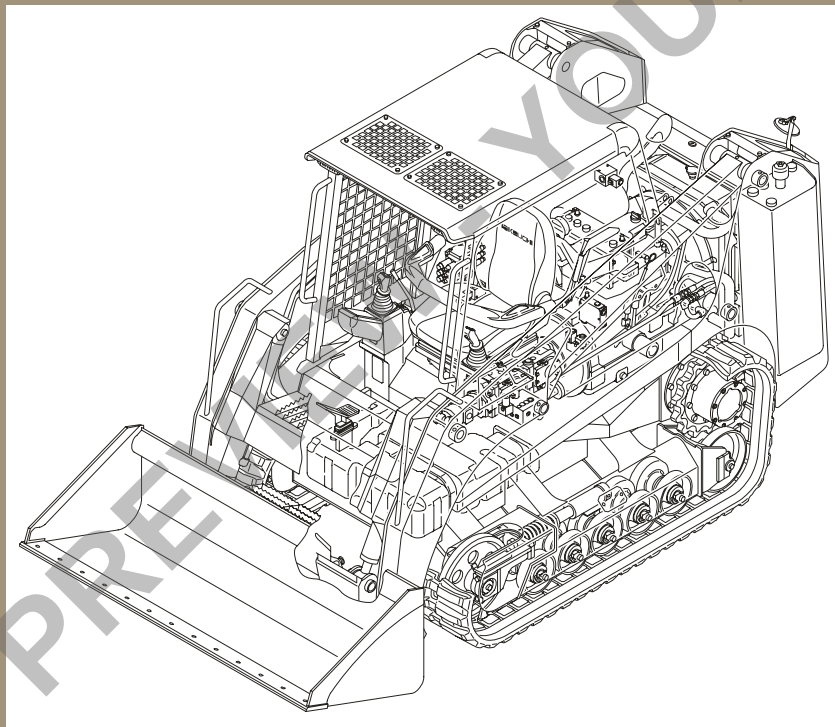
CTL75

GEHL®

Form No.
917342
Revison C
08/10

Compact Track Loader



Service Manual

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FOREWORD

This manual, which is written for engineers who service the machine, describes procedures for disassembly and assembly, inspection and maintenance, and troubleshooting, as well as maintenance reference values and an outline of the specifications. Refer to this manual during daily work to improve your services. Note that the information is subject to change without notice due to design modifications made to the machine from time to time by the manufacturer.

Directional terms: front, rear, left, right

In this manual, the “front” refers to the end of the machine where the bucket is mounted, while the “rear” refers to the other end where the travel motor is mounted. The “right” or “left” refers to the side viewed by a person sitting in the operator’s seat.

Machine serial number

The machine serial number is stamped on the identification plate. Be sure to include this number when sending a report or inquiry or when ordering parts.

Control of manual

Appoint a person in charge of keeping the manuals up to date in your company and inform us of the person’s name for our records. Any revisions or additions to this manual will be sent to the person.

Symbols used in this manual

The symbols used in this manual have the following meanings.

S/N Indicates the machine serial number.
☞ Means “Refer to the section quoted.”
kg Indicates the mass of the equipment or machine.
Means “Tighten to the torque specified here.”
Indicates the use of thread-locking compound.
Indicates the use of grease.

Manual structure

This manual consists of the following parts.

1. Safety
2. Service data
3. Function
4. Disassembly and assembly
5. Troubleshooting
6. Engine

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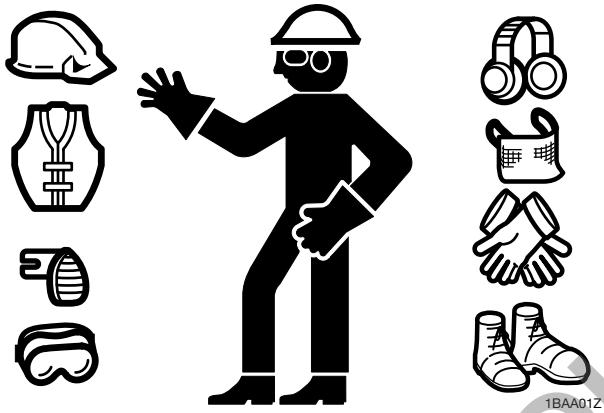
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SAFETY PRECAUTIONS

Observe all safety rules

- Operation, inspection and maintenance of this machine must be performed only by a trained and qualified person.
- All rules, regulations, precautions and safety procedures must be understood and followed when performing operation, inspection and maintenance of this machine.
- Do not perform any operation, inspection or maintenance of this machine when under the influence of alcohol, drugs, medication, fatigue or insufficient sleep.

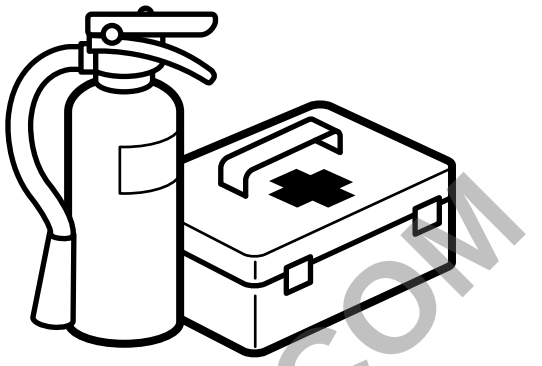
Wear safe clothing and protective gear



1BAA01Z

- Do not wear loose clothing or any accessory that can catch on the controls or the moving parts of the machine.
- Do not wear clothing stained with oil or grease that can easily catch fire.
- Wear protective gear such as helmet, safety shoes, protective goggles, respirator, gloves and earmuffs, as appropriate, depending on the work involved. Especially make sure to wear protective eye-wear and mask when working with a grinding/polishing/sanding machine, hammer or compressed air, as metal fragments or other objects could scatter in such an environment.
- Wear hearing protectors when operating the machine. Loud and prolonged noise can damage or destroy your hearing.

Install an extinguisher and a first aid kit



1BAA02Z

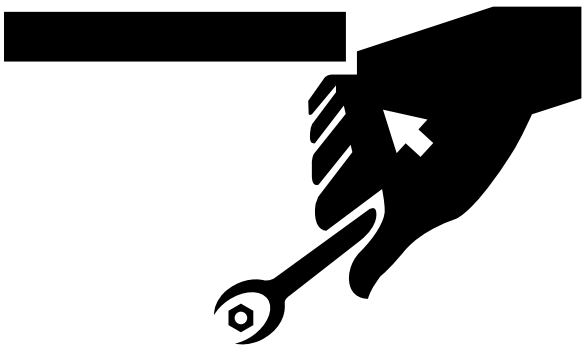
- Install an extinguisher to fight a fire, and learn how to use it.
- Prepare a first aid kit and keep it at a designated place.
- Decide on the procedures to be used in case of fire or other hazards.
- Decide on and take note of the contact(s) in case of emergency.

Place a “Do not operate” alert sign

Serious injury or death may result if an unauthorized person starts the engine or touches the controls during inspection or maintenance.

- Before performing maintenance, stop the engine, remove the key and store it in a safe place.
- Prominently display a “Do not operate” alert sign on places such as the starter switch and the control lever. Place another sign outside of the machine as necessary.

Use the correct tools



1BAA03Z

Do not use damaged or weakened tools or tools designed for other purposes. Use only the correct tools for the work involved.

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SPECIFICATIONS TABLES

Performance

Bucket type			Standard bucket
Bucket capacity		m^3	0.458
Tipping load		kg	2700
Rated loading mass		kg	945
Breakout force		kN	32.9
Raising time (load)		s	4.4
Lowering time		s	2.9
Bucket forward tilting time		s	3.1
Travel speed	Forward 1st	km/h	7.6
	Forward 2nd	km/h	11.6
	Reverse 1st	km/h	7.6
	Reverse 2nd	km/h	11.6
Maximum tractive force		kN	49.2
Gradeability		degree (°)	30
Minimum turning radius	Bucket outside	m	2.295

Dimensions

Overall length in transport condition	Without teeth		mm	3740
	With teeth		mm	–
Overall width (body)			mm	1770
Bucket width			mm	1880
Overall height	Bucket on ground	Canopy	mm	2270
		Cab	mm	2270
	Max. raised height of bucket		mm	4080
Crawler bearing length			mm	1495
Track gauge			mm	1320
Shoe width			mm	450
Crawler bearing area			m^2	1.345
Ground clearance of undercarriage			mm	325
Bucket hinge pin height			mm	3120
Dumping clearance (at 45-degree forward tipping)	Without teeth		mm	2405
	With teeth		mm	–
Dumping reach (at 45-degree forward tipping)	Without teeth		mm	875
	With teeth		mm	–
Bucket roll back angle	On ground		degree (°)	30.7
Bucket dumping angle	Maximum height position		degree (°)	38.5
Maximum digging depth			mm	0

Mass

Gross machine mass	Canopy	kg	5240
	Cab	kg	5330
Operating mass	Canopy	kg	4505
	Cab	kg	4595
Machine mass	Canopy	kg	4430
	Cab	kg	4520
Shipping mass	Canopy	kg	4455
	Cab	kg	4545

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LUBRICANT AND FUEL CHART

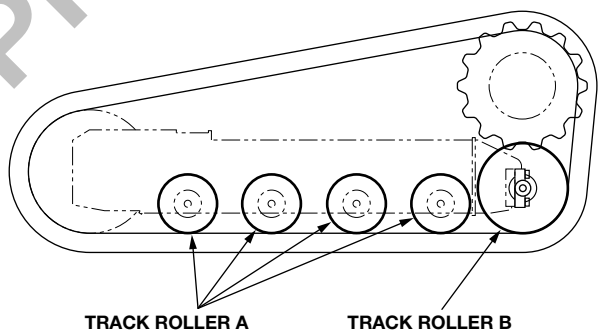
Select the appropriate fuel, lubricant and grease according to the temperature by referring to the table below.

- Regardless of the specified time, change the oil if it becomes too dirty or degraded.
- When refilling, never mix oils of different brands. If a brand is to be changed, replace the whole fuel/oil.

Part	Type	Type by air temperature -30 -20 -10 0 10 20 30 40°C	When to change/ replenish	Capacity
Engine oil pan	Diesel engine oil API: CF class	SAE 10W-30 SAE 15W-40	Every 250 hrs after the first 50 hrs	Upper limit 10.2 L
Hydraulic oil tank	Diesel engine oil API: CD class	SAE 10W-30 SAE 10W-40	Every 1000 hrs	Total amount of oil: 75 L Tank capacity: 49 L
Engine cooling system	Cooling water (water + coolant**)	Mixture of 50% coolant Mixture of 30% coolant	Every 1000 hrs	16.5 L
Travel reduction gear	Gear oil API: GL-4	SAE 90	Every 500 hrs after the first 250* hrs	1.6 L
Track roller A	Diesel engine oil API: CD class	SAE 30	—	0.18 L
Track roller B	Diesel engine oil API: CD class	SAE 30	—	0.17 L
Idler	Diesel engine oil API: CD class	SAE 30	—	0.17 L
Working equipment	Lithium grease EP-2 NLGI No.2	—	Daily or every 10 hrs	As required
Lever/pedal			When required	

* If the ratio of traveling time to total operating time is high, replace the gear oil earlier than the specified time.

** For water, use tap water (soft). Do not use well or river water.
When the ambient temperature drops below 0°C, add coolant (antifreeze). Follow the coolant manufacturer's instructions to determine the mixture ratio.



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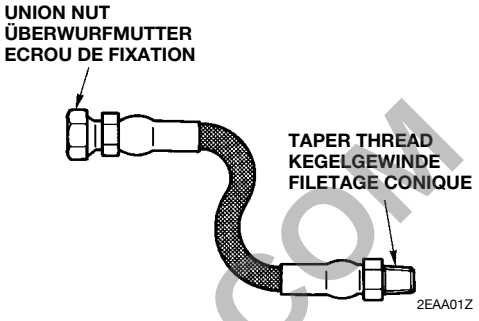
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TIGHTENING TORQUE

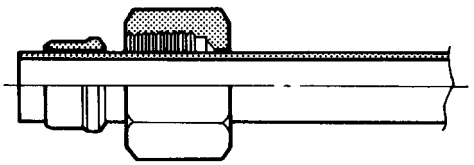
Hydraulic hose

Hose fitting size	Tightening torque	
	Union nut (G)	Taper thread (R)
	N·m	N·m
1/8	$9.8^{+4.9}_{0}$	11.8 ±1.2
1/4	$24.5^{+4.9}_{0}$	29.4 ±2.9
3/8	$49.0^{+4.9}_{0}$	53.9 ±5.4
1/2	$58.8^{+4.9}_{0}$	88.3 ±8.8
3/4	$117.7^{+4.9}_{0}$	147.1 ±14.7
1	$137.3^{+4.9}_{0}$	196.1 ±19.6



Bite-type pipe fitting for steel pipe

Pipe outer diameter (mm)	Tightening torque
	N·m
8	34.3 ±4.9
10	41.7 ±2.5
12	58.8 ±4.9
15	88.3 ±4.9
16	93.2 ±4.9
18	132.4 ±4.9
22	205.9 ±9.8
27.2	245.2 ±9.8
28	313.8 ±19.6
32	313.8 ±19.6
35	411.9 ±19.6

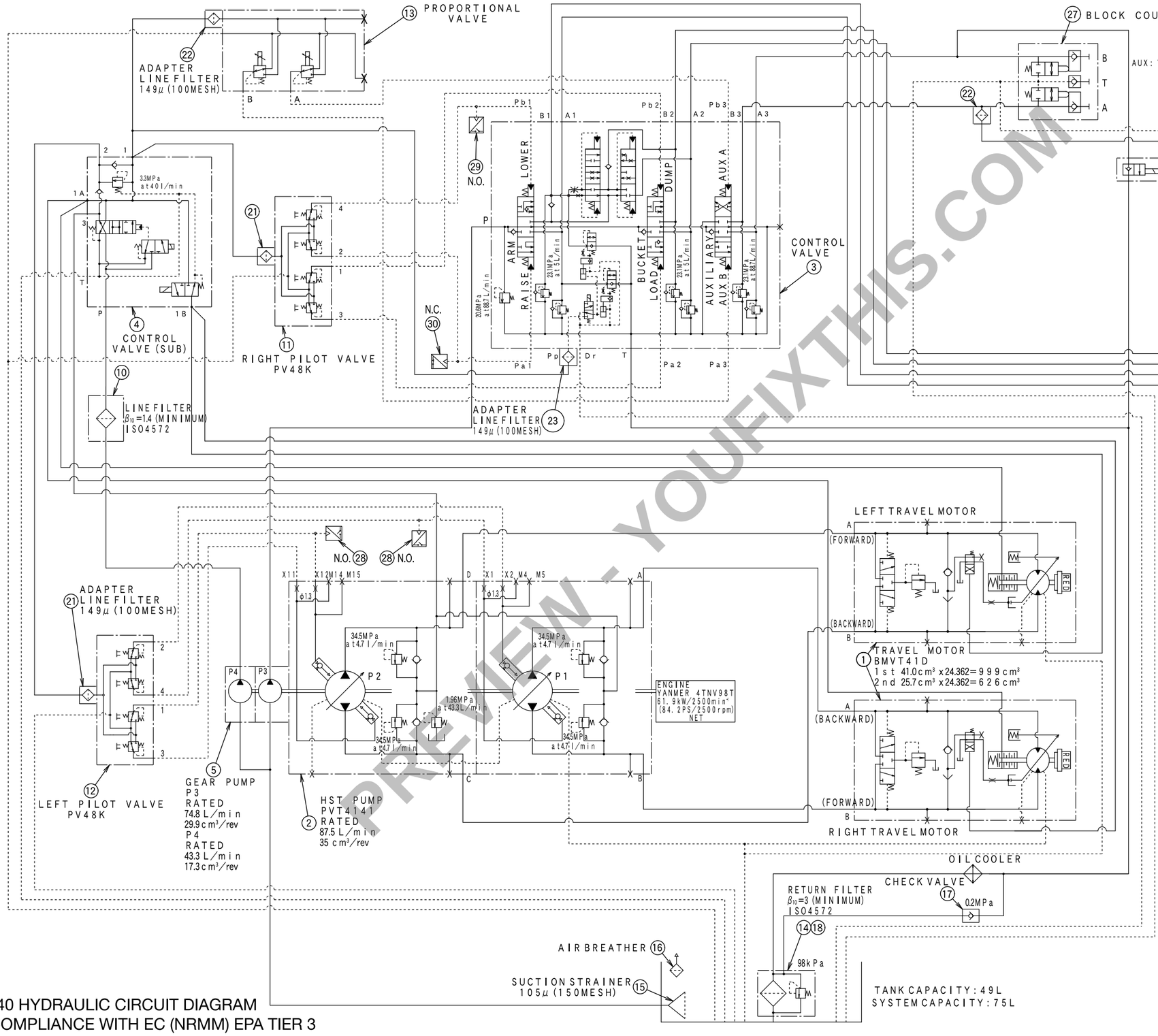


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HYDRAULIC CIRCUIT DIAGRAM

Standard



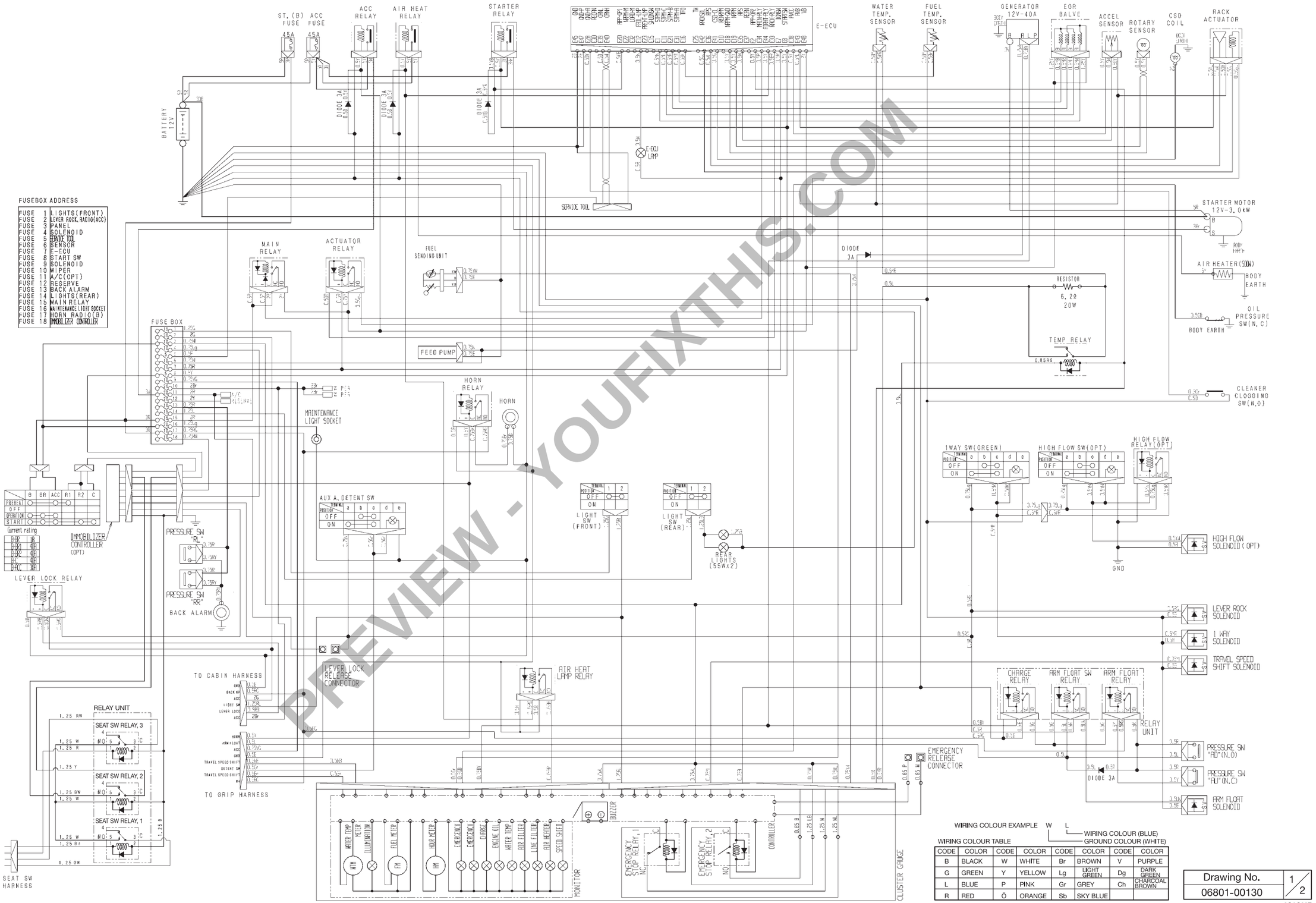
ITEM	PART No.	NAME OF PART
30	17001-00041	PRESSURE SWITCH
29	17001-00060	PRESSURE SWITCH
28	17001-00015	PRESSURE SWITCH
27	19017-47000	BLOCK COUPLER
26		
25		
24		
23	15123-70002	ADAPTOR LINE FILTER
22	15123-75004	ADAPTOR LINE FILTER
21	15123-70008	ADAPTOR LINE FILTER
20	19017-53600	SOLENOID VALVE
19	19017-52000	SOLENOID VALVE
18	15511-00300	RELIEF VALVE
17	15401-40820	CHECK VALVE
16	15520-00800	AIR BREATHER
15	15500-20150	SUCTION FILTER
14	15511-02600	RETURN FILTER
13	19017-52100	PROPORTIONAL VALVE
12	19017-49700	REMOTE C. V (L)
11	19017-49800	REMOTE C. V (R)
10	15511-02500	LINE FILTER
9	19000-85800	BUCKET CYLINDER (L)
8	19000-85700	BUCKET CYLINDER (R)
7	19000-85600	ARM CYLINDER
6	19001-00700	QUICK HITCH CYLINDER
5	19020-23400	GEAR PUMP
4	19017-48100	SUB VALVE
3	19010-47000	CONTROL VALVE
2	19020-23200	HST PUMP
1	19031-26500	TRAVEL MOTOR

TL240 HYDRAULIC CIRCUIT DIAGRAM
IN COMPLIANCE WITH EC (NRMM) EPA TIER 3

2FAC01Z

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ELECTRICAL WIRING DIAGRAM



FUSEBOX ADDRESS

FUSE	1	LIGHTS(FRONT)
FUSE	2	LEVER ROCK, RADIO(ACC)
FUSE	3	PANEL
FUSE	4	SOLENOID
FUSE	5	SERVICE TOOL
FUSE	6	SENSOR
FUSE	7	E-ECU
FUSE	8	START SW
FUSE	9	SOLENOID
FUSE	10	WIPER
FUSE	11	A/C(OPT)
FUSE	12	RESERVE
FUSE	13	BACK ALARM
FUSE	14	LIGHTS(REAR)
FUSE	15	MAIN RELAY
FUSE	16	MAINTENANCE LIGHT SOCKET
FUSE	17	HORN RADIO(B)
FUSE	18	IMMOBILIZER CONTROLLER

WIRING COLOUR EXAMPLE W L
WIRING COLOUR (BLUE)
WIRING COLOUR (WHITE)

WIRING COLOUR TABLE

CODE	COLOR	CODE	COLOR	CODE	COLOR	CODE	COLOR
B	BLACK	W	WHITE	Br	BROWN	V	PURPLE
G	GREEN	Y	YELLOW	Lg	LIGHT GREEN	Dg	DARK GREEN
L	BLUE	P	PINK	Gr	GREY	Ch	CHARCOAL BROWN
R	RED	O	ORANGE	Sb	SKY BLUE		

Drawing No. 06801-00130 1/2

2GAC03Z

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SAUER DANFOSS

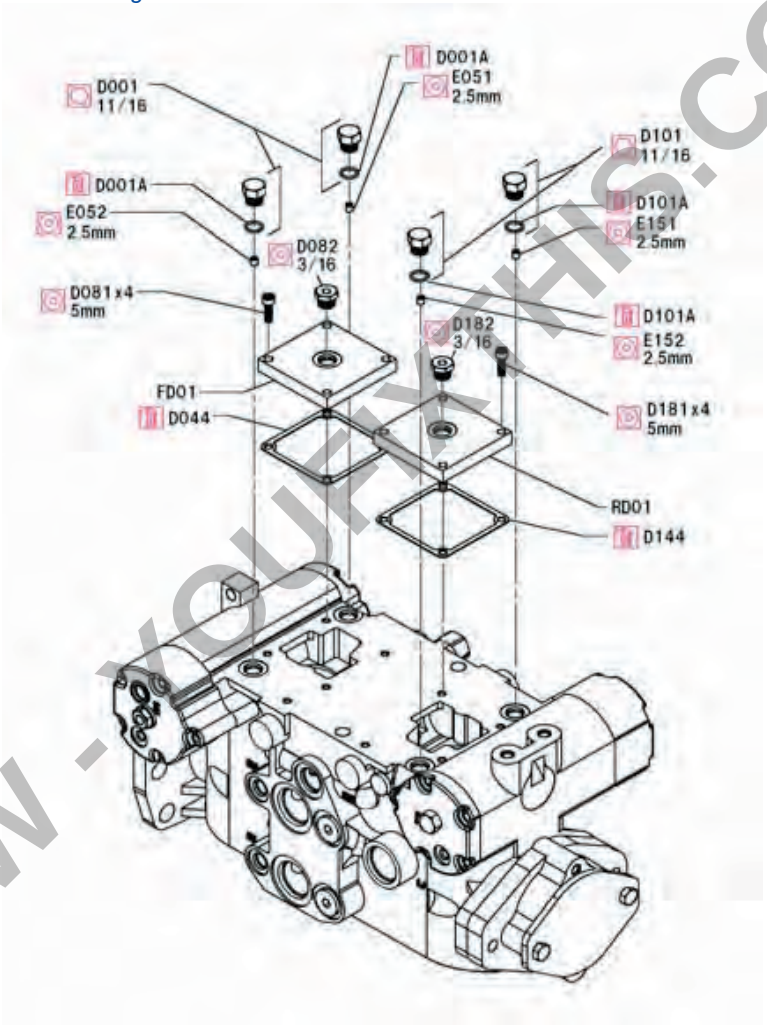
4T Tandem Piston Pump
Repair Instructions
Disassembly

Genuine Parts

REMOVE ORIFICE AND CONTROL COVER

If necessary, remove orifices and control covers.

Removing orifices and control covers



1. Using a 3/16 in. internal HEX wrench, remove plug sockets (D082 and D182). (If necessary, usually not)



2. Using a 5mm internal HEX wrench, remove four screws for each control cover. (D081 and D181).

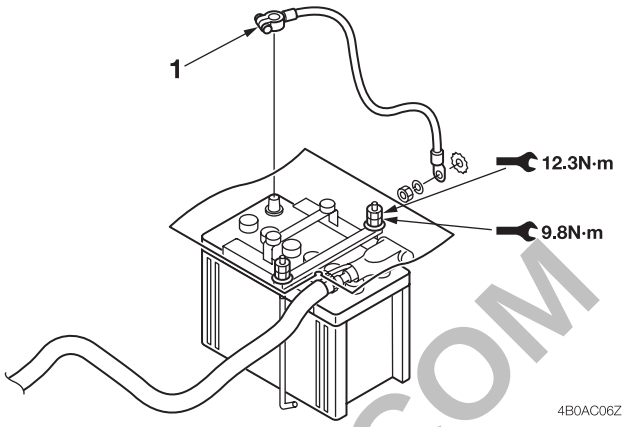


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DRIVE SYSTEM

Removing the engine

1. Disconnect the battery ground cable (1) from the battery terminal.



2. Remove the canopy.
   ☞ "Removing the canopy"

3. Remove the floor frame.
   ☞ "Removing the floor frame"

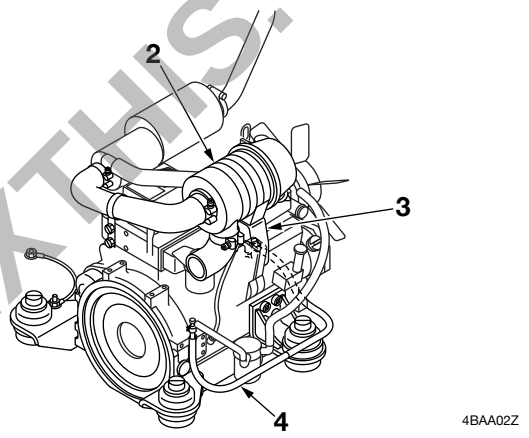
4. Disconnect the electrical wiring to the air cleaner (2).

5. Remove the bracket (3) together with the air cleaner (2).

6. Remove the radiator.
   ☞ "Removing the radiator"

7. Remove the drain hose (4).

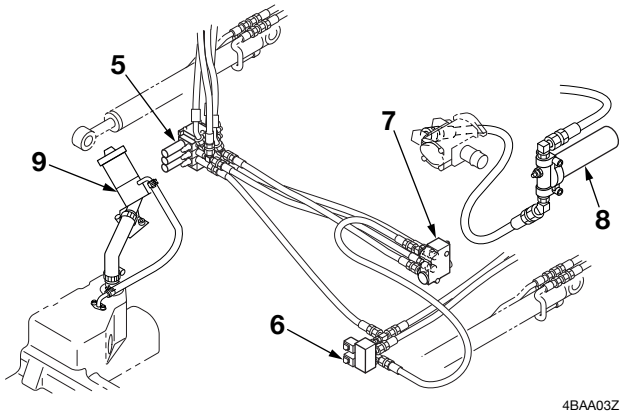
8. Remove the hydraulic pump.
   ☞ "Removing the hydraulic pump"



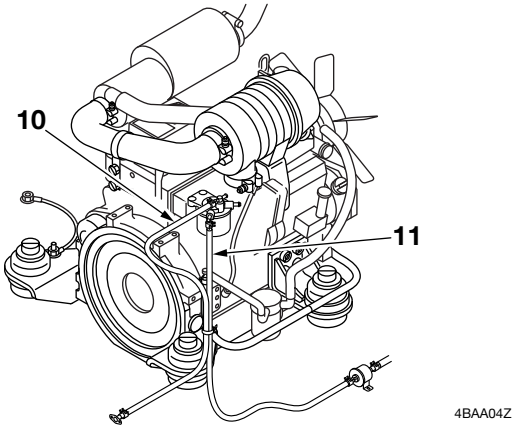
9. Remove the control valve (5), the solenoid valve (6) and the sub valve (7).

10. Remove the line filter (8).

11. Remove the filler opening (9).



12. Disconnect the fuel hoses (10) and (11).



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Figure 7-9 Preventive Maintenance Schedule.

PREVENTIVE MAINTENANCE SCHEDULE FOR AIR CONDITIONING SYSTEMS

NOTE: Typical Maintenance Schedule: 3 months or 15,000 miles, 6 Months or 30,000 miles, 12 Months or 60,000 miles

Installation Date: _____ Mileage: _____

Last Maintenance Check: _____ Mileage: _____

Checked by _____ Mileage: _____

COMPONENT	MAINTENANCE INTERVAL (months) 3*	6*	12*	DONE
1. COMPRESSOR				
Check noise level	•			❑
Check clutch pulley	•			❑
Check oil level	•			❑
Run system 5 minutes	•			❑
Check belts for tension (120 lb max.)	•			❑
Inspect shaft seal (leakage)		•		❑
Check mounting bracket (tighten bolts)		•		❑
Check alignment to clutch w/crankshaft drive pulley		•		❑
Perform manifold gauge check			•	❑
Verify clutch is engaging			•	❑
CONDENSER				
2. Clean dirt/bugs/leaves from coils (w/compressed air)	•			❑
Check inlet/outlet for obstructions/damage	•			❑
RECEIVER-DRIER				
3. Check inlet line from condenser (hot to touch)	•			❑
Check sight glass (streaks or cloudiness)	•			❑
Replace if system is opened			•	❑

COMPONENT	MAINTENANCE INTERVAL (months) 3*	6*	12*	DONE
4. EXPANSION VALVE				
Inspect capillary tube (leakage/damage/looseness)			•	❑
5. EVAPORATOR				
Clean dirt/bugs/leaves form fins/tubes (w/compressed air)			•	❑
Check solder joints on inlet/outlet tubes (leakage)			•	❑
Inspect condensate drain (R-12 or oil leak)			•	❑
6. OTHER COMPONENTS				
Check discharge lines (hot to touch)	•			❑
Check suction lines (cold to touch)	•			❑
Inspect fittings/clamps/hoses		•		❑
Check thermostatic switch (proper operation)			•	❑
Outlets in cab (temperature check; 40 to 50°F)		•		❑
Check fan clutch (proper operation)		•		❑
Inspect all wiring connections		•		❑
Operate manual controls through full functions	•			❑

The following require monthly maintenance:

*Compressor – run system at least 5 minutes (40 degrees Fahrenheit minimum outside temp.) in order to circulate oil and lubricate components.

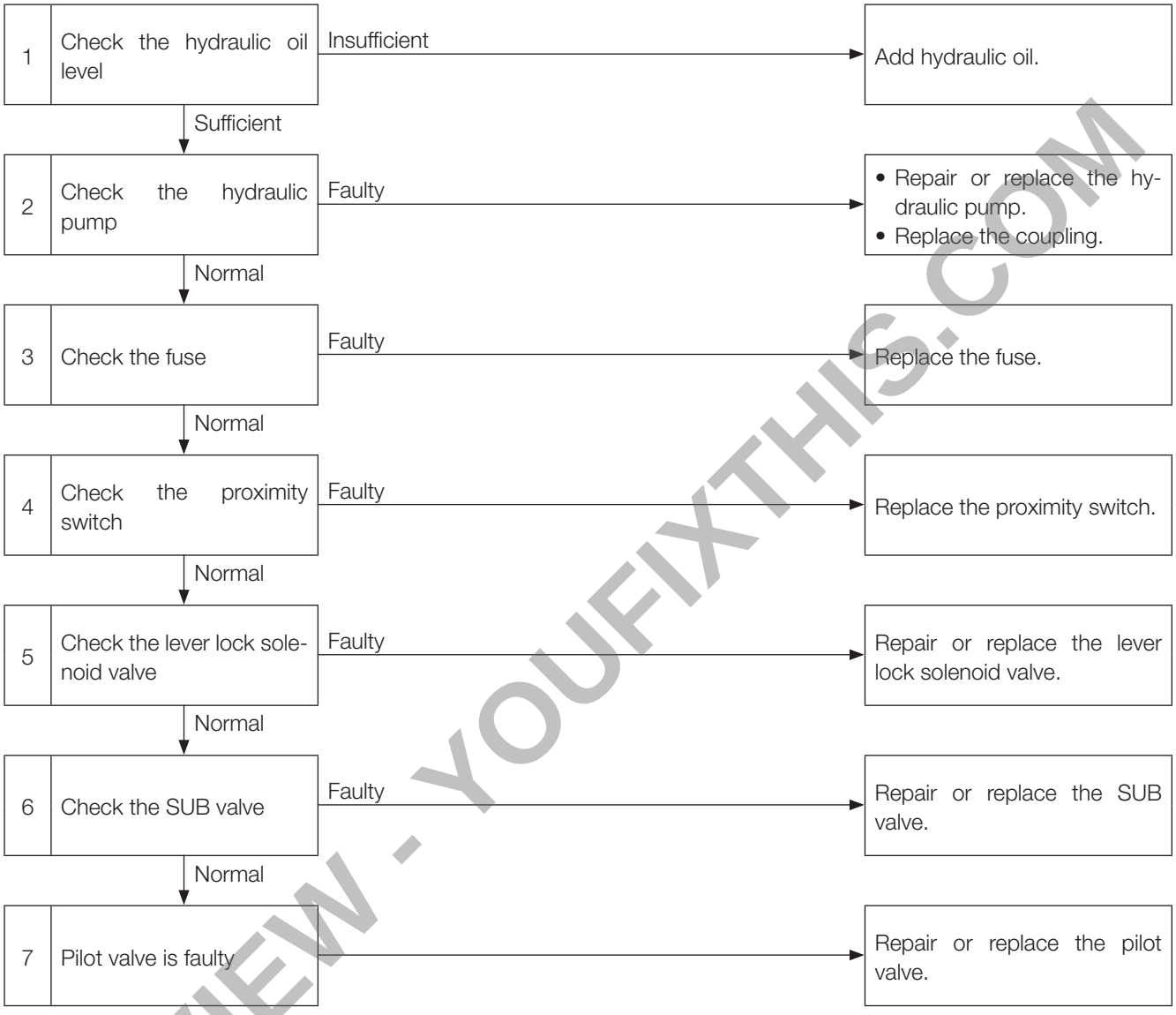
Maintenance notes: _____

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OVERALL MACHINE

No operation is possible.



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Experienced troubleshooters talk to the operator if they can, then personally verify the symptoms of the problem whenever possible. They attempt quick fixes on the basis of their knowledge of common system problems and causes when appropriate. They know where components are located, and make repairs when they have a good idea of what the problem is. They fix the cause or causes as well as the problem. They are confident of their knowledge and ability.

Note: **The best troubleshooters all know who to call when they get stuck.** They know someone who knows more than they do and are not too proud to ask for help or suggestions when needed. The key—understanding system function

The Key–Understanding System Function

Your complete understanding of AC and heater systems and how they work, plus what can go wrong, is the key to troubleshooting and repair. We have talked about components and system function before. Now let's take a little different approach in describing what happens when the air conditioner is turned on. In Figure 8-1 we have used numbers on the illustration to track normal air conditioner function.

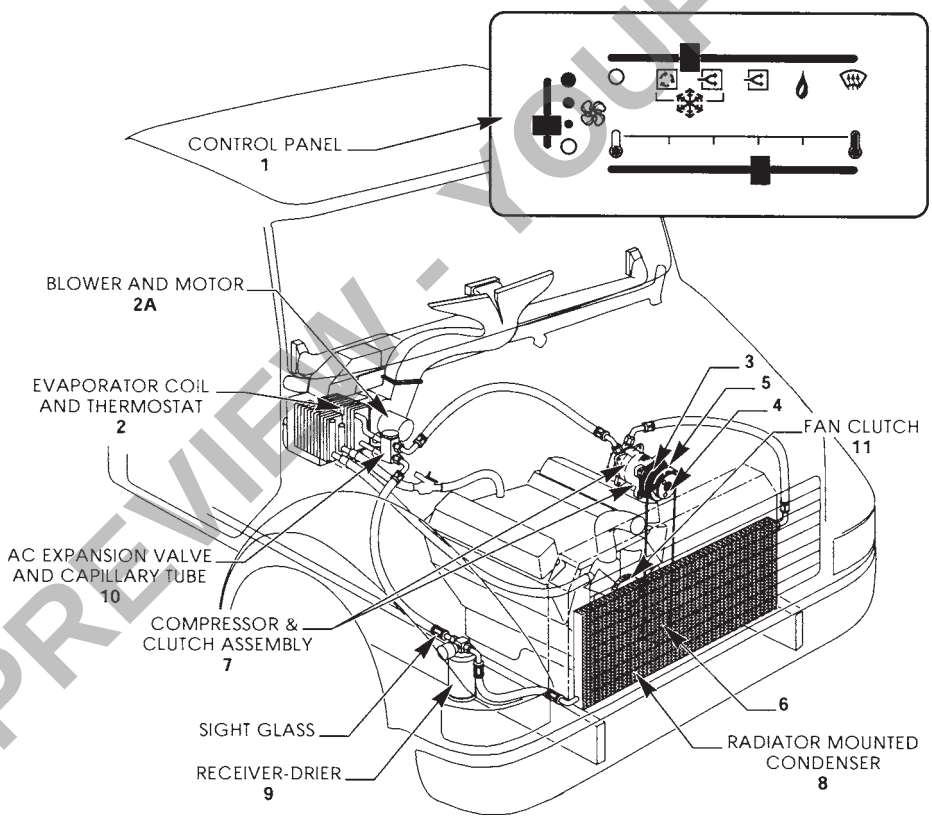


Figure 8-1
An illustration of the typical HVAC system. The numbers follow the action when the AC part of the system is working properly (moving heat out of the cab and into the outside air).

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SAFETY ALERT SYMBOL



This symbol represents the safety alert. The message that follows the symbol contains important information regarding human safety.
Read and understand the message to avoid personal injury or death.

Safety label

Safety labels are used to alert operators or other people exposed to the risks of injury or damage. There are the following three types of labels.
Read the labels carefully as they are important for your safety.

⚠ DANGER

The word "DANGER" indicates an imminently hazardous situation which, if not avoided, is likely to result in serious injury or death.

⚠ WARNING

The word "WARNING" indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death.

⚠ CAUTION

The word "CAUTION" indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

IMPORTANT: The word "IMPORTANT" is used to alert operators and maintenance personnel about situations which could result in damage to the machine and its components.

This manual is intended for trained and qualified personnel only. Warnings or cautions described in this manual do not necessarily cover all safety measures. It is also impossible to cover all hazards and risks which may be associated with the maintenance of the machine in every environment. For maintenance work, each person must take adequate safety precautions against possible hazards in the respective working environment.

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FUNCTION 3

HST pump 3-2
Gear pump 3-5
Control valve 3-6
Sub valve 3-17
Pilot valve 3-19
Proportional control solenoid valve 3-20
Cylinders 3-21
Travel motor 3-22
Proportional control equipment 3-25
Air conditioner system 3-29

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Removing the canopy/cab

1. Remove the battery ground cable from the battery terminal.

2. Raise the lift arm.
   ☞ "Lift arm stopper"

3. Remove the two fixing bolts (A) at the front.

4. Suspend the canopy (20).
   • Hang the hoisting cable on the hook and suspend the canopy.

5. Disconnect the electrical wiring (1) from the canopy.

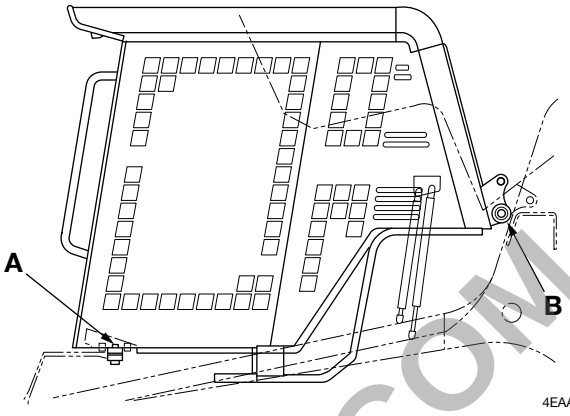
6. Remove the gas springs (2) and the fixing pin.

7. Lower the canopy and lower the lift arm to the ground.

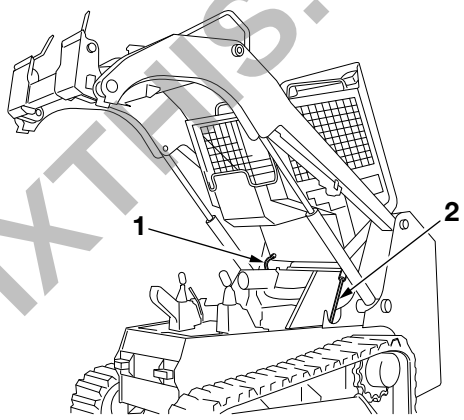
8. Remove the two fixing bolts (A) at the rear.

9. Suspend the canopy and remove it.
   • Connect the hoisting cable to the center of the canopy to keep it horizontal.
   kg Canopy: Approx. 198 kg
   kg Cab: Approx. 241 kg

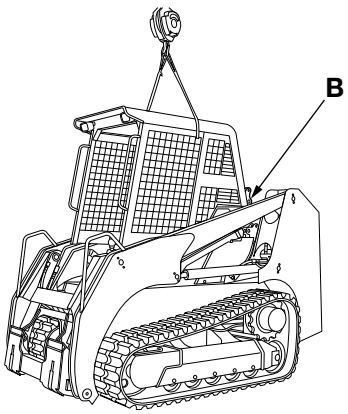
10. Remove the cushion rubber between the canopy and the frame.



4EAA10Z



4EAA11Z



4EAA12Z

Installing the canopy/cab

For installation, follow the same procedure as for removal in the reverse order.

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Gear

Replace a gear if it is in the following condition.

1. The shaft or the gear side surfaces is rough with scratches that easily catch a fingernail.
2. There are cracks in the tooth roots and there is extreme abnormal wear in the tooth surfaces.

The shaft size for the gear use limit is shown in the figure above.

Seals

- Check oil seals for scratches in the seal surface, wear, deformation or deterioration of the rubber's elasticity. If a seal is abnormal, replace it.
- Replace seals each time the hydraulic pump is disassembled.
- Check the backup ring for scaling and cutting. If it is abnormal, replace it.

Test operation

The best method for testing the pump's operation is to mount it in a test stand. However, if this is not possible, use an actual machine on which the pump to be tested is mounted.

If any abnormal wear is discovered during disassembly, be sure to replace the hydraulic oil and return filter.

1. Install a pressure gauge in the high-pressure piping near the pump.
2. Run the engine at 500 to 1,000 min^{-1} and set the control valve in the neutral position.
3. Run the pump for 10 minutes under the conditions in 2 above, then increase the engine's speed to 1,500 to 2,000 min-1 and then run it for another 10 minutes.
4. Next, run the pump so that it reaches the rated pressure for 5 minutes at a time for each additional 1.96 to 2.94 MPa of pressure.

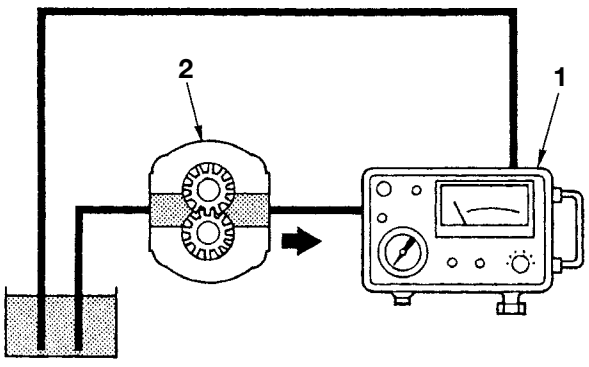
After operating each circuit for about 5 minutes, replace the return filter or clean it.

During the process of raising the pressure, pay careful attention to the oil temperature, the pump's surface temperature and the operating noise. If the oil temperature or the pump's surface temperature becomes abnormally high, eliminate the load from the pump and let the temperature drop before resuming the test.

Measuring the discharge volume

After completing the test operation, measure the discharge volume.

1. Connect a tester (1) to the discharge side of the pump (2).
   - Be sure to connect to the right side.
2. Open the tester's loading valve and start the engine.
3. Run the engine at the rated speed.
4. Gradually close the loading valve and apply the rated pressure to the pump (2).
5. Measure the discharge volume and the pump's rpm (engine speed).



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This “Troubleshooting” section describes the fault diagnosis and corrective actions mainly for hydraulic systems. The cause of the problem can be investigated by following the arrows in the chart shown at the beginning of each item.

Notes on troubleshooting and servicing

1. Do not disassemble the faulty part without first investigating the following.
   a. Ask the user the following questions.
      - The situation when the fault occurred.
      - Any abnormalities or changes before the fault occurred.
      - Any faulty parts other than the part in question.
      - Any identical failure in the past
   b. Drive the machine yourself and confirm the faulty condition.
      - Determine if it is really faulty by referring to the performance criteria. Note that such determination may differ depending on the person.

Important: By operating the user’s machine, you could make a bad situation worse. Therefore, before driving the machine, always ask the user’s permission to do so.

   c. Determine the cause of trouble based on the information obtained from the user and by driving the machine yourself. Also remember that once the machine has been disassembled, it is almost impossible to reproduce the conditions of the trouble, and so there will be no second chance to find out the true cause. Therefore be sure to find the true cause of the trouble before attempting disassembly.

2. When multiple causes are suspected, start with the simplest one.

3. Think why the trouble occurred and try to correct the root cause of the problem.

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