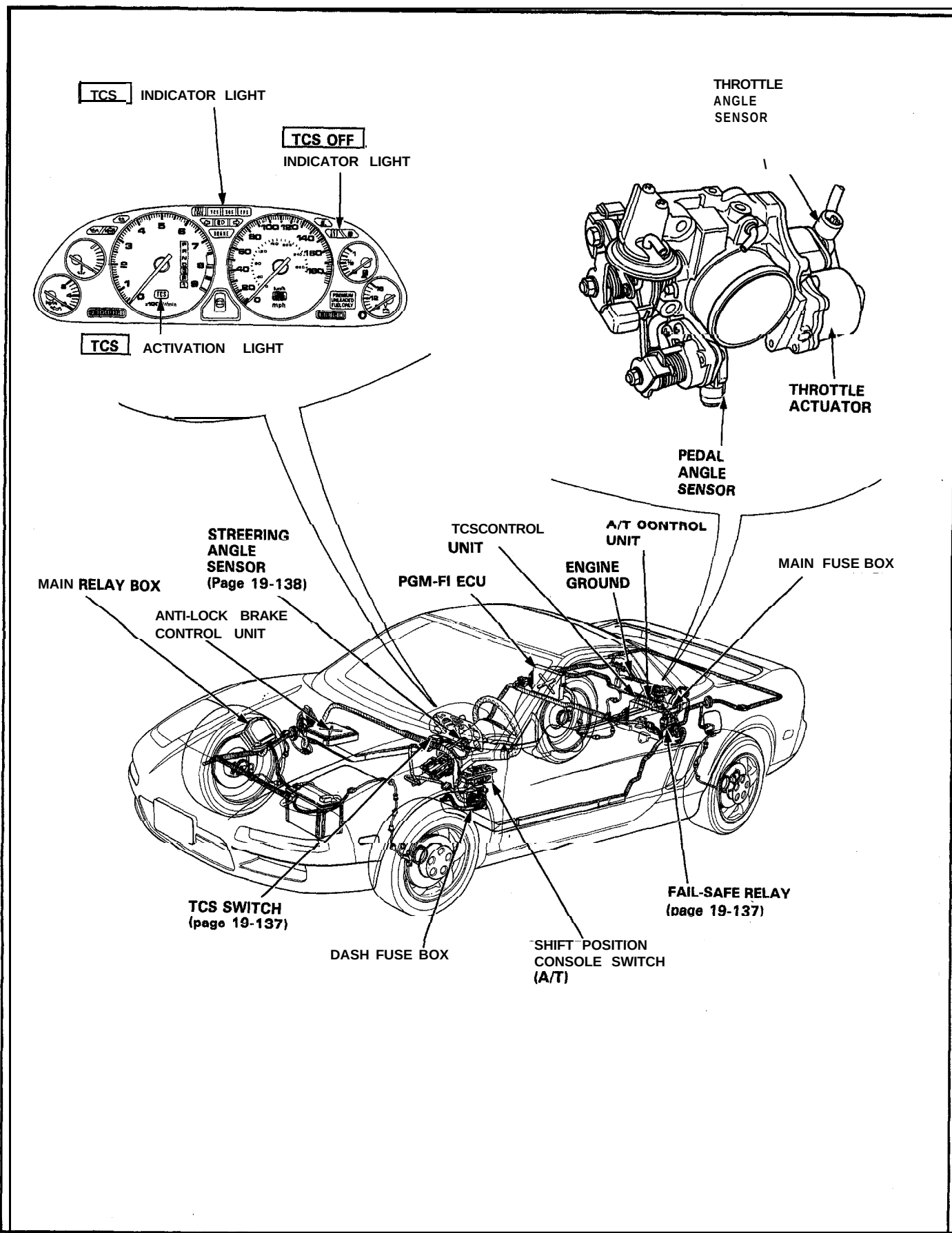


TCS (Traction Control System)

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Replacement	19-138



Component Location Index





System Description

- Outline

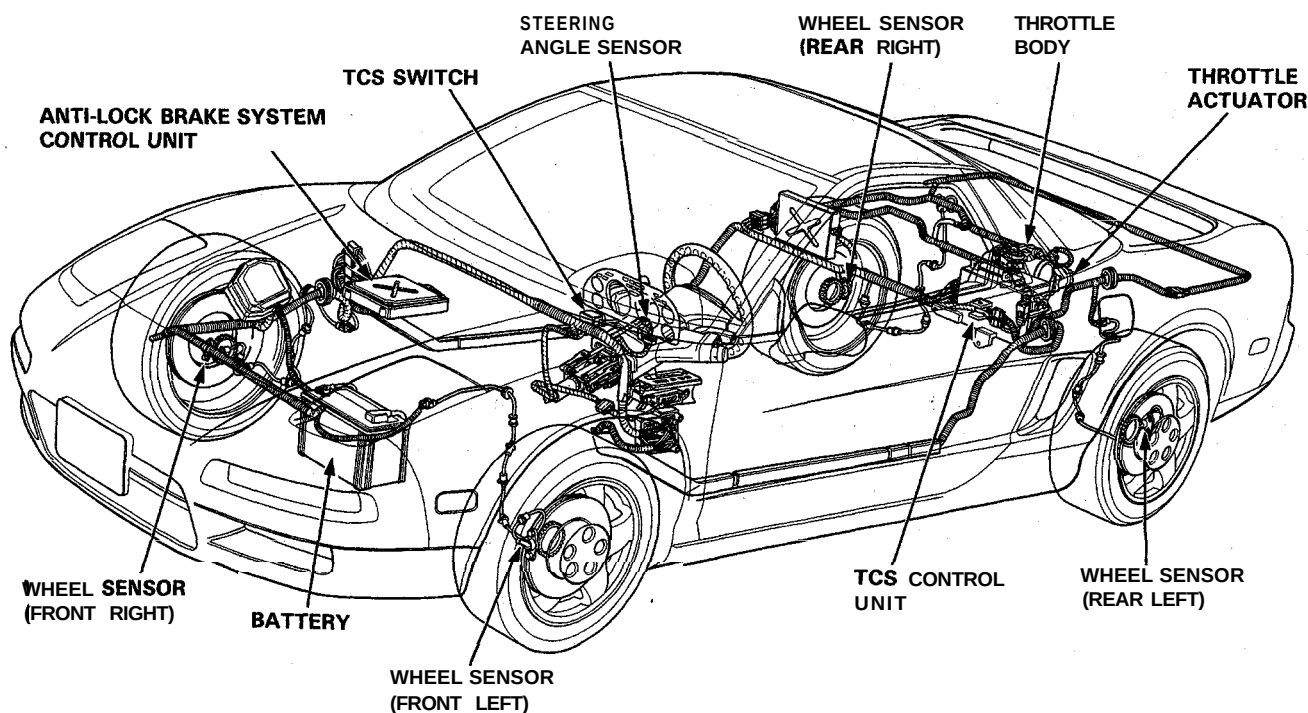
Role of System

The NSX traction control is a variable system designed to enhance traction during acceleration and cornering. It does so by determining the optimum amount of wheel spin for any given driving situation, then suppressing surplus engine power accordingly.

Construction and Function

The TCS control unit gets signals about the vehicle's speed, direction, and road conditions from sensors at the wheels and the steering column. Based on these signals, the control unit will determine the optimum amount of wheel spin. Because the system is variable, the control unit may determine, depending on the driving conditions, that some wheel spin is beneficial (thus enhancing straight-line acceleration), or that no wheel spin is beneficial (thus enhancing cornering). For any given driving situation, the control unit will determine the amount of wheel spin best suited to the driver's needs and, if necessary, will then signal the throttle actuator and PGM-FI control unit to reduce engine power.

The system is automatically "ready" whenever the engine is started, but can be manually canceled with the TCS switch. However, once activated, the system cannot be canceled until it is once again in the ready state.



Components:

- **Wheel sensors.** The TCS "shares" the wheel sensors with the Anti-lock brake system. The wheel sensors transmit wheel speed signals to the TCS through the Anti-lock brake system control unit.
- **Steering angle sensor.** The steering angle sensor signals the TCS control unit about the amount of steering angle.
- **Throttle actuator.** The throttle actuator gets signals from the TCS control unit and closes the throttle valve accordingly.
- **TCS control unit.** The control unit gets driving condition signals from the sensors and, if necessary, signals the throttle actuator to close the throttle valve and engine control unit (PGM-FI control unit).

Construction and Function

TCS Control unit

Acceleration Control:

The TCS control unit gets signals from the wheel sensors about the rotational speed of each wheel. Traction control is activated when the rotational speed of the driving wheels differs from the rotational speed of the driven wheels (i.e., vehicle speed).

Handling Control:

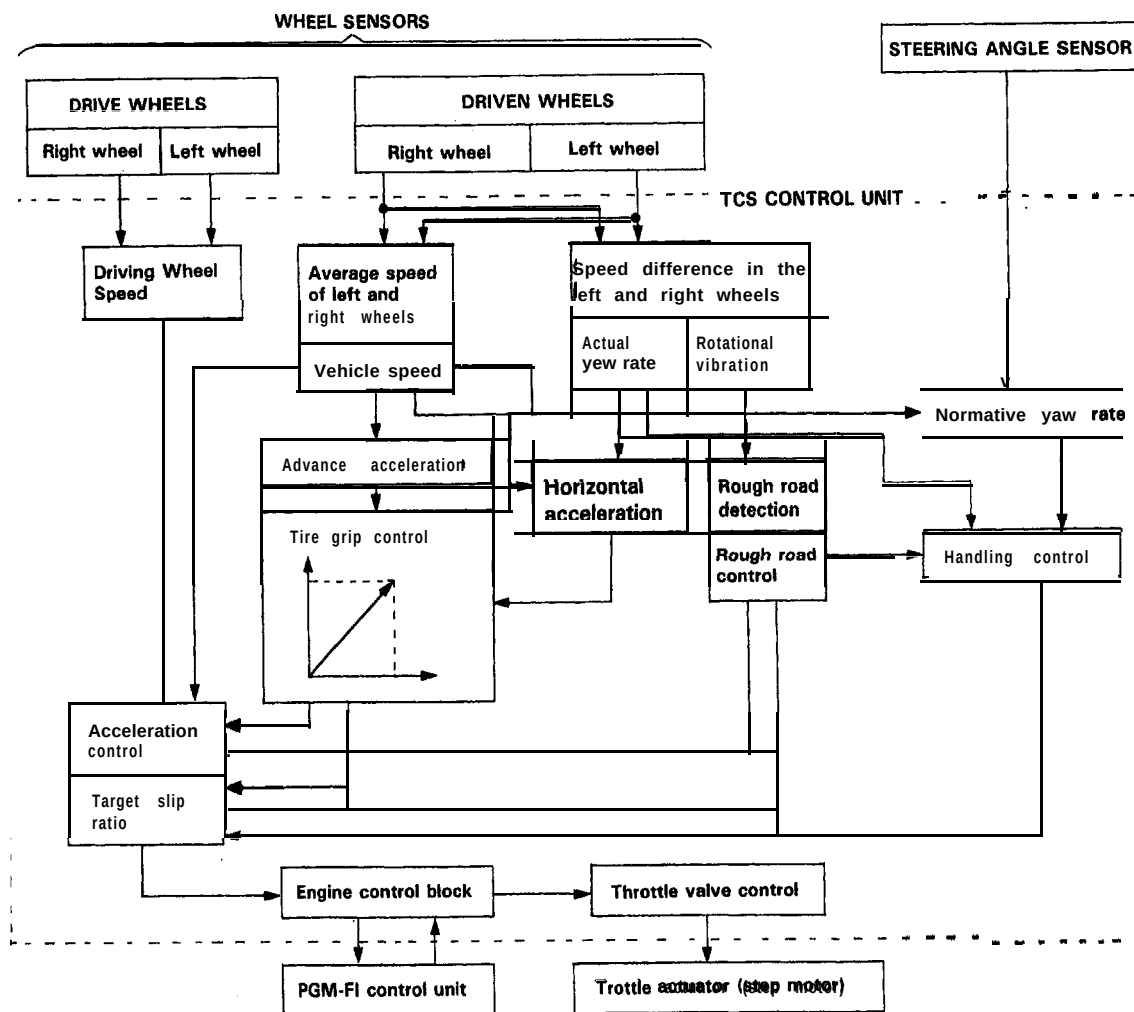
Based on signals about driving wheel and driven wheel rotational speeds, the control unit calculates the car's "yaw" rate (i.e., the turn rate of the car's body). Based on signals from the steering angle sensor, the control unit also calculates the yaw rate expected by the driver. If the difference between actual and expected yaw rates is substantial—that is, if the direction of the car's body will exceed the driver's expected line—the control unit signals the throttle actuator, which closes the throttle valve, thus reducing engine power and maintaining the expected line.

Rough Road Control:

Based on signals from the wheel sensors, the control unit detects a rough road based on frequency of wheel rotational vibration. The control unit then signals the throttle actuator to relax engine power, thus improving acceleration efficiency.

Grip Control:

Based on signals about wheel speed and yaw rate, the control unit determines the efficiency of the grip of the tires on the road and signals the throttle actuator to relax engine power if necessary, thus improving grip.





Fail-Safe Function:

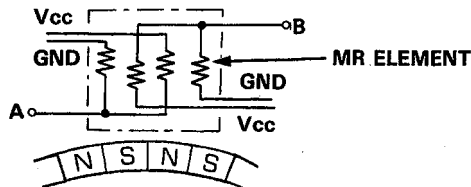
If the control unit detects an abnormality, it shuts the traction control system off and causes the TCS system indicator light to come on. However if the abnormality is detected while the TCS is activated, the control first establishes the appropriate wheel spin velocity, then shuts the system down, thus preventing excessive wheel spin.

Self-Diagnosis Function:

If the control unit detects an abnormality, it records a "problem code" which can be used to diagnose the problem. The failure code is shown at the TCS system indicator light when the Service Check connector terminals are connected with a jumper wire.

Steering Angle Detection

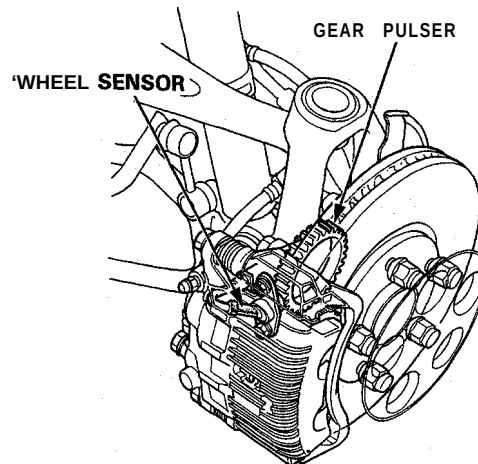
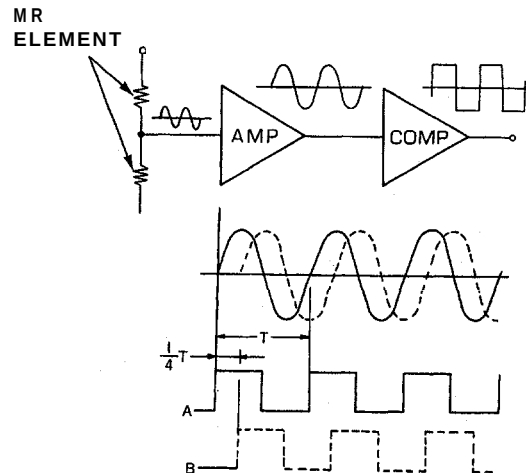
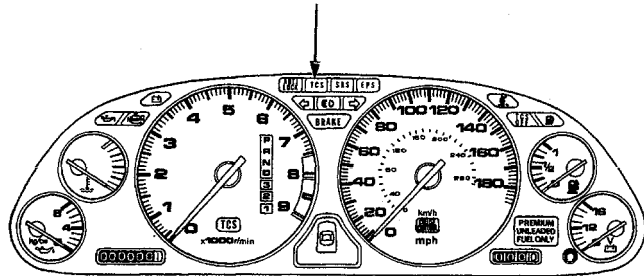
Steering angle is detected by the steering angle sensor, located on the steering column. The sensor uses two magnetoresistor elements to determine steering angle and direction of rotation. When the driver turns the steering wheel, a magnet in the steering shaft generates waves in the "MR" elements. These waves are amplified and converted into signals which the control unit can interpret as angle and direction of turn.



Vehicle Speed Detection

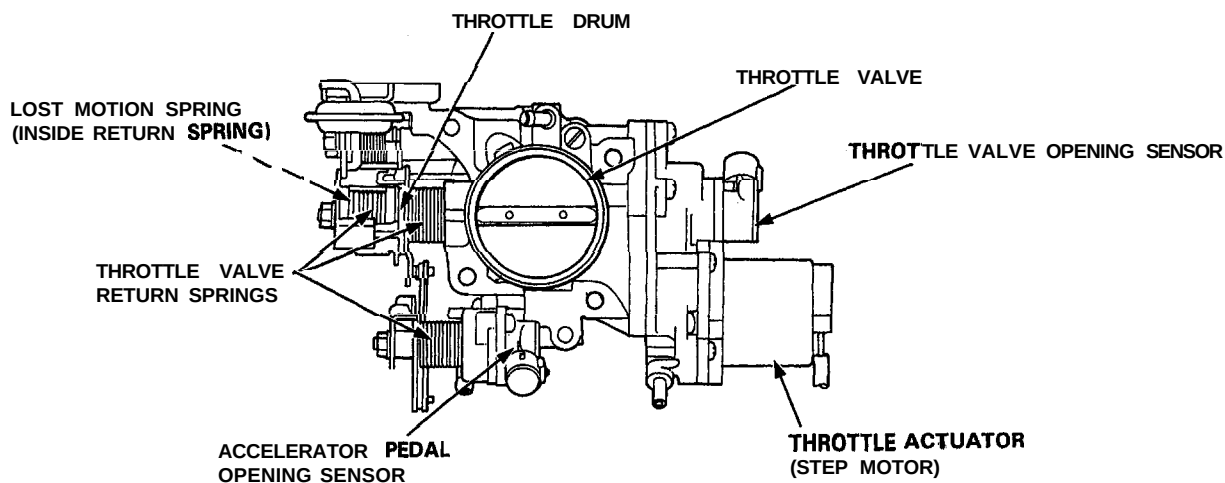
Wheel rotation speed is detected by the wheel sensors, located at each wheel. The signals are sent to the control unit, which compares each wheel's speed and determines whether traction control is required.

TCS SYSTEM INDICATOR

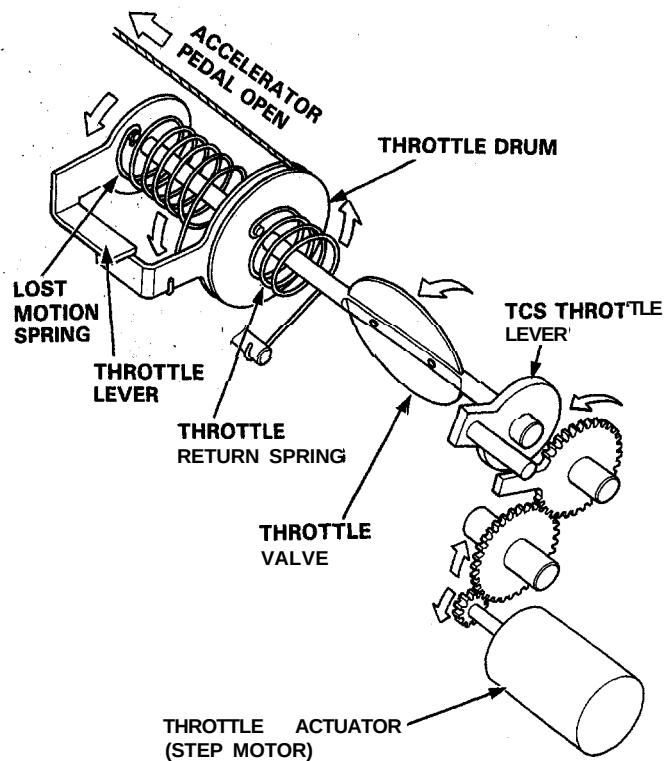


Engine Output Control

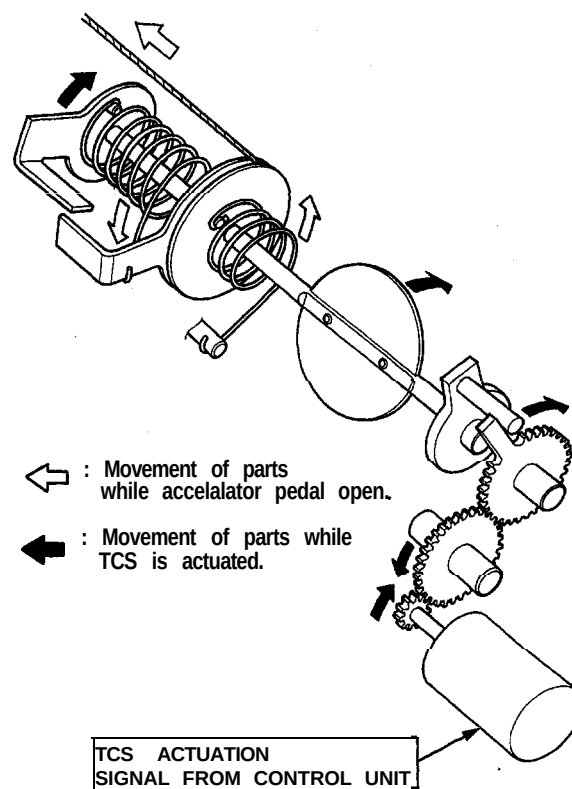
When the TCS is activated, the control unit signals the throttle actuator, located next to the throttle valve. The throttle actuator is linked to the throttle valve through a series of reduction gears. Although the accelerator pedal position is still within the driver's control, the throttle valve is automatically relaxed to achieve optimum traction.



DURING NORMAL DRIVING:

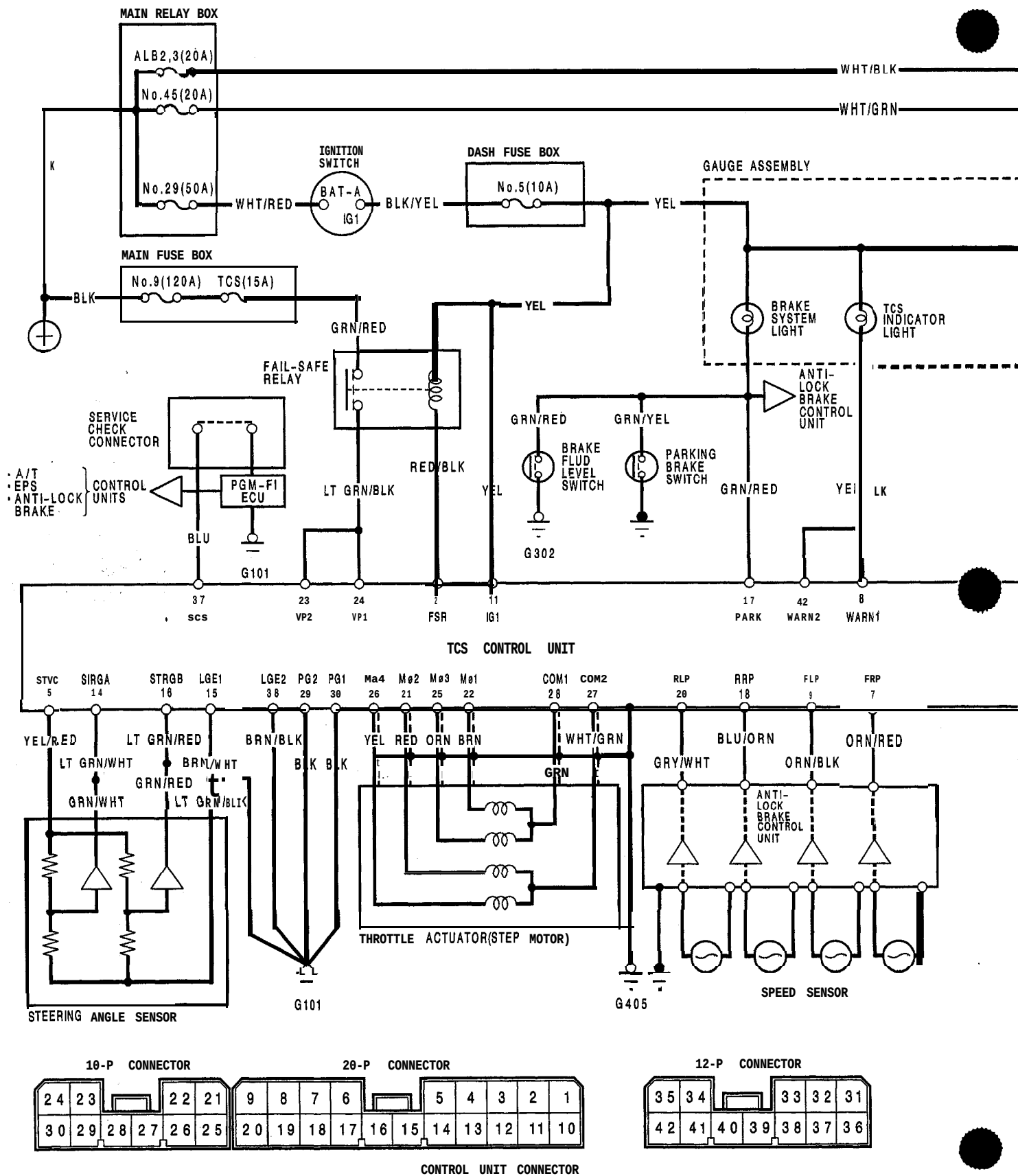


DURING TCS ACTUATION:





Circuit Diagram



Troubleshooting

TCS Indicator Light

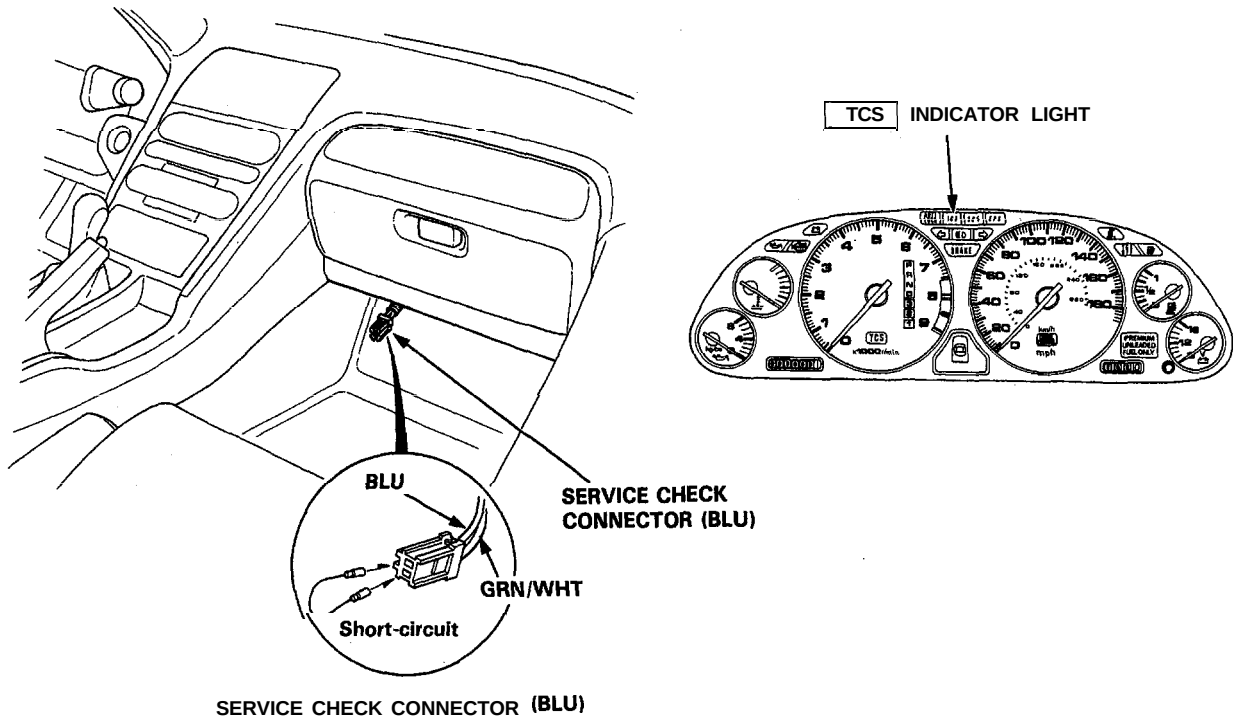
Temporary Driving Conditions:

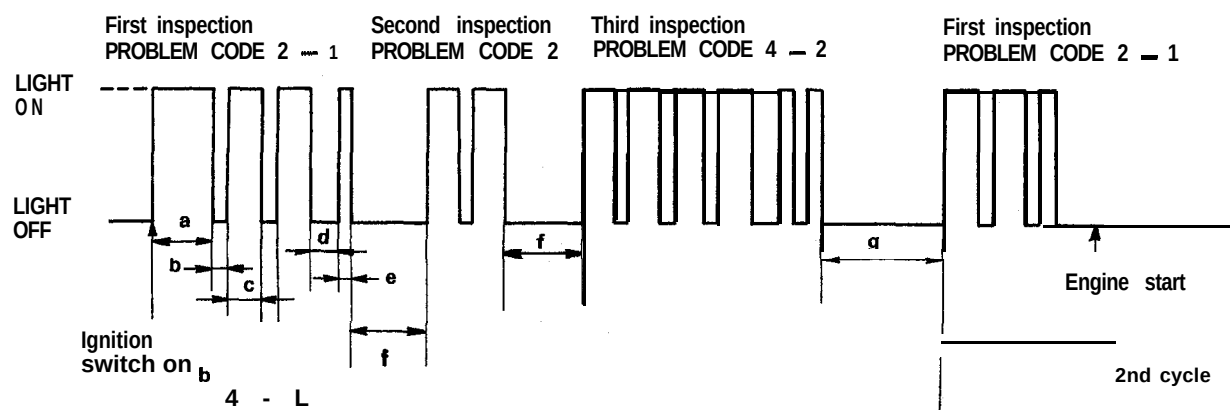
1. The TCS indicator light will come on and the control unit memorizes the problem code under certain temporary conditions:
 - The spare tire is installed, or a tire of the improper size is installed.
 - The tire pressures are not correct.
2. If the TCS indicator light does not come back on after correcting the tire or tire pressure problem. The TCS system is OK.

NOTE: Remove the ALB 2.3 (20A) fuse for at least 3 seconds to clear the problem code from the TCS control unit memory.

TCS Problem Code Indication:

1. Stop the engine.
2. Turn the ignition switch on and confirm that the TCS indicator light comes on.
3. Turn the ignition switch off.
4. Connect the two terminals of the Service Check Connector with a jumper wire.
5. Turn the ignition switch on, but do not start the engine.
6. Record the blinking frequency of the TCS indicator light. The blinking frequency indicates the problem code. Long blinks indicate the main code; short blinks indicate the sub-code.
7. Refer to the Troubleshooting Guide (page 19-84) for repair information.





NOTE:

- The TCS control unit has three memory registers. When a problem occurs, the control unit stores the problem code in the first memory register. If another problem occurs, or the same problem occurs again, the control unit moves the first problem code to the next memory register and stores the second problem code in the first register. If there's a third problem occurrence, the two existing problem codes are moved up one register and the third problem code is stored in the first register. If problems continue to occur, the oldest problem code is moved out of the last register and lost, and the most recent problem code is stored in the first register.
- The TCS indicator light will not come on again after the engine starts unless another problem occurrence is detected. However, there will still be a problem code stored in the control unit's memory.
- After the repair is completed, disconnect the jumper wire from the Service Check connector and remove the ALB 2.3 fuse (20A) from the main relay box for at least 3 seconds to erase the control unit's memory.
- The control unit's memory is erased if the connector is disconnected from the control unit, or if the control unit is removed from the car.

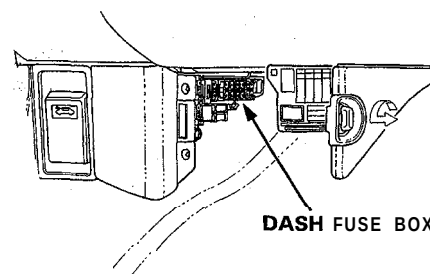
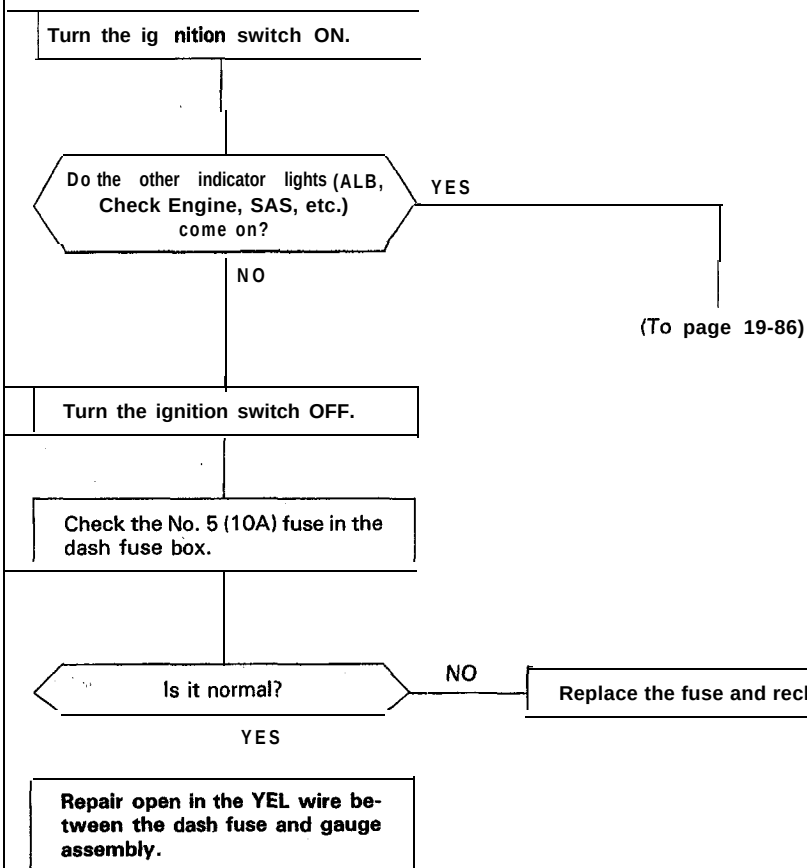
Problem Code	System Indicated	Related components											
		TCS (15A) FUSE	ALB 2.3 (20 A) FUSE	No. 5 (10 A) FUSE	Parking brake switch	Charging System	Fail-safe relay	Throttle body	Throttle actuator	Pedal angle sensor	Throttle angle sensor	Steering angle sensor	PGM-FI ECU
—	The TCS indicator light, TCS OFF indicator light, TCS activation and TCS switch indicator light do not come on for two seconds when the ignition switch is first turned on.	○	○										
—	The TCS OFF indicator light and the TCS activation light do not go off two seconds after the ignition switch is turned on.												
—	The TCS indicator light does not go off after the engine starts.												
—	The TCS OFF indicator light does not go off after the engine starts.												
Stays on	TCS control unit or battery voltage too low												
1-2	TCS control unit												
2	Parking brake signal				○								
2-1	Steering angle sensor											○	
3-1	PGM-FI ECU												○
3-2	NeP Signal (engine speed signal)												○
3-3	Abnormal TQOUT signal												○
3-4	Abnormal VREF (reference voltage) signal												○
3-5	Abnormal PA sensor signal												○
3-6	Abnormal θ ACP (throttle drum angle sensor)												○
3-7	Abnormal θ TH (throttle angle sensor)												○
4-1	Wheel sensor R. Front												○
4-2	Wheel sensor L. Front												○
4-4	Wheel sensor R. Rear												○
4-8	Wheel sensor L. Rear												○
4-9	All wheel sensor												○
5-1	Abnormal fail-safe relay, throttle actuator or throttle body	○											
6-1	A/T control unit												○



- Troubleshooting Flowchart

The TCS indicator light, TCS OFF indicator light, TCS activation light and the TCS switch indicator light do not come on for two seconds when the ignition switch is first turned on (no bulb check).

NOTE: The TCS indicator light stays on until the engine starts.



(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

(From page 19-85)

Turn the ignition switch OFF.

Disconnect the 20-P and 12-P connectors from the TCS control unit.

Ground the following terminals individually to the body ground and turn the ignition switch ON. Check the lights:
 TCS indicator light: No. 8 or No. 42 terminal
 TCS OFF indicator light: No. 36 terminal
 TCS activation light: No. 31 terminal
 TCS switch indicator light: No. 40 terminal

Do all the lights come on?

YES

Check the AL8 2.3 (20A) fuse in the main relay box.

Is it normal?

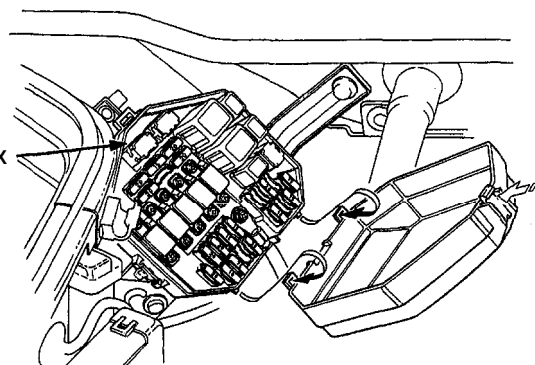
YES

(To page 19-87)

NO

- Replace defective bulb.
- Repair open in the wire between the TCS control unit and gauge assembly.

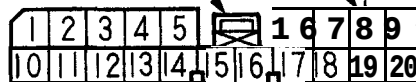
MAIN RELAY BOX



Replace the ALB 2.3 (20A) fuse and recheck.

YEL/BLK WIRE

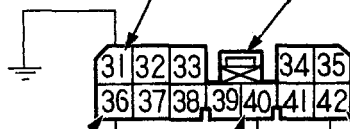
20-P CONNECTOR



View from terminal side

RED/GRN WIRE

12-P CONNECTOR



View from terminal side

GRY/BLK WIRE

LT GRN/YEL WIRE

YEL/BLK WIRE



(From page 19-86)

Turn the ignition switch ON.

Measure the voltage between the No. 35 terminal of the 12-P connector and body ground.

Is there battery voltage?

NO

Repair open in the **WHT/BRK** wire between the TCS control unit and main relay box.

YES

Measure the voltage between the No. 11 terminal of the 20-P connector and body ground with the ignition switch ON.

Is there battery voltage?

NO

Repair open in the **YEL** wire between the TCS control unit and dash fuse box.

YES

Turn the ignition switch OFF.

Check for continuity to body ground between the No. 15 terminal of the 20-P connector and No. 38 terminal of the 12-P connector individually.

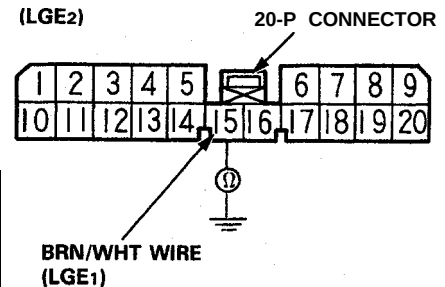
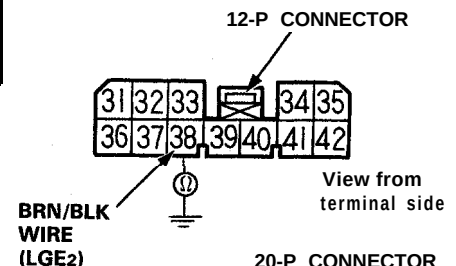
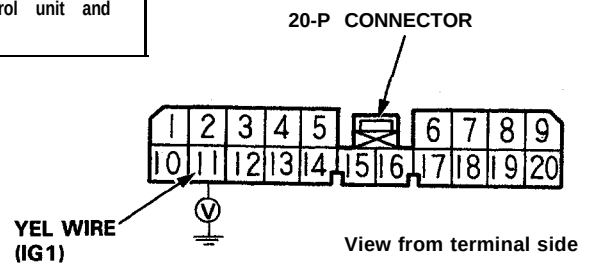
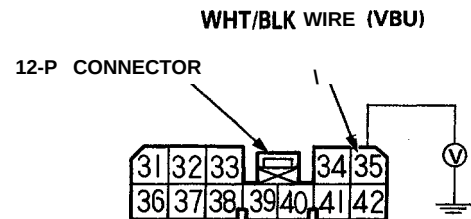
Is there continuity?

NO

- Repair open in the **BRN/WHT** or **BRN/BLK** wire between the TCS control unit and body ground.
- Repair poor ground (G101).

YES

- Check for poor connection or loose wires.
- Substitute known-good TCS control unit and recheck.

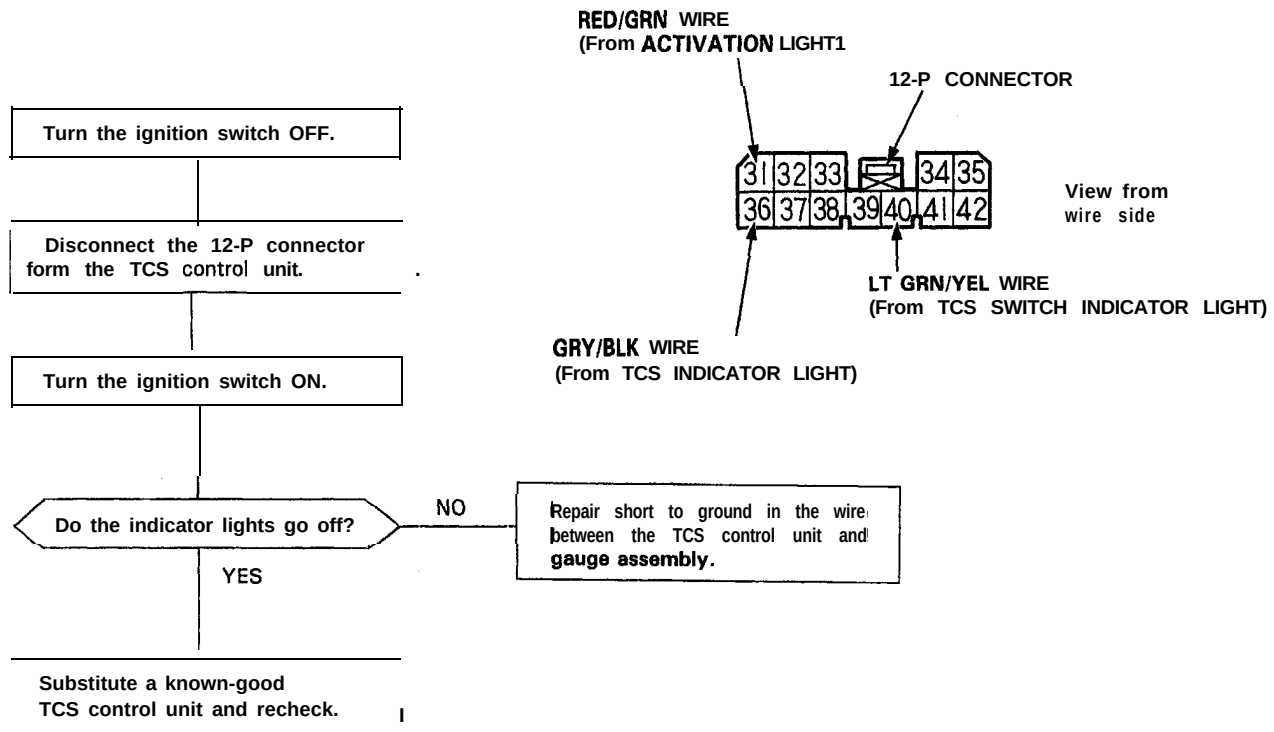


(cont'd)

Troubleshooting

• Troubleshooting Flowchart (cont'd)

The TCS OFF indicator light and the TCS activation light do not go off two seconds after the ignition switch is turned on.

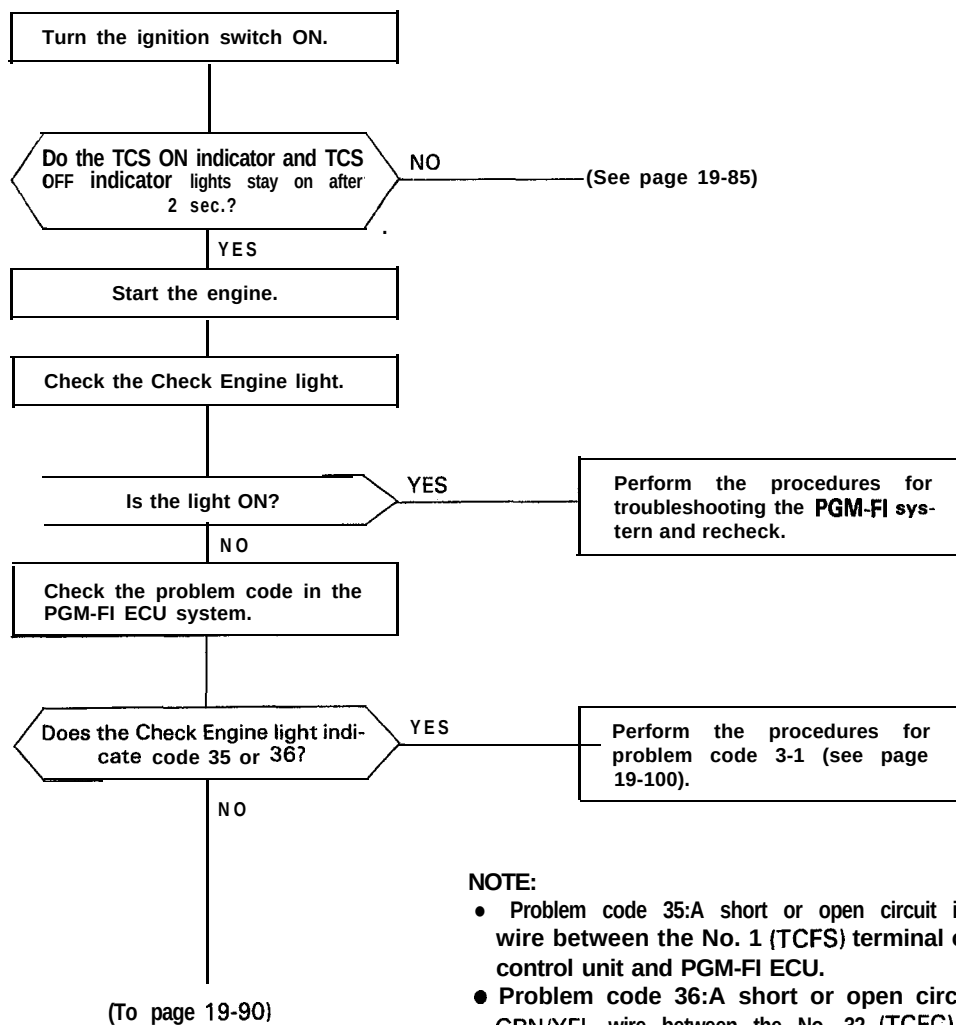




The TCS indicator light does not go off after the engine starts:

NOTE:

- When the engine starts, a TCS system check is performed. The TCS indicator light will go off if the system is normal.
- If the back-up power supply is less than 8V to the TCS control unit (No. 35 terminal), the system check is stopped and TCS indicator light comes on.



NOTE:

- Problem code 35:A short or open circuit in the GRY wire between the No. 1 (TCFS) terminal of the TCS control unit and PGM-FI ECU.
- Problem code 36:A short or open circuit in the GRN/YEL wire between the No. 32 (TCFC) terminal of the TCS control unit and PGM-FI ECU.

(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

(From page 19-89)

Start the engine.

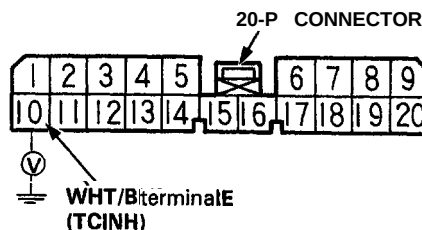
View

Measure the voltage between the No. 10 terminal of the 20-P connector for the TCS control unit and body ground.

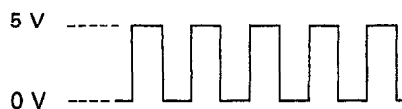
from

NOTE: NOTE:

- Use the 10 V range a similar range in the analog tester.



Confirm that the analog tester pointer swings to approximately 2.5 V.



Is there approximately 2.5 V?

NO

(To page 19-91)

YES

Turn the ignition switch OFF.

Disconnect the 12-P and 20-P connectors from the TCS control unit

Turn the ignition switch ON.

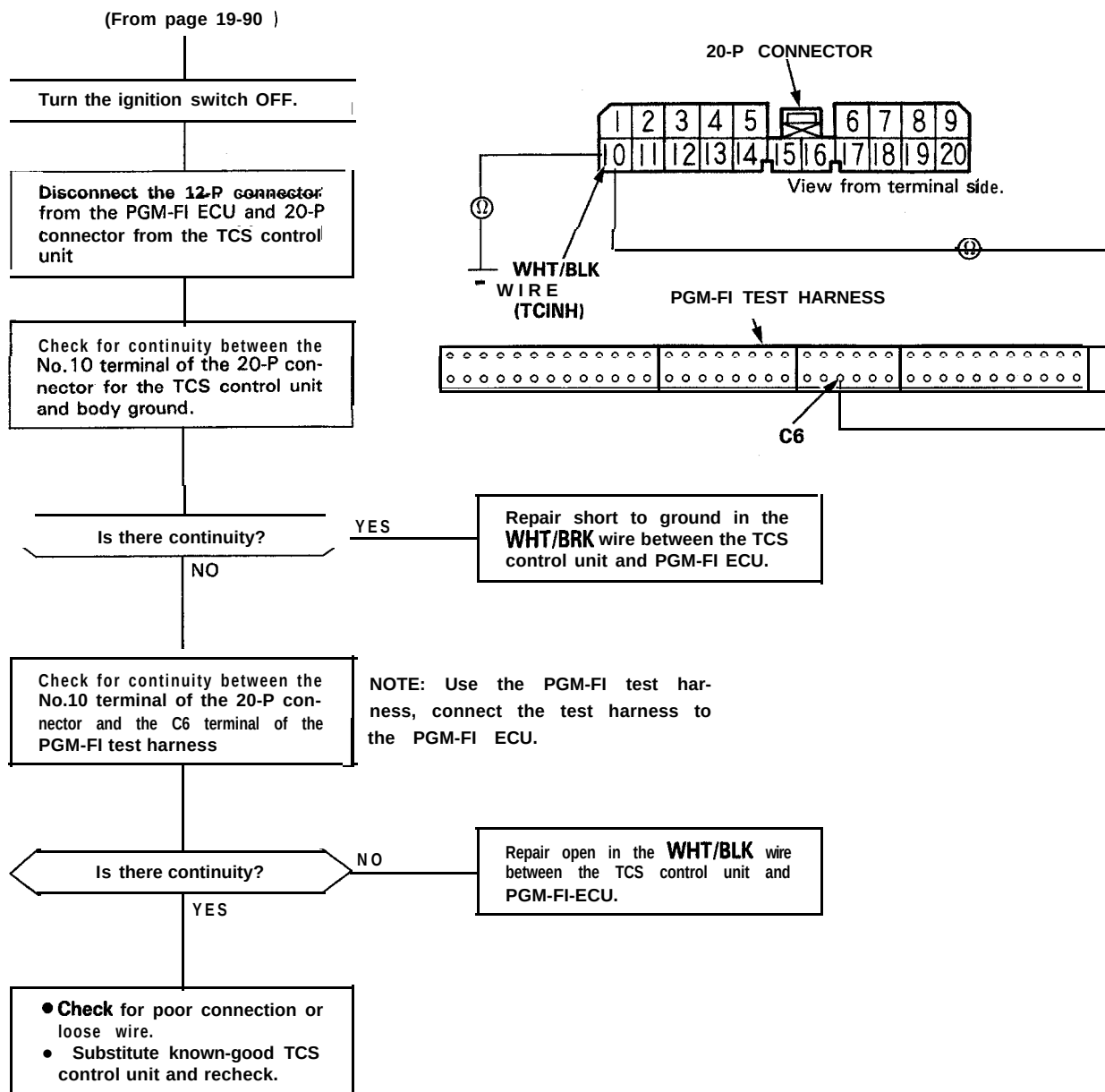
Is the TCS indicator light on?

YES

Repair short to ground in the YEL/BLK wire between the TCS control unit and the gauge assembly.

NO

- Check for poor connection or loose wire.
- Substitute known-good TCS control unit and recheck.



(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

The TCS OFF indicator light does not go off, after the engine starts.

Turn the ignition switch ON.

Check for problem code in the PGM-FI ECU system

Does the Check Engine light indicate code 35 or 36?

YES

Perform the procedures for problem code 3-l.

NO

Measure the voltage between the No. 10 terminal of the 20-P connector for TCS control unit and body ground.

NOTE:

- Problem code 35 (TCFS: short or open circuit)
- Problem code 36 (TCFC: short or open circuit)

NOTE:

- Check when engine is warmed up.
- Use the 1 OV range or a similar range in the analog tester.



Confirm that the analog tester pointer swings to approximately 2.5 V.

20-P CONNECTOR



View from terminal side.



WHT/BLK WIRE
(TCINH: Signal from PGM-FI)

Is there approximately 2.5 V?

NO

Repair open and short circuit in the WHT/BLK wire between the TCS control unit and PGM-FI ECU.

YES

(To page 19-93)



(From page 19-92)

Measure the voltage between the No. 35 terminal of the 12-P connector for the EPS control unit and body ground.

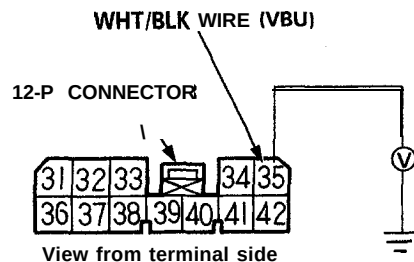
Is there battery voltage?

NO

See Alternator and Regulator Test
(Section 23).

YES

- Check for poor connections and loose wires at the TCS control unit.
- Substitute know-good TCS Control unit and recheck.



NOTE: The TCS OFF indicator light comes on if the TCS control unit back-up power (VBU) is more than 18V.

(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

Problem codes 1-2 or the TCS indicator light stays on: TCS Control Unit.

NOTE:

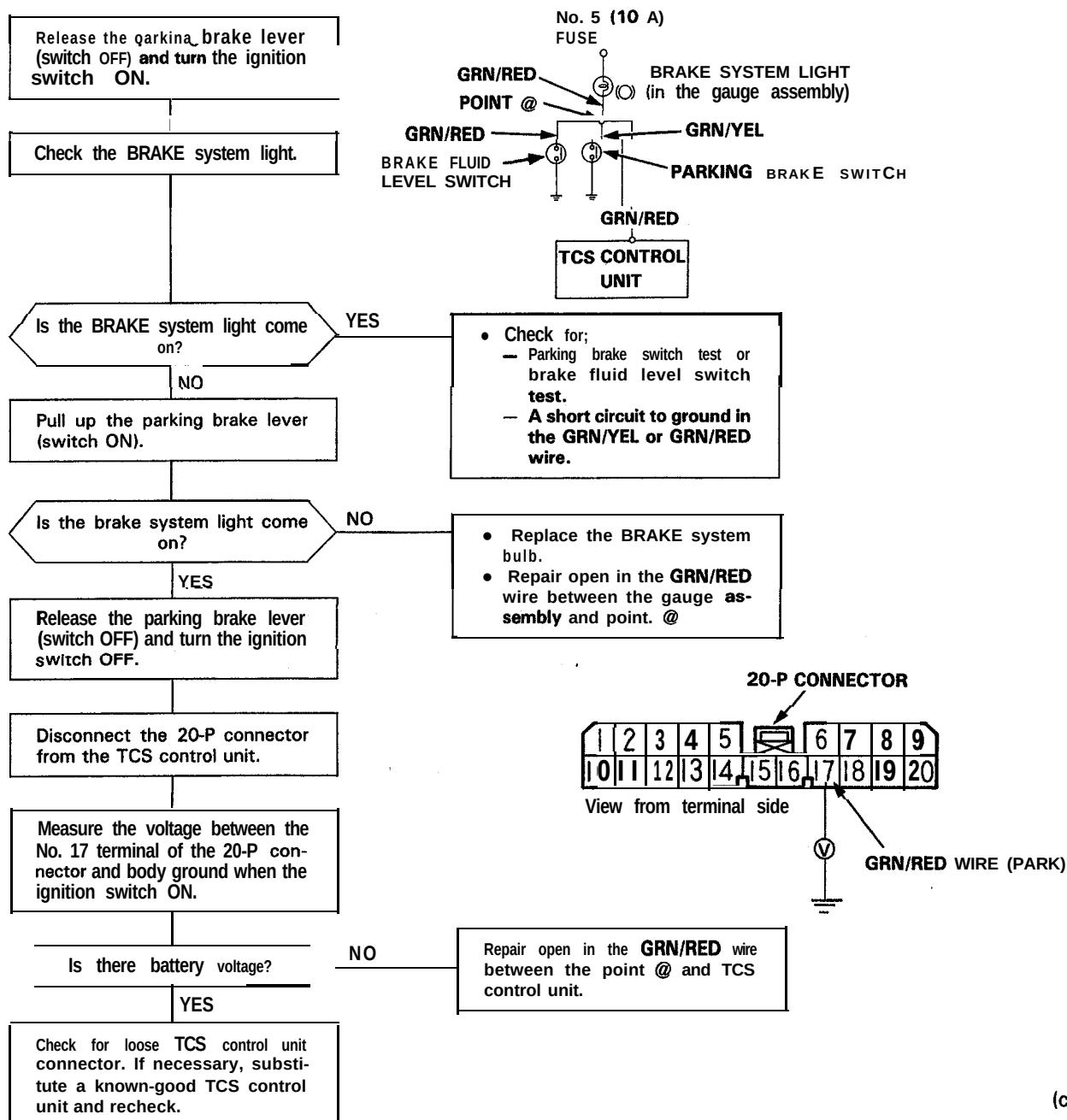
- If the TCS indicator light indicates problem code 1-2, replace the TCS control unit.
- If the TCS indicator light stays on, check for a short to body ground in the YEL/BLK wire between the control unit and the TCS indicator light. If the wire is OK, replace the TCS control unit.



Problem code 2: Parking brake signal

NOTE:

- Before proceeding to the troubleshooting procedure, be sure to perform a running test and check whether the TCS indicator light comes on or not. If the TCS indicator light does not come on, the system is working properly. If the TCS indicator light comes on, make sure the parking brake lever is released.
- When both of the front wheels are running at 10 km/h (6.2 mph) or over and the parking brake is applied for more than 30 seconds continuously, the TCS control unit will cause the TCS indicator light to come on. When the parking brake switch is turned OFF, the input signal to the TCS control unit becomes high. When the parking switch is turned ON, the input signal to the TCS control unit becomes low. Also, when the wire between the No.5 (10 A) fuse and the TCS control unit is disconnected or cut, the input signal becomes low.



(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

Problem code 2-1: Steering angle sensor system.

NOTE: The TCS control unit performs the ~~self-diag~~ diagnosis for the steering angle sensor when the average speed of the front two wheels exceeds 16 km/hr. The **TCS** indicator light comes on if the yaw rate is generated and the steering angle signal that corresponds to this yaw rate is not input when the steering wheel is turned while there is no input from the STOP (brake light signal) and PARK (Parking brake signal).

Start the engine.

1.

Push the TCS switch 3 times within three seconds.

2.

Turn the steering wheel slowly from left to right more than 1.5 turns.

3.

Push the TCS switch 2 times within 3 seconds.

4.

Return the steering wheel to the left side slowly, check the number of times the **TCS** indicator light flashes after the wheel has moved approximately one turn.

NOTE:

- Always maintain the same number of rotations.
- Step 1 to 4 are the steering angle sensor check procedures for actual vehicle operating condition. This will be called the "steering angle sensor system check" in the following sections.

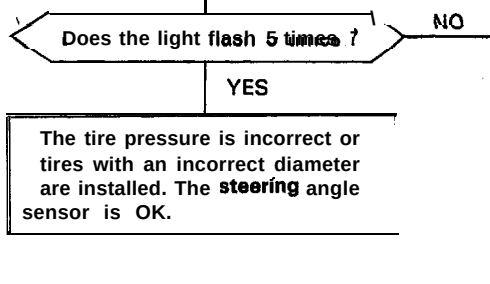
NOTE:

- Start checking after the steering wheel moves at least 1.5 turns from the right to the left.
- Turn the steering wheel slowly, no faster than one turn in four seconds.

NOTE: Always maintain the same number of rotations.

NOTE:

- Start the check from the beginning when the steering wheel moves at least one turn from the left to the right.
- Turn the steering wheel slowly, no faster than one turn in four seconds.



Measure the voltage between the No. 1 (+) and No. 5 (–) terminals of the steering angle sensor.

Is there approximately 4.5V?

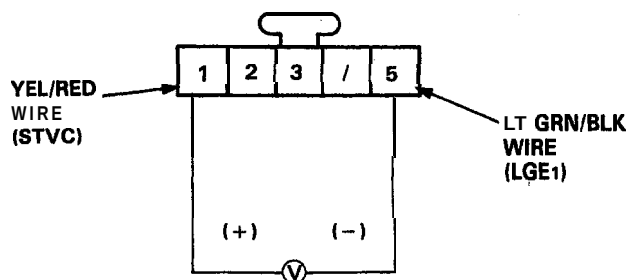
YES

NO

(To page 19-97)

(To page 19-98)

View from terminal side.





(From page 19-96)

Turn the ignition switch OFF.

Disconnect the 5-P connector from the steering angle sensor.

Check for continuity between the No. 5 terminal and body ground.

Is there continuity?

NO

Repair open in the **LT GRN/BLK** wire between the No. 5 terminal and TCS control unit.

YES

Check for resistance between the No. 1 and No. 5 terminals

NOTE: Use the digital multimeter. Resistance is approximately 40 k Ω .

Is there approximately 40 K Ω ?

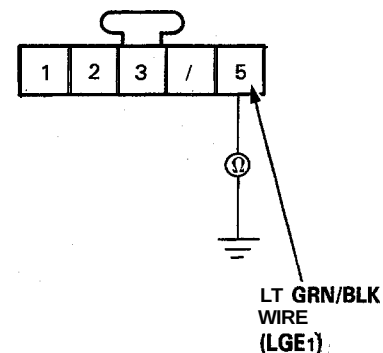
YES

- Substitute a known-good control unit and recheck.
- Check for poor connections or poor wires.

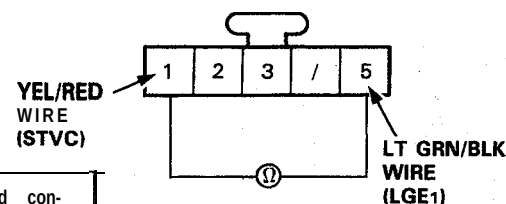
NO

Repair open or short circuit in the **YEL/RED** wire between the No. 1 terminal and TCS control unit.

View from terminal side



View from terminal side



(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

(Form page 19-96)

Connect the voltmeter between the No. 2 (+) and No. 5 (-) terminals of the steering angle sensor.

Turn the steering wheel slowly one revolution.

Does the needle pulse 4.5V→0V→4.5V→0V repeatedly?

YES

Connect the voltmeter between the No. 3 (+) and No. 5 (-) terminals of the steering angle sensor.

Turn the steering wheel slowly one revolution.

Does the needle pulse 4.5V→0V→4.5V→0V repeatedly?

YES

Check for open or short in the LT GRN/RED and LT GRN/WHT wire between the steering angle sensor and TCS control unit. (Refer to 5 and 6.)

If there is no open or short-circuit, check for poor connections or loose wires. If the connections substitute a known-good TCS control unit and recheck.

NO

Turn the ignition switch OFF.

Disconnect the 5-P connector from the steering angle sensor.

Check for resistance between the No. 2 and No. 5 terminals

is there ∞ or 0 Ω ?

NO

(To page 19-99)

YES

(∞) Repair open in the LT GRN/RED (GRN/RED) wire between the No. 2 terminal and TCS control unit.

(0 Ω) Repair short-circuit in the LT GRN/RED (GRN/RED) wire between the No. 2 terminal and TCS control unit.

NOTE: Use the digital multimeter. Resistance is approximately 50 k Ω .

NO

Turn the ignition switch OFF.

Disconnect the 5-P connector from the steering angle sensor.

Check for resistance between the No. 3 and No. 5 terminals.

Is there ∞ or 0 Ω ?

NO

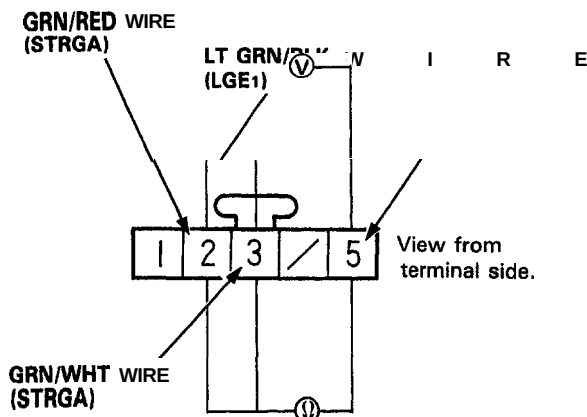
(To page 19-99)

YES

(∞) Repair open in the LT GRN/WHT (GRN/WHT) wire between the No. 3 terminal and TCS control unit.

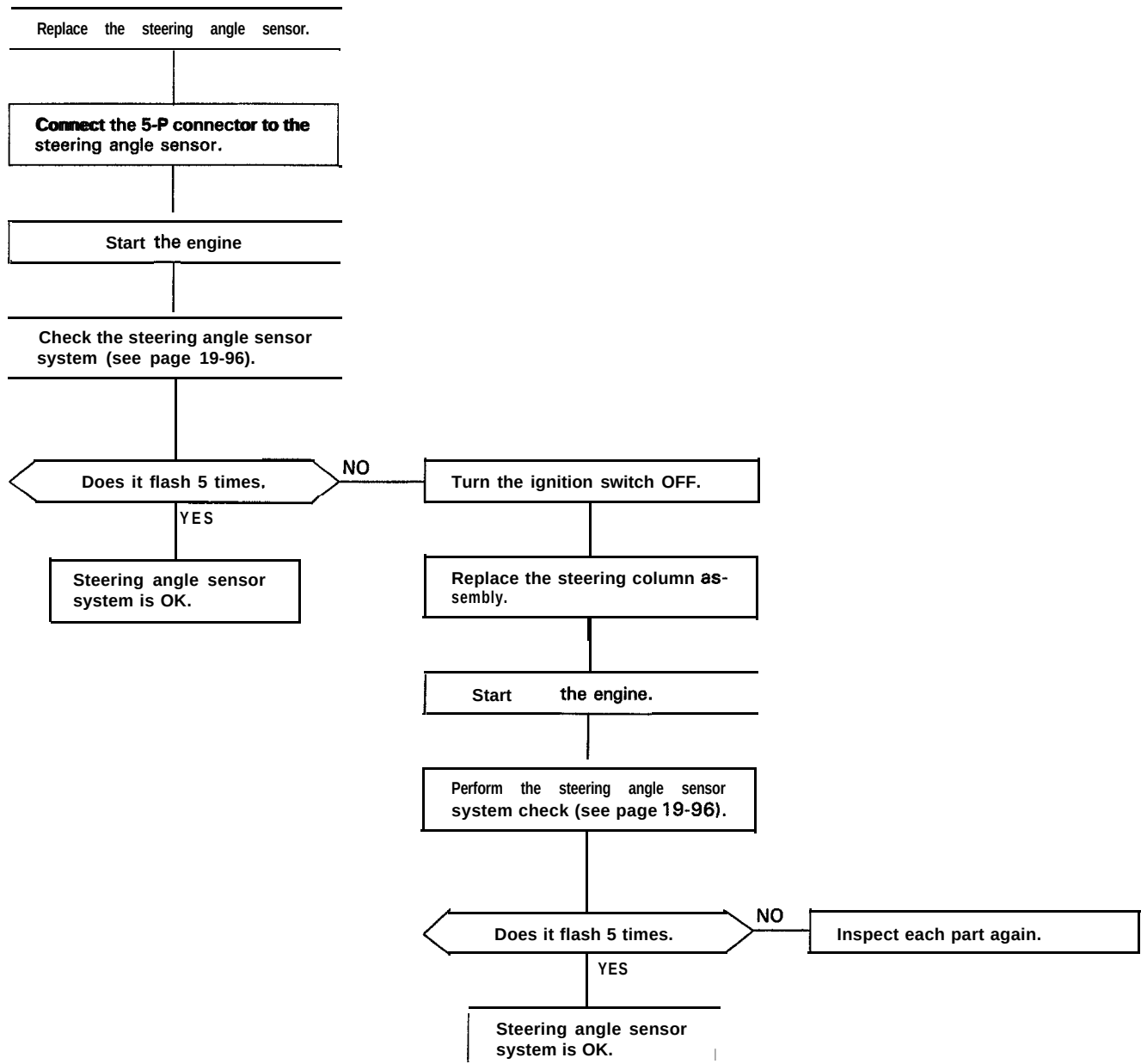
(0 Ω) Repair short-circuit in the LT GRN/WHT (GRN/WHT) wire between the No. 3 terminal and TCS control unit.

NOTE: Use the digital multimeter. Resistance is approximately 50 k Ω .





(From page 19-98)



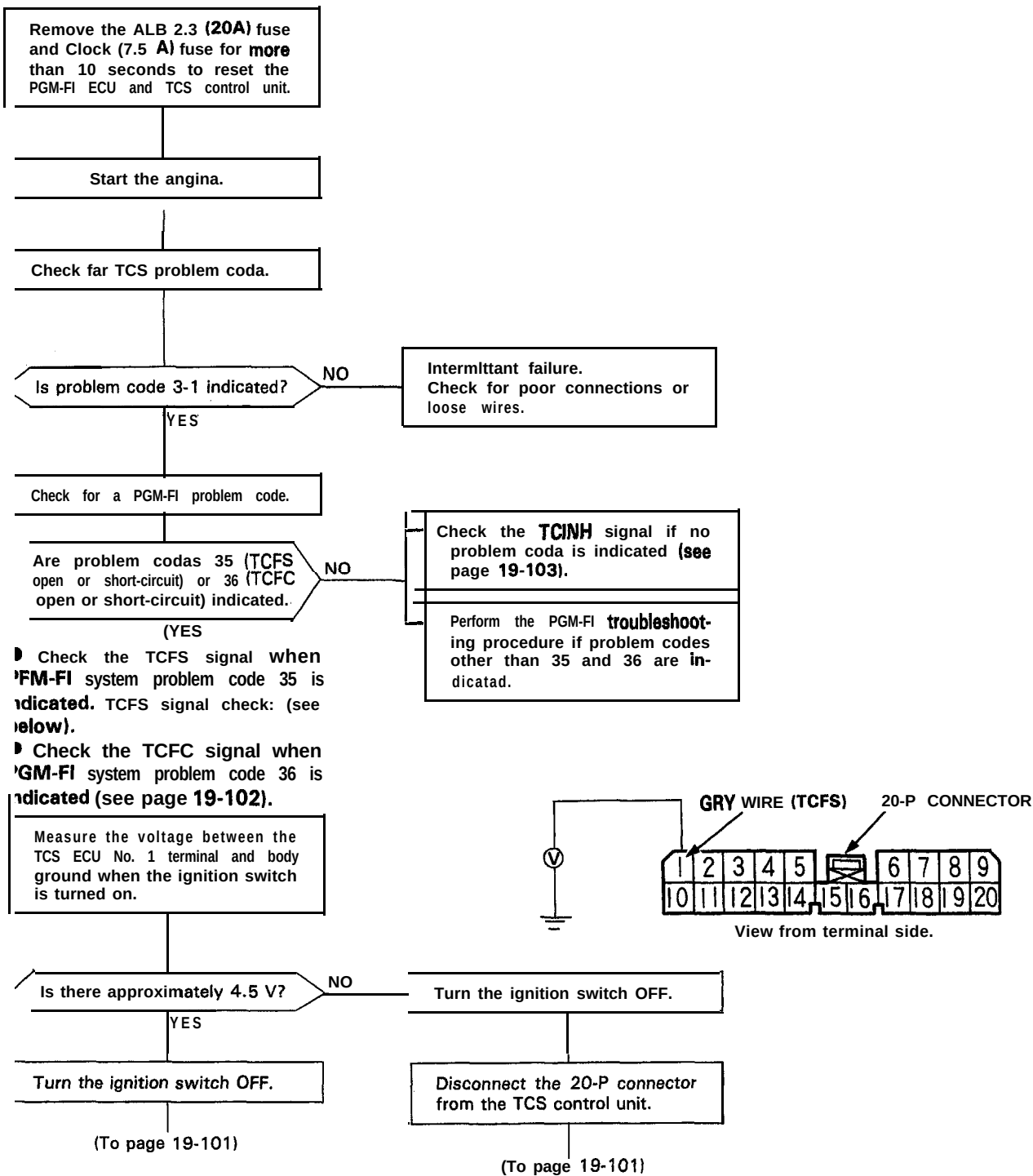
(cont'd)

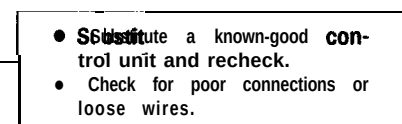
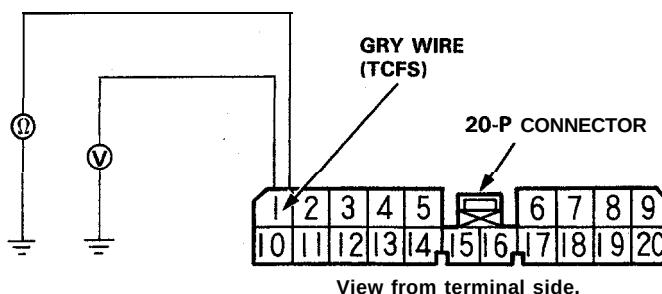
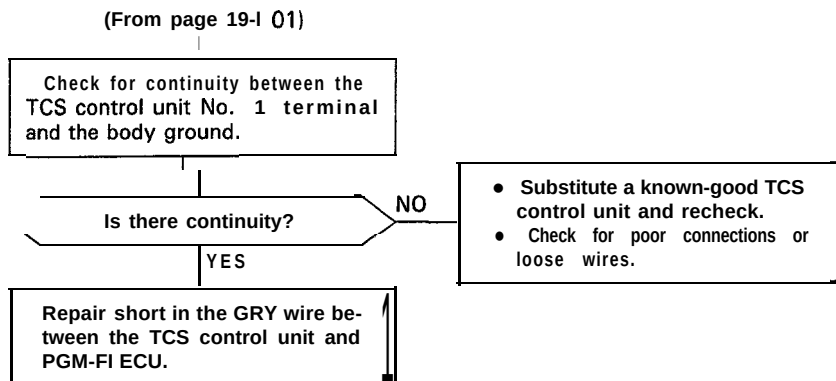
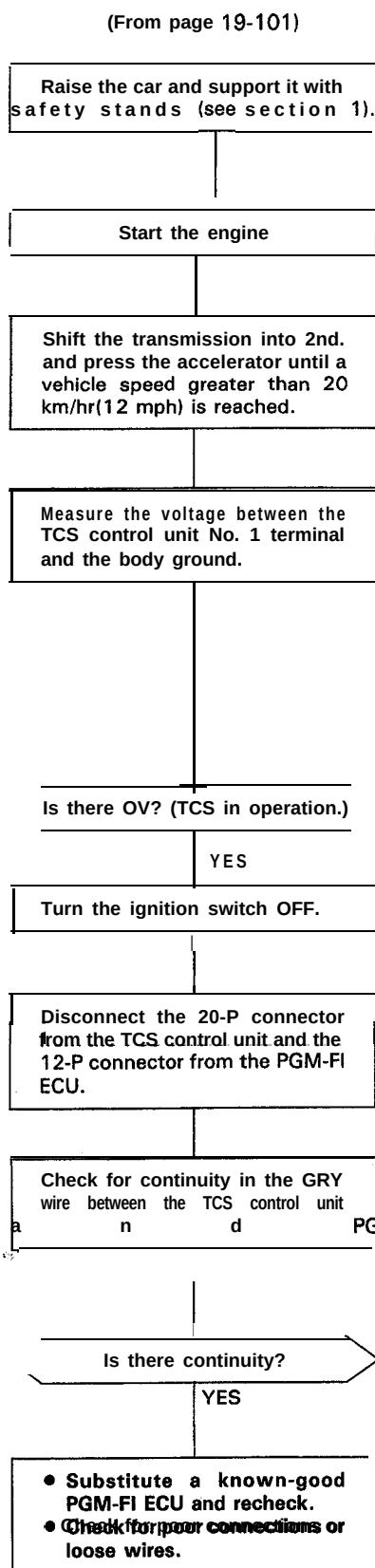
Troubleshooting

Troubleshooting Flowchart (cont'd)

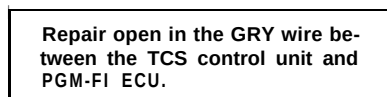
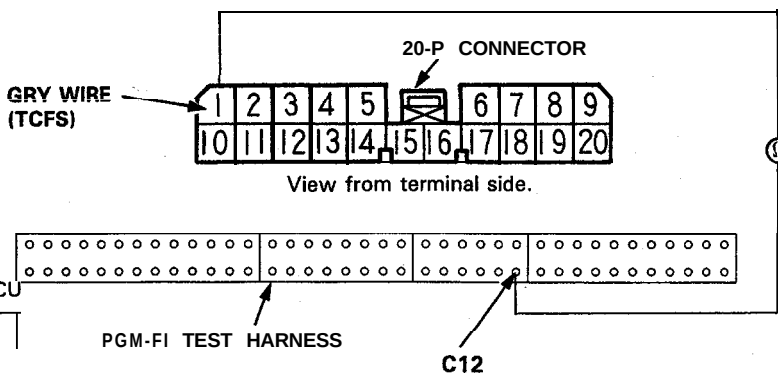
Problem code 3-1: The PGM-FI system (TCINH, TCFS and TCFC signals).

NOTE: The PGM-FI ECU outputs the TCINH signal to the TCS control unit when the correct TCFS signal and TCFC signal have been input to it from the TCS control unit.





NOTE: Use the PGM-FI test harness (see section 11).



(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

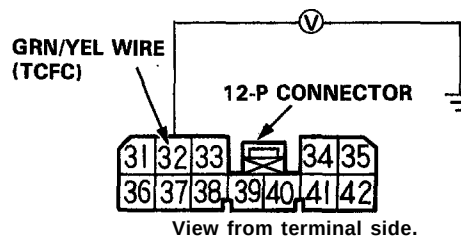
- TCFC signal check.

Turn the ignition switch ON.

Measure the voltage between the TCS control unit No. 32 terminal and body ground.

NOTE:

- Use the 10 V range or a similar range in the analog tester.
- Confirm that the analog tester needle is swinging at approximately 3.5V.



Is there approximately 3.5 V?

NO

YES

Turn the ignition switch OFF.

Disconnect the 12-P connector from the TCS control unit and the 12-P connector from the PGM-FI ECU.

Check for continuity between the TCS control unit No. 32 terminal and body ground.

Is there continuity?

NO

- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.

YES

Repair short in the **GRN/YEL** wire between the TCS control unit and PGM-FI ECU.

Disconnect the 12-P connector from the TCS control unit and the 12-P connector from the PGM-FI ECU.

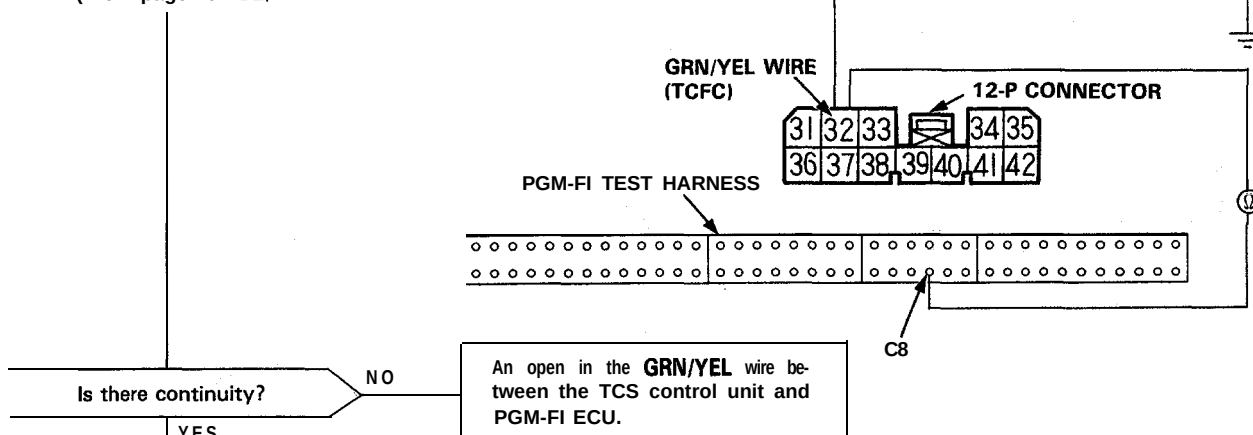
Check for continuity in the GRN/YEL wire between the TCS control unit and PGM-FI ECU.

NOTE: Use the PGM-FI test harness, connect the test harness to the PGM-FI ECU (see section 11).

(To page 19-103)



(From page 19-I 02)



- Substitute a known-good PGM-FI ECU and recheck.
- Check for poor connections or loose wires.

- TCINH signal check: see blow.

Start the engine.

Measure the voltage between the TCS control unit No. 10 terminal and body ground.

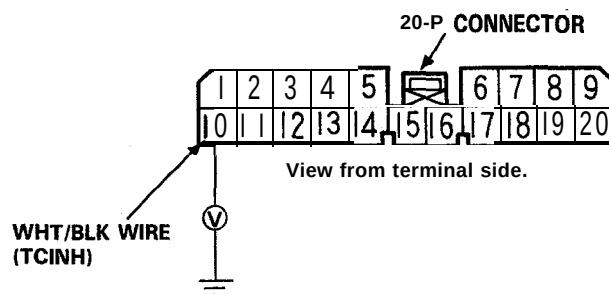
Check if the analog tester needle pulses in small increments in the range below 5 V.

Does the needle pulse in the range approximately 2.5V?

YES

- Substitute a known-good ECU and recheck.
- Check for poor connections or loose wires.

NOTE: Use the 10 V range or a similar range in the analog tester.



(To page 19-I 04)

(cont'd)

Trouble shooting Flowchart (cont'd)

(From page 19-1 03)

Turn the ignition switch OFF.

Disconnect the 20-P connector from the TCS control unit and the 12-P connector from the PGM-FI ECU

Check for open or short in the WHT/BLK wire between the TCS control unit and PGM-FI ECU.

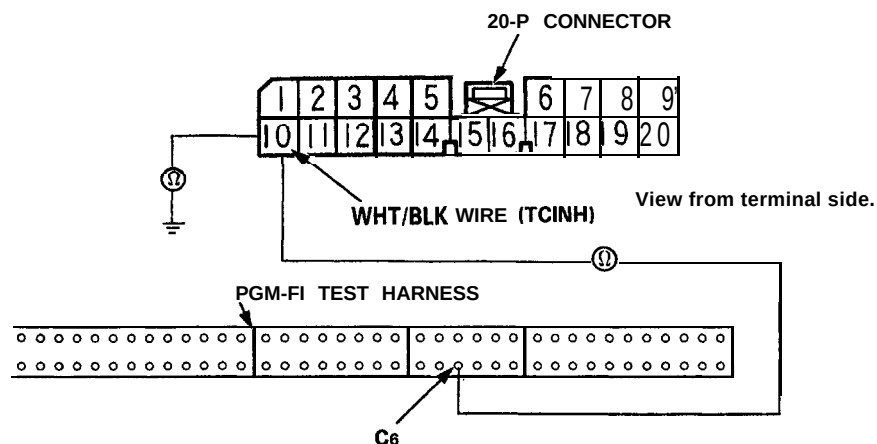
Is there an open or short?

NO

- Substitute a known-good PGM-FI ECU and recheck.
- Check for poor connections or loose wires.

YES

Repair open or short in the **WHT/BLK** wire **between** the TCS control unit and PGM-FI ECU.



NOTE: Use the PGM-FI test harness (see section 1 1).



Problem code 3-2: Engine speed signal (NEP).

Remove the ALB 2.3 (20A) fuse for more than 3 seconds to reset TCS control unit.

Start the engine.

Is problem code 3-2 indicated?

NO
intermittent failure.
Check for poor connections or loose wires.

YES

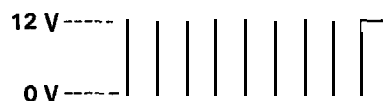
Measure the voltage between the TCS control unit No. 41 terminal and body ground.

NOTE:

- Use the 10 V range or a similar range in the analog tester.
- Check with the engine idling and warmed-up.

Is there approximately 6.0 V?

NO



YES

- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.

Turn the ignition switch OFF.

Disconnect the 12-P connector from the TCS control unit, the 12-P connector from the PGM-FI ECU and the 26-P connector from the A/T control unit.

Check for continuity between the TCS control unit No. 41 terminal and body ground.

Is there continuity?

NO

YES

Repair short in the GRN wire between the TCS control unit, PGM-FI ECU and A/T control unit.

(To page 19-106)

12-P CONNECTOR

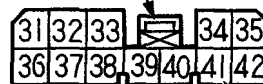


View from terminal side.



GRN WIRE (NEP)

12-P CONNECTOR



View from terminal side.



GRN WIRE (NEP)

(cont'd)

Troubleshooting

- Troubleshooting Flowchart (cont'd)

(From page 19-1 05)

Check for continuity in the GRN wire between the TCS control unit and PGM-FI ECU.

NOTE: Use the PGM-FI test harness (see section 1 1).

Is there continuity?

YES

NO

Repair open in the GRN wire between the TCS control unit and PGM-FI control unit.

Connect the 12-P connector to the PGM-FI ECU.

Start the engine.

Measure the voltage between the TCS control unit No. 41 terminal and body ground.

is there approximately 6.0 V?

NO

YES

Turn the ignition switch OFF.

Disconnect the 26-P connector to the A/T control unit.

Start the engine

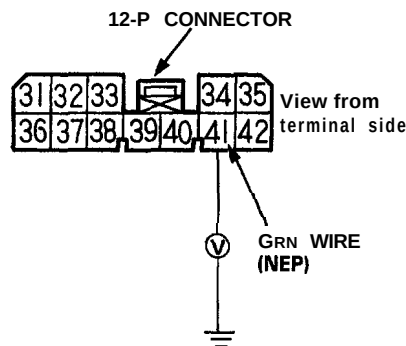
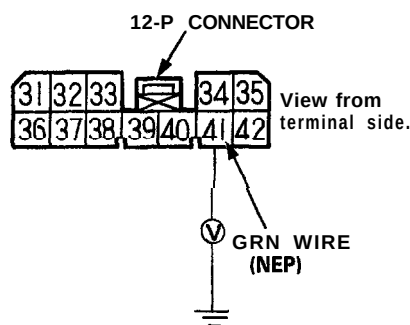
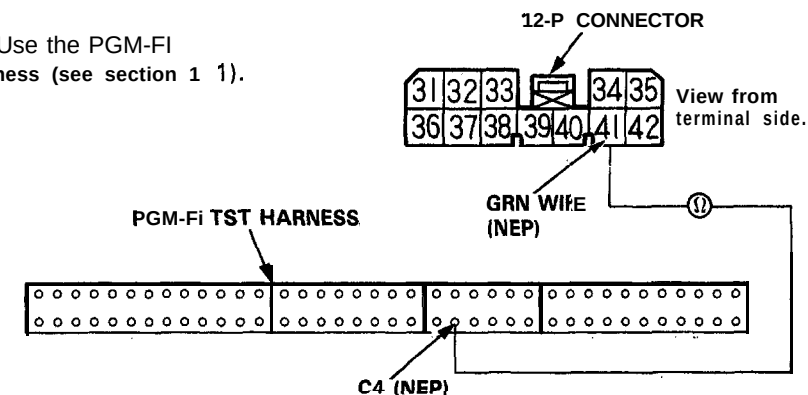
Measure the voltage between the TCS control unit No. 41 terminal and body ground.

is there approximately 6.0 V?

NO

YES

- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.



- Substitute a known-good PGM-FI ECU and recheck.
- Check for poor connections or loose wires.

Substitute a known-good A/T control unit and recheck. (internal short-circuit of the A/T control unit.)



Problem code 3-3: The output torque signal (TQ OUT).

Remove the ALB 2.3 (20A) fuse for more than 3 seconds to reset TCS control unit.

Start the engine.

Is problem code 3-3 indicated?

NO

Intermittent failure.
Check for poor connections or loose wires.

YES

Start the engine.

Measure the voltage between the TCS control unit No. 39 terminal and body ground.

Is there approximately 3.3 V?

NO

YES

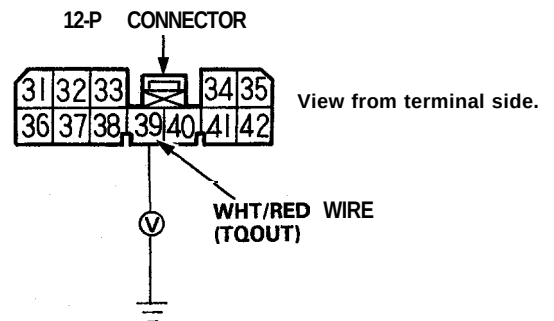
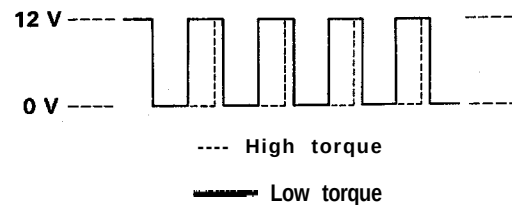
- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.

Turn the ignition switch OFF.

(To page 19-108)

NOTE:

- Use the 10 V range or a similar range in the analog tester.
- Check with the engine idling and warmed-up.



(cont'd)

Troubleshooting

- Troubleshooting Flowchart (cont'd)

(From page 19-107)

Disconnect the 12-P connector from the TCS control unit and the 12-P connector from the PGM-FI ECU.

Check for continuity in the WHT/RED wire between the TCS control unit and the PGM-FI ECU.

NOTE: Use the PGM-FI test harness (see section 11)

Is there continuity?

YES

NO

Repair open in the WHT/RED wire between the TCS control unit and PGM-FI ECU.

Check for continuity between the TCS control unit No. 39 connector and body ground.

Is there continuity?

NO

YES

Repair short in the WHT/RED wire between the TCS control unit and the PGM-FI ECU.

- Substitute a known-good PGM-FI ECU and recheck.
- Check for poor connections or loose wires.

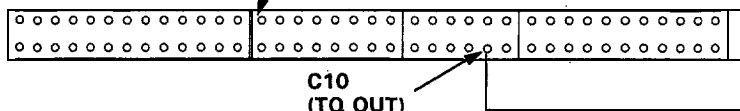
12-P CONNECTOR



View from terminal side.

WHT/RED WIRE (TQOUT)

PGM-FI TEST HARNESS



12-P CONNECTOR



View from terminal side.

WHT/RED WIRE (TQOUT)



Problem code 3-4: The 5V standard voltage (VREF).

Remove the ALB 2.3 (20A) fuse for more than 3 seconds to reset TCS control unit.

Start the engine

Is problem code 3-4 indicated?

NO

Intermittent failure.
Check for poor connections or loose wires.

YES

Measure the voltage between the TCS control unit No. 13 terminal and body ground.

Is there approximately 5 V?

NO

YES

- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.

Turn the ignition switch OFF.

(To page 19-110)

20-P CONNECTOR



BLU WIRE
(VREF)

V

View from terminal side.

4

(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

(From page 19-109)

Disconnect the 20-P connector from the TCS control unit, the 22-P connector from the PGM-FI ECU and the 20-P connector from the A/T control unit.

Check for continuity between the TCS control unit No. 13 terminal and body ground.

Is there continuity?

NO

YES

Repair short in the **BLU** wire between the TCS control unit, **PGM-FI** ECU and the A/T control unit.

Check for continuity in the BLU wire between the TCS control unit and PGM-FI ECU.

Is there continuity?

YES

NO

Repair open in the BLU wire between the TCS control unit and PGM-FI ECU.

Connect the 22-P connector to the PGM-FI ECU.

Turn the ignition switch ON.

Measure the voltage between the TCS control unit No. 13 terminal and body ground.

Is there approximately 5 V?

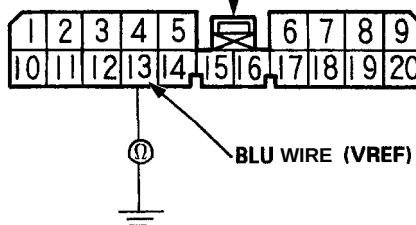
NO

YES

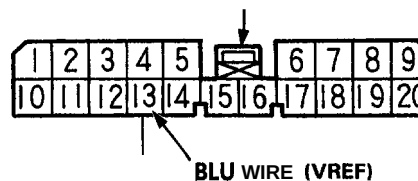
(To page 19-111)

- Substitute a known-good PGM-FI ECU and recheck.
- Check for poor connections or loose wires.

20-P CONNECTOR

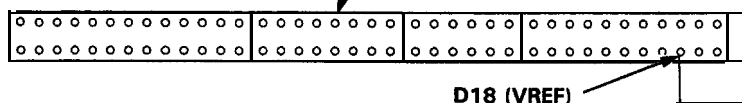


20-P CONNECTOR

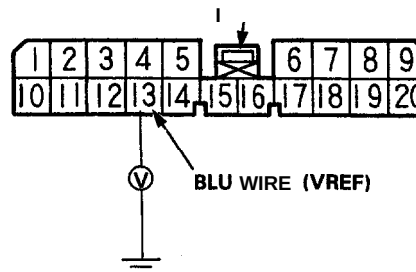


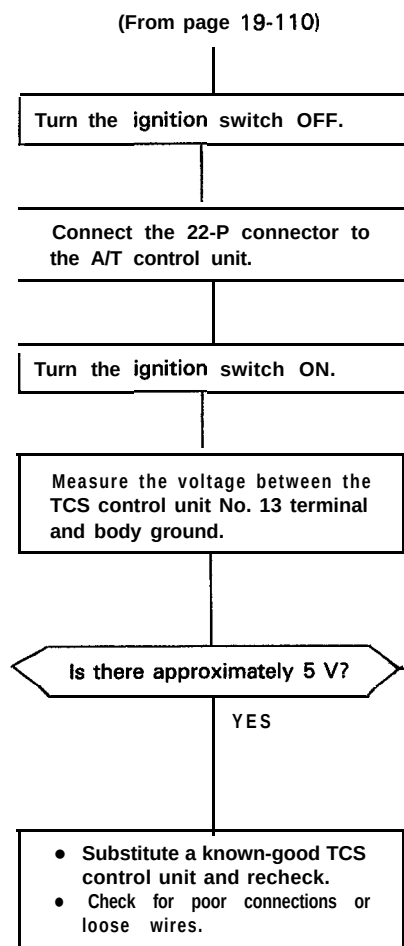
NOTE: Use the PGM-FI test harness (see section 11)

PGM-FI TEST HARNESS



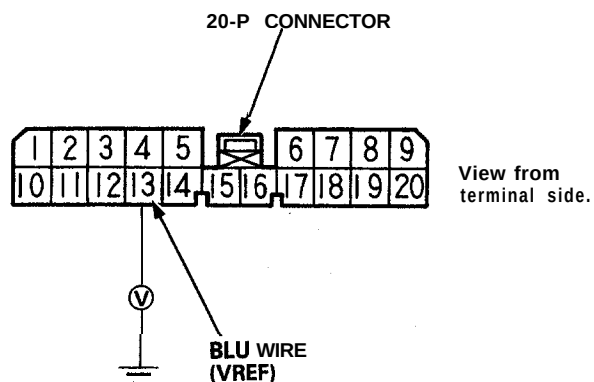
20-P CONNECTOR





NO

Substitute a known-good AK control unit and recheck.
(Internal short-circuit of the A/T control unit.)



(cont'd)

Troubleshooting

- Troubleshooting Flowchart (cont'd)

Problem code 3-5: The atmospheric pressure sensor (PA).

Remove the ALB 2.3 (20A) fuse and Clock (7.5A) fuse for more than 10 seconds to reset the PGM-FI ECU and TCS control unit.

Start the engine.

Does the Check Engine light indicate problem code 13?

NO

Intermittent failure.
Check for poor connections or loose wires.

YES

Does the check engine light indicate problem code 13?

NO

YES

Repair according to the PGM-FI troubleshooting guide.

Measure the voltage between the TCS control unit No. 12 terminal and body ground.

Is the voltage approximately 2.0 V to 3.0 V?

NO

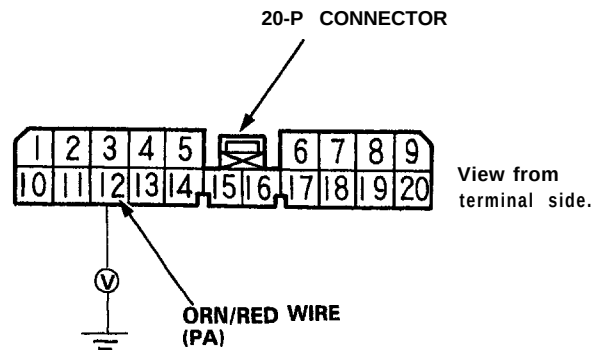
YES

- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.

Turn the ignition switch OFF.

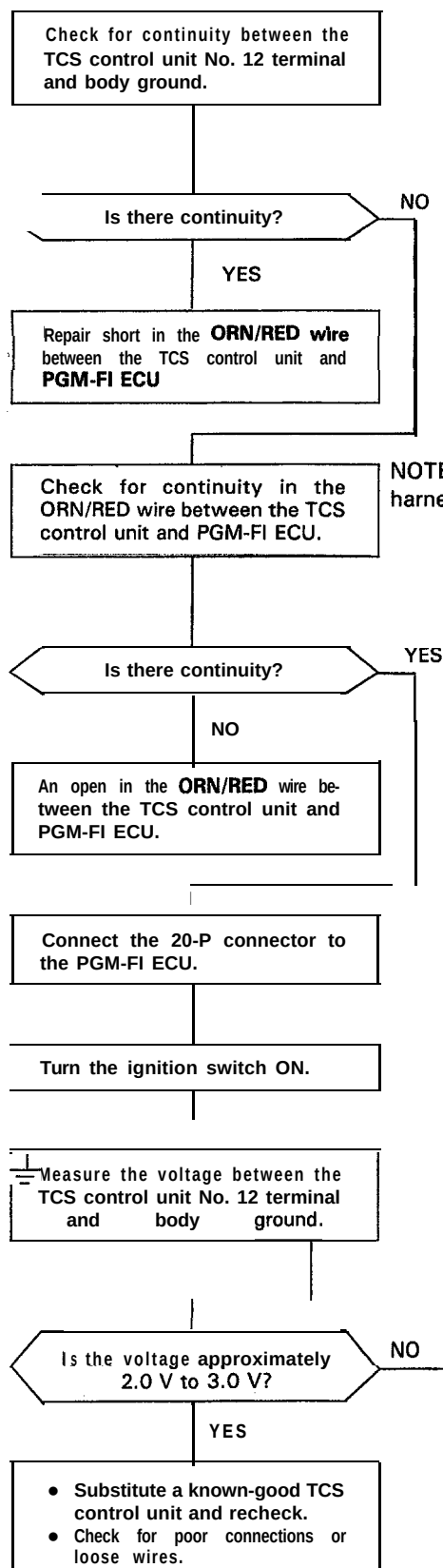
Disconnect the 20-P connector from the TCS control unit and the 22-P connector from the PGM-FI ECU.

(To page 19-113)

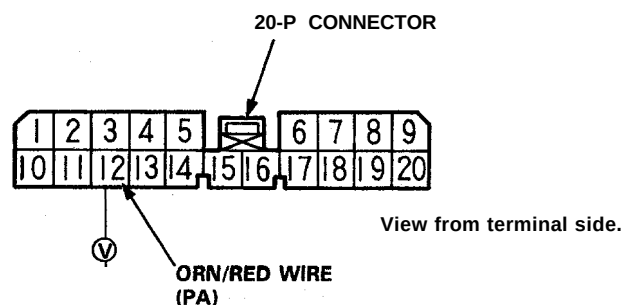
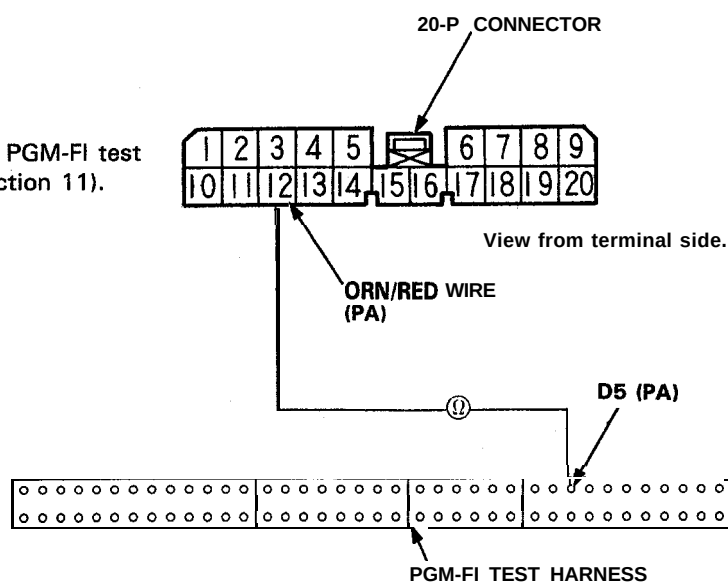
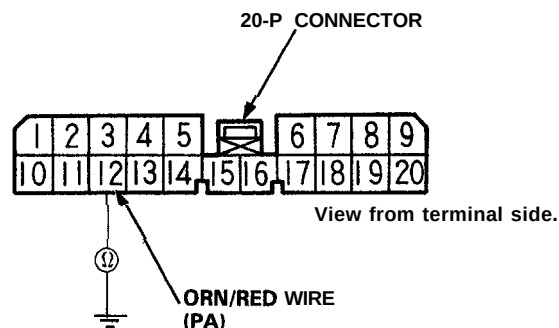




(From page 19-112)



NOTE: Use the PGM-FI test harness (see section 11).



(cont'd)

Troubleshooting

- Troubleshooting Flowchart (cont'd)

Problem code 3-6: The pedal angle sensor (θ ACP).

Remove the **ALB 2.3 (20A)** fuse for more than 3 seconds to reset the TCS control unit.

Start the engine.

Is problem code 3-6 indicated?

NO

Intermittent failure.
Check for poor connections or loose wires.

YES

Turn the ignition switch OFF.

Disconnect the 3-P connector from the pedal angle sensor.

Turn the ignition switch ON.

Measure the voltage between the No. 1 (+) and No. 3 (-) terminals.

Is there approximately 5V?

NO

Measure the voltage between the No. 1 terminal and body ground.

YES

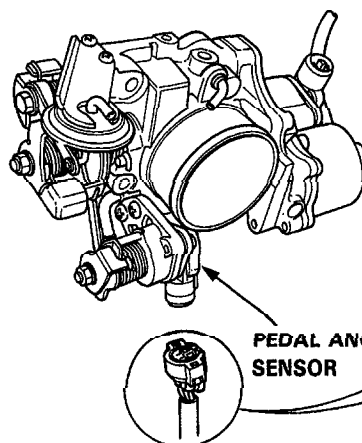
Turn the ignition switch OFF.

Connect the 3-P connector to the pedal angle sensor.

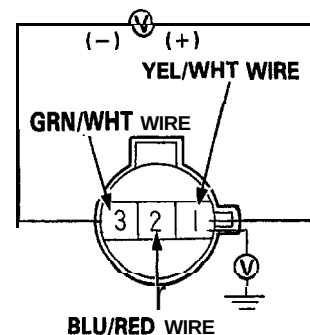
Turn the ignition switch ON.

When the throttle is completely closed and open, measure the voltage between the TCS control unit No. 4 terminal and body ground.

(To page 19-115)



PEDAL ANGLE SENSOR



View from terminal side.

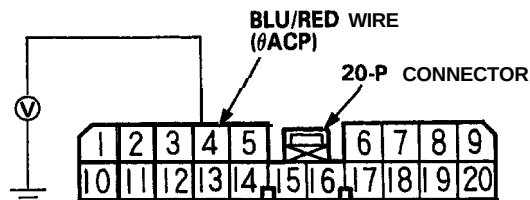
Is there approximately 5V?

NO

Check for open or short in the **YEL/WHT** wire between the PGM-FI ECU and pedal angle sensor. If the wire is OK, substitute a known-good PGM-FI ECU and recheck.

YES

Repair open in the **GRN/WHT** wire between the PGM-FI ECU and the pedal angle sensor.



View from terminal side.



(From page 19-114)

Is there voltage ?

- Approximately 0.5 V when completely closed.
- Approximately 4.5 V when completely open.
- Between the 0.5 V (closed) and 4.5 V (open).

NO

YES

- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.

Turn the ignition switch OFF.

Disconnect the 20-P connector from the TCS control unit, 8-P connector from the PGM-FI ECU, 3-P connector from the pedal angle sensor and the 22-P connector from the A/T control unit.

Check for continuity between the TCS control unit No. 4 terminal and body ground.

Is there continuity?

NO

YES

Repair short in the BLU/RED wire between the TCS control unit, PGM-FI ECU, A/T control unit and the pedal angle sensor.

Check for continuity in the BLU/RED wire between the TCS control unit and pedal angle sensor.

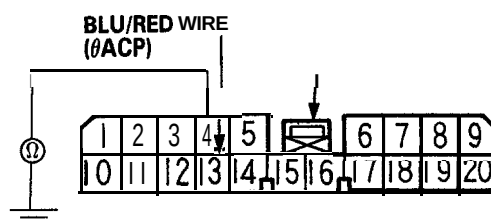
Is there continuity?

NO

YES

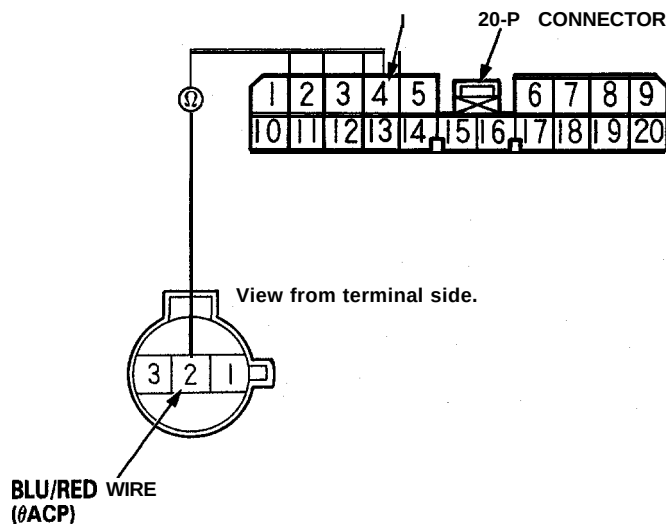
- If OK, replace the pedal angle sensor.
- Check for poor connections or loose wires.

20-P CONNECTOR



BLU/RED WIRE (θACP)

20-P CONNECTOR



BLU/RED WIRE (θACP)

Repair open in the BLU/RED wire between the TCS control unit and pedal angle sensor.

(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

Problem code 3-7: The throttle opening angle sensor (θ TH)

NOTE: If the Check Engine light indicates problem code 7 or "D" indicator light indicates problem code 3, refer to the appropriate troubleshooting flowchart.

Remove the ALB 2.3 (20 A) fuse for more than 3 seconds to reset TCS control unit.

Start the engine.

Is problem code 3-7 indicated?

NO

intermittent failure.
Check for poor connections or poor wires.

YES

When the throttle is completely closed and open, measure the voltage between the TCS control unit No. 3 terminal and body ground.

Is there voltage?

- Approximately 0.5 V when completely close.
- Approximately 4.5 V when completely open.
- Between the 0.5 V (closed) and 4.5 V (open).

NO

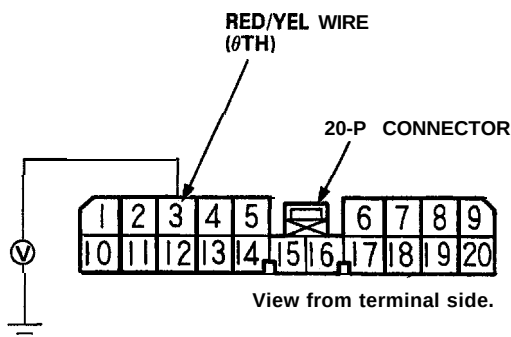
YES

- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.

Turn the ignition switch OFF.

Disconnect the 20-P connector from the TCS control unit and the 3-P connector from the throttle angle sensor.

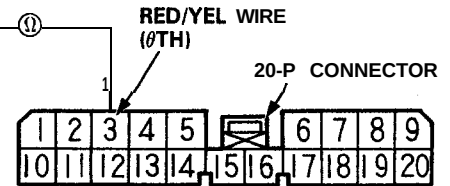
(To page 19-I 17)





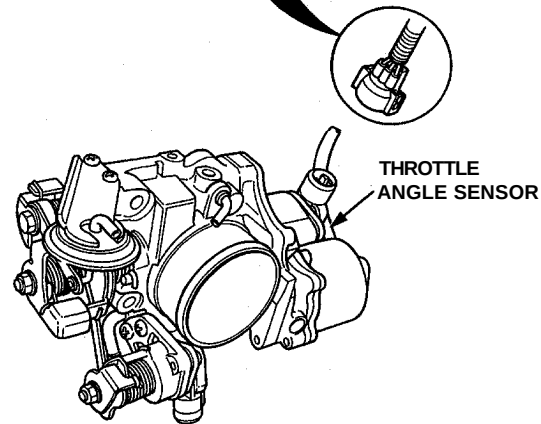
(from page 19-I 16)

Check for continuity in the RED/
YEL wire between the TCS con-
trol unit and throttle angle sensor.



View from terminal side.

RED/YEL WIRE
(θTH)



Is there continuity?

NO

YES

- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.

Repair open in the RED/YEL wire between the TCS control unit and the throttle angle sensor. (Problem codes are displayed by the PGM-FI and the **A/T** indicators when there is a short.)

(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

Problem code 4-1: Wheel sensor R. Front. 4-4: Wheel sensor R. Rear.
4-2: Wheel sensor L. Front 4-8: Wheel sensor L. Rear.

NOTE: The **TCS** indicator light comes on when the average speed of either the right or left front wheels exceeds 15 km/h (9.3 mph) and the ANTI-LOCK BRAKE control unit signal stops for more than 3 seconds.

Remove the ALB 2.3 (20 A) fuse for more than 3 seconds to reset the TCS and Anti-lock brake control units.

Test drive for approximately 3 miles at more than 15 km/h (9.3 mph).

Check the TCS system for a problem code.

Are problem codes 4-1, 4-2, 4-4 and 4-8 indicated?

NO

Intermittent failure.
Check for poor connections or loose wires.

YES

Check the Anti-lock brake system for a problem code.

Are problem codes 4-1, 4-2, 4-4 and 4-8 indicated?

NO

NOTE: Use the 10 V range or a similar range in the analog tester.

YES

Perform the repair according to the Anti-lock brake control unit troubleshooting chart.

Measure the voltage between the TCS control unit 20-P connector No. 7, 9, 18 and 20 terminals and body ground.

Make sure that there is 0 V when the wheel is stopped and approximately 2 V when the wheel is rotated by hand.

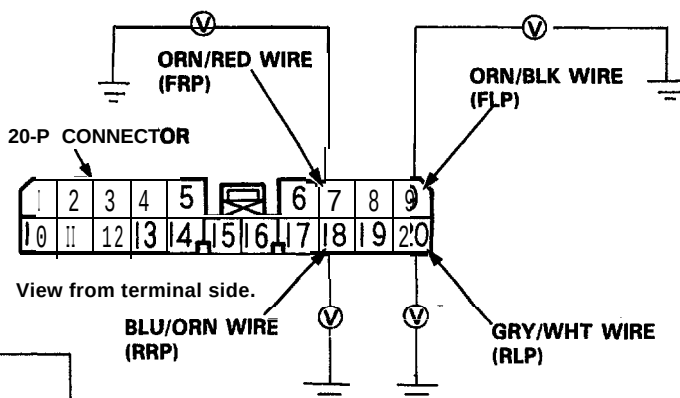
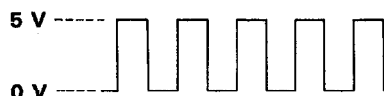
Is there voltage?

ON

YES

- Substitute a known-good TCS control unit and recheck.
- Check for poor connections or loose wires.

(To page 19-1 19)





(From page 19-118)

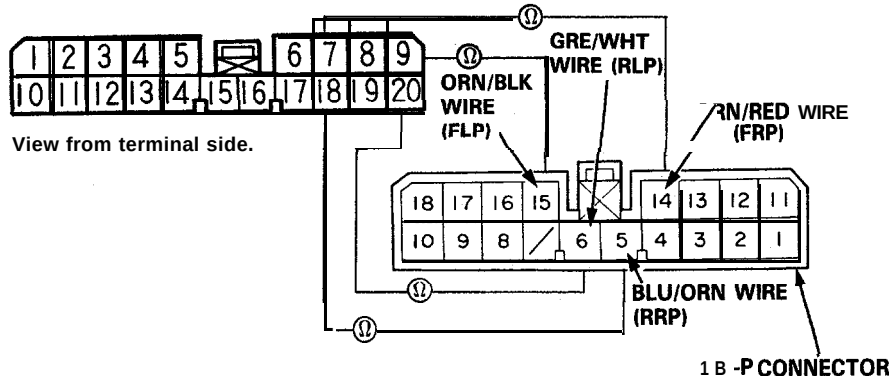
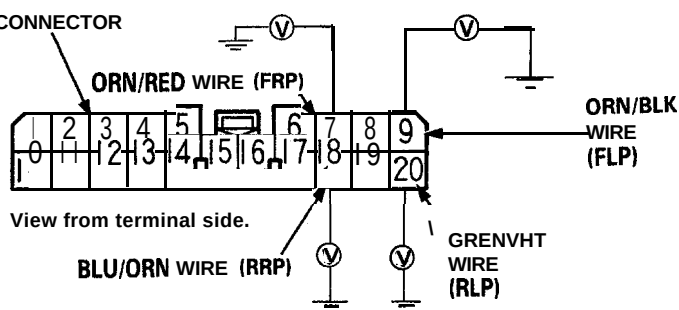
Turn the ignition switch OFF.

Disconnect the 18-P connector from the Anti-lock brake control unit.

Turn the ignition switch ON.

Measure the voltage between the TCS control unit 20-P connector No. 7, 9, 18 and 20 terminals and body ground.

20-P CONNECTOR



Is there approximately 5 V?

NO

YES

Turn the ignition switch OFF.

Disconnect the 20-P connector from the TCS control unit.

Check for continuity in the ORN/RED, ORN/BLK, BLU/ORN and GRY/WHT wires between the TCS control unit and the Anti-lock brake control unit.

Is there continuity?

YES

NO

Repair open in the ORN/RED, ORN/BLK, BLU/ORN and GRY/WHT wires between the TCS control unit and the Anti-lock brake control unit.

Turn the ignition switch OFF.

Disconnect the 20-P connector from the TCS control unit.

Check for continuity between the TCS control unit No. 7, 9, 18 and 20 terminals and body ground.

Is there continuity?

NO

YES

Repair short-circuit in the ORN/RED, ORN/BLK, BLU/ORN and GRY/WHT wires between the TCS control unit and the Anti-lock brake control unit.

- Substitute a known-good control unit and recheck.
- Check for poor connections or loose wires.

- Substitute a known-good ALB control unit and recheck
- Check for poor connections or loose wires.

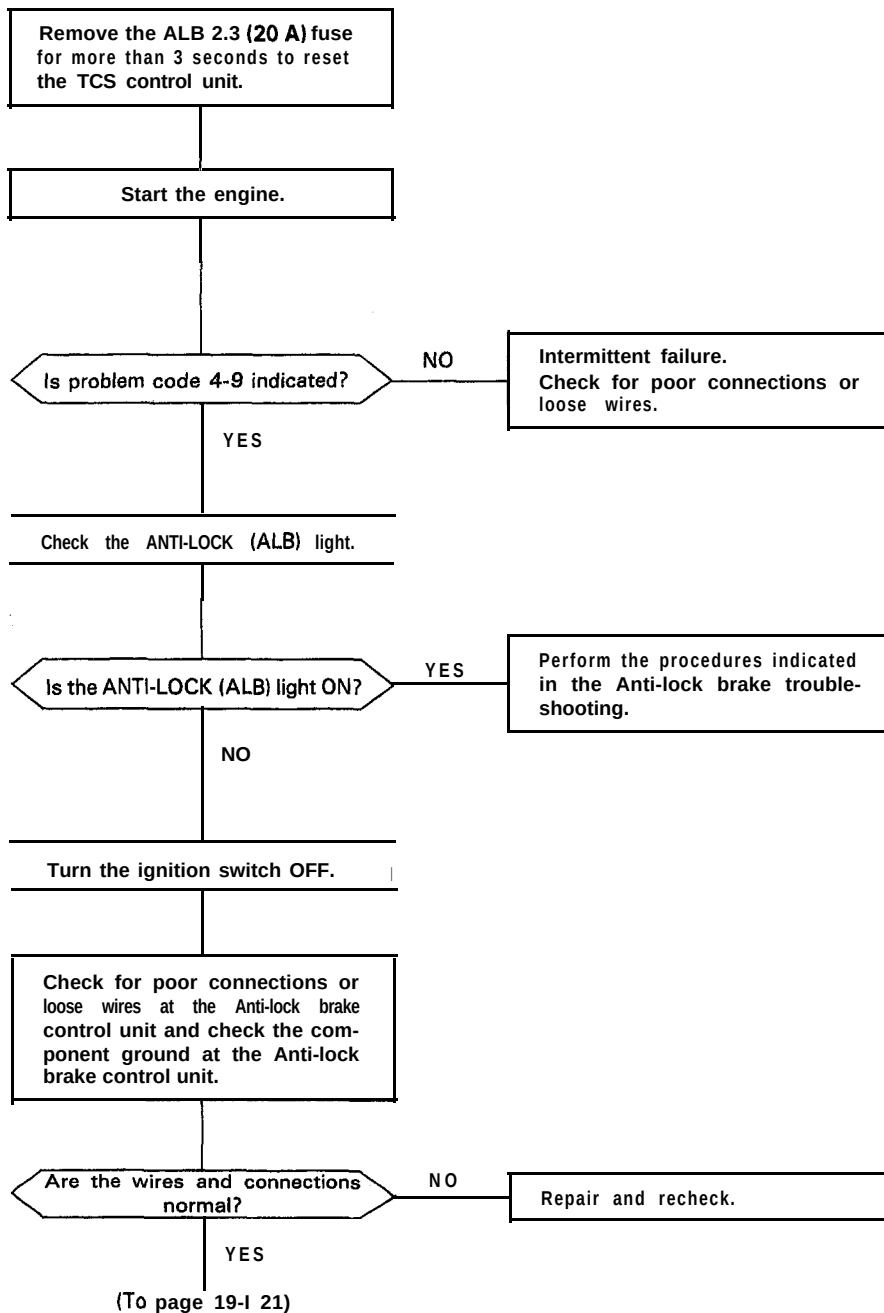
(cont'd)

Troubleshooting

• Troubleshooting Flowchart-(cont'd)

Problem code 4-9: All wheel sensors.

NOTE: The TCS indicator light comes on when the vehicle is stopped and engine is running and signals from all four wheels are disconnected for more than three seconds.





(From page 19-120)

Disconnect the 20-P connector from the TCS control unit and 18-P connector from the Anti-lock brake control unit.

Check for continuity between;

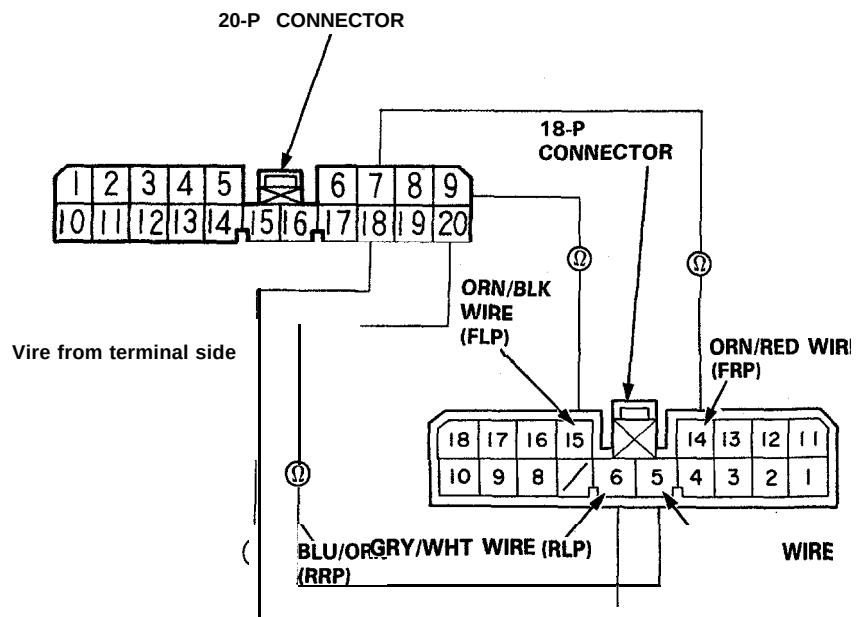
- 20-P connector and 18-P connector
 - No. 7 (ORN/RED) and No. 14 terminals
 - No. 9 (ORN/BLK) and No. 15 terminals
 - No. 18 (BLU/ORN) and No. 5 terminals
 - No. 20 (GRY/WHT) and No. 6 terminals

Is there continuity?

YES

No

Repair open in the ORN/RED, ORN/BLK, BLU/ORN or GRY/WHT wire between the TCS control unit and ALB control unit.



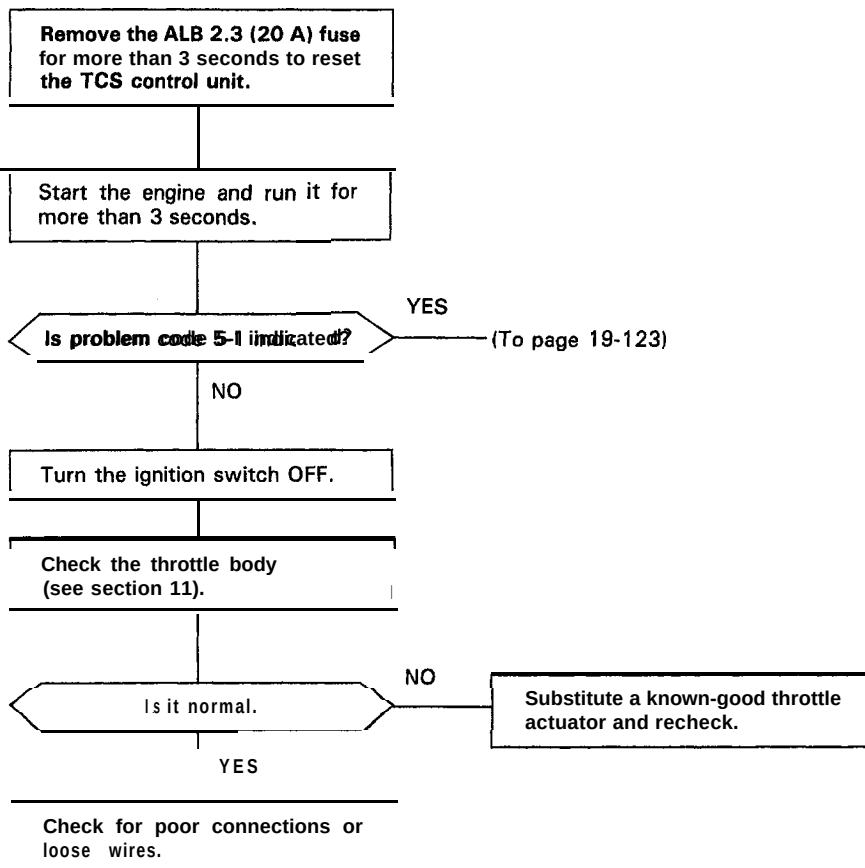
- Check for poor connections or loose wires at TCS control unit.
- Substitute known-good TCS control unit and recheck.

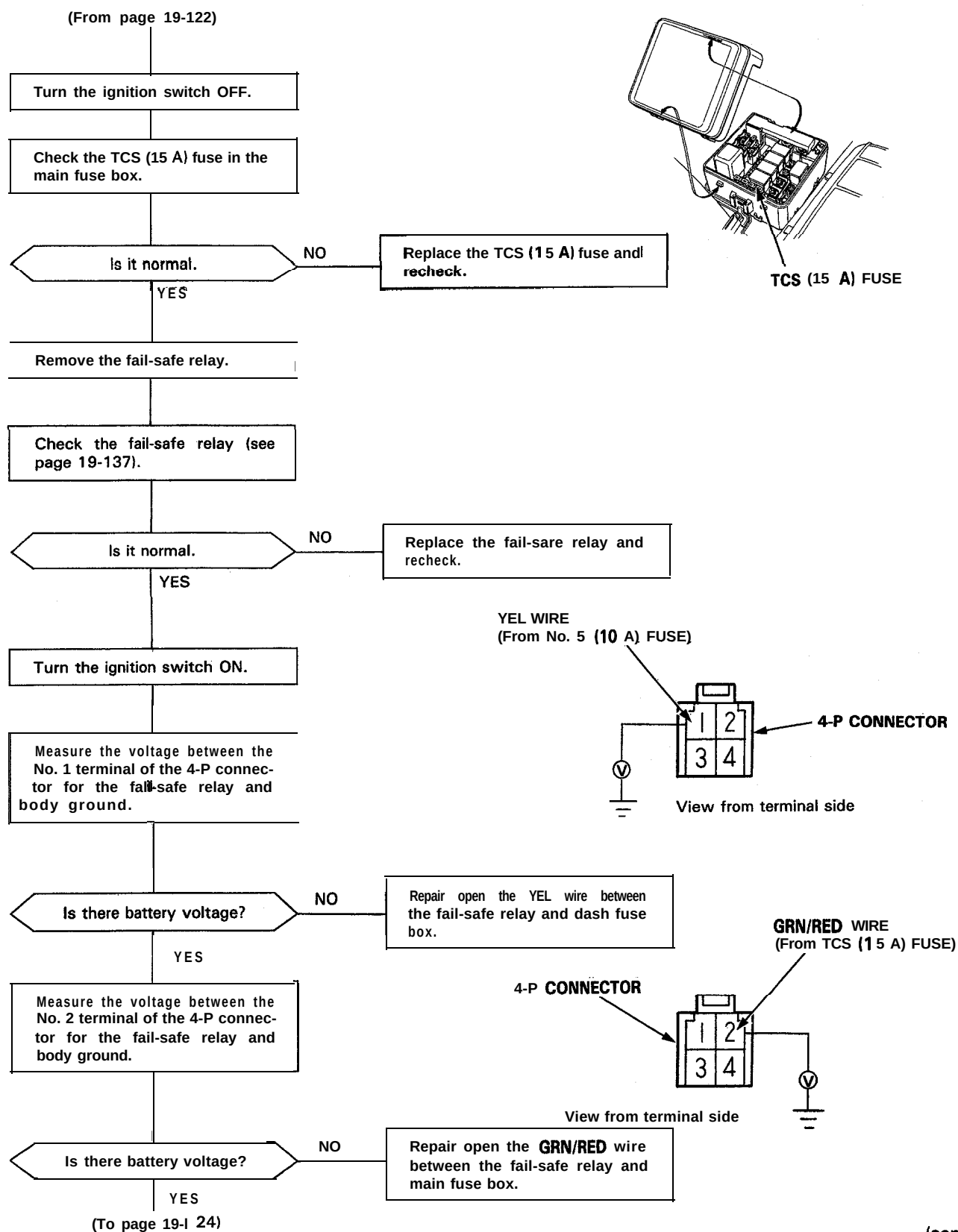
(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

Problem code 5-1 : Fail-safe relay system and the throttle actuator system.





(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

(From page 19-I 23)

Turn the ignition switch OFF.

Install the fail-safe relay.

Disconnect the 20-P connector from the TCS control unit.

Turn the ignition switch ON.

Measure the voltage between the No.2 (RED/BLK) terminal of the 20-P connector and body ground.

Is there battery voltage?

NO

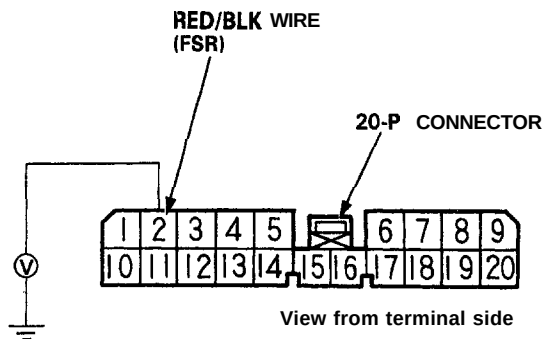
(To page 19-126)

YES

Turn the ignition switch OFF.

Connect the 20-P connector to the TCS control unit.

(To page 19-I 25)





(From 19-I 24)

Measure the voltage between the No. 2 (RED/BRK) terminal of the 20-P connector and body ground.

Start the engine.

When the TCS indicator light remains ON: is there battery voltage?
When the TCS indicator light remains OFF: is there no voltage?

NO

- Check for poor connections or loose wire.
- Substitute a known-good TCS control unit and recheck.

YES

Measure the voltage between the No. 23, No. 24 terminals of the 1 O-P connector for the TCS control unit and body ground.

Is there battery voltage?

YES

(To page 19-I 27)

NO

Turn the ignition switch OFF.

Disconnect the 1 O-P connector from the TCS control unit and 4-P connector from the fail-safe relay.

Check for continuity between the No. 23, No. 24 terminals of the 10-P connector and No. 4 terminal of the 4-P connector

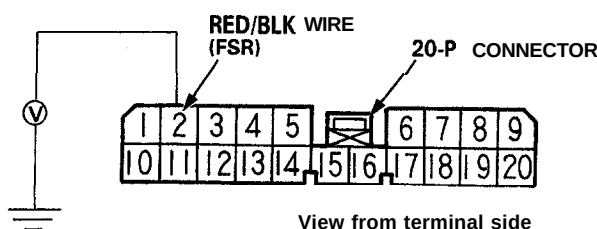
Is there continuity?

YES

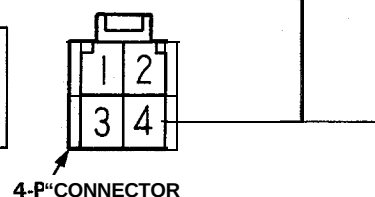
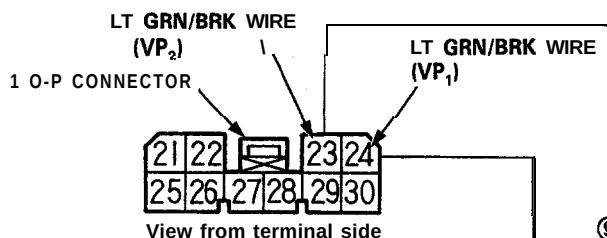
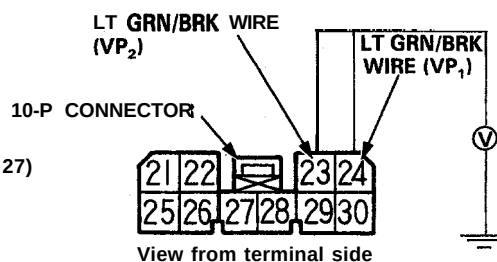
- Check for poor connections or loose wires.
- Substitute a known-good TCS control unit and recheck.

NO

1
Repair open in the LT GRN/BRK wires between the TCS control unit and fail-safe relay.



NOTE: Since there is a capacitor inside the TCS control unit, the battery voltage can be measured if the fail-safe relay system is functioning properly.



(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

(From page 19-124)

Turn the ignition switch OFF.

Disconnect the 4-P connector from the fail-safe relay.

Check for continuity between the No. 2 terminal of the 20-P connector for the TCS control unit and No. 3 of the 4-P connector for the fail-safe relay.

Is there continuity?

NO

Repair open in the **RED/BLK** wire between the TCS control unit and fail-safe relay.

YES

Check for continuity between the No. 2 (RED/BLK) terminal of the 20-P connector and body ground.

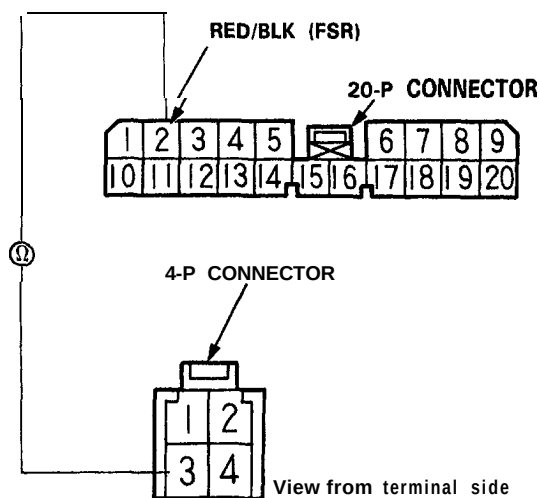
Is there continuity?

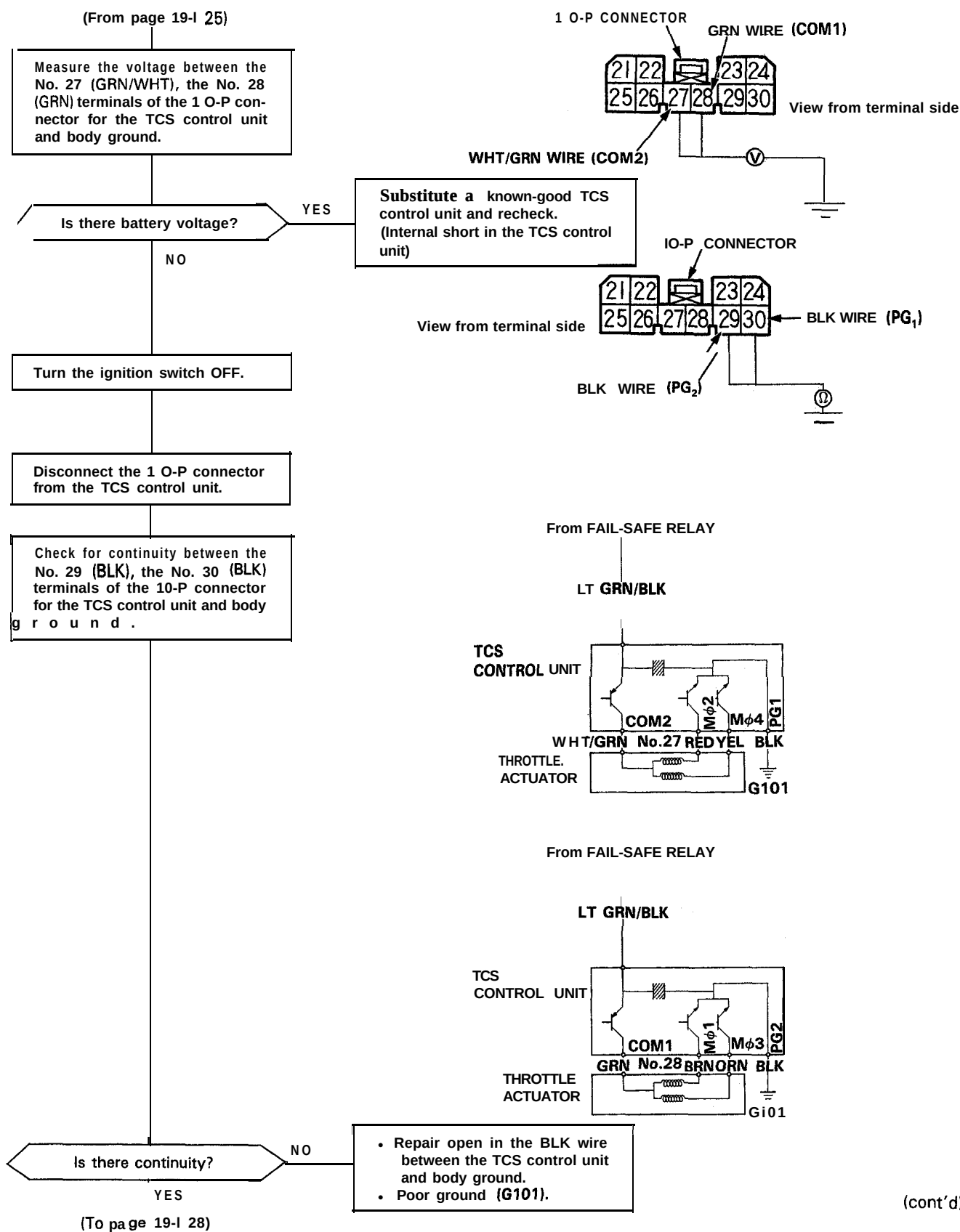
YES

Repair short in the RED/ BRK wire to the body ground.

NO

- Check for poor connections or loose wires.
- Substitute a known-good TCS control unit and recheck.





Troubleshooting

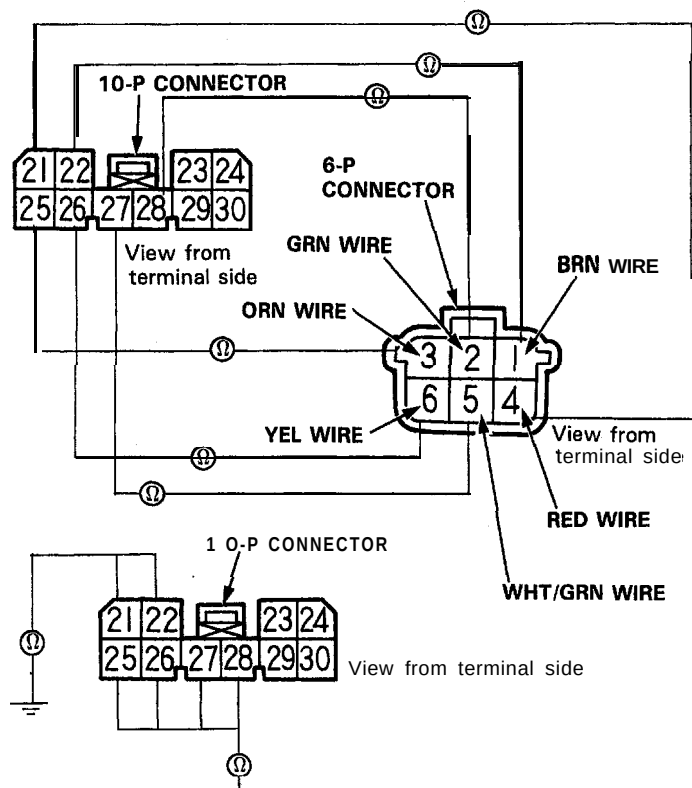
Troubleshooting Flowchart (cont'd)

(From page 19-127)

Disconnect the 6-P connector from the throttle actuator.

Check for continuity between;

- IO-P connector and 6-P connector
 - No.21 (RED) and No.4 (RED) terminals
 - No.22 (BRN) and No.1 (BRN) terminals
 - No.25 (ORN) and No.3 (ORN) terminals
 - No.26 (YEL) and No.6 (YEL) terminals
 - No.27 (WHT/GRN) and No.5 (WHT/GRN) terminals
 - No.28 (GRN) and No.2 (GRN) terminals
- IO-P connector and body ground
 - No.21 (RED) terminal and body ground
 - No.22 (BRN) terminal and body ground
 - No.25 (ORN) terminal and body ground
 - No.26 (YEL) terminal and body ground
 - No.27 (WHT/GRN) terminal and body ground
 - No.28 (GRN) terminal and body ground



Is there continuity without a short to body ground?

NO

Repair wire between the TCS control unit and throttle actuator that is defective.

YES

Check for continuity (internal short) between the terminals of the 6-P connector;

- No.1, No.3 and No.5 terminals
- No.4, No.6 and No.2 terminals

NOTE: Inspect the single unit throttle actuator.

Is there continuity?

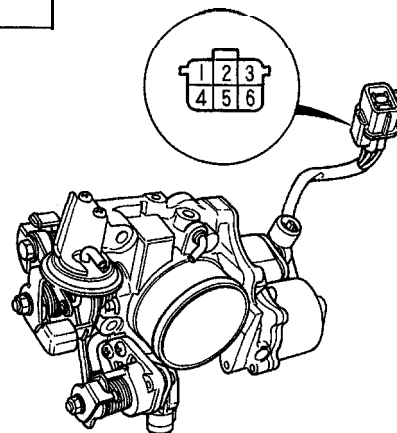
YES

Replace the throttle actuator.

NO

(To page 19-129)

View from terminal side

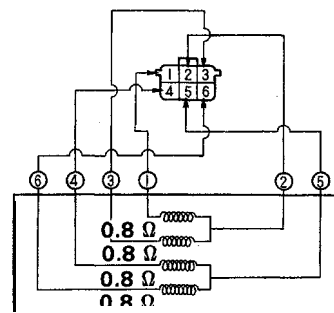




(From page 19-128)

Measure resistance between the terminals of the 6-P connector;

- No. 1, No.3 and No.2 terminals
- No.4, No.6 and No.5 terminals



Is there approximately 0.8 Ω?

NO

Replace the throttle actuator.

YES

Check for continuity (short) between the terminals of the 6-P connector and throttle actuator body.

Is there continuity?

YES

Replace the throttle actuator.

NO

Connect the 10-P and 20-P connector to the TCS control unit and 6-P connector to the throttle actuator.

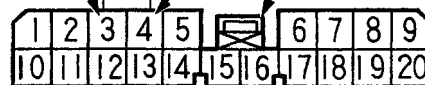
Turn the ignition switch ON.

Measure the voltage between the No.3 (RED/YEL), and the No.4 (BLU/RED) terminals of the 20-P connector for the TCS control unit when the accelerator pedal is released.

RED/YEL WIRE (θTH)

BLU/RED WIRE (θACP)

20-P CONNECTOR



View from terminal side

Is there more than approximately 0.3 V?

YES

Substitute a known-good throttle actuator assembly and recheck.

NO

- Check for poor connections or loose wires.
- Substitute a known-good TCS control unit and recheck.

(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

Problem code 6-1: The A/T shift position signal (ATSP).

Remove the ALB 2.3 (20 A) fuse for more than 3 seconds to reset the TCS control unit.

Raise the car and support it with safety stands (see section 1).

Start the engine.

Make sure the TCS OFF indicator light does not come on.

Shift the shift lever ☐ range then slowly increase the speed up to 50 km/h (31 mph) and maintain this speed for 30 seconds.

Is problem code 6-1 indicated?

YES

(To page 19-132)

NO

Measure the voltage between the No. 6 (LT GRN) terminal of the 20-P connector for TCS control unit and body ground.

When the shift position is ☐ or ☐ : is there no voltage?
When the shifts **R**, **D**, **3**, **2** or battery voltage?

YES

Repair poor connections loose wire.

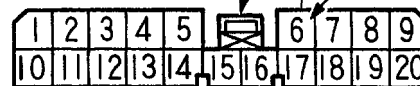
NO

Turn the ignition switch OFF.

(To page 19-131)

20-P CONNECTOR

LT GRN WIRE
(AT PN)



View from terminal side





(From page 19-130)

Disconnect the 20-P connector from the TCS control unit.

Check for continuity between the No. 6 (LT GRN) terminal of the 20-P connector and body ground.

When the shift position is ☐ or ☐ : is there continuity?
When the shift position is ☐ R , ☐ D , ☐ 3 , ☐ 2 or ☐ 1 ; is there no continuity?

YES

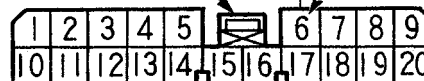
- Check for poor connections or loose wires.
- Substitute a known-good TCS control unit and recheck.

NO

- Repair open or short to ground in the LT GRN wire **between** the TCS control unit and shift position indicator.
- The shift position indicator or shift position console switch is defective.

20-P CONNECTOR

LT GRN WIRE
(AT PN)



View from terminal side



(cont'd)

Troubleshooting

Troubleshooting Flowchart (cont'd)

(From page 19-131)

Check the A/T control system for a problem code.

Is problem code indicated?

YES

Perform the procedures indicated in the A/T troubleshooting.

NO

Start the engine.

Measure the voltage between the No. 33 (ORN/BLU) terminal of the 12-P connector for TCS control unit and body ground when the shift position is **2** or **N**.

Is there voltage?

NO

(To page IS-I 33)

YES

Measure the voltage between the No. 33 (ORN/BLU) terminal of the 12-P connector for TCS control unit and body ground when the shift position is **1** or **R**.

Is there approximately 5.0-V?

NO

(To page 19-134)

YES

Turn the ignition switch OFF.

Disconnect the connectors from the A/T control unit.

Measure the voltage between the No. 33 (ORN/BLU) terminal of the 12-P connector for TCS control unit and body ground.

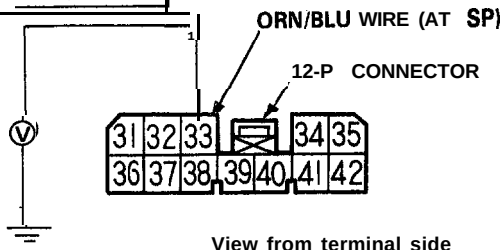
Is there voltage?

YES

Substitute a known-good TCS control unit and recheck.

NO

Substitute a known-good A/T control unit and recheck.





(From page 19-132)

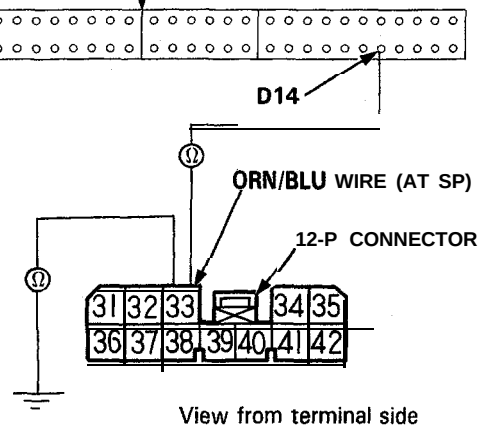
Turn the ignition switch OFF.

Disconnect the 12-P connector from the TCS control unit and 22-P connector from the A/T control unit, then connect the test harness to the 22-P connector.

Check for open or short in the ORN/BLU wire between the No. 33 terminal of the 12-P connector and D14 terminal of the test harness.

NOTE: Use the test harness (see section 14)

TEST HARNESS



Is there an open or short?

YES

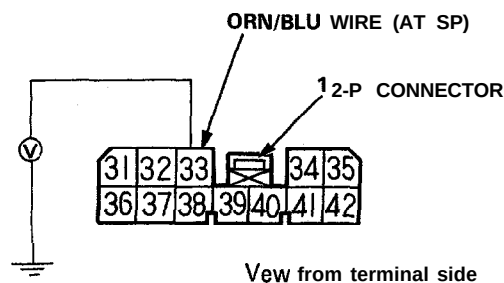
Repair open or short in the ORN/BLU wire.

NO

Reconnect the 22-P connector to the A/T control unit.

Start the engine.

Measure the voltage between the No. 33 (ORN/BLU) terminal of the 12-P connector for TCS control unit and body ground.



Is there voltage?

YES

- Check for poor connections or loose wire.
- Substitute a known-good TCS control unit and recheck.

NO

- Check for poor connections or loose wires.
- Substitute a known-good A/T control unit and recheck.

(cont'd)

Troubleshooting

-Troubleshooting Flowchart (cont'd)

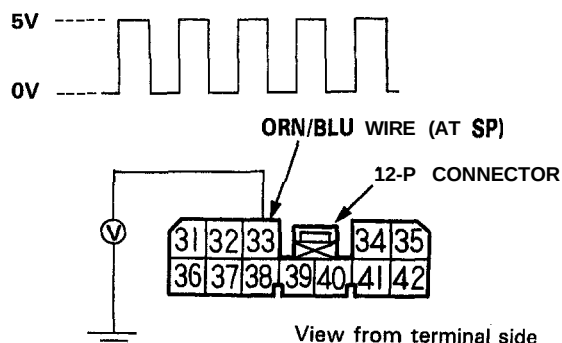
(From page 19-132)

Measure the voltage between the No. 33 (ORN/BLU) terminal of the 12-P connector for TCS control

shift position is 3 or ☐ in 4th.

NOTE:

- Check when engine is warmed up.
- Use the 10 V range or a similar range in the analog tester.



Is there approximately 2-3 V?

YES

- Check for poor connections or loose wires.
- Substitute a known-good TCS control unit and recheck.

NO

Turn the ignition switch OFF.

Disconnect the 20-P connector from the TCS control unit.

Start the engine.

Measure the voltage between the No. 33 (ORN/BLU) terminal of the 12-P connector for TCS control unit and body ground when the shift position is: ☐ or ☐ in 4th.

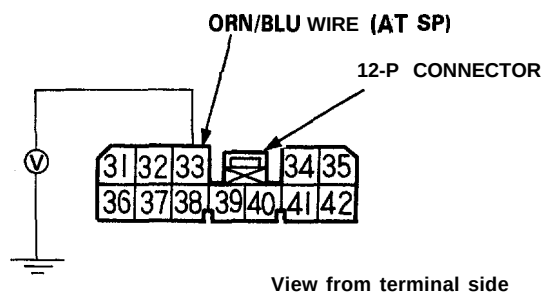
Is there approximately 2-3 V?

YES

- Check for poor connections or loose wires.
- Substitute a known-good TCS control unit and recheck. (internal short in the TCS control unit).

NO

Substitute a known-good A/T control unit and recheck.





Traction Control System Function Method

NOTE: Perform these procedures after the user reports these difficulties and the diagnosis is determined.

Raise the car and support it with safety stands (see section 1).

Check for TCS indicator lights.

Start the engine.

Press the brake pedal.

Make sure that the TCS indicator lights do not flash or light.

Are the lights normal?

NO

Perform the procedures indicated in the troubleshooting guide.

YES

Shift the transmission into **2**.

Press the accelerator pedal all the way down.

Make sure that the speedometer display change to approximately 20 mph (30 km/h) and the engine speed is 1,000-2,000 rpm.

Is it normal?

NO

Press the brake pedal and stop the rear wheels.

Turn the ignition switch OFF.

Measure the voltage between the No. 34 (GRN/WHT) terminal of the 12-P connector for the TCS control unit and body ground.

Is the voltage 0 V?

NOTE: Stop slowly to prevent damage to the suspension.

NO

Check the wire harness.

Replace the TCS control unit.

YES

Does it flash?

NO

YES

(To page 19-136)

NOTE: The TCS activation light, TCS OFF indicator light and TCS switch indicator light will remain on for about 2 seconds after the ignition switch is turned on to show that the system circuit is functioning.

GRN/WHT WIRE
(From BRAKE LIGHT SWITCH)

12-P CONNECTOR

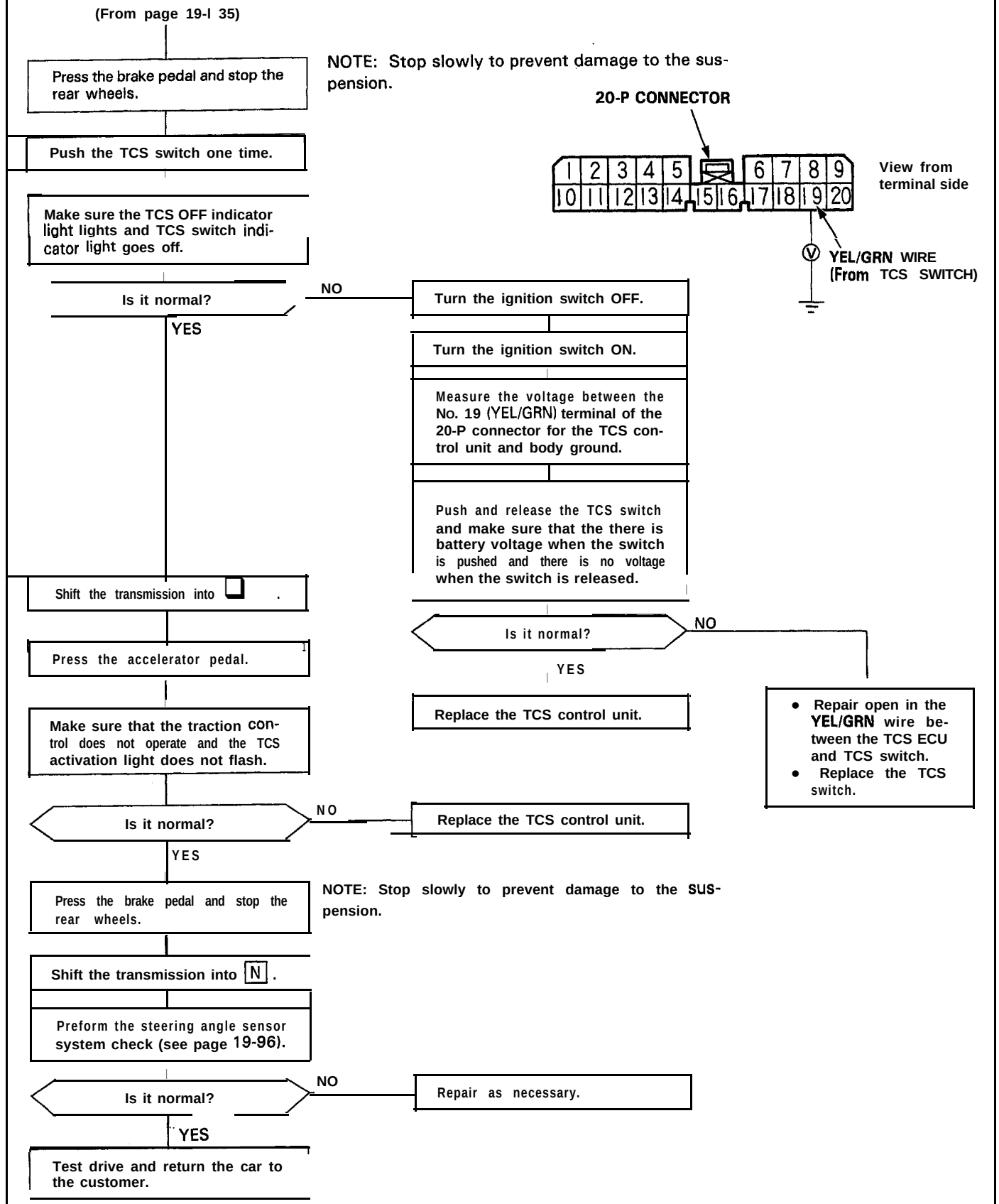


View from wire side



Troubleshooting

-Troubleshooting Flowchart (cont'd)



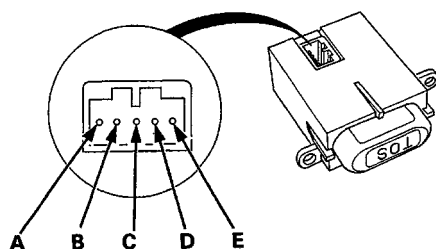
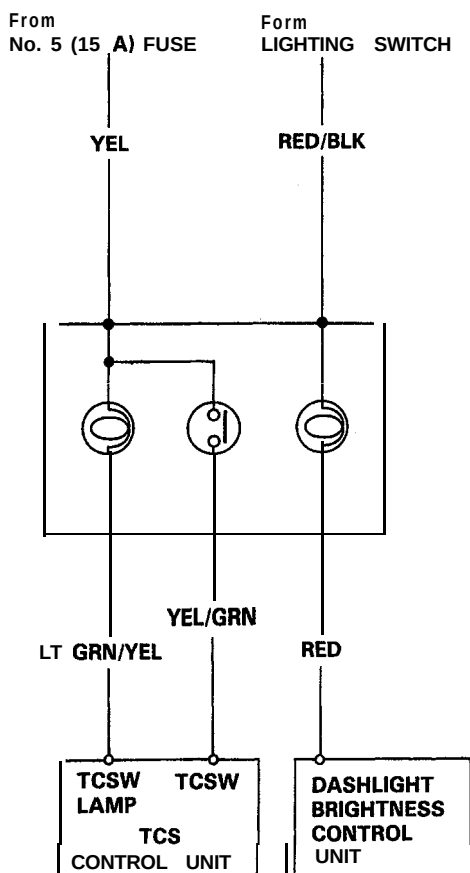


Electronic Components

-TCS Switch Test

There should be continuity between the D and E terminals when the switch is pushed and there should be no continuity when the switch is released.

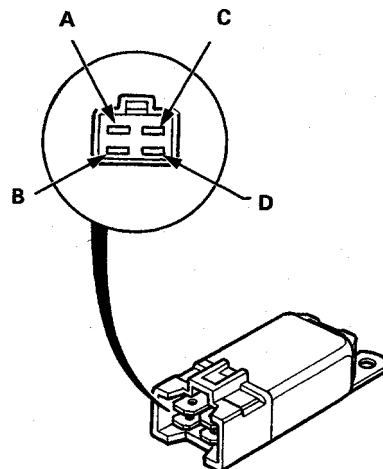
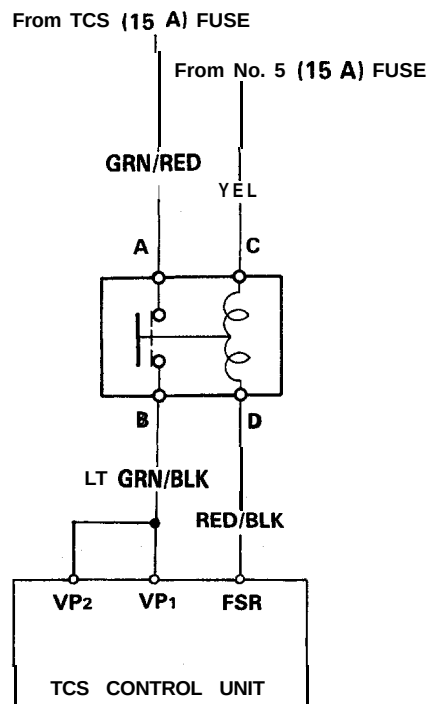
D...C: Indicator light
D...E: Switch
B...A: Light



- Fail-Safe Relay Test

There should be continuity between the A and B terminals when the battery is connected to the C and D terminals.

There should be no continuity between the A and B terminals when the battery is disconnected.

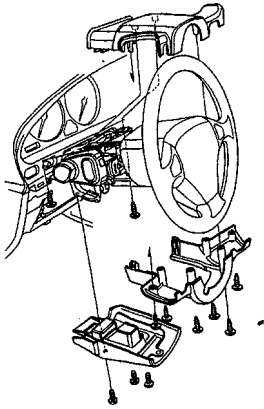


Electronic Components

Steering Angle Sensor Replacement

Removal:

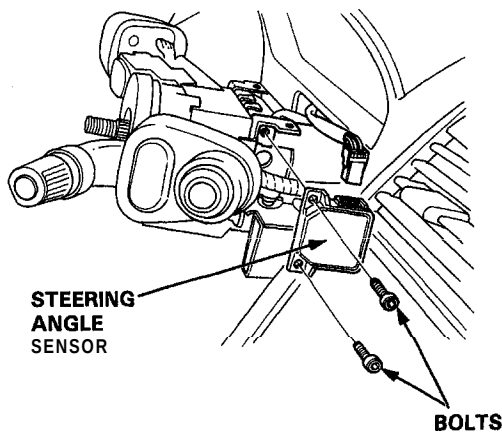
1. Remove the steering column covers.



2. Disconnect the 5-P connector from the steering angle sensor.
3. Remove the steering angle sensor mounting bolts, then remove the steering angle sensor.

NOTE: Take care not to drop the adjusting shim used between the steering angle sensor and sensor mounting bracket.

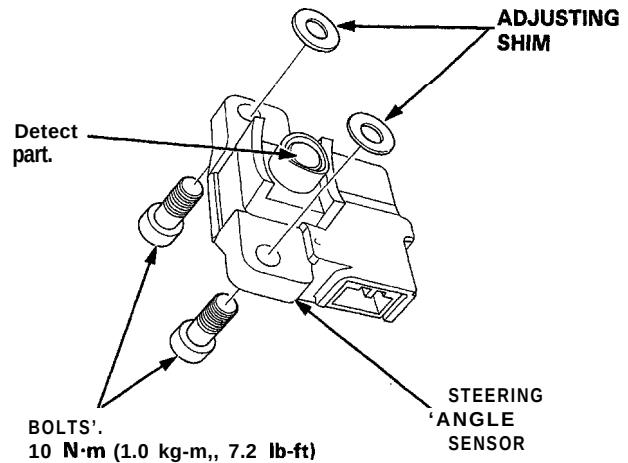
CAUTION: Handle with care not to damage or drop the steering angle sensor as it is sensitive.



Installation:

1. Install the steering angle sensor by tightening 2 bolts and make sure the adjusting shim is installed properly.

CAUTION: Do not apply any grease or oil to the adjusting shim.



2. Connect the 5-P connector to the steering angle sensor.
3. Install the steering column covers.
4. Perform the steering angle sensor system check (See page 19-96).
If there is an abnormality, check the troubleshooting flowchart (see page 19-96).

NOTE:

- There is no need to select (replace) the shim when the steering angle sensor is replaced.
Use the original shim.
- Selection (Replacement) of the adjusting shim (for adjusting the air gap) is required only when the steering column assembly (without the sensor) is replaced.



Selection of the adjusting shim for the steering angle sensor air gap adjustment.

NOTE:

- The adjustment of the air gap between the steering shaft and the steering angle sensor should be carried out in order to obtain adequate sensor output.
- The adjusting shim reference number is stamped on the steering column. Adequate air gap can be kept by selecting the adjusting shim with the reference number

Selection of The Adjusting Shim

Reference Number	Shim (P/N): (Thickness)
1	Not used: (0 mm)
2	A: (0.1 mm)
3	B: (0.2 mm)
4	A + B: (0.3 mm)
5	C: (0.4 mm)
6	A+C: (0.5 mm)
7	B + C: (0.6 mm)
8	D: (0.7 mm)

Adjusting Shim

Parts Number	Thickness	Color
A: 53395-SL0-A01	0.1 mm	Yellow
B: 53396-SL0-A01	0.2 mm	Black
C: 53397-SL0-A01	0.4 mm	Green
D: 53398-SL0-A01	0.7 mm	White

Reference Number Locations

