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.

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CHAPTER 1

GENERAL CAUTIONS FOR MAINTENANCE WORK

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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.


E3A040

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.

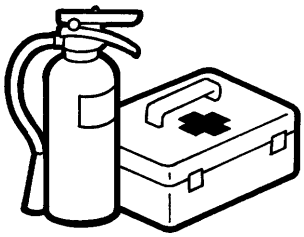
Avoid harmful asbestos dust

- 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

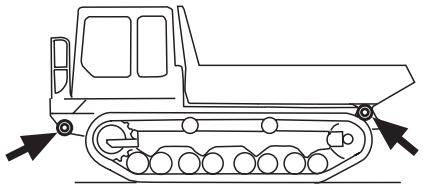
Provide adequate ventilation when working in an enclosed area

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.


OE3A090

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.



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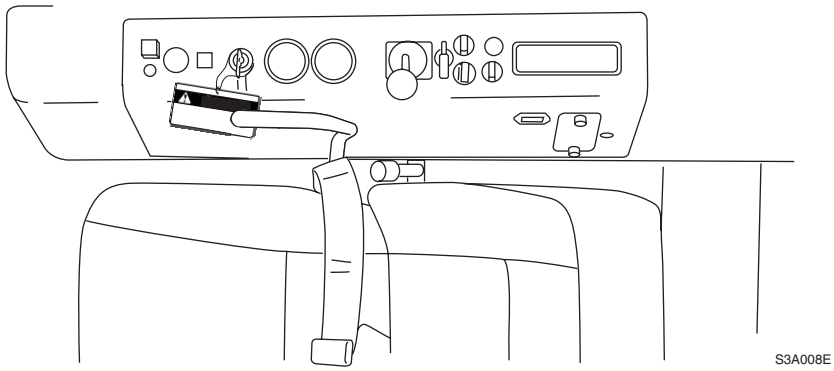
Attach the “SERVICING IN PROGRESS” tag to the starter switch

- 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.

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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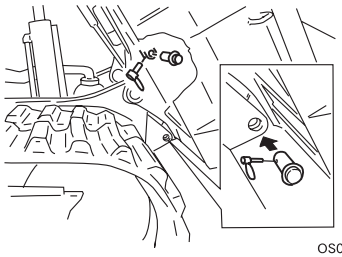
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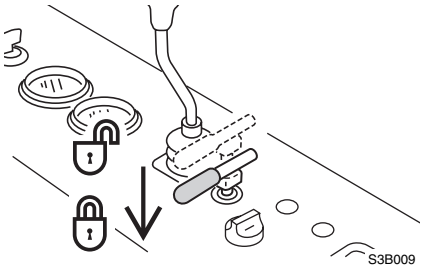
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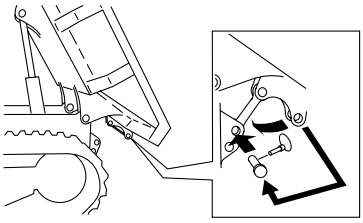
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When operating the crane

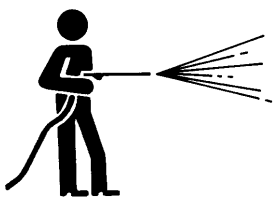
- The crane and the hoisting & rigging equipment must be operated by qualified operators.
- Never allow any persons to go beneath the lifted loads.
- When detaching a heavy component, first lift it with the crane as a safety support before removing its fixing bolts.

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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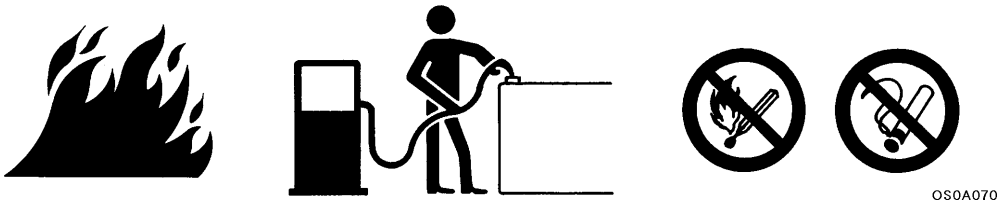
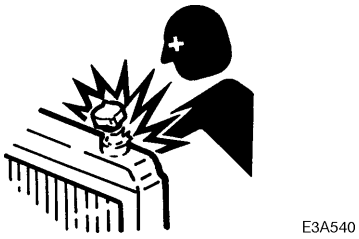
Precautions for fueling and oiling

- 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

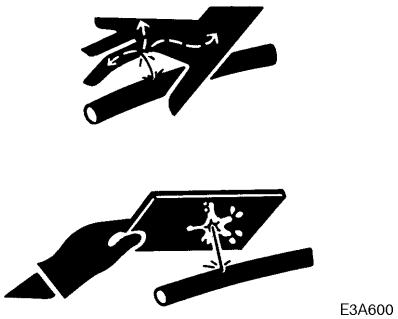
- When welding or repairing the electrical system, disconnect the negative terminal of the battery to interrupt the electric circuit.

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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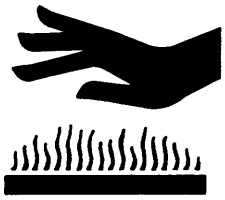
Be careful when servicing systems under high temperature and high pressure

- 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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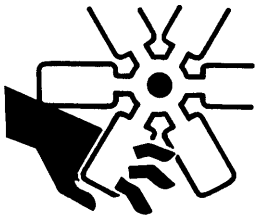
Rotating radiator fan and fan belt

- 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.



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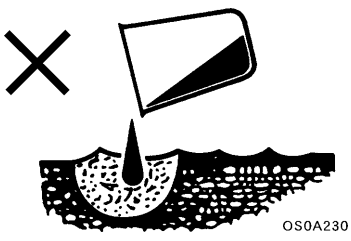
Processing wastes

- 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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1-3. Preparations

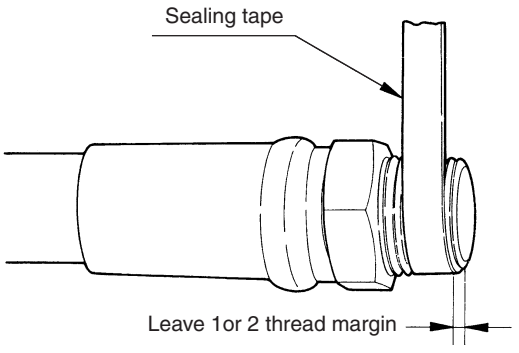
(1) Review the client service history for details of the most recent service (when the machine was last serviced, how long (months or hours) since the machine has operated since then, and any problems and their solutions at that time).
(2) Prepare the service tools, measuring instruments (which must 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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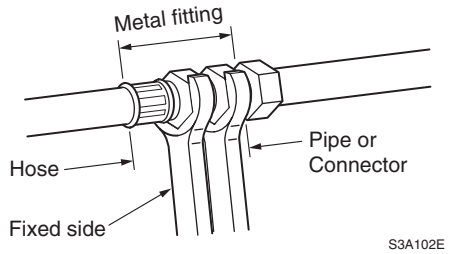
1-5. Cautions for Removal and Installation of Hydraulic Equipment

(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

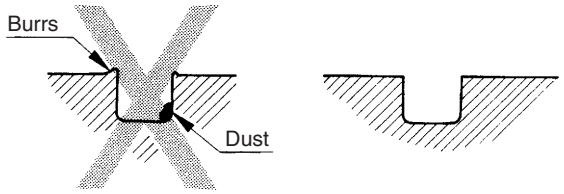
(1) Installation of hydraulic hose.
Take care not to twist the hoses. For hoses with a metal fitting, use two wrenches to prevent twisting. Use one to fix the hose, and the other to tighten the fitting to the specified tightening torque. Carefully check that the hoses do not came in contact after tightening.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



(2) When installing hoses, first tighten to the specified torque and then lossen 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 lossen 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.



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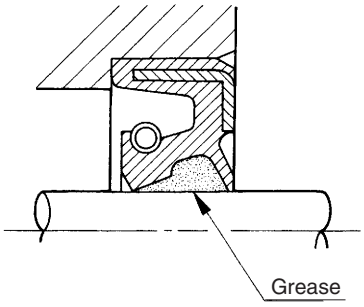
(2) Be careful not to twist O-rings. If an O-ring is twisted, remove the twist with the fingertips.
(3) During insertion, be careful not to damage the seal.
(4) Handling of Floating Seals
- Wipe all oil off the O-ring and housing of the floating seal.
- When assembling, apply a thin coating of gear oil 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.



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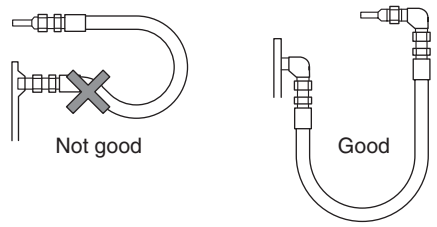
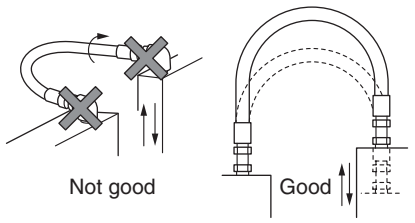
1-8. Correct Installation of Hydraulic Hose

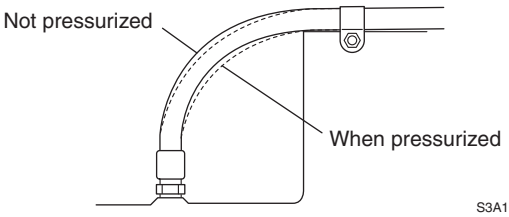
In order to mount the hydraulic hose most effectively and economically, observe the following cautions.



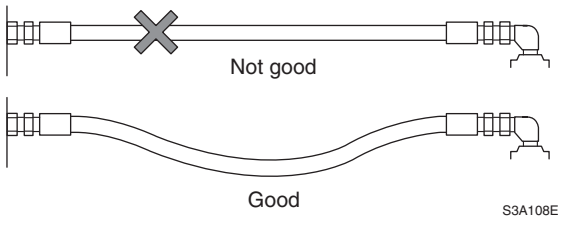
1. When a hose is used at the minimum bending radius, use elbows to avoid sharp bending.



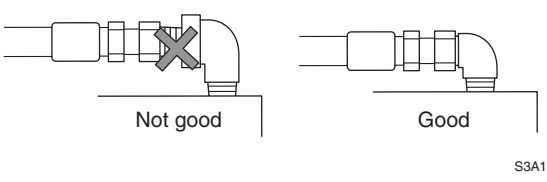
2. To prevent twisting, the hose should be bent in the same direction as it moves.



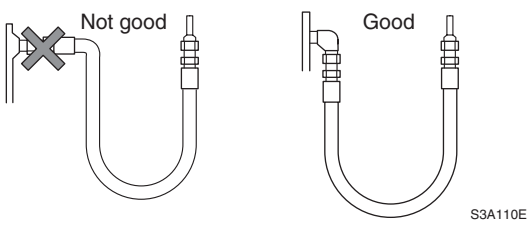
3. When the hose is pressurized, the hose length varies slightly at the bend. Allow this change to occur and do not try to fasten the bend.



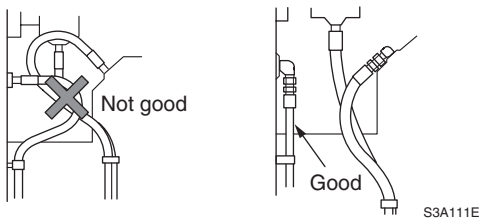
4. It is necessary for the hose to have ample slackness for elongation and contraction, because its length will change by +2 % to -4 % when used at high pressure.



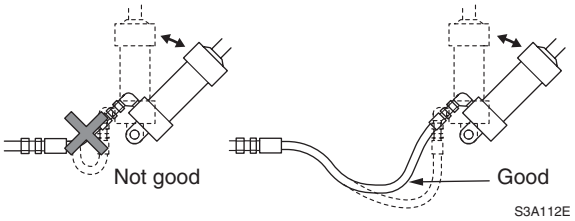
5. Use the proper adapters, not pipes, in order to reduce the number and length of joints and improve the external appearance.



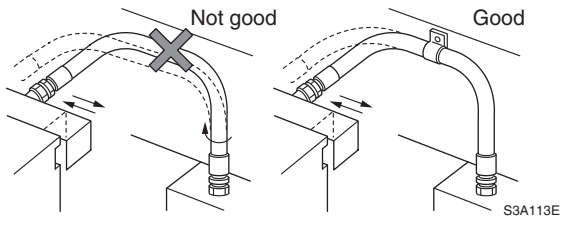
6. Use an elbow to prevent excessive twisting or bending of the hose.



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.



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

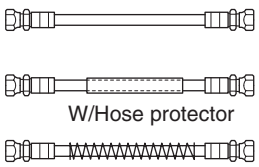
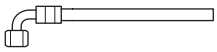
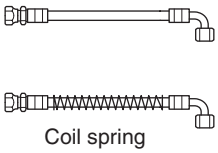
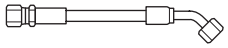
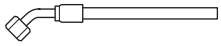
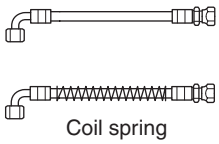
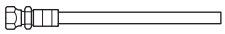


9. When a bent hose is attached to two different planes, fix as shown in the diagram to prevent twisting.

1-9. Types of Hydraulic Hoses

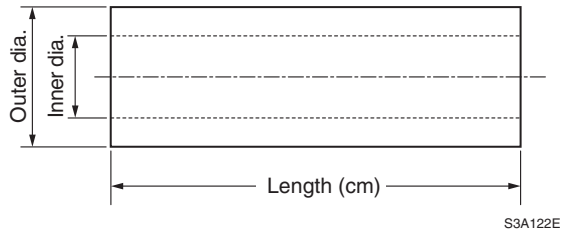
1. High-pressure and middle-pressure hoses

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	 S3A115E	G90–ø6.3 G90–ø9.5 G90–ø19	G1/4 G3/8 G3/4	 S3A119
G–G90	G1/4 G3/8 G1/2 G3/4 G1	 S3A116E	G–G45	G1/4 G3/8 G1/2 G3/4 G1	 S3A120
G45–ø9.5	G3/8	 S3A117	G90–G	G1/4 G3/8 G1/2 G3/4 G1	 S3A121E
G–ø6.3 G–ø19	G1/4 G3/4	 S3A118			

2. Low-pressure hoses

Parts code No. 15305–×××××
Length (cm)
Code



Braided hoses (smooth cover)

Code	Name	Inner diameter in. (mm)		Outer diameter in. (mm)		Thickness in. (mm)
06×××	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)
09×××	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)
12×××	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

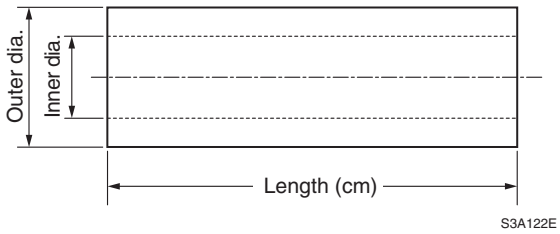
Code	Name	Inner diameter in. (mm)	Outer diameter in. (mm)	Thickness in. (mm)
16×××	SL–16	0.654 ±0.024 (16.6 ±0.6)	0.945 ±0.031 (24.0 ±0.8)	0.146 (3.7)
20×××	SL–20	0.866 ±0.039 (22.0 ±1.0)	1.240 ±0.043 (31.5 ±1.1)	0.187 (4.75)

Spiral hoses (spiral stripes cover)

Code	Name	Inner diameter in. (mm)		Outer diameter in. (mm)		Thickness in. (mm)
12×××	SL–12	0.500 (12.7)	+0.012 (+0.3) –0.020 (–0.5)	0.866 (22.0)	±0.039 (±1.0)	0.183 (4.65)
19×××	SL–19	0.748 (19.0)	+0.020 (+0.5) –0.028 (–0.7)	1.134 (28.8)	±0.039 (±1.0)	0.193 (4.9)
25×××	SL–25	1.000 (25.4)	+0.020 (+0.5) –0.028 (–0.7)	1.425 (36.2)	±0.039 (±1.0)	0.213 (5.4)
26×××	SL–26	1.063 (27.0)	+0.020 (+0.5) –0.028 (–0.7)	1.496 (38.0)	±0.039 (±1.0)	0.217 (5.5)
31×××	SL–31	1.252 (31.8)	+0.020 (+0.5) –0.028 (–0.7)	1.740 (44.2)	±0.059 (±1.5)	0.244 (6.2)
32×××	SL–32	1.299 (33.0)	+0.020 (+0.5) –0.028 (–0.7)	1.850 (47.0)	±0.059 (±1.5)	0.276 (7.0)
34×××	SL–34	1.339 (34.0)	+0.020 (+0.5) –0.028 (–0.7)	1.890 (48.0)	±0.059 (±1.5)	0.276 (7.0)
38×××	SL–38	1.500 (38.1)	+0.028 (+0.7) –0.039 (–1.0)	2.047 (52.0)	±0.059 (±1.5)	0.274 (6.95)
41×××	SL–41	1.681 (42.7)	+0.028 (+0.7) –0.039 (–1.0)	2.244 (57.0)	±0.079 (±2.0)	0.281 (7.15)

Spiral hoses

Code	Name	Inner diameter in. (mm)	Outer diameter in. (mm)	Thickness in. (mm)
19×××	SL–19	0.748 ±0.024 (19.0 ±0.6)	1.181 ±0.079 (30.0 ±2.0)	0.217 (5.5)
25×××	SL–25	1.000 ±0.024 (25.4 ±0.6)	1.433 ±0.079 (36.4 ±2.0)	0.217 (5.5)
31×××	SL–31	1.252 ±0.024 (31.8 ±0.6)	1.673 ±0.098 (42.5 ±2.5)	0.211 (5.35)
32×××	SL–32	1.299 ±0.024 (33.0 ±0.6)	1.732 ±0.098 (44.0 ±2.5)	0.217 (5.5)
38×××	SL–38	1.500 ±0.024 (38.1 ±0.6)	1.933 ±0.098 (49.1 ±2.5)	0.217 (5.5)
41×××	SL–41	1.677 ±0.024 (42.6 ±0.6)	2.11 ±0.098 (53.6 ±2.5)	0.217 (5.5)
47×××	SL–47	1.890 ±0.024 (48.0 ±0.6)	2.378 ±0.118 (60.4 ±3.0)	0.244 (6.2)
58×××	SL–58	2.374 ±0.031 (60.3 ±0.8)	2.913 ±0.118 (74.0 ±3.0)	0.270 (6.85)



Parts code No. 15306–×××××
Length (cm)
Code

Parts code No. 15307–×××××
Length (cm)
Code

Code	Name	Inner diameter in. (mm)	Outer diameter in. (mm)	Thickness in. (mm)
06×××	F–15–06	0.248 (6.3)	0.512 (13.0)	0.132 (3.35)
09×××	F–15–09	0.374 (9.5)	0.657 (16.7)	0.142 (3.6)
12×××	F–15–12	0.500 (12.7)	0.807 (20.5)	0.154 (3.9)
19×××	F–15–19	0.748 (19.0)	1.181 (30.0)	0.217 (5.5)
25×××	F–15–25	1.000 (25.4)	1.457 (37.0)	0.228 (5.8)
32×××	F–15–32	1.252 (31.8)	1.764 (44.8)	0.256 (6.5)
38×××	F–15–38	1.500 (38.1)	2.012 (51.1)	0.256 (6.5)
50×××	F–15–50	2.000 (50.8)	2.575 (65.4)	0.287 (7.3)

Code	Name	Inner diameter in. (mm)	Outer diameter in. (mm)	Thickness in. (mm)
41×××	SLV–41	1.677 ±0.024 (42.6 ±0.6)	2.268 ±0.098 (57.6 ±2.5)	0.295 (7.5)
47×××	SLV–47	1.890 ±0.024 (48.0 ±0.6)	2.579 ±0.118 (65.5 ±3.0)	0.344 (8.75)
32×××	SLV–32	1.299 ±0.024 (33.0 ±0.6)	1.890 ±0.098 (48.0 ±2.5)	0.295 (7.5)

Code	Name	Inner diameter in. (mm)	Outer diameter in. (mm)	Thickness in. (mm)
38×××	SLV38B	$1.500\ ^{+0.028}_{-0.039}$ $(38.1\ ^{+0.7}_{-1.0})$	$2.008\ ^{+0.079}_{-0.039}$ $(51.0\ ^{+2.0}_{-1.0})$	0.254 (6.45)
41×××	SLV–41	$1.677\ ^{+0.028}_{-0.039}$ $(42.6\ ^{+0.7}_{-1.0})$	$2.165\ ^{+0.079}_{-0.039}$ $(55.0\ ^{+2.0}_{-1.0})$	0.244 (6.2)
47×××	SLV–37	$1.913\ ^{+0.028}_{-0.039}$ $(48.6\ ^{+0.7}_{-1.0})$	$2.441\ ^{+0.079}_{-0.039}$ $(62.0\ ^{+2.0}_{-1.0})$	0.264 (6.7)

1-10. How to Release Air from Hydraulic Units

1-10-1. Releasing Air from the HST System

Before replacing the HST pump or supplying the hydraulic oil after repair, release air according to the following procedures. If unusual wear is found while disassembling, replace the hydraulic oil and the return filter.

⚠ WARNING

Be sure to install the wagon stopper to hold the wagon when inspecting or servicing the machine with the wagon in the dump position.

Serial No.30500003~30500038

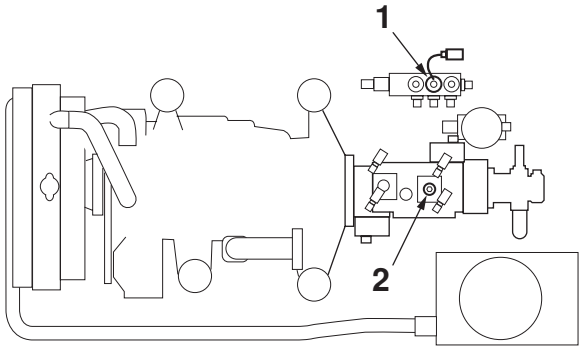
(1) Disconnect the harness of the solenoid valve (1) for the parking brake.
This is to keep the parking brake activated while operating the travel lever.

(2) Remove the air release plug (2) of the HST pump, fill the hydraulic oil in the housing, and tighten the air release plug (2).

(3) Reconnect the harness of the solenoid valve (1).

(4) Restart the engine at 1500 to 1800 rpm, and repeat traveling forward and backward three or four times.

(5) Keep running the engine at the nominal rotation speed for a while, then stop the engine and inspect the oil surface of the hydraulic oil tank.



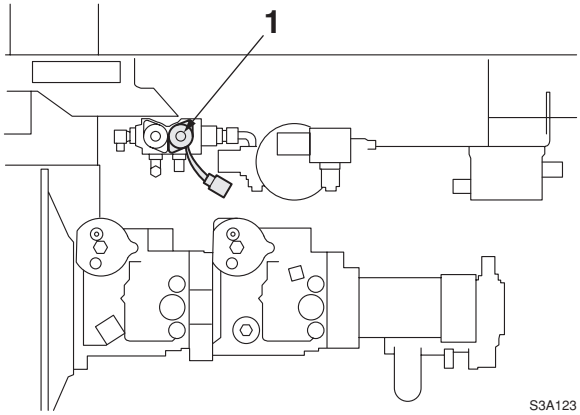
S2A123

Serial No.30510001~

(1) Disconnect the harness of the solenoid valve (1) for the parking brake.
This is to keep the parking brake activated while operating the travel lever.

(2) Remove the air release plug (2) of the HST pump, fill the hydraulic oil in the housing, and tighten the air release plug (2).

(3) Loosen the air release plugs (3) and (4) of the remote piping.



S3A123

(4) Start the engine, keep it idling, and operate the travel lever.

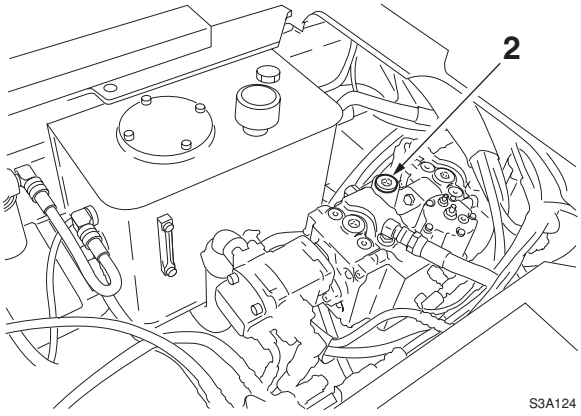
(5) When the hydraulic oil overflows through the holes for the air release plugs (3) and (4), tighten those plugs.

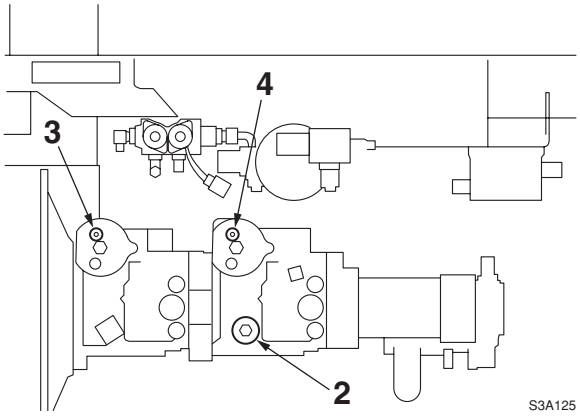
(6) Stop the engine, check for any oil leak, and inspect the hydraulic oil surface.

(7) Reconnect the harness of the solenoid valve (1).

(8) Restart the engine at 1500 to 1800 rpm, and repeat traveling forward and backward three or four times.

(9) Keep running the engine at the nominal rotation speed for a while, then stop the engine and inspect the oil surface of the hydraulic oil tank.





1-10-2. Releasing Air from Hydraulic Cylinder

For releasing air from hydraulic cylinder, refer to section “1-5. Cautions for Removal and Installation of Hydraulic Equipment”.

CHAPTER 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

2-1. Specifications

Main specifications of machine

Item			Unit	Serial Number	
				30500003~30500038	30510001~
Dimensions/Weight					
	Overall length		mm	4660	←
	Overall width		mm	2000	←
	Overall height		mm	2720	←
	Tumbler center distance		mm	3155	←
	Track gauge		mm	1550	←
	Minimum ground clearance		mm	435	←
	Machine mass		kg	5640	5700
	Ground pressure	Unloaded	kPa	19.7	19.9
		Loaded	kPa	32.5	32.7
Traveling performance					
	Travel speed	1 st	km/hr	6.0	7.5
		2 nd	km/hr	8.6	9.2
	Min. turning radius		mm	——	——
Work performance					
	Max. load capacity		kg	3700	←
	Wagon dimensions	Length	mm	2615	←
		Width	mm	1795	←
		Height	mm	285	←
	Wagon capacity	Struck	m^3	1.15	←
		Heaped	m^3	2.055	←
	Wagon floor face height		mm	1345	←
	Dump angle		degree	65	←
	Dump clearance		mm	895	←
	Max. dump lift		kN	53	←
	Max. possible dump inclination angle		degree	30	←
	Max. height when dumping		mm	3625	←

Hydraulic equipment

Item			Unit	Serial Number	
				3050003~30500038	30510001~
Hydraulic pump					
Type			——	Tandem pumps (HST)	←
Drive mechanism			——	Mounted on the engine through CF coupling	←
Displacement			cm^3/rev	41	51
Max. no. of revolutions			rpm	3000	←
Max. working pressure			MPa	35.0	←
Pressure cut (PC) vave set pressure			MPa	34.5	←
Charge relief set pressure			MPa	1.57 at 1800 min^{-1}	2.18 at 1800 min^{-1}
Charge pump		Type	——	——	Internal gear pump
		Desplacement	cm^3/rev	——	23.7
			——	——	——
Working equipment pump		Type		Internal gear pump	←
		Desplacement	cm^3/rev	20.3	13.7
Pilot pressure pump		Type		Internal gear pump	←
		Desplacement	cm^3/rev	5.1	5.0
Travel motor (Hydraulic motor)					
Type				Variable displacement piston motor	←
Motor displacement			cm^3/rev	55.1~ 38.3	81.4~ 65.5
Low pressure relief valve set pressure			MPa	——	——
Reduction gears					
Reduction gear ratio				1/32.11	1/23.168
Max. output revolution speed			min^{-1}	125	84
Brake					
Parking brake torque (Hydraulic motor)			N·m	12523	13671or more
Brake release pressure			MPa	1.25~3.9	1.1or less
Swing motor (Hydraulic motor)					
Type				Fixed displacement piston motor	←
Motor displacement			cm^3/rev	27.4	←
High pressure relief valve set pressure			MPa	12.3	←
Reduction gears					
Reduction gear ratio				1/22.7	←
Max. output revolution speed			min^{-1}	——	——
Brake					
Parking brake torque (Hydraulic motor)			N·m	1796 or more	←
Brake release pressure			MPa	2.0~6.4	←

Undercarriage

Item		Unit	Serial Number	
			30500003~30500038	30510001~
Carrier roller	Suspension system	——	Rigid	←
	Qty. (Each side)	Pcs.	2	←
	Bearing type	——	Ball bearing (6206)	←
	Sealing structure	——	Oil seal	←
	Amount of lubricant	mL	45~50	←
Track roller	Suspension system	——	Oscillating	←
	Qty. (Each side)	Pcs.	8	←
	Bearing type	——	Roller bearing (32008JR)	←
	Sealing structure	——	Floating seal	←
	Amount of lubricant	mL	160	←
Idler	Qty. (Each side)	Pcs.	1	←
	Bearing type	——	Roller bearing (32209JR)	←
	Sealing structure	——	Floating seal	←
	Amount of lubricant	mL	170	←
Sprocket	No. of teeth	——	16	17
Crawler belt	Type	——	Endless chain	←
	Shoe width	mm	450	←
	Lug height	mm	35	←
	Core pitch × No. of links	mm	110 × 74	←
	Shoe (Each side)	——	——	——
	Crawler drive mechanism	——	——	——
Crawler adjusting mechanism		——	——	Hydraulic cylinder

Engine

Item	Unit	Serial Number	
		30500003~30500038	30510001~
Engine model	——	4TNE106–TB	4TNV106–NTB
Type	——	Vertical, water-cooled, 4-cycle diesel engine	←
Combustion	——	Direct fuel injection	←
Number of cylinders–Bore × Stroke	mm	4–106 × 125	←
Total displacement	mL	4412	←
Rated output/revs.	kW/min^{-1}	67.7/2500	←
Maximum torque/revs.	N·m	284.4~309.9/1600±100	297/1600
Specific fuel consumption	g/kW·h	237 or less	252
Maximum no-load speed	min^{-1}	2700 ±25	2680 ±80
Minimum no-load speed	min^{-1}	1100 ±25	1100 ±50
Engine dry mass	kg	320	330
Fuel system type			
Fuel injection pump	——	In-line (ZEXEL AD)	Distributorinjection System (YPD-M4P4)
Filtration type	——	Paper filtering, full flow	←
Governor	——	Mounted on the fuel injection pump, mechanical, for all-range speeds	←
Lubrication system			
Lubrication pump		Trochoid pump	←
Filtration type	——	Paper filtering	←
Cooling system			
Cooling system type	——	Forced circulation, radiator	←
Radiator	——		
Type	——	Pressurized (with a pressure applying cap)	←
Radiator cap Pressure	MPa	0.1	←
Fan	——	Resin, 500 dia. × 8 pc.	←
Air cleaner	——	Cyclonic	←
Starting device	——	Electric type	←
Starter	V-kW	24–3.5	←
Type	——		
Nominal rated output	V-A	24–35	←
Clutch type	——		
Alternator	——		
Nominal rated output	V-A	24–35	←
Rated	min^{-1}	5000	←
Battery	——		
Type	——	75D23R	←
Battery voltage 5 hrs rate capacity	V-A·h	24–64	←
Cold starting aid	——		
Air heater	V-W	24–1650	←
Engine stop device			
Stop solenoid	V	24	←