

4 Maintenance

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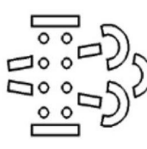
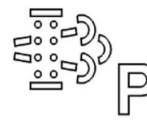
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4.1 Lubrication and maintenance

4.1.1 Lubrication and maintenance chart for daily inspection

Daily	
x	Examine and repair all the controls and switches.
x	Examine and tighten all the fasteners and hardware.
x	Examine and repair the hoses, belts and wiring.
x	Examine and fill the engine oil level.
x	Examine and fill the transmission oil level.
x	Clean debris from the air screens and radiator.
x	Examine and fill the radiator coolant level.
x	Examine and adjust belt tension.
x	Examine and fill the fuel tank level.
x	Examine and clean the fuel filter sediment bowl. When the warning lamp turns on, water is in the fuel filter sediment bowl.
x	Examine and repair the lamps and flashers.
x	Examine and adjust the clutch pedal free play.
x	Examine and the clutch pedal cable (cab tractors only). Replace if worn.
x	Examine and adjust the brake adjustment and balance.
x	Examine parking brake.
x	Examine, adjust, or replace the tire condition and pressure.
x	Examine and adjust the steering free play.

4.1.2 Lubrication and maintenance chart

First 50 hours	Every 250 hours	Every 500 hours	Other	
				Lamp flashes when a diesel particulate filter (DPF) regeneration is required.
				Lamp flashes when a parked diesel particulate filter (DPF) regeneration is required.
			x	Examine and tighten the wheel bolt after 8 hours of initial run time. If bolts were loose, examine again after 8 hours until bolts keep the correct tightness.
x				Examine and adjust the steering joint.
x				Examine and adjust the toe in.

First 50 hours	Every 250 hours	Every 500 hours	Other	
x				Examine, adjust and tighten the tie rod ends.
x				Examine the electrical wiring.
x				Examine and tighten the hardware on the outside of the engine.
			Every 50 hours	Examine and clean the air cleaner element.
x	x		First 50 hours then every 250 hours	Replace the engine oil and engine oil filter. Replace the engine oil yearly, if the tractor is used less than 250 hours.
	x			Clean and replace the transmission oil, filter, and filter screen.
	x			Examine the radiator fins
	x			Examine and adjust the front wheel alignment.
	x			Examine and adjust the front wheel fore and aft.
	x		Yearly or every 250 hours	Remove the clutch housing plug to examine for an oil leak. If oil drains from the plug, fix the oil leak. Reinstall the clutch housing plug.
	x		Yearly or every 250 hours	Examine and fill the front axle oil level.
			Every 400 hours	Change the fuel filter element.
x		x	First 50 hours then every 500 hours	Replace the engine oil filter. Replace the engine oil filter yearly, if the tractor is used less than 500 hours.
		x		Replace the front axle oil.
		x		Replace the air cleaner element.
x			First 50 hours then every 1000 hours	Examine and adjust the belts and belt tension.
			Every 1000 hours	Inspect the engine valve clearance.
			Every 1000 hours	Examine the starter.
			Every 1000 hours	Examine the alternator.
			Every 1000 hours	Examine and tighten the hardware on the outside of the engine.

First 50 hours	Every 250 hours	Every 500 hours	Other	
			Every two years or 1000 hours	Change the engine coolant.
			Every 1500 hours	Examine, clean or replace the EGR cooler.
			Every 3000 hours	Examine the turbocharger.
			Every 3000 hours	Examine and clean the EGR system.
			Every 3000 hours	Clean the DPF.
x			Yearly	Examine the power steering hoses.
x			Yearly	Examine the fuel hoses.
			Yearly	Inspect, clean, or replace the air conditioner elements and cab air filter.
			As necessary	Bleed the air from the fuel system
			As necessary	If the engine has not been started for 12 months or longer, replace the engine oil and filter.
			As necessary	Examine the condition of the battery.
			As necessary	Fill and bleed the air from the coolant system.

Related Links

[Parked diesel particulate filter regeneration](#) page 145

[Automatic diesel particulate filter regeneration](#) page 144

4.1.3 Lubrication fill and drain locations

- Grease fittings
- ⊙ Fill location
- ⊕ Drain location
- ▲ Oil check window
- ⊗ Coolant fill location
- △ Coolant drain location
- Oil check dipstick

Ref	Description	Type
1	Crankcase	Engine oil
2	Radiator	Coolant
3	Radiator overflow reservoir	Coolant
4	Fuel tank	Diesel fuel

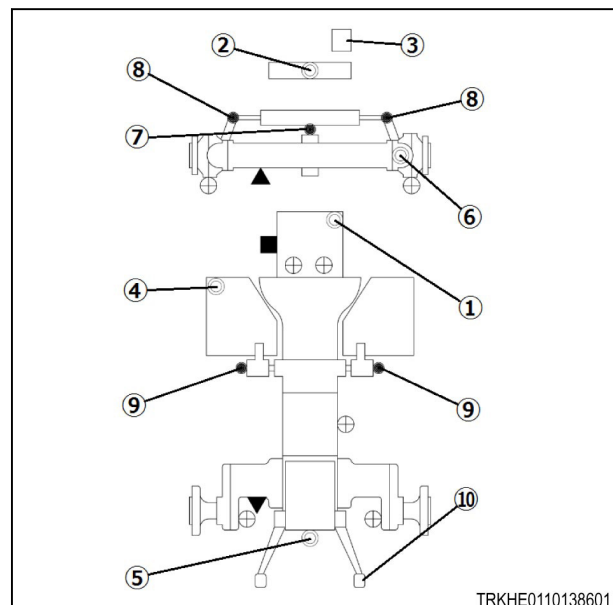


Fig. 1

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Ref	Description	Type
5	Rear housing	Hydraulic oil
6	Four-wheel drive axle	Hydraulic oil
7	Axle pivots	Grease
8	Tie rod ends	Grease
9	Brake pivots	Grease
10	Levelling crank	Grease

4.1.4 Lubrication fittings

Clean the grease gun and the lubrication fittings before and after lubricating to prevent contamination from dirt.

NOTE:

When operating in muddy or extremely wet conditions, lubricate the fittings daily.

4.2 Engine oil and filter

4.2.1 Examine the engine oil

Procedure

1. Park the machine on a solid, level surface. Apply the parking brake, stop the engine, and take the key with you.
2. Wait a short time to let the oil stabilize in the crankcase.
3. Pull out the dipstick (1) from the level gauge guide pipe.

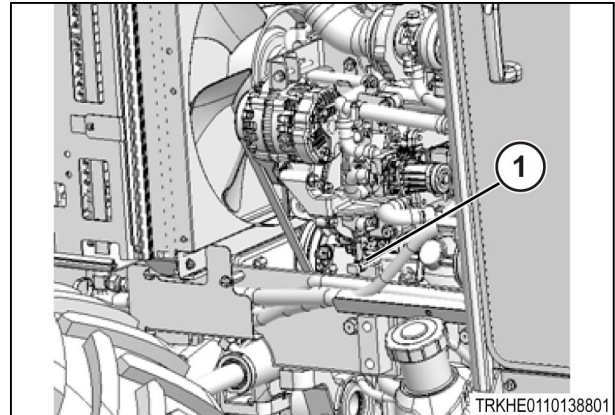


Fig. 2

4. Make sure the oil level is between the full (1) and the lower limit (2) on the dipstick.

IMPORTANT: Change the engine oil, if the oil level is at the upper notch (3).

5. Wipe off the dipstick, momentarily install in the engine, and examine the oil level again.

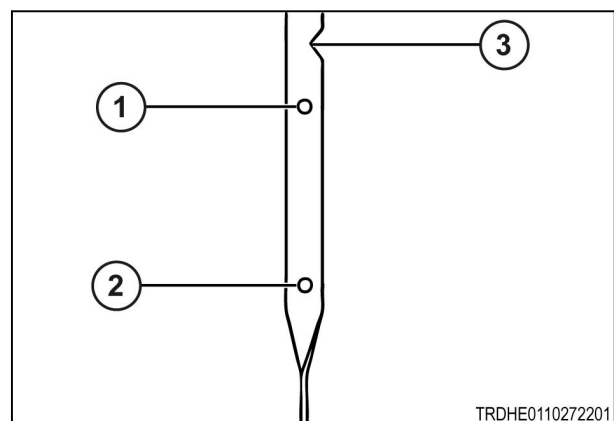


Fig. 3

6. Add oil through filler opening (1) as required.

NOTE:

Add oil slowly to let the air leave the crankcase.

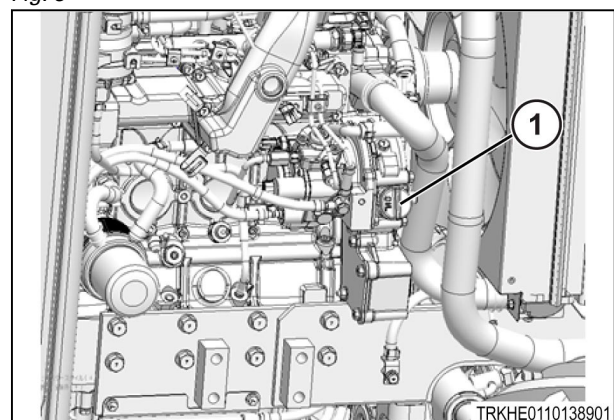


Fig. 4

Related Links

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4.2.2 Change the engine oil



WARNING: Fire hazard. Fuel safety.

Personal injury or machine damage can occur.

Clean up any spilled oil immediately.

IMPORTANT:

Do not leave a combustible material such as cloth and work gloves on and around the engine. Spilled fuel can cause a fire.

IMPORTANT:

When you add oil, be careful not to let dust enter through the oil filler. Foreign material, like dust, entering the system can cause engine damage.

IMPORTANT:

The oil level above the full mark on the dipstick can cause engine problems. Be sure to examine the oil level with the oil level gauge.

IMPORTANT:

Do not dump used oil. It is against by law. For discarding of used oil, see with your local dealer. Change engine oil and the oil filter at the same time. Engine oil analysis is recommended when changing engine oil.

IMPORTANT:

Do not reuse oil filter elements.

Procedure

1. Operate the machine until the engine is warm (temperature gauge must show above the cold mark).
2. Park the machine on a solid, level surface. Apply the parking brake, stop the engine, and take the key with you.
3. Put a catch pan in position.
4. Remove the two drain plug (1) from the oil pan.



CAUTION: Hot components can burn.

Personal injury can occur.

Use suitable personal protective equipment.

5. When all the oil has drained, install the drain plugs. Tighten to 41 Nm (30 lbf ft) .

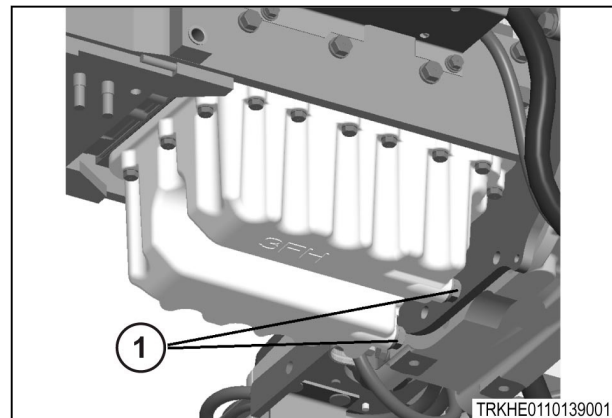


Fig. 5

6. Fill the engine crankcase through the filler opening (1), until the oil level is at the full mark on the dipstick.

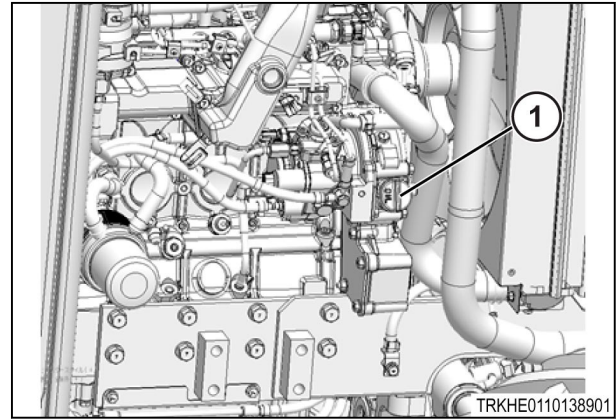


Fig. 6

Related Links

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[Lubrication and maintenance chart](#) page 137

4.2.3 Replace the engine oil filter

Procedure

1. Remove the engine oil filter (1) from the engine and discard.
2. Make sure the original filter gasket has been removed.
3. Lubricate the new gasket on the replacement element with clean engine oil.
4. Install a new oil filter until the gasket contacts the adapter.
5. Tighten the oil filter 3/4 turn by hand or to 17 Nm (13 lbf ft) by wrench.
6. Add engine oil to the engine.
7. Clean any spilled oil.
8. Start the engine and examine for leaks.
9. Examine the engine oil level and add oil as required

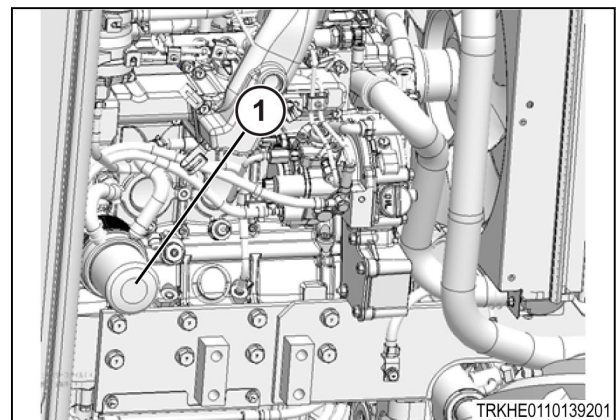


Fig. 7

4.3 Exhaust system - diesel particulate filter (DPF)

4.3.1 Diesel particulate filter system

The diesel particulate filter (DPF) system is an exhaust gas cleaner. When a specified amount of particulate material is reached in the DPF, a DPF regeneration is performed to burn off and remove the particulate material from the DPF.



CAUTION:

During DPF regeneration, the exhaust system becomes hot. Do not operate the tractor near flammable materials during DPF regeneration.

There are three requirements for a DPF regeneration:

- The DPF must contain a minimum specified amount particulate matter.
- The engine must be at a minimum specified load.
- The engine must be at operating temperature.

The engine electronic control unit (ECU) calculates the amount of particulate material in the DPF based on operating time since the last regeneration occurred and by the use of sensors. The DPF system controls the fuel injection, throttle valve, and so on to increase and control the DPF internal temperature during DPF regeneration.



CAUTION:

The DPF system can fail if you leave the tractor running for several hours without monitoring.

There are two types of DPF regenerations:

- Automatic DPF regeneration - performs automatically during the operation of the tractor, if all conditions are met.
- Parked DPF regeneration - you must park the tractor and start the parked DPF regeneration.

4.3.2 Automatic diesel particulate filter regeneration



CAUTION:

During a diesel particulate filter (DPF) regeneration, the exhaust system becomes hot. Make sure to keep the tractor away from flammable material and do not leave the tractor unattended.

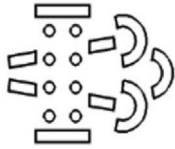
An automatic DPF regeneration occurs during normal tractor operation when the requirements for DPF regeneration are met.

- The DPF must contain a minimum specified amount particulate matter.
- The engine must be at a minimum specified load.
- The engine must be at operating temperature.
- The DPF regeneration inhibit button must be OFF.

Automatic DPF regeneration will stop if any of the requirements for a DPF regeneration are no longer met.

NOTE: *You can continue to use the tractor during automatic DPF regeneration.*

Engine load	Engine speed	Engine temperature
More than 30%	Any speed	More than 70 °C (158 °F)
Less than 30%	Above 2300 rpm	More than 70 °C (158 °F)

	<p>Clogged diesel particulate filter (DPF) lamp</p>	<p>Lamp flashes after you start the tractor when a diesel particulate filter (DPF) regeneration is required.</p> <p>Lamp is ON during a diesel particulate filter (DPF) regeneration.</p> <p>The lamp goes OFF when</p> <ul style="list-style-type: none"> • DPF regeneration is complete. • engine conditions are not met.
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The automatic DPF regeneration will take up to approximately 30 minutes. It is recommended that you let the automatic DPF regeneration finish before you stop the tractor.

Stop or prevent automatic DPF regeneration

The diesel particulate filter regeneration inhibit button (1) will stop a DPF regeneration, or prevent a DPF regeneration. Press and hold the DPF regeneration inhibit button for three seconds to set the inhibit mode ON.

When inhibit mode is ON, the lamp in the DPF regeneration inhibit button will be ON.

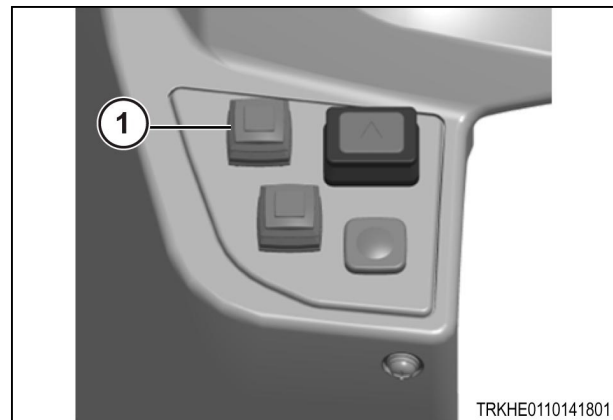



Fig. 8

	<p>DPF regeneration inhibit lamp</p>	<p>Lamp is ON when the diesel particulate filter (DPF) regeneration is inhibited. Press and hold the DPF regeneration inhibit button for three seconds to set the inhibit mode ON or OFF.</p>
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4.3.3 Parked diesel particulate filter regeneration

There are two classifications of parked diesel particulate filter (DPF) regenerations:

- 1st stage - It is highly recommended to complete a parked DPF regeneration, before the tractor's DPF enters the 2nd stage of parked DPF regeneration.
- 2nd stage - Engine speed is limited to 1500 rpm, engine power is limited to 50%, and the alarm will sound. Parked DPF regeneration must be performed immediately. If the tractor does not complete the parked DPF regeneration, contact your dealer.



CAUTION:

During a parked DPF regeneration, the exhaust system becomes hot. Make sure to park the tractor away from flammable material before you start a parked DPF regeneration and do not leave the tractor unattended.

Stage	Clogged DPF lamp	Parked DPF regeneration lamp	Regeneration request alarm	Engine output
1st stage			No audio alarm	Normal output
	ON for 0.5 second ; OFF for 0.5 second	Flashing		
2nd stage			Audio alarm	Engine speed limited to 1500 rpm and engine output is limited to 50%.
	ON for 0.5 second ; OFF for 2.5 seconds	Flashing	ON for 0.5 second ; OFF for 2.5 seconds	

A parked DPF regeneration will take up to approximately 30 minutes to complete. The tractor cannot be moved while you do a parked DPF regeneration.

Stop a parked DPF regeneration

The diesel particulate filter regeneration inhibit button (1) will stop the DPF regeneration. Press and hold the DPF regeneration inhibit button for three seconds to set the inhibit mode ON.

When inhibit mode is ON, the lamp in the DPF regeneration inhibit button will be ON.

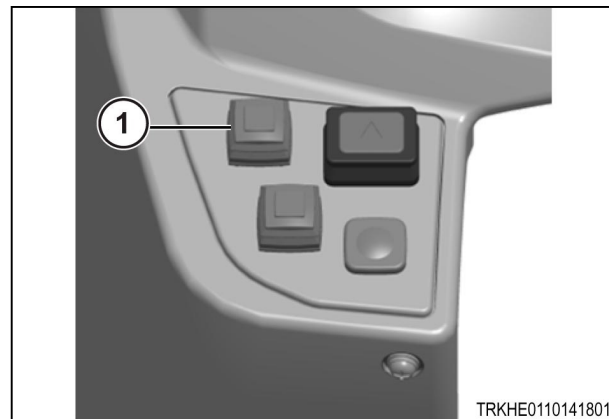


Fig. 9

	DPF regeneration inhibit lamp	Lamp is ON when the diesel particulate filter (DPF) regeneration is inhibited. Press and hold the DPF regeneration inhibit button for three seconds to set the inhibit mode ON or OFF.
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Procedure

1. If the engine is cold, increase the engine speed and let the engine warm.
2. Park the tractor away from any flammable material.
3. Apply the parking brake.
4. Put the range gear shift lever into the neutral position.
5. For power shuttle tractors, put the power shuttle lever into neutral.

6. Make sure that the PTO switch is off.
7. Put all the PTO shift levers into the neutral position.
8. Put the engine speed at low idle.
9. Press and hold the parked diesel particulate filter regeneration button (1) for three seconds.

The lamp in the parked diesel particulate filter regeneration button will be ON.

Result

During a parked diesel particulate filter regeneration, the engine speed will automatically increase to 2300 rpm and the lamps for clogged DPF and parked DPF regeneration will be ON. Once the DPF regeneration is complete, the engine speed will automatically decrease and the lamps for clogged DPF and parked DPF regeneration will go OFF. The lamp in the parked diesel particulate filter regeneration button will go OFF.

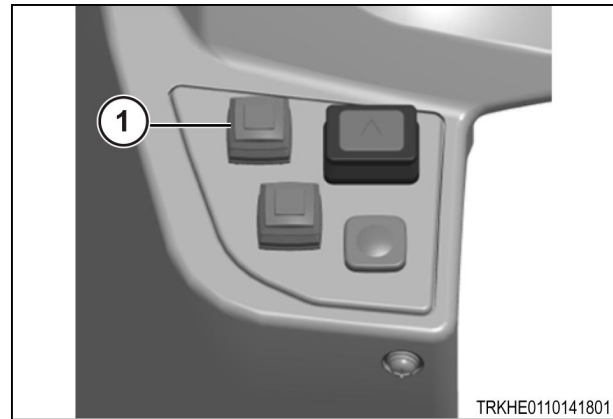


Fig. 10

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4.4 Transmission oil

The transmission oil lubricates the transmission, center housing, and rear axles, and is used as hydraulic fluid.

NOTE:

Adding oil to the transmission will also keep the oil level correct in the center housing and rear axles.

4.4.1 Examine the transmission oil level

Procedure

1. Lower the 3-point linkage and all external hydraulically controlled equipment.
2. Park the machine on a solid, level surface. Stop the engine, apply the parking brake, and take the key with you.
3. Examine the oil level in the oil level window (1).

Result

The oil level must be seen between the lines (A) in the oil level window.

4. If necessary, add oil.
 - a) Remove the filler plug (2).
 - b) Add oil through the filler opening.
 - c) Install the filler plug.

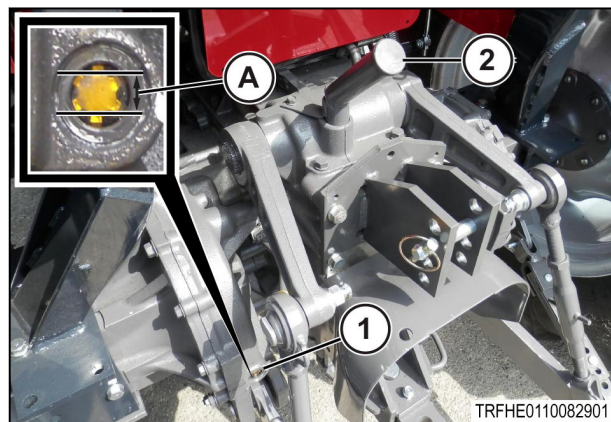


Fig. 11

Related Links

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4.4.2 Change the transmission oil and filter

Procedure

1. Lower the 3-point linkage fully.
2. Park the tractor on a solid, level surface. Apply the parking brake, stop the engine, and take the key with you.
3. Put a catch pan in position.

4. Remove the drain plug (1) and let all oil drain from the system.
5. Loosen the bolt (2) and remove the suction filter (3).

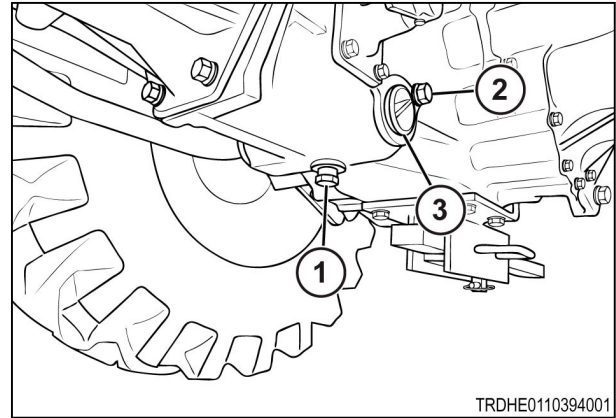


Fig. 12

6. Remove the transmission oil filter (1). Use a filter wrench, if necessary.
7. Make sure that the original filter gasket is fully removed.
8. Clean the filter adapter.
9. Lubricate the gasket on the new filter with clean hydraulic oil.
10. Install the new transmission oil filter until the gasket touches the adapter and tighten an additional 3/4 turn by hand or to 17 Nm (13 lbf ft) by wrench.

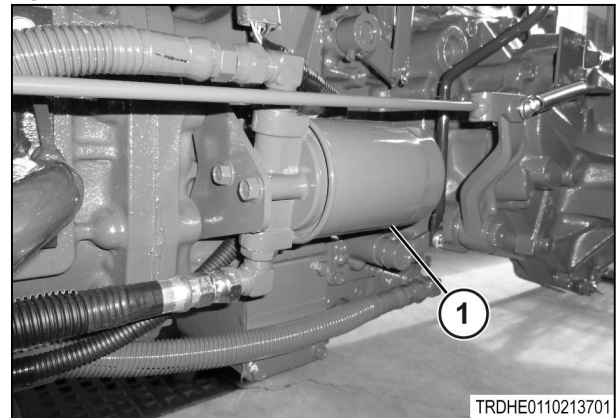


Fig. 13

11. If the tractor has a hydrostatic transmission, there is an additional transmission oil filter.
 - a) Remove the additional transmission oil filter (1).
 - b) Make sure that the original filter gasket is fully removed.
 - c) Clean the filter adapter.
 - d) Lubricate the gasket on the new filter with clean hydraulic oil.
 - e) Install the new transmission oil filter until the gasket touches the adapter and tighten an additional 3/4 turn by hand or to 25 Nm (18 lbf ft) by wrench.

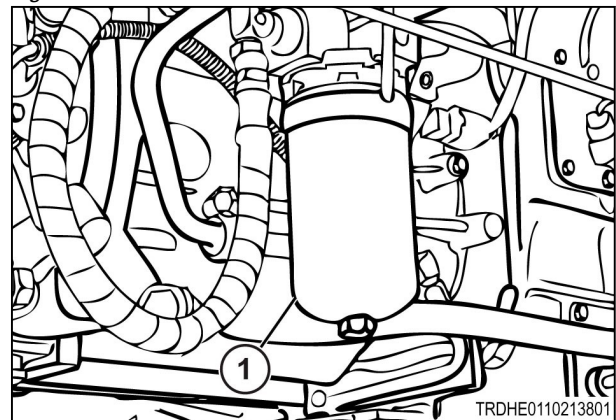


Fig. 14 Hydrostatic tractors

12. Install the drain plug.
13. Fill the system with clean transmission oil.
14. Start the tractor and let idle several minutes while operating the hydraulic controls.

IMPORTANT:

If the hydraulic system does not operate correctly after the transmission oil is changed or after long term storage, see your dealer.

15. Stop the engine and lower the 3-point linkage.
16. Examine the oil level. Add transmission oil as necessary.
17. Examine for leaks, and repair as necessary.

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[Lubrication and maintenance chart](#) page 137

4.5 Front axle oil

The front drive axle has a common oil level for the front differential housing and each wheel reduction unit.

4.5.1 Examine the front axle oil level

Procedure

1. Park the machine on a solid, level surface. Stop the engine, apply the parking brake, and take the key with you.
2. Remove the oil fill plug (1) on the top of the right-hand front axle.
3. Remove the plugs (2) on the top of the final case on both sides of the axle.
4. Examine the oil level.
Make sure that the oil level is at the mid point of the axle shaft inside the front axle housing. If the oil level is low, add oil to the front axle through the fill plug.
5. Install the plugs on the top of the final case on both sides of the axle.
6. Install the oil fill plug.

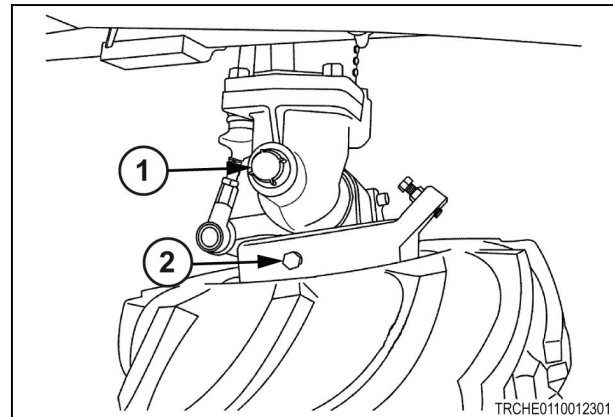


Fig. 15

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4.5.2 Change the front axle oil

Procedure

1. Park the machine on a solid, level surface. Stop the engine, apply the parking brake, and take the key with you.
2. Put suitable catch pans under the drain plugs (1).
3. Remove the drain plugs and drain the oil out of the final case on the front axle.
4. Wrap the threads of the drain plugs with sealing tape.
5. When the oil has drained completely, install the drain plugs securely.
6. Remove the plugs (2) on the top of the final case on both sides of the axle to let air out of the front axle.
7. Fill with oil through the oil fill hole (3).
8. Wait 5 minutes to let air to escape from the front axle.
9. Examine the oil level.
10. Install the plugs on the top of the final case on both sides of the axle.

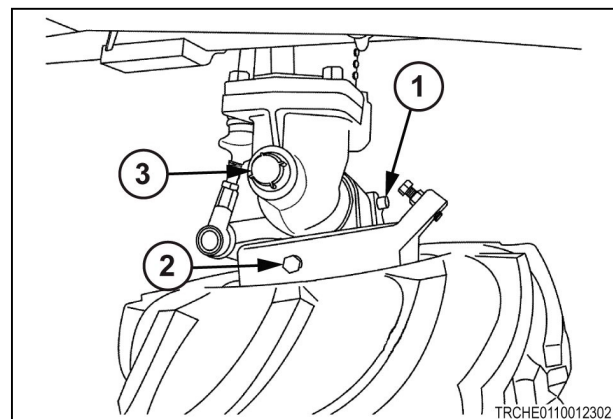


Fig. 16

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4.6 Coolant

4.6.1 Coolant level

The radiator is equipped with an overflow tank (1) to keep the coolant in the radiator at the correct level. Check the coolant level in the overflow tank during the daily inspection.

Open the engine cover. Make sure the coolant level in the overflow tank is between FULL and LOW.

If the coolant is below the LOW level, add coolant to the overflow tank so the level is between FULL and LOW.

IMPORTANT:

Do not fill the overflow tank above the FULL level. Overfilling will prevent the radiator from correctly operating and can cause a coolant leak.

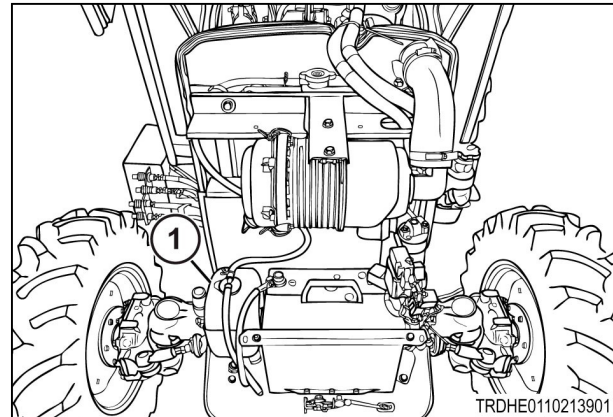


Fig. 17

4.6.2 Replace the coolant

Procedure

1. Park the tractor on a solid, level surface. Apply the parking brake, stop the engine, and take the key with you.
2. Make sure the engine is cool.
3. Put a catch pan in position.
4. Drain the coolant from the radiator and engine.
 - a) Remove the clamp and remove the radiator drain (1).
 - b) Remove the clamp and remove the rubber cap (2) from the engine drain .

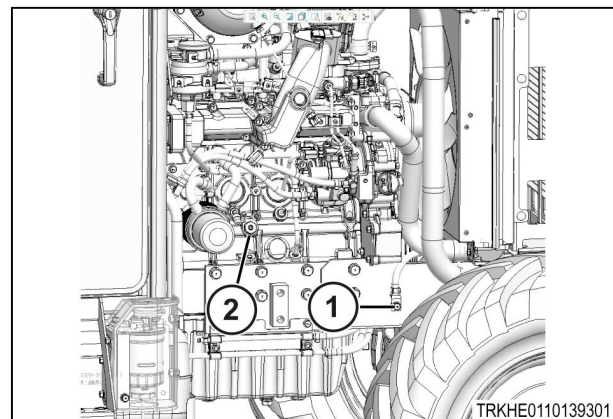


Fig. 18

5. Remove the radiator cap (1). Drain the coolant.
6. Remove the overflow tank (2).
7. Flush the inside of the radiator and the overflow tank with water.
8. Install the overflow tank.
9. Install the radiator drain hose. Attach the hose with the clamp.
10. Install rubber cap onto the engine drain. Attach the rubber cap with the clamp.
11. Fill the cooling system with coolant.
12. Install the cap (3) on the overflow tank.
13. Install the radiator cap.
14. Operate the engine for five minutes at approximately 1500 rpm.
15. Stop the engine and take the key with you.
16. Examine the coolant level and add coolant as necessary. The coolant level must be between LOW and FULL.

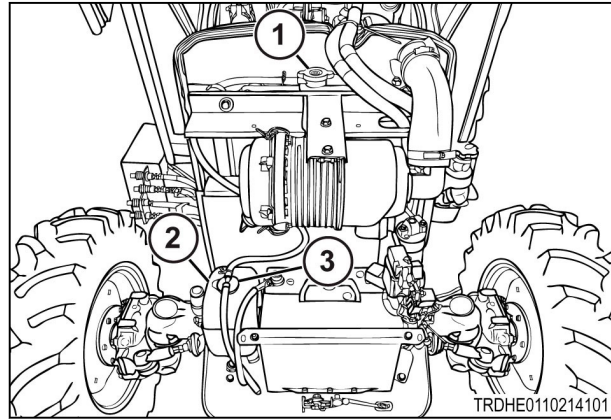


Fig. 19

4.6.3 Coolant

The engine coolant mixture must be 40 to 60 percent ethylene or propylene-glycol based antifreeze and water. The best mixture is 50 percent antifreeze and 50 percent water.

Do not use water only as coolant.



Fig. 20

4.6.4 Clean the radiator



DANGER: Component movement hazard.

Personal injury, death, or machine damage can occur.

Stop the engine and stop all components from moving before servicing.

The radiator screen can plug with grass, straw, insects, and debris. Clean the radiator screen when necessary.

IMPORTANT:

A debris in the radiator fins will cause the engine to become too hot and the engine oil consumption to increase.

Do not apply high pressure water directly to the radiator as this can damage to the fins.

Do not directly spray water on the electrical wiring or electrical parts around the engine.

Procedure

1. Park the tractor on a solid, level surface.
2. Turn the front tires to the right.
3. Apply the parking brake, stop the engine, and take the key with you.
4. Make sure the engine is cool.
5. Open the engine cover.
6. Pull out the radiator screen (1) to the right.
7. Clean the radiator screen.
8. Wash dirt and other debris from between the fins in the radiator core (2) with water.
9. Install the radiator screen.
10. Close the engine cover.

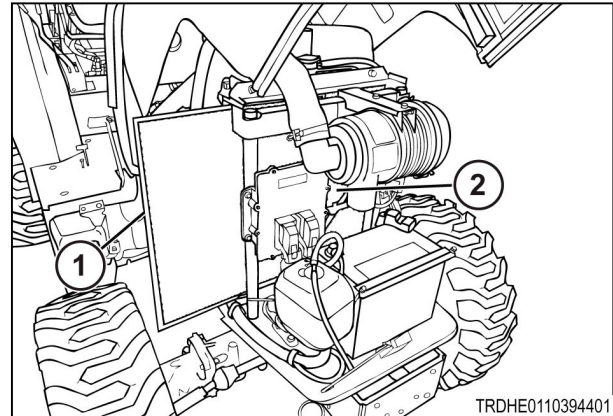


Fig. 21

TRDHE0110394401

4.7 Belts

4.7.1 Engine belt



WARNING: Hot components can burn.

Severe personal injury can result.

Let the engine and components cool before doing maintenance.

IMPORTANT:

If too much tension is applied to the belt, the bearings in the fan will be damaged.

Examine the belt for damage for cracks, peeling, and wear. Replace the belt if you see damage.

The correct engine belt tension helps to make sure there is correct coolant flow through the cylinder block and the radiator.

The tension on the engine belt must be 5 mm to 10 mm (.20 in to 0.4 in) of deflection at 100 N (22.0 lb) of force.

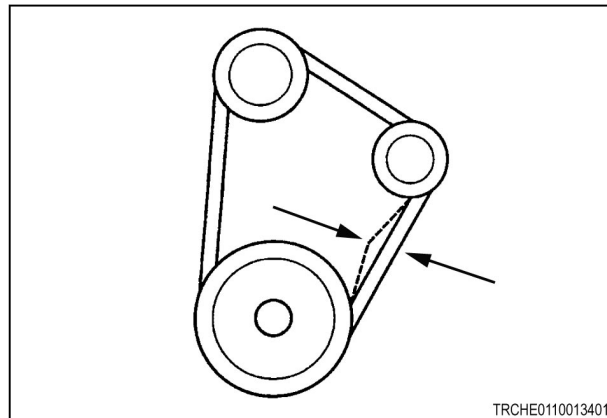


Fig. 22

4.7.2 Adjust the engine belt

The tension on the engine belt must be 5 mm to 10 mm (.20 in to 0.4 in) of deflection at 100 N (22.0 lb) of force.

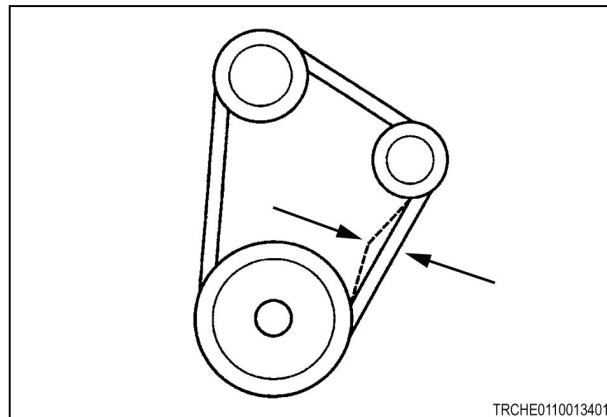


Fig. 23

Procedure

1. Loosen the alternator pivot bolt (1).
2. Loosen the tensioner bracket bolt (2).
3. Pull outward on the top of the alternator to get the correct tension on the belt.
4. Tighten the tensioner bracket bolt.
5. Tighten the alternator pivot bolt.

IMPORTANT:

Do not pry against the alternator housing or pulley. Carefully pry against the alternator mounting flange to prevent damage.

IMPORTANT:

If too much tension is applied to the belt drive, the bearing in the alternator will be damaged.

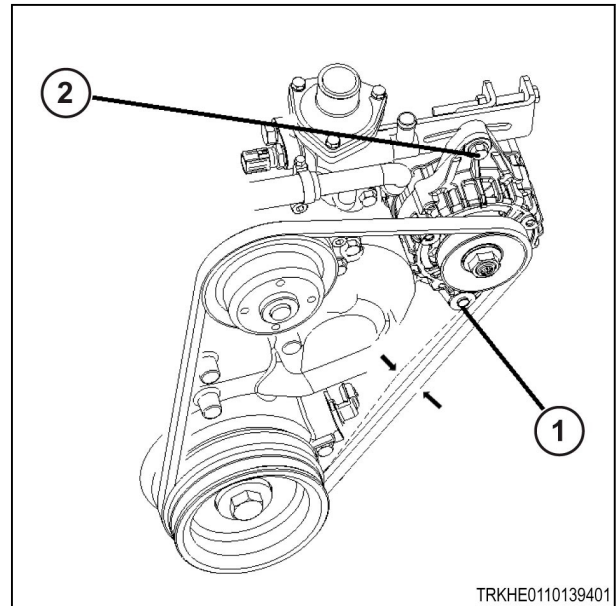


Fig. 24

4.7.3 Adjust the air conditioner compressor belt

The tension is correct when the belt deflects 10 mm to 15 mm (0.4 in to 0.6 in) when pushed by hand between the pulleys.

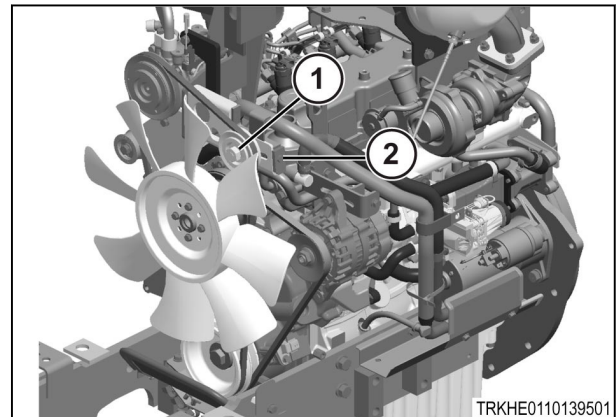


Fig. 25

Procedure

1. Loosen the tensioner nut (1).
2. Use the adjustment bolt (2) to move the tensioner pulley.
3. Tighten the tensioner nut.

After finishing the procedure

NOTE: *Check the tension of a new belt after one hour of operation. Adjust the tension if necessary.*

4.8 Engine air filter

IMPORTANT:

Never operate the engine with the air filters removed.

Open the engine cover to service the air filter (1) and the dust ejector (2).

The dust ejector is a trap for dust deposits that fall from the outer element.

Periodically squeeze the dust ejector to release the deposits. If the deposits are damp, wipe the ejector clean with a cloth.

NOTE:

Regular cleaning of the dust ejector can reduce filter element maintenance.

The air filter (1) is a dry paper element that filters dust particles from the intake air.

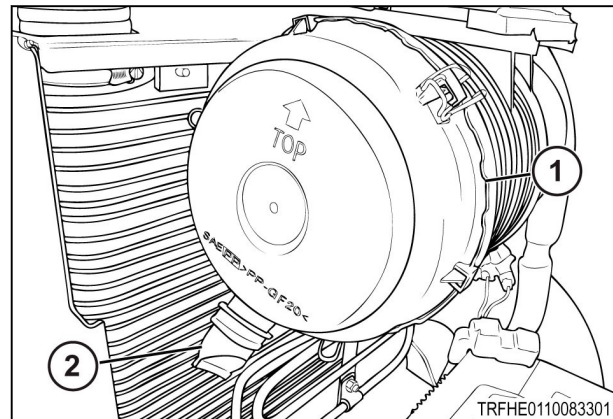


Fig. 26

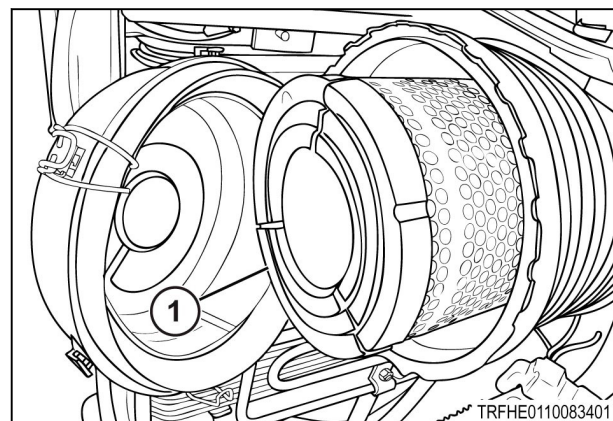


Fig. 27

4.8.1 Replace the engine air filter

Procedure

1. Open the engine cover.
2. Release the latches (1) on the air filter housing.
3. Remove the cover from the air filter housing.

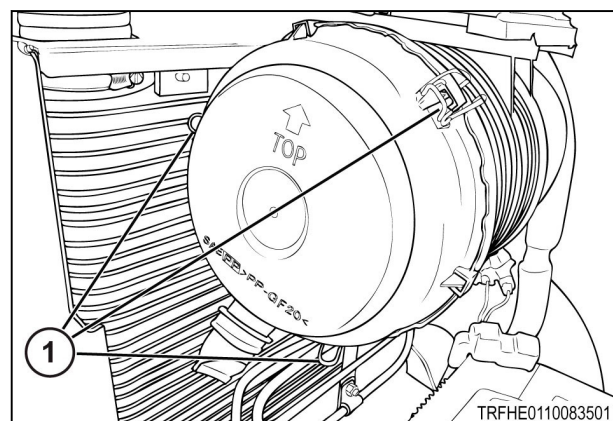


Fig. 28

4. Pull the outer filter element (1) from the air filter housing (2).
5. If there is moisture in the air filter housing, wipe the inside with a clean cloth.

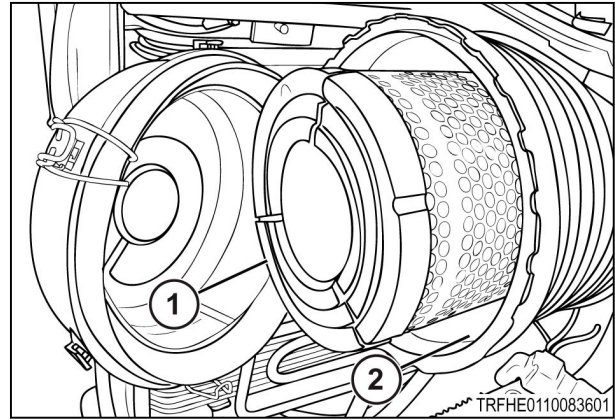


Fig. 29

6. Pull the inner element (1) from the air filter housing.
7. Inspect the inner element.
If the color of the element is not the correct color (indicating dirt) or is damaged, replace the inner and outer elements.

IMPORTANT:

Do not clean the inner element. The inner element protects the engine from dust entering if the outer element fails.

8. Install the outer element.
9. Install the cover.
10. Close the latches.
11. Close the engine cover.

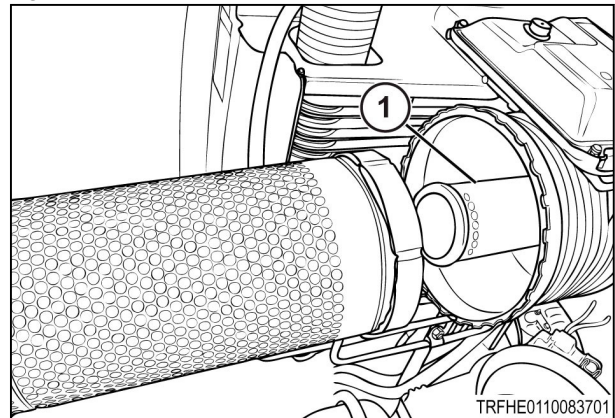


Fig. 30

4.8.2 Clean the engine air filter

IMPORTANT:

- Only use an air filter designed for your tractor.
- Do not use a single air filter element.
- A wrong air filter can cause an intake air volume sensor error.
- A wrong air filter can change the temperature of the DPF regeneration and cause DPF soot accumulation.
- Clean the air cleaner frequently. A restricted air filter can decrease engine combustion and restrict the DPF.
- When you clean the air filter / air cleaner, pay attention not to damage the air flow sensor. Do not blow high pressure air or spray cleaner onto the sensing parts of air flow sensor.

The air filter (1) can be cleaned (if in good condition).

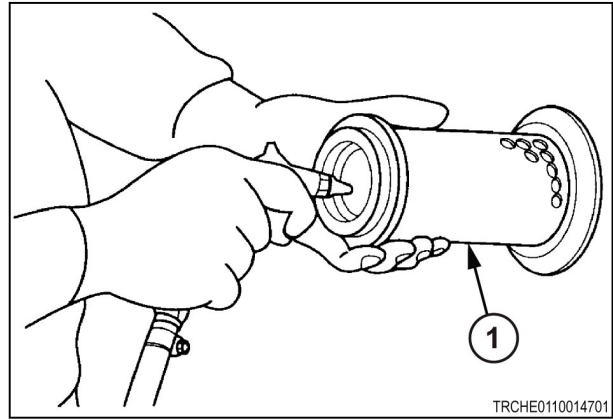


Fig. 31

Procedure

1. Remove loose dirt, grass, chaff, and other debris using compressed air not more than 200 kPa (30 psi) from inside the element. Be careful not to damage the element pleats with air flow.
2. After the element is clean, examine the element for pin holes, punctures, or tears. If the element paper, canister or seal show any signs of damage, replace the element.

IMPORTANT:

Do not hit the filter element against a rock, concrete or other hard item when cleaning. This can result in damage of the filter element, reducing engine performance.

4.9 Cab air filters

4.9.1 Change the cab air filter



Fig. 32

The air conditioner filter (1) is in the left-hand side of the roof. Inspect and clean the air conditioner filter every month, depending on use and conditions.

NOTE: *Neglected cleaning of the air filter will cause deteriorated airflow rate, along with problems with the air conditioner unit.*

Procedure

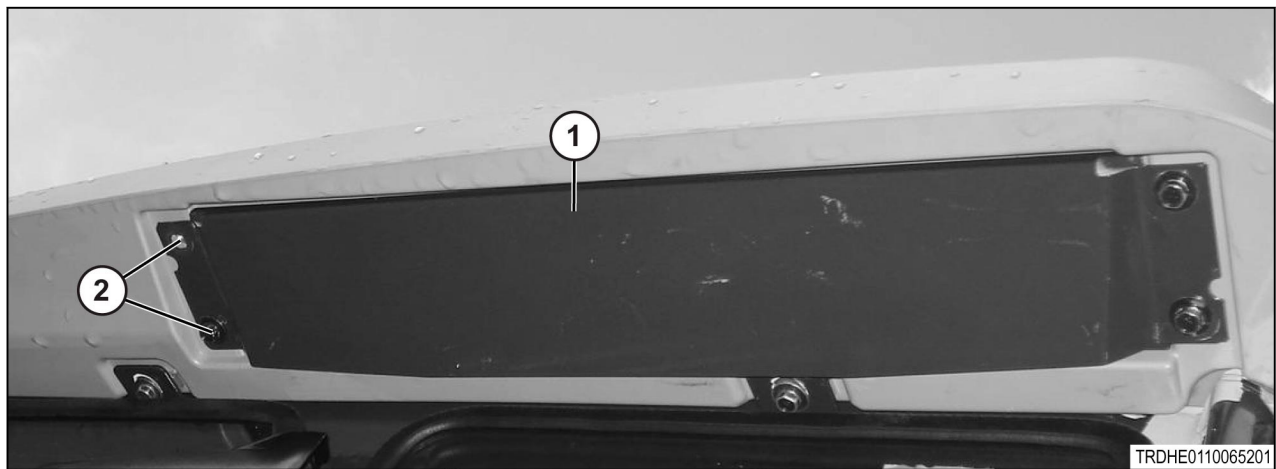


Fig. 33

1. Remove the four screws (2), and open the filter cover (1).
2. Remove the air conditioner filter (1).

NOTE: *The air conditioner filter and filter cover (2) can be removed at the same time.*

3. Blow the filter with compressed air from the opposite side of air flow.
4. Install the filter.

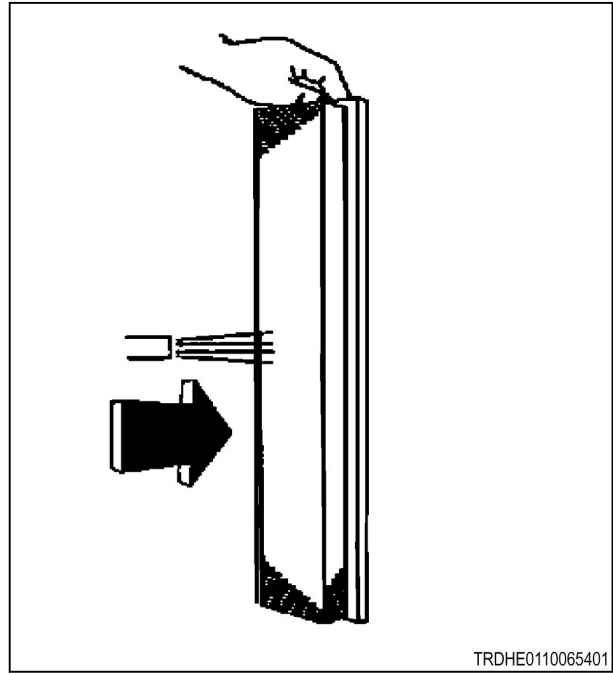


Fig. 35

4.9.2 Service the recirculation air filter

Procedure

1. Remove the cover (1).
2. Remove the air filter (2).
3. Clean the air filter.
IMPORTANT: Do not damage the element pleats with compressed air.
4. Inspect the air filter and replace if damaged.
5. Install the air filter.
6. Install the cover.

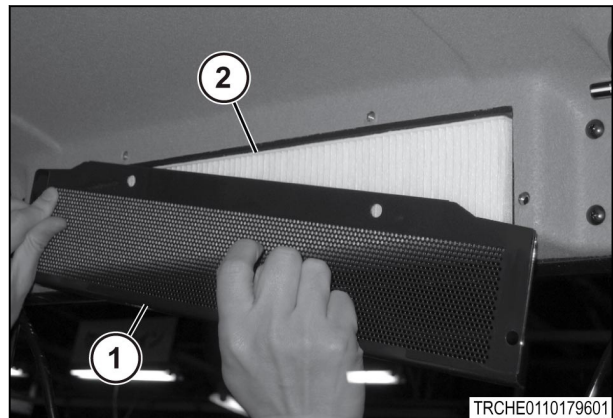


Fig. 36

4.10 Fuel system



WARNING: Fire hazard. Fuel safety.

Personal injury, death, or machine damage can occur.

Stop the engine and let the engine cool before fueling. Never smoke while fueling the machine.

IMPORTANT:

Do not tamper with the injection pump or the injector adjustments. Tampering will cause severe engine damage or engine failure. The warranty will not cover a machine with tampering.

Use only clean ultra low sulfur diesel fuel of correct grade. Water or dirt in the fuel tank or other parts of the fuel system can cause repeated blockage of the fuel filter and possible injection pump damage.

Keep the area around the fuel cap clean and use only clean diesel fuel to prevent dirt and water from getting into the fuel tank when filling.

Do not let the fuel tank go completely empty.

Keep the fuel tank full to reduce condensation.

4.10.1 Fuel filters

The fuel filter (1) is located on the right side.

The fuel filters strain the fuel before the fuel enters the injection pump.

The area around the fuel filters must be completely clean when servicing the fuel filters.

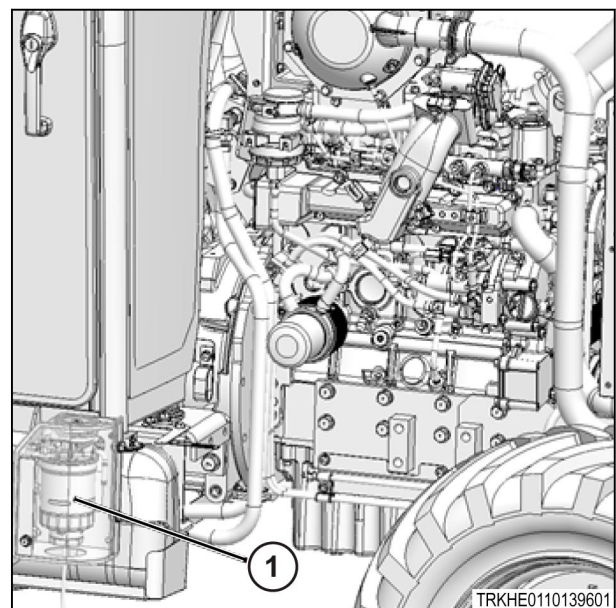


Fig. 37

4.10.2 Drain water from the fuel filter

Drain the water from the fuel filter:

- Weekly
- Every 50 hours of operation

If foreign materials stick to the drain plug mounting section, the O-ring can be damaged. If the O-ring is damaged, fuel will leak and a fuel leak can cause fires.

Procedure

1. Clean the area around the fuel filter (1).
2. Examine the filter bowl for deposits of sediment or water. Clean as necessary.

NOTE: *If there is some sediment or water deposits in the filter bowl, the water in the fuel lamp will illuminate.*

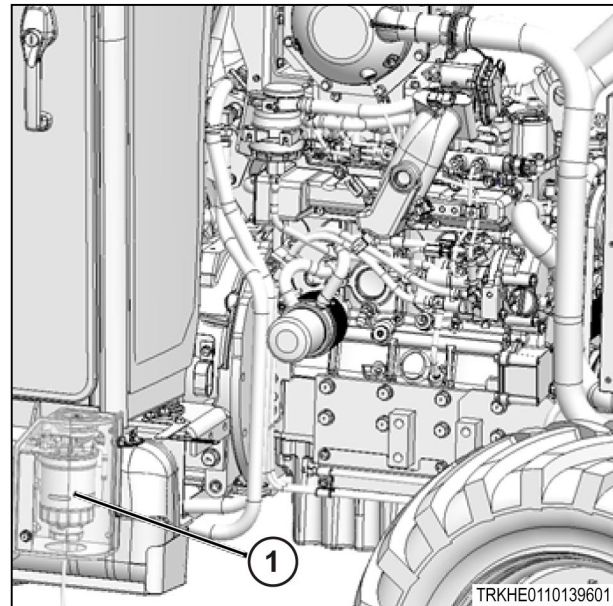


Fig. 38

3. Put a container under the main fuel filter.
4. Open the drain plug (1) located on the bottom of the fuel filter.
5. When the water is drained, close the drain plug and tighten to 1 Nm (8 lbf inches)

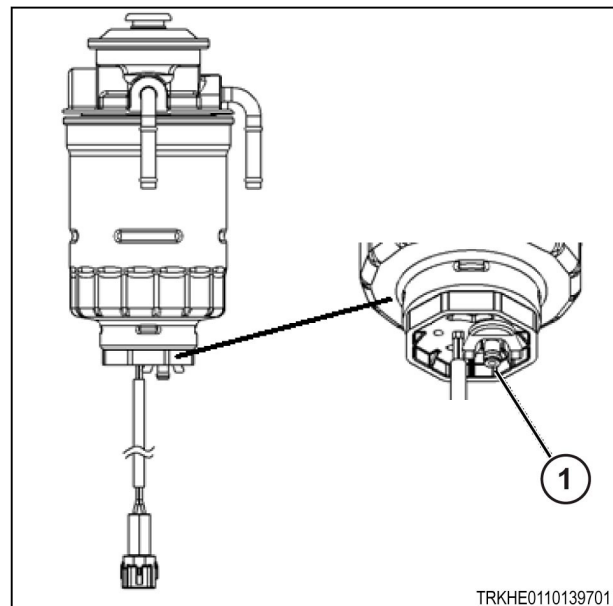


Fig. 39

4.10.3 Replace the fuel filter**IMPORTANT:**

Do not use a solvent for the cleaning of the filter housing and drain plug. The inside rubber parts and filter housing will be damaged.

Procedure

1. Open the drain plug (1) to drain the fuel.
2. Loosen the water level sensor unit (2).
3. Remove the filter housing (3).
4. Remove the filter from the filter housing.
5. Install a new filter in the filter housing.
6. Hand tighten the filter housing to the filter head.
Tighten to 17 Nm (150 lbf inches).
7. Tighten the water level sensor unit. (
Tighten to 5 Nm (43 lbf inches).
8. Push the pump (4) to remove the air from the fuel filter.
9. Start the engine and run at an idle for several minutes.
10. Stop the engine, and take the key with you.
11. Examine the fuel filter for any leaks.

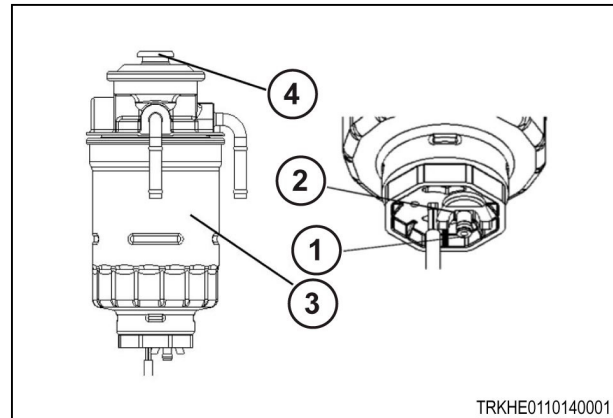


Fig. 40

4.10.4 Remove air from the fuel system


WARNING: Fire hazard. Fuel safety.

Personal injury, death, or machine damage can occur.

Clean up any spilled fuel immediately.

Procedure

Push the top of the fuel filter (1).

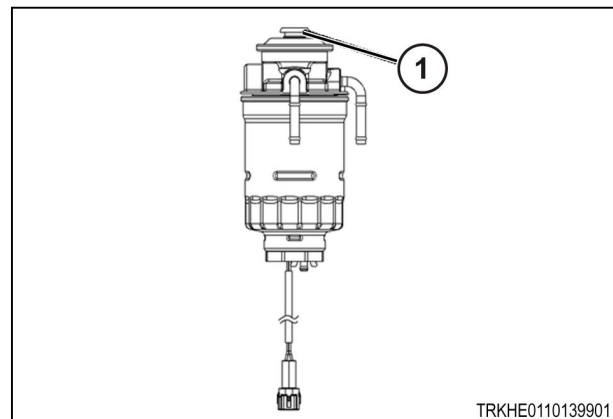


Fig. 41

4.10.5 Fuel tank filler cap

When the fuel tank filler cap is removed, a hissing or popping noise can be heard. This is because of the cap design and is a normal condition. Do not change the cap or use an unapproved replacement as fuel leakage can occur during possible machine upset.

4.10.6 Hand throttle lever

The hand throttle lever must remain in the position selected by the operator. Through normal use, friction against the hand throttle lever can decrease, causing the hand throttle lever to move out of the selected position. Turn the adjusting nut (1) as required to hold the hand throttle lever in the selected position.

NOTE:

Remove the side cover to get access to the adjusting nut.

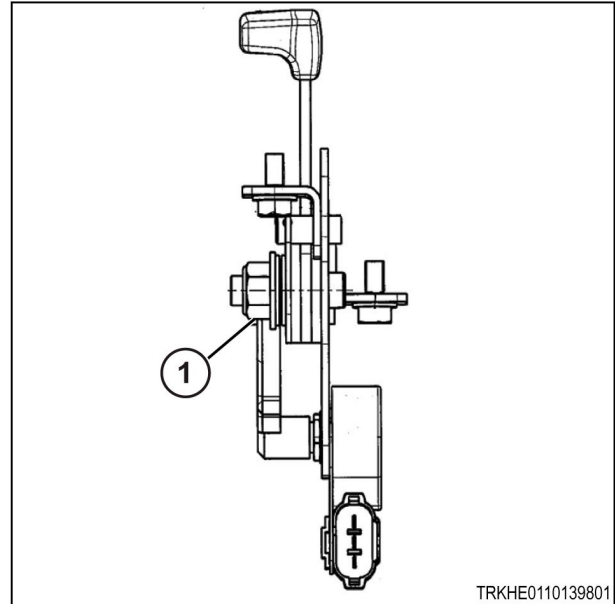


Fig. 42

4.11 Electrical system

4.11.1 Battery



WARNING: Battery explosion and acid hazard.

Battery gases are explosive and acid is corrosive. Personal injury or death can occur.

Keep sparks or open flame away from the battery. Always disconnect the grounded (-) cable first. If fluid comes in contact with skin or cloths, wash fluid off immediately. If fluid is ingested or gets in the eyes, seek medical help immediately. Never charge a frozen battery.

When charging the battery from an external source, set charging voltage below 16 volts. Set charging ampere below 1/10 (one tenth) of the battery capacity (13.0 A or less). The battery temperature must not rise above 45 °C (113 °F).

If you have any questions about the battery, contact your dealer.

The battery (1) is located under the engine cover in front of the radiator.

Keep the top of the battery clean. Make sure the cable connections are clean and tight. Debris on the battery can cause discharge of the battery and fire.

The battery is a maintenance free type. It is not necessary to add water to the battery.

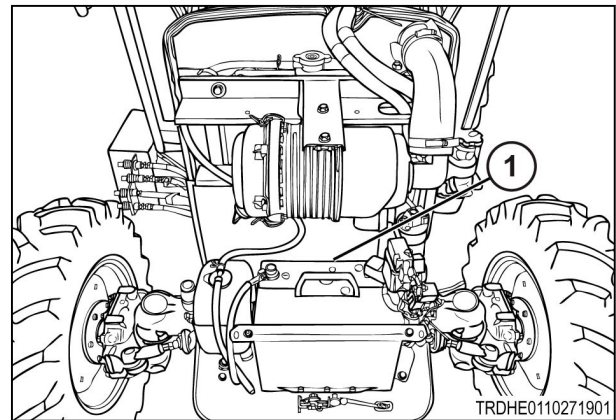


Fig. 43

The battery indicator (1) color shows the battery condition. When checking the battery, park the machine on a level surface and check the indicator at the top of the battery.

If the indicator shows a clear or light green color, tap the battery body to remove the bubble inside the indicator.

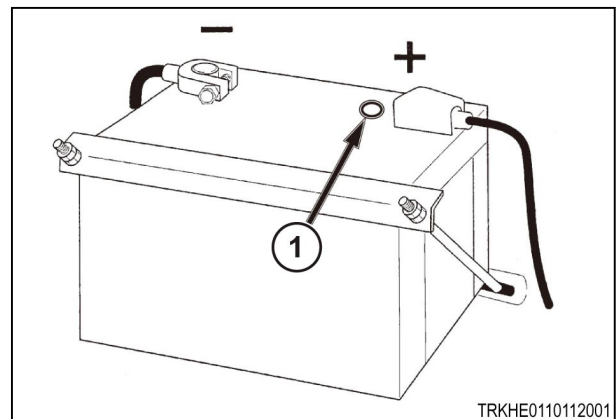


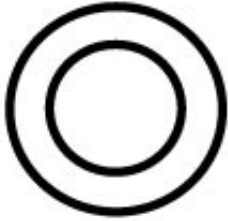


Fig. 44

Indicator Color		Condition	Correction
	Green	Charged	Usable
	Black	Discharged	Charge battery
	Clear	Low electrolyte	Replace battery

If the battery performance is weak, remove the battery and charge the battery with a battery charger. Follow the instructions for the battery charger. Repeated battery charging can be because of a problem with the tractor charging system and/or the battery.

NOTE:

When charging the battery from an external power supply, the battery temperature must not become more than 45 °C (113 °F). If the battery does become too hot, reduce or stop the charge rate.

NOTE:

When handling the battery, never close or cover the battery vent.

The battery will discharge if the machine is in storage for a long time, especially in colder ambient temperatures. Remove the negative battery terminal before storing the machine for more than one month. After storage, check the make sure the battery has enough charge for operation. If in storage for more than six months, charge the battery.

4.11.2 Replace the battery

Before starting the procedure**IMPORTANT:**

Do not reverse the battery cable connections as severe electrical system damage will result.

IMPORTANT:

Never close or cover the vent of the battery.

The battery is a maintenance free type. It is not necessary to add water to the battery.

Procedure

1. Disconnect the negative (-) cable (1) first.
2. Disconnect the positive (+) cable (2).
3. Remove the battery retaining clamp.
4. Remove the battery.
5. Install the battery.

NOTE:

The replacement battery must be the same size and the same capacity.

6. Install the battery retaining clamp.
7. Install the positive (+) cable first.
The positive cable connects to the starter solenoid.

IMPORTANT:

Do not reverse the battery cable connections. This will cause electrical system damage.

8. Install the negative (-) cable.
The negative cable connections to the machine frame.

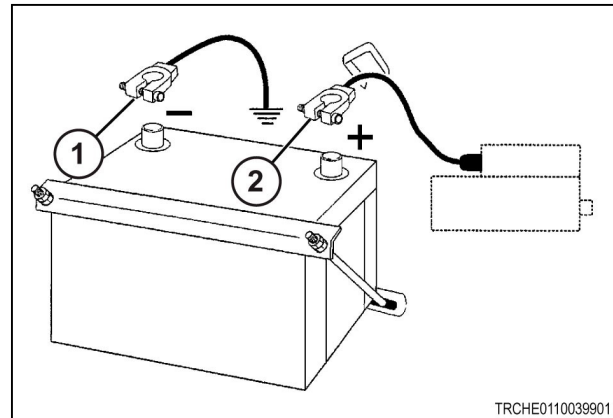


Fig. 45

4.11.3 Start the engine with a booster battery


DANGER:

Bypass starting may override neutral start switches causing death or serious injury. The neutral start switch system is designed to prevent starting the machine in gear. Any manual override of this system can cause death or serious injury. Never connect booster cables to the starter terminals or short across the starter terminals.


DANGER:

When connecting a booster battery or auxiliary power source to the tractor battery as a starting aid, ALWAYS connect the jumper cables as described to prevent possible explosion of hydrogen gas released by the batteries.


DANGER:

Gas given off by batteries is explosive! To avoid personal injury or damage to battery, avoid sparks near batteries.

Procedure

1. Make sure the key switch is in the OFF position.
2. Connect one end of the jumper cable to the positive post of the booster battery.
3. Connect the other end to the positive post on your battery.
4. Connect one end of the second jumper cable to the negative post of the booster battery.
5. Connect the other end to a clean chassis ground on your tractor.
6. Start the machine.
7. Disconnect the jumper cable from the chassis ground on your tractor first.

IMPORTANT:

Make sure the clamp does not touch any other metal while the other end of the cable remains fastened to the starting aid.

8. Disconnect the jumper cable from the negative post of the booster battery.

9. Disconnect the jumper cable from the positive post on your battery.
10. Disconnect the jumper cable from the positive post of the booster battery.

4.11.4 Fuses



WARNING: Electrical system failure.

Serious personal injury or major damage to equipment and components can occur.

Check all electrical systems and connections after working on the machine and before returning the machine to normal operation.



WARNING: Wiring and fuse modification.

Fuse protection and safety features can be bypassed causing personal injury or death.

Do not change the wiring or fuses.



CAUTION: Negative ground system.

Positive circuits can short circuit and be a potential personal injury or fire hazard.

Insulate and shield positive circuits.



WARNING: Fire hazard. Electrical system failure.

Personal injury or machine damage can occur.

Do not replace any fuse with a fuse of higher amperage rating. Do not use wire or foil to bypass the fuse protection.

IMPORTANT:

If fuses blow repeatedly, examine the electrical system for grounded or shorted circuits.

4.11.4.1 Fuse location

Main fuses

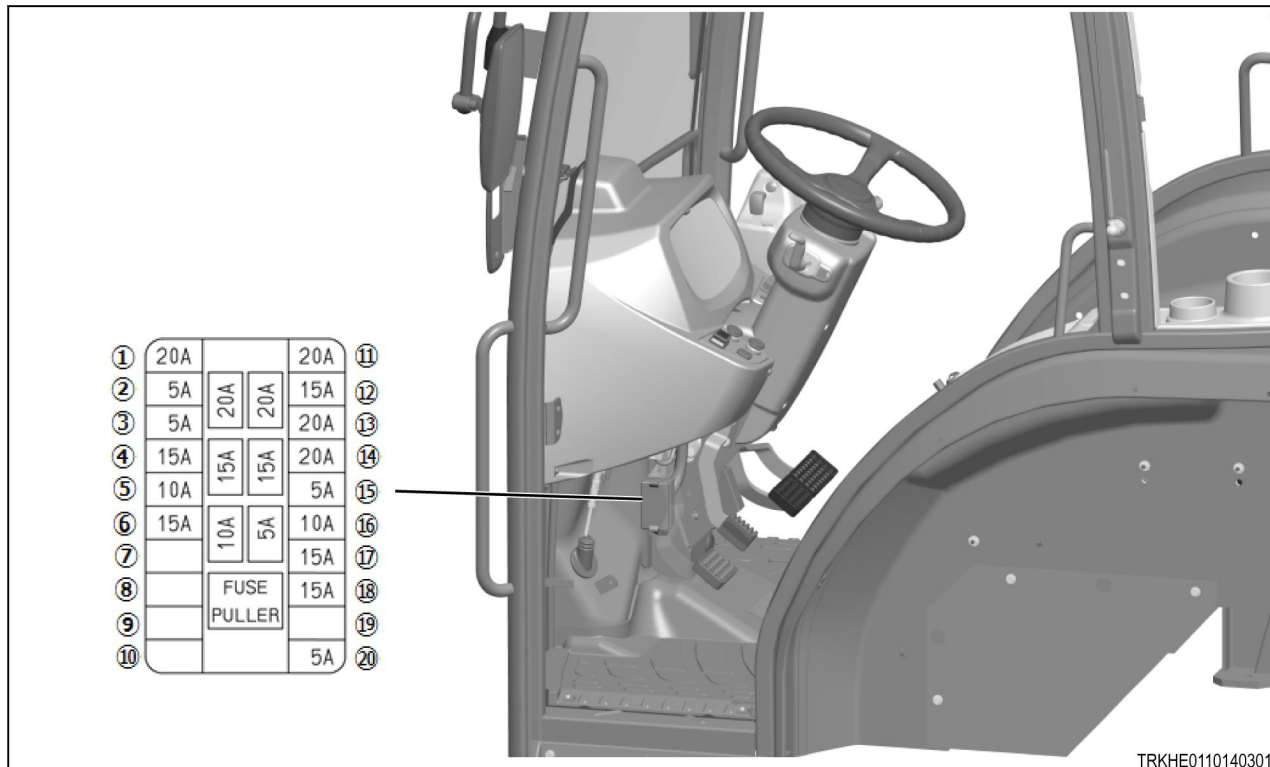


Fig. 46

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Ref	Amp	Function	Ref	Amp	Function
1	20	Audio, power socket, air suspension	11	20	Trailer, 3rd function power supply
2	5	Safety circuit	12	15	Work lamp
3	5	Starting circuit	13	20	Head lamp, tail lamp, position lamp
4	15	Can circuit	14	20	Turn signal, hazard warning lamps
5	10	Instrument panel	15	5	Horn
6	15	Controller	16	10	Constant power to instrument panel
7			17	15	External power
8			18	15	External power
9			19		
10			20	5	Check fuse

Fuses on engine

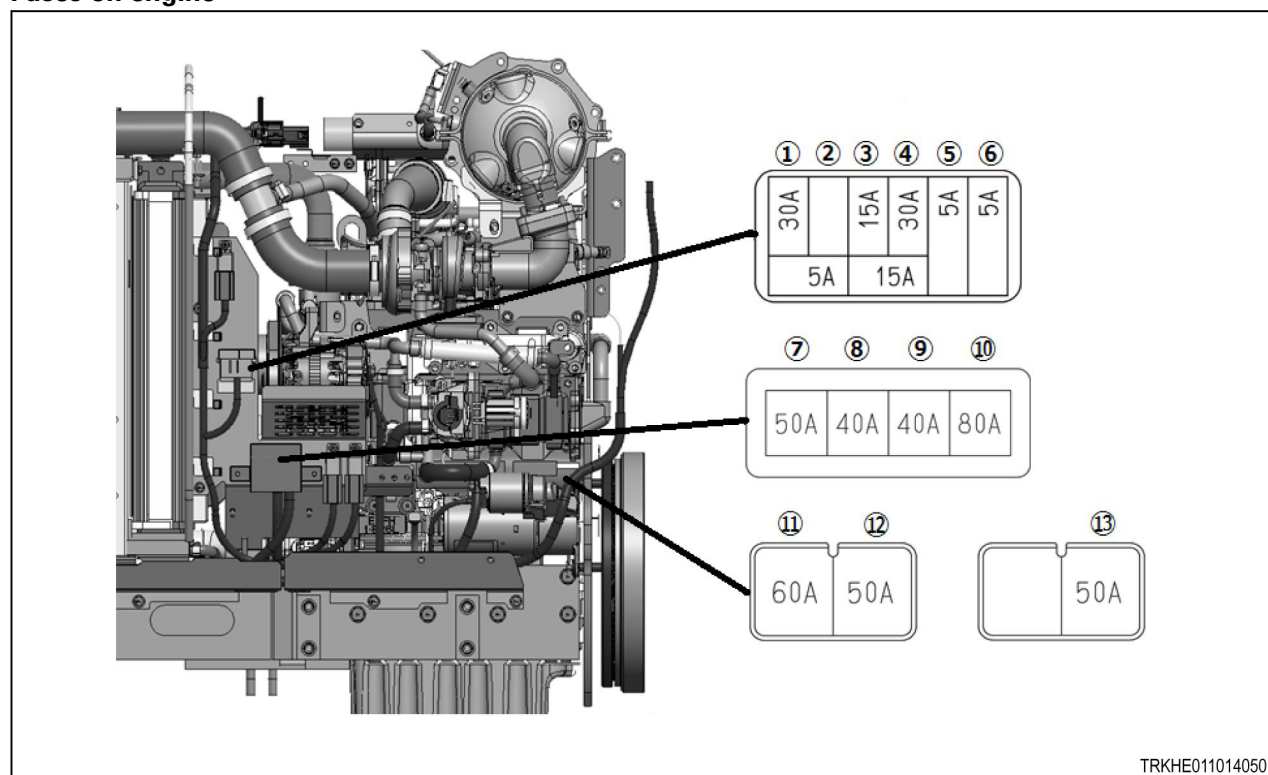


Fig. 47

Ref	Amp	Function
1	30	Extra fuse
2		
3	15	Glow relay coil, lambda (oxygen) sensor power

Ref	Amp	Function
4	30	Engine ECU, main
5	5	Main relay coil
6	5	Engine ECU (+Battery)

Ref	Amp	Function
7	50	Main circuit, starter
8	40	Engine ECU
9	40	Glow plug
10	80	Charge circuit

Ref	Amp	Function
11	60	Cab circuit
12	50	Main circuit (+Battery)

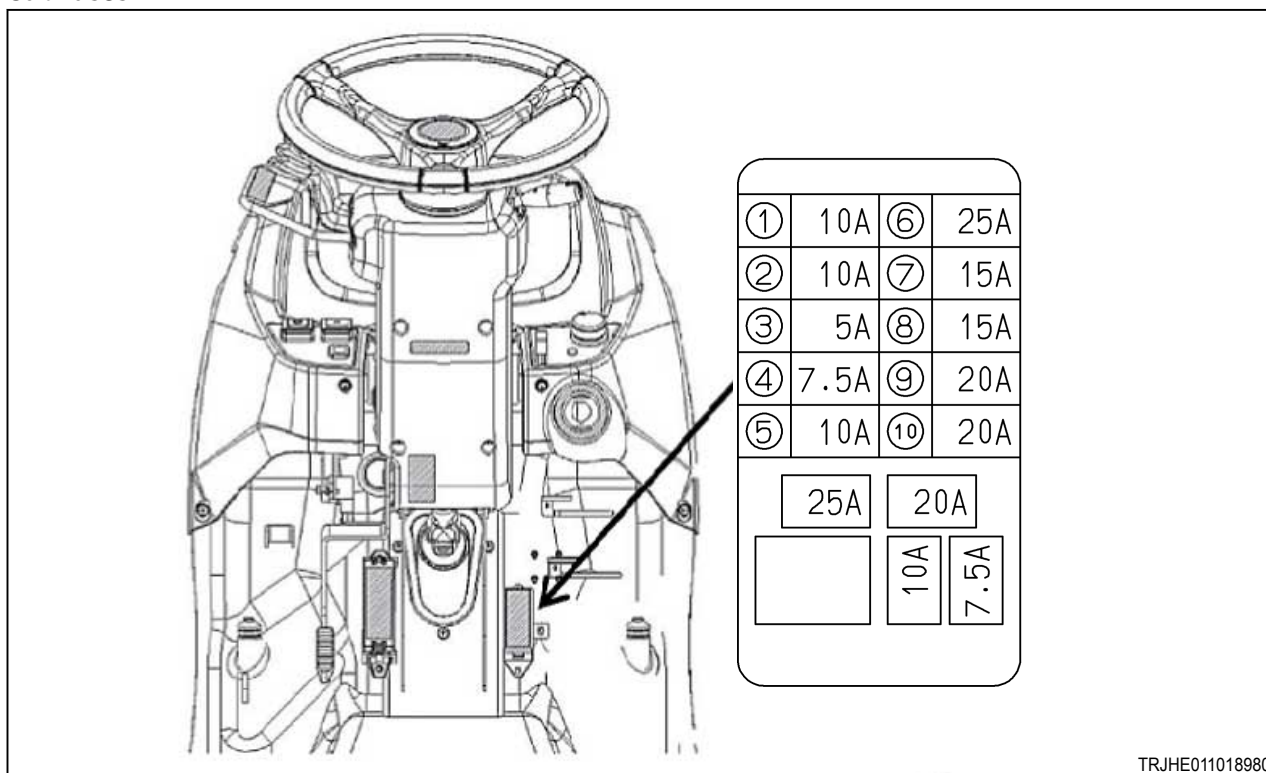
Cab models

Ref	Amp	Function
13	50	Main circuit (+Battery)

Platform models

To remove a slow blow fuse, remove the screw that fasten the wire to the terminal on the slow blow fuse.

Cab fuses



TRJHE0110189802

Fig. 48

Ref	Amp	Function
1	10	Front work lamps
2	10	Rear work lamps
3	5	Audio (ACC)
4	7.5	Air conditioner
5	10	Wiper switch, washer motor, work lamp, rear defroster
6	25	Cab fan
7	15	Brake lamp
8	15	Cab lamp, defroster
9	20	Front windscreen wiper
10	20	Rear windscreen wiper

4.11.5 Relay - function and location

Engine relays

The engine relays are on the left side of the engine by the radiator.

	Function
1	Main
2	Starter
3	Glow plug

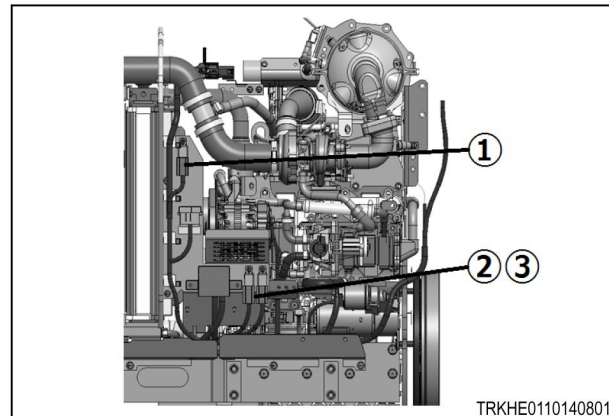


Fig. 49

Vehicle relays

The vehicle relays are on the firewall of the console.

	Function
1	Flasher
2	Timer relay
3	Function relays (5P type)

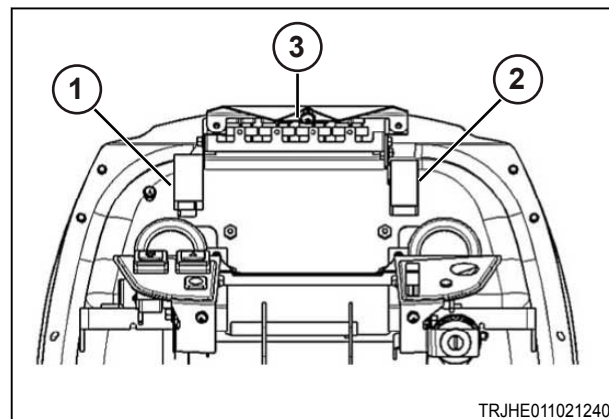


Fig. 50

Vehicle relays - hydrostatic tractors

	Function
A	Safety relay
B	Brake pedals
C	IG signal
D	Range gear shift neutral detection
E	External source
F	Stop lamp - left
G	Stop lamp - right
I	Brake lamp (deluxe cab only)

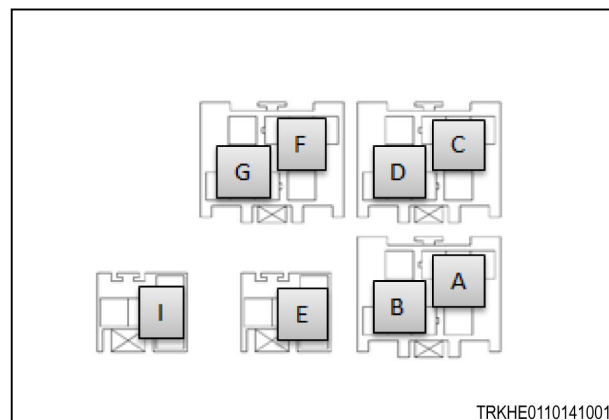
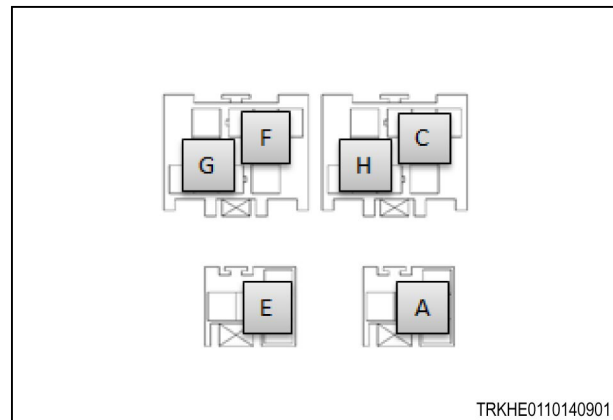


Fig. 51

Vehicle relays - power shuttle tractors

	Function
A	Safety relay
C	IG signal
E	External source
F	Stop lamp - left
G	Stop lamp - right
H	Forward/reverse shift neutral detection



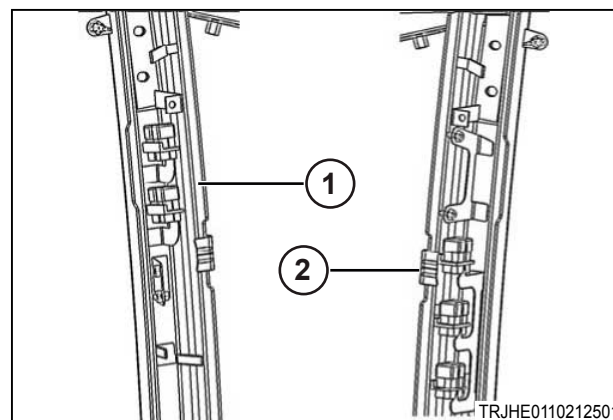
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Fig. 52

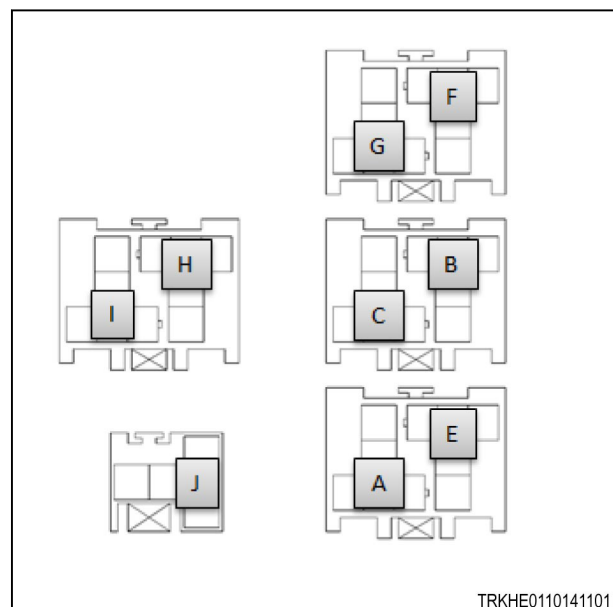
Cab relays

The cab relays are on the left side (1) center cab post and right side (2) center cab post.

	Cab post	Function
A	Right	Air conditioner compressor
B	Right	Front wiper
C	Right	Rear wiper
D	Right	Air conditioner
E	Right	Blower motor
F	Right	Blower motor (high)
G	Right	Blower motor (middle)
H	Left	Front work lamps
I	Left	Rear work lamps
J	Left	Defrost relay (deluxe cab only)



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Fig. 53

4.11.6 Connector location

Platform tractors

These connectors are available to install optional accessories:

- (1) External power
- (2) Rear work lamps
- (3) Trailer connector
- (4) Auxiliary power
- (5) Auxiliary power for the third function solenoid valve
- (6) Radio connection
- (7) Forward signal
- (8) Vehicle speed signal
- (9) Electric diagnostic tool (EDT) connector
- (10) Back-up alarm

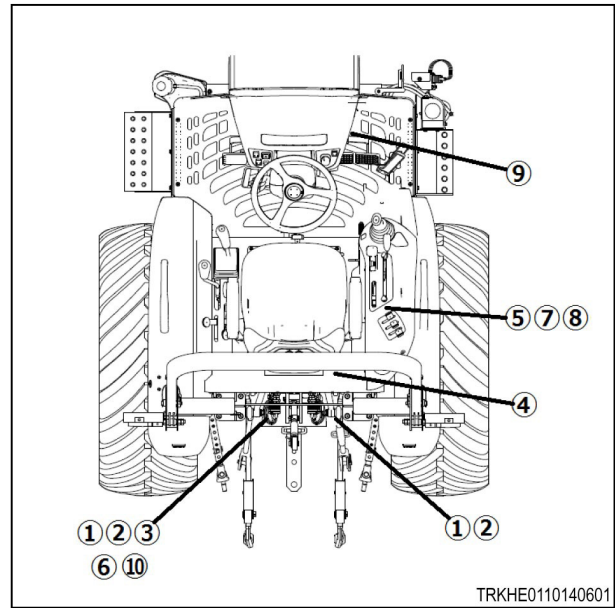


Fig. 54

Cab tractors

These connectors are available to install optional accessories:

- (1) Radio connection
- (2) Trailer connector

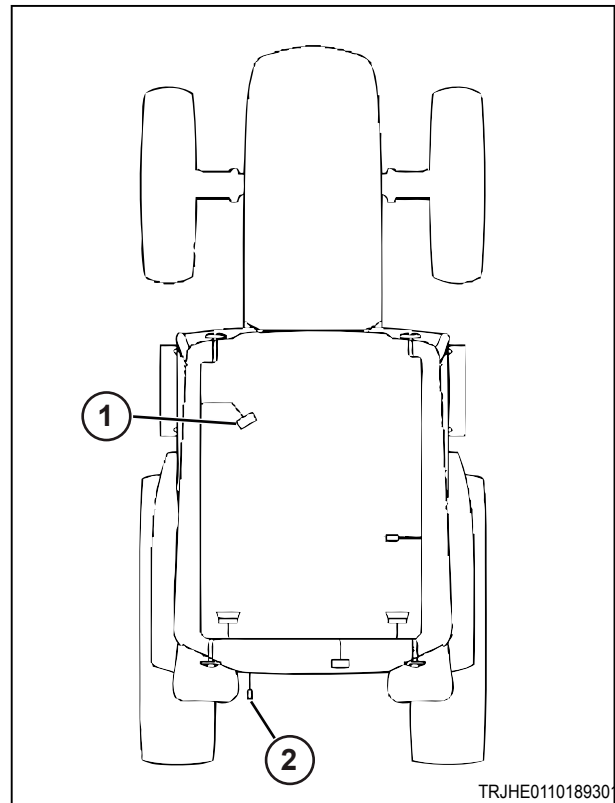


Fig. 55

Trailer connector

Ref	Wire color	Function
1	Black	Auxiliary
2	White/black	Work lamps
3	Green/white	Left-hand turning lamp and warning lamp
4		
5	Green	Right-hand turning lamp and warning lamp
6	Yellow	Tail lamps
7	White/black	Ground

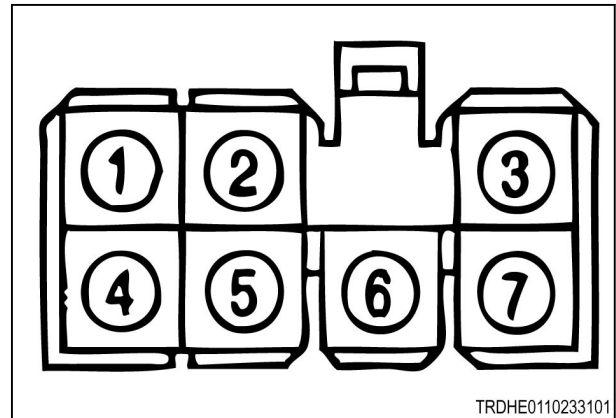


Fig. 56

4.11.7 Examine the neutral start system

Before starting the procedure



WARNING: Neutral safety bypass.

Personal injury can occur.

Do not bypass the neutral switch. If the neutral switch does not operate properly, see the dealer immediately.

The machine has a neutral start system. To start the machine, all the following is necessary:

- Forward/reverse lever in the neutral position (power shuttle tractors).
- Range gear shift lever in the neutral position (hydrostatic tractors).
- Power take-off (PTO) switch in the off position.

IMPORTANT:

Make sure no people or obstructions are around the machine. Sudden movement of the machine can occur.

Make sure the starting circuit is operating correctly.

Test	PTO switch	Forward/reverse lever	Engine starts
1	off	in neutral	yes
2	on	in neutral	no
3	off	in gear	no

Power shuttle tractors

Test	PTO switch	Range gear shift lever	Parking brake	Engine starts
1	off	in neutral	applied or released	yes
2	on	in neutral	applied or released	no
3	off	in gear	released	no
4	off	in gear	applied	yes

Hydrostatic tractors

After finishing the procedure

If the neutral start system is not operating correctly, the neutral start system must be repaired immediately by your dealer.

4.12 Brakes

4.12.1 Examine the brake adjustment

Through use, the free play will increase and the brake balance can change.

Adjust and balance the brakes before there is too much free play.

The correct free play (A) of each single brake pedal is 30 mm to 35 mm (1-3/16 in to 1-3/8 in).

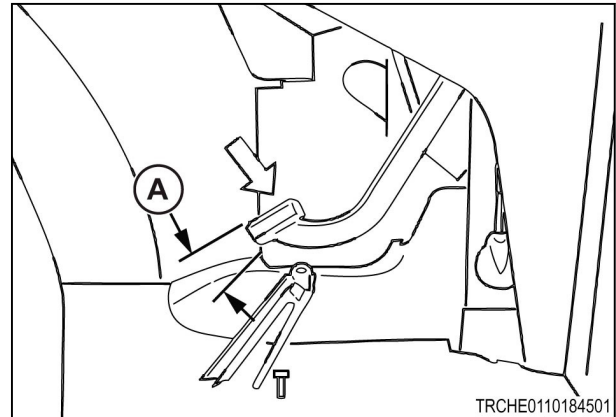


Fig. 57

Procedure

1. Release the brake pedal latch.
2. Put a measuring device at the bottom of the brake pedal.
3. Push the brake pedal down by hand.
4. Measure the brake pedal free play.
5. Examine the other brake pedal.

The free play must be the same for both brake pedals.

4.12.2 Adjust the brakes



WARNING: Machine control hazard.

Personal injury, death, or machine damage can occur.

Lock the brake pedals together with the pedal lock. Make sure the brakes are adjusted equally.

Procedure

1. Loosen the upper lock nut (1) and the bottom lock nut (2).
2. Adjust the pedal turnbuckle (3) so the free play is correct for the brake pedal.

NOTE:

Check for contact between the brake arm and the transmission case boss when only the brake turnbuckle is adjusted.

3. Repeat the procedure for the other brake. The free play in both pedals must be equal.
4. Tighten the lock nuts against the turnbuckles.
5. Latch the pedals together.
6. Operate the tractor at low speed.

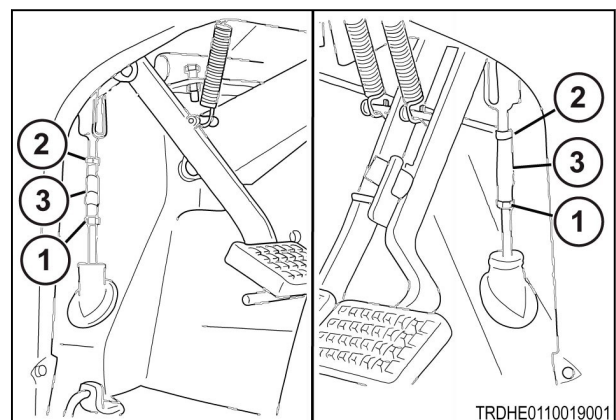


Fig. 58

7. Press the brake pedals.

Result

If the tractor pulls to one side, adjust one brake. Make sure all lock nuts are tight. Examine the operation of the brakes.

4.13 Clutch - power shuttle tractors

4.13.1 Adjust the clutch pedal

Correct free play (A) is 25 mm to 35 mm (1 in to 1.37 in).

IMPORTANT:

The free play for the clutch must be adjusted correctly to reduce wear on the clutch and the release bearing.

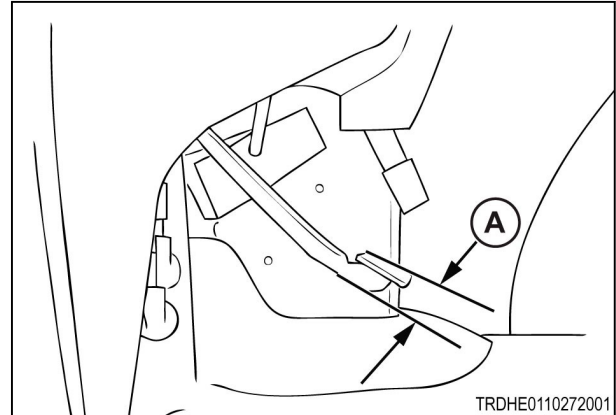


Fig. 59

Procedure

1. Loosen the upper lock nut (1) on the clutch rod or cable.
2. Loosen the bottom lock nut (2) on the clutch rod or cable.
3. Adjust the free play.
 - On platform tractors, adjust the turnbuckle (3).
 - On cab tractors, adjust the lock nuts.
4. Tighten the lock nuts.
5. Examine the operation of the clutch.

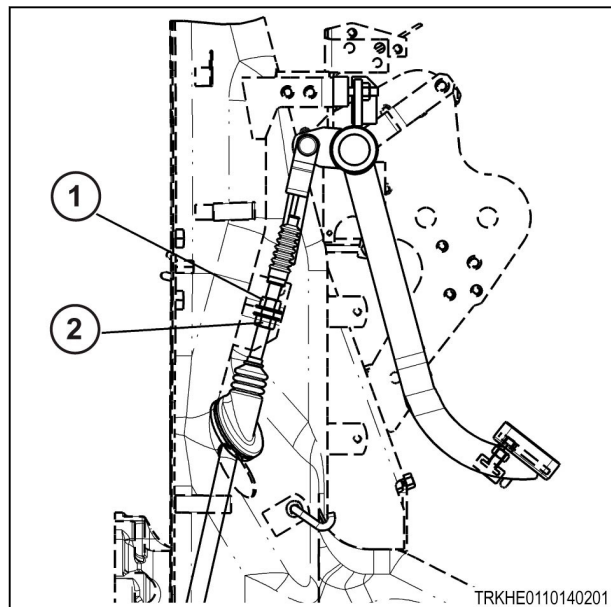
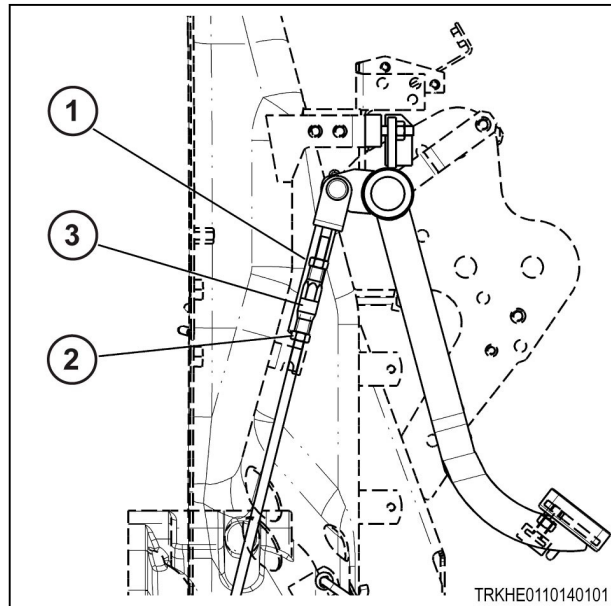


Fig. 60

4.14 Clutch housing plug

Remove the clutch housing drain plug (1) to remove any moisture build up.

Oil draining through the hole indicates leakage from the engine rear crankshaft seal and/or the transmission input shaft. See your dealer if there are signs of oil leakage.

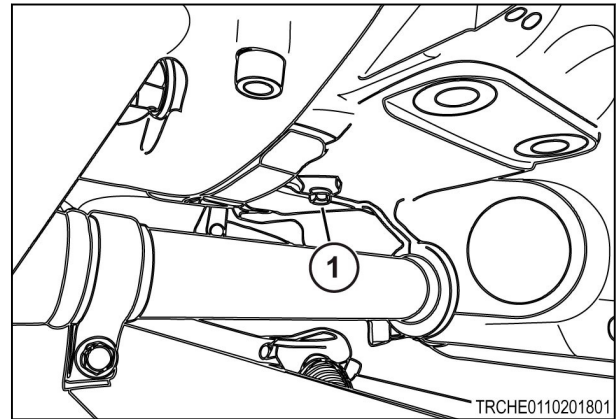


Fig. 61

4.15 Wheels and tires

Examine the wheels and the tires periodically for:

- correct tire pressures
- tight wheel hardware
- any damage that can be dangerous to the tractor operation and the operator safety

Correct the condition before operating the tractor.

Correct tire pressure will help keep the tires in good condition.

If a tire has deep scratches, cuts, or punctures, have the tire repaired or replaced by qualified personnel as soon as possible.

IMPORTANT:

If a tire replacement is necessary, the same tire dimension must be installed to keep the correct front/rear axle ratio.

AG and R-4 tire arrangement must be kept at a 1 to 5 percent front wheel lead ratio. Turf tire arrangement must be kept at a 1 to 3 percent front wheel lead ratio.

Related Links

[Front axle specifications](#) page 223

4.15.1 Tire inflation pressures

Tire type	Tire location	Tire size	Pressure kPa (psi)
AG (R1)	Front	8-16 6 ply	190 (28)
	Rear	13.6-24 6 ply	193 (28)
Turf	Front	27x8.50-15 NHS 6 ply	310 (45)
	Rear	41x14.00-20 NHS 4 ply	170 (25)
R4	Front	10-16.5 NHS 6 ply	340 (49)
	Rear	14.9-24 6 ply	210 (30)
R4	Front	10-16.5 NHS 6 ply	310 (45)
	Rear	17.5L-24 6 ply	166 (24)
R4	Front	25x8.50-14 NHS 6 ply	310 (45)
	Rear	15x19.5 NHS 6 ply	140 (20)
Snow	Front	250/75R16	200 (29)
	Rear	400/80R24	120 (18)

The maximum tire pressures for maximum loads are given. Tire pressure can be reduced as the load on the tire is reduced.

Tire pressures vary according to make, load, and speed as well as to the type of work being carried out. Refer to the inflation tables issued by the tire manufacturers.

4.15.2 Wheel bolt torque



CAUTION:

Correct wheel bolt torque must be maintained. Installation of front or mid mounted implements (for example: loaders, mowers) increase loads and require frequent examination of wheel bolts.

Periodically, examine the wheel bolts torque on the front and the rear wheels.

4.15.2.1 Wheel bolt torque chart

Wheel bolts	Torque
Front wheel lug nut	230 Nm (170 lbf ft)
Rear wheel lug nut	230 Nm (170 lbf ft)
Rear wheel center to rim bolts (Ag and industrial tires only)	230 Nm (170 lbf ft)

4.15.3 Tie rod end



WARNING: Machine control hazard.

Personal injury or machine damage can occur.

The nut on the tie rod end must be tight.

Make sure the nuts (1) on both tie rod ends are tight. If loose, tighten the nuts.

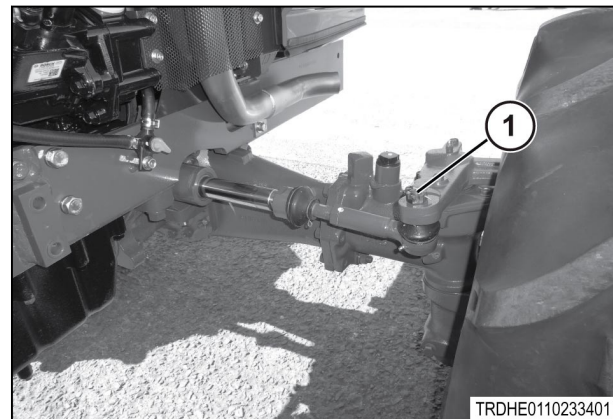
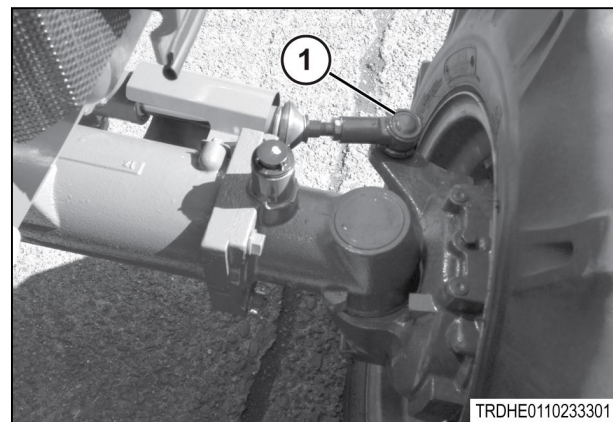


Fig. 62

4.15.4 Adjust the front wheel alignment

The correct toe-in dimensions of the front wheels (A minus B) are 2 mm to 8 mm (0.08 in to 0.31 in).

NOTE:

Measure toe-in from the tire center to the tire center at a point halfway up on the face of each tire.

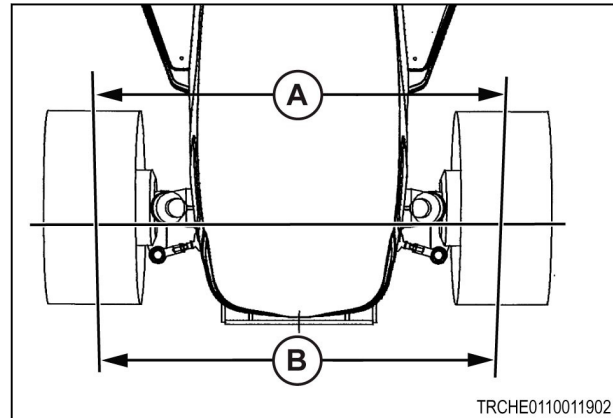


Fig. 63

Procedure

1. Loosen the lock nut.
2. Rotate the tie rod to adjust.

NOTE:

Adjust each side evenly.

3. Tighten the lock nut.

NOTE:

The tie rod ball joints must rotate freely in the cylinder ends. The ball joints must move freely after the nuts are tightened.

4.15.5 Front wheel spacing

The tire spacing is measured from the centerline of each front tire.

Tire type	Tire size	Spacing mm (in)
R1	8-16 6 ply	1130 (44.49)
Turf	27 x 8.50-15 NHS 6 ply	1155 (45.47)
R4	10-16.5 NHS 6 ply	1150 (45.28)
R4	25 x 8.50-14 NHS 6 ply	1160 (45.67)
Snow	250/75R16	1180 (46.46)

4.15.6 Rear wheel spacing



WARNING: Components can be heavy.

Severe injury can result from not lifting correctly.

Use appropriate lifting equipment for heavy components.

Tractors come with the tires in the narrowest position (1).

Three other rear wheel spacing settings are available by:

- reversing the wheel centers
- moving the rear tires and wheels from side to side
- changing the position of the wheel rim on the wheel center

Lug type tires must always be installed so when seen from the rear, the V-pattern of the tread point up.

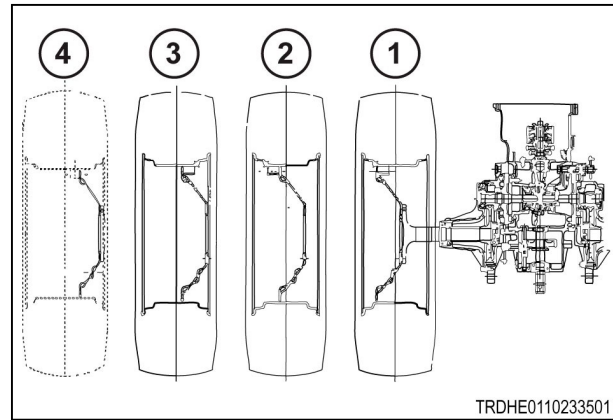


Fig. 64

Tire type	Tire size	Reference	Setting mm (in)
AG (R1)	13.6-24 6 ply	1	1265 (49.80)
		2	1370 (53.94)
		3	1465 (57.68)
		4	1570 (61.81)
R4	14.9-24 6 ply	1	1265 (49.80)
		2	1370 (53.94)
		3	1465 (57.68)
		4	1570 (61.81)
R4	17.5L-24 6 ply	1	1265 (49.80)
		2	1370 (53.94)
		3	1465 (57.68)
		4	1570 (61.81)
Snow	1400/80R24	1	1265 (49.80)
		2	1370 (53.94)
		3	1465 (57.68)
		4	1570 (61.81)

Tire type	Tire size	Reference	Setting mm (in)
Turf	41x14.00-20 NHS 4 ply	1	1165 (45.87)
		2	1270 (50.00)
R4	15x19.5 NHS 6 ply	3	1305 (51.38)

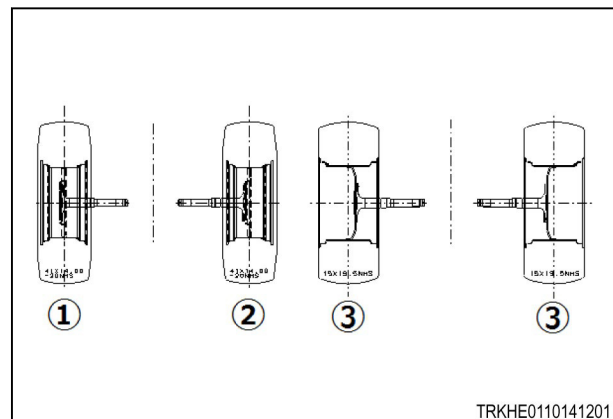


Fig. 65

4.15.6.1 Change the rim offset

Procedure

1. Lift the rear of the machine so the tire is off the ground.
2. Put blocks into position to support the machine.
3. Remove the rim (1) from the wheel center (2).
4. Turn the wheel center so the rim brackets can move around the outer edge of the wheel center.
5. Put the rim on the opposite side of the wheel center.
6. Install the rim to the wheel center.
7. Repeat the procedure for the other side.
8. Tighten all wheel bolts.

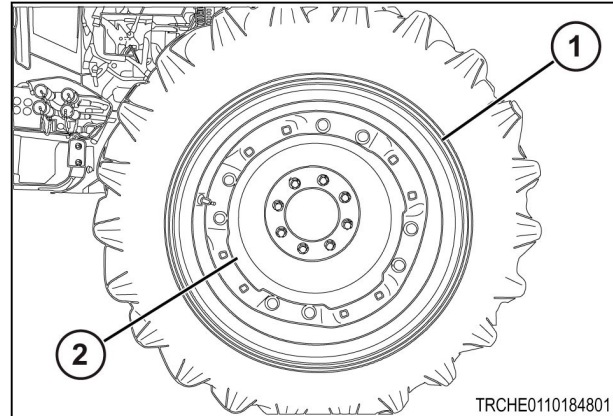


Fig. 66

After finishing the procedure

Examine the wheel bolt torque again after a short period of operation.

4.15.6.2 Move the rear wheels from side to side

Procedure

1. Lift the rear of the machine so both tires are off the ground.
2. Put blocks into position to support the machine.
3. Remove the bolts fastening the rear wheel assemblies to the rear axle hubs.
4. Move the rear wheel assemblies to the other side of the machine.
5. Install the rear wheel assemblies to the rear axle hubs.
6. Tighten all wheel bolts.

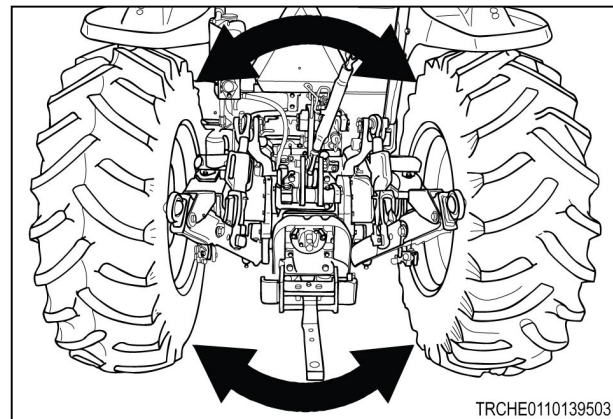


Fig. 67

After finishing the procedure

Check the wheel bolt torque again after a short period of operation.

4.15.7 Steering free play



WARNING: Machine control hazard.

Personal injury or machine damage can occur.

Excessive steering free play must be corrected before use.

Check steering for excessive looseness, as indicated by steering wheel free play. Maximum free play (1) is approximately 30 mm (1.25 in) when measured at outside of the steering wheel rim.

Excessive free play can be caused by:

- Air in the steering system
- Worn or damaged power steering unit
- Worn or damaged steering cylinder

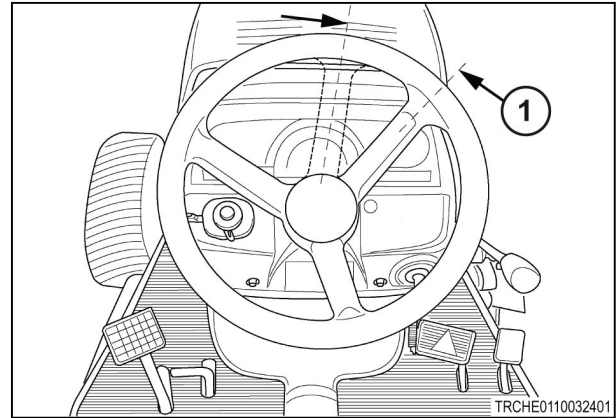


Fig. 68

4.15.8 Front axle fore and aft

Fore and aft play between the front drive axle (1) and the supports must be 0.1 mm to 0.3 mm (0.004 in to 0.012 in).

Lift the front tires off the ground to measure front axle fore and aft play.

To adjust the front axle fore and aft play:

1. Loosen the lock nut (2).
2. Turn the adjusting bolt (3) until the fore and aft play is correct.
3. Tighten the lock nut.

NOTE:

Too much fore and aft play will cause noise. This noise will be louder when using four-wheel drive.

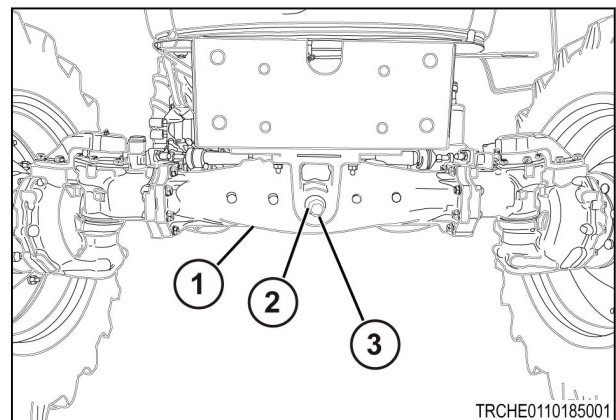


Fig. 69

4.16 Prepare tractor for storage

If tractor is to be stored for extended time, such as off-season times, correct maintenance must be made to protect the tractor. The maintenance will be different in the geographical area and storage season.

Procedure

1. Replace the engine oil and the filter.
2. Operate at low idle five minutes to lubricate parts.
3. Lubricate all grease fittings and lightly lubricate the control linkage pivots.
4. Remove implements.
5. Keep the tractor in an enclosed area, if possible, for protection from the weather.

If the tractor cannot be kept in an enclosed area, use a cover. Cover the exhaust pipe to keep rain or snow out of the exhaust pipe.

6. Lift the tractor and put stands below the axles to remove weight from the tires.
7. Lift and lock, turn rate of lower knob fully clockwise, the the 3-point linkage in the up position.
8. Press the clutch pedal to the disengaged position and lock it with the hook (1).

NOTE: Some tractor models do not have the hook, thus this step is not required.

Result

The clutch will be in the disengaged position and will prevent seizure during long storage time.

9. Add a fuel conditioner to the fuel tank.
10. Fill the fuel tank to prevent condensation in the fuel tank. Fill with fuel tank winter fuel before winter.
11. Remove the battery and keep in cool dry location.
Keep the battery charged during storage period.
12. Put a cover on the air filter inlet.
13. Make sure the engine coolant mixture is correct.
14. Touch up scratches with paint.

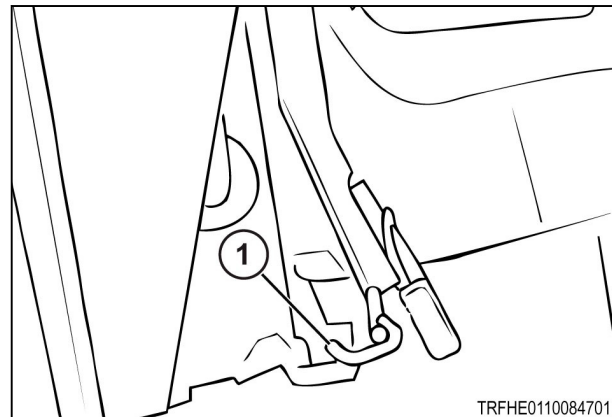


Fig. 70

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4.17 Power washing

When cleaning the machine with a power washer:

- Keep the tip at least 1 m (40 in) (A) from the machine.
- Use a fan spray nozzle (1), not a stream nozzle (2).
- Do not directly spray electrical components, such as ECU's, fuse boxes, and relays.

IMPORTANT:

If a high pressure washer is used, follow the instructions in the operator manual and safety signs for the power washer. Not using correctly can cause personal injury or damage to the machine.

Not using a power washer correctly can cause:

- Damage to electrical parts or a fire caused by a short circuit
- Damage to hydraulic hoses causing an oil leak
- Removal of decals and safety signs
- Damage to engine, radiator, or inside of the cab
- Damage to rubber and plastic parts
- Paint removal

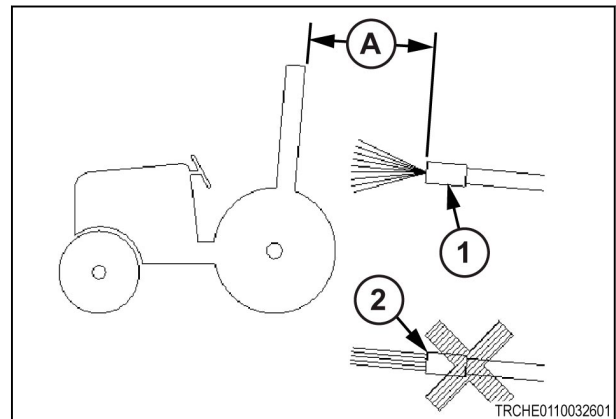


Fig. 71

6 Specifications

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6.1 Specifications

6.1.1 Engine specifications

Description	1835M	1840M
Type	Water-cooled, turbocharged diesel engine	
Model	E3FH	
Make	ISEKI & CO., LTD	
Number of cylinders	3	
Combustion system	Direct injection system	
Compression ratio	17.5 : 1	
Injection	Common rail system	
Bore	87 mm (3.425 in)	
Stroke	102.4 mm (4.031 in)	
Displacement	1826 cm ³ (111.4 in ³)	
Rated speed	2600 rpm	
Low idle speed	1000 rpm	
High idle speed	2730 rpm	
Maximum torque at 1600 rpm	120 Nm (88.5 lbf ft)	125 Nm (92.3 lbf ft)
Engine horsepower (estimated gross) at 2600 rpm	27.0 kW (36.2 hp)	29.4 kW (39.4 hp)
Engine cooling	Forced water cooling by centrifugal pump	
Fan	380 mm (15.0 in), 7 blades	
Air cleaner	Dual stage, dry element	
Air intake	Engine cover grille	
Cold starting aid	Glow plug	
Firing order	1-3-2	
Valve clearance (cold) - intake	0.35 mm (0.014 in)	

6.1.2 Electrical specifications

Component	All models
System voltage	12 Volt
Grounding	Negative
Battery cold cranking amperage (cca) @ 18° C (0° F)	600 cca
Battery JIS type	80D26R
Battery holder dimensions	Length: 259 mm (10.2 in) Width: 172 mm (6.8 in) Height: 200 mm (7.9 in)

Component	All models
Alternator rating	60 ampere for platform tractors
	75 ampere for cab tractors
Starter rating	12 V / 2.0 kW (2.68 hp)

6.1.3 Power shuttle transmission specifications

Component	All power shuttle tractor models
Primary transmission	Four speed synchronized
Range transmission	3-speed sliding mesh
Gear selection	12 forward, 12 reverse
Power shuttle clutch	Electro-hydraulic control with multiple wet disc plates
Clutch	Single stage, dry type

6.1.4 Hydrostatic transmission specifications

	All hydrostatic tractor models
Primary transmission	Infinite
Range transmission	3-speed sliding mesh
Gear speeds	3 forward, 3 reverse
Clutch	None

6.1.5 Power take-off specifications

Description	All models
Type	Independent, engine driven
Control	Electro-hydraulic control
Clutch	Hydraulically engaged, multiple plate wet disc
Rear PTO shaft	
Type	35 mm (1.375 in) diameter, 6 spline
Output	Clockwise rotation
Engine speed at 540 PTO rpm	Power shuttle: 2430 rpm
	Hydrostatic: 2504 rpm
Mid-PTO shaft (optional)	
Shaft Size	25 mm (0.983 in) diameter, 15 spline
Output	Clockwise rotation
Mid-PTO speed at 2600 engine rpm	Power shuttle: 1916 rpm
	Hydrostatic: 1916 rpm

6.1.6 Front axle specifications

Description	
Engagement	Mechanical
Joint on axle	Bevel gear
Turn angle	57° inward
Oscillation angle	6° to 8°
Steering	Hydrostatic
Front wheel drive ratio	1.6226

6.1.7 Rear axle specifications

All models	
Final reduction	Outboard

6.1.8 Brake specifications

All models	
Type	Wet Multi Disc
Actuation	Mechanical
Braking area	109.23 cm ² (16.93 in ²) x 2 x 3 pieces

6.1.9 Hydraulic specifications

All models	
Main hydraulic system	
Pump	Transmission mounted
Maximum output	47.8 l/min (12.62 gal/min)
Pressure	16.3 mPa (2364 psi)
Steering system	
Type	Hydrostatic
Pump	Separate transmission case - mounted gear pump
Maximum output	26.5 l/min (7 gal/min)
Pressure setting	10.8 mPa (1566 psi)
Rear linkage	
Type	3-Point linkage
Size	Category I
Control	Operated by single position control lever
Lift capacity	
Measured at ball ends	1270 kg (2800 lb)
Measured at 610 mm (24 in)	1150 kg (2535 lb)

6.1.10 Fuel specifications

	All models
Type	Ultra low sulfur fuel only
Above 4 °C (39 °F)	No. 2-D
Below 4 °C (39 °F)	No. 1-D

6.1.11 Slope angle for stationary operation

	All models
Up/down	Maximum of 20 degrees
Side to side	Maximum of 20 degrees

6.1.12 Capacities

Component	Quantity
Fuel tank	40.0 L (10.56 US gal)
Engine crankcase and filter	5 L (5.28 US qt)
Coolant (engine + radiator)	6.6 L (7 US qt)
Coolant (reserve tank)	1.1 L (1.16 US qt)
Hydraulic system	Power shuttle: 31.0 L (8.18 US gal)
	Hydrostatic: 28.0 L (7.4 US gal)
Front axle	7.5 L (7.9 US qt)

6.1.13 Lubrication specifications

IMPORTANT: *Examine fluid levels after filling.*

AGCO Genuine lubricants are the recommended products for this machine. The use of other lubricants may not give the same level of necessary performance.

Component	Specifications			
Grease fitting	AGCO Multi-Purpose Lithium II Grease or equivalent			
Engine oil	Massey Ferguson Multiguard® or equivalent in the correct SAE viscosity. Oil must meet or exceed requirements API service classification CK-4 class			
	Recommended Viscosity:			
	<table border="1"> <tbody> <tr> <td>Between -35 °C and 40 °C (-31 °F to 104 °F)</td> <td>SAE 5W-30</td> </tr> <tr> <td>Between -20 °C to 40 °C (-4 °F to 104 °F)</td> <td>SAE 10W-30</td> </tr> </tbody> </table>	Between -35 °C and 40 °C (-31 °F to 104 °F)	SAE 5W-30	Between -20 °C to 40 °C (-4 °F to 104 °F)
Between -35 °C and 40 °C (-31 °F to 104 °F)	SAE 5W-30			
Between -20 °C to 40 °C (-4 °F to 104 °F)	SAE 10W-30			
Engine coolant	50/50 mixture ethylene glycol and water			

Component	Specifications	
	Freezing protection (original factory fill)	-34° C (-30° F)
Transmission and differential housing (including hydraulic system)	Permatran® 821 XL or equivalent	
Front axle	Permatran® 821 XL or equivalent	

6.1.14 Air conditioner specifications

	All Models
Compressor model	SV07E
Compressor displacement	70 cu cm (4.27 cu in) /rev
Refrigerant type	R134A
Refrigerant capacity	900 g to 1000 g (31.75 oz to 34.25 oz)
Lubricant type	ND-oil 8
Lubricant capacity	110 cu cm (3.72 fl oz)

6.1.15 Wheel bolt torque chart

Wheel bolts	Torque
Front wheel lug nut	230 Nm (170 lbf ft)
Rear wheel lug nut	230 Nm (170 lbf ft)
Rear wheel center to rim bolts (Ag and industrial tires only)	230 Nm (170 lbf ft)

6.1.16 Tire inflation pressures

Tire type	Tire location	Tire size	Pressure kPa (psi)
AG (R1)	Front	8-16 6 ply	190 (28)
	Rear	13.6-24 6 ply	193 (28)
Turf	Front	27x8.50-15 NHS 6 ply	310 (45)
	Rear	41x14.00-20 NHS 4 ply	170 (25)
R4	Front	10-16.5 NHS 6 ply	340 (49)
	Rear	14.9-24 6 ply	210 (30)
R4	Front	10-16.5 NHS 6 ply	310 (45)
	Rear	17.5L-24 6 ply	166 (24)
R4	Front	25x8.50-14 NHS 6 ply	310 (45)
	Rear	15x19.5 NHS 6 ply	140 (20)
Snow	Front	250/75R16	200 (29)
	Rear	400/80R24	120 (18)

The maximum tire pressures for maximum loads are given. Tire pressure can be reduced as the load on the tire is reduced.

Tire pressures vary according to make, load, and speed as well as to the type of work being carried out. Refer to the inflation tables issued by the tire manufacturers.

6.1.17 Maximum load capacity

Power shuttle

Specification based on tire size	8-16 6 ply front tire and 13.6-24 6 ply Ag rear tire
Platform Tractors	
Front Axle Weight	655 kg (1444 lb)
Rear Axle Weight	920 kg (2028 lb)
Total Weight	1575 kg (3472 lb)
Cab Tractors	
Front Axle Weight	720 kg (1587 lb)
Rear Axle Weight	1030 kg (2271 lb)
Total Weight	1750 kg (3858 lb)
Maximum Weight Capacities	
Front Axle Capacity	1800 kg (3969 lb)
Rear Axle Capacity	1800 kg (3969 lb)
Total Capacity	3000 kg (6615 lb)

Hydrostatic

Specification based on tire size	8-16 6 ply front tire and 13.6-24 6 ply Ag rear tire
Platform Tractors	
Front Axle Weight	665 kg (1466 lb)
Rear Axle Weight	935 kg (2061 lb)
Total Weight	1600 kg (3527 lb)
Cab Tractors	
Front Axle Weight	730 kg (1609 lb)
Rear Axle Weight	1045 kg (2304 lb)
Total Weight	1775 kg (3913 lb)
Maximum Weight Capacities	
Front Axle Capacity	1800 kg (3969 lb)
Rear Axle Capacity	1800 kg (3969 lb)
Total Capacity	3000 kg (6615 lb)

6.2 Dimensions

6.2.1 Cab tractor dimensions

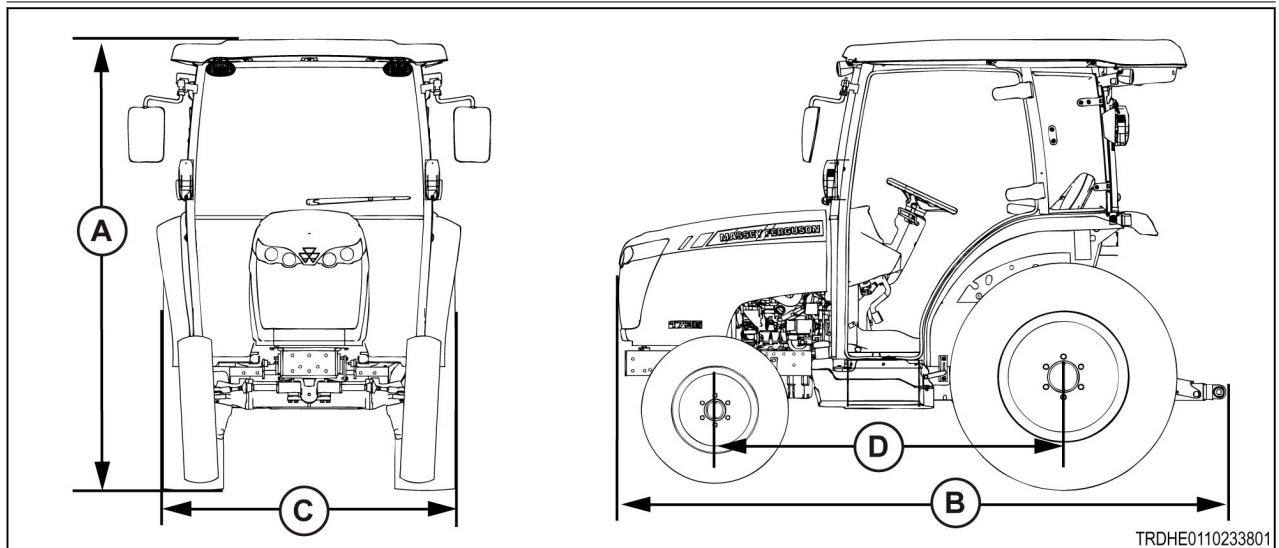


Fig. 1

Specifications based on tire size		8-16-6 front tire and 13.6-24-6 Ag rear tire
A	Overall height	2320 mm (91.3 in)
B	Overall length (front grille to end of three-point)	3100 mm (122.0 in)
C	Minimum width	1715 mm (67.5 in)
D	Wheelbase	1770 mm (69.7 in)
Ground clearance		365 mm (14.4 in)
Turning radius (with brake)		2.5 m (98.4 in)

6.2.2 Platform tractor dimensions

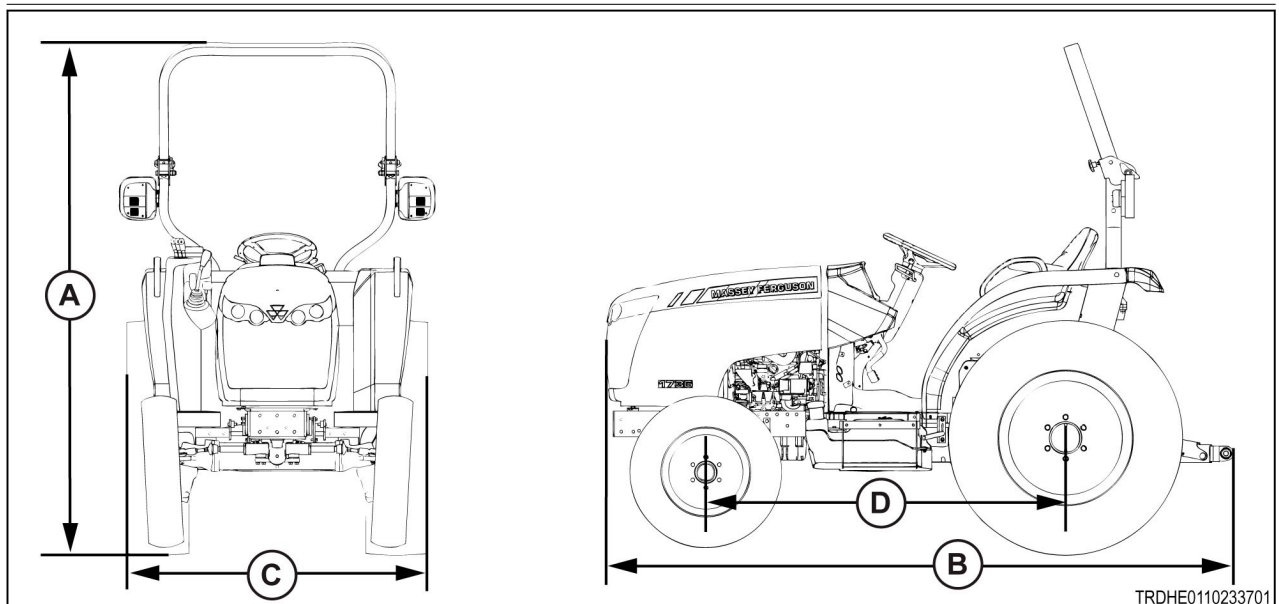








Fig. 2

Specifications based on tire size		8-16-6 front tire and 13.6-24-6 Ag rear tire
A	Overall height	2520 mm (99.2 in)
B	Overall length (front grille to end of three-point)	3100 mm (122.0 in)
C	Minimum width	1715 mm (67.5 in)
D	Wheelbase	1770 mm (69.7 in)
Ground clearance		365 mm (14.4 in)
Turning radius (with brake)		2.5 m (98.4 in)

6.3 Ground speed charts

Power shuttle tractors

Shift Positions	Tire	R1		Turf		R4	
	Front	8-16		27×8.50-15		10-16.5	
	Rear	13.6-24		41×14.00-20		14.9-24	
Range	Gear	km/h	mph	km/h	mph	km/h	mph
Forward							
	1	0.37	0.23	0.33	0.21	0.38	0.24
	2	0.56	0.35	0.50	0.31	0.58	0.36
	3	0.87	0.54	0.78	0.48	0.91	0.57
	4	1.29	0.8	1.15	0.71	1.34	0.83
	1	1.58	0.98	1.40	0.87	1.64	1.02
	2	2.38	1.48	2.12	1.32	2.47	1.53
	3	3.73	2.32	3.31	2.06	3.87	2.4
	4	5.51	3.42	4.89	3.04	5.72	3.55
	1	7.31	4.54	6.49	4.03	7.58	4.71
	2	11.04	6.86	9.80	6.09	11.46	7.12
	3	17.28	10.74	15.34	9.53	17.94	11.15
	4	25.53	15.86	22.6	14.04	26.5	16.47
Max. Speed		26.80	16.65	23.79	14.78	27.82	17.29
Reverse							
	1	0.34	0.21	0.30	0.19	0.36	0.22
	2	0.52	0.32	0.46	0.29	0.54	0.34
	3	0.81	0.5	0.72	0.45	0.84	0.52
	4	1.20	0.75	1.06	0.66	1.24	0.77
	1	1.46	0.91	1.30	0.81	1.52	0.94
	2	2.21	1.37	1.96	1.22	2.29	1.42
	3	3.45	2.14	3.07	1.91	3.59	2.23
	4	5.10	3.17	4.53	2.81	5.30	3.29
	1	6.77	4.21	6.01	3.73	7.02	4.36
	2	10.22	6.35	9.07	5.64	10.61	6.59
	3	16.00	9.94	14.20	8.82	16.61	10.32
	4	23.64	14.69	20.98	13.04	24.53	15.24