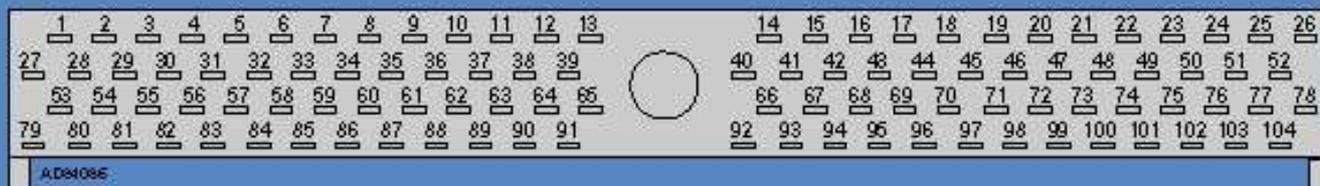


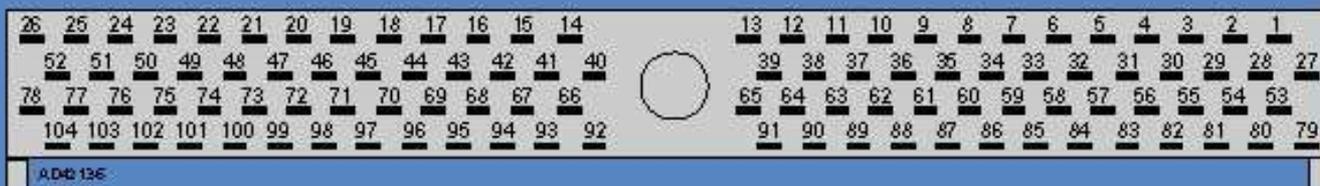
Telephone:
Fax:
VAT Registration No.:

Name:		Manufacturer:	Ford
Address:		Model:	KA
		Year:	1998
		Registration:	
Tel - Private:		Mileage:	
Tel - Business:		Job number:	

Terminal side



Wire side



Component/circuit description	ECM pin	Signal	Condition	Typical value	Oscilloscope setting (Suggested settings - Voltage/time per division)	Wave form
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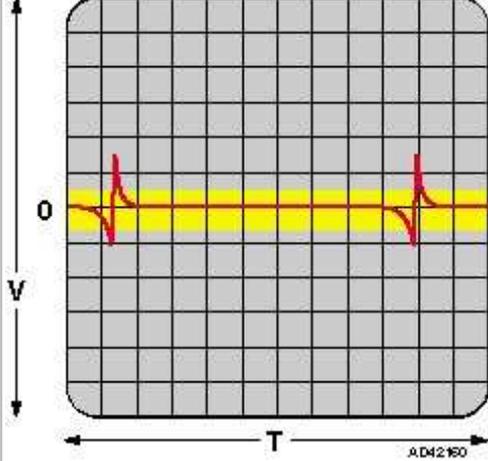
AC compressor clutch relay	69		Engine idling - AC OFF	11-14 V		
AC compressor clutch relay	69		Engine idling - AC ON - AC compressor ON	0-1 V		
AC refrigerant pressure switch 1	41			Connected pin - no test data available or random digital signal		
AC refrigerant pressure switch 2	86			Connected pin - no test data available or random digital signal		
Alternator	59		Engine idling	8-9 V		
Battery	55		Ignition OFF	11-14 V		
Camshaft position (CMP) sensor	76		Engine idling	0 V		
Camshaft position (CMP) sensor	85		Engine idling		5 V/20 ms	
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		
Crankshaft position (CKP) sensor	21		Engine idling		2 V/1 ms	
Crankshaft position (CKP) sensor	22		Engine idling		2 V/1 ms	Reversed 
Data link connector (DLC)	13		Engine idling	0,5 V		
Data link connector (DLC)	15		Engine idling	5 V		
Data link connector (DLC)	16		Engine idling	0 V		
Data link connector (DLC) - some models	79		Engine idling	11-14 V		
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		
Earth - without PATS	27		Ignition ON	0 V		
Engine control module (ECM) - without PAS	31		Ignition ON	0 V		
Engine control relay	71		Ignition OFF	0 V		
Engine control relay	71		Ignition ON	11-14 V		
Engine control relay	97		Ignition OFF	0 V		
Engine control relay	97		Ignition ON	11-14 V		
Engine coolant blower motor relay	68		Engine idling - coolant blower motor OFF	11-14 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 - with AC - except Escort	17		Engine idling - coolant blower motor OFF	11-14 V		
Engine coolant blower motor relay	17		Engine idling - coolant blower motor ON - high speed	0-1 V		
Engine coolant blower motor relay - without AC	68		Engine idling - coolant blower motor ON	0-1 V		
Engine coolant 'hot' warning lamp - some models	98		Ignition ON - lamp OFF	11-14 V		
Engine coolant 'hot' warning lamp	98		Ignition ON - lamp ON	0 V		
Engine coolant temperature (ECT) sensor	38		Ignition ON - coolant temp. 10°C	3,5 V		
Engine coolant temperature (ECT) sensor	38		Ignition ON - coolant temp. 80°C	0,5 V		
Engine coolant temperature (ECT) sensor	91		Ignition ON	0 V		
Evaporative emission (EVAP) canister purge valve	67		Ignition ON	11-14 V		
Evaporative emission (EVAP) canister purge valve	67		Engine hot - valve operating		10 V/50 ms	
Exhaust gas pressure sensor - some models	65		Engine idling	0,6 V		
Exhaust gas pressure sensor	65		Engine running	0,6-4 V - varies with pressure		
Exhaust gas pressure sensor	90		Ignition ON	5 V		
Exhaust gas pressure sensor	91		Ignition ON	0 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		
Fuel pump relay	40		Ignition ON	11-14 V briefly then 0 V		
Fuel pump relay	40		Engine idling	11-14 V		
Fuel pump relay - with PATS	54		Ignition ON	0-1 V briefly then 11-14 V		
Fuel pump relay	54		Engine cranking	0-1 V		
Fuel pump relay - without PATS	80		Ignition ON	0-1 V briefly then 11-14 V		
Fuel pump relay	80		Engine cranking	0-1 V		
Heated oxygen sensor (HO2S)	60		Engine idling - engine hot	0,1-0,9 V fluctuating	0,2 V/1 sec.	
Heated oxygen sensor (HO2S)	91		Ignition ON	0 V		

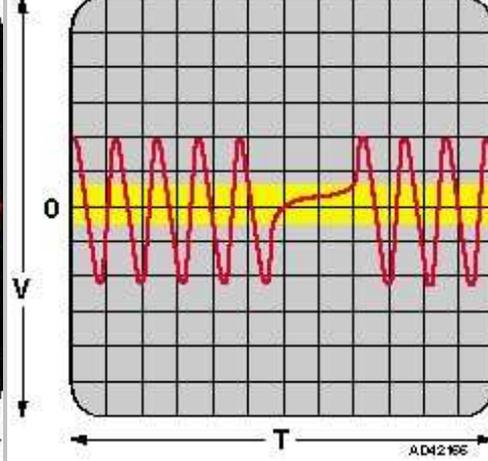
Heated oxygen sensor (HO2S)	93		Start engine	11-14 V for 20 seconds		
Heated oxygen sensor (HO2S)	93		Start engine	0 V after 20 seconds		
Heated rear window relay - some models	14		Engine idling - heated rear window OFF	0 V		
Heated rear window relay	14		Engine idling - heated rear window ON	5 V		
Heater function control module	48		Engine idling	6,5 V		
Idle air control (IAC) valve	83		Engine idling - engine hot	40%	2 V/5 ms	29
Ignition coil	26		Engine idling		5 V/1 ms	33
Ignition coil	52		Engine idling		5 V/1 ms	33
Injector 1 - with PATS	70		Ignition ON	11-14 V		
Injector 1	70		Engine idling	4 ms	10 V/2 ms	35
Injector 1 - without PATS	75		Ignition ON	11-14 V		
Injector 1	75		Engine idling	4 ms	10 V/2 ms	35
Injector 2 - with PATS	96		Ignition ON	11-14 V		
Injector 2	96		Engine idling	4 ms	10 V/2 ms	35
Injector 2 - without PATS	101		Ignition ON	11-14 V		
Injector 2	101		Engine idling	4 ms	10 V/2 ms	35
Injector 3 - with PATS	20		Ignition ON	11-14 V		
Injector 3	20		Engine idling	4 ms	10 V/2 ms	35
Injector 3 - without PATS	74		Ignition ON	11-14 V		
Injector 3	74		Engine idling	4 ms	10 V/2 ms	35
Injector 4 - with PATS	95		Ignition ON	11-14 V		
Injector 4	95		Engine idling	4 ms	10 V/2 ms	35
Injector 4 - without PATS	100		Ignition ON	11-14 V		
Injector 4	100		Engine idling	4 ms	10 V/2 ms	35
Intake air temperature (IAT) sensor	39		Ignition ON - air temp. 10°C	3,5 V		
Intake air temperature (IAT) sensor	91		Ignition ON	0 V		
Mass air flow (MAF) sensor	36		Ignition ON	0 V		

Mass air flow (MAF) sensor	88	←	Engine idling - engine hot	0,7 V		
Mass air flow (MAF) sensor	88	←	3000 rpm	1,5 V		
Neutral position (NP) switch	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	91	↔	Ignition ON	0 V		
Octane coding plug - some models	30	←	Ignition ON	0 V		
Octane coding plug	30	←		Connected pin - no test data available or random digital signal		
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		
Passive anti-theft system (PATS)	8	←	Engine idling	11-14 V		
Passive anti-theft system (PATS)	19	←	Engine idling	11-14 V		
Passive anti-theft system (PATS)	27		Engine idling	0 V		
Passive anti-theft system (PATS)	42		Engine idling	11-14 V		
Passive anti-theft system (PATS)	53		Engine idling	11-14 V		
Passive anti-theft system (PATS) - Escort	6	←		Connected pin - no test data available or random digital signal		
Passive anti-theft system (PATS) - Fiesta	11	←	Engine idling	11-14 V		
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		
Throttle position (TP) sensor	89	←	Ignition ON - throttle closed	0,9 V		
Throttle position (TP) sensor	89	←	Ignition ON - throttle fully open	4,8 V		
Throttle position (TP) sensor	90	⇒	Ignition ON	5 V		
Throttle position (TP) sensor - 9/97-98	91	↔	Ignition ON	0 V		
Vehicle speed sensor (VSS)	58	←	Ignition ON - vehicle pushed	0 V or 11-14 V		
Vehicle speed sensor (VSS)	58	←	Vehicle moving - 10 mph	20 Hz - increases with vehicle speed		

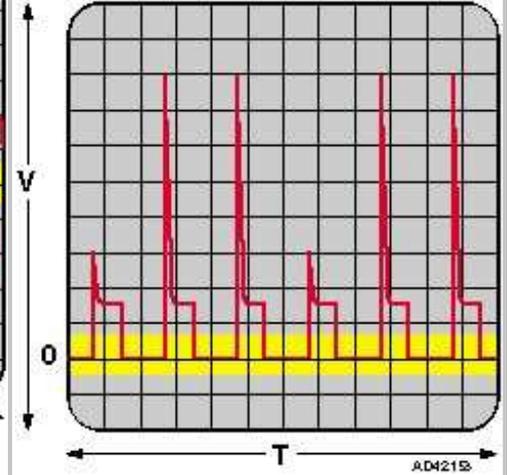
11. Analogue, AC, frequency modulated



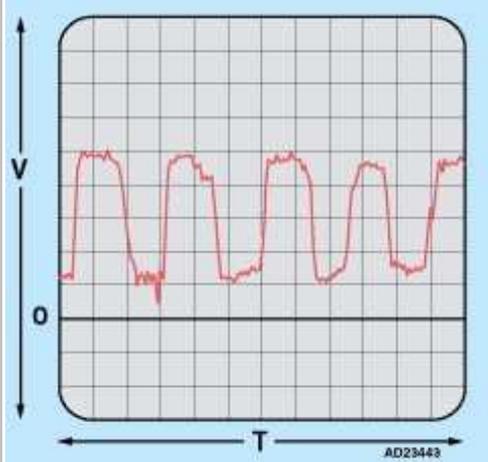
2. Analogue, AC, frequency modulated



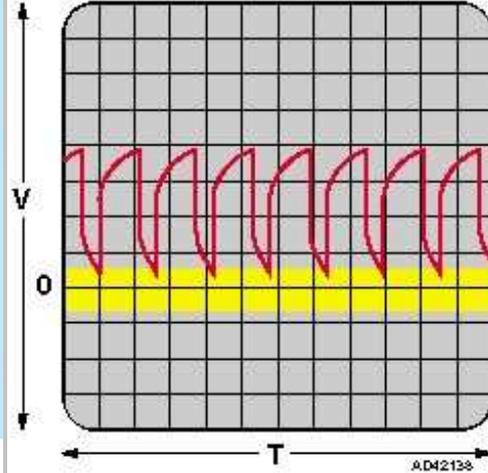
20. Digital, DC, pulse width modulated or digital, DC, frequency modulated



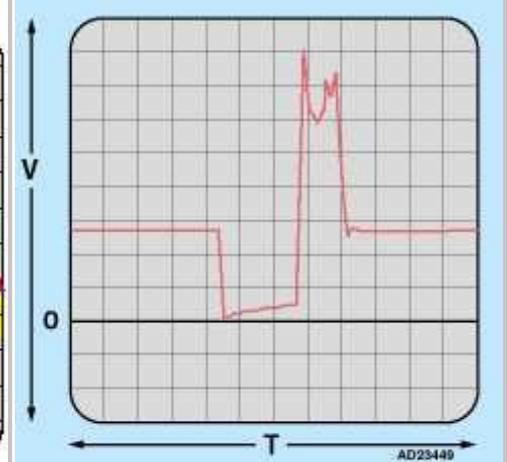
21. Analogue, DC



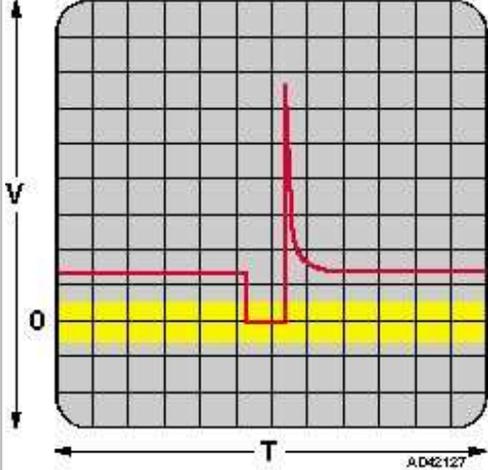
29. Digital, DC, pulse width modulated or digital, DC, frequency modulated



33. Digital, DC, frequency modulated



35. Digital, DC, pulse width modulated



43. Digital, DC, frequency modulated

