570T
Backhoe Loader

SERVICE MANUAL

Part number 51590702
English
March 2019
Replaces part number 48082187

CASE
CONSTRUCTION

Safety rules

⚠ DANGER

Improper operation or service of this machine can result in an accident.
Do not operate this machine or perform any lubrication, maintenance, or repair on it until you have read and understood the operation, lubrication, maintenance, and repair information.
Failure to comply will result in death or serious injury.

D0010A

⚠ WARNING

Maintenance hazard!
Always perform all service procedures punctually at the intervals stated in this manual. This ensures optimum performance levels and maximum safety during machine operation.
Failure to comply could result in death or serious injury.

W0132A

NOTICE: *Extreme working and environmental conditions require shortened service intervals.*

Use Case fluids, lubricants, and filters for the best protection and performance of your machine. All fluids, lubricants, and filters must be disposed of in compliance with environmental standards and regulations. Contact your Dealer with any questions regarding the service and maintenance of this machine.

Use this manual with the operator's manual to understand and perform the complete service procedures. Read the safety decals and information decals on the machine. Read the Operator’s Manual and safety manual. Understand the operation of the machine before you start any service.

Before you service the machine, put a “Do Not Operate” tag on the steering wheel or over the key switch. Ensure the tag is at a location where everyone who might operate or service the machine may see clearly.

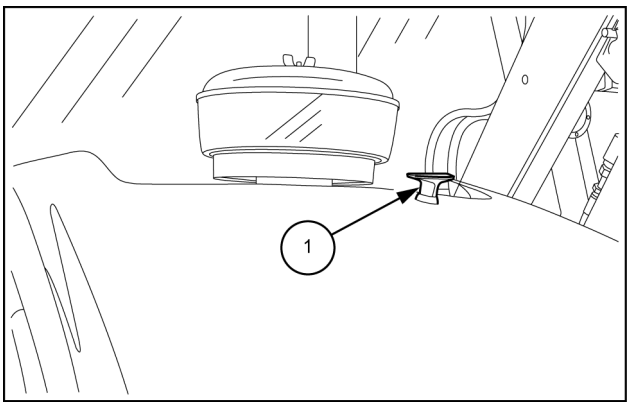
Plastic and resin parts

- Avoid using gasoline, paint thinner, etc. when cleaning plastic parts, console, instrument cluster, etc.
- Use only water, mild soap, and a soft cloth when you clean these parts.
- Using gasoline, thinners, etc. can cause discoloration, cracking, or deformation of the part being cleaned.

Basic instructions

Open the hood:

1. Shut down the engine.
2. Turn the handle **(1)** counter-clockwise to release the hood latch.



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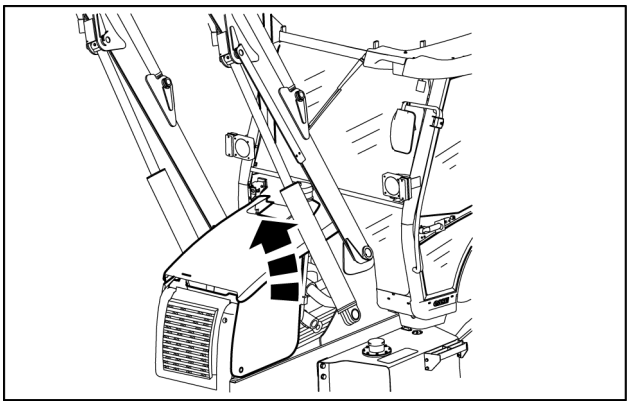
3. Lift the hood and rotate forward.



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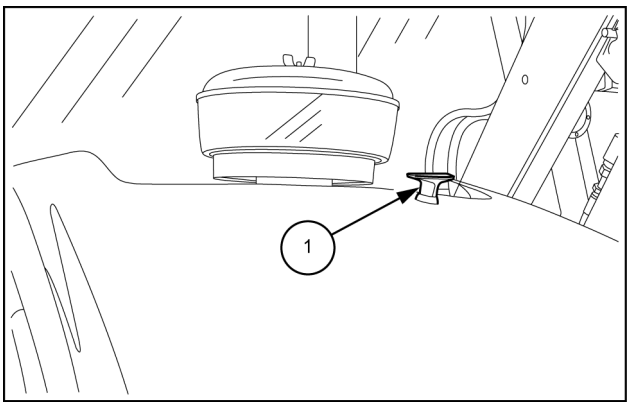
NOTICE: *To avoid damage to the hood parts, always close the hood before moving the loader.*

Close the hood:

1. Lower the hood.
2. Turn the handle **(1)** clockwise to lock the hood latch.



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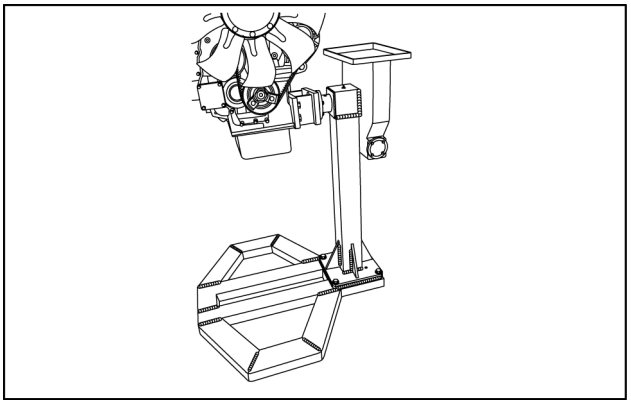
Abbreviation - Measurements

Typical applications	Metric unit		Imperial unit	
	Name	Symbol	Name	Symbol
Area (Land area)				
	hectare	ha	acre	ac
	square meter	m²	square foot	ft²
			square inch	in²
	square millimeter	mm²	square inch	in²
Electricity				
	ampere	A	ampere	A
	volt	V	volt	V
	microfarad	µF	microfarad	µF
	ohm	Ω	ohm	Ω
Force				
	kilonewton	kN	pound	lb
	newton	N	pound	lb
Force per length				
	newton per meter	N/m	pound per foot	lb/ft
			pound per inch	lb/in
Frequency				
	megahertz	MHz	megahertz	MHz
	kilohertz	kHz	kilohertz	kHz
	hertz	Hz	hertz	Hz
Frequency − Rotational				
	revolution per minute	r/min	revolution per minute	r/min [a]
		rpm		rpm
Length				
	kilometer	km	mile	mi
	meter	m	foot	ft
	centimeter	cm	inch	in
	millimeter	mm	inch	in
	micrometer	µm		
Mass				
	kilogram	kg	pound	lb
	gram	g	ounce	oz
	milligram	mg		
Power				
	kilowatt	kW	horsepower	Hp
	watt	W	Btu per hour	Btu/hr
			Btu per minute	Btu/min
Pressure or stress (Force per area)				
	kilopascal	kPa	pound per square inch	psi
			inch of mercury	inHg
	pascal	Pa	inch of water	inH2O
	megapascal	MPa	pound per square inch	psi

380000301 Engine stand



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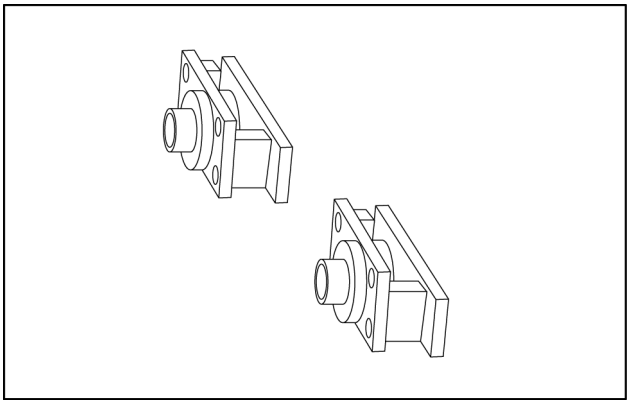
380200415 Support



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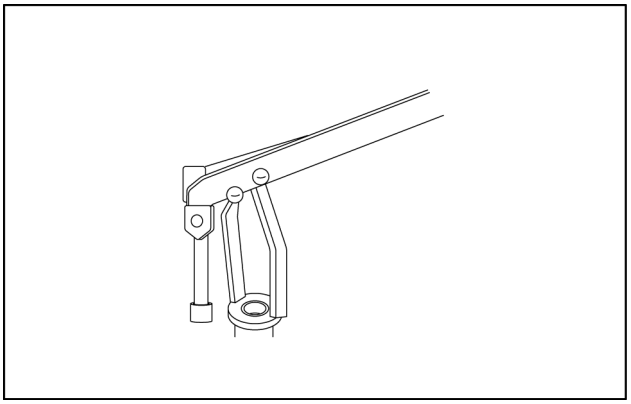
380000302 Cylinder head valve spring compressor



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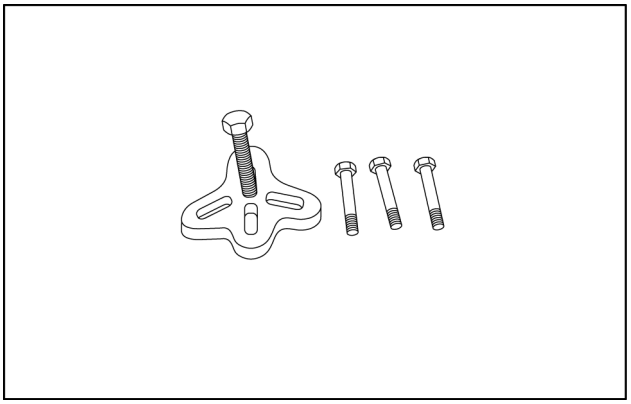
380200447 Puller (FIP gear & crank pulley hub)



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Engine - Static description

The S8000 is a 4 cylinder turbo charged and after cool diesel engine.

It features a cross flow cylinder head, with the inlet and exhaust manifolds on opposite sides of the cylinder head.

The fuel and air combustion process, takes place in the specially designed bowel in the crown of the pistons.

Cylinder head assembly

The cylinder head incorporates valves and springs, with the valve rocker arm shaft assembly bolted to the cylinder block through the cylinder head.

Cylinder head retaining bolts are evenly spaced with a six-point pattern around each cylinder, this ensures an even clamping load across the cylinder head.

The intake and exhaust manifolds are bolted to the head, the intake manifold is mounted on the right side of the engine, with the diesel injectors mounted outside the rocker cover.

The exhaust manifold is mounted on the left side of the engine.

Water outlet connections and thermostat being attached to the front of the cylinder block directly behind the radiator valve guides are inserted into the cylinder head, and replaceable.

Special replaceable cast alloy valve seats are pressed into each valve port during manufacturing.

No oversize valve seats on guides are available. All valves are fitted with positive value rotators, valve clearance is maintained by adjustment of the self locking adjusting screw, mounted in each of the rocker arms.

Camshaft assembly

The camshaft runs in 3 replaceable bushes.

The camshaft drive gear is in mesh with and driven by the camshaft idler gear which is driven by the crankshaft timing gear.

Camshaft end thrust is controlled by a thrust plate bolted to the block, and located between the camshaft gear and the front camshaft journal.

Cylinder block assembly

The cylinder block is an alloy cast iron with deep cylinder skirts & water jackets for cooling the cylinders.

The cylinder bores are machined integral with the cylinder block, during the manufacturing process.

Cylinders are in line, vertical and numbered 1 to 4 from radiator to the engine rear.

The oil sump, which is attached to the bottom of the cylinder block, is the reservoir for the engine oil lubrication system.

A cast iron engine front cover and front plate is attached to the front of the engine and covers all of the timing gear assembly.

Crankshaft assembly

The crankshaft is supported in the cylinder block by 5 main bearings.

The crankshaft is manufactured from steel with machined finished crank webs. End thrust is controlled by a thrust bearing incorporated in the center main bearing of the crankshaft.

Connecting rods

Connecting rods “wedge” shaped at the small end has been designed to reduce the reciprocating weight at the piston end.

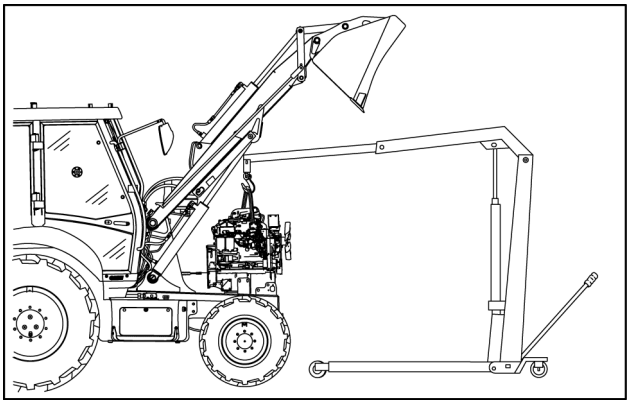
Engine - Install

If applicable, remove caps and plugs from previously disconnected hoses and fittings. Remove identification tags after making the hose and wire connections.

NOTE: *The photos in this procedure may be different from your machine and are for reference only.*

1. Position the engine in the machine.

NOTICE: *Make sure that the flex plate/converter assembly stays in place on the transmission.*



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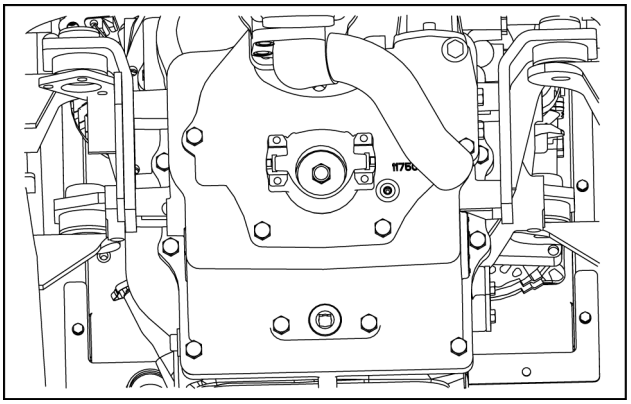
2. Install and tighten the flat washers and cap screws securing the transmission to the engine.

   Tighten cap screws to a torque of **52 – 57 N·m** (**38 – 42 lb ft**).

   Install and tighten the front engine mounting bolts, flat washers, and nuts.

   Tighten the self-locking nuts to a torque of **90 – 100 N·m** (**66 – 74 lb ft**).

3. Disconnect the lifting equipment from the lifting eyes on the engine.



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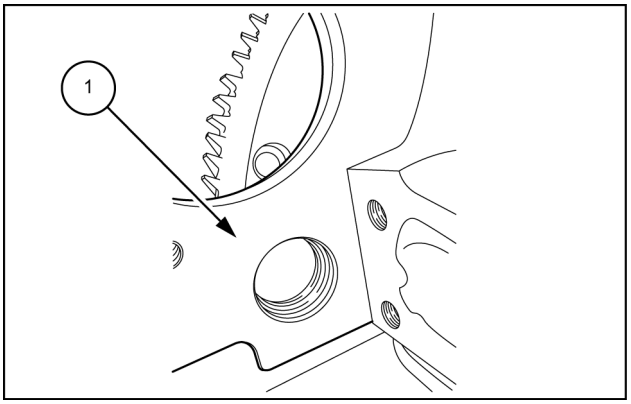
4. Tighten the cap screws through the access in the flywheel housing **(1)** and fasten the flywheel to the flex plate. Tighten cap screws to a torque of **52 – 57 N·m** (**38 – 42 lb ft**) when fixing the torque converter.
5. Install the access cover to the bell housing.

   Tighten it to a torque value of **52 – 57 N·m** (**38 – 42 lb ft**).

6. Install the starter onto the engine.

   Tighten it to a torque value of **40 N·m** (**29 lb ft**).
   Refer to **Engine starter - Install (55.201)**.



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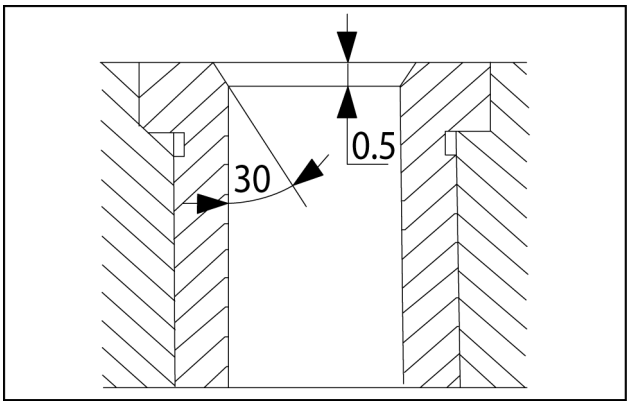
Installation of new sleeves

1. Preparation for fitting new sleeves:
   - After removal of the old sleeves, the parent bore must be thoroughly cleaned both in the top recess off the sleeve flange and in the parent bore itself.
   - A check must be made to ensure that the whole areas of contact with the sleeves in the cylinder block are free from burrs, corrosion or damage. Remove any burrs present.
   - Check engine block bore quality and if necessary restore to **106.850 – 106.900 mm** (**4.207 – 4.209 in**).
   - Check if cylinder liner outer diameter is **107.020 – 107.050 mm** (**4.213 – 4.215 in**).

NOTE: *The cylinder liners are delivered as spare parts with an over dimension outer diameter of* ***0.200 mm*** *(****0.008 in****).*

   - Ensure that the sleeve is thoroughly clean before fitting. If cleaning fluid is used to wash the sleeve, it is IMPORTANT: that the sleeve be thoroughly dried and well oiled before fitting.
   - Throughout the whole operation, extreme cleanliness is essential as the entry of the smallest particle or other foreign matter is sufficient to cause local distortion of the sleeve bore.
2. Lubricate the outside diameter of the sleeves with clean oil using spray. The use of brush is not recommended.
3. Press a new sleeve (**0.2 mm** (**0.008 in**) oversize if necessary) from the top of the block as below.
   - set the liner on the crankcase and start force fitting. After force fitting **70 – 90 mm** (**2.756 – 3.543 in**). check that the load is higher than **5000 N** (**1124.04 lb**) and lower than **23000 N** (**5170.6 lb**). Continue force fitting stop for **5 min**. with a setting load of above **50000 N** (**11240.4 lb**).
   - Ensure contact between edge and crank case with a settling blow. After inserting, the liners must be bored and surface-ground. Cylinder liners are delivered as spare parts with an inner diameter slightly below nominal diameter in order to be able to correct possible deformation appearing during mounting.
4. Skim the block face, and top of sleeves to achieve required flatness.
5. A chamfer in the internal diameter at the top of sleeve to **30°**, **0.500 mm** (**0.020 in**) should be maintained, to prevent piston damage on re-assembly.



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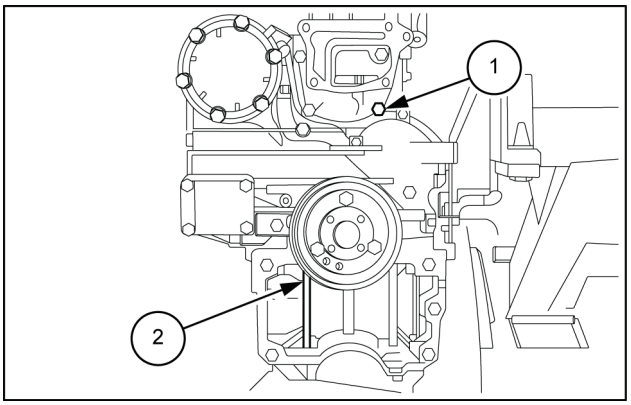
7. Loosen all the bolts **(1)** securing front cover and bolts **(2)** on oil sump.
8. Take care to loosen the bolt below the fuel injection pump progressively to remove the cover.

ATTENTION: *Do not pull the cover out without loosening the bolt. The cover may get damaged and need replacement.*

9. Remove front cover, taking care of front oil seal and oil sump gasket.



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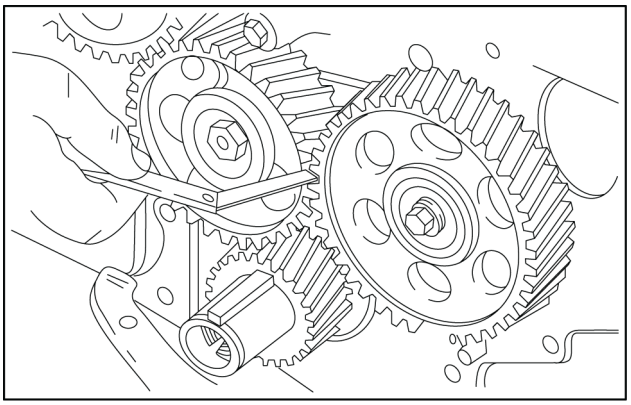
Timing gear removal

NOTE: *The crankshaft timing gear cannot be removed without removing crankshaft from the engine. For crankshaft removal procedure refer to* ***Crankshaft - Remove (10.103)****.*

1. Before removing the timing gear use a dial indicator on feeler gauge to measure the backlash between each set of gears.
2. Rotate the gears and check the backlash at four equal points on the gears. Renew if the backlash exceeds **0.16 mm** (**0.01 in**).



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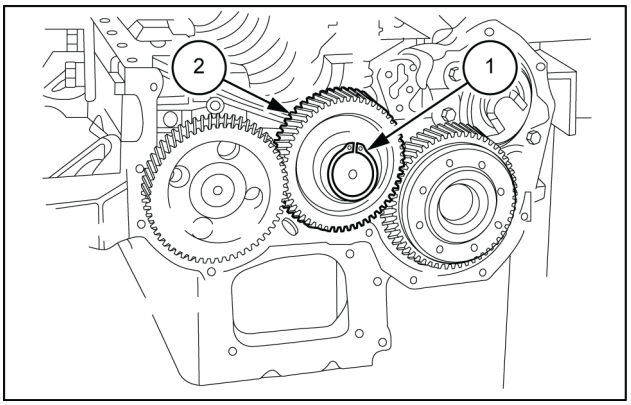
Idler gear

3. Remove circlip and spacer **(1)** and idler gear **(2)** from the hub.



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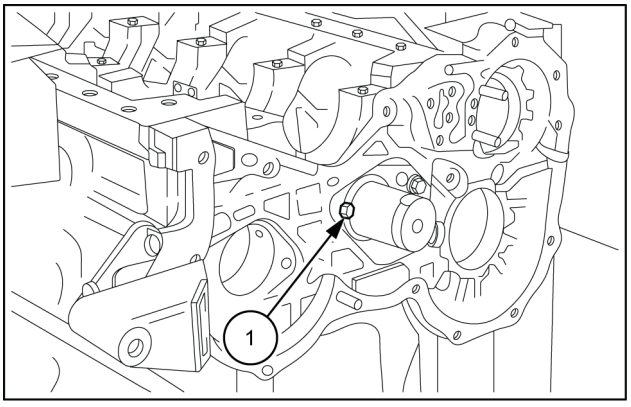
4. Withdraw bolts **(1)** and remove hub from the rear cover.



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Cylinder heads - 101

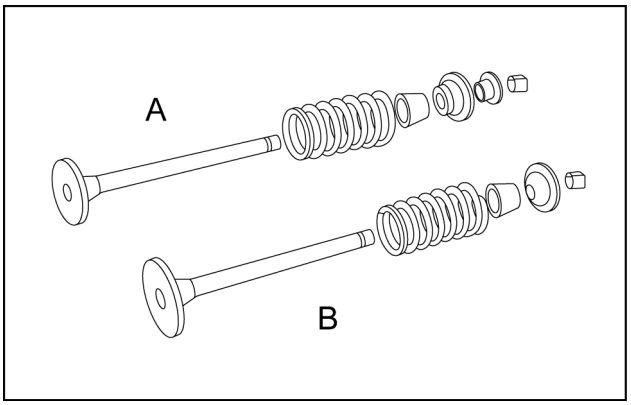
SERVICE

Cylinder heads - Assemble

1. Insert the valves into the guides from which they were removed and lap with a suitable paste. Ensure that all traces and paste are removed after lapping.

   A. Exhaust

   B. Inlet



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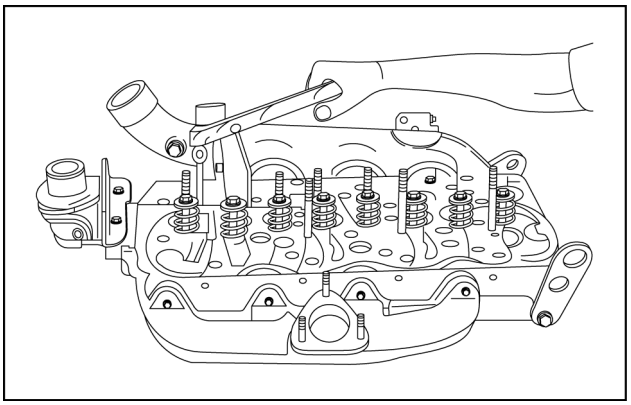
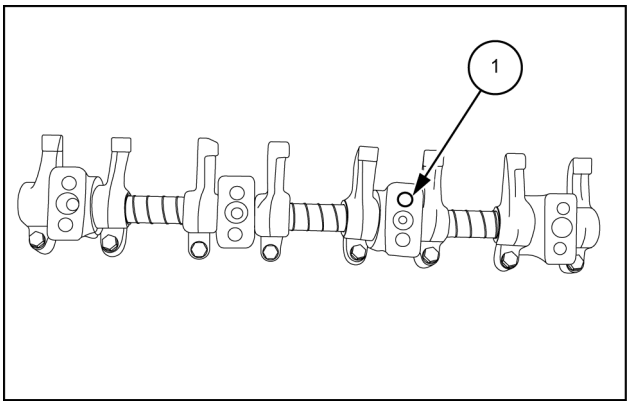
2. Lubricate all components with clean engine oil on re-assembly. Use a spring compressor (special tool no. **380000302**) to re-assemble the valves, valve springs and retainers, and collects.
3. Coat all tappets with clean engine oil prior to assembly and insert tappet into its original position.
4. Reassemble the rocker shaft assembly following the same order in reverse of disassembly.



PTIL13TLB0773AA 2

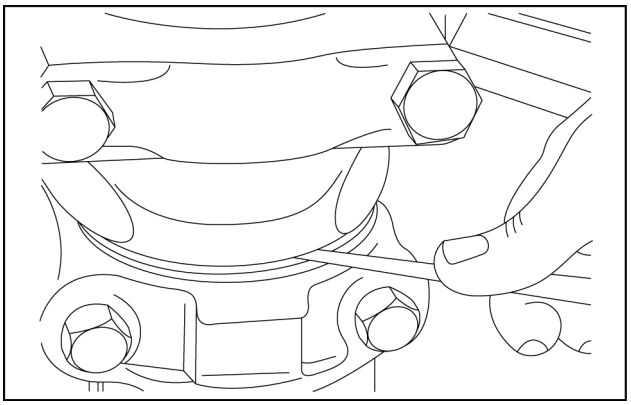
5. Ensure each ball end of rocker arm screws are seated in its push rod before tightening rocker assembly fully.

NOTE: *Ensure that screw* ***(1)*** *securing second retainer (from side of the engine) and shaft is fitted. This ensures oil grooves and holes face downwards.*



PTIL13TLB0774AB 3

5. Using feeler gauges, check the side clearance of each connecting rod to crankshaft, which should be within **0.06 – 0.10 mm**.
6. Refit the oil pump tube/screen and oil sump as described in the relevant section, refill engine oil and coolant and run the engine checking for leaks.



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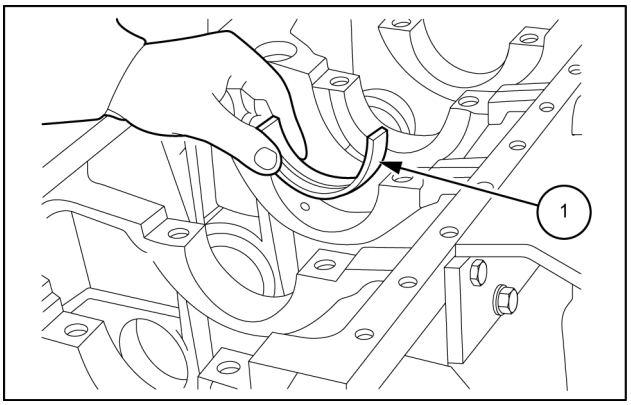
11. Retrieve main bearing shells **(1)** and thrust washer from the cylinder block.



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Fuel injection system - Install - Feed pump

For assembly and installation follow the disassembly and removal procedure in reverse order.

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Air cleaners and lines - 202

SERVICE

Throttle control linkage - Adjust

1. Move the throttle lever **(1)** to the high idle position and then to the low idle position.
2. The throttle lever **(1)** must move smoothly and hold the setting when it is released. If not the throttle lever **(1)** must be adjusted.
3. Loosen the nuts **(7)** & **(8)** at the fuel pump end.
4. Tighten the inner nut **(7)** to a torque of **5.6 – 6.2 N·m** (**4.1 – 4.6 lb ft**).
5. Then tighten the outer jam nut **(8)** to a torque of **3.3 – 5.7 N·m** (**2.4 – 4.2 lb ft**)

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Intake and exhaust manifolds and muffler - 254

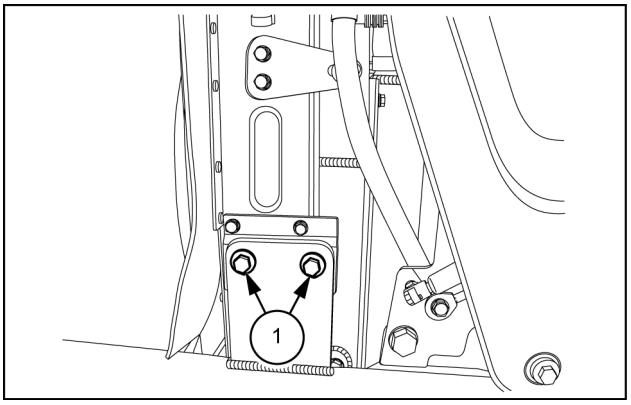
Radiator - Install

NOTE: *The photos in this procedure may be different from your machine and are for reference only.*

1. Attach suitable lifting equipment to the cooling pack.
2. Lower the assembly just in front of the fan and slowly guide the cooling pack backward clearing the fan.

NOTE: *Adjust fan shroud to obtain **20 mm** (**0.787 in**) clearance around the fan.*

3. Install and tighten the mounting bolts **(1)**.



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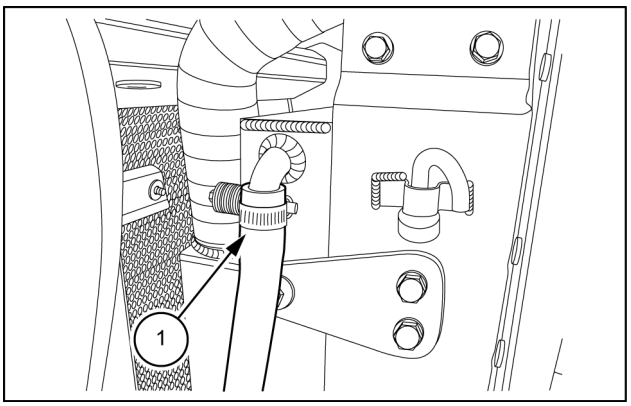
4. Connect all oil cooler hoses **(1)**, on each side of the assembly.



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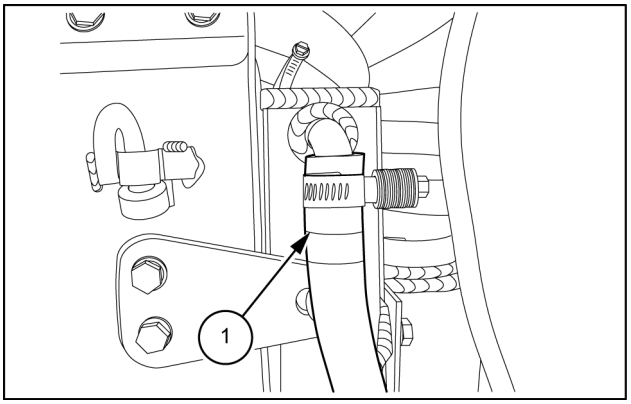

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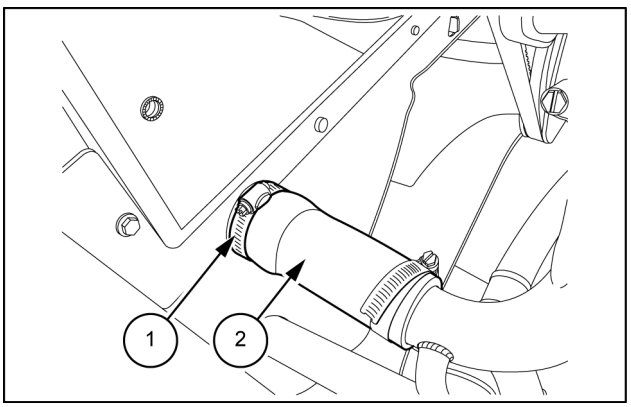
5. Connect the lower radiator hose **(2)** and tighten the clamp **(1)**.



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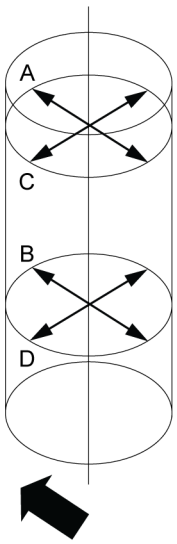
Engine diagnostic sheet 3

MEASURE RING GAPS
(By fitting each ring half way down its own bore)

Cylinder	1	2	3	4	5	6	Units of measurement
Top ring							
2nd ring							
Oil control							

MEASURE BORE WEAR



Front of engine

Cylinder												
A												
C												
B												
D												
Ovality	A/C	B/D	A/C	B/D	A/C	B/D	A/C	B/D	A/C	B/D	A/C	B/D
A to C and B to D												
Maximum ovality												
Taper	A/B	C/D	A/B	C/D	A/B	C/D	A/B	C/D	A/B	C/D	A/B	C/D
A to B and C to D												
Maximum ovality												

ADDITIONAL INFORMATION

Signed _____

Position _____ Date _____

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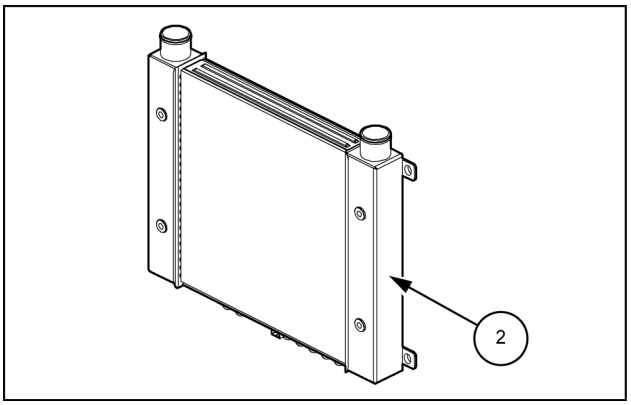
Aftercooler - Install

1. Install the aftercooler **(2)** on the radiator.



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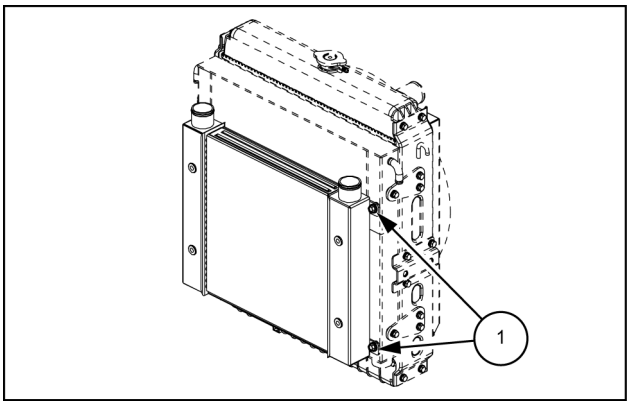
2. Install and tighten the mounting bolts **(1)** on both the sides.



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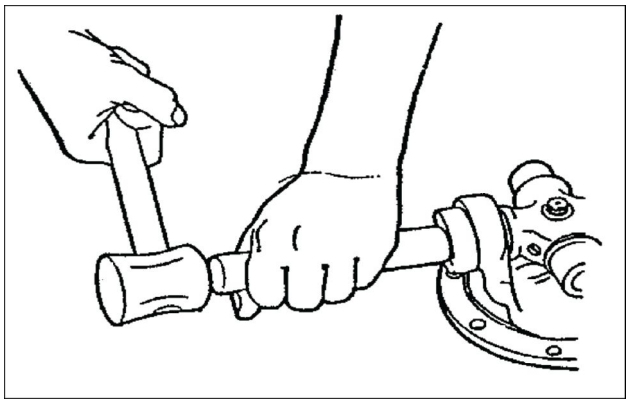
3. Connect the hoses.
4. Install the condenser. Refer to **Air-conditioning condenser - Install (50.200)**.

Drive shaft from transmission to rear axle - Assemble - Rear propeller shaft

1. All assembly operations to be done in a dust free atmosphere and all parts used should be clean and free from dirt and other impurities.
2. If load markings or wear are observed on journal peg diameter, needle rollers or inner diameter of bearing races of dismantled universal joint , the entire universal joint is to be replaced, because new Journal used with old bearing race assemblies or new bearing assemblies used with old journal will wear more rapidly making another replacement necessary in a short time.
3. All assembly operations to be carried out in a dust free atmosphere and all parts used should be clean and free of dirt and other impurities.
4. Insert journal in flange yoke cross holes and using a soft nosed drift (which is slightly smaller than the outside diameter of bearing race assembly), tap the bearing race assembly into position by a soft hammer taking care to avoid accidental spillage of needle rollers (see figure **1**).
   Fit shim if required on top of bearing race assembly and snap ring in the yoke ear groove.



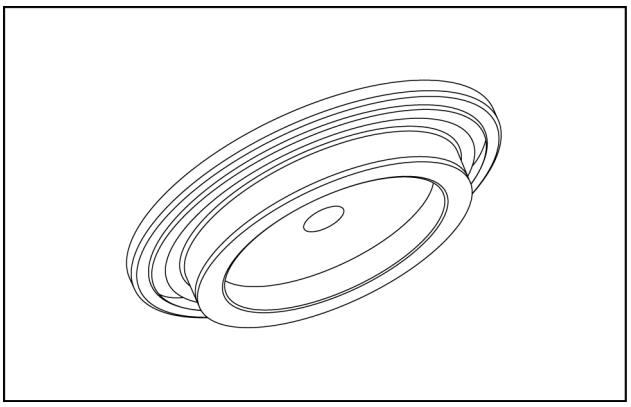
PTIL18TLB0357AB 1

5. To insert the second bearing race assembly in the other yoke ear of flange yoke turn the flange yoke by **180°** and insert journal in flange yoke cross holes and using a soft nosed drift (which is slightly smaller than the outside diameter of bearing race assembly), tap the bearing race assembly into position by a soft hammer taking care to avoid accidental spillage of needle rollers (see figure **1**).
6. To insert the remaining two bearing race assemblies in the other yoke, insert journal in flange yoke cross holes and using a soft nosed drift (which is slightly smaller than the outside diameter of bearing race assembly), tap the bearing race assembly into position by a soft hammer taking care to avoid accidental spillage of needle rollers (see figure **1**) and
   To insert the second bearing race assembly in the other yoke ear of flange yoke turn the flange yoke by **180°** and insert journal in flange yoke cross holes and using a soft nosed drift (which is slightly smaller than the outside diameter of bearing race assembly), tap the bearing race assembly into position by a soft hammer taking care to avoid accidental spillage of needle rollers (see figure **1**).

Contents

Front axle system - 25

380200468 Driver



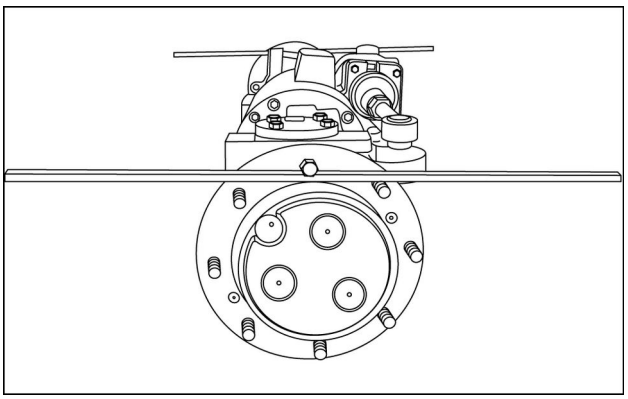
PTIL13TLB0698AA 26

Powered front axle - Toe in adjust

Toe-in adjustment

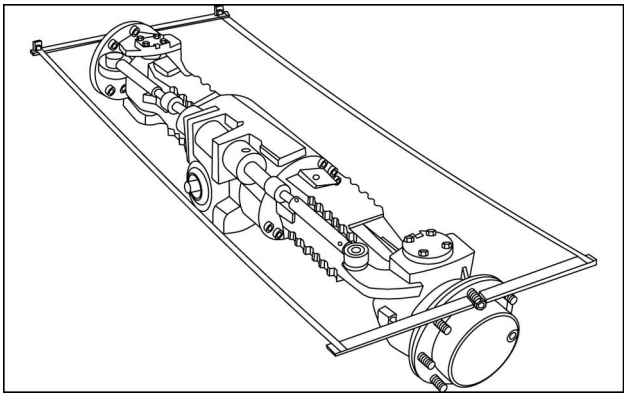
1. Put two equal **1 m** (**39.37 in**) bars on the wheel sides and lock them with two nuts on the wheel hub stud bolt.

ATTENTION: *The two bars should be fixed on their middle so that they are perpendicular to the supporting surface and parallel to the pinion shaft axis; align the two bars.*



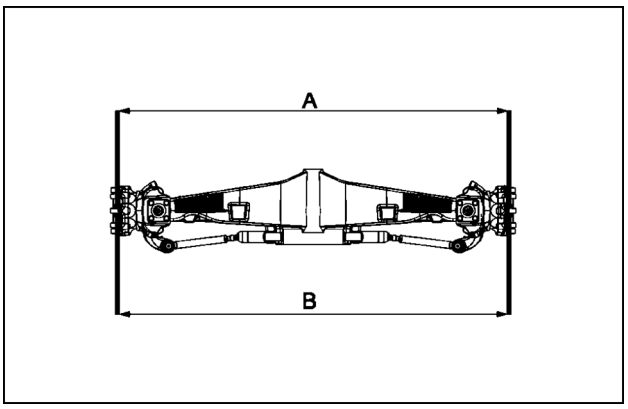
RCPH10TLB618ABL 1

2. Measure “A” and “B” at ends of the bar.



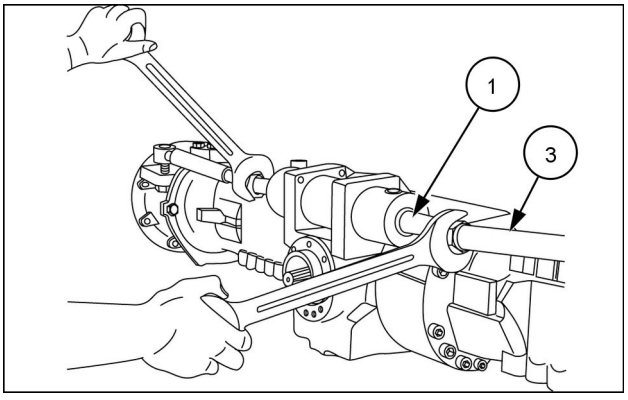
RCPH10TLB619ABL 2

3. Check that the difference of the measurements between the wheel hubs diameters ends is within the requested tolerance range. Refer to **Powered front axle - General specification (25.100)**.



RCPH10TLB718ABL 3

4. If toe-in is incorrect, operate with two wrenches on the guide rods **(1)** screwing in and out the two joint tie rods **(3)** equally till the toe-in is within the requested tolerance.



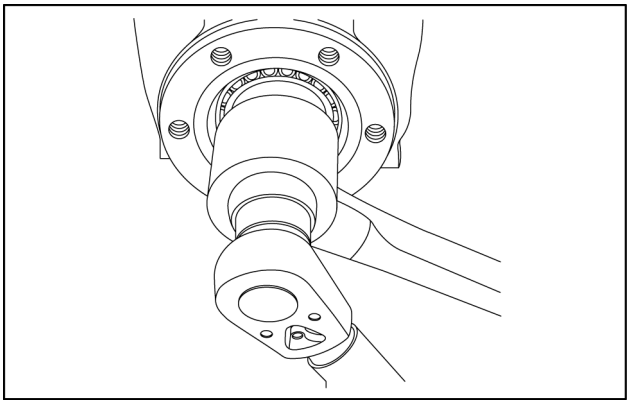
RCPH10TLB620ABL 4

Axle pinion - Disassemble

Refer **Axle pinion - Exploded view (25.102)**

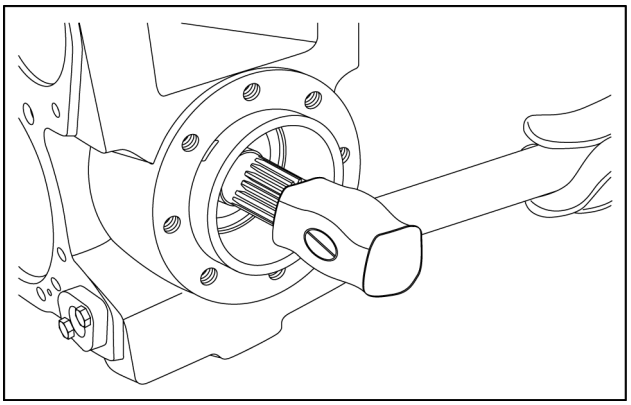
1. Unscrew the lock nut using special tools **380000021** and **380200461**.

NOTE: *This operation damages the ring nut, the ring nut must be replaced when assembling the group.*



PTIL13TLB0172AA 1

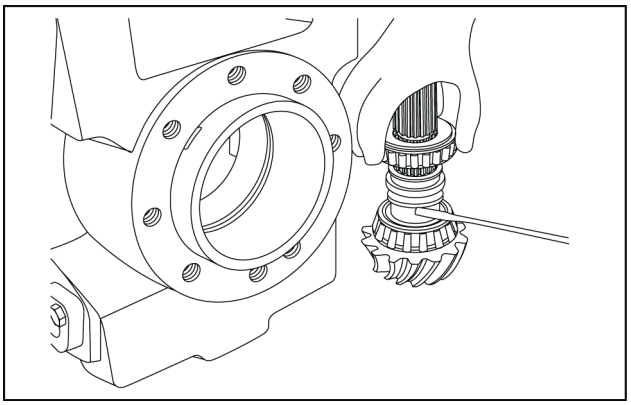
2. Tap the end shaft with a soft hammer to remove the bevel pinion.
3. Collect the washer and the bearing cone.



PTIL13TLB0173AA 2

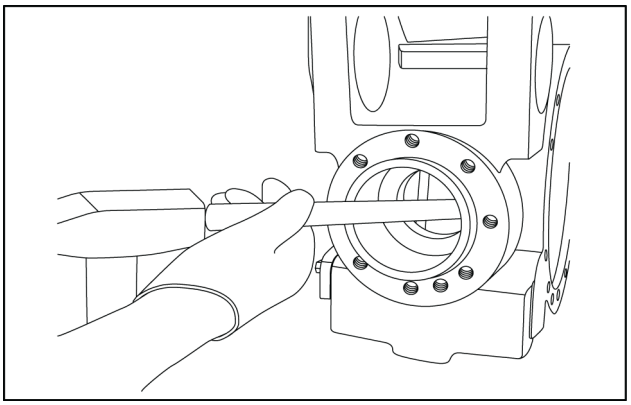
4. Once the bevel pinion has been removed, collect the washer, the collapsible spacer and the washer.

NOTE: *The collapsible spacer must be replaced when assembling the group.*



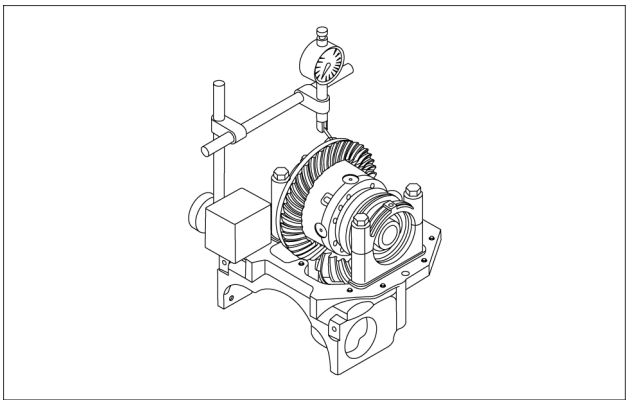
PTIL13TLB0174AA 3

5. Check the bearing cups wear condition.
6. If bearings replacement is necessary, remove bearing cups from central body with a drift and a hammer.



PTIL13TLB0175AA 4

5. Position a magnetic-base dial gauge on the differential support, so that the feeler stylus touches the surface of one tooth of the crown gear with a 90° angle.

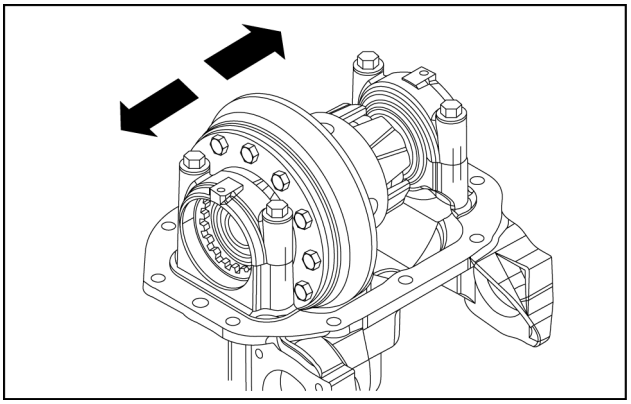


PTIL13TLB0581AA 5

6. Lock the pinion and move the crown gear alternatively and note the pinion-ring gear backlash, measured with the comparator.
   Repeat the operation on 2 or more points (teeth), rotating the crown gear, so that to obtain an average value.

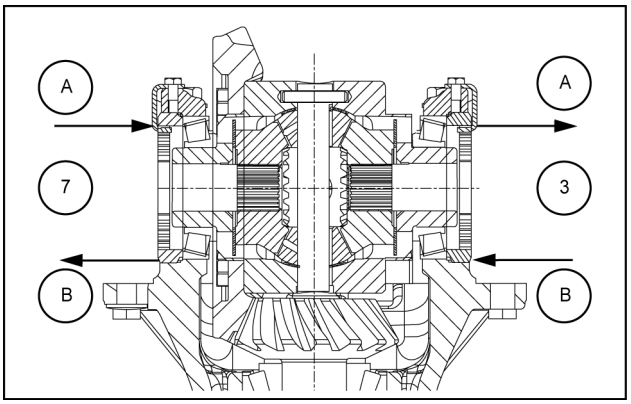
   Check if the measured backlash value is within the requested range of **0.150 – 0.300 mm** (**0.006 – 0.012 in**).

   Set the backlash by turning the adjusting ring nuts **(3)** and **(7)** with the special tool **380000406**.



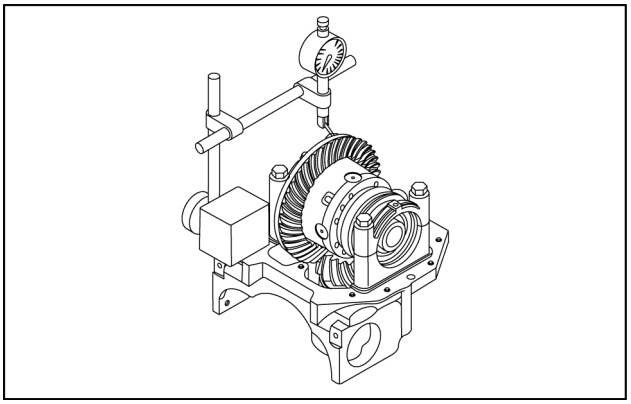
PTIL13TLB0582AB 6

7. Adjust the ring nuts **(3)** and **(7)**, remembering that:
   A. If the measured backlash is greater than the given tolerance range, unscrew the adjuster ring nut **(3)** and screw in the adjuster ring nut **(7)** by the same measure.
   B. If the measured backlash is less than the given tolerance range, unscrew the adjuster ring nut **(7)** and screw in the adjuster ring nut **(3)** by the same measure.



PTIL13TLB0583AB 7

8. Once the adjustment of the pinion-ring gear backlash has been carried out, check also that there is a minimum pre-loading on the differential box bearings.
   Repeat the whole sequence of the above mentioned operations till the indicated conditions are reached.



PTIL13TLB0584AA 8

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Final drive hub, steering knuckles, and shafts - 108

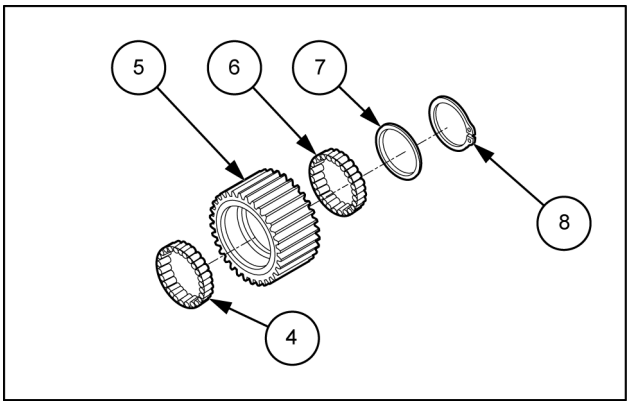
Final drive hub, steering knuckles, and shafts - Assemble

Reduction gear

Refer **Final drive hub, steering knuckles, and shafts - Exploded view (25.108)**

1. Collect all epicyclic reduction gear parts, the planetary gears carrier **(3)**, the planetary gears **(5)**, the needle bearings **(4)** and **(6)**, the washer **(7)** and the snap rings **(8)** of every pin.

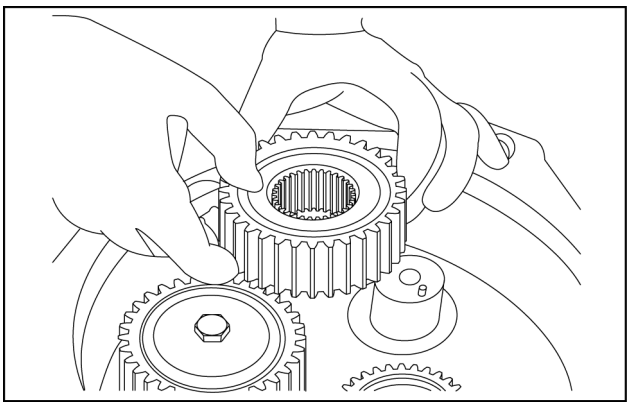
NOTE: *With new planetary gears it is advisable to assembly new needle bearings.*



PTIL13TLB0525AB 1

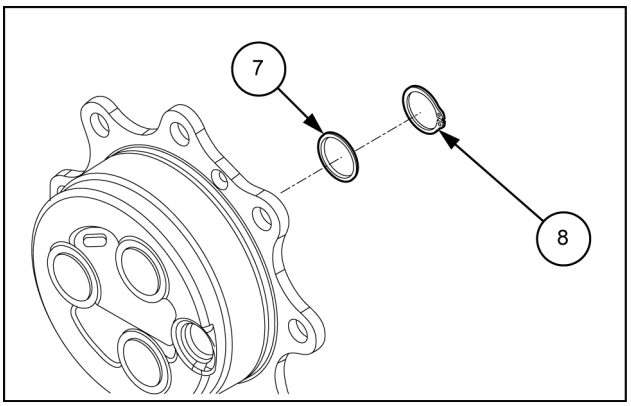
2. Insert the needles **(4)** and **(6)** into the gears **(5)**.

NOTE: *Grease well the needles **(4)** and **(6)**.*
Insert the gears **(5)** with assembled needles in the planetary carrier pins.



PTIL13TLB0526AA 2

3. Assemble the washer **(7)** and snap ring **(8)** on every pin.



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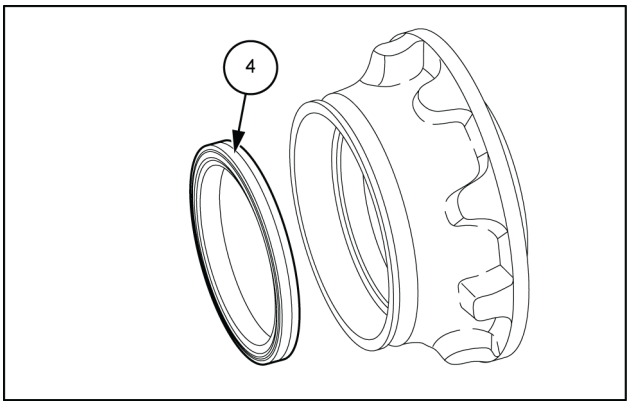
Front axle system - 25

Final drive hub, steering knuckles, and shafts - 108

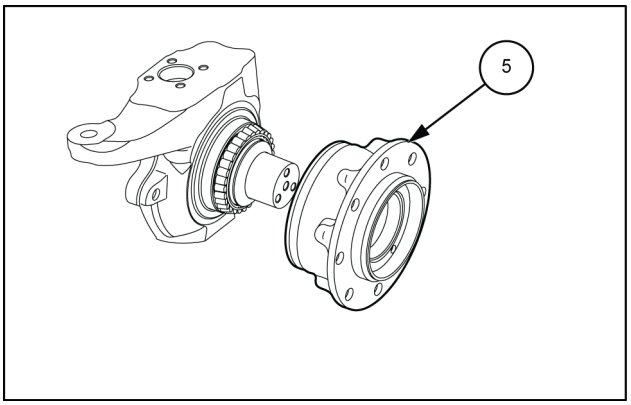
4. Install wheel cartridge seal.
   A. Coat outer and inner surface of the seal **(4)** with grease Kluberplus S 06-100.
   B. Press inner wheel seal into wheel hub until proper seated.
      Pressing force: **2500 – 13500 N** (**562 – 3035 lb**).
   C. Verify seal is proper seated



PTIL13TLB1505AB 5

5. Install wheel hub onto knuckle.
   A. Press wheel hub **(5)** onto knuckle.
      Pressing force: **400 – 2300 N** (**90 – 517 lb**).

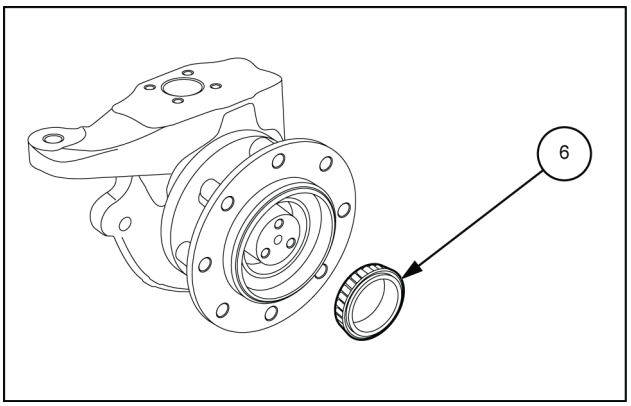
NOTE: *Alignment of hub to knuckle to be controlled to ensure seal is installed properly.*



PTIL13TLB1506AB 6

6. Install outer bearing cone.
   A. Pack inner bearing rollers lightly with #2 Moly Disulfide grease.
   B. Press the bearing cone **(6)** to flush or **0.250 mm** (**0.010 in**) above the end of knuckle shaft while rotating the hub to allow bearings to roll. This will ensure the bearing does not get damaged and sets correctly.
      Pressing force: **3447 – 9480 N** (**775 – 2131 lb**).

NOTE: *Keep cup and cone matched.*



PTIL13TLB1507AB 7

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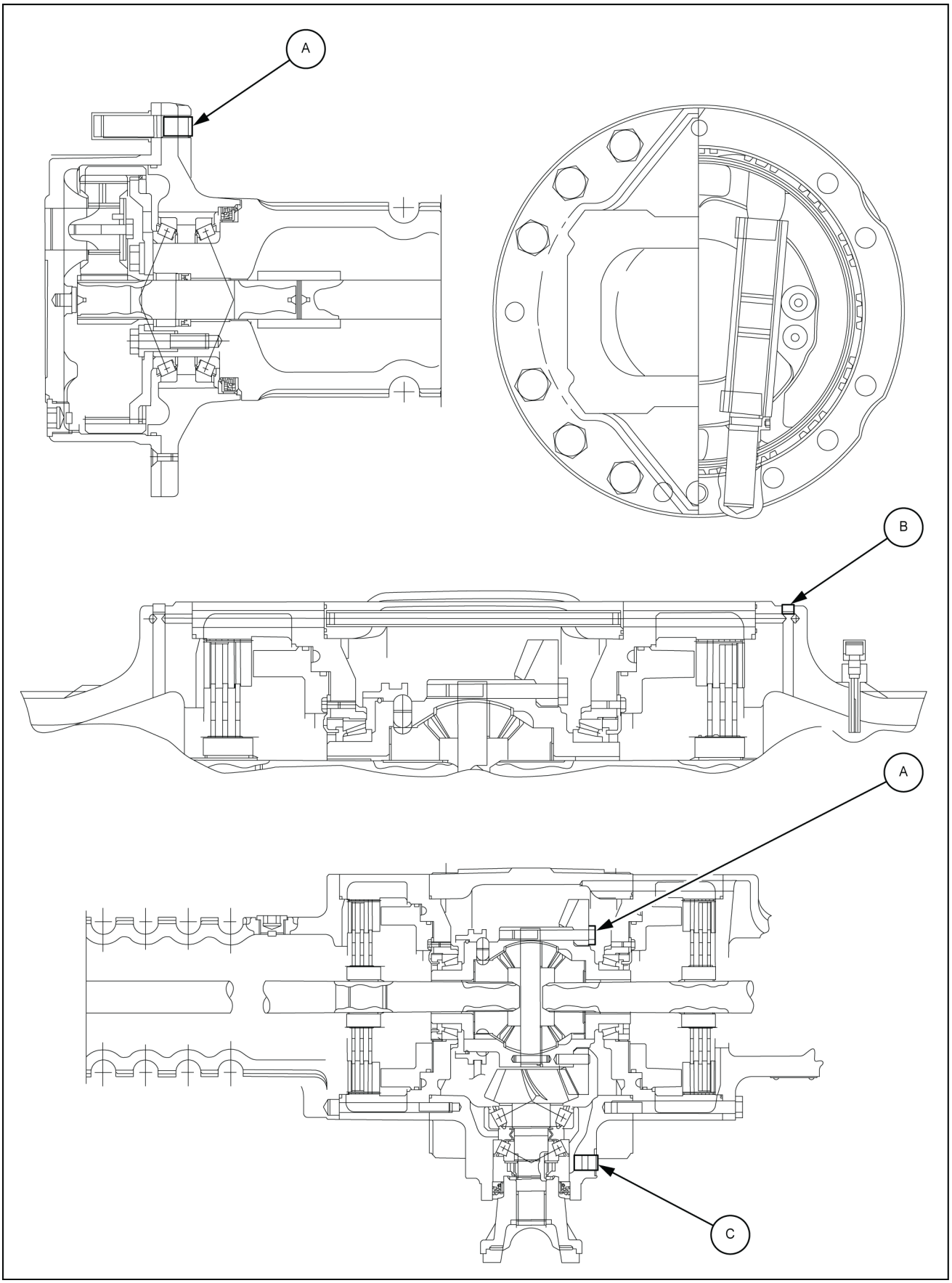
Front axle system - 25

Non-powered front axle - 400

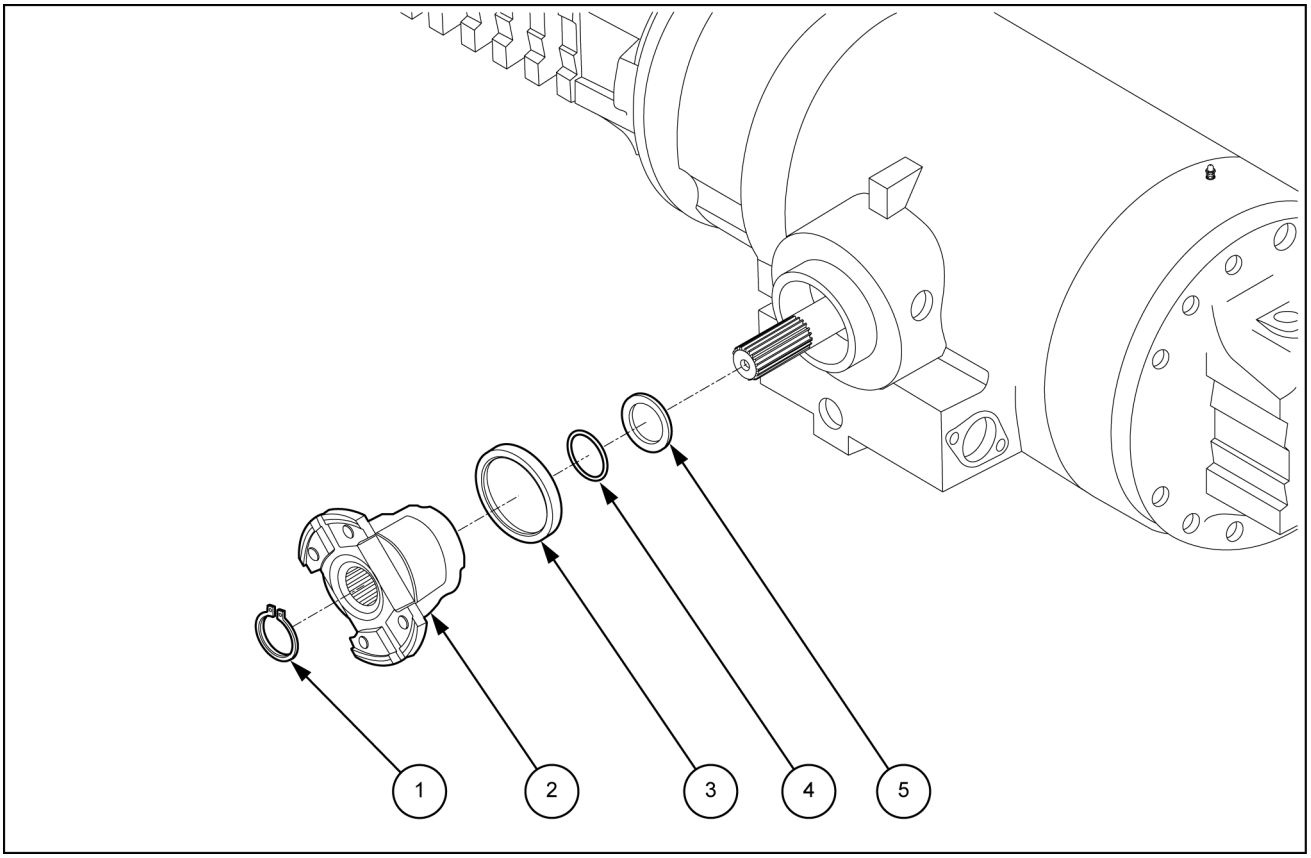
Sealing compounds and adhesives application



PTIL13TLB0004HB 2

Rear axle - Component identification

Flange group

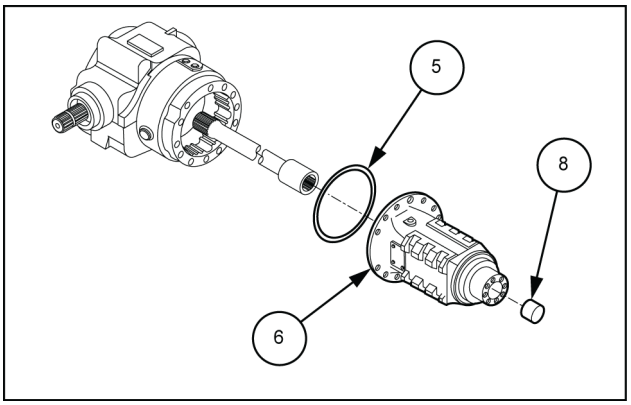


PTIL13TLB0012FB 1

1. Lock ring
2. Flange
3. Seal ring
4. O-ring
5. Washer

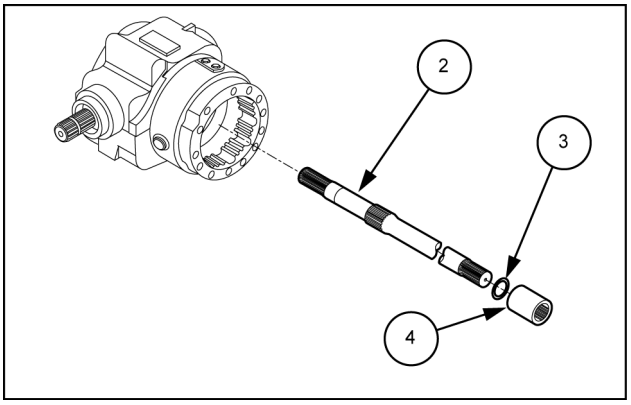
4. Remove the beam trumpet **(6)** and collect the O-ring **(5)**.

ATTENTION: *Once the beam trumpet has been removed, the long half shaft* ***(2)*** *is free. Remove the bush* ***(8)*** *from the beam trumpet* ***(6)*** *only if the wear conditions require this. Be careful not to damage the bush seat.*



PTIL13TLB0048AB 4

5. Remove the shaft **(2)** and the splined sleeve **(4)**.
6. Only if necessary remove the snap ring **(3)** from the splined sleeve.



PTIL13TLB0049AB 5

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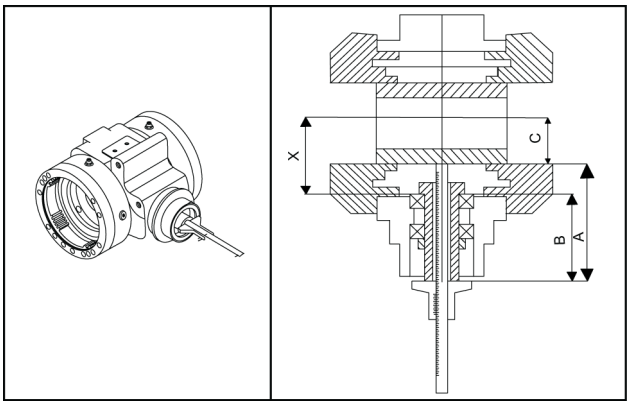
Rear axle system - 27

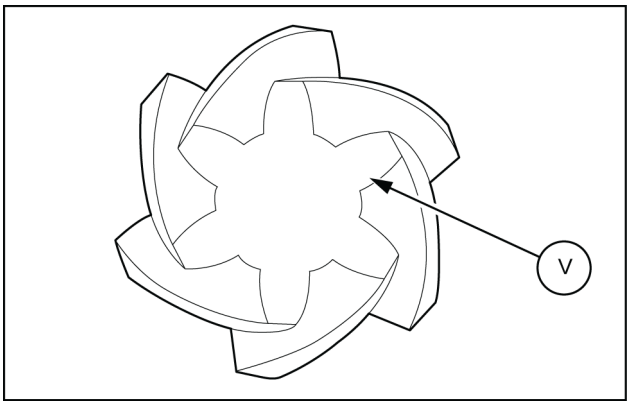
Powered rear axle - 100

9. To adjust bevel gear/pinion measure the distance “A” with a depth gauge.
   Calculate the value “X” as follows: X=(A+C)-B mm where “B” and “C” are known.



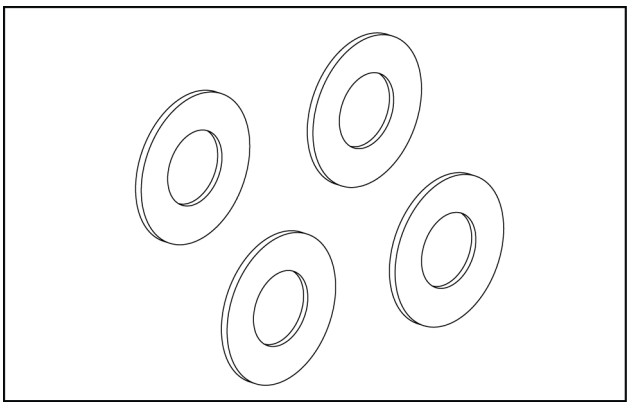
PTIL13TLB0127AA 5

10. From the value “X” deduct the value “ **(V)**” (stamped on the pinion head) to get the value “S”.
    S=X-V mm



PTIL13TLB0128AB 6

11. Choose the shim **(2)** with thickness value (S) among the available shims range.



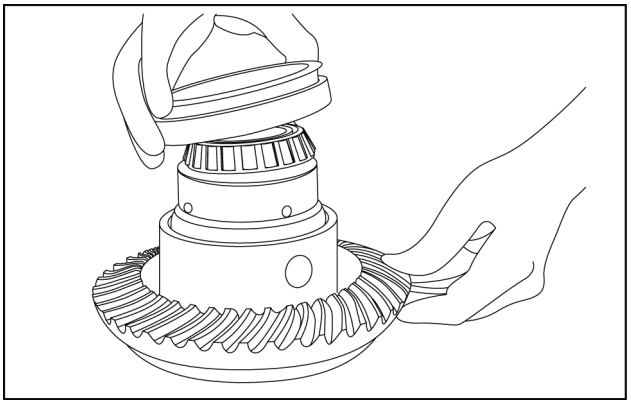
PTIL13TLB0129AA 7

Shims range										
Spess./ thick - mm	2.5	2.6	2.7	2.8	2.9	3.0	3.1	3.2	3.3	3.4
Qty.	-	-	-	-	-	-	-	-	-	-

Differential - Disassemble - Bush

Refer **Differential - Component identification - Bush (27.106)**

1. Remove the differential support group before disassembling the differential group.
   Differential - Component identification - Bush (27.106).
2. Remove the lock ring **(9)**.
3. Remove the sleeve **(10)** and pins **(11)** from the differential housing **(12)**.

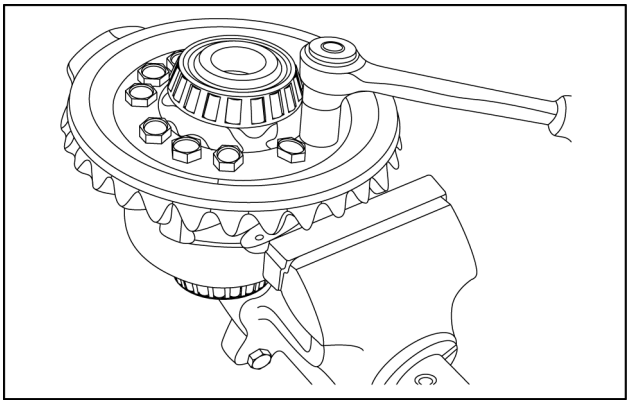


PTIL13TLB0105AA 1

4. Lock the differential with a clamp.
5. Unscrew the fastening screws **(7)** and remove the bevel gear **(5)**.

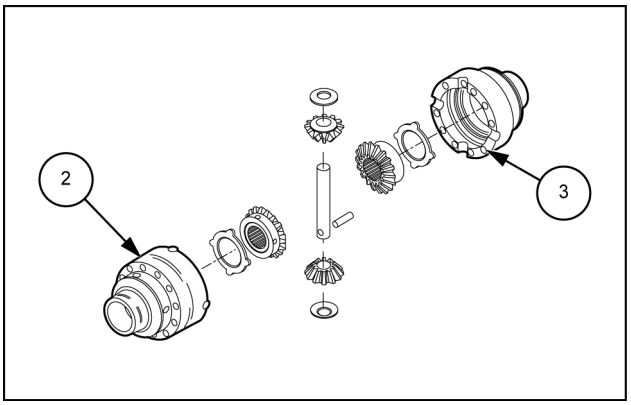
NOTICE: *This will make both differential half boxes **(2)** and **(3)** free, so take care not to drop the internal components.*

6. Make alignment marks on the half boxes before splitting them.



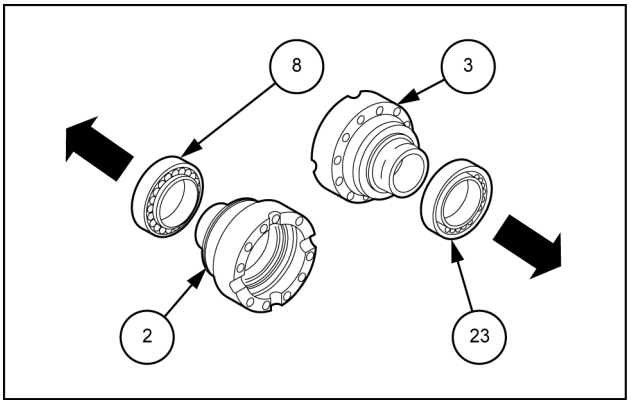
PTIL13TLB0106AA 2

7. Disassemble the differential half boxes **(2)** and **(3)** with the relative components.
8. Disassemble all the components.
9. Check the operating and wear conditions of the components.



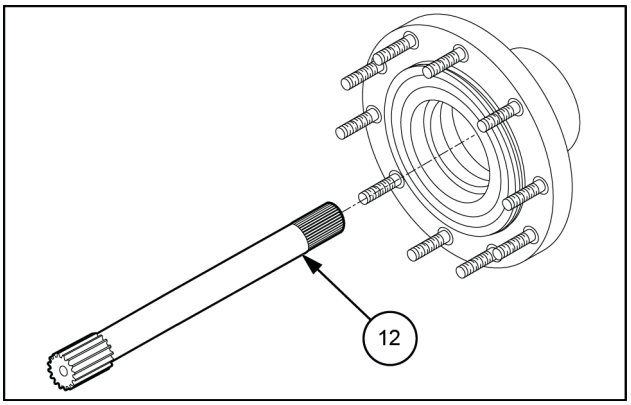
PTIL13TLB0107AB 3

10. Remove the bearings cones **(8)** and **(23)** of the half boxes **(2)** and **(3)**, using two levers or a three-hold extractor.



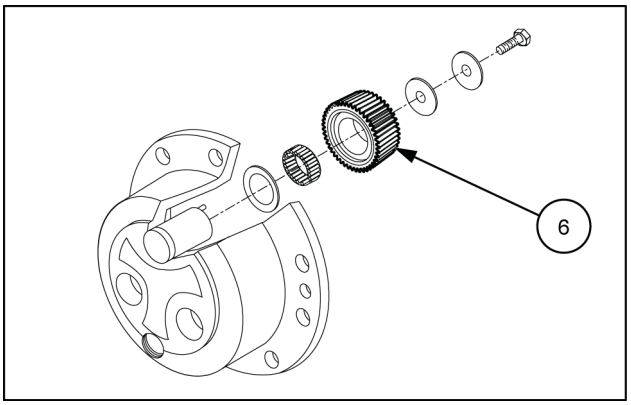
PTIL13TLB0108AB 4

5. Remove the shaft **(12)** from the wheel hub **(13)**.



PTIL13TLB0021AB 4

6. To replace the planetary gears **(6)**:
   - Remove the fastening bolts **(10)** on every pin **(8)**,
   - Remove the washers **(7)** and **(9)**,
   - Remove the planetary gears **(6)** from the pins,
   - Collect the needle bearing **(5)** and check their conditions,
   - Collect the thrust washer **(4)**.



PTIL13TLB0022AB 5

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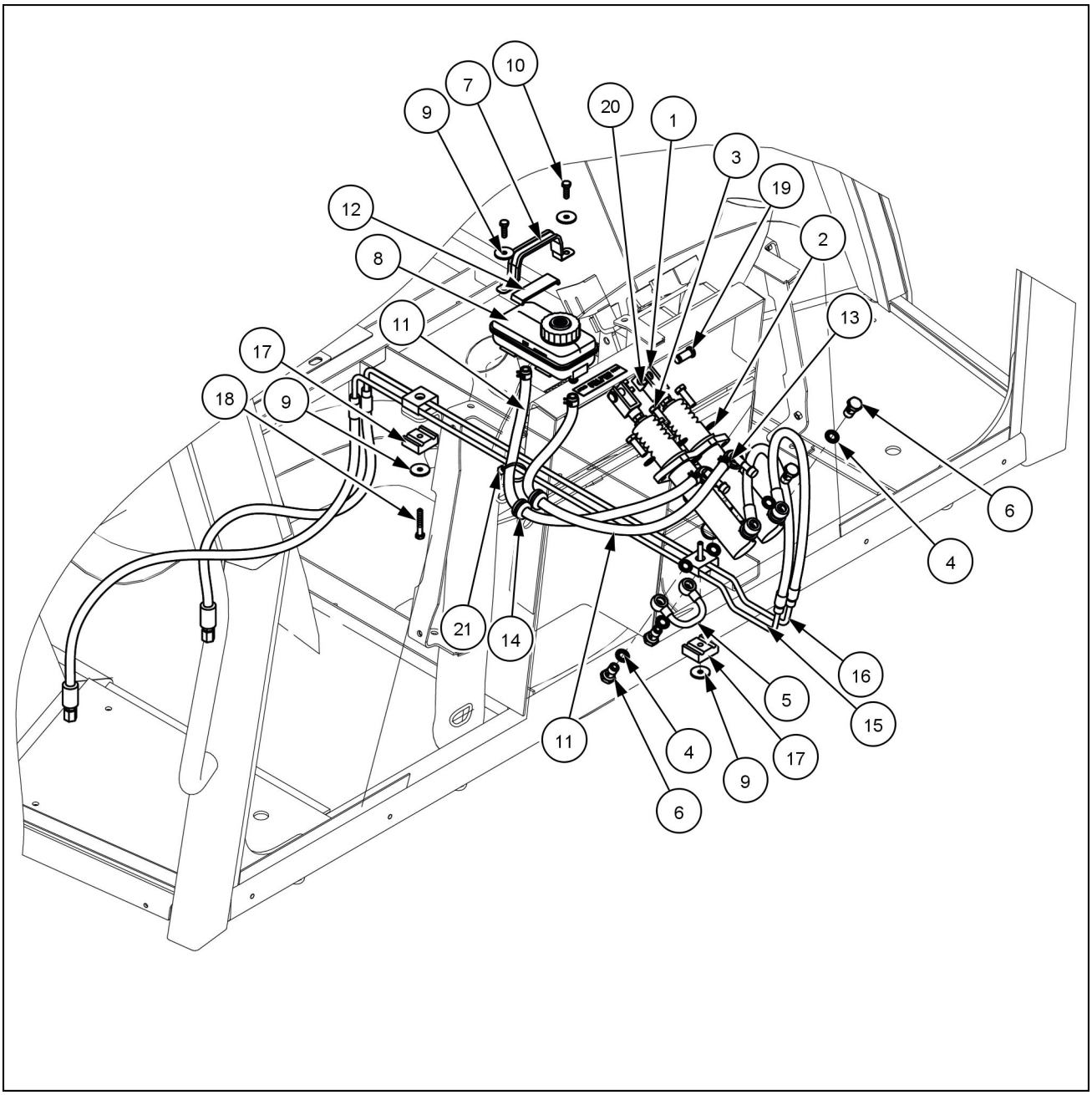
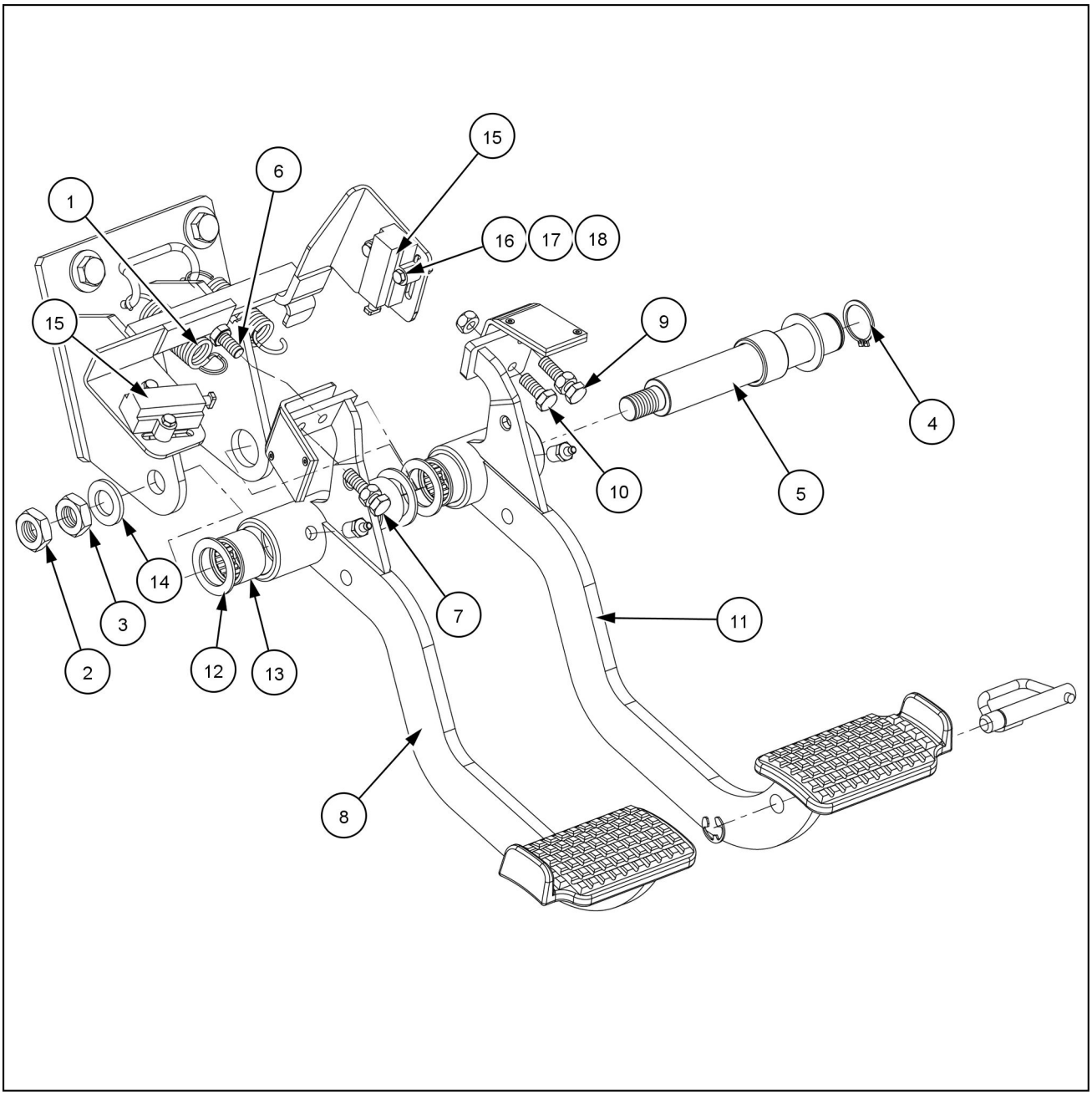
Brake master cylinder - Exploded view



PTIL18TLB0011GA 1

1. Master brake cylinder
2. Conical spring washer
3. Bolt
4. Sealing washer
5. Brake pump connection pipe
6. Banjo bolt
7. Brake oil dump fixing strip
8. Brake fluid reservoir
9. Washer
10. Bolt
11. Tube
12. Rubber adhesive
13. Brake tube clamp
14. Rubber track
15. Right-hand side tube, brake pump to axle
16. Left-hand side tube, brake pump to axle
17. Pipe lock
18. Bolt
19. Brakes and clutch pump pin
20. Retaining clip
21. Cable tie

Brake pedals - Assemble



PTIL18TLB0010GA 1

1. Install the left-hand side brake pedal **(8)** on the brake pedal mounting bracket and hand tighten the bolts **(6)** and **(7)**. Tighten the bolt **(6)** to **28.80 N·m** (**254.90 lb in**).
2. Install the right-hand side brake pedal **(11)** on the brake pedal mounting bracket and hand tighten the bolts **(9)** and **(10)**. Tighten the bolt **(10)** to **28.80 N·m** (**254.90 lb in**).
3. Install the brake pedal shaft **(5)** along with four washers **(12)** and needle bearing **(13)**. See image **1**.
4. Insert the circlip **(4)** on the brake pedal shaft **(5)**.
5. Insert the washer **(14)** and the check nuts **(3)** and **(2)**. Torque the check nuts to **134.0 – 156.0 N·m** (**1186.0 – 1380.7 lb in**).

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Hydraulic systems - Test - Pressure testing

1. Park the machine on a level surface. Put the backhoe in the transport position and lower the loader bucket to the floor.
2. The oil must be at operating temperature. To heat the oil, do the following steps:
   A. With the engine running at full throttle, hold the loader control lever in the rollback position for **15 s**.
   B. Put the loader control lever in the neutral position for **15 s**.
   C. Repeat Steps A and B until the temperature of the oil is **50 °C** (**122 °F**) or the side of the reservoir is very warm.
3. Use a pressure gauge with a capacity of at least **450 bar** (**6526 psi**). Remove the PLUG 1/4" BSP (V204029_30377) from 2-spool valve assembly & assemble the sensor of **G1/4**" thread to measure the main system pressure.
4. With the engine running at full throttle, operate & hold loader lift or stabilizer lever and read the pressure gauge. Make a record of the reading.
5. Decrease the engine speed and stop the engine.
6. Refer **Hydraulic systems - General specification (35.000)** for standard values. If value is within the range then pressure is set. Else refer **Hydraulic systems generic sub-group - Troubleshooting (35.AAA)** for troubleshooting guidelines.

NOTE: *The same procedure to be followed for the swing valve only.*

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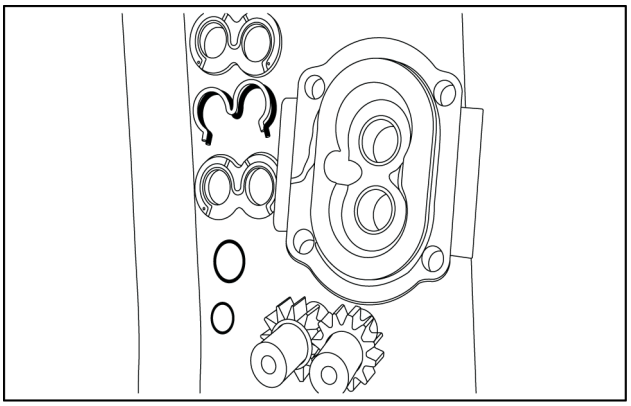
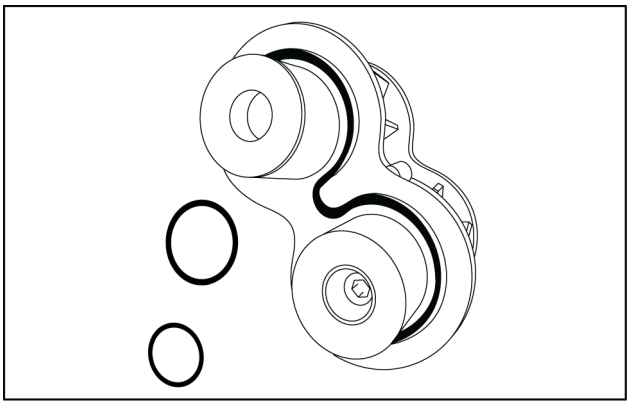
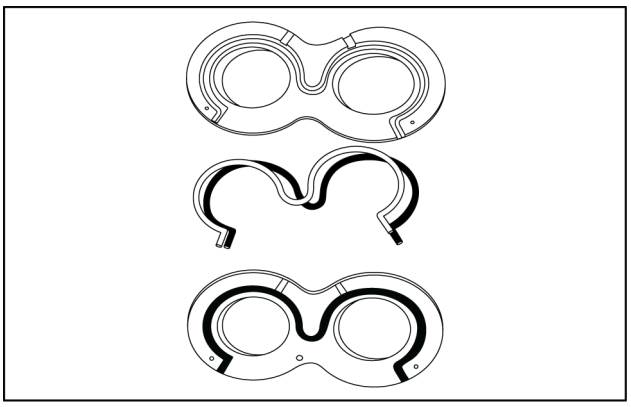
10. Check and replace the seals on the balance plate as a standard practice.



PTIL13TLB1003AA 11

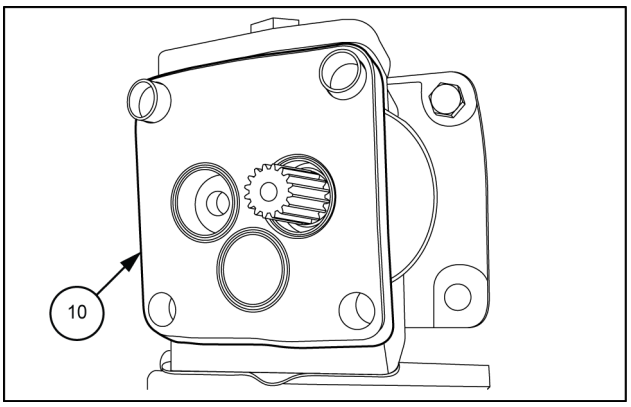


PTIL13TLB1004AA 12



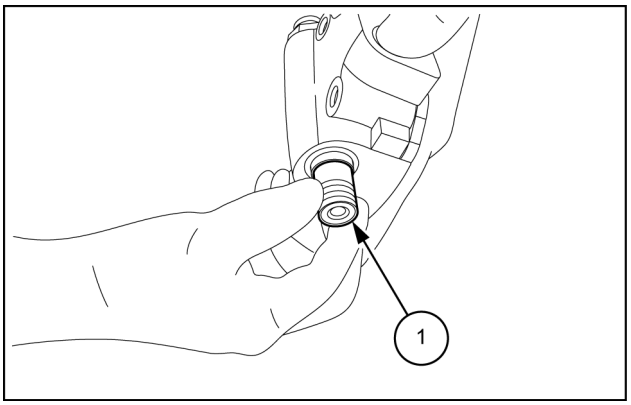
PTIL13TLB1005AA 13

11. Remove the first body **(10)**.



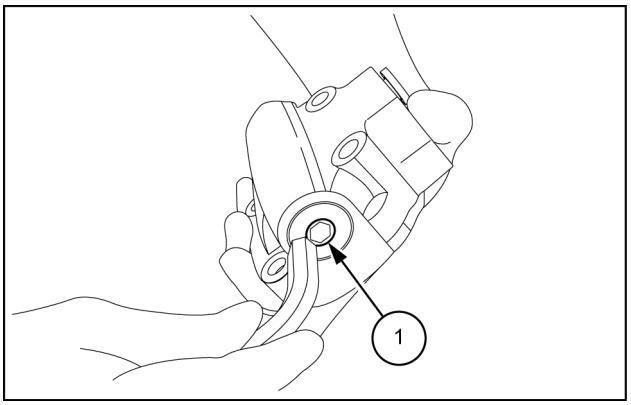
PTIL13TLB1006AB 14

17. Install the spool **(1)** into the priority valve.



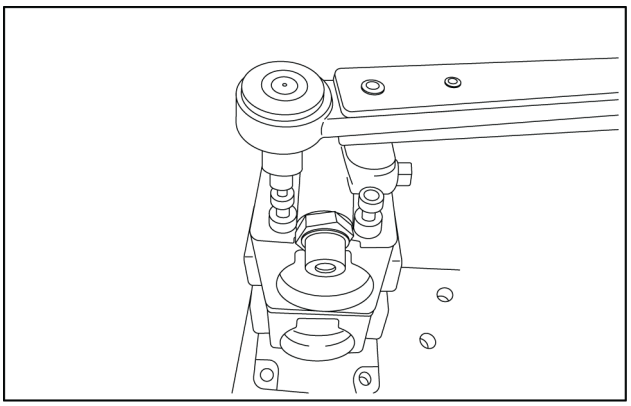
PTIL13TLB1672AB 17

18. Tighten the plug **(1)** using allen key.



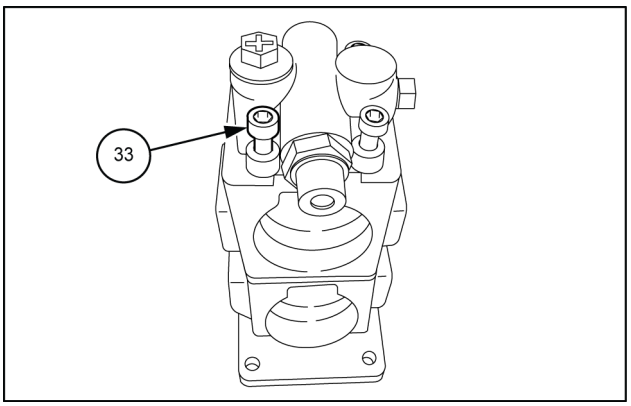
PTIL13TLB1671AB 18

19. Place the seal on the cover.
20. Reassemble the priority valve on the pump.



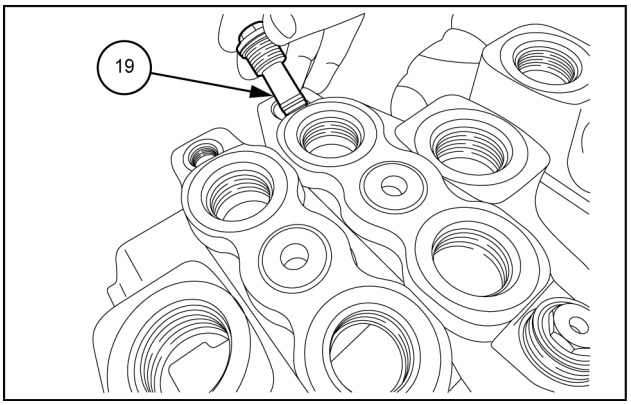
PTIL13TLB1037AA 19

21. Insert the washer and the bolts.
22. Tighten the screws **(33)** with torque of **45 N·m** (**398 lb in**).



PTIL13TLB1038AB 20

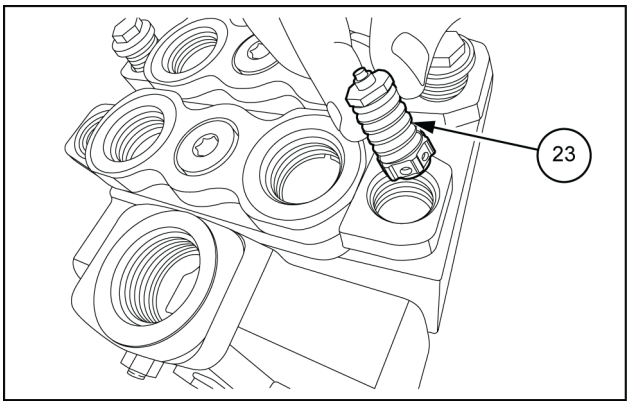
2. Tighten the plug **(19)** to **24 N·m** (**212.42 lb in**) torque (wrench **13 mm**) with the pneumatic torque gun.



PTIL13TLB1380AB 8

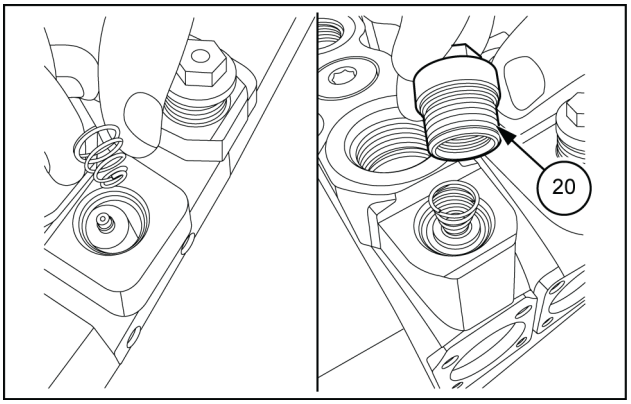
Fixed catridge valves assembly

1. Install the fixed relief **(23)** into the A1 and B1 cavities. As shown in the picture.



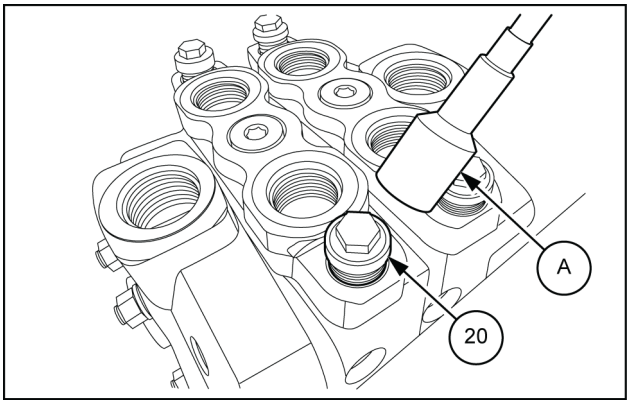
PTIL13TLB1381AB 9

2. Assemble the valve springs as shown and assemble plugs **(20)** in to the cavities as shown in the picture (Make sure that the O-ring is attached in the plug).



PTIL13TLB1382AB 10

3. Tighten the plug **(20)** to **24 N·m** (**212.42 lb in**) torque (wrench **13 mm**) with the **(A)**.



PTIL13TLB1383AB 11

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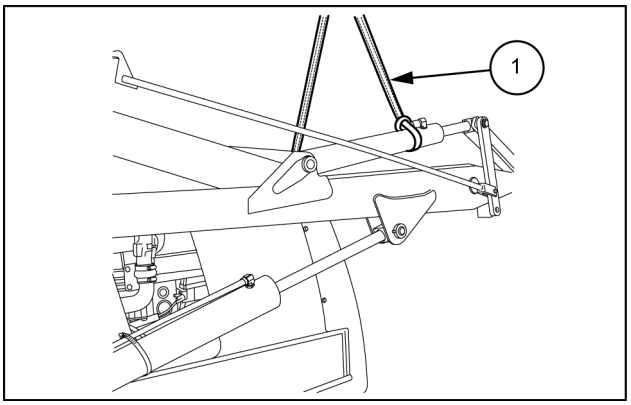
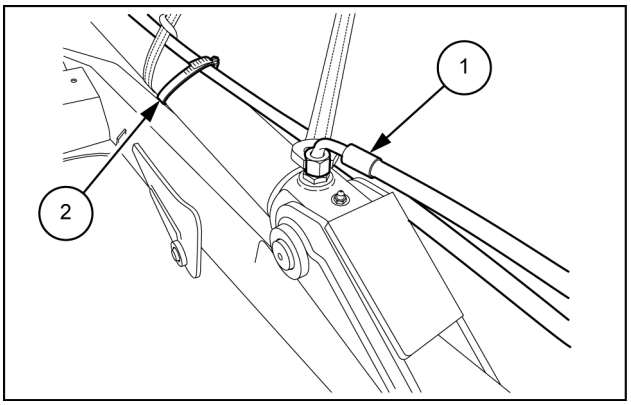
Front loader arm hydraulic system - 701

1. Raise the loader.
2. Attach a suitable lifting device **(1)** to the loader cylinder on both sides.



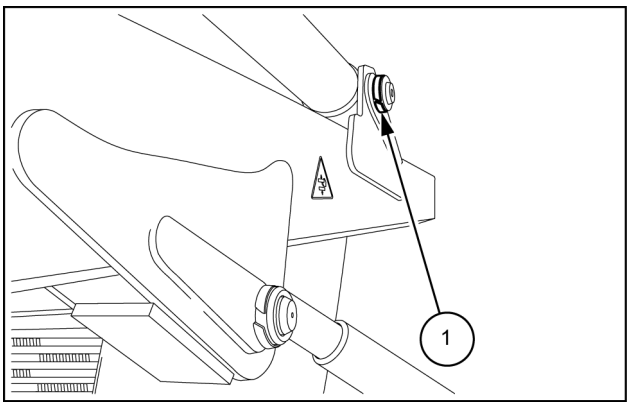
PTIL13TLB0477AB 1

3. Disconnect the hydraulic lines **(1)** from the cylinders and cap them immediately after removing the clamp **(2)**.



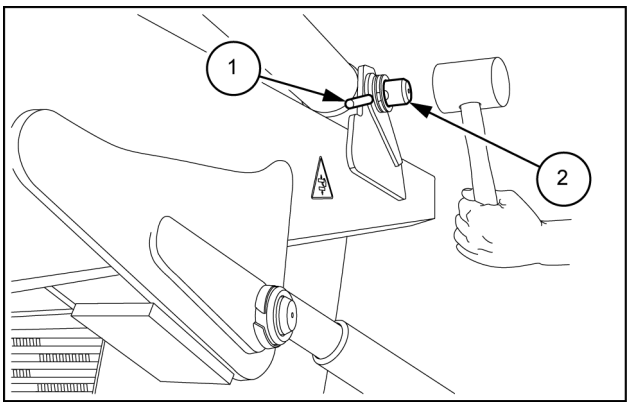
PTIL13TLB0478AB 2

4. Remove the wear ring **(1)** from both sides.



PTIL13TLB0480AB 3

5. Tap and remove the cotter pin **(1)** using a wooden hammer.
6. Now tap and remove the pivot pin **(2)** from the connecting link.



PTIL13TLB0481AB 4

Excavator and backhoe hydraulic controls - Disassemble

Refer to **Excavator and backhoe hydraulic controls - Exploded view (35.726)**.

1. Loosen and remove the tie rod nuts and washer at both ends.
2. Gently tap and slide the tie rod out.
3. Gently pry and separate the blocks.
4. Remove all the plugs and tap out the spools.
5. Unscrew and remove the relief valves.
6. Clean and keep all the components in a neat and clean environment.

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Excavator and backhoe hydraulic controls - 726

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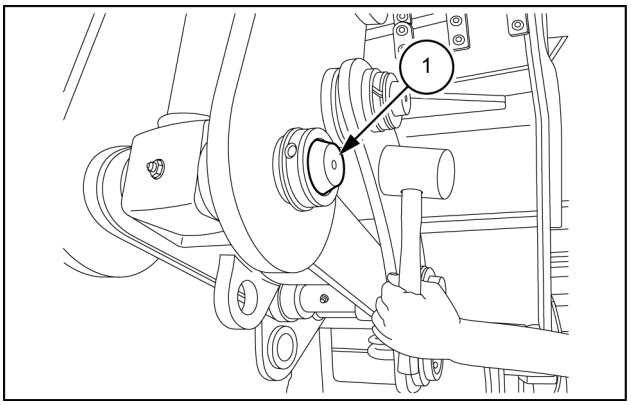
Dipper hydraulic system - 737

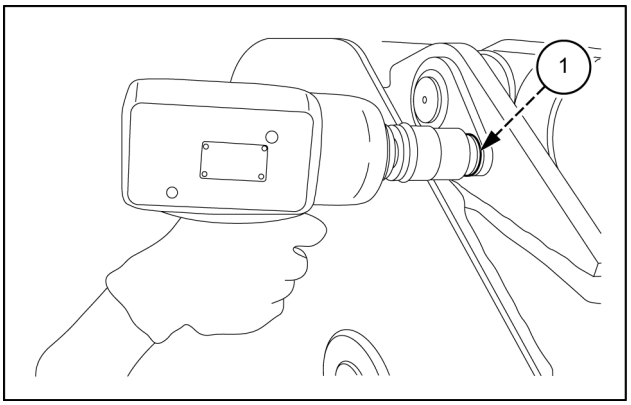
7. Tap the pivot pin **(1)** from one end using a wooden hammer and keep it resting on the arm.



PTIL13TLB0495AB 5

8. On the other side remove the pivot pin retainer bolt **(1)**.

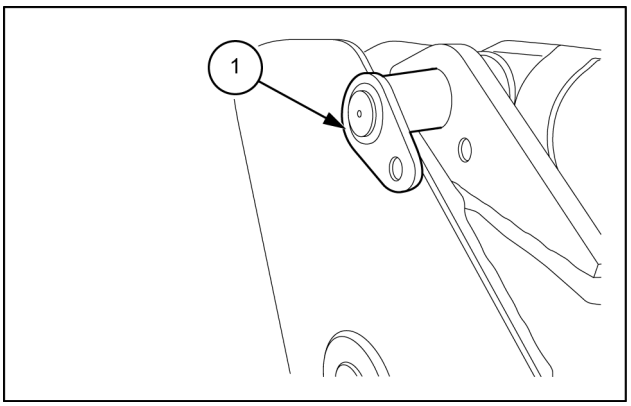
NOTE: *Ensure to collect all the shims for easy retainment during installation.*



PTIL13TLB0496AB 6

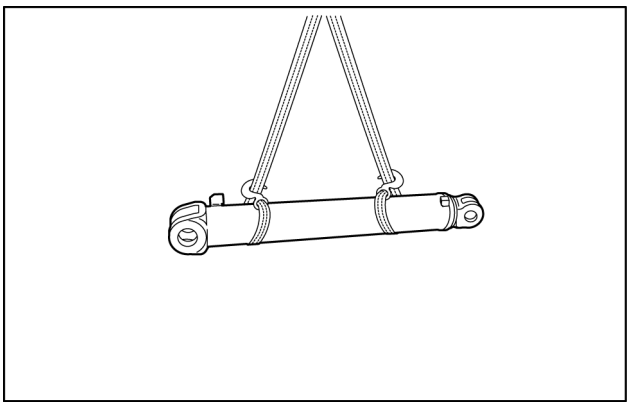
9. Tap the pivot pin **(1)** out from other side to remove the dipper cylinder completely from the machine.

NOTE: *Ensure to collect all the shims and keep it aside for easy retainment while installing.*



PTIL13TLB0497AB 7

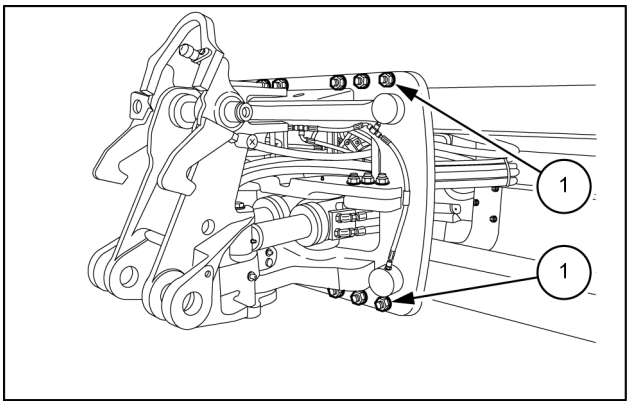
10. Lift the suspended cylinder from the arm and place it in a secure location.



PTIL13TLB0452AA 8

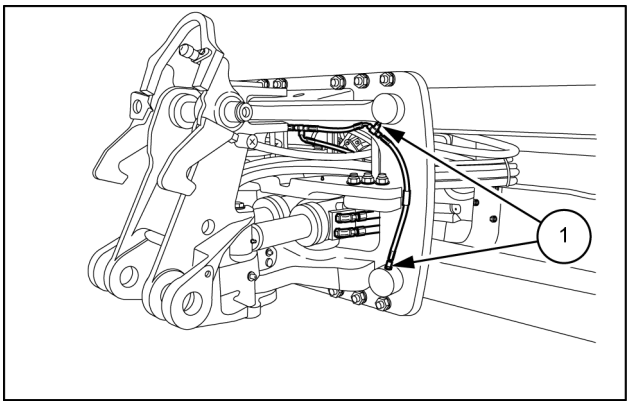
7. Install and tighten the slide frame mounting nuts **(1)**. Torque: **75.0 kgm** (**542.5 ftlbs.**).

NOTE: *Install the washer with the bottom surface facing the frame.*



PTIL13TLB1533AB 4

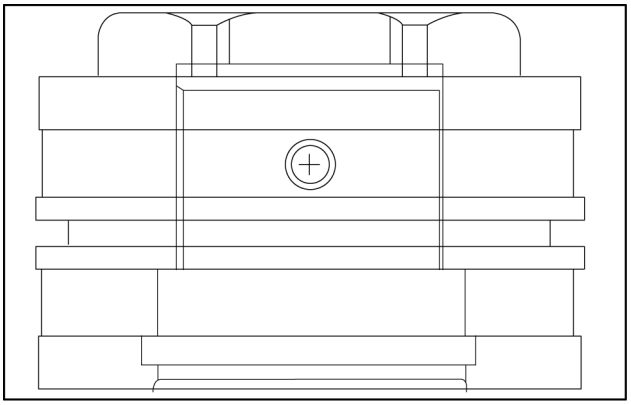
8. Install the hydraulic lines **(1)** to the locking pistons.



PTIL13TLB1532AB 5

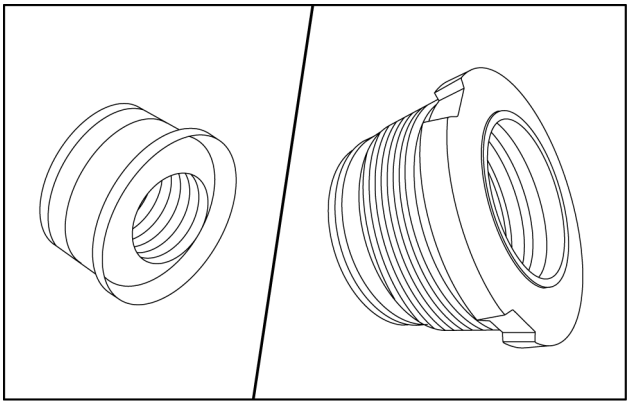
9. Install the boom. Refer to **Boom - Install (84.910)**.
10. Connect the negative terminal of the battery and start the engine.
11. Operate all the hydraulic controls.
12. Check locking and unlocking operation 2–3 times.
13. Stop the engine and check the hydraulic oil level. Top up as required.

Piston



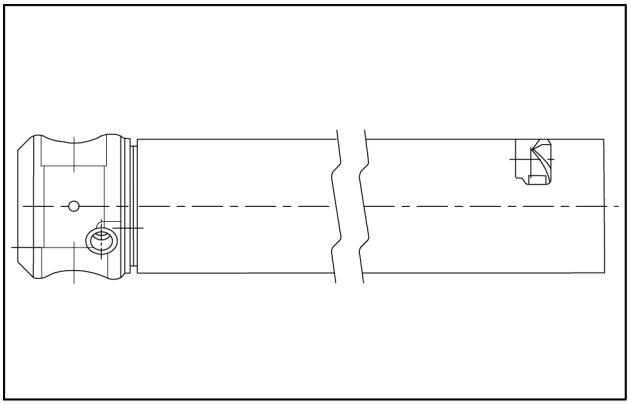
PTIL13TLB1043AA 3

Gland



PTIL13TLB1044AA 4

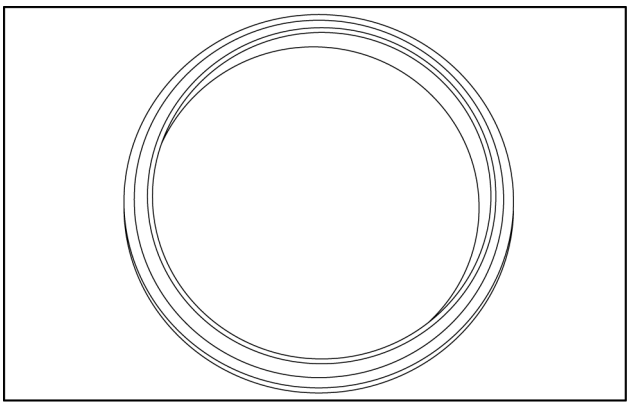
Tube weldment



PTIL13TLB1045AA 5

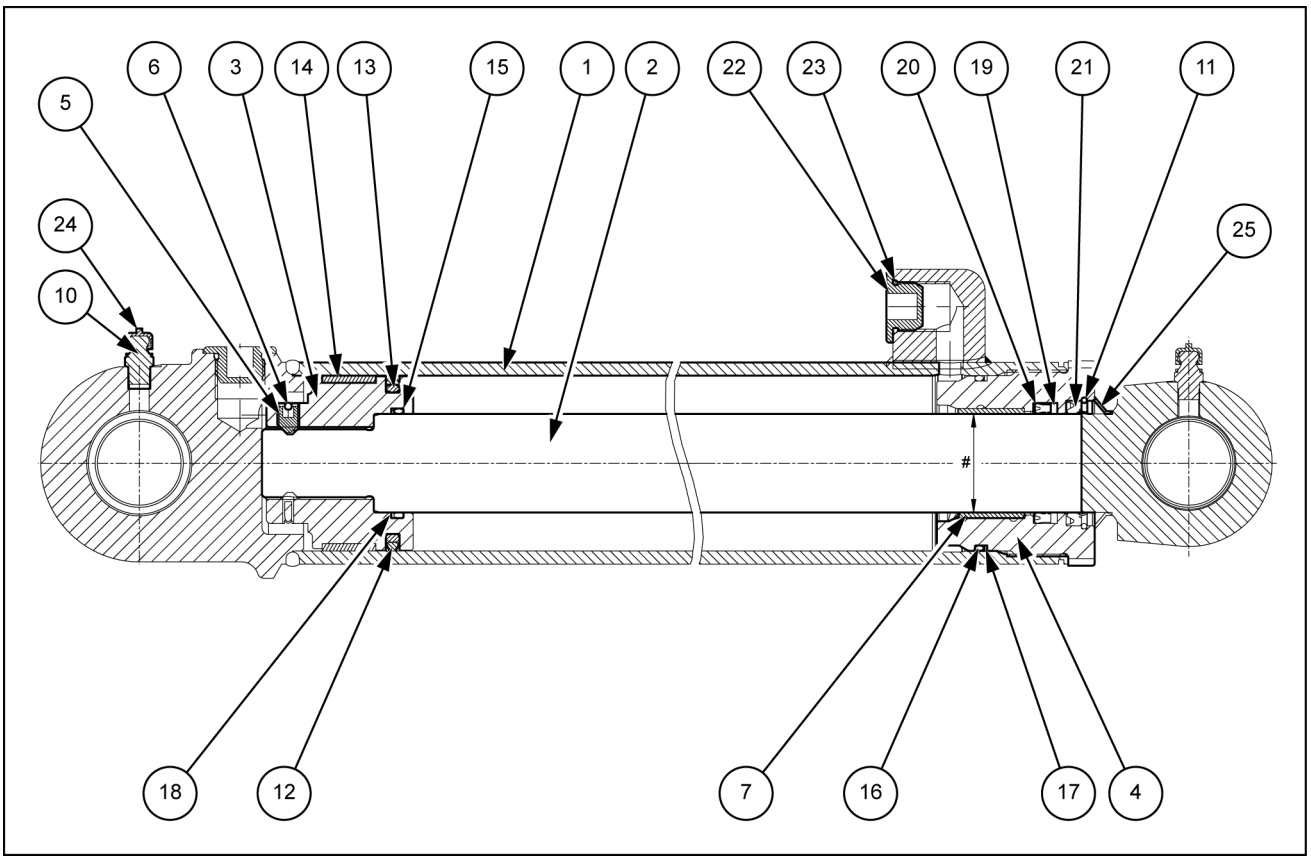
Gland seals

Wiper seal



PTIL13TLB1046AA 6

Hydraulic systems generic sub-group - Disassemble - Lift cylinder



PTIL13TLB1471FB 1

1. Clean the cylinder using good clean cloth. Ensure that dirt does not go inside through ports.
2. Hold the cylinder on a bench vise firmly with proper support by using rexin on the outer surface to prevent any damages on the outer tube.
3. Mark a straight line on tube and HEC before disassembly to make the reassembly easy.
4. Use de-caulking tool / blunt chisel and remove Head end cover caulking.
5. Unscrew the Head end cover **(4)** by using adjustable hoot spanner.
6. Gently pull out the piston rod **(2)** along with Head end cover from the tube s/a **(1)**.
7. Hold the piston rod s/a on a bench vise firmly with proper support by using rexin.
8. Remove the piston seals **(11)**, **(12)** & **(13)** and snap ring **(8)** gently by using bend screwdriver and unscrew the grub screw **(9)** by using Allen key.
9. De-torque the piston **(3)** by using torque wrench and remove piston.
10. Remove the piston O-ring **(14)** from the piston by using bend screwdriver.
11. Remove the head end cover **(4)** from the piston rod gently.

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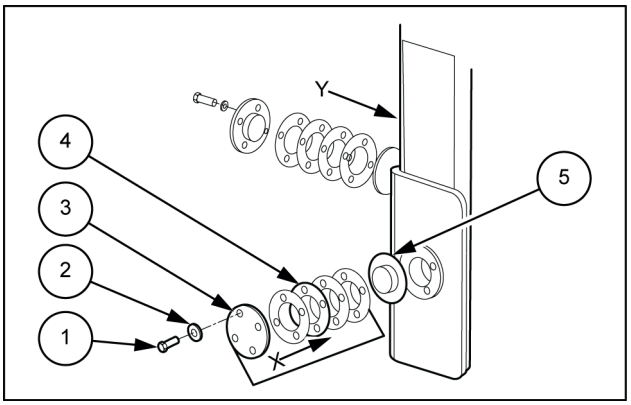
Hydraulic systems generic sub-group - AAA

4. Add one more shim **(4)** to the number of shims **(4)** count in step **3** to front of cover sleeve locking **(3)**.
5. Place the remaining shims **(4)** on back of cover sleeve locking **(3)**.
6. Assemble the whole arrangement inside the hole and tighten the four **M10** bolts **(1)** and conical washers **(2)**.



PTIL12TLB0484AB 4

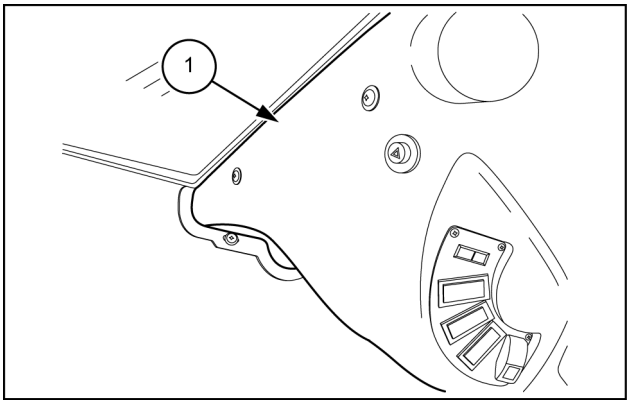
7. Follow the same procedure for the other pads also.

Steering column - Remove

1. Park the machine on a level surface and apply the parking brake.
2. Lower the bucket to the floor.

NOTE: *Refer to* ***Steering column - Exploded view (41.101)*** *for the following steps.*

3. Switch off the engine and disconnect the battery.
4. Remove the steering wheel **(4)** by removing the nut **(2)**.
5. Remove the front console **(1)**.
6. Disconnect the electrical connections for speedometer and switches.
7. Unscrew the side cover screws **(7)** and remove the covers **(6)**.
8. Disconnect and remove the combinations switches **(5)**.
9. Loosen and remove the steering column **(12)** mounting bolts **(14)**.



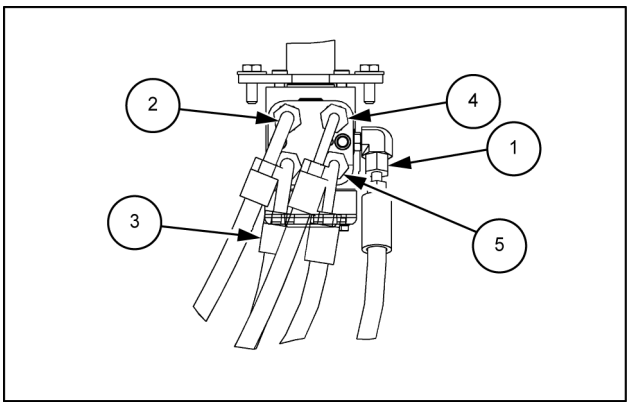
PTIL13TLB1458AB 1

Hydraulic steering system - Remove - Control valve

NOTE: *Put identification tags on all disconnected hoses. Close disconnected hoses and fittings with caps and plugs.*

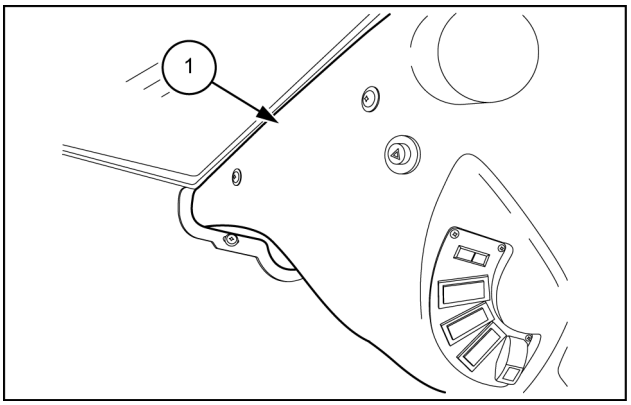
Refer to **Cab - Remove (90.150)**.

1. Disconnect the hoses **(1)**, **(2)**, **(3)**, **(4)** and **(5)**, identify and tag them.
2. Cap all the open ports.



PTIL13TLB1457AB 1

3. Unscrew and remove the front console **(1)**.
4. Disconnect the electrical connections for speedometer and switches.



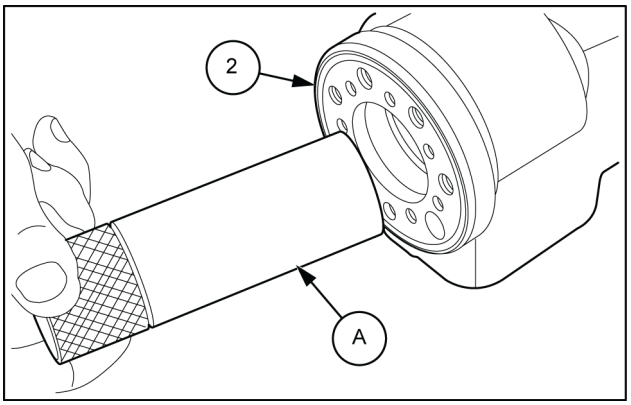
PTIL13TLB1458AB 2

Refer to **Steering column - Exploded view (41.101)**.

5. Install acceptable lifting equipment to the orbital block.
6. Loosen and remove the mounting bolts **(8)**.
7. Remove the orbital block **(13)** from the outside of the cabin.

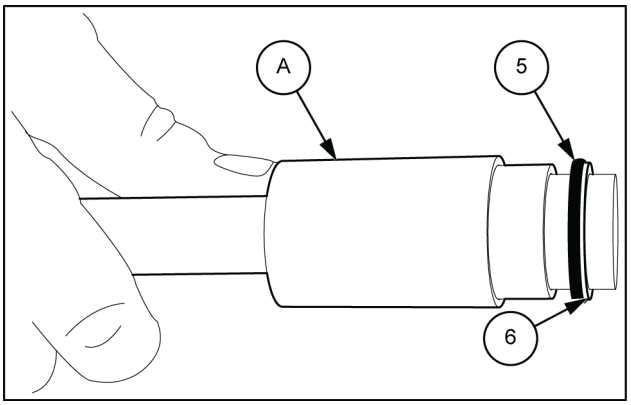
Installation instruction for O-ring/King-ring/Roto Glyd

1. Turn the steering unit until the bore is horizontal. Move the outer part of the assembly tool **(A)** into the bore for the spool/sleeve **(2)**.



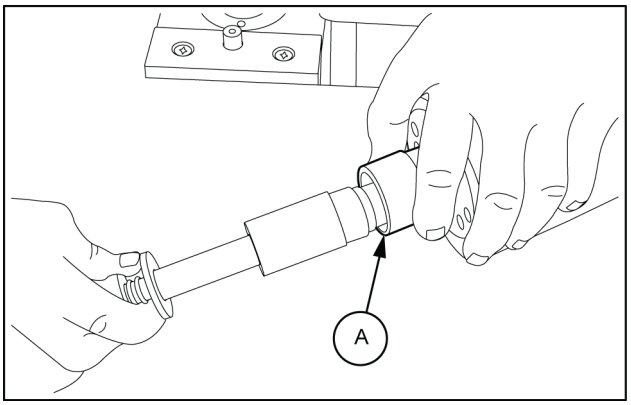
PTIL13TLB1151AB 8

2. Apply grease to the O-ring **(5)** and king-ring/roto Glyd **(6)** with hydraulic oil and put them on the tool **(A)**.



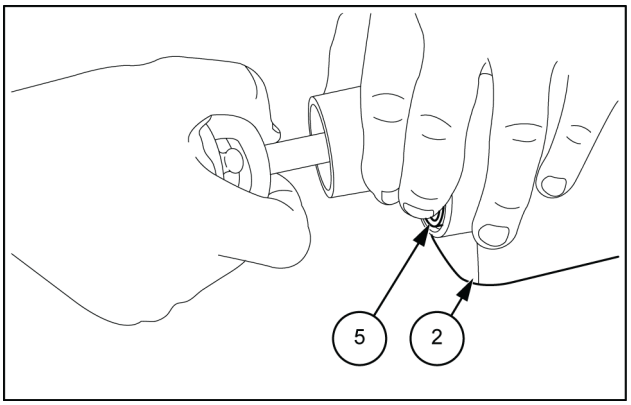
PTIL13TLB1152AB 9

3. Hold the outer part of the assembly tool **(A)** in the bottom of the steering unit housing and move the inner part of the tool **(A)** to the bottom.



PTIL13TLB1153AB 10

4. Push and turn the O-ring/king-ring **(5)** to its position in the housing **(2)**.



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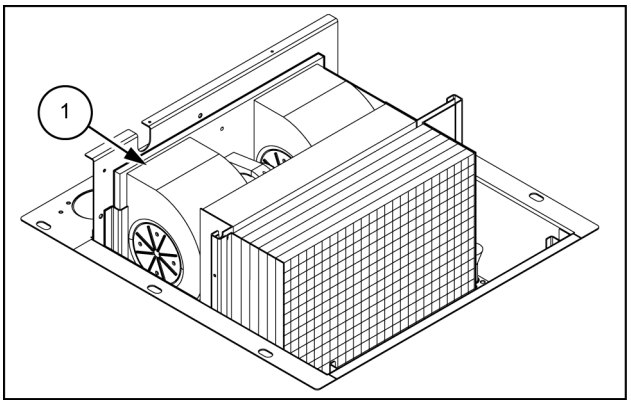
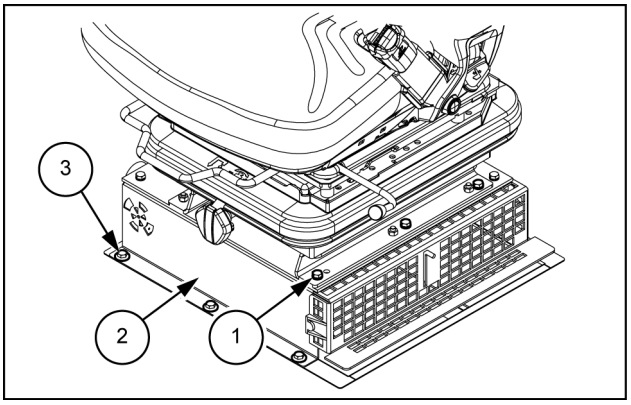
Heating - Install - Blower motor

1. Install the blower motor **(1)** and secure it with mounting hardware.
2. Connect the blower motor connectors.



PTIL14TLB0150AB 1

3. Install the cover **(2)** with the bolts **(3)**.
4. Install the seat and tighten the bolts **(1)**.



PTIL14TLB0153AB 2

Air conditioning - Static description

Description and operation

NOTE: *The Air Conditioning compressor will only run when the cab blower motor is operating.*

To operate, turn the switch **(1)**, which will engage the air conditioning compressor.

NOTE: *Once the air conditioning compressor is On, the indicator **(3)** illuminates.*

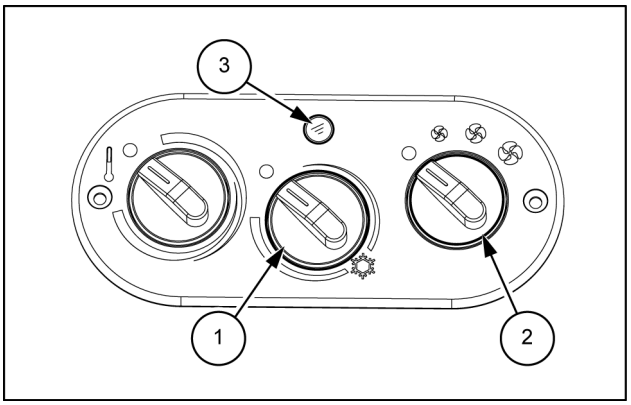
A three speed blower is used for the air circulation and operates by turning the switch **(2)**, mounted to the right of the operator seat.

1st Position – Low Speed

2nd Position – Medium Speed

3rd Position – Higher Speed

The air–conditioner filter is located on the left hand side of the seat pod.



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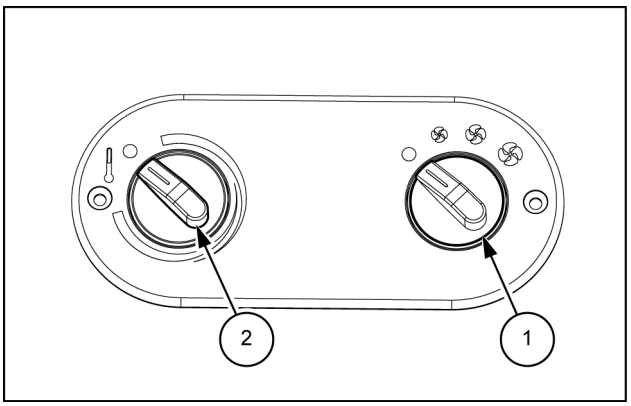


PTIL14TLB0070AB 2

Refrigerant R–134a

⚠WARNING
R134A can be dangerous if improperly handled. Therefore it is important the following warning and directions are adhered to.
R134A has a boiling point of **-12 °C** (**10 °F**).
Never expose any part of the air-conditioner system to flame or excessive heat because of risk of fire or explosion, and the production of phosgene gas.
Never disconnect or disassemble any part of the air-conditioning system as escaping refrigerant can cause frostbite.

⚠WARNING
If refrigerant should contact the skin use the same treatment as for frostbite.
Warm the area with your hand or lukewarm water **32 °C** (**90 °F**), cover the area loosely with a bandage to protect affected area against infection and consult a doctor immediately.
If refrigerant should contact the eyes wash immediately in cold clean water for at least **5 min** and consult a doctor immediately.

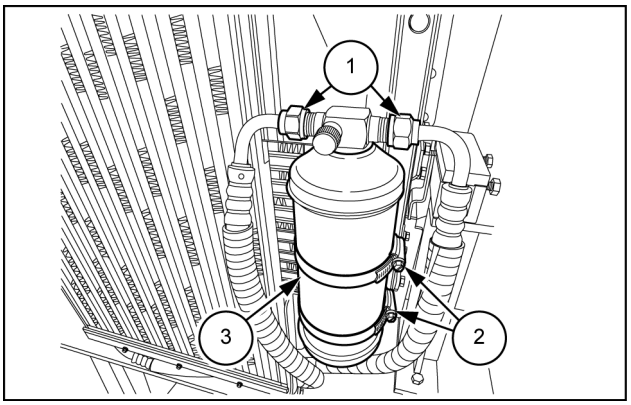
Air conditioning - Remove - Receiver drier

⚠ WARNING

Explosion hazard!
Air-conditioning refrigerant boils at -12 °C (10 °F)!
-NEVER expose any part of the air-conditioning system to a direct flame or excessive heat.
-NEVER disconnect or disassemble any part of the air-conditioning system.
Discharging refrigerant gas into the atmosphere is illegal in many countries.
Failure to comply could result in death or serious injury.

W0340A

1. Evacuate the refrigerant from the system using the recommended equipment.
2. Fasten identification tags on the hoses and disconnect the hoses **(1)** from the receiver drier **(3)**.
3. Install plugs in the hoses and caps on the fittings to prevent any dirt entering the system.
4. Loosen the support clamps **(2)** and remove the receiver-drier **(3)**.



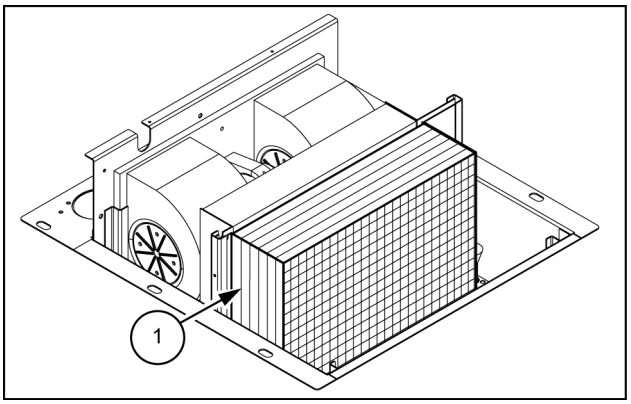
PTIL14TLB0143AB 1

Air-conditioning evaporator - Install

1. Install the evaporator **(1)** and secure it with mounting hardware.

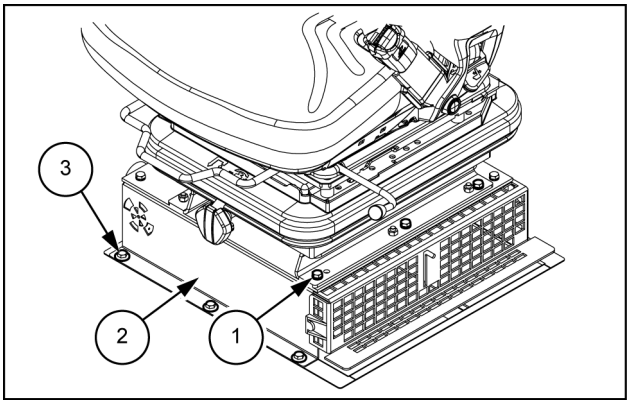
ATTENTION: *Make sure that the evaporator fins are not damaged while installing.*

2. Remove the caps and connect the evaporator connections.



PTIL14TLB0152AB 1

3. Install the cover **(2)** with the bolts **(3)**.
4. Install the seat and tighten the bolts **(1)**.



PTIL14TLB0153AB 2

5. Recharge the refrigerant..

Sl. No.	Engine	
1	X-015	TO MAIN HARNESS
2	X-201	GROUND
3	X-200	GROUND
4	X-147	FUEL LEVEL SENSOR
5	X-146	FUEL LEVEL SENSOR
6	X-143	ALTERNATOR D+
7	X-001A	ALTERNATOR B+
8	X-111	ST. RELAY
9	X-004A	LOW OIL PRESSURE SWITCH
10	X-008	FUSE BOX-O/P
11	X-007	FUSE BOX-I/P
12	X-135	FUEL SHUTOFF
13	X-002	ENG. COOLANT TEMP SWITCH
14	X-003	ENG. COOLANT TEMP. SENDER
15	X-005	STARTER MOTOR
16	X-006	STARTER SOLENOID
17	X-014	4WD SOL. VALVE
18	X-013	REV. SPEED SOL. VALVE
19	X-012	FOR. SPEED SOL. VALVE
20	X-115	SPEED SENSOR
21	X-011A	TRANS HIGH OIL TEMP. SW.
22	X-011	TRANS HIGH OIL TEMP. SW.
23	X-009A	HYDRAULIC FILTER
24	X-009B	HYDRAULIC FILTER
25	X-017	TO MAIN HARNESS
26	X-016	TO MAIN HARNESS

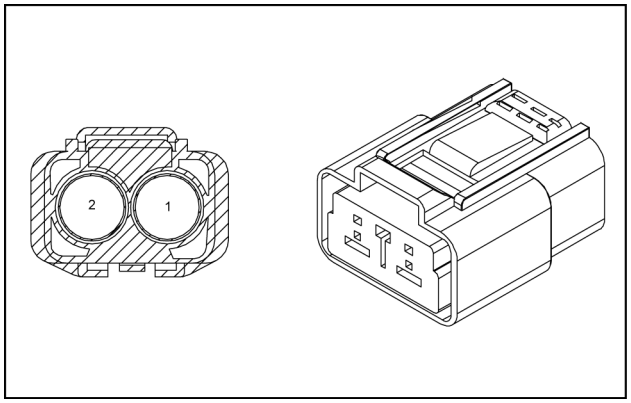
Sl. No.	Tail lamp	
1	X-052	TAIL LAMP
2	X-089	REAR LEFT LIGHT
3	X-090	REAR RIGHT LIGHT

Sl. No.	Cabin	
1	X-058	FRONT HEAD LAMP 2
2	X-062A	ROOF LIGHT
3	X-062B	ROOF LIGHT
4	X-206	GROUND
5	X-092	TO MAIN
6	X-069	CABIN FAN
7	X-067	REAR WORKING LAMP 2
8	X-066	LICENSE PLATE LAMP 2
9	X-065	LICENSE PLATE LAMP 1
10	X-068	REAR WORKING LAMP 1
11	X-071	FRONT WORK LAMP 1
12	X-063A	RH SPEAKER IN
13	X-063B	RH SPEAKER IN
14	X-070	WIPER MOTOR
15	X-061A	RADIO ANTENNA
16	X-061	RADIO
17	X-042	RH SPEAKER
18	X-064	LH SPEAKER
19	X-072A	LH SPEAKER
20	X-072B	LH SPEAKER

Sl. No.	Front left light horn	
1	X-060	LEFT FRONT LIGHT
2	X-400	TO HORN JUMPER HARNESS
3	X-112	TO LEFT FRONT LIGHT

CONNECTOR X-016 – To main harness

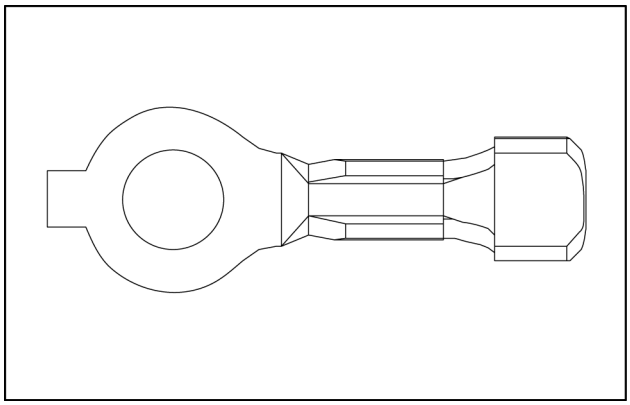
CONNECTOR X-016 – To main harness		
CAV ID	**WIRE ID**	**COLOR**
1	P002	RD
2	G131	BK



PTIL13TLB1240AA 9

CONNECTOR X - 026A - Batter voltage switch term 2

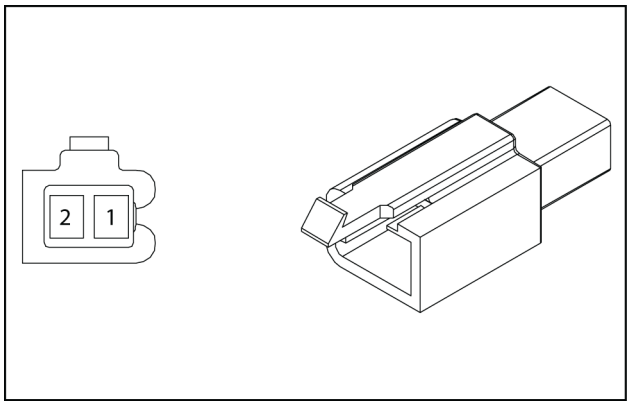
CONNECTOR X - 026A - Batter voltage switch term 2		
CAV ID	**WIRE ID**	**COLOR**
1	1150	RD



PTIL13TLB1249AA 8

CONNECTOR X - 036 Brake de-clutch

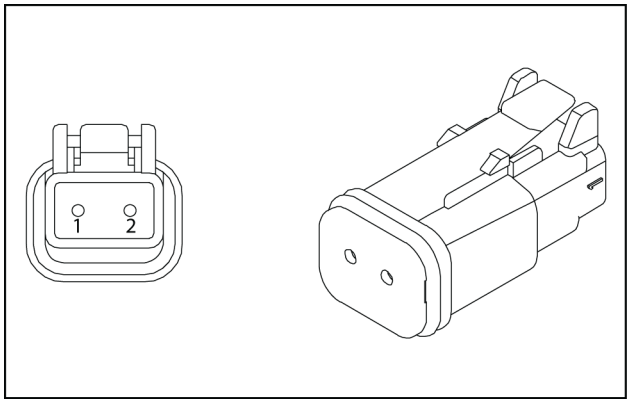
CONNECTOR X - 036 Brake de-clutch		
CAV ID	**WIRE ID**	**COLOR**
1	2150	YE
2		



PTIL13TLB1258AA 7

CONNECTOR X-046 - RTD solenoid

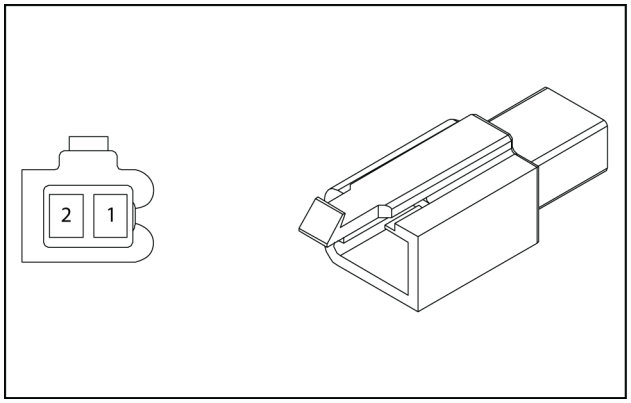
CONNECTOR X-046 - RTD solenoid		
CAV ID	**WIRE ID**	**COLOR**
1	2010	WH
2	G184	BK



PTIL13TLB1268AA 8

CONNECTOR X-055 – W/H Main 2

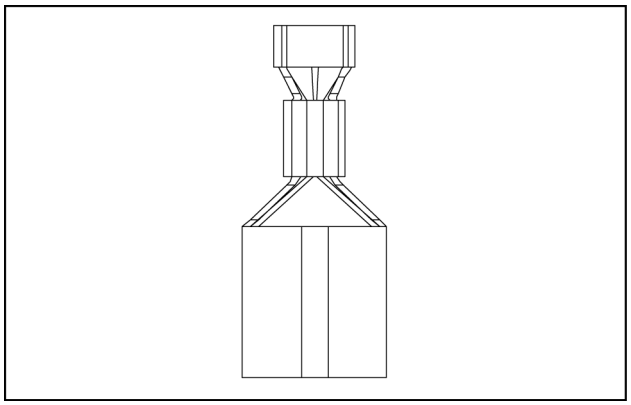
CONNECTOR X-055 – W/H Main 2		
CAV ID	**WIRE ID**	**COLOR**
1	1555	OR
2	–	–



PTIL13TLB1278AA 7

CONNECTOR X-063A - RH speaker IN

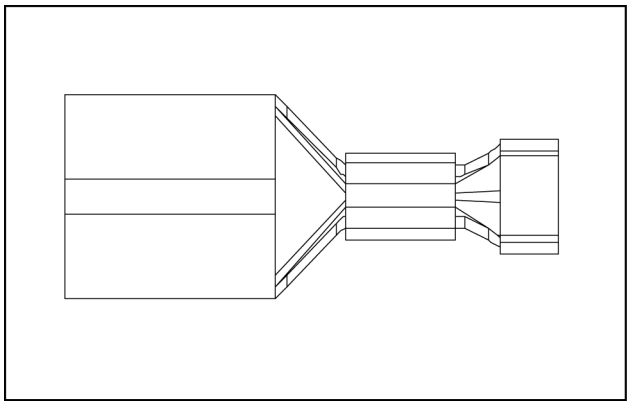
CONNECTOR X-063A - RH speaker IN		
CAV ID	**WIRE ID**	**COLOR**
1	7020	BK



PTIL13TLB1287AA 6

CONNECTOR X-072A - LH Speaker

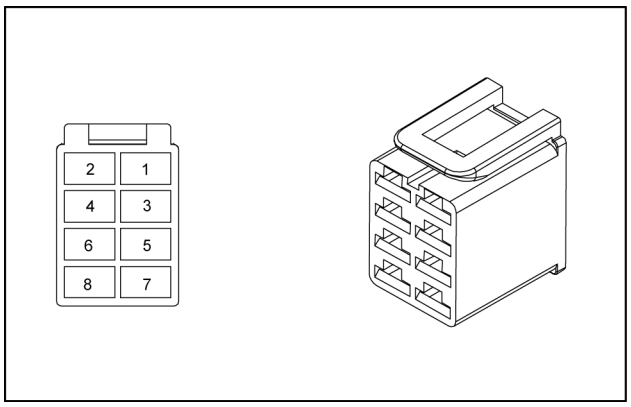
CONNECTOR X-072A - LH Speaker		
CAV ID	**WIRE ID**	**COLOR**
1	7000	BK



PTIL13TLB1297AA 3

CONNECTOR X-078A - Side shift locking switch

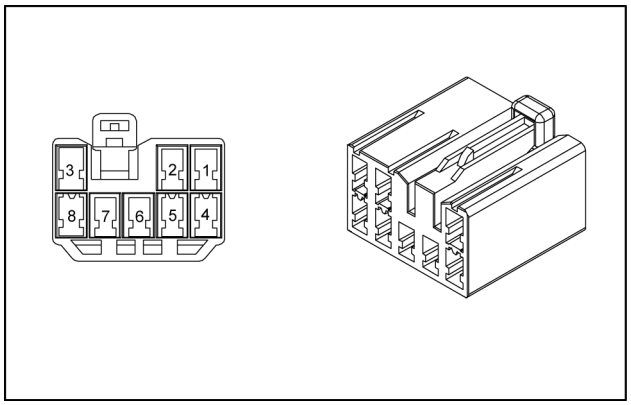
CONNECTOR X-078A - Side shift locking switch		
CAV ID	**WIRE ID**	**COLOR**
1	-	-
2	1559	OR
3	-	-
4	-	-
5	-	-
6	2240	WH
7	-	-
8	-	-



PTIL13TLB1305AA 13

CONNECTOR X-093 – To cab harness

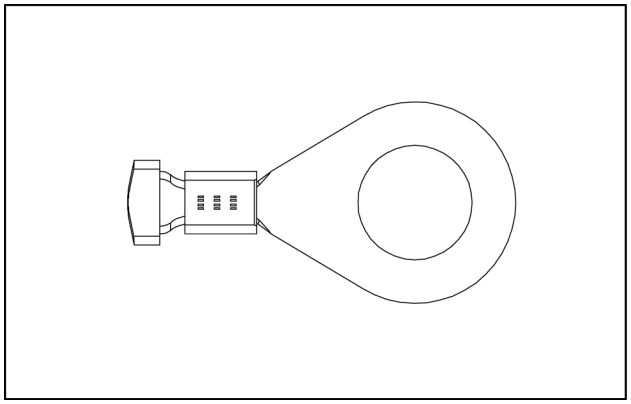
CONNECTOR X-093 – To cab harness		
CAV ID	**WIRE ID**	**COLOR**
1		
2	3320	VT
3	42C1	VT
4	3C06	YE
5	P008	RD
6	6303	BR
7	3573	VT
8	4010	BR



PTIL13TLB1311AA 4

CONNECTOR X - 004 - Starter motor B+

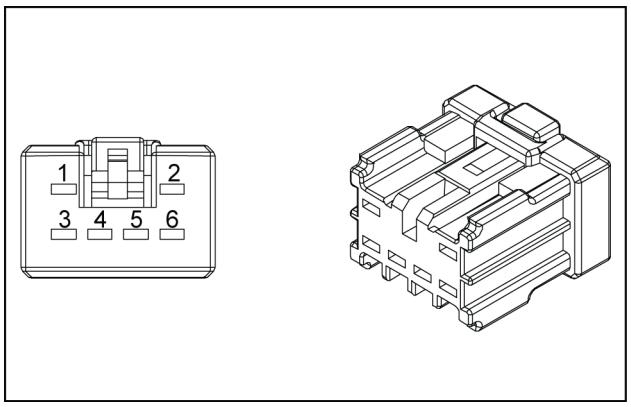
CONNECTOR X-004 - Starter motor B+		
CAV ID	**WIRE ID**	**COLOR**
1	1130	RD



PTIL14TLB0187AA 5

CONNECTOR X - 102 - Harness front RH

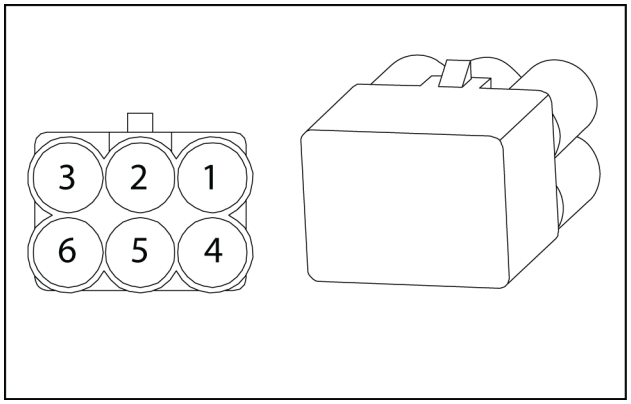
CONNECTOR X - 102 - Harness front RH		
CAV ID	**WIRE ID**	**COLOR**
1	3503	OR
2	4211	VT
3	-	-
4	G162	BK
5	3513	WH
6	3541	OR



PTIL13TLB1319AA 3

CONNECTOR X-112 - To left front light

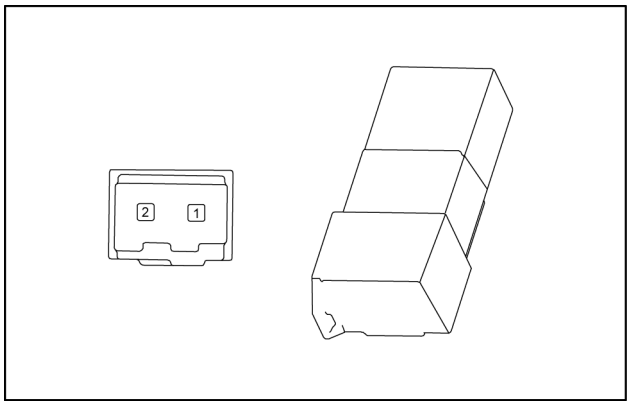
CONNECTOR X-112 - To left front light		
CAV ID	**WIRE ID**	**COLOR**
1	3120	VT
2	3110	OR
3	3100	OR
4	G164	BK
5	3130	VT
6	87709653	



PTIL13TLB1328AA 2

CONNECTOR X-122 - Fuse holder

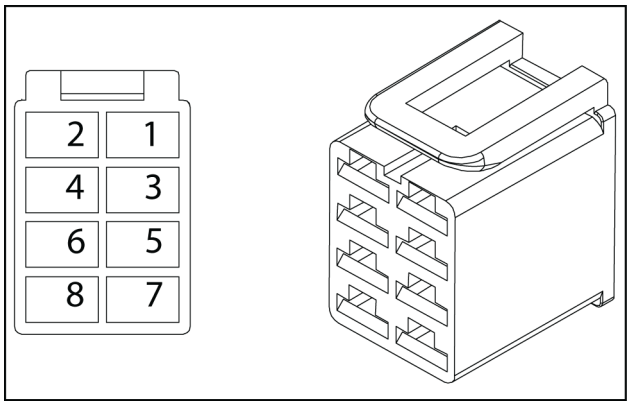
CONNECTOR X-122 - Fuse holder		
CAV ID	**WIRE ID**	**COLOR**
1	P005	RD
2	P017	RD



PTIL14TLB0207AA 3

CONNECTOR X-138A - Radio switch

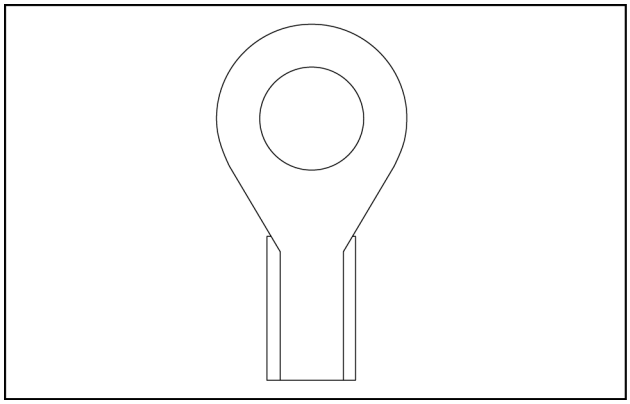
CONNECTOR X-138A - Radio switch		
CAV ID	**WIRE ID**	**COLOR**
1	-	-
2	3C04	RD
3		-
4	-	-
5	-	-
6	3C05	YE
7	-	-
8	-	-



PTIL13TLB1345AA 7

CONNECTOR X-147 – Fuel level sensor

CONNECTOR X-147 – Fuel level sensor		
CAV ID	**WIRE ID**	**COLOR**
1	G133	BK

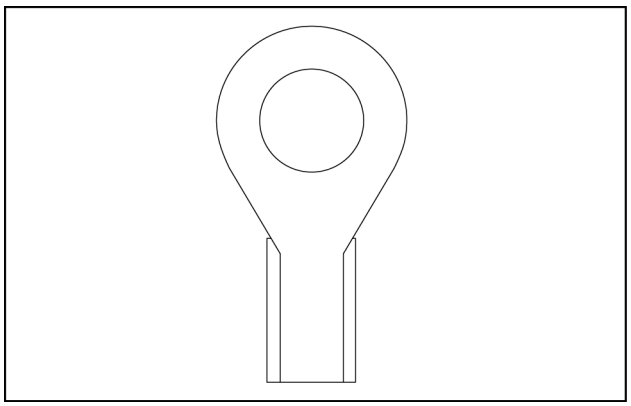


PTIL13TLB1355AA 8

Harnesses and connectors - Component diagram 20

CONNECTOR X-200 – Ground

CONNECTOR X-200 – Ground		
CAV ID	**WIRE ID**	**COLOR**
1	G100	BK



PTIL13TLB1363AA 1

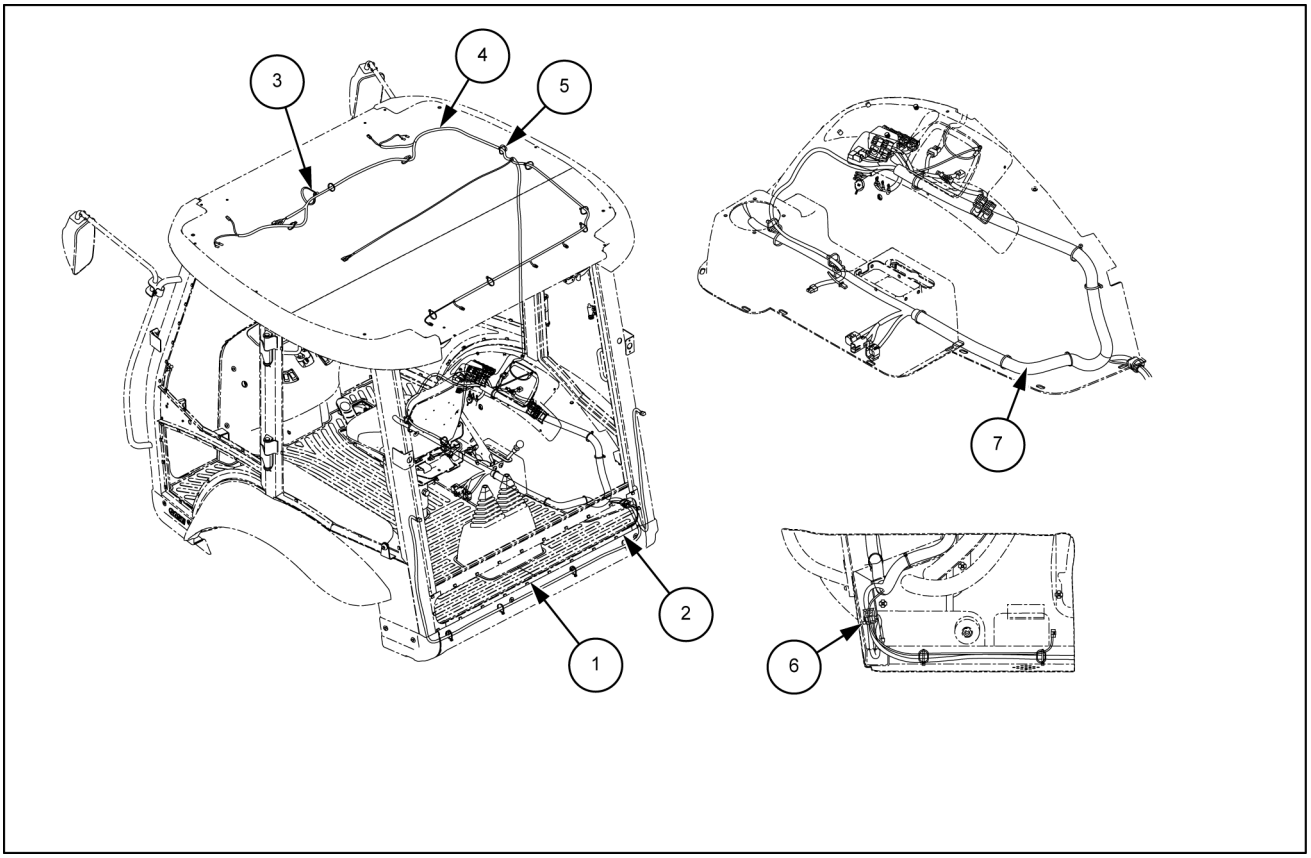
Wiring harnesses - Electrical schematic sheet 01 - Power distribution/charging system

Wiring harnesses - Electrical schematic sheet 06 - Hydraulics

Wiring harnesses - Electrical schematic sheet 11 - Instrument cluster/speedometer

Wiring harnesses - Electrical schematic sheet 16 - HVAC (optional)

Cabin main harness

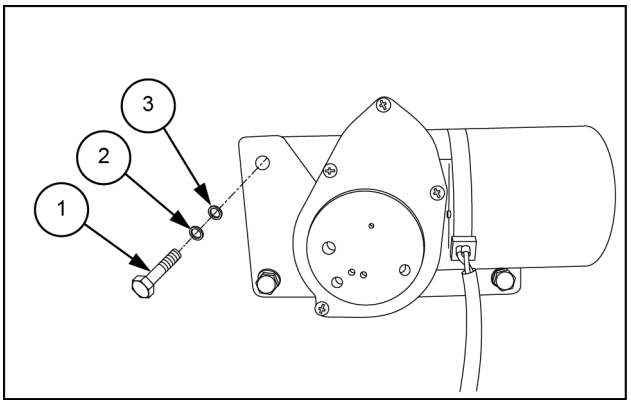


PTIL13TLB0712FB 4

1. Tail lamp harness
2. Strap cable
3. Hose tie
4. Cab harness
5. Ring
6. Strap cable
7. Main harness

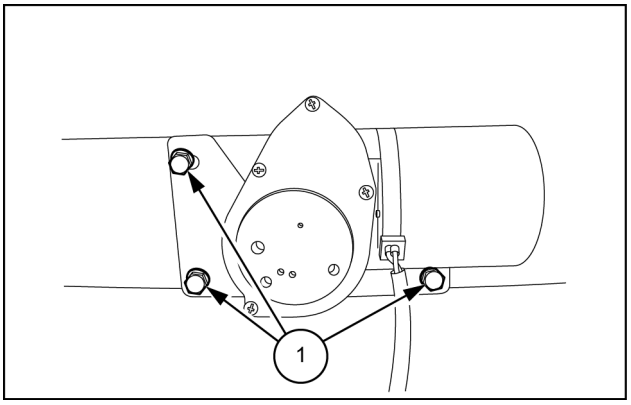
Windshield wiper motor - Install

1. Using hexagonal bolt **(1)**, washer **(2)** and lock washer **(3)** align the wiper motor to the cabin panel.



PTIL13TLB1756AB 1

2. Install the wiper motor by tightening the bolts **(1)**.



PTIL13TLB1755AB 2