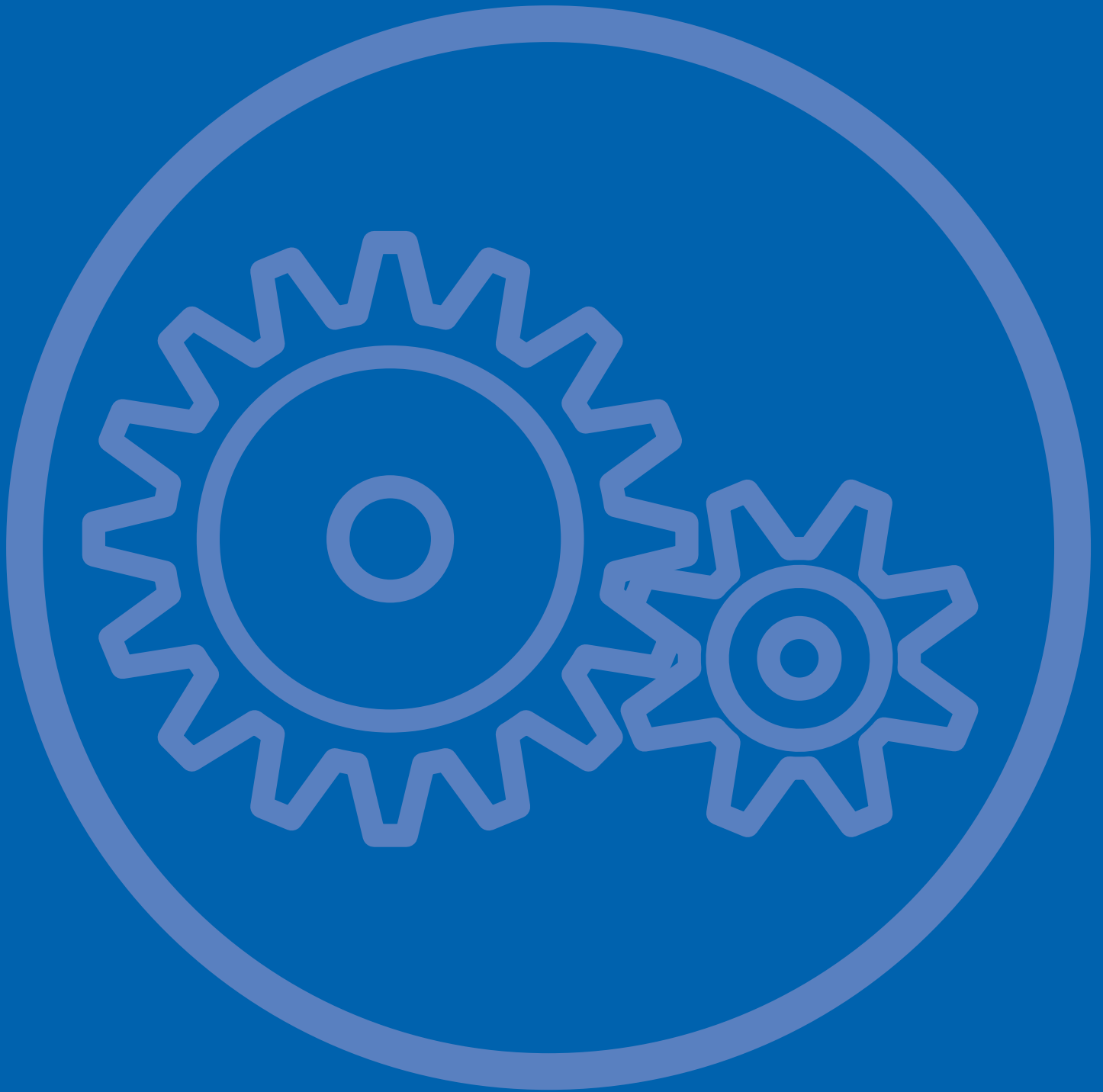




Workshop manual

CRT 48 Petrol



English

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8 Technical data

1 Introduction

1.1 California Proposition 65

WARNING!

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

1.2 Document description

This manual gives a full description of how to do maintenance and repair on the product. It also gives safety instructions that the personnel must obey.

1.3 Target group

This manual is for personnel with a general knowledge of how to do repair and do servicing. All personnel that do repair or do servicing on the product must read and understand the manual.

1.4 Revisions

Changes to the product can cause changes to the maintenance work and spare parts. Separate information is sent out for each change.

Read the manual together with all received information about changes to maintenance and spare parts for the product.

1.5 Safety



WARNING: All personnel that repair or do servicing on the product must read and understand the safety instructions in this workshop manual.

1.6 Servicing tools

The manual gives information about necessary servicing tools. Always use original tools from Husqvarna.

2 Safety

2.1 Safety definitions

Warnings, cautions, and notes are used to point out particularly important parts of the manual.



WARNING: Used if there is a risk of injury or death for the operator or bystanders if the instructions in the manual are not obeyed.



CAUTION: Used if there is a risk of damage to the product, other materials or the adjacent area if the instructions in the manual are not obeyed.

Note: Used to give more information that is necessary in a given situation.

2.2 General safety instructions

- Read and obey this workshop manual.
- Obey the local safety regulations when you repair or do servicing of the product.
- The safety equipment you use must obey local regulations.
- Use only the equipment that the manufacturer recommends.
- Use personal protective equipment.
- Use protective gloves and safety glasses. The safety glasses must obey the ANSI Z87.1 for US or EN166 for EU countries.
- Use hearing protection when the product is in operation.
- Always stop the product before you repair or do servicing of the product.
- Remove flammable materials from the work area. The product can cause sparks.
- Do not point compressed air to your body. Compressed air can go into the blood stream.
- Always tighten the nuts and the bolts on the product correctly.
- Do checks of the product for warning labels that are damaged. Replace the warning labels that are damaged.
- Always read the warning labels of product supplies.
- Obey the local waste regulations.
- Gasoline and its fumes are poisonous.
- Gasoline can cause damage to the eyes and the skin.
- Gasoline can cause breathing problems.
- Gasoline is flammable.

2.3 Symbols on the product



WARNING! This product can be dangerous and cause serious injury or death to the operator or others. Be careful and use the product correctly.



Read the manual carefully and make sure that you understand the instructions before you use the product.



Use hearing protection and eye protection.



Keep sparks and flames away from the product. Risk of fire.



Stop the engine before you fill fuel.



Use clean, filtered fuel.



Risk of injury. Be careful around the drive belt.



Hot surface.



Keep your hands away from the blades.



Keep your feet away from the blades.



Lifting point.



Ignition key position OFF.



Ignition key position ON.



Ignition key position, start the engine.



Oil level indicator.



Tie-down bracket.



Water tank.



This product is in compliance with applicable EC directives.



The exhaust fumes from the engine contain carbon monoxide, an odorless, poisonous and very dangerous gas. Do not run the product indoors or in closed spaces.

Note: Other symbols/decals on the product refer to special certification requirements for some markets.

3 Prepare and do servicing on the product

3.1 Maintenance schedule

	Daily	Each 20 h	Each 50 h	Each 100 h	Each 200 h	Each 300 h
Do a check of the fuel level.	X					
Do a check of the engine oil level each 4 hours of operation.	X					
Examine the air filter. Replace the air filter if it is necessary.	X					
Make sure that nuts and screws are tightened.	X					
Clean the product immediately after the operation. Use a high-pressure washer.	X					
Lubricate the trowel arms.	X					
Do a check of the oil level in the gearboxes.		X				
Lubricate the grease nipples of the drive system, the gearboxes and the blade pitch controls.		X				
Lubricate the control linkages.		X				
Examine the drive belt for damage.			X			
Lubricate steering cylinder pivots.			X			
Replace the engine oil after the first 20 h of operation, then at this interval.				X		
Do a check of the fuel filter.				X		
Examine and clean the spark plug. Replace the spark plug if it is necessary.					X	
Replace the oil filter.					X	
Replace the spark plug.						X
Replace the fuel filter.						X
Replace the pressure relief valve on the gearboxes.						X
Replace the oil in the gearboxes.						X

3.2 Air filter



WARNING: Use approved respiratory protection when you clean or replace the air filter. Discard used air filters correctly. Inhalation of the dust in the air filter may be dangerous to your health.



CAUTION: Always replace a damaged air filter, or the dust will go into the engine and cause engine damage.

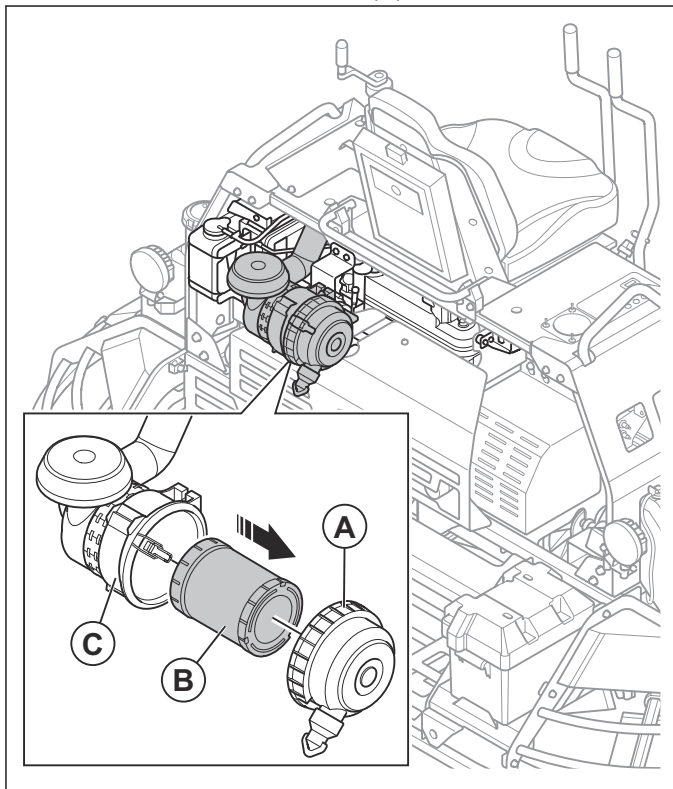
3.2.1 To clean or replace the air filter



WARNING: Do not clean the air filter with compressed air. This causes damage to the air

filter and the risk increases that you breathe the dangerous dust.

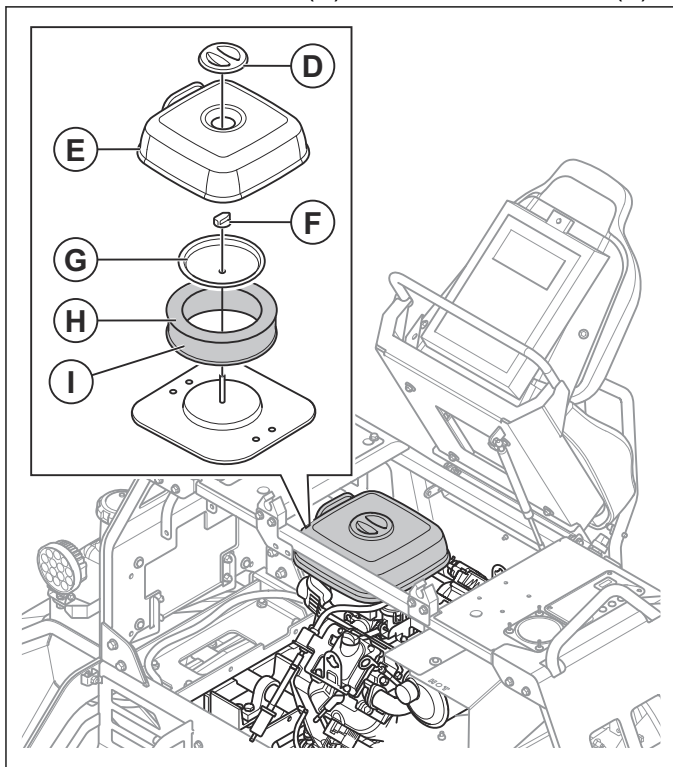
1. Remove the air filter cover (A).



Note: Only for CRT 48-57K.

2. Remove the foam filter element (B) and the paper filter element (C).

3. Remove the fastener (D) and the air filter cover (E).



Note: Only for CRT 48-37V.

4. Remove the fastener (F) and the retainer (G).
5. Remove the air filter (H).
6. If the air filter has a pre-cleaner (I), remove it from the air filter.
7. Clean the air filter housing with a brush.
8. Examine the air filter elements for damage.
9. Tap the paper filter element against a hard surface or use a vacuum cleaner to remove the particles.



CAUTION: Do not let the nozzle of the vacuum cleaner touch the surface of the paper filter element. Keep a small distance. The sensitive surface of the paper filter element becomes damaged if objects touch it.

10. Clean the foam filter element with a solution of soap and water.
11. Flush the foam filter element in clean water.
12. Compress the foam filter element to remove the water and let the foam filter element dry fully.



CAUTION: Do not put oil on the foam filter element.

13. If the air filter has a pre-cleaner, clean it in liquid detergent and water. Let the pre-cleaner air dry fully.



CAUTION: Do not put oil on the pre-cleaner.

14. Install the air filter in the opposite sequence.

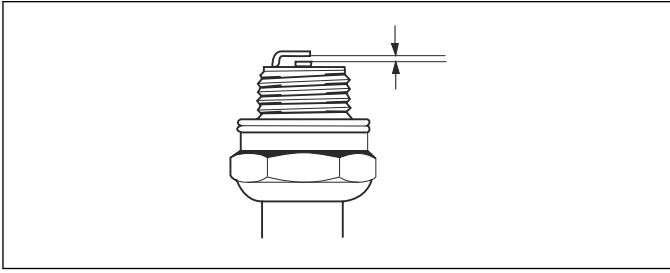
3.3 To examine the spark plug



CAUTION: Always use the recommended spark plug type. Incorrect spark plug type can cause damage to the product.

- Examine the spark plug if the engine is low on power, is not easy to start or does not operate correctly at idle speed.
- To decrease the risk of unwanted material on the spark plug electrodes, obey these instructions:
 - a) Make sure that the idle speed is correctly adjusted.
 - b) Make sure that the fuel mixture is correct.
 - c) Make sure that the air filter is clean.

- If the spark plug is dirty, clean it and make sure that the electrode gap is correct. Refer to the engine manual.



- Replace the spark plug, if necessary.

3.4 To replace the engine oil

If the engine is cold, start the engine for 1–2 minutes before you drain the engine oil. This makes the engine oil warm and easier to drain.



WARNING: Engine oil is very hot directly after the engine stops. Let the engine become cool before you drain the engine oil. If you spill engine oil on your skin, clean with soap and water.

- Refer to the engine manual to replace the engine oil.

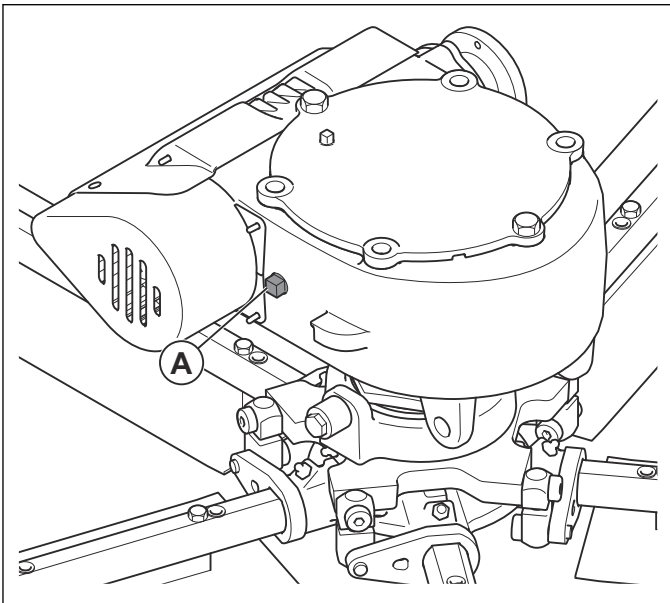
3.5 To replace the oil filter

- Refer to the engine manual to replace the oil filter.

3.6 To do a check of the gearbox oil level

There are 2 gearboxes on the product. Do this procedure for each gearbox.

1. Remove 1 of the oil fill plugs (A).



2. Examine the gearbox oil level. The oil level is correct when it is at the bottom of the threads in the hole for the oil fill plug.

3. If the oil level is low, fill with Glycoyle synthetic gear oil.



CAUTION: Do not fill too much and do not mix different types of gearbox oil. The gearbox can become damaged.

4. Dry the threads of the oil fill hole in the gearbox and the threads of the oil fill plug.
5. Apply LOCTITE® 545™ or equivalent to the threads of the oil fill plug.
6. Install the oil fill plug.
7. Torque the oil fill plugs to 16–20 Nm/12–15 lb-ft.

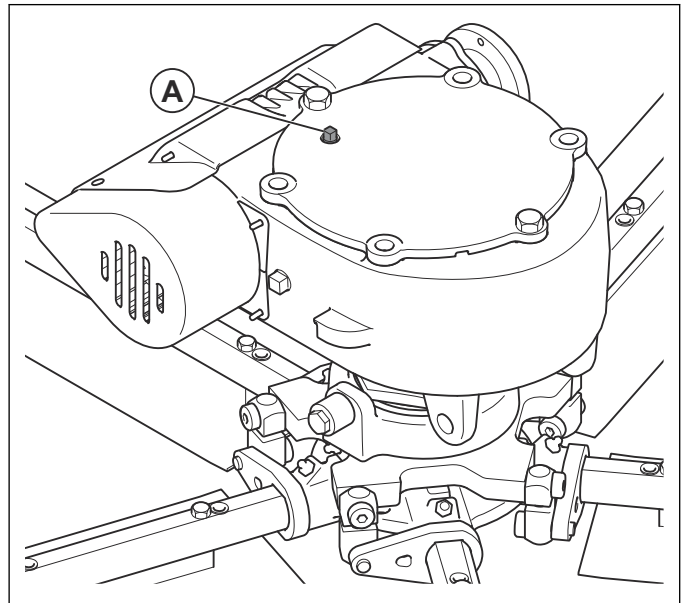
3.7 To do a check of the pressure relief valve on the gearbox

Do this procedure each time that you do a check of the oil level in the gearbox.



CAUTION: If the pressure relief valve is clogged, there is a risk of oil leakage from the gearbox shaft seals.

1. Examine the pressure relief valve (A).

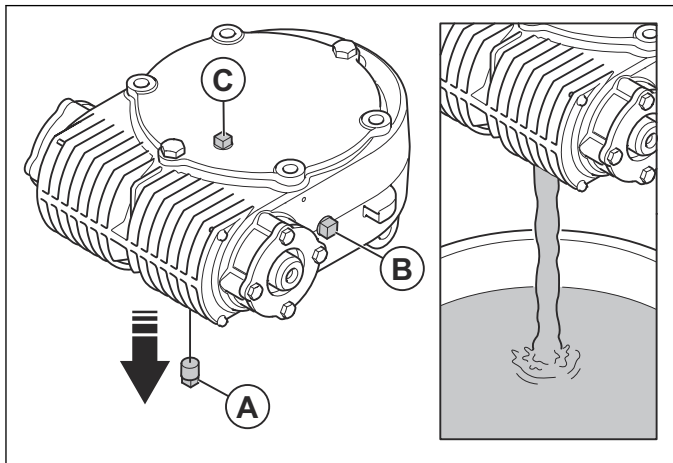


2. If it is clogged, clean it.
3. If the pressure relief valve cannot be cleaned, replace it.

3.8 To replace the oil in the gearbox

There are 2 gearboxes on the product. Do this procedure for each gearbox.

1. Put a container of a minimum 3.8 l/4.0 qts below the gearbox.
2. Remove the drain plug (A), the oil fill plug (B) and the pressure relief valve (C). Let the oil run out into the container.



- a) Lift slightly the rear of the product to let the remaining oil run out.
 - b) When all oil is drained, put the product back on level ground.
3. Dry the threads of the oil drain hole in the gearbox and the threads of the oil drain plug.
 4. Apply LOCTITE® 545™ or equivalent to the threads of the oil drain plug.
 5. Install the oil drain plug for the gearbox (A).
 6. Fill with Glycoyle synthetic gear oil trough 1 of the holes for the oil fill plugs (B).
 7. Fill until the oil level is at the bottom of the threads in the hole for the oil fill plug.
 8. Dry the threads of the oil fill hole in the gearbox and the threads of the oil fill plug.
 9. Apply LOCTITE® 545™ or equivalent to the threads of the oil fill plug.
 10. Install the oil fill plug.
 11. Torque the oil drain plug and oil fill plugs to 16–20 Nm/12–15 lb-ft.

3.9 To replace the blades

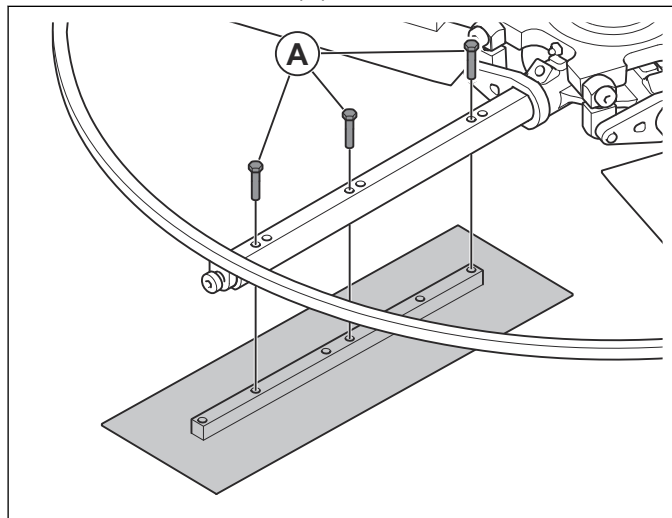


WARNING: Before you replace the blades, stop the product, let the engine become cool and disconnect the battery.

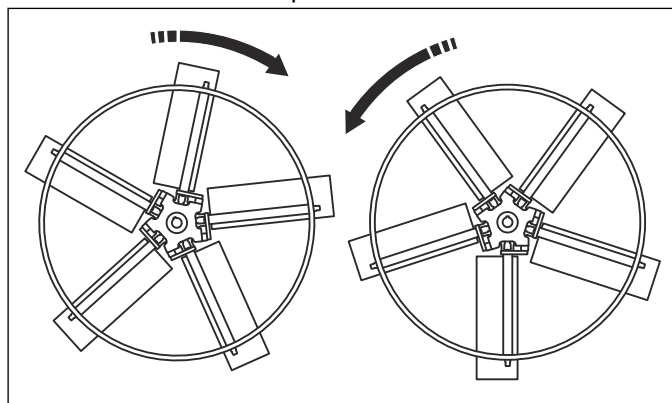


WARNING: Use protective gloves.

1. Lift the product with lifting equipment.
2. Put supports below the frame of the product.
3. Remove the screws (A) and remove the blades.



4. Align the screw holes of the blade shafts with the screw holes of the new blades.
 - a) If you install combination blades, put the blades as shown in the picture.



Note: Finish blades are symmetrical. Thus, it is not important which edge points in the direction of rotation.

5. Apply grease to the threads of the screws to make the removal of the screws easier the next time.
6. Install the new blades with the lubricated screws.
7. Put plastic plugs in the remaining holes in the blades. This is to make sure that the holes are not filled with concrete during operation.

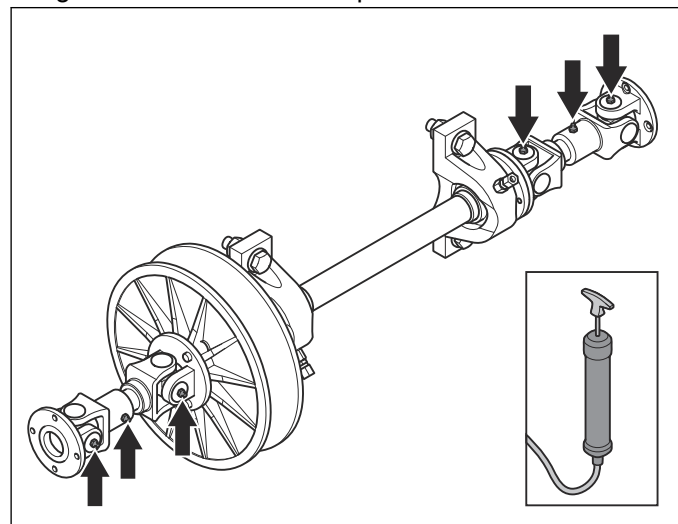
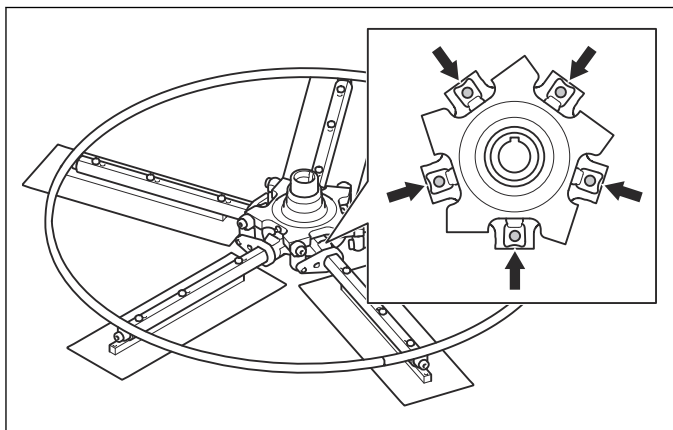
3.10 To lubricate the blade shafts

Use a general type of grease.

1. Put the product on a flat, level surface with the blades flat.
2. Stop the engine and disconnect the battery.

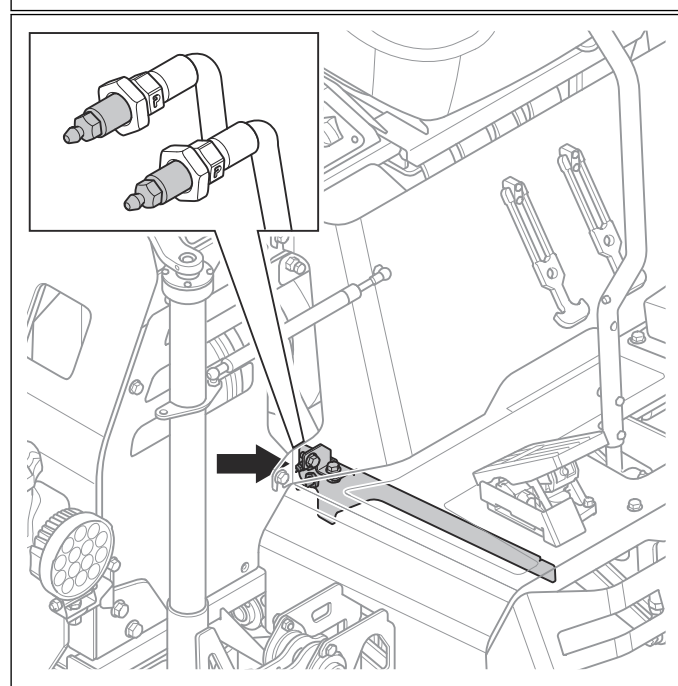
3. Increase the blade pitch to the maximum angle. This makes it easier to get access to the grease nipples.
4. Replace broken or blocked grease nipples.
5. Push grease through the grease nipples until grease comes out around the blade shafts.

- Lubricate the grease nipples of the drive system, the gearboxes and the blade pitch controls.



3.11 To lubricate the control linkages, universal joints and the drive system bearings

- Use a general type of grease.



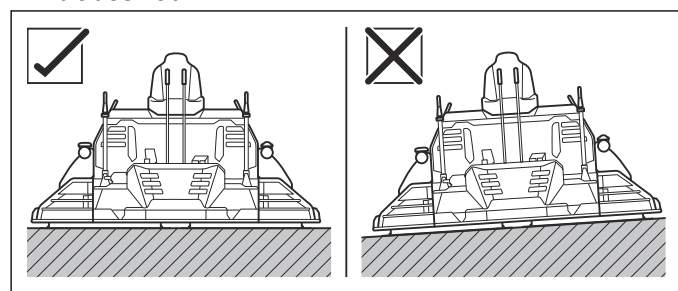
- Replace broken or blocked grease nipples.

3.12 To remove the drive belt



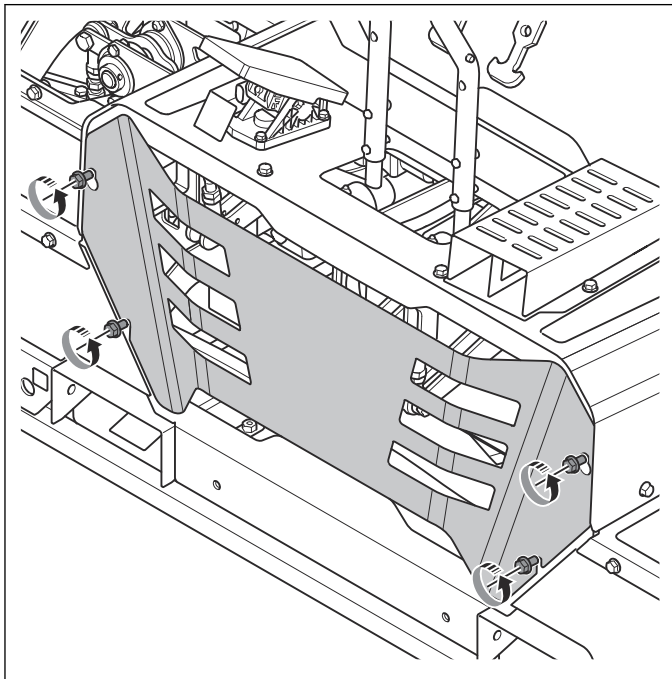
WARNING: Do not operate the product without the drive belt cover installed.

1. Put the product on a flat, level surface with the blades flat.

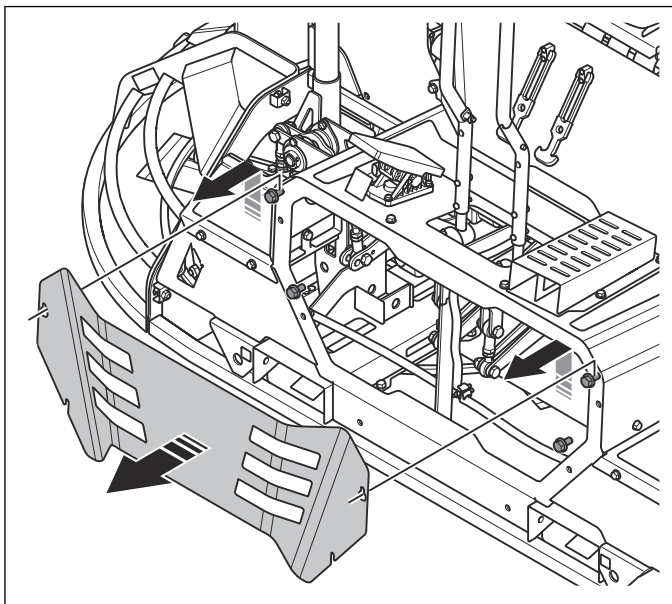


2. Stop the engine and disconnect the battery.

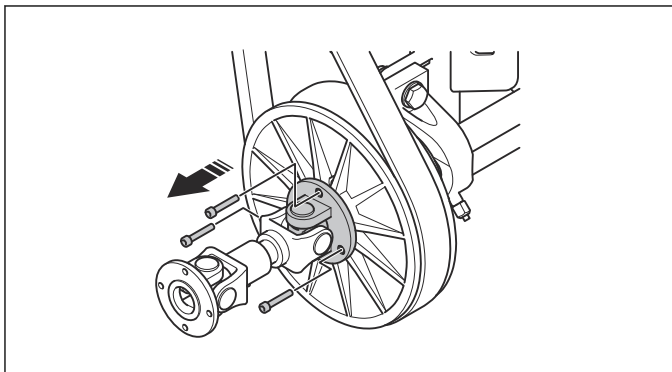
3. Loosen the 4 screws on the front cover.



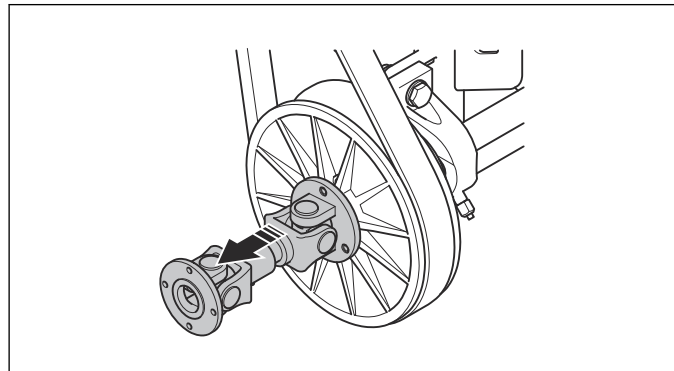
4. Remove the cover.



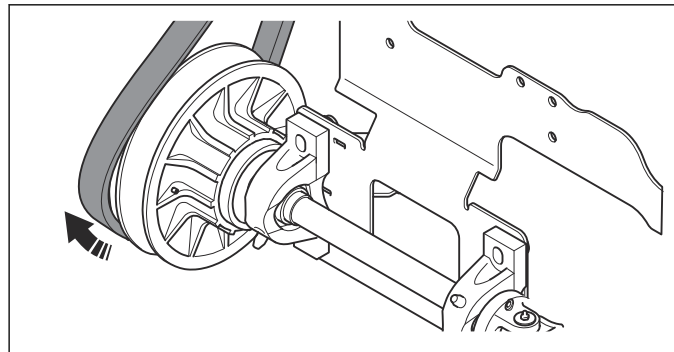
5. Remove the 4 screws that hold the universal joints to the shaft.



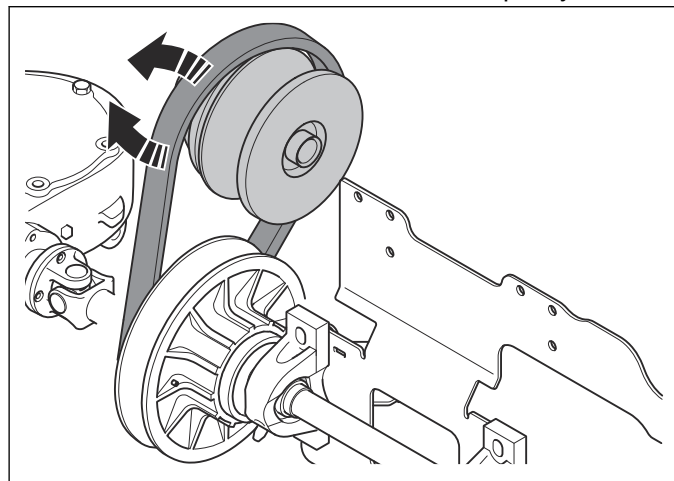
6. Put away the universal joint.



7. Remove the drive belt from the pulley.



8. Remove the drive belt from the clutch pulley.

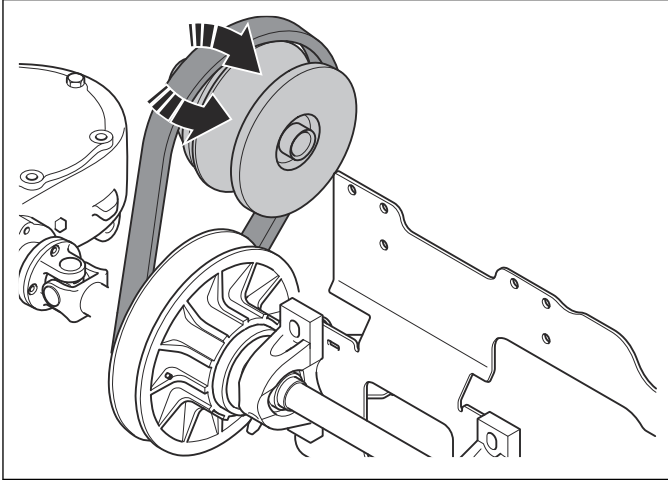


3.13 To install the drive belt

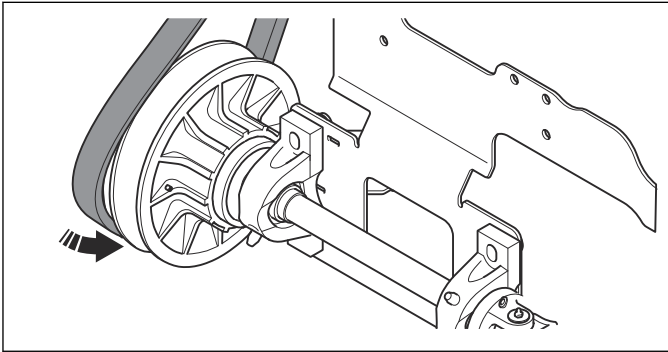


WARNING: Do not operate the product without the drive belt cover installed.

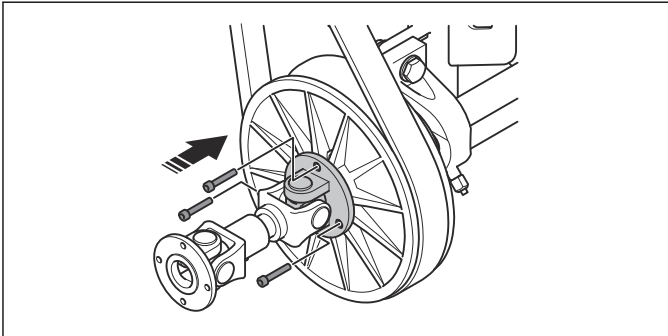
1. Install the drive belt on the clutch pulley.



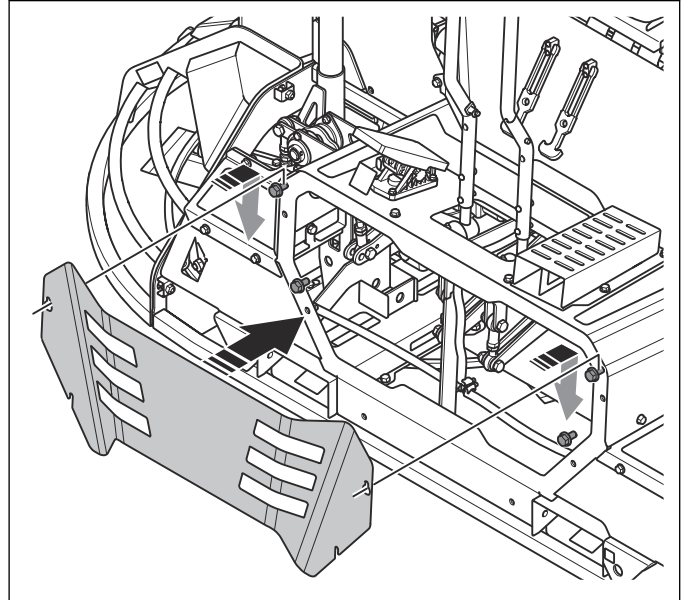
2. Install the drive belt on the pulley assembly.



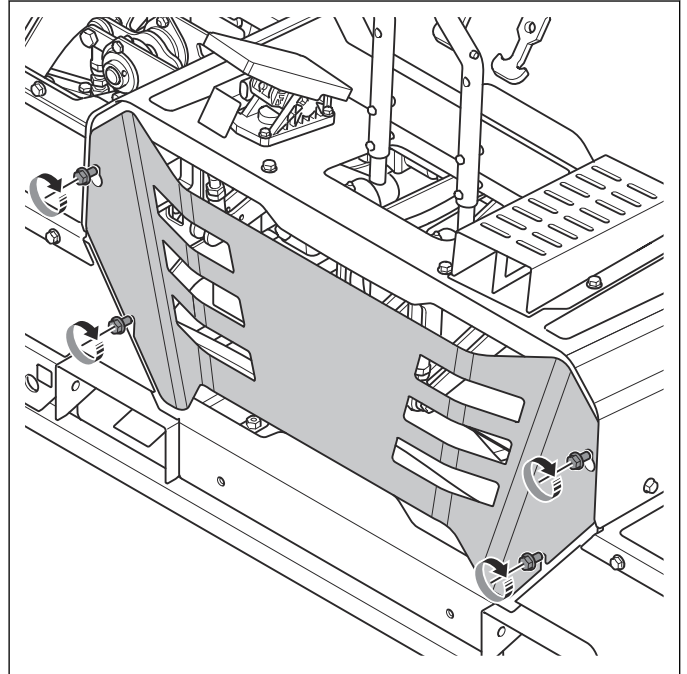
3. Install and tighten the 4 screws that hold the universal joints to the shaft.



4. Install the front cover.



5. Tighten the 4 screws.



3.14 To move the product

- For transportation information, refer to operator's manual of the product.

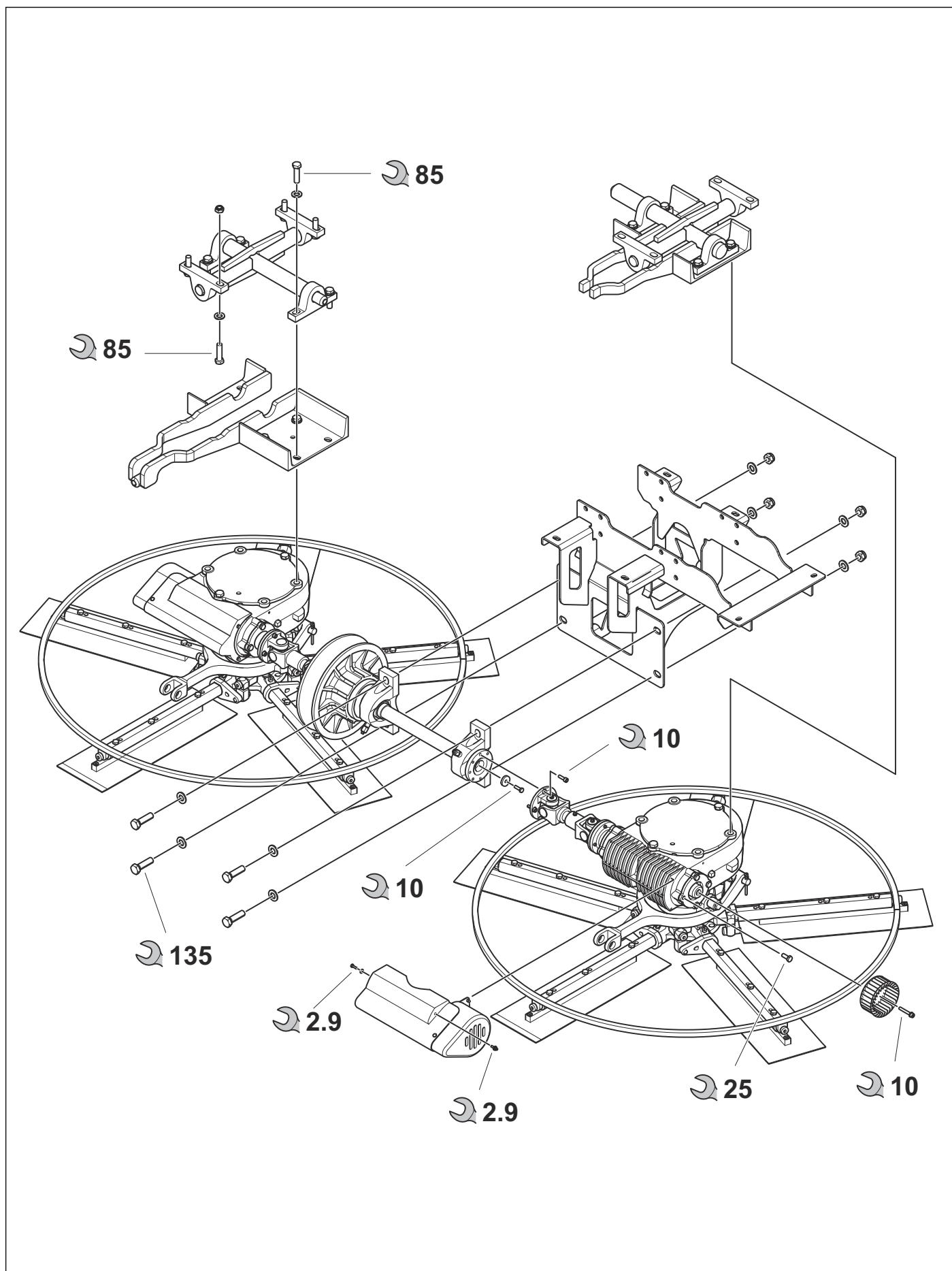
4 Servicing data

4.1 Symbols in the diagrams

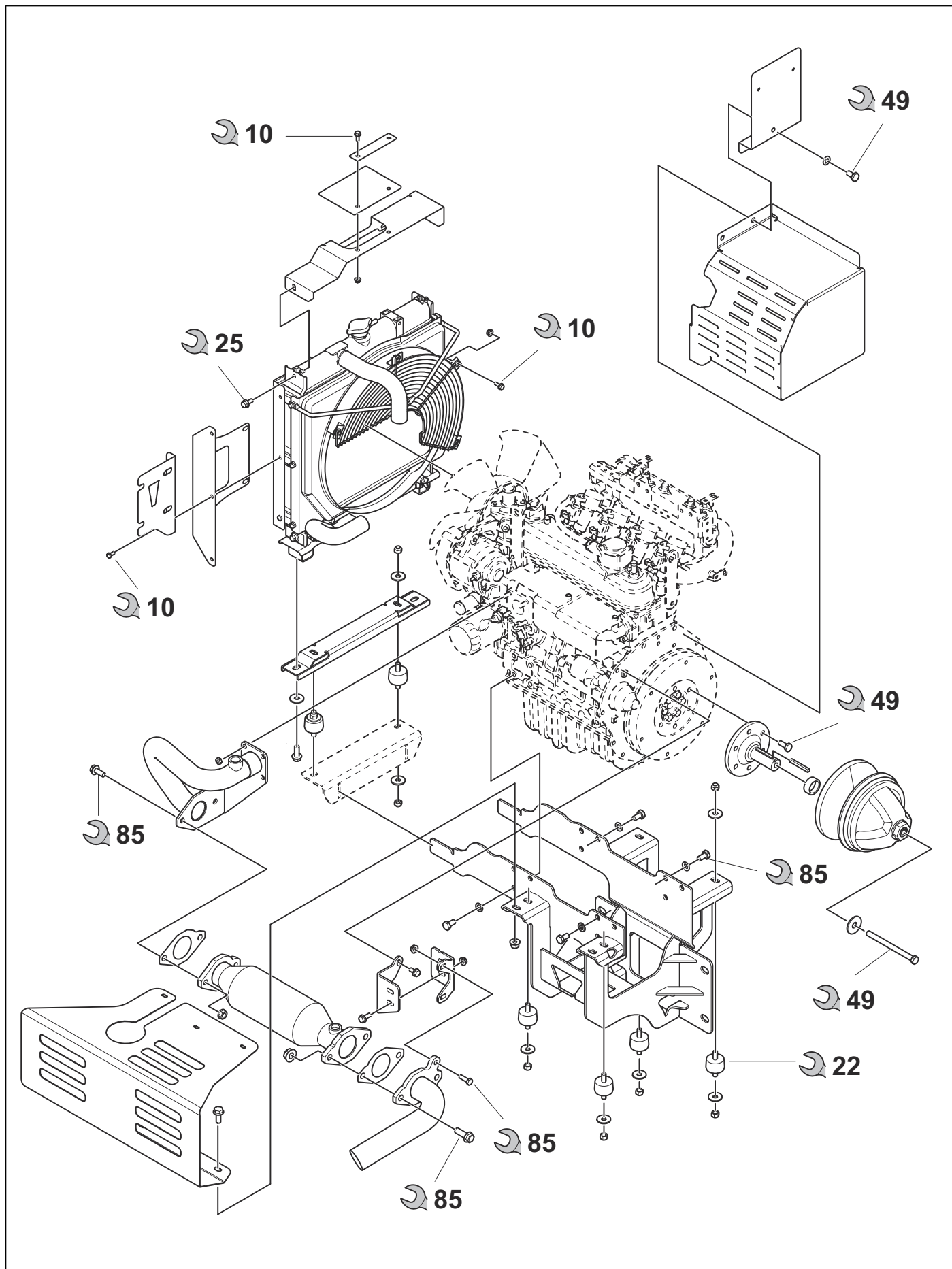


Tightening torque, Nm

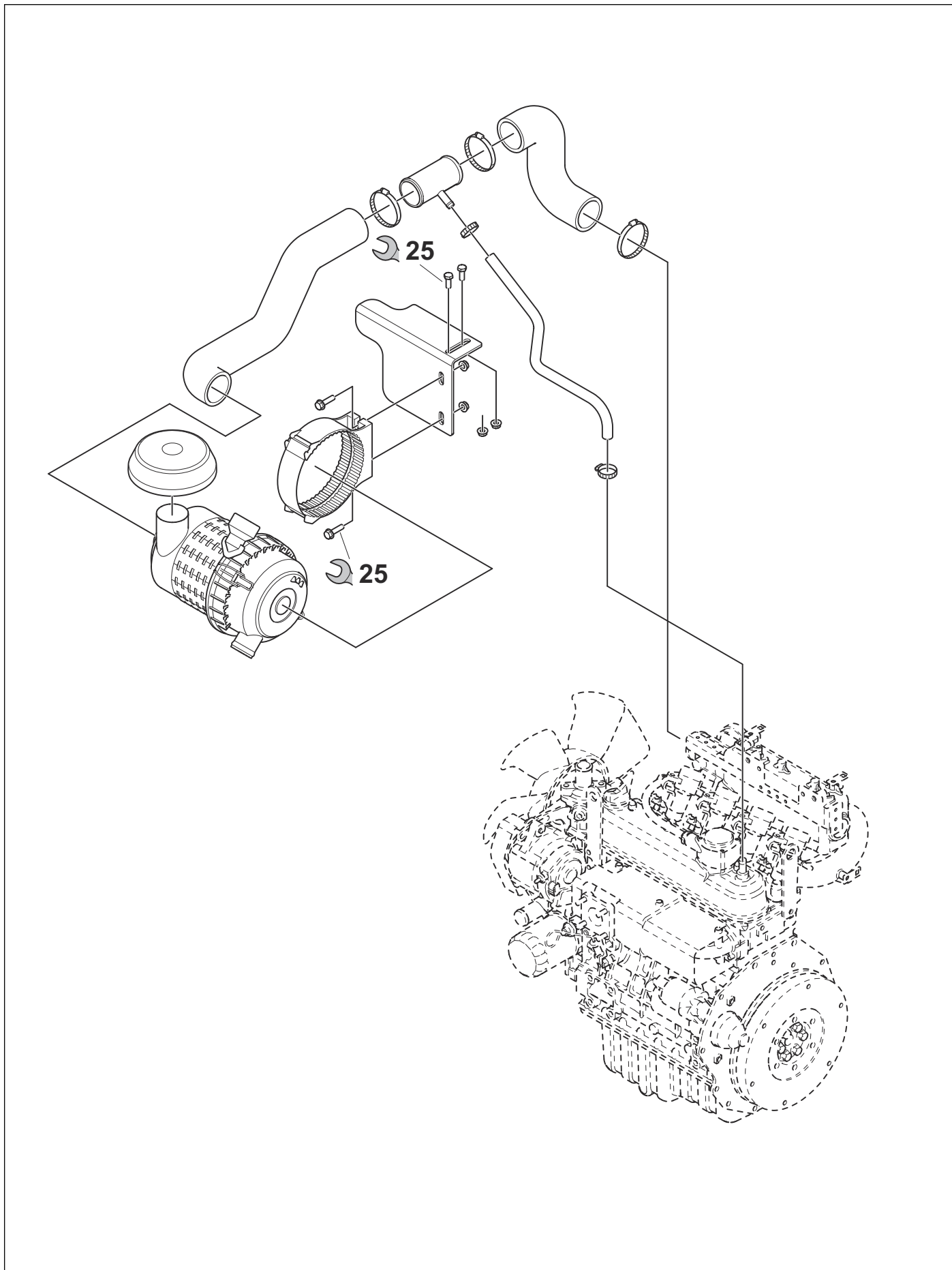
4.2 Tightening torques drive and gearbox



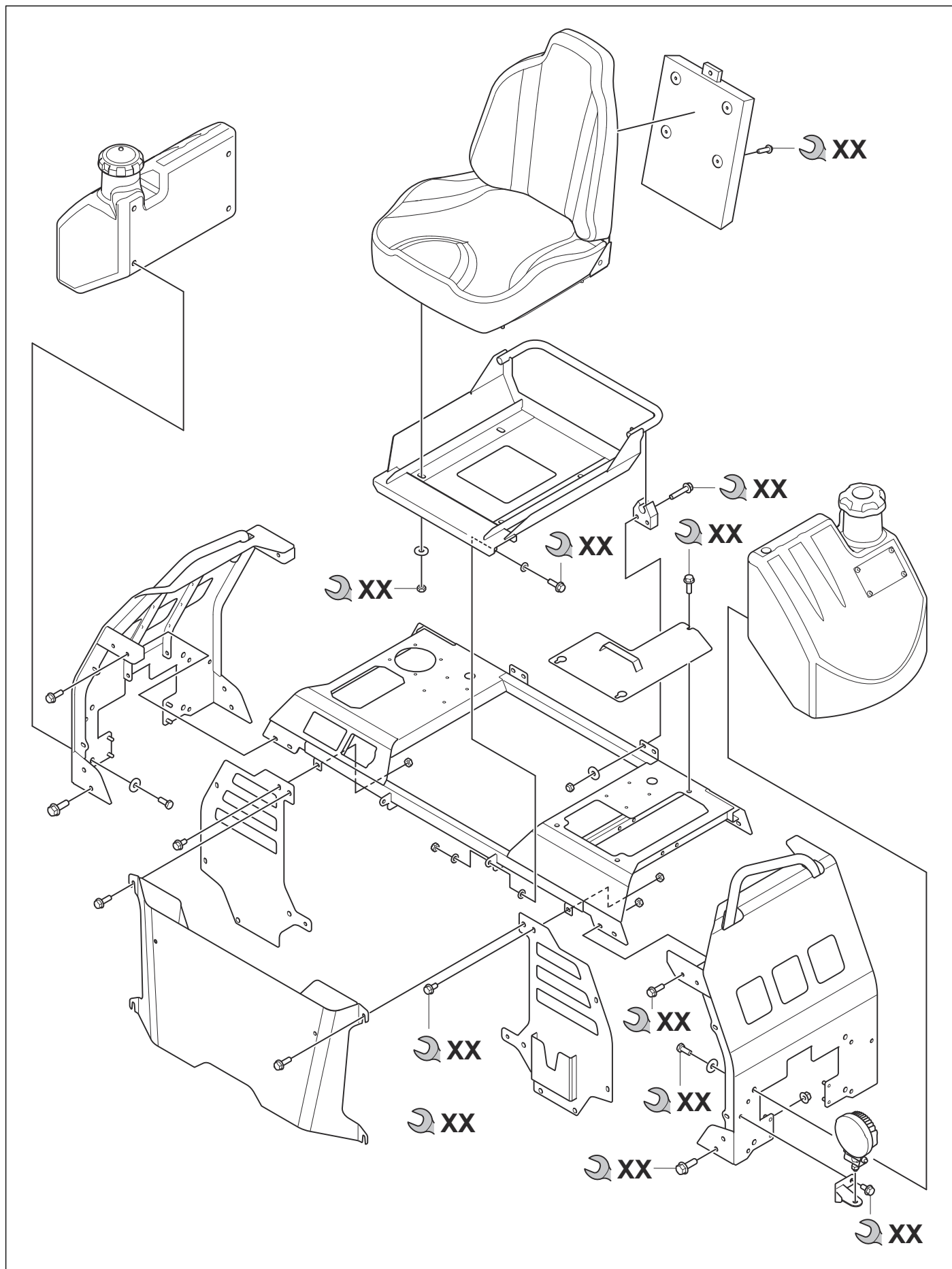
4.3 Tightening torques engine plate and muffler



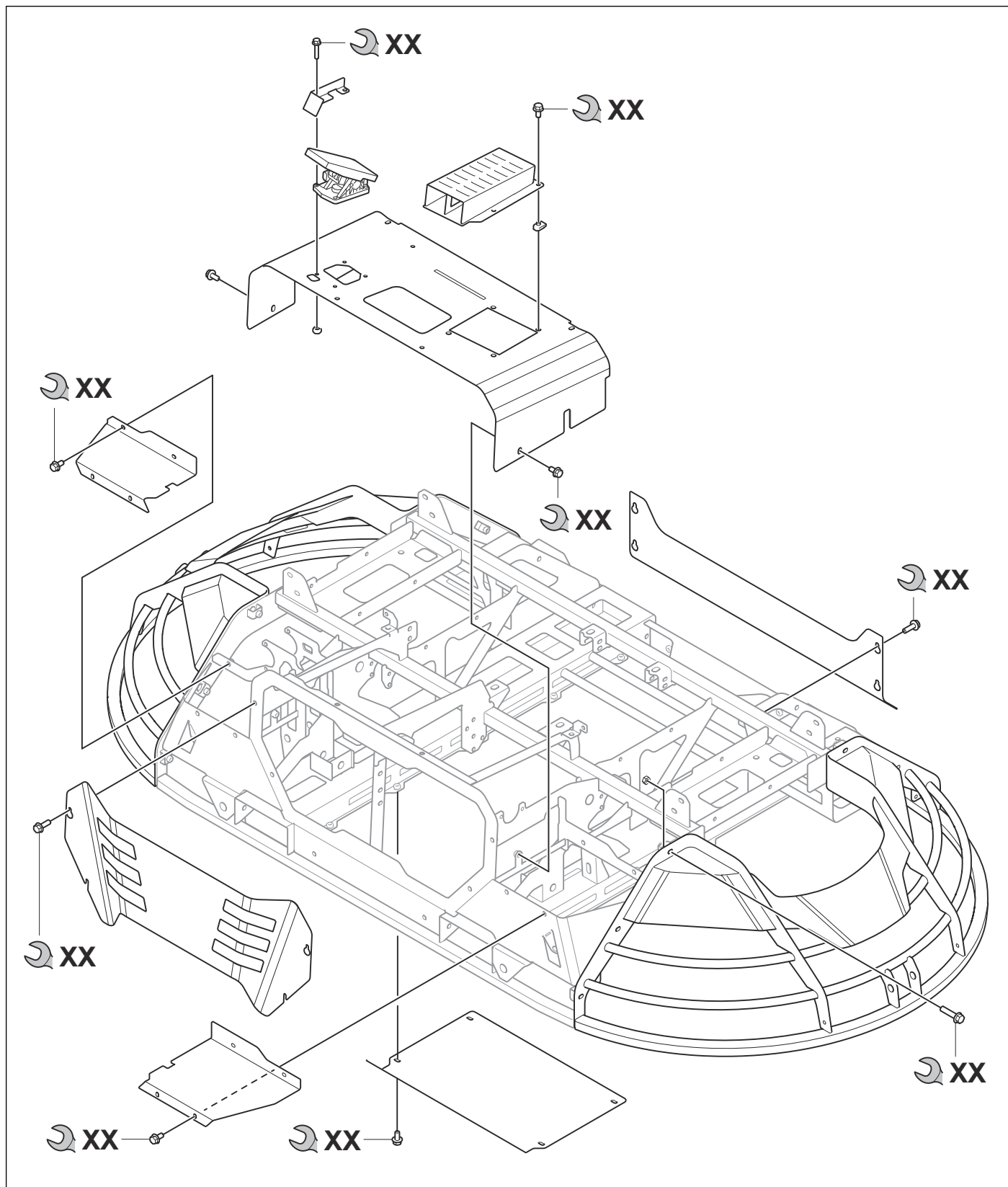
4.4 Tightening torques air filter



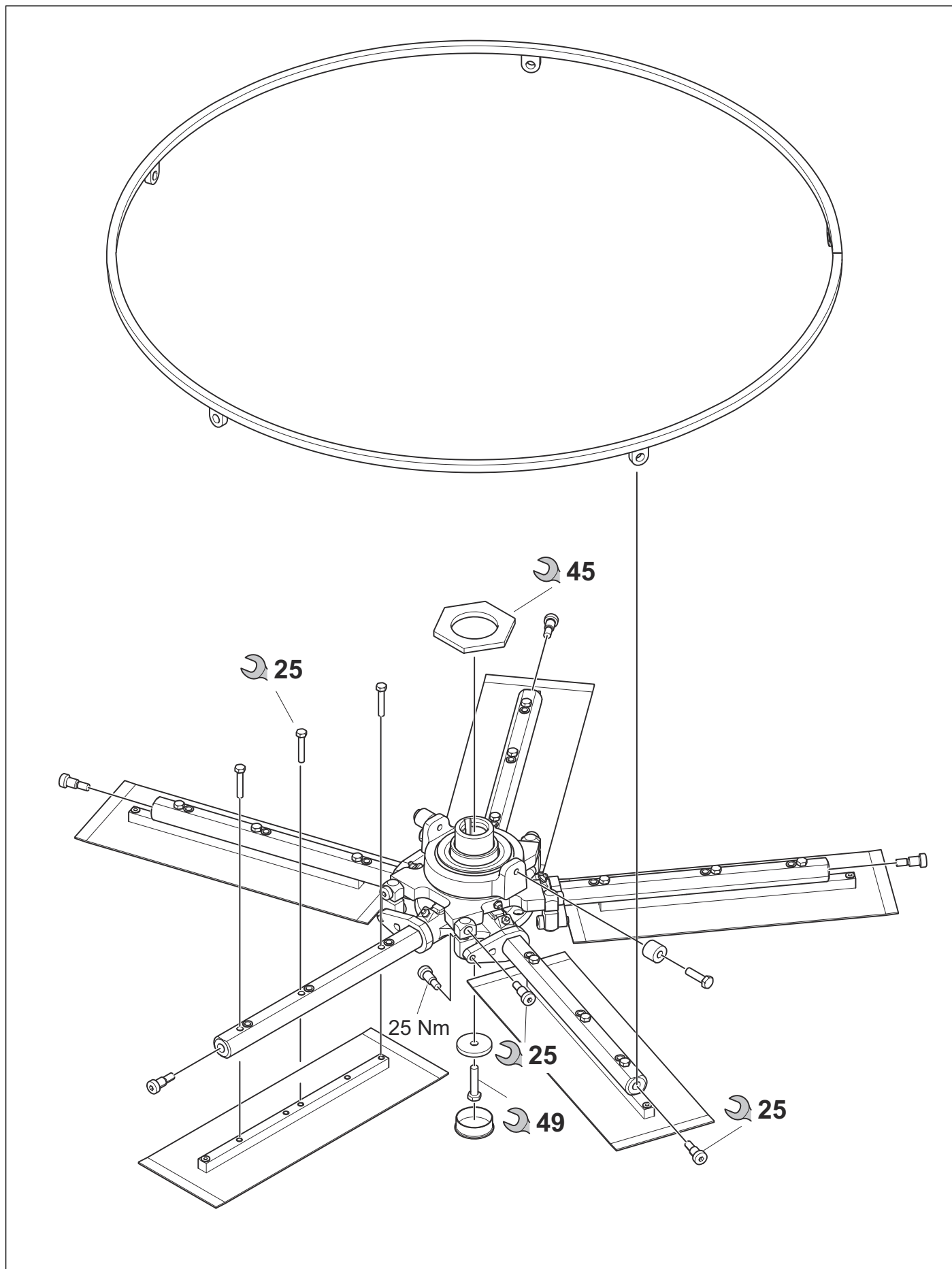
4.5 Tightening torques frame seats and panel - upper



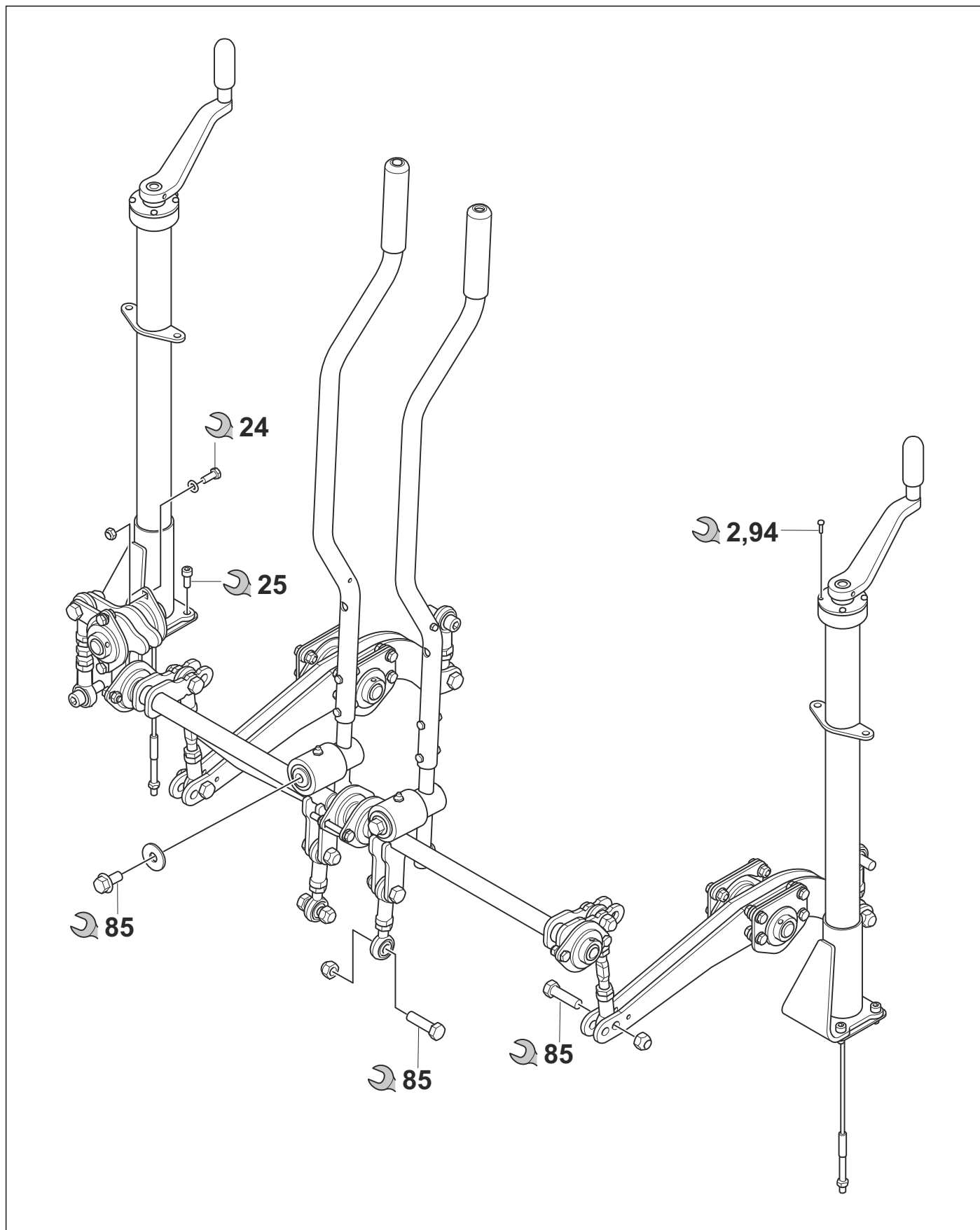
4.6 Tightening torques frame seats and panel - lower



4.7 Tightening torques spider and blades



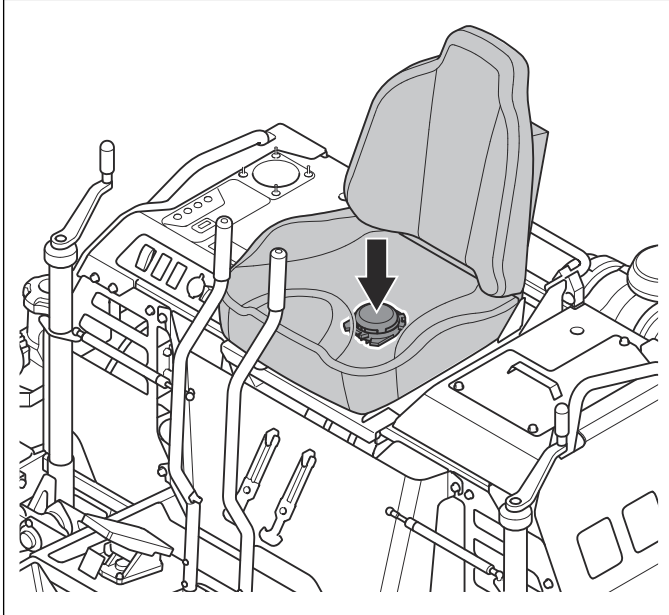
4.8 Tightening torques steering



5 Troubleshooting

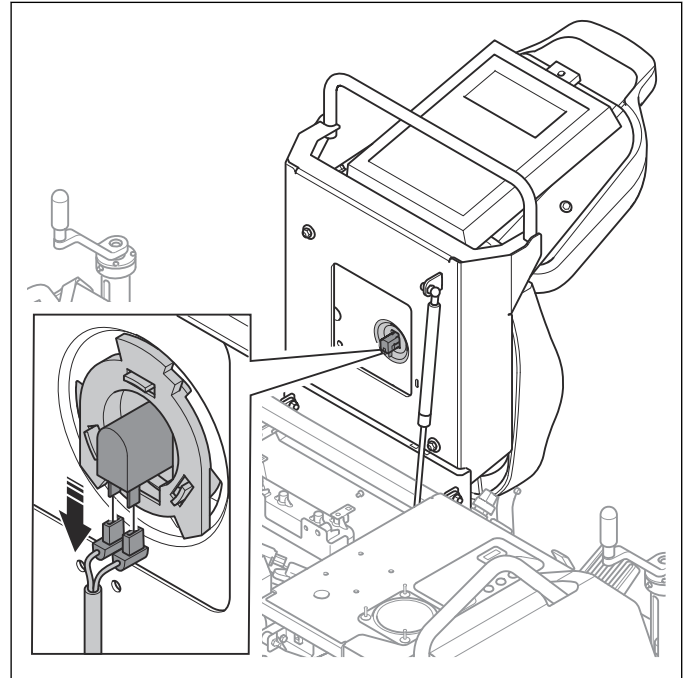
5.1 Operator presence control

The switch for the operator presence control lets the product operate when the circuit through the coil (terminals 85 and 86) is closed. When an operator is in the seat, the switch is closed. The product can then be operated.

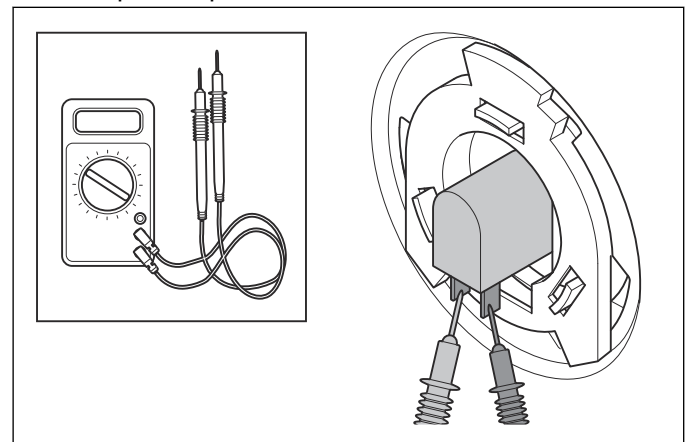


5.1.1 To do a check of the operator presence control

1. Disconnect the wires for the switch for the operator presence control.



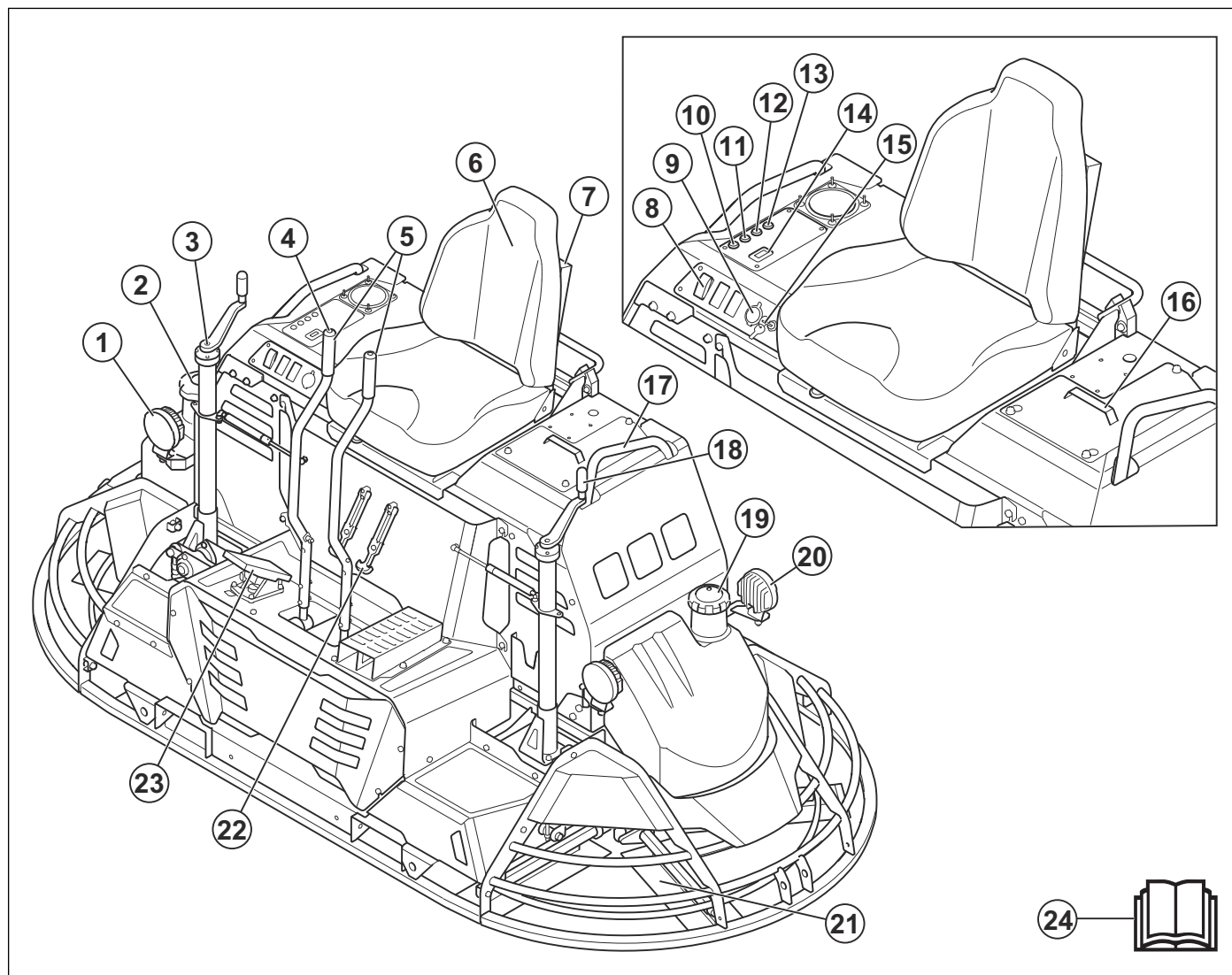
2. Connect a multimeter to the wires from the switch for the operator presence control.



The circuit must be closed when the switch for the operator presence control is closed. The circuit must be open when the switch for the operator presence control is opened.

6 Repair and servicing

6.1 Product overview



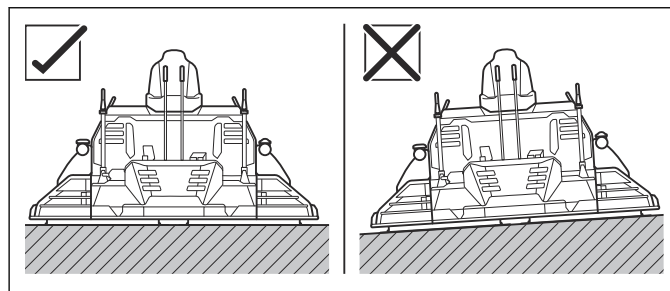
1. Front work light
2. Fuel tank cap
3. Right blade pitch control
4. Button for retardant spray control
5. Steering controls
6. Seat with operator presence control
7. Pocket for the operator's manual
8. Work light switch
9. USB charger outlet
10. Low oil pressure indicator
11. High coolant temperature indicator
12. Low voltage indicator
13. Engine check indicator
14. Hour meter
15. Ignition key
16. Service hatch
17. Lifting point, 1 on each side
18. Left blade pitch control
19. Water and retardant tank cap
20. Rear work light
21. Blade

22. Rubber straps, to lock the steering controls during transportation
23. Throttle control, foot pedal
24. Operator's manual

6.2 To remove the gearboxes

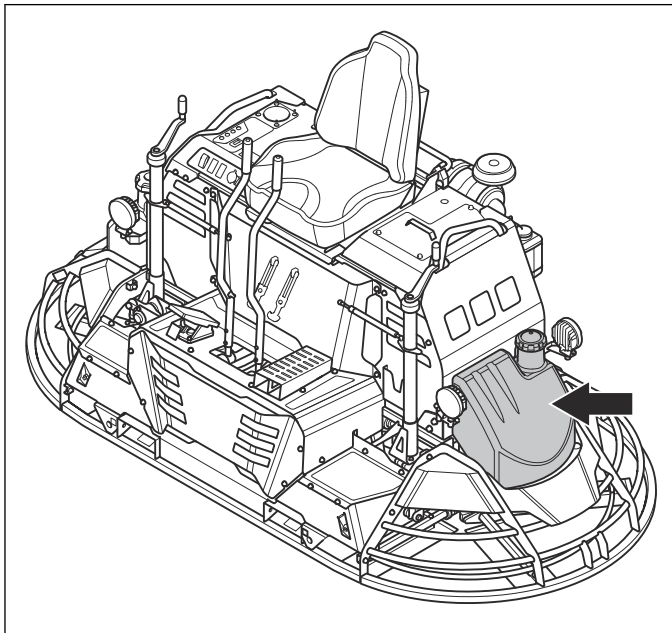
To lift the product, use a lifting equipment with capacity of minimum 648 kg/1428 lbs.

1. Put the product on a flat, level surface with the blades flat.

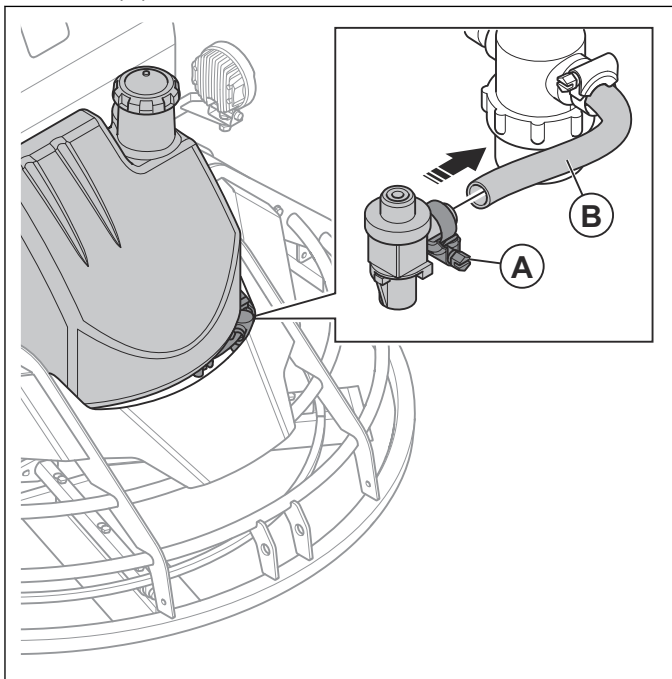


2. Stop the engine and disconnect the battery.

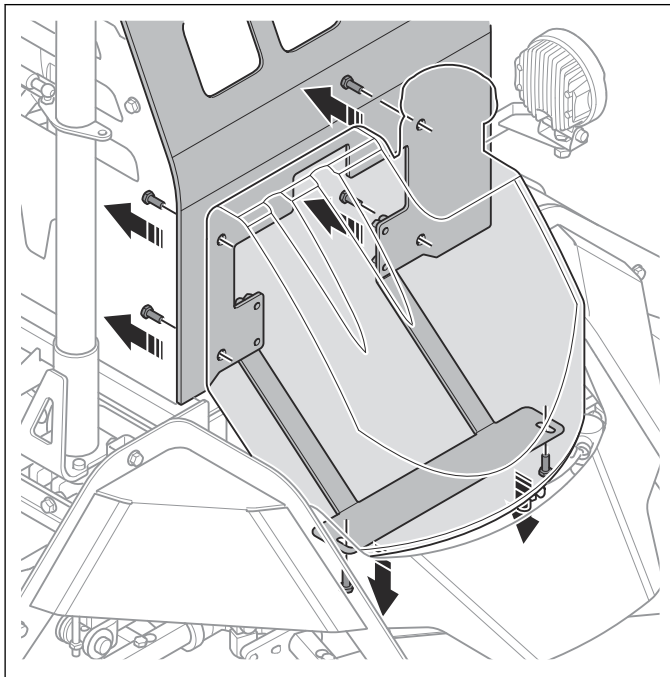
3. Drain the water tank.



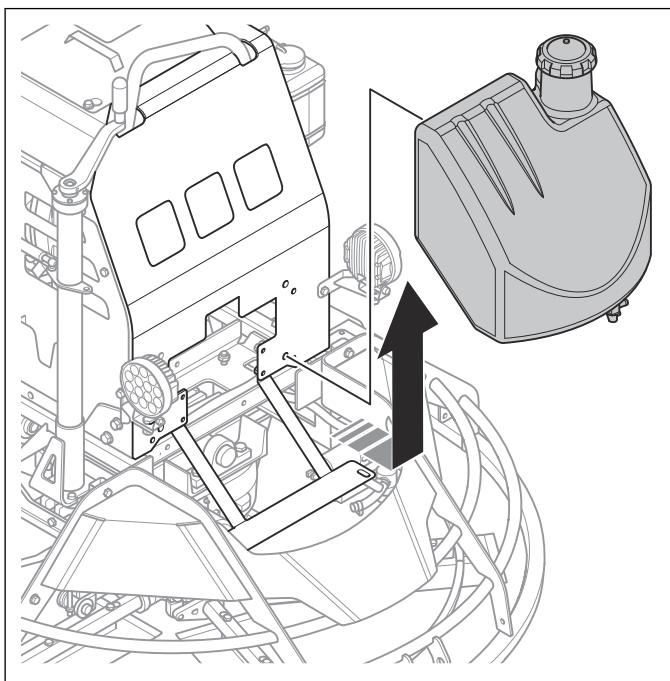
4. Loosen the hose clamp (A) and disconnect the water hose (B).



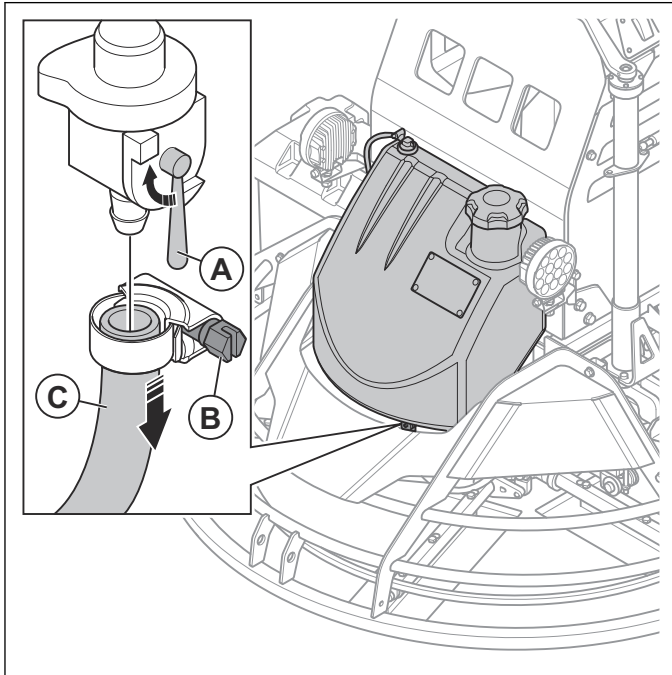
5. Remove the 6 screws for the water tank.



6. Remove the water tank.

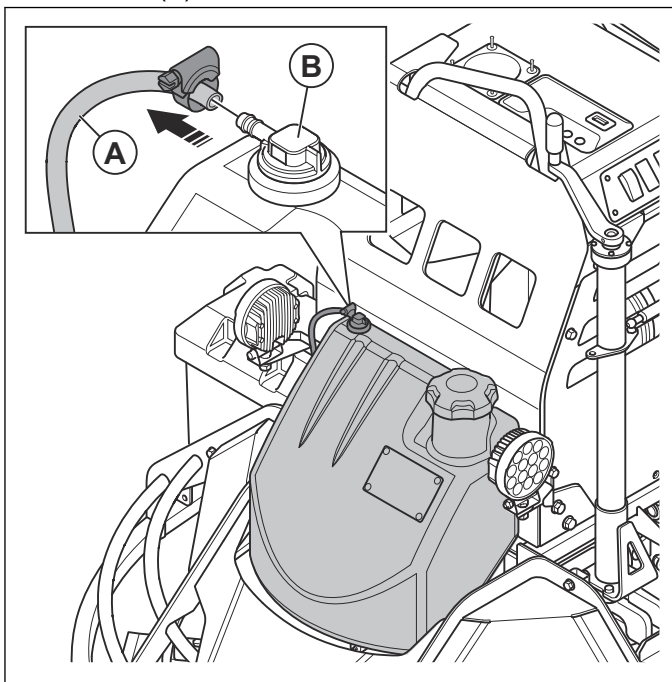


7. Turn the fuel lever (A) to close the fuel valve.

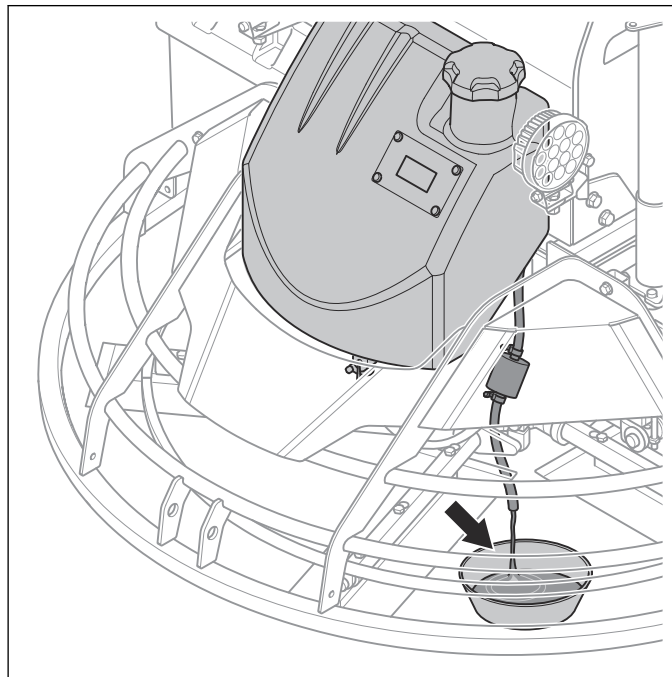


8. Loosen the hose clamp (B) and disconnect the fuel hose (C).

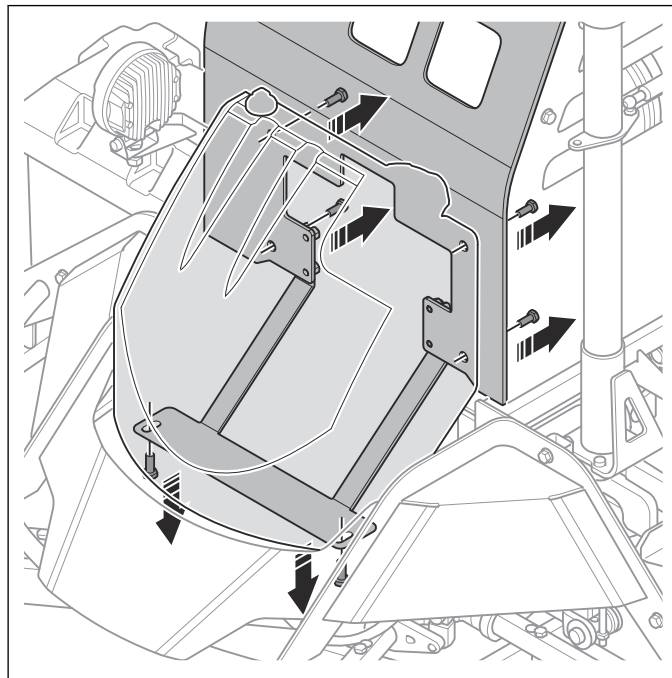
9. Remove the hose (A) for the ventilation valve of the fuel tank (B).



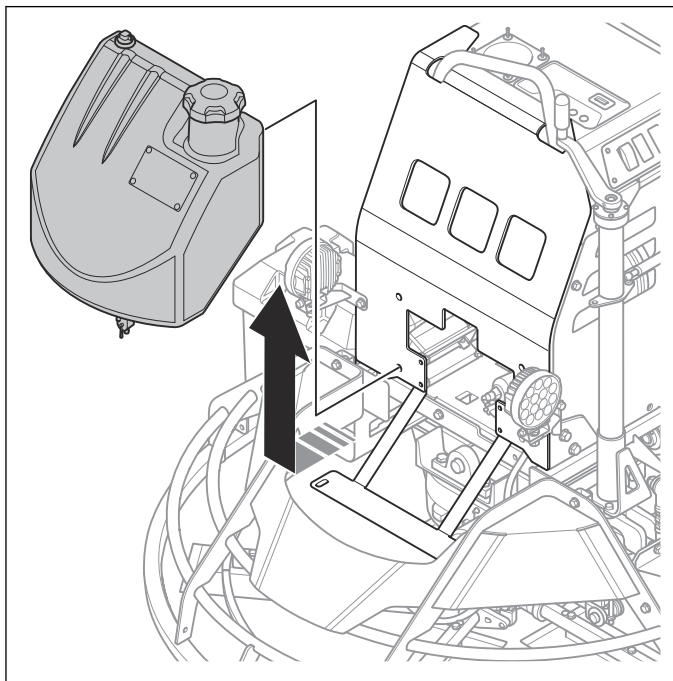
10. Put the remaining fuel from the fuel hose into a container.



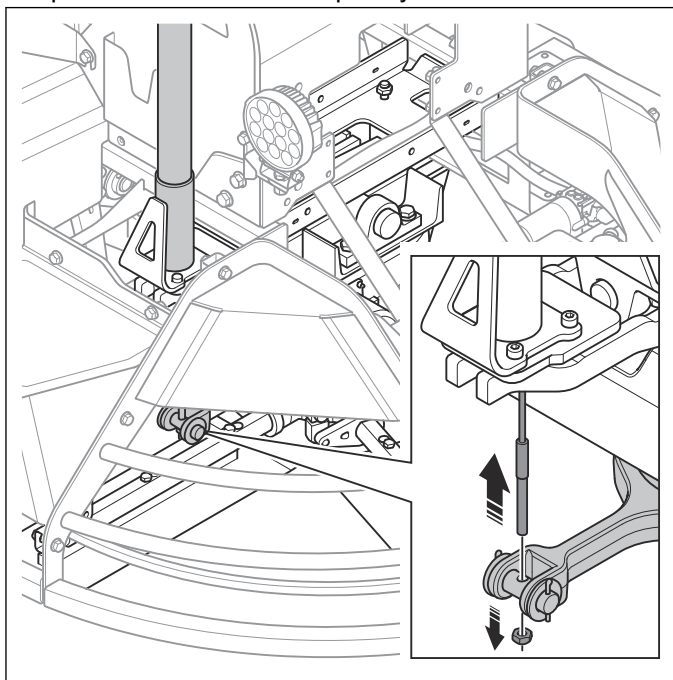
11. Remove the 6 screws for the fuel tank.



12. Remove the fuel tank.

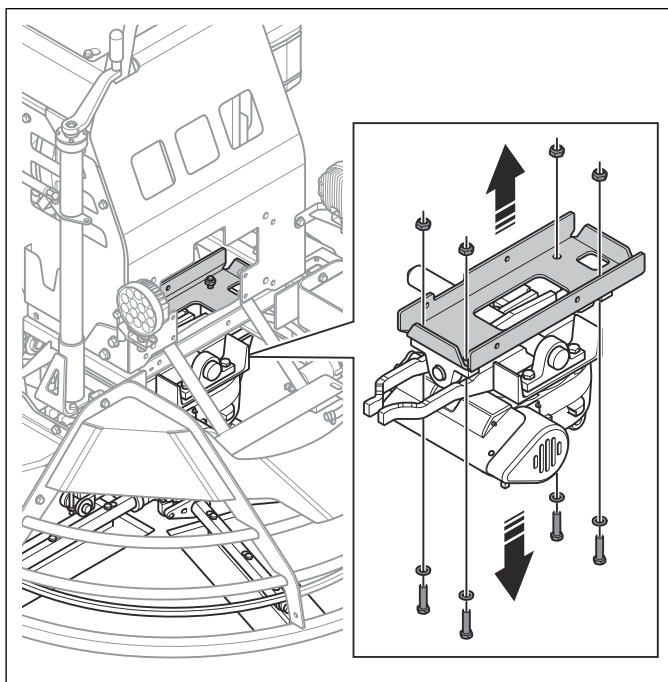


13. Remove the nut from each pitch cable and pull the pitch cable out from the pitch yoke.

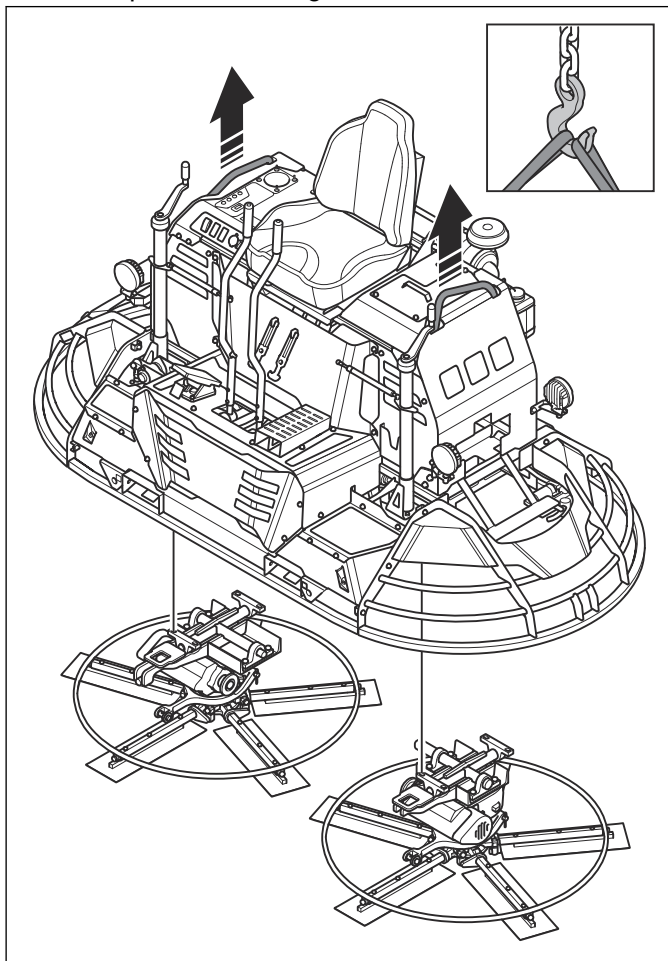


14. Disconnect the universal joints from the gearbox flanges.

15. Remove the bolts, the washers and the nuts for the bearings flanges on the lever couplings on each side.



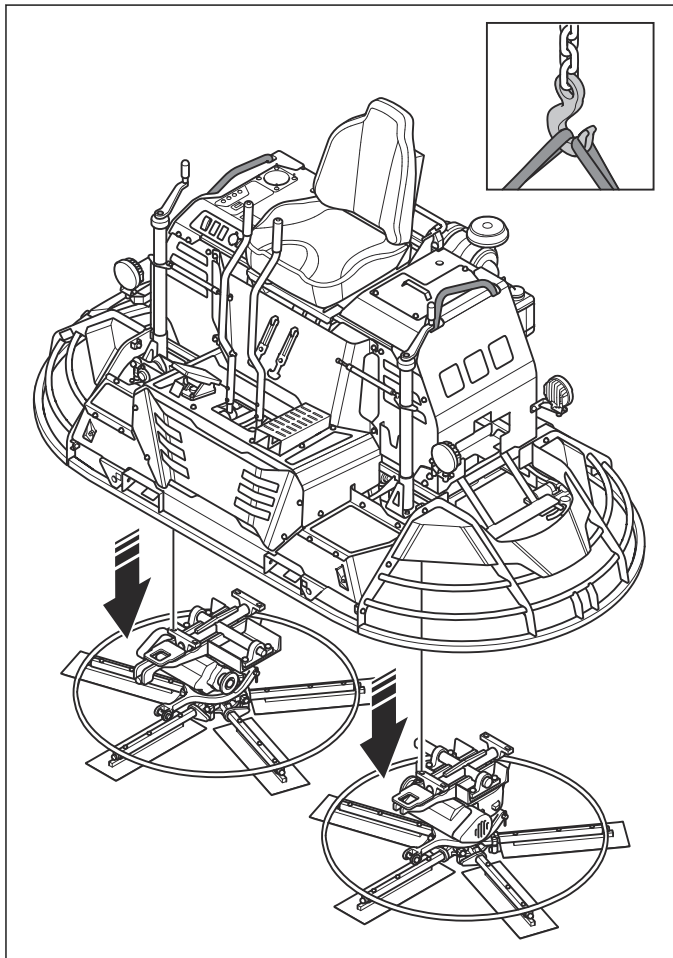
16. Attach the lifting equipment to the lifting points and lift the product off the gearboxes.



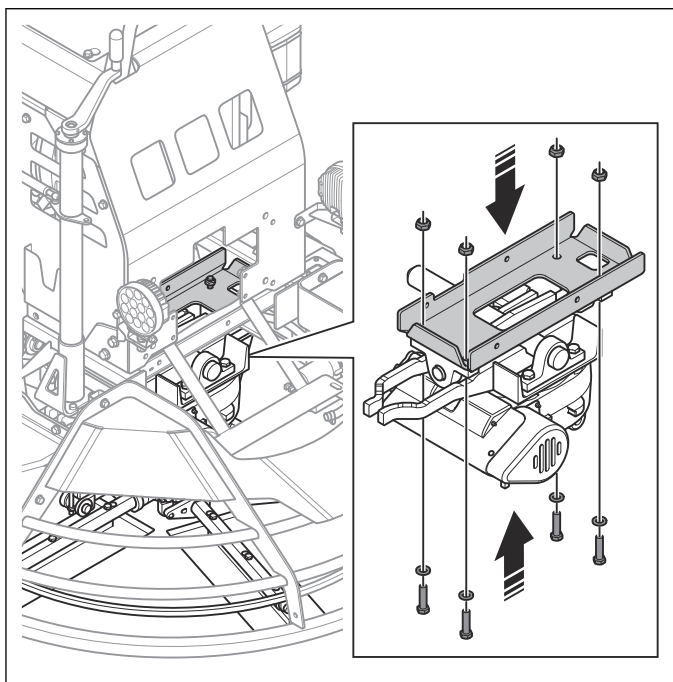
CAUTION: The product can be not balanced when you lift it. Let a bystander help you when you lift the product.

6.3 To install the gearboxes

1. Use the lifting equipment to lower the product above the gearbox, the pulley assembly and the drive belt guard.

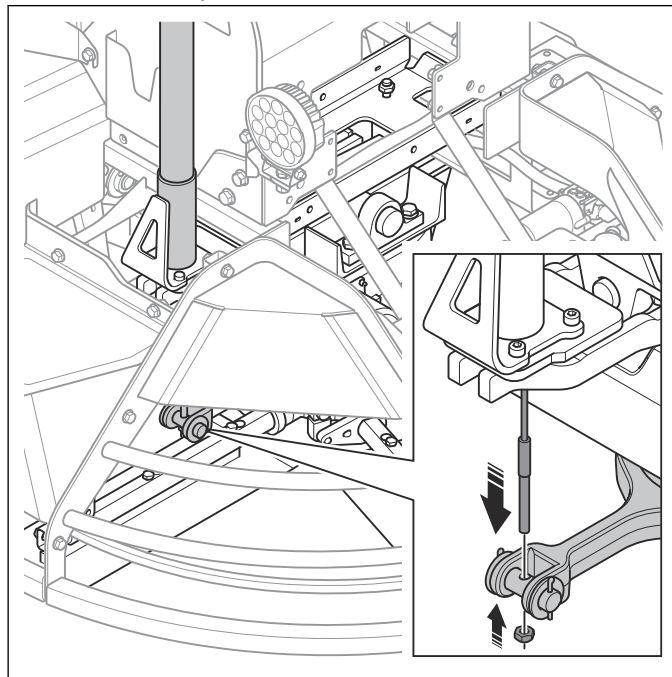


2. Align the bolts holes with the bearing flanges on the lever couplings. Install the bolts, the washes and the nuts.

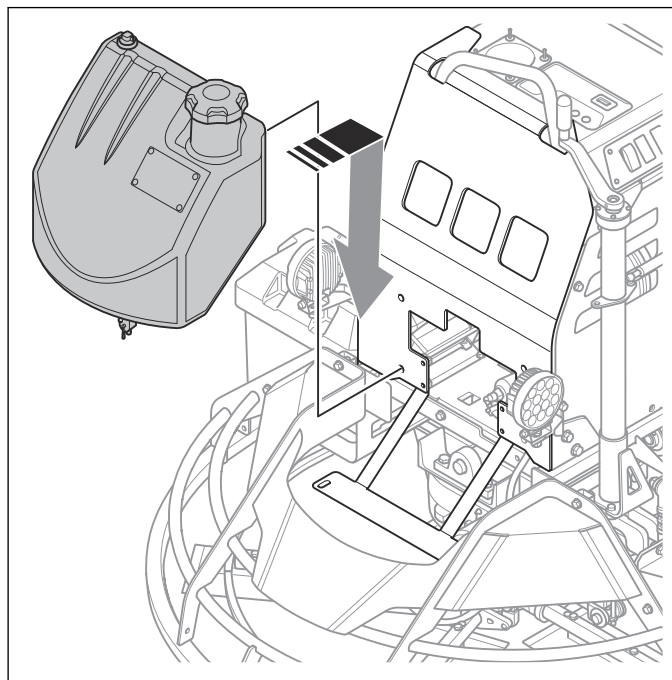


3. Connect the universal joints to the gearbox flanges.

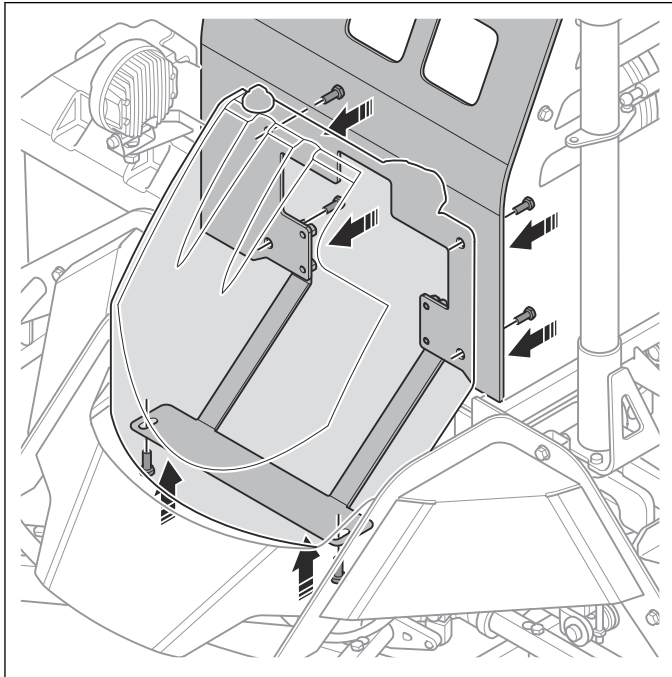
4. Install the pitch cable to pitch yoke and tighten the nut on each pitch.



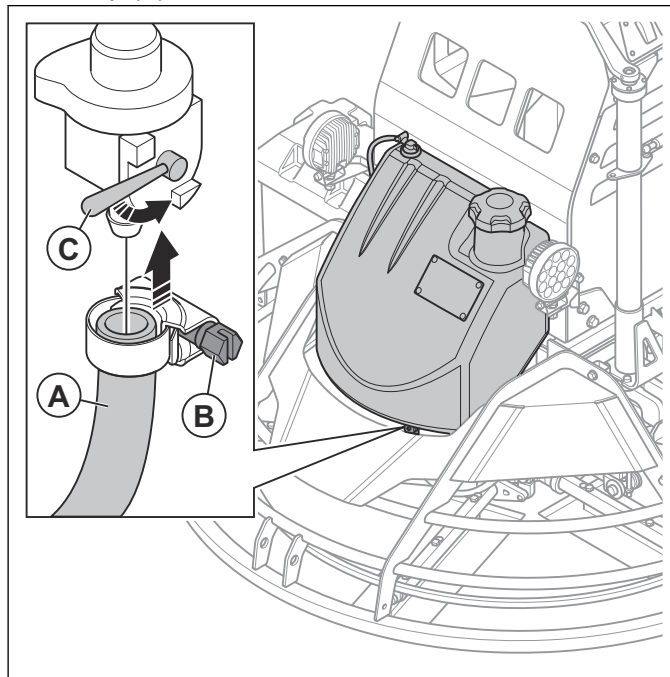
5. Install the fuel tank.



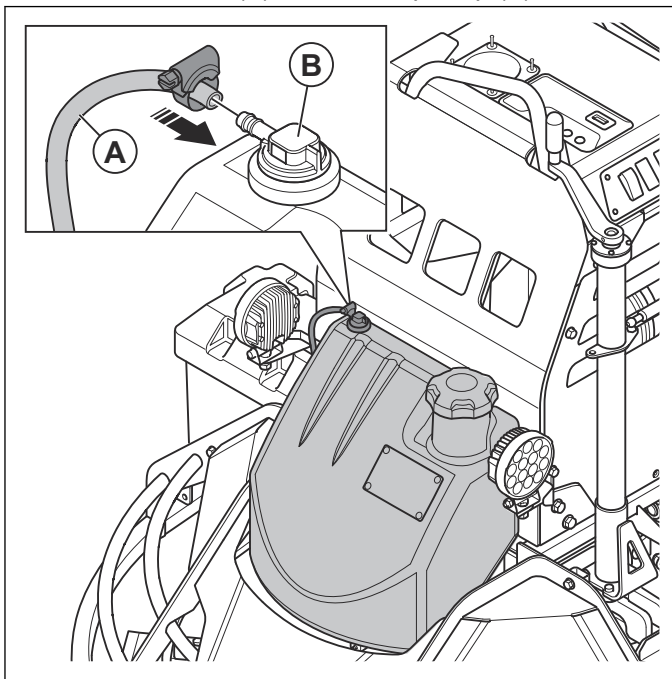
6. Tighten the 6 screws for the fuel tank.



8. Connect the fuel hose (A) and tighten the hose clamp (B).

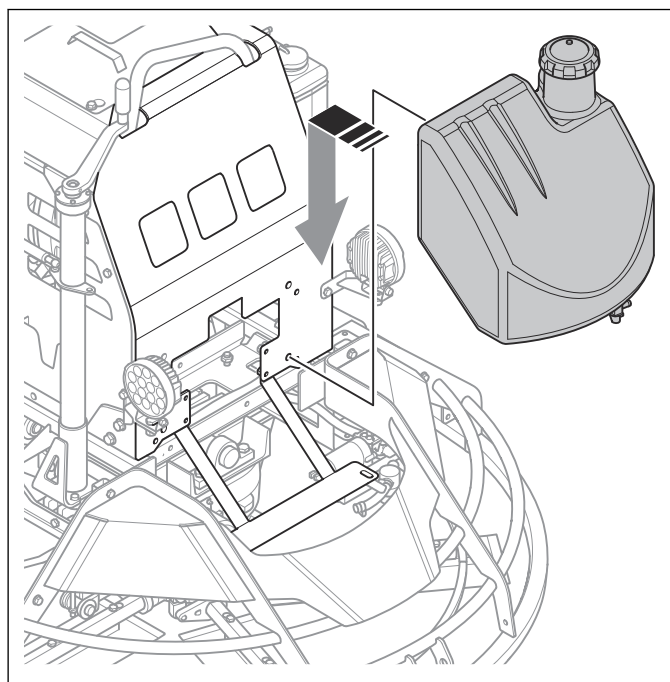


7. Install the hose (A) for the fuel pickup (B).

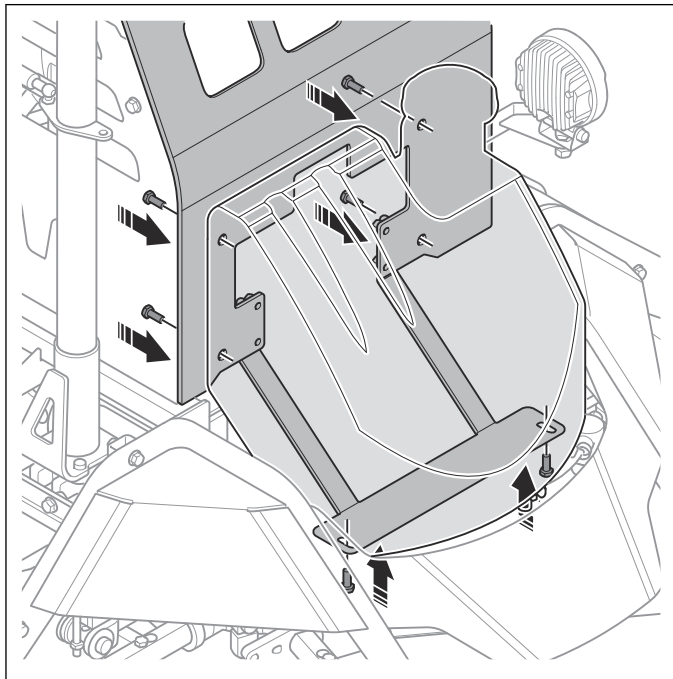


9. Turn the fuel valve (C) to open the fuel valve

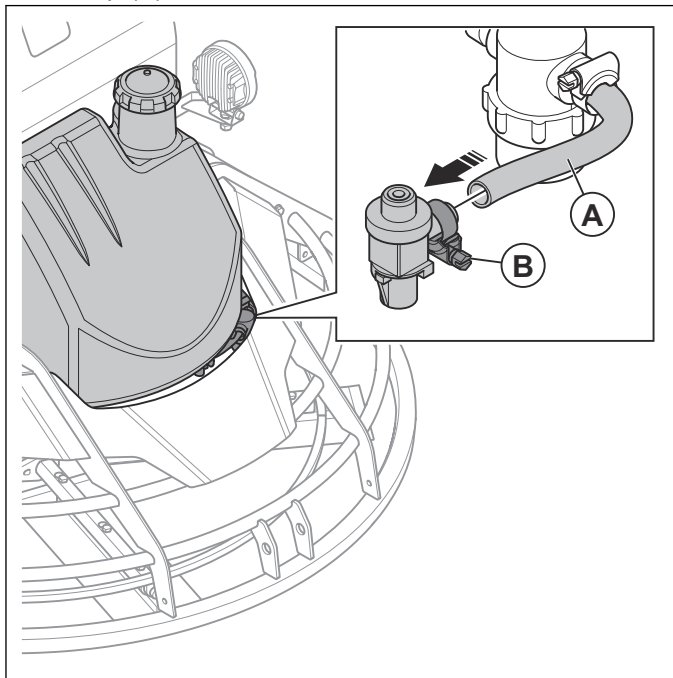
10. Install the water tank.



11. Tighten the 6 screws for the water tank.



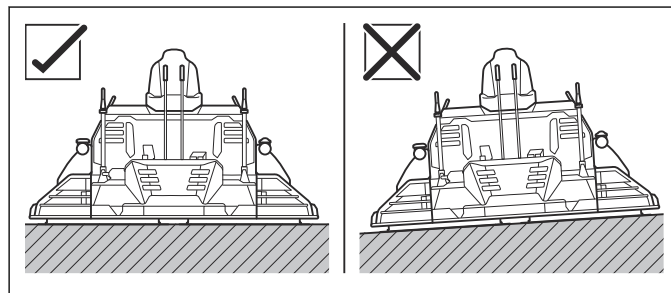
12. Connect the water hose (A) and tighten the hose clamp (B).



13. Fill the water tank.

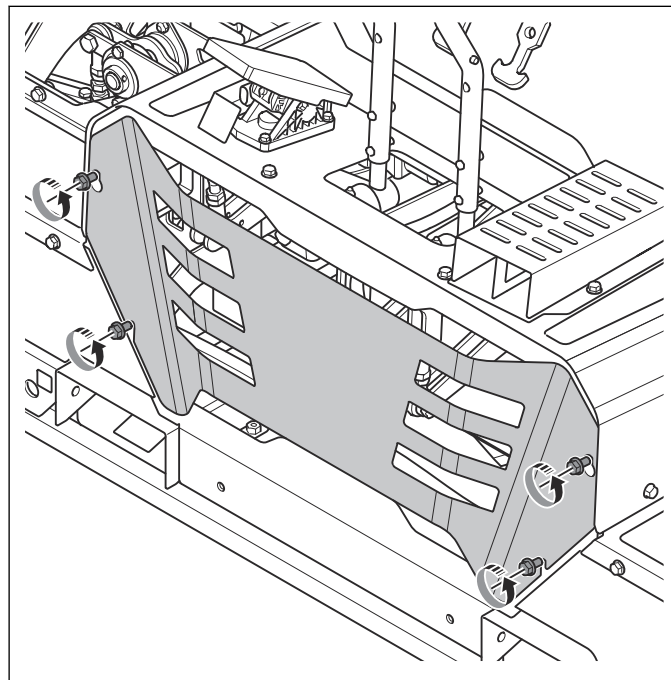
6.4 To disassemble the drive system

1. Put the product on a flat, level surface with the blades flat.

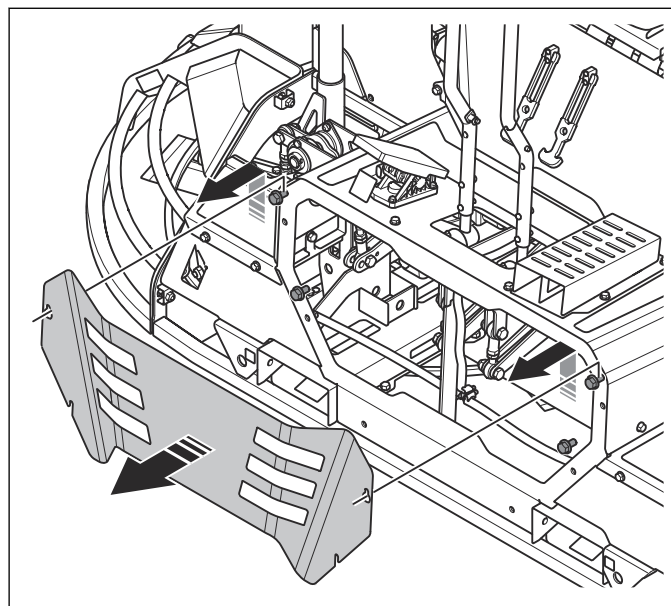


2. Stop the engine and disconnect the battery.

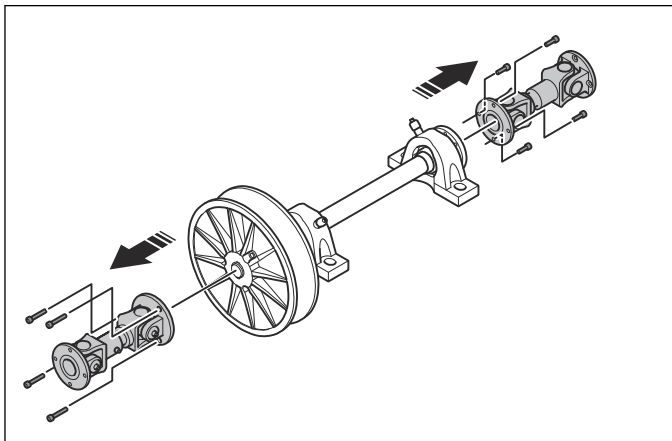
3. Loosen the 4 screws on the front cover.



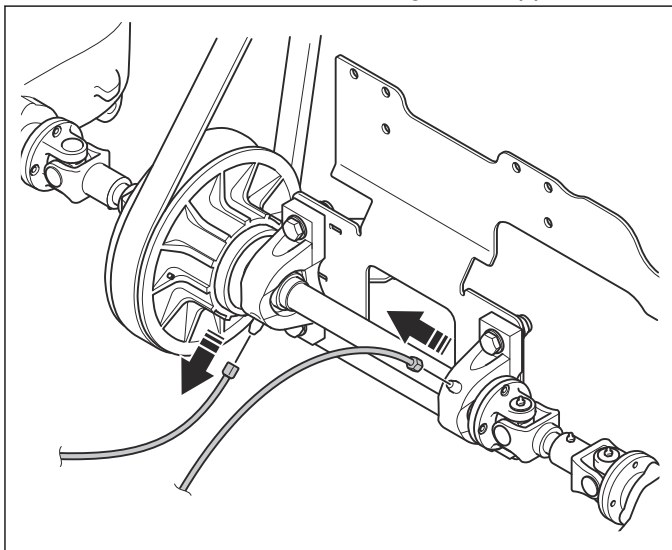
4. Remove the front cover.



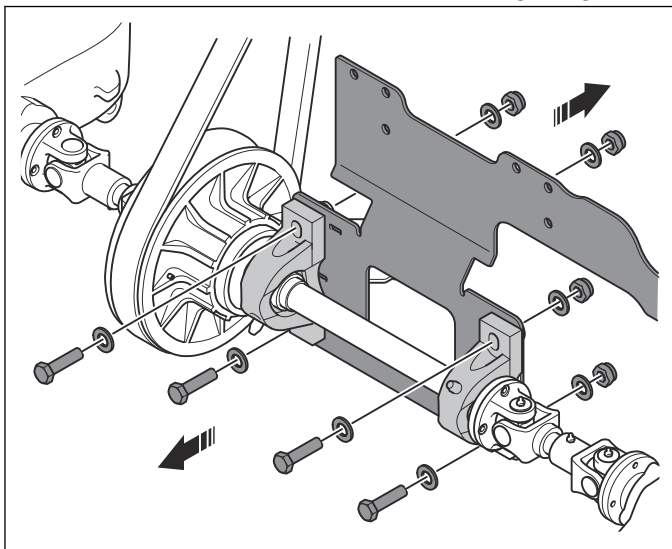
5. Remove the 8 screws that hold the universal joints to the shaft.



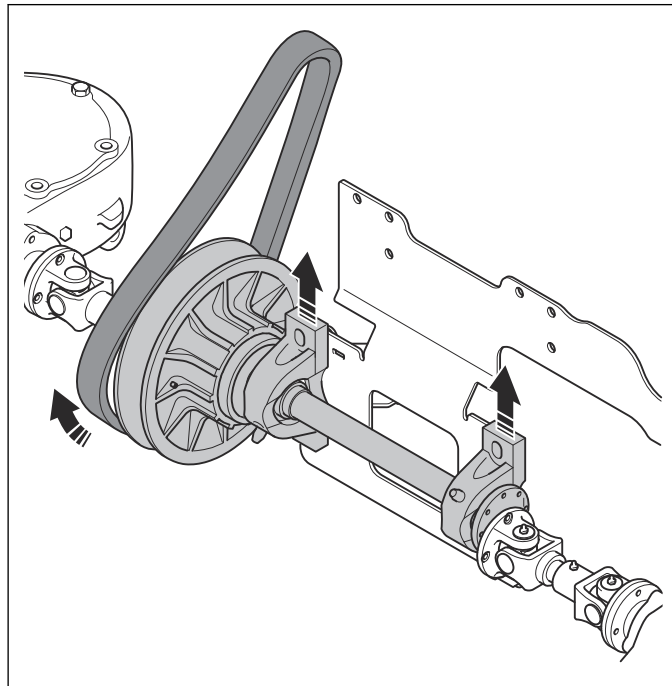
6. Disconnect the 2 hoses at the grease nipples.



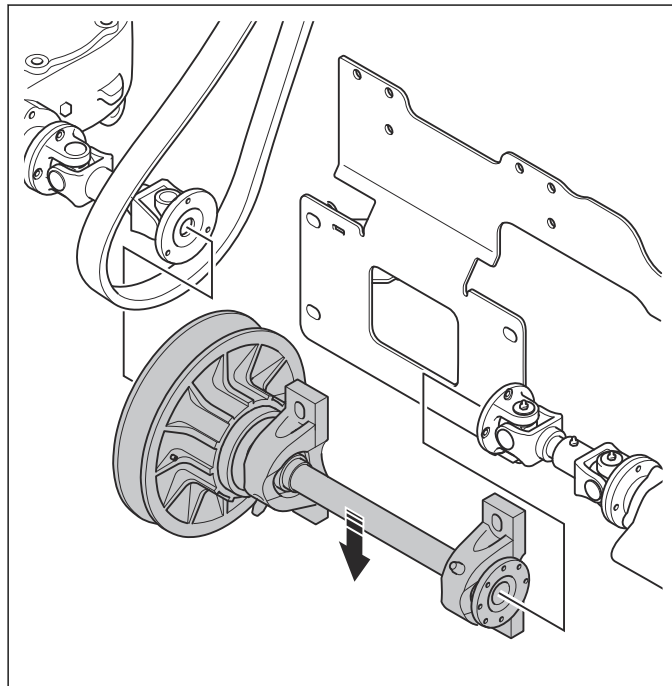
7. Remove the 4 screws from each bearing flange.



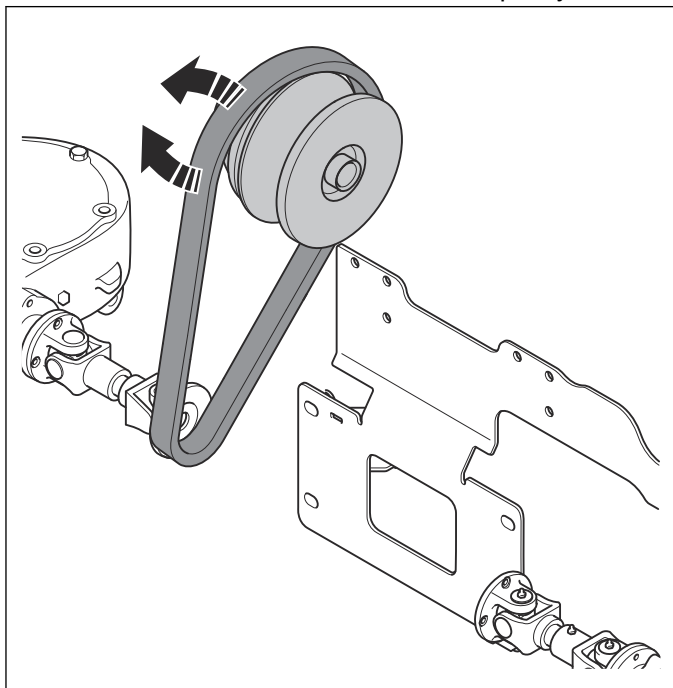
8. Lift the pulley assembly and remove the drive belt.



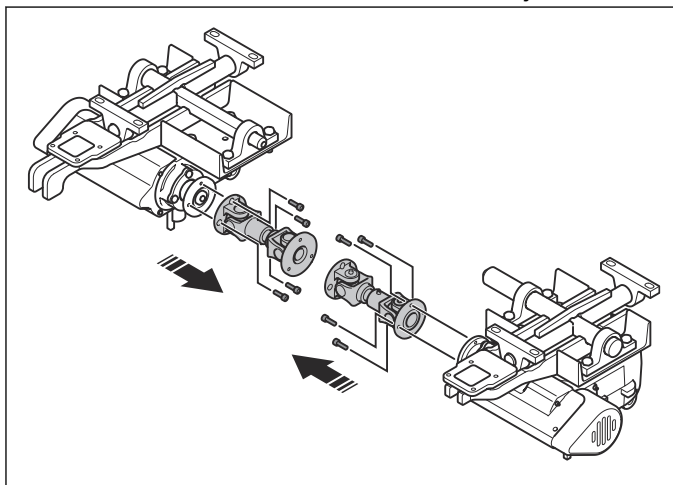
9. Remove the pulley assembly.



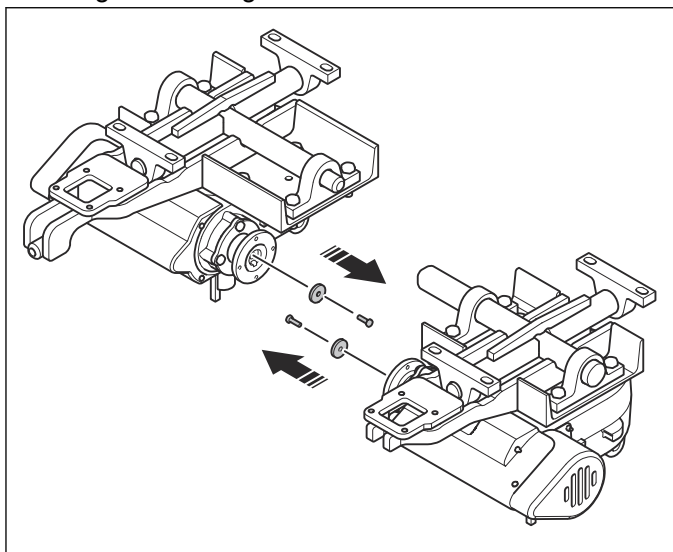
10. Remove the drive belt from the clutch pulley.



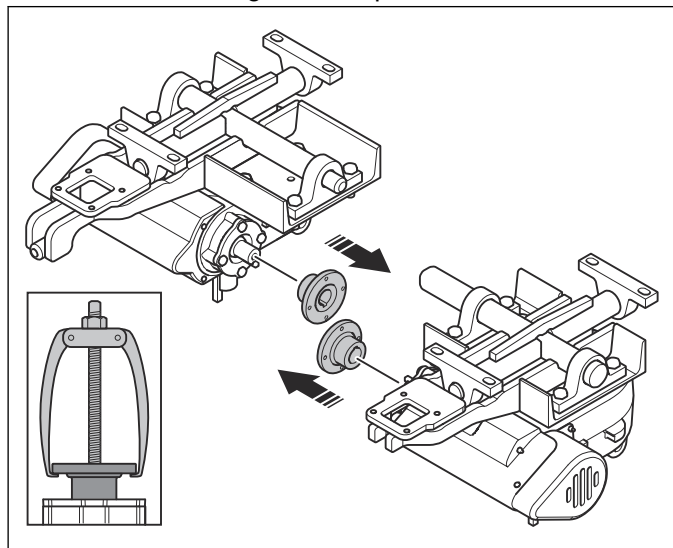
11. Remove the 8 screws and the universal joints.



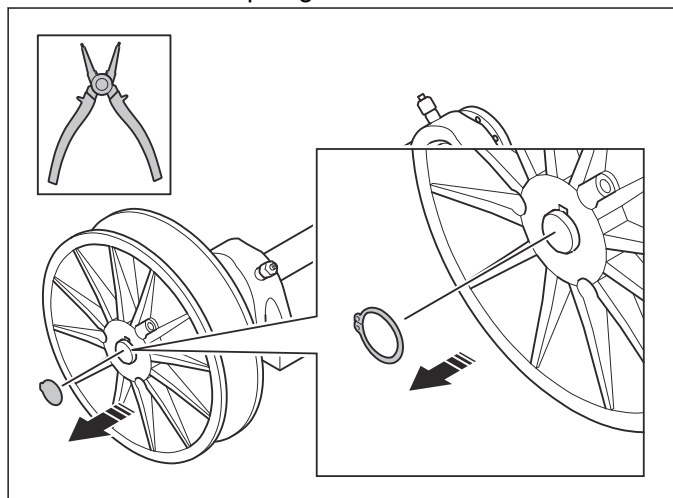
12. Remove the 2 center bolts and the 2 washers from the gearbox flanges.



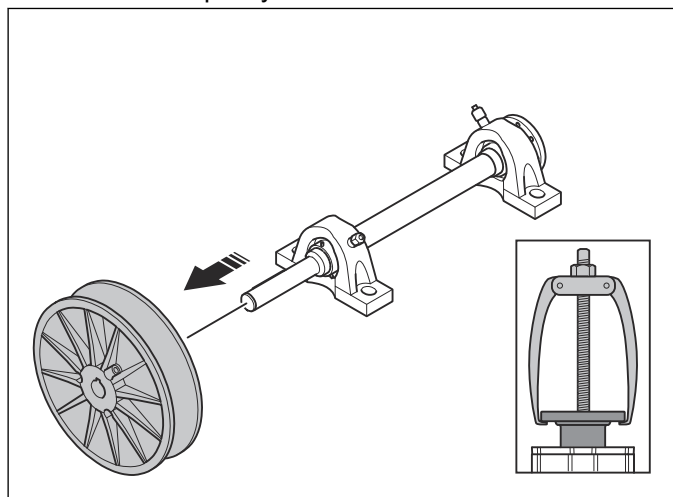
13. Remove the flanges with a puller.



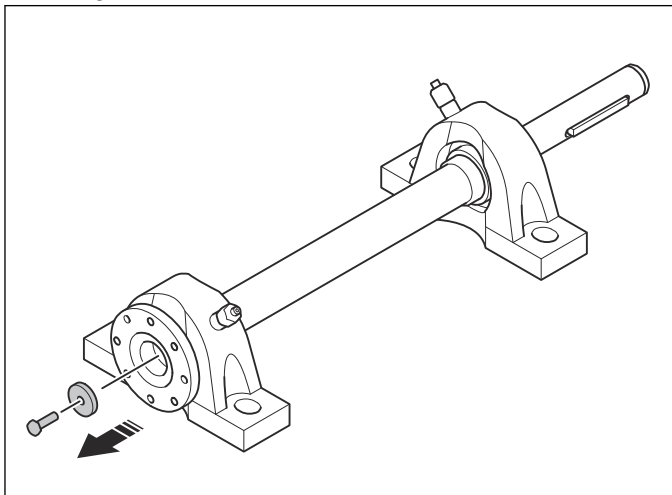
14. Remove the snap ring.



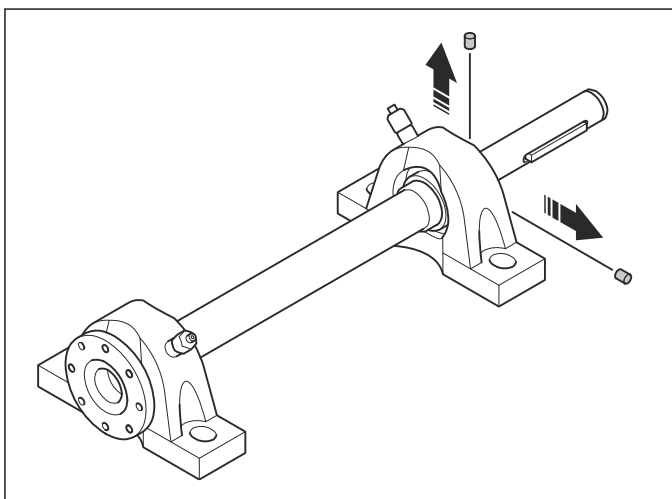
15. Remove the pulley wheel from the shaft.



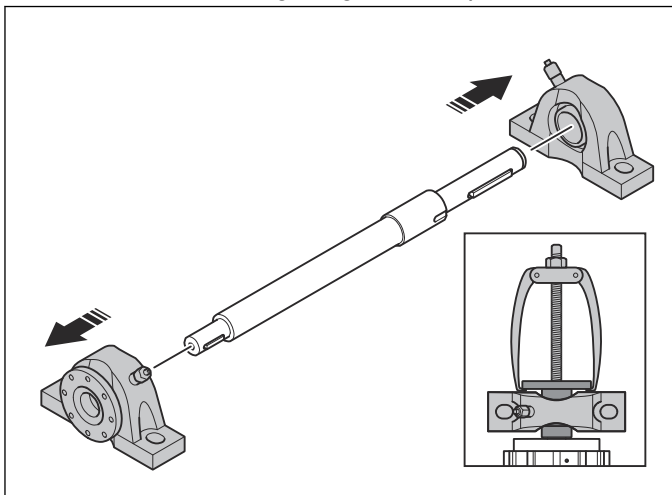
16. Remove the center bolt and washer from the shaft flange.



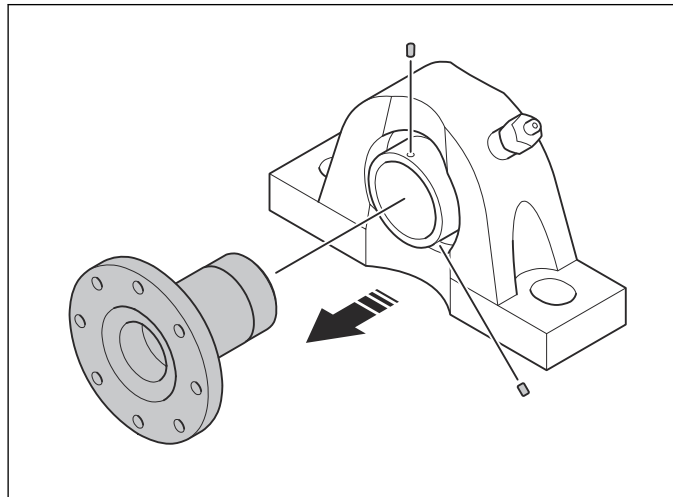
17. Remove the screws from the shaft.



18. Remove the bearing flanges with a puller.

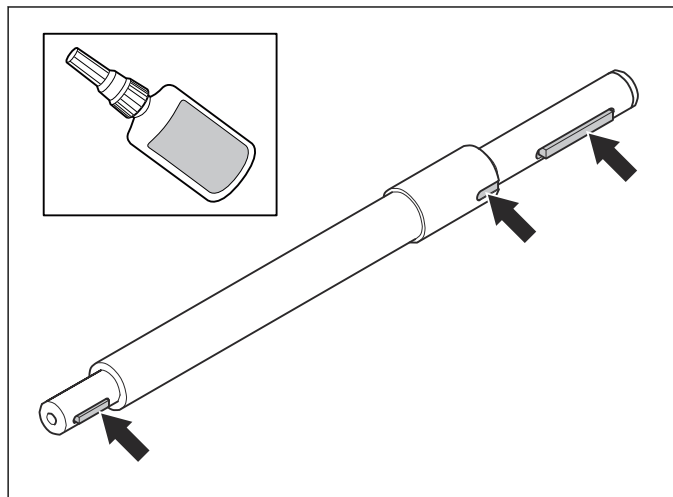


19. Remove the set screws and remove the shaft flange.

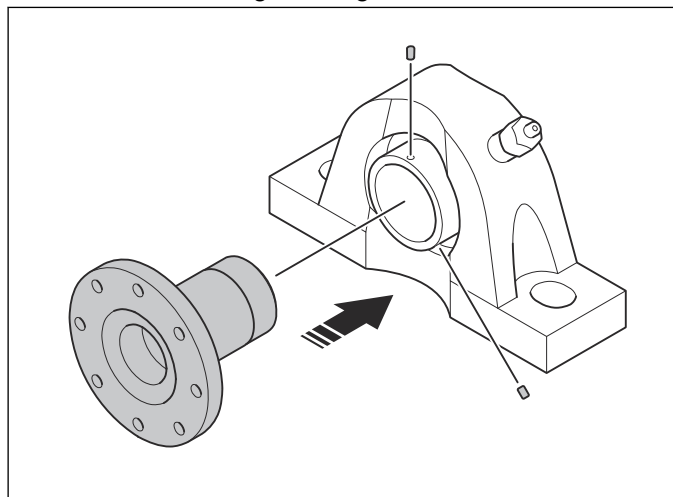


6.5 To assemble the drive system

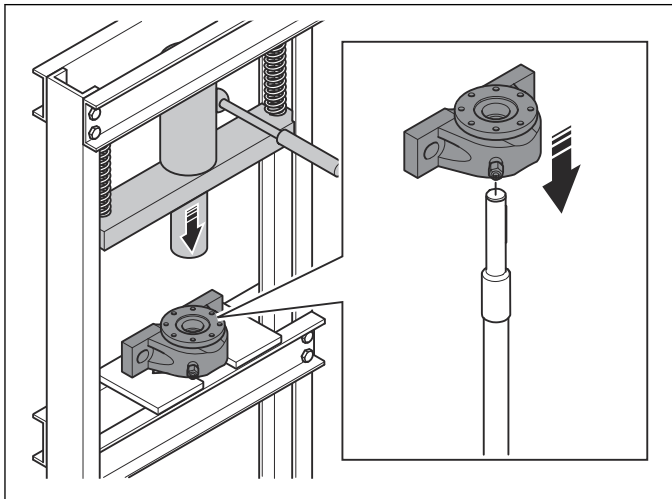
1. Put anti-seize compound to the 3 areas of the drive shaft.



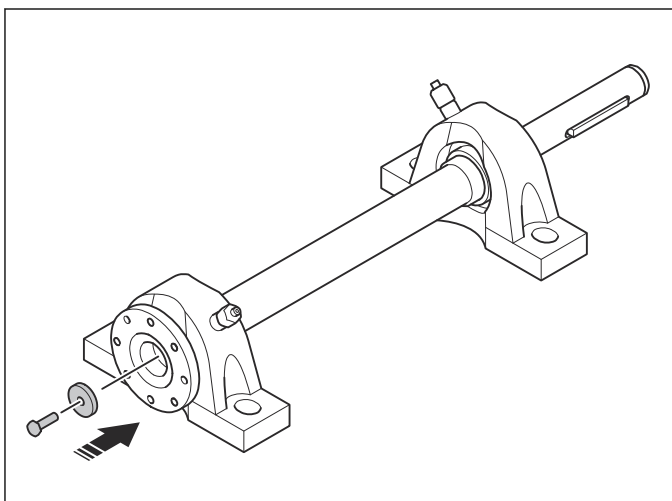
2. Put the shaft flange and tighten the set screws.



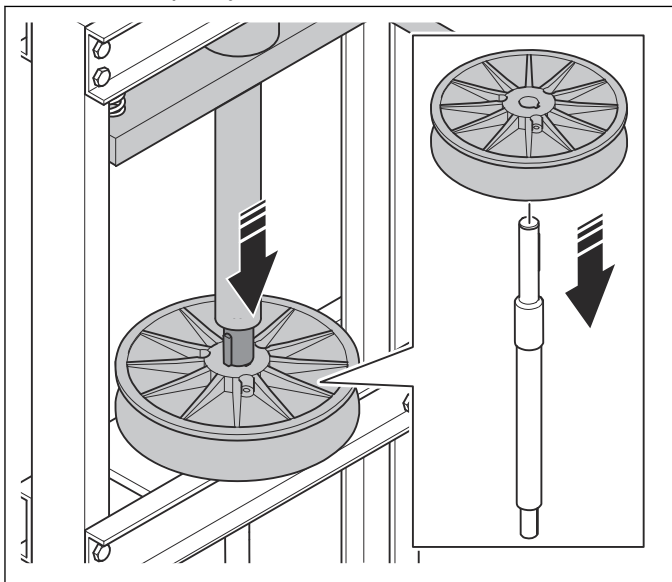
3. Install the bearings and shaft flanges with a press.



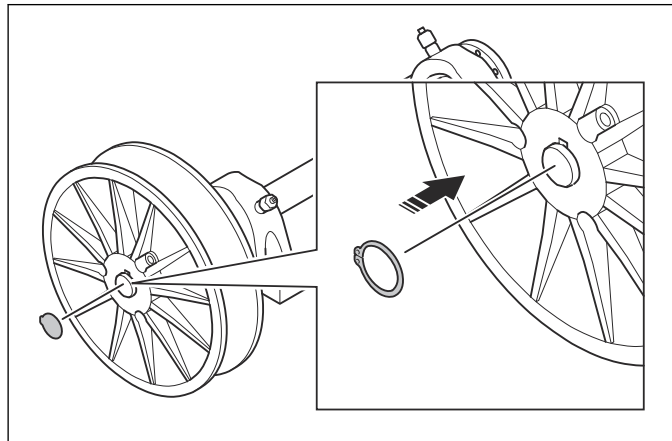
4. Install the washer and the center bolt.



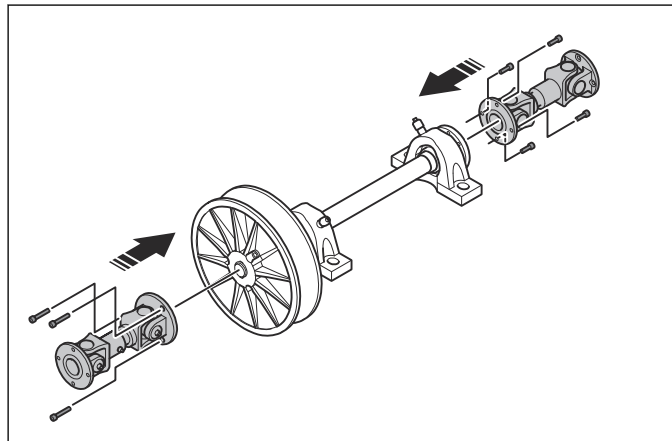
5. Install the pulley wheel.



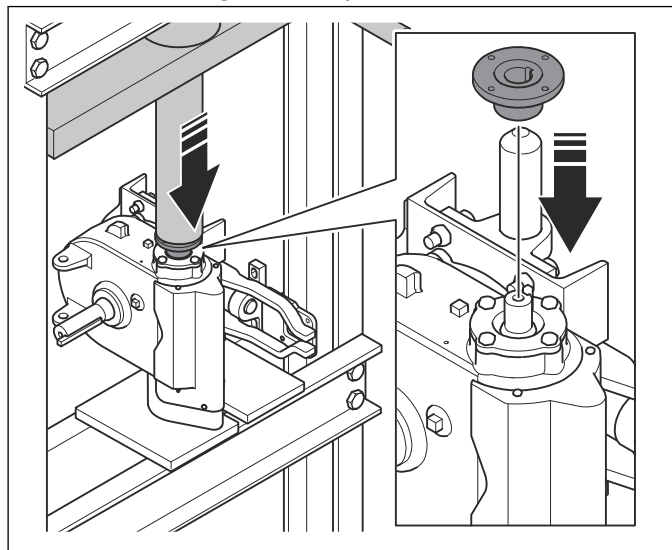
6. Install the snap ring.



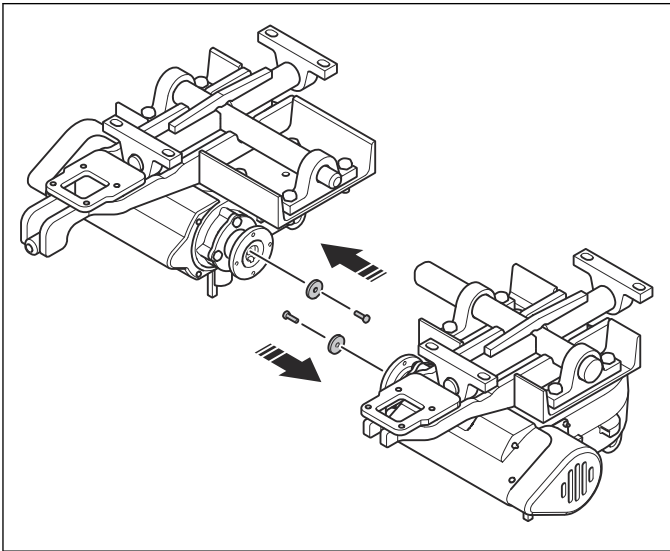
7. Install the universal joints.



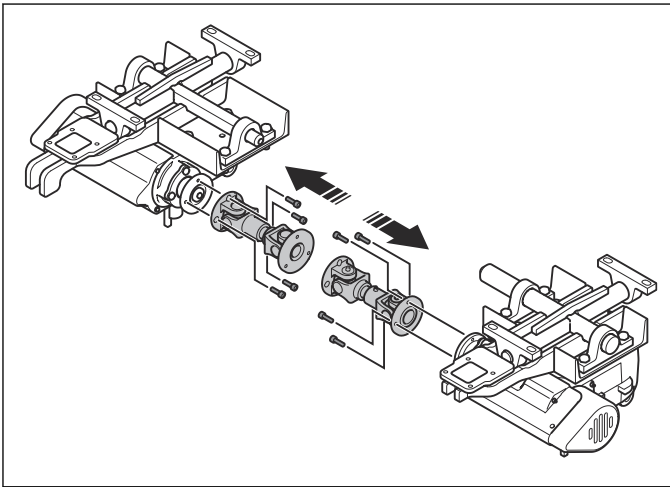
8. Install the flanges with a press.



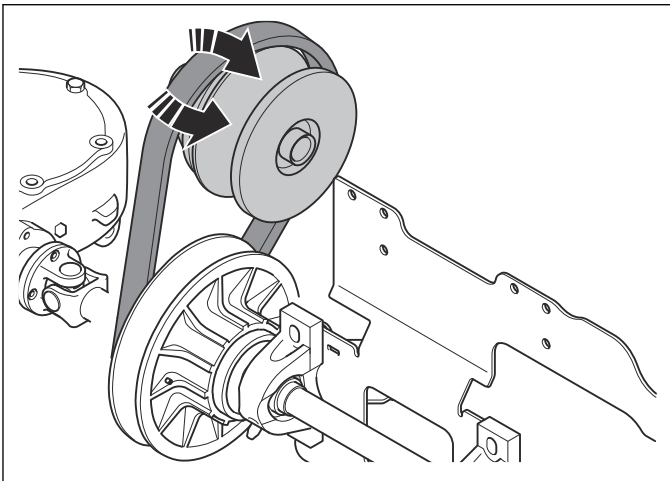
9. Install the 2 washers and the 2 center bolts on the gearbox flanges.



10. Install the universal joints and tighten the 8 screws.



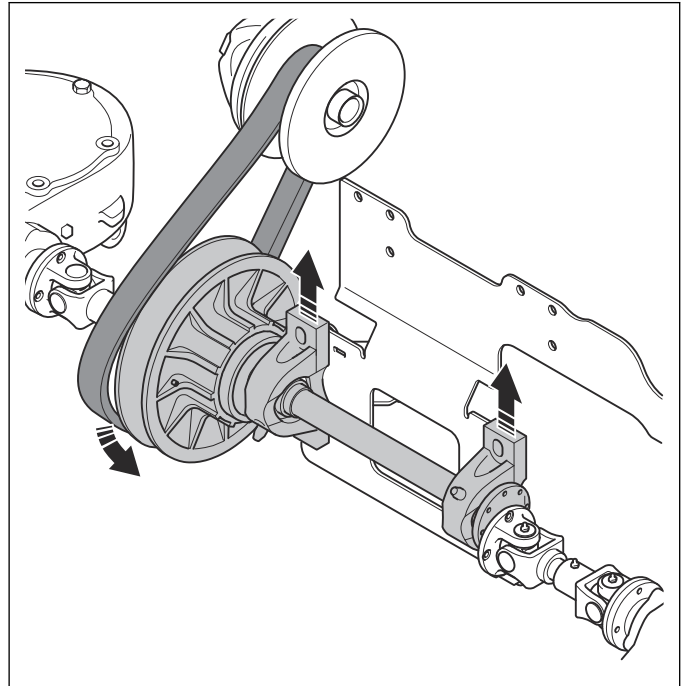
11. Install the drive belt on the clutch pulley.



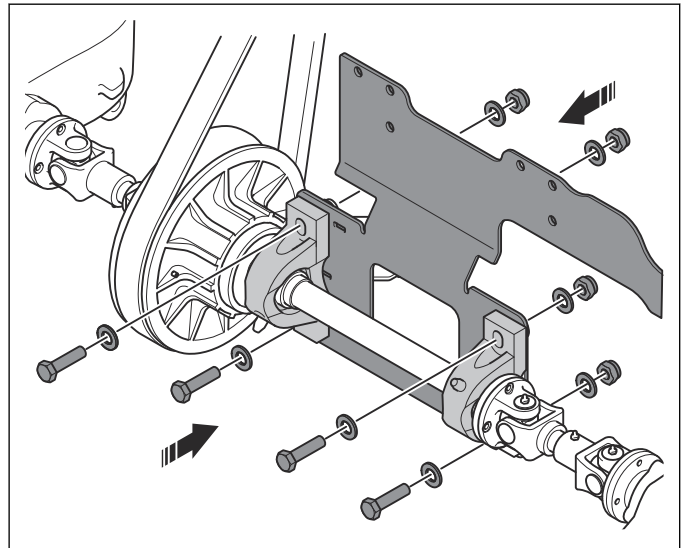
12. Install the pulley assembly, do the procedure that follows.

- a) Put the pulley assembly between the shafts.

- b) Install the drive belt.

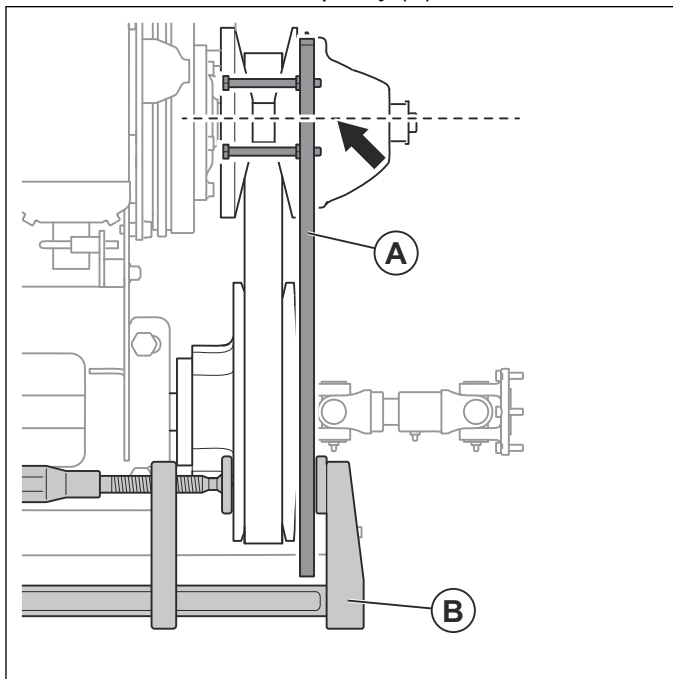


- c) Install the 4 bolts, the 4 washers and the 4 nuts to each bearing flange. Do not tighten the bolts.

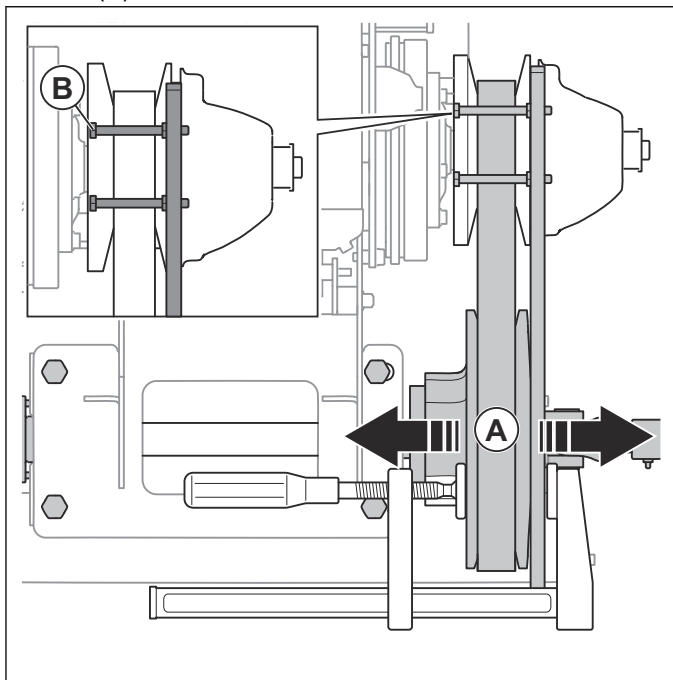


- d) Make the service tool. Refer to *Service tool assembly* on page 84.

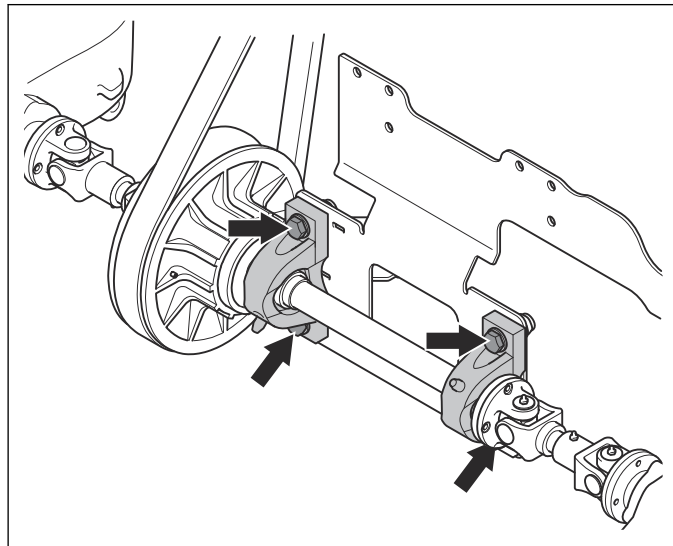
- e) Attach the service tool to the drive shaft pulley with a clamp (B). Align the middle points between the bolts of the service tool with the shaft for the clutch pulley (A).



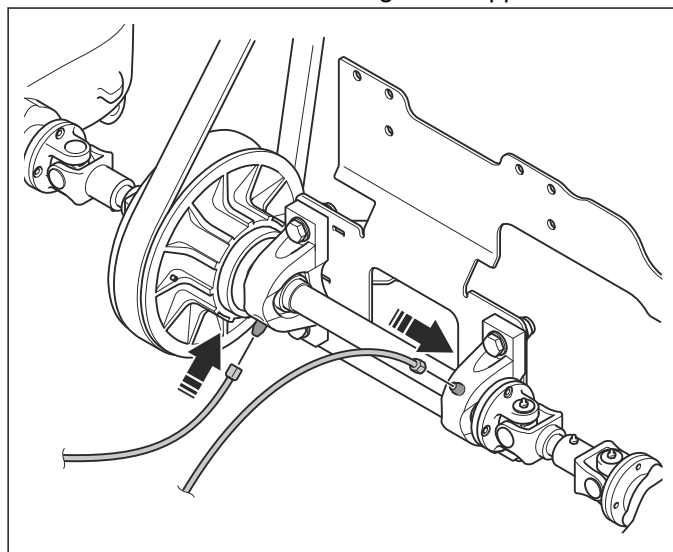
- f) Adjust the drive shaft pulley (A), align the heads of the bolts with the inner edge of the CVT pulley (B).



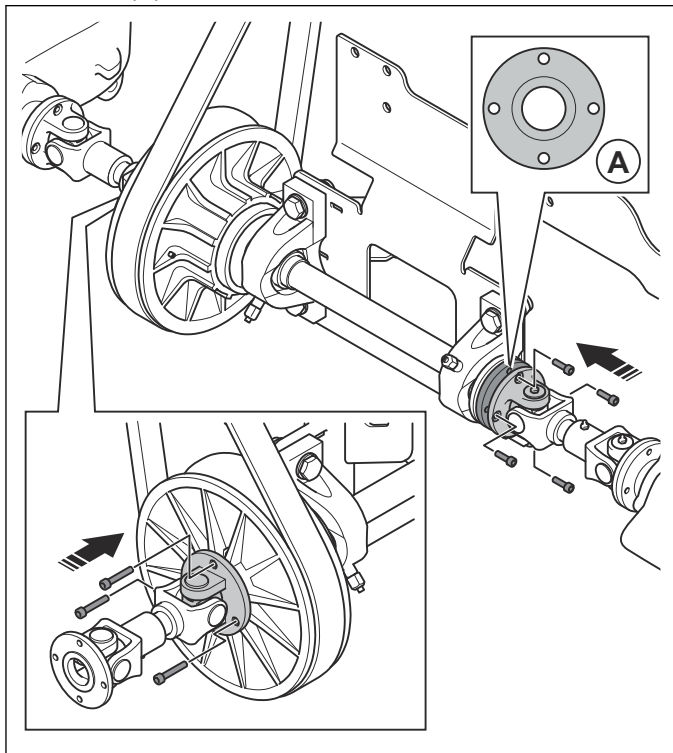
- g) Tighten the 4 bolts for each bearing flange.



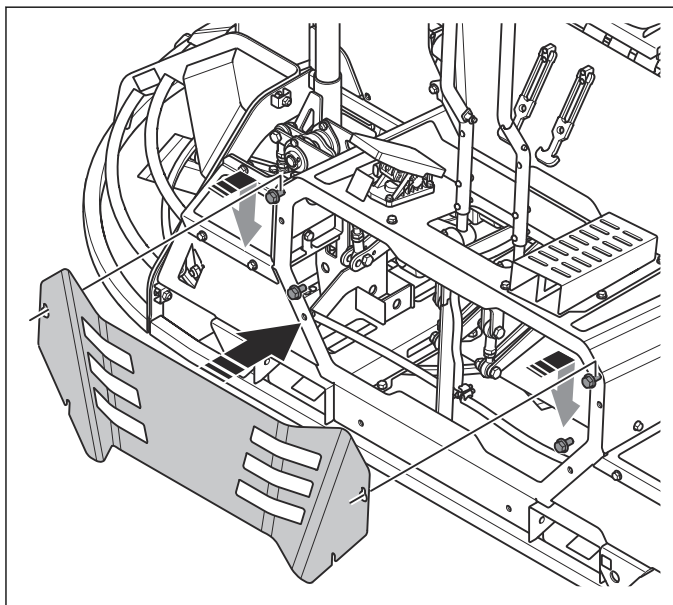
13. Connect the 2 hoses at the grease nipples.



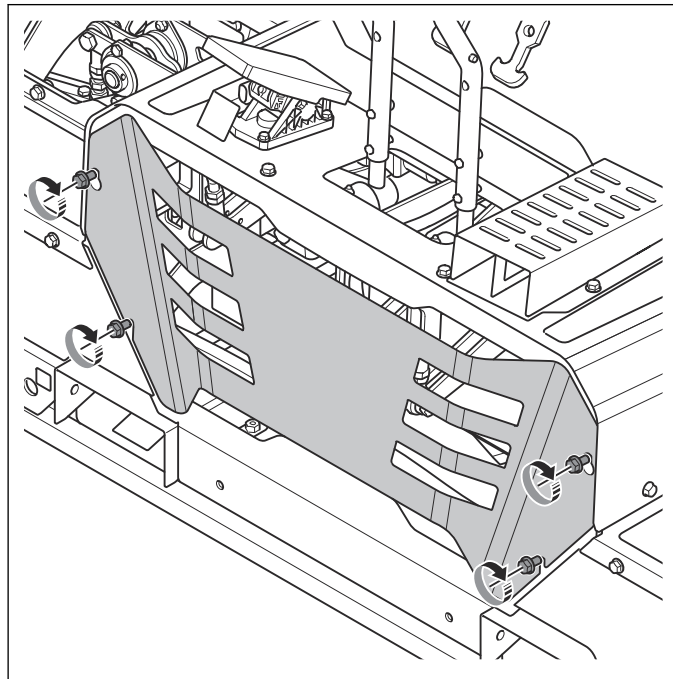
14. Install and tighten the 8 screws that hold the universal joint to the shaft. If it is necessary, use shims (A).



15. Install the front cover.

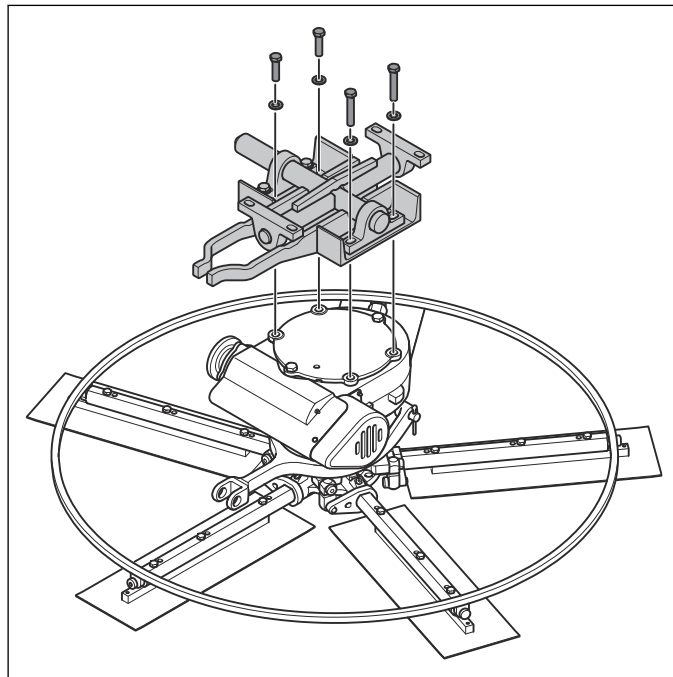


16. Tighten the 4 screws.

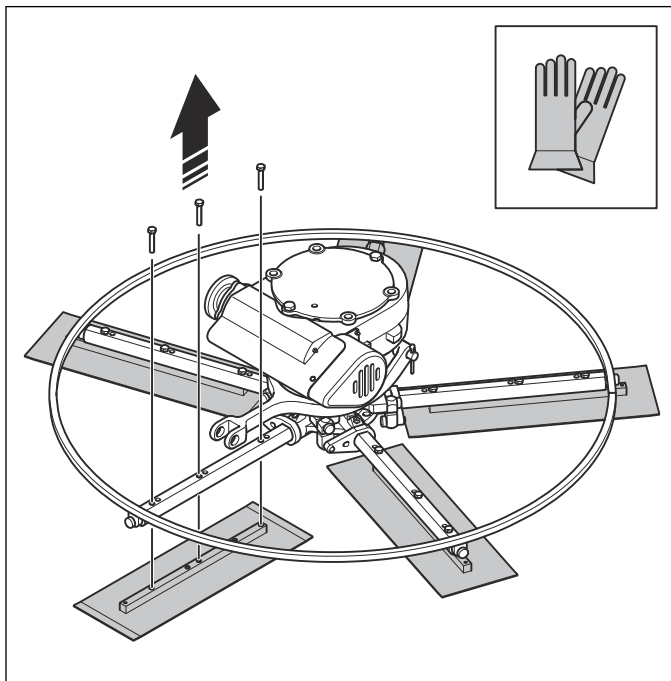


6.6 To disassemble the lower unit

1. Remove the gearboxes from the product. Refer to .
2. Remove the lever couplings.

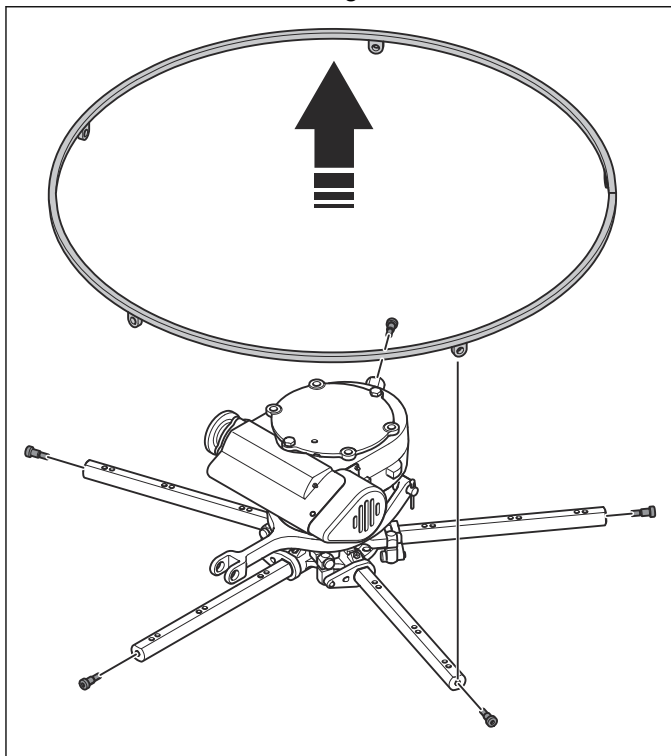


3. Remove the screws and remove the blades.

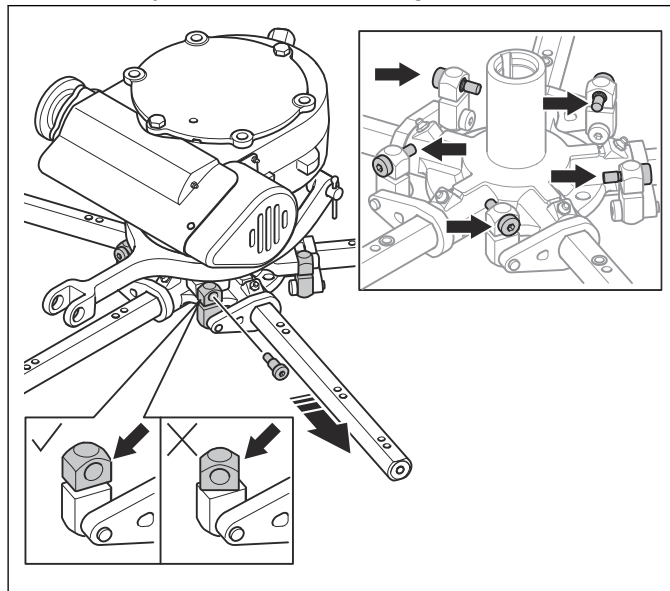


WARNING: Use protective gloves.

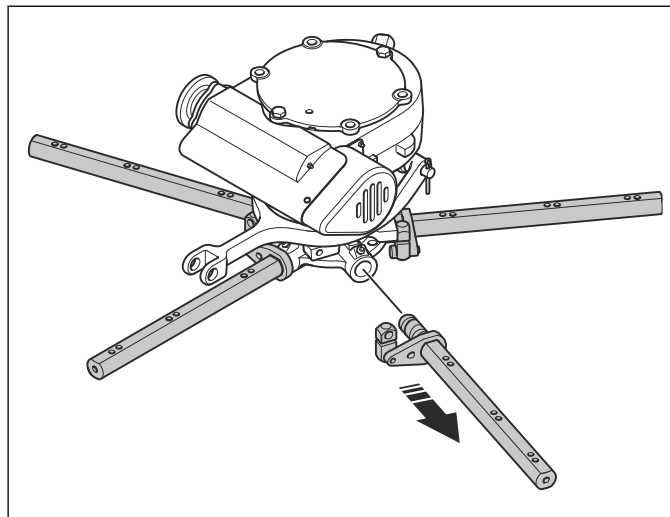
4. Remove the stabilizer ring.



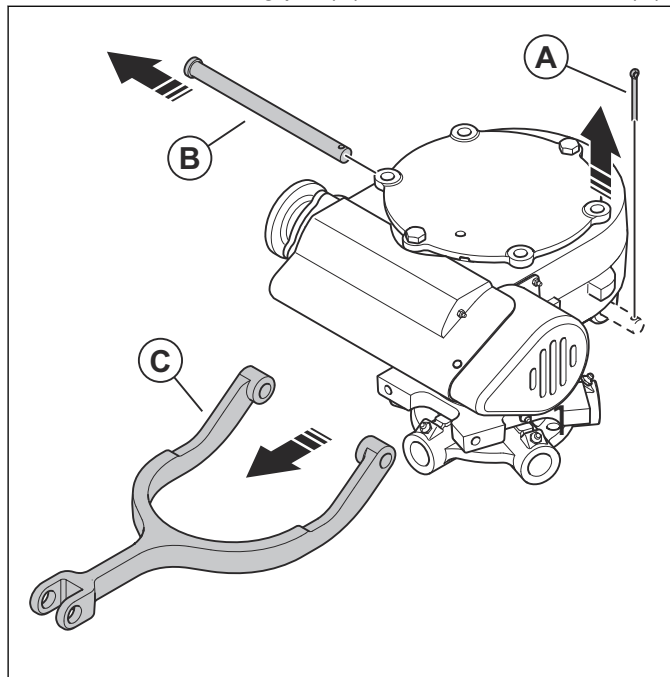
5. Remove the 5 shoulder bolts from the ring assembly. Do not turn the lifting links.



6. Remove the arms.

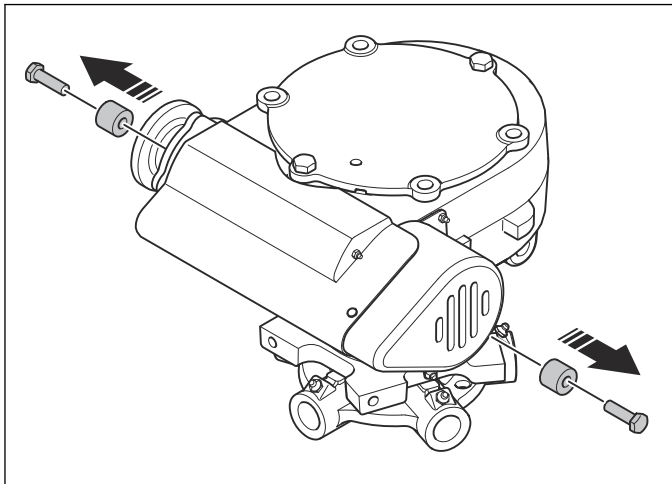


7. Pull out the locking pin (A) and remove the shaft (B).

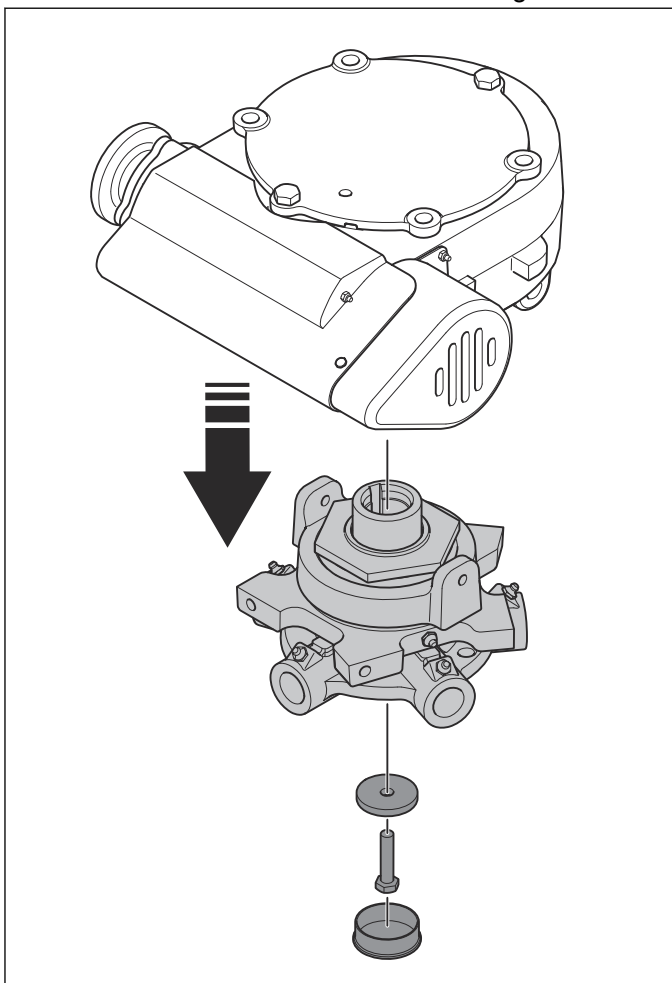


8. Remove the blade yoke (C).

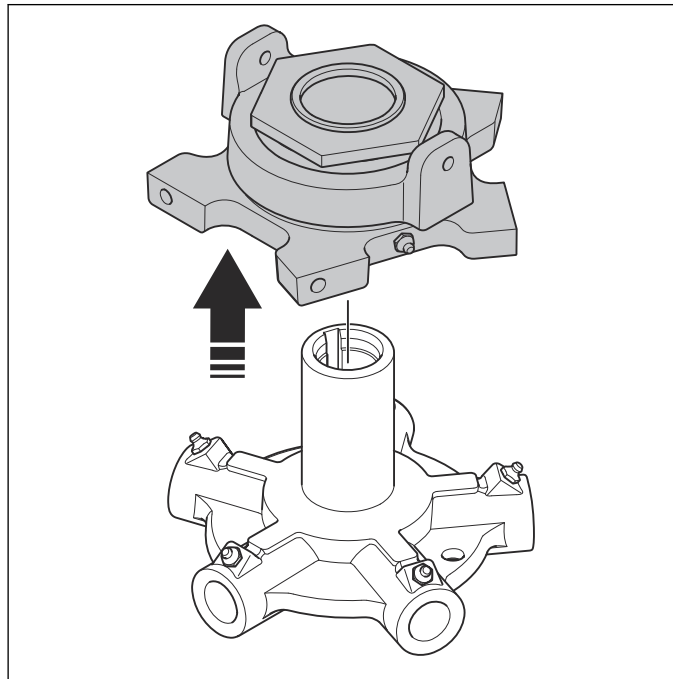
9. Remove the 2 roller guides.



10. Remove the plug, the screw and the washer from the hub. Remove the hub unit from the gearbox.



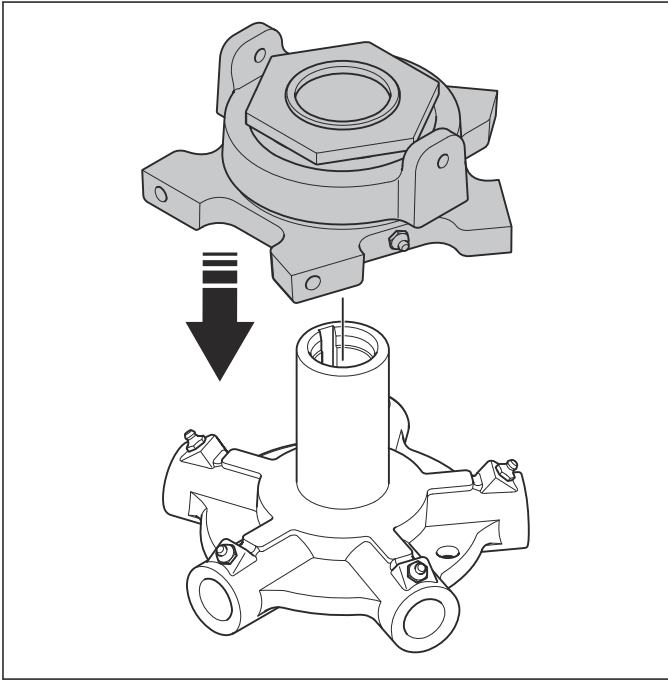
11. Remove the ring assembly.



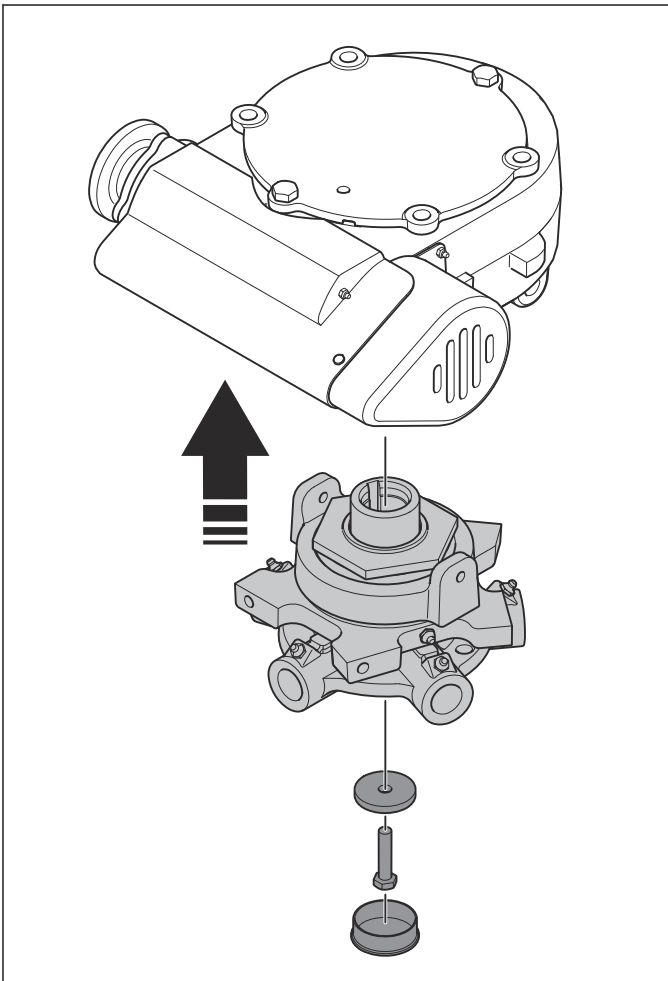
12. Do the procedure for the opposite gearbox.

6.7 To assemble the lower unit

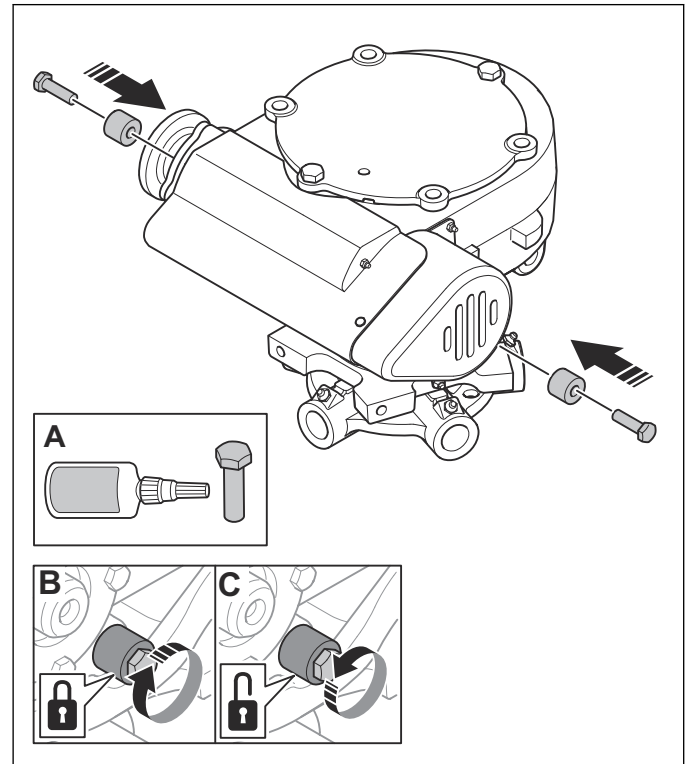
1. Install the ring assembly on the hub.



2. Install the hub, the washer, the screw and the plug on the gearbox.

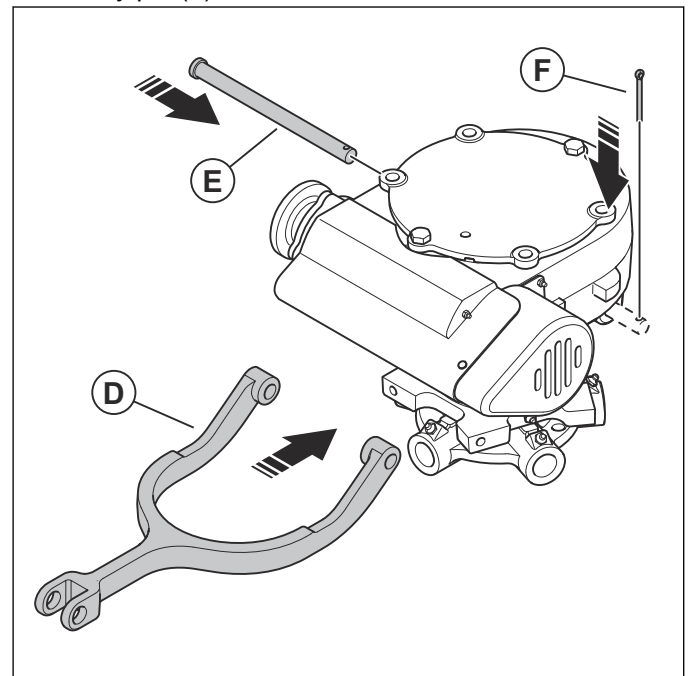


3. Install the 2 roller guides.

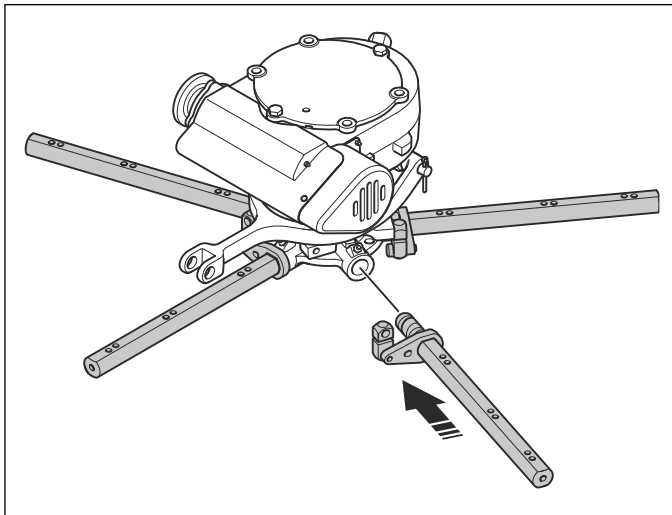


- a) Put LOCTITE® 271 or equivalent in the holes for the on the bolts (A).
- b) Install the roller guides and tighten the bolts until the roller guide cannot turn (B).
- c) Loosen the bolt until the roller guide can turn (C).

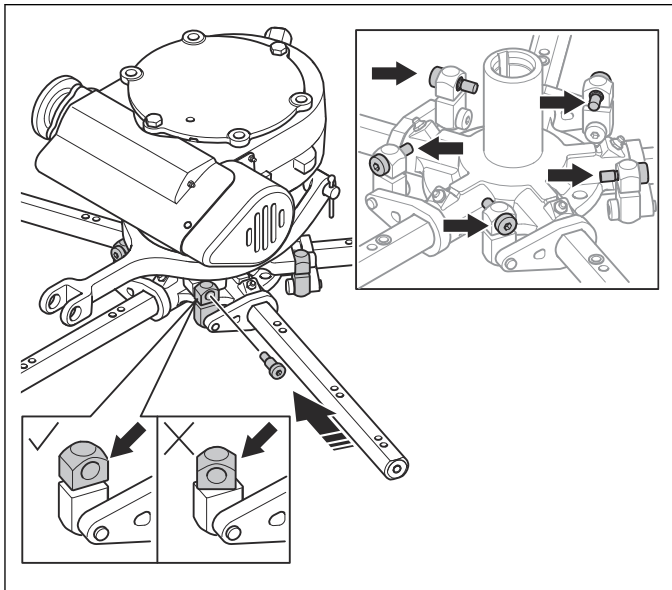
4. Install the blade yoke (D), the shaft (E), and the safety pin (F).



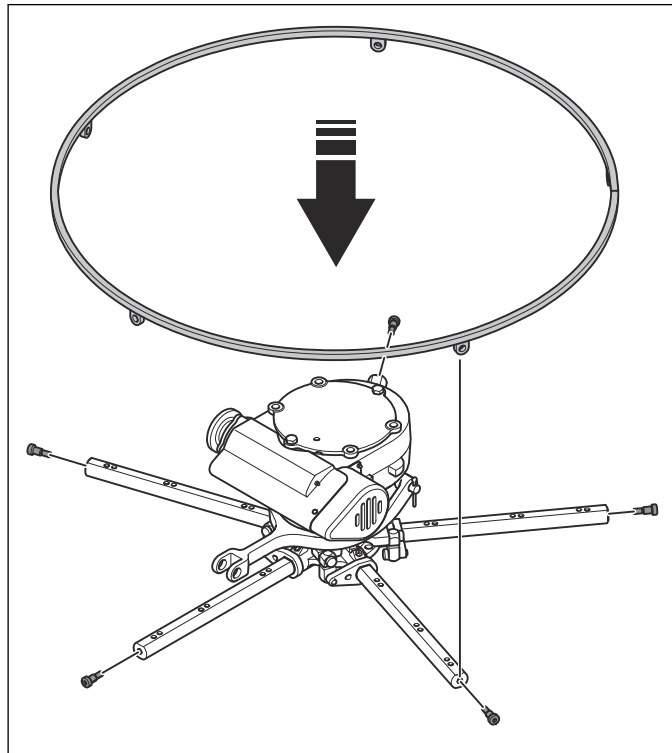
5. Install the arms (D) and tighten the bolts (E)



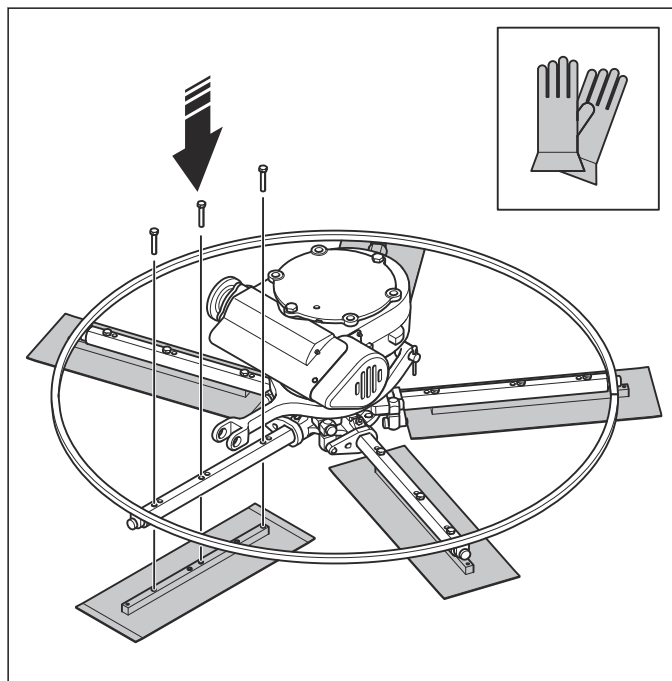
6. Install the 5 shoulder bolts on the ring assembly.



7. Install the stabilizer ring.

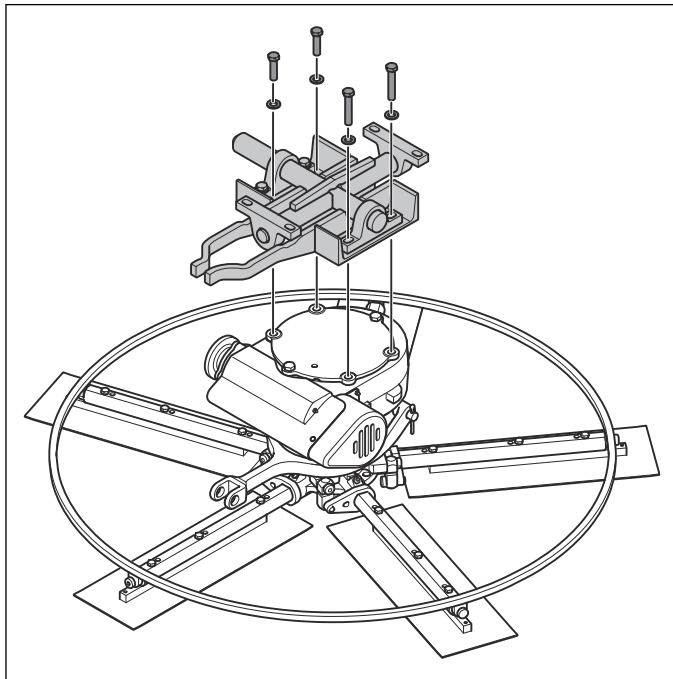


8. Install the blades.

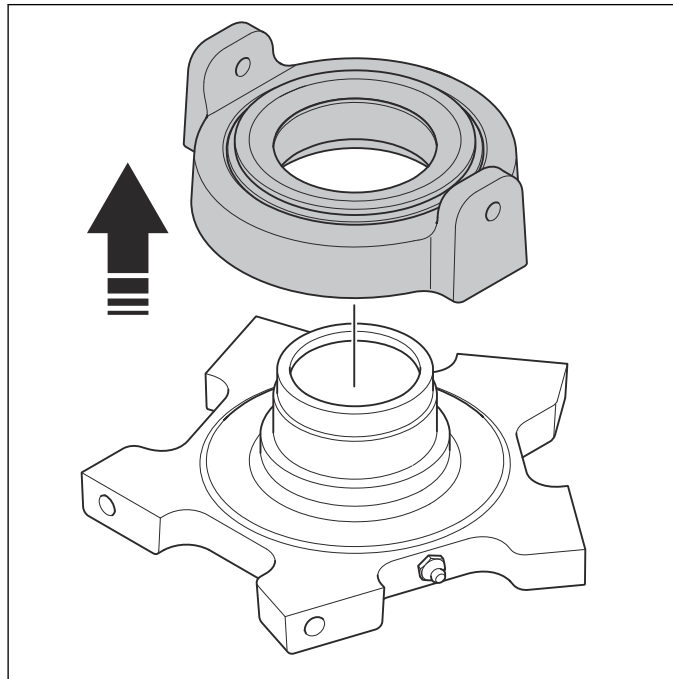


WARNING: Use protective gloves.

9. Install the lever couplings.

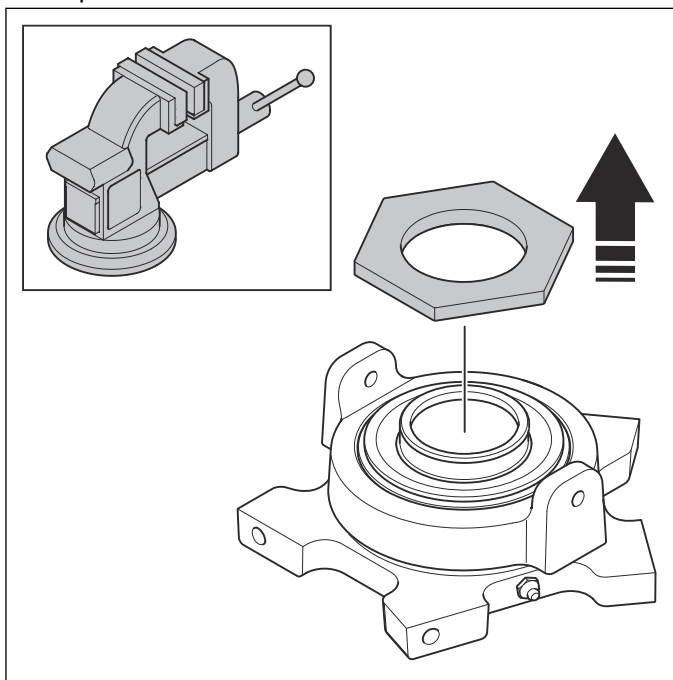


4. Remove the bearing holder.

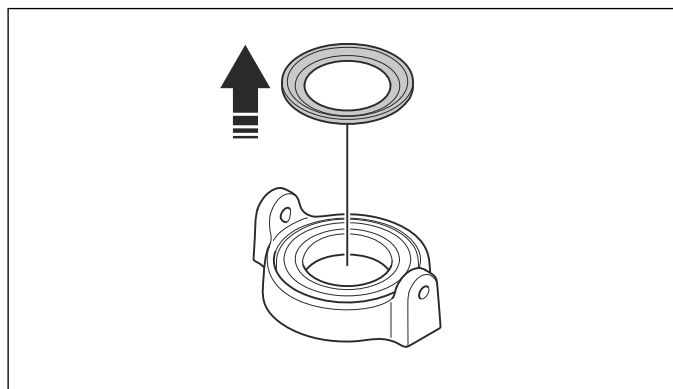


6.8 To disassemble the ring assembly

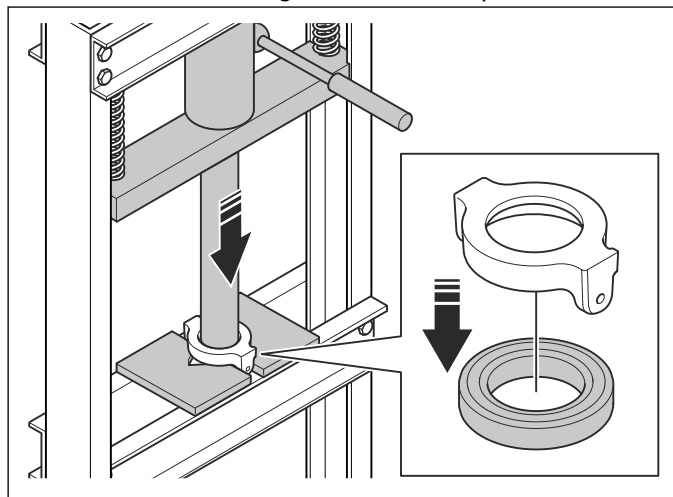
1. Remove the gearbox. Refer to .
2. Remove the lower unit. Refer to *To disassemble the lower unit on page 35*.
3. Put the ring assembly in a vise and remove the ring cap.



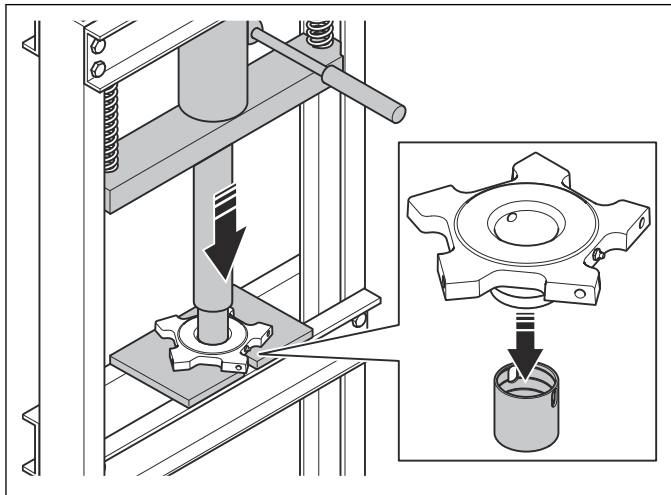
5. Remove the seal.



6. Remove the bearing with a mandrel press.

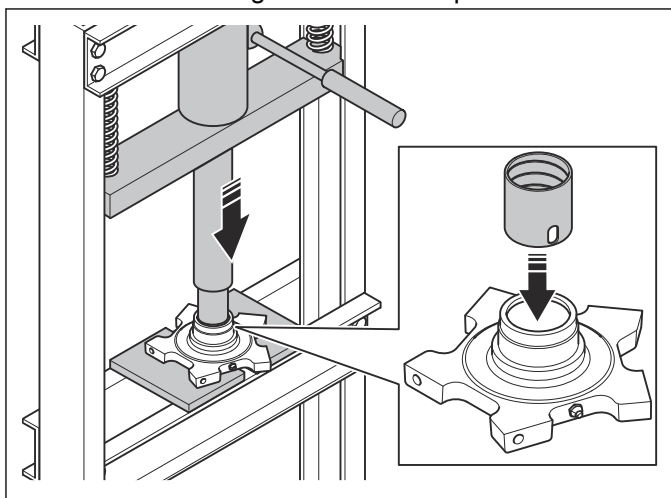


7. Remove the bushing with a mandrel press.

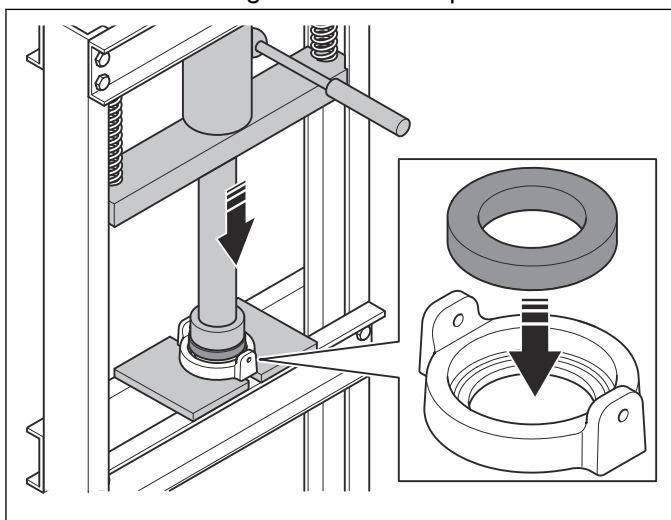


6.9 To assemble the ring assembly

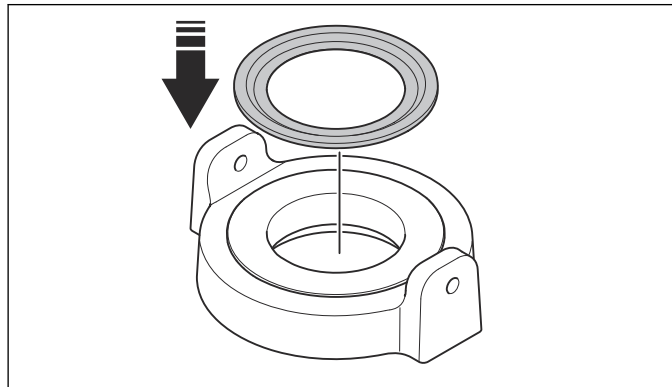
1. Install the bushing with a mandrel press.



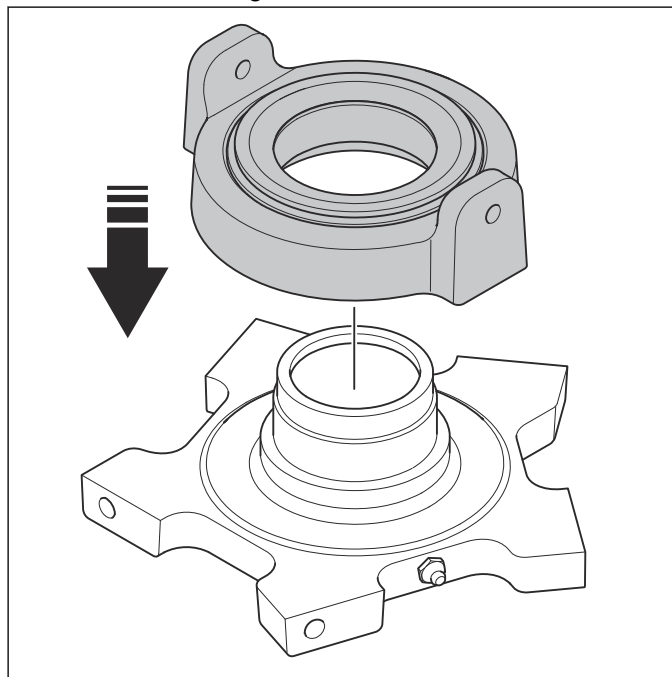
2. Install the bearing with a mandrel press.



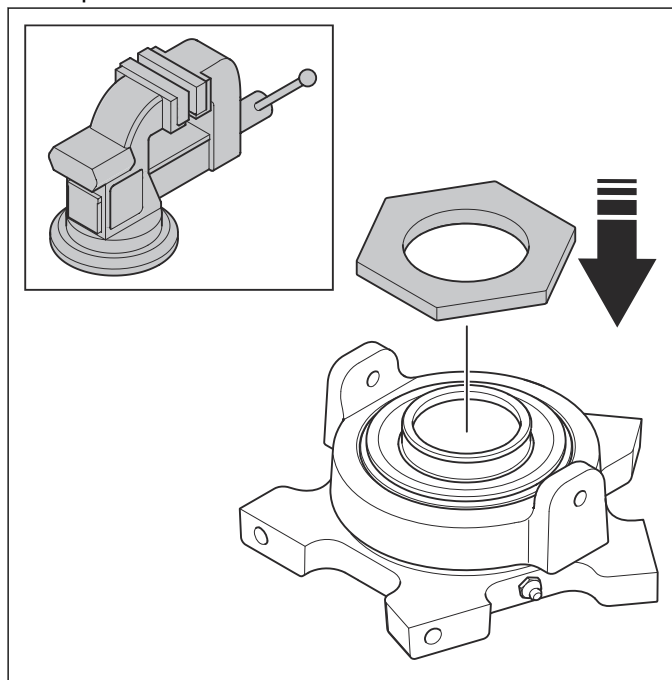
3. Install the seal.



4. Install the bearing.



5. Put the ring assembly in a vise and install the ring cap.

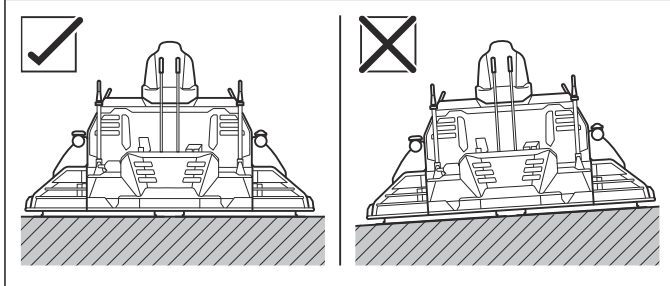


6. Install the lower unit. Refer to *To assemble the lower unit on page 38*.

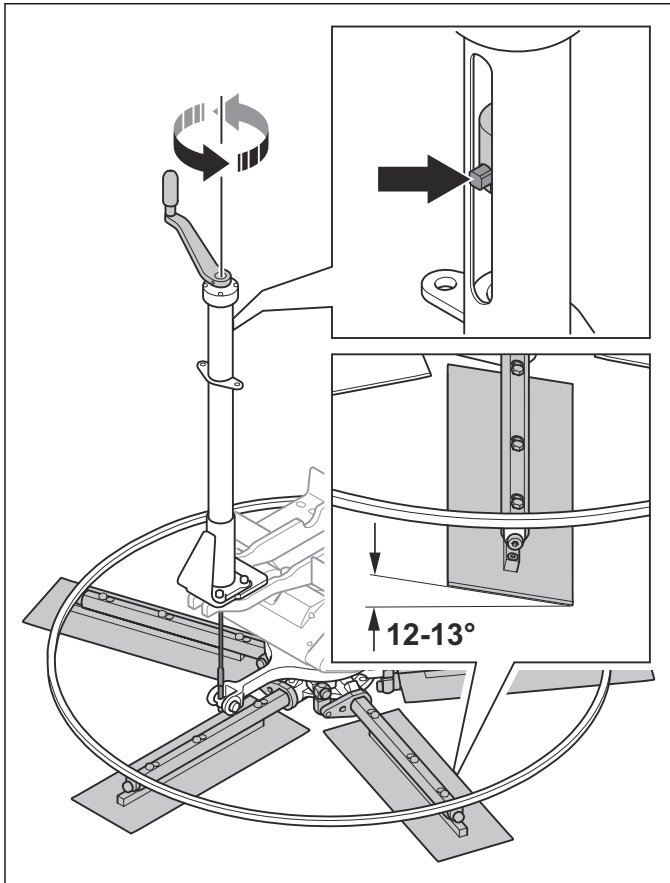
7. Install the gearbox. Refer to *To install the gearboxes on page 26*.

6.10 To adjust the blade pitch

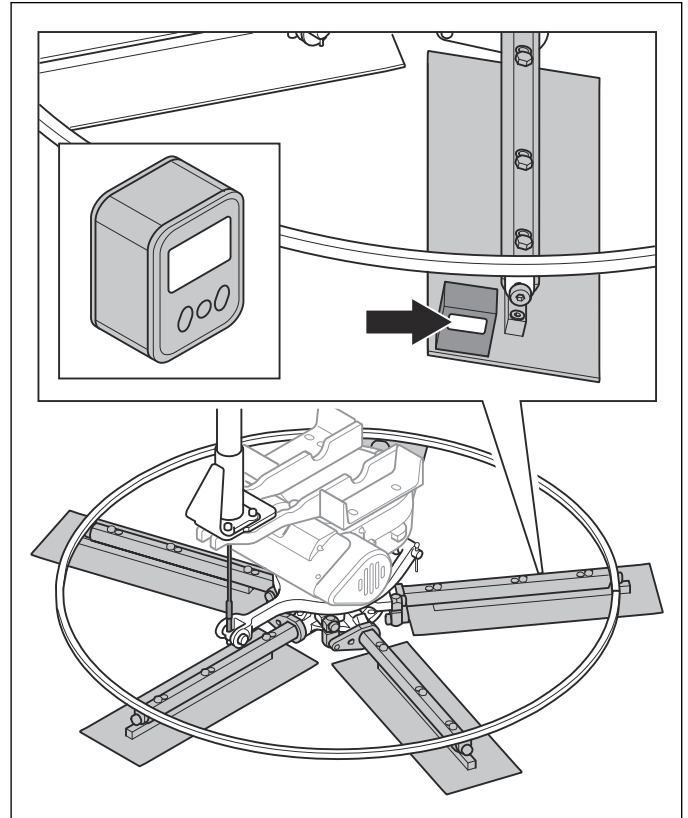
1. Put the product on a flat, level surface and install the new blades.



2. Turn the blade pitch controls so the blades are at half the maximum pitch.

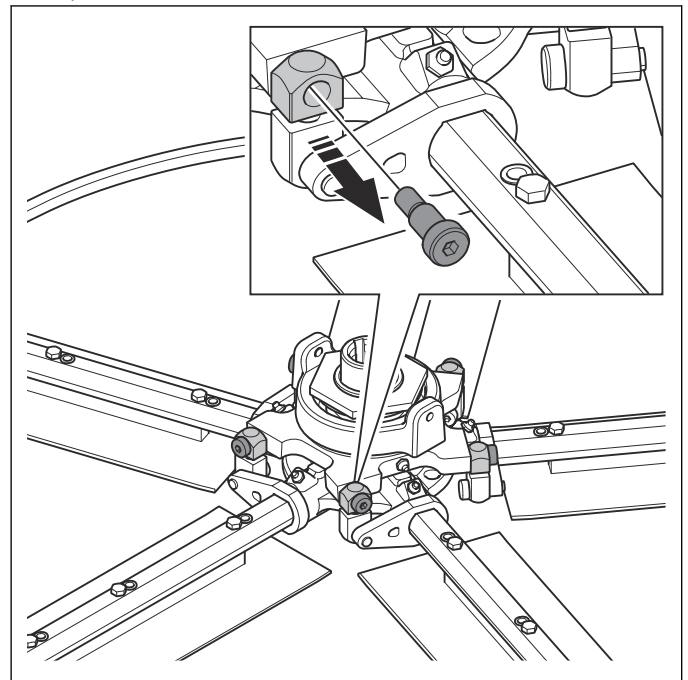


3. Check the angle of each blade with an angle gauge.

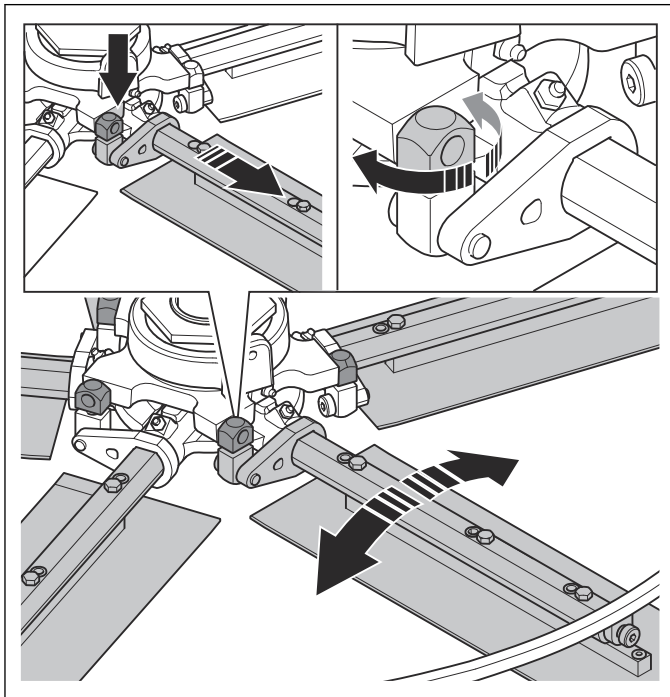


4. Adjust the arms so they have the same angle.

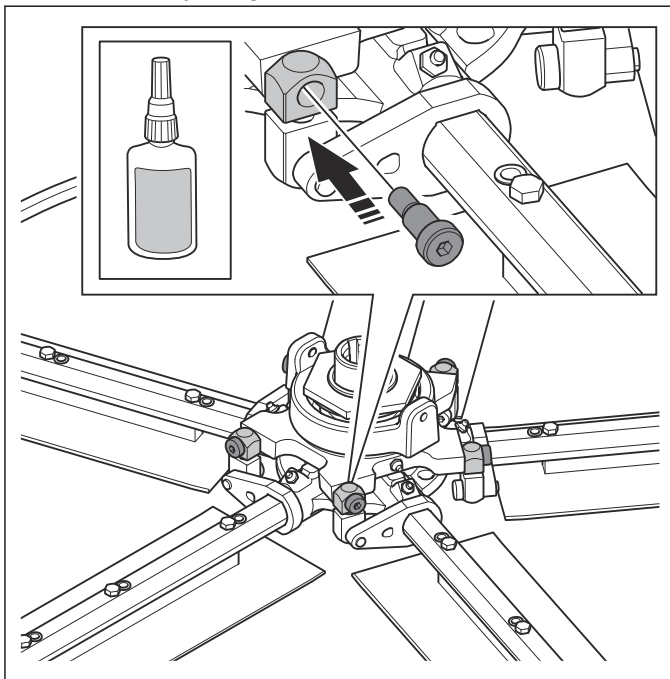
a) Remove the shoulder bolt.



b) Turn the linkage.



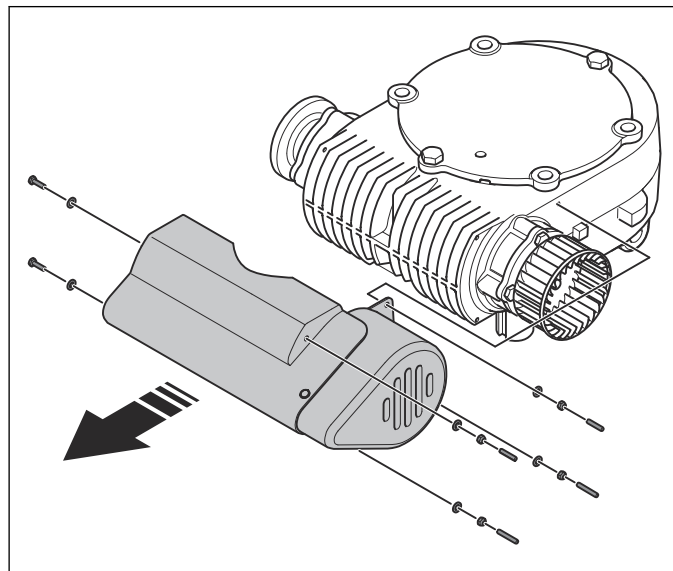
5. Put medium strength threadlocker on each shoulder bolt before you tighten them.



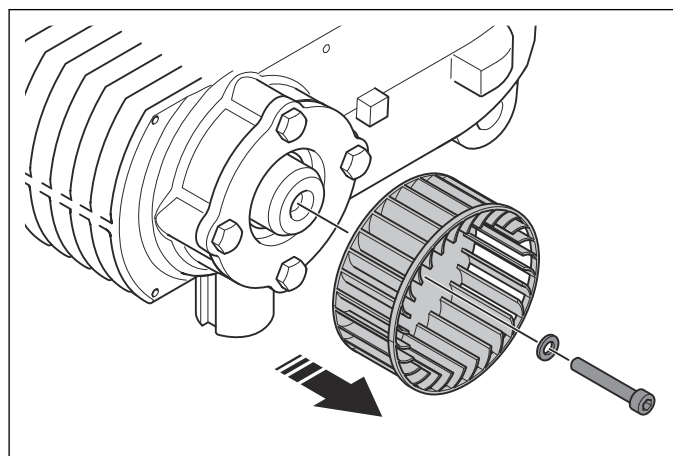
6.11 To disassemble the gearbox

1. Drain the oil in the gearbox. Refer to *To replace the oil in the gearbox on page 9*.
2. Remove the gearbox. Refer to .
3. Remove the lower unit. Refer to *To disassemble the lower unit on page 35*.

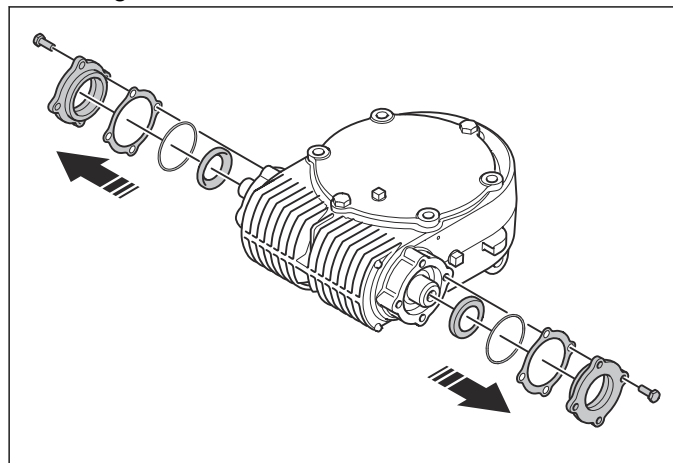
4. Remove the cover.



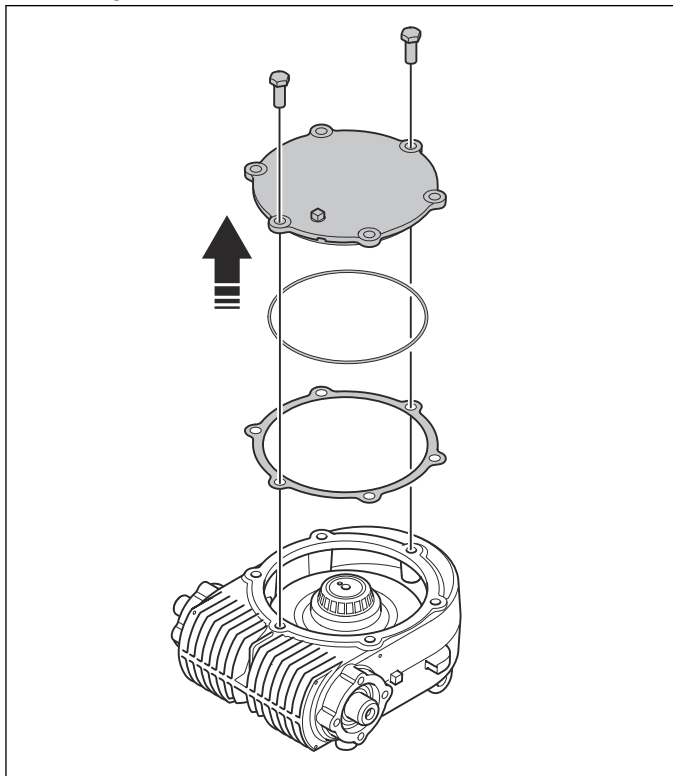
5. Remove the fan.



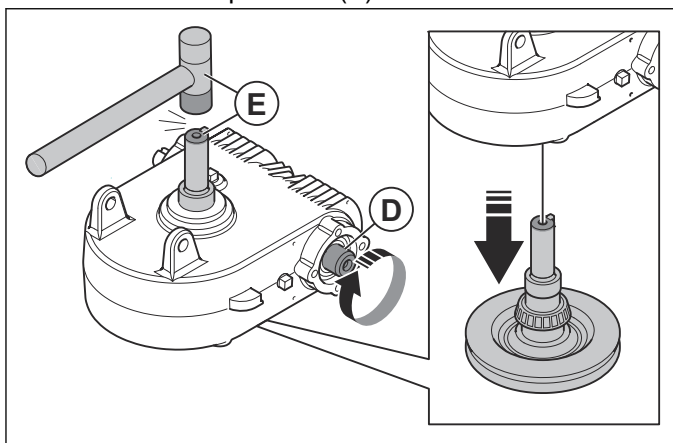
6. Remove the screws, the seal covers, the shims, the O-rings and the seals.



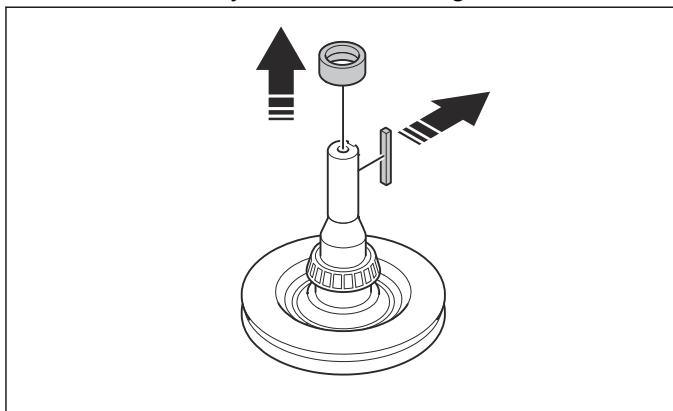
7. Remove the screws, the top cover, the shim and O-ring.



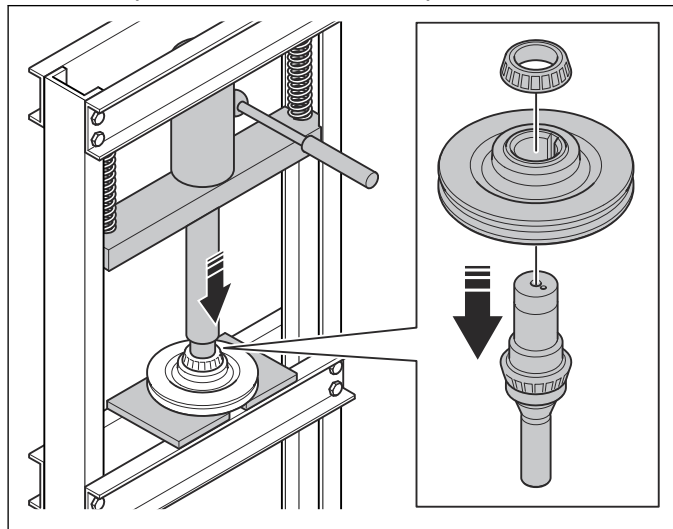
8. Turn the input shaft (D) and at the same time remove the output shaft (E) with a rubber hammer.



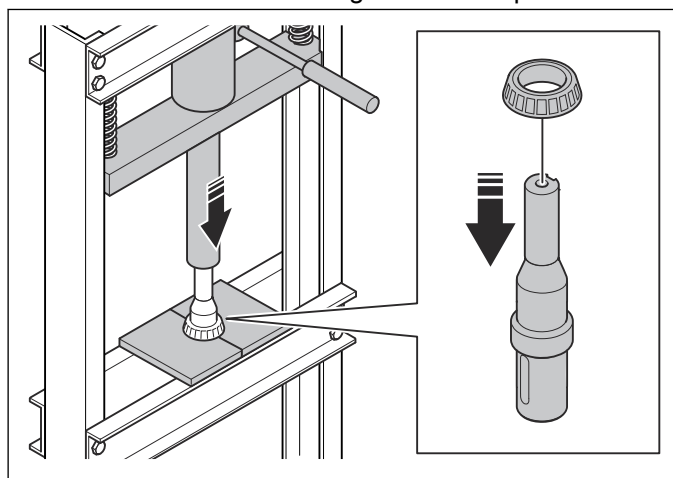
9. Remove the key and thrust bearing.



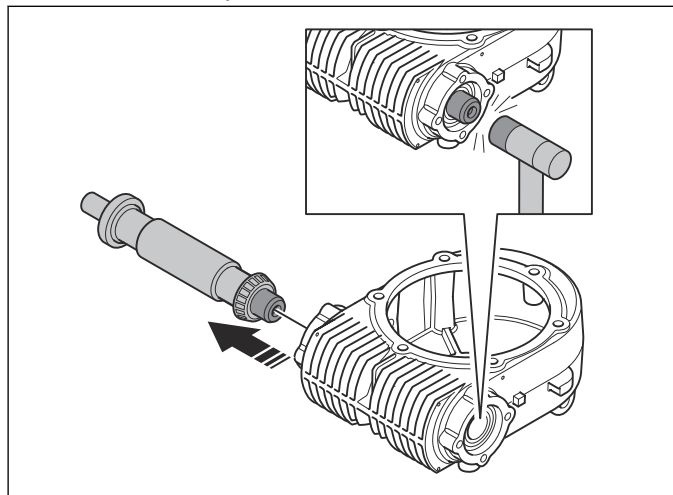
10. Remove the output gear and the top bearing from the output shaft with a mandrel press.



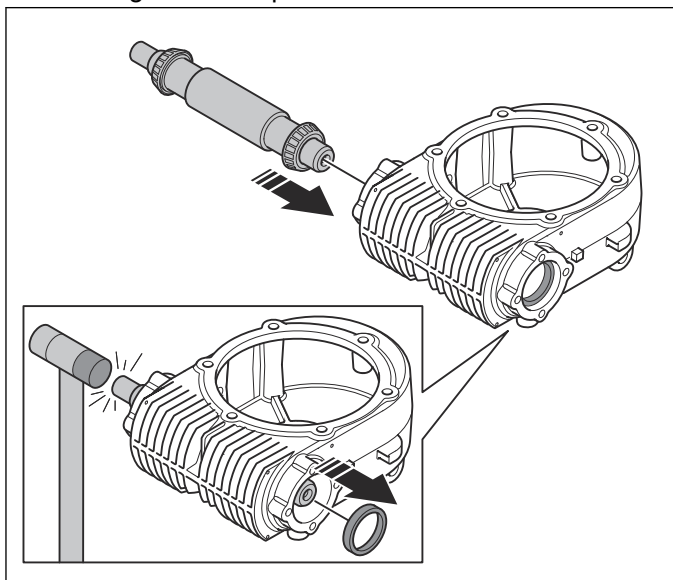
11. Remove the lower bearing from the output shaft.



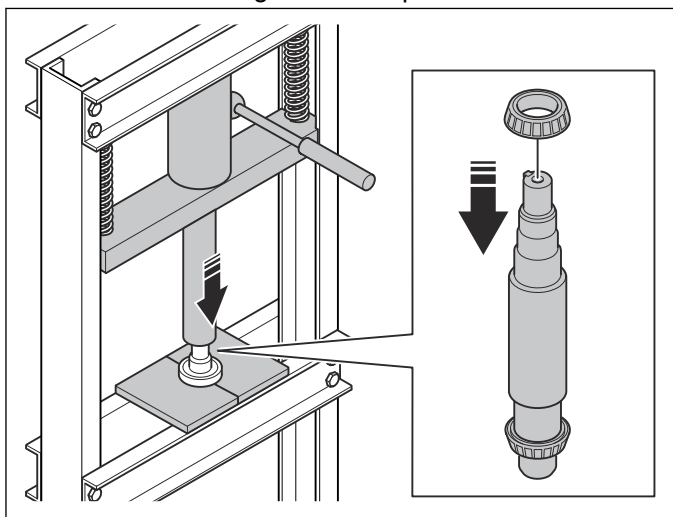
12. Remove the input shaft with a rubber hammer.



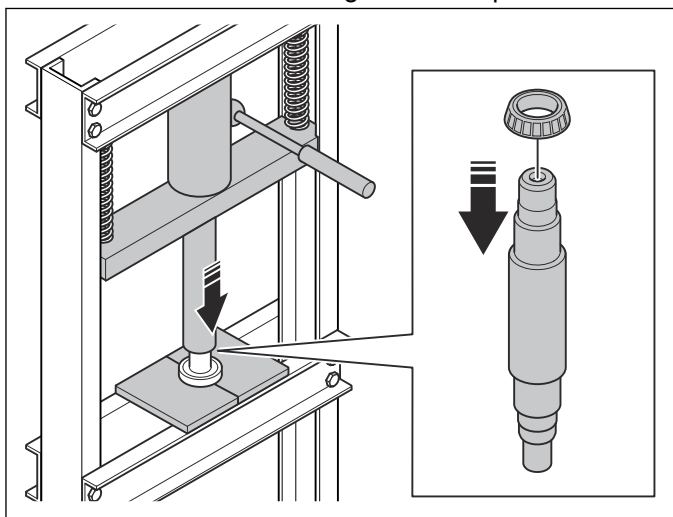
13. Remove the outer bearing race from the gearbox housing with the input shaft and a rubber hammer.



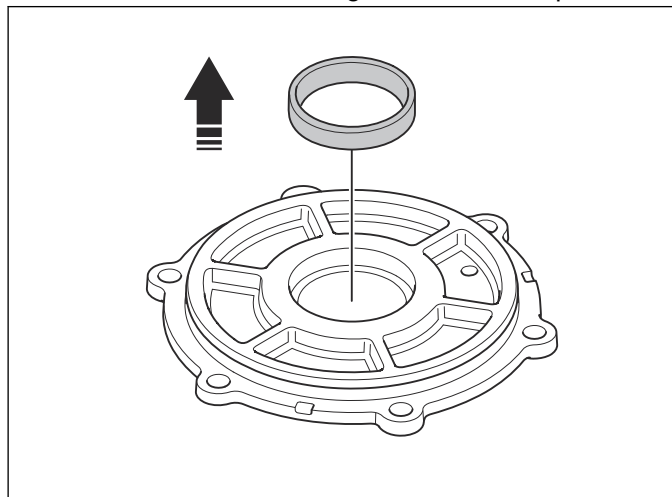
14. Remove a bearing from the input shaft.



15. Remove the other bearing from the input shaft.

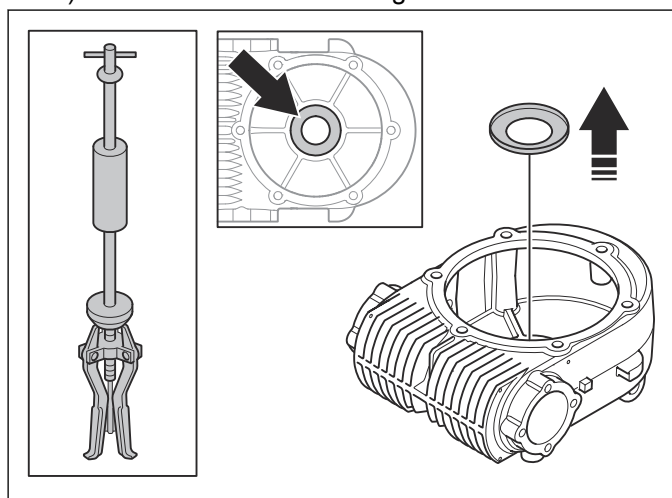


16. Remove the outer bearing race from the top cover.

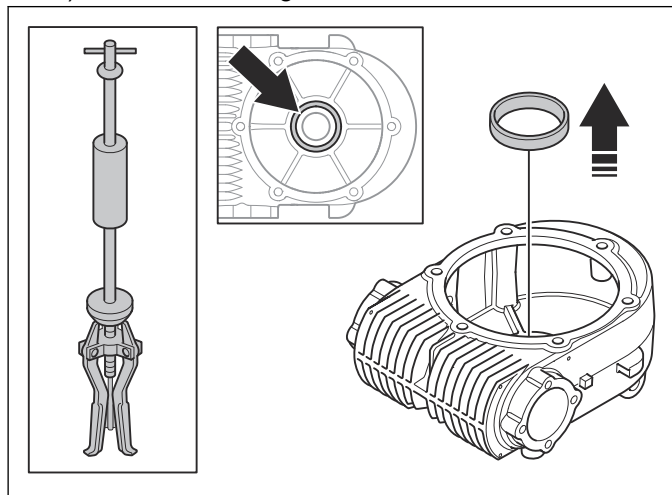


17. Remove the outer bearing race from the gearbox housing with an inner puller.

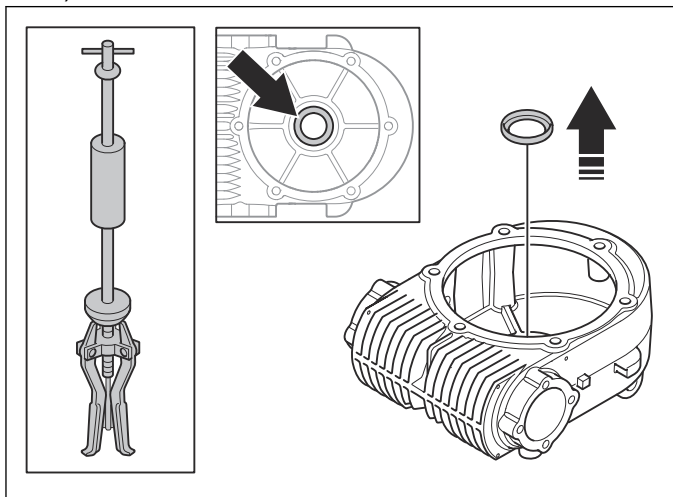
a) Remove the outer bearing race.



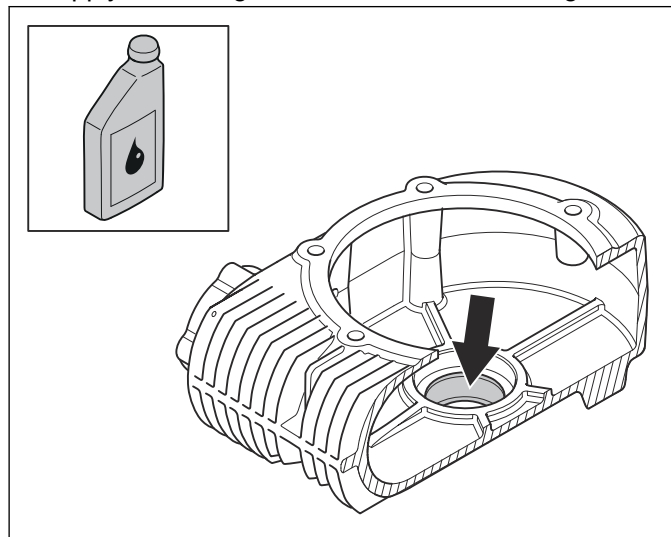
b) Remove the large seal.



c) Remove the small seal.

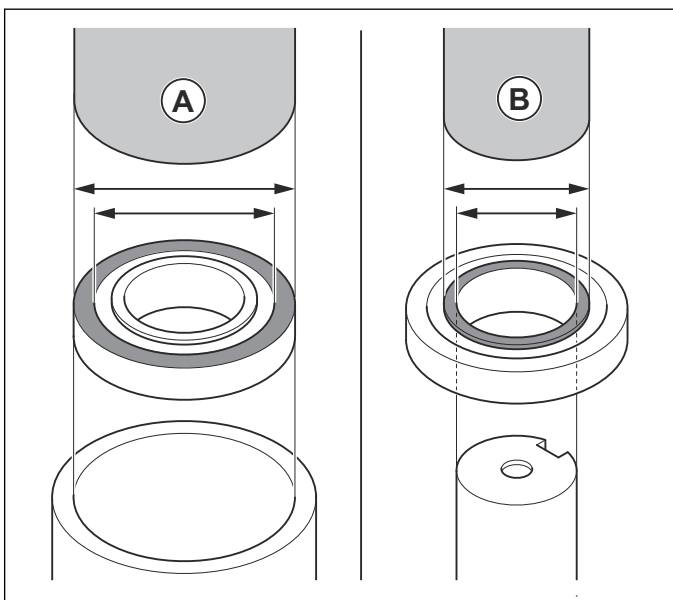


5. Apply ISO 460 gear oil in the bottom of the gearbox.



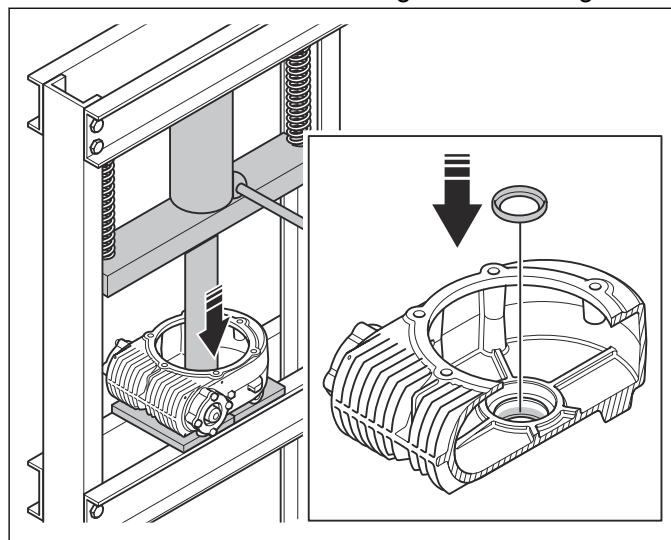
6.12 To select correct mandrel dimension

When you install the bearings with a press, use mandrels of the correct dimension.

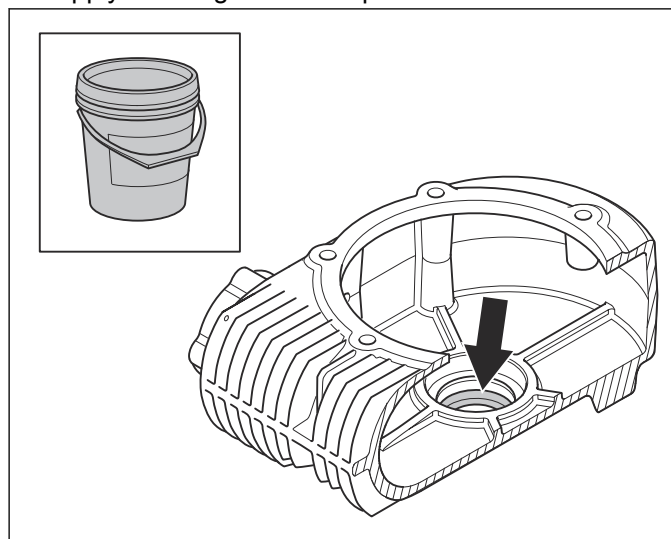


1. Put pressure with the mandrel on the outer bearing ring (A) when you do cylinder press.
2. Put pressure with the mandrel on the inner bearing ring (A) when you do shaft press.

6. Install the small seal into the gearbox housing.



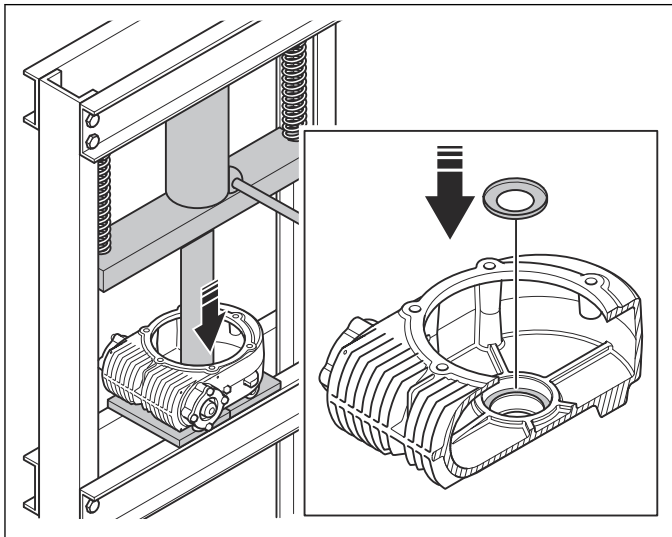
7. Apply Gadus grease on top of the small seal.



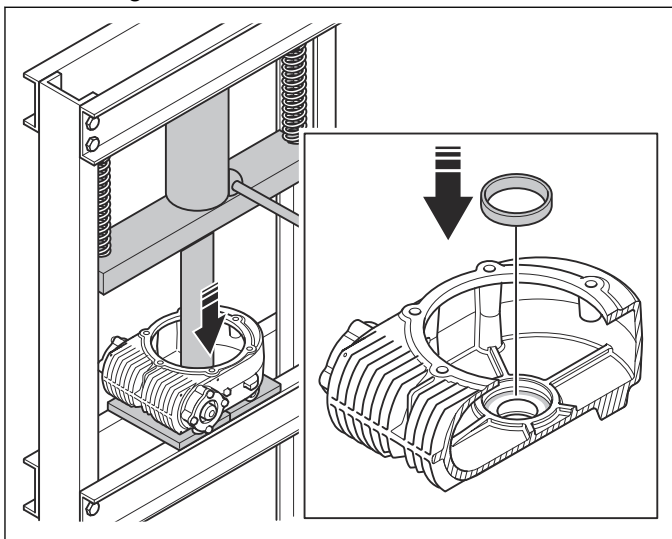
6.13 To assemble the gearbox

1. Assemble the top cover, refer to *To assemble the top cover of the gearbox on page 50.*
2. Assemble the seal covers, refer to *To assemble the seal covers of the gearbox on page 51.*
3. Assemble the input shaft, refer to *To assemble the input shaft of the gearbox on page 52.*
4. Assemble the output shaft, refer to *To assemble the output shaft of the gearbox on page 52.*

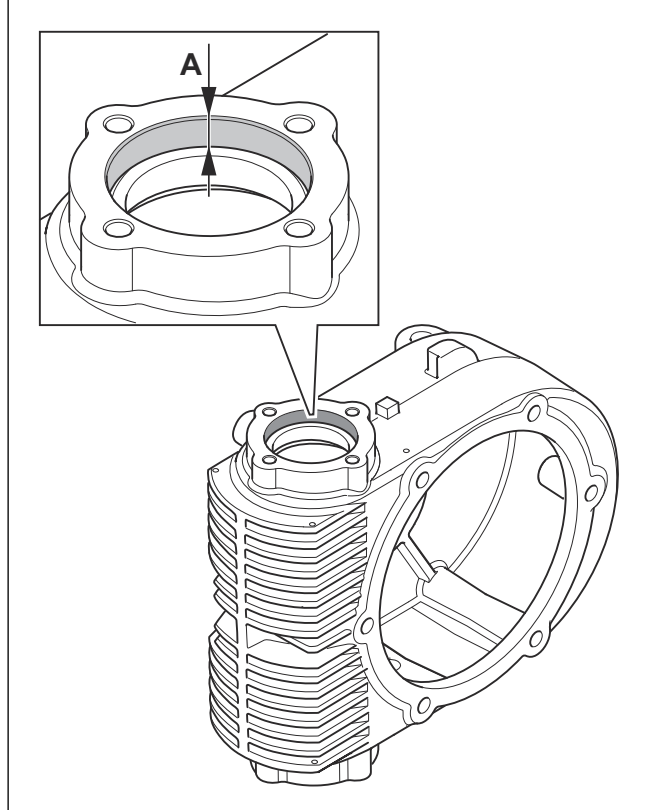
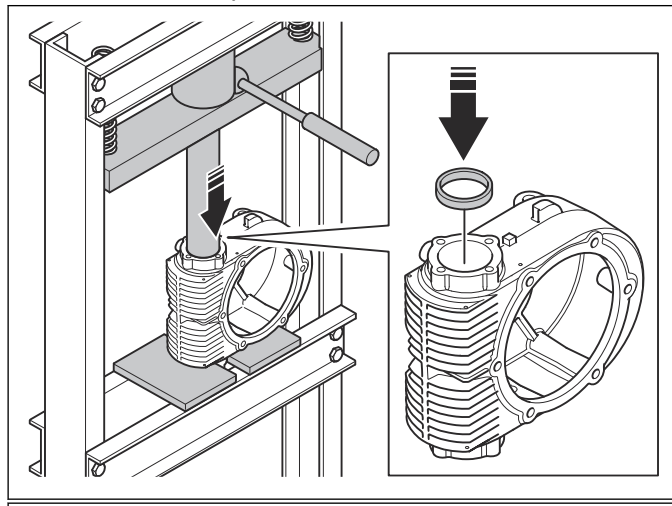
8. Install the large seal into the gearbox housing.



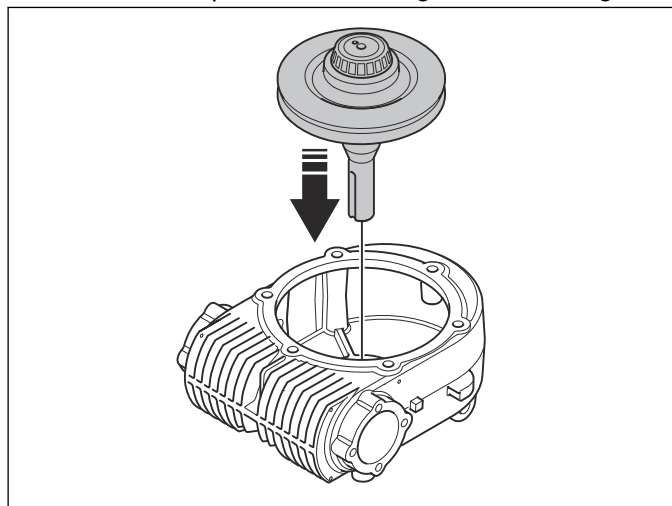
9. Install the outer bearing race into the gearbox housing.



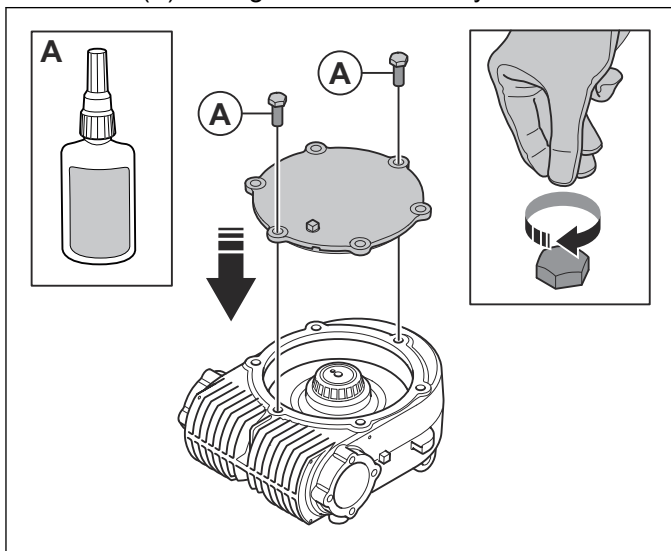
10. Install 1 of the outer bearing races on the input shaft. Press it to a depth of 10mm.



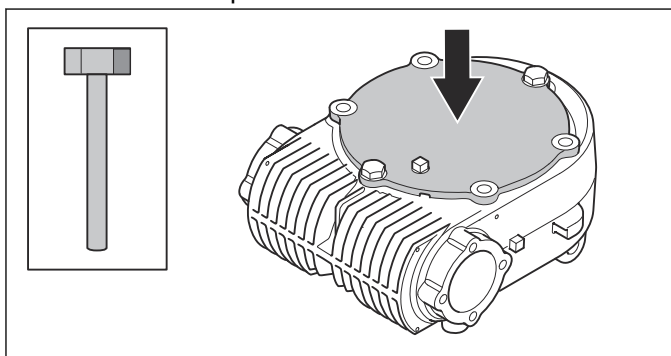
11. Install the output shaft into the gearbox housing.



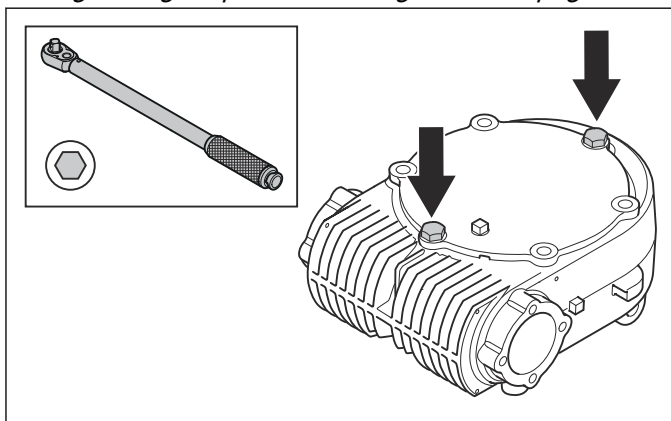
12. Install the top cover. Apply LOCTITE® 243 on the 2 screws (A) and tighten the screws by hand.



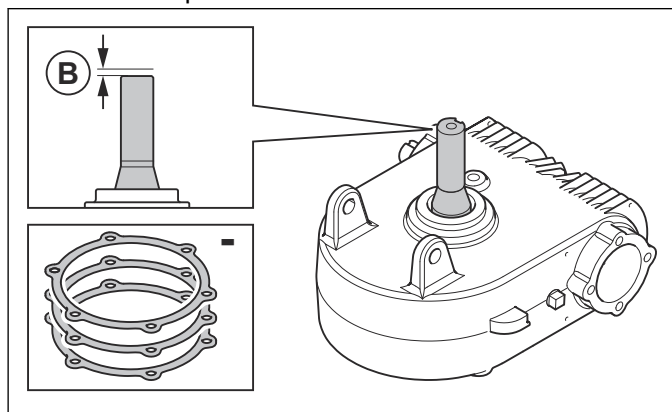
13. Hit the cover top with a rubber hammer.



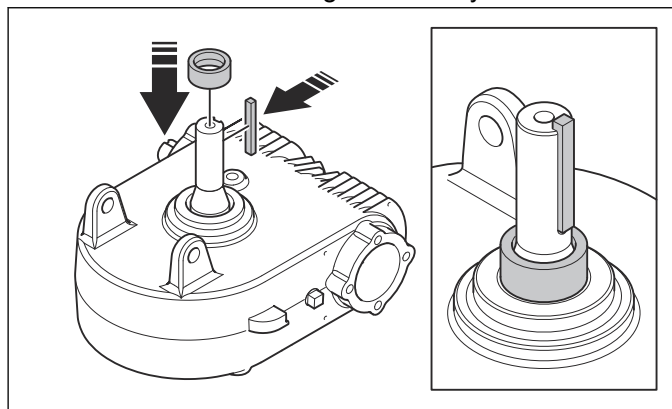
14. Tighten the 2 screws with a torque wrench. Refer to *Tightening torques drive and gearbox on page 14*.



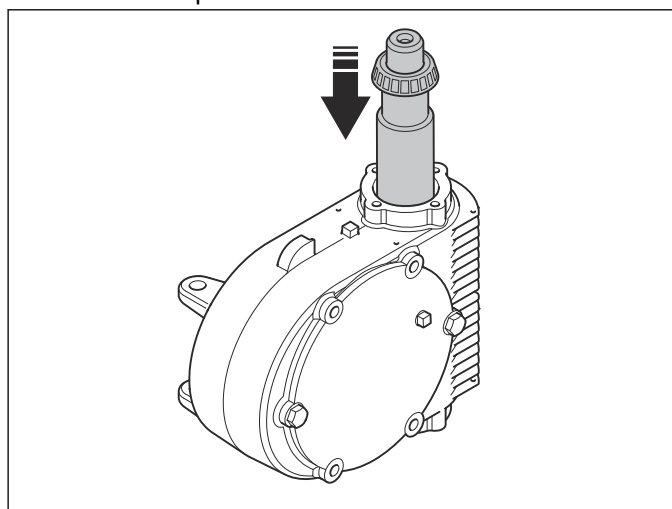
15. Make sure that the axial play (B) on the output shaft is less than 0.55 mm. If it is necessary, remove the shims or replace them with thinner shims.



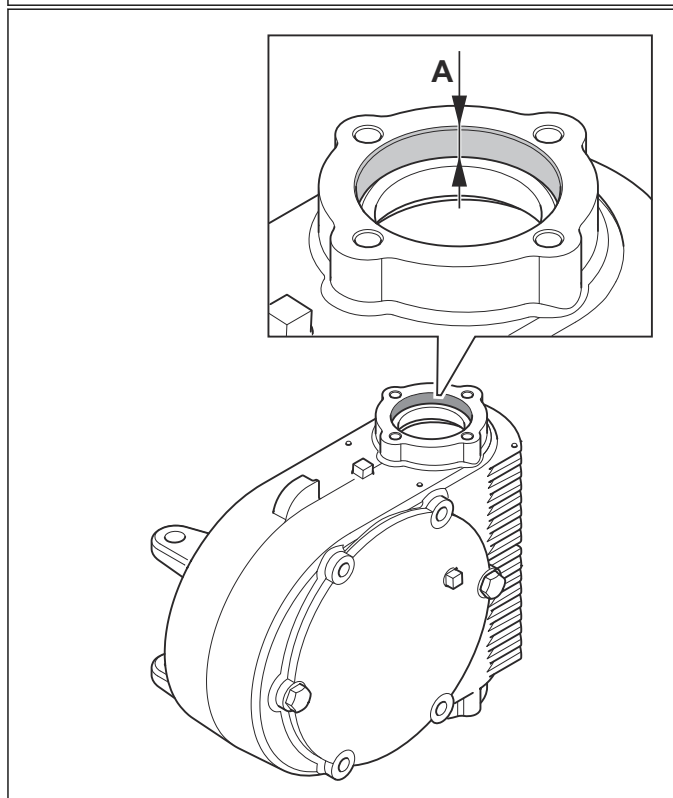
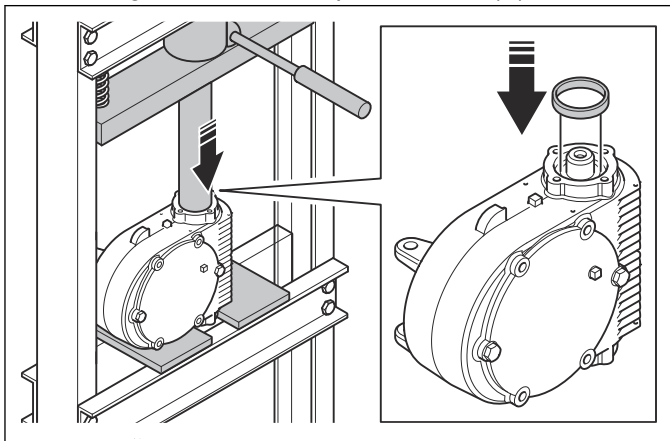
16. Install the thrust bearing and the key.



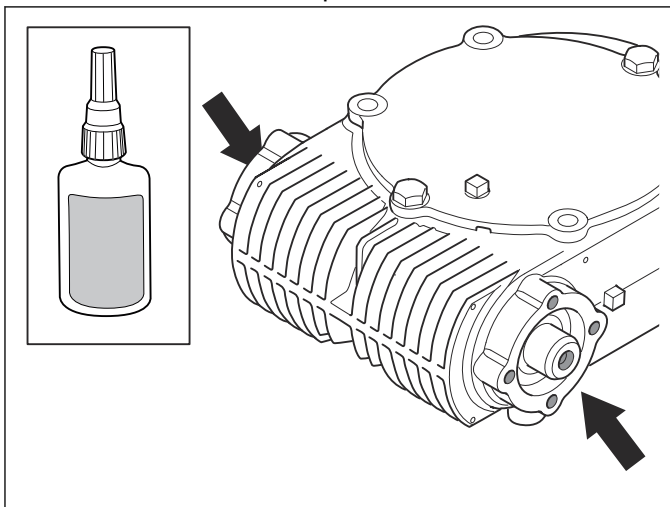
17. Install the input shaft.



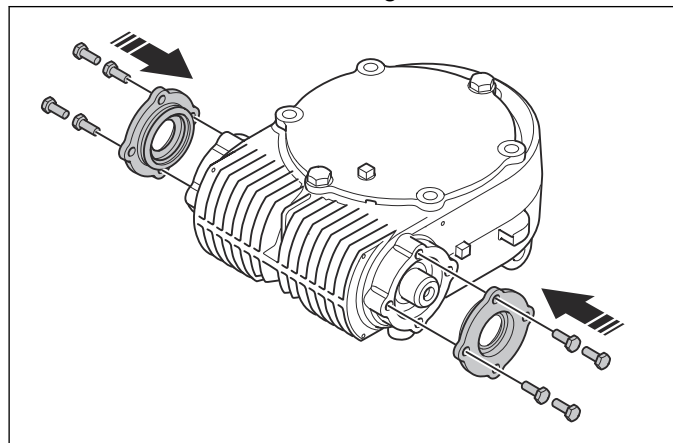
18. Install the outer bearing race on the gearbox housing. Press it to a depth of 10mm (A).



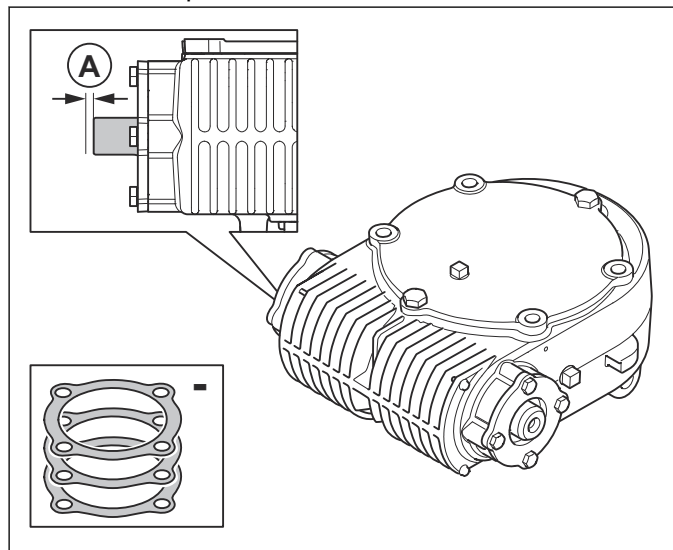
19. Apply LOCTITE® 243 in the 4 holes for the screws and at the end of the input shaft on each side.



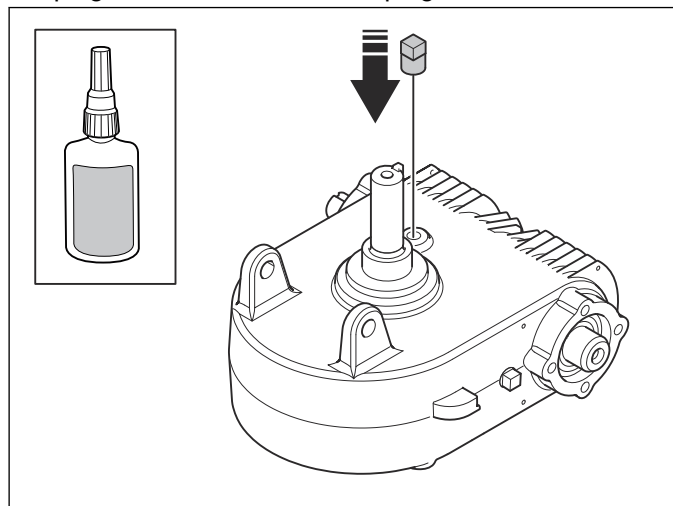
20. Install the seal covers and tighten the screws.



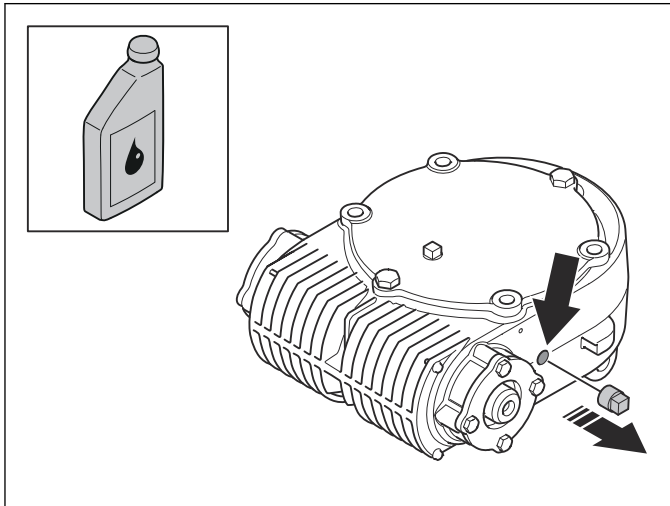
21. Make sure that the axial play (C) on the input shaft is less than 0.55 mm. If it is necessary, remove the shims or replace them with thinner shims.



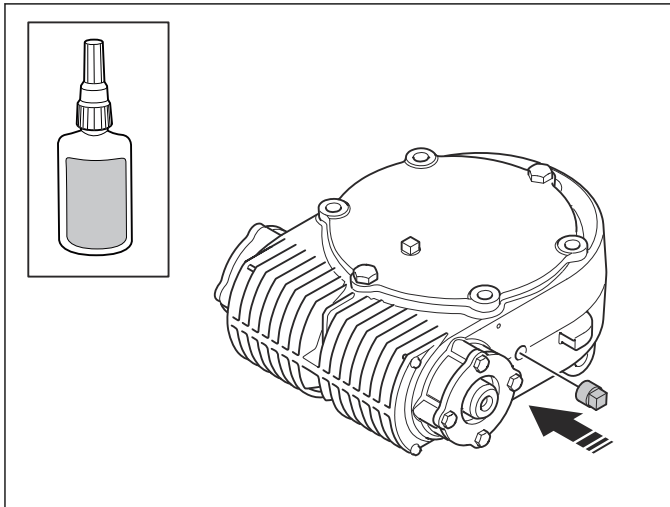
22. Apply LOCTITE® 545™ to the threads of the oil drain plug and install the oil drain plug.



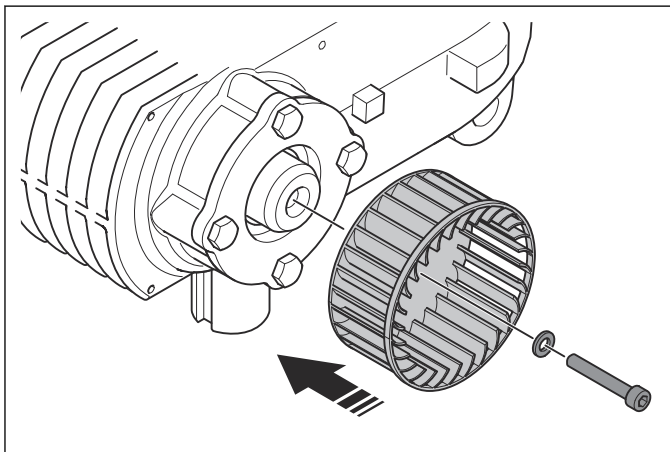
23. Fill with 1.5 liters of Glycoyle synthetic gear oil oil through the hole for the oil fill plug.



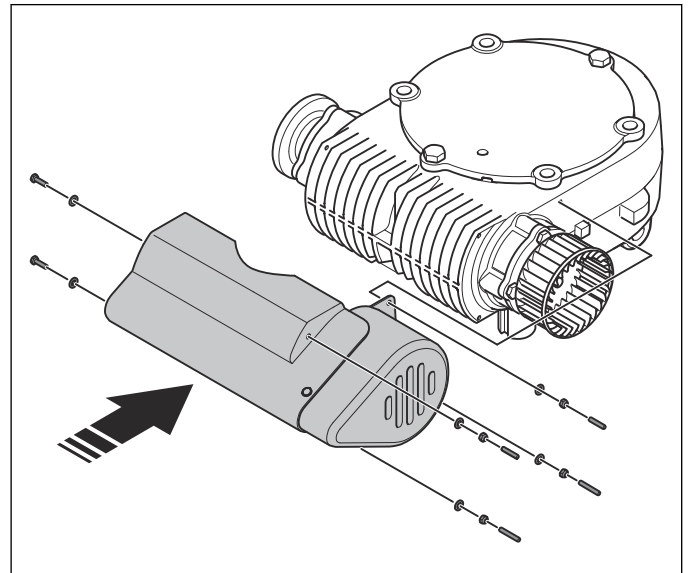
24. Apply LOCTITE® 545™ on the threads of the oil fill plug and install the oil fill plug.



25. Install the fan.



26. Install the cover.

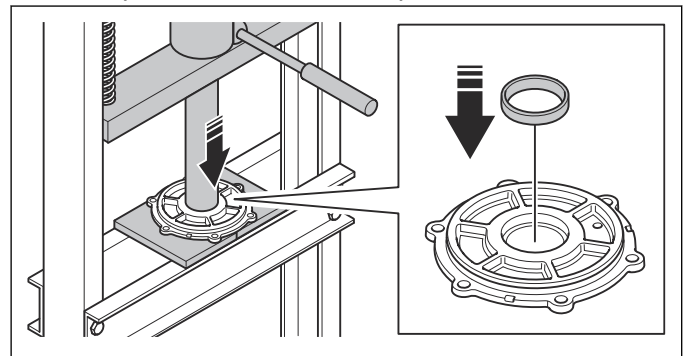


27. Install the lower unit. Refer to *To assemble the lower unit on page 38*.

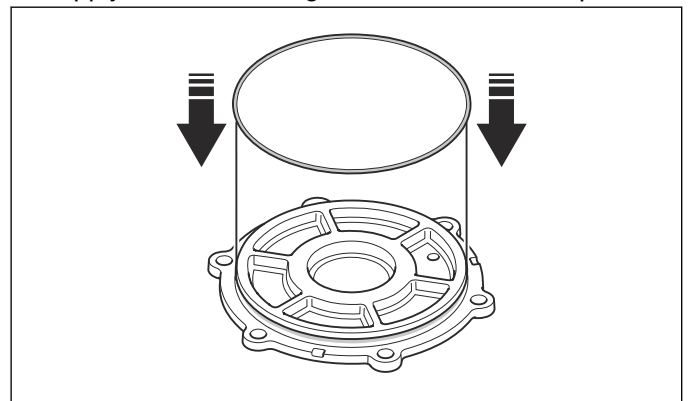
28. Install the gearbox. Refer to *To install the gearboxes on page 26*.

6.13.1 To assemble the top cover of the gearbox

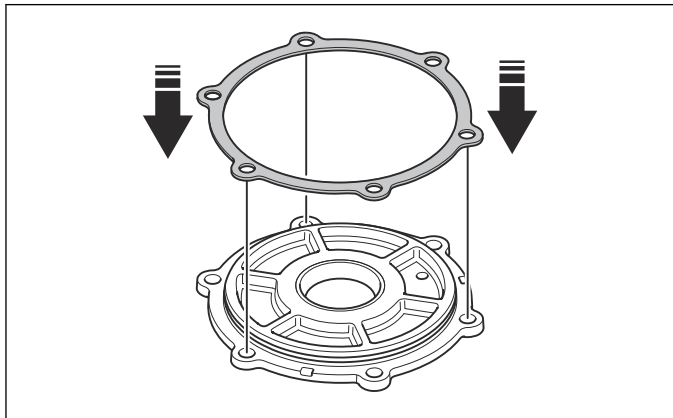
1. Install the outer bearing race for the output shaft into the top cover with a mandrel press.



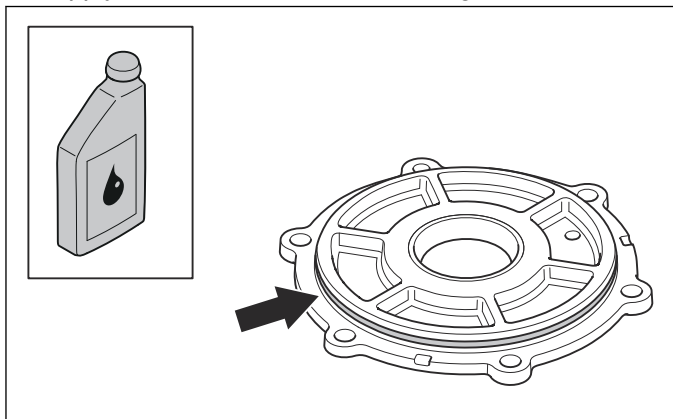
2. Apply oil on the O-ring and install it on the top cover.



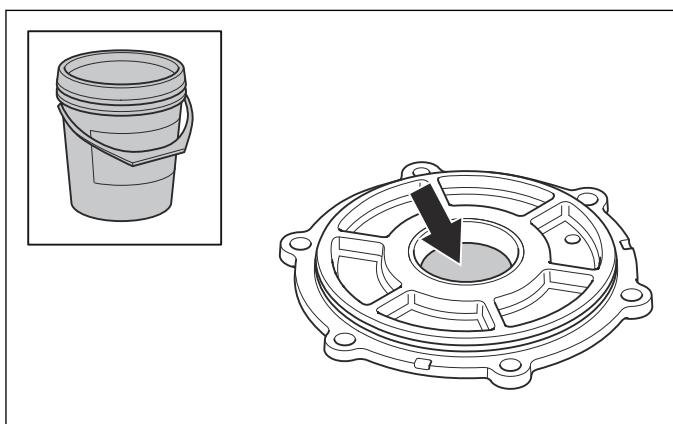
3. Install the shim on the top cover.



4. Apply ISO 460 oil around the O-ring.

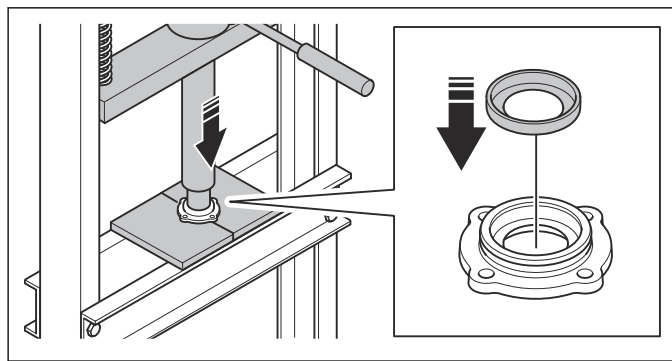


5. Apply Gadus grease in the middle of the top cover.

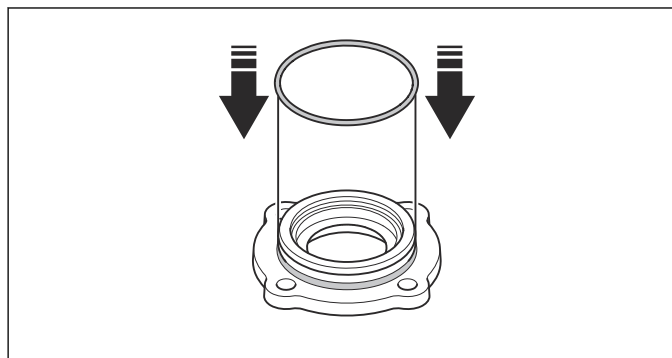


6.13.2 To assemble the seal covers of the gearbox

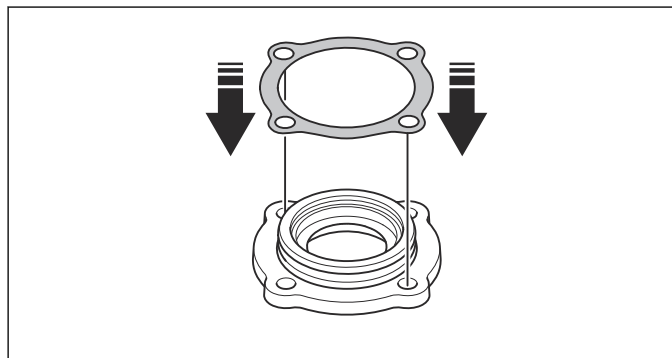
1. Install the seals on the seal covers.



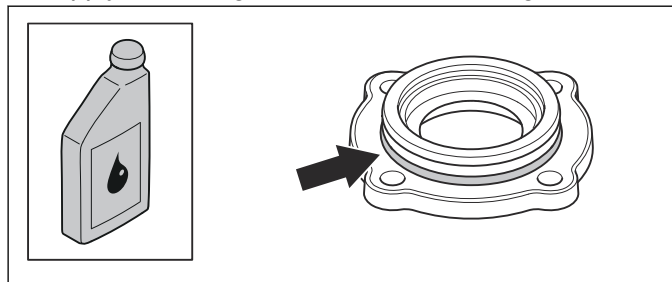
2. Apply oil on the O-rings and install them on the seal cover.



3. Install the shims on the seal cover.

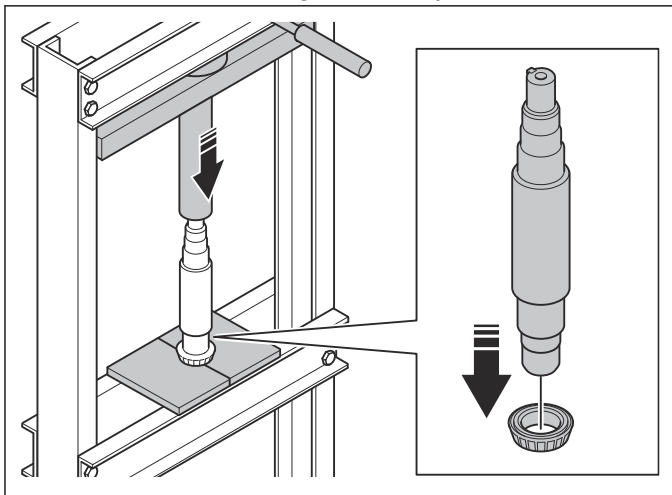


4. Apply ISO 460 gear oil around the O-rings.

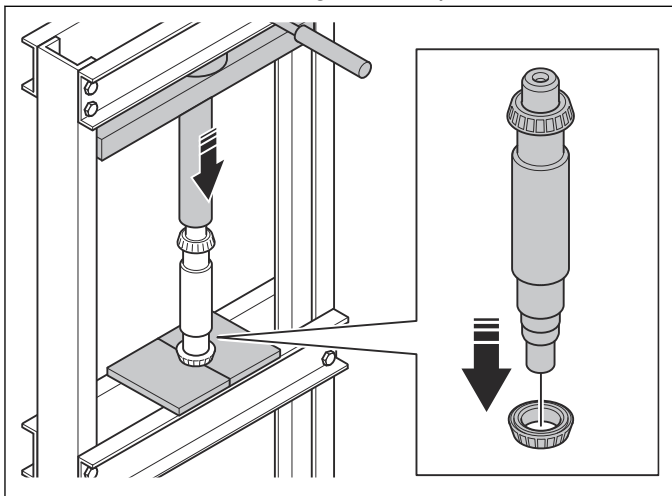


6.13.3 To assemble the input shaft of the gearbox

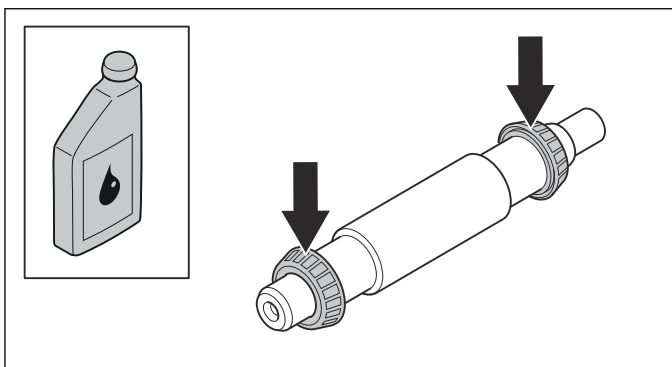
1. Install 1 of the bearings on the input shaft.



2. Install the other bearing on the input shaft.

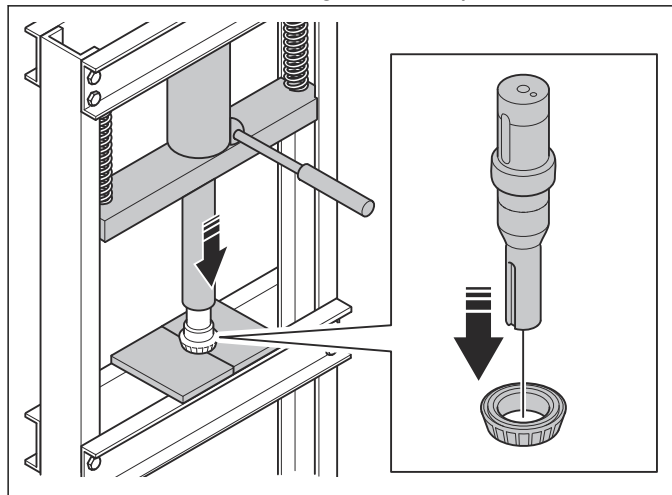


3. Apply ISO 460 gear oil on the bearings on the input shaft.

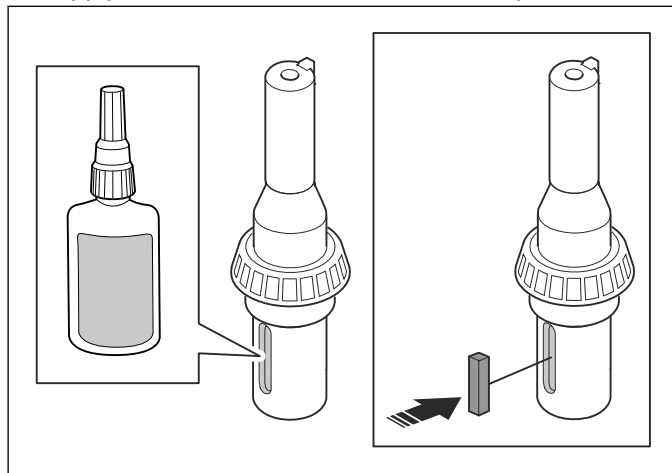


6.13.4 To assemble the output shaft of the gearbox

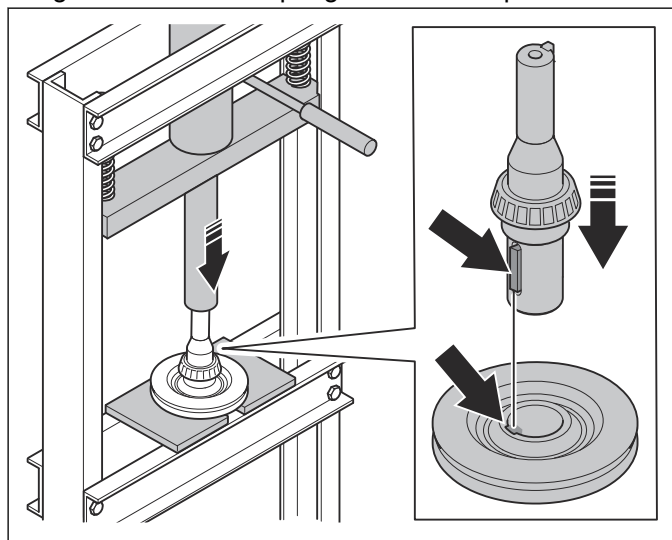
1. Install the lower bearing on the output shaft.



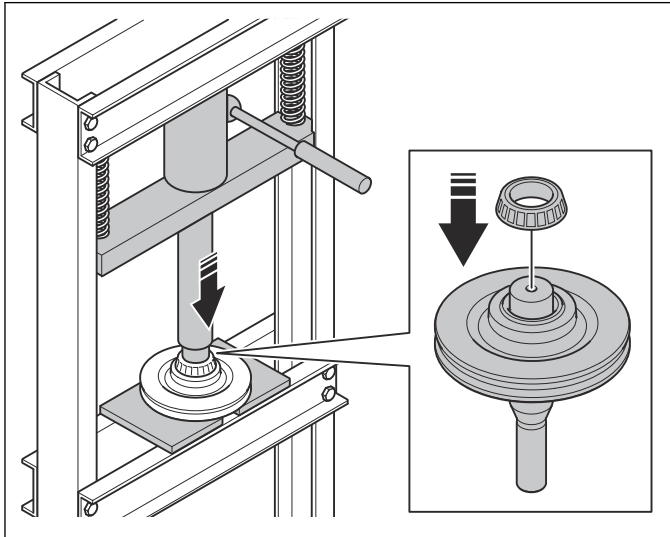
2. Apply LOCTITE® 243 and install the key.



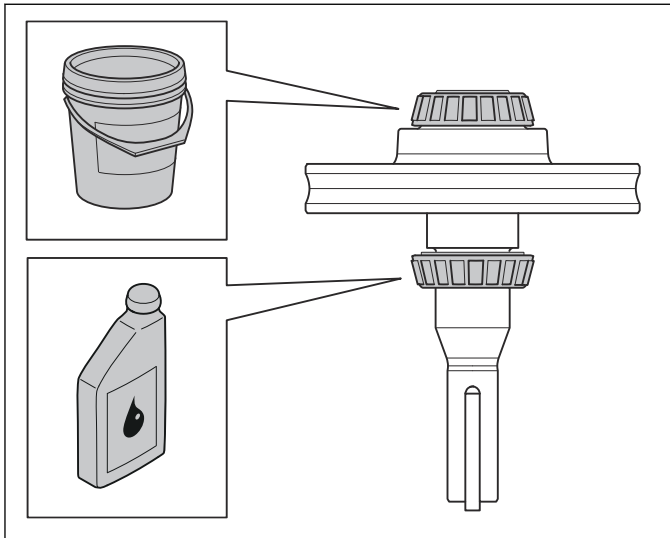
3. Align the hole for the key with the notch in the output gear. Install the output gear on the output shaft.



4. Install the top bearing on the output shaft.

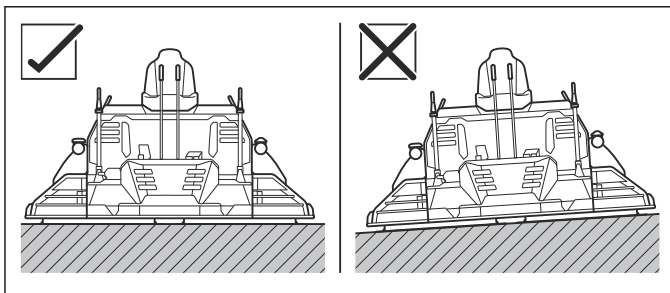


5. Apply Gadus grease on the top bearing and ISO 460 gear oil on the lower bearing.



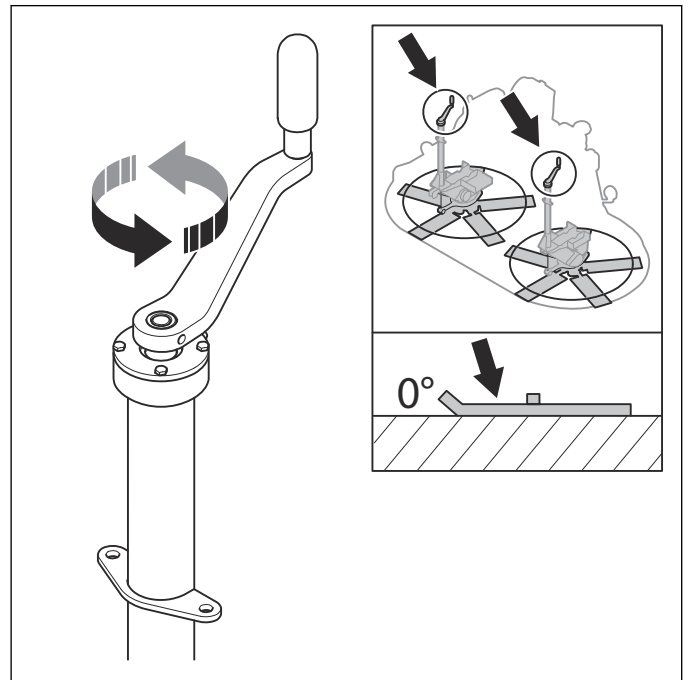
6.14 To disassemble the blade pitch control

1. Put the product on a flat, level surface with the blades flat.



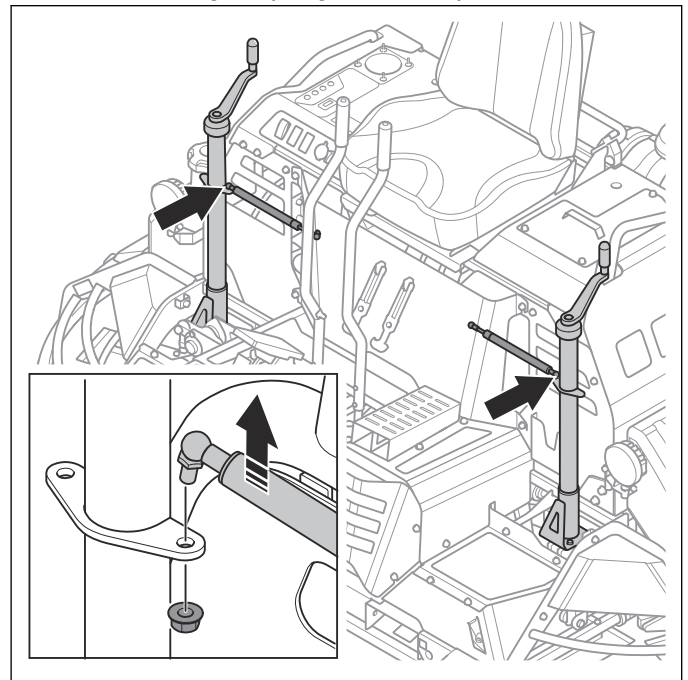
2. Stop the engine and disconnect the battery.

3. Adjust the blade pitch controls until the blades are flat.

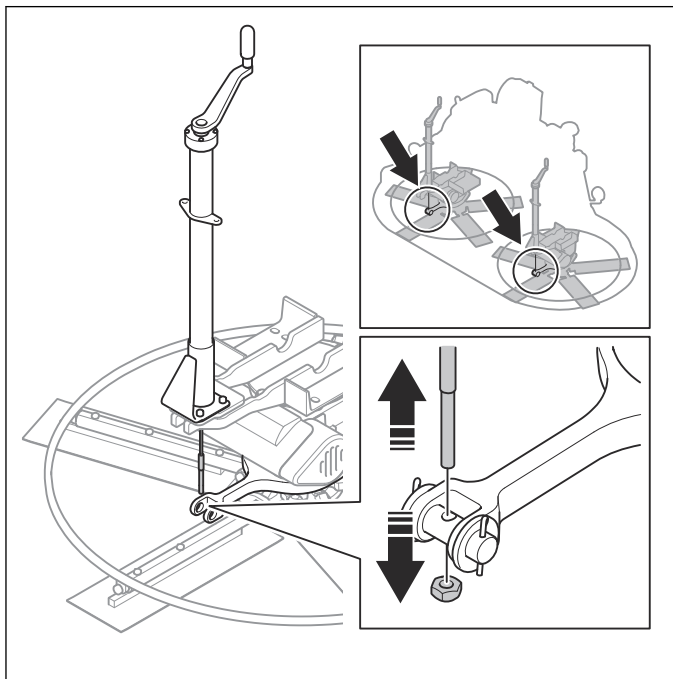


- a) To increase the blade pitch, turn the left blade pitch control clockwise and the right blade pitch control counterclockwise.
- b) To decrease the blade pitch, turn the left blade pitch control counterclockwise and the right blade pitch control clockwise.

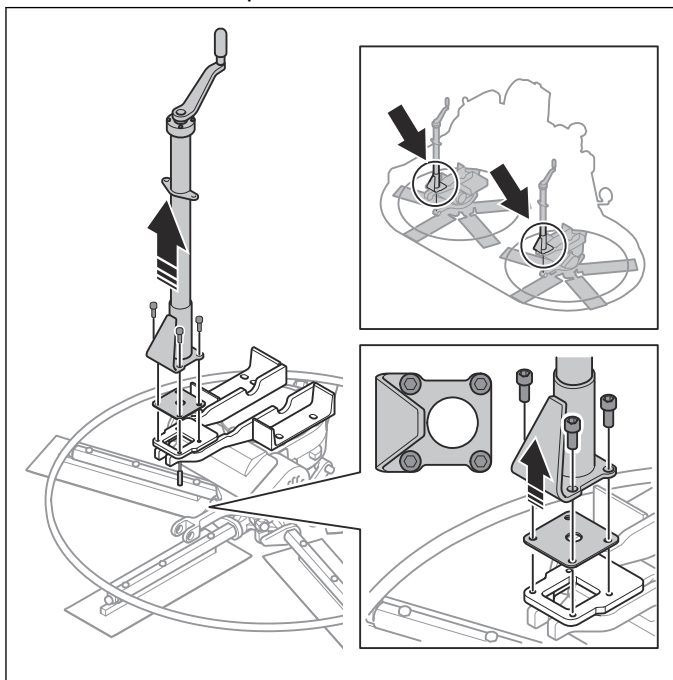
4. Remove the gas springs from the pitch control.



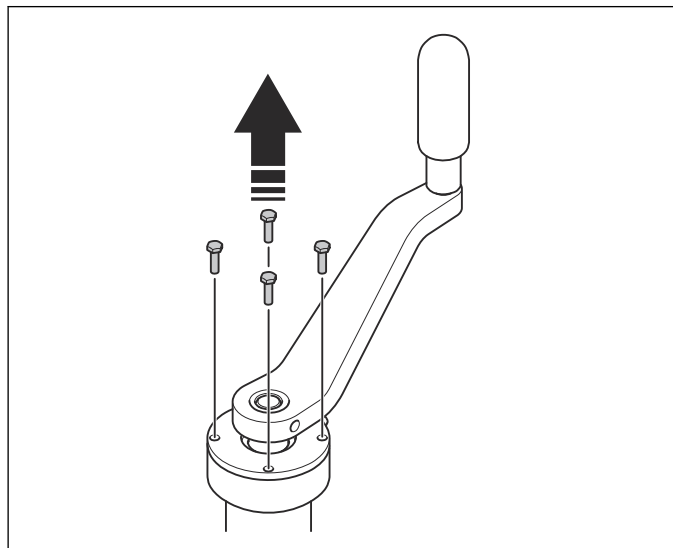
5. Remove the locknuts.



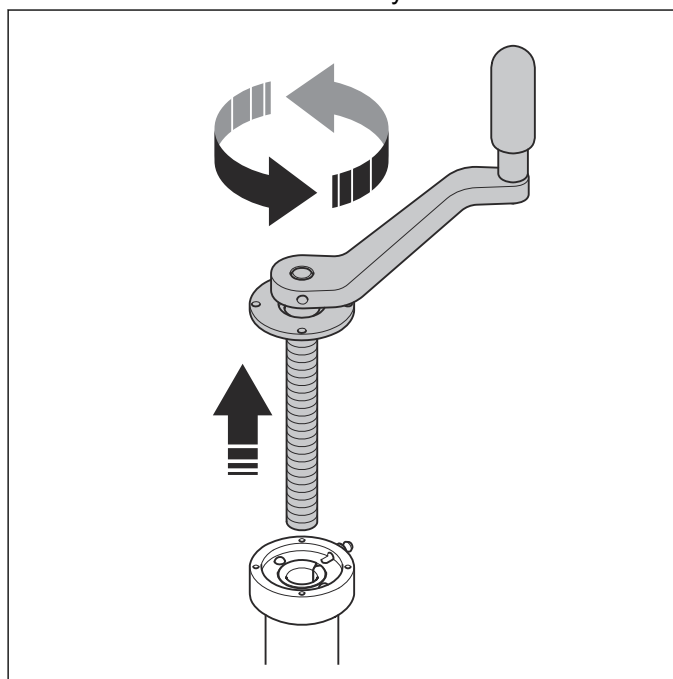
6. Remove the 4 screws and the blade pitch control on each side of the product.



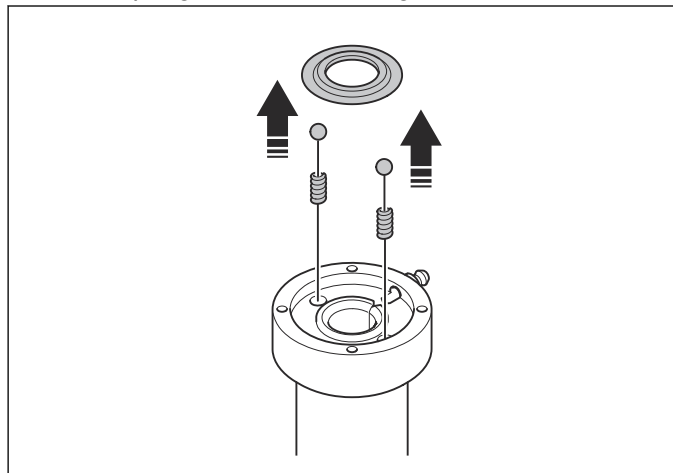
7. Remove the 4 screws.



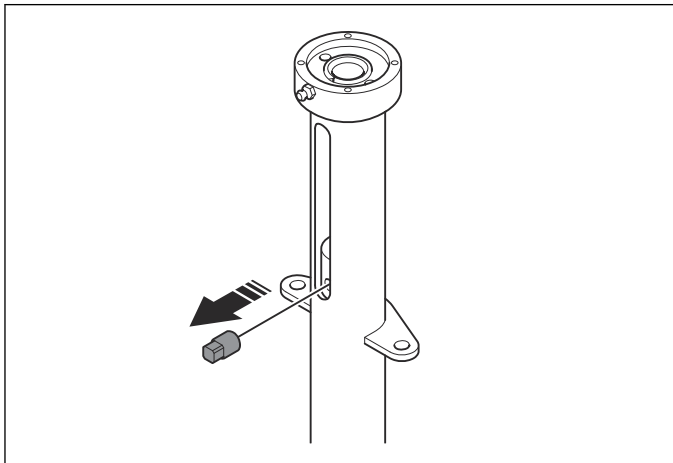
8. Remove the handle assembly.



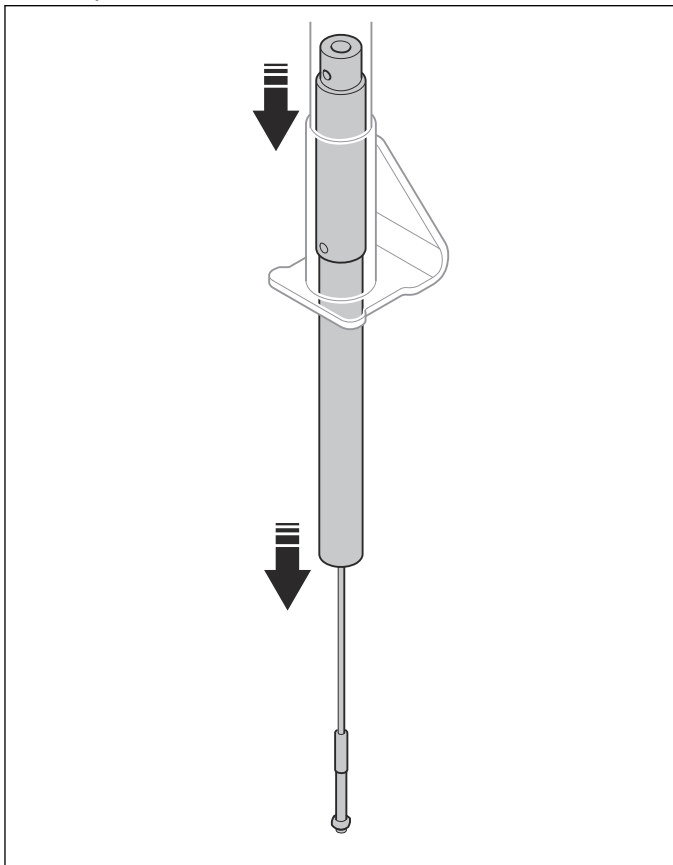
9. Remove the washer, the 2 spring-loaded balls and the 2 springs from the housing.



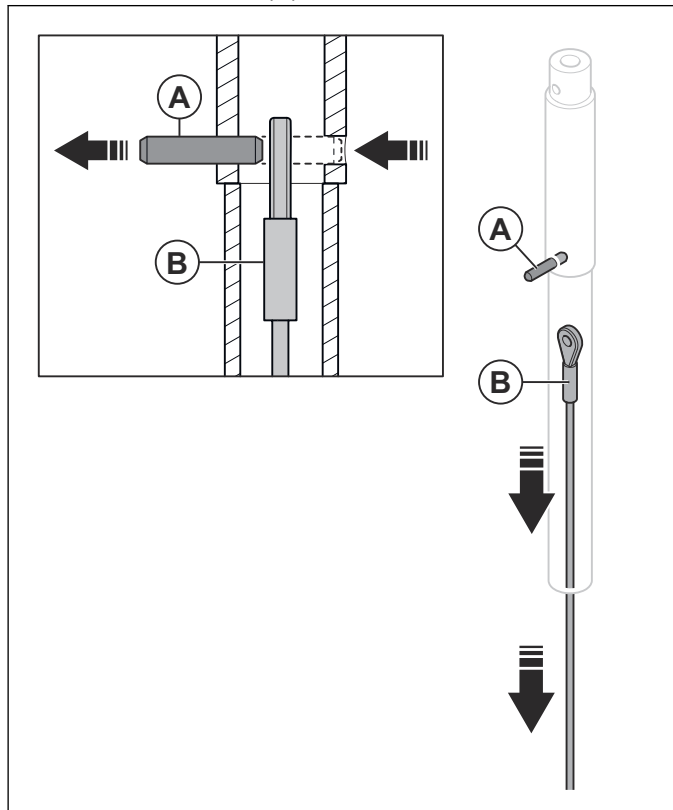
10. Remove the index bolt.



11. Move the rod, the cable tube and the cable out of the pitch control tube.

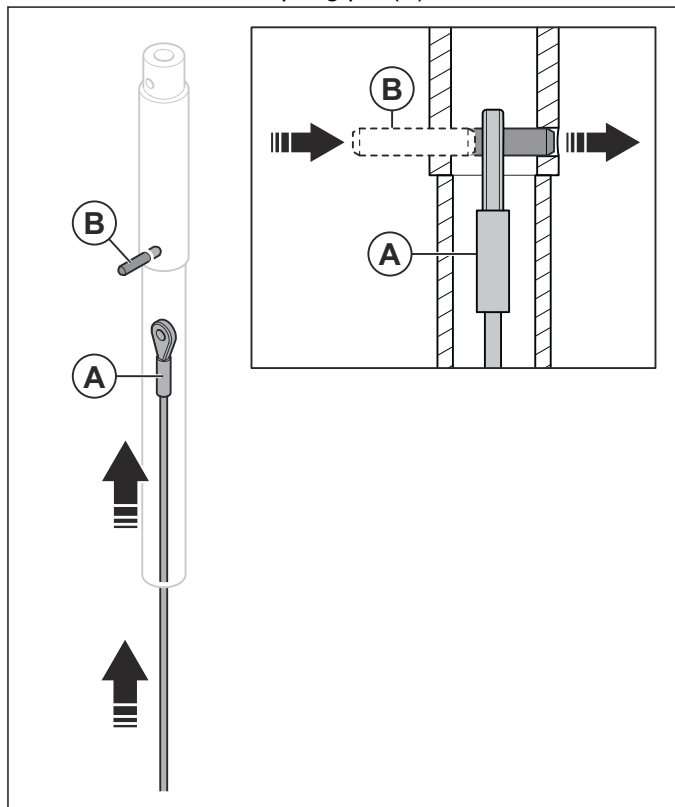


12. Push the pin (A) half through the pitch control and remove the cable (B).

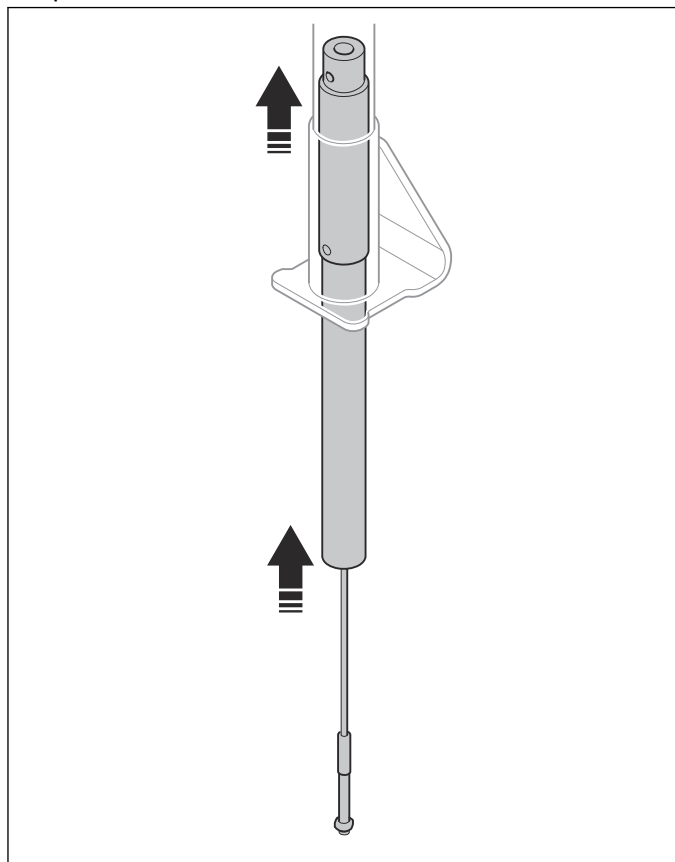


6.15 To assemble the blade pitch control

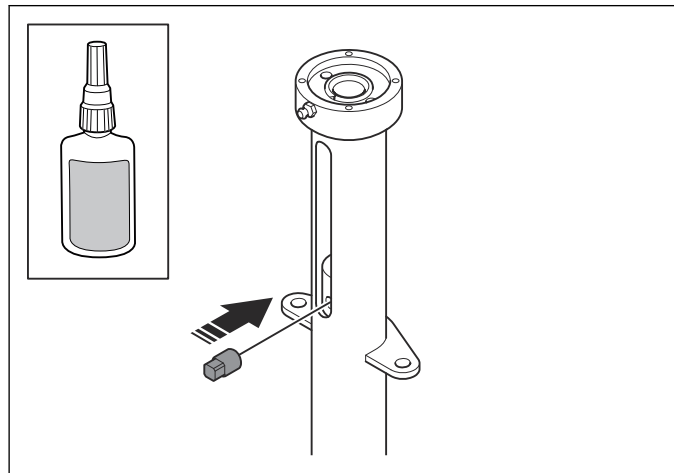
1. Install the cable into the cable tube (A) and attach the cable with the spring pin (B).



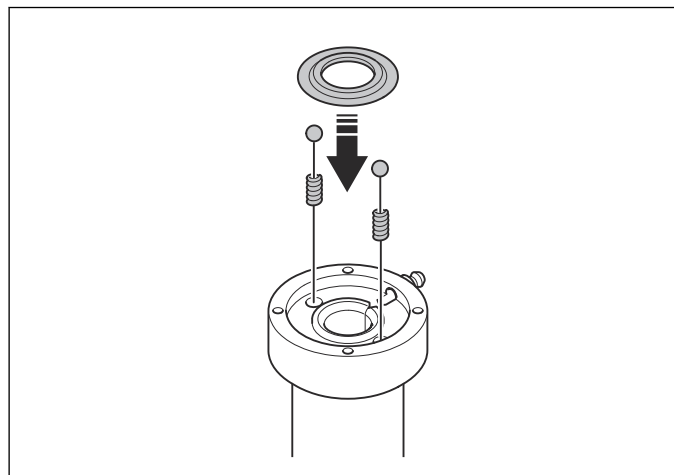
2. Install the rod, the cable tube and the cable into the pitch control tube.



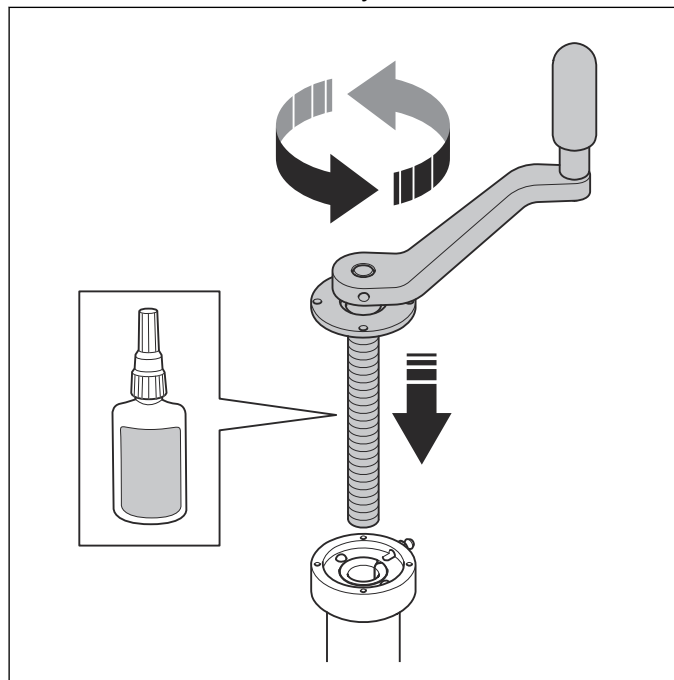
3. Apply LOCTITE® 243 to the threads of the index bolt and install the index bolt.



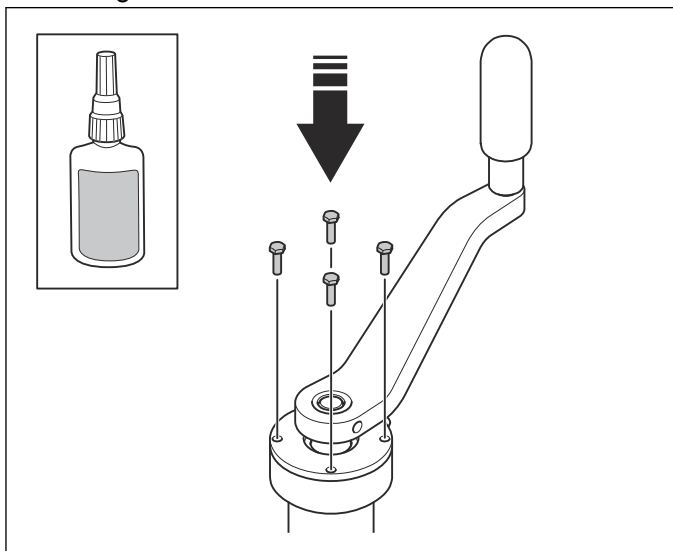
4. Install the washer, the 2 springs and the 2 spring-loaded balls.



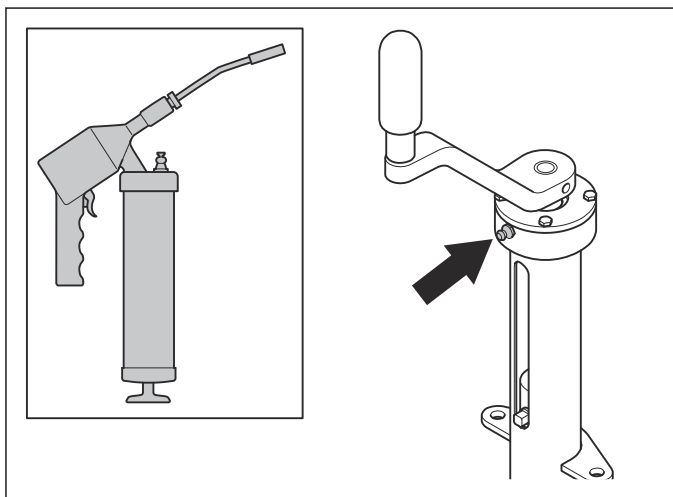
5. Apply oil to the threads of the handle assembly and install the handle assembly.



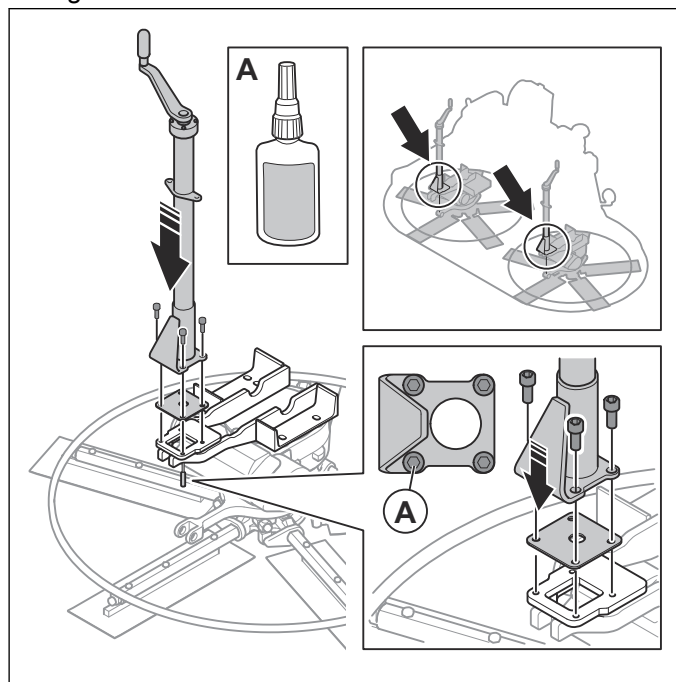
6. Apply LOCTITE® 243 to the threads on the 4 screws and tighten the screws.



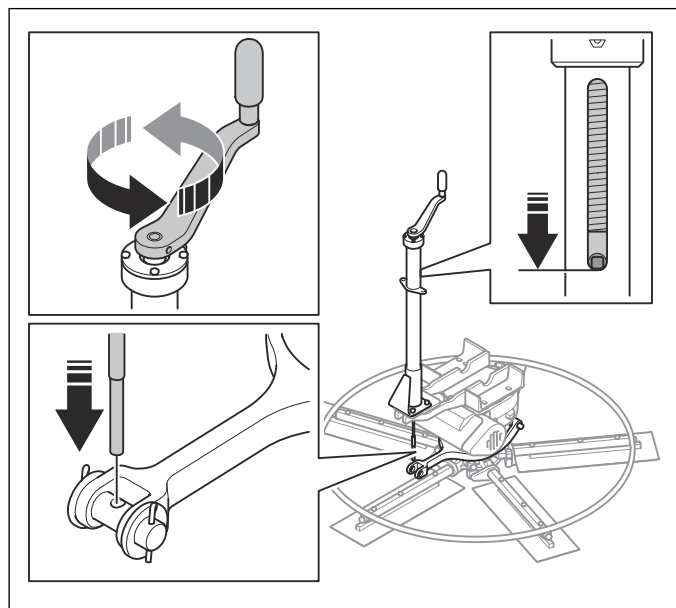
7. Lubricate the housing through the grease nipple. Use Alvania RL 2.



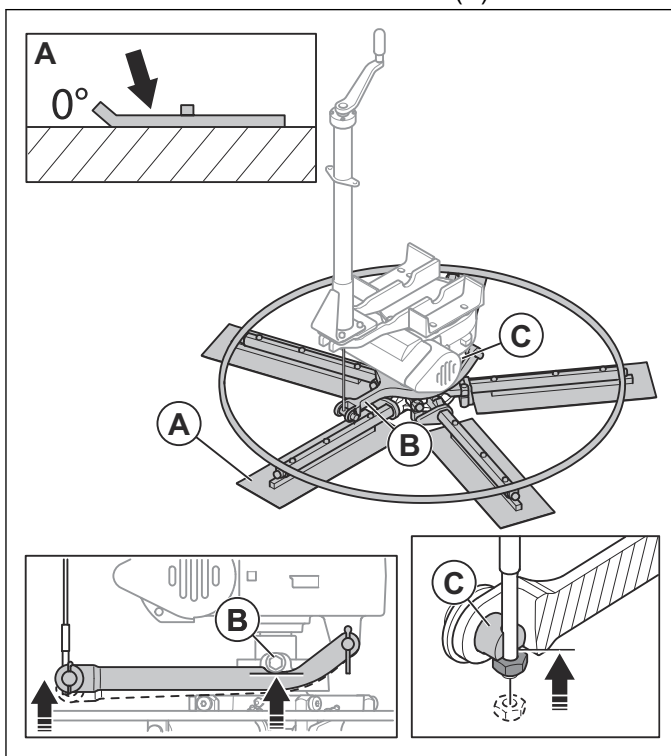
8. Apply LOCTITE® 243 to the threads on the 4 screws (A). Install the blade pitch control on the product and tighten the screws.



9. Turn the handle to its lowest position and put the cable into the cable mount.



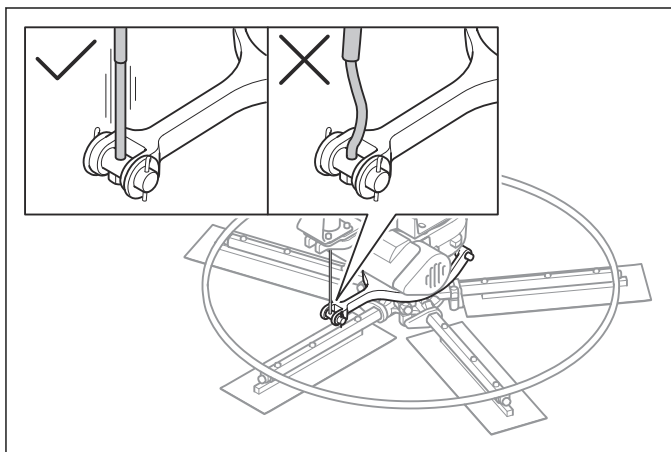
10. Make sure that the blades are flat (B).



11. Lift the yoke until it touches the rollers (C).

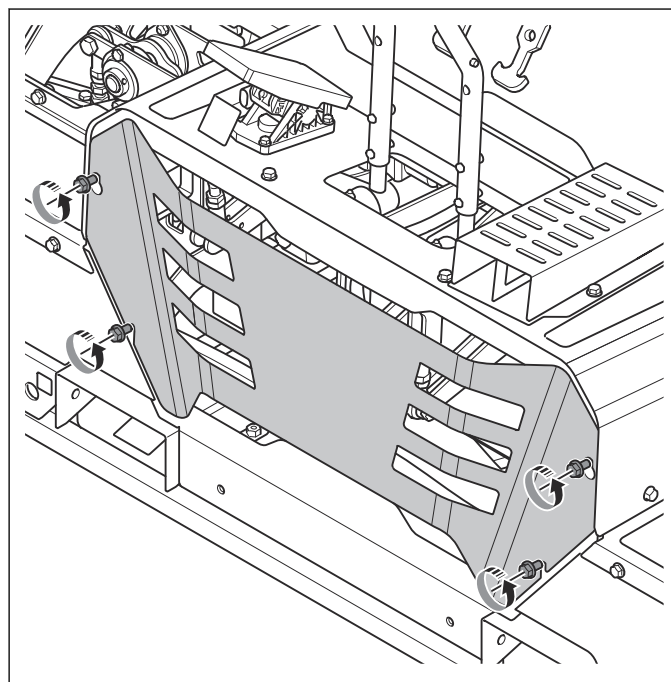
12. Turn the locknut until it touches the cable mount (D).

13. Make sure that the cable is tensioned.

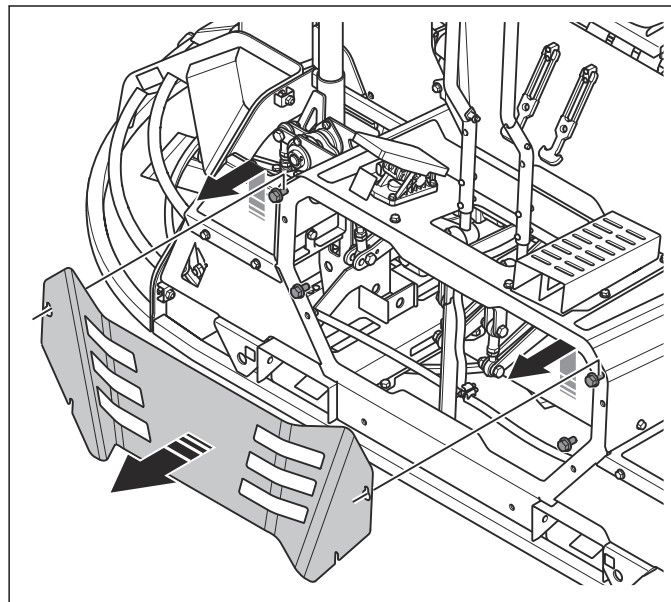


6.16 To remove the steering system

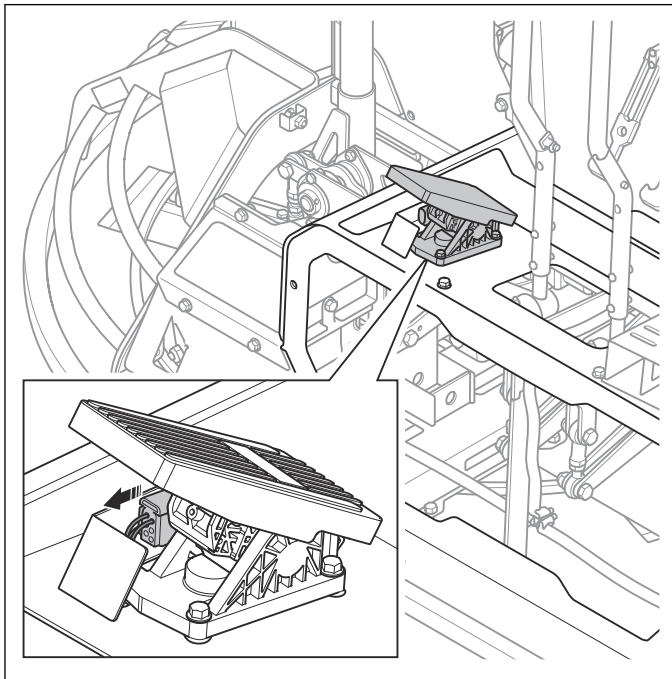
1. Loosen the 4 screws on the front cover.



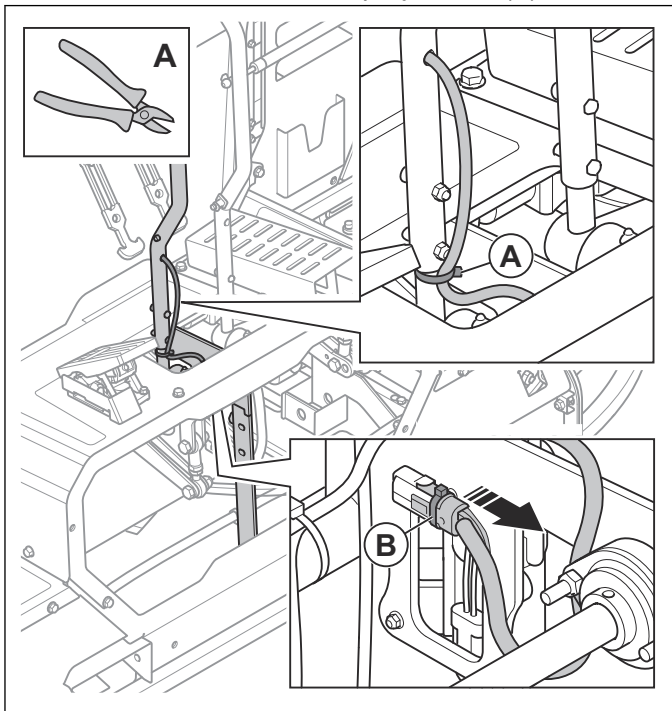
2. Remove the front cover.



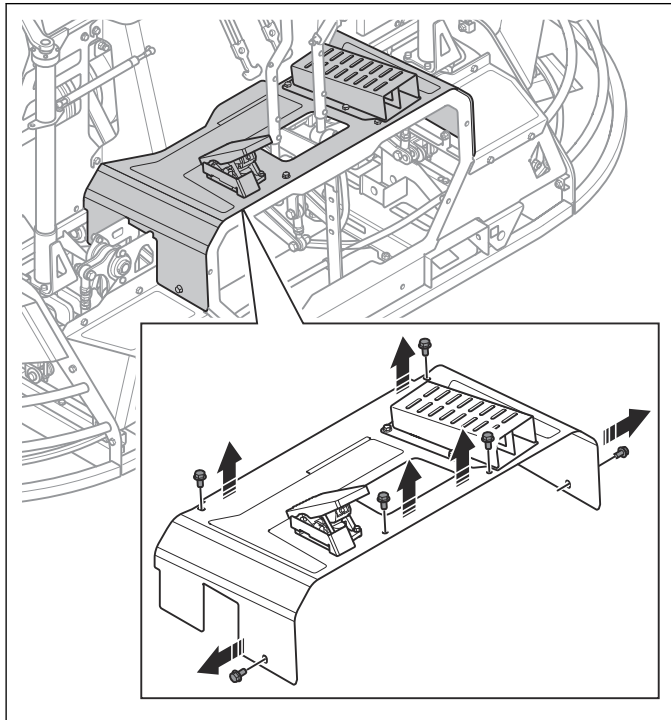
3. Remove the connector to the throttle control.



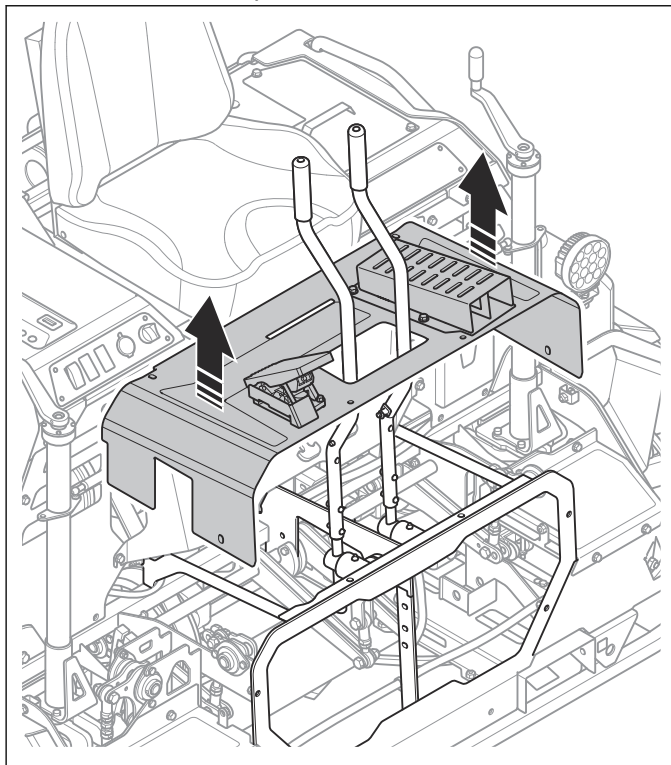
4. Cut the cable tie (A) and disconnect the wire harness for the retardant spray switch (B).



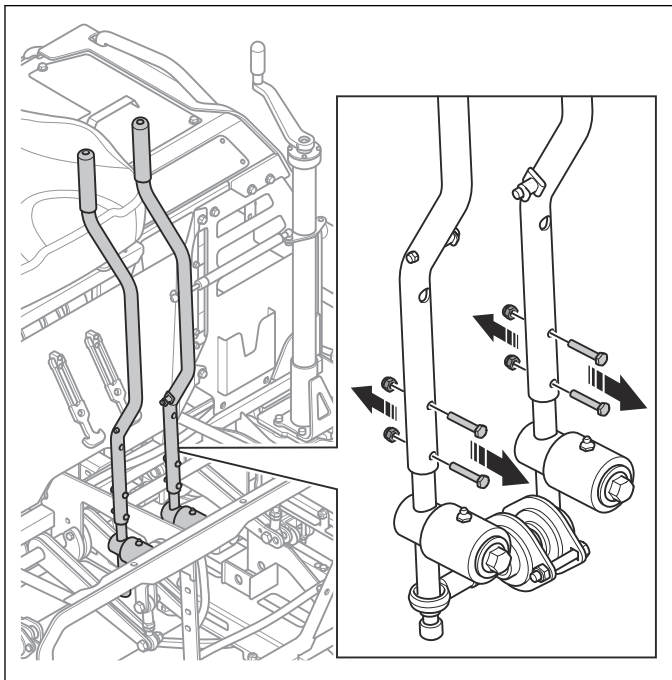
5. Remove the 2 side bolts, 2 side nuts and the 4 top screws.



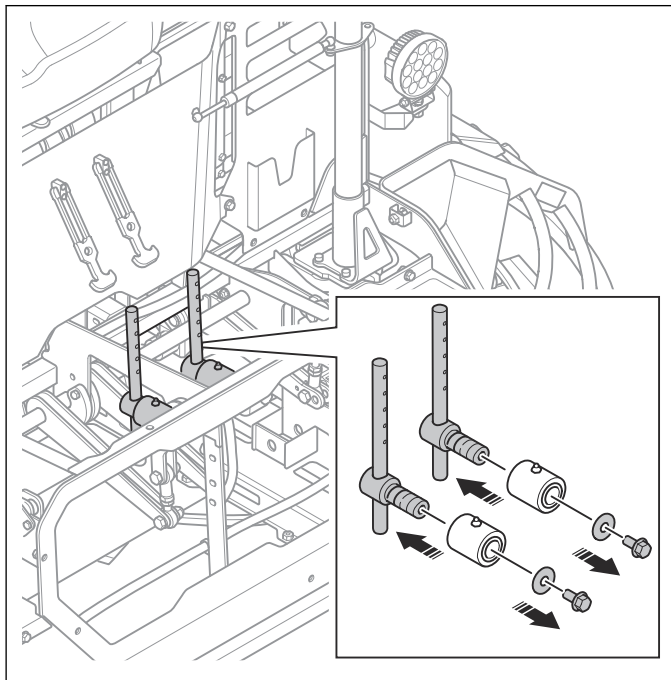
6. Remove the foot plate.



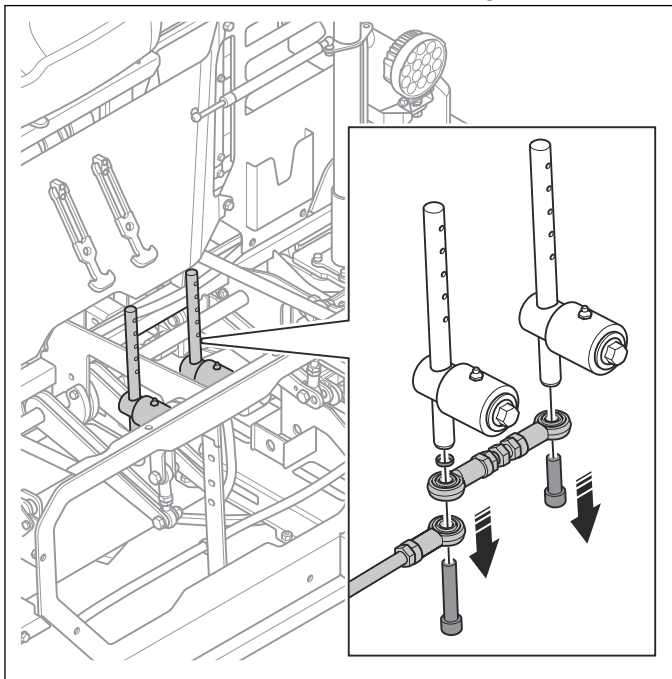
7. Remove the 4 bolts, the 4 nuts and the 2 steering levers.



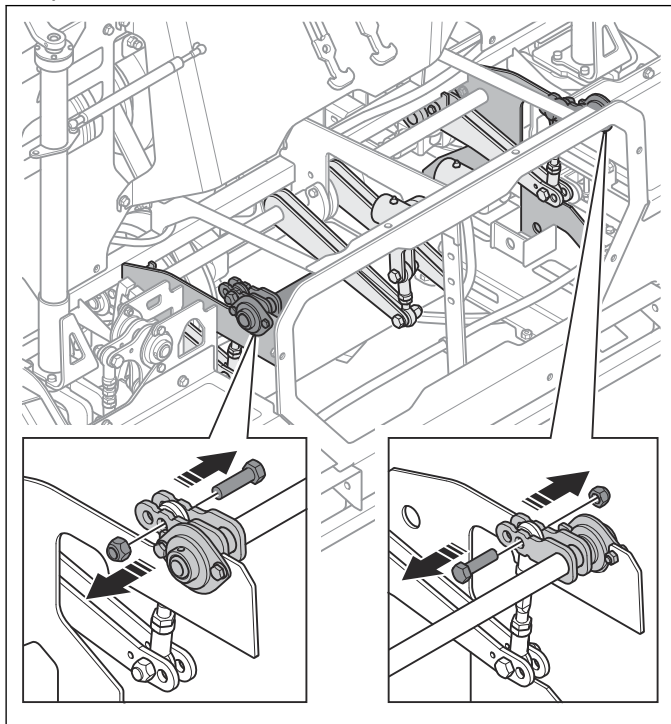
9. Remove the 2 screws, 2 washer and the steering lever mounts.



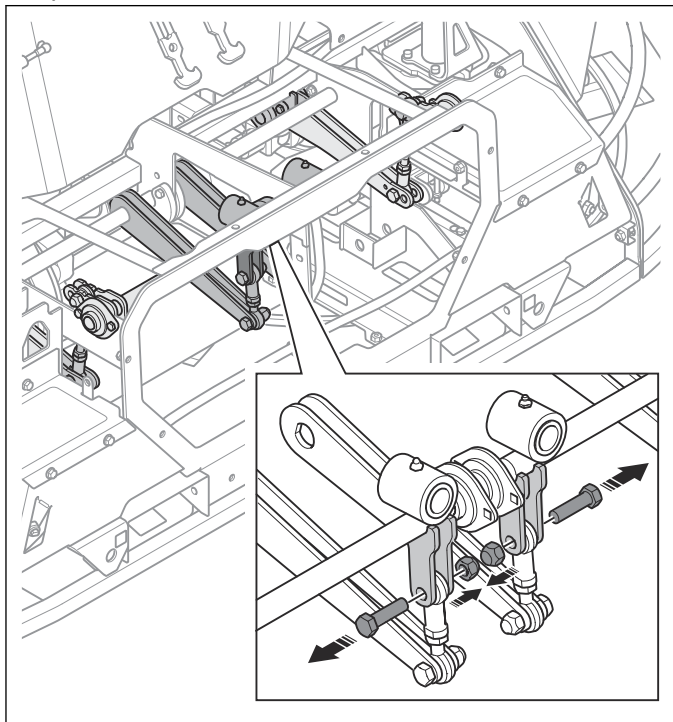
8. Remove the 2 bolts, the spacer and the pivot bracket at the bottom of each steering lever mount.



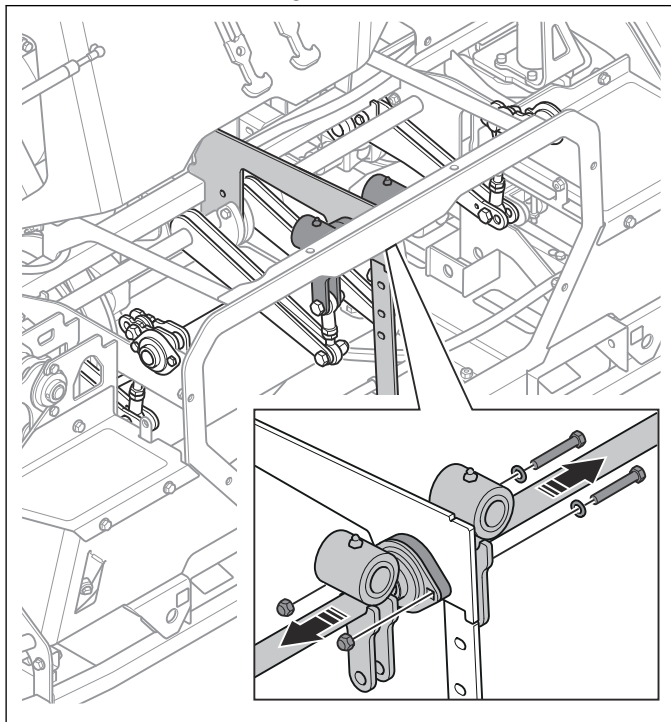
10. Remove the 2 bolts and the 2 nuts from the outer pivot brackets.



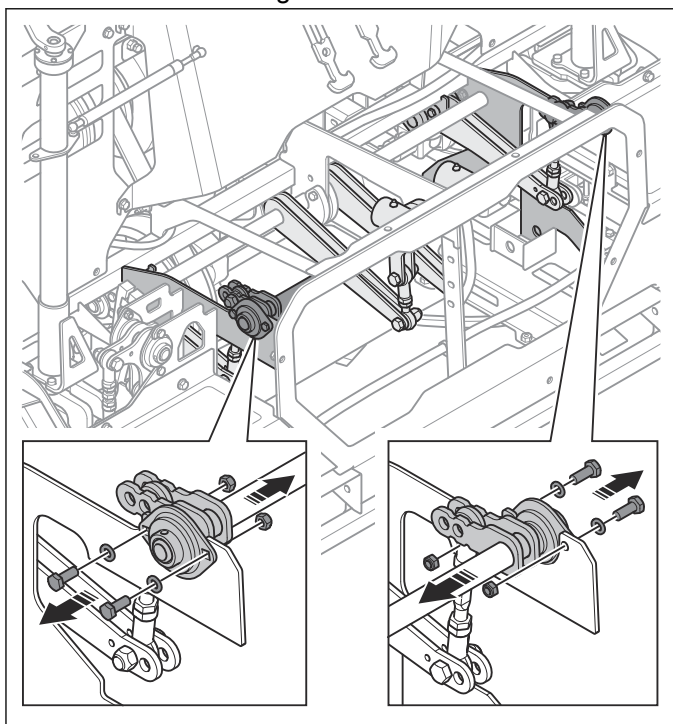
11. Remove the 2 bolts and the 2 nuts from the inner pivot brackets.



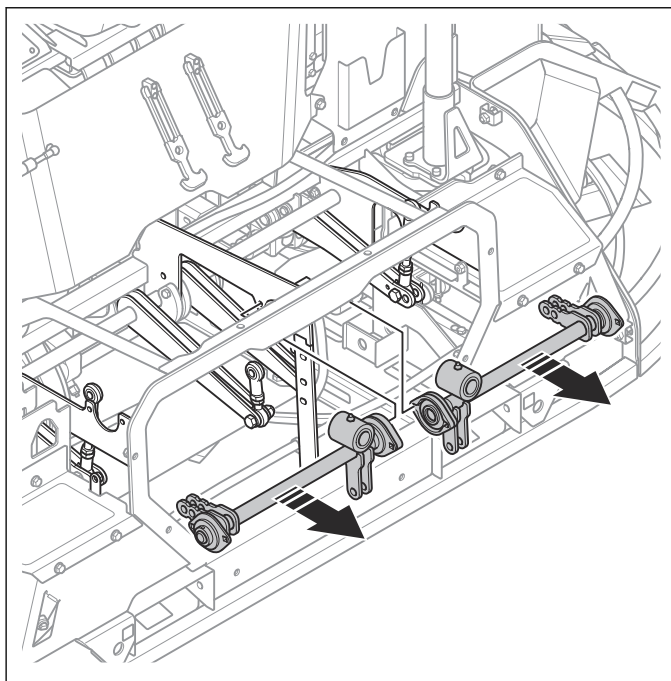
13. Remove the 2 bolts, the 2 washers and the 2 nuts for the center bearings.



12. Remove the 4 bolts, the 4 washers and the 4 nuts for the outer bearings.

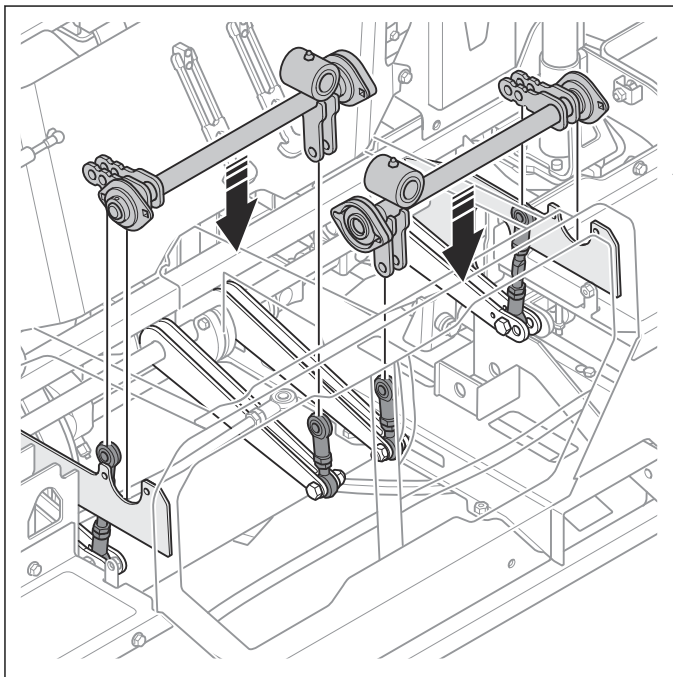


14. Remove the control shaft.

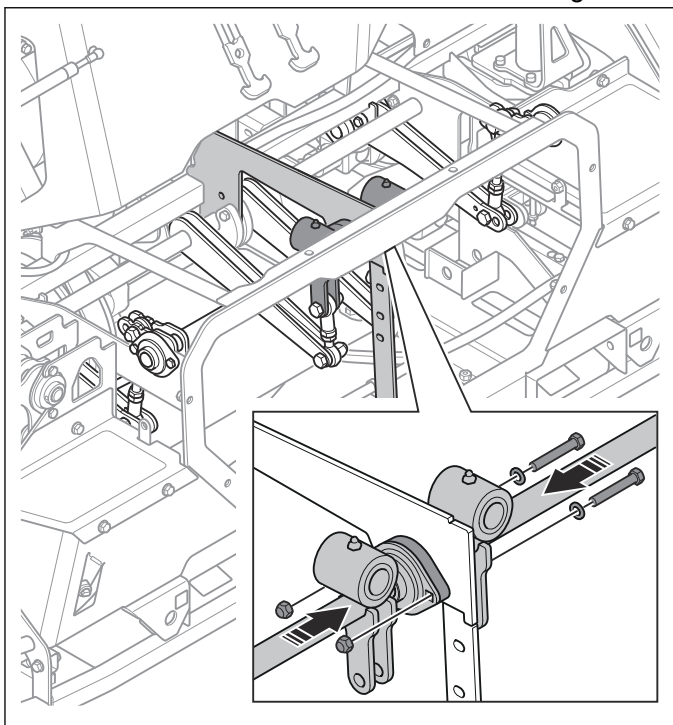


6.17 To install the steering system

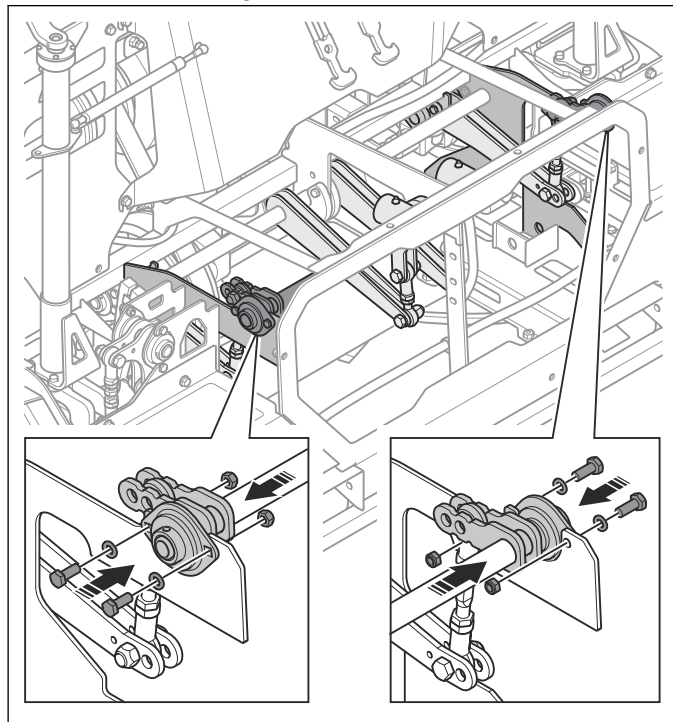
1. Install the control shaft.



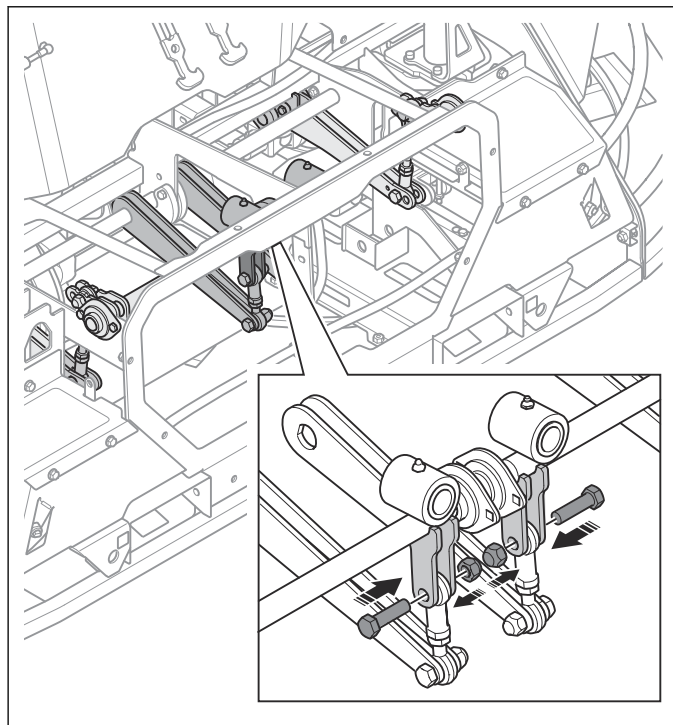
2. Apply grease to the center bearings and the outer bearings. Install the control shaft, the 2 bolts, the 2 washers and the 2 nuts on the center bearings.



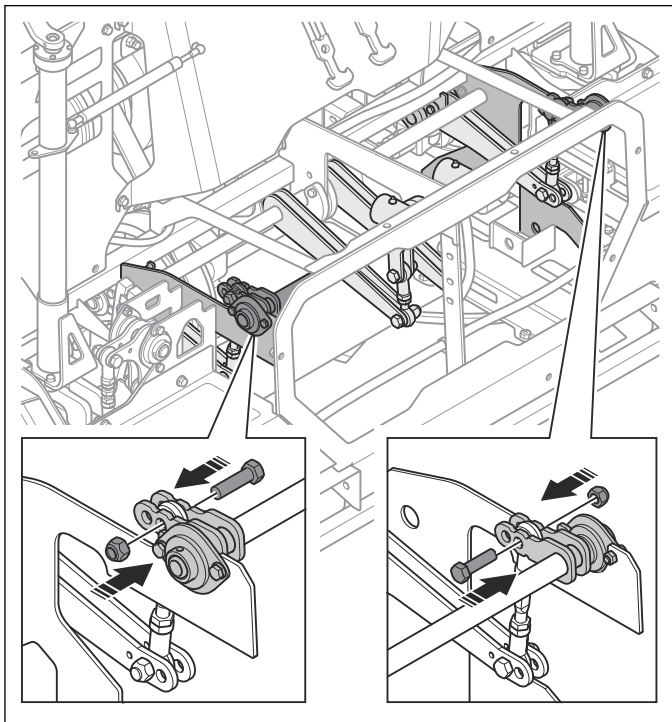
3. Install the 4 bolts, the 4 washers and the 4 nuts on the outer bearing.



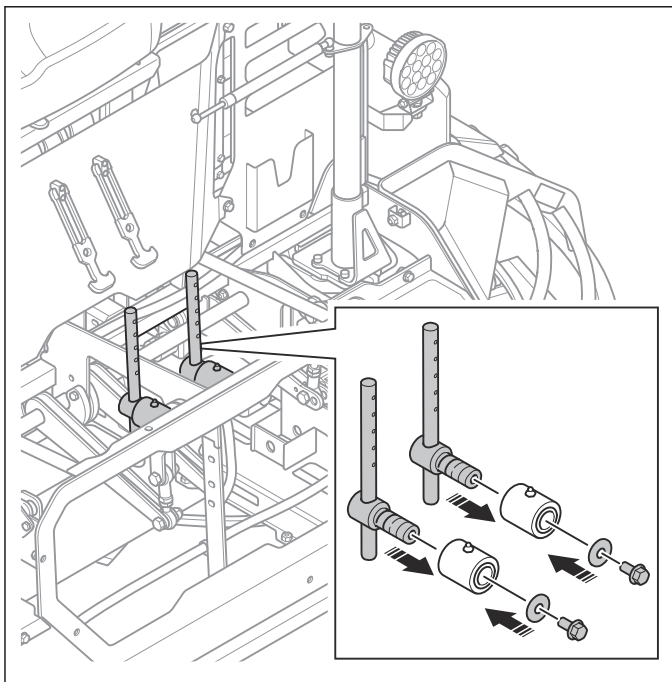
4. Install the 2 bolts and the 2 nuts on the inner pivot brackets.



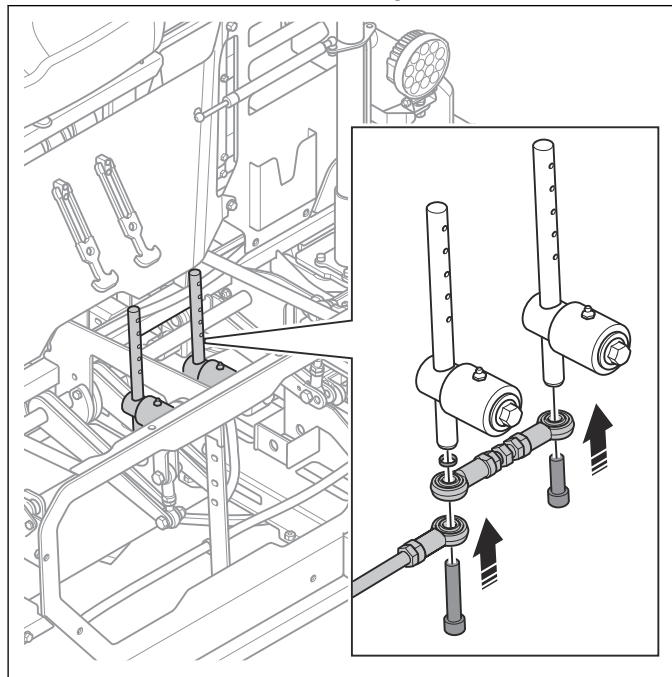
5. Install the 2 bolts and the 2 nuts on the outer pivot brackets.



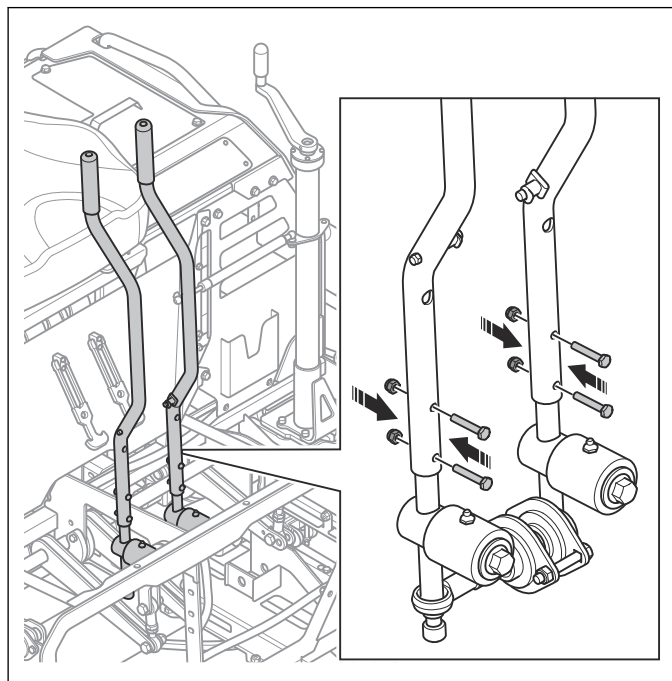
6. Install the steering lever mounts, the 2 screws and the 2 washer.



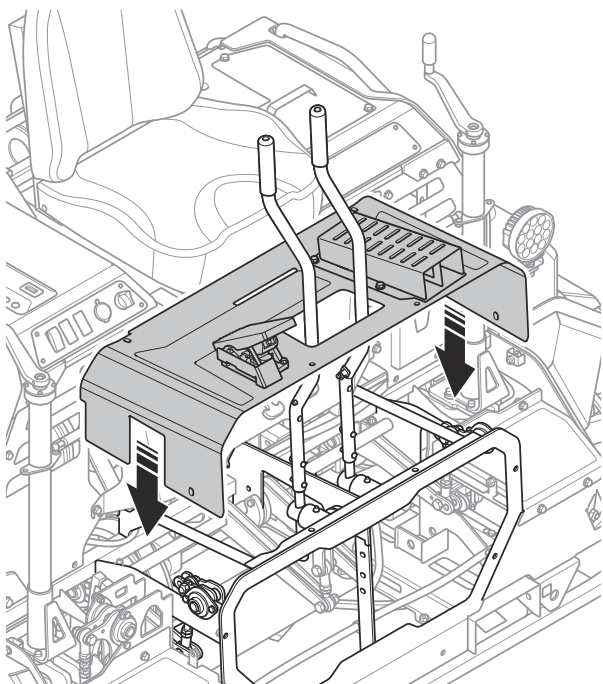
7. Install the pivot bracket, the spacer and the 2 bolts at the bottom of each steering lever mount.



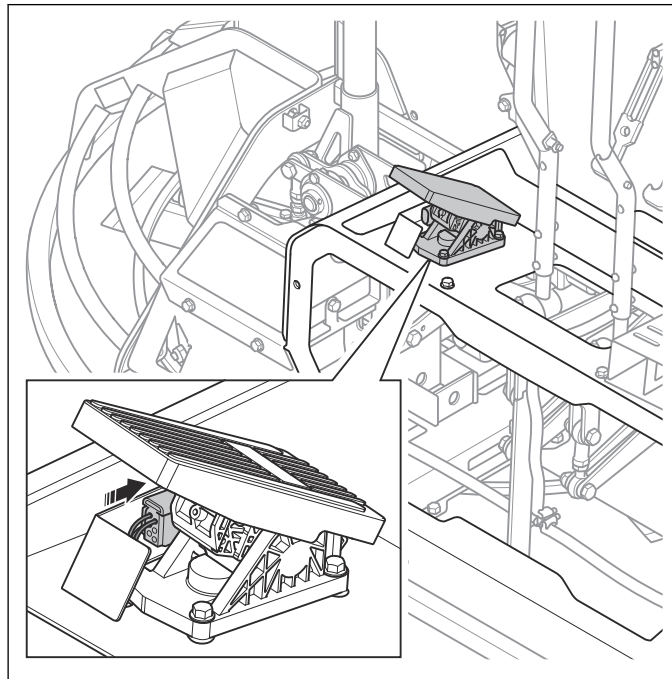
8. Install the 2 steering lever arms, the 4 bolts and the 4 nuts.



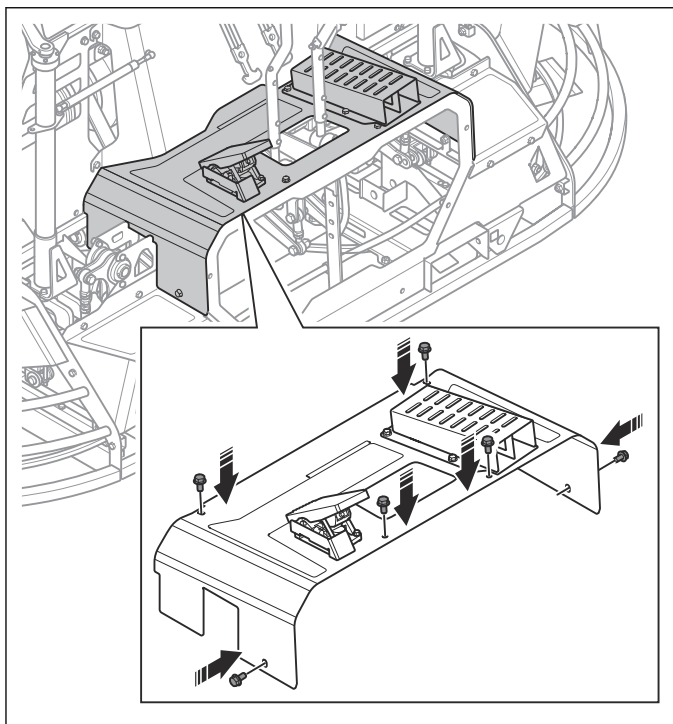
9. Install the foot plate.



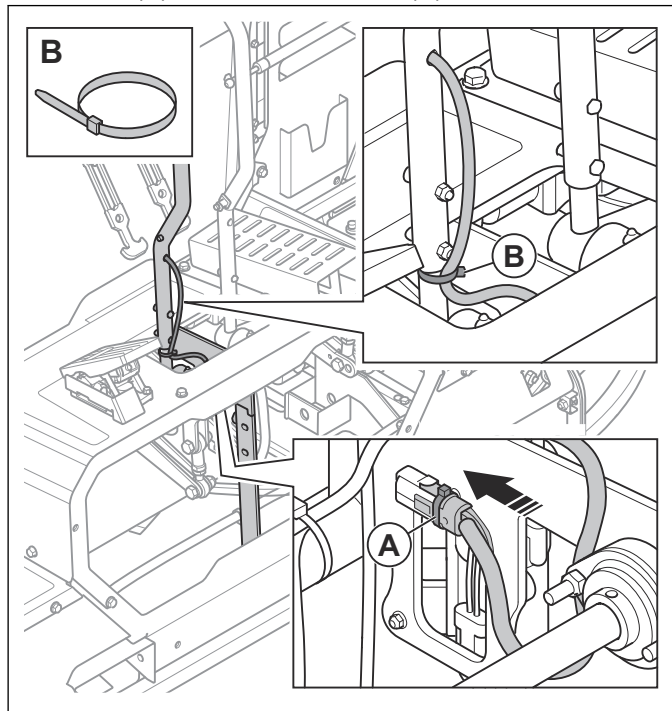
11. Install the connector to the throttle control.



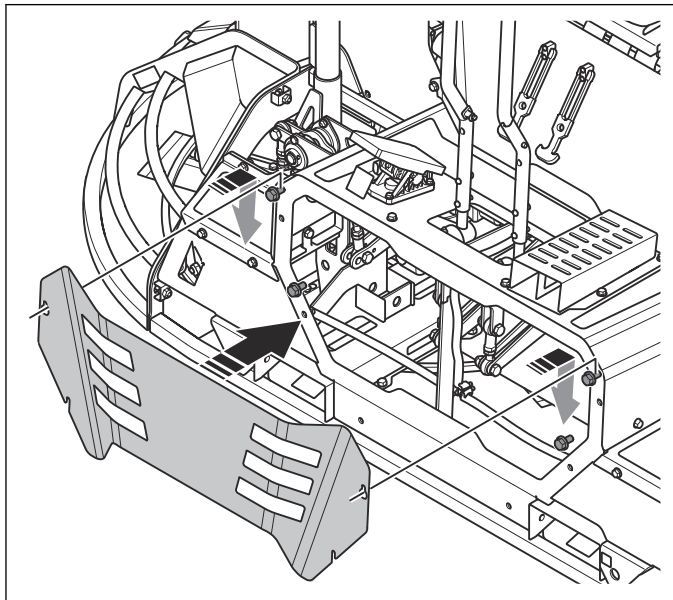
10. Install the 2 side bolts, 2 side nuts and the 4 top screws.



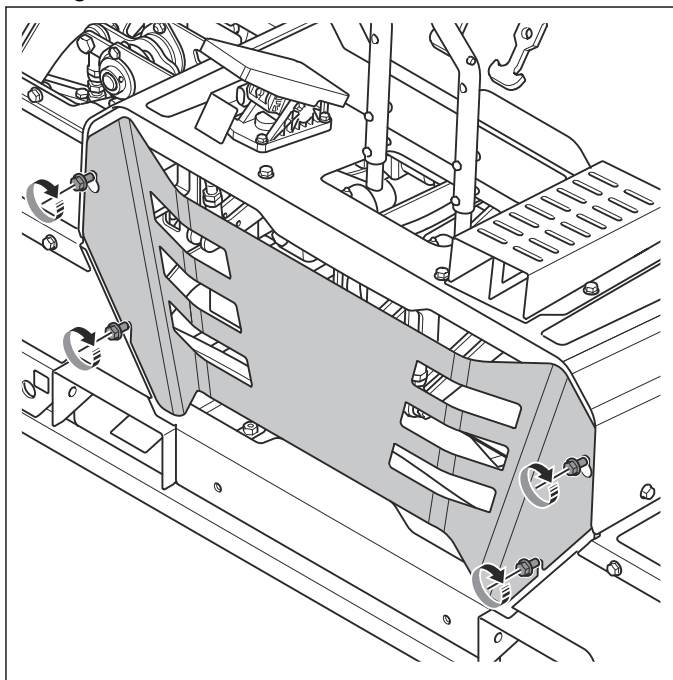
12. Connect the wire harness for the retardant spray switch (A). Put new cable ties (B).



13. Install the front cover.



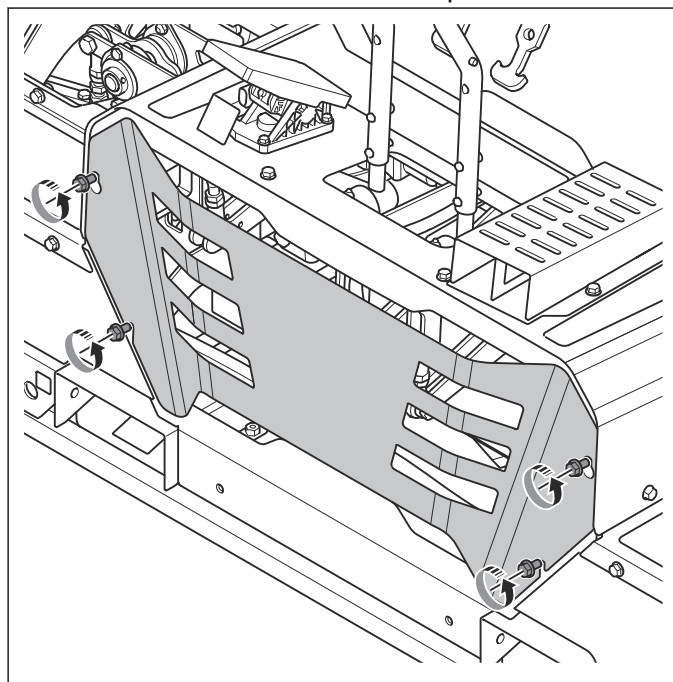
14. Tighten the 4 screws.



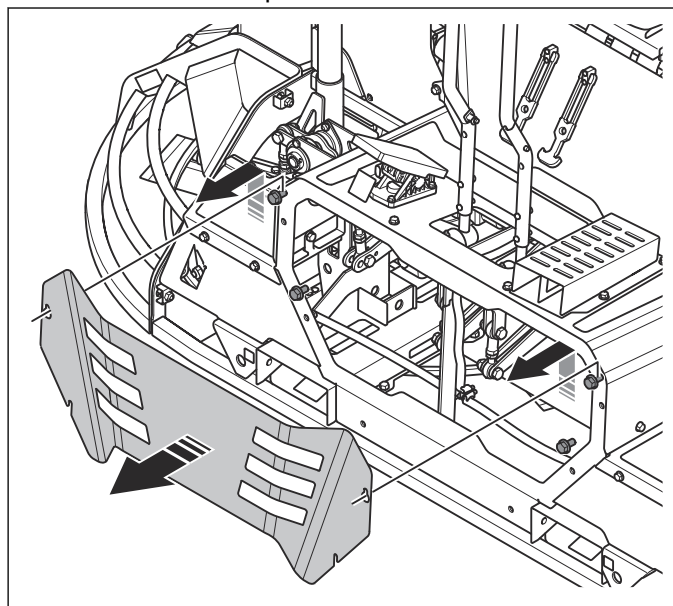
6.18 To adjust the steering levers, forward and rearward

For most operators, the best position for the steering levers is approximately a 5° forward lean.

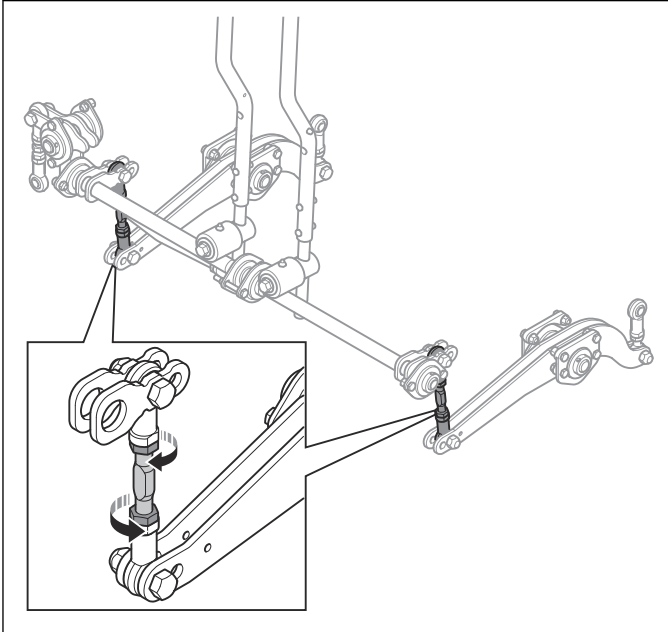
1. Loosen the 4 screws on the front plate.



2. Remove the front plate.

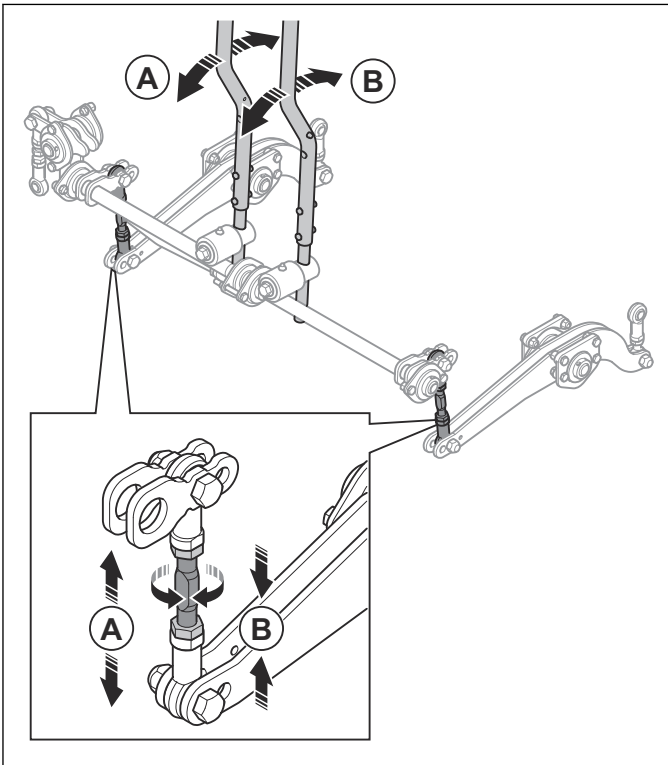


3. Loosen the jam nuts.



4. Turn the linkage.

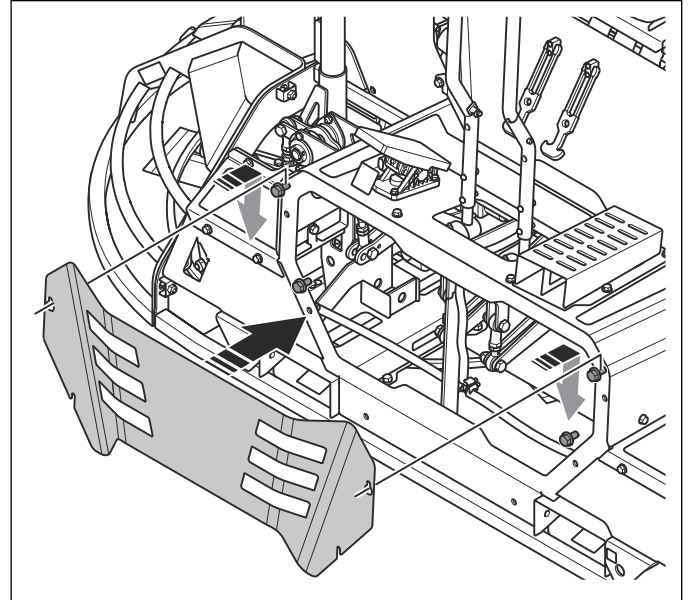
- a) Extend the linkage length to adjust the steering levers forward (A).



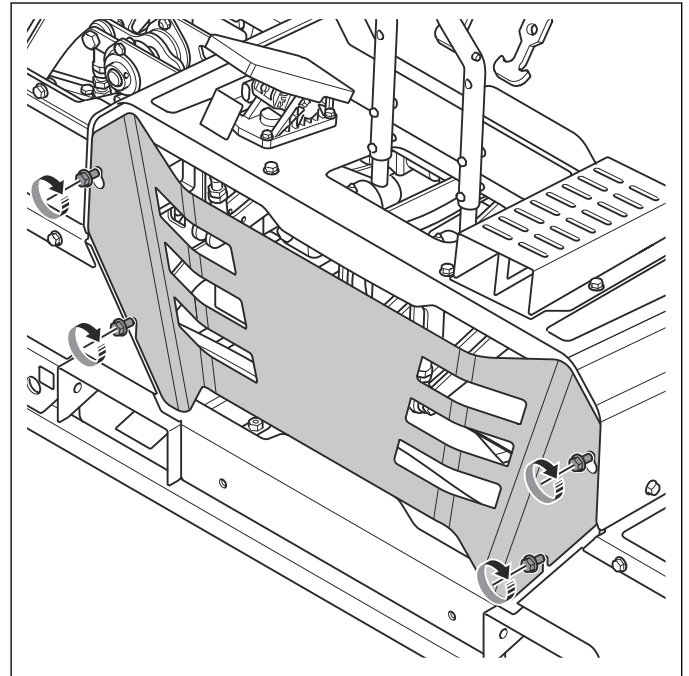
- b) Decrease the linkage length to adjust the steering levers rearward (B).

5. Tighten the jam nuts.

6. Install the front plate.



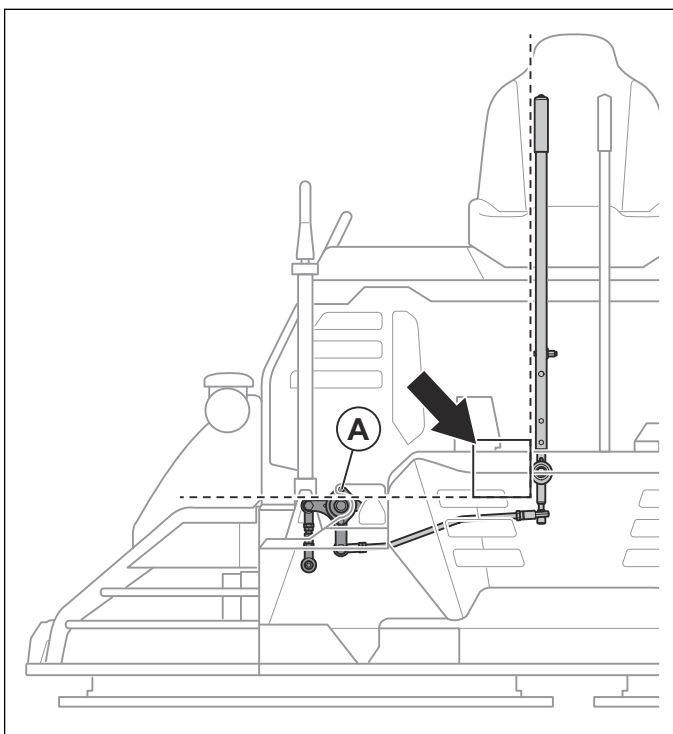
7. Tighten the 4 screws.



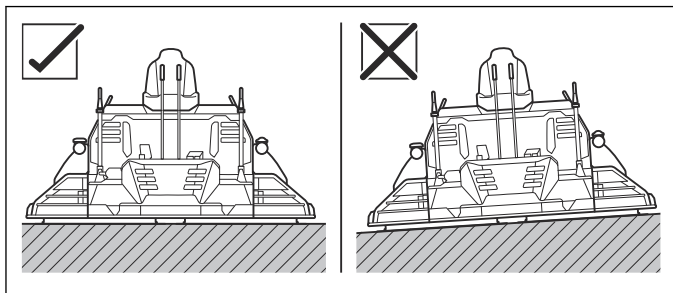
6.19 To set the steering levers in center position

The pivot bracket (A) must be in a horizontal position when the product is not in operation. The right steering

lever must be in a vertical position when the product is not in operation.

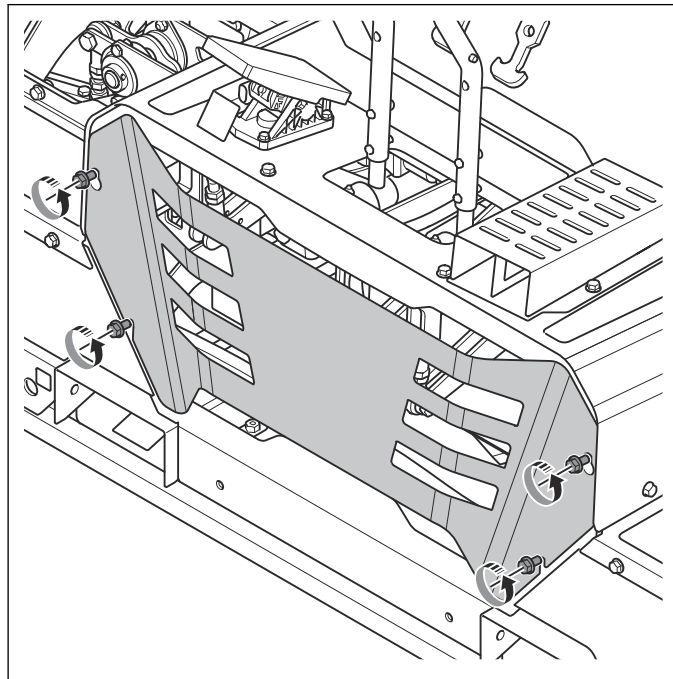


1. Put the product on a flat, level surface with the blades flat.

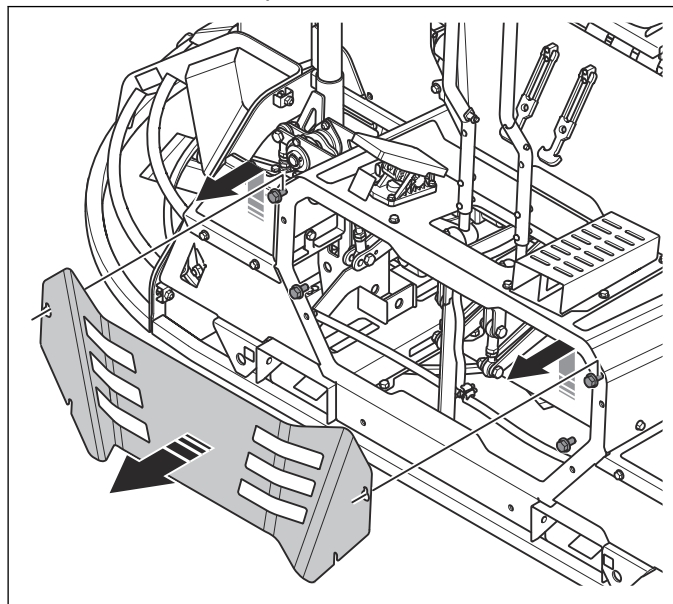


2. Make sure that the movement control levers are in a vertical position and parallel to each other.

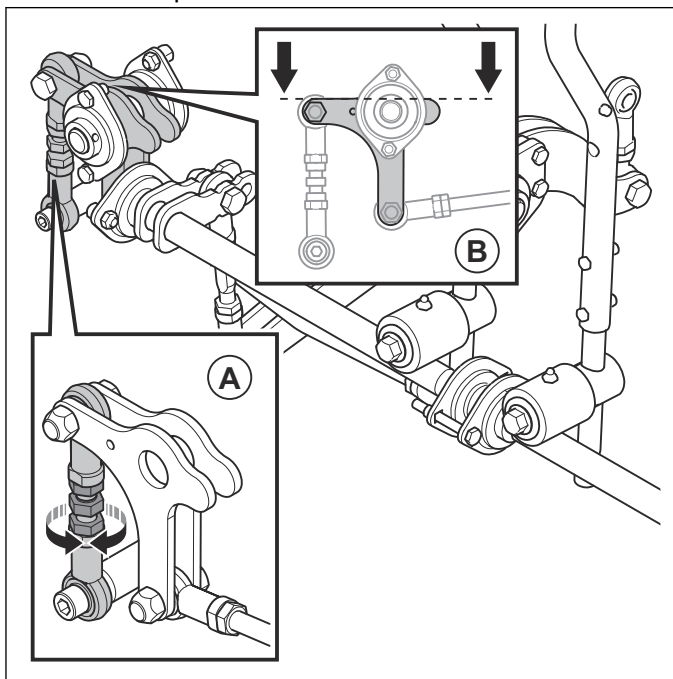
3. Loosen the 4 screws in the front plate.



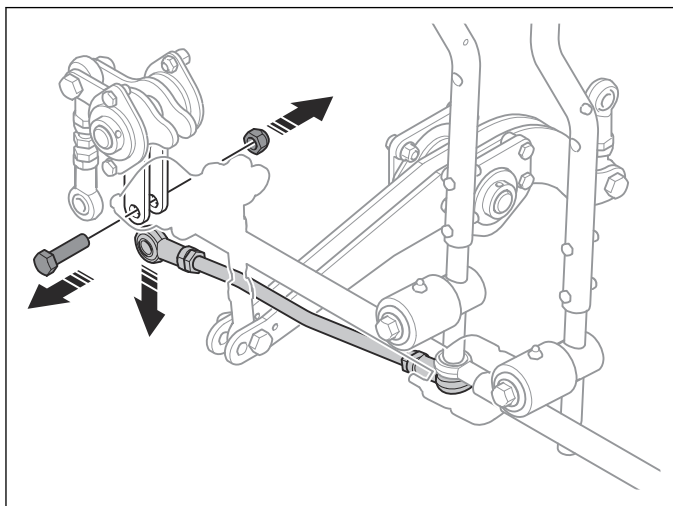
4. Remove the front plate.



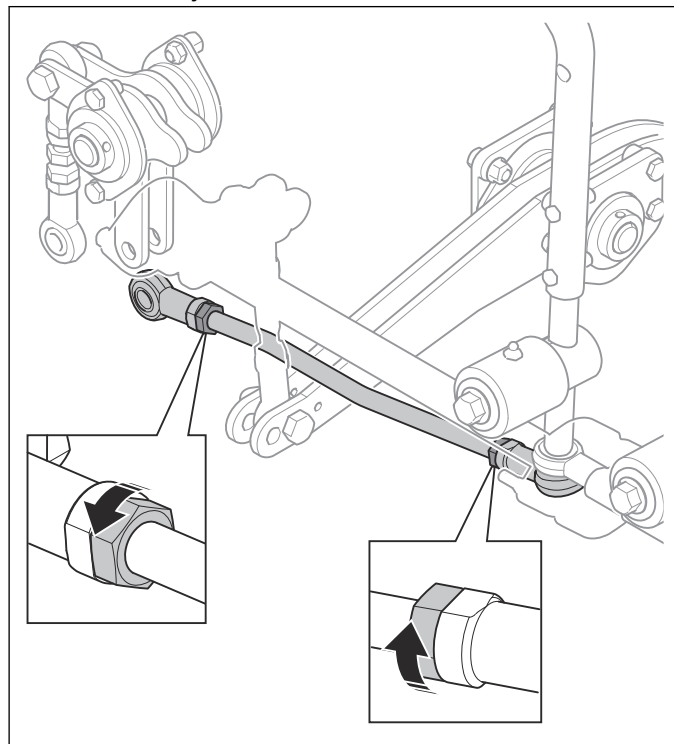
5. Adjust the linkage (A) until the bracket (B) is in a horizontal position.



6. Remove the nut and the bolt.

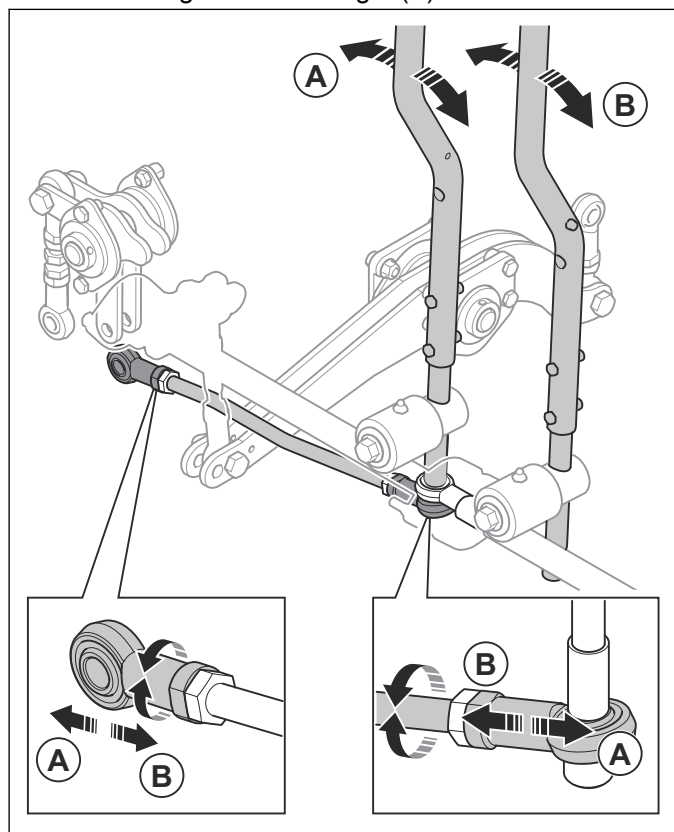


7. Loosen the jam nuts.



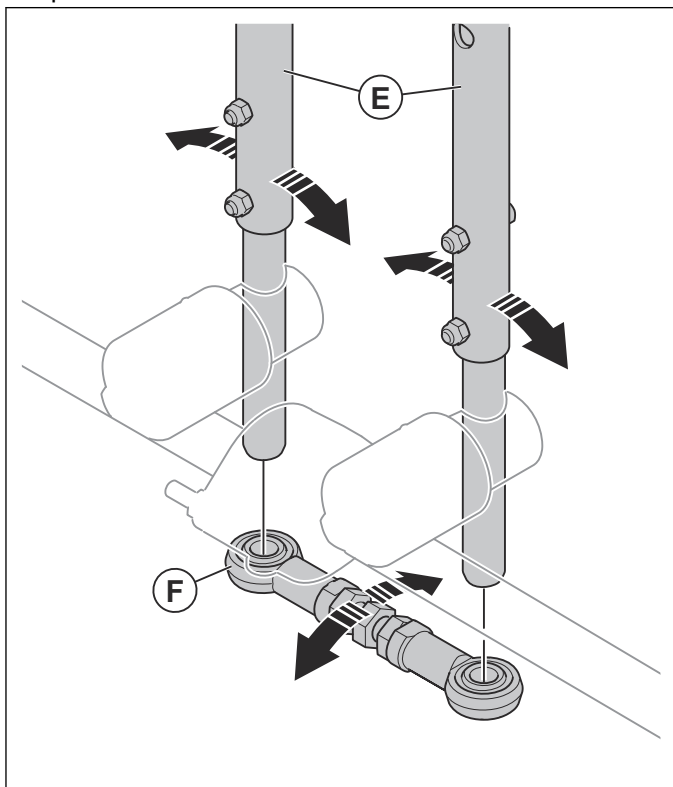
8. Turn the linkage.

- a) Extend the linkage length to adjust the right steering lever to the right (A).

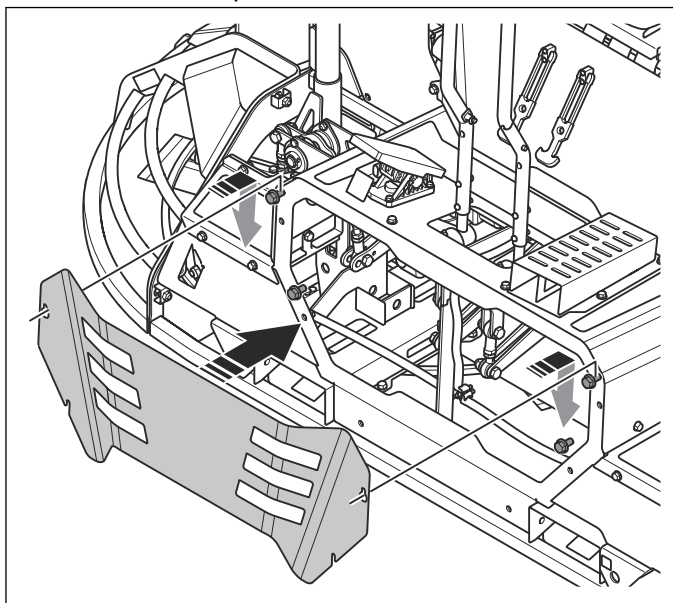


- b) Decrease the linkage length to adjust the right steering lever to the left (B).

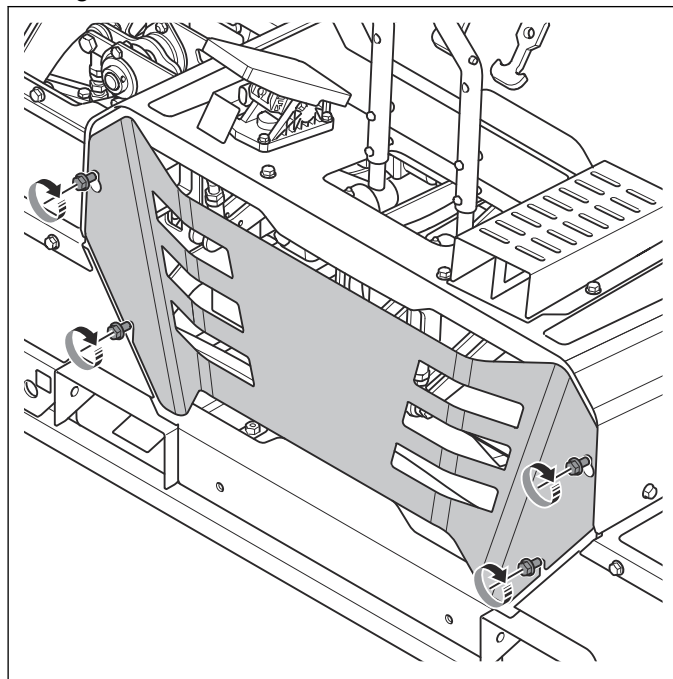
9. Adjust the link (F) to make the steering levers (E) parallel to each other.



10. Install the front plate.



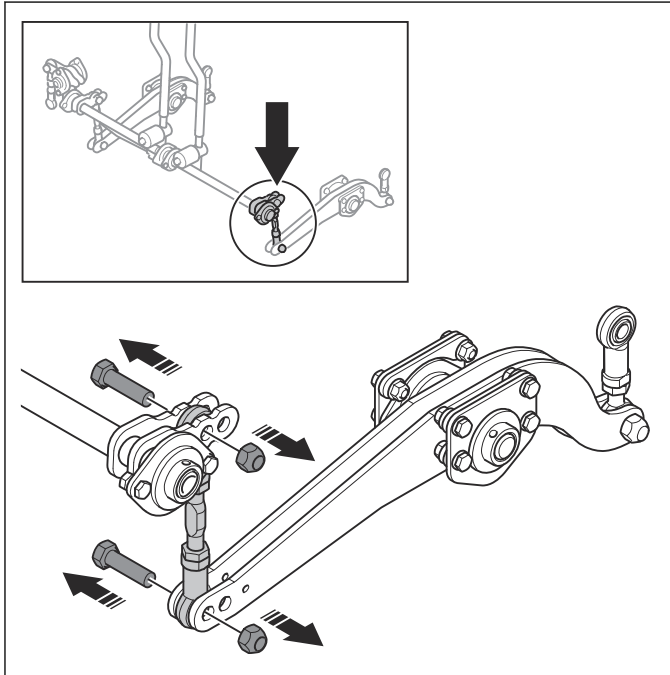
11. Tighten the 4 screws.



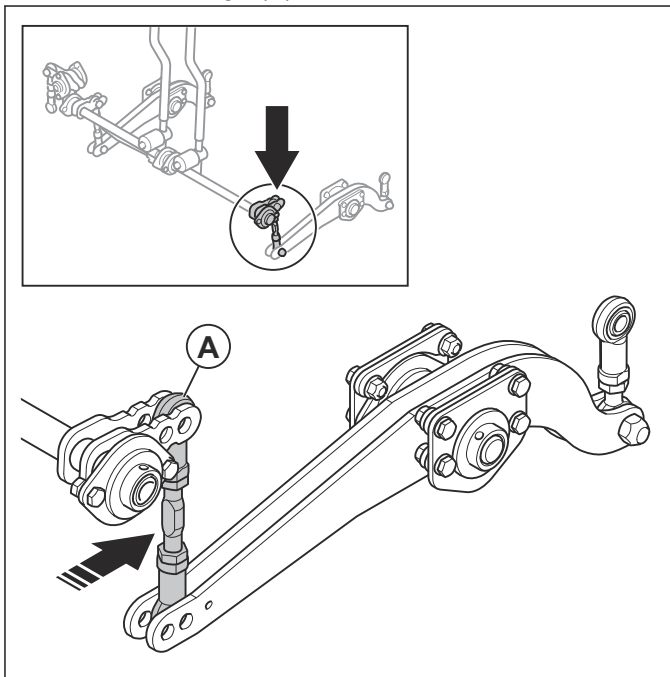
6.20 To adjust the reaction of the steering levers

Adjustment of the connection points on the steering pivots sets how sensitive the reaction of the steering levers is.

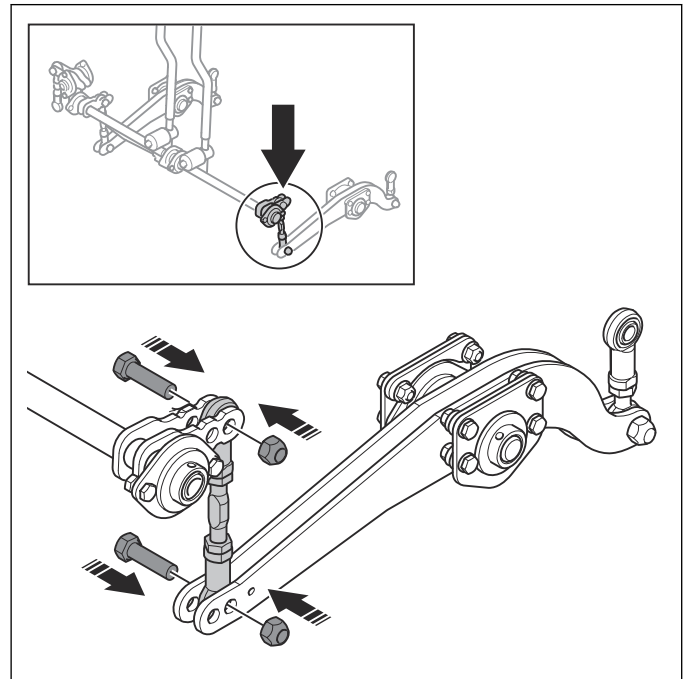
1. Remove the 2 bolts and 2 nuts.



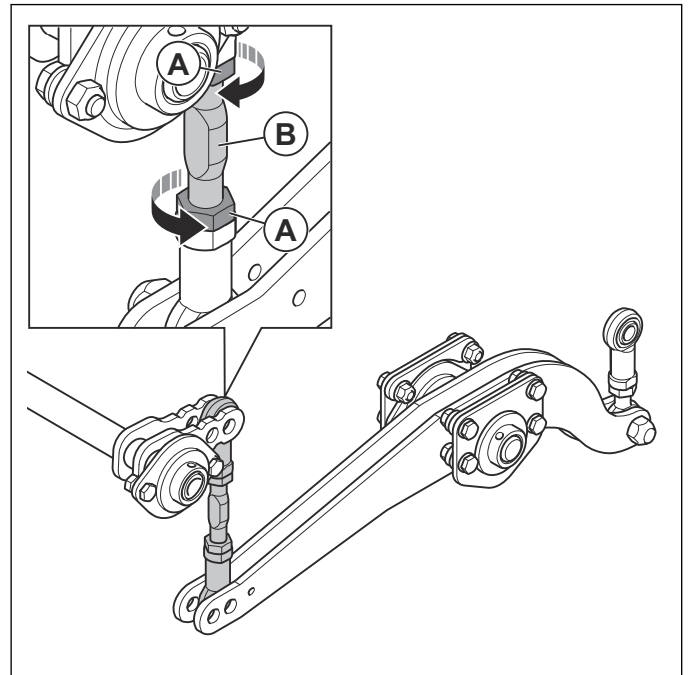
2. Move the linkage (A).



3. Install the 2 bolts and 2 nuts.



4. If it is necessary, adjust the links.

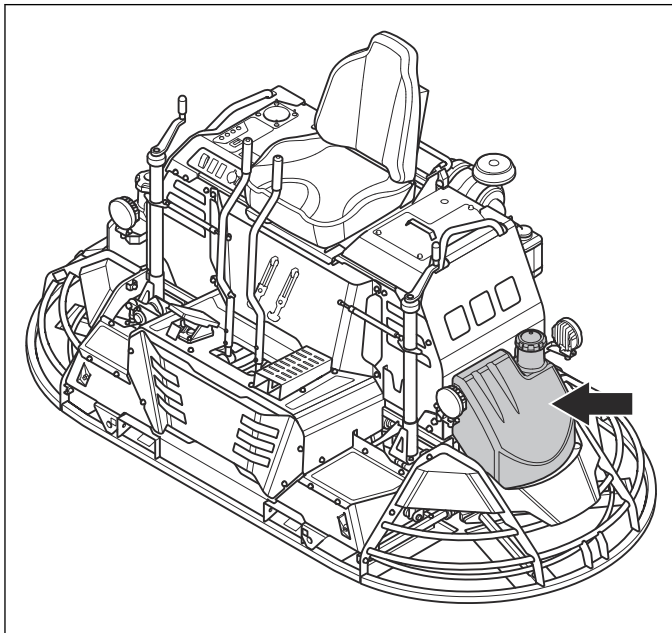


- a) Loosen the jam nuts (B).
- b) Turn the linkage (C).
- c) Tighten the jam nuts.

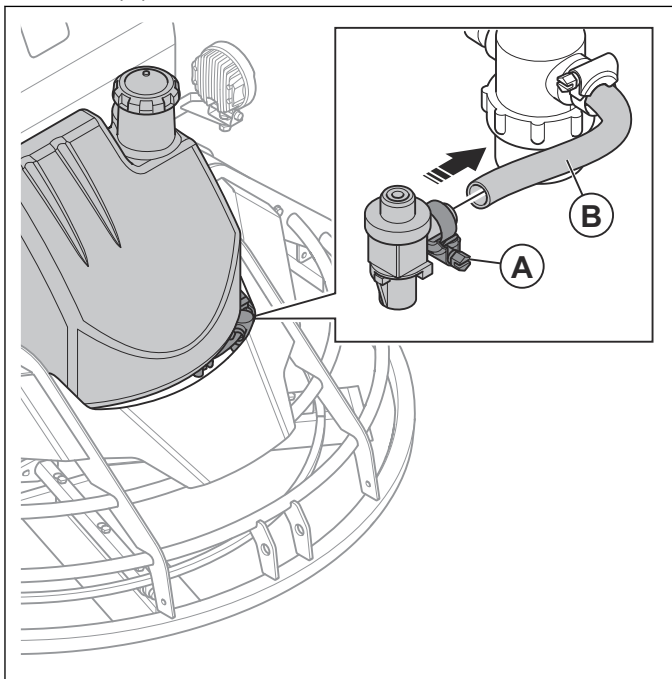
6.21 To remove the engine

1. Stop the engine and disconnect the battery.
2. Remove the drive belt. Refer to *To remove the drive belt on page 10*.

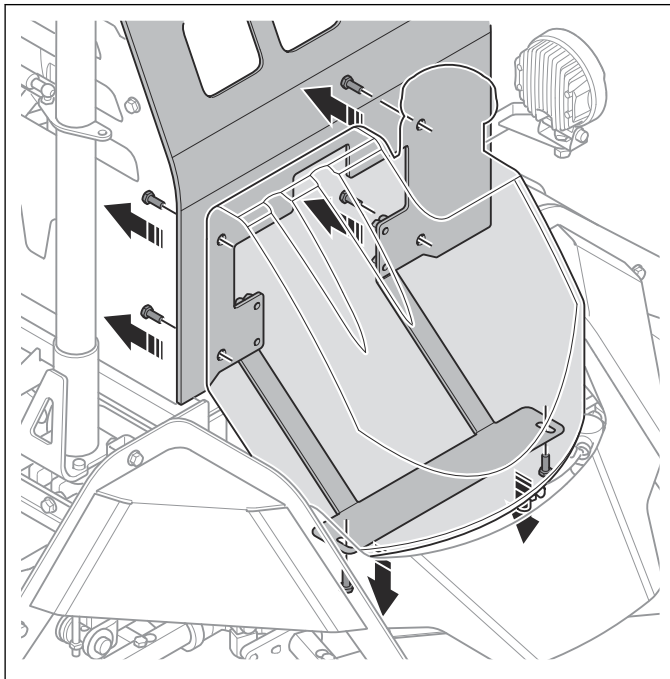
3. Drain the water tank.



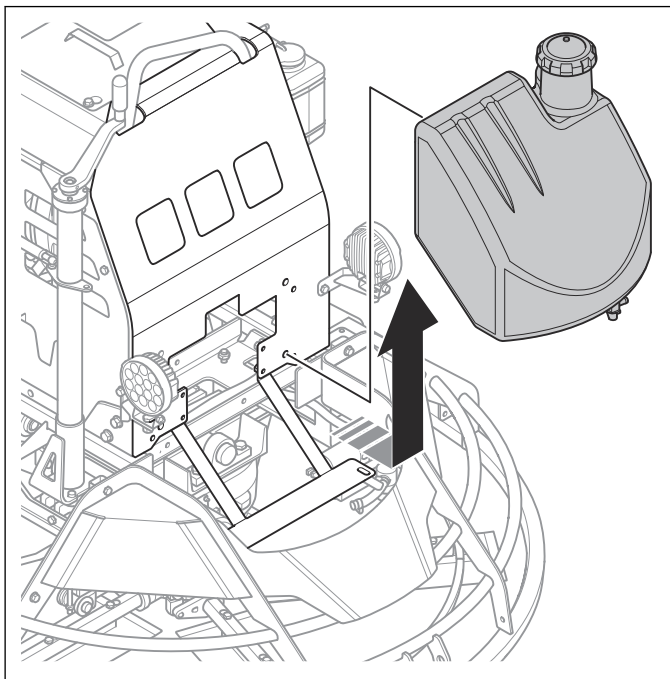
4. Loosen the hose clamp (A) and disconnect the water hose (B).



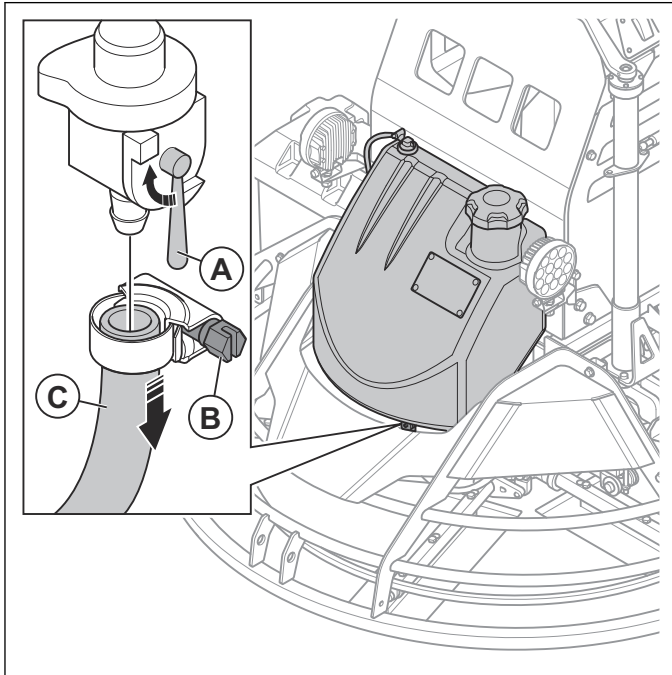
5. Remove the 6 screws for the water tank.



6. Remove the water tank.

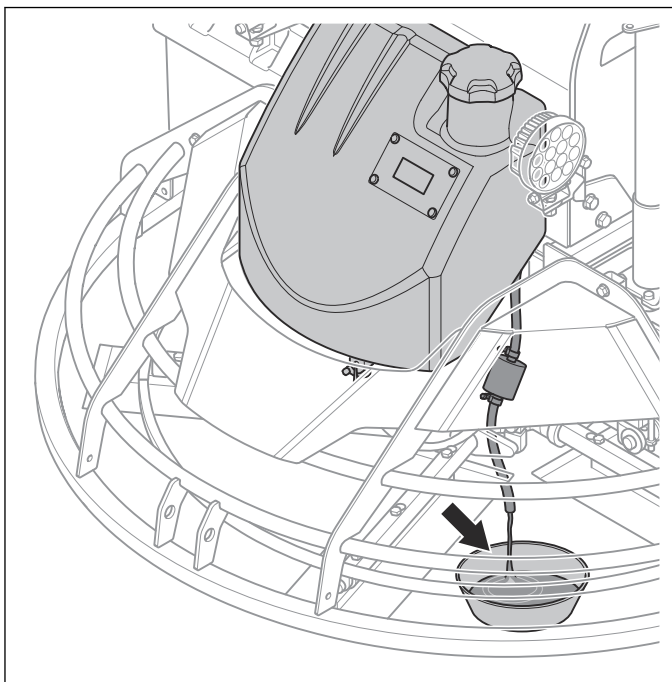


7. Turn the fuel valve (A) to close the fuel valve.

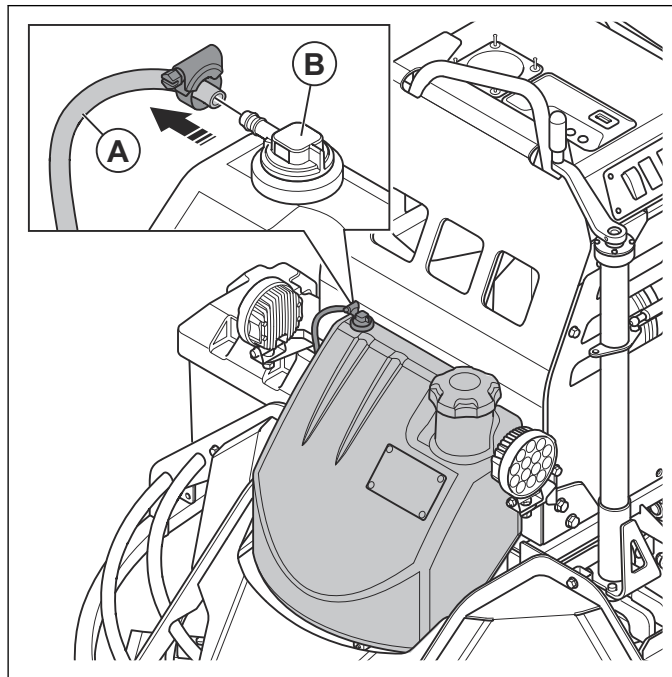


8. Loosen the hose clamp (B) and disconnect the fuel hose (C).

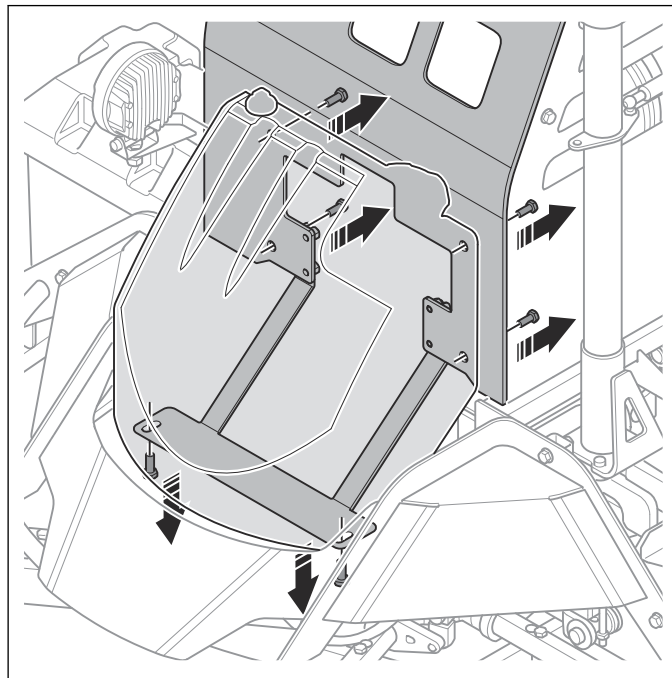
9. Drain the remaining fuel from the fuel hose into a container.



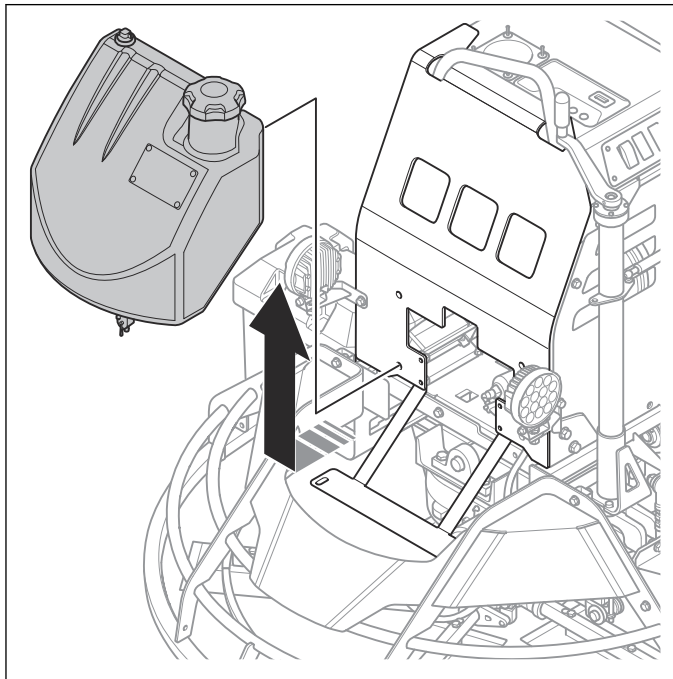
10. Loosen the hose (A) for the ventilation valve (B) of the fuel tank.



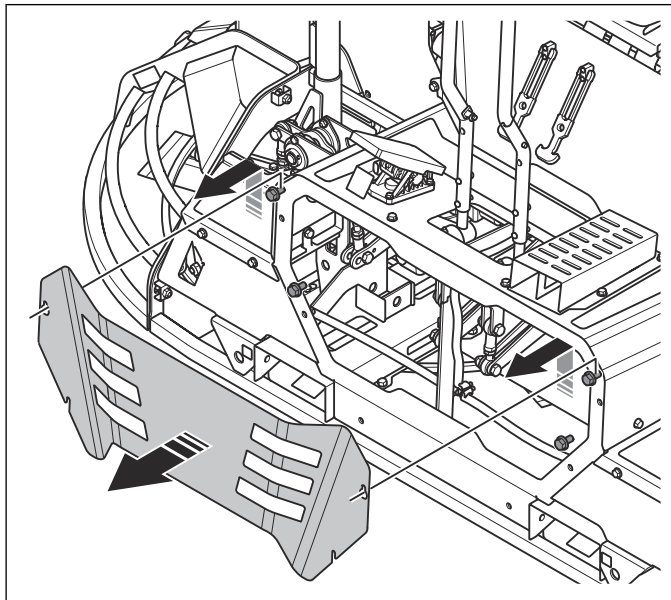
11. Remove the 6 screws for the fuel tank.



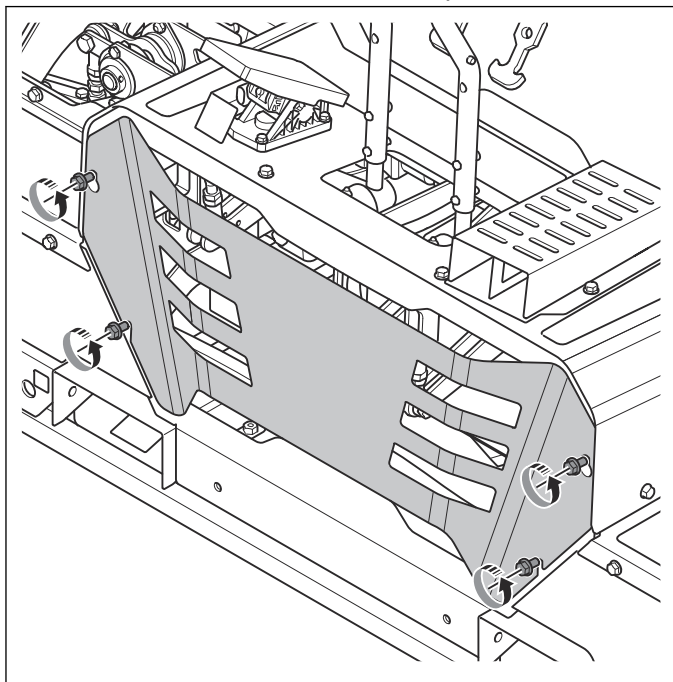
12. Remove the fuel tank.



14. Remove the front plate.

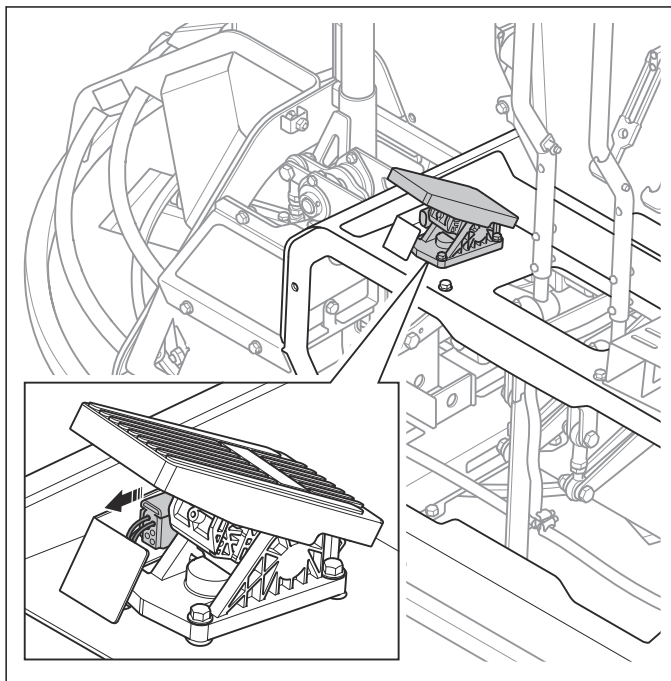


13. Loosen the 4 screws on the front plate.

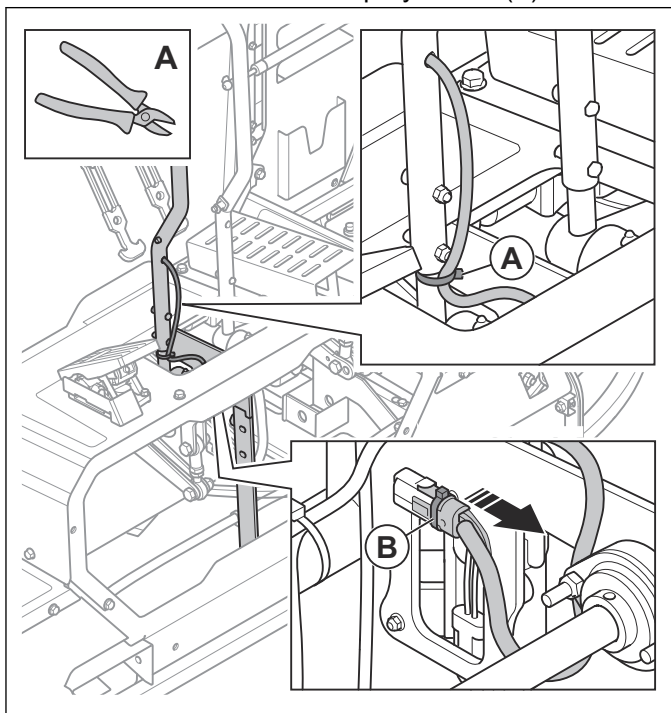


15. Remove the drive belt. Refer to *To remove the drive belt on page 10*.

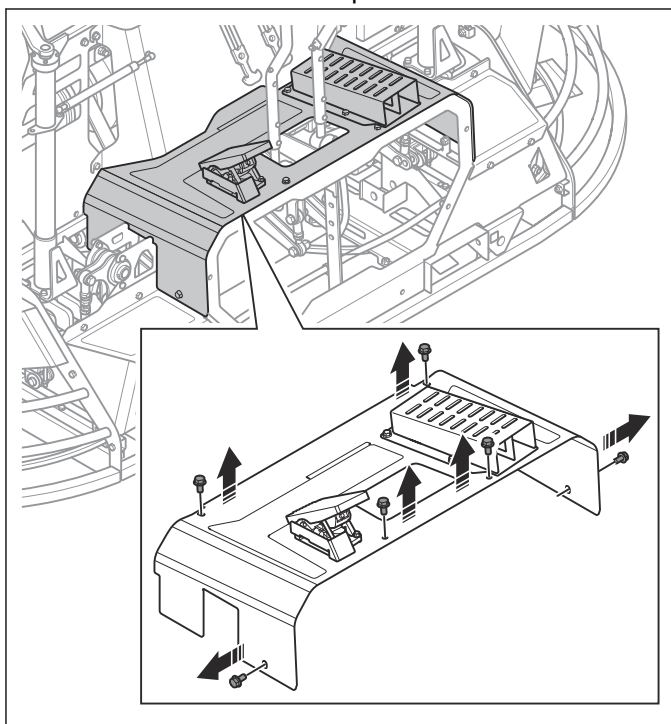
16. Remove the connector to the throttle control.



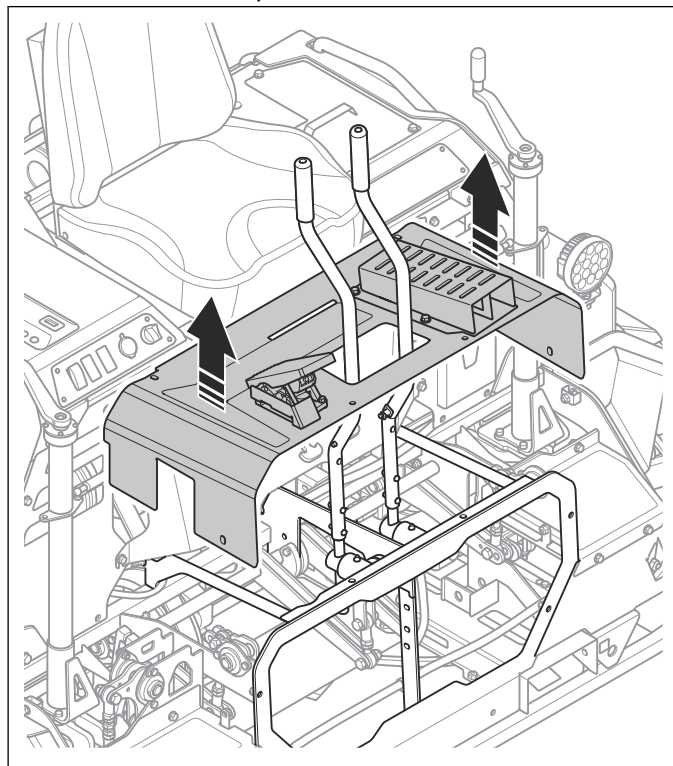
17. Cut the cable tie (A) and disconnect the wire harness for the retardant spray switch (B).



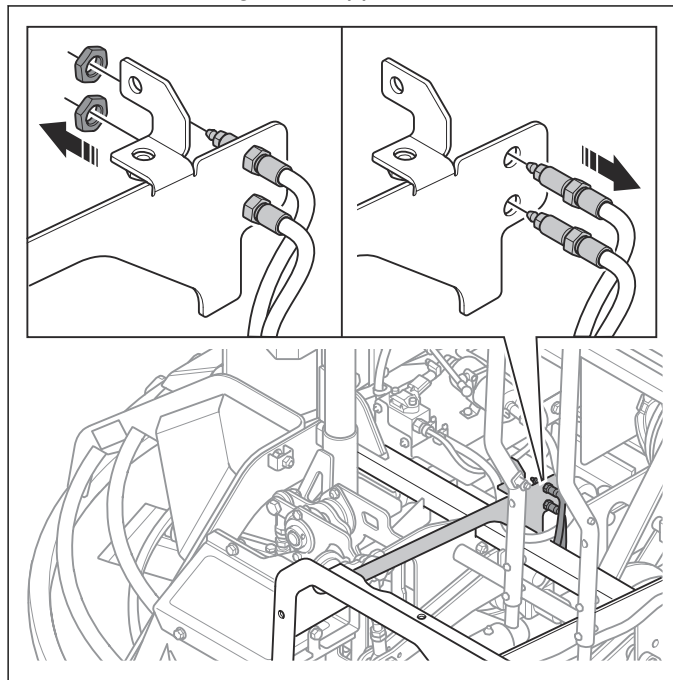
18. Remove the 2 side bolts, 2 side nuts and the 4 top screws. Remove the foot plate.



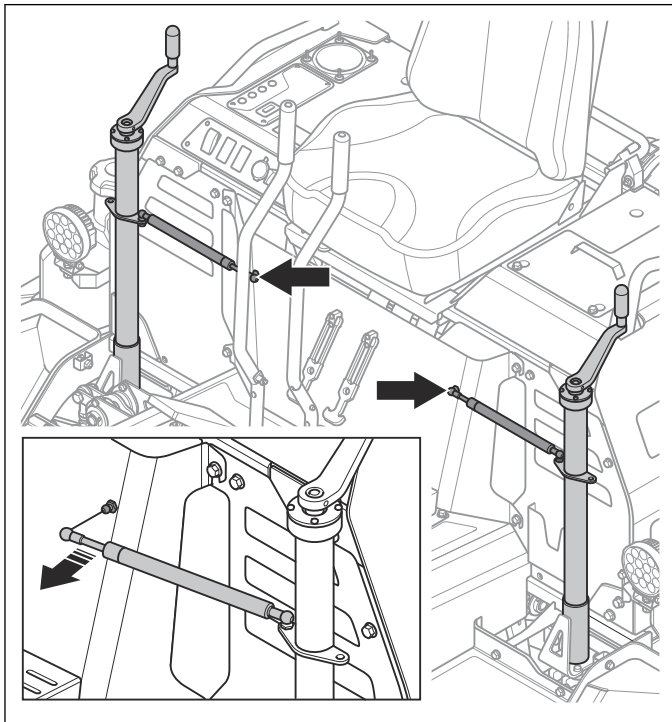
19. Remove the foot plate.



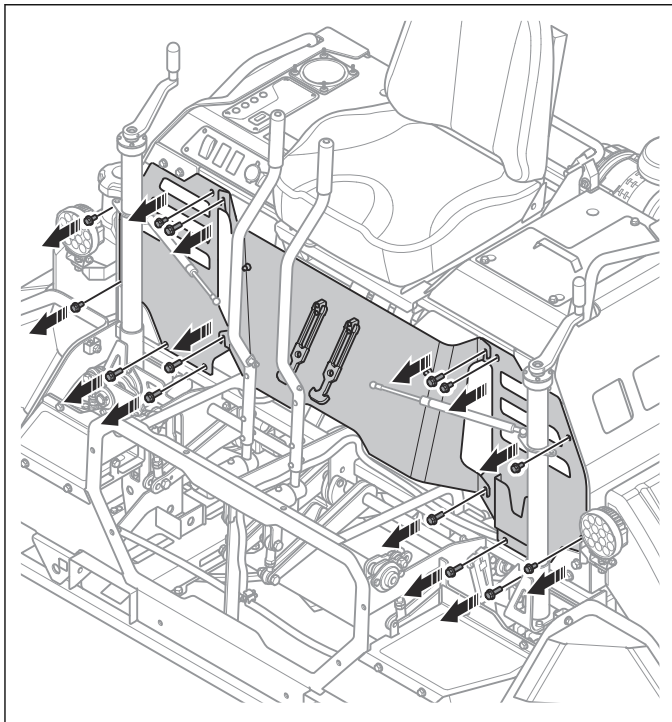
20. Disconnect the grease nipples.



21. Remove the gas springs.

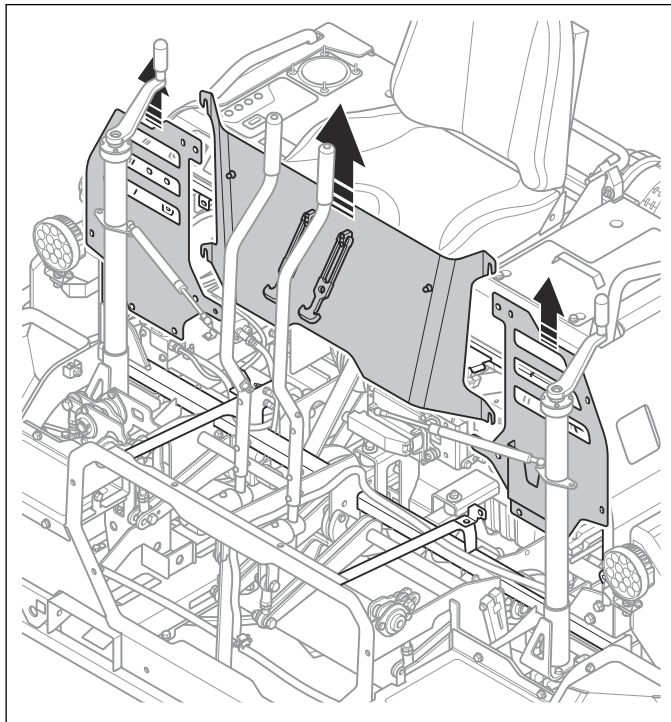


22. Remove the 14 screws for the front plates.

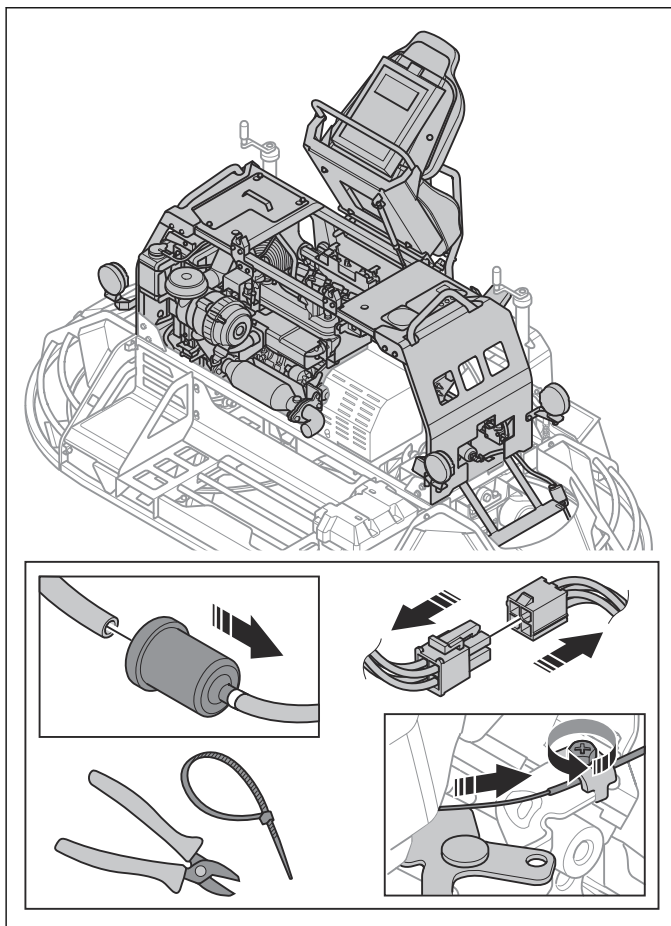


23. Disconnect all the relays, pumps and electronic units that are attached to the front plate.

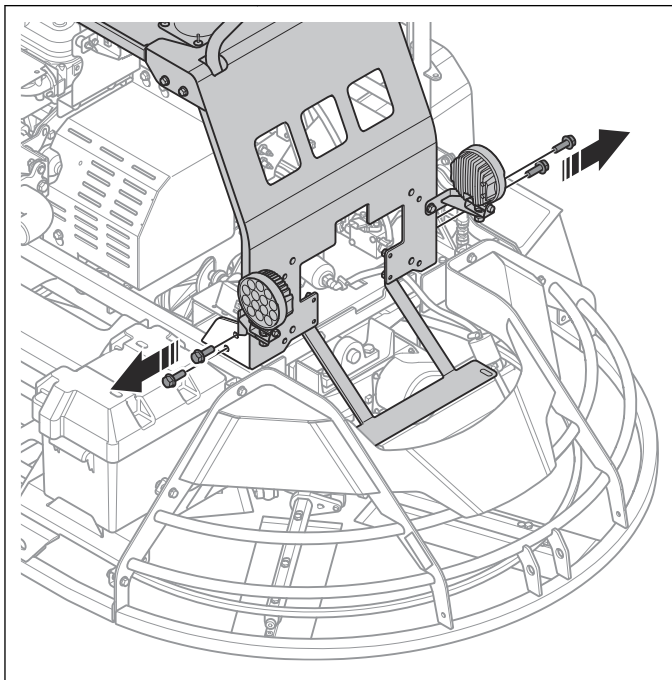
24. Remove the front plates.



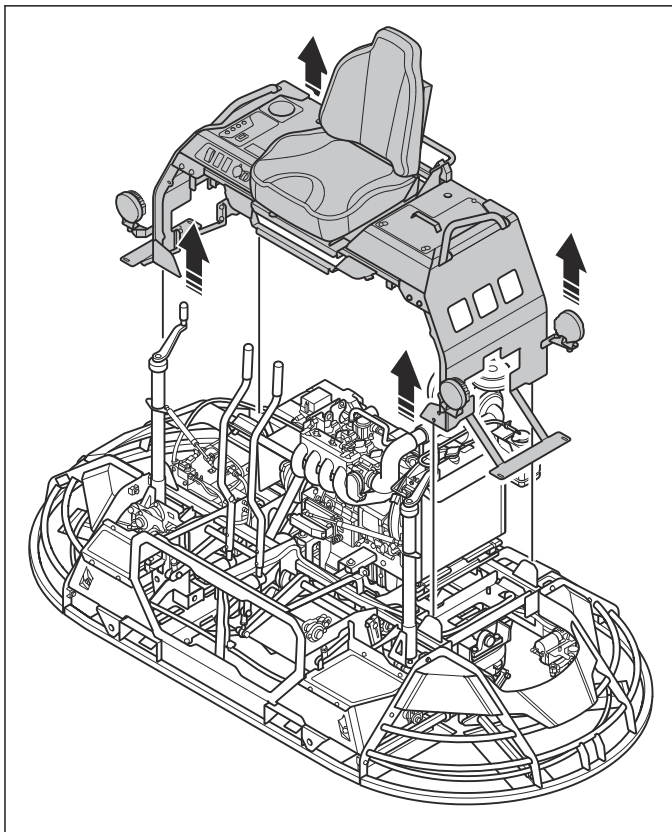
25. Disconnect the cables, wires, hoses and remove the cable ties on the cross brace.



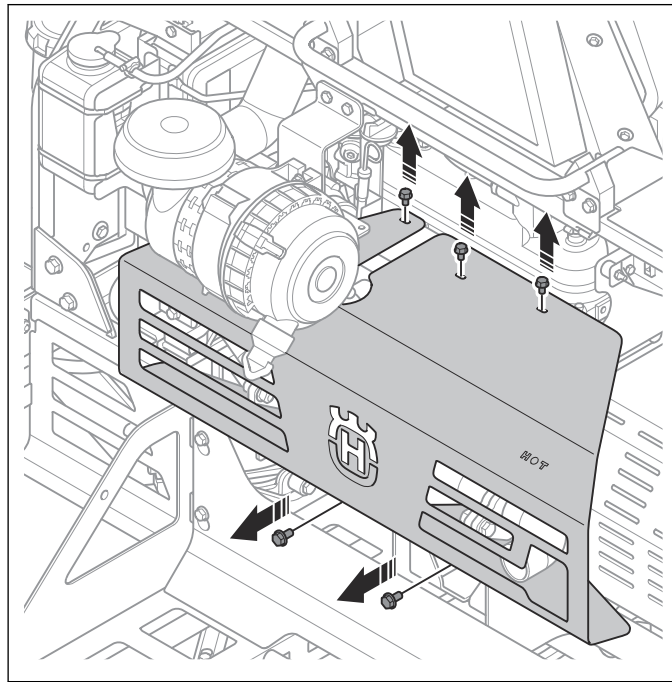
26. Remove the 2 bolts, 2 washers and the 2 nuts for the cross brace.



27. Remove the cross brace.

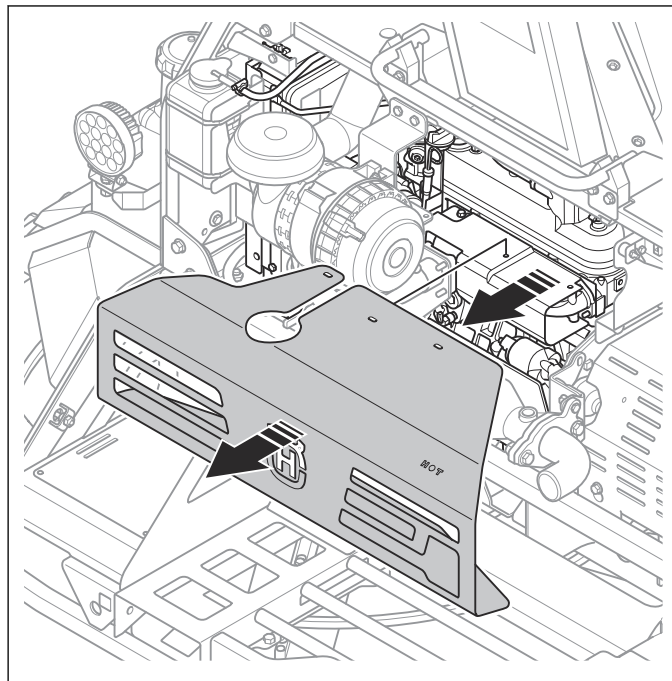


28. Remove the screws for the heat shield.



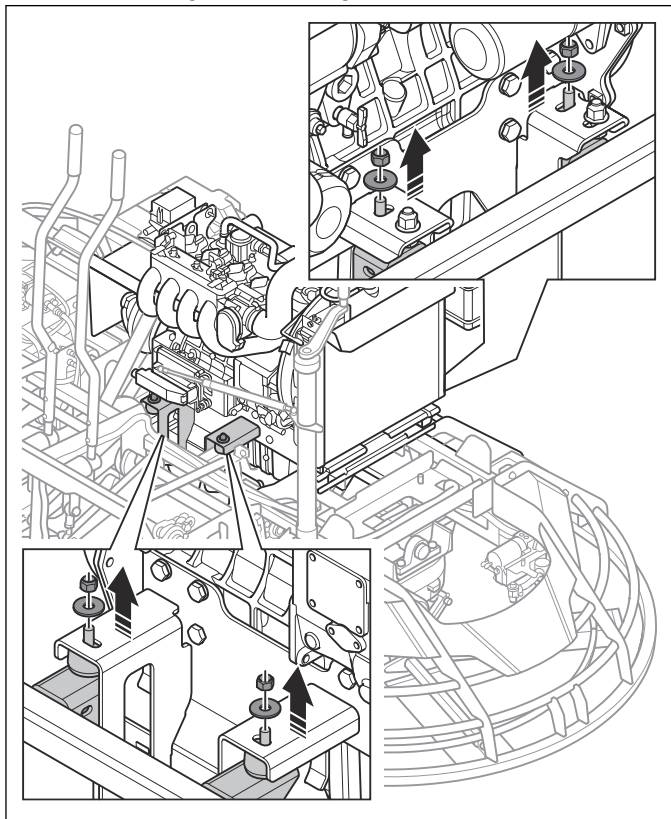
Note: This is only for CRT 48-57K.

29. Remove the heat shield.

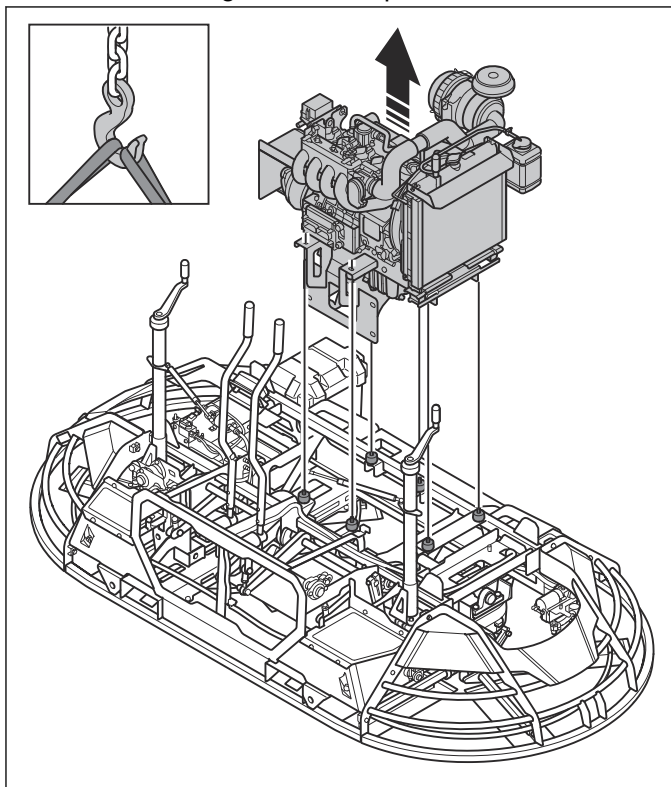


Note: This is only for CRT 48-57K.

30. Remove the 4 bolts, the 4 washers and the 4 nuts from the engine mountings.

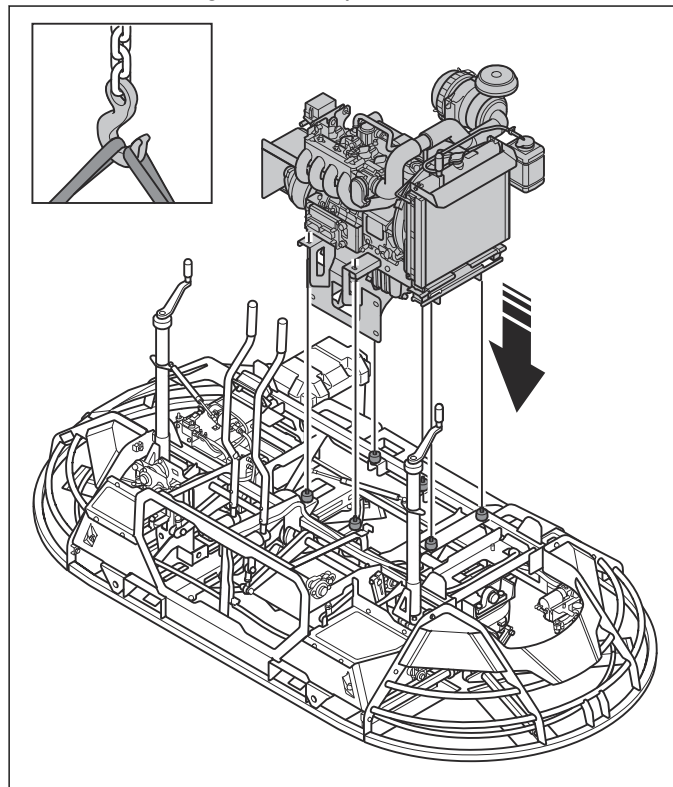


31. Attach the lifting equipment to the engine and remove the engine from the product.

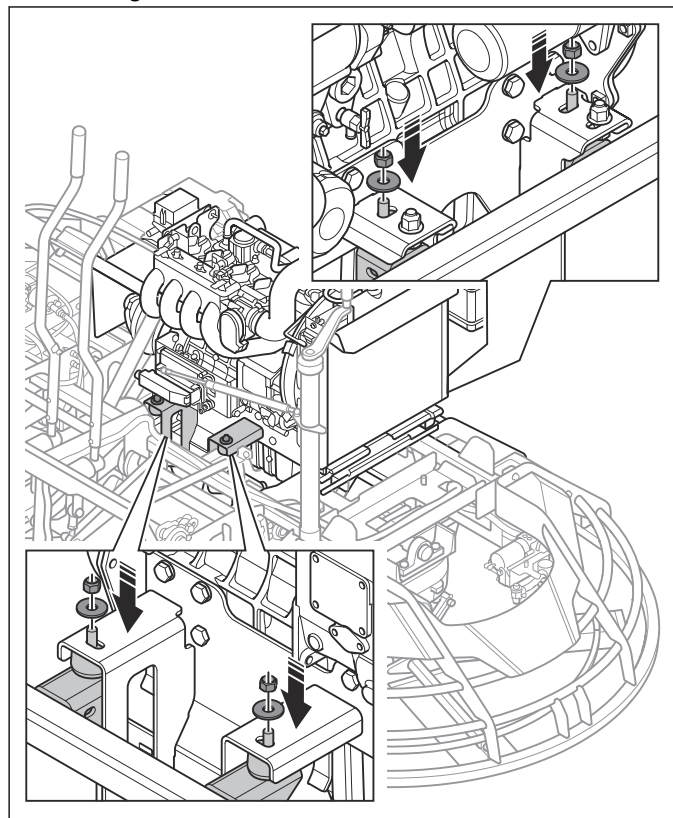


6.22 To install the engine

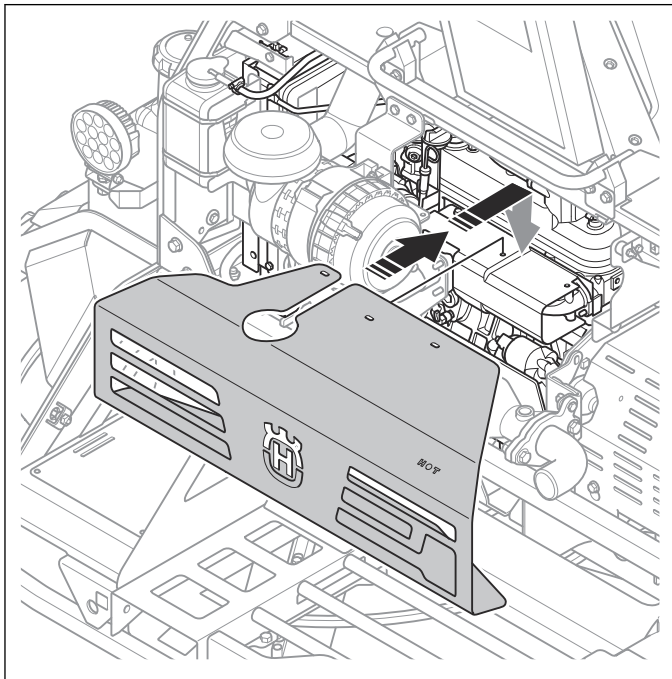
1. Install the engine on the product.



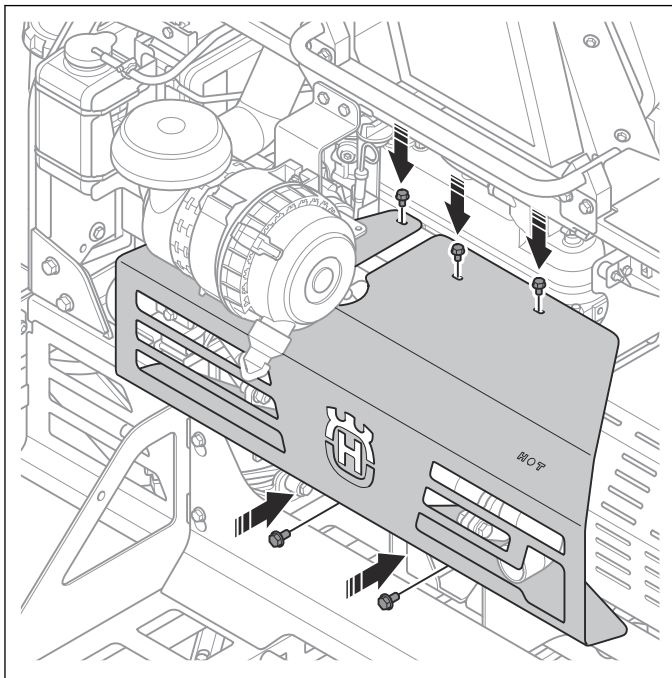
2. Install the 4 bolts, the 4 washers and the 4 nuts for the engine.



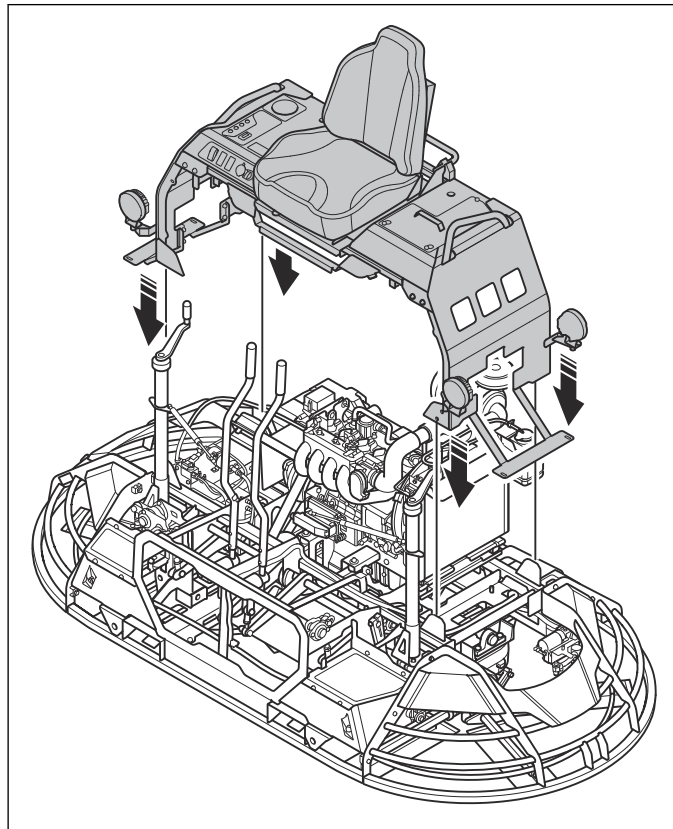
3. Install the heat shield. Only CRT 48-57K.



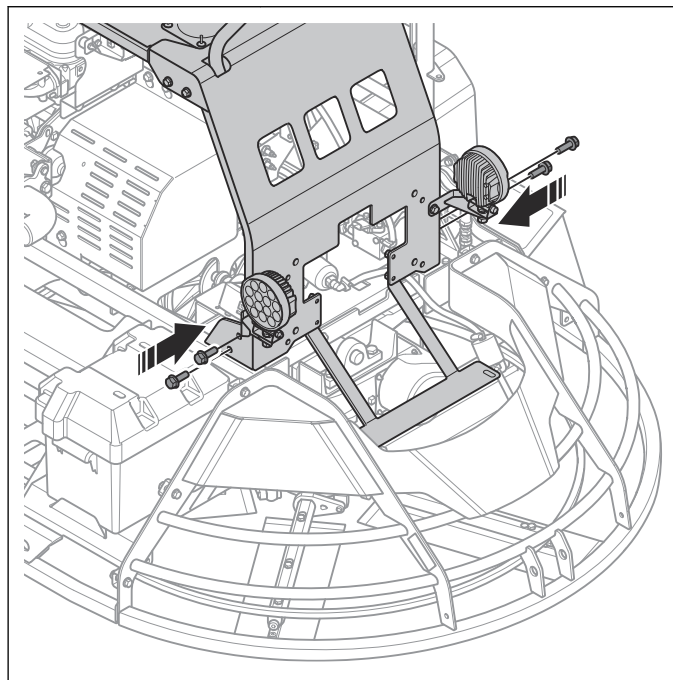
4. Install the screws for the heat shield. Only CRT 48-57K.



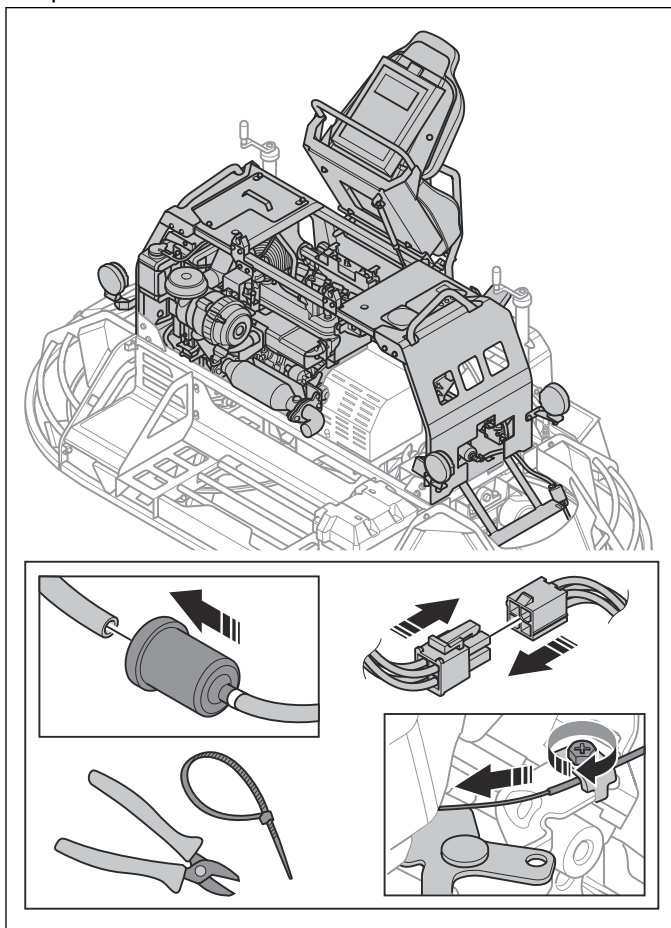
5. Install the cross brace.



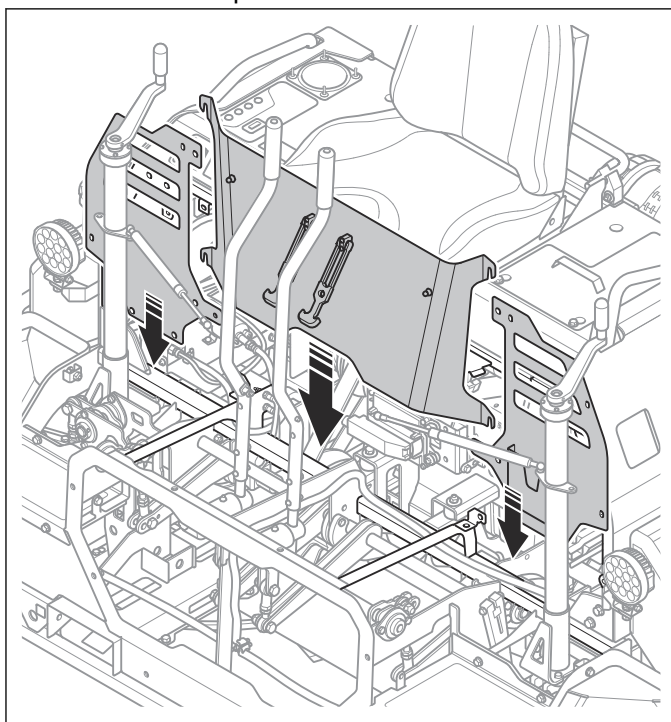
6. Install the 2 bolts, 2 washers and the 2 nuts for the cross brace.



7. Connect the cables, wires, hoses to the engine and put cable ties on the cross brace.

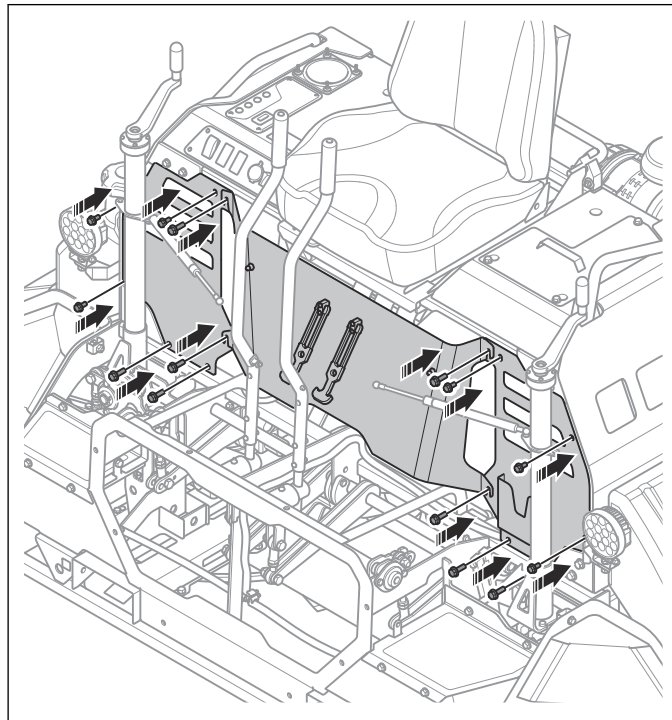


8. Install the front plates.

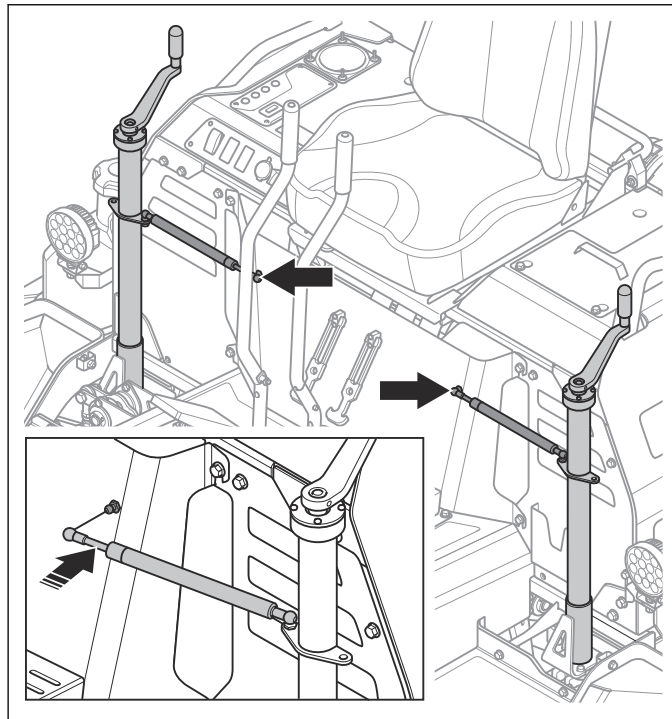


9. Connect all the relays, pumps and electronic units that must be attached to the front plate.

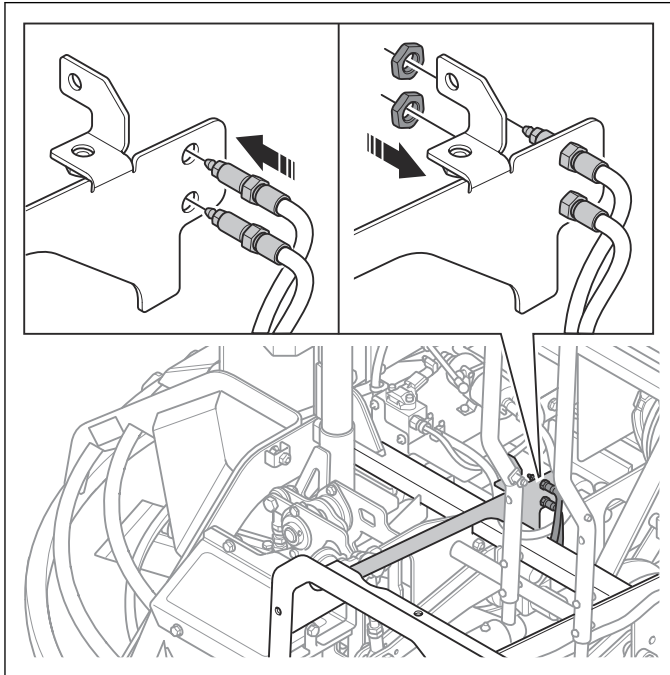
10. Install the 14 screws for the front plates



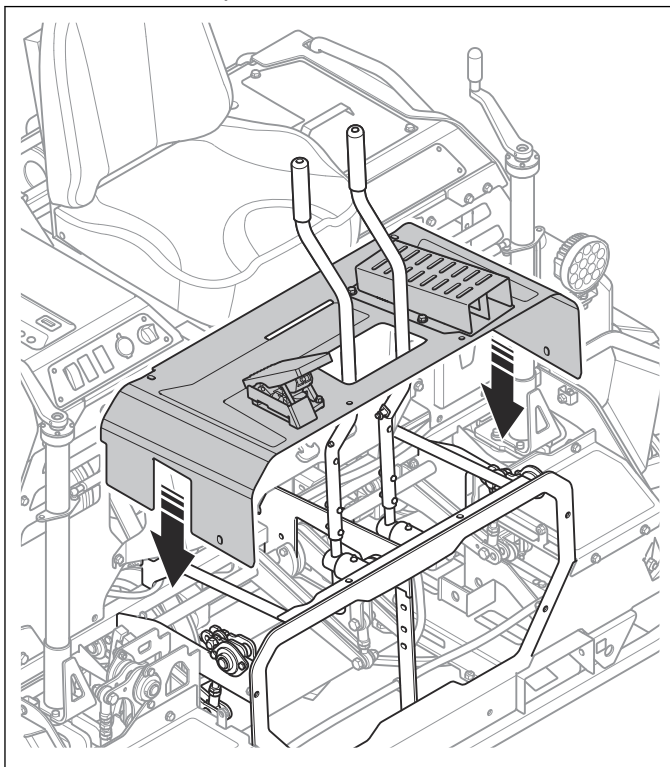
11. Install the gas springs.



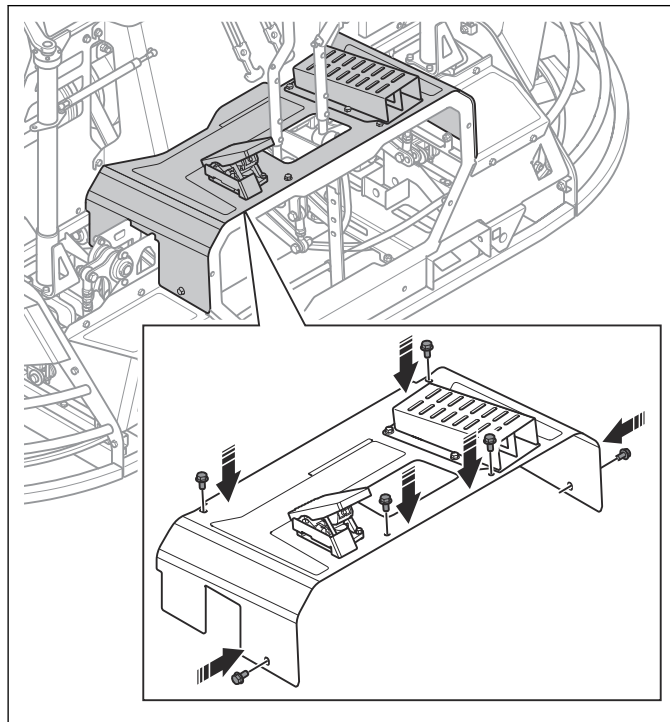
12. Install the nuts and the grease nipples.



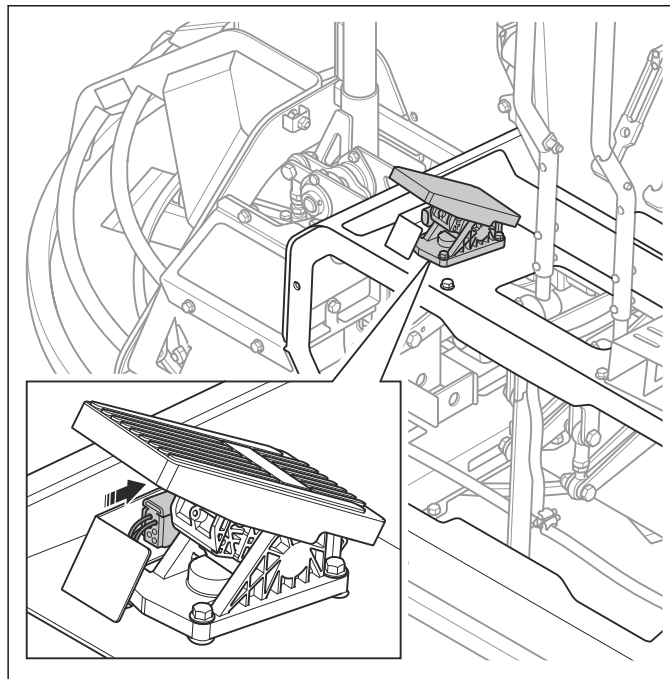
13. Install the foot plate.



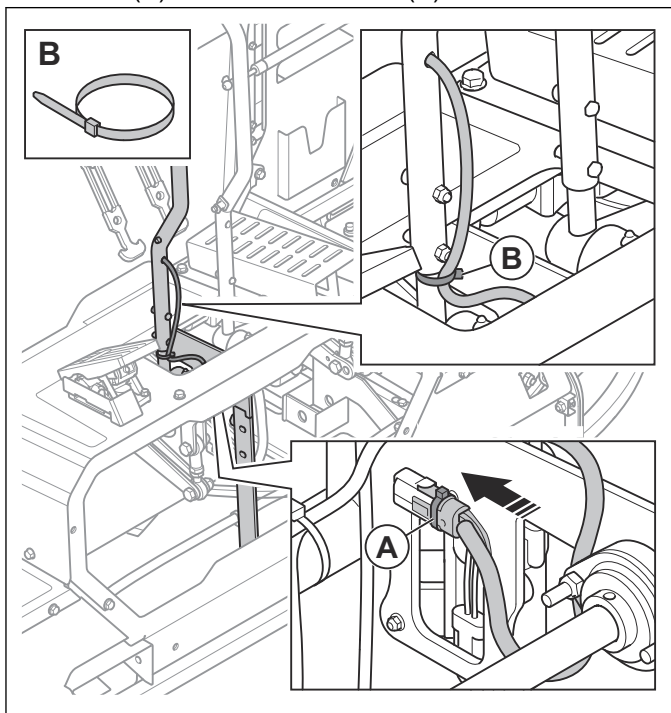
14. Install the 2 side bolts, 2 side nuts and the 4 top screws.



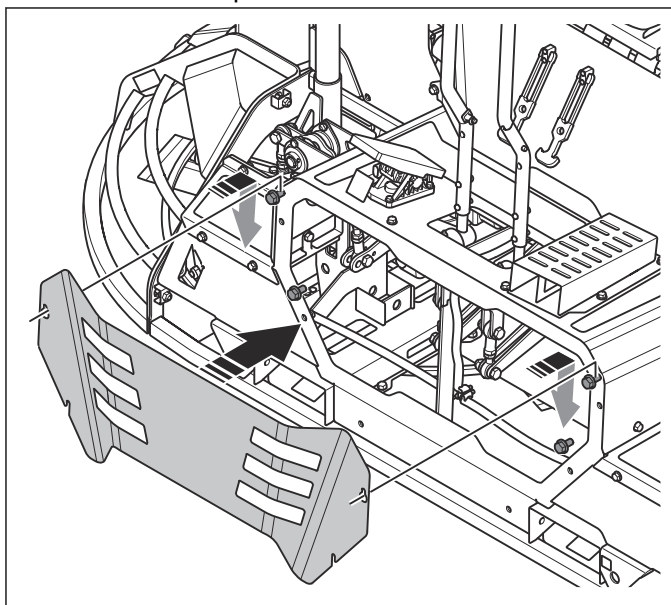
15. Install the connector to the throttle control.



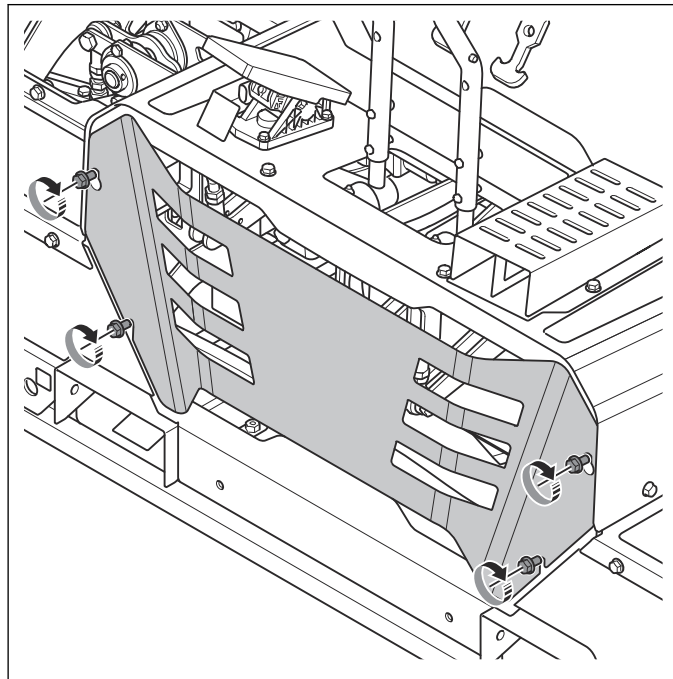
16. Connect the wire harness for the retardant spray switch (A). Put new cable ties (B).



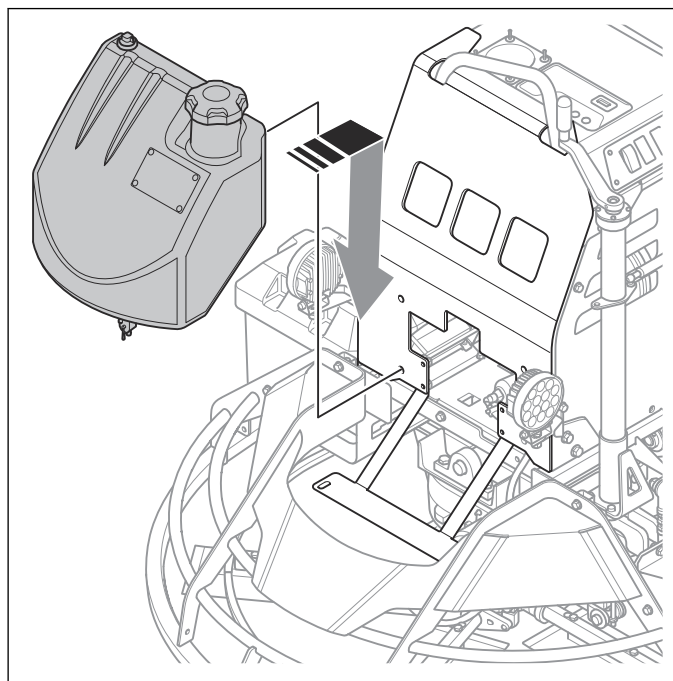
17. Install the front plate.



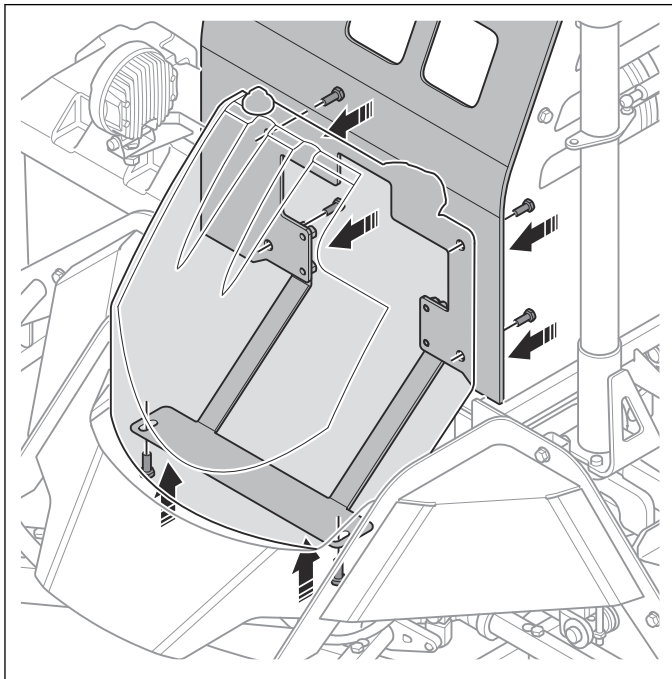
18. Tighten the 4 screws.



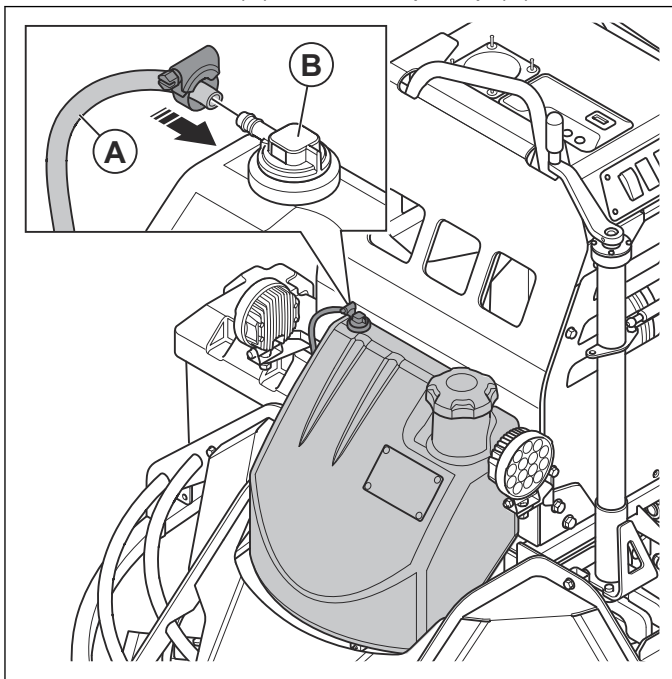
19. Install the fuel tank.



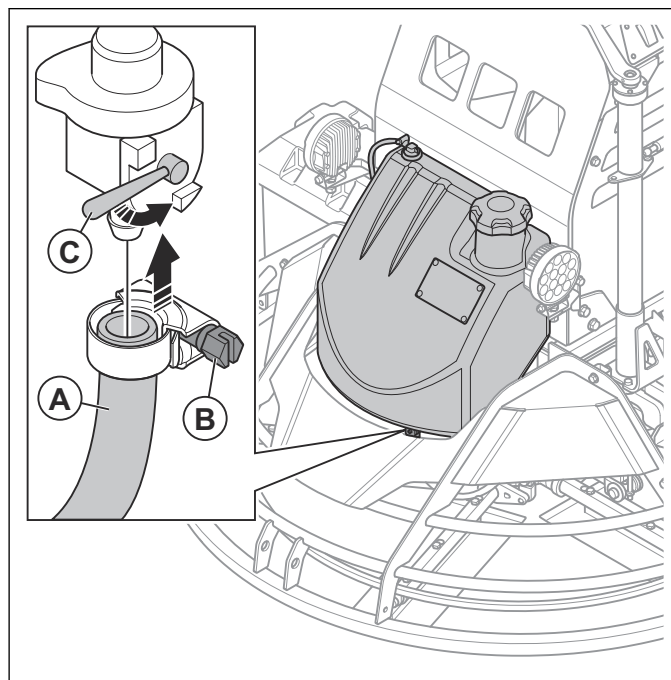
20. Tighten the 6 screws for the fuel tank.



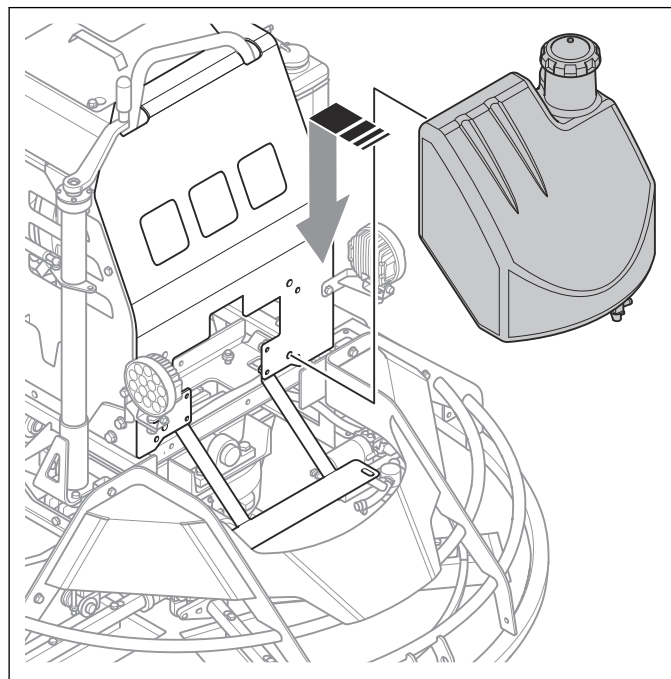
21. Install the hose (A) for the fuel pickup (B).



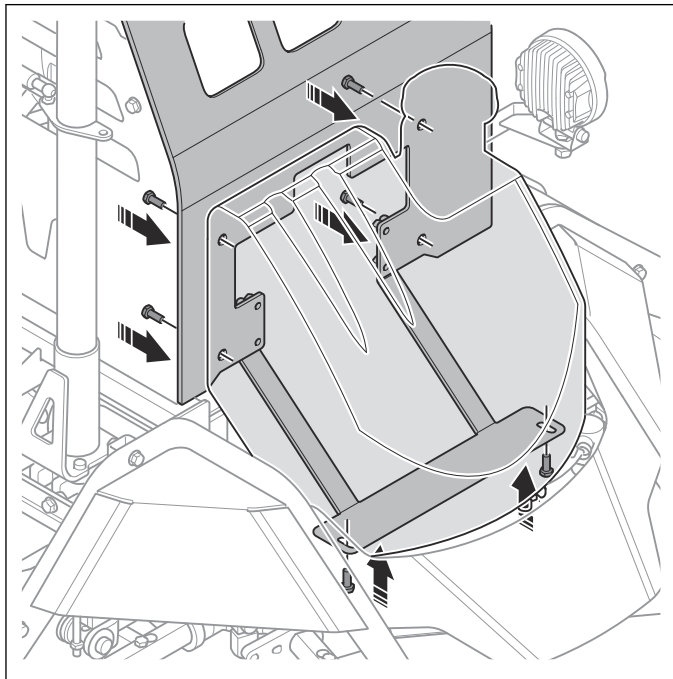
22. Connect the fuel hose (A) and tighten the hose clamp (B). Turn the fuel valve (C) to open the fuel valve.



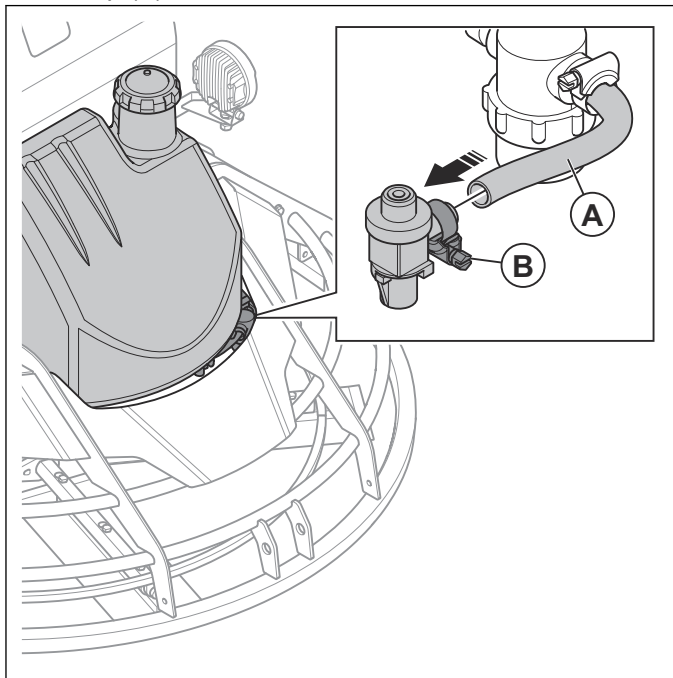
23. Install the water tank.



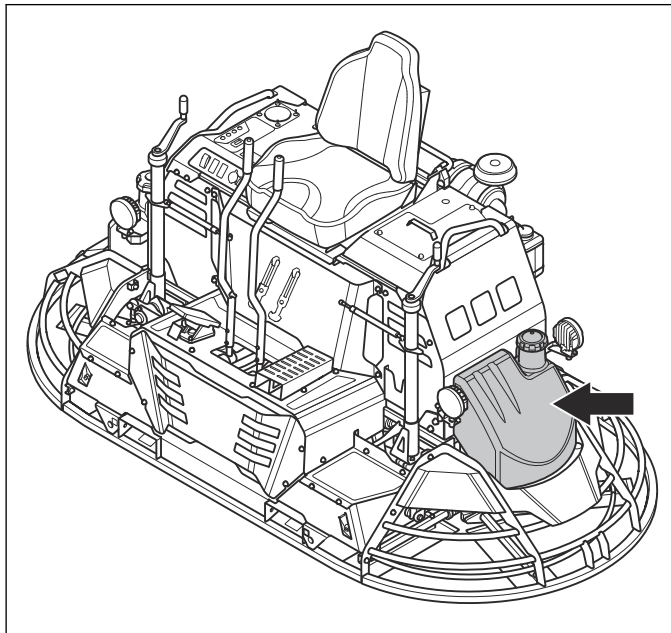
24. Tighten the 6 screws for the water tank.



25. Connect the water hose (A) and tighten the hose clamp (B).



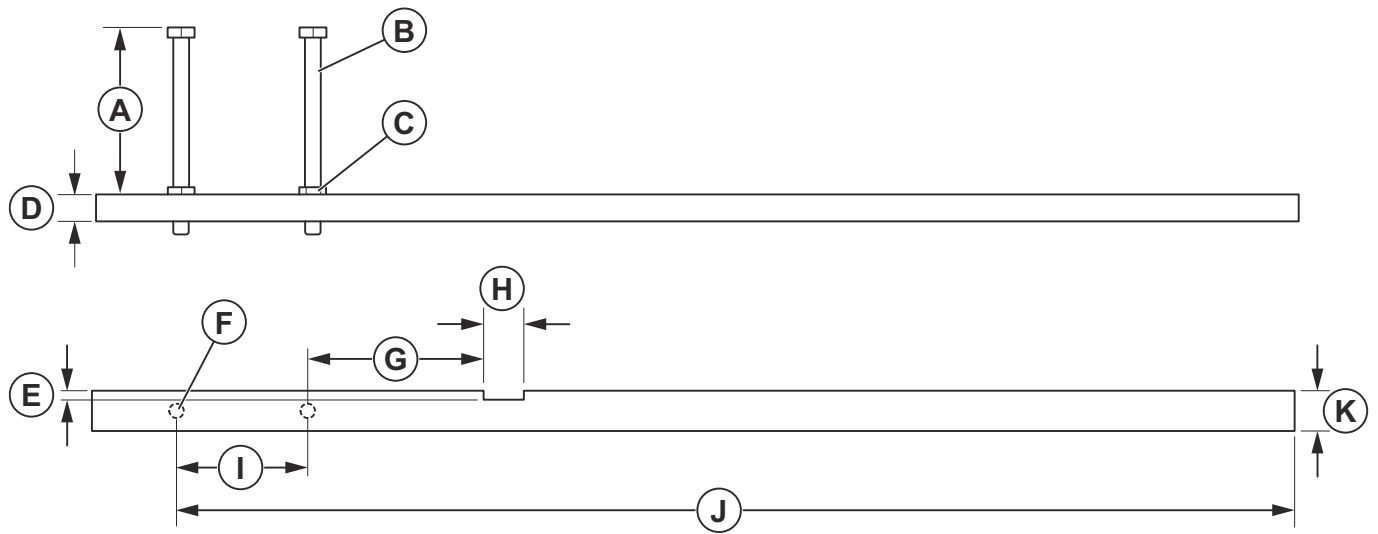
26. Fill the water tank.



27. Install the drive belt. Refer to .

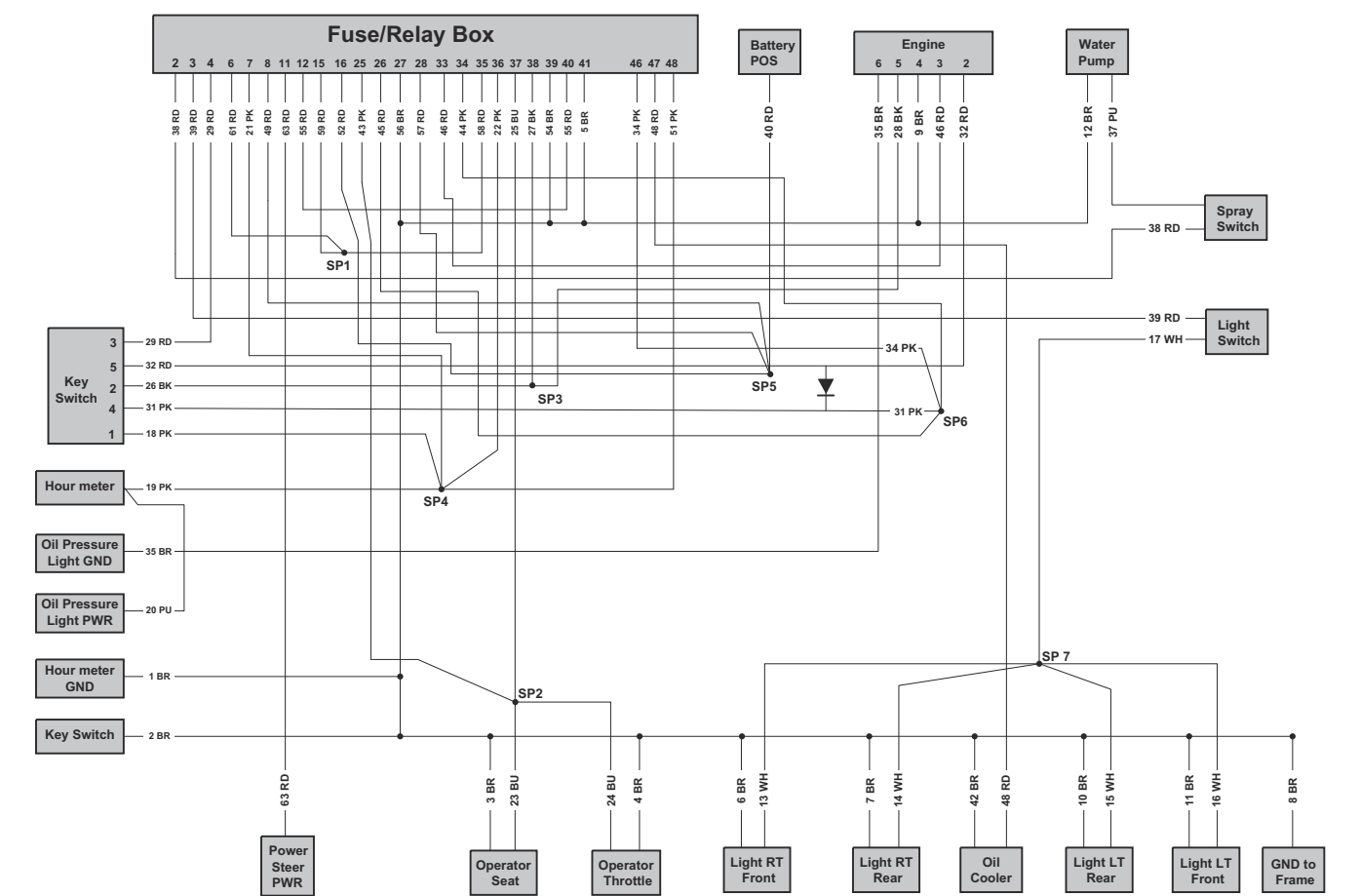
7 Diagrams

7.1 Service tool assembly

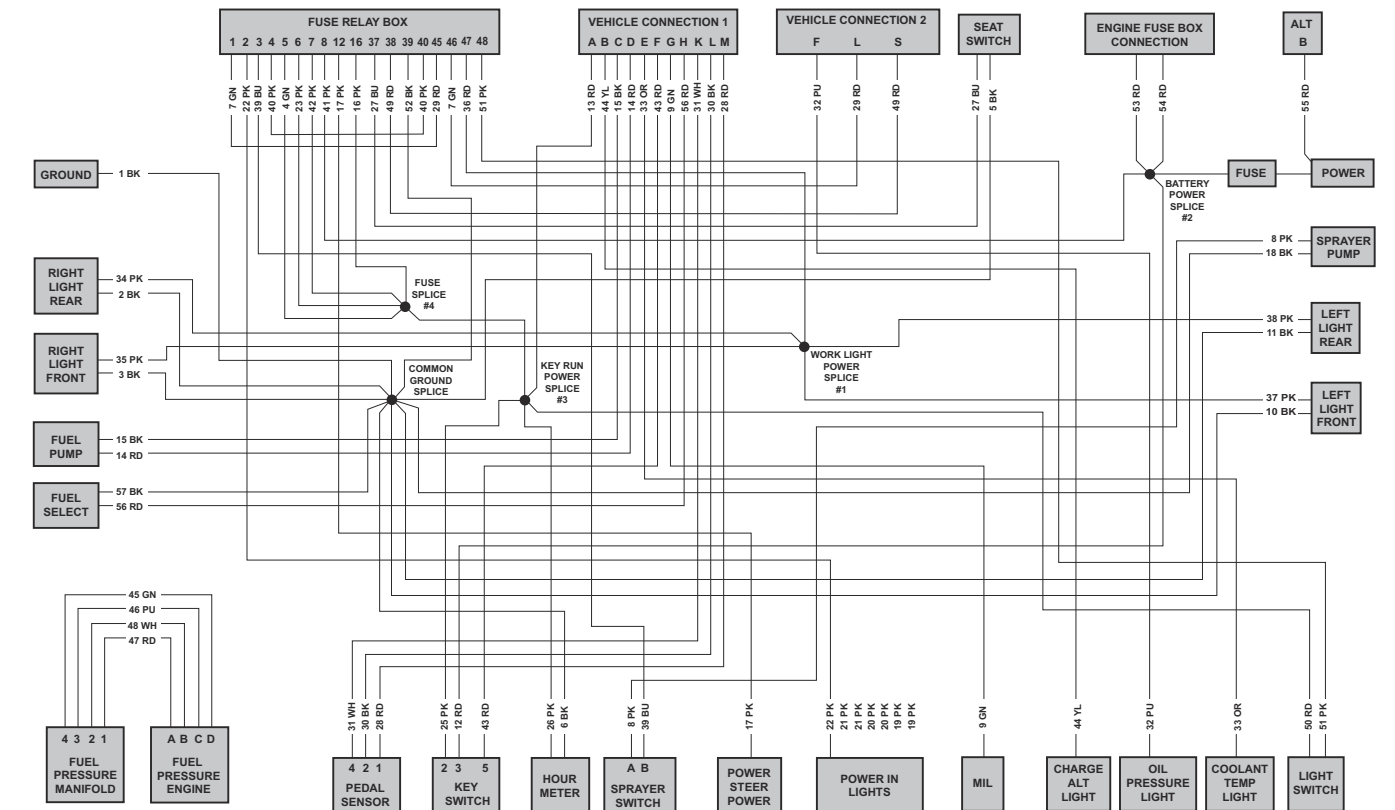


A	64.5 mm	G	67 mm
B	M6 × 1.0 × 75 mm	H	15 mm
C	M6 Jam Nut	I	50 mm
D	10 mm	J	425 mm
E	4 mm	K	16 mm
F	M6 × 1.0 mm × 2		

7.2 Wiring diagram CRT 48-37V



7.3 Wiring diagram CRT 48-57K



8 Technical data



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