

Do not force the locks.

ECM AND ITS CIRCUIT CHECK

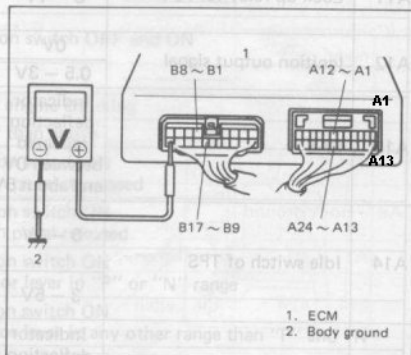
ECM and its circuits can be checked at ECM wiring couplers by measuring voltage and resistance.

CAUTION:

ECM cannot be checked by itself. It is strictly prohibited to connect voltmeter or ohmmeter to ECM with couplers disconnected from it.

NOTE:

As each terminal voltage is affected by the battery voltage, confirm that it is 11V or more when ignition switch is ON.



VOLTAGE CHECK

- Remove radio speaker cover (front left side). Refer to Fig. 6E-135.
- Remove radio speaker, if equipped.
- Remove ECM with its bracket, fuse box, relays and wire harness from steering column holder.
- Remove ECM cover. Cover off allows you to see Pin number marks. *Fig. 6E-99 Checking Voltage*
- Check that ECM couplers are connected securely. **couplers = connectors.**
- Check voltage at each terminal of couplers connected. **ECU is connected but loose for easy access to pins! out= Output pin**

TER-MINAL	CIRCUIT	NORMAL VOLTAGE	CONDITION
A1	Ignition (fail safe) signal	10 – 14V	Ignition switch ON Brown (tachometer signal)
A2	Air-conditioner circuit (if equipped)	10 – 14V	Ignition switch ON
		0 – 1V	With engine running Air-conditioner ON no wire means, no A/C option
A3	Diagnosis switch terminal DLC	10 – 14V	Ignition switch ON
		0V	Ignition switch ON Diagnosis switch terminal grounded
A4	Ground (for California spec. only) Signal	0 volts means Calif	This is an input telling ECU that this car is CALIF.
A5	Blank	—	—
A6	Power steering pressure switch (if equipped)	10 – 14V	Ignition switch ON
		0 – 1V	With engine running at idle speed, turning steering wheel to the right and left as far as it stops, repeating it a few times P/S overload, req. high idle.
A7	Test switch terminal DLC	10 – 14V	Ignition switch ON
		0V	Ignition switch ON Test switch terminal grounded
A8	Canister purge VSV	10 – 14V	Ignition switch ON
A9	Duty check terminal	—	DLC —
A10	Blank	—	—

**OUT
OUT**

DLC is the diagnostic logic connector next to battery. **if jumpers found here, remove before driving.**

TER-MINAL	CIRCUIT	NORMAL VOLTAGE	CONDITION	
A11	TCC Lock-up relay for A/T	10 – 14V	Ignition switch ON	
		0 – 1V	With "D" range position, driving vehicle at 67 km/h (42 mile/h) on flat road and keeping it for 4 seconds or more	OUT
A12	Ignition output signal	0V	Ignition switch ON	OUT
		0.5 – 3V	While engine cranking	Orange
A13	CAS CMP	Indicator deflection repeated between 0V and about 5V	Ignition switch ON Crankshaft turned slowly	WHITE
A14	Idle switch of TPS	0 – 1V	Ignition switch ON Throttle valve is at idle position (with throttle opener rod drawn in by vacuum pump gauge)	
		3 – 5V	Ignition switch ON Throttle valve opens larger than idle position	
A15	VSS MPH Veh.speed,Sensor	Indicator deflection repeated between 0V and 3 – 5V	Ignition switch ON Rear left tire turned slowly with rear right tire locked	
A16	REGTS CALIF EGR only	3.8 – 4.5V	Ignition switch ON Sensor ambient temperature: 20°C (68°F)	
A17	ATS IAT	2.2 – 3.0V	Ignition switch ON Sensor ambient temperature: 20°C (68°F)	
A18	WTS ECT	0.5 – 0.9V	Ignition switch ON Cooling water temperature: 80°C (176°F)	
A19	Oxygen sensor	Refer to	Diagnostic Flow Chart for Code No. 13	Cell +
A20	Serial data terminal	3 – 5V	Ignition switch ON	Scan tool OUT
A21	TPS TP pin Throttle Angle.	0.5 – 1.2V	Ignition switch ON Throttle valve at idle position (with throttle opener rod drawn in by vacuum gauge)	
		3.4 – 4.7V	Ignition switch ON Throttle valve at full open position	
A22	Pressure sensor MAP	3.6 – 4.4V	Ignition switch ON Barometric pressure: 760 mmHg	
A23	Power source of sensors	4.75–5.25V	Ignition switch ON	OUT
A24	Ground of sensors	0V	Ground out to sensors,	Gray Yellow OUT
B1	Power source	10 – 14V	Ignition switch ON	Blue-black
B2	Ground		Main ECU ground input.	black-grn
B3	Blank			
B4	Blank			
B5	EGR VSV	10 – 14V	Ignition switch ON	OUT

91-95 8v Sidekick (no Samurai !)

Never hot wire these pins!

ELECTRONIC FUEL INJECTION SYSTEM 6E-7

TER-MINAL	CIRCUIT	NORMAL VOLTAGE	CONDITION
B6	ISC solenoid valve	—	Modulated PWM running
B7	Power source	10 – 14V	Ignition switch ON
B8	Injector \oplus RED wire	—	Pulsed near 6mS , requires a SCOPE
B9	Power source for back-up circuit	10 – 14V	Ignition switch OFF and ON DTC memory
B10	Ground	—	—
B11	Engine start switch (Engine start signal)	6 – 10V 0V	While engine cranking Other than above
B12	Clutch switch (M/T only)	0 – 1V	Ignition switch ON Clutch pedal depressed
		10 – 14V	Ignition switch ON Clutch pedal released
	Shift switch (A/T only)	0 – 1V	Ignition switch ON Selector lever in "P" or "N" range
		10 – 14V	Ignition switch ON Selector lever in any other range than "P" and "N"
B13	"CHECK ENGINE" light	0 – 1V 10 – 14V	Ignition switch ON When engine running NO DTC's stored !
B14	Throttle opener VSV	10 – 14V	Ignition switch ON
B15	Main relay ground Coil	0 – 2V	Ignition switch ON
B16	Fuel pump relay ground Coil	0 – 4V	For 3 sec. after ignition switch ON
		10 – 14V	3 sec. after ignition switch ON goes to BAT+
B17	Injector \ominus Yellow	—	Pulsed near 5mS , requires a SCOPE

RESISTANCE CHECK

1. Disconnect ECM couplers from ECM with ignition switch OFF.

CAUTION:

Never touch terminals of ECM itself or connect voltmeter or ohmmeter.

2. Check resistance between each pair of terminals disconnected couplers as listed in following table.

CAUTION:

- Be sure to connect ohmmeter probe from wire harness side of coupler.
- Be sure to turn OFF ignition switch for this check.
- Resistance in table represents that when parts temperature is 20°C (68°F).

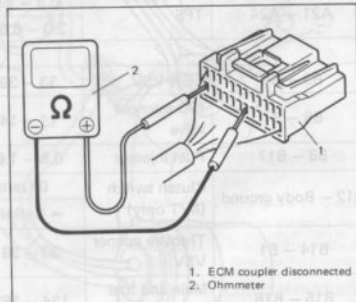


Fig. 6E-100 Checking Resistance

DO NOT HOT WIRE
the ECU or the INJECTOR
or the ECU WILL
be damaged

NOTE:

The Injector is NOT grounded.
The Injector is NOT tied to battery.
The Injector is DUAL RAIL DRIVEN !!

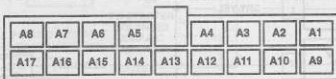
TERMINALS	CIRCUIT	STANDARD RESISTANCE	CONDITION
A3 – Body ground	Diagnosis switch terminal	∞ (infinity)	DLC, diag. logic conn. next to battery
A4 – Body ground (California spec. model only)	ECM ground	0 (zero)	This is an INPUT ! to ecu telling ecu, I'm a Calif. body.
A7 – Body ground	Test switch terminal	∞ (infinity)	DLC
A8 – B1	Canister purge VSV	30 – 38 Ω	OUT
A9 – Body ground	Duty check terminal	∞ (infinity)	DLC
A11 – B1	Lockup relay	90 – 110 Ω	TCC OUT
A14 – A24	Idle switch	0 (zero)	Throttle valve is at idle position
		∞ (infinity)	Throttle valve opens larger than idle position
A15 – Body ground	VSS	Ohmmeter indicator deflects between 0 and ∞	Rear left tire turned slowly with rear right tire locked VEH. SPEED, SENSOR
A16 – A24 (California spec. model only)	REGTS	214 – 313.8 k Ω	Sensor ambient temp. 20°C (68°F) On Calif. cars only.
A17 – A24	ATS IAT	2.28 – 2.87 k Ω	Sensor ambient temp. 20°C (68°F)
A18 – A24	WTS ECT	0.29 – 0.35 k Ω	Engine cooling water temp. 80°C (176°F)
A21 – A24	TPS	0.3 – 2 k Ω	Throttle valve at idle position with PS coupler disconnected
		2.0 – 6.5 k Ω	Throttle valve at full open position
B5 – B1	EGR VSV	33 – 39 Ω	OUT
B6 – B1	ISC solenoid valve	11 – 14 Ω	OUT
B8 – B17	Fuel injector	0.8 – 1.8 Ω	OUT
B12 – Body ground	Clutch switch (M/T only)	0 (zero)	Clutch pedal depressed
		∞ (infinity)	Clutch pedal released
B14 – B1	Throttle opener VSV	33 – 39 Ω	OUT
B15 – B16	Main and fuel pump relay	124 – 153 Ω	OUT

ECM CONNECTOR IDENTIFICATION

This following ECM voltage chart is for use with a digital multimeter to further aid diagnosis. The voltages you get may vary due to low battery charge or other reasons, but they should be very close.

THE FOLLOWING CONDITIONS MUST BE MET BEFORE TESTING:

- Engine at operating temperature • Engine idling (for "ENG. RUN" column)
- Test terminal not grounded • All voltages shown "B+" indicate system voltage



B conn. to Suzuki

BACK VIEW OF ECM CONNECTOR C1 (GREEN)

Warning GM/GEO changed A to B, So A1 = B1 in the funny GM world.

CAVITY / PIN	WIRE COLOR	CIRCUIT	VOLTAGE	
			KEY "ON"	ENG. RUN
1/A1	BLU/BLK	IGNITION POWER INPUT	B+	B+
2/A2	BLK/GRN	GROUND	0*	0*
3/A3	—	NOT USED	—	—
4/A4	—	NOT USED	—	—
5/A5	LT GRN/YEL	EGR SOLENOID VACUUM VALVE CONTROL	B+	B+
6/A6	LT GRN/BLK	IAC VALVE CONTROL	B+	B+
7/A7	BLU/BLK	IGNITION POWER INPUT	B+	B+
8/A8	RED	FUEL INJECTOR POWER INPUT	0*	B+
9/A9	WHT	MEMORY POWER INPUT	B+	B+
10/A10	BLK/BLU	GROUND	0*	0*
11/A11	BLK/YEL	CRANK SIGNAL	0*(1)	0*
12/A12	BLK/RED	PARK/NEUTRAL SIGNAL (AUTOMATIC TRANSMISSION)	0*(2)	0*(2)
13/A13	PPL/YEL	MALFUNCTION INDICATOR LAMP (MIL) CONTROL	0*	B+
14/A14	LT GRN/WHT	THROTTLE OPENER SOLENOID VACUUM VALVE CONTROL	B+	B+
15/A15	BLU	MAIN RELAY CONTROL	0.8V	0.8V
16/A16	PNK	FUEL PUMP RELAY CONTROL	B+(3)	0*
17/A17	YEL	FUEL INJECTOR CONTROL	0*	B+

Do not panic if your 5sp car has no A/T pins.

* Less than .5 volts.

(1) B+ while cranking.

(2) B+ in R, D, L, 2.

(3) 0V for 3 seconds.

(4) 0V with A/C "ON."

(5) 0V with wheels cramped.

(6) 0V with purge "ON."

(7) 5V off idle.

(8) Varies with vehicle speed.

(9) Varies with temperature.

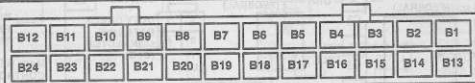
(10) Varies with engine load.

ECM CONNECTOR IDENTIFICATION

This following ECM voltage chart is for use with a digital multimeter to further aid diagnosis. The voltages you get may vary due to low battery charge or other reasons, but they should be very close.

THE FOLLOWING CONDITIONS MUST BE MET BEFORE TESTING:

- Engine at operating temperature
- Engine idling (for "ENG. RUN" column)
- Test terminal not grounded
- All voltages shown "B+" indicate system voltage



**Suzuki
A pins**

BACK VIEW OF ECM CONNECTOR C2 (YELLOW)

CAVITY / PIN	WIRE COLOR	CIRCUIT	VOLTAGE	
			KEY "ON"	ENG. RUN
1/B1	BRN	IGNITION SIGNAL (TACHOMETER)	B+	B+
2/B2	YEL/BLK	A/C ON SIGNAL	B+	B+(4)
3/B3	BLU/YEL	DIAGNOSTIC REQUEST SIGNAL	B+	B+
4/B4	BLK/GRN	GROUND SIGNAL	0*	0*
5/B5	—	NOT USED	—	—
6/B6	BLU/ORN	POWER STEERING PRESSURE SIGNAL	B+(5)	B+(5)
7/B7	BLU/RED	TEST SWITCH SIGNAL	B+	B+
8/B8	LT GRN/RED	EVAP CANISTER PURGE VALVE CONTROL	B+	B+(6)
9/B9	PPL	DUTY CHECK OUTPUT	0*	0*
10/B10	—	NOT USED	—	—
11/B11	WHT/YEL	TCC RELAY CONTROL (AUTOMATIC TRANSMISSION)	B+	B+
12/B12	ORN	IGNITER DRIVER OUTPUT	0*	.2-.4V
13/B13	WHT	CMP SENSOR INPUT	0*	1-2V
14/B14	BLU/WHT	IDLE SWITCH SIGNAL	5V	0*(7)
15/B15	YEL	VEHICLE SPEED INPUT	0-5V(8)	0-5V(8)
16/B16	RED/GRN	EGR TEMPERATURE INPUT	3-4.5V(9)	3-4.5V(9)
17/B17	RED/BLK	IAT INPUT	.5-3V(9)	.5-3V(9)
18/B18	RED/YEL	ECT INPUT	.5-3V(9)	.5-3V(9)
19/B19	YEL/BLU	EXHAUST OXYGEN CONCENTRATION INPUT	0*	0-.9V VARIES
20/B20	PPL/GRN	SERIAL DATA OUTPUT	5V	5V
21/B21	GRY	THROTTLE POSITION INPUT	.6-1.5V	.6-1.5V
22/B22	GRY/GRN	MAP INPUT	3-4V	1-5V(10)
23/B23	GRY/RED	REFERENCE VOLTAGE	5V	5V
24/B24	GRY/YEL	SENSOR GROUND	0*	0*

Missing? if no A/C

Missing? if no A/T

Missing? if not Calif

Cell+ output

*SCAN port

Sensor power
Output !

* Less than .5 volts.

(1) B+ while cranking.

(2) B+ in R, D, L, 2.

(3) 0V for 3 seconds.

(4) 0V with A/C "ON."

(5) 0V with wheels cramped.

(6) 0V with purge "ON."

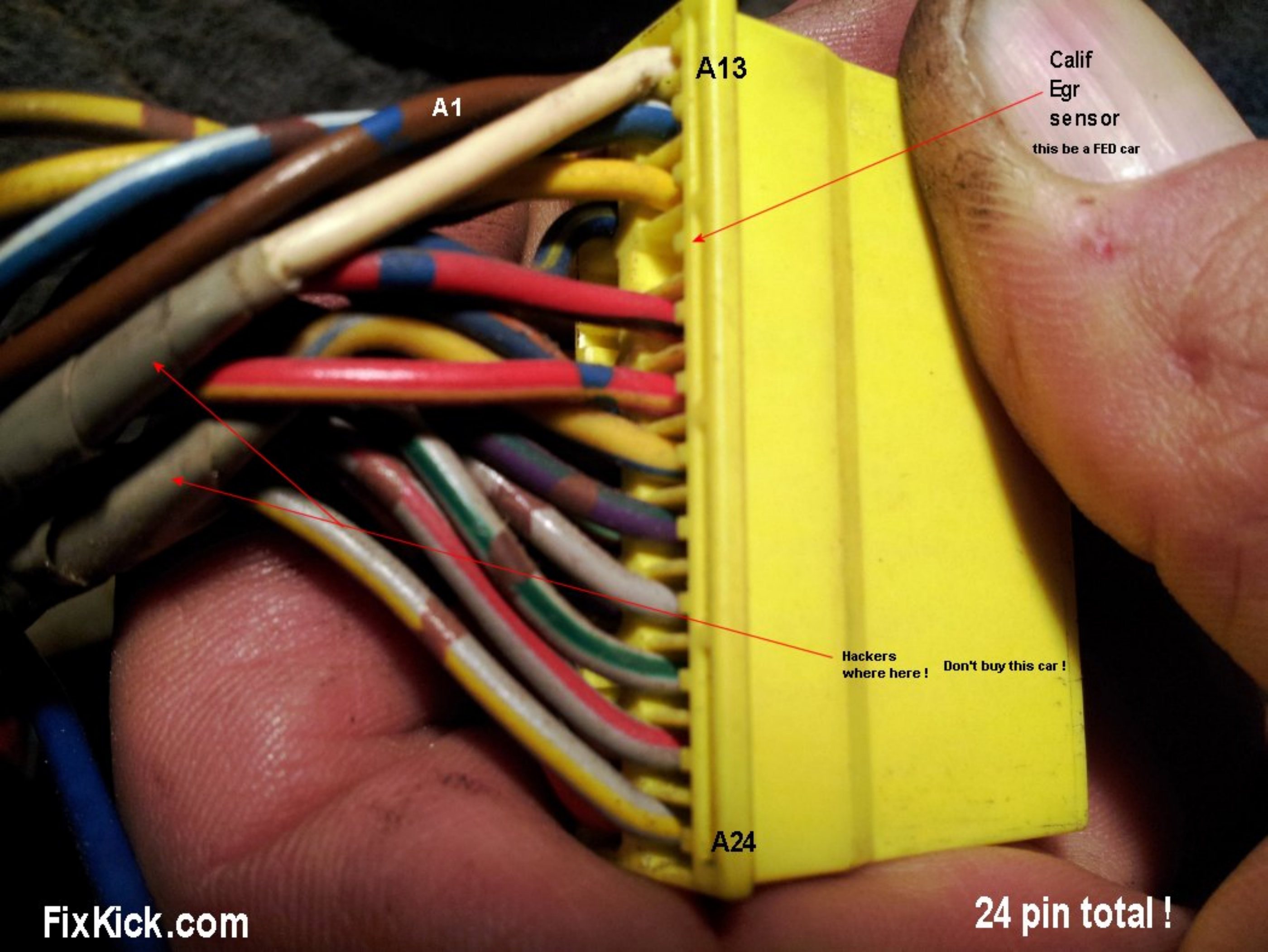
(7) 5V off Idle.

(8) Varies with vehicle speed.

(9) Varies with temperature.

(10) Varies with engine load.

Figure A-6 - ECM Connector Terminal End View 1.6L (VIN U) (2 of 2)



A1

A13

Calif
Egr
sensor
this be a FED car

Hackers
where here ! Don't buy this car !

A24

12V
POWER
IGN

B
1

N/C N/C

B
4

ISC

B
5

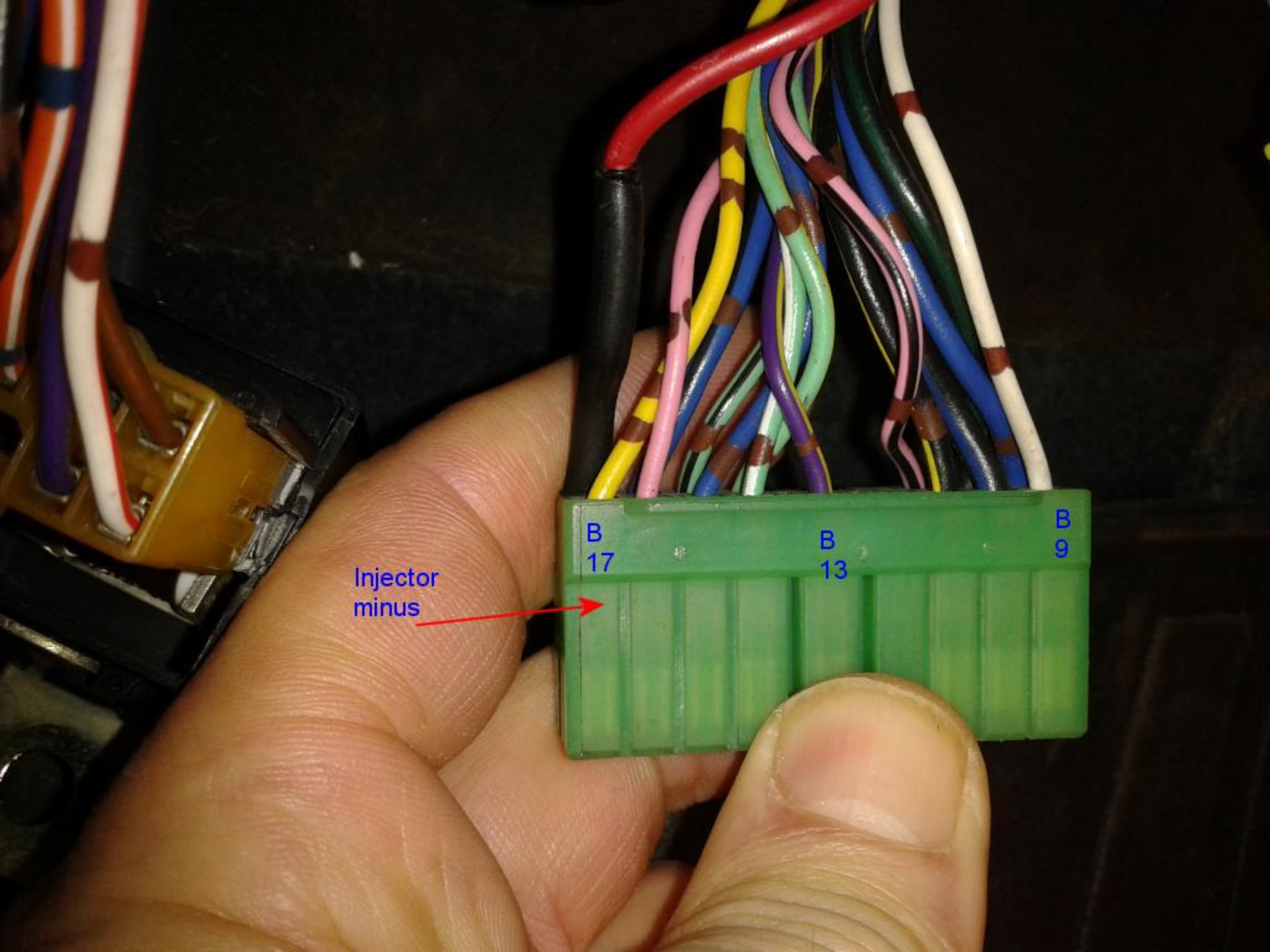
B7
12V
POWER

INJECTOR

RED WIRE

B
8

1991 tracker, (E28?)



Injector
minus

B
17

B
13

B
9