



17FL328 PANEL

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SCOPE

This publication describes the 17FL328 panel, which is used in OHV Statex III control systems that are fitted with Trolley Assist equipment, and backplane wiring. This publication also provides instructions for card removal, installation, and repair.

DESCRIPTION

The 17FL328 panel (Fig. 1) has five 104-pin connectors (Fig. 2) mounted above the cards for connecting input and output circuits. They are identified as CNA, CNB, CNC, CND and CNE.

The cards in this panel are protected by a cover, which is hinged at the bottom and latched at the top.

The panel has eight cards comprising of four different functional card types, which are described as follows:

1. Power Supply Card – provides +5V and ± 15V power for use by the other cards in the panel, and ± 15V and +19V power for external use.
2. System Central Processing Unit (CPU) Card – provides control of propulsion and dynamic retarding functions on the truck; battery backed random access memory (RAM); real-time clock; and downloadable code storage (flash erasable-programmable read only memory (EPROM)).

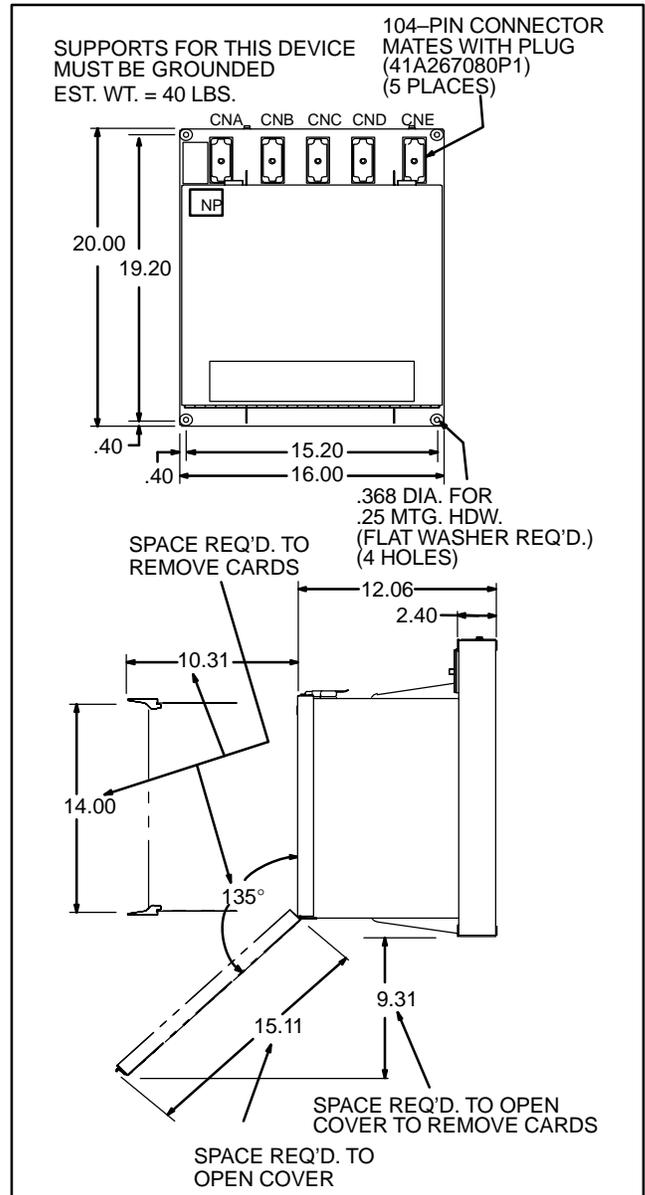


FIG. 1. 17FL328 PANEL OUTLINE. E-39280A.

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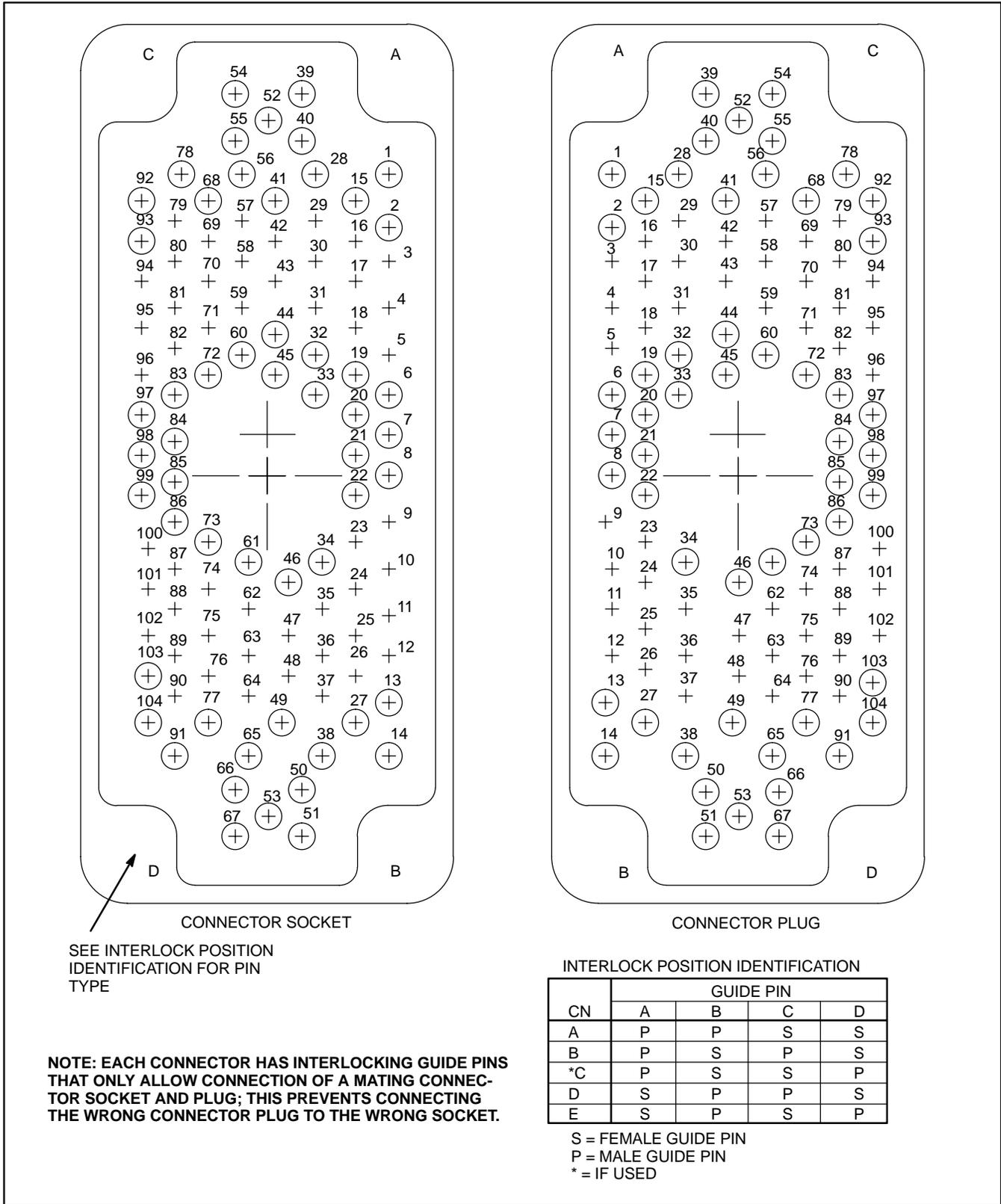


FIG. 2. TYPICAL PANEL CONNECTOR SOCKET AND PLUG. E-39282A.

3. Analog Input/Output (I/O) Card – provides signal conditioning for analog signals to/from the 17FL328 panel. This card monitors voltages and currents required to control propulsion, dynamic retarding, and trolley assist functions.
4. Digital Input/Output (I/O) Card – provides battery-level drive signals to control relays, contactors and light-emitting diodes (LEDs) and receives battery-level status feedbacks of relays, contactors and switches.
4. Event data for maintainers through the 17FM532 2-Digit Diagnostic Display panel.
5. Statistical data of the history of various component and system function operations, accessible only with a PTU.
6. The panel is also capable of receiving inputs from the engine (oil pressure, crankcase pressure, engine coolant pressure, engine coolant temperature), Motorized Wheels (temperature) and alternator blower (pressure) to provide warning signals to the driver if malfunctions in these areas occur.

The card complement of the various forms of the 17FL328 panels are listed in **Table 1**.

The 17FL328 panel receives input signals from speed sensors on the alternator and Motorized Wheels, voltage and current feedback signals from various control devices, and command inputs from the operator. Using these inputs, the panel controls relays, contactors, and other external devices to provide the following:

1. Propulsion and dynamic retarding control of the truck.
2. Trolley Assist equipment control.
3. Speed restrictions during overspeed and other operating restrictions if faults occur.

TABLE 1. 17FL328 PANEL CARD COMPLEMENT.

Slot #	Panel Form	
	A1	Description
1	Reserved	No socket: space required for clearance of FB100 card
2	17FB100B2	Power Supply
3	17FB101D2	CPU
4	17FB140A1	Analog I/O
5	Spare	No socket
6	17FB155A1	Analog I/O
7	17FB104B1	Digital I/O
8	17FB104B1	Digital I/O
9	17FB103B1	Digital I/O
10	17FB104B1	Digital I/O

CARD REMOVAL

CAUTION: Some FB cards contain static sensitive components. To prevent damage to these components, it is recommended that a properly connected ground strap be worn whenever removing, handling or installing the card. It is also recommended that after a card has been removed, it is carried and stored in a static proof bag or container.

CAUTION: Remove all external power to the panel before removing a card. Failure to do so could cause damage to the card and/or to other cards in the panel.

The cards are removed by first loosening the two spring clips on the top of the hinged cover. Swing the cover down to gain access to the cards.

Each card is locked in place with a locking quick-release lever at the top and bottom. Lift both levers at the same time to release the locking arrangement and slide the card out of the socket in the backplane.

Using both hands, grasp the card at the top and bottom and pull gently. The card will slide easily in its guide strips to complete the removal.

CARD INSTALLATION

CAUTION: *Some FB cards contain static sensitive components. To prevent damage to these components, it is recommended that a properly connected ground strap be worn whenever removing, handling or installing the card. It is also recommended that the card is carried and stored in a static proof bag or container until installation.*

CAUTION: *Remove all external power to the panel before installing a card. Failure to do so could cause damage to the card and/or to other cards in the panel.*

The cards are keyed to prevent them from inadvertently being inserted into the wrong card slot.

CAUTION: *To prevent damage to the card and/or the panel, do NOT force the card into position.*

To install a card, carefully insert it into its top and bottom card slots. Slide the card into the panel until the locking quick-release levers are close to the panel edges. Hold the levers and gently press the card further into the panel until the card and backplane connectors start to engage. When the card is inserted far enough for the locking levers to catch on the panel edge, move both locking levers to the lock position at the same time.

Swing the cover up and over the cards and latch the two spring clips at the top.

CARD REPAIR

The cards in the 17FL328 panel are very complex and not repairable by the customer. Should one of the cards become inoperable, return it to the truck OEM under the GE Unit Exchange Program.

CAUTION: *To prevent damage to the card, always transport the card inside an anti-static bag.*

PANEL BACKPLANE WIRING

The connectors on the FB cards each contain 210 pins. These connectors mate with 210-pin receptacles in the panel back, or backplane. The receptacle pins are wire-wrapped, not soldered, to the panel connectors (CNA through CNE) to permit connection to circuits external to the 17FL328 panel. The wrapping is done with a special tool that wraps each wire tightly around the pin. The pins are long enough to enable connecting multiple wires. See Figs. 3 and 4.

The panel backplane also has printed circuits on it to facilitate inter-card circuit connections.

Tables 2 through 9 provide wire connection points between the backplane card receptacle pins and the panel connector pins.

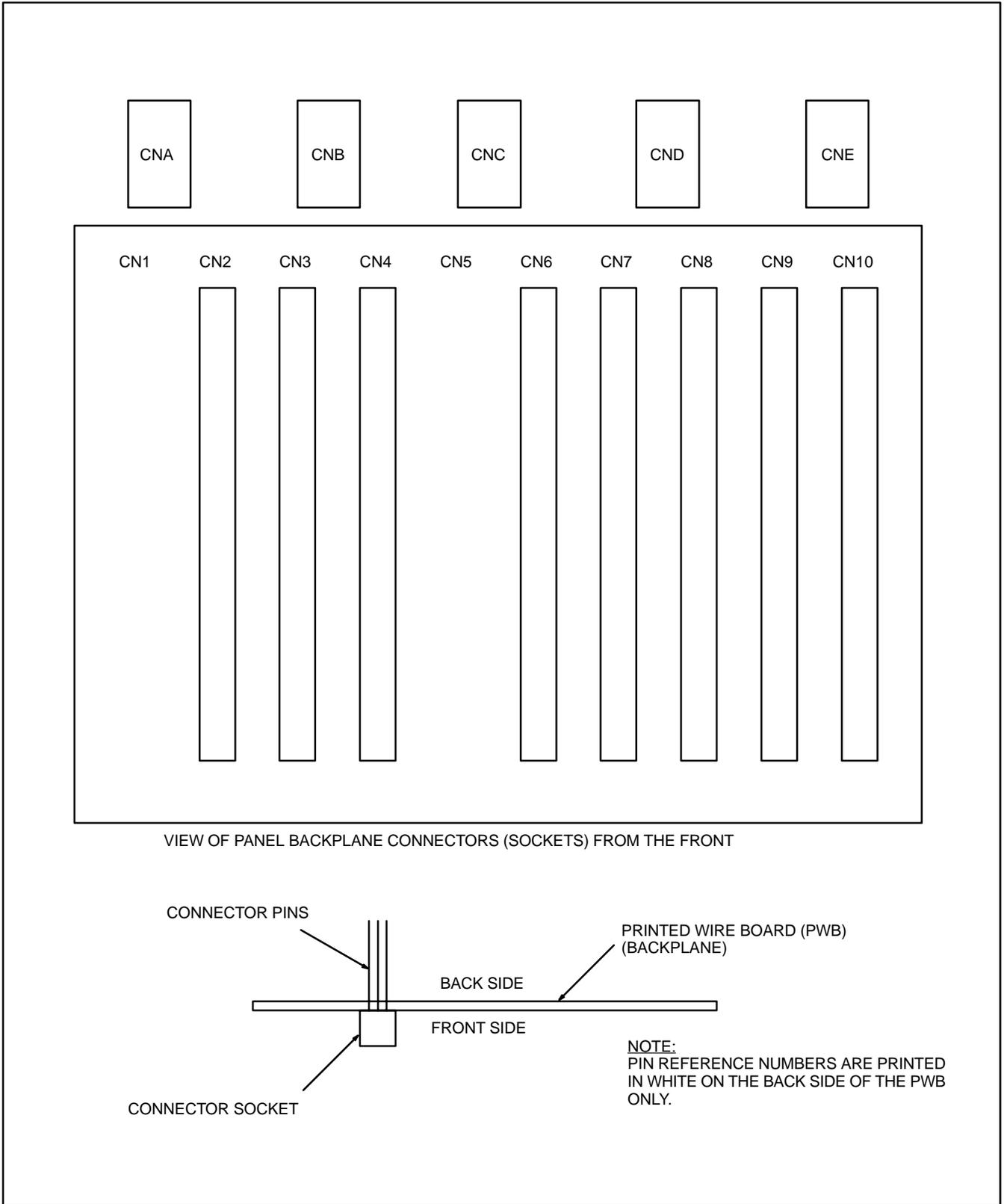


FIG. 3. 17FL328 PANEL BACKPLANE DRAWING. E-41687.

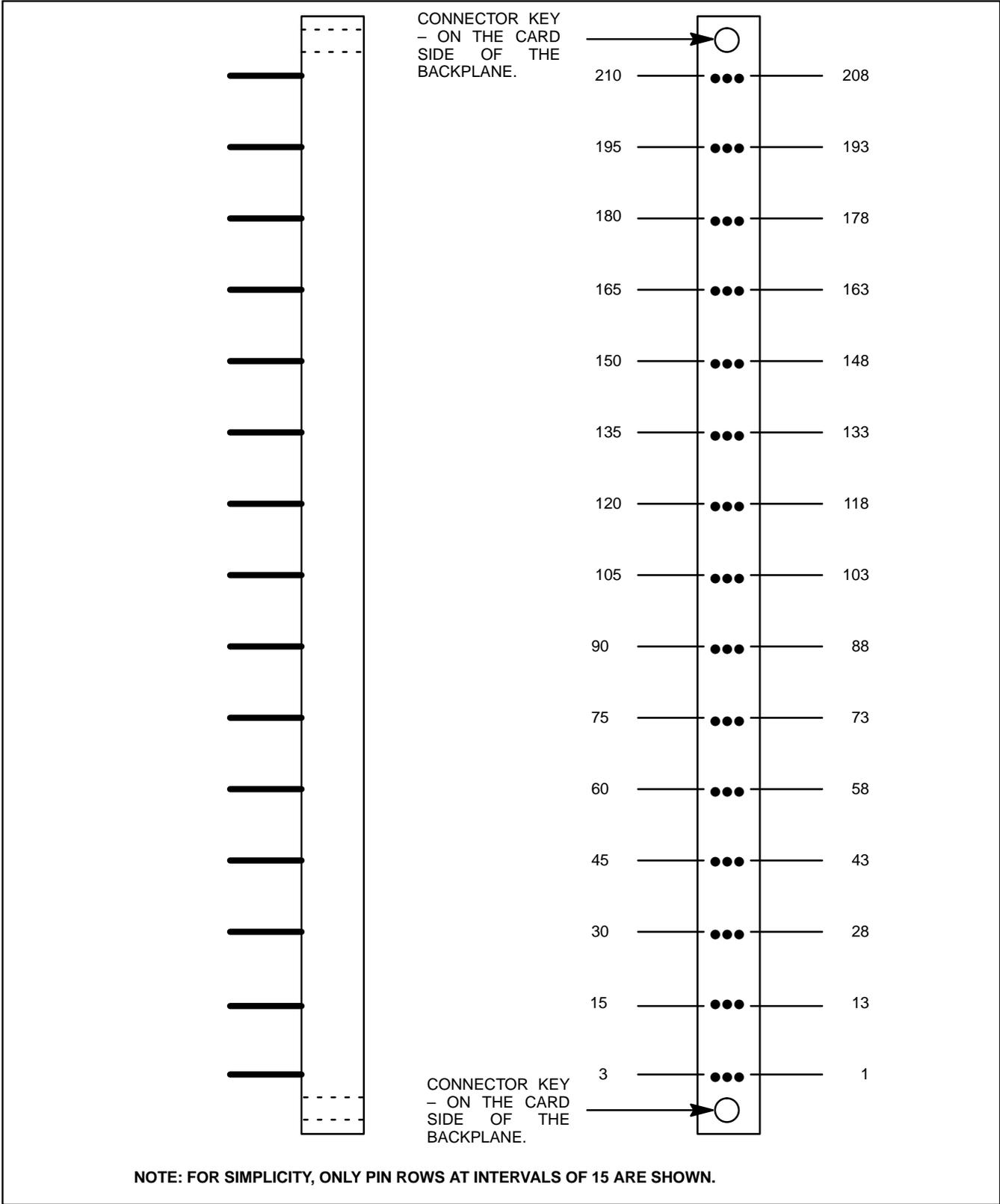


FIG. 4. BACKPLANE CONNECTOR PIN LOCATION. E-39284.

TABLE 2. BACKPLANE WIRE CONNECTIONS — CN2 TO PANEL CONNECTOR(S).

CN02	CN	CN02	CN	CN02	CN	CN02	CN	CN02	CN	CN02	CN	CN02	CN
1		31		61		91		121	A-5	151	A-16	181	A-21
2		32		62	A-27	92		122	A-5	152	A-16	182	A-21
3		33		63		93		123	A-5	153	A-16	183	A-21
4		34		64	A-26	94		124	A-4	154	A-42	184	A-20
5		35		65		95		125	A-4	155	A-42	185	A-20
6		36		66	A-26	96		126	A-4	156	A-42	186	A-20
7		37		67		97		127	A-3	157	A-1	187	A-19
8		38		68	A-26	98		128	A-3	158	A-1	188	A-19
9		39		69		99		129	A-3	159	A-1	189	A-19
10		40		70		100		130		160	A-28	190	A-18
11		41		71	A-27	101		131		161	A-28	191	A-18
12		42		72		102		132		162	A-28	192	A-18
13		43		73	A-25	103		133	A-11	163	A-2	193	
14		44		74		104		134	A-11	164	A-2	194	
15		45		75	A-25	105		135	A-11	165	A-2	195	
16		46		76		106		136	A-10	166	A-29	196	A-40
17		47		77	A-25	107		137	A-10	167	A-29	197	A-40
18		48		78		108		138	A-10	168	A-29	198	A-40
19		49		79		109	A-14	139	A-9	169	A-17	199	A-55
20		50		80		110	A-14	140	A-9	170	A-17	200	A-55
21		51		81		111	A-14	141	A-9	171	A-17	201	A-55
22		52		82		112	A-13	142		172	A-24	202	
23		53		83		113	A-13	143		173	A-24	203	
24		54		84		114	A-13	144		174	A-24	204	
25		55		85	A-6	115	A-12	145	A-15	175	A-23	205	A-39
26		56		86	A-7	116	A-12	146	A-15	176	A-23	206	A-39
27		57		87	A-8	117	A-12	147	A-15	177	A-23	207	A-52
28		58		88		118		148	A-41	178	A-22	208	A-54
29		59		89		119		149	A-41	179	A-22	209	A-54
30		60		90		120		150	A-41	180	A-22	210	A-52

TABLE 3. BACKPLANE WIRE CONNECTIONS — CN3 TO PANEL CONNECTOR(S).

CN03	CN	CN03	CN										
1		31		61		91		121		151		181	A-97
2		32		62		92		122		152		182	A-81
3		33		63		93		123		153		183	A-87
4		34		64		94		124		154		184	A-96
5		35		65		95		125		155		185	A-103
6		36		66		96		126		156		186	A-86
7		37		67		97		127		157		187	A-95
8		38		68		98		128		158		188	A-102
9		39		69		99		129		159		189	A-85
10		40		70		100		130		160		190	A-94
11		41		71		101		131		161		191	A-101
12		42		72		102		132		162		192	
13		43		73		103		133		163		193	
14		44		74		104		134		164		194	
15		45		75		105		135		165		195	
16		46		76		106		136		166		196	
17		47		77		107		137		167		197	
18		48		78		108		138		168		198	
19		49		79		109		139		169		199	
20		50		80		110		140		170		200	
21		51		81		111		141		171		201	
22		52		82		112		142		172	A-100	202	
23		53		83		113		143		173	A-84	203	
24		54		84		114		144		174	A-90	204	
25		55		85		115		145		175	A-99	205	
26		56		86		116		146		176	A-83	206	
27		57		87		117		147		177	A-89	207	
28		58		88		118		148		178	A-98	208	
29		59		89		119		149		179	A-82	209	
30		60		90		120		150		180	A-88	210	

TABLE 4. BACKPLANE WIRE CONNECTIONS — CN4 TO PANEL CONNECTOR(S).

CN04	CN	CN04	CN	CN04	CN	CN04	CN	CN04	CN	CN04	CN	CN04	CN
1		31		61		91	B-38	121	B-11	151	B-18	181	B-15
2		32		62		92	A-47	122	B-48	152	B-60	182	B-30
3		33		63		93	B-51	123	B-102	153		183	B-94
4		34		64		94	B-14	124		154	B-4	184	B-29
5		35		65		95	B-74	125	B-63	155	B-31	185	B-57
6		36		66		96	A-64	126	A-63	156	B-98	186	B-80
7		37		67		97	B-13	127		157	B-17	187	B-42
8		38		68		98	B-91	128	B-62	158		188	B-69
9		39		69		99		129	B-87	159	B-97	189	B-79
10		40		70		100	B-27	130	B-24	160		190	B-40
11		41		71		101	B-90	131	B-73	161		191	B-56
12		42		72		102	B-104	132	B-101	162	B-83	192	B-93
13		43		73		103	B-12	133	B-35	163		193	B-39
14		44		74		104		134	B-61	164	B-44	194	B-41
15		45		75		105	B-89	135	B-86	165	B-8	195	B-68
16		46		76		106	B-26	136	B-7	166	B-3	196	B-52
17		47		77		107	B-37	137	B-46	167		197	B-28
18		48		78		108	B-103	138	B-100	168	B-96	198	B-78
19		49		79		109		139	B-6	169	B-16	199	A-32
20		50		80		110	B-49	140	B-34	170	B-59	200	A-46
21		51		81		111	B-67	141	B-85	171	B-82	201	B-92
22		52		82	A-34	112		142	B-20	172	B-2	202	A-31
23		53		83	B-66	113	B-64	143	B-22	173	B-70	203	B-54
24		54		84	A-53	114	B-77	144	B-99	174	B-71	204	A-61
25		55		85	A-33	115		145	B-33	175		205	A-49
26		56		86	B-65	116	B-76	146	B-21	176	B-58	206	A-45
27		57		87	A-65	117	B-47	147	A-62	177	B-81	207	A-60
28		58		88	B-50	118	B-25	148	B-32	178	B-1	208	A-48
29		59		89	B-75	119	B-36	149	B-45	179	B-43	209	A-44
30		60		90	B-53	120	B-88	150	B-84	180	B-95	210	A-59

TABLE 5. BACKPLANE WIRE CONNECTIONS — CN6 TO PANEL CONNECTOR(S).

CN06	CN	CN06	CN	CN06	CN	CN06	CN	CN06	CN	CN06	CN	CN06	CN
1		31		61		91	C-46	121	C-95	151	C-84	181	
2		32		62		92		122	C-82	152		182	
3		33		63		93		123	C-81	153		183	
4		34		64		94		124		154		184	
5		35		65		95		125	C-98	155		185	
6		36		66		96		126		156		186	
7		37		67		97		127		157		187	
8		38		68		98		128		158		188	
9		39		69		99		129		159		189	
10		40		70		100		130		160		190	
11		41		71		101		131		161		191	
12		42		72		102		132		162		192	
13		43		73		103		133		163		193	
14		44		74		104		134		164		194	
15		45		75		105		135		165	C-83	195	
16		46		76		106		136		166		196	
17		47		77		107		137		167		197	
18		48		78		108		138	C-85	168		198	
19		49		79		109		139		169		199	
20		50		80		110		140		170		200	
21		51		81		111		141		171		201	
22		52		82		112		142		172		202	
23		53		83	C-35	113		143	C-96	173		203	
24		54		84		114		144		174		204	
25		55		85		115		145		175		205	
26		56		86		116		146	C-34	176		206	
27		57		87		117		147		177	C-86	207	
28		58		88		118	C-100	148		178		208	
29		59		89		119	C-99	149		179		209	
30		60		90		120		150		180		210	

TABLE 6. BACKPLANE WIRE CONNECTIONS — CN7 TO PANEL CONNECTOR(S).

CN07	CN	CN07	CN	CN07	CN	CN07	CN	CN07	CN	CN07	CN	CN07	CN
1		31		61		91		121		151		181	C-68
2		32		62		92		122	C-30	152		182	C-92
3		33		63		93		123	C-30	153		183	C-92
4		34		64		94	C-76	124		154		184	C-68
5		35		65		95		125	C-31	155	C-49	185	C-57
6		36		66		96		126	C-31	156		186	C-57
7		37		67		97		127		157		187	
8		38		68		98		128	C-33	158	C-69	188	C-14
9		39		69		99		129	C-33	159	C-69	189	C-14
10		40		70		100		130		160	C-103	190	
11		41		71		101	C-52	131	C-42	161	C-70	191	C-51
12		42		72		102	C-52	132	C-29	162	C-70	192	C-51
13		43		73		103		133		163	C-104	193	C-38
14		44		74		104		134	C-32	164		194	C-94
15		45		75		105	C-28	135	C-32	165	C-66	195	C-94
16		46		76		106		136	C-88	166	C-101	196	C-38
17		47		77		107		137	C-44	167	C-67	197	C-93
18		48		78		108	C-55	138	C-44	168	C-53	198	C-93
19		49		79		109		139	C-43	169		199	C-71
20		50		80		110	C-41	140	C-43	170	C-59	200	C-79
21		51		81		111	C-41	141	C-64	171	C-65	201	C-79
22		52		82		112		142	C-90	172	C-58	202	C-71
23		53		83		113	C-56	143	C-89	173	C-58	203	C-78
24		54		84		114	C-56	144		174	C-59	204	C-78
25		55		85		115		145		175		205	C-50
26		56		86		116	C-40	146		176	C-72	206	C-45
27		57		87		117	C-54	147		177	C-72	207	C-45
28		58		88		118		148	C-102	178		208	C-50
29		59		89		119	C-39	149	C-91	179	C-60	209	C-80
30		60		90		120	C-39	150	C-77	180	C-60	210	C-80

TABLE 7. BACKPLANE WIRE CONNECTIONS — CN8 TO PANEL CONNECTOR(S).

CN08	CN	CN08	CN	CN08	CN	CN08	CN	CN08	CN	CN08	CN	CN08	CN
1		31		61		91		121	D-45	151		181	D-72
2		32		62		92		122	D-81	152	C-13	182	D-83
3		33		63		93		123	D-81	153	C-12	183	D-83
4		34		64		94	D-30	124	D-44	154		184	D-72
5		35		65		95	D-17	125	D-80	155	C-10	185	D-60
6		36		66		96	D-16	126	D-80	156	C-13	186	D-60
7		37		67		97		127	D-43	157		187	D-19
8		38		68		98	D-15	128	C-61	158	D-79	188	C-20
9		39		69		99	D-39	129	C-61	159	D-79	189	C-20
10		40		70		100	D-32	130		160	D-4	190	D-18
11		41		71		101	D-58	131	C-17	161	C-47	191	C-21
12		42		72		102	D-58	132	C-3	162	C-47	192	C-21
13		43		73		103		133		163	D-3	193	C-6
14		44		74		104	D-33	134	C-73	164		194	C-19
15		45		75		105	C-15	135	C-73	165	C-23	195	C-19
16		46		76		106		136	D-8	166	D-2	196	C-6
17		47		77		107	D-28	137	D-93	167	C-22	197	C-18
18		48		78		108	C-16	138	D-93	168	C-8	198	C-18
19		49		79		109	D-29	139	D-94	169	D-1	199	C-75
20		50		80		110	D-71	140	D-94	170	C-48	200	C-4
21		51		81		111	D-71	141	C-24	171	C-9	201	C-4
22		52		82		112	D-41	142	D-6	172	D-69	202	C-75
23		53		83		113	D-59	143	D-7	173	D-69	203	D-82
24		54		84		114	D-59	144	C-27	174	C-48	204	D-82
25		55		85	D-31	115	D-40	145		175	D-21	205	C-7
26		56		86		116	C-1	146	C-27	176	C-63	206	C-74
27		57		87		117	C-2	147	C-26	177	C-63	207	C-74
28		58		88		118	D-42	148	D-5	178	D-20	208	C-7
29		59		89		119	D-70	149	C-25	179	C-62	209	C-5
30		60		90		120	D-70	150	C-11	180	C-62	210	C-5

TABLE 8. BACKPLANE WIRE CONNECTIONS — CN9 TO PANEL CONNECTOR(S).

CN09	CN	CN09	CN	CN09	CN	CN09	CN	CN09	CN	CN09	CN	CN09	CN
1		31		61		91	D-26	121		151		181	
2		32		62		92	D-48	122	D-102	152	D-22	182	E-37
3		33		63		93	D-76	123	D-100	153	D-22	183	E-37
4		34		64		94	D-37	124		154		184	
5		35		65		95	D-64	125	D-86	155	D-9	185	E-77
6		36		66		96	D-90	126	D-101	156	D-9	186	E-91
7		37		67		97	D-12	127		157		187	
8		38		68		98	D-47	128		158	D-85	188	E-76
9		39		69		99	D-104	129		159	D-85	189	E-76
10		40		70		100	D-25	130		160		190	
11		41		71		101	D-63	131		161	E-38	191	E-63
12		42		72		102	D-103	132		162	E-38	192	E-63
13		43		73		103	D-36	133		163		193	
14		44		74		104	D-62	134		164	E-67	194	
15		45		75		105	D-75	135	D-97	165	E-51	195	E-53
16		46		76		106	D-13	136		166		196	
17		47		77		107	D-35	137	D-23	167	D-98	197	E-48
18		48		78		108	D-89	138	D-23	168	D-84	198	E-104
19		49		79	D-51	109	D-11	139		169		199	
20		50		80	D-53	110	D-34	140	D-10	170		200	E-11
21		51		81	D-67	111	D-46	141	D-10	171	E-50	201	E-11
22		52		82	D-66	112		142		172		202	
23		53		83	D-49	113	D-24	143	D-99	173		203	E-49
24		54		84	D-50	114	D-61	144	D-99	174	E-66	204	E-49
25		55		85	D-14	115		145	E-13	175	E-14	205	E-25
26		56		86	D-65	116	D-74	146	E-13	176	E-65	206	E-36
27		57		87	D-77	117	D-73	147	E-13	177	E-65	207	E-36
28		58		88	D-27	118		148	E-27	178		208	E-12
29		59		89	D-38	119	D-87	149	E-27	179	E-64	209	E-10
30		60		90	D-91	120	D-88	150	E-27	180	E-64	210	E-10

TABLE 9. BACKPLANE WIRE CONNECTIONS — CN10 TO PANEL CONNECTOR(S).

CN10	CN	CN10	CN	CN10	CN	CN10	CN	CN10	CN	CN10	CN	CN10	CN
1		31		61		91		121	E-18	151		181	E-2
2		32		62		92		122	E-23	152	E-82	182	E-79
3		33		63		93		123	E-23	153	E-96	183	E-79
4		34		64		94	E-46	124	E-32	154		184	E-2
5		35		65		95	E-47	125	E-22	155	E-71	185	E-93
6		36		66		96	E-89	126	E-22	156	E-82	186	E-93
7		37		67		97		127	E-19	157		187	E-1
8		38		68		98	E-75	128	E-21	158	E-95	188	E-41
9		39		69		99	E-103	129	E-21	159	E-95	189	E-41
10		40		70		100	E-9	130		160	E-17	190	E-15
11		41		71		101	E-88	131	E-20	161	E-94	191	E-52
12		42		72		102	E-88	132	E-98	162	E-94	192	E-52
13		43		73		103		133		163	E-30	193	E-28
14		44		74		104	E-74	134	E-45	164		194	E-56
15		45		75		105	E-102	135	E-45	165	E-70	195	E-56
16		46		76		106		136	E-62	166	E-43	196	E-28
17		47		77		107	E-101	137	E-33	167	E-81	197	E-55
18		48		78		108	E-87	138	E-33	168	E-80	198	E-55
19		49		79		109	E-8	139	E-44	169	E-59	199	E-40
20		50		80		110	E-61	140	E-44	170	E-69	200	E-54
21		51		81		111	E-61	141	E-85	171	E-58	201	E-54
22		52		82	E-90	112	E-7	142	E-31	172	E-3	202	E-40
23		53		83	E-24	113	E-73	143	E-60	173	E-3	203	E-68
24		54		84		114	E-73	144	E-84	174	E-69	204	E-68
25		55		85	E-34	115	E-6	145		175	E-16	205	E-39
26		56		86		116	E-100	146	E-84	176	E-42	206	E-78
27		57		87		117	E-86	147	E-97	177	E-42	207	E-78
28		58		88		118	E-5	148	E-4	178	E-29	208	E-39
29		59		89	E-35	119	E-99	149	E-83	179	E-57	209	E-92
30		60		90		120	E-99	150	E-72	180	E-57	210	E-92



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