H - TESTS W/O CODES

1992 Subaru SVX

1992 ENGINE PERFORMANCE
Trouble Shooting - No Codes

Justy, Legacy, Loyale, SVX

INTRODUCTION

Before diagnosing symptoms or intermittent faults, perform steps in F - BASIC TESTING and G - TESTS W/ CODES article in the ENGINE PERFORMANCE Section. Use this section to diagnose driveability problems that exist when a hard fault code is not present.

NOTE: Some driveability problems may have been corrected by manufacturer with a revised computer calibration chip or computer control unit. Check with manufacturer for latest chip or computer application.

Symptom checks are intended to direct the technician to malfunctioning component(s) so that further diagnosis may be performed. A "symptom" should lead to further testing of specific components or systems, or verification of adjustment specifications.

Use intermittent test procedures to locate driveability problems that DO NOT occur when the vehicle is being tested. These test procedures should also be used if a soft (intermittent) trouble code was present, but no problem was found during self-diagnostic testing.

NOTE: For specific testing procedures, see I - SYS/COMP TESTS article in the ENGINE PERFORMANCE Section. For verifying specifications, C - SPECIFICATIONS or D - ADJUSTMENTS article in the ENGINE PERFORMANCE Section.

SYMPTOMS

NOTE: For Justy carbureted, see SYMPTOM DIAGNOSIS (JUSTY CARBURETED). For other models, see appropriate SYMPTOM DIAGNOSIS chart.

SYMPTOM DIAGNOSIS (CARBURETED - JUSTY)

Symptom checks cannot be used properly unless the problem occurs while the vehicle is being tested. To reduce diagnostic time, ensure steps in F - BASIC TESTING and G - TESTS W/ CODES articles in the ENGINE PERFORMANCE Section have been performed before diagnosing a symptom. Symptoms available for diagnosis include:

* Does not start - cold
* Does not start - warm
* Rough or unstable idle
* Idle speed too high
* Engine stalls

* Improper engine operation/poor fuel mileage
* Engine afterburn occurs
* Engine backfires
* Engine knocks

DOES NOT START - COLD

* Check battery condition.
* Ensure sufficient secondary spark is available.
* Ensure ignition and valve timing are correct.
* Verify choke valve is closed.
* Ensure fuel level is at specified mark on carburetor sight glass.

* Ensure fuel system pressure is correct.
* Check for contaminated fuel.
* Ensure correct vacuum hose routing.
* Check slow fuel-cut solenoid valve operation. A click should be heard from solenoid valve as ignition switch is cycled on and off.

* Check charcoal canister operation by clamping hose(s) shut. If problem discontinues, check vacuum hose routing.
* Ensure exhaust system is not restricted.

DOES NOT START - WARM

* Check battery condition.
* Ensure sufficient secondary spark is available.
* Ensure ignition and valve timing are correct.
* Verify choke valve is open.
* Ensure fuel level is at specified mark on carburetor sight glass.

* Ensure fuel system pressure is correct.
* Check for contaminated fuel.
* Check for clogged fuel return hose.
* Check for loose or clogged carburetor jets.
* Check for fuel percolation.

* Ensure correct vacuum hose routing.
* Check float chamber vent solenoid operation.
* Check slow fuel-cut solenoid valve operation. A click should heard from solenoid valve as ignition switch is cycled on and off.

* Check charcoal canister operation by clamping hose(s) shut. If problem stops, check vacuum hose routing.
* Ensure exhaust system is not restricted.

ROUGH OR UNSTABLE IDLE

* Ensure there are no vacuum leaks.
* Verify vacuum hose routing is correct.
* Ensure idle adjustment is correct.
* Ensure fast idle adjustment is correct.

* Check vacuum choke break diaphragm.
* Check choke valve operation.
* Ensure fuel level is at specified mark on carburetor sight glass.

* Check for fuel percolation.
* Check PCV system operation.
* Check EGR operation.

* Verify ignition timing is correct.
* Briefly remove spark plug wires individually to determine if

problem can be isolated.
* Check thermostatic air cleaner operation.

IDLE SPEED TOO HIGH

* Check idle-up actuator vacuum hose routing.
* Check fast idle cam for binding.

* Check linkage for binding.
* Check choke adjustment and operation.

* Check throttle cable adjustment.
* Check ignition timing.

ENGINE STALLS

* Verify correct air cleaner intake control door operation.
* Ensure correct choke adjustment and operation.

* Check idle compensator operation.
* Check idle mixture adjustment.

* Ensure there are no vacuum leaks.
* Check PCV system operation.
* Check EGR valve operation.

POOR FUEL MILEAGE

* Ensure there are no vacuum leaks.
* Ensure ignition and valve timing are correct.
* Verify choke valve is open (engine warm).
* Ensure fuel level is at specified mark on carburetor sight glass.

* Verify base timing is correct and timing advance system is functional.
* Ensure sufficient secondary spark is available.
* Check canister purge control valve operation.

* Ensure engine has sufficient compression.
* Ensure exhaust system is not plugged.
* Check carburetor mixture control duty cycle using dwell meter.
* Check engine for overheating or overcooling.

ENGINE AFTERBURN OCCURS

* Ensure idle adjustment is correct.
* Ensure automatic choke operation is correct.
* Check for clogged carburetor main air bleed.

* Ensure ignition timing is correct.
* Check spark plug cables for poor contact.

ENGINE BACKFIRES

* Ensure idle adjustment is correct.
* Ensure automatic choke operation is correct.
* Check for clogged carburetor main jet.

* Ensure ignition timing is correct.
* Check carburetor mixture control duty cycle using dwell

meter.

ENGINE KNOCKS

* Check for clogged carburetor main jet.
* Ensure operation of ignition control unit is correct.
* Check EGR valve operation.

* Ensure ignition timing is correct.
* Check for poor or contaminated fuel.

* Check for carbon in combustion chamber.
* Check engine for overheating.

SYMPTOM DIAGNOSIS (JUSTY PFI)

TROUBLE No.											CHECK ENGINE light		POSSIBLE CAUSE
1	2	3	4	5	6	7	8	9	10		U	D	
													FUEL INJECTOR
	◎	◎	○	○	○		○	○			ON	*1	• Connector not connected
	○	○	○	◎	◎		○				ON	ON	• Poor contact of terminal
	◎	◎	○	○	○		○				ON	ON	• Short circuit
	◎	◎	○	○	○		○	○			ON	ON	• Discontinuity of wiring harness
	△	○	○	△	○		○	△	○		*2	*2	• Performance characteristics unusual
	△	○	△	△	○		○	△			*2	*2	• Clogged filter
	△	○	○	○	○		○	△			*2	*2	• Clogged nozzle
○											OFF	*	• Stuck open
			○				○		○		OFF	*	• Slight leakage from seat
													CRANK ANGLE SENSOR
◎											ON	ON	• Connector disconnected
	○	○	◎	◎	◎		○	○			ON	*1	• Poor contact of terminal
◎											ON	ON	• Short circuit
◎											ON	ON	• Discontinuity of wiring harness
													POWER TRANSISTOR OF IGNITION COIL
◎											OFF	*	• Connector not connected
	○	○	◎	◎	◎		○				OFF	*	• Poor contact of terminal
◎											OFF	*	• Short circuit
◎											OFF	*	• Discontinuity of wiring harness
													AIR REGULATOR [1800 cc model only]
						◎					OFF	*	• Connector not connected
	○	◎	○								OFF	*	• Short circuit
						◎					OFF	*	• Discontinuity of wiring harness
													KNOCK SENSOR [2700 cc model only]
								◎			ON	ON	• Connector not connected
				○	○						ON	ON	• Short circuit
								◎			ON	ON	• Discontinuity of wiring harness
													DUTY SOLENOID
					△						OFF	*	• Connector disconnected
											OFF	*	• Poor contact of terminal
								○			OFF	*	• Short circuit
					△						OFF	*	• Discontinuity of wiring harness
			○	○	○	○	○	○			OFF	*	• Disconnected or cracked hose
													AIR CONTROL VALVE [2700 cc model only]
	○	△	◎								ON	ON	• Connector not connected
	△	○	◎								ON	*1	• Poor contact of terminal
			○				○				ON	ON	• Short circuit
	○	△	◎								ON	ON	• Discontinuity of wiring harness
			◎			◎					OFF	*	• IAS improperly adjusted
					◎	◎					ON	*	• Stuck open
	○	○	◎								OFF	*	• Stuck closed
													ENGINE GROUNDING
○											ON		• Disconnecting of engine grounding terminal at intake manifold
◎	◎	○	◎	◎	◎						ON	*1	• Poor contact of engine grounding terminal
○											ON		• Discontinuity of wiring harness for engine grounding
1	2	3	4	5	6	7	8	9	10	11	U	D	

#: CHECK ENGINE light

Fig. 1: Chart 1 of 2 - Symptom Diagnosis (Justy PFI Models)
Courtesy of Subaru of America, Inc.

*: The CHECK ENGINE light blinks.
*1: The CHECK ENGINE light blinks when contact is resumed during inspection (although poor contact is present in the D-check).
*2: The CHECK ENGINE light lights when the mixture is leaner than that specified and does not light (U-check) or blink (D-check) when the mixture is richer.
*3: The CHECK ENGINE light lights when abnormality is detected in the D-check mode if the idle switch persistently remains off with the accelerator pedal released.

Symbols shown in the table refer to the degree of possibility of the reason for the trouble ("Very often" to "Rarely").
◎ : Very often
○ : Sometimes
△ : Rarely
☆ : Occurs only in extremely low temperatures

TROUBLE No.										CHECK ENGINE light		POSSIBLE CAUSE
1	2	3	4	5	6	7	8	9	10	U	D	
		☆	◎				△	△	○	ON	ON	AIR FLOW METER • Connector not connected
		△	◎	◎	◎		◎	○	△	ON	*1	• Poor contact of terminal
		☆	◎				△	○	△	ON	ON	• Short circuit
		☆	◎				△	△	○	ON	ON	• Discontinuity of wiring harness
		○	○	○	○		△	◎	○	*2	*2	• Performance characteristics unusual
	☆	○	☆		○		○	○	○	ON	ON	COOLANT THERMOSENSOR • Connector not connected
	△	△	◎	○	○		◎	△	○	ON	*1	• Poor contact of terminal
	☆	○	☆		○		○	○	○	ON	ON	• Short circuit
	☆	○	☆		○		○	○	○	ON	ON	• Discontinuity of wiring harness
	☆	○	☆		○		◎	◎	◎	*2	*2	• Performance characteristics unusual
				○	◎		◎			OFF	ON	IDLE SWITCH OF THROTTLE SENSOR • Connector not connected
				○			○			ON	*1	• Poor contact of terminal
				○	△		○			ON	ON	• Short circuit
					△		○			OFF	ON	• Discontinuity of wiring harness
							○			OFF	*3	• Improper adjustment
					◎		◎			ON	ON	THROTTLE SENSOR • Connector not connected
				◎	◎		◎			ON	*1	• Poor contact of terminal
△					◎		◎			ON	ON	• Short circuit
					◎		◎			ON	ON	• Discontinuity of wiring harness
	○	○	△	○	◎		◎			OFF	*	• Performance characteristics unusual
	○	○	◎	◎	◎	○		△		*2	*2	PRESSURE REGULATOR • Sensing hose not connected
	△				○		○		◎	OFF	*	• Fuel pressure too high
○	○	○	◎	◎	◎		◎			*2	*2	• Fuel pressure too low

TROUBLE		
1	Engine will not start	No initial combustion
2		Initial combustion occurs.
3		Engine stalls after initial combustion.
4	Rough idle and engine stall	
5	Inability to drive at constant speed	
6	Inability to accelerate and decelerate	
7	Engine does not return to idle.	
8	Afterburning in exhaust system	
9	Knocking	
10	Excessive fuel consumption	
11		
U	CHECK ENGINE light operation	U-check mode & read memory mode
D		D-check mode

Fig. 2: Chart 2 of 2 - Symptom Diagnosis (Justy PFI Models)
Courtesy of Subaru of America, Inc.

SYMPTOM DIAGNOSIS (LOYALE)

*: The CHECK ENGINE light blinks.
*1: The CHECK ENGINE light blinks when contact is resumed during inspection (although poor contact is present in the D-check).
*2: The CHECK ENGINE light lights when abnormality is detected in the D-check mode if the idle switch persistently remains off with the accelerator pedal released.
*3: The CHECK ENGINE light lights when the specified performance characteristics are unusual with the throttle valve in the slightly-opened position.

Symbols shown in the table refer to the degree of possibility of the reason for the trouble ("Very often" to "Rarely").
◎ : Very often
○ : Sometimes
△ : Rarely
☆ : Occurs only in extremely low temperatures

TROUBLE		
1	Engine will not start.	No initial combustion
2		Initial combustion occur.
3		Engine stalls after initial combustion.
4	Rough idle and engine stall.	
5	Inability to drive at constant speed	
6	Inability to accelerate and decelerate	
7	Engine does not return to idle.	
8	Afterburning in exhaust system	
9	Knocking	
10	Excessive fuel consumption	
11	Inability to "kick-down" and upshift	
U	CHECK ENGINE light operation	U-check mode & read memory mode
D		D-check mode

TROUBLE No.											CHECK ENGINE light		POSSIBLE CAUSE
1	2	3	4	5	6	7	8	9	10	11	U	D	
													AIR FLOW METER
		☆	◎				△	△	○		ON	ON	• Connector not connected
		△	◎	◎	◎		◎	○	△		ON	*1	• Poor contact of terminal
		☆	◎				△	○	△		ON	ON	• Short circuit
		☆	◎				△	△	○		ON	ON	• Discontinuity of wiring harness
		○	○	○	○		△	◎	○		OFF	*	• Performance characteristics unusual
													COOLANT THERMOSENSOR
	☆	○	☆		○		○	○	○		ON	ON	• Connector not connected
	△	△	◎	○	○	△	◎	◎	○		ON	*1	• Poor contact of terminal
	☆	○	☆		○		○	○	○		ON	ON	• Short circuit
	☆	○	☆		○		○	◎	○		ON	ON	• Discontinuity of wiring harness
	☆	○	○	△	○	○	◎	◎	◎		OFF	*	• Performance characteristics unusual
													IDLE SWITCH OF THROTTLE SENSOR
			◎	○	◎	◎	◎				ON	ON	• Connector not connected
			◎	○		◎	◎				ON	*1	• Poor contact of terminal
			◎	◎	△		◎				ON	ON	• Short circuit
			◎		△	◎	◎				ON	ON	• Discontinuity of wiring harness
			◎			◎	◎				OFF	*2	• Improper adjustment
1	2	3	4	5	6	7	8	9	10	11	U	D	

Fig. 3: Chart 1 of 2 - Symptom Diagnosis (Loyale)
Courtesy of Subaru of America, Inc.

TROUBLE No.											CHECK ENGINE light		POSSIBLE CAUSE
1	2	3	4	5	6	7	8	9	10	11	U	D	
				◎	◎		◎			○	ON	*1	THROTTLE SENSOR ● Poor contact of terminal
△			◎		◎		◎			◎	ON	ON	● Short circuit
			△		◎		◎			◎	ON	ON	● Discontinuity of wiring harness
	○	○	△	○	◎		◎			◎	OFF	*3	● Performance characteristics unusual
								△			OFF	*	PRESSURE REGULATOR ● Sensing hose cracked or disconnected
	△				○		○		◎		OFF	*	● Fuel pressure too high
○	○	○	◎	◎	◎		◎				OFF	*	● Fuel pressure too low
○											ON	ON	FUEL INJECTOR ● Connector not connected
	○	○	◎	◎	◎		○				ON	*1	● Poor contact of terminal
○											ON	ON	● Short circuit
○											ON	ON	● Discontinuity of wiring harness
	○	○	◎	◎	◎		◎		◎		OFF	*	● Performance characteristics unusual
	○	○	○	○	○						OFF	*	● Clogged filter
○	△										OFF	*	● Stuck open
			○				○		○		OFF	*	● Slight leakage from seat
													AIR CONTROL VALVE
	○	△	◎								ON	ON	● Connector not connected
	△	○	◎								ON	*1	● Poor contact of terminal
			○				○				ON	ON	● Short circuit
	○	△	◎								ON	ON	● Discontinuity of wiring harness
			◎			◎					OFF	*	● IAS improperly adjusted
						◎					OFF	*	● Stuck open
	○	○	◎								OFF	*	● Stuck closed
													CRANK ANGLE SENSOR
◎											ON	ON	● Connector not connected
	○	○	◎	◎	◎		○	○			ON	*1	● Poor contact of terminal
◎											ON	ON	● Short circuit
◎											ON	ON	● Discontinuity of wiring harness
													POWER TRANSISTOR OF IGNITION COIL
◎											OFF	*	● Connector not connected
	○	○	◎	◎	◎		○	△			OFF	*	● Poor contact of terminal
◎											OFF	*	● Short circuit
◎											OFF	*	● Discontinuity of wiring harness
1	2	3	4	5	6	7	8	9	10	11	U	D	

Fig. 4: Chart 2 of 2 - Symptom Diagnosis (Loyale)
Courtesy of Subaru of America, Inc.

SYMPTOM DIAGNOSIS (LEGACY)

Parts to check		ECU power supply	Air flow sensor	Water temperature sensor	Idle switch	Throttle sensor	Fuel pump	Pressure regulator	Fuel injector	Igniter (power transistor)	Ignition coil	Spark plug	Knock sensor	Cam angle sensor	Crank angle sensor	By-pass air control solenoid valve	O_2 sensor	Waste-gate control solenoid valve
Symptom	Failure of engine to start: Initial combustion does not occur.	1	10	11			5	6	7	2	3	4		8	9			
	Failure of engine to start: Initial combustion occurs.	1		10			2	3	4	5	6	7		8	9	11		
	Failure of engine to start: Engine stalls after initial combustion.	1	2	7		8	4	5	6	11	12	13		9	10	3		
	Rough idling	1	3	12	8	7	4	5	6	9	10	11		13	14	2	15	16
	Hard to drive at constant speed	1	4	6	8	7	3	2	9	12	13	14		10	11		5	15
	Poor acceleration/ deceleration	1	2	6	7	8	3	4	5	13	14	15	9	11	12	10	10	2
	Poor return to idle			3	2											1		
	Backfire			3	4	5		6	7					2	1			
	Knocking		1	2				4	5				3		6			7
	Excessive fuel consumption		3	4				1	2									
	Shocks while driving	1	8						7	4	5	6		2	3			
	Poor engine revving		2	3	4	5		1										
Remarks		Include engine ground circuit.														Check hoses.		Check hoses.

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Fig. 5: Symptom Diagnosis (Legacy)
Courtesy of Subaru of America, Inc.

SYMPTOM DIAGNOSIS (SVX)

Symptom \ Part to check		ECU power supply	Air flow sensor	Water temperature sensor	Throttle sensor	Fuel pump	Pressure regulator	Fuel injector	Ignitor	Ignition coil	Spark plug	Knock sensor 1 & 2	Crank angle sensor 1	Crank angle sensor 2	Cam angle sensor	O_2 sensor 1 & 2	Induction solenoid valve	By-pass air control solenoid valve	Auxiliary air control valve
Failure of engine to start	Internal combustion does not occur.	1	11	12		5	6	7	2	3	4		8	9	10				
	Internal combustion occur.	1	11			2	3	4	5	6	7		8	9	10			12	13
	Engine stalls after initial combustion.	1	2	8	9	5	6	7	13	14	15		10	11	12			3	4
Rough idling		1	3	11	10	7	8	9	4	5	6		12	13	14	15		2	
Hard to drive at constant speed		1	4	6	7	3	2	8	12	13	14		9	10	11	5			
Poor acceleration/ deceleration		1	2	6	7	3	4	5	13	14	15	8	10	11	12		16	9	
Poor return to idle				3	2													1	
Backfire				4	5		6	7					1	2	3				
Knocking			1	2			4	5				3	6	7					
Excessive fuel consumption			3	4			1	2											
Shocks while driving		1	9					8	5	6	7		2	3	4				
Poor engine revving			2	3	4		1												
Remarks		Include ECU grounding circuit.															Check hoses and relating part	Check hoses	Check hoses

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Check possible faults in numerical order (1, 2, or 3).

Courtesy of Subaru of America, Inc.

Fig. 6: Symptom Diagnosis (SVX)
Courtesy of Subaru of America, Inc.

INTERMITTENTS

INTERMITTENT PROBLEM DIAGNOSIS

Intermittent fault testing requires duplicating circuit or component failure to identify problem. These procedures may lead to the computer setting a fault code, which may help in diagnosis.

If problem vehicle does not produce fault codes, monitor voltage or resistance values using a DVOM while attempting to reproduce the conditions causing intermittent fault. A status change on DVOM indicates a fault has been located.

Use a DVOM to pinpoint faults. When monitoring voltage, ensure ignition switch is in ON position or engine is running. Ensure ignition switch is in OFF position or negative battery cable is disconnected when monitoring circuit resistance. Status changes on DVOM during test procedures indicate area of fault.

TEST PROCEDURES

Intermittent Simulation

To reproduce the conditions creating an intermittent fault, use the following methods:

* Lightly vibrate component.
* Heat component.
* Wiggle or bend wiring harness.

* Spray component with water.
* Remove/apply vacuum source.

Monitor circuit/component voltage or resistance while simulating intermittent. If engine is running, monitor for self-diagnostic codes. Use test results to identify a faulty component or circuit.