

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.

-  Indicates the machine serial number.
-  Means “Refer to the section quoted.”
-  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

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.

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

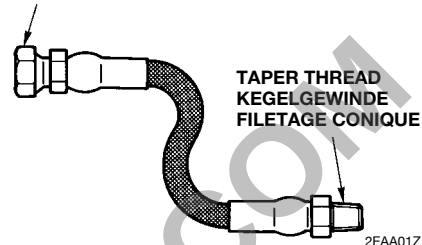
Gross machine mass	Canopy	kg	5240
	Cab	kg	5330
Operating mass	Canopy	kg	4505
	Cab	kg	4595
Machine mass	Canopy	kg	4430
	Cab	kg	4520
Shipping mass	Canopy	kg	4455
	Cab	kg	4545

TIGHTENING TORQUE

Hydraulic hose

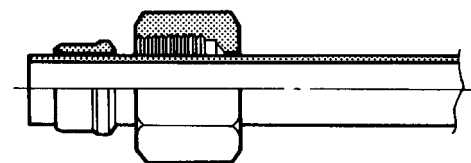
Hose fitting size	Tightening torque	
	Union nut (G)	Taper thread (R)
	N·m	N·m
1/8	$9.8^{+4.9}_0$	11.8 ± 1.2
1/4	$24.5^{+4.9}_0$	29.4 ± 2.9
3/8	$49.0^{+4.9}_0$	53.9 ± 5.4
1/2	$58.8^{+4.9}_0$	88.3 ± 8.8
3/4	$117.7^{+4.9}_0$	147.1 ± 14.7
1	$137.3^{+4.9}_0$	196.1 ± 19.6

UNION NUT
ÜBERWURFMUTTER
ECROU DE FIXATION



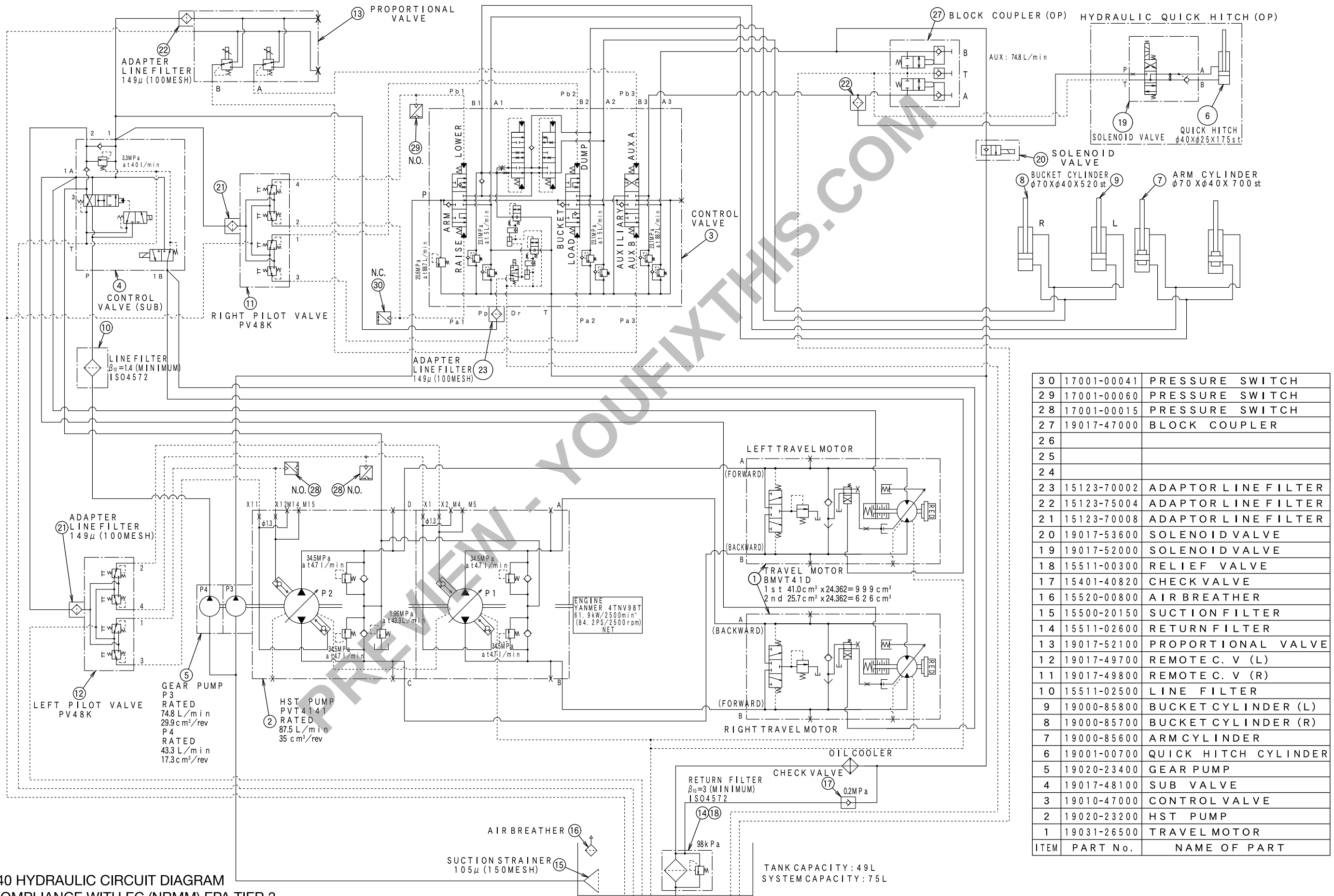
Bite-type pipe fitting for steel pipe

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



HYDRAULIC CIRCUIT DIAGRAM

Standard



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

ELECTRICAL WIRING DIAGRAM

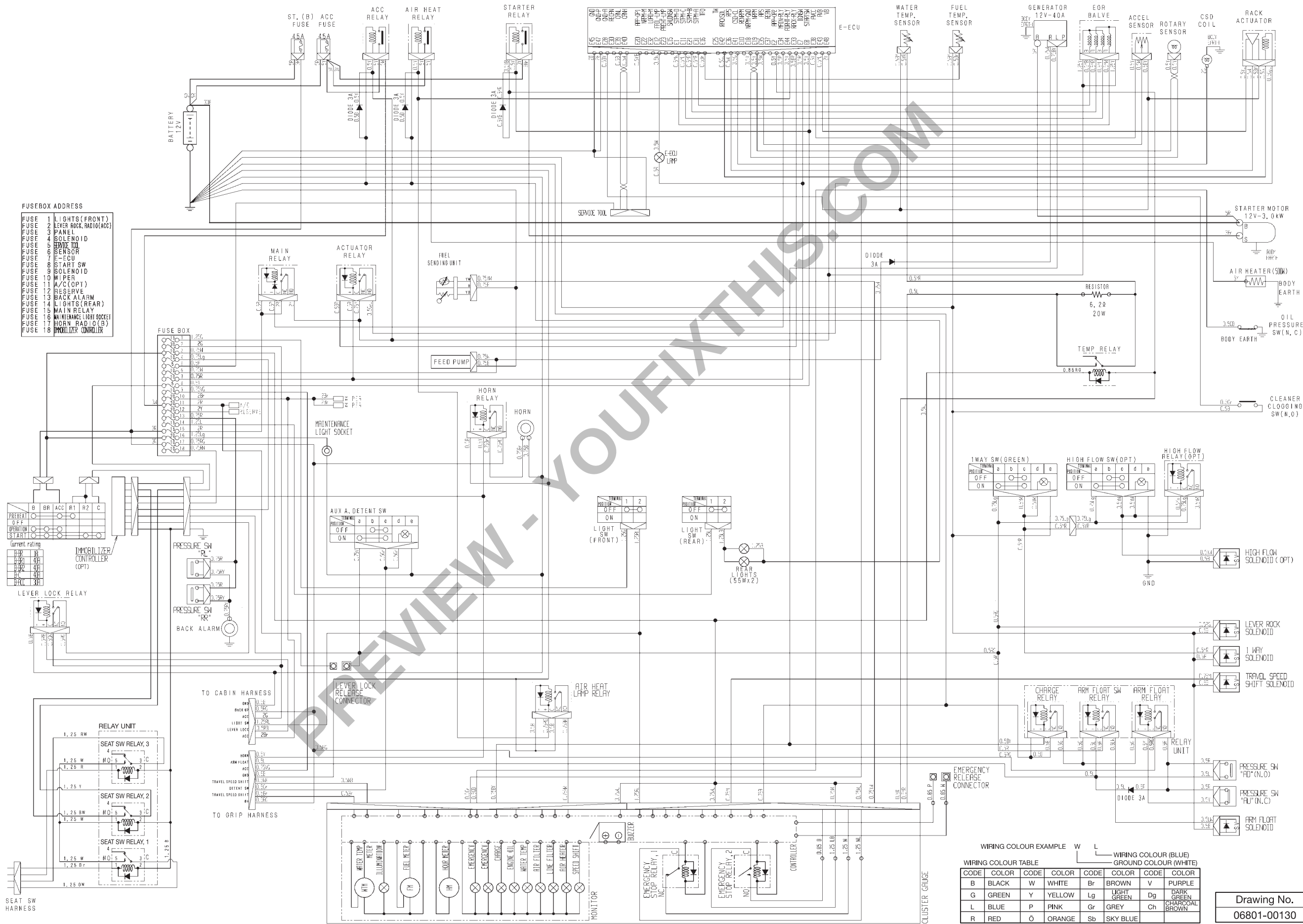


Figure 7-9 Preventive Maintenance Schedule.



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)				COMPONENT	MAINTENANCE INTERVAL (months)			
	3*	6*	12*	DONE		3*	6*	12*	DONE
1. COMPRESSOR					4. EXPANSION VALVE				
Check noise level	•			☐	Inspect capillary tube			•	☐
Check clutch pulley	•			☐	(leakage/damage/looseness)				
Check oil level	•			☐	5. EVAPORATOR				
Run system 5 minutes	•			☐	Clean dirt/bugs/leaves form			•	☐
Check belts for tension	•			☐	fins/tubes (w/compressed air)			•	☐
(120 lb max.)					Check solder joints on			•	☐
Inspect shaft seal (leakage)		•		☐	inlet/outlet tubes (leakage)			•	☐
Check mounting bracket		•		☐	Inspect condensate drain				☐
(tighten bolts)					(R-12 or oil leak)				
Check alignment to clutch		•		☐	6. OTHER COMPONENTS				
w/crankshaft drive pulley					Check discharge lines	•			☐
Perform manifold gauge check			•	☐	(hot to touch)				
Verify clutch is engaging			•	☐	Check suction lines	•			☐
					(cold to touch)				
CONDENSER					Inspect fittings/clamps/hoses		•		☐
2. Clean dirt/bugs/leaves from	•			☐	Check thermostatic switch			•	☐
coils (w/compressed air)					(proper operation)				
Check inlet/outlet for	•			☐	Outlets in cab (temperature		•		☐
obstructions/damage					check; 40 to 50°F)				
RECEIVER-DRIER					Check fan clutch (proper		•		☐
3. Check inlet line from	•			☐	operation)				
condenser (hot to touch)					Inspect all wiring		•		☐
Check sight glass	•			☐	connections				
(streaks or cloudiness)					Operate manual controls	•			☐
Replace if system is opened			•	☐	through full functions				

The following require monthly maintenance:

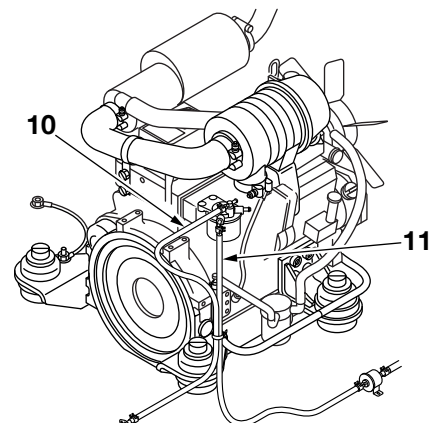
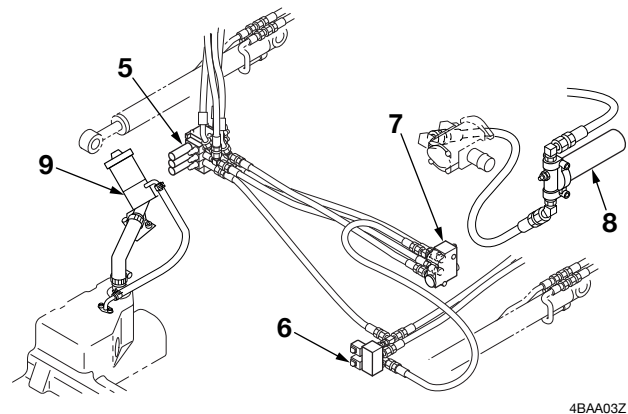
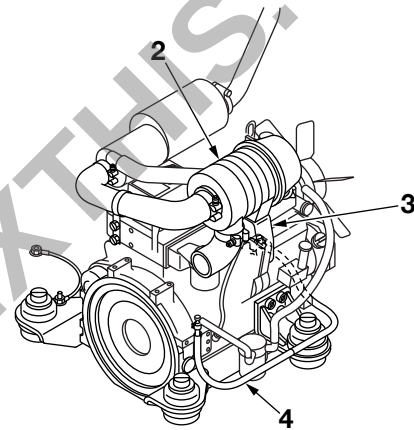
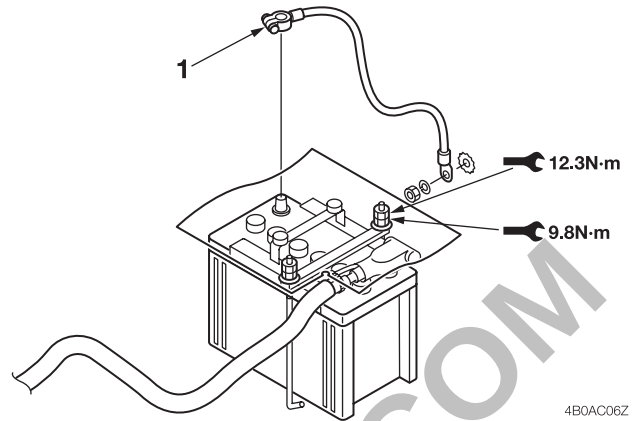
*Compressor – run system at least 5 minutes (40 degrees Fahrenheit minimum outside temp.) in order to circulate oil and lubricate components.

Maintenance notes: _____

DRIVE SYSTEM

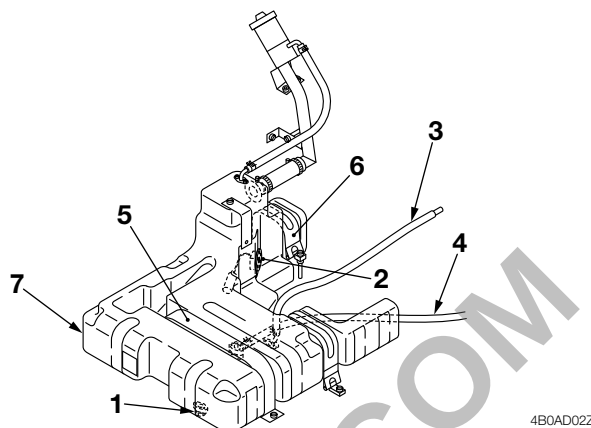
Removing the engine

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).



Removing the fuel tank

1. Remove the floor frame.
☞ "Removing the floor frame"
2. Remove the lever stands.
☞ "Removing the lever stand"
3. Remove the hydraulic pump.
☞ "Removing the hydraulic pump"
4. Loosen the drain plug (1) and drain the fuel.
 - Fuel tank capacity: 90 L
5. Disconnect the electrical wiring from the fuel sender (2).
6. Disconnect the fuel hoses (3) and (4).
7. Take out the bolts and remove the band (5).
8. Loosen the bolts and nuts, and then remove the bands (6).
9. Remove the fuel tank (7).

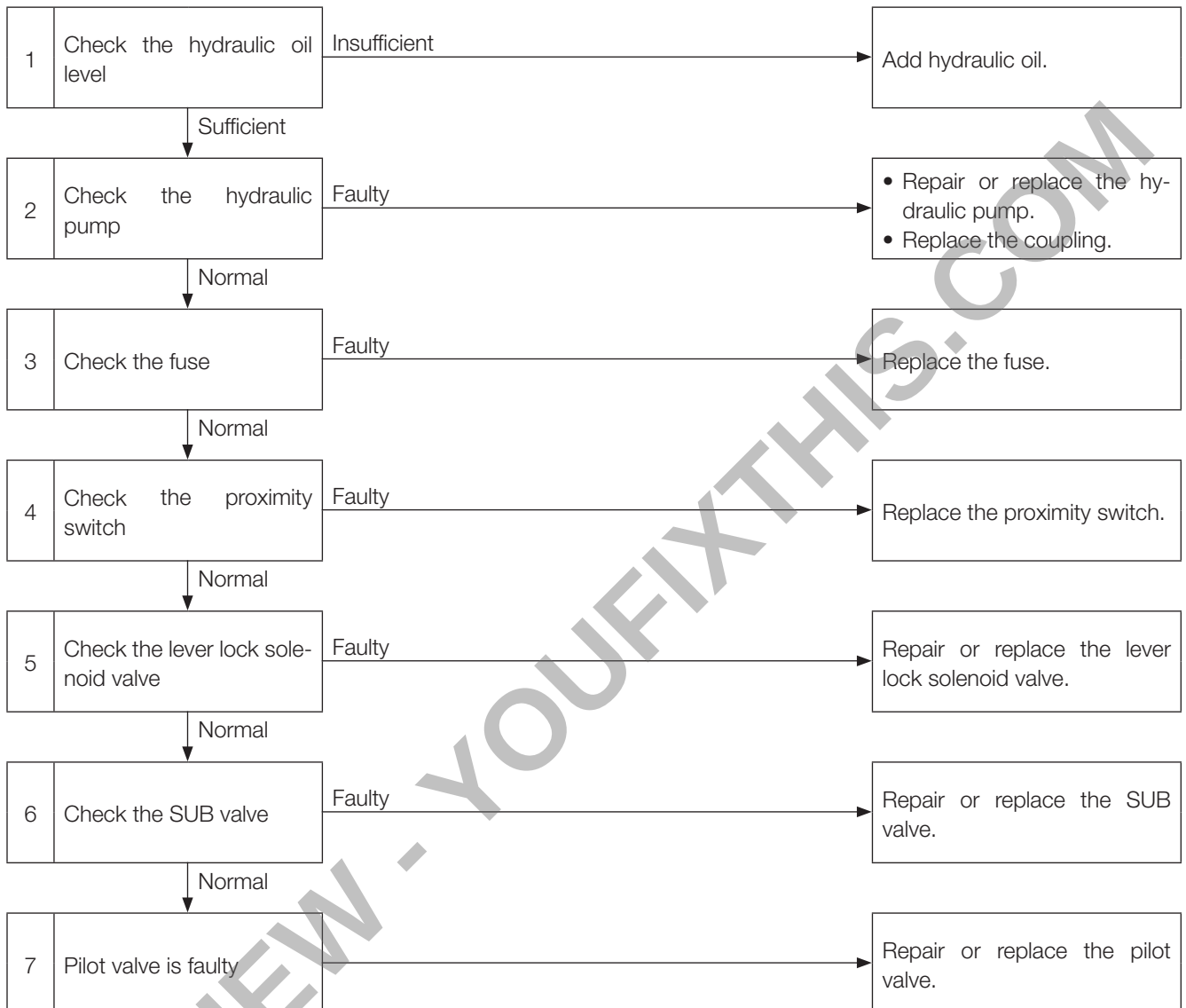


Installing the fuel tank

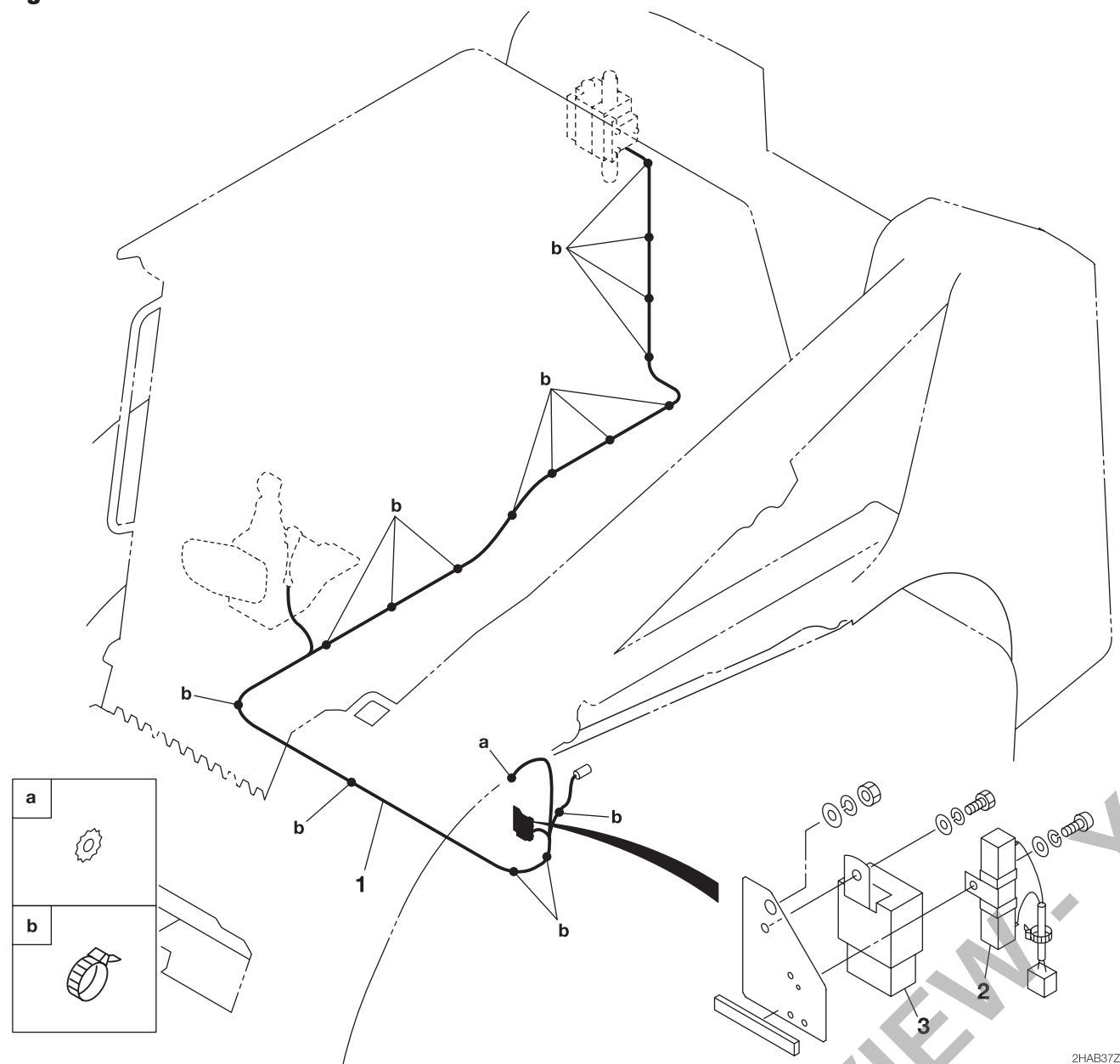
For installation of the fuel tank, follow the same procedure as for removal in the reverse order.

OVERALL MACHINE

No operation is possible.

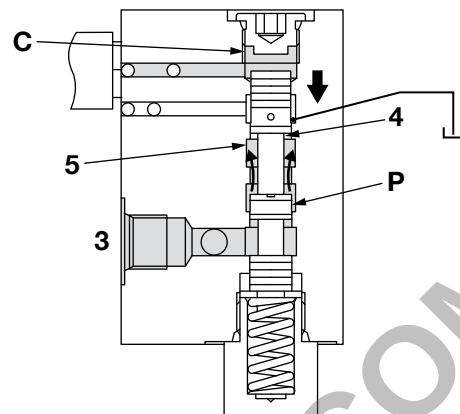


High Flow



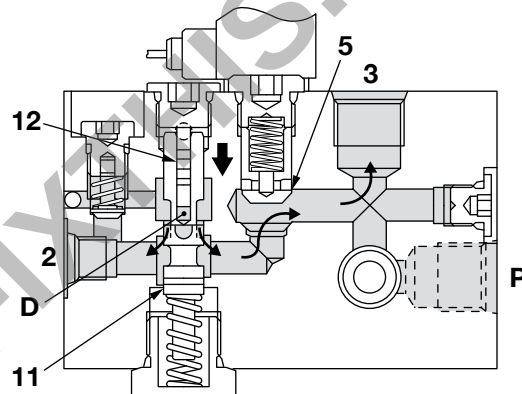
1. Wire harness (06942-00510)
2. Resistor
3. Relay

The oil that has entered the chamber C moves the spool (4) downward. As a result, the port P and the port 3 are disconnected, while the port P and the passage (5) are connected, and the oil flows from the port P to the port 1A.



3KAA04Z

The pressure oil in the port 1A passes through the bore on the side panel of the spool (11) and the wire clearance, and then flows into the chamber D of the spool (11) and piston (12). When the pressure in the chamber D becomes higher than the set pressure, the spool (11) moves downward to allow the oil in the port 1 to flow to the port 2. This keeps the pressure in the port 1 at the set pressure. The pressure oil in the port 2 pushes up the poppet (5) and flows into the port 3.

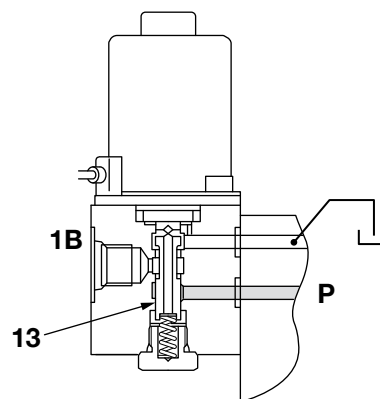


3KAA05Z

When the solenoid valve B is not energized:

The pressure oil from the port P is blocked by the spool (13).

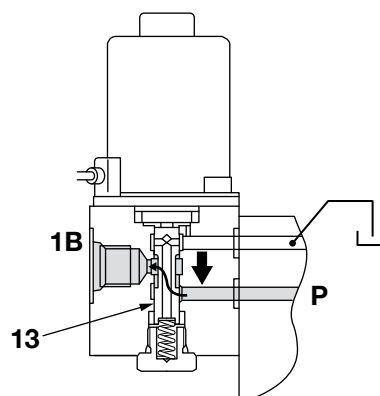
The port 1B is connected with the port T.



3KAA06Z

When the solenoid valve B is energized

A magnetic field is generated around the coil that causes the push rod to be pulled downward and the spool (13) to be pushed downward. The oil flows from the port P to the port 1B, and the passage to the port T is blocked.

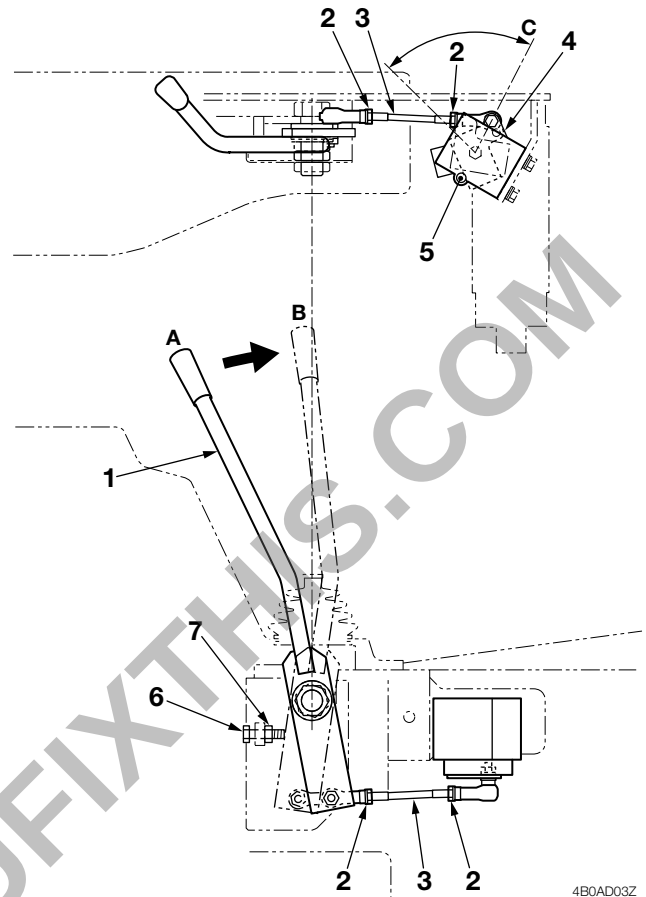


3KAA07Z

Adjusting the throttle lever

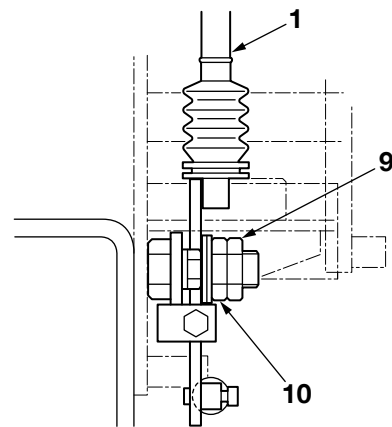
Lever operation position

1. Loosen the nut (2).
2. Turn the rod (3) to set the throttle lever (1) and the sensor lever (4) of the accelerator sensor to the following positions.
The throttle lever (1) is at the idle position (A): The lever is pushed all the way forward.
The Sensor lever (4) is at the idle position (C): The lever is pushed back all the way by the spring force.
3. Slightly squeeze in the rod (3) so that the sensor lever (4) is not contacting the stopper pin (5).
4. Retighten the nut (2).
5. Move the throttle lever (1) to the full throttle position (B) and retain the position.
6. Screw in the bolt (6) until its end pushes against the throttle lever (1).
7. Tighten the nut (7) to secure the bolt (6).



Lever control force

1. Loosen the lock nut (9) and turn the nut (10) to adjust the control force.
Control force 44.1 N
☞ "2. Service data, Performance criteria, Lever operating force"
2. Upon completion of the adjustment, tighten the lock nut (9) by holding the nut (10) to prevent it from turning.
3. Operate the throttle lever (1) again to make sure that the control force is stable.





4T Tandem Piston Pump Repair Instructions Disassembly



REMOVE SERVO PISTON, COVERS AND DISPLACEMENT LIMITERS (continued)

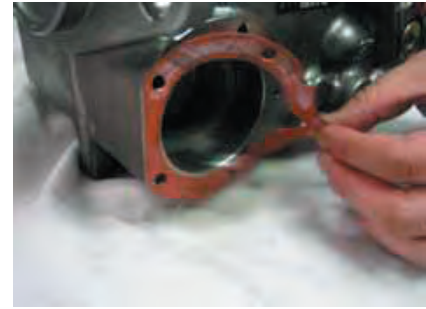
1. If necessary, using a 13mm HEX wrench, remove and discard displacement limiter locknuts (L025, L125). Remove adjustment screws (L020, L120) from servo covers.
2. If necessary, using a 11/16 in. HEX wrench, remove plugs (L010, M010, L110, M110) and discard O-rings (L010A, M010A, L110A, M110A).



3. Secure servo piston. Using 7mm and 13 mm HEX wrench, remove seal nut (T060, T160) and discard.
4. Using a 5mm internal HEX wrench, remove five screws (L005, M005, L015, M015) from each servo cover.



5. Remove servo cover (M001, M011). Unthread servo cover (L001, L011) from servo piston.
6. Remove and discard servo cover gaskets (L002, M002, L012, M012).



Load check valve (A)

1. Take out the plug (10) and remove the O-ring (11) from the plug (10).

Remove the spring (9) and the needle valve (8).

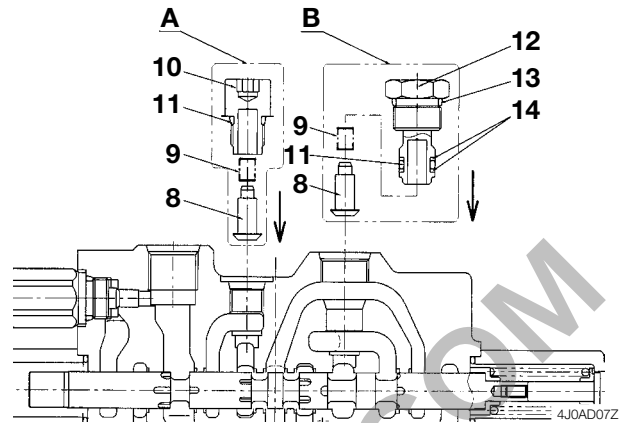
- When assembling, be sure to set the valve straight.

Load check valve (B)

1. Take out the plug (12) and remove the O-rings (11) and (13) and the backup ring from the plug (12).

2. Remove the spring (9) and the needle valve (8).

- When assembling, be sure to set the valve straight.



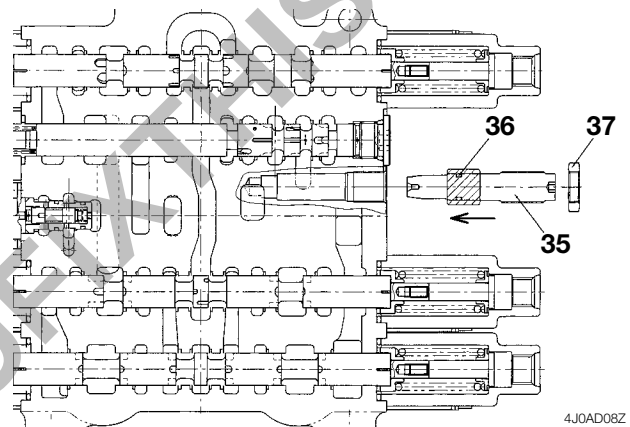
Flow ratio adjuster valve

1. Loosen the lock nut (37) and remove the adjuster (35).

2. Remove the O-ring (36) from the adjuster (35).

- When assembling, grease the diagonally shaded area in the figure.
- After assembly and when the flow ratio adjustment is complete, tighten the lock nut with the specified torque.

👉 "Adjusting the flow ratio"



Arm float valve

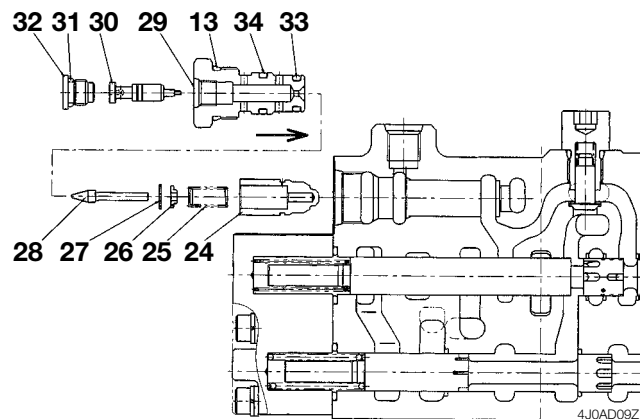
1. Take out the plug (32) and remove the O-ring (31) from the plug (32).

2. Remove the piston (30).

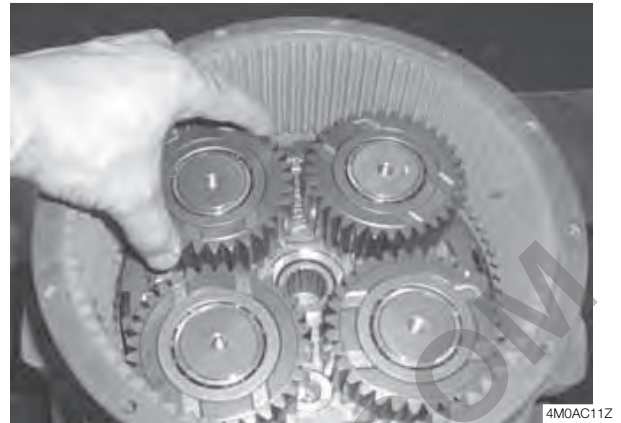
3. Take out the plug (29) and remove the O-rings (13), (34) and (33).

4. Remove the needle valve (28) and the check valve (24).

5. Take out the snap ring (27) from the check valve (24) and remove the spring seat (26) and the spring (25).

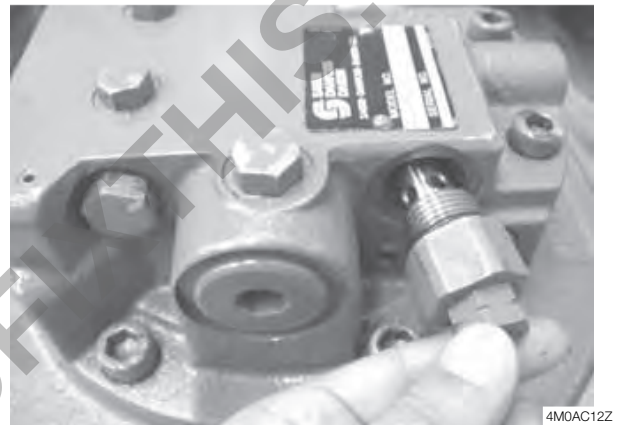


6. Remove the planet gear (7).
 - Remove the planet gear (7) together with the needle bearing (16).

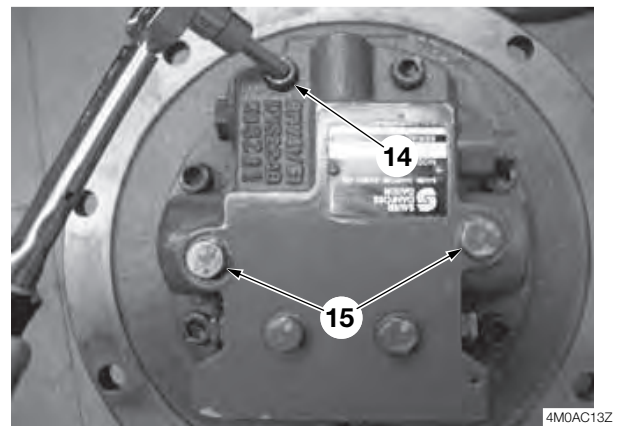


Hydraulic motor

1. Remove the relief valves (50).



2. Take out the cap screws (14) and (15), and then remove the valve body (13).



3. Remove the springs (28), the pins (2), the O-rings (8, 9, 35) and the valve plate (11).



1. Check the operation of actuators other than the auxiliary line.

Check the bucket as listed in the table on the right to see if the problem is in the auxiliary line alone. If the problem is in the auxiliary line, then check the main relief valve and the hydraulic pump (P3).

☞ “5-8”

Lever operated	Place to be checked	
Bucket	Relief valve R3	Pump P3

2. Check the proportional controller.**Inspection**

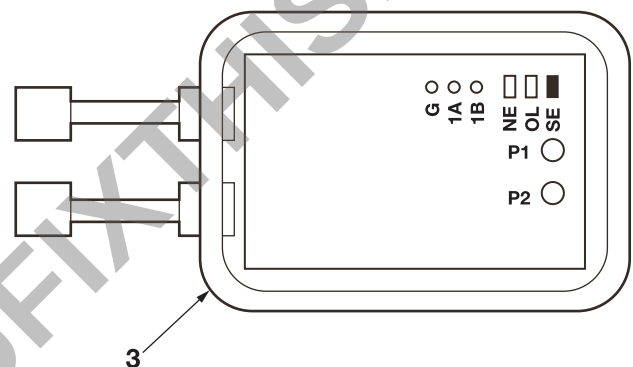
The proportional controller (3) has a built-in fault detection function that shuts down the output of the solenoid drive current for the proportional solenoid valve (4) if an error is detected.

The fault detection function is retained until it is reset at power-up after the error has been eliminated.

a. Sensor error

The input proportional signals are continuously monitored with respect to range. If the input signal falls outside the operating range due to a wire break or the like, a sensor error is detected. If this occurs, the “SE” LED on the controller lights up.

- Repair the wiring connected to the proportional lever (2), or replace the handle assembly of the pilot valve.

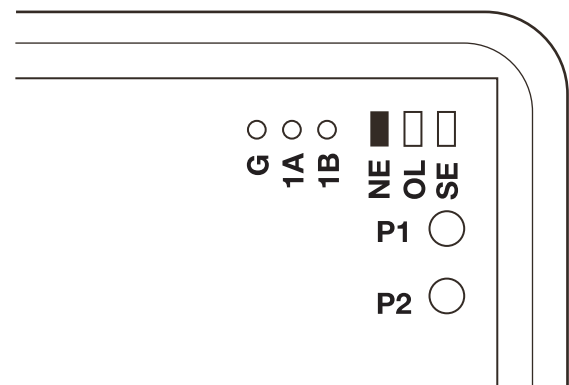


5P0AC01Z

b. Neutral error

If the output of the proportional control drive current falls outside the neutral range within a certain time (approx. 1 second) after power-up, a neutral error is detected. If this occurs, the “NE” LED on the controller lights up.

- Remove any foreign matter from the proportional lever (2) and clean it, or replace the handle assembly.

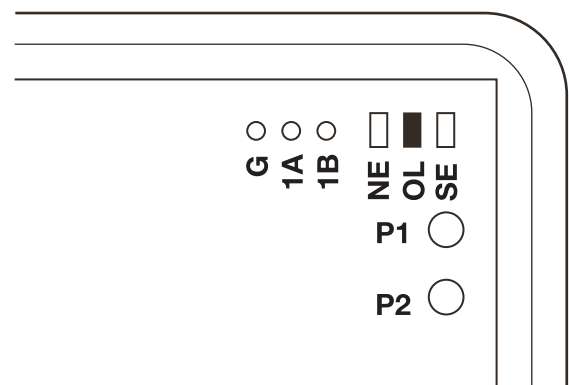


5P0AC02Z

c. Overcurrent

If the drive current output of either of the solenoid valve (A) or (B) exceeds the limit value due to a short circuit or the like, an overcurrent error is detected. If this occurs, the “OL” LED on the controller lights up.

- Repair the wiring between the controller and the solenoid valve A or B.



5P0AC03Z

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