SERVICE MANUAL

W190D
W230D
Tier2
Wheel Loader

Part number 48083745
English
July 2018

NEW HOLLAND CONSTRUCTION

Basic instructions - Electrical equipment precautions

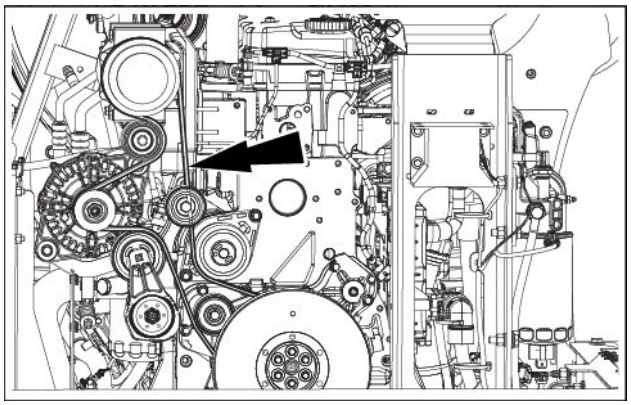
⚠ WARNING

Battery acid causes burns. Batteries contain sulfuric acid.
Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.
Failure to comply could result in death or serious injury.

W0111A

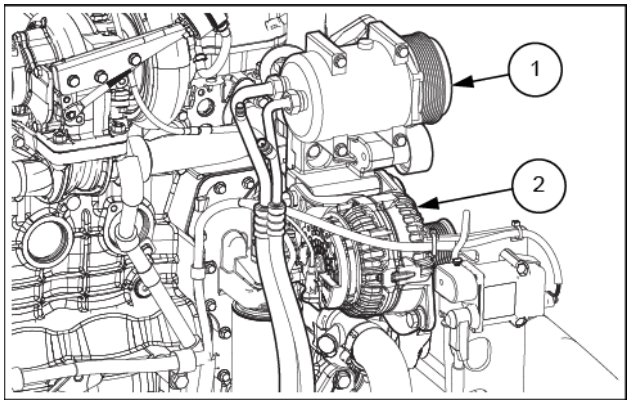
- The disassembly of electrical equipment is not allowed.
- Handle equipment with care so as not to drop it or bump it.
- Connector should be removed by unlocking while holding the connector.
- Never disconnect electrical plugs by pulling on the wires. Always use only the electrical connectors to make the disconnection.
- Check that connector is connected and locked completely.
- Engine key off before removing and connecting connector.
- Engine key off before touching terminals of starter and alternator.
- Wash machine with care so as not to splash water on electrical equipment and connector.
- If water has entered a sealed connection, thoroughly dry both connectors before reconnecting
- Remove battery grounding terminal before beginning work close to battery and battery relay with tools.

20. Remove the drive belt from the engine.



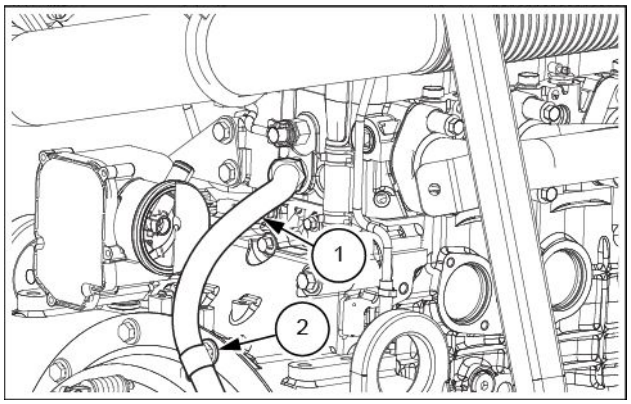
LEIL17WHL0117AB 21

21. Tag and disconnect the ACT connector from the air-conditioning compressor clutch and ALT_5, ALT_B connectors from the alternator.
Remove the alternator **(2)** and air-conditioning compressor **(1)**.



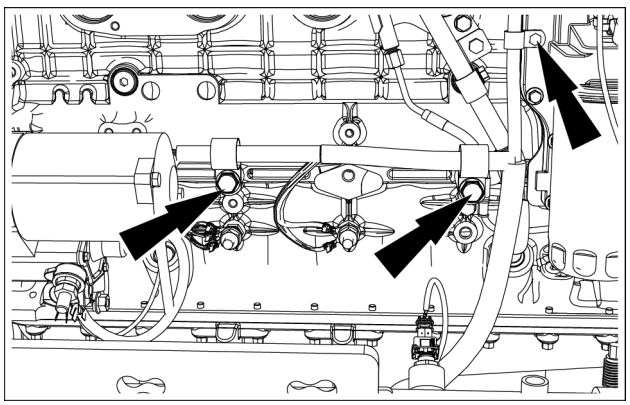
LEIL17WHL0116AB 22

22. Remove the clamp **(2)** that secures the heater supply hose **(1)** to the flywheel cover.
Tag and disconnect the heater supply hose **(1)** from the engine.



LEIL17WHL0115AB 23

23. Remove the clamps that secure the cables to the engine.



LEIL16WHL0570AB 24

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Engine and crankcase - 001

(*) See content for specific models

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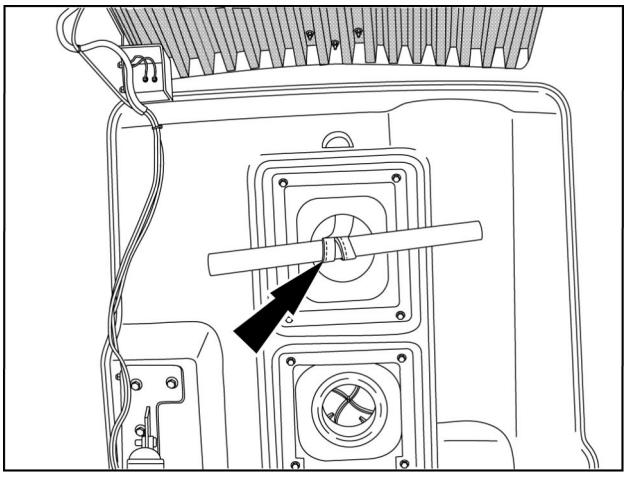
Fan and drive - 414

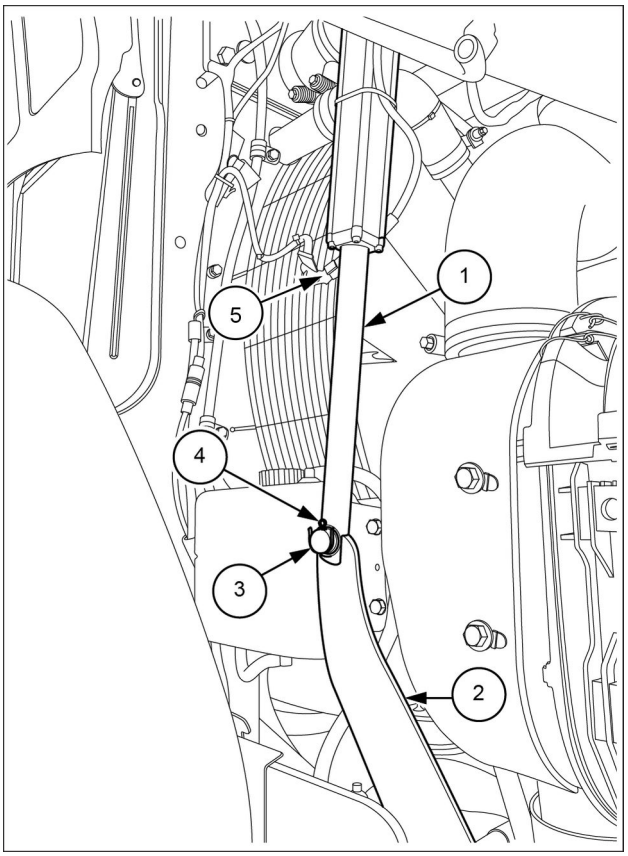
6. Place a solid steel bar through the strap loop (see arrow) and tighten. Attach the other end of the strap to a suitable lifting device and remove any slack in the line.

NOTE: *note the position of the lifting bar strap. It is offset to even out the weight distribution of the hood.*



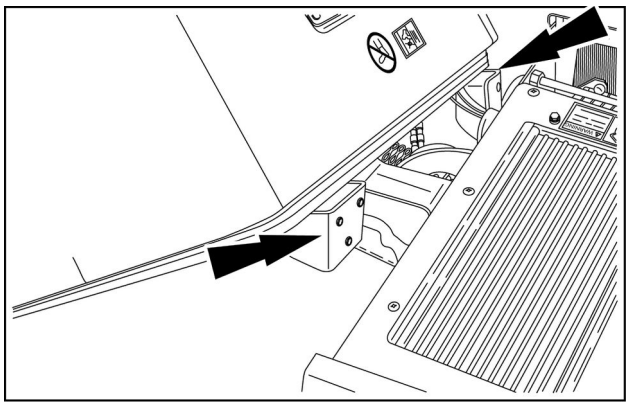
RAPH12WEL0600AA 3

7. Disconnect the connector **(5)**. Remove the cotter pin **(4)** and the clevis pin **(3)** to separate the hood support strut **(2)** from the lifting to separate the. Turn the timed disconnect switch back to the ON position and run hood strut up. Once strut is retracted, return the timed disconnect switch back to the OFF position.



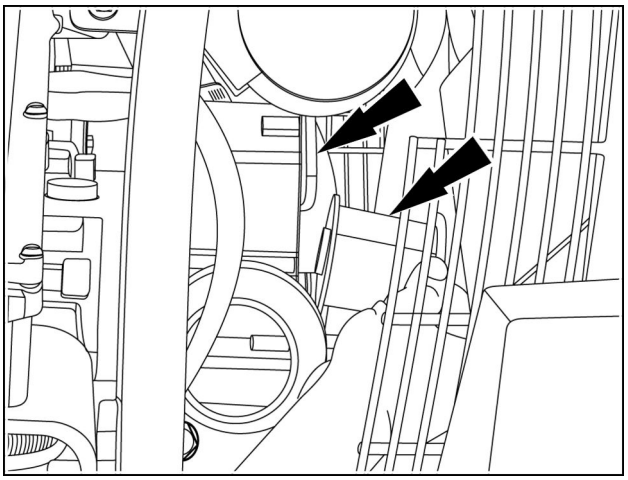
LEIL16WHL1837BB 4

8. Remove the hood bracket bolts and move hood away from back plate, allowing enough clearance to reach the front bolts of the air cooler unit.



LEIL13WHL0183AA 5

6. Remove the filters from the filter housing and replace them.



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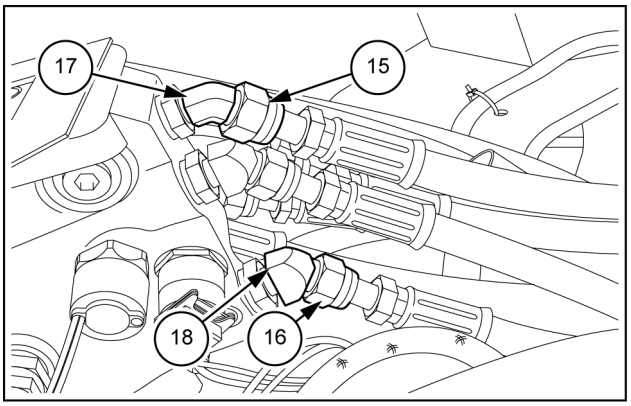
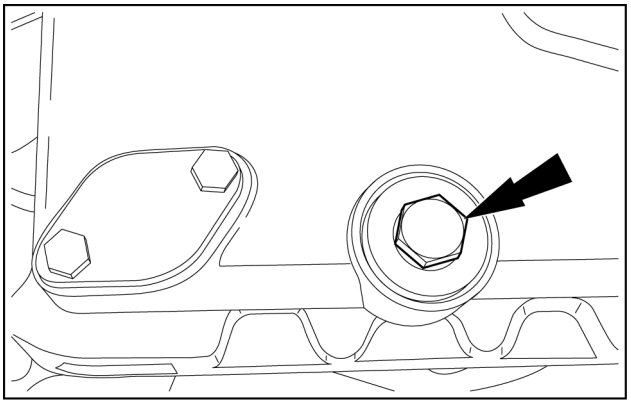
19. Install new O-ring face seals in fittings **(17)** and **(18)**. Connect brake to the hydraulic reservoir hose **(16)** and the brake pump pressure hose **(15)** following tags installed during removal. Remove and discard tags.



LEIL13WHL1435AB 20

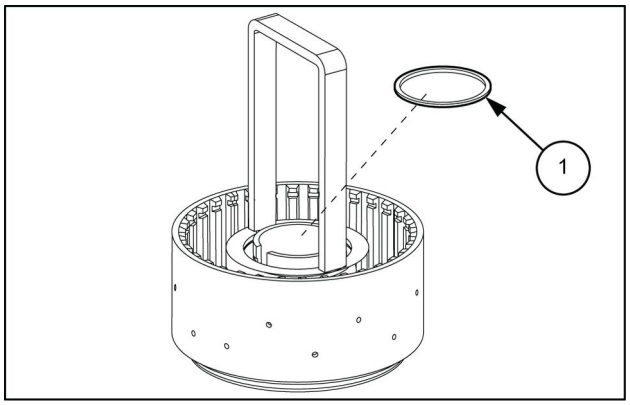
20. Check that transmission drain plug is tight.



LEIL13WHL1454AB 21

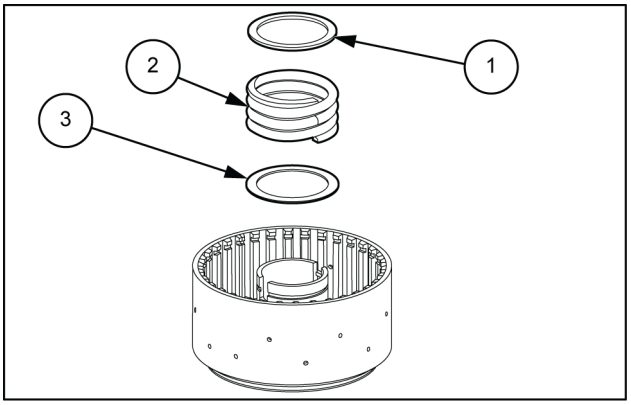
21. Fill the transmission to correct level shown in sight glass, with approved transmission hydraulic oil.
22. Install the hydraulic pump.
23. Install the cab.
24. Start and run engine at idle speed with transmission in neutral. If transmission oil level is at or below bottom of cross hatch region, put articulation lock in LOCKED position and add additional approved transmission hydraulic oil until oil level is up to crosshatch region. Shut down engine and put articulation lock in OPERATING position.

12. Preload the compression spring with special tool 380001556 and unsnap L-ring **(1)**.



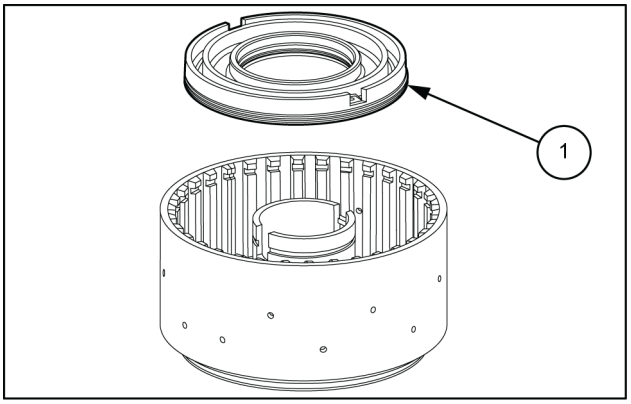
LEIL13WHL0847AB 77

13. Remove the support shim **(1)**, the compression spring **(2)** and the washer **(3)**.



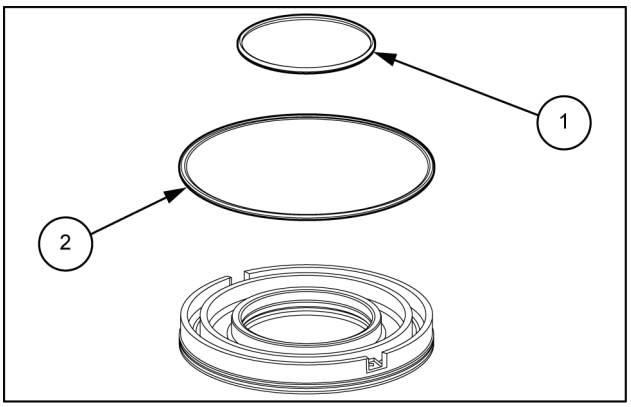
LEIL13WHL0848AB 78

14. Using compressed air, remove the piston **(1)** from the disc carrier.



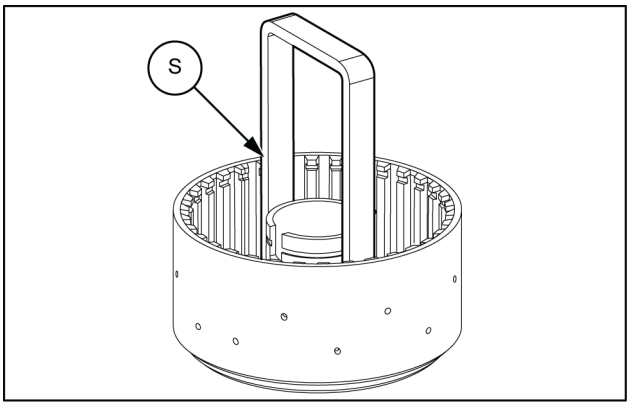
LEIL13WHL0849AB 79

15. Remove both O-rings **(1)** and **(2)**.



LEIL13WHL0850AB 80

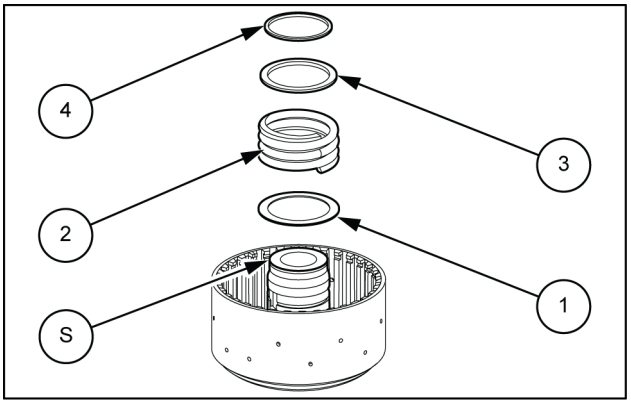
8. Use special tool 380001556 **(S)** to place piston into the disc carrier.



LEIL13WHL0893AB 8

9. Mount the inner installer **(S)** onto the disc carrier. Install the disc **(1)**, the compression spring **(2)**, the support shim **(3)** and the L-ring **(4)**.

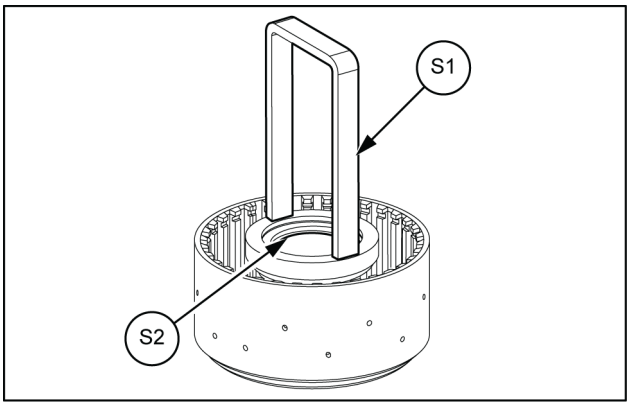
NOTE: *for installation position of the support shim **(3)** and L-ring **(4)** see the next two steps.*



LEIL13WHL0894AB 9

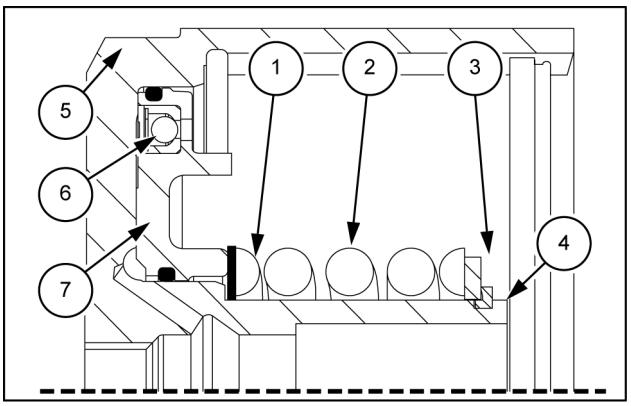
10. Use special tool 380001556 **(S1)** and pressure piece **(S2)** to preload compression spring until the L-Ring has engaged into the annular grove.

NOTE: *Always use a new L-ring.*



LEIL13WHL0895AB 10

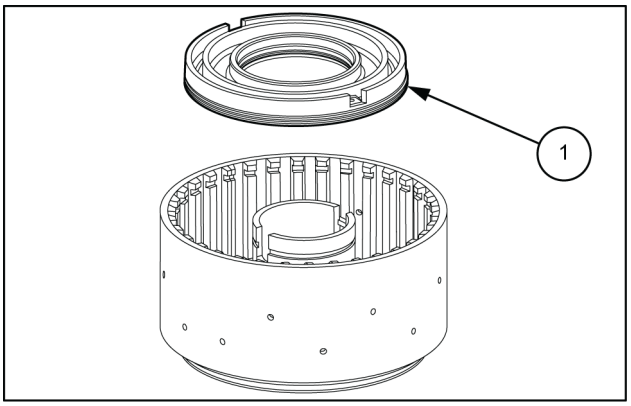
11. Disc carrier with piston retraction:
    1. Washer
    2. Compression spring
    3. Support shim
    4. L-Ring
    5. Disc carrier
    6. Drain valve (piston)
    7. Piston with O-Rings



LEIL13WHL0896AB 11

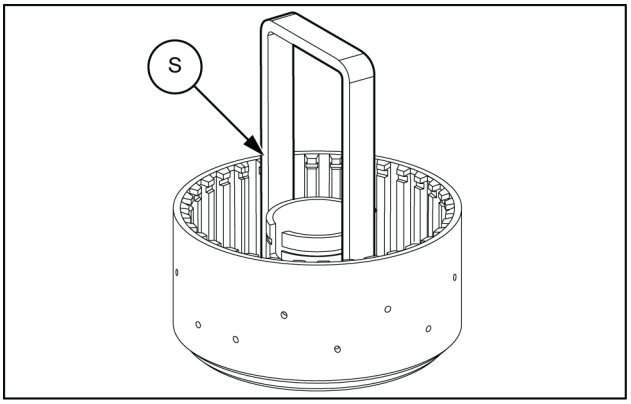
4. Place the piston **(1)** into the disc carrier.

NOTE: *observe installation position.*



LEIL13WHL0849AB 96

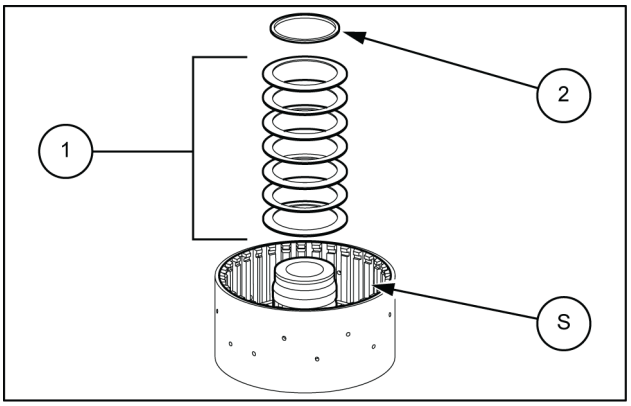
5. Use special tool 380001556 **(S)** to place piston into the disc carrier.



LEIL13WHL0893AB 97

6. Mount the inner installer **(S)** onto the disc carrier. Install the cup spring package **(1)** and L-ring **(2)**.

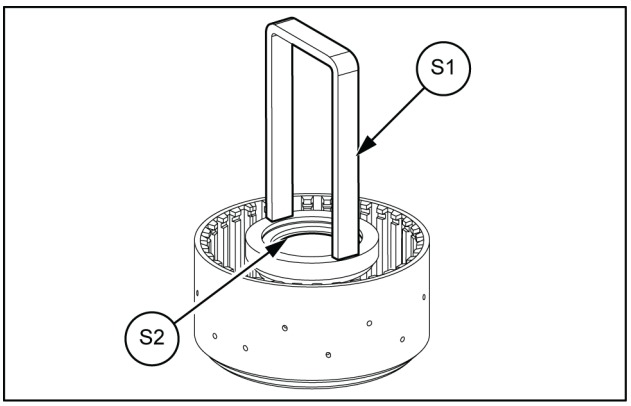
NOTE: *for installation position of cup spring package and L-ring see next two steps.*



LEIL13WHL0911AB 98

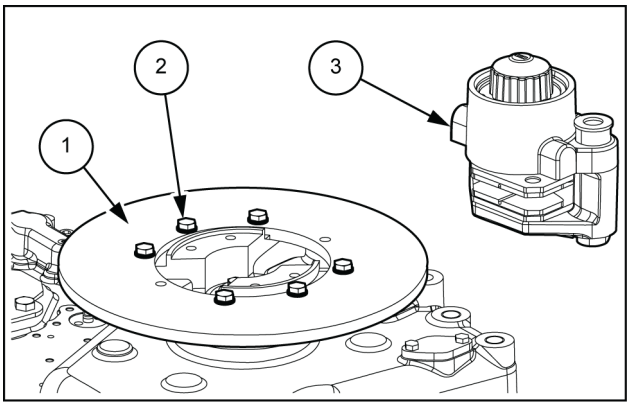
7. Use special tool 380001556 **(S1)** and pressure piece **(S2)**, until L-Ring has engaged into the annular grove to preload cup spring package.

NOTE: *always use a new L-ring.*



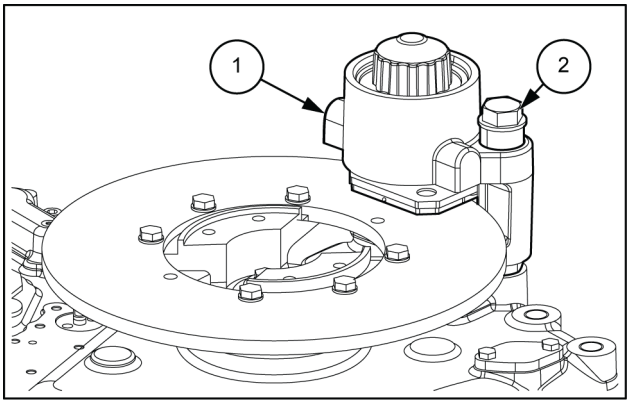
LEIL13WHL0895AB 99

4. Secure the brake disc **(1)** at the output flange **(2)** using hexagonal bolts and washers. Torque to **68 N·m** (**50 lb ft**). Connect a hand-operated pump at port and apply approximately **80 bar** (**1160 psi**) pressure to the parking brake **(3)** and bring it in contact position.



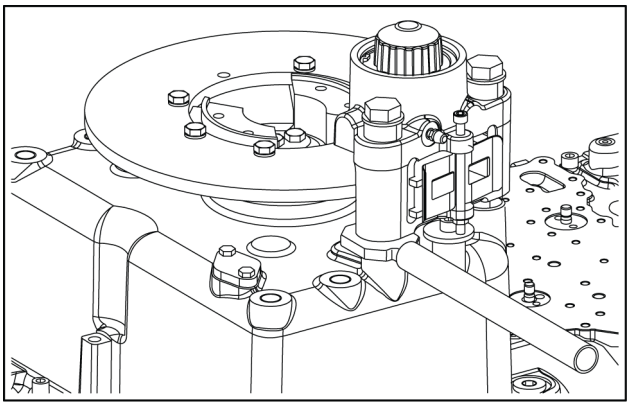
LEIL13WHL0993AB 183

5. Attach the parking brake **(1)** on transmission housing using the hexagonal bolt - guide pin **(2)**.
Torque to **46 N·m** (**34 lb ft**).



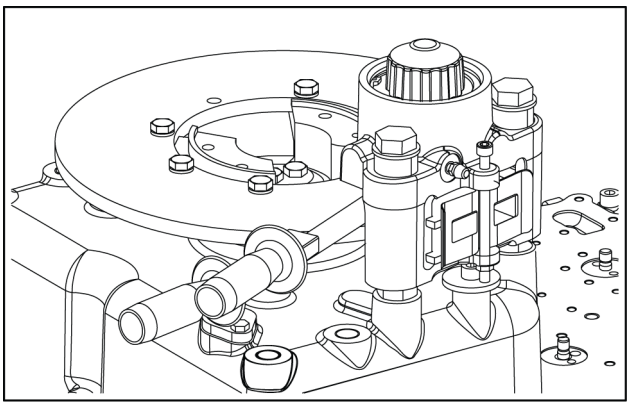
LEIL13WHL0994AB 184

6. Secure the hexagonal nut on brake caliper using the open end wrench insert. Torque to **230 N·m** (**170 lb ft**).



LEIL13WHL0995AA 185

7. Insert setting gauge on both sides between base disc and brake disc and hold in its position. Clearance: **0.5 – 1.5 mm** (**0.02 – 0.06 in**), Nominal clearance: **1.0 mm** (**0.04 in**).

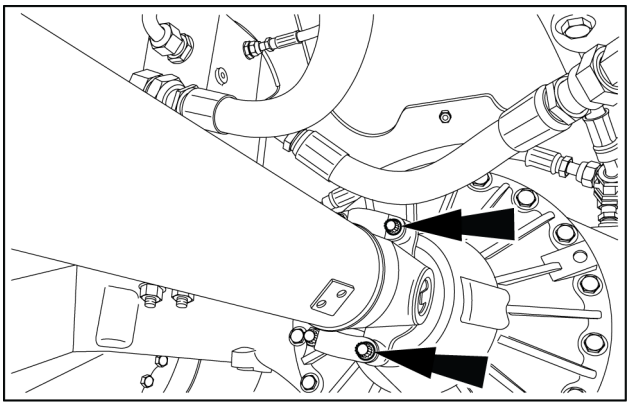


LEIL13WHL0996AA 186

Drive shaft - Install - Front Drive Shaft

NOTE: *the W230D Series machines use mechanical style yokes (no bearing straps) and may appear different from the machine pictured.*

1. Apply antiseize compound to the bearing area of the front drive shaft.
2. Place the front drive shaft into position in the center bearing of the machine.
3. Install the bolts and straps that fasten the front drive shaft to the front axle.
   W190D: **75 – 81 N·m** (**55 – 60 lb ft**)
   W230D: **136 – 149 N·m** (**100 – 110 lb ft**)

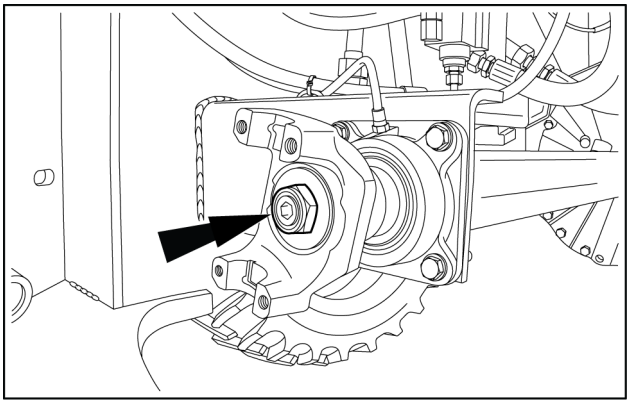


LEIL13WHL1065AB 1

4. Apply antiseize compound to the splines on the front drive shaft.
5. Install the yoke to the front drive shaft, making sure the alignment marks made during removal are aligned.

NOTE: *if a new front drive shaft has been installed, make sure the yoke being installed is* ***90*** *˚ to the yoke on the other end of the front drive shaft.*

6. Install the lock nut and washer which fastens the yoke to the front drive shaft. Tighten the lock nut to a torque of **339 – 375 Nm** (**250 – 275 lb.ft**).



LEIL13WHL1064AB 2

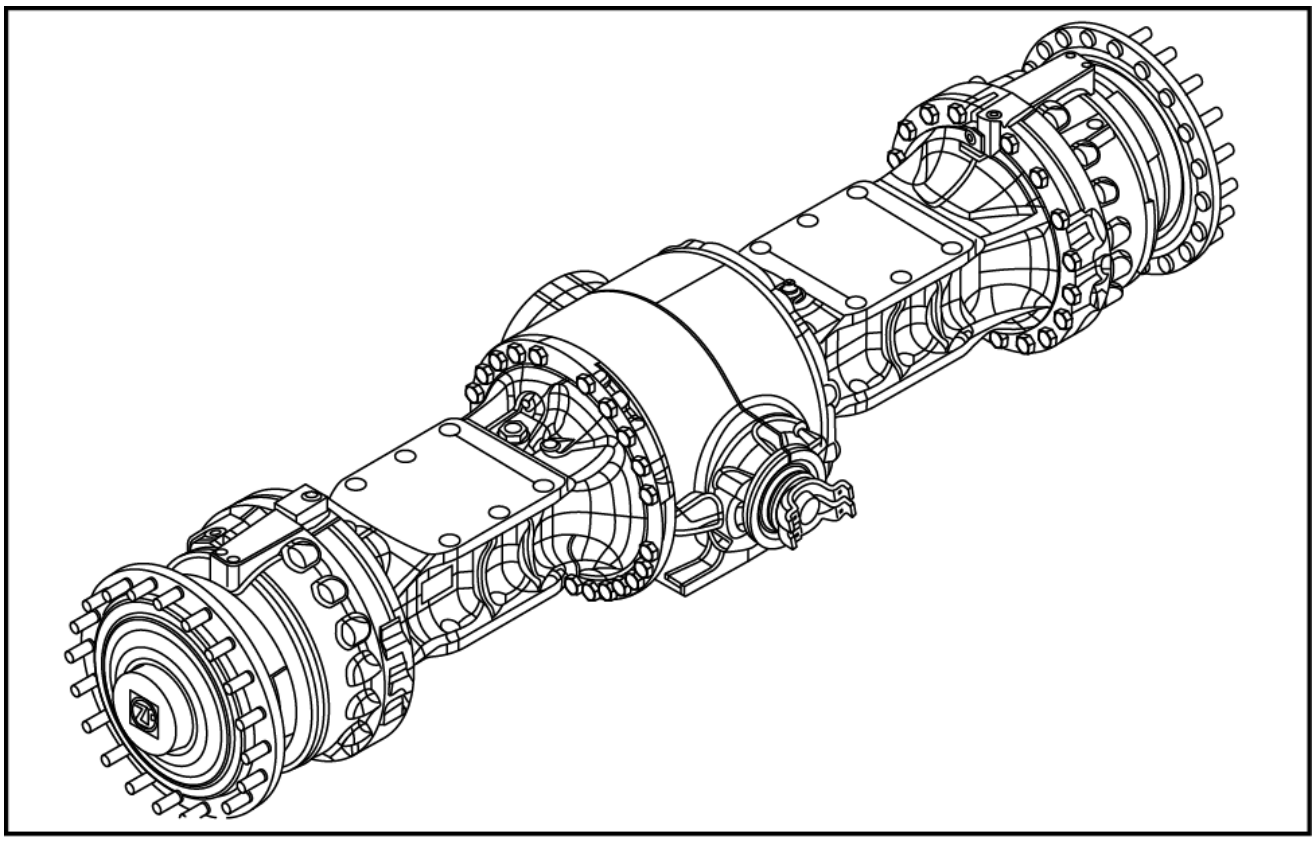
7. Tighten the set screws that secure the center bearing to the front drive shaft alternately until they stop turning and the hexagonal head socket wrench starts to spring. Turn the set screw down to the shaft and then back it off 1/4 turn and lock it with the jam nut.

NOTE: *if installing new bearing, remove longer set screws and jam nuts from the old bearing to reuse them on the new bearing.*

Powered front axle - General specification

Front Axle Model MT-L3105II - Open Differential

Front Axle Model MT-L3105II - Locking Differential



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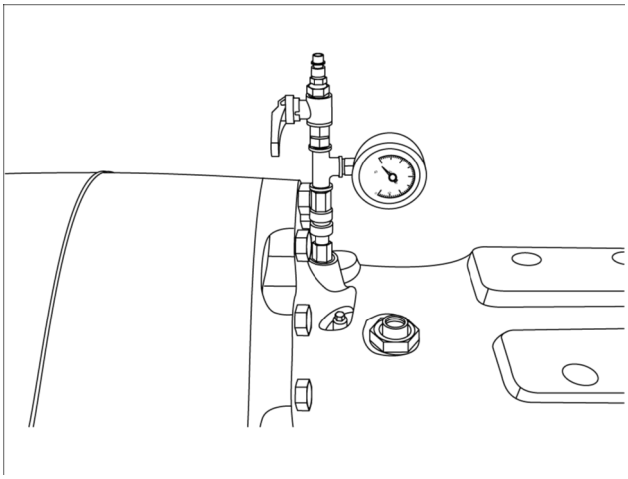
OVERALL WIDTH	**2476 mm** (**97 in**)
DISTANCE FLANGE TO FLANGE	**2314 mm** (**91 in**)
WHEEL MOUNTING BOLT CIRCLE DIAMETER	**425 mm** (**17 in**)
WHEEL MOUNTING BOLTS (LIMITED SLIP DIFFERENTIAL)/WHEEL MOUNTING STUDS (LOCKING DIFFERENTIAL)	20 (M22x1.5)
HUB RATIO	6.00:1
CROWN/PINION RATIO	4.11:1
OVERALL RATIO	24.67:1
CLOCKWISE INPUT ROTATION (FACING INPUT FLANGE) FOR FORWARD TRAVEL	–

21. Differential lock leak test. Pressurize the lock to p = **1 bar** (**15 psi**), close the shutoff valve and remove the air line. No noticeable pressure loss must occur within 10 seconds.

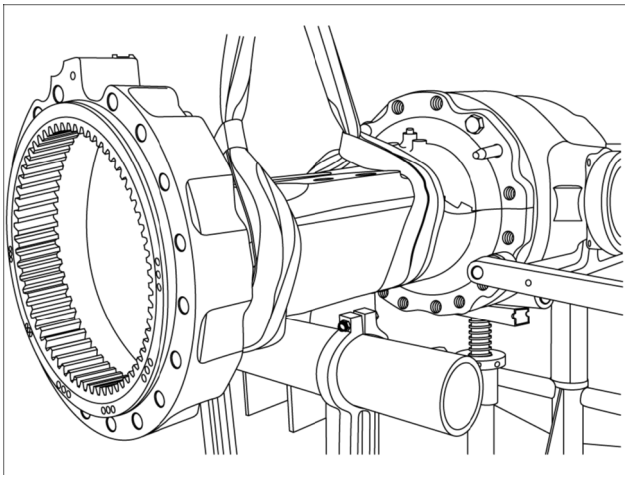
NOTE: *this operation is only needed for versions with DHL differential.*



RAIL11WEL0369BA 21

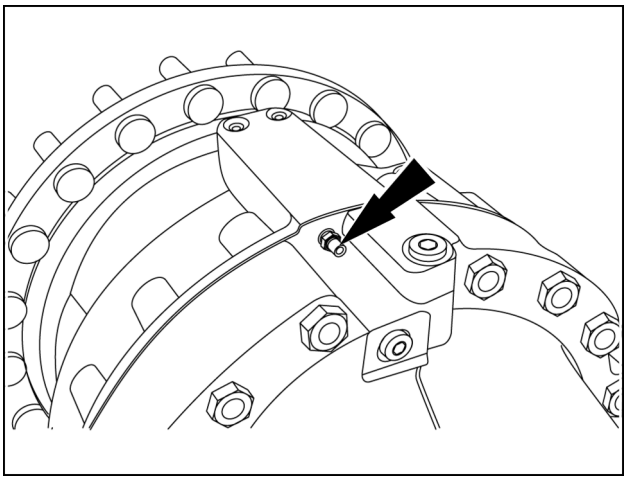
22. Rotate the input flange, in both directions and several times, to roll the crown wheel over the input pinion. Remove the axle housing and lift the differential out of the axle drive housing. Compare the obtained contact pattern with the contact pattern examples at the beginning of this section.

NOTE: *if the tooth contact pattern differs, an incorrect shim size was selected in* ***5****. This must be corrected.*



RAIL11WEL0370BA 22

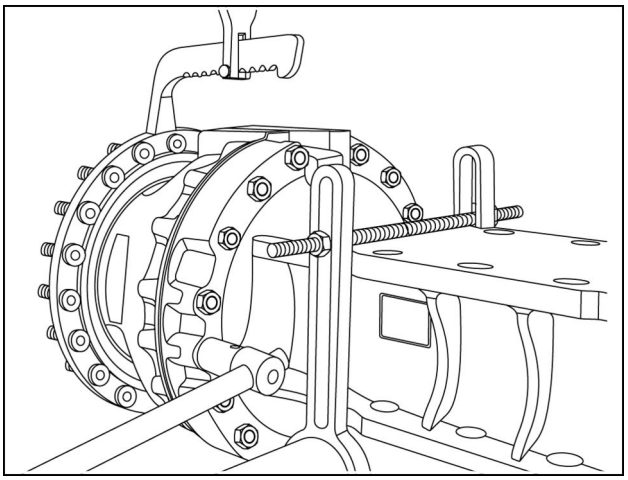
4. Remove the bleeder valves to avoid damage during the output and axle housing separation.



RCIL11WHL004BAF 4

5. Attach a suitable lifting device to the output assembly. Remove the bolts and separate the output assembly from the axle housing.

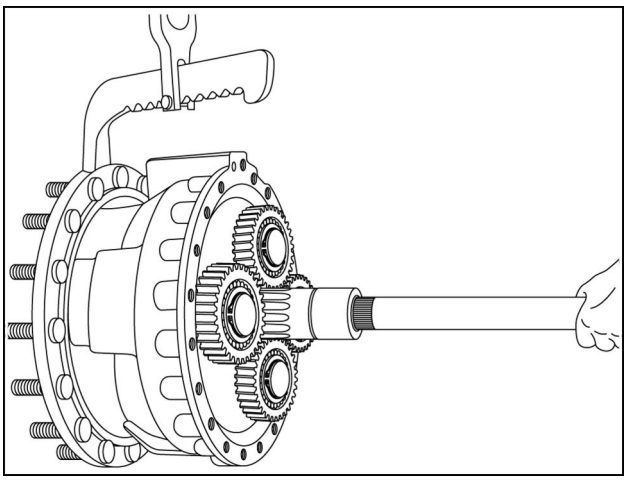
NOTE: *attach the load carrying device with a wheel nut.*



RCIL11WHL005BAF 5

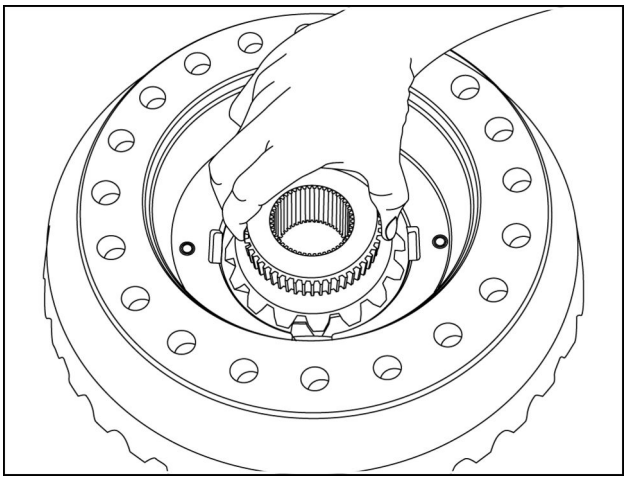
6. Pull the stub shaft and sun gear shaft from the output.

NOTE: *watch for the loose shim(s).*



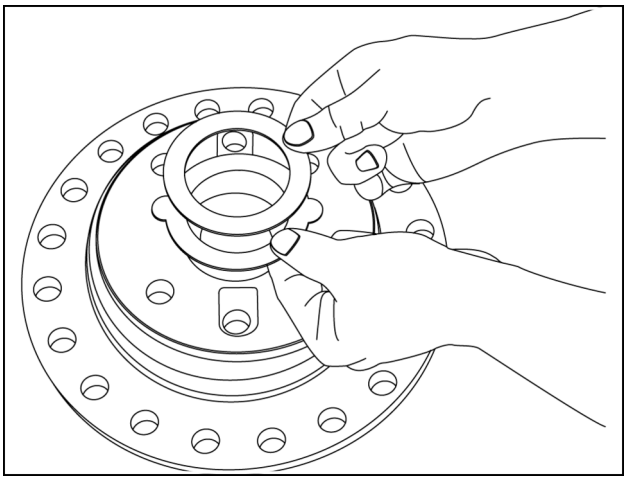
RCIL11WHL006BAF 6

7. Mount the second axle bevel gear.



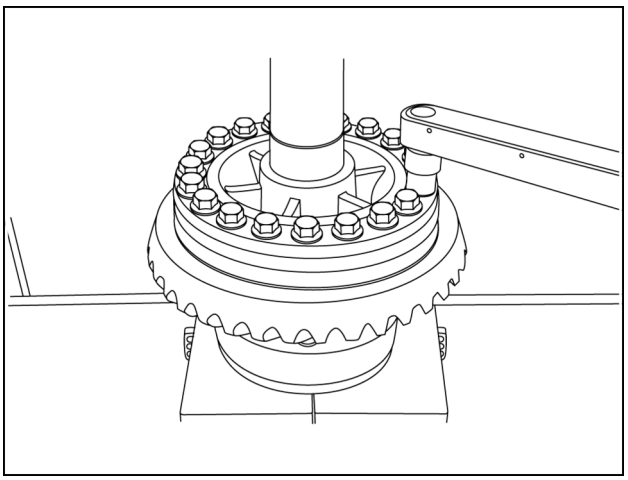
RCIL11WHL082BAF 7

8. Secure the thrust washers into the housing cover with grease.



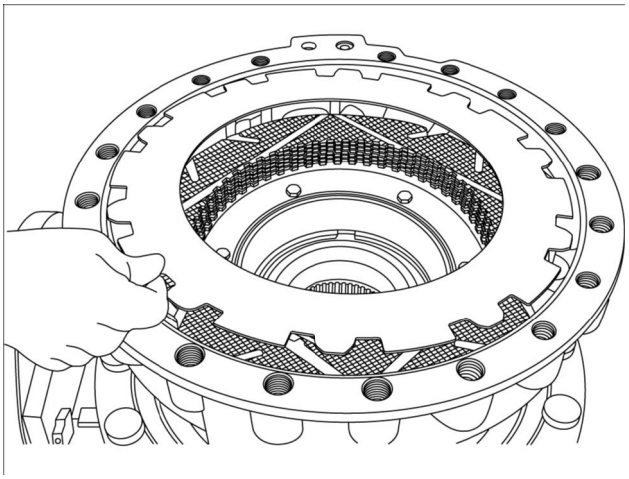
RCIL11WHL083BAF 8

9. Mount two adjusting bolts and insert the housing cover until the contact with the differential housing is obtained. Preload the differential by using a press. Secure with new locking bolts. Torque to **400 N·m** (**295 lb ft**).



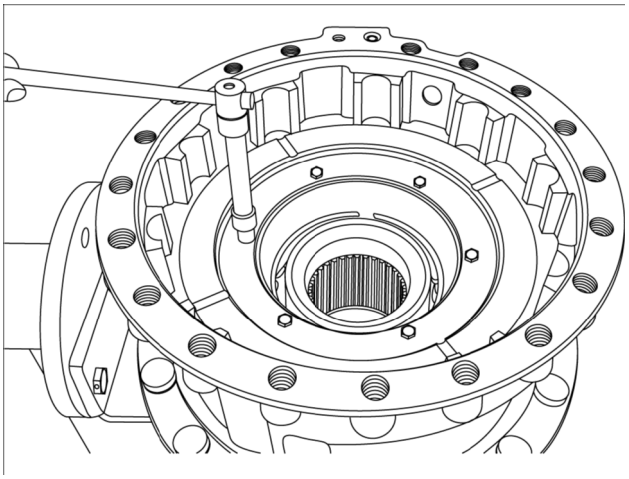
RCIL11WHL084BAF 9

10. Lift the disk package out of the brake housing.



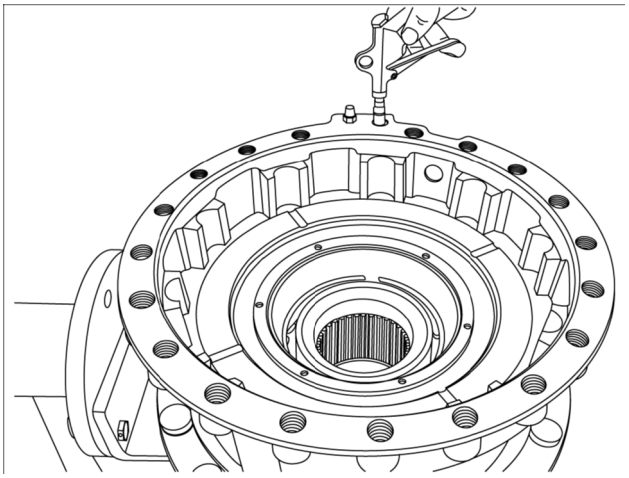
RAIL11WEL0193BA 10

11. Remove the bolts, releasing cover and cup spring.



RAIL11WEL0194BA 11

12. Mount the bleeder valve. Use compressed air to remove the piston from the brake housing.



RAIL11WEL0195BA 12

Wheel hub - Visual inspection Model 3105 II

NOTICE: *do not use compressed air to dry bearings. Allow bearings to air dry.*

NOTICE: *wear face protection when using compressed air.*

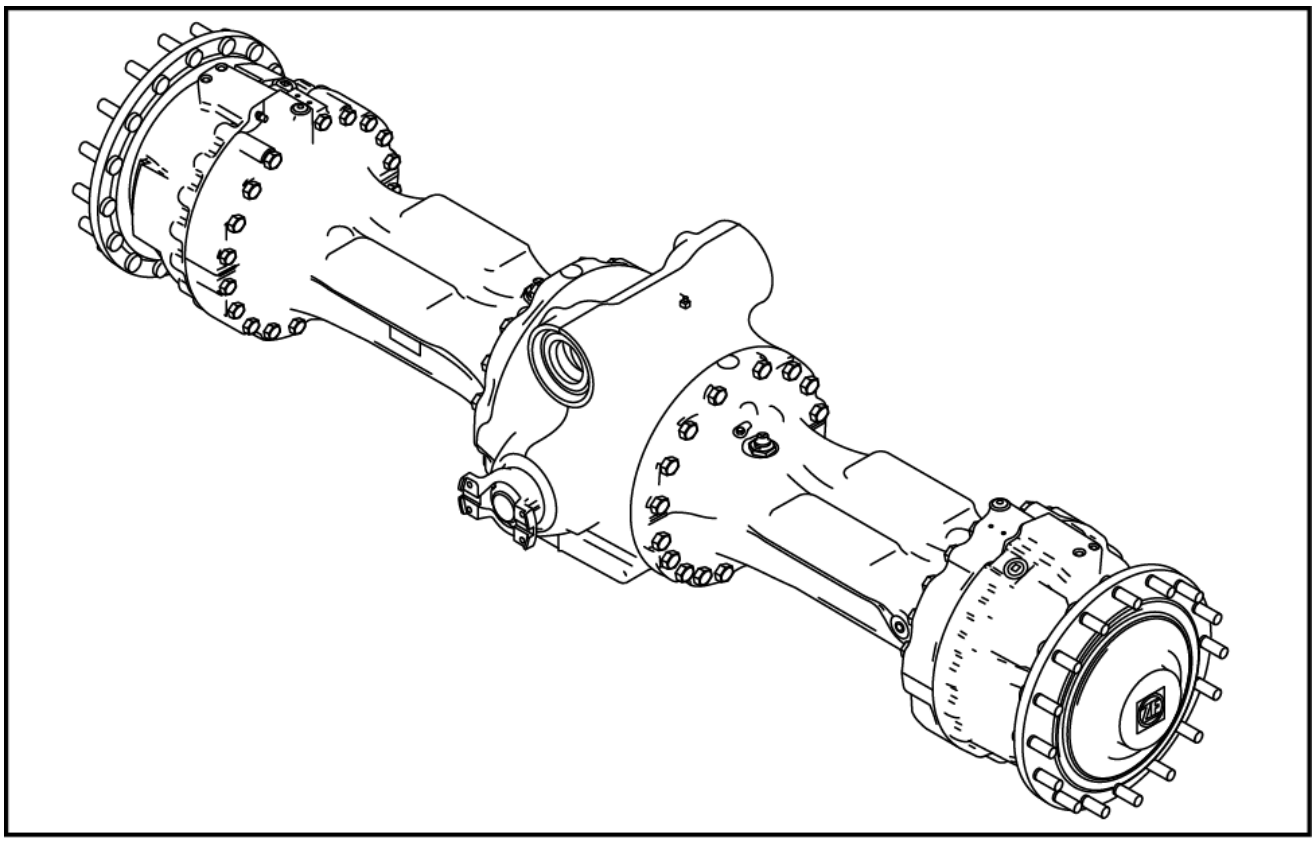
1. Clean all parts except the friction plates in the brake disc pack by using a cleaning solvent. Use compressed air to clear the passages in the planetary ring gear and brake housing.
2. Inspect the bearing rollers for pitting, scoring, deformation, or other damage. Check the inner face and bearing cage for deformation, dents, and other damage. Check the associated bearing cups for scratches, grooves, or cracks. Check the bearings for rough spots or binding by holding bearing and rotating. If the bearing binds or action are not smooth, replace the bearing.
3. Inspect the bearing cups for pitting, scoring, cracks, or other damage. Replace if any of these conditions are seen.

NOTE: *if a bearing or bearing cup requires replacement, the associated part must also be replaced.*

4. Check the planetary ring gear, planetary gears, and planetary carrier gear teeth for cracks, breaks, chipping, or other damage. Replace the part if any of these conditions are seen. Check the planetary carrier shaft splines for broken, cracked, or twisted condition. Replace if needed.
5. Check the wheel end shaft for cracked, broken, or twisted splines. Replace if any of these conditions are seen.

W230D

Rear Axle Model MT-L3095II - Open Differential

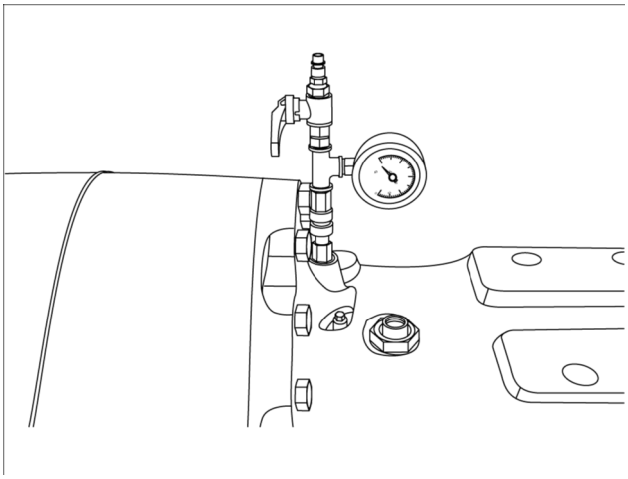


LEIL13WHL1209AA 2

OVERALL WIDTH	**2483 mm** (**98 in**)
DISTANCE FLANGE TO FLANGE	**2314 mm** (**91 in**)
WHEEL MOUNTING BOLT CIRCLE DIAMETER	**425 mm** (**17 in**)
WHEEL MOUNTING STUDS	20 (M22x1.5)
HUB RATIO	6.00:1
CROWN/PINION RATIO	4.11:1
OVERALL RATIO	24.67:1
CCW INPUT ROTATION (FACING INPUT FLANGE) FOR FORWARD TRAVEL	–

20. Leak test differential lock. Pressurize the lock to p = **1 bar** (**15 psi**), close the shutoff valve and remove the air line. No noticeable pressure loss must occur within 10 seconds.

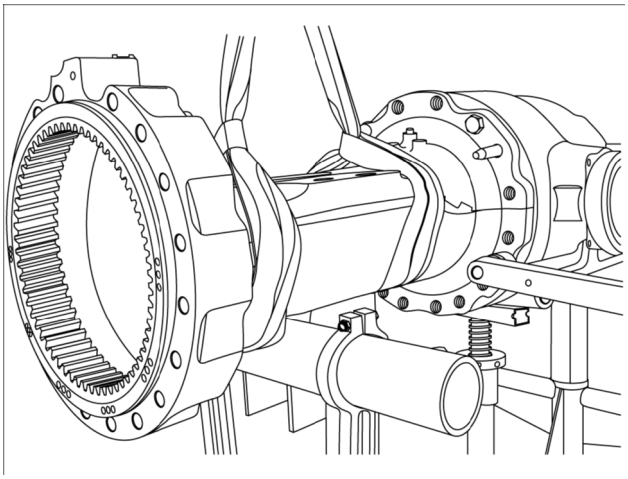
NOTE: *this operation is only needed for versions with DHL differential.*



RAIL11WEL0369BA 21

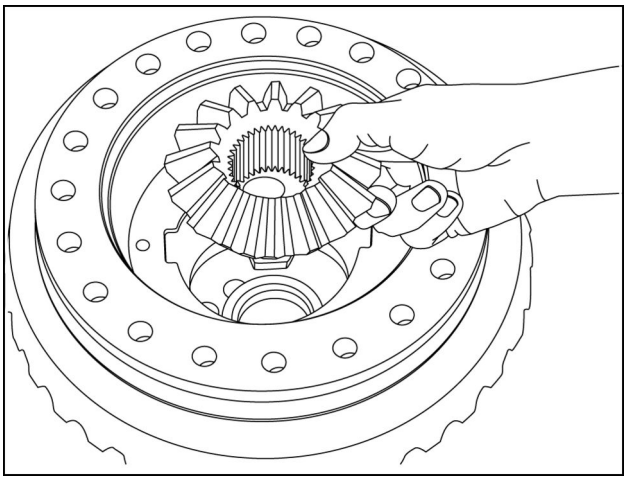
21. In both directions, several times, rotate the input flange to roll the crown wheel over the input pinion. Remove the axle housing and lift the differential out of the axle drive housing. Compare the obtained contact pattern with the contact pattern examples at the beginning of this section.

NOTE: *if the tooth contact pattern differs, an incorrect shim size was selected in the previous steps. This must be corrected.*



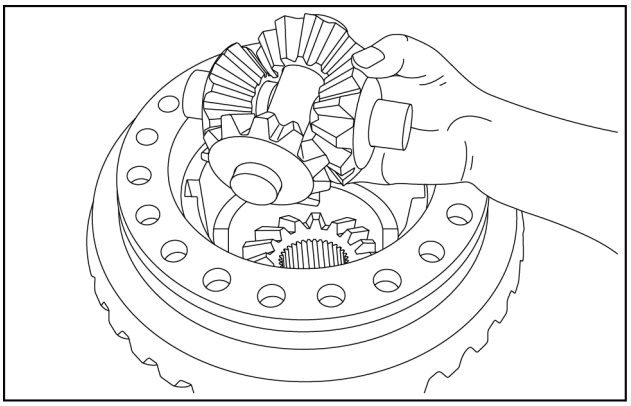
RAIL11WEL0370BA 22

5. Install the axle bevel gear until the contact is made. Then install the inner discs with teeth.



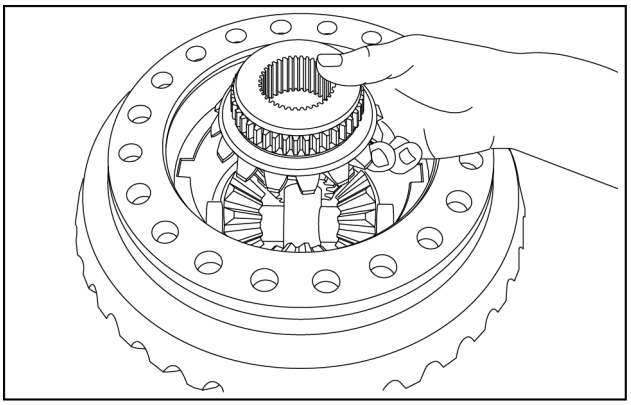
RCIL11WHL078BAF 5

6. Preassemble the differential spider and insert it into the differential housing/pressure ring.



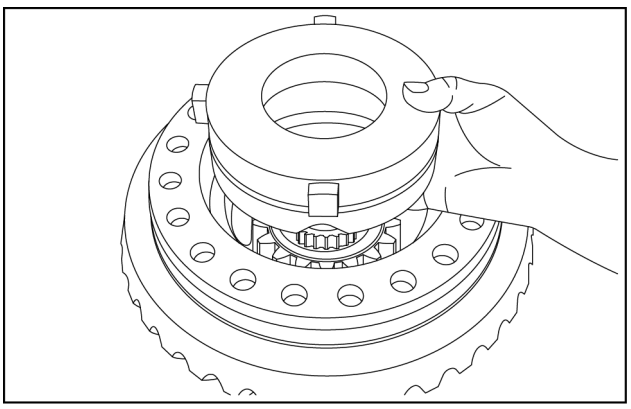
LEIL13WHL0599AA 6

7. Install the second axle bevel gear.



LEIL13WHL0600AA 7

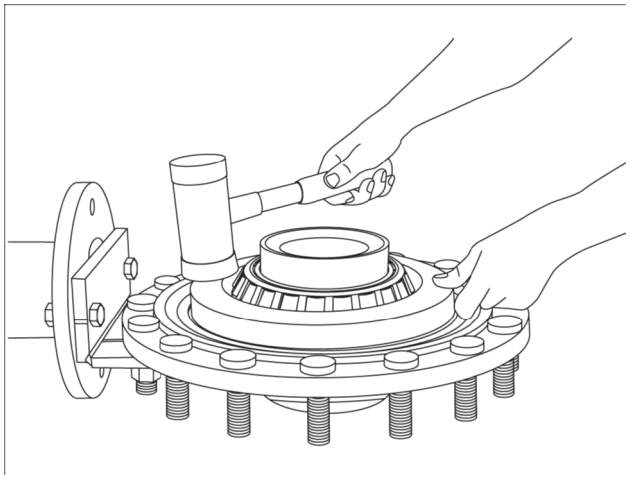
8. Install the second thrust ring into the differential housing



LEIL13WHL1201AA 8

7. Heat the slide bushing and position it at the output shaft collar. Then position the slide bushing with the pressure ring **381000106**.

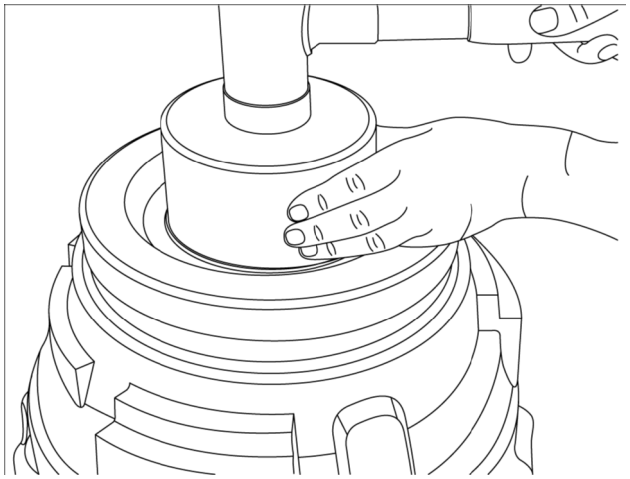
NOTE: *an exact installation position is obtained when using the specified pressure ring.*



RAIL11WEL0429BA 7

8. Use the **381000073** driver tool to insert the shaft seal into the brake housing.

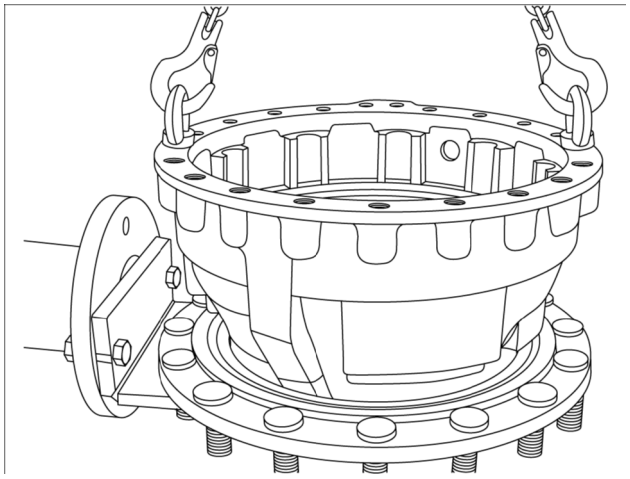
NOTE: *an exact installation position is obtained when using the specified driver tool. Make note of the installation position (Step **6**). Wet the outer diameter of the shaft seal with mineral spirits before the assembly.*



RAIL11WEL0430BA 8

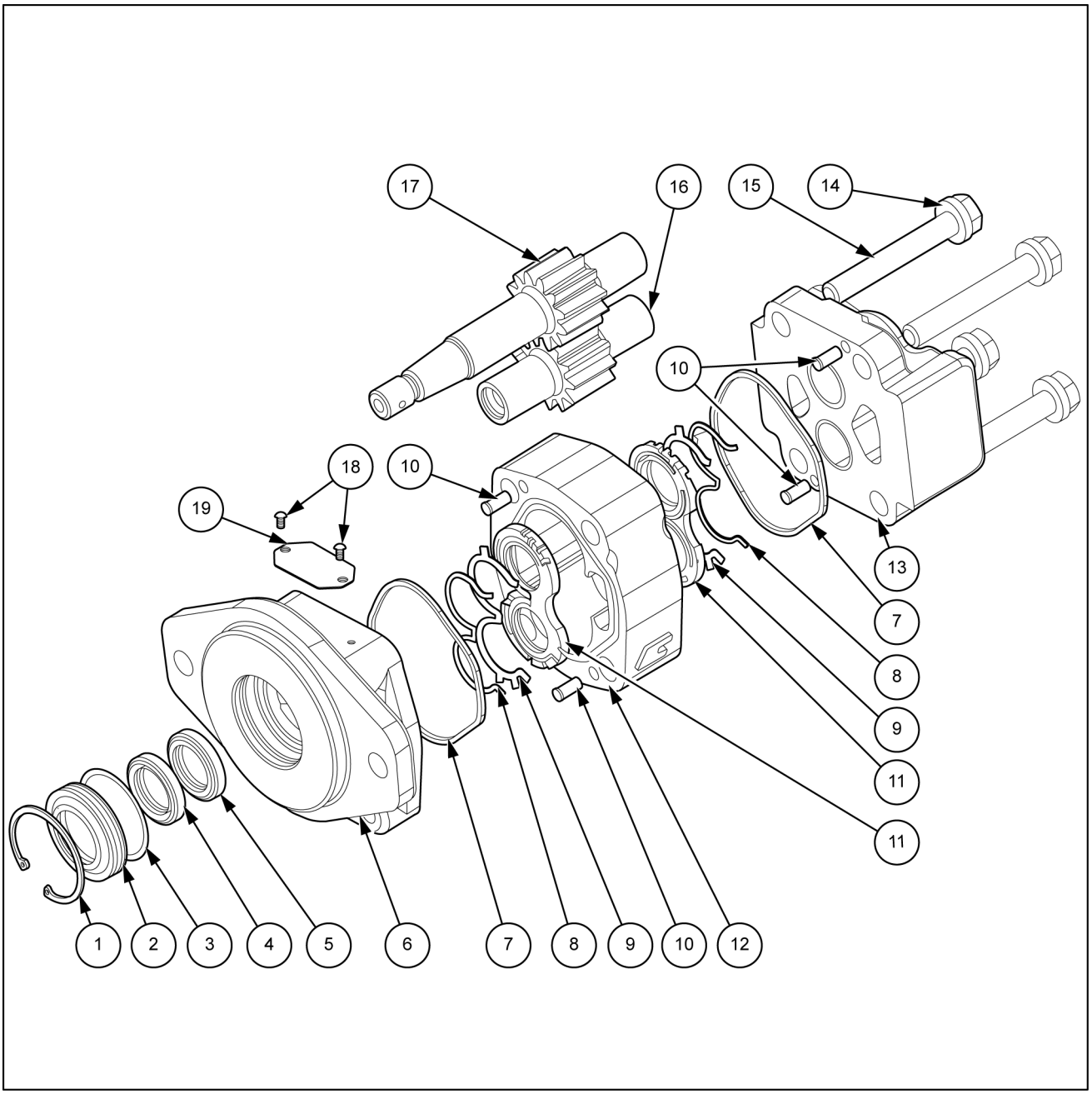
9. Use a suitable lifting device and insert the premounted brake housing over the output shaft until the contact is made.

NOTE: *before clamping the seal rings (slide ring seal) to the installation dimension, clean the sliding surfaces and apply an oil film. A leather cloth soaked in oil is recommended for this step.*



RAIL11WEL0431BA 9

Brake pump - Exploded view



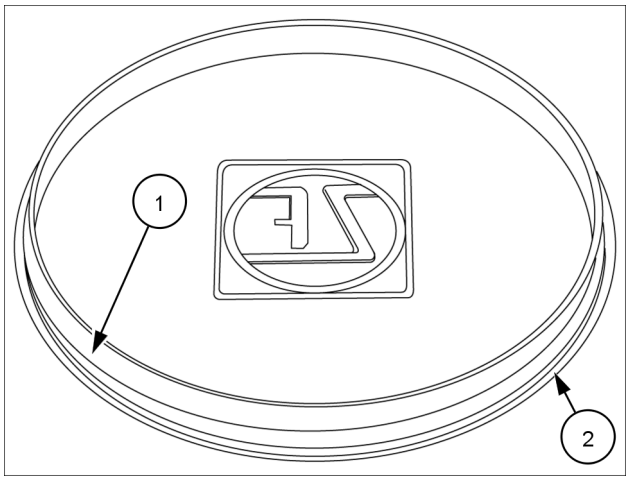
LEIL13WHL1146GB 1

1. Retaining Ring
2. Seal Retainer
3. O-Ring
4. Outer Lip Seal
5. Inner Lip Seal
6. Shaft End Cover Housing
7. Q–Ring
8. Backup Seal
9. Channel Seal
10. Dowel Pin
11. Thrust Plate
12. Gear Housing
13. Port End Cover Housing
14. Washer
15. Bolt
16. Driven Gear
17. Drive Gear
18. Drive Screw
19. Name Plate

1. Park the machine on a level surface and lower the loader bucket to the floor. Stop the engine.
2. Put the blocks on both sides of each tire to prevent the machine movement.
3. Make sure the brake accumulators **(1)**, parking brake accumulator **(2)** and brake damping accumulators are completely discharged.
   Push down and release the brake pedal several times (at least 30 times).
4. Turn the timed disconnect switch to the OFF position.
5. Remove the left cab skirt located under the cab to gain access to the accumulators.
6. To release the pressure in the parking brake accumulator, the line at the accumulator must be slowly cracked open. A pan will be needed to catch the hydraulic oil.
7. Connect a drain hose to the quick disconnect couplings in each brake circuit to release any pressure in the brake circuit.
8. Clean the brake accumulators **(1)**, parking brake accumulator **(2)**, brake damping accumulators and lines.
9. Put an identification tag on the line that is connected to the parking brake accumulator **(2)**.
10. Connect a vacuum pump to the hydraulic reservoir. Start the vacuum pump.
11. Disconnect the tubes from both brake accumulators **(1)**.
12. Loosen the clamp studs **(8)** on the accumulator clamps **(7)**.
13. Remove the accumulators **(1)** from the accumulator clamps **(7)**.
14. Install plugs in the hoses.
15. Disconnect the hose from the parking brake accumulator **(2)**.
16. Remove the nut **(3)** and the parking brake accumulator **(2)**.
17. Install a plug in the hose.
18. Disconnect the hose from the brake damping accumulators.
19. Remove the brake damping accumulators from the machine. Install plugs in the hoses.

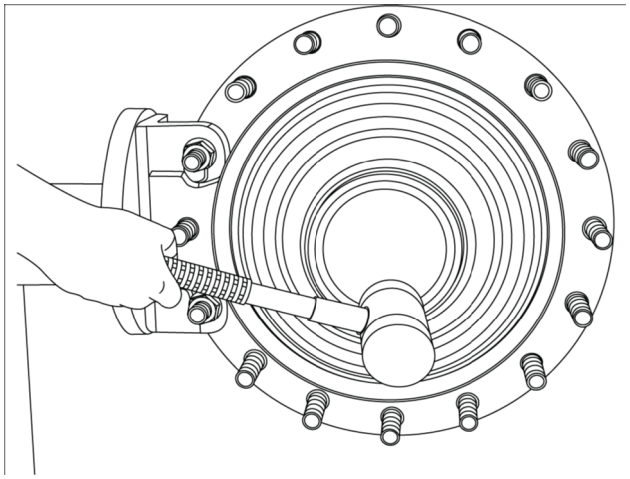
26. Install a new O-ring **(1)** on the cover and wet the contact face **(2)** with **TEROSTAT® MS-9360**.

***NOTE: TEROSTAT® MS-9360** has a curing period greater than **24 h**.*



RAIL11WEL0448BA 26

27. Install the cover onto the output shaft until fully seated.



RAIL11WEL0449BA 27

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(*) See content for specific models

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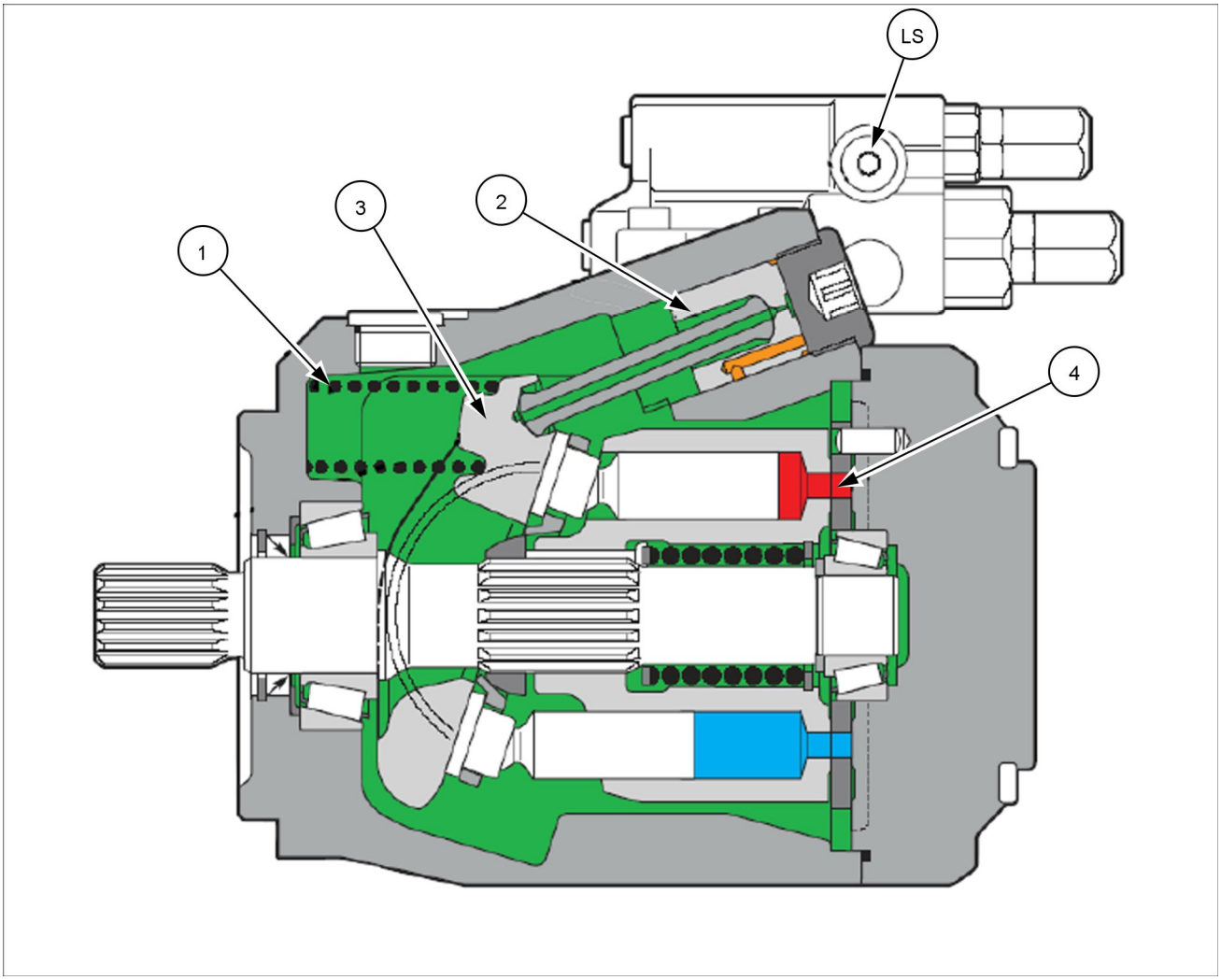

RCPH11WHL038GAN 2

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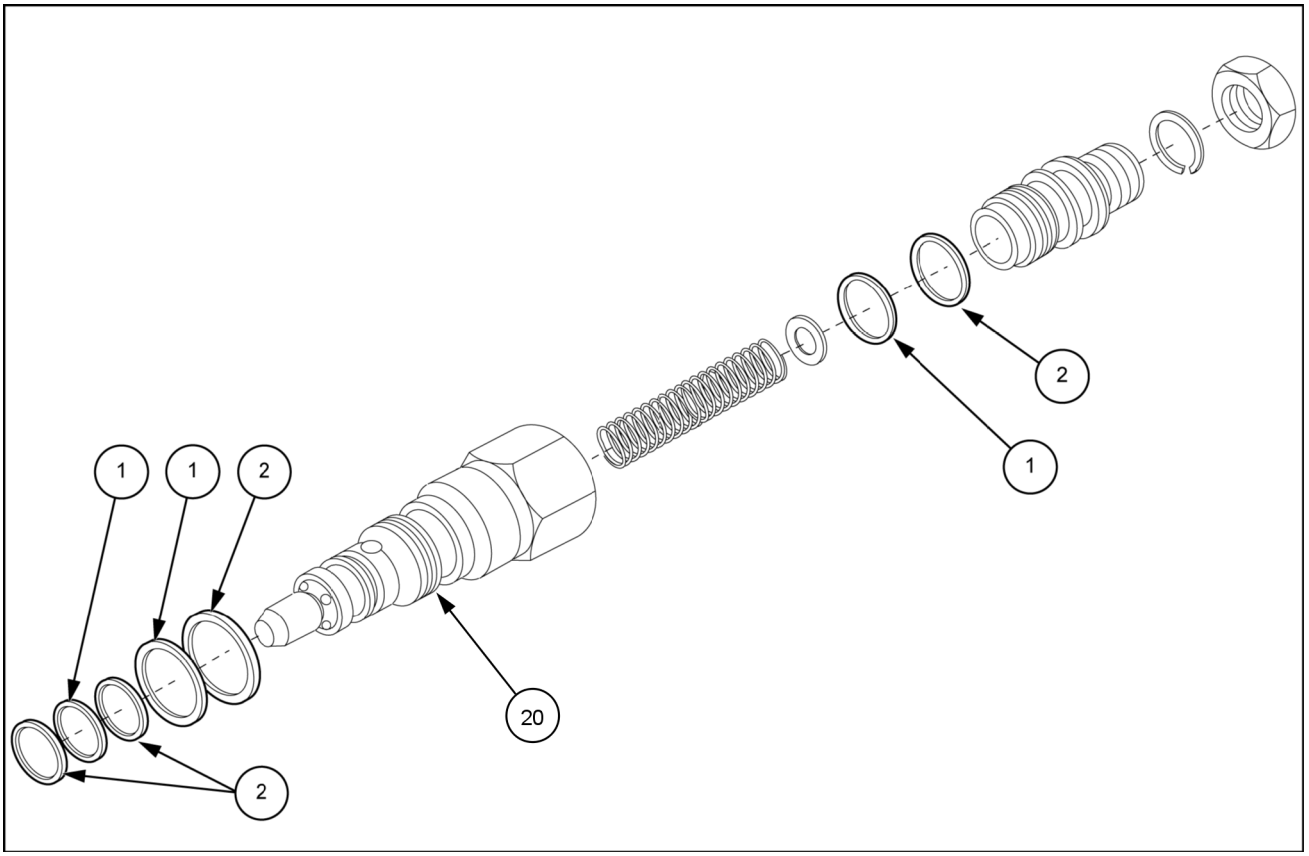
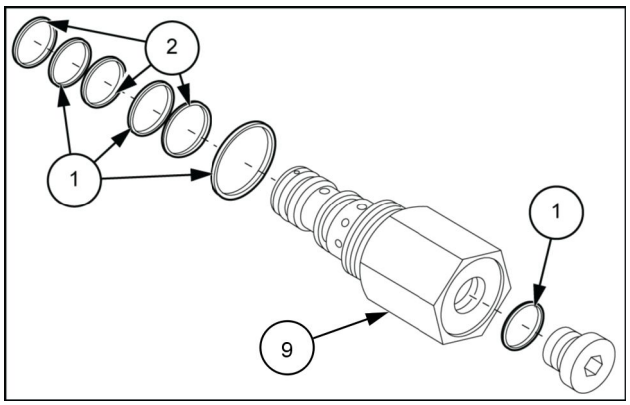
4. Install new O-rings **(1)** and thrust rings **(2)** on the pressure relief valve **(20)**.



LEIL13WHL1350FB 4

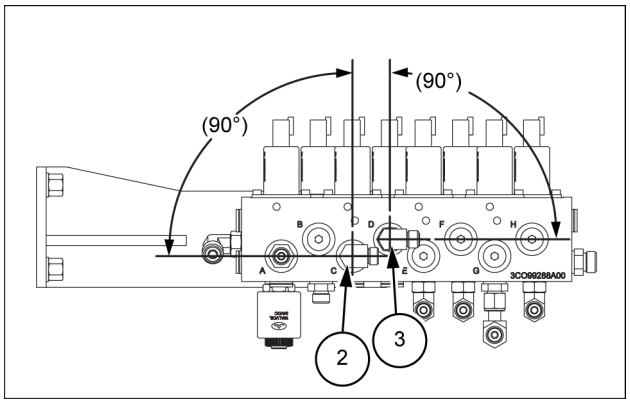
1. O-rings
2. Thrust rings

5. Install new O-rings **(1)** and thrust rings **(2)** on the pilot pressure reducing valve **(9)**.



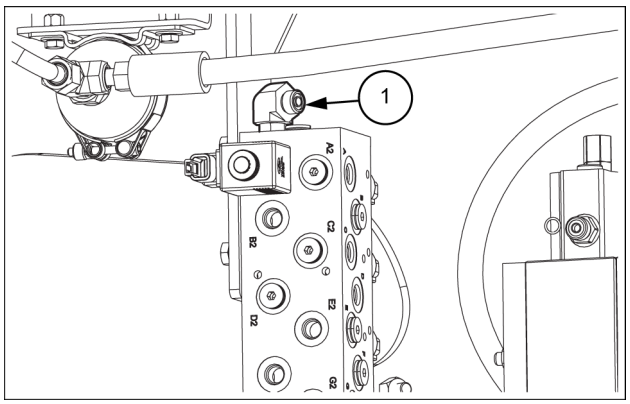
LEIL13WHL1340AB 5

9. Apply to the **90°** swivel elbow **(2)** and **90°** elbow **(3)** the angle orientation shown in figure **9**.



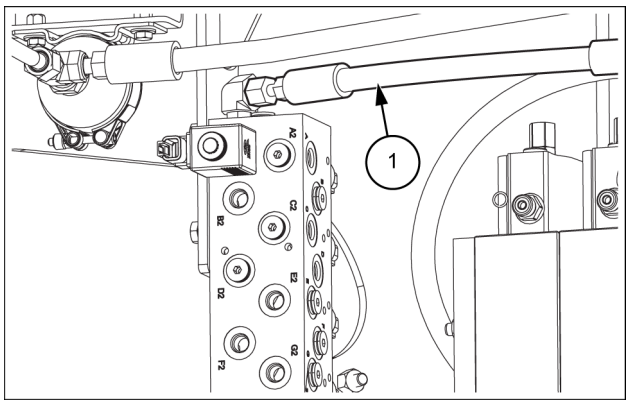
LEIL17WHL1163AB 9

10. Remove the cap and install the **90°** elbow **(1)** to the Pst port of the electro-hydraulic control valve.



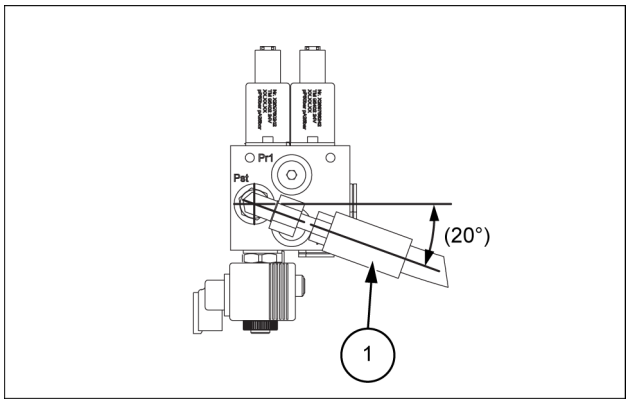
LEIL17WHL1160AB 10

11. Unplug and connect the pilot pressure hose **(1)** to the Pst port of the electro-hydraulic control valve.



LEIL17WHL1159AB 11

12. Apply to the pilot pressure hose **(1)** the angle orientation shown in figure **12**.



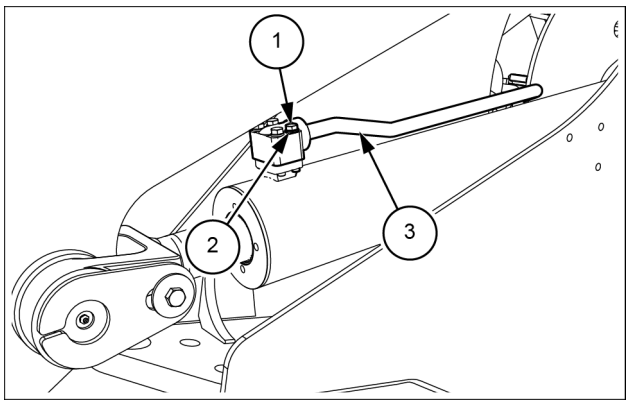
LEIL17WHL1164AB 12

Lift arm cylinder - Remove

1. Park the machine on a level surface and lower the bucket to the floor. Stop the engine and apply the parking brake.

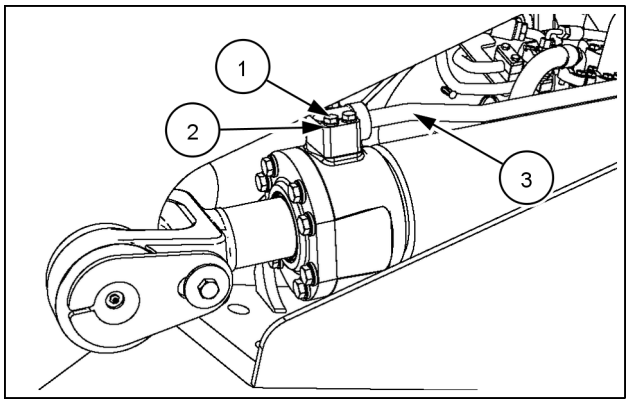
NOTICE: *with the engine NOT running, pump the brake repeatedly to be sure the brake accumulators have no hydraulic pressure, put the ignition switch in the ON position then move the joystick or loader control back and forth several times to release any hydraulic pressure in the pilot control circuit, turn ignition switch OFF.*

2. Relieve the pressure in the Ride control accumulator with the manual bleeder valve located at the rear of the front chassis.
3. Loosen the filler cap on the hydraulic reservoir to release any pressure.
4. Remove the four bolts **(1)** and the washers **(2)** that secure the lift rod tube **(3)** to the lift arm cylinder.



LEIL16WHL0590AB 1

W190D



LEIL16WHL1820AB 2

W230D

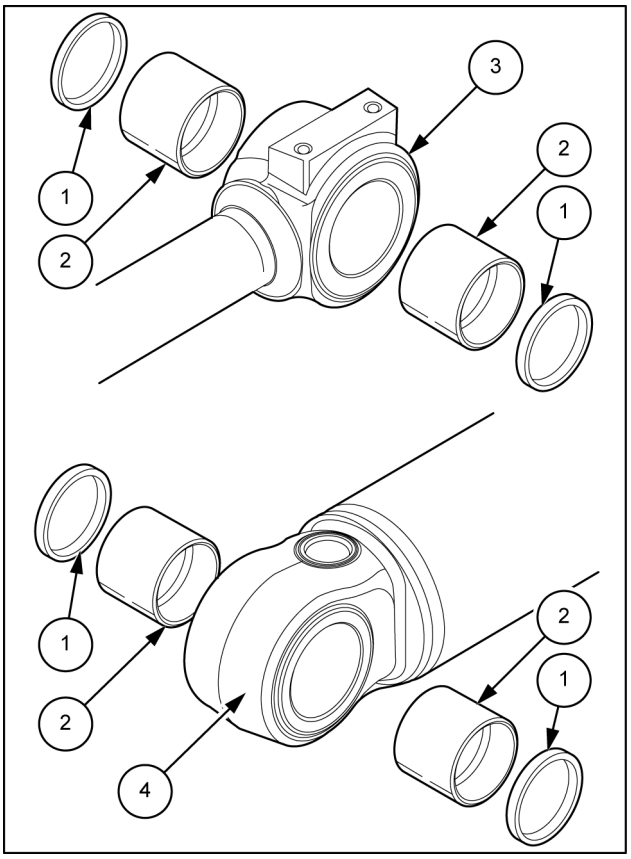
9. Install the charging hose fitting onto the accumulator.
10. Tighten the needle valve by turning it clockwise. Slowly open the gauge valve **(D)** and observe the reading on the gauge. This reading is the nitrogen pressure level inside the accumulator.
11. Open the valve **(A)** on the nitrogen supply tank. While observing the pressure on the gauge, slightly open the needle valve on the accumulator charge hose. By regulating the needle valve, fill the accumulator to pressure according to temperature chart below. Close the needle valve. Close the valve **(A)** on the nitrogen supply tank.

Temperature	Accumulator pre-charge pressure
10 °C (**50 °F**)	**16.36 bar** (**237.22 psi**)
13 °C (**55 °F**)	**16.55 bar** (**239.98 psi**)
16 °C (**61 °F**)	**16.74 bar** (**242.73 psi**)
18 °C (**64 °F**)	**16.87 bar** (**244.62 psi**)
21 °C (**70 °F**)	**17.06 bar** (**247.37 psi**)
24 °C (**75 °F**)	**17.26 bar** (**250.27 psi**)
27 °C (**81 °F**)	**17.45 bar** (**253.02 psi**)
29 °C (**84 °F**)	**17.58 bar** (**254.91 psi**)
32 °C (**90 °F**)	**17.77 bar** (**257.66 psi**)
35 °C (**95 °F**)	**17.96 bar** (**260.42 psi**)
38 °C (**100 °F**)	**18.15 bar** (**263.17 psi**)

12. Close the valve **(B)** by turning to the right (clockwise). After a few minutes, check the accumulator for leakage.
13. Back off the needle valve on the accumulator end of the charging hose by turning it counterclockwise the maximum amount. This will prevent nitrogen from escaping from the accumulator as the hose is removed. Remove the charging hose from the accumulator.
14. Install the cap screws.
15. Remove the charging hose from the nitrogen supply tank.

Loader bucket control cylinder - Install - Bushing

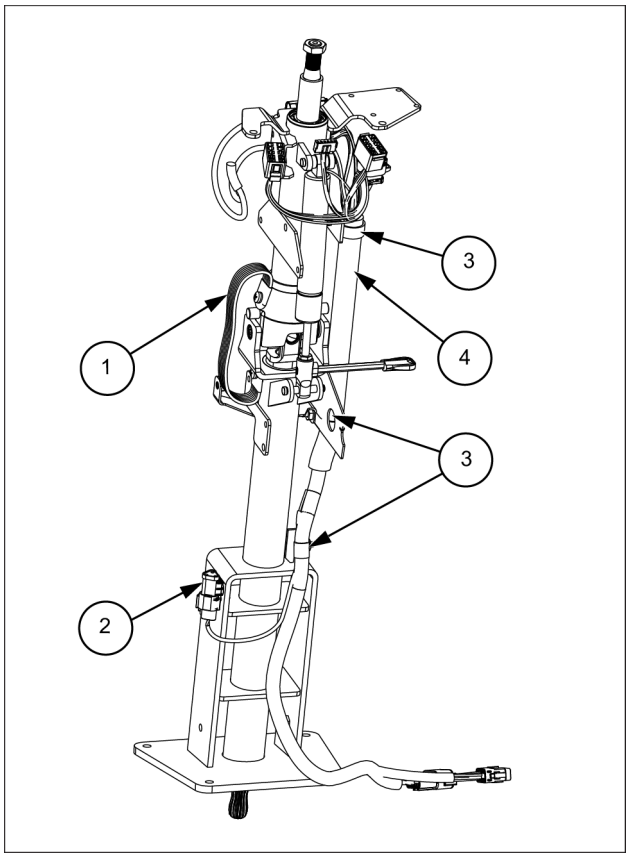
1. Use an acceptable driver to press new bushings **(2)** into piston rod eye **(3)** until recessed **8 mm** (**0.315 in**).
2. Use an acceptable driver to install wipers **(1)** until flush with piston rod eye **(3)**. The lips of the wipers **(1)** must be towards outside of bore.
3. Use an acceptable driver to press new bushings **(2)** into tube **(4)** eye until recessed **8 mm** (**0.315 in**).
4. Use an acceptable driver to install wipers **(1)** until flush with tube **(4)** eye. The lips of wipers **(1)** must be towards outside of bore.



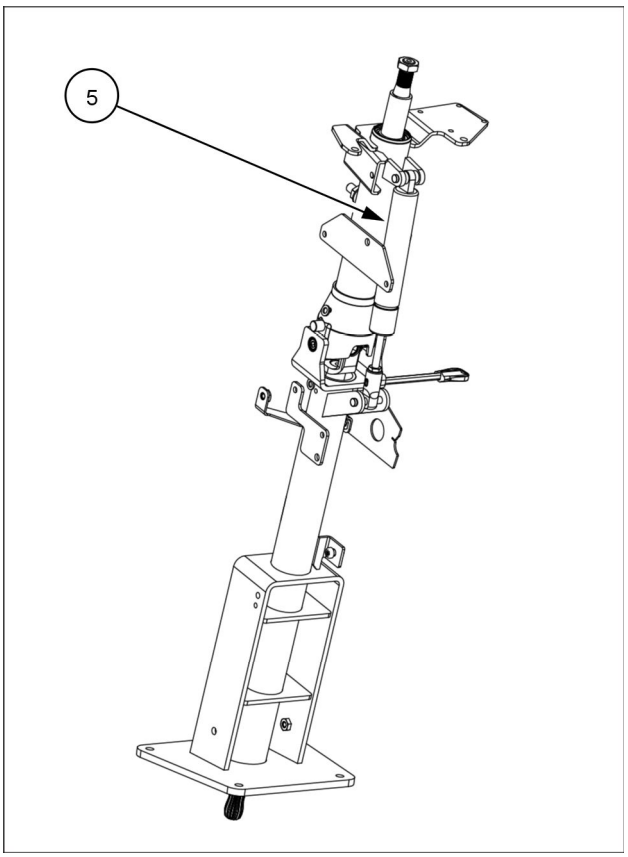
LEIL13WHL1356BB 1

27. Place two stands below and in contact with the front frame.
28. Install blocks between the rear axle and the rear frame on both sides of the machine to prevent the rear frame from tipping.
29. Put a jack in contact with both sides of the rear frame near the center pivot area. Use another jack at the rear of the machine to prevent the rear frame from tipping.
30. Loosen and remove the bolt **(1)**, washer **(2)**, and spacer **(3)** that fasten the upper pivot pin **(4)** to the rear chassis **(5)**.
31. Use a prybar to remove the upper pivot pin **(4)**.
32. Loosen and remove the bolts **(1)** and washers **(2)** that fasten the lower pin plate **(15)** to the lower pivot pin **(10)**.
33. Loosen and remove the bolts **(1)** and washers **(2)** that fasten the lower pin plate **(15)** to the bottom of the rear chassis **(5)**.
34. Use a suitable ram and hand pump **1288730249** to remove the lower pivot pin **(10)**.
35. Install the puller on the bottom spacer **(14)**.
36. Remove the bottom spacer **(14)**.
37. Release the parking brake.
38. Use prybars to turn the left rear wheel backwards and the right rear wheel forward to move the front of the rear frame to the left for access to the bearings. Install blocks under the wheels to prevent the rear frame from moving.
39. Apply the parking brake.
40. Hold the bearing retainer **(13)** in place and loosen and remove the bolts **(1)** and washers **(2)** that fasten the bearing retainer **(13)** and shims **(8)** to the bottom of the rear pivot.
41. Remove the bearing retainer **(13)** and shims **(8)**.
42. Remove the lower bearing spacer **(11)** from the top of the lower pivot.
43. Loosen and remove the bolts **(1)** and washers **(2)** that fasten the bearing retainer **(7)** and shims **(8)** to the top of the top pivot.
44. Remove the bearing retainer **(7)** and shims **(8)**.
45. Use the puller to remove the seal **(6)** from the top of the bottom pivot.
46. Use the puller to remove the seal **(6)** from the bottom of the top pivot.

16. Remove the ground strap **(1)** unscrewing the two fixing screws and related washers.
    Separate the connector **X-TERM (Receptacle)** from the steering column **(5)**.
    Remove the three clamp **(3)**.
    Separate the pedestal harness **(4)** from the steering column **(5)**.



LEIL18WHL0324BB 18



LEIL18WHL0325BA 19

HYDRAULIC COMPONENTS OF THE STEERING SYSTEM WITH AUXILIARY STEERING - Sheet 2 of 4

1. Orbitrol valve
2. Steering priority valve
3. Right-hand rod hose
4. Right-hand base hose
5. Block clamp
6. O-ring
7. Clamp
8. Right-hand steering cylinder hose
9. Auxiliary steering valve
10. Steering load sense hose
11. Steering pump isolator
12. Rubber mount bushing
13. Steel mount bushing
14. Belleville washer, M10x22
15. Bolt, M10x35 CL 10.9
16. Steering pressure hose
17. Auxiliary steering tank hose
18. **45°** elbow
19. Filter manifold
20. Auxiliary steering pressure hose
21. Hydraulic connector
22. **90°** elbow
23. Hydraulic connector
24. Nut, M6
25. Washer, 6.6x18x1.6 mm
26. Hydraulic connector
27. Auxiliary pressure tube assembly
28. **90°** elbow
29. Auxiliary steering pump
30. Nut, M10
31. Washer, 10.5x18x1.6mm
32. **90°** elbow
33. Auxiliary pressure hose
34. Hydraulic connector
35. Hydraulic tank filter
36. Hydraulic tank
37. Pressure sensor
38. **45°** elbow
39. **90°** elbow
40. Bolt, M6x110 CL 10.9
41. Washer, 6.6x18x1.6 mm
42. Auxiliary steering bracket
43. Bolt, M10x30 CL 10.9
44. Washer, 11x24x3 mm
45. Nut, M8
46. Washer, 9x16x1.6 mm
47. Clamp
48. Washer, 9x16x1.6 mm
49. Bolt, M8x25 CL 10.9
50. Bolt, M12x40 CL 10.9
51. Tie hose
52. Cable tie strap
53. Auxiliary steering module harness
54. Auxiliary steering cable
55. Clamp
56. Starter engine
57. Electrical boot
58. Battery negative cable
59. Tie strap

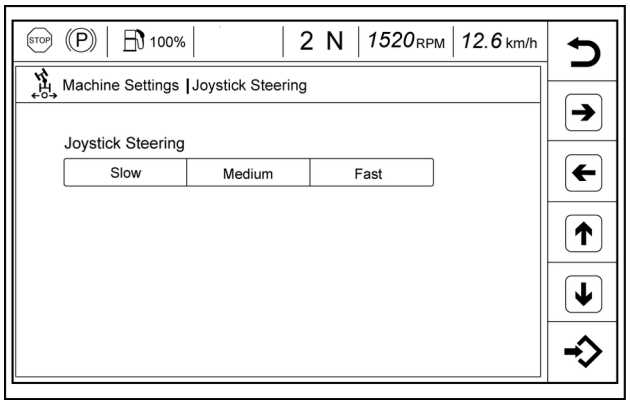
HYDRAULIC COMPONENTS OF THE STEERING SYSTEM WITH AUXILIARY STEERING - Sheet 2 of 3

1. Orbitrol valve
2. Steering priority valve
3. Right-hand rod hose
4. Right-hand base hose
5. Block clamp
6. O-ring
7. Clamp
8. Right-hand steering cylinder hose
9. Auxiliary steering valve
10. Steering load sense hose
11. Steering pump isolator
12. Rubber mount bushing
13. Steel mount bushing
14. Belleville washer, M10x22
15. Bolt, M10x35 CL 10.9
16. Steering pressure hose
17. Auxiliary steering tank hose
18. **45°** elbow
19. Filter manifold
20. Auxiliary steering pressure hose
21. Hydraulic connector
22. **90°** elbow
23. Hydraulic connector
24. Nut, M6
25. Washer, 6.6x18x1.6 mm
26. Hydraulic connector
27. Auxiliary pressure tube assy
28. **90°** elbow
29. Auxiliary steering pump
30. Nut, M10
31. Washer, 10.5x18x1.6mm
32. **90°** elbow
33. Auxiliary pressure hose
34. Hydraulic connector
35. Hydraulic tank filter
36. Hydraulic tank
37. Pressure sensor
38. Clamp
39. **90°** elbow
40. Bolt, M6x110 CL 10.9
41. Washer, 6.6x18x1.6 mm
42. Auxiliary steering bracket
43. Bolt, M10x30 CL 10.9
44. Washer, 11x24x3 mm
45. Nut, M8
46. Washer, 9x16x1.6 mm
47. Clamp
48. Washer, 9x16x1.6 mm
49. Bolt, M8x25 CL 10.9
50. Bolt, M12x40 CL 10.9
51. Tie hose
52. Cable tie strap
53. Auxiliary steering module harness
54. Auxiliary steering cable
55. Clamp
56. Starter engine
57. Electrical boot
58. Battery neg. cable
59. Tie strap

The three speed levels are:

1. Slow - from **4.5 s** to **5.5 s** *
2. Medium - from **3.2 s** to **4.5 s** *
3. Fast - from **2.8 s** to **3.2 s** *

*(time to take the machine from all right to all left).
The purpose of this setting is to make steering the machine equipped with the JSS similar to the standard steering system:



LEIL15WHL0533AA 5

1. With the engine at idle speed, with all the controls in neutral and JSS ON, steer the machine completely to the left.
2. Set a speed level (e.g. 1, 2 or 3).
3. Move the joystick completely to the right and at the same time, with a chronometer, start measuring the time. Stop the chronometer when the machine is completely steered on the right-hand side. Take the time to compare it with the time specified in the table of speed levels.
4. Move the joystick completely to the left and at the same time, with a chronometer, start measuring the time. Stop the chronometer when the machine is completely steered on the left-hand side. Take the time to compare it with the time specified in the table of speed levels. If the value is not in the range shown in the table, follow the system calibration procedure.
5. Repeat what is specified in point **1**, **2**, **3**, and **4** with the engine at high idle.
6. If the adjustments are not exact, verify the specifications given in paragraphs A and B.

3. Start and run the machine at high idle.
4. Turn the steering wheel and read the pressure.
5. The pressure should be **8 – 10 bar** (**116 – 145 psi**).
6. If pressure is not as specified, replace the steering relief valve **(1)**.

NOTE: *the relief valve is not adjustable.*

Contents

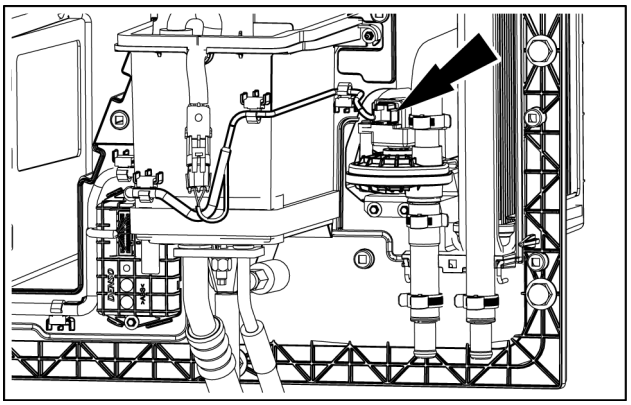
Steering - 41

Auxiliary steering - 910

Contents

Wheels - 44

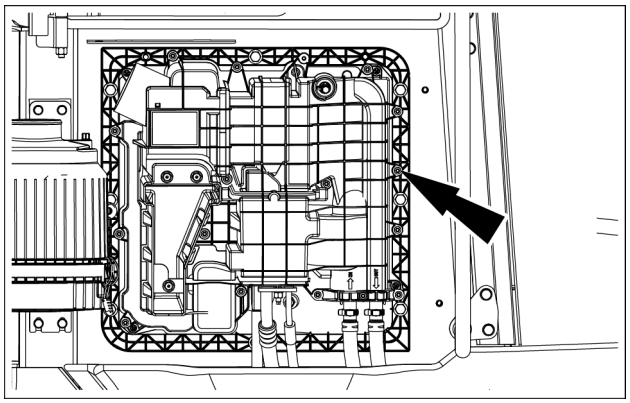
3. Connect the electrical connector.



LEIL18WHL0466AB 3

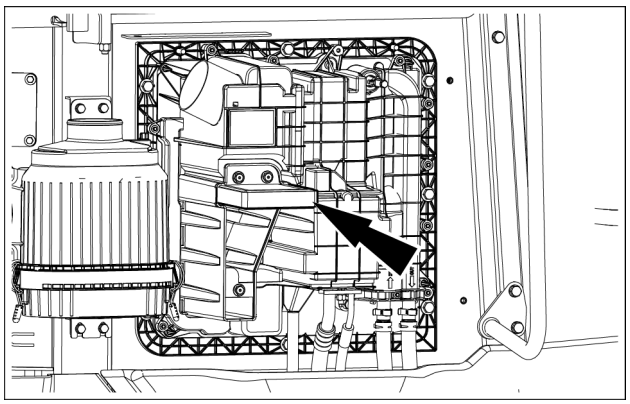
4. Position the cover case in place. Install the cover case with 16 screws.

NOTE: *for clarity, only one of the 16 screws is indicated in figure* ***4****.*



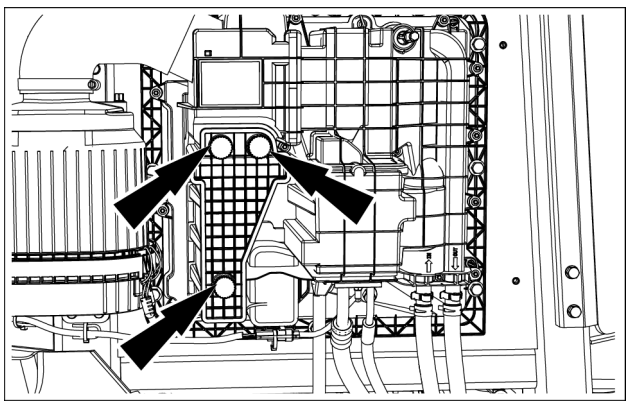
LEIL18WHL0459AB 4

5. Insert the cab air recirculation filter.



LEIL18WHL0454AB 5

6. Install the cab air recirculation filter cover with the three retaining knobs.



LEIL18WHL0453AB 6

Air conditioning - Charging

Recovery and charging station connections

1. Clean the external surfaces of the compressor and hoses. Remove the caps from the service ports on the suction and pressure hoses.

NOTICE: *Do not steam clean any air conditioning system parts while the system is charged. The heat will cause the refrigerant to rise to a pressure that could cause the system to explode.*

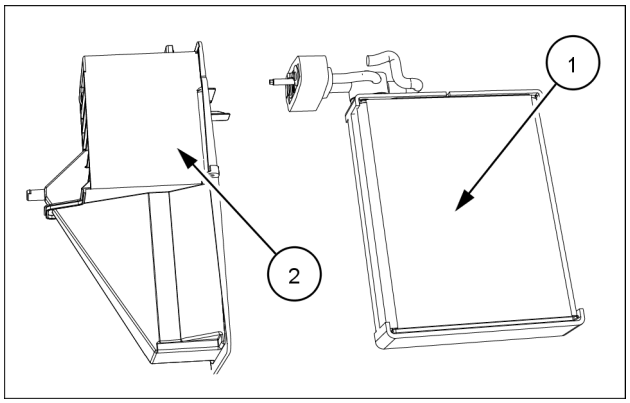
2. Connect the hoses from the test gauges to the service ports by turning the knurled knobs on the depressors.
3. Connect the hose from the low pressure gauge to the port on the suction hose.
4. Connect the hose from the high pressure gauge to the port on the discharge hose.

NOTICE: *always wear safety goggles when working with liquid refrigerant. Liquid refrigerant in your eyes could cause blindness.*

5. Make sure the charging station **OEM1598** manifold gauge valves are in the closed position.
6. Start the engine and run at **1500 RPM** maximum speed. Operate the air conditioner system at maximum cooling setting and blower speed for 15 minutes with the cab door open. Observe the test gauges and check the chart on page 13 against the gauge readings.

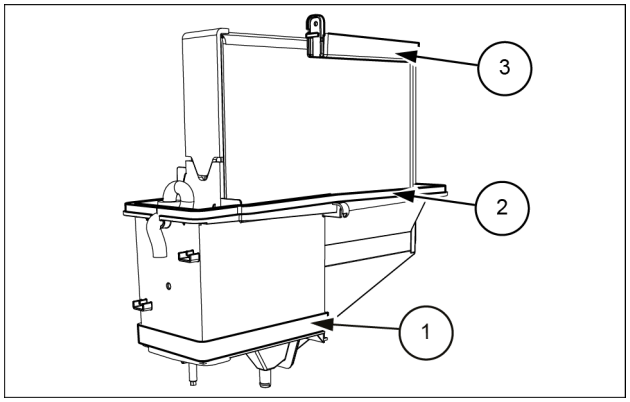
Air-conditioning evaporator - Install

1. Insert the air conditioning evaporator **(1)** to the water drain tank **(2)**.



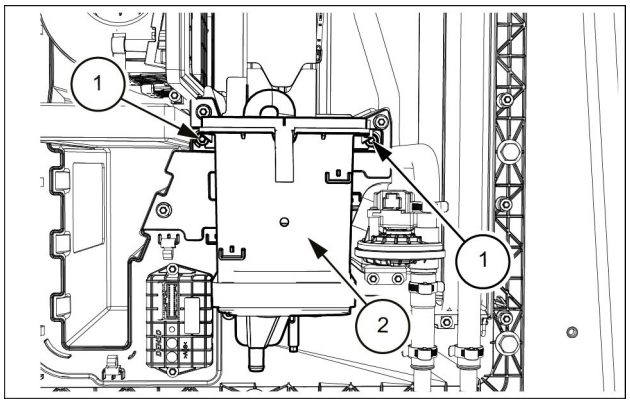
LEIL16WHL1249AB 1

2. Install the case gasket **(1)**, the water drain tank gasket **(2)** and the evaporator sensor bracket **(3)** to the air conditioning evaporator.



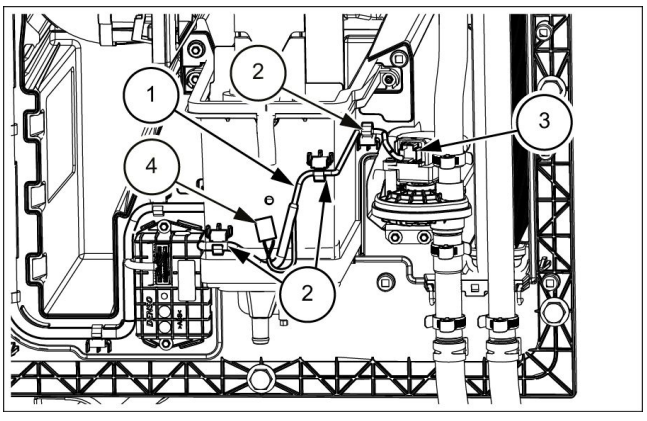
LEIL16WHL1246AB 2

3. Insert the water drain tank **(2)** from the cab heater assembly. Install the bolts **(1)** to secure the water drain tank **(2)**.



LEIL16WHL1245AB 3

4. Connect the electrical connectors **(3)** and **(4)**. Install the three clamps **(2)** holding the air conditioning wire harness **(1)** on the water drain tank.



LEIL18WHL0465AB 4

F-3F5 - SPARE (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 08 SH08 - POWER DISTRIBUTION (FUSE BLOCK LC3)**

F-3F6 - SPARE (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 08 SH08 - POWER DISTRIBUTION (FUSE BLOCK LC3)**

F-3F7 - SPARE (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 08 SH08 - POWER DISTRIBUTION (FUSE BLOCK LC3)**

F-3F8 - 12V CONVERTER (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 08 SH08 - POWER DISTRIBUTION (FUSE BLOCK LC3)**

F-4F1 - 24V CIGAR (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 09 SH09 - ACCESSORY PWR DIST (FUSE BLOCK LC4)**

F-4F10 - SPARE (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 09 SH09 - ACCESSORY PWR DIST (FUSE BLOCK LC4)**

F-4F2 - SPARE (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 09 SH09 - ACCESSORY PWR DIST (FUSE BLOCK LC4)**

F-4F3 - A/C CLUTCH (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 09 SH09 - ACCESSORY PWR DIST (FUSE BLOCK LC4)**

F-4F4 - SPARE (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 09 SH09 - ACCESSORY PWR DIST (FUSE BLOCK LC4)**

F-4F5 - SPARE (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 09 SH09 - ACCESSORY PWR DIST (FUSE BLOCK LC4)**

F-4F6 - BLOWER (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 09 SH09 - ACCESSORY PWR DIST (FUSE BLOCK LC4)**

F-4F7 - SEAT (Fuse)

Component Type	Fuse
Wiring frames	**SHEET 09 SH09 - ACCESSORY PWR DIST (FUSE BLOCK LC4)**

Wiring harnesses - Electrical schematic sheet 03 SH03 - PWR DISTR-BATTERY / STARTER / KEY

Type	Component	Connector / Link
ECU	**A-MAIN JB CAB** - JUNCTION BLOCK INTO CAB (ECU)	
ECU	**A-SFB** - SMART FUSE BOX (ECU)	**X-X6** - SFB [A-SFB] (47554341)
Fuse	**F-GH** - INLINE GH FUSE (Fuse)	**X-GH2** - GRID HEATER [F-GH] (84140737) **X-GH3** - GRID HEATER RING TERMINAL [F-GH] (84140737)
Fuse	**F-LC6F1** - MAIN ECU (Fuse)	
Fuse	**F-LC6F10** - TELE (Fuse)	
Fuse	**F-LC6F2** - KEY/HORN (Fuse)	
Fuse	**F-LC6F3** - ECU AUX (Fuse)	
Fuse	**F-LC6F5** - FFH (Fuse)	
Fuse	**F-MAIN CAB** - FUSE (Fuse)	
Voltage source	**G-001** - BATTERY (Voltage source)	**X-563** - BATTERY LUG [G-001] **X-567** - BATTERY LUG [G-001] **X-P5321** - JUMP START [G-001]
Voltage source	**G-002** - BATTERY (Voltage source)	**X-564** - BATTERY LUG [G-002] **X-566** - BATTERY POSITIVE [G-002] **X-P5320** - JUMP START [G-002]
Voltage source	**G-G1** - ALTERNATOR (Voltage source)	**X-ALT** - ALTERNATOR [G-G1] (8602487)
Power outlet	**J-JS+** - JUMP START (Power outlet)	**X-JS+** - JUMP START STUD POS [J-JS+]
Power outlet	**J-JS-** - JUMP START STUD (Power outlet)	**X-JS-** - JUMP START STUD NEG [J-JS-]
Relay	**K-ISOLATOR** - ISOLATOR (Relay)	**X-DC2** - NON-DISC POWER STUD [K-ISOLATOR] (84140737) **X-ISO** - ISOLATOR [K-ISOLATOR] (87687242) **X-D(S)** - MASTER DISCONNECT SWITCHED [K-ISOLATOR] (84163398)
Relay	**K-LC6R4** - CRANK CONTROL (Relay)	
Relay	**K-LC7R1** - FF HEATER RELAY (Relay)	
Relay	**K-LC7R2** - STARTER RELAY (Relay)	
Motor	**M-STRT_MTR** - STARTER MOTOR (Motor)	**X-ST** - START SIGNAL TO STARTER [M-STRT_MTR] (84426134)
Switch	**SW-KEY** - IGNITION SWITCH (Switch)	**X-KEY** - KEY SWITCH [SW-KEY] (87699176)
Switch	**SW-MD** - MASTER DISCONNECT (Switch)	
Connector	X-563	**X-563** - BATTERY LUG [G-001]
Connector	X-564	**X-564** - BATTERY LUG [G-002]
Connector	X-566	**X-566** - BATTERY POSITIVE [G-002]
Connector	X-567	**X-567** - BATTERY LUG [G-001]
Connector	X-ALT	**X-ALT** - ALTERNATOR [G-G1] (8602487)
Connector	X-ALT_B	**X-ALT_B** - ALTERNATOR B+ (84399576)
Connector	X-B4	**X-B4** - ALTERNATOR TO STARTER B+ (84401309)
Connector	X-BAT-GND	**X-BAT-GND** - BATTERY GROUND (84140737)
Connector	X-CAB_E	**X-CAB_E** - CAB TO ENGINE [SH7: B-5] (84807216)
Connector	X-CAB_E-2	**X-CAB_E-2** - CAB TO ENG 2 [SH9: C-2] (87703902)
Connector	X-CP	**X-CP** - CAB POWER (84401295)

Wiring harnesses - Electrical schematic sheet 14 SH14 - CAB & CHASSIS GROUND PWR DISTR

Type	Component	Connector / Link
Connector	X-GND_FRNT	**X-GND_FRNT** - CHASSIS GROUND (84140737)
Connector	X-GND_GRL	**X-GND_GRL** - GROUND GRILL TERMINAL (84140737)
Connector	X-GND_PED	**X-GND_PED** - GROUND PEDESTAL RING [SH14: B-6] (84140737)
Connector	X-GND_RR	**X-GND_RR** - CHASSIS GROUND (84140737)
Connector	X-GND_RR2	**X-GND_RR2** - CHASSIS GROUND [SH28: B-2] (84426126)
Connector	X-GND_RR3	**X-GND_RR3** - SEC STRG CHASSIS GRND [SH14: B-4] (84426126)
Connector	X-GND_RR4	**X-GND_RR4** - (84140737)
Connector	X-GRD_WIF	**X-GRD_WIF** - WATER IN FUEL GRND (84426120)
Connector	X-SSG	**X-SSG** - SECONDARY STEERING GROUND RING [SH21: C-1] (84401307)
Connector	X-X31CF1-2	**X-X31CF1-2** - CAB GROUND BLOCK (84122130)
Connector	X-X31CF1-3	**X-X31CF1-3** - CAB GROUND BLOCK (84122130)
Connector	X-X31CF2-1	**X-X31CF2-1** - STEERING COLUMN GROUND (84122130)
Connector	X-X31CF2-2	**X-X31CF2-2** - STEERING COLUMN GROUND (84122130)
Connector	X-YSS	**X-YSS** - SEC STEERING VALVE SOL [Y-Y_SS] (87695582)

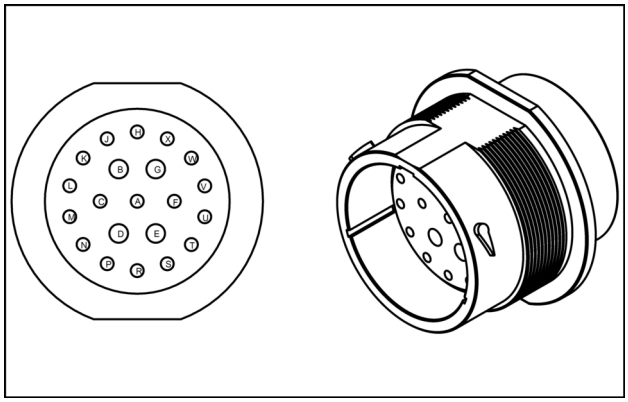
Wiring harnesses - Electrical schematic sheet 25 SH25 - GEAR CONTROL UNIT 1

Type	Component	Connector / Link
ECU	**A-108F** - ZF DIAGNOSTIC CONNECTOR (ECU)	**X-ZF_DI** - DIAGNOSTIC [A-108F] (84364851)
ECU	**A-TRANS** - TRANSMISSION CONTROL UNIT (ECU)	**X-TECM** - TRANS CONTROLLER [SH25: C-6] (84550089)
ECU	**A-TRC** - TRANS CONTROLLER ON TRANNY (ECU)	**X-TRC** - TRANS CONTROLLER ON TRANNY CNH [A-TRC] (47669071)
Connector	X-CAB_TR	**X-CAB_TR** - CAB TO TRANSMISSION [SH26: A-2] (87696944)
Connector	X-SP_PK_CLN	**X-SP_PK_CLN** - SPLICE PACK CLEAN GRND [SH25: C-1] (87352746)
Connector	X-TECM	**X-TECM** - TRANS CONTROLLER [SH25: C-6] (84550089)
Connector	X-TRANS	**X-TRANS** - TRANSMISSION TO CAB (87696949)
Connector	X-TRC	**X-TRC** - TRANS CONTROLLER ON TRANNY CNH [A-TRC] (47669071)
Connector	X-YLS	**X-YLS** - TRANS LOCKUP SOLENOID (82012083)
Connector	X-ZF_DI	**X-ZF_DI** - DIAGNOSTIC [A-108F] (84364851)
Solenoid	**Y-YLS** - LOCKUP SOLENOID (Solenoid)	

Wiring harnesses - Electrical schematic sheet 36 SH36 - REAR DEFROST, BACKUP ALARM

Type	Component	Connector / Link
ECU	**A-SFB** - SMART FUSE BOX (ECU)	**X-X6** - SFB [A-SFB] (47554341)
Ground	**GND-069** - (Ground)	GND-069
Speaker	**H-BU_ALRM** - BACKUP ALARM (Speaker)	**X-BU2** - BACK UP ALARM [H-BU_ALRM] (84426117) **X-BU1** - BACK UP ALARM [H-BU_ALRM] (84426117)
Resistor	**R-WND_HTR** - REAR WINDSHIELD HEATER ELEMENT (Resistor)	**X-RWHE1** - REAR WINDOW HEATER [R-WND_HTR] (87688695) **X-RWHE2** - REAR WINDOW HEATER [SH13: C-3] (87688695)
Switch	**SW-BCK_U_SW** - BACKUP ALRM CANCEL SW (Switch)	**X-S_BU** - CANCEL BACKUP ALARM [SW-BCK_U_SW] (87716755)
Switch	**SW-R_DEF_SW** - REAR DEFROST SWITCH (Switch)	**X-S_RDF** - SWITCH REAR DEFROST [SW-R_DEF_SW] (87716755)
Connector	X-BU1	**X-BU1** - BACK UP ALARM [H-BU_ALRM] (84426117)
Connector	X-BU2	**X-BU2** - BACK UP ALARM [H-BU_ALRM] (84426117)
Connector	X-CAB_E	**X-CAB_E** - CAB TO ENGINE [SH7: B-5] (84807216)
Connector	X-EHD_23	**X-EHD_23** - ENG TO PL23 HOOD (87694154)
Connector	X-ENG	**X-ENG** - ENGINE TO CAB [SH18: C-6] (87696948)
Connector	X-HD_23	**X-HD_23** - HOOD PL23 (87694153)
Connector	X-RWHE1	**X-RWHE1** - REAR WINDOW HEATER [R-WND_HTR] (87688695)
Connector	X-RWHE2	**X-RWHE2** - REAR WINDOW HEATER [SH13: C-3] (87688695)
Connector	X-S_BU	**X-S_BU** - CANCEL BACKUP ALARM [SW-BCK_U_SW] (87716755)
Connector	X-S_RDF	**X-S_RDF** - SWITCH REAR DEFROST [SW-R_DEF_SW] (87716755)
Connector	X-X3	**X-X3** - SFB [SH3: A-1] (47554344)
Connector	X-X4	**X-X4** - SFB (47554343)
Connector	X-X7	**X-X7** - SFB [SH3: A-3] (84538791)

X-BTM_F - BOTTOM TO FRONT STD (87696087) (Plug)

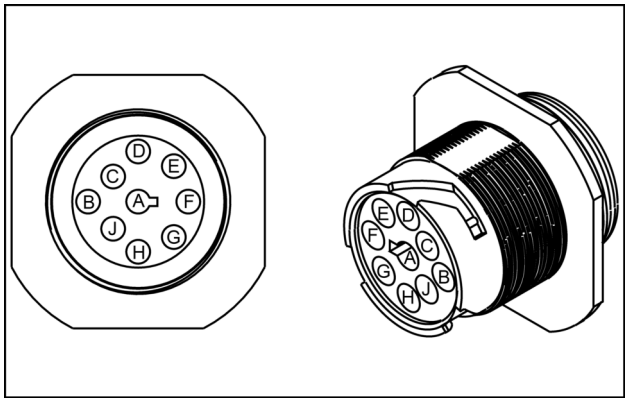


87696087 28

87696087

Pin	From	Wire	Description	Color-Size	Frame
A	**X-BTM (Receptacle) pin 17** - BOTTOM TO CAB STD (87704523)	687A	FRONT AXLE TEMP	YE - 0.8	**SHEET 20 SH20 - UCM VEHICLE DRIVELINE / FAN CONTROL**
C	**X-BTM (Receptacle) pin 20** - BOTTOM TO CAB STD (87704523)	132D	LH HIGH BEAM LAMP	VT - 0.8	**SHEET 28 SH28 - LIGHTING HAZARD WARNING, BLINKERS, DRIVING**
F	**X-BTM (Receptacle) pin 22** - BOTTOM TO CAB STD (87704523)	133A	LH LOW BEAM LAMP	VT - 0.8	
H	**X-BTM (Receptacle) pin 23** - BOTTOM TO CAB STD (87704523)	127B	LH POSITION	VT - 0.8	
J	**X-BTM (Receptacle) pin 24** - BOTTOM TO CAB STD (87704523)	136B	LH FRONT TURN	VT - 0.8	
K	**X-BTM (Receptacle) pin 25** - BOTTOM TO CAB STD (87704523)	137A	RH HIGH BEAM LAMP	VT - 0.8	
L	**X-BTM (Receptacle) pin 26** - BOTTOM TO CAB STD (87704523)	138A	RH LOW BEAM LAMP	VT - 0.8	
M	**X-BTM (Receptacle) pin 27** - BOTTOM TO CAB STD (87704523)	130E	RH POSITION	VT - 0.8	
N	**X-BTM (Receptacle) pin 28** - BOTTOM TO CAB STD (87704523)	135D	RH FRONT TURN	VT - 0.8	
P	**X-BTM (Receptacle) pin 5** - BOTTOM TO CAB STD (87704523)	366A	RIDE CONTROL SIG	WH - 0.8	**SHEET 22 SH22 - UCM-LOADER BOOM CONTROL**
R	**X-BTM (Receptacle) pin 14** - BOTTOM TO CAB STD (87704523)	367A	COUPLER VALVE SIG	WH - 0.8	
S	**X-BTM (Receptacle) pin 9** - BOTTOM TO CAB STD (87704523)	368A	COUPLER VALVE RTRN	BR - 0.8	
T	**X-BTM (Receptacle) pin 21** - BOTTOM TO CAB STD (87704523)	112A	HORN	YE - 0.8	**SHEET 34 SH34 - MIRRORS, HORN BEACON**
U	**X-BTM (Receptacle) pin 13** - BOTTOM TO CAB STD (87704523)	291A	ROLL BACK PRESSURE SW	YE - 0.8	**SHEET 22 SH22 - UCM-LOADER BOOM CONTROL**
V	SP-651A-P-X	651C	5V GND2	BL - 0.8	

X-DIA - DIAGNOSTIC PORT [A-DIA] (87736919) (Plug)

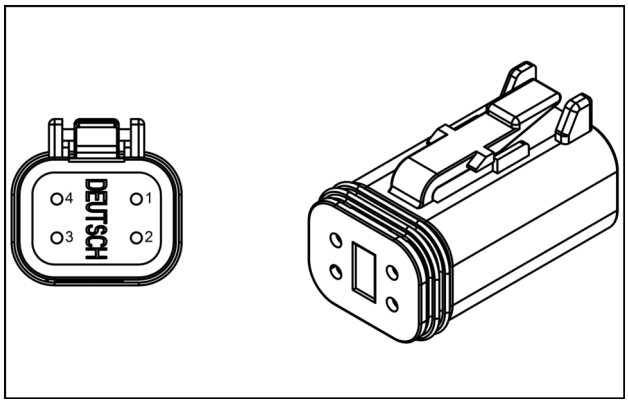


87736919 66

87736919

Pin	From	Wire	Description	Color-Size	Frame
A	**X-SP_PK_CLN (Receptacle) pin X** - SPLICE PACK CLEAN GRND [SH25: C-1] (87352746)	945	CAB CLEAN GROUND DIAG	BK - 0.8	**SHEET 16 SH16 - ENGINE CONTROL UNIT 1, GRID HEATER, FILTER HEATER**
B	**X-LC2 (Receptacle) pin 8A** - LOADCENTER 2 [SH7: B-3] (87733581)	798	DIAGNOSTIC B+	RD - 0.8	
C	SP-HH-P-X	CAN_HI	CAN	YE - 0.8	
D	SP-LH-P-X	CAN_LI	CAN	GN - 0.8	
E	**X-CAB_E (Receptacle) pin 20** - CAB TO ENGINE [SH7: B-5] (84807216)	303	ISO K LINE	WH - 0.8	
H	SP-B_HE-P-X	CANB_HD	CAN	WH - 0.8	
J	SP-B_LE-P-X	CANB_LD	CAN	BL - 0.8	

X-DIAG_T - TELEMATICS DIAGNOSTIC [SH38: B-1] (87694101) (Receptacle)

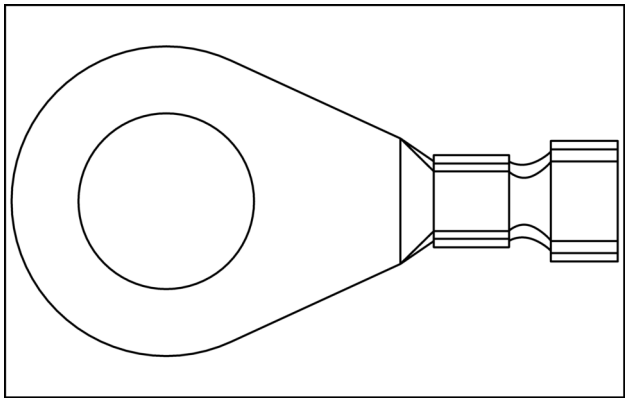


87694101 67

87694101

Pin	From	Wire	Description	Color-Size	Frame
2	**X-X_TEL (Receptacle) pin 7** - TELEMATICS [SH38: C-6] (87700156)	CAN_TH	CAN	TN - 0.8	**SHEET 38 SH38 - MISCELLANOUS, TELEMATICS**
3	**X-X_TEL (Receptacle) pin 6** - TELEMATICS [SH38: C-6] (87700156)	CAN_TL	CAN	LB - 0.8	
4	**X-SP_PK_CLN (Receptacle) pin X** - SPLICE PACK CLEAN GRND [SH25: C-1] (87352746)	912	CAB GROUND CLN	BK - 0.8	**SHEET 12 SH12 - POWER DISTRIBUTION 1 CLEAN GROUND BLK**

X-GND_ENG3 - GROUND ENG BLOCK [SH15: C-3] (84140737) (Plug)

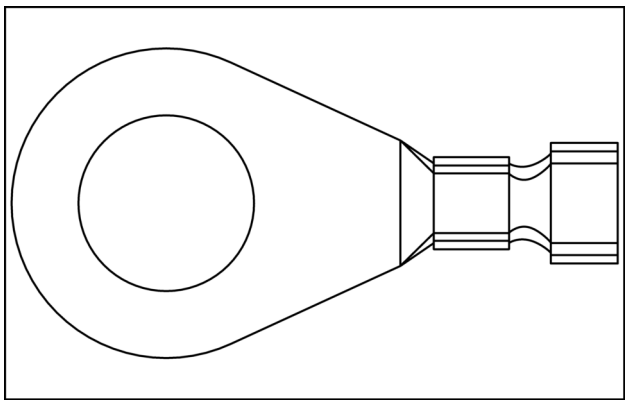


84140737 105

84140737

Pin	From	Wire	Description	Color-Size	Frame
1	SP-208-P-X	208	HOOD LIFT GROUND	BK - 2.0	**SHEET 14 SH14 - CAB & CHASSIS GROUND PWR DISTR**
1	**X-GRD_WIF (Plug) pin 1** - WATER IN FUEL GRND (84426120)	281	WIF GROUND	BK - 1.0	

X-GND_ENG4 - GROUND ENG BLOCK [SH29: B-3] (84140737) (Plug)

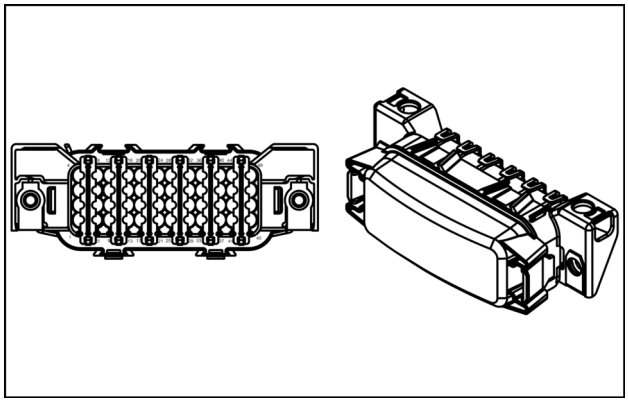


84140737 106

84140737

Pin	From	Wire	Description	Color-Size	Frame
1	**X-ISO pin 3** - ISOLATOR [K-ISOLATOR] (87687242)	251	ISOLATOR GRND	BK - 0.8	**SHEET 03 SH03 - PWR DISTR-BATTERY / STARTER / KEY**
1	**X-ENG_H (Plug) pin 1** - ENGINE TO HOOD (87700321)	242	TAIL LIGHT GROUND	BK - 1.0	
1	SP-243-P-X	243	TAIL LIGHTS GRND EURO	BK - 0.8	
1	**X-BU1 (Plug) pin 1** - BACK UP ALARM [H-BU_ALRM] (84426117)	244	BACKUP ALARM GND	BK - 0.8	

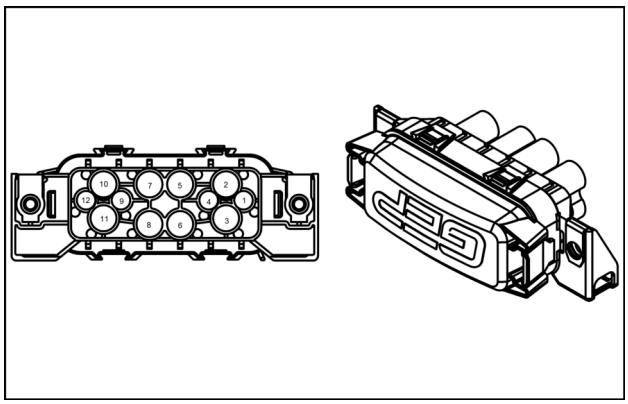
X-LC6 - LOADCENTER 6 [SH16: A-3] (84380518) (Receptacle)



84380518 147

84380518

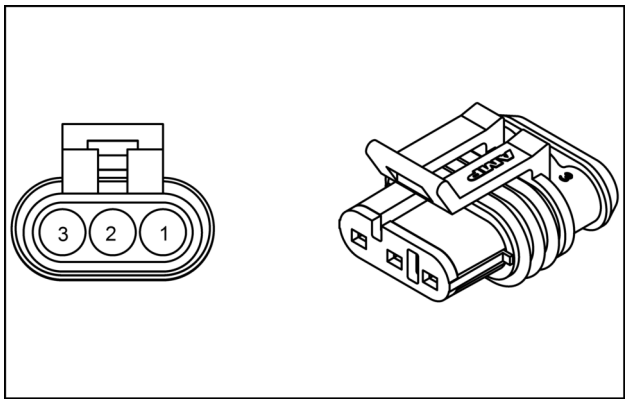
X-LC7 - LOAD CENTER 7 (84563565) (Receptacle)



84563565 148

84563565

X-LEV1 - INLINE TO DEF LEVEL & TEMP (84062580) (Plug)

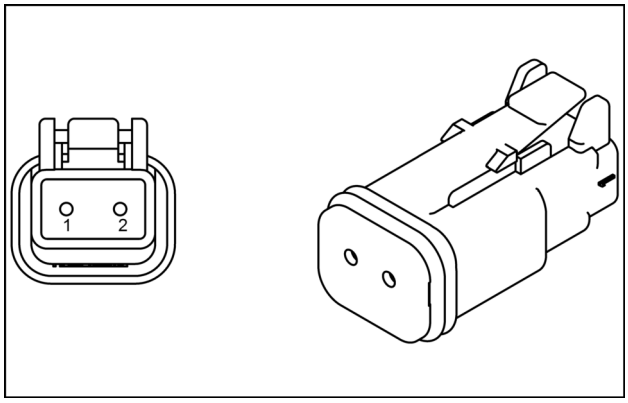


84062580 149

84062580

Pin	From	Wire	Description	Color-Size	Frame
5	SP-859A-P-X	859A	REAR WORK LIGHTS	VT - 1.0	**SHEET 31 SH31 - LIGHTING WORKING LIGHTS CAB ROOF, FRONT AND REAR**
6	SP-949A-P-X	949A	FRONT WORK LIGHTS GND	BK - 2.0	
7	SP-953A-P-X	953A	ROOF GND	BK - 2.0	

X-RRWL - RIGHT REAR WORK LIGHT [LMP-RR_WL] (87695582) (Receptacle)

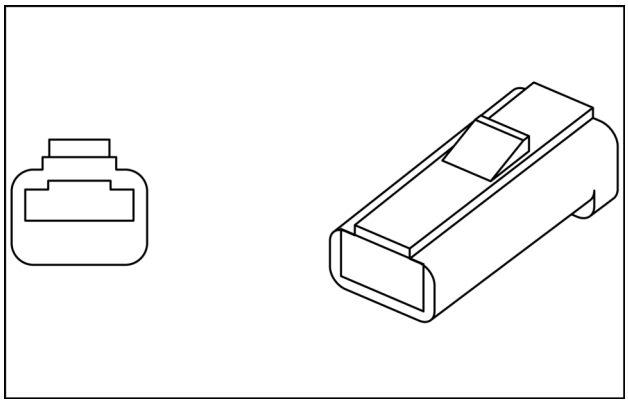


87695582 196

87695582

Pin	From	Wire	Description	Color-Size	Frame
1	SP-859A-P-X	859C	RIGHTT REAR WORK LIGHT	VT - 0.8	**SHEET 31 SH31 - LIGHTING WORKING LIGHTS CAB ROOF, FRONT AND REAR**
2	SP-953A-P-X	953F	RIGHT REAR WORK LIGHT GND	BK - 1.0	

X-RWHE1 - REAR WINDOW HEATER [R-WND_HTR] (87688695) (Receptacle)

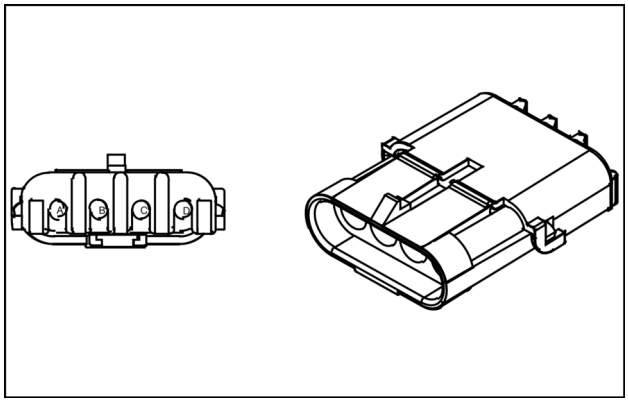


87688695 197

87688695

Pin	From	Wire	Description	Color-Size	Frame
1	**X-LC3 (Receptacle) pin R3_87** - LOADCENTER 3 [SH35: B-6] (84529039)	801	REAR DEFROST PWR	OR - 2.0	**SHEET 36 SH36 - REAR DEFROST, BACKUP ALARM**

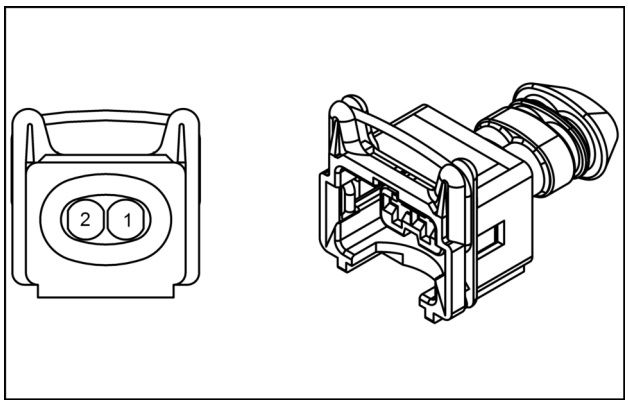
X-TS2 - TRANS SHIFTER 2 [A-PFNR] (47702209) (Receptacle)



47702209 237

47702209

X-TSS - SPEED SENSOR TURBINE [B-TS_S] (84364854) (Receptacle)

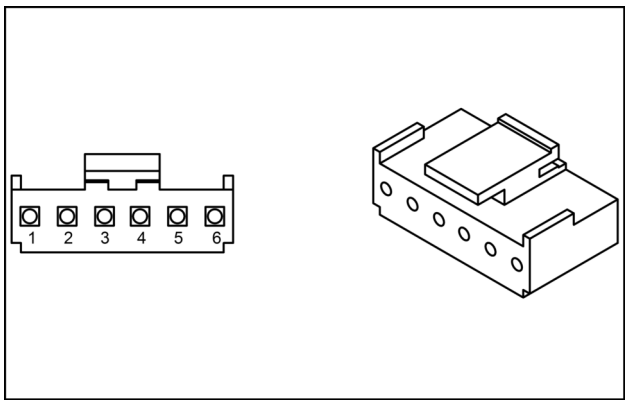


84364854 238

84364854

Pin	From	Wire	Description	Color-Size	Frame
1	**X-TRANS (Plug) pin 8** - TRANSMISSION TO CAB (87696949)	700A	TURBINE SPEED SENSOR	YE - 0.8	**SHEET 26 SH26 - GEAR CONTROL UNIT 2**
2	**X-TRANS (Plug) pin 14** - TRANSMISSION TO CAB (87696949)	702C	SPEED SENSOR GRND	BL - 0.8	

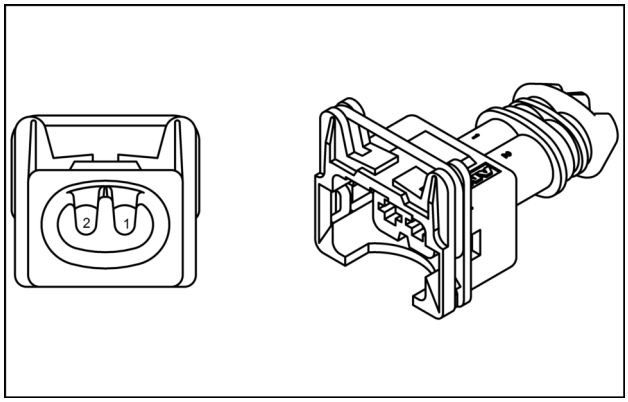
X-TT - TELL TALE INDICATOR [LMP-TTI] (87715979) (Receptacle)



87715979 239

87715979

X-YRC - RIDE CONTROL SOLENOID [Y-YRC] (84607243) (Receptacle)

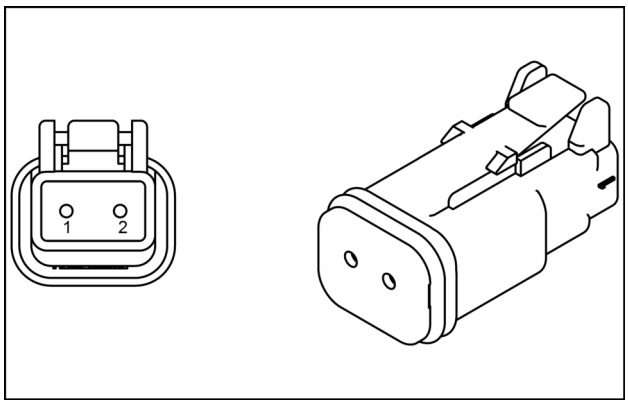


84607243 278

84607243

Pin	From	Wire	Description	Color-Size	Frame
1	**X-FRNT (Receptacle) pin P** - FRONT TO BOTTOM STD (87704426)	366B	RIDE CONTROL SOL PWR	WH - 0.8	**SHEET 22 SH22 - UCM-LOADER BOOM CONTROL**
2	SP-624D-P-X	624C	RIDE CONTROL GND	BK - 0.8	

X-YSS - SEC STEERING VALVE SOL [Y-Y_SS] (87695582) (Receptacle)

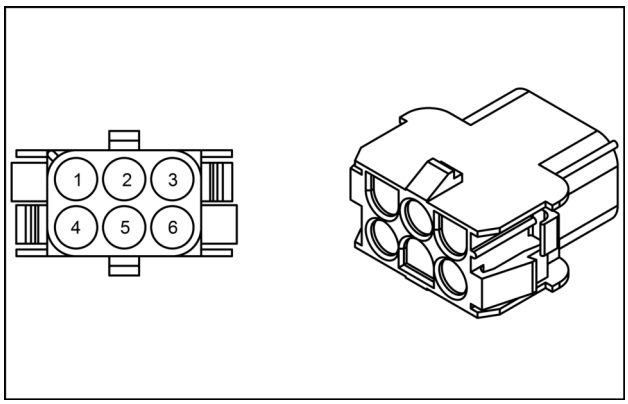


87695582 279

87695582

Pin	From	Wire	Description	Color-Size	Frame
1	SP-441B-P-X	441C	SEC STRG IGN PWR	OR - 1.0	**SHEET 14 SH14 - CAB & CHASSIS GROUND PWR DISTR**

X-ZF_DI - DIAGNOSTIC [A-108F] (84364851) (Plug)



84364851 280

84364851

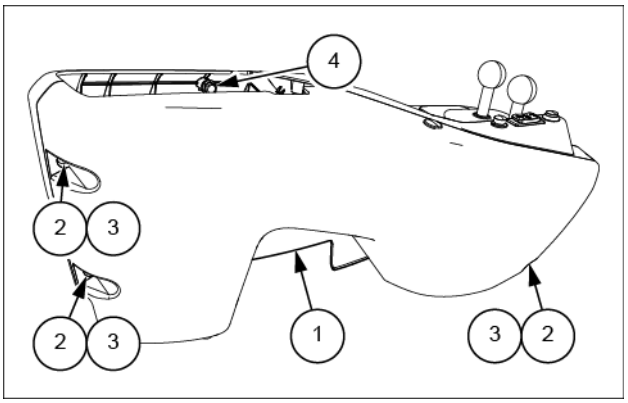
Contents

Electrical systems - 55

Battery - 302

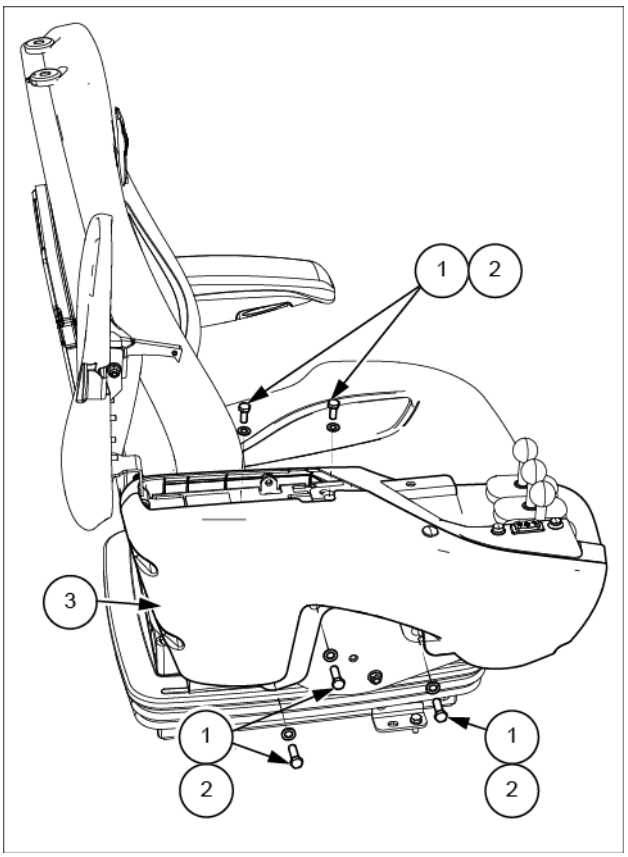
SERVICE

5. Reinstall the left-hand shell **(1)**. Reuse the bolt **(4)** and three bolts **(2)** and washers **(3)**.



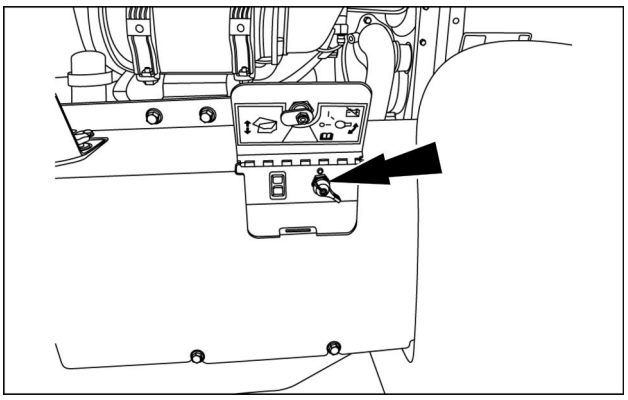
LEIL16WHL0475AB 8

6. Reinstall the armrest **(3)** to the seat. Reuse the five bolts **(1)** and washers **(2)**.



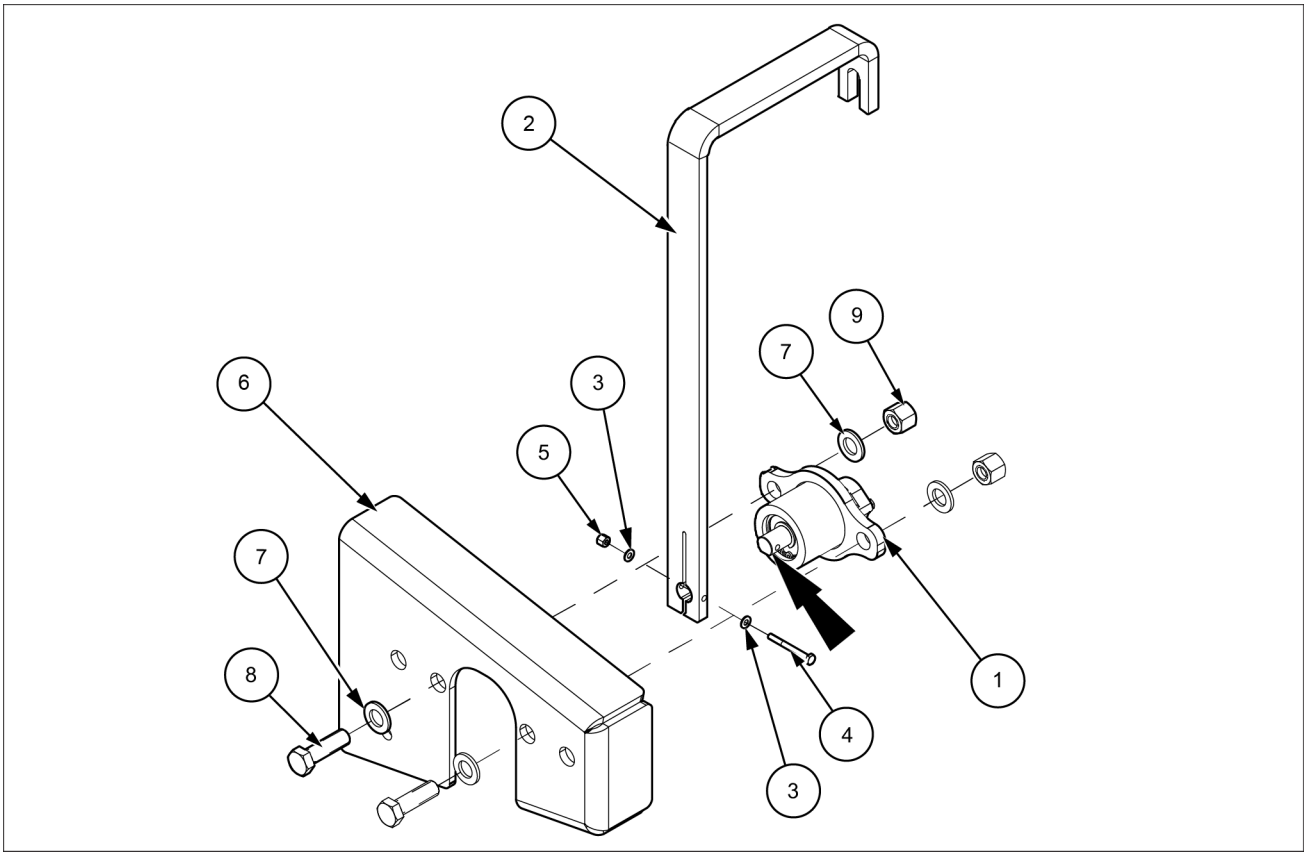
LEIL16WHL0483BB 9

7. Turn the timed disconnect switch to the ON position.



RCPH10WHL106AAH 10

Loader arm and bucket control system - Assemble - Electro-Hydraulic (EH) tilt sensor



LEIL17WHL2229FB 1

1. Use the bolt **(4)**, the two washers **(3)**, and the nut **(5)** to secure the Electro-Hydraulic (EH) tilt sensor **(1)** to the arm fork **(2)**.
   Tighten to **2.9 – 4 N·m** (**2.14 – 2.95 lb ft**).

NOTE: *after installation, make sure that the flat side of sensor pin (see arrow) lines up with the bottom of the arm fork **(2)**.*

2. Use the two bolts **(8)**, the four washers **(7)**, and the two nuts **(9)** to assembly the EH tilt sensor **(1)** to the sensor cover **(6)**.

5010-12 - Logical error at direction select signal

Control Module: TCU

Context:
The Transmission Control Unit **A-TRANS** detects a severe failure that disables control of the transmission.
The Transmission Control Unit **A-TRANS** shuts off the solenoid valves for the clutches and also the common power supply (VPS1). Transmission shifts to neutral position. The park brake will operate normally, also the other functions which use ADM 1 to ADM 8.
The operator has to slow down the vehicle. The transmission will stay in neutral.

Cause:
The Unit Control Module **A-UCM** detects a wrong signal combination for the direction.

Possible failure modes:

1. The fault is intermittent and not currently active.
2. The harnesses or the connectors are damaged or the connectors are not installed.
3. The harness between the shift lever **A-PFNR** and the Unit Control Module **A-UCM** is defective.
4. The shift lever **A-PFNR** is defective.
5. The Unit Control Module **A-UCM** is defective.

Solution:

1. Verify that fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Check if the connector **X-TS1** is connected to the shift lever **A-PFNR**.

   Check if the connector **X-PED_2** is connected to the connector **X-CAB_P2**.

   Check if the connector **X-UCM2A** is connected to the Unit Control Module **A-UCM**.

   A. If a problem is found, restore the connection.

   B. If there are no problems, continue with Step **3**.
3. Disconnect the connector **X-TS1** from the shift lever **A-PFNR**.

   Check the integrity of the connector **X-TS1** and visually check for any damage to the connector and to the pins.

   A. If a problem is found, replace the connector **X-TS1**.

   B. If there are no problems, connect the connector **X-TS1** to the shift lever **A-PFNR** and continue with Step **4**.
4. Disconnect the connector **X-PED_2** from the connector **X-CAB_P2**.

   Check the integrity of the connectors **X-PED_2** and **X-CAB_P2**, visually check for any damage to the connectors and to the pins 1, 2 and 3.

   A. If a problem is found, replace the damaged connector.

   B. If there are no problems, connect the connector **X-PED_2** to the connector **X-CAB_P2** and continue with Step **5**.
5. Disconnect the connector **X-UCM2A** from the Unit Control Module **A-UCM**.

4. Disconnect the connector **X-TRANS** from the connector **X-CAB_TR**.

   Check the integrity of the connector **X-TRANS** and **X-CAB_TR**, visually check for any damage to the connectors and to the pins 8 and 14.

   A. If a problem is found, replace the damaged connector.

   B. If there are no problems, connect the connector **X-CAB_TR** to the connector **X-TRANS** and continue with Step **5**.

5. Disconnect the connector **X-TECM** from the Transmission Control Unit **A-TRANS**.

   Check the integrity of the connector **X-TECM** and visually check for any damage to the connector and to the pins 3 and 41.

   A. If a problem is found, replace the connector **X-TECM**.

   B. If there are no problems, connect the connector **X-TECM** to the Transmission Control Unit **A-TRANS** and continue with Step **6**.

6. Check if the harness between the turbine speed sensor **B-TS_S** and the Transmission Control Unit **A-TRANS** is defective.

   A. If a problem is found, replace defective harness.

   B. If there are no problems, continue with Step **7**.

7. Check the sensor gap at the turbine speed sensor **B-TS_S**.

   A. If a problem is found, adjust the gap or replace the turbine speed sensor **B-TS_S**.

   B. If there are no problems, continue with Step **8**.

8. Disconnect the **X-TSS** connector from the turbine speed sensor **B-TS_S**.

   Check if the turbine speed sensor **B-TS_S** is defective.

   A. If a problem is found, replace the turbine speed sensor **B-TS_S**.

   B. If there are no problems, replace the Transmission Control Unit **A-TRANS**.

Wiring harnesses - Electrical schematic sheet 26 (55.100)

Wiring harnesses - Electrical schematic sheet 20 (55.100)
Wiring harnesses - Electrical schematic sheet 22 (55.100)

5. Check the harness of connector **X-CAB_TR** for a proper condition.

   The key must be in the OFF position.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-CAB_TR** pin 26	Connector **X-UCM1A** pin 2	Short circuit
Connector **X-CAB_TR** pin 3	Connector **X-UCM1A** pin 1	Short circuit

   A. If the value is not correct, replace the harness between the connector and the **A-UCM**.

   B. If the value is correct, continue with Step **6**.

6. Check the RED_BRAKE_FRNT sensor integrity.

   The key must be in the OFF position.

   Remove the RED_BRAKE_FRNT sensor.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-PRB1** pin B	Connector **X-PRB1** pin A	Resistance

   A. If the resistance is an open circuit, replace the RED_BRAKE_FRNT.

   B. If resistance value is correct, continue with Step **7**.

7. Move the cursor of the sensor and, by using a multimeter, perform the following check:

From	To	Value
Connector **X-PRB1** pin B	Connector **X-PRB1** pin C	Resistance changing

   A. If the resistance does not change, replace the RED_BRAKE_FRNT.

   B. If the resistance changes, continue with Step **8**.

8. Check the integrity of the **X-TRANS** connector.

   Disconnect the connector **X-TRANS** from the connector **X-CAB_TR** and visually check the integrity of the pins 1 on both connectors.

   A. If one pin is damaged, replace the relevant harness.

   B. If both pins are not damaged, continue with Step **9**.

9. Check the **X-PRB1** to **X-TRANS** harness for a proper condition.

   The key must be in the OFF position.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-PRB1** pin C	Connector **X-TRANS** pin 1	Short circuit

   A. If the value is not correct, replace the harness between the connector and the RED_BRAKE_FRNT.

   B. If the value is correct, continue with Step **10**.

10. Check the **A-UCM** to **X-TRANS** harness for a proper condition.

    The key must be in the OFF position.

    Use a multimeter to perform the following check:

From	To	Value
Connector **X-UCM1A** pin 15	Connector **X-CAB_TR** pin 1	Short circuit

2663-04 - Hall cell Y1/Y2 voltage abnormally low

Control Module: Keypad and Joystick

Context:
Hall cell Y1/Y2 voltage abnormally low

Cause:

Possible failure modes:

1. The fault is intermittent and not currently active.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, make calibration.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.

A. If a problem is found, repair or replace the damaged wire.

B. If there are no problems, replace the joystick steering valve Y-JSS_STRG_VLV.

Wiring harnesses - Electrical schematic sheet 24 (55.100)

5480-04 - Short circuit to ground at clutch K1

Control Module: TCU

Context:
The detected failure in the system has strong limitations to transmission control. The Transmission Control Unit **A-TRANS** can engage only one gear in each direction. In some cases only one direction will be possible.
The Transmission Control Unit **A-TRANS** will shift the transmission into neutral at the first occurrence of the failure. First, the operator must shift the gear selector into neutral position.
If output speed is less than a threshold for neutral to gear and the operator shifts the gear selector into forward or reverse, the Transmission Control Unit **A-TRANS** will select the limp-home gear.
If output speed is less than a threshold for reversal speed and the Transmission Control Unit **A-TRANS** has changed into the limp-home gear and the operator selects a shuttle shift, the Transmission Control Unit **A-TRANS** will shift immediately into the limp-home gear of the selected direction.
If output speed is greater than the threshold, the Transmission Control Unit **A-TRANS** will shift the transmission into neutral. The operator has to slow down the vehicle and must shift the gear selector into neutral position.
If a failure at another clutch is pending, the Transmission Control Unit **A-TRANS** detects a severe failure that disables control of system.
The Transmission Control Unit **A-TRANS** shuts off all solenoid valves and also both common power supplies (VPS1, VPS2). The park brake is operating, also all functions which use ADM 1 to ADM 8 are disabled.
The Transmission Control Unit **A-TRANS** shifts the transmission to neutral position.

Cause:
There is a short circuit to ground at clutch K1 of the transmission controller of tranny **A-TRC**. The measured resistance value of the valve is out of limit, the voltage at K1 valve is too low.

Possible failure modes:

1. The fault is intermittent and not currently active.
2. The harnesses or the connectors are damaged or the connectors are not installed.
3. The harness between the transmission controller of tranny **A-TRC** and the Transmission Control Unit **A-TRANS** is defective.
4. The harness between the Transmission Control Unit **A-TRANS** and the lockup solenoid **Y-YLS** is defective.
5. The lockup solenoid **Y-YLS** is defective (only for 5-speed models).
6. The transmission controller of tranny **A-TRC** is defective.
7. The Transmission Control Unit **A-TRANS** is defective.

Solution:

1. Verify that fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Check if the connector **X-TRC** is properly connected to the transmission controller of tranny **A-TRC**.

   Check if the connector **X-TRANS** is properly connected to the connector **X-CAB_TR**.

   Check if the connector **X-TECM** is properly connected to the Transmission Control Unit **A-TRANS**.

   Check if the connector **X-YLS** is properly connected to the lockup solenoid **Y-YLS** (only for 5-speed models).

   A. If a problem is found, restore the connection.

   B. If there are no problems, continue with Step **3**.
3. Disconnect the connector **X-TRC** from the transmission controller of tranny **A-TRC**.

B. If there are no problems, connect the connector **X-TRC** to the transmission controller of tranny **A-TRC** and continue with Step **4**.

4. Disconnect the connector **X-TRANS** from the connector **X-CAB_TR**.

   Check the integrity of the connector **X-TRANS** and **X-CAB_TR**, visually check for any damage to the connectors and to the pin 20.

   A. If a problem is found, replace the damaged connector.

   B. If there are no problems, connect the connector **X-CAB_TR** to the connector **X-TRANS** and continue with Step **5**.

5. Disconnect the connector **X-TECM** from the Transmission Control Unit **A-TRANS**.

   Check the integrity of the connector **X-TECM** and visually check for any damage to the connector and to the pin 9.

   A. If a problem is found, replace the connector **X-TECM**.

   B. If there are no problems, continue with Step **6**.

6. Check the harness between the transmission controller of tranny **A-TRC** and the Transmission Control Unit **A-TRANS**S for an open circuit condition.

   Disconnect the connector **X-TRC** from the transmission controller of tranny **A-TRC**.

   The key must be in the OFF position.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-TECM** pin 9	Connector **X-TRC** pin 5	There should be continuity

   A. If there is no continuity, find and repair or replace the wire 839 and/or 839A.

   B. If there is continuity, continue with Step **7**.

7. Check if the transmission controller of tranny **A-TRC** is defective.

   Check the resistance of the transmission controller of tranny **A-TRC**.

   A. If a problem is found, replace the transmission controller of tranny **A-TRC**.

   B. If there are no problems, replace the Transmission Control Unit **A-TRANS**.

Wiring harnesses - Electrical schematic sheet 25 (55.100)

5160-12 - Logical error at internal speed input (55.640)

5170-12 - Logical error at output speed input (55.640)

5160-03 - Short circuit to battery voltage or open circuit at internal speed input (55.640)

5160-04 - Short circuit to ground at internal speed input (55.640)

5170-03 - Short circuit to battery voltage or open circuit at output speed input (55.640)

5170-04 - Short circuit to ground at output speed input (55.640)

A. If any of the listed faults are active, diagnose them first and then return to this fault.

B. If none of the listed faults are active, replace the clutch.

5760-00 - Overtemp converter output

Control Module: TCU

Context:
There is no failure detected in the transmission system or the failure has no or slight effects on the transmission control.
The Transmission Control Unit **A-TRANS** works without or, in special cases, with little limitations.

Cause:
The Transmission Control Unit **A-TRANS** measures an oil temperature at the gear oil temperature sensor **B-GOT** output that is over the allowed threshold.

Possible failure modes:

1. The fault is intermittent and not currently active.
2. Incorrect level of oil into the transmission.
3. The hydraulic oil temperature sensor **B-HOT** is defective.

Solution:

1. Verify that fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Cool down the machine.

   Check the oil level of the transmission.

   A. If a problem is found, restore the oil level of the transmission.

   B. If there are no problems, continue with Step **3**.
3. Check if the hydraulic oil temperature sensor **B-HOT** is defective.

   A. If a problem is found, replace the connector **B-HOT**.

Wiring harnesses - Electrical schematic sheet 19 (55.100)
Wiring harnesses - Electrical schematic sheet 26 (55.100)

Visually check the fuse.

If necessary, use a multimeter to verify the continuity between the two poles of the fuse.

A. If the fuse is broken or damaged, replace the fuse.

B. If the fuse is ok, continue with Step **6**.

6. Check the **A-ECU** supply wiring.

   Disconnect the **X-LC6** connector of the crank control.

   Disconnect the **X-EDC7** connector of the **A-ECU**.

   Use a multimeter to perform the following continuity check:

From	To	Value
Connector **X-LC6 (Receptacle)** pin 5	Connector **X-EDC7 (Plug) pin 2**	There should be continuity
Connector **X-LC6 (Receptacle)** pin 5	Connector **X-EDC7 (Plug) pin 3**	There should be continuity
Connector **X-LC6 (Receptacle)** pin 5	Connector **X-EDC7 (Plug) pin 8**	There should be continuity
Connector **X-LC6 (Receptacle)** pin 5	Connector **X-EDC7 (Plug) pin 9**	There should be continuity

   A. If there is no continuity on one or more checks, there is a failure in the **A-ECU** supply wiring. Locate and repair the failed conductor.

   B. If there is continuity on all checks, check the **A-ECU** for the appropriate software and re-flash, if necessary.

Wiring harnesses - Electrical schematic sheet 03 (55.100)
Wiring harnesses - Electrical schematic sheet 16 (55.100)

65660-03 - Injection Processor (CY33X) Error – Internal Reset / Clock Loss / Voltage Too Low

Control Module: ECU

Context:
Fault path for errors in the power stage component of the common rail (or unit injection, for P342) system. The power stage monitors itself and reports detected errors to the ECU. Monitoring is performed once per camshaft revolution.

Cause:
An internal reset is present longer than No 3 camshaft revolutions.

Possible failure modes:

1. Faulty ECU, clock error.
2. Faulty ECU, power supply voltage.
3. Faulty ECU, software.
4. Faulty ECU, internal failure.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Check the integrity of the harness and the connectors.

   Visually inspect the relevant harness and connector for damage, bent or dislocated pins, corroded terminals or broken wires. Verify that the connectors are fully installed. Flex the harness involved to reveal intermittent breaks or shorts in the wiring concerned. Operate the machine while you monitor the display.

   A. If you find damage or the display indicates other than normal display readings, then repair the damage discovered during the inspection or locate and repair the other than normal display condition and verify that the error has been resolved.

   B. If you do not find damage and the display indicates only normal readings, then continue with Step **3**.
3. Verify the integrity of the F-LC6F1 fuse.

   Verify that the fuse is properly installed.

   Visually check the fuse.

   If necessary, use a multimeter to verify the continuity between the two poles of the fuse.

   A. If the fuse is broken or damaged, replace the fuse.

   B. If the fuse is ok, continue with Step **4**.
4. Check the voltage supply to the **A-ECU**.

   Disconnect the connector **X-EDC7**.

   The key must be in the ON position.

   Use a multimeter to perform the following voltage check:

65749-04 - Shutoff Paths During Initialization - Watchdog

Control Module: ECU

Context:
The ECU comprises so-called redundant shut-off paths (SOP) which deactivate all power stages relevant to injection if certain internal ECU errors are detected. The defects which trigger such a redundant shut-off are an internal watchdog error (Dfp_Mon) and an over- or undervoltage error of the ECU (Dfp_HWEMonU%Supply, %= Max, Min). In order to test the correct functioning of the SOP procedure every path is shortly activated during ECU initialization and following this the fuel injection power stage is activated. Since, however, the SOP is active no injection should occur as it is blocked if the SOP procedure functions correctly. During a successful redundant shut-off test an open circuit (=no current flow) should be detected.
The SOP test can only be carried out once, during ECU initialization if no errors such as short circuits of the injection power stage has been detected previously.

Cause:
Injection occurred although internal shut-off path of the ECU watchdog was active.

Possible failure modes:

1. Faulty ECU, watchdog switch off path defect.
2. Faulty ECU, internal failure.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Check the ECU for the appropriate software and re-flash, if necessary.

   A. If the fault has been resolved, return to the machine to service.

   B. If the fault has not been resolved, escalate an ASIST concern.

65768-03 - Sensor Supply Voltage 3 - High

Control Module: ECU

Context:
For reasons of safety the ECU provides 3 independent **5 V** voltage supplies for the sensors. These sensor supply voltages are monitored to ensure they remain within a given range. This check for voltage limits is done autonomously by the hardware (thresholds not applicable). The error status is then reported via SPI-bus to the diagnostic system management (DSM) where the error status is time-debounced before setting/healing the fault path.

Cause:
The hardware has detected the sensor voltage supply 3 to exceed an upper limit.

Possible failure modes:

1. Faulty battery, voltage too high.
2. Faulty ECU power supply, voltage too high.
3. Faulty ECU supply voltage 3 output wiring, defect in one of the connected components.
4. Faulty ECU, internal failure.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Check the integrity of the harness and the connectors.

   Visually inspect the relevant harness and connector for damage, bent or dislocated pins, corroded terminals or broken wires. Verify that the connectors are fully installed. Flex the harness involved to reveal intermittent breaks or shorts in the wiring concerned. Operate the machine while you monitor the display.

   A. If you find damage or the display indicates other than normal display readings, then repair the damage discovered during the inspection or locate and repair the other than normal display condition and verify that the error has been resolved.

   B. If you do not find damage and the display indicates only normal readings, then continue with Step **3**.
3. Check defects in one of the connected components.

   One at a time, disconnect each component connected to the sensor supply voltage 3 and use the EST to monitor the status of this fault.

   A. If the fault is eliminated after a component disconnection, the relevant component has failed. Replace the relevant component.

   B. If the fault has not been eliminated after components disconnection, continue with Step **4**.
4. Check the battery voltage.

   The engine must be running.

   Use a multimeter to perform the following voltage check:

From	To	Value
Connector **X-563**	Connector **X-566**	There should be about **24 V**

   A. If there is more than **24 V**, continue with Step **5**.

9. Check the ECU CAN 1 circuit for an open circuit condition.

   The key must be in the OFF position.

   Disconnect the diagnostic connector **X-DIA**.

   Disconnect the UCM connector **X-UCM1B**.

   Use a multimeter to perform the following continuity check on the engine harness:

From	To	Value
Connector **X-EDC7 (Plug) pin 35**	Connector **X-DIA (Plug) pin C**	There should be continuity
Connector **X-EDC7 (Plug) pin 34**	Connector **X-DIA (Plug) pin D**	There should be continuity
Connector **X-EDC7 (Plug) pin 35**	Connector **X-UCM1B (Receptacle) pin 34**	There should be continuity
Connector **X-EDC7 (Plug) pin 34**	Connector **X-UCM1B (Receptacle) pin 25**	There should be continuity

   A. If there is no continuity, there is an open circuit condition in the CAN 1 circuit. Locate and repair the shorted conductor.

   B. If there is continuity, check the ECU for the appropriate software and re-flash, if necessary.

Wiring harnesses - Electrical schematic sheet 03 (55.100)
Wiring harnesses - Electrical schematic sheet 16 (55.100)
Wiring harnesses - Electrical schematic sheet 18 (55.100)
Wiring harnesses - Electrical schematic sheet 22 (55.100)
Wiring harnesses - Electrical schematic sheet 24 (55.100)

393374-04 - Torque Limitation due to Fuel Quantity Limitation because of Injection System Errors

Context:
This fault path indicates that a power reduction due to limiting fuel quantity is currently active which limits the engine torque. In other words, this fault path is not used as an actual error status indicating a real defect but is used more for information purposes for service personnel to determine the exact cause of the power limitation (in case a real defect evokes a power reduction the triggering failure also has to be present in the failure memory).
Monitoring is only active if engine speed is above **500 RPM**.

Cause:
A power reduction due to limiting fuel quantity (via limiting torque) is active causing a torque limitation greater than **25%**, of the momentarily allowed maximum torque, or a high idle torque limitation greater than **5%**.

Possible failure modes:

1. Active power reduction due to limiting fuel quantity.

Solution:

1. No actions necessary due to this failure alone. If power reduction occurred due to actual defect, the failure triggering the torque limitation should also be in the failure memory. Follow troubleshooting of this root error.

B. If the measurement is correct, continue with Step **5**.

5. Check the and the ride control solenoid (**Y-YRC**) integrity.

   Remove the and the ride control solenoid (**Y-YRC**).

   Use a multimeter to perform the resistance measurement of the solenoid.

   A. If the resistance is an open circuit, replace the and the ride control solenoid (**Y-YRC**).

   B. If the resistance is not an open circuit, continue with Step **6**.

6. Check the integrity of connectors **X-FRNT** and **X-BTM_F**.

   Disconnect the connector **X-BTM_F** from the connector **X-FRNT** and visually check the integrity of pins P of both connectors.

   A. If one pin is damaged, replace the harness relevant to the damaged connector.

   B. If all pins are not damaged, continue with Step **7**.

7. Check the integrity of harness between the connector **X-FRNT** and the connector **X-YRC**.

   Remove the connector **X-YRC** from the and the ride control solenoid (**Y-YRC**).

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-FRNT** pin P	Connector **X-YRC** pin 1	Short circuit

   A. If the measurement is not correct, replace the harness.

   B. If the measurement is correct, continue with Step **8**.

8. Check the integrity of connectors **X-CAB_B** and **X-BTM**.

   Disconnect the connector **X-BTM** from the connector **X-CAB_B** and visually check the integrity of pin 5 of both connectors.

   A. If one pin is damaged, replace the harness relevant to the damaged connector.

   B. If all pins are not damaged, continue with Step **9**.

9. Check the integrity of harness between connectors **X-BTM** and **X-BTM_F**.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-BTM** pin 5	Connector **X-BTM_F** pin P	Short circuit

   A. If the measurement is not correct, replace the harness.

   B. If the measurement is correct, continue with Step **10**.

10. Check the integrity of harness between connector **X-CAB_B** and **A-UCM**.

    Disconnect the connector **X-UCM3B** from **A-UCM** and visually check the integrity of pin 6 of **X-UCM3B**.

    Use a multimeter to perform the following check:

From	To	Value
Connector **X-UCM3B** pin 6	Connector **X-CAB_B** pin 5	Short circuit

    A. If the measurement is not correct, replace the harness.

    B. If the measurement is correct, replace the **A-UCM**.

Wiring harnesses - Electrical schematic sheet 22 (55.100)

518111-03 - Bucket Angle Sensor Channel 1 Over Voltage

Control Module: UCM

Context:
The **A-UCM** detects a value from the channel 1 of the BUCKET ANGLE (**B-BKT_ANG**) greater than the upper limit.

Cause:
The **A-UCM** detects, on pin 21 of connector **X-UCM1B**, a voltage > **4.75 V**; as a consequence, the advanced EH bucket features (RTD) is disabled.

Possible failure modes:

1. The fault is intermittent and not currently active.
2. The harness between the **A-UCM** and the BUCKET ANGLE is damaged.
3. The connectors **X-BUA** or **X-FRNT_EH** or **X-BTM_FEH** or **X-BTM_EH** or **X-CAB_EH** or **X-UCM1B** are damaged.
4. The BUCKET ANGLE is damaged.
5. The harness relevant to the BUCKET ANGLE is damaged.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Check the integrity of the harness between the **A-UCM** and the BUCKET ANGLE.

   Visually check the integrity of the harness and check for any damage.

   A. If the harness is damaged, replace the harness.

   B. If the harness is not damaged, continue with Step **3**.
3. Check the BUCKET ANGLE sensor integrity.

   Remove the BUCKET ANGLE sensor.

   Use a multimeter to perform the following check:

From	To	Value
BUCKET ANGLE pin P1	BUCKET ANGLE pin N1	The sensor resistance

   A. If the resistance is an open circuit, replace the BUCKET ANGLE.

   B. If the resistance value is correct, continue with Step **4**.
4. Use a multimeter to perform the following check:

From	To	Value
BUCKET ANGLE pin P1	BUCKET ANGLE pin OUT1	A resistance value

   A. If the measurement is a short circuit, replace the BUCKET ANGLE.

   B. If the measurement is correct, continue with Step **5**.
5. Check the integrity of the connectors **X-UCM1B**.

   Disconnect the connector **X-UCM1B** from the **A-UCM**.

Connect the connector **X-BTS** to the connector **X-SST**.

Remove the AUX STEERING PRESSURE sensor.

Use a multimeter to perform the following check:

From	To	Value
Connector **X-PSS** pin B	Connector **X-PSS** pin A	+ **5 V**

A. If the value is not correct, replace the harness between the connector **X-SST** and the connector **X-PSS**.

B. If the value is correct, continue with Step **6**.

6. Check the integrity of the connectors **X-BTM** and **X-CAB_B**.

   The key must be in OFF position.

   Disconnect the connector **X-BTM** from the connector **X-CAB_B**.

   Visually check the integrity of the pin 11 of both connectors.

   A. If one pin is damaged, replace the harness relevant to the connector.

   B. If both pins are not damaged, continue with Step **7**.

7. Check the integrity of the harness between the connector **X-BTS** and the connector **X-BTM**.

   The key must be in OFF position.

   Disconnect the connector **X-BTS** from the connector **X-SST**.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-BTS** pin 4	Connector **X-BTM** pin 11	Short circuit

   A. If the value is not correct, replace the harness between the connector **X-BTS** and the connector **X-BTM**.

   B. If the value is correct, continue with Step **8**.

8. Check the integrity of the connectors **X-UCM1A**.

   The key must be in OFF position.

   Disconnect the connector **X-UCM1A** from the **A-UCM**.

   Visually check the integrity of pin 8.

   A. If the pin is damaged, replace the relevant harness.

   B. If the pin is not damaged, continue with Step **9**.

9. Check the integrity of the harness between the connectors **X-CAB_B** and **X-UCM1A**.

   The key must be in OFF position.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-CAB_B** pin 11	Connector **X-UCM1A** pin 8	Short circuit

   A. If the measurement is not correct, replace the harness between the connector **X-CAB_B** and the connector **X-UCM1A**.

   B. If the measurement is correct, continue with Step **10**.

10. Check the AUX STEERING PRESSURE sensor integrity.

518129-05 - Open Circuit at Boom Raise Valve High Side Driver

Control Module: UCM

Context:

The **A-UCM**, driving the boom rise, detects an open circuit or a low current; as a consequence:

- Boom Function disabled;
- Open Boom LSD;
- Command Boom HSD PWM to **0%**;
- Disabled advanced EH features (RTT/Float, HC).

Cause:
The **A-UCM** detects, on pin 7 of connector **X-UCM4A**, an open circuit or a low current risen by BSP.

Possible failure modes:

1. The fault is intermittent and not currently active.
2. The harness between **A-UCM** and the connector **X-BOOM_RAISE** is damaged.
3. The connectors **X-BOOM_RAISE** or **X-FRNT_EH** or **X-BTM_FEH** or **X-BTM_EH** or **X-CAB_EH** or **X-UCM1B** or **X-UCM4A** are damaged.
4. The harness between connectors **X-FRNT_EH** and **X-BTM_FEH** is damaged.
5. The harness between connectors **X-BTM_EH** and **X-BTM_FEH** is damaged.
6. The harness between connectors **A-UCM** and the connector **X-CAB_EH** is damaged.
7. The BOOM_RAISE SOLENOID is damaged.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Visually check the integrity of the harness between the connectors **X-UCM4A**, **X-UCM1B** and **X-BOOM_RAISE** for any damage.

   A. If the harness is damaged, replace the harness.

   B. If the harness is not damaged, continue with Step **3**.
3. Check the integrity of connector **X-BOOM_RAISE**.

   Disconnect the connector **X-BOOM_RAISE** from the ELECTROHYDRAULIC VALVE (**A-EH_VLV**) and visually check the integrity of pins 1 and 2 of the connector.

   A. If one pin is damaged, replace the harness relevant to the connector.

   B. If the pins are not damaged, continue with Step **4**.
4. Check the integrity of connectors **X-BTM_FEH** and **X-FRNT_EH**.

   Disconnect the connector **X-BTM_FEH** from the connector **X-FRNT_EH** and visually check the integrity of pins B and C of both connectors.

   A. If one pin is damaged, replace the harness relevant to the damaged connector.

Use a multimeter to perform the following check:

From	To	Value
Connector **X-UCM3B** pin 25	Connector **X-UCM1B** pin 30	< + **24 V**

A. If the measurement is correct, replace the **A-UCM**.

B. If one measurement is not correct, continue with Step **6**.

6. Check the integrity of connectors **X-CAB_EH** and **X-BTM_EH**.

   Disconnect the connector **X-CAB_EH** from the connector **X-BTM_EH** and visually check the integrity of pins G and F of both connectors.

   A. If one pin is damaged, replace the harness relevant to the damaged connector.

   B. If all pins are not damaged, continue with Step **7**.

7. Check the integrity of harness between the connectors **X-BTM_EH** and **X-BUCKET_DUMP**.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-BTM_EH** pin G	Connector **X-BTM_EH** pin F	< + **24 V**

   A. If the measurement is correct, replace the harness between connector **X-CAB_EH** and the **A-UCM**.

   B. If the measurement is not correct, continue with Step **8**.

8. Check the integrity of connectors **X-BTM_FEH** and **X-FRNT_EH**.

   Disconnect the connector **X-BTM_FEH** from the connector **X-FRNT_EH** and visually check the integrity of pins G and F of both connectors.

   A. If one pin is damaged, replace the harness relevant to the damaged connector.

   B. If all pins are not damaged, continue with Step **9**.

9. Check the integrity of harness between the connector **X-FRNT_EH** and the connector **X-BUCKET_DUMP**.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-FRNT_EH** pin G	Connector **X-FRNT_EH** pin F	< + **24 V**

   A. If the measurement is correct, replace the harness between connectors **X-BTM_EH** and **X-BTM_FEH**.

   B. If the measurement is not correct, continue with Step **10**.

10. Check the integrity of connector **X-BUCKET_DUMP**.

    Disconnect the connector **X-BUCKET_DUMP** from the ELECTROHYDRAULIC VALVE (**A-EH_VLV**) and visually check the integrity of pins 1 and 2 of the connector.

    A. If one pin is damaged, replace the harness relevant to the connector.

    B. If the pins are not damaged, replace the BUCKET DUMP SOLENOID.

Wiring harnesses - Electrical schematic sheet 22 (55.100)

518137-04 - Short to Ground at AUX 1 Left High Side Driver

Control Module: UCM

Context:

The **A-UCM**, driving the AUX 1 Left, detects a grounding connection; as a consequence:

- AUX I Function disabled;
- Open AUX 1 LSD ;
- Command AUX I HSD PWMs to **0%** Bucket Function disabled.

Cause:
The **A-UCM** detects, on pin 32 of connector **X-UCM3B**, a short circuit to ground risen by BSP.

Possible failure modes:

1. The fault is intermittent and not currently active.
2. The harness between **A-UCM** and the connector **X-AUX_1_LEFT** is damaged.
3. The connectors **X-AUX_1_LEFT** or **X-FRNT_EH** or **X-BTM_FEH** or **X-BTM_EH** or **X-CAB_EH** or **X-UCM1B** or **X-UCM3B** are damaged.
4. The harness between **A-UCM** and the connector **X-AUX_1_LEFT** is damaged.
5. The harness between connectors **X-BTM_EH** and **X-AUX_1_LEFT** is damaged.
6. The harness between connectors **X-FRNT_EH** and **X-AUX_1_LEFT** is damaged.
7. The AUX 1 LEFT SOLENOID is damaged.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Visually check the integrity of the harness between the connectors **X-UCM3B**, **X-UCM1B** and **X-AUX_1_LEFT** for any damage.

   A. If the harness is damaged, replace the harness.

   B. If the harness is not damaged, continue with Step **3**.
3. Check the integrity of connector **X-UCM3B**.

   Disconnect the connector **X-UCM3B** from the **A-UCM** and visually check the integrity of pin 32.

   A. If the pin is damaged, replace the harness.

   B. If the pin is not damaged, continue with Step **4**.
4. Check the integrity of connector **X-UCM1B**.

   Disconnect the connector **X-UCM1B** from the **A-UCM** and visually check the integrity of pin 10.

   A. If the pin is damaged, replace the harness.

   B. If the pin is not damaged, continue with Step **5**.
5. Check the integrity of harness between the **A-UCM** and the connector **X-AUX_1_LEFT**.

B. If the functionality is not restored, replace the **A-UCM**.

Wiring harnesses - Electrical schematic sheet 22 (55.100)

518145-03 - Short to Power/Open Circuit at Park Brake Low Side Driver

Control Module: UCM

Context:
The **A-UCM** detects a value from PARKING BRAKE SOLENOID (Y-Y_BP) out of higher limit.

Cause:
The **A-UCM** detects on pin 22 of connector **X-UCM1A** a short circuit to power.

Possible failure modes:

1. The fault is intermittent and not currently active.
2. The harness between **A-UCM** and the PARKING BRAKE SOLENOID is damaged.
3. The PARKING BRAKE SOLENOID is damaged.
4. The connectors **X-BTM** and **X-CAB_B** are damaged.
5. The harness between the connector **X-BTM** and the PARKING BRAKE SOLENOID is damaged.
6. The harness between the connector **X-CAB_B** and the **A-UCM** is damaged.

Solution:

1. Park Brake Function disabled (PB always active)
   - Open PB LSD
   - Command PB HSD to OFF
   - Set B.PBrakeAct = 01 (Park Brake Actuator Active)

   Set the key in OFF position.

   Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Check the integrity of the harness between the **A-UCM** and the PARKING BRAKE SOLENOID.

   Visually check the integrity of the harness and check for any damage.

   A. If the harness is damaged, replace the harness.

   B. If the harness is not damaged, continue with Step **3**.
3. Check the PARKING BRAKE SOLENOID integrity.

   Remove the PARKING BRAKE SOLENOID sensor.

   Use a multimeter to perform the resistance measurement of the solenoid.

   A. If the resistance is a short circuit, replace the PARKING BRAKE SOLENOID.

   B. If the resistance is not short circuit, continue with Step **4**.
4. Check the integrity of connectors **X-BTM** and **X-CAB_B**.

   Disconnect the connector **X-BTM** from the connector **X-CAB_B** and visually check the integrity of pins 18 and 19 of both connectors.

   A. If one pin is damaged, replace the harness relevant to the damaged connector.

518150-05 - Electrical Ignition Power Relay- Open Circuit

Control Module: SFB

Context:
Open circuit Electrical Ignition Power Relay.

Cause:
The Smart Fuse box measure an open circuit Electrical Ignition Power Relay (X3-8) when the key is OFF.

Possible failure modes:

1. The fault is intermittent and not currently active.
2. The harness between Smart Fuse Box and key switch Ignition is damaged.
3. The key switch Ignition connector is damaged.
4. The Smart Fuse Box connector is damaged.
5. The Electrical Ignition Power Relay is defective.
6. The Smart Fuse Box is defective.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Check the integrity of the harness between Smart Fuse Box and Ignition Power Relay (**X-LC5** pin 86).

   Visually check the integrity of the harness and check for any damage.

   A. If the harness is damaged, replace the harness.

   B. If the harness is not damaged, continue with Step **3**.
3. Check the integrity of the Ignition Power Relay connector (**X-LC5** pin 86).

   The key must be in the OFF position.

   Disconnect Ignition Power Relay connector and visually check the integrity of the pin.

   A. If the pin is damaged, replace the connector.

   B. If the pin is not damaged, continue with Step **4**.
4. Check the integrity of the Smart Fuse Box connector.

   The key must be in the OFF position.

   Disconnect **X-X3** connector and visually check the integrity of the pin 8.

   A. If the pin 8 is damaged, replace the **X-X3** connector.

   B. If the pin 8 is not damaged, continue with Step **5**.
5. Check the signal circuit for an open circuit condition on the harness between Electrical Ignition Power Relay pin (**X-LC5** pin 86) and Smart Fuse Box.

   Use a multimeter to perform the following voltage check:

11. Replace the PILOT ENABLE SOLENOID.
    A. If the functionality is restored, the procedure ends.
    B. If the functionality is not restored, replace the **A-UCM**.

Wiring harnesses - Electrical schematic sheet 22 (55.100)

518291-31 - Error at 24VLP Supply Rail

Control Module: UCM

Context:

The **A-UCM** detects the absence of the 24VLP power supply; as a consequence the following functions are disabled:

- Warning LED disabled;
- Aux Steering Disabled;
- FAN Commanded in Open Loop.

Cause:
The **A-UCM** detects, on pin 2 of connector **X-UCM4B**, a voltage < **10 V**.

Possible failure modes:

1. The fault is intermittent and not currently active.
2. The harness between **A-UCM** and the LC2 is damaged.
3. The connectors **X-LC2** or **X-UCM4B** are damaged.
4. The harness between **A-UCM** and the connector **X-LC2** is damaged.
5. The UCM VS1/VLP (**F-2F4**) is burnt.
6. The harness between the LC2 and the power supply is damaged.

Solution:

1. Verify that the fault is present and active.

   Use the Electronic Service Tool (EST) to check the status of this fault.

   A. If the fault is present and active, continue with Step **2**.

   B. If the fault is no longer present or in an inactive state, the fault may be intermittent and not currently active.
2. Visually check the integrity of the harness between the connectors **X-UCM4B** and **X-LC2** for any damage.

   A. If the harness is damaged, replace the harness.

   B. If the harness is not damaged, continue with Step **3**.
3. Check the integrity of connector **X-UCM4B**.

   Disconnect the connector **X-UCM4B** from the **A-UCM** and visually check the integrity of pin 2.

   A. If the pin is damaged, replace the harness.

   B. If the pin is not damaged, continue with Step **4**.
4. Check the integrity of harness between the **A-UCM** and the power supply.

   Use a multimeter to perform the following check:

From	To	Value
Connector **X-UCM4B** pin 2	Ground	≥ + **10 V**

   A. If the measurement is correct, replace the **A-UCM**.

   B. If the measurement is not correct, continue with Step **5**.
5. Check the integrity of connector **X-LC2**.

   Disconnect the connector **X-LC2** from LC2 and visually check the integrity of pins 4A and 4B.

With the key switch in the “OFF” position, use a multimeter to measure the resistance of the CAN connection on the vehicle (VE) harness side:

From	To	Value
Connector **X-ECU** pin 46	Connector **X-ECU** pin 47	There should be **120 Ω**
Connector **X-ECU** pin 46	Chassis ground	There should not be continuity
Connector **X-ECU** pin 47	Chassis ground	There should not be continuity

Use a multimeter to measure the resistance of the CAN termination resistor, internal to the Keypad unit:

From	To	Value
Connector **X-ECU** pin 46	Connector **X-ECU** pin 47	There should be **120 Ω**

A. If the measured resistances are correct and neither conductor is grounded, check the Keypad unit for the appropriate software and re-flash, if necessary.

B. If the measured resistances are not correct or one or both of the conductors is grounded, refer to the appropriate vehicle service manual and electrical schematics to locate and restore the termination resistance to the CAN circuit.

6. Visually inspect the relevant harnesses and connectors for damage, bent or dislocated pins, corroded terminals, or broken wires.

   Verify that the connectors are fully installed.

   Flex the harnesses involved to reveal intermittent breaks or shorts in the wiring concerned.

   Operate the machine while you monitor the display.

   A. If you find damage or the display indicates other than normal display readings, then repair the damage discovered during the inspection or locate and repair the other than normal display condition and verify that the error has been resolved.

   B. If you do not find damage and the display indicates only normal readings, then erase the fault code and continue operation.

From	To	Value
Connector **X-X6** pin 2	+ **5 V**	There should be an open circuit
Connector **X-CAB_E** pin 10	+ **5 V**	There should be an open circuit
Connector **X-ENG** pin 10	+ **5 V**	There should be an open circuit
Connector **X-ENG_H** pin 2	+ **5 V**	There should be an open circuit

A. If there is an short circuit to B+, replace the harness.

B. If there is an open circuit, continue to Step **6**.

6. Check the Electrical Ignition Power Relay pin (L-NA-TAIL pin 2) circuit for an short circuit to B+.

   The key must be in the OFF position.

   Use a multimeter to perform the following voltage check:

From	To	Value
Connector L-NA-TAIL pin 2	+ **5 V**	There should be an open circuit

A. If there is an short circuit to B+, replace the Electrical Ignition Power Relay.

B. If there is an open circuit, continue to Step **7**.

7. Check the Smart Fuse Box signal circuit for an short circuit to B+.

   The key must be in the OFF position.

   Use a multimeter to perform the following voltage check:

From	To	Value
Connector **A-SFB** pin OUT_19_H_CS	+ **5 V**	There should be an open circuit to B+

A. If there is a short circuit, replace the Smart Fuse Box.

Wiring harnesses - Electrical schematic sheet 29 (55.100)

The key must be in the OFF position.

Use a multimeter to perform the following voltage check:

From	To	Value
Connector **A-SFB** pin OUT_45_H_CS_L	Chassis ground	There should be not voltage

A. If there is a voltage, replace the Smart Fuse Box.

Wiring harnesses - Electrical schematic sheet 36 (55.100)

A. If the fuse is damaged, replace the fuse.

B. If the fuse is not damaged, continue with Step **6**.

6. Check the Battery K Isolator.

   The key must be in the OFF position.

   Use a multimeter to perform the following voltage check:

From	To	Value
Connector **X-ISO** pin 1	Chassis ground	There should be an open circuit
Connector **X-ISO** pin 2	Chassis ground	There should be an open circuit
Connector **X-ISO** pin 3	Chassis ground	There should be a short

   A. Verify the Battery K Isolator Power supply (pin X-D)

   B. If Battery K Isolator is right functioning, replace the Smart Fuse Box.

Wiring harnesses - Electrical schematic sheet 03 (55.100)
Wiring harnesses - Electrical schematic sheet 04 (55.100)
Wiring harnesses - Electrical schematic sheet 06 (55.100)

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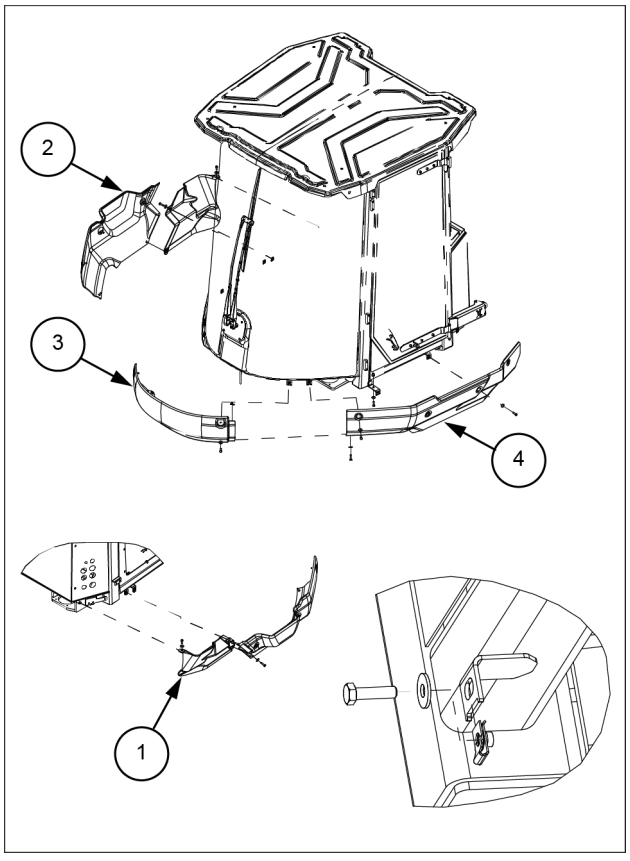
Availability of some models and equipment builds varies according to the country in which the equipment is being used. For exact information about any particular product, please consult your NEW HOLLAND CONSTRUCTION dealer.

Cab - Remove

Rollover Protective Structure (ROPS)

1. Park the machine on a level surface and lower the bucket to the ground.
   Stop the engine.
   Actuate the brake pedal several times to discharge the brake accumulators.
2. Put the key switch to ON position and move the joystick to the raise and to the lower position in order to release any hydraulic pressure in the hydraulic circuit.
3. Slowly loosen the filler cap on the hydraulic oil tank to release air pressure.
4. Put the key switch to OFF position.
5. Put the articulation lock in the locked position.
6. Put the timed disconnect switch to OFF position.
7. Put a suitable container below the radiator drain. Remove cap and drain coolant into container. Install cap after coolant has drained.
8. Discharge and recover the air-conditioning refrigerant. Refer to **Air conditioning - Charging (50.200)**.
9. Remove the right-hand rear fender and steps (if equipped).
10. Remove the relevant bolts, washers, and nuts to disassemble:

    • the right-hand rear cab skirt **(1)**;
    • the right-hand cab skirt **(2)**;
    • the center cab skirt **(3)**;
    • the left-hand cab skirt **(4)**.



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Contents

Platform, cab, bodywork, and decals - 90

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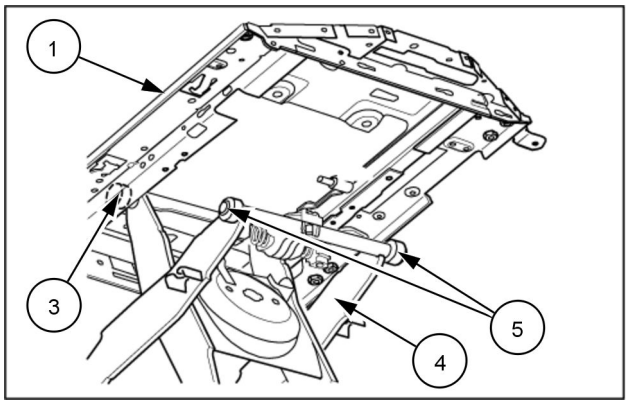
18. Turn counterclockwise the upper suspension part **(1)** by approximately of **45°**.
19. Lift the upper suspension part **(1)** above ad forward the rear roller **(3)**.
20. Pull and remove the two front rollers **(5)** and two rear rollers **(3)** from the lifting structure **(4)**.



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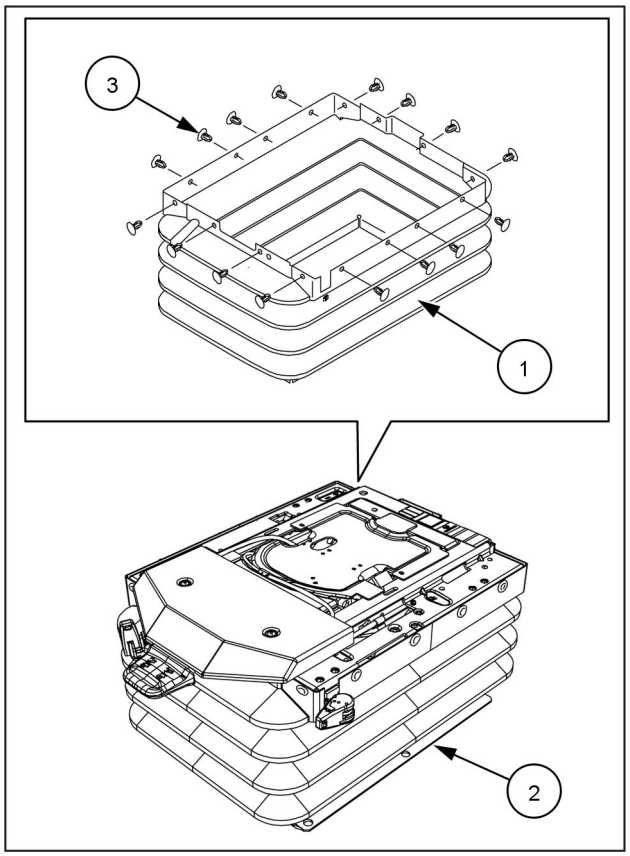
4. Install the 16 bellows pins **(3)** that attach the upper suspension part **(2)** to the bellows **(1)**.



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