

AIR BAG RESTRAINT SYSTEM

1998 Toyota Supra

1998 AIR BAG RESTRAINT SYSTEMS
Toyota

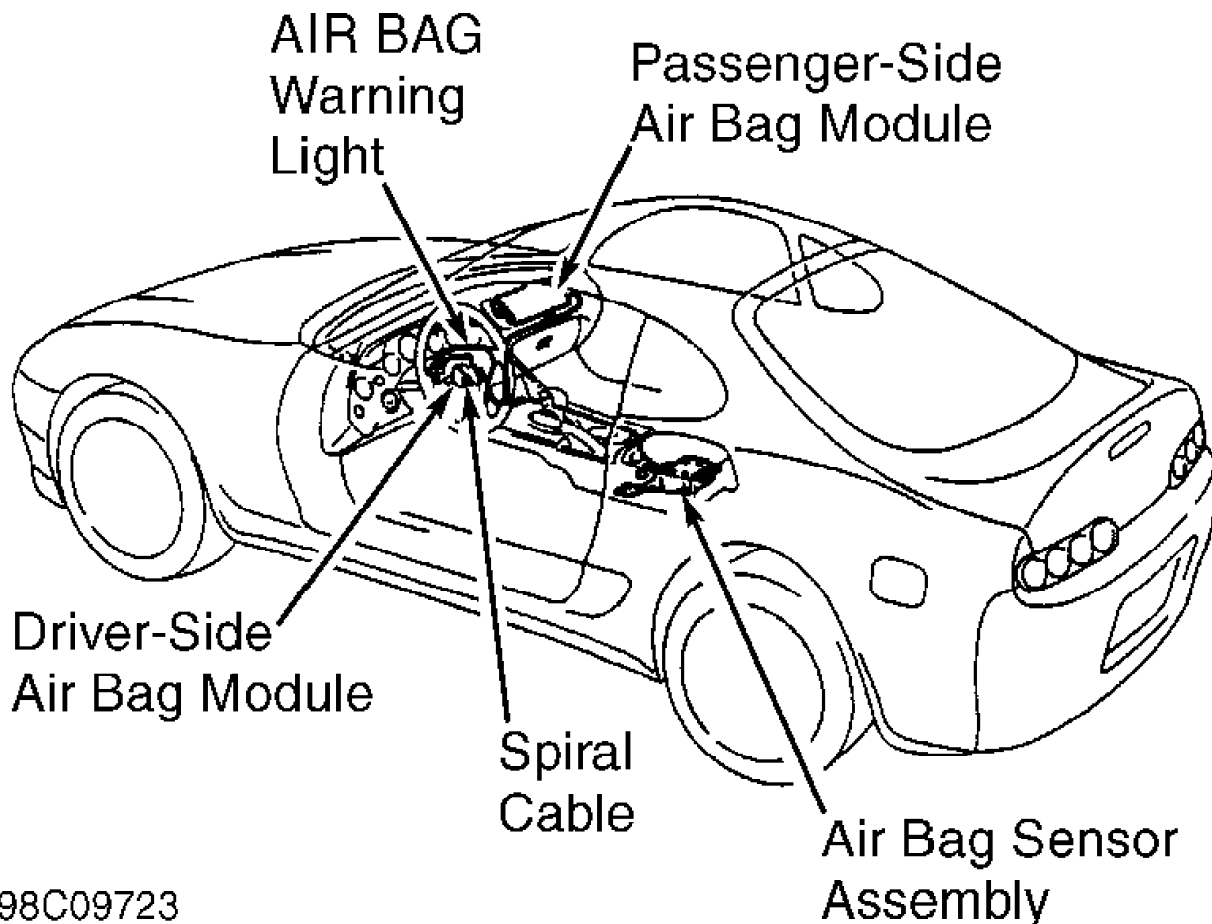
Supra

DESCRIPTION & OPERATION

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

Supplemental Restraint System (SRS), also known as air bag system, is designed to provide increased accident protection for driver and passenger by deploying air bags in a front-end collision. The air bag system is designed to be used in conjunction with 3-point safety belts.

The air bag system includes the following components: driver-side air bag module, passenger-side air bag module, spiral cable, AIR BAG warning light, air bag sensor assembly and associated wiring harnesses. See Fig. 1.



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Fig. 1: Locating Restraint System Components
Courtesy of Toyota Motor Sales, U.S.A., Inc.

AIR BAG SENSOR ASSEMBLY

The air bag sensor assembly is located on the floor inside rear of center console box. It consists of an air bag sensor, safing sensor and diagnosis, ignition control and drive circuits. It receives signals from the air bag sensor and determines whether air bag system must be deployed or not.

DRIVER-SIDE AIR BAG MODULE

The driver-side air bag and inflator is stored in the steering wheel pad. It contains a squib, igniter charge and gas generant and inflates the air bag when instructed by air bag sensor assembly. Driver-side air bag module is also called steering wheel pad.

PASSENGER-SIDE AIR BAG MODULE

The passenger-side air bag and inflator is stored in the instrument panel above glove box. It contains a squib, igniter charge and gas generant and inflates the air bag when instructed by air bag sensor assembly.

SPIRAL CABLE

The spiral cable is attached to combination switch and is used as an electrical joint between chassis wiring harness and driver-side air bag module. Spiral cable is also known as clockspring.

SYSTEM OPERATION CHECK

Turn ignition switch to ACC or ON position. AIR BAG warning light should come on for about 6 seconds and then go out. If AIR BAG warning light does not operate as specified, see DIAGNOSIS & TESTING.

SERVICE PRECAUTIONS

Observe the following precautions when servicing air bag system:

- * Disable air bag system before servicing any air bag system 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 diagnosing air bag system, 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 air bag system. Air bag system is equipped with a back-up power source that may allow air bag to deploy until 90 seconds after disconnecting negative battery cable.
- * If vehicle was in a minor collision but air bags did not deploy, inspect all system components for any sign of damage, and replace as necessary.
- * Never use air bag system components from another vehicle. Replace air bag system components with new parts.
- * Remove air bag sensor assembly, if repairing the vehicle requires impacting (shocking) the vehicle.
- * Air bag sensor assembly contains mercury. After replacement, DO NOT destroy old part. When scrapping vehicle or replacing air bag sensor assembly, remove air bag sensor assembly and dispose of it as toxic waste.

- * Never disassemble and repair air bag sensor assembly or steering wheel pad.
- * Replace dropped, cracked, dented or otherwise damaged components.
- * DO NOT expose air bag sensor assembly or driver-side air bag module directly to heat or flame.
- * When diagnosing electrical circuits, use a volt/ohm meter with high impedance (10,000 ohms minimum).
- * Information labels are attached to air bag components. Follow all notices on labels.
- * After work on air bag system is complete, check air bag 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 and 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. Always wear safety glasses, rubber gloves, and long-sleeved shirt during clean-up. After clean-up, wash hands using mild soap and water.
- * Carry a live air bag module with trim cover (air bag) pointed away from your body to minimize injury in case accidental deployment.
- * If air bag system 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 air bag system is not functional, park vehicle until it is repaired and functions properly.

DISABLING & ACTIVATING AIR BAG SYSTEM

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

DISABLING SYSTEM

Turn ignition switch to LOCK position. Disconnect and shield negative battery cable. Wait at least 90 seconds. Remove driver-side air bag module. See DRIVER-SIDE AIR BAG MODULE under REMOVAL & INSTALLATION. Disconnect passenger-side air bag module connector, accessible by removal of glove box finish plate. See Fig. 2. Disconnect air bag sensor assembly connector. See AIR BAG SENSOR ASSEMBLY under REMOVAL & INSTALLATION.

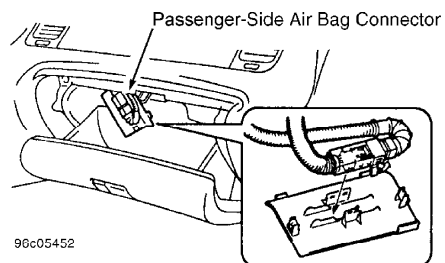


Fig. 2: Disconnecting Passenger-Side Air Bag Connector
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

ACTIVATING SYSTEM

Turn ignition switch to LOCK position. Disconnect and shield negative battery cable. Wait at least 90 seconds. Reconnect passenger-side air bag connector. Install driver-side air bag module. Reconnect negative battery cable. Perform SYSTEM OPERATION CHECK.

DISPOSAL PROCEDURES

WARNING: Undeployed air bags contain substances that can cause illness or injury if improperly handled. Disposing of an undeployed air bag may violate federal, state and/or local laws. If scrapping vehicle, air bag must be deployed while still mounted in vehicle. DO NOT deploy air bags inside vehicle unless vehicle is to be scrapped. Wear gloves and safety glasses when handling air bag. Wrap deployed air bag in a sturdy plastic bag and dispose of it like any other part.

ON-VEHICLE DEPLOYMENT (SCRAPPED VEHICLES ONLY)

Driver-Side & Passenger-Side Air Bag Module

1) Before proceeding, see SERVICE PRECAUTIONS. Ensure steering wheel, driver-side air bag module and passenger-side air bag are not loose. If components are loose, deploy air bag(s) using OFF-VEHICLE DEPLOYMENT procedure.

2) If deploying driver-side air bag module, disconnect spiral cable connector accessible by removal of lower steering column cover. If deploying passenger-side air bag module, disconnect passenger-side air bag connector, accessible by removal of glove box finish plate. See Fig. 2. For either air bag, connect Deployment Tool (09082-00700) connector to air bag module 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. Ensure 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.

OFF-VEHICLE DEPLOYMENT

Driver-Side Air Bag Module

1) Before proceeding, see SERVICE PRECAUTIONS. Remove driver-side air bag module. See DRIVER-SIDE AIR BAG MODULE under REMOVAL & INSTALLATION. Remove connector on rear of driver-side air bag module. Disengage and remove cover from driver-side air bag module. See Fig. 3.

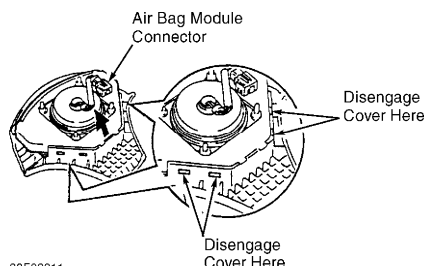
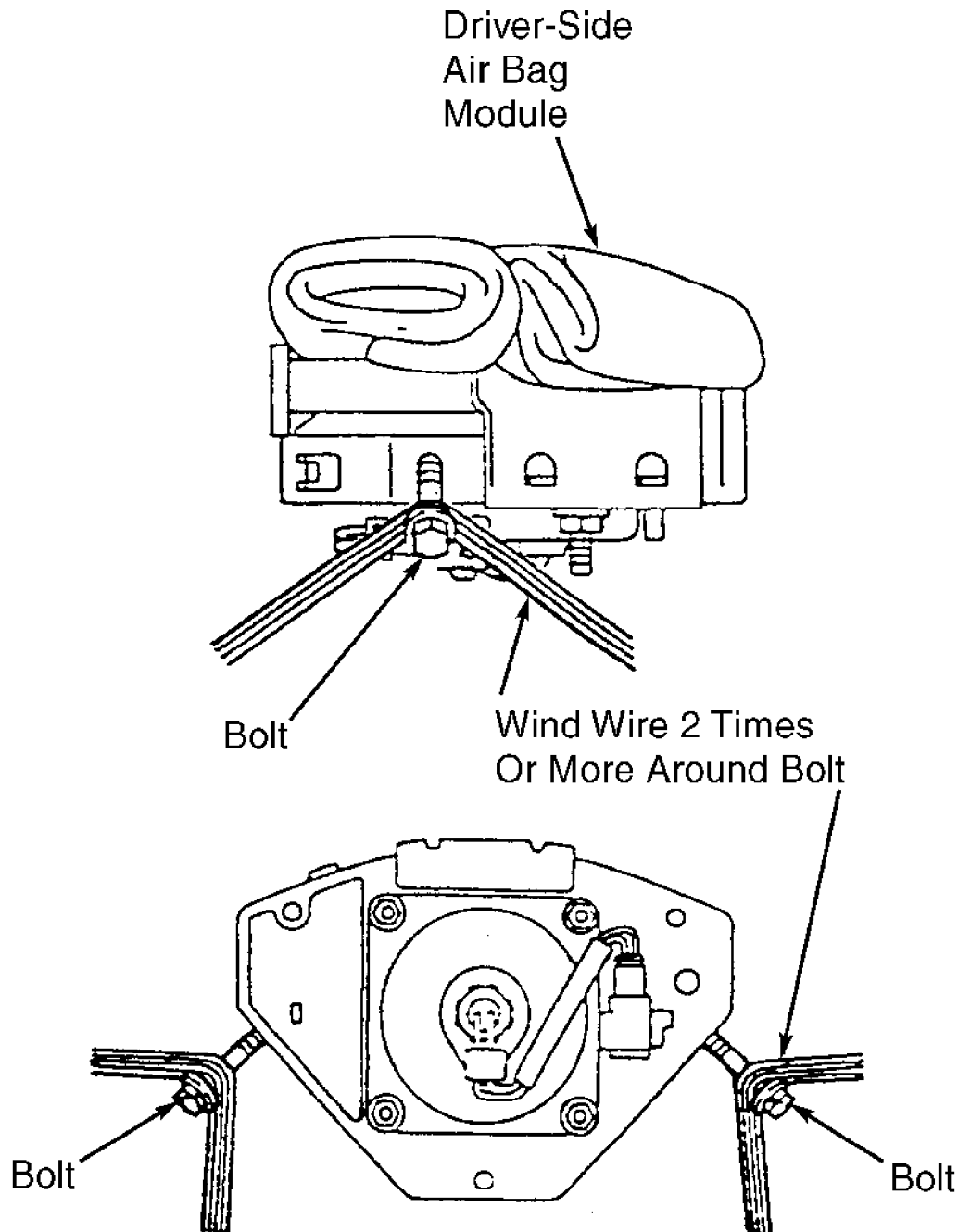


Fig. 3: Removing Driver-Side Air Bag Module Connector & Cover
Courtesy of Toyota Motor Sales, U.S.A., Inc.

2) Install 2 bolts (6 mm X 35 mm) with washers into holes

located in rear of driver-side air bag module. Tighten bolts by hand. DO NOT overtighten bolts. Wrap strong wire at least twice around each bolt. See Fig. 4. Ensure no slack is present in wire. If slack is present, or wire is not strong enough, driver-side air bag module may become loose due to shock when air bag is deployed.



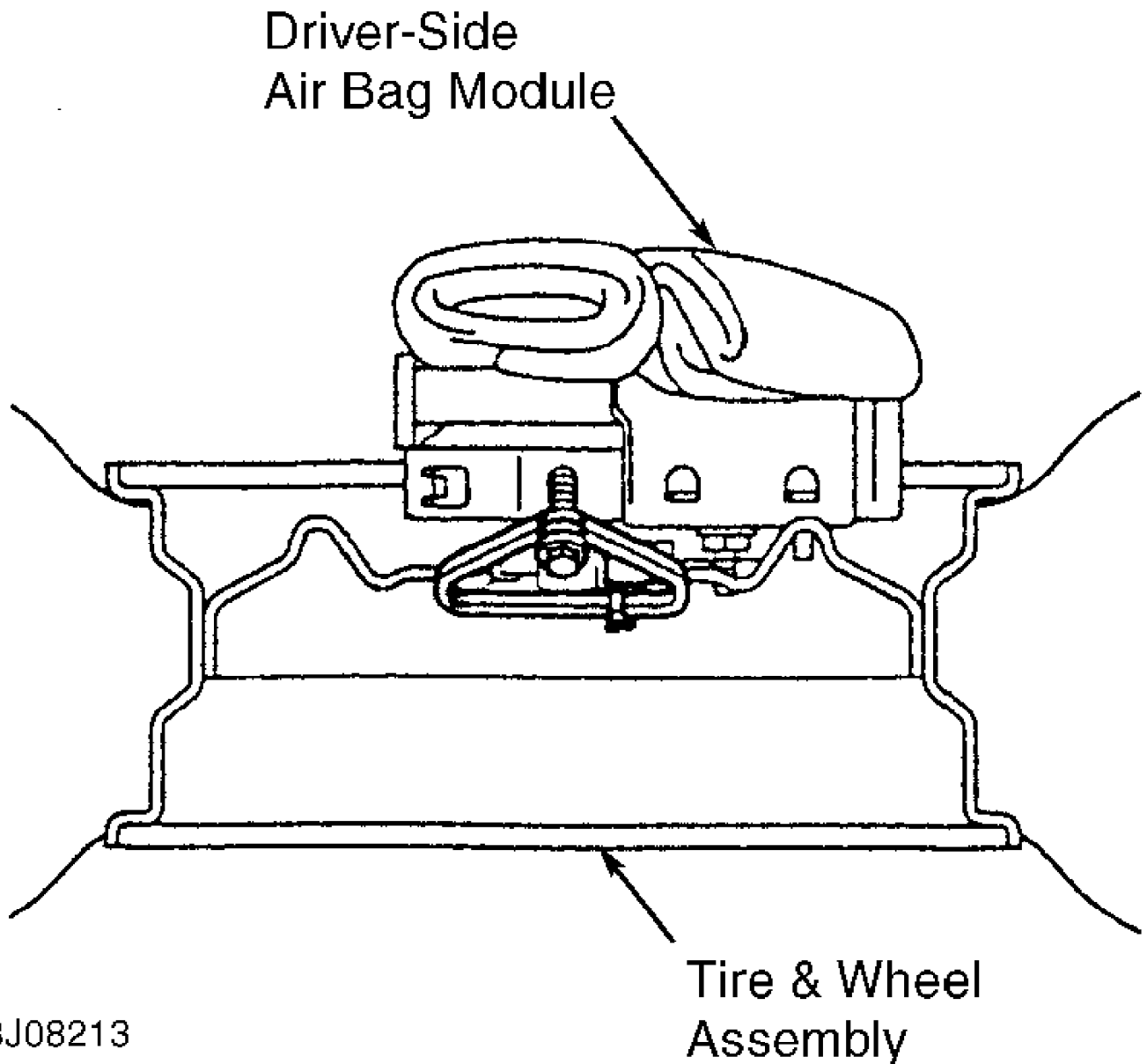
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Fig. 4: Securing Wire To Driver-Side Air Bag Module
Courtesy of Toyota Motor Sales, U.S.A., Inc.

3) Position driver-side air bag module on rim of a scrap wheel and tire assembly with pad side facing upward. See Fig. 5.

Securely tie driver-side air bag module to wheel rim through lug nut holes. Place a large cardboard box (weighted at sides) or 3 scrap tires on top of driver-side air bag module.

4) Connect Deployment Tool (09082-00700) to driver-side air bag module connector. Position deployment tool at least 33 feet away from driver-side air bag module. Press activation switch to deploy driver-side air bag module. Because of heat, wait 30 minutes before handling driver-side air bag module. Seal deployed air bag module in vinyl bag and dispose of in usual manner.



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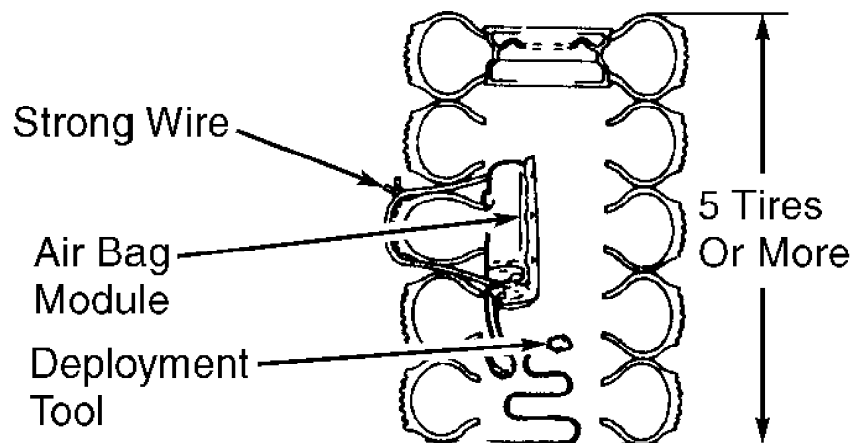
Fig. 5: Securing Driver-Side Air Bag Module To Wheel
Courtesy of Toyota Motor Sales, U.S.A., Inc.

Passenger-Side Air Bag Module

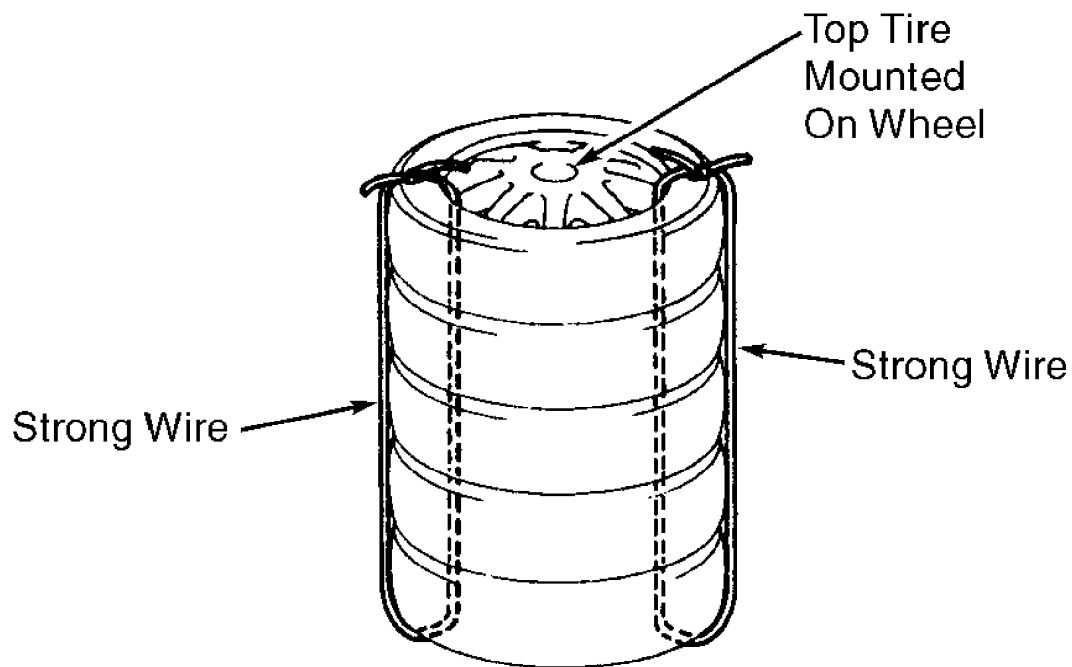
1) Before proceeding, see SERVICE PRECAUTIONS. Remove passenger-side air bag module. See PASSENGER-SIDE AIR BAG under REMOVAL & INSTALLATION.

2) Position passenger-side air bag module inside a scrap tire

with air bag trim cover facing inside. See Fig. 6. Secure passenger-side air bag module to tire with wire. Place this tire between 4 other tires (top tire should have wheel installed). Securely tie all tires together with wire.



ATTACH AIR BAG TO TIRE



SECURE TIRES TOGETHER

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Fig. 6: Preparing Passenger-Side Air Bag Module For Deployment
Courtesy of Toyota Motor Sales, U.S.A., Inc.

3) Connect Deployment Tool (09082-00700) to passenger-side air bag connector. Position deployment tool at least 33 feet away from

passenger-side air bag. Press activation switch to deploy passenger-side air bag. Because of heat, wait 30 minutes before handling passenger-side air bag.

POST-COLLISION INSPECTION

When a vehicle has been involved in a collision, certain components of the passive restraint system must be inspected or replaced. See PASSIVE RESTRAINT SYSTEM INSPECTION article in the GENERAL INFORMATION section for post-collision inspection information.

REMOVAL & INSTALLATION

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

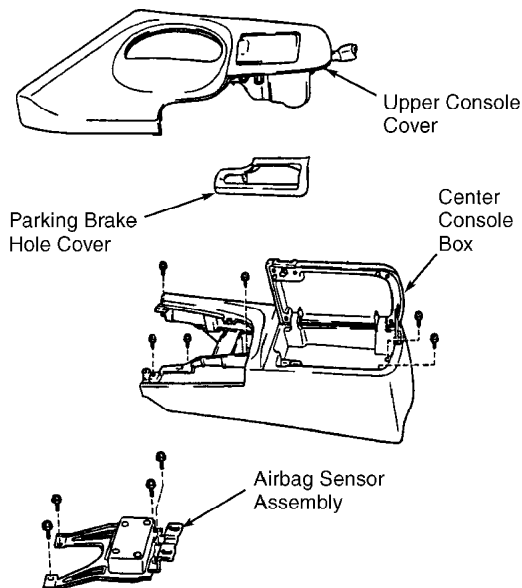
AIR BAG SENSOR ASSEMBLY

Removal & Installation

1) Before proceeding, see SERVICE PRECAUTIONS. Air bag sensor assembly is located on the floor inside rear of center console box. See Fig. 6. Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds.

2) Remove console panel upper. See Fig. 7. Remove parking brake hole cover and center console box. Remove 4 Torx screws retaining air bag sensor assembly. Remove air bag sensor assembly.

3) To install, reverse removal procedure. Tighten air bag sensor assembly Torx screws to specification. See TORQUE SPECIFICATIONS. Check AIR BAG warning light to ensure system is functioning properly. See SYSTEM OPERATION CHECK.



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Fig. 7: Removing Air Bag Sensor Assembly
Courtesy of Toyota Motor Sales, U.S.A., Inc.

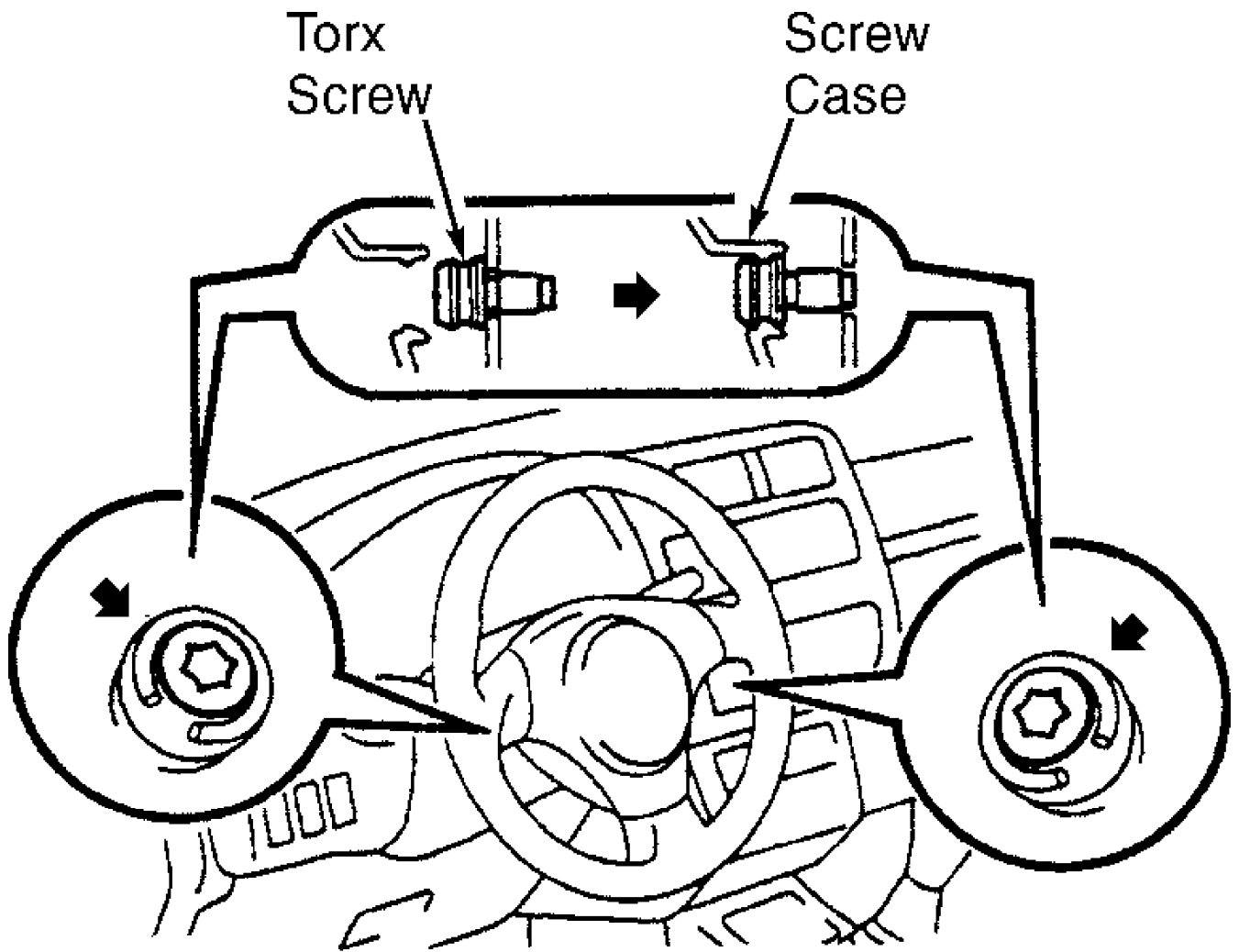
DRIVER-SIDE AIR BAG MODULE

Removal & Installation

1) Before proceeding, see SERVICE PRECAUTIONS. Ensure front wheels are in straight-ahead position. Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Working from back of steering wheel, loosen air bag module mounting Torx screws until groove around screw circumference catches on screw case. See Fig. 8.

2) Pull driver-side air bag module from steering wheel and disconnect driver-side air bag module connector. Place driver-side air bag module on a flat surface with pad cover facing up.

3) To install, reverse removal procedure. Ensure front wheels are in straight-ahead position and spiral cable is properly aligned. See SPIRAL CABLE under ADJUSTMENTS. Tighten driver-side air bag module mounting screws to specification. See TORQUE SPECIFICATIONS. Check AIR BAG warning light to ensure system is functioning properly. See SYSTEM OPERATION CHECK.



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Fig. 8: Removing Driver-Side Air Bag Module
Courtesy of Toyota Motor Sales, U.S.A., Inc.

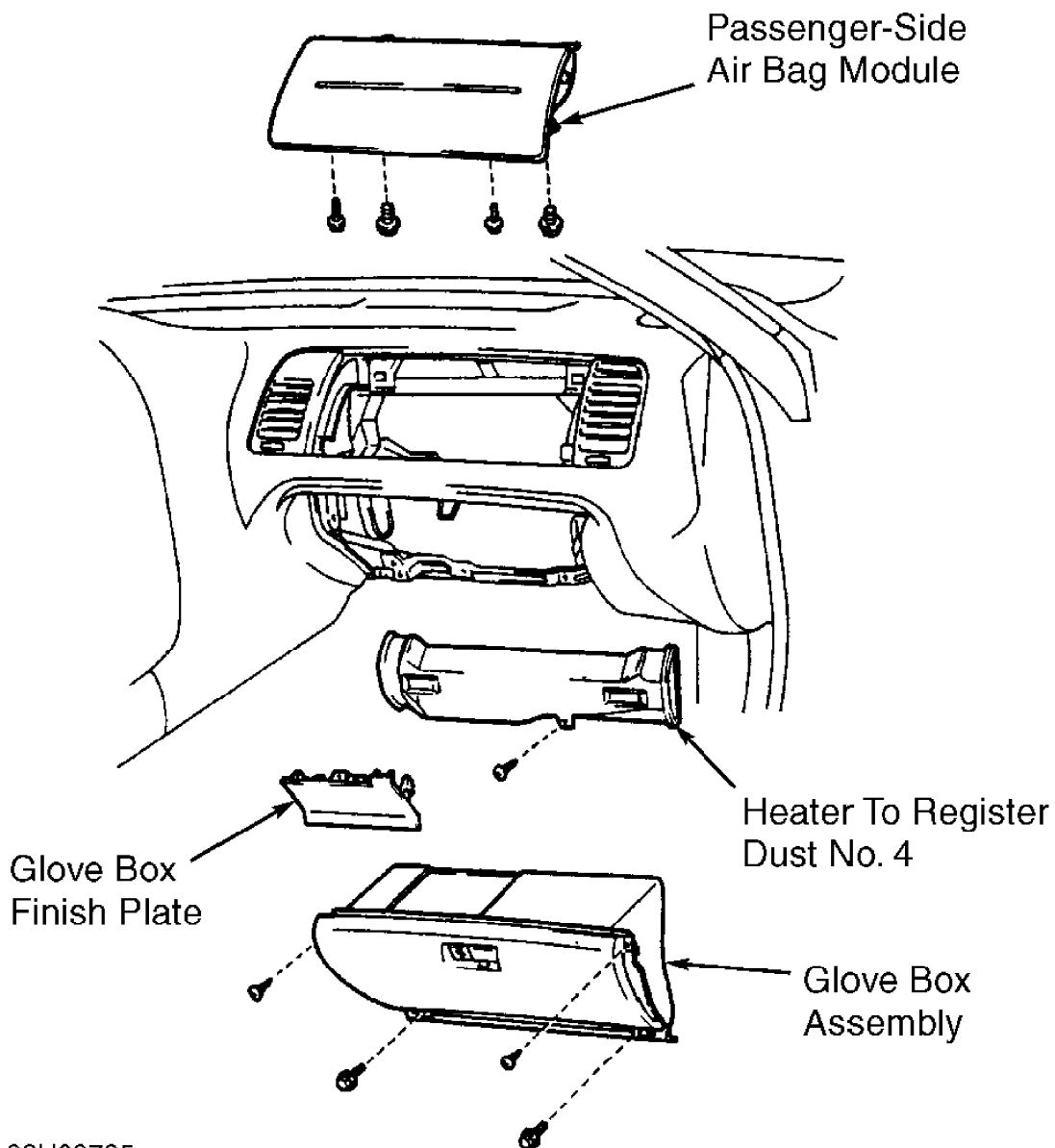
PASSENGER-SIDE AIR BAG MODULE

Removal & Installation

1) Before proceeding, see SERVICE PRECAUTIONS. Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds.

2) Disconnect passenger-side air bag module connector attached to glove box finish plate. See Fig. 9. Remove glove box assembly. Remove heater-to-register duct No. 4. Remove 4 bolts and passenger-side air bag module.

3) To install, reverse removal procedure. Tighten passenger-side air bag bolts to specification. See TORQUE SPECIFICATIONS. Check AIR BAG warning light to ensure system is functioning properly. See SYSTEM OPERATION CHECK.



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Fig. 9: Removing Passenger-Side Air Bag Module
Courtesy of Toyota Motor Sales, U.S.A., Inc.

SPIRAL CABLE

Removal & Installation

1) Before proceeding, see SERVICE PRECAUTIONS. Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Remove driver-side air bag module. See DRIVER-SIDE AIR BAG MODULE.

2) Remove steering wheel. See STEERING WHEEL. Remove lower steering column cover. Disconnect lower spiral cable connector. Remove 4 screws and spiral cable.

3) To install, reverse removal procedure. Before installing spiral cable, ensure front wheels are in straight-ahead position and spiral cable is properly aligned. See SPIRAL CABLE under ADJUSTMENTS. Tighten steering wheel nut and driver-side air bag module screws to specification. See TORQUE SPECIFICATIONS. Check AIR BAG warning light to ensure system is functioning properly. See SYSTEM OPERATION CHECK.

STEERING WHEEL

Removal & Installation

1) Before proceeding, see SERVICE PRECAUTIONS. Ensure front wheels are in straight-ahead position. Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Remove driver-side air bag module. See DRIVER-SIDE AIR BAG MODULE.

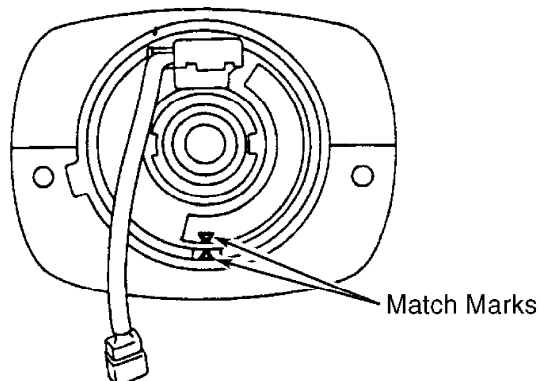
2) Remove steering wheel nut. Match mark steering wheel and steering column for reassembly reference. Using appropriate puller, remove steering wheel.

3) To install, reverse removal procedure. Ensure front wheels are in straight-ahead position and spiral cable is properly aligned. See SPIRAL CABLE under ADJUSTMENTS. Tighten steering wheel nut and driver-side air bag module screws to specification. See TORQUE SPECIFICATIONS. Check AIR BAG warning light to ensure system is functioning properly. See SYSTEM OPERATION CHECK.

ADJUSTMENTS

SPIRAL CABLE

Ensure front wheels are in straight-ahead position. Turn spiral cable counterclockwise until it becomes difficult to turn. Turn spiral cable clockwise about 2 1/2 turns to align match marks. See Fig. 10. Install steering wheel.



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Fig. 10: Adjusting Spiral Cable
Courtesy of Toyota Motor Sales, U.S.A., Inc.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Air Bag Sensor Assembly Screws	15 (20)
Passenger-Side Air Bag Module-	15 (20)
To-Instrument Panel Reinforcement Bolt	
Steering Wheel Nut	26 (35)
	INCH Lbs. (N.m)
Driver-Side Air Bag Module Screw	78 (8.8)
Passenger-Side Air Bag Module-	75 (8.5)
To-Instrument Panel Bolt	

DIAGNOSIS & TESTING

AIR BAG WARNING LIGHT CHECK

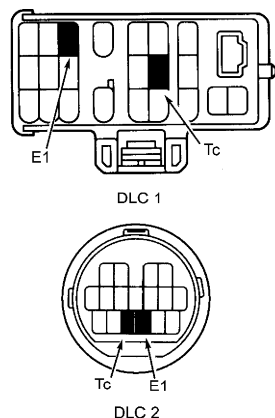
Turn ignition switch to ACC or ON position. If air bag warning light comes on for about 6 seconds and then goes off, system is functioning properly. If AIR BAG warning light comes on and stays on (or flashes), Diagnostic Trouble Code (DTC) is stored in air bag sensor assembly. Go to RETRIEVING CODES. If AIR BAG warning light responds in any other way, go to DIAGNOSTIC TESTS.

RETRIEVING CODES

Using Diagnosis Check Wire

CAUTION: System may be damaged if jumper wire is incorrectly connected across terminals of Data Link Connector (DLC1). Use Diagnosis Check Wire (09843-18020) when connecting terminals of DLC1.

1) Turn ignition switch to ACC or ON position. Wait about 20 seconds. Using Diagnosis Check Wiring (09843-18020), connect terminals Tc and E1 of Data Link Connector (DLC1). See Fig. 11. DLC is located at right rear corner of engine compartment.



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Fig. 11: Identifying Data Link Connectors
Courtesy of Toyota Motor Sales, U.S.A., Inc.

2) If AIR BAG warning light flashes 2 times per second, system is normal (normal code). If AIR BAG warning light does not

flash Diagnostic Trouble Codes (DTCs) or flashes DTCs without DLC1 connection, proceed to DTCS NOT DISPLAYED under DIAGNOSTIC TESTS or DTCS CONTINUOUSLY DISPLAYED under DIAGNOSTIC TESTS. If AIR BAG warning light is on continuously and DTC is normal (flashes 2 times per second), source voltage is low. Go to SOURCE VOLTAGE DROP under DIAGNOSTIC TESTS.

3) If AIR BAG warning light flashes, count number of flashes to determine DTCs that are set. For example, DTC 12 is: FLASH, 1.5-second pause, FLASH, FLASH. If more than one DTC is displayed, a 2.5-second pause will occur between each DTC. Lowest numbered DTC will be displayed first, followed by next higher number DTC until all DTCs have been displayed.

4) After all DTCs are displayed, a 4-second pause will occur, and DTC display will be repeated. See appropriate DTC under DIAGNOSTIC TESTS. After repairing, clear DTCs. See CLEARING CODES.

NOTE: If DTCs other than those listed under DIAGNOSTIC TESTS are displayed, replace the air bag sensor assembly. If the air bag warning light does not function as described, proceed to appropriate test under DIAGNOSTIC TESTS.

Using Toyota Hand-Held Tester

Install Toyota hand-held tester to DLC1 or DLC2. DLC1 is located in right rear corner of engine compartment panel. DLC2 is located under left side of instrument panel. See Fig. 11. Read DTC by following prompts on tester. See tester operator's manual for instructions.

CLEARING CODES

Codes are cleared when ignition switch is turned to OFF position.

RELEASING SHORTING SPRING

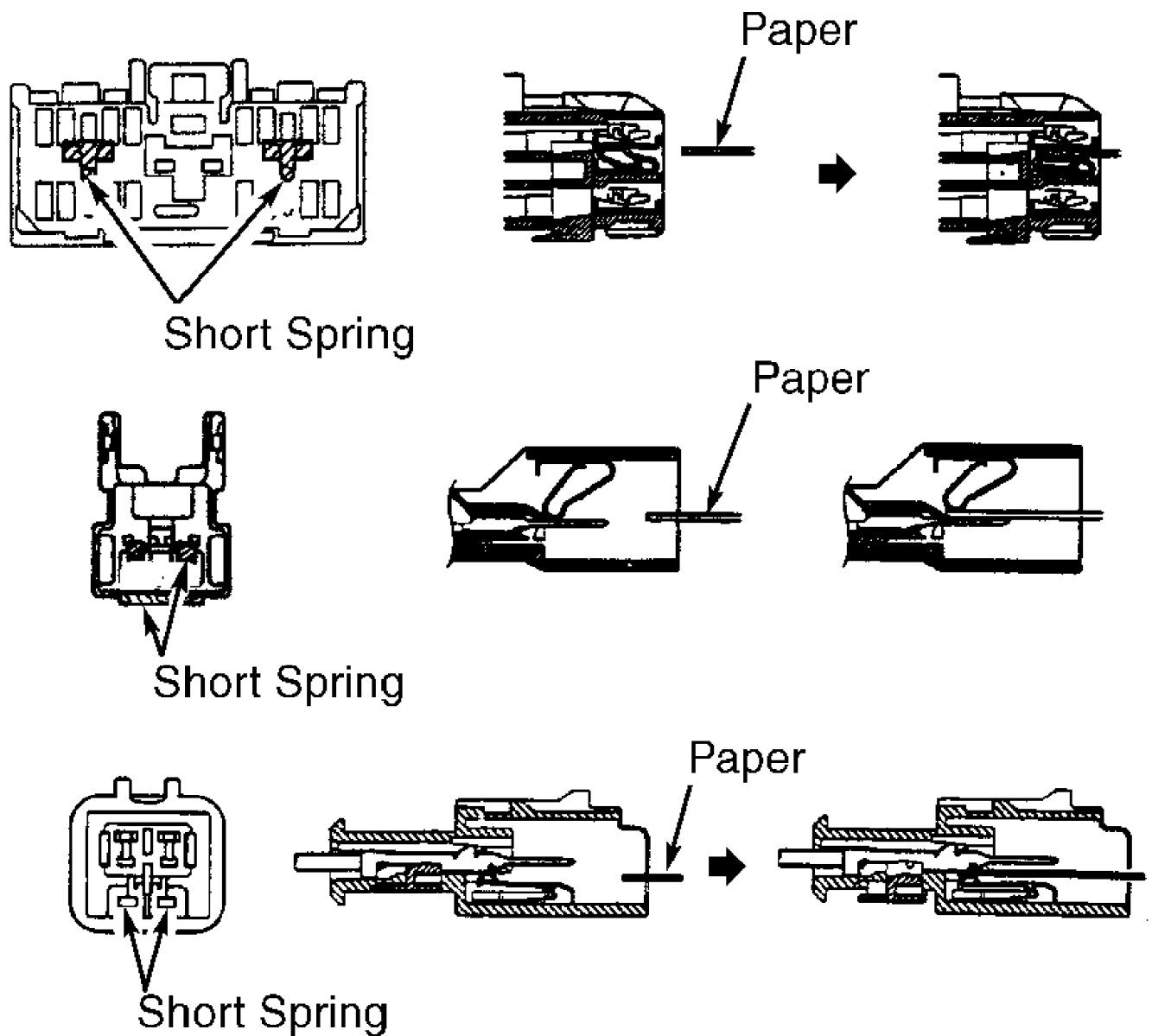
NOTE: Perform this procedure only if you were sent here from DIAGNOSTIC TESTS.

1) Air bag squib circuit consists of circuit between air bag sensor assembly and air bag. If voltage is accidentally applied across squib circuit (as when testing, for example), air bag will deploy.

2) To prevent accidental deployment, squib circuit connectors contain a spring-loaded shorting bar (shorting spring). When squib circuit connector is disconnected, shorting spring automatically shorts squib circuit positive and negative circuits together. This prevents air bag deployment if voltage is accidentally applied across squib circuit.

3) When connector halves are attached, shorting bar is in released position (no continuity exists between terminals). When connector is disconnected, shorting bar is engaged (continuity exists between terminals).

4) Some testing procedures require shorting spring to be in released position with connector disconnected (this is opposite of its normal position). To hold shorting spring in released position, obtain a piece of paper that is same thickness as male terminal blade that slides under shorting spring when the connector is connected. See Fig. 12.



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Fig. 12: Releasing Shorting Spring
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

CAUTION: If paper thicker than male terminal is used, connector terminal could be damaged. Damaged connector terminal could result in system fault. Always use paper that is same thickness as male terminal.

5) With squib circuit connector disconnected, insert paper into female terminal, sliding it under shorting spring. This lifts spring, breaking circuit and allowing test procedure to be performed.

DIAGNOSTIC TESTS

WARNING: Failure to follow service precautions may result in air bag deployment and personal injury. See SERVICE PRECAUTIONS.

After component replacement, check system operation. See SYSTEM OPERATION CHECK.

CAUTION: Ensure ignition switch is in LOCK position before disconnecting or connecting negative battery cable. If ignition switch is in ACC or ON position when negative battery cable is disconnected or connected, air bag sensor may be damaged. To prevent damage to connector terminals, DO NOT probe terminal ends. Instead, backprobe terminals (probe terminal where wire enters harness connector).

NOTE: In the following tests, the term squib connector and module connector may be used interchangeably.

AIR BAG WARNING LIGHT DOES NOT ILLUMINATE

Description

AIR BAG warning light is located in instrument cluster. When air bag system is normal, AIR BAG warning light illuminates for about 6 seconds after ignition switch is turned from LOCK to ACC or ON position, and turns off automatically. If a malfunction is present in air bag system, AIR BAG warning light illuminates to inform operator of malfunction. When Data Link Connector 1 (DLC1) terminals Tc and E1 are connected together, a Diagnostic Trouble Code (DTC) is displayed by blinking AIR BAG warning light.

Diagnostic Procedure

1) Remove ECU-B fuse and check continuity across fuse blades. ECU-B fuse is located in fuse at left side of instrument panel. If fuse is faulty, go to step 4). If fuse is okay, reinstall fuse and go to next step.

2) Disable air bag system. See DISABLING SYSTEM under DISABLING & ACTIVATING AIR BAG SYSTEM. Reconnect negative battery cable. Turn ignition switch to ACC or ON position. Measure voltage between ground and harness side of air bag sensor assembly connector Black/Yellow wire (circuit LA). See WIRING DIAGRAMS. If 10-14 volts is not present, repair AIR BAG warning light bulb or circuit. If 10-14 volts is present, go to next step.

3) Turn ignition switch to LOCK position. Disconnect negative battery cable. Reconnect air bag sensor assembly connectors. Leave air bag modules disconnected. Reconnect negative battery cable and wait at least 2 seconds. Turn ignition switch to ACC or ON position. If AIR BAG warning light illuminates, system operation is normal. If AIR BAG warning light does not come on, check for poor connection at air bag sensor assembly connector Black/Yellow wire. If connection is okay, replace air bag sensor assembly.

4) Recheck ECU-B fuse. If fuse is blown, check harness between ECU-B fuse and AIR BAG warning light. If fuse is okay, check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.

AIR BAG WARNING LIGHT IS ILLUMINATED WITH IGNITION OFF

Description

AIR BAG warning light is located in instrument cluster. When air bag system is normal, AIR BAG warning light illuminates for about 6 seconds after ignition switch is turned from LOCK to ACC or ON position, and turns off automatically. If a malfunction is present in air bag system, AIR BAG warning light illuminates to inform operator of malfunction. When Data Link Connector 1 (DLC1) terminals Tc and E1 are connected together, a Diagnostic Trouble Code (DTC) is displayed by blinking AIR BAG warning light.

Diagnostic Procedure

Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Access and disconnect air bag sensor assembly connector. See AIR BAG SENSOR ASSEMBLY under REMOVAL & INSTALLATION. Reconnect negative battery cable. Perform SYSTEM OPERATION CHECK. If AIR BAG warning light does not illuminate, replace air bag sensor assembly. If AIR BAG warning light is still illuminated, repair AIR BAG warning light circuit Black/Yellow wire or circuit AB (Black/Yellow wire) leading to the DLC1. See WIRING DIAGRAMS.

AIR BAG WARNING LIGHT INTERMITTENT

If AIR BAG warning light comes on intermittently, perform following tests to simulate driving conditions. If problem cannot be found, replace all components including wiring harness.

- * Wiggle-test wiring harness.
- * Apply heat to components with a hair dryer.
- * Spray water onto entire vehicle (not directly onto electrical components) to simulate humidity.

DTCS NOT DISPLAYED

NOTE: Use following procedure if DTCs are not displayed or air bag warning light stays on when jumper wire is connected between terminals Tc and E1 of DLC1.

Description

When DLC1 terminals Tc and E1 are connected together, air bag sensor assembly is set in Diagnostic Trouble Code (DTC) output mode. DTC is displayed by blinking AIR BAG warning light.

Diagnostic Procedure

1) Turn ignition switch from LOCK to ACC or ON position. If AIR BAG warning light does not illuminate for about 6 seconds, repair AIR BAG warning light circuit. See WIRING DIAGRAMS. If AIR BAG warning light illuminates for about 6 seconds, go to next step.

2) Measure voltage between DLC1 terminals Tc and E1. See Fig. 11. If 10-14 volts is present, go to step 4). If 10-14 volts is not present, go to next step.

3) Measure voltage between ground and DLC1 terminal Tc. If 10-14 volts is present, repair harness between ground and DLC1 terminal E1. See WIRING DIAGRAMS. If 10-14 volts is not present, go to next step.

4) Turn ignition switch to LOCK position. Disconnect negative battery cable and wait at least 90 seconds. Access and disconnect air bag sensor assembly connector. See AIR BAG SENSOR ASSEMBLY under REMOVAL & INSTALLATION. Connect one end of jumper wire to harness side of air bag sensor assembly connector Pink/Black wire (circuit Tc). See WIRING DIAGRAMS. Leave other end of jumper wire disconnected. Reconnect air bag sensor assembly connector with jumper wire connected. Connect negative battery cable and turn ignition switch to ACC or ON position. Wait at least 20 seconds. Connect unconnected end of jumper wire to ground. If AIR BAG warning light does not illuminate, replace air bag sensor assembly. If AIR BAG warning light illuminates, check Pink/Black wire between air bag sensor assembly and DLC1.

DTCS CONTINUOUSLY DISPLAYED

NOTE: Use following procedure if DTCs are displayed without connecting jumper wire between terminals Tc and E1 of DLC1.

Description

When DLC1 terminals Tc and E1 are connected together, air bag sensor assembly is set in Diagnostic Trouble Code (DTC) output mode. DTC is displayed by blinking AIR BAG warning light.

Diagnostic Procedure

1) Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Access and disconnect air bag sensor assembly connector. See AIR BAG SENSOR ASSEMBLY under REMOVAL & INSTALLATION.

2) Measure resistance between ground and air bag sensor assembly connector Pink/Black wire (circuit Tc). See WIRING DIAGRAMS. If resistance is more than one megohm, replace air bag sensor assembly. If resistance is less than one megohm, replace harness and connector.

SOURCE VOLTAGE DROP

Description

The air bag sensor assembly is equipped with a voltage-increase circuit to allow system operation in case source (battery) voltage drops below minimum. When battery voltage drops, voltage-increase circuit functions to increase voltage of air bag system to normal voltage.

The malfunction display for this circuit is different from other air bag system circuits. When source voltage drop is detected and no other DTCs are present, the AIR BAG warning light remains illuminated constantly. Source voltage drop is not recorded in air bag sensor assembly as a malfunction, and when source voltage returns to normal, AIR BAG warning light will turn off.

Diagnostic Procedure

1) Turn ignition switch to LOCK position. Disable air bag system. See DISABLING SYSTEM under DISABLING AND ACTIVATING AIR BAG SYSTEM. Reconnect negative battery cable.

2) Turn ignition switch to ON position. Turn on electrical accessories (defogger, wipers, headlights, blower motor, etc.). Measure voltage between ground and air bag sensor assembly connector Black/Orange wire (circuit IG2) and Gray wire (circuit ACC). See WIRING DIAGRAMS. Turn electrical accessories off. If voltage is 10-14 volts, go to next step. If voltage is not 10-14 volts, check harness between battery and air bag sensor assembly and check battery and charging system.

3) Turn ignition switch to LOCK position. Activate air bag system. See ACTIVATING SYSTEM under DISABLING & ACTIVATING AIR BAG SYSTEM. Turn ignition switch to ON position. Turn on electrical accessories again. If AIR BAG warning light goes out, system operation is normal at this time. If AIR BAG warning light does not go out, check for DTCs. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC is displayed, go to appropriate DTC. If a normal code is displayed (2 flashes per second), replace air bag sensor assembly.

DTC 11: DRIVER-SIDE AIR BAG SQUIB CIRCUIT SHORT TO GROUND

Description

The driver-side air bag squib circuit consists of the air bag sensor assembly, spiral cable and driver-side air bag module. The squib causes driver-side air bag to deploy when all deployment conditions are satisfied.

Possible Causes

DTC 11 could be caused by a short to ground in squib circuit,

squib malfunction, spiral cable malfunction or air bag sensor assembly malfunction.

NOTE: During testing, if DTCs other than DTC 11 are displayed, disregard them.

Diagnostic Procedure

1) Disable air bag system. See DISABLING SYSTEM under DISABLING & ACTIVATING AIR BAG SYSTEM.

2) Measure resistance between ground and terminal D+ (Yellow/Red wire) of upper spiral cable connector. If resistance is more than one megohm, go to next step. If resistance is less than one megohm, go to step 7).

3) Measure resistance between ground and terminal P+ (Blue wire) of passenger-side air bag module harness connector. If resistance is more than one megohm, go to next step. If resistance is less than one megohm, repair or replace harness or connector between air bag sensor assembly and passenger-side air bag module.

4) Reconnect air bag sensor assembly connector. Connect jumper wire between terminal D+ (Yellow/Red wire) and terminal D- (Yellow/Green wire) of upper spiral cable connector. Connect jumper wire between terminal P+ (Blue wire) and terminal P- (Yellow wire) of passenger-side air bag module harness connector. Connect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve DTCs. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 11 is displayed, replace air bag sensor assembly. If DTC 11 is not displayed, go to next step.

5) Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Reconnect upper spiral cable connector (to driver-side air bag module). Reconnect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 11 is displayed, replace driver-side air bag module. If DTC 11 is not displayed, go to next step.

6) Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Reconnect passenger-side air bag module connector. Reconnect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 11 is displayed, replace passenger-side air bag module. If DTC 11 is not displayed, system is functioning properly at this time. Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.

7) Disconnect spiral cable lower connector. Measure resistance between ground and terminal D+ (Yellow/Red wire) of upper spiral cable connector. If resistance is more than one megohm, replace wiring harness between spiral cable and air bag sensor assembly. If resistance is less than one megohm, replace spiral cable.

DTC 12: DRIVER-SIDE AIR BAG SQUIB CIRCUIT SHORT TO BATTERY

Description

The driver-side air bag squib circuit consists of the air bag sensor assembly, spiral cable and driver-side air bag module. The squib causes driver-side air bag to deploy when all deployment

conditions are satisfied.

Possible Causes

DTC 12 could be caused by a short to battery in squib circuit, squib malfunction, spiral cable malfunction or air bag sensor assembly malfunction.

NOTE: During testing, if DTCs other than DTC 12 are displayed, disregard them.

Diagnostic Procedure

1) Disable air bag system. See DISABLING SYSTEM under DISABLING & ACTIVATING AIR BAG SYSTEM. Connect negative battery cable.

2) Measure voltage between ground and D+ (Yellow/Red wire) terminal of upper spiral cable connector. If voltage is zero volt, go to next step. If voltage more than zero volt, go to step 7).

3) Measure voltage between ground and P+ (Blue wire) terminal of passenger-side air bag module harness connector. If voltage is zero volt, go to next step. If voltage more than zero volt, repair or replace harness or connector between air bag sensor assembly and passenger-side air bag module.

4) Disconnect negative battery cable. Reconnect air bag sensor assembly connector. Connect jumper wire between terminal D+ (Yellow/Red wire) and terminal D- (Yellow/Green wire) of upper spiral cable connector. Connect jumper wire between terminal P+ (Blue wire) and terminal P- (Yellow wire) of passenger-side air bag module harness connector. Connect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 12 is displayed, replace air bag sensor assembly. If DTC 12 is not displayed, go to next step.

5) Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Reconnect upper spiral cable connector (to driver-side air bag module). Reconnect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 12 is displayed, replace driver-side air bag module. If DTC 12 is not displayed, system is functioning properly at this time. Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.

6) Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Reconnect passenger-side air bag module harness connector. Reconnect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 12 is displayed, replace passenger-side air bag module. If DTC 12 is not displayed, system is functioning properly at this time. Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.

7) Disconnect spiral cable lower connector. Measure voltage between ground and terminal D+ (Yellow/Red wire) of upper spiral cable connector. If voltage is zero volt, replace wiring harness between spiral cable and air bag sensor assembly. If voltage is more than zero volt, replace spiral cable.

DTC 13: SHORT IN DRIVER-SIDE AIR BAG MODULE SQUIB CIRCUIT

Description

The driver-side air bag squib circuit consists of the air bag sensor assembly, spiral cable and driver-side air bag module. The squib causes driver-side air bag to deploy when all deployment conditions are satisfied.

Possible Causes

DTC 13 could be caused by a short between D+ (Yellow/Red wire) and D- (Yellow/Green wire) in squib circuit, squib malfunction, spiral cable malfunction or air bag sensor assembly malfunction.

NOTE: During testing, if DTCs other than DTC 13 are displayed, disregard them.

Diagnostic Procedure

1) Disable air bag system. See DISABLING SYSTEM under DISABLING & ACTIVATING AIR BAG SYSTEM.

2) Release shorting spring mechanism on connector (air bag sensor assembly side) between air bag sensor assembly and spiral cable. See RELEASING SHORTING SPRING under DIAGNOSIS & TESTING. Measure resistance between terminals D+ (Yellow/Red wire) and D- (Yellow/Green wire) of upper spiral connector. If resistance is less than one megohm, go to step 5). If resistance is more than one megohm, go to next step.

3) Connect air bag sensor assembly connector. Reconnect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 13 is displayed, replace air bag sensor assembly. If DTC 13 is not displayed, go to next step.

4) Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Reconnect upper spiral cable connector to driver-side air bag module. Reconnect negative battery cable. Wait at least 2 seconds. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 13 is displayed, replace driver-side air bag module. If DTC 13 is not displayed, the system is functioning properly at this time. Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.

5) Disconnect connector between air bag sensor assembly and spiral cable (lower spiral cable connector). Release shorting spring on lower spiral cable connector. See RELEASING SHORTING SPRING under DIAGNOSIS & TESTING. Measure resistance between terminals D+ (Yellow/Red wire) and D- (Yellow/Green wire) of upper spiral cable connector. If resistance is less than one megohm, replace spiral cable. If resistance is more than one megohm, go to next step.

6) Release shorting spring on air bag sensor assembly connector. See RELEASING SHORTING SPRING under DIAGNOSIS & TESTING. Measure resistance between terminal D+ (Yellow/Red wire) and D- (Yellow/Green wire) of air bag sensor assembly side of lower spiral cable connector. If resistance less than one megohm, replace harness between air bag sensor assembly and spiral cable. If resistance is more than one megohm, system is functioning properly at this time.

Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.

DTC 14: OPEN IN DRIVER-SIDE AIR BAG MODULE SQUIB CIRCUIT

Description

The driver-side air bag squib circuit consists of the air bag sensor assembly, spiral cable and driver-side air bag module. The squib causes driver-side air bag to deploy when all deployment conditions are satisfied.

Possible Causes

DTC 14 could be caused by a open in D+ (Yellow/Red wire) or D- (Yellow/Green wire) in squib circuit, squib malfunction, spiral cable malfunction or air bag sensor assembly malfunction.

NOTE: During testing, if DTCs other than DTC 14 are displayed, disregard them.

Diagnostic Procedure

1) Disable air bag system. See DISABLING SYSTEM under DISABLING & ACTIVATING AIR BAG SYSTEM.

2) Measure resistance between terminals D+ (Yellow/Red wire) and D- (Yellow/Green wire) of upper spiral cable connector. If resistance is more than one ohm, go to step 5). If resistance is less than one ohm, go to next step.

3) Connect air bag sensor assembly connector. Connect jumper wire between terminal D+ (Yellow/Red wire) and terminal D- (Yellow/Green wire) of upper spiral cable connector. Connect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 14 is displayed, replace air bag sensor assembly. If DTC 14 is not displayed, go to next step.

4) Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Reconnect upper spiral cable connector to driver-side air bag module. Reconnect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 14 is displayed, replace driver-side air bag module. If DTC 14 is not displayed, the system is functioning properly at this time. Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.

5) Disconnect lower spiral cable connector. Measure resistance between terminals D+ (Yellow/Red wire) and D- (Yellow/Green wire) of upper spiral cable connector. If resistance is more than one ohm, replace spiral cable. If resistance is more than one ohm, go to next step.

6) Measure resistance between terminal D+ (Yellow/Red wire) and D- (Yellow/Green wire) of air bag sensor assembly side of lower spiral cable connector. If resistance more than one ohm, replace harness between air bag sensor assembly and spiral cable. If resistance is less than one ohm, system is functioning properly at this time. Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.

DTC 31: AIR BAG SENSOR ASSEMBLY MALFUNCTION

Description

The air bag sensor assembly consists of an air bag sensor, safing sensor, drive circuit, diagnosis circuit and ignition control circuit. The air bag sensor assembly receives signals from air bag sensor, judges whether or not the air bag must be deployed and detects diagnosis system malfunction.

Possible Causes

DTC 31 could be caused by a air bag sensor assembly malfunction.

NOTE: If a DTC other than DTC 31 is displayed at same time as DTC 31, repair fault indicated by DTC other than DTC 31 before using this procedure.

Diagnostic Procedure

- 1) Disable air bag system. See DISABLING SYSTEM under DISABLING & ACTIVATING AIR BAG SYSTEM. Reconnect negative battery cable.
- 2) Turn ignition switch to ON position. Measure voltage between ground and air bag sensor assembly connector Black/Orange wire (circuit IG2) and Gray wire (circuit ACC). See WIRING DIAGRAMS. If voltage is more than 16 volts, check battery and charging system operation. If voltage is less than 16 volts, go to next step.
- 3) Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Repeat at least 5 times. Retrieve DTCs. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 31 is displayed, replace air bag sensor assembly. If DTC 31 is not displayed, system is functioning properly at this time. Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.

DTC 53: SHORT IN PASSENGER-SIDE AIR BAG SQUIB CIRCUIT

Description

The passenger-side air bag squib circuit consists of the air bag sensor assembly and passenger-side air bag module. The squib circuit causes the passenger-side air bag to deploy when deployment conditions are satisfied.

Possible Causes

DTC 53 could be caused by a short in Blue (circuit P+) and Yellow (circuit P-) wires in passenger-side air bag squib circuit, passenger-side air bag squib malfunction or air bag sensor assembly malfunction.

NOTE: During testing, if DTCs other than DTC 53 are displayed, disregard them.

Diagnostic Procedure

- 1) Disable air bag system. See DISABLING SYSTEM under DISABLING & ACTIVATING AIR BAG SYSTEM.
- 2) Release shorting spring on air bag sensor connector. See RELEASING SHORTING SPRING under DIAGNOSIS & TESTING. Measure resistance between passenger-side air bag harness connector Blue wire (circuit P+) and Yellow wire (circuit P-). See WIRING DIAGRAMS. If resistance is more than one megohm, go to next step. If resistance is less than one megohm, repair or replace harness or connector between passenger-side air bag module and air bag sensor assembly.
- 3) Reconnect air bag sensor assembly connector. Connect negative battery cable. Wait at least 2 seconds. Turn ignition switch

to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve DTCs. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 53 is not displayed, go to next step. If DTC 53 is displayed, replace air bag sensor assembly.

4) Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Reconnect passenger-side air bag module connector. Connect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve DTCs. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 53 is not displayed, system is functioning properly at this time. Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT. If DTC 53 is displayed, replace passenger-side air bag module.

DTC 54: OPEN IN PASSENGER-SIDE AIR BAG SQUIB CIRCUIT

Description

The passenger-side air bag squib circuit consists of the air bag sensor assembly and passenger-side air bag module. The squib circuit causes the passenger-side air bag to deploy when deployment conditions are satisfied.

Possible Causes

DTC 54 could be caused by an open in Blue (circuit P+) and Yellow (circuit P-) wires in passenger-side air bag squib circuit, passenger-side air bag squib malfunction or air bag sensor assembly malfunction.

NOTE: During testing, if DTCs other than DTC 54 are displayed, disregard them.

Diagnostic Procedure

1) Disable air bag system. See DISABLING SYSTEM under DISABLING & ACTIVATING AIR BAG SYSTEM.

2) Measure resistance between passenger-side air bag module harness connector Blue wire (circuit P+) and Yellow wire (circuit P-). See WIRING DIAGRAMS. 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 passenger-side air bag module and air bag sensor assembly.

3) Reconnect air bag sensor assembly connector. Connect jumper wire between passenger-side air bag module harness connector Blue wire (circuit P+) and Yellow wire (circuit P-). Connect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve DTCs. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC 54 is not displayed, go to next step. If DTC 54 is displayed, replace air bag sensor assembly.

4) Turn ignition switch to LOCK position. Disconnect negative battery cable. Wait at least 90 seconds. Reconnect passenger-side air bag module connector. Connect negative battery cable. Wait at least 2 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Clear DTCs. See CLEARING CODES under DIAGNOSIS & TESTING. Turn ignition switch to LOCK position. Wait at least 20 seconds. Turn ignition switch to ACC or ON position. Wait at least 20 seconds. Retrieve DTCs. See RETRIEVING CODES under DIAGNOSIS & TESTING. If DTC

54 is not displayed, system is functioning properly at this time.
 Check for intermittent fault. See AIR BAG WARNING LIGHT INTERMITTENT.
 If DTC 54 is displayed, replace passenger-side air bag module.

WIRING DIAGRAMS

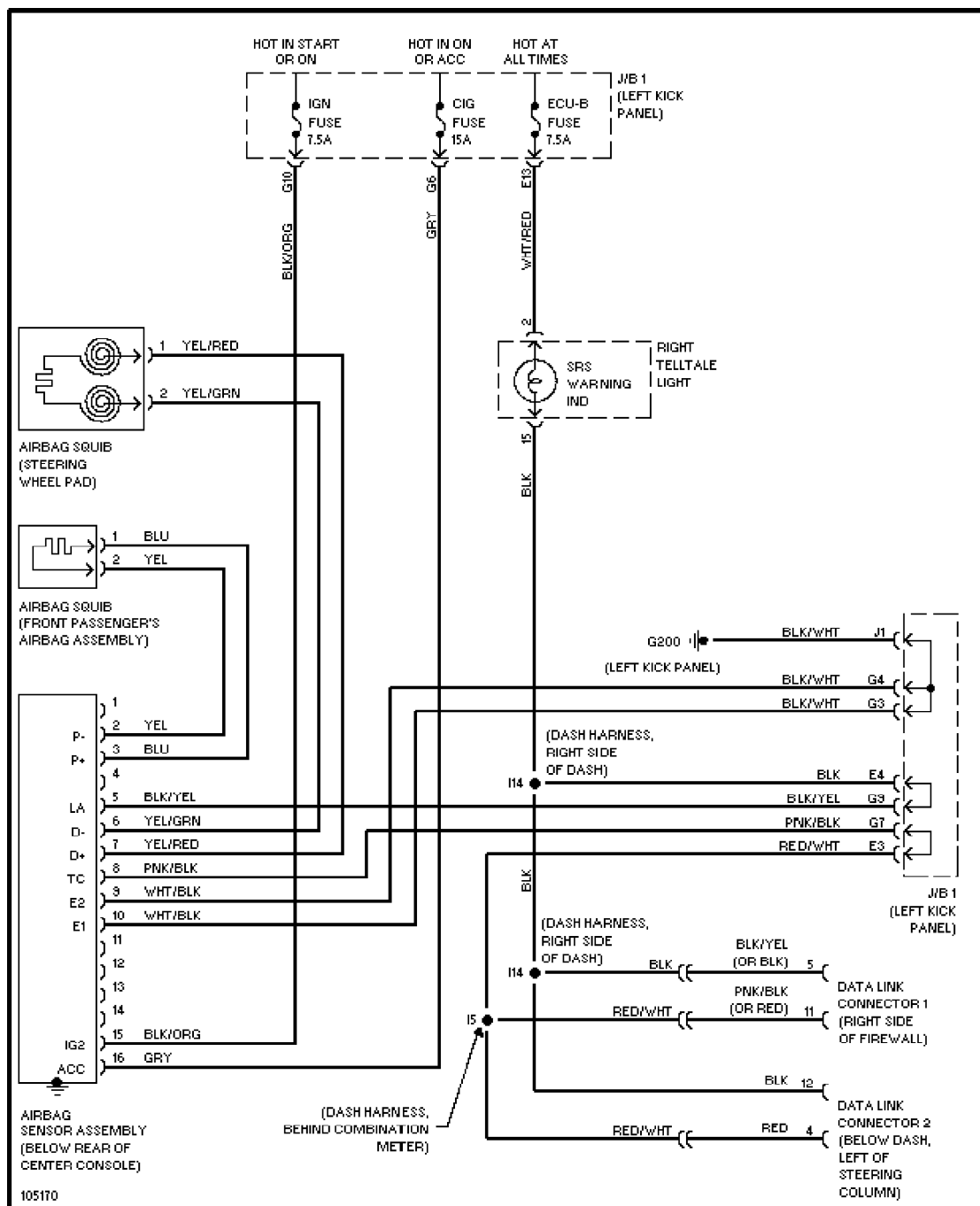


Fig. 13: Air Bag System Wiring Diagram