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SECTION 1 GENERAL

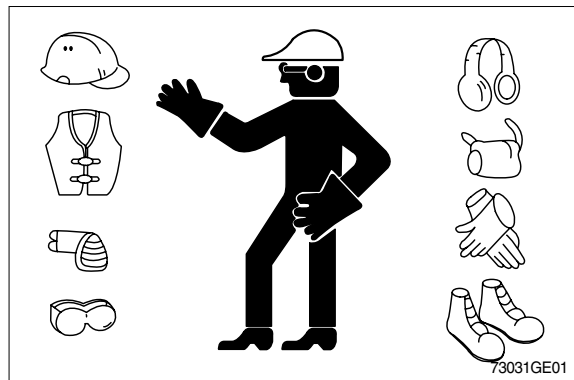
GROUP 1 SAFETY HINTS

FOLLOW SAFE PROCEDURE

Unsafe work practices are dangerous. Understand service procedure before doing work; Do not attempt shortcuts.

WEAR PROTECTIVE CLOTHING

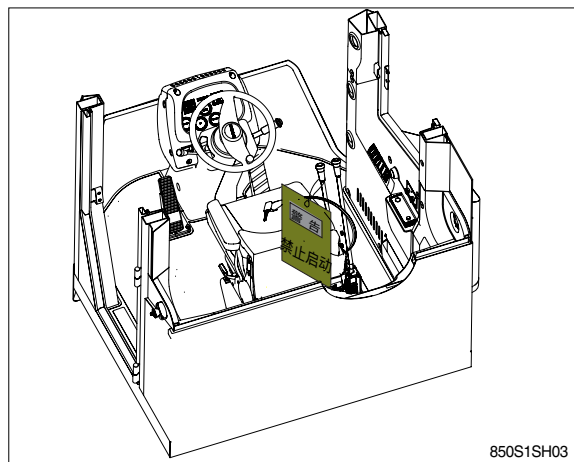
Wear close fitting clothing and safety equipment appropriate to the job.



WARN OTHERS OF SERVICE WORK

Unexpected machine movement can cause serious injury.

Before performing any work on the wheel loader, attach a 「Do Not Operate」 tag on the right side controller lever.



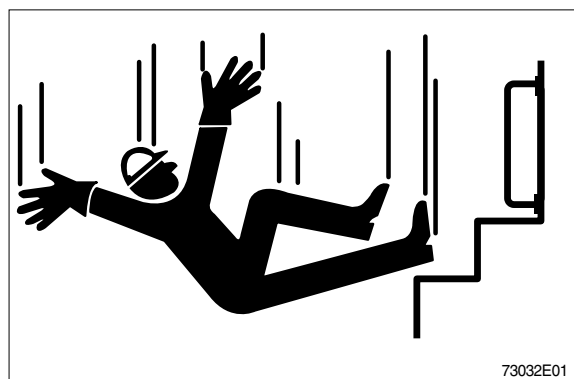
USE HANDHOLDS AND STEPS

Falling is one of the major causes of personal injury.

When you get on and off the machine, always maintain a three point contact with the steps and handrails and face the machine. Do not use any controls as handholds.

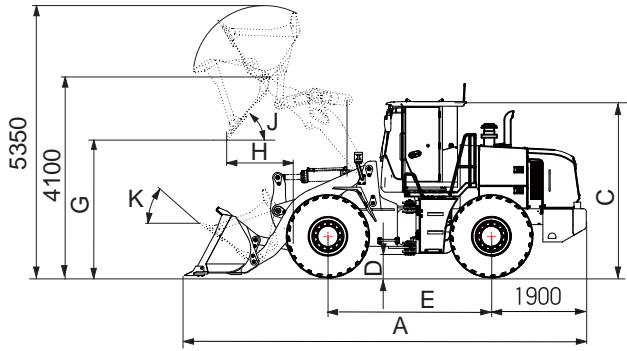
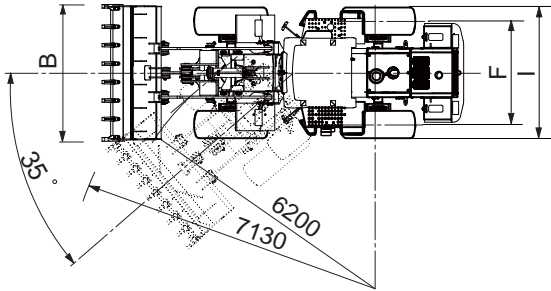
Never jump on or off the machine. Never mount or dismount a moving machine.

Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.



2. SPECIFICATIONS

WITH TOOTH TYPE BUCKET



850S2SE02

Description		Unit	Specification	
Operating weight		kg (lb)	16500 (36380)	
Bucket capacity	Struck	m ³ (yd ³)	2.6 (3.4)	
	Heaped(Filled)		3.0 (3.9)	
Overall length	A	mm (ft-in)	7900 (25' 11")	
Overall width	B		2980 (9' 9")	
Overall height	C		3420 (11' 3")	
Ground clearance	D		410 (1' 4")	
Wheelbase	E		3200 (10' 6")	
Tread	F		2250 (7' 5")	
Dump clearance at 45°	G		3100 (10' 2")	
Dump reach (full lift)	H		1240 (4' 1")	
Width over tires	I		2845 (9' 4")	
Dump angle	J		degree (°)	45
Roll back angle (carry position)	K			49
Cycle time	Lift (with load)	sec	5.6	
	Dump (with load)		1.1	
	Lower (empty)		3.5	
Maximum travel speed		km/hr(mph)	39.0 (24.2)	
Braking distance		m(ft-in)	12.5 (41' 0")	
Minimum turning radius (center of outside tire)			6.2 (20' 4")	
Gradeability		degree (°)	30	
Travel speed	Forward	First gear	10.6 (6.6)	
		Second gear	39.0 (24.2)	
	Reverse	First gear	14.5 (9.0)	

8. Accessory checks

- | | | | |
|---------------------------------------|--------------------------|--------------------------|-------|
| · Operating lights check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Work light check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Brake light check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Cab light check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Horn circuit check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Windshield washer and wiper check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Defroster blower check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Heater/Air conditioner blower check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Heater functional check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Air conditioner functional check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

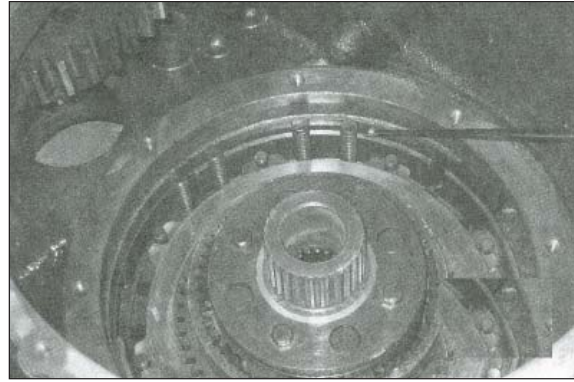
9. Cab components and vandal protection checks

- | | | | |
|-----------------------------------|--------------------------|--------------------------|-------|
| · Cab door latch check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Cab door hold, open latch check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Cab door release button check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Cab door lock check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Cab door window check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Cab window latch check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Seat and seat belt check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Air intake filter door check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Engine side panels check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Radiator cap access door check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Frame locking bar check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |
| · Service decal check | <input type="checkbox"/> | <input type="checkbox"/> | _____ |

6. MAIN FAILURES AND REMEDIES

Main Failures	Remedies
The engine rotating, but machine can not run	
<ol style="list-style-type: none"> 1. Did not in any gears 2. Hydraulic oil level too low 3. Brake rod of shift valve can not return 4. Insufficient oil supply due to shifting oil pump damaged or oil seals broken 	<ol style="list-style-type: none"> 1. Put into gear or check if it correct 2. Add oil 3. Dismantle and check the brake rod 4. Replace oil pump or oil seals
Insufficient driving force	
<ol style="list-style-type: none"> 1. Low oil pressure at inlet of torque converter 2. Clutch sliding 3. Insufficient engine speed 	<ol style="list-style-type: none"> 1. Check oil level; clean sump strainer and filter; check the pressure regulating valve of torque converter 2. Inspect clutch oil pressure and piston oil seal 3. Inspect the engine
Variable speed oil pressure too low	
<ol style="list-style-type: none"> 1. Misalignment of reducing valve 2. Obstructed oil filter 3. Damaged oil pump 4. Serious oil leakage in clutch oil seal 	<ol style="list-style-type: none"> 1. Realignment 2. Clean oil filter 3. Replace oil pump 4. Replace oil seals
Oil temperature in torque converter too high	
<ol style="list-style-type: none"> 1. Oil level in transmission too low or too high 2. Clutch sliding 3. Long-time, heavy load operation 	<ol style="list-style-type: none"> 1. Fill oil acc. to specified 2. Check oil pressure of clutch 3. Stop to cool
Can not put into gear after emergent braking	
<ol style="list-style-type: none"> 1. Misalignment limit screws of air brake valve pedal 2. Choked piston of air brake valve. Return is unavailable after release of brake. 3. Choked brake valve rod 	<ol style="list-style-type: none"> 1. Realign the limit screws of pedal so that air brake valve can return completely. 2. Clean and repair the piston 3. Dismantle and check brake valve rod

- (7) Insert 15 springs and spring pins, and put the gear I cylinder body assy.



850KTM37

- 1 Gear I cylinder body



850KTM38

- (8) Put the mid-cover and use a M22 socket wrench to fasten up 8-M14M0 bolts on the mid-cover.

- 1 Mid-cover

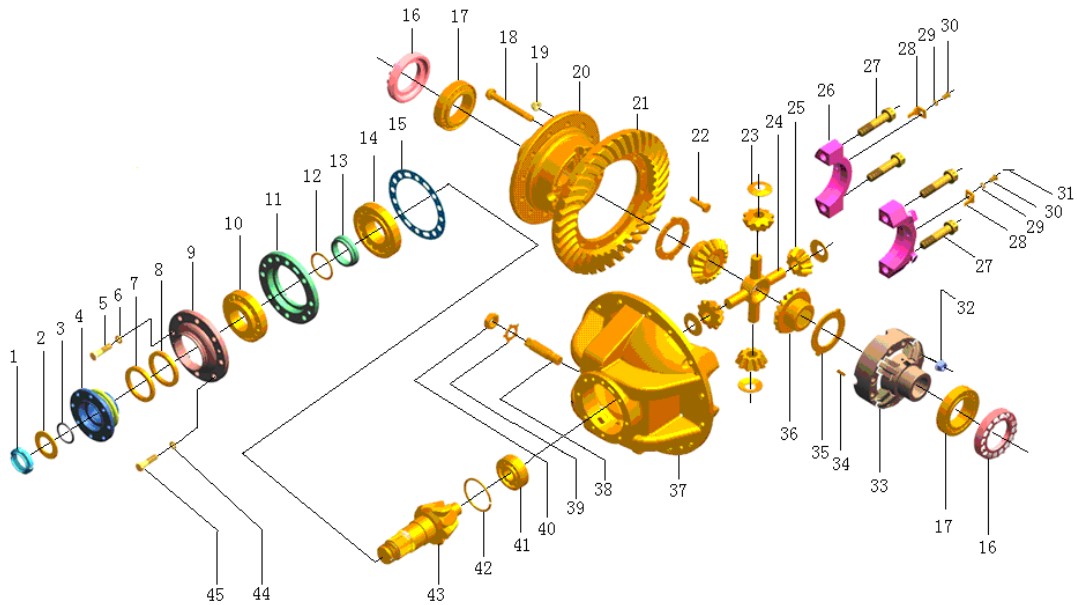


850KTM39



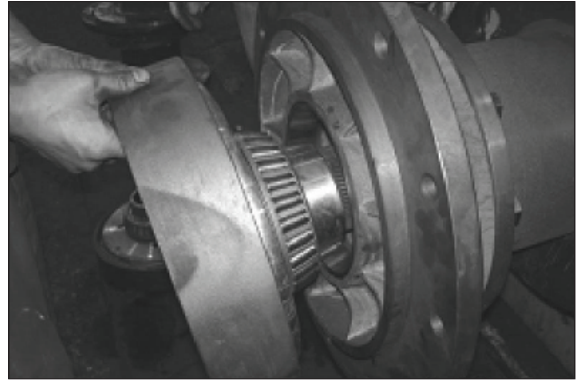
850KTM40

(3) Main reductor



- | | | | | | |
|----|------------------|----|-----------------------|----|-------------------|
| 1 | Lock nut | 16 | Adjusting nut | 31 | Iron wire |
| 2 | Washer | 17 | Bearing | 32 | Nut |
| 3 | O-ring | 18 | Differential bolt | 33 | Cage |
| 4 | Flange | 19 | Nut | 34 | Pin |
| 5 | Bolt | 20 | Differential cage | 35 | Thrust washer |
| 6 | Washer | 21 | Driven bevel gear | 36 | Axle shaft gear |
| 7 | Oil seal | 22 | Bolt | 37 | Differential cage |
| 8 | Oil seal | 23 | Washer | 38 | Bolt |
| 9 | Sealing gland | 24 | Differential crossing | 39 | Lock plate |
| 10 | Bearing | 25 | Bevel gear | 40 | Nut |
| 11 | Bearing bushing | 26 | Bearing seat | 41 | Bearing |
| 12 | Adjusting washer | 27 | Bolt | 42 | Stop ring |
| 13 | Shaft bushing | 28 | Lock plate | 43 | Bevel gear |
| 14 | Bearing | 29 | Washer | 44 | Washer |
| 15 | Adjusting washer | 30 | Bolt | 45 | Bolt |

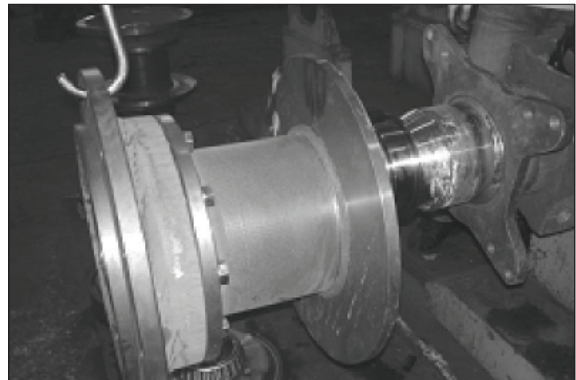
(5) Pull the ring gear carrier out.



850KAX34

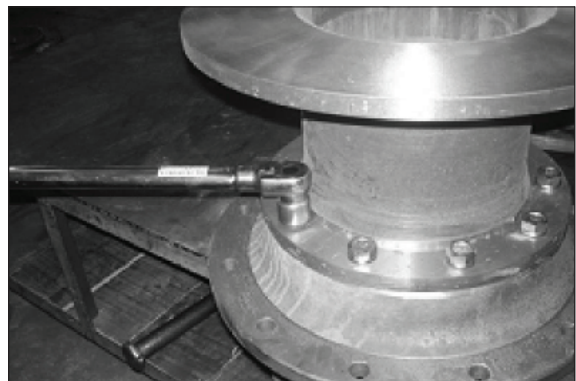
(6) Pull the hub and brake disc out (can be removed as one body).

※ When pulling the hub and brake disc out, be careful to keep balance as being hung in the air not to make the spline on the shaft to scratch oil seal.



850KAX35

(7) Remove the bolts from brake disc to separate the brake disc from hub.



850KAX36



850KAX37

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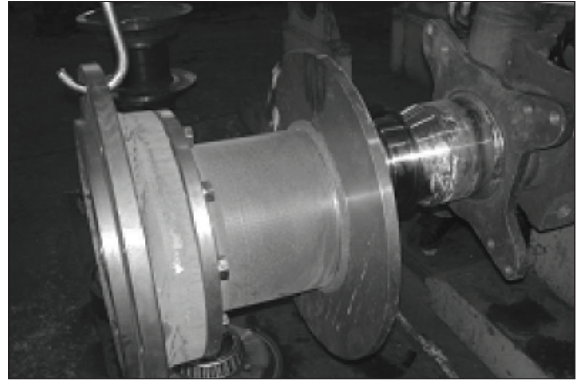


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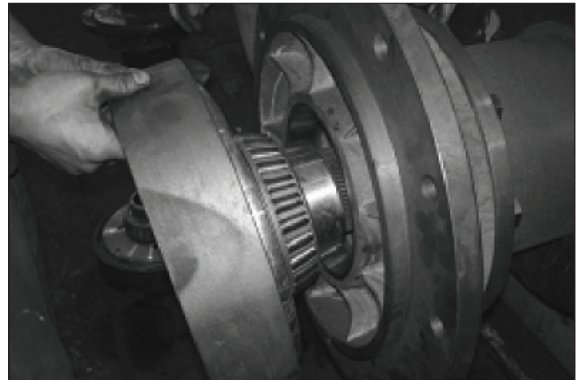
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6) REASSEMBLY OF AXLE

- (1) Clean the axle housing assembly and put it on a support, insert the preheated gasket to wheel side supporting axle thermally securing the end surface of gasket to be perpendicular with axle center and the parallelism with support is controlled within 0.1 mm.
- (2) Mount the hub assembly at the both sides of axle.
 - ※ When assembling hub and brake disc, keep them in good balance and suspending to prevent the oil seal from being scratched by spline.
- (3) Preheat the inner race of bearing and fit it into the small side of ring carrier assembly welded and align the female spline of ring carrier with the spline of wheel side supporting axle to assemble.

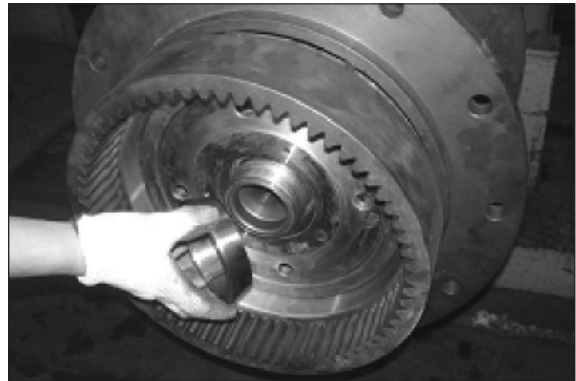


850KAX69



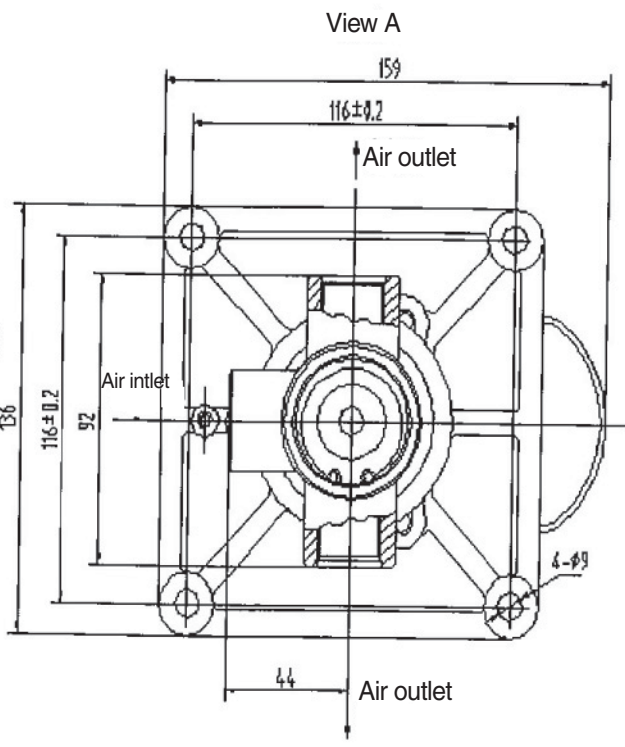
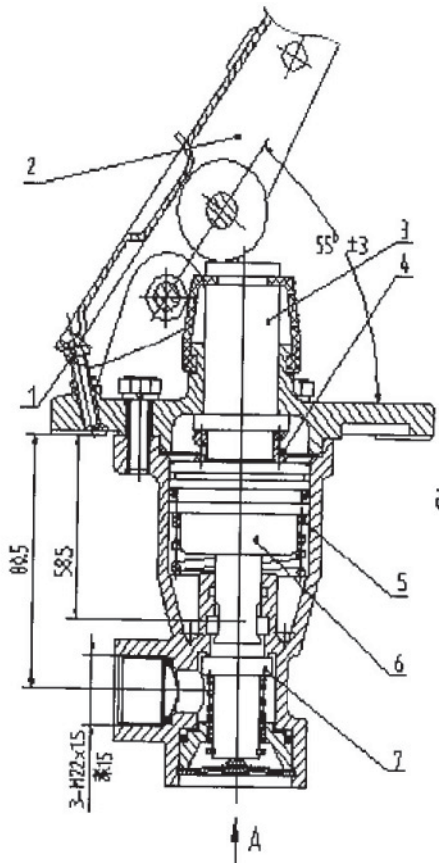
850KAX70

- (4) Fit taper bushing.



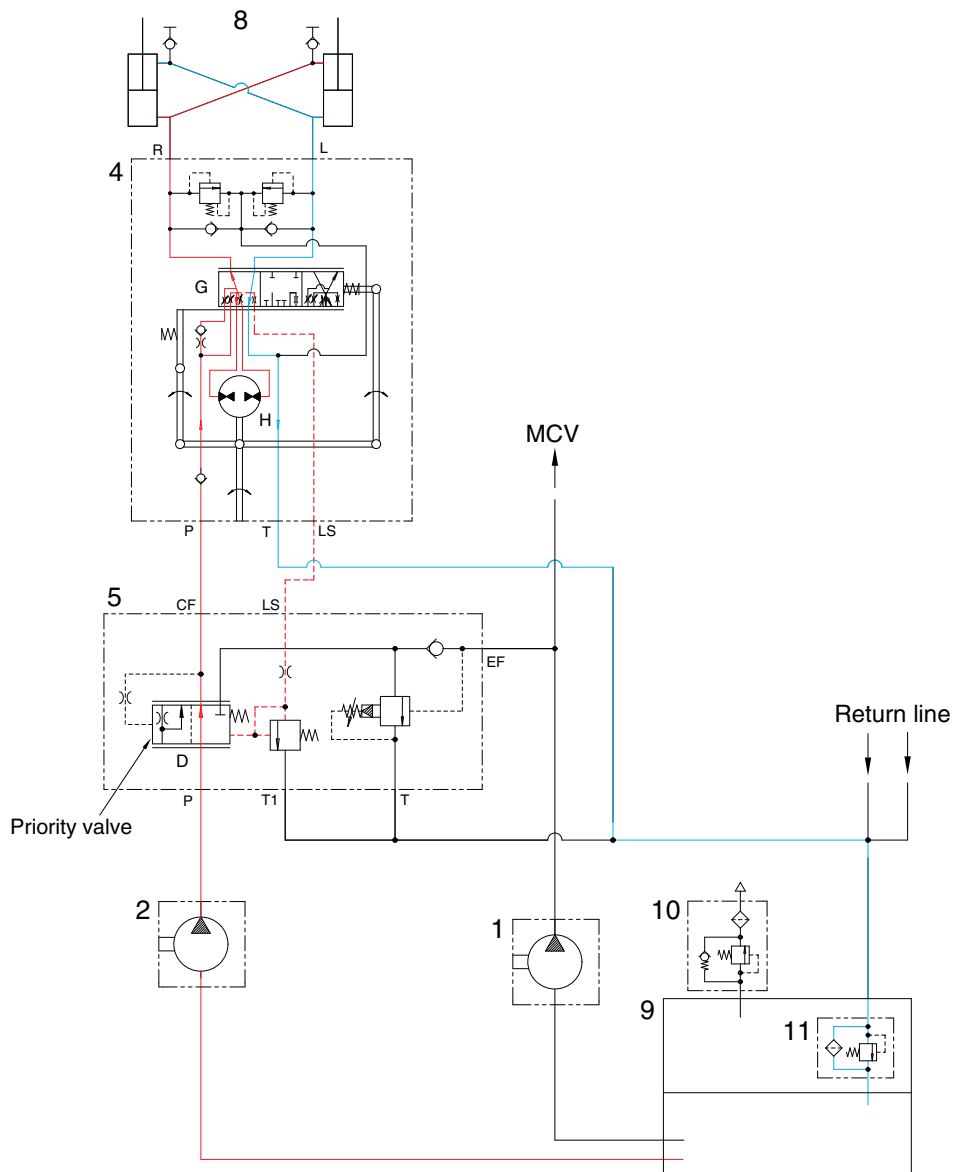
850KAX71

STRUCTURE AND MOUNTING SIZE



- | | | |
|---------|---------------------|----------------|
| 1 Bolt | 4 Equalizing spring | 7 Intake valve |
| 2 Pedal | 5 Spring | |
| 3 Rod | 6 Piston | |

4. RIGHT TURN



763S4SE04

When the steering wheel is turned to the right, the spool (G) within the steering unit (4) connected with steering column turns in right hand direction.

At this time, the oil discharged from the steering pump (2) flows into the spool (G) of the steering unit (4) through the spool (D) of priority valve in steering valve (5) and flows into the gerotor (H).

Oil flow from the gerotor flows back into the spool (G) where it is directed out the right work port (R) to the respective chamber of the steering cylinders (8).

Oil returned from left and right cylinder returns to hydraulic tank (9) through the spool (G) of the steering unit (4).

When the above operation is completed, the machine turns to the right.

5) MOUNTING AND USING

- (1) When transporting, mounting, and storing the product, be careful that the product does not receive impacts that may damage the machined surface.
- (2) Never disassemble the product in a dusty place before assembling to machine to prevent dust from entering.
- (3) Before using the product, check there is no scratch or rust on the joint surface.
- (4) Operating fluid should be clean, cleanliness meeting ISO4406 19/16 grade and up.
- (5) Allowable oil temperature range : -20 ~ 110°C.

6) TROUBLESHOOTING

Problem	Cause	Remedy
Too low steering pressure or heavy steering	<ol style="list-style-type: none"> 1. Damaged steering relief valve. 2. Dirt fluid has caused stuck spool. 	<ol style="list-style-type: none"> 1. Clean or replace with new relief valve. 2. Change fluid, and disassemble and clean the valve.
Insufficient flow in working system	<ol style="list-style-type: none"> 1. Damaged load relief valve 2. Dirt fluid has caused stuck spool. 3. Orifice a is clogged 	<ol style="list-style-type: none"> 1. Clean or replace with new relief valve. 2. Change fluid, and disassemble and clean the valve. 3. Clean the orifice.
Too high fluid temperature	<ol style="list-style-type: none"> 1. Dirt has made the priority spool stuck. 2. Damaged priority spool spring. 3. Dirt has made the load relief valve stuck. 	<ol style="list-style-type: none"> 1. Remove and clean, and then replace. 2. Replace with a good spring. 3. Remove and clean, and then replace.
Leakage	<ol style="list-style-type: none"> 1. Damaged or deteriorated O-ring. 2. Poor sealing at flange joining port. 	<ol style="list-style-type: none"> 1. Replace with good O-ring. 2. Check the sealing and make it even.

2. TEST TOOLS

1) CLAMP-ON ELECTRONIC TACHOMETER INSTALLATION

- Service equipment and tools
Tachometer

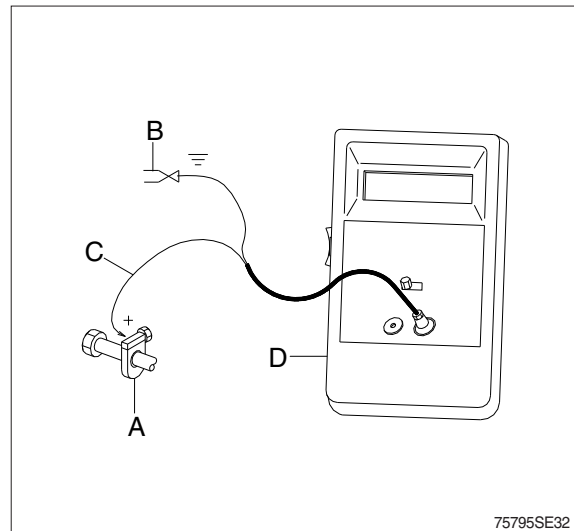
A : Clamp on tachometer.

Remove paint using emery cloth and connect to a straight section of injection line within 100 mm (4in) of pump. Finger tighten only-do not over tighten.

B : Black clip (-). Connect to main frame.

C : Red clip (+). Connect to transducer.

D : Tachometer readout. Install cable.



2) DIGITAL THERMOMETER INSTALLATION

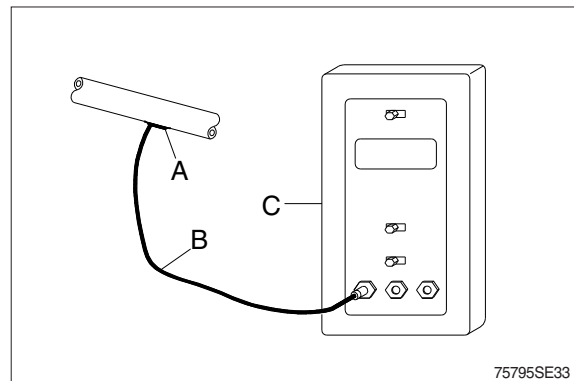
- Service equipment and tools
Digital thermometer

A : Temperature probe.

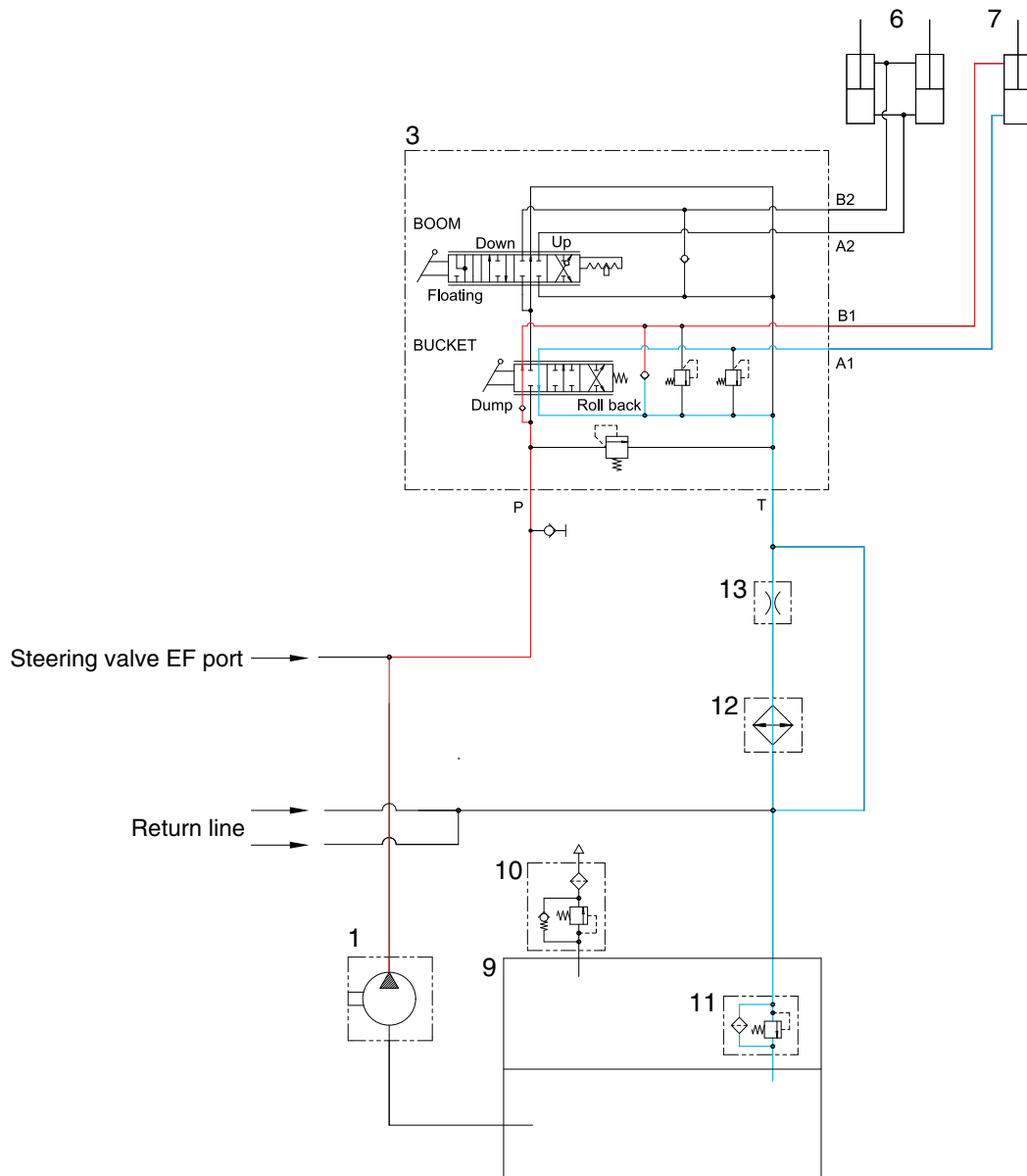
Fasten to a bare metal line using a tie band. Wrap with shop towel.

B : Cable.

C : Digital thermometer.



4) WHEN THE BUCKET CONTROL LEVER IS IN THE DUMP POSITION



763S5WE05

- If the bucket control lever is pushed forward, the bucket spool is moved to dump position.
- The oil from main pump (1) flows into main control valve (3) and then goes to the small chamber of bucket cylinder (7).
- The oil at the large chamber of bucket cylinder (7) returns to hydraulic tank (9).
- When this happens, the bucket is dumped.

7) TROUBLESHOOTING

No.	Problem	Cause	Remedy
1	Insufficient operating pressure	1. Pressure of main relief valve is on low side.	1. Regulate pressure of main relief valve.
		2. Spool of main relief valve is stuck.	2. Remove and clean, or replace valve spool.
		3. Damaged pressure regulating spring.	3. Replace with new product.
		4. Too much pressure loss in system line.	4. Replace piping, or regulate pressure of main relief valve within the allowable range of pressure.
2	Insufficient operating flow	1. Oil supply to system is insufficient.	Check oil source and repair oil pump.
		2. Too much leaks inside valve.	
		a. Too high oil temperature, low viscosity	a. Take measures to reduce oil temperature.
		b. Improper hydraulic oil.	b. Change hydraulic oil.
		c. Too much clearance between slide valve and valve body.	c. Replace slide valve to keep a reasonable clearing.
		3. Main relief valve failure.	3. Repair or replace the main relief valve.
3	Malfunction in return	1. Damaged or deformed return spring.	1. Replace with new product.
		2. Dirt between valve lever and valve body.	2. Clean part.
4	External seeps and leaks	1. Damaged seal ring.	1. Replace with new product.
		2. Loose fastening pieces.	2. Fasten related fastening piece.
		3. Too high oil temperature, low viscosity.	3. Takes measures to reduce oil temperature.
		4. Poor sealing on flange surface.	4. Check fastening and sealing of related parts.
5	Bucket dumping	1. Overload valve is stucked.	1. Clean and reassemble.
		2. Dirty fluid.	2. Change fluid.
		3. Damaged O-ring.	3. Replace O-ring.
		4. Internal leakage of cylinder.	4. Inspect cylinder.

2. TROUBLESHOOTING

※ Diagnose malfunction charts are arranged from most probable and simplest to verify, to least likely, more difficult to verify. Remember the following steps when troubleshooting a problem :

Step 1. Operational check out procedure (see section 1)

Step 2. Operational checks (see group 3)

Step 3. Troubleshooting

Step 4. Tests and adjustments (see group 4)

Problem	Cause	Remedy
Noisy hydraulic pump	<p>Low oil supply or wrong viscosity.</p> <p>Plugged or pinched suction line.</p> <p>Air in oil.</p> <p>Plugged suction strainer.</p> <p>Loose or missing hydraulic line clamps.</p> <p>Hydraulic lines in contact with frame.</p> <p>Worn or damaged pump.</p>	<p>Fill reservoir with recommended oil.</p> <p>Clean or replace line.</p> <p>Check for foamy oil.</p> <p>Tighten connections.</p> <p>Replace O-rings and or lines.</p> <p>Inspect and clean strainer in reservoir.</p> <p>Tighten or replace clamps.</p> <p>Inspect and repair.</p> <p>Do hydraulic pump performance check in group 3. Do hydraulic pump flow test in group 4.</p>
No or Slow hydraulic functions	<p>Failed or worn hydraulic pump.</p> <p>Cold oil.</p> <p>Slow engine speed.</p> <p>Suction line air leak.</p> <p>Low oil supply.</p> <p>Wrong oil viscosity.</p> <p>Oil leaking past cylinders or control valve.</p> <p>Blocked or damaged line.</p> <p>Binding loader control valve (MCV) spool.</p>	<p>Do performance check.</p> <p>Warm oil up.</p> <p>Adjust engine speed.</p> <p>Check high idle speed.</p> <p>Check for foamy oil.</p> <p>Add recommended oil.</p> <p>Use recommended oil.</p> <p>Check cylinder drift in group 3.</p> <p>Inspect lines.</p> <p>Inspect valve.</p>

7. LOADER CYLINDER DRIFT TEST

· SPECIFICATION

Oil temperature $45 \pm 5^{\circ}\text{C}$ ($113 \pm 9^{\circ}\text{F}$)

Boom horizontal

Bucket horizontal

Bucket unloaded

Item	Standard value
Retraction of boom cylinder rod	4 mm
Retraction of bucket cylinder rod	6 mm

· GAUGE AND TOOL

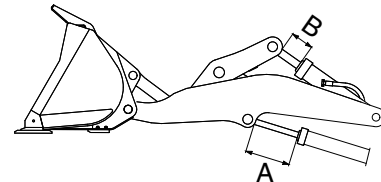
Stop watch

Temperature reader

▲ Put the safety lock lever in the lock position.

▲ Do not go under the work equipment.

- 1) Set the boom and bucket horizontal, then stop the engine.
- 2) Stop the engine, wait for 5 minutes, then start measuring.
- 3) Measure the amount the boom and bucket cylinder rods retract during 5 minutes.



A : Retraction of boom cylinder rod

B : Retraction of bucket cylinder rod

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