

ENGINE - 10

580N EP
Tier 4B (final)
Tractor Loader Backhoe
PIN NFC716000 and above

SERVICE MANUAL

Part number 47936417

1st edition English

October 2015



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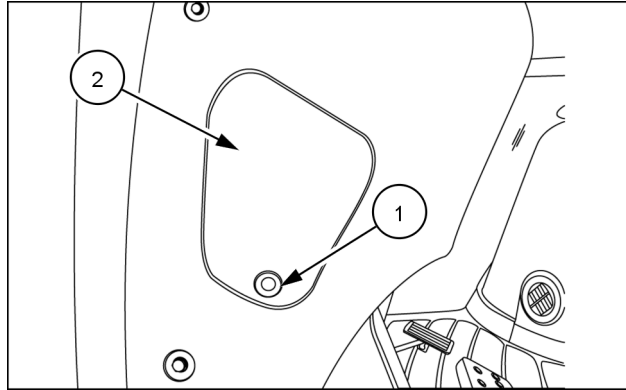
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Basic instructions – Fuse and relay locations

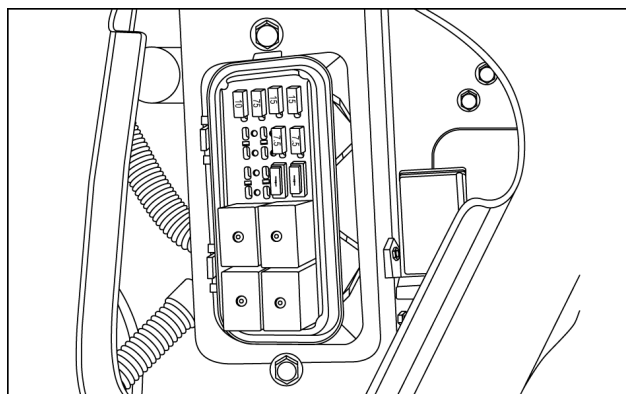
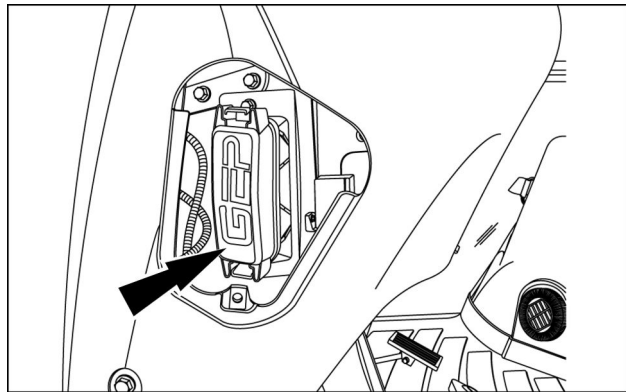
The machine is equipped with five fuse box locations. Two locations in the front console, a side console box and two external locations (Glow-plug Control Unit and Telematics System).

Front console box

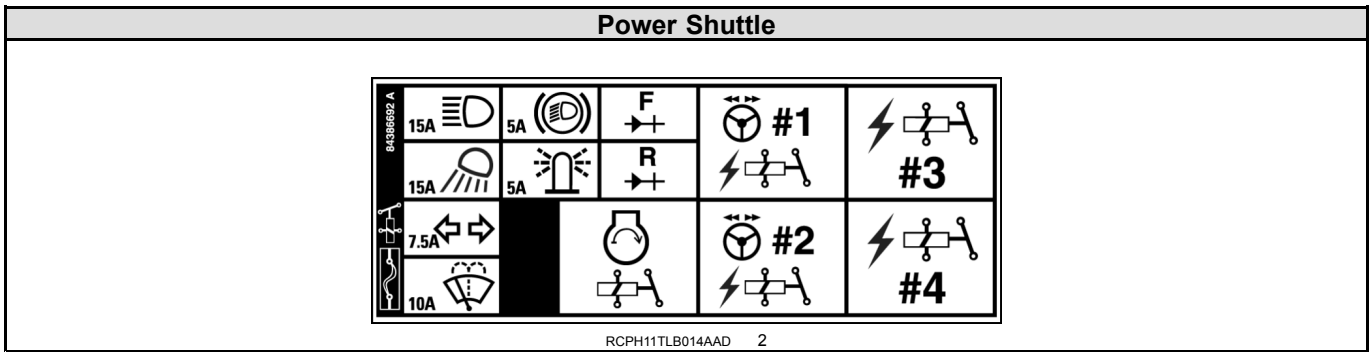
1. Turn the thumb screw (1) to loosen the panel cover (2) for the fuse box. Remove the panel cover.





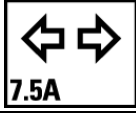



2. Remove the fuse box cover.






Left-hand side steering column console panel



Fuse icon definitions

Symbol	Function
	Head lights
	Front work lights
	Turn signal, Hazards
	Front wiper/washer
	High beam
	Beacon

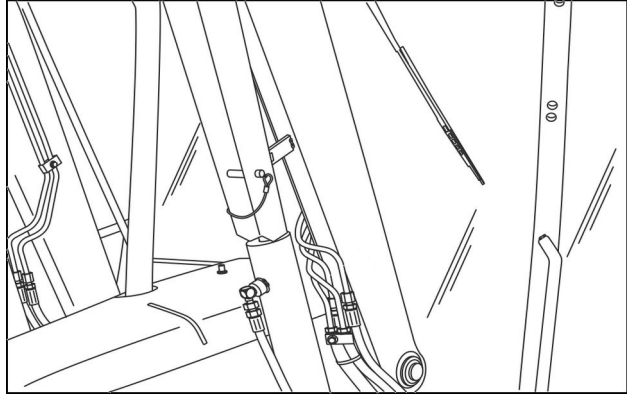
Relay icon definitions

Symbol	Function
	Comfort steer relay and Power relay #1
	Comfort steer relay and Power relay #2
	Power relay #3

INTRODUCTION

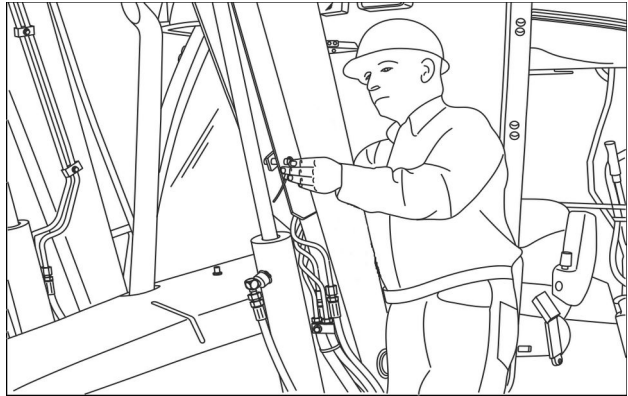
Lower supported loader lift arms:

1. Raise the lift arms so that the end of the support strut no longer rests on the cylinder.
2. Shut down the engine.



RCPH10TLB227AAF 4

3. Remove the retaining pin from the support strut.
4. Raise the support strut up to the storage position and secure with the retaining pin, as shown.



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5. Start the engine.
6. Lower the loader to the ground.

INTRODUCTION

Torques for Inch O-Ring Boss (ORB) non-adjustable port and stud end connections

SAE Dash size	UN/UNF Thread size	Inch Tube OD	Ferrous		Non-Ferrous	
			S-Series (Heavy Duty)	L-Series (Light Duty)	S-Series (Heavy Duty)	L-Series (Light Duty)
2	5/16-24	3.18 mm (0.125 in) 1/8	—	—	8.5 N·m (6.3 lb ft)	5 N·m (3.7 lb ft)
3	3/8-24	4.76 mm (0.187 in) 3/16	15.5 N·m (11.4 lb ft)	9.3 N·m (6.9 lb ft)	10.5 N·m (7.7 lb ft)	6.3 N·m (4.6 lb ft)
4	7/16-20	6.35 mm (0.25 in) 1/4	37 N·m (27.3 lb ft)	22 N·m (16.2 lb ft)	19 N·m (14.0 lb ft)	11.5 N·m (8.5 lb ft)
5	1/2-20	7.94 mm (0.313 in) 5/16	42 N·m (31.0 lb ft)	25 N·m (18.4 lb ft)	26 N·m (19.2 lb ft)	15.5 N·m (11.4 lb ft)
6	9/16-18	9.52 mm (0.375 in) 3/8	47 N·m (34.7 lb ft)	28 N·m (20.7 lb ft)	32 N·m (23.6 lb ft)	19 N·m (14.0 lb ft)
8	3/4-16	12.7 mm (0.5 in) 1/2	89 N·m (65.6 lb ft)	53 N·m (39.1 lb ft)	53 N·m (39.1 lb ft)	32 N·m (23.6 lb ft)
10	7/8-14	15.88 mm (0.625 in) 5/8	121 N·m (89.2 lb ft)	73 N·m (53.8 lb ft)	63 N·m (46.5 lb ft)	38 N·m (28.0 lb ft)
12	1-1/16-12	19.05 mm (0.75 in) 3/4	178 N·m (131.3 lb ft)	107 N·m (78.9 lb ft)	100 N·m (73.8 lb ft)	60 N·m (44.3 lb ft)
14	1-3/16-12	22.22 mm (0.875 in) 7/8	225 N·m (166.0 lb ft)	135 N·m (99.6 lb ft)	131 N·m (96.6 lb ft)	79 N·m (58.3 lb ft)
16	1-5/16-12	25.4 mm (1.0 in) 1	283 N·m (208.7 lb ft)	170 N·m (125.4 lb ft)	156 N·m (115.1 lb ft)	94 N·m (69.3 lb ft)
20	1-5/8-12	31.75 mm (1.25 in) 1-1/4	300 N·m (221.3 lb ft)	180 N·m (132.8 lb ft)	210 N·m (154.9 lb ft)	126 N·m (92.9 lb ft)
24	1-7/8-12	38.1 mm (1.5 in) 1-1/2	388 N·m (286.2 lb ft)	233 N·m (171.9 lb ft)	220 N·m (162.3 lb ft)	132 N·m (97.4 lb ft)
32	2-1/2-12	50.8 mm (2.0 in) 2	388 N·m (286.2 lb ft)	233 N·m (171.9 lb ft)	315 N·m (232.3 lb ft)	189 N·m (139.4 lb ft)

NOTE: Final torque tolerance +/- 10 % of the given torque specification.

Installation of flange connectors

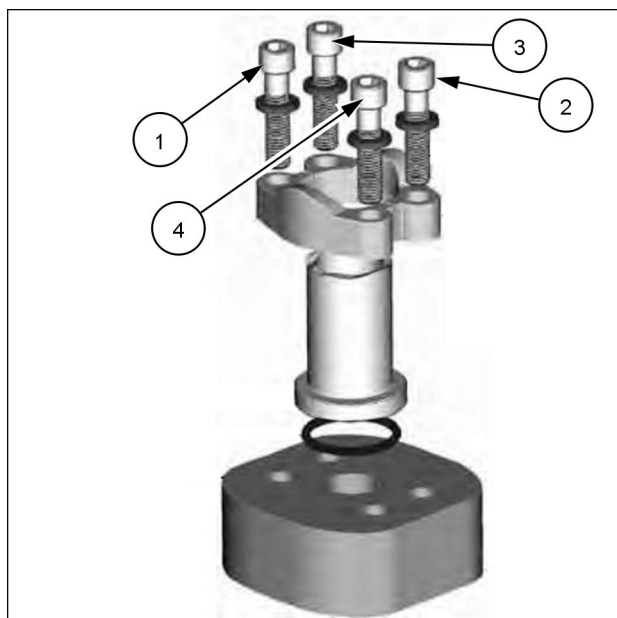
Flange connections typically have four bolts, although some flange connections may have more or fewer. The flange connector consists of four main components:

- A body (flange head)
- An O-ring
- One “captive” or two “split” flange clamps
- Bolts and washers

1. Remove protective connector caps only immediately prior to assembly.
2. Inspect the components to ensure that the male and female port threads and sealing surfaces are free of burrs, nicks, and scratches, or any foreign material. Do not use if impurities are found.
3. Place the O-ring in the groove, the groove will be either on the port side or the flange side.
4. Assemble the flange head and the clamps.
5. Position and hold the flange assembly over the port.
6. Finger tighten the bolt hardware evenly and in a crossing pattern.
7. Tighten the bolt hardware to **60 %** of the torque value. Use the same crossing pattern. See the torque tables for the proper torque value.

NOTE: For bolt hardware that is not Metric Class 8.8 and 10.9 or Inch Grade 8 see the “Torque - Minimum tightening torques for normal assembly” **Torque - Minimum tightening torques for normal assembly ()**.

8. Tighten the bolt hardware 1 and 2 to **100 %** of the torque value.
9. Tighten the bolt hardware 3 and 4 to **100 %** of the torque value.



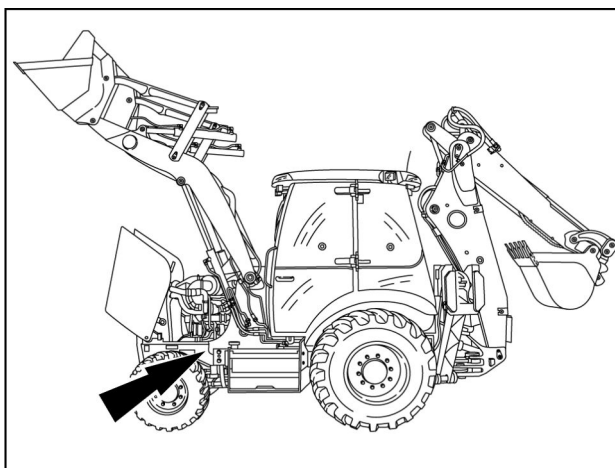
RAIL15TLB0611BA 4

General specification – Severe Cold Weather Package (SCWP)

Machines with the Severe Cold Weather Package (SCWP) option installed, have specific components that allow for near normal machine operation at consistent or prolonged ambient temperatures below **-18 °C (0 °F)**. The owner operator or dealer may easily identify a machine equipped with the Severe Cold Weather Package (SCWP) by the decal next to the maintenance decal on the left-hand side of the machines engine compartment.

NOTICE: Only use the recommended fluids for the Severe Cold Weather Package (SCWP) as listed in the capacities chart in this manual. Do not mix fluids as it may have an adverse affect on a components operation. See **Capacities ()** for fluid and capacity specifications.

NOTE: The operator may follow the same starting procedure as described in the “Cold temperature operation”, see the operator’s manual for details.



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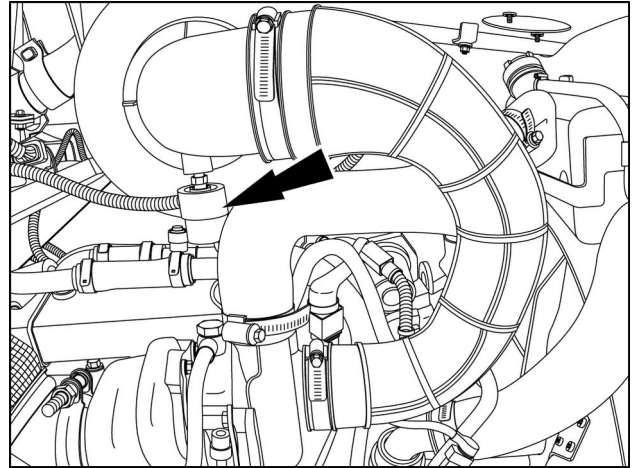
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Engine - Engine and crankcase

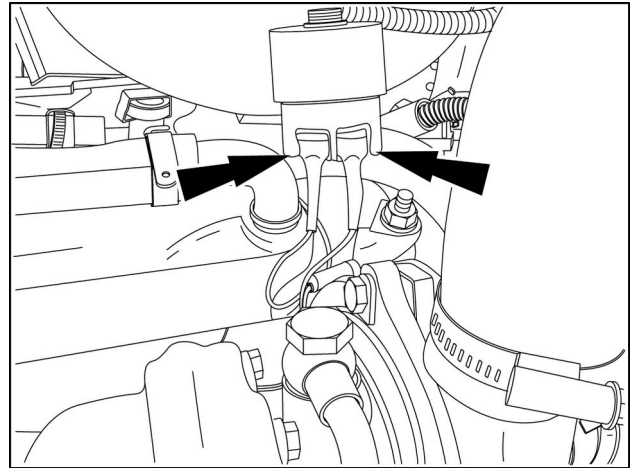
ID	RPM	Results
1	Below 2150 RPM	Hydraulic system problem(s). Check the setting of the main relief valve. Check the output of the hydraulic pump.
2	2150 - 2300 RPM	
3	2025 - 2200 RPM	
4	Below 1450 RPM	
1	Above 2300 RPM	Hydraulic system problem(s). Check the setting of the main relief valve. Check the output of the hydraulic pump. Check for leakage in the loader control valve.
2	2150 - 2300 RPM	
3	2025 - 2200 RPM	
4	Above 1720 RPM	
1	2150 - 2300 RPM	Hydraulic system problem(s). Check the setting of the main relief valve. Check the output of the hydraulic pump.
2	Below 2150 RPM	
3	2025 - 2200 RPM	
4	1450 - 1720 RPM	
1	2150 - 2300 RPM	Torque converter or transmission problems.
2	2150 - 2300 RPM	
3	Above 2200 RPM	
4	Above 1720 RPM	
1	2150 - 2300 RPM	Torque converter or transmission problems.
2	2150 - 2300 RPM	
3	Below 2025 RPM	
4	Below 1450 RPM	

NOTE: For assembly purposes, identify and label all electrical connectors.

12. Disconnect the wires from the air restriction indication switch.
13. Remove the air filter assembly and cap all openings.

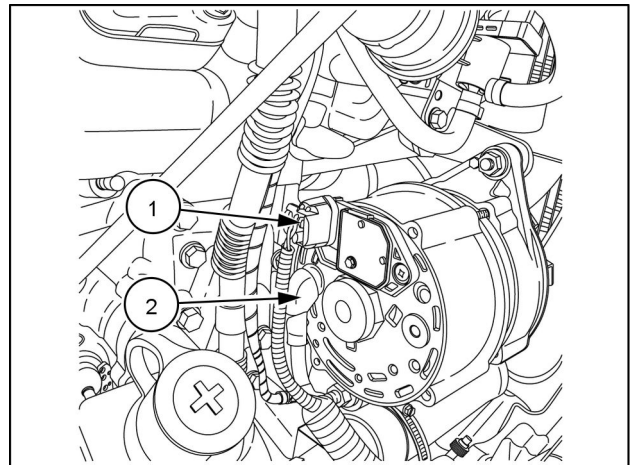


RAIL14FRK0104BA 8



RAIL14FRK0122BA 9

14. Disconnect the wiring harness connector (1) and the positive battery cable (2) from the rear of the alternator.



RAPH12FRK0163AA 10

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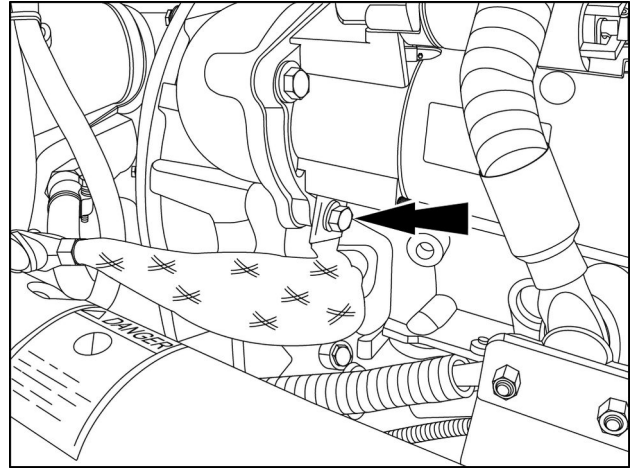
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11. Secure the starter ground strap with the star washer and bolt.

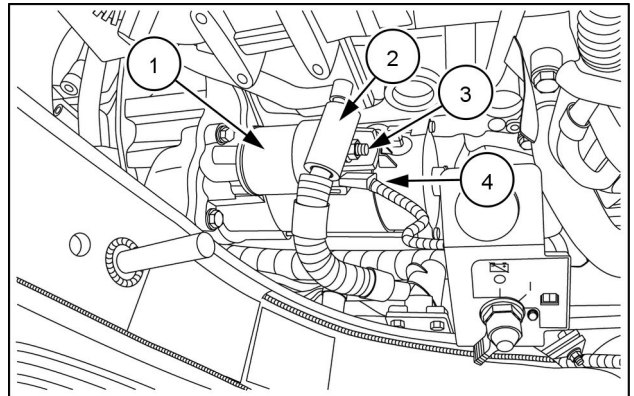


RAIL14FRK0129BA 10

Specification

Starter-to-flywheel bolt torque	40 - 47 N·m (30 - 42.0 lb ft)
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12. Install the wire harness (4).
13. Install the positive battery cable (2) to the starter (1) and secure with a nut (3). tighten to specification.

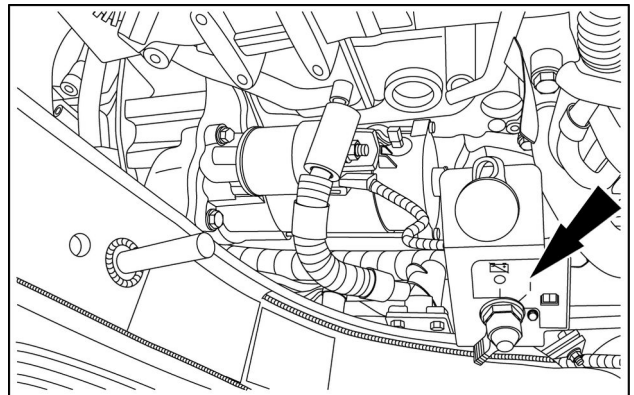


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Specification

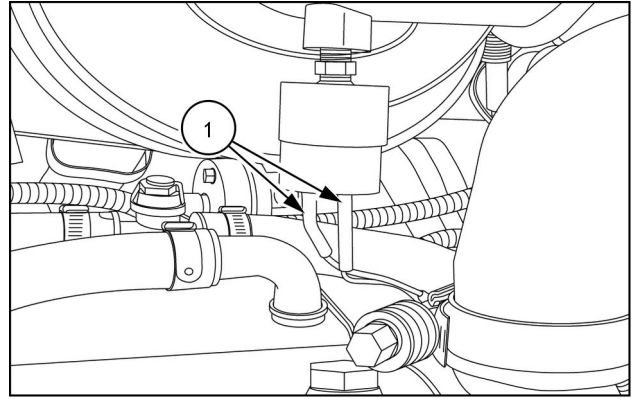
Starter jumper cable-to starter nut torque	16 - 20 N·m (12 - 15 lb ft)
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14. If equipped, secure the battery disconnect switch bracket to the frame.



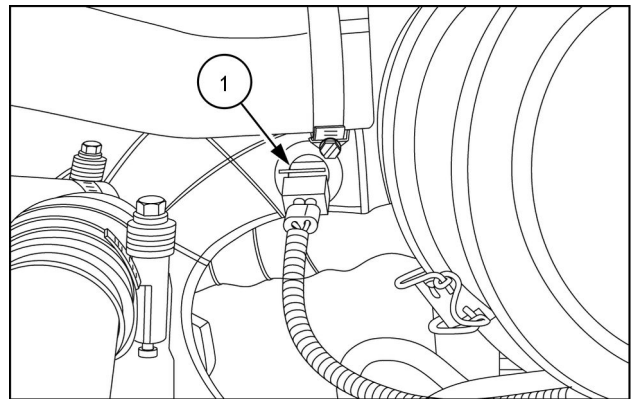
RAIL14TLB0403AA 12

4. Disconnect the air restriction sensor (1).



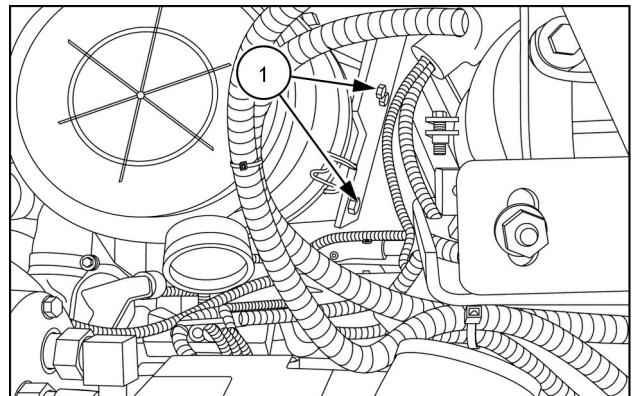
RAIL14TLB1152AA 3

5. Disconnect the humidity sensor (1).



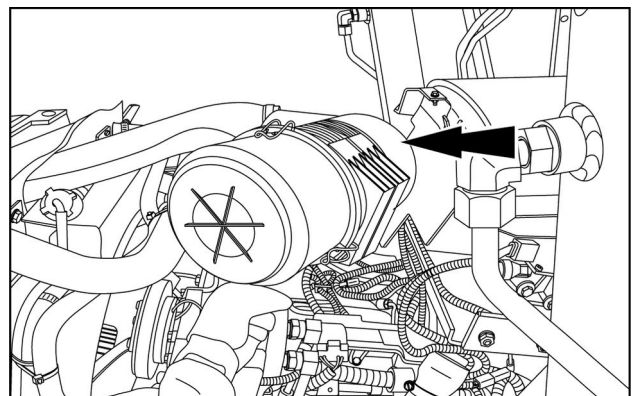
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6. Remove the air cleaner mounting bolts (1).



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7. Remove the air cleaner.



RAIL14TLB1155AA 6

Next operation:
Air intake system - Install (10.202)

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Engine - 10

Fuel filters - 206

Fuel filters - Replace	3
Fuel-water separator filter - Replace	4

7. Start up the engine.

- DO NOT crank the engine for more than **30 s** .
- If the engine will not start, repeat the bleeding process.

NOTE: *The engine will start hard the next four or five times. Generally, the engine will crank for ten seconds the second time it is started and about five seconds the third time it is started.*

8. Run the engine for several minutes and then shut down the engine.

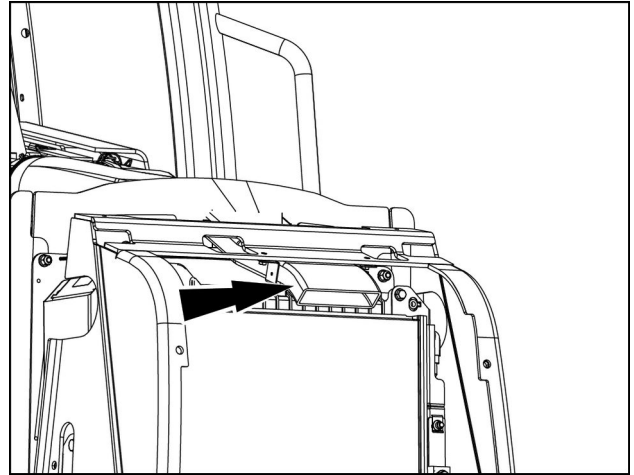
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Engine lubrication system - 304

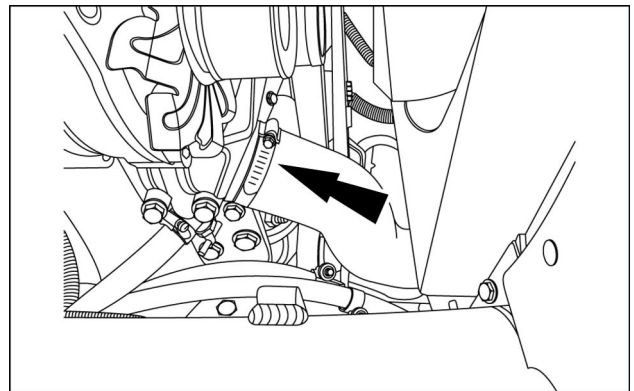
Engine lubrication system - Drain fluid	6
Engine lubrication system - Filling	7
Engine lubrication system - Replace – oil and filter	3

7. Remove the air intake tube.



RAIL14TLB1349BA 8

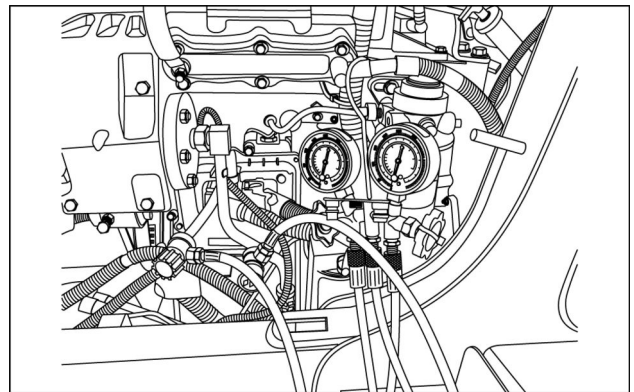
8. Remove the lower radiator hose.



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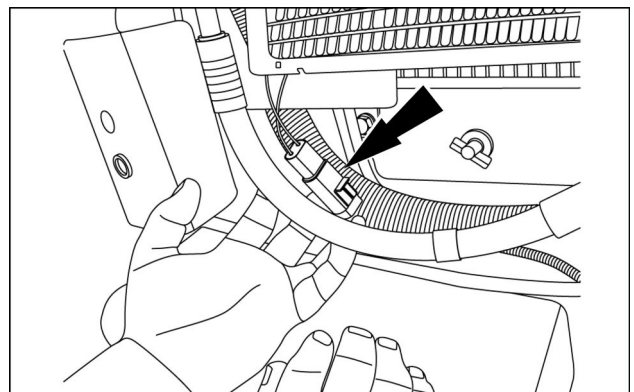
9. Discharge the A/C system.

NOTICE: Use appropriate reclaiming devices when recovering A/C refrigerant.



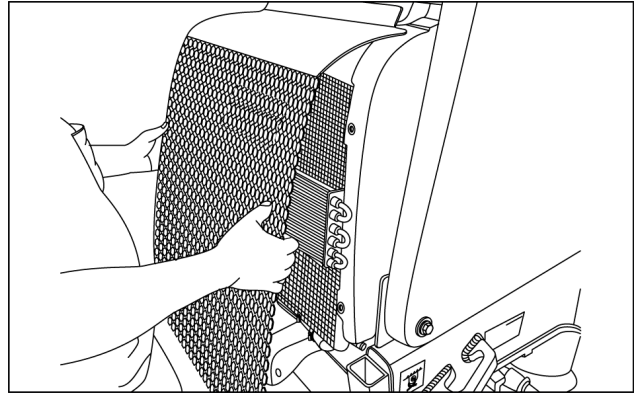
RCPH11TLB018AAM 10

10. Disconnect the high pressure switch.



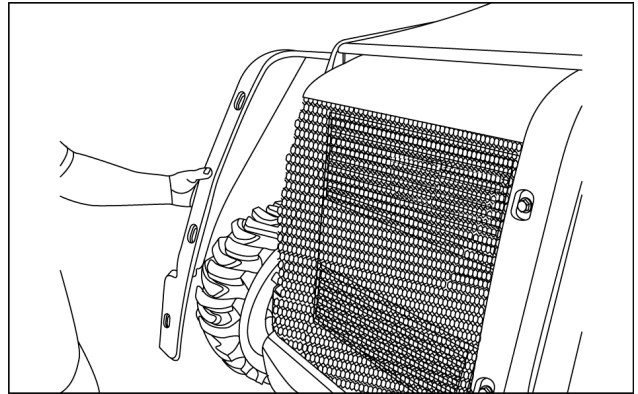
RCPH11TLB019AAM 11

19. Install the grill.



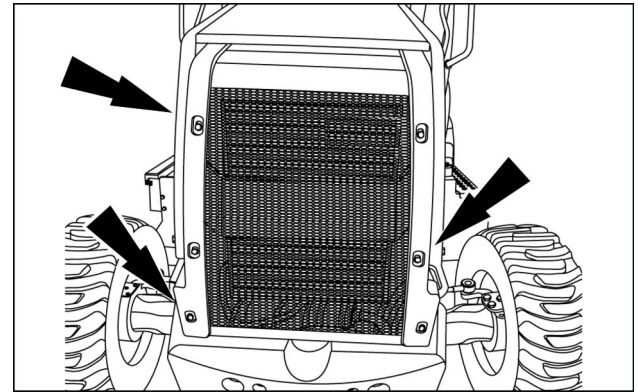
RAIL12UTL0323AA 18

20. Install the grill bumpers.



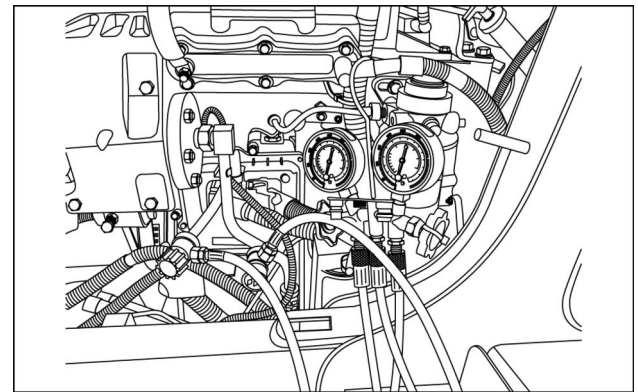
RAIL12UTL0322AA 19

21. Install all grill hardware.



RAIL12UTL0324AA 20

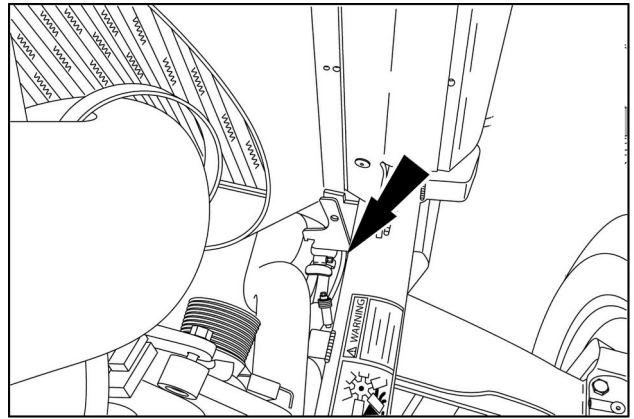
22. Recharge the A/C system.



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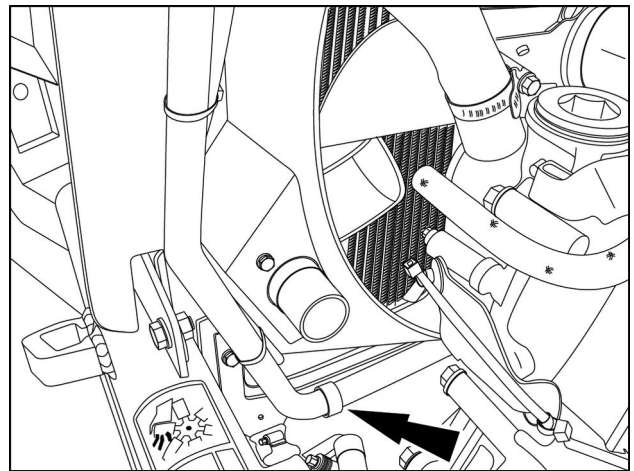
23. Refill the system with coolant. See **Radiator - Filling (10.400)**.

15. Loosen the shroud-bracket-to-transmission oil cooler line clamp.



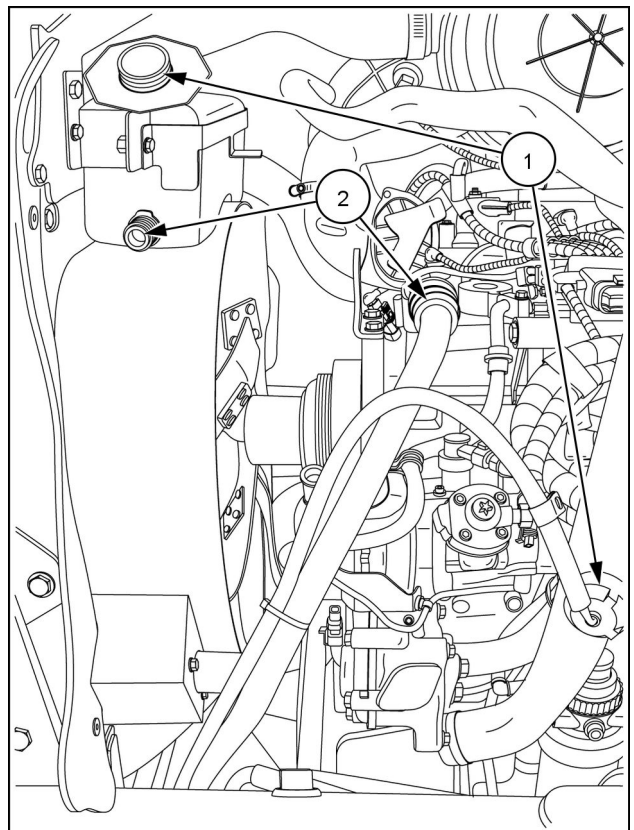
RAPH12FRK0965BA 9

16. Disconnect and remove the radiator fill tube clamp.



RAIL14FRK0145BA 10

17. Remove the de-areation cap.
18. Disconnect the radiator fill tube (2) from the de-areation tank. Cap all openings.



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