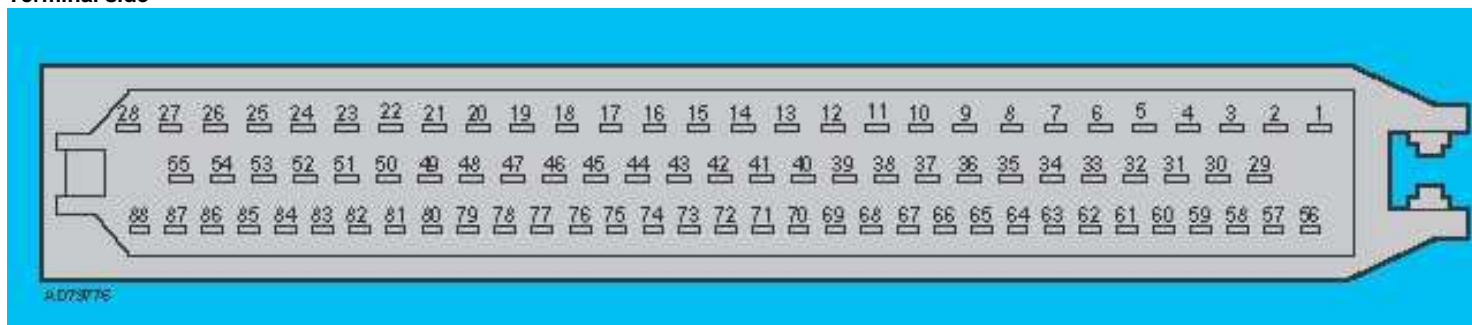
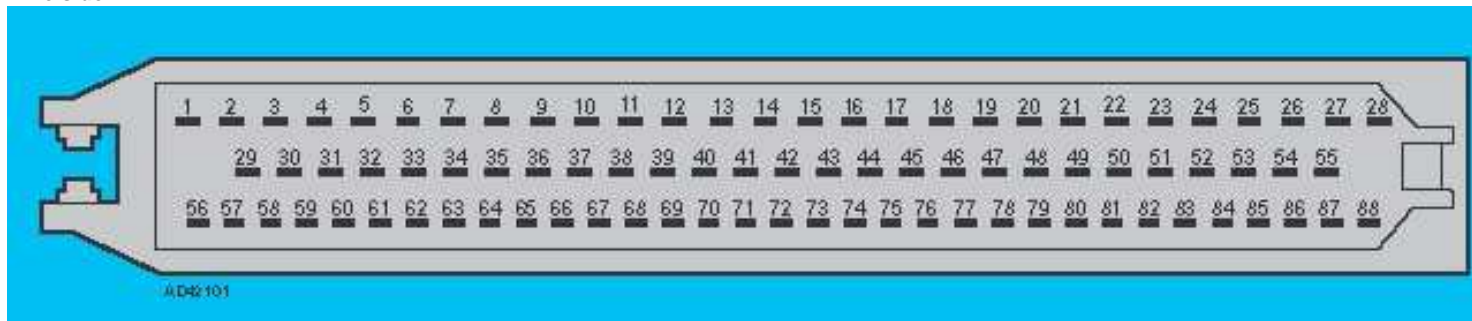


Terminal side











































Wire side



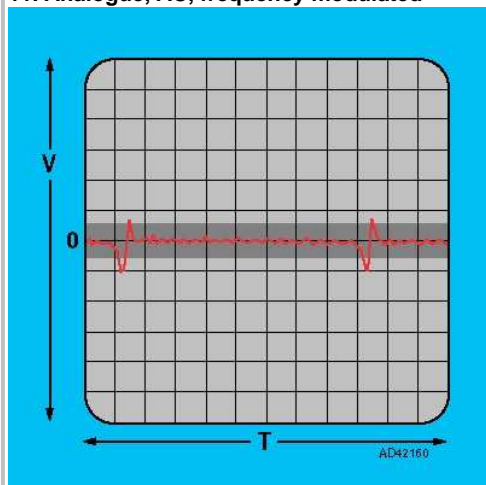
Component/circuit description	ECM pin	Signal	Condition	Typical value	Oscilloscope setting (Suggested settings - Voltage/time per division)	Wave form
AC compressor clutch relay	48		Ignition ON	11-14 V		
AC compressor clutch relay	48		Engine idling - AC compressor OFF	11-14 V		
AC compressor clutch relay	48		Engine idling - AC compressor ON	0-1 V		
AC control module - if fitted	86			Connected pin - no test data available or random digital signal		
AC refrigerant pressure switch	85			Connected pin - no test data available or random digital signal		
Alarm system control module	81			Connected pin - no test data available or random digital signal		
Battery	26		Ignition OFF	11-14 V		
Camshaft position (CMP) sensor	16		Engine cranking	0 V		
Camshaft position (CMP) sensor	16		Engine idling		5 V/20 ms	
Camshaft position (CMP) sensor	44		Ignition ON	0 V		
Crankshaft position (CKP) sensor	67		Engine cranking	3,7 V ac		
Crankshaft position (CKP) sensor	67		Engine idling	8 V ac	5 V/2 ms	
Crankshaft position (CKP) sensor	67		3000 rpm	21 V ac		
Crankshaft position (CKP) sensor	68		Ignition ON	0 V		
Data link connector (DLC)	60		Ignition ON	0 V		
Data link connector (DLC)	87		Ignition ON	11-14 V		
Data link connector (DLC)	88		Ignition ON	0 V		
Earth	6		Ignition ON	0 V		
Earth	28		Ignition ON	0 V		
Earth	34		Ignition ON	0 V		
Earth	55		Ignition ON	0 V		

Engine control relay	27		Ignition OFF	11-14 V		
Engine control relay	27		Ignition ON	0-1 V		
Engine control relay	27		Engine cranking	0-1 V		
Engine control relay	54		Ignition ON	11-14 V		
Engine coolant temperature (ECT) sensor	43		Ignition ON	0 V		
Engine coolant temperature (ECT) sensor	78		Ignition ON - 20°C	4 V		
Engine coolant temperature (ECT) sensor	78		Ignition ON - 80°C	1,1 V		
Evaporative emission (EVAP) canister purge valve	36		Ignition ON	11-14 V		
Evaporative emission (EVAP) canister purge valve	36		Engine hot - valve operating		10 V/20 ms	 20
Fuel pump relay	1		Ignition ON	11-14 V		
Fuel pump relay	1		Engine idling	0 V		
Heated oxygen sensor (HO2S)	70		Engine idling - engine hot	0,1-1,0 V fluctuating	0,2 V/1 sec.	 21
Heated oxygen sensor (HO2S)	71		Ignition ON	0 V		
Idle air control (IAC) valve	2		Ignition ON	5 V		
Idle air control (IAC) valve	2		Engine idling	70%	5 V/20 ms	 25
Idle air control (IAC) valve	29		Ignition ON	5-7,5 V fluctuating		
Idle air control (IAC) valve	29		Engine idling	26%	5 V/20 ms	 25
Ignition coil - cylinder 1	25		Ignition ON	11-14 V		
Ignition coil - cylinder 1	25		Engine cranking	9 V		
Ignition coil - cylinder 1	25		Engine idling		5 V/2 ms	 33
Ignition coil - cylinder 2	23		Ignition ON	11-14 V		
Ignition coil - cylinder 2	23		Engine cranking	9 V		
Ignition coil - cylinder 2	23		Engine idling		5 V/2 ms	 33
Ignition coil - cylinder 3	24		Ignition ON	11-14 V		
Ignition coil - cylinder 3	24		Engine cranking	9 V		
Ignition coil - cylinder 3	24		Engine idling		5 V/2 ms	 33
Ignition coil - cylinder 4	50		Ignition ON	11-14 V		
Ignition coil - cylinder 4	50		Engine cranking	9 V		
Ignition coil - cylinder 4	50		Engine idling		5 V/2 ms	 33
Ignition coil - cylinder 5	52		Ignition ON	11-14 V		
Ignition coil - cylinder 5	52		Engine cranking	9 V		
Ignition coil - cylinder 5	52		Engine idling		5 V/2 ms	 33
Ignition coil - cylinder 6	51		Ignition ON	11-14 V		
Ignition coil - cylinder 6	51		Engine cranking	9 V		
Ignition coil - cylinder 6	51		Engine idling		5 V/2 ms	 33
Ignition switch	56		Ignition ON	11-14 V		

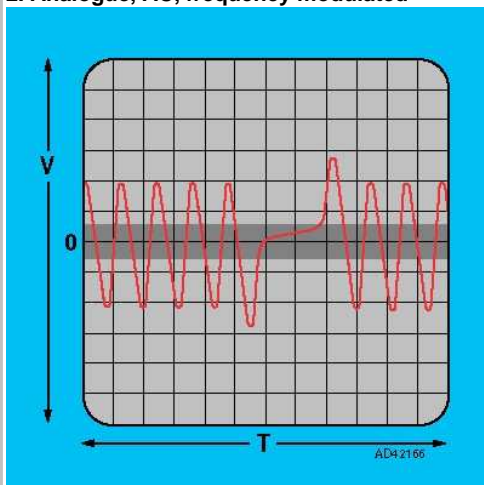
Injector 1	3		Ignition ON	11-14 V		
Injector 1	3		Engine idling - engine hot	3,4 ms	10 V/2 ms	 35
Injector 2	5		Ignition ON	11-14 V		
Injector 2	5		Engine idling - engine hot	3,4 ms	10 V/2 ms	 35
Injector 3	4		Ignition ON	11-14 V		
Injector 3	4		Engine idling - engine hot	3,4 ms	10 V/2 ms	 35
Injector 4	33		Ignition ON	11-14 V		
Injector 4	33		Engine idling - engine hot	3,4 ms	10 V/2 ms	 35
Injector 5	31		Ignition ON	11-14 V		
Injector 5	31		Engine idling - engine hot	3,4 ms	10 V/2 ms	 35
Injector 6	32		Ignition ON	11-14 V		
Injector 6	32		Engine idling - engine hot	3,4 ms	10 V/2 ms	 35
Instrument panel	17		Ignition ON	11-14 V		
Instrument panel	73		Ignition OFF	0 V		
Instrument panel	73		Ignition ON	11-14 V		
Instrument panel	74		Ignition OFF	0 V		
Instrument panel	74		Ignition ON	11-14 V		
Intake air temperature (IAT) sensor	43		Ignition ON	0 V		
Intake air temperature (IAT) sensor	77		Ignition ON - 10°C	3,8 V		
Mass air flow (MAF) sensor	14		Ignition ON	0 V		
Mass air flow (MAF) sensor	41		Ignition ON	1,0-2,0 V		
Mass air flow (MAF) sensor	41		Engine idling	1,9-2,7 V		
Mass air flow (MAF) sensor	41		3000 rpm	2,9-3 V		
Mass air flow (MAF) sensor	41		Engine idling - full throttle briefly	4 V		
Mass air flow (MAF) sensor - filament burn-off	13		Engine idling - engine hot	0 V		
Mass air flow (MAF) sensor - filament burn-off	13		1500 rpm min. - coolant temp. 65°C min. - switch ignition OFF	2-5 V briefly - after 5 seconds		
Oxygen sensor heater relay	37		Ignition ON	11-14 V		
Oxygen sensor heater relay	37		Engine idling	0 V		
Spare cable	8			Connected pin - no test data available or random digital signal		
Throttle position (TP) sensor	12		Ignition ON - throttle closed	0,5 V		
Throttle position (TP) sensor	12		Ignition ON - throttle fully open	4,5 V		
Throttle position (TP) sensor	43		Ignition ON	0 V		
Throttle position (TP) sensor	59		Ignition ON	5 V		
Transmission control module (TCM) - AT	11			Connected pin - no test data available or random digital signal		

Transmission control module (TCM) - AT	64	←		Connected pin - no test data available or random digital signal		
Transmission control module (TCM) - AT	74	⇒		Connected pin - no test data available or random digital signal		
Transmission control module (TCM) - AT	87	←		Connected pin - no test data available or random digital signal		
Transmission control module (TCM) - AT	88	←		Connected pin - no test data available or random digital signal		
Transmission shift position switch - AT	65	←		Connected pin - no test data available or random digital signal		
Trip computer	81	←		Connected pin - no test data available or random digital signal		

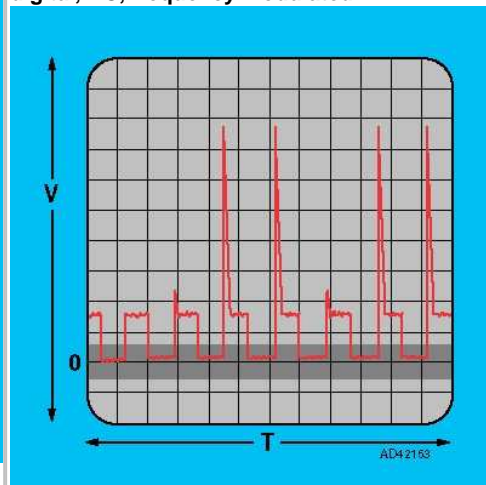
11. Analogue, AC, frequency modulated



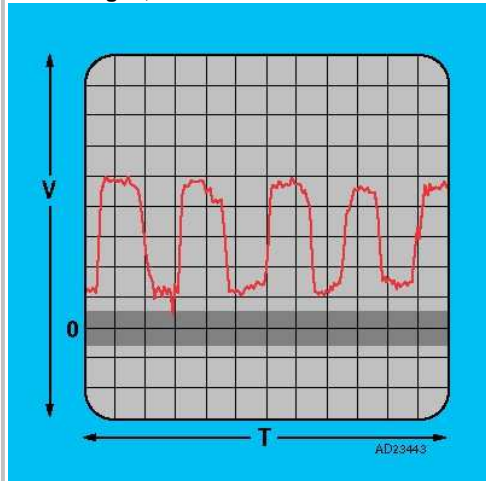
2. Analogue, AC, frequency modulated



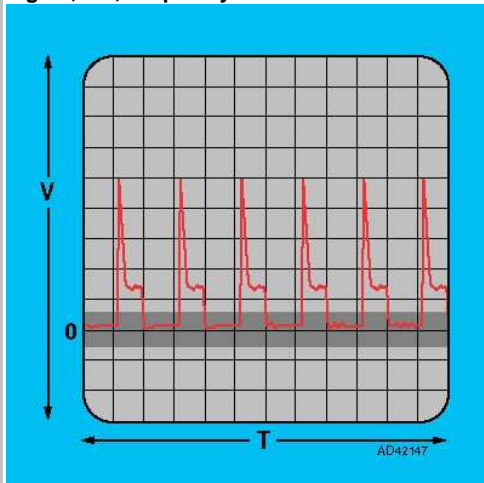
20. Digital, DC, pulse width modulated or digital, DC, frequency modulated



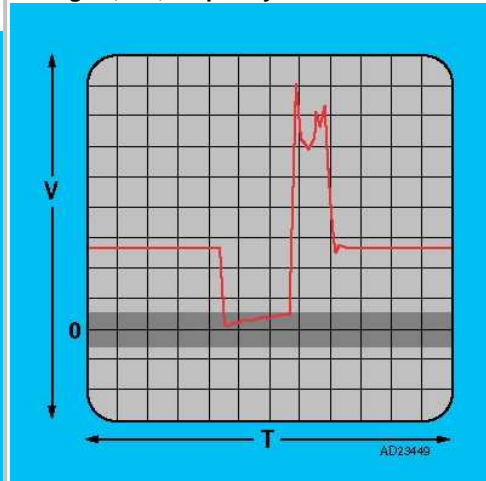
21. Analogue, DC



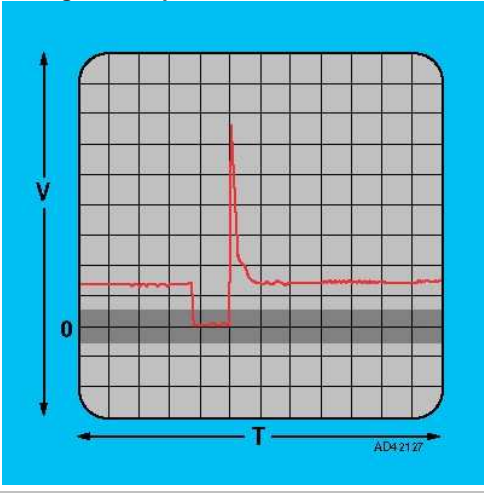
25. Digital, DC, pulse width modulated or digital, DC, frequency modulated








33. Digital, DC, frequency modulated



35. Digital, DC, pulse width modulated



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