

POWER DISTRIBUTION AND GROUNDS (1200 4-TEC)

SERVICE TOOLS

Description	Part Number	Page
FLUKE 115 MULTIMETER	529 035 868	4

GENERAL

POWER DISTRIBUTION DIAGRAM

Refer to the *WIRING DIAGRAM*.

Power distribution is shown in red on the color wiring diagram. Refer to *KNOWLEDGE CENTER*.

NOTE: Refer to *WIRING DIAGRAM INFORMATION* subsection for how to properly interpret the *WIRING DIAGRAM*.

OVERVIEW

All the electrical system is powered by DC current supplied by a 12 V battery. The battery charge is maintained by the charging system.

Electrical system is protected by fuses located in a fuse box.

Automatic Power Cut-Off

The ECM features an automatic power cut-off that will completely turn off the ECM (after engine was running) and thus cutting all power to components. All the vehicle electrical loads will be turned off (except the clock in the multifunction gauge). This feature prevents the battery from discharging if the tether cord cap is left on engine cut-off switch when the engine is not running.

NOTE: If a power cable is connected to the communication connector power cut-off will not occur.

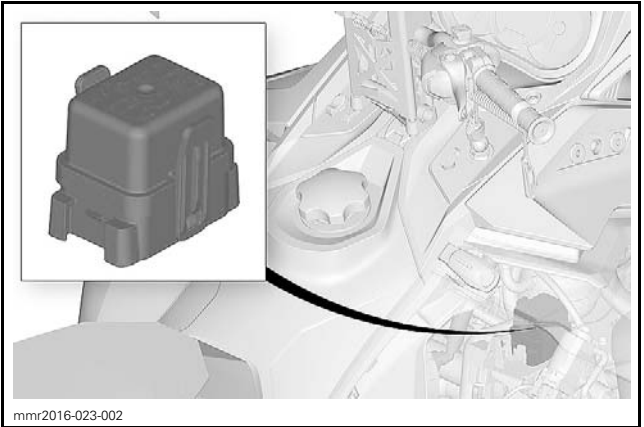
The cut-off time is as follows.

ACTION	POWER CUT-OFF TIME
Removing tether cord cap	Approximately 15 seconds
Setting emergency engine stop switch to STOP (tether cord cap connected)	Approximately 20 seconds

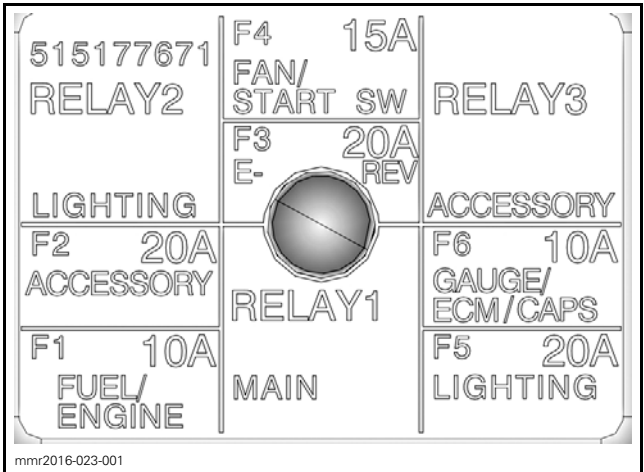
NOTE: The ECM will remain off until the START/RER button is pressed.

FUSES

Fuse Box Location



Fuse Box



F1	Fuel / Engine	10 A
F2	Accessory	20 A
F3	E-REV (if equipped)	20 A
F4	Fan / Start SW	15 A
F5	Lighting	20 A
F6	Gauge / ECM / CAPS	10 A

R1	Main
R2	Lighting
R3	Accessory

RELAY STATE (ON)	RELAY STATE (OFF)
R1 - Main Relay	
When START/RER button is pressed When engine is running	Refer to <i>AUTOMATIC POWER CUT OFF</i> in this subsection
R2 - Lighting Relay	
When engine reaches 800 RPM	Refer to <i>AUTOMATIC POWER CUT OFF</i> in this subsection OR If engine is turned off
R3 - Accessory Relay	
When engine reaches 1000 RPM	If engine drops below 950 RPM

The following actions will be taken by the ECM to preserve electrical power for the most important functions.

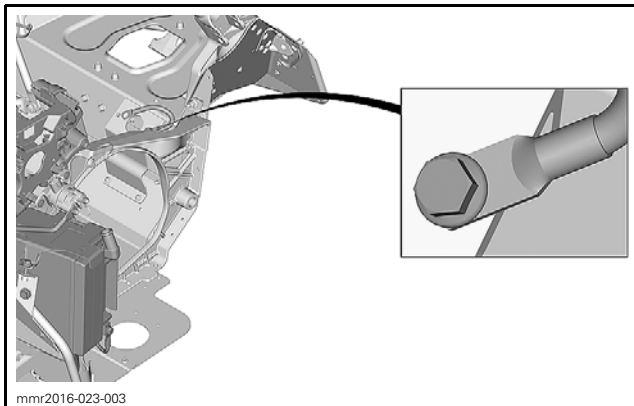
CONDITION	ECM CORRECTIVE ACTION
If battery voltage is lower than 12 V for 10 seconds	Relay 3 is disabled.
If battery voltage is lower than 11.5 V	Idle speed is increased.
If battery voltage is lower than 11 V	Low battery pilot lamp turns on.

Fuse box contacts are identified as seen from the top of the fuse box with letters to identify rows and numbers to identify columns. The combined letter and number identify the coordinate of a contact that is used in the wiring diagram and procedures.

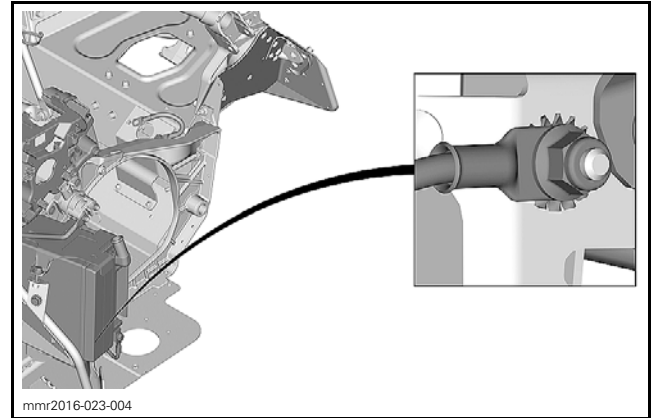
NOTICE Do not apply any lubricant or sealant product to the terminal contacts in fuse box.

GROUNDS

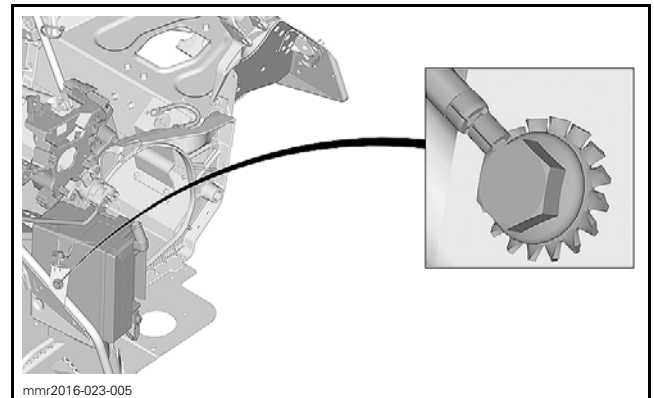
Chassis Ground Locations



TIGHTENING TORQUE	
Chassis Ground	10 N•m ± 2 N•m (89 lbf•in ± 18 lbf•in)

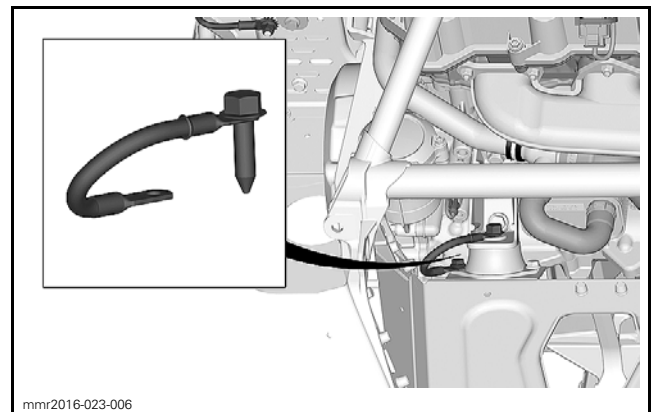


TIGHTENING TORQUE	
Chassis Ground	7.5 N•m ± 1 N•m (66 lbf•in ± 9 lbf•in)



TIGHTENING TORQUE	
Chassis Ground	7 N•m ± 1 N•m (62 lbf•in ± 9 lbf•in)

Engine Ground Location

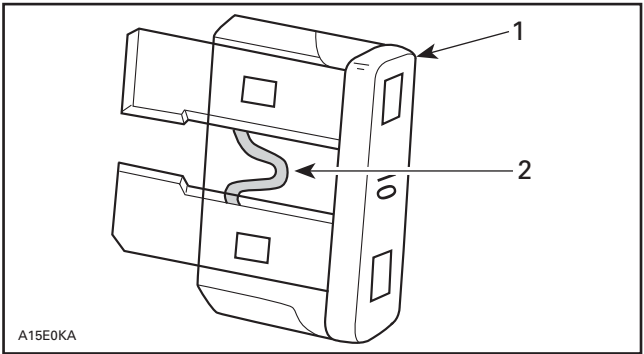


TIGHTENING TORQUE	
Engine Ground	31.5 N•m ± 3.5 N•m (23 lbf•ft ± 3 lbf•ft)

PROCEDURES

FUSE INSPECTION

Check if filament is melted. Replace as necessary.

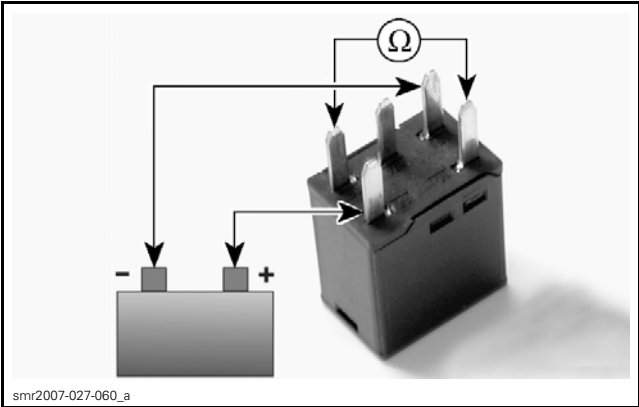


- 1. Fuse
- 2. Check if melted

⚠ WARNING

Do not use a higher rated fuse as this can cause severe damage to electric components and/or a fire. If fuse has burnt out, the cause of the malfunction should be determined and corrected before restarting.

TERMINAL		RESISTANCE
30	87	0.5 Ω max. (continuity)



If relay failed any test, replace it.

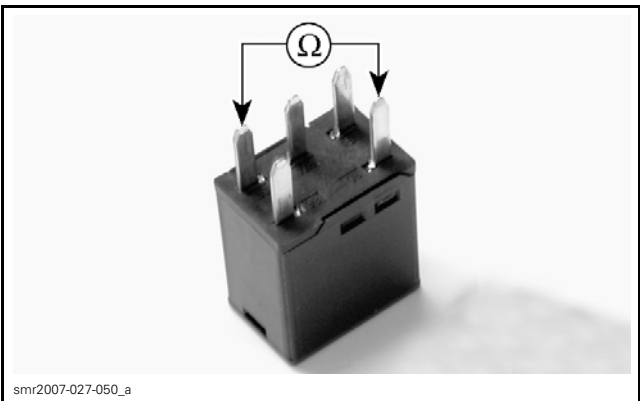
RELAY CONTINUITY TEST

- 1. Remove relay.
- 2. Set multimeter to Ω.

REQUIRED TOOL	
FLUKE 115 MULTIMETER (P/N 529 035 868)	

- 3. Probe relay as follows.

TERMINAL		RESISTANCE
30	87	Open circuit (OL)



- 4. Connect battery as shown and probe relay again as follows.