GROUP 31

WHEEL AND TIRE

CONTENTS

GENERAL DESCRIPTION

M1311000100327

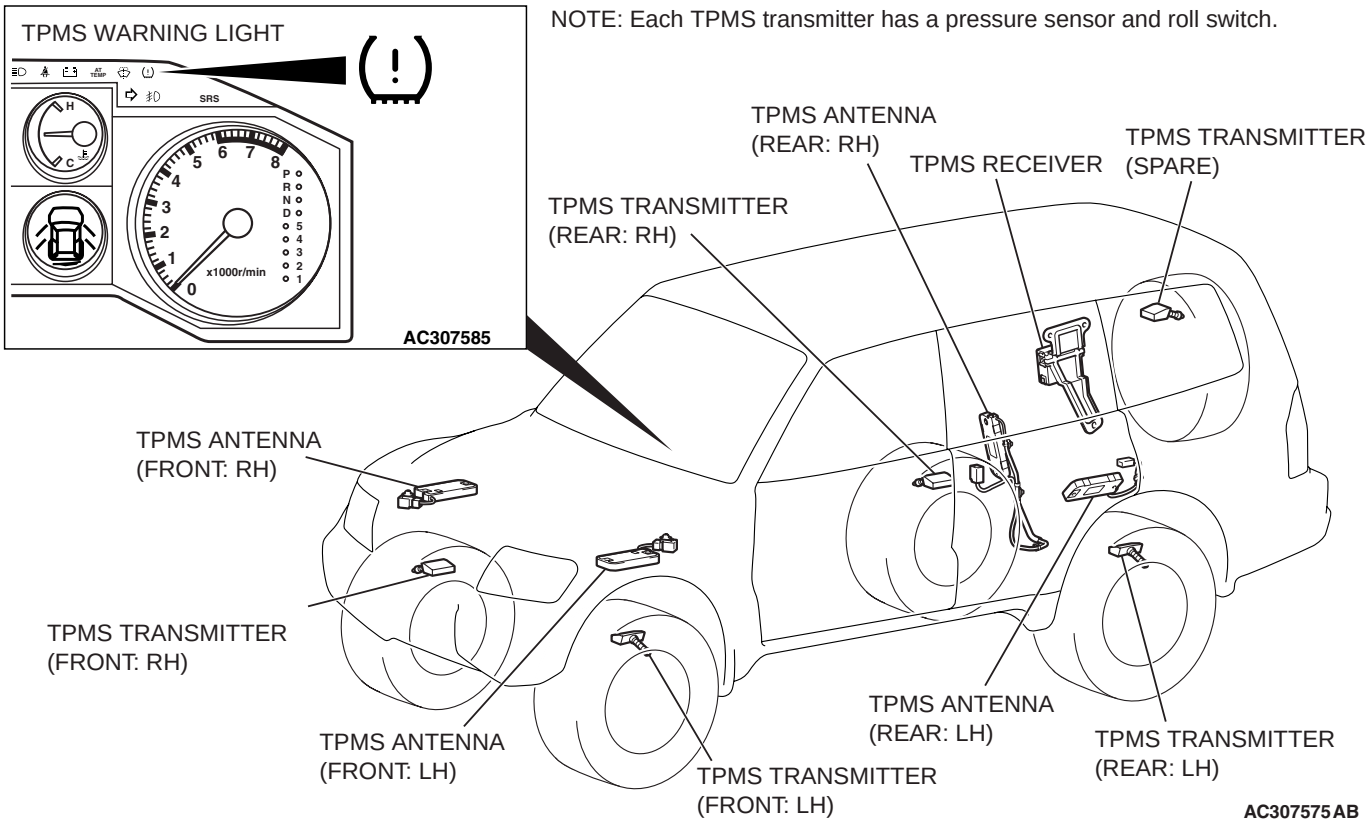
FEATURE

- Warns driver of low tire pressure by illuminating the TPMS warning light on the combination meter
- Warns driver of TPMS problems by flashing the TPMS warning light on the combination meter

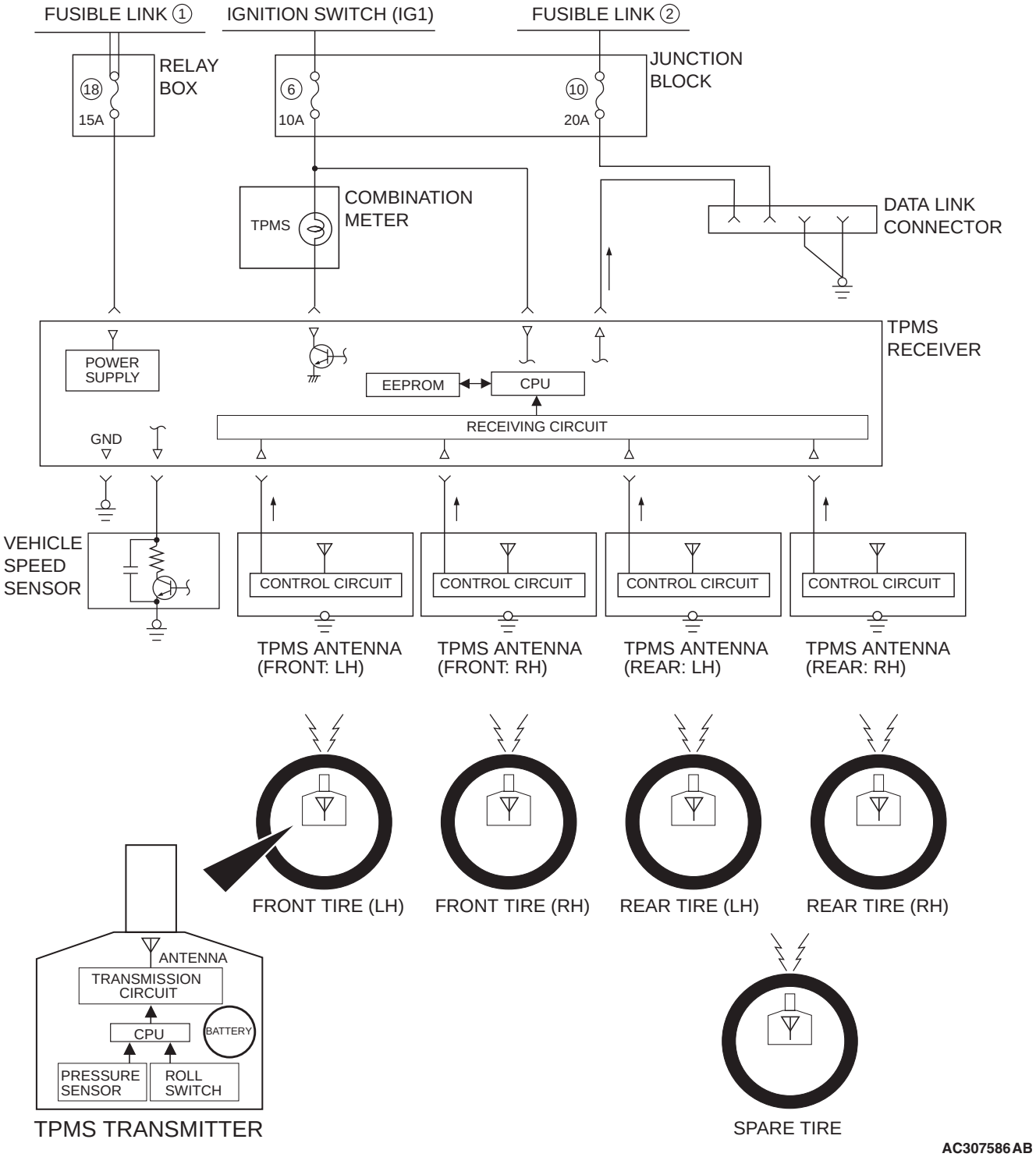
TIRE PRESSURE MONITORING SYSTEM (TPMS)

The Tire Pressure Monitoring System (TPMS) consists of five TPMS transmitters (tire pressure sensors and roll switches) installed in all tires, four TPMS antennas installed inside the wheel houses, a TPMS receiver installed inside the lower quarter trim (RH), and a TPMS warning light on the combination meter. Each TPMS antenna receives radio frequency signal output from the TPMS transmitter, the TPMS receiver interprets the signals and detects abnormality of tire pressure and/or the system, and the TPMS warning light illuminates or flashes to alert.

CONSTRUCTION DIAGRAM



CIRCUIT DIAGRAM



- The TPMS receiver processes input signals from each TPMS transmitter as well as vehicle speed signals from the vehicle speed sensor. When the road tire pressure is low, it sends a warning signal causing the TPMS warning light to be illuminated. When the TPMS has problems, it sends a warning signal causing the TPMS warning light to be flashed.
- The TPMS transmitter includes a roll switch that senses tire rotation. The TPMS receiver can determine which tires are rotating (road tire) and stationary (spare tire).
- For 3 seconds after the ignition switch is turned to the "ON" position, the TPMS receiver illuminates the TPMS warning light to check any breaks in the TPMS warning light circuit.

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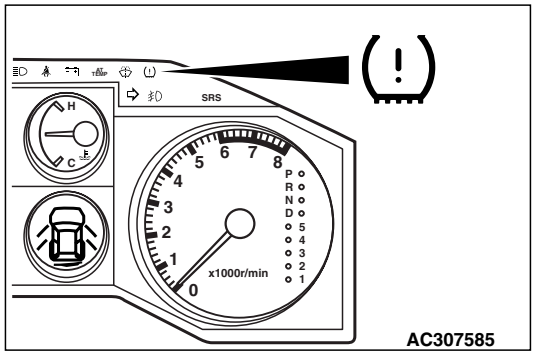
- By connecting the scan tool to the data link connector, data stored in the TPMS receiver (data of tire pressure and tire pressure sensor ID, the alarm status and warning history, etc.) can be displayed and the tire pressure sensor ID can be registered.



TPMS WARNING LIGHT

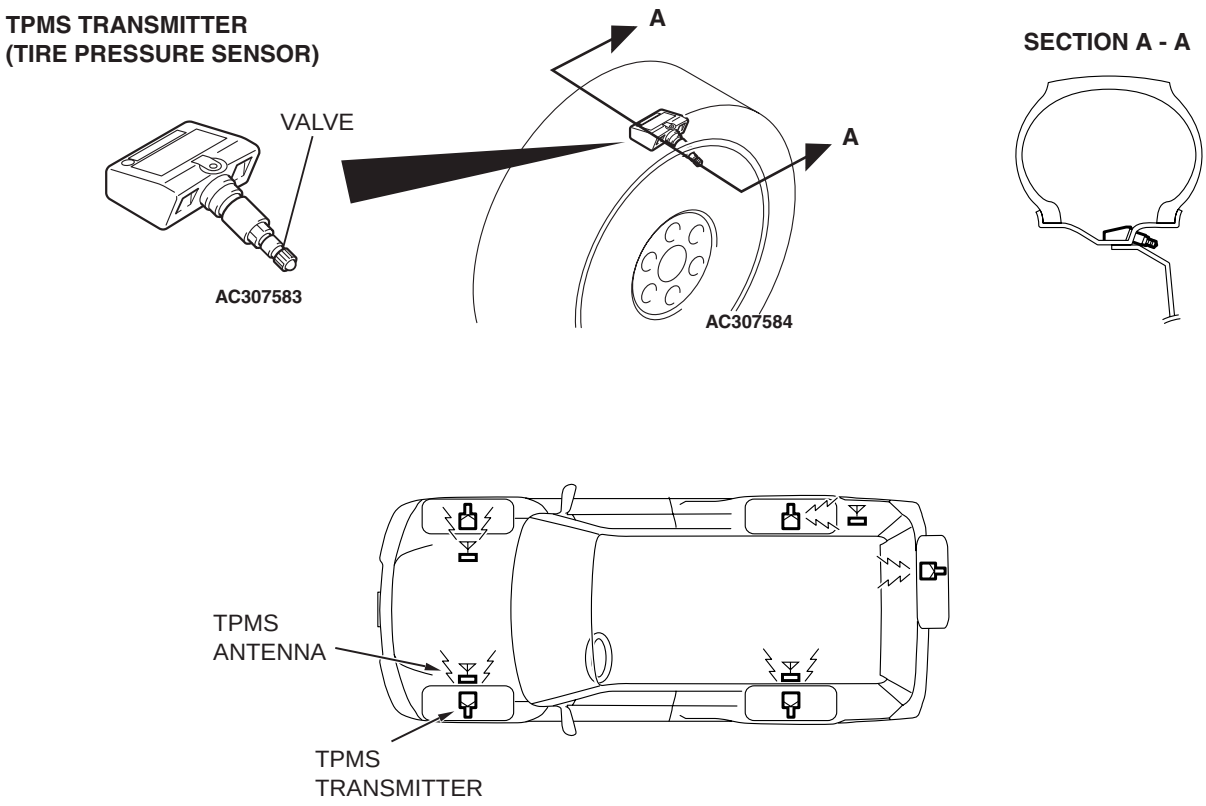
The TPMS warning light on the combination meter illuminates or flashes to alert the driver when signals are entered from the TPMS receiver.

CIRCUMSTANCE	WARNING LIGHT
For 3 seconds after the ignition switch is turned to the "ON" position (warning light circuit self-check)	Illuminates
TPMS problems	Flashes
Low tire pressure of any road tire	Illuminates

NOTE: Immediately after the tire pressure sensor ID has been recognized, the TPMS receiver cannot recognize the road tires until the vehicle is driven for some time. Therefore, if the spare tire pressure is low, the TPMS warning light will illuminate.

NOTE: The tire pressure monitoring is not applicable for the spare tire. Therefore, if the low-pressure road tire is used as a spare tire, the TPMS warning light will go out as soon as the TPMS receiver recognizes that.

TPMS TRANSMITTER (TIRE PRESSURE SENSOR)



The TPMS transmitter combines the valve and tire pressure sensor in a single unit. The TPMS transmitters are mounted inside the tires (including the spare tire). The TPMS transmitter measures tire pressure directly with its tire pressure sensor and sends radio frequency signals to the antenna inside the wheel house. The TPMS transmitter includes a roll switch that senses tire rotation. The TPMS receiver can determine which tires are rotating (road tire) and stationary (spare tire).

NOTE: Use only genuine wheels. The use of non-genuine wheels may cause the improper installation of the TPMS transmitters, possibly resulting in air leakage and damage to the TPMS transmitter.

TIRE PRESSURE SAMPLING TIMING

Tire pressure sampling: Once every 30 seconds

DATA TRANSMISSION TIMING

VEHICLE STATUS	TRANSMISSION TIMING
At vehicle moving and service period	once every 1 minute
At vehicle stationary	once every 1 hour

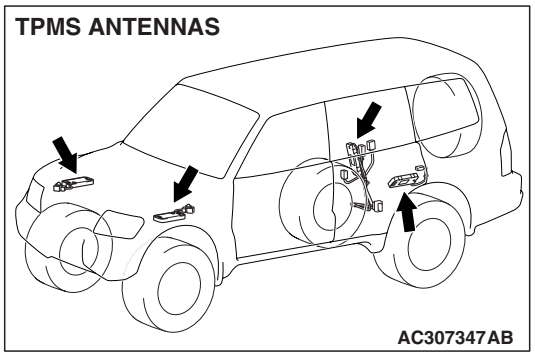
If a sampled pressure varies by ±10 kPa (1.5psi) from the last transmitted pressure value, an additional transmission will occur.

NOTE: Vehicle moving = vehicle speed: approximately 30 km/h (19 mph) or more <roll switch: ON>

NOTE: Service period = First 15 minutes after vehicle stops <roll switch: OFF>

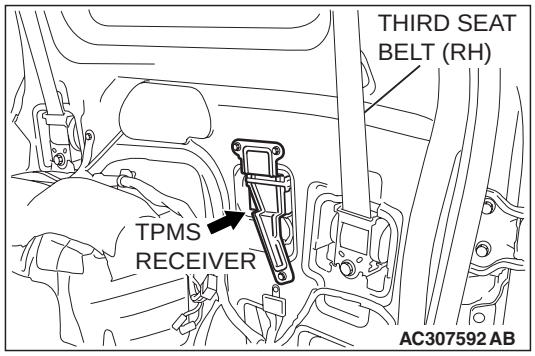
NOTE: Vehicle stationary = Situations except vehicle moving and service period <roll switch: OFF>

TPMS ANTENNAS



The TPMS for Montero has four TPMS antennas. Each TPMS antenna is installed inside the wheel house. The TPMS antenna receives radio frequency signal from the TPMS transmitter and sends it to the TPMS receiver via feeder cable.

TPMS RECEIVER



1. The TPMS receiver is installed at the inner quarter panel (RH), and monitors the tire pressure of road tires except spare tire. The TPMS receiver receives a signal from a TPMS transmitter every one minute if the TPMS transmitter is revolving (i.e. it is embedded in road wheel tire).

   NOTE: The TPMS receiver detects automatically that the tire is "spare" tire (not on the road). Then the receiver ignores the spare tire. The spare tire transmitter sends a signal once every hour if it stationary (i.e. it is embedded in spare tire).
2. When the ignition switch is at the "LOCK" (OFF) position, The TPMS receiver should operate intermittently (supplies power to receiving circuit intermittently).
3. The TPMS receiver has the following functions:
   - Scan tool (MUT-III) communication functions
   - Warning function

     The pressure sensor data can be displayed by using a magnet to send the signal from each TPMS transmitter.
   - Tire pressure sensor ID check function <TPMS special function (for data list, refer to P.31-82).> Each tire pressure sensor ID currently registered in the TPMS receiver is displayed.

SCAN TOOL (MUT-III) COMMUNICATION FUNCTIONS

The following functions can be performed by connecting the scan tool to the data link connector and starting the MUT-III.

- Diagnostic trouble code reading function (for DTC chart, refer to P.31-19.)
- Service data reading function (for service data list, refer to P.31-81.)
- Actuator testing function (for test item, refer to P.31-82.)
- Tire pressure sensor ID registration function <TPMS special function (for data list, refer to P.31-82).>

  NOTE: If the TPMS transmitters or TPMS receiver are replaced, the tire pressure sensor ID for all tires must be registered in the TPMS receiver.
- Tire pressure sensor check function <TPMS special function (for data list, refer to P.31-82).>

WARNING FUNCTIONS

The TPMS receiver determines the need for a warning based on the input data from the TPMS antennas and the vehicle speed sensor signal from the vehicle speed sensor. When the TPMS receiver sends a warning signal (a TPMS warning light bulb check signal, a tire pressure warning signal, or a TPMS warning signal), the TPMS warning light on the combination meter is illuminated or flashed. Three seconds after the ignition switch is turned to the "ON" position, or if the problem is corrected, the TPMS warning light goes off.

TPMS warning light bulb check signal <TPMS warning light: illuminated>

- The TPMS receiver turns on the TPMS warning light for 3 seconds when the ignition switch is turned to the "ON" position. The driver can judge disconnection of the TPMS warning light if it does not come on.
- After the 3 seconds illumination, the TPMS receiver turns off the TPMS warning light for 0.2 second, so that the mechanic can detect the failure of the illumination circuit through the TPMS warning light ON in the tire pressure warning state.

Tire pressure warning signal <TPMS warning light: illuminated>

- When a received tire pressure sensor ID matches the registered tire pressure sensor ID in the TPMS receiver, and the received tire pressure value is lower than the threshold value, then the TPMS receiver considers it in the tire pressure warning state and outputs the warning and sets the diagnostic trouble code.
- Also while the vehicle is parked (ignition switch: "LOCK" (OFF) position), the TPMS receiver monitors tire pressure. And it outputs the warning when the ignition switch is turned to the "ON" position, if the tire pressure is in the warning state.
- When the received tire pressure sensor ID matches with the registered tire pressure sensor ID in the TPMS receiver, and the tire pressure value received is higher than the threshold value, the TPMS receiver clears the tire pressure warning against the tire pressure sensor ID. If the tire warning is cleared for all the tires including the spare tire, the TPMS warning light will go out.

TIRE PRESSURE THRESHOLD VALUES

ITEM	TIRE PRESSURE kPa (psi)
Standard pressure at cold (reference)	200 (29)
Alarm ON pressure	158 (23) or less
Alarm OFF pressure	174 (25) or more

TPMS warning signal (EEPROM abnormality) <TPMS warning light: flashes>

- The TPMS receiver checks EEPROM. When information in the EEPROM is considered abnormal due to tire pressure sensor ID deterioration, etc., the TPMS receiver outputs the warning and sets a diagnostic trouble code.

TPMS warning signal (reception failure) <TPMS warning light: flashes>

- The TPMS receiver outputs the warning signal and sets a diagnostic trouble code when the signals matched with the registered tire pressure sensor IDs in the TPMS receiver were not received.
- When the TPMS receiver receives normal signals for the tire pressure sensor ID that had reception failure problems, the TPMS receiver clears the warning.

TPMS warning signal (TPMS transmitter battery voltage abnormality) <TPMS warning light: flashes>

- The TPMS receiver is considered to be in system warning state due to TPMS transmitter low battery voltage against its tire pressure sensor ID. The receiver outputs the warning signal and sets a diagnostic trouble code under the following conditions. The received tire pressure sensor ID matches the registered tire pressure sensor ID in the TPMS receiver, and function code 'Low Battery' is received consecutively.
- The TPMS receiver clears the warning state against its tire pressure sensor ID under the following conditions. The received tire pressure sensor ID matches with the registered tire pressure sensor ID in the TPMS receiver, and 'Normal Pressure' function code is received consecutively.

TPMS warning signal (vehicle speed signal abnormality) <TPMS warning light: flashes>

- When vehicle speed input is always less than 5 km/h (3 mph), the TPMS receiver judges the system to be vehicle speed signal abnormality warning and outputs the warning and set a diagnostic trouble code.
- The warning will be cleared when vehicle speed signal is over 5 km/h (3 mph) for over 1 second with the ignition switch in the "ON" position.

TPMS warning signal (Transmitter OFF mode) <TPMS warning light: flashes>

- Transmitting signal of the TPMS transmitter should be stopped during transportation to dealer because it will break Japanese radio wave regulation.
- OFF mode is canceled at dealer. So, output warning and set DTC 17 (Transmitter OFF Mode, ALL Tire) during transmitter OFF mode for reminding cancel of OFF mode.
- When the TPMS receiver receives the signals from all registered tire pressure sensor, the TPMS receiver clears the warning.

TPMS OPERATIONAL CHARACTERISTICS

- The TPMS receiver monitors the tire pressure of road tires except spare tire.
- The TPMS transmitter includes a roll switch that senses tire rotation. The TPMS receiver can determine which tires are rotating (road tire) and stationary (spare tire).
- The recommended cold tire pressure at normal condition for Montero is 200 kPa (29 psi). The TPMS warning light will turn ON and DTC 23/27/32/36/41/ will be stored in memory when the air pressure in any road tire is below 158 kPa (23.0 psi).
- The TPMS warning light will turn OFF and the DTC 23/27/32/36/41 in memory will be eliminated when the tire pressure is increased to at least 174 kPa (25.25 psi).
- Customers may experience what appears to be an "intermittent" tire pressure warning light because the air pressure in the tires normally fluctuates under various operating conditions:
  - In cold weather, tire pressure will become lower due to the ambient temperature, and the TPMS warning light will turn ON if tire pressure drops below 158 kPa (23.0 psi). The tire pressure will increase after driving (tires warm up), and the TPMS warning light will turn OFF.

    Regardless of the ambient temperature, set the tire pressure to 200 kPa (29 psi) with the tires cold [vehicle has been parked for at least three hours or driven less than 1.6 kilometers (one mile) after having been parked for three hours].

    NOTE: Tire pressure changes at slightly less than 6.9 kPa (1 psi) per 5.5°C (10°F) of ambient temperature change.
    For example, climates with seasonal temperatures that vary from 32°C (90°F) in the summer to -12°C (10°F) in the winter have a 44 degree Celsius (80 degrees Fahrenheit) temperature change. This can result in an approximate 55 kPa (8 psi) change in tire pressure. In this example:
    - If the tire pressure was set when the ambient temperature was 32°C (90°F) in the summer, it can be about 145 kPa (21 psi) on the coldest day in the winter. This will cause the TPMS warning light to turn on.
    - If the tire pressure was set when the ambient temperature was -12°C (10°F) in the winter, it can be about 255 kPa (37 psi) on the hottest day of the summer. This will create a rougher ride.

    The important point is that customers should have their tire pressure seasonally adjusted.

TIRE PRESSURE MONITORING SYSTEM (TPMS) SERVICE PRECAUTIONS

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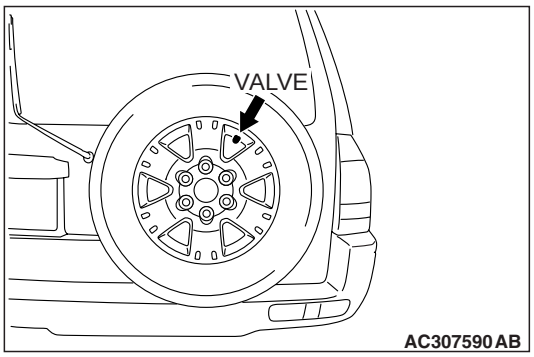
- Transmitting signal of the TPMS transmitter should be stopped during transportation to dealer because it will break Japanese radio wave regulation.
- OFF mode is canceled at dealer. So, output warning and set DTC 17 during transmitter OFF mode for reminding cancel of OFF mode.
- Do not use an aerosol puncture-repair spray. Such a spray could damage the tire pressure sensor (TPMS transmitter).
- Whenever the TPMS transmitters and/or TPMS receiver are replaced with new ones, the tire pressure sensor IDs must be registered into the TPMS.
- Install the spare tire as shown. If the spare tire valve (TPMS transmitter) is not positioned as shown, the roll switch, which is incorporated in the TPMS transmitter, may operate. In that case, the system may determine the spare tire as a road tire incorrectly.



- The use of non-genuine wheels may cause the improper installation of the TPMS transmitters, possibly resulting in air leakage and damage to the TPMS transmitter.
- When the tire is removed from the wheel, a special procedure must be observed to avoid the TPMS transmitter damage. Refer to "TPMS transmitter Removal and Installation (P.31-94)".
- The grommet at base of valve stem should be replaced with a new one every five years or when the tire is replaced. For the replacement procedure, refer to "TPMS transmitter Removal and Installation (P.31-94)".
- After the TPMS transmitter is replaced and the tires are inflated, retighten the valve nut (TPMS transmitter mounting nut) to the specified torque, refer to "TPMS transmitter Removal and Installation (P.31-94)".
- Replace the TPMS transmitter when the TPMS transmitter battery is discharged. The battery cannot be removed from the TPMS transmitter. Nominal service life of the battery is 10 years or 160,000 km (100,000 miles).
- If the valve core and valve cap are replaced, use a genuine replacement part. The valve core is similar to a conventional one, but nickel plating was applied to avoid electric corrosion.
- TPMS may not work normally in the following circumstances:
  - A wireless facility or device using the same frequency with the TPMS transmitter is near the vehicle.
  - Snow or ice is stuck inside the wheel houses and /or on the wheels.
  - The TPMS transmitter's battery is discharged.
  - Wheels other than Mitsubishi genuine wheels are being used.
  - Wheels that are not fitted with TPMS transmitters are being used.
  - Wheels whose tire pressure sensor IDs are not registered by the vehicle are being used.

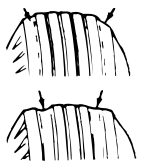
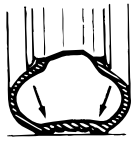
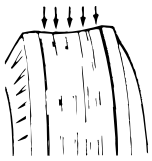
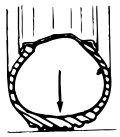
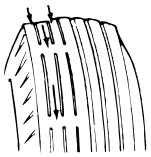
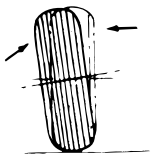
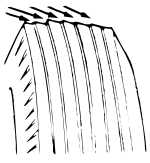
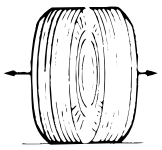
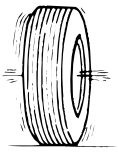
NOTE: Tire inflation pressures vary with the ambient temperature. If the vehicle is subjected to large variations in ambient temperature, the tire inflation pressures may be under-inflated (causing the TPMS warning light to come on) when the ambient temperature is relatively low. If the TPMS warning light comes on, adjust the tire inflation pressure.

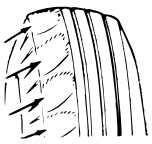
NOTE: If any of the road wheel tires do not contain a TPMS transmitter, and the customer continues driving, the TPMS warning light will flash.

WHEEL AND TIRE DIAGNOSIS

DIAGNOSIS

M1311000700318

SYMPTOM		PROBABLE CAUSE		REMEDY	REFERENCE PAGE
Rapid wear at shoulders	 ACX00923AB	Under-inflation or lack of rotation	 ACX00924AE	Adjust the tire pressure.	P.31-85
Rapid wear at center	 ACX00925AE	Over-inflation or lack of rotation	 ACX00926AI		
Cracked treads	 ACX00927AB	Under-inflation		Adjust the tire pressure.	P.31-85
Wear on one side	 ACX00928AB	Excessive camber	 ACX00929AE	Check the camber.	Refer to GROUP 33, On-vehicle service – Front wheel alignment check and adjustment P.33-5.
Feathered edge	 ACX00930AB	Incorrect toe-in	 ACX00931AE	Adjust the toe-in.	
Bald spots	 ACX00932AB	Unbalanced wheel	 ACX00933AB	Balance the wheels.	–

SYMPTOM		PROBABLE CAUSE	REMEDY	REFERENCE PAGE
Scalloped wear	 ACX00934	Lack of rotation of tires or worn or out-of-alignment suspension	Rotate the tires, and check the front suspension alignment.	Refer to GROUP 33, On-vehicle service – Front wheel alignment check and adjustment P.33-5.

WHEEL BALANCE ACCURACY

M1311001700560

PURPOSE

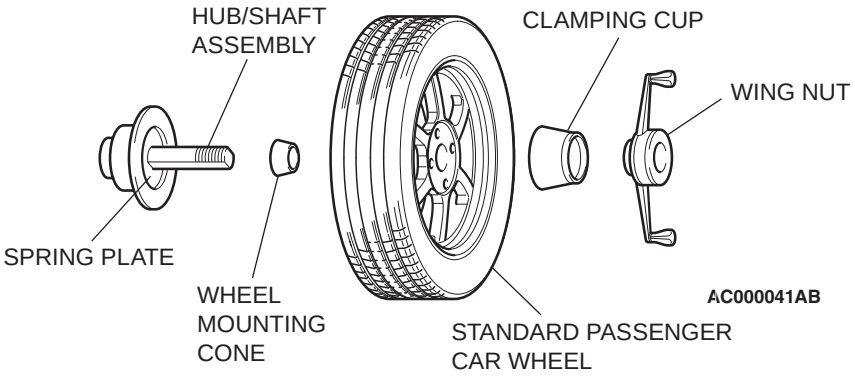
This section contains tips and procedures for achieving accurate wheel balance. Steering wheel vibration and/or body shake can result if any of these procedures are not carefully observed.

1. Wheels and tires must be properly mounted on a balancer in order to achieve correct balance. Centering the wheel on the shaft of the balancer is essential for proper mounting.
2. Off-the-car wheel balancers must be calibrated periodically to ensure good balancing results. An inaccurately calibrated balancer could cause unnecessary replacement of tires, shocks, suspension components, or steering components.

Check your balancer's calibration approximately every 100 balances. Your wheel balancer's instruction manual should include calibration procedures. If the calibration procedures specifically for your balancer are missing, use the generic steps in this section for zero calibration, static balance, and dynamic balance checks. The wheel balancer calibration checks are also described in the flowchart (Refer to P.31-13).

PROCEDURE <BALANCING TIPS>

1. Confirm that the balancer's cone and the wheel mounting cone are undamaged and free of dirt and rust.
2. On this vehicle, the wheel's center hole on the hub side has a chamfered edge. Use a back-mounting cone on your wheel balancer to center the wheel on the balancer shaft.
3. Install a wheel mounting cone. The appropriate size cone for this vehicle is 67.0 mm (2.64 inches).
4. Before balancing the wheel, remove any wheel weights from both sides. Also check both sides for any damage.
5. When installing wheel weights, hammer them at a straight (not diagonal) angle.



<CONFIRMING PROPER BALANCE>

1. After balancing the wheel, loosen the wing nut and turn the wheel 180 degrees against the balancer's hub. Then re-tighten the wing nut and check the balance again. Repeat wheel balance if necessary.
2. Turn the wheel again 180 degrees against the balancer's hub. If the wheel becomes out-of-balance each time it is turned against the balancer's hub, the wheel balancer may require calibration.

<WHEEL BALANCER CALIBRATION CHECKS>

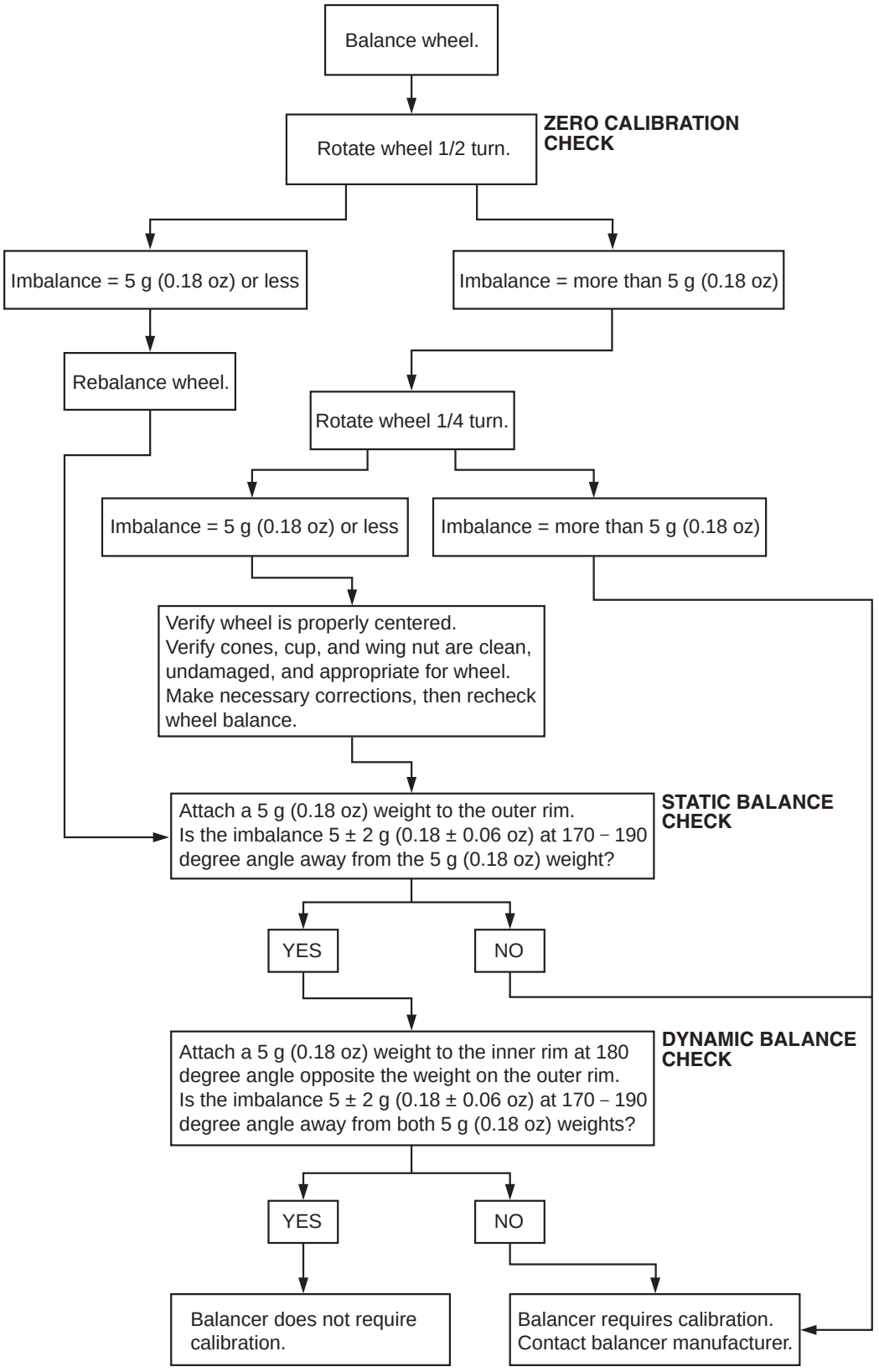
1. Mount an undamaged original-equipment alloy rim and tire assembly (wheel) onto your off-the-car wheel balancer. Balance the wheel.
2. <<Zero Calibration Check>>

   Loosen the balancer wing nut, rotate the wheel a half-turn (180 degrees), and retighten the nut. Recheck the balance.
   - If the imbalance is 5 g (0.18 ounce) or less, the zero calibration is OK. Rebalance the wheel, then go to Step 4 to check static balance.
   - If the imbalance is more than 5 g (0.18 ounce), go to Step 3.
3. Loosen the balancer wing nut, rotate the wheel 1/4 turn (90 degrees), and retighten the nut. Recheck the wheel balance.
   - If the imbalance is 5 g (0.18 ounce) or less, the wheel may not be centered on the balancer, or the balancing cones, the cup, and/or wing nut are damaged, dirty, or inappropriate for the wheel. You may need to refer to the balancer manufacturer's instructions to verify the correct attachments. After making the necessary corrections, recheck the wheel balance. If OK, then go to Step 4.
   - If the imbalance is more than 5 g (0.18 ounce), the balancer requires calibration. Contact the balancer manufacturer for calibration by their repair representative.
4. <<Static Balance Check>>

   Attach a 5 g (0.18 ounce) weight to the outer rim. Recheck the balancer. The balancer should detect 5 $\pm$ 2 g (0.18 $\pm$ 0.06 ounce) of imbalance 170 to 190 degrees away from the 5 g (0.18 ounce) weight.
   - If the imbalance is within specification, the static balance calibration is correct. Go to Step 5 to check the dynamic balance.
   - If the imbalance is out of specification, the balancer requires calibration. Contact the balancer manufacturer for calibration by their repair representative.
5. <<Dynamic Balance Check>>

   Attach a 5 g (0.18 ounce) weight to the inner rim 180 degrees opposite the 5 g (0.18 ounce) weight that was added in Step 4. Recheck the balance. The balancer should detect 5 $\pm$ 2 g (0.18 $\pm$ 0.06 ounce) of imbalance 170 to 190 degrees away from both the inner and outer 5 g (0.18 ounce) weights.
   - If the imbalance is within specification, the dynamic balance calibration is correct. The balancer calibration checks are complete.
   - If the imbalance is out of specification, the balancer requires calibration. Contact the balancer manufacturer for calibration by their repair representative.

WHEEL BALANCER CALIBRATION CHECKING FLOW CHART



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TSB Revision

TIRE PRESSURE MONITORING SYSTEM (TPMS) DIAGNOSIS

INTRODUCTION TO DIAGNOSIS

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TPMS MAY NOT WORK NORMALLY IN THE FOLLOWING CIRCUMSTANCES:

- A wireless facility or device using the same frequency with the TPMS transmitter is near the vehicle.
- Snow or ice is stuck inside the wheel houses and /or on the wheels.
- The TPMS transmitter's battery is discharged.
- Wheels other than Mitsubishi genuine wheels are being used.
- Wheels that are not fitted TPMS transmitters are being used.
- Wheels whose tire pressure sensor IDs are not registered by the vehicle are being used.

WHEN THE TPMS WARNING LIGHT IS ON

- If the TPMS warning light illuminates, check the inflation pressure of all the tires (including the spare tire) and adjust if necessary. If the TPMS warning light still remains illuminated, a flat tire or a defective TPMS transmitter is suspected.
- If a road tire does not contain a TPMS transmitter, the TPMS warning light will flash and the TPMS will not work normally. Replace the tire with one containing a TPMS transmitter.

AFTER REPLACING TPMS COMPONENTS

- Whenever the TPMS transmitter and/or TPMS receiver are replaced, register the tire pressure sensor ID of all the TPMS transmitter-contained tires.
- After the TPMS antennas and feeder cable are replaced, also register the tire pressure sensor ID of all the TPMS transmitter-contained tires, and then check the receiver function through the completion of the registration.
- Whenever any TPMS component (transmitter, antenna, feeder cable, and receiver) is removed and installed, confirm that no TPMS DTC is set.

TPMS TROUBLESHOOTING STRATEGY

M1311002400034

Use these steps to plan your diagnostic strategy. If you follow them thoroughly, you will be sure that you have exhausted most of the possible ways to find a TPMS fault.

1. Gather information about the problem from the customer.
2. Verify that the condition described by the customer exists. If the condition matches a symptom listed in the TPMS Symptom Chart (Refer to P.31-47), execute an inspection procedure for the symptom.
3. Check the vehicle for any TPMS DTC.
4. If you cannot verify the condition and there are no TPMS DTCs, the malfunction is intermittent. Refer to GROUP 00, How to use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-13.
5. If there is an TPMS DTC, record the number of the DTC, then erase the DTC from the memory using the scan tool.
6. Recreate the TPMS DTC set conditions to see if the same TPMS DTC will set again.
   - If the same TPMS DTC sets again, perform the TPMS diagnostic trouble code procedures for the DTC. Refer to P.31-19.
   - If you cannot get the same TPMS DTC to set again, the malfunction is intermittent. Refer to GROUP 00, How to use Troubleshooting/Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-13.

TPMS DIAGNOSTIC FUNCTION

M1311002600027

HOW TO CONNECT THE SCAN TOOL (MUT-III)

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

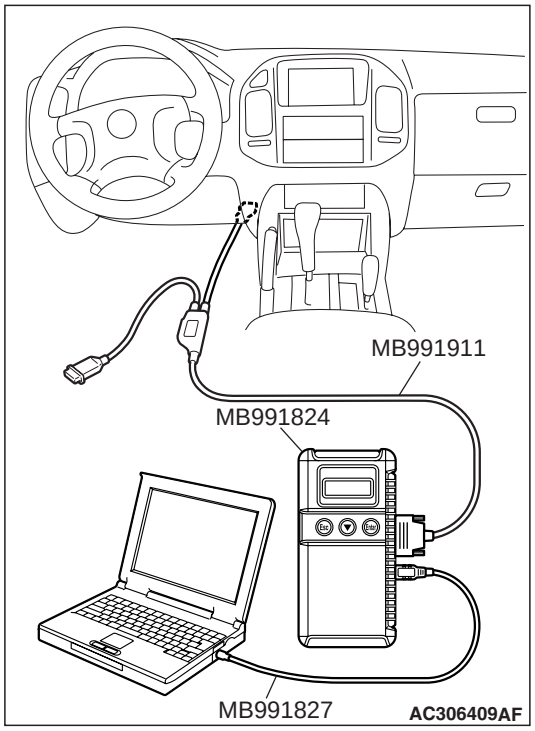
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

1. Ensure that the ignition switch is at the "LOCK" (OFF) position.
2. Turn on the personal computer.
3. Connect special tool MB991827 to special tool MB991824 and the personal computer.
4. Connect special tool MB991911 to special tool MB991824.
5. Connect special tool MB991911 to the data link connector.
6. Turn the power switch of special tool MB991824 to the "ON" position.

   NOTE: When special tool MB991824 is energized, special tool MB991824 indicator light will be illuminated green.
7. Start the MUT-III system on the personal computer.

NOTE: Disconnecting scan tool MB991958 is the reverse of the connecting sequence, first making sure that the ignition switch is at the "LOCK" (OFF) position.



HOW TO READ AND ERASE DIAGNOSTIC TROUBLE CODES

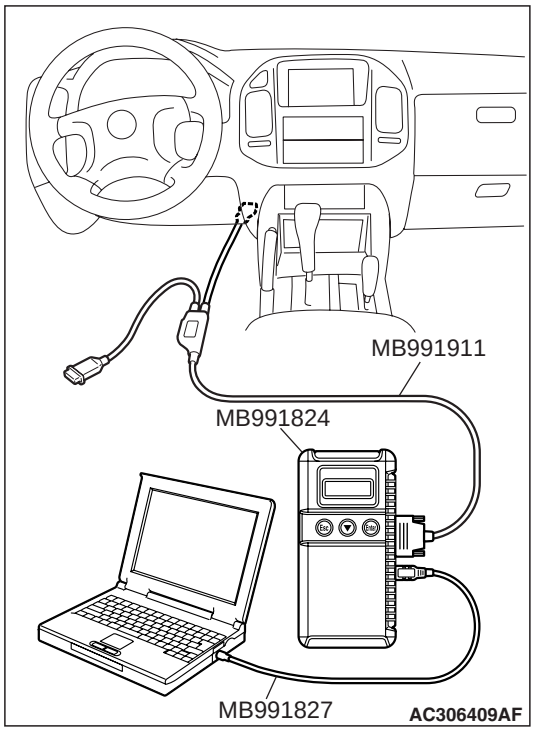
Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

NOTE: If the vehicle battery voltage is low, diagnostic trouble codes will not be set. Check the vehicle battery if scan tool MB991958 does not display.



1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "TPMS" from the "CHASSIS" tab.
6. Select "MITSUBISHI."
7. Select "Diagnostic Trouble Code."
8. If a DTC is set, it is shown.
9. Choose "Erase DTCs" to erase the DTC.

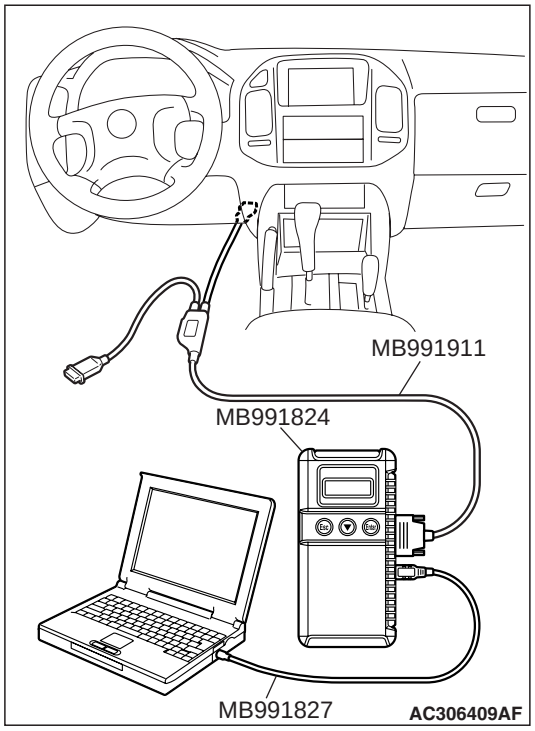
HOW TO READ DATA LIST

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "TPMS" from the "CHASSIS" tab.
6. Select "MITSUBISHI."
7. Select "Data List."
8. Choose an appropriate item and select the "OK" button.

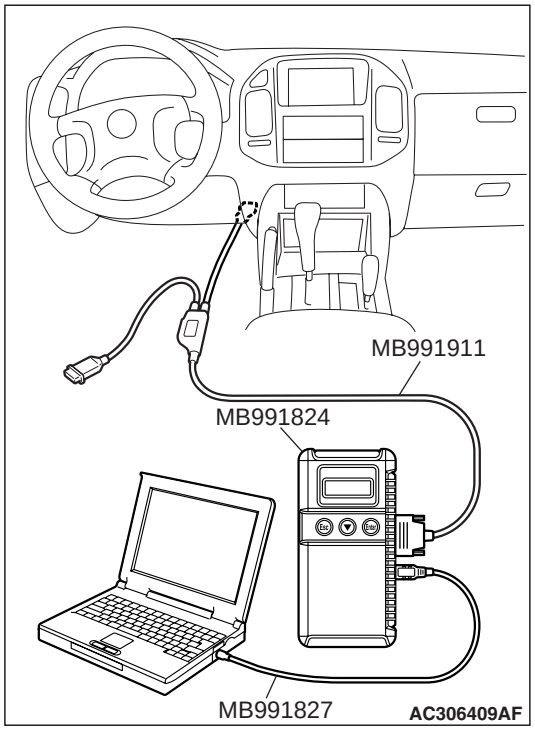
HOW TO PERFORM ACTUATOR TEST

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

⚠ CAUTION

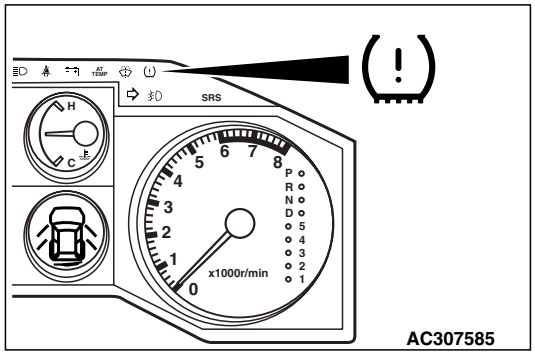
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "TPMS" from the "CHASSIS" tab.
6. Select "MITSUBISHI."
7. Select "Actuator Test."
8. Choose an appropriate item and select the "OK" button.

TPMS WARNING LIGHT CHECK

M1311002500020



1. Check that the TPMS warning light illuminates for approximately three seconds when the ignition switch is turned to the "ON" position. (If it does not illuminate, perform troubleshooting for TPMS Inspection Procedure No.3. Refer to P.31-58).
2. Check that it illuminates for approximately three seconds and then goes out (If the warning light does not turn off and stays on, perform troubleshooting for TPMS Inspection Procedure No.1. Refer to P.31-48) (If the warning light does not turn off and flashes, perform troubleshooting for TPMS Inspection Procedure No.2. Refer to P.31-54).

DIAGNOSTIC TROUBLE CODE CHART

M1311002700024

⚠ CAUTION

- **During diagnosis, a DTC code associated with another system may be set when the ignition switch is turned to the "ON" position with connector(s) disconnected. When diagnosis is finished, check all systems for DTC code(s). If DTC code(s) are set, erase them all.**
- **Tire pressure sensor ID registration must be done before any diagnosis.**

DTC	DIAGNOSTIC CONTENT		REFERENCE PAGE
11	TPMS abnormality	ID code not registered	P.31-20
13		EEPROM failure	P.31-22
14		Vehicle Speed Signal	P.31-23
17		Transmitter OFF Mode, ALL Tire	P.31-28
21	TPMS transmitter 1 abnormality	Transmitter battery voltage	P.31-29
22		Tire pressure sensor ID reception failure	P.31-31
23		Tire air pressure low	P.31-45
43		Transmitter OFF Mode	P.31-28
25	TPMS transmitter 2 abnormality	Transmitter battery voltage	P.31-29
26		Tire pressure sensor ID reception failure	P.31-31
27		Tire air pressure low	P.31-45
44		Transmitter OFF Mode	P.31-28
29	TPMS transmitter 3 abnormality	Transmitter battery voltage	P.31-29
31		Tire pressure sensor ID reception failure	P.31-31
32		Tire air pressure low	P.31-45
45		Transmitter OFF Mode	P.31-28
34	TPMS transmitter 4 abnormality	Transmitter battery voltage	P.31-29
35		Tire pressure sensor ID reception failure	P.31-31
36		Tire air pressure low	P.31-45
46		Transmitter OFF Mode	P.31-28
38	TPMS transmitter 5 abnormality	Transmitter battery voltage	P.31-29
39		Tire pressure sensor ID reception failure	P.31-31
41		Tire air pressure low	P.31-45
47		Transmitter OFF Mode	P.31-28

TPMS DIAGNOSTIC TROUBLE CODE PROCEDURES

DTC 11: TPMS Abnormality (ID Code Not Registered)

TPMS DTC SET CONDITION

DTC 11 will be set if the tire pressure sensor IDs are not registered correctly in the TPMS receiver. At the same time this DTC is set, the TPMS warning light flashes.

TROUBLESHOOTING HINT

Execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function."

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function."

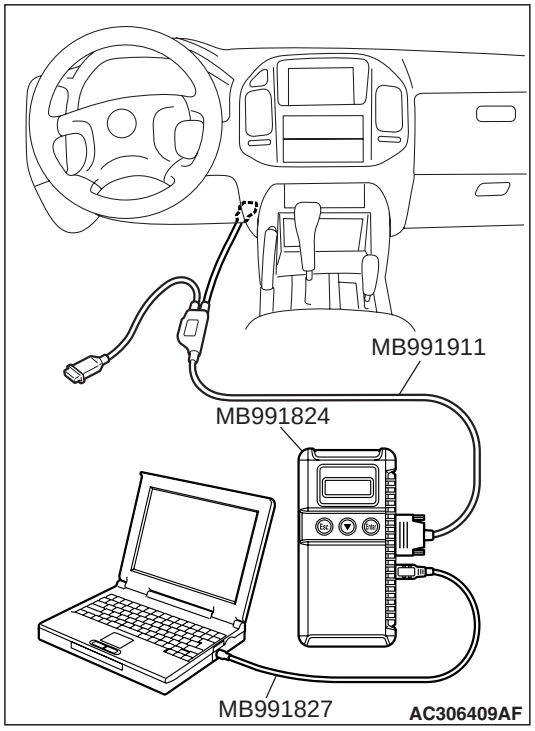
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86).

Q: Is the "Tire Pressure Sensor ID Registration" complete?

YES : Go to Step 2.
NO : Go to Step 4.



STEP 2. Recheck for diagnostic trouble code.

NOTE: If the "Tire Pressure Sensor ID Registration" has been completed successfully, the DTC will be erased automatically.

Q: Does diagnostic trouble code 11 reset?

YES : Go to Step 3.
NO : The procedure is complete.

STEP 3. Execute "Tire Pressure Sensor ID Check" on scan tool MB991958 "Special Function."

All the tire pressure sensor IDs, which have been registered in Step 1, should be displayed on scan tool MB991958.

Q: Are all the registered tire pressure sensor IDs displayed?

YES : Replace the TPMS receiver (Refer to P.31-93). And then go to Step 1.
NO : Repeat the troubleshooting from Step 1.

STEP 4. Execute "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function."

Q: Are all tire pressure sensor IDs displayed?

YES : Repeat the troubleshooting from Step 1.
NO : Carry out troubleshooting for DTC 22/26/31/35/39 (tire pressure sensor ID reception failure) from the Step 3 (Refer to P.31-31).

DTC 13: TPMS Abnormality (EEPROM Failure)

TPMS DTC SET CONDITION
DTC 13 will be set if there is any fault in the TPMS receiver's EEPROM. At the same time this DTC is set, the TPMS warning light flashes.

TROUBLESHOOTING HINT
Replace the TPMS receiver.

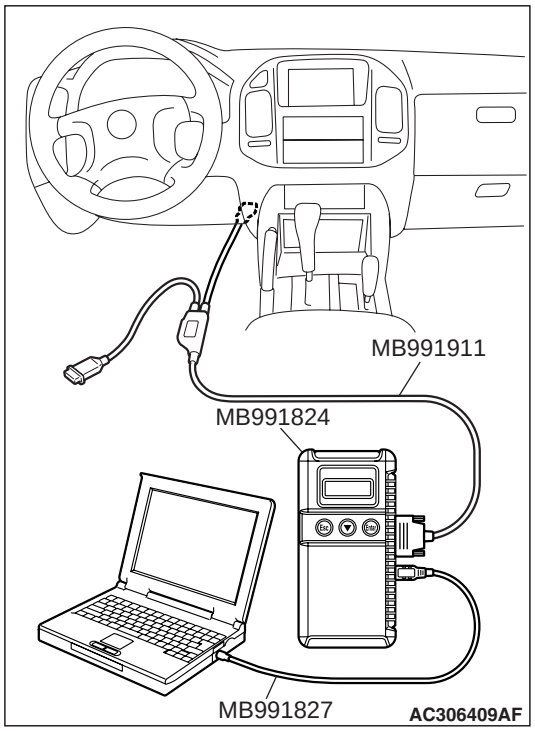
DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Check the illumination condition of the TPMS warning light after the following procedures.
(1) Replace the TPMS receiver (Refer to P.31-93).

⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(2) Connect scan tool MB991958 to the data link connector.
(3) Turn the ignition switch to the "ON" position.
(4) Execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" (Refer to P.31-86).
(5) Check the illumination condition of the TPMS warning light.



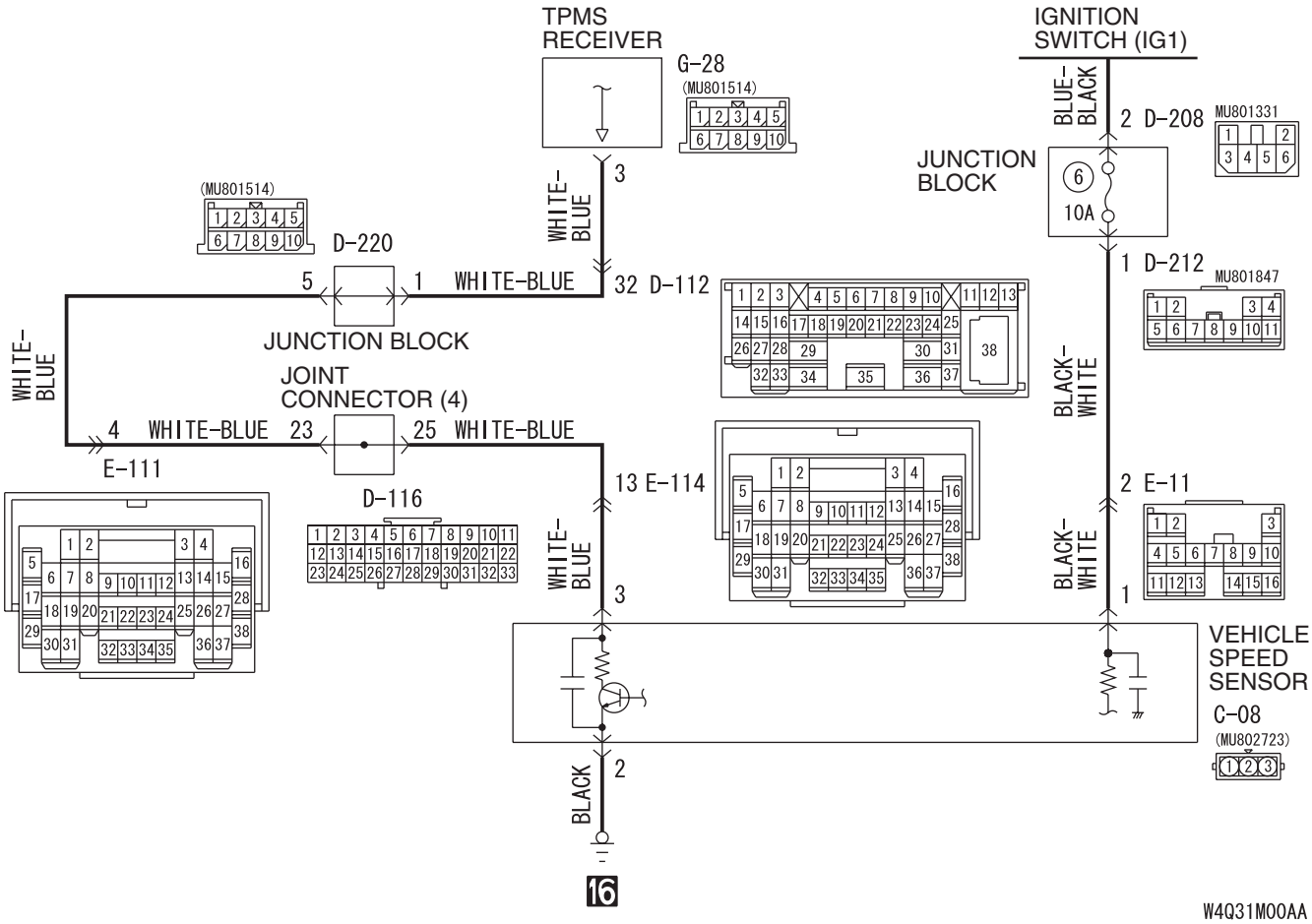
Q: Is the TPMS warning light still flashing?
YES : Go to Step 2.
NO : Go to Step 2.

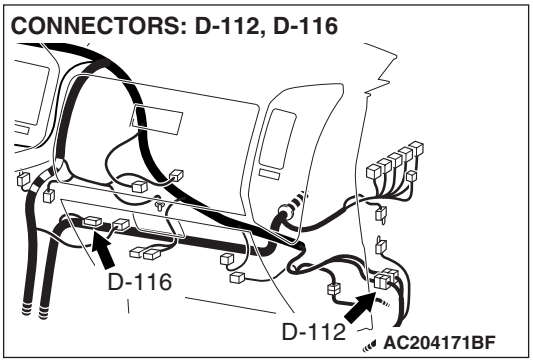
STEP 2. Recheck for diagnostic trouble code.

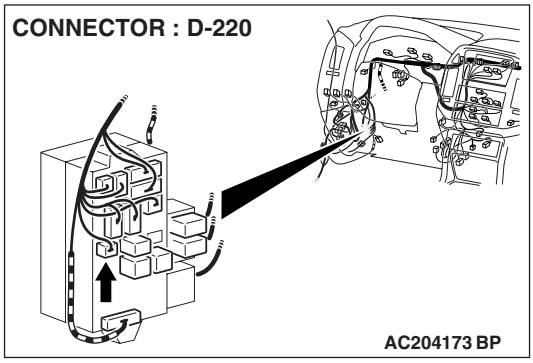
Q: Does diagnostic trouble code 13 reset?
YES : Repeat the troubleshooting from Step 1.
NO : The procedure is complete.

DTC 14: TPMS Abnormality (Vehicle Speed Signal)

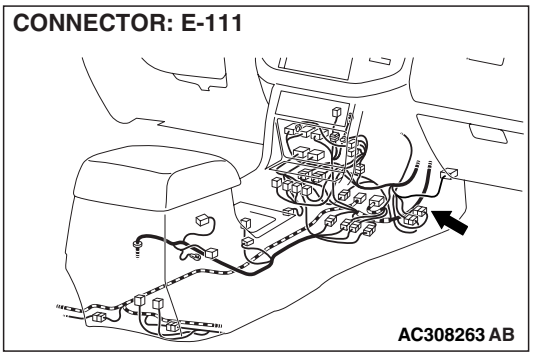
Vehicle Speed Sensor Circuit

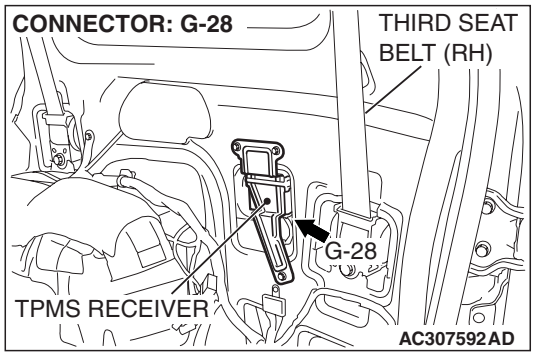






TSB Revision





CIRCUIT OPERATION

The TPMS receiver monitors the vehicle speed signal.

TPMS DTC SET CONDITION

DTC 14 will be set if the TPMS receiver does not receive vehicle speed signal of 5 km/h (3 mph) or more during driving. At the same time this DTC is set, the TPMS warning light flashes. TPMS receiver senses the vehicle's driving state by a roll switch inside the TPMS transmitter.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS DTC TO SET ARE:)

- Malfunction of the vehicle speed sensor
- Damaged wiring harness or connector
- Malfunction of the TPMS receiver

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Check A/T diagnostic trouble code.

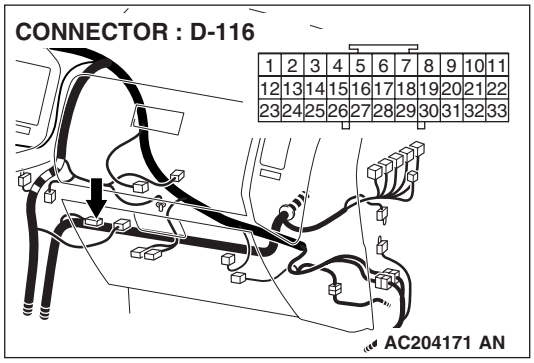
Q: Is A/T DTC 29 (vehicle speed sensor system) set?

YES : Carry out troubleshooting for A/T DTC 29 (vehicle speed sensor system) (Refer to GROUP 23A, Diagnostic Trouble Code Procedures P.23A-170).

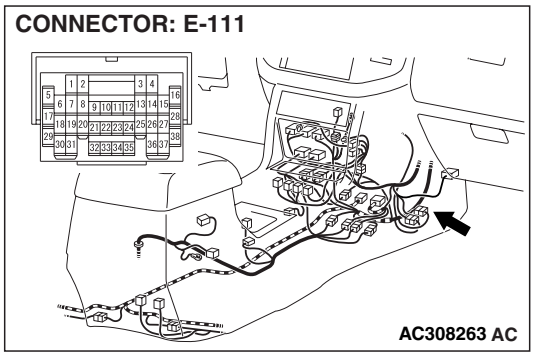
NO : Go to Step 2.

STEP 2. Check the following connectors.

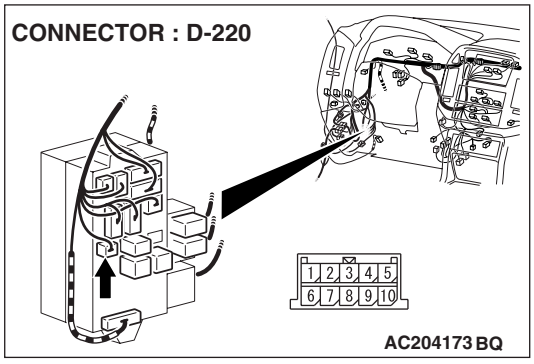
- Joint connector D-116



- Intermediate connector E-111



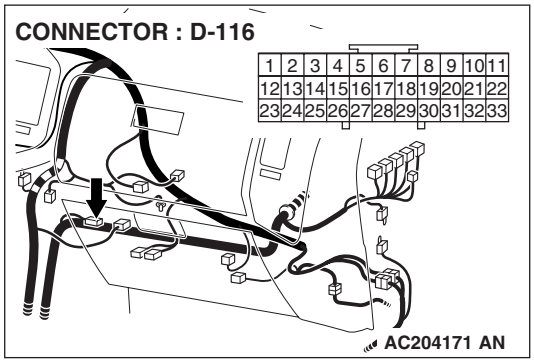
- Junction block connector D-220

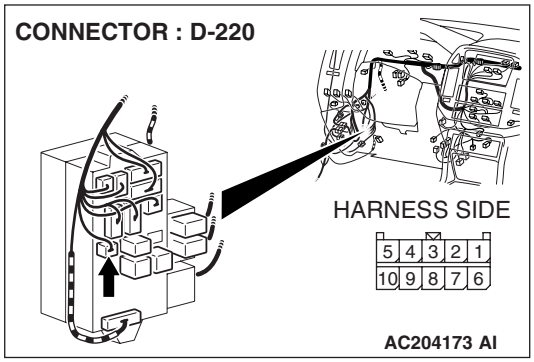


Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 3.
NO : Repair it. And then go to Step 7.



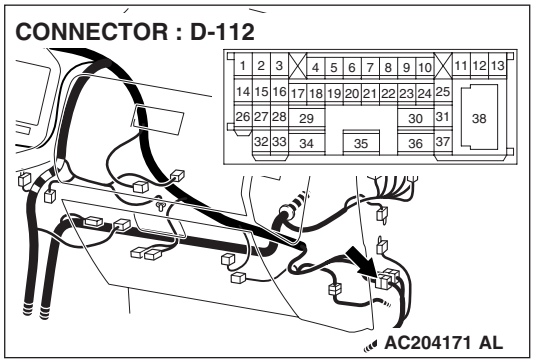


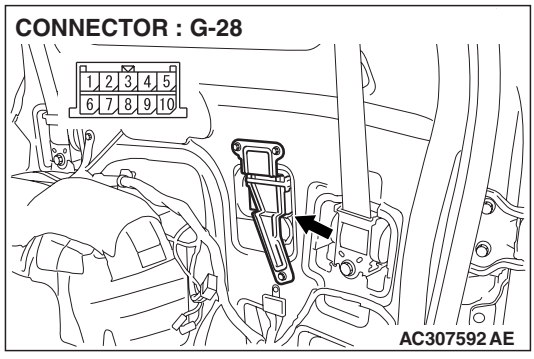
STEP 3. Check the following harness wire.

- The wire between joint connector D-116 (terminal 23) and junction block connector D-220 (terminal 5)

Q: Is the harness wire damaged?

YES : Repair or replace it. And then go to Step 7.
NO : Go to Step 4.





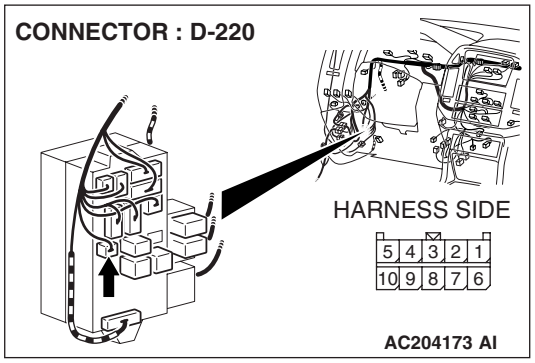
STEP 4. Check the following connectors.

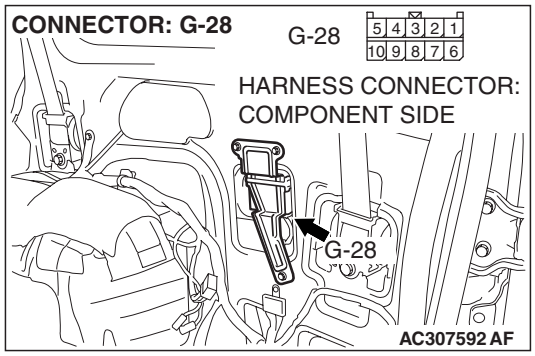
- Intermediate connector D-112
- TPMS receiver connector G-28

Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 5.
NO : Repair it. And then go to Step 7.



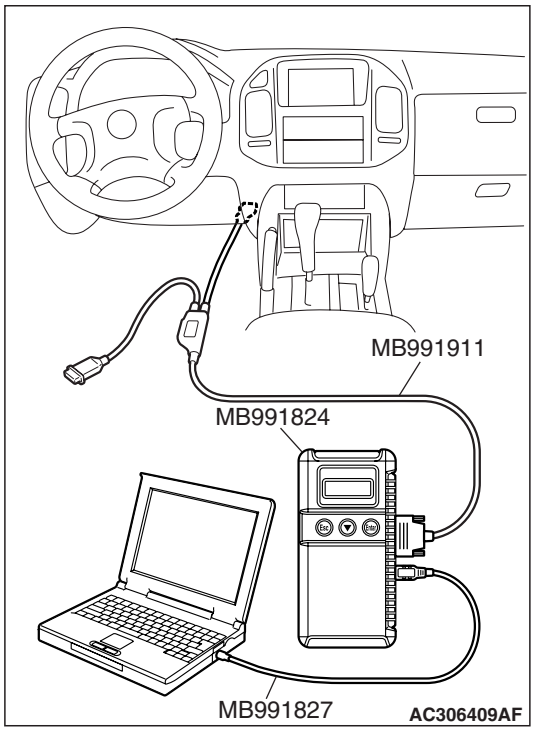


STEP 5. Check the following harness wire.

- The wire between junction block connector D-220 (terminal 1) and TPMS receiver connector G-28 (terminal 3)

Q: Is the harness wire damaged?

YES : Repair or replace it. And then go to Step 7.
NO : Go to Step 6.



STEP 6. Using scan tool MB991958, check data list.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Check the following data list.
- Item 04: VSS (Vehicle Speed Signal)

(3) Drive the vehicle at 30 km/h (19 mph) or more, and compare the value shown on scan tool MB991958 with the speedometer in the combination meter.

Q: Does the vehicle speed shown on scan tool MB991958 correspond to that on the speedometer?

YES : It can be assumed that this malfunction is intermittent. Go to Step 7.
NO : Replace the TPMS receiver. And then execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86). And then go to Step 7.

STEP 7. Recheck for diagnostic trouble code.
Drive the vehicle for a while at 5 km/h (3 mph) or more and then check the diagnostic trouble code.

Q: Does diagnostic trouble code 14 reset?

YES : Repeat the troubleshooting from Step 1.
NO : The procedure is complete.

DTC 17/43/44/45/46/47: TPMS Abnormality (Transmitter OFF Mode)

TPMS DTC SET CONDITION

DTC 17, 43, 44, 45, 46, or 47 is set if the TPMS is in the "Transmitter OFF Mode." At the same time this DTC is set, the TPMS warning light flashes.

- Transmitting signal of the TPMS transmitter should be stopped during transportation to dealer because it will break Japanese radio wave regulation.
- OFF mode is canceled at dealer. So, output warning and set DTC 17 (Transmitter OFF Mode, ALL Tire) during transmitter OFF mode for reminding cancel of OFF mode.
- When the TPMS receiver receives the signals from all registered tire pressure sensor, the TPMS receiver clears the warning.

TPMS DTC CLEAR CONDITION

When the TPMS receiver receives the signals from all registered tire pressure sensor, the TPMS receiver clears the warning.

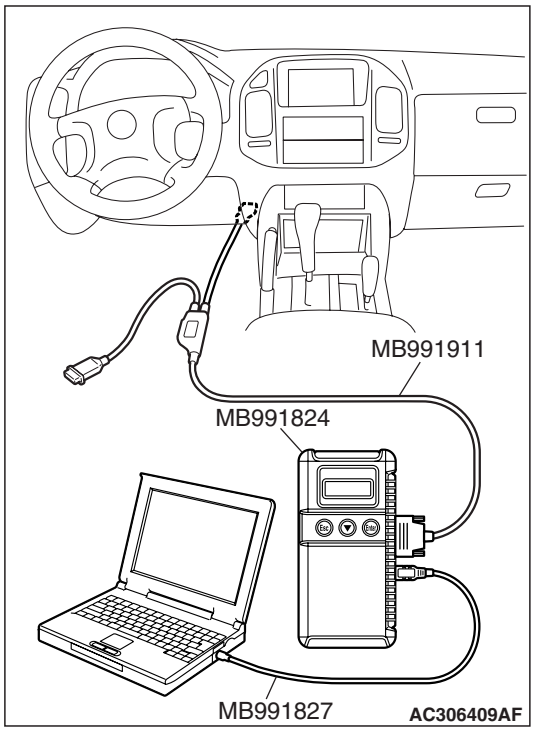
TROUBLESHOOTING HINT

Execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function."

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



STEP 1. Execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function." And then recheck for diagnostic trouble code.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86).
(4) Check the diagnostic trouble code.

Q: Does diagnostic trouble code 17/43/44/45/46/47 reset?

YES <DTC17> : Replace the TPMS receiver and then execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86). And then go to Step 2.

YES <DTC43/44/45/46/47> : Replace the faulty TPMS transmitter and then execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86). And then go to Step 2.

NO : Go to Step 2.

STEP 2. Recheck for diagnostic trouble code.

Q: Does diagnostic trouble code 17/43/44/45/46/47 reset?

YES : Repeat the troubleshooting from Step 1.

NO : The procedure is complete.

DTC 21/25/29/34/38: TPMS Transmitter Abnormality (Transmitter Battery Voltage)

TPMS DTC SET CONDITION

DTC 21, 25, 29, 34 or 38 is set if the battery in the TPMS transmitter is discharged. At the same time this DTC is set, the TPMS warning light flashes.

TROUBLESHOOTING HINT

Replace the TPMS transmitter if its battery is discharged.

NOTE: The battery cannot be removed from the TPMS transmitter. Nominal service life of the battery is 10 years or 160,000 km (100,000 miles).

DIAGNOSIS

NOTE: To help determine which TPMS transmitter is defective, make a note of the tire pressure sensor ID, which the DTC indicates, prior to the troubleshooting.

Required Special Tools:

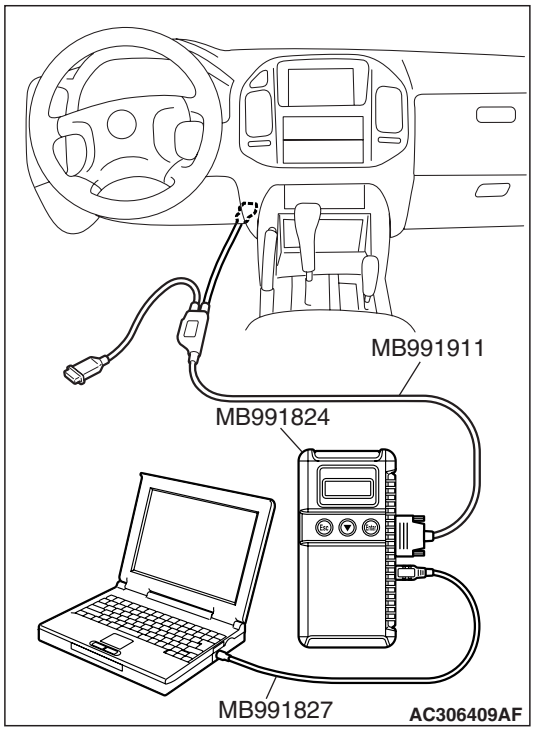
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Execute "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function."

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Execute "Tire Pressure Sensor Check" for all tires (Refer to P.31-89).



Q: Is information on the tire pressure sensor displayed on scan tool MB991958 after the TPMS transmitter is activated?

YES : Determine which TPMS transmitter is defective by using scan tool MB991958, and replace its TPMS transmitter. Then execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86). And then go to Step 2.

NO : Replace the TPMS transmitter, which is not activated and then execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86). And then go to Step 2. (If the TPMS transmitter is not activated and no data is displayed, the TPMS transmitter battery is completely flat).

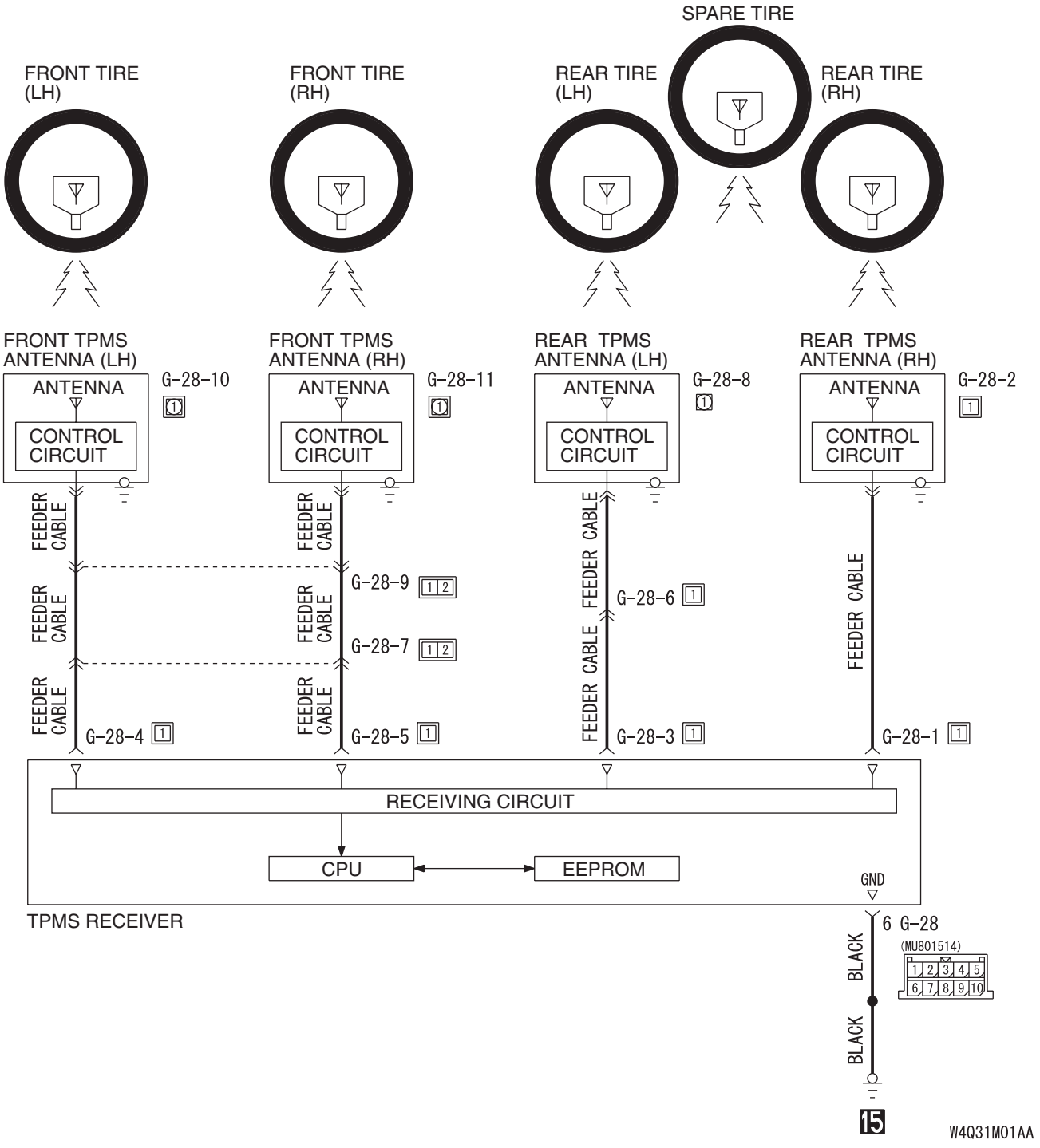
STEP 2. Recheck for diagnostic trouble code.

Q: Does diagnostic trouble code 21, 25, 29, 34 or 38 reset?

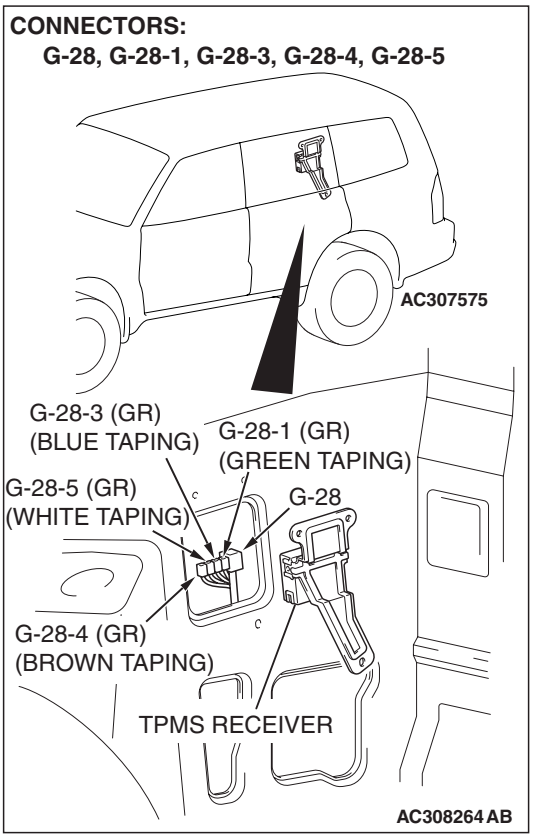
YES : Repeat the troubleshooting from Step 1.
NO : The procedure is complete.

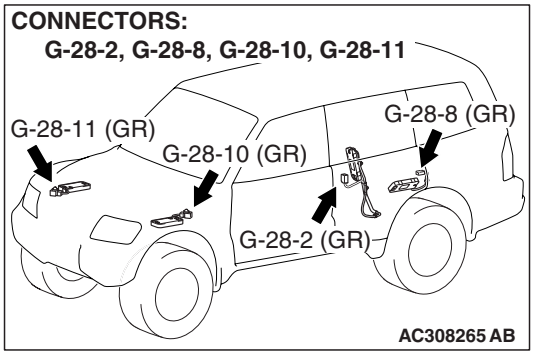
DTC 22/26/31/35/39: TPMS Transmitter Abnormality (Tire Pressure Sensor ID Reception Failure)

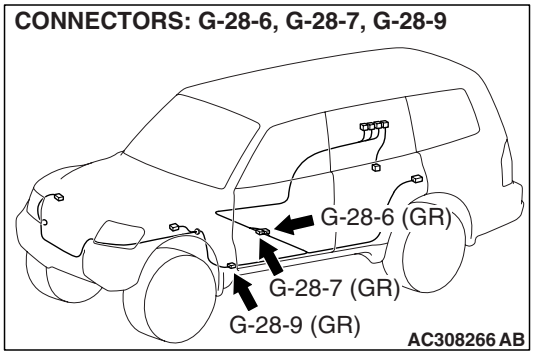
TPMS Transmitter Data Transmission Circuit



TSB Revision







CIRCUIT OPERATION

The TPMS receiver receives data from the TPMS transmitters through the TPMS antennas and feeder cables.

TPMS DTC SET CONDITION

DTC 22, 26, 31, 35 or 39 is set if the TPMS receiver cannot receive data from the TPMS transmitters normally, even when the tire pressure sensor IDs have been registered. At the same time this DTC is set, the TPMS warning light flashes.

NOTE: DTC is also set for the spare tire. This is not a fault. The spare tire is stationary (fixed). Therefore, its transmitter roll switch does not work, and the TPMS transmitter transmits its tire pressure data once every 1 hour. This transmission timing causes the DTC to be set for the spare tire. Do not attempt to diagnose the spare tire for this DTC.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS DTC TO SET ARE:)

- Installing a tire/wheel that does not contain the TPMS transmitter
- Tire pressure sensor IDs are not registered yet
- Damaged feeder cable or connector
- Malfunction of TPMS transmitter
- Malfunction of TPMS antenna
- Malfunction of TPMS receiver

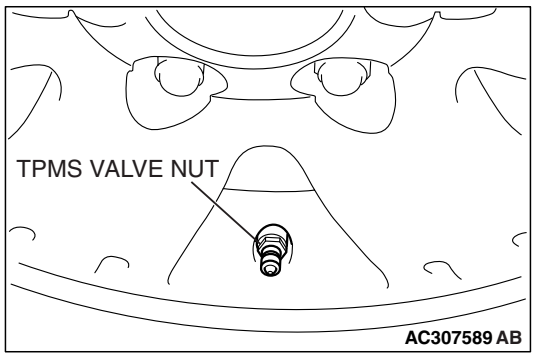
DIAGNOSIS

NOTE: To help determine which TPMS transmitter is defective, make a note of the tire pressure sensor ID and tire number, which the DTC indicates, prior to the troubleshooting. Also execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function", and make a note for the registered tire pressure sensor IDs.

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Visually check whether the wheels contain the TPMS transmitter.

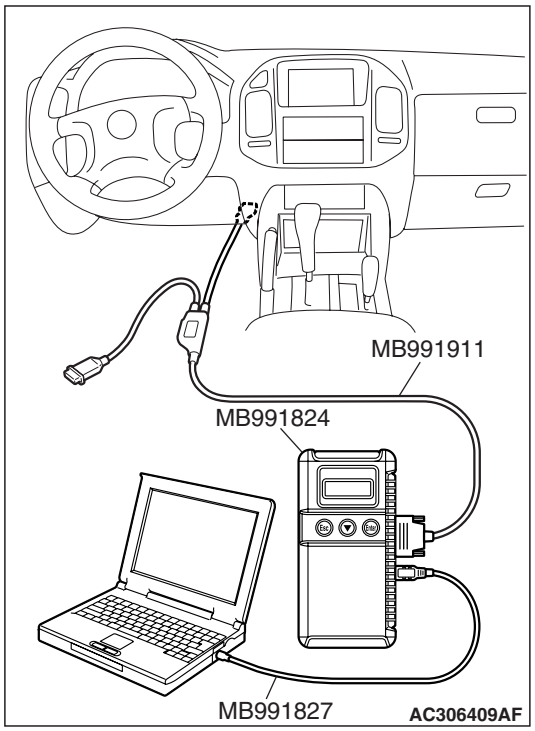


Check the road wheel tires and the spare tire. On TPMS transmitter-fitted tires, the TPMS transmitter is secured using a valve nut. Check for the valve nut.

Q: Are the wheels fitted with the TPMS transmitter?

YES : Go to Step 2.

NO : Install a TPMS transmitter-fitted wheel (the spare tire should also be fitted with the TPMS transmitter). And then execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86). And then go to Step 18.



STEP 2. Check each tire pressure sensor ID by executing "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function."

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Execute "Tire Pressure Sensor Check" for all tires to check each tire pressure sensor ID (Refer to P.31-89).

Q: Is the tire pressure sensor ID, which DTC indicates, shown on the scan tool?

YES : Data can be received from the TPMS transmitters normally. Therefore, it is judged that the DTC is set due to a defective TPMS transmitter roll switch. Replace the TPMS transmitter of the road wheel, which the DTC indicates (Refer to P.31-94). And then go to Step 3. (The DTC will be also set for the spare tire. However, the spare tire TPMS transmitter does not have to be replaced).

NO <when the recognized tire pressure sensor ID does not correspond to the registered one> : Execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86). And then go to Step 18.

NO <when one (or more) of the tire pressure sensor ID(s) cannot be recognized> : Replace the relevant TPMS transmitter (Refer to P.31-94). And then go to Step 3.

STEP 3. Execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function."

Q: Is the "Tire Pressure Sensor ID Registration" complete (Have the tire pressure sensor IDs been registered)?

YES : Go to Step 18.

NO <the tire pressure sensor ID (front-LH) cannot be recognized> : Go to Step 4.

NO <the tire pressure sensor ID (front-RH) cannot be recognized> : Go to Step 7.

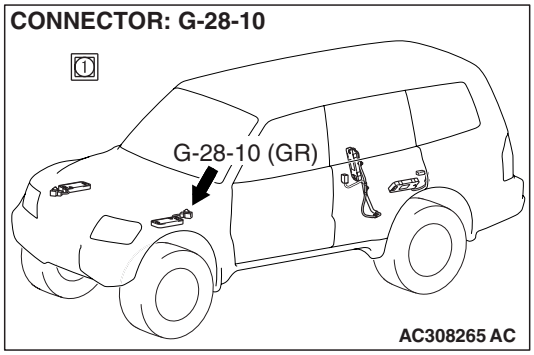
NO <the tire pressure sensor ID (rear-LH) cannot be recognized> : Go to Step 10.

NO <the tire pressure sensor ID (rear-RH) cannot be recognized> : Go to Step 13.

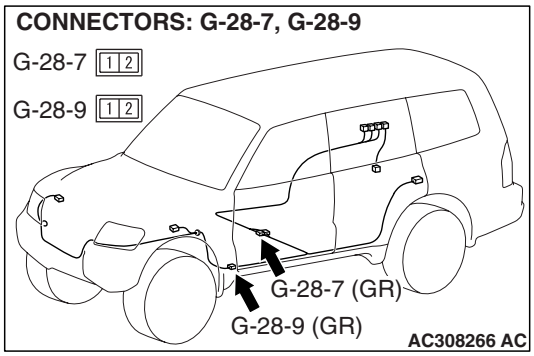
NO <none of the tire pressure sensor IDs can be recognized> : Replace the TPMS receiver (Refer to P.31-93). And then go to Step 17.

STEP 4. Check the following connectors.

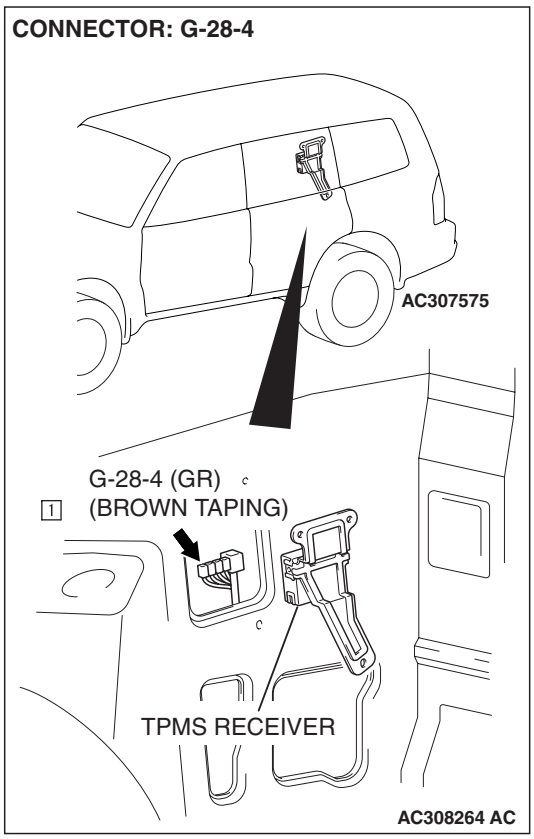
- TPMS antenna (front-LH) connector G-28-10



- Intermediate connectors G-28-7 and G-28-9



- TPMS receiver connector G-28-4

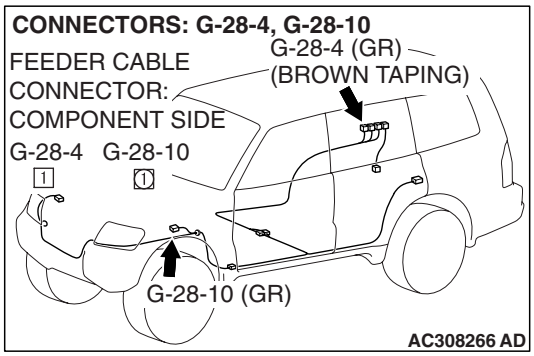


Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 5.

NO : Repair it. And then go to Step 17.

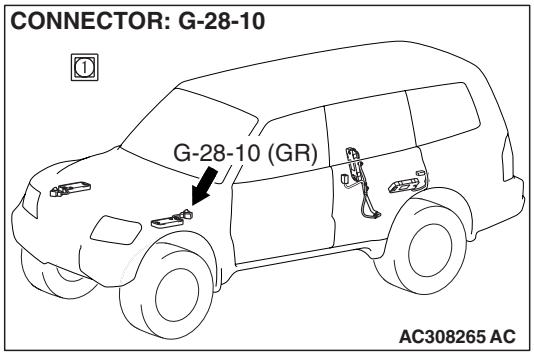


STEP 5. Check the following feeder cable.

- The cable between TPMS antenna (front-LH) connector G-28-10 (terminal 1) and TPMS receiver connector G-28-4 (terminal 1)

Q: Is there any faults or kinks along the feeder cable routing?

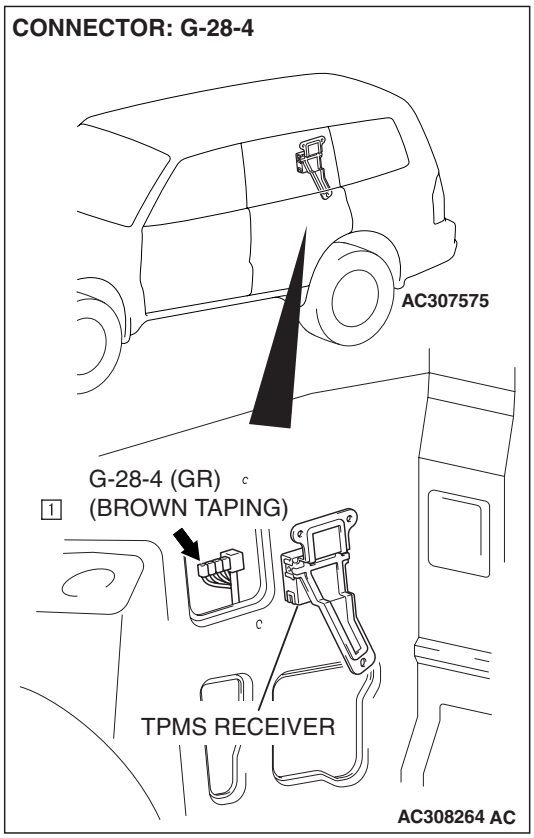
YES : Repair or replace it. And then go to Step 17.
NO : Go to Step 6.



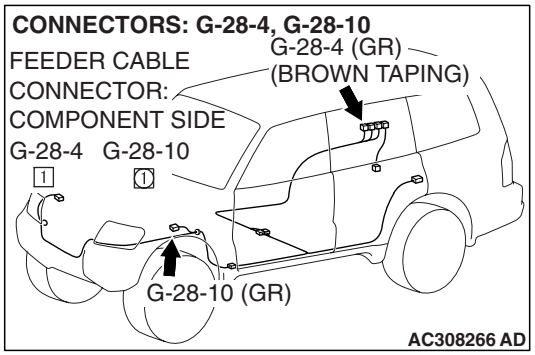
STEP 6. Check the feeder cable core wire for continuity.

(1) Disconnect the following connectors.

- TPMS antenna (front-LH) connector G-28-10



- TPMS receiver connector G-28-4



(2) Check the feeder cable core wire for continuity as below.
- The cable between TPMS antenna (front-LH) connector G-28-10 (terminal 1) and TPMS receiver connector G-28-4 (terminal 1)

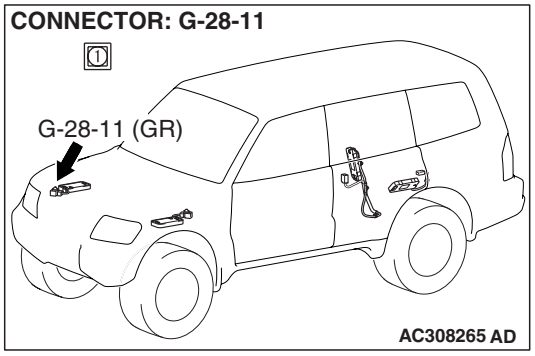
Q: Is there continuity between the feeder cable core wire?

YES : Replace the TPMS antenna (front-LH) (Refer to P.31-91). And then go to Step 16.

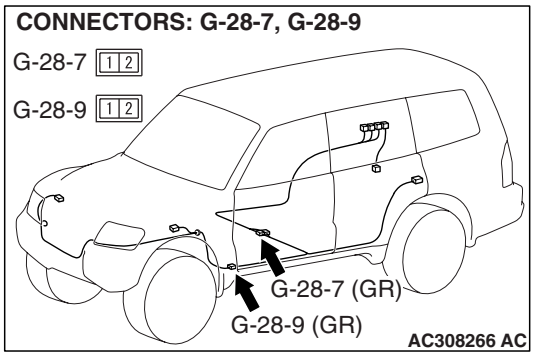
NO : Replace the feeder cable. And then go to Step 17.

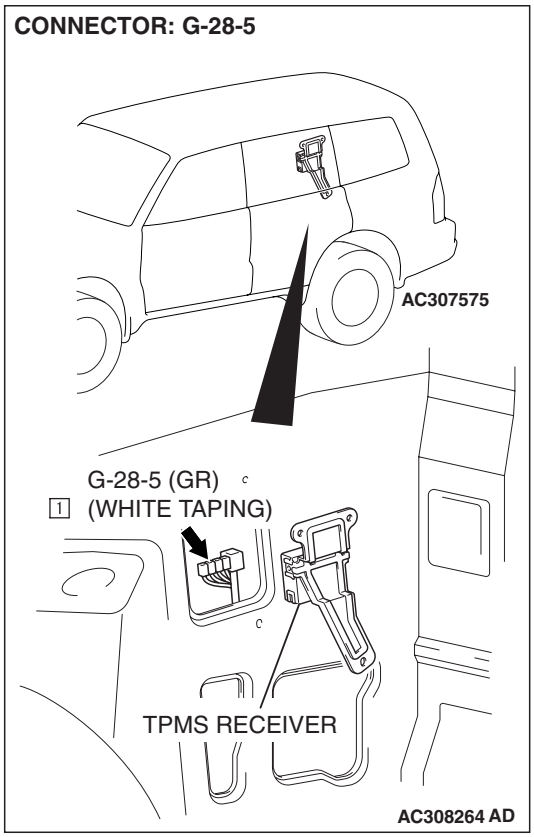
STEP 7. Check the following connectors.

- TPMS antenna (front-RH) connector G-28-11



- Intermediate connectors G-28-7 and G-28-9



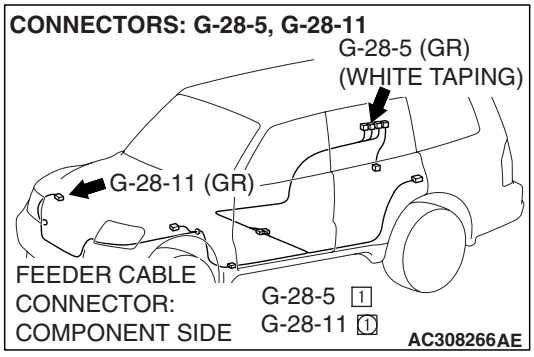


- TPMS receiver connector G-28-5

Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 8.
NO : Repair it. And then go to Step 17.



STEP 8. Check the following feeder cable.

- The cable between TPMS antenna (front-RH) connector G-28-11 (terminal 1) and TPMS receiver connector G-28-5 (terminal 1)

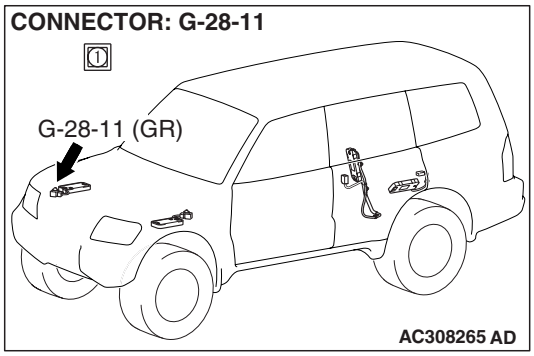
Q: Is there any faults or kinks along the feeder cable routing?

YES : Repair or replace it. And then go to Step 17.
NO : Go to Step 9.

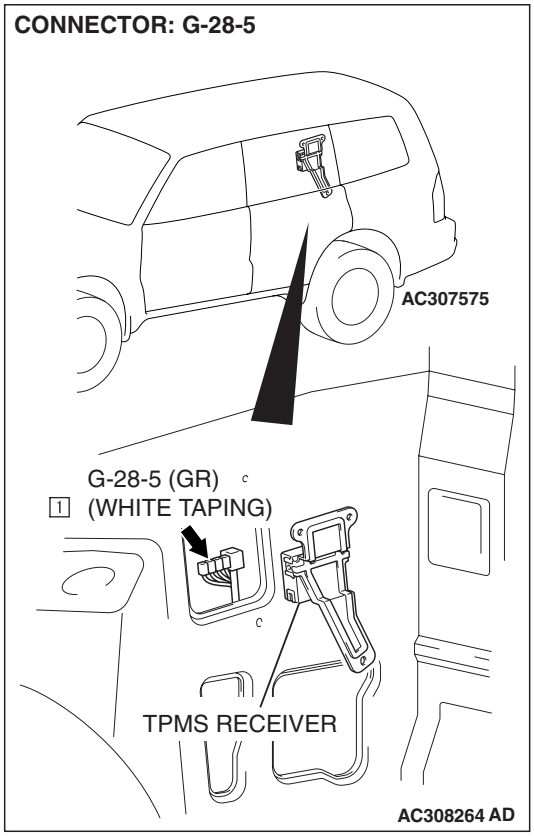
STEP 9. Check the feeder cable core wire for continuity.

(1) Disconnect the following connectors.

- TPMS antenna (front-RH) connector G-28-11

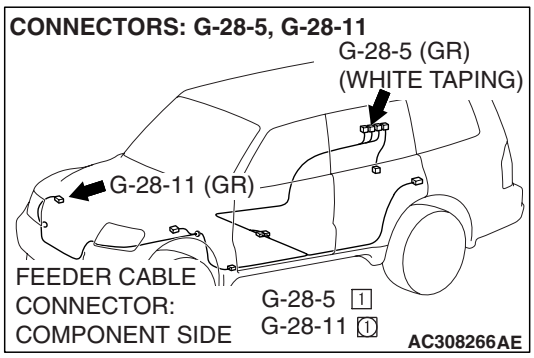


- TPMS receiver connector G-28-5



(2) Check the feeder cable core wire for continuity as below.

- The cable between TPMS antenna (front-RH) connector G-28-11 (terminal 1) and TPMS receiver connector G-28-5 (terminal 1)



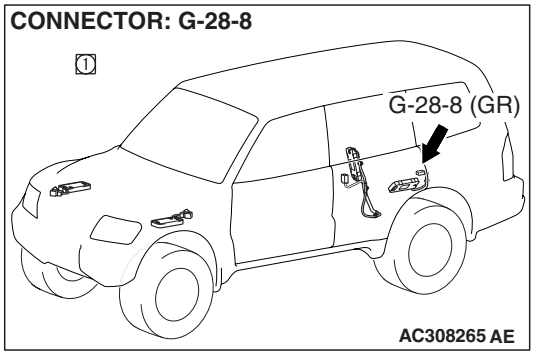
Q: Is there continuity between the feeder cable core wire?

YES : Replace the TPMS antenna (front-RH) (Refer to P.31-91). And then go to Step 16.

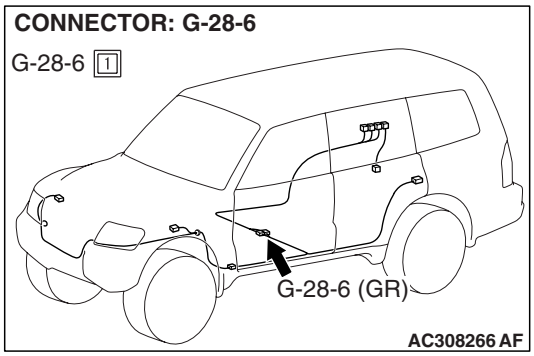
NO : Replace the feeder cable. And then go to Step 17.

STEP 10. Check the following connectors.

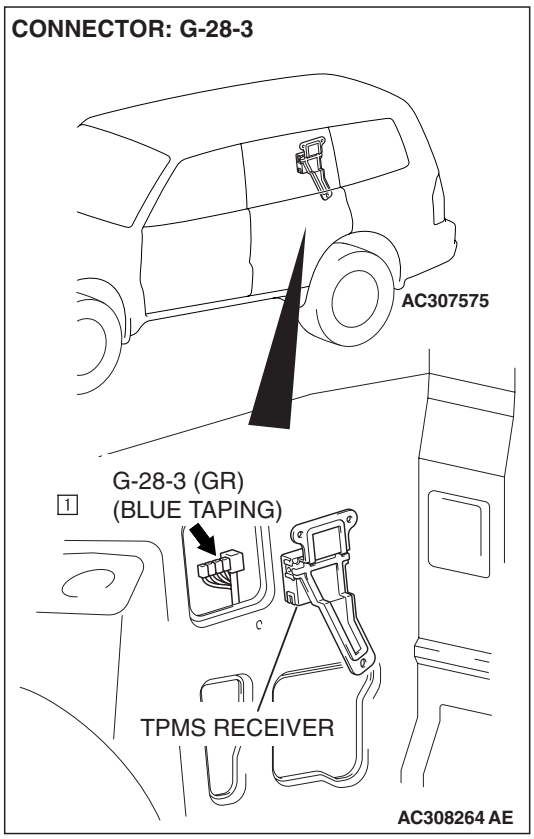
- TPMS antenna (rear-LH) connector G-28-8



- Intermediate connector G-28-6



- TPMS receiver connector G-28-3

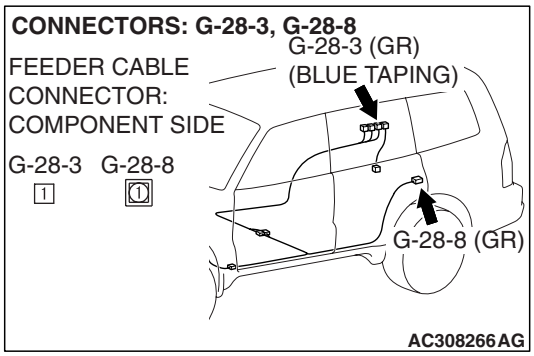


Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 11.

NO : Repair it. And then go to Step 17.



STEP 11. Check the following feeder cable.

- The cable between TPMS antenna (rear-LH) connector G-28-8 (terminal 1) and TPMS receiver connector G-28-3 (terminal 1)

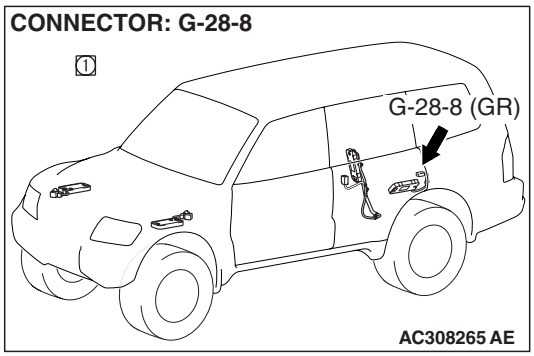
Q: Is there any faults or kinks along the feeder cable routing?

YES : Repair or replace it. And then go to Step 17.
NO : Go to Step 12.

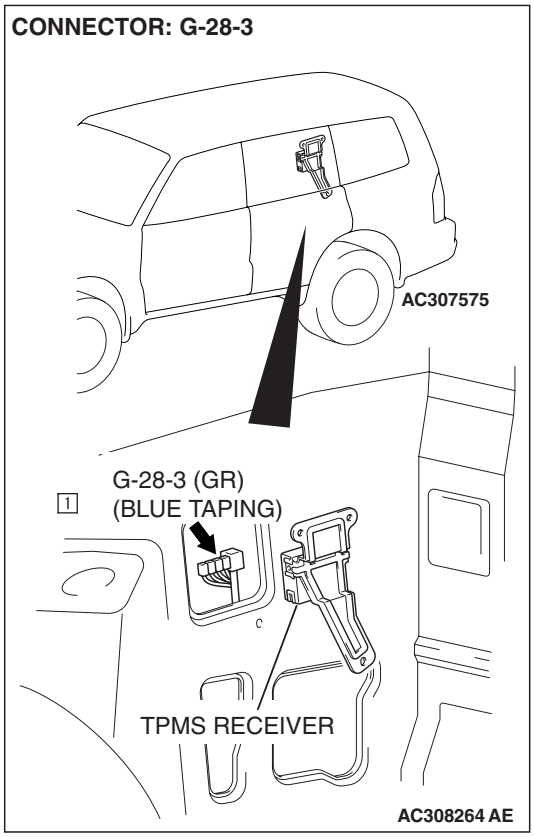
STEP 12. Check the feeder cable core wire for continuity.

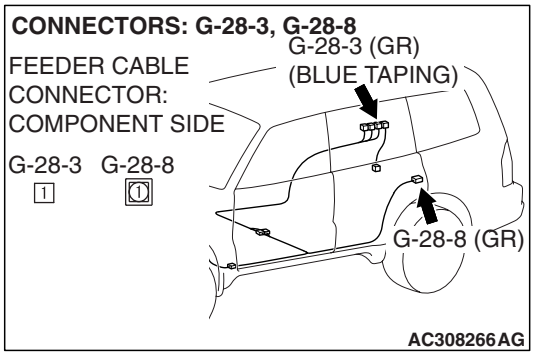
(1) Disconnect the following connectors.

- TPMS antenna (rear-LH) connector G-28-8



- TPMS receiver connector G-28-3





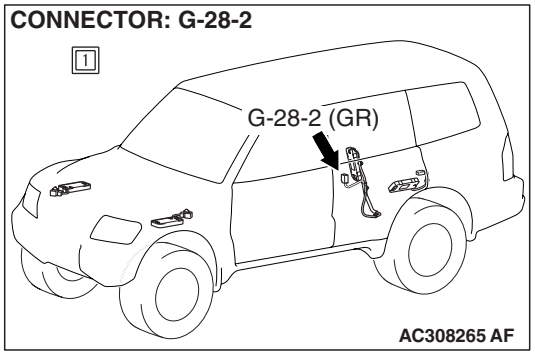
(2) Check the feeder cable core wire for continuity as below.
- The cable between TPMS antenna (rear-LH) connector G-28-8 (terminal 1) and TPMS receiver connector G-28-3 (terminal 1)

Q: Is there continuity between the feeder cable core wire?

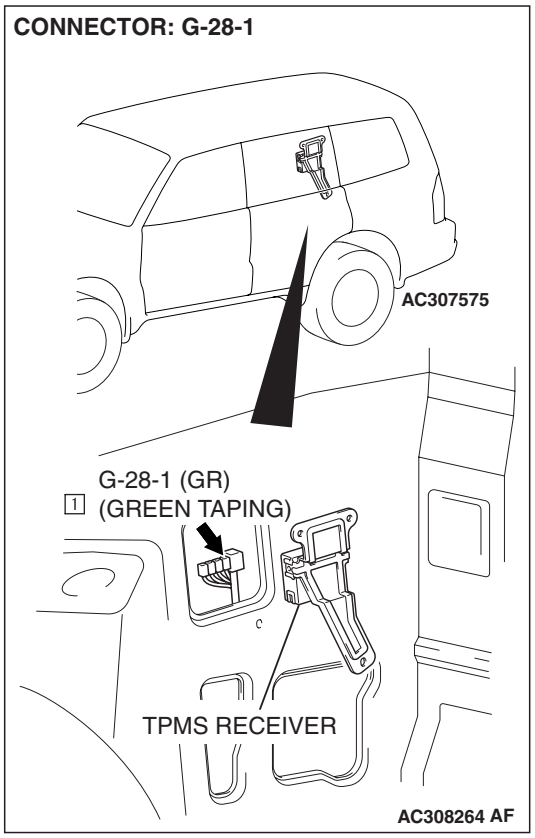
YES : Replace the TPMS antenna (rear-LH) (Refer to P.31-91). And then go to Step 16.

NO : Replace the feeder cable. And then go to Step 17.

STEP 13. Check the following connectors.
- TPMS antenna (rear-RH) connector G-28-2



- TPMS receiver connector G-28-1

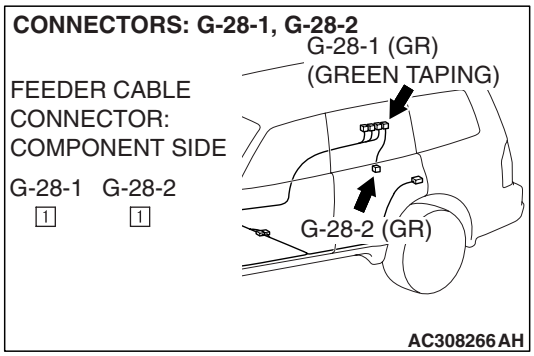


Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 14.

NO : Repair it. And then go to Step 17.



STEP 14. Check the following feeder cable.

- The cable between TPMS antenna (rear-RH) connector G-28-2 (terminal 1) and TPMS receiver connector G-28-1 (terminal 1)

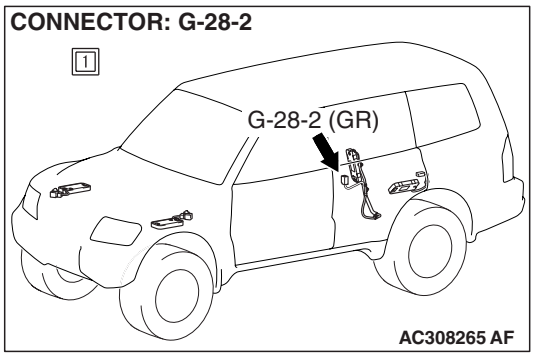
Q: Is there any faults or kinks along the feeder cable routing?

YES : Repair or replace it. And then go to Step 17.
NO : Go to Step 15.

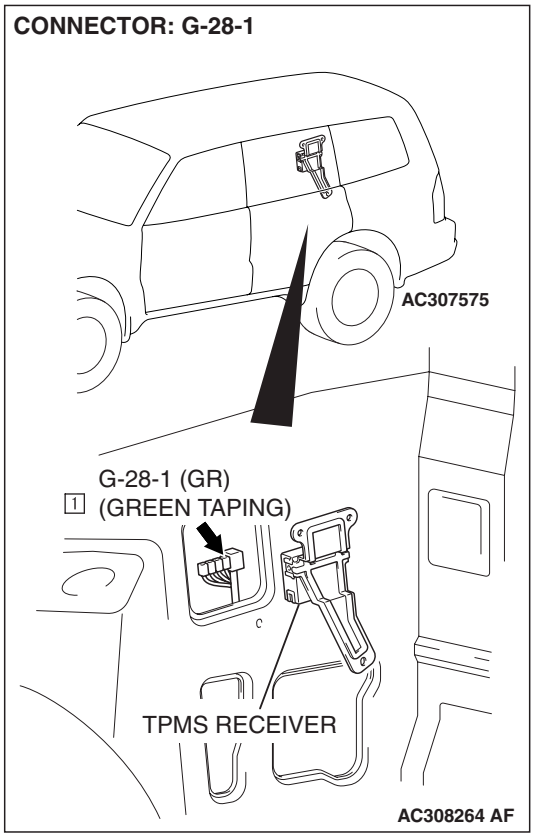
STEP 15. Check the feeder cable core wire for continuity.

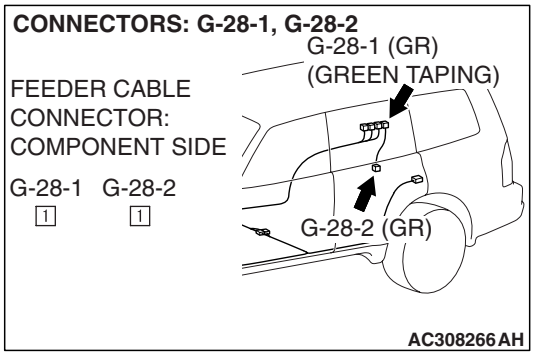
(1) Disconnect the following connectors.

- TPMS antenna (rear-RH) connector G-28-2



- TPMS receiver connector G-28-1





(2) Check the feeder cable core wire for continuity as below.
- The cable between TPMS antenna (rear-RH) connector G-28-2 (terminal 1) and TPMS receiver connector G-28-1 (terminal 1)

Q: Is there continuity between the feeder cable core wire?

YES : Replace the TPMS antenna (rear-RH) (Refer to P.31-91). And then go to Step 16.

NO : Replace the feeder cable. And then go to Step 17.

STEP 16. Execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function."

Q: Is the "Tire Pressure Sensor ID Registration" complete?

YES : Go to Step 18.

NO : Replace the TPMS receiver (Refer to P.31-93). And then go to Step 17.

STEP 17. Execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function."

Q: Is the "Tire Pressure Sensor ID Registration" complete?

YES : Go to Step 18.

NO : Repeat the troubleshooting from Step 1.

STEP 18. Recheck for diagnostic trouble code.

Q: Does diagnostic trouble code 22, 26, 31, 35 or 39 reset?

YES : Repeat the troubleshooting from Step 1.

NO : The procedure is complete.

DTC 23/27/32/36/41: TPMS Transmitter Abnormality (Tire Air Pressure Low)

TPMS DTC SET CONDITION

DTC 23, 27, 32, 36 or 41 is set when the TPMS receiver recognized a low tire pressure from one or more of the TPMS transmitters. At the same time this DTC is set, the TPMS warning light illuminates.

TIRE PRESSURE THRESHOLD VALUES

ITEM	TIRE PRESSURE kPa (psi)
Standard pressure at cold (reference)	200 (29)
Alarm ON pressure	158 (23) or less
Alarm OFF pressure	174 (25) or more

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS DTC TO SET ARE:)

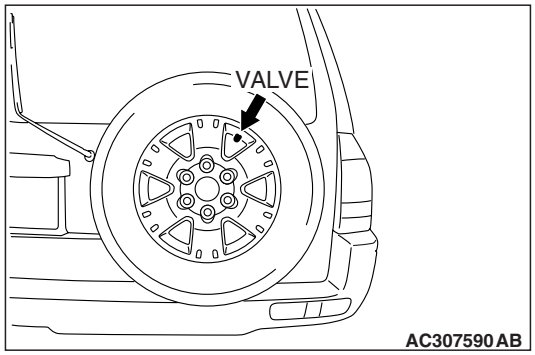
- Low tire inflation pressure
- Punctured tire
- Damaged tire valve grommet and/or valve core
- Defective TPMS transmitter
- Malfunction of the TPMS receiver

DIAGNOSIS

NOTE: Prior to performing troubleshooting for DTC 23, 27, 32, 36 or 41, first carry out "TPMS Inspection Procedure No.1: The TPMS Warning Light Stays On" (Refer to P.31-48). If the troubleshooting is not complete and DTC 23, 27, 32, 36 or 41 is set, carry out troubleshooting as described below.

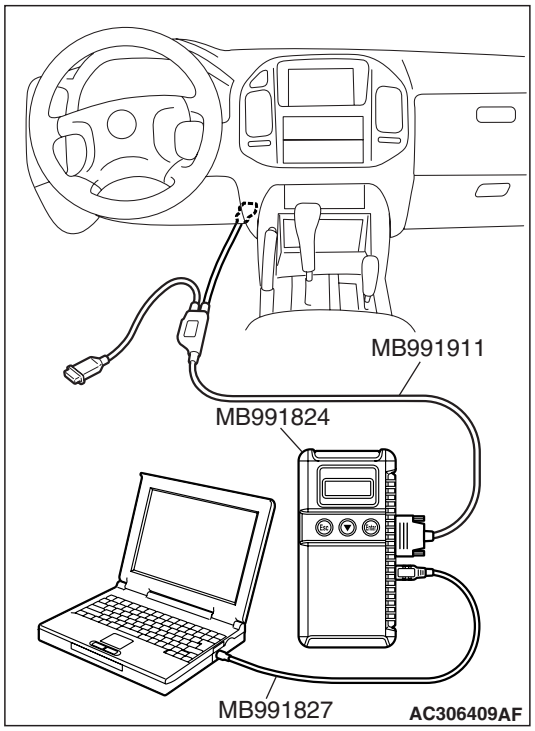
Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



⚠ CAUTION

The system does not monitor inflation pressure of the tire, which the TPMS receiver has recognized as a spare tire. However, if the spare tire is not installed as shown (the valve is not positioned as shown), the roll switch, which is incorporated in the TPMS transmitter, may operate. In that case, the system may determine the spare tire as a road tire incorrectly. If the tire is recognized incorrectly and its inflation pressure is low, the TPMS warning light will illuminate. To avoid this, always install the spare tire in a specified position. Furthermore, even if the spare tire was installed correctly, follow the diagnosis steps below.



STEP 1. Use an accurate tire pressure gauge to measure the tire inflation pressure of all tires (including the spare tire). Then execute "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function."

(1) Use an accurate tire pressure gauge to measure the tire inflation pressure of all tires (including the spare tire), and note the inflation pressures.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(2) Connect scan tool MB991958 to the data link connector.
(3) Turn the ignition switch to the "ON" position.
(4) Execute "Tire Pressure Sensor Check" for all the TPMS transmitter-fitted tires (Refer to P.31-89).

Q: Is the tire inflation pressure shown on scan tool MB991958 within ± 10 kPa (1.5 psi) from the actual inflation pressure? <Ambient temperature during measurement must be 0 – 50°C (32 – 122°F)>

YES : Adjust the tire inflation pressures to the value specified on the tire pressure label. Then execute "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function" (Refer to P.31-89) to update the tire inflation pressure data on scan tool MB991958. Make sure that the pressures displayed on scan tool MB991958 correspond to the value specified on the tire pressure label. Then go to Step 2.

NO : Replace the TPMS transmitter, where the tire pressure sensor is inaccurate. Then execute "Tire Pressure Sensor ID Registration" (Refer to P.31-86). Then go to Step 3.

STEP 2. Recheck for diagnostic trouble code.

Q: Does diagnostic trouble code 23, 27, 32, 36 or 41 reset?

YES : Replace the TPMS receiver (Refer to P.31-93). On completion, execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" (Refer to P.31-86). Then go to Step 3.

NO : The procedure is complete.

STEP 3. Recheck for diagnostic trouble code.

Q: Does diagnostic trouble code 23, 27, 32, 36 or 41 reset?

YES : Repeat the troubleshooting from Step 1.

NO : The procedure is complete.

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TPMS SYMPTOM CHART

M1311003100025

⚠ CAUTION

During diagnosis, a DTC code associated with another system may be set when the ignition switch is turned to the "ON" position with connector(s) disconnected. when diagnosis is finished, check all systems for DTC codes. If DTC code(s) are set, erase them all.

SYMPTOM	INSPECTION PROCEDURE NO.	REFERENCE PAGE
The TPMS warning light stays on.	1	P.31-48
The TPMS warning light flashes.	2	P.31-54
The TPMS warning light does not illuminate as a bulb check for three seconds when the ignition switch is turned to the "ON" position.	3	P.31-58
In spite of abnormally low tire pressure at a road wheel, the TPMS warning light does not illuminate.	4	P.31-70
Communication between the scan tool and the TPMS is not possible.	5	P.31-77

NOTE: Whenever the TPMS transmitters and/or TPMS receiver are replaced with new ones, the tire pressure sensor IDs must be registered into the TPMS.

NOTE: The use of non-genuine wheels will cause the improper installation of the TPMS transmitters, possibly resulting in air leakage and damage to the TPMS transmitter.

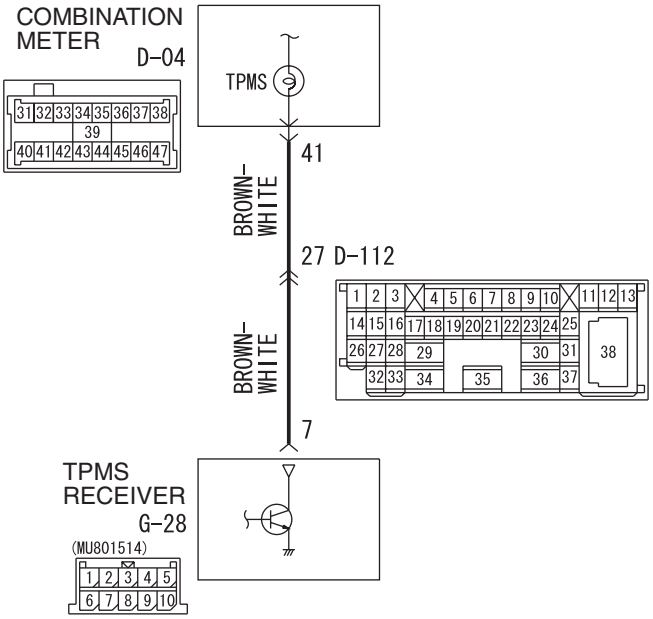
NOTE: TPMS may not work normally in the following circumstances:

- *A wireless facility or device using the same frequency with the TPMS transmitter is near the vehicle.*
- *Snow or ice is stuck inside the wheel houses and /or on the wheels.*
- *The TPMS transmitter's battery is discharged.*
- *Wheels other than Mitsubishi genuine wheels are being used.*
- *Wheels that are not fitted with TPMS transmitters are being used.*
- *Wheels whose tire pressure sensor IDs are not registered by the vehicle are being used.*

TPMS SYMPTOM PROCEDURES

INSPECTION PROCEDURE 1: The TPMS Warning Light Stays On.

TPMS Warning Light Signal Circuit



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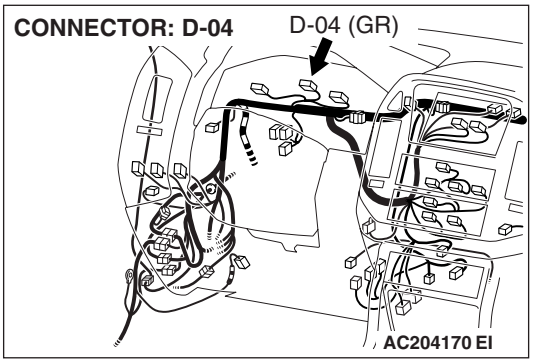

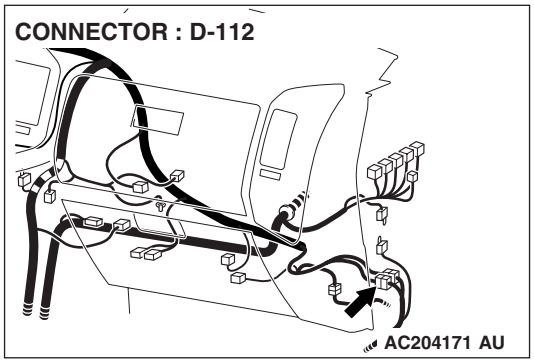

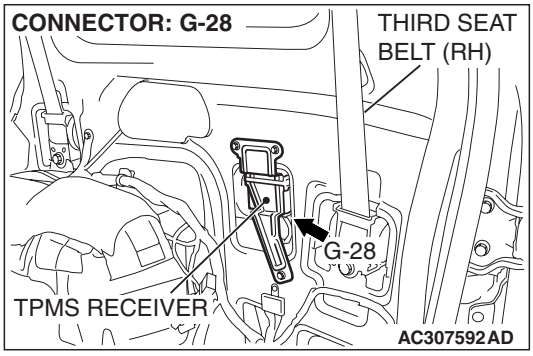

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CIRCUIT OPERATION

- The TPMS warning light will illuminate when the tire inflation pressure of any road wheel is below 158 kPa (23.0 psi).
- Furthermore, the TPMS warning light illuminates for three seconds immediately after the ignition switch is turned to the "ON" position. This is a bulb check of the TPMS warning light.

TECHNICAL DESCRIPTION (COMMENT)

If the TPMS warning light illuminates for three seconds after the ignition switch is turned to the "ON" position, and does not go out, diagnose the signal circuit of the TPMS warning light as follows (from Step 6).

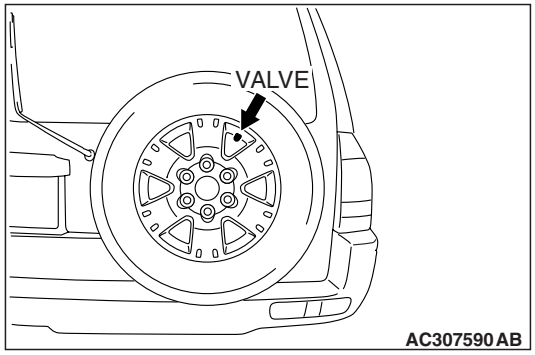
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Low tire inflation pressure
- Punctured tire
- Damaged tire valve grommet and/or valve core
- Inaccurate tire pressure sensor of the TPMS transmitter
- TPMS warning light signal harness wire shorted to ground
- Malfunction of the combination meter
- Malfunction of the TPMS receiver

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



⚠ CAUTION

The system does not monitor inflation pressure of the tire, which the TPMS receiver has recognized as a spare tire. However, if the spare tire is not installed as shown (the valve is not positioned as shown), the roll switch, which is incorporated in the TPMS transmitter, may operate. In that case, the system may determine the spare tire as a road tire incorrectly. If the tire is recognized incorrectly and its inflation pressure is low, the TPMS warning light will illuminate. To avoid this, always install the spare tire in a specified position. Furthermore, even if the spare tire was installed correctly, follow the diagnosis steps below.

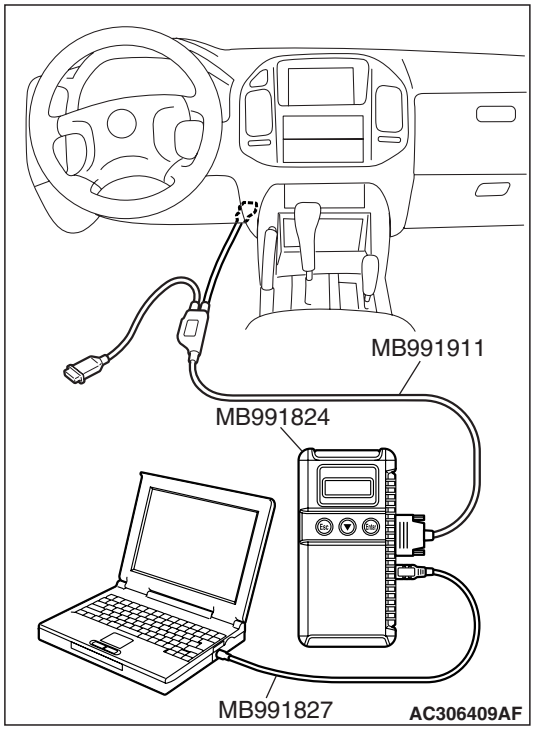
STEP 1. Inspect the all tires.

Visually check all the tires for any sign of air leak or puncture.

Q: Are all the tires (including spare tire) in good condition?

YES : Go to Step 2.

NO : Replace the valve grommet or valve core, or repair the flat tire. Replace the tire if necessary. And then go to Step 2.



STEP 2. After the tire inflation pressure is adjusted and the TPMS transmitter sends inflation pressure information on it, check the TPMS warning light.

(1) Wait until the tires cool down, and adjust all the tire inflation pressures (including spare tire) to the value specified on the tire pressure label.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(2) Connect scan tool MB991958 to the data link connector.
(3) Turn the ignition switch to the "ON" position.
(4) Execute "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function" (Refer to P.31-89).
(5) Check the TPMS warning light.

Q: Is the TPMS warning light turned off?

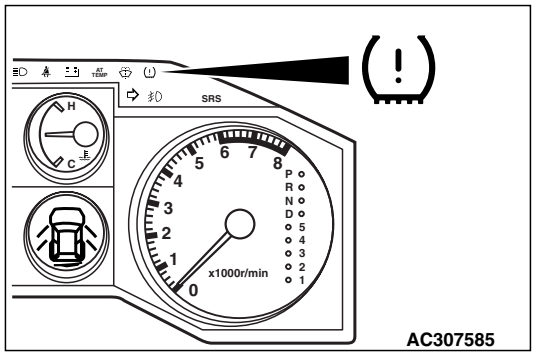
YES : The procedure is complete.
NO : Go to Step 3.

STEP 3. Check the tire inflation pressure again.

Use a tire pressure gauge to check that all the tire inflation pressures (including spare tire) meet the value specified on the tire pressure label.

Q: Are all the tires (including spare tire) in good condition?

YES : Go to Step 4.
NO : Replace the valve grommet or valve core, or repair the damaged tire. Replace the tire if necessary. And then return to Step 2.



STEP 4. Check the TPMS warning light.

Turn the ignition switch to the "ON" position. The TPMS warning light should illuminate for three seconds, and then go out momentarily.

NOTE: If the TPMS warning light goes out momentarily, the TPMS warning light circuit is correct. However, as DTC 23, 27, 32, 36 or 41 (TPMS transmitter abnormality – Tire air pressure low) has been set, the TPMS warning light illuminated.

Q: Turn the ignition switch to the "ON" position. Does the TPMS warning light illuminate for three seconds, and then go out momentarily?

YES : Go to Step 5.
NO : Go to Step 6.

STEP 5. Using scan tool MB991958, read the diagnostic trouble code.

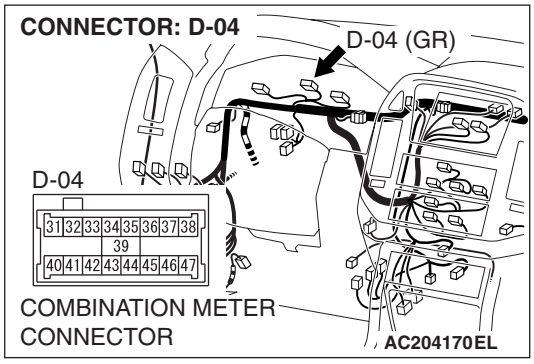
Use scan tool MB991958 to check whether DTC 23, 27, 32, 36 or 41 (TPMS transmitter abnormality – Tire air pressure low) is set.

Q: Is DTC 23, 27, 32, 36 or 41 set?

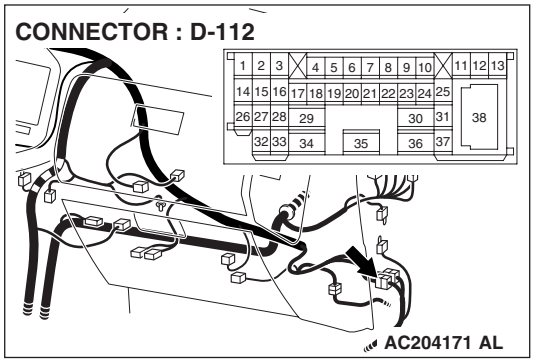
YES : Carry out troubleshooting for DTC 23/27/32/36/41 (TPMS transmitter abnormality – Tire air pressure low) (Refer to P.31-45).
NO : Replace the TPMS receiver (Refer to P.31-93) and execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" (Refer to P.31-86). And then go to Step 9.

STEP 6. Check the following connectors.

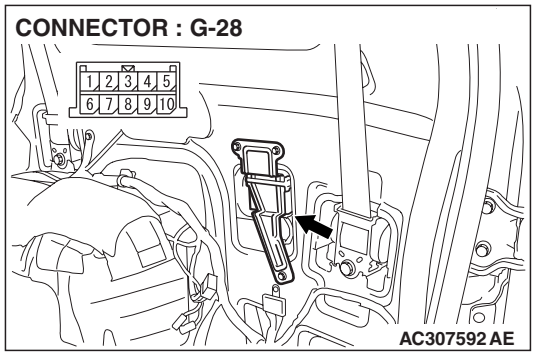
- Combination meter connector D-04



- Intermediate connector D-112



- TPMS receiver connector G-28

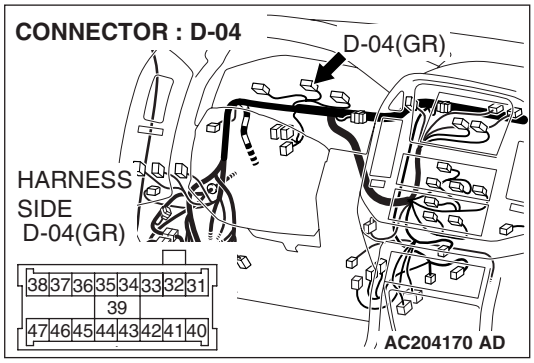


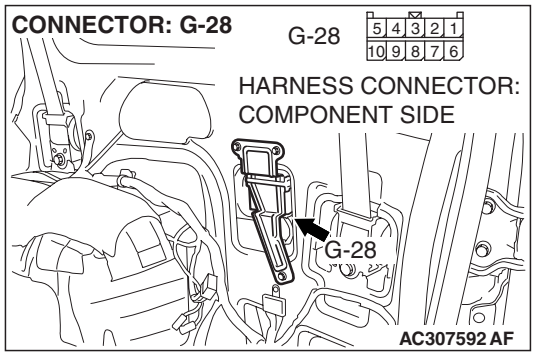
Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair it. And then go to Step 9.





STEP 7. Check the following harness wire.

- The wire between combination meter connector D-04 (terminal 41) and TPMS receiver connector G-28 (terminal 7)

Q: Is the harness wire damaged?

YES : Repair or replace it. And then go to Step 9.
NO : Go to Step 8.

STEP 8. Check the combination meter.

Check that the combination meter warning lights and indicators other than TPMS warning light illuminate normally.

Q: Are there any faults on the combination meter?

YES : Replace the meter assembly (Refer to P.54A-76). And then go to Step 9.
NO : Replace the TPMS receiver (Refer to P.31-93) and execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" (Refer to P.31-86). And then go to Step 9.

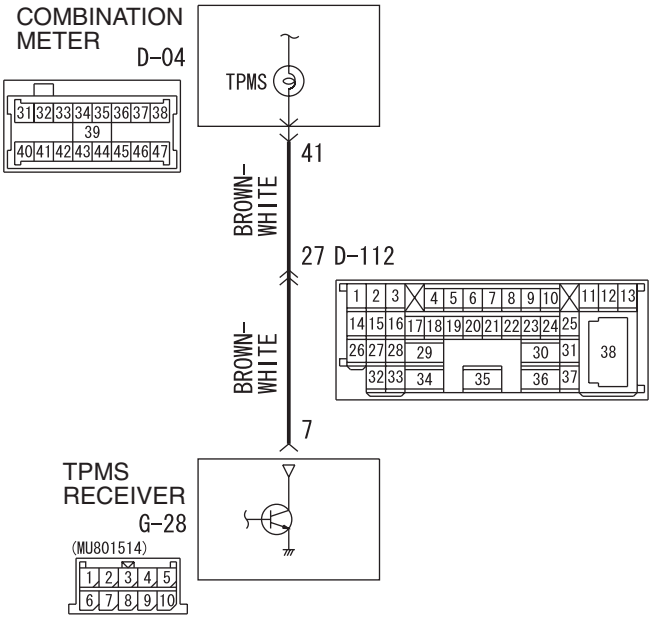
STEP 9. Retest the system.

Q: Turn the ignition switch to the "ON" position. Does the TPMS warning light illuminate for three seconds, and then go out?

YES : The procedure is complete.
NO : Repeat the troubleshooting from Step 1.

INSPECTION PROCEDURE 2: The TPMS Warning Light Flashes.

TPMS Warning Light Signal Circuit



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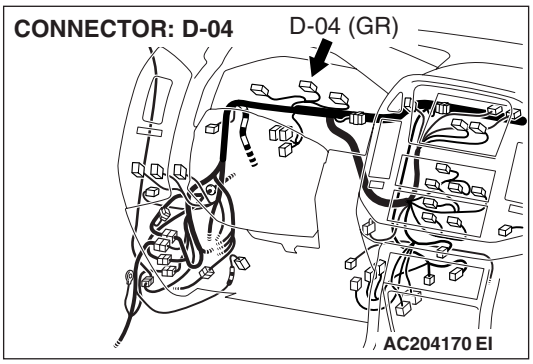

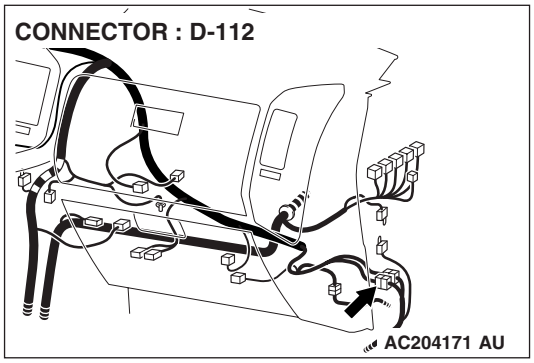

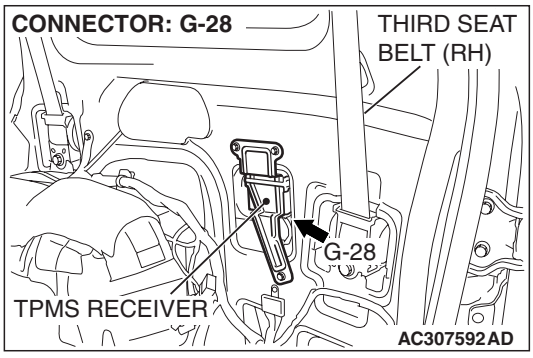

CIRCUIT OPERATION

- The TPMS warning light will flash when a fault has occurred in the TPMS.
- The TPMS warning light may also flash when a fault has occurred in the TPMS warning light signal circuit (including open circuit and shorted circuit).

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TECHNICAL DESCRIPTION (COMMENT)

- If any TPMS DTCs are set, carry out the relevant troubleshooting.
- If no TPMS DTC is set, carry out the trouble-shooting for the TPMS warning light signal circuit.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- A fault has occurred in the TPMS.
- Damaged harness wire or connector in the TPMS warning light signal circuit
- Malfunction of the combination meter
- Malfunction of the TPMS receiver

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

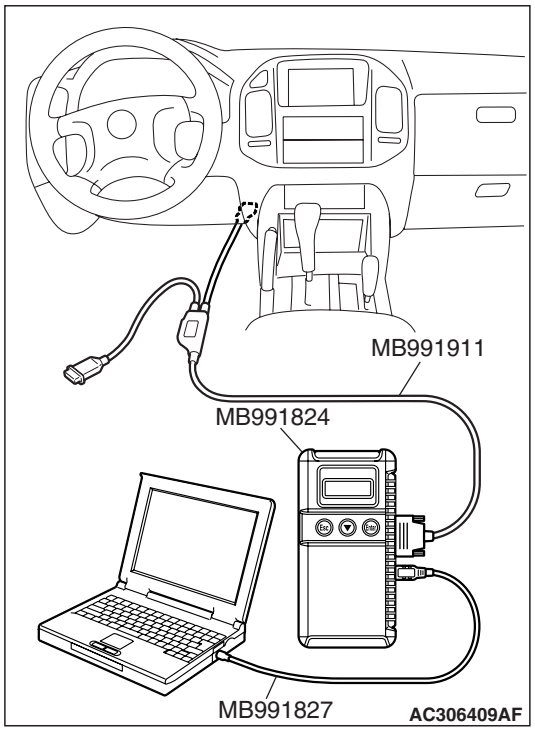
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check whether any TPMS DTC is set.

Q: Is any TPMS DTC set?

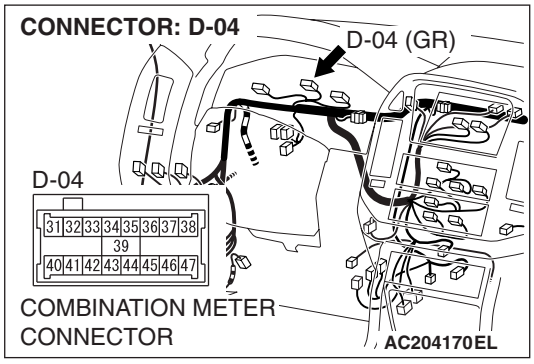
YES : Carry out the relevant TPMS troubleshooting (Refer to P.31-19).

NO : Go to Step 2.

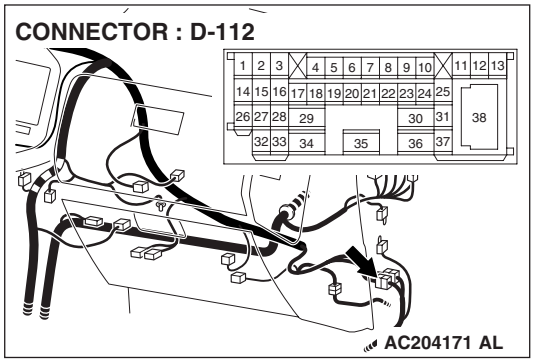


STEP 2. Check the following connectors.

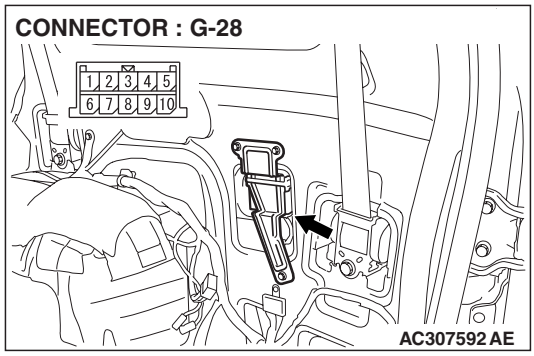
- Combination meter connector D-04



- Intermediate connector D-112



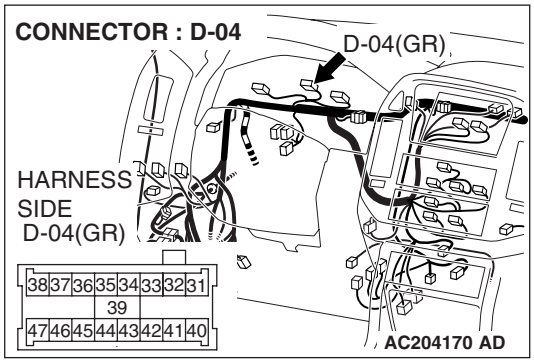
- TPMS receiver connector G-28

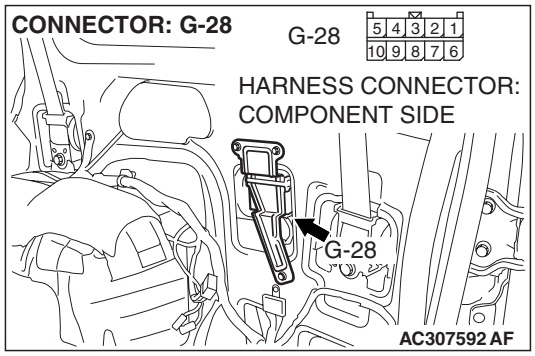


Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 3.
NO : Repair it. Then go to Step 5.





STEP 3. Check the following harness wire.

- The wire between combination meter connector D-04 (terminal 41) and TPMS receiver connector G-28 (terminal 7)

Q: Is the harness wire damaged?

YES : Repair or replace it. Then go to Step 5.
NO : Go to Step 4.

STEP 4. Check the combination meter.

Check that the combination meter warning lights and indicators other than TPMS warning light illuminate normally.

Q: Are there any faults on the combination meter?

YES : Replace the meter assembly (Refer to P.54A-76). Then go to Step 5.
NO : Replace the TPMS receiver (Refer to P.31-93) and execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" (Refer to P.31-86). Then go to Step 5.

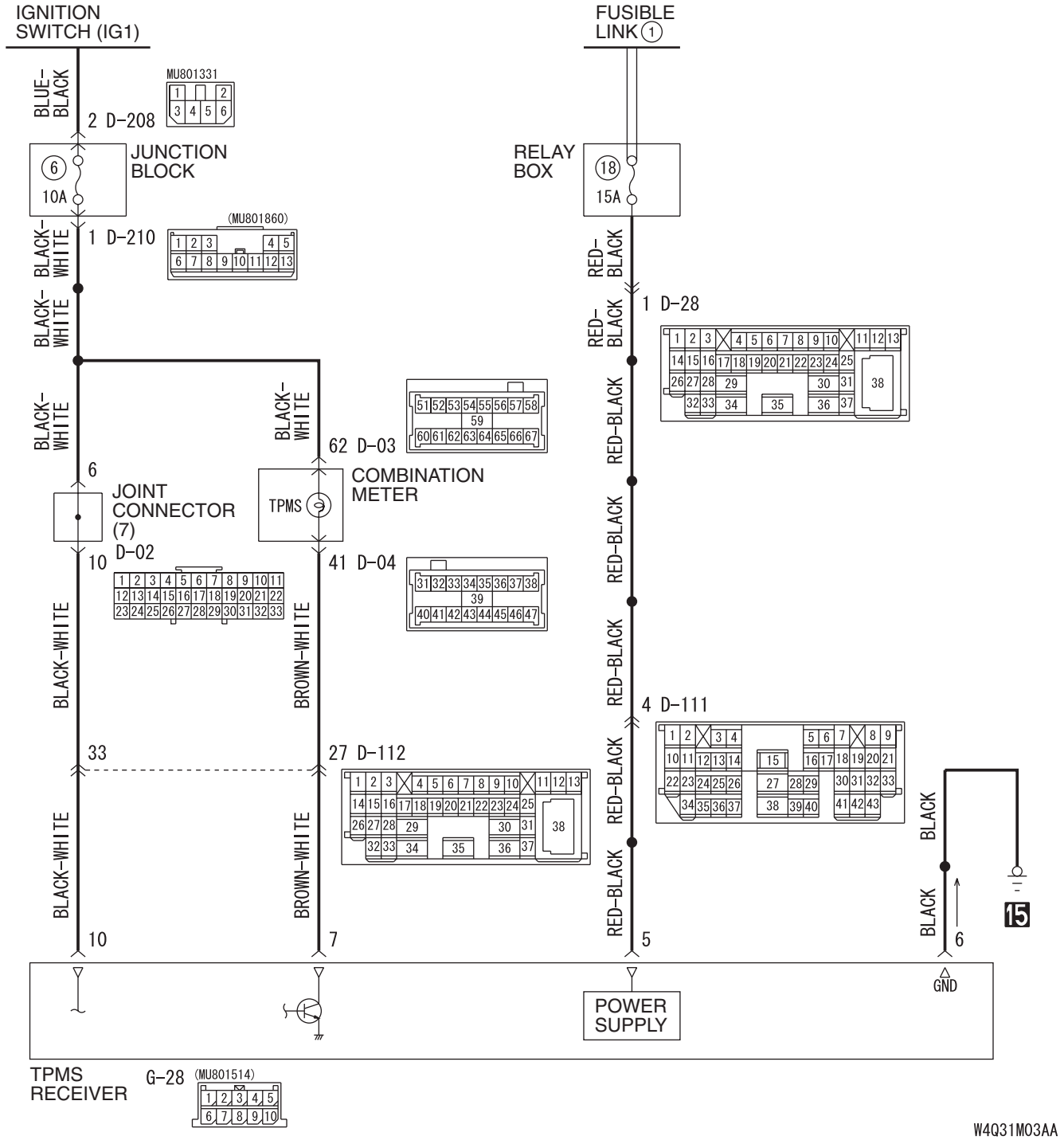
STEP 5. Retest the system.

Q: Turn the ignition switch to the "ON" position. Does the TPMS warning light illuminate for three seconds, and then go out?

YES : The procedure is complete.
NO : Repeat the troubleshooting from Step 1.

INSPECTION PROCEDURE 3: The TPMS Warning Light does not Illuminate as a Bulb Check for Three Seconds when the Ignition Switch is Turned to the "ON" Position.

TPMS Receiver Power Supply and Ground, Ignition Signal Input and TPMS Warning Light Circuit



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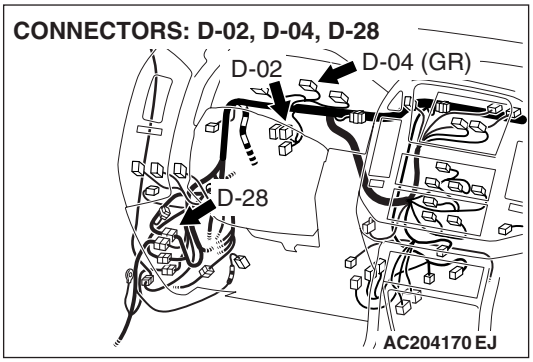
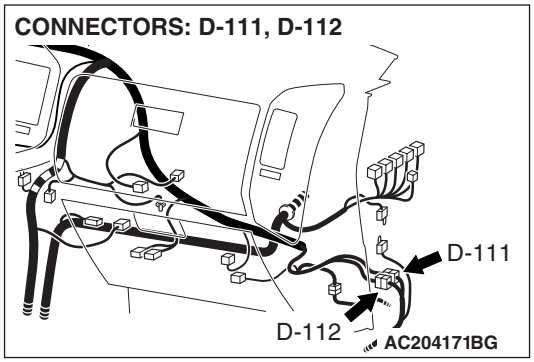
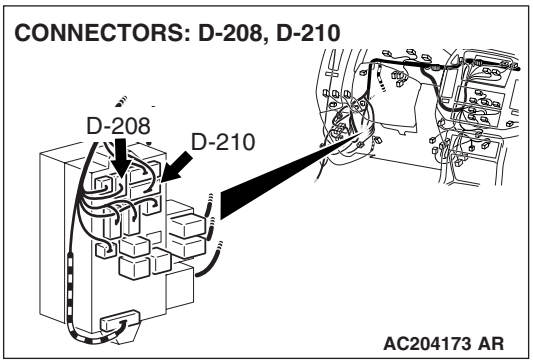
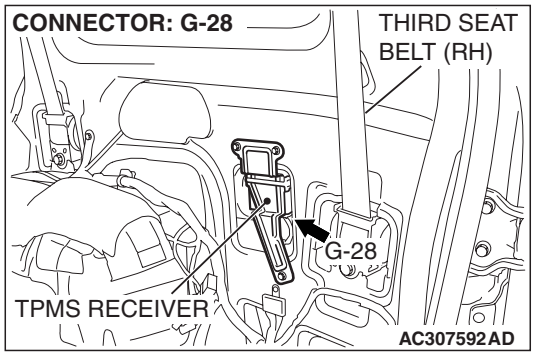
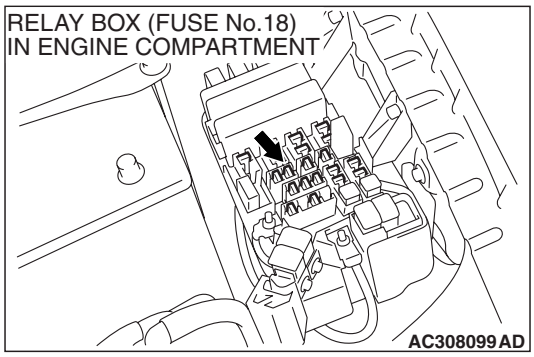










CIRCUIT OPERATION

For three seconds after the ignition switch is turned to the "ON" position, the TPMS receiver illuminates the TPMS warning light to check any breaks in the TPMS warning light circuit.

TECHNICAL DESCRIPTION (COMMENT)

If the TPMS warning light does not illuminate for three seconds when the ignition switch is turned to the "ON" position, diagnose the TPMS warning light signal circuit, power supply to the TPMS receiver, ignition signal, and/or ground circuit.

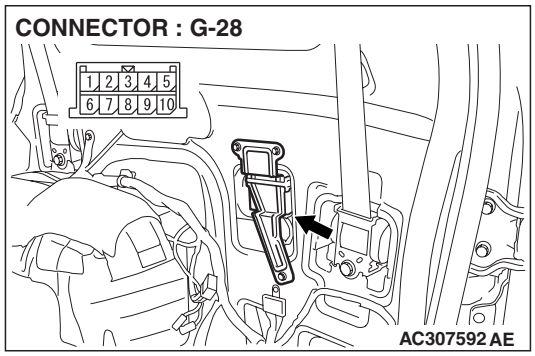
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- TPMS warning light signal harness wire open circuit
- Ignition signal harness wire of the TPMS receiver or battery power supply harness wire open circuit
- Ground harness wire of the TPMS receiver open circuit
- Malfunction of the combination meter
- Malfunction of the TPMS receiver

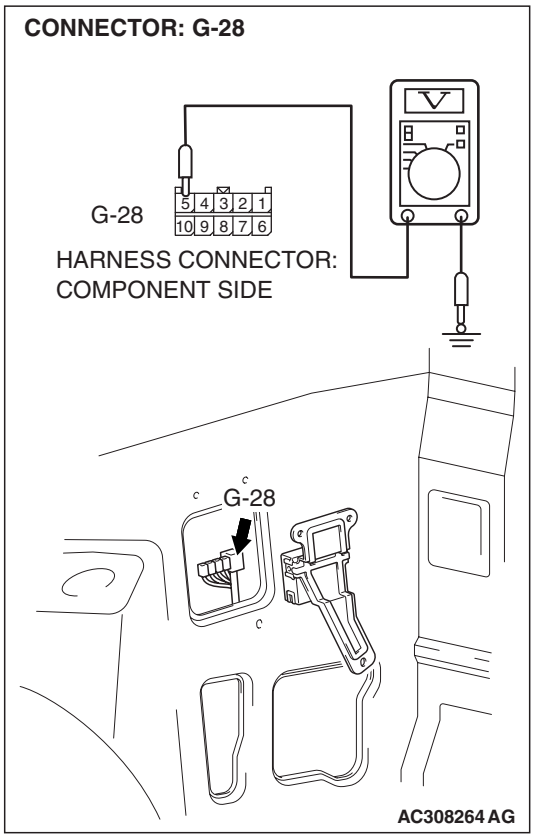
DIAGNOSIS

Required Special Tool:
- MB991223: Harness Set

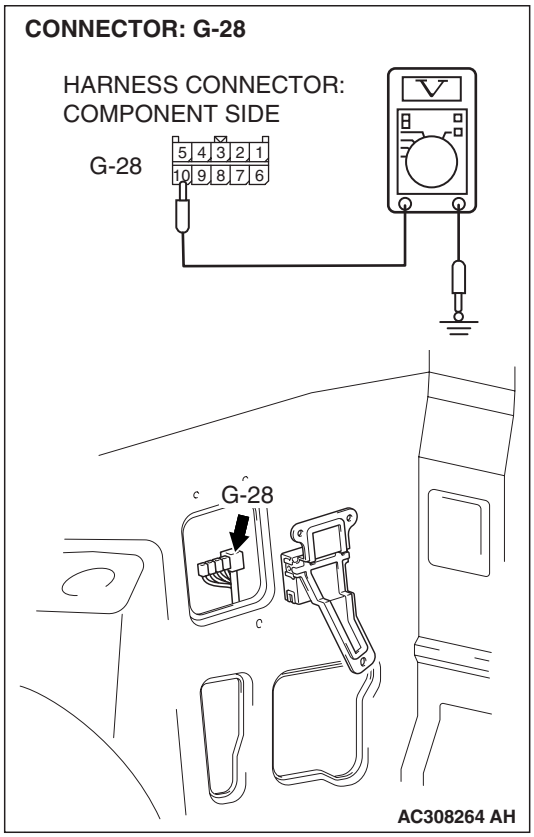
STEP 1. Measure the voltage at G-28 TPMS receiver connector.



(1) Disconnect TPMS receiver connector G-28, and check at the harness connector (component side).



(2) Measure the voltage between terminal 5 and ground. It should measure battery positive voltage (approximately 12 volts).
(3) Turn the ignition switch to the "ON" position.



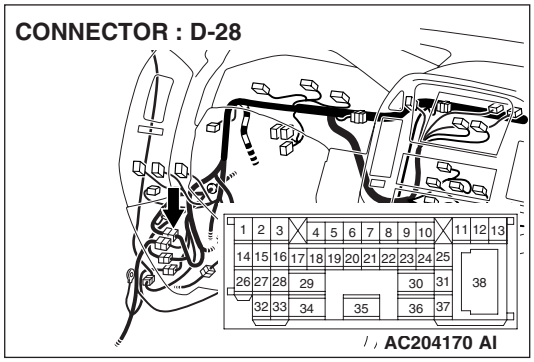
(4) Measure the voltage between terminal 10 and ground. It should measure battery positive voltage (approximately 12 volts).

Q: Is battery positive voltage (approximately 12 volts) present?

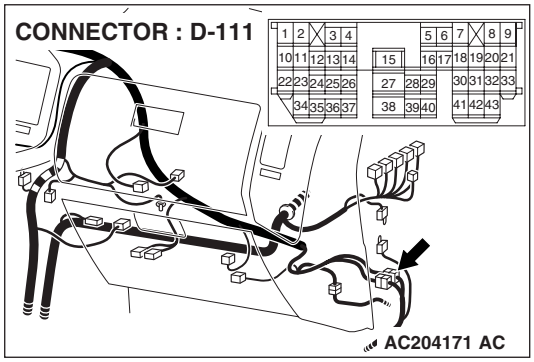
YES <all the measured voltages are equivalent to battery positive voltage> : Go to Step 6.
NO <voltage between terminal 5 and ground is not battery positive voltage> : Go to Step 2.
NO <voltage between terminal 10 and ground is not battery positive voltage> : Go to Step 4.

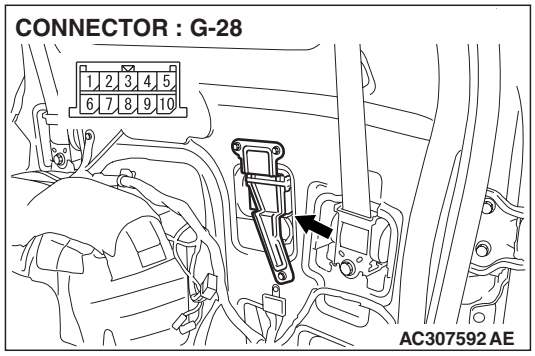
STEP 2. Check the following connectors.

- Intermediate connector D-28



- Intermediate connector D-111





- TPMS receiver connector G-28

Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

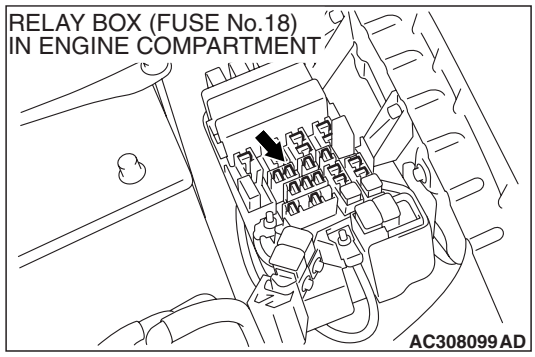
YES : Go to Step 3.
NO : Repair it. And then go to Step 12.

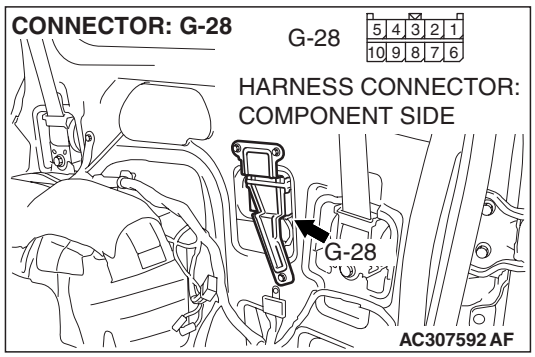
STEP 3. Check the following harness wire.

- The wire between relay box in engine compartment (fuse number 18) and TPMS receiver connector G-28 (terminal 5)

Q: Is the harness wire damaged?

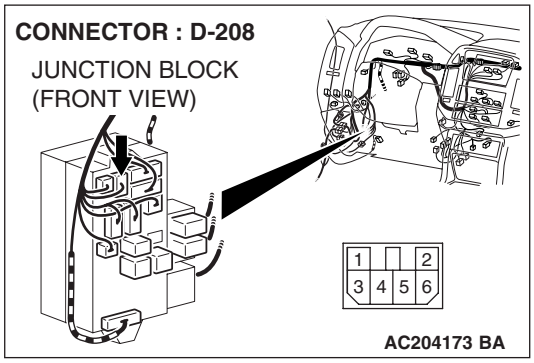
YES : Repair or replace it. And then go to Step 12.
NO : Repeat the troubleshooting from Step 1.

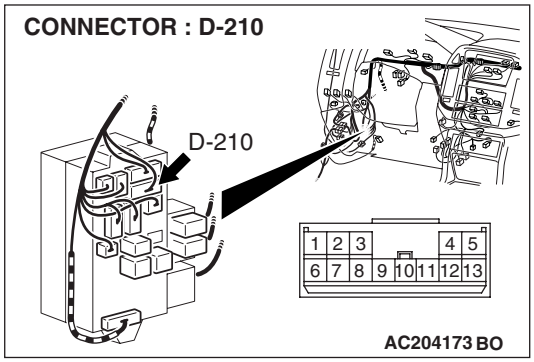




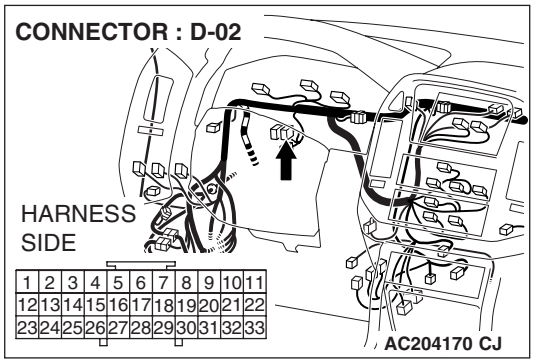
STEP 4. Check the following connectors.

- Junction block connectors D-208 and D-210

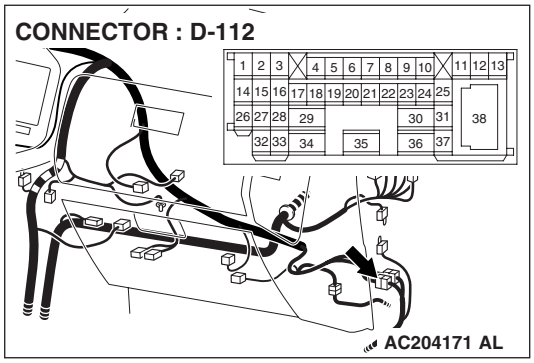


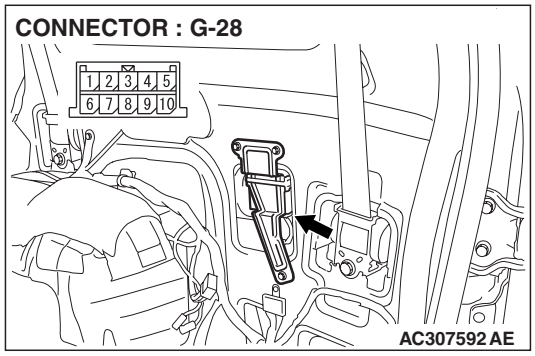


- Joint connector D-02



- Intermediate connector D-112





- TPMS receiver connector G-28

Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

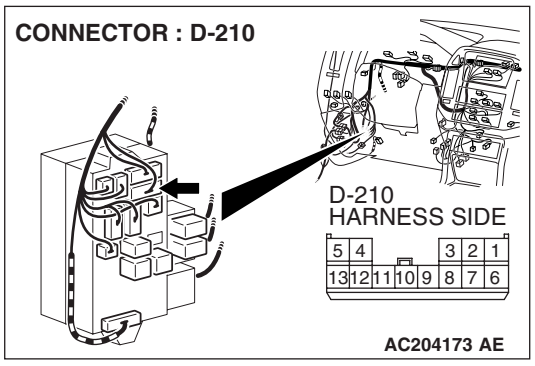
YES : Go to Step 5.
NO : Repair it. And then go to Step 12.

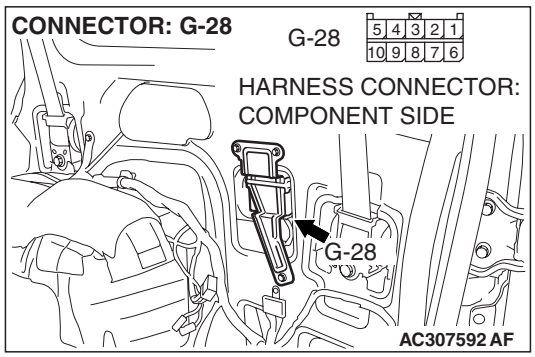
STEP 5. Check the following harness wire.

- The wire between junction block connector D-210 (terminal 1) and TPMS receiver connector G-28 (terminal 10)

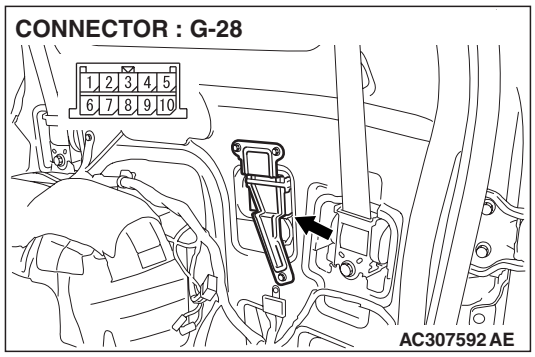
Q: Is the harness wire damaged?

YES : Repair or replace it. And then go to Step 12.
NO : Repeat the troubleshooting from Step 1.

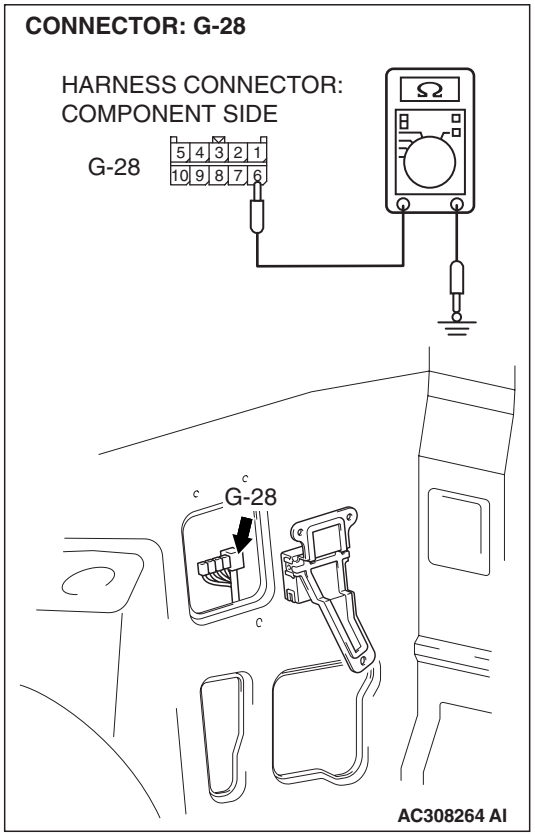




STEP 6. Measure the resistance at C-118 TPMS receiver connector.



(1) Disconnect TPMS receiver connector G-28, and check at the harness side.



(2) Measure the resistance between terminal 6 and ground. It should measure less than 2 ohms.

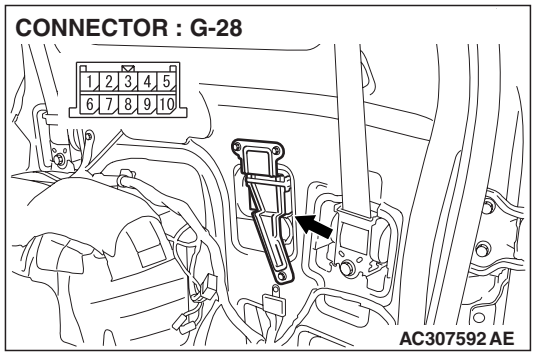
Q: Is the measured resistance less than 2 ohms?

YES : Go to Step 9.
NO : Go to Step 7.

STEP 7. Check the following connector.

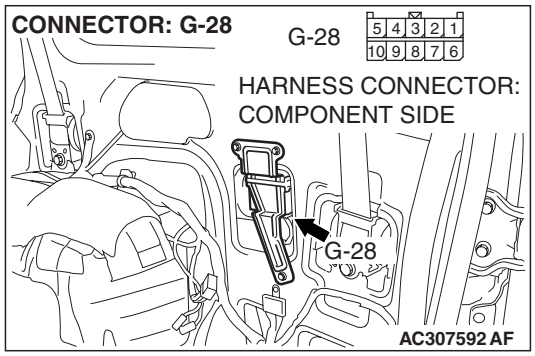
- TPMS receiver connector G-28

Check the connector for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Are the connector and terminals in good condition?

YES : Go to Step 8.
NO : Repair it. And then go to Step 12.

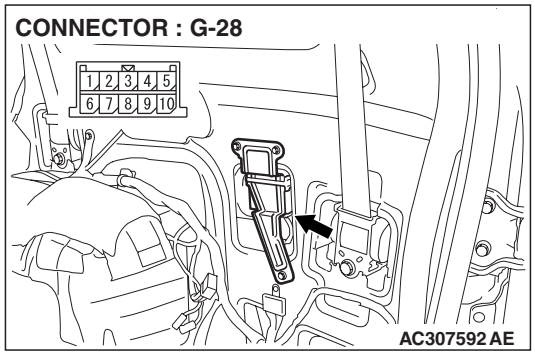


STEP 8. Check the following harness wire.

- The wire between TPMS receiver connector G-28 (terminal 6) and ground.

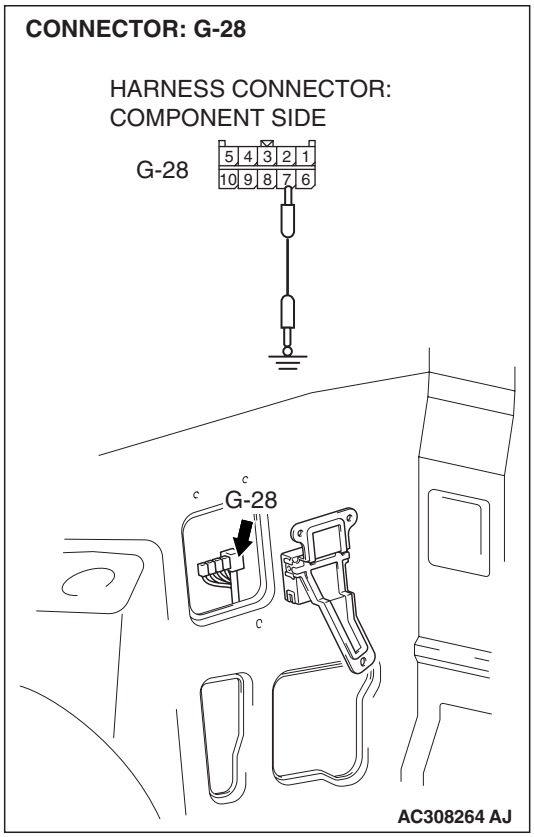
Q: Is the harness wire damaged?

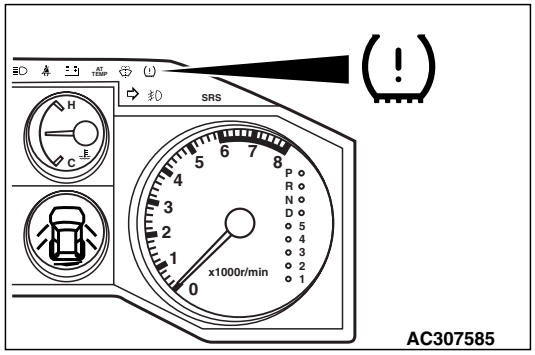
YES : Repair or replace it. And then go to Step 12.
NO : Return to Step 6.



STEP 9. Check the TPMS warning light circuit at TPMS receiver connector G-28.

(1) Disconnect TPMS receiver connector G-28.
(2) Turn the ignition switch to the "ON" position.





(3) Ground terminal 7 of disconnected connector G-28 from the TPMS receiver. The TPMS warning light should illuminate.

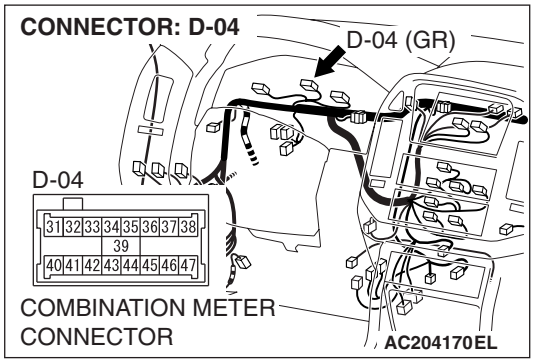
Q: Does the TPMS warning light illuminate?

YES : Replace the TPMS receiver (Refer to P.31-93) and execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" (Refer to P.31-86). And then go to Step 12.

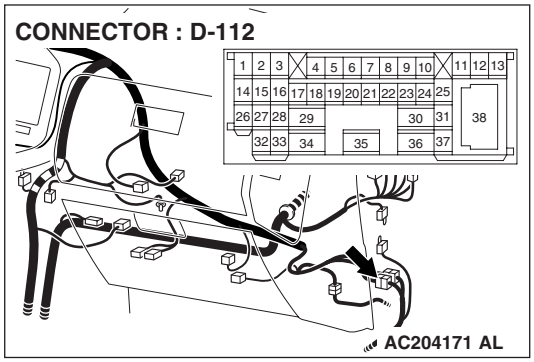
NO : Go to Step 10.

STEP 10. Check the following connectors.

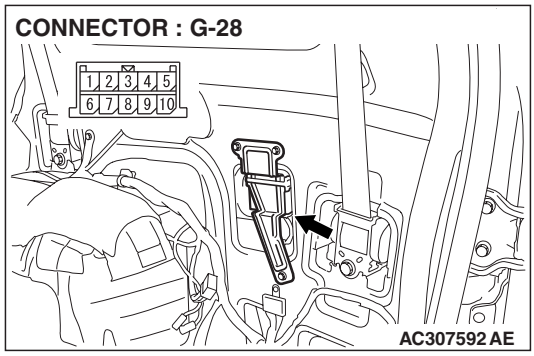
- Combination meter connector D-04



- Intermediate connector D-112



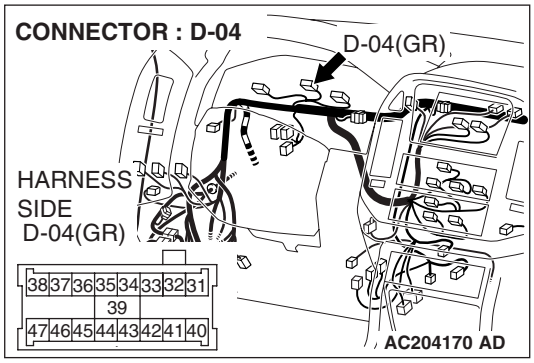
- TPMS receiver connector G-28

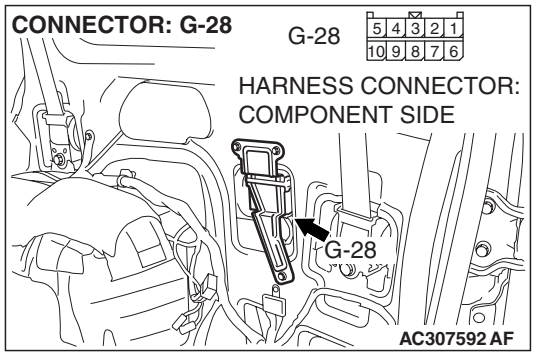


Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 11.
NO : Repair it. And then go to Step 12.





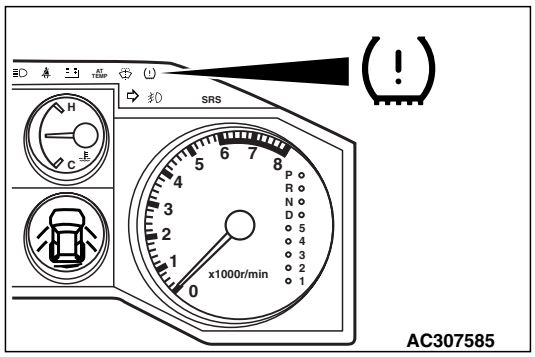
STEP 11. Check the following harness wire.

- The wire between combination meter connector D-04 (terminal 41) and TPMS receiver connector G-28 (terminal 7)

Q: Is the harness wire damaged?

YES : Repair or replace it. And then go to Step 12.

NO : Replace the combination meter case (Refer to P.54A-76). And then go to Step 12.



STEP 12. Retest the system.

Q: Turn the ignition switch to the "ON" position. Does the TPMS warning light illuminate for three seconds, and then go out?

YES : The procedure is complete.

NO : Repeat the troubleshooting from Step 1.

INSPECTION PROCEDURE 4: In Spite of Abnormally Low Tire Pressure at a Road Wheel, the TPMS Warning Light does not Illuminate.

SYSTEM OPERATION
The TPMS warning light will illuminate when the ignition switch is turned to the "ON" position if tire pressure of any road wheel is low.

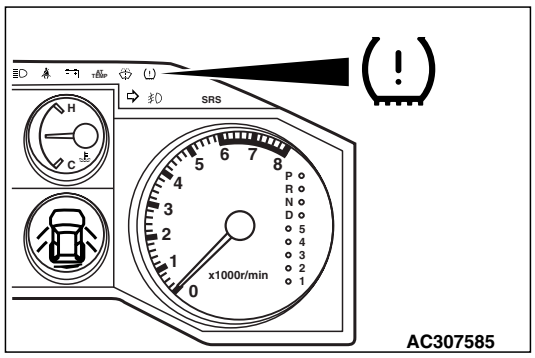
NOTE: As long as the spare tire is not being used as a road wheel tire, the TPMS does not warn the driver even if the spare tire inflation pressure has decreased.

TECHNICAL DESCRIPTION (COMMENT)
- The TPMS may not detect a failure if the TPMS transmitter does not send timely information or there is any interference with the antenna.
- The tire pressure sensor or roll switch inside the TPMS transmitter may be inaccurate or defective. In this case, the TPMS may not detect a failure.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- The TPMS transmitter does not send timely information or there is any interference with the antenna.
- Damaged harness wire or connector
- Malfunction of the combination meter
- Malfunction of the TPMS transmitter
- Malfunction of the TPMS receiver

DIAGNOSIS

Required Special Tools:
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

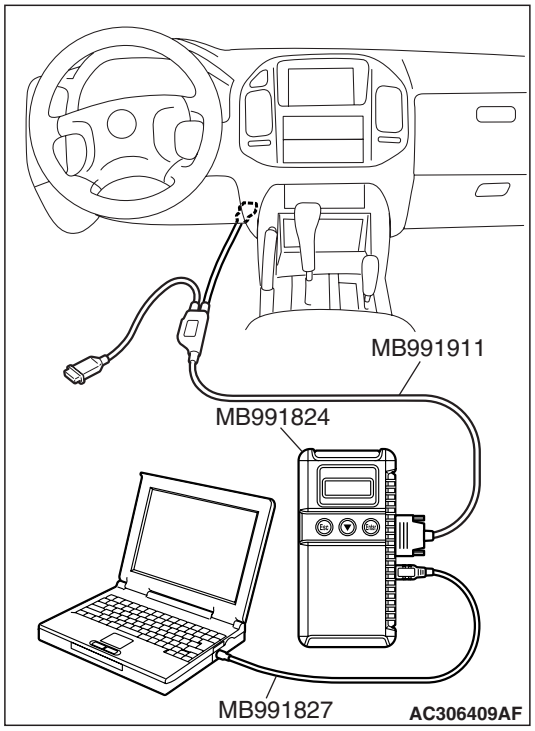


STEP 1. Check the TPMS warning light.
Check whether the TPMS warning light illuminates for three seconds after the ignition switch is turned to the "ON" position.

Q: Does the TPMS warning light illuminate for three seconds?

YES : Check that the TPMS warning light illuminates for three seconds and then go out. And then go to Step 2.

NO : Go to TPMS Inspection Procedure No.3 "The TPMS Warning Light does not Illuminate as a Bulb Check for Three Seconds when the Ignition Switch is Turned to the "ON" Position" (Refer to P.31-58).



STEP 2. Using scan tool MB991958, read the diagnostic trouble code.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check whether DTC 23, 27, 32, 36 or 41 (TPMS transmitter abnormality – Tire air pressure low) is set.

NOTE: If DTC23, 27, 32, 36 or 41 is set, the TPMS receiver is defective. In Step 1, the TPMS warning light illuminated for three seconds and then went out. However, the DTC is set. This means that a contradiction has arisen in the receiver operation.

Q: Is DTC 23, 27, 32, 36 or 41 (TPMS transmitter abnormality – Tire air pressure low) set?

YES : Replace the TPMS receiver (Refer to P.31-93). And then go to Step 15.
NO : Go to Step 3.

STEP 3. Execute "Tire Pressure Sensor ID Check" and "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function."

(1) Execute "Tire Pressure Sensor ID Check" on scan tool MB991958 "Special Function" (Refer to P.31-88), and make a note of all the registered tire pressure sensor IDs.

NOTE: This note is needed when you check the registered IDs.

(2) Execute "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function" for the relevant road tire (Refer to P.31-89).
(3) Confirm the tire inflation pressure and tire pressure sensor ID, which are shown on scan tool MB991958 display.

Q: Are the tire inflation pressure and tire pressure sensor ID displayed?

YES : Go to Step 4.
NO : It is judged that the TPMS could not detect abnormal reception due to a defective TPMS transmitter. Replace the relevant TPMS transmitter (Refer to P.31-94). And then go to Step 15.

STEP 4. Check the tire pressure sensor ID, which is shown on scan tool MB991958 display.

Compare the tire pressure sensor ID shown on scan tool MB991958 with the tire pressure sensor ID noted at Step 3.

Q: Is the tire pressure sensor ID shown on scan tool MB991958 the same as the noted ID?

YES : Go to Step 5.
NO : Go to Step 15.

STEP 5. Check the tire pressure, which is shown on scan tool MB991958 display.

Q: Is the shown tire inflation pressure less than the threshold value (158 kPa, 23.0 psi)?

YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Use an accurate tire pressure gauge to measure the relevant road tire inflation pressure.

Compare the actually measured value with the value shown on scan tool MB991958 to determine whether the TPMS transmitter pressure sensor is inaccurate.

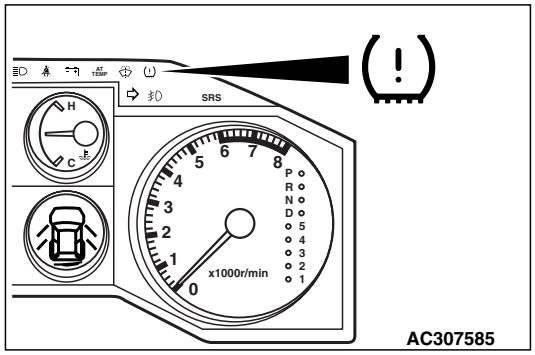
NOTE: In areas where atmospheric pressure is low (such as high altitude), scan tool MB991958 value will reduce accordingly. This is not a failure. For your reference, the value reduces approximately 3.5 kPa (0.5 psi) for every 305 meters (1,000 feet).

Q: Is the tire inflation pressure shown on scan tool MB991958 within ± 10 kPa (1.5 psi) from the actual inflation pressure? <Ambient temperature during measurement must be 0 – 50°C (32 – 122°F)>

YES : The procedure is complete.
NO : Replace the TPMS transmitter of the relevant road tire (Refer to P.31-94). And then go to Step 15.

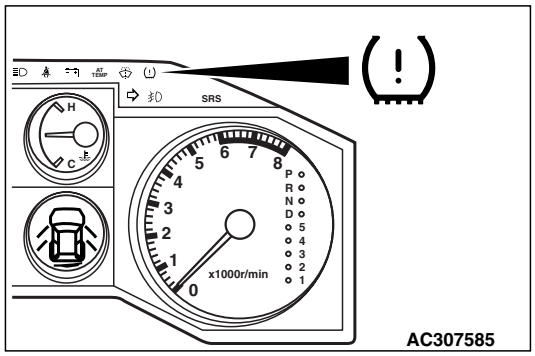
STEP 7. Check the illumination condition of the TPMS warning light.

Turn the ignition switch to the "ON" position. Check that the TPMS warning light illuminates for three seconds, goes out momentarily, and then illuminates again.



Q: Does the TPMS warning light illuminate again?

YES : Go to Step 8.
NO : Go to Step 9.



STEP 8. Check the relevant road tire for improper inflation pressure or any other problems, and make necessary repairs. Then drive the vehicle and check if the TPMS warning light comes on.

(1) If the relevant road tire has been punctured, repair it. If the valve grommet or valve core is defective, replace it (Refer to P.31-94).
(2) Adjust the relevant road tire inflation pressure to the value specified on the tire pressure label.
(3) Drive the vehicle, and check that the TPMS warning light goes out within 10 minutes after the vehicle speed reaches 30 km/h (19 mph).

Q: Does the TPMS warning light go out?

YES : The procedure is complete. (For some reason, the TPMS transmitter could not communicate with the TPMS receiver momentarily).
NO : The roll switch of the TPMS transmitter may be defective. Replace the TPMS transmitter of the relevant road tire (Refer to P.31-94). And then go to Step 15 .

STEP 9. Using scan tool MB991958, read the diagnostic trouble code.

Check whether DTC 23, 27, 32, 36 or 41 (TPMS transmitter abnormality – Tire air pressure low) is set.

Q: Is DTC 23, 27, 32, 36 or 41 (TPMS transmitter abnormality – Tire air pressure low) set?

YES : Replace the TPMS receiver (Refer to P.31-93). And then go to Step 15.
NO : Go to Step 10.

STEP 10. Reproduce the abnormal condition, and check the TPMS warning light.

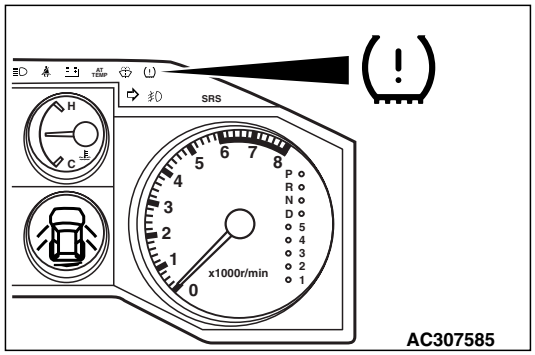
(1) Adjust all the tire inflation pressures (including spare tire) to the value specified on the tire pressure label.
(2) Drive the vehicle at 30 km/h (19 mph) or higher.

⚠ CAUTION

You can stop the vehicle momentarily when you drive it for 15 minutes.

(3) Then drive the vehicle continuously for 15 minutes at 100 km/h (62 mph) or lower.
(4) Stop the vehicle, and use a tire pressure gauge to reduce the relevant road tire inflation pressure to 138 kPa (20.1 psi) i.e. 20 kPa (2.9 psi) lower than the threshold value.
(5) Execute "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function" for the relevant road tire (Refer to P.31-89).
(6) Check that the value shown on scan tool MB991958 is lower than the threshold value.

Threshold value: 158 kPa (23.0 psi)



(7) Check the illumination condition of the TPMS warning light.

Q: Does the TPMS warning light illuminate?

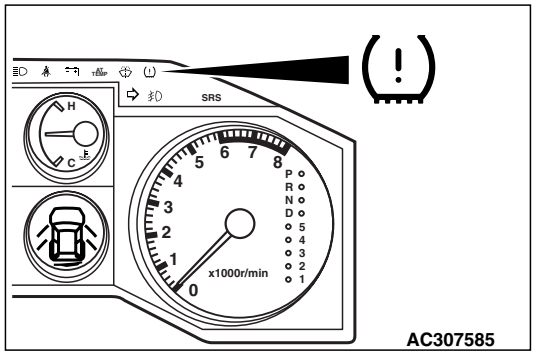
YES : Go to Step 11.
NO : Execute "Tire Pressure Sensor ID Registration on scan tool MB991958 "Special Function" (Refer to P.31-86). And then go to Step 12.

STEP 11. Adjust the relevant road tire inflation pressure, and check that the TPMS warning light goes out.

When the abnormal condition was reproduced in Step 10, the TPMS warning light illuminated. Therefore, the TPMS can be determined to be normal. The TPMS receiver could not detect the road wheels after tire rotation. Check that the TPMS warning light goes out as follows:

(1) Wait until the tires cool down, and adjust the relevant road tire inflation pressure to the value specified on the tire pressure label.
(2) Use a magnet to force the TPMS transmitter to send a signal. The signal sending procedure is the same as executing "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function" (Refer to P.31-89).

NOTE: By forcing the TPMS transmitter to send a signal, the transmitter informs the TPMS receiver of the correct tire inflation pressure. Then the warning light should go off.



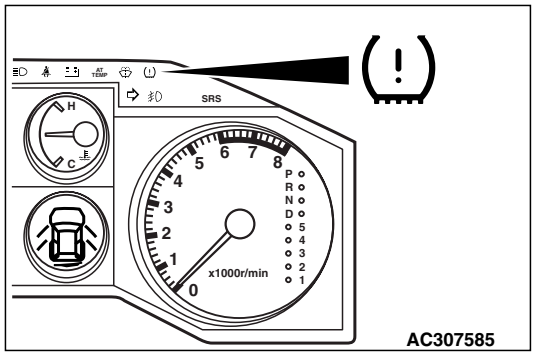
(3) Check that the TPMS warning light is off.

Q: Does the TPMS warning light remain off?

YES : The procedure is complete.

NO : Repeat this Step.

STEP 12. Check the illumination condition of the TPMS warning light.



Turn the ignition switch to the "ON" position. Check that the TPMS warning light illuminates for three seconds, goes out momentarily, and then illuminates again.

Q: Does the TPMS warning light illuminate again?

YES : Go to Step 13.

NO : Replace the TPMS receiver (Refer to P.31-93). And then go to Step 15.

STEP 13. Using scan tool MB991958, read the diagnostic trouble code.

Check whether DTC 23, 27, 32, 36 or 41 (TPMS transmitter abnormality – Tire air pressure low) is set.

Q: Is DTC 23, 27, 32, 36 or 41 (TPMS transmitter abnormality – Tire air pressure low) set?

YES : The TPMS receiver could not detect the road wheels after tire rotation. Wait until the tires cool down, and adjust the relevant road tire inflation pressure to the value specified on the tire pressure label. And then go to Step 14.

NO : Replace the TPMS receiver (Refer to P.31-93). And then go to Step 15.

STEP 14. Using scan tool MB991958, check data list item 04: VSS (Vehicle Speed Signal).

(1) Check the following data list.
- Item 04: VSS (Vehicle Speed Signal)

(2) Drive the vehicle at 30 km/h (19 mph) or more, and compare the value shown on scan tool MB991958 with the speedometer in the combination meter.

Q: Does the vehicle speed shown on scan tool MB991958 correspond to that on the speedometer?

YES : The roll switch in the TPMS transmitter may be defective. Replace the TPMS transmitter of the relevant road tire (Refer to P.31-94). And then go to Step 15 .

NO : Carry out troubleshooting for DTC 14 (TPMS abnormality – Vehicle speed signal) (Refer to P.31-23).

STEP 15. Tire pressure sensor ID registration and TPMS check

(1) Execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" when the relevant road tire inflation pressure is lower than 138 kPa (20.1 psi) (Refer to P.31-86).

(2) Check whether the TPMS warning light illuminates and DTC 23, 27, 32, 36 or 41 (TPMS transmitter abnormality – Tire air pressure low) is set.

(3) If the relevant road tire has been punctured, repair it. If the valve grommet or valve core is defective, replace it (Refer to P.31-94).

(4) Wait until the road tires cool down, and adjust the relevant road tire inflation pressure to the value specified on the tire pressure label.

(5) Use a magnet to force the TPMS transmitter to send a signal. The signal sending procedure is the same as executing "Tire Pressure Sensor Check" on scan tool MB991958 "Special Function" (Refer to P.31-89).

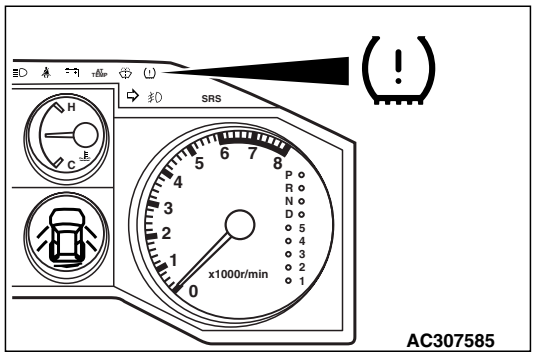
NOTE: By forcing the TPMS transmitter to send a signal, the transmitter informs the TPMS receiver of the correct tire inflation pressure. Then the warning light should go off.

(6) Check that the TPMS warning light is off.

Q: Does the TPMS warning light remain off?

YES : The procedure is complete.

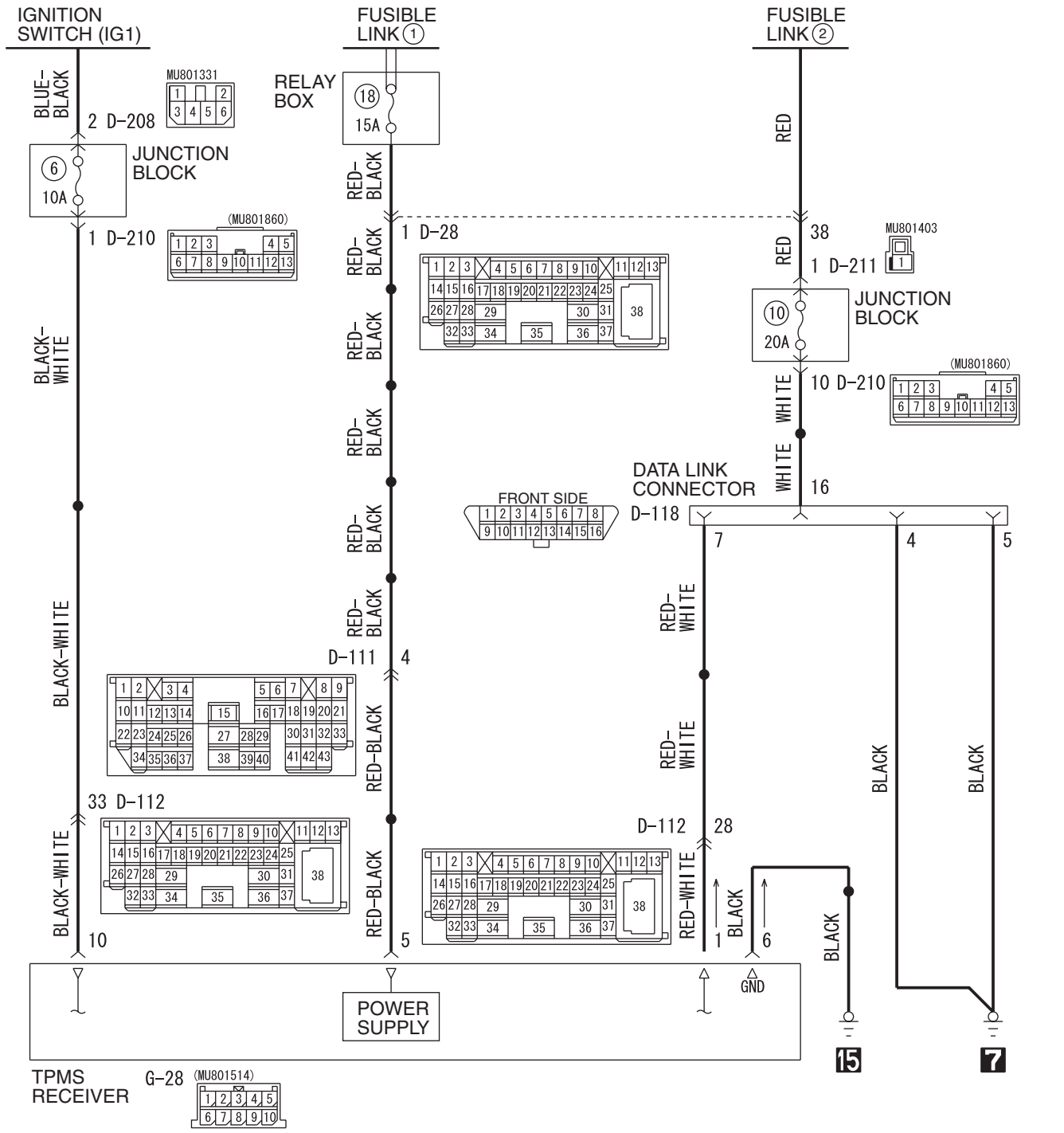
NO : Repeat this Step..



AC307585

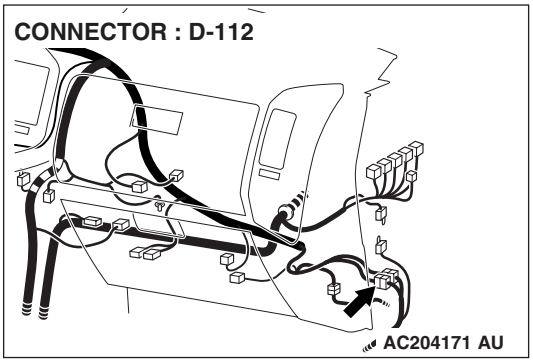
INSPECTION PROCEDURE 5: Communication between the Scan Tool and the TPMS is not Possible.

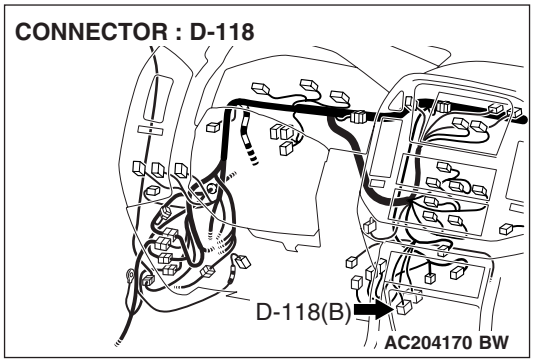
Data Link Connector Circuit

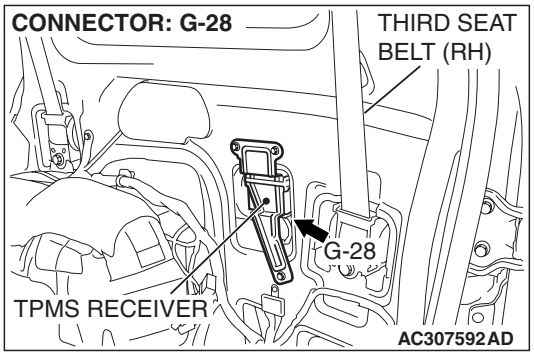


W5Q31M000A

TSB Revision







CIRCUIT OPERATION

The diagnostic output is made from the TPMS receiver (terminal 1) to the diagnostic output terminal (terminal 7) of the data link connector.

TECHNICAL DESCRIPTION (COMMENT)

When communication with the scan tool is not possible, the cause is probably an open circuit in the diagnostic output circuit or an open circuit in the TPMS receiver power/ground circuit.

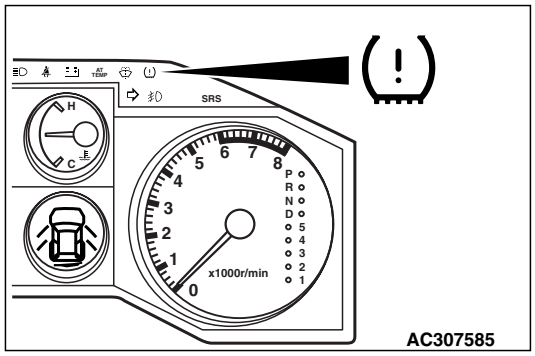
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Damaged harness wire or connector
- Malfunction of the TPMS receiver

DIAGNOSIS

Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



STEP 1. Check the TPMS warning light.

Check whether the TPMS warning light illuminates for three seconds after the ignition switch is turned to the "ON" position.

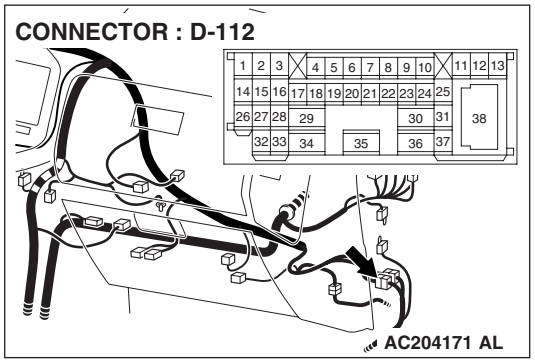
Q: Does the TPMS warning light illuminate for three seconds?

YES : Check that the TPMS warning light illuminates for three seconds and then goes out. And then go to Step 2.

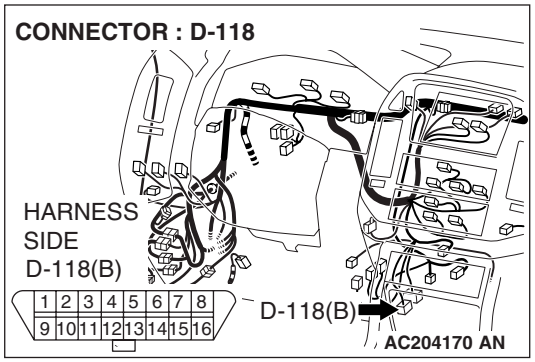
NO : Go to TPMS Inspection Procedure No.3 "The TPMS Warning Light does not Illuminate as a Bulb Check for Three Seconds when the Ignition Switch is Turned to the "ON" Position" (Refer to P.31-58).

STEP 2. Check the following connectors.

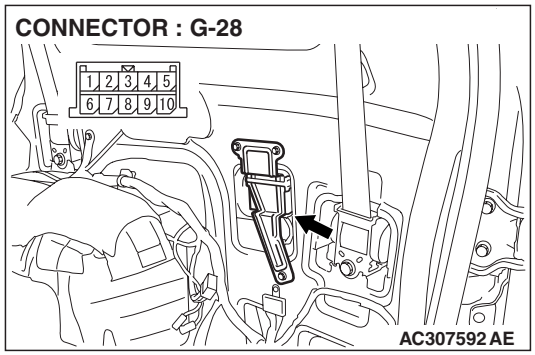
- Intermediate connector D-112



- Data link connector D-118



- TPMS receiver connector G-28

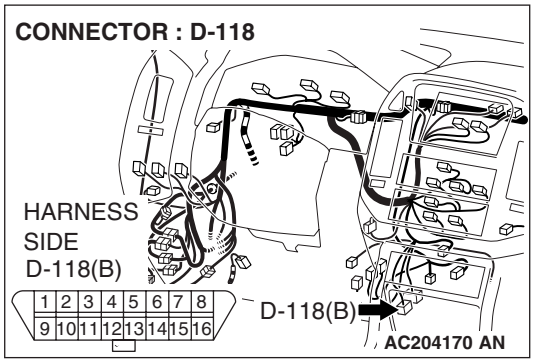


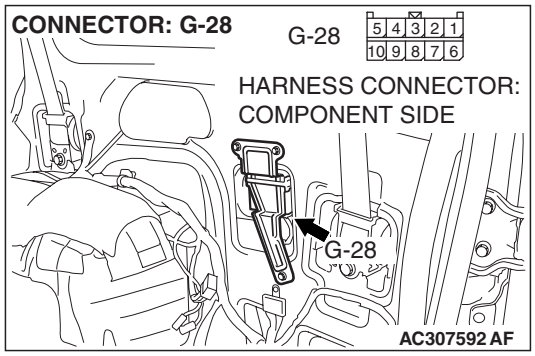
Check the connectors for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 3.

NO : Repair it. And then go to Step 4.





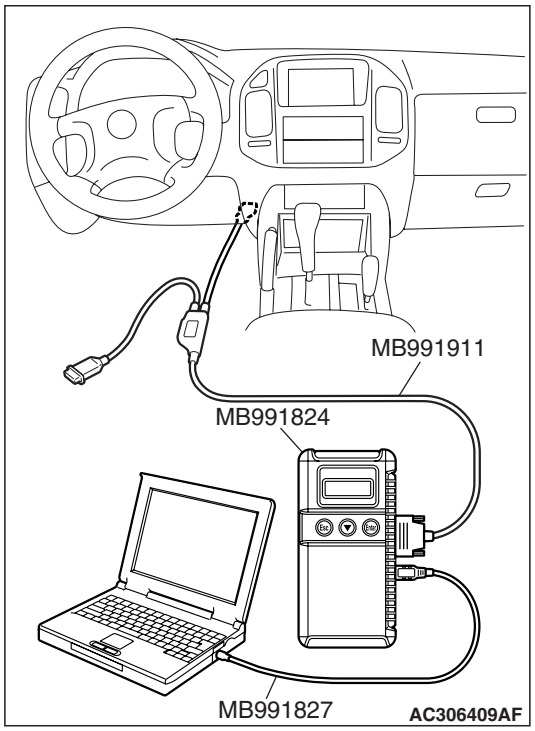
STEP 3. Check the following harness wire.

- The wire between data link connector D-118 (terminal 7) and TPMS receiver connector G-28 (terminal 1)

Q: Is the harness wire damaged?

YES : Repair or replace it. And then go to Step 4.

NO : Replace the TPMS receiver (Refer to P.31-93) and execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" (Refer to P.31-86). And then go to Step 4.



STEP 4. Retest the system.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Retest the system.

Q: Does the scan tool communicate with the TPMS system?

YES : The procedure is complete.

NO : Repeat this procedure from Step 1.

TPMS SERVICE DATA LIST

M1311003300052

The following items can be read by the scan tool from the TPMS receiver input data.

MUT-III SCAN TOOL DISPLAY	ITEM NO.	CHECK ITEM	DISPLAY TEXT OR UNIT
Ignition Signal	01	Ignition ON	IG ON/IG OFF
VSS	04	Vehicle speed signal data	km/h or mph
Air Pressure, Tire 1	05	Air pressure data 1	kPa or in. Hg
Air Pressure, Tire 2	06	Air pressure data 2	kPa or in. Hg
Air Pressure, Tire 3	07	Air pressure data 3	kPa or in. Hg
Air Pressure, Tire 4	08	Air pressure data 4	kPa or in. Hg
Air Pressure, Tire 5	09	Air pressure data 5	kPa or in. Hg
Pressure reducing threshold level	35	Tire pressure warning threshold level set for pressure reduction	kPa or in. Hg
Pressure rising threshold level	36	Tire pressure warning threshold level set for pressure rising	kPa or in. Hg
Warning History 1 (Day)	45	Warning history 1 (date)	D (D: day)
Warning History 1 (Time)	46	Warning history 1 (time)	H (H: hour)
Warning History 1 (Tire)	81	Warning history 1 (tire)	–
Warning History 1 (Detail)	82	Warning history 1 (details of warning)	–
Warning History 2 (Day)	47	Warning history 2 (date)	D (D: day)
Warning History 2 (Time)	48	Warning history 2 (time)	H (H: hour)
Warning History 2 (Tire)	83	Warning history 2 (tire)	–
Warning History 2 (Detail)	84	Warning history 2 (details of warning)	–
Warning History 3 (Day)	49	Warning history 3 (date)	D (D: day)
Warning History 3 (Time)	50	Warning history 3 (time)	H (H: hour)
Warning History 3 (Tire)	85	Warning history 3 (tire)	–
Warning History 3 (Detail)	86	Warning history 3 (details of warning)	–
No.of Air Pressure low Warning	55	Number of past tire pressure warnings	TIME
No.of VSS&EEPROM fail Warning	56	Number of past vehicle speed signal input and EEPROM abnormality warnings	TIME
Number of reception fail Warning	57	Number of past reception failure warnings	TIME
No.of XMTR Low Voltage Warning	58	Number of past TPMS transmitter low battery voltage abnormality warnings	TIME
Number of Warning History	59	Number of records currently stored	TIME
Number of ID Registration	60	Number of past ID registrations	TIME
Number of ID (registered)	61	Number of IDs currently registered	–

TPMS ACTUATOR TEST

M1311006200021

The scan tool activates the following actuator for testing.

MUT-III SCAN TOOL DISPLAY	NO.	ITEM	PARTS TO BE ACTIVATED
TPMS Indicator Lamp Check	60	Compulsory illumination of the TPMS warning light	TPMS warning light

TPMS SPECIAL FUNCTION DATA LIST

M1311006300028

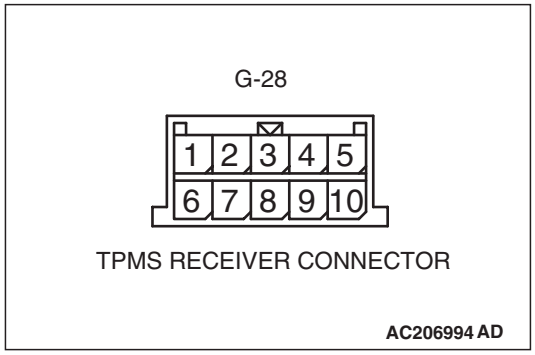
When the TPMS "Special Function" is executed, the TPMS receiver uses the data below.

TPMS SPECIAL FUNCTION DATA LIST

FUNCTION	MUT-III SCAN TOOL DISPLAY	ITEM		DISPLAY TEXT OR UNIT
Tire Pressure Sensor ID Registration	5tires PRES SNSR ID Registration (NORMAL SPARE TIRE)	5 tires pressure sensor ID registration		–
	–	ID registration flag (tire 1)		OK/ –
	–	ID registration flag (tire 2)		OK/ –
	–	ID registration flag (tire 3)		OK/ –
	–	ID registration flag (tire 4)		OK/ –
	–	ID registration flag (tire 5)		OK/ –
Tire Pressure Sensor ID Check	1st	Tire pressure sensor ID	Not checked	FFFFF
			Checked	e.g. 4B9B45
	2nd	Tire pressure sensor ID	Not checked	FFFFF
			Checked	e.g. 4B9B46
	3rd	Tire pressure sensor ID	Not checked	FFFFF
			Checked	e.g. 4B9B47
	4th	Tire pressure sensor ID	Not checked	FFFFF
			Checked	e.g. 4B9B48
	5th	Tire pressure sensor ID	Not checked	FFFFF
			Checked	e.g. 4B9B49
Tire Pressure Sensor Check	Tire pressure sensor ID	Tire pressure sensor ID	Not checked	FFFFF
			Checked	e.g. 4B9B45
	Tire Pressure	Tire pressure data		kPa or in. Hg

CHECK AT TPMS RECEIVER

M1311003400026



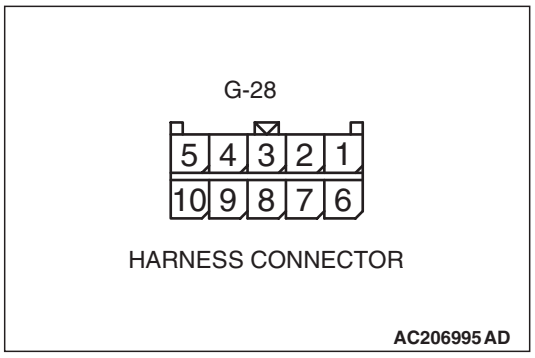
TERMINAL VOLTAGE CHECK CHART

Measure the voltages between terminal 6 (ground terminal) and each respective terminal.

CONNECTOR TERMINAL NO	SIGNAL	CHECKING REQUIREMENT		NORMAL CONDITION
1	Scan tool	When the scan tool is connected		Serial communication with Scan tool
		When the scan tool is not connected		Approximately 0 V
3	Vehicle speed sensor	• Ignition switch: "ON" • Move the vehicle slowly forward		0 ⇔ 5 V (changes repeatedly)
5	TPMS receiver power supply	Always		Battery positive voltage
7	TPMS warning light signal	Ignition switch: "ON"	When the light is switched off	Approximately 10 V
			When the light is illuminated	Approximately 0 V
10	Ignition signal	Ignition switch: "ON"		Battery positive voltage

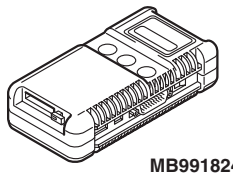
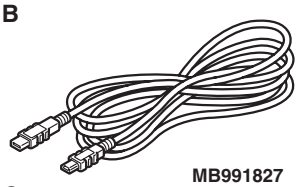
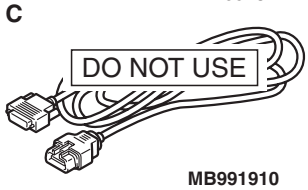
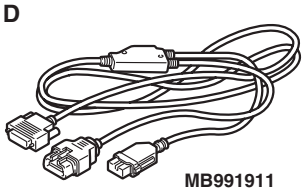
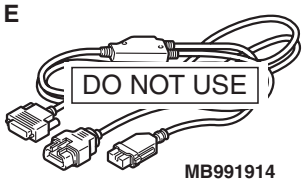
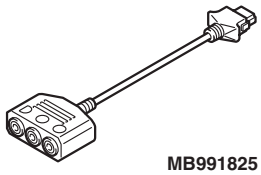
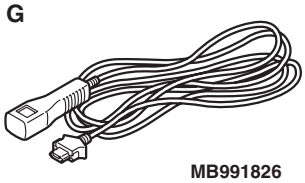
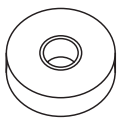
TPMS RECEIVER GROUND CHECK

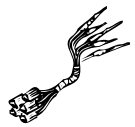
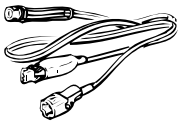
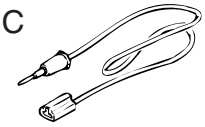
1. Turn the ignition switch to the "LOCK" (OFF) position and disconnect the TPMS receiver connector.
2. Check the resistance and continuity between terminal 6 of the harness connector and body ground. The resistance should measure less than 2 ohms.



SPECIAL TOOLS

M1311000600032

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  MB991824 B  MB991827 C  MB991910 D  MB991911 E  MB991914 F  MB991825 G  MB991826 MB991958	MB991958 A: MB991824 B: MB991827 C: MB991910 D: MB991911 E: MB991914 F: MB991825 G: MB991826 MUT-III sub assembly A: Vehicle communication interface (V.C.I.) B: MUT-III USB cable C: MUT-III main harness A (Vehicles with CAN communication system) D: MUT-III main harness B (Vehicles without CAN communication system) E: MUT-III main harness C (for Daimler Chrysler models only) F: MUT-III measurement adapter G: MUT-III trigger harness	MB991824-KIT *NOTE: G: MB991826 MUT-III trigger harness is not necessary when pushing V.C.I ENTER key*	For communication with TPMS receiver • Diagnostic trouble code reading • Service data reading • Actuator testing • Executing TPMS special function **⚠ CAUTION** **MUT-III main harness B (MB991911) should be used. MUT-III main harness A and C should not be used for this vehicle.**
 AC308883	-	MIT46716 #8821 (Miller tool) PT30B (Snap-on tool) or general moderately strong magnet	TPMS transmitter data transmission

TOOL	TOOL NUMBER AND NAME	SUPERSESSION	APPLICATION
A  B  C  D  MB991223AG	MB991223 A: MB991219 B: MB991220 C: MB991221 D: MB991222 Harness set A: Test harness B: LED harness C: LED harness adapter D: Probe	General service tools	Checking the continuity and measuring the voltage at the TPMS receiver harness connector

ON-VEHICLE SERVICE

TIRE INFLATION PRESSURE CHECK

M1311000900527

NOTE: For information on tire inflation pressure, refer to the label attached to the center pillar on the driver's side.

NOTE: The TPMS is not a substitute for regular checks of the tire inflation pressure. Be sure to check the tire inflation pressure as usual.

TIRE WEAR CHECK

M1311001000356

Measure the tread depth of the tires.

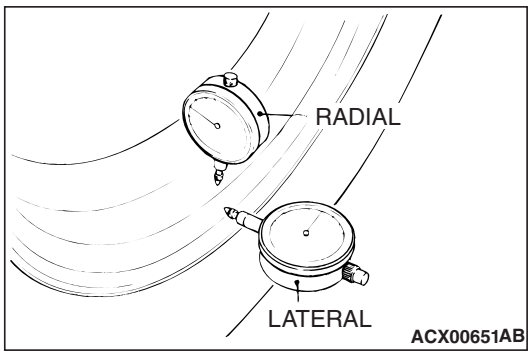
Minimum limit: 1.6 mm (0.06 inch)

If the remaining tread depth is less than the minimum limit, replace the tire.

NOTE: When the tread depth of the tires is reduced to 1.6 mm (0.06 inch) or less, wear indicators will appear.

WHEEL RUNOUT CHECK

M1311001100610



Jack up the vehicle so that the wheels are clear of the floor. While slowly turning the wheel, measure wheel runout with a dial indicator.

Maximum limit:
Radial runout: 1.0 mm (0.04 inch)
Lateral runout: 1.0 mm (0.04 inch)

If wheel runout exceeds the limit, replace the wheel.

TPMS SPECIAL FUNCTION

TIRE PRESSURE SENSOR ID REGISTRATION

M1311003900021

- When the TPMS transmitter and TPMS receiver are replaced, execute "Tire Pressure Sensor ID Registration." The TPMS won't function until the "Tire Pressure Sensor ID Registration" has been complete.
- Also when the TPMS antenna(s) and feeder cable(s) are replaced, execute "Tire Pressure Sensor ID Registration." This is necessary to check whether data has been sent correctly from the TPMS transmitter.

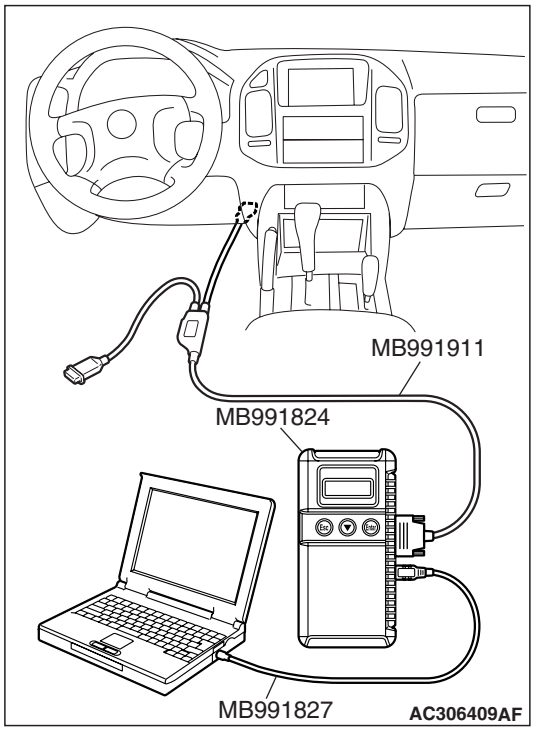
Required Special Tools:

- MIT46716: TPMS Magnet
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

Register the tire pressure sensor IDs as described in the procedure below.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "TPMS" from the "CHASSIS" tab.
6. Select "MITSUBISHI."
7. Select "Special Function."
8. Select "Tire Pressure Sensor ID Registration."

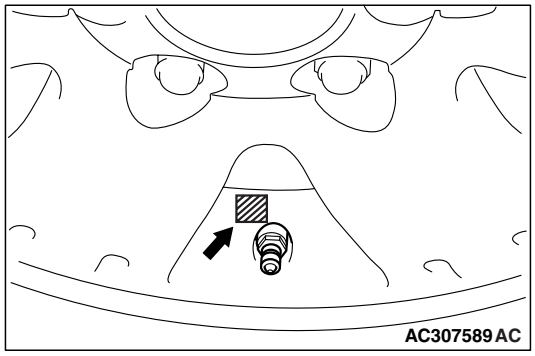
⚠ CAUTION

Register all tire pressure sensor IDs within five minutes.

9. Select "5tires PRES SNSR ID Registration (NORMAL SPARE TIRE)" and start the tire pressure sensor ID registration.
10. Emit signal from a TPMS transmitter as follows:

    NOTE: You can start out the following operations from any TPMS transmitter. The tire pressure sensor ID registration has no order.

    (1) Clean the TPMS transmitter location on the wheel rim.



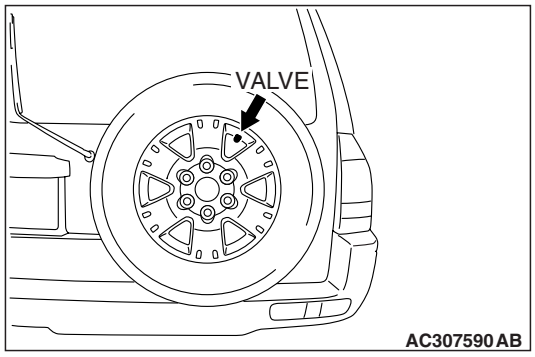
(2) Position MIT46716 or a strong magnet as shown, and hold it there for 5 seconds or more.

NOTE:

- *By doing this work, the reed switch (incorporated in the TPMS transmitter) will activate the TPMS transmitter to send the tire pressure sensor ID.*
- *If the TPMS transmitter is not activated, slide the magnet until it is activated. If the TPMS transmitter is still not activated, move the vehicle (turn the tire) by approximately half a turn of the tire. Then attempt to activate the TPMS transmitter.*

11. Check completion of the above through scan tool MB991958.
12. Repeat the above steps 8 and 9 for all tires (including the spare tire).

NOTE: If the spare tire pressure sensor ID cannot be registered, bring the spare tire near one of the road tires. Then register the tire pressure sensor ID. There is no TPMS antenna for the spare tire, so this work helps the road tire TPMS antenna receive signal from the spare tire securely.



⚠ CAUTION

If the spare tire is removed, always reinstall it as shown. If the spare tire valve (TPMS transmitter) is not positioned as shown, the roll switch, which is incorporated in the TPMS transmitter, may operate. In that case, the system may determine the spare tire as a road tire incorrectly.

13. Check the completion of the tire pressure sensor ID registration (display on the screen).
14. After tire pressure sensor ID registration, turn the ignition switch to the "LOCK" (OFF) position.
15. Remove scan tool MB991958.

TIRE PRESSURE SENSOR ID CHECK

M1311004100028

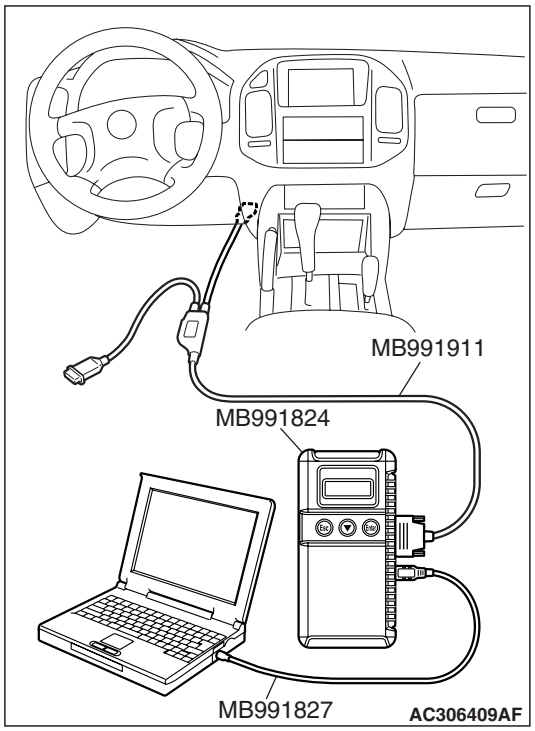
Required Special Tools:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

Check the tire pressure sensor IDs, which is registered in the TPMS receiver, as described below.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "TPMS" from the "CHASSIS" tab.
6. Select "MITSUBISHI."
7. Select "Special Function."
8. Select "Tire Pressure Sensor ID Check."
9. Check the tire pressure sensor IDs on the PC display.
10. After tire pressure sensor ID check, turn the ignition switch to the "LOCK" (OFF) position.
11. Remove scan tool MB991958.

FROM THE MUT-III DIAGNOSIS SCREEN

You can check the tire pressure sensor ID on the diagnosis screen as described below.

1. Operate scan tool MB991958 as follows:
   - Press "Special" button on the diagnosis screen.
   - Select "Tire Pressure Sensor ID Check" from the "Special Function" menu.
2. Check the tire pressure sensor IDs on the PC display.
3. After tire pressure sensor ID check, turn the ignition switch to the "LOCK" (OFF) position.
4. Remove scan tool MB991958.

TIRE PRESSURE SENSOR CHECK

M1311004000065

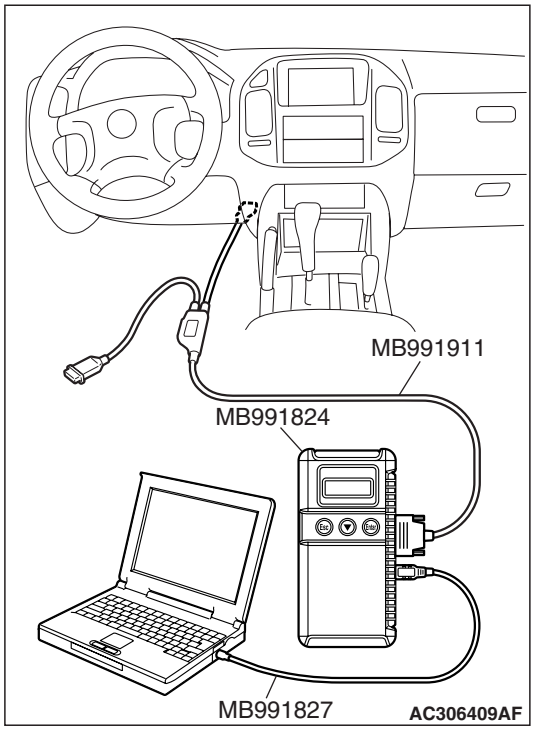
Required Special Tools:

- MIT46716: TPMS Magnet
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: Vehicle Communication Interface (V.C.I.)
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

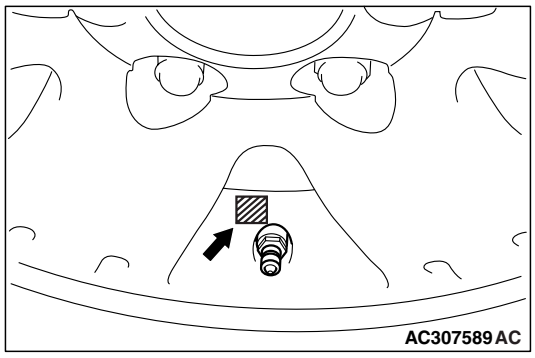
Check the condition of the tire pressure sensor as described below.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



1. Connect scan tool MB991958 to the data link connector.
2. Turn the ignition switch to the "ON" position.
3. Select "Interactive Diagnosis" from the start-up screen.
4. Select "System select."
5. Choose "TPMS" from the "CHASSIS" tab.
6. Select "MITSUBISHI."
7. Select "Special Function."
8. Select "Tire Pressure Sensor Check."
9. Send the signal from an intended transmitter as follows:
   (1) Clean the TPMS transmitter location on the wheel rim.



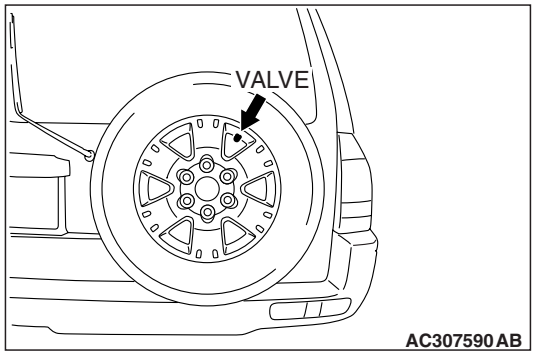
   (2) Position MIT46716 or a strong magnet as shown, and hold it there for 5 seconds or more.

   NOTE: By doing this work, the reed switch (incorporated in the TPMS transmitter) will activate the TPMS transmitter to send the pressure sensor data.

   NOTE: If the TPMS transmitter is not activated, slide the magnet until it is activated. If the TPMS transmitter is still not activated, move the vehicle (turn the tire) by approximately half a turn of the tire. Then attempt to activate the TPMS transmitter.

10. Check the data on the PC display.

    NOTE: If the spare tire pressure sensor cannot be checked, bring the spare tire near one of the road tires. Then check the tire pressure sensor. There is no TPMS antenna for the spare tire, so this work helps the road tire TPMS antenna receive signal from the spare tire securely.



⚠ CAUTION
If the spare tire is removed, always reinstall it as shown. If the spare tire valve (TPMS transmitter) is not positioned as shown, the roll switch, which is incorporated in the TPMS transmitter, may operate. In that case, the system may determine the spare tire as a road tire incorrectly.

11. After tire pressure sensor check, turn the ignition switch to the "LOCK" (OFF) position.
12. Remove scan tool MB991958.

WHEEL AND TIRE

INSTALLATION SERVICE POINT

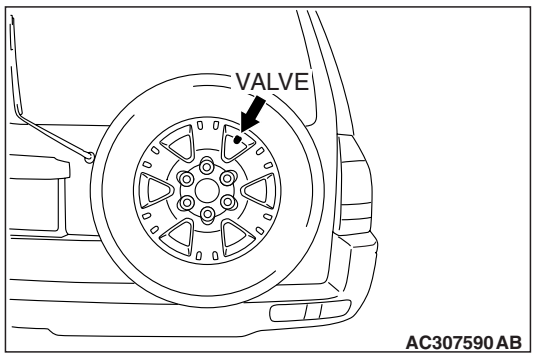
M1311001300313

ROAD WHEELS

Tighten the wheel nuts to the specified torque.

Tightening torque: 108 ± 10 N·m (80 ± 7 ft-lb)

SPARE WHEEL



⚠ CAUTION
Install the spare tire as shown. If the spare tire valve (TPMS transmitter) is not positioned as shown, the roll switch, which is incorporated in the TPMS transmitter, may operate. In that case, the system may determine the spare tire as a road tire incorrectly.

Install the spare wheel to the back door, positioning the valve as shown. And then tighten the mounting bolts and/or the lock cylinder to the specified torque.

Tightening torque: 46 ± 8 N·m (34 ± 5 ft-lb)

WHEEL AND TIRE REPLACEMENT

M1311005800020

⚠ CAUTION
Do not use non-genuine wheels. The use of non-genuine wheels may cause the improper installation of the TPMS transmitters, possibly resulting in air leakage and damage to the TPMS transmitter.

- When the tire is removed from the wheel, a special procedure must be observed to avoid the TPMS transmitter damage. Refer to TPMS transmitter Removal and Installation (P.31-94).
- When a tire is replaced, always replace the rubber grommet of the TPMS transmitter. Refer to TPMS transmitter Removal and Installation (P.31-94).

TIRE PRESSURE MONITORING SYSTEM (TPMS)

TPMS ANTENNA

REMOVAL AND INSTALLATION

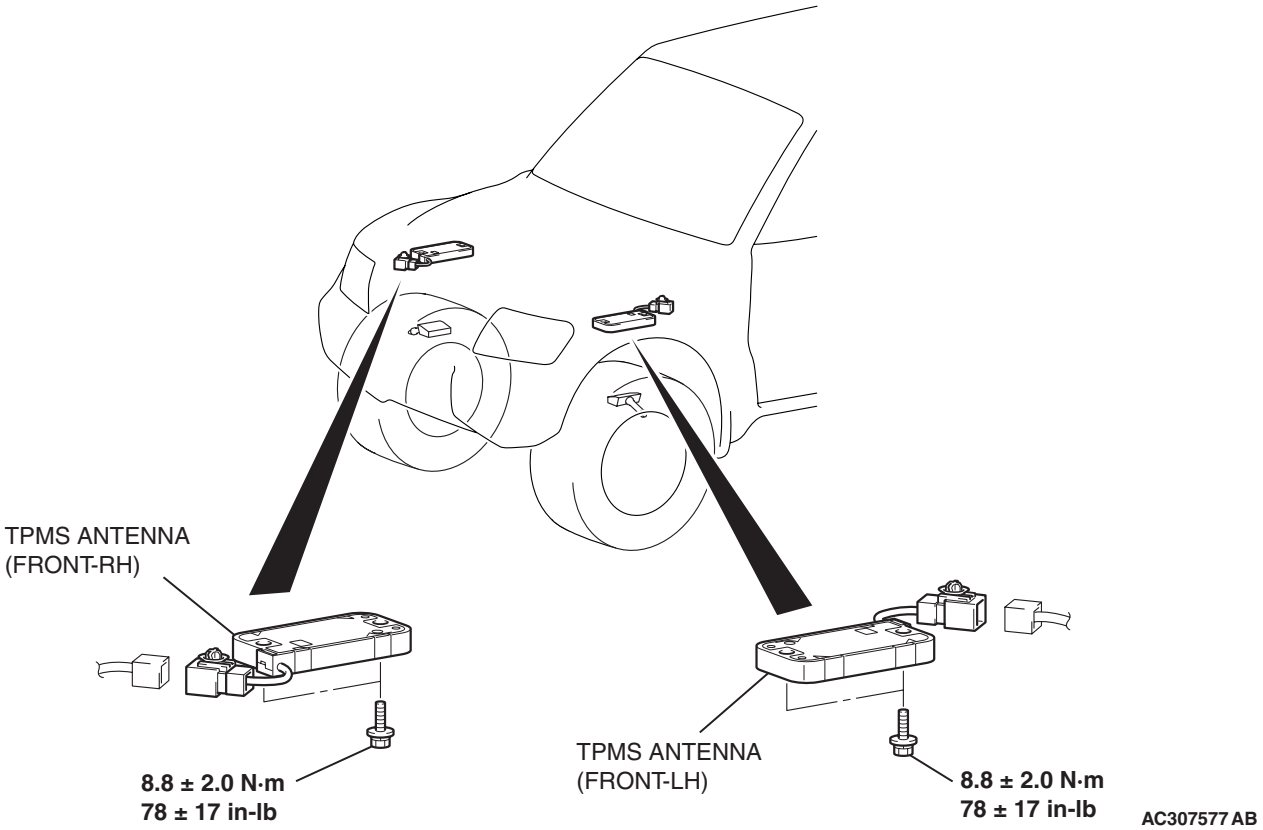
M1311003600042

<TPMS ANTENNA (FRONT)>

⚠ CAUTION

- **Do not drop the TPMS antenna.**
- **TPMS antenna should not be exposed to temperatures above 105°C (221°F).**
- **If any TPMS antenna is replaced, execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" to check the receiver function.**

Pre-removal Operation	Post-installation Operation
• Splash Shield Removal (Refer to GROUP 42, Fender P.42-7.)	• Splash Shield Installation (Refer to GROUP 42, Fender P.42-7.) • Receiver Function Check by Executing "Tire Pressure Sensor ID Registration" <If a new TPMS antenna is installed> (Refer to P.31-86.) • TPMS Failure Check (check that the TPMS warning light does not illuminate or flash).

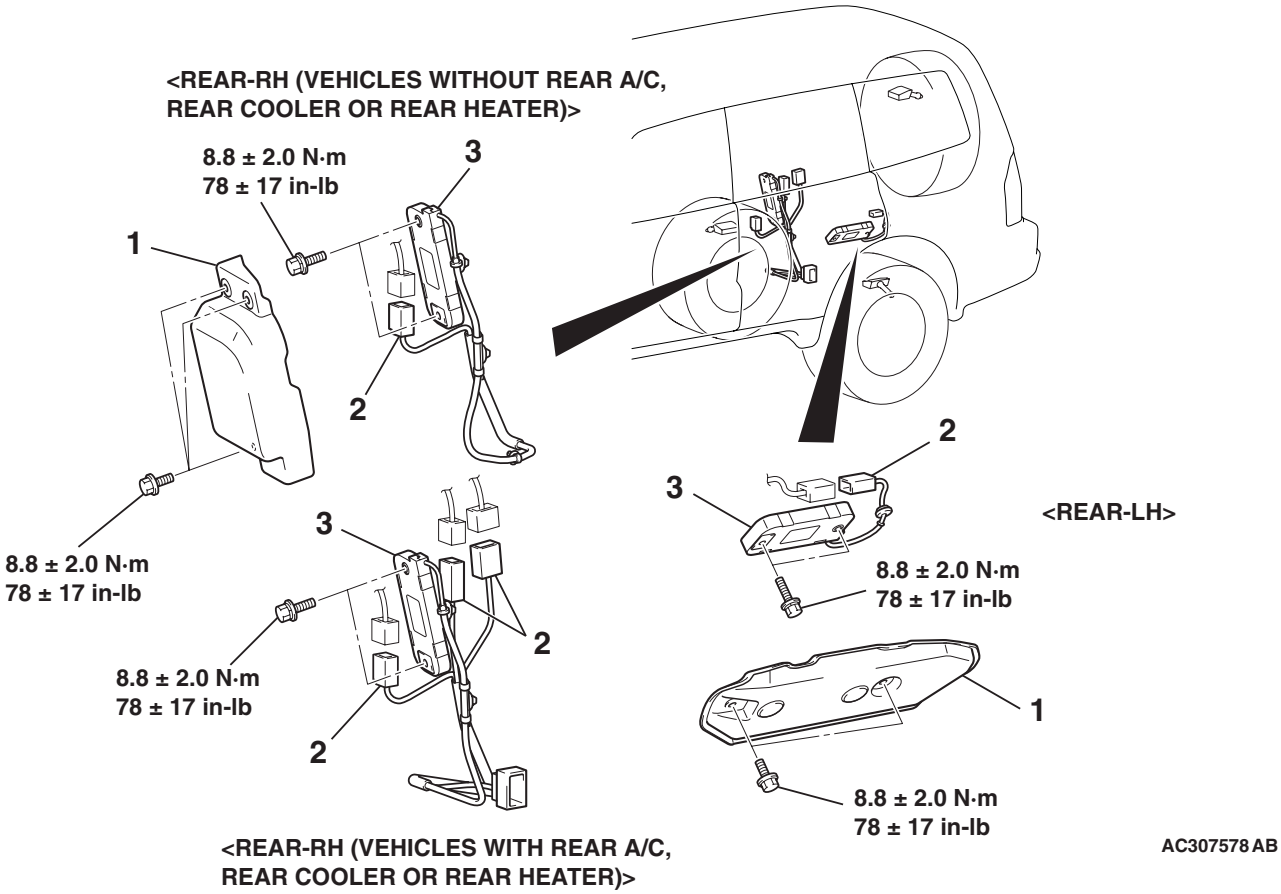


<TPMS ANTENNA (REAR)>

⚠ CAUTION

- **Do not drop the TPMS antenna.**
- **TPMS antenna should not be exposed to temperatures above 105°C (221°F).**
- **If any TPMS antenna is replaced, execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function" to check the receiver function.**

Pre-removal Operation	Post-installation Operation
• Upper Quarter Trim and Lower Quarter Trim Removal (Refer to GROUP 52A, Trims P.52A-8.)	• Lower Quarter Trim and Upper Quarter Trim Installation (Refer to GROUP 52A, Trims P.52A-8.) • Receiver Function Check by Executing "Tire Pressure Sensor ID Registration" <If a new TPMS antenna is installed> (Refer to P.31-86.) • TPMS Failure Check (check that the TPMS warning light does not illuminate or flash).



TPMS ANTENNA (REAR-LH)
REMOVAL STEPS

1. TPMS ANTENNA COVER
2. CONNECTOR(S)
3. TPMS ANTENNA (REAR-LH)

TPMS ANTENNA (REAR-RH)
REMOVAL STEPS

- REAR HEATER UNIT AND REAR BLOWER ASSEMBLY <VEHICLES WITH REAR A/C, REAR COOLER OR REAR HEATER> (REFER TO GROUP 55A, REAR HEATER UNIT AND REAR BLOWER ASSEMBLY P.55A-136.)

1. TPMS ANTENNA COVER
2. CONNECTOR(S)
3. TPMS ANTENNA (REAR-RH)

TSB Revision

TPMS RECEIVER

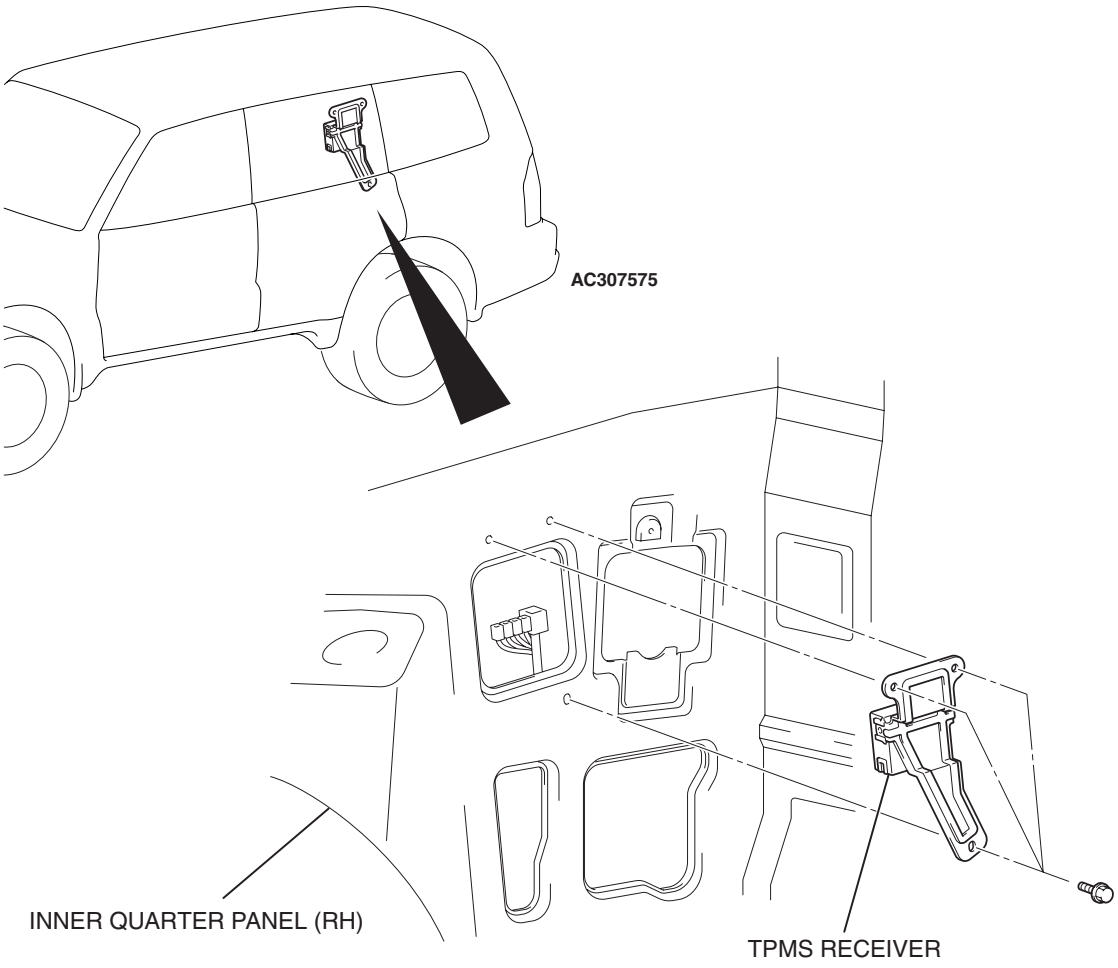
REMOVAL AND INSTALLATION

M1311003700049

⚠ CAUTION

- **Do not drop the TPMS receiver.**
- **TPMS receiver should not be exposed to temperatures above 85°C (185°F).**
- **If the TPMS receiver is replaced, execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function."**

Pre-removal Operation	Post-installation Operation
• Upper Quarter Trim (RH) and Lower Quarter Trim (RH) Removal (Refer to GROUP 52A, Trims P.52A-8.) • Rear Blower Assembly Removal <Vehicles with rear A/C, rear cooler or rear heater> (Refer to GROUP 55A, Rear heater Unit and Rear Blower Assembly P.55A-136.)	• Rear Blower Assembly Installation <Vehicles with rear A/C, rear cooler or rear heater> (Refer to GROUP 55A, Rear heater Unit and Rear Blower Assembly P.55A-136.) • Lower Quarter Trim (RH) and Upper Quarter Trim (RH) Installation (Refer to GROUP 52A, Trims P.52A-8.) • Tire Pressure Sensor ID Registration <If a new TPMS receiver is installed> (Refer to P.31-86.) • TPMS Failure Check (check that the TPMS warning light does not illuminate or flash).



AC307579 AB

TPMS TRANSMITTER

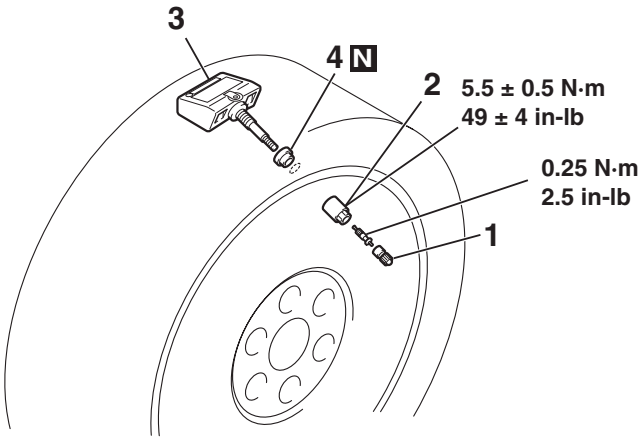
REMOVAL AND INSTALLATION

M1311003800079

⚠ CAUTION

- **Ensure valve cap is always in place except when adjusting tire pressure.**
- **If the valve core and valve cap are replaced, use a genuine replacement part. The valve core is similar to a conventional one, but uses nickel plating to avoid corrosion.**
- **Relieve tire pressure by removing the valve nut rather than by removing the valve core.**
- **Replace the valve stem grommet with a new one every five years or when the tire is replaced.**
- **If you shake the TPMS transmitter, you can hear a rattle, but this is not a failure. It is normal.**
- **Do not drop the TPMS transmitter from height greater than 1 meter (3.3 feet).**
- **Do not expose the TPMS transmitter to extraneous magnetic fields.**
- **TPMS transmitter should not be stored at temperatures above 80°C (176°F).**
- **TPMS transmitter should not be exposed to temperatures above 100°C (212°F).**
- **If the TPMS transmitter is replaced, execute "Tire Pressure Sensor ID Registration" on scan tool MB991958 "Special Function."**

Pre-removal Operation	Post-installation Operation
• Wheel and Tire Removal (Refer to P.31-90.)	• Wheel and Tire Installation (Refer to P.31-90.) • Tire Pressure Sensor ID Registration <If a new TPMS transmitter is installed> (Refer to P.31-86.) • TPMS Failure Check (check that the TPMS warning light does not illuminate or flash.)



AC307580 AB

REMOVAL STEPS

<<A>> 1. VALVE CAP
<<A>> 2. VALVE NUT
• LET TPMS TRANSMITTER FALL INTO TIRE
<<B>> • TIRE BEAD
<<B>> 3. TPMS TRANSMITTER
<<C>> 4. GROMMET

INSTALLATION STEPS

>>A<< 4. GROMMET
>>A<< 3. TPMS TRANSMITTER
>>A<< 2. VALVE NUT
>>B<< • TIRE BEAD MOUNTING
>>C<< • TIRE PRESSURE INFLATION
>>C<< • VALVE NUT RETIGHTENING
1. VALVE CAP

TSB Revision

REMOVAL SERVICE POINTS

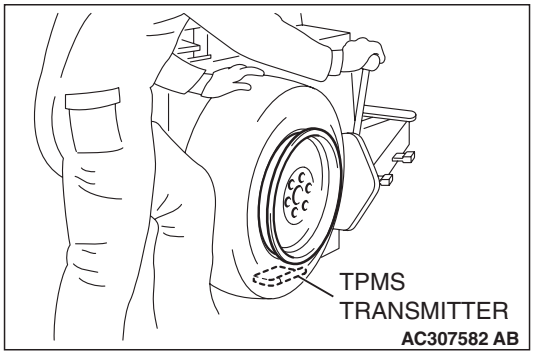
<<A>> VALVE CAP/VALVE NUT REMOVAL

⚠ CAUTION

Ensure valve cap is always in place except when adjusting tire pressure.

1. Remove the valve cap.
2. Rotate tire so that valve stem is in the 6 o'clock position.
3. Use a long-reach 17.2 mm (0.68 inch) socket to unscrew the valve nut a few turns. Slowly push valve stem into tire so that tire pressure is relieved.
4. Once tire pressure is relieved, remove the valve nut.

<<B>> TIRE BEAD/TPMS TRANSMITTER REMOVAL



1. Place on tire changing machine and break both tire beads ensuring that the TPMS transmitter remains in the bottom of the tire.

⚠ CAUTION

Be careful not to damage the TPMS transmitter.

2. Lubricate tire well and remove outer side of the tire.
3. Reach inside the tire and remove the TPMS transmitter.
4. Remove tire from rim using proper tire changing equipment procedures.

<<C>> GROMMET REMOVAL

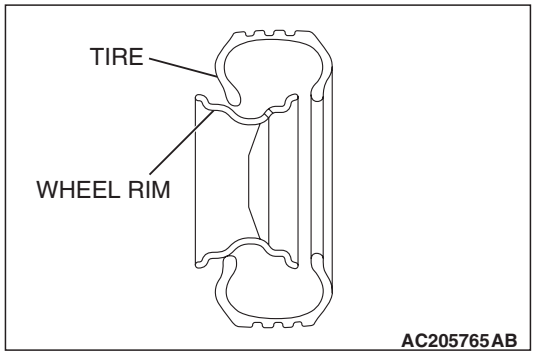
⚠ CAUTION

Use a soft tool to remove the grommet to prevent scratching the valve of the TPMS transmitter.

Remove the grommet from the TPMS transmitter.

INSTALLATION SERVICE POINTS

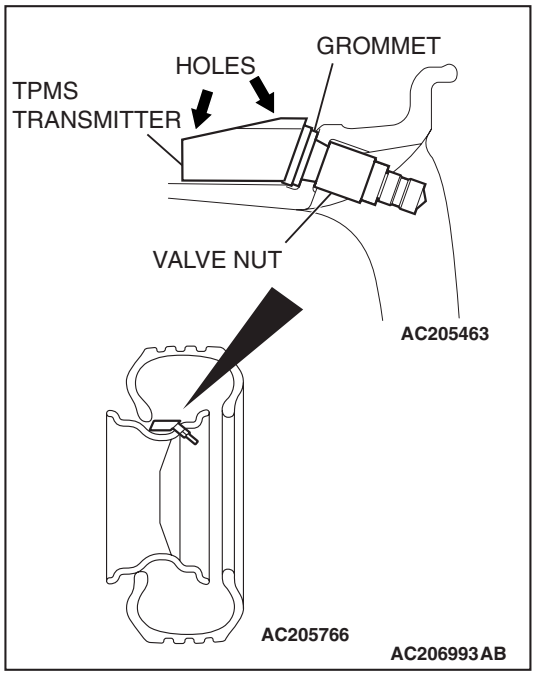
>>A<< GROMMET/TPMS TRANSMITTER/VALVE NUT INSTALLATION



1. Slide inner tire bead over rim face. Use lubricant, as normal procedures require.
2. Install a new grommet to the TPMS transmitter.

⚠ CAUTION

- **Visually check that TPMS transmitter is not deformed or damaged.**
- **When installing the TPMS transmitter, be sure the rim, grommet and valve nut are clean.**
- **Ensure that the grommet is located inside the valve hole before installing the valve nut.**
- **While installing the valve nut, hold the valve and grommet firmly in contact with the rim.**
- **While installing the valve nut, ensure that the tool is kept aligned to the valve and the valve hole.**
- **After installing the valve nut, check that the grommet is compressed.**

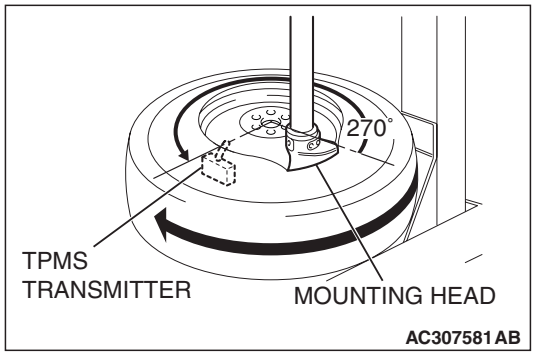


3. Mount TPMS transmitter valve through rim hole as illustrated. Both holes in the transmitter case should face away from center of rim. Tighten valve nut finger tight, then slowly torque the valve nut to 5.5 ± 0.5 N·m (49 ± 4 in-lb).

⚠ CAUTION

Install the TPMS transmitter correctly. If the TPMS transmitter is installed incorrectly, it may not work correctly, or become damaged when the tire is installed.

4. Check that the TPMS transmitter is correctly assembled (Refer to illustration).
   - One side of lower lip of the TPMS transmitter case can touch the rim after torquing.
   - Except for the grommet, valve nut and lower lip of the TPMS transmitter, no other part of the front of the TPMS transmitter case should be touching the rim.



>>B<< TIRE BEAD MOUNTING

1. Place wheel and tire on turntable of tire mounting machine. Ensure that the TPMS transmitter is 270 degrees (3 o'clock position) from mounting head when the outer tire bead is mounted as illustrated.
2. Lubricate tire well and mount outer tire bead as normal. Ensure that the tire does not rotate during mounting.

>>C<< TIRE PRESSURE INFLATION/VALVE NUT RETIGHTENING

⚠ CAUTION

After tire inflation, retighten the valve nut 5.5 ± 0.5 N·m (49 ± 4 in-lb). This is necessary, because the TPMS transmitter is secured to the wheel with the valve nut and rubber grommet. The rubber grommet will be depressed by tire pressure or deteriorate over a period of time, which requires the valve nut to be retightened.

Inflate tire to required pressure, then retorque the valve nut to 5.5 ± 0.5 N·m (49 ± 4 in-lb).

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATION

M1311001600303

ITEM	SPECIFICATION
Spare wheel mounting bolt (lock cylinder)	46 ± 8 N·m (34 ± 5 ft-lb)
TPMS antenna cover mounting bolt	8.8 ± 2.0 N·m (78 ± 17 in-lb)
TPMS antenna mounting bolt	8.8 ± 2.0 N·m (78 ± 17 in-lb)
Valve core	0.25 N·m (2.5 in-lb)
Valve nut (TPMS transmitter mounting nut)	5.5 ± 0.5 N·m (49 ± 4 in-lb) <when installing the TPMS transmitter to the wheel> 5.5 ± 0.5 N·m (49 ± 4 in-lb) <when retightening after tire inflation>
Wheel nut	108 ± 10 N·m (80 ± 7 ft-lb)

GENERAL SPECIFICATIONS

M1311000200335

ITEM		SPECIFICATION
Tire Pressure Monitoring System (TPMS)		Equipped (for road tires and spare tire)
TPMS transmitter's transmission frequency MHz		315
TPMS warning pressure kPa (psi)	Warning ON	158 (23) or less
	Warning OFF	174 (25) or more
Wheel	Type	Aluminum type with TPMS transmitter (exclusive wheel for TPMS)
	Size	16 × 7JJ
	Amount of wheel offset mm (in)	46 (1.8)
	Pitch circle diameter (PCD) mm (in)	139.7 (5.50)
Tire	Size	265/70R16 112S

NOTE: PCD (Pitch Circle Diameter) indicates the pitch circle diameter of the wheel installation holes.

SERVICE SPECIFICATIONS

M1311000300417

ITEM		LIMIT
Tread depth of tire mm (in)		Minimum 1.6 (0.06)
Wheel runout	Radial runout mm (in)	Maximum 1.0 (0.04)
	Lateral runout mm (in)	Maximum 1.0 (0.04)