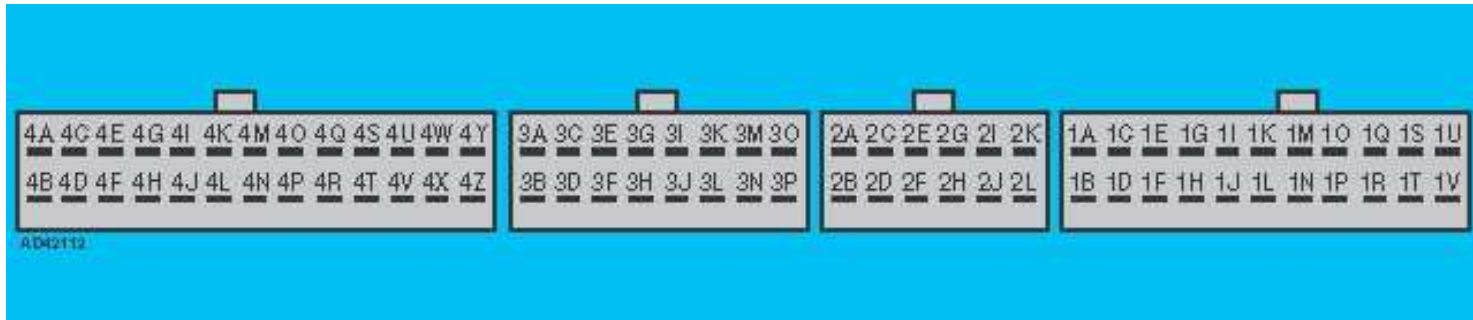






















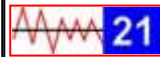
Terminal side








Wire side



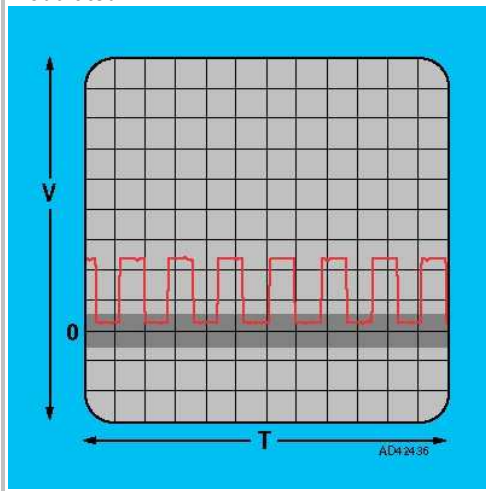
Component/circuit description	ECM pin	Signal	Condition	Typical value	Oscilloscope setting (Suggested settings - Voltage/time per division)	Wave form
AC condenser blower motor relay	1V		AC ON - condenser blower motor ON	0 V		
AC condenser blower motor relay	1V		AC ON - condenser blower motor OFF	11-14 V		
AC control module - through refrigerant pressure switch	1O		Engine idling - AC OFF	11-14 V		
AC control module - through refrigerant pressure switch	1O		Engine idling - AC ON	4 V		
AC relay	1G		Engine idling - AC OFF	11-14 V		
AC relay	1G		Engine idling - AC ON	0 V		
Battery	4I		Ignition OFF	11-14 V		
Brake pedal position (BPP) switch - MT	1Q		Ignition OFF - brake pedal released	0 V		
Brake pedal position (BPP) switch - MT	1Q		Ignition OFF - brake pedal depressed	11-14 V		
Camshaft position (CMP) sensor	4G		Ignition ON - engine turned	0 V or 5 V switching		
Camshaft position (CMP) sensor	4G		Engine idling	2,5 V	2 V/0,1 sec.	
Closed throttle position (CTP) switch	3L		Ignition ON - throttle closed	0 V		
Closed throttle position (CTP) switch	3L		Ignition ON - throttle slightly open	11-14 V		
Closed throttle position (CTP) switch	3O		Ignition ON	0 V		
Clutch pedal position (CPP) switch	1L		Ignition ON - gear lever not in neutral - clutch pedal depressed	0 V		
Clutch pedal position (CPP) switch	1L		Ignition ON - gear lever not in neutral - clutch pedal released	11-14 V		
Crankshaft position (CKP) sensor	4E (4H)		Engine idling		1 V/10 ms	
Crankshaft position (CKP) sensor	4H (4E)		Engine idling		1 V/10 ms	
Crankshaft position (CKP) sensor	4E		Ignition ON	0 V		
Data link connector (DLC)	1E			Connected pin - no test data available or random digital signal		

Data link connector (DLC)	1I			Connected pin - no test data available or random digital signal		
Data link connector (DLC)	4M			Connected pin - no test data available or random digital signal		
Earth	4A		Ignition ON	0 V		
Earth	4C		Ignition ON	0 V		
Earth	4D		Ignition ON	0 V		
Earth - MT	3A		Ignition ON	0 V		
Engine coolant blower control module - AT	1A		Engine idling - coolant blower motor OFF	11-14 V		
Engine coolant blower control module - AT	1A		Engine idling - coolant blower motor ON - high speed	0 V		
Engine coolant blower motor relay	1B		Engine idling - coolant blower motor OFF	11-14 V		
Engine coolant blower motor relay	1B		Engine idling - coolant blower motor ON	0 V		
Engine coolant temperature (ECT) sensor	3G		Ignition ON - coolant temp. 20°C	2 V		
Engine coolant temperature (ECT) sensor	3G		Ignition ON - engine hot	0,8 V		
Engine coolant temperature (ECT) sensor	3O		Ignition ON	0 V		
Exhaust gas recirculation (EGR) solenoid - vacuum	4P		Ignition ON	11-14 V		
Exhaust gas recirculation (EGR) solenoid - vacuum	4P		Engine idling	11-14 V		
Exhaust gas recirculation (EGR) solenoid - vent	4O		Ignition ON	11-14 V		
Exhaust gas recirculation (EGR) solenoid - vent	4O		Engine idling	11-14 V		
Exhaust gas recirculation (EGR) valve position sensor	3I		Ignition ON	5 V		
Exhaust gas recirculation (EGR) valve position sensor	3J		Ignition ON	0,8 V		
Exhaust gas recirculation (EGR) valve position sensor	3J		Vehicle moving	2,2-2,7 V		
Exhaust gas recirculation (EGR) valve position sensor	3O		Ignition ON	0 V		
Front fog lamps relay	1N		Headlamps ON - fog lamps OFF	0 V		
Front fog lamps relay	1N		Headlamps ON - fog lamps ON	11-14 V		
Fuel pressure regulator control solenoid	4J		Ignition ON	11-14 V		
Fuel pressure regulator control solenoid	4J		Start engine - engine hot	0 V for 120 secs then 11-14 V		
Fuel pump relay	1U		Ignition ON	0 V briefly then 11-14 V		
Fuel pump relay	1U		Engine idling	0 V		
Fuel pump relay	4B		Ignition OFF	0 V		
Fuel pump relay	4B		Ignition ON	11-14 V		
Headlamp switch	1H		Headlamps OFF	0 V		
Headlamp switch	1H		Headlamps ON	11-14 V		
Heated oxygen sensor (HO2S) - LH	3D		Engine idling - engine hot	0,1-0,9 V fluctuating	0,2 V/1 sec.	
Heated oxygen sensor (HO2S) - LH	3D		RPM increasing - engine hot	0,5-1 V fluctuating		
Heated oxygen sensor (HO2S) - LH	3D		RPM decreasing - engine hot	0-0,4 V fluctuating		

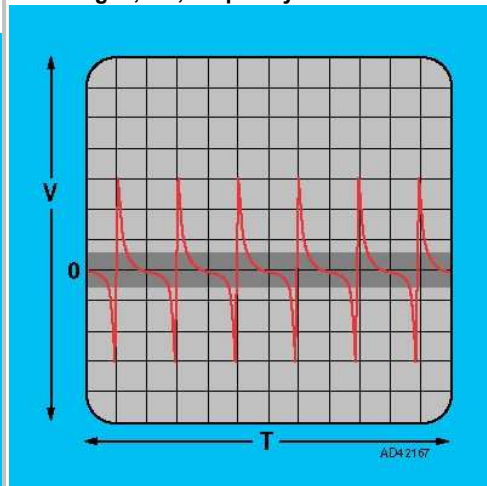
Heated oxygen sensor (HO2S) - RH	3C	←	Engine idling - engine hot	0,1-0,9 V fluctuating	0,2 V/1 sec.	 21
Heated oxygen sensor (HO2S) - RH	3C	←	RPM increasing - engine hot	0,5-1 V fluctuating		
Heated oxygen sensor (HO2S) - RH	3C	←	RPM decreasing - engine hot	0-0,4 V fluctuating		
Heated rear window switch	1J	←	Ignition ON - heated rear window OFF	11-14 V		
Heated rear window switch	1J	←	Ignition OFF - heated rear window ON	0 V		
Heater/AC motor switch	1P	←	Ignition ON - heater motor switch in position OFF, 1 or 2	11-14 V		
Heater/AC motor switch	1P	←	Ignition ON - heater motor switch in position 3 or 4	0 V		
Idle air control (IAC) valve	4Q	⇒	Ignition ON	6 V		
Idle air control (IAC) valve	4Q	⇒	Engine idling - engine hot	10 V		
Idle air control (IAC) valve	4Q	⇒	Engine idling - engine hot	37%		
Ignition amplifier	4N	⇒	Ignition ON	0 V		
Ignition amplifier	4N	⇒	Engine idling	0,6 V	1 V/10 ms	 32
Injector 1	4U	⇒	Ignition ON	11-14 V		
Injector 1	4U	⇒	Engine idling	4 ms	10 V/2 ms	 35
Injector 2	4V	⇒	Ignition ON	11-14 V		
Injector 2	4V	⇒	Engine idling	4 ms	10 V/2 ms	 35
Injector 3	4W	⇒	Ignition ON	11-14 V		
Injector 3	4W	⇒	Engine idling	4 ms	10 V/2 ms	 35
Injector 4	4X	⇒	Ignition ON	11-14 V		
Injector 4	4X	⇒	Engine idling	4 ms	10 V/2 ms	 35
Injector 5	4Y	⇒	Ignition ON	11-14 V		
Injector 5	4Y	⇒	Engine idling	4 ms	10 V/2 ms	 35
Injector 6	4Z	⇒	Ignition ON	11-14 V		
Injector 6	4Z	⇒	Engine idling	4 ms	10 V/2 ms	 35
Intake air temperature (IAT) sensor	3K	←	Ignition ON - air temp. 20°C	2,0 V		
Intake manifold air control solenoid 1	4K	⇒	Engine idling	11-14 V		
Intake manifold air control solenoid 1	4K	⇒	Engine running - 4900-6300 rpm	0 V		
Intake manifold air control solenoid 2	4L	⇒	Engine idling	11-14 V		
Intake manifold air control solenoid 2	4L	⇒	Engine running - 4900-6300 rpm	0 V		
Mass air flow (MAF) sensor	3B	←	Engine idling	1-2 V		
Mass air flow (MAF) sensor	3O	⇒	Ignition ON	0 V		
Neutral position (NP) switch - MT	1L	←	Ignition ON - gear lever in neutral	0 V		
Neutral position (NP) switch - MT	1L	←	Ignition ON - gear lever not in neutral	11-14 V		
Park/neutral position (PNP) switch - AT	1L	←	Ignition ON - AT in P or N	0 V		

Park/neutral position (PNP) switch - AT	1L	←	Ignition ON - AT not in P or N	11-14 V		
Power steering pressure (PSP) switch - if fitted	3P	←	Engine idling - steering wheel not turned	11-14 V		
Power steering pressure (PSP) switch - if fitted	3P	←	Engine idling - steering wheel turned	0 V		
Starter motor	1C	←	Engine cranking	9 V		
Throttle position (TP) sensor	3F	←	Ignition ON - throttle closed	0,1-1,1 V		
Throttle position (TP) sensor	3F	←	Ignition ON - throttle fully open	2,8-4,5 V		
Throttle position (TP) sensor	3I	⇒	Ignition ON	5 V		
Throttle position (TP) sensor	3O	↘	Ignition ON	0 V		
Transmission control module (TCM) - AT	1K	↗	Engine idling - coolant temp. 60°C max.	0 V		
Transmission control module (TCM) - AT	1K	↗	Engine idling - coolant temp. 60°C min.	11-14 V		
Transmission control module (TCM) - AT	1R	←	Engine idling	2,5 V		
Transmission control module (TCM) - AT	1R	←	Vehicle moving - AT shifts up	11-14 V		
Transmission control module (TCM) - AT	1S	←	Engine idling	11-14 V		
Transmission control module (TCM) - AT	1S	←	Vehicle moving - AT shifts down	0 V		
Transmission control module (TCM) - AT	1T	←	Ignition ON	0 V or 11 V		
Transmission control module (TCM) - AT	1T	←	Engine idling	6 V		
Transmission control module (TCM) - AT	3H	←	Ignition ON	3,9 V		
Vehicle speed sensor (VSS)	1M	←	Ignition ON - vehicle pushed	0 V or 5 V switching		
Vehicle speed sensor (VSS)	1M	←	Vehicle moving	2,5 V		

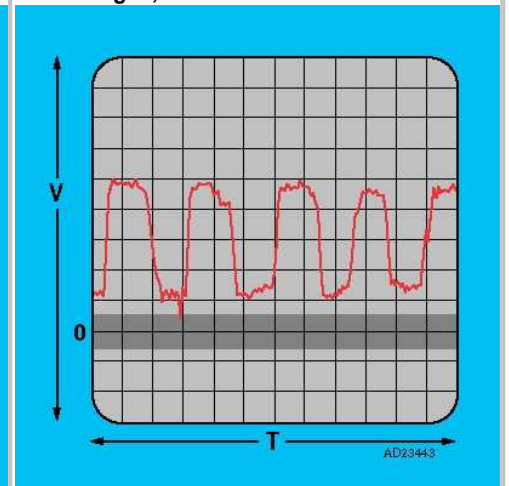
45. Digital, DC, frequency & pulse width modulated



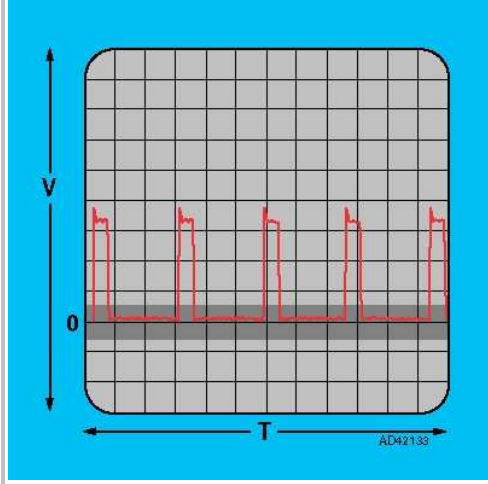
1. Analogue, AC, frequency modulated



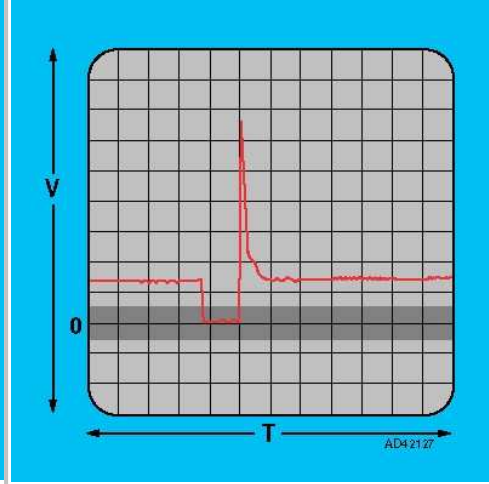
21. Analogue, DC








32. Digital, DC, frequency modulated



35. Digital, DC, pulse width modulated



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