Capacities

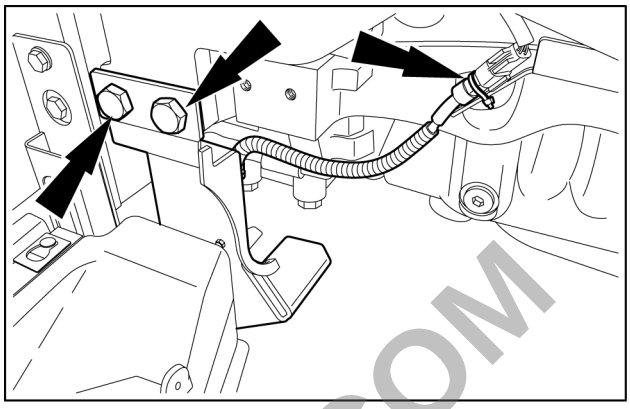
Unit	PUMA 150	PUMA 165
Main fuel tank	**264.0 L (69.7 US gal)**	
Auxiliary fuel tank	**64.0 L (16.9 US gal)**	
DEF/ADBLUE® tank	**56.0 L (14.8 US gal)**	
Cooling system	**26 l (6.9 US gal)**	
Engine (including filter)	**15 l (3.96 US gal)**	
Transmission/rear axle/hydraulics		
Semi Powershift	**75 l (19.8 US gal)**	
Full Powershift	**75 l (19.8 US gal)**	
4WD front axle — differential	**9 l (2.38 US gal)**	
4WD front hubs (Class 3 axle — less brakes)	**1.25 l (0.33 US gal)**	
4WD front hubs (Class 3 axle — with brakes)	**3.0 l (0.79 US gal)**	
4WD front hubs (Class 4 axle — less brakes)	**3.6 l (0.95 US gal)**	
4WD front hubs (Class 4 axle — with brakes)	**4.0 l (1.06 US gal)**	
Front PTO	**0.5 l (0.13 US gal)**	

Unit	PUMA 150 CVX	PUMA 165 CVX	PUMA 180 CVX
Main fuel tank	**264.0 L (69.7 US gal)**		
Auxiliary fuel tank	**64.0 L (16.9 US gal)**		
DEF/ADBLUE® tank	**56.0 L (14.8 US gal)**		
Cooling system	**26 l (6.9 US gal)**		
Engine (including filter)	**15 l (3.96 US gal)**		
Transmission/rear axle/hydraulics	**65 l (17.2 US gal)**		**68 l (18.0 US gal)**
4WD front axle — differential	**9 l (2.38 US gal)**		
4WD front hubs (Class 3 axle — less brakes)	**1.25 l (0.33 US gal)**		
4WD front hubs (Class 3 axle — with brakes)	**3.0 l (0.79 US gal)**		
4WD front hubs (Class 4 axle — less brakes)	**3.6 l (0.95 US gal)**		
4WD front hubs (Class 4 axle — with brakes)	**4.0 l (1.06 US gal)**		
Front PTO	**0.5 l (0.13 US gal)**		

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7. Disconnect the radar electrical connector and remove the radar (if fitted).



BAIL13TR01648AB 6

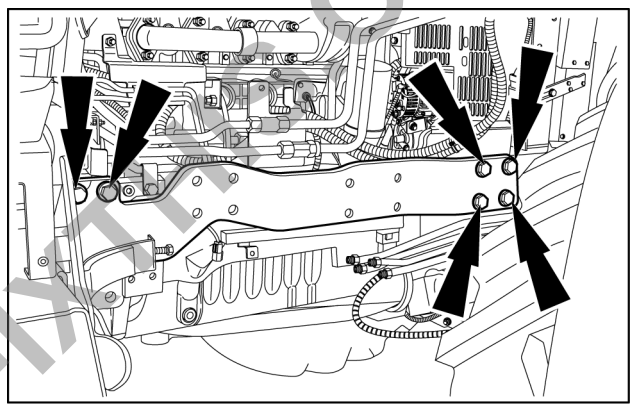
8. **⚠ WARNING**

   Heavy object!
   ALWAYS use a hoist or get assistance to lift the component.
   Failure to comply could result in death or serious injury.

   W0086A

   Remove the right-hand side rail.

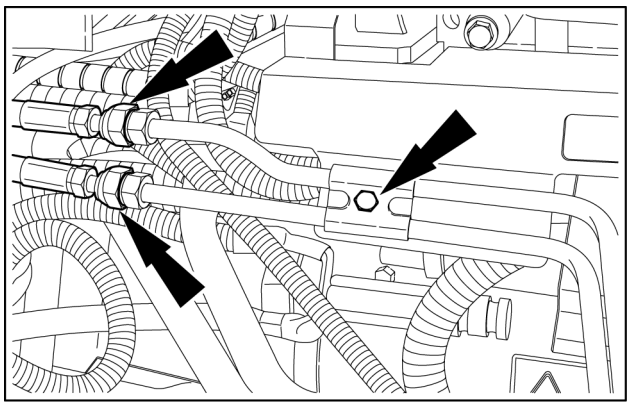
NOTE: *Repeat this step for the left-hand side.*



BAIL13TR01649AB 7

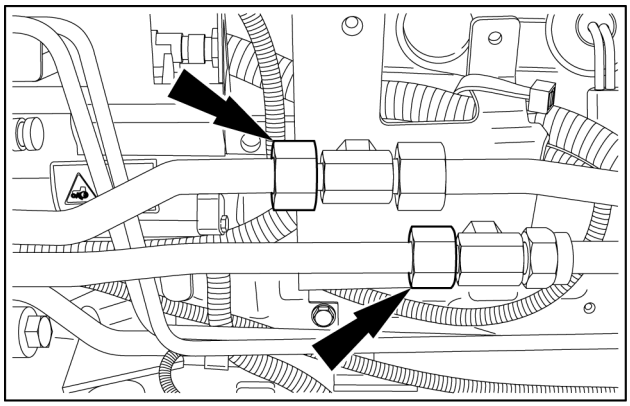
All vehicles

9. 1. Disconnect the front Power Take-Off (PTO) pipes.
   2. Detach the PTO pipe bracket.



BAIL13TR01655AB 8

10. Disconnect the oil cooler supply and return pipes.



BAIL13TR01656AB 9

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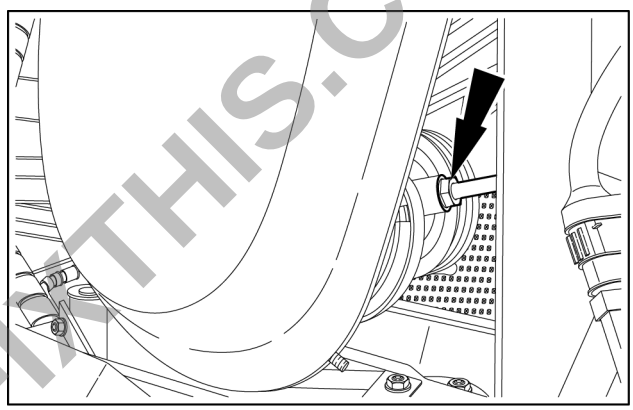
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Diesel Oxidation Catalyst (DOC) - Remove

Prior operation:
Remove the front exhaust pipe, For further information refer to **Exhaust pipes - Remove (10.254)**.

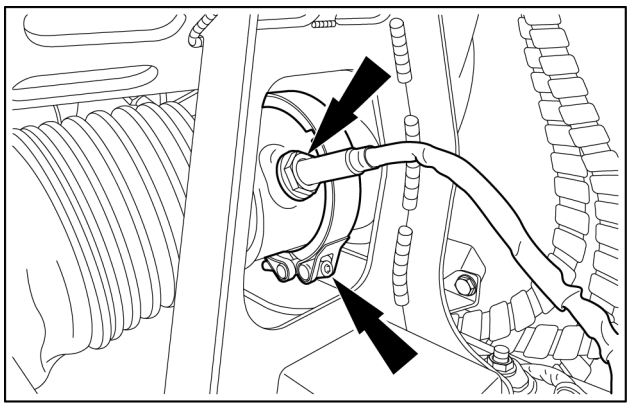
NOTICE: *Emissions sensors mounted in the exhaust stream are sensitive to extreme vibrations. Use of tools that generate extreme vibrations, such as impact wrenches and hammers, will result in damage to emission sensors. Avoid using these tools during any service procedure in close proximity of emission sensors. If the use of these tools cannot be avoided, remove the sensors using extreme caution prior to performing any service procedure.*

1. Using the Electronic Service Tool (EST), select the controller tests and carry out the flushing routine and then the emptying routine before commencing any repairs to the Selective Catalytic Reduction (SCR) components.
2. Remove the Diesel Oxidation Catalyst (DOC) temperature sensor.



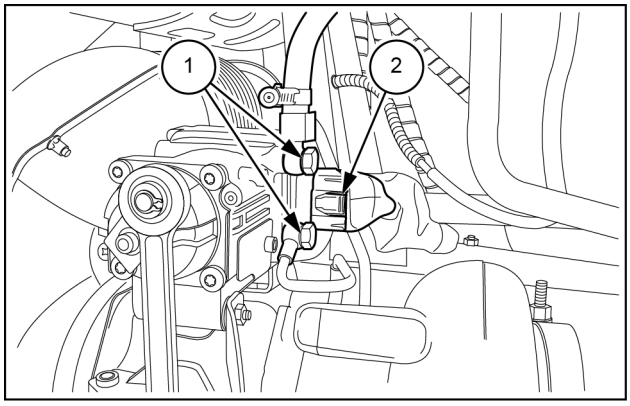
BAIL13TR01620AB 1

3. 1. Detach the up stream NO_x sensor.
   2. Remove the exhaust clamp.



BAIL13TR01738AB 2

4. A. Disconnect the coolant lines from the exhaust flap **(1)**.
   B. Disconnect the electrical connector **(2)**.

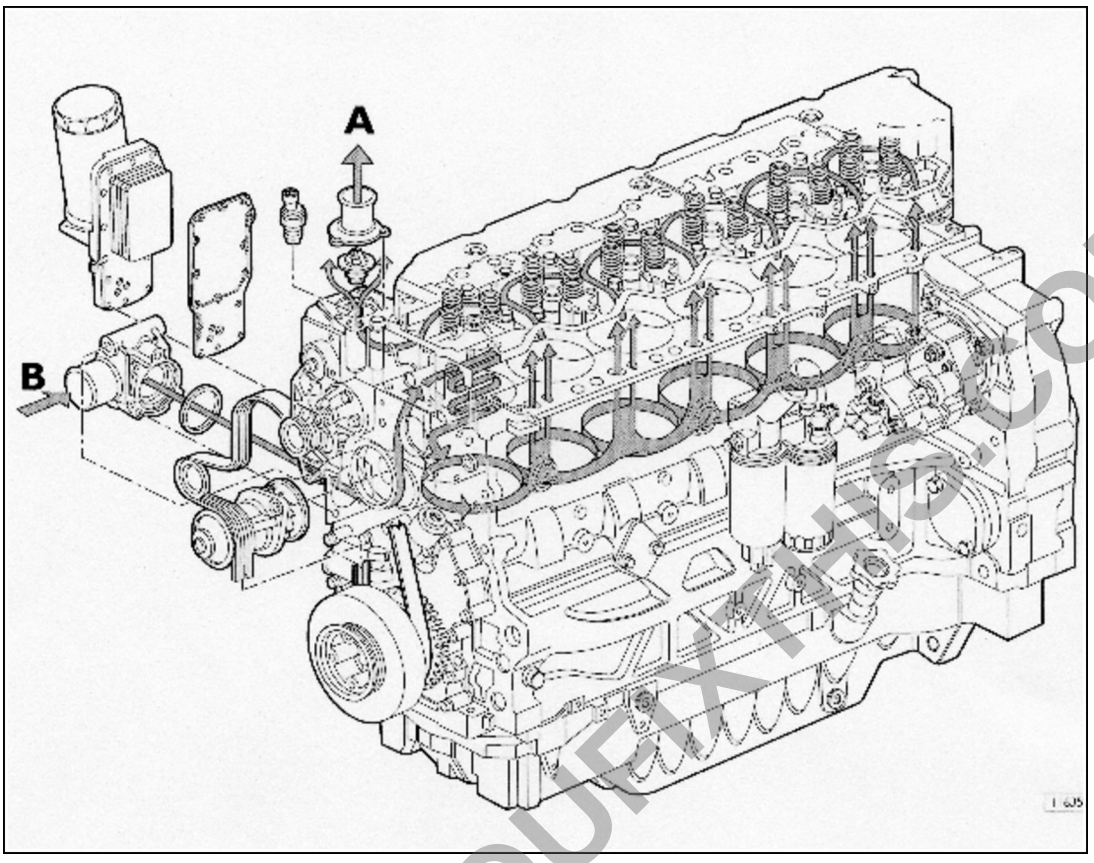


BAIL13TR01641AB 3

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Engine cooling system - Overview



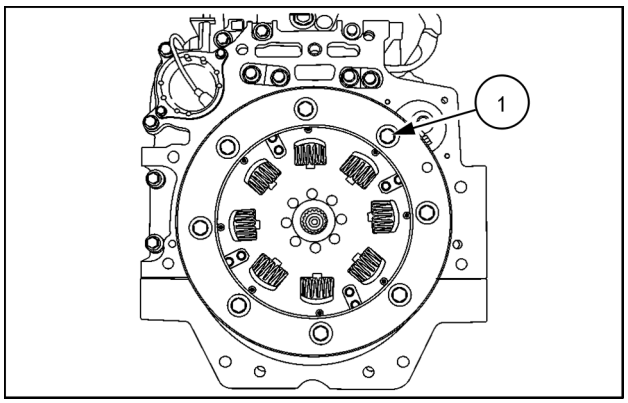
BAIL07CCM266AMA 1

A Coolant flow from the thermostat
B Coolant flow to the coolant pump

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Flywheel damper - Torque



SVIL13TR00001AC 1

Reference	Description	Torque
1	Bolt	**88 Nm** (**65 lb ft**)

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Semi-Powershift transmission - General specification

PUMA® 150	WE
PUMA® 165	WE

Transmission		18/19 forward and 6 reverse speeds.
Gear type		helical toothed
Range gears		3 forward ranges and 1 reverse range for a total of 18 forward and 6 reverse speeds on **40 kph** models. 19 forward and 6 reverse speeds for **50 kph** models
Gear type		helical toothed
Reduction ratios:		
Low		(24 x 15) : (46 x 55) = 1 : 7.03
Normal		(24 x 25) : (46 x 37) = 1 : 2.84
High		1
Speed and range shift controls		by three buttons located on the control lever
Shift and range gear lubrication		forced-fed by a gear pump (same as the power steering circuit pump)
Number of driven discs - Clutch A		7
Thickness of driven discs - Clutch A	mm	2.65 to 2.75
Number of drive discs - Clutch A		7
Thickness of drive discs - Clutch A	mm	1.80 - 2.00
Multi-pack clutch A thickness under a load of **1600 N** (**359.7 lb**)	mm	32.7 to 32.9
Number of Belleville springs - Clutch A	mm	9
Free spring length - Clutch A	mm	4.2
Compressed spring length under a load of **2108 N** (**473.9 lb**)	mm	3.28
Number of driven discs - Clutch B		7
Thickness of driven discs - Clutch B	mm	2.65 to 2.75
Number of drive discs - Clutch B		7
Thickness of drive discs - Clutch B	mm	1.80 - 2.00
Multi-pack clutch B thickness under a load of **1600 N** (**359.7 lb**)	mm	32.7 to 32.9
Number of Belleville springs - Clutch B		9
Free spring length - Clutch B	mm	4.2
Compressed spring length under a load of **2108 N** (**473.9 lb**)	mm	3.28
Number of driven discs - Clutch C		8
Thickness of driven discs - Clutch C	mm	2.70 to 2.80
Number of drive discs - Clutch C		8
Thickness of drive discs - Clutch C	mm	1.5
Multi-pack clutch C thickness under a load of **1600 N** (**359.7 lb**)	mm	26.2 to 26.4
Number of Belleville springs - Clutch C		8
Free spring length - Clutch C	mm	4.1
Compressed spring length under a load of **1784 N** (**401.1 lb**)	mm	3.22
Number of driven discs - Clutches D & E		6

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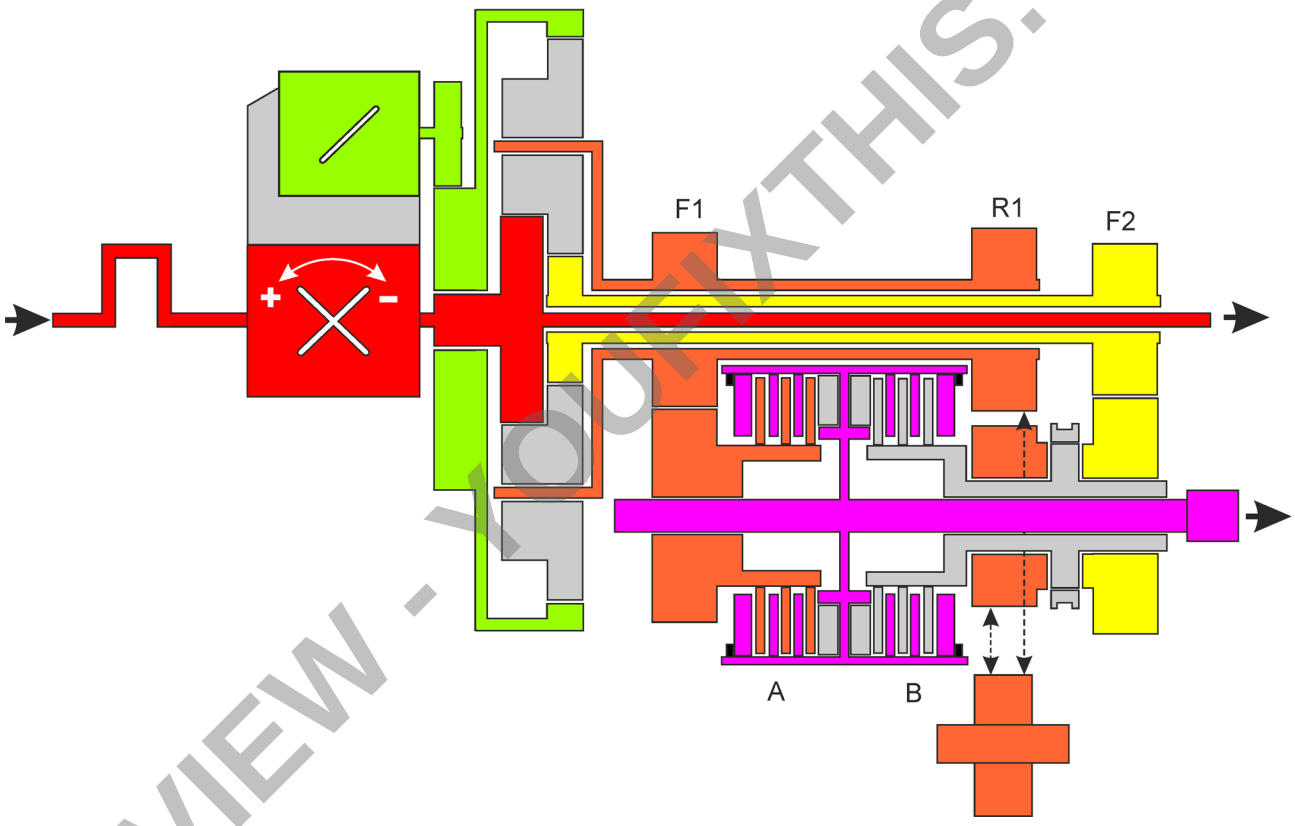
Continuously Variable Transmission (CVT) - Functional diagram

PUMA® 150 CVX	WE
PUMA® 165 CVX	WE
PUMA® 175 CVX	WE

The following diagrams show the transmission power flow in the individual mechanical gears and in the stationary control (Powered-zero) () and neutral position / park position operating modes.

Color coding

Direct drive from the diesel engine	Hydrostatic motor and power collecting gear/ring gear
Power collecting gear/planet carrier with permanently driven gears	Power collecting gear/sun gear with permanently driven gears
Power flow	Transmission output shaft



SS11K088 1

Neutral position

In the neutral position and the park position, the transmission is not engaged. No mechanical gears is engaged and clutches **(A)** and **(B)** are open.
If the tractor rolls off inadvertently in the neutral position or if it is shifted into the neutral position while the tractor is in motion, the speed differences arising as a result are equalized by the hydrostatic drive. This means that the relevant gear can be engaged at synchronous speed at any time, thus engaging the power unit.

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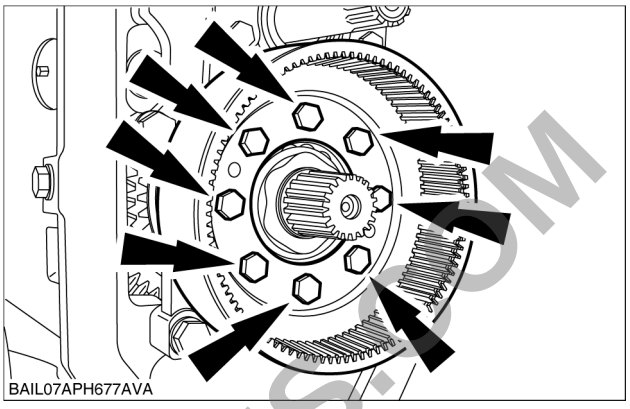
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Creeper - Install

PUMA® 150	WE
PUMA® 165	WE

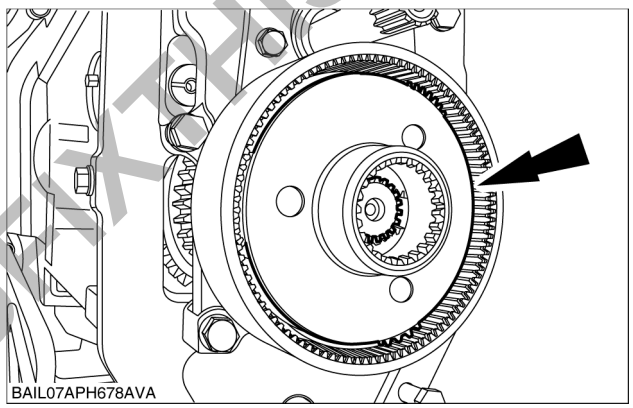
1. Install the ring gear and back plate.
   Tighten the retaining bolts to **49 Nm** (**36 lb ft**).

NOTE: *Make sure that the dowels in the rear of the back plate are correctly located in the holes in the gear cover.*



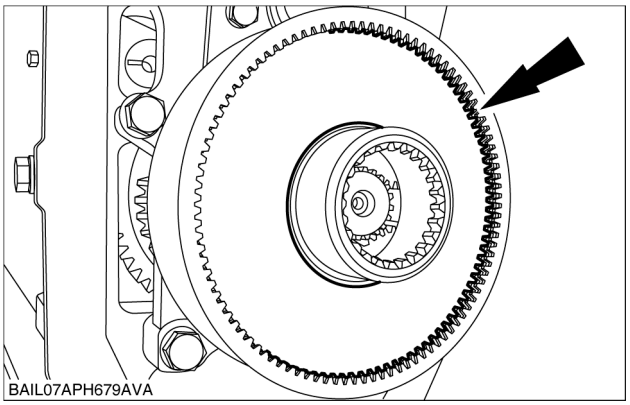
BAIL07APH677AVA 1

2. Install the planetary gear assembly.



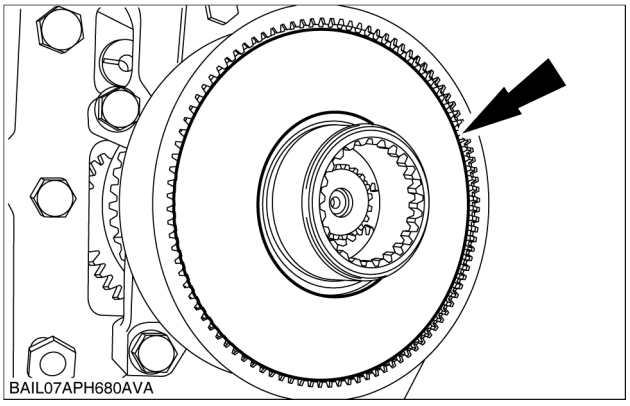
BAIL07APH678AVA 2

3. Install the planetary gear inner toothed ring.



BAIL07APH679AVA 3

4. Install the reducer gear outer plate.



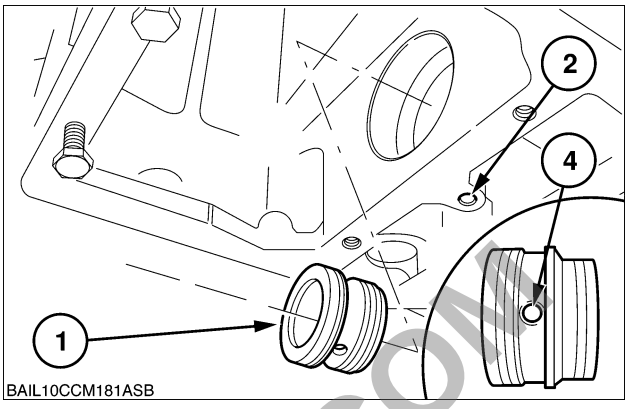
BAIL07APH680AVA 4

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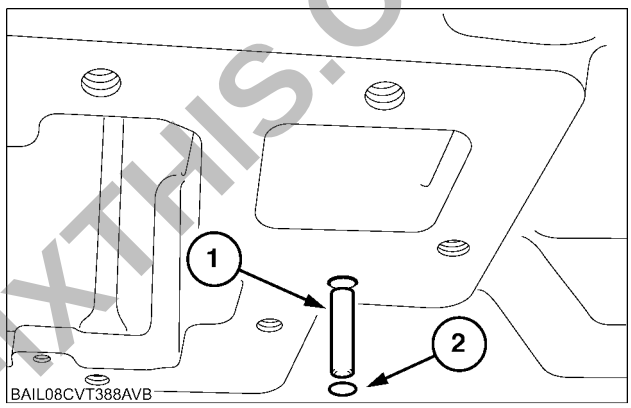
1. Install the oil supply manifold **(1)** into the rear axle housing.

NOTE: *Make sure hole **(4)** in the oil supply manifold is aligned with the hole **(2)** in the rear axle housing.*
It is recommended that petroleum jelly is used to hold the seals in place, and also to aid assembly.



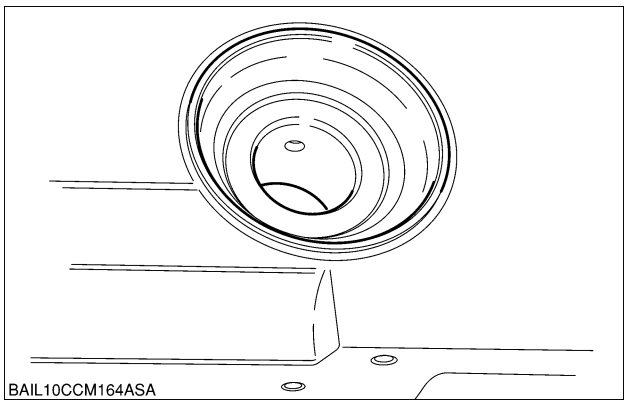
BAIL10CCM181ASA 5

2. Install the oil supply manifold retaining pin **(1)** and a new O-ring **(2)**
The petroleum jelly can be used to hold the pin in position.



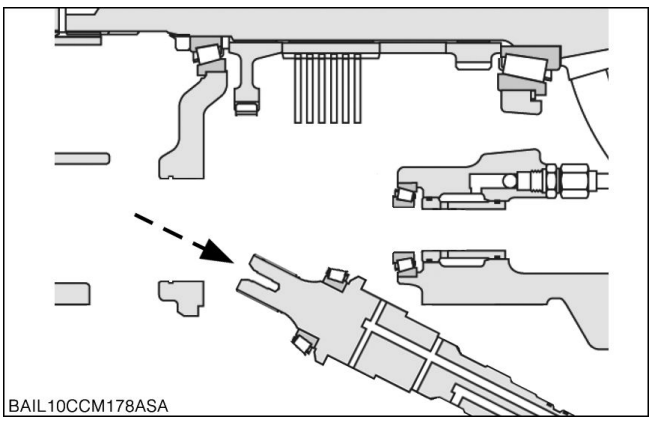
BAIL08CVT388AVB 6

3. Install the rear bearing into the housing. The use of petroleum jelly can help the bearing stay in position while installing the 4wd clutch.



BAIL10CCM164ASA 7

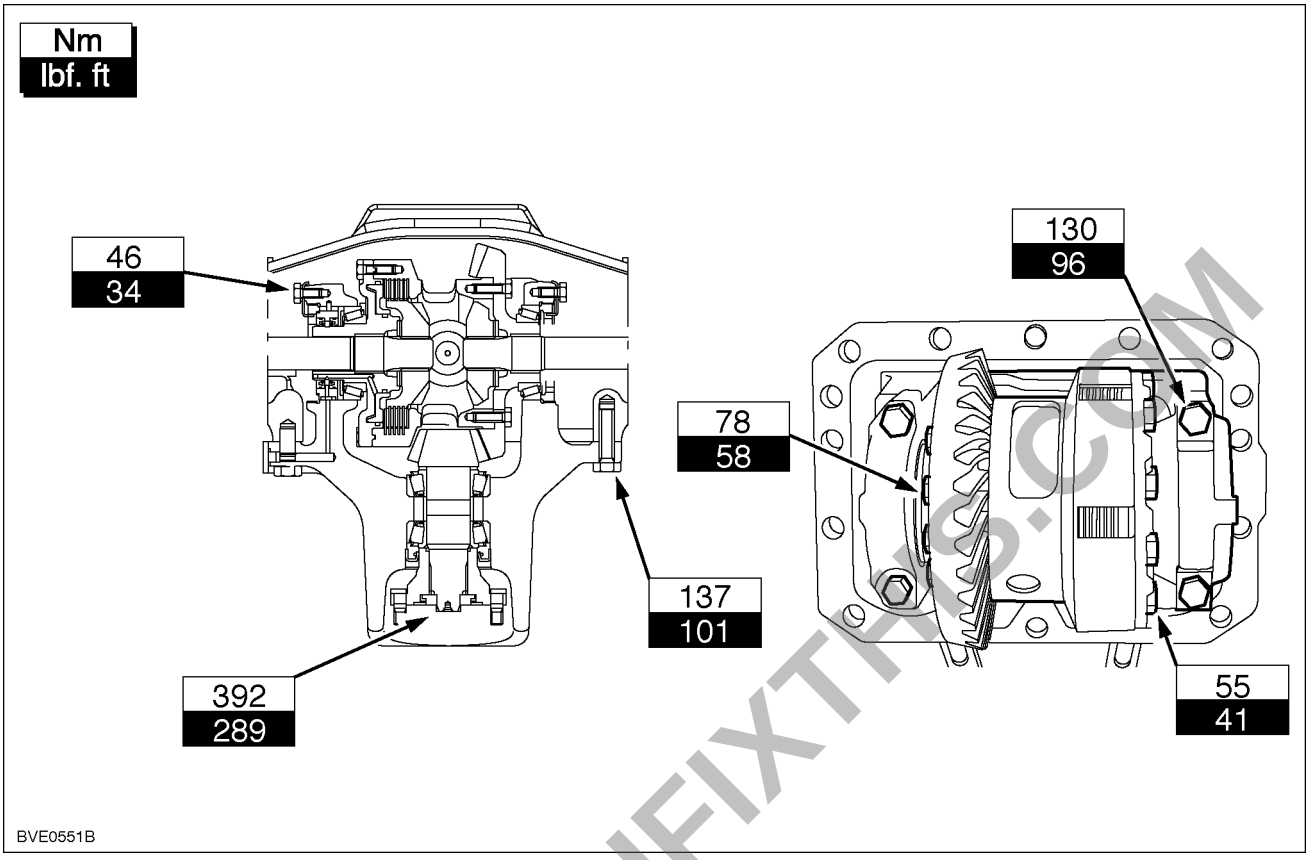
4. Put the 4wd clutch shaft into the transmission housing. Use petroleum jelly on the seals to hold them in place and aid assembly.



BAIL10CCM178ASA 8

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BVE0551B 4

Multi-Wet Plate Differential Lock

Powered front axle - Special tools

NOTE: *The operations described in this section can only be carried out with the essential tools indicated by an (X). To work safely and efficiently and obtain the best results, it is also necessary to use the recommended specific tools listed below and certain other tools, which are to be made according to the drawings included in this manual.*

List of special tools necessary to carry out the different operations described in this Section.

Tool No.	Description
380000251	Front axle overhaul stand
X **380000227**	Front differential casing removal - installation hook
380000255	Front axle differential casing overhaul fixture
X **380000268**	Front axle drive pinion nut spanner
380000257	Front bevel gear pinion retainer wrench
X **380000248**	Pinion Bearing Preload adjusting tool
X **380000463**	Drive pinion bearing adjustment tool
380001000	Front axle drive pinion retaining tool
X **380000249**	Front axle drive pinion cone point adjustment gauge
380000270	Front axle hub bearing pulling aids (two)

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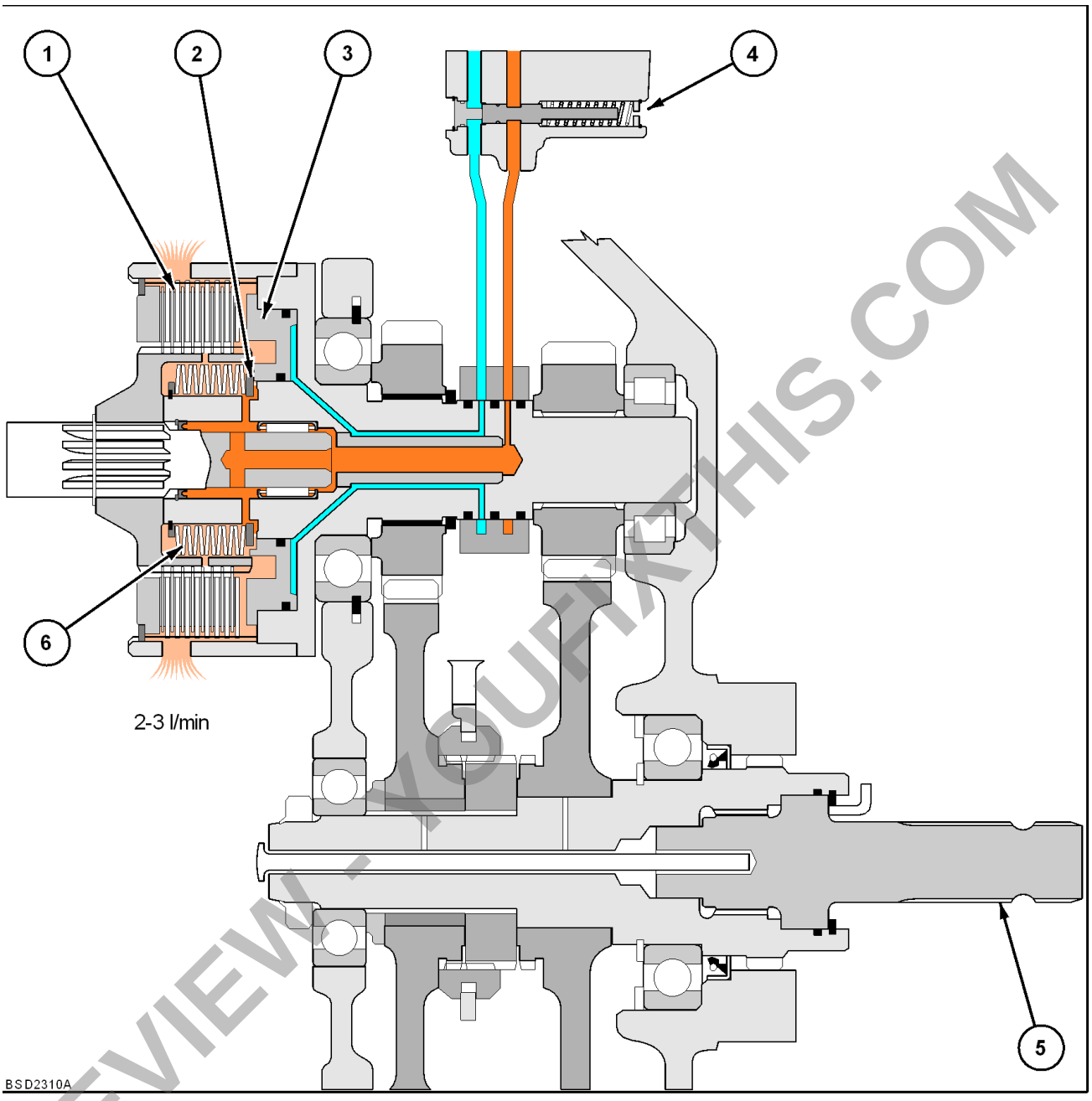
Powered rear axle - Troubleshooting

Problem	Possible Cause	Correction
Noisy rear axle when the vehicle is moving, and also with the transmission in neutral (not originating from final drives)	Pinion and/or crown wheel bearing incorrect adjustment	Remove the rear axle housing and adjust the pinion and crown wheel bearings correctly
	Excessive wear or incorrectly adjusted sun and planetary gears	Remove the differential, install new parts where necessary and adjust the differential gear backlash
	Excess differential side gears to half-shaft spline backlash	Remove the differential, install new parts where necessary and adjust the differential gear backlash
Noisy rear axle with the vehicle under load and upon release	Excessive pinion to crown wheel backlash	Remove the rear axle housing and adjust the pinion and crown wheel bearings correctly
	Defective internal rear axle component(s)	Remove the rear axle housing, install new parts where necessary and adjust the differential gear backlash
Noisy rear axle and over-heating	Insufficient pinion and/or crown wheel backlash	Remove the rear axle housing and adjust the pinion and crown wheel bearings correctly
Noisy final drive(s) when the vehicle is moving and also with the transmission in neutral	Final drive shaft bearing incorrectly adjusted	Remove the final drive housing and adjust the bearing(s)
	Defective internal final drive component(s)	Remove the final drive housing and install new parts where necessary
	Excess final drive shaft to final drive spline backlash	Remove the final drive housing and install new parts where necessary
Differential lock not engaging.	Low rear axle oil level	Top up to correct level
	Blocked oil filter	Install a new oil filter
	Defective hydraulic pump	Overhaul or install a new hydraulic pump
	Faulty differential lock switch	Install a new switch
	Power supply not reaching solenoid valve: detached or damaged connectors, defective solenoid valve or remote switch	Repair the electrical connection. Overhaul or install a new solenoid valve or remote switch
	Differential lock control solenoid valve stuck on discharge	Overhaul or install a new solenoid valve
	Oil leaks through the seals with consequent pressure drop: cylinder piston oil supply line seal(s)	Install new seal(s) where necessary
Differential lock not disengaging	Faulty differential lock/unlock switch	Install a new switch
	Power supply not reaching solenoid valve: detached or damaged connectors, defective solenoid valve or remote switch	Repair the electrical connection. Overhaul or install a new solenoid valve or remote switch
	Differential lock control solenoid valve stuck on delivery.	Overhaul or install a new solenoid valve
	Oil leaks through the seals with consequent pressure drop: cylinder piston oil supply line seal(s)	Install new seal(s) where necessary
With differential lock engaged and control switch on automatic mode, the differential lock does not disengage when raising lift arms using the Fast Raise switch.	Faulty differential lock switch (connected to the Fast Raise switch).	Install a new differential lock switch.

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Rear electro-hydraulic control - Dynamic description



BSD2310A 1

PTO CONTROL CLUTCH-DISENGAGED

Lubrication Circuit Oil

Lubrication Oil
@ Reduced Flow

Return to Reservoir

1 Clutch Plates
2 Washer
3 Piston
4 Lubrication Valve
5 PTO Output Shaft
6 Bellville Springs

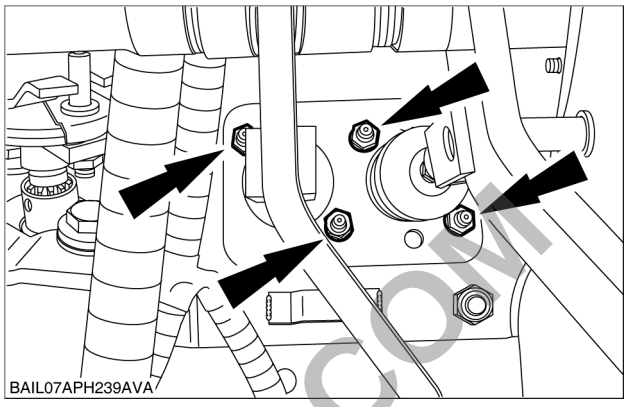
PTO Engaged (initial engagement)
Engagement of the PTO is considered as a two phase operation.
When the PTO is operated the engagement solenoid is energised and the brake solenoid disengaged.
Low pressure hydraulic circuit oil flows from the solenoid and past the end of the lubrication valve to the rear of the clutch piston. As pressure increases the PTO clutch piston moves forward against the washer **(2)** and bellville springs

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Brake master cylinder - Install

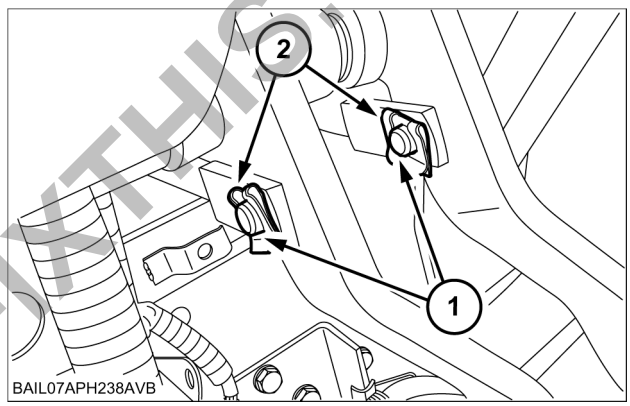
1. From the engine side, install the brake master cylinder. Install the four brake master cylinder retaining bolts.

NOTE: *Lubricate the gaiters to assist installation of the master cylinder.*



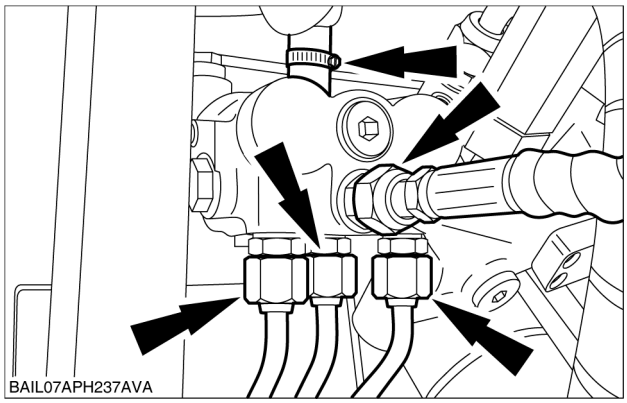
BAIL07APH239AVA 1

2. Install both brake master cylinder push rod clevis pins **(1)**, and install the brake master cylinder push rod clevis pin retaining clips **(2)**.



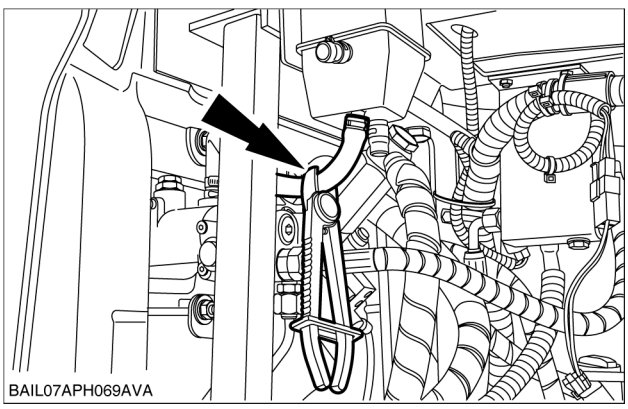
BAIL07APH238AVB 2

3. Connect the brake master cylinder pipe and hose connections.



BAIL07APH237AVA 3

4. Remove the clamp from the brake master cylinder reservoir hose.



BAIL07APH069AVA 4

Next operation:
Adjust the brake pedal height if required.

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Trailer brake hydraulic control - Hydraulic schema

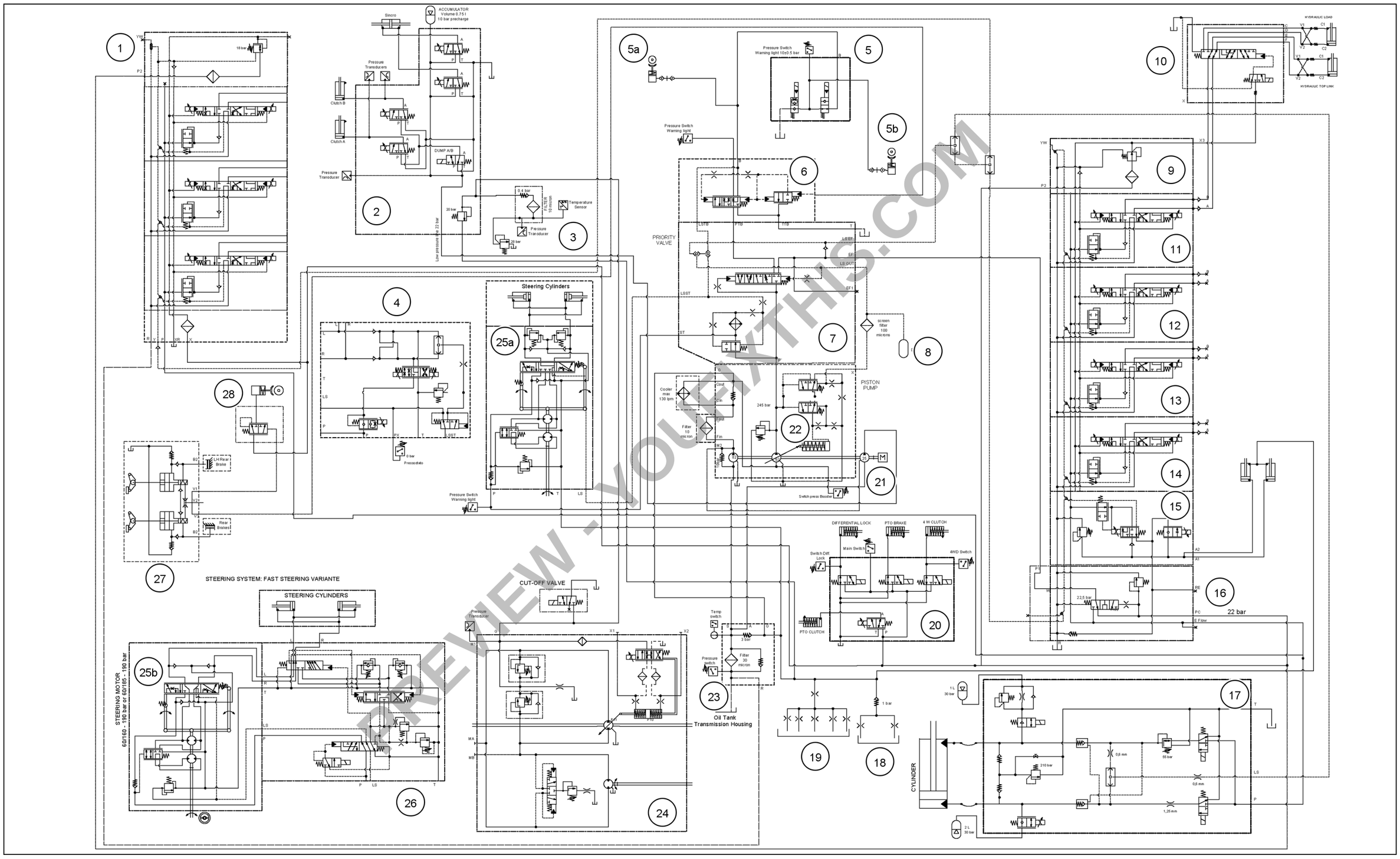
PUMA® 150 CVX	WE
PUMA® 165 CVX	WE
PUMA® 175 CVX	WE

Trailer brake hydraulic schematic — Italian

Item	Description	Item	Description
1.	Italian trailer brake valve	2.	Pressure switch/warning lamp **14.5 - 15.5 bar**
3.	Right-hand rear brake	4.	Left-hand rear brake
5.	Master cylinders	6.	Pressure switch/warning lamp **9.5 - 10.5 bar**
7.	Priority valve	8.	100 micron screen filter
9.	10µm filter	10.	Pressure switch booster
11.	30µm filter	12.	Transmission housing
13.	Vacuum switch	14.	Temperature switch
15.	10µm filter	16.	Oil cooler
17.	Auxiliary test port	18.	Steering motor
A.	Load sensing from EHRs and suspension valve	B.	To EHRs and suspension valve
C.	To hydrostat	D.	To lubrication
E.	Maximum **130 L/min** (**34 US gpm**)		

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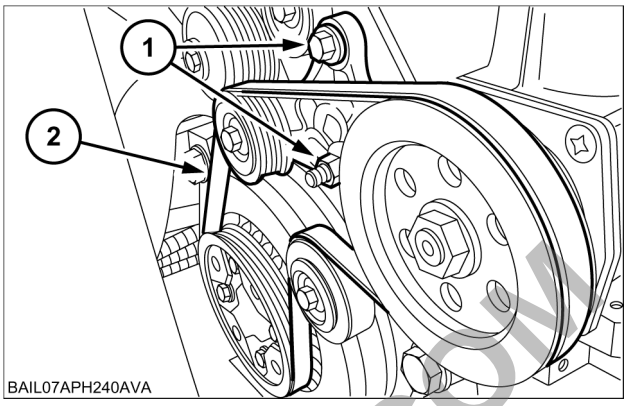


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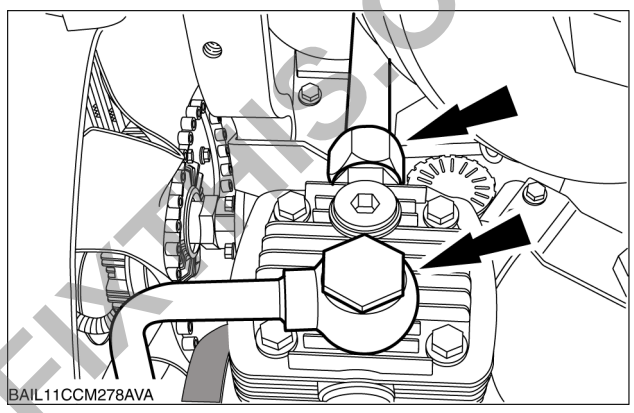
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3. Loosen the air compressor drive belt tensioner **(1)**, de-tension and remove the air compressor drive belt **(2)**.



BAIL07APH240AVA 3

4. Disconnect the air cleaner to air compressor supply pipe and the air compressor outlet pipe.

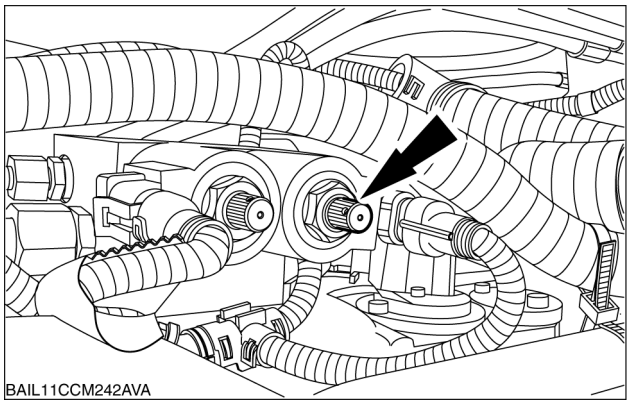


BAIL11CCM278AVA 4

Vehicles with suspended front axle

5. Depressurise the front suspension system, by rotating the knurled knob on the lowering solenoid counterclockwise, and allow the vehicle to lower completely onto the axle stops.
   Rotate the knob clockwise to close the valve.

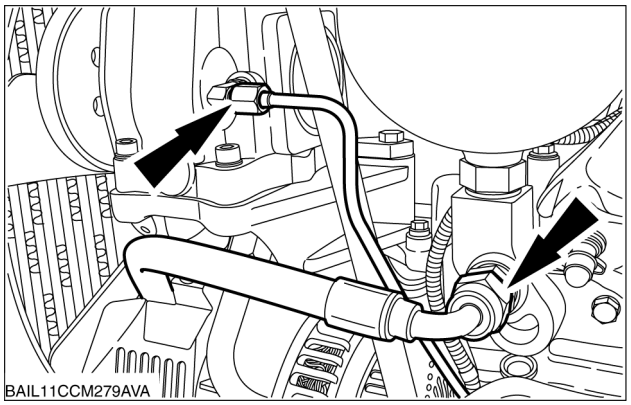
NOTE: *It may be necessary to remove the right-hand rear wheel to gain access to the front suspension valve.*



BAIL11CCM242AVA 5

All Vehicles

6. Disconnect the front suspension accumulator pipe (if fitted) and the compressor oil supply pipe.



BAIL11CCM279AVA 6

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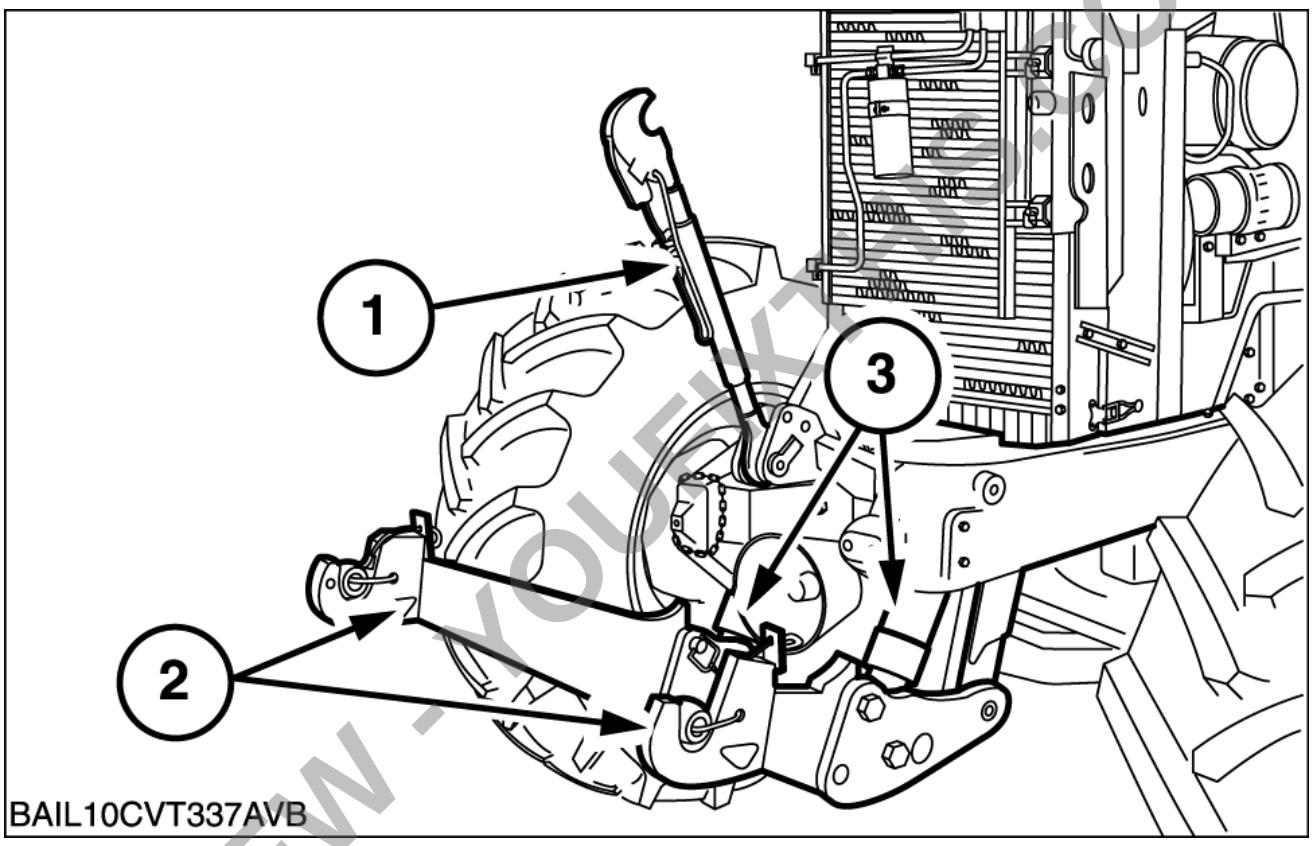
Front hitch - Static description

NOTE: *The three point front hitch is an option which may be fitted during manufacture, or as a dealer installed accessory. Whichever option is fitted the principles of operation described here apply to both.*

⚠ WARNING

Entanglement hazard!
Extreme care must be exercised when adjusting and checking hitch and control linkage when the engine is running and when linkage is hydraulic or mechanical load. Study the linkage and hitch travel. Keep the hands, arms, legs, and feet out of the travel arc of the hitch and linkage. Failure to comply could result in death or serious injury.

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BAIL10CVT337AVB 1

The front hitch consists of an adjustable top link **(1)** a pair of folding lower links **(2)** and two large double action cylinders **(3)**. The top link and lower links have open claw ends that permit rapid coupling and uncoupling of implements. The claws are equipped with self-locking latches to make sure that there is positive retention of the 3 point hitch to the implement. The two large double-action cylinders provide maximum lifting power throughout the entire lifting range. The front hitch may be operated by using the electronic rear remote or mid-mount valves (if fitted).

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Power steering system - Dynamic description

Turn Assist Hydraulic Operation

Refer to: **Power steering system - Hydraulic schema (41.200)**
Hydraulic oil is fed from the steering pump **(12)** to the change or pilot valve **(10)** . When the system is enabled by activating the Turn Assist switch, the solenoid **(11)** moves against the spring pressure to allow oil to activate the change or pilot valve **(10)**. The change valve spool overcomes the spring pressure and allows the oil to reach the distributor spool **(7)** this directs the oil flow from the steering motor directly to the distributor spool and split valve. If the steering wheel is rotated left for example, the pilot pressure is exerted on the distributor spool thus enabling oil to flow to the Split valve **(4)** which in turn allows the increased oil flow to activate the steering cylinder **(1)**.

Operating and Monitoring System

The electrical and hydraulic systems allow safe operation and monitoring of system in the following manner: When the system is enabled by using the Turn Assist switch, the electronics perform a functional and status check. The split valve spool is checked to ensure that it is not stuck in such a manner that would allow the Turn Assist system to be active or operate in a dangerous way which may cause loss of control of the tractor. Should such a state exist the system activates the critical stop audible and visual alarms to the operator. If there is an invalid state that does not endanger the operator, only the visual alarm is activated. If the split valve is stuck at the midpoint of travel, then the system is in between these two modes and will be unable to determine exactly which mode the tractor is in and the critical stop alarms are activated. If the distributor spool becomes stuck it will be forced back into place by hydraulic pressure and the system will revert to normal steering mode.
When the system has determined that the hydraulic components are functioning correctly the system then checks the operator inputs and verifies that the operator controls are working correctly. The solenoids, sensors, and switches are checked for correct operational voltage and current levels and any failure will cause the system to go into a fail-safe mode. If there is any problems with any of these components the system deactivates itself and prevents any electrical engagement of the system. If there are no problems with the components then the system goes into standby mode awaiting operator inputs. The system constantly monitors itself checking for failures and illegal logic combinations during fast steer operation and notifies the operator via the visual and audible alarms in the event of a system error or component failure.

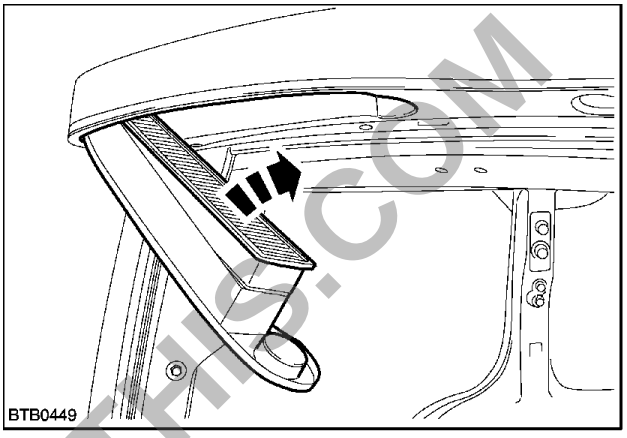
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Cab air filters - Cleaning

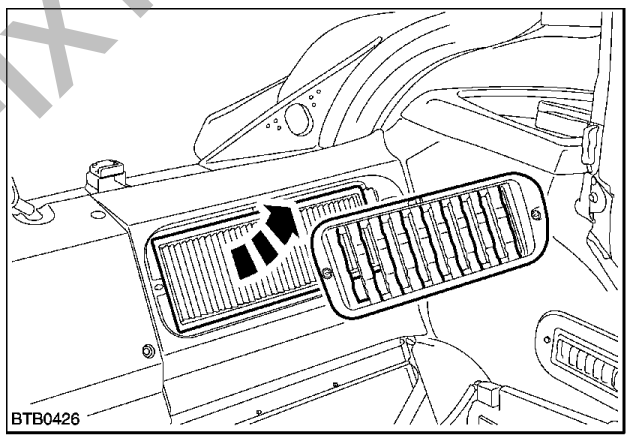
Before servicing the filters, switch off the blower and close the roof hatch, all windows and one door. Slam the final door and the resulting back pressure will dislodge most of the loose dirt from the underside of the filters.

Remove filter elements. The fresh air filters have a prefilter element fitted that is designed to catch most of the dust/chaff. This prefilter is part of the filter and should be pulled out from the underside and cleaned first, then pushed back in.



BTB0449 1

The recirculation filter is fitted with a pull tab. This should be used to remove the filter. The filter pleats should never be used to remove the filter as damage will result.



BTB0426_505 2

Blow the dust from the upper surface through the element to the underside. Clean by blowing with compressed air not exceeding **2 bar** (**29 psi**). Hold the nozzle at least **30 cm** (**12 in**) from the element to prevent damage to the pleats.

NOTICE: *Care should be taken when using compressed air as this may damage to the filter.*

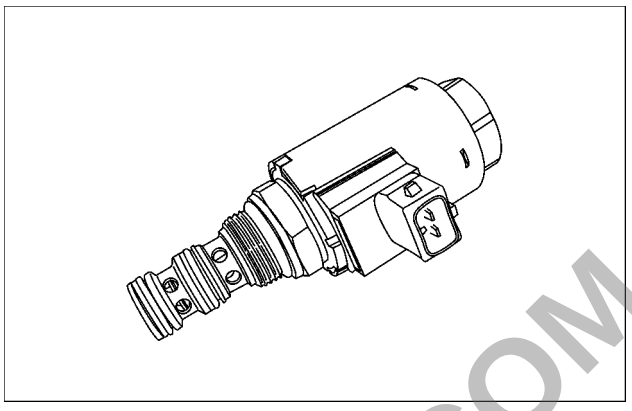
Clean all filter chambers with a damp, lint free cloth. Replace the filter elements with the rubber seal uppermost and re-install the covers.

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Solenoid valves

The solenoid valves (see figure **12**) work in much the same way as relays, except that the iron core of the electromagnet is not fixed in place. As a result, the windings in the control circuit cause the iron core to move. A solenoid is basically a winding around an iron core. In the center of the core there is a plunger which is free to move through the core. When an electrical current passes through the winding, an electromagnetic force is produced which causes the plunger to move through the core. If the current is switched OFF, the force is stopped and the plunger is returned by a spring. The plunger is used for example for the moving of a hydraulic spool or a mechanical lever.

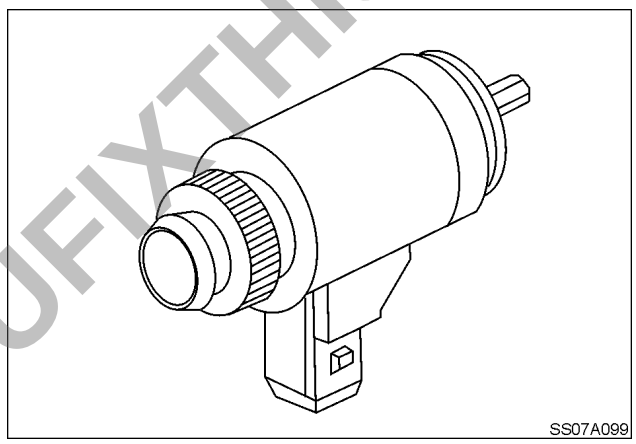


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Common faults of solenoid valves are a shorted (short circuit to ground) or broken (open circuit) winding, as well as sticking internal component parts.

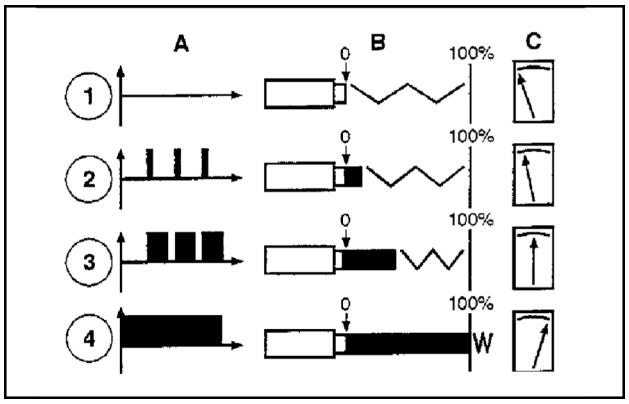
Proportional solenoid valves

Whenever it is necessary to provide proportional control of a solenoid valve, the principle of operation called pulse width modulation (PWM) is used. The pulse width modulation uses a variable DC voltage signal to control a solenoid valve. The voltage signal is pulsed ON and OFF many times a second at a constant voltage level. The processors for a pulse width modulation contain transistors that are supplied with a constant input voltage which is switched ON and OFF to achieve the variable voltage signal. With a proportional solenoid valve (see figure **13**) and an appropriate pulse width modulation for example the hydraulic output flow is proportional to the average DC voltage. The lower average voltage allows the proportional solenoid valve to operate with less residual magnetism and so the entire circuit will operate smoother.



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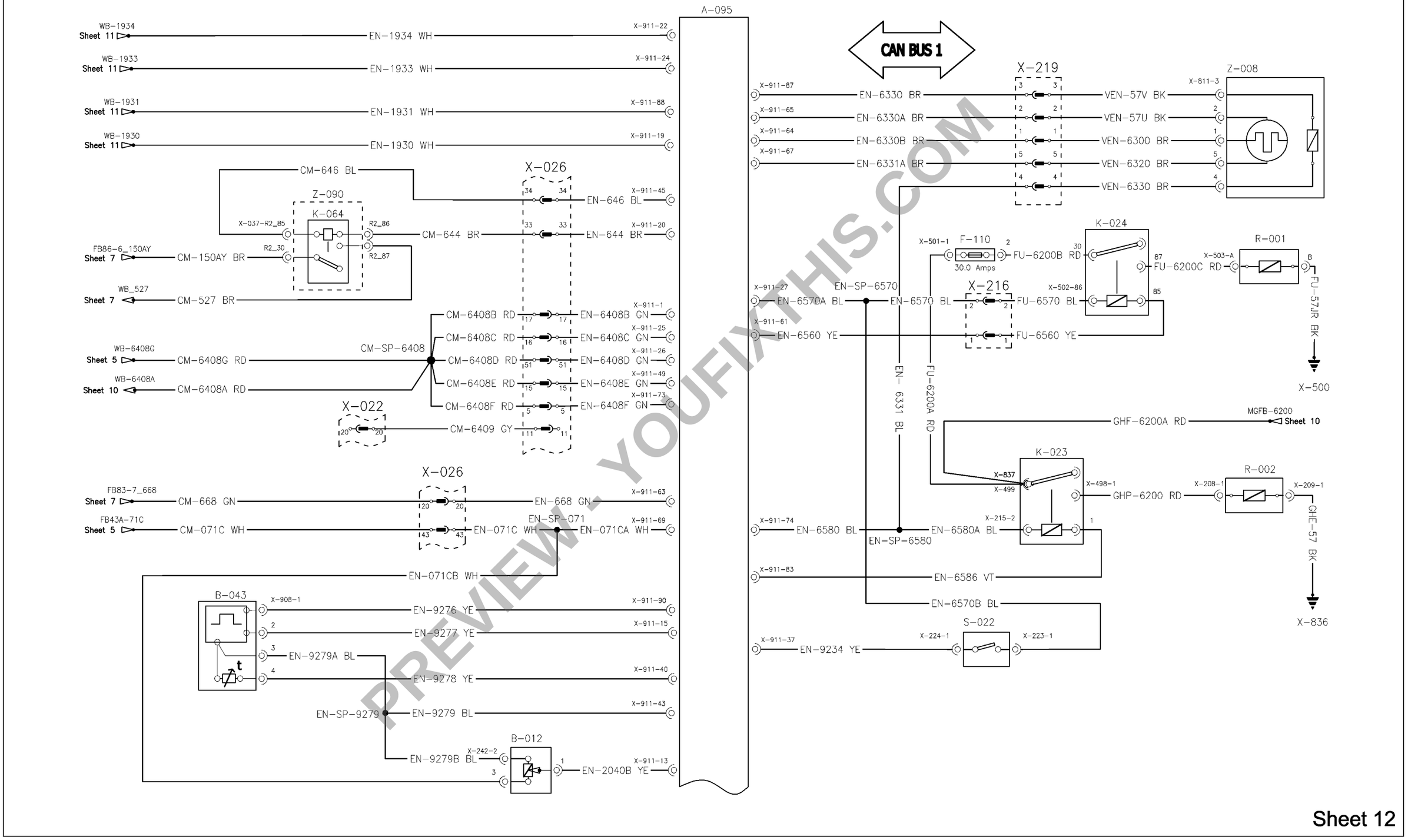
The variable DC voltage signal is determined by varying the duration of the ON pulse relative to the OFF pulse (see figure **14**). The ratio between the ON time and the cycle time is called duty cycle and is stated as a percentage of one complete cycle. The diagrams in column **(A)** show the voltage signal that is sent to the solenoid valve (pulse width modulation). The diagrams in column **(B)** show the spring displacement of the solenoid valve (appropriate to the solenoid valve opening). The diagrams in column **(C)** show the reading on a voltmeter connected to the solenoid valve terminals (average DC voltage). The diagrams **(1)** to **(3)** show the normal operating range of a proportional solenoid valve controlled by pulse width modulation. Diagram **(4)** shows the behavior of the solenoid valve with a constant input voltage signal (full opening). Diagram **(1)** shows the OFF position (no signal is directed to the solenoid valve). Increasing the duty cycle causes the increase of the pressure in the hydraulic circuit, which results in a voltmeter reading increase. Diagram **(3)** shows the maximum signal that is used during the normal activity of the solenoid valve (its duty cycle is around 0.5).



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Controller and CAN bus cross-references

Controller/ CAN bus	Schematic reference
ARU	**Electronic module Armrest control unit (ARU) - Electronic schema (55.640)**
AUTO	**Global Positioning System (GPS) control unit - Electronic schema (55.911)**
ECU	**Engine Control Unit (ECU) - Electronic schema (55.015)**
EPL	**Electronic park lock actuator/controller - Electronic schema (55.031)**
ICU	**Electronic module Instrument control unit - Electronic schema (55.640)**
UCM	**Electronic module Universal controller - Electronic schema (55.640)**
CAN bus 1	**Wiring harnesses - Electrical schematic sheet 51 (55.100)**
CAN bus 2	**Wiring harnesses - Electrical schematic sheet 52 (55.100)** **Wiring harnesses - Electrical schematic sheet 53 – CAN bus 2 (mid-mount remote control valves) (55.100)**
CAN bus 3	**Wiring harnesses - Electrical schematic sheet 54 (55.100)**
CAN bus 4	**Wiring harnesses - Electrical schematic sheet 55 (55.100)**

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Code	Description	Possible failure
U51	Engine speed error	1) Engine speed must be between **850 - 950 RPM** 2) CAN bus error
U55	PTO started	1) The PTO was started during the PTO twist sensor calibration, ensure the PTO is turned off
U58	PTO sensor open circuit	Wiring or connectors to PTO twist sensor
U59	PTO sensor short circuit to ground	Wiring or connectors to PTO twist sensor
U70	PTO twist sensor not calibrated	Calibration value was too high or too low
U75	Quick fill calibration value too high	1) Wiring problem (on clutch solenoid) 2) Clutch solenoid damaged 3) Clutch mechanical problem
U76	Quick fill calibration value too low	1) Wiring problem (on clutch solenoid) 2) Clutch solenoid damaged 3) Clutch mechanical problem
U77	Damper calibration value too high	1) Wiring problem 2) Sensor damaged 3) Wrong damper installation 4) Mechanical problem on driveline
U78	Damper calibration value too low	1) Wiring problem 2) Sensor damaged 3) Wrong damper installation 4) Mechanical problem on driveline
U79	PTO twist sensor not plausible	1) Sensor damaged or incorrectly installed
U95	Synchronizer potentiometer signal is out of range for F2 position	1) Wiring problem on synchronizer solenoids or potentiometer 2) Potentiometer damaged 3) Driveline mechanical problem
U96	Synchronizer potentiometer signal is out of range for R1 position	1) Wiring problem on synchronizer solenoids or potentiometer 2) Potentiometer damaged 3) Driveline mechanical problem
U97	F2 did not engage properly	1) Wiring problem on synchronizer potentiometer 2) Synchronizer potentiometer damaged 3) Clutch B or dump valve problem (electrical, hydraulic or mechanical) 3) Driveline mechanical problem
U98	R1 did not engage properly	1) Wiring problem on synchronizer potentiometer 2) Synchronizer potentiometer damaged 3) Clutch B or dump valve problem (electrical, hydraulic or mechanical) 3) Driveline mechanical problem
U104	F2/R1 wrong neutral position	1) Wiring problem 2) Potentiometer damaged 3) Driveline mechanical problem
U107	Clutch not working	1) Wiring problem 2) Potentiometer damaged 3) Driveline mechanical problem
U108	Damper torque not readable	1) Wiring problem 2) Sensor damaged 3) Wrong damper installation 4) Damper not calibrated
U109	Hydro not in position	1) Wiring problem (on hydro–in or hydro–out sensors) 2) Sensor damaged (hydro–in or hydro–out) 3) Low pressure on hydraulic circuit 4) Mechanical problem

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Electrical systems - 55

FAULT CODES - DTC

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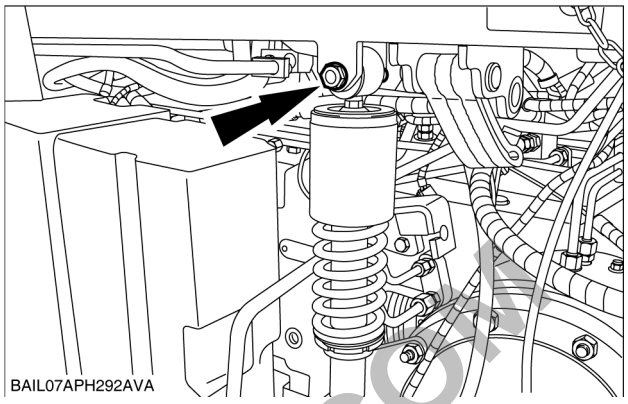
PUMA® 150 CVX
PUMA® 150
PUMA® 165 CVX
PUMA® 165
PUMA® 175 CVX

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36. Remove the upper left rear damper/spring assembly bolts.

NOTE: *Repeat this step for the right-hand side.*

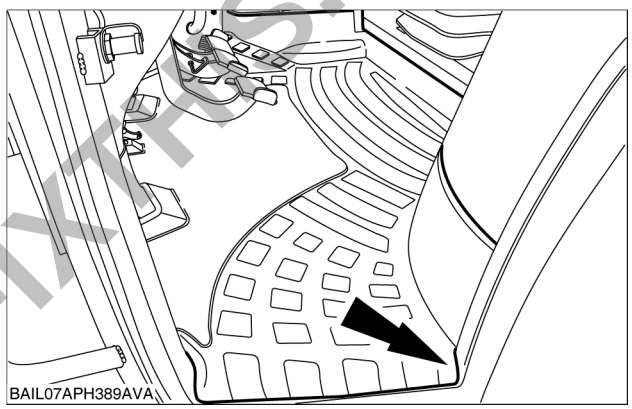
NOTE: *It may not be possible to remove the damper/spring assembly upper bolt until the cab is being raised.*



BAIL07APH292AVA 36

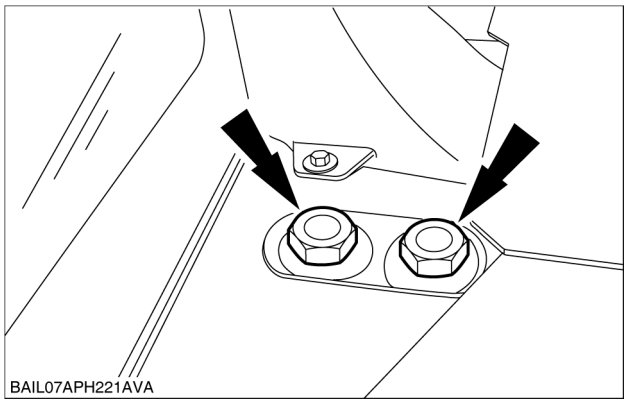
All vehicles

37. Raise the cab floor mat on both sides.



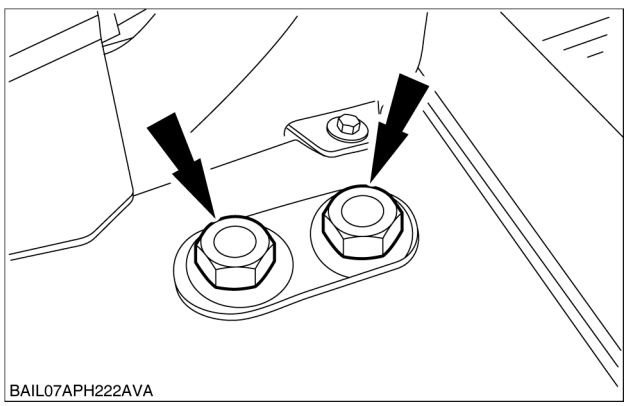
BAIL07APH389AVA 37

38. Remove the cab front left-hand mounting bolts.



BAIL07APH221AVA 38

39. Remove the cab front right-hand mounting bolts.



BAIL07APH222AVA 39

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