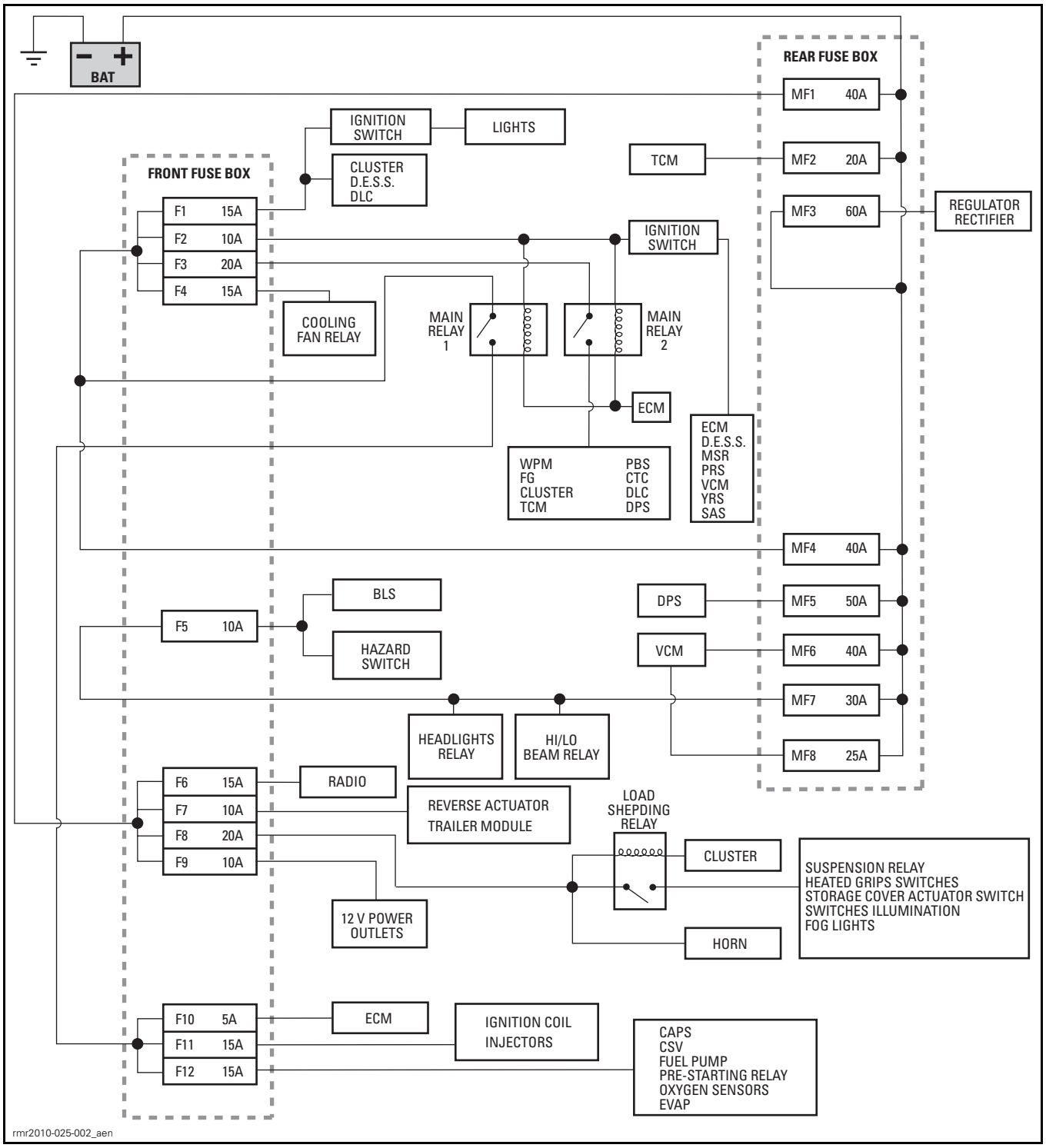
POWER DISTRIBUTION

SERVICE TOOLS

Description	Part Number	Page
FLUKE 115 MULTIMETER	529 035 868	9

SERVICE PRODUCTS

Description	Part Number	Page
DIELECTRIC GREASE	293 550 004	6



SIMPLIFIED ELECTRICAL SCHEMATICS

BLS	Brake lights switch
CAPS	Camshaft position sensor
CSV	Clutch valve solenoid
CTG	Coolant temperature gauge
DLC	Diagnostic link connector
DPS	Dynamic power steering
ECM	Engine control module
FG	Fuel gauge
MSR	Multifunction switch right
PBS	Parking brake switch
PRS	Pillion rider (Passenger) switch
SAS	Steering angle sensor
TCM	Transmission control module
VCM	Vehicle control module
WPM	Windshield and parking brake module
YRS	Yaw rate sensor

GENERAL

It is highly recommended to disconnect the battery when replacing any electric or electronic component.

⚠ WARNING

Always disconnect battery exactly in the specified order, BLACK (-) cable first, RED (+) cable last. Always reconnect BLACK (-) cable last. Do not place tools on battery.

COMPONENT DESCRIPTION

Rear Fuse Box

The rear fuse box contains the main fuses.

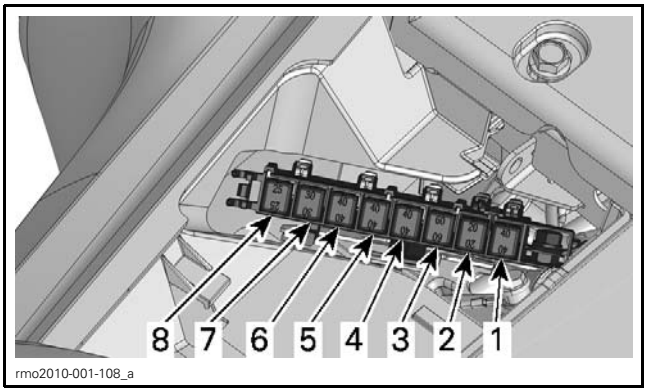
Rear Fuse Box Location

The rear fuse box is located under the seat on the right side of the vehicle.

1. Rear fuse box (master)

Fuse Description

The rear fuse box contains the main fuses. They protect the beginning of the circuits or high amperage components.



rmo2010-001-108_a

UNDER SEAT- PARTS REMOVED FOR MORE CLARITY

NO.	DESCRIPTION	
MF1	Accessories (supplies fuses F6, F7, F8, F9)	40 A
MF2	TCM valves (SE5 model)	20 A
MF3	Rectifier/regulator	60 A
MF4	Main fuse (supplies fuses F1, F2, F3, F4)	40 A
MF5	Dynamic Power Steering (DPS) motor	50 A
MF6	VCM pump	40 A
MF7	Lights (supplies relays R6, fuse F5 and relay R8 control)	30 A
MF8	VCM valves	25 A

The fuse box is a single bus bar type which feeds power to each fuse through its lower contact. Power comes either directly from the battery, or from the voltage regulator/rectifier through MFB34 rectifier fuse (F3).

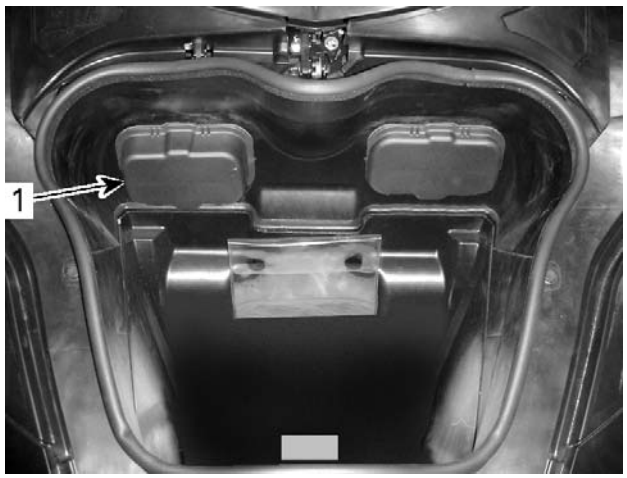
The top contact receives power through the fuse and distributes it to the subsystem, or component.

Front Fuse Box

The front fuse box contains the following items:
- The subsystem fuses
- Relays
- Spare fuses of various ratings (in the cover)
- A fuse removal tool.

Front Fuse Box Location

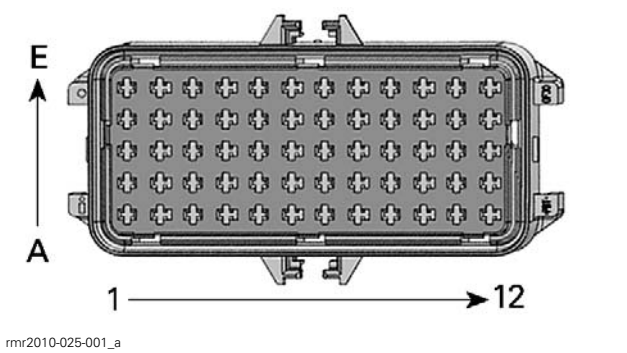
The front fuse box is located under the RH plastic cover inside the front storage compartment.



rmo2010-001-012_a

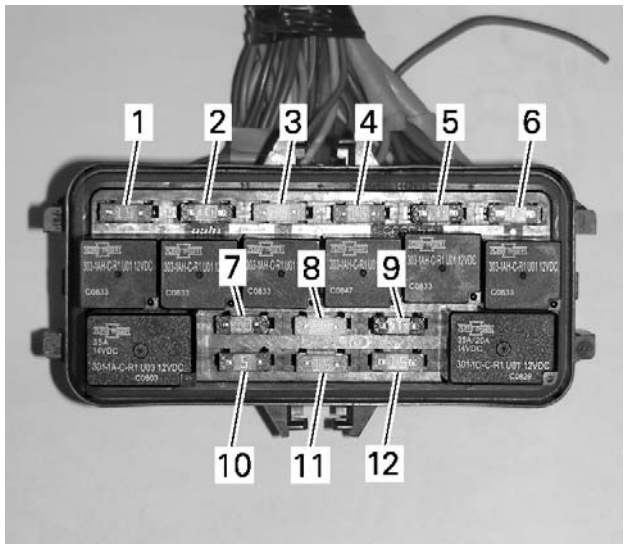
INSIDE FRONT STORAGE COMPARTMENT
1. Front fuse box

Fuse Description



rmr2010-025-001_a

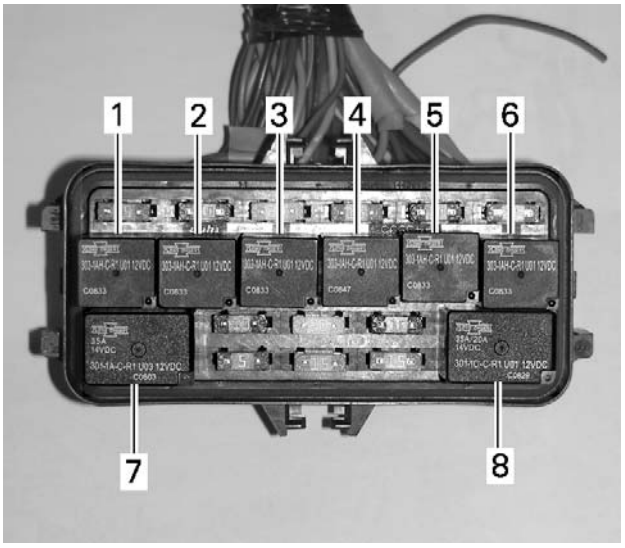
FRONT FUSE BOX PIN-OUT



rmo2010-001-109_a

NO.	DESCRIPTION	
F1	**Direct battery power:** Cluster D.E.S.S. Diagnostic link connector (DLC) **Through ignition switch:** Lights	15 A
F2	**Direct battery power:** Main relays control **Through ignition switch:** Steering angle sensor (SAS) Yaw rate sensor (YRS) Vehicle control module (VCM) Engine control module (ECM) D.E.S.S. Pillion rider switch (PRS) Multifunction switch, right (MSR)	10 A
F3	**Direct battery power:** Main relay 2 power **Through main relay 2:** Windshield and parking brake module (WPM) Cluster Fuel level gauge Coolant temperature gauge Parking brake switch illumination Transmission control module (TCM) Dynamic Power Steering control (DPS)	20 A
F4	**Direct battery power:** Cooling fan relay	15 A
F5	**Direct battery power:** Hazard switch Brake light switch	10 A
F6	**Direct battery power:** Radio	15 A
F7	**Direct battery power:** Reverse actuator Trailer module	10 A
F8	**Direct battery power:** Horn Load shedding relay **Through load shedding relay :** Suspension relay Heated grips Front storage compartment light Storage cover actuator Switches illumination Fog lights	20 A
F9	**Direct battery power:** 12 volt power outlets	10 A
F10	**Through main relay 1:** Engine control module (ECM)	5 A
F11	**Through main relay 1:** Ignition coil Fuel injectors	15A
F12	**Through main relay 1:** Fuel pump motor H2OS (oxygen sensors) heaters Pre-starting relay EVAP purge valve Clutch valve Camshaft position sensor (CAPS)	15 A

Relay Description



rmo2010-001-109_b

NO.	DESCRIPTION
R1	Air controlled suspension
R2	Pre-starting
R3	Main relay 2
R4	Cooling fan
R5	Load shedding relay
R6	Headlights relay
R7	Main relay 1
R8	Headlights high beam/low beam relay

TROUBLESHOOTING

DIAGNOSTIC TIPS

NOTE: It is a good practice to check for fault codes using B.U.D.S. software as a first troubleshooting step. Refer to *COMMUNICATION TOOLS AND B.U.D.S. SOFTWARE* subsection.

IMPORTANT: When troubleshooting an electrical system fault, check battery condition, cables and connections first.

Always refer to the *WIRING DIAGRAM* when troubleshooting an electrical circuit.

Install a battery charger on battery terminals (under seat) for any tests that involve a prolonged "key ON" period. If battery voltage gets too low, some accessories are shut off by the ECM.

NOTICE Never force a multimeter probe into an electrical terminal.

Before interchanging relays for troubleshooting, ensure relays are identical by comparing information written on the relay outer casing.

4- pin relays may be inverted 180° at installation and work correctly. Make sure that the relay tabs are properly aligned with the fuse holder terminals at installation.

Circuit Testing

Check the related-circuit fuse condition with a test lamp, multimeter, fuse tester or ohmmeter. A visual inspection on its own could lead to an incorrect conclusion.

If a group of fuses or components are not supplied in voltage check the related main fuse (in rear fuse box) first.

Electrical Connection Inspection

When replacing an electric or electronic component, always check electrical connections. Make sure they are tight, make good contact, and are corrosion-free. Dirty, loose or corroded contacts are poor conductors and are often the source of a system or component malfunction.

Pay particular attention to ensure that pins are not bent or pushed out of their connectors.

Ensure all wire terminals are properly crimped on wires, and connector housings are properly fastened.

Check for signs of moisture, corrosion or dullness. Clean pins properly and coat them with DIELECTRIC GREASE (P/N 293 550 004) or other appropriate lubricant (except if otherwise specified) when reassembling them.

Pay attention to ground wires.

TESTING SEQUENCE

Electrical Power Does Not Come ON

Electrical system power up is normally identified by the gauge powering up and cycling through its self-test function.

If gauge do not come ON, check the following:

– Battery and connections condition, refer to *CHARGING SYSTEM* subsection.
– Main relays and circuits, refer to *RELAYS* in this subsection.
– Ignition switch and circuits, refer to *IGNITION SYSTEM* subsection.

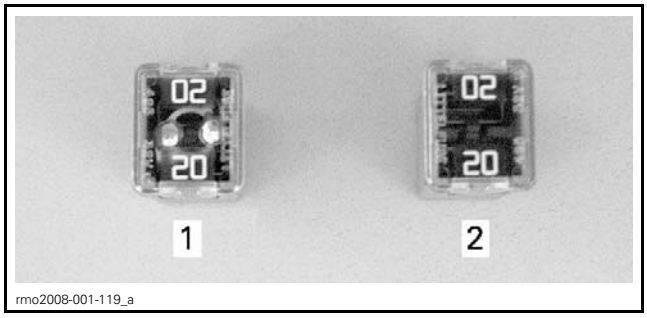
PROCEDURES

FUSES

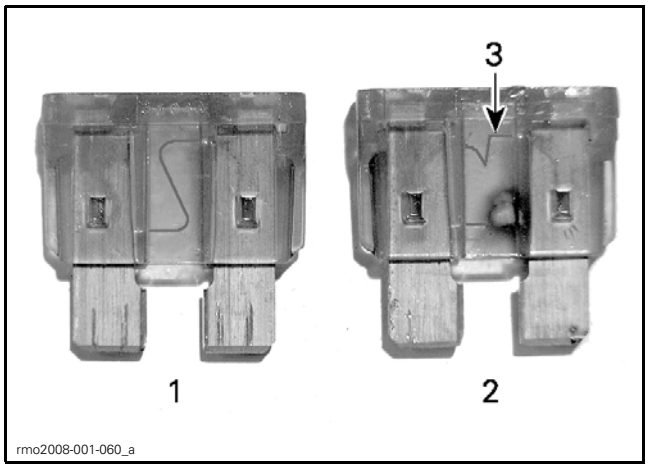
Fuse Inspection

If an electrical system fault occurs, check the fuses. If a fuse is burnt, replace it with a fuse of the same rating.

Keep in mind that an electrical component may require more than one fuse, one low amperage rated fuse for its control circuit, and another higher rated fuse for the main component power. These two fuses may not be in the same fuse box.



REAR FUSE BOX FUSES
1. Good fuse
2. Blown fuse



FRONT FUSE BOX FUSES
1. Good fuse
2. Blown fuse
3. Melted filament

A visual inspection of a fuse may not be conclusive.

Two metal contacts are visible on top of the front fuse box fuses. They can be used for testing the fuse using a test lamp, fuse tester or a multimeter. They can also be used for testing the circuit the fuse protects without removing the fuse.

However, when testing a fuse using an ohmmeter, the fuse must always be removed from the fuse box.

NOTE: A good fuse will show battery voltage on both sides. Battery voltage read on one side only indicates a blown fuse. No voltage on either side indicates a circuit problem.

Fuse Replacement

⚠ WARNING

When replacing a fuse, do not use a higher rated fuse than recommended. Use of a higher rated fuse can lead to severe component or circuit damage, an overheat condition, and possibly and electrical fire. If a fuse has burnt out, the source of the malfunction should be identified and corrected before applying power to the vehicle.

NOTICE **Do not apply a silicone-based dielectric grease or similar product on fuse or relay plug-in terminals in front fuse box. Use of such a product will cause premature failure of the relay contacts.**

Front Fuse Box

1. Open front storage compartment.
2. Remove RH plastic cover.
3. Remove fuse box cover.
4. Identify and replace blown fuse with a fuse of the same rating.

Rear Fuse Box

1. Open seat.
2. Open fuse box cover.
3. Identify and replace blown fuse with a fuse of the same rating.

RELAYS

Main Relay 1 (R7) Operational Test

NOTE: A defective ignition switch or ECM will not allow main relays control.

If no voltage is supplied to fuses F10, F11 and F12 in front fuse box with the ignition switch (key) ON, test main relay 1 (R7) as follows:

Check fuse F2 in front fuse box.

If F2 is good, carry out a *MAIN RELAY 1 (R7) QUICK TEST*.

If F2 is blown, refer to the *WIRING DIAGRAM* and look for a short circuit or component.

If input voltage, control circuit and relay are good, the circuits supplied by the relay may be defective.

Main Relay 1 (R7) Quick Test

Refer to *FRONT FUSE BOX* in this subsection for pinout information.

1. Locate main relay 1 relay in the front fuse box.
2. While touching the relay, turn ignition switch (key) ON. You should feel it "click".

NOTE: Main relay 2 (R3) also clicks with key ON. Make sure not to be mistaken between R3 and R7. Main relays remain "ON" for a while once activated by the ECM.

If relay clicks when key is turned ON, check voltage input at pin A1 of front fuse box. If voltage is read at pin A1, test relay, refer to *RELAY BENCH TEST* in this subsection.

If relay does not click when key is turned ON, check voltage input at pin B1 of front fuse box. If voltage is read at pin B1, carry out a *MAIN RELAY 1 (R7) CONTROL CIRCUIT TEST*. If there is no voltage at pin B1, look for an open circuit.

Main Relay 1 (R7) Control Circuit Test

Refer to *FRONT FUSE BOX* in this subsection for pinout information.

1. Remove main relay 1.

2. Set multimeter to Vdc.
3. Turn ignition switch (key) ON.
4. Place multimeter RED (+) probe on a positive source such as the starter solenoid battery input.
5. Place the multimeter BLACK (COM) probe on pin A3 of front fuse box.

MAIN RELAY 1 CONTROL CIRCUIT TEST		
TEST PROBES		RESULT (WITH KEY ON)
Front fuse box pin A3	Positive source	Battery voltage

If ground signal is good, test relay, refer to *RELAY BENCH TEST* in this subsection.

If ground signal is not good, refer to *WIRING DIAGRAM* and look for an open circuit.

Main Relay 2 (R3) Operational Test

NOTE: A defective ignition switch or ECM will not allow main relays control.

If no voltage is supplied to cluster connector pin 8 with ignition switch (key) ON (cluster does not turn on), test relay 2 (R3) as follows:

Check fuses F2 and F3 in front fuse box.

If F2 and F3 are good, carry out a *MAIN RELAY 2 (R3) QUICK TEST*.

If F2 or F3 are blown, refer to the *WIRING DIAGRAM* and look for a short circuit or component.

If input voltage, control circuit and relay are good, the circuits supplied by the relay may be defective.

Main Relay 2 (R3) Quick Test

Refer to *FRONT FUSE BOX* in this subsection for pinout information.

1. Locate main relay 2 in the front fuse box.
2. While touching the relay, turn ignition switch (key) ON. You should feel it "click".

NOTE: Main relay 1 (R7) also clicks with key ON. Make sure not to be mistaken between R3 and R7. Main relays remain "ON" for a while once activated by the ECM.

If relay clicks when key is turned ON, check voltage input at pin C5 of front fuse box. If voltage is read at pin C5, test relay, refer to *RELAY BENCH TEST* in this subsection.

If relay does not click when key is turned ON, check voltage input at pin D5 of front fuse box. If voltage is read at pin D5, carry out a *MAIN RELAY 2 (R3) CONTROL CIRCUIT TEST*. If there is no voltage at pin D5, look for an open circuit.

Main Relay 2 (R3) Control Circuit Test

Refer to *FRONT FUSE BOX* in this subsection for pinout information.

1. Remove main relay 2.
2. Set multimeter to Vdc.
3. Turn ignition switch (key) ON.
4. Place multimeter RED (+) probe on a positive source such as the starter solenoid battery input.
5. Place the multimeter BLACK (COM) probe on pin C6 of front fuse box.

MAIN RELAY 1 CONTROL CIRCUIT TEST		
TEST PROBES		RESULT (WITH KEY ON)
Front fuse box pin C6	Positive source	Battery voltage

If ground signal is good, test relay, refer to *RELAY BENCH TEST* in this subsection.

If ground signal is not good, refer to *WIRING DIAGRAM* and look for an open circuit.

Load Shedding Relay (R5) Operational Test

The load shedding relay will cut off power to the following components if the battery voltage is too low:

– Console switches illumination (except the parking brake switch)
– Front and rear heated grips
– Air controlled suspension
– Front storage cover actuator
– Fog lights.

If battery and charging system are within specifications and the above components are not functional, check fuse F8.

If fuse F8 is good, check the relay input voltage at pins C9 and D9 of front fuse box. If voltage is good at pins C9 and D9, carry out a *LOAD SHEDDING RELAY CONTROL CIRCUIT TEST*. If there is no voltage at pins C9 and D9, look for an open circuit between fuse F8 and relay.

If F8 is blown, refer to the *WIRING DIAGRAM* and look for a short circuit or component.

Load Shedding Relay (R5) Control Circuit Test

Refer to *FRONT FUSE BOX* in this subsection for pinout information.

1. Remove load shedding relay.
2. Set multimeter to Vdc.
3. Start engine.
4. Place multimeter RED (+) probe on a positive source such as the starter solenoid battery input.
5. Place the multimeter BLACK (COM) probe on pin D10 of front fuse box.

LOAD SHEDDING RELAY CONTROL CIRCUIT TEST		
PROBES		RESULT (WITH ENGINE RUNNING)
Front fuse box pin D10	Positive source	Battery voltage

If ground signal is good, check voltage input at pin C1 (suspension relay input) of front fuse box. If voltage does not reach pin C1, test relay, refer to *RELAY BENCH TEST*. If voltage reaches pin C1, check other accessories wiring for an open circuit.

If ground signal is not good, refer to *WIRING DIAGRAM* and look for an open circuit between relay and gauge. If circuit is not open, the gauge may be defective.

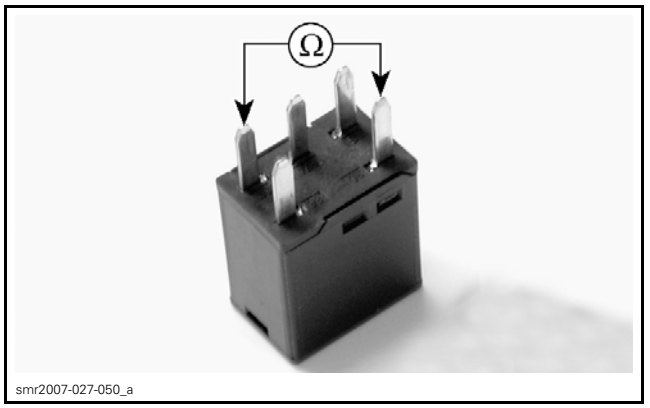
Relay Bench Test

Remove relay.

Use the FLUKE 115 MULTIMETER (P/N 529 035 868), and select the Ω position.

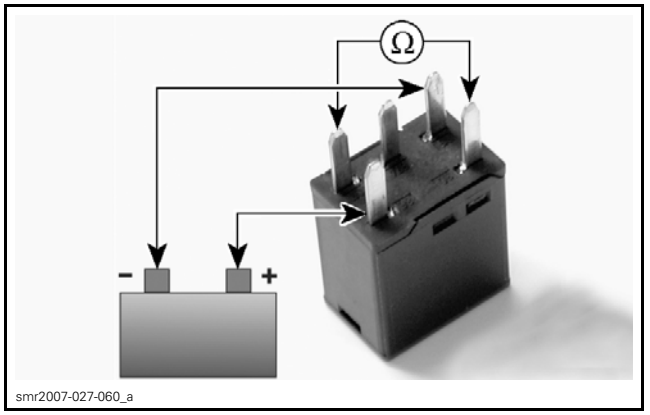
Probe relay as follows.

TERMINAL		RESISTANCE
30	87	Open circuit (OL)
	87a (if applicable)	Close to 0 Ω



Connect battery between terminals 85 and 86 as shown and probe relay again as follows.

TERMINAL		RESISTANCE
30	87	Close to 0 Ω
	87a (if applicable)	Open circuit (OL)



BATTERY CONNECTED BETWEEN TERMINALS 85 AND 86

If the relay failed a test, replace it.

NOTE: Use the same method to test 4-pin relays. On some 5-pin relays, the 87a is unused, see *WIRING DIAGRAM* for details.