**DT 466E & INTERNATIONAL ® 530E ELECTRONIC CONTROL SYSTEM DIAGNOSTICS**

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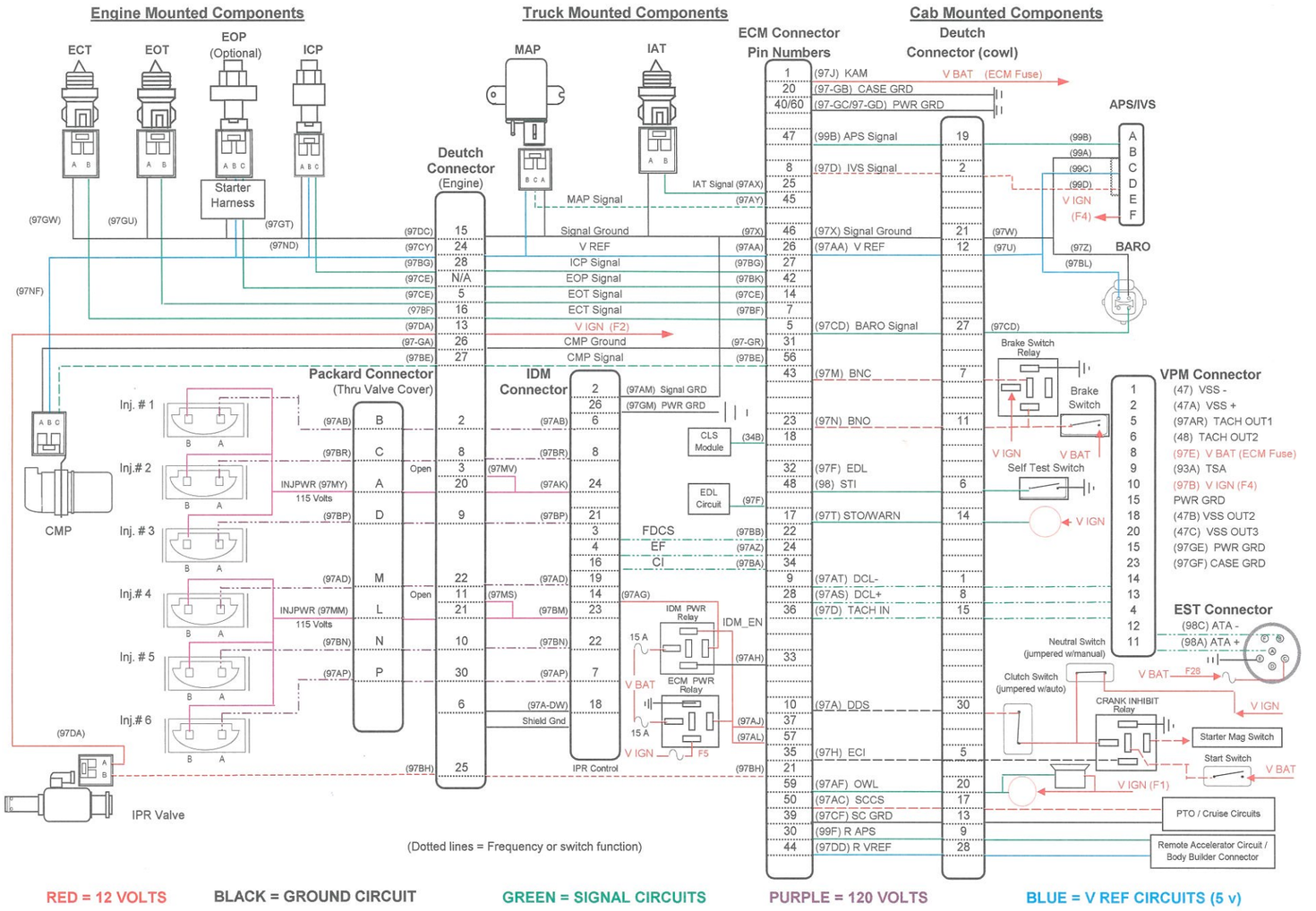
|---|---|---|---|
| Mechanic | Date | Chassis Model | Complaint |
| Customer Name | | Vin Number | Active Codes |
| Dealer Name | | Engine Serial Number | Inactive Codes |
| Dealer Location | | VPM Serial Number VPM version | Test Codes |
| Unit# | | ECM Serial Number ECM version | Event Log Codes |

| Flash Codes | Circuit Index | Condition Description | Comments | Probable Causes |
|---|---|---|---|---|
| 111 | ECM | No Errors Detected - Flash Code Only | No Errors Detected by The ECM or IDM | |
| 112 | ECM_PWR | Electrical System Voltage B+ Out of Range High | ECM Voltage Is Continuously More Than 18 Volts | Chargining System Fault |
| 113 | ECM_PWR | Electrical System Voltage B+ Out of Range Low | ECM Voltage Less Than 6.5 - Cause of Nostart / Misfire | Low Batt, Loose Connections or Restance In Circuit |
| 114 * | ECT | Engine Coolant Temp Signal Out of Range Low | Default 82°F, No Fast Idle | ECT Signal Circuit or Sensor Shorted to Ground |
| 115 * | ECT | Engine Coolant Temp Signal Out of Range High | Default 82°F, No Fast Idle | ECT Circuit or Sensor Open |
| 121 * | MAP | MAP, Freq Out of Range | Default Inferred MAP - Low Power, Slow Acceleration | High Frequency Noise, Defective Sensor |
| 122 * | MAP | MAP, Signal Is Inactive | Default Inferred MAP - Low Power, Slow Acceleration | Short High, Low or Open |
| 123 | MAP | MAP Above Spec. Level At Low Idle | Default Inferred MAP - Low Power, Slow Acceleration | Hose to MAP Sensor Plugged |
| 124 * | ICP | ICP Signal Out of Range Low | Default Open Loop Control - Underrun At Idle | Circuit Short Low, Open, Defective Sensor |
| 125 | ICP | ICP Signal Out of Range High | Default Open Loop Control - Underrun At Idle | Circuit Short High, Defective Sensor |
| 131 * | APS/IVS | Accelerator Position Signal Out of Range Low | Signal Voltage Lower Than .152 Volts - Eng. Idle Only | Short to Grd or Open In Circuit, Defective Sensor |
| 132 * | APS /IVS | Accelerator Position Signal Out of Range High | Signal Voltage Higher Than 4.55 Volts - Eng. Idle Only | Short to Vref or 12 Volt, Defective Sensor |
| 133 * | APS /IVS | Accelerator Position Signal In Range Fault | APS / IVS Conflict - Limited to 0% APS | Failed APS Signal |
| 134 * | APS /IVS | Accelerator Position And Idle Validation Disagree | APS / IVS Conflict - Limited to 0% APS | Both APS And IVS Signal Failure |
| 135 * | APS /IVS | Idle Validation Switch Circuit Fault | APS / IVS Conflict - Limited to 50% APS | Failed IVS Signal |
| 141 | VSS | Vehicle Speed Signal Out of Range Low | VPM Detects VSS Out of Range - Cruise/PTO disengauged | VSS Circuit Open or Shorted to Ground |
| 142 | VSS | Vehicle Speed Signal Out of Range High | VPM Detects VSS Out of Range - Cruise/PTO disengauged | VSS Circuit Shorted to Vref or 12 Volts |
| 143 | CMP | Wrong # of CMP Signal Transitions Per Cam Rev | CMP Signal Intermittent | Poor Connection, Defective Sensor |
| 144 | CMP | CMP Signal Noise Detected | ECM Detects Excessive Outside Inputs | Electrical Noise |
| 145 | CMP | CMP Signal Inactive While Icp Has Increased | No CMP Signal While ICP Signal Increased | Short High, Low or Open, Defective Sensor |
| 151 | BARO | Barometric Pres Signal Out of Range High | BARO Signal Voltage High | BARO circuit Short High or Open Circuit |
| 152 | BARO | Barometric Pres Signal Out of Range Low | BARO Signal Voltage Low | BARO circuit Short Low |
| 154 | IAT | Intake Air Temp. Signal Out of Range Low | IAT Signal Voltage Low - Defaults to 77° C | IAT Signal Circuit or Sensor Shorted to Ground |
| 155 | IAT | Intake Air Temp. Signal Out of Range High | IAT Signal Voltage Low - Defaults to 77° C | IAT Circuit or Sensor Open |
| 211 * | EOP | Engine Oil Pres Signal Out of Range Low | EOP Signal Voltage Low | EOP circuit Short Low |
| 212 * | EOP | Engine Oil Pres Signal Out of Range High | EOP Signal Voltage High | EOP circuit Short High or Open |
| 213 | SCCS | Remote Throttle Signal Out of Range Low | Remote APS Signal Lower Than 152Mv | Open APS Circuit |
| 214 | SCCS | Remote Throttle Signal Out of Range High | Remote APS Signal Higher Than 4.55 Volts | Shorted APS Circuit |
| 221 | SCCS | SCCS Switch or Circuit Fault | SCCS Signal Incorrect Voltage | Short or Resistance In SCCS Circuit |
| 222 | BRAKE | Brake Switch Circuit Fault | Voltage at ECM pins #23 (BNO) And #43 (BNC) Are The Same | Faulty Switch or Relay |
| 223 | DCL/ATA | VPM Not Communicating With ECM | Engine Will Operate On Field Defaults | Shorted or Open DCL Circuit, Faulty VPM |
| 224 | KAM_PWR | KAM Corrupt | KAM Memorty Voltage Supply Lost | Lack of B+ to ECM Term 1,Batt Disconnected |
| 231 | DCL/ATA | ATA Common Fault | ATA Link Open or Shorted, VPM fault | ATA Device Grounded or Overloaded, Faulty VPM |
| 232 | DCL/ATA | Unable to Forward ECM Message to ATA DCL | Will Not Turn Warning Light On | ATA Data Link Circuits Shorted High or Low |
| 233 | TACH | Tachometer Buffer Is Inactive | VPM Not Receiving Tach Signal | Circuit 97D Open or Shorted |
| 234 | DCL/ATA | Unable to Forward ATA Message to ECM | Will Not Turn Warning Light On | Key is off w/EST installed, DCL wiring faults, Faulty ECM |
| 235 | DCL/ATA | VPM/ECM DCL Fault | No ECM Diagnostic Replies | DCL wiring faults, Faulty ECM |
| 241 | IPR | Injection Contrl Press Reg. OCC Self Test Failed | IPR - Output Circuit Check - Engine Off Test Only | Short High or Low or Open |
| 242 | ECM IDM | FDCS Circuit to IDM OCC Self Test Failed | FDCS - Output Circuit Check - Engine Off Test Only | Short High or Low or Open |
| 243 | IDM PWR | IDM Power Relay OCC Self Test Failed | IDM Relay - Output Circuit Check - Engine Off Test Only | Circuit 97AH Shorted High /Low |
| 244 | EDL | EDL OCC Fault | EDL Relay - Output Circuit Check - Engine Off Test Only | Open or Short Circuits 97F,92D,92E |
| 253 | ECM IDM | Fuel Inj Sync Circuit OCC Self Test Failed | Cyl Ident - Output Circuit Check - Engine Off Test Only | Open 97AG -- No IDM Power |
| 254 | ECM | OCC Out of Range High | Output Circuit Check Out of Range High | High Voltage During OCC Test |
| 255 | ECM | OCC Out of Range Low | Output Circuit Check Out of Range Low | Low Voltage During OCC Test |
| 311 * | EOT | Engine Oil Temp Signal Out of Range Low | EOT Signal Low | EOT Signal Circuit or Sensor Shorted to Ground |
| 312 * | EOT | Engine Oil Temp Signal Out of Range High | EOT Signal High | EOT Circuit or Sensor Open |
| 313 | EOP** | Engine Oil Pres Below Warning Level | Engine Monitor of Low Oil Press, Oil Light On | No or low oil, sticking oil pressure regualtor, pickup |
| 314 | EOP** | Engine Oil Pres Below Critical Level | Engine Monitor of Low Oil Press, Shutdown (If Equipped) | tube blocked or cracked, worn bearings or oil pump |
| 315 * | | Engine Speed (Tach Rpm) Limit Exceeded | ECM Recorded Excessive Engine Speed | Transmission Improperly Downshifted |
| 321 | ECT** | Engine Coolant Temp. Above Warning Level | Coolant Temperature Greater Than 224.6°F (107°C) | Cooling system problem |
| 322 | ECT** | Engine Coolant Temp Above Critical Level | Coolant Temperature Greater Than 233.6°F (112.5°C) | |
| 323 | ECL | Engine Coolant Below Warning/Critical Level | ECM Detects Low Coolant Level | Check Coolant Level If Low Check For Leaks |
| 325 | ECT | Power Reduced, Matched to Cooling Sys Performance | Engine Power Reduced Due Monitoring System | Repair Low Coolant Level or Coolant Overtemp |
| 331 * | IPR | Injection Cntrl Press Above System Working Range | ICP Above 3675 Psi (25 Mpa) | Grounded IPR Circuit, Stuck IPR Valve |
| 332 * | ICP | Injection Control Pres Above Spec With Engine off | ICP Sig. Volt. Higher Than Expected W/Eng Not Running | Circuit Shorted to Voltage, Defective Sensor |
| 333 * | IPR | Injection Control Pres Above/Below Desired Level | Desired Pressure Does Not Match Output | Check For Proper Oil And Servicing, Test IPR |
| 421-426 | INJ | Low Side to High Side Open (Cyl Number Indicated) | IDM Detected A Open Circuit For Injector Circuit | Individual Injector Harness Open |
| 431-436 | INJ | Low Side Shorted to High Side(Cyl Number Indicated) | IDM Detected A Short Circuit For an Injector | Injector or Harness Shorted Low Side to High Side |
| 441-446 | INJ | Low Side Shorted to B+(Cylinder Number Indicated | IDM Detected 12 Volts At Injector Drive Low Side | Inj Harness Shorted On Low (Control) Circuit to B+ |
| 451-456 | INJ | Low Side Shorted to Ground(Cyl Number Indicated) | IDM Detected Inj. Low Side Shorted to Grd - 3 Cyl. Run | Inj Harness Shorted On Low (Control) Circuit to Grd. |
| 461-466 | Perf. Diag. | Cylinder Contrib. Test Failed(Cyl Number Indicated) | ECM Finds Cylinder Contribution Insufficient | Refer to Performance Diagnsotics |
| 511 * | INJ | Bank 1 Has Multiple Faults | Right Side Has More Than 1 High Side Fault | Right Side Short, Open And Ground |
| 512 * | INJ | Bank 2 Has Multiple Faults | Left Side Has More Than 1 High Side Fault | Left Side Short, Open And Ground |
| 513 * | INJ | High Side to Bank 1 Open | High Voltage Supply Open - Cyl. #1, #2, #3 | Open Circuit Bank #1 |
| 514 * | INJ | High Side to Bank 2 Open | High Voltage Supply Open - Cyl. #4, #5, #6 | Open Circuit Bank #2 |
| 515 * | INJ | Bank 1 High Side Short to Ground or B+ | Right Side High Voltage Circuit Shorted | Harness to Right Side of Engine Shorted |
| 521 * | INJ | Bank 2 High Side Short to Ground or B+ | Left Side High Voltage Circuit Shorted | Harness to Left Side of Engine Shorted |
| 522 * | IDM PWR | IDM Fault | Internal IDM Fault | Defective IDM |
| 523 | IDM PWR | IDM Power Voltage Is Low | Voltage Is Low At IDM | Circuit 97CP/97AG Low Volts; IDM Relay Def. |
| 524 * | INJ | Both High Side Switches Shorted together | Short Circuit Between Bank #1 & #2 | IDM Harness Shorted |
| 531 * | ECM IDM | Fuel Inj. Sync Signal Low | Detected Low Volt. At CI Signal - Engine Misfire/Cutout | Ci Signal Shorted Low - Intermittent |
| 532 * | ECM IDM | Fuel Inj. Sync Signal High | Detected High Voltage At CI Signal - Engine Misfire/Cutout | Ci Signal Shorted High or Open to ECM - Intermittent |
| 541 * | ECM IDM | IDM Feedback toggle Not Detected By ECM | 100HZ signal sent from IDM w/key on engine not running | IDM not powered up, Open/Shorted |
| 543 * | ECM IDM | IDM Faults Not Received | Repair Codes 242, 243 or 253 first if set | Circuit 97Cp/97Ag Low Volts; IDM Relay Def. |
| 544 | INJ | Injector Fault In Bank 2 | IDM Dectected More Than 1Left Side Injector Low Volts | Injector Harness Shorted to Ground |
| 545 | INJ | Injector Fault In Bank 1 | IDM Detected More Than 1 Right Side Injector Low Volts | Injector Harness Shorted to Ground |
| 612 * | CMP | Incorrect ECM Installed For CMP Timing Wheel | Mismatch Between ECM And CMP Sensor | Incorrect ECM |
| 613 * | VPM | Installed ECM Not Compatible With VPM Software | VPM / ECM Are Not Compatible | Components Changed In The Field Not Compatible |
| 614 * | VPM | Installed VPM Not Compatible With ECM Software | VPM / ECM Are Not Compatible | Components Changed In The Field Not Compatible |
| 615 | KAM_PWR | Programmable Parameter KAM Corrupt Fault | KAM Memory Defective | Interrupted KAM power supply or defective ECM |
| 621 * | VPM | Engine Using Mfg. Default Rating Program Engine | Engine Operates At 25 Hp. Default | VPM Not Programmed But Installed On Truck |
| 622 * | VPM | Engine Using Field Default Rating | Engine Limited to 160 Hp., Options Not Available | VPM Not Programming ECM Check Other Codes |
| 623 * | VPM | Invalid Engine Rating Code; Check VPM Programming | Engine Family Ratings Not Received From VPM | VPM Not Programmed Properly |
| 625 | ECM | Module Software Background Process Was Inactive | ECM Software Is Faulty | Replace ECM |
| 631 | ECM | Rom(Read Only Memory) Self Test Fault | ECM Failure | Replace ECM |
| 632 | ECM | Ram Memory-CPU Self Test Fault | ECM Failure | Replace ECM |
| 633 | DCL/ATA | VPM Is Communicating Incorrectly With ECM | ECM/VPM Incorrect Communications | Circuits 97At / 97 As Open/Shorted |
| 634 | VPM | Internal Fuel Meter Memory Location In Error | VPM Memory For Fuel Meter Cannot Be Read | Fuel totals May Be Incorrect; Replace VPM |
| 635 | VPM | Internal Hourmeter Memory Location In Error | VPM Memory For Hourmeter Cannot Be Read | Hour totals May Be Incorrect; Replace VPM |
| 641 | VPM | Internal Odometer Memory Location In Error | VPM Memory For Odometer Cannot Be Read | Milege totals May Be Incorrect; Replace VPM |
| 642 | VPM | Internal Fuelmeter Fault | EEprom Memory Cannot Write Fuelmeter totals | Fuel totals Are Lost; Replace VPM to Correct |
| 643 | VPM | Internal Hourmeter Fault | EEprom Memory Cannot Write Hourmeter totals | Hour totals Are Lost; Replace VPM to Correct |
| 644 | VPM | Internal Odometer Fault | EEprom Memory Cannot Write Odometer totals | Milege totals Are Lost; Replace VPM to Correct |
| 645 | VPM | Raw EEprom Memory Location Error | EEprom Memory Not Read By VPM | Check For Other Codes Set |
| 651 | VPM | Feature Memory Data Content Corrupted | VPM Detects Error In Feature List | With VPM On Pull Fuse F4 And Reinstall |
| 652 | VPM | Eng.-Fuel Memory Data Content Corrupted | VPM Detects Error In Engine Rating List | With VPM On Pull Fuse F4 And Reinstall |
| 653 | VPM | Eng. Rating Memory Data Content Corrupted | Attempt to reprogram, replace VPM if reoccurs | |
| 654 | VPM | Watchdog Time-out Fault | VPM Software Fault Detected | VPM Will Reset |

* Indicates WARN Lamp on When Fault Set

** Faults only available if Engine Protection is enabled

# DT 466E & INTERNATIONAL® 530E Electronic Engine Controls - 1995




**60 Pin Signal Values DT 466E & International ® 530E** — 2/23/95

| Pin Number | Acronym | Circuit Name | Circuit Number | Key Off | Key On | Low Idle Signal | Low Idle Data List | High Idle Signal | High Idle Data List | Operating Range | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | KAM PWR | Keep Alive Memory Power | 97 J | V BAT | V BAT | V BAT | V BAT | V BAT | V BAT | V BAT | B+ for ECM KAM memory & VPM |
| 5 | BARO | Barometric Pressure Sensor | 97 CD | 0v | 4.4 - 4.6 v | 4.4 - 4.6 v | 15-14 PSI | 4.5 - 4.6 v | 15-14 PSI | 4.9 - 2.0 v | 4.6v =Avg. BARO sea level |
| 7 | ECT | Engine Coolant Temperature | 97 BF | 0-.25v | Temperature Dependent | | | | | .6v = 195°F | 4.53 v= -40°F / .358v= 230°F |
| 8 | IVS | Idle Validation Switch | 97 D | 0v/0v | 0v/12v | 0v | - | 12v | - | 0/12v | APS Pedal Up/Down |
| 9 | DCL (-) | Data Communication Link | 97 AT | 0v | 1 - 3 v | 1 - 3 v | - | 1 - 3 v | - | Variable Freq. | Digital data stream from VPM 1 - 3 v |
| 10 | DDS (clutch) | Driveline Disengagement Switch | 97 A | 0v/0v | 12v/0v | 12v/0v | Off/On | 12v/0v | Off/On | 12v/0v | Clutch Pedal Up/Down(Cruise/PTO) |
| 14 | EOT | Engine Oil Temperature | 97 CE | 0v | Temperature Dependent | | | | | .6v = 195°F | 4.53 v= -40°F / .358v= 230°F |
| 17 | STO/WARN | Self Test Output/Warn Lamp | 97 T | 0v | B + | B + | - | B + | - | 12v | 0v=Light On 12v=Light Off |
| 18 | CLS | Coolant Level Switch | 34 B | 0v | B + | B + | - | B + | - | 12v | 0v=Light On 12v=Light Off |
| 20 | CASE GRD | Case Ground | 97 GB | 0v | 0v | 0v | - | 0v | - | 0v | |
| 21 | IPR (reg) | Injection Pressure Regulator | 97 BH | 0v | 10 - 13 v | 10 - 13 v | - | 10 - 13 v | - | 10 - 13 v | Duty Cycle Current Controlled |
| 22 | FDCS | Fuel Delivery Command Signal | 97 BB | 0v | 0v | 1-2v/44 Hz | - | 2-3v/200 Hz | - | 49/150 Hz | 700-2300 RPM (Dependent upon rating) |
| 23 | BNO | Brake Normally Open Switch | 97 N | 0v/12v | 0v/12v | 0v/12v | Off/On | 0v/12v | Off/On | 0v/12v | Brake Pedal Up/Down |
| 24 | EF | IDM Feedback (Electronic feedback) | 97 AZ | 0v | 1 - 3 v | .3-1 v | - | 1.5 - 2.5 v | - | 46.5/200 Hz | 100 Hz with key on engine off |
| 25 | IAT | Intake Air Temperature Sensor | 97 AX | 0v | Temperature Dependent | | | | | 3.07v=68°F | 4.53 v= -40°F / .358v= 230°F |
| 26 | V REF | Voltage Reference | 97 AA | 0v | 5 ± .5v | 5 ± .5v | - | 5 ± .5v | - | 5 ± .5v | |
| 27 | ICP - sensor | Injection Control Pressure Sensor | 97 BG | 0v | .2 - .3v | .75 - .81 v | 425-475 PSI | 1.8 - 2.5 v | 1300-1900 | .75 - 3.85 v | Values depend upon H.P. rating |
| 28 | DCL (+) | Data Communication Link | 97 AS | 0v | 1 - 3 v | 1 - 3 v | - | 1 - 3 v | - | Variable Freq. | Digital data stream from VPM 1 - 3 v |
| 30 | R APS | Remote Accelerator Pedal Sensor | 99 F | | | | | | | | Option installed by body builder |
| 31 | CMP GRD | CMP Sensor Ground | 97 GR | 0v | 0v | 0v | - | 0v | - | 0v | |
| 32 | EDL | Engine Data Line | 97 F | 0v | 0v | 0.1 | - | B + | - | 0/12 | Auto Trans. (WOT @ load transition) |
| 33 | IDM_EN | IDM Enable Relay | 97 AH | 0v | 0v | 0v | - | 0v | - | 12v/0v | 12v=IDM Off 0v=IDM On |
| 34 | CI | Cylinder Identification | 97 BA | 0v | .5 v | 6-7v / 5-7 Hz | - | 20 - 23 Hz | - | 5 Hz-23 Hz | W/Fluke 88 in Tach mode reads RPM |
| 35 | ECI | Engine Crank Inhibit | 97 H | 0v | 0v | 0v | - | 0v | - | 0v/12v | 0v=Crank Allowed 12v=Crank Inhibited |
| 36 | TACH (out) | Tachometer Output | 97 D | 0v | 0v | 6.5v/140Hz | 700 RPM | 6.5v/540 Hz | 2700 RPM | 140-540Hz | Varies with H.P. rating(TACHX5= RPM ) |
| 37 | V PWR | Ignition Power | 97 AJ | 0v | V IGN | V IGN | V IGN | V IGN | V IGN | V IGN | Ignition source power |
| 39 | SC GRD | Speed Control Grd. | 97 CF | 0v | 0v | 0v | - | 0v | - | 0v | |
| 40 | PWR GRD | Power Ground | 97 GC | 0v | 0v | 0v | - | 0v | - | 0v | |
| 42 | EOP | Engine Oil Pressure Sensor | 97 BK | 0v | .7 - .1 v | 2 -4.7v | 10 -38 PSI | 4.6 -4.8 v | 38 PSI | .7 - 4.8 v / 0-38 PSI | Sensor limited to 38 PSI Maximum |
| 43 | BNC | Brake Normally Closed | 97 M | 0v | 12v/0v | 12v/0v | Off/On | 12v/0v | Off/On | 12v/0v | Brake Pedal Up/Down (Cruise/PTO) |
| 44 | R VREF | Remote Voltage Reference | 97 DD | 0v | 5 ± .5v | 5 ± .5v | - | 5 ± .5v | - | 5 ± .5v | |
| 45 | MAP | Manifold Absolute Pressure Sensor | 97 AY | 0v | 2.5v | 2.5v | 0 PSI | 2.5v | .5 - 2.5 PSI | 108-186 Hz | 108/114Hz=Atmosp. Pres.(sea level) |
| 46 | Sig. GRD | Signal Ground | 97 X | 0v | 0v | 0v | - | 0v | - | 0v | Ground for all sensor signals |
| 47 | APS | Accelerator Pedal Sensor | 99B | 0v | .25v - .5 v | .25v - .5 v | 0% | 3.5 - 4.0 v | 100% | .25-4v / 0-100 % | |
| 48 | STI | Self Test Input | 98 | 0v | 5v | 5v | - | 5v | - | | 0v when grounded for engine off tests |
| 50 | SCCS | Cruise Control | 97 AC | 0v | 6.58v | 6.58v | - | 6.58v | - | | Varies with switch position |
| 56 | CMP | Camshaft Position Sensor | 97 BE | 0v | 12 or 2.5 v | 6 - 7v | - | 6 - 7v | - | 140-540Hz | Varies with H.P. rating(CMPX5= RPM ) |
| 57 | V PWR | Ignition Power | 97 AL | 0v | V IGN | V IGN | V IGN | V IGN | V IGN | V IGN | Ignition source power |
| 59 | OWL | Oil/Water Lamp | 97 AF | 0v | 12v | 12v | - | 12v | - | | 0v=OWL On 12v=OWL Off |
| 60 | PWR GRD | Power Ground | 97 GD | 0v | 0v | 0v | | 0v | | 0v | |