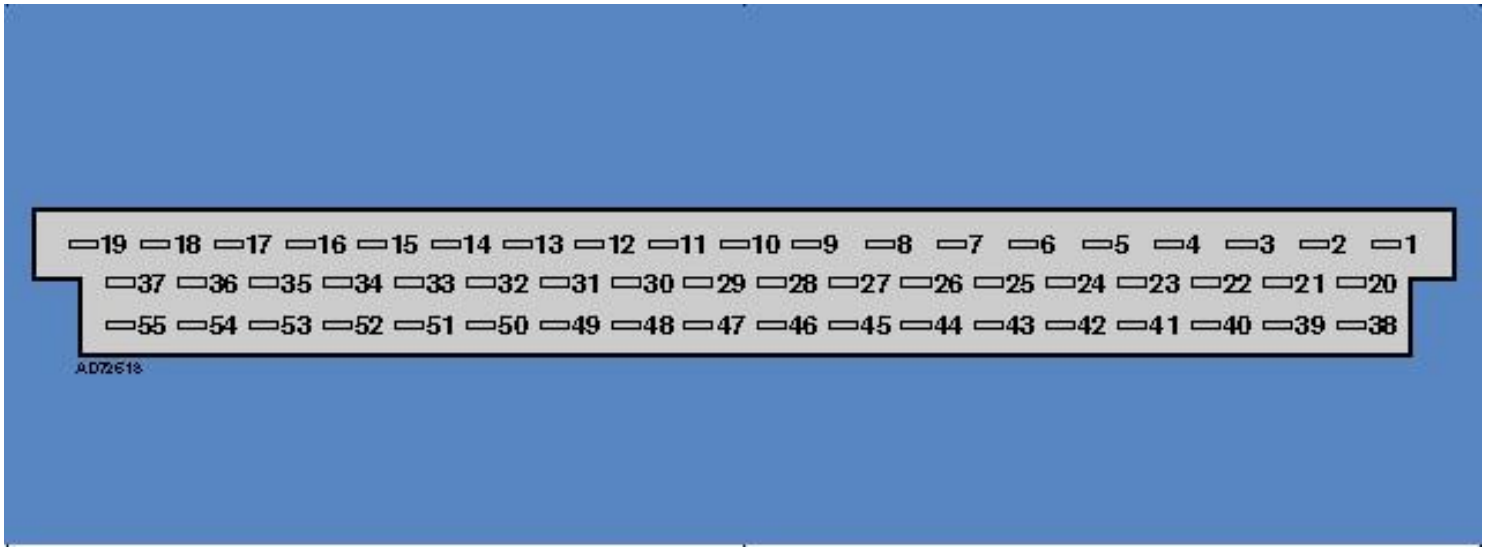
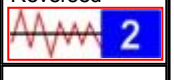
Telephone:
Fax:
VAT Registration No.:

Terminal side



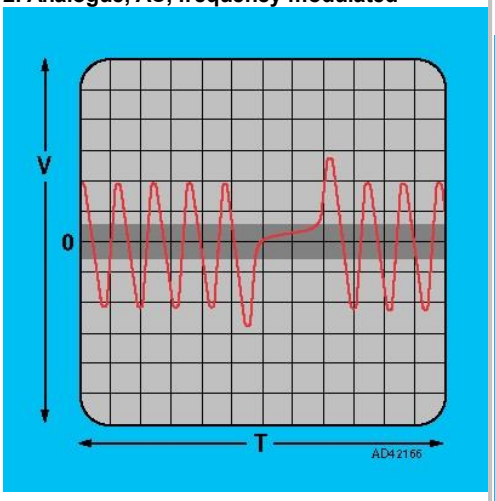
Wire side

Component/circuit description	ECM pin	Signal	Condition	Typical value	Oscilloscope setting (Suggested settings - Voltage/time per division)	Wave form
AC compressor clutch relay	23	←	AC compressor ON	10,5 V min.		
Air conditioning	40	←	AC compressor ON	11-14 V		
Air conditioning	41	←	AC ON	11-14 V		
Battery	18	←	Ignition OFF	11-14 V		
Closed throttle position (CTP) switch	30	⊣	Ignition ON	0 V		
Closed throttle position (CTP) switch	52	←	Ignition ON - throttle closed	0 V		
Closed throttle position (CTP) switch	52	←	Ignition ON - throttle slightly open	11-14 V		
Crankshaft position (CKP) sensor	47 (48)	←	Engine idling		2 V/1 ms	
Crankshaft position (CKP) sensor	48 (47)	←	Engine idling		2 V/1 ms	Reversed 
Crankshaft position (CKP) sensor - shield wire	19	⊣	Ignition ON	0 V		

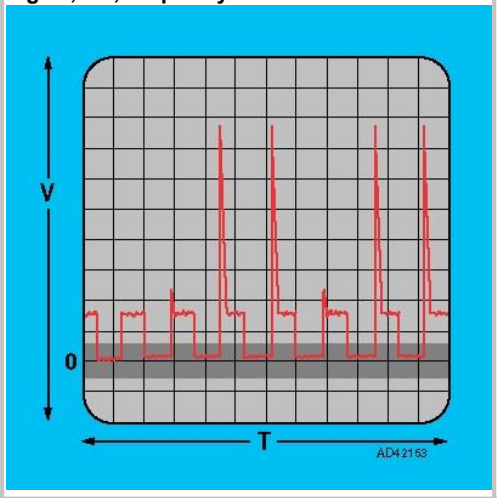
Data link connector (DLC)	13			Connected pin - no test data available or random digital signal		
Data link connector (DLC)	55			Connected pin - no test data available or random digital signal		
Earth	14		Ignition ON	0 V		
Earth	19		Ignition ON	0 V		
Earth	24		Ignition ON	0 V		
Engine control module (ECM) - pin 13	15			Connected pin - no test data available or random digital signal		
Engine control module (ECM) - pin 15	13			Connected pin - no test data available or random digital signal		
Engine coolant temperature (ECT) sensor	30		Ignition ON	0 V		
Engine coolant temperature (ECT) sensor	45		Ignition ON - coolant temp. 20°C	2,2 V		
Engine coolant temperature (ECT) sensor	45		Ignition ON - coolant temp. 80°C	1 V		
Evaporative emission (EVAP) canister purge valve	5		Engine running	1-99%	10 V/50 ms	
Heated oxygen sensor (HO2S)	10		Ignition ON	0 V		
Heated oxygen sensor (HO2S)	28		Engine idling - accelerate briefly	0,1-1,0 V fluctuating	0,2 V/1 sec.	
Heated oxygen sensor (HO2S) - shield wire	19		Ignition ON	0 V		
Ignition amplifier	1		Engine idling	30 Hz	1 V/20 ms	
Ignition amplifier	1		3000 rpm	100 Hz		
Ignition switch	27		Ignition ON	11-14 V		
Injectors - cylinders 1 & 2	16		Engine idling	4-5 ms	10 V/5 ms	
Injectors - cylinders 3 & 4	17		Engine idling	4-5 ms	10 V/5 ms	
Intake air temperature (IAT) sensor	44		Ignition ON - air temp. 20°C	2,2 V		
Malfunction indicator lamp (MIL)	15		Ignition ON - MIL ON	0-1 V		
Malfunction indicator lamp (MIL)	15		Engine running - MIL OFF	11-14 V		
Octane coding plug	30		Ignition ON	0 V		
Octane coding plug	46			Connected pin - no test data available or random digital signal		
Relay module	3		Ignition ON	0-1 V briefly then 11-14 V		
Relay module	3		Engine cranking	0-1 V		
Relay module	3		Engine running	0-1 V		
Relay module	36		Ignition OFF	11-14 V		
Relay module	36		Ignition ON	0-1 V		
Relay module	37		Ignition ON	11-14 V		
Starter motor inhibitor switch relay	42		Ignition ON - AT not in P or N	5 V		

Starter motor inhibitor switch relay	42	⇦	Ignition ON - AT in P or N	0-1 V		
Tachometer - some models	6	⇨	Engine idling	30 Hz		
Tachometer	6	⇨	3000 rpm	100 Hz		
Volume air flow (VAF) sensor	7	⇦	Ignition ON	0-1 V		
Volume air flow (VAF) sensor	7	⇦	Engine idling	1,2-1,6 V		
Volume air flow (VAF) sensor	7	⇦	2000 rpm	1,7-2,1 V		
Volume air flow (VAF) sensor	7	⇦	3000 rpm	2,3-2,7 V		
Volume air flow (VAF) sensor	7	⇦	4000 rpm	2,5-2,9 V		
Volume air flow (VAF) sensor	12	⇨	Ignition ON	5 V		
Volume air flow (VAF) sensor	26	⊣	Ignition ON	0 V		
Wide open throttle (WOT) switch	30	⊣	Ignition ON	0 V		
Wide open throttle (WOT) switch	53	⇦	Ignition ON - throttle closed	11-14 V		
Wide open throttle (WOT) switch	53	⇦	Ignition ON - throttle fully open	0 V		

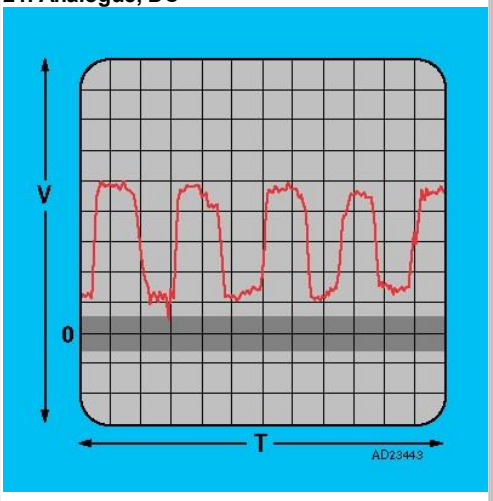
2. Analogue, AC, frequency modulated



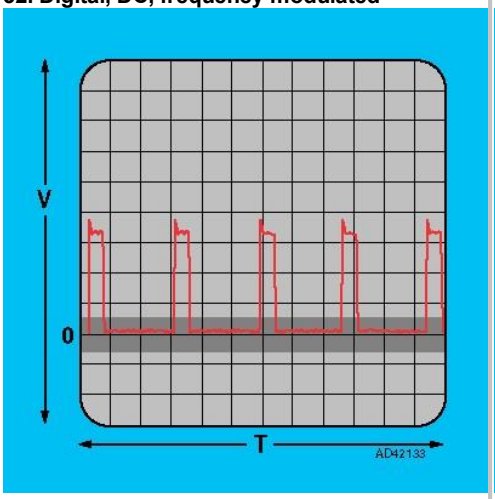
20. Digital, DC, pulse width modulated or digital, DC, frequency modulated



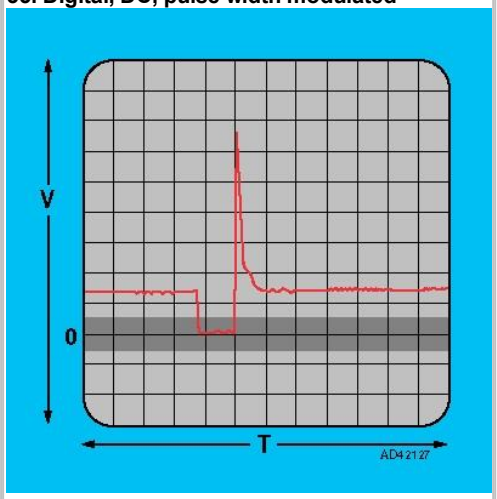
21. Analogue, DC



32. Digital, DC, frequency modulated



35. Digital, DC, pulse width modulated



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