2009 CHERY A1 Service Manual

FOREWORD

This manual contains on-vehicle service and diagnosis procedures for the Chery A1.

A thorough familiarization with this manual is important for proper repair and maintenance. It should always be kept in a handy place for quick and easy reference.

The contents of this manual, including drawings and specifications, are the latest available at the time of printing. As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Chery dealers. This manual should be kept up-to-date.

Chery Automobile Company, Ltd. reserves the right to alter the specifications and contents of this manual without obligation or advance notice.

NOTE:

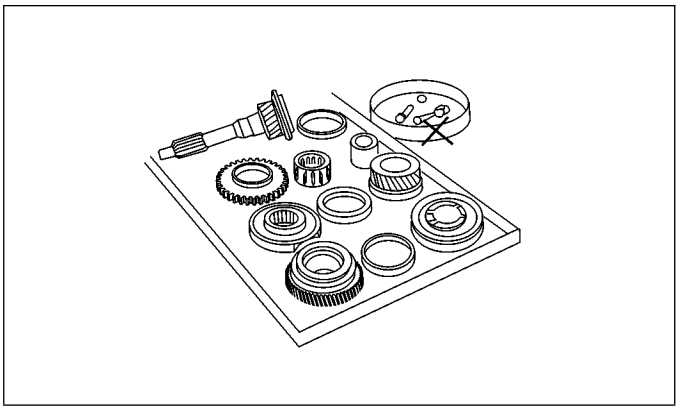
This A1 service manual only applies to the following engines and transaxles:

- **1.3L with M/T**
- **1.3L with AMT**

CONTENTS

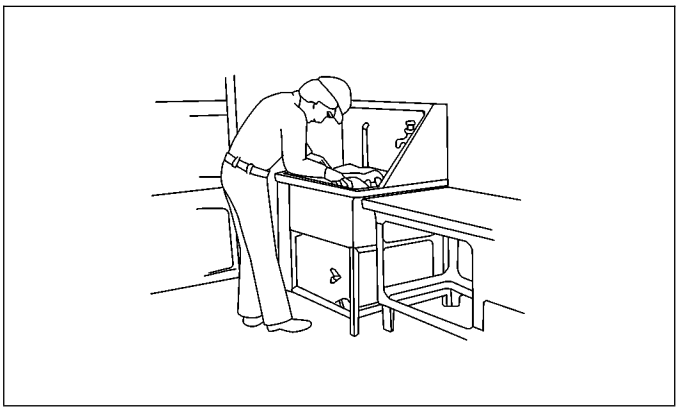
Arrangement of Parts

- All disassembled parts should be carefully arranged for reassembly.
- Be sure to separate and identify the parts to be replaced from those that will be reused.



Cleaning of Parts

- Carefully and thoroughly clean all parts to be reused.

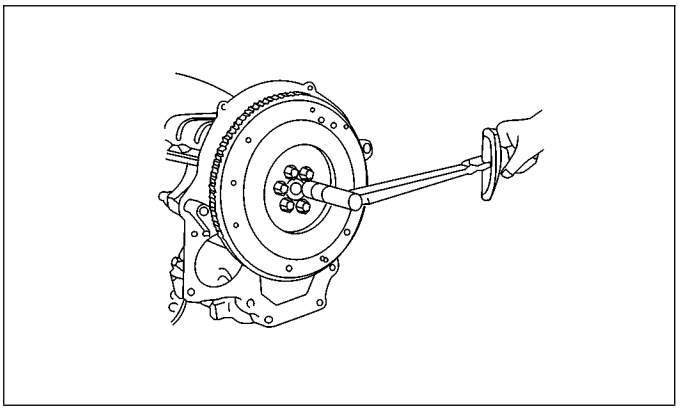


WARNING!

Using compressed air can cause dirt and other particles to fly out causing injury to the eyes. Wear protective eye wear whenever using compressed air.

Component Reassembly

- Standard values, such as torques and certain adjustments, must be strictly observed in the reassembly of all parts. If removed, replace these parts with new ones:
  - Oil seals
  - Gaskets
  - O-rings
  - Lock washers
  - Cotter pins
  - Nylon nuts



GENERAL INFORMATION

Description

The 1.3L in-line four cylinder engine has the following features:

- Double overhead camshafts
- Four valves per cylinder
- Aluminum cylinder head
- Cast iron cylinder block

Operation

The 1.3L engine utilizes 4 valve-per-cylinder and a double overhead camshaft design. The engine uses an individual coil ignition system. The cylinder block is made of cast iron and the bearing caps are integrated into the lower cylinder block assembly. An aluminum oil pan bolts to the bottom of the lower cylinder block. The camshafts are mounted in the cylinder head and act against valve tappets to open and close the valves. The camshafts are driven off the front of the cylinder head by one timing belt. The belt is driven by a sprocket that is located on the crankshaft. The piston assembly is an aluminum piston with a cast iron connecting rod.

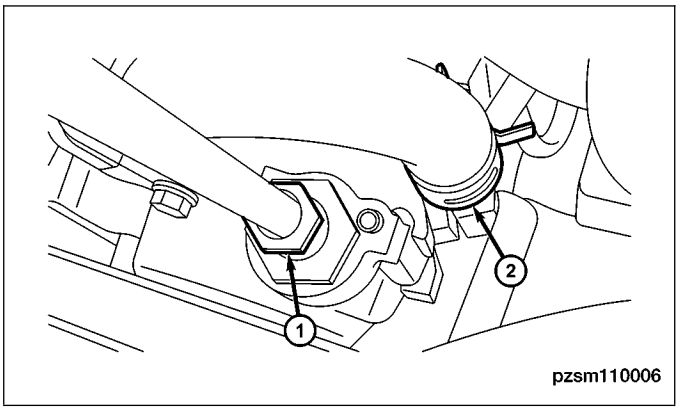
The aluminum cylinder head contains double overhead camshafts with four valves per cylinder. The valves are arranged in two in-line banks. The cylinder head incorporates powdered metal valve guides and seats. The cylinder head is sealed to the block using a multi-layer steel head gasket and retaining bolts.

Specifications

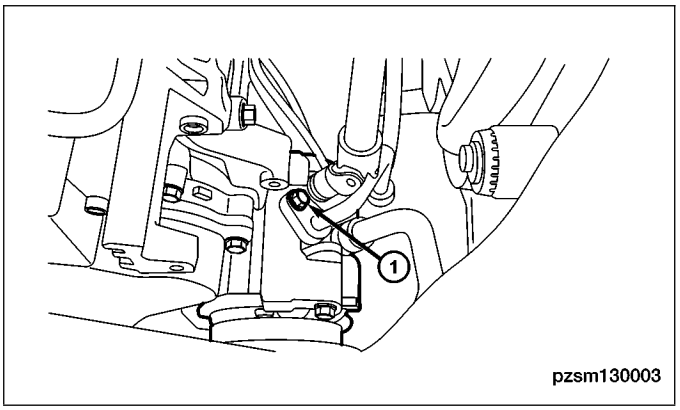
1.3L Engine Specifications

DESCRIPTION	SPECIFICATION
Type	In-Line OHV, DOHC
Number of Cylinders	4
Compression Ratio	10.0:1
Compression Pressure	10.0 - 13.5 bar
Max. Compression Pressure Variation Between Cylinders	30%
Stroke	77.5 mm
Cylinder Volume	1.297 L
Bore	73 mm
Fuel Designation (Not less than)	#93
Engine Oil Quantity	3.5 L
Fuel Supply Mode	Multi-Point Electronic Controlled Gasoline Injection
Engine Oil Designation	SAE 10W-40 (Grade SL or above)
Displacement	1297 cc
Firing Order	1-3-4-2

26. Remove the power steering pump pressure pipe (1) and return hose clamp (2).

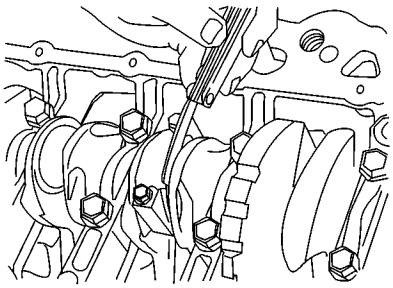


27. Remove the A/C compressor line bolt (1) from the A/C compressor.
(Tighten: A/C compressor line bolts to 20 ± 5 N·m)
NOTE: After removing the A/C lines, plug the A/C lines to prevent any debris from entering the A/C system.



28. Raise and support the vehicle.
29. Drain the engine oil.
30. Remove the exhaust pipe assembly (See Exhaust Pipe Assembly Removal & Installation in Section 07 Exhaust).
31. Remove the suction line retaining bolts on the front sub-frame.

4. Using a feeler gauge, check connecting rod side clearance.
   - Check axial clearance of connecting rod.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Crankshaft

Specifications

Torque Specifications

DESCRIPTION	TORQUE (N·m)
Main Bearing Cap Bolts	1st Step: Tighten the bolt to 45 ± 5 N·m 2nd Step: Tighten the bolt an additional 180 ± 10°
Lower Cylinder Block Bolts	25 ± 5

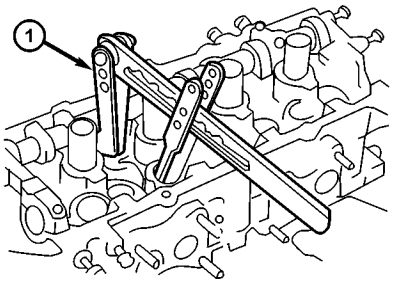
Clearance Specifications

DESCRIPTION	SPECIFICATION (mm)
Diameter of Crankshaft Main Journals	46.01
Diameter of Crankshaft Rod Journals	44.485 - 44.495
Out-of-Round Maximum of Crankshaft Main Journals	0.008
Axial Clearance of Crankshaft	0.02 - 0.30
Radial Clearance of Crankshaft	0.0035 - 0.034
Coaxality Crankshaft Main Journal	0.05
Thrust Washer Thickness	2.4 - 2.405

Disassembly

1. Remove the front crankshaft oil seal (See Front Crankshaft Oil Seal Removal & Installation in Section 02 Engine).
2. Remove the rear crankshaft oil seal (See Rear Crankshaft Oil Seal Removal & Installation in Section 02 Engine).
3. Remove the pistons with connecting rod assemblies.

3. Using the special tool CH-20018 (1), compress the valve spring.



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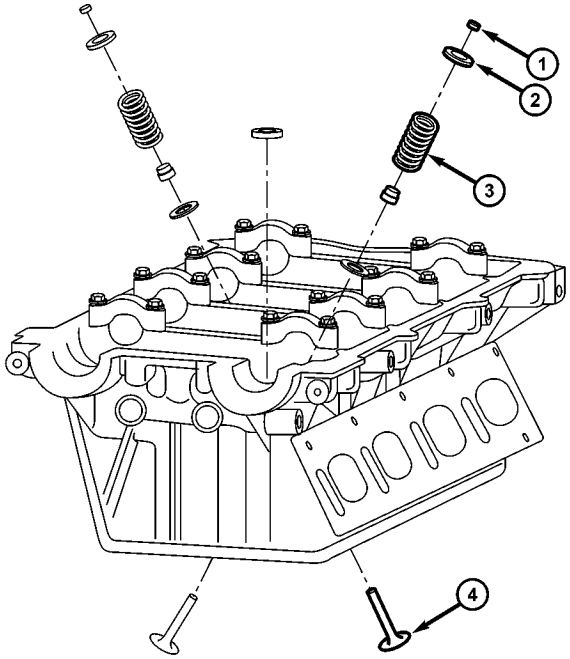
4. Remove the valve keeper (1), valve spring retainer (2) and valve spring (3).
5. Push the valve stem from the cylinder head and remove the valve (4).



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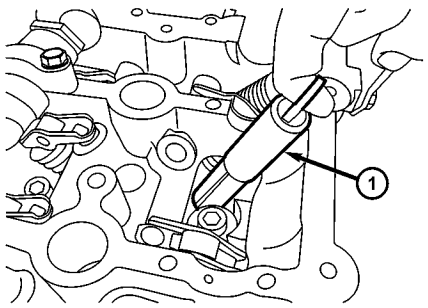
6. Using special tool CH-20013 (1), remove the valve oil seal.
7. Remove the valve guide if necessary.
8. Remove the spark plugs.



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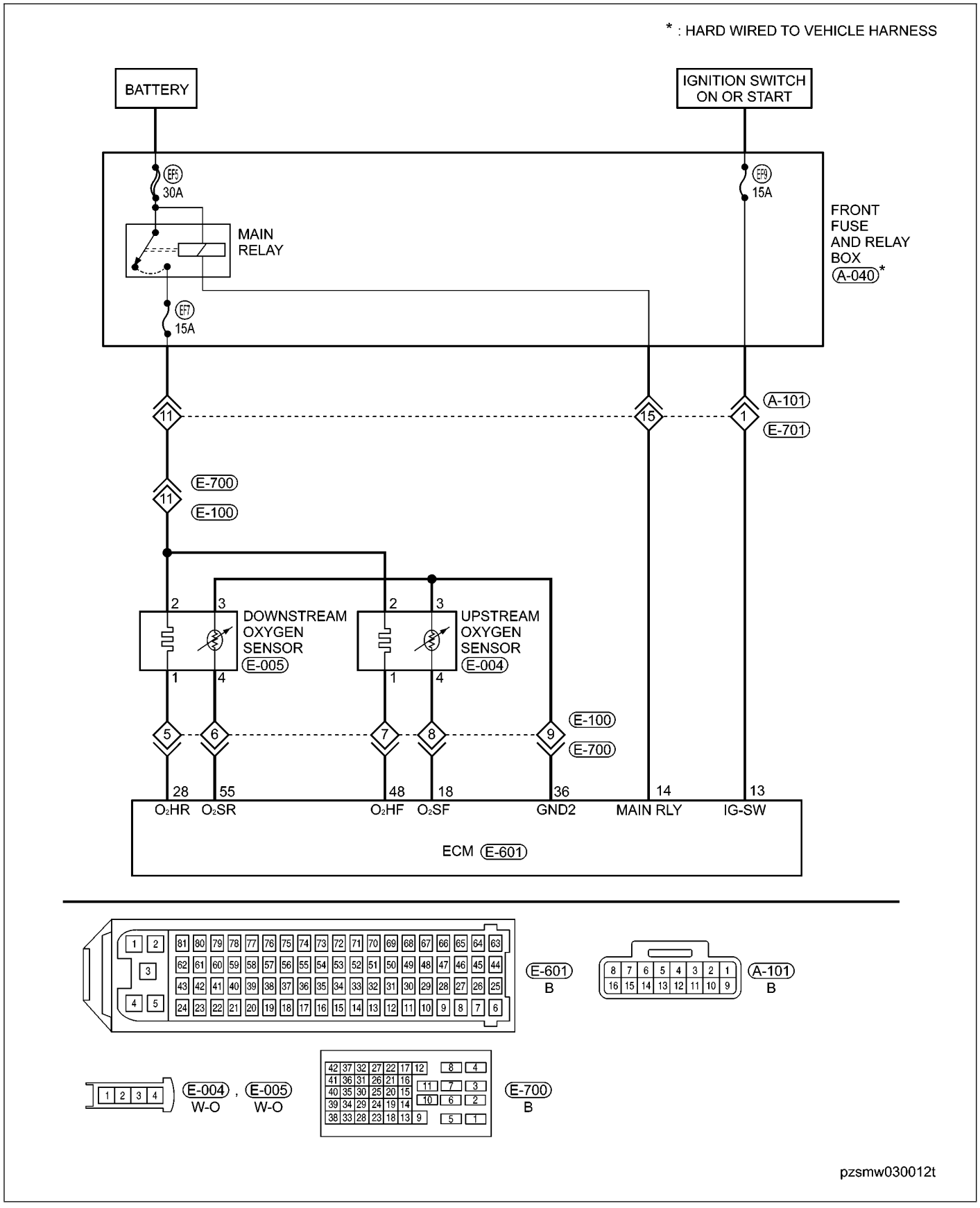
P0031 - O_2 Sensor 1 Heater Control Circuit Low
P0032 - O_2 Sensor 1 Heater Control Circuit High

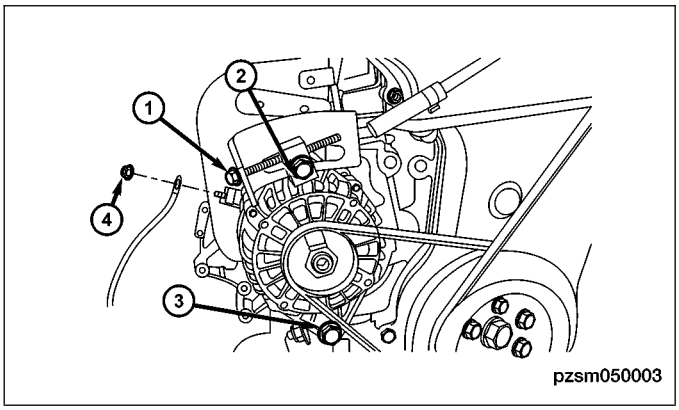


ON-VEHICLE SERVICE

Generator

Removal & Installation

1. Disconnect the negative battery cable.
2. Remove the generator electrical connector.
3. Disconnect the generator cable nut (4).
4. Loosen the generator belt tension bolt (1) to remove the generator drive belt.
5. Remove the generator upper retaining bolt (2).
6. Remove the generator lower retaining bolt (3). (Tighten: Generator mounting bolts to 30 N·m)



7. Remove the generator from the engine.
8. Installation is in the reverse order of removal.

Installation Note:

- After the generator is installed, adjust the drive belt tension.

Generator Inspection

1. Start the engine.
   NOTE: If the battery warning lamp lights, there may be a problem with the charging system.
2. With the engine running, check the output voltage of the generator with a digital multimeter (note the voltage).
3. If the voltage is between 14.1 - 14.7 V, the generator is good.

8. Install the tire and wheel assembly and install the wheel mounting nuts.
   (Tighten: Wheel mounting nuts to 110 N·m)

Wheel Assembly

Description

Original equipment wheels are designed for operation up to the specified maximum vehicle capacity.

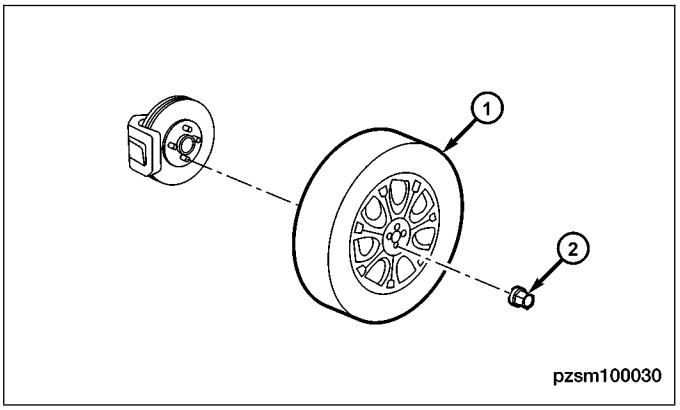
Inspect wheels for the following:
- Dents or cracks
- Damaged wheel bolt holes
- Air leaks from any area or surface of the rim
- Excessive run out

NOTE :
Do not attempt to repair a wheel by hammering, heating or welding.

NOTE :
The wheel nuts are designed for specific applications. Do not use replacement bolts with a different design or lesser quality.

Removal & Installation

1. Raise and support the vehicle.
2. If the vehicle is equipped with wheel center caps that cover the wheel nuts, remove the cap with an appropriate removal tool utilizing the notch located between the wheel and the outer edge of the cap.
   NOTE: Use care not to damage the finish on the wheel.
3. Remove the wheel mounting nuts (2) and the tire and wheel assembly (1).
   (Tighten: Wheel mounting nuts to 110 N·m)
4. Installation is in the reverse order of removal.



Wheel Balance

Description

Balance the wheel assembly, if necessary follow the wheel balancer manufacturer's instructions.
- Road test the vehicle for at least 5 miles.
- If the vibration persists, continue with Diagnosis & Testing procedure.

NOTE :
- Wheel balance equipment must be calibrated and maintained as outlined by the equipment manufacturer's specifications.
- Wheel weight must fit the rim.

A/C System Performance

NOTE :
The ambient air temperature must be a minimum of 21°C for this test.

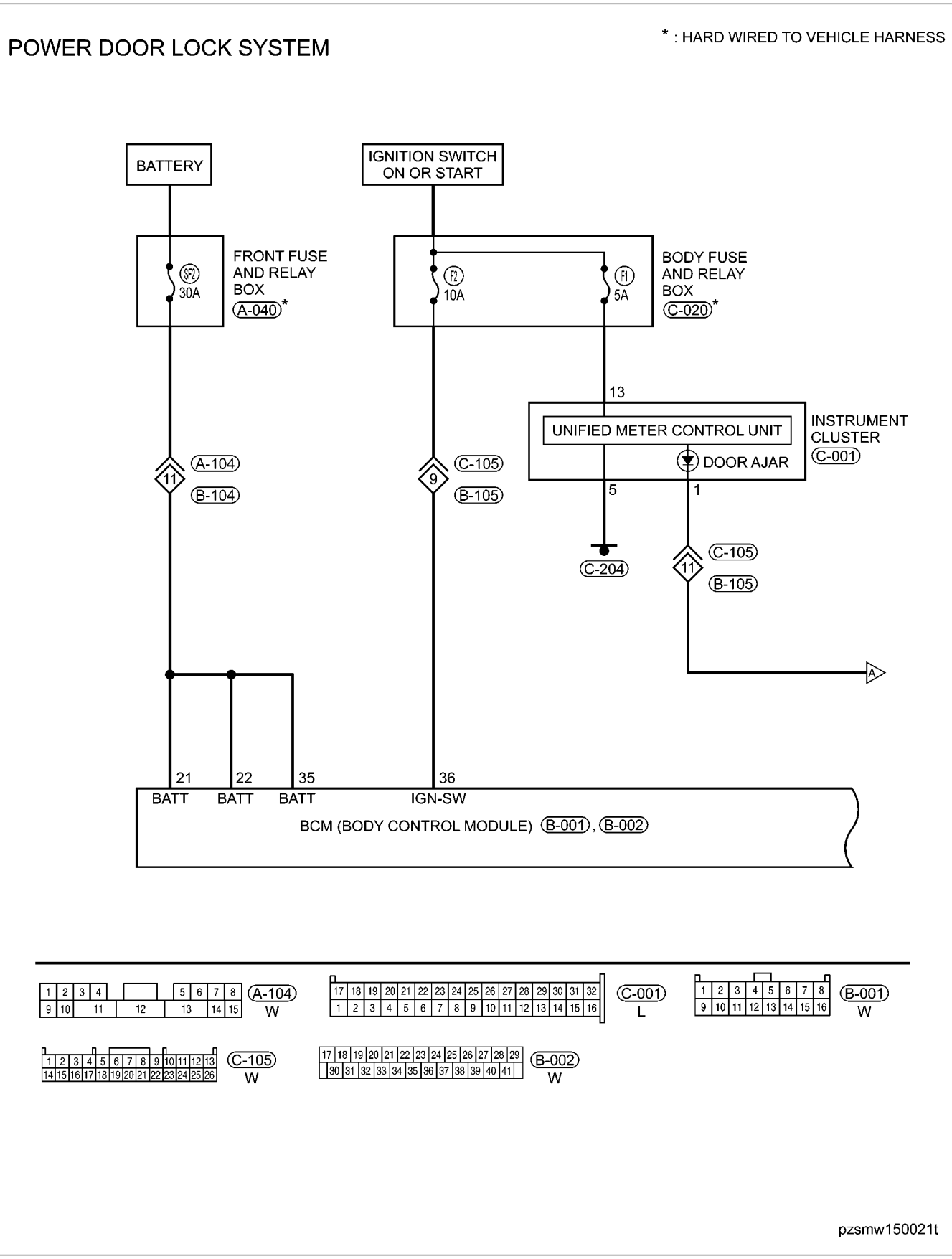
1. Connect a manifold gauge set.
2. Set the A/C Heater mode control switch knob in the Panel position, the temperature control knob in the full cool position, the A/C button in the On position, and the blower motor switch knob in the highest speed position.
3. Start the engine and hold the idle at 2,000 RPM with the compressor clutch engaged.
4. The engine should be at operating temperature. The doors and windows must be open.
5. Insert a thermometer in the driver side center A/C (panel) outlet. Operate the engine for five minutes.
6. The compressor clutch may cycle, depending upon the ambient temperature and humidity.
7. With the compressor clutch engaged, record the discharge air temperature and the compressor discharge pressure.
8. Compare the discharge air temperature to the performance temperature and pressure chart.

NOTE :
The discharge air temperatures will be lower if the humidity is less than the percentages shown.

TEMPERATURE AND PRESSURE					
Ambient Air Temperature and Humidity	21°C (80% humidity)	27°C (80% humidity)	32°C (80% humidity)	38°C (50% humidity)	43°C (20% humidity)
Air Temperature at Center Panel Outlet	10 to 13°C	14 to 17°C	15 to 18°C	17 to 20°C	14 to 17°C
Evaporator Inlet Pressure at Charge Port	241 to 276 kPa	262 to 290 kPa	269 to 296 kPa	275 to 303 kPa	262 to 290 kPa
Compressor Discharge Pressure	1241 to 1792 kPa	1380 to 1930 kPa	1380 to 1930 kPa	1655 to 2206 kPa	1567 to 2068 kPa

Electrical Schematics

Power Door Lock System (Page 1 of 3)



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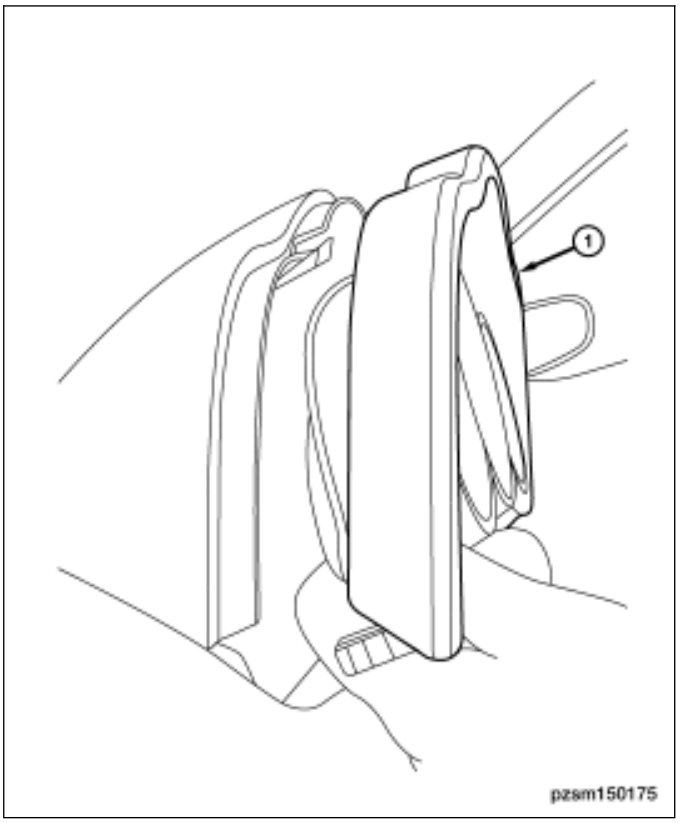
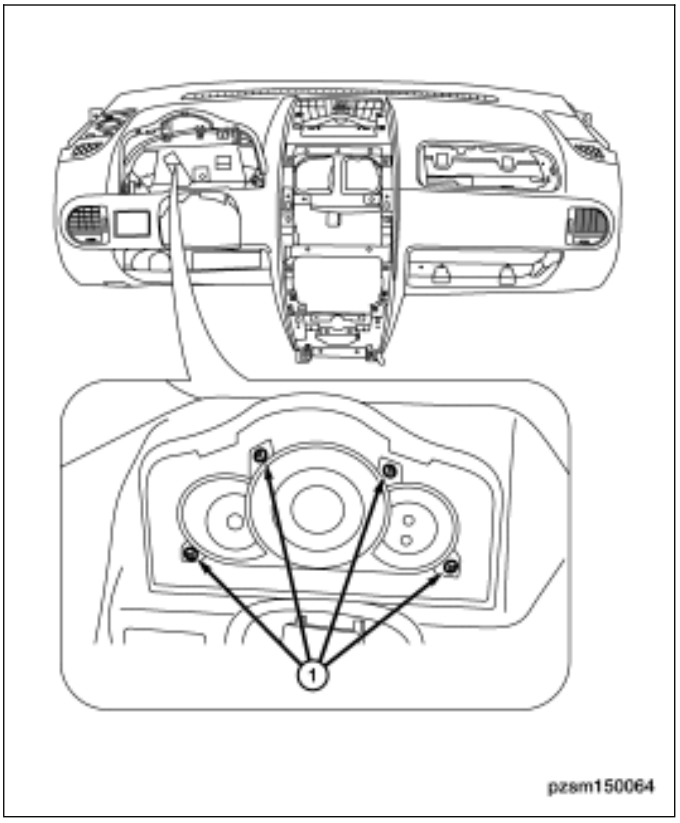
4. Remove the instrument cluster cover (1).



5. Remove the retaining screws (1) around the cluster.



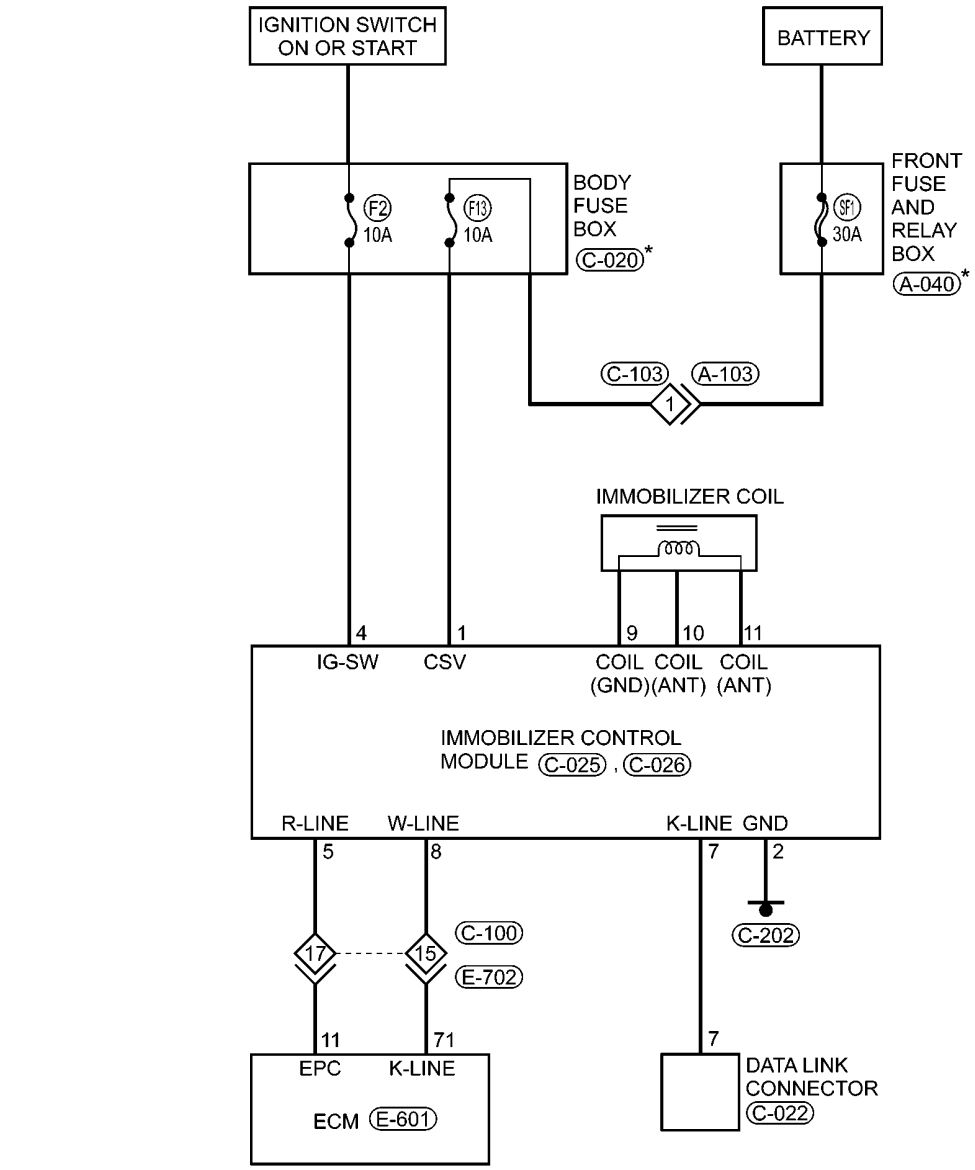
6. Disconnect the instrument cluster electrical connector.
7. Remove the instrument cluster.
8. Installation is in the reverse order of removal.

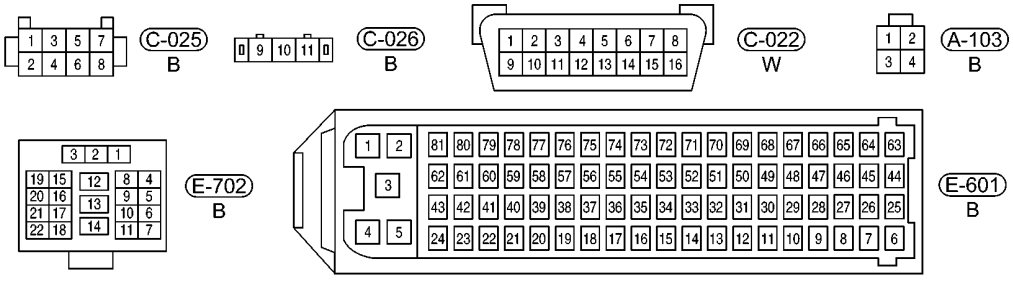
Electrical Schematics

Immobilizer Control Module (Page 1 of 1)

IMMOBILIZER

* : HARD WIRED TO VEHICLE HARNESS





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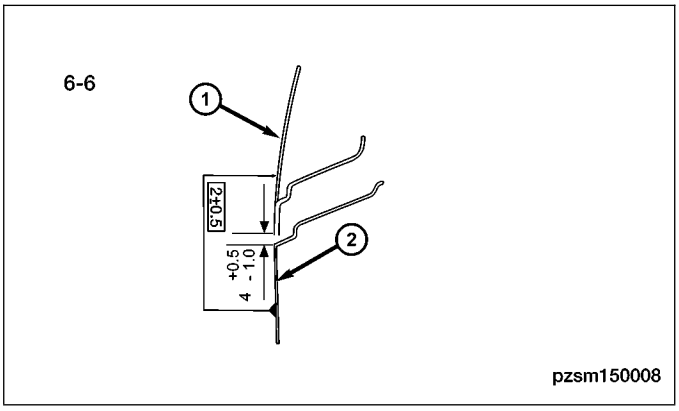
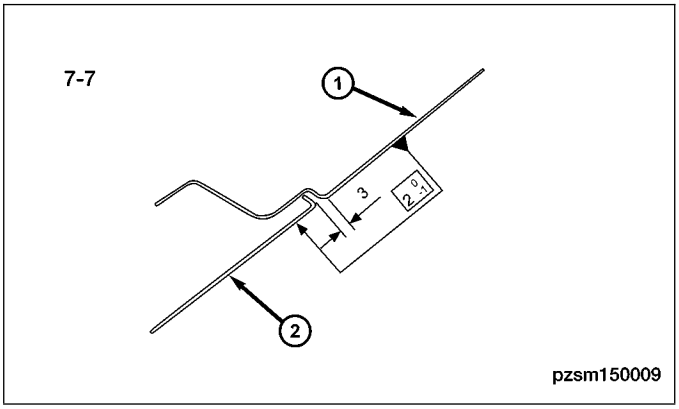
Clearance between front hood and front fender at 6-6: 4 mm



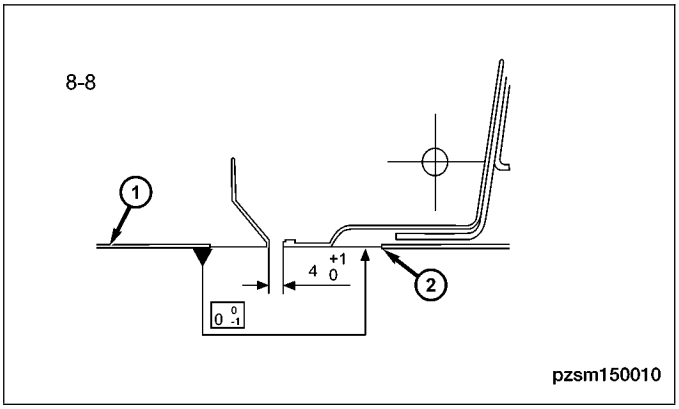
1 - Front Compartment Cover	2 - Front Fender

Clearance between front fender and A-pillar (side wall) at 7-7: 3 mm



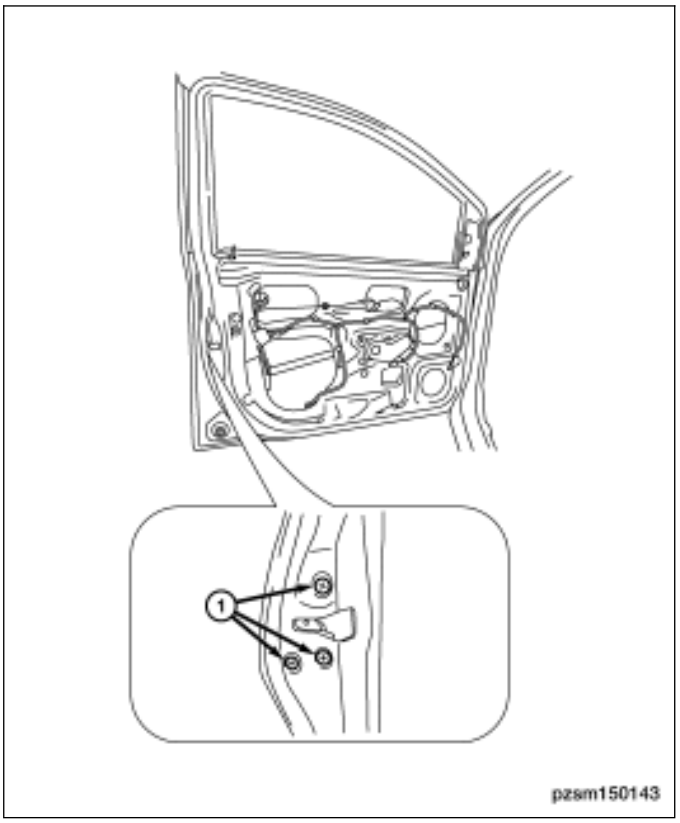
1 - A-pillar	2 - Front Fender

Clearance between front fender and front vehicle doors at 8-8: 4 + 1 mm



1 - Front Fender	2 - Front Door

28. Remove the power lock motor retaining bolts (1). (Tighten: Power lock motor retaining bolts to 8 ± 1 N·m)



29. Disconnect the power lock motor electrical connector (1).
30. Disconnect the door lock motor connecting rod to the outside door handle.
31. Remove the power door lock motor.