CAT® Lift Trucks

Service Manual

Chassis & Mast — MC/FC

GP15N	T25C-55001-up
GP15ZN	T34-52001-up
GP18N	T25C-75001-up
GP18ZN	T34-72001-up
GP20CN	T34-22001-up
GP20N	T17D-10001-up
GP20ZN	T35-10001-up
GP25N	T17D-60001-up
GP25ZN	T35-60001-up
GP30N	T13F-40001-up
GP35N	T13F-60001-up
GPE15N	T34-00001/19001-up
GPE18N	T34-40001/49001-up
GPE20CN	T34-30001/39001-up
GPE20N	T17D-20001/38001-up
GPE20ZN	T35-20001/38001-up
GPE25N	T17D-70001/88001-up
GPE25ZN	T35-70001/88001-up
GPE30N	T13F-10001/20001-up
GPE35N	T13F-80001/90001-up

DP15N	T16D-54001/64001-up
DP18N	T16D-74001/84001-up
DP20CN	T16D-24001/28001-up
DP20N	T18C-20001/40001-up
DP25N	T18C-70001/90001-up
DP30N	T14E-10001/20001-up
DP35N	T14E-80001/90001-up

For use with S4Q2, S4S and K15/K21/K25 Engine Service Manuals.

99719-38110

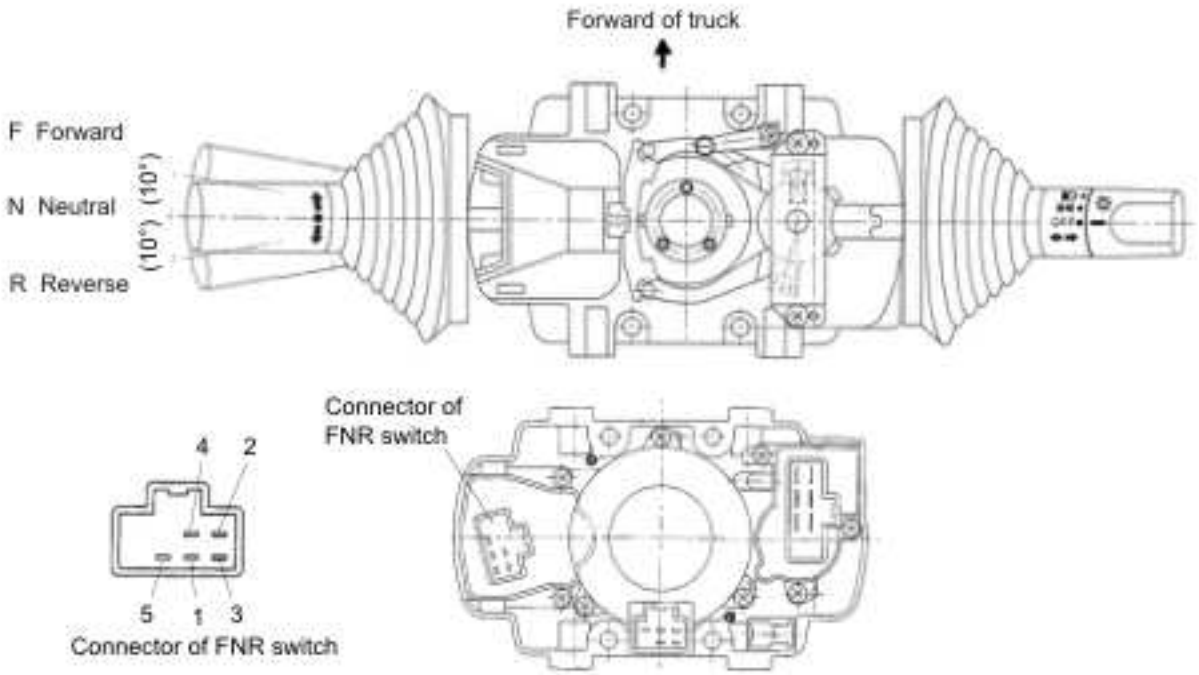
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Chapter 1 GENERAL INFORMATION

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5. Technical Data 1-5
6. Performance 1-7

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2.2.7 Direction lever assembly (Powershift truck)



Connection table

Terminal / Wire color / Lever position	1	2	3	4	5
	G/W	B	B/R	B	L/W
F Forward		○	○		
N Neutral	○			○	
R Reverse		○			○

Abbreviations:
G/W = Green/White
B = Black
BR = Brown
L/W = Blue/White

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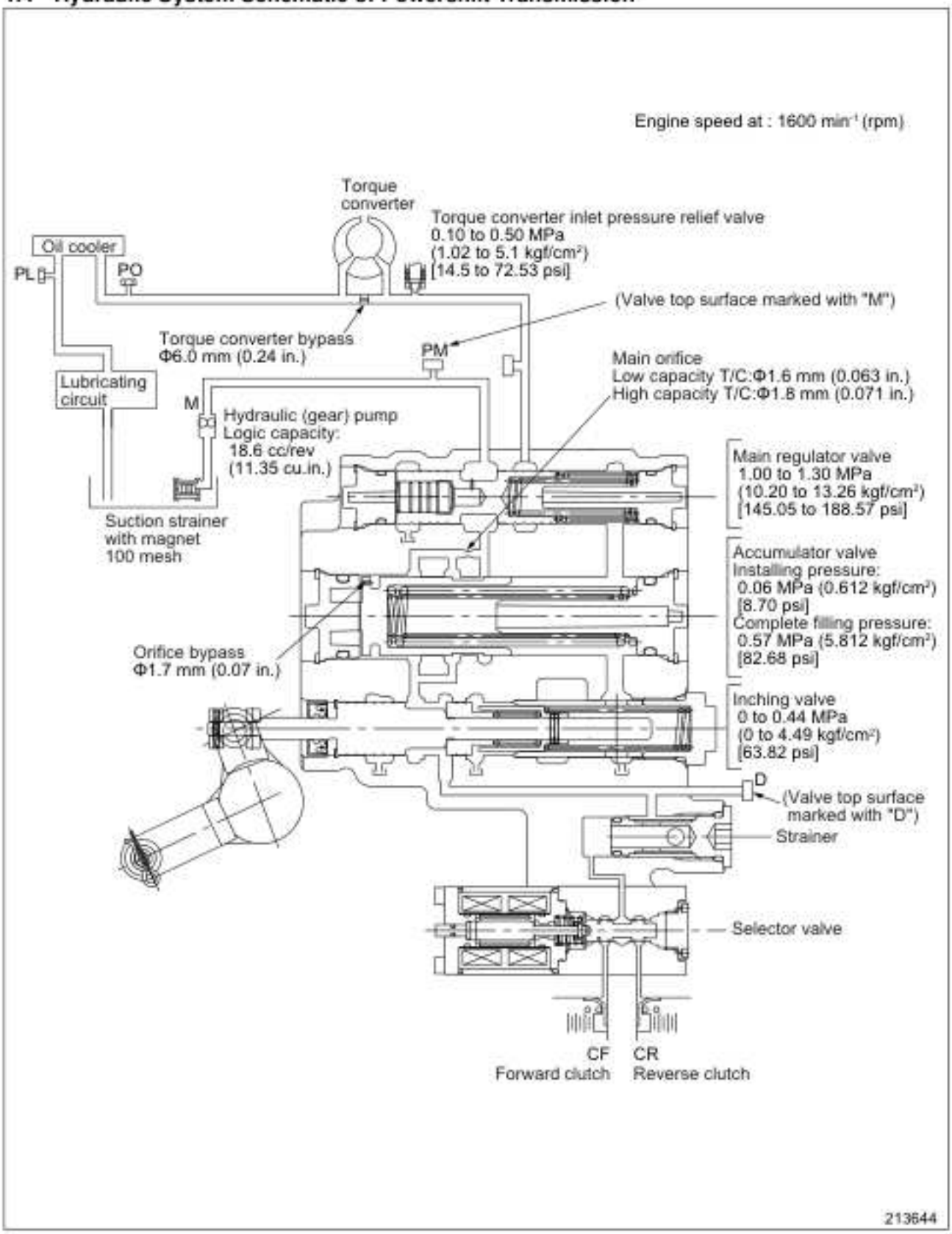
Note: The error code "F-16" is displayed if the direction lever is held between "F" and "N" or "R" and "N" over 1.8 seconds. In this case, the error is reset by turning the direction lever to the NEUTRAL position.
If the error still do not reset stop the truck.
Turn the starter switch to [OFF] position, then start the truck.
For more details, refer to Chapter 4 CONTROLLERS, "10. Error Codes and Troubleshootings."

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Error code	Description	Probable cause	Check item
F-14	Att3 lever neutral error	1. Connector contact bad	1. Connector connection check
		2. Harness bad	2. Harness connection check
		3. Att3 lever bad	3. Lever connection check
		4. Controller bad	
F-16	Shift lever error	1. Hold the lever between F and N position or R and N position for over 1.8 seconds.	1. Place the lever in the NEUTRAL position. If problem persists, restart engine.
		2. Connector contact bad	2. Connector connection check
		3. Harness bad	3. Harness connection check
		4. Shift lever bad	4. Shift lever check
		5. Controller bad	
F-17	Speed error	1. Connector contact bad	1. Connector connection check
		2. Harness bad	2. Harness connection check
		3. Speed sensor bad	3. Sensor connection check
		4. Controller bad	
F-20	Lift lever error	1. Connector contact bad	1. Connector connection check
		2. Harness bad	2. Harness connection check
		3. Lift lever bad	3. Lever connection check
		4. Controller bad	
F-22	Tilt lever error	1. Connector contact bad	1. Connector connection check
		2. Harness bad	2. Harness connection check
		3. Tilt lever bad	3. Lever connection check
		4. Controller bad	
F-24	Att1 lever error	1. Connector contact bad	1. Connector connection check
		2. Harness bad	2. Harness connection check
		3. Att1 lever bad	3. Lever connection check
		4. Controller bad	
F-26	Att2 lever error	1. Connector contact bad	1. Connector connection check
		2. Harness bad	2. Harness connection check
		3. Att2 lever bad	3. Lever connection check
		4. Controller bad	
F-28	Att3 lever error	1. Connector contact bad	1. Connector connection check
		2. Harness bad	2. Harness connection check
		3. Att3 lever bad	3. Lever connection check
		4. Controller bad	
F-29	Joystick lever error	1. Joystick lever bad	1. Check if any other errors is present (e.g.: F20, F22, F24, F26, F28)
		2. Input unit bad	2. Input unit check
		3. Harness bad	3. Harness connection check
F-31	Sensor battery error	1. Wheel sensor bad	1. Wheel sensor check
		2. VCM bad	2. VCM check
		3. Harness bad	3. Harness connection check
F-34	Speed sensor error	1. Connector contact bad	1. Connector connection check
		2. Harness bad	2. Harness connection check
		3. Speed sensor bad	3. Sensor connection check
		4. Controller bad	

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1.4 Hydraulic System Schematic of Powershift Transmission



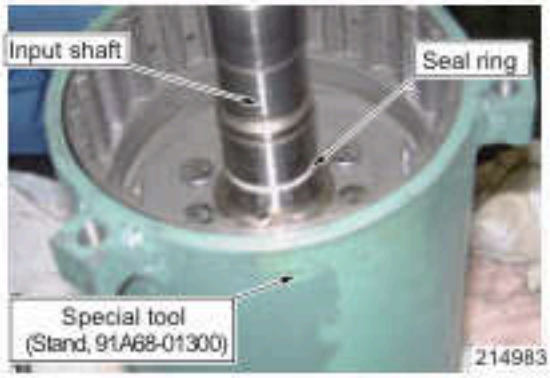
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5.6 Forward Input Shaft Gear Assembly, Reassembly

5.6.1 Forward clutch piston, Reassembly

(1) Place the input shaft on the special tool (stand, 91A68-01300).

Part name	Part number
Stand	91A68-01300

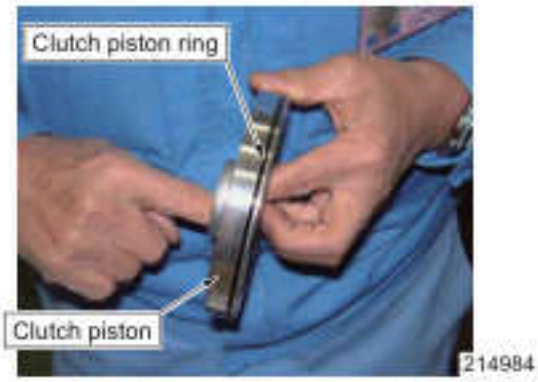


(2) Install seal ring to input shaft.

Part name	Part number	Quantity
Seal ring	65425-03300	1

(3) Install piston ring to forward clutch piston.

Part name	Part number	Quantity
Clutch piston	91A24-21500	1
Piston ring	65425-13000	1



(4) Apply oil to piston ring and sliding area of clutch piston.

(5) Install input shaft to clutch piston.

(6) Using a wooden bar, install clutch piston.

Note: When installing the clutch piston with a wood bar, be sure to tap on the boss of clutch piston.

(7) Install clutch spring and spring retainer.

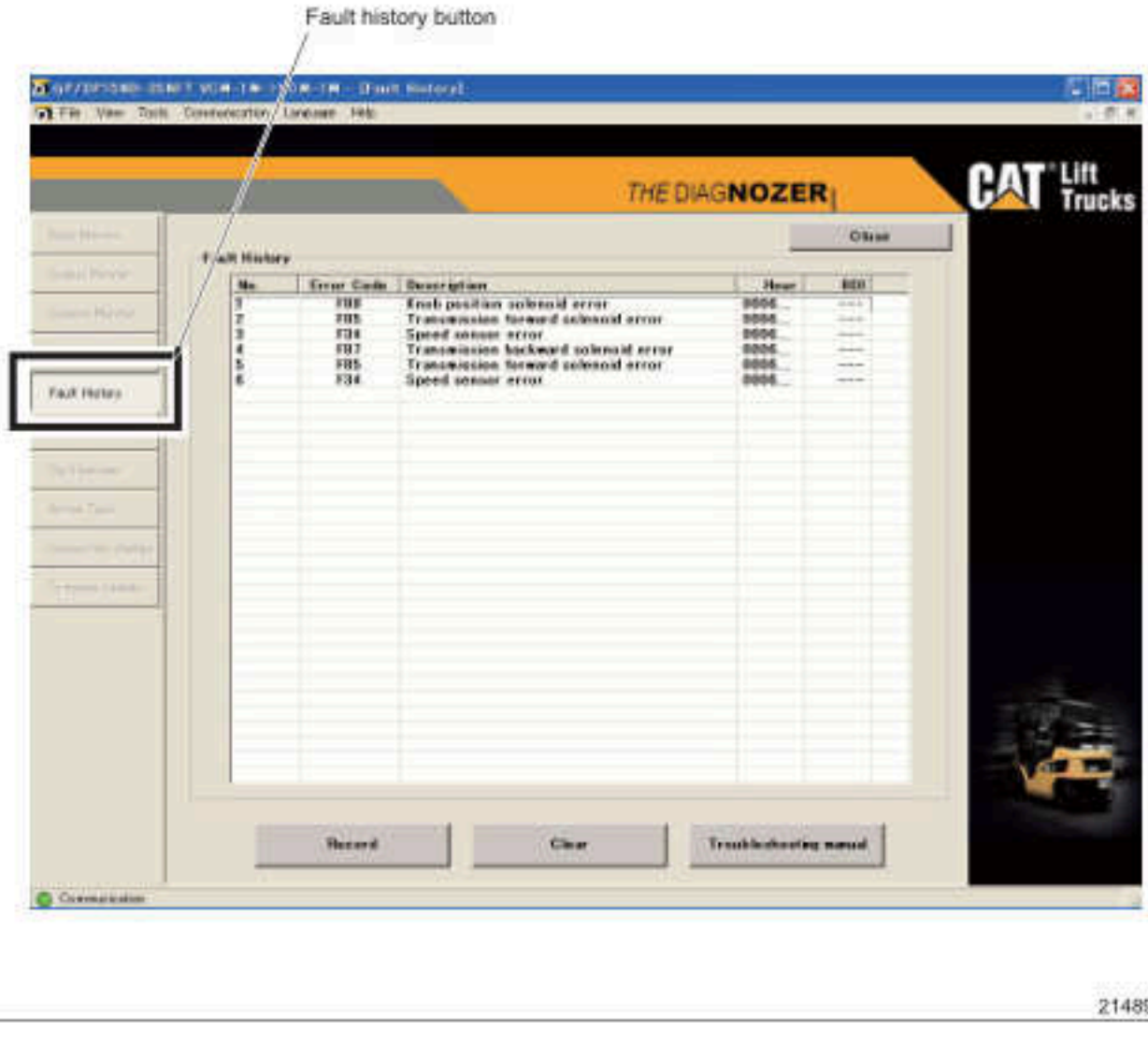




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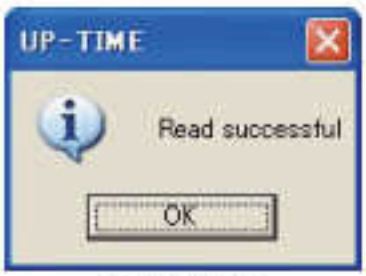
(5) Error history

Click fault history button from the menu or toolbox to read past faults stored in the memory of controller. If the read is successfully completed, the dialog box displays a "Read successful" message. If not, a "Read error" message is displaced, and the fault history monitor screen will be displayed in the main windows.



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When the read is successful



Success dialog

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When the read is unsuccessful

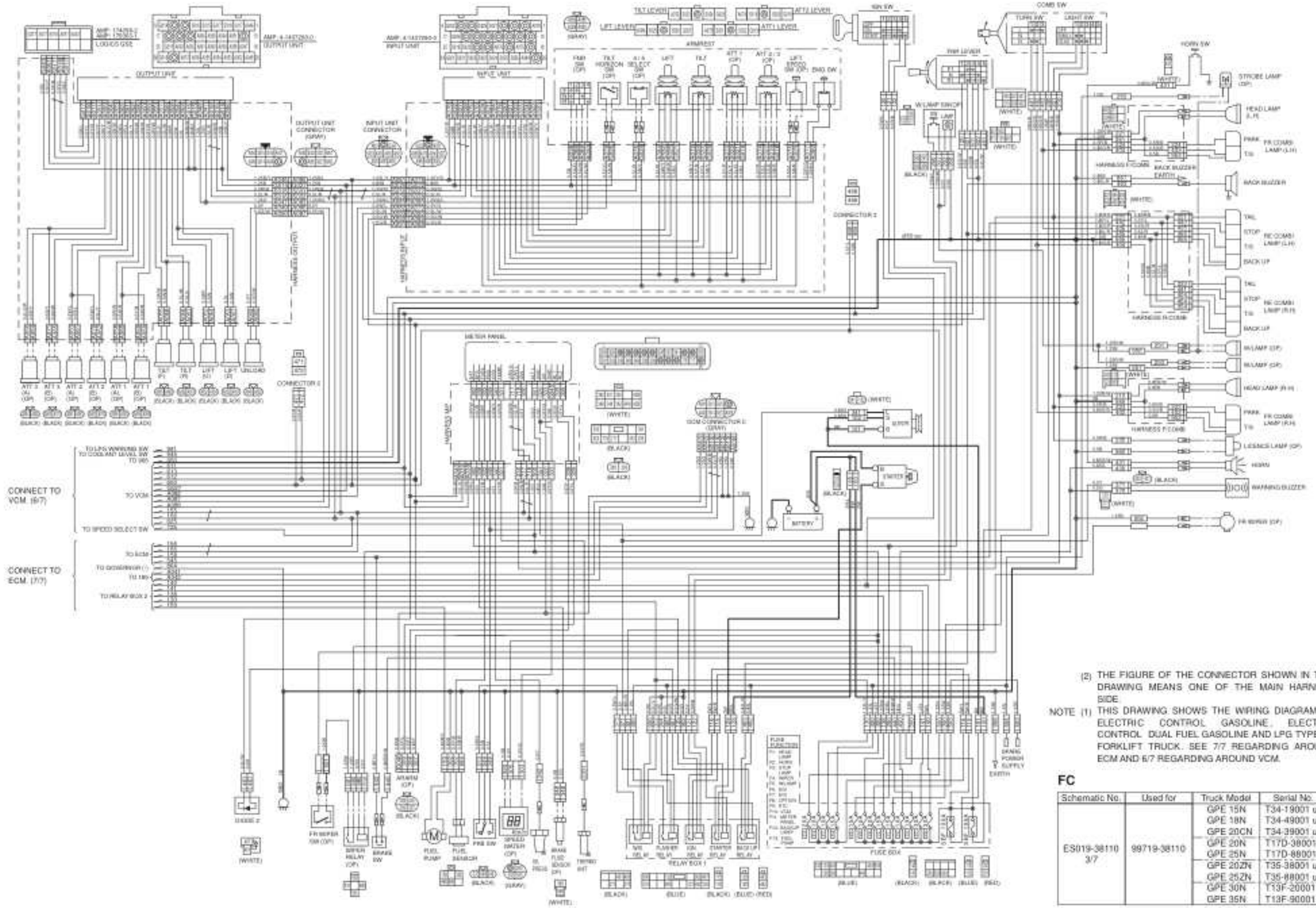


Error dialog

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Electrical Schematic (3/7)



(2) THE FIGURE OF THE CONNECTOR SHOWN IN THIS DRAWING MEANS ONE OF THE MAIN HARNESS SIDE.

NOTE (1) THIS DRAWING SHOWS THE WIRING DIAGRAM OF ELECTRIC CONTROL GASOLINE, ELECTRIC CONTROL DUAL FUEL GASOLINE AND LPG TYPE OF FORKLIFT TRUCK. SEE 7/7 REGARDING AROUND ECM AND 6/7 REGARDING AROUND VCM.

FC

Schematic No.	Used for	Truck Model	Serial No.
ES019-38110 3/7	99719-38110	GPE 15N	T34-19001 up
		GPE 18N	T34-49001 up
		GPE 20CN	T34-39001 up
		GPE 20N	T17D-38001 up
		GPE 25N	T17D-88001 up
		GPE 20ZN	T35-38001 up
		GPE 25ZN	T35-88001 up
		GPE 30N	T13F-20001 up
		GPE 35N	T13F-90001 up

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