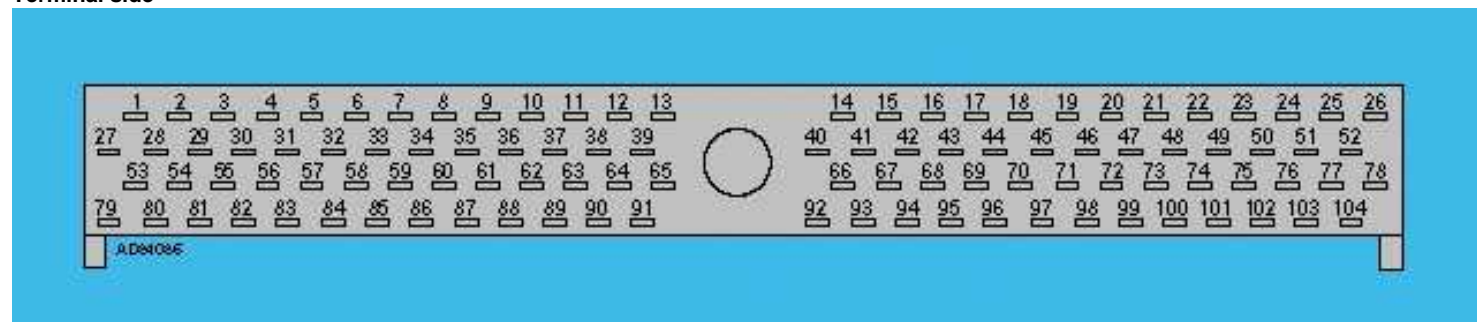


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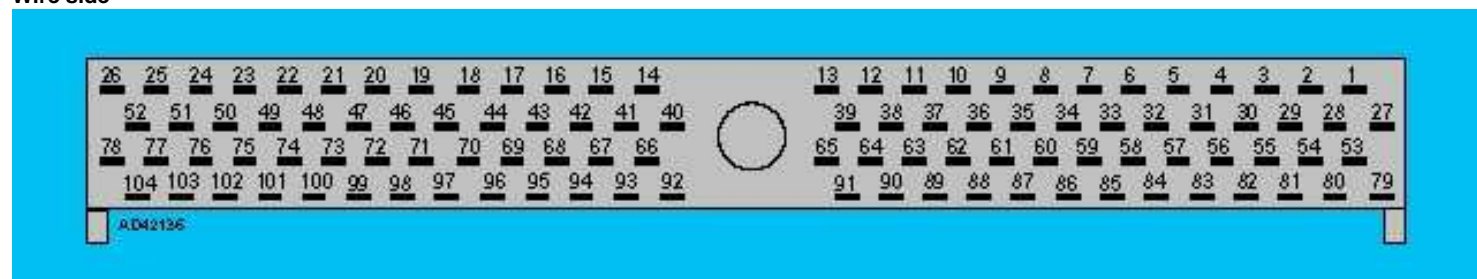
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VAT Registration No.:


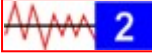
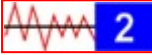
**Terminal side**








**Wire side**



Component/circuit description	ECM pin	Signal	Condition	Typical value	Oscilloscope setting (Suggested settings - Voltage/time per division)	Wave form
ABS control module - some models	4			Connected pin - no test data available or random digital signal		
AC compressor clutch relay	69		Engine idling - AC OFF	11-14 V		
AC compressor clutch relay	69		Engine idling - AC ON - AC compressor ON	0-1 V		
AC refrigerant pressure switch 1	41			Connected pin - no test data available or random digital signal		
AC refrigerant pressure switch 2 - AT	66			Connected pin - no test data available or random digital signal		
AC refrigerant pressure switch 2 - MT	86			Connected pin - no test data available or random digital signal		
Automatic transmission	1			Connected pin - no test data available or random digital signal		
Automatic transmission	27			Connected pin - no test data available or random digital signal		
Automatic transmission	53			Connected pin - no test data available or random digital signal		

Automatic transmission	72			Connected pin - no test data available or random digital signal		
Automatic transmission	81			Connected pin - no test data available or random digital signal		
Automatic transmission	84			Connected pin - no test data available or random digital signal		
Automatic transmission - with PATS	80			Connected pin - no test data available or random digital signal		
Automatic transmission - without PATS	54			Connected pin - no test data available or random digital signal		
Barometric pressure (BARO) sensor - some models	34	←		Connected pin - no test data available or random digital signal		
Barometric pressure (BARO) sensor	91	↔	Ignition ON	0 V		
Battery	55	←	Ignition OFF	11-14 V		
Brake pedal position (BPP) switch	92	↔	Ignition ON - brake pedal depressed	11-14 V		
Brake pedal position (BPP) switch	92	↔	Ignition ON - brake pedal released	0 V		
<u>Camshaft position (CMP) sensor</u>	76	↔	Engine idling	0 V		
<u>Camshaft position (CMP) sensor</u>	85	←	Engine idling		5 V/20 ms	 11
Clutch pedal position (CPP) switch	64	←	Ignition ON - clutch pedal released - gear lever not in neutral	5 V		
Clutch pedal position (CPP) switch	64	←	Ignition ON - clutch pedal depressed	0 V		
Clutch pedal position (CPP) switch	91	↔	Ignition ON	0 V		
<u>Crankshaft position (CKP) sensor</u> - MT 03/96-98	21	←	Engine idling		2 V/1 ms	 2
<u>Crankshaft position (CKP) sensor</u>	22	←	Engine idling		2 V/1 ms	 2
Data link connector (DLC)	13			Connected pin - no test data available or random digital signal		
Data link connector (DLC)	15			Connected pin - no test data available or random digital signal		
Data link connector (DLC)	16			Connected pin - no test data available or random digital signal		
Earth	24		Ignition ON	0 V		
Earth	25		Ignition ON	0 V		
Earth	51		Ignition ON	0 V		
Earth	77		Ignition ON	0 V		
Earth	103		Ignition ON	0 V		
Engine coolant blower motor relay	17	↔→	Engine idling - coolant blower motor OFF	11-14 V		
Engine coolant blower motor relay	17	↔→	Engine idling - coolant blower motor ON	0-1 V		
Engine coolant blower motor relay - with AC	68	↔→	Engine idling - coolant blower motor ON - low speed	0-1 V		

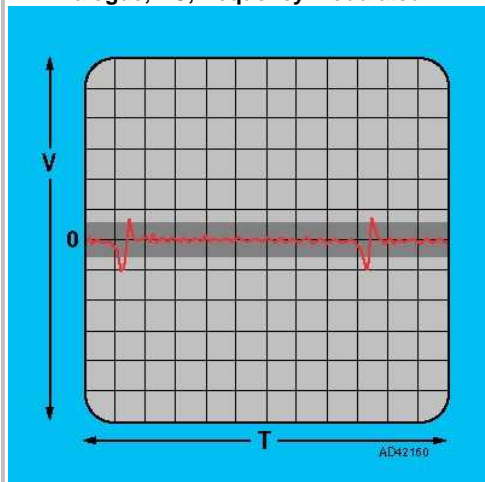
Engine coolant blower motor relay - without AC	68		Engine idling - coolant blower motor ON	0-1 V		
<u>Engine coolant temperature (ECT) sensor</u>	38		Ignition ON - coolant temp. 10°C	3,5 V		
<u>Engine coolant temperature (ECT) sensor</u>	38		Ignition ON - coolant temp. 80°C	0,5 V		
<u>Engine coolant temperature (ECT) sensor</u>	91		Ignition ON	0 V		
<u>Evaporative emission (EVAP) canister purge valve</u>	56		Ignition ON	11-14 V		
<u>Evaporative emission (EVAP) canister purge valve</u>	56		Engine running		10 V/50 ms	Intermittent 20
Exhaust gas pressure sensor	65		Ignition ON	0,5 V		
Exhaust gas pressure sensor	65		Engine idling	0,6 V		
Exhaust gas pressure sensor	65		3000 rpm	0,75 V		
Exhaust gas pressure sensor	91		Ignition ON	0 V		
Exhaust gas pressure sensor - some models	90		Ignition ON	5 V		
Exhaust gas recirculation (EGR) solenoid - some models	47		Ignition ON	11-14 V		
Exhaust gas recirculation (EGR) solenoid	47		Engine idling - valve operating	0 V		
<u>Heated oxygen sensor (HO2S) - after cat</u>	35		Engine idling - engine hot	0,3-0,7 V	0,2 V/0,5 sec.	76
<u>Heated oxygen sensor (HO2S)</u>	91		Ignition ON	0 V		
<u>Heated oxygen sensor (HO2S) - after cat - with PATS</u>	73		Start engine	11-14 V for first 20 seconds		
<u>Heated oxygen sensor (HO2S)</u>	73		Start engine	0 V after 20 seconds		
<u>Heated oxygen sensor (HO2S)</u>	100		Start engine	11-14 V for 20 seconds		
<u>Heated oxygen sensor (HO2S)</u>	100		Start engine	0 V after 20 seconds		
<u>Heated oxygen sensor (HO2S) - after cat - without PATS</u>	95		Start engine	11-14 V then 0 V alternating every 20 seconds		
<u>Heated oxygen sensor (HO2S)</u>	95		Start engine	0 V after 20 seconds		
<u>Heated oxygen sensor (HO2S) - before cat</u>	60		Engine idling - engine hot	0,1-0,9 V fluctuating	0,2 V/1 sec.	21
<u>Heated oxygen sensor (HO2S)</u>	91		Ignition ON	0 V		
<u>Heated oxygen sensor (HO2S) - before cat - without PATS</u>	93		Start engine	11-14 V for 20 seconds		
<u>Heated oxygen sensor (HO2S)</u>	93		Start engine	0 V after 20 seconds		
Heated windscreen relay	14		Engine idling - heated windscreen OFF	0 V		
Heated windscreen relay	14		Engine idling - heated windscreen ON	11-14 V		
<u>Idle air control (IAC) valve</u>	83		Engine idling	40%	2 V/5 ms	29
<u>Ignition coil - cylinders 1 &amp; 4 - MT 03/96-98</u>	26		Engine idling		5 V/1 ms	33
<u>Ignition coil - cylinders 2 &amp; 3 - MT 03/96-98</u>	52		Engine idling		5 V/1 ms	33
<u>Ignition control module (ICM) - except MT 03/96-98</u>	23		Ignition ON	0 V		

<a href="#">Ignition control module (ICM)</a>	48	←	Engine idling		2 V/10 ms	 32
<a href="#">Ignition control module (ICM)</a>	49	←	Engine idling	30 Hz	5 V/20 ms	 4
<a href="#">Ignition control module (ICM)</a>	49	←	3000 rpm	100 Hz		
<a href="#">Ignition control module (ICM)</a>	50	⇒	Engine idling	30 Hz	2 V/10 ms	 32
<a href="#">Ignition control module (ICM)</a>	50	⇒	3000 rpm	100 Hz		
<a href="#">Injector 1 - with PATS</a>	70	⇒	Ignition ON	11-14 V		
<a href="#">Injector 1</a>	70	⇒	Engine idling	3,4 ms	10 V/2 ms	 35
<a href="#">Injector 1 - without PATS</a>	75	⇒	Ignition ON	11-14 V		
<a href="#">Injector 1</a>	75	⇒	Engine idling	3,4 ms	10 V/2 ms	 35
<a href="#">Injector 2 - with PATS</a>	96	⇒	Ignition ON	11-14 V		
<a href="#">Injector 2</a>	96	⇒	Engine idling	3,4 ms	10 V/2 ms	 35
<a href="#">Injector 2 - without PATS</a>	101	⇒	Ignition ON	11-14 V		
<a href="#">Injector 2</a>	101	⇒	Engine idling	3,4 ms	10 V/2 ms	 35
<a href="#">Injector 3 - with PATS</a>	20	⇒	Ignition ON	11-14 V		
<a href="#">Injector 3</a>	20	⇒	Engine idling	3,4 ms	10 V/2 ms	 35
<a href="#">Injector 3 - without PATS</a>	74	⇒	Ignition ON	11-14 V		
<a href="#">Injector 3</a>	74	⇒	Engine idling	3,4 ms	10 V/2 ms	 35
<a href="#">Injector 4 - with PATS</a>	95	⇒	Ignition ON	11-14 V		
<a href="#">Injector 4</a>	95	⇒	Engine idling	3,4 ms	10 V/2 ms	 35
<a href="#">Injector 4 - without PATS</a>	100	⇒	Ignition ON	11-14 V		
<a href="#">Injector 4</a>	100	⇒	Engine idling	3,4 ms	10 V/2 ms	 35
Instrumentation control module - AT	10			Connected pin - no test data available or random digital signal		
Instrumentation control module	79			Connected pin - no test data available or random digital signal		
Instrumentation control module	86			Connected pin - no test data available or random digital signal		
<a href="#">Intake air temperature (IAT) sensor</a>	39	←	Ignition ON - air temp. 10°C	3,5 V		
<a href="#">Intake air temperature (IAT) sensor</a>	91	↔	Ignition ON	0 V		
Intake manifold air control solenoid	44	⇒	Ignition ON	11-14 V		
Intake manifold air control solenoid	44	⇒	Engine idling - accelerate briefly	0 V briefly		
<a href="#">Mass air flow (MAF) sensor</a>	36	↔	Ignition ON	0 V		
<a href="#">Mass air flow (MAF) sensor</a>	88	←	Engine idling - engine hot	0,7 V		
<a href="#">Mass air flow (MAF) sensor</a>	88	←	3000 rpm	1,5 V		
Neutral position (NP) switch - MT	91	↔	Ignition ON	0 V		

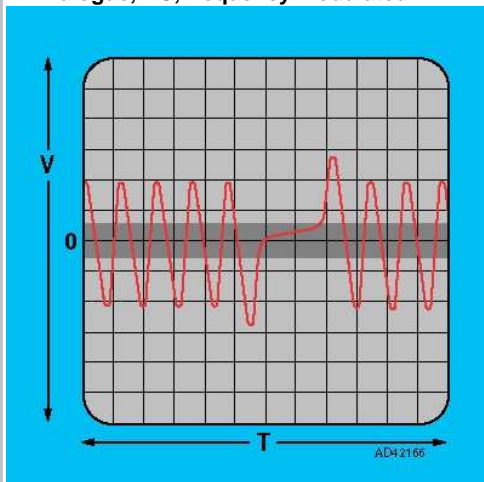
Neutral position (NP) switch - some models	64	←	Ignition ON - gear lever not in neutral	5 V		
Neutral position (NP) switch	64	←	Ignition ON - gear lever in neutral	0 V		
Octane coding plug	30	←	Engine idling	0 V		
Octane coding plug	91	↗	Ignition ON	0 V		
Overdrive selection switch - AT	29	←	Ignition ON - overdrive selected	0 V		
Overdrive selection switch	29	←	Ignition ON - overdrive not selected	11-14 V		
Park/neutral position (PNP) switch	64	←	Ignition ON - AT not in P or N	5 V		
Park/neutral position (PNP) switch	64	←	Ignition ON - AT in P or N	0 V		
Park/neutral position (PNP) switch	91	↗	Ignition ON	0 V		
Passive anti-theft system (PATS)	6			Connected pin - no test data available or random digital signal		
Passive anti-theft system (PATS)	8			Connected pin - no test data available or random digital signal		
Passive anti-theft system (PATS)	11			Connected pin - no test data available or random digital signal		
Passive anti-theft system (PATS)	19			Connected pin - no test data available or random digital signal		
Passive anti-theft system (PATS)	42			Connected pin - no test data available or random digital signal		
Passive anti-theft system (PATS) - MT	27			Connected pin - no test data available or random digital signal		
Passive anti-theft system (PATS)	53			Connected pin - no test data available or random digital signal		
Passive anti-theft system (PATS)	79			Connected pin - no test data available or random digital signal		
Power steering pressure (PSP) switch	31	←	Engine idling - steering wheel not turned	0 V		
Power steering pressure (PSP) switch	31	←	Engine idling - steering wheel turned	9 V		
Power steering pressure (PSP) switch	91	↗	Ignition ON	0 V		
<a href="#">Relay module</a>	40	←	Ignition ON	11-14 V briefly then 0 V		
<a href="#">Relay module</a>	40	←	Engine idling	11-14 V		
<a href="#">Relay module</a>	71	←	Ignition OFF	0 V		
<a href="#">Relay module</a>	71	←	Ignition ON	11-14 V		
<a href="#">Relay module</a>	97	←	Ignition OFF	0 V		
<a href="#">Relay module</a>	97	←	Ignition ON	11-14 V		
<a href="#">Relay module</a> - with PATS	54	↗↘	Ignition ON	0-1 V briefly then 11-14 V		
<a href="#">Relay module</a>	54	↗↘	Engine cranking	0-1 V		
<a href="#">Relay module</a> - without PATS	80	↗↘	Ignition ON	0-1 V briefly then 11-14 V		

<u>Relay module</u>	80		Engine cranking	0-1 V		
Tachometer - MT 03/96-98	48			Connected pin - no test data available or random digital signal		
<u>Throttle position (TP) sensor</u>	89		Ignition ON - throttle closed	0,9 V		
<u>Throttle position (TP) sensor</u>	89		Ignition ON - throttle fully open	4,8 V		
<u>Throttle position (TP) sensor</u>	90		Ignition ON	5 V		
<u>Throttle position (TP) sensor</u>	91		Ignition ON	0 V		
Transmission fluid temperature sensor	37			Connected pin - no test data available or random digital signal		
Trip computer - some models	43			Connected pin - no test data available or random digital signal		
Vehicle speed sensor (VSS)	58		Ignition ON - vehicle pushed	0 V or 11-14 V switching		
Vehicle speed sensor (VSS)	58		Vehicle moving - 10 mph	20 Hz - increases with vehicle speed		
Vehicle speed sensor (VSS)	58		Vehicle moving	50%	5 V/50 ms	43

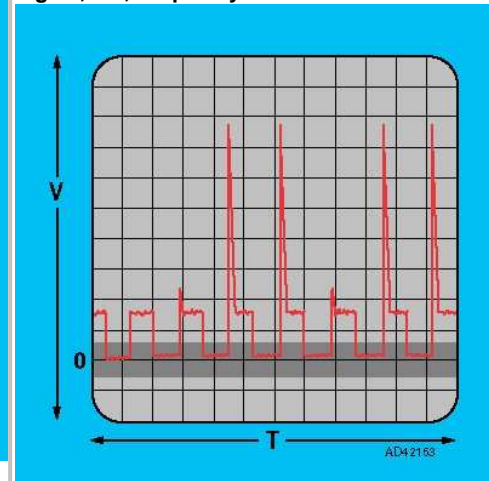
11. Analogue, AC, frequency modulated



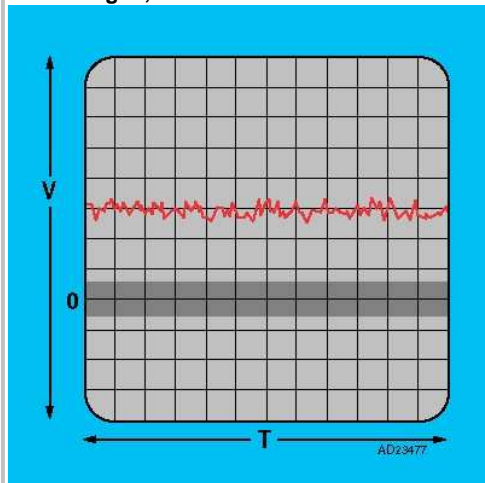
2. Analogue, AC, frequency modulated



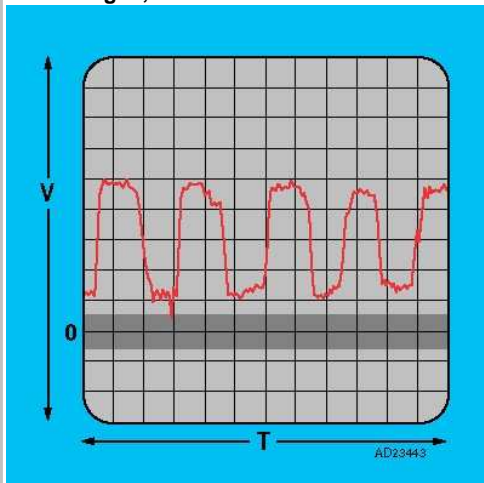
20. Digital, DC, pulse width modulated or digital, DC, frequency modulated



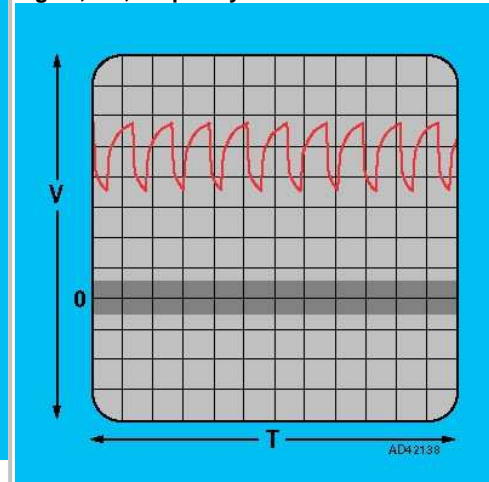
76. Analogue, DC



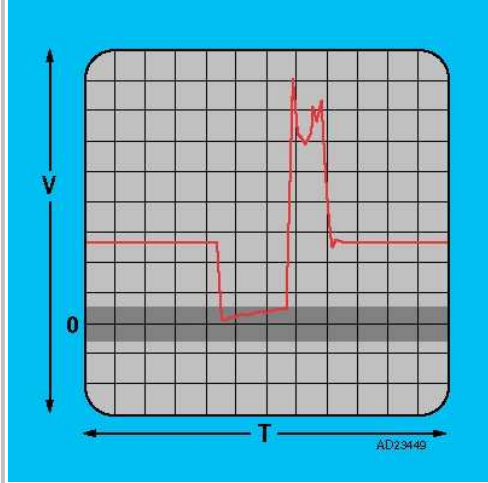
21. Analogue, DC



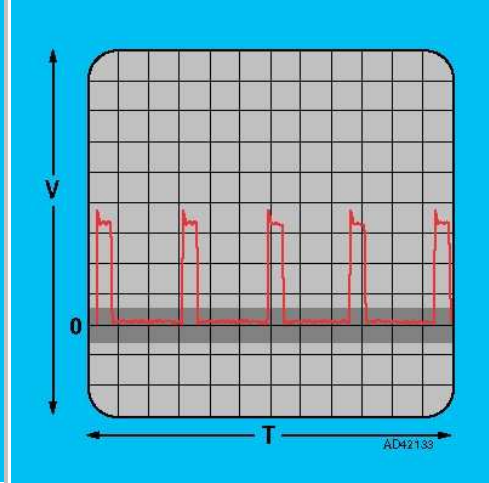
29. Digital, DC, pulse width modulated or digital, DC, frequency modulated



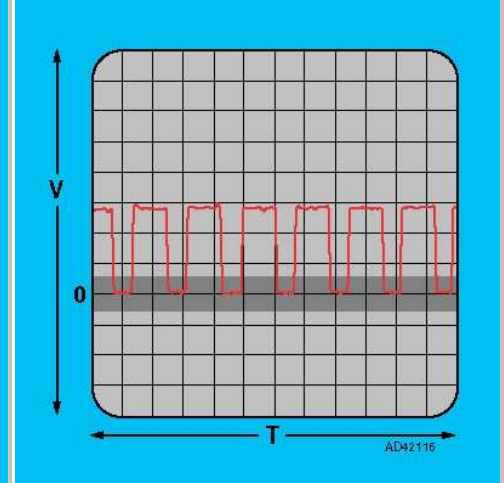
33. Digital, DC, frequency modulated



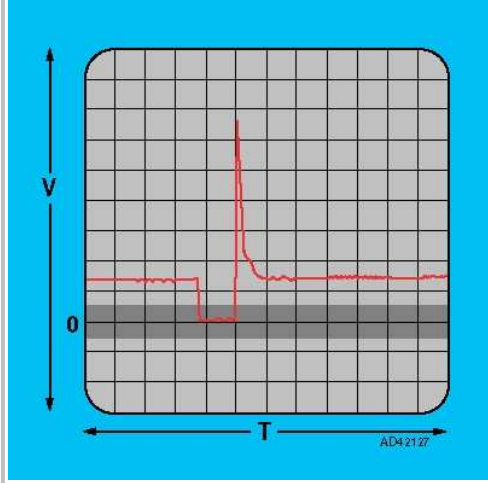
32. Digital, DC, frequency modulated



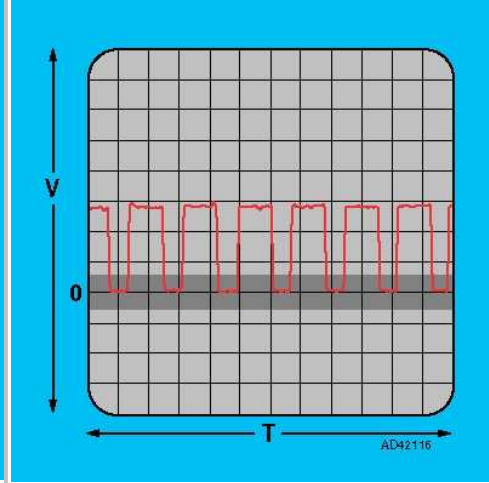
4. Digital, DC, frequency modulated



35. Digital, DC, pulse width modulated



43. Digital, DC, frequency modulated



↔	input/output signal
←	input signal
⇒	output signal
⚡→	ECM switched earth
⚡	ECM earth circuit