

## Electrical: SRS Air Bag and Seatbelts

[FAQ Home](#)

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### [Volvo Maintenance FAQ for 7xx/9xx/90 Cars](#)

[SRS Cautions](#)

[SRS Onboard Diagnostic Codes: Pre 1993 Cars](#)

[SRS Onboard Diagnostic Codes: 1992+ Cars](#)

["Bad" Crash Sensor and Wiring Connector Faults](#)

[Replacing SRS Crash Sensor Control Unit](#)

[Air Bag and SRS Components Lifetime](#)

[Seat Belt Mechanism Repair](#)

[Seat Belt Retraction Reset](#)

[Seat Belt Button Replacement](#)

[Seat Belt Replacement](#)

[Air Bag Anti-Theft Devices](#)

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**SRS Cautions.** Before touching your SRS system or any of its components, be sure you know what you are doing by reading the Volvo OEM SRS manual which is available from Volvo Technical Literature. In addition, switch the ignition "off" and **disconnect the battery** negative lead, then **wait at least ten minutes** before doing any work on the system. Do not pound or tap anywhere near the SRS crash sensor (for example, while under the car) if the ignition is "on" even if you are not working on the SRS system. Do not use an electrical welding unit on the car without disconnecting the battery negative lead. Do not under any circumstance use an ohmmeter or live electrical measurement instrument to measure resistance in the airbag/seat tensioner or wiring while these components are connected, as this may cause them to activate. You are highly advised to leave any repairs to trained dealer personnel who know what they are doing.

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### **SRS Onboard Diagnostic Codes: 1992 and Prior Cars**

[Tip: Bob] There are three possible locations for SRS test point. In [1992+ cars](#) with two diagnostic test socket boxes (box "A" has the probe, the test button, and the LED readout lamp) at the left strut tower, socket 5 in box "B" is SRS. Accessing code and resetting is same as for check engine light.

In earlier cars, the test location is the fusebox behind ash tray. There are 4 fuse holders across the front of the fuse box, some of these do not have fuses. The second from left would be SRS test point. It has a terminal on one side only. You plug in to this socket and ground it to read/ reset code.

[Jeffrey Davis] Use an 18 - 22 gauge solid wire with 1/4 to 1/2 inch of insulation stripped from the ends. Insert the end of the jumper you made into the test point opening so it is gripped by the clip inside. Arrange the wire so you can touch the other end of it to the grounded metal ring of the cigarette lighter. Turn the ignition on so the dash warning lights are on and wait 15 seconds. Ground the test terminal for 2 full seconds. The SRS light will flash immediately when the connection is first broken. This is not a fault code. The light will then flash one to ten times for the code (see [table](#) below). The light will then come back on. Without turning the key off, clear the fault codes. Ground the test terminal three times for at least 0.25 seconds each time all within a period of 1.5 to 5 seconds. It will probably take several tries to get the rhythm. The lamp will go out for 4 seconds, re-light for 3 seconds, and then go out. If the light does not stay out, then there is still a fault present and you will need to go further in to it.

[Jay Simkin] Always read the codes three times before resetting them. Often they will not reset after just one, or even two readings. If you still have SRS trouble codes, try this as a last resort. Disconnect the negative battery terminal clamp. Let the car sit for 1/2 hour. Reconnect the negative terminal clamp and drive the car. Do this three times. If the SRS light re-sets, fine. If not, it is time to replace the SRS sensor.

In [780](#) cars, the test point for the SRS OBD system is not in the front row of fuse sockets nor in the engine compartment, but rather is a brown/black wire with a female spade connector, located in the vicinity of the fuse panel or behind the radio. Reading codes is done the same way as above by grounding the wire.

Code	Fault	Corrective Actions
1	Fault in crash sensor	Check all electrical connections and/or replace crash sensor.
2	Fault in standby power unit or in wiring between unit and sensor	Check all electrical connections between unit and crash sensor. Replace standby power unit. Replace crash sensor.
3*	Test terminal or SRS warning light lead is shorted to battery + or to ground. Symptom: warning light continuously on or always off.  (*SRS light will always be on or will not activate)	Check at test terminal connector for short circuit to battery + or ground. Check wiring harness and connectors

4	Air bag assembly resistance low	Check wiring, contact reel, and connectors for short circuits. Measure resistance of contact reel. Replace air bag module
5	Air bag assembly resistance high	Check gas generator connector. Check wiring and contact reel for open circuit. Replace air bag module.
6	Not used	
7	Not used	
8	Air bag or wiring shorted to battery positive +	a. Check wiring and connectors for shorts. b. Check wiring and contact reel. Measure circuit resistance. c. Replace crash sensor.
9	Air bag assembly shorted to ground -.	a. Check for grounded gas generator wiring. b. Check wiring and contact reel for short to ground. Measure circuit resistance. c. Replace air bag module.
10	Mercury switch in sensor shorted, or closed for more than one minute. Lead to seat belt tensioner shorted to ground or battery positive.	a. Ensure that crash sensor is correctly installed. b. Replace crash sensor. c. 780: Check seat belt tensioner wiring.
11**	BOTH seat belt tensioners disconnected (no code if only one connected).  (**780 only. Car must be started twice to enable code 11 to be displayed.)	a. Ensure both tensioners are connected. b. Check common wiring harness. c. Replace crash sensor.

**SRS Onboard Diagnostic Codes: 1993+ Cars.** Later 940 and 960 cars have an onboard diagnostic system for the Supplemental Restraint System that both monitors the system and stores any fault codes for later diagnosis. Faults can occur in components such as airbags, seat belt tensioners, and the sensor unit or in their associated wiring circuits. A fault is indicated by the SRS lamp in the instrument panel, which remains "on" until the fault has been remedied and the OBD system cleared.

**SRS Codes.** Per Jay Simkin, 9 out of 10 times some fluke makes the SRS code lamp go on, and once it is reset it never comes on again. There is always a chance that the system has a weak component (maybe the backup power capacitor) that

may have been affected by an electrical glitch. Could have just been a very hard jolt that set it off. Make sure you follow the instructions carefully, including reading the codes at least three times, to properly reset the system.

A. To read faults, refer to the OBD diagnostic output boxes on the front of the driver's side strut tower. You will find two, labelled "A" and "B". Box "A" has the probe, the test button, and the LED readout.

1. Remove the selector lead from the side of "A" and insert it into terminal 5 of output box "B".
2. Turn the ignition "on" to key position II.
3. Wait about ten seconds. Press the button on box "A". Keep it pressed for about 1 second.
4. Read off the LED flashes. [Codes](#) have three digits: A-B-C. If code 1-1-1 is read, there are no stored fault codes. If a code other than 1-1-1 is obtained, write it down and press the button again to see if there are more. When the first code recurs, all codes have been read. If you can't obtain any flashing light, see [No Codes](#).
5. [Jay Simkin] Always read the codes three times before resetting them. Often they will not reset after just one, or even two readings.

Code	Fault
1-1-1	OK: No faults detected in the OBD system
1-1-2	Internal fault in the sensor unit
1-2-7	SRS lamp, short circuit or break in circuit
2-1-1	Steering wheel module, short circuit in wiring
2-1-2	Steering wheel module, break in wiring
2-1-3	Steering wheel module, short circuit to ground
2-1-4	Steering wheel module, short circuit to +12V
2-2-1	Passenger module, short circuit in wiring
2-2-2	Passenger module, break in wiring
2-2-3	Passenger module, short circuit to ground
2-2-4	Passenger module, short circuit to +12V
2-3-1	Seat belt tensioner left, short circuit in wiring
2-3-2	Seat belt tensioner left, break in wiring
2-3-3	Seat belt tensioner left, short circuit to ground
2-3-4	Seat belt tensioner left, short circuit to +12V
2-4-1	Seat belt tensioner right, short circuit in wiring

2-4-2	Seat belt tensioner right, break in wiring
2-4-3	Seat belt tensioner right, short circuit to ground
2-4-4	Seat belt tensioner right, short circuit to +12V
No code	SRS lamp in the instrument cluster does not light
No code	Fault in diagnostic output

B. To clear fault codes other than 1-1-2 (indicating a crash sensor fault, which must not be cleared but rather returned to the dealer):

1. Remember to read the codes three times before clearing.
2. Remove the selector lead from the side of "A" and insert it into terminal 5 of output box "B".
3. Turn the ignition "on" to key position II.
4. Press the button on box "A". Keep it pressed for at least 5 seconds.
5. Release the button. The LED lights.
6. Press the button again when the LED lights and keep it pressed for at least 5 seconds.
7. The codes are now cleared.

To check whether codes are cleared, repeat procedure A above. If codes remain, then the fault persists and must be repaired.

[Jay Simkin] If you still have SRS trouble codes, try this as a last resort. Disconnect the negative battery terminal clamp. Let the car sit for 1/2 hour. Reconnect the negative terminal clamp and drive the car. Do this three times. If the SRS light re-sets, fine. If not, it is time to replace the SRS sensor and the power module.

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**"Bad" Crash Sensor and Wiring Connector Faults.** How do you know the sensor is really bad? On my 91 240, the SRS light came on while driving indicating a fault in the system. I bought the factory SRS service manual which said that the trouble code showed a bad airbag or wiring from the crash sensor to the airbag. I then bought the test resistor which substitutes for the air bag to see if the SRS light would go out. Because the air bag and all the associated wiring checked good, the manual said the crash sensor is bad but only by elimination. After learning that a new sensor listed for \$960, I studied the wiring diagram for the SRS system and discovered that the power for the SRS light comes from the dashboard not the SRS system which turns the light out when no fault codes are stored. So if there were no power to the system the light would stay on. I cleaned the contacts of the yellow or orange connector, where there was power, which is under the carpet of the transmission tunnel driver's side. I then cleared the trouble codes (see below) and everything checked out fine. That was over a year ago and the light reacts normally. The manual did not mention this as a possible cause. I hope this explanation will help you and others with "bad" sensors.

[More on this problem from Jeffrey Davis:] A common problem is corrosion of the contacts on the yellow or orange power connector for the crash sensor under the

carpet on the transmission tunnel. If the procedure to reset the fault codes doesn't work, make sure the contacts are clean and then try to clear the codes again. If the SRS light comes back on, the problem is probably another component or even low battery voltage. Faults must be cleared for the light to go out.

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**Replacing SRS Crash Sensor Control Unit.** [Query] I have entrusted my 1991 740 Turbo to a Volvo dealer to diagnose the SRS warning light. The service rep wants me to authorize replacement of the SRS control unit at a cost of \$1500 (!), adding that the unit is 'mine' once the protective packaging is opened, regardless of the condition of the original. Given this policy, is it possible to determine if a SRS control unit is bad short of swapping parts?

[Response] Buy a used unit from a boneyard. For about \$100-150, you can purchase the sensor/control unit and power supply box, install it, and be off and running. Just make sure that the donor car did not have its air bags deployed: the crash sensor is a one-use-only device.

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**Air Bag and SRS Component Lifetime.** Notes:Bob] The owner's manual and SRS sticker in many cars indicates a need for a dealer check of the air bag, sensor, and diagnostic portions of the SRS system after ten years and to potentially replace the air bags. The bag replacement interval was extended to 15 years (Volvo Service Bulletin 88-0001 April 2003) . "According to the owners manual the airbag must be replaced after 10 years. Tests have shown that the service life can be extended to 15 years. Further tests have indicated that the service life of driver's airbags, manufactured between 1987 and 1992 which are 15 years old can be increased to 20 years. For driver's and passenger airbags manufactured between 1993 and 1996, the service life can be extended to 15 years. The airbag system has self-diagnostics. This means that the only check required is to ensure that the warning lamp is working and no diagnostic trouble code (DTC) is stored. The warning lamp indicates if a diagnostic trouble (DTC) is stored." If the SRS light comes on with key in run position and goes out after approximately 10 seconds or at engine start, all is well. [Jay Simkin] An email letter from Volvo North America Customer Service in June, 2007 refers to a newer Volvo Service Manager Bulletin 88-017 dated 7/12/2006 and notes:

Dear Mr. Simkin,

Thank you for contacting Volvo. Volvo has recently extended the life of the SRS components to be the same as the lifetime of the car. We have done this after gaining extensive knowledge about the aging of pyrotechnic components from both development and production follow-up tests. Periodic inspections and servicing of the SRS components, based solely on the age of the vehicle, are no longer required.

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## Seat Belt Mechanism Repair

**Seat Belt Won't Release.** [Tip from Dick Riess] When my seat belt would not release, I squirted WD-40 down the mouth of the buckle receiver and now it works perfectly, in fact better than previously. Never have seen lubrication of this even suggested and I know a lot of receivers have been replaced. Perhaps they just need a squirt of lube. [Editor: try Superlube or Mobil 1 Spray for non-staining

lubes].

### **Seat Belt Won't Fasten.**

[Query:] The driver's side safety belt on my 1990 740 will not fasten. It slides in the fastener/buckle but does not click and the holder will not latch to hold the metal tip in the buckle. When looking in the buckle, I can see some kind of red plastic device which I can move around but can't get out. Anybody had this problem before and know how to fix it?

[Response: Alan Carlo] I had a similar problem on the passenger belt. I took it out of the car and disassembled the plastic cover. It is glued/sonic welded together so I had to cut/pry it apart. Once the cover was off I found a lot of junk in the mechanism. Carefully disassemble, clean and lightly lube the mechanism and test it before re-gluing the cover together. If memory serves there is a plastic slide and spring in there. It is clear how it works once the cover is off. [Editor] You will need to remove the center console to reach the belt buckle bolt: see the [FAQ File](#).

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### **Seat Belt Retraction Reset.**

[Query] I removed the front passenger seat. When I was ready to reinstall the seat belt reel unit located on the bottom of the seat it wouldnt give me any slack. I could feed it more belt but it wouldn't give any back. After playing with it for too long I decided that I would just get a different seat belt from the junkyard. As soon as I removed the belt off another 740 it did the same thing. Is there any kind of reset. [Response: Don Foster] You must hold the spool in exactly the same orientation as when it's mounted. Otherwise the internal latch locks it up. It can be a royal pita. [Response: John Randstrom] You must duplicate the angle that the seat belt assembly is mounted to the seat frame before the belt will unspool. I took me quite a few positions before it freed up. After this experience I always pull out some slack and put a large safety pin through the webbing that prevents the excess from being drawn into the belt assembly before unbolting it from the seat.

**[Instructions with illustrations](#) to rebuild the retractor when the seat belt retractor hangs, making it a PITA to get the seat belt out.**

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**Seat Belt Button Replacement.** [Query] The little black plastic button, mounted in the seat belt near the edge of the seat to hold the buckle, has broken and my buckle now falls to the floor. How do I repair this? [Editor] While the button is not available separately from the belt, you can fabricate a substitute using a "bachelor's button" from a fabric store. This is a button mounted to a thumb-tack-like post and can be inserted into the existing hole without damaging the belt.

**Seat Belt Latch Red Button Replacement.** [Larry Dennis] This red button in the latch deteriorates in the sun and can break. An easy fix is to find one from a car that has seen less sun, usually from the back seat belt latches. The button will pop off easily with a pocket knife under the tab on the side of the red button. Be carefull not to drop anything down in there. There is a spring that sits in a hole under the red button which usually stays in place while removing the red button. Just pop the new one in place. Just make sure the belt latch operates properly

before someone uses it.

**Replacing the Belt Latch Assembly.** [Scott Cook] Just replaced the latch assembly in our 1990 745 because the red button deteriorated. The part costs about \$60 from Tasca Volvo, and is dead easy to replace. (NOTE: If you have a 740, you DO NOT want part #9188778; that is for a 940, right front seat, nor do you want it's driver side counterpart. Tasca's web site's search system sent me the 940 part instead of the correct 740 part.) The latch comes in an assembly with the metal strap that mounts it to the seat, a new bolt, and a new LED. The driver's side unit comes with a new switch and the wiring to plug right in to your car's harness. All you do is remove the old one and put the new one in. Wedging your fingers in between the seat and the console to get the new bolt started takes about 2 to 3 minutes of patience. The rest is a breeze. [Koos Hagg] Try the local Pick n Pull for a used unit for about \$3-\$4: not new, but better than your existing failed latch.

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### **Seat Belt Replacement.**

[Query:] I bought a 960 wagon as an accident victim. Replaced a windshield and fender and all is well except the passenger side seat belt is drawn tight and won't release. I opened the cover and see a cigar shaped item with a warning label. Can someone tell me my next move to solve our problem?

[Response: Bob] Did your air bag deploy? If so, both front seatbelts MUST be replaced. The force of the pyrotechnic seatbelt pretensioners damages the inertia reel components, and the belts are stretched. It is recommended all occupied belts be replaced after an accident, and the front belts always deploy with the air bag. If there was no bag deployment, there is a problem with the inertia reel and I recommend that you REPLACE that belt.

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**Air Bag Anti-Theft Devices.** Has any clever Volvo owner out there come up with an airbag anti-theft device? At approximately \$2,000 for each system, these have now surpassed radios as the number one stolen item on the car. I could imagine that someone could use anti-theft bolts to secure the bag assemblies, or even cover the bolt/screw heads with epoxy to deter someone from a quick removal. Any ideas

[Response: Tom Irwin] (un)Fortunately, I live in the car theft capital of the world [LA] and there are several solutions... The Robo Cap. This is an easy to use "half-cap" type device that slips over the underside half of your steering wheel. The Steel cap is covered with a good quality Nylon Material that has a sleeve sewn on it. From this sleeve you withdraw about a 14"l x .5"d Chrome steel rod. Insert the rod down through the face of the cap and under your dash. It will snap into place and lock automatically. A simple twist of a high security key will release it and it stows in reverse order. Using it myself adds about 20 seconds to my day. Freon WILL NOT touch it. You can't get at the locking area. Hacksaw to steering wheel? Nope! Half the wheels circumference is covered. You need only protect ONE of your airbags. Since they deploy in pairs, a single (unprotected passenger side)airbag is virtually worthless on the black market. Oh, and it locks the steering too. Cost? About \$50 US. [Response 2: Steve Ringlee] Try placing some hot melt glue in the



recesses of the torx screw heads holding the airbags in position. This makes removing the bags impossible unless you use a pick to remove the glue, a deliberately tedious task designed to deter the thief .

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