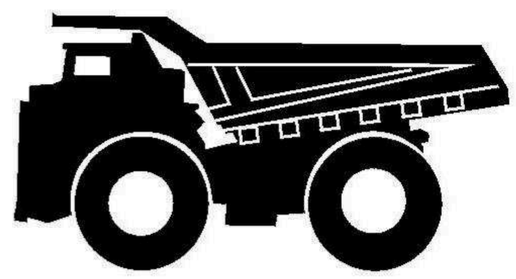
DG708

Shop Manual



730E

DUMP TRUCK

SERIAL SUFFIX **AFE47-B thru AFE47-AL**

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STATEX III ELECTRICAL SYSTEM CHECKOUT PROCEDURE

TABLE OF CONTENTS

SECTION ..... PAGE

GENERAL INFORMATION E3-1

COMMUNICATIONS PORT CHECK E3-2

PTU Hookup E3-2

1.0 SEQUENCE TESTS - (Engine not running) E3-4

1.1 Throttle System Check and Adjustment E3-5

1.1.1 Electronic throttle system E3-5

1.1.2 Electronic throttle system Fuel Enhancement ("Fuel Saver") E3-6

1.2 Retard System Check and Adjustment - Electronic Pedal System E3-8

1.2.1 Williams Electronic Retard Pedal and ACC/RET or RET Interface E3-8

1.2.2 Electronic Retard Pedal, Current Production Trucks E3-9

1.3 Reverser and Propulsion Contactors Check E3-11

1.4 Propulsion Lockout Test (DDEC, MTU Engines) E3-12

1.5 Retard Contactors Operation Check E3-13

1.6 Ground Fault Sensing Check E3-13

1.7 Ground Fault in Retard Operation Check E3-13

1.8 Override Operation Check E3-14

1.9 Anti-Reversal Function (AR) Check E3-15

1.10 Overspeed Retard Operation Check E3-15

1.11 Hoist Interlock Operation Check E3-16

1.12 Motor Blower Fault Light Operation Check E3-17

2.0 DIGITAL INPUT/OUTPUT SIGNALS TESTS - FL275 CARD PANEL E3-18

2.1 Setup Manual Digital Input/Output Test on PTU E3-18

2.2 Digital Input Checks E3-19

2.3 Digital Output Checks E3-21

3.0 ANALOG INPUT SIGNALS TESTS - FL275 CARD PANEL E3-24

3.1 Setup Analog Input Monitor Screen on PTU E3-24

3.2 Analog Input Checks E3-25

3.3 Frequency Input Checks E3-32

4.0 SPEED EVENT CHECKS E3-34

4.1 Single Speed Overspeed - Overspeed Settings Check E3-35

4.2 Empty Truck - 2 Speed Overspeed Settings Check E3-35

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ELECTRICAL CONTROL CABINET

The following pages illustrate the electrical control cabinet, components and terminal boards located inside the cabinet as noted for truck models 445E, 510E, 630E, 685E, and 730E. Actual component location and equipment will vary dependent on optional equipment installed.

Components in the cabinet are labelled with abbreviations for identification. These abbreviations are shown on the item number of the illustrations and are listed alphabetically at the end of this section.

This information should be used in conjunction with applicable electrical schematics located in the rear of this manual when troubleshooting the electrical system.

⚠WARNING

This system is capable of developing high Voltage. Use caution when working with the system.

⚠CAUTION

Some of the components on the cards are sensitive to static electricity. To prevent damage, it is recommended that a properly connected ground strap be worn when removing, handling or installing a card. It is also recommended that after a card has been removed, it is carried and stored in a static proof bag or container.

NOTE: There are no adjustment potentiometers on the control cards. Cards should not be removed during troubleshooting unless it has been determined that a card is at fault.

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F-20: Sensor Power Fault

A common failure point can be the connector on the suspension pressure sensors. These connectors take a lot of abuse from pressure washing and occasionally short circuit or develop floating voltages from water and dirt intrusion. The quickest way to fix these problems is to disconnect the two halves and blow out any debris and clean the contacts. The process of disconnecting and re-inserting a connector often clears up many problems. If a problem persists, check the crimps on the terminals for intermittent connection due to vibration and wear.

On the 930E's, the most common cause for sensor power faults is a short in the harness coming from the back of the cab to the Aux/Junction box. This harness contains a splice for sensor power. This splice is approximately 305 mm (12 in.) from the connector and is exposed to vibration and dirt from the left tire. It may be possible to locate this splice and repair it. A single wire for circuit 39F carries 18v from the payload meter to the splice, where it branches out for each sensor.

The 39F circuit from PLM II™ is over-current protected. If this circuit is shorted to ground, the payload meter will automatically shut off the 18v supply. This will cause the payload meter to register faults for all the sensors.

In general, check the voltages at the sensors. It may be possible to disconnect each sensor in the junction box to see where the short may be. If disconnecting all the sensors does not clear the fault, it is likely that the problem lies within the harness from the back of the cab to the control cabinet.

Refer to the following page for the fault tree diagram.

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3. Pump Cycle Timer (also called a "Flasher" timer, because it contains an LED that illuminates when there is power going to SV2): The Pump Cycle Timer (8) mounts on SV2 solenoid and generates a timed pulse signal to control the reciprocating cycle rate of the grease pump.

4. Grease Reservoir: For the 730E, the right front frame torque tube is utilized for the reservoir. The reservoir has a capacity of 30 gal. [approximately 214 lbs. (97 kg)] of grease.

5. Vent Valve:
With the vent valve closed, the pump continues to cycle until maximum pressure is achieved. As this occurs, the vent valve opens and allows the grease pressure to drop to 0, so the injectors can recharge for their next output cycle.

6. 24 VDC Solid State System Timer:
The Solid State System Timer sends out a 24 VDC timed-interval signal to energize the solenoid valves, causing the grease pump to operate. This timer is mounted in the cab (in the housing under the passenger seat) to insure temperature stability. Its operating temperature range is -20°F to 131°F (-29°C to 55°C).

7. Pressure Switch (N/C 2500 psi [17 238 kPa]):
opens the 24 volt supply to the cycle timer, when the grease line pressure exceeds this limit.

8. Injectors (SL-1): each injector delivers a controlled amount of pressurized lubricant to a designated lube point. Refer to Figure 3-2 for locations.

System Operation:

1. During truck operation, with the pump and timer systems in a rest state, a preset time interval occurs.
2. The solid state system timer sends out a 24 VDC signal to energize SV1, causing it to open.
3. As SVI opens, the resulting hydraulic fluid pressure flows through the pressure reducing valve closing the vent valve and also flows on to SV2.
4. The pressure reducing valve lowers hydraulic fluid pressure to the operating range of the hydraulic pump [maximum pressure 300 p.s.i. (2069 kPa)].
5. After the system pressure has been reduced, it passes on to SV2. Each operation of SV2 moves the hydraulic cylinder which operates the grease pump. As SV2 turns "On" and "Off" (refer to cycle timer/flasher below), it changes the direction of the hydraulic cylinder movement back and forth, thus causing a "pumping" action.
6. The cycle timer/flasher sends a pulsing signal, 1 second "On" and 1 second "Off" (adjustable), to SV2. Solenoid valve SV2 directs the hydraulic fluid to the pump at 30 cycles/minute.
7. With the vent valve closed, the pump continues to cycle until lubricant pressure rises to 2500 psi (17238 kPa) and the injectors have metered grease to the points of lubrication.
8. If system pressure rises above 2500 psi (17 238 kPa), the N/C pressure switch will open until the timed cycle is complete and the solid state system timer terminates the 24VDC signals to SV1 and SV2. (See NOTE: below step 11.)
9. As SV2 is de-energized the pump stops cycling.
10. As SV1 is de-energized, the hydraulic fluid stops flowing to the pressure reducing valve and the vent valve allowing it to open.
11. As the vent valve opens, the grease pressure drops to zero (0), so the injectors can recharge for their next output cycle.

    NOTE: When the N/C pressure switch opens, SV2 is de-energized causing the pump to stop; however, until the timed cycle is complete, SV1 remains energized, keeping the vent valve closed and holding pressure in the grease line.

    If the grease line pressure now drops to where the switch closes again, the pump will restart to hold grease line pressure, but the injectors will not recharge.

12. The system is now at rest, ready for another lube cycle and the sequence repeats itself.

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STATEX III CONNECTION INFORMATION

CONNR	PIN NO	SIGNAL NAME	SIGNAL TYPE	LOCATION CARD - PIN	DESCRIPTION	RELATED GROUP SIGNALS	EF8500 SH. LOCATION SCHEMATIC
A	1	-VBAT	POWER SUPPLY	100-157,158,159	BATTERY GROUND CONNECTION FOR SYSTEM POWER SUPPLY CARD	----	22
A	4	VEE	POWER OUTPUT	100-124,125,126	REGULATED -15VDC SUPPLY (350 MILLIAMPS MAX)	CNA-4,10,15	13
A	5	VEE	POWER OUTPUT	100-121,122,123	REGULATED -15VDC SUPPLY (350 MILLIAMPS MAX)	CNA-5,9,22	13
A	7	+19V	POWER OUTPUT	100-86	REGULATED 19VDC OUTPUT FOR RETARD CONTROL CIRCUITS (500 MILLIAMPS MAX)	CNA-7,8	22
A	8	+19V	POWER OUTPUT	100-87	REGULATED 19VDC OUTPUT FOR RETARD CONTROL CIRCUITS (500 MILLIAMPS MAX)	CNA-8,7	22
A	9	VDD	POWER OUTPUT	100-139,140,141	REGULATED +15VDC SUPPLY (350 MILLIAMPS MAX)	CNA-9,5,22	13
A	10	VDD	POWER OUTPUT	100-136,137,138	REGULATED +15VDC SUPPLY (350 MILLIAMPS MAX)	CNA-10,4,15	13
A	15	-VBAT	SHIELD	100-145,146,147	REGULATED POWER SUPPLY SHIELD CONNECTION	CNA-15,4,10	13
A	16	_VBAT	SHIELD	100-151,152,153	SHIELD - CHANNEL 'A' RS232 FOR PTU	CNA-16,88,98,82	26
A	17	-VBAT	SHIELD	100-169,170,171	SHIELD - CHANNEL 'B' RS232 FOR PTU	CNA-17,90,100,84	26
A	20	GRND	POWER SUPPLY	100-184,185,186	BATTERY GROUND CONNECTION FOR SYSTEM POWER SUPPLY CARD	----	22
A	21	GRND	POWER SUPPLY	100-181,182,183	BATTERY GROUND CONNECTION FOR SYSTEM POWER SUPPLY CARD	----	22
A	22	GRND	SHIELD	100-178,179,180	REGULATED POWER SUPPLY SHIELD CONNECTION	CNA-22,9,5	13
A	23	SIG3_R (GRND)	ANALOG OUTPUT	100-175,176,177	SPARE ANALOG OUTPUT SIGNAL 3 RETURN	CNA-23,34	16
A	24	SIG5_R (GRND)	ANALOG OUTPUT	100-172,173,174	SPARE ANALOG OUTPUT SIGNAL 5 RETURN	CNA-24,47	16
A	28	-VBAT	POWER SUPPLY	100-160,161,162	BATTERY GROUND CONNECTION FOR SYSTEM POWER SUPPLY CARD	----	22
A	29	-VBAT	POWER SUPPLY	100-166,167,168	BATTERY GROUND CONNECTION FOR SYSTEM POWER SUPPLY CARD	----	22
A	31	SIG4_R	ANALOG OUTPUT	102-202	SPARE ANALOG OUTPUT SIGNAL 4 RETURN	CNA-31,64	16
A	32	SIG2_R	ANALOG OUTPUT	102-199	SPARE ANALOG OUTPUT SIGNAL 2 RETURN	CNA-32,33	16
A	33	SIG2	ANALOG OUTPUT	102-85	SPARE ANALOG OUTPUT SIGNAL 2	CNA-33,32	16
A	34	SIG3	ANALOG OUTPUT	102-82	SPARE ANALOG OUTPUT SIGNAL 3	CNA-34,23	16
A	39	+VBAT	POWER	100-205,202	+28VDC POWER INPUT	----	19
A	41	-VBAT	POWER SUPPLY	100-148,149,150	BATTERY GROUND CONNECTION FOR SYSTEM POWER SUPPLY CARD	----	22
A	42	-VBAT	POWER SUPPLY	100-154,155,156	BATTERY GROUND CONNECTION FOR SYSTEM POWER SUPPLY CARD	----	22
A	44	TRKSPD(+)	ANALOG OUTPUT	102-209	SPEEDOMETER DRIVE OUTPUT SIGNAL (0-1MA) DRIVES SPEEDOMETER IN TRUCK CAB (5K OHM MAXIMUM)	CNA-44,46	16
A	45	SIG1	ANALOG OUTPUT	102-206	SPARE ANALOG OUTPUT SIGNAL 1	CNA-45,49	16
A	46	TRKSPD(-)	ANALOG OUTPUT	102-200	SPEEDOMETER DRIVE RETURN SIGNAL (0-1MA) DRIVES SPEEDOMETER IN TRUCK CAB (5K OHM MAXIMUM)	CNA-46,44	16
A	47	SIG5	ANALOG OUTPUT	102-92	SPARE ANALOG OUTPUT SIGNAL 5	CNA-47,24	16
A	48	MOTS(-)	ANALOG OUTPUT	102-208	MOTOR TEMPERATURE METER IN CAB (0-1MILLIAMP, 5K OHM MAXIMUM)	CNA-48,59	16
A	49	SIG1_R	ANALOG OUTPUT	102-205	SPARE ANALOG OUTPUT SIGNAL 1 RETURN	CNA-49,45	16
A	52	+VBAT	POWER	100-207,210	+28VDC POWER INPUT	----	19
A	53	ENGRPMCMD	ANALOG OUTPUT	102-84	ENGINE RPM COMMAND OUTPUT SIGNAL (0-10VDC)	CNA-53,62	16
A	54	+VBAT	POWER	100-208,209	+28VDC POWER INPUT	----	19
A	55	-VBAT	POWER SUPPLY	100-200,201	BATTERY GROUND CONNECTION FOR SYSTEM POWER SUPPLY CARD	----	22
A	59	MOTS(+)	ANALOG OUTPUT	102-210	MOTOR TEMPERATURE METER IN CAB (0-1 MILLIAMP, 5K OHM MAXIMUM)	CNA-59,48	16
A	60	ENGRPM(-)	ANALOG OUTPUT	102-207	ENGINE TACHOMETER DRIVE OUTPUT SIGNAL (0-1MA DRIVES TACH. IN TRUCK CAB (5K OHM MAXIMUM)	CNA-60,61	16
A	61	ENGRPM(+)	ANALOG OUTPUT	102-204	ENGINE TACHOMETER DRIVE RETURN SIGNAL (0-1MA DRIVES TACH. IN TRUCK CAB (5K OHM MAXIMUM)	CNA-61,60	16
A	62	ENGRPMCMD_R	ANALOG OUTPUT	102-147	ENGINE RPM COMMAND RETURN SIGNAL (0-10VDC)	CNA-62,53	16
A	63	BRKBLV_R	ANALOG OUTPUT	102-126	BRAKE BLENDING VALVE TO ADD HYDRAULIC BRAKING TO RETARDING EFFORT RETURN SIGNAL (0-10VDC INTO 1K OHM)	CNA-63,65	16
A	64	SIG4	ANALOG OUTPUT	102-96	SPARE ANALOG OUTPUT SIGNAL 4	CNA-64,31	16
A	65	BRKBLV	ANALOG OUTPUT	102-87	BRAKE BLENDING VALVE TO ADD HYDRAULIC BRAKING TO RETARDING EFFORT OUTPUT SIGNAL (0-10VDC INTO 1K OHM)	CNA-65,63	16
A	82	GRNDA	SERIAL COMM	101-4:7	GRND - CHANNEL 'A' RS232 FOR PTU	CNA-82,16,88,98	26
A	84	GRNDB	SERIAL COMM	100-	GRND - CHANNEL 'B' RS232 FOR PTU	CNA-84,17,90,100	26
A	85	RS422A	SERIAL COMM	100-	FOR FUTURE USE	----	-
A	86	RS422A	SERIAL COMM	100-	FOR FUTURE USE	----	-
A	88	RXDA	SERIAL COMM	101-4:3	RDX - CHANNEL 'A' RS232 FOR PTU	CNA-88,98,82,16	26
A	90	RXDB	SERIAL COMM	100-	RDX - CHANNEL 'B' RS232 FOR PTU	CNA-90,100,84,17	26
A	94	RS422A	SERIAL COMM.	100-	FOR FUTURE USE	----	-
A	95	RS422A	SERIAL COMM.	100-	FOR FUTURE USE	----	-
A	96	RS422A	SERIAL COMM.	100-	FOR FUTURE USE	----	-
A	98	TXDA	SERIAL COMM.	101-4:2	TDX - CHANNEL 'A' RS232 FOR PTU	CNA-98,82,16,88	26
A	100	TXDB	SERIAL COMM.	100-	TDX - CHANNEL 'B' RS232 FOR PTU	CNA-100,84,17,90	26
A	101	RS422A	SERIAL COMM.	100-	FOR FUTURE USE	----	-
A	102	RS422A	SERIAL COMM.	100-	FOR FUTURE USE	----	-
A	103	RS422A	SERIAL COMM.	100-	FOR FUTURE USE	----	-
B	1	MOTINHI_RT	DIGITAL INPUT	102-178	+15VDC RETURN TO INHIBIT MOTOR FIELD FIRING PLUSES	CNB-1,85	17
B	2	MFSEFP_RS	SHIELD	102-172	MOTOR FIELD STATIC EXCITER FIRING FIRING PULSES SHIELD	CNB-2,6,7	15
B	3	SPARE_RS	SHIELD	102-166	FUTURE SIGNAL SHIELD	CNB-3,58,31	17
B	6	MFSEFPHI	DIGITAL OUTPUT	102-139	MOTOR FIELD STATIC EXCITER FIRING FIRING PULSES FOR SCR #1 & 2	CNB-6,7,2	15
B	7	MFSEFPLO	DIGITAL OUTPUT	102-136	MOTOR FIELD STATIC EXCITER FIRING FIRING PULSES FOR SCR #1 & 2	CNB-7,2,6	15
B	8	FAULT(+)	ANALOG INPUT	102-165	GROUND FAULT DETECTION +/- 114 MA DC LEAKAGE OR 119 PEAK MA AC LEAKAGE	CNB-8,22	15
B	11	AOUTVLT_RS	SHIELD	102-121	ALTERNATOR RECTIFIED VOLTAGE FEEDBACK SHIELD	CNB-11,102,48	13
B	12	UNDEF2_RS	SHIELD	102-103	SPARE ANALOG INPUT SIGNAL SHIELD	CNB-12,13,27	17
B	13	UNDEF2	ANALOG INPUT	102-97	SPARE ANALOG INPUT SIGNAL	CNB-13,27,12	17
B	14	MFAMP_RS	SHIELD	102-94	MOTOR FIELD CURRENT INPUT SHIELD	CNB-14,47,65	15
B	15	COOLPS_R	ANALOG INPUT	102-181	ENGINE COOLANT PRESSURE REFERENCE (0.5-4.5VDC = 0 TO FULL SCALE) (5VDC SUPPLY REQUIRED, MAX VOLATGE = 4.5 VOLTS)	CNB-15,84,30	17
B	16	AFSEFP_RS	SHIELD	102-169	ALTERNATOR FIELD STATIC EXCITER FIRING PULSES SHIELD	CNB-16,78,92	15
B	18	M1AMPS	ANALOG INPUT	102-151	MOTOR 1 CURRENT SIGNAL CURRENT MAX. = 2110 AMPS FOR GE 772 = 3500 AMPS FOR GTE 776,787,788 PROTECTION CURRENT LIMIT = 3000 AMPS FOR GE 776,787,788 = 1620 AMPS FOR GE 772 ACCEL CURRENT LIMIT = 1350 AMPS FOR GE 772 = 2000 AMPS FOR GE 776 HSB WITH 1200 HP = 2000 AMPS FOR GE 791 AS3 = 2250 AMPS FOR GE 788 ES1/ES2 OR FS1/FS2 = 2250 AMPS FOR GE 787 ES1 WITH 1600 OR 1800 HP = 2500 AMPS FOR GE 776 KS6 WITH 1350 HP = 2500 AMPS FOR GE 776 HSB = 2500 AMPS FOR GE 788,791 = 2700 AMPS FOR GE 787FS1 = 2850 AMPS FOR GE787FS2 RETARDING CURRENT LIMIT = 720 AMPS FOR GE 722 = 1320 AMPS FOR GE 776,791,788(190 TON) = 1320 AMPS FOR GE 787(240 TON,1800 RPM) = 1390 AMPS FOR GE 787(220,240 TON,1900 RPM) = 1390 AMPS FOR GE 787(260 TON) = 1390 AMPS FOR GE 788(208,260 TON)	CNB-18,100,63	15
B	20	COOLTS_R	ANALOG INPUT	102-142	ENGINE COOLANT TEMPERATURE RETURN SIGNAL (+15VDC SUPPLY REQUIRED)	CNB-20,43,95	17
B	21	ALTFAMPS	ANALOG INPUT	102-146	ALTERNATOR FIELD CURRENT FEEDBACK SIGNAL (0-800 AMPS = 0-4 VOLTS)	CNB-21,66,38	15
B	22	FAULT(-)	ANALOG INPUT	102-143	GROUND FAULT DETECTION +/- 114 MA DC LEAKAGE OR 119 PEAK MA AC LEAKAGE	CNB-22,8	15
B	24	MTOC_RS	SHIELD	102-130	MOTOR TERT. CURRENT PROT. SHIELD	CNB-24,98,73	15
B	25	M2VOLTS_RS	SHIELD	102-118	MOTOR 2 VOLTAGE SIGNAL SHIELD	CNB-25,81,36	13
B	26	UNDEF3_RS	SHIELD	102-106	SPARE ANALOG INPUT SIGNAL SHIELD	CNB-26,104,91	17
B	27	UNDEF2_R	ANALOG INPUT	102-100	SPARE ANALOG INPUT SIGNAL REFERENCE	CNB-27,12,13	17
B	28	ALTINHIBI	DIGITAL INPUT	102-197	+15VDC SIGNAL TO INHIBIT ALTERNATOR FIELD FIRING PLUSES	CNB-28,45	17
B	30	COOLPS	ANALOG INPUT	102-182	ENGINE COOLANT PRESSURE SIGNAL (0.5-4.5VDC = 0 TO FULL SCALE) (5VDC SUPPLY REQUIRED, MAX VOLATGE = 4.5 VOLTS)	CNB-30,15,84	17
B	31	SPARE_R	ANALOG INPUT	102-155	FUTURE SIGNAL REFERENCE	CNB-31,3,58	17
B	32	M2TS_R	ANALOG INPUT	102-148	MOTOR 2 THERMISTOR SIGNAL REFERENCE SIMPLE OVER LIMIT TRIP TEMPERATURE LIMIT = 220 DEG. C MAXIMUM TEMPERATURE = 300 DEG. C MIMIMUM TEMPERATURE = -100 DEG C	CNB-32,77	13

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