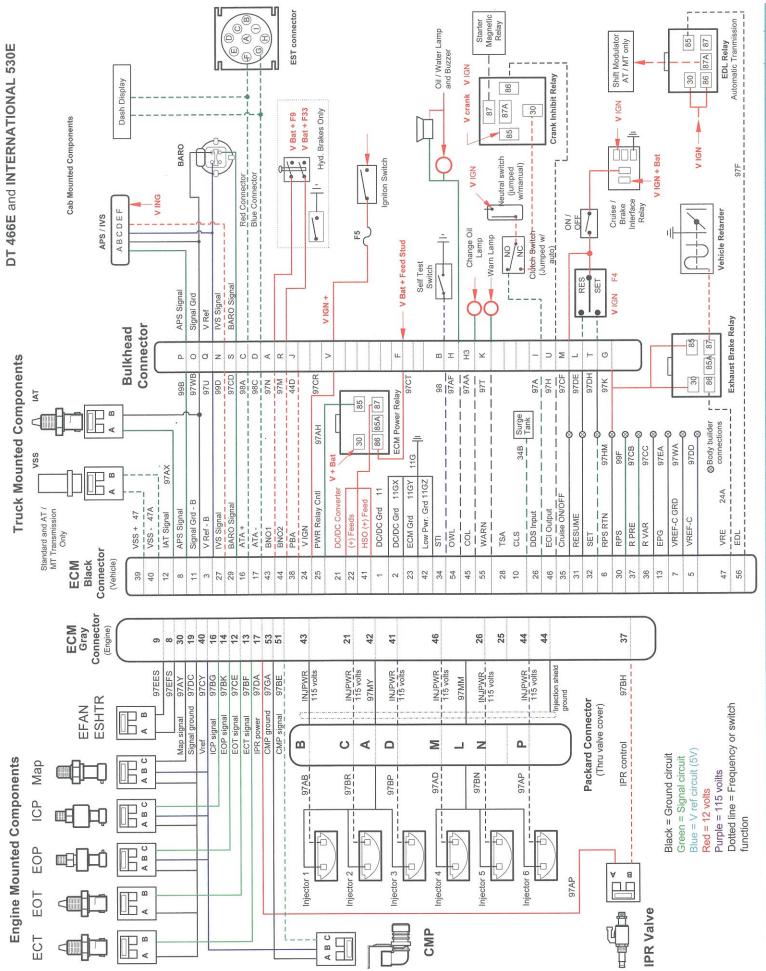
DTC	Circuit				T				
	s Index	Condition	Comments	Cause		Circuit Index	Condition	Comments	Cause
111	ECM	No errors detected. (Flash code only)	No errors detected by ECM		265	VRE	Vehicle Retarder Relay OCC fault	Vehicle Retarder Relay OCC check (engine off test only)	Open or short circuits
112	ECM_PWF	R System voltage B+ (Out of Range High)	ECM voltage is continuously above 18 volts	Charging system fault	266	WARN	Engine Warning lamp OCC fault	Engine Warning Lamp OCC check (engine off test only)	Open or short circuits (bulb failed
113	ECM_PWF	R System voltage B+ (Out of Range Low)	ECM voltage below 6.5 (cause of No start / misfire)	Low battery, loose connections, or cricuit resistance	311*	EOT	Engine Oil Temperature signal Out of Range Low	Default 212 F (100 C) No fast idle, EOT above 4.8 V	EOT signal circuit or sensor shorted to ground
114*	ECT	Engine coolant temperature signal Out of Range Low	Default 180 F (82 C) ECT below 0.127 V	ECT signal circuit or sensor shorted to ground	312*	EOT	Engine Oil temperature signal Out of Range High	Default 212 F (100 C) No fast idle, EOT below 0.2 V	EOT circuit or sensor shorted to ground
115*	ECT	Engine coolant temperature signal Out of Range High	Default 180 F (82 C) ECT above 4.6 V	ECT circuit or sensor open	313	EOP**	Engine Oil Pressure below warning level	Engine monitor of low oil pressure (oil light on)	No or low oil, stuck oil pressure regulator, pickup
121*	MAP	Manifold Absolute Pressure signal Out of Range Hig	h Default inferred MAP > 4.9 V (low power, slow acceleration)	MAP circuit shorted High (defective sensor)	314	EOP**	Engine Oil Pressure below critical level	Engine monitor of low oil pressure (shutdown, if equipped)	Tube blocked or cracked, worn bearings or oil pum
122*	MAP	Manifold Absolute Pressure signal Out of Range Low	v Default inferred MAP < 0.39 V (low power, slow acceleration)	MAP circuit shorted Low or Open	315*	CMP	Engine Speed above warning level	ECM recorded excessive engine speed above 3000 rpm	Transmission incorrectly downshifted
123*	MAP	Manifold Absolute pressure signal In Range fault	Default inferred (low power, slow acceleration)	Plugged hose to MAP sensor	316	ECT	ECT fails to reach commanded set point	Enabled only when Cold Ambient Temperature enabled	Leaking thermostat, cooling system problems
124*	ICP	Injection Control Pressure signal Out of Range Low	Default open loop control - underrun at idle - ICP below 0.39 V	Circuit short low, open (defective sensor)	321	ECT**	Engine Coolant Temperature above warning level	Coolant Temperature > 224.6 F (107 C)	Cooling system problem
125*	ICP	Injection Control Pressure signal Out of Range High	Default open loop control - underrun at idle - ICP above 4.497 V	Circuit short high (defective sensor)	322	ECT**	Engine Coolant Temperature above critical level	Coolant Temperature > 233.6 F (112.5 C)	Cooling system problem
131*	APS/IVS	Accelerator Position signal Out of Range Low	Signal voltage below .152 Volts (engine idle only)	Short to ground or open	323	ECL	Engine Coolant Level below warning/critical level	ECM detects low coolant level	Check coolant level if low. Check for leaks
132*	APS/IVS	Accelerator Position signal Out of Range High	Signal voltage below .152 Volts (engine idle only)	Short to ground or open	324	IST	Idle Shutdown timer enabled engine shutdown	IST is on and idle time exceede limit	Idle time exceeded limit
133*	APS/IVS	Accelerator Position signal In Range fault M	APS/IVS conflict - limited to 0% APS	Failed APS signal	V-97040000	ECT	Power reduced (normal in certain conditions)	High altitude or hot ambient temperature	Failed APS signal
134*	APS/IVS	Accelerator Position and idle validation disagree	APS/IVS conflict - limited to 0% APS	APS and IVS signal failures	331*	IPR	ICP above 3675 psi (25 mPa)	ICP above 3675 psi (25 MPa)	Grounded IPR circuit. Stuck IPR valve
135*	APS/IVS	Idle Validation Switch circuit fault	APS/IVS conflict - limited to 50% APS	IVS signal failure	332*	ICP	Injection Control Pressure above spec with engine Off		Circuit shorted to voltage. (defective sensor)
141	VSS	Vehicle Speed Signal Out of Range Low	VSS sig. at 0 mph < .48V (cruise/PTO disengaged - eng. rpm limited)	VSS circuit open or shorted to ground	333*	IPR SYS	Injection control Pressure above/below desired level	ICP desired does not = ICP signal (long period of time)	
142	VSS	Vehicle Speed Signal Out of Range High	VSS sig. at 0 mph < 4.492V (cruise/PTO disengaged - eng. rpm limited)	VSS circuit shorted to Vref or 12 Volts				e) ICP desired does not = ICP signal (long period of time)	Air in oil, wrong oil, wrong IPR, leaking injector O-ring, ICP sensor, or high pressure pump. (See manual.)
143	CMP	Wrong No. of CMP signal transitions per cam rev.	Intermittent CMP signal	Poor connection (defective sensor)			ICP unable to build presssure during cranking	Less than 725 psi ICP pressure after 10 seconds of cranking	Air in oil or injection problem (See manual.)
144	CMP	CMP signal noise detected	ECM detects electrical noise in circuit	Electrical noise (injector voltage skorted to ground)		EPG	EPG unable to reach commanded set point		Hydraulic pressure system leakage
145*	CMP	CMP signal inactive while ICP has increased	No CMP signal while ICP signal increased	Short high, low,or open (defective sensor)	421-426	INJ	High side to low side open (cylinder No. indicated)	ECM detected a short circuit for an injector	Injector harness opem
151	BAP	Barometric Pressure signal Out of Range High	BAP signal voltage above 4.9 V for 1.0 sec. (defaults to 14.7 psi)	BAP circuit short high or open circuit	431-436		High side shorted to low side (cylinder No. indicated)	ECM detected an open circuit for fuel circuit	Injector or harness shorted low side to high side
152	BAP	Barometric Pressure signal Out of Range Low	BAP signal voltage below 1.0 V for 1.0 sec. (defaults to 14.7 psi)	BAP circuit short low	451-456		High side shorted to ground or Vbat (cyl. No. indicated)	20	Injector harness shorted on low (control) circuit to grd.
154	IAT	Intake Air Temperature signal Out of Range Low	IAT signal voltage low (defaults to 77 C, IAT below 0.127 V	IAT signal circuit or sensor shorted to ground	451-456		Cylinder Contribution Test failed (cyl. No. indicated)	ECM finds cylinder contribution insufficient	Refer to performance diagnostics
155	IAT	Intake Air Temperature signal Out of Range High	IAT signal voltage low (defaults to 77 C, IAT below 4.6 V	IAT circuit or sensor open	513*		Low side to Bank 1 open	High voltage supply open (Cylinders 1,2, and 3)	Bank 1 circuit open
211*	EOP	Engine Oil Pressure signal Out of Range Low	EOP signal voltage low, below 0.039 V	EOP circuit short low	514*	INJ	Low side to Bank 2 open	High voltage supply open (Cylinders 4, 5, and 6)	Bank 2 circuit open
212*	EOP	Engine Oil Pressure signal Out of Range High	EOP signal voltage high , above 4.9 V	EOP circuit short high or open	515*	INJ	Bank 1 low side short to ground or B+	Bank 1 side high voltage circuit shorted	Bank 1 circuit shorted
213	RPS	Remote throttle signal Out of Range Low	RPS signal sensor below 0.249 V	Open RPS circuit	521*	INJ	Bank 2 low side short to ground or B+	Bank 2 side high voltage circuit shorted	Open RPS circuit
214	RPS	Remote throttle signal Out of Range High	RPS signal sensor above 4.5 V	Shorted RPS circuit	525*	ECM	Injector drive circuit fault	ECM can not supply sufficient voltage to injectors	Engine or injector harness, or ECM problem
215	VSS	Vehicle Speed Signal frequency Out of Range High	Speedo, cruise, PTO disabled (eng. rpm limited, sig. freq. > 4375 Hz)	Misadjusted / faulty speed sensor, elect. noise in circuit	612*	CMP	Incorrect ECM installed for CMP timing wheel	Mismatch between ECM and engine target wheel (I6, V8)	Incorrect ECM strategy for engine
216	EPG	Electronic Pressure Governor signal Out of Range Low	EPG signal voltage below .039 V	Circuit open, short to ground (defective sensor)	614*		EFCR / EECM ING mismatched configuration	Programming problem	Incompatible components changed in the field
221	SCCS (RPTO) Cruise PTO control sw. circuit fault (or remote PTO sw.)	SCCS signal and voltage incorrect for switch state	Short or resistance in SCCS circuit			Engine using Mfg. engine default rating program	Engine operates at 25 hp default	ECM not programmed, but installed on truck
221	BRAKE	Brake switch circuit fault	Voltage at ECM (BNO2) are not the same	Faulty or misadjusted switch	622* I		Engine using field default rating	Progamming problem. Eng.limited to160 hp (options not available	
225	EOP	Engine Oil Pressure signal In Range fault	EOP signal above 40 psi w/eng. Off, key On (disables eng. protection)	Wire harness, connector problem, or faulty sensor	623* I		Invalid engine rating code. Check ECM programing	Programming problem	ECM not programmed correctly
226	EPG	Electronic Presssure Governor signal Out of Range High	EPG signal voltage above 4.9 V	Circuit short high (defective sensor)			Field defaults active	Programming or ECM problem	Programming or internal ECM problem
231	ATA	ATA Data Communiction link error	ATA Link open or shorted, WTEC controller interference	ATA device grounded or overloaded		ECM_PW	Unexpected reset fault	ECM momentarily lost power	See ECM_PWR cicuit diagnostics
236	ECL	Engine Coolant Level switch circuit fault	Engine Coolant Level switch circuit fault	Open or short circuits			Read Only Memory (ROM) self test fault	ECM failure	Internal ECM problem
241	IPR	Injection Control pressure Regulator OCC test failed	IPR Output Circuit Check (engine off test only)	Short high, low, or open	632 E		RAM memory CPU self test fault	ECM failure	Internal ECM problem
244	EDL	Engine to transmission Data Line OCC self test failed	EDL relay Output Circuit Check (engine off test only)	Open or short circuits	655 E		Programmable parameter list level incompatible	Programming problem	Progamming problem
246	EFAN	Engine Fan OCC self test failed	Fan relay Output Circuit Check (engine off test only)	Open or short circuits			RAM programmable parameter list corrupt	Programming problem or ECM memory problem	Programming or internal ECM problem
256	RSE	Radiator Shutter Enable OCC self test failed	Shutter relay Output Circuit Check (engine off test only)	Open or short circuits			Calibration level incompatible	Programming problem	internal ECM problem
262	COL	Change Oil Lamp OCC fault	Change Oil Lamp Output Circuit Check (engine off test only)	Open or short circuits (bulb failed)	665 E		Change Oil Lamp OCC fault	Change Oil Lamp Output Circuit Check (engine off test only	450 450 TAA 550 TO 10 5 TAA 650 TO 444 TO 10 5 TAA 650 TO 10 TAA 650 T
263	OWL	Oil Water lamp OCC fault	Oil Water Lamp Output Circuit Check (engine off test only)	Open or short circuits (bulb failed)				- Control of the cont	, opon or short officials (raffed build)
								- SK	

^{*} Indicates WARN lamp ON when fault is set

^{* *} Indicates faults only available if engine protection is enabled.



in	Item	Circuit	Circuit	Kev	Low Idle		High Idle		Operating	Comments	
in	пеш	Circuit	No.	ON	Signal	Data List	Signal	Data List	Range	Comments	
СМ	CONNECTO	PR (GREY)									
	EFN	Fan	97EFS						0v Solenoid Of	N, fan OFF 12v / Open: solenoid OFF, fan Of	
	ESHTR	Shutters	97EES							.,	
2	EOT	Engine Oil Temperature	97CE	Temper	ature Depen	dent			1.9v = 194°F	4.75v = -40 °F .669v = 230 °F	
3	ECT	Engine Coolant Temperature	97BF		ature Depen				.65v = 199°F	4.53v = -40 °F .356v = 230 °F	
4	EOP	Engine Oil Pressure	97BK	.61v	2.6v	39 psi	3.60v	60 psi	.5v - 4.64v	.5v = 0 psi $4.64v = 80 psi$	
6	ICP	Injection Control pressure sensor	97BG	.2v	.48v	431 psi	1.97v	1370 psi	.3v - 4.5v	.84v = 444 psi 3.64v = 3000 psi	
7	IPR	Injection Pressure Regulator	97DA	B+	B+	-	B+	_	B+	Power supply for IPR valve	
9	Sig Grd D	Signal Ground D	97DC	0v	0v	_	Ov	_	0V	Ground for engine sensors	
1	INJ 2	Injector 2	97BR		measure Vo	oltage				High voltage pulse with signal	
4	INJ SHD	Injector 2 Injector Shield Ground	STER	DO HOL	moudare re	Jilago				g	
5	INJ 5	Injector 5	97BN	Do not	measure Vo	oltage				High voltage pulse with signal	
3	INJ GRD	Injector Grounds	97MM		measure Vo					Bank 1 injector grounds to ECM	
)	MAP	Manifold Absolute Pressure 4,5, and 6)	97AY	.88v	.96v	.5 psi	1.36v	3.75 psi	.85v - 4.56v	.88v = 0 psi 4.13v = 32 psi	
		Injection Pressure Regulator control	97BH	.00v	.90v	.o psi	0v	- por	0v	Duty Cycle Duty Controlled	
	IPR_CNTR	Voltage Reference D	97CY		5 ± 5v		5 ± 5v		5 ± 5v	V– Ref for engine sensors	
)	VREF_D	_				ltago	3 ± 3V		0 ± 00	High voltage pulse with signal	
	INJ_3	Injector 3	97BP		measure Vo					Bank 2 injector grounds to ECM	
	ING_GRD	Injector Power (1, 2, and 3)	97MY		measure Vo	75.0				High voltage pulse with signal	
	INJ_1	Injector 1	97AB		measure Vo	-				High voltage pulse with signal	
	INJ_6	Injector 6	97AP		measure Vo	77.				High voltage pulse with signal	
	INJ_4	Injector 4	97AD		measure Vo	ntage	2 ///		140 – 600 HZ	700 – 3000 RPM Hz varies with RPM	
	CMP	Camshaft position sensor	97BE	5v / 1v	2.11v		2.44v 0v	_	140 – 600 HZ 0v	CMP sensor ground	
3	CMP Grd	Camshaft sensor ground	97GA	0v	0v	-	UV	_	UV	CMF sensor ground	
4		ECTOR (BLACK)							_		
	DC / DC	Pwr Ground for injector drivers	11GW	0v	0v	-	0v	_	0v		
	DC / DC	Pwr Ground for injector drivers	11GX	0v	0v	-	0v	_	0v		
	VREF_B	Voltage Reference B	97U	$5 \pm 5v$	5 ± 5v	-	5 ± 5v	-	5 ± 5v	V - Ref for cab mounted sensors	
	HGE	Hydraulic Governor	97HE						0v	Input for HYD pressure governor	
	VREF_C	Voltage Reference C	97DD	$5 \pm 5v$	5 ± 5v	-	5 ± 5v	_	5 ± 5v	V - Ref for body builder sensors	
	RPS_GRD	Remote pedal sensor ground	97HM	0v	0v	-	0v	_	0v	Remote accelerat or pedal sensor ground	
	Sig_Grd C	Signal ground C	97WA	0v	0v	-	0v	-	47. 0.74.	Signal ground for body builder sensors	
	APS	Accelerator Pedal Sensor	99B	.47v	.47v	0%	3.74v	102%	.47v - 3.74v	APS signal (min 3.65v required for 102%	
	CLS	Coolant Level Switch	34B		ent on Cools	ant Level	0		0v / 5v 0v	0v = Low Coolant. 5v = Full Coolant.	
	Sig_Grd B	Signal ground B	97BW	0v	0v	-	0v	-	3v = 68°F	Signal ground cab mounted sensors 3.87v = 32°F 2.29v = 99°F	
	IAT	Air Intake Temperature	97AX	remper	ature Deper	ident			3V - 00 F	.49v = 10 psi 4.88v = 510 psi	
	EPG	Electronic Pressure Gov. Sensor Communication Link (Red)	97EA 98A	Digital d	lata signal (N	Vo signal no	EST data o	display)		Dash / Diagnostic / Programming	
	ATA (+) ATA (-)	Communication Link (Red)	98C				EST data o			Dash / Diagnostic / Programming	
	DC / DC	Pwr Supply for injector drivers	97CL	B+	B+	B+	B+	B+	B+	Power from ECM power relay	
	DC / DC	Pwr Supply for injector drivers	97CK	B+	B+	B+	B+	B+	B+	Power from ECM power relay	
	ECM_GRD	ECM Ground	11GY	0v	0v	_	0v		0v	•	
	VIGN (+)	ECM Ignition Voltage	97CR	B+	B+	B+	B+	B+	B+	Power from ignition circuit	
	ECM CNT	ECM Power relay control	97AH	1.5v	1.5v	_	1.5v	-	B+ / 1.5v	1.5v = ECM relay ON. B+ = ECM relay ON.	
	DDS	Driveline Disengagement	97A		utch pedal d	own. 1:	2v = Clutch p	pedal up. 0	√ = Trans in gear	. 12v = Trans in neutral.	
	IVS	Idle Invalidation Switch	99D	0v / 12v		_	12v	-	0v / 12v	0v = APS at idle. 12v = APS off idle.	
	TSA	Two Speed Axle Switch	93A	0V = Hi	gh axle rang		ow axle rang	ge.			
	BAP	Barometric Pressure Sensor	97CD	4.6v	4.6v	14.7 psi	4.6v	14.7 psi	2.55v – 4.8v	4.6 = Sea level. 2.6v = 10,000 ft (approx.)	
	RPS	Remote Pedal Sensor	99F	-	-	0%	-	102%	.47V – 3.74V	RPM signal (min 3.799V reqd. for 102%	
	RAS	Resume / Accelerate Switch	97DK				The state of the s	ed (accel or		Note: Signal only when COO is ON.	
	SET	Cruise Set Switch	97DJ			12V = Sw		ed (cruise / I		Note: Signal only when COO is ON.	
	STI	Self Test Input	98	4.7v	4.7V	0=10#	4.7v	Onloss	4.5v – 5.02v	Diagnostic button ground circuit.	
	COO	Cruise ON / OFF Switch	97CF	12v/0v	12v/0v	On/Off	12v/0v	On/Off	12v/0v	0v = Cruise/PTO Off. 12v = Cruise/PTO C Remote variable PTO On/Off	
	RVAR	Remote Variable PTO	97CC		TO On.	0v = PTO				Remote Variable PTO On/Off	
	RPRE	Remote Preset PTO	97CB	12V = F	TO On.	0v = PTO	OII.			Memore Fleser FTO OHM/OH	
0	PBA	Parking Brake Applied Switch	44D	Digital	cianal from	WTEC mod	lule transmis	ssion		*Allison World Class transmission only.	
9	VSS	Vehicle Speed Input	47	2.25v	2v 14vac	MPH	2v 14vac	MPH	2v 14vac	Manual and mechanical transmissions	
	VSS (+)	Vehicle Speed Sensor (+)	47	2.25v 2.25v	2v 14vac 2v 14vac	MPH	2v 14vac 2v 14vac	MPH	2v 14vac 2v 14vac	VSS signal is an AC sine wave	
)	VSS (-)	Vehicle Speed Sensor (-)	47A	2.25V B+	B+	B+	B+	B+	B+	Power from ECM power relay	
)		Voltage from ECM_PWR relay	97AL 11GZ	0v	0v	B+	0v	_	0v	. S. of from Low power roley	
2	ECM_GRD	ECM Ground Brake Switch 1	97N	12v/0v	12v/0v	Off/On	12v/0v	Off/On	12v/0v	0v = Break released. 12v = Brake depresse	
3	BNO_1	Brake Switch 1	97N 97M	12v/0v 12v/0v	12v/0v 12v/0v	Off/On	12v/0v 12v/0v	Off/On	12v/0v 12v/0v	0v = Break released. 12v = Brake depresse	
	BNO_2 COL		97M	12v/0v 12v/ .6v		-	12v/6v	0.11/011	12v/.6v	12v = Lamp Off. 6v = Lamp On.	
5	ECI	Change Oil Lamp Engine Crank Inhibit Relay	97AA 97H	0v	12v/ .0v	_	12v/.0v	_	0v/12v	0v = Allow crank6v = Inhibits crank.	
7	VRE	Vehicle Retarder Output	24A	0.4	1 C V						
	OWL	Oil / Coolant Warning lamp	97AF	12v/ 6v	12v/ .6v	-	12v/.6v		12v/.6v	12v = Lamp Off6v = Lamp On	
	WARN	Oil / Coolant Warning lamp	97T		12v/ .6v	_	12v/.6v		12v/.6v	12v = Lamp Off6v = Lamp On	
,	EDL	Engine Data Line	92F				ated shift so	hedule.		Automatic transmission relay	
,	VSSCALB	Vehicle Speed Output	47D					e speedome	er only)	Varies with vehicle speed	
	VOOCALD	Tachometer Output	97AP		requency 0v					Varies with engine RPM. Hz = (RPM/5)	