

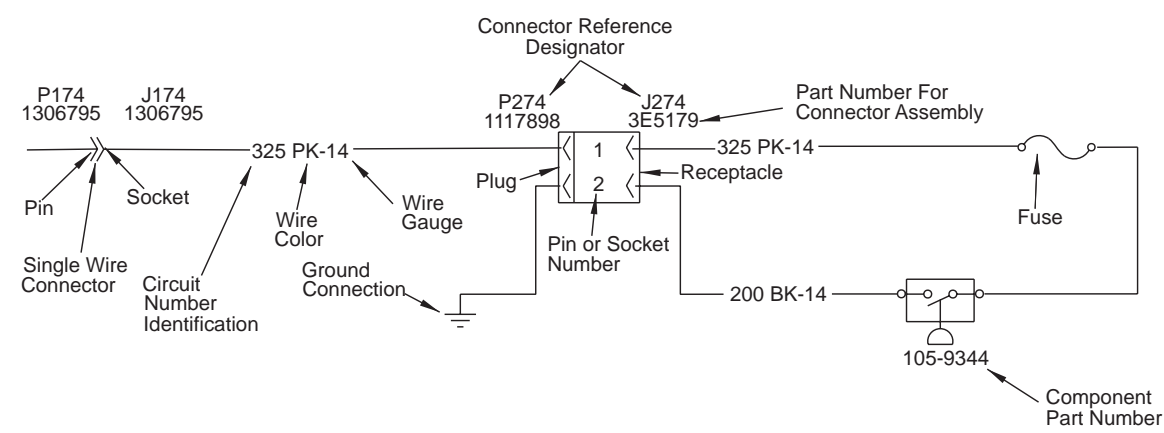
# Schematic

## C-10, C-12, 3406E, C-15, and C-16 On-highway Engine Electrical System

- CPD1-UP
- 8YF1-UP
- EGH1-UP
- 1MM1-UP
- 2KS1-UP
- 2WS1-UP
- 3CS1-UP
- 6NZ1-UP
- 7CZ1-UP
- 9NZ1-UP

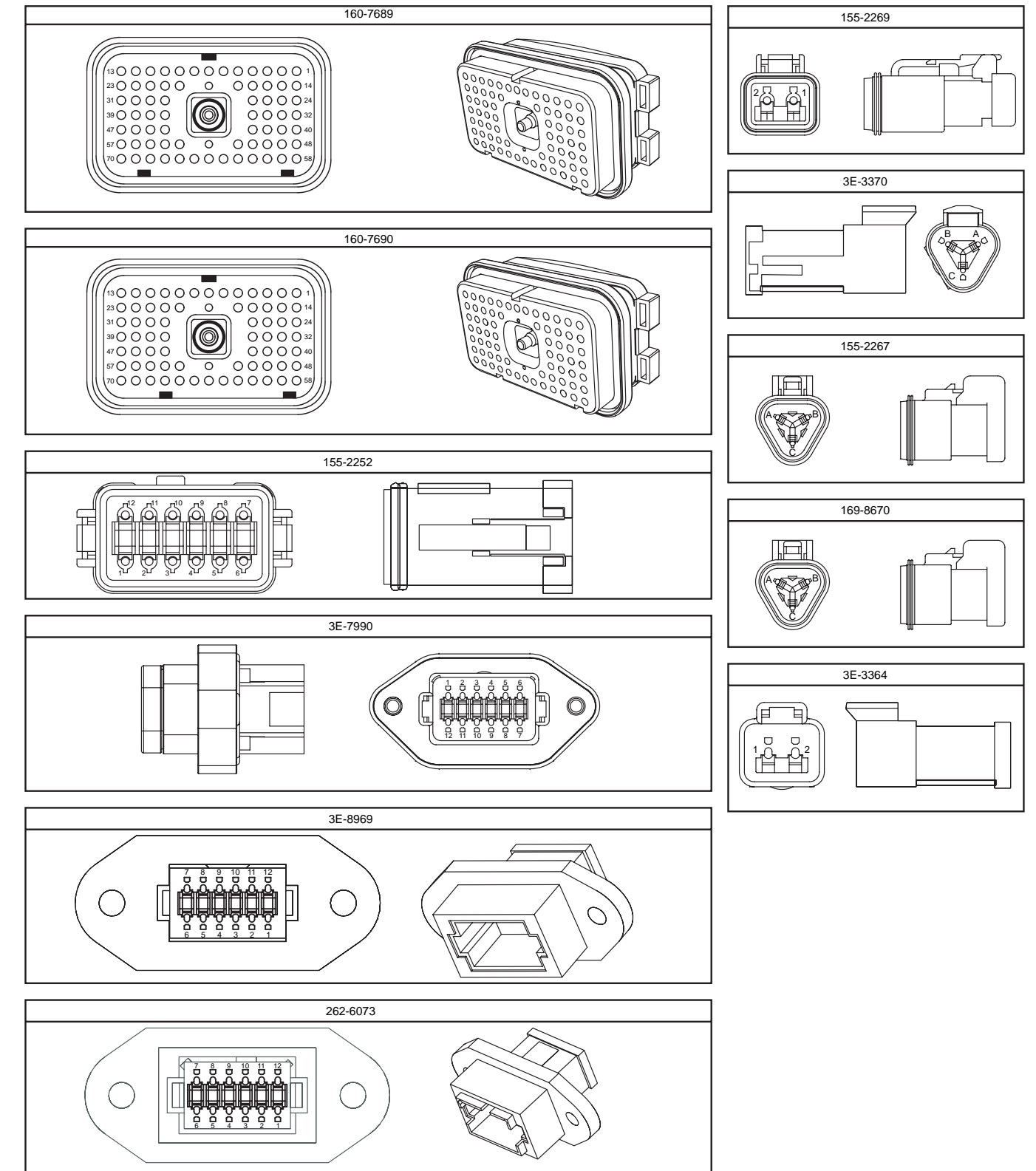
Diagnostic Code Listing					
PID-FMI	Description	Flash Codes	PID-FMI	Description	Flash Codes
0-00	No Detected Faults	55	105-11	Very High Intake Manifold Temp Warning	64
1-11	Cylinder 1 Fault	72	108-03	Atmospheric Pressure Sensor Open Circuit	26
2-11	Cylinder 2 Fault	72	108-04	Atmospheric Pressure Sensor Short Circuit	26
3-11	Cylinder 3 Fault	73	110-00	High Coolant Temp Warning	61
4-11	Cylinder 4 Fault	73	110-03	Coolant Temp Sensor Open Circuit	27
5-11	Cylinder 5 Fault	74	110-04	Coolant Temp Sensor Short Circuit	27
6-11	Cylinder 6 Fault	74	110-11	Very High Coolant Temp Warning	61
22-11	Cam Sensor to Crank Sensor Calibration	42	111-01	Low Coolant Level Warning	62
22-13	Check Timing Sensor Calibration	42	111-02	Coolant Level Sensor Fault	12
30-08	Invalid PTO Throttle Signal	29	111-03	Coolant Level Voltage High	12
30-13	PTO Throttle Sensor Calibration	29	111-04	Coolant Level Voltage Low	12
41-03	8 Volt Supply Above Normal	21	111-11	Very Low Coolant Level	62
41-04	8 Volt Supply Below Normal	21	121-05	Retarder Solenoid Lo/Hi Open Circuit	14
43-02	Ignition Key Switch Fault	71	121-06	Retarder Solenoid Lo/Hi Short Circuit	14
52-11	Air Inlet Shutoff Shutdown	00	122-05	Retarder Solenoid Med/Hi Open Circuit	14
54-05	Multi-Function Output #6 Open Circuit	66	122-06	Retarder Solenoid Med/Hi Short Circuit	14
54-06	Multi-Function Output #6 Short Circuit	66	168-01	Low ECM Battery Power	17
55-05	Multi-Function Output #7 Open Circuit	67	168-02	Low or Intermittent Battery Power to ECM	51
55-06	Multi-Function Output #7 Short Circuit	67	171-03	Outside Air Temp Sensor Open Circuit	00
64-12	Loss of Engine Cam Sensor RPM Signal	34	171-04	Outside Air Temp Sensor Short Circuit	00
71-00	Idle Shutdown Override	01	171-11	No Ambient Air Temp Data	00
71-01	Idle Shutdown Occurrence	47	174-00	High Fuel Temp Warning	65
71-14	PTO Shutdown Occurrence	47	174-03	Fuel Temp Sensor Open Circuit	13
84-00	Vehicle Overspeed Warning	41	174-04	Fuel Temp Sensor Short Circuit	13
84-01	Loss of Vehicle Speed Signal	31	190-00	Engine Overspeed Warning	35
84-02	Invalid Vehicle Speed Signal	36	190-12	Loss of Engine Crank Sensor RPM Signal	34
84-08	Vehicle Speed Out of Range	36	191-07	Transmission Not Responding	68
84-10	Vehicle Speed Rate of Change	24	224-11	Theft Deterrent Enabled	00
84-14	Quick Stop Occurrence	00	224-14	Emergency Cranking With Theft Deterrent Enabled	00
91-08	Invalid Throttle Signal	32	231-02	J1939 Required Data Not Received	58
91-13	Throttle Sensor Calibration	28	231-11	J1939 Data Link Fault	58
100-01	Low Oil Pressure Warning	46	241-12	J1939 Device Not Responding	58
100-03	Oil Pressure Sensor Open Circuit	24	232-03	5 Volt Supply Above Normal	21
100-04	Oil Pressure Sensor Short Circuit	24	232-04	5 Volt Supply Below Normal	21
100-11	Very Low Oil Pressure	46	245-11	Brake Switch #1 Fault	00
102-00	Boost Pressure Sensor Stuck High	25	247-11	Brake Switch #2 Fault	00
102-03	Boost Pressure Sensor Open Circuit	25	249-11	J1922 Data Link Fault	58
102-04	Boost Pressure Sensor Short Circuit	25	252-11	Incorrect Engine Software	59
105-00	High Inlet Air Temp Warning	64	253-02	Check Customer or System Parameters	56
105-03	Inlet Air Temp Sensor Open Circuit	38	253-11	Check Transmission Customer Parameters	56
105-04	Inlet Air Temp Sensor Short Circuit	38			

### Harness And Wire Symbols

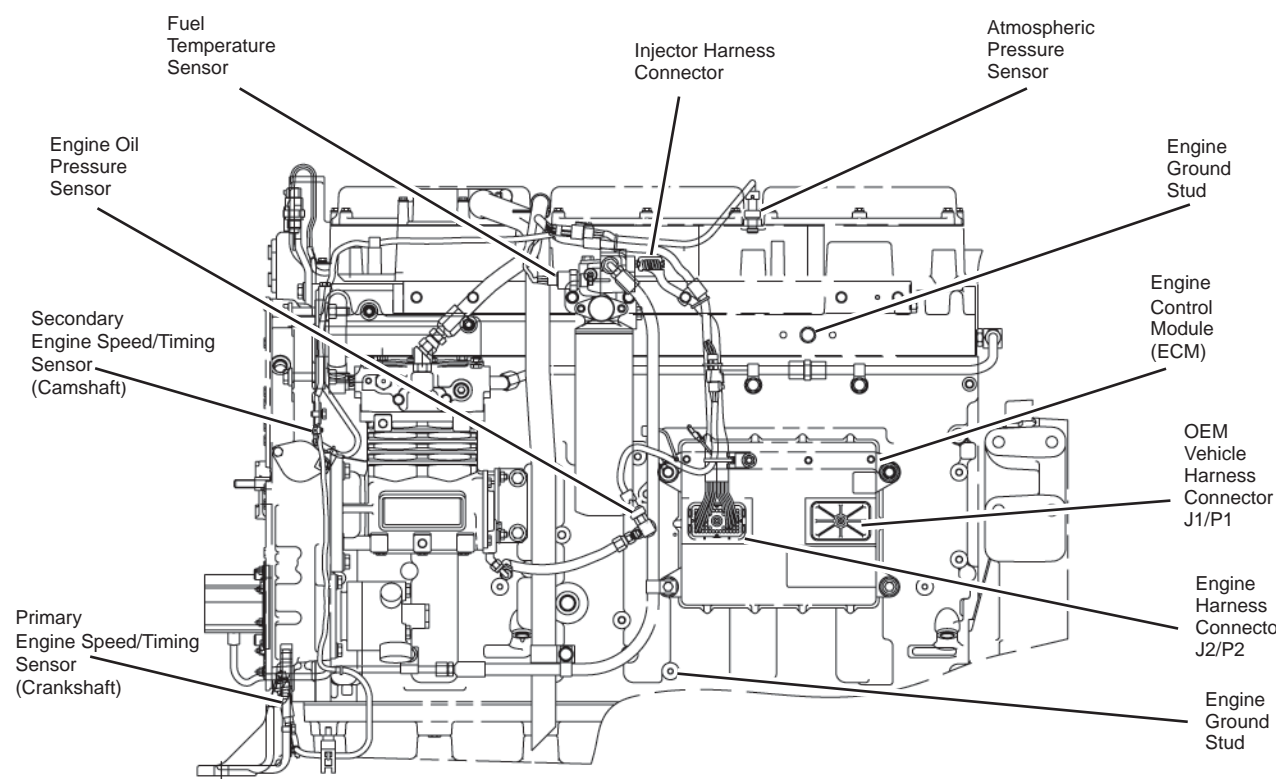


### Related Electrical Service Manuals

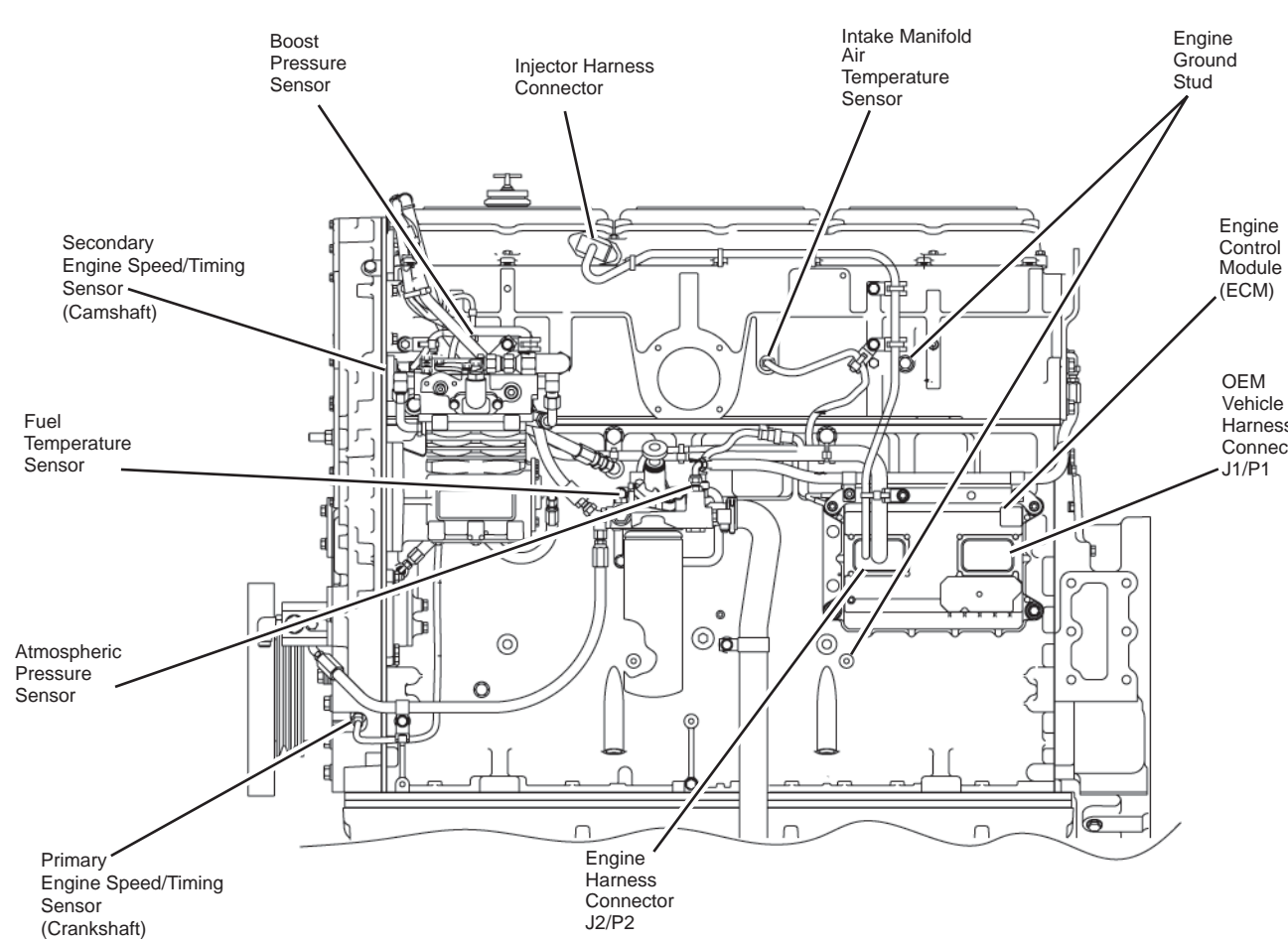
Title	Form Number
Troubleshooting (ALL)	REN2238
Systems Operation / Testing and Adjusting(C-10/C-12)	REN2235
Systems Operation / Testing and Adjusting(C-15/C-16)	REN2307
Systems Operation / Testing and Adjusting(3406E)	SENR5017



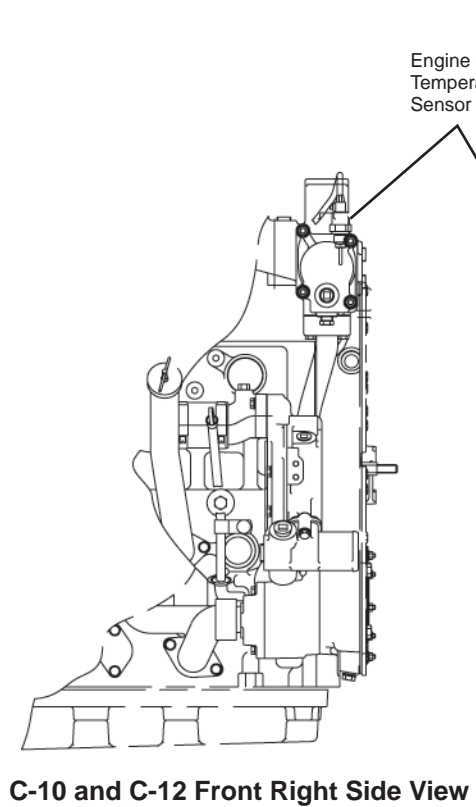
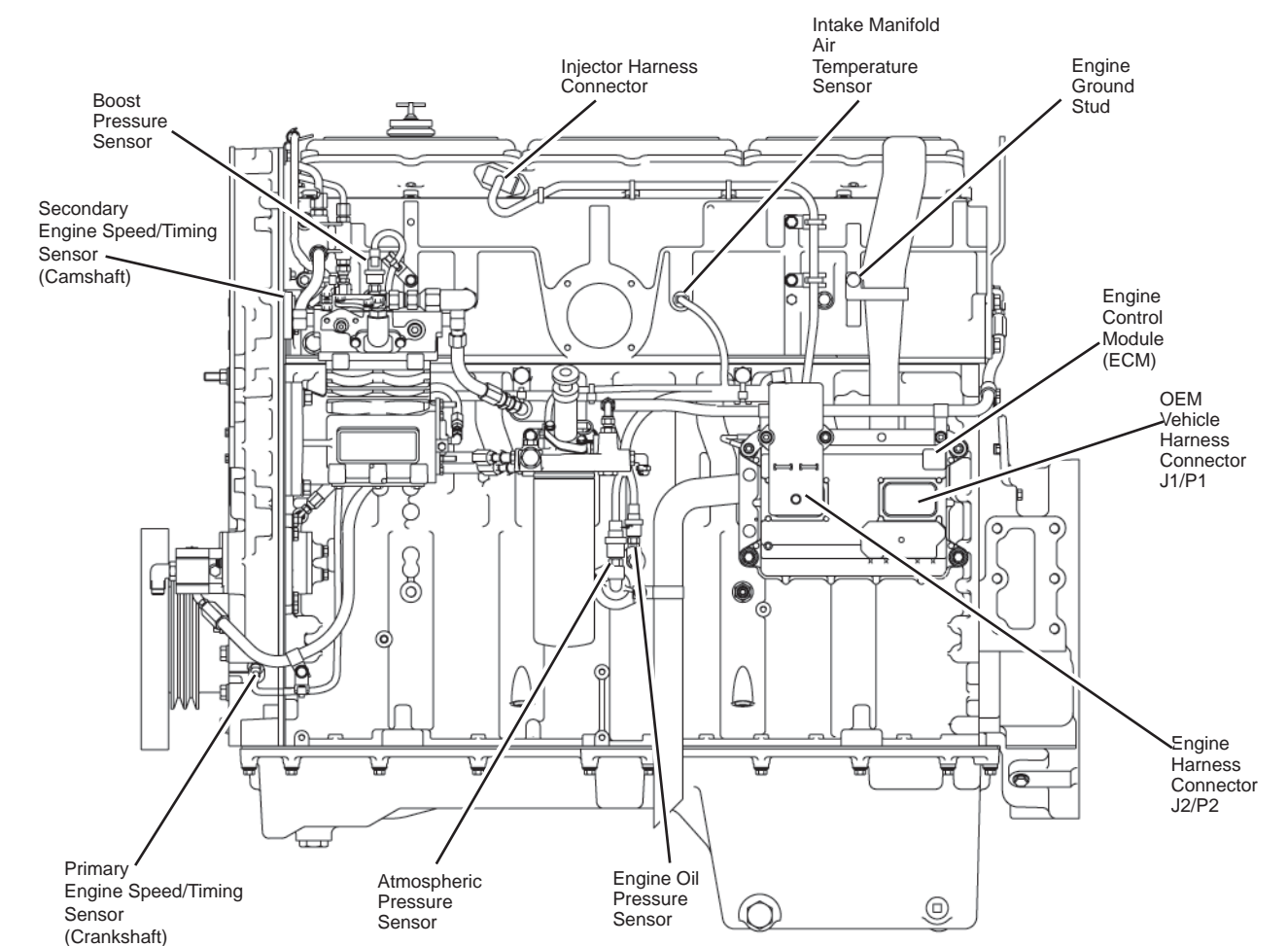
C-10 and C-12 Left Side View



3406E Left Side View



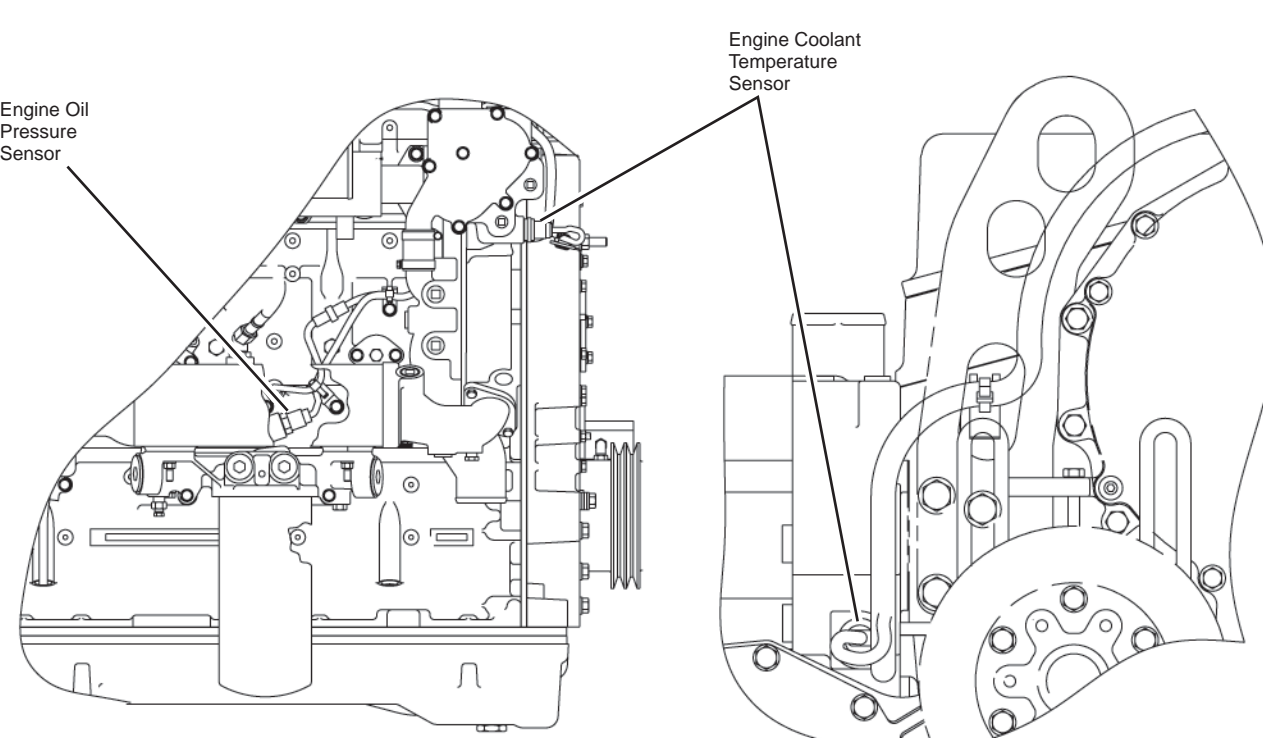
C-15 and C-16 Left Side View



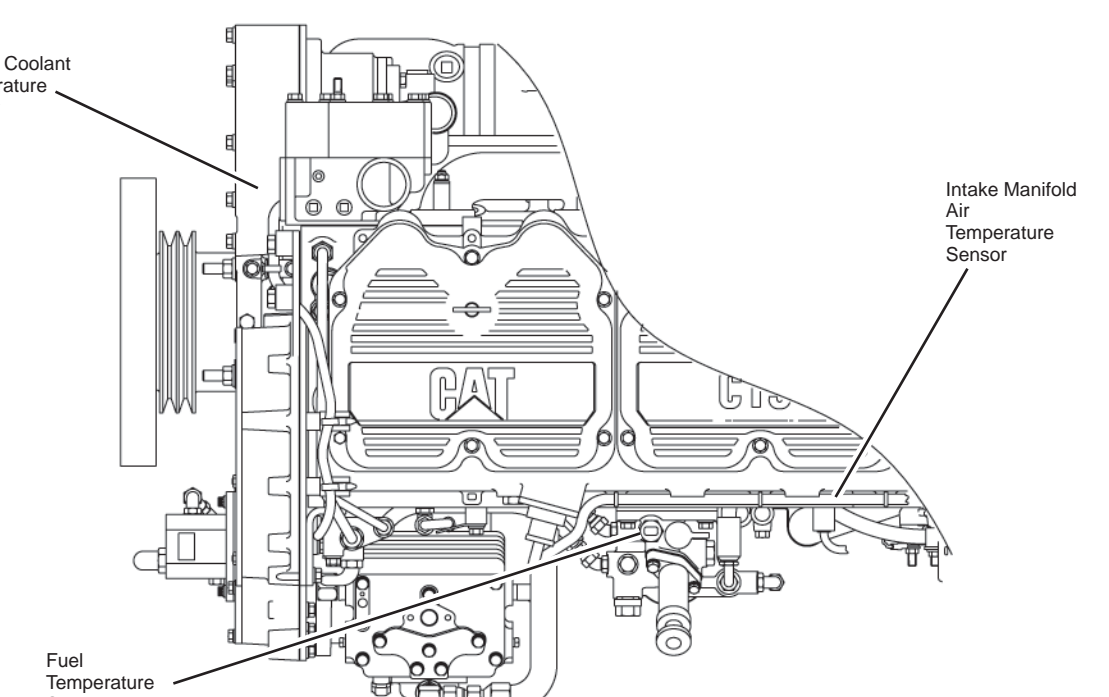
C-10 and C-12 Front Top View

Atmospheric Pressure Sensor

3406E Right Side View

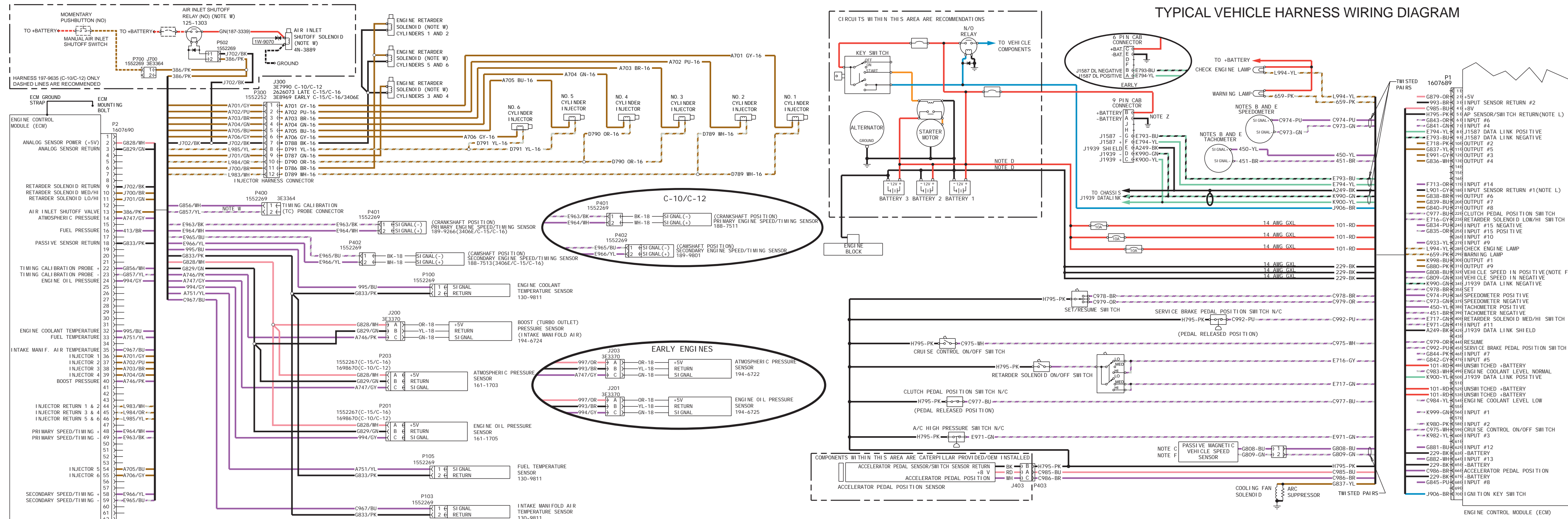


3406E Front View

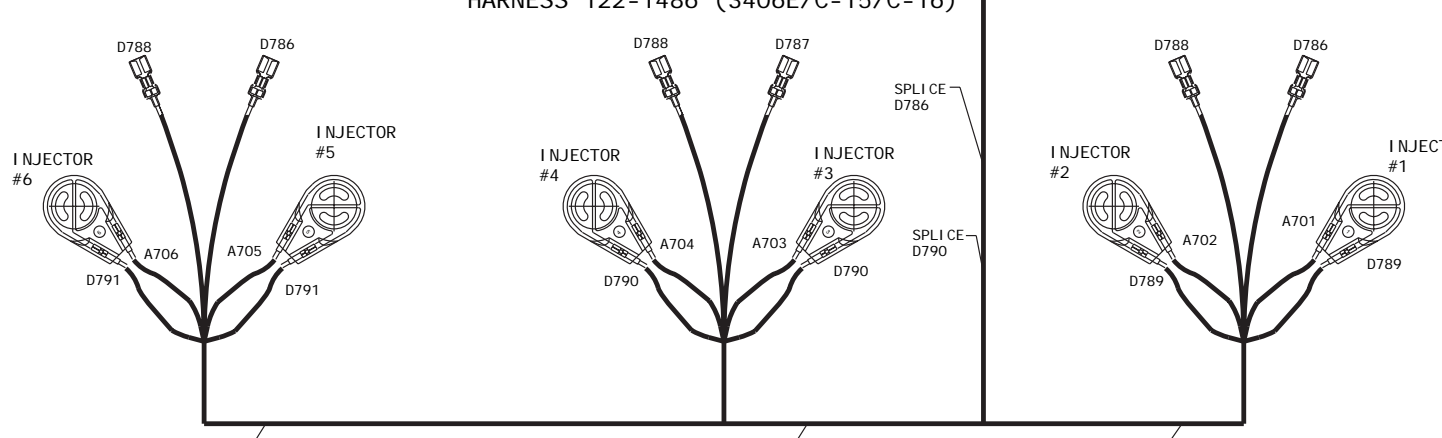


C-15 and C-16 Front Top View

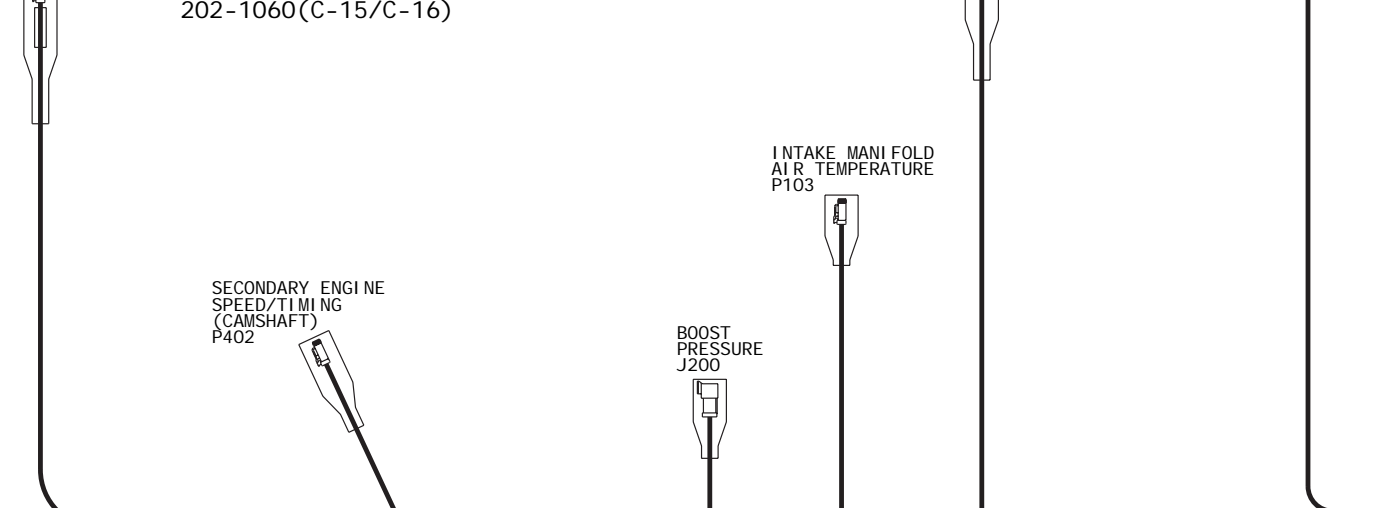
TYPICAL VEHICLE HARNESS WIRING DIAGRAM



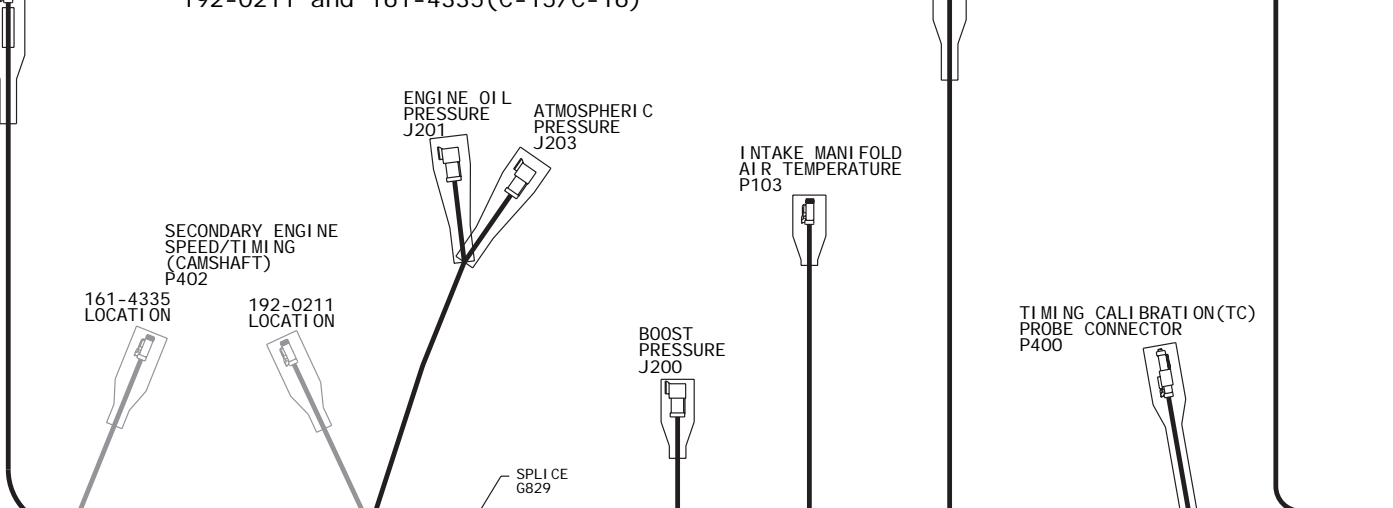
CONNECTOR AND SPLICE LOCATIONS FOR HARNESS 122-1486 (3406E/C-15/C-16)



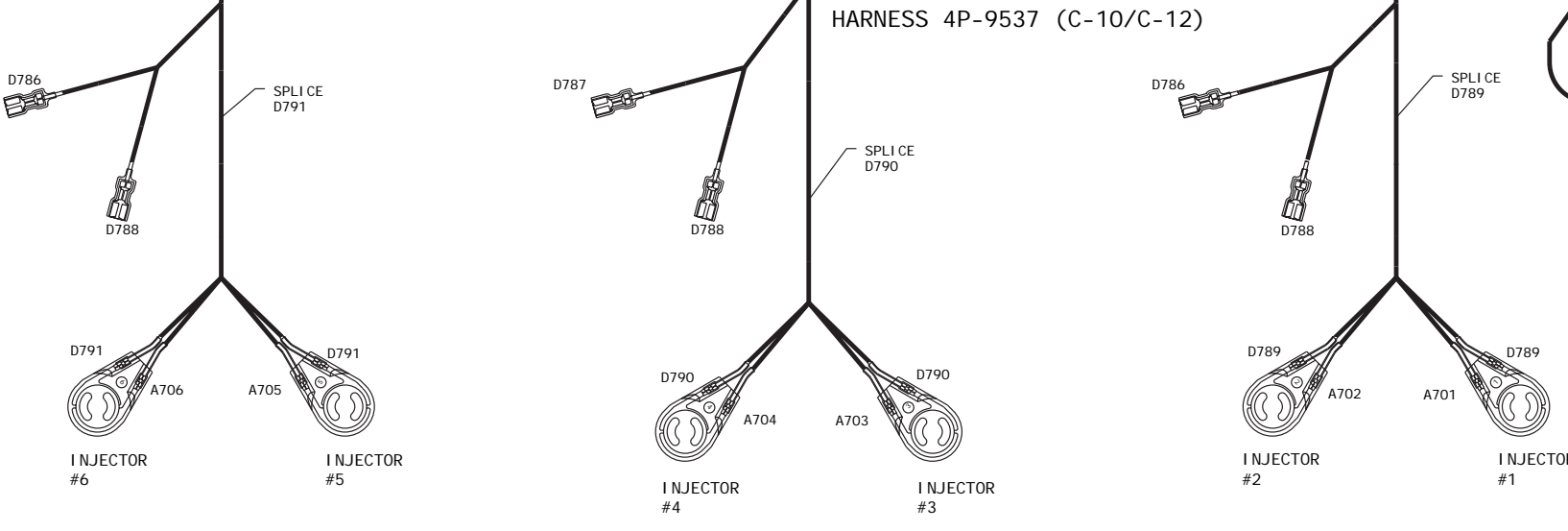
CONNECTOR AND SPLICE LOCATIONS FOR HARNESS 202-1060(C-15/C-16)



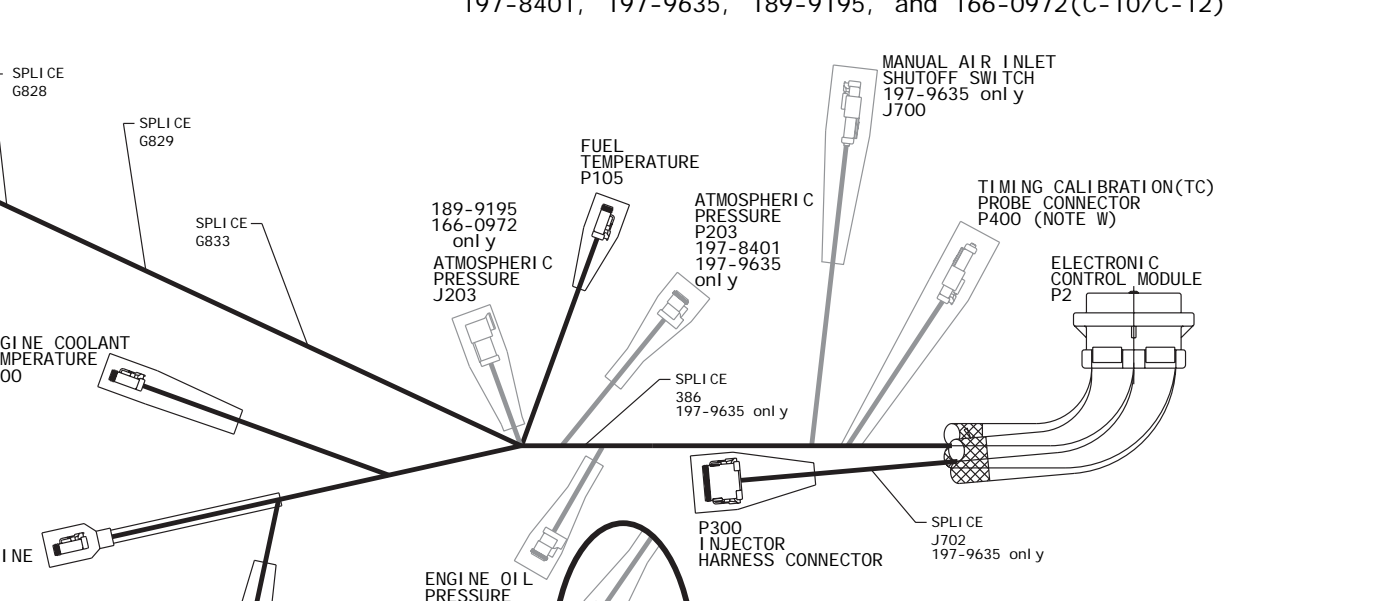
CONNECTOR AND SPLICE LOCATIONS FOR HARNESSES 192-0211 and 161-4335(C-15/C-16)



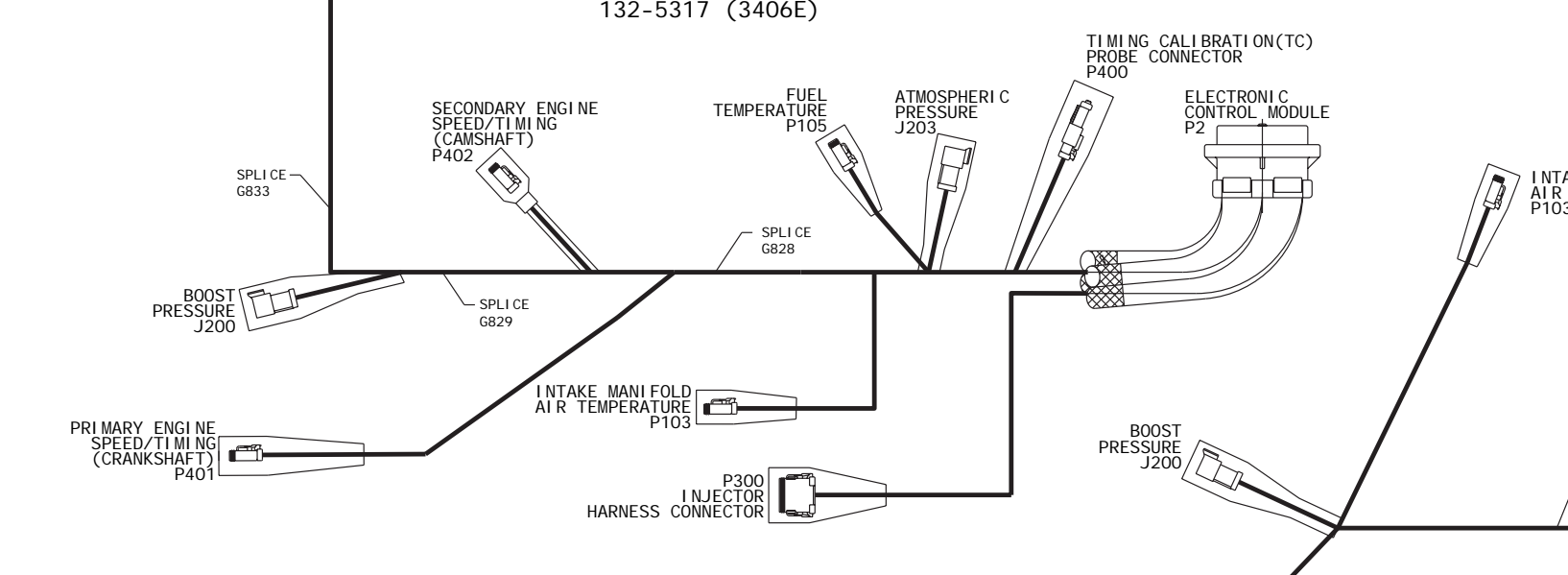
CONNECTOR AND SPLICE LOCATIONS FOR HARNESS 4P-9537 (C-10/C-12)



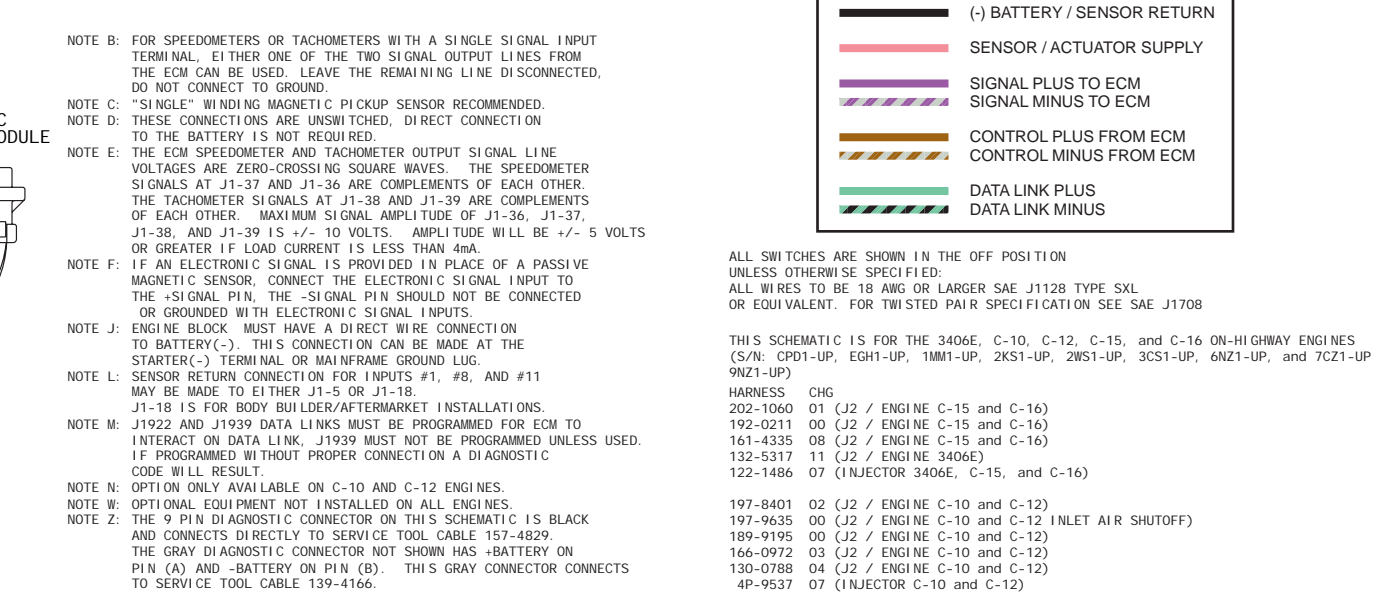
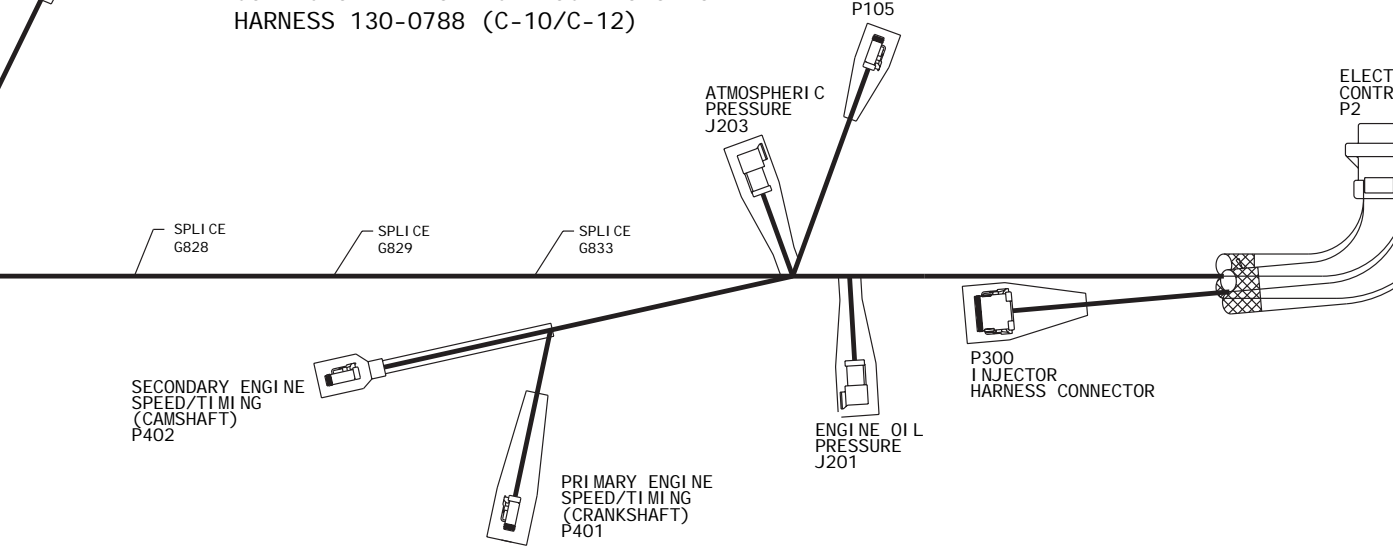
CONNECTOR AND SPLICE LOCATIONS FOR HARNESSES 197-8401, 197-9635, 189-9195, and 166-0972(C-10/C-12)



CONNECTOR AND SPLICE LOCATIONS FOR HARNESS 132-5317 (3406E)



CONNECTOR AND SPLICE LOCATIONS FOR HARNESS 130-0788 (C-10/C-12)



NOTE B: FOR SPEEDMETERS OR TACHOMETERS WITH A SINGLE SIGNAL INPUT TERMINAL, EITHER ONE OF THE TWO SIGNAL OUTPUT LINES FROM THE ECM CAN BE USED. LEAVE THE REMAINING LINE DISCONNECTED. DO NOT CONNECT TO GROUND.

NOTE C: "SIGNAL" WINDING MAGNETIC PICKUP SENSOR RECOMMENDED. THESE CONNECTIONS ARE UNSWITCHED. DIRECT CONNECTION TO THE BATTERY IS NOT REQUIRED.

NOTE D: THE ECM SPEEDOMETER AND TACHOMETER OUTPUT SIGNAL LINE VOLTAGES ARE ZERO-DROSSING SQUARE WAVES. THE SPEEDOMETER SIGNALS AT J1-37 AND J1-38 ARE COMPLEMENTS OF EACH OTHER. THE TACHOMETER SIGNALS AT J1-39 AND J1-40 ARE COMPLEMENTS OF EACH OTHER. MAXIMUM SIGNAL AMPLITUDE OF J1-36, J1-37, J1-38, AND J1-39 IS 14 VOLTS. AMPLITUDE WILL BE 4-5 VOLTS OR GREATER IF LOAD CURRENT IS LESS THAN 40A.

NOTE E: IF AN ELECTRONIC SIGNAL IS PROVIDED IN PLACE OF A PASSIVE MAGNETIC SENSOR, CONNECT THE ELECTRONIC SIGNAL INPUT TO THE BATTERY(-). THIS CONNECTION CAN BE MADE AT THE STARTER(-) TERMINAL OR MAINFRAME GROUND. LEAVE THE SENSOR RETURN CONNECTION FOR INPUTS #1, #6, AND #11 MAY BE MADE TO EITHER J1-5 OR J1-18.

NOTE F: J1-18 IS FOR BODY BUILDERS/AFTERMARKET INSTALLATIONS. J1922 AND J1929 DATA LINKS MUST BE PROGRAMMED FOR ECM TO INTERACT ON DATA LINK. J1939 MUST NOT BE PROGRAMMED UNLESS USED. IF PROGRAMMED IN THOUT PROPER CONNECTION A DIAGNOSTIC CODE WILL RESULT.

NOTE G: OPTION ONLY AVAILABLE ON C-10 AND C-12 ENGINES.

NOTE H: OPTIONAL EQUIPMENT NOT INSTALLED ON ALL ENGINES.

NOTE I: THE 9 PIN DIAGNOSTIC CONNECTOR ON THIS SCHEMATIC IS BLACK AND CONNECTS DIRECTLY TO SERVICE TOOL TABLE 157-4829.

NOTE J: THE GRAY DIAGNOSTIC CONNECTOR NOT SHOWN HAS -BATTERY ON PIN (A) AND -BATTERY ON PIN (B). THIS GRAY CONNECTOR CONNECTS TO SERVICE TOOL TABLE 129-4166.

THIS SCHEMATIC IS FOR THE 3406E, C-10, C-12, C-15, and C-16 ON-HIGHWAY ENGINES (5.9L CRDI-UP, 6011-UP, 18M1-UP, 2K31-UP, 28S1-UP, 30S1-UP, 6K21-UP, and 7K21-UP 9K21-UP).

HARNESS CHG: 202-1060 01 (J2 / ENGINE C-15 and C-16) 197-9635 00 (J2 / ENGINE C-15 and C-16) 161-4335 08 (J2 / ENGINE C-15 and C-16) 132-5317 11 (J2 / ENGINE 3406E) 122-1486 07 (CONNECTOR 3406E, C-15, and C-16)

197-8401 02 (J2 / ENGINE C-10 and C-12) 197-9635 00 (J2 / ENGINE C-10 and C-12) 189-9195 00 (J2 / ENGINE C-10 and C-12) 166-0972 03 (J2 / ENGINE C-10 and C-12) 130-0788 04 (J2 / ENGINE C-10 and C-12) 4P-9537 07 (CONNECTOR C-10 and C-12)