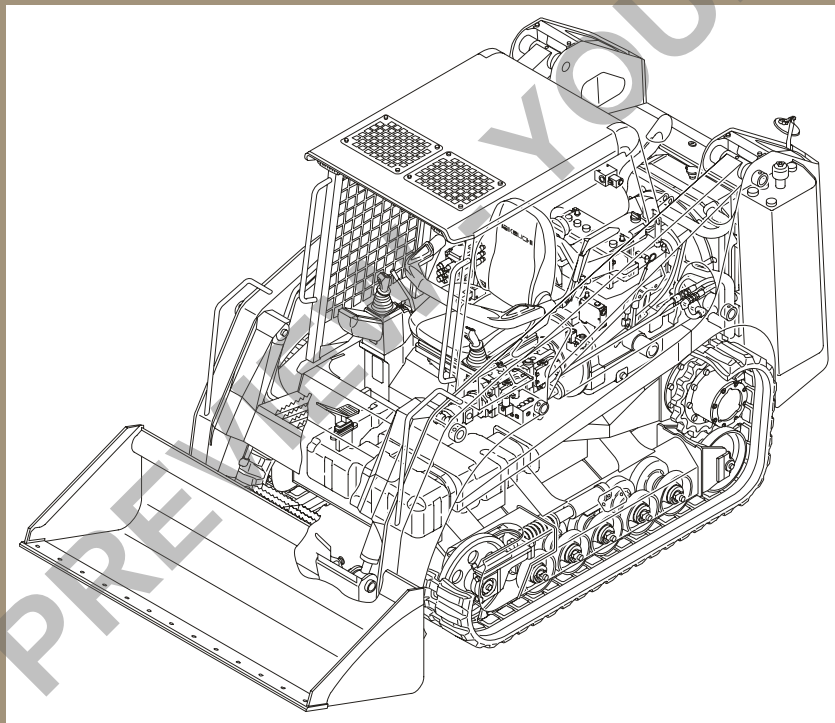
CTL65

GEHL®

Form No.
917337
Revison C
08/10

Compact Track Loader

Service Manual



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SERVICE DATA 2

Dimensional drawing 2-2
Specifications tables 2-3
Lubricant and Fuel chart 2-6
Performance criteria 2-8
Tightening torque 2-16
Hydraulic circuit diagram 2-19
Electrical wiring diagram 2-23
Wire harness diagram 2-25

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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	0.351
Tipping load		kg	2380
Rated loading mass		kg	735
Breakout force		kN	29.9
Raising time (load)		s	4.0
Lowering time		s	2.6
Bucket forward tilting time		s	2.6
Travel speed	Forward 1st	km/h	7.3
	Forward 2nd	km/h	10.9
	Reverse 1st	km/h	7.3
	Reverse 2nd	km/h	10.9
Maximum tractive force		kN	40.6
Gradeability		degree (°)	30
Minimum turning radius	Bucket outside	m	2.082

Dimensions

Overall length in transport condition	Without teeth		mm	3430
	With teeth		mm	–
Overall width (body)			mm	1580
Bucket width			mm	1675
Overall height	Bucket on ground	Canopy	mm	2130
		Cab	mm	2235
	Max. raised height of bucket		mm	3905
Crawler bearing length			mm	1390
Track gauge			mm	1260
Shoe width			mm	320
Crawler bearing area			m^2	0.890
Ground clearance of undercarriage			mm	310
Bucket hinge pin height			mm	3030
Dumping clearance (at 45-degree forward tipping)	Without teeth		mm	2370
	With teeth		mm	–
Dumping reach (at 45-degree forward tipping)	Without teeth		mm	730
	With teeth		mm	–
Bucket roll back angle	On ground		degree (°)	29.3
Bucket dumping angle	Maximum height position		degree (°)	38.6
Maximum digging depth			mm	0

Mass

Gross machine mass	Canopy	kg	4270
	Cab	kg	4360
Operating mass	Canopy	kg	3710
	Cab	kg	3800
Machine mass	Canopy	kg	3635
	Cab	kg	3725
Shipping mass	Canopy	kg	3580
	Cab	kg	3670

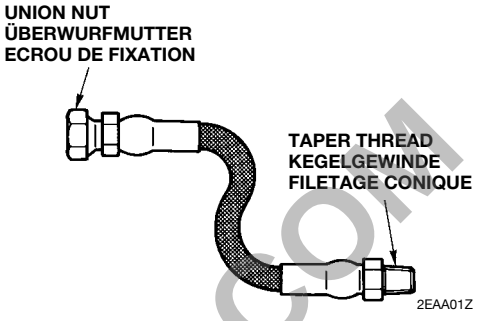
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TIGHTENING TORQUE

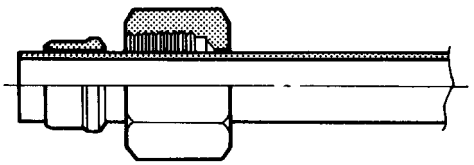
Hydraulic hose

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

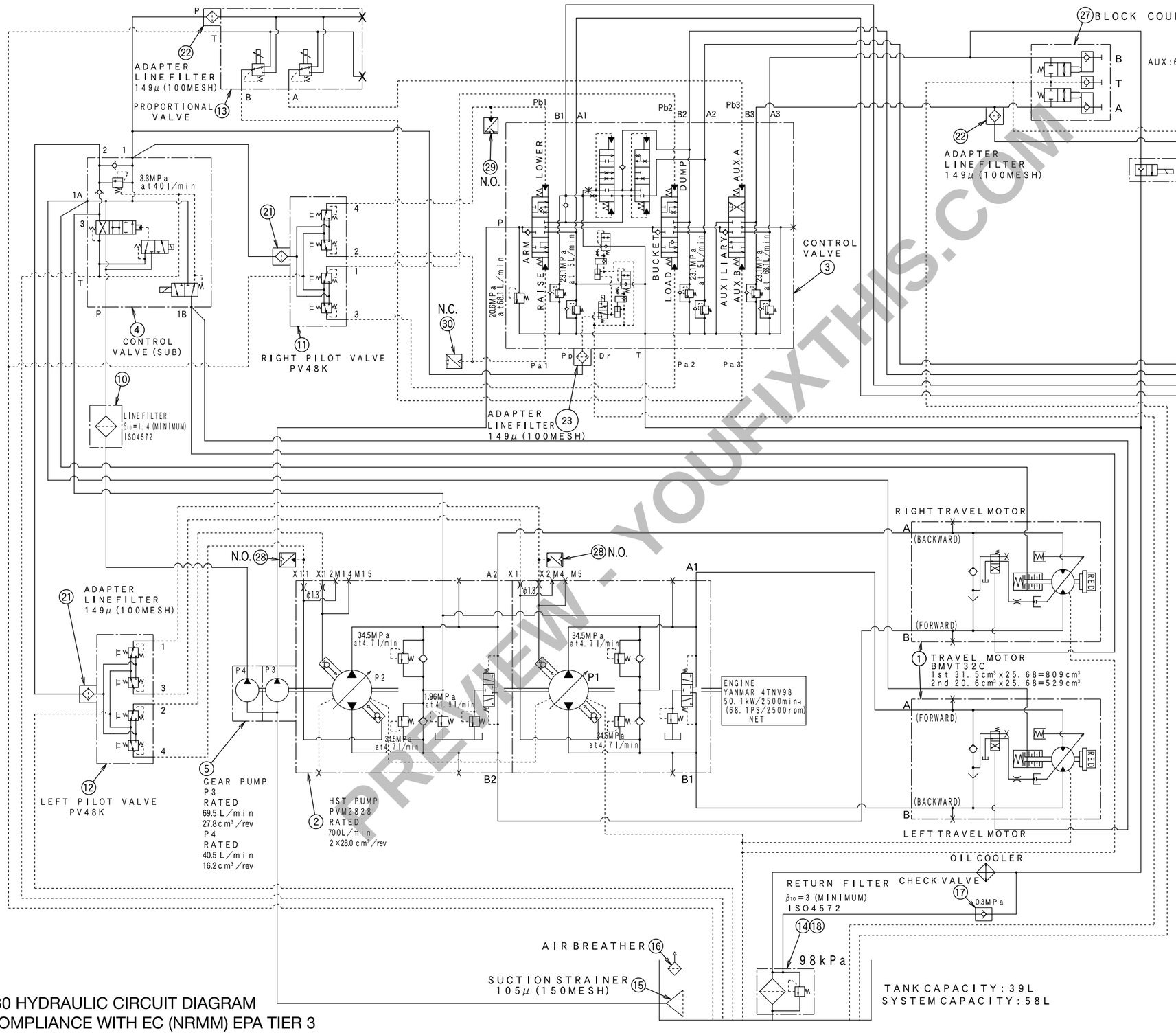


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HYDRAULIC CIRCUIT DIAGRAM

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	15401-40830	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	19000-81400	BUCKET CYLINDER (L)
8	19000-81300	BUCKET CYLINDER (R)
7	19000-81800	ARM CYLINDER
6	19001-00700	QUICK HITCH CYLINDER
5	19020-17900	GEAR PUMP
4	19017-48100	SUB VALVE
3	19010-45200	CONTROL VALVE
2	19020-20200	HST PUMP
1	19031-26600	TRAVEL MOTOR

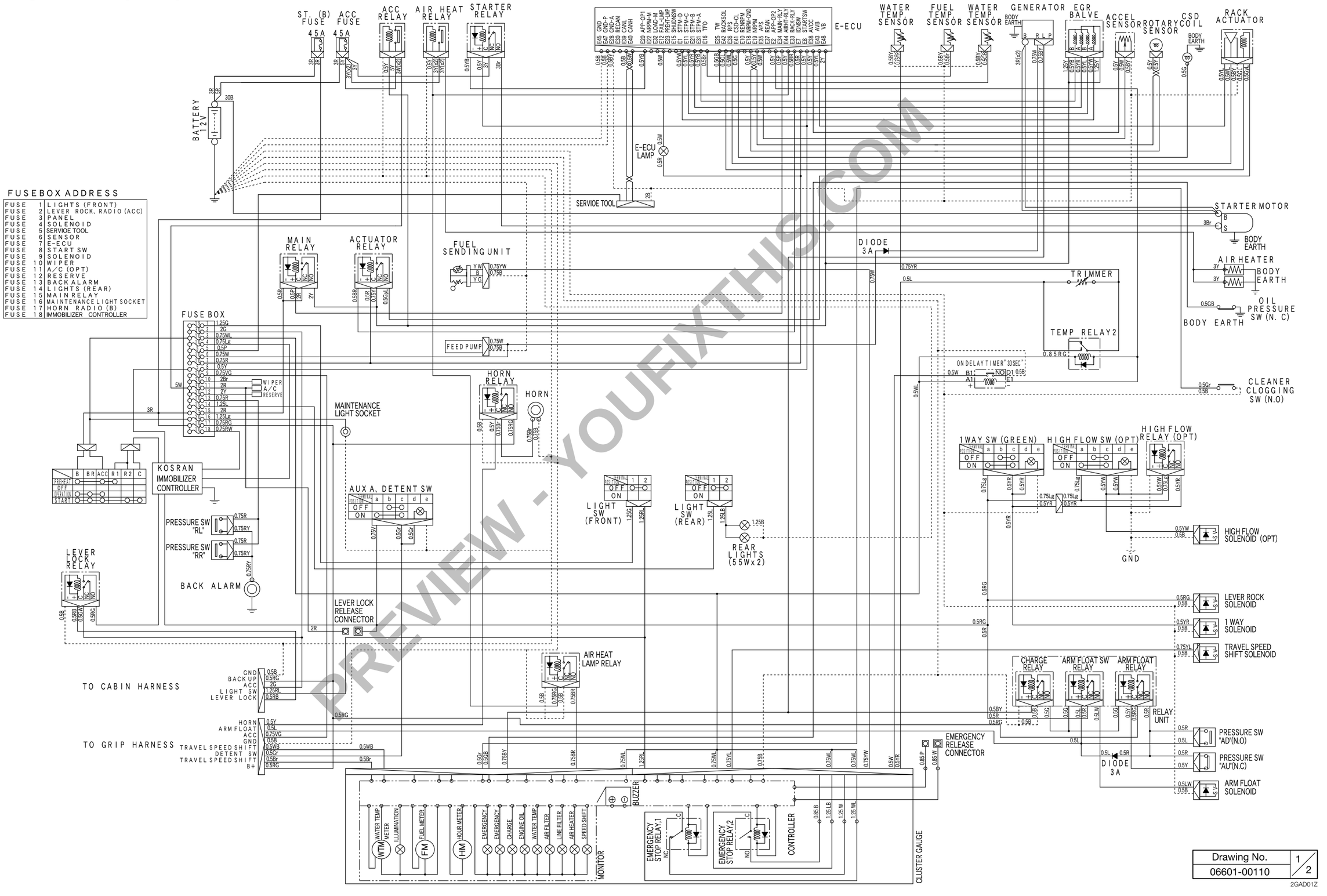
TL230 HYDRAULIC CIRCUIT DIAGRAM
IN COMPLIANCE WITH EC (NRMM) EPA TIER 3

2FAD01Z

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ELECTRICAL WIRING DIAGRAM



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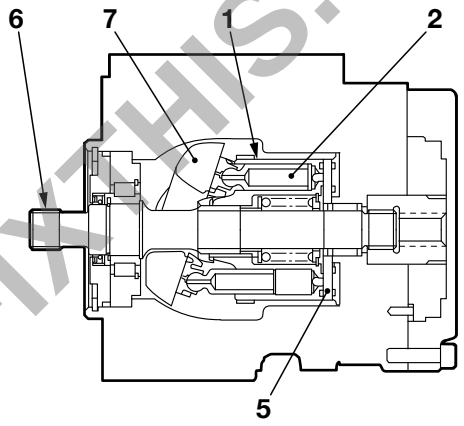
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HST PUMP

This pump is a tandem pump with a remote function for hydrostatic transmission. When combined with an HST travel motor, it can control the speed of the motor from zero to the specified maximum rate steplessly.

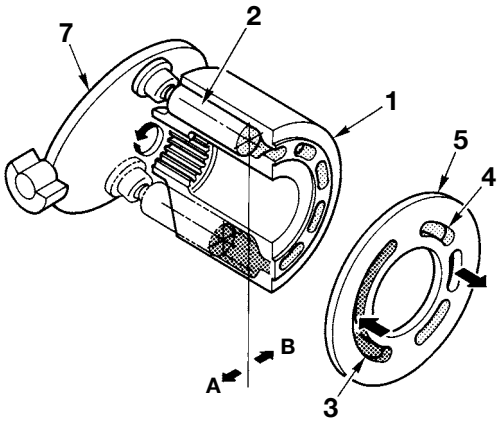
Hydraulic pump

The cylinder block (1) is constructed with the pistons (2), and at its end surface, it is in contact with the valve plate (5) containing the intake port (3) and the exhaust port (4). The cylinder block (1) rotates freely and is connected to the drive shaft (6) via the spline. The swash plate (7), on the other hand, is fixed at an angle to the housing, and the pistons (2) are designed to rotate along with the swash plate (7).



3IAA01Z

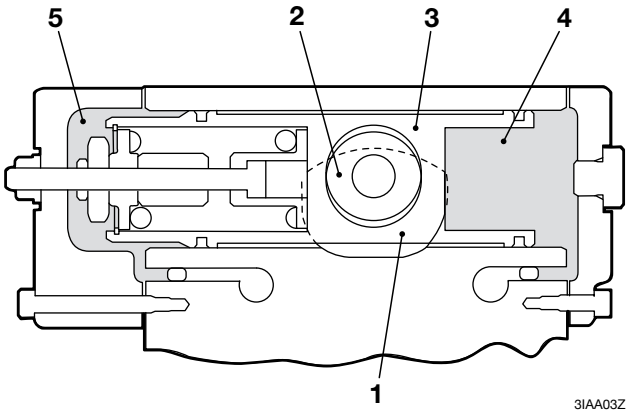
The cylinder block (1) rotates as the drive shaft (6) is rotated, and for every rotation of the cylinder block (1), the pistons (2) mounted in the cylinder block (1) complete one stroke of intake and exhaust. Thus, continuous operation of intake and exhaust can be obtained by continuously rotating the drive shaft (6).
The displacement of the pistons (2) can be varied by modifying the tilt angle of the swash plate (7).



3IAA02Z

Controlling

There are bearings attached to both sides of the swash plate (1) which is mounted at an angle to the housing and connected to the control cylinder (3) with the pistons (2). The right and left spring chambers (4 and 5) are connected with the tank circuit, and thus their pressures are equal. The swash plate (1) under these conditions is adjusted to maintain its neutral position.



3IAA03Z

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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: _____

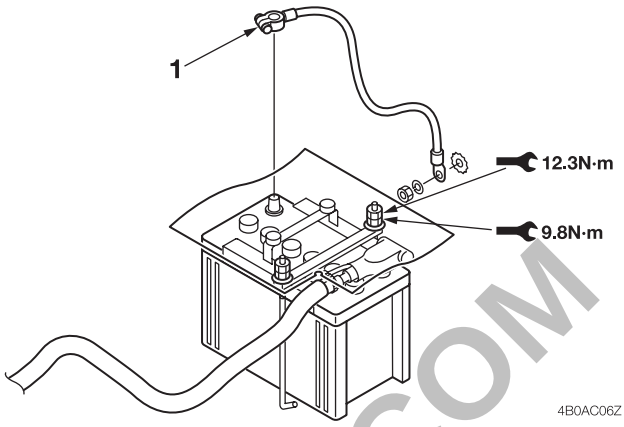
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DRIVE SYSTEM

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"

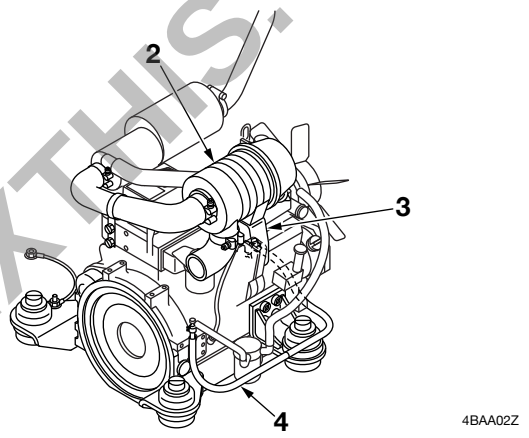
4. Disconnect the electrical wiring to the air cleaner (2).

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

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

7. Remove the drain hose (4).

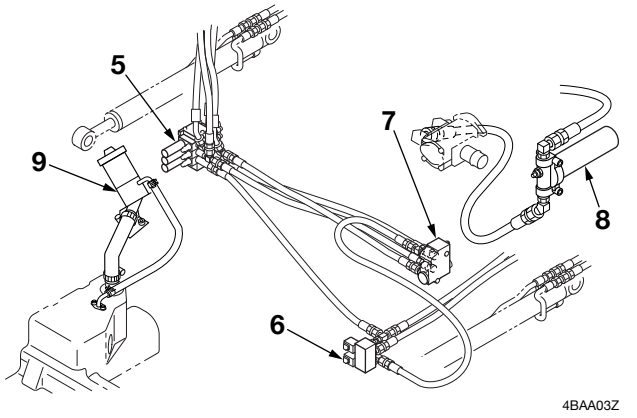
8. Remove the hydraulic pump.
   ☞ "Removing the hydraulic pump"



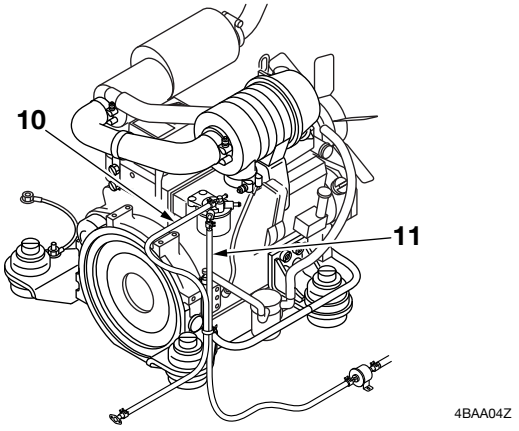
9. Remove the control valve (5), the solenoid valve (6) and the sub valve (7).

10. Remove the line filter (8).

11. Remove the filler opening (9).



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



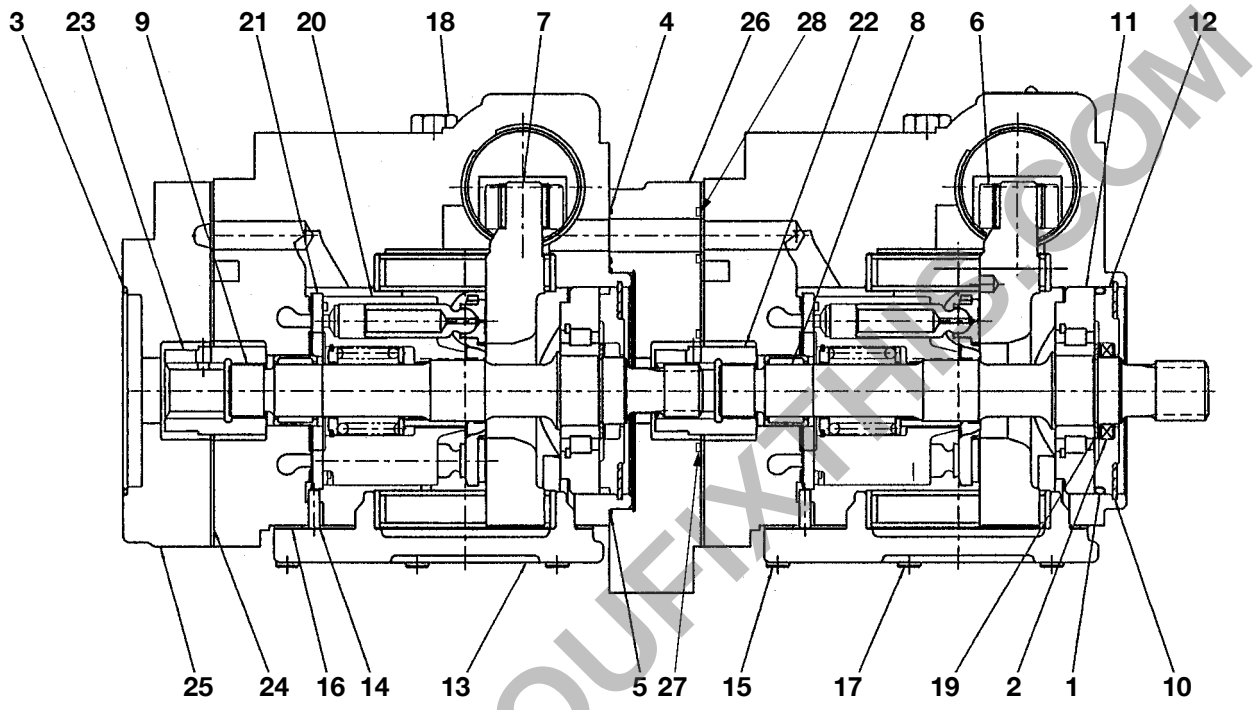
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HST PUMP

Construction

Pump assembly (1/4)



4IAA01Z

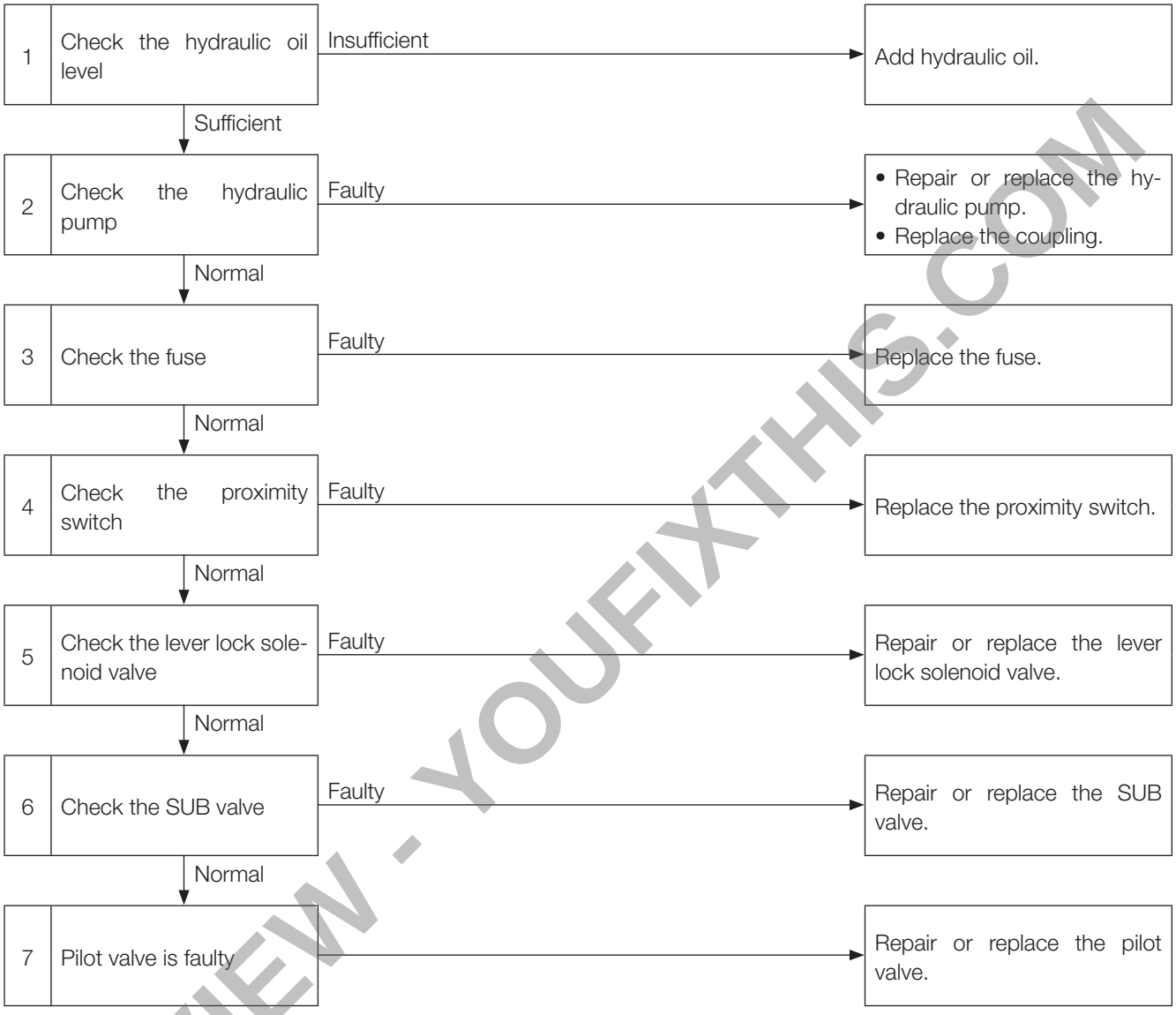
1. O-ring
2. Seal
3. O-ring
4. O-ring
5. O-ring
6. Bearing
7. Swash plate
8. Shaft
9. Shaft
10. Ring
11. Bearing
12. Seal carrier
13. Cover
14. Pin
15. Cap screw
16. Gasket
17. Cap screw
18. Plug
19. Ring
20. Cylinder block
21. Valve plate
22. Coupling
23. Coupling
24. Gasket
25. Pad “A” adaptor
26. Pad “B” adaptor
27. O-ring
28. O-ring

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OVERALL MACHINE

No operation is possible.



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NO.	CATEGORY OF WIRE	SIZE & WIRE COLOR	FROM	TO
1	AVS	5R	BATTERY, TERMINAL +	FUSIBLE LINK, 45A
2	AVS	5R	BATTERY, TERMINAL +	FUSIBLE LINK, 45A
3	AVS	5R	FUSIBLE LINK, 45A	FUSE BOX, B INPUT (FUSE 15,17,18)
4	AVS	3R	STARTER SWITCH, B	FUSE BOX, B INPUT (FUSE 15,17,18)
5	AVS	5Y	FUSIBLE LINK, 45A	JOINT-1
6	AVS	5Y	JOINT-1	ACC RELAY, C
7	AVS	3Y	JOINT-1	AIR HEAT RELAY, C
8	AVS	3Y	JOINT-1	AIR HEAT RELAY, C
9	AVS	3Y	JOINT-1	STARTER RELAY, C
10	AVS	5W	ACC RELAY, NO	FUSE BOX, ACC INPUT (FUSE, 9-14)
11				
12	AVS	3Y	AIR HERT RELAY, NO	AIR HERTER
13	AVS	3Y	AIR HERT RELAY, NO	AIR HERTER
14	AVS	3Br	STARTER RELAY, NO	STARTER MOTOR, S
15	AVS	5L	STARTER SWITCH, ACC	FUSE BOX, ACC INPUT (FUSE, 1~7, 16)
16				
17	AVS	3Y	STARTER SWITCH, C	FUSE BOX, C INPUT (FUSE 8)
18				
19				
20	AVSS	1.25G	FUSE 1	LIGHT SWITCH, B (FRONT)
21	AVSS	1.25RL	LIGHT SWITCH, L (FRONT)	FRONT WORK LIGHT, + (CABIN)
22	AVSS	2G	FUSE 2	JOINT-2
23	AVSS	1.25G	JOINT-2	SAFETY BAR PROXIMITY SWITCH, C
24	AVSS	1.25G	JOINT-2	LEVER LOCK RELAY, C
25	AVSS	0.5RB	SAFETY BAR PROXIMITY SWITCH, NO	LEVER LOCK RELAY, COIL +
26				
27	AVSS	0.75WL	FUSE 3	JOINT-3
28				
29				
30	AVSS	0.75Lg	FUSE 4	CONNECTOR FOR THEFT PREVENTION DEVICE
31	AVSS	0.5RG	JOINT-28	AUXILIARY CIRCUIT 1-WAY SWITCH, a
32	AVSS	0.5RG	AUXILIARY CIRCUIT 1-WAY SWITCH, a	AUXILIARY CIRCUIT HIGH FLOW (OPT)
33				
34				
35				
36	AVSS	0.75YR	AUXILIARY CIRCUIT 1-WAY SWITCH, c	AUXILIARY CIRCUIT 1-WAY SWITCH, d
37	AVSS	0.75YR	AUXILIARY CIRCUIT 1-WAY SWITCH, c	AUXILIARY CIRCUIT HIGH FLOW (OPT)
38	AVSS	0.75YR	AUXILIARY CIRCUIT 1-WAY SWITCH, d	AUXILIARY CIRCUIT 1-WAY SOLENOID, +
39	AVSS	0.5P	FUSE 5	CAN CONNECTOR
40				
41				
42	AVSS	0.75W	FUSE 6	JOINT-7
43				
44	AVSS	0.75W	JOINT-7	JOINT-8
45	AVSS	0.75W	JOINT-8	D1, A
46	AVSS	0.75W	JOINT-8	FEED PUMP, +
47				
48				
49				
50	AVSS	0.75WB	D1, K	GENERATOR, R
51				
52				
53				
54				
55				
56	AVSS	0.5R	JOINT-31	ACTUATOR RELAY, +
57	AVSS	0.75R	FUSE 7	JOINT-31
58	AVSS	0.5R	JOINT-31	E-ECU E7, IGSW
59	AVSS	0.5R	JOINT-31	FAIL- LAMP +
60	AVSS	0.5W	E-ECU E12, FAIL- LMP	FAIL- LAMP -
61	AVSS	0.5GyL	ACTUATOR RELAY, NO	RACK ACTUATOR
62	AVSS	0.5GL	E-ECU E42, RACKSOL	RACK ACTUATOR
63	AVSS	0.5WL	E-ECU E36, RPS	RACK ACTUATOR
64	AVSS	0.5YL	E-ECU E43, AVB	RACK ACTUATOR

NO.	CATEGORY OF WIRE	SIZE & WIRE COLOR	FROM	TO
65	AVSS	1.25R	MAIN RELAY, +	MAIN RELAY, C
66	AVSS	0.5P	MAIN RELAY, -	E-ECU E34, MAIN-RLY
67	AVSS	2Y	MAIN RELAY, NO	JOINT-11
68	AVSS	2Y	JOINT-11	E-ECU E48, VB
69	AVSS	0.75Y	JOINT-11	ACTUATOR RELAY, C
70	AVSS	2Y	JOINT-11	JOINT-12
71	AVSS	0.5Y	JOINT-12	ACC RELAY, +
72	AVSS	1.25Y	JOINT-12	JOINT-9
73	AVSS	0.5BR	ACTUATOR RELAY, -	E-ECU E33, RACK-RLY
74				
75	AVSS	0.5Y	FUSE 8	JOINT-13
76	AVSS	0.5Y	JOINT-13	E-ECU E8, STARTSW
77	AVSS	0.5Y	JOINT-13	CONNECTOR FOR THEFT PREVENTION DEVICE
78	AVSS	0.5YB	STRATER RELAY, -	E-ECU E20, APP-OP1
79	AVSS	0.5YR	CONNECTOR FOR THEFT PREVENTION DEVICE	STRATER RELAY, +
80	AVSS	0.75VG	FUSE 9	CN4-1PROPORTIONAL CONTROL, ACC
81	AVSS	0.5RG	JOINT-28	AUXILIARY CIRCUIT A DETENT SWITCH, a
82	AVSS	0.5Gy	AUXILIARY CIRCUIT A DETENT SWITCH, c	AUXILIARY CIRCUIT A DETENT SWITCH, d
83	AVSS	0.5Gy	AUXILIARY CIRCUIT A DETENT SWITCH, c	CN4-2 AUXILIARY CIRCUIT, DETENT
84	AVSS	0.5B	AUXILIARY CIRCUIT A DETENT SWITCH, e	JOINT-14 (GROUND)
85	AVSS	0.5B	AUXILIARY CIRCUIT 1-WAY SOLENOID, e	JOINT-14 (GROUND)
86	AVSS	2Br	FUSE 10	JOINT-4
87	AVSS	2R	FUSE 11	JOINT-23
88	AVSS	2Y	FUSE 12	AUXILIARY POWER SUPPLY, +
89	AVSS	0.75R	FUSE 13	JOINT-15
90	AVSS	0.75R	JOINT-15	PRESSURE SWITCH (BACK ALARM)
91	AVSS	0.75R	JOINT-15	PRESSURE SWITCH (BACK ALARM)
92	AVSS	0.75RY	PRESSURE SWITCH (BACK ALARM)	JOINT-16
93	AVSS	0.75RY	PRESSURE SWITCH (BACK ALARM)	JOINT-16
94	AVSS	0.75RY	JOINT-16	BACK ALARM, +
95	AVSS	1.25L	FUSE 14	LIGHT SWITCH, B (REAR)
96	AVSS	1.25LB	LIGHT SWITCH, L (REAR)	JOINT-17
97	AVSS	1.25LB	JOINT-17	REAR WORK LIGHT, R (+)
98	AVSS	1.25LB	JOINT-17	REAR WORK LIGHT, L (+)
99				
100	AVSS	0.75R	FUSE 15	MAIN RELAY, C
101				
102	AVSS	1.25Lg	FUSE 16	MAINTENANCE LIGHT SOCKET, +
103				
104	AVSS	0.75RG	FUSE 17	JOINT-18
105	AVSS	0.75RG	JOINT-18	CABIN, BACK UP POWER SUPPLY
106	AVSS	0.75RG	JOINT-18	HORN RELAY, NO
107	AVSS	0.75RG	JOINT-18	ARM FLOAT RELAY, c
108	AVSS	0.75Br	HORN RELAY, C	JOINT-6
109	AVSS	0.5Y	HORN RELAY, +	CN4-3 HORN SWITCH
110	AVSS	0.75Br	HORN, +	JOINT-6
111	AVSS	0.75RW	FUSE 18	CONNECTOR FOR THEFT PREVENTION DEVICE
112	AVSS	0.75Br	JOINT-6	CONNECTOR FOR THEFT PREVENTION DEVICE
113	AVSS	0.75B	HORN, -	JOINT-19 (GROUND)
114	AVSS	1.25B	JOINT-19 (GROUND)	REAR WORK LIGHT, R (-)
115	AVSS	0.5B	ACC RELAY, -	JOINT-19 (GROUND)
116	AVSS	0.5B	AIR HERT RELAY, -	JOINT-19 (GROUND)
117	AVSS	2B	JOINT-19 (GROUND)	MAIN BODY GROUND
118				
119	AVSS	0.75RG	JOINT-18	CN4-4 B POWER SUPPLY
120	AVSS	1.25B	JOINT-20 (GROUND)	REAR WORK LIGHT, L (-)
121	AVSS	0.75B	JOINT-20 (GROUND)	AUXILIARY CIRCUIT 1-WAY SOLENOID, -
122				
123	AVSS	0.75B	JOINT-20 (GROUND)	FEED PUMP, -
124	AVSS	2B	JOINT-20 (GROUND)	MAIN BODY GROUND
125				
126				
127	AVSS	0.5B	LEVER LOCK RELAY, -	JOINT-10 (GROUND)
128				

NO.	CATEGORY OF WIRE	SIZE & WIRE COLOR	FROM	TO
129				
130	AVSS	0.5B	JOINT-10 (GROUND)	E-ECU E45, GND
131	AVSS	0.5B	JOINT-10 (GROUND)	E-ECU E47, GND-P
132	AVSS	2B	JOINT-10 (GROUND)	MAIN BODY GROUND
133				
134	AVSS	2B	JOINT-14 (GROUND)	CN4-5 PROPORTIONAL CONTROL HARNESS, GROUND
135	AVSS	1.25B	JOINT-14 (GROUND)	MAINTENANCE LIGHT SOCKET, -
136				
137	AVSS	0.5B	JOINT-14 (GROUND)	D5, A
138	AVSS	0.5B	JOINT-14 (GROUND)	D6, A
139	AVSS	2B	JOINT-14 (GROUND)	MAIN BODY GROUND
140	AVSS	0.5B	D6, A	2ND SPEED TRAVEL SOLENOID, -
141	AVSS	0.5B	D5, A	LEVER LOCK SOLENOID, -
142	AVSS	0.75R	LEVER LOCK RELAY, NO	CONNECTOR FOR THEFT PREVENTION DEVICE
143	AVSS	0.75RG	CONNECTOR FOR THEFT PREVENTION DEVICE	JOINT-28
144	AVSS	0.5RG	D5, K	LEVER LOCK SOLENOID, +
145	AVSS	0.5RG	JOINT-28	D5, K
146	AVSS	1.25RG	JOINT-28	LEVER LOCK RELEASE CONNECTOR, B
147				
148				
149	MVVS 0.5	W	CAN CONNECTOR	E-ECU E40, CAN H
150	MVVS 0.5	B	CAN CONNECTOR	JOINT-21
151	MVVS 0.5	SH	JOINT TO (150)	TAPE A TERMINAL
152	AVSS	0.5B	JOINT-21	E-ECU E39, CAN L
153	AVSS	0.5B	JOINT-21	E-ECU E30, RECAN
154				
155	MVVS 0.5	W	E-ECU E19, NRPM	ROTARY SENSOR
156	MVVS 0.5	B	E-ECU E18, NRPM-GND	ROTARY SENSOR
157	MVVS 0.5	SH	JOINT TO (156)	TAPE A TERMINAL
158				
159	AVSS	0.5B	FUEL SENDING UNIT	JOINT-25 (GROUND)
160				
161	AVSS	2R	JOINT-23	A/C POWER SUPPLY (OPT)
162	AVSS	2R	JOINT-23	LEVER LOCK RELEASE CONNECTOR, A
163				
164	AVSS	0.5LW	D3, K	ARM FLOAT SOLENOID, +
165	AVSS	0.5B	D3, A	ARM FLOAT SOLENOID, -
166				
167				
168	AVSS	0.75Lg	D6, K	2ND SPEED TRAVEL SOLENOID, +
169				
170				
171	AVSS	0.5BY	GENERATOR, L	JOINT-26
172				
173				
174	AVSS	2Br	JOINT-4	CABIN, ACC POWER SUPPLY
175	AVSS	2Br	JOINT-4	WIPER POWER SUPPLY, +
176				
177				
178				
179				
180				
181	AVSS	0.5GB	E-ECU E16, TW	WATER TEMP SENSOR
182	AVSS	0.5YB	E-ECU E31, STPM-A	EGR BALVE, B
183	AVSS	0.5YR	E-ECU E21, STPM-B	EGR BALVE, A
184	AVSS	0.5YL	E-ECU E11, STPM-C	EGR BALVE, B
185	AVSS	0.5YW	E-ECU E1, STPM-D	EGR BALVE, A
186	AVSS	0.5Y	E-ECU E38, AVCC	ACCEL SENSOR
187	AVSS	0.5W	E-ECU E35, APS	ACCEL SENSOR
188				
189	AVSS	0.5G	E-ECU E41, CSD-CL	CSD COIL

Drawing No. 06642-02200 3/4

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- On a cold day the temperature can drop below zero. The engine may run cooler so the engine coolant is cooler when it circulates through the heater. The heat in the cab moves out of the cab faster (remember heat always moves to a cooler area until both are the same temperature—nature's law). To maintain cab comfort you have to increase the flow of coolant through the heater, increase coolant temperature, and/or move more air through the heater core.
- On a hot day, an off-road vehicle experiences cooling at a slower rate than an on-road vehicle. This is a result of high sun-load, large window area and often less insulation.

It is important for you to keep environmental effects in mind when you are servicing or diagnosing heater or air conditioner systems. If you work in Denver the altitude will affect system function and pressure. In Houston the heat and humidity may lower heat transfer to the air at the condenser and increase system operating pressures.

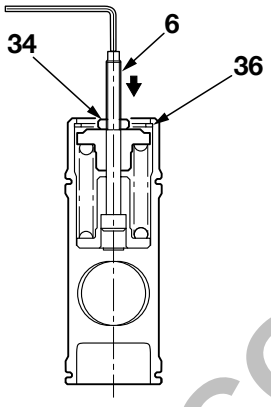
Chapter Review

- HVAC systems range from simple cab heaters to multi-function combination systems. The multi-function system can heat and cool the cab and sleeper unit, and have separate auxiliary components and controls for driver and passenger comfort.
- Both heater (engine) coolant and air conditioner refrigerant circulate inside sealed, pressurized systems. The normal air conditioner operating pressure ranges from 150 to 250 pounds per square inch, sometimes higher with a different refrigerant.
- Air conditioners have a high and a low pressure side within the system. The compressor is the starting point of the high side. Pressure drops at the expansion valve opening to the evaporator.
- The basic components of an AC system are the compressorclutch assembly, high pressure lines, condenser, receiver-drier, expansion valve, evaporator, thermostat, blower assembly, and suction lines. There may be other controls installed for more complex systems.
- The basic components of a heater system are the inlet and outlet hoses, a water valve and valve control, heater core and fan or blower assembly. There may be other controls for more complex systems.
- An air conditioner system uses the "change of state" of refrigerant inside the system to move heat from the cab air to the outside air. Refrigerant changes from a gas to a liquid in the condenser, and back to a gas in the evaporator.
- A heater system uses the heat from the engine, carried to the heater core by the action of the water pump, to warm the air in the cab. There is no change of state within the heater system.
- Environmental conditions affect how both heaters and air conditioners work. Weather, driving conditions, color of the vehicle are factors. All contribute to heat gain or loss inside a cab and how much heat energy must be moved to maintain occupant comfort.

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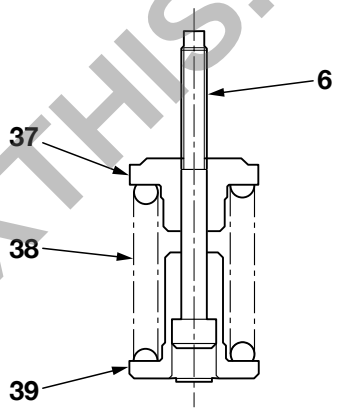
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c. Attach the nut (34) to the tie bolt (6), and manually tighten the nut (34) to compress the spring.
   - Hold the tie bolt with a hex wrench to prevent it from turning.
   - Tighten the nut until no load is applied to the snap ring (36).
d. Remove the snap ring (36).
e. Remove the spring assembly.
f. Remove the nut (34).



4IAA25Z

g. Remove the spring guide (37), the spring (38) and the spring guide (39) from the tie bolt (6).



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Special tools

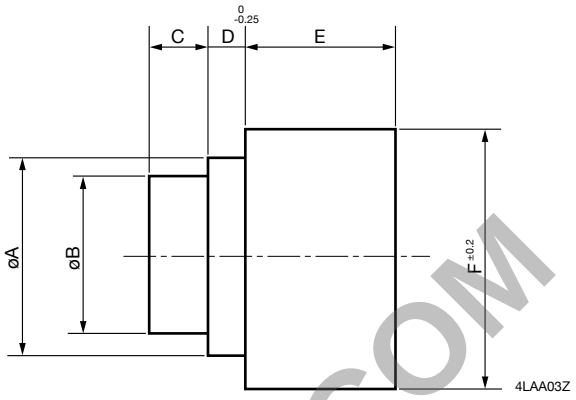
Unit: mm

Installation jig B

Quantity: 1

Material: SS41

	A	B	C	D	E	F
Arm	49.0	36.5	10	5.0	15	60
Bucket	44.0	34.5	10	5.0	15	55

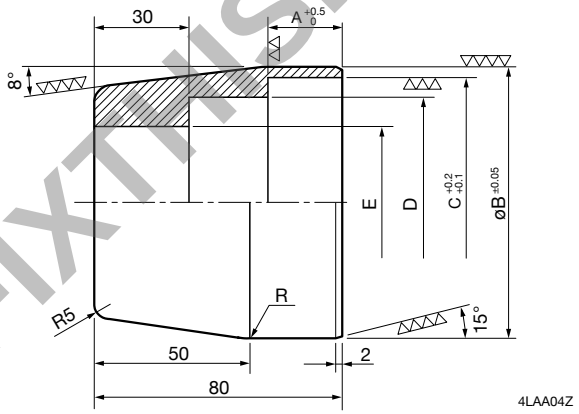


Sliding jig C

Quantity: 1

Material: STKM13C

	A	B	C	D	E
Arm	15.7	65.5	63	45	25
Bucket	15.7	65.5	63	45	25

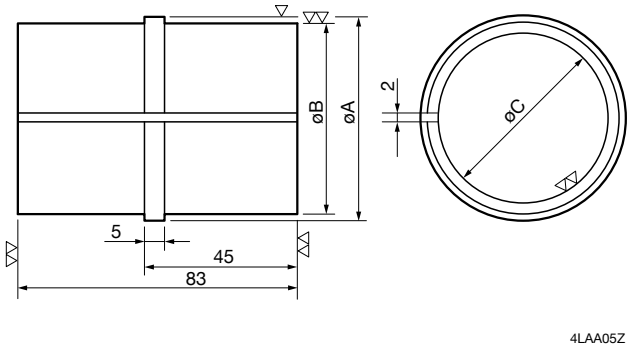


Fitting jig D

Quantity: 1

Material: Nylon

	A	B	C
Arm	70	68	60
Bucket	70	68	60

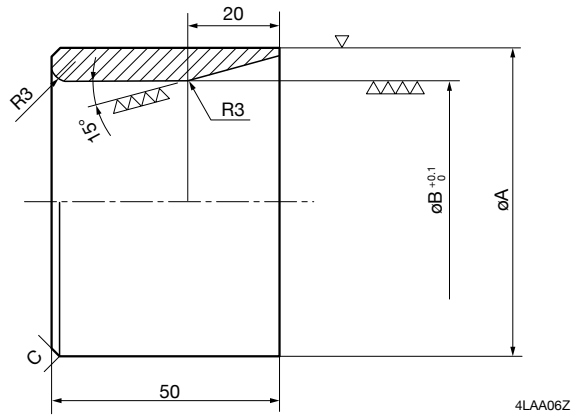


Corrective jig E

Quantity: 1

Material: STKM13C

	A	B
Arm	80	65
Bucket	80	65



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6. Check for leak inside the arm cylinder.

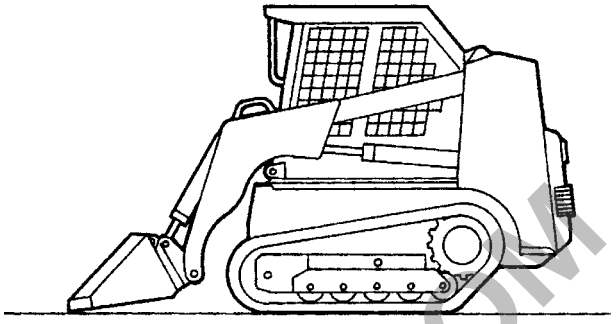
a. Lower the bucket to the ground, tilting the bucket forward (approx. 10° from the horizontal) with the tip contacting the ground.

b. Check the right and left cylinder individually. The hose connected to the cylinder not to be checked should be disconnected and fitted with a plug. (Do not fit the plug to the cylinder.)

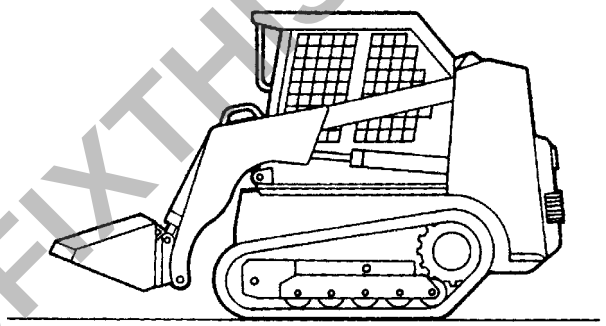
c. Disconnect the hose only from the rod side of the cylinder to be checked, and drain the oil from the piping. Fit the plug to the hose just disconnected.

d. Tilt the bucket back and lift it from the ground.

- If oil comes out from the piping on the side of the rod while the lift arm is lowering, oil must be leaking inside the control valve.



5GAC06Z



5GAC07Z

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