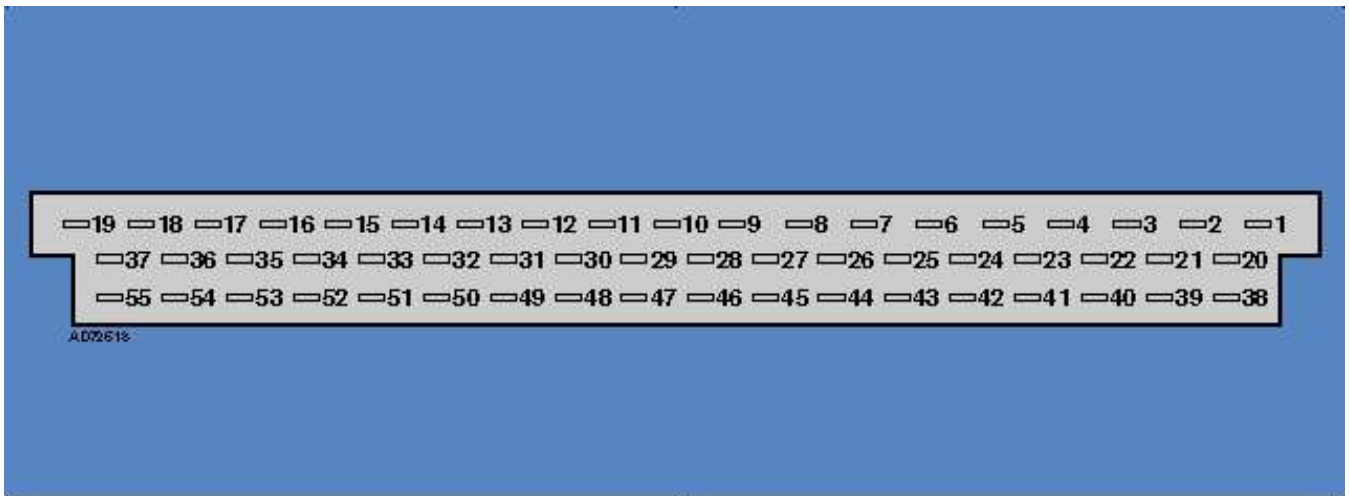


Telephone:
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K143	AC compressor clutch relay
X88	AC connector
S63	AC refrigerant pressure switch
S341	AC refrigerant triple pressure switch
A16	Anti-lock braking system (ABS) control module
31	Battery -
30	Battery +
B132	Camshaft position (CMP) sensor
B54	Crankshaft position (CKP) sensor
X1	Data link connector (DLC)
A161	Digital multifunction display
A35	Engine control module (ECM)
K46	Engine control relay
B24	Engine coolant temperature (ECT) sensor
H63	Engine malfunction indicator lamp (MIL)
B75	Engine speed (RPM) sensor
Y104	Evaporative emission (EVAP) canister purge valve
Y28	Exhaust gas recirculation (EGR) solenoid
M12	Fuel pump
K20	Fuel pump relay
F	Fuse
B72	Heated oxygen sensor (HO2S)
Y99	Idle air control (IAC) valve
T1	Ignition coil
15	Ignition switch - ignition ON
50	Ignition switch - start signal
Y3	Injector
A5	Instrument panel - MIL light
B25	Intake air temperature (IAT) sensor
B69	Knock sensor (KS)
B30	Mass air flow (MAF) sensor
S328	Module temperature switch
A171	Relay module
K213	Reverse polarity protection relay
M73	Secondary air injection (AIR) pump
K152	Secondary air injection (AIR) pump relay
Y111	Secondary air injection (AIR) solenoid
K4	Starter motor relay
P7	Tachometer
B147	Throttle position (TP) sensor

X79	Transmission connector
A57	Transmission control module (TCM)
B33	Vehicle speed sensor (VSS)

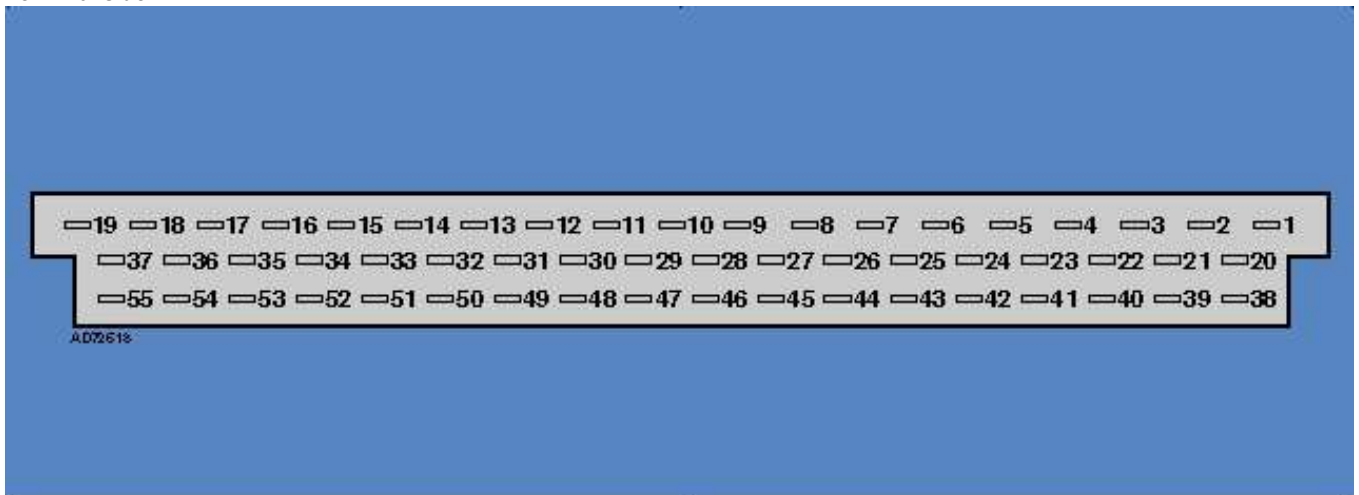


bl = blue	br = brown	el = cream	ge = yellow
gn = green	gr = grey	nf = neutral	og = orange
rs = pink	rt = red	sw = black	vi = violet
ws = white	hbl = light blue	hgn = light green	rbr = maroon
x = braided cable	y = high tension	z = non-cable connection	

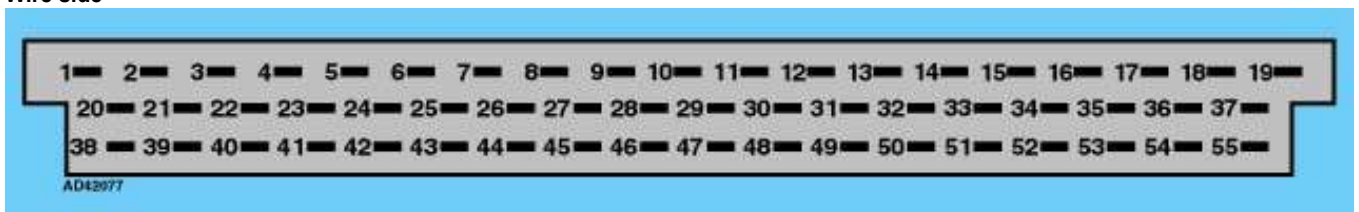
NOTE: In certain diagrams (Citroen, Peugeot & Renault), colour codes are replaced by numbers which are used to identify a particular cable and not the colour. In this instance, the cables will be numbered at each end close to the harness connector.

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Terminal side





Wire side



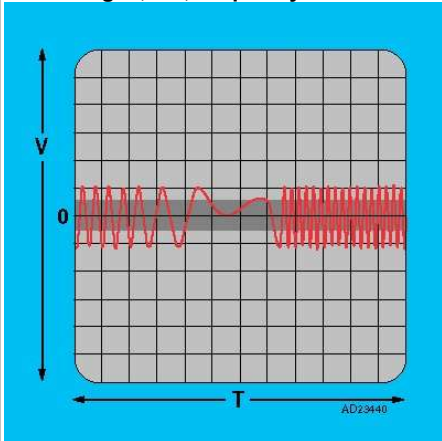
Component/circuit description	ECM pin	Signal	Condition	Typical value	Oscilloscope setting (Suggested settings - Voltage/time per division)	Wave form
Air conditioning	12	←	Ignition ON - AC OFF	0 V		
Air conditioning	12	←	Engine idling - engine hot - AC ON - AC compressor ON	11-14 V		
Air conditioning	31	←	Engine idling - engine hot - AC ON	11-14 V		
AC compressor clutch relay	53	↔	Engine idling - AC OFF	11-14 V		
AC compressor clutch relay	53	↔	Engine idling - AC ON - AC compressor ON	0 V		
AC switch	31	←	Ignition ON - AC OFF	0 V		
AC switch	31	←	Engine idling - engine hot - AC OFF	0 V		
Automatic transmission	11			Connected pin - no test data available or random digital signal		
Battery	18	←	Ignition OFF	11-14 V		

Camshaft position (CMP) sensor	2		Ignition ON	0 V		
Camshaft position (CMP) sensor	4 (2)		Ignition ON	150 kHz		
Camshaft position (CMP) sensor	4 (2)		Engine idling		0,5 V/2 ms	13
Camshaft position (CMP) sensor	22		Engine cranking	2 V		
Camshaft position (CMP) sensor	22		Engine idling		0,5 V/2 ms	13
Camshaft position (CMP) sensor - shield wire	19		Ignition ON	0 V		
Crankshaft position (CKP) sensor	2		Ignition ON	0 V		
Crankshaft position (CKP) sensor	3 (2)		Ignition ON	150 kHz		
Crankshaft position (CKP) sensor	3 (2)		Engine idling		5 V/2 ms	6
Crankshaft position (CKP) sensor	21		Engine cranking	2 V		
Crankshaft position (CKP) sensor	21		Engine idling		0,5 V/0,1 ms	83
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	9		Ignition ON	0 V		
Earth	19		Ignition ON	0 V		
Earth	24		Ignition ON	0 V		
Earth	28		Ignition ON	0 V		
Earth	41		Ignition ON	0 V		
Earth - MT	30		Ignition ON	0 V		
Engine control relay - Omega	16		Ignition OFF	11-14 V		
Engine control relay	16		Ignition ON	0-1 V		
Engine control relay	37		Ignition OFF	0 V		
Engine control relay	37		Ignition ON	11-14 V		
Engine control relay	46		Ignition OFF	0 V		
Engine control relay	46		Ignition ON	11-14 V		
Engine coolant temperature (ECT) sensor	5		Engine idling - coolant temp. 80-110°C	0,8-1,5 V		
Evaporative emission (EVAP) canister purge valve	17		Engine cranking	11-14 V		
Evaporative emission (EVAP) canister purge valve	17		Engine idling - engine hot	0%		
Evaporative emission (EVAP) canister purge valve	17		Engine running - accelerate briefly	1% min.	10 V/20 ms	20
Exhaust gas recirculation (EGR) solenoid - X20XEV	42		Engine cranking	11-14 V		
Exhaust gas recirculation (EGR) solenoid	42		Engine idling - engine hot	0%		

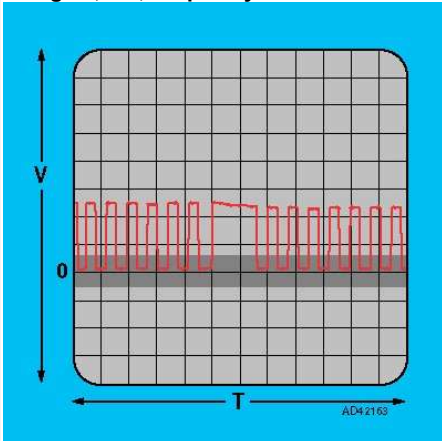
Exhaust gas recirculation (EGR) solenoid	42		Engine running - accelerate briefly	1% min.	10 V/0,1 sec.	Intermittent 19
Fuel pump relay - Omega	15		Ignition ON	0-1 V briefly then 11-14 V		
Fuel pump relay	15		Engine idling	0-1 V		
Heated oxygen sensor (HO2S)	7		Engine idling - engine hot	5 V		
Heated oxygen sensor (HO2S)	25		Engine idling - engine hot	0,4 V max. 3,85 V min. fluctuating	1 V/2 sec.	22
Heated oxygen sensor (HO2S)	36		Engine idling - engine hot		2 V/5 ms	65
Heated oxygen sensor (HO2S) - shield wire	19		Ignition ON	0 V		
Idle air control (IAC) valve	52		Engine idling - engine cold	6-6,5 V		
Idle air control (IAC) valve	52		Engine idling - engine hot	7-9 V	2 V/5 ms	24
Ignition coil	38		Engine cranking		5 V/2 ms	33
Ignition coil	40		Engine cranking		5 V/2 ms	33
Ignition coil - shield wire	19		Ignition ON	0 V		
Ignition switch	47		Ignition ON	11-14 V		
Immobilizer control module - if fitted	47			Connected pin - no test data available or random digital signal		
Injector 1	50		Engine running		10 V/2 ms	35
Injector 1 - C18XE/C18XEL	50		Engine running - engine hot	1,9-3,1 ms	10 V/2 ms	35
Injector 1 - X20XEV	50		Engine running - engine hot	2-3,5 ms	10 V/2 ms	35
Injector 2	49		Engine running		10 V/2 ms	35
Injector 2 - C18XE/C18XEL	49		Engine running - engine hot	1,9-3,1 ms	10 V/2 ms	35
Injector 2 - X20XEV	49		Engine running - engine hot	2-3,5 ms	10 V/2 ms	35
Injector 3	51		Engine running		10 V/2 ms	35
Injector 3 - C18XE/C18XEL	51		Engine running - engine hot	1,9-3,1 ms	10 V/2 ms	35
Injector 3 - X20XEV	51		Engine running - engine hot	2-3,5 ms	10 V/2 ms	35
Injector 4	48		Engine running		10 V/2 ms	35
Injector 4 - C18XE/C18XEL	48		Engine running - engine hot	1,9-3,1 ms	10 V/2 ms	35
Injector 4 - X20XEV	48		Engine running - engine hot	2-3,5 ms	10 V/2 ms	35
Instrument panel	14			Connected pin - no test data available or random digital signal		
Intake air temperature (IAT) sensor	6		Ignition ON - air temp. 10-80°C	0,5-3 V		
Knock sensor (KS)	1 (20)		2000 rpm	160 mV min. ac	50 mV/1 ms	38

Knock sensor (KS)	20 (1)	←	2000 rpm	160 mV min.	50 mV/1 ms	 38
Knock sensor (KS) - shield wire	19	↔	Ignition ON	0 V		
Malfunction indicator lamp (MIL)	35	↔	Ignition ON - MIL ON	0-1 V		
Malfunction indicator lamp (MIL)	35	↔	Engine idling - MIL OFF	11-14 V		
Mass air flow (MAF) sensor	8	↔	Engine running	0 V		
Mass air flow (MAF) sensor - C18XE/C18XEL	27	←	Engine idling - engine hot	0,25-0,67 V		
Mass air flow (MAF) sensor - X20XEV	27	←	Engine idling - engine hot	0,3-0,7 V		
Mass air flow (MAF) sensor - shield wire	19	↔	Ignition ON	0 V		
Module temperature switch - Omega	33	←		Connected pin - no test data available or random digital signal		
Park/neutral position (PNP) switch	30	←	Ignition ON - AT in P or N	0 V		
Park/neutral position (PNP) switch	30	←	Ignition ON - AT not in P or N	11-14 V		
Relay module - except Omega	15	↔	Ignition ON	0-1 V briefly then 11-14 V		
Relay module	15	↔	Engine idling	0-1 V		
Relay module	16	↔	Ignition OFF	11-14 V		
Relay module	16	↔	Ignition ON	0-1 V		
Relay module	37	←	Ignition OFF	0 V		
Relay module	37	←	Ignition ON	11-14 V		
Relay module	46	←	Ignition OFF	0 V		
Relay module	46	←	Ignition ON	11-14 V		
Secondary air injection (AIR) pump relay/AIR solenoid - X20XEV	44	↔	Engine idling - engine cold	0-1 V		
Secondary air injection (AIR) pump relay/AIR solenoid	44	↔	Engine idling - engine hot	11-14 V		
Tachometer	32	⇒		Connected pin - no test data available or random digital signal		
Throttle position (TP) sensor	26	←	Ignition ON - throttle closed	0,1-0,9 V		
Throttle position (TP) sensor	26	←	Ignition ON - throttle fully open	3,9-4,9 V		
Throttle position (TP) sensor	34	⇒	Ignition ON	5 V		
Throttle position (TP) sensor - shield wire	19		Ignition ON	0 V		
Transmission control module (TCM) - X20XEV	10	←	Engine idling - engine hot - AT in P or N	11-14 V		
Transmission control module (TCM)	10	←	Engine idling - engine hot - AT in D	0 V		
Vehicle speed sensor (VSS)	29	←	Ignition ON - vehicle moving	0-12 V fluctuating	5 V/2 sec.	 43

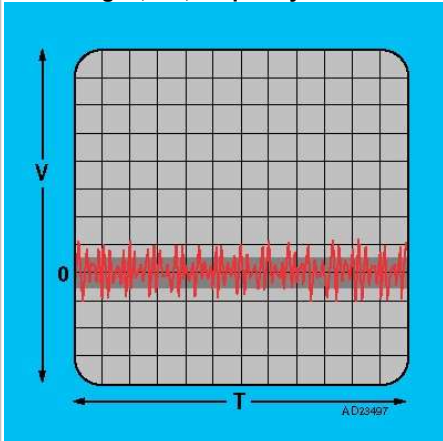
13. Analogue, AC, frequency modulated



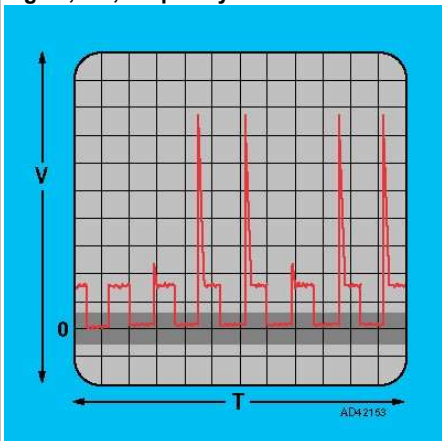
6. Digital, DC, frequency modulated



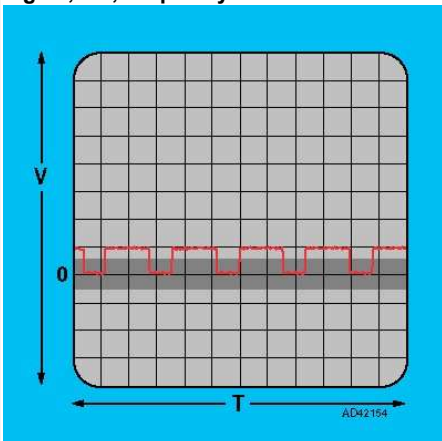
83. Analogue, AC, frequency modulated



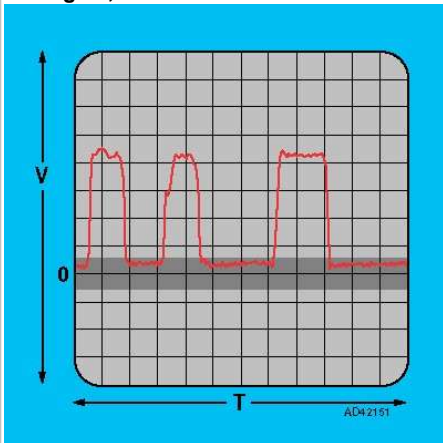
20. Digital, DC, pulse width modulated or digital, DC, frequency modulated



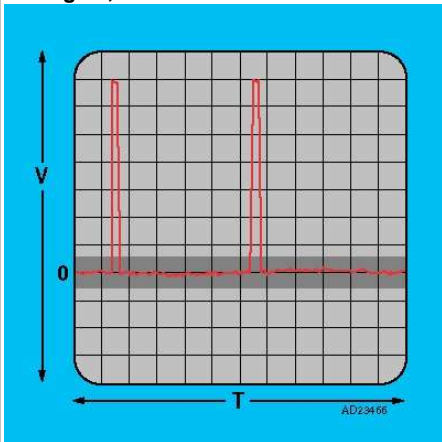
19. Digital, DC, pulse width modulated or digital, DC, frequency modulated



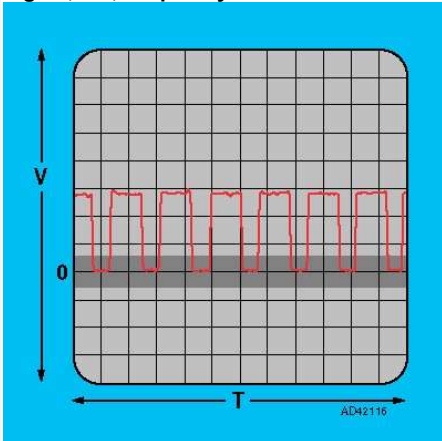
22. Digital, DC



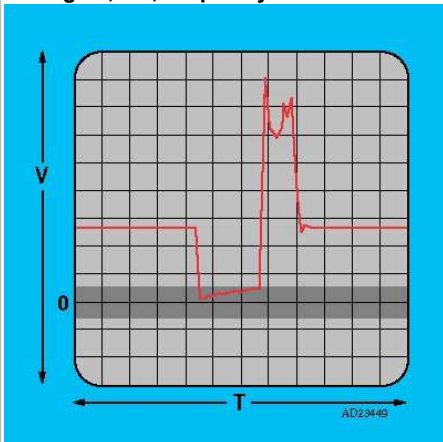
65. Digital, DC



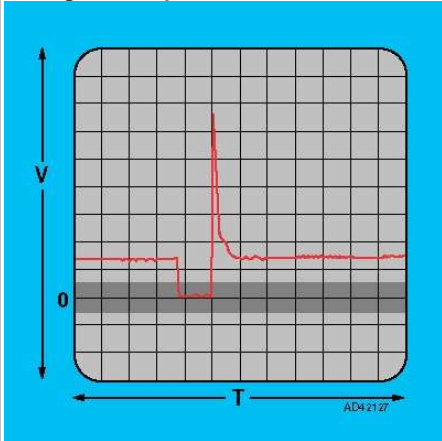
24. Digital, DC, pulse width modulated or digital, DC, frequency modulated



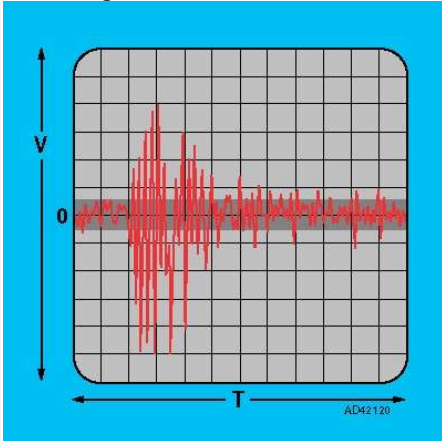
33. Digital, DC, frequency modulated



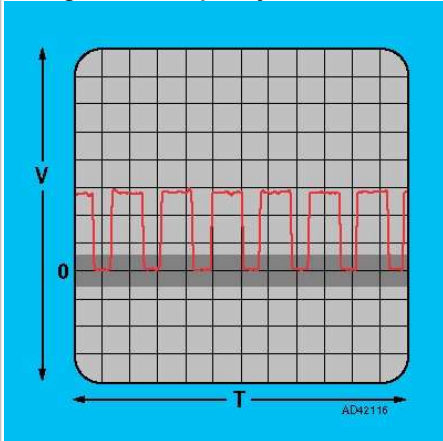
35. Digital, DC, pulse width modulated








38. Analogue, AC



43. Digital, DC, frequency modulated



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