3. SYSTEM DIAGNOSIS

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3.1 GFI DIAGNOSIS PROCEDURE

The GFI diagnosis procedure has been developed to provide a quick and thorough method of diagnosing problems and to provide solutions.

1. **VERIFY PROBLEM EXISTS.** Troubleshooting begins because the vehicle operator/user has a real or imagined concern. Spend time with the operator/owner to determine what is wrong and what is working right. The first step in diagnosing any problem is to identify what the problem is. Mistaking or ignoring symptoms can lead to unnecessary work and/or part replacement.

2. **PERFORM PRELIMINARY DIAGNOSTICS.**

   - *Visual inspection* - Many problems are the result of poor connections or simple faults that can be discovered by visual inspection. This can save time and energy.

   - *Eliminate the base vehicle* - It is important to isolate the system that is the source of concern. The GFI system Reacts to base vehicle systems such as power and secondary ignition.

   - *Review known conditions* - Technical Service Bulletins (TSBs) provide information on known conditions and save time and effort.

3. **DIAGNOSE SYMPTOM USING THE GUIDES IN THIS MANUAL.** The specific condition diagnostics provide tests that lead to specific solutions.

4. **CORRECT SYSTEM AS REQUIRED.**

5. **PERFORM DRIVEABILITY EVALUATION AND VERIFY PROBLEM NO LONGER EXISTS.**

3.1.1 FINAL DRIVEABILITY EVALUATION PROCEDURES

Upon completion of the system repairs, each vehicle should pass a routine performance test before being released. If the vehicle does not pass any portion of the evaluation, the problem must be corrected and the evaluation procedure performed again. The evaluation procedure consists of two segments:

A. Starting and Idling Test

B. On-Road Driving Test with Driver Evaluation

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1. The vehicle must have a minimum of 500 psi in the natural gas tank and 1 gallon in the gasoline tank to perform this test.

2. Start vehicle:

   - Set the GFI selector switch in the Natural Gas position and start vehicle.

   - Turn ignition key to the ON position and wait 3-5 seconds.

   - Turn key to the START position, then release key when engine starts. Do not press accelerator during start up procedures.

   - Vehicle must start on natural gas.

3. Allow vehicle to warm up for 5 minutes and idle engine in Park or Neutral.

   - Idling quality must be smooth with no stumbling or stalling or MIL lights. The GFI switch indicator light should remain on with no flashing or pulsing.

   - If idling quality is not acceptable, diagnose and correct problem(s) using the System Diagnosis section of the GFI Service Manual. Repeat test procedure once problem has been corrected.

4. A standard route for the driving test is recommended for the driveability test. Route selection should include the following criteria:

   - Route should be approximately 2   miles (3 km) long.

   - Contain a section which will allow the vehicle to be safely accelerated to 30 mph (50 km/h).

   - Contain at least one full stop such as a traffic light or stop sign.

   CAUTION: *To minimize the risk of accidents with customer vehicles, plan a clockwise route (a loop with no left turns) and avoid travel on highways or freeways. Observe all posted legal and safety regulations.*

5. Driveability must be evaluated during the following conditions:

   - In-gear idle

   - Acceleration to road speed (30 mph or 50 km/h)

   - Cruise

   - All conditions must be smooth with no stumbling, stalling or MIL lights. The GFI switch indicator light should remain on with no flashing or pulsing.

6. If driveability is not acceptable, diagnose and correct problem(s) using the System Diagnosis section of the GFI Service Manual. Repeat test procedure once problem has been corrected.

7. After completing driving circuit, place vehicle transmission into Park position and close 1/4 turn CNG shut-off valve.

8. Immediately increase engine to high idle (1500 to 2000 rpm). Vehicle should switch to gasoline in less than 60 seconds. Auto-switch has occurred when green GFI dash light is no longer lit and vehicle continues to idle high.

9. Continue running in gasoline and idle (normal speed) engine in Park or Neutral.

   - Idling quality must be smooth with no stumbling or stalling or MIL lights.

   - If idling quality is not acceptable, diagnose and correct problem(s) using the System Diagnosis section. If problem is a base vehicle fault, follow base vehicle diagnosis and repair procedures.

3.2 PRELIMINARY DIAGNOSTICS

Many problems are the result of poor connections or simple standard system problems that can be discovered by visual inspection.

TEST STEP	RESULTS	ACTION TO TAKE
PD01 PERFORM VISUAL CHECK		
1. Check recent work performed (e.g. tune-up, new equipment etc.) has not disrupted system components. 2. Confirm tank valves are on 3. Verify CNG tank pressure exceeds 800 psi 4. Check for worn, chafed, or crimped fuel lines and hose 5. Check system connections for natural gas fuel leaks 6. Check for vacuum leaks (includes loose fittings and worn, chafed and crimped hose) 7. Check for proper electrical connections 8. Check that the GFI IAT and MST sensors are securely mounted and in proper location.	YES NO	• Go to PD02 • Repair As Required
PD02 PERFORM GENERAL INSPECTION		
1. Check vehicle has been tuned and normal maintenance has been performed 2. Check standard equipment is in good condition 3. Confirm correct calibration is loaded in vehicle	YES NO	• Go to PD03 • Repair As Required
PD03 PERFORM PRELIMINARY POWER CHECK		
1. Check Voltage • Check battery voltage is > 12.5 volts • Check battery voltage at crank is > 9.6 volts 2. Verify proper ground connections: *(with Key On Engine Off)* • Measure voltage between Battery negative terminal and system ground lugs. Voltage must be ≤ 50 mv (.05v) 3. Check fuses. If fuse blown check for shorted circuit 4. Check all connectors for proper connection	YES NO	• Go to Specific Condition if required. • Repair As Required
PD04 CHECK FOR PCM FAULT CODES		
1. Check for base vehicle fault codes *For active codes: the PCM may set the MIL, while in gasoline or natural gas mode. If the problem is with the natural gas system, the selector switch will flash while set in natural gas mode*	YES NO	• Codes are present, perform base vehicle diagnosis and Repair As Required. • Go to Specific Condition Diagnostic

NOTE: *When it is necessary to disconnect the battery power, base vehicle adaptive learn functions are reset. The vehicle may exhibit poor performance in gasoline mode after battery is reconnected and engine started. In gasoline mode, drive the vehicle approximately 5 minutes under varying conditions from idle to acceleration. This will reestablish the gasoline adaptive learn settings.*

3.3 SPECIFIC CONDITION DIAGNOSTICS

3.3.1 REFERENCE INDEX (WHERE TO GO)

ED01 NO START - GASOLINE		ACTION TO TAKE
A. Perform Preliminary Diagnostics		• Repair As Required
C. Bypass J28 & J29 (TDC) and Retry Start To bypass, disconnect J/P28 and J/P29 then connect P28 and P29 together.		
1. Vehicle fails to start	YES	• Perform base vehicle diagnosis and Repair As Required
	NO	• Vehicle starts - Reconnect J/P28 and J/P 29 and Go to step 2
2. Check power relay function (J26)		**USE TEST PROCEDURE CP03**
	YES	• Test OK go to step 3
	NO	• Replace Relay Module
3. Confirm Compuvalve communicates with monitor **USE TEST PROCEDURE CP02**		**USE TEST PROCEDURE CP05**
	YES	• Test OK go to ED01-D
	NO	• Kit fails to communicate **USE TEST PROCEDURE CP05**
D. Bypass injector cutout and Retry Start		
1. Vehicle fails to start	YES	• Perform base vehicle diagnosis and Repair As Required
	NO	• Vehicle starts - Go to step 2
2. Check Relay function (J19 or Auxiliary if used)		**USE TEST PROCEDURE CP04**
	YES	• Module OK - Not a GFI system fault or incorrect appraisal of concern
	NO	• Replace Fuse and Relay Module or relay for auxiliary relay

ED02	NO START - ALTERNATE FUEL (NO GREEN LIGHT) (STARTS ON GASOLINE)		ACTION TO TAKE
A.	Perform Preliminary Diagnostics		• Repair As Required
B.	Confirm Alternate Fuel Supply/Fuel Flow		USE TEST PROCEDURE CP07

ED03	NO START - ALTERNATE FUEL (GREEN LIGHT ON) (STARTS ON GASOLINE)		ACTION TO TAKE
A.	Perform Preliminary Diagnostics		• Repair As Required
B.	Check TACH Signal		
	1. Start vehicle on gasoline and confirm apparent RPM with Monitor NOTE: For mono-fuel vehicles, check RPM during crank	YES NO NO	• Go to ED03-C • Go to step 2 • Kit fails to communicate USE TEST PROCEDURE CP05
	2. Check continuity between Intercepts and P28 and P29	YES NO	• Go to ED03-C • Repair as required
C.	Check MAP Signal		USE TEST PROCEDURE CP06
		YES NO	• MAP sensor and vacuum OK - go to ED03-D • Repair as required
D.	Check for dual Fueling (both fuels being delivered to engine)		
	1. Disconnect injector intercept connectors then attempt to Start - does vehicle start?	YES NO	• Check Relay Module (J19) Function and Auxiliary Relay if used for second injector intercept (use test procedure CP04) repair as required • Go to ED03-E
E.	Confirm Correct Calibration Loaded in Compuvalve		
	1. Use monitor software and determine calibration that is loaded	NO NO	• Incorrect calibration - Load correct factory calibration • Kit does not communicate - USE TEST PROCEDURE CP05

ED04	HARD STARTING / FALSE STARTS - CNG NOTE: It is typical for Alternative Fuel powered vehicles to require longer crank times.		ACTION TO TAKE
A.	Perform Preliminary Diagnostics		• Repair As Required
B.	Confirm Power at P26 (Red plug at Fuse and Relay Module 1. Switched B+ (SW B+ Pin A) should be hot with Key ON (including during crank) 2. Battery (B+ Pin B) should be hot at all times		• Repair As Required
C.	Check Ignition System NOTE: Alternative fuels requires a higher firing voltage to ignite. A marginal ignition system may affect the alternate fuel system before gasoline performance is affected.		
	1. Perform base vehicle ignition system diagnostics		• Repair As Required
D.	Confirm Alternate Fuel Supply/Fuel Flow		USE TEST PROCEDURE CP07

ED05	STARTS THEN DIES OR STALLS UNDER LOAD - CNG		ACTION TO TAKE
A.	Perform Preliminary Diagnostics		• Repair As Required
B.	Check Timing Intercept		USE TEST PROCEDURE CP11
C.	Check Closed Loop Operation		
	1. Confirm system goes closed loop within 10 to 200 seconds after start. NOTE: *It may be necessary to depress and release throttle to initiate closed loop operation.* 2. Confirm sensor voltage "swings" during operation. Refer to Paragraph 2.5.5 on page 2-7. 3. Monitor CLCF - it should not exceed 1.280	YES NO	• Go to ED05-D • Check Oxygen Sensor Operation and Repair as required
D.	Check Compuvalve Injector Operation		USE TEST PROCEDURE CP12
E.	Confirm Alternate Fuel Supply/Fuel Flow		USE TEST PROCEDURE CP07

ED06	POOR PERFORMANCE - CNG Rough Idle / Low Power / Stalls / Poor Acceleration		ACTION TO TAKE
A.	Perform Preliminary Diagnostics		• Repair As Required
B.	Check MAP Signal		USE TEST PROCEDURE CP06
		YES	• MAP sensor and vacuum OK - go to ED03-D
		NO	• Repair as required
D.	Check GFI Sensors for Function (IAT & MST)		
	1. Is Sensor functioning - use monitor and record values	YES NO	• Sensor reading are in specification - go to EDO6-E • Replace Sensor
E.	Check Closed Loop Operation		
	1. Confirm system goes closed loop within 10 to 200 seconds after start. NOTE: *It may be necessary to depress and release throttle to initiate closed loop operation.* 2. Confirm sensor voltage "swings" during operation. Refer to Paragraph 2.5.5 on page 2-7. 3. Monitor CLCF - it should not exceed 1.280	YES NO	• Go to ED06-F • Check Oxygen Sensor Operation and Repair as required
F.	Check Coolant Circulation		
	1. Check Coolant Levels and hoses 2. Feel Hoses for circulation through Components		• Fill and repair to Vehicle Specifications
G.	Check For Compuvalve Injector "Leak Thru" To perform this test do the following steps: A) Turn Ignition Key Off then ON B) Use MONITOR - read and record FAP value C) Wait 2 minutes and record new FAP value		
	1. Does FAP drop more than 10 psi?	YES	• Check system for leaks - Repair as required. If no external leaks found - Replace Compuvalve
		NO	• Go to ED06-H

ED06	POOR PERFORMANCE - CNG (CONTINUED)		ACTION TO TAKE

H. **Check For Fuel Contamination** To perform this test do the following steps: A) Relieve pressure in system B) Remove inlet fuel hose and check fitting and port for contaminates	

1. Is contamination present	YES	• Service Filter as required
2. Is heavy contamination present	YES	• Service Filters Perform Compuvalve Cleaning Procedure

ED07	POOR PERFORMANCE (GASOLINE ONLY)	ACTION TO TAKE

A. **Perform Base Vehicle Diagnosis**
1. Remove GFI from system
   a. Bypass intercepts (TDC, O2, injectors)
   b. Disconnect Power (J26)
	• Repair As Required

ED08	BACKFIRING (MISFIRES) - CNG	ACTION TO TAKE

A. **Perform Preliminary Diagnostics**
The following base vehicle can cause backfiring conditions when operating on alternative fuel.
 	
  a. Ignition System
  NOTES: *Alternate Fuel requires a higher firing voltage to ignite. A marginal ignition system may affect the Alternate Fuel system before gasoline performance is affected.*
It has been observed that spark plugs and/or wires that are damaged or badly worn may significantly contribute to backfiring in certain vehicles.
 	
  b. Unregulated air supply (e.g. open or damaged air box or intake tubes.)
  c. Operator error - Throttle held open during crank
  d. Mechanical Condition	

1. Perform base vehicle system diagnostics	• Repair As Required
B. **Check Timing Advance**	**USE TEST PROCEDURE CP11**
C. **Check Compuvalve Injector Operation**	**USE TEST PROCEDURE CP12**

ED09	FUEL GAUGE DOES NOT REGISTER *NOTE: On some vehicles, it is normal that the fuel gauge does not respond after autoswitching. Some gauges cannot reset while vehicle is running. Key off the vehicle, then key on - the fuel gauge should respond in normal fashion..*	ACTION TO TAKE

Before beginning this test, the technician must ensure that the vehicle has a minimum of 500 psi of natural gas and 1 gallon of gasoline.	

A. Bypass Fuel Gauge Intercept (Pins A & B of P33)		
1. Does gauge work in gasoline mode with bypass	YES	• Go to step 2
	NO	• Perform base vehicle diagnosis and Repair As Required
2. Check harness continuity between intercept and P33	YES	• Continuity OK - go to ED09-B
	NO	• Replace Harness

B. Check FSP Sensor on Regulator	**USE TEST PROCEDURE CP09**

ED11	ALTERNATIVE FUEL LEAK	ACTION TO TAKE
A. Perform Leak Test		
1. Perform test according to instructions in Section 5		• Repair as required. Replace component exhibiting external fuel leaks

NOTES:

3.4   COMMON PROCEDURES

The following tests are common procedures that are used to troubleshoot the GFI system. The technician is directed to the specific procedure in the diagnostic test being performed.

CP01	BYPASSING AN INTERCEPT		ACTION TO TAKE
	For troubleshooting it is sometimes necessary to bypass an intercept made for the system. These include the fuel gauge, canister purge, fuel injector cutout, TPS and circuits that require the use of an auxiliary relay.		
TO BYPASS AN INTERCEPT:			
1.	Detach the connector for circuit in question.		
2.	Make a mating connector for the intercept side of the existing connector. Run a short piece of wire from one pin socket to the next pin socket (e.g. from Pin A to Pin B). Construct connector per the instructions in section 3.4.		
3.	Plug the new connector into the intercept side of the existing connector, this returns the circuit to the base vehicle configuration.		
TO BYPASS J28 AND J29 (OXYGEN SENSOR AND TDC CONNECTIONS):			
1.	The Oxygen Sensor and TDC connections are divided between two connectors, input (J/P 29) and output (J/P 28). To bypass, detach P29 from J29 and P28 from J28 then connect P29 and P28 together.		

CP02	TESTING WIRE CONTINUITY		ACTION TO TAKE
1.	Locate connectors specified in test or procedure.		
2.	Using the wiring schematic in section 3, trace wires from pin to pin.		
3.	Use a voltmeter or ohmmeter and confirm that wire is not broken or grounded.		• Replace or Repair As Required.

CP03	CHECKING RELAY FUNCTION - POWER RELAY		ACTION TO TAKE
	The following test applies only to the power relay, J26, in the fuse and relay module.		
1.	Disconnect J/P35.		
2.	Check fuses.		• Replace As Required
3.	With Key On, Engine Off; Ground Pin A of P35 and confirm battery power at Pin d through J of P35.	YES	• Go to step 4
		NO	• If circuit open - (no power present), Replace Fuse and Relay Module.
4.	Disconnect J/P 26. Check battery voltage at pin A & B.	YES	• Go to step 4
		NO	• Replace Fuse and Relay Module
5.	Using a continuity tester, check continuity between Pin B of J26 and Pin J of P35.	YES	• If circuit open - Relay OK - no further test required
		NO	• If circuit closed - Replace Fuse and Relay Module.

CP04	CHECKING RELAY FUNCTION - RELAY MODULE OR AUXILIARY RELAY		ACTION TO TAKE
To check that the relay module or an auxiliary module is properly functioning, make the following tests: (This test is not applicable for the power relay in the module.)
1.	Disconnect power (J/P 26).		
2.	Check continuity between pins of J16A and P35B.	YES	• If circuit closed - continue with step 3
		NO	• If circuit open - Replace Module or Relay being tested.
3.	Connect power (J/P 26). Ground pin B of P35.		
4.	With Key On, Engine Off check continuity for pins J19A and J19B.	YES	• If circuit open - Relay OK - no further test required
		NO	• If circuit closed - Replace Module or Relay being tested.

CP05	CONFIRM COMPUVALVE COMMUNICATES		ACTION TO TAKE
1.	Communicate with Compuvalve at diagnostic plug	YES	• Communications OK - no further testing required
		NO	• No communications Go To step 2
		NO	• Values out of range -RPM > 0 with engine off -MAP and BAP not between 20-30 Kit scrambled - Replace Compuvalve
2.	(With Key On) Check for 5 volts between pin C & D of J27	YES	• Go to step 3
		NO	• Go to step 4
3.	(With Key OFF) Check for 5 volts between pins C & D of J27	YES	• 5 volts present - Go to step 5
		NO	• Check RS232 Cable and monitor equipment for function - Correct As Required.
4.	Check Power Relay Function - J26 **USE TEST PROCEDURE CP03**	YES	• Relay Function OK - Replace Compuvalve
		NO	• Replace Relay Module
5.	a. Disconnect all connectors except: J25 (compuvalve) J/P35 (fuse and relay module) J/P26 (power) J/P 8 (RS232)	YES	• Communications possible go to step c
	b. Attempt communication with compuvalve	NO	• No communication **USE TEST PROCEDURE CP02**
	c. Reattach 1 connector at a time and observe communications	YES	• Communications possible with all connectors reattached
		NO	• No communication after making connection - Replace Compuvalve

CP06	TESTING MAP SIGNAL	ACTION TO TAKE

TESTING MAP SENSOR IN COMPUVALVE

1.	Disconnect MAP elbow from barb on compuvalve		
2.	With Key ON, Engine OFF - Use the monitor and note the MAP value.		
3.	Gently apply a vacuum to the barb on the compuvalve and observe if the MAP value on the monitor deflects down from value noted in step 2.	YES	• MAP value deflects - Sensor OK - go to vacuum source test.
		NO	• MAP value DOES NOT deflect - sensor bad - replace compuvalve

TESTING VACUUM SOURCE
NOTE: *MAP signal will not react without a TACH signal present.*

4.	Reconnect vacuum hoses and tubes removed in step 1.		
5.	With Key On, Engine On, monitor MAP values during acceleration and deceleration.	YES	• MAP value varies - vacuum source OK - no action required
		NO	• MAP value does not change: - Hoses are kinked, obstructed or disconnected - correct as required - Hoses OK - incorrect connection to vacuum source - correct according to factory template for vehicle.

CP07	CONFIRM ALTERNATE FUEL SUPPLY/FUEL FLOW	ACTION TO TAKE

1.	Confirm tank valves and quarter valve in OPEN position and tank pressure exceeds 300 psi		• Recharge Cylinders As Required
2.	(During Key On Engine Off and Crank with switch set to alt fuel) Use the monitor and confirm the following:	YES	• Variables are correct - Not a GFI system fault or incorrect appraisal of concern
	- FSP > 300 psi (switch in CNG position) - FAP > 95 psia	NO	• Kit fails to communicate USE TEST PROCEDURE CP05
	- Switch = NG	NO	• Monitor readout does not indicate switch set to alt fuel - USE TEST PROCEDURE CP09
		NO	• - FAP value between 22 psia and 95 psia - USE TEST PROCEDURE CP08
		NO	• - If FAP less than 22 psia or greater than 160 psia - Replace Compuvalve

CP08	CONFIRM GFI REGULATOR SOLENOID IS OPERATING		ACTION TO TAKE
1.	Listen for audible "click" when regulator solenoid energized	YES	• Solenoid operating - go to step 4
		NO	• Go to step 2
2.	Check pin voltage & resistance values at J3, Pins D & F (Refer to values given in Voltage and Resistance Chart)	YES	• Go to step 3
		NO	• If values out of specification - Replace Compuvalve and coil harness
3.	Check diode a. Remove split loom from HPS coil harness to expose area with heatshrink covering diode. b. Examine heatshrink for signs of burning or rupture. Do not attempt to remove heatshrink.	YES	• Physical Damage Visible - Replace Coil Harness
		NO	• Diode OK - go to step 4
4.	Check coil resistance value between pins D & F of P3 a. Value must be between 6.0 - 8.0 ohms b. Gently wiggle connection around diode splice. CAUTION: *Do not attempt to bend diode or flex wires more than 30 degrees.* 1. Resistance value must remain steady (does not vary by more than 1 ohm while being flexed)?	YES	• Values OK - Check Compuvalve Communications - **Use Test Procedure CP05**
		NO	• Values out of Specification - Replace Coil Harness

CP09	CHECK FSP SENSOR ON REGULATOR		ACTION TO TAKE
TESTING GROUND AND KIT POWER SIGNALS			
1.	(With ignition OFF) Check Pin A of J3 ground path (< 5 ohms between pin and ground lug).	YES	• Ground and power signals OK - go to step 4
		NO	• Go to PD03 - repair as required
2.	Remove Pin B of P3.		
3.	(With ignition ON) Confirm voltage at Pin C of J3 = 5v ± .05v		
TESTING SENSOR ON REGULATOR			

4.	(With ignition ON) Measure voltage on wire previously removed from Pin B of P3. Reading will vary with tank pressure approximately as follows:
	
	Tank Pressure (psi) FSP Voltage
	    0 0.25 Volts
	   1500 2.5 Volts
	   3000 4.75 Volts
		YES	• Sensor OK

		NO	• Voltage out of specification - replace FSP Sensor
5.	With Key Off, disconnect J/P 33		
6.	With switch in NG, check continuity between pins D & E of P33. Is circuit closed	YES	• Go to step 7
		NO	• Replace switch assembly
7.	With switch in GASO, check continuity between pins C & D of P33. Is circuit closed	YES	• Go to step 8
		NO	• Replace switch assembly
8.	Check pin voltage & resistance values for pins B, C, D & E of J33	YES	• Values OK - Switch & circuit OK
		NO	• Values out of specification - Replace Compuvalve

CP11	CHECK TIMING INTERCEPT		ACTION TO TAKE

1.	Start engine on Alternate Fuel
	   a. Monitor ADVANCE
	   b. System applies advance after 10 seconds
		YES	• Engine Stalls When Advance Applied go to step 2

		NO	• Go to next diagnostic procedure listed
2.	Bypass J28 & J29 and retry start	YES	• Engine stalls - Reconnect J/P28 and J/P 29 and Go to next diagnostic procedure listed for condition.
		NO	• No stall - Replace Compuvalve

CP12	CHECK COMPUVALVE INJECTOR OPERATION		ACTION TO TAKE
1.	Using monitor, observe open/close routine of low flow injectors (#1 and #2) during crank and idle. Listen to injectors to confirm operation.	YES	• Injectors (#1 and #2) open and close and engine starts and idles- go to step 2.
		NO	• Injector(s) are not opening - replace compuvalve
2.	Operate vehicle under load and slowly accelerate. Using monitor, observe high flow injectors (#3 thru #7). Low demand will turn on #3, increased demand will turn on #3 & #4 etc. Observe for each high flow injector and note the following conditions: A. Does vehicle stall when injector is on? B. Does exhaust indicate a extreme lean condition at time of stall (Does CLCF abruptly climb while O2 volts rapidly drops)? **NOTE:** *Some smaller engines do not use the larger injectors (# 6 and #7) during normal operation. All engines use #3, #4 and #5) DO NOT exceed manufacturer's recommended operational limits (do not redline engine).*	YES	• Vehicle stalls - Injector(s) are not opening - replace compuvalve
		NO	• Vehicle continues to run - injectors OK Go to next diagnostic procedure listed for condition.

3.5   MONITOR READOUT REFERENCE CHART

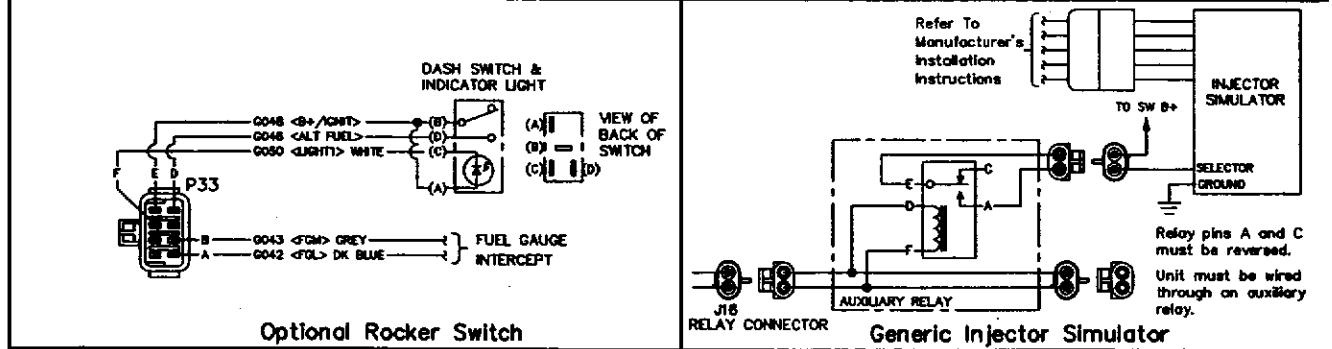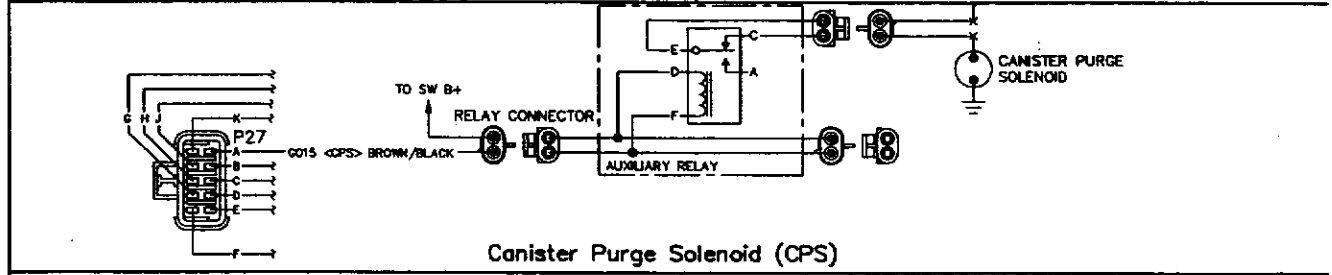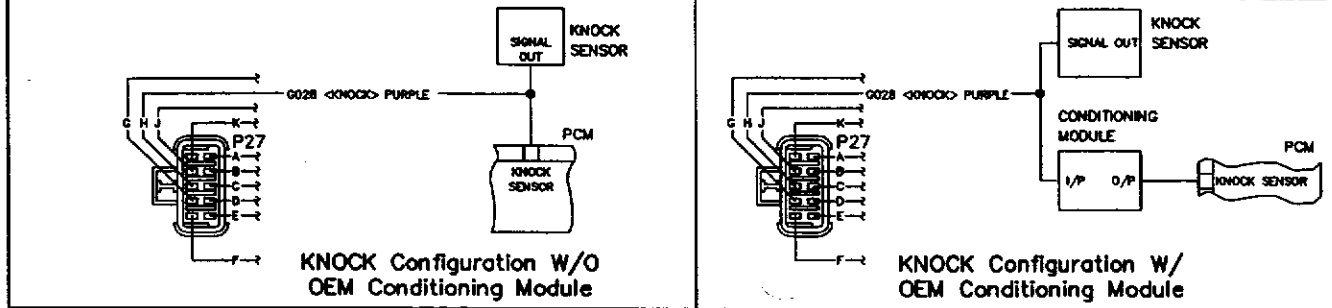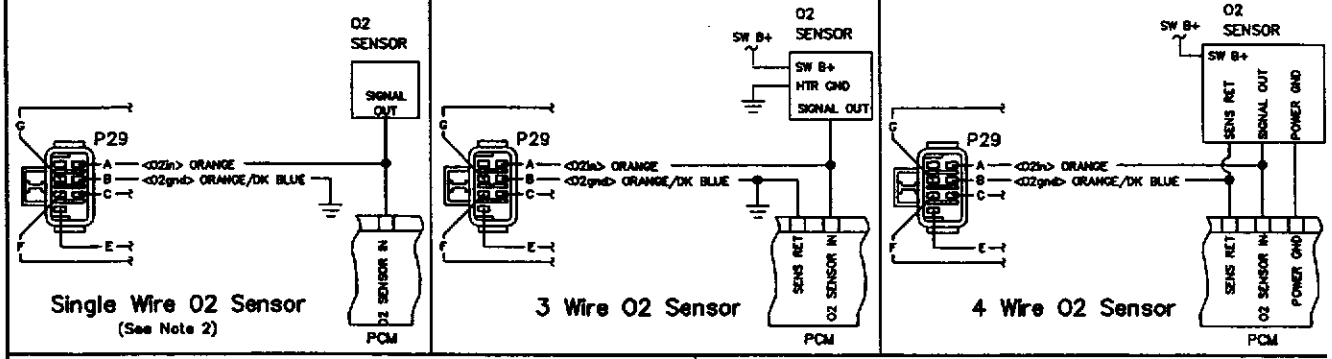| VARIABLE	UNITS	(GASOLINE) ALL MODES	KOEO	COLD IDLE	HOT IDLE	CRUISE 30 MPH	CRUISE 55 MPH	ACCEL.	EXTENDED DECEL.[1]
SYSTEM STATUS INDICATORS									
IGNITION	–	ON	ON	ON	ON	ON	ON	ON	ON
SWITCH	--	GASO	NG	NG	NG	NG	NG	NG	NG
FUEL	--	GASO	NG	NG	NG	NG	NG	NG	NG
NG, SOL	–	OFF	ON/OFF	ON	ON	ON	ON	ON	ON
GAS RLY	–	OFF	ON	ON	ON	ON	ON	ON	ON
PRESSURES									
BAP	in. Hg	same as NG	24-30	24-30	24-30	24-30	24-30	24-30	24-30
MAP	in. Hg	same as NG	same as BAP	9-12	9-12	11-15	18-27	>20	<10
DMAP	in. Hg	same as NG	0	±2.0	±2.0	±5.0	±5.0	>5.0	<0
FAP	PSIA	same as NG	95-130	95-130	95-130	95-130	95-130	95-130	95-130
TANK LEVEL	PSIG	note 2	0-3600	300-3600	300-3600	300-3600	300-3600	300-3600	300-3600
TEMPERATURES									
IAT	°C[6]	same as NG	-40 to 40	-40 to 40	-40 to 40	-40 to 40	-40 to 40	-40 to 40	-40 to 40
FRT	°C[6]	same as NG	-5 to MST	Ambient	-5 to MST	-5 to MST	-5 to MST	-5 to MST	-5 to MST
MST	°C[6]	same as NG	-40 to 125	-40 to 40	-40 to 125	-40 to 125	-40 to 125	-40 to 125	-40 to 125
TMIX	°C[6]	same as NG	> MST	> MST	> MST	> MST	> MST	> MST	> MST
CLOSED LOOP CONTROL									
O2 LOOP	--	OPEN	OPEN	OPEN/CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	OPEN
CLCF	Lambda	1.000	1.000	1.000	0.900-1.100	0.800-1.200	0.800-1.200	0.800-1.200	1.000
O2 VOLTS	Volts	0.001-1.000	0.001-1.000	0.001-1.000	0.001-1.000	0.001-1.000	0.001-1.000	0.001-1.000	0.001-0.550
SPARK ADVANCE									
ADVANCE	Degrees	Bypassed	Bypassed	Bypassed	5-9	8-12	8-12	10-15	6-10

VARIABLE	UNITS	(GASOLINE) ALL MODES	KOEO	COLD IDLE	HOT IDLE	CRUISE 30 MPH	CRUISE 55 MPH	ACCEL.	EXTENDED DECEL.[1]
TACH AND ENGINE MODE[3]									
RPM	RPM	same as NG	0	Function of Engine Performance and OEM Specifications					
INJECTOR STATUS									
INJ1	--	OFF	OFF	5-25 ms	5-25 ms	5-25 ms	5-25 ms	5-25 ms	OFF
INJ2	--	OFF	OFF	OFF	5-25 ms	5-25 ms	5-25 ms	5-25 ms	OFF
INJ3	--	CLOSED	CLOSED	OPEN/CLOSED	OPEN/CLOSED	OPEN/CLOSED	OPEN/CLOSED	OPEN/CLOSED	CLOSED
INJ4	--	CLOSED	CLOSED	OPEN/CLOSED	OPEN/CLOSED	OPEN/CLOSED	OPEN/CLOSED	OPEN/CLOSED	CLOSED
INJ5	--	CLOSED	CLOSED	CLOSED	CLOSED	OPEN/CLOSED	OPEN/CLOSED	OPEN/CLOSED	CLOSED
INJ6	--	CLOSED	CLOSED	CLOSED	CLOSED	OPEN/CLOSED	OPEN/CLOSED	OPEN/CLOSED	CLOSED
INJ7	--	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	OPEN/CLOSED	OPEN/CLOSED	CLOSED
INJ8	--	CLOSED	CLOSED	CLOSED	CLOSED	CLOSED	OPEN/CLOSED	OPEN/CLOSED	CLOSED
RUNNING DATA									
RUN TIME	seconds	0	0	<100 s	>600 s	Data Not Pertinent			
NBASIC	%	same as NG	N/A	58 to 64	58 to 64	65 to 80	78 to 84	70 to 84	50 to 60
EGR	%	same as NG	N/A	0.0	0 to 5	6 to 30	6 to 30	0 to 5	0 to 5
MAX EGR	%	same as NG	10 to 30	10 to 30	10 to 30	10 to 30	10 to 30	10 to 30	10 to 30
MAF	G/S	same as NG	N/A	5 to 10	4 to 9	10 to 30	20 to 40	20 to 50	5 to 8
LTAR	UNITY	same as NG	1.0	1.0	1.0	1.0	1.0	1.0	1.0/1.5
NMFF	SCFH	same as NG	N/A	100 to 400	50 to 250	300 to 750	1000 to 3000	3000 to 6800	0 to 70
ADAPT	UNITY	same as NG	0.75 to 1.25	0.75 to 1.25	0.75 to 1.25	0.75 to 1.25	0.75 to 1.25	0.75 to 1.25	0.75 to 1.25
MAP INDEX	–	same as NG	N/A	2 to 5	2 to 5	4 to 9	8 to 10	8 to 12	0 to 2
RPM INDEX	–	same as NG	N/A	1 to 3	1 to 3	5 to 6	6 to 8	6 to 12	0 to 7
BATTERY	Volts	same as NG	≈12.5	≈14.5	≈14.5	≈14.5	≈14.5	≈14.5	≈14.5

NOTES:

1. Extended Decel refers to deceleration over 5 seconds in duration.

2. GFI System does not register FSP in gasoline mode.

3. Function of engine operation and OEM specifications.

4. The values in this chart represent average approximations only. Specific vehicles may have slight variations because of individual vehicle characteristics.

5. The default values for a open or shorted sensors are: IAT = 52 C; MST = 77 C; and, FRT = -23 C. If the monitor values equal one of these defaults AND does not fluctuate after Key ON, a problem may exist with the sensor.

6. The values shown are for use with the FMON utility screen. The vehicle monitor screen for FCOM dealer software displays temperatures in Kelvin. To convert to Celsius, subtract 273 from the Kelvin value shown on screen (K - 273 = C).

7. Refer to the Appendix in the FMON software instructions for a description of the monitor readout variables.

3.6   GFI II SYSTEM ELECTRICAL SCHEMATIC

Single Wire O2 Sensor (See Note 2)

3 Wire O2 Sensor

4 Wire O2 Sensor

KNOCK Configuration W/O OEM Conditioning Module

KNOCK Configuration W/ OEM Conditioning Module

Canister Purge Solenoid (CPS)

Optional Rocker Switch

Generic Injector Simulator

FROM BASE VEHICLE ENGINE/SENSORS

TO BASE VEHICLE ENGINE/SENSORS
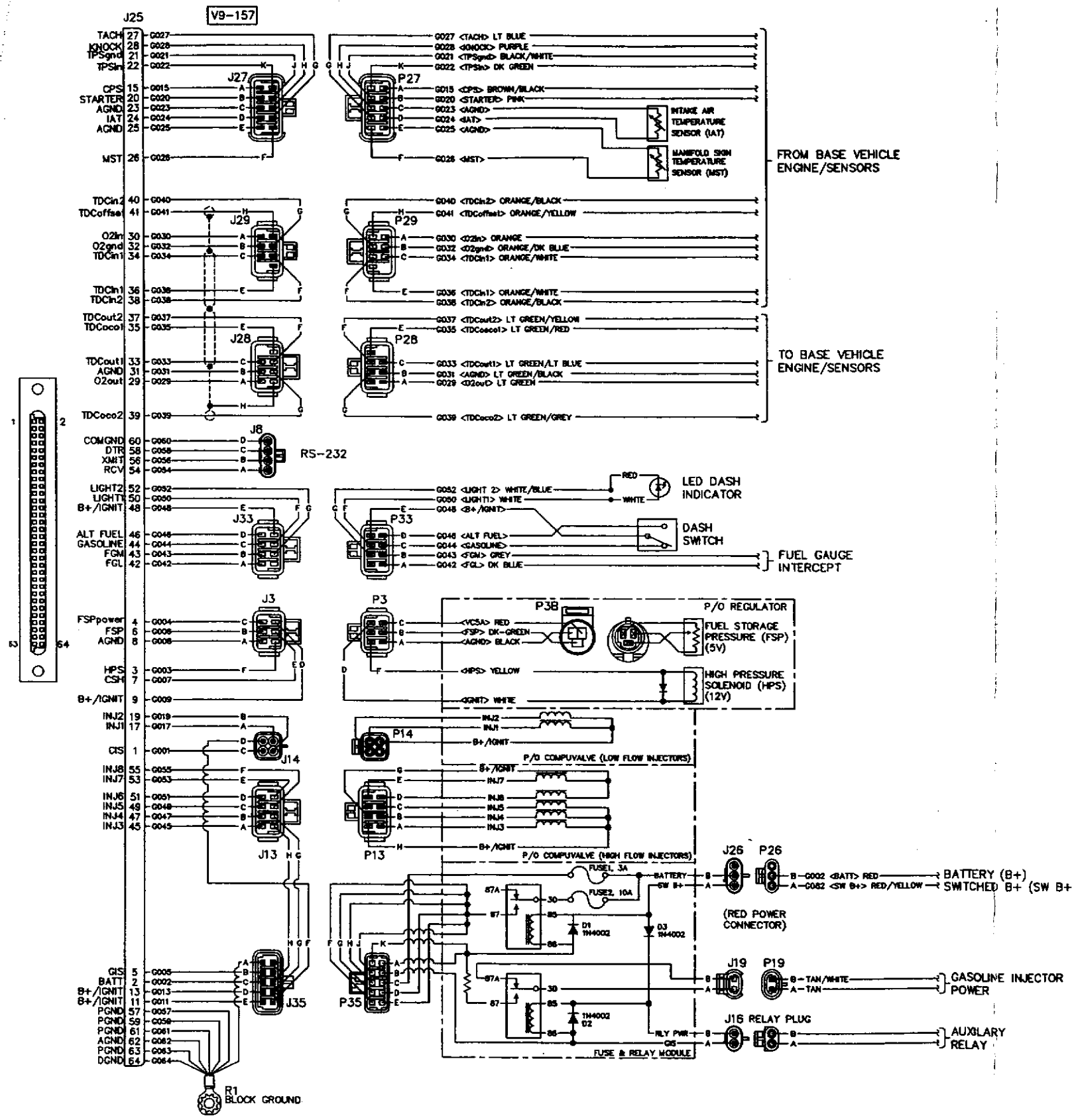
LEGEND:
- ☒ OR ⊗   Male Terminal
- ■ OR ●   Male Terminal – Pin A
- ☐ OR ○   Female Terminal
- –< INJnc1 >– System Circuit Description
- — Gxxx–x —GFI Circuit Number

NOTES:
1. Connectors are shown as viewed from mating surface end. Wires enter connector from rear except where noted.

2. A single wire OEM O2 sensor should be replaced with a heated O2 sensor (P/N NZO3007).

3. Refer to specific vehicle installation template for TAP/INTERCEPT requirements and locations.

4. Unused connectors and terminal ports must be sealed. Refer to parts catalog for part numbers.

5. Refer to specific base vehicle schematics for OEM wire colors, labels and pin ID details.

3.7 GFI I ELECTRICAL SYSTEM SCHEMATIC

This schematic is reproduced from the GFI I Installation Manual dated December 21, 1992. It is for reference only. Wiring and details apply only to GFI I installations and not GFI II installations.
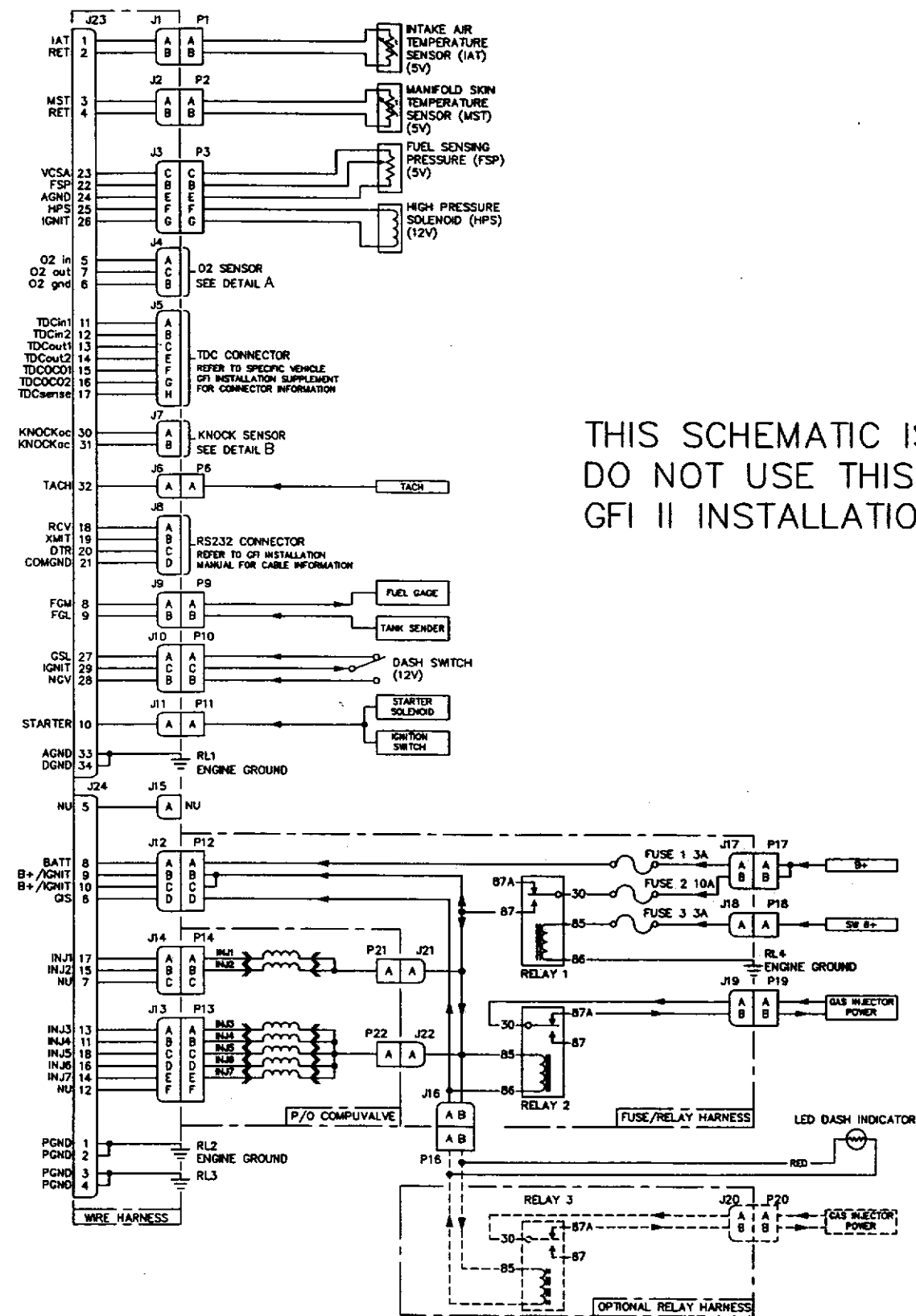
THIS SCHEMATIC IS FOR REFERENCE ONLY
DO NOT USE THIS INFORMATION FOR NEW
GFI II INSTALLATIONS!

3.8 VOLTAGE AND RESISTANCE CHART

The values in these charts are based on J25 being connected to compuvalve unless otherwise noted.

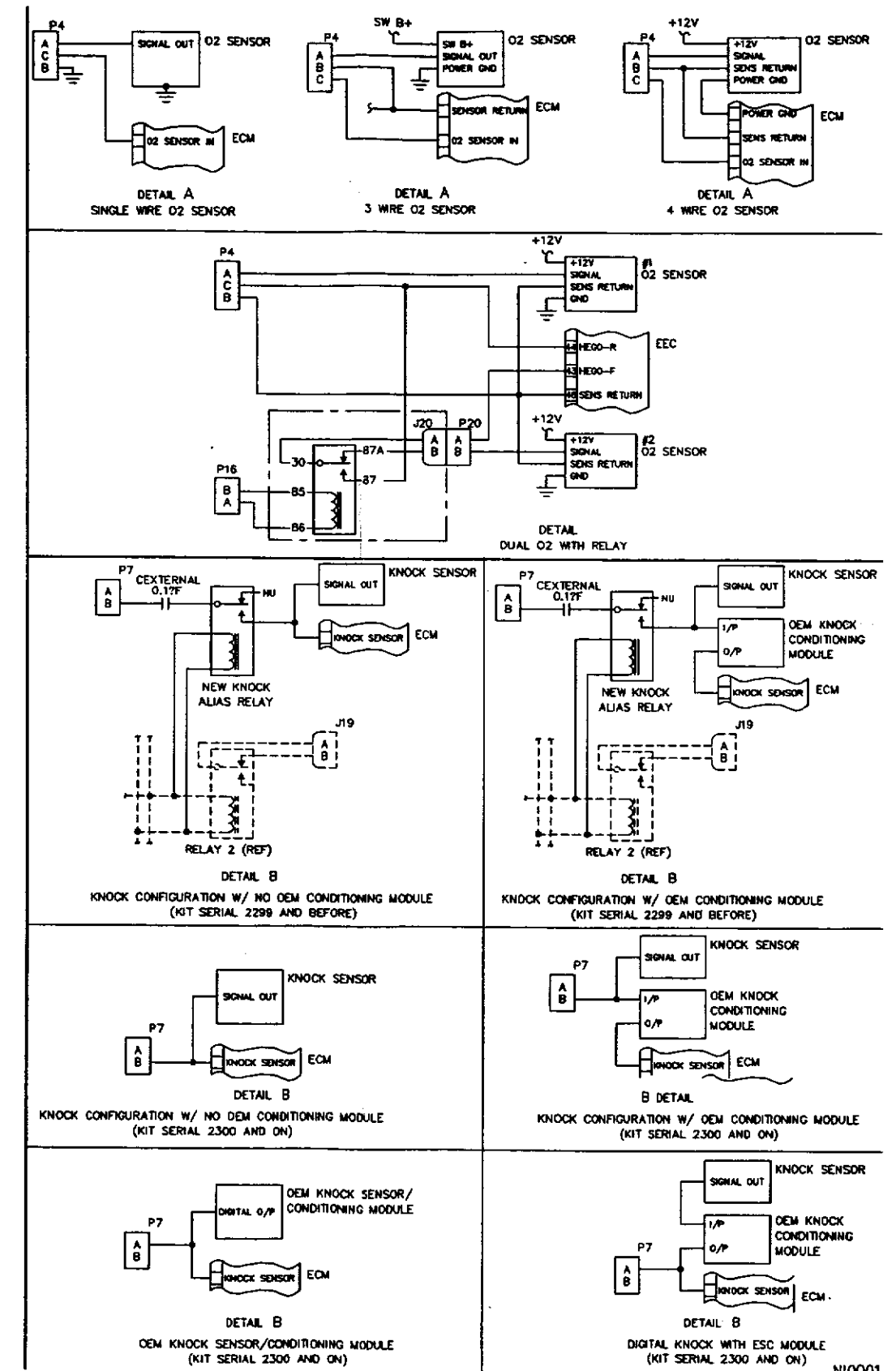| Conn. / Pin ID	Signal Name	Value Measured	To	Serial Number	Key OFF	Key ON (Gaso)	Key ON (ALT)	Engine ON (Gaso)	Engine ON (ALT)	Comments:
REGULATOR J3										
J3-A	AGND	Voltage	GND	ALL	0 Vdc	0 - 5 Vdc	0 - 5 Vdc	0 Vdc	0 Vdc	
		Resistance	GND	ALL	>700 kohm	-	-	-	-	
J3-B	FSP	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	see comment	see comment	Input Signal Range = 0 Vdc to 5 Vdc
		Resistance	GND	ALL	>500 kohm	-	-	-	-	P3 Disconnected
J3-C	FSP POWER	Voltage	GND	ALL	0 Vdc	5 Vdc	5 Vdc	5 Vdc	5 Vdc	
		Resistance	GND	ALL	212 ohm	-	-	-	-	P3 Disconnected
J3-D	IGNIT	Voltage	GND	ALL	0 Vdc	Batt +	Batt +	Batt +	Batt +	Relay 1 must be functional
		Resistance	GND	ALL	>100 kohm	-	-	-	-	P3 Disconnected, Connect Ohmmeter and wait 30 seconds before reading value
J3-E	CSH	Voltage	GND	ALL	0 Vdc	Batt +	0 Vdc / Batt +	Batt +	0 Vdc / Batt +	Temperature < C / > C
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	
J3-F	HPS	Voltage	GND	ALL	0 Vdc	Batt +	0 Vdc	Batt +	0 Vdc	
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P3 Disconnected
RS-232 J8										
J8-A	RCV	Voltage	GND	ALL	-15 Vdc	-15 Vdc	-15 Vdc	-15 Vdc	-15 Vdc	P8 Connected, not communicating
		Voltage	GND	ALL	-15 to + 15 Vdc	-15 to + 15 Vdc	-15 to + 15 Vdc	-15 to + 15 Vdc	-15 to + 15 Vdc	P8 Connected, communicating
		Resistance	GND	ALL	>200 kohm	-	-	-	-	P8 Disconnected
J8-B	XMIT	Voltage	GND	ALL	-15 Vdc	-15 Vdc	-15 Vdc	-15 Vdc	-15 Vdc	P8 Connected, not communicating
		Voltage	GND	ALL	-15 to + 15 Vdc	-15 to + 15 Vdc	-15 to + 15 Vdc	-15 to + 15 Vdc	-15 to + 15 Vdc	P8 Connected, communicating
		Resistance	GND	ALL	>200 kohm	-	-	-	-	P8 Disconnected
J8-C	DTR	Voltage	GND	ALL	see comment	see comment	see comment	see comment	see comment	Input +15 Vdc = Force RS232 Only Mode with GFI
		Voltage	GND	ALL	see comment	see comment	see comment	see comment	see comment	Input -15 Vdc = Normal Communications
		Resistance	GND	ALL	16 kohm	-	-	-	-	P8 Disconnected
J8-D	COMGND	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	0 Vdc	0 Vdc	
		Resistance	GND	ALL	0 ohm	-	-	-	-	P8 Disconnected
COMPUVALVE INJECTORS J/P 13 & J/P 14										
J13-A	INJ3	Voltage	GND	ALL	0 Vdc	BATT +	BATT +	BATT +	Off=BATT + On = 0 Vdc	Relay 1 must be functional
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P13 Disconnected
J13-B	INJ4	Voltage	GND	ALL	0 Vdc	BATT +	BATT +	BATT +	Off=BATT + On = 0 Vdc	Relay 1 must be functional
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P13 Disconnected
J13-C	INJ5	Voltage	GND	ALL	0 Vdc	BATT +	BATT +	BATT +	Off=BATT + On = 0 Vdc	Relay 1 must be functional
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P13 Disconnected
J13-D	INJ6	Voltage	GND	ALL	0 Vdc	BATT +	BATT +	BATT +	Off=BATT + On = 0 Vdc	Relay 1 must be functional
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P13 Disconnected
J13-E	INJ7	Voltage	GND	ALL	0 Vdc	BATT +	BATT +	BATT +	Off=BATT + On = 0 Vdc	Relay 1 must be functional
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P13 Disconnected
J13-G, H	IGNIT High Flow Pwr	Voltage	GND	ALL	0 Vdc	Batt +	Batt +	Batt +	Batt +	Relay 1 must be functional
		Resistance	GND	ALL	>100 kohm	-	-	-	-	P3 Disconnected, Connect Ohmmeter and wait 30 seconds before reading value

Conn. / Pin ID	Signal Name	Value Measured	To	Serial Number	Key OFF	Key ON (Gaso)	Key ON (ALT)	Engine ON (Gaso)	Engine ON (ALT)	Comments:
P13-A	INJ3	Resistance	GND	ALL	infinite	-	-	-	-	J13 Disconnected
	INJECTOR	Resistance	P13-H	ALL	2.5 ohm	-	-	-	-	J13 Disconnected
P13-B	INJ4	Resistance	GND	ALL	infinite	-	-	-	-	J13 Disconnected
	INJECTOR	Resistance	P13-H	ALL	2.5 ohm	-	-	-	-	J13 Disconnected
P13-C	INJ5	Resistance	GND	ALL	infinite	-	-	-	-	J13 Disconnected
	INJECTOR	Resistance	P13-H	ALL	2.5 ohm	-	-	-	-	J13 Disconnected
P13-D	INJ6	Resistance	GND	ALL	infinite	-	-	-	-	J13 Disconnected
	INJECTOR	Resistance	P13-G	ALL	2.5 ohm	-	-	-	-	J13 Disconnected
P13-E	INJ7	Resistance	GND	ALL	infinite	-	-	-	-	J13 Disconnected
	INJECTOR	Resistance	P13-G	ALL	2.5 ohm	-	-	-	-	J13 Disconnected
J14-A	INJ1	Voltage	GND	ALL	0 Vdc	BATT +	BATT +	BATT +	Off = BATT + On = 0 Vdc	Relay 1 must be functional. These injectors are pulsed on and off.
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P14 Disconnected
J14-B	INJ2	Voltage	GND	ALL	0 Vdc	BATT +	BATT +	BATT +	Off = BATT + On = 0 Vdc	Relay 1 must be functional. These injectors are pulsed on and off.
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P14 Disconnected
J14-C	CIS	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	0 Vdc	0 Vdc	Not used for GFI Natural Gas Version
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P14 Disconnected
J14-D	IGNIT	Voltage	GND	ALL	0 Vdc	Batt +	Batt +	Batt +	Batt +	Relay 1 must be functional
	High Flow Pwr	Resistance	GND	ALL	>100 kohm	-	-	-	-	P3 Disconnected, Connect Ohmmeter and wait 30 seconds before reading value
P14-A	INJ1	Resistance	GND	ALL	infinite	-	-	-	-	J14 Disconnected
	INJECTOR	Resistance	P14-D	ALL	2.5 ohm	-	-	-	-	J14 Disconnected
P14-B	INJ2	Resistance	GND	ALL	infinite	-	-	-	-	J14 Disconnected
	INJECTOR	Resistance	P14-D	ALL	2.5 ohm	-	-	-	-	J14 Disconnected
SENSORS & ENGINE SIGNALS	**J27**									
J27-A	CPS	Voltage	GND	ALL	0 Vdc	-	-	-	-	Software Dependent
		Resistance	GND	ALL	>10M ohm	-	-	-	-	J27 Disconnected
J27-B	STARTER	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	0 Vdc	0 Vdc	B + During crank only
		Resistance	GND	ALL	>300k ohm	-	-	-	-	
J27-D	IAT	Voltage	GND	ALL	0 Vdc	5 Vdc	5 Vdc	5 Vdc	5 Vdc	P27 Connected
		Voltage	GND	ALL	0 Vdc	IAT Sensor	IAT Sensor	IAT Sensor	IAT Sensor	P27 Connected
		Resistance	GND	ALL	2.9 kohm	-	-	-	-	P27 Disconnected
		Resistance	J3-C	ALL	2.7 kohm	-	-	-	-	P27 Disconnected
J27-C	RET	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	0 Vdc	0 Vdc	P27 Disconnected
		Resistance	GND	ALL	0 ohm	-	-	-	-	P27 Disconnected
J27-F	MST	Voltage	GND	ALL	0 Vdc	5 Vdc	5 Vdc	5 Vdc	5 Vdc	P27 Disconnected
		Voltage	GND	ALL	0 Vdc	MST Sensor	MST Sensor	MST Sensor	MST Sensor	P27 Connected
		Resistance	GND	ALL	2.9 kohm	-	-	-	-	P27 Disconnected
		Resistance	J3-C	ALL	2.7 kohm	-	-	-	-	P27 Disconnected
J27-E	RET	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	0 Vdc	0 Vdc	-
		Resistance	GND	ALL	0 ohm	-	-	-	-	-
J27-J	TPS$_{in}$	Voltage	GND	ALL	0 Vdc	5 Vdc	5 Vdc	5 Vdc	5 Vdc	-
		Resistance	GND	ALL	2.9 kohm	-	-	-	-	P27 Disconnected Negative lead on J27-K
J27-K	TPS$_{gnd}$	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	0 Vdc	0 Vdc	-
		Resistance	GND	ALL	0 ohm	-	-	-	-	P27 Disconnected
J27-G	TACH	Voltage	GND	ALL	0 Vdc	see comment	see comment	see comment	see comment	Vehicle Dependent, INPUT ONLY
		Resistance	GND	ALL	46 kohm	-	-	-	-	P27 Disconnected
		Resistance	J3-C	ALL	46 kohm	-	-	-	-	P27 & P3 Disconnected
J27-H	KNOCK	Voltage	GND	ALL	0 Vdc	see comment	see comment	see comment	see comment	Voltages are KNOCK sensor dependent
		Resistance	GND	ALL	>10M ohm	-	-	-	-	P27 Disconnected

Conn. / Pin ID	Signal Name	Value Measured	To	Serial Number	Key OFF	Key ON (Gaso)	Key ON (ALT)	Engine ON (Gaso)	Engine ON (ALT)	Comments:
O2 & TDC	**J28 & J29**									
J29-A	O2$_{in}$	Voltage	GND	ALL	0 Vdc	0.1 - 0.9 Vdc	0.1 - 0.9 Vdc	0.1 - 0.9 Vdc	0.1 - 0.9 Vdc	Vehicle Oxygen Sensor Output
		Resistance	GND	ALL	1 Mohm	-	-	-	-	P29 Disconnected
		Resistance	J29-B	ALL	>1 Mohm	-	-	-	-	P29 Disconnected, Negative lead on J29-B
J29-B	O2$_{gnd}$	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	0 Vdc	0 Vdc	-
		Resistance	GND	ALL	>500 kohm	-	-	-	-	P29 Disconnected
J28-A	O2$_{out}$	Voltage	GND	ALL	0 Vdc	0.1 - 0.9 Vdc	0.1 - 0.9 Vdc	0.1 - 0.9 Vdc	0.1 - 0.9 Vdc	Gasoline - Vehicle Oxygen Sensor Output Alternate Fuel - GFI Oxygen Output
		Resistance	J29-B	ALL	>1 Mohm	-	-	-	-	P28 Disconnected
		Resistance	J29-B	ALL	>1 Mohm	-	-	-	-	P28 Disconnected, Negative lead on J28-B
J29-C, E	TDC$_{in1}$	Voltage	GND	ALL	0 Vdc	see comment	see comment	see comment	see comment	Vehicle TDC Signal Amplitude
		Resistance	GND	ALL	21 kohm	-	-	-	-	P29 Disconnected
J29-F, G	TDC$_{in2}$	Voltage	GND	ALL	0 Vdc	see comment	see comment	see comment	see comment	Vehicle TDC Signal Amplitude
		Resistance	GND	ALL	21 kohm	-	-	-	-	P29 Disconnected
J29-H	TDC$_{offset}$	Voltage	GND	ALL		see comment	see comment	see comment	see comment	Input Signal Only
		Resistance	GND	ALL	56 kohm	-	-	-	-	P29 Disconnected
J28-B	AGND	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	0 Vdc	0 Vdc	-
		Resistance	GND	ALL	0 ohm	-	-	-	-	
J28-C	TDC$_{out1}$	Voltage	GND	ALL	0 Vdc	see comment	see comment	see comment	see comment	Vehicle TDC Signal Amplitude
		Resistance	GND	ALL	>200 kohm	-	-	-	-	P28 Disconnected
J28-F	TDC$_{out2}$	Voltage	GND	ALL	0 Vdc	see comment	see comment	see comment	see comment	Vehicle TDC Signal Amplitude
		Resistance	GND	ALL	>200 kohm	-	-	-	-	P28 Disconnected
J28-E	TDC$_{oco1}$	Voltage	GND	ALL	0 Vdc	see comment	see comment	see comment	see comment	Open Collector Output, Voltage level will be value selected as pull-up voltage
		Resistance	GND	ALL	>200 kohm	-	-	-	-	P28 Disconnected
J28-G	TDC$_{oco2}$	Voltage	GND	ALL	0 Vdc	see comment	see comment	see comment	see comment	Open Collector Output, Voltage level will be value selected as pull-up voltage
		Resistance	GND	ALL	>200 kohm	-	-	-	-	P28 Disconnected
LIGHT, SWITCH & FUEL GAUGE J33										
J33-A	FGL	Voltage	GND	>2300	0 Vdc	-	-	-	-	-
		Resistance	GND	>2300	120 kohm	-	-	-	-	-
J33-B	FGM	Voltage	GND	>2300	0 Vdc	-	-	-	-	-
		Resistance	GND	ALL	12 kohm	-	-	-	-	-
J33-C	GSL	Voltage	GND	ALL	0 Vdc	Batt +	0 Vdc	Batt +	0 Vdc	J33-E must be good
		Resistance	GND	ALL	>100 kohm	-	-	-	-	P33 Disconnected
J33-D	ALT FUEL	Voltage	GND	ALL	0 Vdc	0 Vdc	Batt +	0 Vdc	Batt +	J33-E must be good
		Resistance	GND	ALL	>100 kohm	-	-	-	-	P33 Disconnected
J33-E	IGNIT	Voltage	GND	ALL	0 Vdc	Batt +	Batt +	Batt +	Batt +	Relay 1 must be functional
		Resistance	GND	ALL	>100 kohm	-	-	-	-	P3 Disconnected, Connect ohmmeter and wait 30 seconds before reading value.
J33-F	LIGHT1	Voltage	GND	ALL	0 Vdc	Min. BATT +	<0.5 Vdc	Min. BATT +	<0.5 Vdc	Alt Fuel mode, HPS active and FAP pressure reasonable. GFI in execution mode
		Resistance	GND	ALL	>200 kohm	-	-	-	-	
J33G	LIGHT2	Voltage	GND	ALL	0 Vdc	BATT +	0 Vdc	BATT +	0 Vdc	
	(LED power)	Resistance	GND	ALL	>100 kohm	-	-	-	-	
POWER J35										
J35-C	BATT	Voltage	GND	ALL	0 Vdc	BATT +	BATT +	BATT +	BATT +	Relay 1 must be functional
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	
J35-D,E,F,G,H,J	B+/IGNIT	Voltage	GND	ALL	0 Vdc	BATT +	BATT +	BATT +	BATT +	Relay 1 must be functional, 10A fuse must be good
		Resistance	GND	ALL	>100 kohm	-	-	-	-	J35 Disconnected, Connect ohmmeter and wait 30 seconds before reading
J35-B	GIS	Voltage	GND	ALL	0 Vdc	BATT +	0 Vdc	BATT +	0 Vdc	Alt Fuel mode, HPS active and FAP pressure reasonable. GFI in execution mode
		Resistance	GND	ALL	>10 Mohm	-	-	-	-	P35 Disconnected
J35-A,K	GND	Voltage	GND	ALL	0 Vdc	0 Vdc	0 Vdc	0 Vdc	0 Vdc	Relay 1 must be functional
		Resistance	GND	ALL	< 0.5 ohm	-	-	-	-	-