

J - PIN VOLTAGE CHARTS

1995 Volvo 850

1995 ENGINE PERFORMANCE
Volvo - Pin Voltage Charts

850

* PLEASE READ THIS FIRST *

NOTE: Unless stated otherwise in testing procedures, perform all voltage tests using a Digital Volt-Ohmmeter (DVOM) with a minimum 10-megohm input impedance. Voltage readings may vary slightly due to battery condition or charging rate.

INTRODUCTION

Pin voltage charts are supplied to reduce diagnostic time. Checking pin voltages at Electronic Control Unit (ECU) determines whether it is receiving and transmitting proper input and output signals. Charts may also help determine if ECU wiring harness is shorted or open.

TESTING

To read values requires the use of a scan tester, DVOM, Breakout Box (981-3190) and Adapter (981-3195). DO NOT measure resistance/voltage at ECU. Manufacturer does not recommend checking values directly at ECU connectors, as damage to wiring harness or ECU harness connector could occur. Unless otherwise specified, values specified in table are with ignition on and engine at normal operating temperature. Values are measured between ground terminal A20 and specified ECU terminal. See ECU PIN VALUES - FUEL INJECTION table or ECU PIN VALUES TABLE - IGNITION.

ECU PIN VALUES - FUEL INJECTION

ECU PIN VALUES TABLE - FUEL INJECTION

ECU Terminal (1)	Circuit (Condition)	Voltage
A1	Throttle Position Sensor Signal (Ignition On & Closed Throttle)	0.5
	Throttle Position Sensor Signal (Ignition On & Wide Open Throttle)	4.2
A2	Throttle Position Sensor Power Supply (Ignition On)	5
A3-A7		
A8	Mass Airflow Sensor Power Ground (Ignition On)	Zero
A9	Injectors Control Signal (Ignition On)	Zero
	Injectors Control Signal (Engine Idling)	(2)
A10	Power Supply From Battery (Ignition On)	Battery

A11		
A12	Mass Airflow Sensor Signal Ground (Ignition On)	Zero
A13	Mass Airflow Sensor Signal (Ignition On)	2.8
	Mass Airflow Sensor Signal (Engine Idling)	3.6
A14	Sensor Ground (Ignition On)	Zero
A15	Engine Coolant Temperature Sensor (Ignition On)	(3)
A16	Idle Air Control Valve Opening Signal (Ignition On)	(4)
	IAC Valve Opening Signal (Engine Idling)	11-11.5
A17	Idle Air Control Valve Closing Signal (Ignition On)	(5)
	IAC Valve Closing Signal (Engine Idling)	(6)
A18		
A19	Power Supply From Main Relay (Ignition On)	Battery
A20	Signal Ground (Always)	(7)
A21		
A22	Heated Oxygen Sensor Signal (Ignition On)	0.45
	Heated Oxygen Sensor Signal (Engine Idling)	0.1-0.9 (Fluctuates)
A23	Heated Oxygen Sensor Ground (Always)	Zero
A24	Main Relay Control Signal (Ignition On)	1
A25	A/C Compressor (Ignition On)	Zero
	A/C Compressor (Engine Idling)	(8)
A26		
A27	Air Injection Control Solenoid Signal (Solenoid Activated)	Zero
	Air Injection Control Solenoid Signal (Solenoid Deactivated)	Battery
A28	Heated Oxygen Sensor Preheater (Ignition On)	Battery
	Heated Oxygen Sensor Preheater (Engine Idling)	0.5
A29	System Ground (Always)	Zero
A30	Power Supply From Ignition Switch (Ignition On)	Battery
B1-B4		
B5	Data Link Connector Test Lead (Ignition On)	Battery
B6		

B7	Malfunction Indicator Light (MIL) Control Signal (MIL On)	0.5
	Malfunction Indicator Light (MIL) Control Signal (MIL Off)	Battery
B8-B11		
B12	Load Signal (Ignition On)	Zero
	Load Signal (Engine Idling)	(9)
B13-B17		
B18	Vehicle Speed Sensor Signal (Ignition On & Drive Wheel Turning)	0.6-7
B19		
B20	Throttle Position Sensor Signal (Ignition On & Closed Throttle)	0.5
	Throttle Position Sensor Signal (Ignition On & Wide Open Throttle)	4.2
B21	Tachometer Signal (Ignition On)	Zero
	Tachometer Signal (Engine Idling)	4-7
B22	Air Injection Pump Relay Signal (Relay On)	Zero
	Air Injection Pump Relay Signal (Relay Off)	Battery
B23	Engine Coolant Temperature Signal (Ignition On)	6
B24	PNP Idle Compensation Signal (Ignition On, In Park Or Neutral)	5
	PNP Idle Compensation Signal (Ignition On, Except In Park Or Neutral)	0.1
B25		
B26	Idling Compensation Signal (Ignition On)	11
B27	Fuel Pump Relay Control Signal (Ignition On)	7.5
	Fuel Pump Relay Control Signal (Engine Idling)	4.5
B28		
B29	Fuel Consumption Signal (Ignition On, Models With Trip Computer)	0.8
	Fuel Consumption Signal (Ignition On, Models Without Trip Computer)	Zero

- (1) - Check pin value between ECU ground terminal A20 and specified ECU terminal.
- (2) - Specification is 0.3 volt. Injector "On" time is 2.0-2.5 milliseconds. Voltage and "On" time increases with engine speed and load.

- (3) - Specification is 1.8 volts with sensor temperature at 68°F (20°C) or 200 millivolts with sensor temperature at 212°F (100°C). Voltage decreases as temperature increases.
- (4) - Specification is 2.2 volts on models with chassis No. 30699 or less, or 3.4 volts on models with chassis No. 30700 or greater and all 5-door models.
- (5) - Specification is 12 volts on models with chassis No. 30699 or less, or 10.5 volts on models with chassis No. 30700 or greater.
- (6) - Specification is 7.5 volts on models with chassis No. 30699 or less, or 4.5 volts on models with chassis No. 30700 or greater.
- (7) - Measured with negative lead connected to negative battery terminal.
- (8) - Zero voltage with A/C off. Battery voltage with A/C on.
- (9) - Frequency is 34 Hz. Duty cycle is 99.8 percent. Frequency increases and duty cycle percentage decreases with engine speed.

ECU PIN VALUES - IGNITION

ECU PIN VALUES TABLE - IGNITION

ECU Terminal (1)	Circuit (Condition)	Voltage
A1	RPM Sensor Signal (Ignition On)	Zero
	RPM Sensor Signal (Engine Idling)	1.2 AC Volts
A2	RPM Sensor Ground (Ignition On)	Zero
A3		
A4	Camshaft Position Sensor Signal (Ignition On)	(2) 5 Or Zero
A5	EGR Temperature Sensor Signal (Ignition On)	(3)
A6-A9		
A10	Power Supply From Battery (Ignition On)	Battery
A11-A13		
A14	Camshaft Position Sensor Power Supply (Ignition On)	Battery
A15	Camshaft Position Sensor Ground (Ignition On)	Zero
A16	EGR Temperature Sensor Ground (Ignition On)	Zero
A17	Low Speed Cooling Fan (Fan Off)	Battery
	Low Speed Cooling Fan (Fan On)	Zero
A18-A19		
A20	ECU Signal Ground (Ignition On)	(4) Zero

A21		
A22	Front Knock Sensor Signal (Ignition On)	Zero
A23	Front Knock Sensor Ground (Ignition On)	Zero
A24	Rear Knock Sensor Ground (Ignition On)	Zero
A25	Rear Knock Sensor Signal (Ignition On)	Zero
A26	High Speed Cooling Fan (Fan Off)	Battery
	High Speed Cooling Fan (Fan On)	Zero
A27	EGR Controller Signal (Ignition On)	Battery
A28	Control Unit Cooling Fan Signal (Fan Off)	Battery
	Control Unit Cooling Fan Signal (Fan On)	0.8
A29	System Ground (Always)	Zero
A30	Power Supply From Ignition Switch (Ignition On)	Battery
B1		
B2	Torque Control Signal From TCM (Ignition On)	5
B3	Torque Control Signal From TCM (Ignition On)	5
B4	Torque Control Acknowledgment Signal (Ignition On)	5
B5	Data Link Connector Test Lead (Ignition On)	Battery
B6		
B7	Malfunction Indicator Light (MIL) Control Signal (MIL On)	Zero
	Malfunction Indicator Light (MIL) Control Signal (MIL Off)	Battery
B8	Variable Intake Manifold Solenoid Signal (Solenoid Closed)	(5)
	Variable Intake Manifold Solenoid Signal (Solenoid Open)	(6)
B9-B11		
B12	Load Signal (Ignition On)	Zero
	Load Signal (Engine Idling)	(7)
B13	Power Stage Control Signal (Ignition On)	0.15
	Power Stage Control Signal (Engine Idling)	0.6
B14-B17		
B18	Vehicle Speed Sensor Signal (Ignition On & Drive Wheel Turning)	0.6-7

B19		
B20	Throttle Position Sensor Signal (Ignition On & Closed Throttle)	0.5
	Throttle Position Sensor Signal (Ignition On & Wide Open Throttle)	4.2
B21	Tachometer Signal (Ignition On)	Zero
	Tachometer Signal (Engine Idling)	4-7
B22		
B23	Engine Coolant Temperature Signal (Ignition On)	6
B24		
B25	A/C Acknowledgment Signal (Engine Idling & A/C Off)	Zero
	A/C Acknowledgment Signal (Engine Idling & A/C On)	Battery
B26	Idling Compensation Signal (Engine Idling & Engine Cooling Fan Off)	Battery
B26	Idling Compensation Signal (Engine Idling & Engine Cooling Fan On)	0.7
B27	A/C High Pressure Switch (Ignition On)	Zero
B28	A/C Control Signal (Ignition On)	7-12
	A/C Control Signal (Engine Idling & A/C On)	Zero
	A/C Control Signal (Engine Idling & A/C Off)	Battery
B29	Rev Counter Signal (Ignition On)	11
	Rev Counter Signal (Engine Idling)	6.5
B30		

- (1) - Check pin value between ECU ground terminal A20 and specified ECU terminal.
- (2) - Specification is dependent on camshaft position.
- (3) - 4.6 volts with sensor temperature at 32°F (0°C) or 1.8 volts with sensor temperature at 176°F (80°C). Voltage decreases as temperature increases.
- (4) - Measured with negative lead connected to negative battery terminal.
- (5) - Specification is battery voltage on models with chassis No. 30699 or less, or 0.5 volt on models with chassis No. 30700 or greater and all 5-door models.
- (6) - Specification is 0.5 volt on models with chassis No. 30699 or less, or battery voltage on models with chassis No. 30700 or greater.
- (7) - Frequency is 34 Hz. Duty cycle is 99.8 percent. Frequency increases and duty cycle percentage decreases with engine speed.