tilting the coupler forward and back the skid steer away from the attachment at the same time.

General specification - Biodiesel fuels - Biodiesel fuels

Biodiesel usage in NEW HOLLAND CONSTRUCTION products

Introduction to Fatty Acid Methyl Ester (FAME) biodiesel

FAME biodiesel, called biodiesel fuel in the following section, consists of a family of fuels derived from vegetable oils treated with methyl esters.

There are two main biodiesel fuel types: Rapeseed Methyl Ester (RME) and Soybean Methyl Ester (SME). RME is a blend of rapeseed and sunflower methyl ester, and is the preferred crop in Europe. SME is the preferred crop in the United States.

Biodiesel fuel is a renewable alternative fuel source. Its use and development is promoted worldwide, especially in Europe and in the United States.

NOTICE: *Your emissions control system is compatible with up to* ***20 %*** *biodiesel fuel (B20). Be aware that the use of biodiesel fuel that does not comply with the standards mentioned in this section could lead to severe damage to the engine, fuel system or aftertreatment system of your machine. The use of non-approved fuels may void NEW HOLLAND CONSTRUCTION Warranty coverage.*

Biodiesel fuel can be used to run diesel engines as pure biodiesel fuel or when blended with standard diesel fuel:

- B5: indicates the blend of **5 %** biodiesel and **95 %** diesel fuels.
- B7: indicates the blend of **7 %** biodiesel and **93 %** diesel fuels.
- B20: indicates the blend of **20 %** biodiesel and **80 %** diesel fuels.
- B100: indicates pure biodiesel, or **100 %** biodiesel fuel. Do not use.

Biodiesel fuel has several positive features in comparison with diesel fuel:

- Biodiesel fuel adds lubricity to the fuel, which is beneficial in many circumstances, particularly as sulfur and aromatics are removed from the fuel.
- Biodiesel has a greater cetane number and burns cleaner.
- Biodiesel produces less particulate matter and reduces smoke emissions.
- Biodiesel is fully biodegradable and non-toxic.

Diesel and biodiesel fuel specifications

Tier 4a diesel fuel specifications are covered by the following:

- **EN 590** - Specification of Diesel fuel. (10 ppm sulfur maximum.)

Biodiesel blends are covered by:

- European Diesel Fuel Specification **EN 590** allows up to **7 %** biodiesel since 2009. European fuel suppliers are allowed to use up to **7 %** biodiesel fuel (B7) to supply the network.

Pure biodiesel (B100) specification is covered by the following requirements:

- Europe: **EN 14214:2009** - Automotive fuels. Fatty Acid Methyl Ester (FAME) for diesel engines. Requirements and test methods.
- **DIN V 51606** - German standard for biodiesel.

Before raw oil can be converted into usable biodiesel fuel, it must undergo transesterification to remove glycerides. During the transesterification process, the oil reacts with an alcohol to separate the glycerine from the fat or vegetable oil. This process leaves behind two products: methyl ester (the chemical name for biodiesel) and glycerine (a byproduct usually sold for use in soaps or other products).

NOTICE: *Biodiesel fuels approved for use in the NEW HOLLAND CONSTRUCTION equipment must be transesterified and comply with the European Standard* ***EN14214*** *or the German standard* ***DIN V 51606****.*

NOTICE: *Cold Pressed Biodiesel, Cold Pressed Oil, Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel, are fuels that are normally made from Rapeseed oil or similar high oil content crops. These kinds of fuel are not transesterified, so they do not fulfil the* ***EN14214*** *requirements. There is no recognized quality standard available for these types of fuel. Therefore the use of Cold Pressed Biodiesel, Cold Pressed Oil, Straight Vegetable Oil (SVO), or more generally unrefined vegetable oils used as motor fuel are NOT APPROVED at any blend in any NEW HOLLAND CONSTRUCTION product.*

NOTICE: *Any engine and fuel injection equipment fitted to a NEW HOLLAND CONSTRUCTION vehicle found to have run with any blend of NON-APPROVED fuel (fuel not fulfilling the specification described in the requirement* ***EN14214****) will no longer be covered for Warranty by NEW HOLLAND CONSTRUCTION.*

Biodiesel fuel usage conditions

You must stringently follow the biodiesel fuel usage conditions. Incorrect application of the biodiesel fuel usage conditions could lead to severe damage to the engine, fuel injection equipment and aftertreatment system.

The main concerns related to operation with biodiesel fuels are:

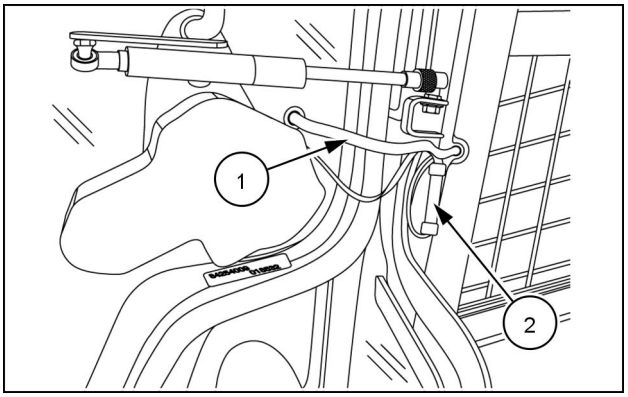
- Filters and injector blockage caused by poor fuel quality.

Cab door removal and installation

NOTICE: *During the removal process retain all door hinge shims and keep in a secure location. The shims are required for a proper fit when installing the door at a later date.*

1. Open door.
2. Disconnect the washer hose **(1)**.
3. Disconnect the wire harness **(2)**.
4. Plug the jumper connector into the harness **(2)**.

   NOTE: *Jumper connector is tied to the door harness.*



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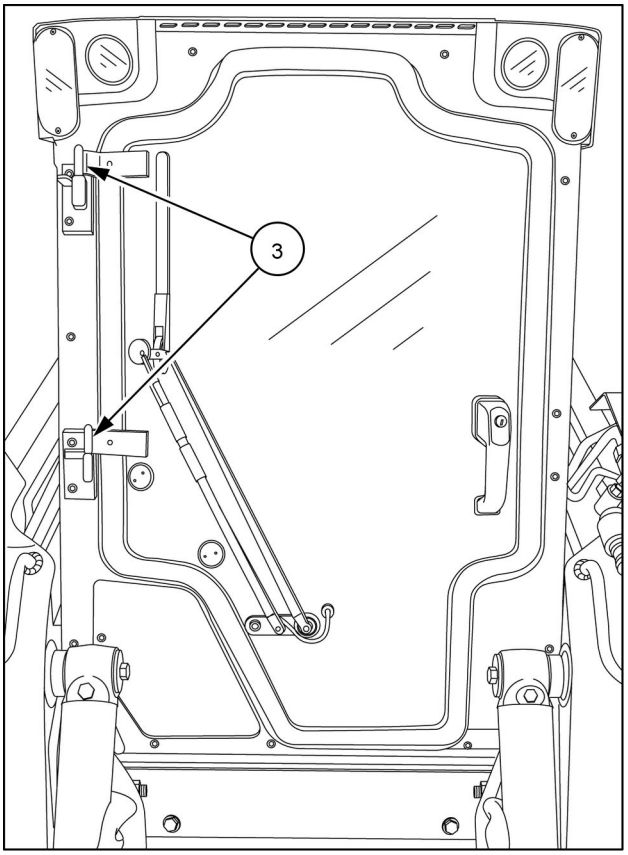
5. Lift off hinges **(3)**.



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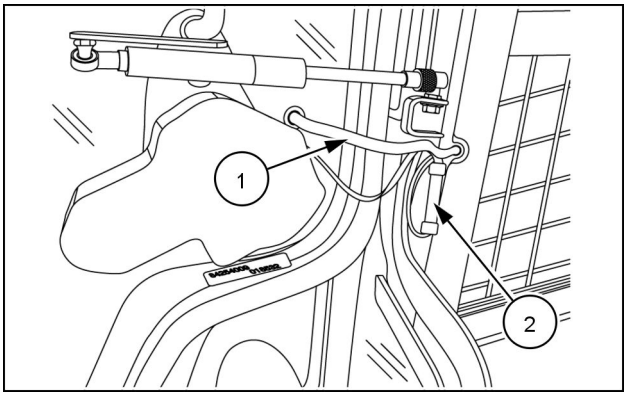
Installation

NOTE: *If door hinge shims were removed during the removal procedure; install the shims.*

1. Install the door on the hinges.
2. Install the washer hose **(1)**.
3. Unplug the jumper connector from the wire harness **(2)**.
4. Connect the wire harness **(2)**.
5. Tie the jumper connector to the door harness.



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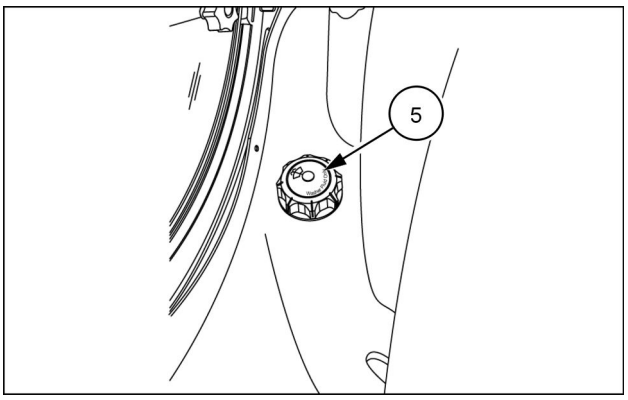
The rear inside cab.

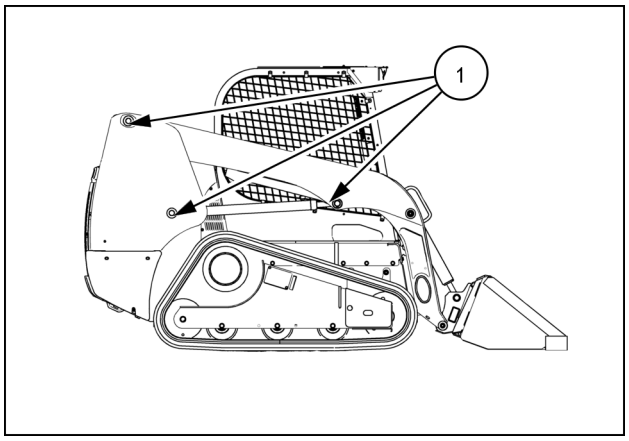
- Windshield washer reservoir **(5)** is located inside of the cab, right side of the seat between side window of the cab and the seat.



93109373A 4

Lift arm, pivot points, coupler pins and cylinder pins

1. All of the loader lift arm lubrication points **(1)** can be accessed with the loader lift arms in the lowered position. Grease the lift arm pivots, coupler pins and cylinder pins every 10 hours of operation. Lower pins may require more frequent service intervals if submerged in water.



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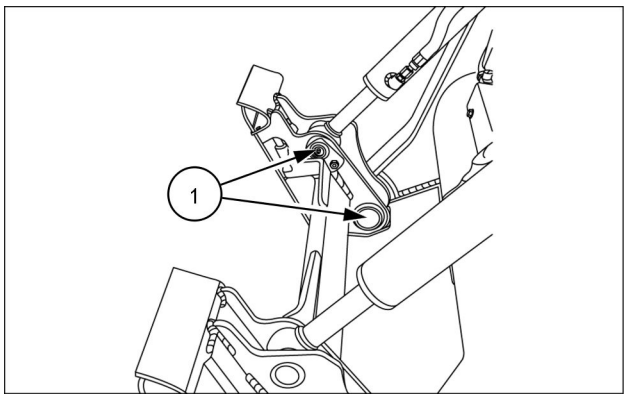
NOTICE: *Clean the grease fittings before greasing.*

NOTE: MOLY LUBE *is recommended*



931007513 2

9. Install the drain plug once all old oil has finished draining. Tighten to a torque of **68 - 82 N·m** (**50 - 60 lb ft**).
10. Remove the engine oil dipstick to provide crankcase ventilation.

NOTICE: *DO NOT FLOOD THE VALVE COVER WITH OIL.*

11. Slowly add the correct type and quantity of oil, see the oil table below. Use an oil spout that is smaller than the engine oil fill neck, allowing air to pass around the oil fill neck.

NOTE: *Keep the oil fill spout in the upper half of the oil fill neck.*

NOTE: *On turbo engines, slowly fill to avoid flooding valve cover with oil.*

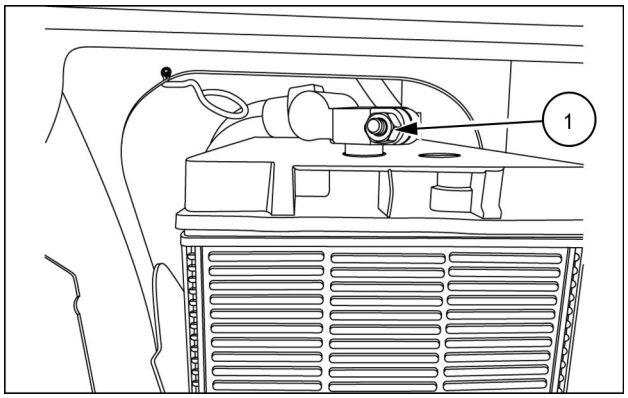
12. Start the engine and run at idle speed. Check the engine oil filter and drain plug for leaks. After two minutes, stop the engine, wait for 2 to 3 minutes and check the engine oil level.
13. Install access cover and secure with bolts
14. Close rear access door and engine hood.
15. Dispose of the oil in accordance with the local regulations. DO NOT drain onto the ground or into a drain. BE RESPONSIBLE TO THE ENVIRONMENT.

Engine crank case oil

Capacity - with filter change	
L213, L216, L218, L220	**7 l** (**7.5 US qt**)
L230 and C238	**8 l** (**8.5 US qt**)
Specifications	**NEW HOLLAND AMBRA UNITEK MASTERGOLD SBL CJ-4**

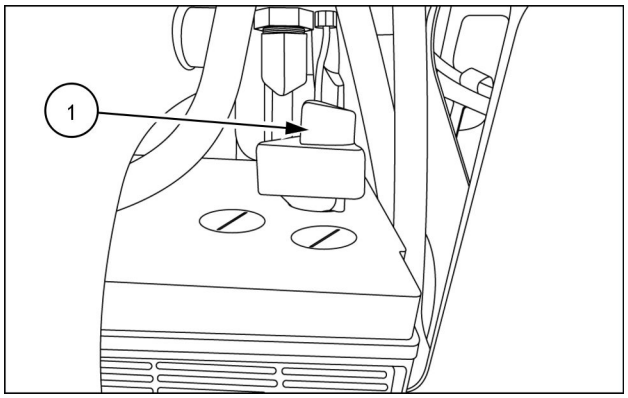
NOTE: *See the engine oil viscosity tables on page **7-20** for the recommended viscosity at ambient temperature ranges.*

3. Disconnect the negative cable connection **(1)**.



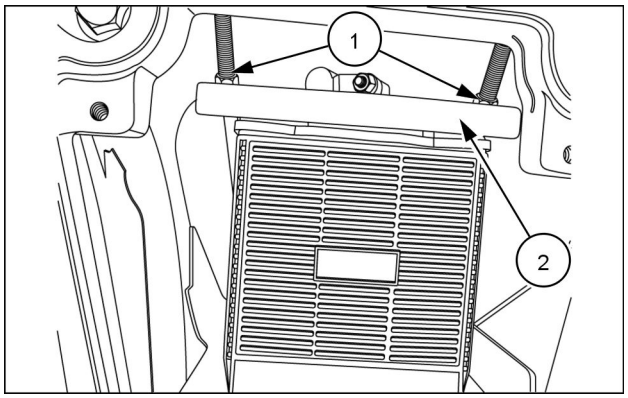
931001641 4

4. Disconnect the positive cable connection **(1)**.



931002054 5

5. Loosen the nuts **(1)** and remove the battery hold-down **(2)**.



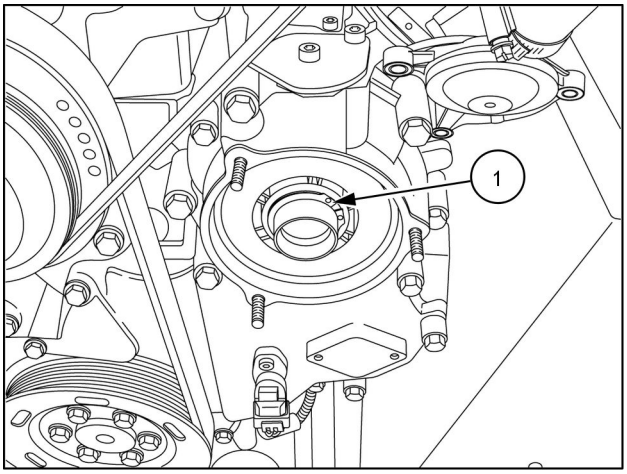
931001639 6

Blowby re-circulation filter

Models L230 and C238 only

NOTE: *The charge air cooler and the radiator must be removed to access the blowby re-circulation filter.*

1. Remove the cover.
2. Remove the snap ring **(1)**.



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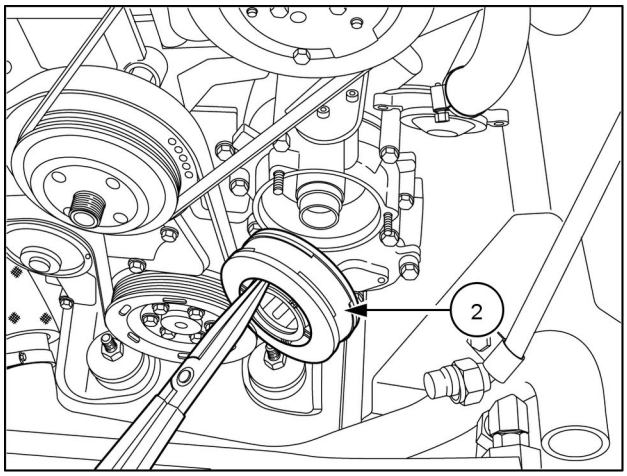
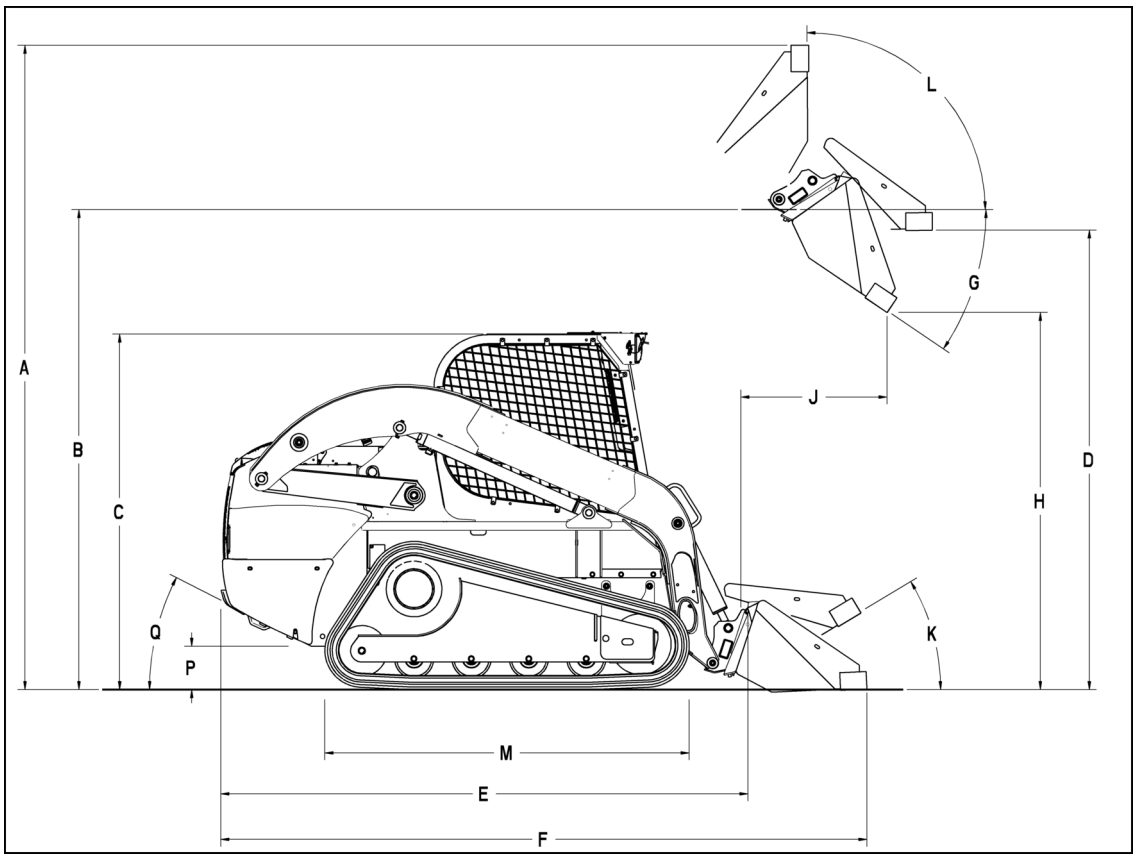
3. Slide the filter **(2)** off the drive hub.
4. Slide the new filter on the drive hub.
5. Install the snap ring **(1)**.
6. Install the cover.



RAPH12SSL0059AA 2

FAULT CODE	ENGINE TYPE	DETECTED BY	FAULT DESCRIPTION
3218	F5C	ENGINE	Injector Solenoid: Short Circuit in Injection Bank 2 (all injectors of the same bank can be affected)
3230	F5C	ENGINE	Injector Processor (CY33X) Error - Internal Reset / Clock Loss / Voltage Too Low
3235	F5C	ENGINE	Injector: Number of Injections Limited by Charge Balance
3236	F5C	ENGINE	Injector: Number of Injections Limited by Quantity Balance
3237	F5C	ENGINE	Injector: Number of Injections Limited by Software
3238	F5C	ENGINE	EDC SPI: ECM Internal SPI Communication Error - CJ940
3239	ISM-IDI	ENGINE	ECU Problem - EEPROM Read Error 1
3239	F5C	ENGINE	EDC EEPROM - Read Operation Failure
3240	ISM-IDI	ENGINE	ECU problem - EEPROM Write Error
3240	F5C	ENGINE	EDC EEPROM - Write Operation Failure
3241	F5C	ENGINE	EDC EEPROM - Default Value Used
3242	F5C	ENGINE	EDC - ECM (Locked) Recovery Occurred
3243	F5C	ENGINE	EDC - ECU Internal Visibility of Software Resets in DSM
3244	F5C	ENGINE	EDC - ECU Recovery (Visible) - Recovery Occurred
3245	F5C	ENGINE	EDC - ECM Processor - Watchdog Not Plausible
3252	F5C	ENGINE	EDC - Controller Watchdog - SPI Communication Failure
3253	F5C	ENGINE	EDC - ADC Monitoring - Reference Voltage Too High
3255	F5C	ENGINE	EDC - ADC Monitoring - Test Impulse Error
3256	F5C	ENGINE	EDC - ADC Monitoring - Queue Error
3258	ISM-DI	ENGINE	Starter Relay: Output Open Load / Short to Battery
3258	F5C	ENGINE	Starter Relay: High Side Power - Short Circuit to Battery
3259	ISM-DI	ENGINE	Starter Relay: Output Short to Ground
3259	F5C	ENGINE	Starter Relay: High Side Power - Short Circuit to Ground
3260	F5C	ENGINE	Starter Relay: Low Side Power - Open Load
3261	F5C	ENGINE	Starter Relay: Low Side Power - Short Circuit to Battery of Excess Temperature
3262	F5C	ENGINE	Starter Relay: Low Side Power - Short Circuit to Ground
3265	F5C	ENGINE	Injector: Overrun Monitoring - Injection Time Too Long
3266	ISM-IDI	ENGINE	Over Speed
3266	ISM-IDI	ENGINE	Speed sensor: Sensor 1 - Wrong Signal (deviation **20 RPM**)
3266	ISM-IDI	ENGINE	Speed sensor: Sensor 2 - Wrong Signal (deviation **20 RPM**)
3266	F5C	ENGINE	Engine Speed Sensor: Redundant Engine Speed in Overrun Monitoring - Speed Signal Not Plausible
3267	ISM-DI	ENGINE	SCV(+) Output Short to Battery; SCV(-) Output Short to Battery
3268	ISM-DI	ENGINE	SCV(+) Output Open Load/Short to Ground; SCV(-) Output Open Load/Short to Ground; SCV coil open; SCV coil short;
3283	F5C	ENGINE	EDC: Sensor Supply Voltage 2 - High
3285	F5C	ENGINE	EDC: Sensor Supply Voltage 3 - High
3293	ISM-DI	ENGINE	Common Rail Pressure Exceeds High Upper Limit
3293	F5C	ENGINE	Fuel Metering Unit: Maximum Positive Deviation of Rail Pressure Exceeded
3301	F5C	ENGINE	Fuel Metering Unit: Maximum Negative Rail Pressure Deviation with Metering Unit on Lower Limit is Exceeded
3305	ISM-DI	ENGINE	Common Rail Pressure Falls Below the Control Limit of the Target Pressure
3305	F5C	ENGINE	Fuel Metering Unit: Minimum Common Rail Pressure Exceeded
3309	ISM-DI	ENGINE	Common Rail Pressure Exceeds Upper Limit
3309	F5C	ENGINE	Fuel Metering Unit: Maximum Rail Pressure Exceeded
3334	ISM-DI	ENGINE	CAN Bus Open Related to TSC1 Message
3334	ISM-IDI	ENGINE	TSC1 Time Out Error
3334	F5C	ENGINE	CAN Bus Communication: Timed Out of CAN message TSC1-PE Torque (When Active)
3335	F5C	ENGINE	CAN Bus Communication: CAN message not received from Vehicle controller (TSC1)

FAULT CODE	ENGINE TYPE	DETECTED BY	FAULT DESCRIPTION
9156	ALL	UCM	Hydraulics Enable: Button Error from AIC
9158	ALL	UCM	Pattern Select (ISO/H): Short to Ground
9159	ALL	UCM	Pattern Select (ISO/H): Short to Ground
9160	ALL	UCM	Pattern Select (ISO/H): Short to Power
9161	ALL	UCM	Pattern Select (ISO/H): Short to Power
9401	ALL	IC	Memory Error - Memory Corruption detected and repaired
9403	ALL	IC	Memory Error - Unrecoverable memory corruption operable
9404	ALL	IC	Memory Error - Hour Meter Corrupted
9405	ALL	IC	CAN Time Out - Loss of DM1 from UCM
9406	ALL	IC	CAN Time Out - Loss of all communication from UCM
9407	ALL	IC	Memory Error - Unrecoverable Hardware ID
9408	ALL	IC	Memory Error - Unrecoverable Panel ID
9410	ALL	IC	CAN Time Out - Loss of EGR Inducement status from EDC



631002263 9

LARGE VERTICAL FRAME (C238)

LOCATION	COMPONENT	MEASUREMENT
A	Overall Operating Height (Fully Raised)	**4096 mm** (**161.3 in**)
B	Height to Hinge Pin (Fully Raised)	**3330 mm** (**131.1 in**)
C	Cab Height	**2043 mm** (**80.4 in**)
D	Highest Level Bucket Height	**3155 mm** (**124.2 in**)
E	Overall Length (No Attachment)	**2993 mm** (**117.8 in**)
F	Overall Length (With std Bucket)	**3631 mm** (**143.0 in**)
G	Dump Angle (Fully Raised)	**54.7 °**
H	Dump Height (Maximum Reach)	**2655 mm** (**104.5 in**)
J	Dump Reach (Fully Raised)	**864 mm** (**34.0 in**)
K	Maximum Rollback @ Ground	**32.8 °**
L	Maximum Rollback (Fully Raised)	**84.8 °**
M	Wheel Base	**1602 mm** (**63.1 in**)
P	Ground Clearance (Belly Pan)	**243 mm** (**9.6 in**)
Q	Angle of Departure	**32 °**
U	Rear axle to bumper	N/A