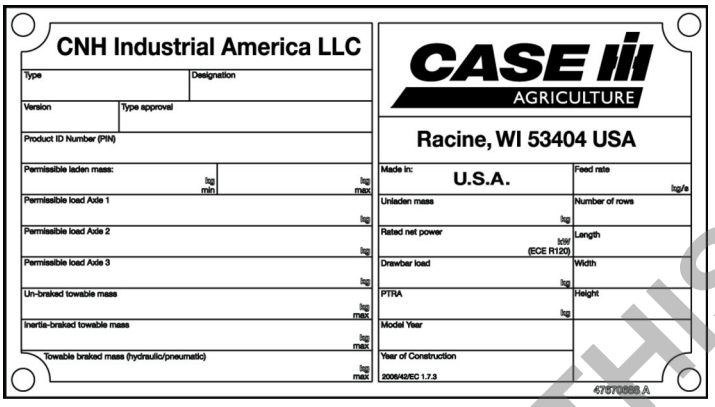
Product identification

Patriot® 4440	NA

Sprayer model and product identification number

Write your model number, product identification number (PIN) or serial number of major components on the lines provided. If needed, give these numbers to your dealer when you need parts or information for your machine.

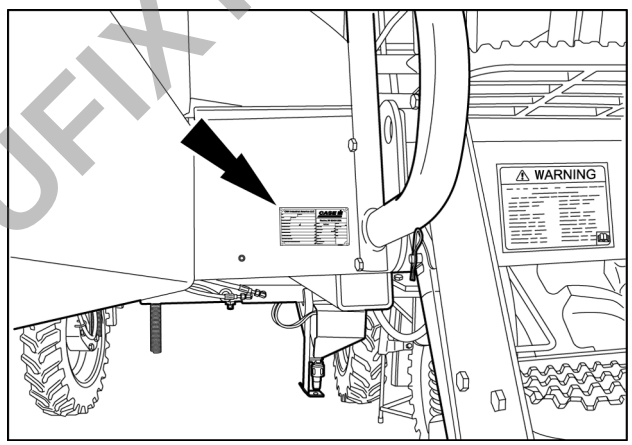


RAIL14SP00419AA 1

Model :

PIN:

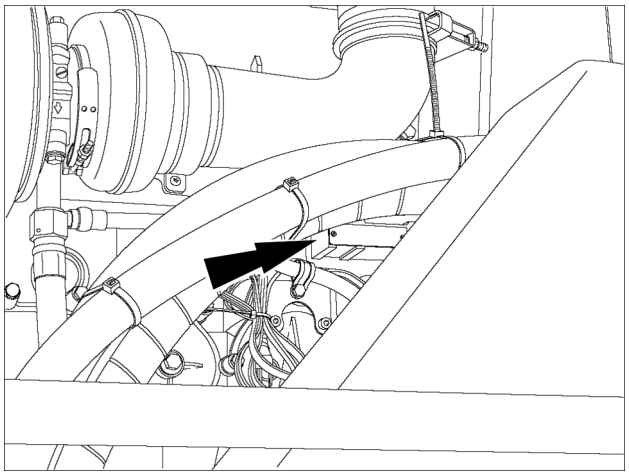
NOTE: *Located on the front of the catwalk by the ladder on the left side of the machine.*



RAIL14SP00421AA 2

Engine serial number

NOTE: *Located on the rear left hand side of the engine.*

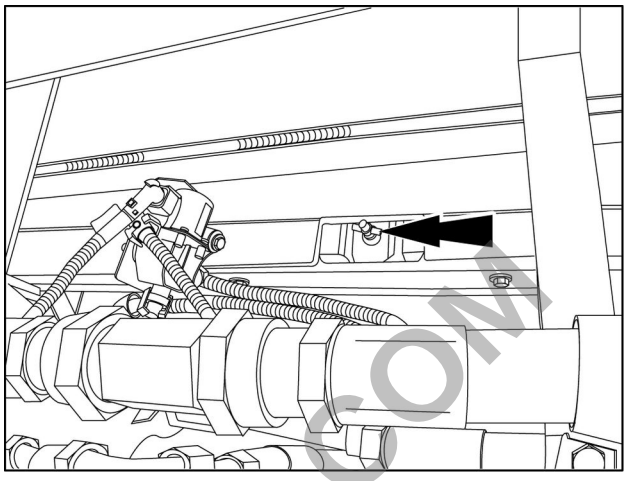


RCPH11BEN187BAM 3

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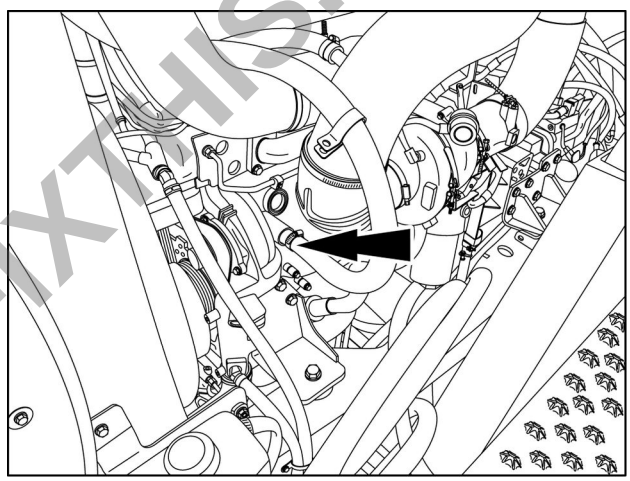
4. Add extension hose to radiator drain and drain the coolant from the cooling system and the engine.
5. Tighten the drain fitting when the coolant is finished draining.



RAIL14SP00428AA 4

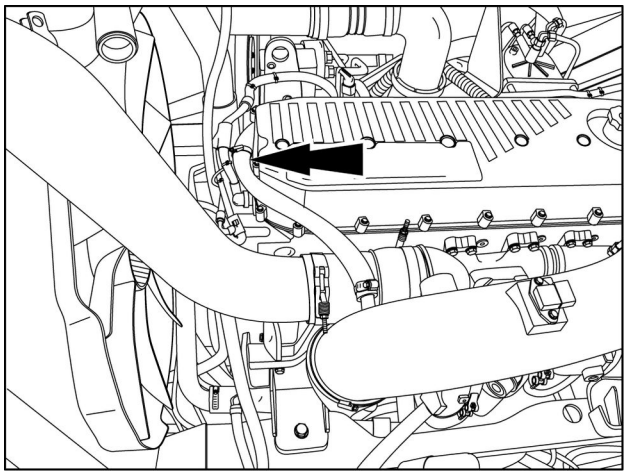
6. Disconnect the hose from the deaeration tank at the engine block.

NOTE: *Cap and plug all disconnected hoses and fittings.*



RAIL14SP00429AA 5

7. Disconnect the engine breather hose at the engine.



RAIL14SP00430AA 6

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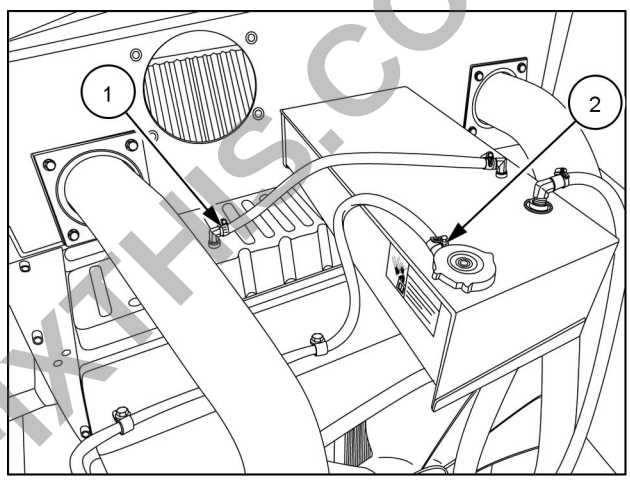
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Radiator - Remove

Patriot® 4440	NA

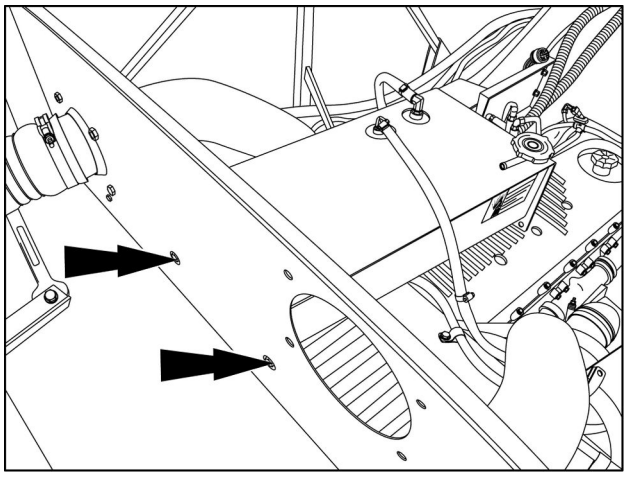
Prior operation:
Remove the air cleaner / muffler assembly **Engine - Remove - Air filter housing/SCR muffler sub assembly (10.001)**.
Prior operation:
Aftercooler - Remove (10.310)
Prior operation:
Oil cooler/Heat exchanger - Remove (35.300)

1. Disconnect the hose from the top of the radiator **(1)** at the radiator.
2. Disconnect the overflow bottle hose **(2)** at the deaeration tank cap.

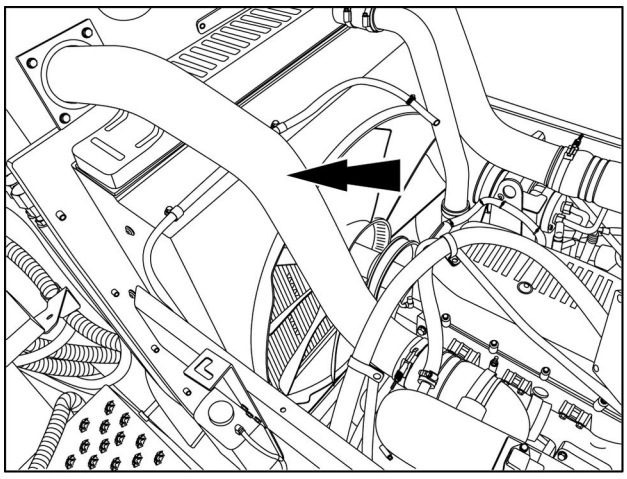


RAIL14SP00496AA 1

3. Support the deaeration tank, remove the mounting bolts and remove the tank from the cooling package frame.


RAIL14SP00497AA 2

4. Remove the left hand charged air cooler tube.


RAIL14SP00498AA 3

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Gearbox - Remove - Hydrostatic pump drive

Patriot® 4440	NA

⚠ DANGER

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 will result in death or serious injury.

D0076A

⚠ WARNING

Burn hazard!
Do not handle engine coolant, engine oil, or hydraulic oil at temperatures that exceed 49 °C (120 °F). Allow fluids to cool before proceeding.
Failure to comply could result in death or serious injury.

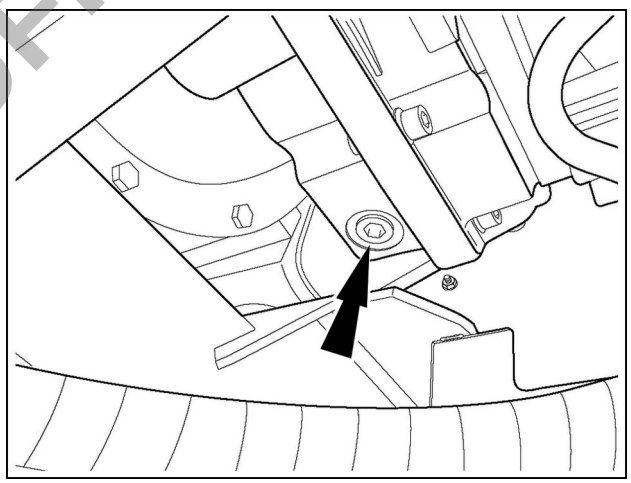
W0330A

Park machine on level surface.

Prior operation:
Remove engine hood, refer to **Engine hood - Remove (90.105)**.
Prior operation:
Remove engine cowling, refer to **Engine hood - Remove - Engine shroud (90.105)**.

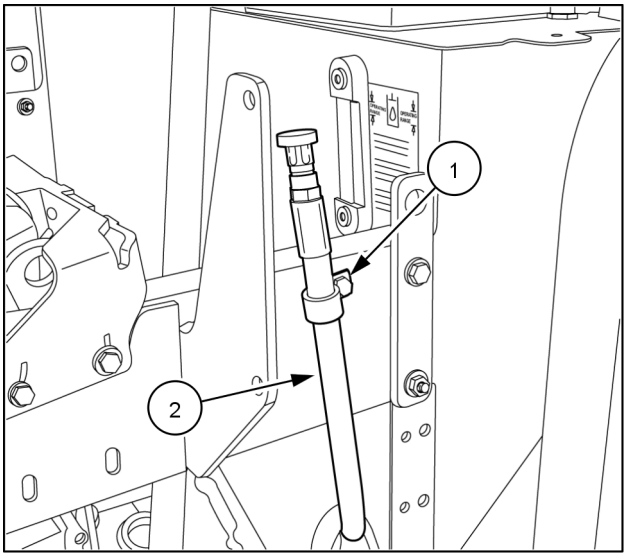
1. Remove drain plug and drain oil from pump drive housing into a properly sized container.
2. Drain oil from the hydraulic system.
3. Remove the hydraulic tank. Refer to **Oil reservoir - Remove - Hydraulic tank (35.300)** for instructions.
4. Remove the hydrostatic pumps. Refer to **Pump - Remove - Hydrostatic pump (29.218)** for instructions.

NOTE: *The auxiliary pumps do not need to be separated from the hydrostatic pumps.*



RCPH11BEN092BAS 1

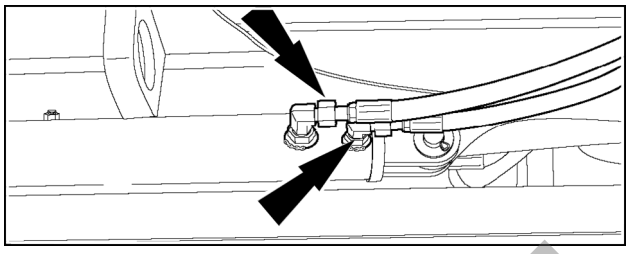
5. Remove hardware and clamp **(1)** holding vent hose **(2)** for pump drive housing.



RCPH11SPR082BAC 2

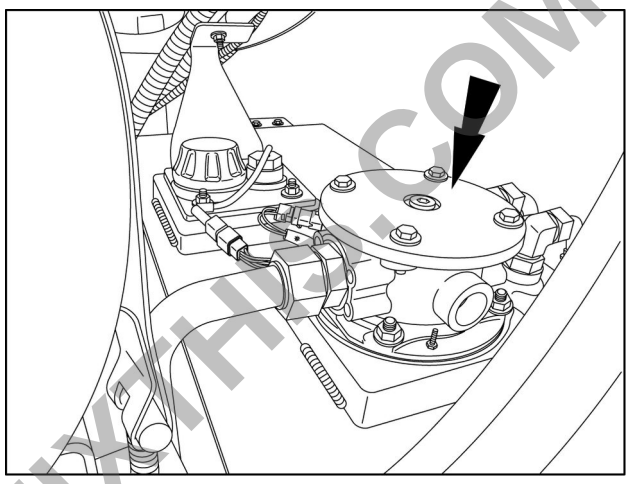
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4. Install hoses to cylinder.



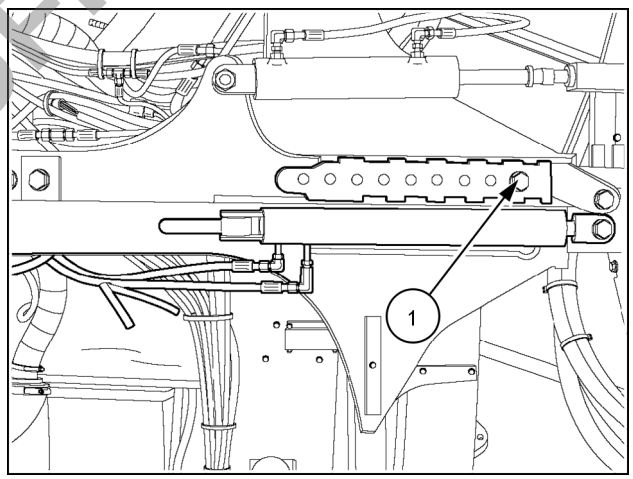
RCPH11BEN078BAU 4

5. Install a new in-tank return filter on the auxiliary hydraulic circuit.
6. Start the engine and run in neutral at a minimum of **1500 RPM**.
7. Properly jack and support the axle.



RAIL14SP00274AA 5

8. Remove the axle stop bolt **(1)**.
9. Cycle the cylinder five times through complete stroke to move any air and debris to the tank.
10. Install bolt into the position it was removed from.
11. Lower the machine off the support.
12. Allow the engine to run at **1500 RPM** with the vehicle in neutral for a minimum of 20 minutes to filter and warm the hydraulic oil prior to any operation
13. Run the machine for at least one hour under light load to complete the hydraulic oil filtration.
14. Shut down the machine and check for leaks.



RCPH11BEN040BAU 6

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Rear axle - Remove - Axle adjust cylinder

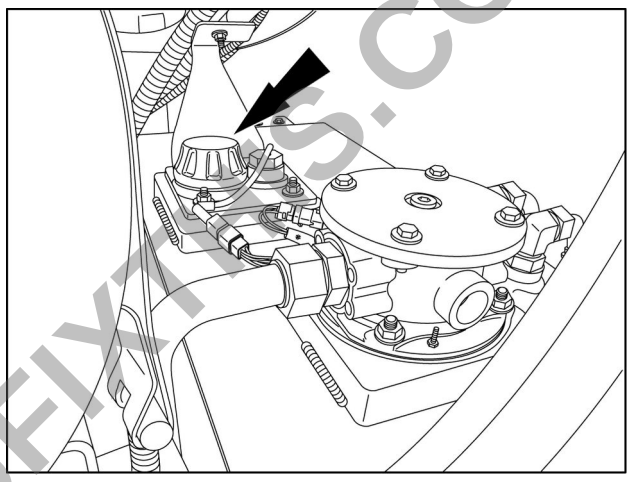
Patriot® 4440	NA

⚠ WARNING

Escaping fluid!
The hydraulic tank is a pressurized system. Vent tank slowly by loosening the breather before performing work on the hydraulic system.
Failure to comply could result in death or serious injury.

W1047A

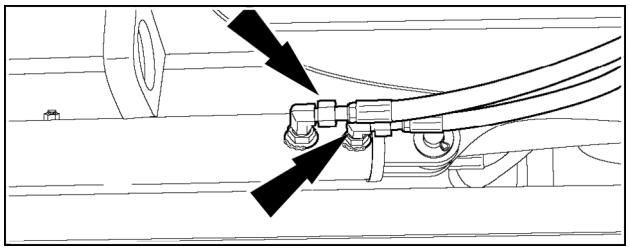
1. Power wash entire machine, especially around area to be worked on.
2. Remove the pressure from the hydraulic tank by slowly loosening the breather cap until pressure is bled from the hydraulic tank. Tighten breather.



RAIL14SP00274AA 1

3. Disconnect hydraulic lines.

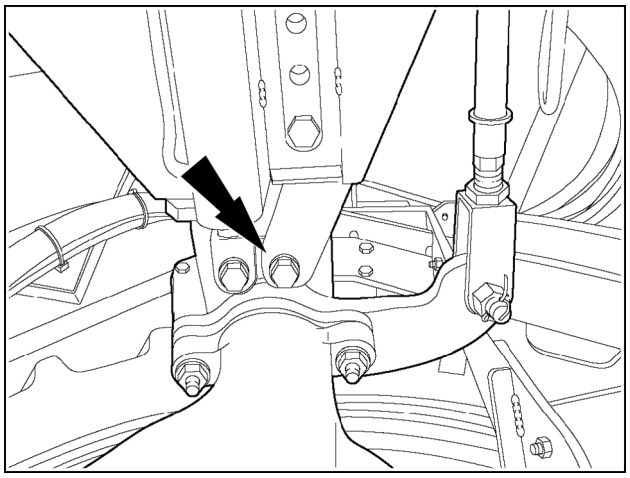
NOTE: *Clean all connections to be removed with an aerosol degreaser and brush before loosening. Repeat flush with aerosol degreaser with fitting backed out 2-3 turns. Immediately cap or plug any connection that is opened with clean, threaded caps and plugs. Label hoses prior to removal.*



RCPH11BEN078BAU 2

4. Remove bolts holding axle slide bar. (Outer end of bar shown).

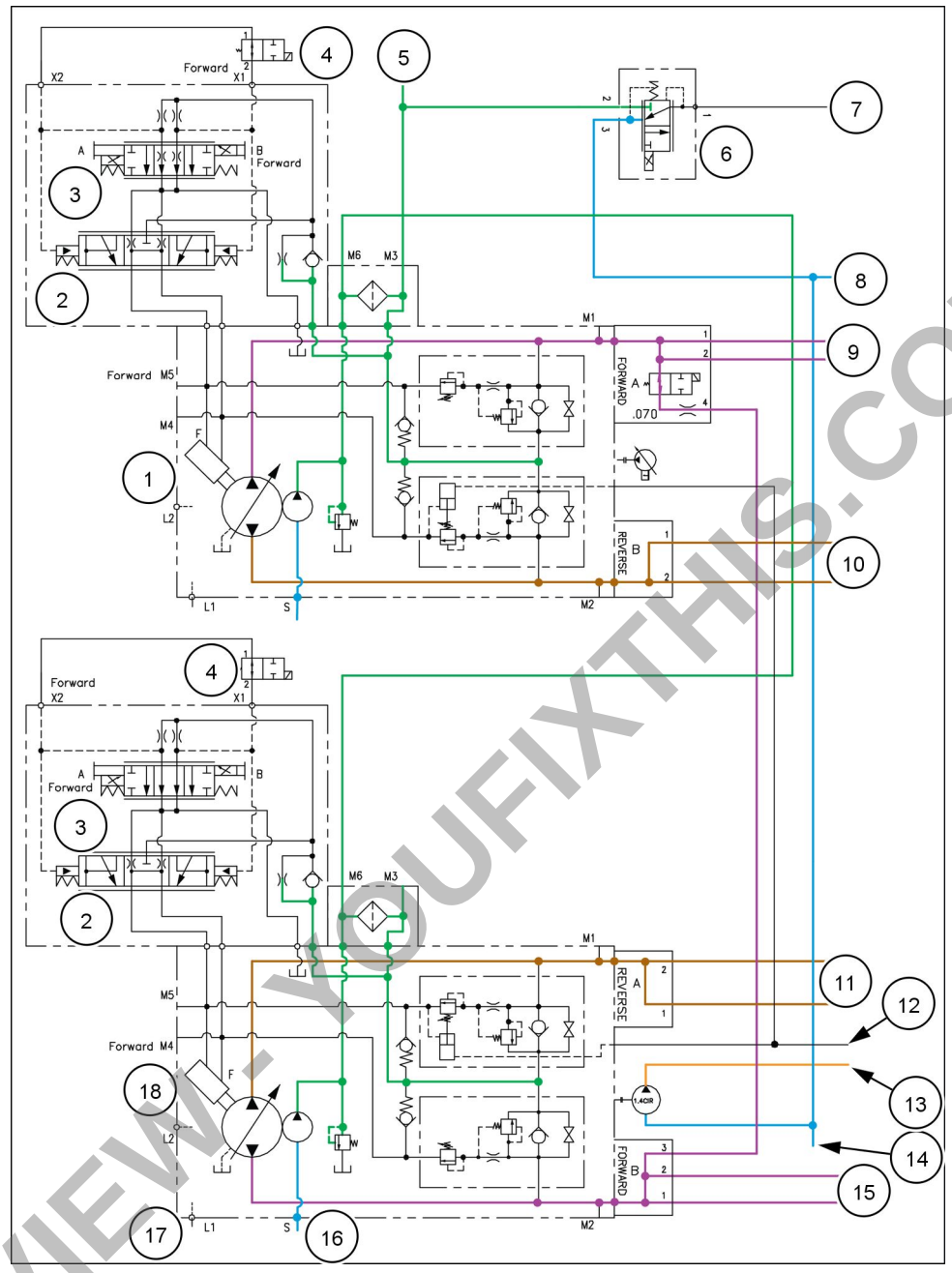
NOTE: *Lower slide bar straight down to remove from tube.*



RCPH11BEN059BAU 3

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RAIL13SPO5032HA 1

The milli-amp signal from the Power-train Control Module (PCM) is sent to a Electronic Proportional (EP) valve on each pump.

Item	Description	Item	Description
1	Hydrostatic pump – Right front (RF), Left rear (LR)	10	To wheel motor RF and LR – reverse travel
2	Stroking piston – pump	11	To wheel motor RR and LF – reverse travel
3	Electronic Proportional (EP) valve	12	To valve reverse pressure limiter
4	Shunt valve	13	Gear pump supply to Pulse Width Modulation (PWM) valve
5	Charge pressure to park brake valve	14	Gear pump suction from hydraulic tank
6	Motor Control Valve (MCV)	15	To wheel motor RR and LF – forward travel
7	Motor Control Valve (MCV) supply to wheel motors	16	Charge pump suction from hydraulic tank
8	To park brake valve	17	L1 return to hydraulic tank
9	To wheel motor RF and LR – forward travel	18	Hydrostatic pump – Right rear (RR), Left front (LF)

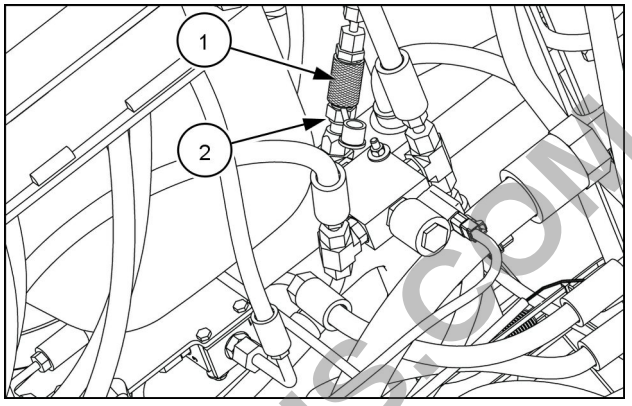
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Parking brake or parking lock - Component identification - Quick disconnect

Patriot® 4440	NA

This quick disconnect is located just above the park brake valve just in front of the oil pan. It is used primarily as a troubleshooting aid when testing certain hydraulic components. By disconnecting the quick disconnect fitting **(1)** from the male fitting **(2)**, no oil is supplied to the planetary drive hubs allowing the internal parking brakes to remain applied.

The parking brake quick disconnect is also used for towing purposes.

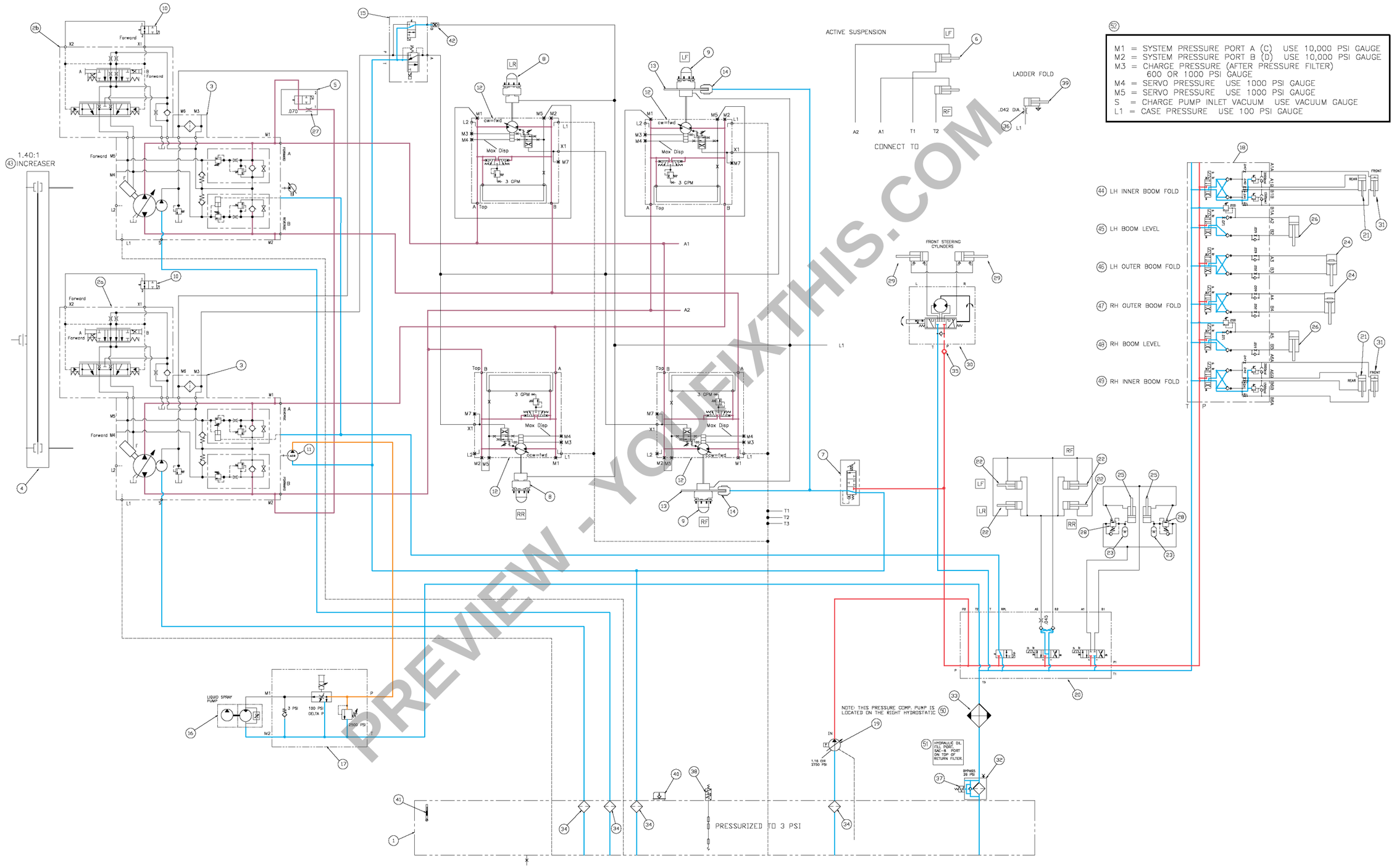


RAIL16SP00001AA 1

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HYDRAULIC SCHEMATIC



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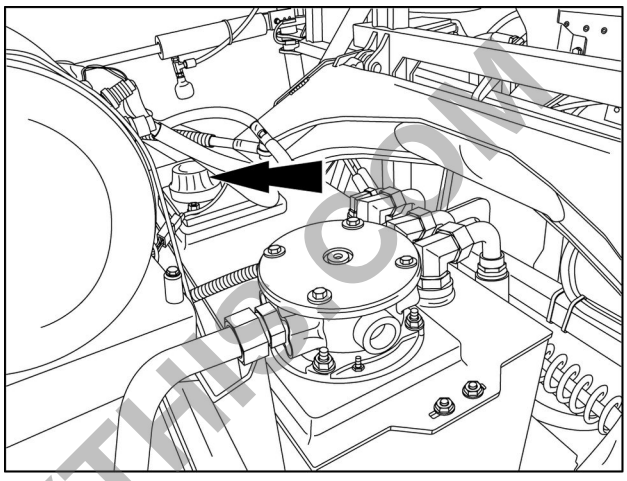
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Oil cooler/Heat exchanger - Remove

Patriot® 4440	NA

Prior operation:
Aftercooler - Remove (10.310)

1. Remove the pressure from the hydraulic tank by slowly loosening the breather cap until pressure is bled from the hydraulic tank.

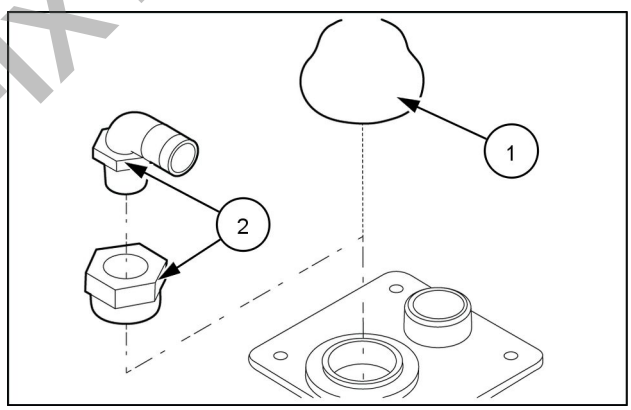


RAIL13SP04768AA 1

2. Use vacuum tool 323763 on hydraulic tank to minimize fluid drain from tank.

NOTE: *Tool number 323763 is sold through CNH parts system.*

3. Remove the breather **(1)** and install the 323763 vacuum tool **(2)** to the breather port.
4. Apply a vacuum.



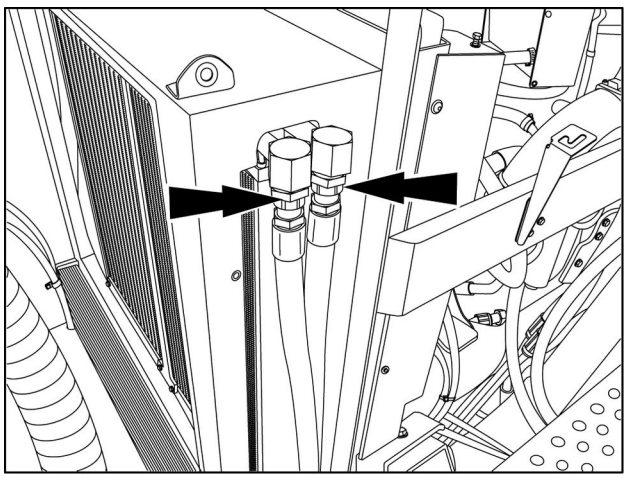
RAIL13SP01432AA 2

Left Hand Cooler

5. Label and disconnect the inlet and outlet cooler hoses.

NOTE: *Clean all connections to be removed with an aerosol degreaser and brush before loosening. Repeat flush with aerosol degreaser with fitting backed out 2-3 turns.*

NOTE: *Immediately cap or plug any connection that is opened with clean, threaded caps and plugs.*



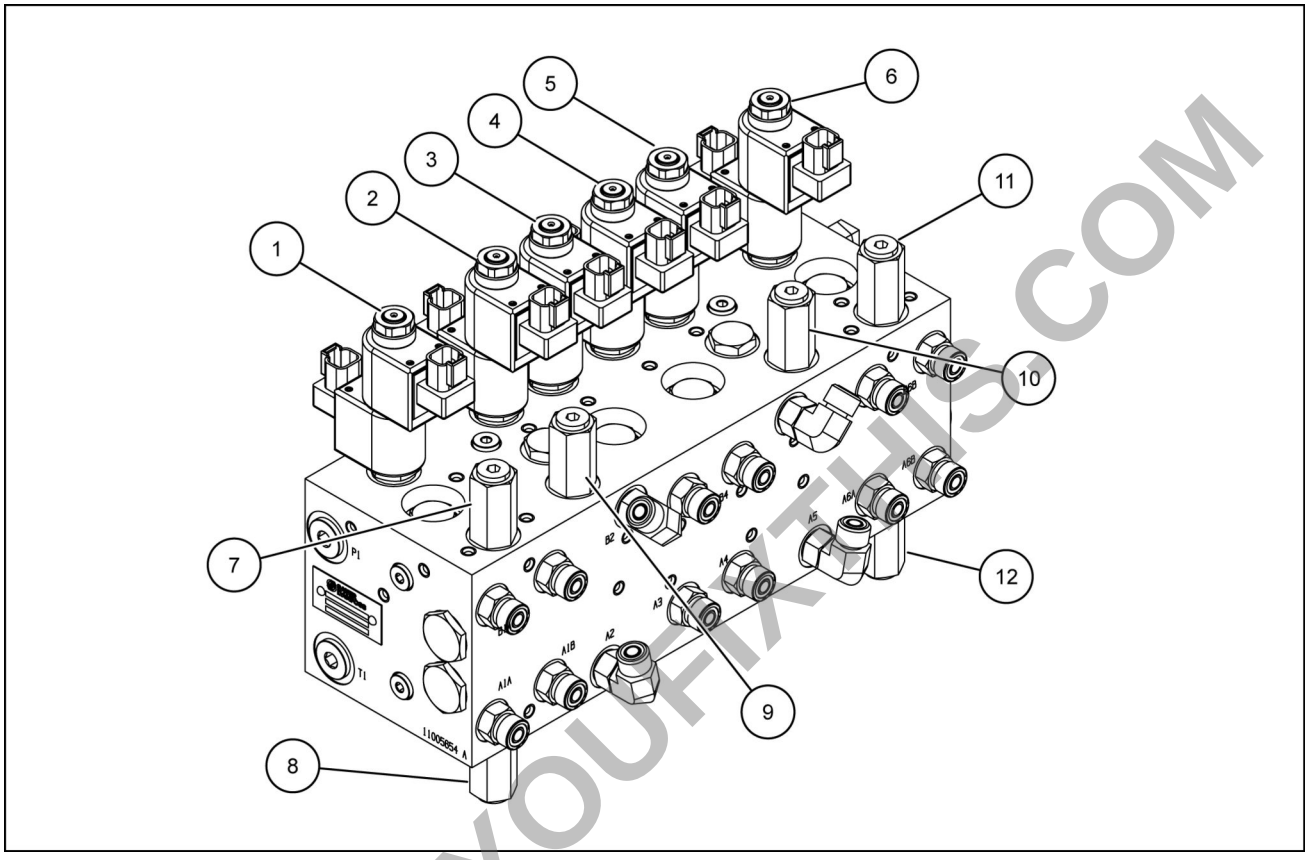
RAIL14SP00516AA 3

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Control valves - External view - Six section and eight section valve bank

Patriot® 4440	NA



RAIL12SP01448FA 1

6 section valve bank

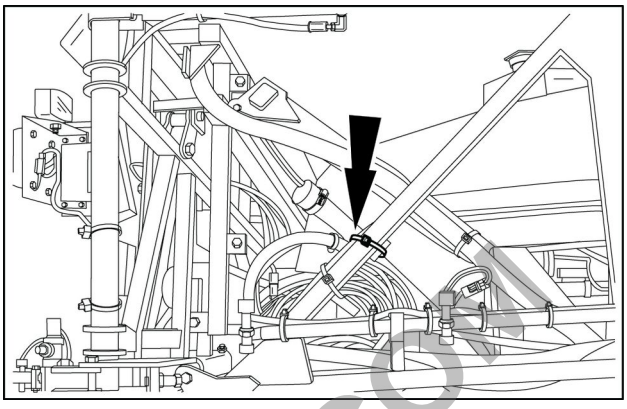
1	Left inner boom fold	7	Left inner boom fold **103 bar** (**1500 psi**) rod end relief valve
2	Left boom level	8	Left inner boom fold **207 bar** (**3000 psi**) blind end relief valve
3	Left outer boom fold	9	Left boom level **14 bar** (**200 psi**) blind end relief valve
4	Right outer boom fold	10	Right boom level **14 bar** (**200 psi**) blind end relief valve
5	Right boom level	11	Right inner boom fold **103 bar** (**1500 psi**) rod end relief valve
6	Right inner boom fold	12	Right inner boom fold **207 bar** (**3000 psi**) blind end relief valve

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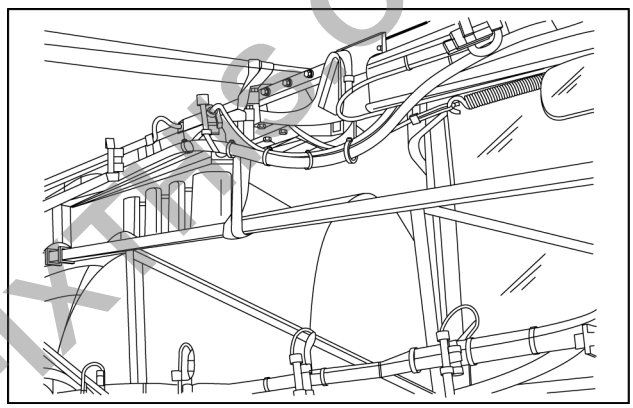
7. Pull all disconnected wiring and hoses back to the inner boom. Secure wiring and hoses to the inner boom frame.

NOTE: *Take note of wiring and hose routing before removal for proper installation.*



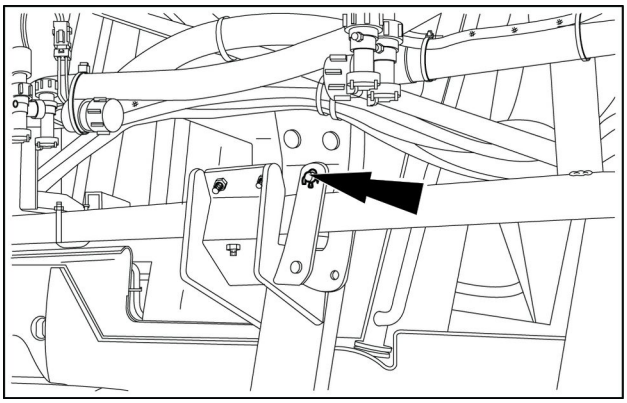
RAIL13SP01958AA 6

8. Attach proper lifting device to the inner boom assembly.



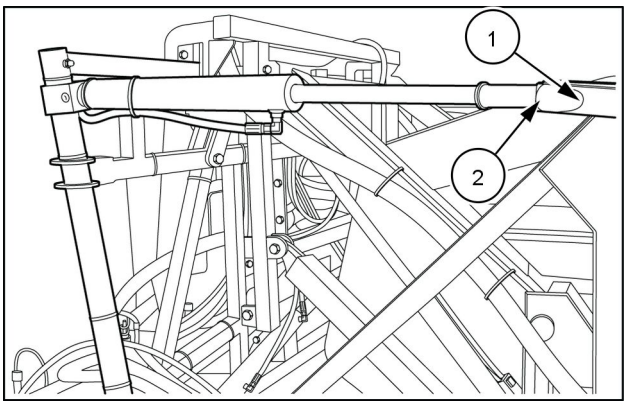
RAIL13SP01959AA 7

9. Remove boom lock pin from the cradle.



RAIL13SP01960AA 8

10. Remove the nut and bolt **(1)** from the cylinder pin. While supporting the cylinder, remove the rod end cylinder mounting pin **(2)**.



RAIL13SP01578AA 9

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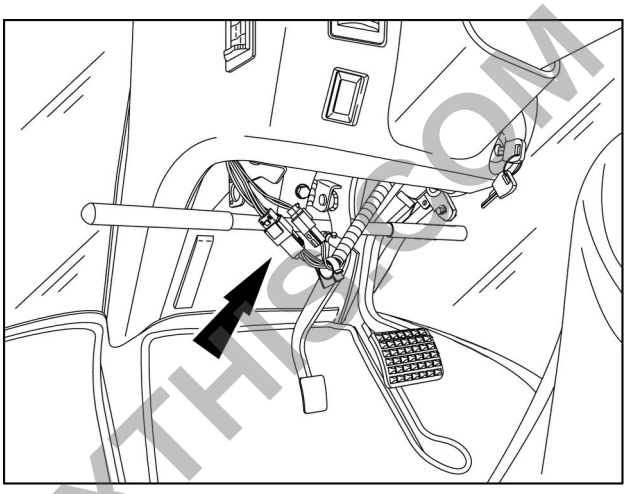
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Steering column - Remove - Turn signal lever assembly

Patriot® 4440	NA

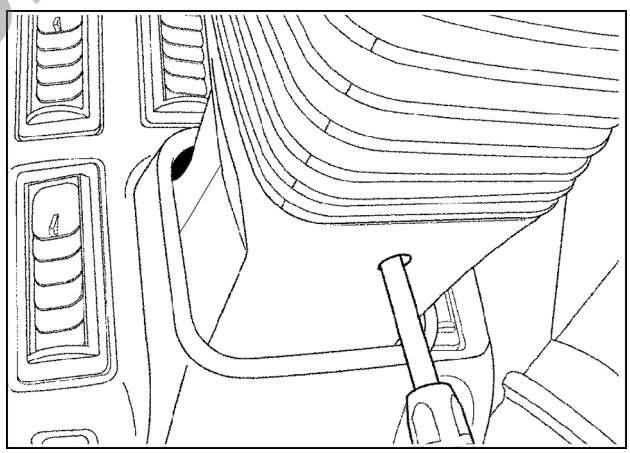
Prior operation:
Power steering wheel - Remove (41.101)

1. Disconnect the turn signal harness connectors from the cab wire harness.



RAIL14SP00532AA 1

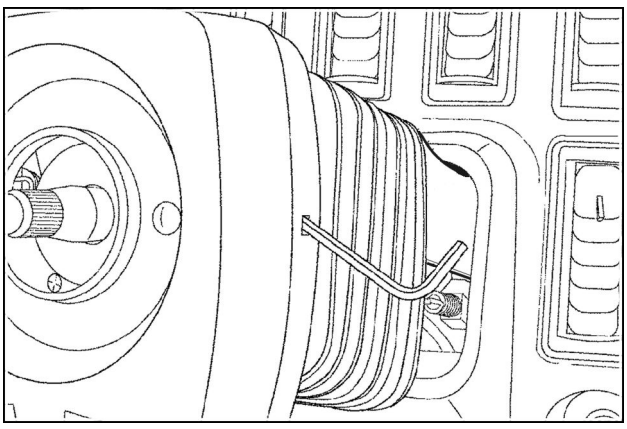
2. Extend and tilt the steering column down . Remove the torx screw securing the top steering column cover to the steering column.
3. Remove the torx socket screw securing the bottom steering column cover to the steering column.



RCPH10CCH210BAO 2

4. Remove the top cover from the steering column.
5. Remove the bottom cover from the steering column.
6. Use a 4 mm hex wrench to loosen the turn signal lever assembly clamp bolt .

NOTE: *There is a positioning tab on the shift lever/turn signal assembly in the 10 o'clock position. The tab aligns with a hole in the steering column assembly. The clamp bolt must be loosened enough for the tab to disengage the steering column.*



RCPH10CCH209BAO 3

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Front wheels - Remove

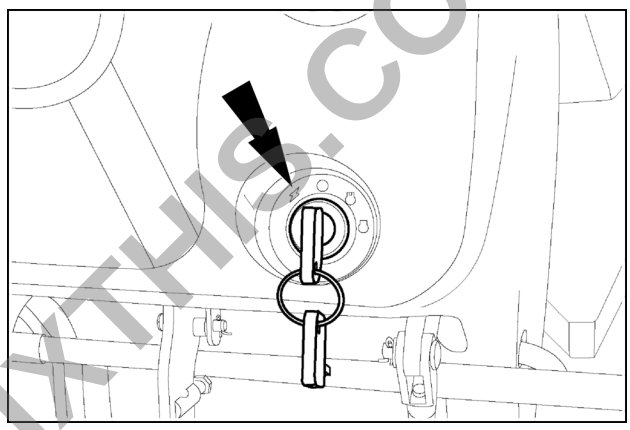
Patriot® 4440	NA

⚠ 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.

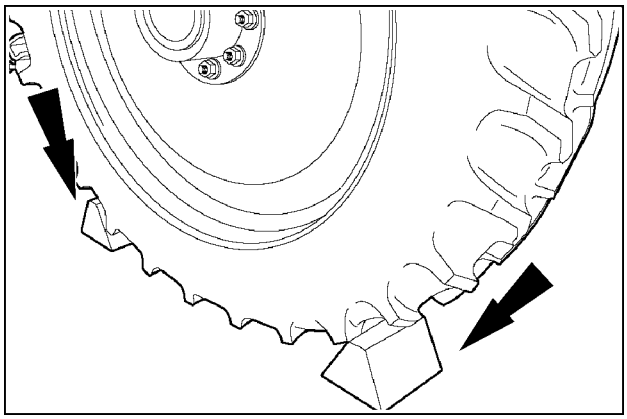
W0398A

1. Park the machine on solid, level surface.
2. Shut the engine off and remove key from switch.



RCPH11BEN377BAU 1

3. Chock wheels in front and rear of tire on opposite axle of tire to be removed.



RCPH11BEN378BAU 2

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Ventilation - Testing - Blower speed driver

Patriot® 4440	NA

NOTE: *If the blower motor intermittently cycles to full speed for short periods, blower speed driver may be entering thermal protection mode. Check for an intermittent short to chassis at the blower motor or short to heat sink on the blower speed driver.*

Test N°1	
Test Point	**Condition** Check HVAC power fuses 26 and 27.
Expected Result	**Result** Fuses are good. Continue to step 2
Other Result (Possible Cause)	**Result** Blown fuse located. **Action** Replace blown fuse(s). Troubleshooting complete.

Test N°2	
Test Point	**Condition** Ignition switch Off. Disconnect the blower motor from the harness. **Check** Measure continuity between pins 1 and 2 through the motor.
Expected Result	**Result** Continuity present. **Action** Go to Step 3.
Other Result (Possible Cause)	**Result** No continuity. **Action** Replace the blower motor.

Test N°3	
Test Point	**Condition** Reconnect the motor to the harness. Check for error codes related to ATC system. **Check** Check for error codes related to ATC system.
Expected Result	**Result** No ATC error codes, continue to step 4
Other Result (Possible Cause)	**Result** ATC error codes are present. **Action** Follow troubleshooting procedure for other related error codes.

Test N°4	
Test Point	**Condition** Replace the Acc3 relay with a known good relay. **Check** Operate blower.
Expected Result	**Result** Blower still does not operate. Install original Acc3 relay. **Action** Go to Step 5.
Other Result (Possible Cause)	**Result** Blower is operable. **Action** Troubleshooting complete.

Test N°5	
Test Point	**Condition** Ignition switch on. Access the HVAC floor module. **Check** Measure voltage between connector X-086 pin K and chassis ground.

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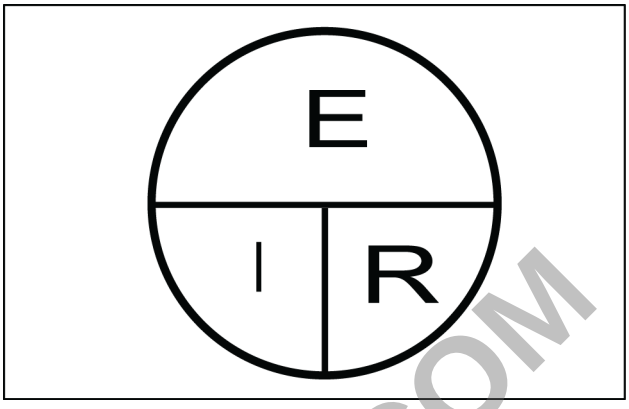
NOTICE:

Formulas to remember:

E = I x R Voltage = Current x Resistance

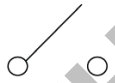
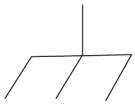
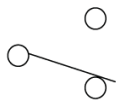
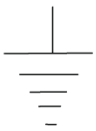
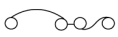
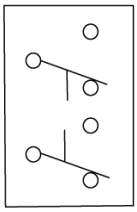
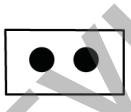
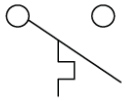
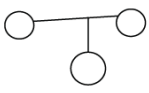
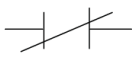
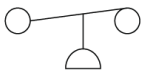
I = E/R Current = Voltage/Resistance

R = E/I Resistance = Voltage/Current



RAIL13SP01285AA 3

Electrical symbols

	Battery		Switch N.O. SPST
	Fuse		Switch N.O. SPST
	Junction point		
	Circuit ground		Switch SPDT
	Earth ground		
	Auto reset circuit breaker		Switch DPDT
	Terminal block		
	Relay contact N.O.		Switch, level, N.C.
	Relay coil		Switch, temp, N.O.
	Relay contact N.C.		Switch, pressure, N.C.

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Wire connectors - Component diagram - Main frame harness

Patriot® 4440	NA

Connector	Description
X-640F5	Front lights interface
X-666F5	WIF Sensor
X-603F5	Radar interface
X-610F5	Fuel sender
X-648F5	Ground
XB-6F3	Main frame bulkhead
X-47FA5	Splice 047A
X-625F5	Front washer
X-612F5	Mirror
X-800M3	Remote (ENG)
X-630M3	Remote power
X-627F5	Auxiliary boom lights
X-627M5	Cap auxiliary boom lights
G1–MF5	Chassis ground
XB-801M4	Engine interface
CG-MF5	Ground box
X-614F5	Axle in
X-613F5	Axle out
X-647F5	Motor control
X-632F5	Reverse limiter
X-631F5	Park brake
X-608F5	Backup alarm
X-609F5	Backup alarm
X-606F5	Tail light interface
X-639F5	Left hand control
X-646F5	Left hand control over ride
X-638F5	Charge PSI
X-629F5	Hydraulic filter indicator
X628F5	Hydraulic oil temperature / level
X-643F5	Traction control
X-641F5	Right hand control
X-645F5	Right hand control over ride

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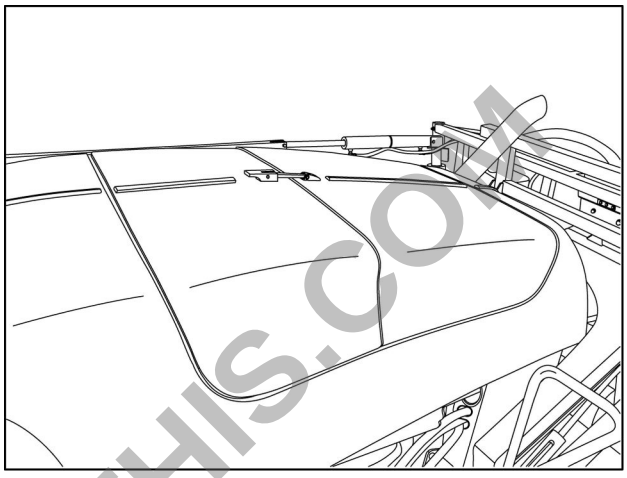
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Diesel Exhaust Fluid (DEF)/AdBlue® dosing module - Remove

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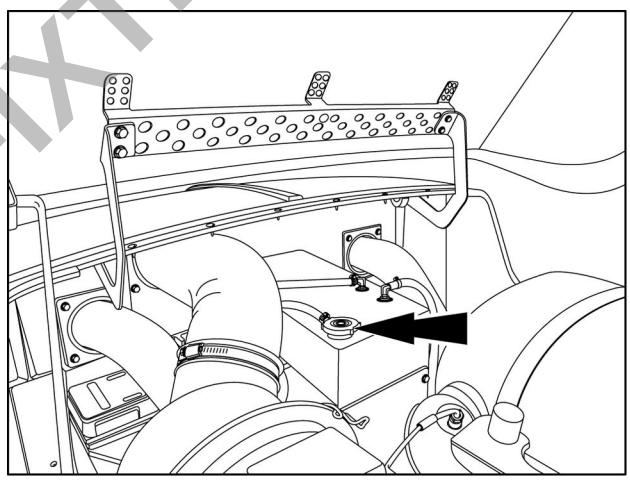
Allow the system to cool before working on the exhaust system.

1. Open the engine hoods.



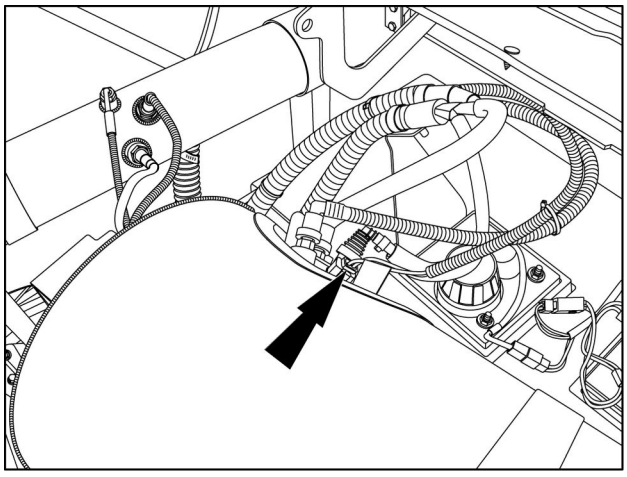
RAIL14SP00322AA 1

2. After the engine has cooled, carefully loosen the cap on the deaeration tank to relieve the pressure in the engine cooling system.
3. After the pressure is released tighten the cap.



RAIL14SP00331AA 2

4. Disconnect the harness lead from the dosing module.



RAIL14SP00332AA 3

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Electrical systems - 55

FAULT CODES - DTC

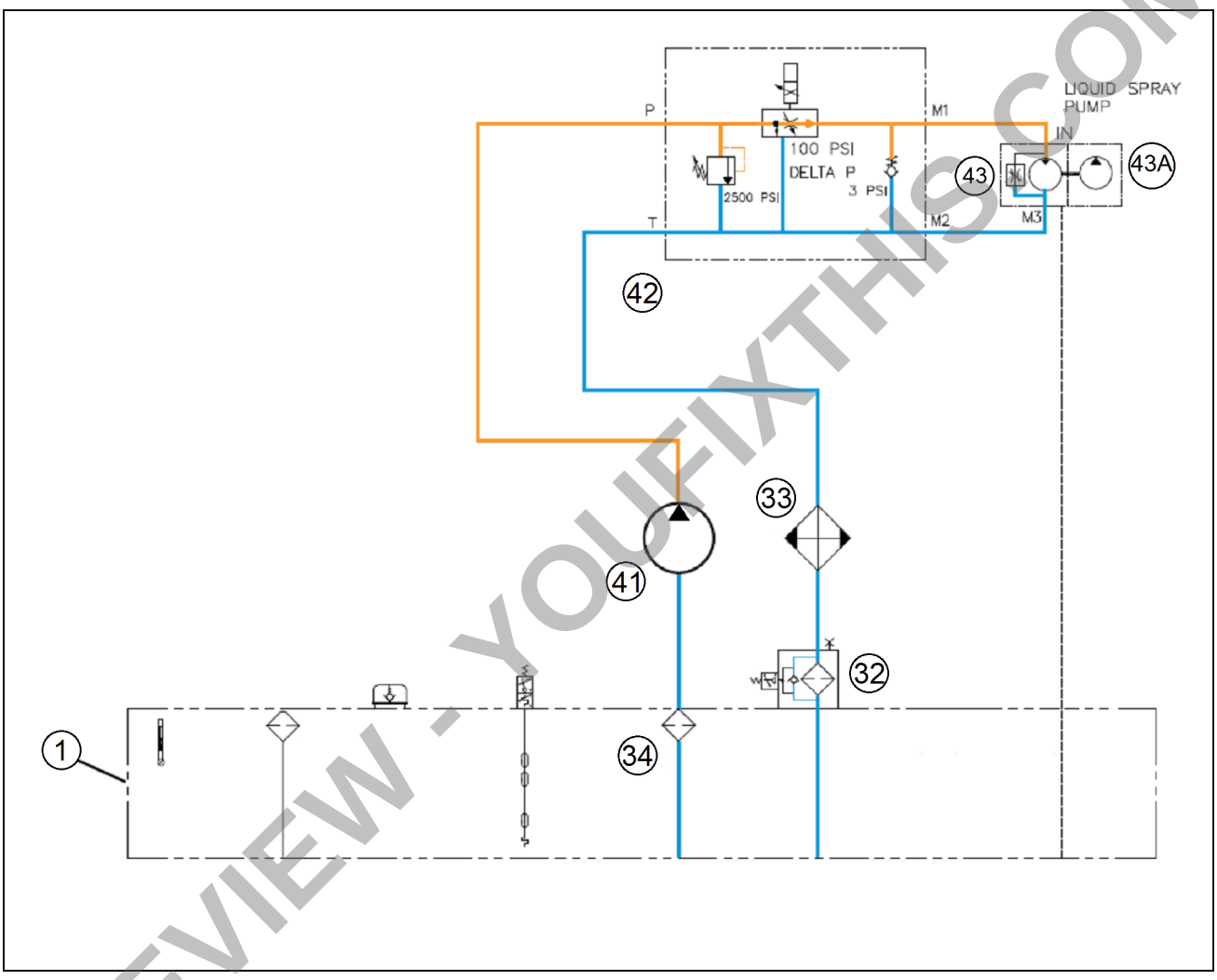
Patriot® 4440 TIER 4B (FINAL) sprayer [YGT044001 -]

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Spray system details

Product is delivered to the spray boom by the product liquid pump **(43A)**. The product liquid pump is of centrifugal design and is driven by a variable speed hydraulic motor **(43)**. The oil supply for the drive motor comes from the product delivery gear pump **(41)** mounted on the left rear of the engine. An electrically controlled Pulse Width Modulated (PWM) valve **(42)** in the PWM valve block allows for adjustment of the product pump speed automatically by the application rate controller or manually by the operator from the cab. The PWM valve keeps the product pump **(43A)** speed constant to maintain the required spray pressure, independent of engine speed. PWM valve **(42)** passes through the oil cooler **(33)** and the filter **(32)** to the hydraulic reservoir **(1)**. Oil flowing to the gear pump **(41)** passes through a suction strainer **(34)**.



RAIL13SP04022GA 5

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Product pump - Remove

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⚠ WARNING

Chemical hazard!
Wear protective clothing and a face shield when working with chemicals. Do not allow chemicals to contact skin or eyes. Always follow the chemical manufacturer's instructions.
Failure to comply could result in death or serious injury.

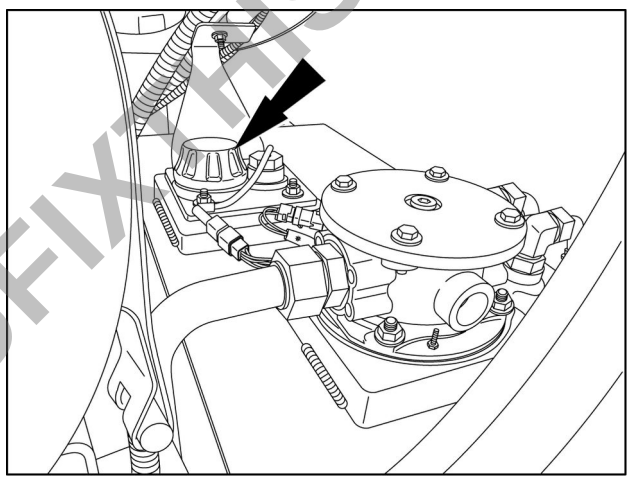
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⚠ WARNING

Escaping fluid!
The hydraulic tank is a pressurized system. Vent tank slowly by loosening the breather before performing work on the hydraulic system.
Failure to comply could result in death or serious injury.

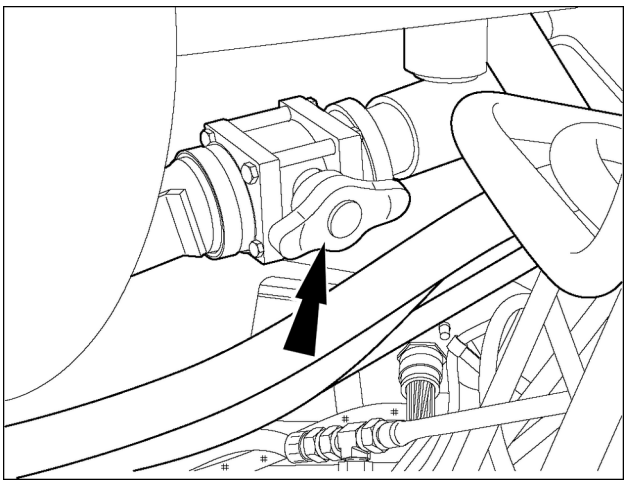
W1047A

1. Slowly loosen the breather on the hydraulic tank to release the pressure on the hydraulic tank.



RAIL14SP00274AA 1

2. Close manual sparge valve located at the front lower side of the product tank.



RCPH11BEN026BAS 2

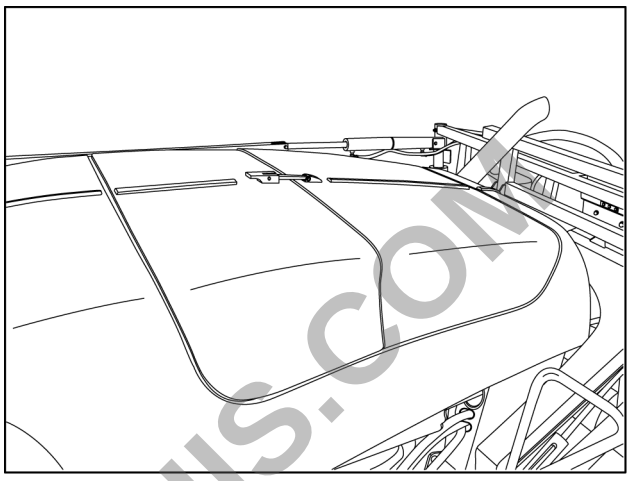
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Engine hood - Remove

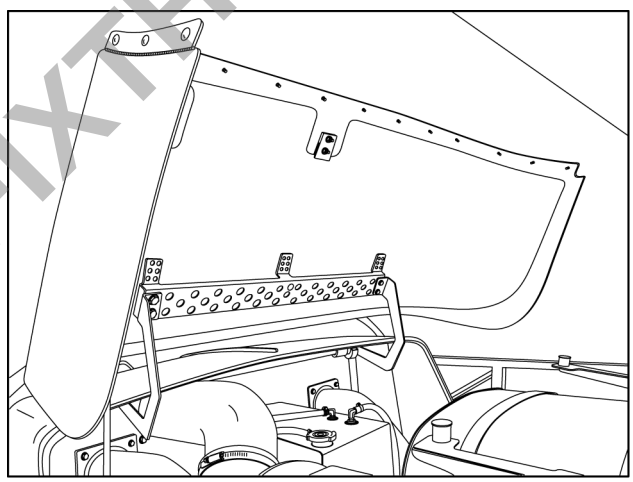
Patriot® 4440	NA

1. Open the hoods.



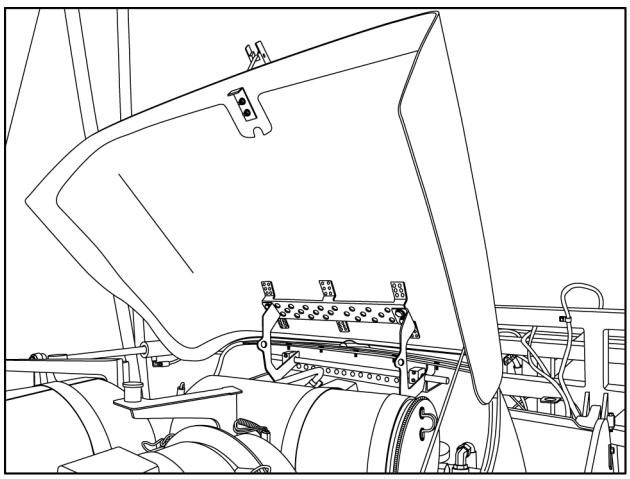
RAIL14SP00322AA 1

2. Support the front hood, remove the mounting bolts and remove the hood from the hinges.



RAIL14SP00348AA 2

3. Support the rear hood, remove the mounting bolts and remove the hood from the hinges.



RAIL14SP00349AA 3

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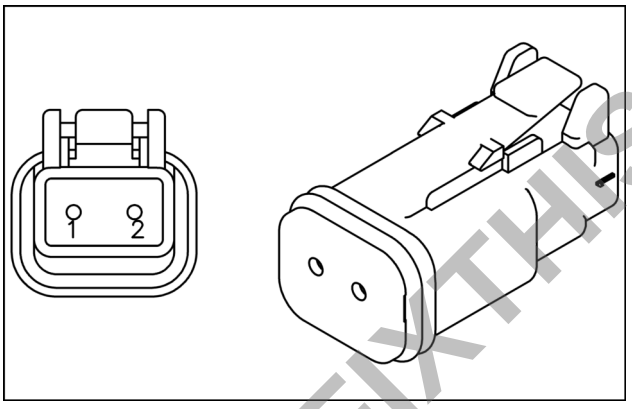
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Wire connectors - Component diagram 03 - Connectors 30 through 39

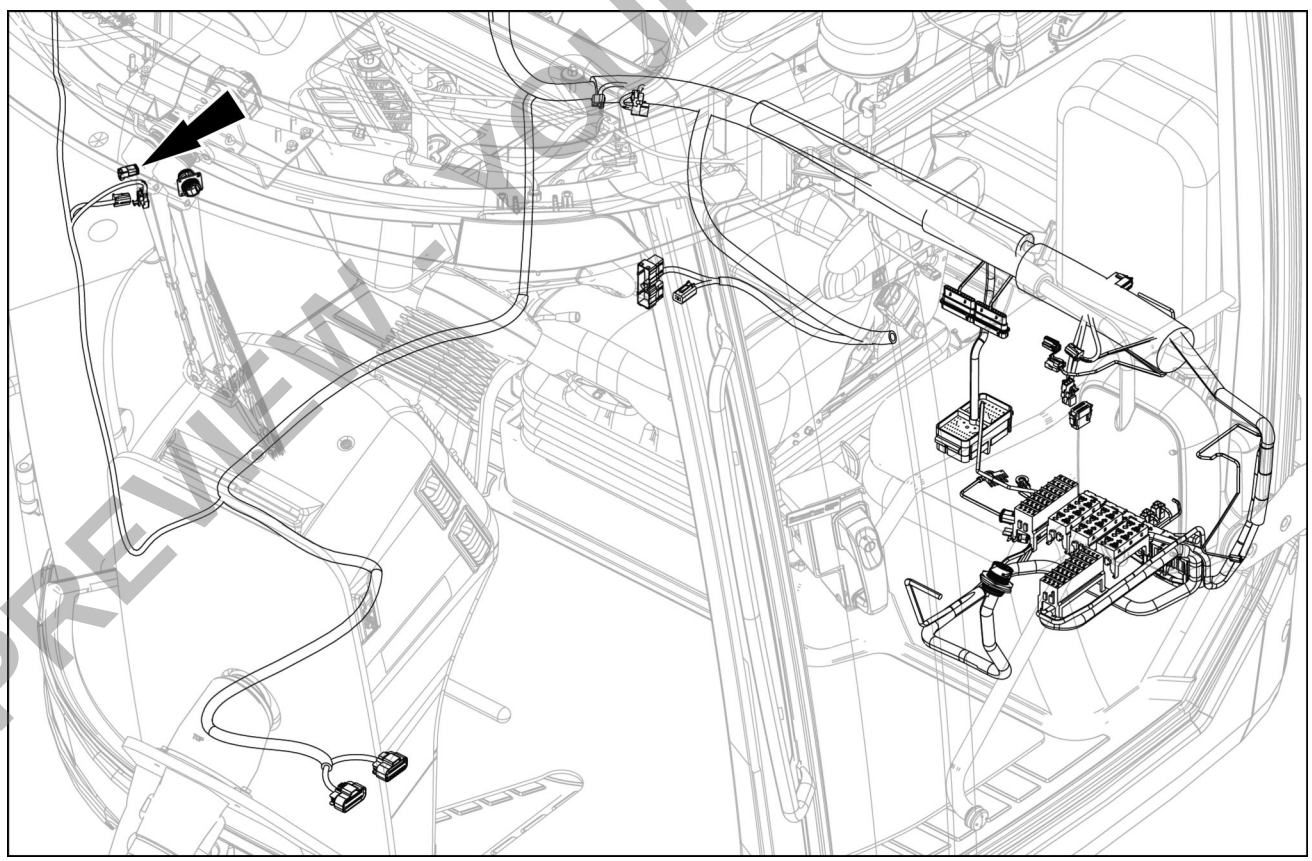
Patriot® 4440	NA

CONNECTOR C030M ICU SPEAKER (Male)

CONNECTOR C030M ICU SPEAKER			
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**	**ELECTRICAL SCHEMATIC FRAME**
1	MC900 (YE)	BUZZER +	
2	MC901 (BL)	BUZZER –	



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RAIL16SP00113FA 2

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