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EZ-Tech® Electronic Service Tool (EST)

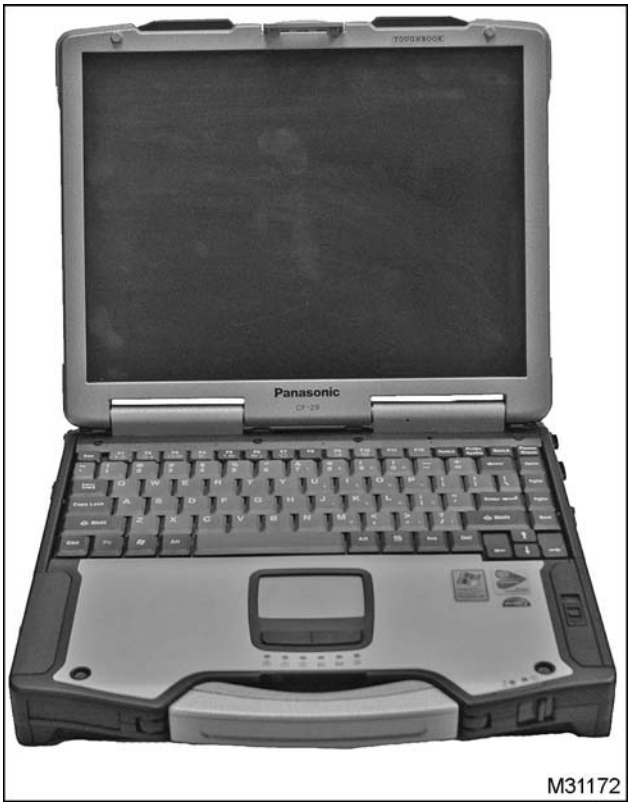

Figure 315 J-45067

The EZ-Tech® Electronic Service Tool (EST) is used to run the MasterDiagnostics® software for diagnosing and troubleshooting engine and vehicle problems.

MasterDiagnostics® Software

MasterDiagnostics® software, loaded to an EST or laptop computer, is used to check performance of engine systems, diagnose engine problems, and store troubleshooting history for an engine.

FRP Breakout Harness

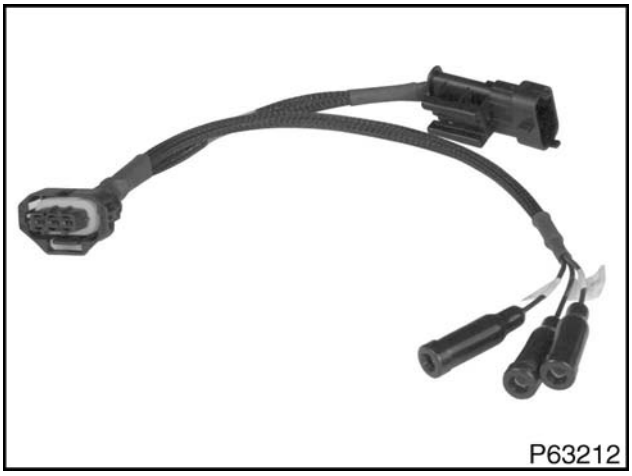

Figure 316 ZTSE4829

The FRP Breakout Harness is used to measure voltage and resistance on circuits connected to the Fuel Rail Pressure (FRP) sensor.

IC4 USB Interface Cable

Figure 317 ZTSE4632-USB

The IC4 USB Interface Cable connects the EST to the truck Controller Area Network (CAN) through the vehicle diagnostic connector.

Test Meters

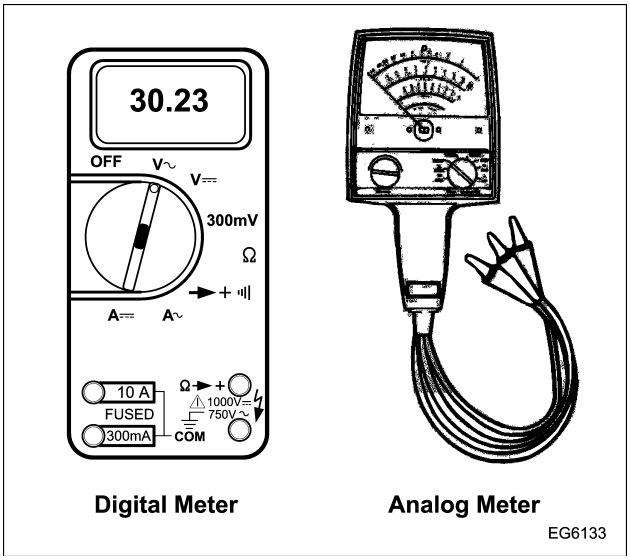

Figure 343 Typical Test Meters

Test meters come in a variety of models. Any working model will be adequate for simple tests. However, accurate readings are important. Make sure the test meter is of high quality. The Fluke 88 Digital Multimeter (DMM) is recommended because it has very little current and a high impedance (resistance) of 10 megaohms (10 MΩ).

CAUTION: Only use a high impedance digital multimeter when troubleshooting an electronic circuit. Do not use any kind of battery powered test light. Battery test lights can damage an electronic control circuit.

NOTE: Some devices in an electronic control system are not capable of carrying an appreciable amount of current. Therefore, test equipment must be designed to not damage any part the electronic control system. Do not use analog meters unless specified. Analog meters use too much current to test an electronic control system.

Jumper Wires

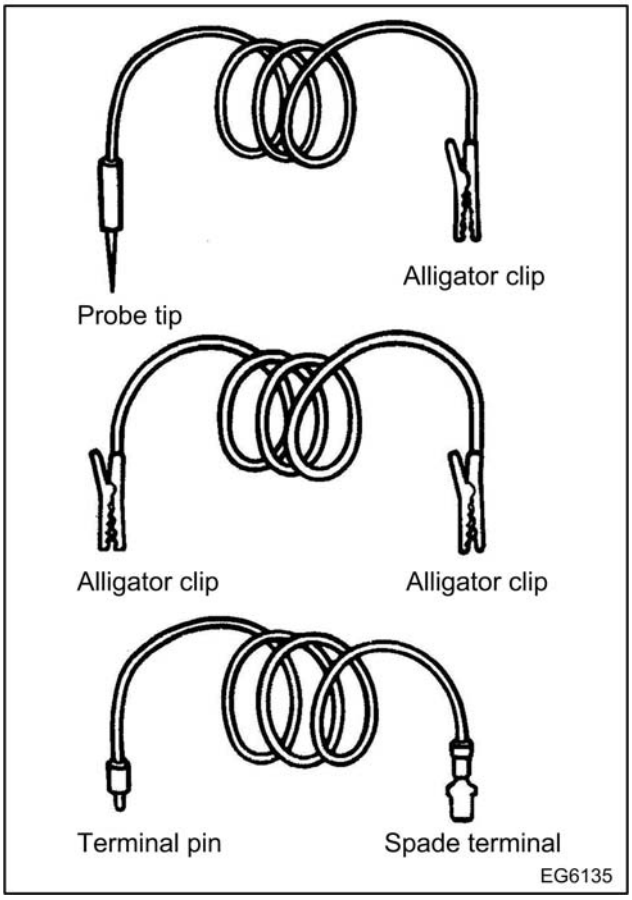

Figure 344 Jumper wires

Jumper wires allow a circuit to bypass a suspected opening or break in a circuit. Use a jumper wire to check for open relay contacts, wire breaks and poor ground connections. Several jumper wires with different tips should be available.

Abbreviations and Acronyms

Abbreviations and Acronyms

A or amp – Ampere
ABDC – After Bottom Dead Center
ABS – Antilock Brake System
AC – Alternating Current
A/C – Air Conditioner
ACC – Air Conditioner Control
ACCEL – Accelerator
ACD – Air Conditioner Demand
ACM – Aftertreatment Control Module
ACT PWR GND – Actuator Power Ground
A/F – Air to Fuel ratio
AFD – Aftertreatment Fuel Drain
AFI – Aftertreatment Fuel Injector
AFP – Aftertreatment Fuel Pressure
AFS – Aftertreatment Fuel Supply
AFT – Aftertreatment
AIT – Air Intake Temperature
Amb – Ambient
amp or A – Ampere
AMS – Air Management System
API – American Petroleum Institute
APS – Accelerator Position Sensor
APS/IVS – Accelerator Position Sensor / Idle Validation Switch
ASTM – American Society for Testing and Materials
ATA – American Trucking Association
ATDC – After Top Dead Center
AWG – American Wire Gauge

B+ or VBAT – Battery Voltage
BAP or BARO – Barometric Absolute Pressure
BARO or BAP – Barometric Absolute Pressure
BBDC – Before Bottom Dead Center
BCP – Brake Control Pressure
BCS – Boost Control Solenoid
BDC – Bottom Dead Center
bhp – Brake Horsepower
BNO – Brake Normally Open
BOO – Brake On / Off
BPS – Brake Pressure Switch
BSV – Brake Shut-off Valve
BTDC – Before Top Dead Center
BTU – British Thermal Unit

C – Celsius
CAC – Charge Air Cooler
CAN – Controller Area Network
CAP – Cold Ambient Protection
CARB – California Air Resources Board
cc – Cubic centimeter
CCA – Cold Cranking Ampere
CCV – Coolant Control Valve
CDR – Crankcase Depression Regulator
CID – Cubic Inch Displacement
cfm – Cubic feet per minute
cfs – Cubic feet per second
CFV – Coolant Flow Valve
CKP – Crankshaft Position
CKPO – Crankshaft Position Out
cm – Centimeter
CMP – Camshaft Position
CMPO – Camshaft Position Out
CMV – Coolant Mixer Valve
CO – Carbon Monoxide
COO – Cruise On / Off switch
CPU – Central Processing Unit
CSS – Cold Start Solenoid
CSR – Cold Start Relay
CTC – Coolant Temperature Compensation
Cyl – Cylinder

DB – Decibel
DCA – Diesel Coolant Additive
DDI – Digital Direct Fuel Injection
DDS – Driveline Disengagement Switch
DLC – Data Link Connector
DME – Dimethyl Ether
DMM – Digital Multimeter
DOC – Diesel Oxidation Catalyst
DPF – Diesel Particulate Filter
DT – Diesel Turbocharged
DTC – Diagnostic Trouble Code
DTRM – Diesel Thermo Recirculation Module

EBC – Exhaust Brake Controller
EBP – Exhaust Back Pressure
EBPD – Exhaust Back Pressure Desired
ECI – Engine Crank inhibit
ECL – Engine Coolant Level
ECM – Engine Control Module
ECM PWR – Engine Control Module Power
ECT – Engine Coolant Temperature
ECT2 – Engine Coolant Temperature 2
EFAN – Electronic Engine Fan
EFANS – Electronic Engine Fan Speed
EFP – Engine Fuel Pressure
EFRC – Engine Family Rating Code
EFT – Engine Fuel Temperature
EG – Ethylene Glycol
EGC – Electronic Gauge Cluster
EGDP – Exhaust Gas Differential Pressure

Truck Computer Analysis of Performance and Economy (TCAPE) – Truck Computer Analysis of Performance and Economy is a computer program that simulates the performance and fuel economy of trucks.

Turbocharger – A turbine driven compressor mounted to the exhaust manifold. The turbocharger increases the pressure, temperature and density of intake air to charge air.

Variable capacitance sensor – A variable capacitance sensor measures pressure. The pressure forces a ceramic material closer to a thin metal disc in the sensor, changing the capacitance of the sensor.

Vehicle Electronic System Programming System – The computer system used to program electronically controlled vehicles.

Vehicle Retarder Enable/Engage – Output from the ECM to a vehicle retarder.

Vehicle Speed Sensor (VSS) – Normally a magnetic pickup sensor mounted in the tailshaft housing of the transmission, used to indicate ground speed.

Viscosity – The internal resistance to the flow of any fluid.

Viscous fan – A fan drive that is activated when a thermostat, sensing high air temperature, forces fluid through a special coupling. The fluid activates the fan.

Volt (v) – A unit of electromotive force that will move a current of one ampere through a resistance of one Ohm.

Voltage – Electrical potential expressed in volts.

Voltage drop – Reduction in applied voltage from the current flowing through a circuit or portion of the circuit current multiplied by resistance.

Voltage ignition – Voltage supplied by the ignition switch when the key is ON.

Washcoat – A layer of alumina applied to the substrate in a monolith-type converter.

MaxxForce® 11 (10.5L)

330 hp @ 1700 rpm

International® MaxxForce® 11 330 hp @ 1700 rpm / 1250 ft•lb @ 1000 rpm	
50 state 2008 Model Year (MY)	
Engine model	GDT330
Engine Family Rating Code (EFRC)	2232 and 1132
Injector part number, original equipment	62.10100-6107
Turbocharger part number	62.09100-7793
Injection timing	Nonadjustable
High idle speed - manual transmission	2200 rpm
High idle speed - automatic transmission	2200 rpm
Low idle speed	600 rpm
Full load on chassis dynamometer or highway, stabilized engine operating temperature	
Manifold boost pressure (gauge)	Peak torque – 203 kPa (30 psi) / 2.25 V
	Rated speed – 288 kPa (42 psi) / 3.22 V

DTC	SPN	FMI	Circuit	Condition Description
1380	158	1	ECM PWR (page 305)	B+ to ECM out-of-range LOW
1381	158	3	ECM PWR (page 305)	B+ to ECM out-of-range spiked HIGH
1382	158	4	ECM PWR (page 305)	B+ to ECM out-of-range spiked LOW
1607	8021	5	CMP (page 271)	CMP - No signal
1608	8021	7	CMP (page 271)	CMP sensor angle based phase system error disagreement
1609	8021	8	CMP (page 271)	CMP sensor time based phase system disagreement
1610	8021	14	CMP (page 271)	CMP circuits reversed
1611	8021	3	CMP (page 271)	CMP signal out-of-range HIGH
1612	8021	4	CMP (page 271)	CMP signal out-of-range LOW
1614	8064	3	CKP (page 268)	CKP signal out-of-range HIGH
1615	8064	4	CKP (page 268)	CKP signal out-of-range LOW
1616	1442	5	FPCV (page 377)	Fuel Pressure Control Valve open circuit
1617	1442	11	FPCV (page 377)	Fuel Pressure Control Valve short circuit
1618	1119	0	ELS (page 356)	Lambda Sensor correction value above normal
1619	1119	1	ELS (page 356)	Lambda Sensor not plausible
1620	1119	2	ELS (page 356)	Lambda Sensor circuit intermittent contact
1621	1119	5	ELS (page 356)	Lambda Sensor monitoring below lower limit
1622	1119	7	ELS (page 356)	Lambda Sensor circuit fault
1623	1119	11	ELS (page 356)	Lambda heater circuit fault
1624	7319	16	ELS (page 356)	Lambda Temp calculation above normal
1625	7319	17	ELS (page 356)	Lambda Temp calculation below normal
1626	7319	18	ELS (page 356)	Lambda Temp calibration calculation value above normal
1627	7319	19	ELS (page 356)	Lambda Temp calibration calculation value below normal
1628	1119	22	ELS (page 356)	Lambda Sensor Temp above maximum
1629	1119	12	ELS (page 356)	Lambda Sensor not detected in exhaust system
1630	1119	15	ELS (page 356)	Lambda Sensor SPI communication error status
1635	7311	4	ECT2 (page 312)	ECT2 signal out-of-range LOW
1636	7311	3	ECT2 (page 312)	ECT2 signal out-of-range HIGH
1729	3251	4	EGDP (page 320)	EGDP signal out-of-range LOW
1731	3251	3	EGDP (page 320)	EGDP signal out-of-range HIGH
1737	3241	4	EGT1 (page 336)	EGT1 signal out-of-range LOW
1738	3241	3	EGT1 (page 336)	EGT1 signal out-of-range HIGH