4 - OPERATING INSTRUCTIONS

COMMISSIONING THE UNIT

Engine break-in procedure

Your tractor will provide long and dependable service if given proper care during the first 50-hour break-in period. During the first 50 hours of operation:

1. Avoid "lugging" the engine. Operating in too high a gear under heavy load may cause engine lugging, which is indicated when the engine will not respond to a throttle increase.
2. Use the lower gear ratios when pulling heavy loads and avoid continuous operation at constant engine speeds. You will save fuel and minimize engine wear by selecting the correct gear ratio for a particular operation. Operating the tractor in low gear with a light load and high engine speed wastes fuel.
3. Avoid prolonged operation at either high or low engine speeds without a load on the engine.
4. Check the instruments frequently and keep the radiator and oil reservoirs filled to recommended levels. Daily checks include the engine oil level, radiator coolant, and air cleaner.
5. After the first 50 hours of use, be sure to perform the maintenance items listed in the maintenance schedule.

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3 - CONTROLS AND INSTRUMENTS

ACCESS TO OPERATOR'S PLATFORM

Cab door

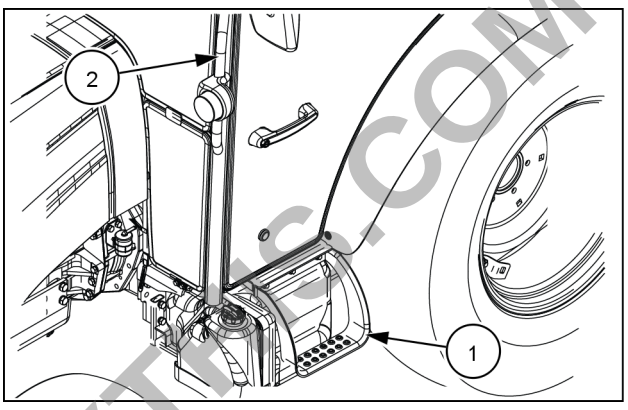
Opening doors from the outside

Whenever possible use the left-hand side door to board the tractor. Use the step **(1)** and grab handle **(2)** to aid in boarding

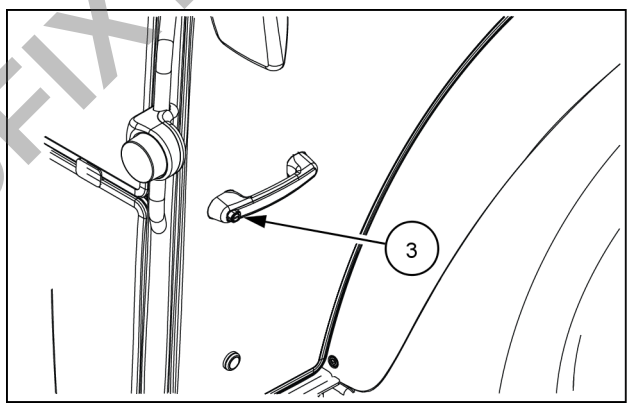
With the door unlocked, press button **(3)** and pull the door towards you.

The opening button on both doors are fitted with lock and key, so the cab can be locked from either side.

NOTE: *The ignition key is used to lock the cab doors.*



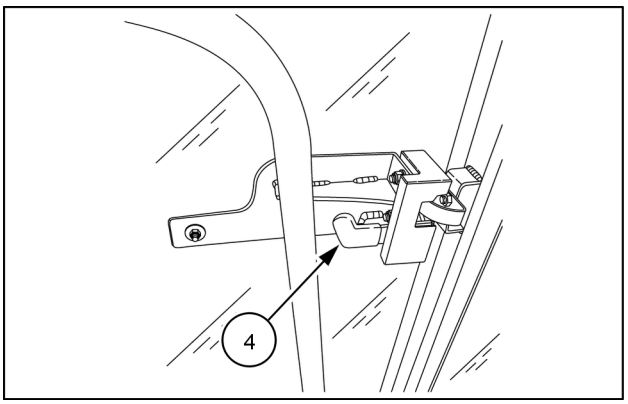
NHIL15CT00563AA 1



NHIL15CT00588AA 2

Opening the doors from the inside

Push the lever **(4)** downwards and push door away from you.



NHIL15CT00524AA 3

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MAINTENANCE CHART

Maintenance chart

Maintenance action	Check	Change fluid	Replace	Tighten	Grease	Test	Adjust	Bleed	Drain fluid	Cleaning	Page no.
Every 10 hours or daily											
Engine oil level - Check	x										7-9
Engine cooling system - Check	x										7-11
After first 50 hours											
Engine oil and oil filter - Change		x									7-12
Fuel pre-filter - Replace			x								7-14
Hydraulic oil filter - Replace			x								7-15
Hydraulic (HST) oil filter - Replace			x								7-16
Wheel bolt / nut - Tighten				x							7-17
Every 50 hours											
Grease fittings					x						7-18
Transmission fluid level - Check	x										7-19
Clutch pedal free play - Check	x										7-20
Brake pedal free play - Check	x										7-21
Hydrostatic transmission (HST) neutral adjustment - Check	x										7-21
Engine belts - Check	x										7-22
Wheels and tires pressure - Check	x										7-23
Front axle and differential oil level - Check	x										7-24
Air cleaner - Clean - Primary element					x						7-25
Cab air filter - Clean	x										7-26
Every 100 hours											
Fuel filter-Drain						x					7-27
Every 300 hours											
Engine oil and oil filter - Change		x									7-28
Hydraulic oil filter - Replace			x								7-29
Hydrostatic Transmission (HST) oil filter - Replace - HST system			x								7-30
Fuel pre-filter - Replace			x								7-31
Engine belts - Check	x										7-32
Wheel bolt / nut - Check				x							7-32
Air cleaner primary element - Replace			x								7-33
Every 500 hours											
Fuel filter - Replace			x								7-34
Cab air filter - Replace			x								7-35
Every 600 hours											
Front axle and differential fluid - Change		x									7-36
Transmission fluid - Change		x									7-38
Every 1000 hours											
Air cleaner inner element - Replace			x								7-39
Engine coolant - Draining and flushing						x					7-40
General maintenance											
Fuel injection system - Bleed							x				7-41
Hydrostatic transmission (HST) neutral adjustment								x			7-43
Engine belts - Adjust								x			7-44
Battery									x		7-45

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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

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9 - SPECIFICATIONS

Wheel tread settings

NOTE: *Tread settings are measured from center of tire to center of tire.*

Front wheel settings

Tire Type	Tractor Model	Setting	NOTE
Agricultural, R1 7-14	Front-Wheel Drive	**1205 mm** (**47.4 in**)	Not Adjustable (Dished in only)
Turf, R3 25 x 8.50-14	Front-Wheel Drive	**1159 mm** (**45.6 in**)	Not Adjustable (Dished out only)
Industrial (R4) 25 x 8.50-14	Front-Wheel Drive	**1159 mm** (**45.6 in**)	Not Adjustable (Dished out only)

NOTICE: *Never attempt to widen the tread setting by reversing front wheels on a front-wheel drive system.*

NOTE: *Torque front wheel bolts and nuts to* ***176 - 196 N·m (130 - 145 lb ft)****.*

Rear wheel settings

Tire Type	Tractor Model	Setting	NOTE
Agricultural, R1 11.2-24	Front-Wheel Drive	**1166 mm** (**45.9 in**)	Not adjustable (Dished out only)
Turf, R3 41 x 14.00-20	Front-Wheel Drive	**1208 mm** (**47.5 in**)	Not adjustable (Dished out only)
Industrial, (R4) 43 x 16-20	Front-Wheel Drive	**1283 mm** (**50.5 in**)	Not adjustable (Dished in only)

NOTE: *Torque rear wheel bolts and nuts to .* ***176 - 196 N·m (130 - 145 lb ft)***

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Engine coolant - Draining and flushing

⚠ WARNING

Hot liquid under pressure!
Never remove the filler cap or the recovery tank cap while the engine is running or the coolant is hot. Let the system cool. Turn the filler cap to the first notch and allow any pressure to escape, and then remove the filler cap. Loosen the recovery tank cap slowly to allow any pressure to escape. Failure to comply could result in death or serious injury.

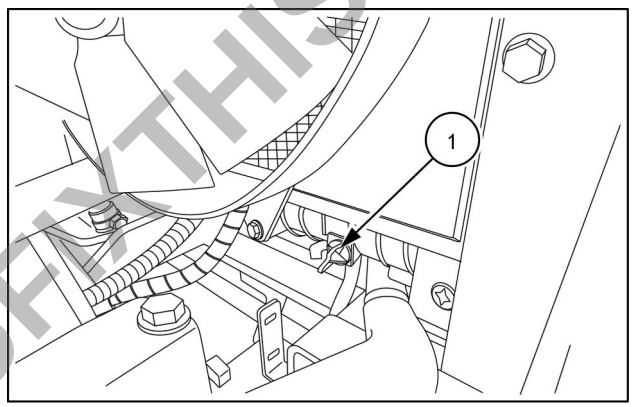
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Draining and flushing the cooling system

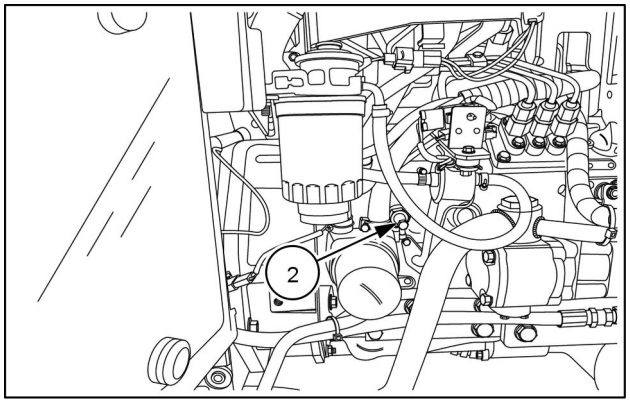
NOTE: *Drain and flush the radiator and engine block every 1000 hours of usage or 24 months, whichever comes first. Refill with a 50/50 mixture of permanent antifreeze and clear water.*

To drain the cooling system:

1. Use a suitable receptacle to catch the used coolant. Remove the radiator cap and open the drain valve **(1)** on the left- side of radiator to drain the radiator and drain plug **(2)** on right side of engine block to drain engine block.
2. After the coolant has drained, place a water hose in the radiator filler neck and run water through the system. When water is flowing from the block drain plug port start the engine. When the water flowing from the block port is free from coloration and sediment, stop the engine and remove the hose. Allow all water to drain from the system through the radiator drain valve and block port.
3. Close the radiator drain valve and reinstall the block drain plug. Slowly refill the system with a 50/50 solution of ethylene glycol antifreeze and water. Fill until the coolant level is approximately **4 cm** (**1.6 in**) below the bottom of the filler neck. Do not fill beyond this level.
4. Clean the radiator cap and cap seal and install the cap.



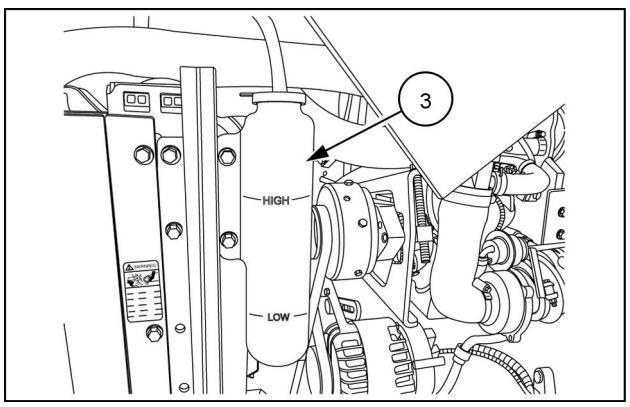
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5. Add coolant to the coolant reservoir **(3)** until fluid level is between the “LOW” and “HIGH” lines on the side of the reservoir.
6. Run the engine until normal operating temperature is reached, then stop the engine. Recheck the coolant level when the engine is cold and add additional coolant as necessary.

NOTICE: *Never run the engine when the cooling system is empty. Do not add cold water or cold antifreeze solution if the engine is hot.*

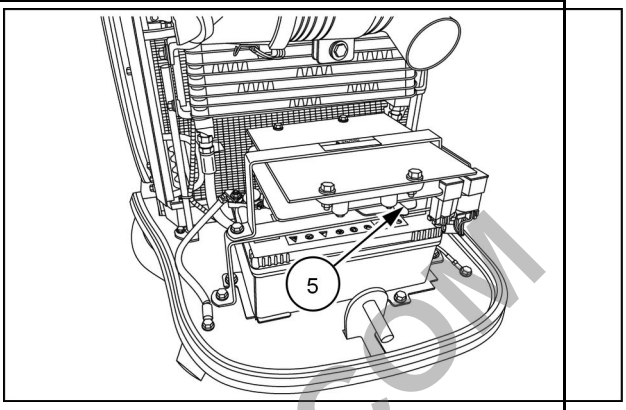
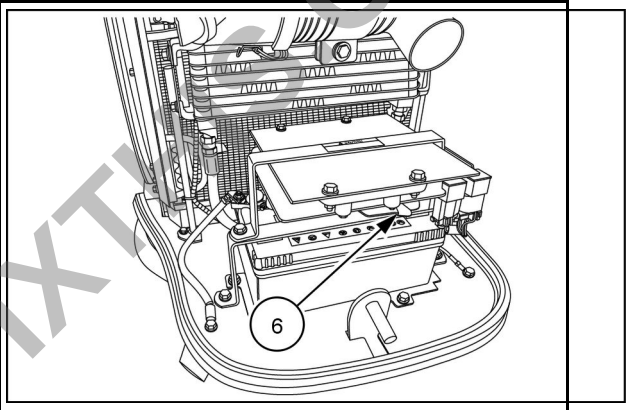
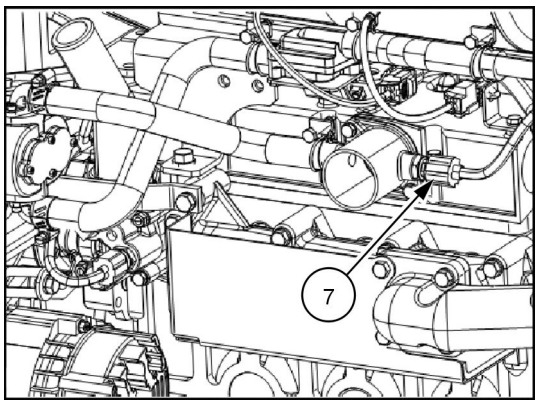
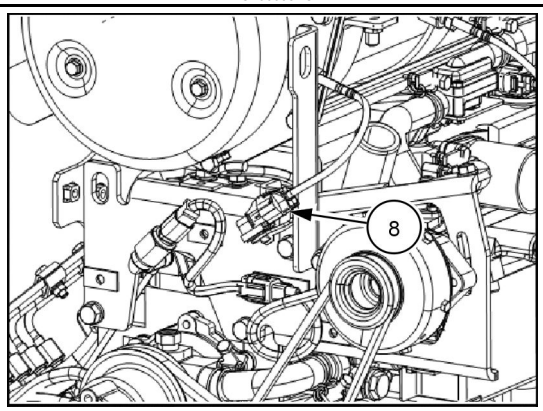


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NOTE: *Cooling system capacity is **5.1 L** (**5.4 US qt**)*

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Fault code	Possible cause	Check	Location
AB09	Engine Control Unit (ECU) Barometric pressure sensor **(5)** Located inside (ECU)	Normal sensor signal over 0.25 volts Connector connection Wiring harness for open or shorted circuit	 NHIL15CT00620AA 5
AB10	Engine Control Unit (ECU) Ambient temperature sensor **(6)** Located inside (ECU)	Normal (ECU) temperature less than 115 °C (239 °F)	 NHIL15CT00620AA 6
AB12	Intake manifold temperature sensor **(7)**	Normal sensor signal 0.08 to 4.85 volts Connector connection Wiring harness for open or shorted circuit	 NHIL14CT00058AC 7
AB13	Exhaust gas temperature sensor **(8)**	Normal sensor signal 164.8 to 4000 ohms Connector connection Wiring harness for open or shorted circuit	 NHIL14CT00059AC 8

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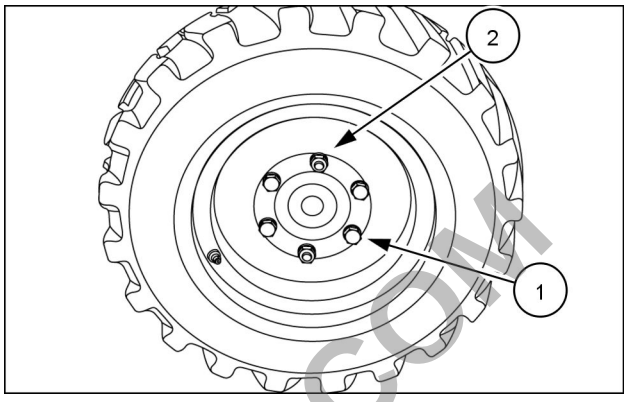
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Wheel bolt / nut - Tighten

Tighten the wheel bolts **(1)** and nuts **(2)** to the specified torque any time the wheel assembly is removed from the tractor or the wheel bolts are loosened.

Front Wheel Torque

- **176 - 196 N·m** (**130 - 145 lb ft**)



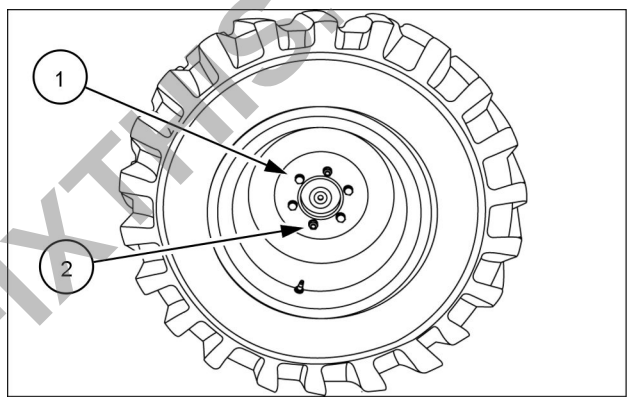
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Rear Wheel Torque

- **176 - 196 N·m** (**130 - 145 lb ft**)

NOTICE: *Check and tighten wheel bolts* ***(1)*** *and nuts* ***(2)*** *to proper torque specifications after the following hours of use:*

- First 5 hours
- First 50 hours
- Every 300 hours



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Diesel Particulate Filter (DPF) regeneration

⚠ CAUTION

Burn hazard!
During the Diesel Particulate Filter (DPF) regeneration process the exhaust stack and fixed hood area becomes extremely hot. Allow area to cool before servicing or working near the exhaust system components.
Failure to comply could result in minor or moderate injury.

C0102B

⚠ WARNING

Fire hazard!
During the Diesel Particulate Filter (DPF) forced regeneration process the exhaust stack and fixed hood area becomes extremely hot. Park the machine outside and away from combustible or highly flammable material.
Failure to comply could result in death or serious injury.

W1165B

Definitions of system components and operations

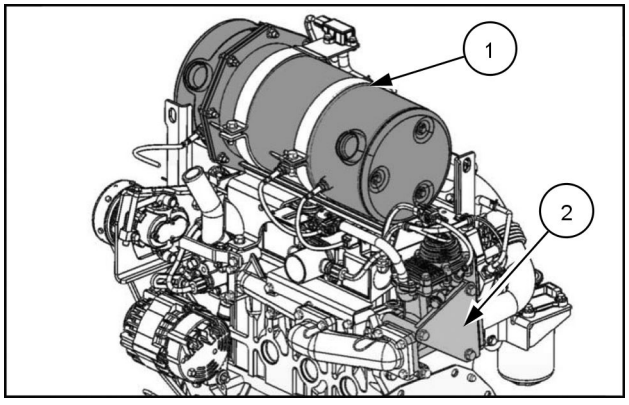
The following terms will define the system components and operational modes.

- Diesel Oxidation Catalyst (DOC) - Is a catalytic converter that reduces emission element such as hydrocarbons, carbon monoxide and unburned fuel.
- Diesel Particulate Filter (DPF) - Is a filter that captures soot from the engine exhaust.
- Burner - This component generates the required heat to burn the soot that is contained in the (DPF) during the regeneration process.
- (DPF) switch - Switch located on the right-hand side of the dash. This switch is used to stop or delay the regeneration process or to exit the inhibited regeneration mode.
- Regeneration - This is the process of burning/cleaning of the soot that is contained in the (DPF) by the burner.
- Inhibited Regeneration - The regeneration process is disabled by the use of the (DPF) switch

Diesel Oxidation Catalyst (DOC) and Diesel Particulate Filter (DPF)

The Diesel Oxidation Catalyst (DOC) and the Diesel Particulate Filter (DPF) function is to reduce engine exhaust hydrocarbons, carbon monoxide and other toxic gases. This system converts exhaust emissions to harmless carbon dioxide and water. The (DPF) also traps Particular Matter (PM)

To meet tier 4 emission regulations the Diesel Oxidation Catalyst and Diesel Particulate Filter **(1)** and burner **(2)** are installed on your tractor and are located under the engine hood of the tractor.



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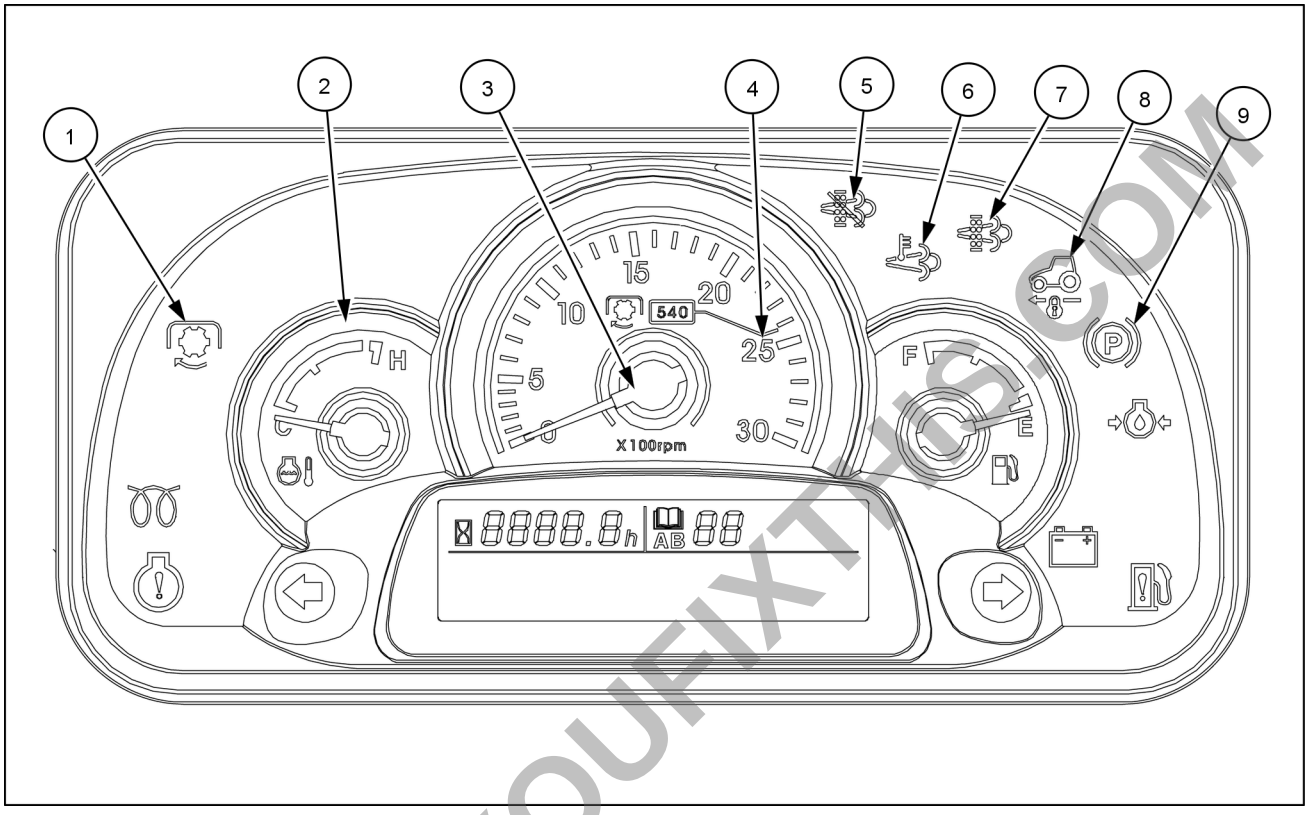
It is very important to read this operator's manual and understand the safe operation of your tractor. If you have any questions in the operation of this emission system please contact your NEW HOLLAND dealer

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FORWARD CONTROLS

Instrument panel



NHIL14CT00054FA 1

1. PTO Indicator Light - When either the rear or mid PTO is engaged, the indicator will be illuminated amber with the key in the "START" or "ON" positions.
2. Temperature Gauge - Indicates coolant temperature. It is activated when the key switch is turned to the "ON" position. The gauge will register cold with the key switch in the "OFF" position. If the needle registers in the white range of the gauge, this indicates a normal operating temperature. If the needle moves to the red portion of the gauge, this indicates an overheated condition. Stop the tractor engine immediately and investigate the cause.
3. Tachometer - Registers engine rpm (Revolutions Per Minute). The gauge is marked in increments of 100 and will return to zero when the engine is not running.
4. PTO Speed Indicator - Determined by the position of the needle on the tachometer. The tachometer is marked to indicate **540 RPM** of PTO. If the needle registers above the **540 RPM** mark, this indicates a dangerous over speed condition, and the engine rpm should be reduced immediately.
5. Diesel Particulate Filter (DPF) Inhibited Indicator Light - This indicator light will be illuminated when the (DPF) switch is placed in the inhibited position, to indicate the regeneration of the (DPF) is stopped.
6. Diesel Particulate Filter (DPF) Temperature Indicator Light - This indicator light will be illuminated when the engine exhaust temperature is sufficient for the regeneration of the (DPF) to start.
7. Diesel Particulate Filter (DPF) Regeneration Indicator Light - This indicator light will be illuminated either continuous or blinking, when the regeneration of the (DPF) is in operation. The regeneration is started when the (DPF) soot load is over 60% or every four hours of operation and the engine exhaust temperature is at a sufficient temperature for regeneration to start.
8. Cruise Control Indicator Light (HST only) - Illuminates amber with the key switch in the "ON" position and the cruise control rocker switch is engaged.
9. Park Brake Indicator Light - Illuminates if the park brake is engaged with the key switch rotated from the "OFF" position.

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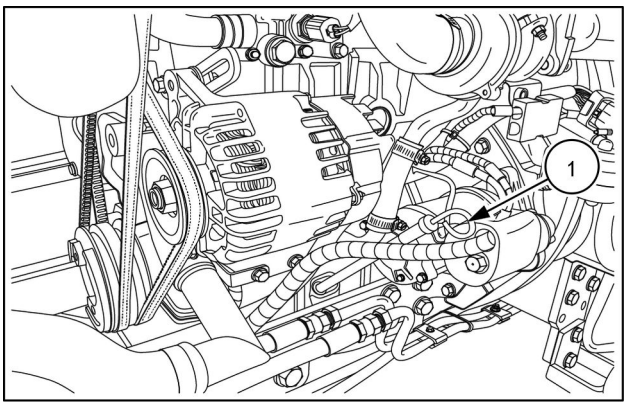
Maintenance action	Check	Change fluid	Replace	Tighten	Grease	Test	Adjust	Bleed	Drain fluid	Cleaning	Page no.
Alternator	x										7-46
Chassis fuses			x								7-47
Cab fuses			x								7-48
Main fuse-Engine Control Unit (ECU)			x								7-49
Main fuse-cab electrical system			x								7-50
Headlight bulb			x								7-51
Rear tail/brake/hazard/turn signal bulbs			x								7-52
Front turn signal/hazard light bulb			x								7-53
Wheels bolt/nut				x							7-54
Front wheels toe-in								x			7-55
Brake pedal free play								x			7-56
Clutch pedal free play								x			7-57

Every 10 hours or daily

Engine oil level - Check

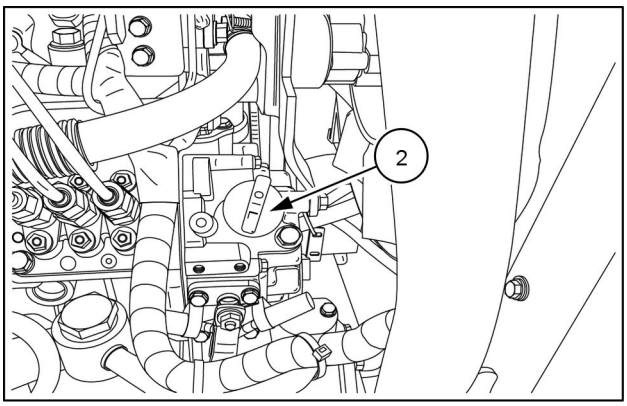
NOTE: *Check the engine oil level daily or after every 10 hours of operation.*

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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2. If the oil level is low, remove the filler cap **(2)** add oil through the filler hole.



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Problem	Possible Cause	Correction
Instrument panel engine oil pressure indicator light is "ON" during operation.	Lack of engine oil	Add engine oil as needed
	Low viscosity of engine oil	Replace oil with proper viscosity type
	Faulty pressure switch	Replace switch
	Faulty engine oil pump	Repair oil pump as needed
	Engine oil filter clogged	Replace the filter
Instrument panel battery charging indicator is "ON" during operation.	Bad electrical connection	Check battery terminals, ground, and repair as needed
	Faulty alternator	Repair or replace alternator as needed
	Faulty battery	Replace battery
	Incorrect fan belt tension or belt broken	Adjust belt tension or replace belt
Diesel Particulate Filter (DPF) and burner not functioning properly	Excessive soot build up in (DPF)	Start regeneration of (DPF) system
	Air pump not working	Check air pump belt tension and electrical current to air pump clutch
	Burner not igniting	Defective burner injector, contact authorized dealer
	Burner not igniting	Defective burner ignitor, contact authorized dealer
	Burner not igniting	Insufficient fuel supply to burner, check clogged fuel pre-filter.
	Engine Control Unit (ECU) not functioning properly	Contact authorized dealer for electronic diagnosis
Engine will only run for approximately thirty seconds	Excessive soot load in Diesel Particulate Filter (DPF)	Contact authorized dealer

Clutch - Troubleshooting

Problem	Possible Cause	Correction
Clutch slips	Incorrect adjustment of clutch pedal free play	Adjust the pedal free play correctly
	Clutch disc lining worn or broken	Replace clutch disc
Clutch does not release	Excessive clutch pedal free play	Adjust the pedal free play
	Clutch disc damaged	Repair or replace clutch disc

Hydraulic service brakes - Troubleshooting

Problem	Possible Cause	Correction
Brake does not work or only one side works.	Incorrect brake pedal free play	Adjust brake pedal free play to correct specification
	Brake disc lining worn or broken	Replace brake discs as needed
After engaging brake pedal, pedal will not return	Return spring damaged	Replace the spring
	Lack of lubrication in brake shaft linkage parts	Clean and lubricate linkage as needed
	Damaged internal brake parts	Repair internal brake parts as needed

Hydraulic Lift System - Troubleshooting

Problem	Possible Cause	Correction
The three-point linkage will not raise	Lack of transmission / hydraulic oil	Add oil as needed

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