

WSM

**WORKSHOP MANUAL
KUBOTA EXCAVATOR**

U17-3α

Kubota

Record of Revisions

| Symbol | Date | Main Revised Points & Corrective Measures | Person-in-charge |
|--------|-----------|---|------------------|
| △ 1 | Aug. 2008 | Maintenance intervals EU - version revised. | I. Okae |
| △ 2 | Oct. 2008 | Correction of descriptions on: 1. Engine model name for EU - version 2. Retractable track frame | I. Okae |
| △ 3 | | | |
| △ 4 | | | |

U17-3 α is the model name of EU - version
U17/U17-3 is the model name of KTC, KCL and KTA - version

CONTENTS

I. GENERAL

..... I-S-1

II. MACHINE BODY

- Mechanism Section II-M-1
- Service Section..... II-S-1

III. ENGINE

- Mechanism Section III-M-1
- Service Section..... III-S-1

IV. HYDRAULIC SYSTEM

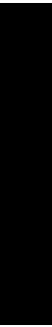
- Mechanism Section IV-M-1
- Service Section..... IV-S-1

V. ELECTRICAL SYSTEM

- Mechanism Section V-M-1
- Service Section..... V-S-1

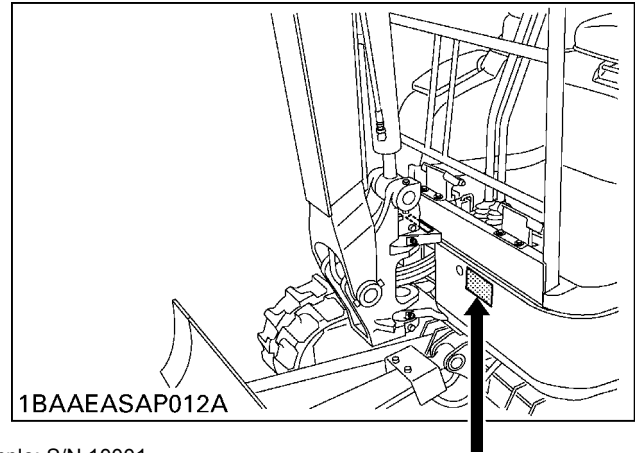
I. GENERAL

| | |
|---|-----------------|
| A. BODY AND ENGINE IDENTIFICATION MARKS | I-S-3 |
| B. SAFETY PRECAUTIONS FOR SERVICING, DISASSEMBLY AND REASSEMBLY | I-S-5 |
| a. Safety Measures Before Starting Work | I-S-5 |
| b. Safety Measures During Work | I-S-5 |
| c. Preparation for Disassembly | I-S-6 |
| d. Precautions for Disassembly and Reassembly | I-S-6 |
| C. IMPORTANT SAFETY PROCESS AND CRITICAL FUNCTIONAL PROCESS | I-S-7 |
| D. IMPORTANT INSPECTION ITEMS AFTER REASSEMBLING | I-S-9 |
| a. Piping | I-S-9 |
| E. MAINTENANCE INTERVALS | I-S-15 Δ |
| a. EU-version | I-S-15 Δ |
| b. PP (KTC, KCL)-version | I-S-17 |
| c. KTA-version | I-S-19 |
| d. Hydraulic Oil Check for Machines with Hydraulic Breakers | I-S-20 |
| e. Maintenance Items | I-S-21 |
| f. Troubleshooting for Operators | I-S-23 |
| g. Periodic Replacement of Important Component Parts | I-S-24 |
| h. Recommended Oils | I-S-25 |
| i. Lifting Capacity | I-S-26 |
| F. PRODUCT INFORMATION | I-S-31 |
| a. U17-3 α Development Concept | I-S-31 |
| b. Why Minor Change? | I-S-31 |
| c. Quick Chart | I-S-32 |
| d. Major Sales Feature | I-S-33 |
| e. Specifications Comparison | I-S-34 |

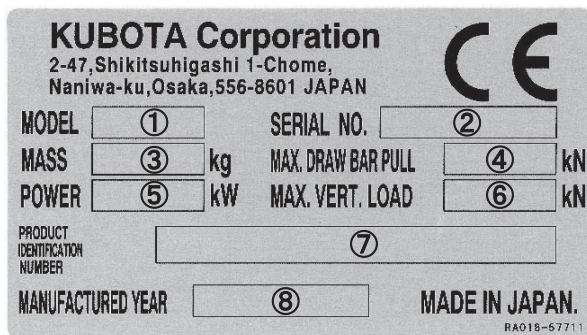


A. BODY AND ENGINE IDENTIFICATION MARKS

If trouble occurs during use, or servicing is necessary, contact your dealer. Pass on your machine model, engine type and serial number to them.

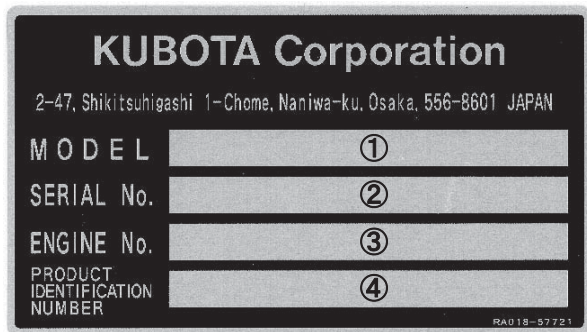


Example: S/N 10001



EU-version

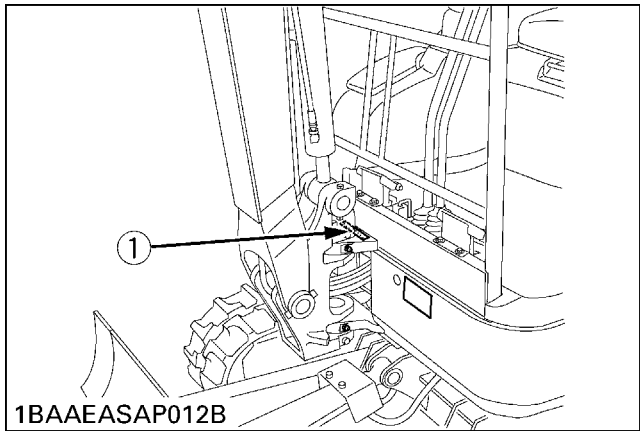
| No. | Items | Contents |
|-----|-------------------------------|---------------------|
| ① | MODEL | U17-3α |
| ② | SERIAL No. | 10001 |
| ③ | MASS | 1650 |
| ④ | MAX, DRAW BAR PULL | 32.3 |
| ⑤ | POWER | 11.6 |
| ⑥ | MAX, VERT, LOAD | 2.7 |
| ⑦ | PRODUCT IDENTIFICATION NUMBER | >JKUU0173*01S10001< |
| ⑧ | MANUFACTURED YEAR | 2008 |



Name plate: Code No. RA018-57721

| No. | Items | Contents |
|-----|----------------------------|---------------------|
| ① | Machine model | U17-3α |
| ② | Serial No. | 10001 |
| ③ | Engine No. | |
| ④ | PRODUCT IDENTIFICATION No. | >JKUU0173*01S10001< |

(1) Machine serial number



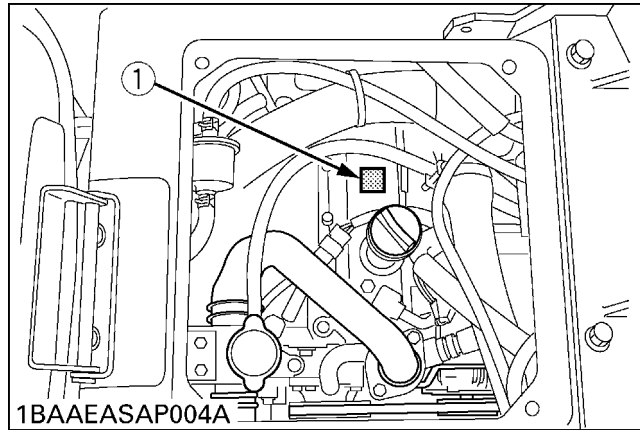
(1) Serial No.

(2) Engine serial number

The engine serial number is an identified number for the engine. It is marked after the engine model number. It indicates month and year of manufacture as follows.

e.g. D902-8L001

“8” indicates year of 2008 and “L” indicates June. So, 8L indicates that the engine was manufactured in June 2008.



(1) Engine serial No.

Year of manufacture

| Alphabet or Number | Year | Alphabet or Number | Year |
|--------------------|------|--------------------|------|
| 1 | 2001 | F | 2015 |
| 2 | 2002 | G | 2016 |
| 3 | 2003 | H | 2017 |
| 4 | 2004 | J | 2018 |
| 5 | 2005 | K | 2019 |
| 6 | 2006 | L | 2020 |
| 7 | 2007 | M | 2021 |
| 8 | 2008 | N | 2022 |
| 9 | 2009 | P | 2023 |
| A | 2010 | R | 2024 |
| B | 2011 | S | 2025 |
| C | 2012 | T | 2026 |
| D | 2013 | V | 2027 |
| E | 2014 | | |

Month of manufacture

| Month | Engine Serial Number | |
|-----------|----------------------|----------|
| | 0001 ~ 9999 | 10000 ~ |
| January | A0001 ~ A9999 | B10000 ~ |
| February | C0001 ~ C9999 | D10000 ~ |
| March | E0001 ~ E9999 | F10000 ~ |
| April | G0001 ~ G9999 | H10000 ~ |
| May | J0001 ~ J9999 | K10000 ~ |
| June | L0001 ~ L9999 | M10000 ~ |
| July | N0001 ~ N9999 | P10000 ~ |
| August | Q0001 ~ Q9999 | R10000 ~ |
| September | S0001 ~ S9999 | T10000 ~ |
| October | U0001 ~ U9999 | V10000 ~ |
| November | W0001 ~ W9999 | X10000 ~ |
| December | Y0001 ~ Y9999 | Z10000 ~ |

A: Engine Model Name and Serial Number

B. SAFETY PRECAUTIONS FOR SERVICING, DISASSEMBLY AND REASSEMBLY

Safety precautions for servicing

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

Safety precautions for disassembly and reassembly

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 clothes. (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.) required for servicing and inspect for any problems before starting work.
2. Hammer heads (metal parts) must be firmly secured to their handles.
3. Check hoisting tools (wire ropes, hoisting chains, etc.) before use.

(3) Set workshop in order

1. Secure appropriate space needed for disassembly.
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. Crane work must be carried out using pre-determined 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. Basically, use a crane for objects heavier than 44lb (20kg).
2. Crane operation and hoisting must be performed only by qualified personnel.
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 underneath.
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 disconnect negative (-) 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 assembled only after removing the coating.
3. Separated parts must be correctly reassembled using alignment marks.
4. As a rule, use a press to reassemble bearings, bushing and oil seals. Use pads when using a hammer.

e. Maintenance

CAUTION

When adding oil and servicing:

1. Park the machine on a large, flat place.
2. Place the bucket and dozer on the ground.
3. Stop the engine
4. Move the attachment control lever and dozer lever to make sure the remaining pressure is relieved.
5. Draw out the starter key and check around the machine for safety.

Before starting the job, carefully read the Operational Manual in " ! Servicing Precautions" on the yellow pages.

f. Waste Disposal

WARNING

Do not carelessly throw away and burn waste materials. Such actions may lead to environmental pollution and punishment by local laws.

When disposing of waste:

- * Let out waste fluid from the machine into a container.
- * Do not let waste fluid flow on the ground as well as into a river, lake, marsh, and sea.
- * Contact your dealer or a qualified industrial waste handler to treat (dispose of or incinerate) harmful waste materials. Those materials include waste oil, fuel, cooling water (anti-freeze), coolant, solvent, filters, batteries, rubber and other toxic substances.

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. Essential Adhesives

Screw adhesive type:

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

Instantaneous adhesive:

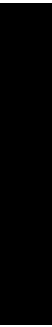
- Use Three-Bond 1733 or Three-Bond 1741E adhesive.
Keep the bond areas free of oil and water.

2. Important Safety Process **S**

1. Reconnecting the fuel hose (clearance, hose routes, clamps, etc.)
2. Electrical cabling (engine, instrument panel, controls, etc.) (wiring routes, clamps and couplers)

3. Important Critical Functional Process **A**

1. Setting up the travel wheel motor (tightening torque)
2. Reassembling the rotary joints (joint direction and shaft set-up)
3. Installing the swivel base bearing and the swivel motor (tightening torque)
4. Fitting the pump couplings (tightening torque)



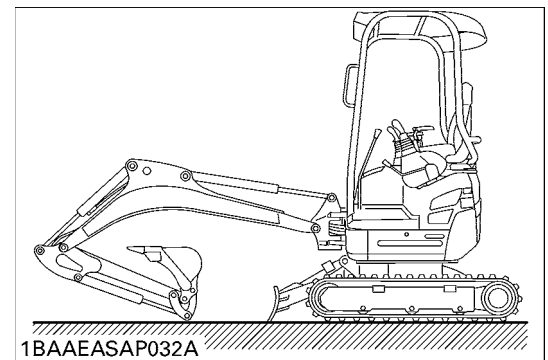
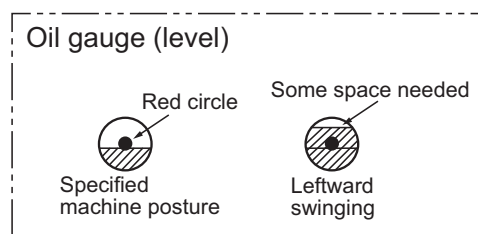
D. IMPORTANT INSPECTION ITEMS AFTER REASSEMBLING

1. Operate the Machine and Check for Unusual Noise and Vibrations.
2. Make Sure the Safety Decals and Wireharness Clamps Are in Their Specified Positions.
3. 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.
- 2) Make sure the hydraulic oil temperature is in the range of 10-30°C (50-86°F) and see if the oil level is within the specified zone of the oil level gauge.
- 3) Extend the track cylinder to Max. position.
- 4) Keep the machine front as shown as following posture.

Posture: Extend the rods of the arm and bucket cylinders to max. Place the bucket link on the ground, the offset swing at the center, and the dozer also on the ground.



a. Piping

(1) General precautions

- Tighten 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 do 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 contact or twist.

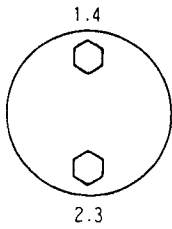
* Excessively tight contact

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.

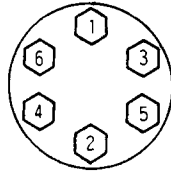
(3) Precautions in tightening the bolts and nuts

- 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 undertighten 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.

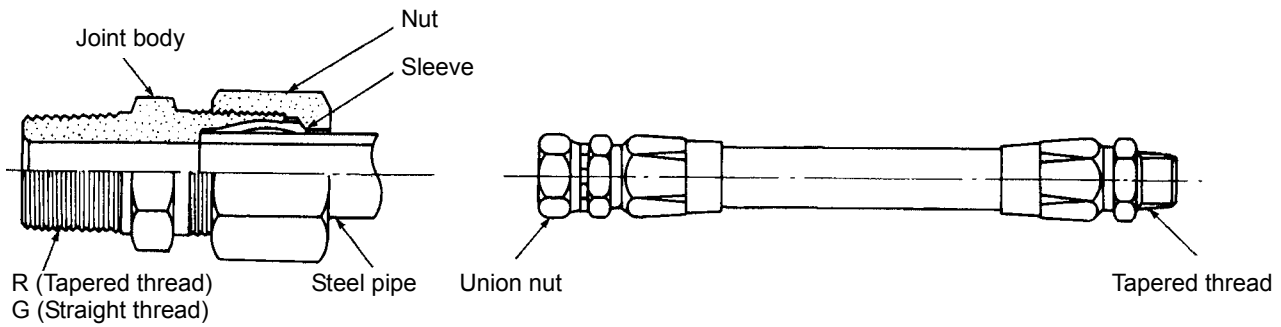
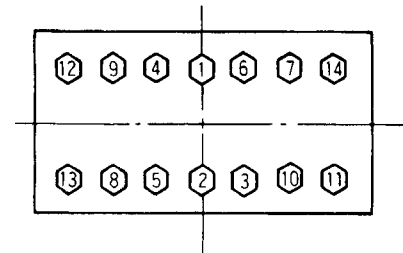
Top and bottom alternately



Diagonally



Diagonally starting from center



(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 ~ 5.5 36.2 ~ 39.8 | 49.0 ~ 68.6 5.0 ~ 7.0 36.2 ~ 50.6 | 22 mm 0.87 in |
| 1/2" | 58.8 ~ 63.7 6.0 ~ 6.5 43.4 ~ 47.0 | 83.4 ~ 88.3 8.5 ~ 9.0 61.5 ~ 65.1 | 27 mm 1.06 in |
| 3/4" | 117.7 ~ 127.5 12.0 ~ 13.0 86.8 ~ 94.0 | 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 × 1.5 | 20 ~ 30 2.0 ~ 3.1 14.75 ~ 22.13 |
| M14 × 1.5 | 20 ~ 30 2.0 ~ 3.1 14.75 ~ 22.13 |
| M16 × 1.5 | 30 ~ 50 3.1 ~ 5.1 22.13 ~ 36.9 |
| M18 × 1.5 | 30 ~ 50 3.1 ~ 5.1 22.13 ~ 36.9 |
| M22 × 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 | | 8 mm 0.31 in |
| 1/4" | 36.3 ~ 44.1 3.7 ~ 4.5 26.8 ~ 32.5 | W/O-ring <i>Joint Torque</i> 58.8 ~ 78.5 6 ~ 8 43.4 ~ 57.9 | 19 mm 0.75 in | When in steel pipe is in use. | 12 mm 0.47 in |
| 3/8" | 39.2 ~ 49.0 4.0 ~ 5.0 28.9 ~ 36.2 | W/O-ring <i>Joint Torque</i> 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 <i>Joint Torque</i> 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 | |
| 12 | Ø32 ~ 51 | 68311-72830 | |

(7) Nuts for piping

| Steel pipe size (O.D. × I.D. × Thickness) | Tightening torque N·m kgf·m ft·lbf | Spanner size (reference) | Remarks |
|---|--|-----------------------------|-------------------------------|
| 8 × 6 × 1 mm 0.31 × 0.24 × 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 × 7 × 1.5 mm 0.39 × 0.28 × 0.06 in | 39.2 ~ 44.1 4.0 ~ 4.5 28.9 ~ 32.5 | 19 mm 0.75 in | |
| 12 × 9 × 1.5 mm 0.47 × 0.35 × 0.06 in | 53.9 ~ 63.7 5.5 ~ 6.5 39.7 ~ 47.0 | 21 mm 0.83 in | |
| 16 × 12 × 2 mm 0.63 × 0.47 × 0.08 in | 88.3 ~ 98.1 9.0 ~ 10.0 65.1 ~ 72.3 | 29 mm 1.14 in | |
| 18 × 14 × 2 mm 0.71 × 0.55 × 0.08 in | 127.5 ~ 137.3 13.0 ~ 14.0 94.0 ~ 101.3 | 32 mm 1.26 in | |
| 27.2 × 21.6 × 2.8 mm 1.07 × 0.85 × 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 tightness torque table below.

| Nomial Dia. | 4T  | 7T  | 9T  |
|-------------|--|---|--|
| | 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

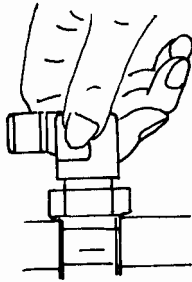
[ex. bolts]

| Types | Material | Tensile strength | Hardness | Bolt head marking | |
|-------|--------------|--|----------------------------|---|---------------------|
| 4T | SS41 | Over 392 MPa 4000 kgf/cm ² 56892 lbf/in ² | H _{RB} 62 ~ 98 |  | No mark or marked 4 |
| 7T | S40C S45C | Over 686 MPa 7000 kgf/cm ² 99561 lbf/in ² | H _{RC} 20 ~ 28 |  | Marked 7 |
| 9T | SCr4 | Over 882 MPa 9000 kgf/cm ² 128007 lbf/in ² | H _{RC} 28 ~ 34 |  | Marked 9 |

(10) Washer-equipped elbow

Tightening torque

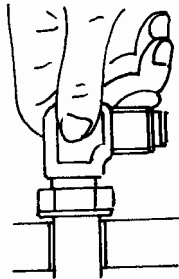
| Size | N·m | kgf·m | ft·lbs |
|------------|-----------|-------------|---------|
| G1/4 | 25 ~ 30 | 2.5 ~ 3.0 | 18 ~ 22 |
| G3/8 | 49 ~ 54 | 5.0 ~ 5.5 | 36 ~ 40 |
| G1/2 | 59 ~ 64 | 6.0 ~ 6.5 | 43 ~ 47 |
| G3/4 G1 | 118 ~ 127 | 12.0 ~ 13.0 | 87 ~ 94 |



Tightening procedure

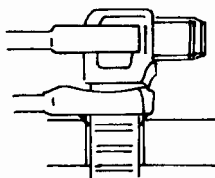
- 1) Connecting with the valve
 - Screw in the elbow by hand until the washer comes into contact.

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) Adhesives

1. Thread adhesive

| | |
|--------------------------|---|
| Types of thread adhesive | Loctite 271 or equivalent (heavy-duty) ThreeBond 1305P or equivalent (heavy-duty) ThreeBond TB1401B or equivalent (light-duty) ThreeBond 1324 (medium-duty) unless otherwise specified |
|--------------------------|---|

* No oil and water allowed on the threads.

| | |
|--------------------------|-------------------------|
| Type of instant adhesive | ThreeBond 1733 or 1741E |
|--------------------------|-------------------------|

* No oil and water allowed on the threads.

2. Radiator hose sealant

| | |
|---------|--------------------------------|
| Sealant | ThreeBond #1208E or equivalent |
|---------|--------------------------------|

E. MAINTENANCE INTERVALS

a. EU-version

[Operator servicing]

| General maintenance | Elapsed hours of operation | | | | | | | | | | Interval |
|---|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|---------------|
| | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | |
| Checking the engine oil level | | | | | | | | | | | daily |
| Check hydraulic oil level | | | | | | | | | | | daily |
| Check fuel level | | | | | | | | | | | daily |
| Check coolant level | | | | | | | | | | | daily |
| Lubricate front-end attachments | | | | | | | | | | | daily |
| Checking the radiator and oil cooler | | | | | | | | | | | daily |
| Check electric cables and connections | | | | | | | | | | | daily |
| Check water separator | | | | | | | | | | | daily |
| Check V-belt | | | | | | | | | | | daily |
| Drain water from the fuel reservoir | | | | | | | | | | ○ | 500 h |
| Lubricate the swivel gear | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 50 h |
| Battery service | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 50 h |
| Tracks and chassis: clean, visually inspect and check tension | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | weekly (50 h) |
| Check nuts and bolts | | ○ | | ○ | | ○ | | ○ | | ○ | 100 h |
| Check, clean air filter 1.) | | | | ○ | | | | ○ | | | 200 h |
| Grease the swivel bearing | | | | ○ | | | | ○ | | | 200 h |

1.) Under dusty conditions the air filter must be cleaned more frequently or replaced.

[Operator servicing]

| General maintenance | Elapsed hours of operation | | | | | | | | | | Interval |
|---|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|------|---------------|
| | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | |
| Checking the engine oil level | | | | | | | | | | | daily |
| Check hydraulic oil level | | | | | | | | | | | daily |
| Check fuel level | | | | | | | | | | | daily |
| Check coolant level | | | | | | | | | | | daily |
| Lubricate front-end attachments | | | | | | | | | | | daily |
| Checking the radiator and oil cooler | | | | | | | | | | | daily |
| Check electric cables and connections | | | | | | | | | | | daily |
| Check water separator | | | | | | | | | | | daily |
| Check V-belt | | | | | | | | | | | daily |
| Drain water from the fuel reservoir | | | | | | | | | | ○ | 500 h |
| Lubricate the swivel gear | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 50 h |
| Battery service | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | 50 h |
| Tracks and chassis: clean, visually inspect and check tension | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | weekly (50 h) |
| Check nuts and bolts | | ○ | | ○ | | ○ | | ○ | | ○ | 100 h |
| Check, clean air filter 1.) | | ○ | | | | ○ | | | | ○ | 200 h |
| Grease the swivel bearing | | ○ | | | | ○ | | | | ○ | 200 h |

1.) Under dusty conditions the air filter must be cleaned more frequently or replaced.