

AIR BAG RESTRAINT SYSTEM

1993 Toyota Celica

1993 ACCESSORIES/SAFETY EQUIPMENT
Toyota Air Bags

Celica

WARNING: To avoid injury from accidental air bag deployment, read and carefully follow all WARNINGS and SERVICE PRECAUTIONS.

DESCRIPTION & OPERATION

The Supplement Restraint System (SRS) consists of an AIR BAG/SRS warning light in the instrument cluster, left and right front impact sensors, steering wheel pad, spiral cable and center air bag sensor. Steering wheel pad contains inflator and bag assembly. Center air bag sensor assembly contains the back-up power source circuit, safety circuit, safing sensor, memory circuit, diagnostic circuit, ignition control and drive circuits. See Fig. 1.

The SRS is designed to deploy when the front-to-rear shock is greater than a specified value. The ignition control and drive circuits calculate signals from the center air bag sensor, deploying air bag.

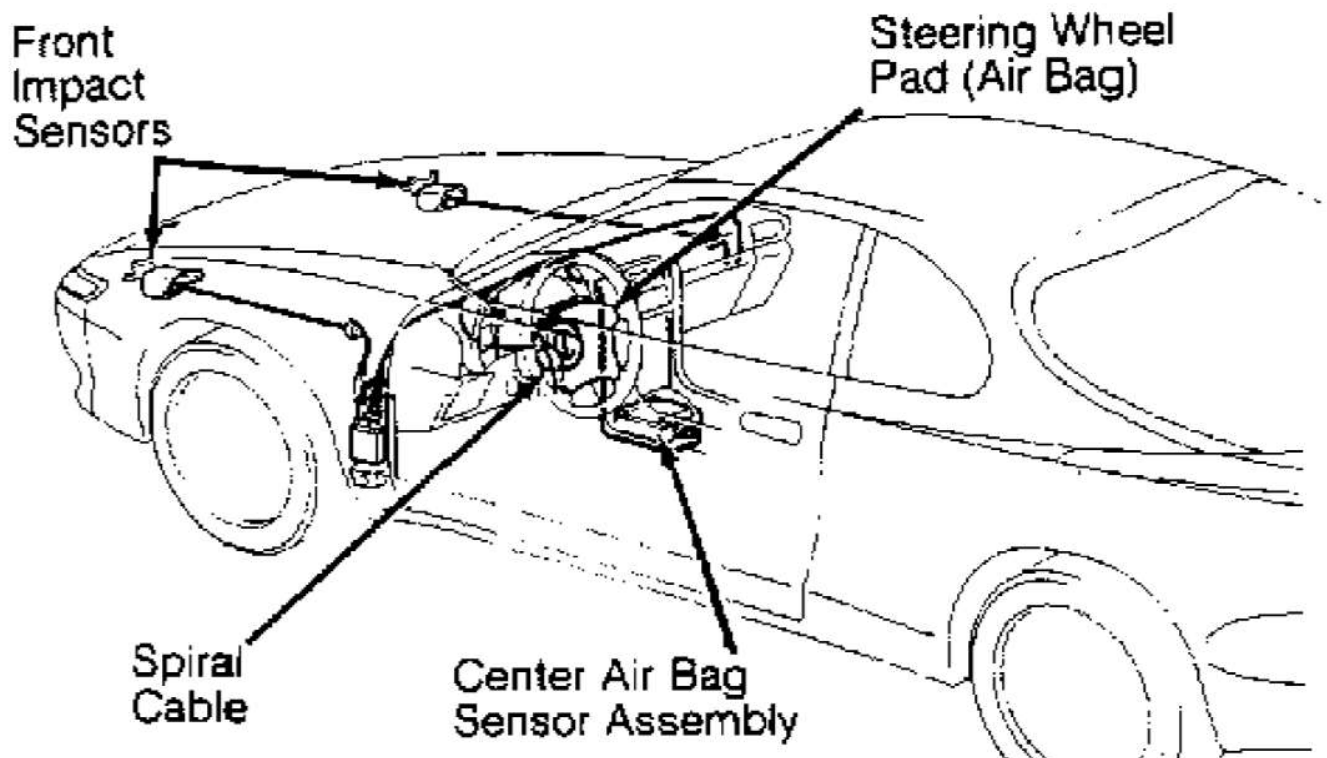


Fig. 1: SRS Component Location
Courtesy of Toyota Motor Sales, U.S.A., Inc.

SYSTEM OPERATION CHECK

Turn ignition switch to ACC or ON position. AIR BAG/SRS warning light in instrument cluster should glow and go out after about 6 seconds. If AIR BAG/SRS warning light glows for more than 6 seconds with ignition switch in ACC or ON position, SRS system is malfunctioning and needs repair. If AIR BAG/SRS warning light glows with ignition off, a short circuit is likely in AIR BAG/SRS warning light circuit. See DIAGNOSIS & TESTING.

SERVICE PRECAUTIONS

Observe following precautions when working with air bag systems:

- * Disable SRS before servicing any SRS or steering column component. Failure to do this could result in accidental air bag deployment and possible personal injury. See DISABLING & ACTIVATING AIR BAG SYSTEM.
- * When trouble shooting SRS, always check for diagnostic codes before disconnecting battery.
- * After turning ignition switch to LOCK position and disconnecting negative battery cable, wait at least 90 seconds before working on SRS. SRS is equipped with a back-up power source that may allow air bag to deploy up to 90 seconds after negative battery cable is disconnected.
- * In a minor collision in which air bag does not deploy, front air bag sensors and steering wheel pad should be inspected.
- * NEVER use air bag parts from another vehicle. Replace air bag parts using new parts.
- * Remove air bag sensors if shocks are likely to be applied to sensors during repairs.
- * Center air bag sensor assembly contains mercury. After replacement, DO NOT destroy old part. When scrapping vehicle or replacing center air bag sensor assembly, remove center air bag sensor assembly and dispose of as toxic waste.
- * Never disassemble and repair front air bag sensors, center air bag sensor assembly or steering wheel pad.
- * If front air bag sensors, center air bag sensor assembly or steering wheel pad is dropped or if cracks, dents or other defects exist in case, bracket or connector, replace parts using new ones.
- * DO NOT expose front air bag sensors, center air bag sensor assembly or steering wheel pad directly to hot air or flame.
- * Use a volt-ohmmeter with high impedance (10 k/ohm minimum) for trouble shooting electrical circuit.
- * Information labels are attached to air bag components. Follow all notices on labels.
- * After work on SRS is completed, check AIR BAG/SRS warning light to ensure system is functioning properly. See SYSTEM OPERATION CHECK.
- * Always wear safety glasses when servicing or handling an air bag.
- * When placing a live air bag on a bench or other surface, always face air bag and trim cover up, away from surface. This will reduce motion of module if it is accidentally deployed.
- * After deployment, air bag surface may contain deposits of sodium hydroxide, which irritates skin, from gas generant combustion. Always wear safety glasses, rubber gloves and long-sleeved shirt during clean-up, and wash hands using mild soap and water.
- * When carrying a live air bag module, trim cover should be pointed away from your body to minimize injury in case of

accidental deployment.

- * If SRS is not fully functional for any reason, vehicle should not be driven until system is repaired and again becomes operational. DO NOT remove bulbs, modules, sensors or other components or in any way disable system from operating normally. If SRS is not functional, park vehicle until it is repaired and functions properly.

DISABLING & ACTIVATING AIR BAG SYSTEM

WARNING: Back-up power supply maintains SRS voltage for about 90 seconds after battery is disconnected. After disabling SRS, wait at least 90 seconds before servicing SRS to prevent accidental air bag deployment and possible personal injury.

To disable SRS, turn ignition switch to LOCK position and disconnect negative battery cable. Wait at least 90 seconds before servicing SRS. To activate SRS, reconnect negative battery cable. Perform SYSTEM OPERATION CHECK.

DISPOSAL PROCEDURES

DEPLOYED AIR BAG

Deployed air bag modules can be disposed of as would any other part. Handle air bag module wearing gloves and safety glasses.

SCRAPPED VEHICLE

NOTE: Some vehicles to be scrapped may have an undeployed air bag. When scrapping vehicles equipped with SRS, deploy air bag module.

1) Before proceeding, follow service precautions. See SERVICE PRECAUTIONS. Disable SRS. See DISABLING & ACTIVATING AIR BAG SYSTEM. Ensure steering wheel and steering wheel pad are not loose. If steering wheel and steering wheel pad are loose, air bag cannot be deployed using this procedure. Follow procedure listed under UNDEPLOYED AIR BAG.

2) Remove instrument panel lower finish panel. Disconnect spiral cable air bag connector, located on lower steering column. Connect Deployment Tool (09082-00700) connector to spiral cable air bag connector. Position deployment tool at least 33 feet from front of vehicle.

3) Close all doors and windows of vehicle. Connect deployment tool Red clip to positive battery terminal and Black clip to negative battery terminal. Ensuring no one is inside or within 33 feet of vehicle, press activation switch to deploy air bag. Because of heat, DO NOT touch air bag for at least 30 minutes after deployment.

UNDEPLOYED AIR BAG

1) Never dispose of a steering wheel pad with an undeployed air bag. Never deploy an air bag inside a vehicle, unless vehicle is to be scrapped.

2) Before proceeding, see SERVICE PRECAUTIONS. Disable SRS. See DISABLING & ACTIVATING AIR BAG SYSTEM. Remove steering wheel pad from vehicle. See STEERING WHEEL PAD & SPIRAL CABLE under REMOVAL & INSTALLATION.

3) To deploy a loose steering wheel pad, manufacturer recommends installing pad to a scrap vehicle wheel rim and tire

assembly. To do so, install 4 bolts in holes provided in rear of steering wheel pad. Tighten bolts by hand until they become difficult to turn. DO NOT overtighten bolts.

4) Wrap strong wire at least twice around bolts on left and right sides of steering wheel pad. See Fig. 2. Ensure no slack is present in wire. If slack is present, or wire is not strong enough, steering wheel pad may become loose due to shock when air bag is deployed.

5) Position steering wheel pad on wheel rim and tire assembly with pad side facing upward. Ensuring wire is tight, separately tie left and right sides of steering wheel pad to wheel rim through lug nut holes. See Fig. 3.

6) Connect Deployment Tool (09082-00700) to steering wheel pad connector. Position deployment tool at least 33 feet from steering wheel pad. Place a large cardboard box (weighted at sides) or 3 scrap tires on top of steering wheel pad. Ensure no one is within 33 feet of steering wheel pad. Press activation switch to deploy air bag.

7) Because of heat, wait 30 minutes before handling air bag. Use Gloves and safety glasses when handling a steering wheel pad with deployed air bag.

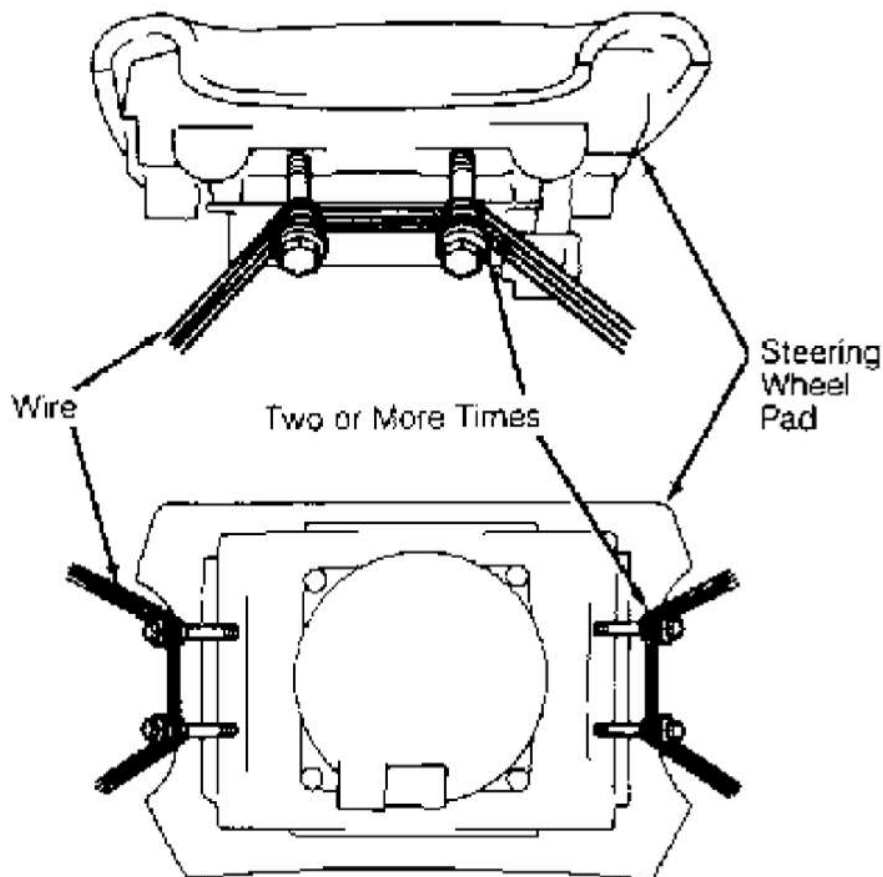


Fig. 2: Installing Wire On Steering Wheel Pad
Courtesy of Toyota Motor Sales, U.S.A., Inc.

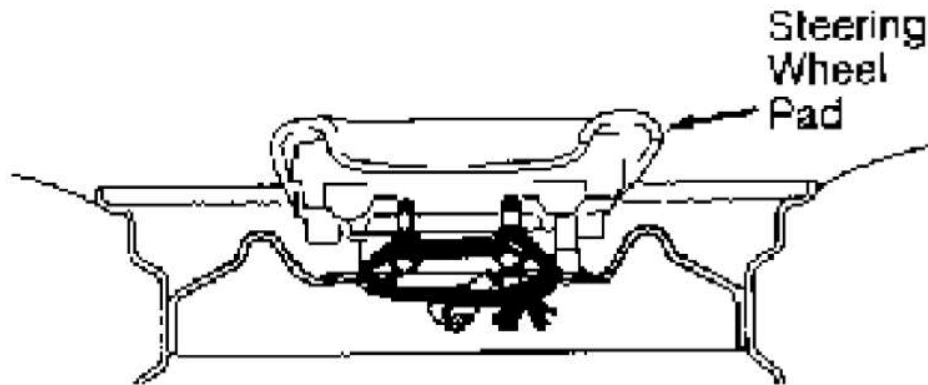


Fig. 3: Installing Steering Wheel Pad On Wheel Assembly
Courtesy of Toyota Motor Sales, U.S.A., Inc.

POST-COLLISION INSPECTION

Check diagnostic system. See SELF-DIAGNOSTIC SYSTEM under DIAGNOSIS & TESTING. Replace center air bag sensor if air bag deployed. Remove steering wheel pad and air bag assembly. Check for following conditions and replace components as necessary:

- * Cut, cracked or markedly discolored steering wheel pad top surface and steering wheel pad grooved portion.
- * Cut, cracked or chipped connectors or wire harnesses.
- * Deformity of horn button contact plate and front air bag sensor bracket.
- * Peeling off of label or damage to series number on front air bag sensor.

WARNING: If horn button contact plate is deformed, never repair it. Instead, replace entire steering wheel assembly. Ensure steering wheel pad does not contact steering wheel. Clearance must be uniform all the way around steering wheel pad.

REMOVAL & INSTALLATION

WARNING: Failure to follow air bag service precautions may result in air bag deployment and personal injury. See SERVICE PRECAUTIONS. After component replacement, perform a system operational check to ensure proper system operation. See SYSTEM OPERATION CHECK.

CENTER AIR BAG SENSOR

Removal & Installation

1) Before proceeding, follow air bag service precautions. See SERVICE PRECAUTIONS. Disable SRS. See DISABLING & ACTIVATING AIR BAG

SYSTEM.

2) Center air bag sensor is located underneath console. Remove center console trim panel. See Fig. 4. Remove 4 screw covers from sides of center console box. Remove 4 center console screws and 2 bolts. Remove center console box.

3) Remove scuff plates. Remove 4 screws, glove box and passenger-side lower trim panel. Remove engine hood release lever. Remove screw covers, 6 screws and instrument cluster lower trim panel.

NOTE: Disconnect center air bag sensor electrical connector before removing sensor attaching screws.

4) Remove 2 screws and radio trim panel. Remove 4 screws and radio. Remove screw covers and 4 screws from center console. Remove instrument panel brace. See Fig. 4. Disconnect center air bag sensor assembly electrical connector. Remove 4 screws and center air bag sensor assembly.

5) To install, reverse removal procedure. Tighten center air bag sensor screws to specification. See TORQUE SPECIFICATIONS. Reactivate SRS. Ensure system is functioning properly. See SYSTEM OPERATION CHECK.

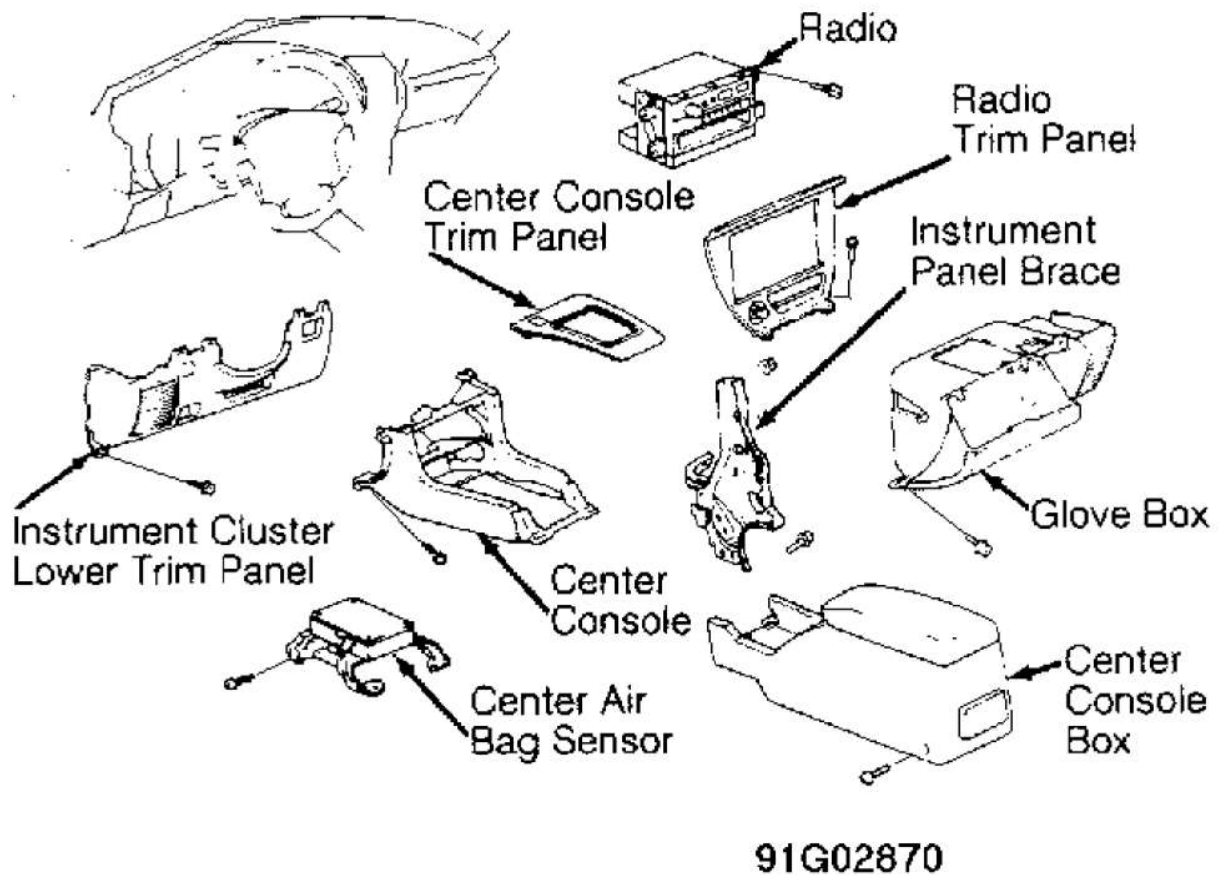


Fig. 4: Removing Center Air Bag Sensor Assembly
Courtesy of Toyota Motor Sales, U.S.A., Inc.

FRONT AIR BAG SENSORS

Removal & Installation

1) Before proceeding, follow air bag service precautions. See SERVICE PRECAUTIONS. Disable SRS. See DISABLING & ACTIVATING AIR BAG SYSTEM.

2) Front air bag sensors are located in left and right fender areas. Remove screws and clips attaching inner fender shield to vehicle.

3) Remove hood lock protector plate or inner fender shield. Disconnect front air bag sensor electrical connector. Remove 2 bolts attaching sensor to fender. Remove front air bag sensor.

4) To install, reverse removal procedure. Ensure arrow marks on sensors face front of vehicle. Tighten front air bag sensor bolts to specification. See TORQUE SPECIFICATIONS. Reactivate SRS. Check AIR BAG warning light to ensure system is functioning properly. See SYSTEM OPERATION CHECK.

STEERING WHEEL PAD & SPIRAL CABLE

Removal & Installation

1) Ensure front wheels are in straight-ahead position. Before proceeding, see SERVICE PRECAUTIONS. Disable SRS. See DISABLING & ACTIVATING AIR BAG SYSTEM. Remove driver-side scuff plate.

2) Remove engine hood release lever. Remove screw covers, 6 screws and lower instrument cluster trim panel(s). Loosen 4 steering wheel pad Torx screws until groove along screw circumference catches on screw case. See Figs. 5 and 6.

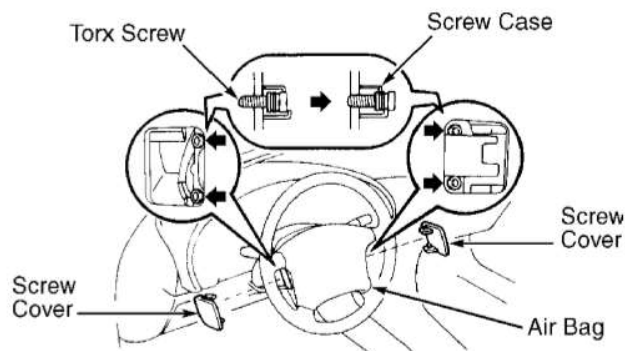
3) Pull steering wheel pad from steering wheel and disconnect steering wheel pad (squib) connector. Remove steering wheel pad assembly. Place steering wheel pad assembly on a flat surface with pad cover facing up.

4) Place a mark on steering wheel and main shaft for installation reference. Using steering wheel puller, remove steering wheel. Remove 4 screws from upper and lower steering column covers.

5) Remove screws attaching spiral cable to combination (headlight/turn signal/wiper) switch. Disconnect spiral cable and remove from vehicle.

6) To install, reverse removal procedure. Before installing spiral cable, ensure spiral cable is properly aligned. See SPIRAL CABLE under ADJUSTMENTS. Tighten steering wheel nut and steering wheel pad screws to specification. See TORQUE SPECIFICATIONS.

7) After spiral cable and steering wheel pad are installed, reactivate SRS. Ensure proper SRS operation. See SYSTEM OPERATION CHECK.



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Fig. 5: Removing Steering Wheel Pad
Courtesy of Toyota Motor Sales, U.S.A., Inc.

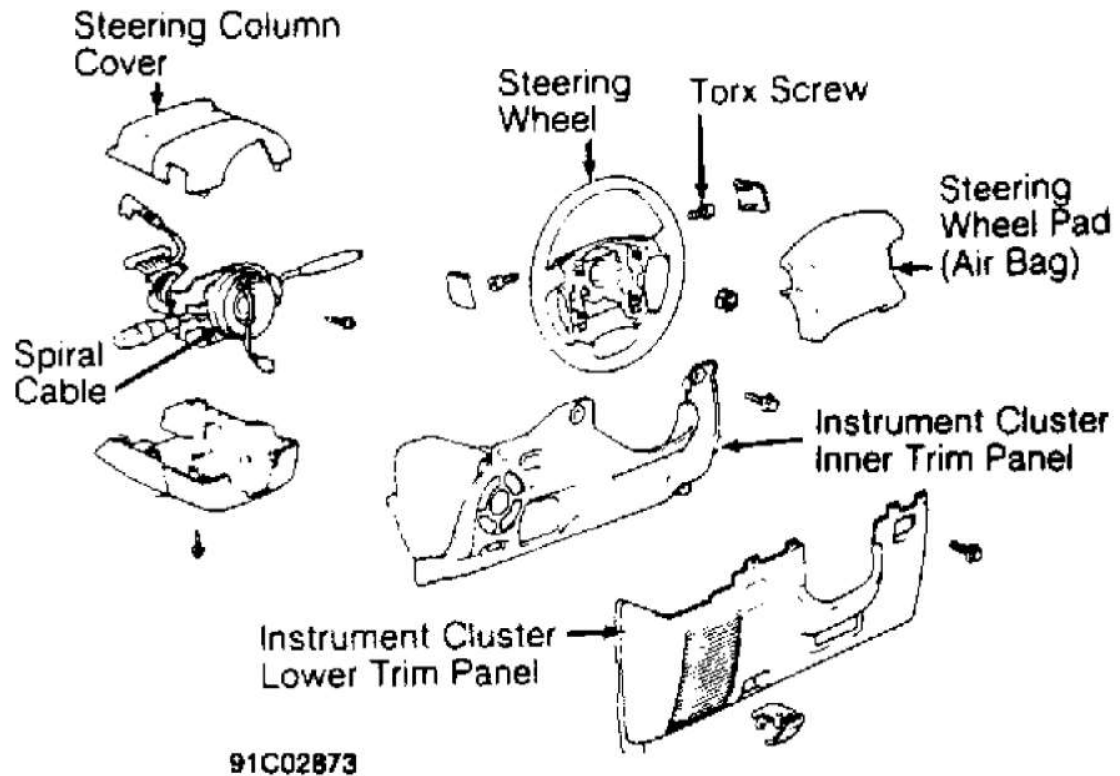


Fig. 6: Exploded View Of Steering Wheel Pad
Courtesy of Toyota Motor Sales, U.S.A., Inc.

ADJUSTMENTS

SPIRAL CABLE

Ensure front wheels are in straight-ahead position. Turn spiral cable counterclockwise until it stops. Turn spiral cable clockwise 2.5 turns. Mating marks should align with Red mark. See Fig. 7. Ensure mating marks are aligned and install steering wheel.

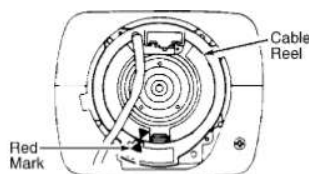


Fig. 7: Aligning Spiral Cable
Courtesy of Toyota Motor Sales, U.S.A., Inc.

WIRE REPAIR

CAUTION: If air bag wiring harness is damaged, replace complete wiring harness assembly. Following WIRE REPAIR procedure is to be used only to repair connector to front air bag sensors.

- 1) Repair wire using 2 Pressure-Contact Sleeves (82988-50010); sleeves are available for repairing air bag connector problems. To repair, uncover front air bag sensor connector to be repaired. Leaving wires as long as possible, cut wiring harness behind connector. Carefully strip .31-.43" insulation from each wire to be repaired. DO NOT damage wire during this operation. If any damage exists, perform stripping operation again.
- 2) Overlap 2 stripped wire ends inside pressure-contact sleeve. Using Crimper (169060-2), place sleeve in correct color-keyed section of tool. With center of sleeve between crimping jaws, squeeze tool until either end comes in contact at section of tool marked CLOSE HERE.
- 3) Pull joined wires on both ends to ensure a secure crimp. Crimp both ends of sleeve using crimper at INS position. See Fig. 8. Thoroughly wrap silicon tape around joint for protection.

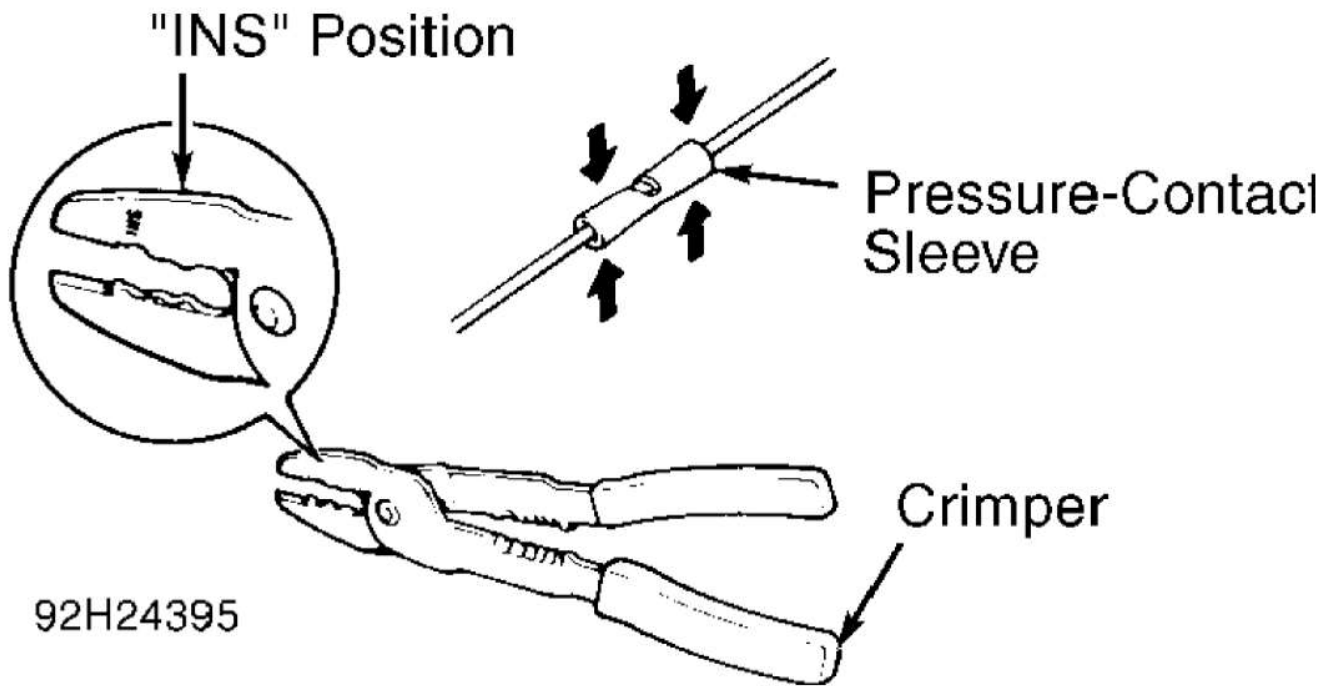


Fig. 8: Crimping Pressure-Contact Sleeve
Courtesy of Toyota Motor Sales, U.S.A., Inc.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS	
Application	Ft. Lbs. (N.m)
Front Air Bag (Impact) Sensor Bolts	19 (26)
Steering Wheel Nut	26 (35)
	INCH Lbs. (N.m)

Center Air Bag Sensor Screws	108 (12)
Steering Wheel Pad Torx Screws	65 (7)

DIAGNOSIS & TESTING

WARNING: Failure to follow air bag service precautions may result in air bag deployment and personal injury. See SERVICE PRECAUTIONS. After component replacement, ensure proper system operation. See SYSTEM OPERATION CHECK.

SELF-DIAGNOSTIC SYSTEM

AIR BAG/SRS Warning Light Check

1) Turn ignition switch to ACC or ON position. Ensure AIR BAG/SRS warning light glows, and then goes out after approximately 6 seconds.

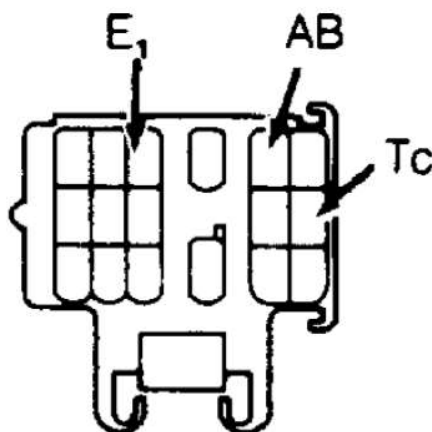
2) When ignition switch is in ACC or ON position and AIR BAG/SRS warning light remains on, center air bag sensor assembly has detected a malfunction code. To identify malfunction code, see DIAGNOSTIC CODE CHECK.

3) If after approximately 6 seconds, air bag warning light sometimes glows or glows even when ignition switch is in OFF position, a short in AIR BAG/SRS warning light circuit is present. See TROUBLE SHOOTING.

NOTE: Celica is equipped with one Data Link Connector (DLC), located in engine compartment.

Diagnostic Code Check

1) Jump DLC terminals Tc and E1 using Diagnosis Check Wiring (09843-18020) jumper harness. See Fig. 9.



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Fig. 9: Data Link Connector (DLC) Terminal ID
Courtesy of Toyota Motor Sales, U.S.A., Inc.

2) Read diagnostic codes by noting number of AIR BAG/SRS warning light flashes. See Fig. 10. Normal code indication will flash

light twice per second. If a malfunction code is present, first number of code number will equal first digit of a 2-digit diagnostic code. After a 1.5-second pause, second number of code number will equal second digit.

3) If 2 or more codes are present, a 2.5-second pause will occur between codes. After all codes are displayed, a 4-second pause will occur and codes will be repeated. After code has been identified, see appropriate diagnostic code and perform tests as specified.

4) If more than one malfunction code is present, codes will flash from smallest numbered code to largest. If malfunction code is not displayed or is continuously displayed, see TROUBLE SHOOTING. If AIR BAG/SRS warning light remains illuminated and diagnostic code is normal code, a source voltage drop is present. This malfunction is not stored in memory. If power source voltage returns to normal after approximately 10 seconds, AIR BAG/SRS warning light will automatically go out. See DIAGNOSTIC CODE NORMAL, SOURCE VOLTAGE DROP under TROUBLE SHOOTING.

5) Code 22 is recorded when a malfunction is present in air bag warning light system. If an open circuit is present in air bag warning light circuit, AIR BAG/SRS warning light will not glow. Diagnostic codes (including Code 22) cannot be confirmed until warning light circuit is repaired.

6) When a malfunction is present in SRS, malfunction Codes 11 through 31 are displayed. Codes 11 through 31 are cleared from memory after repair of malfunction, but Code 41 will remain until cleared.

Code No.	Blink Pattern	Diagnosis	Trouble Area
(Normal)		• System normal	—
		• Source voltage drop	• Battery • Center airbag sensor assembly
11		• Short in squib circuit or front airbag sensor circuit (to ground)	• Steering wheel pad (squib) • Front airbag sensor • Spiral cable • Center airbag sensor assembly • Wire harness
12		• Short in squib circuit or front airbag sensor circuit (to +B)	• Steering wheel pad (squib) • Front airbag sensor • Spiral cable • Center airbag sensor assembly • Wire harness
13		• Short in squib circuit (between D ⁺ wire harness and D ⁻ wire harness)	• Steering wheel pad (squib) • Spiral cable • Center airbag sensor assembly • Wire harness
14		• Open in squib circuit	• Steering wheel pad (squib) • Spiral cable • Center airbag sensor assembly • Wire harness
15		• Open in front airbag sensor circuit	• Front airbag sensor • Center airbag sensor assembly • Wire harness
22		• Airbag warning light system malfunction	• Airbag warning light • Center airbag sensor assembly • Wire harness
31		• Center airbag sensor assembly malfunction	• Center airbag sensor assembly
* 41		• Malfunction stored in memory	• (Center airbag sensor assembly)

* Not used on Corolla, Paseo, Previa or Tercel.

93F75510

Fig. 10: Diagnostic Code ID
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Clearing Malfunction Codes

- 1) Connect wire probes to DLC terminals Tc and AB. See

Fig. 9. Turn ignition switch to ACC or ON position, and wait about 6 seconds. Starting with Tc terminal, apply body ground alternately to terminal Tc and terminal AB twice each, in cycles of .5-1.5 seconds.

2) When alternating probes between body ground, simultaneously release one probe from body ground while applying ground to other terminal. If time interval is too long, code will not clear. After several seconds, when AIR BAG/SRS warning light starts to blink a regular cycle, code cancellation is complete.
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TROUBLE SHOOTING

AIR BAG/SRS WARNING LIGHT REMAINS ILLUMINATED

Turn ignition switch to LOCK position. Disconnect negative battery cable. Disconnect center air bag sensor assembly connector. Reconnect negative battery cable. If warning light remains illuminated, replace center air bag sensor assembly. If warning light goes out, check warning light circuit or Data Link Connector (DLC) terminal AB for an open circuit. See Fig. 9.

AIR BAG/SRS WARNING LIGHT INTERMITTENT

Intermittent malfunctions can make AIR BAG/SRS warning light glow erratically. To diagnose intermittent problems, apply vibration, heat (as with a hair dryer), or humidity (to entire vehicle, not directly to electrical components) to check whether malfunction reoccurs.

DIAGNOSTIC CODE NOT DISPLAYED

1) If code is not displayed after performing diagnostic code check, turn ignition switch to ACC or ON position. Measure voltage between Data Link Connector (DLC) terminals Tc and E1. If battery voltage is not present, go to next step. If battery voltage is present, go to step 3).

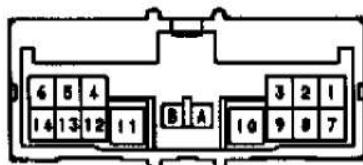
2) Measure voltage between DLC terminal Tc and ground. If battery voltage is present, check harness between terminal E1 of DLC and body ground. If battery voltage is not present, go to next step.

3) Using diagnosis check wiring, jump center air bag sensor assembly connector terminal Tc to ground. If warning light glows, check harness between center air bag sensor assembly and DLC. If warning light does not glow, replace center air bag sensor assembly.

DIAGNOSTIC CODE CONTINUOUSLY DISPLAYED

1) If code is displayed continuously after performing diagnostic code check, turn ignition switch to LOCK position. Disconnect center air bag sensor assembly connector.

2) Check resistance between center air bag sensor assembly connector terminal Tc and ground. See Fig. 11. If resistance is infinite ohms, replace center air bag sensor assembly. If resistance is not infinite ohms, repair or replace harness or connector.



No.	Symbol	Terminal Name	No.	Symbol	Terminal Name
1	IG ₁	Power Source (ECU-IG Fuse)	8	E ₂	Ground
2	-SR	RH Front Airbag Sensor ⊖	9	LA	Airbag Warning Light
3	+SR	RH Front Airbag Sensor ⊕	10	D ⁻	Squib ⊖
4	+SL	LH Front Airbag Sensor ⊕	11	D ⁺	Squib ⊕
5	-SL	LH Front Airbag Sensor ⊖	12	Tc	Diagnosis
6	+B	Battery (ECU-B Fuse)	13	E ₁	Ground
7	IG ₂	Power Source (IGN Fuse)	14	Acc	Power Source (CIG Fuse)
A	-	Electrical Connection Check Mechanism	B	-	Electrical Connection Check Mechanism

Fig. 11: Center Air Bag Assembly Connector Terminal ID
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

DIAGNOSTIC CODE NORMAL, SOURCE VOLTAGE DROP

Circuit Description

1) SRS is equipped with a voltage increase circuit in center air bag sensor assembly. This circuit increases voltage of SRS to normal voltage if source voltage drops.

2) Diagnostic system malfunction display for this circuit is different than other circuits. When AIR BAG/SRS warning light remains lit and diagnostic code is a normal code, source voltage drop is indicated. A malfunction in this circuit is not recorded in center air bag sensor assembly. About 10 seconds after source voltage returns to normal, air bag warning light goes off.

Diagnosis

1) Turn ignition switch to LOCK position. Disconnect center air bag sensor connector. Turn ignition switch to ON position (engine off). Measure voltage between ground and terminals IG₁ and ACC on connector side of center air bag sensor assembly. See Fig. 11. Operate electrical components (defogger, wiper, headlight, heater blower, etc.).

2) Approximately 6.0–11.5 volts should be present at terminals. Turn all electrical components off. Turn ignition switch to LOCK position. Remove voltmeter, and reconnect connector.

3) Turn ignition switch to ON position. Turn on electrical accessories. If air bag warning light goes out after approximately 10 seconds, check battery and charging system. If light does not go out, check diagnostic code. If a malfunction code is present, perform appropriate trouble shooting. If a normal code is present, replace center air bag sensor assembly.

CODE 11, SHORT IN SQUIB CKT, FRONT AIR BAG SENS CKT (TO

GROUND)

Circuit Description

Squib circuit consists of center air bag assembly, spiral cable and steering wheel pad (squib). Squib causes air bag to deploy when deployment conditions have been met. Front air bag sensors detect deceleration force in frontal collision and are located in front left and right sides of vehicle. Code 11 is recorded when a ground short is detected in squib circuit or front air bag sensor circuit.

Diagnosis

1) Disconnect negative battery cable and wait at least 90 seconds. Remove steering wheel pad. See STEERING WHEEL PAD & SPIRAL CABLE under REMOVAL & INSTALLATION.

2) Disconnect the center air bag sensor assembly connector. Measure resistance between terminals +SR and -SR and terminals +SL and -SL of harness side connector of center air bag sensor assembly. See Fig. 11. If resistance is not 755-885 ohms, go to step 9).

3) If resistance is 755-885 ohms, measure resistance between terminals +SR and +SL of harness side connector of center air bag sensor assembly and body ground. If infinite resistance is present, go to next step. If infinite resistance is not present, repair or replace harness or connector between center air bag sensor assembly and front air bag sensor.

4) Measure resistance between terminals D+ and D- on spiral cable side of connector between spiral cable and steering wheel pad and body ground. See Fig. 12. If resistance is infinite, go to next step. If resistance is not infinite, go to step 10).

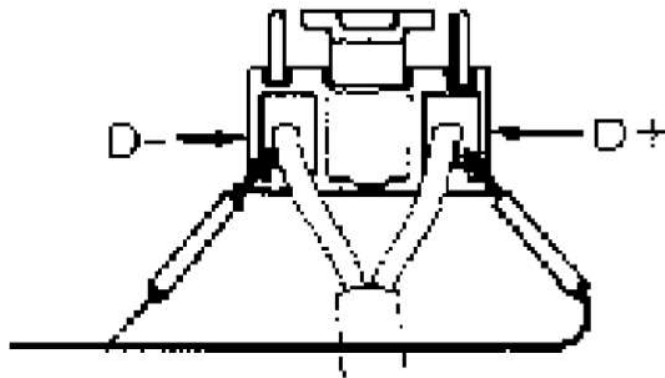


Fig. 12: Spiral Cable-To-Steering Wheel Pad Connector Terminal ID
Courtesy of Toyota Motor Sales, U.S.A., Inc.

5) Reconnect center air bag sensor assembly. Using a jumper wire, jump terminals D+ and D- on spiral cable side of connector

between spiral cable and steering wheel pad. Connect negative battery cable to battery, and wait at least 2 seconds.

6) Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using Diagnosis Check Wiring (09843-18020), jump DLC terminals Tc and E1. See Fig. 9. Check diagnostic code. If Code 11 is not displayed, go to next step. If Code 11 is displayed, replace center air bag sensor assembly.

7) Turn ignition switch to LOCK position. Disconnect negative battery cable and wait at least 90 seconds. Reconnect steering wheel pad (squib) connector. Reconnect negative battery cable and wait 2 seconds.

8) Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using diagnosis check wiring, jump DLC terminals Tc and E1. See Fig. 9. If Code 11 is not displayed, go to next step. If Code 11 is displayed, replace steering wheel pad assembly.

9) Disconnect front air bag sensor connector. Measure resistance between terminals +S and +A (755-885 ohms), +S and -S (infinite ohms), and -S and -A (less than one ohm). See Fig. 13. If resistance is not to specification, replace front air bag sensor. If resistance is okay, repair or replace harness or connector between center air bag sensor assembly and front air bag sensor.

10) Disconnect connector between center air bag sensor assembly and spiral cable. Measure resistance between terminals D+ and D- on spiral cable side of connector between spiral cable and steering wheel pad and body ground. See Fig. 12. If resistance is infinite, repair or replace harness or connector between center air bag sensor assembly and spiral cable. If resistance is not infinite, repair or replace spiral cable.

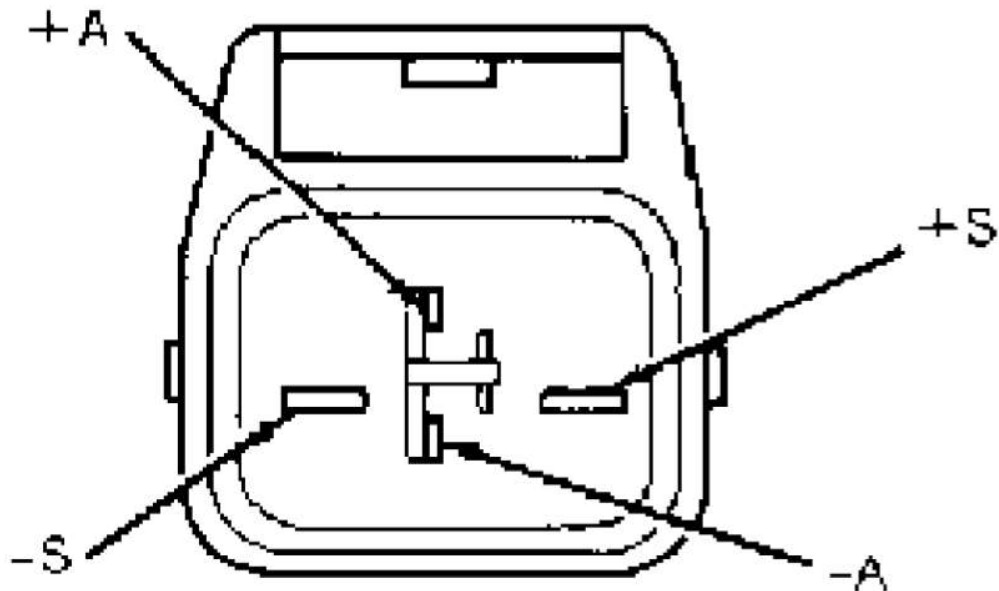


Fig. 13: Front Air Bag Sensor Connector Terminal ID
Courtesy of Toyota Motor Sales, U.S.A., Inc.

CODE 12, SHORT IN SQUIB CKT, FRONT AIR BAG SENS CKT (TO
VOLTAGE)

Circuit Description

Squib circuit consists of center air bag sensor assembly, spiral cable and steering wheel pad (squib). Squib causes air bag to deploy when deployment conditions have been satisfied. Front air bag sensors (located on left and right sides of vehicle) detect deceleration force in a frontal collision.

Diagnosis

1) Disconnect negative battery cable and wait at least 90 seconds. Remove steering wheel pad. See STEERING WHEEL PAD & SPIRAL CABLE under REMOVAL & INSTALLATION.

2) Disconnect center air bag sensor assembly connector. Measure resistance between center air bag sensor harness connector terminals +SR and -SR and terminals +SL and -SL. See Fig. 11. If resistance is not 755-885 ohms, go to DIAGNOSTIC CODE 15, OPEN IN FRONT AIR BAG SENSOR CIRCUIT.

3) If resistance is 755-885 ohms, reconnect negative battery cable. Turn ignition switch to ON position. Measure voltage between ground and terminal +SR or +SL of harness side connector of center air bag sensor assembly. If any voltage is present, repair or replace harness or connector between center air bag sensor assembly and front air bag sensor.

4) If no voltage is present, measure voltage at terminal D+ on spiral cable side of connector between spiral cable and steering wheel pad. See Fig. 12. If no voltage is present, go to step 5). If voltage is present, turn ignition switch to LOCK position. Disconnect connector between center air bag sensor assembly and spiral cable. Turn ignition switch to ON position. Measure voltage at terminal D+ on spiral cable side of connector between spiral cable and steering wheel pad. If no voltage is present, repair or replace harness or connector between center air bag sensor assembly and spiral cable. If voltage is present, repair or replace spiral cable.

5) Turn ignition switch to LOCK position. Disconnect negative battery cable. Reconnect center air bag sensor connector. Using Diagnosis Check Wiring (09843-18020), jump terminals D+ and D- on spiral cable side of connector between spiral cable and steering wheel pad. See Fig. 12. Reconnect negative battery cable.

6) Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using diagnosis check wiring, jump DLC terminals Tc and E1. See Fig. 9. If Code 12 is displayed, replace center air bag sensor assembly.

7) If Code 12 is not displayed, turn ignition switch to LOCK position. Disconnect negative battery cable, and wait at least 90 seconds. Reconnect steering wheel pad (squib) connector. Reconnect negative battery cable and wait at least 2 seconds.

8) Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using diagnosis check wiring, jump DLC terminals Tc and E1. See Fig. 9. If Code 12 is displayed, replace steering wheel pad. If Code 12 is not displayed, system is okay.

CODE 13, SHORT IN SQUIB CKT (BETWEEN D+ HARNESS & D- HARNESS)

Circuit Description

Squib circuit consists of center air bag sensor assembly, spiral cable and steering wheel pad (squib). Squib causes air bag to deploy when air bag deployment conditions are satisfied. Code 13 is recorded when a short is detected in D+ wire harness and D- wire harness of squib circuit. See Fig. 12.

Diagnosis

1) Disconnect negative battery cable and wait at least 90 seconds. Remove steering wheel pad. See STEERING WHEEL PAD & SPIRAL

CABLE under REMOVAL & INSTALLATION.

2) Measure resistance between D+ and D- on spiral cable side of connector between spiral cable and steering wheel pad. See Fig. 12. If resistance is 1000 ohms or more, go to next step. If resistance is not 1000 ohms or more, go to step 6).

3) Reconnect negative battery cable. Clear diagnostic code stored in memory. See CLEARING MALFUNCTION CODES under SELF-DIAGNOSTIC SYSTEM under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position, and wait at least 2 seconds. Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using Diagnosis Check Wiring (09843-18020), jump DLC terminals Tc and E1. See Fig. 9. If Code 13 is present, replace center air bag sensor assembly. If Code 13 is not present, go to next step.

4) Turn ignition switch to LOCK position. Disconnect negative battery cable and wait at least 90 seconds. Reconnect steering wheel pad (squib) connector. Reconnect negative battery cable. Clear diagnostic code.

5) Turn ignition switch to LOCK position and wait at least 2 seconds. Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using diagnosis check wiring, jump DLC terminals Tc and E1. See Fig. 9. If Code 13 is present, replace steering wheel pad. If Code 13 is not present, system is okay.

6) Disconnect connector between center air bag sensor assembly and spiral cable. Release air bag activation prevention mechanism on center air bag sensor assembly side of spiral cable connector. Measure resistance between terminals D+ and D- on spiral cable side of connector, between spiral cable and steering wheel pad. See Fig. 12. If infinite resistance is present, go to next step. If infinite resistance is not present, repair or replace spiral cable.

7) Disconnect center air bag sensor assembly connector. Release air bag activation prevention mechanism on center air bag sensor assembly connector. Measure resistance between terminals D+ and D- on center air bag sensor assembly side of connector between center air bag sensor assembly and spiral cable. See Fig. 12. If resistance is infinite, go to next step. If resistance is not infinite, repair or replace harness or connector between center air bag sensor assembly and spiral cable.

8) Reconnect center air bag sensor assembly connector. Measure resistance between terminals D+ and D- on center air bag sensor assembly side of connector between center air bag sensor assembly and spiral cable. See Fig. 12. If resistance is 1000 ohms or more, system is okay. If resistance is not 1000 ohms or more, replace center air bag sensor assembly.

DIAGNOSTIC CODE 14, OPEN IN SQUIB CIRCUIT

Circuit Description

Squib circuit consists of center air bag sensor assembly, spiral cable and steering wheel pad (squib). Squib causes air bag to deploy when deployment conditions are satisfied. Code 14 is recorded when an open is detected in squib circuit.

Diagnosis

1) Disconnect negative battery cable and wait at least 90 seconds. Remove steering wheel pad. See STEERING WHEEL PAD & SPIRAL CABLE under REMOVAL & INSTALLATION.

2) Disconnect center air bag sensor assembly connector. Measure resistance between terminals D+ and D- on spiral cable side of connector between spiral cable and steering wheel pad. See Fig. 12. If resistance is more than one ohm, go to next step. If resistance is less than one ohm, go to step 5).

3) Disconnect connector between center air bag sensor assembly and spiral cable. Measure resistance between terminals D+ and

D- on spiral cable side of connector between spiral cable and steering wheel pad. If resistance is less than one ohm, go to next step. If resistance is more than one ohm, repair or replace spiral cable.

4) Measure resistance between terminals D+ and D- on center air bag sensor assembly side of connector between center air bag sensor assembly and spiral cable. If resistance is less than one ohm, go to next step. If resistance is more than one ohm, repair or replace harness or connector between center air bag sensor assembly and spiral cable.

5) Reconnect connector to center air bag sensor assembly. Connect connector between center air bag sensor assembly and spiral cable. Using Diagnosis Check Wiring (09843-18020), jump terminals D+ and D- on spiral cable side of connector between spiral cable and steering wheel pad. Connect negative battery cable and wait at least 2 seconds.

6) Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using diagnosis check wiring, jump DLC terminals Tc and E1. See Fig. 9. If Code 14 is displayed, replace center air bag sensor assembly. If Code 14 is not displayed, go to next step.

7) Turn ignition switch to LOCK position. Disconnect negative battery cable, and wait at least 90 seconds. Reconnect steering wheel pad (squib) connector. Connect negative battery cable, and wait at least 2 seconds.

8) Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using diagnosis check wiring, jump DLC terminals Tc and E1. See Fig. 9. If Code 14 is displayed, replace steering wheel pad. If Code 14 is not displayed, system is okay.

DIAGNOSTIC CODE 15, OPEN IN FRONT AIR BAG SENSOR CIRCUIT

Circuit Description

Front air bag sensors (located on left and right side of vehicle) detect deceleration force in a frontal collision. Code 15 is recorded when an open circuit is detected in front air bag sensor circuit.

Diagnosis

1) Disconnect negative battery cable and wait at least 90 seconds. Remove steering wheel pad. See STEERING WHEEL PAD & SPIRAL CABLE under REMOVAL & INSTALLATION.

2) Disconnect center air bag sensor assembly connector. Measure resistance between harness side of center air bag sensor assembly connector terminals +SR and -SR and terminals +SL and -SL. See Fig. 11. If resistance is 755-885 ohms, go to next step. If resistance is not 755-885 ohms, go to step 5).

3) Reconnect center air bag sensor connector. Using Diagnosis Check Wiring (09843-18020), jump terminals D+ and D- on spiral cable side of connector between spiral cable and steering wheel pad. See Fig. 12. Connect negative battery cable, and wait at least 2 seconds.

4) Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using diagnosis check wiring, jump DLC terminals Tc and E1. See Fig. 9. If Code 15 is not present, go to next step. If code is present, replace center air bag sensor assembly.

5) Disconnect front air bag sensor connector. Measure resistance between front air bag sensor terminals +S and +A (755-885 ohms), terminals +S and -S (infinite ohms) and terminals -S and -A (less than one ohm). See Fig. 13. If resistances are not to specification, replace front air bag sensor. If resistances are okay, go to next step.

6) Disconnect center air bag sensor assembly connector. Using diagnosis check wiring, jump center air bag sensor assembly connector terminals +SR and -SR and terminals +SL and -SL. See Fig. 11. Measure resistance between terminals +SR and -SR and terminals +SL and -SL of

harness side connector of front air bag sensor. If resistance is less than one ohm, replace front air bag sensor connector. If resistance is more than one ohm, repair or replace harness or connector between center air bag sensor assembly and front air bag sensor.

DIAGNOSTIC CODE 22, AIR BAG/SRS WARNING LIGHT SYS MALFUNCTION

Circuit Description

AIR BAG/SRS warning light is located in instrument cluster. When SRS is normal, air bag warning light glows for approximately 6 seconds after ignition switch is turned from LOCK to ACC or ON position. Warning light will glow if a malfunction exists in SRS. Code 22 is code for AIR BAG/SRS warning light system malfunction. Code 22 usually cannot be accessed through AIR BAG/SRS warning light because warning light circuit is defective.

Diagnosis (Warning Light Does Not Glow)

1) Remove ECU "B" fuse. Replace fuse as necessary. If fuse is bad, check harness between ECU "B" fuse and AIR BAG/SRS warning light, and between ECU "B" fuse and center air bag sensor assembly. If fuse is okay, check center air bag sensor assembly connector and repair as necessary.

2) If connector is okay, disconnect negative battery cable and wait at least 90 seconds. Remove steering wheel pad. See STEERING WHEEL PAD & SPIRAL CABLE under REMOVAL & INSTALLATION.

3) Disconnect center air bag sensor assembly connector. Reconnect negative battery cable. Measure voltage between center air bag sensor harness side connector terminal LA and ground. See Fig. 11. If battery voltage is present, go to next step. If battery voltage is not present, repair air bag warning light circuit.

4) Disconnect negative battery cable. Reconnect center air bag sensor connector. Reconnect negative battery cable. Turn ignition switch to ACC or ON position, and check operation of AIR BAG/SRS warning light. If AIR BAG/SRS warning light glows, it is okay. If warning light does not glow, check terminal LA of center air bag sensor assembly and electrical connector check mechanism. See Fig. 11. If terminal and connector check mechanism are okay, replace center air bag sensor assembly.

Diagnosis (Warning Light On)

Clear malfunction code stored in memory. Turn ignition switch to LOCK position, and wait at least 2 seconds. Turn ignition switch to ACC or ON position, and wait at least 20 seconds. Using Diagnosis Check Wiring (09843-18020), jump DLC terminals Tc and E1. See Fig. 9. If Code 22 is still present, replace center air bag sensor assembly. If no code is present, see AIR BAG/SRS WARNING LIGHT INTERMITTENT.

DIAGNOSTIC CODE 31, CENTER AIR BAG SENS ASSEMBLY MALFUNCTION

Circuit Description

Center air bag sensor assembly consists of a center air bag sensor, safing sensors, ignition control, drive circuit and diagnosis circuit. It receives signals from air bag sensors and determines whether air bag must be activated. Code 31 is recorded when a malfunction in center air bag sensor assembly is detected.

Diagnosis

1) If a malfunction code other than Code 31 is displayed at same time as Code 31, repair the malfunction indicated by code other than Code 31.

2) If Code 31 is displayed again, clear malfunction Code 41 stored in memory. Turn ignition switch to LOCK position, and wait at least 20 seconds. Turn ignition switch to ACC or ON position, and wait

at least 20 seconds. Repeat this operation at least 5 times. Using Diagnosis Check Wiring (09843-18020), jump DLC terminals Tc and E1. If Code 31 is present, replace center air bag sensor assembly. If Code 31 is not present, see AIR BAG/SRS WARNING LIGHT INTERMITTENT.

DIAGNOSTIC CODE 41, MALFUNCTION STORED IN MEMORY

Circuit Description

If a malfunction occurs in SRS, malfunction Codes 11 to 31 may be displayed. When battery is disconnected after malfunction is repaired, malfunction Codes 11 to 31 will be cleared, but Code 41 will be displayed.

Diagnosis

1) Clear malfunction Code 41 stored in memory. See CLEARING MALFUNCTION CODES under SELF-DIAGNOSTIC SYSTEM under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position, and wait at least 2 seconds. Turn ignition switch to ACC or ON position, and wait at least 20 seconds. If AIR BAG warning light turns off, system is okay.

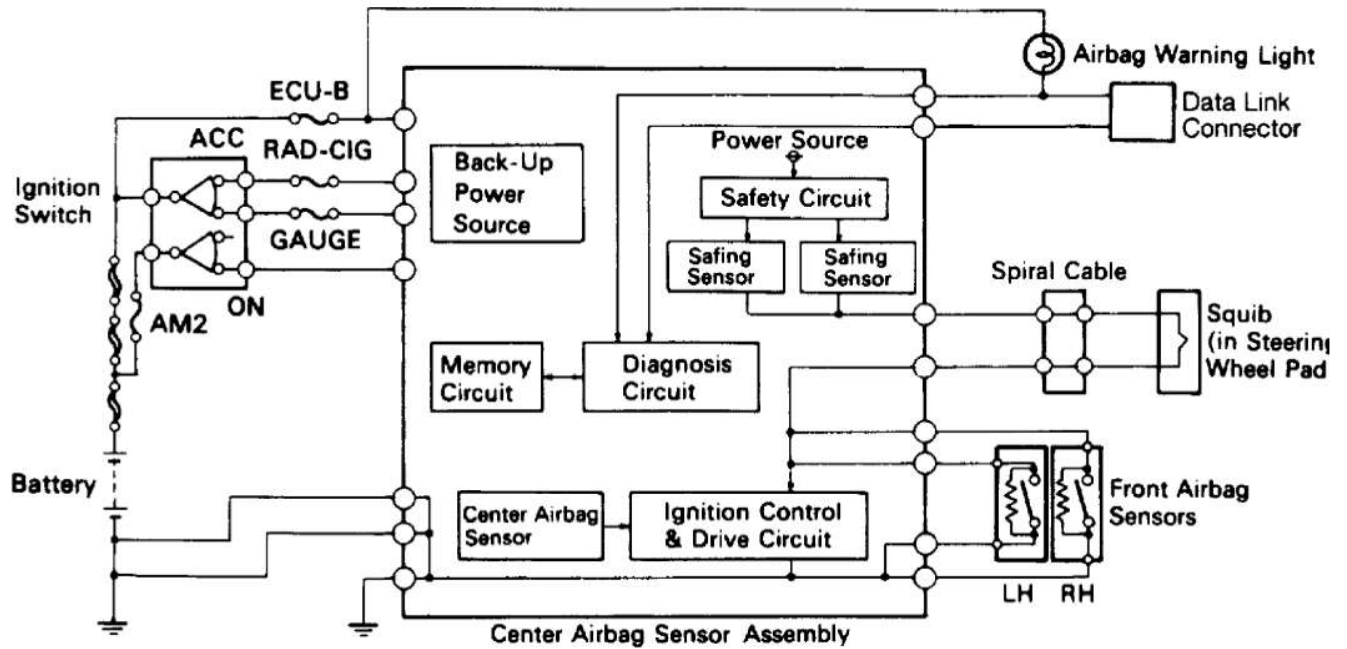
2) If warning light does not go off, turn ignition switch to ACC or ON position and wait at least 20 seconds. Using Diagnosis Check Wiring (09843-18020), jump DLC terminals Tc and E1. See Fig. 9 If Code 41 is present, check harness between ECU "B" fuse and center air bag sensor assembly. If harness is okay, replace center air bag sensor assembly. If Code 41 is not present, perform trouble shooting according to malfunction code displayed.

POST-COLLISION AIR BAG SAFETY INSPECTION

POST-COLLISION AIR BAG SAFETY INSPECTION TABLE

Replace After Deployment	* Air Bag Module * Center Air Bag Sensor Assembly * Front Air Bag Sensors
Inspect & If Damaged, Replace Component (Even If Air Bag Did Not Deploy)	* Spiral Cable * Steering Wheel * Wiring Harness & Connectors
Comments	* If any components are damaged or bent, they must be replaced. * Wiring for Front Air Bag Sensors can be repaired following manufacturer's instructions.

WIRING DIAGRAMS



93H75512

Fig. 14: SRS Wiring Diagram

Courtesy of Toyota Motor Sales, U.S.A., Inc.