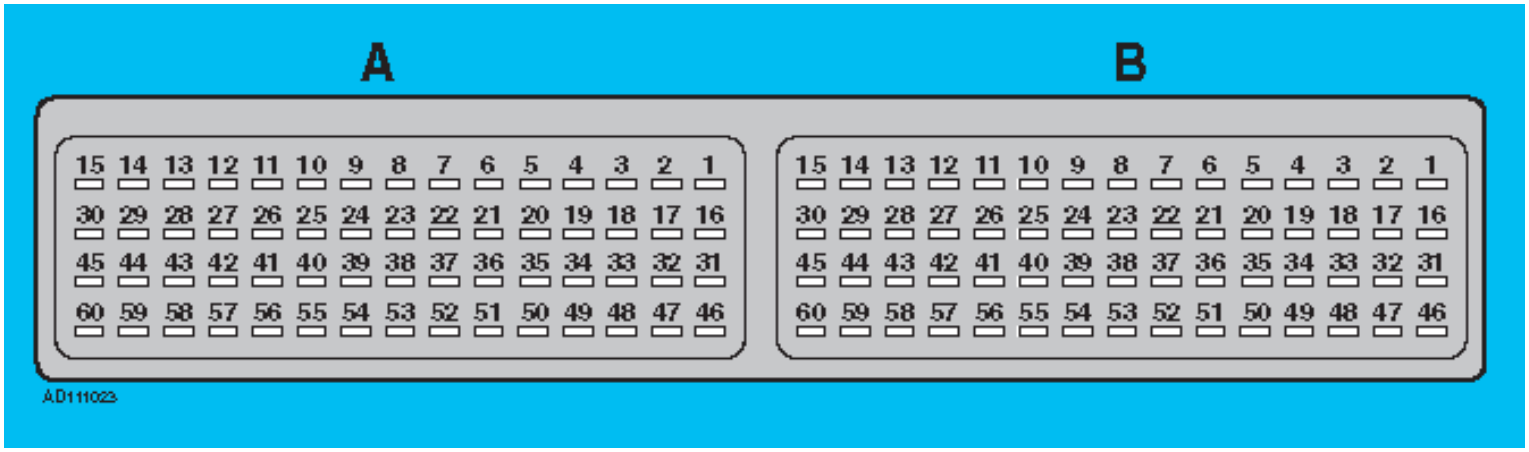
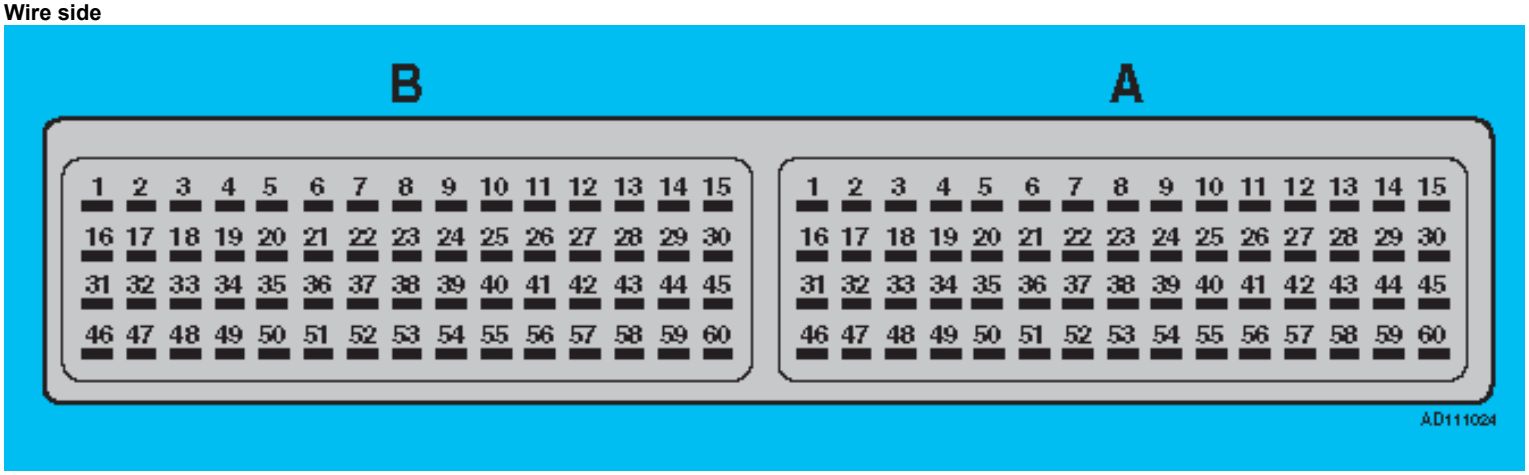
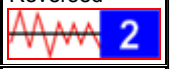
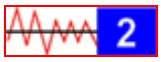
Terminal side

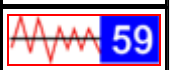
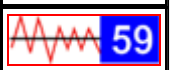


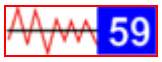
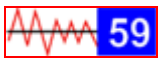
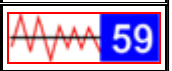
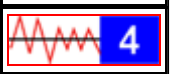
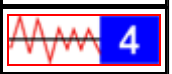
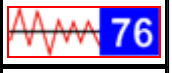
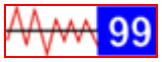
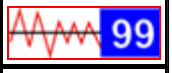
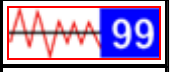
Wire side

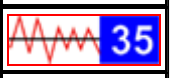
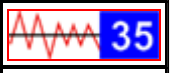
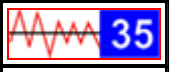
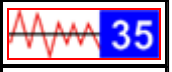
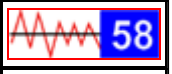
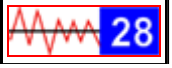


Component/circuit description	ECM pin	Signal	Condition	Typical value	Oscilloscope setting (Suggested settings - Voltage/time per division)	Wave form
AC compressor clutch relay	A49		Ignition ON - AC OFF	11-14 V		
AC compressor clutch relay	A49		Ignition ON - AC ON	0-1 V		
AC refrigerant pressure sensor	B12		Engine idling - AC OFF	1,3-1,5 V		
AC refrigerant pressure sensor	B12		Engine idling - AC ON	2-3 V		
AC refrigerant pressure sensor	B14		Ignition ON	5 V		
AC refrigerant pressure sensor	B57		Ignition ON	0 V		
Accelerator pedal position (APP) sensor	A51		Ignition ON	0 V		
Accelerator pedal position (APP) sensor	A52		Ignition ON - accelerator pedal released	0,3-0,4 V		
Accelerator pedal position (APP) sensor	A52		Ignition ON - accelerator pedal fully depressed	1,7-2,1 V		
Accelerator pedal position (APP) sensor	A53		Ignition ON	5 V		
Accelerator pedal position (APP) sensor	A54		Ignition ON	0 V		

Accelerator pedal position (APP) sensor	A55	⬅	Ignition ON - accelerator pedal released	0,6-0,8 V		
Accelerator pedal position (APP) sensor	A55	⬅	Ignition ON - accelerator pedal fully depressed	3,5-4,2 V		
Accelerator pedal position (APP) sensor	A56	⇨	Ignition ON	5 V		
Alternator	B8	⬅	Ignition ON	11-14 V		
Alternator	B28			Connected pin - no test data available or random digital signal		
Battery	A2	⬅	Ignition OFF	11-14 V		
Brake pedal position (BPP) switch	A8	⬅	Ignition ON - brake pedal released	11-14 V		
Brake pedal position (BPP) switch	A8	⬅	Ignition ON - brake pedal depressed	0-1 V		
Brake pedal position (BPP) switch	A20	⬅	Ignition ON - brake pedal released	0-1 V		
Brake pedal position (BPP) switch	A20	⬅	Ignition ON - brake pedal depressed	11-14 V		
Camshaft position (CMP) sensor	B52	⬅	Ignition ON - engine turned slowly	0 V or 5 V - switching		
CAN data bus - high	A4	⬅⇨		Connected pin - no test data available or random digital signal		
CAN data bus - low	A19	⬅⇨		Connected pin - no test data available or random digital signal		
Clutch pedal position (CPP) switch - MT	A7	⬅	Ignition ON - clutch pedal released	4-6 V		
Clutch pedal position (CPP) switch - MT	A7	⬅	Ignition ON - clutch pedal fully depressed	0-1 V		
Crankshaft position (CKP) sensor	B36	⬅	Engine idling		2 V/5 ms	Reversed 
Crankshaft position (CKP) sensor	B51	⬅	Engine idling		2 V/5 ms	
Cruise control selector switch	A6	⬅	Ignition ON - cruise control OFF	0 V		
Cruise control selector switch	A6	⬅	Ignition ON - cruise control ON	11-14 V		
Cruise control selector switch	A21	⊣	Ignition ON	0 V		
Cruise control selector switch	A22	⇨	Ignition ON - CANCEL switch not operated	5 V		
Cruise control selector switch	A22	⇨	Ignition ON - CANCEL switch operated	0 V		
Data link connector (DLC)	A5	⬅⇨		Connected pin - no test data available or random digital signal		
Earth	B15		Ignition ON	0 V		
Earth	B29		Ignition ON	0 V		
Earth	B30		Ignition ON	0 V		
Earth	B31		Ignition ON	0 V		

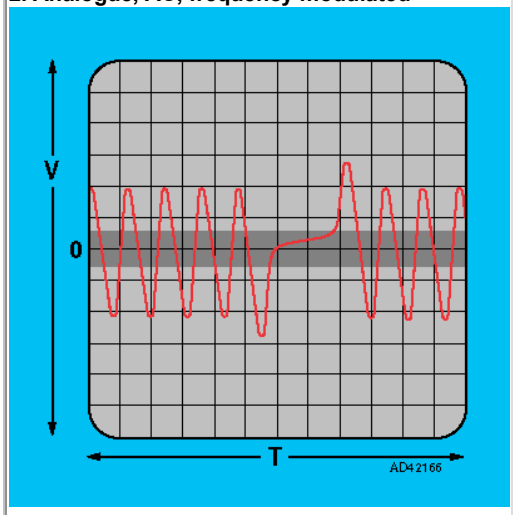
Earth	B48		Ignition ON	0 V		
Earth	B58		Ignition ON	0 V		
Electrical load sensor	B9	←	Ignition ON	0,5-1 V		
Electrical load sensor	B9	←	Engine idling - headlamps ON	1,3-1,7 V		
Electrical load sensor	B9	←	Engine idling - headlamps ON - heater/AC blower motor ON	1,8-2,4 V		
Electrical load sensor	B14	⇨	Ignition ON	5 V		
Electrical load sensor	B57	⊣	Ignition ON	0 V		
Engine control (EC) relay	A1	←	Ignition OFF	0 V		
Engine control (EC) relay	A1	←	Ignition ON	11-14 V		
Engine control (EC) relay	A16	←	Ignition OFF	0 V		
Engine control (EC) relay	A16	←	Ignition ON	11-14 V		
Engine control (EC) relay	A60	⊣▷	Ignition OFF	11-14 V		
Engine control (EC) relay	A60	⊣▷	Ignition ON	0-1 V		
Engine coolant blower motor relay 1	A46	⊣▷	Ignition ON - coolant temp. below 95°C	11-14 V		
Engine coolant blower motor relay 1	A46	⊣▷	Ignition ON - coolant temp. above 95°C	0-2 V		
Engine coolant blower motor relay 2	A47	⊣▷	Ignition ON - coolant temp. below 100°C	11-14 V		
Engine coolant blower motor relay 2	A47	⊣▷	Ignition ON - coolant temp. above 102°C	0-2 V		
Engine coolant blower motor relay 3	A48	⊣▷	Ignition ON - coolant temp. below 100°C	11-14 V		
Engine coolant blower motor relay 3	A48	⊣▷	Ignition ON - coolant temp. above 102°C	0-2 V		
Engine coolant temperature (ECT) sensor	B24	←	Ignition ON - coolant temp. 0°C	3,3-3,8 V		
Engine coolant temperature (ECT) sensor	B24	←	Ignition ON - coolant temp. 50°C	1,3-1,7 V		
Engine coolant temperature (ECT) sensor	B24	←	Ignition ON - coolant temp. 100°C	0,4-0,5 V		
Engine coolant temperature (ECT) sensor	B57	⊣	Ignition ON	0 V		
Engine diagnostic link	A12	⇦		Connected pin - no test data available or random digital signal		
Evaporative emission (EVAP) canister purge valve	B13	⊣▷	Ignition ON	11-14 V		
Evaporative emission (EVAP) canister purge valve	B13	⊣▷	Engine idling		10 V/20 ms	
Exhaust gas recirculation (EGR) valve actuator	B3	⊣▷	Ignition ON	11-14 V		
Exhaust gas recirculation (EGR) valve actuator	B3	⊣▷	Engine idling		10 V/40 ms	

Exhaust gas recirculation (EGR) valve actuator	B4		Ignition ON	11-14 V		
Exhaust gas recirculation (EGR) valve actuator	B4		Engine idling		10 V/40 ms	
Exhaust gas recirculation (EGR) valve actuator	B5		Ignition ON	11-14 V		
Exhaust gas recirculation (EGR) valve actuator	B5		Engine idling		10 V/40 ms	
Exhaust gas recirculation (EGR) valve actuator	B6		Ignition ON	11-14 V		
Exhaust gas recirculation (EGR) valve actuator	B6		Engine idling		10 V/40 ms	
Fuel gauge tank sensor	A24			Connected pin - no test data available or random digital signal		
Fuel pump (FP) relay	A15		Ignition ON	0-2,5 V for 2 secs then 11-14 V		
Fuel pump (FP) relay	A15		Engine idling	0-2,5 V		
Heated oxygen sensor (HO2S) 1	B32		Ignition ON	11-14 V		
Heated oxygen sensor (HO2S) 1	B32		Engine idling		5 V/0,1 sec.	
Heated oxygen sensor (HO2S) 1	B34		Ignition ON	0 V		
Heated oxygen sensor (HO2S) 1	B35		Ignition ON	0,1-4,8 V		
Heated oxygen sensor (HO2S) 1	B37		Engine idling	2,6-2,8 V		
Heated oxygen sensor (HO2S) 1	B38		Engine idling	3,0-3,2 V		
Heated oxygen sensor (HO2S) 2	B47		Ignition ON	11-14 V		
Heated oxygen sensor (HO2S) 2	B47		Engine idling		5 V/0,2 sec.	
Heated oxygen sensor (HO2S) 2	B11		Engine idling		0,2 mV/0,2 sec.	
Heated oxygen sensor (HO2S) 2	B57		Ignition ON	0 V		
Ignition coil 1	B21		Engine idling		2 V/40 ms	
Ignition coil 2	B20		Engine idling		2 V/40 ms	
Ignition coil 3	B19		Engine idling		2 V/40 ms	
Ignition coil 4	B18		Engine idling		2 V/40 ms	
Ignition switch	A29		Ignition OFF	0-1 V		
Ignition switch	A29		Ignition ON	11-14 V		
Immobilizer read coil	A13		Ignition ON	11-14 V		
Immobilizer read coil	A28		Ignition ON	11-14 V		

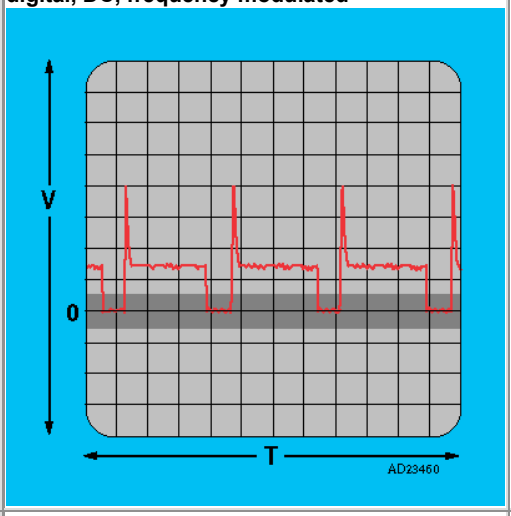
Injector 1	B1		Ignition ON	11-14 V		
Injector 1	B1		Engine idling	2-4 ms	10 V/2 ms	
Injector 2	B2		Ignition ON	11-14 V		
Injector 2	B2		Engine idling	2-4 ms	10 V/2 ms	
Injector 3	B16		Ignition ON	11-14 V		
Injector 3	B16		Engine idling	2-4 ms	10 V/2 ms	
Injector 4	B17		Ignition ON	11-14 V		
Injector 4	B17		Engine idling	2-4 ms	10 V/2 ms	
Intake air temperature (IAT) sensor	B25		Ignition ON - air temp. 0°C	3,1-3,6 V		
Intake air temperature (IAT) sensor	B25		Ignition ON - air temp. 40°C	1,3-1,6 V		
Intake air temperature (IAT) sensor	B25		Ignition ON - air temp. 80°C	0,4-0,6 V		
Intake air temperature (IAT) sensor	B57		Ignition ON	0 V		
Intake manifold air control solenoid	B33		Ignition ON	11-14 V		
Knock sensor (KS)	B56		Engine idling - accelerate briefly		1 V/5 ms	
Manifold absolute pressure (MAP) sensor	B14		Ignition ON	5 V		
Manifold absolute pressure (MAP) sensor	B55		Ignition ON	4 V		
Manifold absolute pressure (MAP) sensor	B55		Engine idling	0,4-2 V		
Manifold absolute pressure (MAP) sensor	B57		Ignition ON	0 V		
Mass air flow (MAF) sensor	B26		Ignition ON	0,5-1 V		
Mass air flow (MAF) sensor	B26		Engine idling	1,3-1,8 V		
Mass air flow (MAF) sensor	B27		Ignition ON	0 V		
Power steering pressure (PSP) switch	B7		Engine idling - steering wheel not turned	11-14 V		
Power steering pressure (PSP) switch	B7		Engine idling - steering wheel turned	0-1 V		
Starter motor relay	B22		Ignition ON	0-1 V		
Starter motor relay	B22		Engine cranking	8-14 V		
Throttle control unit relay	A17		Ignition OFF	0 V		
Throttle control unit relay	A17		Ignition ON	11-14 V		
Throttle control unit relay	A50		Ignition ON	0-1 V		
Throttle motor	B44		Ignition ON - accelerator pedal fully depressed		5 V/2 ms	

Throttle motor	B45	⇨	Ignition ON - accelerator pedal released		5 V/2 ms	28
Throttle motor position sensor	B40	⬅	Ignition ON - throttle closed	1,6-1,9 V		
Throttle motor position sensor	B40	⬅	Ignition ON - throttle fully open	3,8-4,4 V		
Throttle motor position sensor	B41	⊣	Ignition ON	0 V		
Throttle motor position sensor	B53	⇨	Ignition ON	5 V		
Throttle motor position sensor	B54	⬅	Ignition ON - throttle closed	0,7-1 V		
Throttle motor position sensor	B54	⬅	Ignition ON - throttle fully open	3,6-4,2 V		

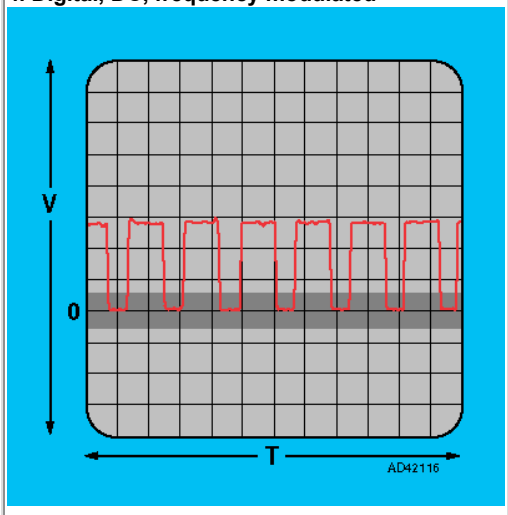
2. Analogue, AC, frequency modulated



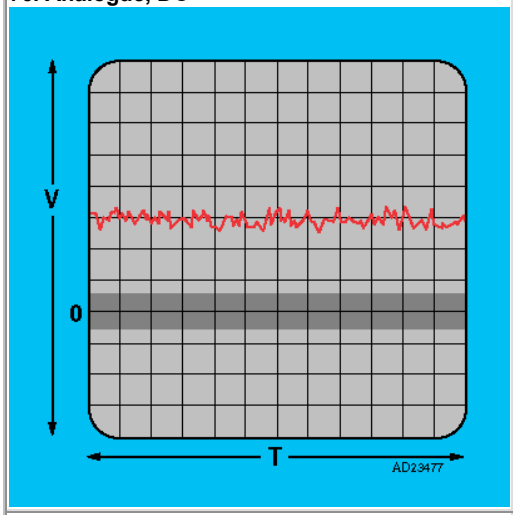
59. Digital, DC, pulse width modulated or digital, DC, frequency modulated



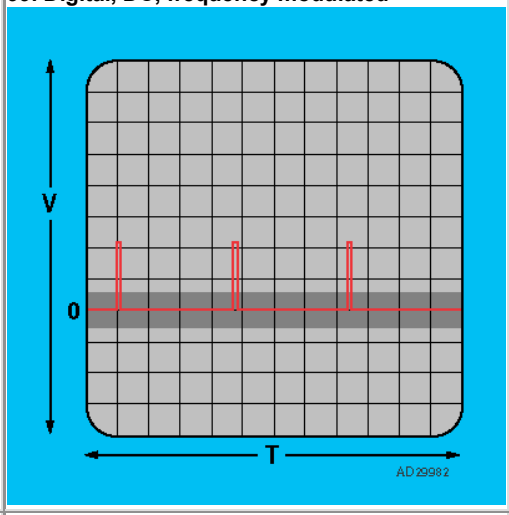
4. Digital, DC, frequency modulated



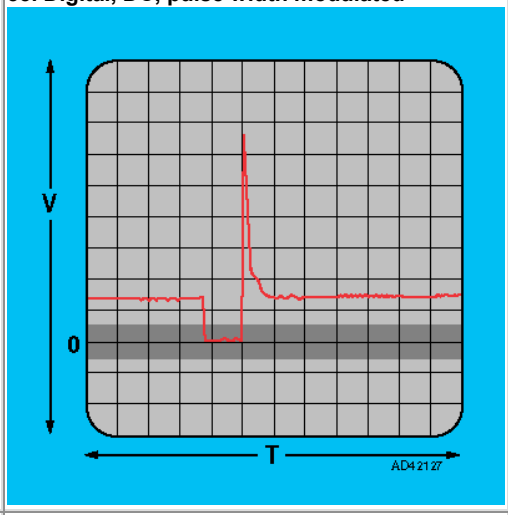
76. Analogue, DC



99. Digital, DC, frequency modulated

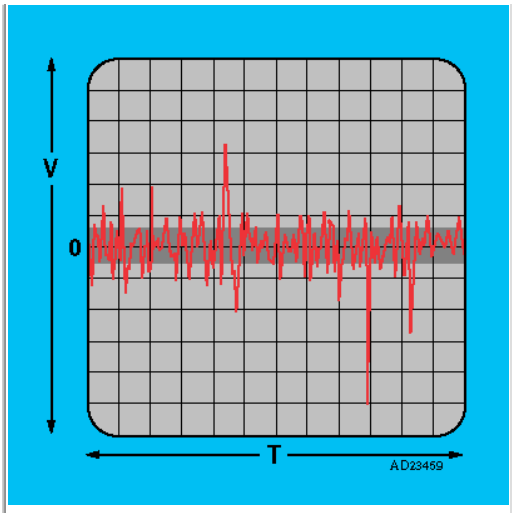


35. Digital, DC, pulse width modulated

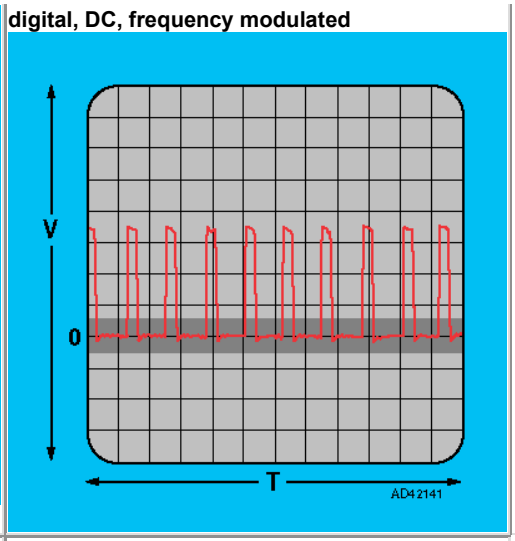


58. Analogue, AC

28. Digital, DC, pulse width modulated or



digital, DC, frequency modulated



	input/output signal
	input signal
	output signal
	ECM switched earth
	ECM earth circuit