#### **General Information**

#### Before replacing devices

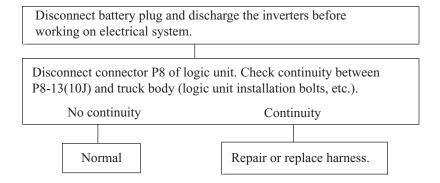
Do not replace devices casually even if replacement is required as a result of troubleshooting. Be sure to check the following items before replacing devices (logic unit, logic card, power supply card, inverters and inverter DSP cards).

- Loose battery connectors
- Abnormal wire harness connections
- Loose connectors
- Broken, bent or loose connector pins
- Dirty connectors

If connectors are dirty, remove the connector and clean connectors.

See "How to clean harness connectors and system components" on page 2-2.

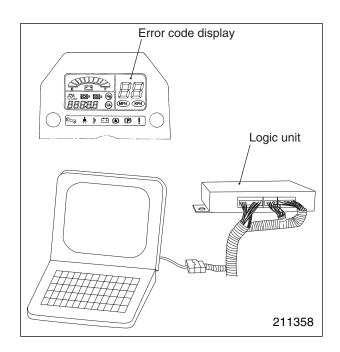
• Ensure that the main harness is not short-circuited to the truck body by using the following procedures.



If any of these items (above items) is a source of the trouble, the device will be damaged even if it is replaced with a new one. Be sure to check the above items and replace carefully.

#### Connection of the service tool

- 1. Turn off the truck power.
- 2. Remove the rear cover.
- 3. Find the connector to the service tool near the logic unit.
- 4. Remove the cover and connect the PC as shown.
- 5. Turn on the truck power.
- 6. Start the service tool software.



# How to clean harness connectors and system components

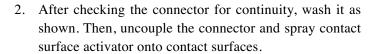
1. Open-circuits are often caused by dirty harness connectors and components. Dust, together with greasy matter, forms grime which, in time, penetrates electrical connections, resulting in loose metal-to-metal contact or, for worse, electrical separation of surfaces in contact. For this reason, it is essential that the connectors and components be cleaned at each periodic inspection and at when servicing the truck. Instead of a commonly used solvent, use electronic parts cleaner (in the manner illustrated on the right).

Electronic parts	Three Bond 29D or
cleaner	Pow-R-Wash CZ*



The cleaner liquid is volatile. All you have to do is just give a strong spray to wash off grime.

No need to wipe off the sprayed liquid.



Install and remove the connector several times to wet the surfaces thoroughly with the activator liquid.

After coupling up the connector, check to be sure that it is in locked state.

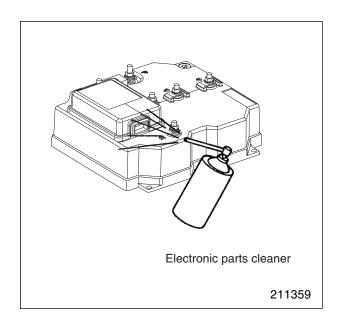
Contact surface	Three Bond 2501S (aerosol)
activator	or Nyogel 760G*

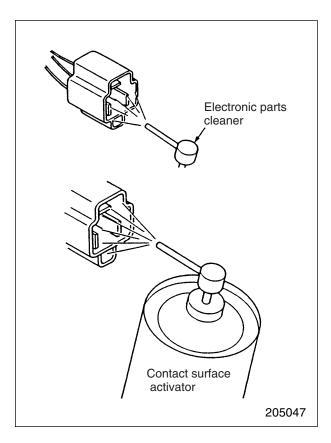
#### NOTE

Do not spray too much liquid into the connector.

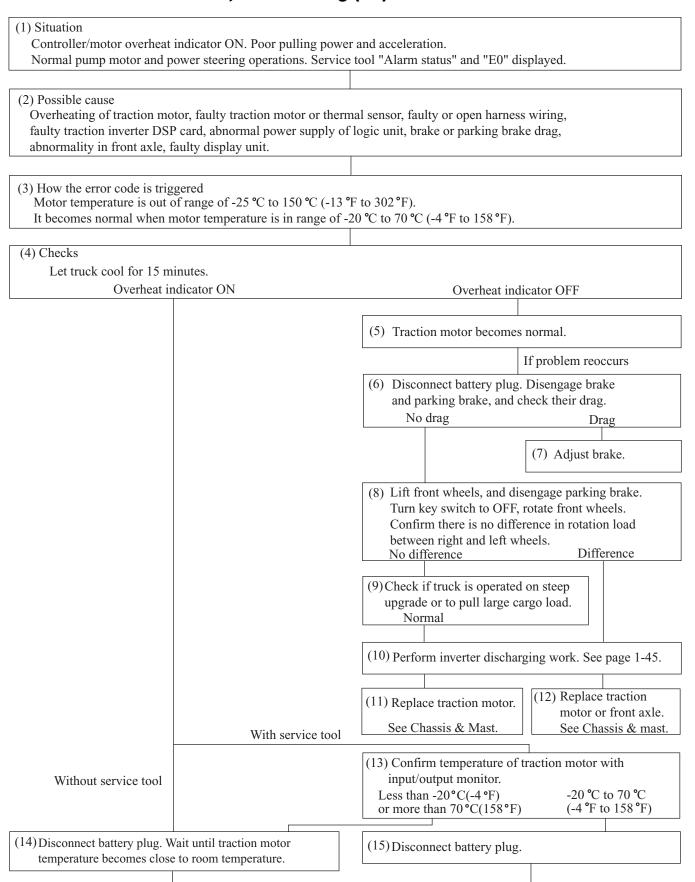
Cleaner liquid reacts differently with some resins (plastic materials).

\*: Products contained in Terminal Maintenance Kit (SE000003)

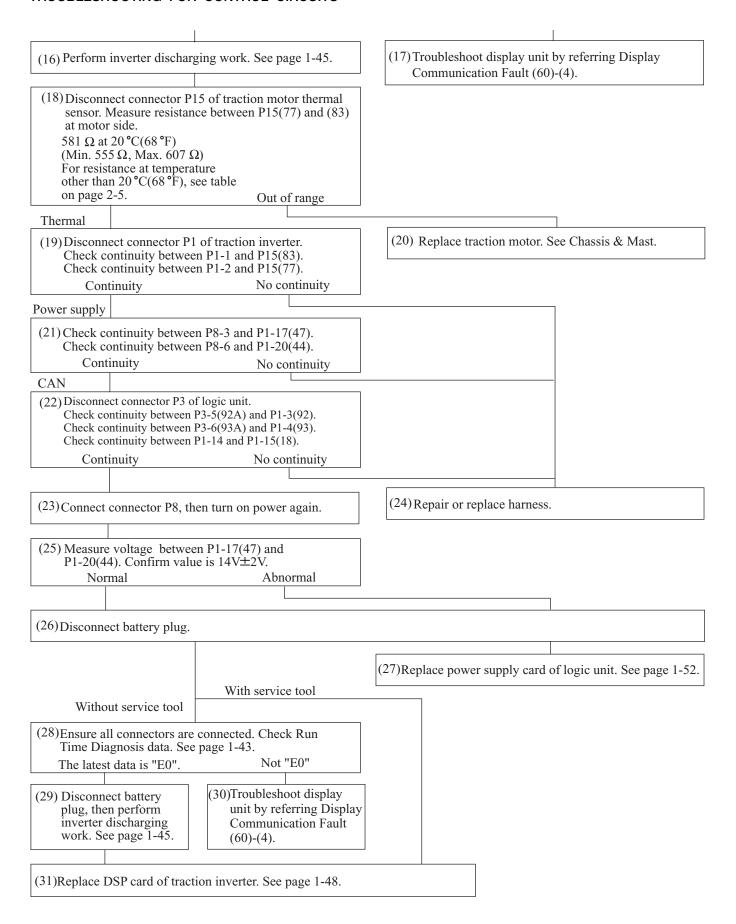


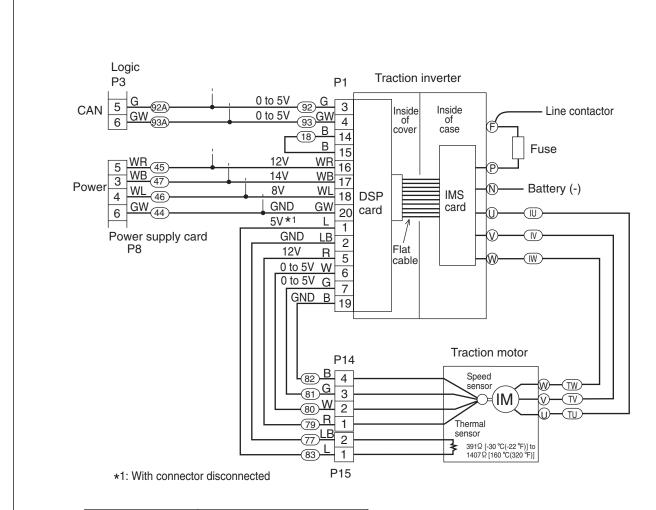


### **Problem: Traction Motor, Overheating (E0)**



#### TROUBLESHOOTING FOR CONTROL CIRCUITS



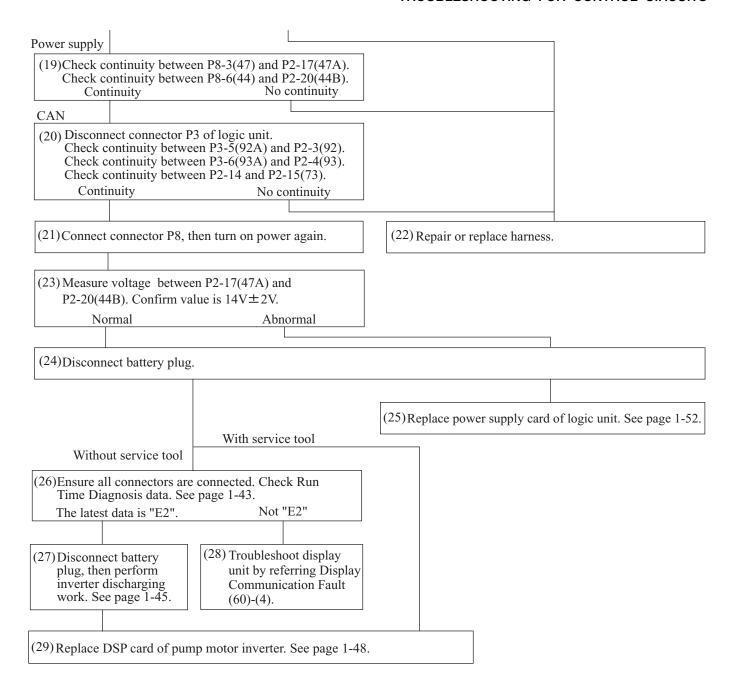


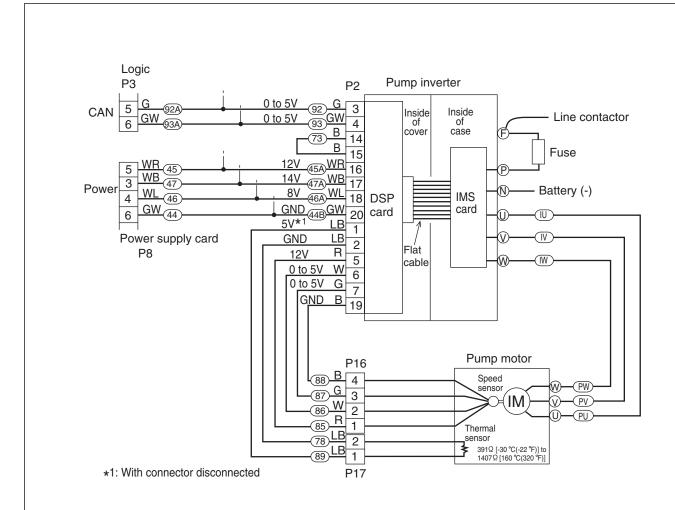
/	BIENT ERATURE	RE	SISTANC	E
(°C)	(°F)	MIN.	TYP.	MAX.
-30	-22	362	391	419
-10	14	428	460	492
0	32	464	498	532
10	50	503	538	574
30	86	587	626	665
50	122	679	722	764
70	158	781	826	872
90	194	891	940	989
110	230	1007	1062	1117
130	266	1128	1194	1259
150	302	1256	1334	1412

211360

### **Problem: Pump Motor, Overheating (Transistor Control Type) (E2)**

	neat indicator ON. Lifting speed erations. Service tool "Alarm state	slower than normal. Normal tractio	n motor
	d, abnormal power supply of log	mal sensor, faulty or open harness vicio unit, abnormal oil pressure of ge	
	at of range of -25 °C to 150 °C (-1	13 °F to 302 °F). of -20 °C to 70 °C (-4 °F to 158 °F).	
(4) Checks			
Let truck cool for 15 m			
Overheat in	dicator ON	Overheat ind	icator OFF
		(5) Pump motor becomes norm	nal.
		]	If problem reoccurs
		(6)Check if truck is operated to	o lift large cargo load.
		l N	Vormal
		(7) Perform inverter discharging	ng work. See page 1-45.
		(8)Check oil pressure of gear Normal	pump and hydraulic lines. Abnormal
	Wid	(9) Replace pump motor. See Chassis & Mast.	(10)Repair or replace gear pump or piping. See Chassis & Mast.
	With service tool		
Without service tool		(11) Confirm temperature of puinput/output monitor.	ump motor with
Without Service tool		Less than -20°C(-4°F) or more than 70°C(158°F)	-20 °C to 70 °C (-4 °F to 158 °F)
(12) Disconnect battery plug. temperature becomes clo	Wait until pump motor ose to room temperature.	(13) Disconnect battery plug.	
(14) Perform inverter discharg	ging work. See page 1-45.	(15) Troubleshoot display unit Communication Fault (60	
(16) Disconnect connector P sensor. Measure resistar 581 Ω at 20 °C(68 °F) (Min. 555 Ω, Max. 607 Ω) For resistance at temperate other than 20 °C(68 °F), se on page 2-8.	ace between P17(78) and (89).		7
(17) Disconnect connector P2		(18) Replace pump motor. See	Chassis & Mast
Check continuity between Check continuity between Continuity	en P2-1 and P17(89).	(10) Replace paint motor. See	Chassis & Mast.

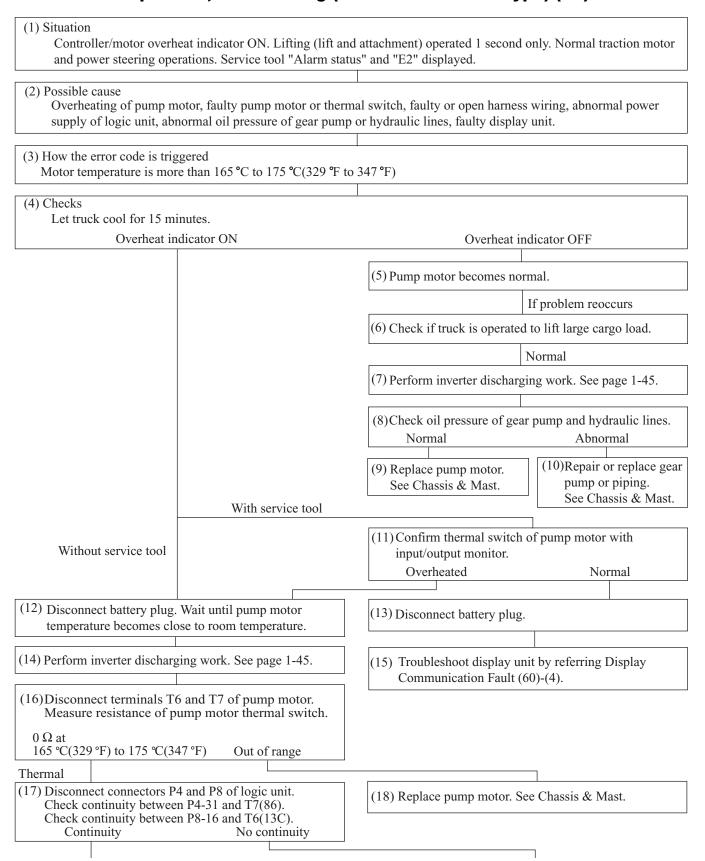




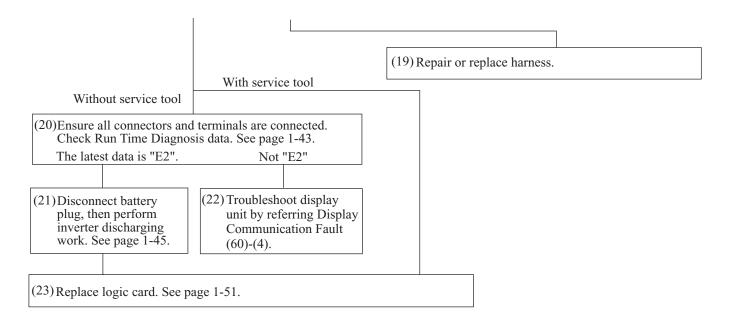
	BIENT RATURE	RE	ESISTANCI	E
(°C)	(°F)	MIN.	TYP.	MAX.
-30	-22	362	391	419
-10	14	428	460	492
0	32	464	498	532
10	50	503	538	574
30	86	587	626	665
50	122	679	722	764
70	158	781	826	872
90	194	891	940	989
110	230	1007	1062	1117
130	266	1128	1194	1259
150	302	1256	1334	1412

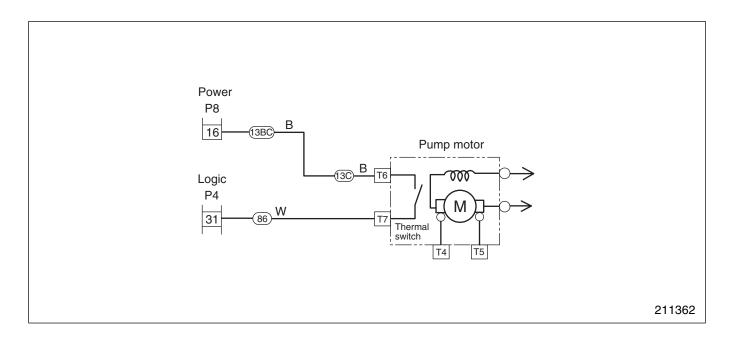
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#### Problem: Pump Motor, Overheating (Contactor Control Type) (E2)



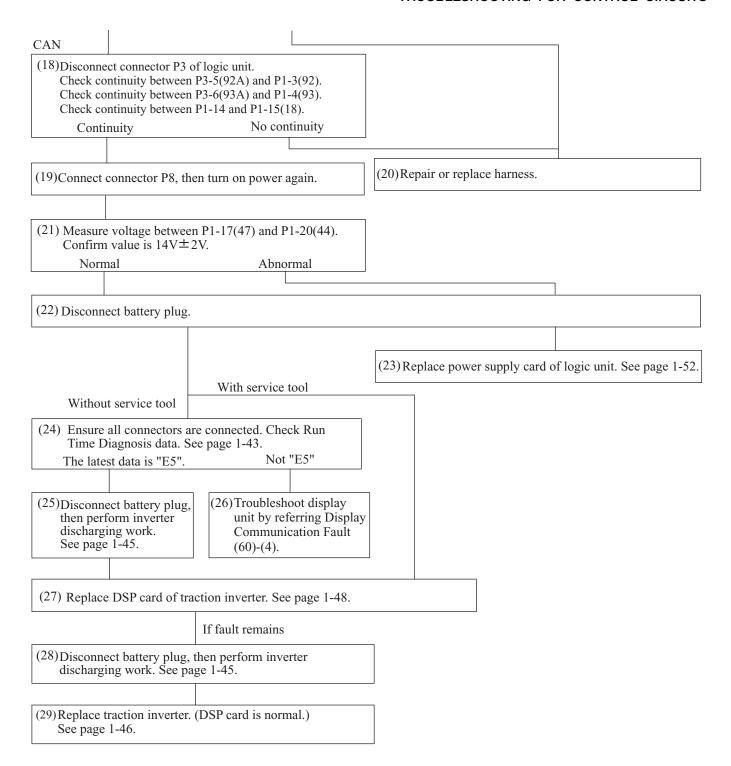
#### TROUBLESHOOTING FOR CONTROL CIRCUITS

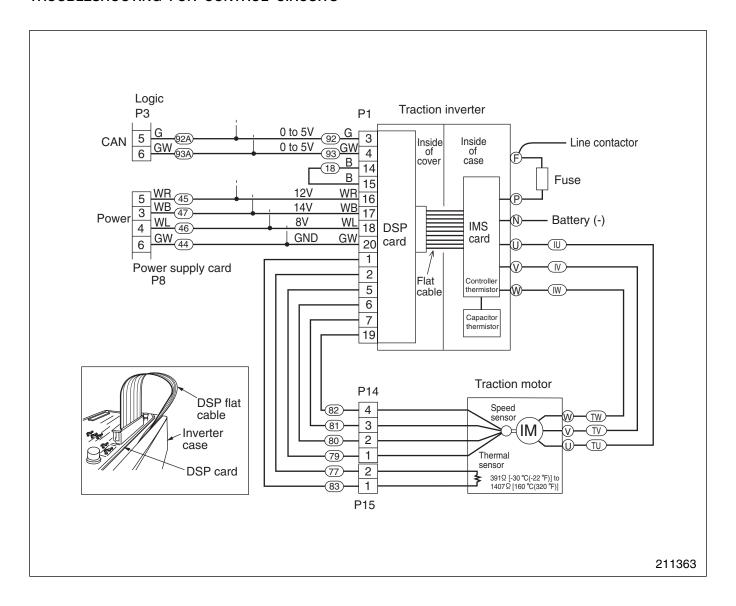




## **Problem: Traction Inverter, Overheating (E5)**

(1) Situation Controller/motor overheat indicator ON. Poor pulling power and acceleration. Normal pump motor and power steering operations. Service tool "Alarm status" and "E5" displayed.			
(2) Possible cause Overheating of traction inverter, faulty traction inverter thermal sensor, open harness wiring, faulty traction inverter PC board, abnormal power supply of logic unit, faulty temperature of traction inverter, faulty display unit.			
Capacitor temperature is	ggered out of range of -25 °C to 100 °C out of range of -25 °C to 110 °C temperature is in range of -20 °C	C (-13 °F to 230 °F).	
(4) Checks Let truck cool for 15 min Overheat in	nutes. ndicator ON	Overheat in	dicator OFF
		(5) Traction inverter becomes a	normal.
			If problem reoccurs
		(6) Check if truck is operated of large cargo load.	n steep upgrade or to pull
			Normal
		(7) Perform inverter dischargir Check thermal paste applie surface. Thermal paste film Normal	ed on inverter mounting
	With service tool	(8) Replace traction inverter. See page 1-46.	(9) Clean mounting surface, apply thermal paste, then reinstall inverter. See page 1-46.
Without service tool		(10) Confirm temperature of co with input/output monitor. Less than -20 °C(-4 °F) or more than 70 °C(158 °F)	-20 °C to 70 °C
(11)Disconnect battery plug. temperature becomes clo		(12) Disconnect battery plug.	
(13)Perform inverter dischar	ging work. See page 1-45.	(14) Troubleshoot display unit Communication Fault (60	
Thermal  (15) Remove traction inverter DSP card cover, then check harness looseness or wire breakage. See page 1-48.  Normal Abnormal			
Power supply  (16) Disconnect connector P1  Check continuity between Check continuity between Continuity	en P8-3 and P1-17(47).	(17) Secure harness if loose. Replace inverter if wire	breaks. See page 1-46.





### Problem: Pump Inverter, Overheating (Transistor Control Type Only) (E7)

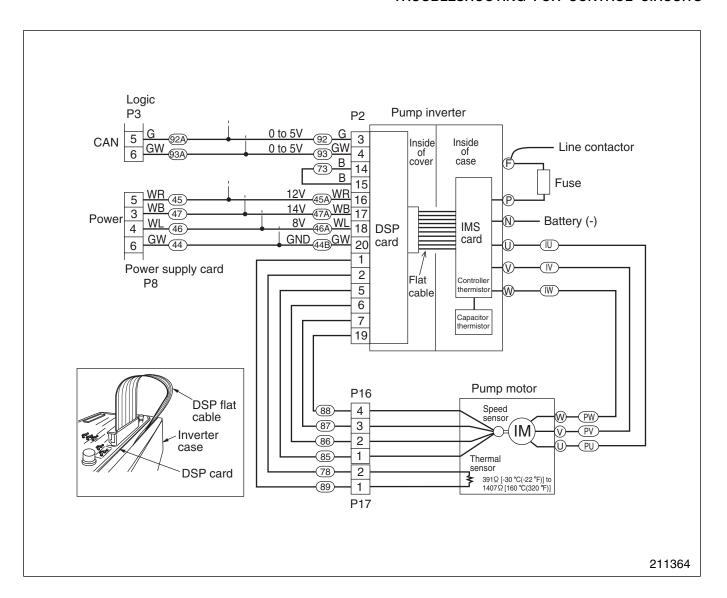
	neat indicator ON. Lifting speed serations. Service tool "Alarm stat	slower than normal. Normal tractius" and "E7" displayed.	ion motor
		mal sensor, open harness wiring, temperature of pump inverter, fau	
Capacitor temperature is	iggered out of range of -25 °C to 100 °C out of range of -25 °C to 110 °C temperature is in range of -20 °C	(-13 °F to 230 °F).	
(4) Checks Let truck cool for 15 m Overheat in	inutes. ndicator ON	Overheat in	dicator OFF
		(5) Pump inverter becomes no	rmal.
		I	f problem reoccurs
		(6) Check if truck is operated	to lift large cargo load.
			 Normal
		(7) Perform inverter dischargin Check thermal paste applie surface. Thermal paste film Normal	ed on inverter mounting
	With service tool	(8) Replace pump inverter. See page 1-46.	(9)Clean mounting surface, apply thermal paste, then reinstall inverter. See page 1-46.
Without service tool		(10) Confirm temperature of convirts input/output monitors. Less than -20°C(-4°F) or more than 70°C(158°F)	-20 °C to 70 °C
(11) Disconnect battery plug. becomes close to room to	Wait until inverter temperature emperature.	(12) Disconnect battery plug.	
(13) Perform inverter discharg	ging work. See page 1-45.	(14) Troubleshoot display uni Communication Fault (6	
Thermal		`	
(15) Remove pump inverter I harness looseness or wire	OSP card cover, then check breakage. See page 1-48.		
Normal	Abnormal		
Power supply			٦
(16)Disconnect connector P2 of pump inverter. Check continuity between P8-3(47) and P2-17(47A). Check continuity between P8-6(44) and P2-20(44B). Continuity No continuity		(17) Secure harness if loose. Replace inverter if wire by	reaks. See page 1-46.

### TROUBLESHOOTING FOR CONTROL CIRCUITS CAN (18) Disconnect connector P3 of logic unit. Check continuity between P3-5(92A) and P2-3(92). Check continuity between P3-6(93A) and P2-4(93). Check continuity between P2-14 and P2-15(73). No continuity Continuity (20) Repair or replace harness. (19) Connect connector P8, then turn on power again. (21) Measure voltage between P2-17(47A) and P2-20(44B). Confirm value is $14V \pm 2V$ . Normal Abnormal (22) Disconnect battery plug. (23) Replace power supply card of logic unit. See page 1-52. With service tool Without service tool (24) Ensure all connectors are connected. Check Run Time Diagnosis data. See page 1-43. Not "E7" The latest data is "E7". (26)Troubleshoot display (25) Disconnect battery plug, unit by referring Display then perform inverter Communication Fault discharging work. (60)-(4). See page 1-45.

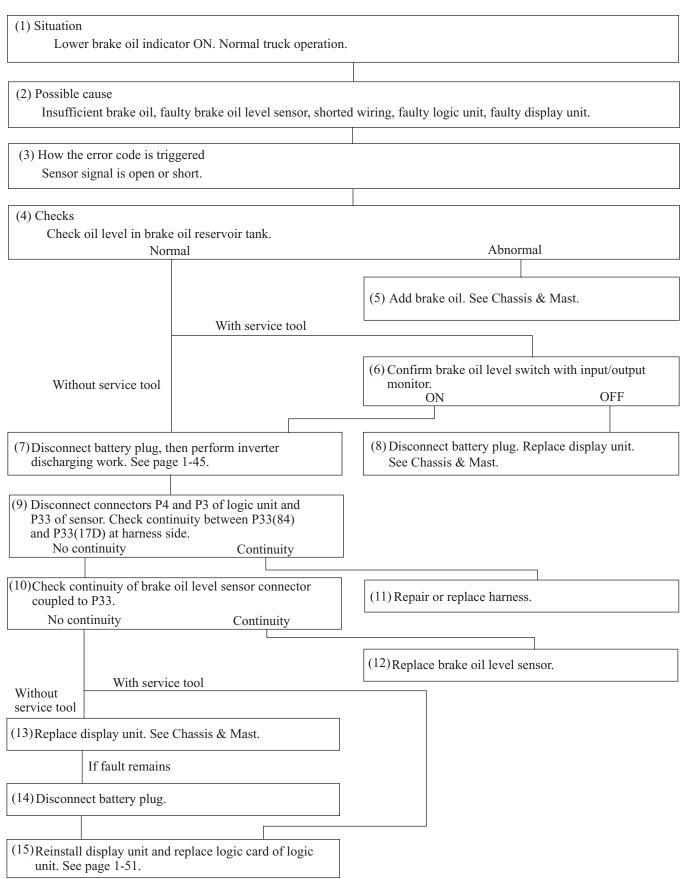
(27) Replace DSP card of pump inverter. See page 1-48.

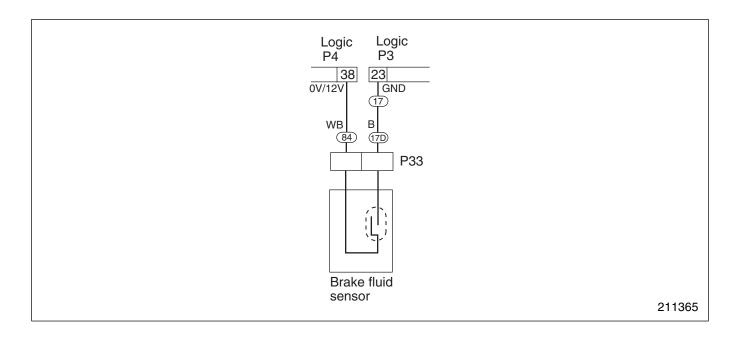
If fault remains

- (28) Disconnect battery plug, then perform inverter discharging work. See page 1-45.
- (29)Replace pump inverter. (DSP card is normal.) See page 1-46.



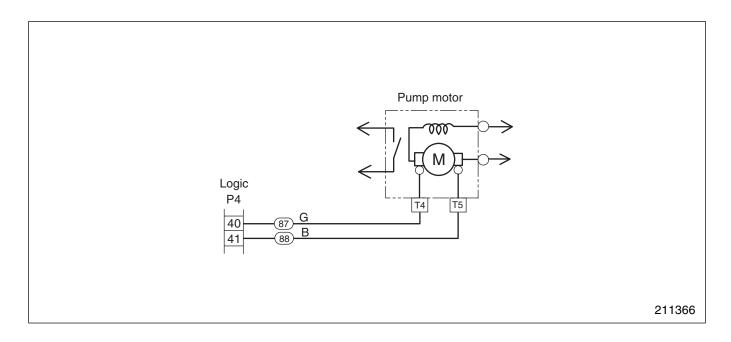
#### **Problem: Brake Oil, Low Level**





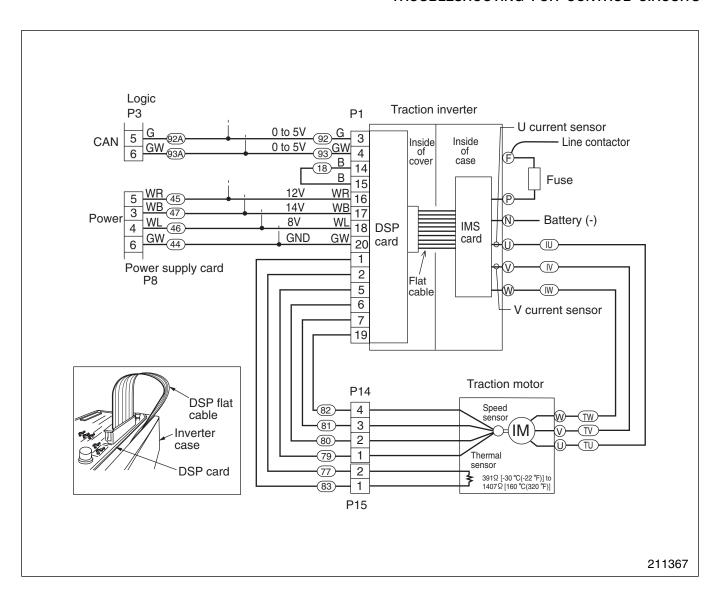
### Problem: Pump Motor, Worn Brushes (Contactor Control Type Only) (br)

(1) Situation Display: "br". "br" and truck speed alternately displayed Lifting (lift and attachment) operates for 1 second only.	during traveling (when no other fault codes are displayed).  Normal traction motor and power steering operations.		
(2) Possible cause			
Worn pump motor brushes, wire breakage, faulty logic c	ard.		
(3) How the error code is triggered Pump motor brushes wear.			
(4) Checks Disconnect battery plug, then perform inverter discharging work. See page 1-45.			
(5) Disconnect brush wear detector wires T4(87) and T5(88) and close key switch. Confirm error code display.			
Error code br	No error code		
(6) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	(10) Check brushes and replace, if necessary.		
(7) Disconnect connector P4 of logic unit and terminals T4(87) and T5(88) of pump motor. Check continuity between P4-40 and T4(87). Check continuity between P4-41 and T5(88).  Continuity  No continuity			
(8) Replace logic card of logic unit. See page 1-51.	(9) Correct or replace wiring.		



## **Problem: Traction Motor Current Sensor Fault (14)**

	: "14". All truck operations inhibited. This fault bring contactor HOLD.	occurs only when turning on power. Line contactor OPEN
		ction inverter, faulty DSP card of traction inverter, c unit.
(a) II		
` ′	rror code is triggered	C 120 A . 120 A
When t	rurning on power, current sensor voltage is out of	range of -120 A to 120 A.
(4) Checks		
Discon	nect battery plug, then perform inverter dischargi	ng work. See page 1-45.
		1
	et connector P1 of traction inverter and remove	
	r. Check DSP flat cable for looseness or wire	
breakage. Norr	mal Abnormal	
	Hiai Abhormai	
8V power supply		
	ntinuity between P8-4 and P1-18(46).	(7) Secure DSP flat cable if loose.
	ntinuity between P8-6 and P1-20(44).	Replace inverter if wire breaks. See page 1-46.
Contin		
	Tronomial and no continuty	
CAN		1
	t connector P3 of logic unit.	
	tinuity between P3-5(92A) and P1-3(92). tinuity between P3-6(93A) and P1-4(93).	
	tinuity between F3-0(93A) and F1-4(93). tinuity between P1-14 and P1-15(18).	
	•	
Contin	Huity Abhormal and no continuity	
(0) 5		
	onnector P8 to logic unit, then turn on power	(10)Repair or replace harness.
again.		
		1
	voltage between P1-18(46) and P1-20(44). value is $8V \pm 2V$ .	
Norr	mal Abnormal	
(12) Disconne	ct battery plug, then perform inverter dischargir	ng work. See page 1-45.
(13)Replace D	OSP card of traction inverter. See page 1-48.	(14)Replace power supply card of logic unit. See page 1-52.
	If fault remains	
	nverter discharging work, then replace nverter. (DSP card is normal.)	



## **Problem: Traction Motor, Over-current (15)**

(1) Situation	
Display: "15". All truck operations inhibited. Line conta	actor OPEN and steering contactor HOLD.
,	etion inverter, faulty DSP card of traction inverter, faulty wire breakage of traction motor speed sensor harness, faulty
(3) How the error code is triggered  Motor current is more than 1018 A (Moment). Motor cur  Motor current is more than 985 A (Fixed time 2).	rrent is more than 990 A (Fixed time 1).
(4) Checks Disconnect battery plug, then perform inverter discharging	ng work. See page 1-45.
(5) Check traction motor and terminal for burning and smell.  Normal Abnormal	
(6) Confirm cable looseness and improper connections (U, V, W phases) for traction inverter and motor.  Normal  Abnormal	(7) Replace traction motor.
(8) Disconnect connector P1 of traction inverter and remove DSP cover. Check DSP flat cable for looseness or wire breakage.	(9) Secure cable if loose or connect cable correctly.
Normal Abnormal	<u> </u>
(10) Confirm connection of traction motor speed sensor connector P14.  Normal Abnormal  Sensor	(11) Secure DSP flat cable if loose.  Replace inverter if wire breaks. See page 1-46.
(12) Disconnect connectors P1 and P14.  Check continuity between P1-5 and P14(79).  Check continuity between P1-6 and P14(80).  Check continuity between P1-7 and P14(81).  Check continuity between P1-19 and P14(82).  Continuity  No continuity	(13) Connect connector securely.
8V power supply	
(14) Check continuity between P8-4 and P1-18(46). Check continuity between P8-6 and P1-20(44). Continuity No continuity	
CAN	1
(15) Disconnect connector P3 of logic unit. Check continuity between P3-5(92A) and P1-3(92). Check continuity between P3-6(93A) and P1-4(93). Check continuity between P1-14 and P1-15(18). Continuity No continuity	
(16) Connect connector P8 to logic unit, then turn on power again.	(17) Repair or replace harness.

(18) Measure voltage between P1-18(46) and P1-20(44).
Confirm value is 8V±2V.
Normal

Abnormal

(19) Disconnect battery plug, then perform inverter discharging work.

(20) Replace DSP card of traction inverter.
See page 1-48.

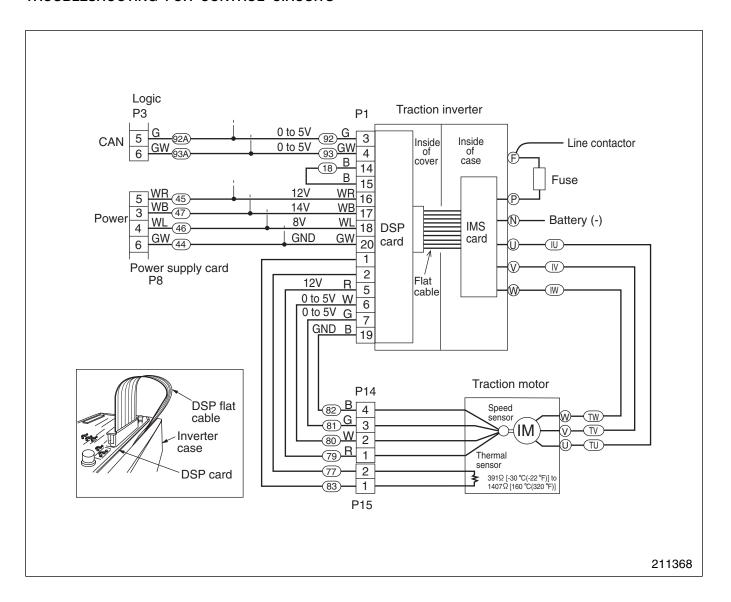
(21) Replace power supply card of logic unit.
See page 1-52.

If fault remains

(22) Perform inverter discharging work, then replace traction inverter. (DSP card is normal.) See page 1-46.

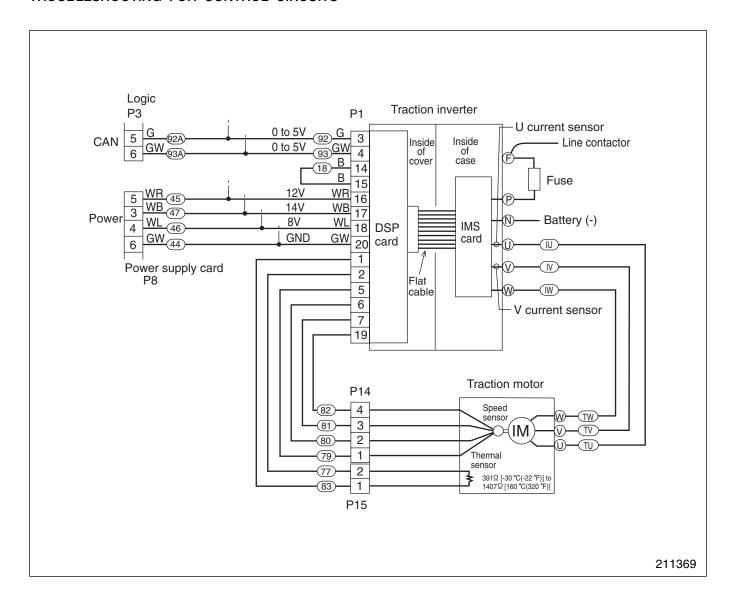
If fault remains

(23) Perform inverter discharging work, then reinstall traction inverter and replace traction motor.



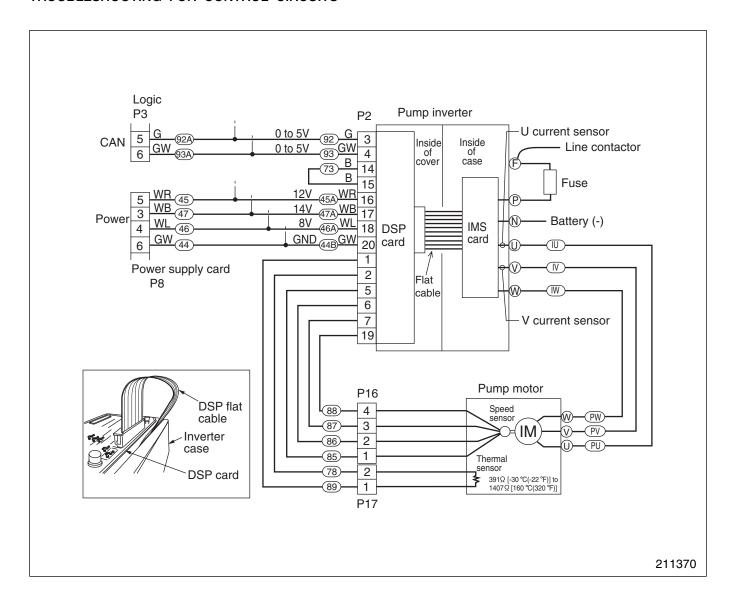
## **Problem: Traction Motor, Stall Timer (16)**

(1) Situation Display:"16". All truck operations inhibited. Line contact	or OPEN and steering contactor HOLD.
(2) Possible cause Stall current flowed more than set time (#20) in traction n wiring, faulty traction inverter DSP card, faulty logic unit	notor, faulty traction inverter current sensor, shorted harness
(3) How the error code is triggered Stall timer set time (set by Setup Option #20) is measured	l while stalling.
(4) Checks Turn off power, then turn on power again. Confirm error No error, problem recurs	code display.  Error code 14
(5) Confirm stall timer set time of Setup Option #20.  Maximum value set Larger value can be set	(6) See troubleshooting for code "14". See page 2-22.
(7) Check to see if truck is operated with heavy cargo load or on steps when motor stalls.	(8) Change set time. See page 1-27.
Normal steeps Heavy load	Note: The more stall occurs, the more overheating occurs. Operate truck under normal condition.
(9) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	(10) Operate under normal condition.
(11) Disconnect connector P1 of traction inverter and remove DSP cover, then check DSP flat cable for looseness or wire breakage. See page 1-48. Normal Abnormal	
Power supply	
(12) Check continuity between P8-5 and P1-16(45). Check continuity between P8-6 and P1-20(44). Continuity No continuity	(13) Secure harness if loose. Replace traction inverter if wire breaks. See page 1-46.
CAN	
(14) Disconnect connector P3 of logic unit.  Check continuity between P3-5(92A) and P1-3(92).  Check continuity between P3-6(93A) and P1-4(93).  Check continuity between P1-14 and P1-15(18).  Continuity  Abnormal and no continuity	
(15) Connect connector P8 to logic unit, then turn on power again.	(16)Repair or replace harness.
(17) Measure voltage between P1-16(45) and P1-20(44). Confirm value is 12V±1V. Normal Abnormal	
(18)Disconnect battery plug, then perform inverter discharging	work. See page 1-45.
(19) Replace DSP card of traction inverter. See page 1-48.	(20)Replace power supply card of logic unit. See page 1-52.



### Problem: Pump Motor Current Sensor Fault (Transistor Control Type Only) (34)

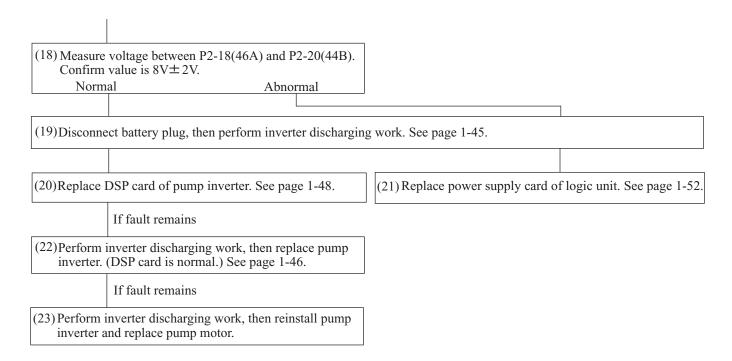
	y: "34". All truck operations inhibited. This faul ontactor OPEN and steering contactor HOLD.	t occurs only when turning on power.
		ump inverter, faulty DSP card of pump inverter, unit.
1 ' '	error code is triggered urning on power, current sensor voltage is out of	f range of -120 A to 120 A.
(4) Checks Disconn	ect battery plug, then perform inverter discharging	ng work. See page 1-45.
	ct connector P2 of pump inverter and remove r. Check DSP flat cable for looseness or wire Abnormal	
8V power supply		
(6)Check con Check con	ntinuity between P8-4(46) and P2-18(46A). It inuity between P8-6(44) and P2-20(44B). Inuity No continuity	(7) Secure DSP flat cable if loose.  Replace pump inverter if wire breaks. See page 1-46.
CAN		]
Check cor Check cor Check cor	ct connector P3 of logic unit. ntinuity between P3-5(92A) and P2-3(92). ntinuity between P3-6(93A) and P2-4(93). ntinuity between P2-14 and P2-15(73). inuity  No continuity	
(9) Connect of again.	connector P8 to logic unit, then turn on power	(10) Repair or replace harness.
Confirm	voltage between P2-18(46A) and P2-20(44B). value is 8V±2V. rmal Abnormal	
(12) Disconne	ect battery plug, then perform inverter discharging	ng work. See page 1-45.
(13) Replace	DSP card of pump inverter. See page 1-48.	(14) Replace power supply card of logic unit. See page 1-52.
	If fault remains	
	inverter discharging work, then replace pump (DSP card is normal.) See page 1-46.	

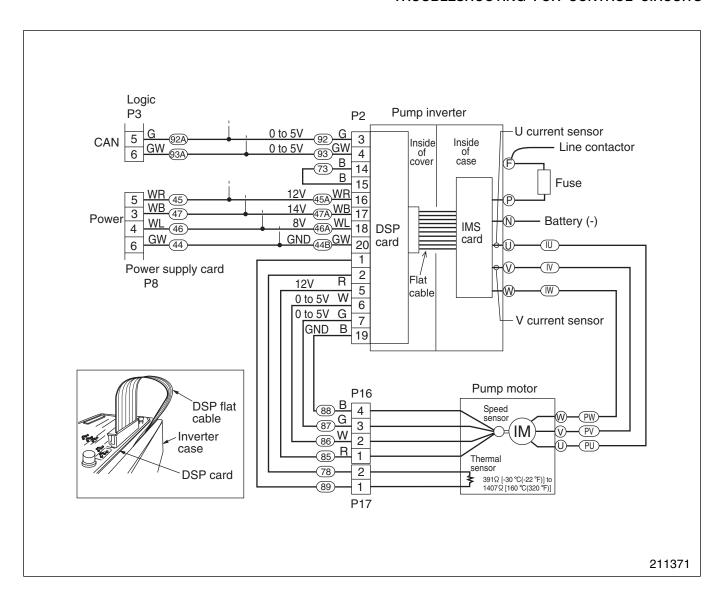


### Problem: Pump Motor Over-current (Transistor Control Type Only) (35)

(1) Situation Display: "35". All truck operations inhibited. Line contactor OPEN and steering contactor HOLD.	
	imp inverter, faulty DSP card of pump inverter, faulty pump akage of pump motor speed sensor harness, faulty main
(3) How the error code is triggered Motor current is more than 1018 A (Moment). Motor cu Motor current is more than 985 A (Fixed time 2).	urrent is more than 990 A (Fixed time 1).
(4) Checks Disconnect battery plug, then perform inverter discharg	ring work. See page 1-45.
(5) Check pump motor and terminal for burning and smell.  Normal  Abnormal	
(6) Confirm cable looseness and improper connections (U, V, W phases) for pump inverter and motor.  Normal  Abnormal	(7) Replace pump motor.
(8) Disconnect connector P2 of pump inverter and remove DSP cover. Check DSP flat cable for looseness or wire breakage.  Normal Abnormal	(9) Secure cable if loose or connect cable correctly.
(10) Confirm connection of pump motor speed sensor connector P16.  Normal Abnormal	(11) Secure DSP flat cable if loose.  Replace pump inverter if wire breaks. See page 1-46.
Sensor  (12) Disconnect connectors P2 and P16.  Check continuity between P2-5 and P16(85).  Check continuity between P2-6 and P16(86).  Check continuity between P2-7 and P16(87).  Check continuity between P2-19 and P16(88).  Continuity  No continuity	(13) Connect connector securely.
8V power supply  (14) Check continuity between P8-4(46) and P2-18(46A). Check continuity between P8-6(44) and P2-20(44B). Continuity  No continuity	
CAN  (15)Disconnect connector P3 of logic unit.  Check continuity between P3-5(92A) and P2-3(92).  Check continuity between P3-6(93A) and P2-4(93).  Check continuity between P2-14 and P2-15(73).  Continuity  No continuity	
(16) Connect connector P8 to logic unit, then turn on power again.	(17) Repair or replace harness.

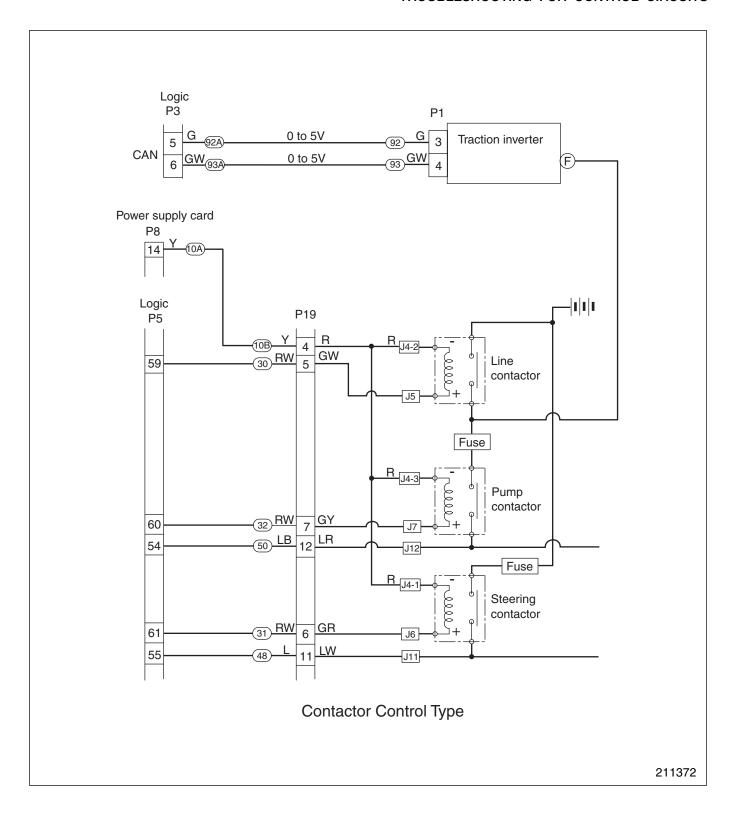
#### TROUBLESHOOTING FOR CONTROL CIRCUITS

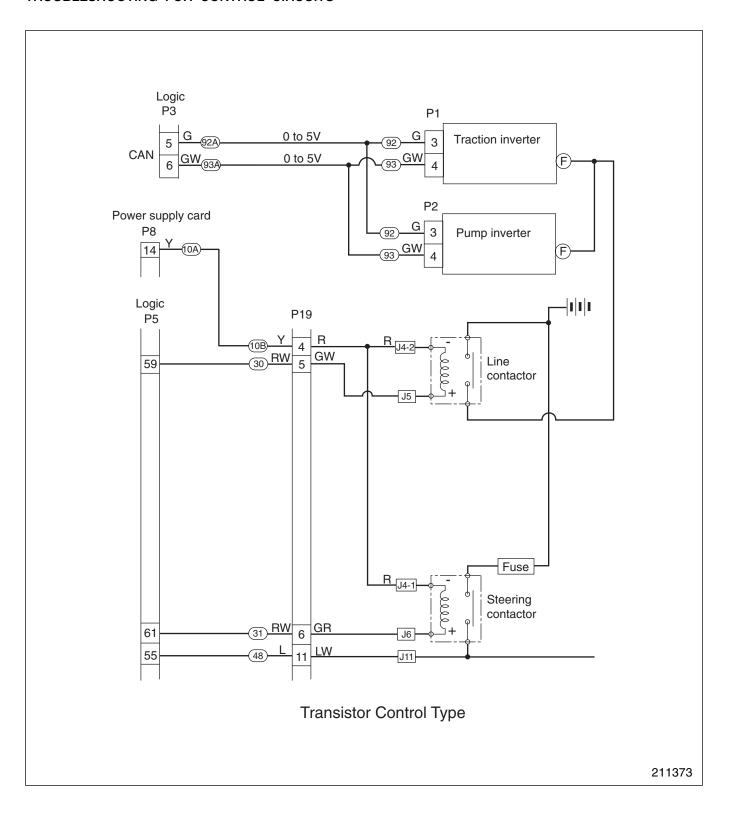




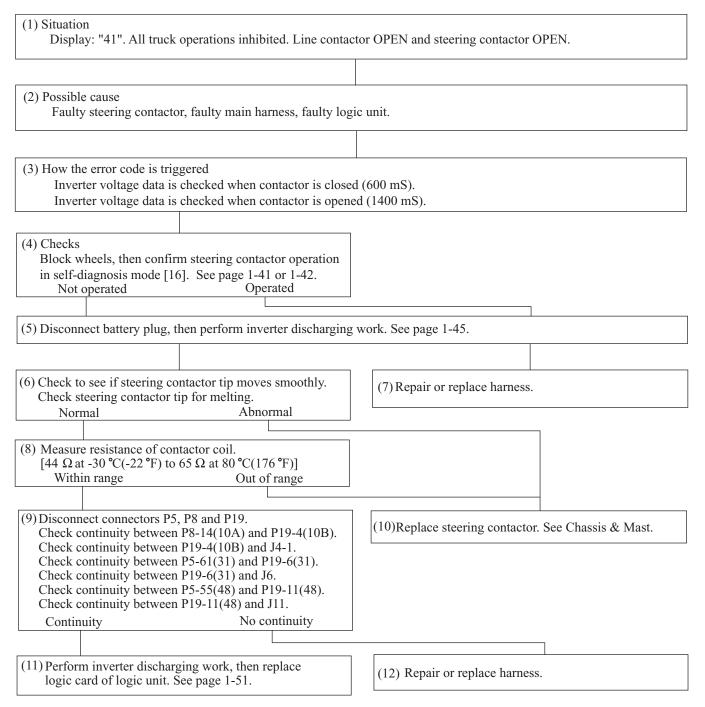
## **Problem: Line Contactor Fault (40)**

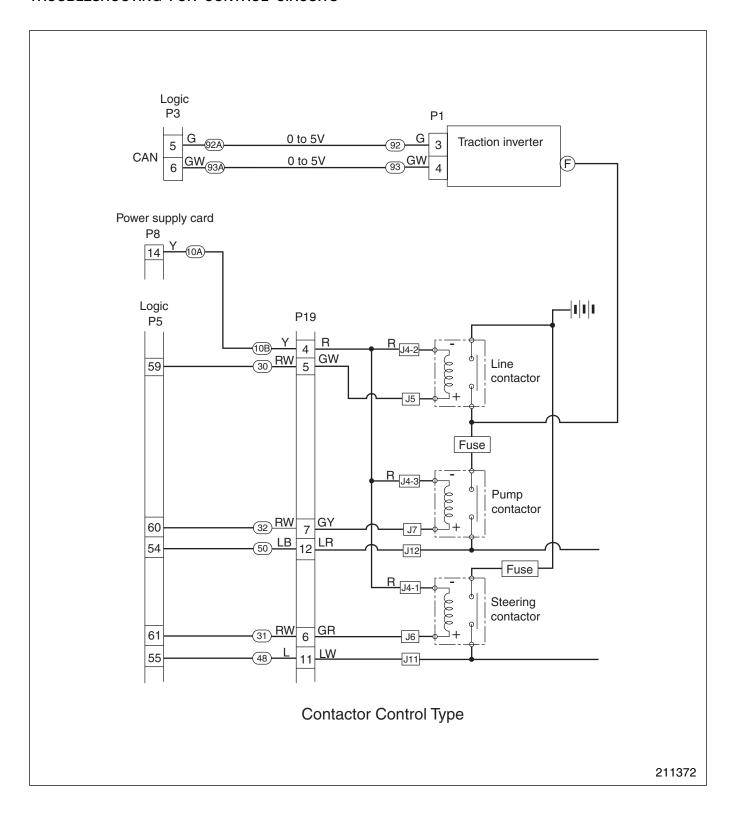
(1) Situation		
Display: "40". All truck operations inhibited. Line conta	actor OPEN and steering contactor HOLD.	
(2) Possible cause Faulty line contactor, faulty main harness, faulty logic to	unit, faulty traction inverter, faulty pump inverter.	
(3) How the error code is triggered Inverter voltage data is checked when contactor is closed (400 mS).		
(4) Checks Turn off power, then turn on power again. Confirm error code display.  Error code 40  Error code 63 or 65		
(5) Block wheels, then confirm line contactor operation in self-diagnosis mode [14]. See page 1-41 or 1-42.  Not operated Operated	(6) See troubleshooting for code "63" or "65". See page 2-61 or 2-64.	
With service tool	Without service tool	
(7) Check DC voltage of pump and tractic with monitor. These values should be shattery voltage.  Traction inverter value  Pump inverted.		
abnormal abnormal  (9) Disconnect battery (10) Disconnect	(11) Replace traction inverter.	
plug, then perform plug, the inverter discharging inverter	en perform discharging ee page 1-45.	
(12) Replace traction inverter. See page 1-46. (13) Replace See page	e pump inverter. e 1-46. (14) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	
(16) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	(15)Replace pump inverter. See page 1-46.	
(17) Check to see if line contactor tip moves smoothly.  Check line contactor tip for melting.  Normal  Abnormal		
(18) Measure resistance of contactor coil. [44 $\Omega$ at -30 °C(-22 °F) to 65 $\Omega$ at 80 °C(176 °F)] Within range Out of range		
(19) Disconnect connectors P5, P8 and P19. Check continuity between P8-14(10A) and P19-4(10B). Check continuity between P19-4(10B) and J4-2. Check continuity between P5-59(30) and P19-5(30). Check continuity between P19-5(30) and J5.	(20) Replace line contactor. See Chassis & Mast.	
Continuity No continuity		
(21) Perform inverter discharging work, then replace logic	(22)Repair or replace harness.	

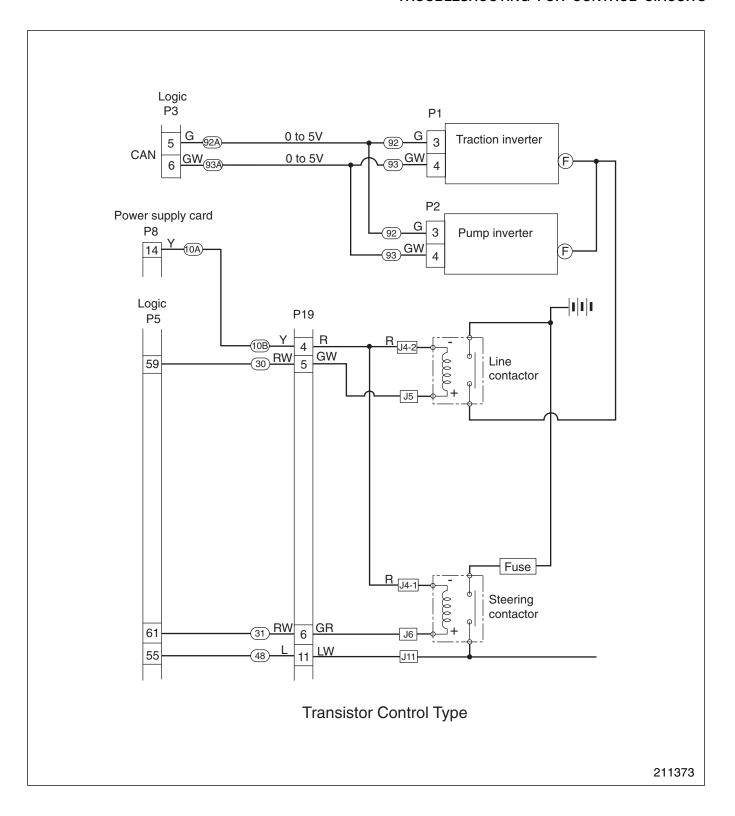




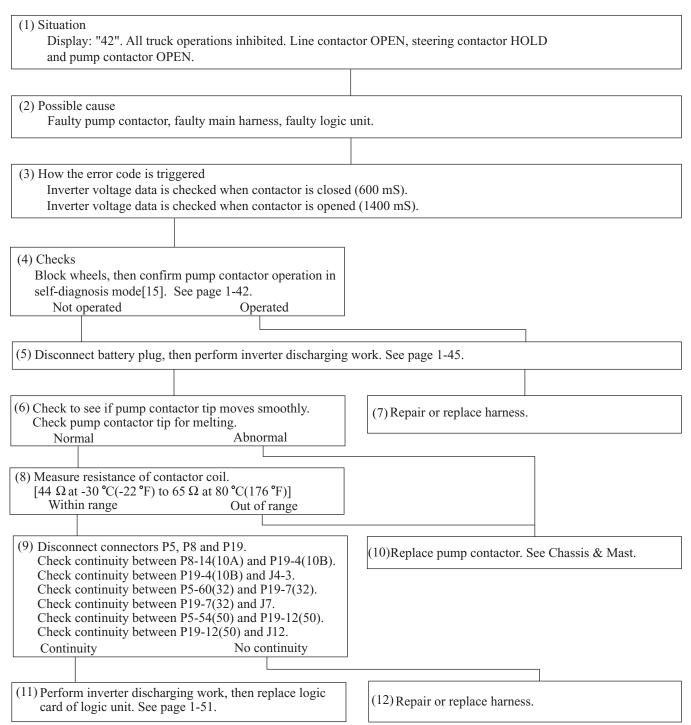
### **Problem: Steering Contactor Fault (41)**

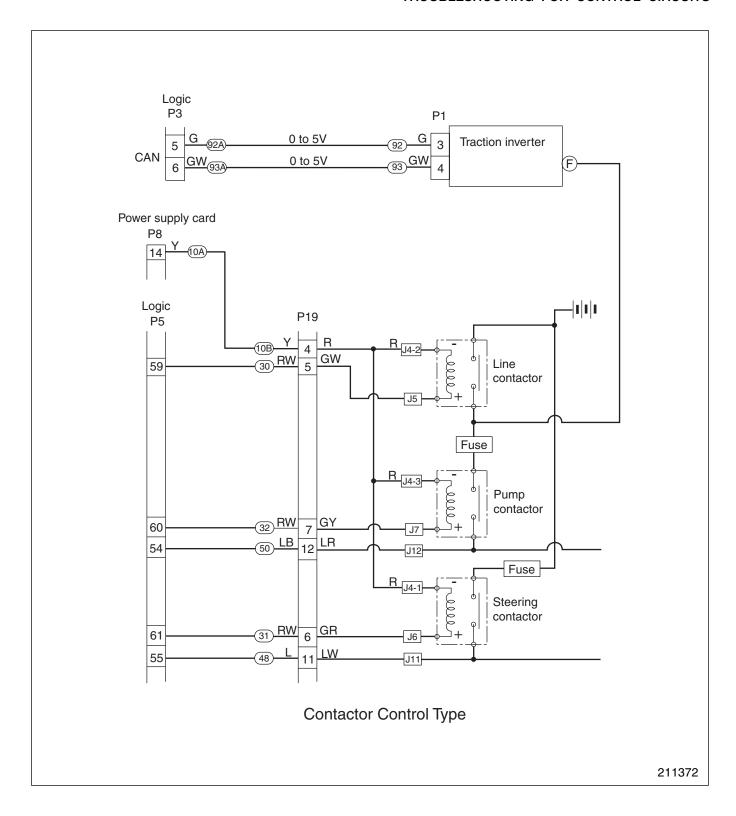




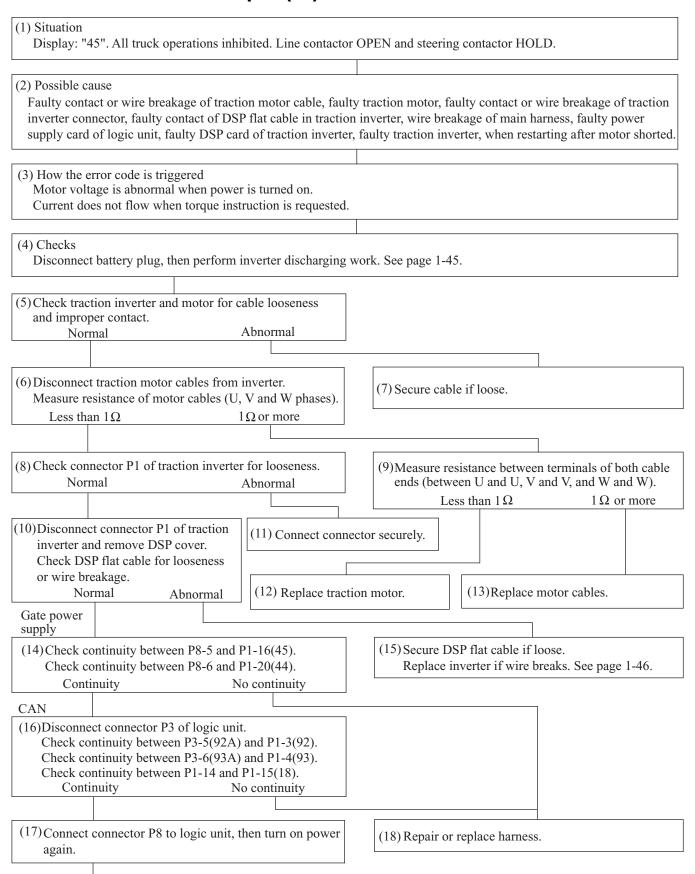


#### Problem: Pump Contactor Fault (Contactor Control Type Only) (42)

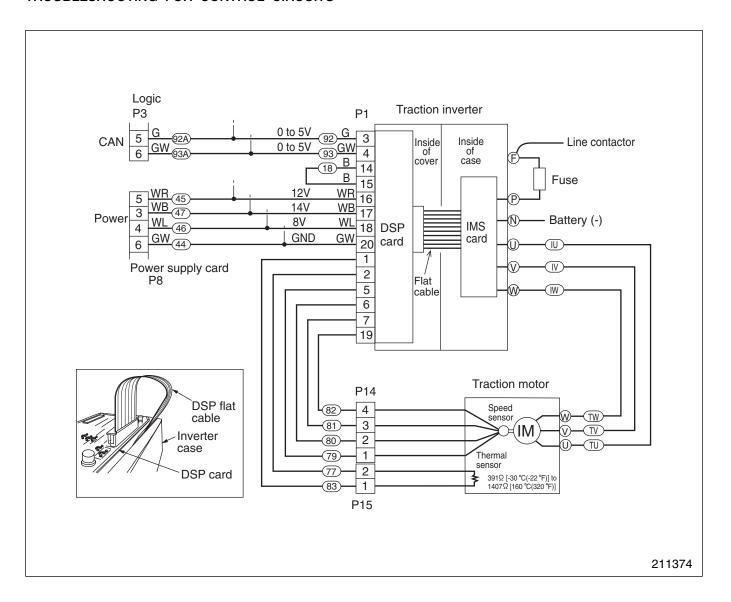




#### **Problem: Traction Motor Open (45)**



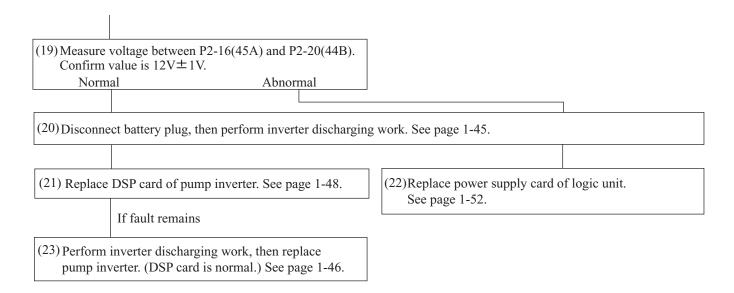
	voltage between P1-16(45) and P1-20(4 value is 12V±1V.	44).		
Norm	al Abnormal			
				]
(20) Disconne	ect battery plug, then perform inverter dis	ischarging v	work. See page 1-45.	
(21) Replace DSP card of traction inverter. See page 1-48.		1-48.	(22)Replace power supply card of See page 1-52.	of logic unit.
	If fault remains		See page 1-32.	
(23)Perform inverter discharging work, then replace traction inverter. (DSP card is normal.) See page 1-46.		traction		

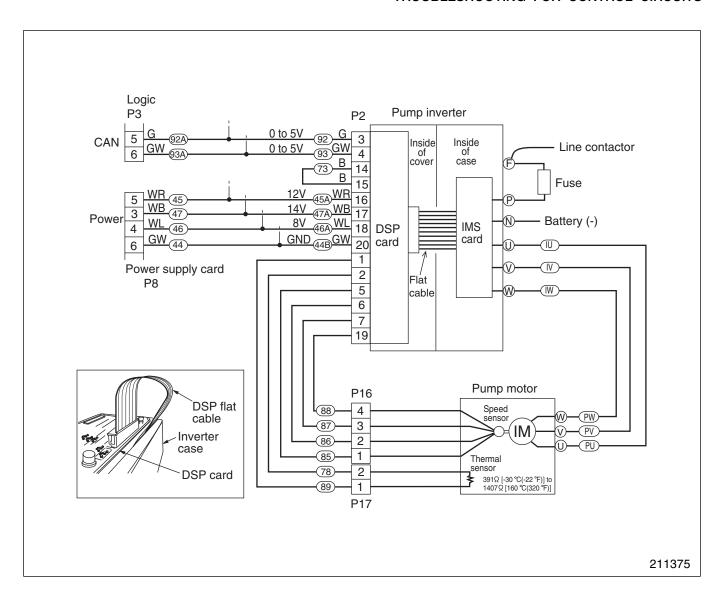


## Problem: Pump Motor Open (Transistor Control Type Only) (47)

(1) Situation	
Display: "47". All truck operations inhibited. Line contactor (	OPEN and steering contactor HOLD.
(2) Possible cause Faulty contact or wire breakage of pump motor cable, faulty pu inverter connector, faulty contact of DSP flat cable in pump inv supply card of logic unit, faulty DSP card of pump inverter, fau	erter, wire breakage of main harness, faulty power
(3) How the error code is triggered  Motor voltage is abnormal when power is turned on.  Current does not flow when rotational speed instruction is requ	uested.
(4) Checks Disconnect battery plug, then perform inverter discharging wo	rk. See page 1-45.
(5) Check pump inverter and motor for cable looseness and improper contact.  Normal  Abnormal	
(6) Disconnect pump motor cables from inverter. Measure resistance of motor cables (U, V and W phases). Less than $1\Omega$ 1 $\Omega$ or more	(7) Secure cable if loose.
(8) Check connector P2 of pump inverter for looseness.  Normal  Abnormal	9) Measure resistance between terminals of both cable ends (between U and U, V and V, and W and W).  Less than $1\Omega$ 1 $\Omega$ or more
(10) Disconnect connector P2 of pump inverter and remove DSP cover. Check DSP flat cable for looseness or wire breakage. Normal Abnormal  (11) Connect connection (12) Replace pump in (13) Replace pu	
Gate power supply	The second secon
(14) Check continuity between P8-5(45) and P2-16(45A). Check continuity between P8-6(44) and P2-20(44B). Continuity No continuity	15)Secure DSP flat cable if loose.  Replace inverter if wire breaks. See page 1-46.
CAN	
(16) Disconnect connector P3 of logic unit.  Check continuity between P3-5(92A) and P2-3(92).  Check continuity between P3-6(93A) and P2-4(93).  Check continuity between P2-14 and P2-15(73).  Continuity  No continuity	
(17) Connect connector P8 to logic unit, then turn on power again.	(18) Repair or replace harness.

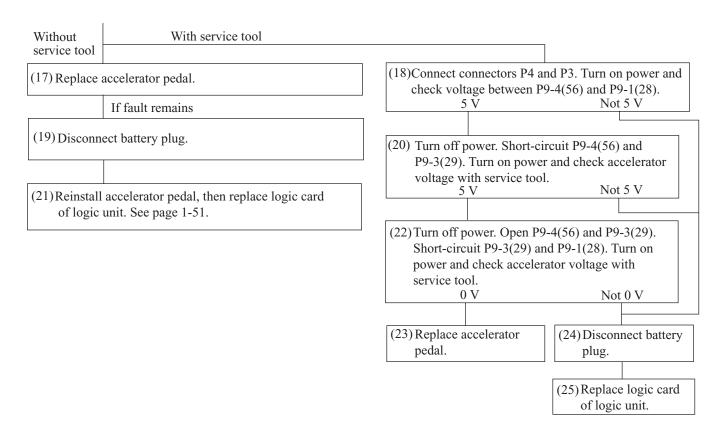
#### TROUBLESHOOTING FOR CONTROL CIRCUITS

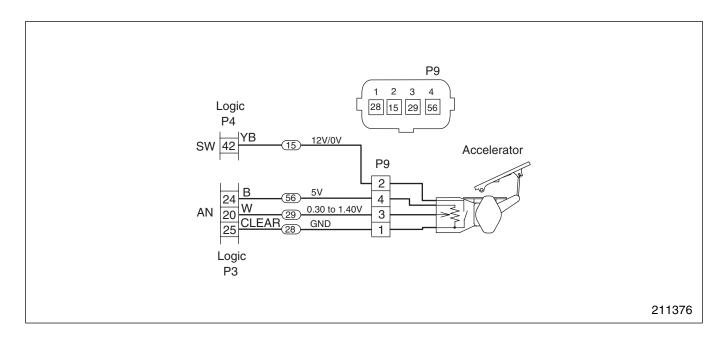




## **Problem: Accelerator Sensor Fault (51)**

(1) Situation Display: "51". All truck operations inhibited. Line contactor OPEN and steering contactor HOLD.						
		r				
(2) Possible Imprope		al linkage, faulty acc	celerator senso	r, faulty main harne	ess, faulty lo	gic unit.
Acceler Sensor	voltage is 1.41 V o	ered e is out of range of ( or more when accelerate	erator switch is	opened.		
(4) Checks Raise	front wheels until				With	service tool
(5) Disconnect battery plug.				(6) Check accelerator sensor voltage with input/output monitor and confirm value is in range of 0.2V to 4.8V. Check relation between sensor voltage and accelerator switch operation.  0.3V or less: OFF  1.41V or more: ON  Abnormal signal  Interrupted		
(7) Check link length of accelerator pedal.  Normal  Abnormal			al		Interrupted	
		(8) Adjust acceleration linkage.	tor pedal	(9) Disconnect bat	tery plug.	(10) Adjust accelerator pedal linkage.
(11) Perform inverter discharging work. See page 1-45.						
		and P3 of logic unit f accelerator sensor				
(13)Check continuity between P3-20 and P9-3(29). (Sensor voltage) Continuity No continuity						
(14) Check continuity between P4-42 and P9-2(15). (Switch) Continuity No continuity						
	ontinuity between	P3-24 and P9-4(56). P3-25 and P9-1(28). No continui				
	With se	rvice tool		(16) Repair or rep	blace harness	<u> </u> s.
Without service tool						

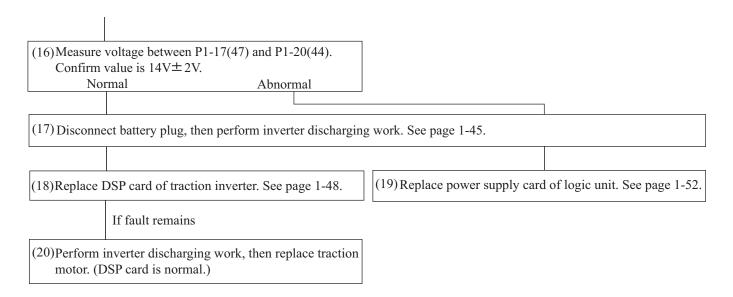


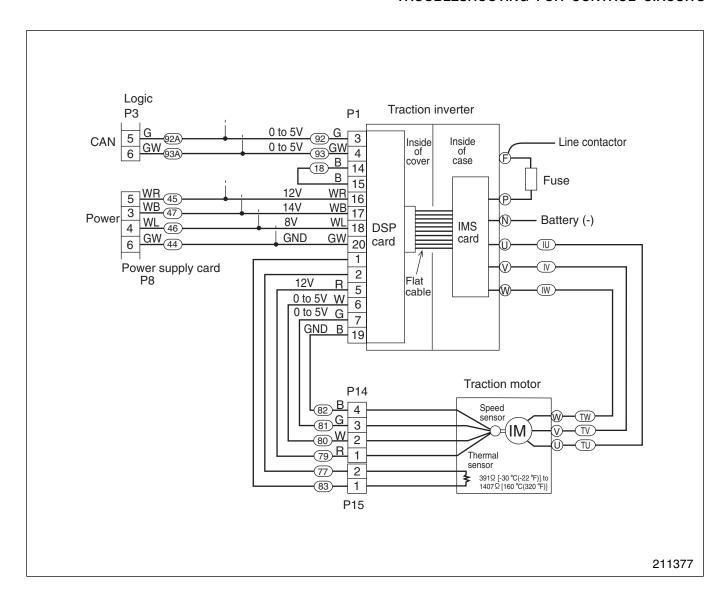


## **Problem: Traction Motor Pulse Input Fault (52)**

(1) Situation Display: "52". All truck operations inhibited. Line contactor OPEN and steering contactor HOLD.  (2) Possible cause Faulty contact of traction inverter connector, faulty connection of traction motor connector and cable, faulty 12V inp voltage of traction inverter, faulty contact or wire breakage of traction motor speed sensor harness, faulty DSP card of traction inverter, faulty traction motor speed sensor.  (3) How the error code is triggered Motor rotation speed is more than 5800 rpm.  (4) Checks Disconnect battery plug, then perform inverter discharging work. See page 1-45.  (5) Check to see if traction motor cables (U, V and W-phases) are connected to traction inverter properly. Normal Abnormal		
(2) Possible cause Faulty contact of traction inverter connector, faulty connection of traction motor connector and cable, faulty 12V inp voltage of traction inverter, faulty contact or wire breakage of traction motor speed sensor harness, faulty DSP card of traction inverter, faulty traction motor speed sensor.  (3) How the error code is triggered Motor rotation speed is more than 5800 rpm.  (4) Checks Disconnect battery plug, then perform inverter discharging work. See page 1-45.  (5) Check to see if traction motor cables (U, V and W-phases) are connected to traction inverter properly.		actor OPEN and steering contactor HOLD.
Faulty contact of traction inverter connector, faulty connection of traction motor connector and cable, faulty 12V inp voltage of traction inverter, faulty contact or wire breakage of traction motor speed sensor harness, faulty DSP card of traction inverter, faulty traction motor speed sensor.  (3) How the error code is triggered  Motor rotation speed is more than 5800 rpm.  (4) Checks  Disconnect battery plug, then perform inverter discharging work. See page 1-45.  (5) Check to see if traction motor cables (U, V and W-phases) are connected to traction inverter properly.		
Motor rotation speed is more than 5800 rpm.  (4) Checks Disconnect battery plug, then perform inverter discharging work. See page 1-45.  (5) Check to see if traction motor cables (U, V and W-phases) are connected to traction inverter properly.	Faulty contact of traction inverter connector, faulty connector voltage of traction inverter, faulty contact or wire breakage.	
Disconnect battery plug, then perform inverter discharging work. See page 1-45.  (5) Check to see if traction motor cables (U, V and W-phases) are connected to traction inverter properly.		
are connected to traction inverter properly.		ing work. See page 1-45.
	are connected to traction inverter properly.	
(6) Check to see if connector P1 of traction inverter is fastened securely. (7) Connect cables properly.	fastened securely.	(7) Connect cables properly.
Normal Abnormal	Normal Abnormal	
(8) Check to see if connector P14 of traction motor speed sensor is fastened securely.  Normal  Abnormal  (9) Fasten connector securely.	sensor is fastened securely.	(9) Fasten connector securely.
Normal Abnormal Sensor		
(10)Disconnect connectors P1 and P14. Check continuity between P1-5 and P14(79). Check continuity between P1-6 and P14(80). Check continuity between P1-7 and P14(81). Check continuity between P1-19 and P14(82). Continuity No continuity (11) Fasten connector securely.	Check continuity between P1-5 and P14(79). Check continuity between P1-6 and P14(80). Check continuity between P1-7 and P14(81). Check continuity between P1-19 and P14(82).	(11) Fasten connector securely.
Power supply	ower	
(12) Check continuity between P8-3 and P1-17(47). Check continuity between P8-6 and P1-20(44). Continuity No continuity	2) Check continuity between P8-3 and P1-17(47).  Check continuity between P8-6 and P1-20(44).  Continuity  No continuity	
CAN  (13) Disconnect connector P3 of logic unit.  Check continuity between P3-5(92A) and P1-3(92).  Check continuity between P3-6(93A) and P1-4(93).  Check continuity between P1-14 and P1-15(18).  Continuity  No continuity	3) Disconnect connector P3 of logic unit. Check continuity between P3-5(92A) and P1-3(92). Check continuity between P3-6(93A) and P1-4(93). Check continuity between P1-14 and P1-15(18).	
(14) Connect connector P8 to logic unit, then turn on power again. (15) Repair or replace harness.		(15)Repair or replace harness.

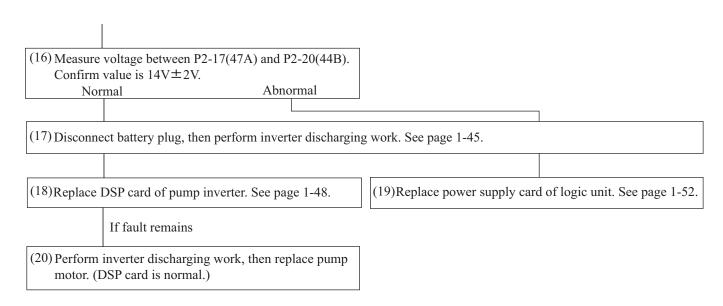
#### TROUBLESHOOTING FOR CONTROL CIRCUITS

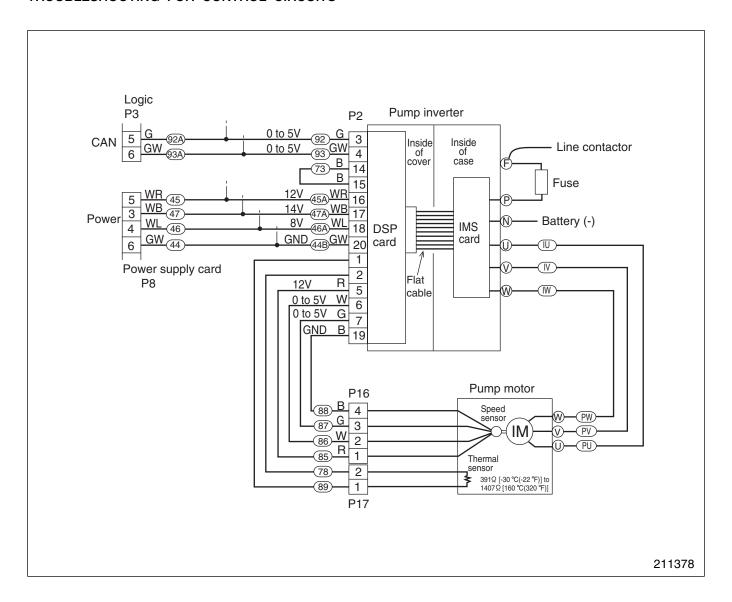




## Problem: Pump Motor Pulse Input Fault (Transistor Control Type Only) (57)

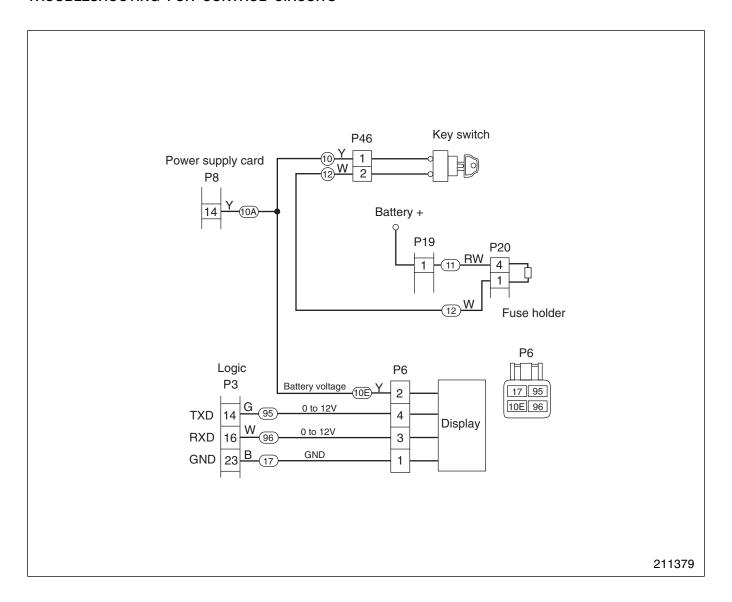
(1) Situation					
Display: "57". All truck operations inhibited. Line contactor OPEN and steering contactor HOLD.					
(2) Possible cause Faulty contact of pump inverter connector, faulty connection of pump motor connector and cable, faulty 12V input voltage of pump inverter, faulty contact or wire breakage of pump motor speed sensor harness, faulty DSP card of pump inverter, faulty pump motor speed sensor.					
(3) How the error code is triggered  Motor rotation speed is more than 4000 rpm. Motor rotation speed is zero while current flows to motor.  Motor rotates in reverse.					
(4) Checks Disconnect battery plug, then perform inverter discharging work. See page 1-45.					
(5) Check to see if pump motor cables (U, V and W-phases) are connected to pump inverter properly.  Normal Abnormal					
(6) Check to see if connector P2 of pump inverter is fastenes securely.  Normal Abnormal	d (7) Connect cables properly.				
(8) Check to see if connector P16 of pump motor speed sensor is fastened securely.  Normal Abnormal	(9) Fasten connector securely.				
Sensor					
(10) Disconnect connectors P2 and P16.  Check continuity between P2-5 and P16(85).  Check continuity between P2-6 and P16(86).  Check continuity between P2-7 and P16(87).  Check continuity between P2-19 and P16(88).  Continuity  No continuity	(11) Fasten connector securely.				
Power supply					
(12)Check continuity between P8-3(47) and P2-17(47A).  Check continuity between P8-6(44) and P2-20(44B).  Continuity  No continuity					
CAN					
(13)Disconnect connector P3 of logic unit. Check continuity between P3-5(92A) and P2-3(92). Check continuity between P3-6(93A) and P2-4(93). Check continuity between P2-14 and P2-15(73). Continuity No continuity					
(14)Connect connector P8 to logic unit, then turn on power again.	(15) Repair or replace harness.				





## **Problem: Display Communication Fault (60)**

(1) Situation		
Display: "60". Normal truck operation.		
(2) Possible cause		
Faulty main harness, faulty display unit, faulty logic unit.		
Tudity main namess, radity display and, radity logic and.		
(3) How the error code is triggered		
Communication is impossible.		
Hour meter data of display unit is abnormal.		
From another troubleshooting flow chart ex. page 2-4, (17)		
(4) Checks		
Disconnect battery plug, then perform inverter discharging work. See page 1-45.		
(5) Disconnect connector P3 of controller. Disconnect		
connector P6 of display unit. Check continuity between P3-14 and P6-4(95).		
Check continuity between P3-16 and P6-3(96).		
Check continuity between P3-23 and P6-1(17).		
Check continuity between P8-14(10A) and P6-2(10E).		
Continuity No continuity		
(6) Check to see if these are shorted to other signal cables. (7) Repair or replace harness.		
Not shorted Shorted		
(8) Replace display unit. (9) Repair or replace harness.		
If fault remains		
(10) Disconnect battery plug, then perform inverter discharging work. See page 1-45.		
(11) Replace logic card of logic unit. See page 1-51.		



## **Problem: Logic Card Initialize Failure (61)**

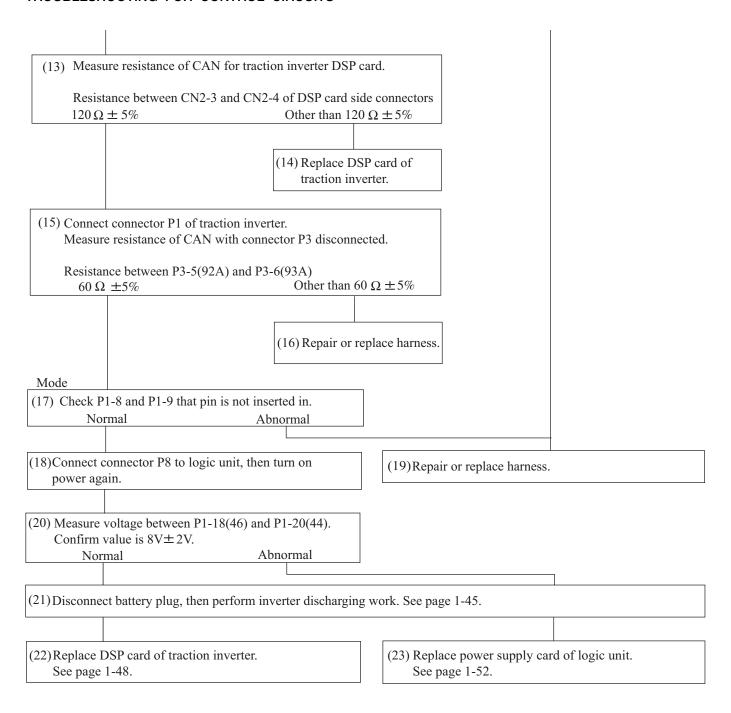
(1) Situation Display: "61". All truck of	operations inhibited. Line conta	ctor OPEN and steering contactor OPEN.
(2) Possible cause Setup Option Group 3 dat faulty logic unit.	a not set, Setup Option Group	and 2 default data not set, faulty Setup Option data,
(3) How the error code is trigger Setup Option data is in ab		
(4) Checks Turn off power, then turn	on power in Setup Option Gro	up 3 setting. See page 1-19.
(5) Set Setup Option Group 3 da	ata. See page 1-31 to 1-33.	
(6) Set Setup Option default da	ta. See page 1-19.	
(7) Turn on power in "RUN" m	ode. See page 1-19.	
(8) With service tool, set Setup Option Group 3 data.		
(9) With service tool, set Setup (		
(10) Disconnect battery plug.	If fault remains	
(11) Replace logic card of logic	unit. See page 1-51.	
(12) With service tool, set Setup	Option Group 3 data.	
(13) With service tool, set Setup	Ontion default data	

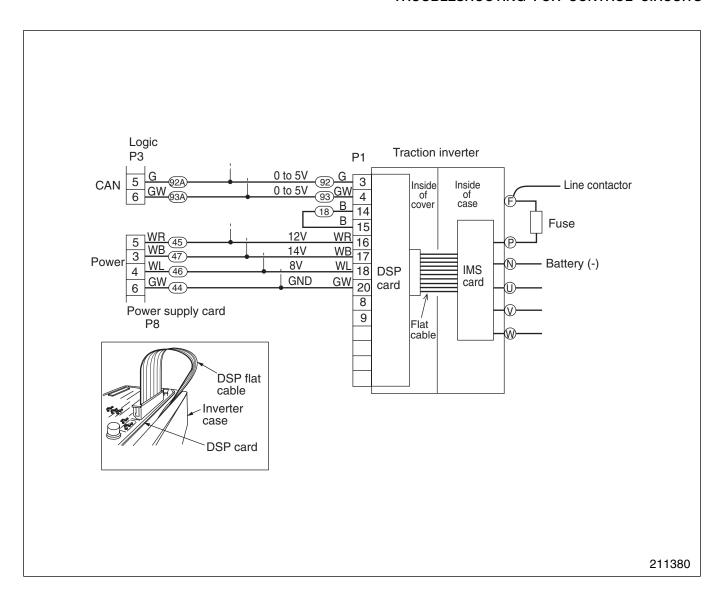
## **Problem: Logics Fault (62)**

(1) Situation Display: "62". All truck operations inhibited. Line conta	actor OPEN and steering contactor OPEN.
(2) Possible cause Faulty EEPROM data, faulty logic unit.	
(3) How the error code is triggered  ROM SUM value of logic card is different from check d data. RAM of logic card is faulty.	ata. EEPROM SUM value of logic card is different from check
(4) Checks Turn off power, then turn on power in Setup Option Gro	oup 3 setting. See page 1-19.
(5) Set Setup Option Group 3 data.	
(6) Set Setup Option default data.	
(7) Turn on power in "RUN" mode. See page 1-19.	Error code "61"
If fault remains "62"	
(8) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	(9) See troubleshooting for code "61". See page 2-59.
(10)Replace logic card of logic unit. See page 1-51.	
(11) With service tool, set Setup Option Group 3 data.	

# **Problem: Traction Inverter Fault (63)**

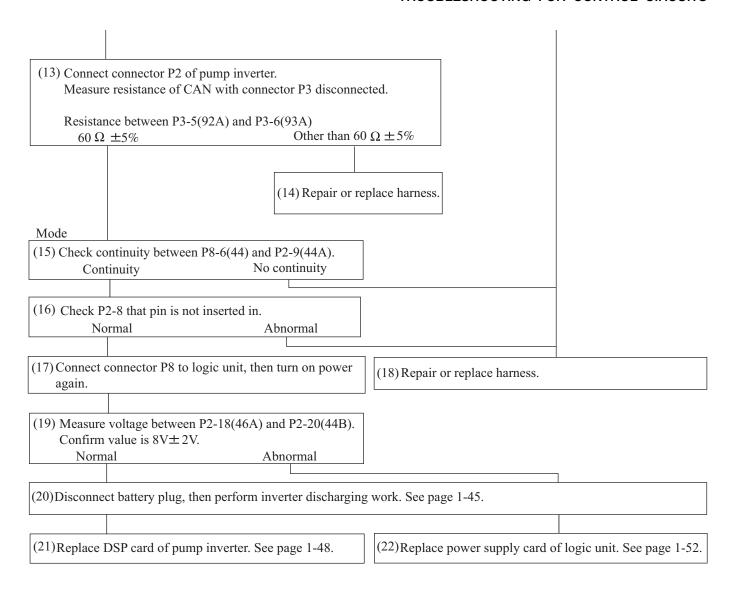
(1) Situation Display: "63". All truck operations inhibited. Line contactor OPEN and steering contactor OPEN.			
(2) Possible cause Faulty contact or wire breakage of DSP flat cable in tracinverter, faulty main harness, faulty logic unit.	ction inverter, faulty DSP card of traction inverter, faulty traction		
(3) How the error code is triggered Traction inverter is connected as pump inverter (P1-9 is ROM SUM value of taction inverter is different from cl RAM of traction inverter is faulty. Communication with	heck data.		
(4) Checks Disconnect battery plug, then perform inverter discharge	ging work. See page 1-45.		
(5) Disconnect connector P1 of traction inverter and remove DSP cover. Check DSP flat cable for looseness or wire breakage.  Normal  8V power supply	; 		
(6) Check continuity between P8-4 and P1-18(46). Check continuity between P8-6 and P1-20(44). Continuity No continuity CAN	(7) Refasten flat cable or replace inverter. See page 1-46.		
(8) Disconnect connector P3 of logic unit.  Check continuity between P3-5(92A) and P1-3(92).  Check continuity between P3-6(93A) and P1-4(93).  Check continuity between P1-14 and P1-15(18).  Continuity  No continuity			
(9) Measure resistance of CAN with connectors P1 and P3 d  Resistance between P3-5(92A) and P3-6(93A) $120 \Omega \pm 5\%$ Other than $120 \Omega \pm 5\%$	isconnected.		
(10) Transistor control Contact  (11) Perform CAN check of Pump Inverter Fault (65).  (12) Repair or repla When repairing repair resistor (harness.	g harness,		

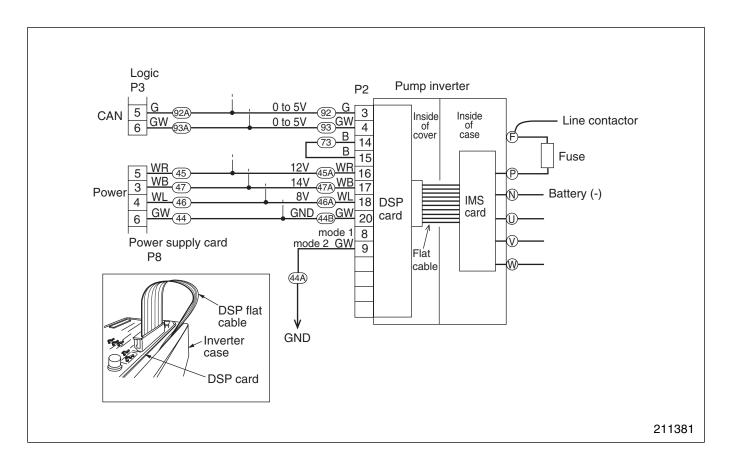




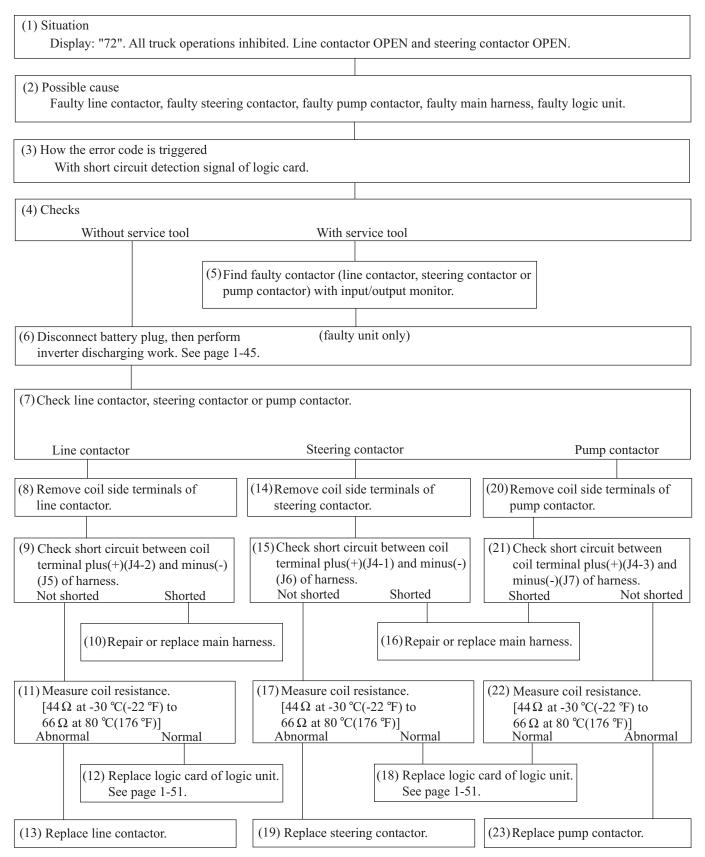
## Problem: Pump Inverter Fault (Transistor Control Type Only) (65)

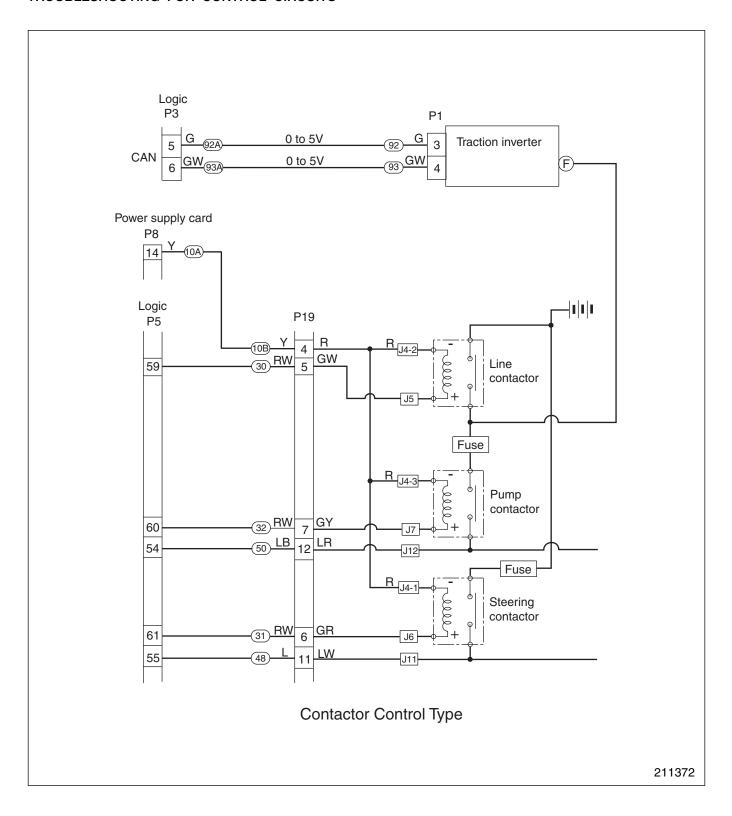
(1) 0'4 -4'					
(1) Situation		ariana intituirat Tima	oton ODENI - 1	1	ODEN
Disp	lay: "65". All truck oper	rations inhibited. Line conta	ictor OPEN and	steering contactor (	JPEN.
(2) Possibl					
		e of DSP flat cable in pum	p inverter, fault	y DSP card of pump	inverter, faulty pump
inverte	r, faulty main harness,	aulty logic unit.			
	e error code is triggered		15		
		traction inverter (P2-9 is opereter is different from check			
		ty. Communication with put		mnossible	
ICTIVI	or pump inverter is taur	y. Communication with pu		inpossible.	
(4) 61 1					
(4) Checks		narfarm invartar dicaharai	na wark Saan	ngo 1 45	
Disco	onnect battery plug, then	perform inverter dischargi	ng work. See pa	age 1-43.	
		mp inverter and remove			
		ole for looseness or wire			
breaka	_	.1			
	Normal	Abnormal			
8V power supply					
	ontinuity between P8-4	(16) and D2 19(16A)			
1 1 1	ontinuity between P8-60	` ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	(7) Refaste	n flat cable or replac	ce inverter. See page 1-46.
	ntinuity	No continuity			
CAN					
	ect connector P3 of logiontinuity between P3-5(				
	ontinuity between F3-5(				
	ontinuity between 13 of				
	ntinuity	No continuity			
(0) Maaaaaa					
(9) Measure	resistance of CAN with	n connectors P2 and P3 disc	onnected.		
Resistan	ce between P3-5(92A)	and P3-6(93A)			
	$\pm 5\%$	Other than 120 $\Omega \pm$	5%		
12000			0 /0		
		(10) Perform CAN chec	k of Traction		
		Inverter Fault (63).			
(44) 3.5					
(11) Measi	are resistance of CAN for	or pump inverter DSP card.			
Dogist	tanaa hatuuaan CN2 2 ar	nd CN2-4 of DSP card side	aannaatara		
120 \$2	± 5%	Other than $120 \Omega \pm$	570		
		(12) Replace DSP card	of pump		
		inverter.	• •		

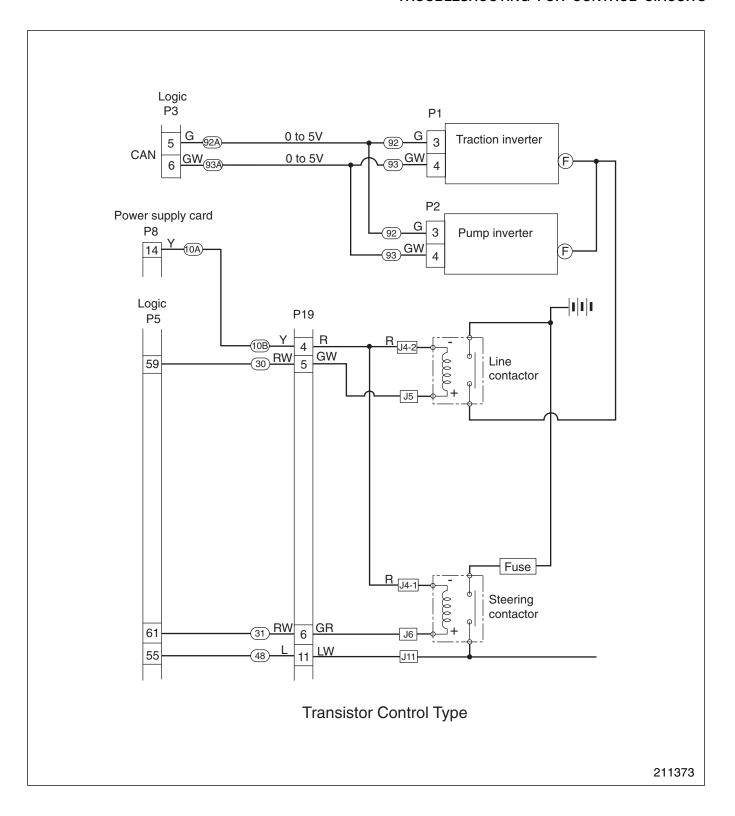




#### **Problem: Contactor Coil Fault (72)**

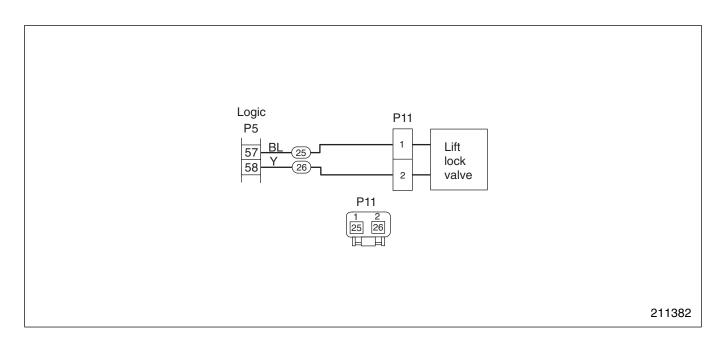






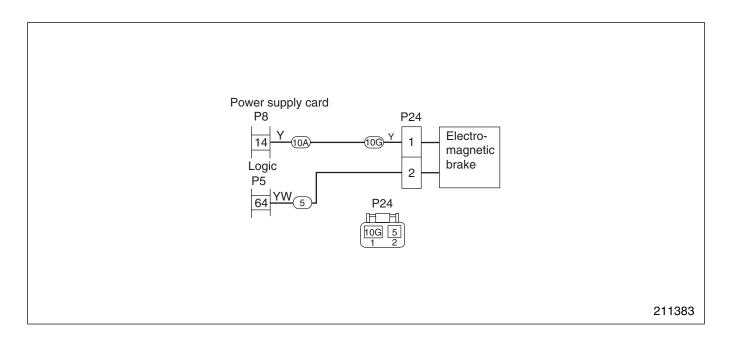
## **Problem: Hydraulic Lock Solenoid Fault (74)**

(1) Situation Display: "74". Pump motor operation inhibited. Normal traction motor operation and power steering operation.				
(2) Possible cause Faulty lift lock valve, faulty main harness, faulty logic unit.				
(3) How the error code is triggered With short circuit detection signal of logic card.				
(4) Checks Disconnect battery plug, then perform inverter discharging work. See page 1-45.				
(5) Disconnect connector P5 of logic unit. Disconnect connector P11 of lift lock valve.				
(6) Check short circuit between P11-1(25) and P11-2(26).				
Shorted	Not shorted			
(7) Repair or replace main harness.	(8) Check short circuit between lift lock valve side connectors. Measure coil resistance.  [40.5 Ω at -30 °C(-22 °F) to 52 Ω at 80 °C(176 °F)]  Normal  Abnormal			
(9) Replace logic card of logic unit. See page 1-51.	(10) Replace lift lock valve.			



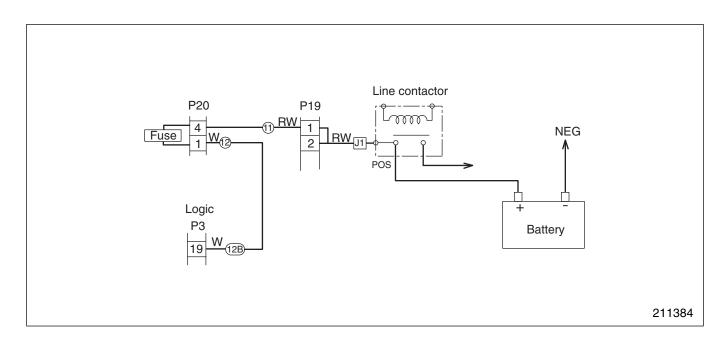
## **Problem: Electromagnetic Brake Solenoid Fault (75)**

(1) Situation				
Display: "75". All truck operations inhibited. Line contactor OPEN and steering contactor HOLD.				
(2) Possible cause				
Faulty electromagnetic brake valve, faulty main harness,	faulty logic unit.			
(3) How the error code is triggered				
With short circuit detection signal of logic card.				
(4) Checks				
Disconnect battery plug, then perform inverter discharging	ng work. See page 1-45.			
(5) Disconnect connector P5 of logic unit. Disconnect connector P24 of electromagnetic brake.				
(6) Check short circuit between P24-1(10G) and P24-2(5).				
Not shorted	Shorted			
<ul><li>(7) Check short circuit between electromagnetic brake side connectors. Measure coil resistance. [Approximately 22.1 Ω]</li></ul>	(8) Repair or replace main harness.			
Shorted Not shorted				
(9) Replace electromagnetic brake.	(10) Replace logic card of logic unit. See page 1-51.			



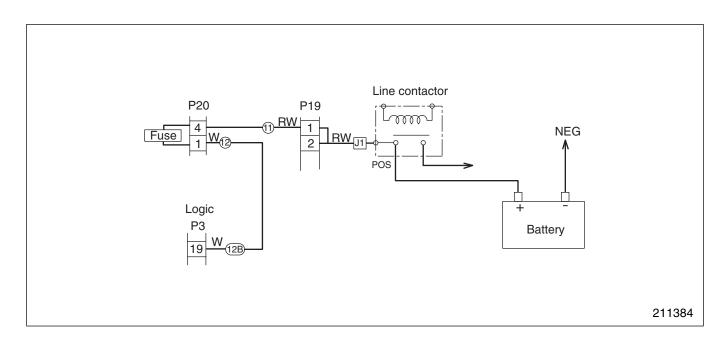
## **Problem: Battery Voltage Too Low (78)**

(1) Situation Display: "78" All tru	ck operations inhibited. Line conta	ctor OPEN and steering contacto	or OPFN
Display. 70 .711 tru	ek operations ininofied. Effic conta	Cool of Drv and scoring contacto	I OI LIV.
	pattery, low voltage battery, impropenent setting (Setup Option #46), fa		
(3) How the error code is t Corrected battery vol 36 V battery: less	tage is too low. Battery voltage is co		
	lug. Measure battery voltage with to V to 55 V	ester.	ormal
(5) Turn on power in Setup See page 1-19.	Option Group 3 setting.	(6) Charge battery or replace v	with proper battery.
(7) Set #41 of Setup Option Set #46 of Setup Option	Group 3. Group 3. See page 1-31 to 1-33.		
(8) Turn off power and turn	on power again.		
	If fault remains		
(9) Disconnect battery plug discharging work. See p			
(10) Check continuity betwee POS(J1).  Continuity	een P3-19(12B) and contactor  No continuity		
(11) Perform inverter discharge card of logic unit. See p	arging work, then replace logic	(12) Repair or replace main h	arness.



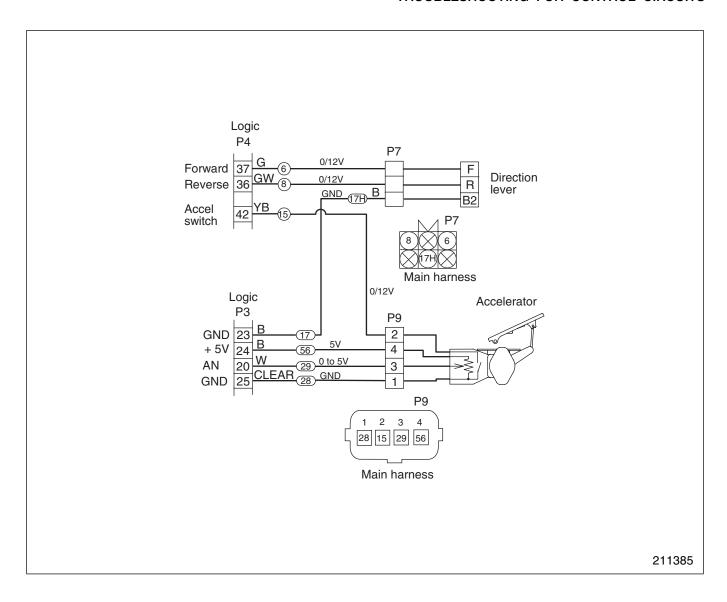
# **Problem: Battery Voltage Too High (79)**

(1) Situation Display: "79". All truck operations inhibited. Line contact	ctor OPEN and steering contactor OPEN.
1 7	
(2) Possible cause Faulty or highly charged battery, high voltage battery, im improper battery voltage adjustment setting (Setup Option	
(3) How the error code is triggered  Corrected battery voltage is too high. Battery voltage is a 36 V battery: more than 42 V 48 V battery: more	
(4) Checks Disconnect battery plug. Measure battery voltage with to 34V to 55 V	ester. Abnormal
(5) Turn on power in Setup Option Group 3 setting. See page 1-19.	(6) Replace with proper battery.
(7) Set #41 of Setup Option Group 3. Set #46 of Setup Option Group 3. See page 1-31 to 1-33.	
(8) Turn off power and turn on power again.	
(9) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	
(10) Check continuity between P3-19(12B) and contactor POS(J1).  Continuity No continuity	
(11) Perform inverter discharging work, then replace logic card of logic unit. See page 1-51.	(12) Repair or replace main harness.



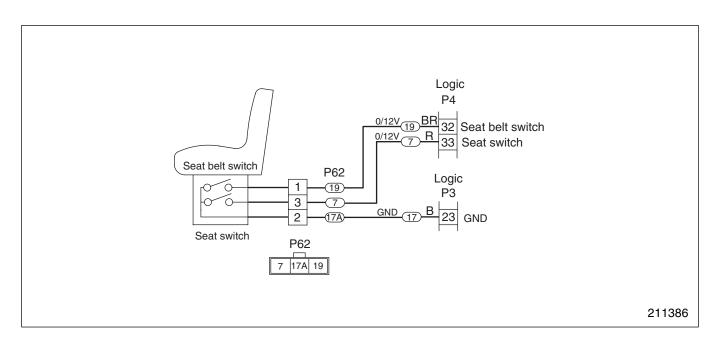
### **Problem: Direction Lever or Accelerator, Faulty Setting (E)**

tor and steering contactor OPEN when turning on power. ontactor HOLD except when turning on power.
er in forward or reverse position, key switch turned on while luring running, faulty direction lever switch, faulty accelerator
ge: More than 0.3 V
pedal.
(7) Turn on power in diagnosis mode. Inspect direction lever and accelerator sensor. See page 1-38.
(faulty unit only)
Accelerator sensor
(10) Refer to error code "51". See page 2-48.
(12) Disconnect connectors P4 and P3 of logic unit.
(13) Check short circuit between P3-23(17) and P4-36(8), P3-23(17) and P4-37(6).  Not shorted  Shorted  (14) Disconnect battery plug. (15)Repair or replace main harness.



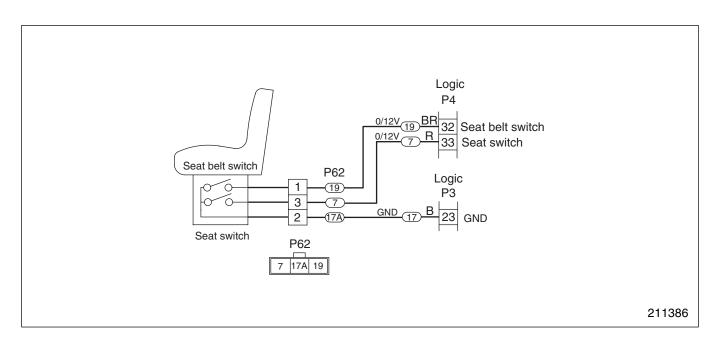
### Problem: Seat Switch, Faulty Setting For Traction ((E))

	Line contactor and steering contactor OPEN when turning on teering contactor HOLD except when turning on power.
(2) Possible cause Operator not on seat, seat switch turned off during runn faulty main harness, faulty logic unit.	ning, improper seat suspension adjustment, faulty seat switch,
(3) How the error code is triggered  Detects seat switch opening when turning on power or	during running.
(4) Checks  If this fault occurred during running	If this fault occurred when turning on power
(5) Stop truck, then move direction lever to neutral. Sit properly in operator's seat and release accelerator pedal.  If fault remains  Normal	
Fail-safe function	
(6) Turn off power. Sit on seat, then turn on power again.	
If fault remains	
(7) Turn off power.	
(8) Adjust seat suspension.  If fault remains Normal	
Faulty seat switch positi	ion
(9) Disconnect battery plug.	
(10) Disconnect connector P62, then short-circuit between terminals (17A) and (7). Turn on power again.  If fault remains  Normal	
(11) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	(12)Replace seat switch.
(13) Disconnect connectors P4 and P3 of logic unit. Check continuity between P62(17A) and P3-23(17). Check continuity between P62(7) and P4-33. Continuity No continuity	
(14) Replace logic card of logic unit. See page 1-51.	(15) Repair or replace main harness.



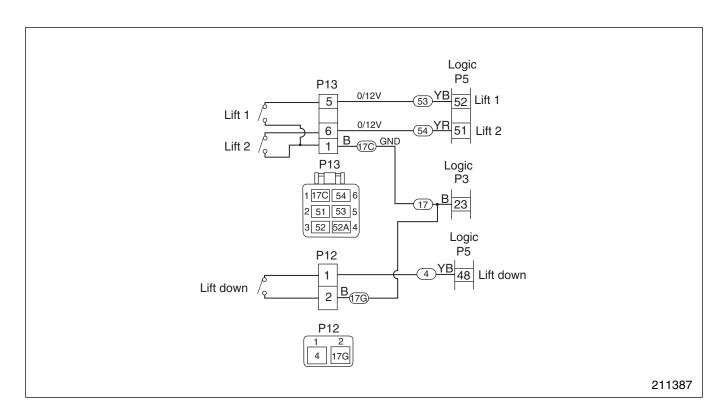
### Problem: Seat Switch, Faulty Setting For Hydraulic ((L))

(1) Situation Display: "L" flickering. All truck operations inhibited. L power. Line contactor OPEN (when truck stops) and stee	Line contactor and steering contactor OPEN when turning on ering contactor HOLD except when turning on power.
(2) Possible cause Operator not on seat, seat switch turned off during pump faulty seat switch, faulty main harness, faulty logic unit.	
(3) How the error code is triggered  Detects seat switch opening when turning on power or or	during pump operation.
(4) Checks  If this fault occurred during pump motor operation	If this fault occurred when turning on power
(5) Sit on seat, then stop pump motor operation.  If fault remains  Normal	
Fail-safe function  (6) Turn off power. Sit on seat, then turn on power again.	
If fault remains	
(7) Turn off power.	
(8) Adjust seat suspension.  If fault remains  Normal  Faulty seat switch positio	on.
(9) Disconnect battery plug.	
(10) Disconnect connector P62, then short-circuit between terminals (17A) and (7). Turn on power again.  If fault remains  Normal	
(11) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	(12) Replace seat switch.
(13)Disconnect connectors P4 and P3 of logic unit. Check continuity between P62(17A) and P3-23(17). Check continuity between P62(7) and P4-33. Continuity No continuity	
(14) Replace logic card of logic unit. See page 1-51.	(15) Repair or replace main harness.



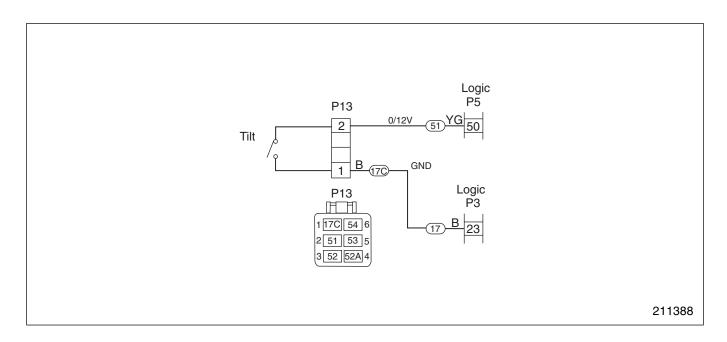
# **Problem: Lift Lever, Faulty Setting (H1)**

	ited. Line contactor and steering contactor OPEN when turning on d steering contactor HOLD except when turning on power.
(2) Possible cause Key switch turned on while operating lift lever, faul harness, faulty logic unit.	lty lift switches 1 and 2, faulty lift down switch, faulty main
(3) How the error code is triggered  Detects lift microswitch 1 or 2, or lift down microswitch 1 or 2.	witch when turning on power.
(4) Checks  If this fault occurred during pump motor operation	If this fault occurred when turning on power
(5) Sit on seat, then stop pump motor operation.  If fault remains  Normal  Fail-safe function	on
(6) Turn off power. Sit on seat, then turn on power again without lift operation.  If fault remains	
(7) Turn off power.  (8) Disconnect connector P13 of microswitch. Sit on sear	ıt,
then turn on power again.  If fault remains  Normal	
(9) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	(10) Replace lift switch 1 or 2.
(11) Check continuity between P5-52 and P13-5(53).  Check continuity between P5-51 and P13-6(54).  Check continuity between P5-48 and P12-1(4).  Check short circuit between P13-5(53) and P13-1(17)  Check short circuit between P13-6(54) and P13-1(17)  Check short circuit between P12-1(4) and P12-2(170)  Continuity, Not shorted  No continuity, Shorted	7C). G).
(12) Disconnect battery plug.	(13)Repair or replace main harness.
(14) Replace logic card of logic unit. See page 1-51.	



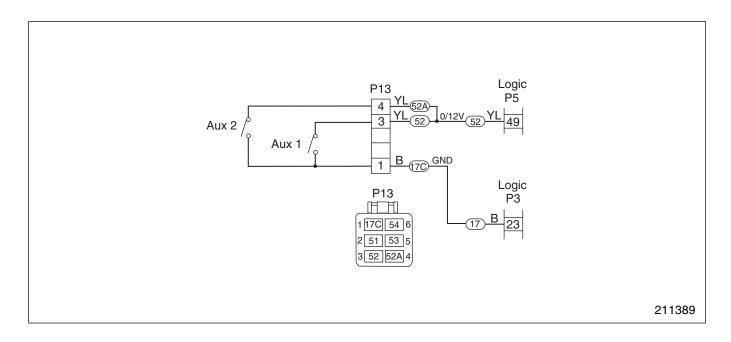
## **Problem: Tilt Lever, Faulty Setting (H2)**

(1) Situation Display: "H2" flickering. All truck operations inhibited power. Line contactor OPEN (when truck stops) and stops.	. Line contactor and steering contactor OPEN when turning on eering contactor HOLD except when turning on power.
(2) Possible cause  Key switch turned on while operating tilt lever, faulty t	ilt switch, faulty main harness, faulty logic unit.
(3) How the error code is triggered  Detects tilt microswitch when turning on power.	
(4) Checks  If this fault occurred during pump motor operation	If this fault occurred when turning on power
(5) Sit on seat, then stop pump motor operation.  If fault remains  Normal	
Fail-safe function	
(6) Turn off power. Sit on seat, then turn on power again without tilt operation.  If fault remains	
(7) Turn off power.	
(8) Disconnect connector P13 of microswitch. Sit on seat, then turn on power again.  If fault remains  Normal	
(9) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	(10) Replace tilt switch.
(11) Check continuity between P5-50 and P13-2(51). Check short circuit between P13-2(51) and P13-1(17C). Continuity, Not shorted No continuity, Shorted	
(12) Disconnect battery plug.	(13) Repair or replace main harness.
(14) Replace logic card of logic unit. See page 1-51.	



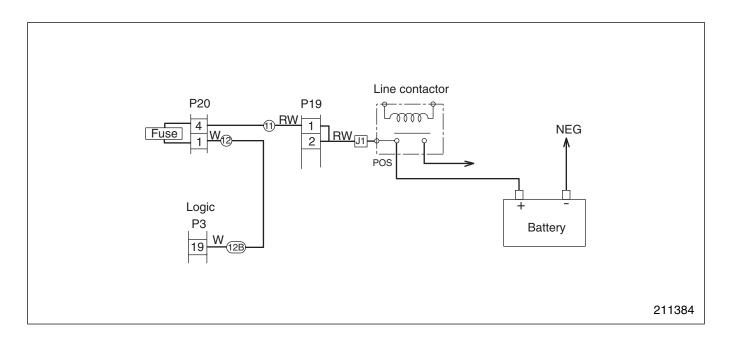
## **Problem: Attachment 1 Lever, Faulty Setting (H3)**

	ed. Line contactor and steering contactor OPEN when turning on steering contactor HOLD except when turning on power.
(2) Possible cause  Key switch turned on while operating attachment 1 or faulty logic unit.	r 2 lever, faulty attachment 1 or 2 switch, faulty main harness,
(3) How the error code is triggered	
Detects attachment 1 or 2 microswitch when turning of	on power.
(4) Checks  If this fault occurred during pump motor operation	If this fault occurred when turning on power
(5) Sit on seat, then stop pump motor operation.  If fault remains  Normal	
Fail-safe function	
(6) Turn off power. Sit on seat, then turn on power again without attachment 1 or 2 operation.  If fault remains	
(7) Turn off power.	
(8) Disconnect connector P13 of microswitch. Sit on seat, then turn on power again.  If fault remains  Normal	
(9) Disconnect battery plug, then perform inverter discharging work. See page 1-45.	(10) Replace attachment 1 or 2 switch.
(11) Check continuity between P5-49, P13-3(52) and P13-4(52A).  Check short circuit between P13-3(52), P13-4(52A) and P13-1(17C).	
Continuity, Not shorted No continuity, Shorted	
(12) Disconnect battery plug.	(13) Repair or replace main harness.
(14) Replace logic card of logic unit. See page 1-51.	



## **Problem: Battery Consumption Too Much ((Lo))**

(1) Situation Display: "Lo" flickering. Battery low indicator ON. All Line contactor OPEN and steering contactor OPEN.	truck operations inhibited.
(2) Possible cause	
Extremely consumed battery, faulty main harness, faulty	logic unit.
(3) How the error code is triggered	
Corrected battery voltage is less than 22 V. Battery voltage	ge is corrected with #46 value.
(4) Checks	
Disconnect battery plug.	
(5) Check battery voltage.	
22V or more Less than 22V	
(6) Set #46 of Setup Option Group 3. See page 1-33.	(7) Charge battery or replace with new battery.
If fault remains	
(8) Perform inverter discharging work. See page 1-45.	
(9) Check continuity between P3-19(12B) and contactor POS(J1).  Continuity  No continuity	
(10)Replace logic card of logic unit. See page 1-51.	(11) Repair or replace main harness.



#### **Problem: Battery Consumption Much**

