

Biodiesel fuel

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 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 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 in 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 your 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 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.*

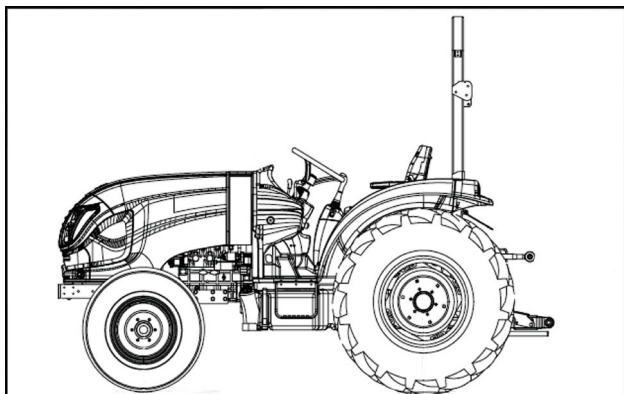
Any spillage of Biodiesel Fuel must be cleaned up immediately before it can cause damage to the environment and the paint finish of the machine.

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.

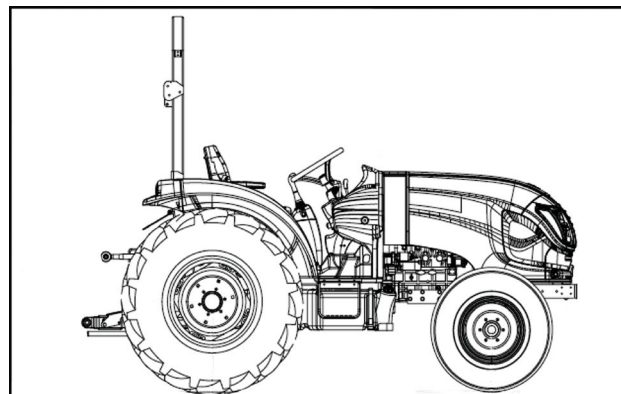
NOTICE: *Be aware that not fulfilling the requirements and conditions of Biodiesel Fuel usage will void your machine's NEW HOLLAND Warranty coverage.*

Machine orientation

NOTE: On this equipment, left-hand and right-hand are determined by standing behind the unit, looking in the direction of travel.

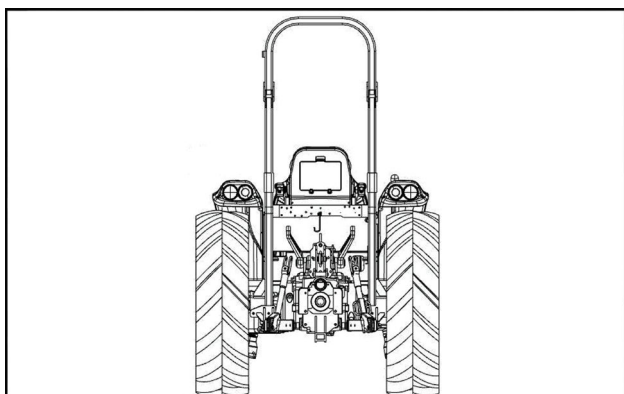


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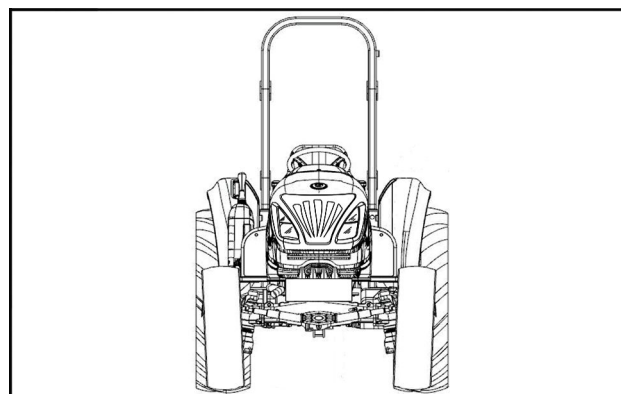
NHIL13CT01188AA 2

Left-hand view



NHIL13CT01186AA 3

Right-hand view



NHIL13CT01345AA 4

Rear view

Front view

What is Not Covered by the Emission Warranty

Please note that Emission Warranty does not cover:

1. Systems and parts that were not first installed on the new equipment or engine as original equipment by ISM
2. Part malfunctions caused by abuse, misuse, improper adjustment, modification, alteration, tampering, disconnection, improper or inadequate maintenance, or use of nonrecommended fuels and lubricating oils.
3. Damage caused by accident, acts of nature, or other events beyond ISM's control.
4. Replacement of expendable items made in connection with scheduled maintenance.
5. Parts requiring replacement, inspection or adjustment during scheduled maintenance intervals where the part is not defective.
6. Parts that are not ISM Service Parts.
7. Loss of time, inconvenience, loss of use of equipment/engine or commercial loss.
8. Equipment with an altered or disconnected hourmeter where the hours cannot be determined. Equipment normally operated outside the United States.
9. Non-defective parts replaced by other than ISM dealers.

What is Covered by the Emission Warranty

The following is a list of systems and parts that are considered a part of the Emission Control System and are covered by the Emission Warranty for engines that were built to conform to CARB regulations:

IMPORTANT! This may not include expendable maintenance items. Emission related parts requiring scheduled maintenance are warranted until their first scheduled replacement point only.

PARTS COVERED

This emission control system warranty applies to the following emission control parts.

- Fuel injection system
- Intake manifold
- Exhaust manifold
- Positive crankcase ventilation system parts (including PCV Valve and Oil Filler Cap)
- Turbocharger (if equipped)
- Charge air cooling system (if equipped)
- Smoke puff limiter (if equipped)
- EGR system (including EGR Valve, EGR Pipe and EGR cooler) (if equipped)
- Intake throttle valve (if equipped)
- Exhaust aftertreatment system (if equipped)
- Aftertreatment Regeneration Device (if equipped)
- Miscellaneous hoses, clamps, connectors and sealing gaskets or devices used in the above systems.

Do not operate tag

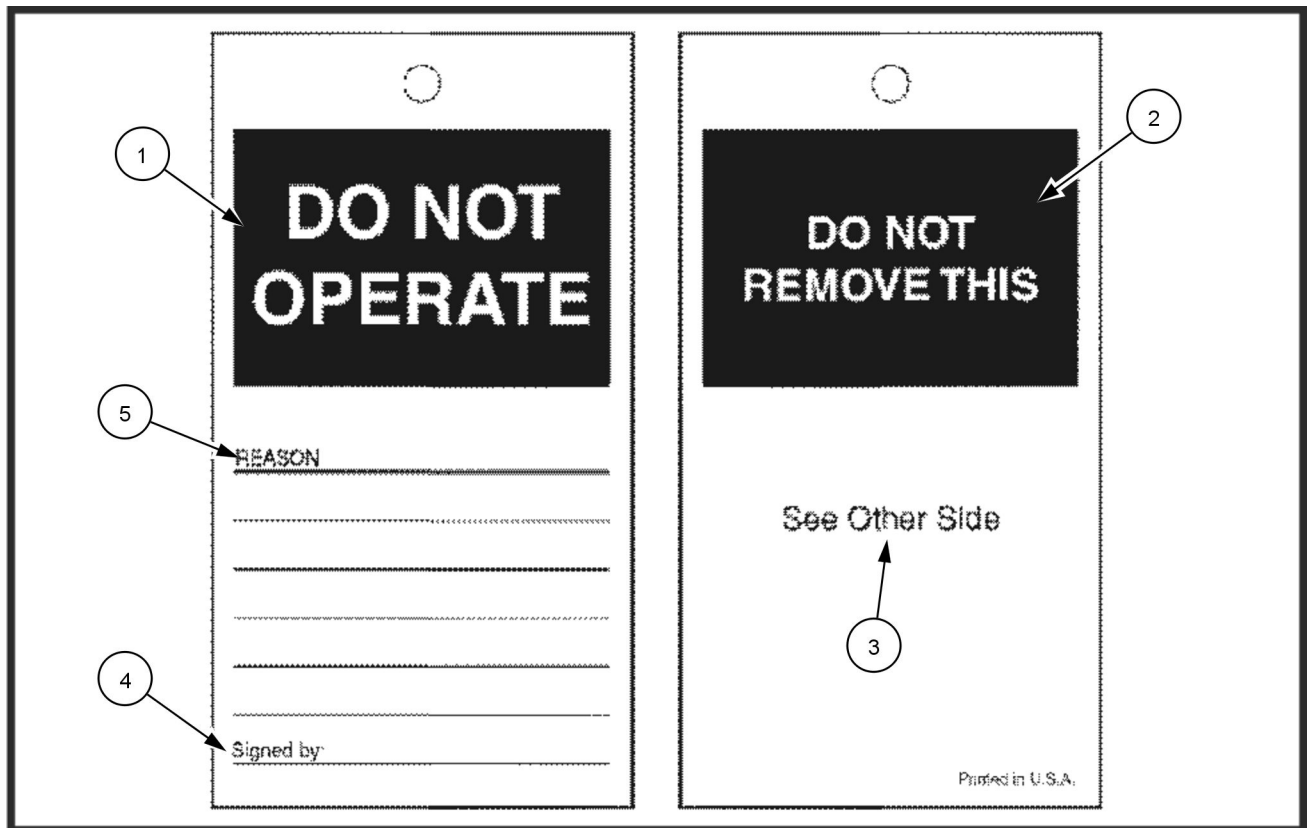
⚠ WARNING

Moving parts!

Disengage the Power Take-Off (PTO), turn off the engine, and remove the key. Wait for all movement to stop before leaving the operator's position. Never adjust, lubricate, clean, or unplug machine with the engine running. Failure to comply could result in death or serious injury.

W0112A

Before you service the machine, put a DO NOT OPERATE tag on the instrument panel.



321_4614 1
DO NOT OPERATE TAG

- A. (1) Do not operate.
- B. (2) Do not remove this.
- C. (3) See other side.
- D. (4) Signed by.
- E. (5) Reason

The DO NOT OPERATE tag can be obtained from your NEW HOLLAND dealer.

(3)

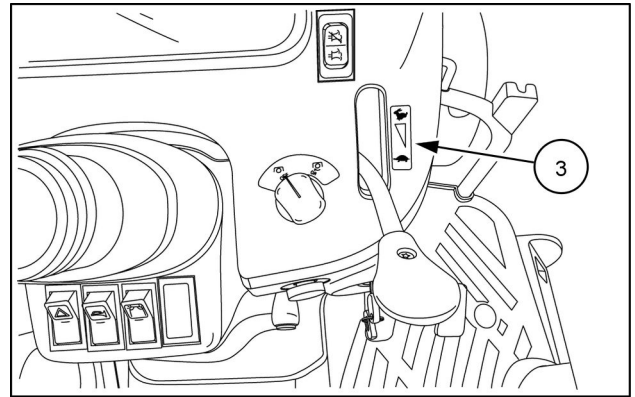
Hand Throttle Lever

- English **MT40232389**

Location: On the right-hand side of the dash panel.



40232389 6



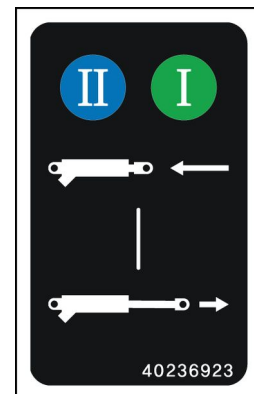
NHIL13CT01005AA 7

(4)

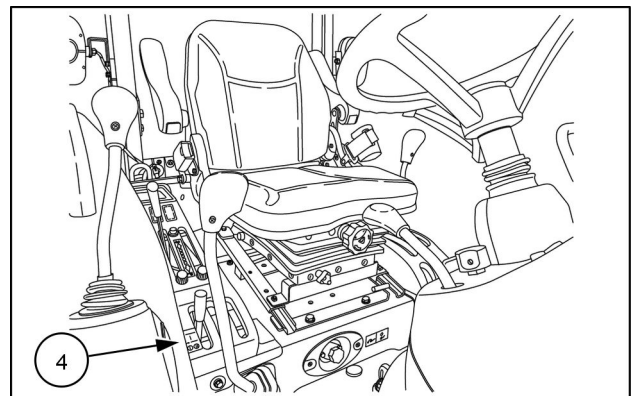
Rear remote valve operation (Optional)

- English **MT40236923**

Location : Right side pod.



40236923 8



NHIL13CT01153AA 9

Brake pedals

⚠ WARNING

Loss of control hazard!

Always reduce the traveling speed and use the steering wheel while you make a turn. When you operate the machine at high speeds, never attempt to make sharp turns by using the turning brake pedals. If you use the individual brakes at high speeds, the machine could become machine unstable.

Failure to comply could result in death or serious injury.

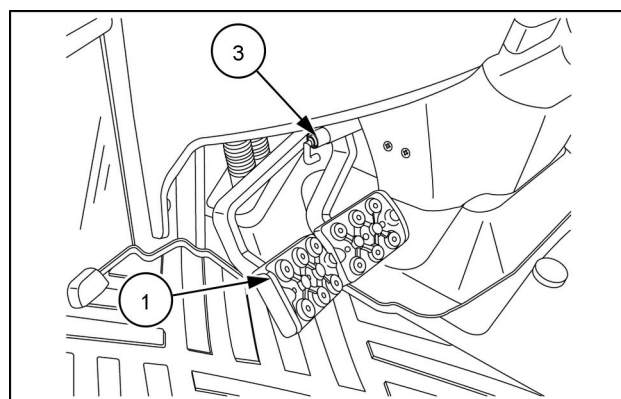
W1237A

The right brake pedal controls the braking action of the right rear wheel. The left brake pedal controls the braking action of the left rear wheel.

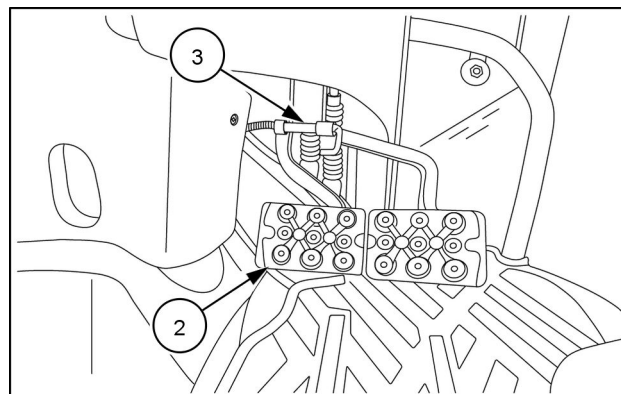
The function of the brake pedals are identical for the HST and gear model tractors except for the location of the pedals. The brake pedals **(1)** on a HST model tractor are located on the left-hand side of the operators platform and the brake pedals **(2)** on a gear model tractor are located on the right-hand side of the operators platform.

Depress both pedals simultaneously to stop the tractor. To assist in making sharp turns at slow speed, depress the right or left brake pedal as required.

The brake pedal connecting pin **(3)** is used to secure the brake pedals together. Lock the pedals together whenever the tractor is operated at high speeds or when the tractor is used on the highway.



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NHIL13CT01055AA 2

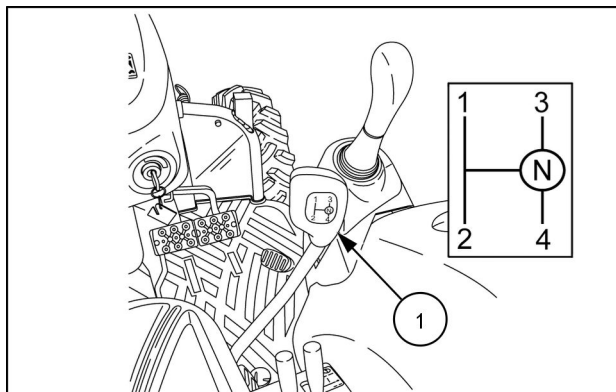
Transmission main shift lever

Gear model

The transmission main gear shift lever **(1)** is located on the right-hand side of the operators platform, and is used to select any one of the four forward or reverse gears.

With the combination of the shuttle shift, main shift, and range selector lever offer the operator a combination of twelve forward and twelve reverse gears.

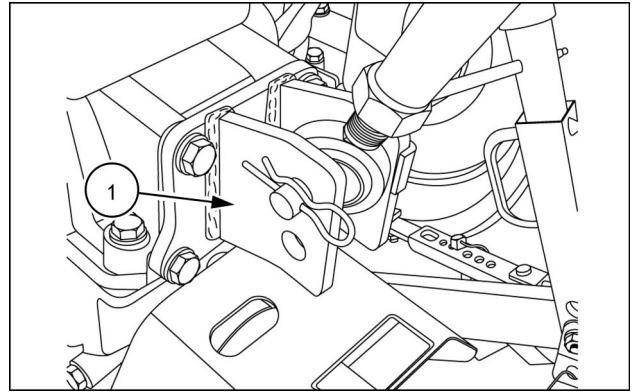
The transmission shift lever operates in a H-pattern. To change gears while in a selected range, depress the clutch pedal and shift the main gear shift lever into the desired gear. The tractor does not have to be stopped because the main shift gears are synchronized.



NHIL13CT01355AA 1

Hydraulic lift rocker

The hydraulic lift rocker (1) has two holes for attaching the upper link. Attach the link using the lower hole for light draft loads, such as mowers. Attach the link to the top hole for heavier draft loads, such as ground engaging equipment.

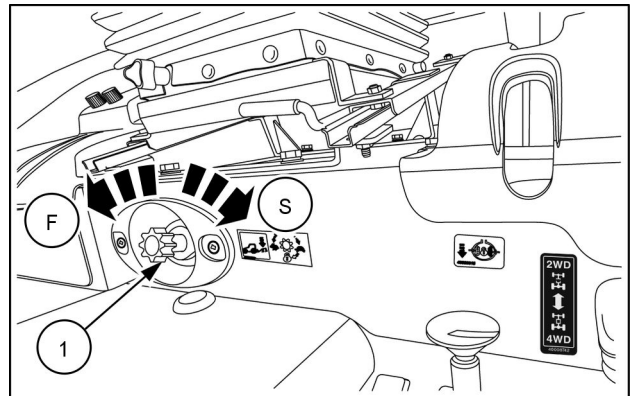


Hydraulic Power Lift (HPL) drop rate control valve

The drop rate control valve (1) provides an adjustment to regulate the flow of oil from the lift cylinder. This allows the operator to slow or increase the rate of drop of the lower links.

Turn the drop rate control valve "IN" (clockwise) to decrease the rate of drop. Turn the valve "OUT" (counter-clockwise) to increase the rate of drop.

The drop rate control valve must be opened before the hydraulic lift control will lower. If the valve is turned all the way "IN" (clockwise), the lower links can be raised to maximum height but cannot be lowered.



(F) Fast
(S) Slow

NOTE: The drop rate control valve needs to be adjusted accordingly to the amount of weight being carried on the rear hitch arms.

Starting the tractor with jumper cables

⚠ WARNING

Unexpected machine movement!
Always sit in the operator's seat to operate the machine. **DO NOT** bypass the key start switch. Sudden and unexpected machine movement or machine runaway could result. Failure to comply could result in death or serious injury.

W0464A

⚠ WARNING

Explosive gas!
Batteries emit explosive hydrogen gas and other fumes while charging. Ventilate the charging area. Keep the battery away from sparks, open flames, and other ignition sources. Never charge a frozen battery. Failure to comply could result in death or serious injury.

W0005A

⚠ WARNING

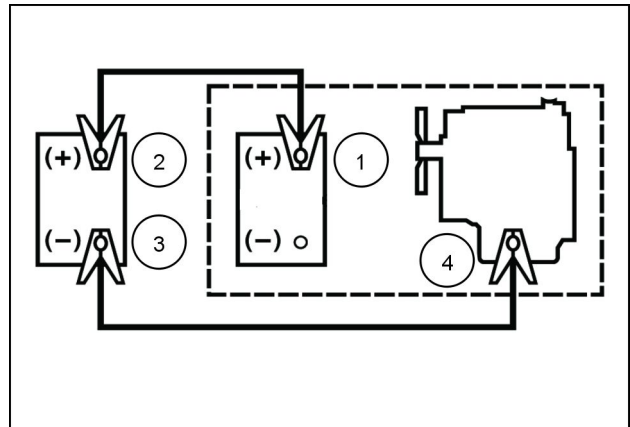
Explosion hazard!
When jump-starting the machine, connect and disconnect the jumper cables exactly as indicated in this manual. **DO NOT** connect the jumper cables to the machine battery terminals. Make sure no persons are near the connecting points before starting the engine. Start the engine from the operator's seat. Failure to comply could result in death or serious injury.

W0342A

NOTICE: When using a auxiliary battery to start the engine, ensure that the polarity of the jumper cables are correct, **POSITIVE to POSITIVE, NEGATIVE to NEGATIVE**, or the alternator or battery may be damaged.

If you must use jumper cables to start the tractor:

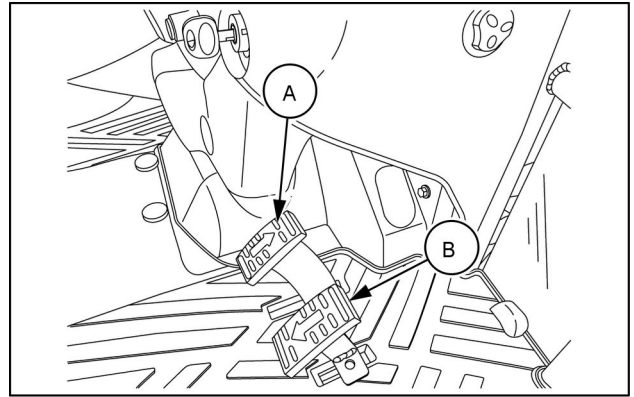
1. Shield your eyes.
2. Connect the red end of the jumper cable to the positive (+) battery terminal **(1)** on the tractor and connect the other red end to the positive (+) battery terminal **(2)** on the auxiliary battery.
3. Connect the black end of the jumper cable to the negative (-) battery terminal **(3)** on the auxiliary battery, then connect the other black end to a tractor frame ground or engine ground **(4)**. Finally, start the tractor by following the safe starting procedures outlined under See **Engine starting system - Operating**.
4. When the engine starts allow the engine to idle, and turn on all electrical equipment (lights, etc.) This will help protect the alternator from possible damage due to changes in load when disconnecting the jumper cables.
5. Disconnect the jumper cables in reverse order, disconnect the black end from the tractor frame or engine ground **(4)** then disconnect the other black end from the negative (-) battery terminal **(3)** on the auxiliary battery. Disconnect the red end from the positive (+) battery terminal **(2)** on the auxiliary battery, then remove the other red end from the positive (+) battery terminal **(1)** on the tractor battery.



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Hydrostatic Transmission (HST) operation

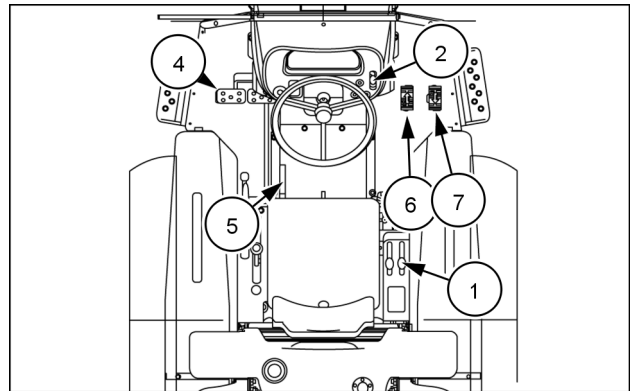
The ground speed of tractors equipped with a hydrostatic transmission is continuously variable, from zero to full rated speed in each range. Speed is controlled by the HST forward **(A)** and reverse **(B)** pedals located on the right-hand operators platform.



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To operate the HST transmission, carry out the following:

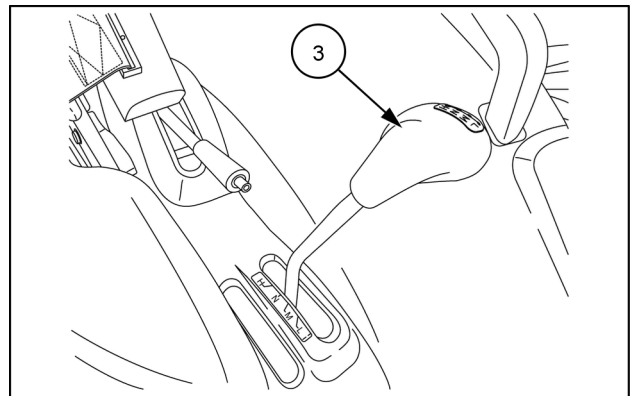
1. Start the engine and pull the HPL control lever **(1)** rearward to lift the implement off the ground .
2. Move the hand throttle lever **(2)** forward until the engine speed is above **1500 RPM**.
3. Place the range gear shift lever **(3)** in the desired range.
4. Depress the brake pedals **(4)** and disengage the park brake lever **(5)**.
5. For forward travel, depress the forward pedal **(6)** until the desired ground speed is reached. For reverse travel, depress the rear pedal **(7)**. Unless the HST cruise control switch is in the engaged position, the transmission returns to neutral and the tractor stops when the pedal is released.



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NOTE: Depress the HST pedals slowly, fast movement of the pedals will cause the tractor to move suddenly.

NOTE: To change the range speed, release the HST pedals and bring the tractor to a stop and select the desired range.



NHIL13CT01174AA 3

Driving the vehicle

Observe the following precautions when driving the tractor:

- Watch where you are going at all times, especially at row ends, on roads, and around trees.
- Use the hazard warning lights, road lights (low beam), and SMV (slow moving vehicle) sign when travelling on public roads, day or night.
- DO NOT permit anyone but the operator to ride on the tractor.
- Lock the brake pedals together when travelling on public roads.
- Make sure the PTO switch is in the "OFF" position.
- Keep the tractor in gear when going downhill. Use a low gear to maintain control with minimum braking.
- If the tractor becomes stuck, back out to prevent upsetting the unit.
- Always use the drawbar for pull-type work. Do not pull from any other part of the tractor, since it may tip backward.

NOTICE: When transporting on the highway, a safety chain with tensile strength equal to the gross weight of the implement should be connected between the tractor and the towed implement. This will control the implement in the event the hitch pin is lost. After attaching the safety chain, check its adjustment by driving the tractor to the right and to the left for a short distance. Readjust to tighten or loosen the chain as necessary. Safety chains and suitable hardware are available from your NEW HOLLAND Dealer.

NOTE: Procure attaching hardware locally. Check implement assembly or the Operator's Manual for attaching hardware specifications, such as bolt size and grade, chain strength, washers, lock washers, nuts, etc.

- Engage the clutch slowly when driving out of a ditch, gully, or up a steep hillside. Immediately disengage the clutch if the front wheels should rise off the ground.
- Reduce speed before turning quickly or applying brakes.
- To make an emergency stop, depress both brake pedals and the clutch pedal (gear model only) simultaneously

NOTE: When making an emergency stop while operating a HST model tractor depress both brake pedals and release the forward or reverse HST pedal.

- Never apply the differential lock when turning.
- Use extreme caution and avoid hard applications of the tractor brakes when pulling heavy, towed loads at road speeds.
- Any towed vehicle with a total weight exceeding that of the towing tractor should be equipped with brakes for safe operation.
- Always sit in the driver's seat while starting or driving the tractor.
- Always check overhead clearance, especially when transporting the tractor.

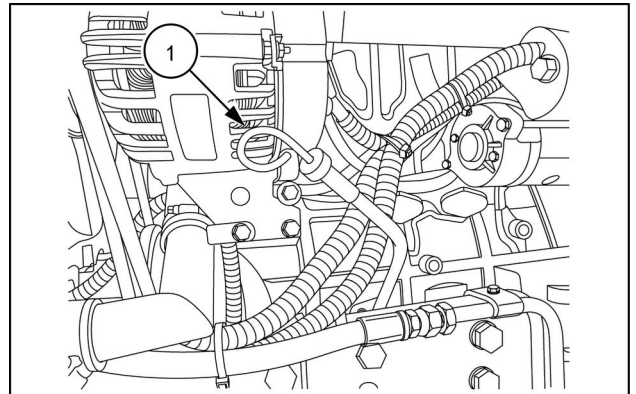
Maintenance action	Grease				Cleaning				Page no.
	Tighten				Drain fluid				
	Replace				Bleed				
	Change fluid				Adjust				
	Check				Test				
General maintenance									
Fuel injection system									7-33
Hydrostatic transmission (HST) neutral adjustment									7-35
Engine belts									7-36
Roll Over Protective Structure (ROPS) frame									7-37
Battery									7-37
Alternator									7-38
Fuses									7-39
Maxi-fuse									7-40
Headlight bulb									7-40
Tail/brake light bulb									7-41
Turn signal/hazard light bulb									7-41
Wheels bolt/nut									7-43
Front wheels toe-in									7-43
Brake pedal free play									7-44
Clutch pedal free play									7-45

Every 10 hours or daily

Engine oil level

NOTE: Check the engine oil level daily or after every 10 hours of operation.

1. After the engine has been stopped for a period of time and with the tractor standing level, check the oil level using the dipstick (1).

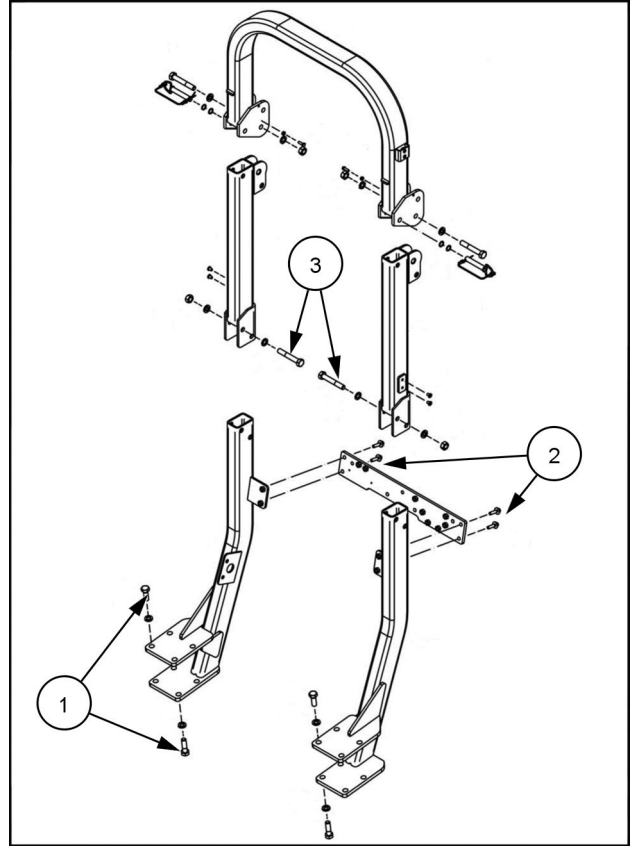


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Roll Over Protective Structure (ROPS)

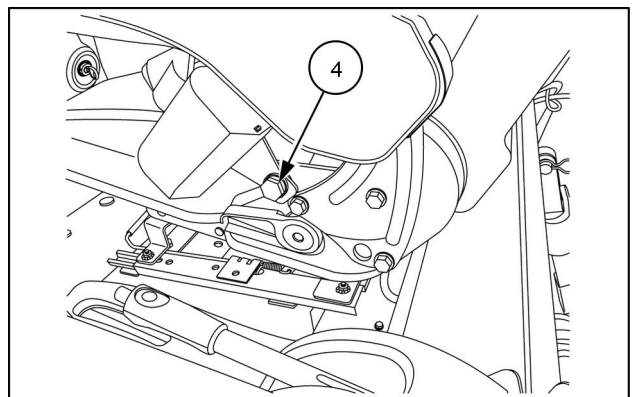
NOTE: *Inspect the ROPS after the first 50 hours of operation. Following the initial inspection, the ROPS should be checked after every 300 hours of operation or every six months, whichever comes first.*

1. Check the torque of the ROPS bottom portion mounting bolts, (1). Tighten the **M14** bolts to the correct torque of **147 N·m (108 lb ft)** if necessary.
2. Check the torque of the ROPS cross brace mounting bolts (2). Tighten the **M10** bolts to the correct torque of **60 N·m (41 lb ft)** if necessary.
3. Check the torque of the ROPS mid portion mounting bolts (3). Tighten the **M14** bolts to the correct torque of **147 N·m (108 lb ft)** if necessary.



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4. Inspect the operator's seat and the mounting parts for the seat belt. Tighten the **M10** bolts (4) to the correct torque of **54 N·m (40 lb ft)** if necessary and replace any parts that show wear or damage.



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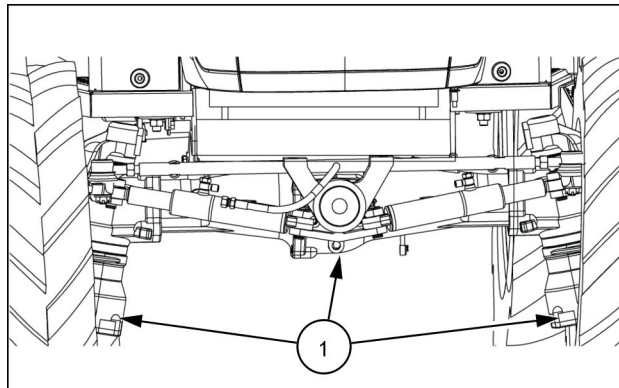
Every 600 hours

Front axle differential fluid

Changing front axle differential and final reduction gear case oil

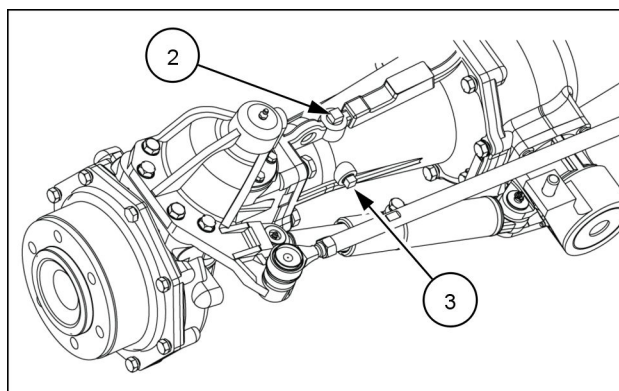
NOTE: The front axle differential case and final reduction gear case oil should be changed after every 600 operating hours.

1. Place a suitable container beneath the oil plugs. With the oil at normal operating temperature, drain the oil by removing the drain plugs **(1)**. After the oil has drained, reinstall the drain plugs and discard the used oil.



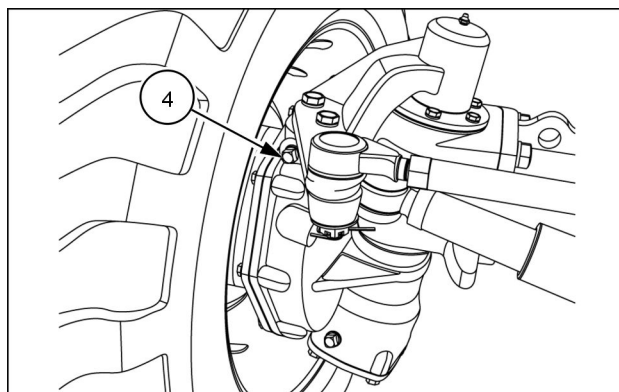
93100925 1

2. Remove the filler plug **(2)** and check plugs **(3)**.
3. Fill the axle with **NEW HOLLAND AMBRA HYPOIDE 90** oil until the oil flows out of the oil level check plug port **(3)**. Reinstall the filler and check plugs, hand tight only.



93100921 2

4. Raise the front axle until both wheels are off the ground.
5. Tilt axle until stops are contacted.
6. Slowly and momentarily remove plug **(4)** from the lower side final drive housing. This will allow any air that is trapped in the lower housing to escape, so that the correct oil level can be achieved. Reinstall plug and tilt axle the opposite direction. Repeat this procedure for the other final drive housing.
7. Lower axle back to the ground.
8. Recheck oil level at check plug port **(3)**, add oil if needed until the oil flows out of the oil level check plug port.
9. After correct oil level is achieved, tighten all plugs.



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NOTE: Approximate fluid capacity for the front axle housing is **8.0 l (8.4 US qt)**.

8 - TROUBLESHOOTING

SYMPTOM(S)

Engine - Troubleshooting

Problem	Possible Cause	Correction
The start motor does not rotate with the key switch in the (START) position.	Low battery charge	Charge or replace
	Loose battery or starter cable terminals	Tighten the terminal
	Key switch faulty	Repair or replace switch
	Safety start switch not completing circuit	Depress clutch pedal fully
	PTO safety switch is not in "OFF" position	Place PTO switch in "OFF" position
	Starter motor faulty	Repair or replace starter motor
The start motor rotates but the engine does not start	Low battery charge	Charge or replace battery
	Air in fuel system	Bleed out the air
	Fuel filter clogged	Clean or replace the filter
	Fuel shutoff valve on fuel filter in closed position	Open the valve
	Fuel shutoff solenoid on fuel injection pump stuck in off position	Check solenoid for proper operation, repair as needed
Engine speed is irregular	Air in fuel system	Bleed the fuel system
	Fuel filter clogged	Clean or replace the filter
	Injection nozzle clogged	Repair or replace nozzle
	Fuel leakage	Repair fuel system
	Irregular fuel injection	Repair or replace fuel injection pump
Engine speed is more than maximum rated high idle speed	Governor malfunction	Repair injection pump as needed
Engine stops suddenly during operation	Fuel shortage	Add fuel and bleed air from fuel system
	Faulty fuel injector	Repair or replace injector
	Faulty fuel injection pump	Repair or replace injection pump
	Internal parts of engine seized due to lack of lubrication	Repair engine as needed
Engine stops at low speed	Faulty injection pump	Repair or replace injection pump as needed
	Engine valve gap is not correct	Adjust the gap
	Low fuel injector pressure	Repair fuel injector as needed
Engine overheating	Lack of coolant	Add coolant as needed
	Fan belt slipping or belt is broken	Adjust belt tension or replace belt
	Dirt attached to the radiator or prescreen	Clean radiator fins or screen as needed
The color of exhaust smoke is white	Low engine operating temperature	Allow engine to obtain higher operating temperature
	Engine burning engine oil	Repair engine as needed
	Engine coolant entering engine exhaust	Repair engine as needed
The color of exhaust gas is black.	Air filter clogged	Clean or replace engine air filter
	Excessive fuel supply	Repair fuel injection pump as needed
	Faulty fuel injector	Repair or replace fuel injector
Low engine power	Fuel injector nozzle clogged	Repair injector as needed
	Carbon accumulation on valve seat	Repair valve and seats as needed
	Incorrect valve gap adjustment	Adjust valve gap to correct amount
	Incorrect fuel injection timing	Check and adjust fuel injection timing as needed
	Lack of fuel supply	Check fuel system for restriction
	Air filter clogged	Clean or replace air filter