

# ANTI-LOCK BRAKE SYSTEM

1994 Toyota Celica

1994 BRAKES  
Toyota Anti-Lock Brake System  
Celica

## DESCRIPTION

Anti-Lock Brake System (ABS) consists of an ABS Electronic Control Unit (ECU), solenoid relay, motor relay, actuator and 4 speed sensors. See Fig. 1.

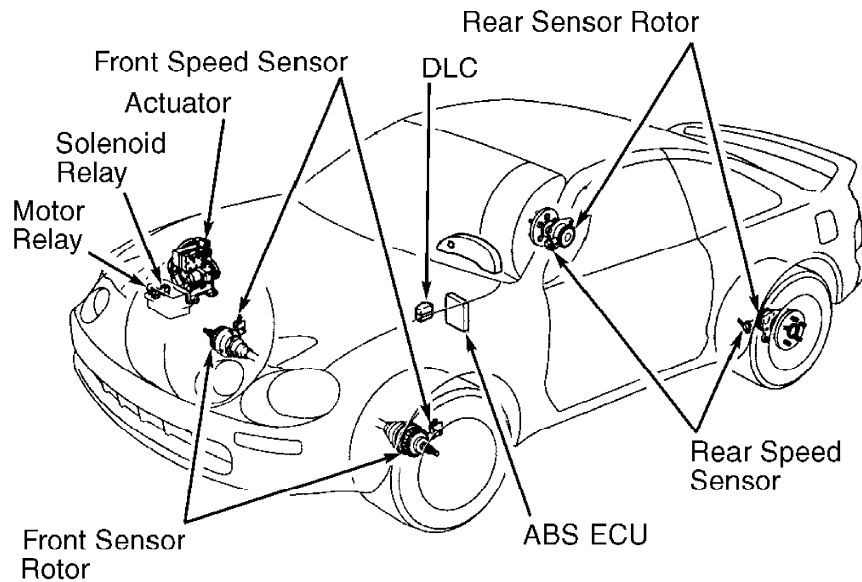
An ABS indicator light is located on the instrument panel. This light comes on for 3 seconds as a bulb test when ignition is first turned on. A primary check is performed after each engine start, and initial vehicle speed exceeds 4 MPH. If brake pedal is pressed before vehicle exceeds 4 MPH, primary check will not occur until brake pedal is released.

NOTE: For more information on brake system, see appropriate BRAKE SYSTEM article.

## OPERATION

Under normal driving conditions, ABS functions as a standard brake system. With detection of wheel lock-up, short pedal pulsations occurring in rapid succession will be felt in brake pedal. Pedal pulsation will continue until there is no longer a need for ABS function.

CAUTION: See ANTI-LOCK BRAKE SAFETY PRECAUTIONS article in GENERAL INFORMATION.



94G47619

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

## BLEEDING BRAKE SYSTEM

**CAUTION:** Brake fluid will damage painted surfaces. If brake fluid gets on a painted surface, wipe off immediately and clean with alcohol. Use only DOT 3 brake fluid from a sealed container. Do not mix brake fluid with any other type.

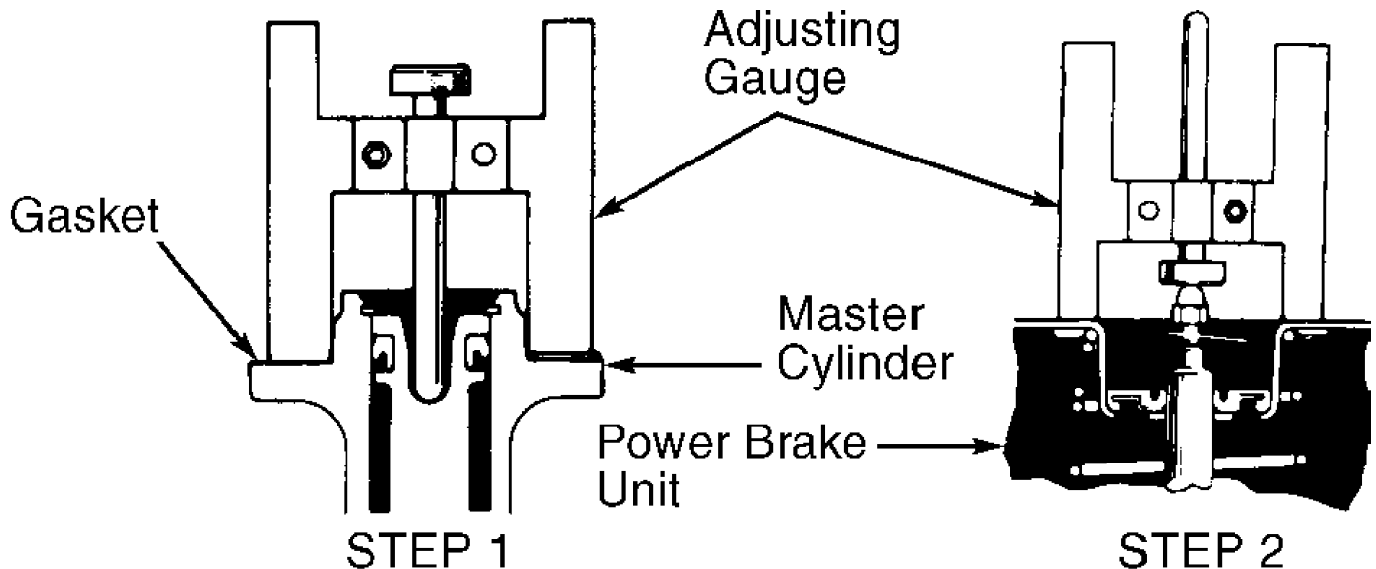
Brake bleeding procedure is same procedure used to bleed non-ABS systems. If master cylinder was rebuilt or reservoir ran empty, bleed master cylinder first. Bleed remaining wheels, starting with brake having longest hydraulic line, working to brake with shortest hydraulic line.

## ADJUSTMENTS

### MASTER CYLINDER PUSH ROD

1) Install Adjusting Gauge (09737-00010) onto master cylinder, with master cylinder gasket in place. Lower gauge pin until it just touches master cylinder piston. See Fig. 2 (STEP 1). Invert gauge, then install onto power brake unit (STEP 2).

2) Measure clearance between brake unit push rod and head of adjusting gauge. Clearance should be zero. If clearance is not zero, adjust brake unit push rod length until push rod just touches head of gauge pin.



92A01556

Fig. 2: Adjusting Master Cylinder Push Rod  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

### BRAKE PEDAL HEIGHT

1) Measure brake pedal height from face of brake pedal pad to asphalt sheet under carpet. See Fig. 3. Brake pedal height should be 6.0-6.4" (152-162 mm). To adjust brake pedal height, remove instrument lower finish panel and air duct (if necessary). Unplug stoplight switch connector. Loosen stoplight switch and lock nut on brake pedal push rod.

2) Adjust pedal height by rotating push rod. After adjusting brake pedal height, tighten lock nut. Adjust stoplight switch. See STOPLIGHT SWITCH. Check and adjust brake pedal free play. See BRAKE

## PEDAL FREE PLAY.

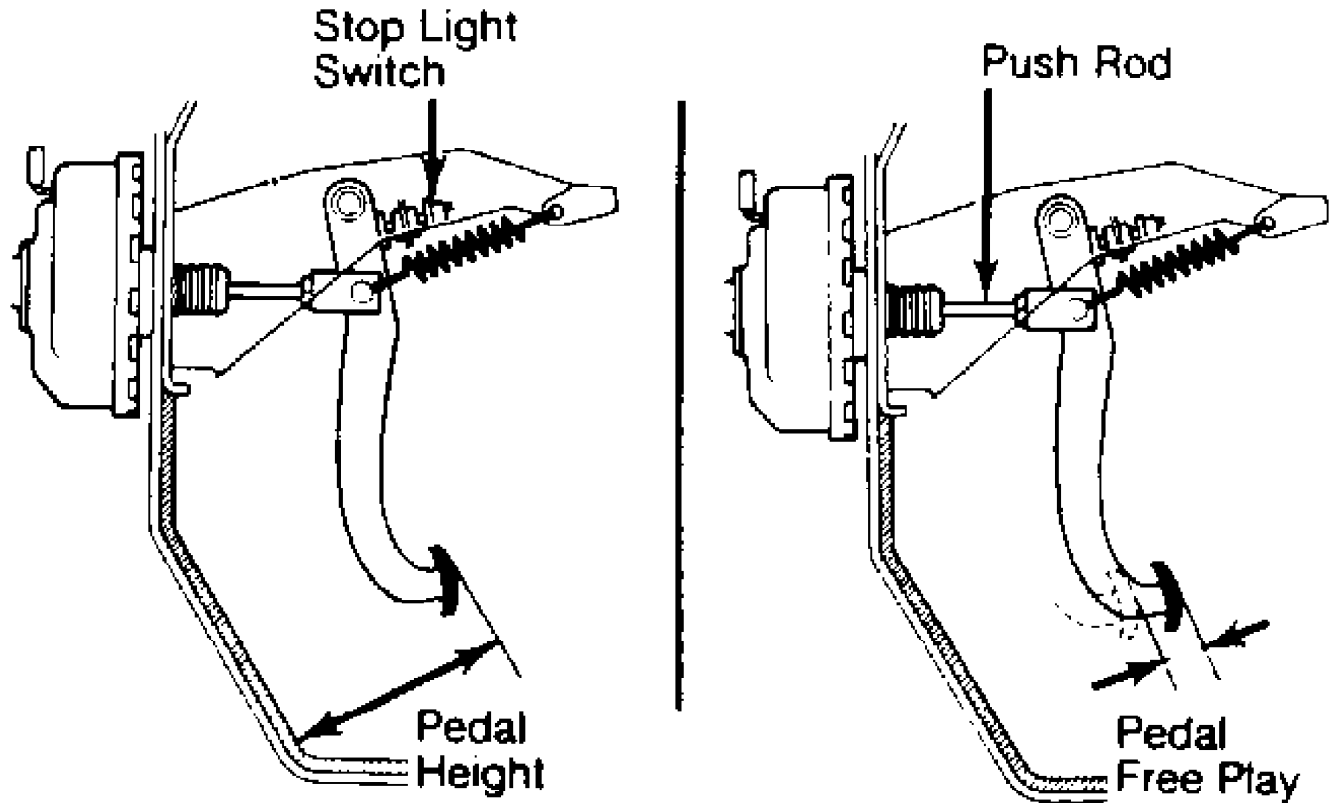


Fig. 3: Measuring Brake Pedal Height & Free Play  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

### BRAKE PEDAL FREE PLAY

1) Brake pedal free play is distance brake pedal travels (with engine stopped) before encountering resistance. To measure brake pedal free play, press brake pedal several times to exhaust vacuum from power brake unit. Press brake pedal and measure travel until initial resistance occurs.

2) Brake pedal free play should be .04-.24" (1-6 mm). If free play is not within specification, adjust by rotating push rod. See Fig. 3. After adjusting brake pedal free play, check brake pedal height. See BRAKE PEDAL HEIGHT.

### BRAKE PEDAL RESERVE DISTANCE

Measure brake pedal reserve distance from face of brake pedal pad to asphalt sheet under carpet, with engine running and force of 110 lbs. (50 kg) applied to brake pedal. Minimum brake pedal reserve distance should be 3.35" (85 mm) for vehicles with 1.8L engine, or 3.54" (90.0 mm) for vehicles with 2.2L engine. If distance is less than specified, inspect brake system.

### STOPLIGHT SWITCH

Stoplight switch is located above brake pedal. See Fig. 3. To adjust stoplight switch, loosen stoplight switch lock nuts and rotate stoplight switch until clearance between pedal stop and threaded end

of switch is .02-.09" (0.5-2.3 mm). Tighten lock nut. Check stoplight operation.

## **PARKING BRAKE SHOES (DISC)**

Raise and support vehicle. Remove wheels. Temporarily install lug nuts to hold brake rotor in place. Remove hole plug to gain access to adjuster. Turn adjuster to expand shoes until brake rotor locks. Back off adjuster 8 notches. Install hole plug.

## **PARKING BRAKE**

**NOTE:** Service brake on rear drum brakes and parking brake shoe clearance on rear disc brakes must be adjusted before adjusting parking brake cable.

Parking brake lever stroke should be 4-7 clicks with a pull force of 44 lbs. (20 kg). To adjust stroke, remove console box. Loosen parking brake cable lock nut. Rotate adjuster nut until parking brake lever travel is as specified. Tighten lock nut. Install console box.

## **TROUBLE SHOOTING**

### **ABS Does Not Operate**

Verify that only normal code exists. SEE RETRIEVING CODES under DIAGNOSIS & TESTING. Check IGl power source. See IGl POWER SOURCE CIRCUIT under DIAGNOSIS & TESTING. See WIRING DIAGRAM. Check ABS actuator. See ACTUATOR CHECK under DIAGNOSIS & TESTING.

### **ABS Does Not Operate Efficiently**

Verify that only normal code exists. SEE RETRIEVING CODES under DIAGNOSIS & TESTING. Check stoplight circuit. See WIRING DIAGRAM. Check ABS actuator. See ACTUATOR CHECK under DIAGNOSIS & TESTING.

### **ABS Warning Light Abnormal**

See ABS WARNING LIGHT CIRCUIT under DIAGNOSIS & TESTING.

### **Cannot Retrieve Codes**

Check ABS warning light circuit. See ABS WARNING LIGHT CIRCUIT under DIAGNOSIS & TESTING. Check Tc terminal circuit. See Tc TERMINAL CIRCUIT under DIAGNOSIS & TESTING.

### **Cannot Perform Sensor Signal Check**

Check Ts terminal circuit. See Ts TERMINAL CIRCUIT under DIAGNOSIS & TESTING.

## **DIAGNOSIS & TESTING**

**NOTE:** DO NOT start engine when retrieving diagnostic codes.

## **RETRIEVING CODES**

1) Ensure battery voltage is about 12 volts. Turn ignition on. ABS light should come on, then go out after 3 seconds. If warning light does not come on, check fuse, bulb, and wiring harness.

2) With ignition on, remove short pin from Data Link Connector (DLC). See Fig. 4. Connect jumper wire between DLC terminals Tc and E1. See Fig. 4. If a malfunction is detected, 4 seconds will elapse, then ABS light will begin to flash a 2-digit code. First series of flashes indicates first digit of code. After a 1.5-second

pause, second series of flashes indicates second digit of code.

3) If 2 or more codes are stored, there will be a 2.5-second pause between each code. After all codes are displayed, a 4-second pause will occur, then all codes will repeat. If ABS system is functioning properly, ABS light will flash 2 times every second. For code interpretation, see DIAGNOSTIC CODES.

4) After replacing or repairing malfunctioning components, clear diagnostic codes. If a battery cable was disconnected during repairs, all codes will be erased. If battery cable was not disconnected during repairs, see CLEARING CODES.

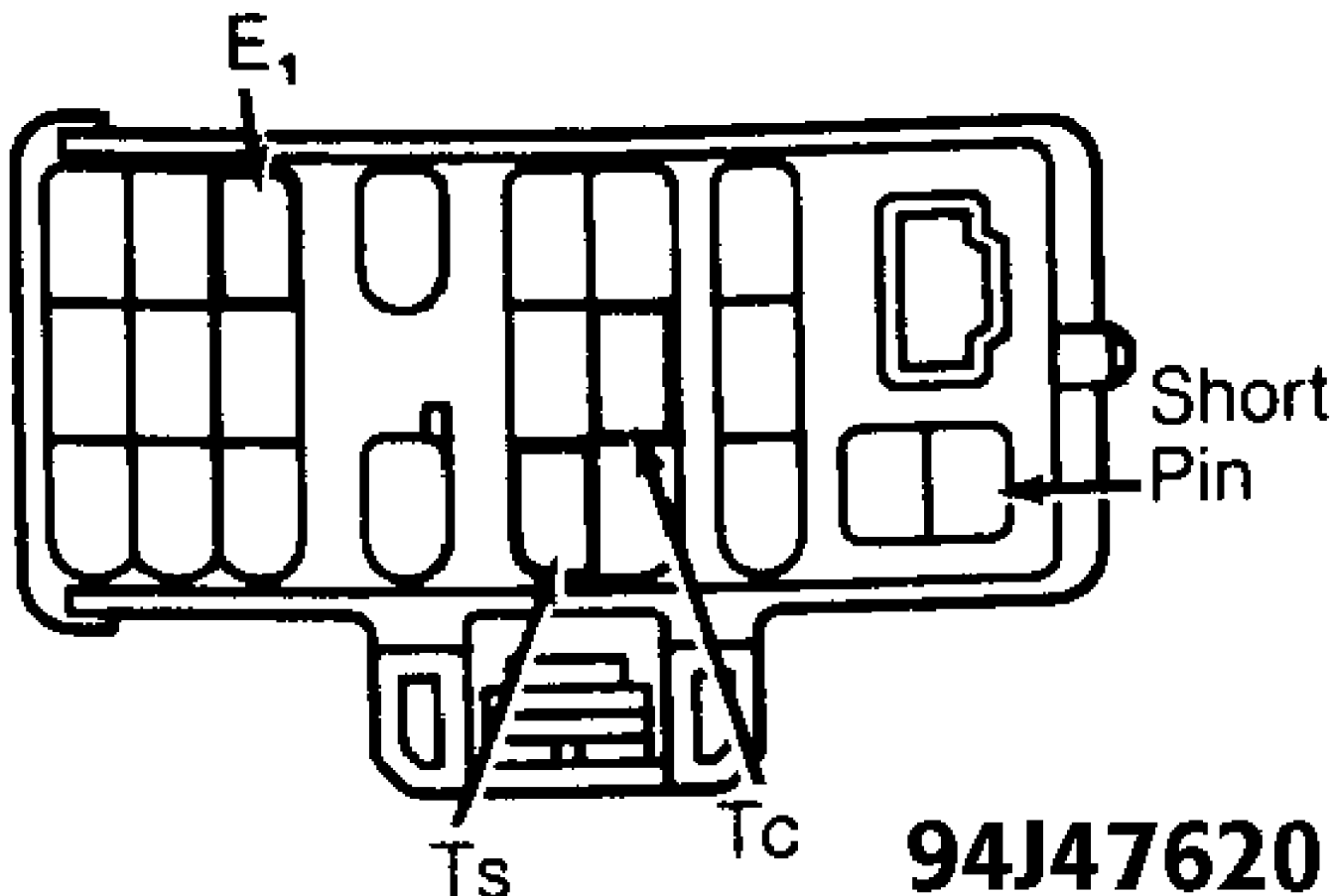


Fig. 4: Identifying Data Link Connector (DLC) Terminals  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

## DIAGNOSTIC CODES

Check suspect components in order given. Checks consist mainly of a visual inspection and continuity tests.

### Code 11

Open in solenoid relay circuit. Check actuator wiring harness, solenoid relay, solenoid relay wiring harness and solenoid relay connector. See SOLENOID RELAY under COMPONENT TESTING.

### Code 12

Short in solenoid relay circuit. Check actuator wiring harness, solenoid relay, solenoid relay wiring harness and solenoid relay connector. See SOLENOID RELAY under COMPONENT TESTING.

Code 13

Open in pump motor relay circuit. Check actuator wiring harness, pump motor relay, pump motor relay wiring harness and pump motor relay connector. See MOTOR RELAY under COMPONENT TESTING.

Code 14

Short in pump motor relay circuit. Check actuator wiring harness, pump motor relay, pump motor relay wiring harness and pump motor relay connector. See MOTOR RELAY under COMPONENT TESTING.

Code 21

Open or short circuit in solenoid for right front wheel. Check actuator solenoid, wiring harness and connector. See ACTUATOR CHECK under DIAGNOSIS & TESTING. See ABS ACTUATOR under COMPONENT TESTING.

Code 22

Open or short circuit in solenoid for left front wheel. Check actuator solenoid, wiring harness and connector. See ACTUATOR CHECK under DIAGNOSIS & TESTING. See ABS ACTUATOR under COMPONENT TESTING.

Code 23

Open or short circuit in solenoid for right rear wheel. Check actuator solenoid, wiring harness and connector. See ACTUATOR CHECK under DIAGNOSIS & TESTING. See ABS ACTUATOR under COMPONENT TESTING.

Code 24

Open or short circuit in solenoid for left rear wheel. Check actuator solenoid, wiring harness and connector. See ACTUATOR CHECK under DIAGNOSIS & TESTING. See ABS ACTUATOR under COMPONENT TESTING.

Code 31

Malfunction of right front wheel speed sensor signal. Check speed sensor, sensor rotor, wiring harness and connector. See SPEED SENSOR DIAGNOSTICS under DIAGNOSIS & TESTING. See FRONT SPEED SENSORS under COMPONENT TESTING.

Code 32

Malfunction of left front wheel speed sensor signal. Check speed sensor, sensor rotor, wiring harness and connector. See SPEED SENSOR DIAGNOSTICS under DIAGNOSIS & TESTING. See FRONT SPEED SENSORS under COMPONENT TESTING.

Code 33

Malfunction of right rear wheel speed sensor signal. Check speed sensor, sensor rotor, wiring harness and connector. See SPEED SENSOR DIAGNOSTICS under DIAGNOSIS & TESTING. See REAR SPEED SENSORS under COMPONENT TESTING.

Code 34

Malfunction of left rear wheel speed sensor signal. Check speed sensor, sensor rotor, wiring harness, and connector. See SPEED SENSOR DIAGNOSTICS under DIAGNOSIS & TESTING. See REAR SPEED SENSORS under COMPONENT TESTING.

Code 35

Open in left front or right rear wheel speed sensor circuit. Check speed sensor, sensor rotor, wiring harness and connector. See SPEED SENSOR DIAGNOSTICS under DIAGNOSIS & TESTING. See appropriate speed sensor testing under COMPONENT TESTING.

Code 36

Open in right front or left rear wheel speed sensor circuit.

Check speed sensor, sensor rotor, wiring harness and connector. See SPEED SENSOR DIAGNOSTICS under DIAGNOSIS & TESTING. See appropriate speed sensor testing under COMPONENT TESTING.

Code 37

Rear speed sensor rotor malfunction. Check rear sensor rotors.

Code 41

Battery voltage is less than 9.5 volts or more than 16.2 volts. Check battery and voltage regulator.

Code 51

Actuator pump motor is locked or pump motor circuit open. Check pump motor, pump motor relay, vehicle battery, actuator wiring harness, connectors, actuator pump motor circuit and actuator ground bolt. See ACTUATOR CHECK under DIAGNOSIS & TESTING. See MOTOR RELAY under COMPONENT TESTING.

ABS Light Always On

Malfunction of ABS ECU. Inspect ABS ECU connector for proper installation and undamaged terminals. Repair as necessary. If connector is okay, temporarily substitute known good ABS ECU. Retest system.

## CLEARING CODES

Turn ignition on. Connect jumper wire between DLC terminals Tc and E1. See Fig. 4. With vehicle stopped, press brake pedal 8 or more times within 3 seconds. Codes will be erased. Verify ABS light goes out after 3 seconds. Verify ABS light flashes a normal code. See RETRIEVING CODES under DIAGNOSIS & TESTING.

## ABS WARNING LIGHT CIRCUIT

- 1) If ABS warning light does not come on at all, go to step 2).
- 2) If ABS warning light stays on, go to step 3).
- 2) Check light bulb and associated wiring. If bulb and wiring are okay, check solenoid relay. See SOLENOID RELAY under COMPONENT TESTING. If relay is okay, check for open circuit in wiring between DLC and solenoid relay, or poor ground connection.
- 3) Remove short pin from DLC. See Fig. 4. If ABS warning light goes out, go to next step. If warning light remains on, check for short circuit in wiring between DLC and ABS ECU.
- 4) Check solenoid relay. See SOLENOID RELAY under COMPONENT TESTING. If relay is okay, check for short in wiring between DLC and solenoid relay.

## ACTUATOR CHECK

- 1) Ensure battery voltage exists. Turn ignition off. Unplug actuator electrical connectors. Connect Test Harness (09990-00200) and Actuator Checker (09990-00150) to vehicle according to manufacturer's instructions.
- 2) Place Sheet "A" (09990-00163) onto actuator checker. Start and idle engine. Set selector switch to FRONT RH position. Press and hold MOTOR switch for a few seconds. Press and hold brake pedal for about 15 seconds. Pedal should not go down. As brake pedal is held, press MOTOR switch for a few seconds. Brake pedal should not pulsate.

NOTE: DO NOT press POWER switch for longer than 10 seconds.

- 3) Press and hold brake pedal. Push and hold POWER switch for

a few seconds. When POWER switch is pressed, brake pedal should not go down. Release POWER switch. Brake pedal should go down. Press and hold MOTOR switch for a few seconds. Brake pedal should return. Release MOTOR switch. Release brake pedal.

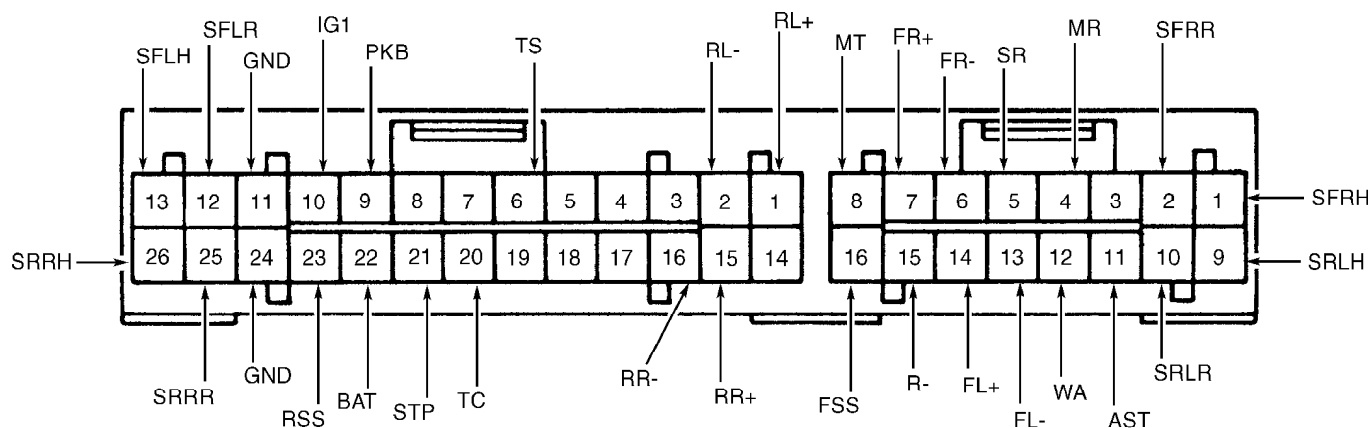
4) Repeat steps 2) through 4) for FRONT LH, REAR RH, and REAR LH by setting selector switch to appropriate positions. After checking remaining wheels, press and hold MOTOR switch for a few seconds. Stop engine. Remove test harnesses and actuator checker. Reconnect actuator wiring to actuator. Clear diagnostic codes. See CLEARING CODES.

## IG1 POWER SOURCE CIRCUIT

1) Ensure charging system is working properly. Repair as necessary. Turn ignition on. Measure voltage between ABS ECU connector terminals IG1 and GND. See Fig. 5. Battery voltage should exist. If battery voltage does not exist, go to next step. If battery voltage exists, replace ABS ECU.

2) Check resistance between ABS ECU connector terminal GND and body ground. Resistance should be one ohm or less. If resistance is not as specified, repair or replace wiring harness or connector as necessary. If resistance is as specified, check ECU-IG1 fuse, located in fuse box.

3) If fuse is okay, check for open in wiring harness and connector between ABS ECU and battery. If fuse is not okay, check for short in all wiring harness components connected to ECU-IG1 fuse. See WIRING DIAGRAM.



94A47621

Fig. 5: Identifying ABS ECU Connector Terminals  
Courtesy of Toyota Motor Sales, U.S.A., Inc.

## Tc TERMINAL CIRCUIT

Turn ignition on. Check for battery voltage between terminals Tc and E1 of DLC. See Fig. 4. If battery voltage does not exist, check for open or short circuit in associated wiring. See WIRING DIAGRAM. If wiring is okay, temporarily substitute known good ABS ECU. Retest system.

## Ts TERMINAL CIRCUIT

Turn ignition on. Check for battery voltage between terminals Ts and E1 of DLC. See Fig. 4. If battery voltage does not exist, check for open or short circuit in wiring between DLC and ABS ECU, or between DLC and ground. See WIRING DIAGRAM. If wiring is okay, temporarily substitute known good ABS ECU. Retest system.



## SPEED SENSOR DIAGNOSTICS

NOTE: While diagnosing speed sensors, system functions as a standard brake system.

1) Ensure battery voltage is about 12 volts. Turn ignition on. ABS light should come on, then go out after about 3 seconds. If ABS light does not come on, check fuse, bulb, and wiring harness.

2) Turn ignition off. DO NOT remove short pin from DLC. Connect DLC terminals Ts and E1. See Fig. 4. Engage parking brake. Start engine. Verify ABS light flashes 4 times per second.

3) Drive vehicle straight ahead at speed greater than 28 MPH. Stop vehicle. Connect jumper between DLC terminals Tc and E1. See Fig. 4. If a malfunction is detected, 4 seconds will elapse, then ABS light will begin to flash a 2-digit code. First series of flashes indicates first digit of code. After a 1.5 second pause, second series of flashes indicates second digit of code.

4) If 2 or more codes are stored, there will be a 2.5-second pause between each code. After all codes are flashed, there will be a 4-second pause, then all codes will repeat.

5) Record diagnostic codes. Turn ignition off. Repair as necessary. See SPEED SENSOR DIAGNOSTIC CODES. Remove jumper wires from DLC. Clear diagnostic codes. See CLEARING CODES.

## SPEED SENSOR DIAGNOSTIC CODES

Code 71

Low voltage of right front speed sensor signal. Check right front speed sensor and sensor installation.

Code 72

Low voltage of left front speed sensor signal. Check left front speed sensor and sensor installation.

Code 73

Low voltage of right rear speed sensor signal. Check right rear speed sensor and sensor installation.

Code 74

Low voltage of left rear speed sensor signal. Check left rear speed sensor and sensor installation.

Code 75

Abnormal signal from right front speed sensor. Check right front sensor rotor.

Code 76

Abnormal signal from left front speed sensor. Check left front sensor rotor.

Code 77

Abnormal signal from right rear speed sensor. Check right rear sensor rotor.

Code 78

Abnormal signal from left rear speed sensor. Check left rear sensor rotor.

ABS Light Blinks 4 Times A Second

All speed sensors and sensor rotors are normal.

## COMPONENT TESTING

Abs ECU Wiring Harness

Remove ABS ECU, leaving connectors attached. See ABS ECU under REMOVAL & INSTALLATION. Backprobe specified ABS ECU terminals to measure voltage. See ABS ECU TERMINAL VOLTAGE table. If voltage is not as specified, check and repair or replace component(s) as necessary. See WIRING DIAGRAM.

ABS ECU TERMINAL VOLTAGE TABLE

Terminal ID (1)	Condition	Voltage
BAT & GND	At All Times	10-14
IG1 & GND SR & R-	Ignition Switch On Ignition Switch On	10-14 9-14
MR & R-	Ignition Switch On	Less Than One
SFRR & GND	Ignition Switch On, ABS Light Off	10-14
SFRH & GND	Ignition Switch On, ABS Light Off	10-14
SFLR & GND	Ignition Switch On, ABS Light Off	10-14
SFLH & GND	Ignition Switch On, ABS Light Off	10-14
SRRR & GND	Ignition Switch On, ABS Light Off	10-14
SRRH & GND	Ignition Switch On, ABS Light Off	10-14
SRLR & GND	Ignition Switch On, ABS Light Off	10-14
SRLH & GND	Ignition Switch On, ABS Light Off	10-14
AST & GND	Ignition Switch On, ABS Light Off	10-14
WA & GND	Ignition Switch On, ABS Light On	Less Than 2
WA & GND	Ignition Switch On, ABS Light Off	10-14
PKB & GND	Ignition Switch On, Parking Brake Switch On	Less Than 1.5
PKB & GND	Ignition Switch On, Parking Brake Switch Off	10-14
STP & GND	Stoplight Switch Off	Less Than 1.5
STP & GND	Stoplight Switch On	8-14
TC & GND	Ignition Switch On	10-14
TS & GND	Ignition Switch On	10-14
FR+ & FR-	Ignition Switch On, Slowly Rotate Right Front Wheel	A/C Voltage Is Generated
FL+ & FL-	Ignition Switch On, Slowly Rotate Left Front Wheel	A/C Voltage Is Generated
RR+ & RR-	Ignition Switch On, Slowly Rotate Right Rear Wheel	A/C Voltage Is Generated

RL+ & RL-	Ignition Switch On, Slowly Rotate Left Rear Wheel	A/C Voltage Is Generated
(1) - For terminal locations, see Fig. 5.		

#### ABS Actuator

1) Using a DVOM, check resistance between actuator connector "B", terminal No. 4, and terminals No. 1-4 of actuator connector "A". See Fig. 6. Resistance should be 5 ohms at each terminal.

2) Check resistance between actuator connector "B", terminal No. 4, and terminals No. 5-8 of actuator connector "A". Resistance should be 2.2 ohms. If resistance is as specified, go to next step. If resistance is not as specified, replace ABS actuator.

3) Check for open or short in wiring harness and connector between ABS ECU and ABS actuator. Repair wiring harness or connector as necessary. If wiring harness and connector are okay, check for diagnostic codes. See RETRIEVING CODES under DIAGNOSIS & TESTING. If same code is still present after codes have been cleared, check contact condition of each actuator connector. If connectors are okay, temporarily substitute known good ABS ECU. Repeat test.

#### Front Speed Sensors

1) Remove front fender lining. Disconnect speed sensor connector. Measure resistance between speed sensor terminals. Resistance should be 600-1800 ohms.

2) Measure resistance between each sensor terminal and sensor body. Resistance should be one megohm or more. If resistance is not as specified, replace speed sensor.

#### Rear Speed Sensors

1) Remove rear seat cushion. Disconnect speed sensor connector. Measure resistance between speed sensor terminals. Resistance should be 800-2100 ohms.

2) Measure resistance between each sensor terminal and sensor body. Resistance should be one megohm or more. If resistance is not as specified, replace speed sensor.

#### Sensor Rotors

Visually inspect sensor rotor serrations for scratches, cracks, missing teeth, or warping. Replace front drive shaft or rear hub as necessary if rotor is damaged.

#### Motor Relay

1) Unplug motor relay, located in engine compartment, on right side. See Fig. 1. Using a DVOM, check resistance between motor relay terminals No. 3 and 4. Resistance should be about 62 ohms. See Fig. 7. Continuity should not exist between terminals No. 1 and 2.

2) Using fused jumper wire, connect positive battery terminal to terminal No. 3. Connect negative battery terminal to terminal No. 4. Continuity should exist between terminals No. 1 and 2. If continuity is not as specified, replace relay.

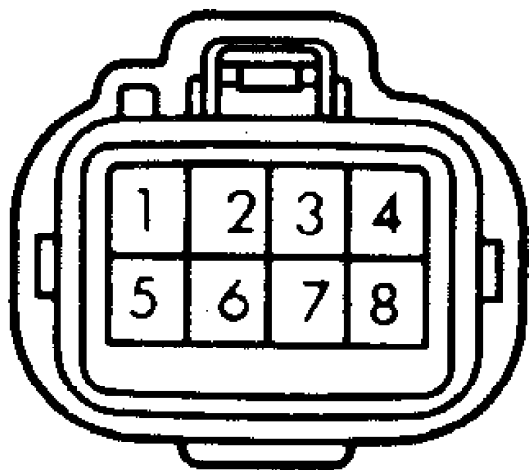
#### Solenoid Relay

1) Unplug solenoid relay, located in engine compartment, on right side. See Fig. 1. Using ohmmeter capable of checking diodes, check for continuity between relay terminals No. 2 and 3. See Fig. 8. Continuity should exist. Continuity should not exist between terminals No. 1 and 3.

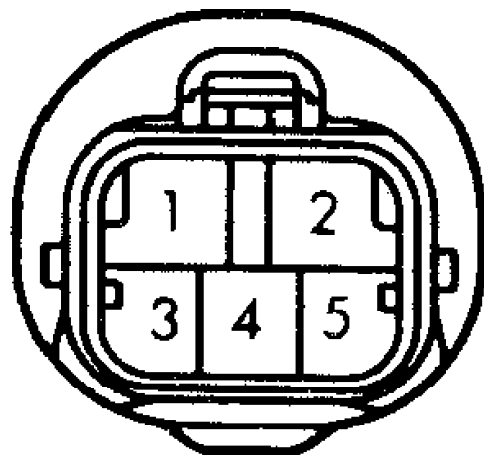
2) Check for continuity between terminals No. 3 and 5. Transpose ohmmeter leads. Again check for continuity. Continuity should exist with ohmmeter leads connected only one way.

3) Using fused jumper wire, connect positive battery terminal

to terminal No. 4. Connect negative battery terminal to terminal No. 6. Continuity should exist between terminals No. 1 and 3. Continuity should not exist between terminals No. 2 and 3. If continuity is not as specified, replace relay.



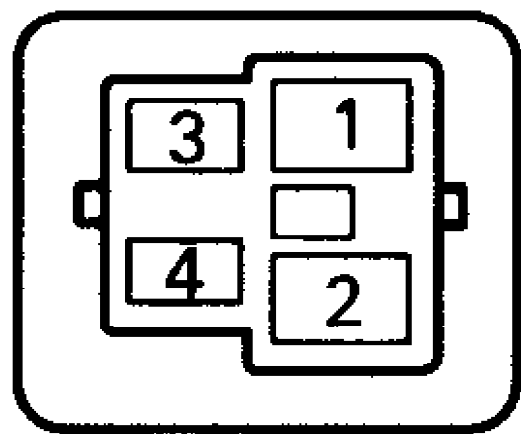
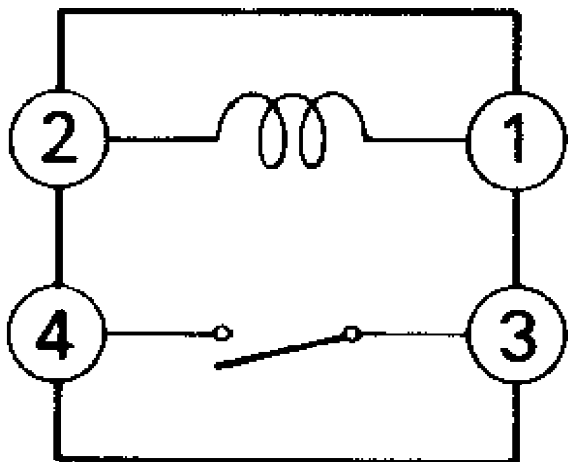
CONNECTOR "A"



CONNECTOR "B"

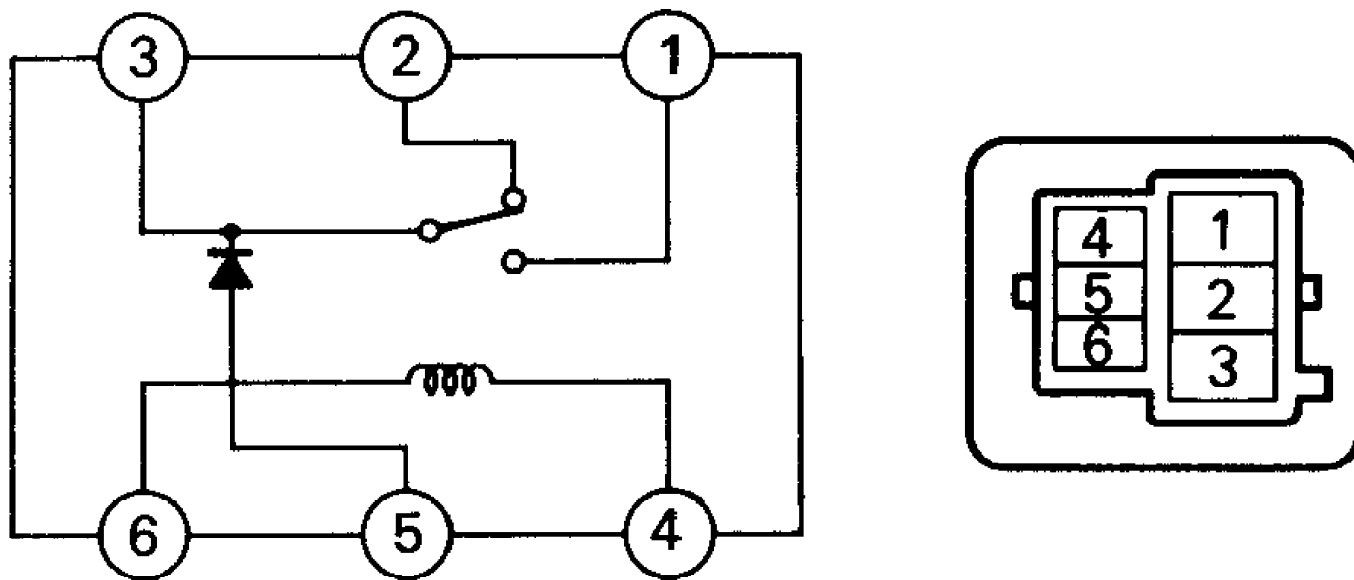
94B47622

Fig. 6: Identifying Actuator Connector Terminals  
Courtesy of Toyota Motor Sales, U.S.A., Inc.



94C47623

Fig. 7: Identifying Motor Relay Terminals  
Courtesy of Toyota Motor Sales, U.S.A., Inc.



94D47624

Fig. 8: Identifying Solenoid Relay Terminals  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

## REMOVAL & INSTALLATION

**WARNING:** Hydraulic system may be under high pressure. Use caution when opening hydraulic system.

### ABS ECU

#### Removal & Installation

Turn ignition off. Disconnect negative battery cable. ABS ECU is located behind left side of dashboard. See Fig. 1. Unplug ABS ECU connector. Remove ABS ECU. To install, reverse removal procedure.

### SOLENOID & PUMP MOTOR RELAYS

#### Removal & Installation

Relays are mounted in right side of engine compartment. See Fig. 1. Unplug relays. To install, reverse removal procedure.

### ACTUATOR

#### Removal & Installation

Turn ignition off. Unplug electrical connectors. Disconnect brakelines. Remove actuator from bracket. See Fig. 9. To install, reverse removal procedure. Bleed brake system. See BLEEDING BRAKE SYSTEM.

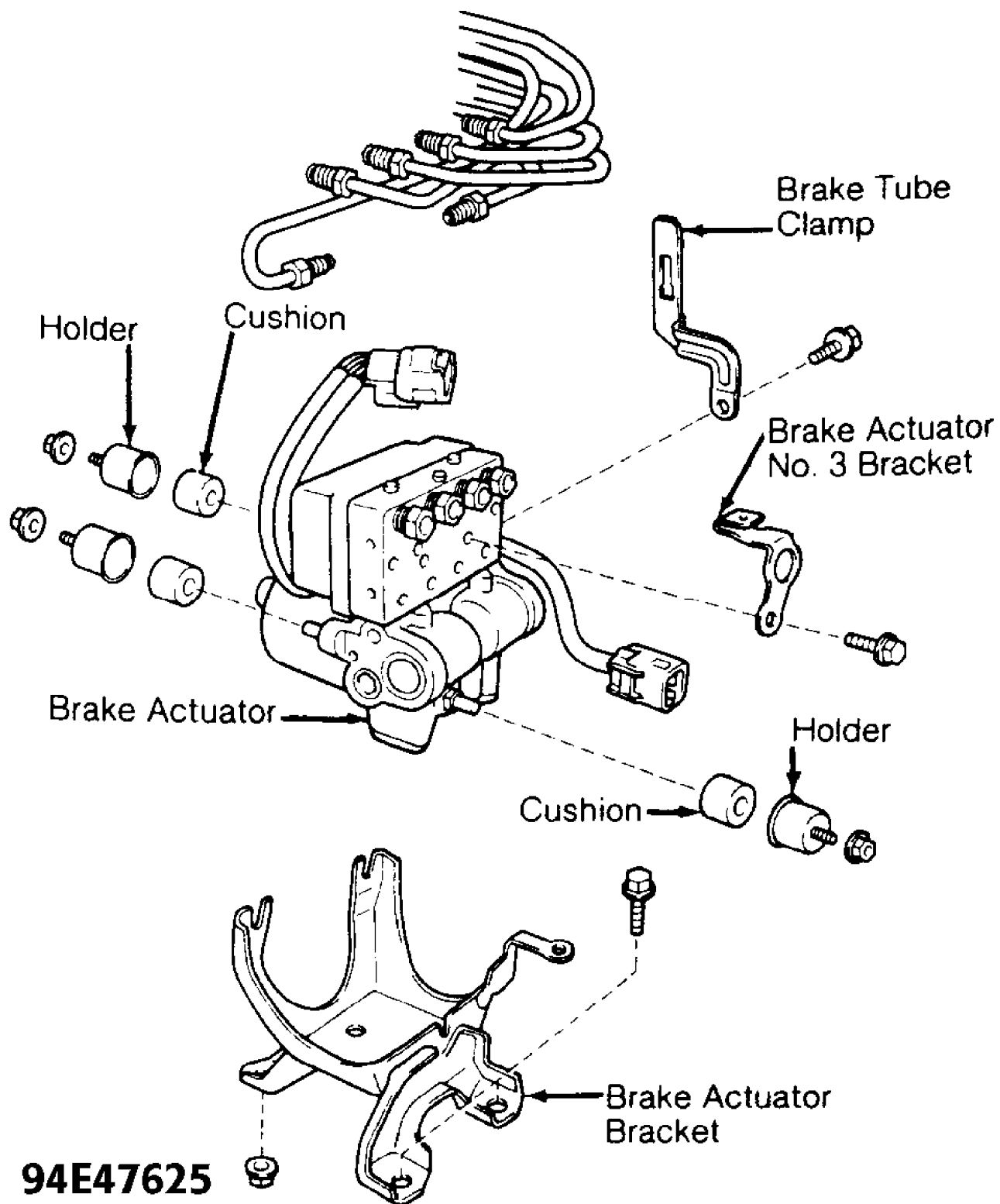


Fig. 9: Removing & Installing ABS Actuator  
 Courtesy of Toyota Motor Sales, U.S.A., Inc.

FRONT SENSOR ROTOR

#### Removal & Installation

Front speed sensor rotor is an integral part of outboard CV joint. Front drive axle must be removed to replace sensor rotor. For removal and installation procedure, see DRIVE AXLES article.

### FRONT WHEEL SPEED SENSORS

#### Removal & Installation

Remove fender shield. Disconnect speed sensor connector. Remove 3 clamp bolts holding sensor wiring harness to vehicle body and strut. Remove speed sensor bolt from steering knuckle. Remove speed sensor. To install, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS.

### REAR SENSOR ROTOR

#### Removal & Installation

Rear speed sensor rotor is an integral part of rear hub. Rear hub must be removed to replace sensor rotor. For removal and installation procedure, see appropriate SUSPENSION - REAR article.

### REAR WHEEL SPEED SENSORS

#### Removal & Installation

On Liftback models, remove rear seat back and deck trim side panel. On Coupe models, remove luggage compartment trim cover. On both models, disconnect speed sensor connector. Pull out sensor wire harness with grommet. Remove 2 clamp bolts holding sensor wiring harness to vehicle body and strut. Remove speed sensor from axle carrier. To install, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS.

### OVERHAUL

DO NOT attempt to overhaul or disassemble actuator assembly. If actuator is defective, replace entire assembly.

### TORQUE SPECIFICATIONS

#### TORQUE SPECIFICATIONS TABLE

Application	Ft. Lbs. (N.m)
Actuator Mounting Bolts & Nuts .....	14 (19)
Brakeline Fittings .....	11 (15)
Wheel Lug Nuts .....	76 (103)
	INCH Lbs. (N.m)
ABS ECU Mounting Screws .....	27 (3)
Wheel Speed Sensor Mounting Bolt .....	71 (8)

### WIRING DIAGRAM

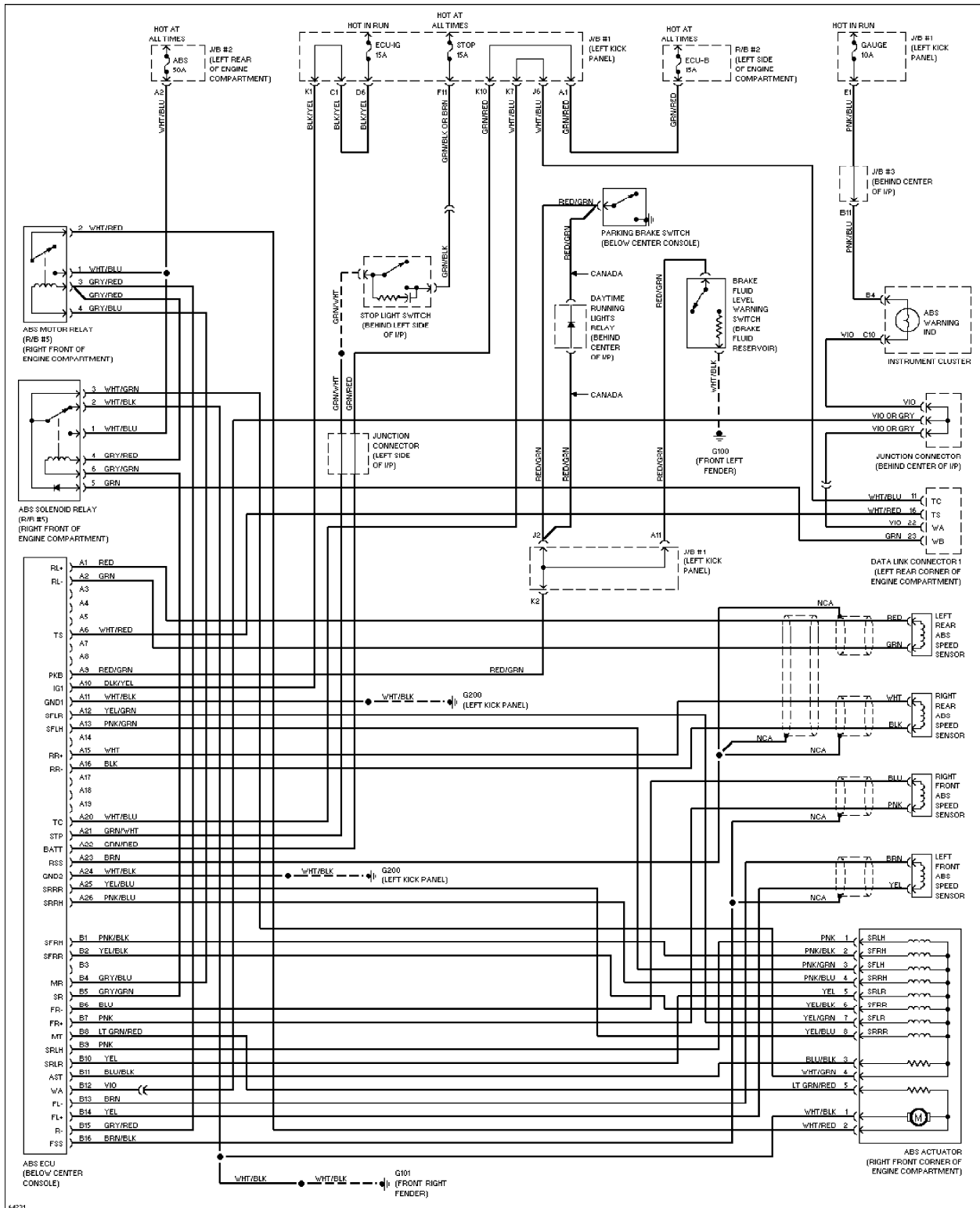


Fig. 10: Anti-Lock Brake System (ABS) Wiring Diagram