CEBM001102

Shop Manual

KOMATSU®

WA180-3
WA180L-3

WHEEL LOADER

SERIAL NUMBERS WA180-3L - A80001 and up
WA180L-3 - 54001

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September 2000

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COOLANT SPECIFICATIONS

GENERAL

Selection and maintenance of the engine coolant is important to long engine life. The following information provides recommendations for selecting the engine coolant and maintaining the coolant inhibitors.

Heavy duty diesel engines require a balanced coolant mixture of water, antifreeze, and supplemental coolant additives. Supplemental coolant additive recommendations are included in the section entitled Inhibitors Conditioners. The coolant mixture **must** be drained and replaced at the specified service interval shown in the OPERATION & MAINTENANCE MANUAL, or every two years of operation, whichever comes first.

WATER

Use water which has a low mineral content. Water used in conjunction with antifreeze, coolant filters and inhibited water must meet the following standards:

Total Hardness - Not to exceed 170 parts per million (10 grains/gallon maximum) to prevent scale deposits. Water containing dissolved magnesium and calcium (the usual reason for water hardness) above the specified amount will cause scale deposits to develop in the engine.

Chlorides - Not to exceed 40 parts per million (2.5 grains/gallon maximum) to prevent corrosion.

Sulfites - Not to exceed 100 parts per million (5.8 grains/gallon maximum) to prevent corrosion.

Dissolved Solids - Not to exceed 340 parts per million (20 grains/gallon maximum) to minimize sludge deposits, scale deposits, corrosion or a combination of these.

If any of the above requirements cannot be met, use distilled, de-ionized, or de-mineralized water. To determine if local water supplies meet these standards, water samples can be tested by water treatment laboratories. Softened water that is prepared using common salt (sodium chloride) contains excessive amounts of chlorides and should not be used.

★ Never use water alone in the cooling system because corrosion will occur.

ANTIFREEZE

In climates where the temperature is above -37°C (-34°F), use a coolant mixture that contains 50 percent antifreeze. **Antifreeze is essential in any climate**. It broadens the operating temperature range by lowering the coolant freezing point and by raising its boiling point. Do **not** use more than 50 percent antifreeze in the mixture unless additional freeze protection is required. **Never** use more than 68 percent antifreeze under any condition.

An antifreeze concentration greater than 68% will adversely affect freeze protection and heat transfer rates. Antifreeze concentrations between 68 and 100% actually have a higher freezing point than a 68% antifreeze concentration and should not be used due to reduced heat transfer rates.

Low silicate ethylene glycol antifreeze is recommended. The antifreeze should contain no more than 0.1% anhydrous alkali metasilicate. Low silicate antifreeze is recommended to avoid the formation of silica-gel (hydro-gel). This gel formation can occur when the cooling system contains an over concentration of high silicate antifreeze and/or supplemental coolant additive. DO NOT use methanol or alcohol as an antifreeze because of its low boiling point.

Antifreeze may retain its freeze protection for more than one season but coolant conditioners must be added to maintain corrosion protection.

Antifreeze formulated with methoxy propanol, or propylene glycol, is not recommended for this system.

★ Do not mix types of antifreeze solutions. Mixed solutions make it impossible to determine the protection against freezing. Antifreeze containing sealer or anti-leak additives should NOT be used in this system. Sealer or anti-leak additives will cause plugging problems in the cooling system.

Check the solution periodically and at normal operating temperature, to be sure the cooling system has sufficient protection against freezing.

The following table shows the approximate percentage of antifreeze solution required for various temperatures.

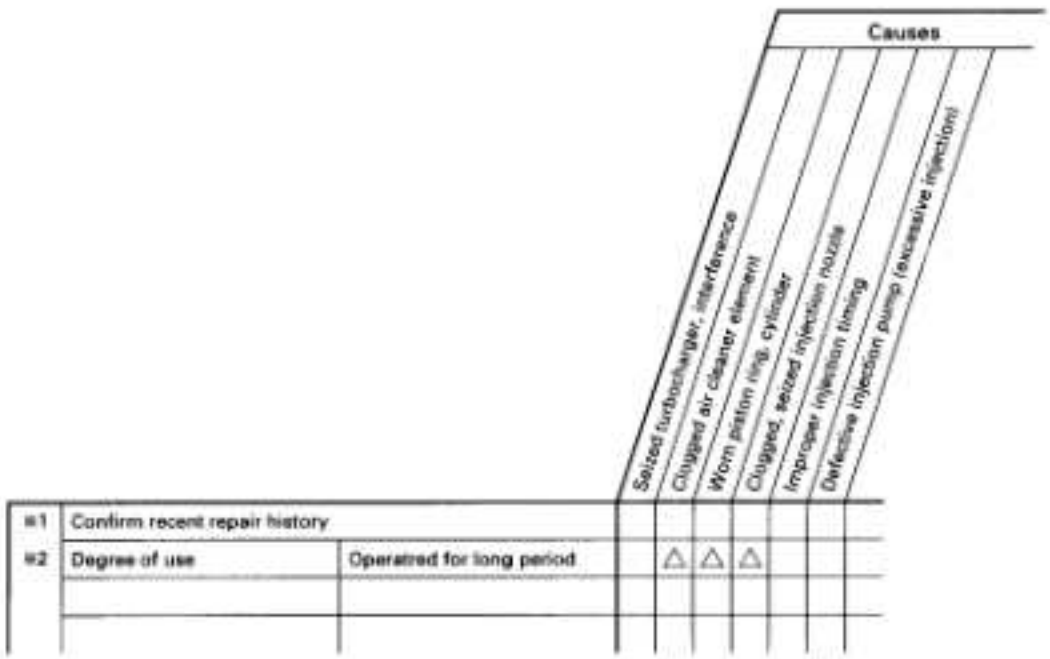
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The basic method of using the troubleshooting chart is as follows.
Items listed for **[Questions]** and **[Check Items]** that have a relationship with the Cause items are marked with ○, and of these, causes that have a high probability are marked with ◎.

Check each of the **[Questions]** and **[Check Items]** in turn, and marke the ○ or ◎ in the chart for items where the problem appeared. The vertical column (Causes) that has the highest number of points is the most probable cause, so start troubleshooting for that item to make the final confirmation of the cause.

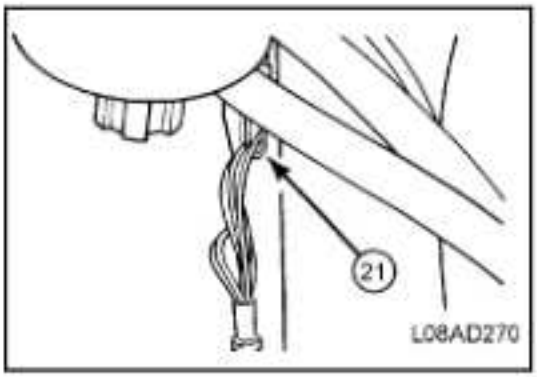
※1. For **[Confirm recent repair history]** in the Question section, ask the user, and mark the Cause column with a to use as reference for locating the cause of the failure. However, do not use this when making calculation to narrow down the causes.

※2. Use the in the Cause column as reference for **[Degree of use (Operated for long period)]** in the Questions section as reference. As a rule, do not use it when calculating the points for locating the cause, but it can be included in necessary to determine the order for troubleshooting.

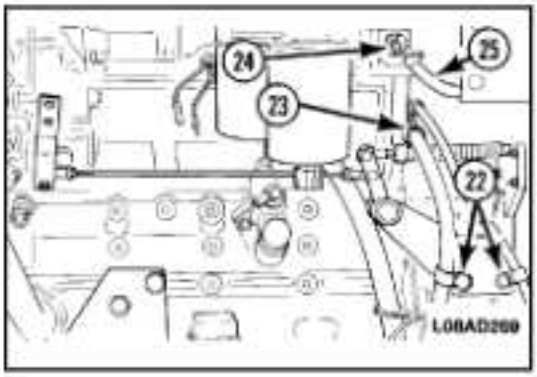


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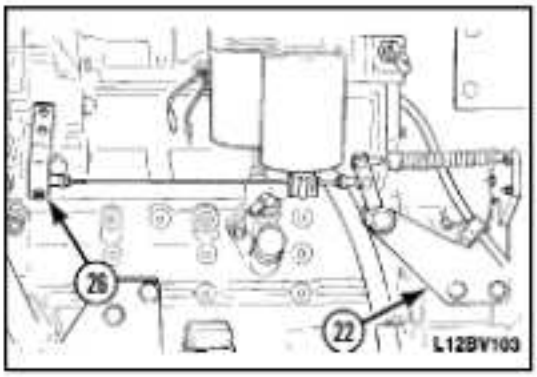
E) Unclip engine harness from floor harness (21).



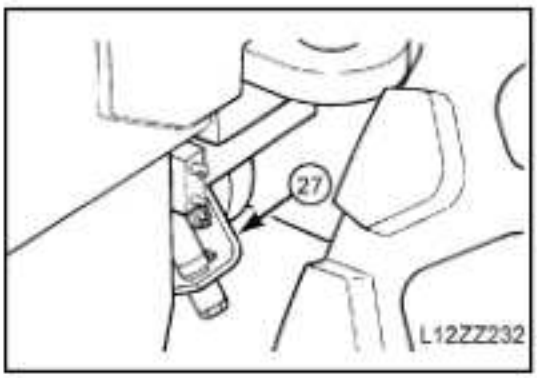
F) Unclip harness and cranking motor cable at throttle bracket (22) at rear of engine (23), and shut off petcock (24), and disconnect heater hose (25).



G) Disconnect throttle linkage rod at fuel pump lever (26), remove throttle bracket (22) and position assembly out of way.

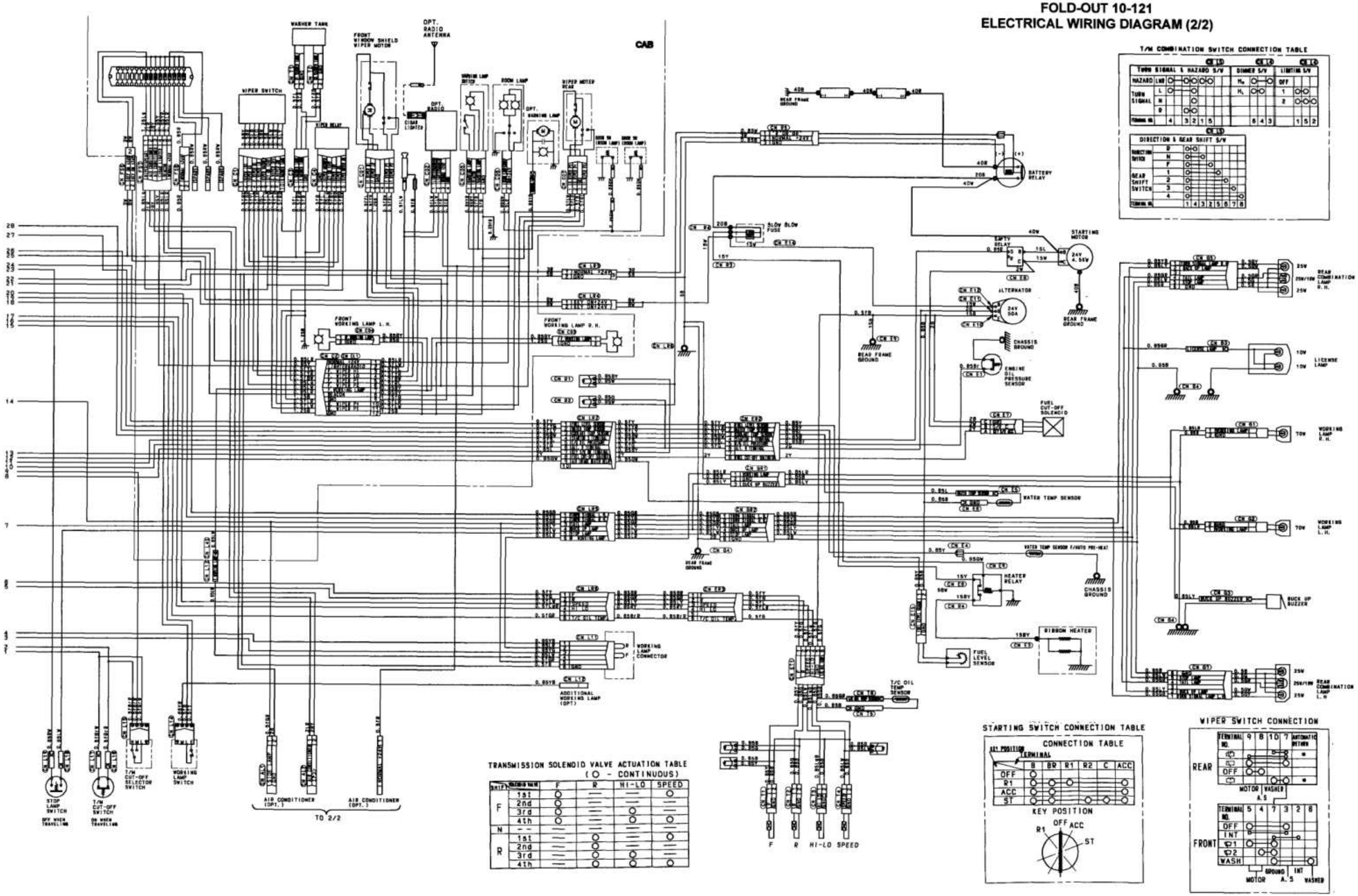


H) Remove remote engine oil drain bracket (27) from trunnion.



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FOLD-OUT 10-121
ELECTRICAL WIRING DIAGRAM (2/2)



T/M COMBINATION SWITCH CONNECTION TABLE

TURN SIGNAL & HAZARD S/V		CN-L5						DIMMER S/V		CN-L6					LIGHTING S/V		CN-L6		
HAZARD	LNR	○		○	○	○			H_2	○		○			OFF				
TURN SIGNAL	L	○							H_1	○	○				1		○	○	
	N			○											2		○	○	○
	R			○	○														
TERMINAL NO.		4		3	2	1	5			6	4	3					1	5	2

DIRECTION & GEAR SHIFT S/V		CN-L5							
DIRECTION SWITCH	R	○	○						
	N	○							
	F	○		○					
GEAR SHIFT SWITCH	1	○			○				
	2	○				○			
	3	○					○		
	4	○						○	
TERMINAL NO.		1	4	3	2	5	6	7	8

TRANSMISSION SOLENOID VALVE ACTUATION TABLE
(○ - CONTINUOUS)

SHIFT	VALVE NAME	F	R	HI-LO	SPEED
F	1st	○	—	—	○
	2nd	○	—	—	—
	3rd	○	—	○	—
	4th	○	—	○	○
N	- -	—	—	—	—
R	1st	—	○	—	○
	2nd	—	○	—	—
	3rd	—	○	○	—
	4th	—	○	○	○

STARTING SWITCH CONNECTION TABLE

KEY POSITION \ TERMINAL	B	BR	R1	R2	C	ACC
OFF						
R1	○		○			○
ACC	○		○			○
ST	○		○	○	○	○

KEY POSITION

WIPER SWITCH CONNECTION

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