WIRING DIAGRAM

24V USA TYPE



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Problem			Symptom	Diagram
○ Truck does not move ○ Truck stops depending on turning angle of tires ○ Truck stops when traveling forward and in reverse ○ Truck stops when accelerating or during plugging ○ Truck travels, but speed cannot be adjusted according to accelerator position.				
Operation pilot lamp goes on	F-R contactor does not close (symbols: MFL, MFR, MRL, MRR)		1 – A	
	One or both of F-R contactors (forward or reverse) do not close		1 – B	
	F-R contactor closes	Truck does not travel in either direction (forward or reverse) (no chopping sound is heard)	2 – A	
		F-R contactor closes, but opens again immediately ○ Spark is produced (commutation failure) ○ Produced when load is heavy	2 – B	
		F-R contactor closes, but opens again immediately — No spark produced	2 – C	
		Truck does not travel. Truck travels but travel speed does not change according to accelerator position (chopping sound is heard)	2 – D	
○ Truck cannot travel at max. travel speed ○ Bypass contactor does not work normally				
Operation pilot lamp goes on	F-R contactor closes	Truck travels but does not accelerate — Bypass contactor (MS) does not close	3 – A	
		Truck travels but does not accelerate — Bypass contactor (MS) closes	3 – B	
○ Lift, tilt do not work ○ Power steering does not work				
		Lift, tilt do not work — Pump contactor (MP) does not close	4 – A	
		Power steering does not work — Power steering contactor (MPS) does not close	4 – B	

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(1) Voltage check

Put the negative lead of meter to the ground and the positive lead to the test point. Read the meter to see test voltage is whether normal or not.

☆ Be careful not to short-circuit the test point to other conductor through the positive lead of meter.

See voltage table Page 10-31.

(2) Print card

☆ When removing the print card, always remove the battery connector first.

☆ Wind tape around the gate line of the thyristor to insulate it.

i) Correcting installed condition of print card.
Try putting in and out its connector repeatedly to correct poor contact caused by dust or rust. At the same time, check lead wires for partial or complete disconnection.

ii) Replacing print card
Try replacing a questionable print card with a good one removed from another normally operating device. If trouble symptom disappears, replace the defective print card part with new one.

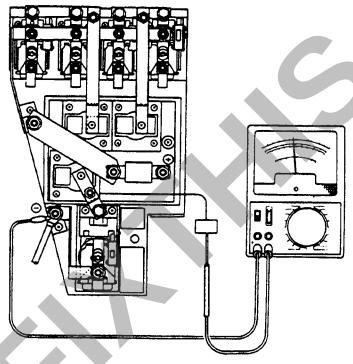
(3) Thyristor check

Checking for blowing out
This is to check internal short circuit of a thyristor. Disconnect the thyristor cathode terminal from the mating part and disconnect the gate Ⓖ terminal. Set an ohmmeter (circuit tester) to the specified range and measure the resistance between the anode Ⓐ and cathode Ⓚ.
Ohmmeter must indicate infinity (∞) regardless of polarity of meter leads. If reading of the meter is near to zero, the thyristor is blowing out.

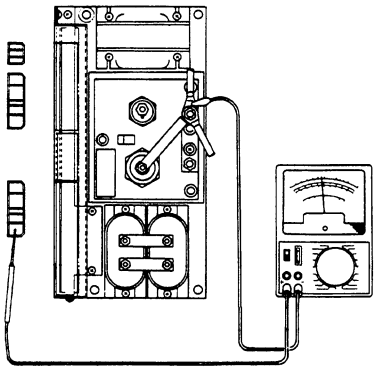
Checking thyristor for conduction
Disconnect the thyristor gate Ⓖ terminal. Set an ohmmeter to the specified range. Measure the resistance between the gate Ⓖ and cathode Ⓚ by connecting the negative lead of meter to the gate Ⓖ and the positive lead to the cathode Ⓚ. The thyristor is normal if the meter indicates a resistance less than 100Ω. The thyristor is defective or its gate Ⓖ lead is disconnected if the meter reading is infinity (∞).

☆ When wires are disconnected during inspection, always wind them with tape to insulate them. Be particularly careful with the gate wire.

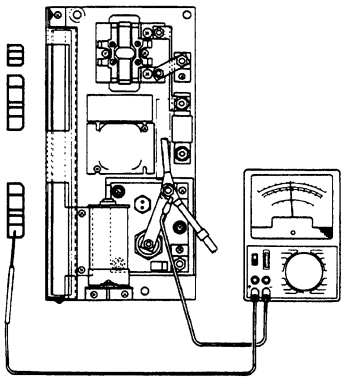
Chopper panel



Contactor panel



24V type



48V type

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5-2 Main electrical parts

Inspection tool and measurement device

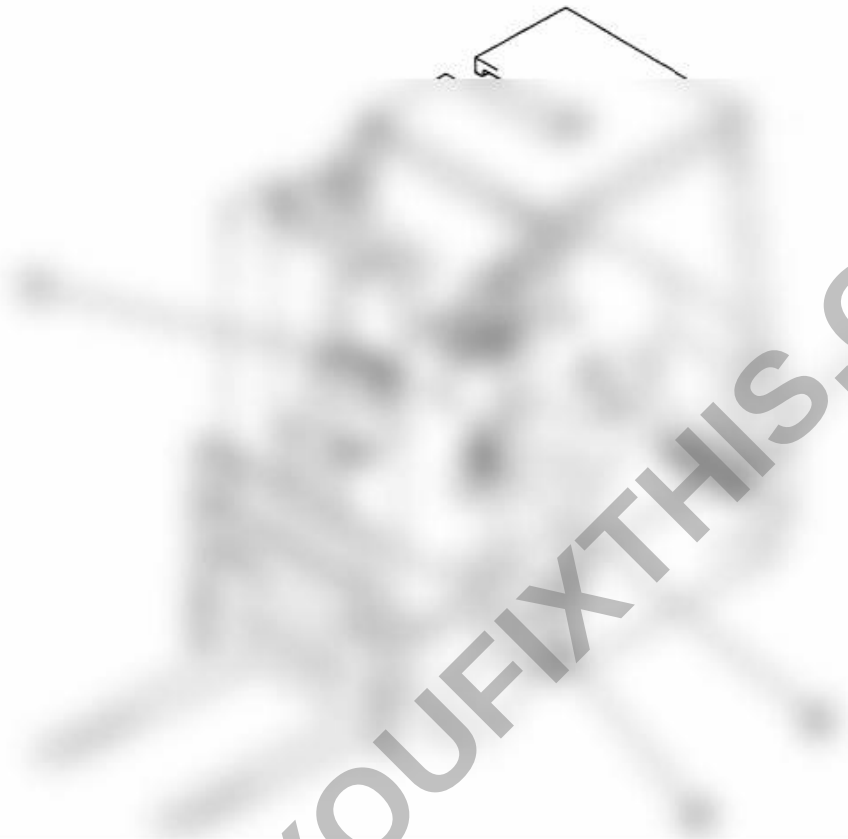
No.	Name	Specifications	Remarks

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ADJUSTMENT OF MICROSWITCH



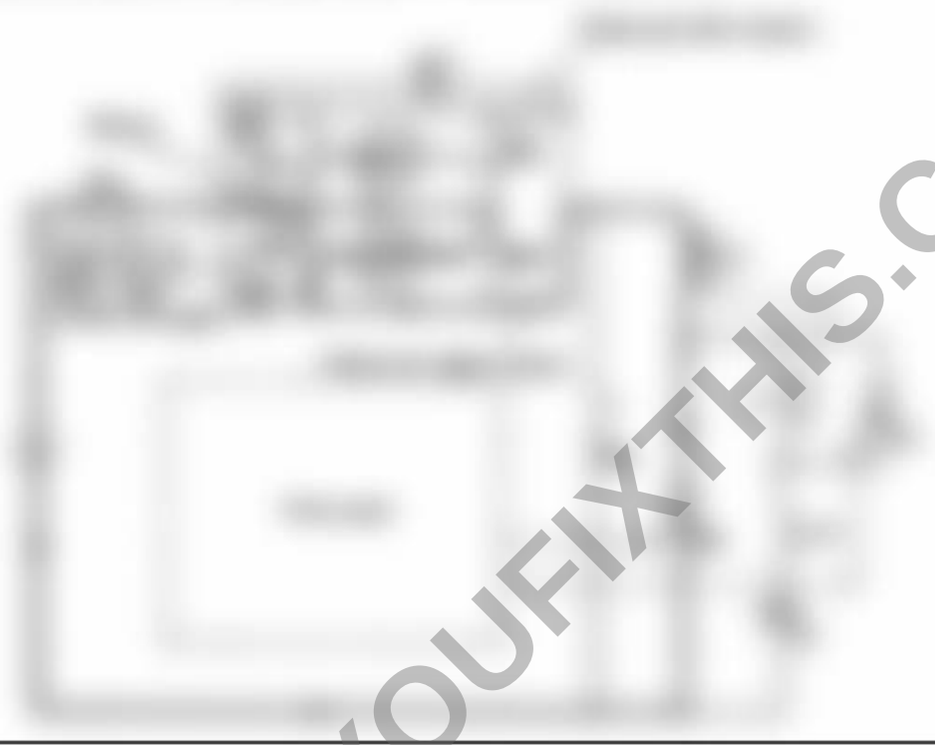
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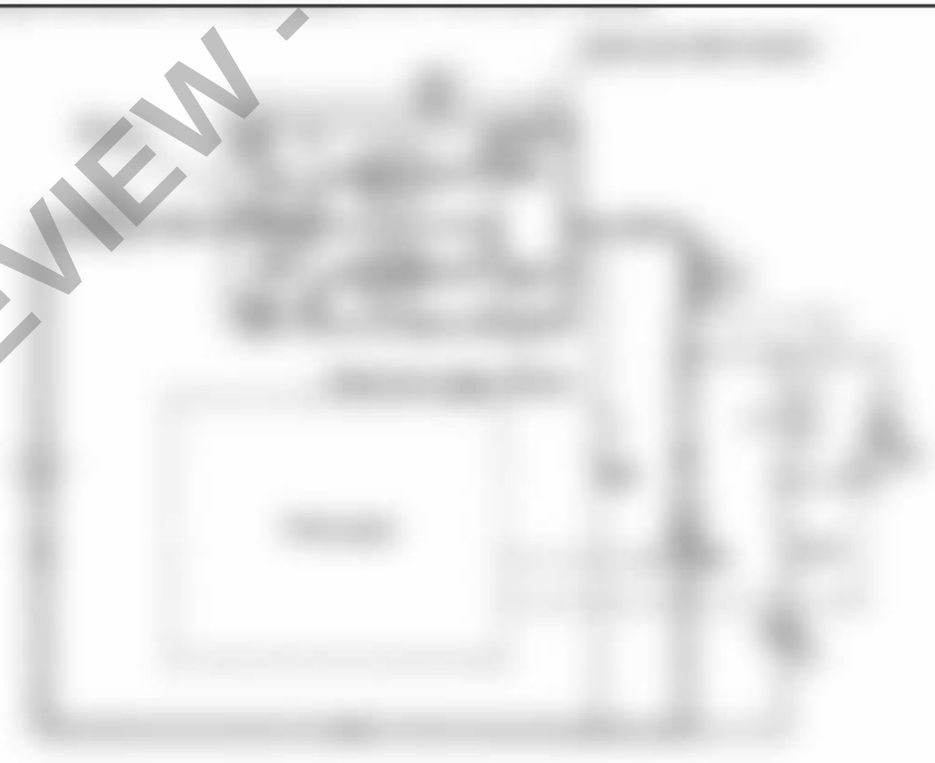
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Travelling forward turning left (tire angle approx. 40°) → left motor stopped (free)



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Check point	Voltage	Operation
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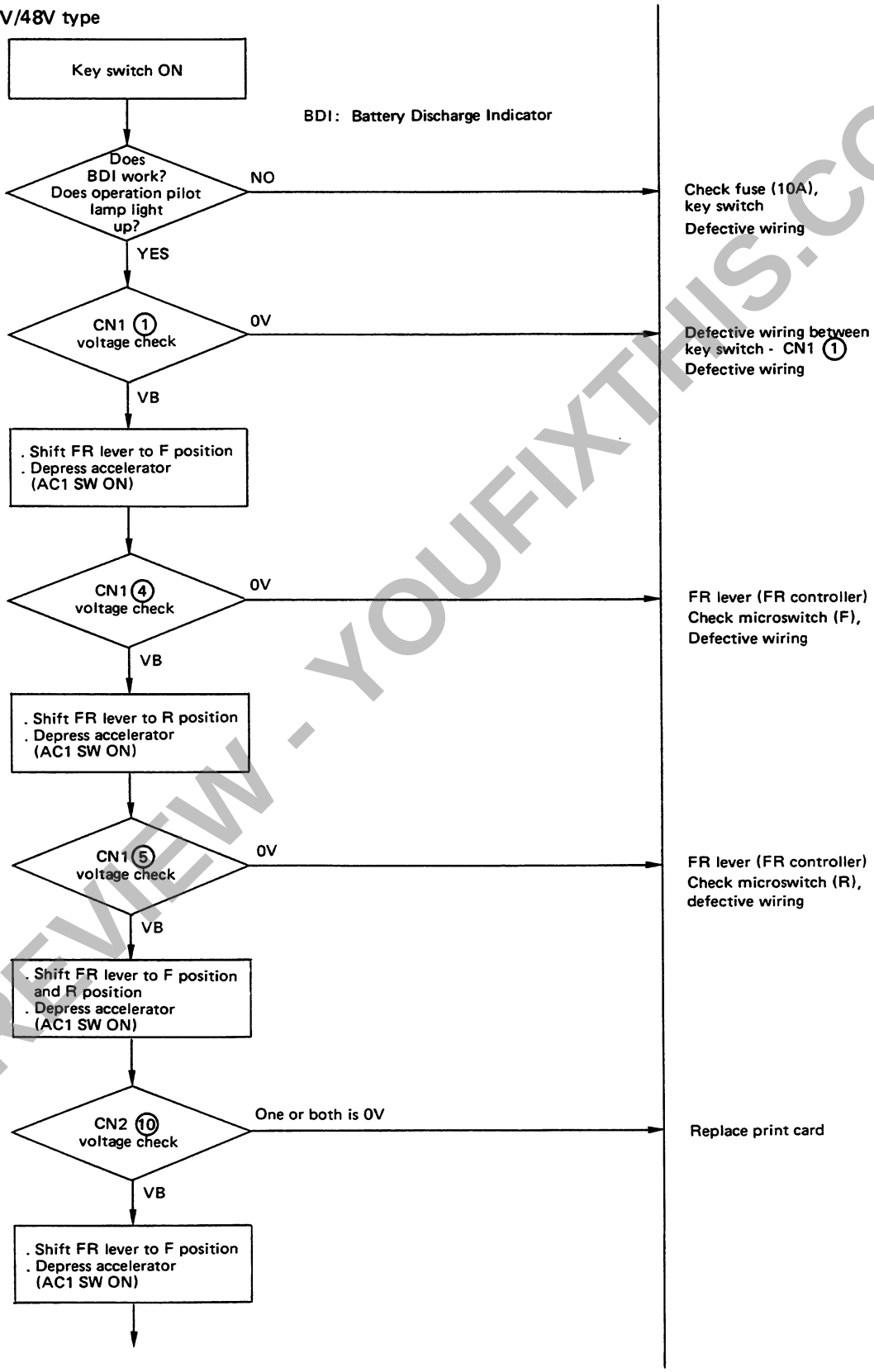
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1-A F-R contactor does not close

1-2 24V/48V type



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