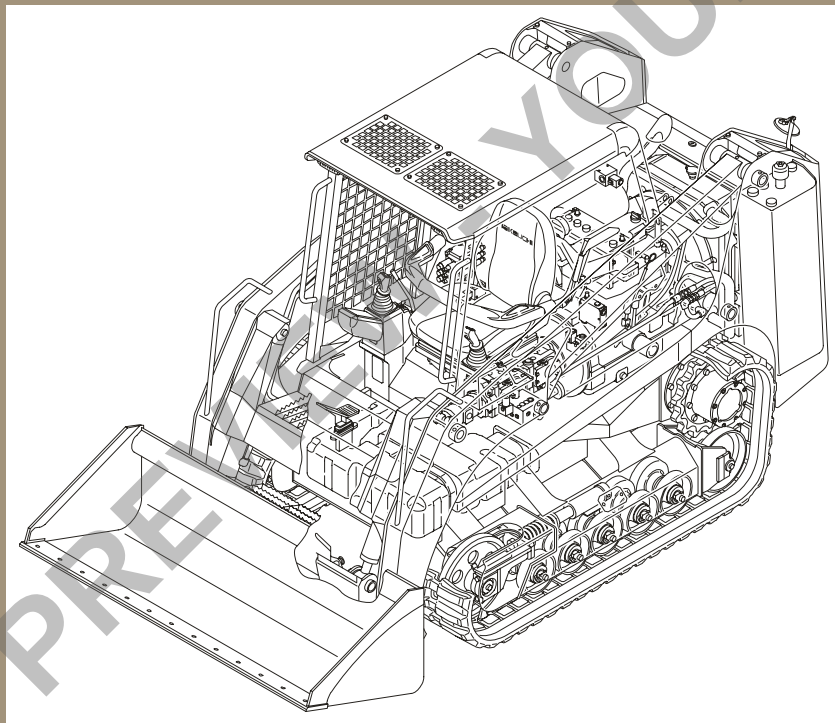
CTL85

GEHL®

Form No.
917338
Revison C
08/10

Compact Track Loader



Service Manual

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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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SPECIFICATIONS TABLES

Performance

Bucket type			Standard bucket
Bucket capacity		m^3	0.579
Tipping load		kg	3400
Rated loading mass		kg	1190
Breakout force		kN	38.5
Raising time (load)		s	4.6
Lowering time		s	2.8
Bucket forward tilting time		s	3.1
Travel speed	Forward 1st	km/h	7.8
	Forward 2nd	km/h	12.0
	Reverse 1st	km/h	7.8
	Reverse 2nd	km/h	12.0
Maximum tractive force		kN	61.2
Gradeability		degree (°)	30
Minimum turning radius	Bucket outside	m	2.435

Dimensions

Overall length in transport condition	Without teeth		mm	3985
	With teeth		mm	—
Overall width (body)			mm	1860
Bucket width			mm	1960
Overall height	Bucket on ground	Canopy	mm	2320
		Cab	mm	2215
	Max. raised height of bucket		mm	4245
Crawler bearing length			mm	1595
Track gauge			mm	1410
Shoe width			mm	450
Crawler bearing area			m^2	1.269
Ground clearance of undercarriage			mm	345
Bucket hinge pin height			mm	3205
Dumping clearance (at 45-degree forward tipping)	Without teeth		mm	2430
	With teeth		mm	—
Dumping reach (at 45-degree forward tipping)	Without teeth		mm	985
	With teeth		mm	—
Bucket roll back angle	On ground		degree (°)	31.4
Bucket dumping angle	Maximum height position		degree (°)	38.7
Maximum digging depth			mm	0

Mass

Gross machine mass	Canopy	kg	6120
	Cab	kg	6230
Operating mass	Canopy	kg	5200
	Cab	kg	5300
Machine mass	Canopy	kg	5120
	Cab	kg	5230
Shipping mass	Canopy	kg	5040
	Cab	kg	5150

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LUBRICANT AND FUEL CHART

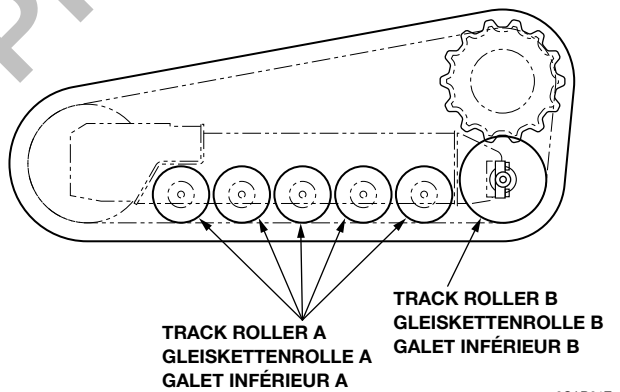
Select the appropriate fuel, lubricant and grease according to the temperature by referring to the table below.

- 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 or more	SAE 10W-30 SAE 15W-40	Every 250 hrs after the first 50 hrs	Upper limit 13.2 L
Hydraulic oil tank	Diesel engine oil API: CD class	SAE 10W-30 SAE 10W-40	Every 1000 hrs	Total amount of oil: 95 L Tank capacity: 60 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	Mobilgear SHC680	—	—	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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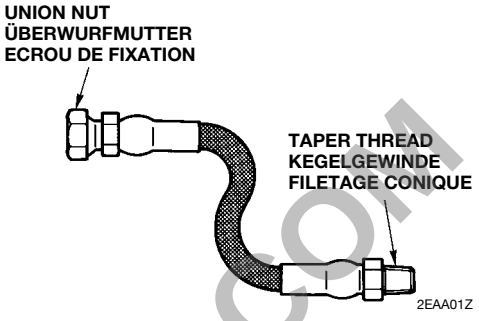
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TIGHTENING TORQUE

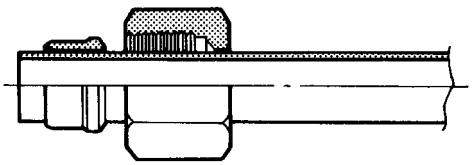
Hydraulic hose

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

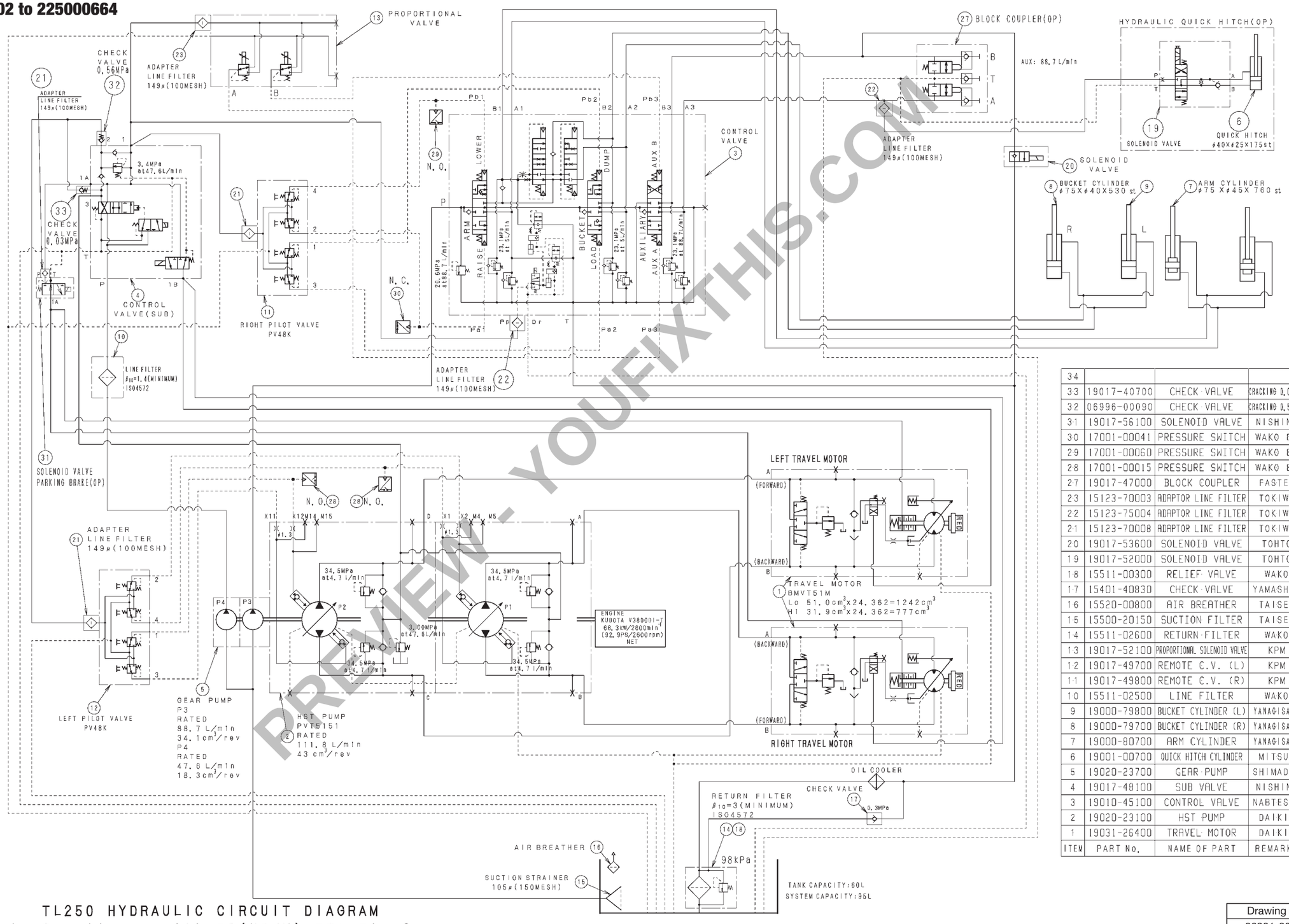


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HYDRAULIC CIRCUIT DIAGRAM

Standard
Serial No. 225000002 to 225000664



ITEM	PART No.	NAME OF PART	REMARKS
34			
33	19017-40700	CHECK VALVE	CRACKING 0.03MPa
32	06996-00090	CHECK VALVE	CRACKING 0.56MPa
31	19017-56100	SOLENOID VALVE	NISHINA
30	17001-00041	PRESSURE SWITCH	WAKO E.
29	17001-00060	PRESSURE SWITCH	WAKO E.
28	17001-00015	PRESSURE SWITCH	WAKO E.
27	19017-47000	BLOCK COUPLER	FASTER
23	15123-70003	ADAPTOR LINE FILTER	TOKIWA
22	15123-75004	ADAPTOR LINE FILTER	TOKIWA
21	15123-70008	ADAPTOR LINE FILTER	TOKIWA
20	19017-53600	SOLENOID VALVE	TOHTO
19	19017-52000	SOLENOID VALVE	TOHTO
18	15511-00300	RELIEF VALVE	WAKO
17	15401-40830	CHECK VALVE	YAMASHIN
16	15520-00800	AIR BREATHER	TAISEI
15	15500-20150	SUCTION FILTER	TAISEI
14	15511-02600	RETURN FILTER	WAKO
13	19017-52100	PROPORTIONAL SOLENOID VALVE	KPM
12	19017-49700	REMOTE C.V. (L)	KPM
11	19017-49800	REMOTE C.V. (R)	KPM
10	15511-02500	LINE FILTER	WAKO
9	19000-79800	BUCKET CYLINDER (L)	YANAGISAWA
8	19000-79700	BUCKET CYLINDER (R)	YANAGISAWA
7	19000-80700	ARM CYLINDER	YANAGISAWA
6	19001-00700	QUICK HITCH CYLINDER	MITSUO
5	19020-23700	GEAR PUMP	SHIMADZU
4	19017-48100	SUB VALVE	NISHINA
3	19010-45100	CONTROL VALVE	NABTESCO
2	19020-23100	HST PUMP	DAIKIN
1	19031-26400	TRAVEL MOTOR	DAIKIN

TL250 HYDRAULIC CIRCUIT DIAGRAM
In Compliance with EC(NRMM) EPA Tier3

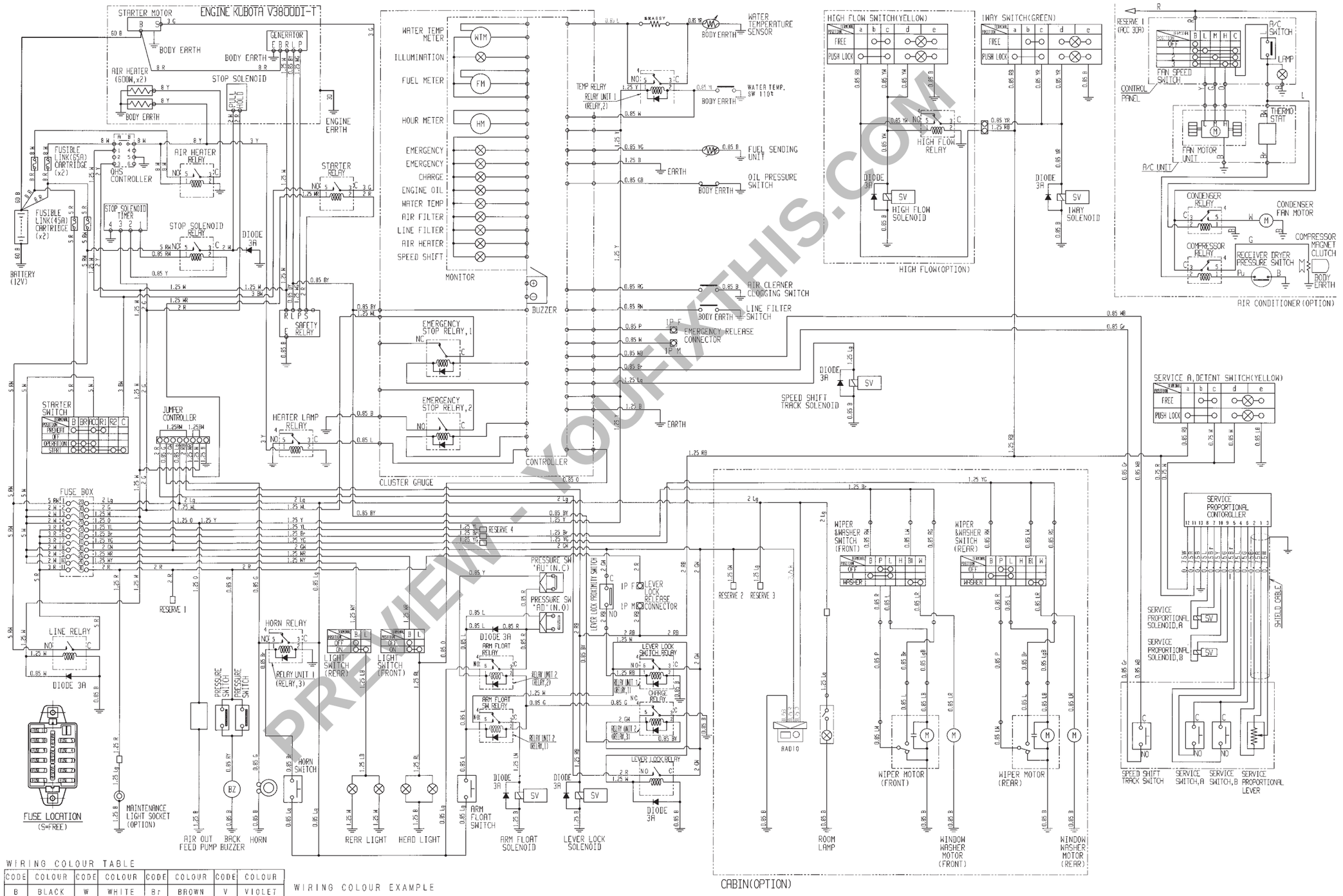
Drawing No. 06901-00200 1/1

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ELECTRICAL WIRING DIAGRAM

Serial No. 225000001 to 225000608



WIRING COLOUR TABLE

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

WIRING COLOUR EXAMPLE

W L
- WIRING COLOUR(BLUE)
- GROUND COLOUR(WHITE)

Drawing No.	1/1
06901-00011	

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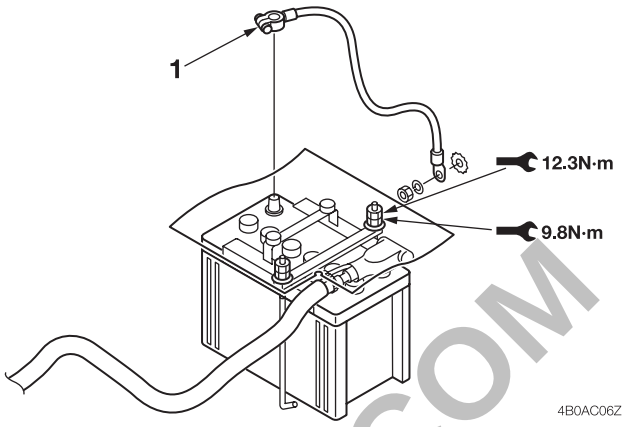
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DRIVE SYSTEM

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"

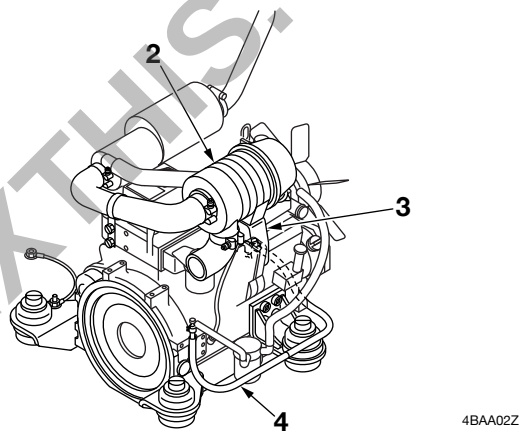
4. Disconnect the electrical wiring to the air cleaner (2).

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

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

7. Remove the drain hose (4).

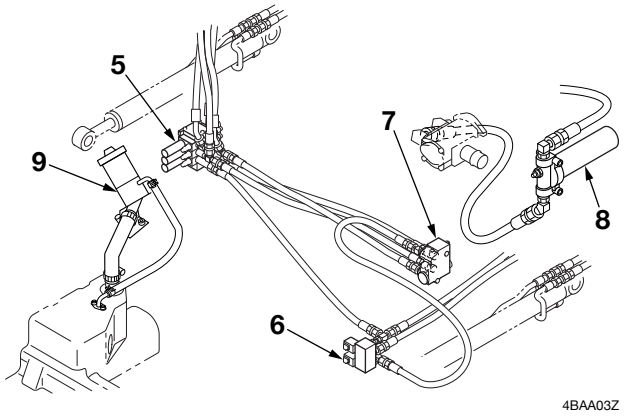
8. Remove the hydraulic pump.
   ☞ "Removing the hydraulic pump"



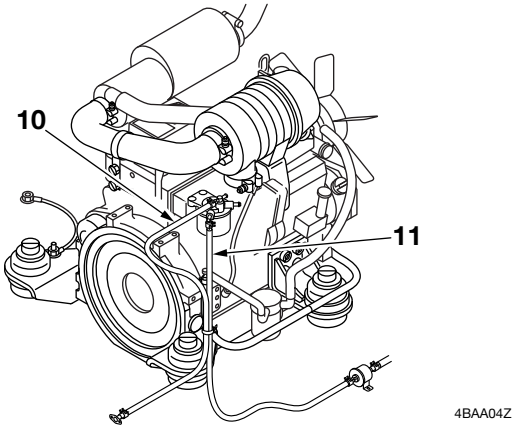
9. Remove the control valve (5), the solenoid valve (6) and the sub valve (7).

10. Remove the line filter (8).

11. Remove the filler opening (9).



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



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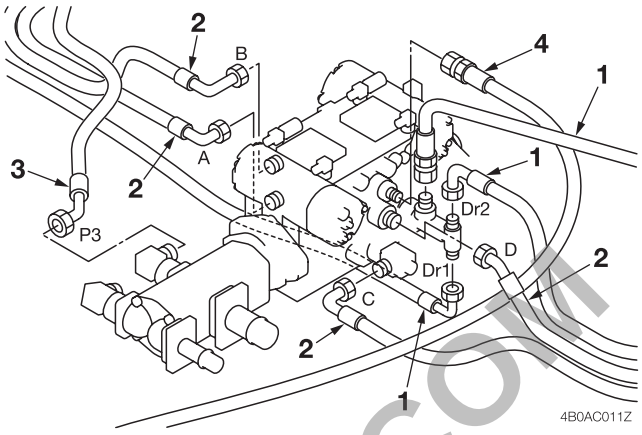
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Removing the hydraulic pump

1. Drain the hydraulic oil from the hydraulic tank.
   ☞ "Removing the hydraulic tank"

2. Disconnect the drain hoses (1) and the HST hoses (2).

3. Disconnect the discharge hoses (3) and the charge hose (4).

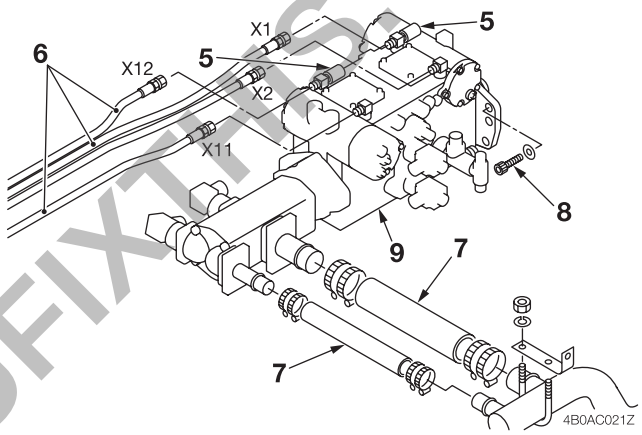


4. Disconnect the electrical wirings from the pressure switches (5).

5. Disconnect the pilot hoses (6).

6. Disconnect the suction hose (7).

7. Remove the cap screws (8) and remove the HST pump (9).
   Cap screw: 255.8 N·m

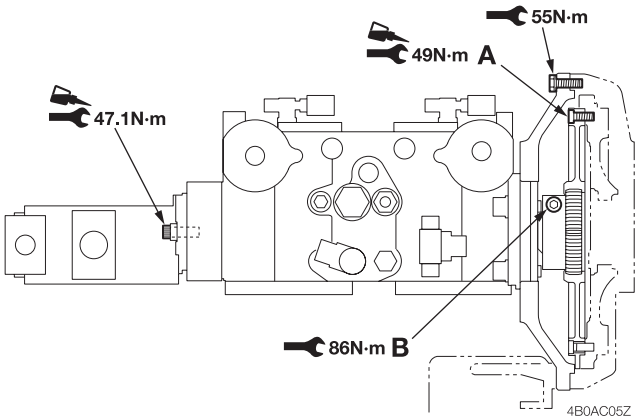


Installing the hydraulic pump

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

A: Use the bolt (thread-locking compound has been applied) that came with the coupling.

B: Use the bolt that came with the coupling.

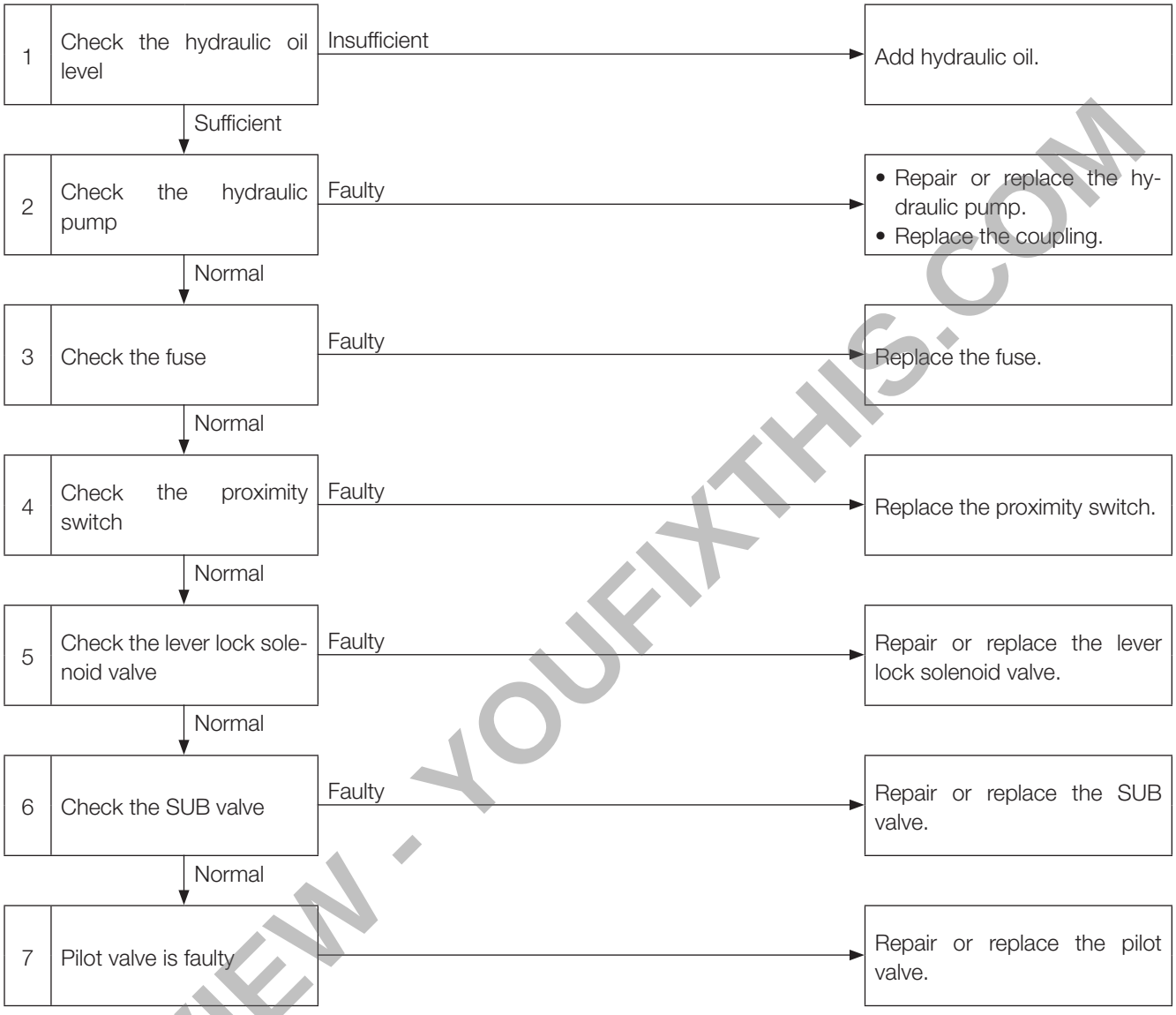


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OVERALL MACHINE

No operation is possible.



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The following AC components are discussed in detail in this section:

1. Compressor/Clutch Assembly
2. Condenser
3. Receiver-Drier
4. Expansion Valve
5. Evaporator Coil

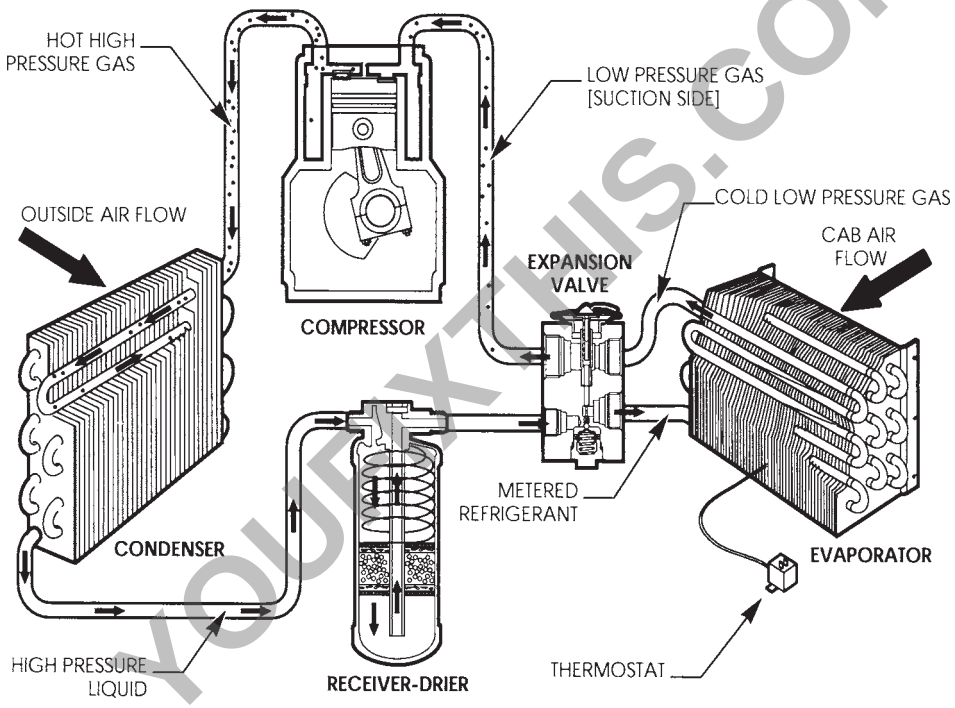


Figure 2-2
Air Conditioner components are connected together to illustrate system operation. The components shown are not to scale. The refrigerant and refrigerant oil are clear in color and not visible in this drawing. The small arrows inside the components and connecting hoses show the direction of refrigerant flow (refrigerant circuit).

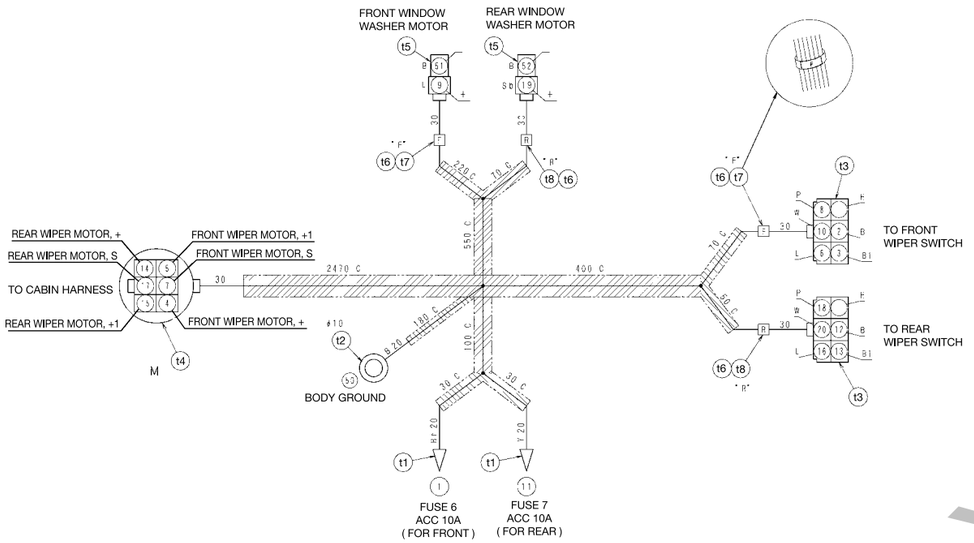
1. Compressor/Clutch Assembly

The compressor/clutch assembly is the heart of the system. When the clutch is engaged, the compressor pumps refrigerant and oil around the system. It raises the temperature and pressure of the refrigerant gas, and forces it to the condenser where it changes state and becomes a liquid. The compressor also sucks the vaporized refrigerant out of the evaporator and back inside itself in the form of gas. One way valves inside the compressor separate the compressed gas (high pressure) side of the system from the suction (low pressure) side. Figure 2-3 shows a cutaway view of a compressor with the high and low pressure sides noted.

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NO.	CONNECTIONS	TABLE OF CONNECTIONS		CONNECTIONS	SIZE	WIRE COLOR
1	FUSE 6, ACC 10A	1	2	FRONT WIPER SW, B	1.25	Br
2			3	FRONT WIPER SW, B1	1.25	Br
3	FRONT WIPER MOTOR, +	4			1.25	Br
4	FRONT WIPER MOTOR, +1	5	6	FRONT WIPER SW, L	0.85	Lg
5	FRONT WIPER MOTOR, S	7	8	FRONT WIPER SW, P	0.85	P
6	FRONT WINDOW WASHER MOTOR, +	9	10	FRONT WIPER SW, W	0.85	L
7	FUSE 7, ACC 10A	11	12	REAR WIPER SW, B	1.25	Y
8			13	REAR WIPER SW, B1	1.25	Y
9	REAR WIPER MOTOR, +	14			1.25	Y
10	REAR WIPER MOTOR, +1	15	16	REAR WIPER SW, L	0.85	G
11	REAR WIPER MOTOR, S	17	18	REAR WIPER SW, P	0.85	R
12	REAR WINDOW WASHER MOTOR, +	19	20	REAR WIPER SW, W	0.85	Sb
13						
14	BODY GROUND	50	51	FRONT WINDOW WASHER MOTOR, -	1.25	B
15			52	REAR WINDOW WASHER MOTOR, -	1.25	B



NO.	STANDARD	NAME
t8	17202-00218	MARK TUBE R
t7	17202-00206	MARK TUBE F
t6	16522-01004	BAND
t5	YAZAKI 7323-2228	2P CONNECTOR F (WITH LOCK)
t4	YAZAKI 7318-3460	6P WATERPROOF CONNECTOR M (WITH LOCK)
t3	YAZAKI 7323-2262	6P CONNECTOR F (WITH LOCK)
t2	LA210	TERMINAL (WITH CAP)
t1	CA104	TERMINAL M (WITH CAP)

Drawing No.	1/1
08824-21410	

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SAUER DANFOSS

4T Tandem Piston Pump
Repair Instructions
Inspection

Genuine Parts

HOUSING

Inspect the housing to ensure that it is clean and free of foreign material. Inspect the swashplate bearing surfaces.

Inspect housing





SIDECOVER

Inspect the side cover to ensure that it is clean and free of foreign material. Inspect the swashplate bearing surfaces.

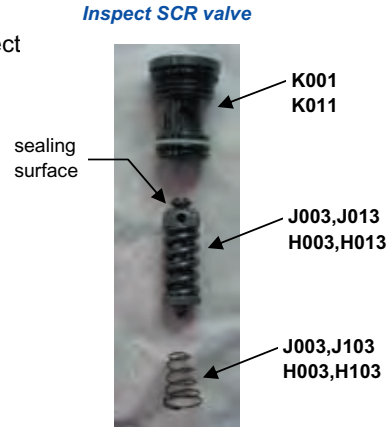
Inspect sidecover



SYSTEM CHECK/RELIEF (SCR)VALVE

Clean and inspect the SCR valves. Inspect the springs. Check the sealing surfaces of the poppet and seat-plug for wear or scratches. Replace as necessary.

Inspect SCR valve



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Inspection and adjustment

Checking the parts

Part	Criteria	Action
O-ring	—	• Replace
Seal	—	• Replace
Spool	• Wear on the sliding portions is 10 µm or greater compared to the non-sliding portions. • Scratches on the sliding portions • Spool does not move smoothly	• Replace • Replace • Replace
Push rod	• Front end is worn 1 mm or more • Scratches on the sliding portions	• Replace • Replace
Plug	• Seal is imperfect due to damage	• Repair or replace
Controls	• Tightening is loose at the pin, shaft or joint of the controls, with looseness of 2 mm or greater • Due to wear, etc., tightening is loose at the pin, shaft or joint of the controls, with looseness of 2 mm or greater	• Tighten to the specified torque • Replace
Casing, port plate	• Scratches, rust, or corrosion at the sliding parts with the spool • Scratches, rust, or corrosion of the seal part in contact with the O-ring	• Replace • Repair or replace

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LIFT ARM

Arm cylinder fails.

1	Check the operation of actuators other than the arm cylinders			
	Normal ↓			
2	Check the pilot valve	Faulty →		Repair or replace the pilot valve.
	Normal ↓			
3	Check the spool operation	Faulty →		Repair or replace the housing block.
	Normal ↓			
4	Test the port relief valve with a replacement valve	Problem solved →	The port relief valve faulty →	Repair or replace the port relief valve.
	No change ↓			
5	Check the arm float solenoid valve	Faulty →		Repair or replace the arm float solenoid valve.
	Normal ↓			
6	Check the arm cylinder	Faulty →		Repair or replace the arm cylinder.

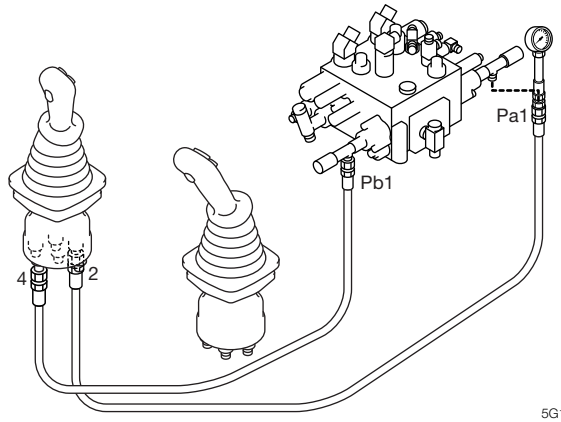
1. Check the operation of actuators other than the arm cylinders.

Check the bucket as listed in the table on the right.
If the bucket is faulty, check the main relief valve and the hydraulic pump P3.
☞ "5-4 and 5-8"

Lever to operate	Location to check	
Bucket	Relief valve R3	Pump P3

2. Check the pilot valve.

a. Disconnect the hose connecting the pilot valve and the control valve (arm block) from the control valve.
b. Fit a pressure gauge to the hose just disconnected.
c. Operate the lever (lift arm) and measure the pressure.
- If the pressure level is between 0 to 3.2 MPa for each angle, it is normal.



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