

Connector A #1 – # A43

All values given below are between the terminals stated in column 1 and terminal #42 (signal ground). If this is not the case this is given within brackets in column 2.

It is very important that the control module ground terminals are connected to the battery negative terminal via the engine, before measurement is carried out.

The values specified in the table apply with the engine unloaded and at normal operating temperature.

U = direct current DC in volts (V), U_{AC} = alternating current AC in volts (V)

U_{bat} = battery voltage, f =, frequency in Hertz (Hz)

U_{low} = voltage approximately 0 V, % duty = duty cycle (pulse ratio) as a percentage (%)

U_{mean} = direct current, mean value (V), t = time in milliseconds (ms)

Terminal	Signal type	Ignition on	Idling	Other	Scrolling value in Volvo Scan Tool (ST)
A1					
A2	Front knock sensor signal	U_{low}			15
A3	Intake air temperature (IAT) signal	$U \sim 2.5$ V at 20°C.		U drops with increased temperature	03
A4	Manifold absolute pressure (MAP) sensor signal	$U = 4.5 - 5$ V depending on atmospheric pressure	$U = 0.9 - 1.4$ V depending on atmospheric pressure	U increases with load to a maximum 5 V at full load	17 18
A5					
A6	Engine speed (RPM) sensor signal (U_{AC} measured to #A20)	$U \sim 3.4$ V	$U_{AC} = 1.2$ V	U_{AC} increases with engine speed	01

				(RPM)	
A7	Engine cooling fan (FC), control signal 1/2– speed	Engine cooling fan (FC) off = U_{bat} Engine cooling fan (FC) on ~ 150 mV			29
A8	Engine cooling fan (FC) E– box (only available in hotter markets)	Engine cooling fan (FC) off = U_{bat} Engine cooling fan (FC) on ~ 150 mV			
A9	Injector 5, control signal (U measured to #A12)	U_{bat}	$U \sim 250$ mV $t \sim 3.0$ ms	U and t increases with engine speed (RPM) and load	13
A10	Injector 1, control signal (U measured to #A12)	U_{bat}	$U \sim 250$ mV $t \sim 3.0$ ms	U and t increases with engine speed (RPM) and load	13
A11	I_{AC} Idle air control (IAC) valve control signal	U_{bat}	$U = 9 - 10$ V % duty ~ 39 %	U decreases and %duty increases with increased load at idling speed	12 21
A12	15–measuring Supply from the ignition lock	U_{bat}			
A13	Power ground	U_{low}			
A14	Heated oxygen sensor (HO2S), preheating signal	U_{bat}	$U_{mean} = 5 - 6$ V % duty = 55 – 65 %	U increases and %duty decreases with increased exhaust temperature	07 08
A15	5 volts power supply	$U = 5$ V			
A16	Throttle position (TP) sensor signal	$U \sim 0.5$ V at closed throttle position (CTP) (idling) $U \sim 4.2$ V at wide open throttle (WOT)			19 20

A17	Ground for knock sensor (KS)	U_{low}			
A18	Sensor ground	U_{low}			
A19					
A20	Engine speed (RPM) sensor signal U_{AC} measured to #A6)	$U \sim 3.4V$	$U_{AC} = 1.2V$	U_{AC} increases with engine speed (RPM)	01
A21	Camshaft position (CMP) sensor signal	$U = U_{low}$ or 5 V	$U_{mean} \sim 2.5 V$ % duty = 50%,		
A22	Engine cooling fan (FC), control signal 1/1 speed	Engine cooling fan (FC) off = U_{bat} Engine cooling fan (FC) on $\sim 150 mV$			29
A23	Injector 4, control signal (U measured to #A12)	U_{bat}	$U_{mean} \sim 250 mV$ $t \sim 3.0 ms$	U and t increases with engine speed (RPM) and load	13
A24	Injector 3, control signal (U measured to #A12)	U_{bat}	$U_{mean} \sim 250 mV$ $t \sim 3.0 ms$	U and t increases with engine speed (RPM) and load	13
A25					
A26	30-measuring Supply voltage from battery	U_{bat}			22
A27	Power supply	U_{bat}			
A28	Power ground	U_{low}			
A29					
A30	Front knock sensor signal	U_{low}			16
A31	Engine coolant temperature (ECT) signal	20°C $\sim 1.8 V$ Engine at operating temperature $\sim 250 mV$ Voltage decreases with increasing temperature			02
A32	Heated oxygen sensor (HO2S) signal	$U = 5 V$	U oscillates between 1–5 volts Low voltage =		05 06

			rich engine High voltage = lean engine		
A33	Ground, heated oxygen sensor (HO2S)	U_{low}			
A34					
A35					
A36	Power supply, camshaft position (CMP) sensor	U_{bat}			
A37	Secondary air injection system (PAIR) solenoid valve	$U = U_{bat}$ valve closed $U = U_{low}$ valve open			37
A38	Injector 2, control signal (U measured to #A12)	U_{bat}	$U_{mean} \sim 250 \text{ mV}$ $t \sim 3.0 \text{ ms}$	U and t increases with engine speed (RPM) and load	13
A39					
A40	EGR	U_{bat}			
A41	Control signal, main relay	$U \sim 1 \text{ V}$			
A42	Signal ground (measured to battery terminal)	U_{low}			
A43					

Connector B #1 – #43

All values specified below are measured between the terminal specified in column 1 and terminal #B28 (signal ground), unless indicated in brackets in column 2.

It is very important that the control module ground terminals are connected to the battery negative terminal via the engine, before measurement is carried out.

The values specified in the table apply with the engine unloaded and at normal operating temperature.

U = DC in volts (V)

U_{bat} = battery voltage

U_{AC} = alternating current AC in volts (V)

f = frequency in Hertz (Hz)

U_{low} = voltage close to 0 V

%duty = duty cycle (pulse ratio) as a percentage (%)

U_{mean} = DC, mean value (V)

t = time in milliseconds (ms)

Termin	Signal type	Ignition on	Idling	Other	Scrolling value in Volvo Scan Tool (ST)
B1					
B2	Torque limiting (automatic transmission)	Model year 1993: U = 5 V Model year 1994: U=1–2 V below U _{bat}		U _{low} at request for ignition retardation	32
B3	Torque limiting (automatic transmission)	Model year 1993: U = 5 V Model year 1994: U=1–2 V below U _{bat}		U _{low} at request for ignition retardation	32
B4	Torque limiting acknowledged (automatic transmission)	Model year 1993: U = 9 – 10 V Model year 1994: U=1–2 V below U _{bat}		U _{low} when request has been received	33
B5	Diagnostic lead	U = 9 – 10 V Note! If the Volvo Scan Tool (ST) or diagnostic lead is connected to the data link connector (DLC) other voltages apply			
B6	Air conditioning (A/C) compressor	U _{low}	U _{low} Air conditioning (A/C) compressor switched off U _{bat} Air conditioning (A/C) compressor is switched on		27
B7	Malfunction indicator lamp (MIL) (combined instrument panel)	U _{low} lamp lit U _{bat} lamp off			
B8					
B9	Signal, air conditioning (A/C) pressure sensor Not model year 1993	U = 0 – 5 V depending on air conditioning A/C pressure U increases with increased air conditioning A/C pressure			
B10					
B11	Signal, ignition discharge modules (IDM)	U ~ 300 mV	U ~ 500 mV f ~ 34 Hz	f and U increase with engine speed	14
B12	Load signal (automatic	U ~ 1– 2 below U _{bat}		U increases	

	transmission)			with increased load	
B13					
B14					
B15					
B16					
B17					
B18	Vehicle speed signal (VSS)	$U_{low} U_{bat}$	$U_{mean} = 6 - 7$ V when the car is rolling $f = 40$ Hz at 20 km/h, f increases with speed	23	
B19					
B20	Throttle position (TP) sensor signal (automatic transmission)	$U \sim 0.5$ V at closed throttle position (CTP) (idling) $U \sim 4.2$ V at wide open throttle (WOT)			
B21	Tachometer signal (combined instrument panel)	U_{bat}	$U_{mean} \sim 7$ V $f \sim 27$ Hz	frequency increases with engine speed (RPM)	
B22					
B23	Engine coolant signal (combined instrument panel and ECC))	$U_{mean} \sim 7$ V $t \sim 21.5$ ms	t increases with increased temperature		
B24	Constant idle speed compensation (automatic transmission)	Model year 1993: P/N- position: $U = 5$ V Other: $U \sim 1$ V Model year 1994: P/N- position: $U = 11.5$ V Other: $U \sim 0.6$ V			31
B25	Confirmation signal, A/C on/off	A/C off: U_{low} air conditioning (A/C) on: U_{bat}			26
B26	Air conditioning (A/C) high- pressure switch 1993 model year only	U_{low}	$U_{low} =$ A/C-pressure below 17 bar $U_{bat} =$ A/C-pressure above 17 bar	28	
B27	Control signal fuel pump	$U \sim 7$ V	$U_{mean} \sim 3.5$ V % duty = 50%	24	
B28	Ground, internal in control module (measured to battery	U_{low}			

	negative terminal)				
B29	Signal, air conditioning (A/C) pressure sensor Not model year 1993	U = 5 V			
B30					
B31					
B32					
B33					
B34					
B35					
B36					
B37					
B38	Control signal, pulsed secondary air injection system (PAIR) pump relay, PAIR system	U = U _{bat} , pulsed secondary air injection system (PAIR) pump off U = U _{low} , pulsed secondary air injection system (PAIR) pump on			24
B39	Fuel consumption signal (trip computer)	U _{bat}	f ~ 15 Hz	f increases with injection volume	
B40	Air conditioning (A/C) relay control signal Permits air conditioning (A/C)) to start	U _{low}	U _{bat} = air conditioning (A/C) not permitted U _{low} = air conditioning (A/C) permitted		25
B41					
B42					
B43					