WSM

WORKSHOP MANUAL
KUBOTA WHEEL LOADER

R420α, R520α
R420S, R520S
minor-change version

Kubota

Code No.97899-62060

Record of Revisions

Symbol	Date	Main Revised Points & Corrective Measures	Person-in-charge
△1			
△2			
△3			
△4			

This WSM is compiled for the aims below:
- Combined version of its Mechanism Chapter (97899-60780) and Service Chapter (97899-60080), previously edited for R420S/α and R520S/α.
- Additional contents on the new emissions control engine (Tier 4)
- VIII Supplement Chapter

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I. GENERAL

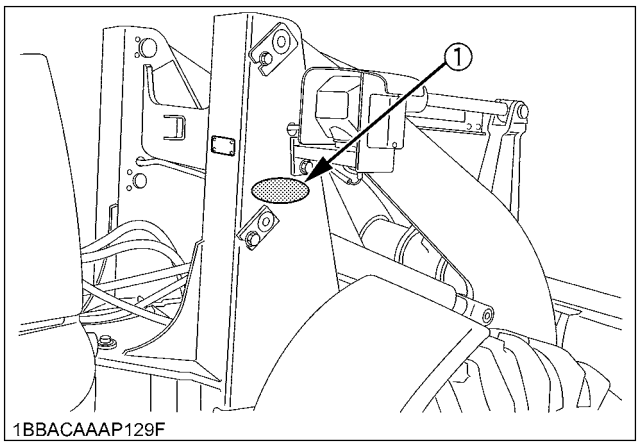
Distribution market	PP-version (KTC, KCL, KTA)					
Machine model	R320S	R320 (Tier 4)	R420S	R420S (Interim Tier 4)	R520S	R520S (Interim Tier 4)
Serial No.	10001~	20001~	10001~	20001~	10001~	20001~

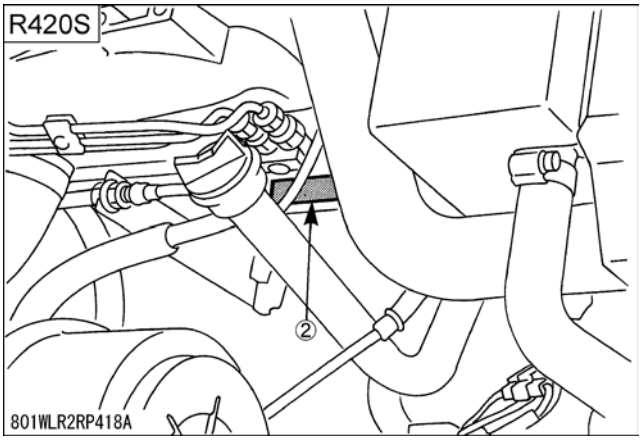
Distribution market	EU-version (KE, KUK, KBM)		
Machine model	R310α (Stage III A)	R420α (Stage III A)	R520α (Stage III A)
Serial No.	20001~	50001~	50001~

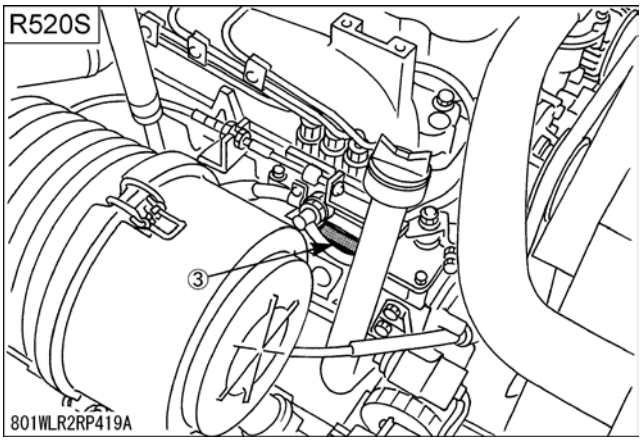
Note: 1. (Tier 4) (Interim Tier 4) (Stage III A) indicate the new emissions control engines, which are described in the Engine section.
2. Customers and dealers are requested to identify their machines according to the serial number and types of engines mounted.

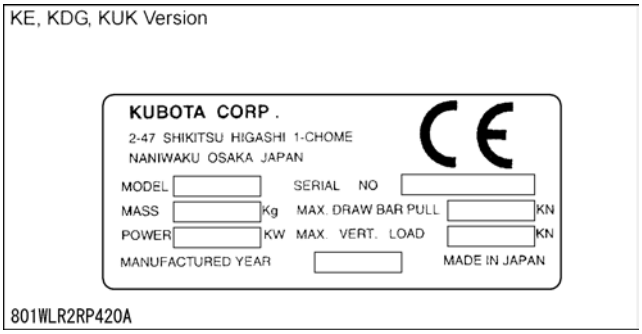
I. GENERAL

(A) BODY AND ENGINE IDENTIFICATIONS MARKS









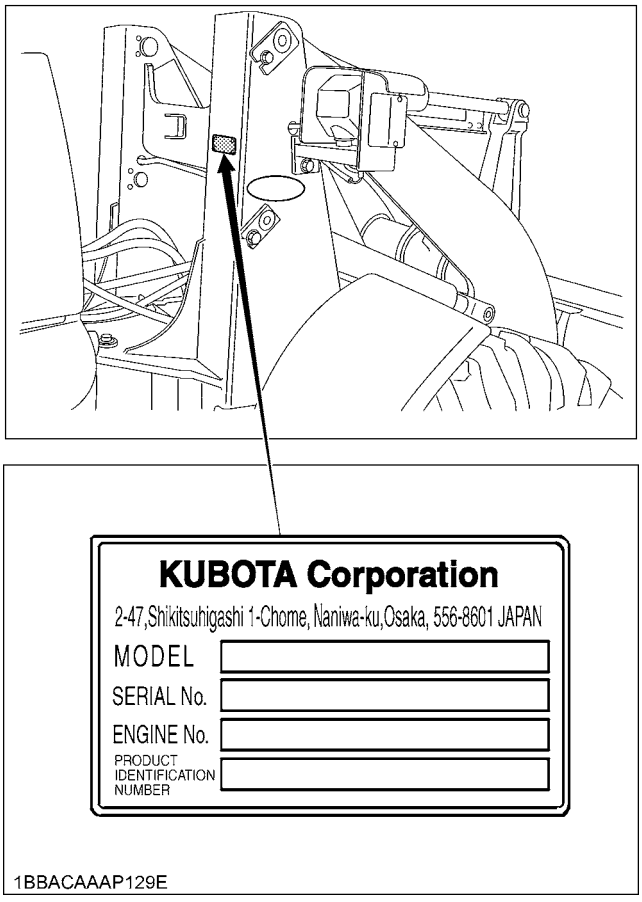
(1) Machine serial No.
(2) Engine serial No.
(3) Engine serial No.

Your dealer is interested in your new wheel loader and has the desire to help you get the most value from it. After reading this manual thoroughly, you will find that you can do some of the regular maintenance yourself. However, when in need of parts or major service, be sure to see your KUBOTA dealer.

For service, contact the KUBOTA dealer/Dealership from which you purchased your wheel loader or your local authorized KUBOTA dealer.

When in need of parts, be prepared to give your dealer both the machine and engine serial numbers. Locate the serial numbers now and record them in the space provided.

	Model	Serial No.
Wheel Loader		
Engine		
Date of Purchase		
Name of Dealer		
(To be filled in by purchaser)		



(B) SAFETY PRECAUTIONS FOR SERVICING, DISASSEMBLY AND REASSEMBLY

- Most accidents during servicing arise from carelessness. Please remember that safety involves both the welfare of the employees and improved work efficiency.

- Machines must be disassembled and assembled efficiently and safely.
  It is very important to thoroughly understand the construction and function of the machine, to make all appropriate preparations, and start operations according to the specified working procedures.

a) Safety measures before starting work

[1] Work clothes

1. Wear specified work cap and clothed. (Under no circumstances may workers wear undershirts only.)
   Cuffs must be kept buttoned, and any tears must be mended.)
2. Wear safety shoes.
3. Do not wear cotton gloves when working on the internal section of engine, reduction gears or hydraulic units for repair or others, or when using a hammer. Wear leather gloves, however, when hoisting wires.

[2] Inspecting equipment and tools

1. Prepare equipment (cranes, fork lifts, tool, etc.) requires for servicing and inspect for any problems before starting work.
2. Hammer heads (metal parts) must be firmly secured to their handles.
3. Check hosting tools (wire ropes, hosting chains, etc.) before use.

[3] Keep workshop in order

1. Secure appropriate space needed for disassembly to the job.
2. Secure a clean, safe place for arranging disassembled parts.
3. Store volatile substances (gasoline, light oil, thinner, oily articles, etc.) in appropriate containers at selected locations to prevent fire hazards.

b) Safety measures during work

[1] Protectors

1. Wear goggles when using chisels for chipping.
2. Use appropriate protectors during welding.
3. Wear a helmet when working with a crane or at elevated locations.

[2] Team work

1. When working with two or more people, divide the work and maintain close communication.
2. Clean work must be carried out using predetermined signals.

[3] Disassembly and assembly

1. Do not wear gloves when using hammers.
2. Use rods of the specified soft material for removing pins. Do not use a hammer as a pad.
3. Do not place fingers in holes when centering.
4. Heavy parts must be adequately supported before removing bolts.

[4] Cranes

1. In principle, use a crane for objects heavier than 44 lb (20 kg)
2. Crane operation and hoisting must be performed only by qualified personal.
3. Pay careful attention to the center of gravity when hoisting, and do not stand under the lifted objects.

[5] Others

1. To work under a jacked-up carrier, be sure to place wood pieces under it.
2. When charging batteries, make sure there are no open flames in the immediate vicinity.
3. All electric tools must be grounded.
4. Before welding the machine, remove the battery.
   - When removing the battery, be sure to connect the positive (-) cord first.
   - When mounting the battery, be sure to connect the positive (+) cord first.

c) Preparation for disassembly

[1] Cleaning

Remove mud and dirt from the body before disassembly.

[2] Acceptance inspection

The machine must be checked before it is disassembled to record existing conditions, such as those listed below.

Model, serial number, and hourmeter reading

- Reason for repair and repair history
- Element stains
- Fuel and oil condition
- Parts damage *(Take photographs if necessary.)

[3] Equipment and tools

Prepare equipment, tools, cranes and parts storage racks as required.

d) Precautions for disassembly and reassembly

[1] Disassembly

1. Follow the specified disassembly procedures.
2. Make alignment marks to insure correct reassembly.
3. Arrange disassembled parts in an orderly way, and attach identification tags or put marks if needed.

[2] Reassembly

1. Clean all parts before assembly. Repair any scratches or dents. Take special precautions against dirt and dust.
2. Parts with rust-preventive coatings must be assembles only after removing the corting.
3. Separated parts must be correctly reassembled using alignment marks.
4. As a rule, use a press to reassembled bearings, bushing and oil seals. Use pads when using a hammer.

(C) IMPORTANT SAFETY PROCESS AND CRITICAL FUNCTIONAL PROCESS

The following instructions are related to essential adhesives, important safety process [S] and critical functional process [A]. Pay special attention in servicing these process. (Pay also close attention in reconnecting the electrical cables.)

(1) Important safety process [S]

1. Assembling and adjustment of brake & inching components.
2. Reconnecting the fuel hose (clearance, hose routes, clamps, etc.)
3. Electrical cabling (engine, instrument panel, controls, etc.) (wiring routes, clamps and couplers)

(2) Important critical functional process [A]

1. Assembling and installing the differential assy.
2. Assembling the center shaft.
3. Fitting the pump couplings (tightening torque).
4. Installing the LST pump (tightening torque).
5. Installing the LST motor (tightening torque)

(3) Essential adhesives

Type of screw adhesive

- Unless otherwise specified, use Three-Bond 1324 adhesive (medium-duty type).
  Keep the screw threads free of oil and water.

Type of instantaneous adhesive

- Use Three-Bond 1733 or Three-Bond 1741E adhesive.
  Keep the bond areas free of oil and water.

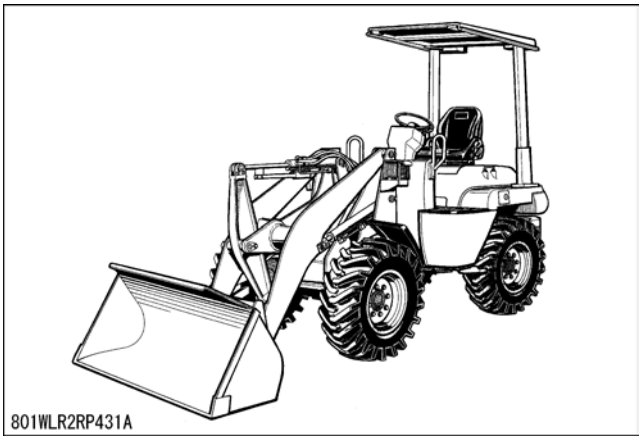
(D) IMPORTANT INSPECTION ITEMS AFTER REASSEMBLING

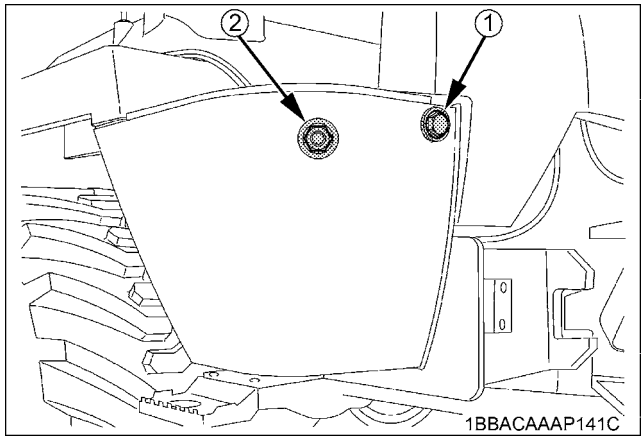
a) Operate the machine and check for unusual noise and vibrations.

b) Make sure the safety decals and wireharness clamps are in their specified positions.

c) With the machine front in a specified posture, check the amount of hydraulic oil.

Checking the oil level (For further details, refer to the Operator's Manual of each model.)
1) Park the machine on a level ground, stop engine and lower the bucket to the ground.
2) Make sure the hydraulic oil temperature is in the range of 10-30℃ (50-86℉) and see if the oil level is within the specified zone of the oil level gauge.
3) Keep the machine front as shown as following posture.





(1) Oil port
(2) Oil level gauge

(E) Service fundamentals

a) Service intervals

Service Interval Chart (Do all previous checks in addition to New checks.)

	Maintenance hours (Hourmeter) / Item of Maintenance		First (hrs)			Maintenance (hrs)								One year from buying	Two years from buying	Ref. Page		
			50	100	500	every 50	every 200	every 250	every 500	every 1000	every 1500	every 2000	every 3000					
1	Check battery liquid level.					○												
2	Drain of the fuel tank					○												
3	Change engine oil			*□				□										
4	Replace engine oil filter cartridge			*□				□										
5	Check for fan belt tension and adjust as necessary.						○											
6	Clean and check air cleaner element, and change if necessary.	Outer element	*○				○			□							*1	@
		Inner element								□							*1	
7	Change, check and replenish oil in front/ rear axle differential case.				*□				○	□								
8	Change hydraulic oil.				*□					□								
9	Change LST oil filter cartridge								□									
10	Change return filter cartridge								□									
11	Change suction filter				*□					□								
12	Change fuel filter cartridge and discharging water from the sediment filter.								□									@
13	Check alternator starteer motor.										○							

○: Check and replenish *□: Replace for the first time □: Replace *○: Check and clean for the first time
△: Consult your local KUBOTA Dealer for this service

■ IMPORTANT

*1 Clean and replace the air filter more frequently if used under dusty conditions. With heavy soil, replace the filter.
*2 Replace only if necessary.
*3 Consult your local KUBOTA Dealer for this service.

	Maintenance hours (Hourmeter) / Item of Maintenance	First (hrs)			Maintenance (hrs)								One year from buying	Two years from buying	Ref. Page		
		50	100	500	every 50	every 200	every 250	every 500	every 1000	every 1500	every 2000	every 3000					
14	Change coolant	Twice a year (Spring and Autumn)															
15	Check and change radiator hose and band.					○								□			
16	Change fuel line and intake airline.					○								□		*2	@
17	Change rubber hose													□			
18	Check and retighten the wheel bolts in the first 100 hrs, and after exchanging tires.	*○					○										
19	Check the damage of electrical circuit and the looseness of the coupler.												○				
20	Check fuel injection nozzle injection pressure.									△						*3	@
21	Check injection pump											△				*3	@

○: Check and replenish *□: Replace for the first time □: Replace *○: Check and clean for the first time
△: Consult your local KUBOTA Dealer for this service

■ IMPORTANT

*1 Clean and replace the air filter more frequently if used under dusty conditions. With heavy soil, replace the filter.
*2 Replace only if necessary.
*3 Consult your local KUBOTA Dealer for this service.

b) Lubricants

Select the Grade by Referring to the Table.

Replenish place		Kind of fuel oil and water	Capacity L(u.s. gal.) R420S/α	Capacity L(u.s. gal.) R520S/α	Viscosity No. classified by temperature; –20 –10 0 10 20 30 40(℃)
Fuel tank		Diesel	54 (14.3)		No.2-D / No.1-D
Engine oil pan		Engine oil	7.0 (1.8)	9.5 (2.5)	SAE 10W(CD) / SAE 30W(CD) / SAE 10W-30(CD)
Front and rear differential case		Gear oil	3.0 (0.8)		* SAE 80W
Hydraulic oil	Total system	Engine oil	60 (15.9)	60 (16.4)	SAE 5W-30 / SAE 10W-30 / SAE 15W-40
	Tank gauge center		42 (11.1)		
Brake fluid reservoir		Hydraulic oil	0.3 (0.08)		Hydraulic oil ISO VG32
Grease nipple		Grease	—		No.2 / No.1 / No.0
Radiator	Full	Coolant	6.5 (1.7)		Soft water / Anti-freeze
	Reserve tank		1.1 (0.3)		

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■ IMPORTANT

- In area where the temperature drops to -10℃ or lower, drain all oil in hydraulic oil tank and replace with all season type engine oil SAE 5W-30(CD) for the winter.
- Use engine oil API service classification CD, CE or CF.

■ NOTE

- It cannot be guaranteed against any problem caused by use of the fuel and lubricating oil and grease that are not specified.

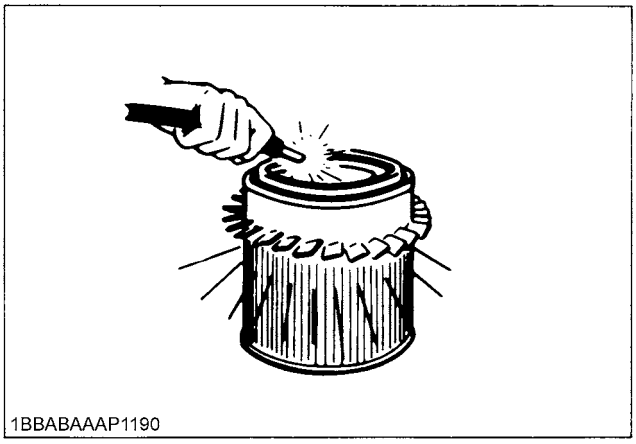
★ Always use the specified gear oil, M80B or equivalent, which is permitted by KUBOTA.
When engine oil is used to the LSD specification differential, crip sounds are generated from differential gears during turning (especially when the steering wheel is maintained at a turned position). (This occurs due to wrong combination of LSD clutch plate and oil, causing change in the friction characteristics, which has no adverse effects including durability)

Specified differential oil type				
M80B				
Shell Donax TD	Mobiland super Universal	Multipurpose Tcuban EP SAE 80W	Chevron Universal Gear Lubricant SAE 80W-90	Multi gear Lubricant EP SAE 80W-90

* For cab version, fill 1.2 L (0.32 US G) of cooling water in the radiator after running for 5 minutes with the engine max. and being turned on the heater.
(Make sure the heater's warm air is on.)
Pay full attention to the hot water when the radiator's cap is released

c) Notices for service items

[1] Air cleaner element cleaning pressure

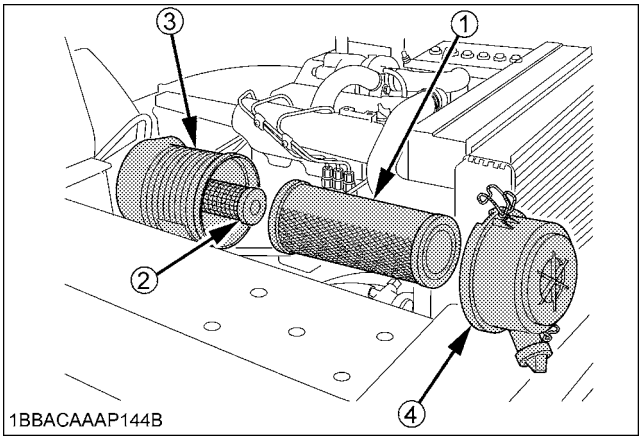


♦ **Cleaning with compressed air**

Pressure of compressed air must be under 205 kPa (2.1 kgf/cm², 30 psi), and the cartridge should be blown clean from the inside to the outside until the dust deposits are remarkably reduced.

■ **IMPORTANT**

- If the air suction is still inadequate, or the color of the exhaust gases is abnormal even after the cleaning, the air filter cartridge must be replaced.



(1) Outer element
(2) Inner element
(3) Case
(4) Dust cover

■ **IMPORTANT**

- Should the machine be used in extreme dusty areas, the air filter element must be inspected and cleaned more frequently than in the specified maintenance periods.
- The air filter has a dry element, keep free from oil.
- Do not run the engine without the air filter.

[2] Periodic parts replacement

To ensure safety at all times, it is important to inspect and maintain the engine on a regular basis. For further safety, it is strongly recommended to periodically replace the following parts which are most essential to safe operation. These parts tend to wear out or deteriorate with time and it is often difficult to determine their condition by periodic inspection. Therefore, even if no defect is found, they should be replaced at certain intervals to maintain their safe operation.
If any defect is found before the specified time, immediately replace or repair the part. Please understand that such periodic replacement is not covered by the maker's warranty.

	Periodic parts of replacement	Replacement intervals
1	Brake rubber hose	every year
2	Rubber parts (piston packing of brake master cylinder etc.)	every two years
3	Brake fluid (Hydraulic oil ISO VG 32)	every two years
4	Fuel lines	every two years
5	Oil pressure hose for steering cylinder	every two years
6	Packing of steering cylinder, seal O ring	every four years

As for overall daily and periodical service items, refer to "Operator's Manual". Code No. R2411-8121-1

d) Tightening torque

[1] General precautions

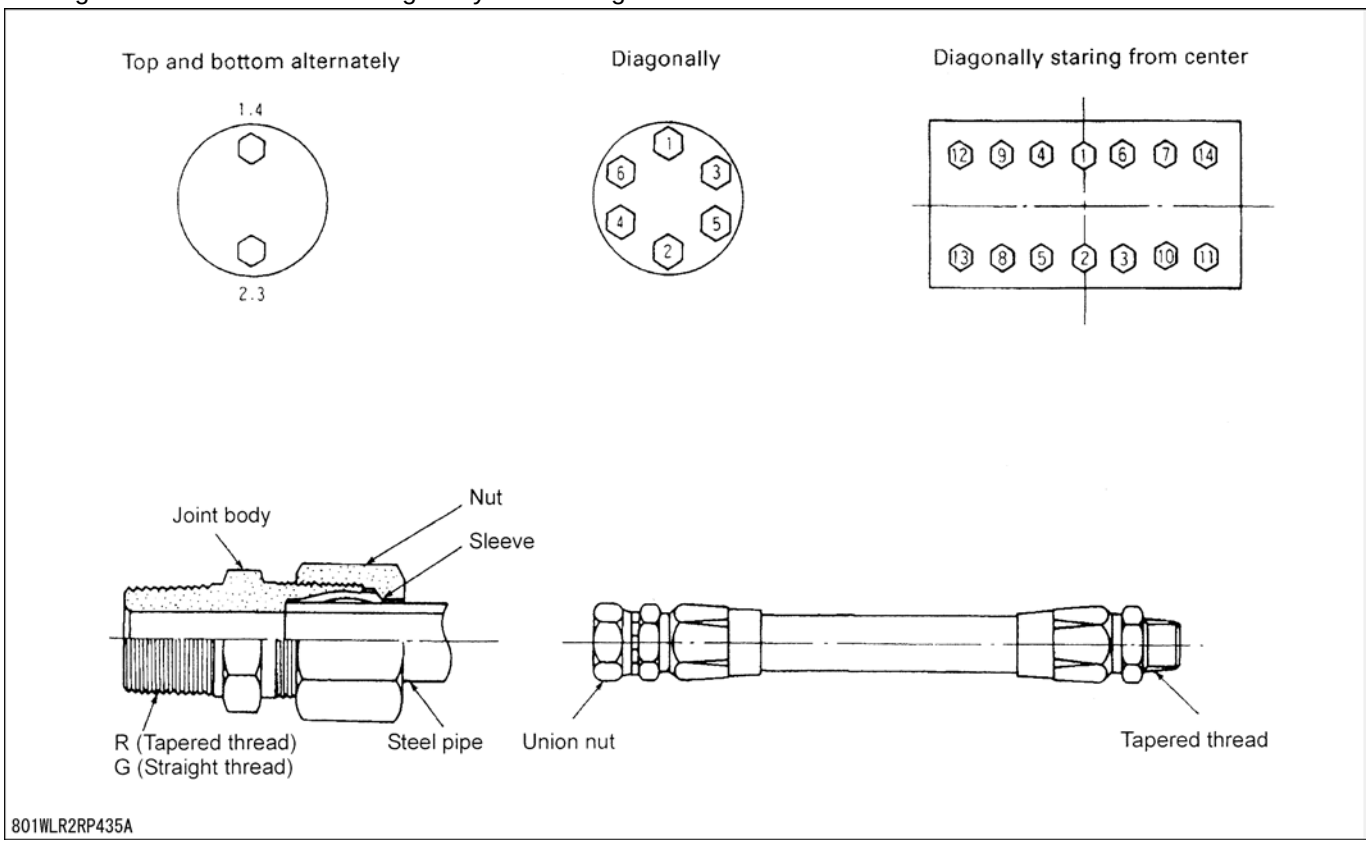
- Tightening the pipe socket to the specified torque. If too tight, the socket itself or a hydraulic component may get damaged. If too loose, an oil leak may result.
- In connecting a new hose or pipe, tighten its nut first to the specified torque and then turn it back (about 45°). Then tighten it again to the specified torque. (Do not this to the sealing tape-applied hose or pipe.)
- When disconnecting a vertical hose or pipe, separate its bottom connection first.
- In disconnecting and reconnecting the hose and pipe, be sure to use two wrenches. With one wrench, restrain the mating part to allow no twist.
- Check the mating connector's sleeve and the hose's taper for dust deposits and scratches.
- When the pipe socket has been tightened up, wipe the joint clean. Apply the maximum operating pressure 2 or 3 times to make sure there is no oil leak.

[2] Hydraulic hose

Check the hydraulic hose for too tight a connect or twist.
*Excessively tight contact condition is:
Let's suppose that a hose is in contact with another hose or other part. If the hose is pulled away by a force of 2 kg but still in contact, it means the contact is too tight.

[3] Precautions in tightening the bolts and nuts

- Use bolts of specified length.
- Do not over tighten the bolts: Its threads may get deformed or the fixed part may get damaged. Do not under tighten the bolt either: It may get loose.
- In other words, tighten the bolt to the specified torque.
- Tighten the bolts and nuts diagonally for even tightness.



[4] Hose screw

Thread size (piping screw)	Tightening torque N-m kgf-m ft-lbf		Wrench size (reference)
	Union nut section	Taper thread section	
1/8"	7.8 ~ 11.8 N-m 0.8 ~ 1.2 kgf-m 5.8 ~ 8.7 ft-lbf	14.71 ~ 19.61 N-m 1.5 ~ 20 kgf-m 10.85 ~ 14.47 ft-lbf	17 mm 0.67 in
1/4"	24.5 ~ 29.4 2.5 ~ 3.0 18.1 ~ 21.7	36.3 ~ 44.1 3.7 ~ 4.5 26.8 ~ 32.5	19 mm 0.75 in
3/8"	49.0 ~ 53.9 5.0 ~ 3.0 18.1~21.7	49.0 ~ 68.6 5.0 ~ 7.0 36.2 ~ 50.6	22 mm 0.87 in
1/2"	49.0 ~ 53.9 5.0 ~ 5.5 36.2 ~ 39.8	83.4 ~ 88.3 8.5 ~ 9.0 61.5 ~ 65.1	27 mm 1.06 in
3/4"	58.8 ~ 63.7 6.0 ~ 6.5 43.4 ~ 47.0	127.5 ~ 147.1 13.0 ~ 15.0 94.0 ~ 108.5	36 mm 1.42 in
1"	137.3 ~ 147.1 14.0 ~ 15.0 101.3 ~ 108.5	147.1 ~ 166.7 15.0 ~ 17.0 108.5 ~ 123.0	41 mm 1.61 in

Metric Size Hose

Thread size (piping screw)	Torque N-m kgf-m ft-lbf
M12 x 1.5	20 ~ 30 2.0 ~ 3.1 14.75 ~ 22.13
M14 x 1.5	20 ~ 30 2.0 ~ 3.1 14.75 ~ 22.13
M16 x 1.5	30 ~ 50 3.1 ~ 5.1 22.13 ~ 36.9
M18 x 1.5	30 ~ 50 3.1 ~ 5.1 22.13 ~ 36.9
M22 x 1.5	40 ~ 60 4.1 ~ 6.1 29.5 ~ 44.25

[5] Joint bodies

Thread size (piping screw)	Tightening torque N-m kgf-m ft-lbf		Spanner size (reference)	Remarks Steel pipe (OD)	
	R (tapered thread)	G (straight thread)			
1/8"	19.6 ~ 29.4 N-m 2.0 ~ 3.0 kgf-m 14.5 ~ 21.7 ft-lbf	---	17 mm 0.67 in	When in steel pipe is in use.	8 mm 0.31 in
1/4"	36.3 ~ 44.1 3.7 ~ 4.5 26.8 ~ 32.5	W/O-ring Joint Torque 58.8 ~ 78.5 6 ~ 8 43.4 ~ 57.9	19 mm 0.75 in		12 mm 0.47 in
3/8"	39.2 ~ 49.0 4.0 ~ 5.0 28.9 ~ 36.2	W/O-ring Joint Torque 78.5 ~ 98.1 8 ~ 10 57.9 ~ 72.3	23 mm 0.91 in		15 mm 0.59 in
1/2"	49.0 ~ 68.6 5.0 ~ 7.0 36.2 ~ 50.6	W/O-ring Joint Torque 117.7 ~ 137.3 12 ~ 14 86.8 ~ 101.3	26 mm 1.02 in		16 mm 0.63 in

[6] Tightening torque table for hose clamp (Screw type)

No.	Dia. (mm)	Code No.	Tightening torque N-m kgf-m ft-lbf
1	ø12 ~ 16	09318-89016	2.5 ~ 3.4 25 ~ 35 1.84 ~ 2.51
2	ø19 ~ 25	09318-89024	
3	ø31 ~ 40	09318-89039	
4	ø36 ~ 46	09318-89045	
5	ø15 ~ 25	RC101-64580	4.9 ~ 5.9 50 ~ 60 3.61 ~ 4.35
6	ø26 ~ 38	68311-72820	
7	ø13 ~ 20	RB101-63630	3.4 ~ 4.4 35 ~ 45 2.58 ~ 3.31
8	ø40 ~ 55	RC411-63180	4.9 ~ 5.9 50 ~ 60 3.61 ~ 4.35
9	ø77 ~ 95	69284-63170	
10	ø50 ~ 60	RC401-63190	
11	ø32 ~ 44	RD411-63820	

[7] Nuts for piping

Steel pipe size (O.D. x I.D. x Thickness)	Tightening torque N-m kgf-m ft-lbf	Spanner size (reference)	Remarks
8 x 6 x 1 mm 0.31 x 0.24 x 0.04 in	29.4 ~ 39.2 3.0 ~ 4.0 21.7 ~ 28.9	17 mm 0.67 in	When sleeve nut is in use.
10 x 7 x 1.5 mm 0.39 x 0.28 x 0.06 in	39.2 ~ 44.1 4.0 ~ 4.5 28.9 ~ 32.5	19 mm 0.75 in	
12 x 9 x 1.5 mm 0.47 x 0.35 x 0.06 in	53.9 ~ 63.7 5.5 ~ 6.5 39.7 ~ 47.0	21 mm 0.83 in	
16 x 12 x 2 mm 0.63 x 0.47 x 0.08 in	88.3 ~ 98.1 9.0 ~ 10.0 65.1 ~ 72.3	29 mm 1.14 in	
18 x 14 x 2 mm 0.71 x 0.55 x 0.08 in	127.5 ~ 137.3 13.0 ~ 14.0 94.0 ~ 101.3	32 mm 1.26 in	
27.2 x 21.6 x 2.8 mm 1.07 x 0.85 x 0.11 in	235.4 ~ 254.97 24.0 ~ 16.0 173.6 ~ 188.1	41 mm 1.61 in	

[8] Tightening torque of bolts and nuts

Refer to the tightening torque table below.

Bolts, Nuts Nominal Dia.	4T 4	7T 7	9T 9
	SS41	S40C, S45C	SCr4
M6	7.8 ~ 9.3 N-m 0.80 ~ 0.95 kgf-m 5.8 ~ 6.9 ft-lbf	9.8 ~ 11.3 N-m 1.00 ~ 1.15 kgf-m 7.2 ~ 8.3 ft-lbf	12.3 ~ 14.2 N-m 1.25 ~ 1.45 kgf-m 9.0 ~ 10.5 ft-lbf
M8	17.7 ~ 20.6 N-m 1.80 ~ 2.10 kgf-m 13.0 ~ 15.2 ft-lbf	23.5 ~ 27.5 N-m 2.40 ~ 2.80 kgf-m 17.4 ~ 20.3 ft-lbf	29.4 ~ 34.3 N-m 3.00 ~ 3.50 kgf-m 21.7 ~ 25.3 ft-lbf
M10	39.2 ~ 45.1 N-m 4.00 ~ 4.60 kgf-m 28.9 ~ 33.3 ft-lbf	48.0 ~ 55.9 N-m 4.90 ~ 5.70 kgf-m 35.4 ~ 41.2 ft-lbf	60.8 ~ 70.6 N-m 6.20 ~ 7.20 kgf-m 44.8 ~ 52.1 ft-lbf
M12	62.8 ~ 72.6 N-m 6.40 ~ 7.40 kgf-m 46.3 ~ 53.5 ft-lbf	77.5 ~ 90.2 N-m 7.90 ~ 9.20 kgf-m 57.1 ~ 66.5 ft-lbf	103.0 ~ 117.7 N-m 10.50 ~ 12.00 kgf-m 75.9 ~ 86.8 ft-lbf
M14	107.9 ~ 125.5 N-m 11.00 ~ 12.80 kgf-m 79.6 ~ 92.6 ft-lbf	123.6 ~ 147.1 N-m 12.60 ~ 15.0 kgf-m 91.1 ~ 108.5 ft-lbf	166.7 ~ 196.1 N-m 17.00 ~ 20.00 kgf-m 123.0 ~ 144.7 ft-lbf
M16	166.7 ~ 191.2 N-m 17.00 ~ 19.50 kgf-m 123.0 ~ 141.0 ft-lbf	196.1 ~ 225.6 N-m 20.00 ~ 23.00 kgf-m 144.7 ~ 166.4 ft-lbf	259.9 ~ 304.0 N-m 26.50 ~ 31.00 kgf-m 191.7 ~ 224.2 ft-lbf
M18	245.2 ~ 284.4 N-m 25.00 ~ 29.0 kgf-m 180.8 ~ 209.7 ft-lbf	274.6 ~ 318.7 N-m 28.00 ~ 32.50 kgf-m 202.5 ~ 235.1 ft-lbf	343.2 ~ 402.1 N-m 35.00 ~ 41.00 kgf-m 253.2 ~ 296.5 ft-lbf
M20	333.4 ~ 392.2 N-m 34.00 ~ 40.00 kgf-m 245.9 ~ 389.3 ft-lbf	367.7 ~ 431.5 N-m 37.50 ~ 44.0 kgf-m 271.2 ~ 318.2 ft-lbf	519.8 ~ 568.8 N-m 53.00 ~ 58.00 kgf-m 383.3 ~ 419.5 ft-lbf

[9] Types and materials of bolts and nuts

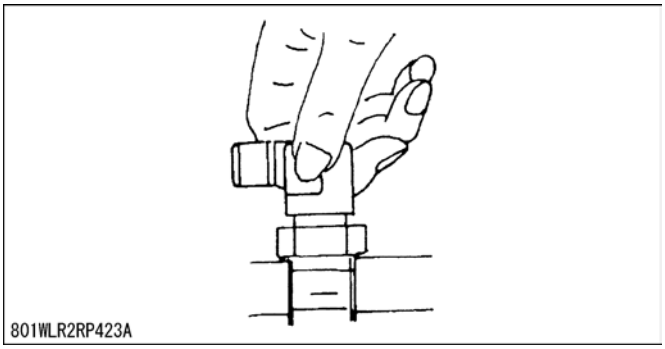
[Hex. bolts]

Types	Material	Tensile strength	Hardness	Bolts head marking	
4T	SS41	Over 392 MPa 4000 kgf/cm^2 56892 lbf/in^2	HrB 62 ~ 98	4	No mark or marked 4
7T	S40C S45C	Over 686 MPa 7000 kgf/cm^2 99561 lbf/in^2	HrC 20 ~ 28	7	Marked 7
9T	SCr4	Over 882 MPa 9000 kgf/cm^2 128007 lbf/in^2	HrC 28 ~ 34	9	Marked 9

[10] Washer-equipped elbow

Tightening torque

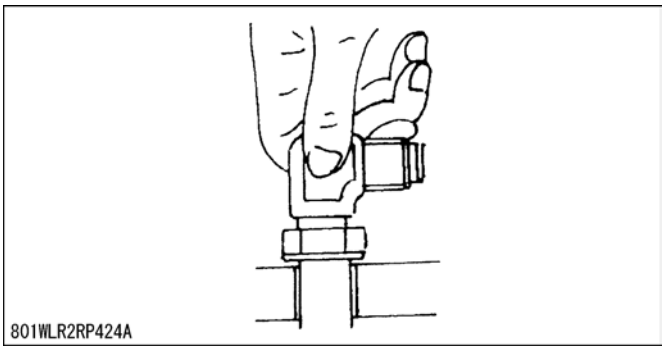
Size	N-m	kgf-m	ft-lbs
G1/4	25 ~ 30	2.5 ~ 3.0	18 ~ 22
G3/8	49 ~ 54	5.0 ~ 5.5	36 ~ 40
G1/2	59 ~ 64	6.0 ~ 6.5	43 ~ 47
G3/4 G1	118 ~ 127	12.0 ~ 13.0	87 ~ 94



Tightening procedure

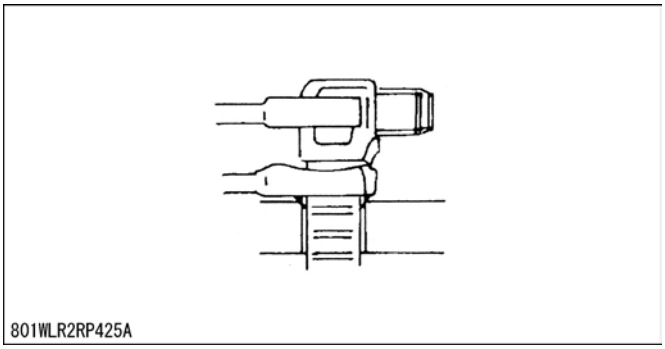
1) Connecting with the valve
- Screw in the elbow by hand until the washer comes into contact.

Note: Clean up the mating seal beforehand.



2) Positioning
- Turn the elbow back to its set position.

Note: Do not make any more than one turn back.

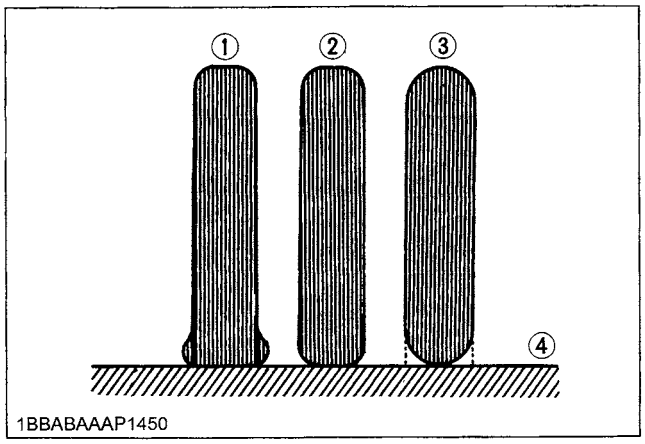


3) Fixing
- Tighten up the lock nut with a wrench.
- Lock nut tightening torque

G1/4: 25 ~ 30 N-m
(2.5 ~ 3.0 kgf-m, 18 ~ 22 ft-lbs)
G3/8: 50 ~ 55 N-m
(5.0 ~ 5.5 kgf-m, 36 ~ 40 ft-lbs)
G1/2: 60 ~ 65 N-m
(6.0 ~ 6.5 kgf-m, 43 ~ 47 ft-lbs)
G3/4: 118 ~ 127 N-m
(12.0 ~ 13.0 kgf-m, 87 ~ 94 ft-lbs)
G1: 118 ~ 127 N-m
(12.0 ~ 13.0 kgf-m, 87 ~ 94 ft-lbs)

[11] Tire maintenance

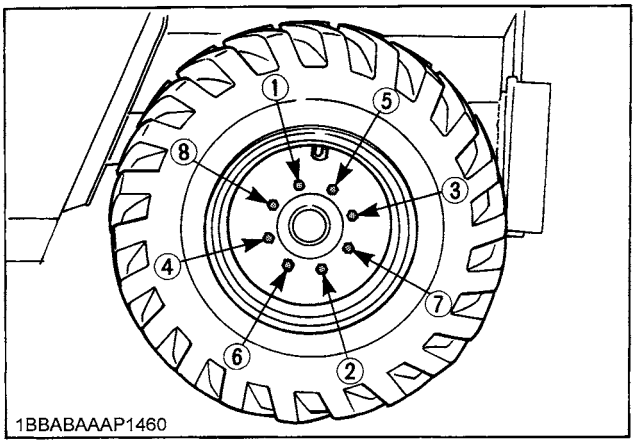
Tire pressure



(1) Deficient
(2) Correct
(3) Excessive
(4) Ground level

Type	R420S	R520S
Tire size	12.5 / 70-16-8PR	15.5 / 60-18-8PR
Front tire	2.6 bar 0.26 ± 0.01 MPa 2.6 ± 0.1 kgf/cm^2 (36.9 ± 1.4psi)	2.2 bar 0.22 ± 0.01 MPa 2.2 ± 0.1 kgf/cm^2 (31.2 ± 1.4psi)
Rear tire	2.6 bar 0.26 ± 0.01 MPa 2.6 ± 0.1 kgf/cm^2 (36.9 ± 1.4psi)	2.2 bar 0.22 ± 0.01 MPa 2.2 ± 0.1 kgf/cm^2 (31.2 ± 1.4psi)

Changing Tires



Conservation of Tires

If the air pressure in the tire is too high or too low, the life of the tire will be shortened.

Make routine checks of the air pressure in tires, and adjust so the pressure is correct.

Always measure the tire pressure, and check for damage to the tires or rims before starting operation.

■ NOTE

Make sure the tire size marked on the R420 tire.
Then follow above chart.

1. Insufficient tire pressure
   Too small an amount of air in the tire can cause it to have excessive slack, which makes for faster wearing down of the tread.
2. Correct tire pressure
3. Excessively high tire pressure
   Too high a tire pressure causes the tractive force of the machine to decrease, or the tire to slip.
   There is also the risk of a blow out.

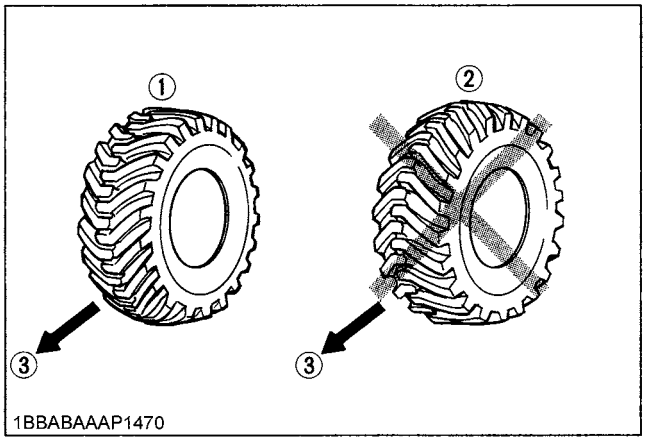
Removal

1. Loosen the hub bolts each by one turn on the wheel to be removed.
2. Raise the wheel off the ground, then loosen and remove the hub bolts and change the tire to a new one.

Fitting

1. Mount wheel to axle and lightly tighten the hub bolts.
2. Lower the wheel to the ground, and tighten the hub bolts to the recommended torque in the order shown above.

Tightening torque	275 to 314 N·m (203 to 231 ft·lb) 28.0 ~ 32.0 kgf·m



(1) Correct
(2) Incorrect
(3) Forward

Mounting the Tires

Lug tires are used to provide strong traction and buoyancy on soft ground. When mounting them, take care to position their tread pattern in the proper direction.

Note: EU-version only

Since start of R420 production, 3 different types of tyres were used. As the recommended air pressure varies with the type of tyre, we herewith provide you the correspondence table.

Type pressure table

Tire size	12.5 / 70-16-6PR	12.5 / 70-16-8PR	33 / 12.5-15-8PR
Type pressure (Front and Rear)	2.0 bar 0.20 ± 0.01 MPa 2.0 ± 0.1 kgf/cm^2	2.6 bar 0.26 ± 0.01 MPa 2.6 ± 0.1 kgf/cm^2	3.2 bar 0.32 ± 0.01 MPa 3.2 ± 0.1 kgf/cm^2

II. MACHINE BODY

Mechanism Chapter