SERVICE MANUAL

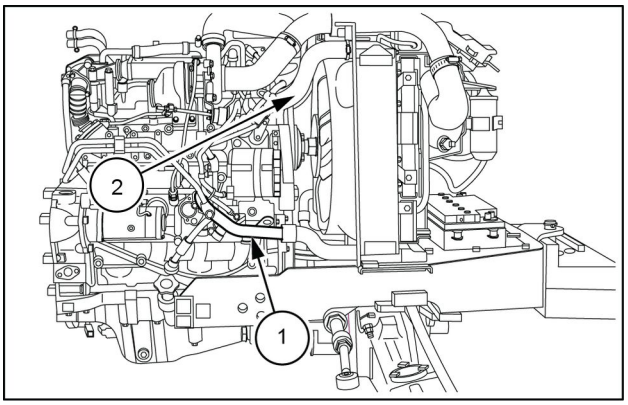
T4.75 PowerStar™
Tier 4B (final)
Tractor

PIN ZDAH00008 and above

Part number 47711469
1st edition English
May 2014

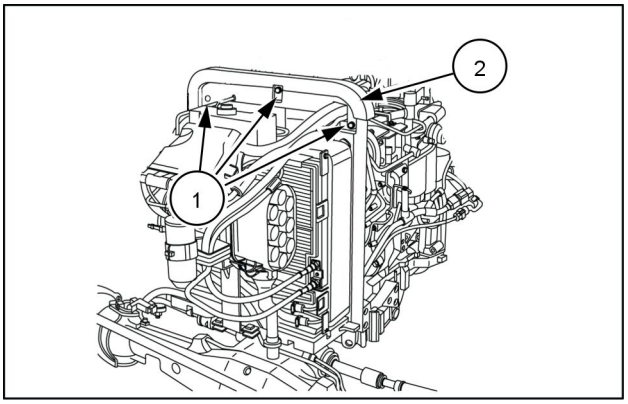
NEW HOLLAND AGRICULTURE

31. Install the tube **(1)** that supplies the engine coolant to the radiator. Secure the tube by tightening the strap.
32. Connect the tube **(2)** that returns the coolant to the engine. Secure the tube.



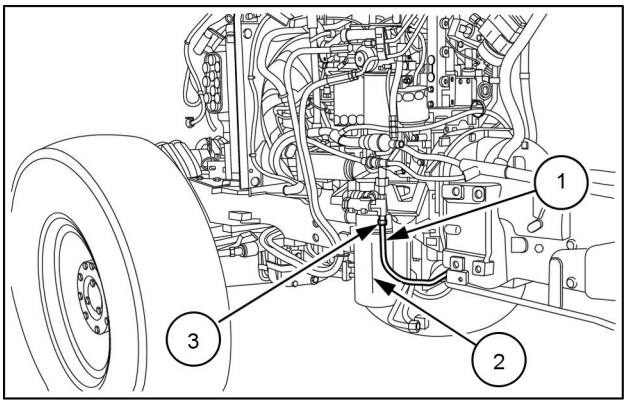
MOIL13TR02877AB 20

33. Install the upper radiator guard **(2)**. Take care to correctly position the electrical wire harnesses and tubes in their seats between the guard itself and the radiator. Tighten the three retaining bolts **(1)** of the radiator guard.



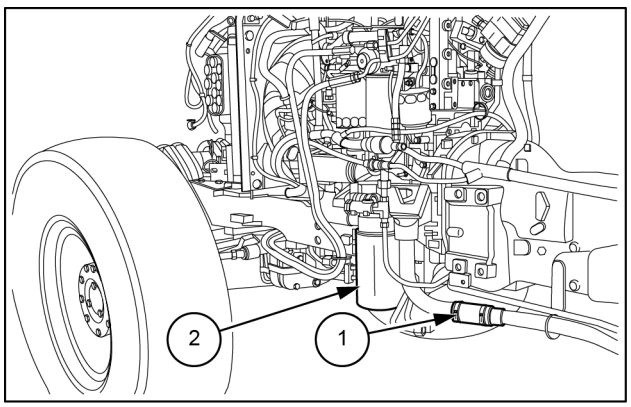
MOIL13TR02942AA 21

34. Install the transmission oil filter **(2)**.
For machines with hydraulic lift and mid mount valves, connect and secure the oil supply tubes to the lift distributor and to the mid mount valves **(1)** (if any) at the connection point **(3)**.



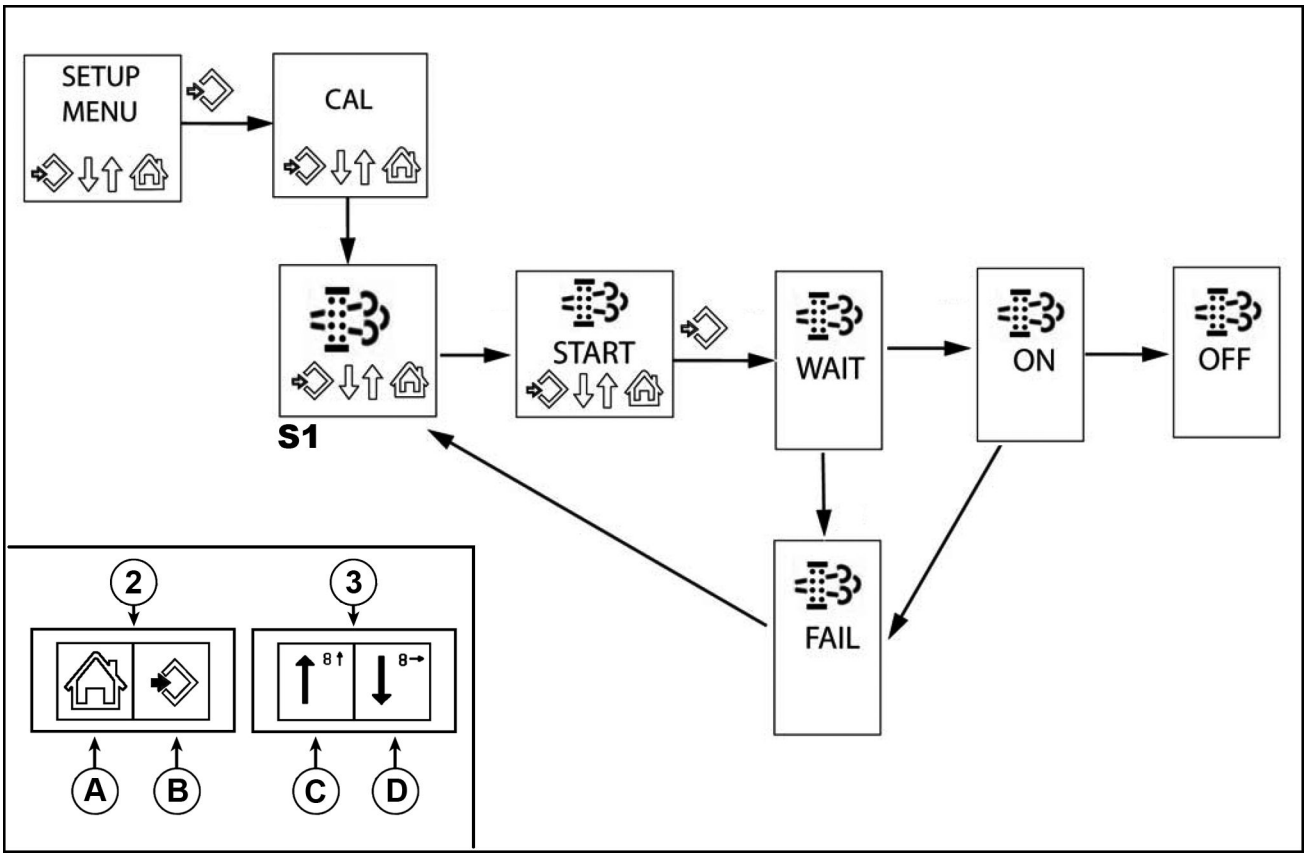
MOIL13TR02888AB 22

35. Install the transmission oil supply tube **(1)** on the filter **(2)**. Secure the supply tube using the straps.



MOIL13TR02887AB 23

Manually regenerating the particulate matter catalyst



DCAPLT5NE072S3F 4

To be able to activate the manual regeneration process, when necessary, it is necessary to stop work for the entire duration of the process (**15 - 20 min**) and set up the following conditions:

- The engine must be running. The machine must be stationary. The hand brake must be engaged.
- The engine must reach normal operating temperature.
- The hand throttle must be set to idle.
- The accelerator pedal must be released.
- The Power Take-Off (PTO) must be disengaged.
- The hydraulic system must not be operating.

NOTE: *Should the above-mentioned conditions change during the regeneration process, the operation will stop.*

To activate forced regeneration, proceed as follows:

- Press the switch **(2)** on the side of the symbol **(B)** for more than three seconds to access the programming menu. The central monitor will display the words **"SETUP MENU"**. Release the switch **(2)**.
- Press the switch **(3)** on the side of the symbol **(D)** several times until the filter symbol **(S1)** appears on the monitor.
- Press the switch **(2)** on the side of the symbol **(B)**.
- If manual filter regeneration is requested, the monitor will automatically display the words **"START"** with the filter symbol.
- Press the switch **(2)** on the symbol **(B)** to move on to the **"WAIT"** message. Filter regeneration now commences. In this phase, if everything proceeds normally, no further action is required from the operator and the electronic control unit will automatically display the various phases of the procedure.
- Once regeneration is complete, the monitor will display the word **"OFF"** with the filter symbol. After two seconds the control unit automatically returns to the initial situation. Press the switch **(2)** several times on the side of the symbol **(A)** until you exit the programming menu.

NOTE: *If during manual regeneration the operator modifies the conditions described above, or other conditions connected with the engine are not satisfactory, regeneration is stopped. The stoppage is signaled to the operator when*

Clutch - 18

Clutch hydraulic release control - 104

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]

Clutch - General specification

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Mechanical
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Mechanical

LUK 279 mm (11")/279 mm (11") CLUTCH – GENERAL SPECIFICATIONS

Type	single disk, dry plate dual clutch unit
Variable	Mechanical: pedal operated for main clutch, with hand lever for Power Take-Off (PTO) clutch
Purpose	8x8 mechanical transmissions with mechanical shuttle with mechanical PTO 12x12 mechanical transmissions with mechanical shuttle and 20x20 creeper unit mechanical shuttle with mechanical PTO
Engagement and release mechanism	Single Belleville spring
Driven plate lining material - main clutch (for models **48/65 kW/HP e 55/74 kW/HP** with mechanical power take-off) - main clutch (for models **73/98** and **79/106 kW/HP** with mechanical Power Take-Off)	n 5 plugs with pads in cerametallic agglomerate.
- PTO clutch (for all of the above models)	In organic agglomerate.
Thickness of driven plates: – main clutch – PTO clutch – wear limit	 **10.4 — 10.6 mm (0.4 — 0.4 in)** **7.4 — 7.8 mm (0.3 — 0.3 in)** See **Clutch - Troubleshooting (18.110)**
Release lever coplanarity adjustment	see **Clutch - Alignment (18.110)**

Clutch - Special tools

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Mechanical
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Mechanical

List of specific tools required for the various operations described in this Section.

- **380001612**: Pin for centering and adjustment of the **279 mm (11 in)/279 mm (11 in)** clutches
- **380000293**: Clutch adjustment gauge (use with tool **380001612**)
- **380000256**: Set of wrenches for adjustment of the **LUK 279 mm (11 in)/279 mm (11 in)** clutch levers

Transmission - 21

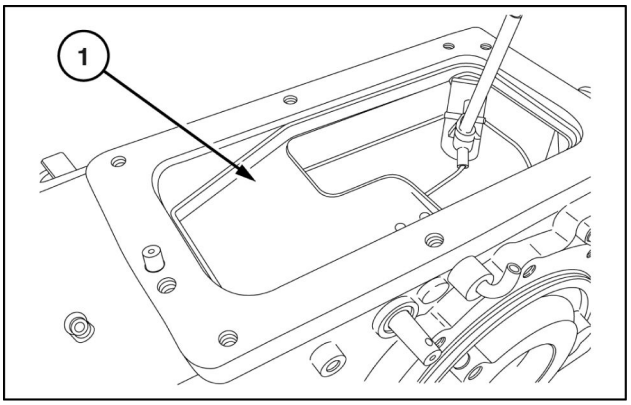
Mechanical transmission - 114

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]

Transmission housing - Install – Rear transmission-gearbox case unit

Prior operation:
Transmission housing - Reseal (21.114)
Prior operation:
Two-speed rear Power Take-Off (PTO) - Install (31.114)

1. Install the tank **(1)** on top of the transmission case.



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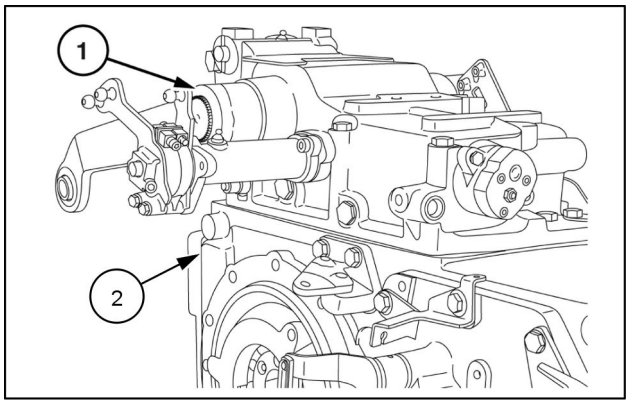
2. Position the hydraulic lift cover **(1)** on top of the rear gearbox case **(2)**. Install the eight retaining bolts.



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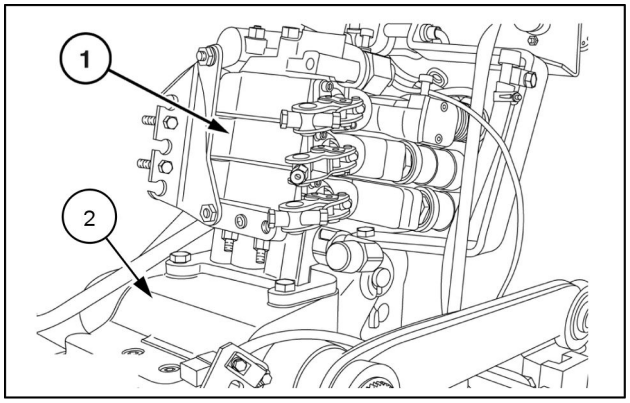
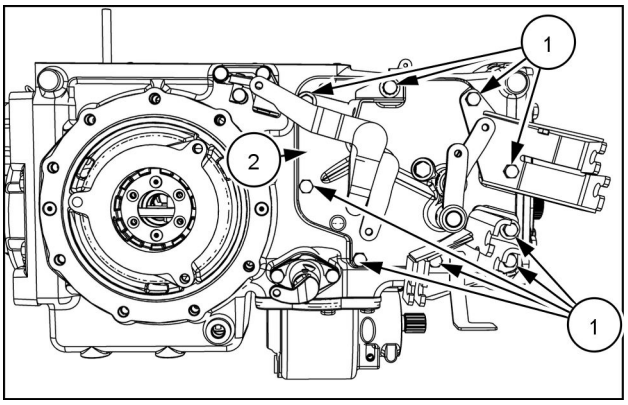
3. Position the rear auxiliary control valve **(1)** on the hydraulic lift cover **(2)**. Secure the rear auxiliary control valve with four bolts.



MOLI11U0094AA 3

9. Align the shift forks to the mating sleeves and position the right-hand side cover **(2)** on the transmission housing and secure with nine bolts **(1)**.



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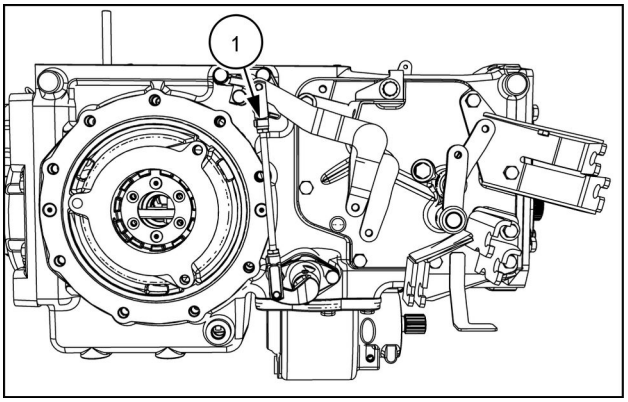
10. Install the parking brake lever **(1)**.

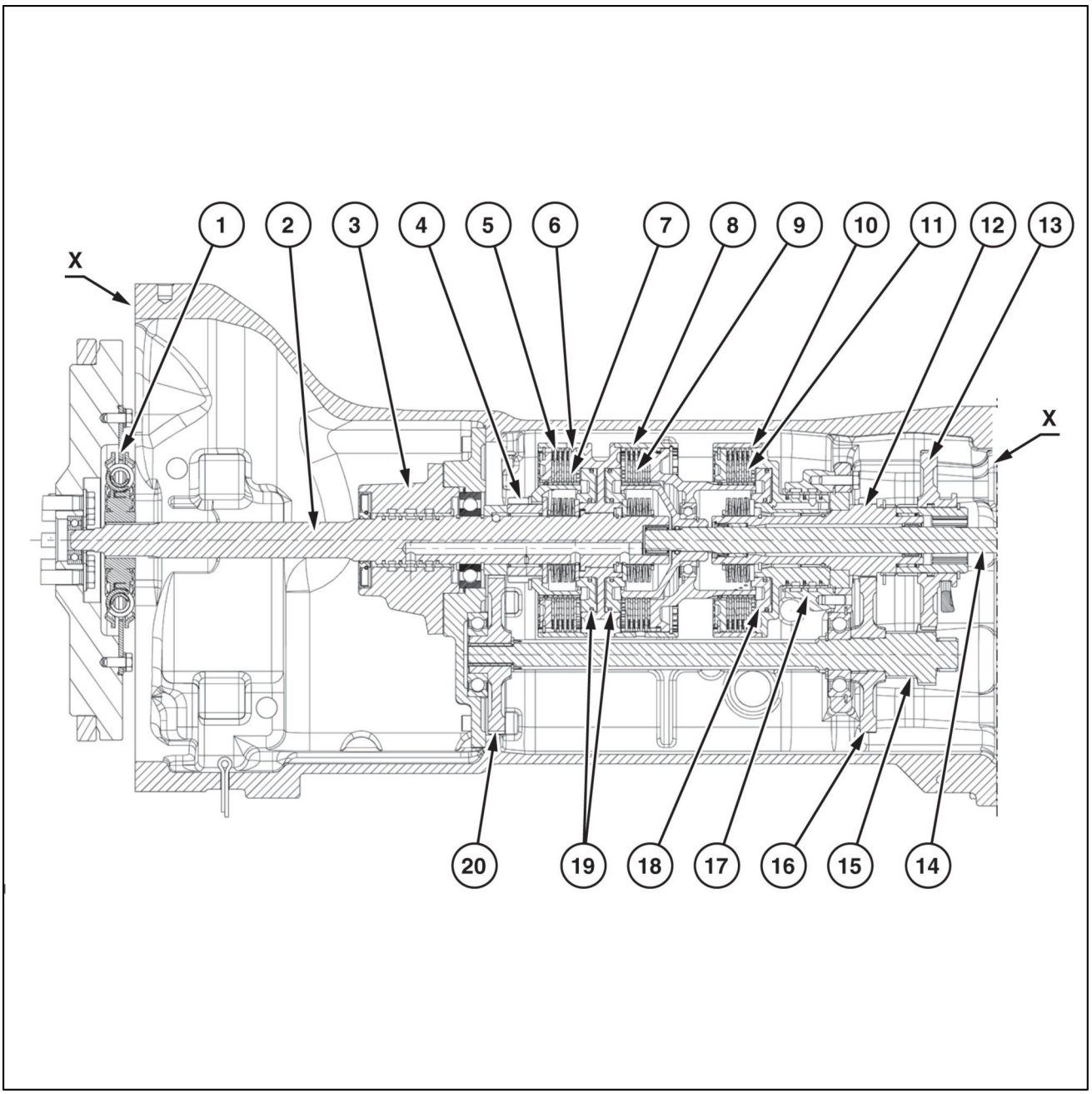


NHVM12TR00673AA 9

Next operation:
Transmission housing - Install (21.114)

Power shuttle transmission - Sectional view

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle

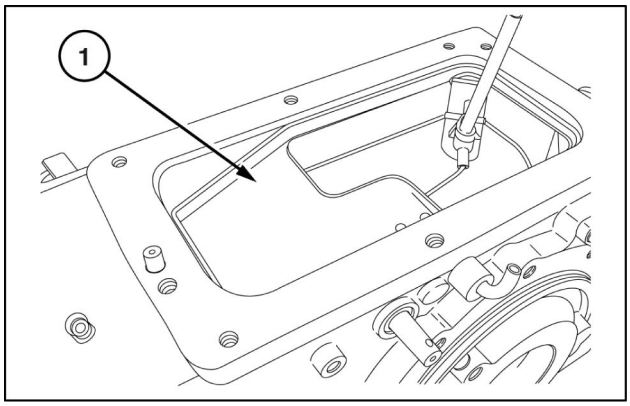


MOLI11U0116GA 1

Longitudinal cross-sectional view of Power-Shuttle and creeper unit gearbox

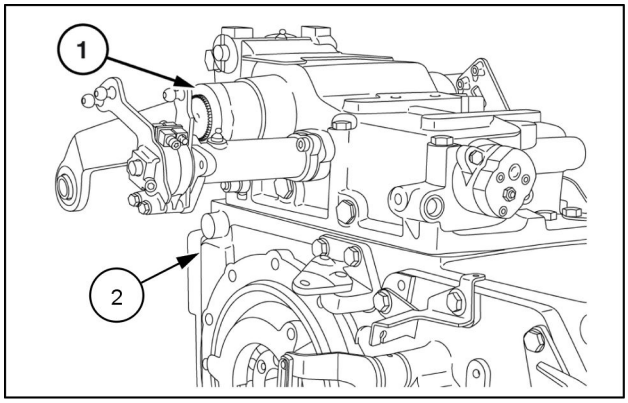
1. Torsion damper disc
2. Clutch control shaft
3. Front manifold
4. Reverse drive gear
5. Drive discs
6. Driven clutch plates
7. Reverse drive clutch
8. Reverse drive clutch casing and power take-off
9. P.T.O. clutch
10. Forward drive clutch casing
11. Forward drive clutch
12. Forward gear drive shaft
13. Creeper unit driven gear
14. Power take-off drive shaft
15. Reverse gear and creeper unit drive shaft
16. Creeper unit gear
17. Rear manifold
18. Forward drive clutch piston
19. Reverse drive clutch piston and power take-off
20. Reverse driven gear

4. Install the tank **(1)** in the top of the transmission housing.



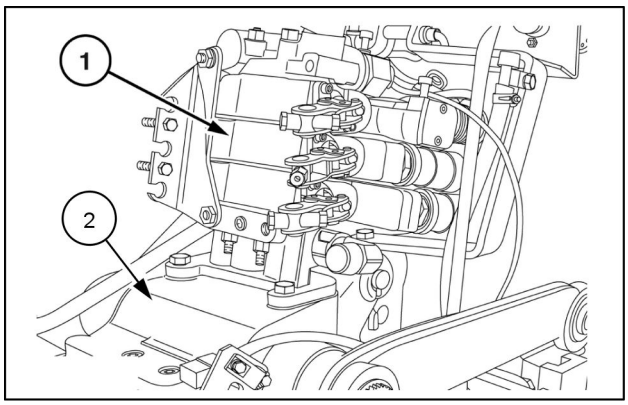
MOLI11U0096AA 4

5. Position the hydraulic lift cover **(1)** on the top of the rear transmission housing **(2)** and instal the eight securing bolts.



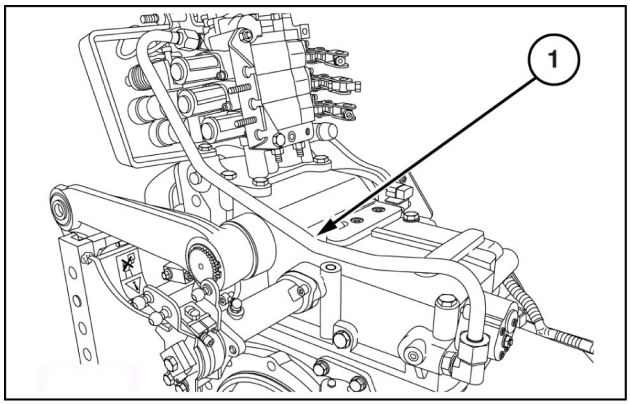
MOLI11U0095AA 5

6. Position the rear auxiliary control valve **(1)** on the hydraulic lift cover **(2)** and install four securing bolts.



MOLI11U0094AA 6

7. Install the delivery pipe **(1)** from the hydraulic lift cover to the rear auxiliary control valve.

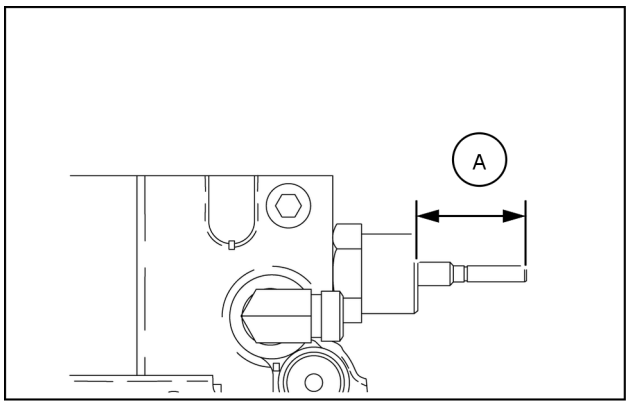


MOLI11U0093AA 7

Power shuttle transmission external controls - Adjust - Hydraulic Power Take-Off (PTO)

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle

1. Pull the spool out from the valve body until **(A) 38.5 mm** (**1.5 in**) is protruding as indication of the engagement position.



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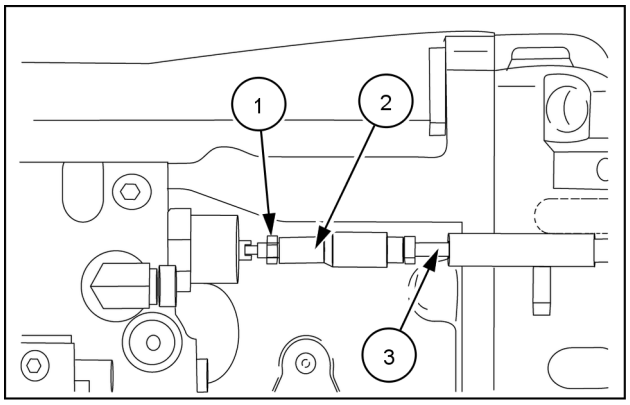
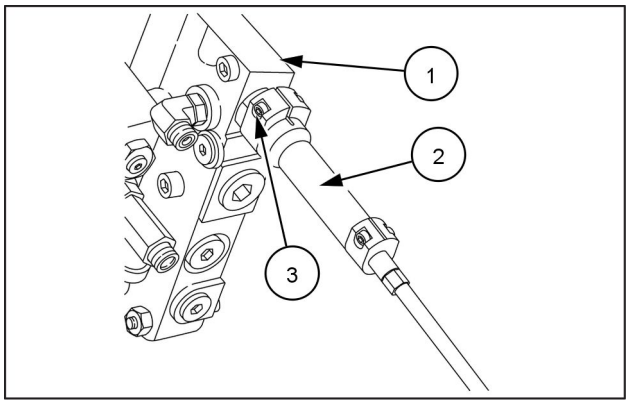
2. Screw the clevis **(2)** fully onto the threaded end of the valve spool and tighten the locknut **(1)**.
3. Connect the cable **(3)** to the clevis on the valve spool.



NHIL12TR00612AA 2

4. Keeping the spool in the extracted position, slide the outer sleeve **(2)** fully against the valve body **(1)** and secure with screw **(3)**.



NHIL12TR00613AA 3

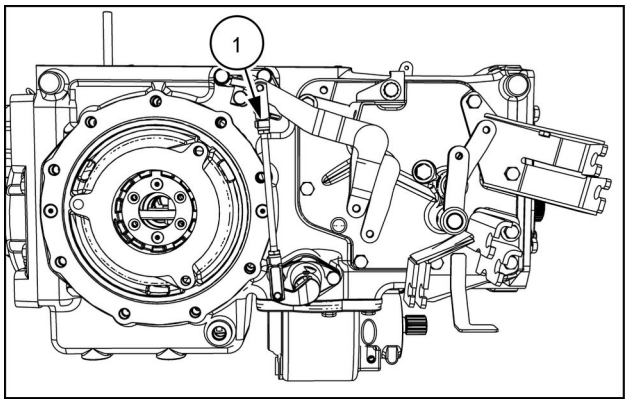
Power shuttle transmission internal components - Remove - Drive gears

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle

Prior operation:
Power shuttle transmission - Remove (21.112)

ATTENTION: *Handle all parts with care. Do not put your hands or fingers between parts. Wear the prescribed safety clothing, including goggles, gloves and safety footwear.*

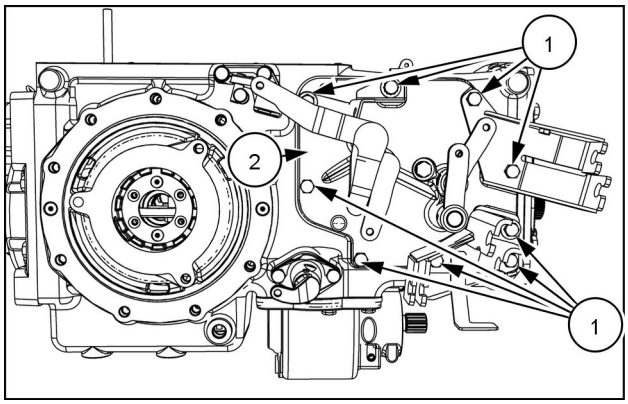
1. Position the rear transmission housing on an adequate support.
2. Remove the parking brake lever **(1)**.



NHVM12TR00673AA 1

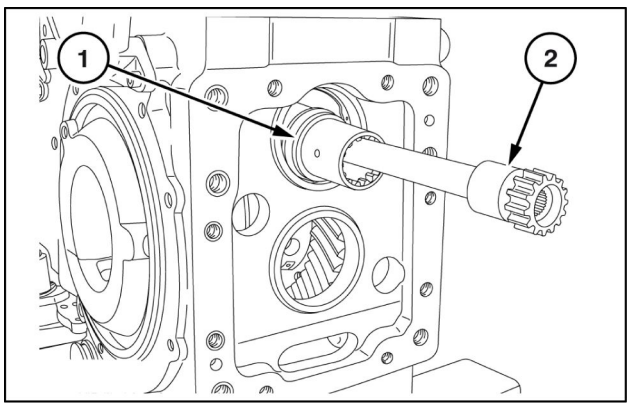
3. Unscrew the nine securing bolts **(1)** and remove the right-hand side cover **(2)**.

NOTE: *Label bracket placement to ease install.*



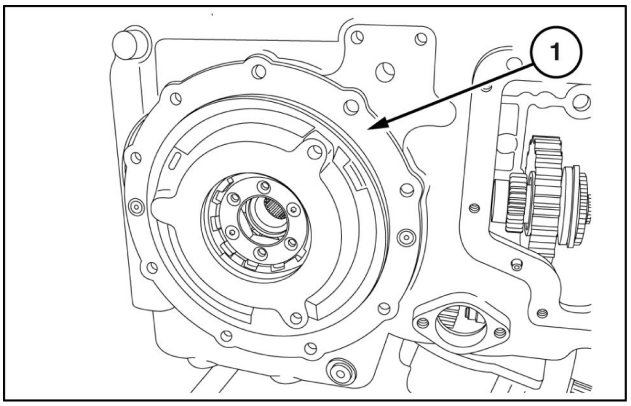
NHVM12TR00672AA 2

4. Extract the Power Take-Off (PTO) shaft **(2)** together with the PTO speed selection coupling **(1)**.



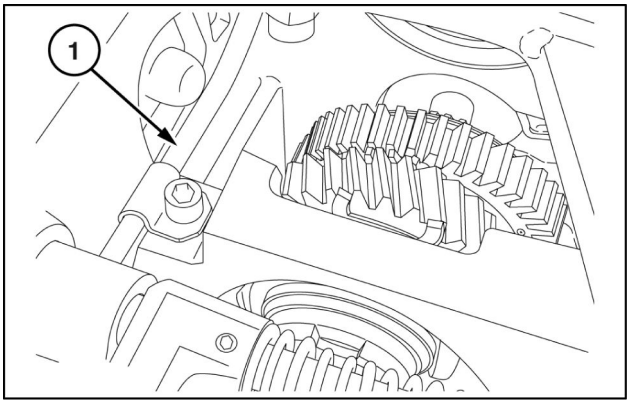
MOLI11U0100AA 3

8. Install the differential and the right-hand bearing support **(1)** of the bevel crown wheel in the housing, secure with relevant screws.



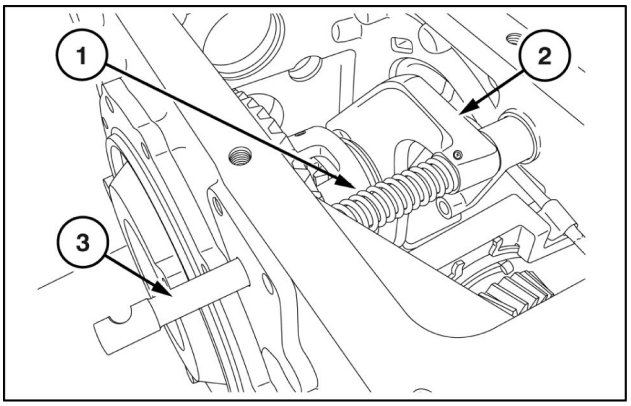
MOLI11U0220AA 3

9. Install the lubrication pipe and secure with bolt **(1)**.



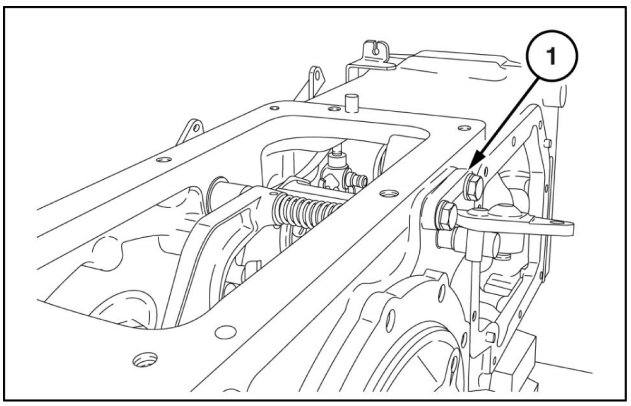
MOLI11U0216AA 4

10. Install the fork **(2)**, spring **(1)** and lock rod **(3)** through the right-hand side of the housing.



MOLI11U0219AA 5

11. Install the differential lock lever **(1)** and secure with bolts.



MOLI11U0218AA 6

Index

Transmission - 21

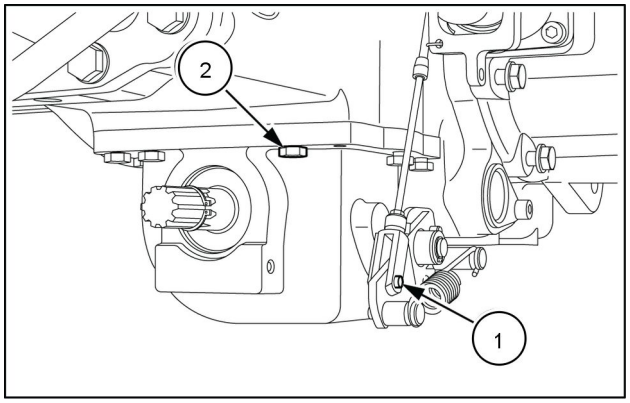
Creeper - 160

(*) See content for specific models

Mechanical control - Install

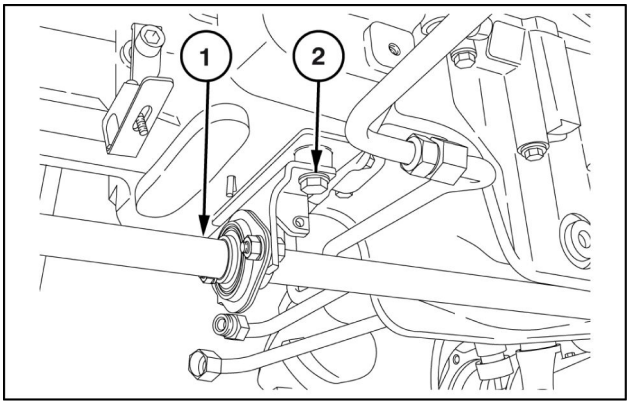
ATTENTION: *Heavy object! The component is heavy. Use care not to drop the component when installing, removing, or handling. Failure to comply could result in minor or moderate injury.*

1. Install gearbox and tighten screws **(2)** and attach linkage **(1)**.



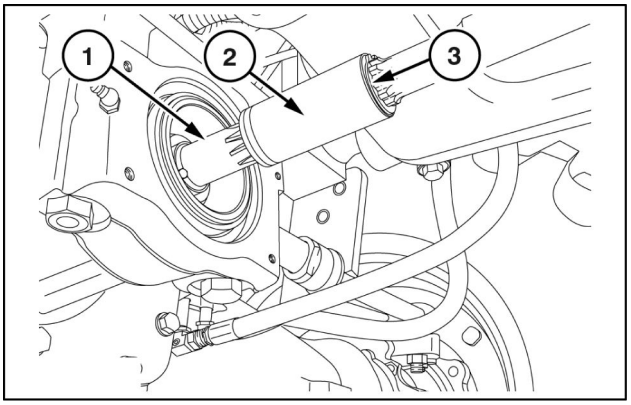
MOIL12UTL0133AA 1

2. Install propeller shaft **(1)** and tighten screws **(2)**.



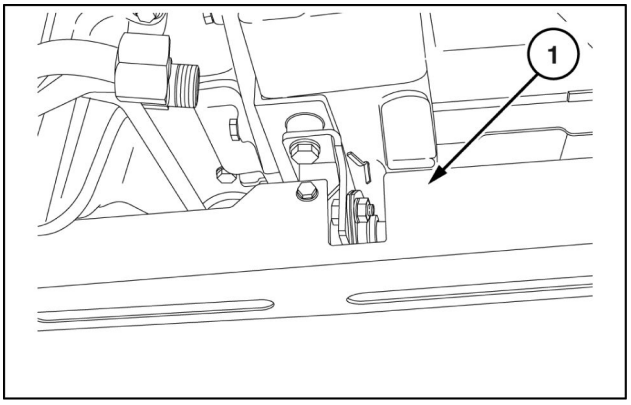
MOLI11U0012AA 2

3. Install sleeve **(2)** on shaft **(1)** and secure with circlip **(3)**. Carry out same step on other side.



MOLI11U0011AA 3

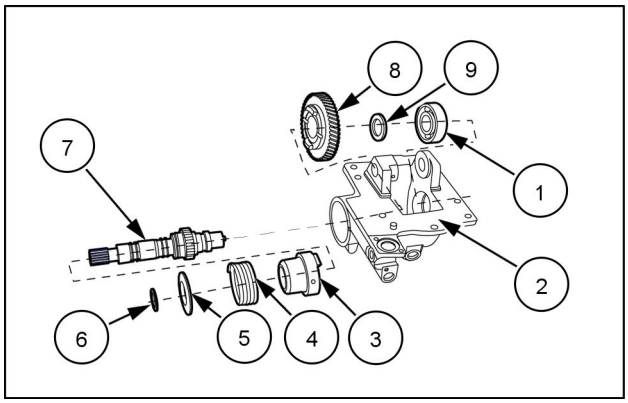
4. Attach propeller shaft guard **(1)** and tighten front, middle and rear screws.



MOLI11U0010AA 4

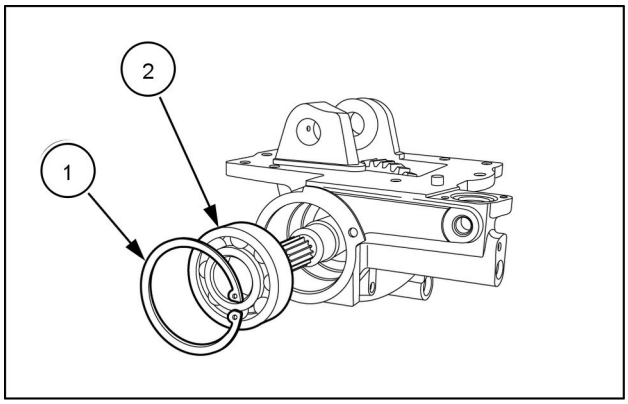
Electro-hydraulic control - Assemble

1. Install the shaft **(7)**. Install snap ring **(6)**, ring **(5)**, spring **(4)** and sleeve **(3)** on shaft **(7)**.
2. Align bearing **(1)**, spacer **(9)** along with gear **(8)** in housing and install shaft **(7)**.



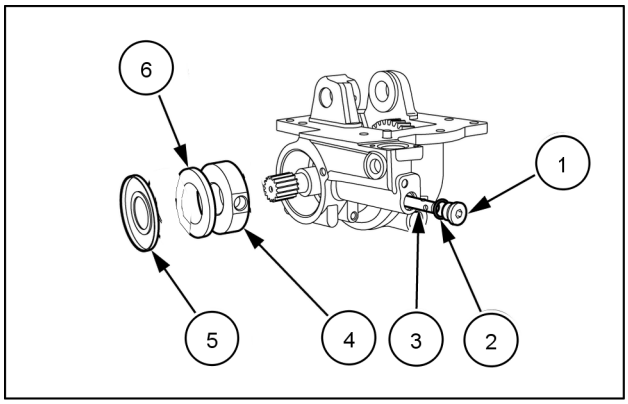
MOIL12UTL0132AB 1

3. Install bearing **(2)** and snap ring **(1)**.



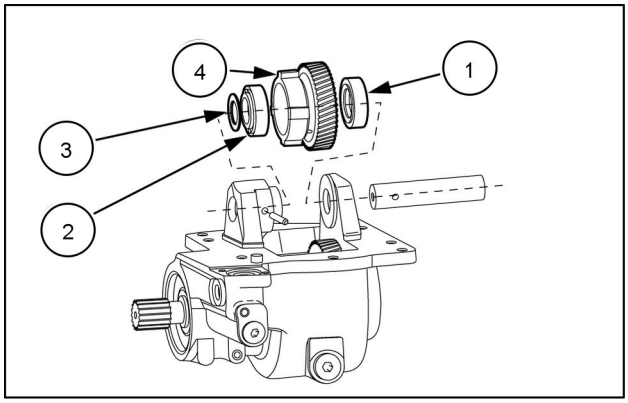
MOIL12UTL0131AA 2

4. Install the hydraulic pipe **(3)**. Tighten the plug **(1)** with the O-ring **(2)**.
5. Install the manifold **(4)**, the seal **(6)**, and the dust seal **(5)**.



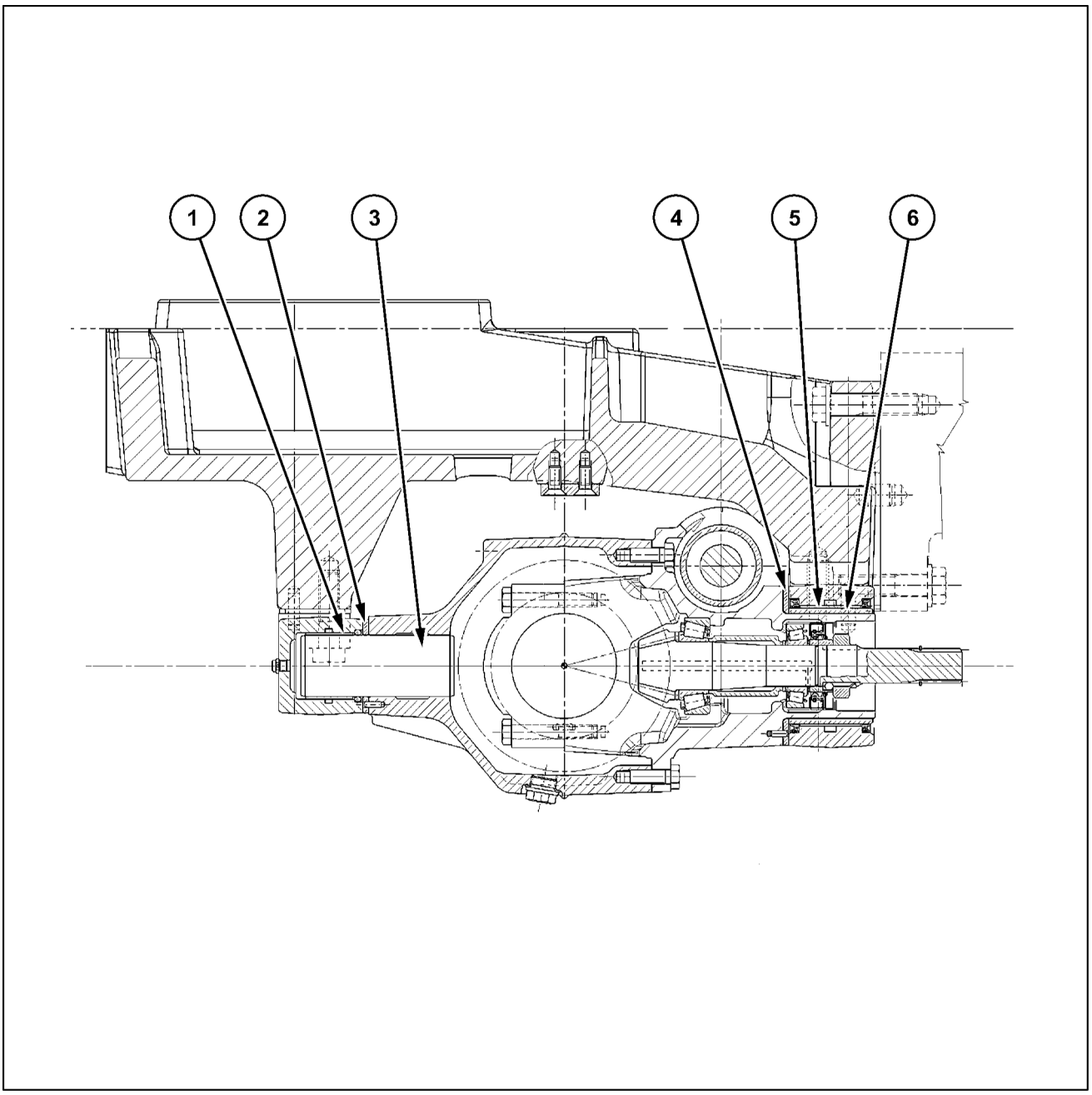
MOIL12UTL0130AA 3

6. Install bearing **(1)** in housing. Align gear **(4)**, bearing **(2)** and spacer **(3)** in housing.



MOIL12UTL0129AA 4

Axle articulation support - Sectional view

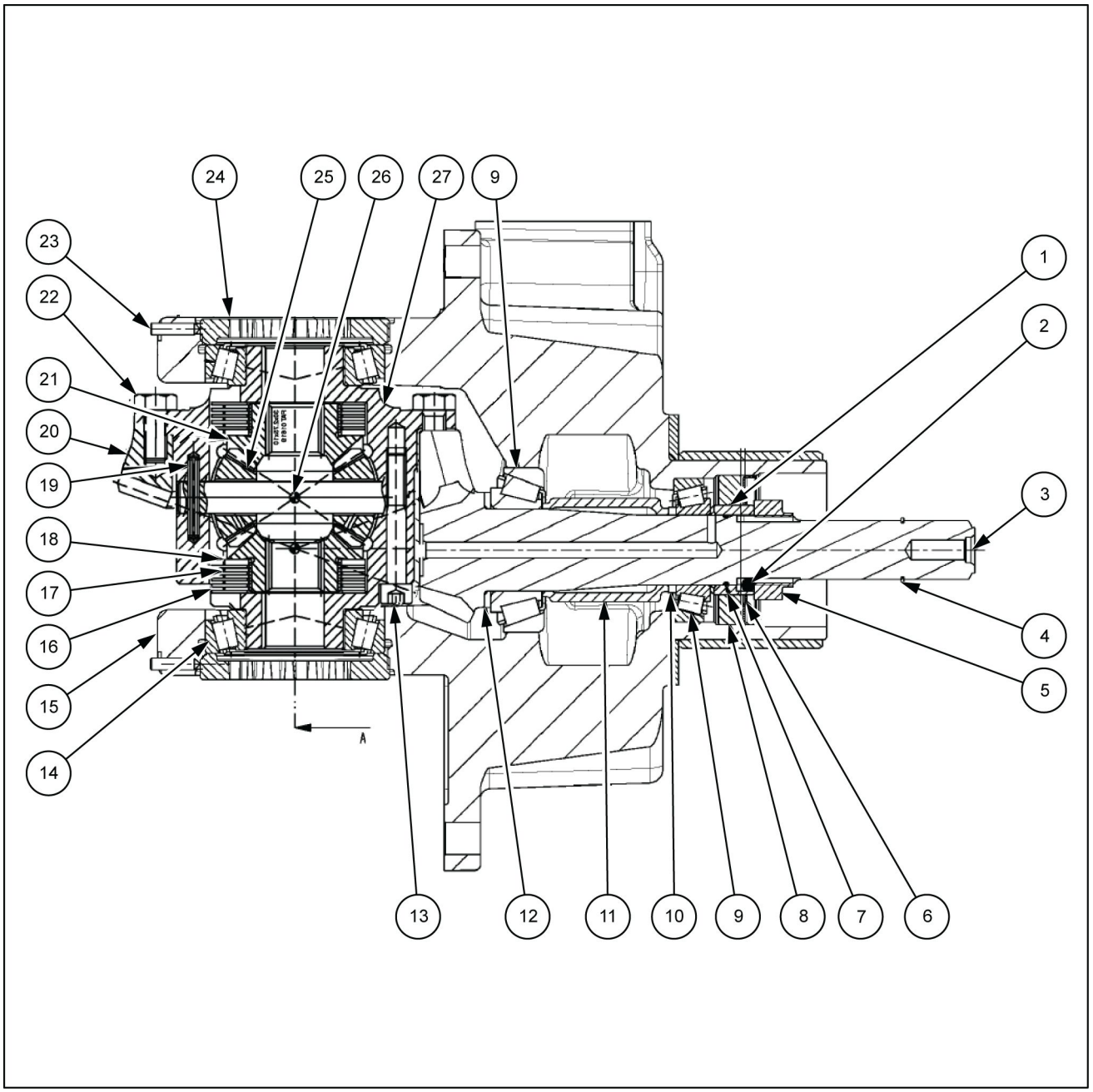


MOLI11U0140GA 1

Cross-sectional views of front axle pivot

1. Axle pivot front bush
2. Front thrust washer
3. Axle pivot front pin
4. Rear thrust washer
5. Rear bush installed on axle support
6. Rear bush installed on bevel drive-differential support

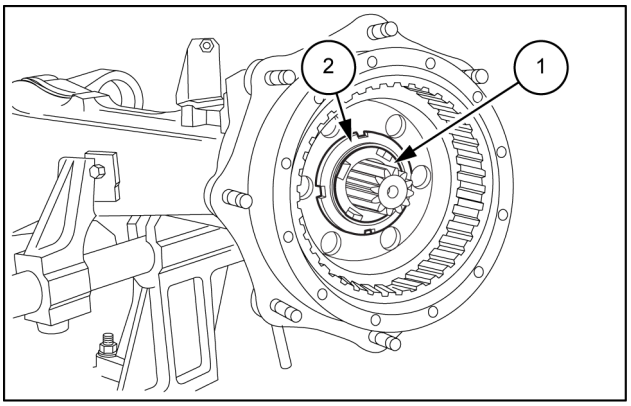
Bevel gear set and differential carrier - Sectional view with self-locking differential with limited slip



MOIL13TR01390GB 1

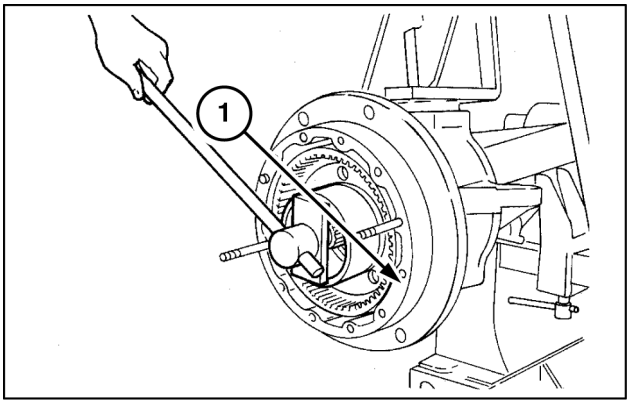
Sectional view bevel drive and self-locking differential with limited slip

3. Remove the locking dent **(1)** on the locking ring nut **(2)** of the hub support bearing.



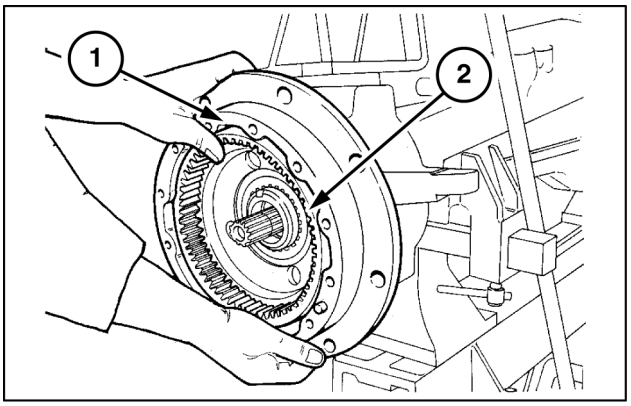
MOIL13TR01370AB 4

4. Remove the locking ring nut of the hub support bearings **(1)** using the wrench **380000295**.



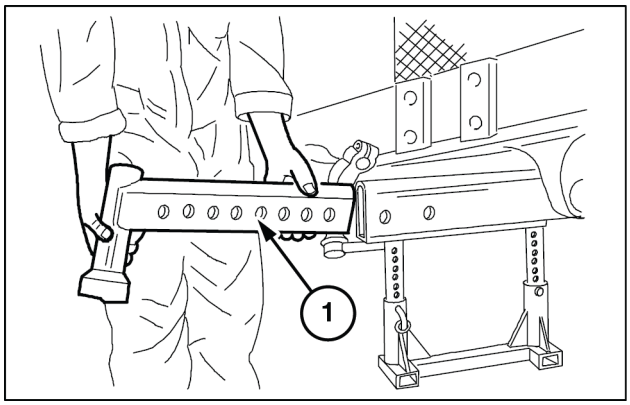
MOLI11U0210AB 5

5. Remove the wheel hub **(1)** together with the epicyclic crown **(2)**. Retrieve the disassembled parts.



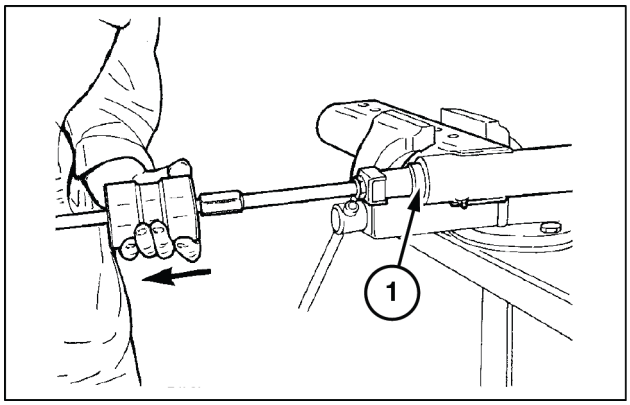
MOLI11U0211AB 6

9. Remove the axle end **(1)**.



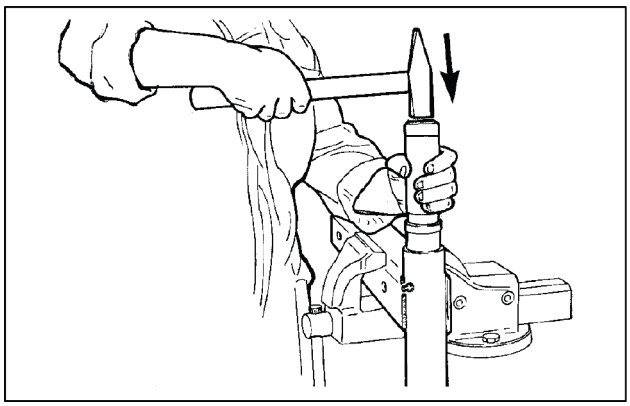
MOLI12U0159AB 8

10. Clamp the end of the axle in a vice and, using an extractor tool, extract the stub axle pin articulation bushings **(1)**.



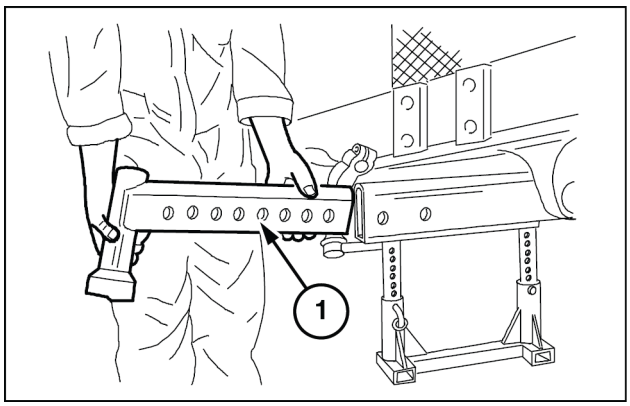
MOLI12U0160AB 9

11. To refit the stub axle, follow the disassembly procedure in reverse order, using a striker to fit the new bushings on the axle ends.



MOLI12U0161AB 10

12. Fit the axle end **(1)**.



MOLI12U0162AB 11

Contents

Rear axle system - 27

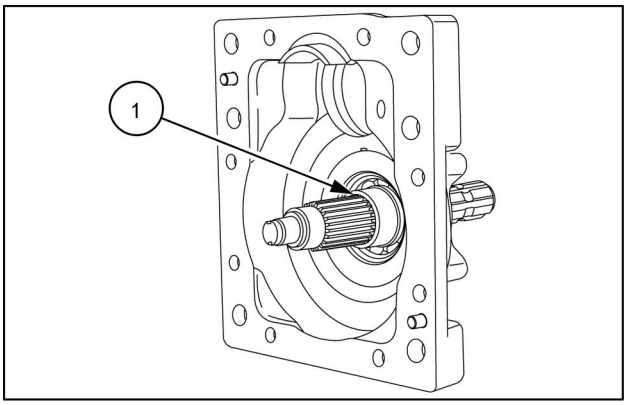
Rear bevel gear set and differential - 106

Rear electro-hydraulic control - Troubleshooting

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle

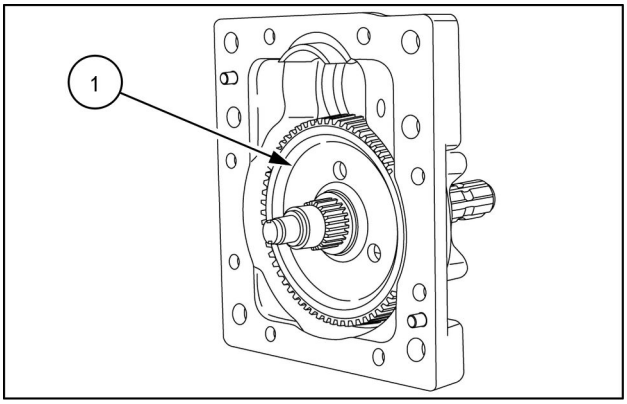
Problem	Possible Cause	Correction
The independent Power Take-Off (PTO) (commanded by the engine flywheel) does not work	Insufficient transmission oil level.	Restore the level.
	Clogged oil filter.	Replace the filter.
	Hydraulic pump inefficient.	Overhaul or replace the pump.
	Solenoid valve controlling the PTO clutch locked on delivery to brake.	Overhaul or replace solenoid valve.
	Oil leaks through the seals with a consequent pressure drop.	Replace the faulty seal elements.
	Command valve malfunctioning	Overhaul or replace the valve
The independent Power Take-Off (PTO) (commandd by the engine flywheel) remains on.	External control malfunctioning.	Check the efficiency of the cable. Adjust the control.
	Command valve malfunctioning.	Overhaul or replace the valve.
Power Take-Off (PTO) control clutch dragging.	PTO command valve locked on delivery to clutch.	Overhaul or replace the valve.
	Worn PTO brake.	Replace the brake.
	Clutch plates damaged or deformed.	Replace discs.
Difficulty in selecting PTO speed by means of lever	External control stiff or incorrectly adjusted.	Lubricate the control cable sheath. Adjust the control.

4. Position the rear spacer **(1)**.



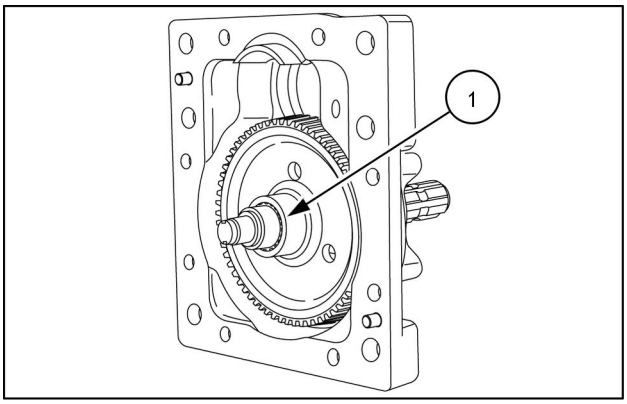
MOIL13UTL0037AA 4

5. Install the 540 rpm PTO driven gear **(1)** on the shaft.



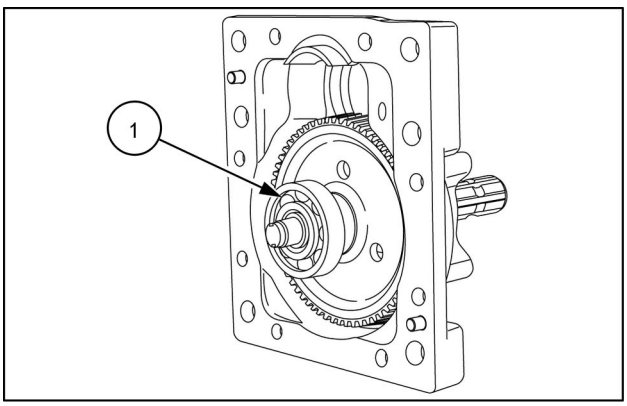
MOIL13UTL0036AA 5

6. Position the front spacer **(1)**.



MOIL13UTL0035AA 6

7. Install the bearing **(1)**.



MOIL13UTL0034AA 7

Power Take-Off (PTO) clutch - Install

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Power Shuttle

1. To re-assemble the Power Take-Off (PTO) clutch in the transmission case, see **Clutch - Install (21.154)**.

Two-speed rear Power Take-Off (PTO) - Assemble mechanical PTO 540/540E rpm

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Mechanical
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	Transmission - Mechanical

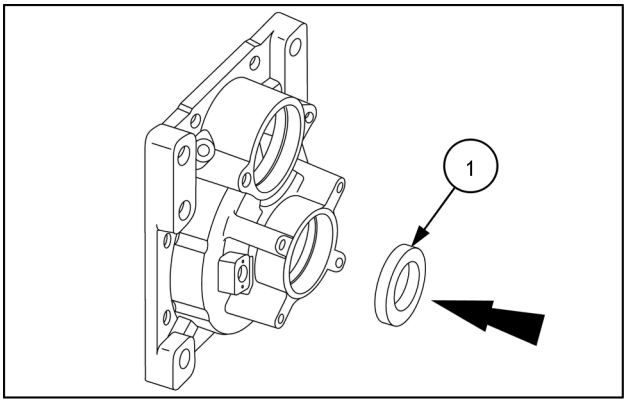
⚠ WARNING

Avoid injury!
Handle all parts carefully. Do not place your hands or fingers between parts. Use Personal Protective Equipment (PPE) as indicated in this manual, including protective goggles, gloves, and safety footwear.
Failure to comply could result in death or serious injury.

W0208A

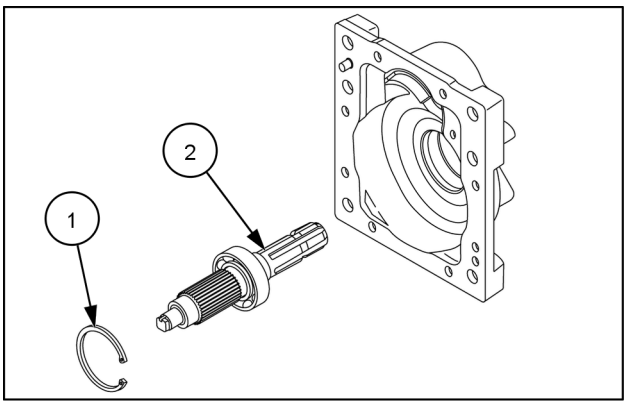
Prior operation:
See **One-speed rear Power Take-Off (PTO) - Disassemble (31.110)**

1. Use a suitable guider to insert and press the seal ring **(1)** in its seat on the PTO cover.



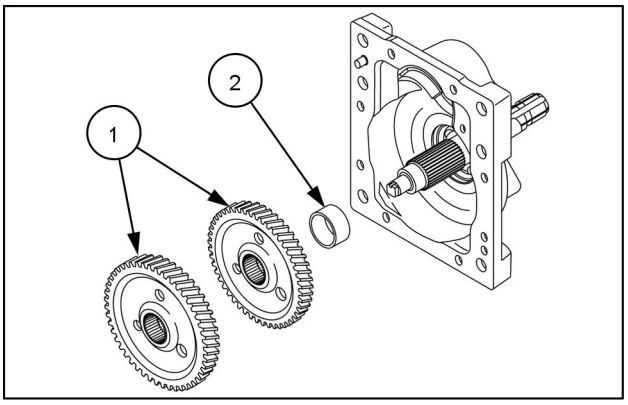
MOIL13UTL0040AA 1

2. Insert the Power Take-Off (PTO) output shaft **(2)** with the bearing mounted.
3. Install the snap ring **(1)** that locks the bearing of the PTO output shaft on the cover.



MOIL13UTL0082AA 2

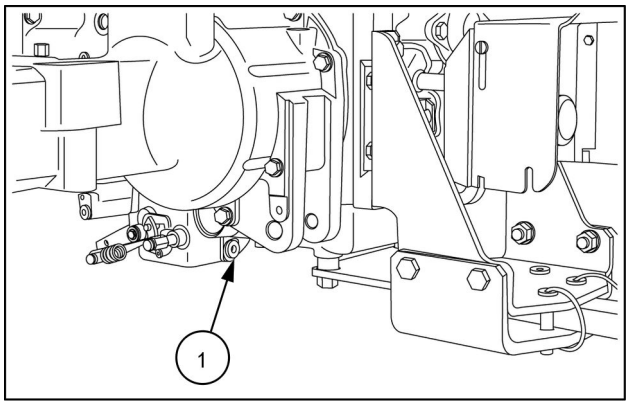
4. Position the spacer **(2)** and the speed gears **(1)** on the PTO output shaft.



MOIL13UTL0081AA 3

21. Screw the drain plug **(1)** onto the rear transmission casing and fill up with oil.

NOTE: *Fill with **35.0 L** (**9.2 US gal**) of oil*



MOIL13UTL0033AA 15

Brakes - Remove

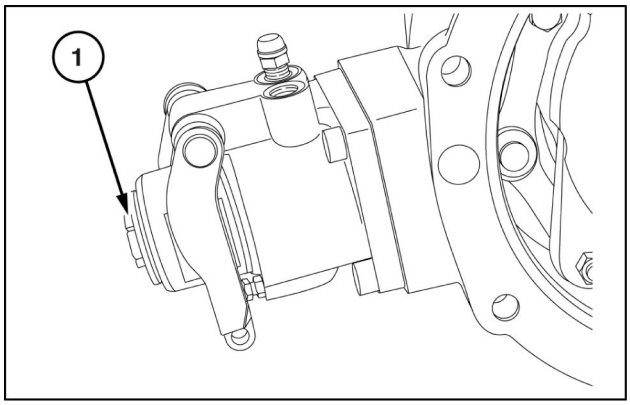
⚠ DANGER

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

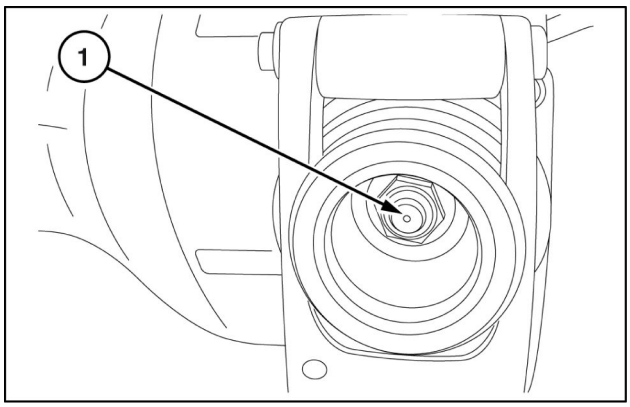
Proceed as follows:

1. Remove the right-hand or left-hand final reduction gear case (see **Powered rear axle - General specification Bevel gear pair and differential (27.100)**).
2. Remove cover **(1)**.



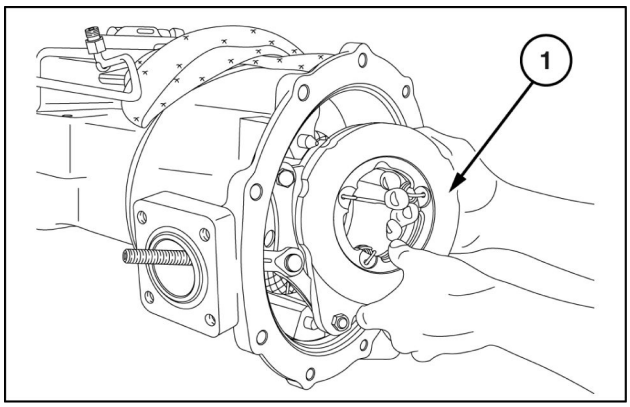
MOLI11U0260AA 1

3. Release and loosen the lock nut **(1)**.



MOLI11U0261AA 2

4. Extract the brake system **(1)**, recovering the disks and the brake support.

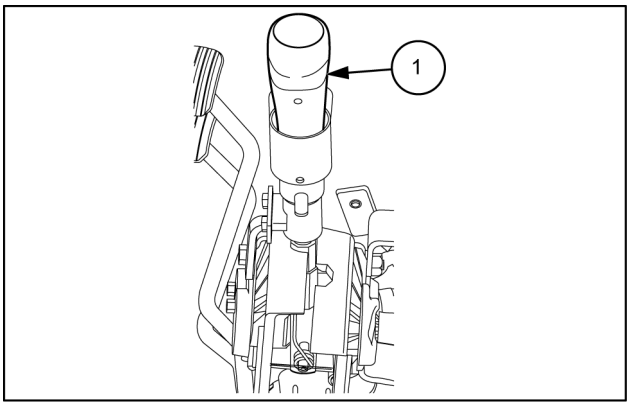


MOLI11U0262AA 3

Parking brake or parking lock - Adjust – Retaining system of the parking lock

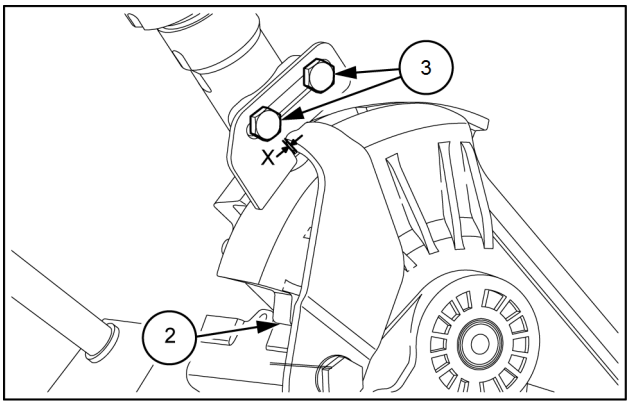
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	

1. Put the reduction gear lever **(1)** fully in the parking position "P".



MOIL12UTL0144AA 1

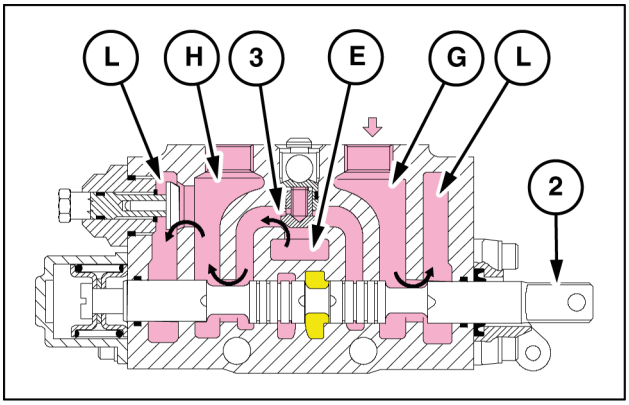
2. Ensure there is no clearance in position **(2)**.
3. Check the clearance **(X)**. Clearance must be between **0.5 - 1 mm** (**0.020 - 0.039 in**).
4. Loosen the screws **(3)**. Move the reduction gear lever slightly to set the clearance. Torque the screws at the end.



MOIL12UTL0145AA 2

Lowering

On pushing back the control lever (located in the cab) the stem **(2)** will shift to the position indicated in Fig. **4**. The oil contained in the cylinder, pressurized by the weight of the lifted implement, will flow to the exhaust **(L)** by way of line **(G)**, while the entire flow from the pump is also conveyed to the exhaust **(L)** through the check valve **(3)** and line **(H)**.



MOLI11U0320AB 4

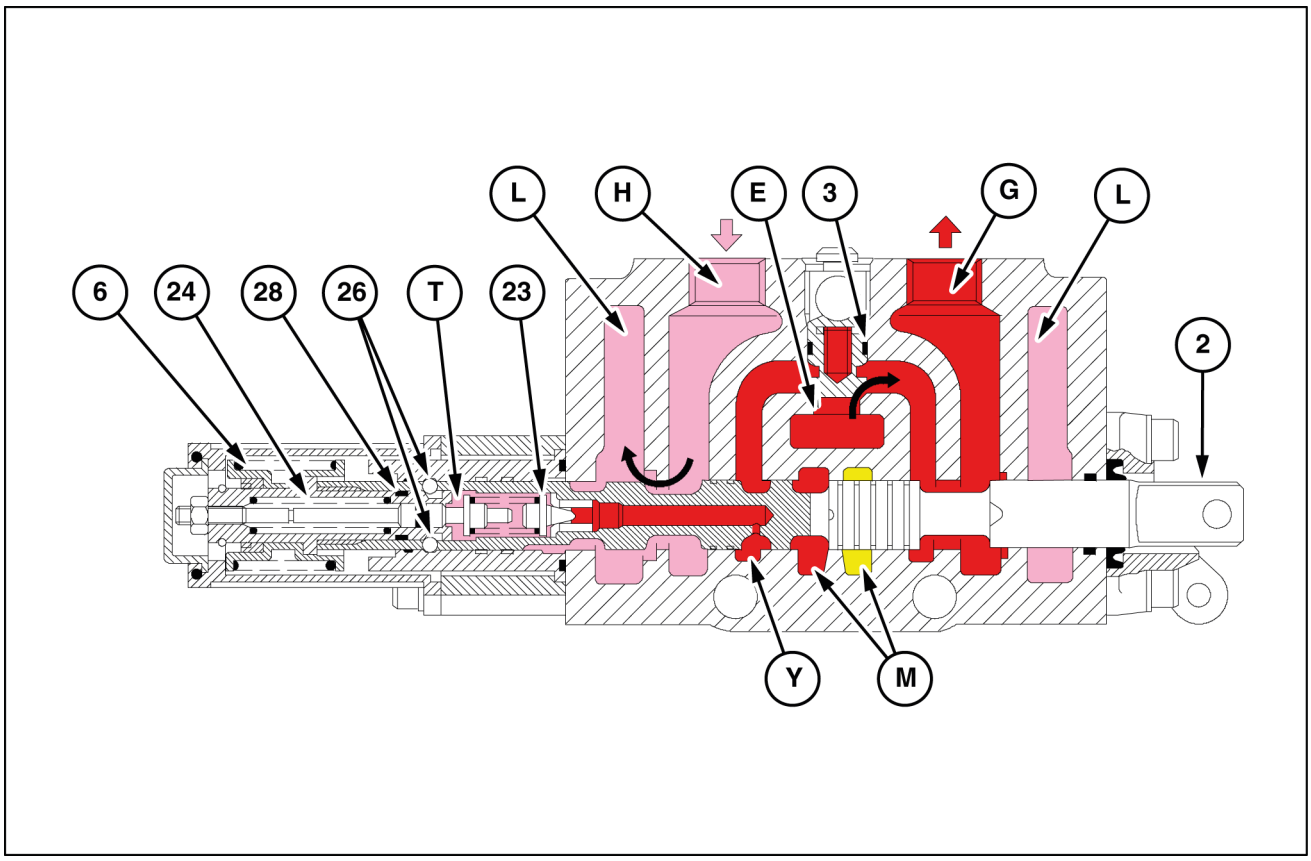
Pressurized oil

Oil in suction, delivery or return

Oil at static rest

NOTE: *For operation of a double-acting cylinder, tighten the screw **(1)**. For operation of a single-acting cylinder, loosen the screw.*

Operating stages of auxiliary control valve for the operation of a single/double-acting cylinder with automatic detent release and float



MOLI11U0321FB 5

Pressurized oil

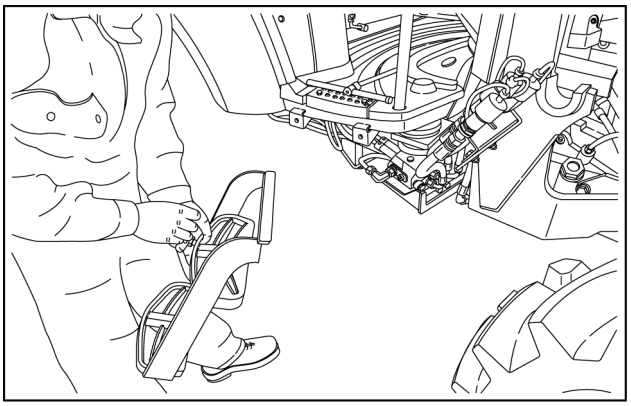
Oil in suction, delivery or return

Oil at static rest

Lifting

On pulling back the control lever (located in the cab), the control valve stem **(2)** shifts and the detent balls **(26)** engage the left hand groove, where they are held in place by the support **(28)** and spring **(24)**. The movement of the spool

6. Re-install the right-hand ladder **(1)**.



MOIL14TR00003AA 5

Front loader bucket hydraulic system - General specification

Type	**655TL** (NSL/MSL)
Engine power	**40 - 58 kW** (**54 - 79 Hp**)
Front tires	**11.2 x 24**
Rear tires	**16.9 x 30**
Bucket width:	
	1829 mm (**72 in**)
	2133 mm (**84 in**)
Hydraulic cylinder dimensions:	
Diameter of stem and diameter of lift control cylinder	**38 - 80 mm** (**1.5 - 3.15 in**)
Diameter of stem and diameter of bucket control cylinder	**38 - 65 mm** (**1.50 - 2.56 in**)
Maximum lifting capacity with bucket size **1829 mm** (**72 in**):	
On the pins	**1640 kg** (**3616 lb**) (NSL) - **1540 kg** (**3395 lb**) (MSL)
At **800 mm** (**32 in**) from the pins	**1020 kg** (**2249 lb**) (NSL) - **1055 kg** (**2326 lb**) (MSL)
Maximum lifting capacity with bucket size **2133 mm** (**84 in**):	
On the pins	**1630 kg** (**3594 lb**) (NSL) - **1530 kg** (**3373 lb**) (MSL)
At **800 mm** (**32 in**) from the pins	**1010 kg** (**2227 lb**) (NSL) - **1040 kg** (**2293 lb**) (MSL)
Hydraulic circuit	The same as the rear hydraulic lift
Pressure regulating valve setting	**190 - 195 bar** (**2755 - 2828 psi**)

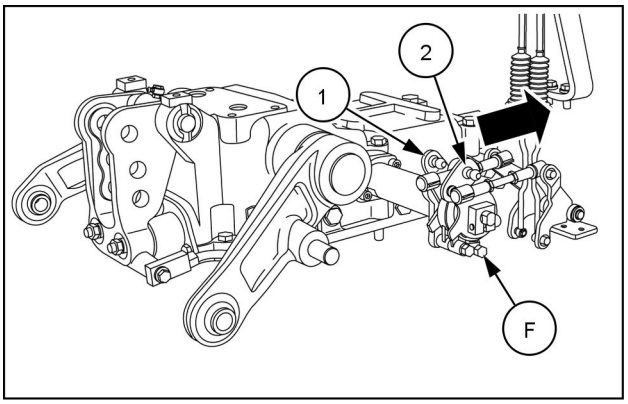
Contents

Hitches, drawbars, and implement couplings - 37

Rear three-point hitch - 110

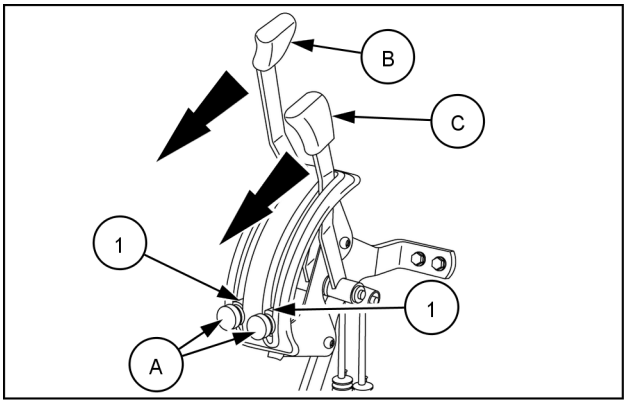
Connect the control levers

1. Proceed as follows:
    1. Rotate the position control lever **(1)** and the draft control lever **(2)** forward on the lift up to the limit stop **(F)**.



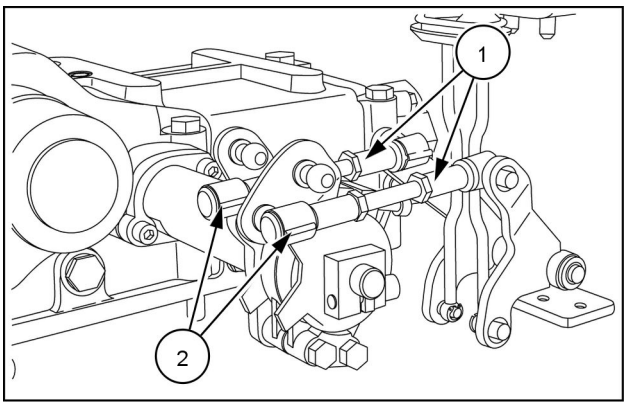
MOIL14UTL0006AA 3

2. Check that the control levers **(B)** and **(C)** in position “1” (+/- **2.0 mm** (**0.1 in**)) are in contact with the limit stop knobs **(A)**.
3. If not, position the knobs properly.



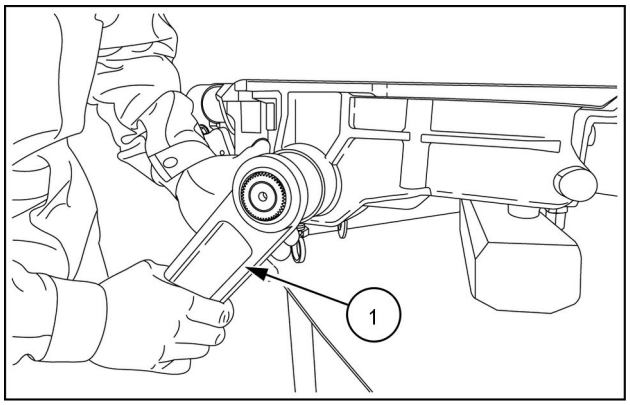
MOIL14UTL0008AA 4

4. Adjust the horizontal tie rods to make it possible to insert them onto the ball-end pins of the hydraulic lift control levers.
5. Lock the tie rods **(1)** on the ball ends, positioning the special straps **(2)** in place.



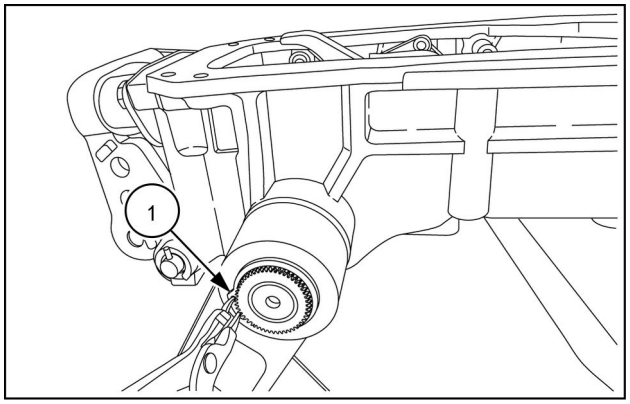
MOIL14UTL0007AA 5

4. Following the mounting marks made on the shaft and on the lift arm during the disassembly phase, insert the lift arm **(1)**.



MOIL14UTL0010AA 4

5. Install the retaining ring **(1)**.
6. Repeat the operations described so far (from point **3** to point **5**) for the left-hand lift arm too.



MOIL14UTL0015AA 5

Index

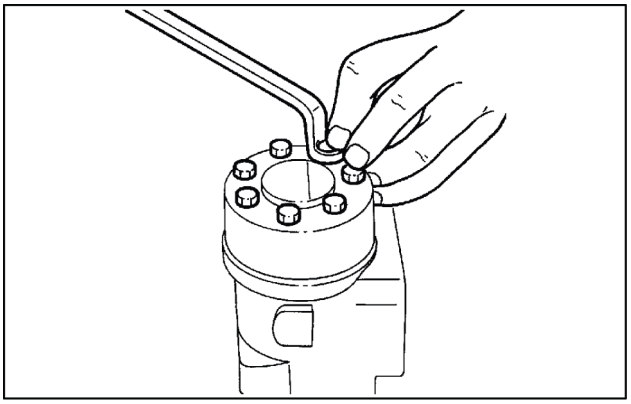
Steering - 41

Pump - 206

Power steering control valve - Disassemble

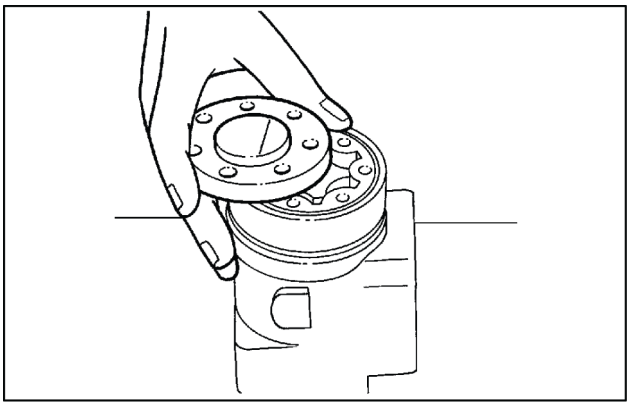
To disassemble the hydrostatic steering control valve, proceed as follows:

1. Remove the cover retaining bolts.



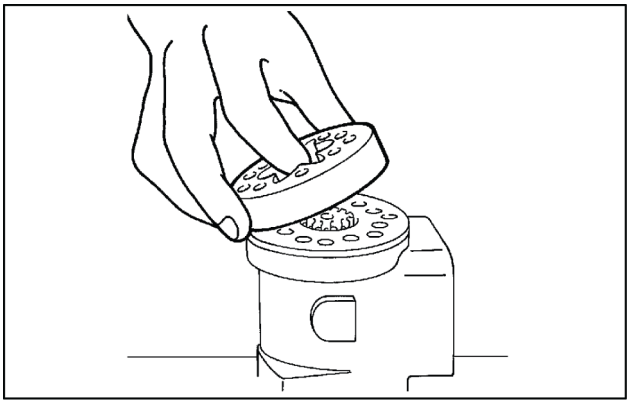
MOLI11U0368AA 1

2. Remove the cover by sliding it sideways.



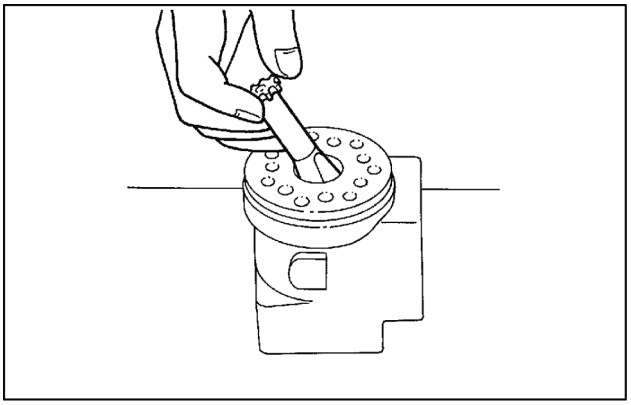
MOLI11U0369AA 2

3. Remove the rotor fixed ring, the rotor and the inner spacer.
4. Remove the two O-rings on the rotor fixed ring.



MOLI11U0370AA 3

5. Extract the rotor drive shaft.



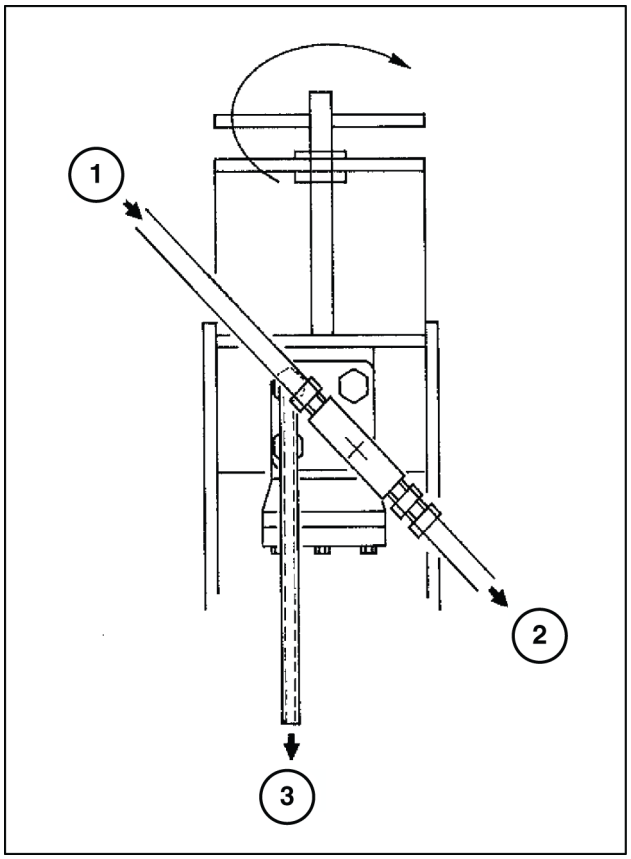
MOLI11U0371AA 4

Pressure relief valve calibration

1. Make the connections as shown in the diagram in the Fig. **2** and complete the circuit as in the Fig. **1**.
2. Using the drive shaft **(1)** (Fig. **2**) simulate a turn (to the left or to the right) so as to interrupt the oil flow to the discharge.
3. Gradually increase the pressure in the circuit by turning the handwheel **(5)** (**Power steering control valve - Assemble (41.200)**), and check on the pressure gauge that the pressure relief valve **(24)** (**Hydraulic control components - Static description – Operation (41.200)**) cuts in at the pressure shown **Hydraulic control components - General specification (41.200)**. If not, increase or reduce the pressure relief valve setting by tightening or slackening the adjuster screw.

   Cylinder safety valve calibration for steering to the left.

   1. From delivery line
   2. To the restriction
   3. Exhaust



MOLI11U0431BB 3

Contents

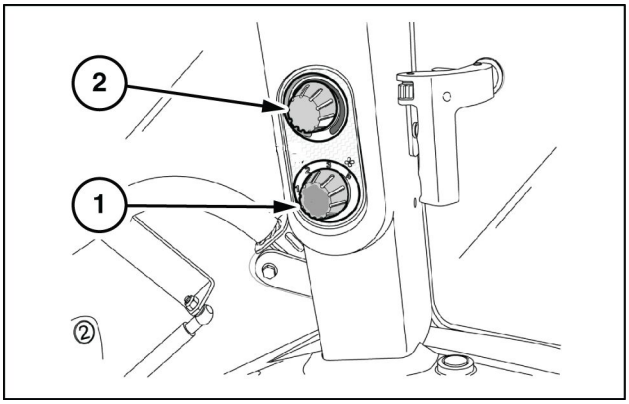
Wheels - 44

Cab heater - Dynamic description

T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	

The heating control knob **(2)** allows the operator to regulate the temperature of the air by increasing or decreasing the circulation of coolant from the engine.

The electric fan knob **(1)** allows the operator to regulate the quantity of air entering the cab through the diffusers.



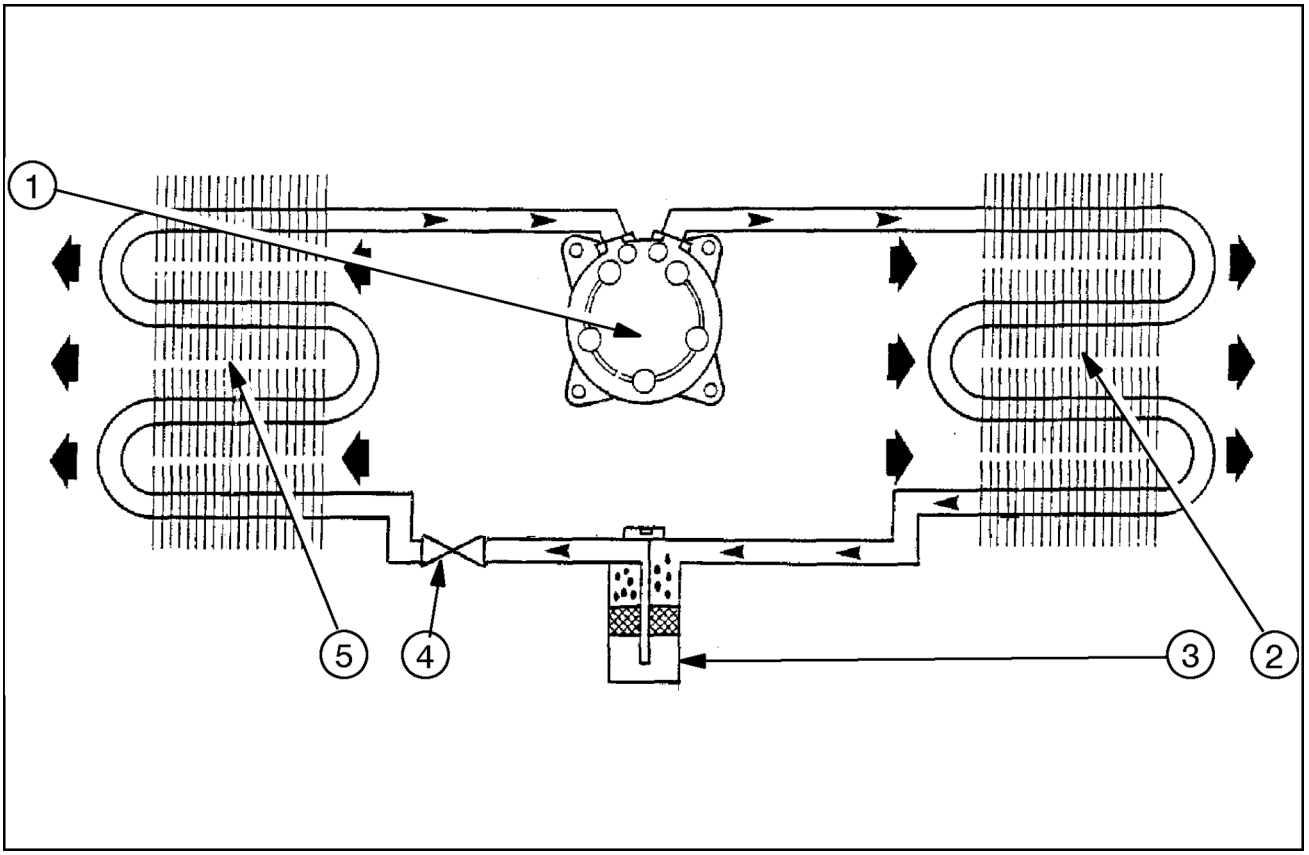
MOLI11U0453 1

Temperature control knob (1)

- Rotated fully in a counter-clockwise direction = minimum temperature (hot water circulation closed).
- Rotated fully in a clockwise direction = maximum temperature (hot water circulation fully open).

The air flow, produced by the electric fan and the forward movement of the tractor, cools the refrigerant by means of heat exchange. This action cools the refrigerant to the point of condensation between **40 - 60 °C** (**104.00 - 140.00 °F**), depending on the ambient temperature, changing the vapor into liquid.
The refrigerant, in liquid state at high pressure, is purified by passing through the receiver-drier **(3)** from where it flows to the expansion valve **(4)**, which restricts the flow of refrigerant and thus reduces its pressure.
As it passes through the expansion valve **(4)**, part of the refrigerant is transformed into vapour and the low temperature mixture of vapour and liquid thus formed enters the evaporator **(5)**.
Here the electric fan causes a continuous circulation of the cab air over the fins of the evaporator **(5)**, helping the refrigerant to absorb heat from the air and thus change completely from a liquid to vapour.
The evaporation process removes heat from the air passing over the evaporator **(5)** and thus reduces the temperature inside the cab.
The flow of air over the cold surface of the evaporator **(5)** also condenses some of the moisture in the air and therefore reduces the humidity in the cab.
On leaving the evaporator **(5)** at **0 - 15 °C** (**32.00 - 59.00 °F**) the low pressure mixture is taken in by the compressor **(1)** to start a new cycle.

Schematic diagram of the air-conditioning system



SEZ50CAP1F-1 2

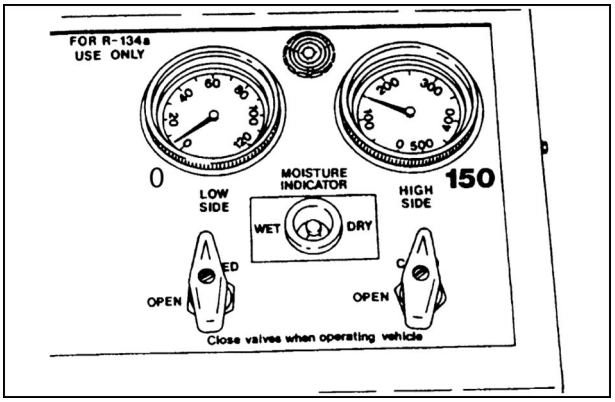
(1). Compressor.
(2). Condenser.
(3). Filter drier.
(4). Expansion valve with thermostatic sensor.
(5). Evaporator.

VARIATIONS IN WORKING TEMPERATURES OF THE CAB AIR CONDITIONING SYSTEM

External ambient temperature	**20 °C** (**68.00 °F**)	**27 °C** (**80.60 °F**)	**28 °C** (**82.40 °F**)	**35 °C** (**95.00 °F**)	**36 °C** (**96.80 °F**)	**43 °C** (**109.40 °F**)
Temperature of air at vent outlets (inside cab)	**4 - 8 °C** (**39.20 - 46.40 °F**)		**6 - 12 °C** (**42.80 - 53.60 °F**)		**12 - 20 °C** (**53.60 - 68.00 °F**)	

Air conditioning - Pressure test Example 10

T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	



20105959N 1

Symptoms

1. Evaporator is only slightly cool.
2. Liquid line and receiver/drier are cool to touch and show frost or considerable moisture.
3. Low side pressure is too low. The gauge should read **20.7 - 207 kPa** (**3 - 30 psi**)
4. High side pressure is too low. See pressure-temperature chart for correct gauge readings.

NOTE: *A normal or high reading of the high side pressure gauge under these conditions indicates that the system is overcharged or that the condenser or receiver/drier is too small.*

DIAGNOSIS: Restriction in the liquid line and/or receiver/drier resulting in a “starved” evaporator (compressor moving refrigerant from the evaporator faster than it can enter).

Corrective Procedures

1. Extract the refrigerant from the system.
2. Replace the liquid lines, receiver/drier, or other obstructed components.
3. Evacuate the system.
4. Charge the system.
5. Performance test the system.

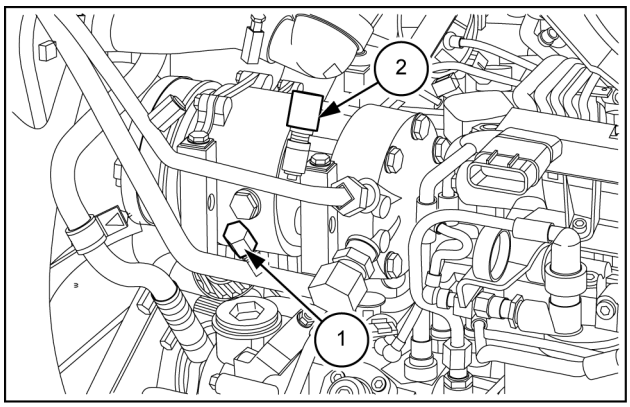
NOTE: *Test procedure based upon ambient temperature of **35 °C (95 °F**). For proper high side gauge reading for other ambient temperatures, refer to the pressure-temperature chart.*

Ambient Temperature* °C (°F)	High Pressure Gauge Reading kPa (psi)
21 °C (**70 °F**)	**786 - 924 kPa** (**114 - 134 psi**)
24 °C (**75 °F**)	**869 - 1007 kPa** (**126 - 146 psi**)
26 °C (**80 °F**)	**972 - 1110 kPa** (**141 - 161 psi**)
29.5 °C (**85 °F**)	**1096 - 1234 kPa** (**159 - 179 psi**)
32 °C (**90 °F**)	**1158 - 1296 kPa** (**168 - 188 psi**)
35 °C (**95 °F**)	**1248 - 1386 kPa** (**181 - 201 psi**)
38 °C (**100 °F**)	**1386 - 1524 kPa** (**201 - 221 psi**)

Air-conditioning compressor lines - Vacuum test

T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	

1. Make sure the charging station manifold gauge valves are in the closed position. Connect the hose from the low pressure gauge to the port on the suction hose, **(1)**. Connect the hose from the high pressure gauge to the port on the discharge hose, **(2)**. Turn both thumbscrews to depress the service valves.
2. Removal of air and moisture from the system is necessary after the refrigerant has been removed from the system after the system has been opened for maintenance. Air enters the system when the system is opened air has moisture that must be removed to prevent damage to the system components.



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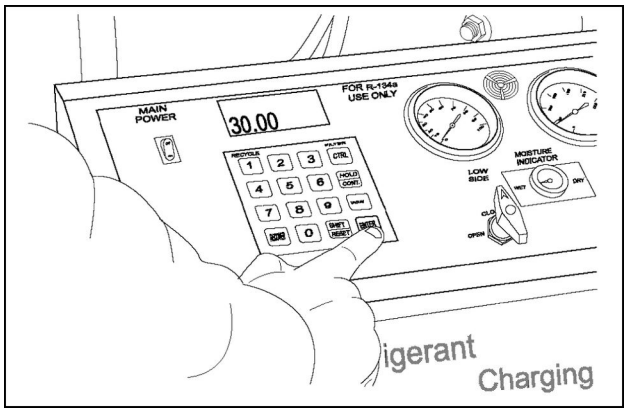
3. Air and moisture are removed from the system by a vacuum pump. A vacuum pump is on the only equipment made that will lower the pressure in a system enough to change the moisture to a vapor so that the moisture can be removed.

NOTE: *Refer to the vacuum pump manufacturer's user manual for additional information.*

4. Connect the main power plug. Move the main power switch to the ON position. Select the vacuum program.



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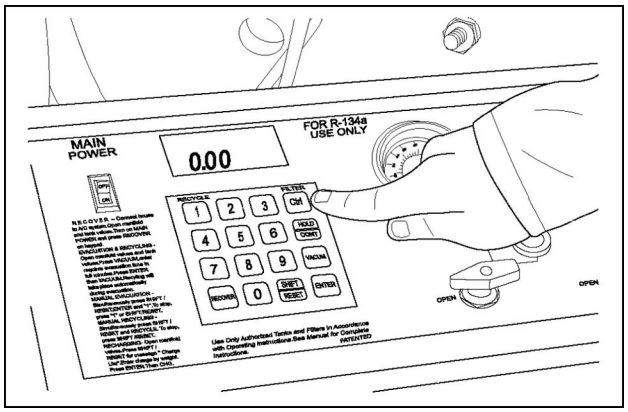
5. Press the Charge key. Program and Charge will appear on the display.



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CONNEC-TIONS	COMPO-NENT NAME	DESCRIPTION	WIRING DRAWING
X-065	S-054	Front corner lights switch	**Harnesses and connectors - Component localisation 06 — main platform harness, left-hand side view (55.100)**
X-078	X-078	Main harness connection - **40 A** socket intermediate connection	**Harnesses and connectors - Component localisation 07 — main platform harness, right-hand side view (55.100)**
X-080	J-005	Cigar lighter connector	**Harnesses and connectors - Component localisation 06 — main platform harness, left-hand side view (55.100)**
X-088	Y-007	Air-conditioning compressor solenoid valve	**Harnesses and connectors - Component localisation 03 — engine harness 2, LH side view (55.100)**
X-090	A-007	Flasher unite	**Harnesses and connectors - Component localisation 06 — main platform harness, left-hand side view (55.100)**
X-091	S-048	Street lights control lever	**Harnesses and connectors - Component localisation 07 — main platform harness, right-hand side view (55.100)**
X-092	S-047	Hazard switch	**Harnesses and connectors - Component localisation 07 — main platform harness, right-hand side view (55.100)**
X-093	S-021	Brake pedal switch left hand	**Harnesses and connectors - Component localisation 07 — main platform harness, right-hand side view (55.100)**
X-094	S-022	Brake pedal switch right hand	**Harnesses and connectors - Component localisation 06 — main platform harness, left-hand side view (55.100)**
X-098	X-098	Main harness - 7-pins trailer socket intermediate connection	**Harnesses and connectors - Component localisation 07 — main platform harness, right-hand side view (55.100)**
X-110	A-003	Cab fuse and relay box	**Harnesses and connectors - Component localisation 07 — main platform harness, right-hand side view (55.100)**
X-120	A-003	Cab fuse and relay box	**Harnesses and connectors - Component localisation 07 — main platform harness, right-hand side view (55.100)**
X-130	A-003	Cab fuse and relay box	**Harnesses and connectors - Component localisation 07 — main platform harness, right-hand side view (55.100)**
X-250	S-039	"Home-Enter" switch	**Harnesses and connectors - Component localisation 06 — main platform harness, left-hand side view (55.100)**

Harnesses and connectors - Identification for platform models

CONNECTION	DESCRIPTION
X-001	Main harness - engine 1 intermediate connection
X-002	Engine 1 - PDU intermediate connection
X-006	PDU
X-007	PDU
X-008	BDS
X-009	BDS
X-010	Starter motor
X-011	Starter motor
X-012	Alternator
X-013	Alternator
X-015	Horn
X-016	Horn
X-017	Corner lamp left hand
X-018	Corner lamp right hand
X-019	Left-hand high beam
X-019	Left-hand low beam
X-020	Right-hand high beam
X-020	Right-hand low beam
X-021	Front grabrail position light/direction light left hand
X-022	Front grabrail position light/direction light right hand
X-023	Connector for stop tail light left hand
X-024	Stop tail light right hand
X-025	Engine 1 - hood intermediate connection
X-026	8A socket
X-027	Cigar lighter connector
X-032	Beacon switch
X-033	Beacon switch
X-035	Front corner lights switch
X-057	Rear worklamp
X-065	Front corner lights switch
X-071	Right beacon intermediate connection
X-073	Left beacon intermediate connection
X-078	25A service socket
X-080	Cigar lighter connector
X-086	Diverter switch
X-090	Flasher unite
X-091	Street lights control lever
X-092	Hazard switch
X-093	Brake pedal switch left hand
X-094	Brake pedal switch right hand
X-098	Main harness - 7-pin trailer socket intermediate connection
X-110	Platform fuse and relay box
X-120	Platform fuse and relay box
X-130	Platform fuse and relay box
X-197	Battery isolator switch
X-198	Battery isolator switch lamp
X-250	"Home-Enter" switch
X-260	"Up-Down" switch
X-270	"Home-Enter" switch
X-290	"Up-Down" switch
X-300	Main harness - transmission intermediate connection
X-303	Differential lock enable/disable switch
X-304	Starter motor
X-309	Wheel speed sensor

Harnesses and connectors - Component localisation 08 - cab roof harness

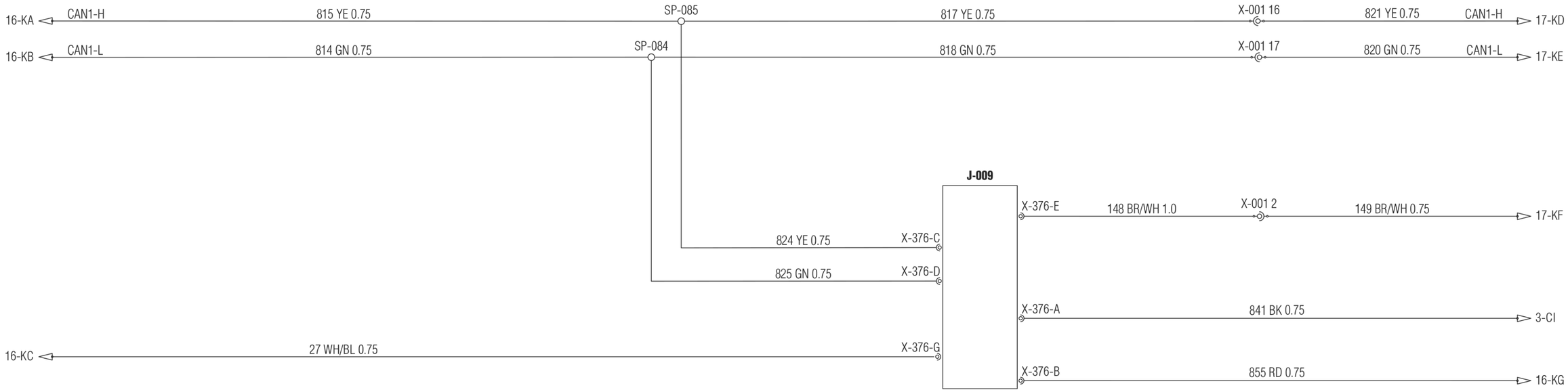
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	

COMPO-NENT NAME	CONNEC-TIONS	DESCRIPTION	WIRING DIAGRAM
F-022	X-130	Worklamps switch power supply [+ **12 V K-001**]	**Wire harnesses - Electrical schematic sheet 02 (55.100)**
F-023	X-130	Blower motor 3th speed left hand power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 05 (55.100)**
F-024	X-130	Blower motor 3th speed right hand power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 05 (55.100)**
F-025	X-130	Reverse gear circuit power supply [+ **12 V K-011**]	**Wire harnesses - Electrical schematic sheet 10 (55.100)**
F-026	X-130	Cigar lighter power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 02 (55.100)**
F-027	X-130	Low beam power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 02 (55.100)**
F-031	X-130	Service socket power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 09 (55.100)**
F-032	X-130	Starter switch power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 02 (55.100)**
F-033	X-110	Position lights power supply [+ **12 V K-002**]	**Wire harnesses - Electrical schematic sheet 02 (55.100)**
F-037	X-120	Blower motor 4th speed left hand power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 05 (55.100)**
F-038	X-120	30A socket circuit power supply [+ **12 V K-014**]	**Wire harnesses - Electrical schematic sheet 09 (55.100)**
F-039	X-120	Blower motor 4th speed right hand power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 05 (55.100)**
F-040	X-120	Fuel heating power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 17 (55.100)**
F-041	X-140	3rd function power supply (for front loader tool)	**Wire harnesses - Electrical schematic sheet 23 (55.100)**
F-045	X-150	Front worklamp power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 20 (55.100)**
F-046	X-150	Rear worklamp power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 20 (55.100)**
F-047	X-150	Interior lamp power supply [+ **12 V F-058** - **125 A**]	**Wire harnesses - Electrical schematic sheet 20 (55.100)**
F-048	X-150	Radio power supply [+ **12 V K-026**]	**Wire harnesses - Electrical schematic sheet 20 (55.100)**
F-049	X-150	Air-conditioning fans power supply [+ **12 V K-026**]	**Wire harnesses - Electrical schematic sheet 20 (55.100)**
F-050	X-150	Wipers power supply [+ **12 V K-026**]	**Wire harnesses - Electrical schematic sheet 20 (55.100)**
F-051	X-150	Air-conditioning switch power supply [+ **12 V K-026**]	**Wire harnesses - Electrical schematic sheet 20 (55.100)**
F-053	X-003	Engine fuse 1 [+ **12 V K-030**]	**Wire harnesses - Electrical schematic sheet 01 (55.100)**
F-054	X-004	Engine fuse 2 [+ **12 V K-030**]	**Wire harnesses - Electrical schematic sheet 01 (55.100)**
F-055	X-049	Engine fuse 3 [+ **12 V K-030**]	**Wire harnesses - Electrical schematic sheet 01 (55.100)**
F-056	X-005	Keep Alive Memory (**KAM**) [+ **12 V G-001**]	**Wire harnesses - Electrical schematic sheet 01 (55.100)**
F-057	X-006	Glow plugs control unit power supply [+ **12 V G-001**]	**Wire harnesses - Electrical schematic sheet 01 (55.100)**
F-058	X-007	Cab power supply [+ **12 V G-001**]	**Wire harnesses - Electrical schematic sheet 01 (55.100)**
F-059	X-014	Main engine power supply [+ **12 V G-001**]	**Wire harnesses - Electrical schematic sheet 01 (55.100)**

Wire harnesses - Electrical schematic sheet 07 LIGHTING

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	

COMPONENT NAME	DESCRIPTION
E-012	Corner lamp left hand
E-013	Corner lamp right hand
E-016	Front grabrail position light/direction light left hand
E-018	Stop tail light left hand
E-019	Front grabrail position light/direction light right hand
E-020	Stop tail light right hand
E-025	Optional rear roof position light/direction light left hand
E-028	Optional rear roof position light/direction light right hand
E-029	Rear direction light left hand
E-030	Rear direction light right hand
E-996	Left-hand low beam
E-997	Left-hand high beam
E-998	Right-hand high beam
E-999	Right-hand low beam
GND-003	Platform fuse and relay box ground
GND-006	Steering column ground
GND-007	Engine ground
H-001	Horn
S-054	Front corner lights switch
X-001	Main harness - engine 1 intermediate connection
X-025	Engine 1 - hood intermediate connection



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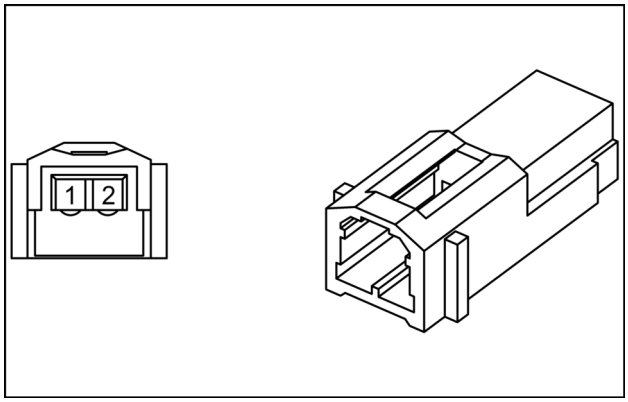
Wire harnesses - Electrical schematic sheet 21 FLASHER AND RADIO CIRCUIT

T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	

COMPONENT NAME	DESCRIPTION
A-007	Flasher unite
GND-006	Steering column ground
S-047	Hazard switch
S-048	Street lights control lever

CONNECTOR X-006 - Connection rear diverter/main harness

CONNECTOR X-006 - Connection rear diverter/main harness		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
1	120 (GL) 24 (OR/WH)	Y-001Ev. 3° distributor X-006Connection rear diverter/main harness X-938Candelette X-006Glow Plugs Power Fuse



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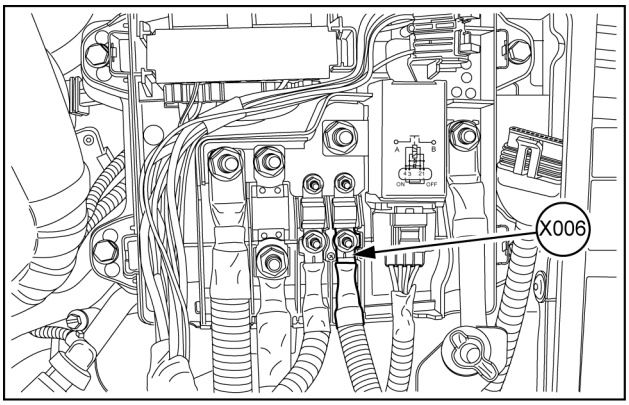

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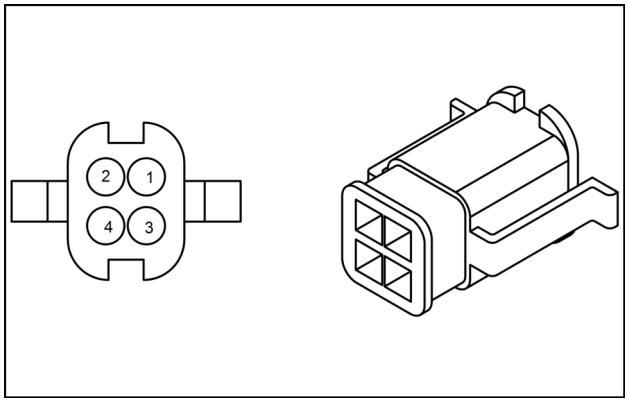
CONNECTOR X-023A - LH rear lamp

CONNECTOR X-023A - LH rear lamp		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
1	265 (RD) 270 (BK)	X-023LH rear lamp - main harness connection X-023ALH rear lamp SP-040 X-023ALH rear lamp
2	267 (YE) 484 (TQ/BK)	X-023ALH rear lamp SP-039 X-023LH rear lamp - main harness connection X-023ALH rear lamp
3	267 (YE) 270 (BK)	X-023ALH rear lamp SP-039 SP-040 X-023ALH rear lamp
4	265 (RD) 484 (TQ/BK)	X-023LH rear lamp - main harness connection X-023ALH rear lamp X-023LH rear lamp - main harness connection X-023ALH rear lamp



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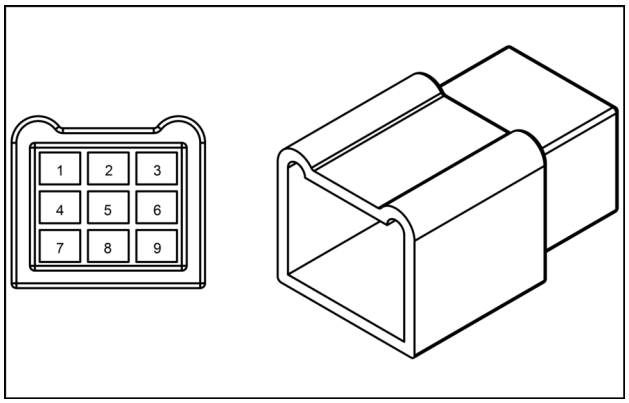
CONNECTOR X-039 - Radio

CONNECTOR X-039 - Radio		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
2	643 (YE)	X-039Radio X-084LH Speaker 1
4	640 (TQ/BK)	X-039Radio X-083RH Speaker 2
5	641 (TQ)	X-039Radio X-082RH Speaker 1
6	642 (YE/BK)	X-039Radio X-085LH Speaker 2
7	644 (BK)	X-039Radio X-404Roof Ground 2
9	653 (WH/GN)	X-150Fuse and relay module X-039Radio



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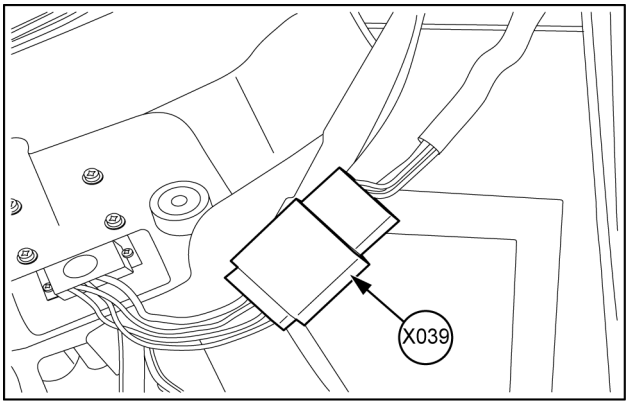

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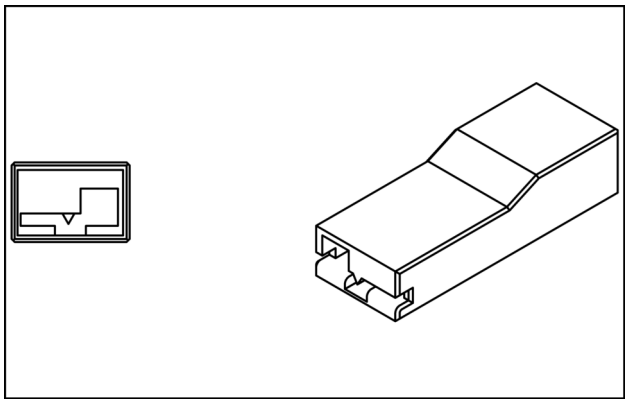
CONNECTOR X-056B - X-056B

CONNECTOR X-056B - X-056B		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
1	2 (BK)	X-024Connessione Cavo Tetto X-056B

Wire connectors - Component diagram 08

CONNECTOR X-080 - Cigar Lighter OPT Lamp

CONNECTOR X-080 - Cigar Lighter OPT Lamp		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
1	651 (YE/BK)	X-080Cigar Lighter OPT Lamp SP-058



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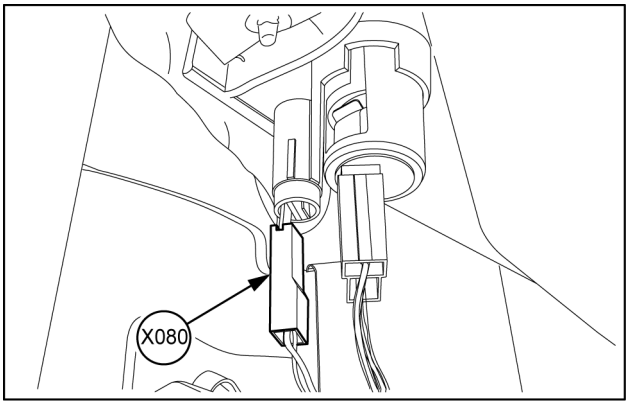

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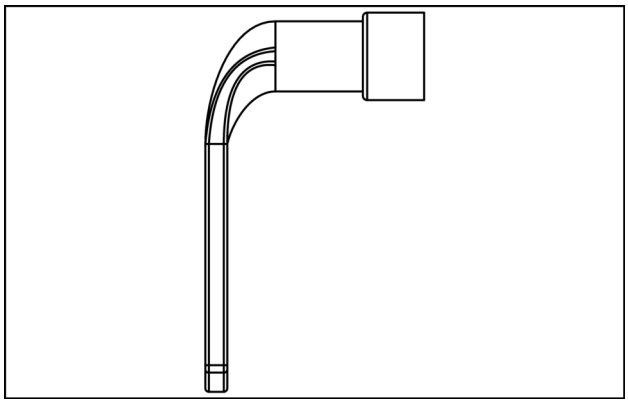
Wire connectors - Component diagram 11

CONNECTOR X-110 - Modulo Relays R1-R8 + Fuses F33-F36

CONNECTOR X-110 - Modulo Relays R1-R8 + Fuses F33-F36		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
33A	698 (WH)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-071
33B	701 (YE/BK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-058
34A	212 (BR) 778 (BR)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-070 X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-070
34B	923 (BR/GY)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-113
35A	140 (BR)	SP-070 X-110Modulo Relays R1-R8 + Fuses F33-F36
35B	139 (WH/VT) 250 (WH/VT)	SP-018 X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-018 X-110Modulo Relays R1-R8 + Fuses F33-F36
36A	227 (BR) 3230 (BR) 913 (BR)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-070 X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-070 X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-070
36B	3231 (OR) 912 (BR/GY)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-323 X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-119
R1_30	572 (BL)	SP-061 X-110Modulo Relays R1-R8 + Fuses F33-F36
R1_85	283 (BK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 X-410Fuse Box Ground 1
R1_86	209 (WH) 286 (WH)	X-510Key Switch 15 X-110Modulo Relays R1-R8 + Fuses F33-F36 X-510Key Switch X-110Modulo Relays R1-R8 + Fuses F33-F36
R1_87	126 (BR) 210 (BR)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-072 X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-072
R2_30	570 (BL)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-061
R2_85	571 (BK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 X-410Fuse Box Ground 1
R2_86	162 (WH/RD)	X-110Modulo Relays R1-R8 + Fuses F33-F36 X-091Light Control SW
R2_87	205 (WH) 696 (WH)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-071 X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-071
R3_30	135 (OR/BK)	SP-005 X-110Modulo Relays R1-R8 + Fuses F33-F36
R3_85	99 (BK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 X-410Fuse Box Ground 1
R3_86	132 (GY)	SP-007 X-110Modulo Relays R1-R8 + Fuses F33-F36
R3_87	133 (GY)	SP-007 X-110Modulo Relays R1-R8 + Fuses F33-F36
R4_30	466 (BL)	X-130Modulo Fuses F1-F32 X-110Modulo Relays R1-R8 + Fuses F33-F36
R4_85	367 (BK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-023
R4_86	467 (PK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-034
R4_87	351 (GN)	X-110Modulo Relays R1-R8 + Fuses F33-F36 X-046LH Fan
R5_30	448 (BL)	X-130Modulo Fuses F1-F32 X-110Modulo Relays R1-R8 + Fuses F33-F36
R5_85	368 (BK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-023
R5_86	468 (PK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-034
R5_87	352 (BR)	X-110Modulo Relays R1-R8 + Fuses F33-F36 X-047RH Fan
R6_30	3232 (OR) 372 (BL)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-323 X-120Modulo Relays R9-R16 + Fuses F37-F40 X-110Modulo Relays R1-R8 + Fuses F33-F36
R6_85	3235 (BK/WH) 442 (BK)	X-323Front Loader X-110Modulo Relays R1-R8 + Fuses F33-F36 X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-023
R6_86	3233 (OR) 370 (RD)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-323 X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-035
R6_87	3234 (OR/BK) 445 (RD/BK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 X-325Front Loader Disposition X-046LH Fan X-110Modulo Relays R1-R8 + Fuses F33-F36
R7_30	373 (BL)	X-120Modulo Relays R9-R16 + Fuses F37-F40 X-110Modulo Relays R1-R8 + Fuses F33-F36
R7_85	362 (BK)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-023
R7_86	371 (RD)	X-110Modulo Relays R1-R8 + Fuses F33-F36 SP-035
R7_87	364 (WH)	X-047RH Fan X-110Modulo Relays R1-R8 + Fuses F33-F36

CONNECTOR X-304 - STARTER MOTOR

CONNECTOR X-304 - STARTER MOTOR		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
1	822 (R)	X-304STARTER MOTOR X-013Alternator



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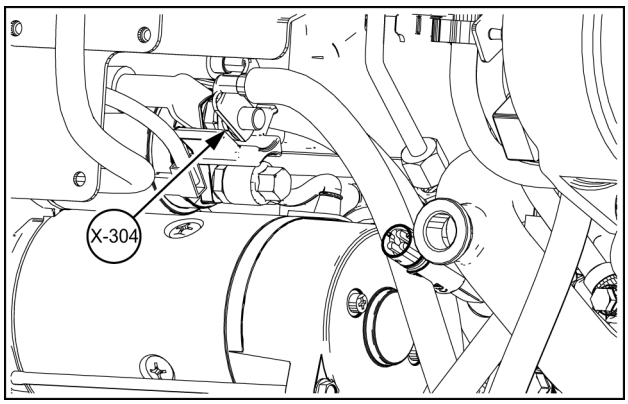

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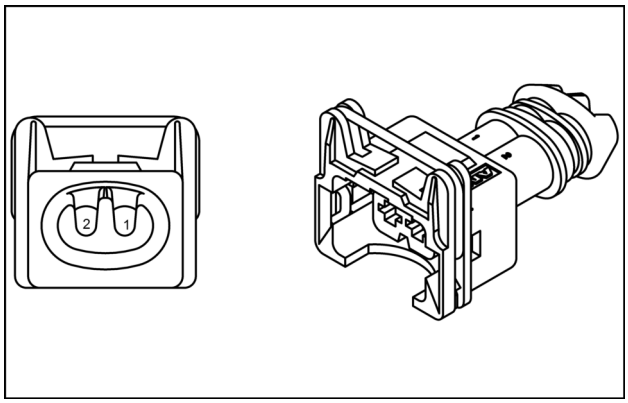
CONNECTOR X-357 - Engine intake air filter

CONNECTOR X-357 - Engine intake air filter		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
1	272 (YE)	X-357Engine intake air filter X-001Frazionamento Motore - cabina
2	304 (BK)	X-357Engine intake air filter X-420MASSA MOTORE



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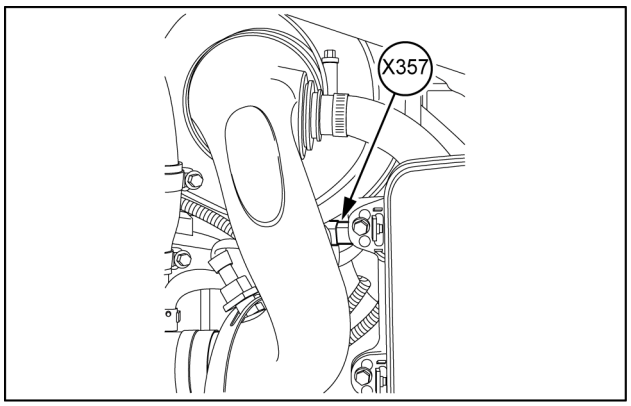

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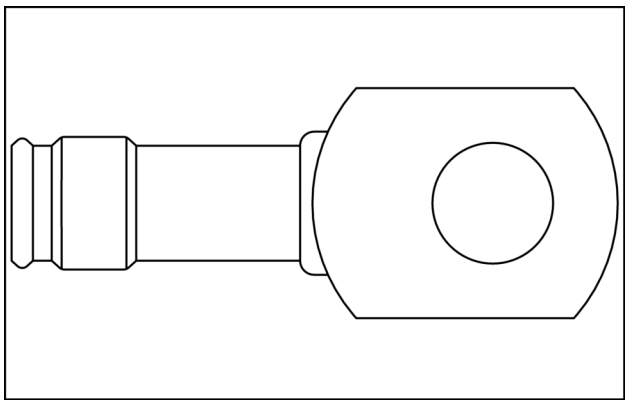

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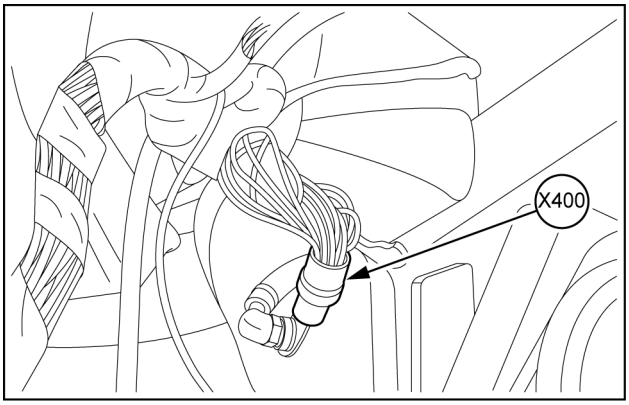
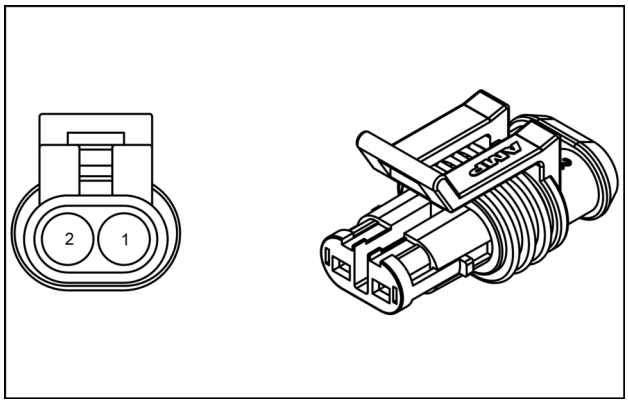


MOIL12TR0495AA 2

CONNECTOR X-555 - Reverse Gear buzzer

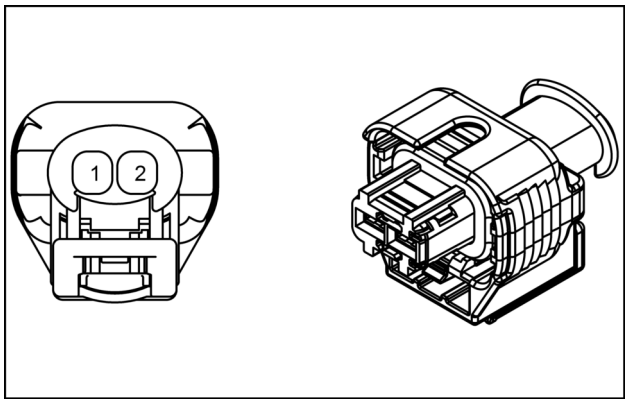
CONNECTOR X-555 - Reverse Gear buzzer		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
1	67 (BL/YE)	X-090Flasher X-098Main/ 7 Pole Socket Extension
2	53 (BK)	SP-014 X-460ADIC CN2



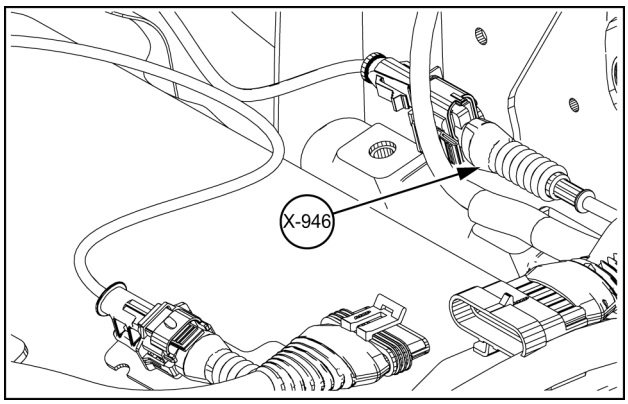
82012083 3

CONNECTOR X-946 - Temp exhaust 1

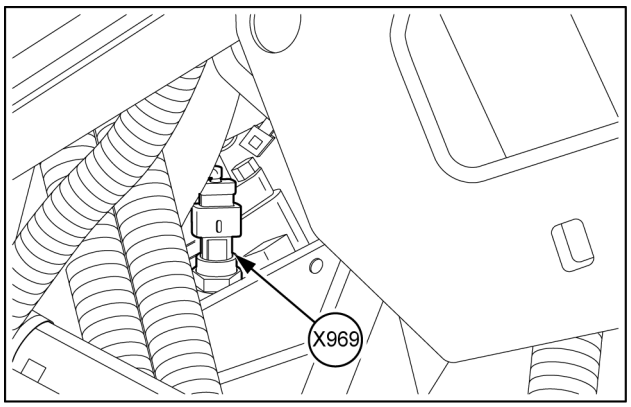
CONNECTOR X-946 - Temp exhaust 1		
PIN NUMBER	**WIRE NUMBER**	**CIRCUIT REFERENCE**
1	324 (BR/YE)	X-937EDC17 CONNECTOR 2 X-946Temp exhaust 1
2	323 (BR/GN)	X-937EDC17 CONNECTOR 2 X-946Temp exhaust 1



84532147 11

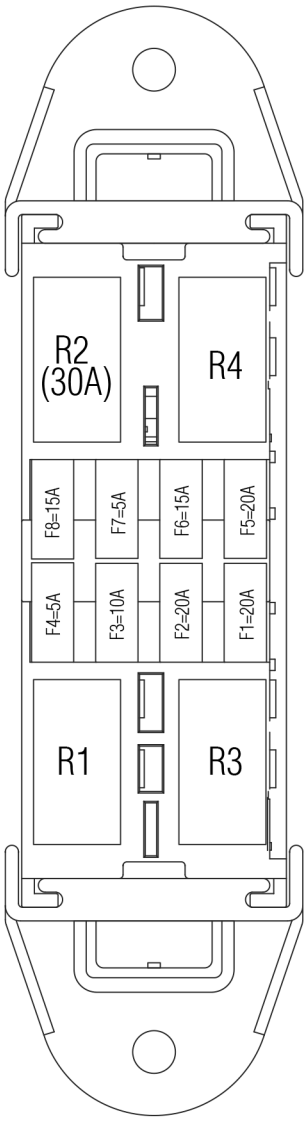


MOIL13TR00062AA 12



MOIL12TR0526AA 19

X-150



MOIL13TR02840HA 1

Contents

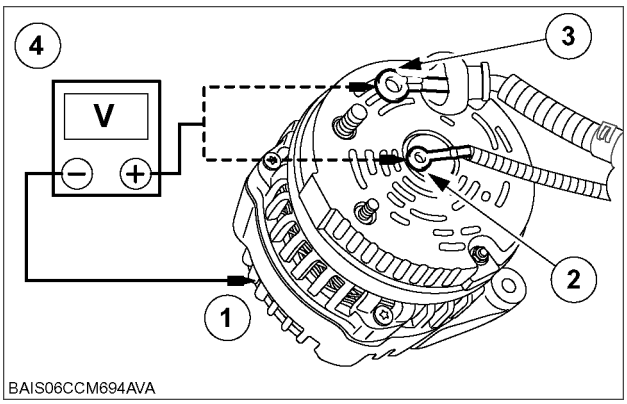
Electrical systems - 55

Engine starting system - 201

Alternator - Electrical test

1. Alternator Wiring Connections Test

Refer to **1**



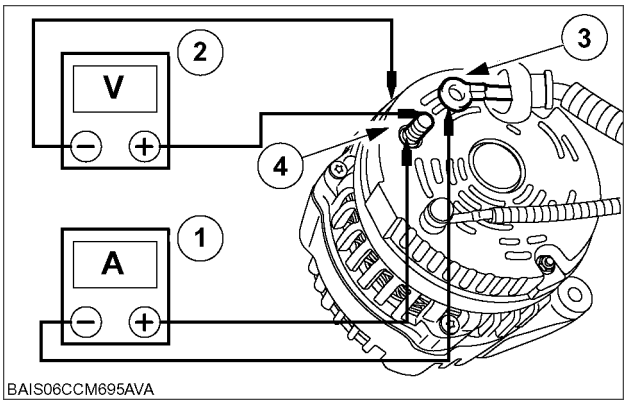
BAIS06CCM694AVA 1

- Disconnect the battery.
- Disconnect the D+ **(2)** and B+ **(3)** terminals from the alternator.
- Reconnect the battery and turn the key start ON but do not start the engine.
  Connect a voltmeter **(4)** between each terminal and earth (ground) **(1)**.
  Battery voltage should be registered.
  If battery voltage is not registered a continuity fault in the external cable circuitry must be traced and remedied.
  Refer to the circuit diagram (see **Wire harnesses - Electrical schematic sheet 01 (55.100)**).
- Connect the D+ terminal, warning lamp (thin brown) wire, to earth (ground). The warning lamp should illuminate.
- Disconnect the battery and reconnect the alternator cable.

NOTE: *If the warning lamp fails to illuminate when the cable is reconnected to the alternator, a fault is indicated in the alternator regulator or rotor circuits. Ensure that the D+ terminal is clean.*

2. Charging Current And Controlled Voltage Tests

Refer to Figure **2**



BAIS06CCM695AVA 2

NOTE: *The following tests should be performed at **20 °C**, a lower temperature will create a higher voltage and a higher temperature will create a lower voltage.*

- Make sure that all the electric utilities of the tractor are switched off and that the key start switch is in OFF position.
- Disconnect the battery negative terminal and the B+ alternator terminal **(4)**.
- Connect an ammeter **(1)** between the disconnected wire (**=brown) **(3)** and the alternator B+ terminal.
- Connect a voltmeter **(2)** between the alternator B+ terminal and earth (ground).
- Reconnect the battery. Start and run the engine at **2000 RPM** and observe the ammeter and voltmeter readings.

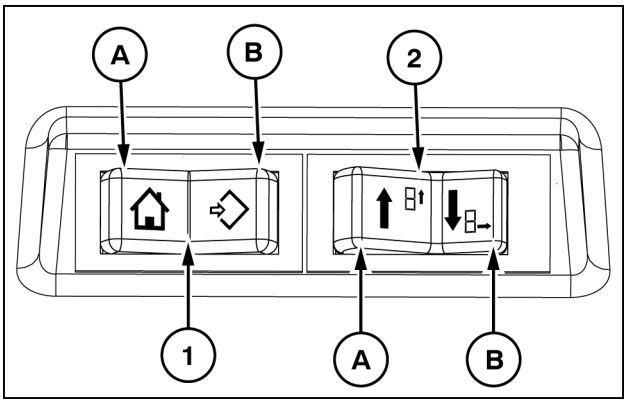
The voltmeter should register in excess of battery voltage and, when the ammeter reading falls to **5 A**, the voltmeter reading should stabilise at **14.1 V +/- 0,15**.
If the voltmeter reading exceeds the above value the alternator regulator is faulty.
If the voltmeter reading is below the specified value a faulty alternator component or a high resistance fault in the external connections of the charging system is indicated.
If the ammeter indicates **0 A**, one of the alternator components is faulty.

Electronic modules - HF - View controller hardware information of Analog Digital Instrument Cluster (ADIC) [ZC]

HF menu is common for all modules.

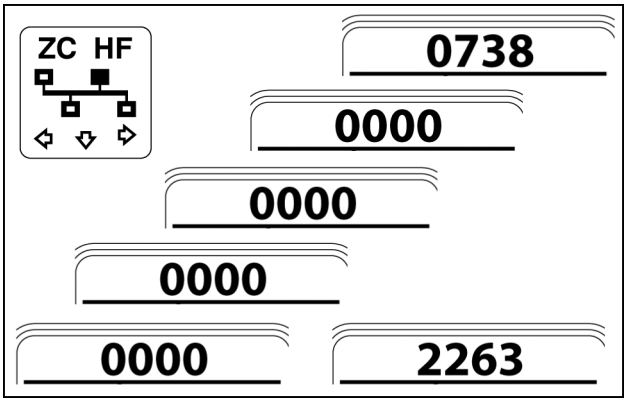
Access the **HH** menu, as described in **Electronic modules - View HH MENU ACCESS (55.640)**, for the **ZC** unit and proceed as follows.

1. Select the **HF** menu with the buttons (**(2)**, **1**) **(A)** or **(B)**, press button (**(1)**, **1**) **(B)** to access the **HH** menu program.



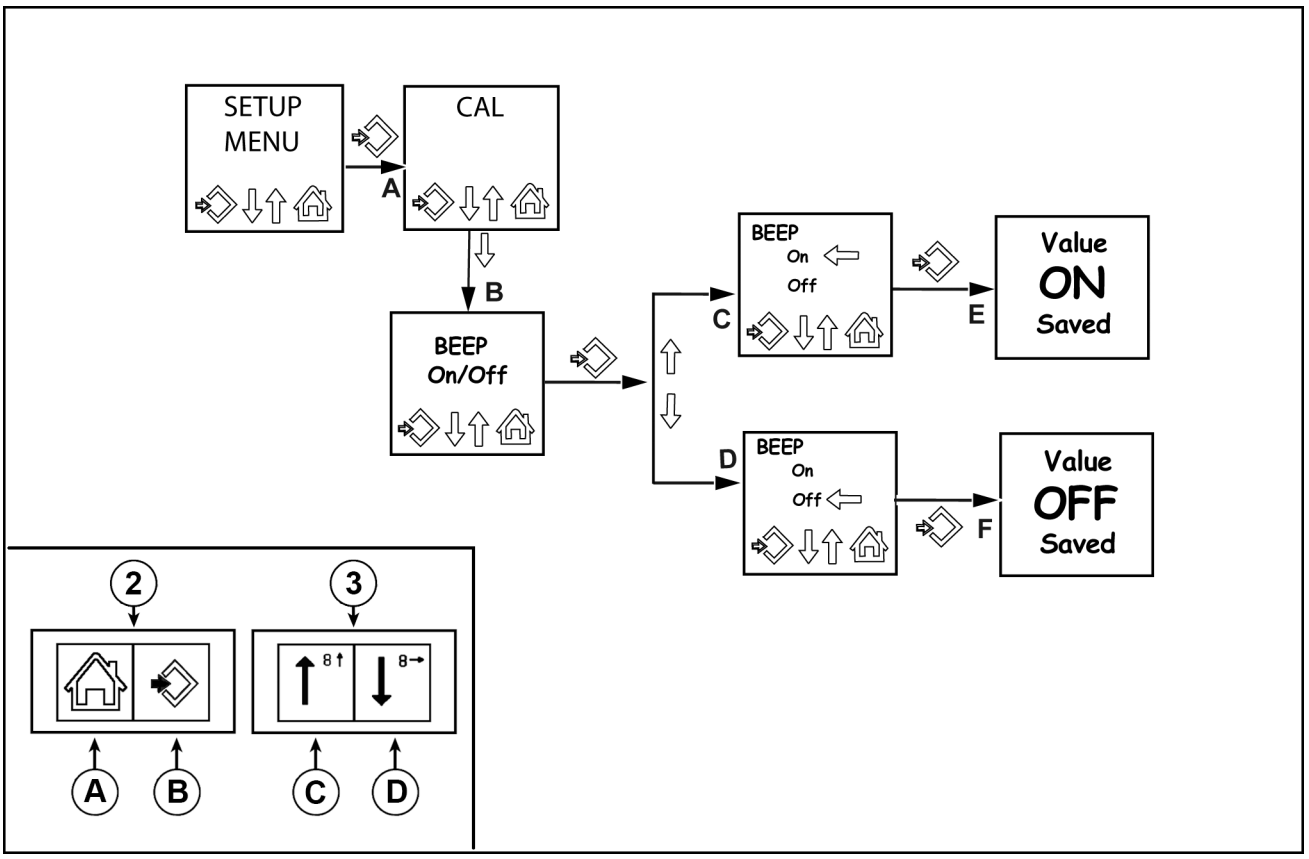
WLAPL4S55C1003A 1

2. The upper side of LCD will then show a sequence of numbers, representing the Hardware Identifier and the Hardware Version and in some cases the Hardware Serial number, as example:
(refer to **2**)
   - **0738**: hardware module identification.
   - **0000.0000**: hardware module release identification.
   - **0000.0000.2263**: Control unit serial number (printed on control unit label).
3. At the end of the procedure, the program automatically returns to the menu **HF**, from which it is possible to move through all the **HH** menus.



WLAPL4S55C1026A 2

Instrument cluster - Dynamic description audible warning on/off



DCAPLT5NE052S3A 1

If you want to turn the audible warning on or off each time a button is pressed, proceed as follows:

- Press the switch **(2)** on the symbol **(B)** for more than three seconds to enter the programming menu The central monitor will show **"SETUP MENU"**. Release the symbol **(B)**.
- Press the switch **(3)** on the symbol **(D)** a number of consecutive times until the monitor shows **"BEEP ON/OFF"**.
- Press the switch **(2)** on the symbol **(B)**; the monitor will show the last setting made, **"BEEP ON"** or **"BEEP OFF"**. Press the switch **(3)** on the symbol **(D)** or **(C)** to change the setting.
- **"ON"** = warning **"BEEP"** on
- **"OFF"** = warning **"BEEP"** off
- After selecting the desired condition (**ON** or **OFF**) press the switch **(2)** on the symbol **(B)** to confirm. The monitor will show **"Value ON Saved"** when enabling the audible warning or **"Value OFF Saved"** when disabling it.

NOTE: *If you want to stop the display, press the switch* ***(2)*** *on the symbol* ***(A)****. This will automatically take you back to viewing the initial page* ***"BEEP ON/OFF"****. Press the same symbol again to exit the programming menu.*

Wire harnesses - Electrical schematic sheet 15 (55.100.DP-C.20.E.15)
Wire harnesses - Electrical schematic sheet 15 (55.100.DP-C.20.E.15)

14093-Seat switch signal short to + 12V or open circuit

Control Module : ADIC

Possible failure modes:

1. Faulty connectors
2. Operator present seat switch faulty
3. Faulty wiring
4. Instrument cluster unit (**ADIC**) defective

Solution:

1. Check the operator present seat switch **S-041**, in **H9**, **ch 26**.

   A. With the driver seated the display must show a value of approximately **1430 mV**, with the driver standing, the display will show a value of approximately **2870 mV**.
   If the values displayed are not okay, Continue to step **2**

   B. If the values displayed are okay, while still in **H9 ch 26**, wiggle the harness and the connector of the instrument cluster unit (**ADIC**) **X-450** and the operator present seat switch **S-041**, to check for an intermittent circuit. **Ch 26** values will change if an intermittent circuit is indicated; Repair or replace as needed.

2. Check the operator present seat switch.

   A. Disconnect the connector **X-355**.
   Check the resistance between **X-355** pin 1 and pin 2
   With the driver seated the resistance must be approximately **500 Ω**, with the driver standing it must be approximately **2000 Ω**.
   If the indicated resistances are not okay, replace the operator present seat switch.

   B. If the switch is okay, Continue to step **3**

3. Check for an open condition.

   A. Disconnect the connector **X-450**. Check between:
   X-355, pin 1 wire 0.5 (BK/WH) and **X-450** pin 6 wire 0.5 (BK/WH).
   X-355 pin 2, wire 0.5 (GN) and **X-450** pin 1, wire 0.5 (GN)
   If an open circuit is indicated, repair or replace the wiring as necessary.

   B. If an open circuit is not indicated, Continue to step **4**

4. Check for a short circuit to a positive voltage

   A. Turn ignition key switch ON. Measure the voltage between the connector:
   X-355 pin 2 , wire 0.5 (GN) and ground
   If a short to positive is indicated, repair or replace the wiring as necessary.

   B. If the harness is okay, download the correct level software. If the fault re-occurs again, remove and replace the instrument cluster unit (**ADIC**).

3063-Cylinder1 - injector cable short circuit (high side to ground)

Control Module : ECU

NOTE: *This diagnostic procedure requires a good quality multimeter to be able to take accurate resistance measurements. The meter should be able to measure to a resolution of* ***0.1 Ω****. Some of the measurements required to be taken, could be as low as* ***0.4 Ω*** *(typical injector solenoid coil resistance is* ***0.4 - 0.5 Ω****) and any inaccuracies in the multimeter could cause a technician to take the wrong diagnostic path.*

NOTE: *Make sure that the multimeter's test lead resistance is taken into account when resistance measurements are taken. Record the multimeter's test lead resistance by touching the leads together on the lowest Ohms scale and mentally recording the resistance value. Subtract this value from the actual resistance measurement taken.*

Context:
The engine control unit (**ECU**) has determined that a short circuit exists in the high side injector circuit for cylinder 1. A power stage component energizes the injection system transistors and simultaneously observes the current flow in the high-side and low-side switching branch by sensing resistors. If there is a deviation from the expected current flow the component detects specific errors and reports them to the **ECU**. This error message is then rearranged so it holds information on performed injections, errors of cylinders on the same bank, bank specific errors and cylinder specific errors. The rearranged error message is then compared to applicable error patterns and if there is a match the failure corresponding to the matched pattern is output. If an error message does not match any pattern the defect is treated as an unclassifiable error. Monitoring is performed once per camshaft revolution. This error is the result of a short circuit of the high side to the low side or ground over 3 camshaft revolutions. As a result of this error an individual cylinder or bank is shut off, based on parameters established in the **ECU**. Some parameters are currently permanent without a healing possibility by switching on the component to see if the defect is still present. Others have an irreversible or reversible Engine OFF.

Cause:
The Engine Control Unit (**ECU**) has determined that there is a fault associated with the current monitoring of the injector output power driver stage.

Possible failure modes:

1. Faulty cylinder 1 solenoid windings.
2. Faulty electrical wiring, short high side to low side or ground (damaged wiring harness).
3. Faulty **ECU**, hardware or software.

Solution:

1. Verify the error code is still present, and in an active state.
   A. If the fault is still present and active, Continue to step **2**.
   B. If the fault is no longer present or is in an inactive state, return machine to proper operation.
2. Carefully disconnect the engine cylinder harness from the **ECU** at **ECU** cylinder harness connector **X-939**. Use a multimeter to check the resistance, on the cylinder harness side of connector **X-939**, between pins 16 and 32. There should be **0.4 - 0.5 Ω**.
   A. If the resistance was within range, leave **ECU** cylinder connector **X-939** disconnected and continue with step **3**.
   B. If the resistance was lower than range minimum, Continue to step **6**.
3. Use a multimeter to check for continuity, on the **ECU** cylinder harness side of connector **X-939**, from pin 16 to chassis ground and pin 32 to chassis ground. Lift does not move when control lever is moved
   A. If there was continuity on either or both pins to chassis ground, Continue to step **4**.
   B. If there was no continuity on either pin to chassis ground, the **ECU** may have failed. Try reloading the **ECU** software and if the fault reoccurs, replace the **ECU**.

3106-Pressure relief valve reached maximum allowed opening count

Control Module : ECU

Context:
The engine control unit (**ECU**) has detected that the pressure relief valve (PRV) has been forced to the open position an excessive number of times.. Normally the fuel pressure in the rail is regulated by the metering unit of the high pressure pump. However, if this component is malfunctioning the rail pressure can rise to critical levels. The PRV is a mechanical safety valve (no electrical connectors) that opens to relieve excess fuel pressure. The PRV opening is detected by evaluating the gradient of the rail pressure (calculated by the **ECU**). This fault will only be cancelled after the **ECU** is reset using the EST.

Possible failure modes:

1. Fuel system failure.
2. The wiring harness may be damaged.
3. Engine control unit (**ECU**) faulty, programmed data error.

Solution:

1. Using the EST, verify the fault code is present.
   A. If the fault code is present, proceed to step **2**.
   B. If the fault code is not present, return the machine to operation.
2. Using the EST, verify there are no other fuel system failures.
   A. No other failures, continue with step **3**.
   B. Other failure - Repair other failures, clear fault code(s), and retest. If the fault does not reoccur, return the machine to service.
3. Visually inspect the connectors for damage, bent, or corroded terminals and locking tabs. Check the harnesses for broken, chaffed, or rubbed wires. Verify that the connectors and/or pins are fully installed. Flex the harnesses concerned to reveal intermittent breaks or shorts in the wiring. Operate the machine while monitoring the EST diagnostic screen.
   A. If no damaged is determine, continue with step **4**.
   B. If damage is found, repair damaged components. Using EST to clear the fault code(s). Operate the equipment to verify repairs. If repairs are complete, return the machine to operation.
4. Using the EST, verify that the **ECU** is programmed with the current data set. If the data set is not current, using the EST, update the **ECU** to the current data set.
   A. If the fault code is still active, proceed to step **5**.
   B. If the fault does not reoccur, return the machine to service.
5. Test the fuel rail pressure.
   A. If the fuel pressure is found in excess of **148500 kPa** (**21538.1 psi**) the valve is stuck closed. Replace the valve. Using the EST, clear the fault code. Operate the machine to verify repairs. If repairs are complete, return the machine to operation.
   B. If low fuel pressure is found, the PRV is stuck open. Replace the valve. Using the EST, clear the fault code. Operate the machine to verify repairs. If repairs are complete, return the machine to operation.

3180-Timeout of CAN message VCM2EDC

Control Module : ECU

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

Cause:
The **ECU** has detected a timeout of **VCM2EDC CAN** message.

Possible failure modes:

1. Faulty harness.
2. CAN BUS interference.
3. Faulty **ECU**.

Solution:

1. Before proceeding clear the error code with the approved diagnostic equipment. Run the tractor under normal conditions and retest.
   A. If the error code is not indicated, check that the system is operating correctly.
   B. If the error code is indicated, continue to step **2**
2. Check for other CAN related error codes displayed.
   A. If other error codes are indicated, continue to test for these errors.
   B. If no other error codes are displayed, continue to step **3**
3. Check all power supplies and grounds to the controllers on the CAN BUS network.
   A. If a fault is indicated, repair or replace the harness as required.
   B. If the power supplies and grounds are okay, download the correct levels of controller software. If the fault is still present, remove and replace the **ECU**.

A. If there was continuity, record the pin number and continue to step **4**.

B. If there was continuity, Continue to step **6**.

4. Disconnect the engine injector harness from the injector (valve) cover at connector **X-940**. Use a multimeter to check for continuity on the injector (valve) cover side of connector :

   From:

   1. Connector **X-940** pin A, if recorded pin in Step 3 was pin 16, to chassis ground
   2. Connector **X-940** pin H, if recorded pin in Step 3 was pin 2, to chassis ground
   3. Connector **X-940** pin D, if recorded pin in Step 3 was pin 1, to chassis ground.
   4. Connector **X-940** pin E, if recorded pin in Step 3 was pin 17, to chassis ground.

   Lift does not move when control lever is moved

   A. If there was continuity, leave connector **X-940** disconnected. Go to Step. **5**.

   B. If there was no continuity, there is a short to ground condition in the engine injector harness between connector **X-940** pin A, D, E or H, and **ECU** connector **X-939** pin 1, 2, 16 or 17. Locate and repair the grounded conductor.

5. Remove the injector (valve) cover and disconnect the injector harness from the injector:

   For:

   1. Injector cylinder no. 1 at connector **X-951**, if recorded pin in Step 3 was pin 16
   2. Injector cylinder no. 2 at connector **X-952**, if recorded pin in Step 3 was pin 2
   3. Injector cylinder no. 3 at connector **X-953**, if recorded pin in Step 3 was pin 1
   4. Injector cylinder no. 4 at connector **X-954**, if recorded pin in Step 3 was pin 17

   Use a multimeter to check for continuity, on the injector, from terminal 1 to chassis ground. Lift does not move when control lever is moved

   A. If there is continuity, the injector solenoid coil has failed: replace the injector.

   B. If there is no continuity, there is a short to ground condition in the injector circuit, between connector **X-951** (if recorded pin in Step 3 was pin 16), or connector **X-952** (if recorded pin in Step 3 was pin 2), or connector **X-953** (if recorded pin in Step 3 was pin 1), or connector **X-954** (if recorded pin in Step 3 was pin 17) and connector **X-940** pin A, D, E or H and **ECU** connector **X-939** pin 1, 2, 16 or 17
   Locate and repair the grounded conductor.

6. Disconnect the engine injector harness from the injector cover at connector **X-940**. Use a multimeter to measure the resistance on the injector cover side of connector :

   From:

   1. **X-940** pin A to B, if recorded pins in Step 2 were pins 16 and 32
   2. **X-940** pin C to D, if recorded pins in Step 2 were pins 31 and 1
   3. **X-940** Pin E to F, if recorded pins in Step 2 were pins 17 and 48
   4. **X-940** Pin G to H, if recorded pins in Step 2 were pins 46 and 2

   There should be **0.4 - 0.5 Ω**.

   A. If the resistance was within range, there is a short circuit condition in the engine injector harness between connector **X-940** pin B, C, F, or G, and **ECU** connector **X-939** pin 31, 32, 46, or 48. Locate and repair the short circuit.

   B. If the resistance was below range, Continue to step **7**

7. Remove the injector (valve) cover and disconnect the injector harness from the injector:

3265-Overrun monitoring - injection time too long

Control Module : ECU

Context:
The Engine Control Unit (**ECU**) has detected that injection time is too long. The sum of all torque-forming energizing times of an individual cylinder exceeds the limit, calculated from the map (depending on the engine speed and the time since the overrun monitoring is active) for more than 100 test events. When the engine is in overrun operation the monitoring becomes active and the current injection energizing time is compared with a maximum permissible time limit. If the limit is exceeded an **ECU** recovery (reset) is triggered and if the error reoccurs in the same driving cycle, the torque-determining power stages are irreversibly shut off. The basic idea is that the operator reacts to an unintentional torque increase, caused by a malfunction of the **ECU**, by releasing the accelerator pedal (reducing engine speed) which causes the engine to enter the overrun operation mode. Overrun monitoring is only released if various conditions are met, such as no accelerator pedal activation, no activated cruise control, no intervention of the vehicle dynamic control or gearbox control is present, etc. This failure could be the result of electronic disturbances, a requested torque increase via tester, the wrong application of injection relevant parameters, or a defective **ECU**. If this failure persists, the **ECU** may need to be replaced.

3362-Torque to quantity map - not plausible

Control Module : ECU

Context:
The engine control unit (**ECU**) has detected an error. This failure can be the result of wrong programming / flashing of the **ECU** or an internal defect. Try to flash the **ECU** correctly with the proper data set. If the error persists, replace the **ECU**.

Wire harnesses - Electrical schematic sheet 18 (55.100.DP-C.20.E.18)

Wire harnesses - Electrical schematic sheet 17 (55.100.DP-C.20.E.17)

(1) Turn the key switch OFF.

Disconnect connector **(2)** of valve **EGR X-964** . Disconnect the **ECU X-939** connector.

(3) Measure the resistance from the connector **ECU X-939** (pin 50, wire 418 (GY) to frame ground. The resistance should be greater than **20,000 Ω**. Wiggle the harness during measurement to reveal an intermittent condition.

(3) Measure the resistance between the **ECU X-939** connector (pin 35, wire 408 (TQ) and frame ground. The resistance should be greater than **20,000 Ω**. Wiggle the harness during measurement to reveal an intermittent condition.

A. The resistance is greater than **20,000 Ω**. Continue with Step **5**monitor.

B. The resistance is less than **20,000 Ω**. There is a short circuit to chassis ground. Repair or replace the wire as required.
Return step **1** to confirm elimination of fault.

5. Measure the resistance of the valve to chassis ground.

(1) Turn the key switch OFF.

(2) Disconnect the **EGR X-964** valve connector.

(3)monitor. Measure the resistance through the component side of the **EGR X-964** valve connector (pin 1) to frame ground. The resistance should be greater than **20,000 Ω**.

A. The resistance is greater than **20,000 Ω**. Temporarily replace the **ECU** and retest.
Return step **1** to confirm the elimination of the fault.

B. The resistance is less than **20,000 Ω**. There is an internal short to chassis ground. Temporarily replace the **EGR** valve and retest.
Return step **1** to confirm the elimination of the fault.

3675-Long time EGR valve drift at closed position

Control Module : ECU

Context:
The **EGR** valve actuator is monitored for long time drift by comparing first and last learned voltage compensation. The absolute value of the difference of the learned voltage values in the closed position and the first learned voltage value is above **200 mV**.

Cause:
The **EGR** valve actuator is drifted or the fully closed position cannot be reached (blocked or sooted actuator)

Possible failure modes:

1. The **EGR** valve actuator is drifted or the fully closed position cannot be reached (blocked or sooted actuator)

Solution:

1. Verify the fault code is still present and in an active state.
   A. If the fault is no longer active or present, return the machine to service.
   B. If the error is still present and active, Temporarily replace the **EGR** valve assembly and retest. Return to step **1** to confirm the elimination of the failure.

3694-Glow plug control module - short circuit to ground at power stage

Control Module : ECU

Context:
The glow plug checking unit has detected a short circuit to ground error.

Cause:
Short circuit to ground error on the power stage for glow plug low voltage system. Pre-glow and post-glow functions may be disabled while this code is active. There may be starting issues such as black smoke and hard starts while this code is active and the engine is cold.

Possible failure modes:

1. High system voltage
2. High engine temperatures
3. Faulty harness
4. Defective glow plug checking unit
5. Defective engine control unit (**ECU**)

Solution:

1. Verify that the fault code is still active. Prior to clearing fault codes write down all fault codes, number of occurrences, and engine hours at last occurrence.

   (1) Use the Electronic Service Tool to clear all fault codes.

   (2) To check for fault code: Start and operate machine.

   A. Error code 3694 is not recorded again. OK to return machine to service.

   B. Fault code 3694 is recorded again. There are also fault codes for high battery voltage or high engine temperatures. Troubleshoot these codes before troubleshooting FC3694.

   C. Fault code 3694 is recorded and is active. Continue with Step **2**.

2. Verify that the wiring harness and connectors are free of damage.

   (1) Inspect the **ECU X-937** connector, the glow plug checking unit connector **X-938** , the intermediate engine control unit - engine components connector **X-941** and the glow plug connectors: **X-955** , **X-956** , **X-957** and **X-958** .
   All connections should be secure, tight, free of corrosion, abrasion and damage.

   (2) Inspect the wiring harness from the glow plug checking unit **X-938** to the glow plugs.
   Verify that the harness is free of damage, corrosion, abrasion and incorrect attachment.

   A. The connectors are secure and the harness is free of damage. Continue with Step **3**.

   B. The connectors or the wiring harness has damage. Repair or replace the wiring harness or connectors as required.
   return to Step **1** to confirm elimination of fault.

3. Measure the voltage on the glow plug checking unit.

   Turn the key switch **(1)** OFF.

   (2) Disconnect the glow plug checking unit connector **X-938** .

   Turn the key switch **(3)** ON.

Wire harnesses - Electrical schematic sheet 17 (55.100.DP-C.20.E.17)
Wire harnesses - Electrical schematic sheet 18 (55.100.DP-C.20.E.18)

3722-Lambda sensor - calculated temperature too high

Control Module : ECU

Context:
The lambda probe (oxygen sensor) measures the O2 concentration correctly only when the measuring cell is within a given temperature field. The temperature is estimated by the inner resistance **(Ri)** of the heater. If the estimated temperature is higher than a threshold, a failure is reported.

Cause:
The calculated temperature (based on inner resistance) of the sensor exceeds **839.96 °C** (**1543.9 °F**).

Possible failure modes:

1. Disconnected lambda probe (oxygen sensor)
2. Faulty electrical wiring or connection
3. Defective Lambda probe (oxygen sensor)

Solution:

1. Verify the fault code is still present and in an active state.
   A. If the fault is no longer active or present, check for an intermittent fault.
   B. If the fault is still present and active, continue with step **2**.
2. Turn the key switch OFF. Disconnect the engine harness from the lambda probe at connector **X-943** . Inspect all connectors, pins, and wiring harness for broken connectors, corrosion, bent pins or wire breaks.
   A. If damage is found, Repair or replace as required.
   B. If no damage is found, leave the connector **X-943** disconnected. Continue with Step **3**.
3. Check the wiring. Disconnect the wiring harness from the **ECU** (connector **X-937**). Place ignition switch in off position. Using a multi-meter to test the wiring harness, refer to the table below for test results.

Type of test	From	A	Result
Resistance	**X-937** pin 64, wire 316 (OR)	**X-943** pin 1, wire 316 (OR)	Continuity
Resistance	**X-937** pin 85, wire 317 (GY)	**X-943** pin 2, wire 317 (GY)	Continuity
Resistance	**X-937** pin 7, wire 314 (GN)	**X-943** pin 3, wire 314 (GN)	Continuity
Resistance	**X-937** pin 86, wire 318 (YE)	**X-943** pin 5, wire 318 (YE)	Continuity
Resistance	**X-937** pin 63, wire 315 (BR)	**X-943** pin 6, wire 315 (BR)	Continuity

   A. If any of the above tests fail. Repair or replace as required.
   B. If the all the above tests are correct, replace the lambda probe.
   Use the electronic service tool (EST) to reset the **ECU** oxygen sensor learning values.

3742-Power stages, injector: Too many SPI errors during MoCSOP execution

Control Module : ECU

Context:
If the during start up the engine control unit (**ECU**) detects a faulty communication over SPI during the **ECU** shut off path test, this fault will occur. Try to flash the **ECU** correctly with the proper data set. If the fault persists, replace the **ECU**.

3762-Level 2 monitoring - sensor supply voltage too high

Control Module : ECU

NOTE: *When the cause of the error code has been rectified, clear the error code and test the system for normal operation.*

NOTE: *Check alternator output voltage. Troubleshoot charging system before proceeding.*

Cause:
The engine control unit (**ECU**) also provides power at **5 V** for the sensors. This **5 V** supply is monitored to ensure it remains within a certain range. The **ECU** monitors the voltage against predetermined lower and upper thresholds.

Possible failure modes:

1. Faulty wiring.
2. Faulty connectors
3. Defective engine control unit (**ECU**)

Solution:

1. Before proceeding clear the error code with the approved diagnostic equipment. Run the tractor under normal conditions and retest.

   A. If the error code is not indicated, check that the system is operating correctly.

   B. If the fault is still present, continue to step **2**
2. Check for other engine sensor related error codes.

   A. If other engine sensor related error codes are displayed, continue to these tests.

   B. If no other engine sensor related error codes are displayed, continue to step **3**
3. Check for **12 V**

   A. Turn the ignition key switch ON. Measure voltage between connector
   . **X-937** , pin 1 (RD/BK) and ground
   X-937 pin 3 (RD/YE) and ground
   X-937 pin 5 (RD/YE) and ground
   X-937 pin 28 (BK/WH) and ground
   If the voltage indicated is not approximately **12 Volts**, Repair or replace wiring harness as needed.

   B. If the **ECU** supply voltage is okay, download the correct level of software.
   If the fault is still present, Remove and replace the **ECU**.

Wire harnesses - Electrical schematic sheet 17 (55.100.DP-C.20.E.17)

3810-Common rail pressure sensor - intermittent signal

Control Module : ECU

Context:
The engine control unit (**ECU**) has detected an intermittent fault in the rail pressure signal.

Cause:
There is a loose connection in the rail pressure circuit.

Possible failure modes:

1. Faulty wiring or connection
2. Defective pressure sensor in the "common rail" injector (**B-023**)

Solution:

1. Disconnect the engine sensor wiring harness from the rail pressure sensor connector **X-967** . Inspect connector housing body/latch, pins, and wiring harness for damage.

   A. If damage is determined after careful inspection, Repair or replace as required.

   B. If no damaged is determine, continue with step **2**.
2. Check the pressure sensor in the "common rail" injector (**B-023**). Inspect connector **X-967** housing body/latch, pins.

   A. If damage is determined after careful inspection, Repair or replace as required.

   B. If no damaged is found. Clear fault and return machine to proper operation.

return to Step **1** to confirm the elimination of the failure.

B. The voltage is greater than **0.5 V**.
There is a short circuit to another voltage source. Repair/replace wiring as needed.
return to Step **1** to confirm the elimination of the failure.

Wire harnesses - Electrical schematic sheet 18 (55.100.DP-C.20.E.18)

(1) Turn the ignition key switch OFF.

(2) Disconnect the **ECU X-937** connector. Disconnect the inline turbine temperature sensor connector **X-971** .

(3) Measure the resistance from the **ECU X-937** connector (pin 82, wire 326 (BK/WH) to frame ground. The resistance should be greater than **20,000 Ω** Wiggle the harness during measurement to reveal an intermittent condition.

A. The resistance is greater than **20,000 Ω**. Continue with Step **5**.

B. The resistance is less than **20,000 Ω** there is a short circuit between the sensor signal wire and chassis ground. Repair or replace the signal wire as required.
Continue with Step **1** to confirm elimination of fault.

5. Measure the resistance of the signal wire to chassis ground.

(1) Turn the ignition key switch OFF.

(2) Disconnect the inline turbine temperature sensor connector **X-971** .

(3) Measure the resistance of the inline turbine temperature sensor connector **X-971** pin 1 to frame ground. The resistance should be greater than **20,000 Ω**.

A. The resistance is greater than **20,000 Ω**. Temporarily replace the **ECU** and retest.
Continue with Step **1** to confirm the elimination of the fault.

B. The resistance is less than **20,000 Ω** There is a short circuit between the sensor and the frame ground. Temporarily replace the sensor and retest.
Continue with Step **1** to confirm elimination of fault.

Index

Electrical systems - 55

FAULT CODES - DTC

Bucket support - Disassemble Position indicator

Powerstar	
T4.75 Powerstar Less cab, Tier 4B (Final) [ZxAHxxxxx]	
T4.75 Powerstar With cab, Tier 4B (Final) [ZxAHxxxxx]	

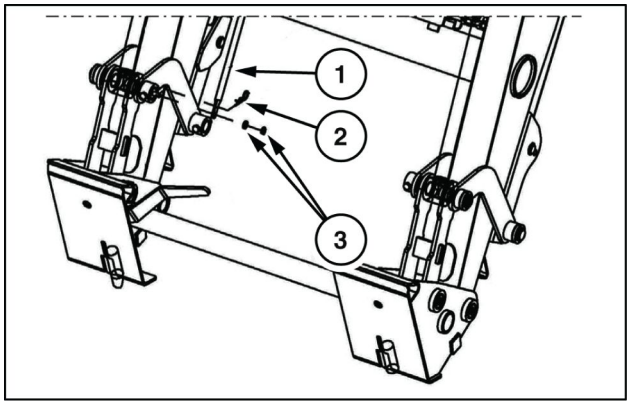
ATTENTION: *Lift and handle all heavy parts using suitable lifting equipment. Make sure that assemblies or parts are supported by means of suitable slings and hooks. Ensure that no-one is in the vicinity of the load to be lifted.*

Proceed as follows:

NOTE: *The lift arm must be fitted on the tractor and securely resting on the ground.*

NOTE: *Perform the following operation with engine switched Off and hydraulic pipes detached.*

1. Extract the cotter pin **(2)** and recover the spacers **(3)**.
2. Detach the position indicator **(1)** from the relevant pin and extract it from the slide slot on the lift arm.



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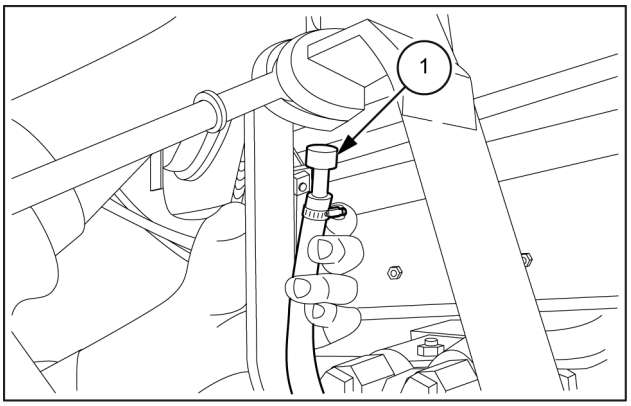
8. Position and secure the breather **(1)** of the transmission case.



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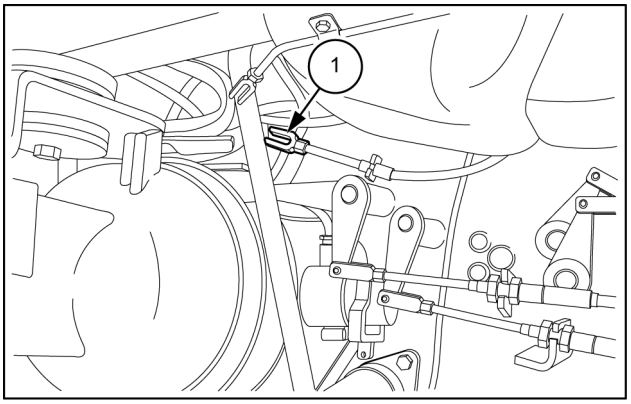
9. Connect the differential lock cable **(1)** with mechanical coupling.



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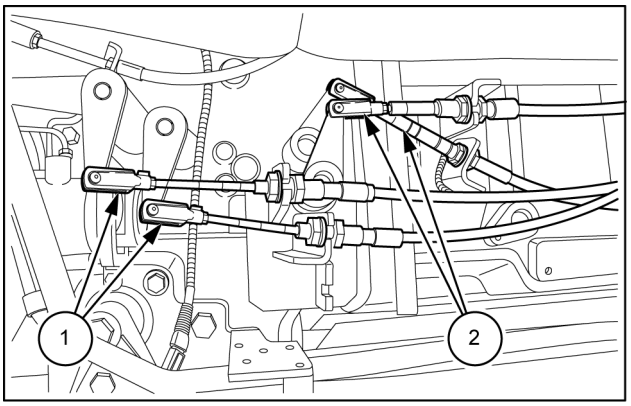
10. Position, connect, and secure the gearshift control tie rods **(2)** and range gear **(1)**.



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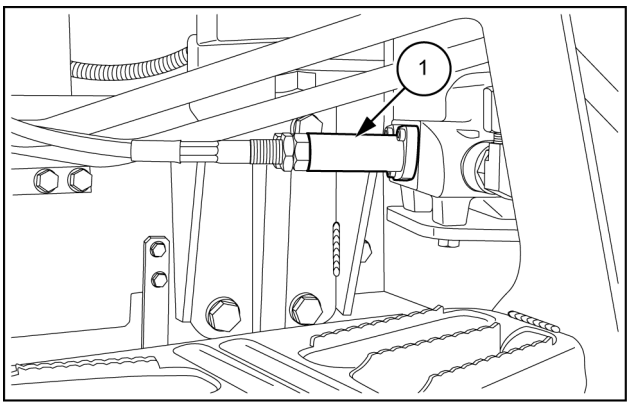
11. Connect the control tie rods **(1)** of the side control valves.



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