

Product: Case 570ST The KING Backhoe Loader Service Repair Manual 51523349

Full Download: <https://www.arepairmanual.com/downloads/case-570st-the-king-backhoe-loader-service-repair-manual-51523349/>

570ST The KING Backhoe Loader

SERVICE MANUAL

Part number 51523349

English

August 2018

Sample of manual. Download All 1199 pages at:

<https://www.arepairmanual.com/downloads/case-570st-the-king-backhoe-loader-service-repair-manual-51523349/>

© 2018 Case New Holland Construction Equipment (India) Pvt. Ltd. All rights reserved.

CASE
CONSTRUCTION



SERVICE MANUAL

570ST - The KING

Link Product / Engine

Product	Market Product	Engine
570ST - The KING Two-Wheel Drive (2WD)	Asia Pacific	8045.45.748
570ST - The KING Four Wheel Drive (4WD)	Asia Pacific	8045.45.748

Contents

INTRODUCTION

Engine.....	10
[10.001] Engine and crankcase	10.1
[10.206] Fuel filters	10.2
[10.202] Air cleaners and lines	10.3
[10.254] Intake and exhaust manifolds and muffler	10.4
[10.400] Engine cooling system	10.5
[10.304] Engine lubrication system.....	10.6
Transmission.....	21
[21.112] Power shuttle transmission.....	21.1
[21.134] Power shuttle transmission external controls	21.2
[21.104] Power shuttle transmission hydraulic components	21.3
[21.154] Power shuttle transmission internal components	21.4
[21.700] Torque converter	21.5
Four-Wheel Drive (4WD) system	23
[23.314] Drive shaft.....	23.1
Front axle system	25
[25.100] Powered front axle	25.1
[25.102] Front bevel gear set and differential	25.2
[25.108] Final drive hub, steering knuckles, and shafts	25.3
[25.400] Non-powered front axle	25.4
Rear axle system.....	27
[27.100] Powered rear axle.....	27.1
[27.106] Rear bevel gear set and differential.....	27.2
[27.124] Final drive hub, steering knuckles, and shafts	27.3
Brakes and controls	33

[33.202] Hydraulic service brakes	33.1
[33.110] Parking brake or parking lock	33.2
Hydraulic systems.....	35
[35.000] Hydraulic systems.....	35.1
[35.300] Reservoir, cooler, and filters.....	35.2
[35.104] Fixed displacement pump	35.3
[35.724] Front loader hydraulic system control	35.4
[35.701] Front loader arm hydraulic system	35.5
[35.723] Front loader bucket hydraulic system	35.6
[35.726] Excavator and backhoe hydraulic controls.....	35.7
[35.736] Boom hydraulic system	35.8
[35.737] Dipper hydraulic system.....	35.9
[35.738] Excavator and backhoe bucket hydraulic system.....	35.10
[35.360] Hammer and rotating bucket hydraulic system	35.11
[35.739] Swing arm hydraulic system	35.12
[35.732] Stabilizer control	35.13
[35.AAA] Hydraulic systems generic sub-group	35.14
Frames and ballasting	39
[39.100] Frame	39.1
[39.129] Stabilizers	39.2
Steering.....	41
[41.101] Steering control	41.1
[41.200] Hydraulic control components.....	41.2
[41.216] Cylinders	41.3
Wheels	44
[44.511] Front wheels.....	44.1
[44.520] Rear wheels.....	44.2
[44.AAA] Wheels generic sub-group	44.3

Electrical systems	55
[55.100] Harnesses and connectors.....	55.1
[55.201] Engine starting system.....	55.2
[55.301] Alternator.....	55.3
[55.302] Battery.....	55.4
[55.011] Fuel tank system	55.5
[55.512] Cab controls.....	55.6
[55.518] Wiper and washer system.....	55.7
[55.404] External lighting	55.8
[55.408] Warning indicators, alarms, and instruments	55.9
Front loader and bucket.....	82
[82.100] Arm.....	82.1
[82.300] Bucket.....	82.2
Booms, dippers, and buckets	84
[84.910] Boom.....	84.1
[84.912] Dipper arm	84.2
Platform, cab, bodywork, and decals	90
[90.156] Cab windshield and windows	90.1
[90.110] Operator platform less cab	90.2
[90.114] Operator protections	90.3
[90.100] Engine hood and panels	90.4



INTRODUCTION

Contents

INTRODUCTION

Safety rules	3
Safety rules	4
Safety rules - Ductile iron	5
Safety rules - Ductile iron	6
Safety rules	7
Personal safety	8
Safety rules - Ecology and the environment	9
Basic instructions - Important notice regarding equipment servicing	10
Basic instructions	11
Basic instructions - Fuse and relay locations	12
Basic instructions	14
Basic instructions	16
Basic instructions	17
Basic instructions - Shop and assembly	19
Basic instructions - Minimum tightening torques for normal assembly	21
Electrical systems - Basic instructions - Standard torque data for hydraulics	26
Torque - Standard torque data for hydraulics	28
Abbreviation - Measurements	30
Capacities	32

Safety rules


Personal safety





This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible death or injury.

Throughout this manual you will find the signal words DANGER, WARNING, and CAUTION followed by special instructions. These precautions are intended for the personal safety of you and those working with you.

Read and understand all the safety messages in this manual before you operate or service the machine.

 DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

 WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

 CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

FAILURE TO FOLLOW DANGER, WARNING, AND CAUTION MESSAGES COULD RESULT IN DEATH OR SERIOUS INJURY.

Machine safety

NOTICE: Notice indicates a situation that, if not avoided, could result in machine or property damage.

Throughout this manual you will find the signal word Notice followed by special instructions to prevent machine or property damage. The word Notice is used to address practices not related to personal safety.

Information

NOTE: Note indicates additional information that clarifies steps, procedures, or other information in this manual.

Throughout this manual you will find the word Note followed by additional information about a step, procedure, or other information in the manual. The word Note is not intended to address personal safety or property damage.

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.

Safety rules - Ductile iron

**⚠ DANGER**

Altering cast ductile iron can cause it to weaken or break.

Before you weld, cut, or drill holes on any part of this machine, make sure that the part is not cast ductile iron.

Failure to comply will result in death or serious injury.

D0148A

Altering cast ductile iron can cause it to weaken or break. Unauthorized modifications to cast ductile iron parts can cause death or serious injury. Do not weld, cut, drill, repair, or attach items to cast ductile iron parts on this machine.

Before you weld, cut, or drill holes on any part of this machine, make sure the part is not cast ductile iron. See your dealer if you do not know if a part is cast ductile iron.

The following items are examples of cast ductile iron parts. There may also be other parts made of cast ductile iron that are not on the list below.

- two-wheel drive steering link
- dump links
- front axle
- stabilizers
- extend-a-hoe
- swing tower
- bucket linkage
- Air-Conditioning (A/C) compressor mounting bracket

Do not make any unauthorized modifications. Consult an authorized dealer before making any changes, additions, or modifications to this machine.

Safety rules - Ductile iron



⚠ DANGER

Improper operation or service of this machine can result in an accident.

Any unauthorized modifications made to this machine can have serious consequences. Consult an authorized dealer on changes, additions, or modifications that may be required for this machine. Do not make any unauthorized modifications.

Failure to comply will result in death or serious injury.

D0030A

Before you weld, cut, or drill holes on any part of this machine, make sure the part is not cast ductile iron. See your dealer if you do not know if a part is cast ductile iron. The following are cast ductile iron parts:

- two wheel drive steering link
- dump links
- front axle
- stabilizers
- extendahoe
- swing
- bucket linkage
- Air Conditioning (A/C) compressor mounting bracket

Unauthorized modifications to cast ductile iron parts can cause injury or death. Welding, cutting, or drilling can cause cast ductile iron to break. Do not weld, cut, or drill to repair or to attach items to cast ductile iron parts on this machine.

Safety rules

Unless otherwise instructed, always perform these steps before you service the machine:

1. Park the machine on a flat, level surface.
2. Place the backhoe in the transport position with the swing lock pin installed for transport.
3. Place the loader bucket on the ground, with the bottom of the loader bucket parallel to the surface.
4. Place the direction control lever and the transmission in neutral.
5. If you need to open the hood to perform service, raise the loader arms and install the support strut.
6. Shut down the engine.
7. Place a 'Do Not Operate' tag on the key switch so that it is visible to other workers or remove the key.

Personal safety

1. Make sure to arrest all fuel leaks. Any fuel or oil spilled on hot surface or electrical components may cause fire accidents. Make sure that the machine is sealed from leakage.
2. Do not allow straw, trash, bird nests or flammable material in the machine and remove the same as they can ignite fire on hot surfaces.
3. Make sure the fire extinguisher installed on or near the machine. If already equipped, the fire extinguisher is maintained and serviced according to the manufacturer's instructions.
4. Check and make sure to clean all the trash from the machine especially around hot components such as the engine, transmission, exhaust, battery, etc. Do these checks and clean the machine at least once a day, probably at the end of the day. More frequent checks and cleaning of machine may be necessary depending on the operating environment and conditions.
5. Inspect the electrical system for loose connections and frayed insulation. Repair or replace the loose or damaged parts.
6. Check and remove the debris accumulation around moving components such as bearings, pulleys, belts, gears, cleaning fans, etc. More frequent cleaning of the machine may be necessary depending on the operating environment and conditions.
7. Check all fuses, relay, and MCB's for correct ratings and validity. Replace the defective or non-complaint parts. Do not to bypass/override/tamper any safety systems of the machine.
8. Check and remove any oily rags or other flammable material on the machine. Do not to store such material around or on the machine.
9. Make sure that do not weld or flame cut any items that contain flammable material. Clean the items thoroughly with non-flammable solvents before welding or flame-cutting.
10. Immediately investigate any unusual smells or odors that may emerge during operation of the machine. Always aware of such observations and actions thereof.
11. Make sure that the machine is serviced only by authorized CASE CONSTRUCTION dealer service team and not by any external parties.
12. Check and remove any non-recommended devices that are fitted on the machine. Do not to use any devices that are not a standard fitment by the company.
13. The personnel make sure that they do not smoke or use mobiles while refuelling. It is not advisable to park the machine near a place which poses fire hazard (Workshops where welding, grinding, gas cutting etc is underway, bonfires etc).

NOTICE: Any damage to the machine due to non-adherence of the above guidelines and instructions may lead the warranty void for the machine.

Safety rules - Ecology and the environment

Soil, air, and water are vital factors of agriculture and life in general. When legislation does not yet rule the treatment of some of the substances required by advanced technology, sound judgment should govern the use and disposal of products of a chemical and petrochemical nature.

NOTE: *The following are recommendations that may be of assistance:*

- Become acquainted with and ensure that you understand the relative legislation applicable to your country.
- Where no legislation exists, obtain information from suppliers of oils, filters, batteries, fuels, antifreeze, cleaning agents, etc., with regard to their effect on man and nature and how to safely store, use, and dispose of these substances.

Helpful hints

- Avoid filling tanks using cans or inappropriate pressurized fuel delivery systems that may cause considerable spillage.
- In general, avoid skin contact with all fuels, oils, acids, solvents, etc. Most of them contain substances that may be harmful to your health.
- Modern oils contain additives. Do not burn contaminated fuels and or waste oils in ordinary heating systems.
- Avoid spillage when draining off used engine coolant mixtures, engine, gearbox and hydraulic oils, brake fluids, etc. Do not mix drained brake fluids or fuels with lubricants. Store them safely until they can be disposed of in a proper way to comply with local legislation and available resources.
- Modern coolant mixtures, i.e. antifreeze and other additives, should be replaced every two years. They should not be allowed to get into the soil, but should be collected and disposed of properly.
- Repair any leaks or defects in the engine cooling or hydraulic system immediately.
- Do not increase the pressure in a pressurized circuit as this may lead to a component failure.
- Protect hoses during welding as penetrating weld splatter may burn a hole or weaken them, allowing the loss of oils, coolant, etc.

Basic instructions - Important notice regarding equipment servicing

All repair and maintenance work listed in this manual must be carried out only by qualified dealership personnel, strictly complying with the instructions given, and using, whenever possible, the special tools.

Anyone who performs repair and maintenance operations without complying with the procedures provided herein shall be responsible for any subsequent damages.

The manufacturer and all the organizations of its distribution chain, including - without limitation - national, regional, or local CASE Dealers, reject any responsibility for damages caused by parts and/or components not approved by the manufacturer, including those used for the servicing or repair of the product manufactured or marketed by the manufacturer.

In any case, no warranty is given or attributed on the product manufactured or marketed by the manufacturer in case of damages caused by parts and/or components not approved by the manufacturer.

The information in this manual is up-to-date at the date of the publication. It is the policy of the manufacturer for continuous improvement. Some information could not be updated due to modifications of a technical or commercial type, or changes to the laws and regulations of different countries.

In case of questions, refer to your Case New Holland Construction Equipments Sales and Service Networks.

Basic instructions

⚠ WARNING

Explosive gas!

Batteries emit explosive hydrogen gas and other fumes while charging. Ventilate the charging area. Keep the battery away from sparks, open flames, and other ignition sources. Never charge a frozen battery.

Failure to comply could result in death or serious injury.

W0005A

⚠ WARNING

Hazardous chemicals!

Battery electrolyte contains sulfuric acid. Contact with skin and eyes could result in severe irritation and burns. Always wear splash-proof goggles and protective clothing (gloves and aprons). Wash hands after handling.

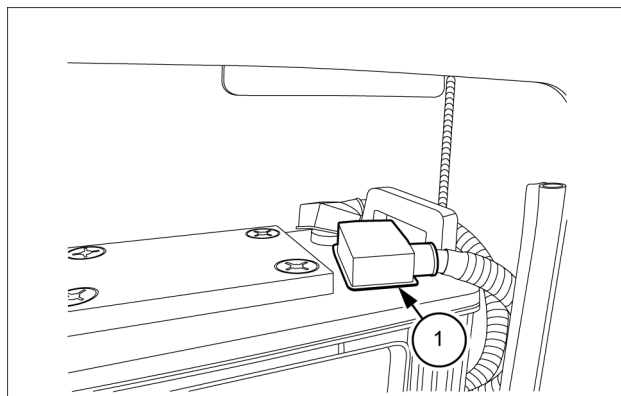
Failure to comply could result in death or serious injury.

W0006A

- Do not run the engine with the alternator wires disconnected.
- Before using an electric welder, disconnect the alternator wires, instrument cluster and batteries.
- Do not use a steam cleaner or a cleaning solvent to clean the alternator.
- Keep the battery vents clean. Ensure the battery vents are not restricted.

Disconnect battery

1. Open the battery compartment cover on the right hand side step of the vehicle, using the key.
2. Disconnect the negative battery cable **(1)** from the negative battery terminal.



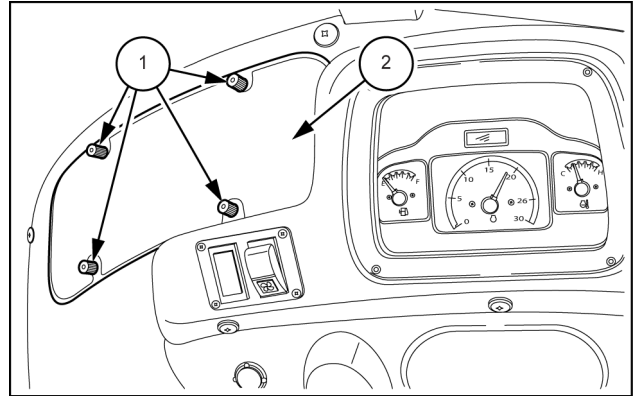
PTIL13TLB1199AB 1

Basic instructions - Fuse and relay locations

The machine is equipped with a fuse located on the side console.

Side console box

1. Turn the thumb screws **(1)** to loosen the panel cover **(2)** for the fuse box. Remove the panel cover.
2. Remove the fuse box covers as needed.
3. Refer to the decal on top of the panel cover for fuse, relay, and/or diode functions.



PTIL13TLB0302AB 1

SI No.	Fuse details	Fuse rating
1	Front work light	15 A
2	12 V power output	10 A
3	Rear work light	15 A
4	Horn, hazard light control	15 A
5	Cabin, fan, radio	10 A
6	Installer ignition	10 A
7	Wiper	10 A
8	Driving lamp LOW	15 A
9	Driving lamp HIGH	15 A
10	Cabin dome light	10 A
11	HVAC (If fitted)	20 A
12	Loader self level	10 A
13	Side shift lock	10 A
14	Cluster	10 A
15	Speedometer	10 A
16	Stop lamps	10 A
17	Hazard lights control ignition	10 A
18	Fuel shutoff	10 A
19	4WD (If fitted)	10 A
20	Shuttle control	10 A

The fuses are arranged as per the figure 2.

1	15 A	10 A	15 A	15 A	10 A	10 A	10 A	15 A	15 A	10 A	10
31	FRONT WORK LIGHT	MOBILE CHARGER	REAR WORK LIGHT	HORN, HAZARD LTS CTL	CABIN FAN, RADIO	INSTALLER IGN	WIPER	DRIVING LAMP LOW	DRIVING LAMP HIGH	CABIN DOME LIGHT	40
21											
11	20 A	10 A	10 A	10 A	10 A	10 A	10 A	10 A	10 A	10 A	30
	HVAC	LOADER SELF LEVEL	SIDE SHIFT LOCK	CLUSTER	SPEEDOMETER	STOP LAMPS	HAZARD LTS CTL IGN	FUEL SHUTOFF	4WD	SHUTTLE CONTROL	20

PTIL12TLB0441AA 2

Lamp details

Before using the machine, it is recommended to check that all lights are clean and correctly operating.

SI No.	Lamp description	Lamp wattage
1	Head lamp	65 W/ 55 W
2	Front work light	55 W
3	Rear work light	55 W
4	Stop lamp	21 W
5	Park lamp	10 W
6	Revers lamp	21 W
7	Turn lamp	21 W
8	Direction indicators	5 W
9	License plate lamp	5 W

Basic instructions

⚠ WARNING

Crushing hazard!

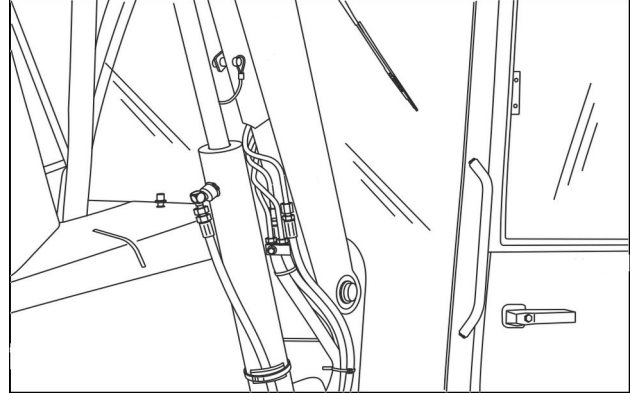
If you service the machine with the loader lift arms raised, always use the support strut. Remove the retaining pin and place the support strut onto the cylinder rod. Install the retaining pin into the support strut. Lower the lift arms onto the support strut.

Failure to comply could result in death or serious injury.

W0230A

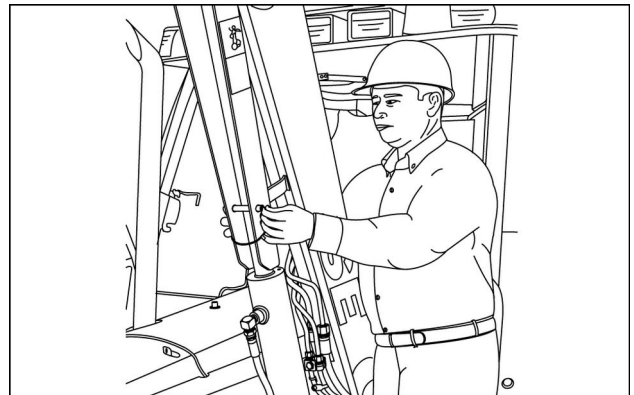
Raise and support loader lift arms:

1. Empty the loader bucket.
2. Raise the loader lift arms to the maximum height.
3. Shut down the engine.



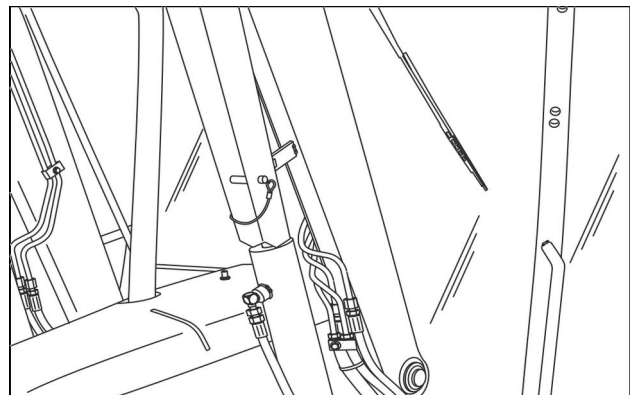
RCPH10TLB230AAF 1

4. Remove the retaining pin.
5. Lower the support strut onto the cylinder rod.
6. Install the retaining pin.



RCPH10TLB221AAF 2

7. Start the engine.
8. Slowly lower the lift arms so that the end of the support strut rests on the cylinder.

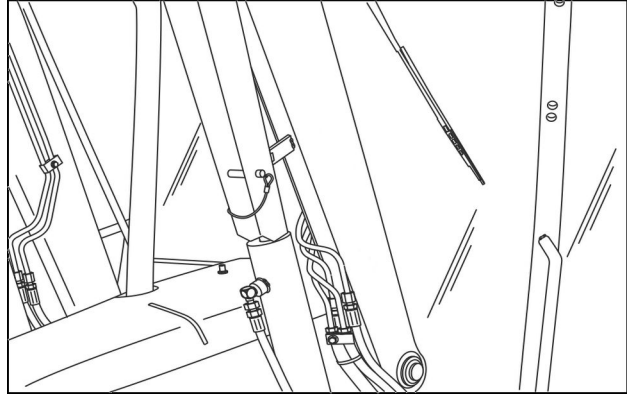


RCPH10TLB227AAF 3

INTRODUCTION

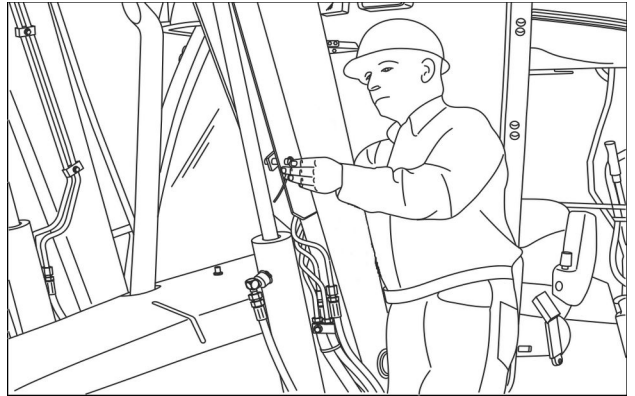
Lower supported loader lift arms:

1. Raise the lift arms so that the end of the support strut no longer rests on the cylinder.
2. Shut down the engine.



RCPH10TLB227AAF 4

3. Remove the retaining pin from the support strut.
4. Raise the support strut up to the storage position and secure with the retaining pin, as shown.



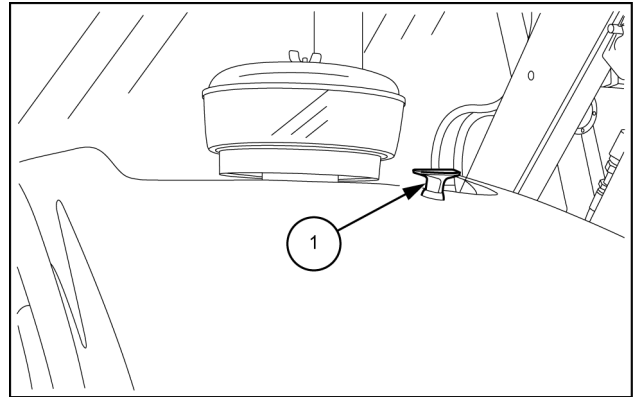
RCPH10TLB231AAF 5

5. Start the engine.
6. Lower the loader to the ground.

Basic instructions

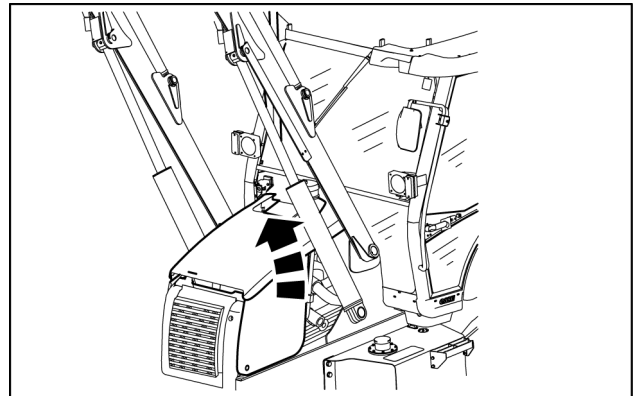
Open the hood:

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



PTIL13TLB1558AB 1

3. Lift the hood and rotate forward.

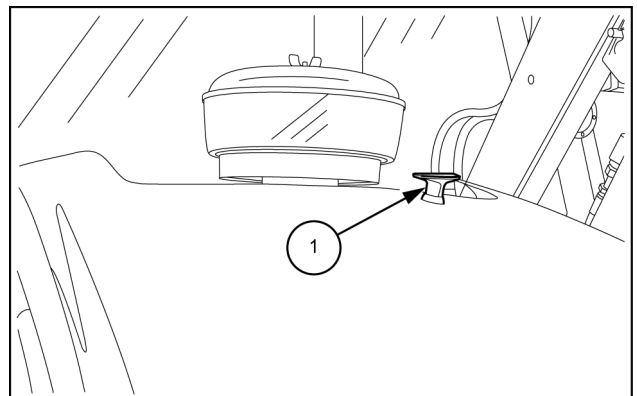


PTIL12TLB0559AB 2

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.



PTIL13TLB1558AB 3

Basic instructions

Types of filter

S.No.	Name
1.	Mud separator
2.	Air cleaner assembly
3.	Fuel filter assembly
4.	Engine oil filter
5.	Hydraulic filter
6.	Transmission oil filter
7.	cab filter

Maintenance – Linkage connection



PTIL18TLB0351GB 1

Right-hand side view

Follow greasing cycle as per usage and application

INTRODUCTION



PTIL18TLB0353GB 2

Left-hand side view

Follow greasing cycle as per usage and application.

Further please refer maintenance chart see **Maintenance chart**.

Basic instructions - Shop and assembly

Shimming

For each adjustment operation, select adjusting shims and measure the adjusting shims individually using a micrometer, then add up the recorded values. Do not rely on measuring the entire shimming set, which may be incorrect, or the rated value shown on each shim.

Rotating shaft seals

For correct rotating shaft seal installation, proceed as follows:

1. Before assembly, allow the seal to soak in the oil it will be sealing for at least thirty minutes.
2. Thoroughly clean the shaft and check that the working surface on the shaft is not damaged.
3. Position the sealing lip facing the fluid.

NOTE: *With hydrodynamic lips, take into consideration the shaft rotation direction and position the grooves so that they will move the fluid towards the inner side of the seal.*

4. Coat the sealing lip with a thin layer of lubricant (use oil rather than grease). Fill the gap between the sealing lip and the dust lip on double lip seals with grease.
5. Insert the seal in its seat and press down using a flat punch or seal installation tool. Do not tap the seal with a hammer or mallet.
6. While you insert the seal, check that the seal is perpendicular to the seat. When the seal settles, make sure that the seal makes contact with the thrust element, if required.
7. To prevent damage to the seal lip on the shaft, position a protective guard during installation operations.

O-ring seals

Lubricate the O-ring seals before you insert them in the seats. This will prevent the O-ring seals from overturning and twisting, which would jeopardize sealing efficiency.

Sealing compounds

Apply a sealing compound on the mating surfaces when specified by the procedure. Before you apply the sealing compound, prepare the surfaces as directed by the product container.

Spare parts

Only use CNH Original Parts or CASE CONSTRUCTION Original Parts.

Only genuine spare parts guarantee the same quality, duration, and safety as original parts, as they are the same parts that are assembled during standard production. Only CNH Original Parts or CASE CONSTRUCTION Original Parts can offer this guarantee.

When ordering spare parts, always provide the following information:

- Machine model (commercial name) and Product Identification Number (PIN)
- Part number of the ordered part, which can be found in the parts catalog

Protecting the electronic and/or electrical systems during charging and welding

To avoid damage to the electronic and/or electrical systems, always observe the following practices:

1. Never make or break any of the charging circuit connections when the engine is running, including the battery connections.
2. Never short any of the charging components to ground.
3. Always disconnect the ground cable from the battery before arc welding on the machine or on any machine attachment.
 - Position the welder ground clamp as close to the welding area as possible.
 - If you weld in close proximity to a computer module, then you should remove the module from the machine.
 - Never allow welding cables to lie on, near, or across any electrical wiring or electronic component while you weld.
4. Always disconnect the negative cable from the battery when charging the battery in the machine with a battery charger.

NOTICE: *If you must weld on the unit, you must disconnect the battery ground cable from the machine battery. The electronic monitoring system and charging system will be damaged if this is not done.*

5. Remove the battery ground cable. Reconnect the cable when you complete welding.

Special tools

WARNING

Battery acid causes burns. Batteries contain sulfuric acid.

Avoid contact with skin, eyes or clothing. Antidote (external): Flush with water. Antidote (eyes): flush with water for 15 minutes and seek medical attention immediately. Antidote (internal): Drink large quantities of water or milk. Do not induce vomiting. Seek medical attention immediately.

Failure to comply could result in death or serious injury.

W0111A

The special tools that CASE CONSTRUCTION suggests and illustrate in this manual have been specifically researched and designed for use with CASE CONSTRUCTION machines. The special tools are essential for reliable repair operations. The special tools are accurately built and rigorously tested to offer efficient and long-lasting operation.

By using these tools, repair personnel will benefit from:

- Operating in optimal technical conditions
- Obtaining the best results
- Saving time and effort
- Working in safe conditions

Basic instructions - Minimum tightening torques for normal assembly

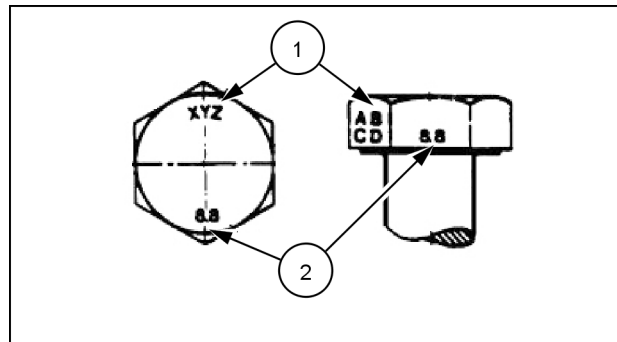
METRIC NON-FLANGED HARDWARE

NOM. SIZE	CLASS 8.8 BOLT and CLASS 8 NUT		CLASS 10.9 BOLT and CLASS 10 NUT		LOCKNUT CL.8 W/CL8.8 BOLT	LOCKNUT CL.10 W/CL10.9 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr		
M4	2.2 N·m (19 lb in)	2.9 N·m (26 lb in)	3.2 N·m (28 lb in)	4.2 N·m (37 lb in)	2 N·m (18 lb in)	2.9 N·m (26 lb in)
M5	4.5 N·m (40 lb in)	5.9 N·m (52 lb in)	6.4 N·m (57 lb in)	8.5 N·m (75 lb in)	4 N·m (36 lb in)	5.8 N·m (51 lb in)
M6	7.5 N·m (66 lb in)	10 N·m (89 lb in)	11 N·m (96 lb in)	15 N·m (128 lb in)	6.8 N·m (60 lb in)	10 N·m (89 lb in)
M8	18 N·m (163 lb in)	25 N·m (217 lb in)	26 N·m (234 lb in)	35 N·m (311 lb in)	17 N·m (151 lb in)	24 N·m (212 lb in)
M10	37 N·m (27 lb ft)	49 N·m (36 lb ft)	52 N·m (38 lb ft)	70 N·m (51 lb ft)	33 N·m (25 lb ft)	48 N·m (35 lb ft)
M12	64 N·m (47 lb ft)	85 N·m (63 lb ft)	91 N·m (67 lb ft)	121 N·m (90 lb ft)	58 N·m (43 lb ft)	83 N·m (61 lb ft)
M16	158 N·m (116 lb ft)	210 N·m (155 lb ft)	225 N·m (166 lb ft)	301 N·m (222 lb ft)	143 N·m (106 lb ft)	205 N·m (151 lb ft)
M20	319 N·m (235 lb ft)	425 N·m (313 lb ft)	440 N·m (325 lb ft)	587 N·m (433 lb ft)	290 N·m (214 lb ft)	400 N·m (295 lb ft)
M24	551 N·m (410 lb ft)	735 N·m (500 lb ft)	762 N·m (560 lb ft)	1016 N·m (750 lb ft)	501 N·m (370 lb ft)	693 N·m (510 lb ft)

NOTE: M4 through M8 hardware torque specifications are shown in pound-inches. M10 through M24 hardware torque specifications are shown in pound-feet.

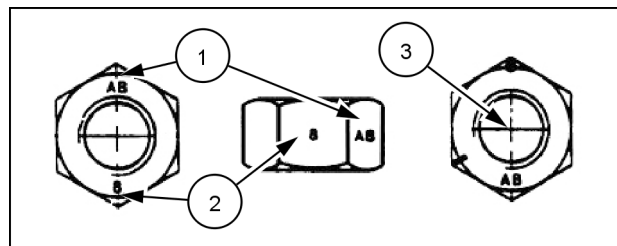
METRIC FLANGED HARDWARE

NOM. SIZE	CLASS 8.8 BOLT and CLASS 8 NUT		CLASS 10.9 BOLT and CLASS 10 NUT		LOCKNUT CL.8 W/CL8.8 BOLT	LOCKNUT CL.10 W/CL10.9 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr		
M4	2.4 N·m (21 lb in)	3.2 N·m (28 lb in)	3.5 N·m (31 lb in)	4.6 N·m (41 lb in)	2.2 N·m (19 lb in)	3.1 N·m (27 lb in)
M5	4.9 N·m (43 lb in)	6.5 N·m (58 lb in)	7.0 N·m (62 lb in)	9.4 N·m (83 lb in)	4.4 N·m (39 lb in)	6.4 N·m (57 lb in)
M6	8.3 N·m (73 lb in)	11 N·m (96 lb in)	12 N·m (105 lb in)	16 N·m (141 lb in)	7.5 N·m (66 lb in)	11 N·m (96 lb in)
M8	20 N·m (179 lb in)	27 N·m (240 lb in)	29 N·m (257 lb in)	39 N·m (343 lb in)	18 N·m (163 lb in)	27 N·m (240 lb in)
M10	40 N·m (30 lb ft)	54 N·m (40 lb ft)	57 N·m (42 lb ft)	77 N·m (56 lb ft)	37 N·m (27 lb ft)	53 N·m (39 lb ft)
M12	70 N·m (52 lb ft)	93 N·m (69 lb ft)	100 N·m (74 lb ft)	134 N·m (98 lb ft)	63 N·m (47 lb ft)	91 N·m (67 lb ft)
M16	174 N·m (128 lb ft)	231 N·m (171 lb ft)	248 N·m (183 lb ft)	331 N·m (244 lb ft)	158 N·m (116 lb ft)	226 N·m (167 lb ft)
M20	350 N·m (259 lb ft)	467 N·m (345 lb ft)	484 N·m (357 lb ft)	645 N·m (476 lb ft)	318 N·m (235 lb ft)	440 N·m (325 lb ft)
M24	607 N·m (447 lb ft)	809 N·m (597 lb ft)	838 N·m (618 lb ft)	1118 N·m (824 lb ft)	552 N·m (407 lb ft)	

IDENTIFICATION**Metric Hex head and carriage bolts, classes 5.6 and up**

20083680 1

1. Manufacturer's Identification
2. Property Class

Metric Hex nuts and locknuts, classes 05 and up

20083681 2

1. Manufacturer's Identification
2. Property Class
3. Clock Marking of Property Class and Manufacturer's Identification (Optional), i.e. marks **60°** apart indicate Class 10 properties, and marks **120°** apart indicate Class 8.

INCH NON-FLANGED HARDWARE

NOMINAL SIZE	SAE GRADE 5 BOLT and NUT		SAE GRADE 8 BOLT and NUT		LOCKNUT GrB W/ Gr5 BOLT	LOCKNUT GrC W/ Gr8 BOLT
	UN-PLATED or PLATED SILVER	PLATED W/ZnCr GOLD	UN-PLATED or PLATED SILVER	PLATED W/ZnCr GOLD		
1/4	8 N·m (71 lb in)	11 N·m (97 lb in)	12 N·m (106 lb in)	16 N·m (142 lb in)	8.5 N·m (75 lb in)	12.2 N·m (109 lb in)
5/16	17 N·m (150 lb in)	23 N·m (204 lb in)	24 N·m (212 lb in)	32 N·m (283 lb in)	17.5 N·m (155 lb in)	25 N·m (220 lb in)
3/8	30 N·m (22 lb ft)	40 N·m (30 lb ft)	43 N·m (31 lb ft)	57 N·m (42 lb ft)	31 N·m (23 lb ft)	44 N·m (33 lb ft)
7/16	48 N·m (36 lb ft)	65 N·m (48 lb ft)	68 N·m (50 lb ft)	91 N·m (67 lb ft)	50 N·m (37 lb ft)	71 N·m (53 lb ft)
1/2	74 N·m (54 lb ft)	98 N·m (73 lb ft)	104 N·m (77 lb ft)	139 N·m (103 lb ft)	76 N·m (56 lb ft)	108 N·m (80 lb ft)
9/16	107 N·m (79 lb ft)	142 N·m (105 lb ft)	150 N·m (111 lb ft)	201 N·m (148 lb ft)	111 N·m (82 lb ft)	156 N·m (115 lb ft)
5/8	147 N·m (108 lb ft)	196 N·m (145 lb ft)	208 N·m (153 lb ft)	277 N·m (204 lb ft)	153 N·m (113 lb ft)	215 N·m (159 lb ft)
3/4	261 N·m (193 lb ft)	348 N·m (257 lb ft)	369 N·m (272 lb ft)	491 N·m (362 lb ft)	271 N·m (200 lb ft)	383 N·m (282 lb ft)
7/8	420 N·m (310 lb ft)	561 N·m (413 lb ft)	594 N·m (438 lb ft)	791 N·m (584 lb ft)	437 N·m (323 lb ft)	617 N·m (455 lb ft)
1	630 N·m (465 lb ft)	841 N·m (620 lb ft)	890 N·m (656 lb ft)	1187 N·m (875 lb ft)	654 N·m (483 lb ft)	924 N·m (681 lb ft)

NOTE: For Imperial Units, **1/4 in** and **5/16 in** hardware torque specifications are shown in pound-inches. **3/8 in** through **1 in** hardware torque specifications are shown in pound-feet.