

SERVICE MANUAL

**Wheel Loader
W270C
W300C**

Print No. 47357329



W270C - W300C Wheel Loader Service Manual 47357329

Table of Contents

| Description | Section No. |
|--|--------------|
| General | Tab 1 |
| Section Index - General | |
| Standard Torque Specifications | 1001 |
| Fluids and Lubricants | 1002 |
| Metric Conversion Chart | 1003 |
| Engines | Tab 2 |
| Section Index - Engines | |
| Engine and Radiator Removal and Installation | 2000 |
| Stall Tests | 2002 |
| After Cooler | 2003 |
| For Engine Repair, See the Engine Service Manual 84394558 | |
| Fuel System | Tab 3 |
| Section Index - Fuel System | |
| For Fuel System Repair, See the Engine Service Manual 84394558 | |
| Electrical | Tab 4 |
| Section Index - Electrical | |
| Removal and Installation of Starter and Alternator | 4001 |
| Electrical Specifications and Troubleshooting | 4002 |
| Batteries | 4003 |
| Jump post option | 4003a |
| Instrument Cluster | 4005 |
| Rear view Camera and Monitor | 4006 |
| Steering | Tab 5 |
| Section Index - Steering | |
| Removal and Installation of Steering Components | 5001 |
| Steering Specifications, Pressure Checks, and Troubleshooting | 5002 |
| Steering Cylinders | 5005 |
| Center Pivot | 5006 |
| Auxiliary Steering Motor and Pump | 5008 |

**W270C - W300C Wheel Loader
Service Manual
47357329**

Table of Contents

| Description | Section No. |
|--|-------------|
| Joystick Steering System (JSS) (Optional) | 5009 |
| Power Train Tab 6 | |
| Section Index - Power Train | |
| Removal and Installation of Power Train Components | 6001 |
| Transmission Specifications, Pressure Checks, and Troubleshooting | 6002 |
| Transmission | 6003 |
| Front Axle | 6004 |
| Rear Axle | 6004 |
| Drive Shafts, Center Bearing, and Universal Joints | 6005 |
| Wheels and Tires | 6006 |
| Transmission Control Valve | 6007 |
| Brakes Tab 7 | |
| Section Index - Brakes | |
| Removal and Installation of Brake Components | 7001 |
| Hydraulic Brake Troubleshooting | 7002 |
| Brake Pump | 7003 |
| Brake Accumulators | 7004 |
| Parking Brake | 7008 |
| Hydraulics Tab 8 | |
| Section Index - Hydraulics | |
| Removal and Installation of Hydraulic Components | 8001 |
| Hydraulic Specifications, Troubleshooting, and Pressure Checks | 8002 |
| Cleaning the Hydraulic System | 8003 |
| Hydraulic Pump | 8004 |
| Loader Control Valve | 8005 |
| Cylinders | 8006 |
| Ride Control Accumulator | 8013 |
| Ride Control Valve | 8014 |

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**W270C - W300C Wheel Loader
Service Manual
47357329**

Table of Contents

| Description | Section No. |
|--|-----------------------|
| Mounted Equipment | Tab 9 |
| Section Index - Mounted Equipment | |
| Air Conditioning Troubleshooting and System Checks For Systems with HFC-134a Refrigerant | 9002 |
| Air Conditioner System Service | 9003 |
| Removal and Installation of Air Conditioning and Heater Components | 9004 |
| Loader | 9006 |
| Rollover Protective Structure (ROPS) Cab Structural Frame (CSF) | 9007 |
| Cab Glass Installation | 9010 |
| Electrical Schematic Foldouts and Hydraulic Schematic Foldout | In Rear Pocket |

SECTION INDEX

GENERAL


| Section Title | Section Number |
|--------------------------------------|-----------------------|
| Standard Torque Specifications | 1001 |
| Fluids and Lubricants | 1002 |
| Metric Conversion Chart | 1003 |


Section 1001

GENERAL TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS - DECIMAL HARDWARE

Use the torques in this chart when special torques are not given. These torques apply to fasteners with both UNC and UNF threads as received from suppliers dry, or when lubricated with engine oil. Not applicable if special graphities, Molydisulfide greases, or other extreme pressure lubricants are used.

| Grade 5 Bolts, Nuts, and Studs | | |
|---|--------------|---------------|
|  | | |
| Size | Pound-Inches | Newton metres |
| 1/4 inch | 108 to 132 | 12 to 15 |
| 5/16 inch | 204 to 252 | 23 to 28 |
| 3/8 inch | 420 to 504 | 48 to 57 |
| | | |
| Size | Pound-Feet | Newton metres |
| 7/16 inch | 54 to 64 | 73 to 87 |
| 1/2 inch | 80 to 96 | 109 to 130 |
| 9/16 inch | 110 to 132 | 149 to 179 |
| 5/8 inch | 150 to 180 | 203 to 244 |
| 3/4 inch | 270 to 324 | 366 to 439 |
| 7/8 inch | 400 to 480 | 542 to 651 |
| 1.0 inch | 580 to 696 | 787 to 944 |
| 1-1/8 inch | 800 to 880 | 1085 to 1193 |
| 1-1/4 inch | 1120 to 1240 | 1519 to 1681 |
| 1-3/8 inch | 1460 to 1680 | 1980 to 2278 |
| 1-1/2 inch | 1940 to 2200 | 2631 to 2983 |


| Grade 8 Bolts, Nuts, and Studs | | |
|---|--------------|---------------|
|  | | |
| Size | Pound-Inches | Newton metres |
| 1/4 inch | 144 to 180 | 16 to 20 |
| 5/16 inch | 288 to 348 | 33 to 39 |
| 3/8 inch | 540 to 648 | 61 to 73 |
| | | |
| Size | Pound-Feet | Newton metres |
| 7/16 inch | 70 to 84 | 95 to 114 |
| 1/2 inch | 110 to 132 | 149 to 179 |
| 9/16 inch | 160 to 192 | 217 to 260 |
| 5/8 inch | 220 to 264 | 298 to 358 |
| 3/4 inch | 380 to 456 | 515 to 618 |
| 7/8 inch | 600 to 720 | 814 to 976 |
| 1.0 inch | 900 to 1080 | 1220 to 1465 |
| 1-1/8 inch | 1280 to 1440 | 1736 to 1953 |
| 1-1/4 inch | 1820 to 2000 | 2468 to 2712 |
| 1-3/8 inch | 2380 to 2720 | 3227 to 3688 |
| 1-1/2 inch | 3160 to 3560 | 4285 to 4827 |


NOTE: Use thick nuts with Grade 8 bolts.

TORQUE SPECIFICATIONS - METRIC HARDWARE

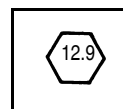
Use the following torques when specifications are not given.

These values apply to fasteners with coarse threads as received from supplier, plated or unplated, or when lubricated with engine oil. These values do not apply if graphite or Molydisulfide grease or oil is used.

| Grade 8.8 Bolts, Nuts, and Studs | | |
|---|--------------|---------------|
|  | | |
| Size | Pound-Inches | Newton metres |
| M4 | 24 to 36 | 3 to 4 |
| M5 | 60 to 72 | 7 to 8 |
| M6 | 96 to 108 | 11 to 12 |
| M8 | 228 to 276 | 26 to 31 |
| M10 | 456 to 540 | 52 to 61 |
| | | |
| Size | Pound-Feet | Newton metres |
| M12 | 66 to 79 | 90 to 107 |
| M14 | 106 to 127 | 144 to 172 |
| M16 | 160 to 200 | 217 to 271 |
| M20 | 320 to 380 | 434 to 515 |
| M24 | 500 to 600 | 675 to 815 |
| M30 | 920 to 1100 | 1250 to 1500 |
| M36 | 1600 to 1950 | 2175 to 2600 |

| Grade 10.9 Bolts, Nuts, and Studs | | |
|---|--------------|---------------|
|  | | |
| Size | Pound-Inches | Newton metres |
| M4 | 36 to 48 | 4 to 5 |
| M5 | 84 to 96 | 9 to 11 |
| M6 | 132 to 156 | 15 to 18 |
| M8 | 324 to 384 | 37 to 43 |
| | | |
| Size | Pound-Feet | Newton metres |
| M10 | 54 to 64 | 73 to 87 |
| M12 | 93 to 112 | 125 to 150 |
| M14 | 149 to 179 | 200 to 245 |
| M16 | 230 to 280 | 310 to 380 |
| M20 | 450 to 540 | 610 to 730 |
| M24 | 780 to 940 | 1050 to 1275 |
| M30 | 1470 to 1770 | 2000 to 2400 |
| M36 | 2580 to 3090 | 3500 to 4200 |

Grade 12.9 Bolts, Nuts, and Studs



Usually the torque values specified for grade 10.9 fasteners can be used satisfactorily on grade 12.9 fasteners.

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

| 37 Degree Flare Fitting | | | |
|--------------------------------|----------------|------------------|------------------|
| Tube OD Hose ID | Thread Size | Pound- Inches | Newton metres |
| 1/4 inch 6.4 mm | 7/16-20 | 72 to 144 | 8 to 16 |
| 5/16 inch 7.9 mm | 1/2-20 | 96 to 192 | 11 to 22 |
| 3/8 inch 9.5 mm | 9/16-18 | 120 to 300 | 14 to 34 |
| 1/2 inch 12.7 mm | 3/4-16 | 180 to 504 | 20 to 57 |
| 5/8 inch 15.9 mm | 7/8-14 | 300 to 696 | 34 to 79 |
| | | | |
| Tube OD Hose ID | Thread Size | Pound- Feet | Newton metres |
| 3/4 inch 19.0 mm | 1-1/16-12 | 40 to 80 | 54 to 108 |
| 7/8 inch 22.2 mm | 1-3/16-12 | 60 to 100 | 81 to 135 |
| 1.0 inch 25.4 mm | 1-5/16-12 | 75 to 117 | 102 to 158 |
| 1-1/4 inch 31.8 mm | 1-5/8-12 | 125 to 165 | 169 to 223 |
| 1-1/2 inch 38.1 mm | 1-7/8-12 | 210 to 250 | 285 to 338 |

| Straight Threads with O-ring | | | |
|-------------------------------------|----------------|------------------|------------------|
| Tube OD Hose ID | Thread Size | Pound- Inches | Newton metres |
| 1/4 inch 6.4 mm | 7/16-20 | 144 to 228 | 16 to 26 |
| 5/16 inch 7.9 mm | 1/2-20 | 192 to 300 | 22 to 34 |
| 3/8 inch 9.5 mm | 9/16-18 | 300 to 480 | 34 to 54 |
| 1/2 inch 12.7 mm | 3/4-16 | 540 to 804 | 57 to 91 |
| | | | |
| Tube OD Hose ID | Thread Size | Pound- Feet | Newton metres |
| 5/8 inch 15.9 mm | 7/8-14 | 58 to 92 | 79 to 124 |
| 3/4 inch 19.0 mm | 1-1/16-12 | 80 to 128 | 108 to 174 |
| 7/8 inch 22.2 mm | 1-3/16-12 | 100 to 160 | 136 to 216 |
| 1.0 inch 25.4 mm | 1-5/16-12 | 117 to 187 | 159 to 253 |
| 1-1/4 inch 31.8 mm | 1-5/8-12 | 165 to 264 | 224 to 357 |
| 1-1/2 inch 38.1 mm | 1-7/8-12 | 250 to 400 | 339 to 542 |

| Split Flange Mounting Bolts | | |
|------------------------------------|------------------|------------------|
| Size | Pound- Inches | Newton metres |
| 5/16-18 | 180 to 240 | 20 to 27 |
| 3/8-16 | 240 to 300 | 27 to 34 |
| 7/16-14 | 420 to 540 | 47 to 61 |
| | | |
| Size | Pound- Feet | Newton metres |
| 1/2-13 | 55 to 65 | 74 to 88 |
| 5/8-11 | 140 to 150 | 190 to 203 |

TORQUE SPECIFICATIONS - STEEL HYDRAULIC FITTINGS

| O-ring Face Seal End | | | | | O-ring Boss End Fitting or Lock Nut | | |
|-----------------------------|-----------------------|----------------|------------------|------------------|--|------------------|------------------|
| Nom. SAE Dash Size | Tube OD | Thread Size | Pound- Inches | Newton metres | Thread Size | Pound- Inches | Newton metres |
| -4 | 1/4 inch 6.4 mm | 9/16-18 | 120 to 144 | 14 to 16 | 7/16-20 | 204 to 240 | 23 to 27 |
| -6 | 3/8 inch 9.5 mm | 11/16-16 | 216 to 240 | 24 to 27 | 9/16-18 | 300 to 360 | 34 to 41 |
| -8 | 1/2 inch 12.7 mm | 13/16-16 | 384 to 480 | 43 to 54 | 3/4-16 | 540 to 600 | 61 to 68 |
| | | | | | | | |
| | | | | | Thread Size | Pound- Feet | Newton metres |
| -10 | 5/8 inch 15.9 mm | 1-14 | 552 to 672 | 62 to 76 | 7/8-14 | 60 to 65 | 81 to 88 |
| | | | | | | | |
| Nom. SAE Dash Size | Tube OD | Thread Size | Pound- Feet | Newton metres | 1-1/16-12 | 85 to 90 | 115 to 122 |
| | | | | | 1-3/16-12 | 95 to 100 | 129 to 136 |
| -12 | 3/4 inch 19.0 mm | 1-3/16-12 | 65 to 80 | 90 to 110 | 1-5/16-12 | 115 to 125 | 156 to 169 |
| -14 | 7/8 inch 22.2 mm | 1-3/16-12 | 65 to 80 | 90 to 110 | 1-5/8-12 | 150 to 160 | 203 to 217 |
| -16 | 1.0 inch 25.4 mm | 1-7/16-12 | 92 to 105 | 125 to 140 | 1-7/8-12 | 190 to 200 | 258 to 271 |
| -20 | 1-1/4 inch 31.8 mm | 1-11/16-12 | 125 to 140 | 170 to 190 | | | |
| -24 | 1-1/2 inch 38.1 mm | 2-12 | 150 to 180 | 200 to 254 | | | |

Section 2000

ENGINE AND RADIATOR REMOVAL AND INSTALLATION

TABLE OF CONTENTS

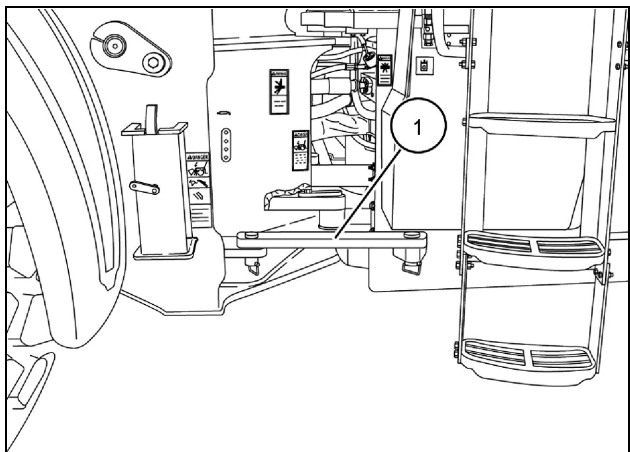
| | |
|--------------------|----|
| Engine | 3 |
| Remove | 3 |
| Install | 12 |
| Radiator | 21 |
| Removal | 21 |
| Installation | 22 |

ENGINE

Removal

NOTE: Put caps on the fittings and plugs in the hoses to prevent foreign material from entering the system when disconnecting fuel lines or hydraulic hoses.

STEP 1



W270R612

Park the machine on a level surface and lower the bucket to the ground. Put the articulation lock (1) in the locked position.

STEP 2

Key in the run position, engine off, place the pilot control switch in the normal operation position.

STEP 3

Move the loader hydraulic control handle to the raise and lower position in order to release any hydraulic pressure in the lift circuit.

STEP 4

Move the loader control handle in and out of the tilt position several times, this will relieve any pressure in the pilot accumulator.

STEP 5

Release the pressure in the ride control accumulator with the bleeder valve in the ride control valve.

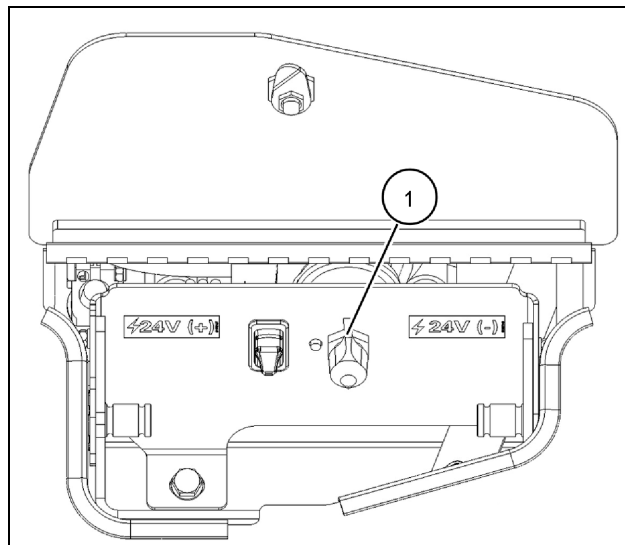
STEP 6

Depress the brake pedal several times to discharge brake accumulators.

STEP 7

Slowly loosen the filler cap on the hydraulic oil tank to release air pressure.

STEP 8



W270R613

Put the master disconnect switch (1) in the off position.

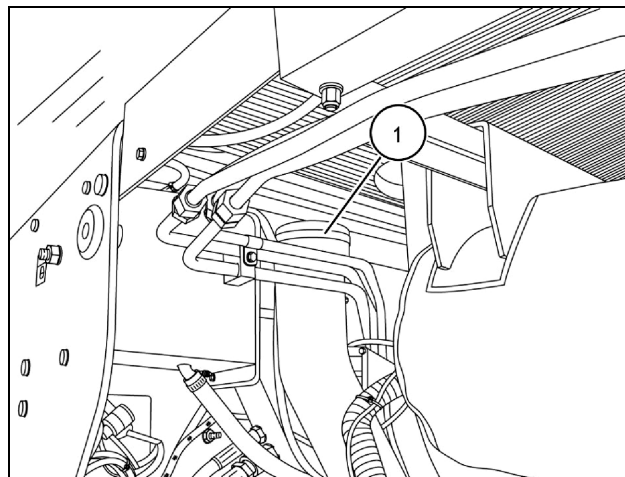
STEP 9

Drain the engine radiator coolant.

STEP 10

Drain the engine oil.

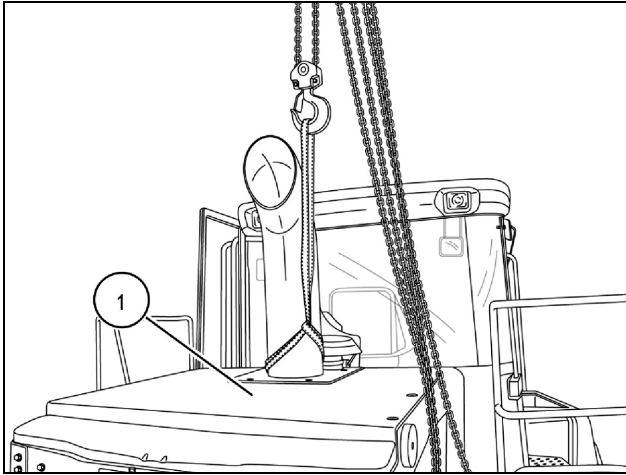
STEP 11



W270R614

Loosen the hose clamp (1) on the air box snorkel under the air inlet hood.

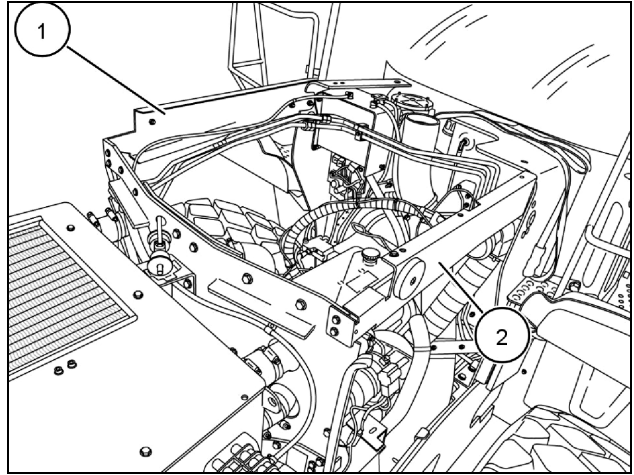
STEP 12



W270R615

Remove the mounting bolts on the exhaust stack hood. Attach lifting equipment to the exhaust stack. Remove the exhaust stack hood (1).

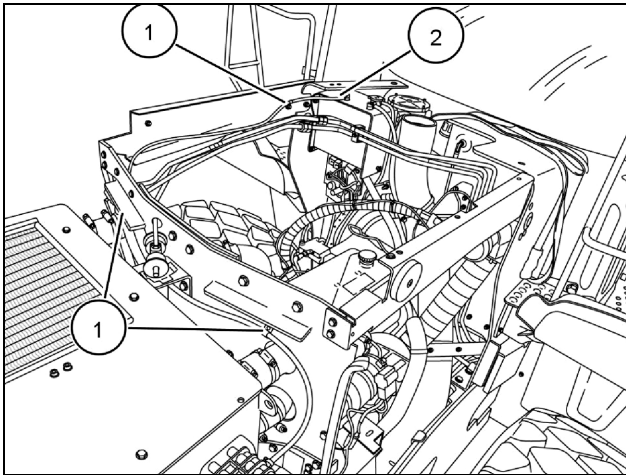
STEP 14



W270R618

Remove the left bracket (1) and right bracket (2).

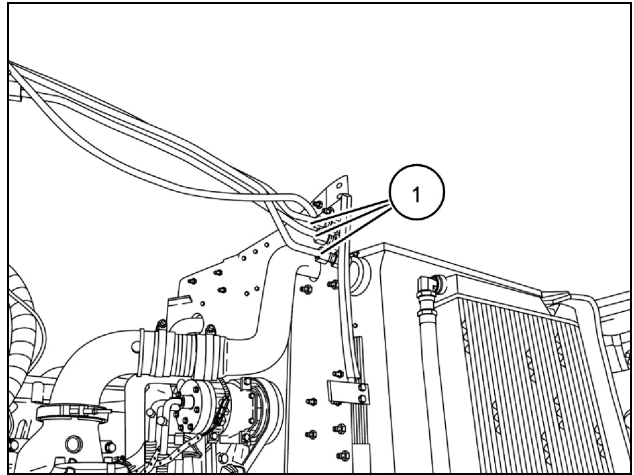
STEP 13



W270R617

Disconnect the deaeration tank overflow hose (2). Remove the P-clamps (1) that secure the overflow hose to the wall and brackets. Position the overflow hose away from the engine and engine wall.

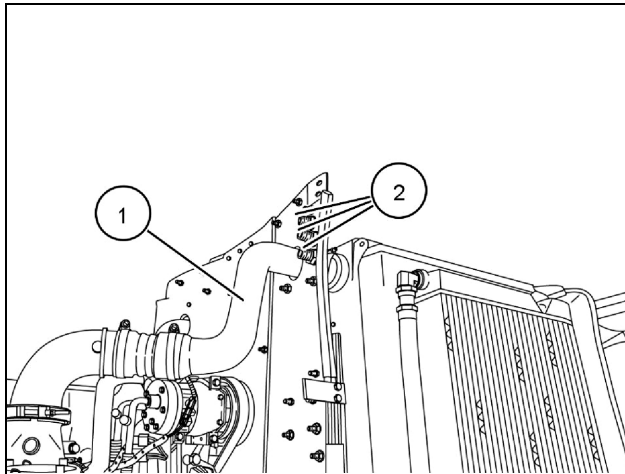
STEP 15



W270R651

Remove the hydraulic oil lines (1).

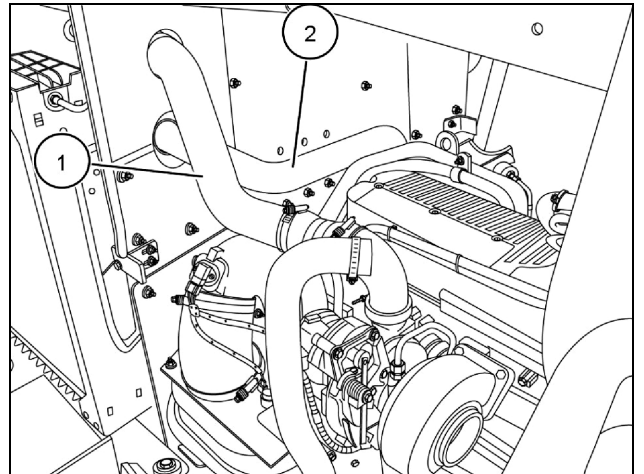
STEP 16



W270R619

Remove the after air cooler tube (1) .
Remove the bulkheads (2).

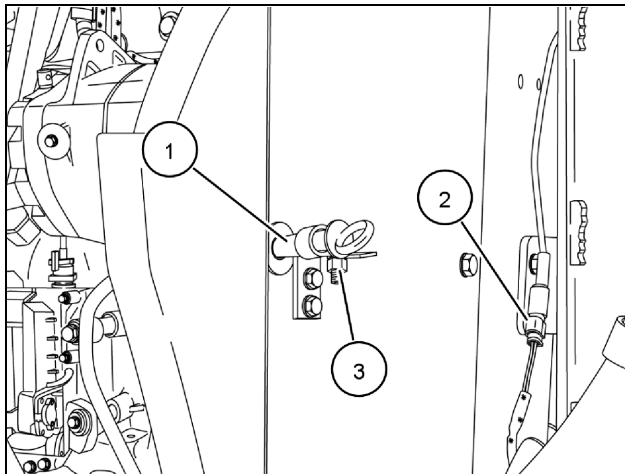
STEP 18



W270R621

Remove the before air cooler tube (1).
Remove the upper radiator tube (2).

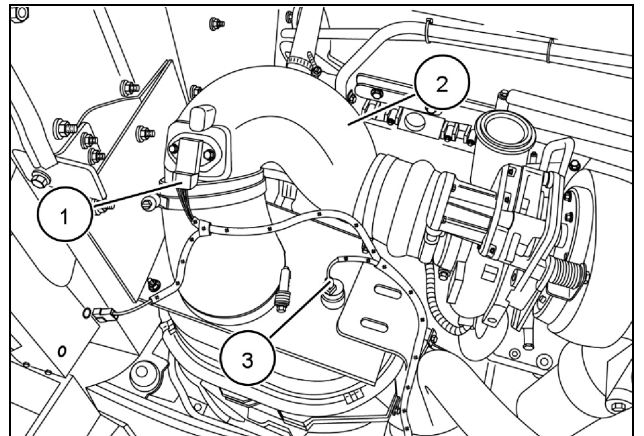
STEP 17



W270R620

Remove the oil dipstick P-clamp (3) . Pull the oil dipstick tube (1) through the wall.
Label and disconnect the hood lift strut electrical connector (2).

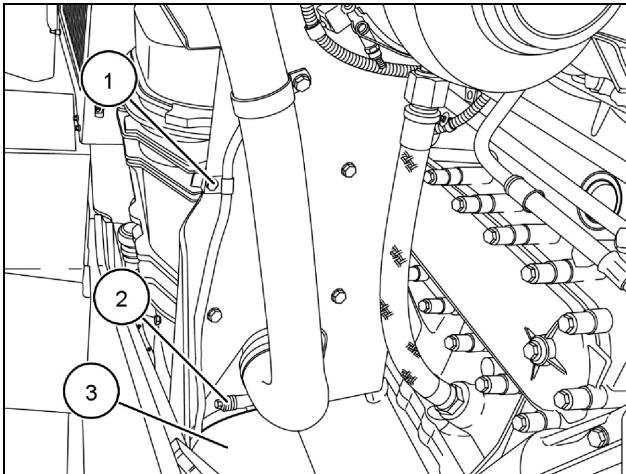
STEP 19



W270R622

Label and disconnect the humidity sensor electrical connector (1). Remove the turbo inlet tube (2).
Label and disconnect the air filter restriction sensor electrical connector (3).

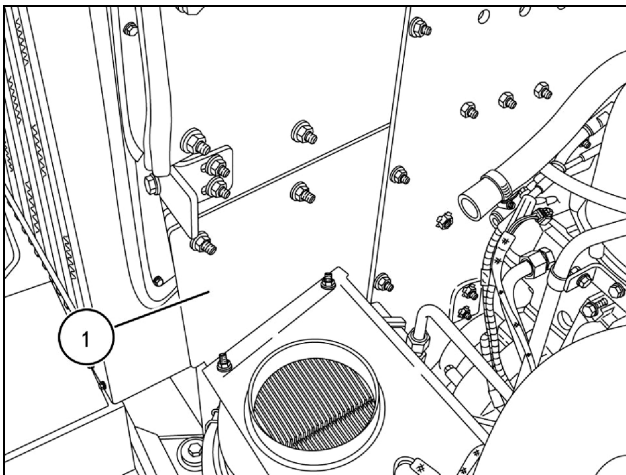
STEP 20



W270R623

Remove the wire harness P-clamp (1).
Loosen the hose clamp on the air box snorkel (2).
Disconnect the air box snorkel (3).

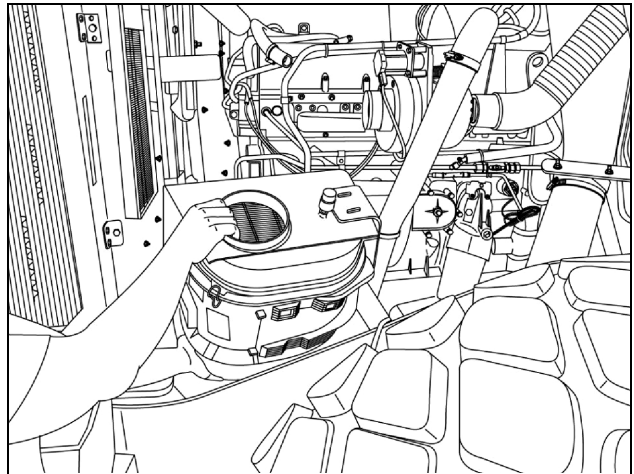
STEP 21



W270R624

Remove the lower, right panel (1) on the engine wall.

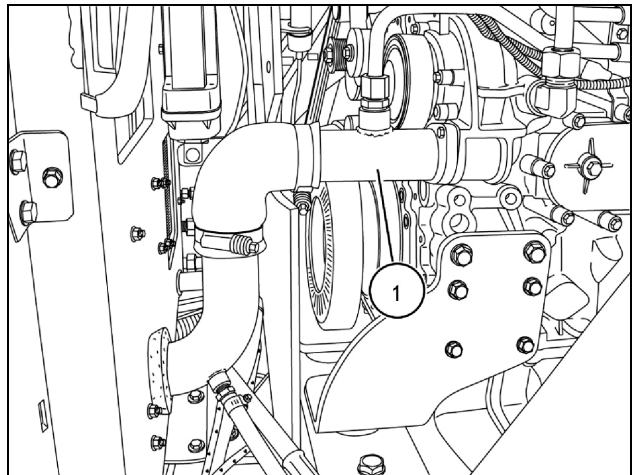
STEP 22



W270R625

Remove the air box assembly.

STEP 23



W270R626

Remove the lower radiator tube (1) .



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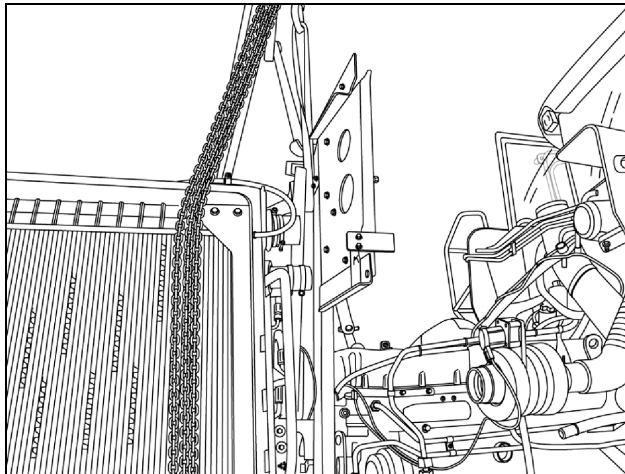
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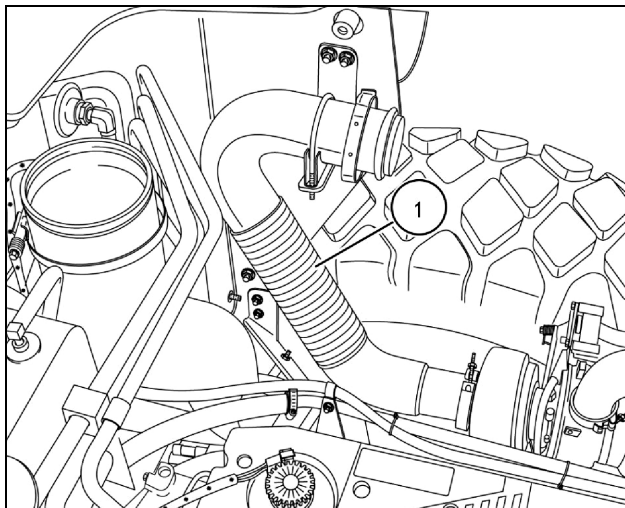
STEP 24



W270R627

Attach lifting equipment to the engine wall. Remove the engine wall's hold-down bolts. Lift and remove the engine wall.

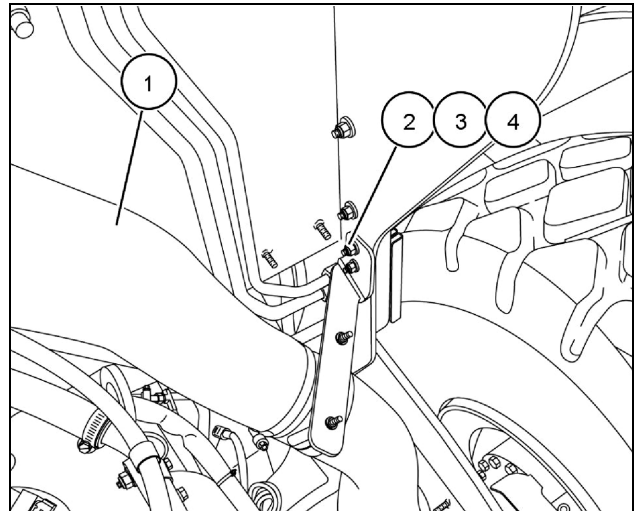
STEP 25



W270R628

Remove the turbo exhaust tube (1).

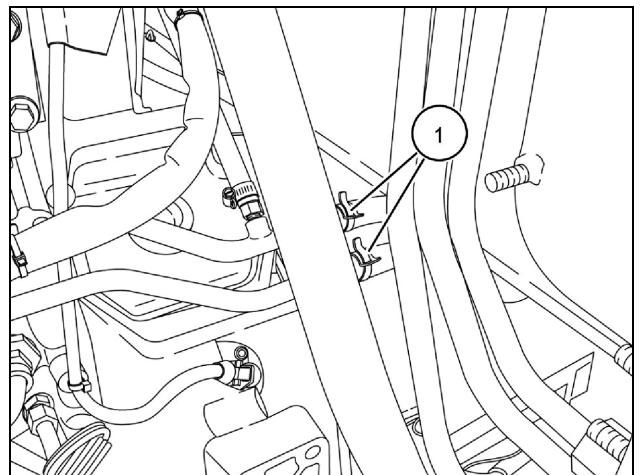
STEP 26



W270R630

Remove two bolts (2), washers (3), and nuts (4). Remove the air box snorkel (1).

STEP 27



W270R631

Disconnect the inlet and outlet heater core heater hoses (1).

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