

# TCR50

**Dump Carrier**

BOOK No. CS2E000

## WORKSHOP MANUAL

Serial No. **30500003 ~ 30500038**  
**30510001 ~**

**TAKEUCHI**

# FOREWORD

This service manual is intended for service engineers who maintain the TAKEUCHI construction machinery, and describes the specifications, maintenance procedures of individual machine sections, and operational precautions.

Read this manual carefully and become familiar with your TAKEUCHI machinery so that you will be able to quickly and accurately maintain and keep it in perfect working order throughout its life.

The dimensions and other values referred to in this manual are for your reference in servicing, and should not be considered as the values stipulated in the Inspection Standard.

This manual represents the most up-to-date information at the time of publication and is subject to change without notice to reflect specification changes for performance improvement or technological advancement, and/or correction of typographical errors. If you find any discrepancies between your machine and the information in this manual, obtain the most up-to-date information from our Parts Department.


You will be informed of major improvements and specification changes by delivery of the revised version of this manual.


We recommend that you read this manual together with:


- 1) TCR50 Operator's Manual**
- 2) TCR50 Parts Manual**

Be sure to read carefully and fully understand the instructions and precautions given in this manual and on the labels on the machine before you start working.

The degrees of hazards caused by improper service are represented by the following warning words and symbols:

 **DANGER** Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This warning is used in safety messages and safety labels, and the necessary precautions are described.

 **WARNING** Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. This warning is used in safety messages and safety labels, and the necessary precautions are described.

 **CAUTION** Indicates a potentially hazardous situation that, if not avoided, could result in minor or moderate injury or damage.

**IMPORTANT** Indicates a potentially hazardous situation that, if not avoided, could result in damage to or reduced life of the machine.

This workshop manual is intended for service engineers who maintain the TAKEUCHI construction machinery. The safety signs given in this manual do not cover all the hazardous situations that may occur when using the machinery.

# CONTENES

## 1. General Cautions for Maintenance Work

1-1. Correct Work .....	1-1
1-2. Safety Precautions .....	1-1
1-3. Preparations .....	1-7
1-4. Cautions for Disassembly and Reassembly .....	1-7
1-5. Cautions for Removal and Installation of Hydraulic Equipment .....	1-8
1-6. Cautions for Removal and Installation of Hydraulic Piping .....	1-8
1-7. Cautions for Handling Seals .....	1-9
1-8. Correct Installation of Hydraulic Hose .....	1-10
1-9. Types of Hydraulic Hoses .....	1-11
1-10. How to Release Air from Hydraulic Units .....	1-15
1-10-1. Releasing Air from the HST System .....	1-15
1-10-2. Releasing Air from Hydraulic Cylinder .....	1-16

## 2. Technical Data

2-1. Specifications .....	2-1-1
2-2. Outside Drawing .....	2-2-1
2-3. Hydraulic Circuit Diagram .....	2-3-1
2-4. Electrical Circuit Diagram .....	2-4-1

## 3. Servicing Standards

3-1. Machine Performance .....	3-1-1
3-1-1. Reference Value Table .....	3-1-1
3-1-2. Methods for Inspecting Performance .....	3-1-2
3-2. Engine Servicing Standards (S/N: 30500003~30500038) .....	3-2-1
3-3. Servicing Standards for Parts of Undercarriage .....	3-3-1
3-4. Control Equipment .....	3-4-1
3-5. Hydraulic Equipment .....	3-4-1
3-5-1. Hydraulic Cylinder .....	3-4-1
3-6. Tightening Torque Table .....	3-6-1
3-6-1. Tightening Torque for Bolts and Nuts for Vehicle .....	3-6-1
3-6-2. Tightening Torque for Bolts and Nuts for Engine (S/N: 30500003~30500038) .....	3-6-2

## 4. Engine Servicing Procedure (S/N: 30500003~30500038)

4-1. Inspection and Adjustment .....	4-1-1
4-1-1. Oil Inspection .....	4-1-1
4-1-2. Cooling Water Inspection .....	4-1-1
4-1-3. Inspecting Water Leak from Cooling Water System and Radiator .....	4-1-1
4-1-4. Fan Belt Tension Inspection and Adjustment .....	4-1-2
4-1-5. Adjusting the Valve Clearance .....	4-1-3
4-1-6. Inspecting the Fuel Injection Valve Injection Pressure and Spray Pattern .....	4-1-4
4-1-7. Fuel Injection Timing Inspection and Adjustment .....	4-1-8
4-1-8. Adjusting the No-load Maximum (or Minimum) Revolutions .....	4-1-9
4-1-9. Sensor Inspection .....	4-1-10
4-2. Engine Body .....	4-2-1
4-2-1. Introduction .....	4-2-1
4-2-2. Cylinder Head .....	4-2-2
4-2-3. Gear Train and Camshaft .....	4-2-11
4-2-4. Cylinder Block .....	4-2-17
4-3. Lubrication System .....	4-3-1
4-3-1. Lubrication System Diagram .....	4-3-1
4-3-2. Trochoid Pump Components .....	4-3-1
4-3-3. Disassembly (Reverse the procedure below for assembly) .....	4-3-2

4-3-4. Servicing Points .....	4-3-2
4-3-5. Parts Inspection and Measurement .....	4-3-2
4-4. Cooling System .....	4-4-1
4-4-1. Cooling Water System .....	4-4-1
4-4-2. Cooling Water Pump Components .....	4-4-1
4-4-3. Disassembly (Reverse the procedure below for assembly) .....	4-4-2
4-4-4. Servicing Points .....	4-4-2
4-5. Fuel Injection System/Governor .....	4-5-1
4-5-1. Introduction .....	4-5-1
4-5-2. Fuel Injection Pump .....	4-5-1
4-5-3. Fuel Injection Valve .....	4-5-7
4-5-4. Fuel Feed Pump .....	4-5-7
4-5-5. Governor .....	4-5-8
4-5-6. Special Service Tools for Disassembly/Assembly .....	4-5-9
4-6. Starting Motor .....	4-6-1
4-6-1. Specifications .....	4-6-1
4-7. Alternator .....	4-7-1
4-7-1. Specifications .....	4-7-1
4-8. Special Service Tools .....	4-8-1
4-8-1. Special Tools .....	4-8-1
4-8-2. Measuring Instruments .....	4-8-3

## 5. Hydraulic System

5-1. Hydraulic Units .....	5-1-1
5-1-1. Hydraulic Pump (S/N: 30500003~30500038) .....	5-1-1
5-1-2. Hydraulic Pump (S/N: 30510001~ ) .....	5-1-5
5-1-3. Gear Pump (S/N: 30510001~ ) .....	5-1-35
5-1-4. Travel Motor (S/N: 30500003~30500038) .....	5-1-41
5-1-5. Travel Motor (S/N: 30510001~ ) .....	5-1-45
5-1-6. Swing Motor .....	5-1-71
5-1-7. Control Valve .....	5-1-93
5-1-8. Solenoid Valves .....	5-1-107
5-1-9. Pilot Valve .....	5-1-113
5-1-10. Swivel Joint .....	5-1-123
5-1-11. Cylinders .....	5-1-129
5-2. Pressure Adjustments .....	5-2-1
5-3. Precautions in Case of Hydraulic Source Failures .....	5-3-1

## 6. Service Procedures for Individual Components

6-1. Undercarriage .....	6-1-1
6-1-1. Removing and Installing the Crawler .....	6-1-1
6-1-2. Removing and Installing the Travel Motor .....	6-1-4
6-1-3. Disassembling and Assembling the Idler .....	6-1-6
6-1-4. Disassembling and Assembling the Carrier Roller .....	6-1-9
6-1-5. Disassembling and Assembling the Track Roller .....	6-1-11
6-1-6. Installing the Floating Seal .....	6-1-19
6-1-7. Removing and Installing the Shoe Tension Cylinder .....	6-1-20

## 7. Fuel, Lube Oil and Grease Recommended

7-1. Fuel, Lube Oil and Grease Recommended .....	7-1-1
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## 8. Troubleshooting

8-1. Phenomenon That is not a Machine Failure .....	8-1-1
8-2. Troubleshooting .....	8-2-1
8-3. HST Troubleshooting .....	8-3-1



# GENERAL CAUTIONS FOR MAINTENANCE WORK

1-1. Correct Work .....	1-1
1-2. Safety Precautions .....	1-1
1-3. Preparations .....	1-7
1-4. Cautions for Disassembly and Reassembly .....	1-7
1-5. Cautions for Removal and Installation of Hydraulic Equipment .....	1-8
1-6. Cautions for Removal and Installation of Hydraulic Piping .....	1-8
1-7. Cautions for Handling Seals .....	1-9
1-8. Correct Installation of Hydraulic Hose .....	1-10
1-9. Types of Hydraulic Hoses .....	1-11
1-10. How to Release Air from Hydraulic Units .....	1-15
1-10-1. Releasing Air from the HST System .....	1-15
1-10-2. Releasing Air from Hydraulic Cylinder .....	1-16





# 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

## 1-1. Correct Work

“Correct Work” means to complete the operation accurately in the quickest time while following the procedures and methods described for appropriate operations.

It is important to review and check the type of service (the components to be inspected, adjusted or disassembled, and procedures to be used), tools, instruments, materials and lubricants to be used, and the precautions to be taken before starting any operation.

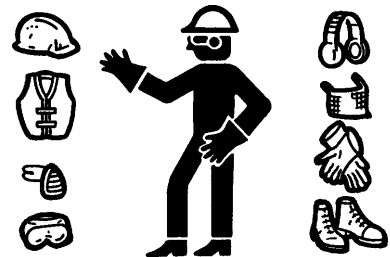
## 1-2. Safety Precautions

### Follow safety rules at your workplace

- The operation and servicing of this machine is restricted to qualified persons.
- When operating or servicing the machine, follow all the safety rules, precautions and procedures.
- Any work performed by a team or with a signal person should be conducted in accordance with signals agreed on beforehand.

### Wear proper clothing and safety items

- Do not wear loose clothing or jewelry that can be caught on the control levers and other machine parts. Also avoid wearing working clothes stained with oil as they can ignite.
- Be sure to wear a helmet, safety goggles, safety shoes, a mask, gloves and other protective items, as appropriate. Take particular precautions when generating metal debris, when striking metal objects with a hammer or when cleaning components with compressed air. Also make sure there are no persons near the machine.



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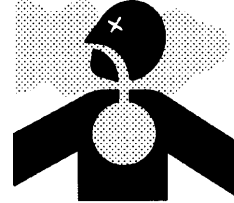
### Use and inspect appropriate tools

- Using damaged or worn tools or using tools inappropriate for the required application is very dangerous, and may also cause damage to the machine. Make sure to use the tools that are appropriate for the specific job.
- Inspect the facilities and tools, especially hoisting and rigging tools, in advance.

# 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

## Avoid harmful asbestos dust

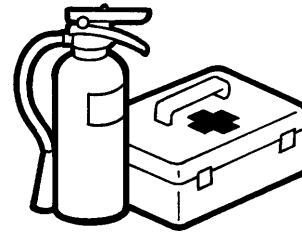
- Air containing asbestos dust is carcinogenic and is hazardous to humans. Inhalation of the air may cause lung cancer. When handling materials that may contain asbestos, keep in mind that:
  - Compressed air must not be used for cleaning.
  - Water must be used to clean the machine to prevent asbestos from scattering in the air.
  - You must work on the windward side when operating the machine in a place where there may be asbestos dust.
  - You should wear an appropriate respirator as necessary.



OE3A090

## Keep a fire extinguisher and first aid kit handy

- The workplace must be provided with a fire extinguisher. Read instructions on the label to familiarize yourself with how to use it.
- Keep a first aid kit in a prescribed place.
- Know what to do in the event of a fire or an accident.
- Know who to contact in an emergency and keep emergency telephone numbers in a prominent place.



E3A080

## Provide adequate ventilation when working in an enclosed area

Engine exhaust fumes are harmful to the human body and their inhalation is extremely hazardous. When starting the engine in an enclosed area, open the windows and doors for ventilation. Also do not idle the engine unnecessarily or leave the engine running while the machine is not in use.

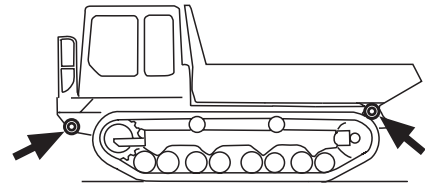


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## 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

### Hook the wire rope on the frame when towing

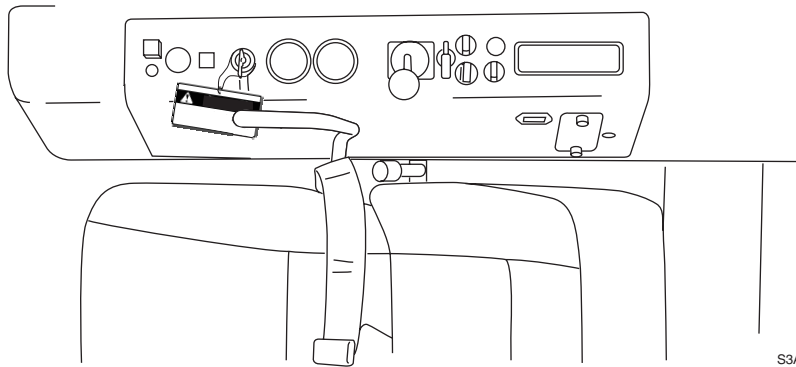
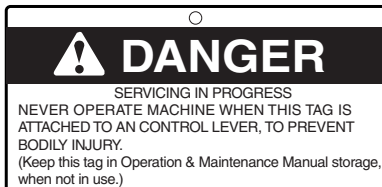
- Improper towing procedures can cause death or serious injury.
- When towing a machine with another machine, use a wire rope strong enough to sustain the machine weight.
- Never tow a machine on a slope.
- Do not use a towing rope that is kinked, distorted or damaged.
- Do not ride on the towing cable or on the wire rope.
- When connecting an object to be towed, make sure that no person enters the space between the machine and the object.
- Align the connection of an object to be towed and the towing part of the machine, and fix them before towing.



OS0J010

### Attach the “SERVICING IN PROGRESS” tag to the starter switch

- If another person should start the engine or operate the control levers while service is in progress, the service personnel can sustain serious bodily injury.  
Always attach the “SERVICING IN PROGRESS” tag to the starter switch, while service is in progress.



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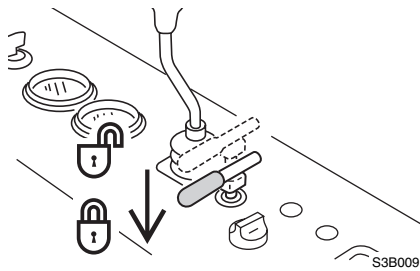
### Keep unauthorized persons away

- Never admit any persons into the work area who are not taking part in the work. Be conscious of the safety of other persons.  
Be especially careful when grinding, welding, or using a large hammer.

# 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

## Working under the machine

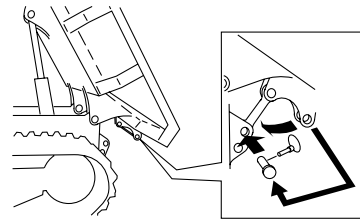
- Never perform service underneath the machine if it is not completely stable.
- Before performing service or repairs underneath the machine, be sure to apply blocks to the tracks to lock the tracks securely.
- To perform service or repairs with the wagon in the dump position, lock the dump lever and lock the wagon with the wagon stopper.



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OS0A300



OS0A220

## When operating the crane

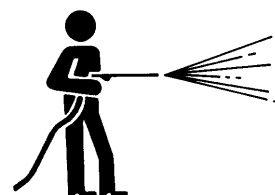
- The crane and the hoisting & rigging equipment must be operated by qualified operators.
- Never allow any persons to go beneath the lifted loads.
- When detaching a heavy component, first lift it with the crane as a safety support before removing its fixing bolts.

## Stop the engine before beginning inspection and servicing

- Be sure to stop the engine before performing inspection and servicing.
- If necessary to perform service while running the engine, as when cleaning the inside of the radiator, be sure to set the lock levers to the lock position, lock the dump lever and do the job together with a partner. (One should take the operator's seat so that he or she can stop the engine at any time.) That person must be careful not to touch any levers in the operator's cab.
- Be extremely careful not to contact the moving fan or fan belt, or any hot surfaces.

## Keep the machine clean

- Spilled oil or grease, or scattered parts are dangerous and can cause falls. Keep the machine clean.
- Getting water into the electrical system may cause it to malfunction, resulting in faulty operation of the machine. Also it may permit electrical leaks that could cause a fire or electric shocks.
- Never clean the sensors, connectors or the operator's seat with water or steam.

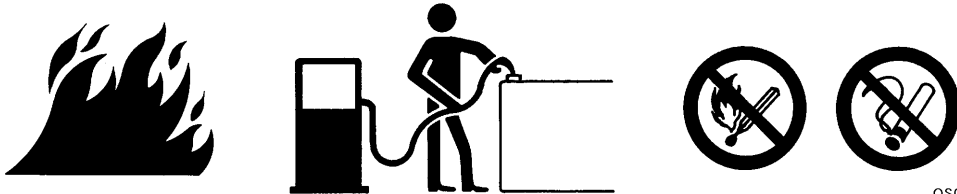


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# 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

## Precautions for fueling and oiling

- Spilled fuel and oil could cause a fire and they are dangerously slippery. Wipe up spills immediately.
- Close the fuel cap and oil cap securely.
- Never use fuel for cleaning.
- Provide good ventilation when replenishing fuel or oil.



## Radiator cooling water level

- Before checking the radiator cooling water level, stop the engine and wait until the engine and the radiator have cooled down.
- Slowly loosen the cap to release the inner pressure before removing the cap.



## Use an explosion-proof lighting source

- Use an explosion-proof lighting source when checking the fuel, the oil, the cooling water, or the battery electrolyte. Failure to use an explosion-proof lighting source may cause ignition to occur, inducing an explosion.



## Precautions for handling battery

- When welding or repairing the electrical system, disconnect the negative terminal of the battery to interrupt the electric circuit.



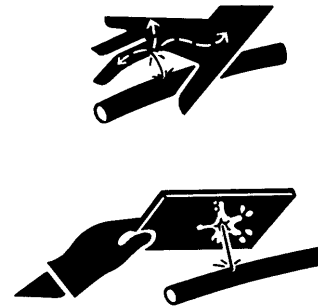
# 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

## Handling high-pressure hoses

- Leaks of fuel and oil could cause a fire.
- Do not bend a high-pressure hose forcibly, or strike it with a hard object. Because abnormally bent or damaged piping, tubes, and hoses easily burst under high pressure, never use them.
- Be sure to retighten or repair any loosened or damaged fuel hoses and hydraulic hoses. If oil or fuel leaks, a fire could be caused.

## Be careful of hot oil under high-pressure

- The hydraulic system for the wagon operates under high pressure.  
When replenishing or draining hydraulic oil, or performing inspection or service, be sure to first relieve the high pressure.
- The emission of hot oil under high-pressure from a small leak could result in serious bodily injury.  
Wear safety goggles and thick gloves when checking for leaks. Use a piece of cardboard or a plywood block to detect emissions of hot oil.  
If the hot oil should contact your body, obtain prompt medical treatment.



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## Be careful when servicing systems under high temperature and high pressure

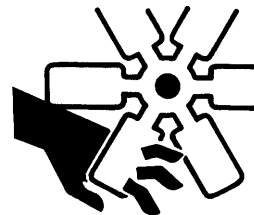
- The engine cooling water and various lube oil systems are still under high temperature and pressure immediately after the engine has stopped. Removing caps, draining oil and water, or replacing filter elements at that time may cause a burn. Wait until the temperature drops, then begin servicing in accordance with the procedures described in this manual.



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## Rotating radiator fan and fan belt

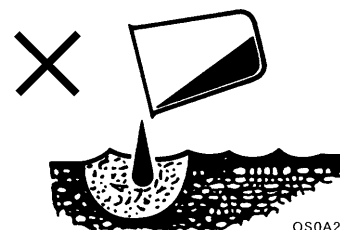
- Never contact the rotating radiator fan or fan belt with any object.
- Contacting the rotating radiator fan or fan belt with any object can result in serious bodily injury.



E3A630

## Processing wastes

- Do not dispose of waste oil in the sanitary sewer system.
- Always drain the oil from the machine into a secure container, and never directly to the ground.
- When disposing of toxic wastes such as fuel, oil, cooling water, solvent, filters, and spent batteries, comply with all applicable disposal regulations.



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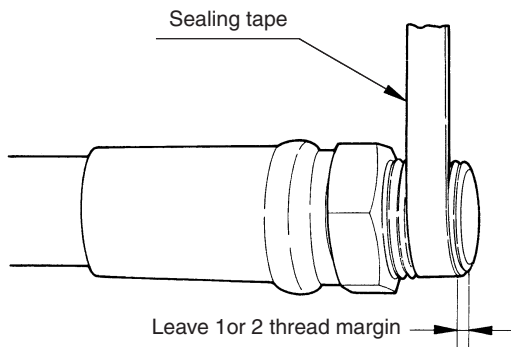
# 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

## 1-3. Preparations

- (1) Review the client service history for details of the most recent service (when the machine was last serviced, how long (months or hours) since the machine has operated since then, and any problems and their solutions at that time).
- (2) Prepare the service tools, measuring instruments (which must be calibrated periodically), containers, and oils and greases required for servicing.
- (3) Make sure that the related reference materials (this manual, Parts Catalogs, etc.) are ready at hand.

## 1-4. Cautions for Disassembly and Reassembly

- (1) Clean the machine before disassembly operation.
- (2) Before disassembly, check the machine conditions and record them.
  - Model, Machine Serial Number, Hourmeter
  - Reason for Repairs, Repair History
  - Dirtiness of Filters
  - Fuel and Oil Conditions
  - Damage to each parts, etc.
- (3) To make reassembly operations easy, make matching marks at the necessary points.
- (4) Clean all disassembled parts and new parts, then arrange them in the proper sequence.
- (5) Be sure to replace all seals and cotter pins, etc., with new parts.
- (6) Keep parts which should not come in contact with oil and water separate from parts with oil on them.
  - Electrical Parts, Rubber, V-Belts, etc.
- (7) When installing bearings, bushings and oil seals, as a rule, use a press. When a hammer, etc., is used, it leaves bruises.
- (8) Wipe all joining surfaces clean so that there is no dirt or dust adhering to them.
- (9) Wrap seal tape from the front end, Wrapping it tight and leaving 1 or 2 threads bare, Overlap the tape by about 0.4 in. (10 mm).



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## 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

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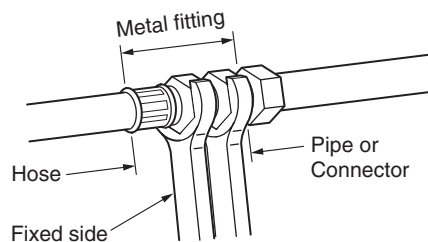
### 1-5. Cautions for Removal and Installation of Hydraulic Equipment

- (1) Check that the hydraulic oil temperature is low enough.
- (2) Release air from the hydraulic tank to prevent the hydraulic oil from flowing out.
- (3) Be sure to plug open the ends of hydraulic components to prevent dust from entering.
- (4) Be sure to wipe hydraulic oil from the hydraulic components so that it will not be mistaken for an oil leak.
- (5) Take care not to damage the plating on the cylinder rod.
- (6) Be sure to raise the bed and secure it by installing the bed stoppers before starting to detach or re-attach the hydraulic cylinder.
- (7) Be sure to release air after installing the hydraulic cylinders.
  - Run the engine at a low speed. Extend and retract the cylinders 4 to 5 times up to 2 to 3.9 in. (50 to 100 mm) from the end of the stroke. Then, fully extend and retract.
- (8) Be sure to release air after installing the HST pump.

### 1-6. Cautions for Removal and Installation of Hydraulic Piping

- (1) Installation of hydraulic hose.

Take care not to twist the hoses. For hoses with a metal fitting, use two wrenches to prevent twisting. Use one to fix the hose, and the other to tighten the fitting to the specified tightening torque. Carefully check that the hoses do not come in contact after tightening. If any contact is found, correct it or use tubes.



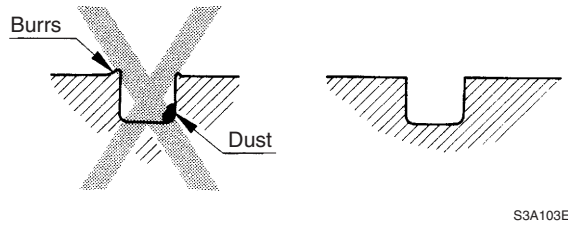
S3A102E

- (2) When installing hoses, first tighten to the specified torque and then loosen them a little. Then retighten to the specified torque.
  - Break in the installed parts before tightening (except those using seal tapes).
- (3) When installing pipes, turn the nuts more 1/4 to 1/2 turn after they reach the sharp torque rise point.
- (4) When installing or removing hoses, use two wrenches, one to fasten the hose and the other to tighten or loosen the hose to prevent twisting.
- (5) Check for oil leakage by applying max. pressure 5 to 6 times after attaching hydraulic hoses or pipes.

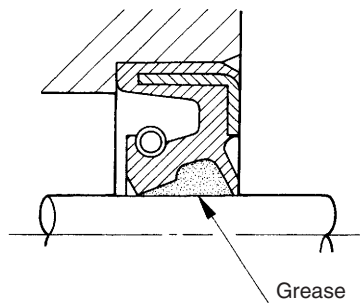


## 1-7. Cautions for Handling Seals

- (1) Clean the grooves for O-rings and if there is any ridge, etc., remove it.



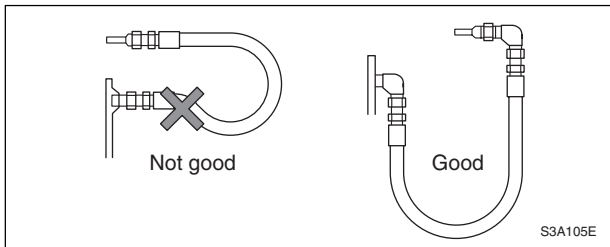
- (2) Be careful not to twist O-rings. If an O-ring is twisted, remove the twist with the fingertips.
- (3) During insertion, be careful not to damage the seal.
- (4) Handling of Floating Seals
- Wipe all oil off the O-ring and housing of the floating seal.
  - When assembling, apply a thin coating of gear oil to the contact surface of the housing.
  - After assembly, turn the seal 2 or 3 times to get it to fit snugly.
- (5) Apply grease to the lip of the oil seal.
- This is to prevent wear when it is first started up after assembly.



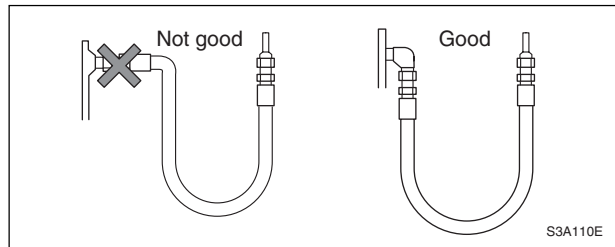
# 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

## 1-8. Correct Installation of Hydraulic Hose

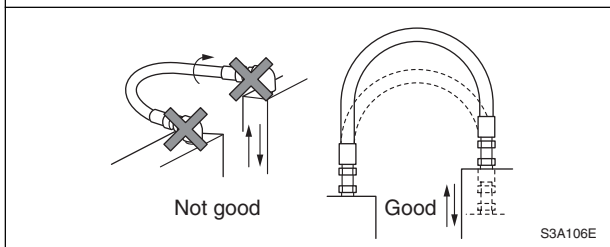
In order to mount the hydraulic hose most effectively and economically, observe the following cautions.



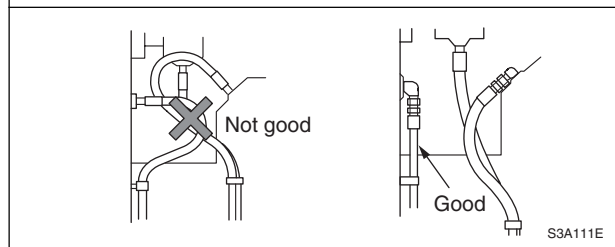
1. When a hose is used at the minimum bending radius, use elbows to avoid sharp bending.



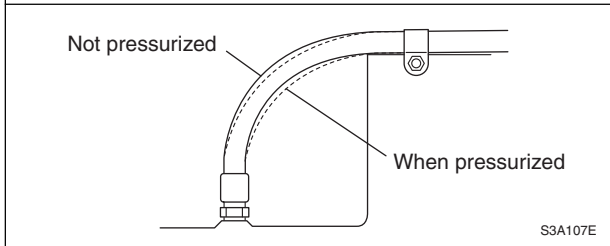
6. Use an elbow to prevent excessive twisting or bending of the hose.



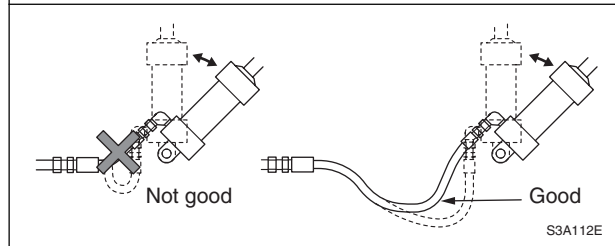
2. To prevent twisting, the hose should be bent in the same direction as it moves.



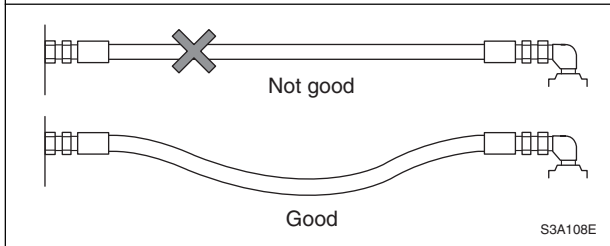
7. Use adapters to make the hose as straight as possible. The outside appearance can be improved by avoiding the use of hoses that are too long.



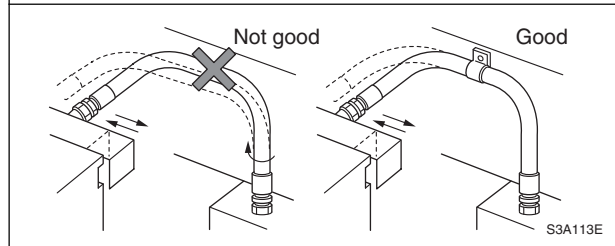
3. When the hose is pressurized, the hose length varies slightly at the bend. Allow this change to occur and do not try to fasten the bend.



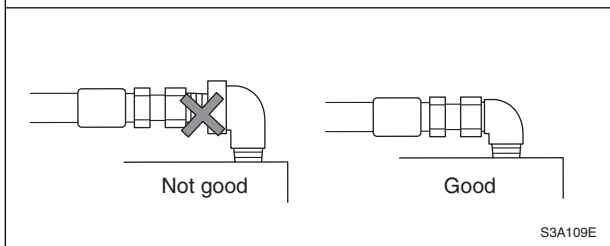
8. The hose should be slightly longer than is absolutely necessary. The extra allows smoother movement of the hose and prevents sharp bending.



4. It is necessary for the hose to have ample slackness for elongation and contraction, because its length will change by +2 % to -4 % when used at high pressure.



9. When a bent hose is attached to two different planes, fix as shown in the diagram to prevent twisting.






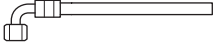

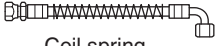
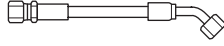


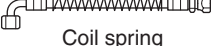
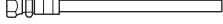
5. Use the proper adapters, not pipes, in order to reduce the number and length of joints and improve the external appearance.

# 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

## 1-9. Types of Hydraulic Hoses

### 1. High-pressure and middle-pressure hoses

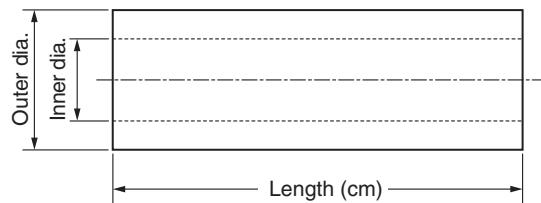
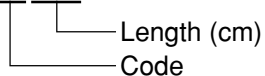
High-pressure and middle-pressure hoses are broadly classified according to their names and fitting sizes as shown in the table below:

Name	Fitting size	Rough sketch	Name	Fitting size	Rough sketch
G-G	G1/4 G3/8 G1/2 G3/4 G1	  W/Hose protector  Coil spring S3A115E	G90- $\phi$ 6.3 G90- $\phi$ 9.5 G90- $\phi$ 19	G1/4 G3/8 G3/4	 S3A119
G-G90	G1/4 G3/8 G1/2 G3/4 G1	  Coil spring S3A116E	G-G45	G1/4 G3/8 G1/2 G3/4 G1	 S3A120
G45- $\phi$ 9.5	G3/8	 S3A117	G90-G	G1/4 G3/8 G1/2 G3/4 G1	  Coil spring S3A121E
G- $\phi$ 6.3 G- $\phi$ 19	G1/4 G3/4	 S3A118			

## 1. GENERAL CAUTIONS FOR MAINTENANCE WORK

### 2. Low-pressure hoses

Parts code No. 15305-xxxxxx



SSA122E

#### Braided hoses (smooth cover)

Code	Name	Inner diameter in. (mm)		Outer diameter in. (mm)		Thickness in. (mm)
06xxx	SL-06	0.248 (6.3)	+0.020 (+0.5) -0.004 (-0.1)	0.453 (11.5)	±0.024 (±0.6)	0.102 (2.6)
09xxx	SL-09	0.374 (9.5)	+0.020 (+0.5) -0.004 (-0.1)	0.598 (15.2)	±0.024 (±0.6)	0.112 (2.85)
12xxx	SL-12	0.500 (12.7)	+0.020 (+0.5) -0.004 (-0.1)	0.728 (18.5)	±0.024 (±0.6)	0.114 (2.9)

#### Braided hoses

Code	Name	Inner diameter in. (mm)	Outer diameter in. (mm)	Thickness in. (mm)
16xxx	SL-16	0.654 ±0.024 (16.6 ±0.6)	0.945 ±0.031 (24.0 ±0.8)	0.146 (3.7)
20xxx	SL-20	0.866 ±0.039 (22.0 ±1.0)	1.240 ±0.043 (31.5 ±1.1)	0.187 (4.75)