

Magnum 235
Magnum 260
Magnum 290
Magnum 315
Magnum 340
Magnum 370
Continuously Variable Transmission (CVT)
Tractor

PIN ZCRD02588 and above

SERVICE MANUAL

Part number 47533562

2nd edition English

October 2013



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INTRODUCTION

Foreword - Important notice regarding equipment servicing

Magnum 235 [ZCRD02588 -] NA, Magnum 260 [ZCRD02588 -] NA, Magnum 290 [ZCRD02588 -] NA, Magnum 315 [ZCRD02588 -] NA, Magnum 340 [ZCRD02588 -] NA, Magnum 370 [ZCRD02588 -] NA

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer. In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The information in this manual is up-to-date at the date of the publication. It is the policy of the manufacturer for continuous improvement. Some information could not be updated due to modifications of a technical or commercial type, or changes to the laws and regulations of different countries.

In case of questions, refer to your CASE IH Sales and Service Networks.

Safety rules

Magnum 235 NA, Magnum 260 NA, Magnum 290 NA, Magnum 315 NA, Magnum 340 NA, Magnum 370


Personal safety





This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual and on machine decals, you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 **DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury. The color associated with DANGER is RED.

 **WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury. The color associated with WARNING is ORANGE.

 **CAUTION**, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. The color associated with CAUTION is YELLOW.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation which, if not avoided, could result in machine or property damage. The color associated with Notice is BLUE.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information which clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

Safety rules - General maintenance safety

Magnum 235 [ZCRD02588 -] NA, Magnum 260 [ZCRD02588 -] NA, Magnum 290 [ZCRD02588 -] NA, Magnum 315 [ZCRD02588 -] NA, Magnum 340 [ZCRD02588 -] NA, Magnum 370 [ZCRD02588 -] NA

General maintenance safety

Keep the area used for servicing the machine clean and dry. Clean up spilled fluids.

Service the machine on a firm, level surface.

Install guards and shields after you service the machine.

Close all access doors and install all panels after servicing the machine.

Do not attempt to clean, lubricate, clear obstructions, or make adjustments to the machine while it is in motion or while the engine is running.

Always make sure that working area is clear of tools, parts, other persons and pets before you start operating the machine.

Unsupported hydraulic cylinders can lose pressure and drop the equipment, causing a crushing hazard. Do not leave equipment in a raised position while parked or during service, unless the equipment is securely supported.

Jack or lift the machine only at jack or lift points indicated in this manual.

Incorrect towing procedures can cause accidents. When you tow a disabled machine follow the procedure in this manual. Use only rigid tow bars.

Stop the engine, remove the key, and relieve pressure before you connect or disconnect fluid lines.

Stop the engine and remove the key before you connect or disconnect electrical connections.

Scalding can result from incorrect removal of coolant caps. Cooling systems operate under pressure. Hot coolant can spray out if you remove a cap while the system is hot. Allow the system to cool before you remove the cap. When you remove the cap, turn it slowly to allow pressure to escape before you completely remove the cap.

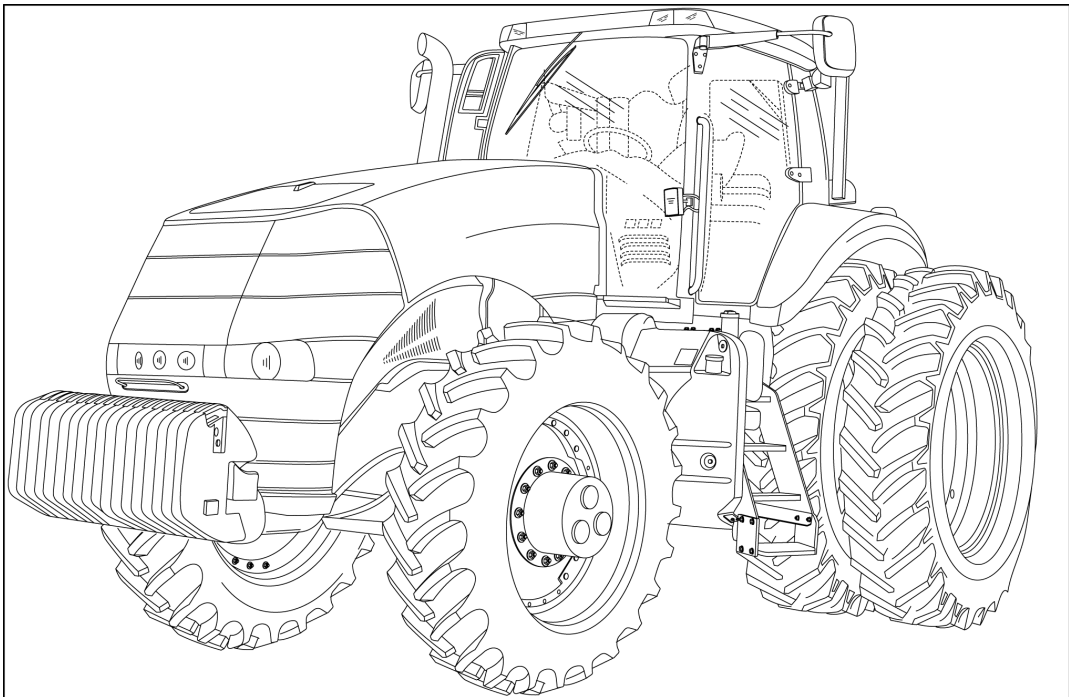
Replace damaged or worn tubes, hoses, electrical wiring, etc.

The engine, transmission, exhaust components, and hydraulic lines may become hot during operation. Take care when you service such components. Allow surfaces to cool before you handle or disconnect hot components. Wear protective equipment when appropriate.

When welding, follow the instructions in the manual. Always disconnect the battery before you weld on the machine. Always wash your hands after you handle battery components.

SERVICE MANUAL

Engine



**Magnum 235 [ZCRD02588 -] , Magnum 260 [ZCRD02588 -] , Magnum 290 [ZCRD02588 -] , Magnum 315 [ZCRD02588 -] , Magnum 340 [ZCRD02588 -] ,
Magnum 370 [ZCRD02588 -]**

Engine - Remove

Magnum 235, Magnum 260, Magnum 290, Magnum 315, Magnum 340, Magnum 370 [ZCRD02588 -]

Prior operation:

Battery - Disconnect (55.302)

Prior operation:

Side shield - Remove (90.102)

Prior operation:

Hood - Remove (90.100)

Prior operation:

Engine cooling system - Emptying (10.400)

Prior operation:

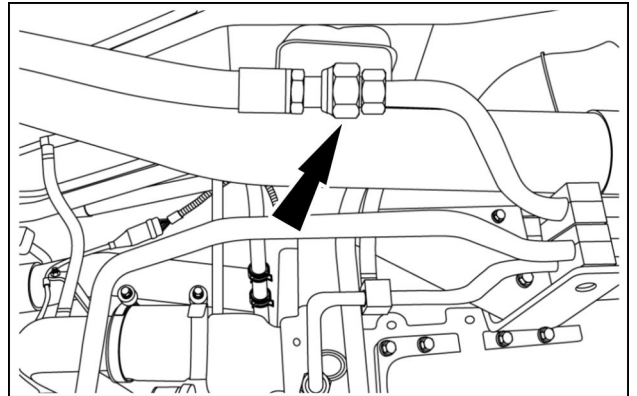
Air conditioning - Recover (50.200)

NOTE: During the disassembly of components with O-ring seals, the seals should be discarded and new seal installed during assembly.

NOTE: Cap all fittings and plug all lines/hoses as they are disconnected.

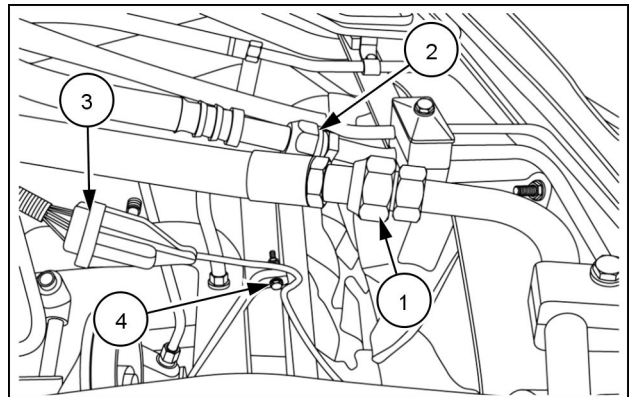
1. Disconnect the hydraulic cooling line connection on the right side (from oil cooler).

NOTE: Be prepared to collect some hydraulic oil by placing a pan under the fitting.



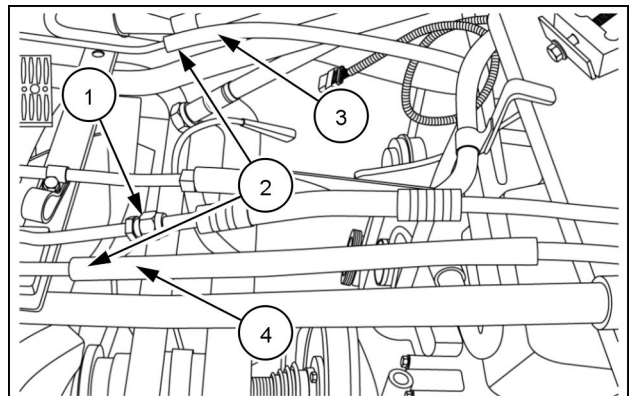
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2. Disconnect the hydraulic line (1) on the left side (to oil cooler). Disconnect the engine cooling fan drive harness connector (3).
3. Disconnect the air conditioning low pressure hose to line fitting (return from condenser) (2).
4. Remove the bolt securing the harness P-clamp (4).



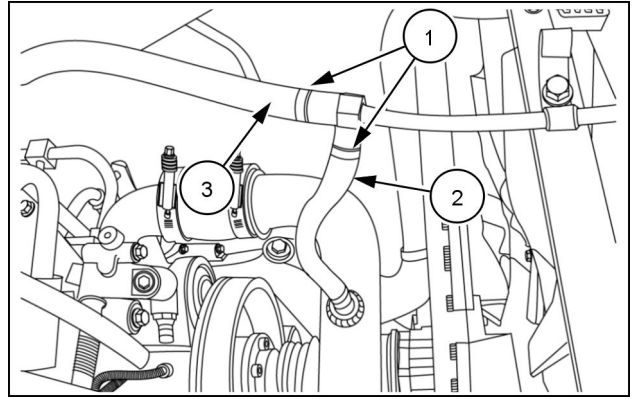
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5. Disconnect the air conditioning high pressure hose to tube fitting (1).
6. Disengage the hose clamps (2), and disconnect the cooler hoses (3) (4).



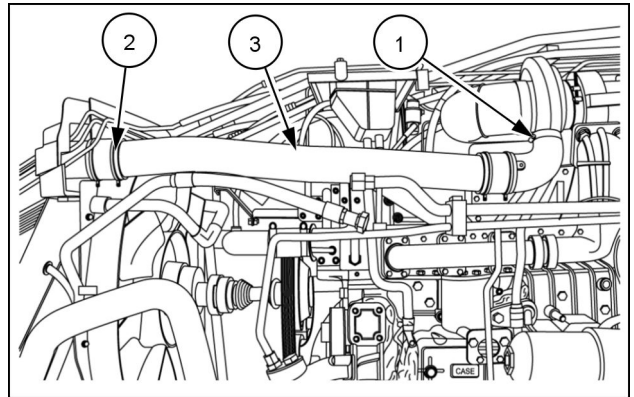
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7. Disengage the hose clamps (1) and disconnect the air vent hose (2) and the hose (3) from the deaeration tank to the recovery bottle.



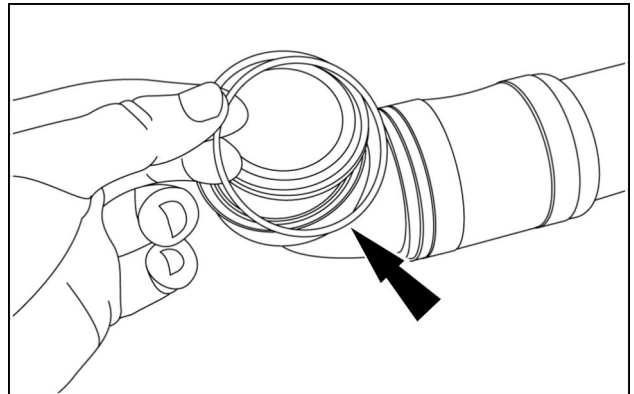
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8. Loosen the turbocharger clamp (1).
9. Loosen the air cooler inlet hose clamp (2).
10. Remove the pipe (3) and set aside.
11. Repeat for the right side air to air tube from the cooler to the intake manifold (not shown).



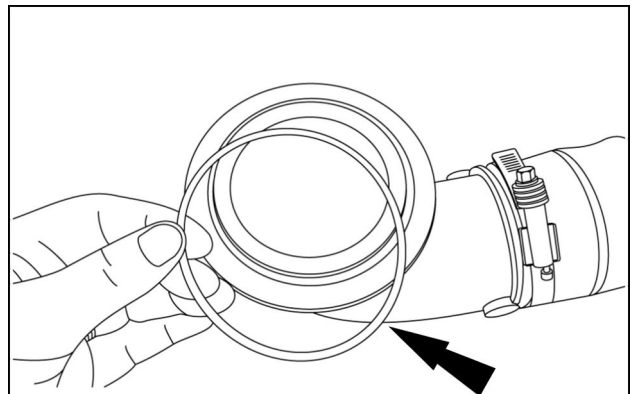
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12. Remove and discard the O-ring seal from the elbow.



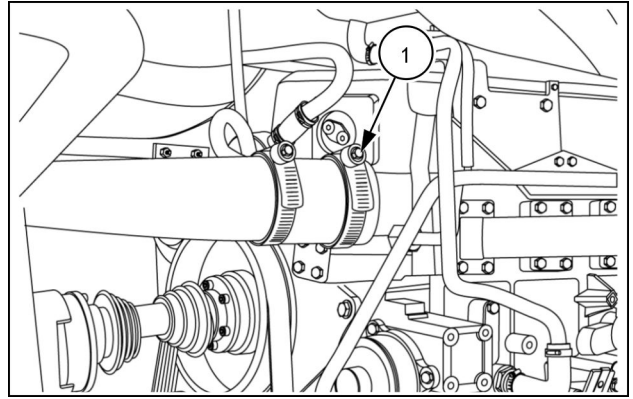
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13. Remove and discard the O-ring seal from the elbow.



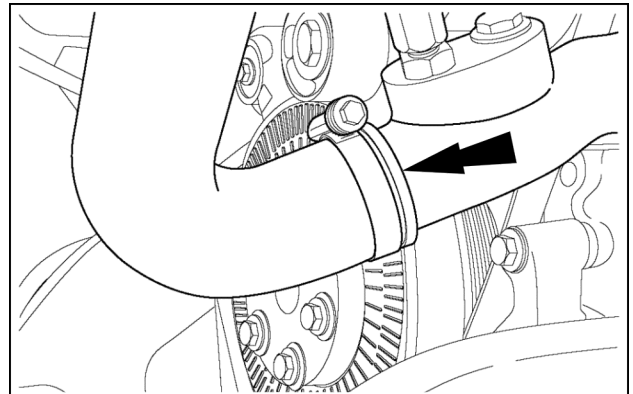
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14. Loosen the hose clamp **(1)** at the engine coolant outlet and disconnect the hose from the thermostat housing.



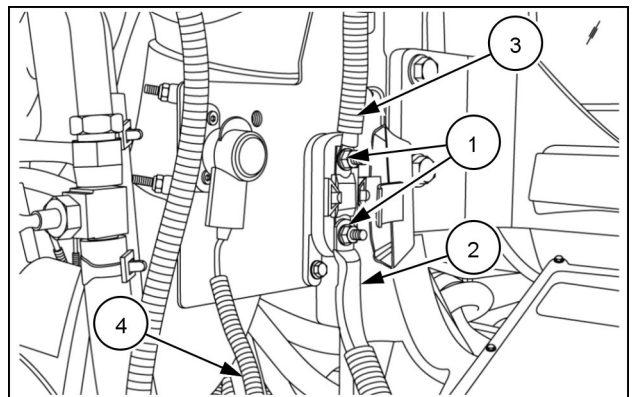
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15. Loosen the hose clamp and disconnect the coolant line into the engine hose.



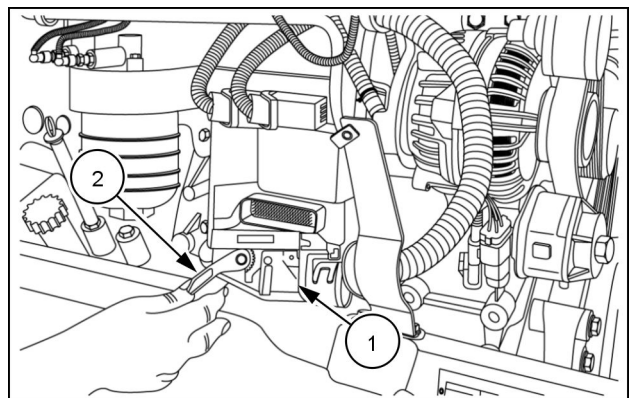
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16. Remove the nuts **(1)** and disengage the engine heater grid cables **(2)** **(3)** to the fuse block.
17. Disconnect the harness connector **(4)** for the **12 V** auxiliary power connection .



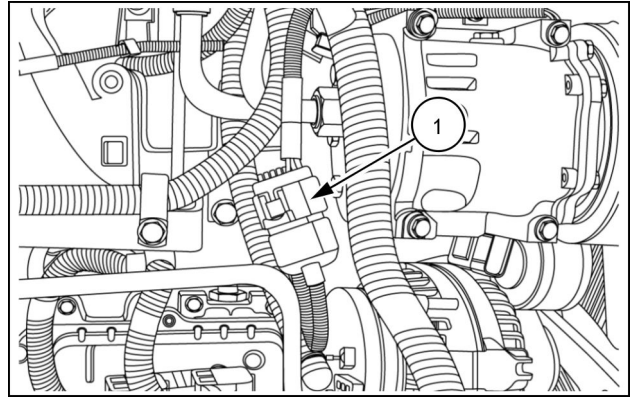
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18. Disconnect the ECM (engine control module) connector **(1)** by moving the locking handle **(2)** from the right (locked position) to the left (unlocked position).



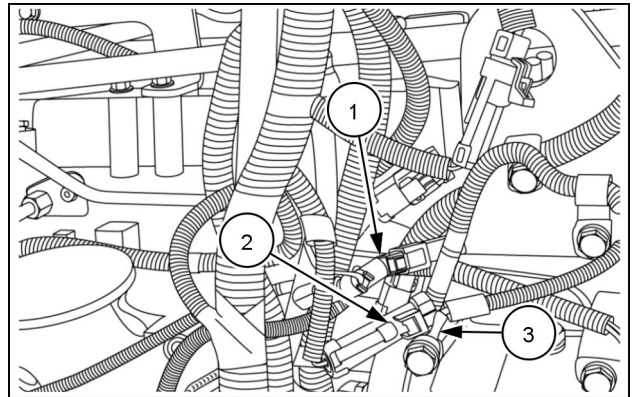
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19. Disconnect the tractor to engine harness connectors **(1)**.



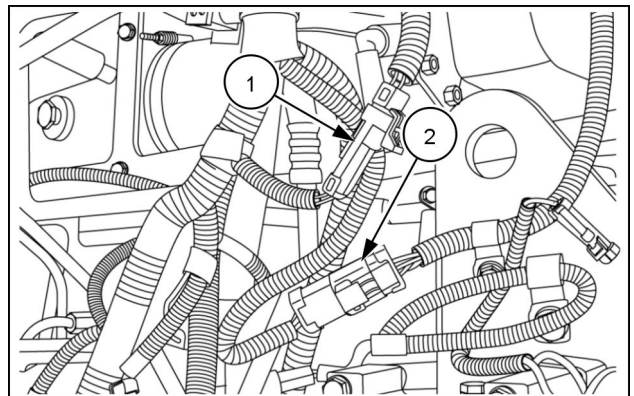
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20. Disconnect the harness connectors to the alternator **(1)** and the A/C compressor clutch **(2)**.
21. Remove the upper left A/C compressor bolt and remove the ground wire **(3)**.



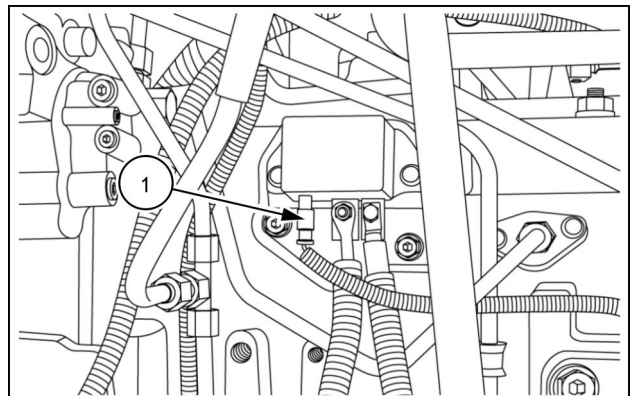
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22. Disconnect the harness connectors to the A/C high pressure switch **(1)** and the engine cooling fan drive **(2)**.



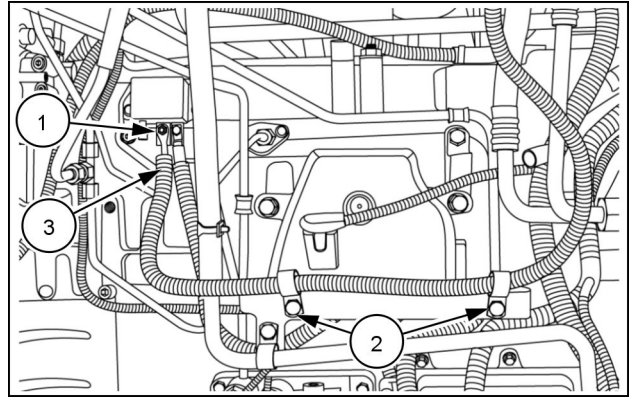
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23. Disconnect the harness connector **(1)** to the grid heater controller.



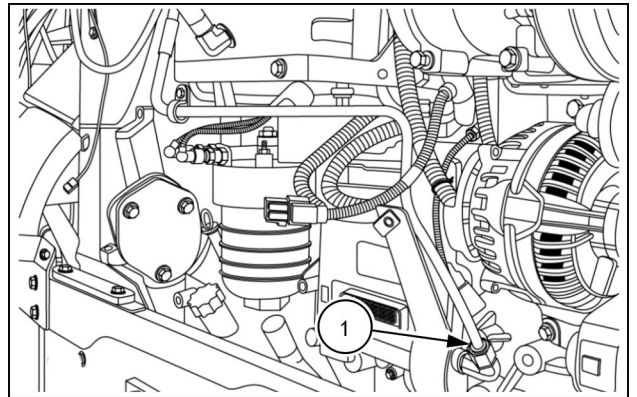
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24. Remove the nut (1) and the clamp bolts (2). Disengage the power cable (3).



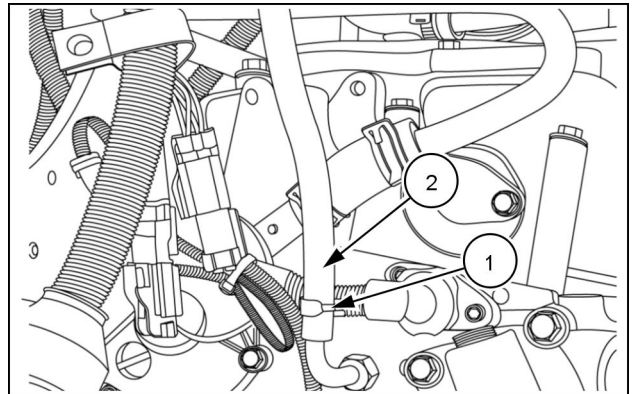
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25. Loosen the nut (1) and disconnect the fuel supply line to the EMC cooler



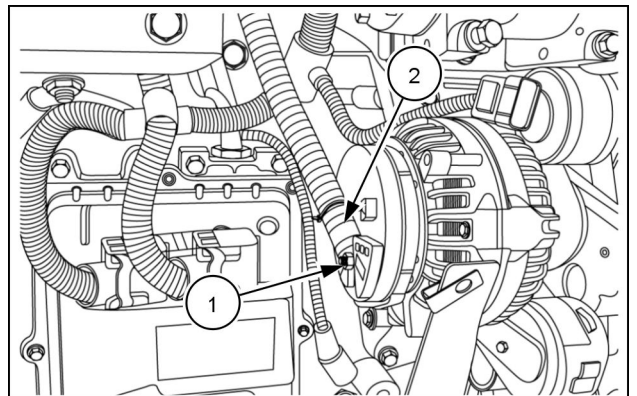
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26. Disengage the clamp (1) and disconnect the fuel return hose (2) from the pipe.



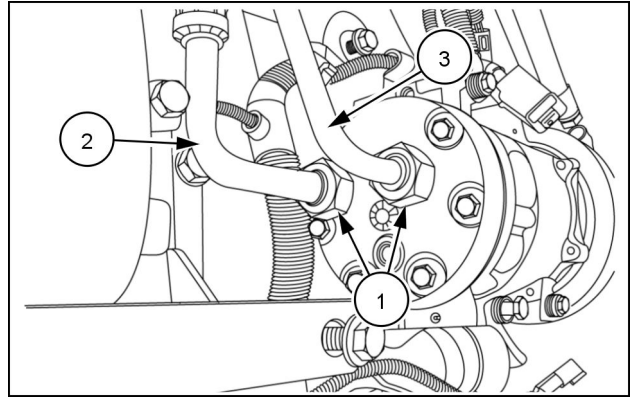
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27. Remove the nut (1) and disengage the alternator output cable (2).



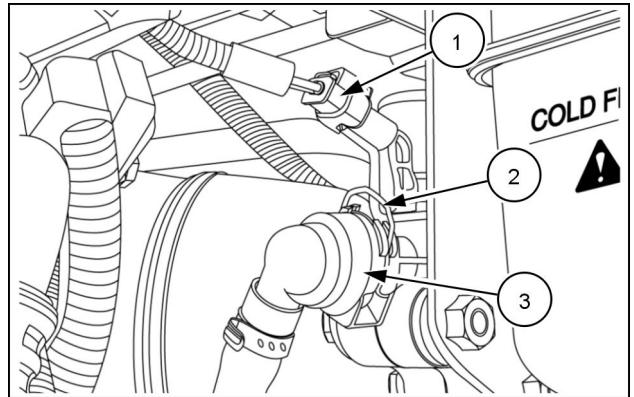
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28. Loosen the nuts **(1)** and disconnect the compressor inlet **(2)** and outlet **(3)** tubes.



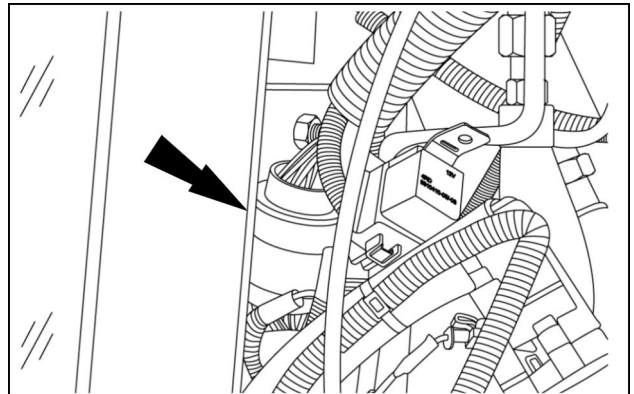
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29. Disconnect the harness connector to the SCR heater control valve solenoid **(1)**.
30. Raise the locking wire **(2)** and disconnect the heater supply connector **(3)** from the valve.
31. Repeat for the outlet hose connection (located on the right side of the valve).



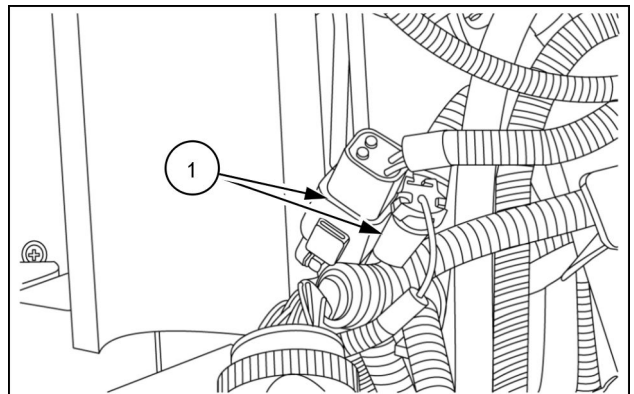
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32. Disconnect the main engine to chassis harness connector.



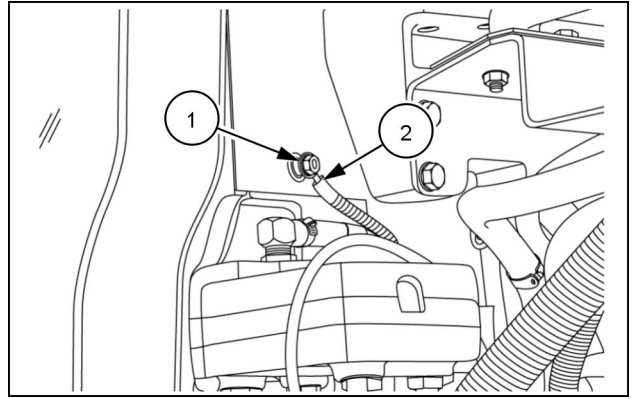
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33. Disconnect the auxiliary engine to chassis harness connectors **(1)**.



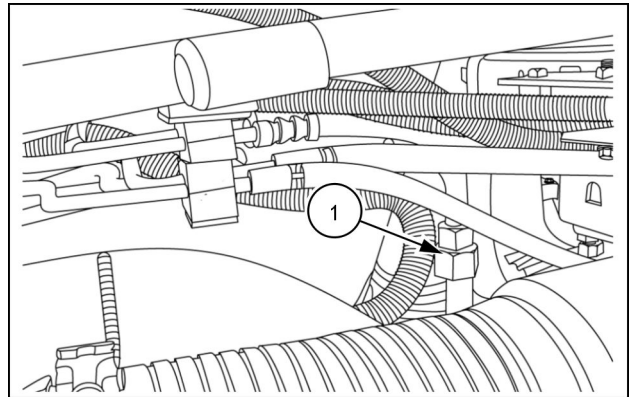
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34. Remove the holding nut (1) and disengage the ground wire (2).



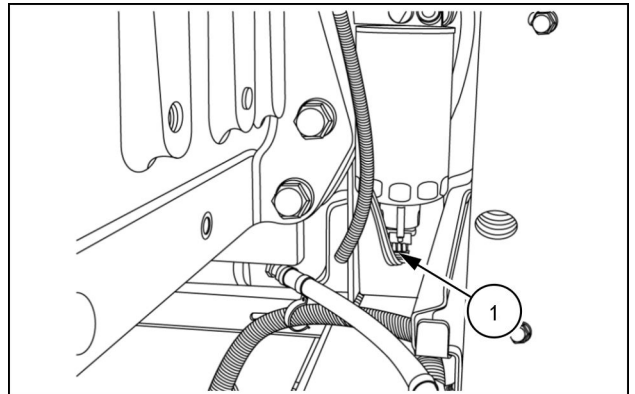
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35. Loosen the fitting and disconnect the hydraulic oil line (1) (right side of engine).



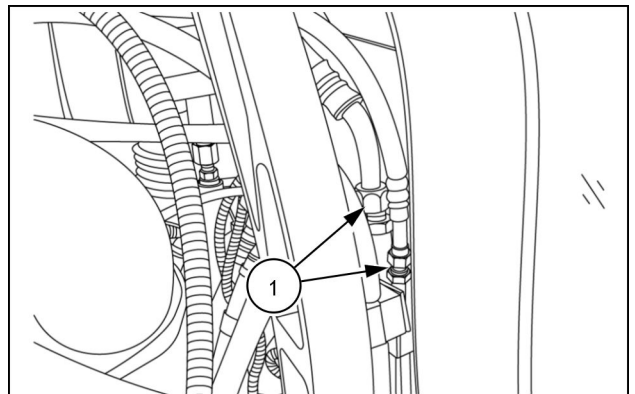
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36. Disconnect the water in fuel sensor connector (1) from the primary fuel filter.



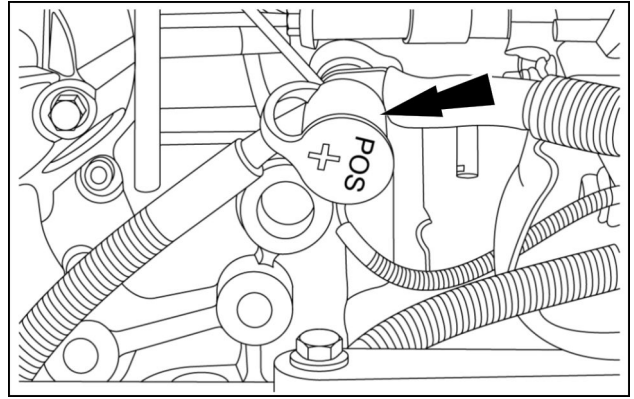
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37. Loosen the nuts (1) and disconnect the A/C lines located between the hood support and the cab.



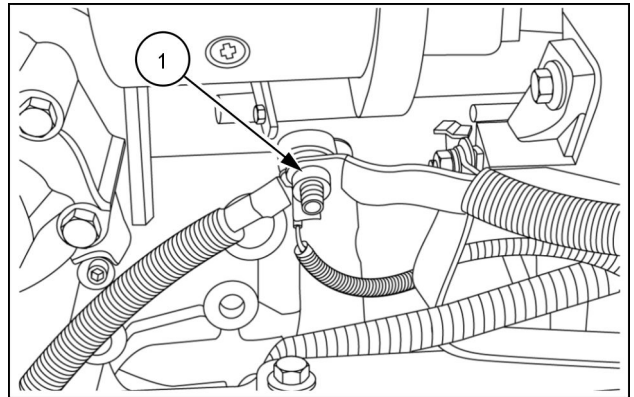
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38. Remove the jump start stud.



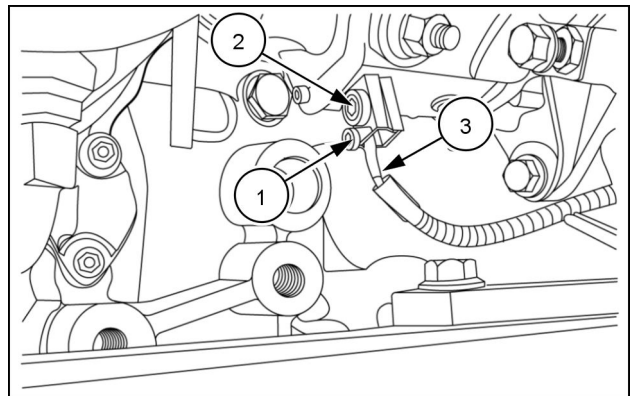
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39. Remove the nut (1) and disengage the cables from the starter.



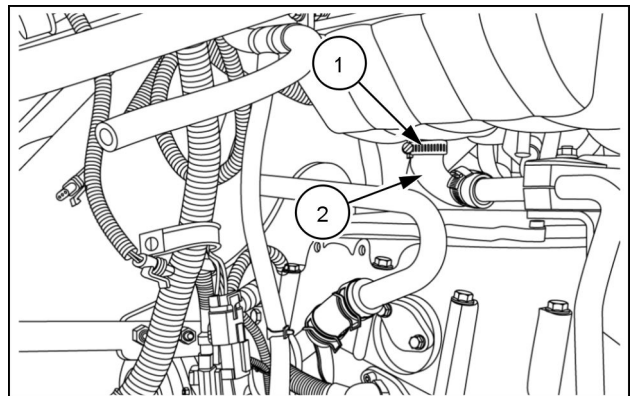
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40. Remove the plug (1), remove the attaching screw (2) and remove the starter solenoid wire (3).



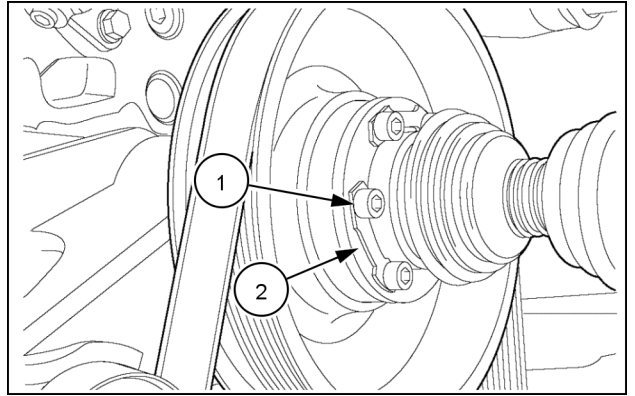
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41. Loosen the hose clamp (1) and disconnect the fill hose elbow (2).



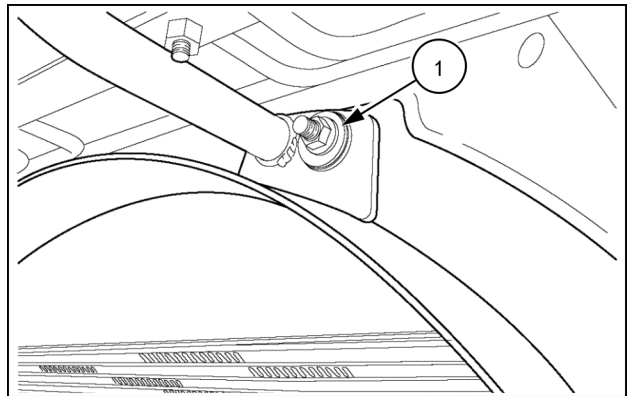
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42. Remove the six socket head bolts **(1)** and three backing plates **(2)** securing the drive shaft assembly to the engine drive pulley. Disengage the drive from the pulley.



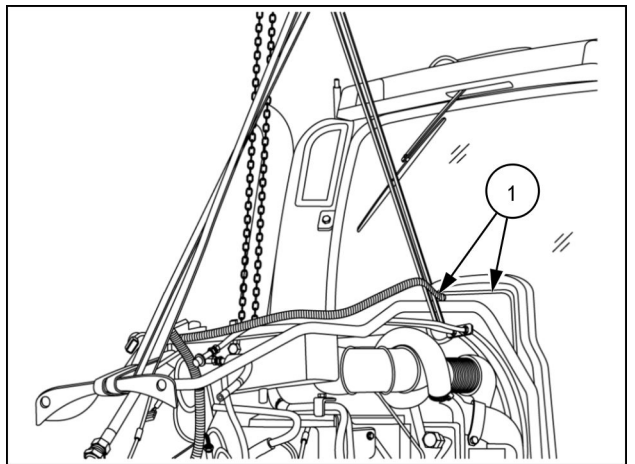
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43. Remove the nuts and washers **(1)** from the cooling assembly support bracket on the left and right sides.



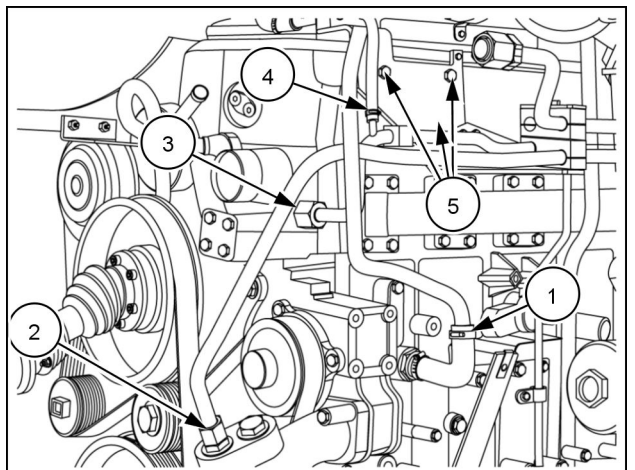
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44. Properly support the bracket, and remove the four bolts **(1)** securing the bracket to the hood support. Remove the assembly and set aside.



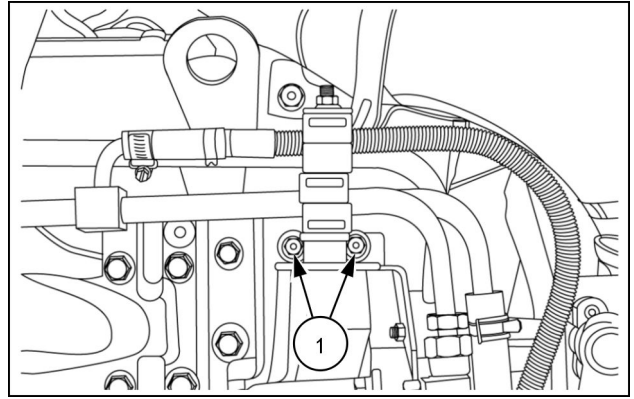
RCPH10CCH037BAB 34

45. Loosen the clamp **(1)** and disconnect the coolant fill line.
46. Loosen the nuts **(2)** and **(3)** and disconnect the cab heater supply and return lines.
47. Disengage the clamp **(4)** and remove the air bleed hose.
48. Remove the three bolts **(5)** securing the front support bracket.



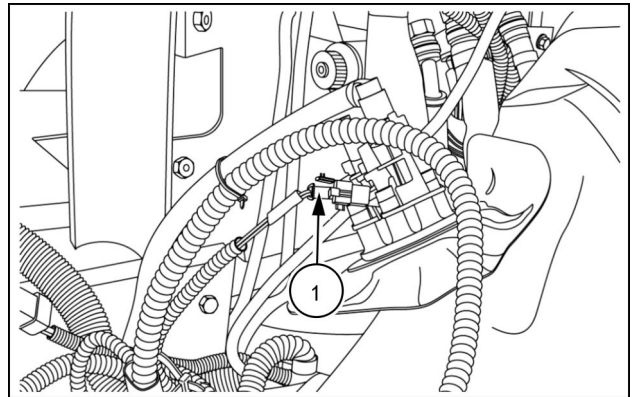
RCPH10CCH038BAB 35

49. Remove the two bolts (1) securing the rear support bracket.



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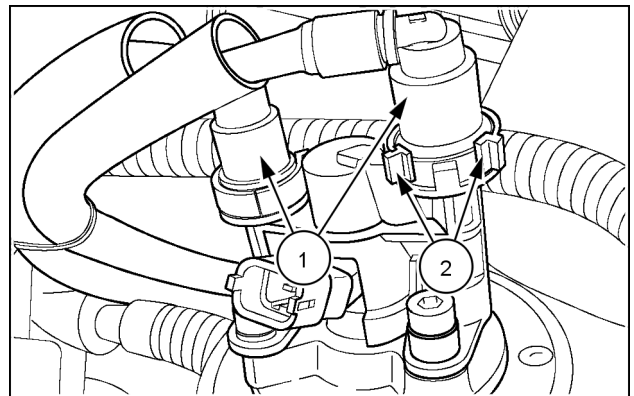
50. Disconnect the harness connector (1) to the dosing valve.



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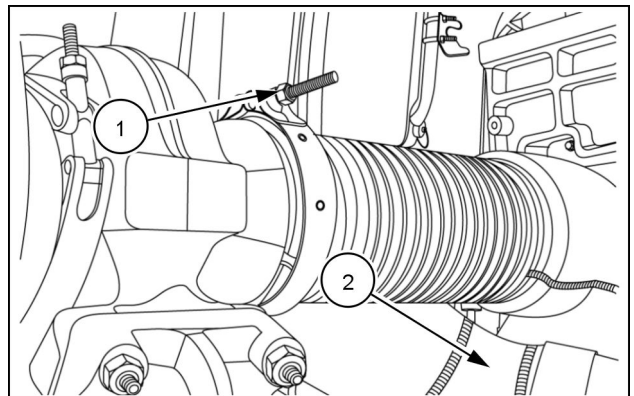
51. Disconnect the DEF supply and return hoses (1).

NOTE: Squeeze the locking tabs (2) together and pull straight upward on the elbow.



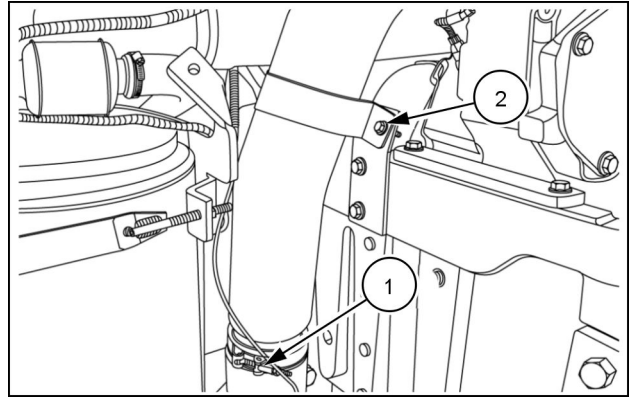
RCPH10CCH359AAB 38

52. Remove the clamp (1) at the turbocharger. Repeat for clamp at the other end of the pipe (2). Remove the pipe and set aside.



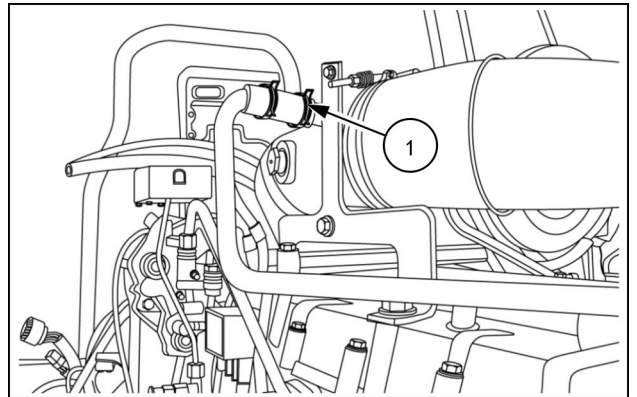
RCPH10CCH806AAB 39

53. Remove the clamp **(1)** at the SCR muffler. Remove the attaching bolt **(2)** securing the support bracket. Remove the pipe and set aside.



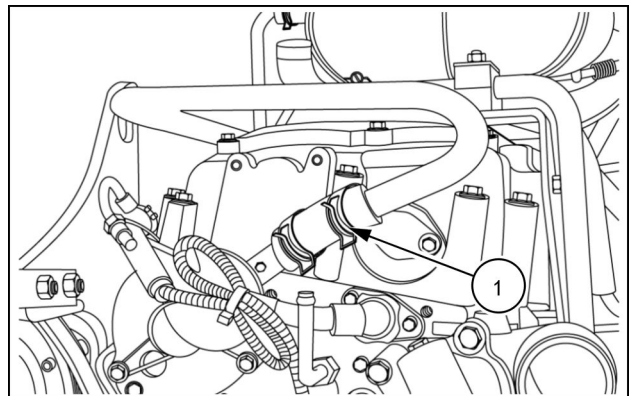
RCPH10CCH803AAB 40

54. Disengage the engine blow-by hose clamp **(1)** at the intake pipe. Disconnect from the intake pipe.



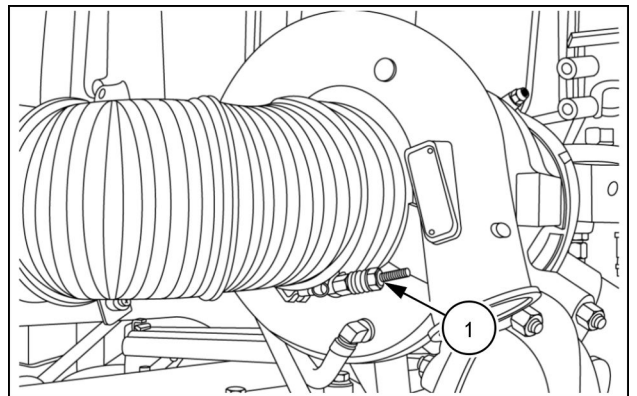
RCPH10CCH805AAB 41

55. Disengage the engine blow-by hose clamp **(1)** at the engine. Remove the pipe and set aside.



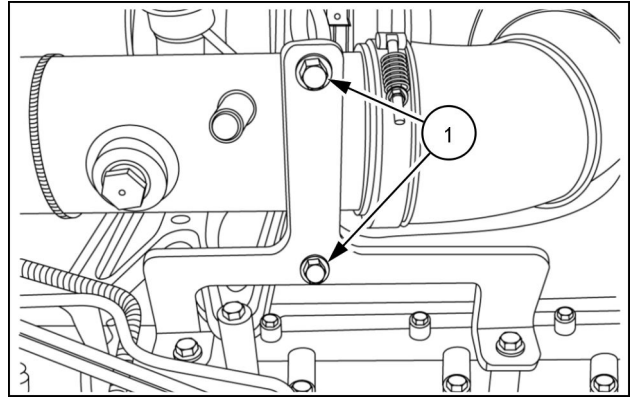
RCPH10CCH807AAB 42

56. Loosen the clamp **(1)** securing the intake pipe elbow to the turbocharger. Disconnect from the turbo.



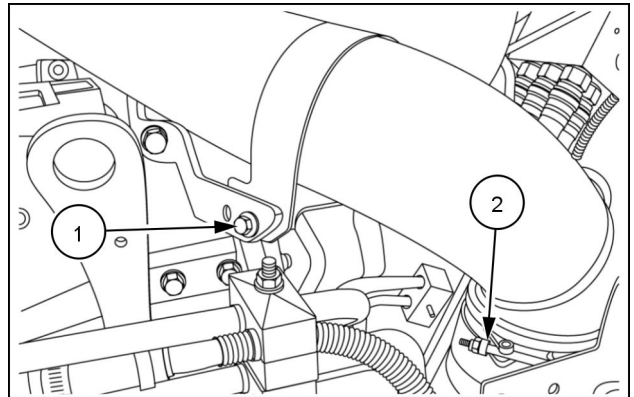
RCPH10CCH809AAB 43

57. Remove the two bolts (1) securing the support clamp to the intake pipe.



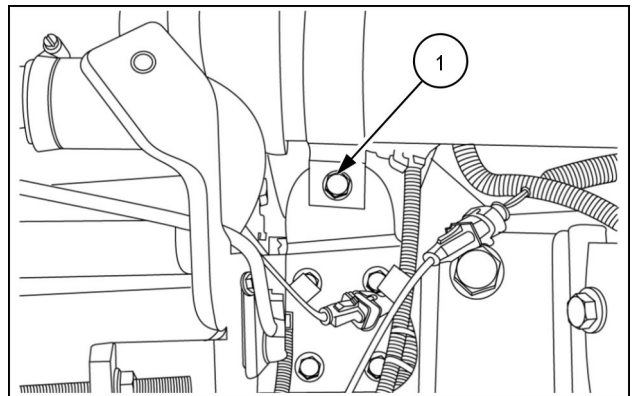
RCPH10CCH808AAB 44

58. Remove the bolt (1) securing the intake support clamp to the bracket. Loosen the clamp (2). Remove the upper intake pipe and set aside.



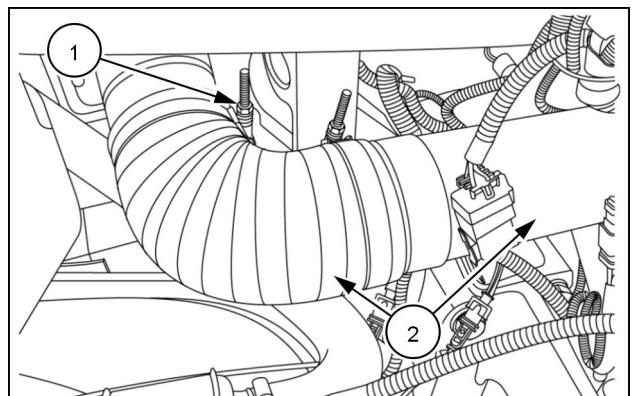
RCPH10CCH804AAB 45

59. Remove the bolt (1) securing the intake pipe support clamp.



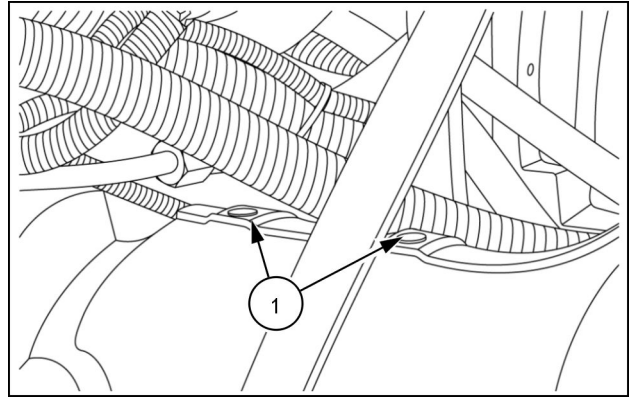
RCPH10CCH811AAB 46

60. Loosen the clamp (1) and remove the intake elbow and pipe assembly (2) from the air cleaner outlet.



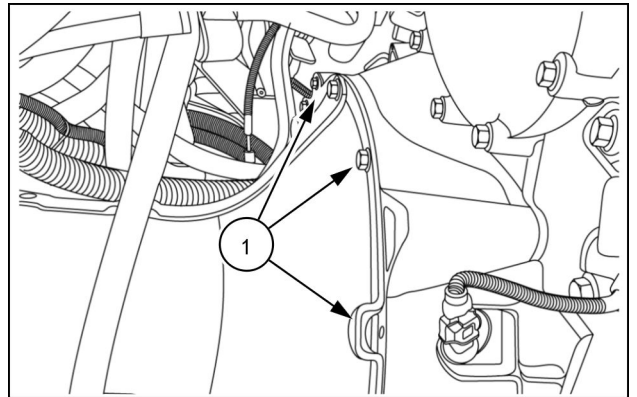
RCPH10CCH810AAB 47

61. Remove the two fasteners (1) securing the two halves of the engine drive shaft cover.



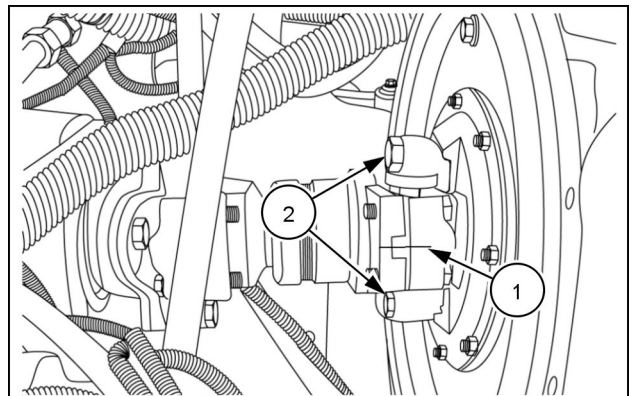
RCPH10CCH812AAB 48

62. Remove the cover bolts (1). Remove the covers and set aside.



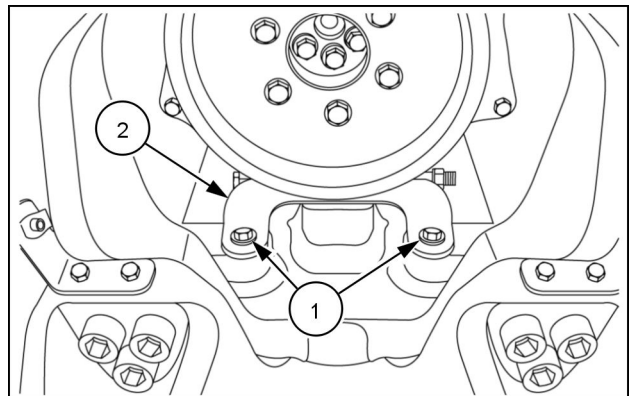
RCPH10CCH813AAB 49

63. Mark the drive shaft (1). Remove the four bolts (2) and disengage the drive shaft from the flywheel.



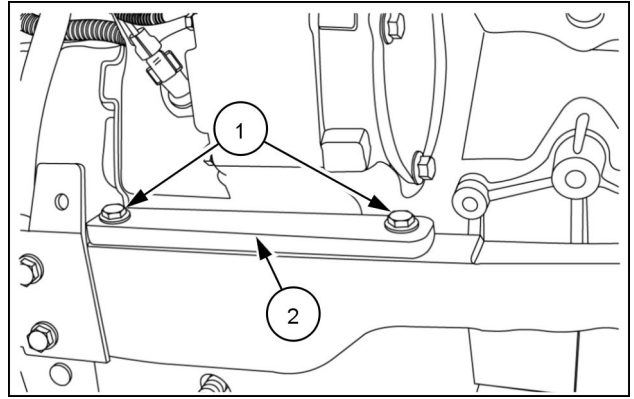
RCPH10CCH817AAB 50

64. Remove the two bolts (1) securing the front engine mount bracket. Remove the bracket (2) and set aside.



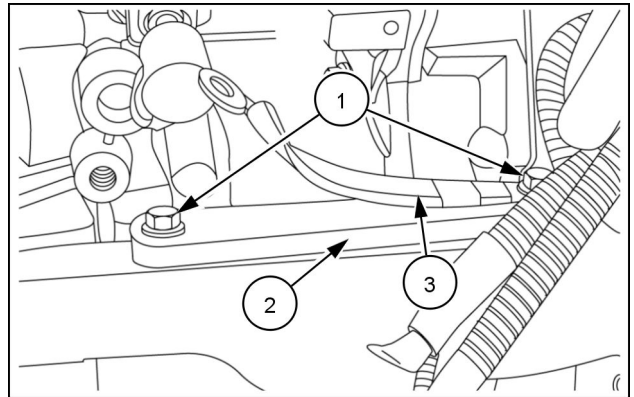
RCPH10CCH814AAB 51

65. Remove the two bolts (1) securing the right rear engine mount plate. Remove the plate (2) and set aside.



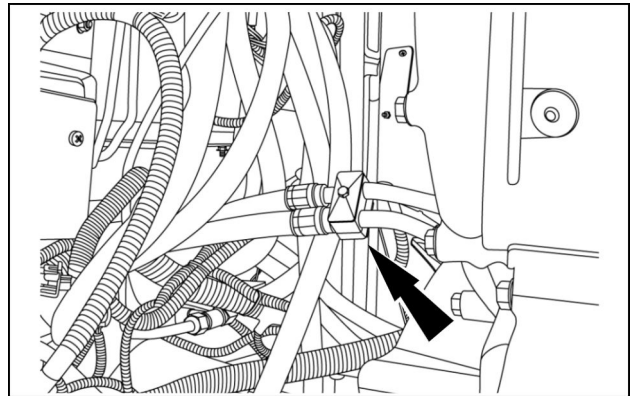
RCPH10CCH815AAB 52

66. Remove the two bolts (1) securing the left rear engine mount plate. Remove the plate (2) along with the ground strap (3) and set aside.



RCPH10CCH816AAB 53

67. Remove the hose clamp (located at the rear of the engine) securing the hydraulic hoses. Move the assembly (from the left side of the engine) off to the side.



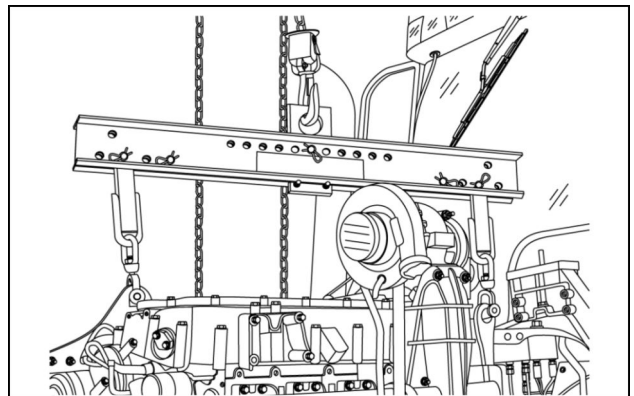
RCPH10CCH829AAB 54

68. **⚠ WARNING**

Heavy objects!
Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders. Failure to comply could result in death or serious injury.

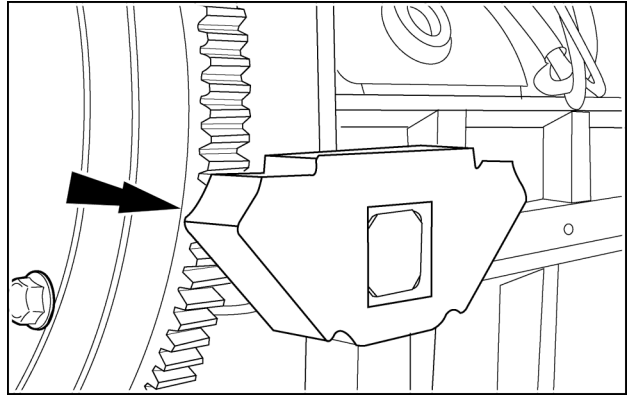
W0398A

Use an appropriate device to support the engine, and carefully remove the engine making sure all hoses, lines and harnesses are disconnected.



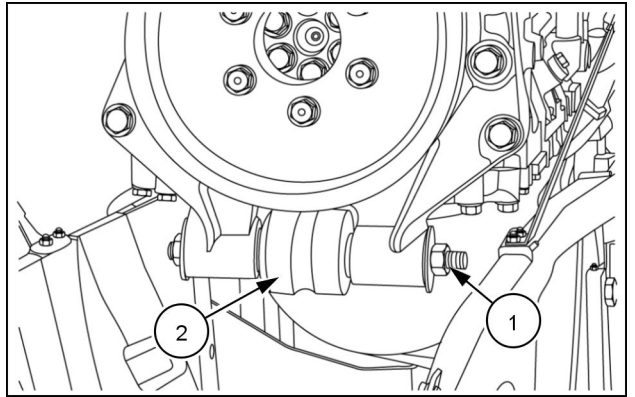
RCPH10CCH832AAB 55

69. Remove the rear engine mount. Inspect for wear and/or damage. Replace as required. Repeat for the left side.



RCPH07CCH166AAB 56

70. Remove the bolt and nut (1) securing the front mount engine mount (2). Inspect mount for wear and/or damage. Replace as required.



RCPH10CCH833AAB 57

Next operation:
Engine - Install (10.001)

Engine - Install

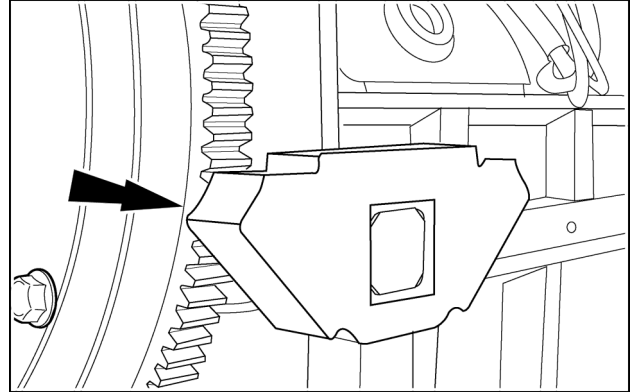
Magnum 235, Magnum 260, Magnum 290, Magnum 315, Magnum 340, Magnum 370 [ZCRD02588 -]

Prior operation:

Engine - Remove (10.001)

NOTE: During the assembly of components with O-ring seals, new seals should be lubricated and installed.

1. Install the rear engine mounts.

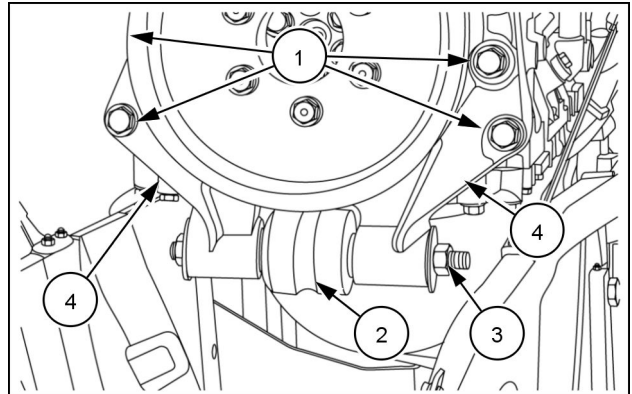


RCPH07CCH166AAB 1

2. If front engine mount brackets (4) were removed, re-install and secure with the four(4) bolts (1) previously removed.

3. Torque the bolts to **110 - 113 N·m (81 - 83 lb ft)**.

4. Position the mount (3), install the bolt and torque the nut (2) to **160 - 220 N·m (118 - 162 lb ft)**.



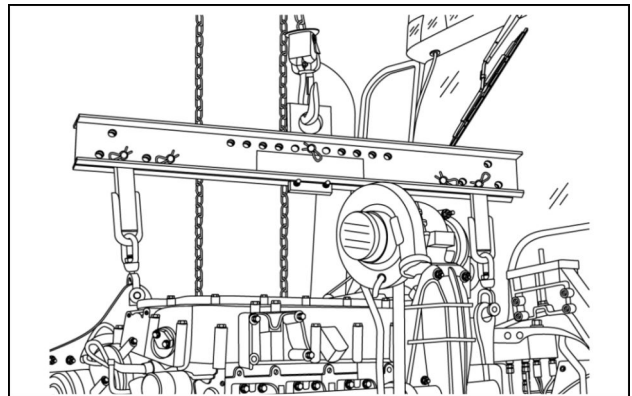
RCPH10CCH833AAB 2

5. **WARNING**

Heavy objects!
Lift and handle all heavy components using lifting equipment with adequate capacity. Always support units or parts with suitable slings or hooks. Make sure the work area is clear of all bystanders. Failure to comply could result in death or serious injury.

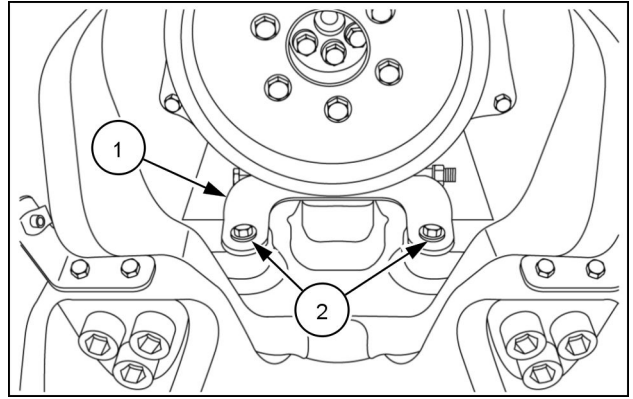
W0398A

Support the engine with proper lifting equipment and lower the engine into position in the front frame.



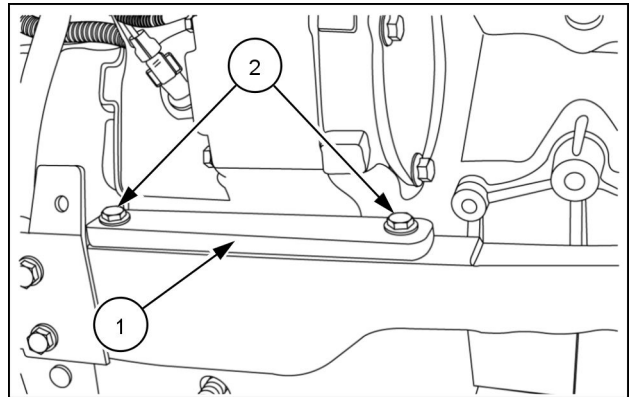
RCPH10CCH832AAB 3

6. Install the front mount bracket (1).
7. Install the bolts (2) removed previously, and torque to **31 - 36 N·m (23 - 27 lb ft)**.



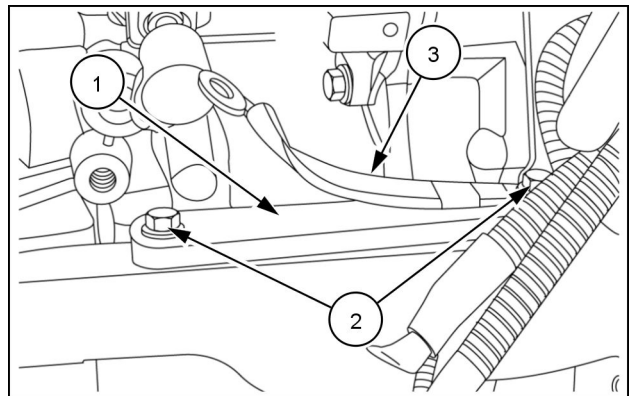
RCPH10CCH814AAB 4

8. Install the plate (1) for the right rear mount.
9. Install the bolts (2) removed previously, and torque to **125 - 150 N·m (92 - 111 lb ft)**.



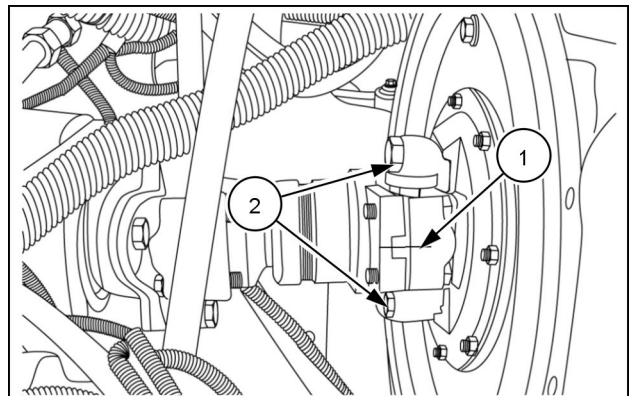
RCPH10CCH815AAB 5

10. Install the plate (1) for the left rear mount.
11. Install the bolts (2) removed previously, along with the grounding strap (3), and torque to **125 - 150 N·m (92 - 111 lb ft)**.



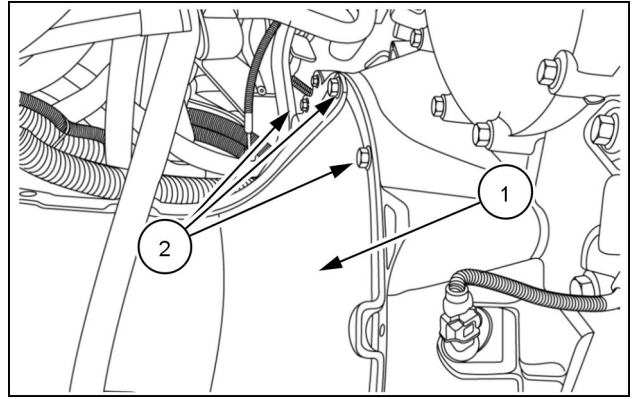
RCPH10CCH816AAB 6

12. Align the marks (1) and attach the drive shaft.
13. Install the four bolts (2) removed previously, and torque to **101 - 113 N·m (74 - 83 lb ft)**.



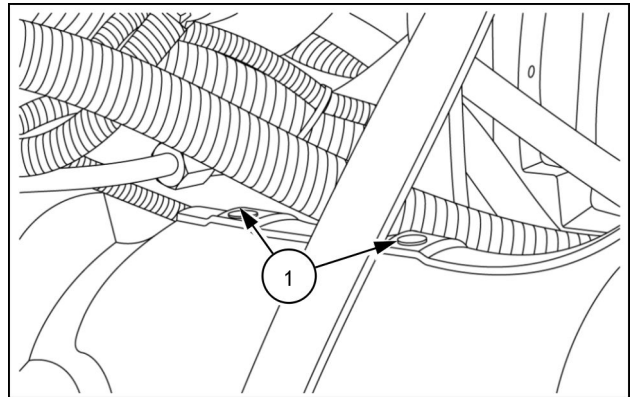
RCPH10CCH817AAB 7

14. Position the two sections of drive shaft cover (1) and secure with the bolts (2) removed previously.



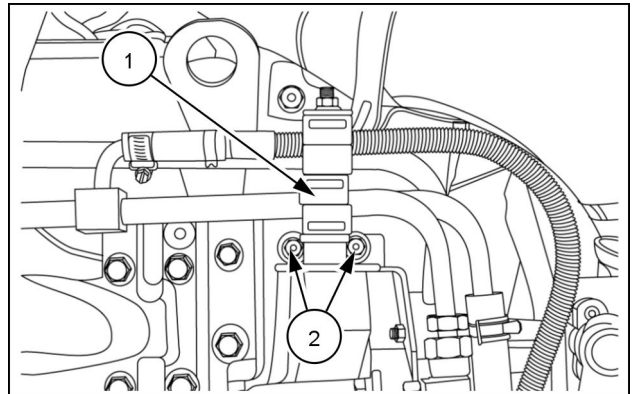
RCPH10CCH813AAB 8

15. Install two new plastic fasteners (1) through the cover halves.



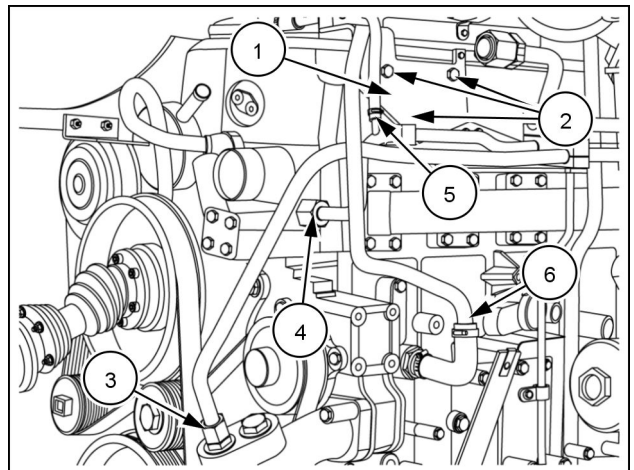
RCPH10CCH812AAB 9

16. At the left side of the engine, install the rear tube support bracket (1). Using the bolts (2) removed earlier, secure bracket to the engine.



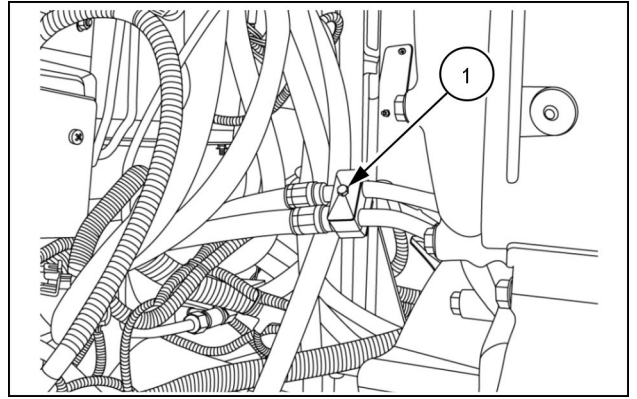
RCPH10CCH800AAB 10

17. Install the front tube support bracket (1). Using the bolts (2) removed earlier, secure bracket to the engine.
18. Connect the cab heater supply (3) and return (3) tubes, and tighten the nuts.
19. Connect the air bleed hose (5) and engage the clamp.
20. Install the fill tube (6) from the deaeration tank to the elbow, and tighten the clamp.



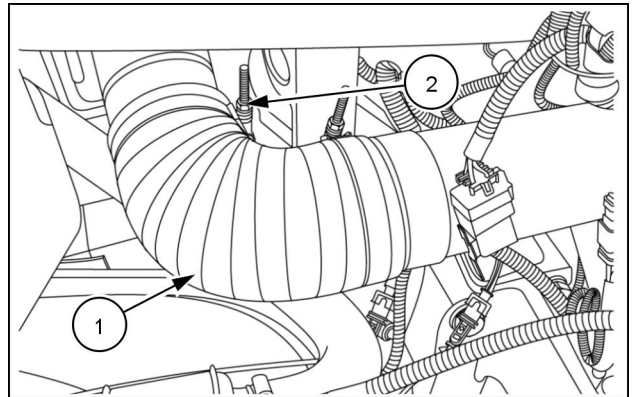
RCPH10CCH038BAB 11

21. At the rear of the engine, install the hydraulic clamp assembly (1) that was removed earlier.



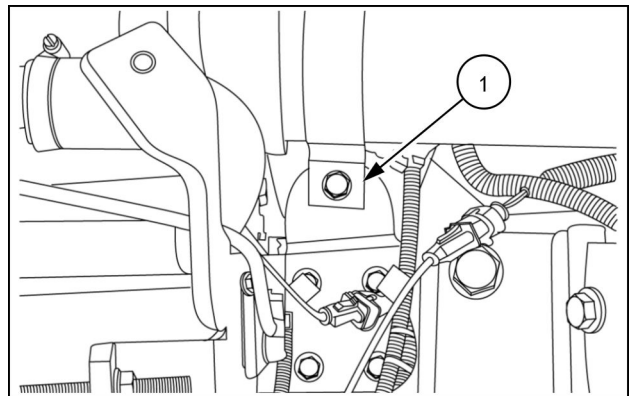
RCPH10CCH829AAB 12

22. Install the elbow and pipe assembly (1) to the air cleaner outlet, and tighten the hose clamp (2).



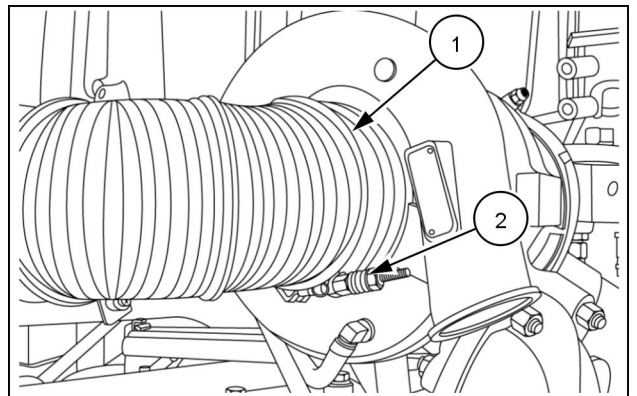
RCPH10CCH810AAB 13

23. With the bolt removed earlier, secure the clamp (1) for the air cleaner outlet pipe to the bracket.



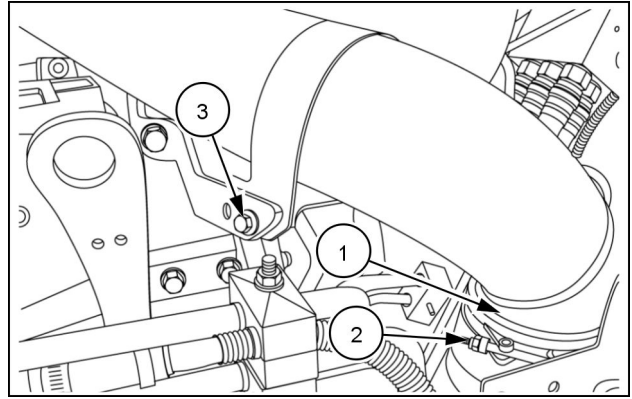
RCPH10CCH811AAB 14

24. Move the pipe between air cleaner outlet and turbocharger inlet into position. Connect the pipe elbow (1) onto the turbo inlet, but do not tighten the clamp (2) at this time.



RCPH10CCH809AAB 15

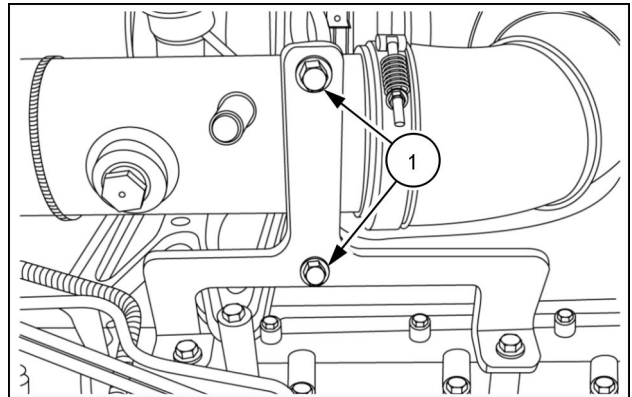
25. Install the opposite end (1) of the pipe into the air cleaner outlet hose. Do not tighten the hose clamp (2) at this time. Secure the pipe support with the bolt (3) removed earlier.



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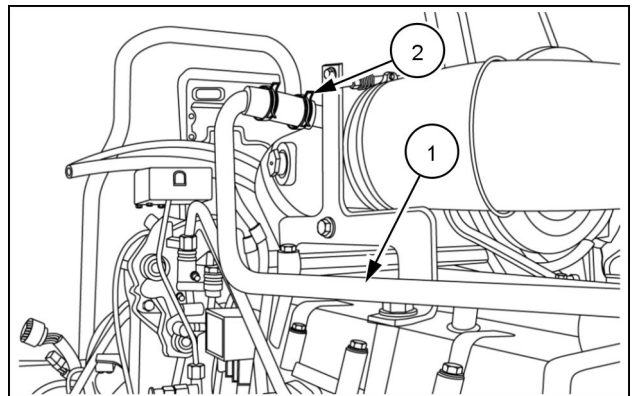
26. Using the bolts (1) remove earlier, secure the intake pipe support to the bracket.

NOTICE: Tighten all hose clamps at this time. It is important to have all hose clamps properly tighten to prevent dirt from entering the intake system.



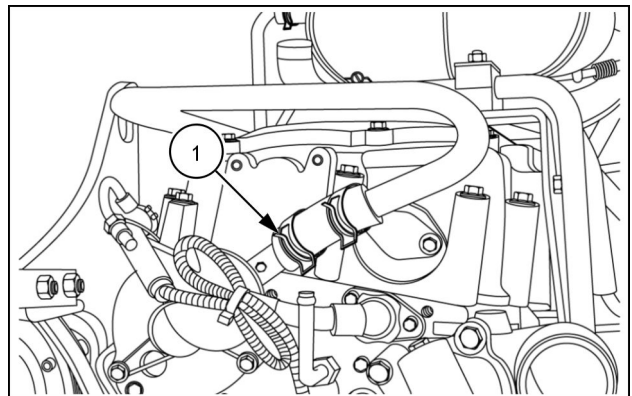
RCPH10CCH808AAB 17

27. Move the engine blow-by tube (1) into position. At the air intake pipe, install the hose connection and engage the clamp (2).



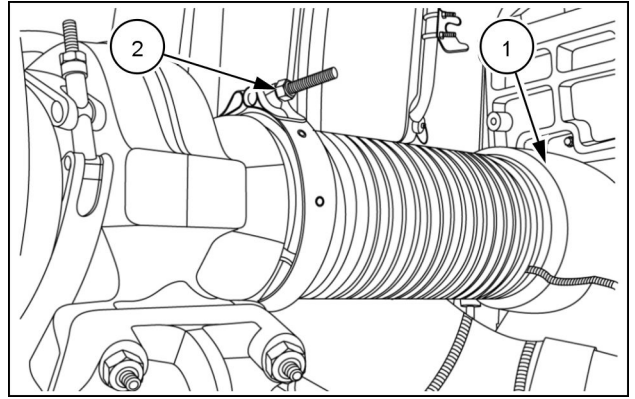
RCPH10CCH805AAB 18

28. Connect the blow-by tube to the engine and engage the clamp (1).



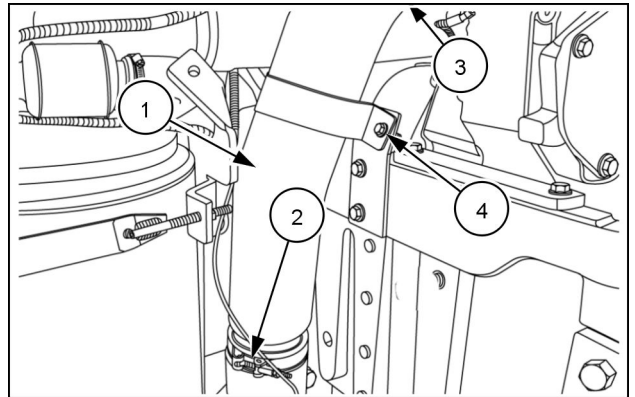
RCPH10CCH807AAB 19

29. Move the exhaust pipe assembly (1) into position. Engage the turbo to pipe clamp (2). Do not tighten the clamp at this time.



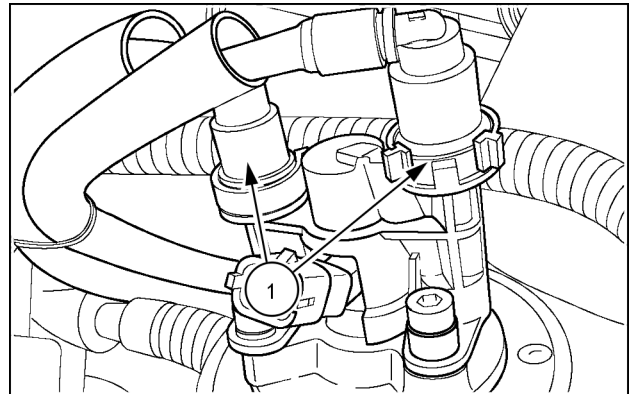
RCPH10CCH806AAB 20

30. Move the exhaust pipe connector (1) between the turbo outlet and converter inlet elbow. Engage the lower (shown) (2) and upper (3) clamps and tighten. Using the bolt (4) removed earlier, secure the support clamp.



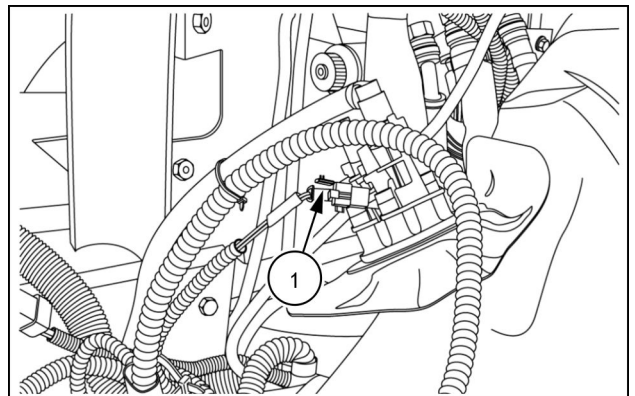
RCPH10CCH803AAB 21

31. Connect the DEF supply and return hoses (1) to the supply module.



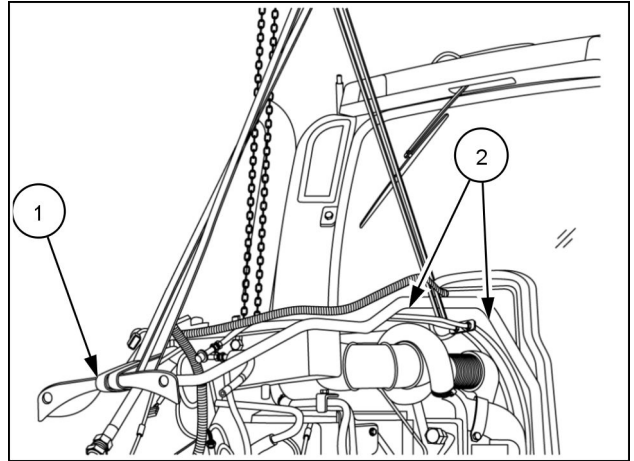
RCPH10CCH359AAB 22

32. Connect the DEF harness connector (1) to the module.



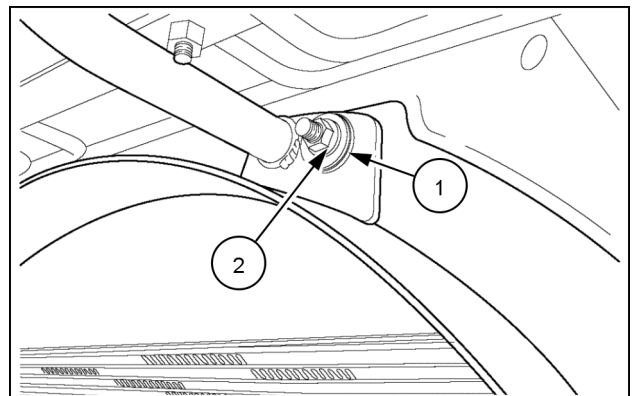
RCPH10CCH801AAB 23

33. With help of an assistant or an appropriate lifting device, move the line and harness assembly (1) over the engine. Secure to the hood support with the four bolts (2) removed earlier.



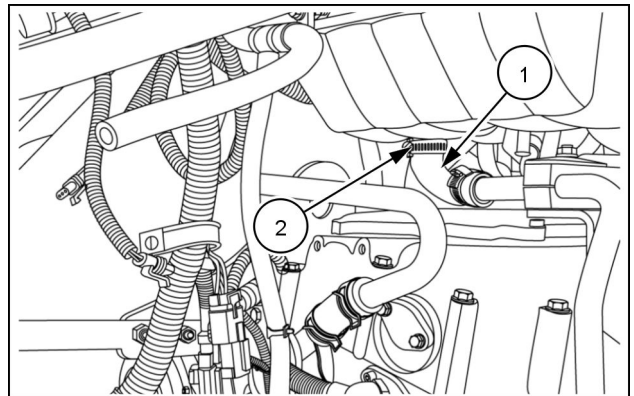
RCPH10CCH037BAB 24

34. Inspect the rubber mounts (right side shown) (1) for the line and harness assembly. Replace as necessary. Place the support alignment holes over the studs, and secure with the washers and nuts (2) removed earlier.



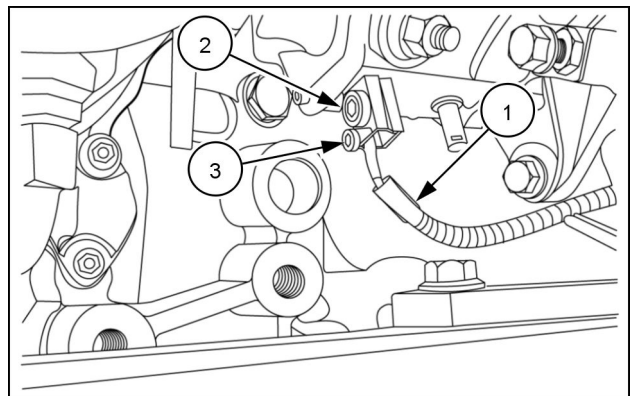
RCPH10CCH572AAB 25

35. Connect the elbow (1) to the deaeration tank, and tighten the hose clamp (2).



RCPH10CCH795AAB 26

36. Install the starter solenoid wire (1), secure with the screw (2) removed earlier and reinstall the plug (3).



RCPH10CCH818AAB 27



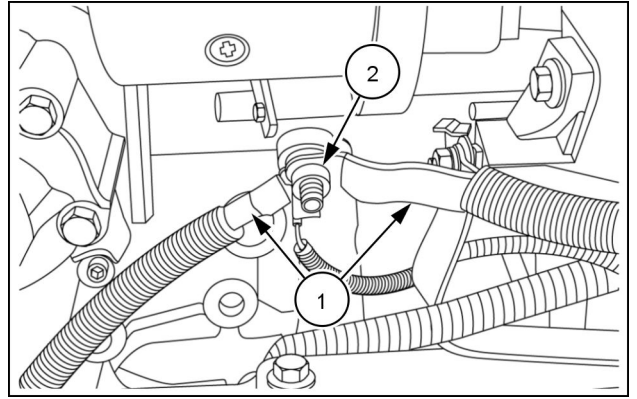
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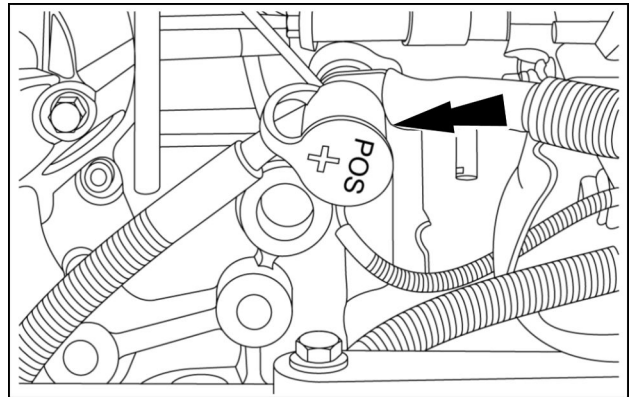
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37. Connect the power cables (1) to the starter and secure with the nut (2) removed earlier.



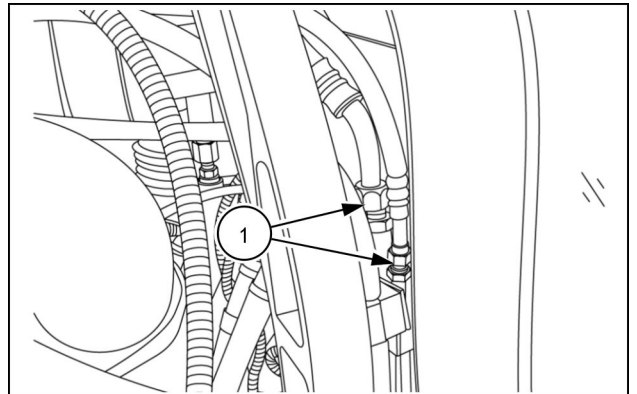
RCPH10CCH797AAB 28

38. Install and tighten the jump start stud removed earlier.



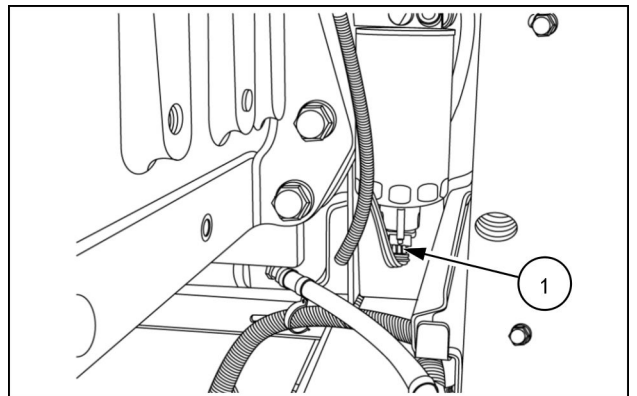
RCPH10CCH796AAB 29

39. Lubricate new O-ring seals with refrigerant oil and install in the refrigerant line fittings (1). Connect the lines and tighten.



RCPH10CCH799AAB 30

40. Install the harness connector for the water in fuel sensor at the primary fuel filter.



RCPH10CCH794AAB 31

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