SERVICE MANUAL

2003

Light Service Support Vehicle
LSSV

Includes: General Information
Military Components

GM Defense

VOLUME 1 OF 1
LSSVSM03

Preface

Caution

Caution: To reduce the chance of personal injury and/or property damage, carefully observe the instructions that follow:

The service manuals of General Motors Corporation are intended for use by professional, qualified technicians. Attempting repairs or service without the appropriate training, tools, and equipment could cause injury to you or others. This could also damage the vehicle, or cause the vehicle to operate improperly.

Proper vehicle service and repair are important to the safety of the service technician and to the safe, reliable operation of all motor vehicles. If you need to replace a part, use the same part number or an equivalent part. Do not use a replacement part of lesser quality.

The service procedures we recommend and describe in this service manual are effective methods of performing service and repair. Some of the procedures require the use of tools that are designed for specific purposes.

Accordingly, any person who intends to use a replacement part, a service procedure, or a tool that is not recommended by General Motors, must first establish that there is no jeopardy to personal safety or to the safe operation of the vehicle.

This manual contains various "Cautions" and "Notices" that you must observe carefully to reduce the risk of personal injury during service or repair. Improper service or repair may damage the vehicle or render the vehicle unsafe. For Cautions and Notices, refer to 2003 C/K Truck Service Manual. These "Cautions" and "Notices" are not exhaustive. General Motors cannot possibly warn of all potentially hazardous consequences of your failure to follow these instructions.

This manual covers service procedures to vehicles that are equipped with a Supplemental Inflatable Restraint (SIR). Refer to the "Cautions" in Cautions and Notices and in Restraints. Refer to SIR component and wiring location views in Restraints before performing a service on or around SIR components or wiring. Failure to follow these "Cautions" could cause air bag deployment, personal injury, or otherwise unneeded SIR repairs.

In order to help avoid accidental air bag deployment and personal injury, whenever you service a vehicle that requires repair of the SIR and another vehicle system, we recommend that you first repair the SIR, then go on to the other system.

BLANK

2003 General Motors LSSV Military Trucks Service Manual Supplement

This manual provides information on the diagnosis, the service procedures, the adjustments, and the specifications for the 2003 GM LSSV Base Pickup and Crewcab.

Information on transmission unit repair (overhaul) can be found in the 2003 Transmission/Transaxle/Transfer Case Unit Repair Manual (TURM), available separately. The TURM contains information on automatic and manual transmissions and transaxles including the fluid flow and circuit description information.

The technicians who understand the material in this manual and in the appropriate Dealer Service Bulletins better serve the vehicle owners.

When this manual refers to a brand name, a part number, or a specific tool, you may use an equivalent product in place of the recommended item. All information, illustrations and specifications in this manual are based on the latest product information available at the time of publication approval. General Motors reserves the right to make changes at any time without notice.

Published by

GM DEFENSE MILITARY TRUCKS

General Motors Corporation

Detroit, Michigan 48265-1000

The information cutoff date is 10-01-2004 LITHO IN U.S.A.

PART NO. LSSVSM03

BLANK

Table of Contents

BLANK

Section 0

General Information

BLANK

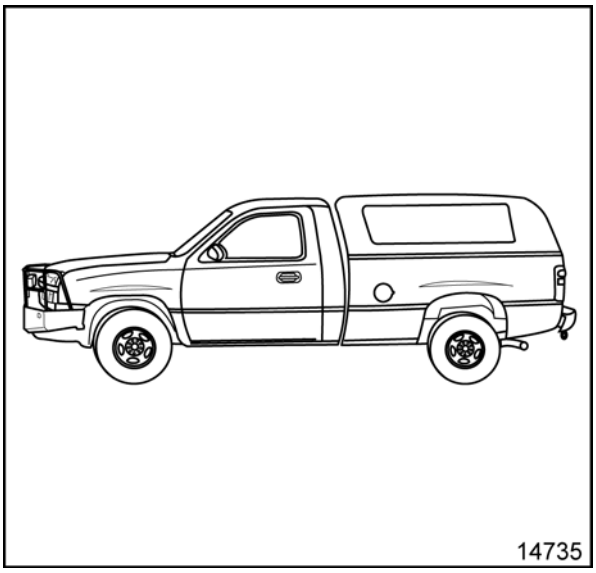
General Information

Vehicle Identification

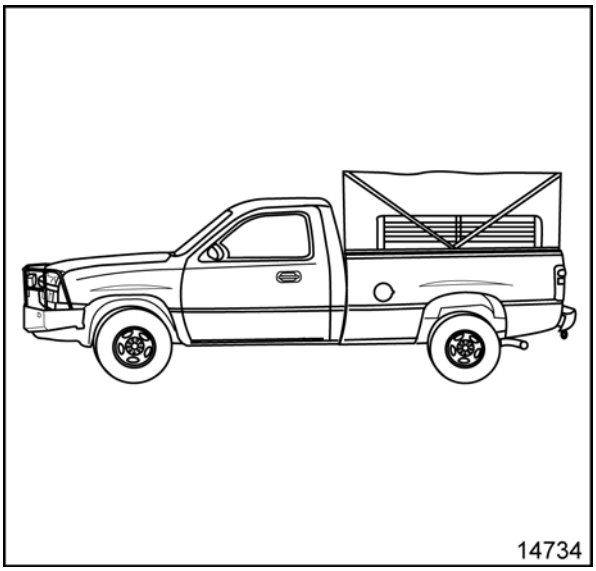
The 2003 LSSV series military pickup models are derived from standard commercial vehicles. The pickup is a 2500HD, or “1-ton” based cargo/troop carrier.

All vehicles have rugged designs intended for all types of roads or infrequent off-road travel. They can ford water obstacles for three minutes without stalling at depths of 51 cm (20 in) at 8 kph (5 mph). These limits are met without causing permanent damage or requiring immediate maintenance.

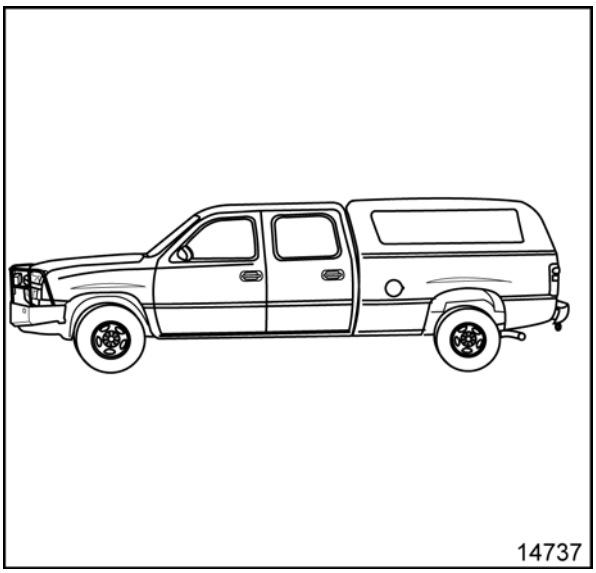
Cargo Carrier Base



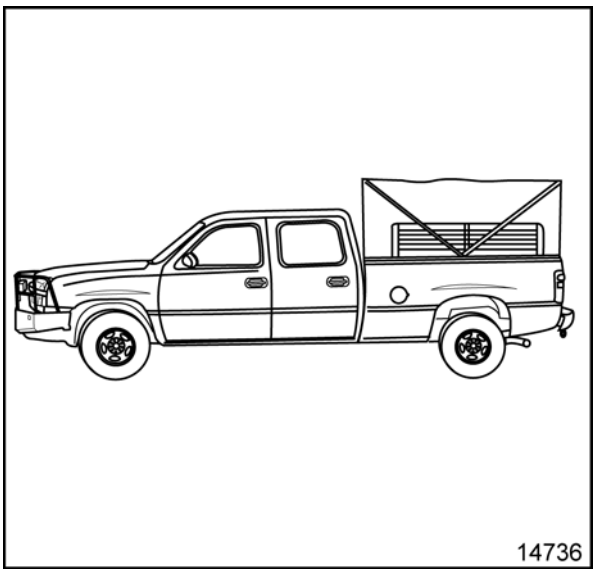
Troop Carrier Base



Cargo Carrier Crew Cab



Troop Carrier Crew Cab



The pickup vehicles are equipped with a 6.6L Turbo diesel engine with a 5-speed Allison automatic transmission and 2-speed transfer case. The vehicles have pintle hooks with a max trailer weight (on highway) of 12,000 lbs (5443 kg). Payload capacity is not to exceed the gross axle weight rating of the front or rear axle.

Each vehicle is equipped with heavy duty shocks front and rear, 4-wheel anti-lock brakes, a locking differential, on-off road tires, front and rear clevis/tie downs and blackout lighting.

A slave receptacle is mounted on the front of the vehicles, protected by a radiator brush guard.

The pickup has a cargo cover and troop seating for up to eight or a hard cap with opening windows and cargo hooks mounted on the bed floor. A specially upgraded electrical system can handle 24V communications equipment and charging of the 24V batteries.

Military Equipment Options

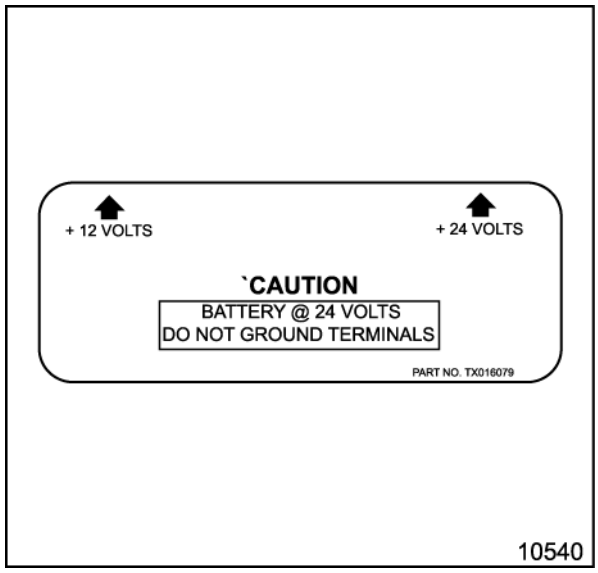
2003 LSSV Specifications/Options

Your vehicle may be equipped with any combination of options.

Description
Blackout Lighting
NATO Slave Start
Rear Clevis/Tie Downs
Pintle Hook
Trailer Light Connection
Weapons Mount
Transfer Case/Differential Vent Filters
Government Data Plate
Cargo Area Troop Seats
Cargo Tie Downs
Cargo Cover (Soft-Top)
Combination Front or Rear Mounted Winch with Remote Control (Multi-mount) 9,000 lb capacity
Cargo Locking Side/Rear Access Cap
Pioneer Tool Kit
24V Electrical System
Fuel Fired Heater
Heavy Duty Front Bumper with Brush Guard and Clevis/Tie Down
Heavy Duty Rear Bumper with Clevis/Tie Downs and Receiver Hitch
Sliding Rear Window

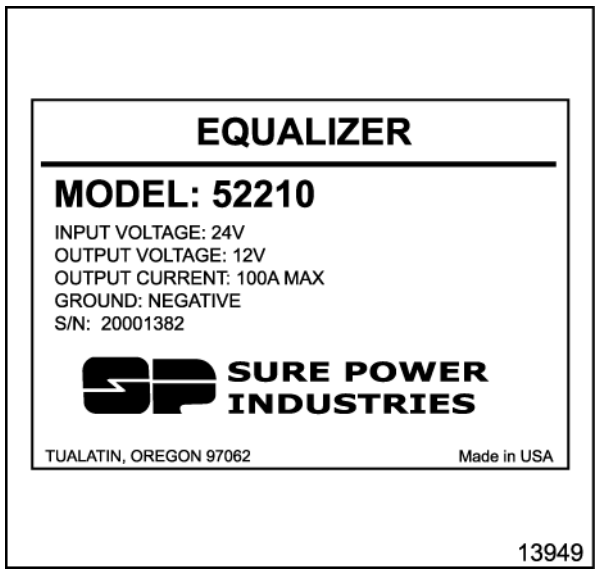
Labels

24V Battery Caution Label



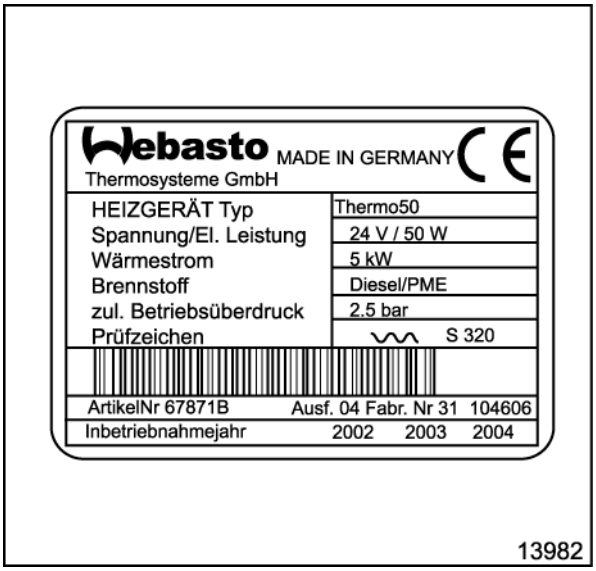
The 24V battery caution label is placed on top of the radiator support near the 24V battery. This battery is on the left side of the engine compartment.

Equalizer Label



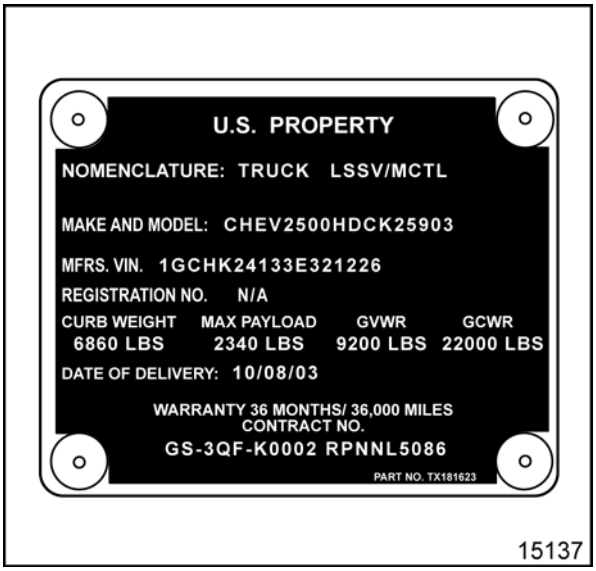
The equalizer label is located on the side of the equalizer. This label includes information on model number, serial number and voltage specifications.

Fuel Fired Coolant Heater Label



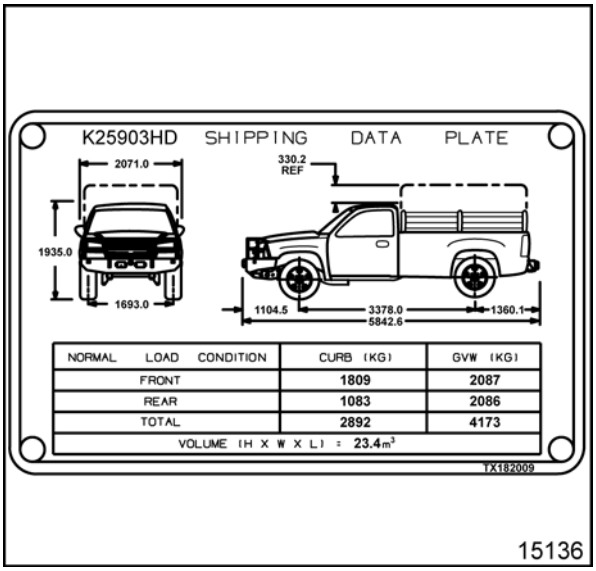
The fuel fired coolant heater label is located on the side of the unit. This label includes information on model, serial number. Refer to Component Locator in Engine Cooling for further information.

Vehicle Identification Plate



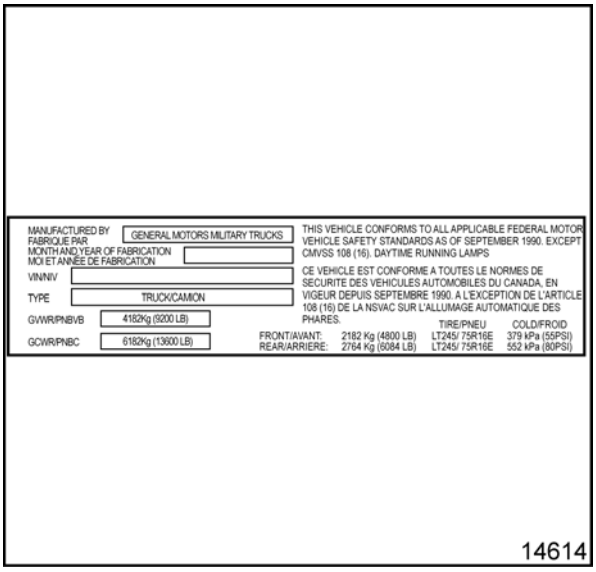
The vehicle identification plate is located on the left front inner door panel under the shipping data plate. This label includes the identification number, contract number and vehicle variant.

Shipping Data Plate



The shipping data plate is located on the left front inner door panel above the vehicle identification plate. This label includes the loading and dimensions.

Statement of Compliance Plate



The statement of compliance plate is located on the left front lower middle of the inner door panel. This label includes the manufacture, date of fabrication, VIN, type of vehicle, vehicle weight and tire pressure.

Winch Warning Label

The winch warning label is fixed to the winch cable hook.

Maintenance and Lubrication

Maintenance

Owner Checks and Services

If the engine, controls, instruments or gages do not operate as described in this supplement manual, refer to one of the following manuals:

- 2003 C/K Truck Owner's Manual
- 2003 C/K Truck Service Manual
- 2003 Diesel Engine Owner's Manual Supplement
- 2003 LSSV Operator's Manual Supplement

If the concern still has not been corrected, shut down the engine and notify your military maintenance unit.

Periodic Maintenance Inspection

- Inspect the condition of the headlamps, taillamps, turn signals, side lamps, and blackout lamps before beginning to operate the vehicle each time.
- Inspect the axle vent tube filter for contaminants every six months and more often when difficult off-road conditions are encountered. Replace as needed.
  Refer to the Front or Rear Axle Vent Tube Filter Replacement procedure in Driveline/Axle.
- Inspect the transfer case vent tube filter for contaminants every six months and more often when difficult off-road conditions are encountered. Replace as needed.
  Refer to Transfer Case Vent Tube Filter Replacement Procedure in Driveline/Axle.
- Winch Maintenance. Refer to Warn Industries Operator's Manual found in glove compartment.

BLANK

Section 3

Suspension

BLANK

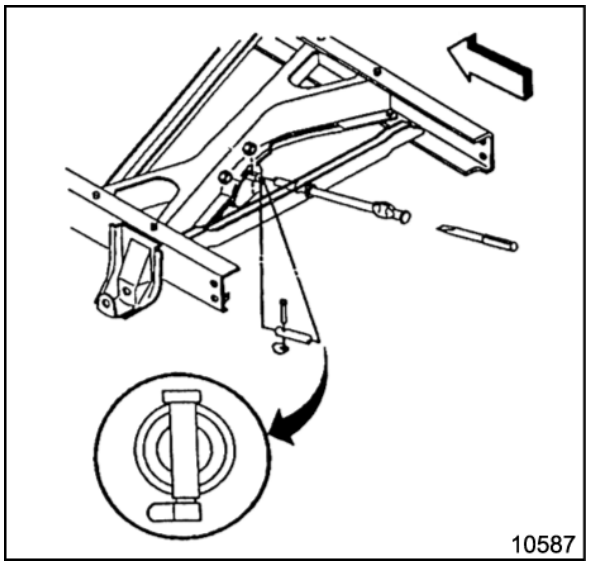
Tires and Wheels

Repair Instructions

Tire Hoist Shaft Extension Replacement

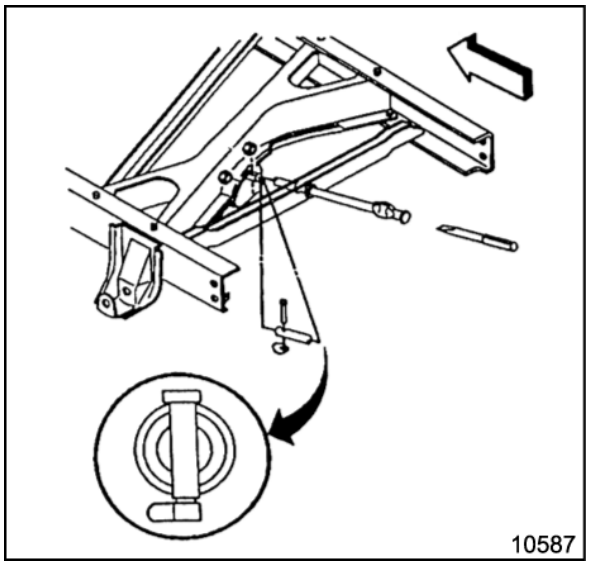
Removal Procedure

1. Remove the spare tire. Refer to Tire Hoist and Shaft Replacement in Tires and Wheels in the 2003 C/K Truck Service Manual.
2. Pull the retainer clip and remove the pin.
3. Remove the tire hoist shaft extension.



Installation Procedure

1. Install the tire hoist shaft extension and align.
2. Install the retainer clip and pin.
3. Install the spare tire. Refer to Tire Hoist and Shaft Replacement in Tires and Wheels in the 2003 C/K Truck Service Manual.



Description and Operation

Tires and Wheels

Spare Wheel Hoist Shaft

The spare tire is located under the rear end of the vehicle.

The hoist shaft allows a link between the tire hoist and the military rear bumper. The factory spare tire hoist tools are used to remove the spare. A hole in the rear of the bumper is provided to allow access. If the tire hoist is damaged it must be replaced.

Refer to Tire Hoist and Shaft Replacement in Tires and Wheels in the 2003 C/K Truck Service Manual.

Section 4

Driveline/Axle

BLANK

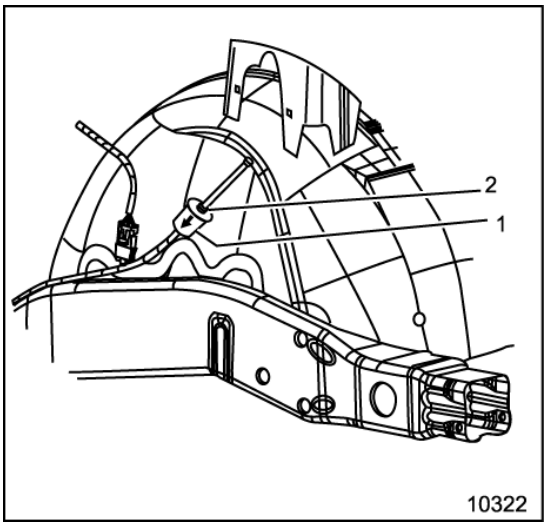
Front Drive Axle

Repair Instructions

Front Axle Vent Tube Filter Replacement

Removal Procedure

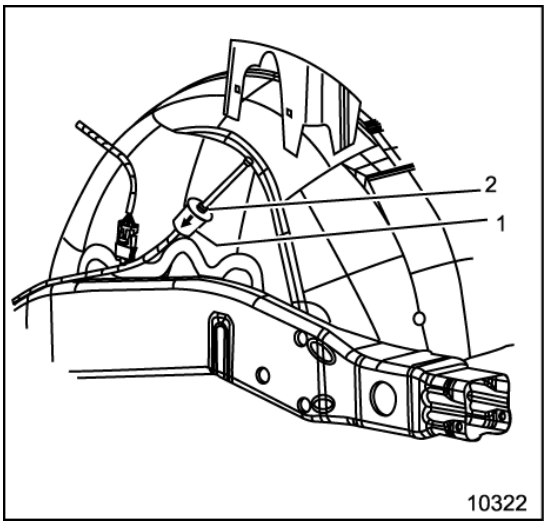
1. Remove the clamps (2) holding the filter (1) to the hoses.
2. Remove the filter from the hoses and discard.



Installation Procedure

Notice: The filter arrow must point toward the axle vent pipe. If replacing the hose, the length of the new hose must match the length of the old hose.

1. Install the filter (1) to the hoses.
2. Install the hose clamps (2) and tighten.



Description and Operation

Front Axle Vent Tube Filter Description

The front axle is specially equipped with a vent tube filter to protect the axle from contaminants found in the off-road environment. The vent filter is attached to a hose with a vented cap at the end, and is mounted in the engine compartment next to the left inner wheel housing.

The filter must be inspected occasionally to see if it needs to be replaced. Refer to Periodic Maintenance Inspections in Maintenance and Lubrication in 2003 LSSV Owners Manual.

Rear Drive Axle

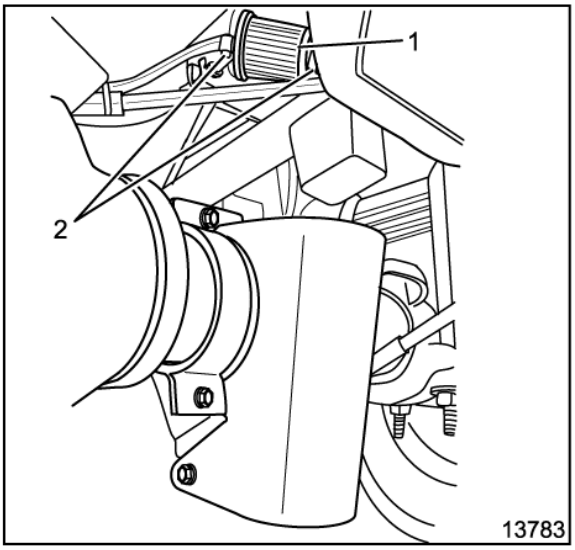
Repair Instructions

Rear Axle Vent Tube Filter Replacement

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

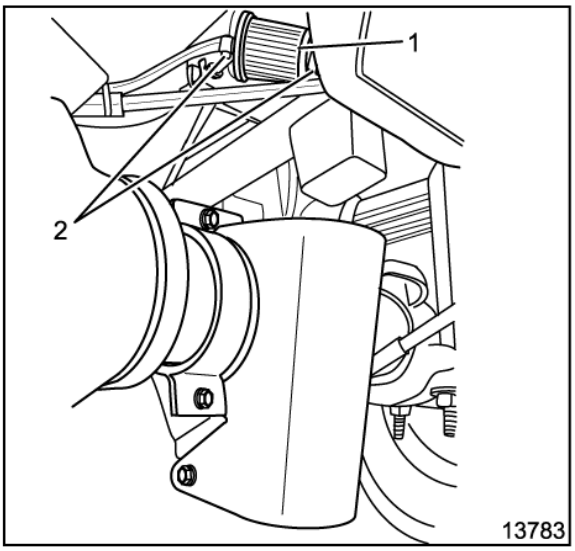
1. Raise and support the vehicle.
2. Install safety stands.
3. Remove the clamps (2) holding the filter (1) to the hoses.
4. Remove the filter and discard.



Installation Procedure

Notice: The filter arrow must point toward the axle vent pipe. If replacing the hose, the length of the new hose must match the length of the old hose.

1. Install the filter (1) to the hoses.
2. Install hose clamps (2) and tighten.
3. Remove safety stands.
4. Lower the vehicle.



Description and Operation

Rear Axle Vent Tube Filter Description

The rear axle is specially equipped with a vent tube filter to protect the axle from contaminants found in the off-road environment. It is attached to a hose with a vented cap at the end. The rear axle vent filter is mounted near the top of the axle housing and the hose is attached to the brake bracket on the driver's side frame rail.

The filter must be inspected occasionally to see if it needs to be replaced. Refer to Periodic Maintenance Inspections in Maintenance and Lubrication in 2003 LSSV Owners Manual.

Transfer Case

Repair Instructions

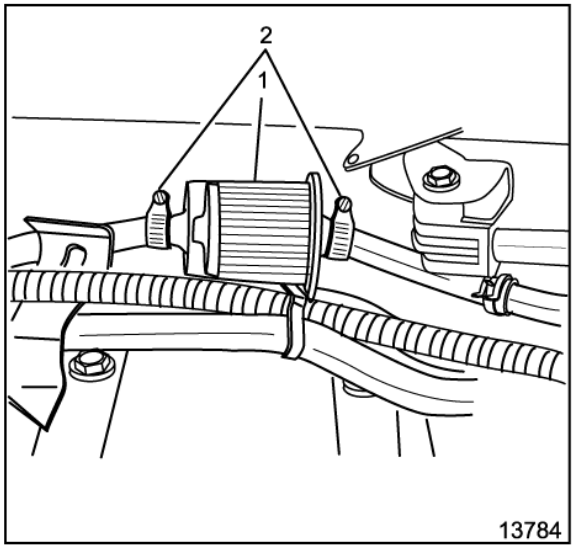
Transfer Case Vent Tube Filter Replacement

Removal Procedure

Note: The filter is located on the left side of the vehicle.

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

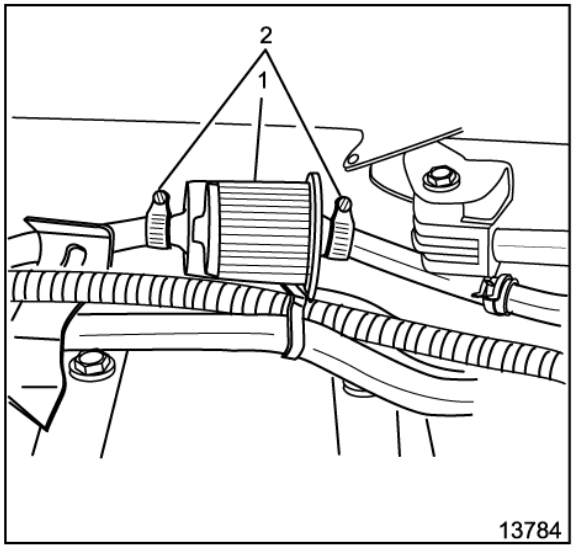
1. Raise and support the vehicle.
2. Install safety stands.
3. Remove the clamps (2) holding the filter (1) to the hoses.
4. Remove the filter and discard.



Installation Procedure

Notice: The filter arrow must point toward the transfer case. If replacing the hose, the length of the new hose must match the length of the old hose.

1. Install the filter (1) to the hoses.
2. Install hose clamps (2) and tighten.
3. Remove safety stands.
4. Lower the vehicle.



Description and Operation

Transfer Case Vent Tube Filter Description

The transfer case is specially equipped with a vent tube filter to protect the transfer case from contaminants found in the off-road environment. The vent filter is attached to a hose with a vented cap at the end, and is mounted under the vehicle next to the left side of the transfer case.

The filter must be inspected occasionally to see if it needs to be replaced. Refer to Periodic Maintenance Inspections in Maintenance and Lubrication in 2003 LSSV Owners Manual.

Section 6

Engine

BLANK

Engine Cooling

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Air Cleaner Bracket Bolts	9 N•m	80 lb in
Fuel Fired Heater Mounting Bolts	10 N•m	88 lb in
Fuel Line Clamps	1.4 N•m	12 lb in
Fuel Pump Bracket Bolts	10 N•m	88 lb in
Stand Pipe Nut	9.5 N•m	84 lb in

Fuel Fired Heater Specifications

Where no threshold values are specified technical data in the table are understood to include standard tolerances for heater units of ±10% at an ambient temperature of 20 °C.

All electrical components are selected for an operating voltage of 22-30 volts.

Fuel Fired Heater Specifications

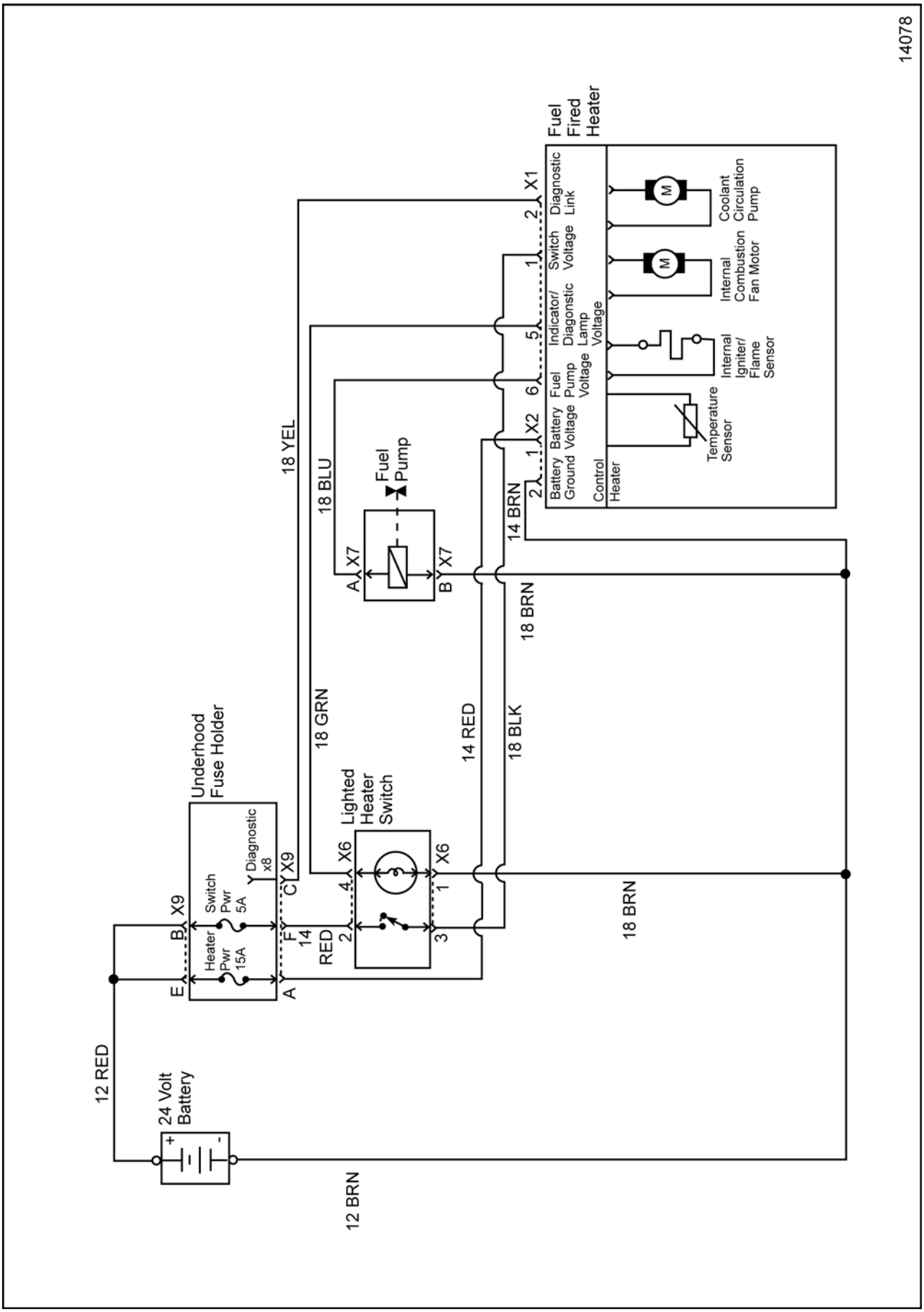
Heater	Operation	Thermo Top 50
Mark of conformity		~S289
Type		Water heater with evaporator burner
Heating Flow	Full load Part load	5.0 kW 2.5 kW
Fuel		Diesel # 1, Diesel # 2, Artic Blends, Kerosene (JP5 and JP8)
Fuel consumption	Full load Part load	0.50 kg/h 0.25 kg/h
Nominal voltage		24 V
Operating voltage range		22-30 Volts
Nominal power consumption without circulation pump (without vehicle air fan)	Full load Part load	32 W 18 W
Permissible ambient temperature: Heater - operation - storage Fuel pump - operation		 -40 °C…+60 °C -40 °C…+120 °C -40 °C…+20 °C
Permissible operating overpressure (heat carrier)		0.4…2.5 bar
Heat exchanger capacity		0.15 L
Minimum coolant circuit capacity		4.00 L

Fuel Fired Heater Specifications (cont'd)

Heater	**Operation**	**Thermo Top 50**
Minimum volume flow for the heater		250 l/h
CO_2 in exhaust (permissible functional range)		7…13 vol. %
Dimensions of heater		length 214 mm (8.4 in) width 106 mm (4.0 in) height 168 mm (6.6 in)
Weight		2.9 kg (7.8 lb)
Coolant Circulation Pump	**Operation**	**Thermo Top 50**
Volume flow against 0.14 bar		450 l/h
Nominal voltage		24 V
Operating voltage range		22-30 V
Nominal power consumption		18 W
Dimensions of circulation pump		length 95 mm (3.7 in) width 61 mm (2.4 in) height 61 mm (2.4 in)
Weight		0.3 kg (0.8 lb)
Fuel Pump	**Operation**	**Thermo Top 50**
Flow Rate		10.3 ml/m (± 10%)
Pressure per Pulse Cycle		3.4 kPa (0.5 psi)
Fuel Line	**Operation**	**Thermo Top 50**
Color		Natural
Diameter		5 ± 0.100 2 ± 0.1 ID
SAE Standard		J1639 – J2260 for Monwall Tubing

Schematic and Routing Diagrams

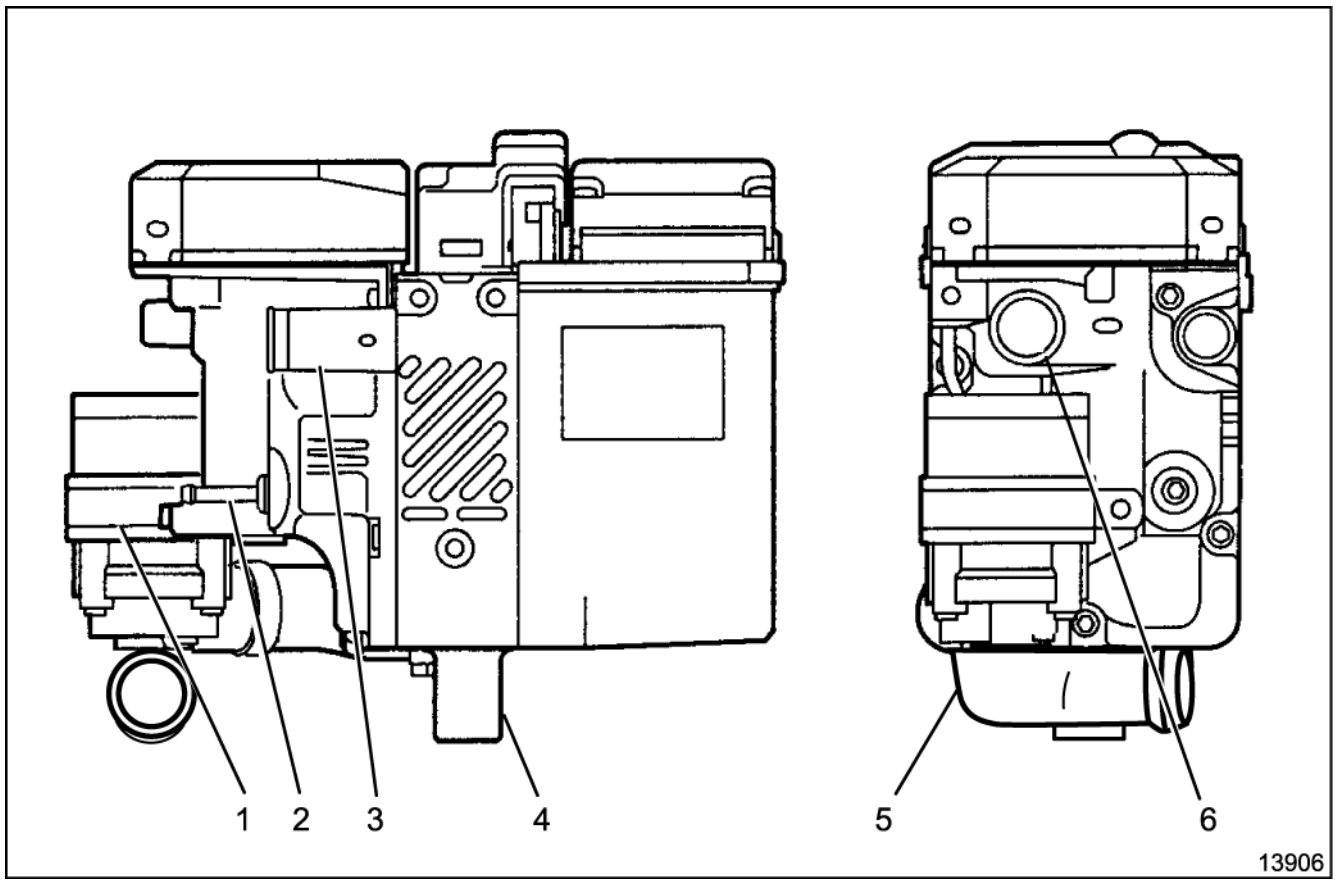
Fuel Fired Heater Schematic



Component Locator

Engine Cooling Component Views

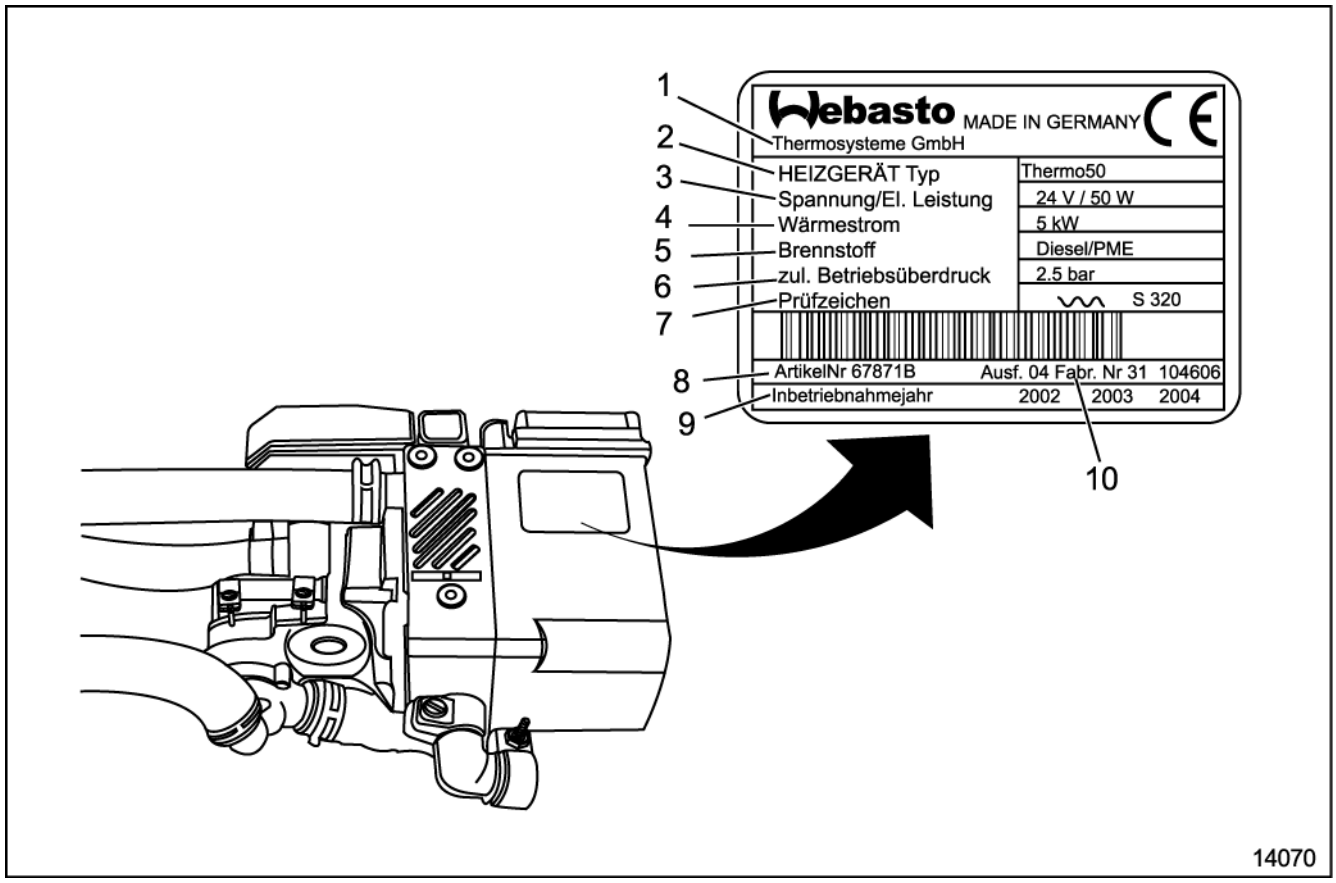
Fuel Fired Heater



Legend

(1) Coolant Circulating Pump
(2) Fuel Inlet
(3) Coolant Outlet
(4) Exhaust Gas Outlet
(5) Coolant Inlet
(6) Combustion Air Inlet

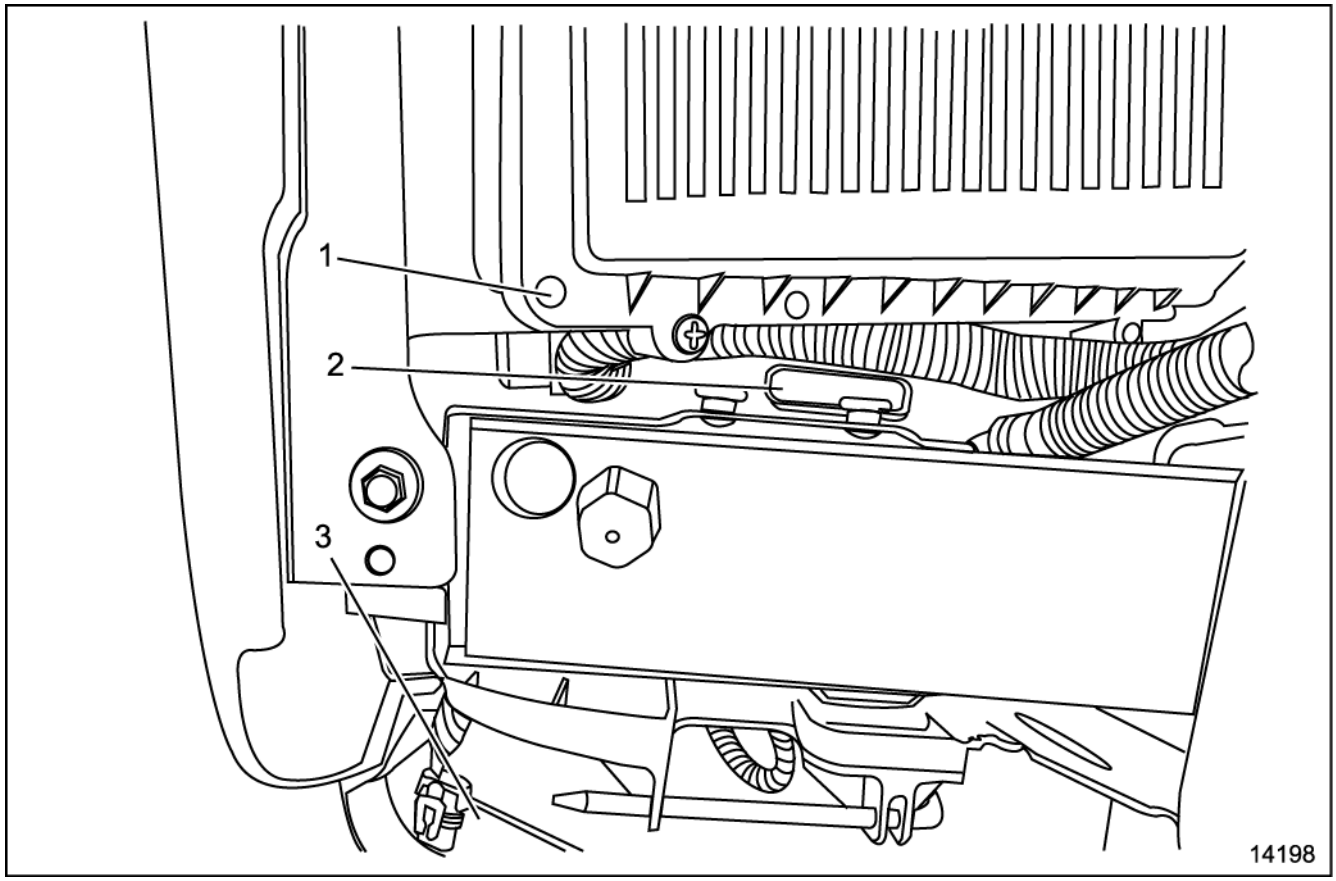
Fuel Fired Heater Label



Legend

(1) Thermo Systems
(2) Type of Heater
(3) Voltage/Electrical Power
(4) Heat Output
(5) Fuel
(6) Max Coolant Pressure
(7) Conformity
(8) Part Number
(9) Date of Installation
(10) Serial Number

Fuel Fired Heater Fuse Block



Legend

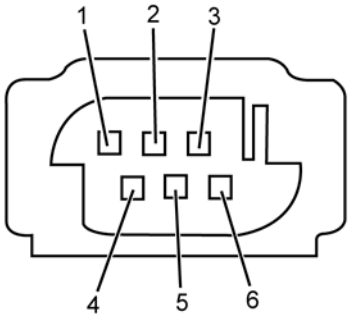
(1) Air Cleaner

(2) Fuel Fired Heater Fuse Block

(3) Front Headlamp (Right)

Engine Cooling Connector End Views

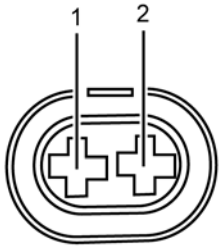
X1 Connector



13983

Connector Part Information	• 6-Way F Connector		
Pin	**Wire Color**	**Circuit No.**	**Function**
1	BLK	___	Switch Signal
2	YEL	___	Diagnostic Signal
3-4	___	___	Not Used
5	GRN	___	Indicator/Diagnostic Lamp
6	BLU	___	Fuel Pump Positive

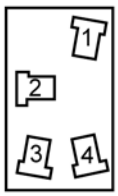
X2 Connector



13984

Connector Part Information	• 2-Way F Connector		
Pin	**Wire Color**	**Circuit No.**	**Function**
1	RED	___	Battery Fused Power
2	BRN	___	Ground

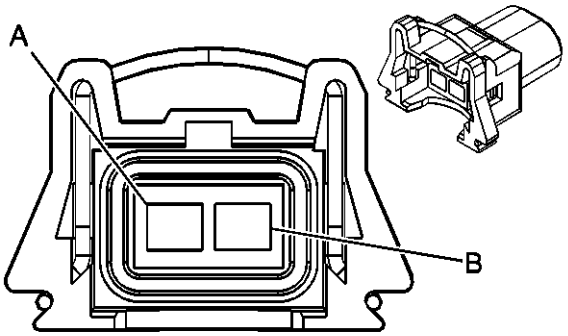
X6 Connector



13985

Connector Part Information	• 4-Way F Connector		
Pin	**Wire Color**	**Circuit No.**	**Function**
1	BRN	___	Ground
2	RED	___	Fused Power
3	BLK	___	Power to Heater
4	GRN	___	Indicator/Diagnostic Lamp

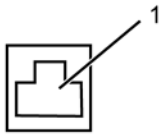
X7 Connector



7982

Connector Part Information	• 12110179 • 2-Way F Metri-Pack 280 Series 1 P2S (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BRN	___	Ground
B	BLU	___	Power to Fuel Pump

X8 Connector



13986

Connector Part Information	• 1-Way F Connector		
Pin	**Wire Color**	**Circuit No.**	**Function**
1	YEL	___	Diagnostic Link

X9 Connector

13987

Connector Part Information	• 6-Way F Connector		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	RED	___	Power To Heater
B	RED	___	Power From Battery
C-D	___	___	Not Used
E	RED	___	Power From Battery
F	RED	___	Power To Switch

Diagnostic Information and Procedures

Diagnostic Starting Point – Fuel Fired Heater

Begin the system diagnosis by reviewing the system Description and Operation. Reviewing the Description and Operation information will help you determine the correct symptom diagnostic procedure when a malfunction exists. Reviewing the Description and Operation information will also help you determine if the condition described is normal operation.

Diagnostic System Check – Fuel Fired Heater

Troubleshooting is normally limited to the isolation of defective components and provides information on defective wiring and connections.

The following possible causes for trouble have not been taken into consideration and must always be excluded as a possible cause for malfunctions:

- Power supply to heater is less than 22 volts at main power connections (charge batteries and perform load test).
- Blown fuses.
- Corrosion on battery terminals for heater, electrical wiring, connections and fuses.
- Loose contacts or connectors, wrong crimping on connectors.
- Ensure heater and components have been correctly installed following all pertaining installation instructions.

Troubleshooting Steps

After 3 consecutive unsuccessful startup attempts, the heater will lock itself out from any further start attempts.

The heater may also enter the lockout mode after experiencing an overheat condition. Before troubleshooting the heater, ensure heater is not in the "Lockout" mode by performing the following reset procedure:

1. Ensure switch is in the OFF position. Turn switch to the ON position. Remove fuse F1 (15 Amp). Refer to wiring diagram. Reinsert after 5 seconds.
2. Cycle the switch OFF and then back ON once more. Remove fuse F1 once again and reinsert after 5 seconds. Heater should attempt to start in 10 seconds after inserting fuse. Coolant must be below the lower threshold before heater will attempt to start.

General Fault Symptoms

The following list includes possible fault symptoms of heaters in installed condition.

Caution: Troubleshooting requires profound knowledge about components and their theory of operation and may only be performed by trained personnel.

Caution: Troubleshooting is normally limited to the isolation of defective components and provides information on defective wiring and connections.

The following possible causes for trouble have not been taken into consideration and must always be included as a possible cause for malfunctions:

- Corrosion on connectors
- Loose contacts on connectors
- Wrong crimping on connectors
- Corrosion on wiring and fuses
- Corrosion on battery terminals

Smell of Fuel

Problem	Action
Fuel leak at vehicle integration.	Check fuel lines for leaks, kinks or obstructions.
Internal leak of the heater.	Remove heater for repair. Refer to Fuel Fired Heater Replacement.

Heater Does Not Achieve Full Load Operations

Problem	Action
Internal problem with the heater.	Remove the heater for repair. Refer to Fuel Fired Heater Replacement.

Continuous White Smoke During Combustion Operation

Problem	Action
Internal problem with the heater.	Remove the heater for repair. Refer to Fuel Fired Heater Replacement.

Heater Cannot Be Switched Off

Problem	Action
Internal failure of the switch.	Replace the switch. Refer to Fuel Fired Heater Switch Replacement.
Circuit short to power between switch and heater.	Repair damaged circuit.

Loss of Fuel (Dripping)

Problem	Action
Fuel leaking at vehicle integration.	Check fuel lines for leaks, kinks or obstructions.
Internal problem with the heater.	Remove the heater for repair. Refer to Fuel Fired Heater Replacement.

Loss of Coolant

Problem	Action
Definition: Heater develops smoke during combustion, smell of exhaust fumes extremely sweet.	
Leaking engine coolant.	Inspect the coolant hoses for leakage, kinks, loose hose clamps.
Internal problem with the heater.	Remove the heater. Refer to Fuel Fired Heater Replacement.

Diagnostic Trouble Code (DTC) List

Reading Diagnostic Trouble Codes

When the heater is activated by a switch, the types of malfunctions are indicated by coded flashing signals via the operation indicator light during the after-run period of the heater. Actual fault flash codes are preceded by 5 quick-pulse flashes. Count the slow flashes only. The sequence is repeated until the heater completes the after-run cycle and shuts down. The coded flashing signals correspond to the numbers in the table below.

DTC List

DTC	Description	Possible Cause
F01	No Start-Up	Fuel Supply Restricted air flow through intake or exhaust
F02	Flame Extinguished	Fuel Supply Restricted air flow through intake or exhaust
F03	Under/Over Voltage	Vehicle charging system
F04	Premature flame detection	Replace Heater
F05	Circulating pump interruption or short circuit	Open or shorted wiring Defective pump
F06	Temperature sensor Interruption or short circuit	Replace Heater
F07	Fuel Metering pump interruption or short circuit	Open or shorted wiring
F08	Combustion air fan motor interruption, short circuit or incorrect fan speed	Replace Heater
F09	Pencil type glow plug/flame detector interruption or short circuit	Replace Heater
F10	Overheating condition	Coolant flow restriction Circulation pump

Heater Will Not Start Up

Step	Action	Yes	No
1	Did you review the Fuel Fired Heater Description and Operation?	Go to Step 2	Go to Description and Operation
2	Turn ON the fuel fired heater switch. Is the combustion fan running?	Go to Step 3	Go to Combustion Fan Inoperative
3	Inspect the combustion air intake tube for damage or obstructions. Is the tube damaged or obstructed?	Go to Step 5	Go to Step 4
4	Inspect the combustion exhaust tube for damage or obstructions. Is the tube damaged or obstructed?	Go to step 6	Go to Step 7

Heater Will Not Start Up (cont'd)

Step	Action	Yes	No
5	Repair or replace the air intake tube or remove the obstruction accordingly. Did you complete the repair?	Go to step 12	—
6	Repair or replace the exhaust tube or remove the obstruction accordingly. Did you complete the repair?	Go to Step 12	—
7	Does the fuel pump operate (clicking) during start-up cycle approx. 30 sec. after switching ON?	Go to Step 8	Go to Fuel Pump Inoperative
8	1. Turn OFF the heater switch. 2. Disconnect fuel line from heater. 3. Turn ON the heater switch. Is the flow lower than 10.3 ml (± 10%) per minute?	Go to Fuel Pump Volume Low	Go to Step 9
9	Does the coolant pump operate when the heater is running (can you feel or hear the pump running)?	Go to Step 10	Go to Coolant Pump Inoperative
10	Does the heater start and operate normally?	Go to Testing for Intermittent and Poor Connection in Wiring Systems of 2003 C/K Truck Service Manual	Go to Step 11
11	Check coolant hoses for obstructions, kinked hoses, low coolant level and proper hose routing. Did you find and correct the condition?	Go to Step 12	Go to Diagnostic Starting Point Engine Cooling in Engine Cooling of 2003 C/K Truck Service Manual
12	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Combustion Fan Inoperative

Step	Action	Value(s)	Yes	No
1	Did you review the Fuel Fired Heater Description and Operation?	—	Go to Step 2	Go to Description and Operation
2	1. Using a DMM measure the voltage at connector X1, pin 1. 2. Turn the fuel fired heater switch to the ON position. Is the voltage near the specified valve?	24V	Go to Step 4	Go to Step 3
3	Using a DMM measure the voltage at the switch connector X6, pin 3. Is the voltage near the specified valve?	24V	Go to Step 7	Go to Step 5

Combustion Fan Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
4	Using a DMM measure the voltage at the heater connector X2, pin 1. Is the voltage near the specified valve?	24V	Go to step 9	Go to Step 12
5	Using a DMM measure the voltage at the switch connector X6, pin 2. Is the voltage near the specified valve?	24V	Go to step 6	Go to Step 8
6	Replace the fuel fired heater switch. Refer to Fuel Fired Heater Switch Replacement. Did you complete the replacement?	—	Go to Step 13	—
7	Test the circuit for poor connections, high resistance or an open. Did you find and correct the condition?	—	Go to Step 13	—
8	Test the fuse F2/circuit for an open, high resistance or poor connections. Did you find and correct the condition?	—	Go to Step 13	—
9	Check the ground circuit at heater connector X2, pin 2. Is the ground circuit complete?	—	Go to Step 11	Go to Step 10
10	Repair the open, high resistance or poor connection. Did you and correct the condition?		Go to Step 13	—
11	Replace the fuel fired heater. Refer to Fuel Fired Heater Replacement. Did you complete the replacement?	—	Go to Step 13	—
12	Test the fuse F1/circuit for an open, high resistance or poor connections. Did you find and correct the condition?	—	Go to Step 13	—
13	Operate the system in order to verify the repair. Did you correct the condition?	—	System OK	Go to Step 2

Fuel Pump Inoperative

Step	Action	Yes	No
1	Did you review the Fuel Fired Heater Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Connect a test lamp to the fuel pump connector. 2. Turn the fuel fired heater switch to the ON position. Does the test lamp blink slowly after 30 seconds?	Go to Step 4	Go to Step 3
3	Test the fuel pump harness for damage, loose connections or an open. Did you find and correct the condition?	Go to Step 8	Go to Step 5

Fuel Pump Inoperative (cont'd)

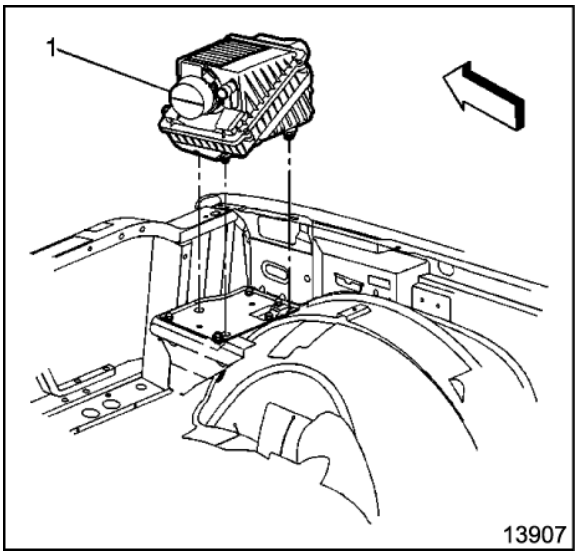
Step	Action	Yes	No
4	1. Reconnect the fuel pump. 2. Turn ON the fuel fired heater switch. 3. Lightly TAP on the fuel pump body. Does the fuel pump begin to click?	Go to Step 6	Go to Step 7
5	Replace the fuel fired heater. Refer to Fuel Fired Heater Replacement. Did you complete the replacement?	Go to Step 8	—
6	System should resume normal operations. **NOTE:** Pump may have been stuck due to dirt or a long period of no operation. Does the system operate normally?	Go to Step 8	Go to Step 2
7	Replace the fuel pump. Refer to Fuel Pump Replacement. Did you complete the replacement?	Go to Step 8	—
8	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Coolant Pump Inoperative

Step	Action	Yes	No
1	Did you review the Fuel Fired Heater Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Remove the center plastic cover from the heater. 2. Disconnect the coolant pump connector X5. 3. Using a fused jumper apply 24V to connector X5 pin 1. 4. Ground connector X5, pin 2. Does the pump operate?	Go to Step 3	Go to Step 4
3	Replace the fuel fired heater. Refer to Fuel Fired Heater Replacement. Did you complete the replacement?	Go to Step 6	—
4	1. Remove the coolant pump. 2. Remove the pump cover. 3. Clean the pump accordingly. 4. Install the pump. Does the pump operate?	Go to Step 6	Go to Step 5
5	Replace the coolant pump. Refer to Fuel Fired Coolant Pump Replacement. Did you complete the replacement?	Go to Step 6	—
6	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Fuel Pump Volume Low

Step	Action	Yes	No
1	Did you review the Fuel Fired Heater Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Disconnect the fuel line from the heater. 2. Turn ON the heater switch. Is the flow lower than 10.3 ml (± 10%) per minute?	Go to Step 3	Go to Testing for Intermittent and Poor Connection in Wiring Systems of 2003 C/K Truck Service Manual
3	Are air bubbles visible in the fuel line?	Go to Step 4	Go to Step 6
4	Inspect the fuel circuit for loose clamps. Did you find and correct the condition?	Go to Step 10	Go to Step 5
5	Fill the fuel tank with sufficient fuel to reach the fuel stand pipe inlet. Is the action complete?	Go to Step 10	—
6	1. Turn OFF the heater switch. 2. Disconnect the fuel line at the pump. 3. Turn ON the heater switch.	Go to Step 9	Go to Step 7
7	1. Using a DMM verify correct operating voltage at connector X7 pin B. 2. Verify correct operation of the fuel pump ground circuit. Was a problem found?	Go to Step 10	Go to Step 8
8	Replace the fuel pump. Refer to Fuel Pump Replacement. Did you complete the replacement?	Go to Step 10	—
9	Repair/replace the damaged fuel line. Did you complete the repair?	Go to Step 10	—
10	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

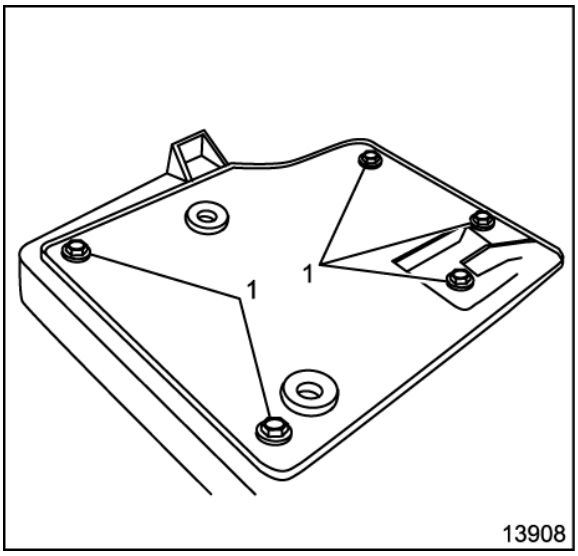


Repair Instructions

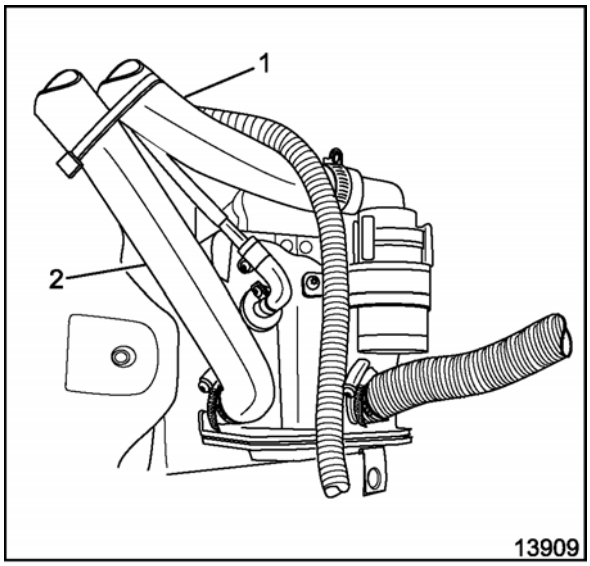
Fuel Fired Coolant Inlet Hose Replacement

Removal Procedure

1. Remove the air cleaner assembly (1). Refer to Air Cleaner Assembly Replacement in Engine Controls - 6.6L in the 2003 C/K Truck Service Manual.



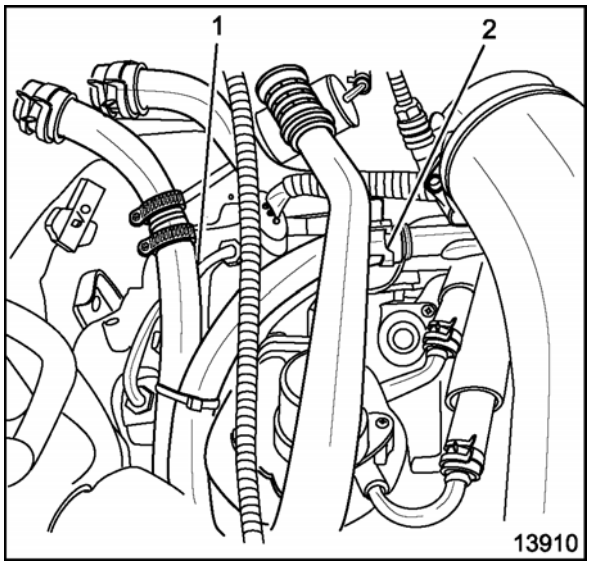
2. Remove the air cleaner assembly bracket bolts (1) and remove the bracket.
3. Drain the cooling system. Refer to Draining and Filling Cooling System in Engine Cooling in the 2003 C/K Truck Service Manual.



4. Loosen the inlet hose clamp and remove hose (1) from the heater.

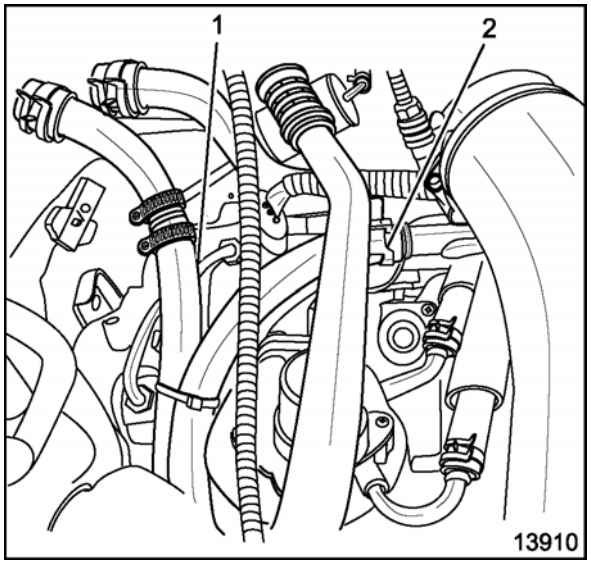
5. Loosen the hose clamp and remove the hose (2).
6. Remove the wiring harness straps and remove the hose from vehicle.

Important: Note routing location for reassembly.

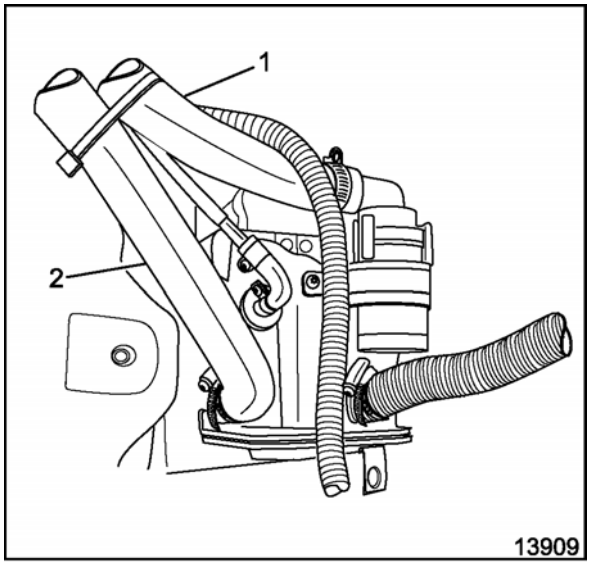


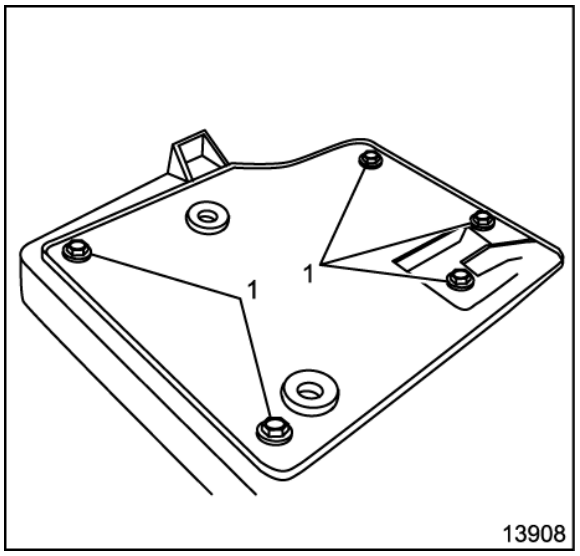
Installation Procedure

1. Install the inlet hose in the same routing location as removed. Secure with wiring harness straps.
2. Install the hose (2) and clamp to the coolant pipe.



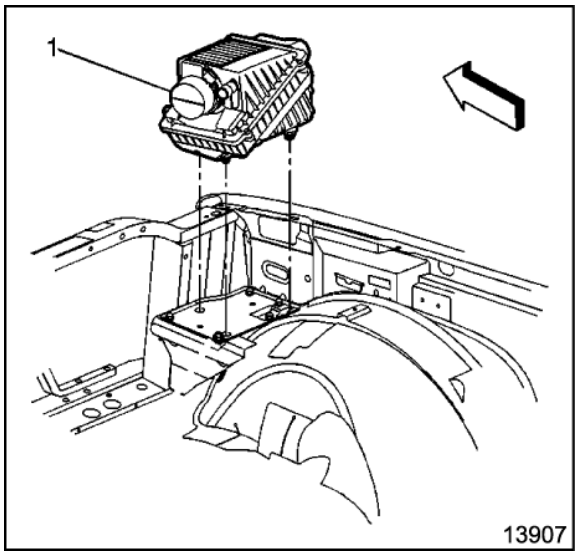
3. Install the hose (1) and clamp to the heater and secure.



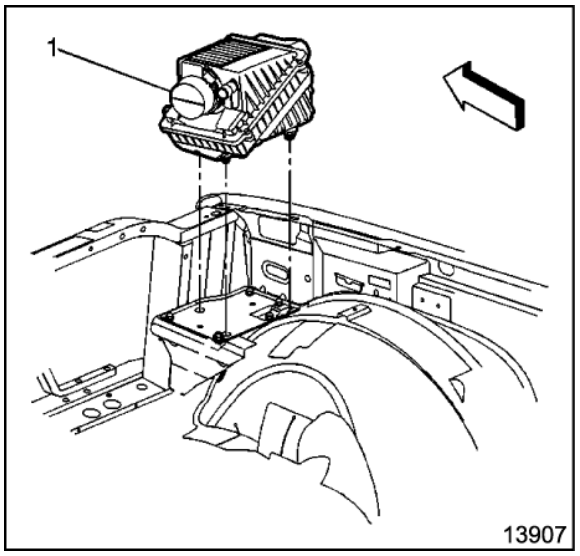


Notice: Refer to Fastener Notice in Cautions and Notices.

4. Install the air cleaner assembly bracket and secure with the bolts (1).
   Tighten
   Tighten bracket bolts to 9 N•m (80 lb in).



5. Install the air cleaner assembly (1). Refer to Air Cleaner Assembly Replacement in Engine Controls - 6.6L in the 2003 C/K Truck Service Manual.
6. Fill the cooling system. Refer to Draining and Filling Cooling System in Engine Cooling in the 2003 C/K Truck Service Manual.
7. Run the engine and heater to inspect for leaks.

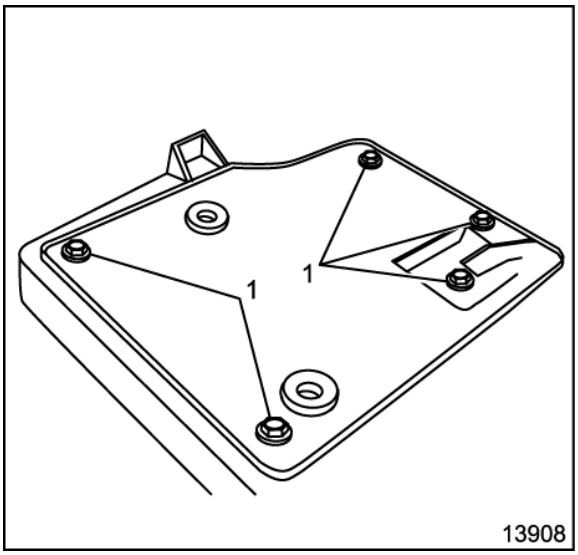


Fuel Fired Coolant Outlet Hose Replacement

Removal Procedure

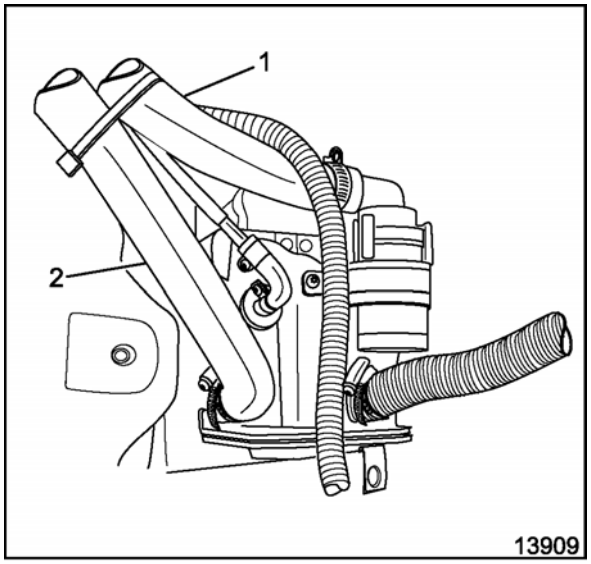
1. Remove the air cleaner assembly (1). Refer to Air Cleaner Assembly Replacement in Engine Controls - 6.6L in the 2003 C/K Truck Service Manual.

2. Remove the air cleaner assembly bracket bolts (1) and the bracket.
3. Drain the cooling system. Refer to Draining and Filling Cooling System in Engine Cooling in the 2003 C/K Truck Service Manual.



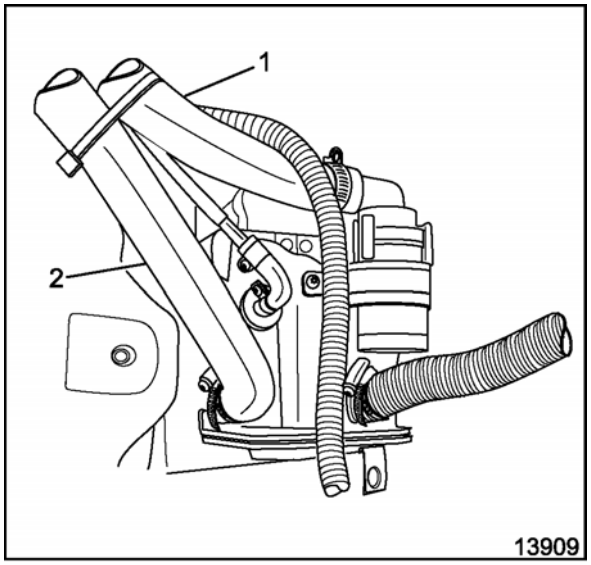
4. Loosen the outlet hose clamp and remove the hose (2) from the heater.
5. Loosen the outlet hose clamp from the splice connector and remove the hose.
6. Remove wiring harness straps and remove the hose from vehicle.

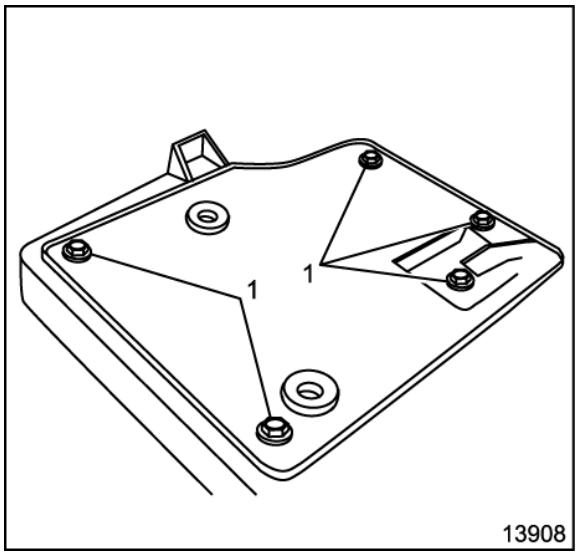
Important: Note routing location for reassembly.



Installation Procedure

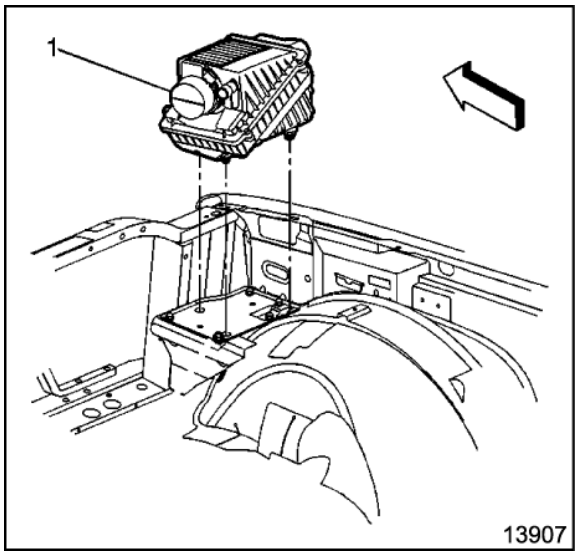
1. Install the outlet hose in the same routing location as removed. Secure with wiring harness straps.
2. Connect the outlet heater hose to the splice connection, firmly and secure with a clamp.
3. Install the hose (2) and clamp to the heater secure with clamp.



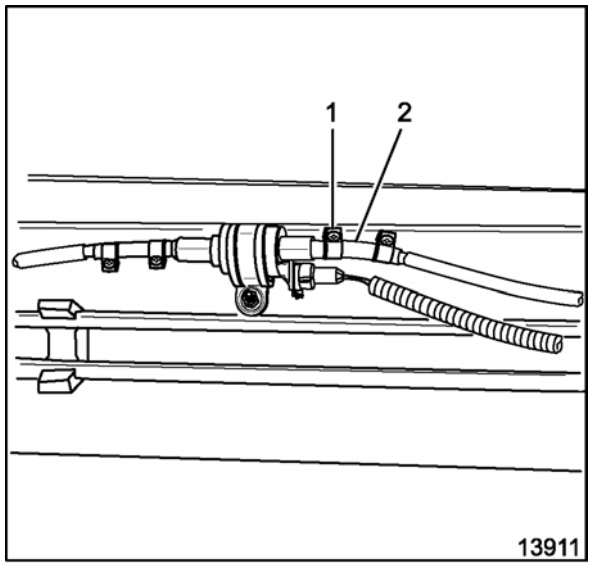


Notice: Refer to Fastener Notice in Cautions and Notices.

4. Install the air cleaner assembly bracket and secure the bolts (1).
   Tighten
   Tighten bracket bolts to 9 N•m (80 lb in).



5. Install the air cleaner assembly (1). Refer to Air Cleaner Assembly Replacement in Engine Controls – 6.6L in the 2003 C/K Truck Service Manual.
6. Fill the cooling system. Refer to Draining and Filling Cooling System in Engine Cooling in the 2003 C/K Truck Service Manual.
7. Run the engine and heater to inspect for leaks.

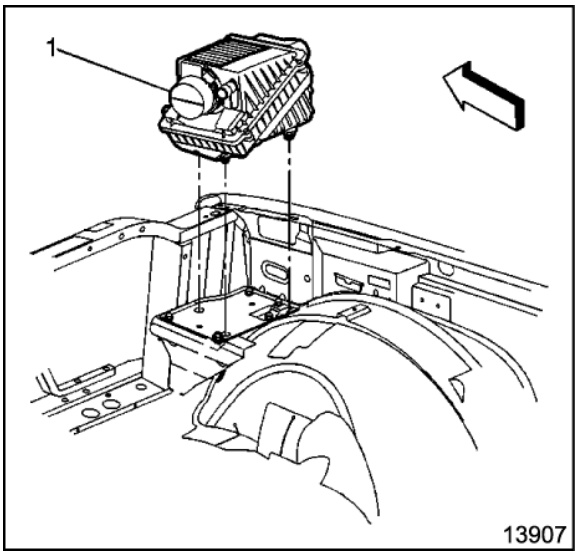


Fuel Hose Replacement – Fuel Pump to Heater

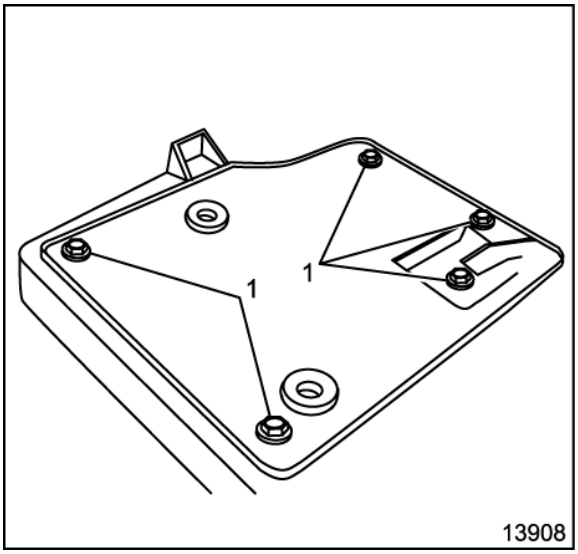
Removal Procedure

1. Remove the front skid plate, (if equipped).
2. Remove the rear skid plate, (if equipped).
3. Loosen the clamp (1) and remove the hose (2) from the dose pump.

4. Remove the air cleaner assembly (1). Refer to Air Cleaner Assembly Replacement in Engine Controls – 6.6L in the 2003 C/K Truck Service Manual.

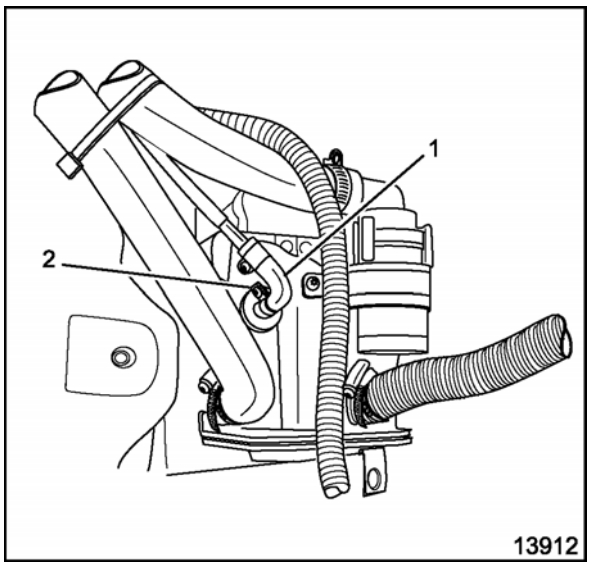


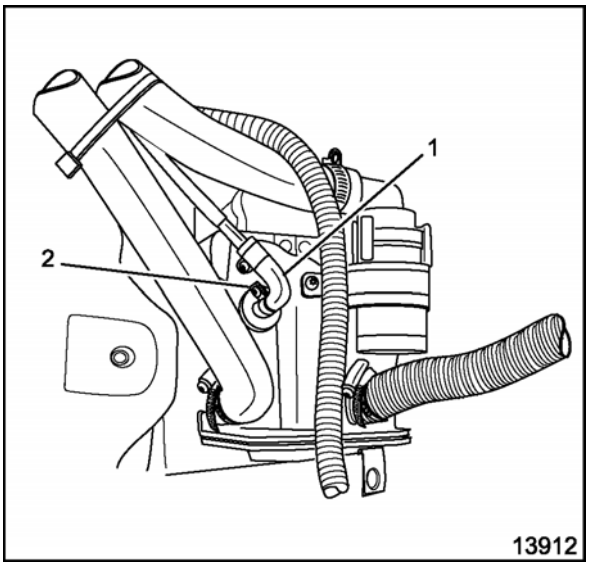
5. Remove the air cleaner assembly bracket bolts (1) and remove the bracket.



6. Loosen the clamp (2) and remove the hose (1) from the heater.
7. Remove the wiring harness straps and hose from vehicle.

Important: Note routing location for reassembly.





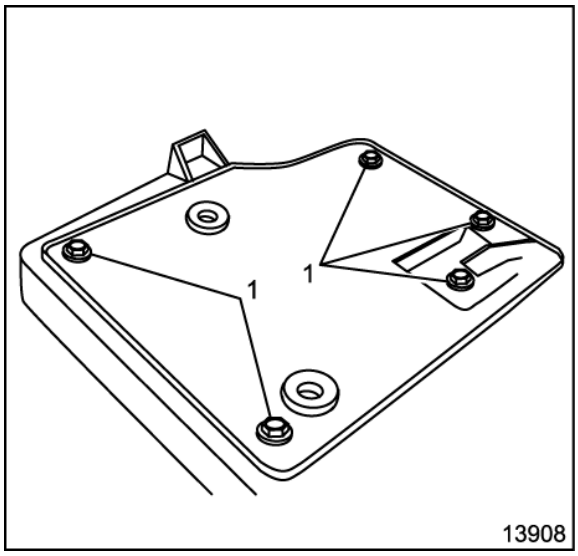
Installation Procedure

Notice: Always cut Mecanyl fuel line with a sharp razor knife or razor edged cutter. Do NOT cut with side cutters, scissors or similar tools as doing so will cause a restriction inside the fuel line.

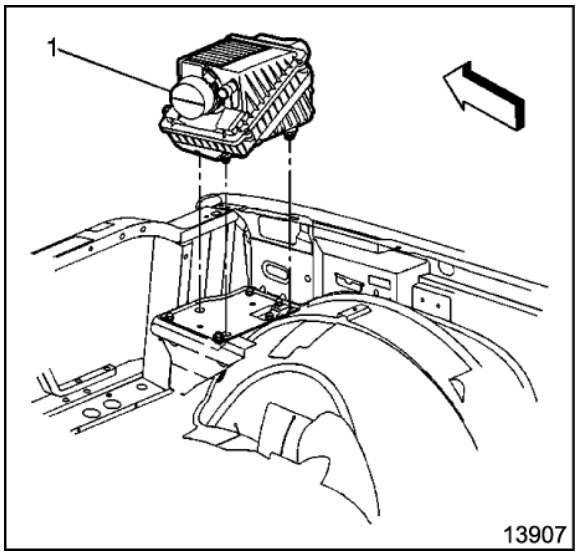
1. Install the hose in the same location and secure with wiring harness straps.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the hose (1) and clamp (2). Secure clamp.
   Tighten
   Tighten clamp to 1.4 N•m (12 lb in).

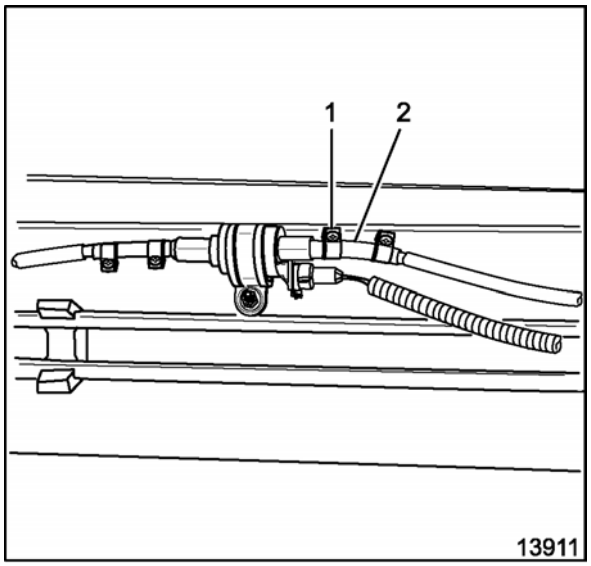


3. Install the air cleaner assembly bracket and bolts (1).
   Tighten
   Tighten bracket bolts to 9 N•m (80 lb in).



4. Install the air cleaner assembly (1). Refer to the Air Cleaner Assembly Replacement in Engine Controls – 6.6L in the 2003 C/K Truck Service Manual.

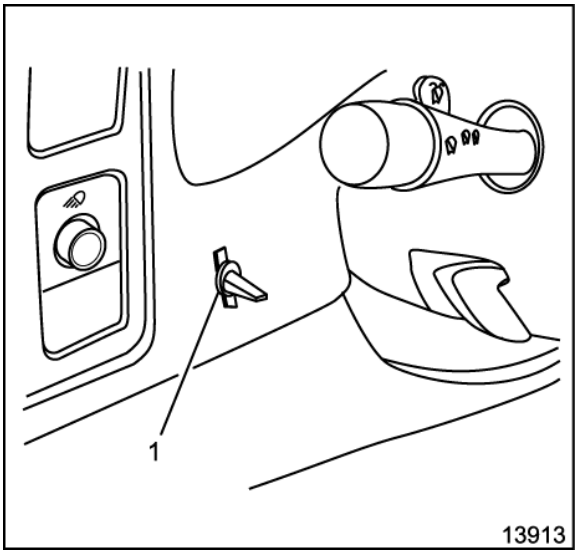
5. Install the hose (2) and clamp (1) to the dose pump and tighten clamp.
   Tighten
   Tighten clamp to 1.4 N•m (12 lb in).
6. Install the rear skid plate, (if equipped).
7. Install the front skid plate, (if equipped).
8. Run the engine and heater to inspect for leaks.



Fuel Fired Heater Switch Replacement

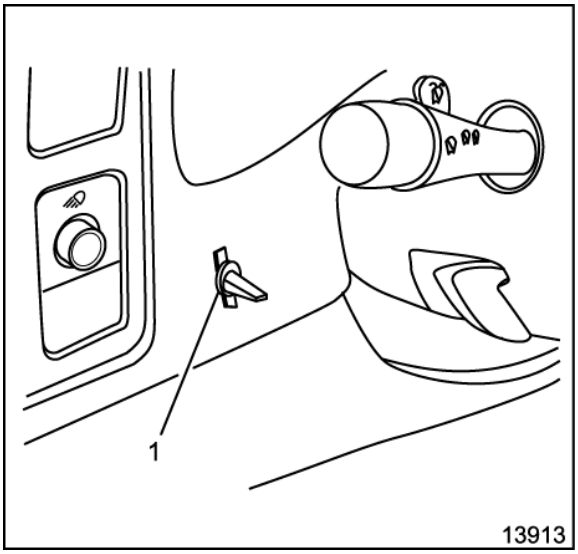
Removal Procedure

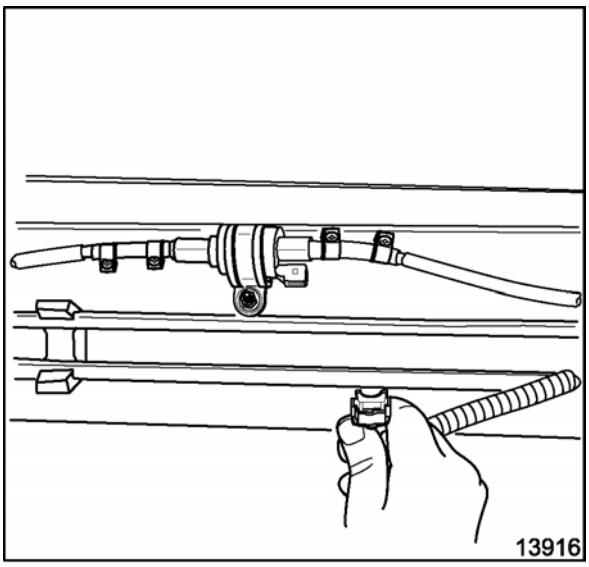
1. Remove the I/P bezel. Refer to Bezel Replacement in Instrument Panel, Gages, and Console in the 2003 C/K Truck Service Manual.
2. Disconnect the electrical connections from the back of the switch.
3. Remove the switch nut (1) and remove the switch from the bezel.



Installation Procedure

1. Install the switch into the opening in the bezel and install nut (1).
2. Connect the electrical connectors in the same location as removed.
3. Install the I/P bezel. Refer to Refer to Bezel Replacement in Instrument Panel, Gages, and Console in the 2003 C/K Truck Service Manual.



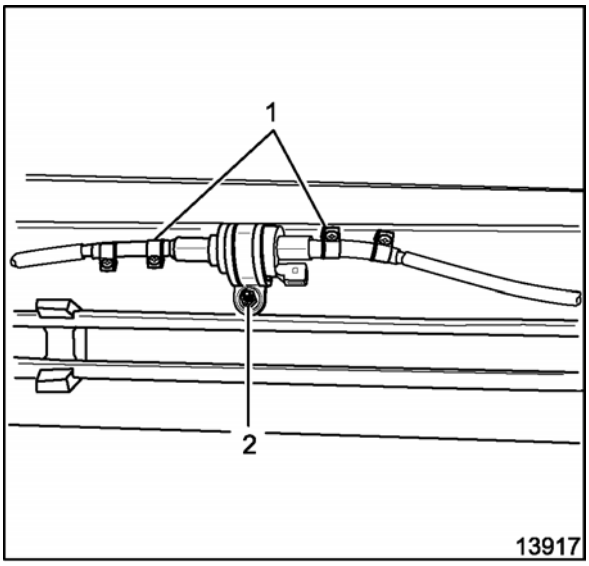


Fuel Pump Replacement

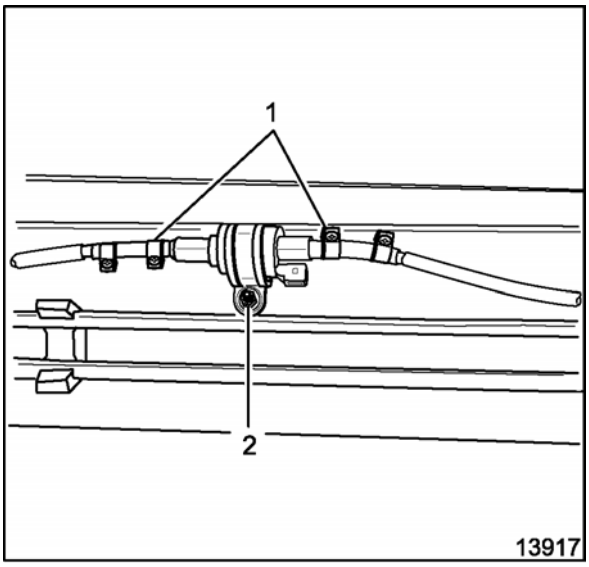
Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

1. Raise and support the vehicle.
2. Remove the rear skid plate, (if equipped).
3. Clamp off the fuel inline to prevent fuel leakage.
4. Remove the harness connector from the fuel pump.



5. Loosen the hose clamps (1).
6. Remove the bracket bolt (2).
7. Remove the fuel pump from the fuel lines.
8. Remove the fuel pump from the vehicle.



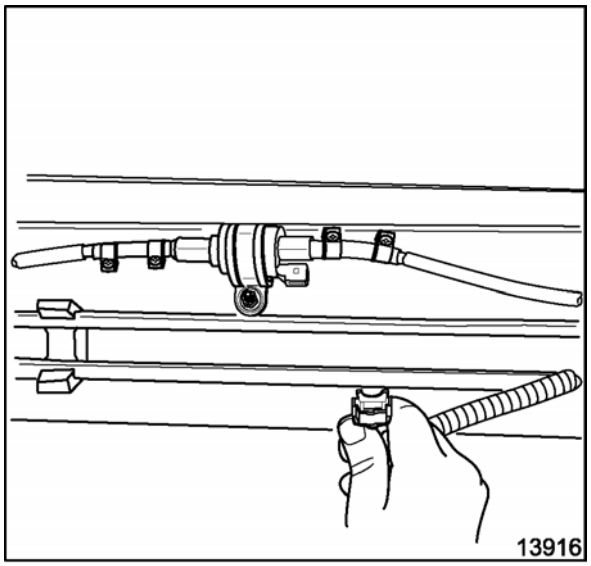
Installation Procedure

1. Install the fuel pump to the vehicle.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bracket nut (2).
   Tighten
   Tighten bracket bolts to 10 N•m (88 lb in).
3. Install the fuel lines, position the clamps (1) and tighten.
   Tighten
   Tighten clamps to 1.4 N•m (12 lb in).

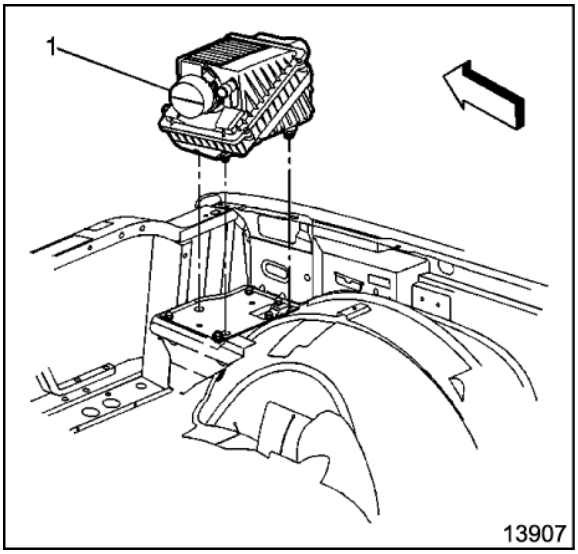
4. Install the harness connector to the fuel pump.
5. Remove the clamp from the fuel inlet line.
6. Install the rear skid plate, (if equipped).
7. Remove the supports and lower the vehicle.
8. Run vehicle engine and heater to inspect for leaks.



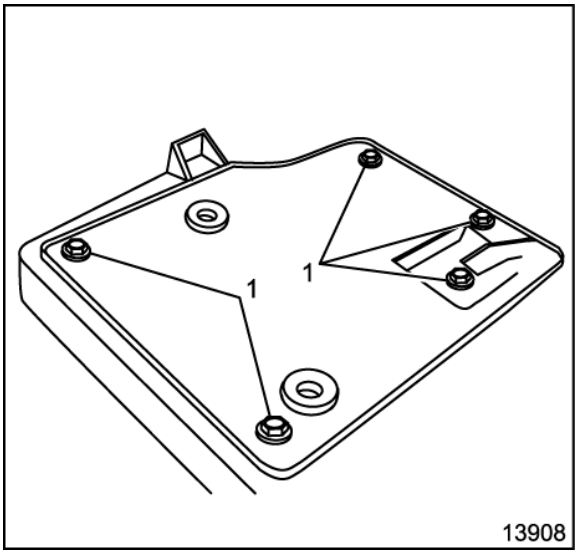
Fuel Fired Heater Replacement

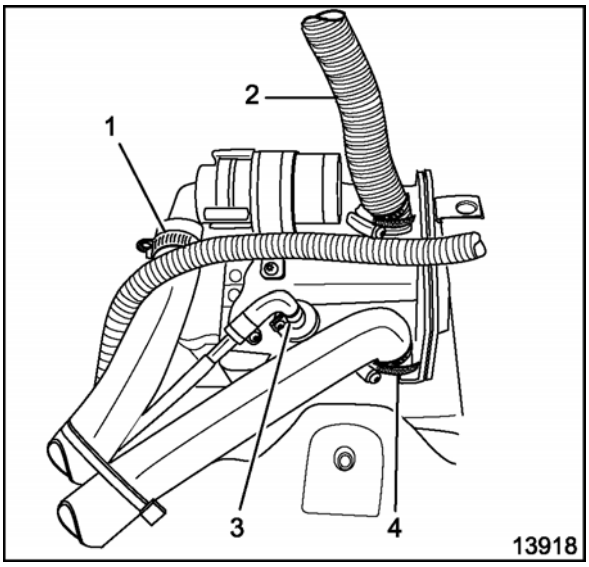
Removal Procedure

1. Remove the air cleaner assembly (1) Refer to Air Cleaner Assembly Replacement in Engine Controls – 6.6L in the 2003 C/K Truck Service Manual.

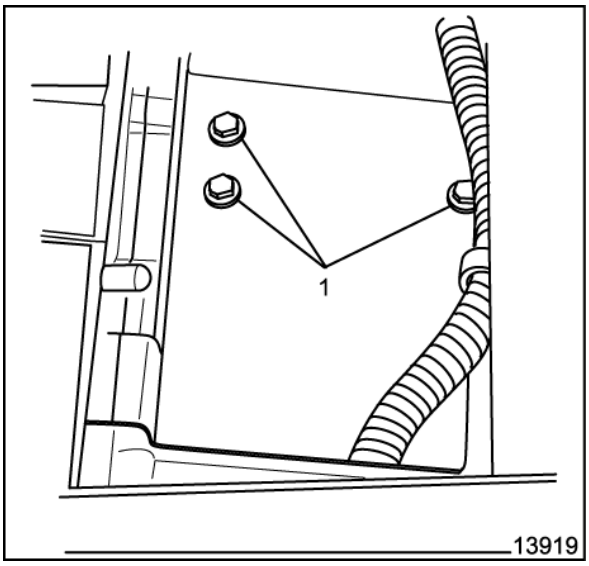


2. Remove the air cleaner assembly bracket bolts (1) and remove bracket.
3. Drain the cooling system. Refer to Draining and Filling Cooling System in Engine Cooling in the 2003 C/K Truck Service Manual.

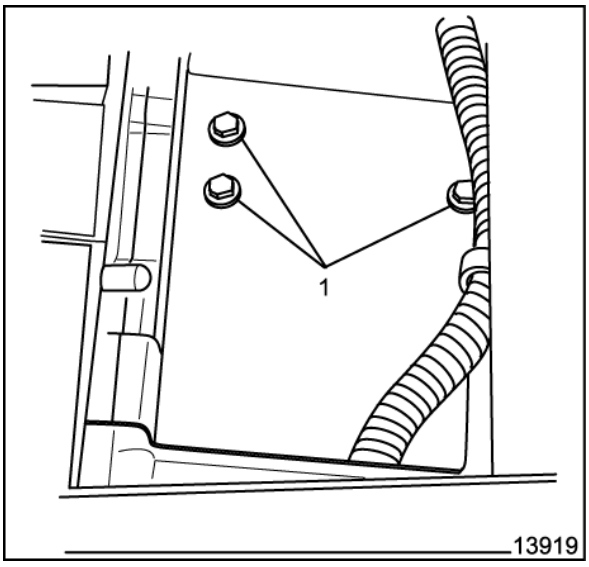




4. Remove the coolant inlet hose clamp and hose (1).
5. Remove the coolant outlet hose clamp and hose (4).
6. Remove combustion air inlet hose clamp and hose (2).
7. Remove the fuel inlet hose clamp and plug the hose (3).
8. Remove the exhaust gas outlet hose clamp and hose.
9. Disconnect the electrical connectors.



10. Remove the front portion of the right wheelhouse panel. Refer to Wheelhouse Panel Replacement in Body Front End in the 2003 C/K Truck Service Manual.
11. Remove the bolts (1) from the heater.
12. Remove the heater from the bottom of the vehicle.

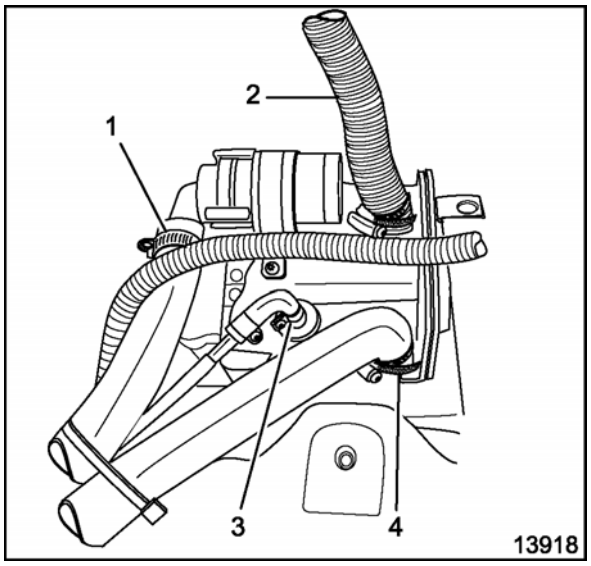


Installation Procedure

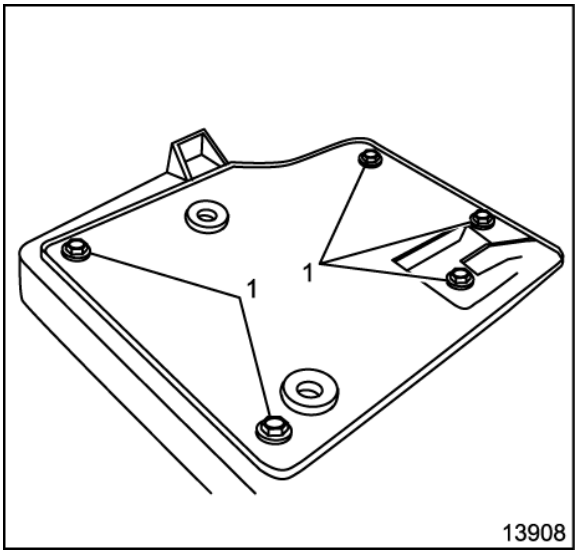
Notice: Refer to Fastener Notice in Cautions and Notices.

1. Install the heater to the bracket and install the bolts (1).
   Tighten
   Tighten heater bolts to 10 N•m (88 lb in).
2. Connect the electrical connections.
3. Install the exhaust gas outlet hose and clamp. Secure clamp.

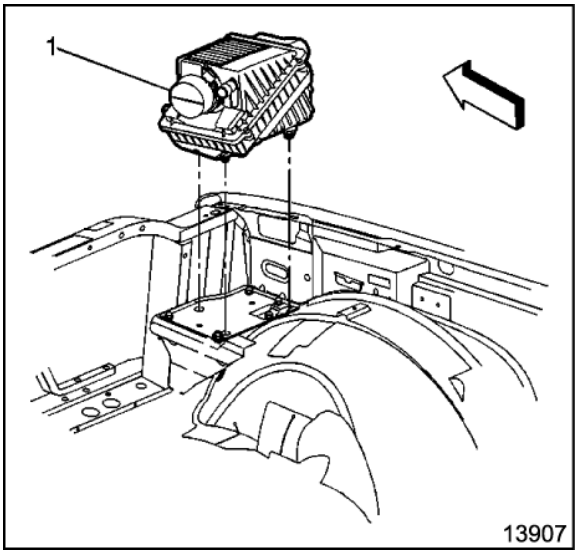
4. Install the fuel inlet hose (3) and clamp. Tighten the clamp.
   Tighten
   Tighten clamp to 1.4 N•m (12 lb in).
5. Install the combustion air inlet hose (2) and clamp. Secure clamp.
6. Install the coolant outlet hose (4) and clamp. Secure clamp.
7. Install the coolant inlet hose (1) and clamp. Tighten the clamp.
   Tighten
   Tighten clamp to 1.4 N•m (12 lb in).

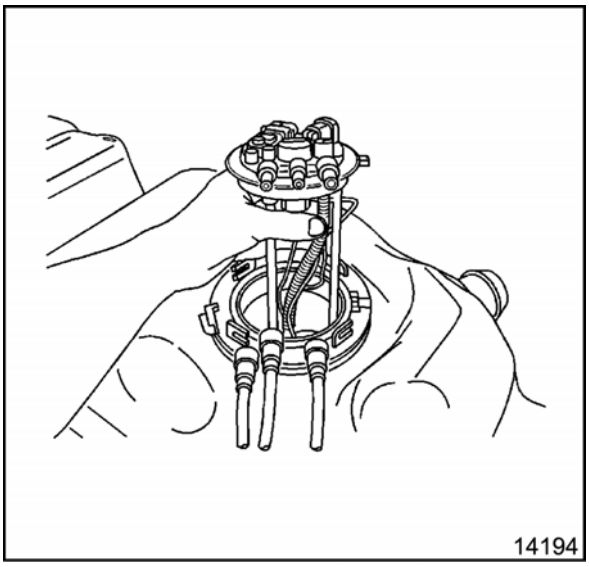


8. Install the air cleaner assembly bracket and bolts (1).
   Tighten
   Tighten bracket bolts to 9 N•m (80 lb in).



9. Install the air cleaner assembly (1). Refer to Air Cleaner Replacement in Engine Controls - 6.6L in the 2003 C/K Truck Service Manual.
10. Fill the cooling system. Refer to Draining and Filling Cooling System in Engine Cooling in the 2003 C/K Truck Service Manual.
11. Run vehicle engine and heater to inspect for leaks.
12. Install the right front wheelhouse panel. Refer to Wheelhouse Panel Replacement in Body Front End in the 2003 C/K Truck Service Manual.

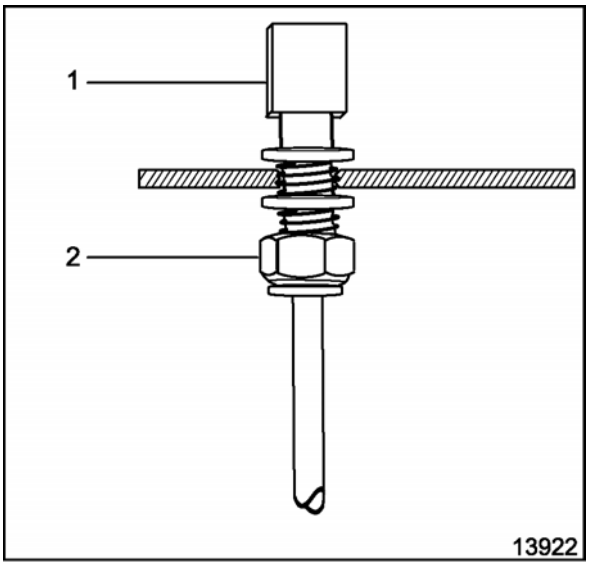




Fuel Tank Stand Pipe Replacement

Removal Procedure

1. Remove the rear skid plate, (if equipped).
2. Remove the fuel tank protection cover.
3. Remove the fuel tank. Refer to Fuel Tank Replacement Pickup in Engine Controls - 6.6L in the 2003 C/K Truck Service Manual.
4. Remove fuel sender unit from fuel tank. Refer to Fuel Sender Assembly Replacement in Engine Controls - 6.6L in the 2003 C/K Truck Service Manual.



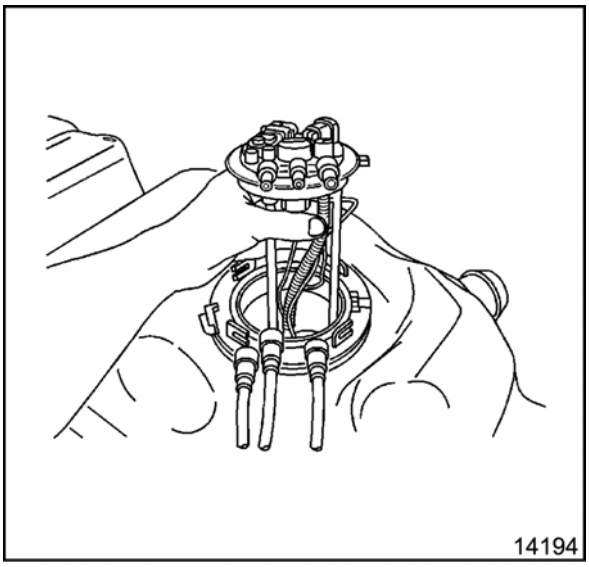
5. Remove the nut (2) from the pipe and remove the pipe (1).

Installation Procedure

1. To prevent fuel seepage around standpipe, remove burrs from both sides of hole.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Place one sealing washer on standpipe. Insert standpipe through hole from underside of sender unit. Place second sealing washer on standpipe. Place nut (2) on pipe (1) and tighten.
   Tighten
   Tighten stand pipe nut to 9.5 N•m (84 lb in).



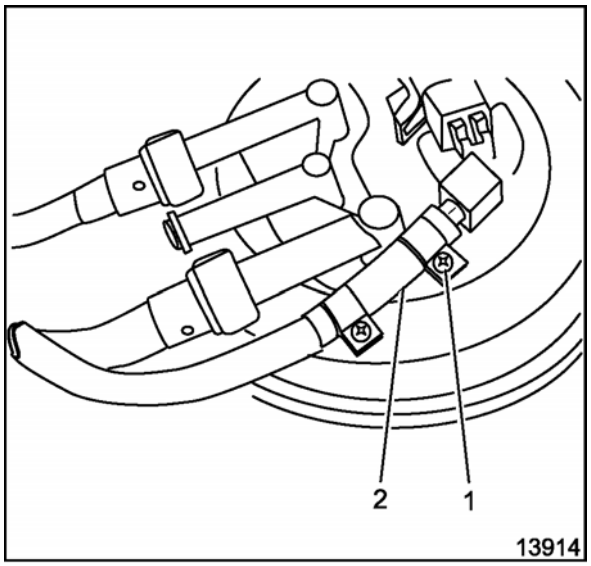
3. Install the fuel sender unit. Refer to Fuel Sender Assembly Replacement in Engine Controls – 6.6L in the C-2003 C/K Truck Service Manual.
4. Install the fuel tank. Refer to Fuel Tank Replacement Pickup in Engine Controls – 6.6L in the 2003 C/K Truck Service Manual.
5. Install the fuel tank protection cover.
6. Install the rear skid plate, (if equipped).

Fuel Hose Replacement – Tank to Fuel Pump

Notice: Always cut Mecanyl fuel line with a sharp razor knife or razor edged cutter. Do NOT cut with side cutters, scissors or similar tools as doing so will cause a restriction inside the fuel line.

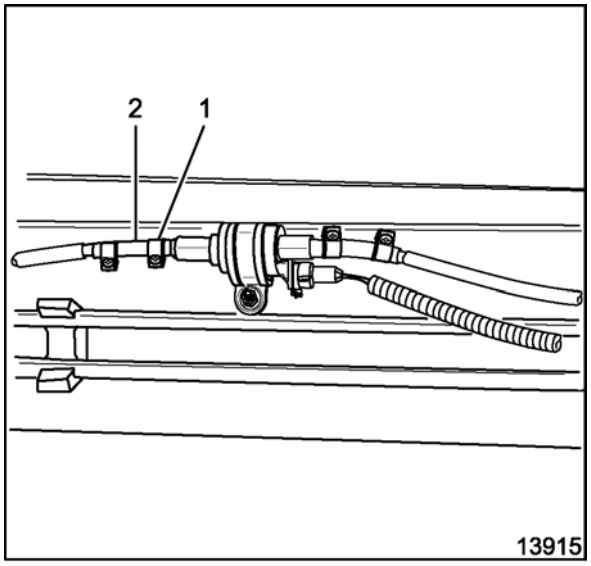
Removal Procedure

1. Remove the fuel tank shield.
2. Remove the rear skid plate, (if equipped).
3. Remove the fuel tank. Refer to Fuel Tank Replacement Pickup in Engine Controls – 6.6L in the 2003 C/K Truck Service Manual.
4. Loosen the clamp (1) and remove the hose (2).



5. Loosen the clamp (1) and remove the hose (2) from the dose pump.
6. Remove the wiring harness straps, securing the line.

Important: Note removal location for reassembly.

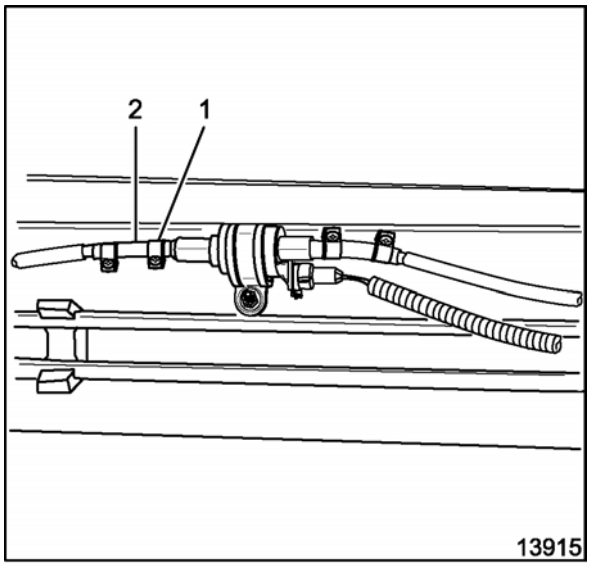


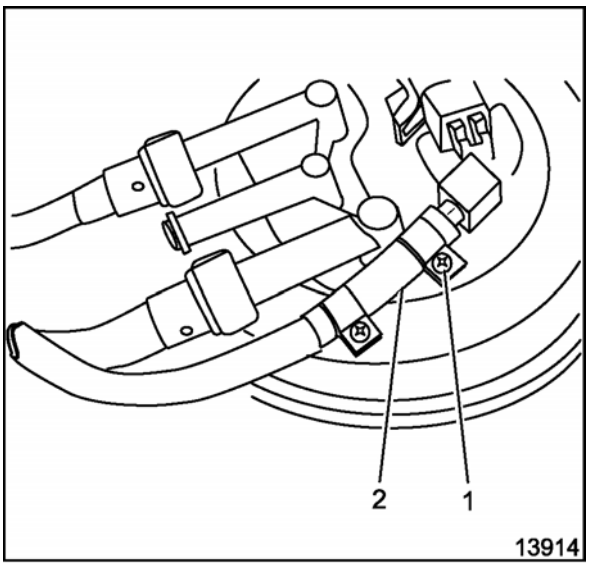
Installation Procedure

1. Install the inlet hose to the vehicle in the same location as removed.

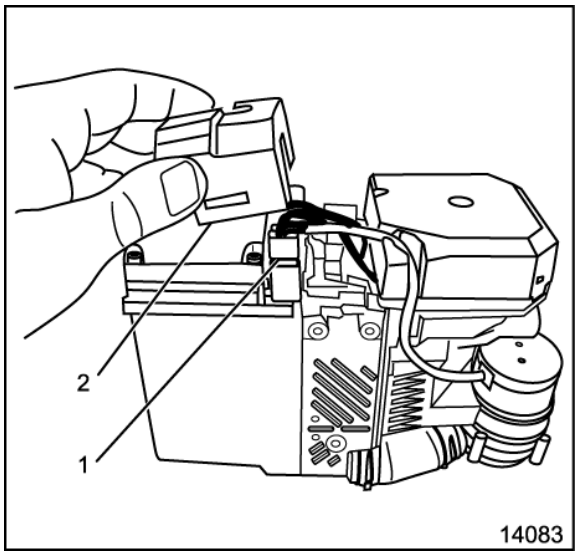
Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the hose (2) and clamp (1) to the dose pump.
   Tighten
   Tighten clamp to 1.4 N•m (12 lb in).





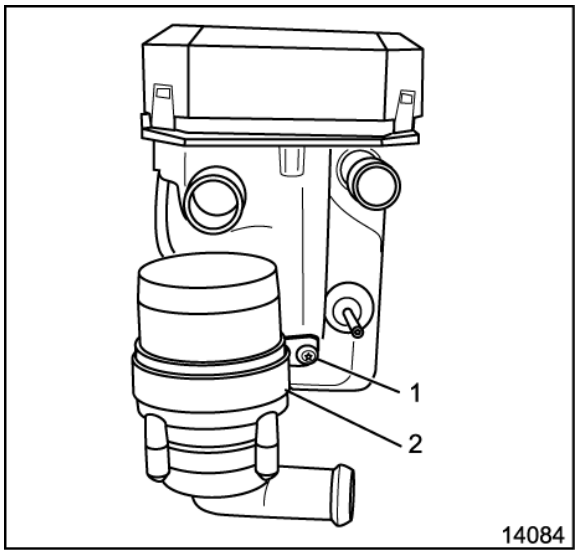
3. Install the hose (2) and clamp (1) to the fuel tank.
   Tighten
   Tighten clamp to 1.4 N•m (12 lb in).
4. Install the fuel tank. Refer to Fuel Tank Replacement Pickup in Engine Controls – 6.6L in the 2003 C/K Truck Service Manual.
5. Install the fuel tank shield.
6. Install the rear skid plate, (if equipped).
7. Run the engine and the fuel fired heater and inspect for leaks.



Fuel Fired Coolant Pump Replacement

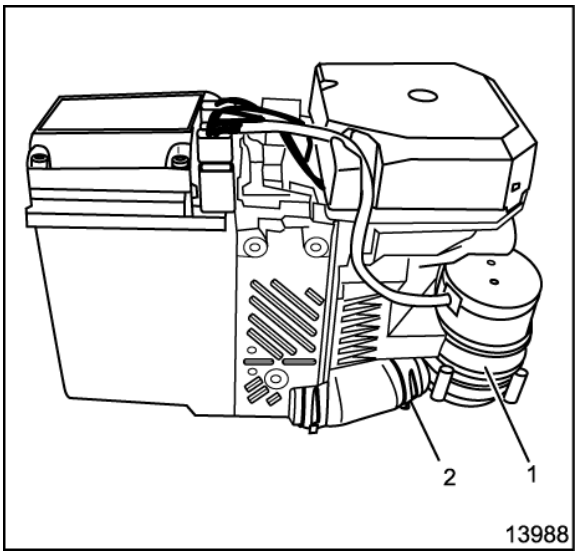
Removal Procedure

1. Remove the fuel fired heater. Refer to Fuel Fired Heater Replacement.
2. Remove the top cover (2).
3. Remove the pump connector (1).



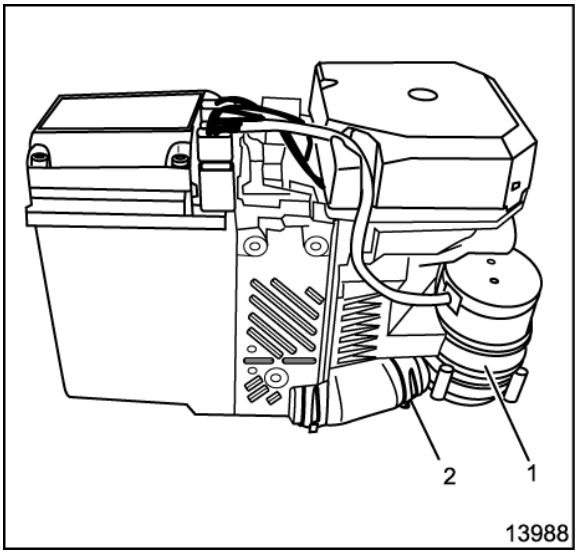
4. Remove the retaining bolt (1).
5. Remove the pump retainer (2).

6. Slide the clamp (2) back from the pump.
7. Remove the pump (1).

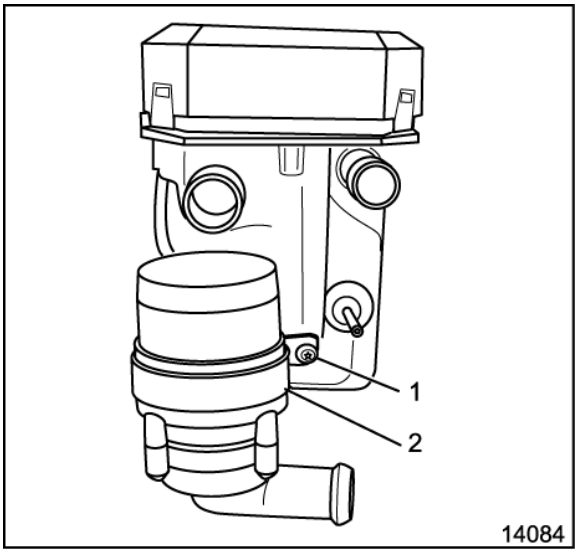


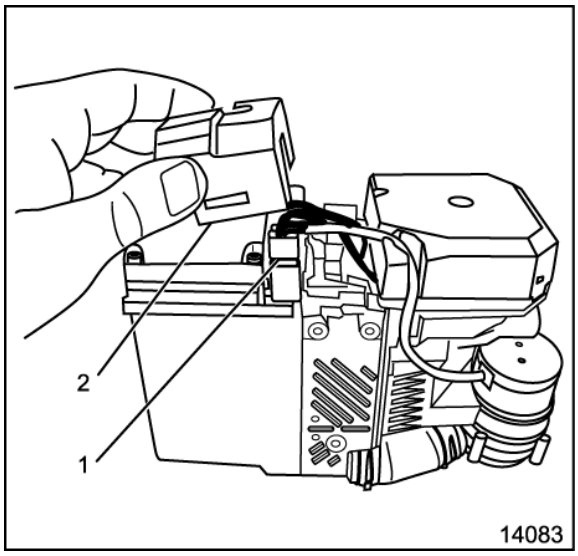
Installation Procedure

1. Install the pump (1) onto the hose.
2. Slide the clamp (2) into position.



3. Install the pump retainer (2).
4. Install the retainer bolt (1).





5. Install the connector (1).
6. Install the top cover (2).
7. Install the fuel fired heater. Refer to Fuel Fired Heater Replacement.

Description and Operation

General Description

Caution:

To Prevent Asphyxiation: DO NOT operate heater while in confined spaces such as closed, unventilated garages. Open an outside garage door before operating the heater.

To Prevent Fire: DO NOT operate heater where flammable or explosive materials, gases or dust may be present. DO NOT operate heater over dry grass or other dry ground cover. Switch heater OFF while refueling vehicle. Switch heater OFF BEFORE entering fueling stations.

To Prevent Burning: NEVER touch hot components of the heating system.

The heater requires no periodic maintenance other than a visual inspection preferably prior to the heating season. Ensure the heater and all components are free from damage and in proper working condition.

During the warmer months of the year when heating is not required, the heater should be switched ON and allowed to run for 5 to 10 minutes once a month at a minimum. This will keep a clean fresh supply of fuel in the heater fuel system and keep all moving parts in top operation condition.

The fuel fired auxiliary heater is used to preheat water-cooled vehicle engines.

In order to minimize the battery's workload the heater switches from full-load operation to part-load operation after reaching a water temperature of 72°C (161.6°F). In this mode of operation the heater operates with extremely low noise and particularly low power and fuel consumption.

The heater consists of the combustion air fan assembly, the control unit/heat exchanger, the burner insert, the combustion chamber, and an additional circulation pump.

Control Unit/Heat Exchanger

The control unit/heat exchanger includes:

- Control unit
- Temperature Sensor
- Overheat Protection
- Heat Exchanger
- Circulation Pump

Caution: The control unit/heat exchanger and the burner housing represent an assembly and must not be dissembled.

Control Unit

The control unit is the center unit and ensures control and monitoring of combustion operation.

The control unit is ventilated by means of a ventilation hose routed from the combustion air collector compartment of the burner.

Temperature Sensor

The temperature sensor senses the coolant temperature in the heat exchanger of the heater as an electrical resistance. This signal is routed to the control unit for processing.

Overheat Protection

Overheat protection, controlled by a temperature resistor, protects the heater against undue operating temperatures. Overheat protection responds at water temperature in excess of 105°C (221°F) and switches the heater OFF.

Heat Exchanger

The heat exchanger transfers the heat generated by combustion to the coolant circuit.

Coolant Circulation Pump

The circulation pump ensures circulation of the coolant within the vehicle and heater coolant circuit. The pump is activated by the control unit and is in continuous operation.

Fuel Pump

The fuel pump is a combined delivery, dosing and shutoff system for the fuel supply of the heater out of the vehicle fuel tank.

BLANK

Engine Electrical

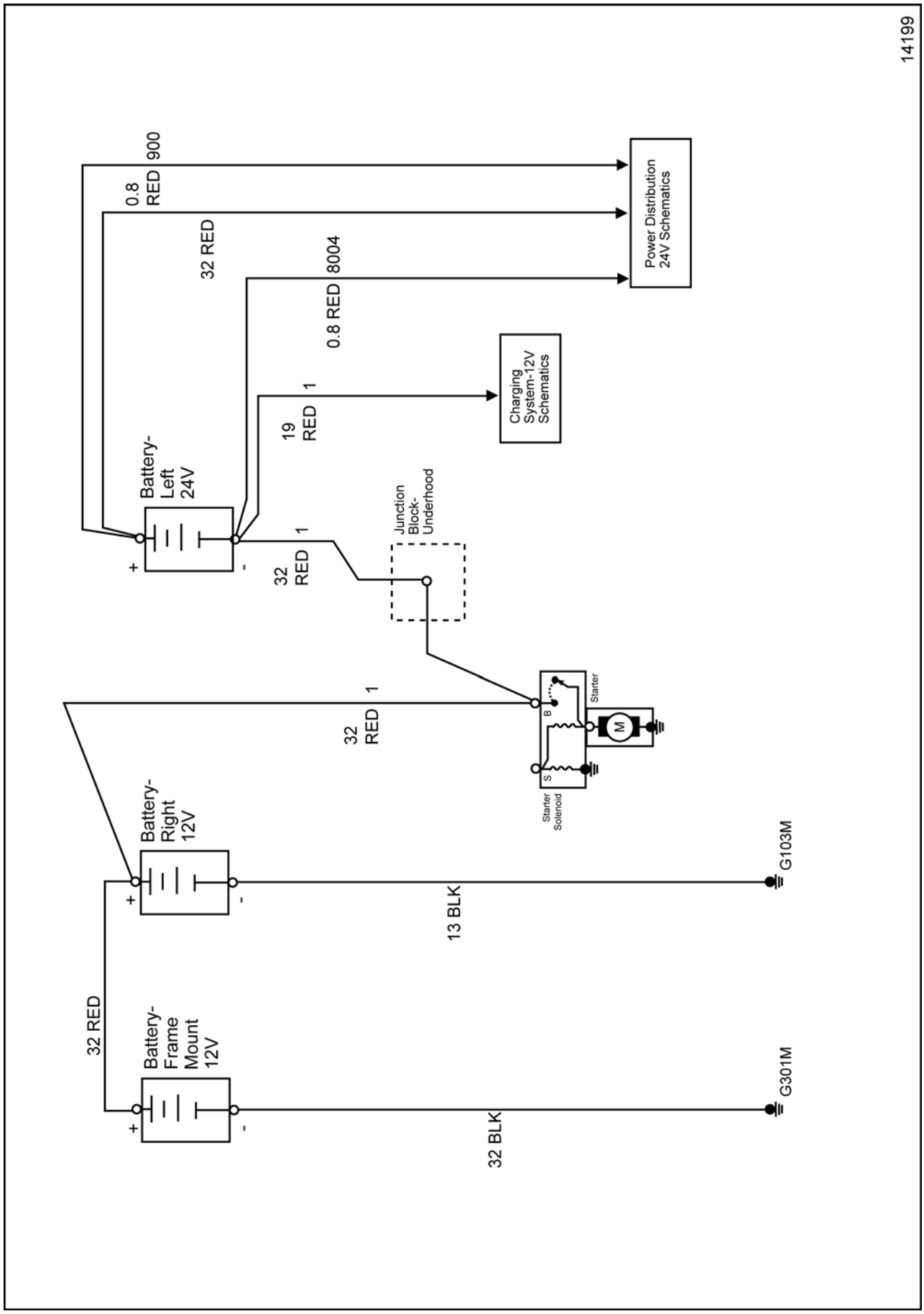
Specifications

Fastener Tightening Specifications

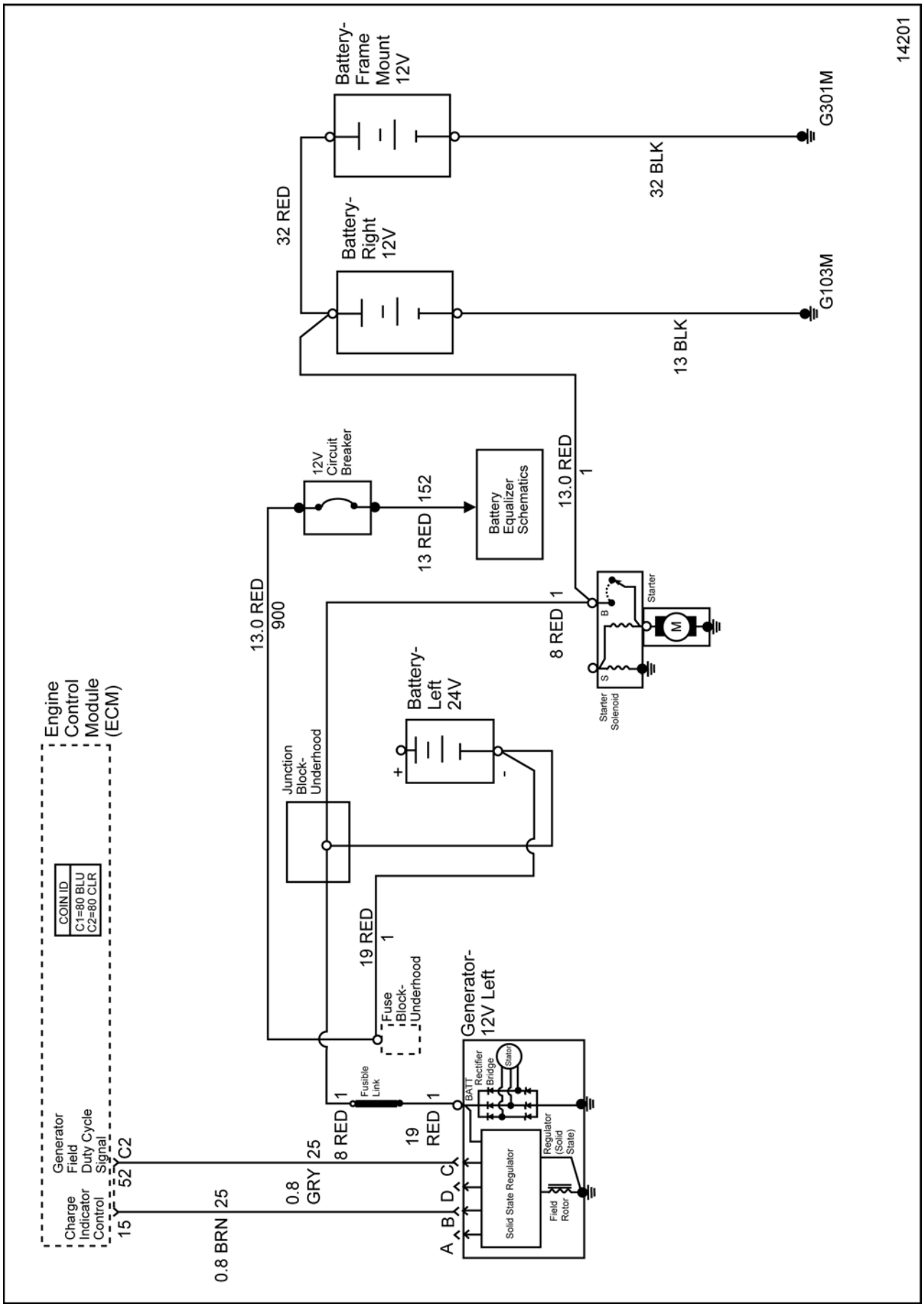
Application	Specification	
	Metric	English
Battery Cable Connections	17 N•m	13 lb ft
Battery Retainer Bolt	25 N•m	18 lb ft
Circuit Breaker Bracket Bolts	6 N•m	53 lb in
Generator Mounting Bolts	50 N•m	37 lb ft
Generator Output Stud Nut	9 N•m	80 lb in

Schematic and Routing Diagrams

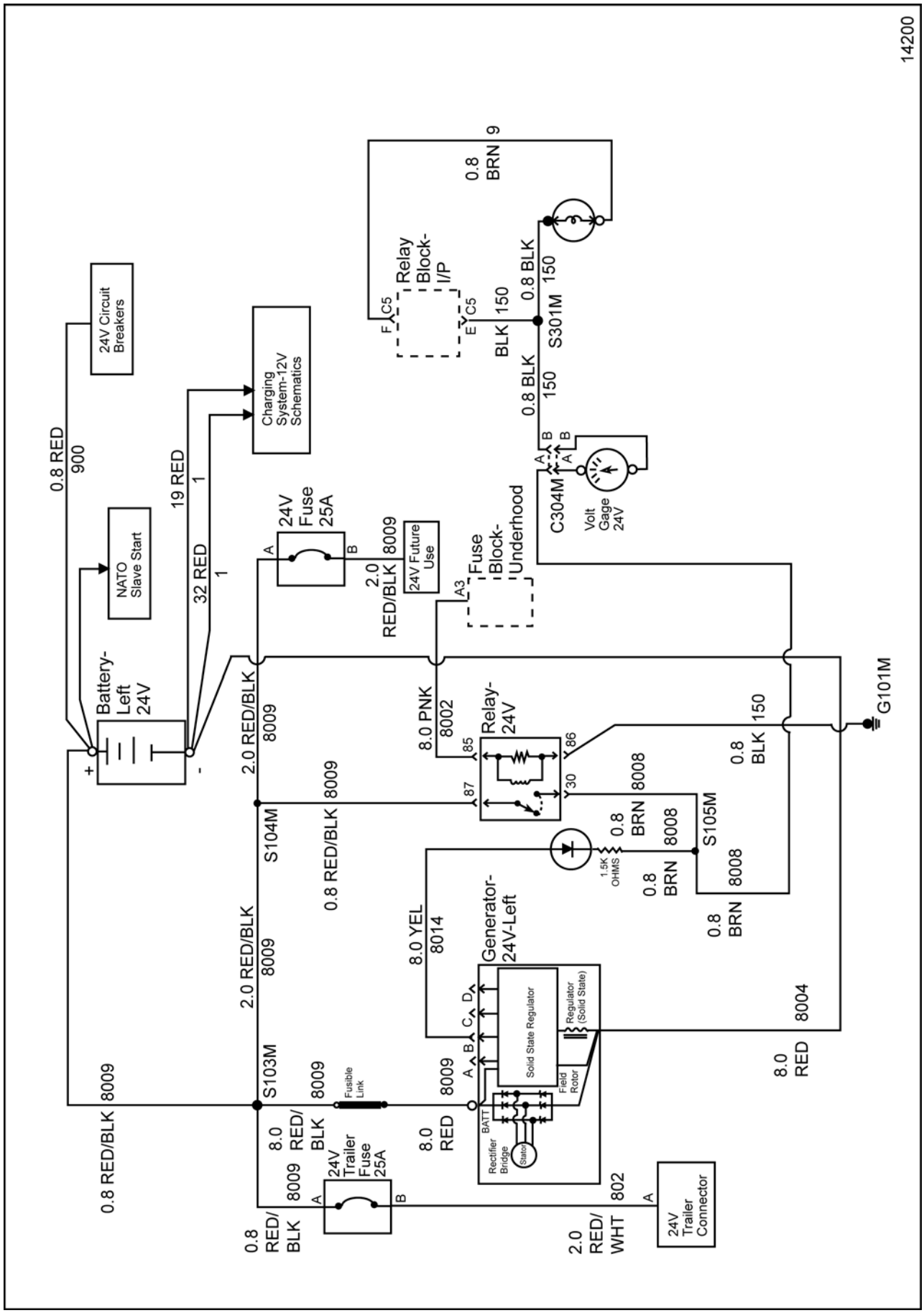
Battery Schematic



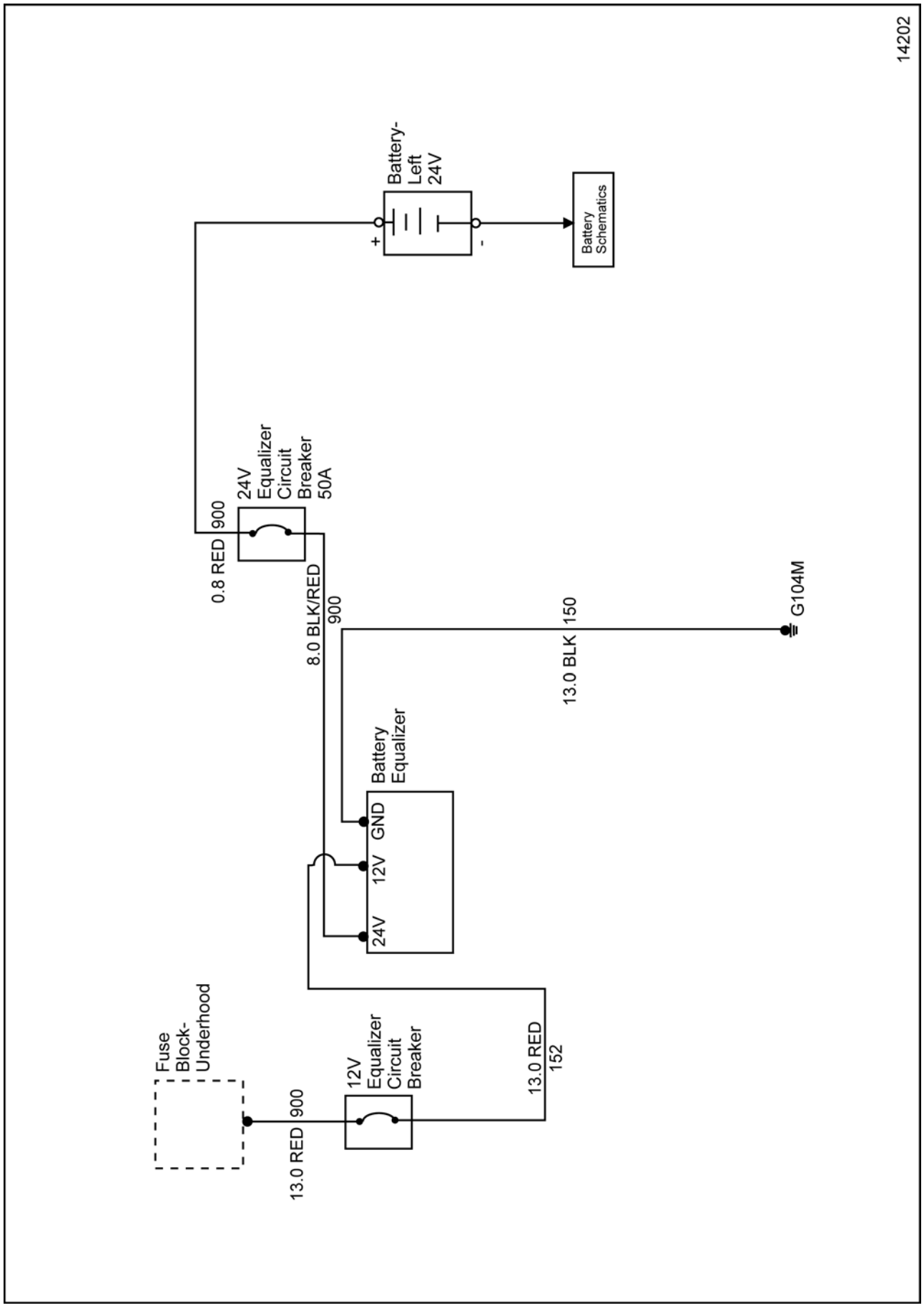
Charging Schematics 12V



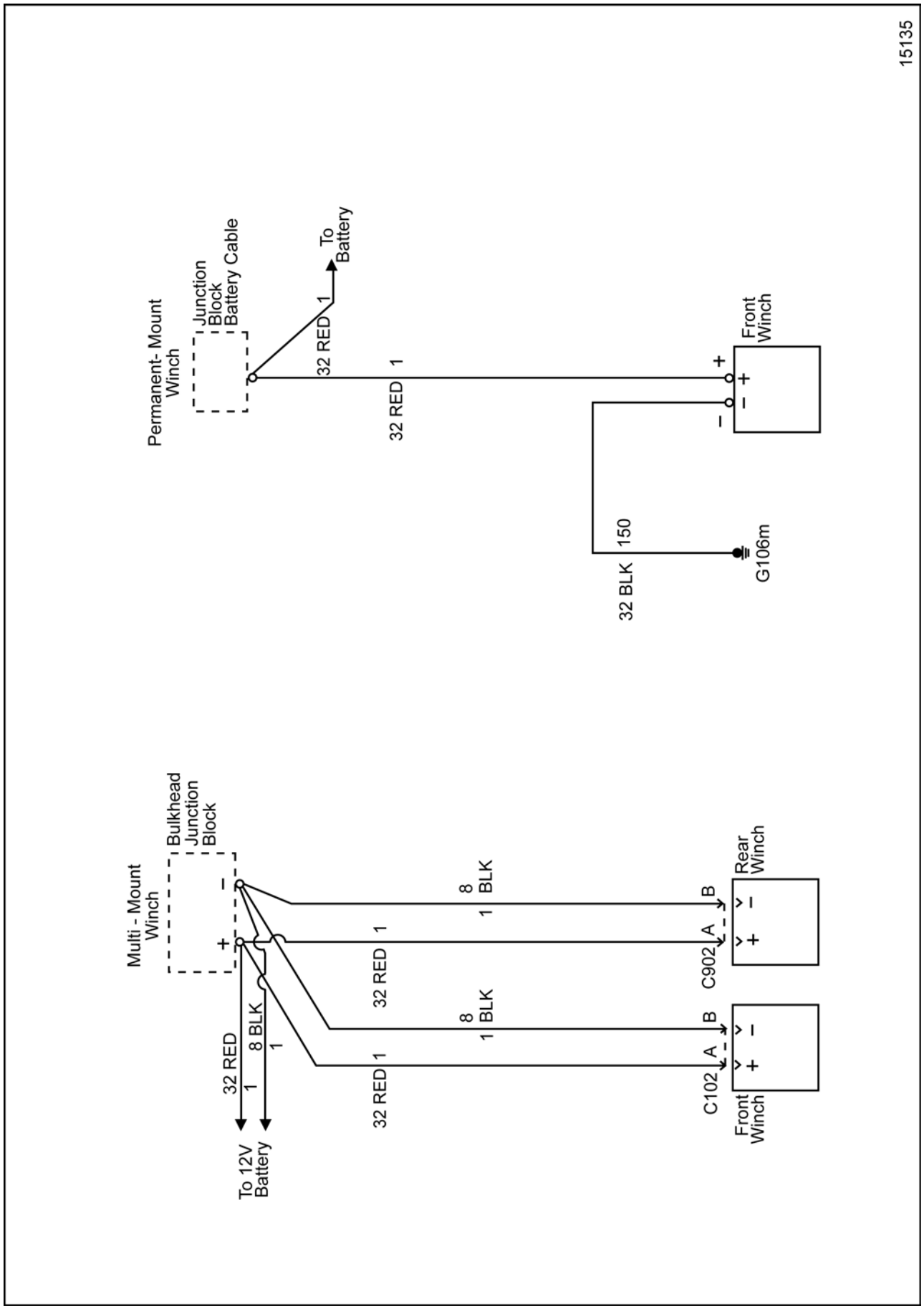
Charging Schematics 24V



Battery Equalizer Schematics



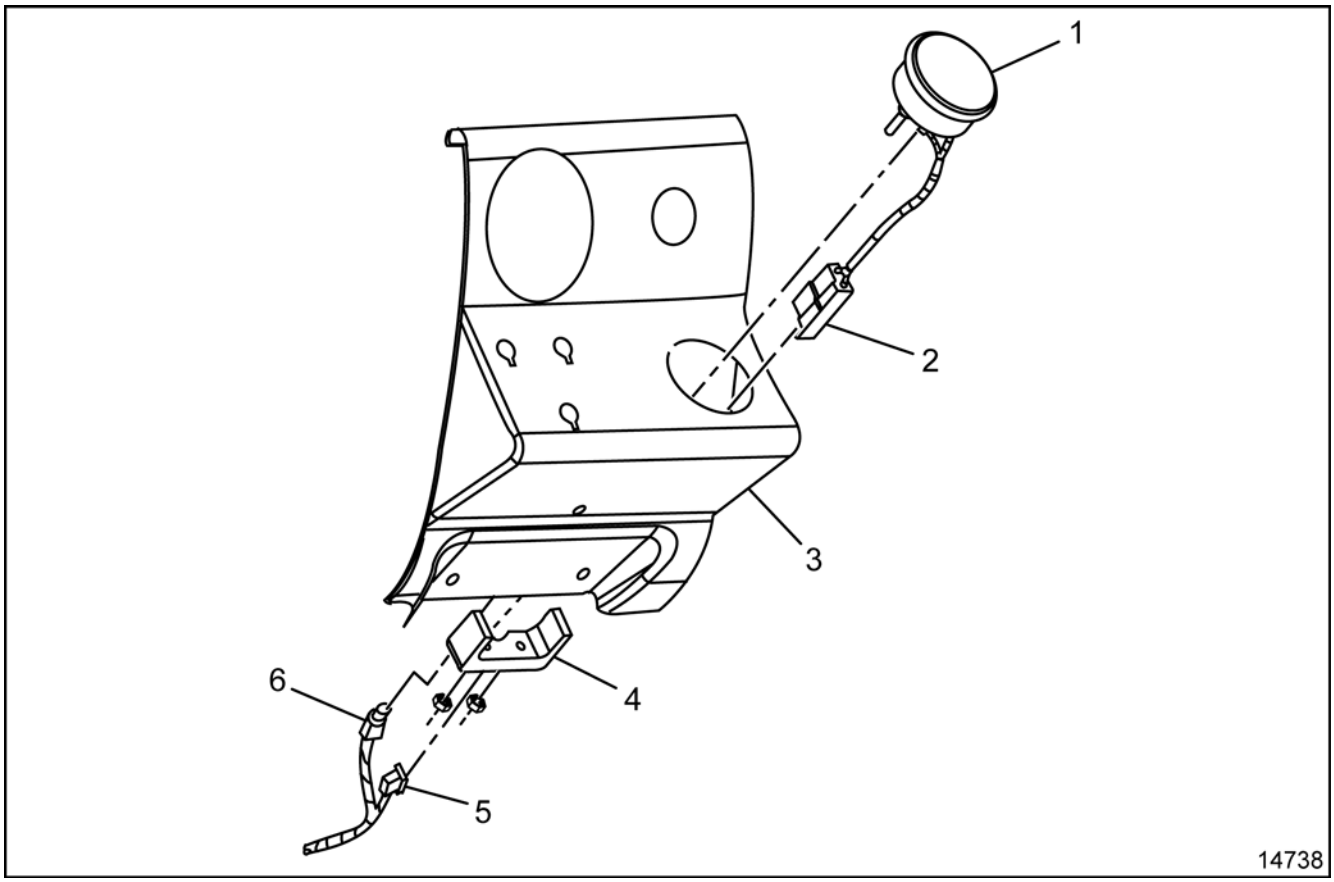
Winch Wiring Schematics



Component Locator

Starting and Charging Component Views

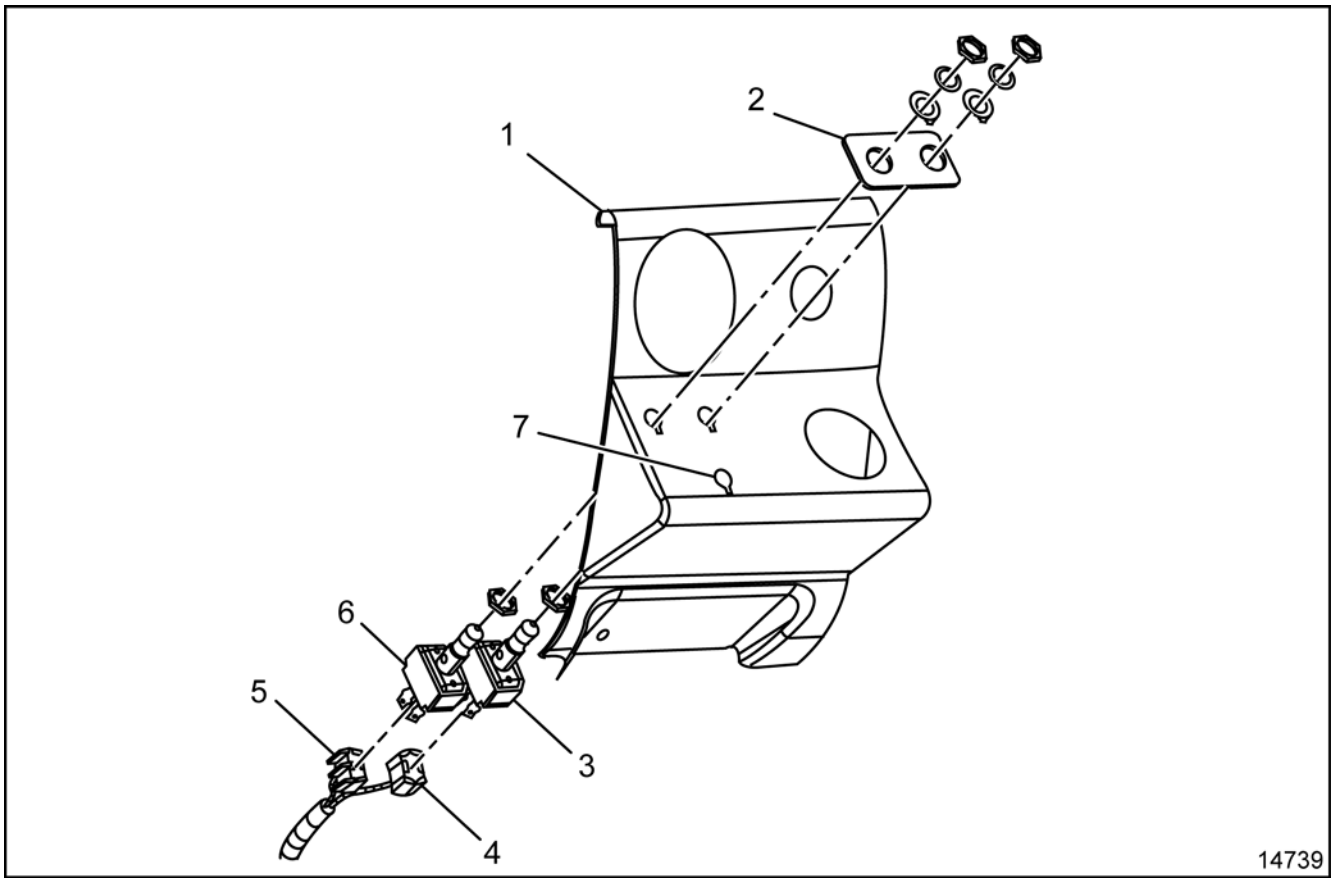
Voltmeter and Lamp



Legend

(1) Voltmeter (24V)
(2) Voltmeter Connector
(3) Mounting Bracket
(4) Voltmeter Bracket
(5) Harness Connector
(6) Voltmeter Illumination Bulb

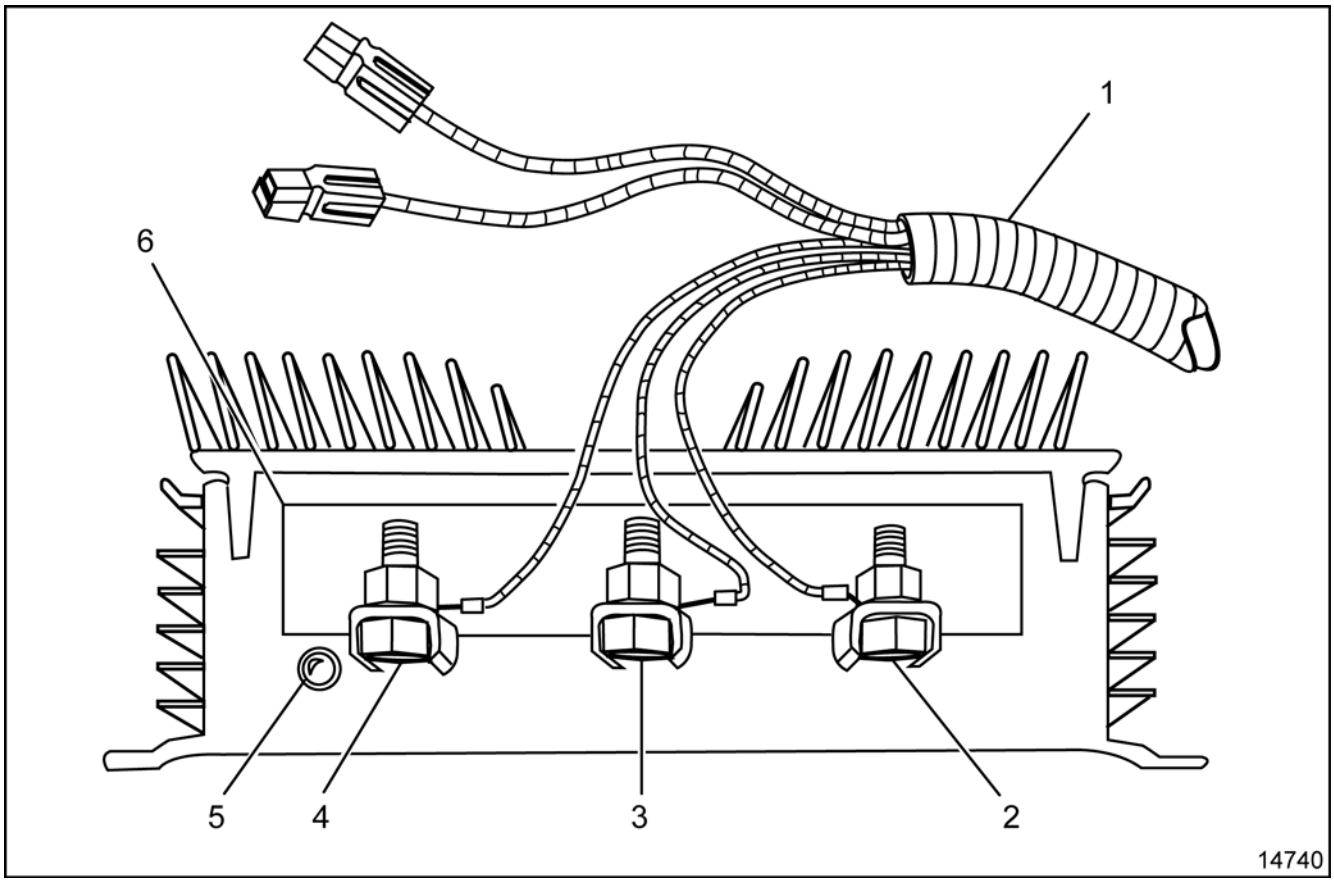
Blackout (B/O) Lamp Switches



Legend

(1) Mounting Bracket
(2) Switch Position Label
(3) Blackout (B/O) Control Switch
(4) Component Connector
(5) Component Connector
(6) Blackout (B/O) Drive Lamp Switch
(7) Accessory Switch Openings

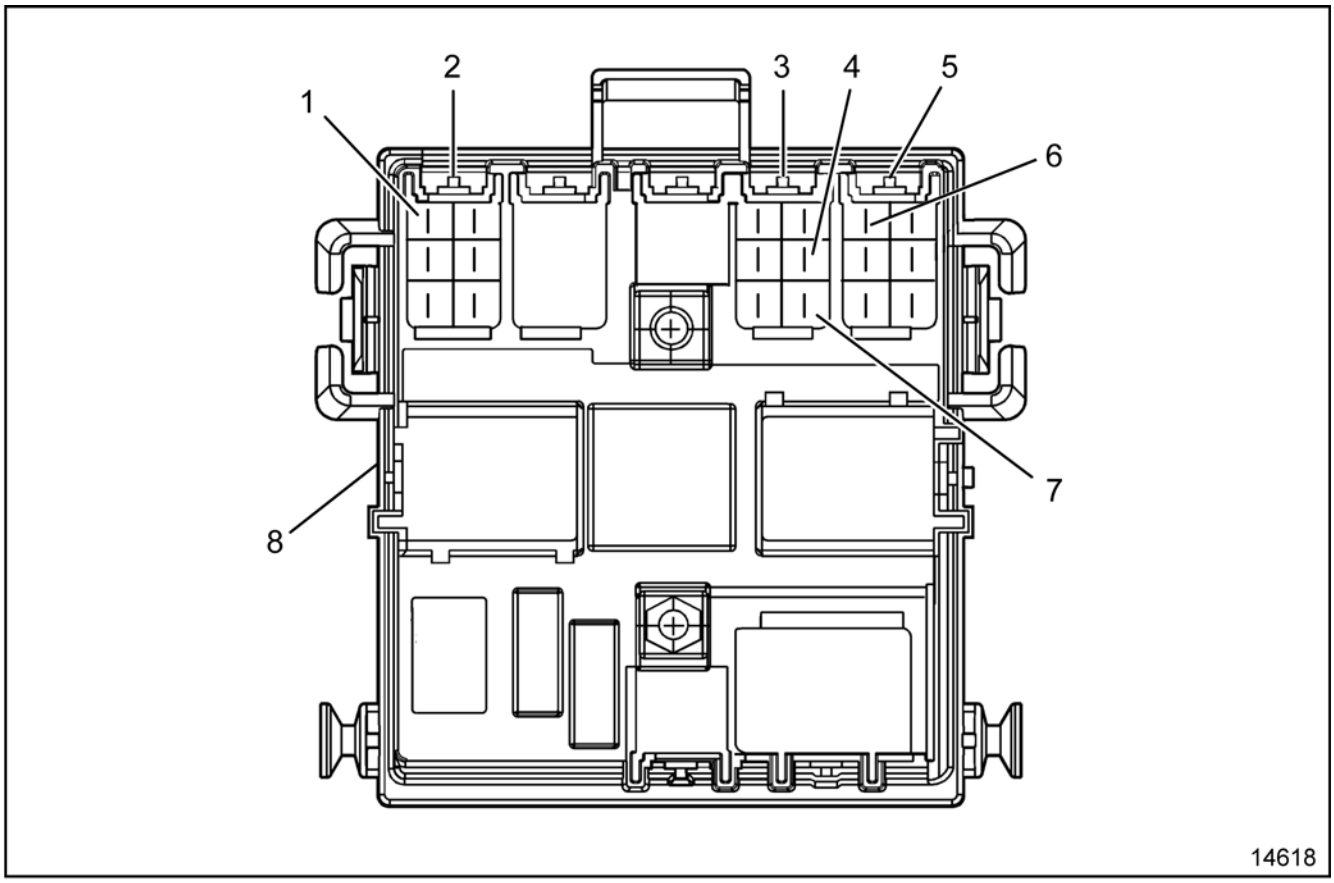
Battery Equalizer



Legend

(1) Battery Equalizer Harness
(2) Ground Connection (Black Wire)
(3) 12V Connection (Red Wire)
(4) 24V Connection (Black/Red Wire)
(5) LED Status Indicator
(6) Battery Equalizer

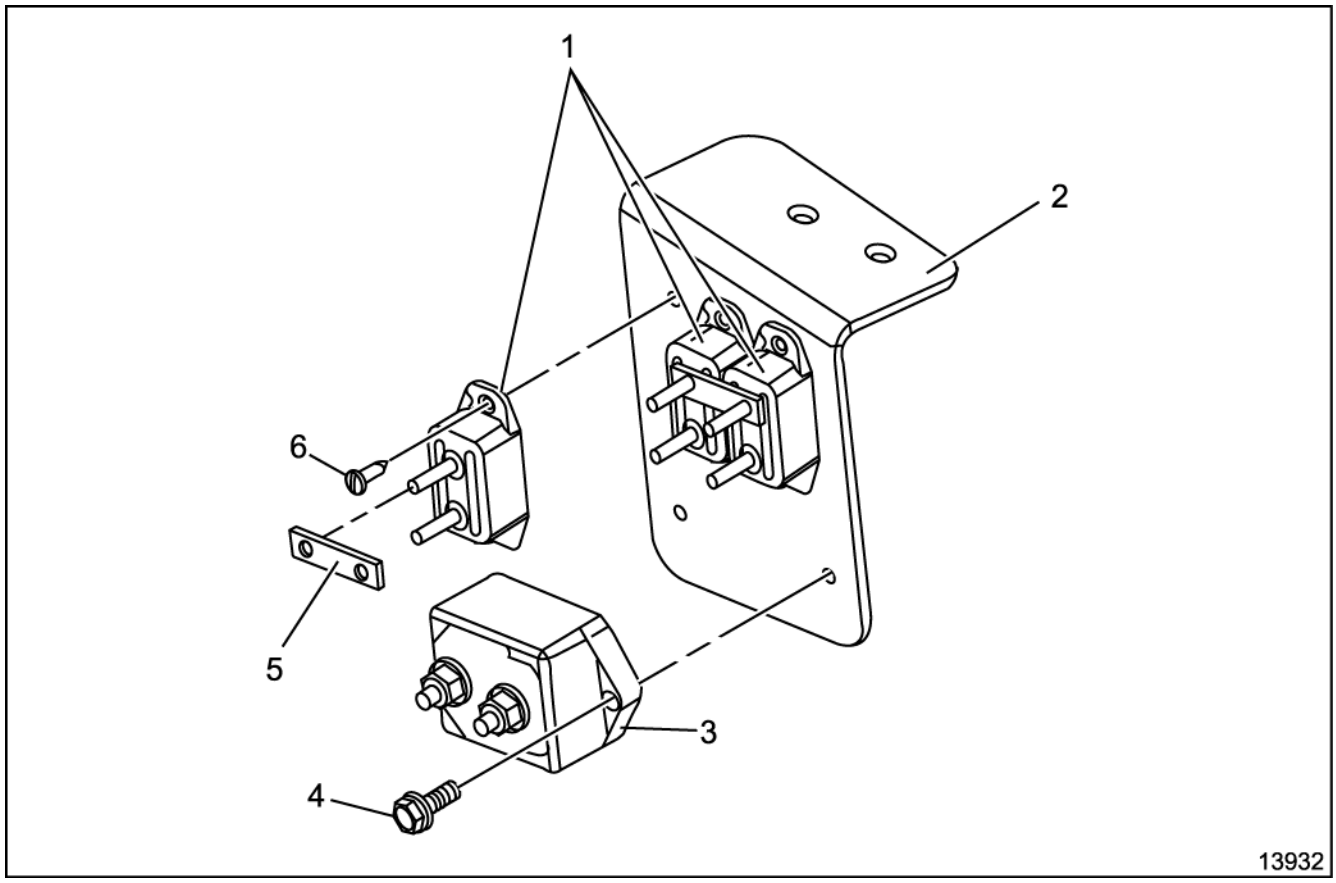
Relay Block – I/P



Legend

(1) Cavity C – Blackout (B/O) Switch
(2) C8 – Connector Location
(3) C5 – Connector Location
(4) Cavity E – 24V Meter Ground
(5) C4 – Connector Location
(6) Cavity D – MAP/Receptacle (if equipped)
(7) Cavity F – 24V Meter
(8) Relay Block – I/P

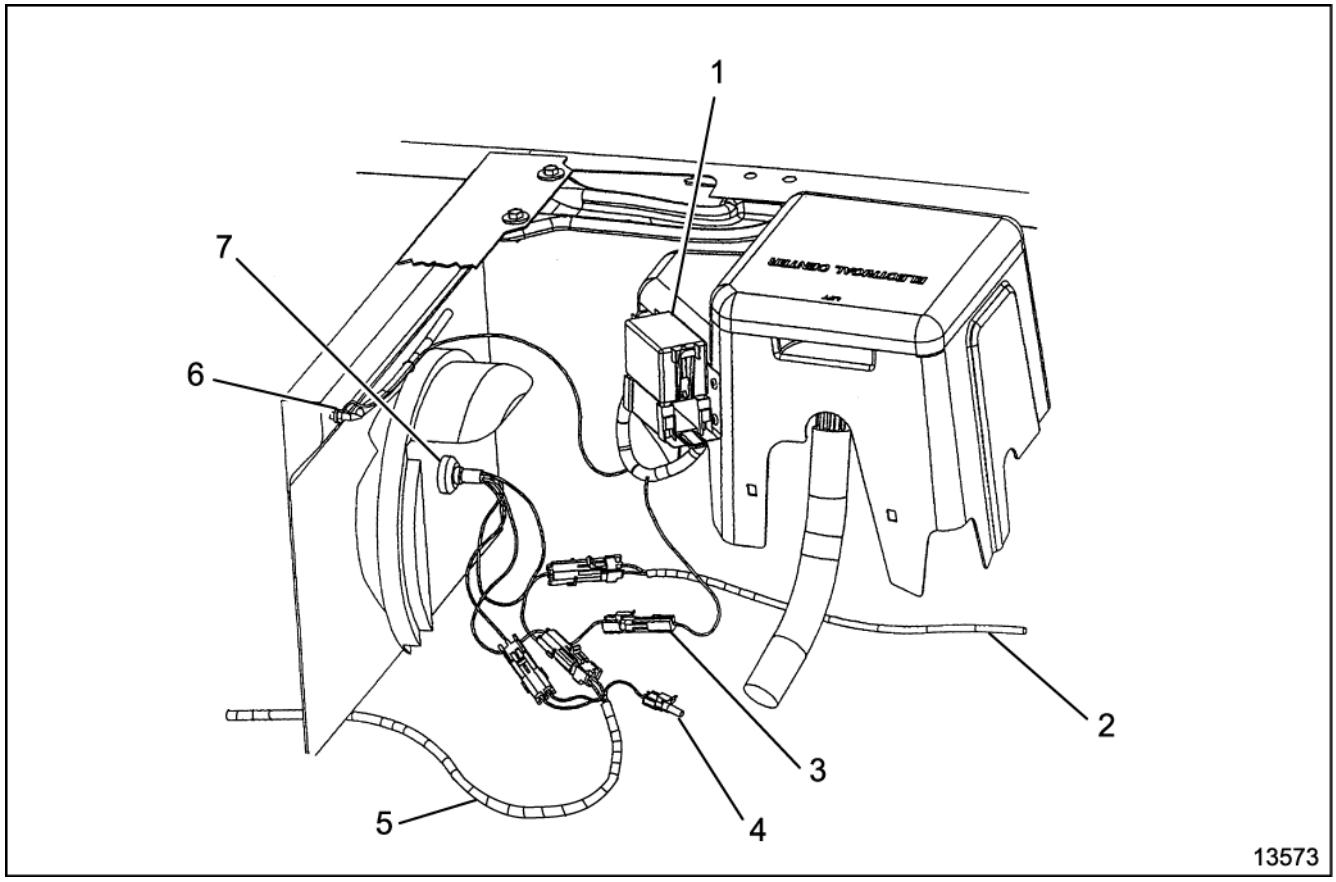
12V and 24V Circuit Breakers



Legend

(1) 50 amp 24V Circuit Breakers
(2) Circuit Breaker Bracket
(3) 120 amp 12V Circuit Breaker
(4) Bolt
(5) Buss Bar
(6) Bolt ½-20 x 0.75

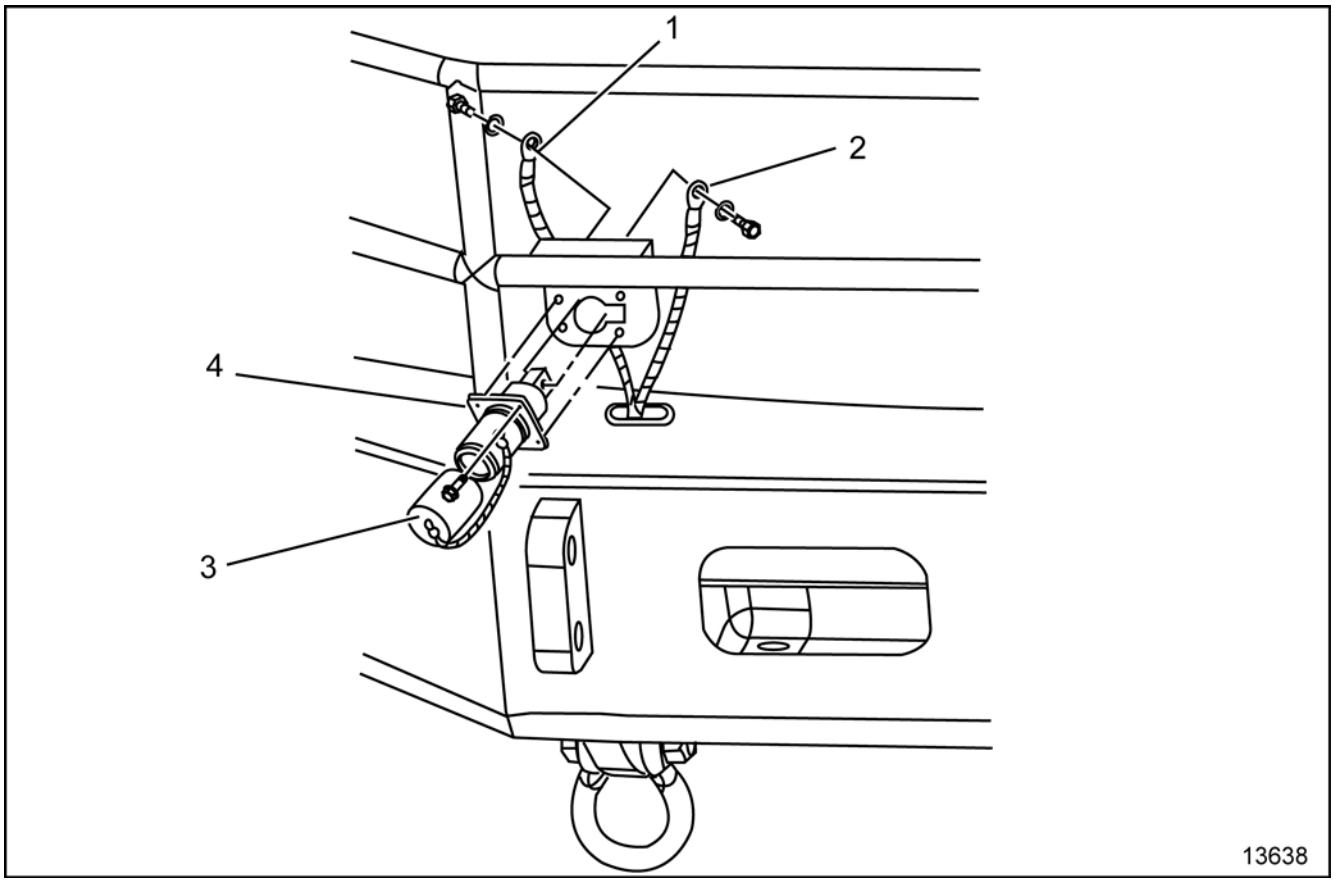
Underhood Wiring



Legend

(1) Interrupt Relays
(2) To Front Blackout (B/O) Lamps
(3) To Ground Stud
(4) To Engine Harness
(5) To Rear Extension Harness
(6) Ground Stud
(7) Blackout (B/O) Panel Harness

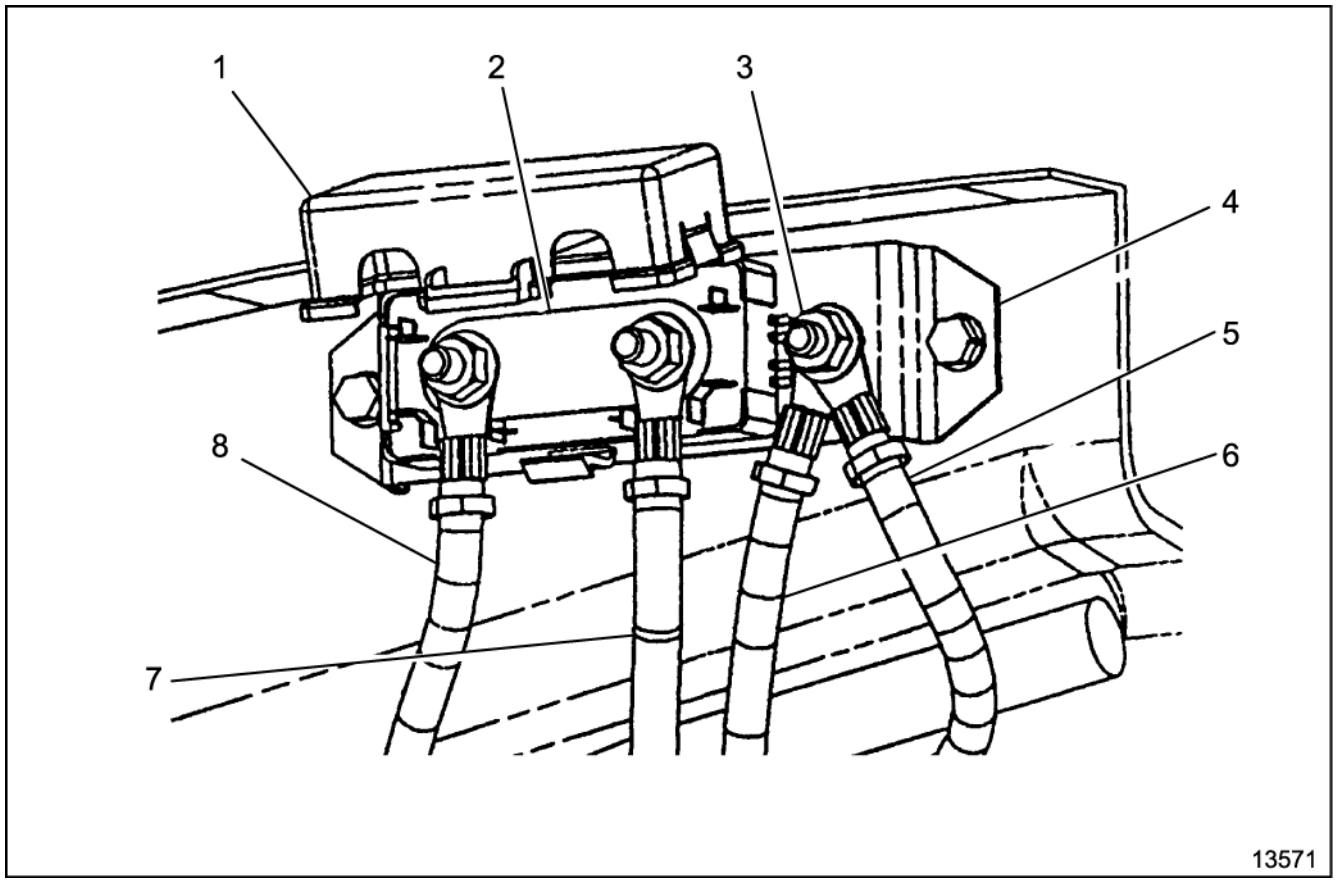
24V Slave Receptacle Assembly



Legend

(1) Battery Negative Ground (Black)
(2) Battery Positive Ground (Red)
(3) Slave Receptacle Cover
(4) Slave Receptacle

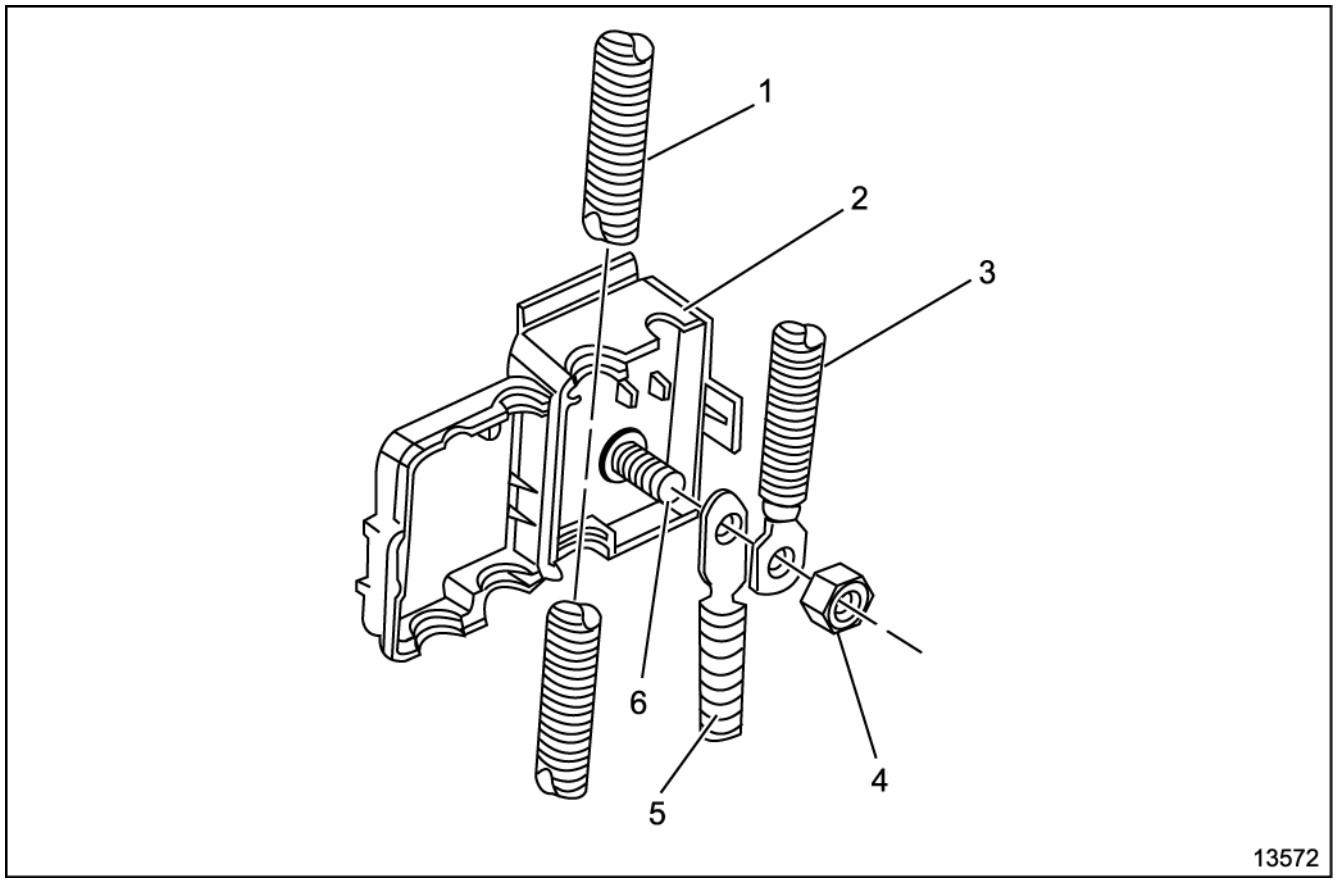
Bulkhead Junction Block



Legend

(1) Junction Block
(2) Jumper Plate
(3) Ground Connection
(4) Mounting Bracket
(5) Negative Winch Cable Rear
(6) Battery Negative Cable
(7) Battery Positive Cable
(8) Positive Winch Cable Rear

Winch Cable and Starter Cable Junction Block

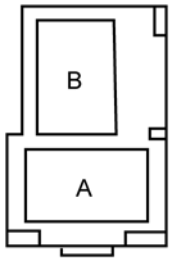


Legend

(1) Battery Positive Cable
(2) Junction Block
(3) Generator Output Cable
(4) Junction Block Post Nut
(5) Positive Winch Cable Front
(6) Junction Block Post

Starting and Charging Connector End Views

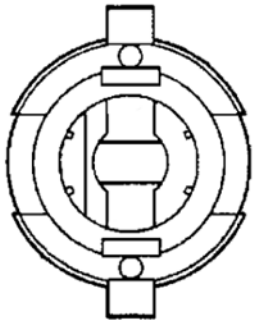
Voltmeter Connector



10547

Connector Part Information	• 02973781 • 2-Way Series 280 (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BRN	8008	Voltmeter Feed
B	BLK	150	Ground

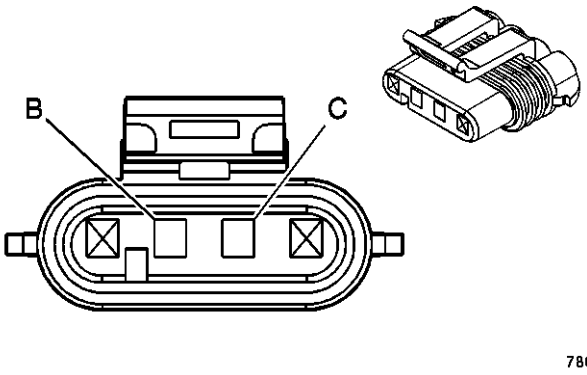
Voltmeter Lamp



7927

Connector Part Information	• 12004264 • 2F LP SOC Hardshell (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BRN	9	Voltmeter Feed
B	BLK	150	Ground

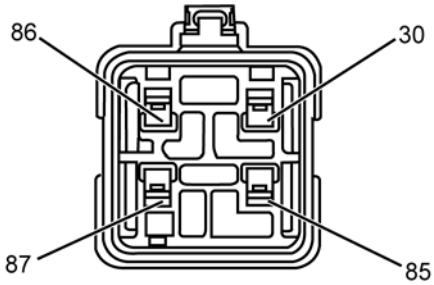
Generator Connector



7862

Connector Part Information	• 15355066 • 4-Way F Metri-Pack 150 Series Sealed (NAT)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	___	___	Not Used
B	YEL	8014	Generator Field Duty Cycle Signal
C-D	___	___	Not Used

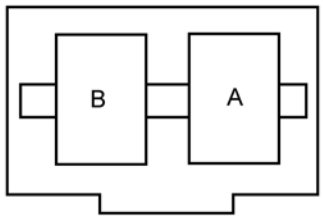
24V Generator Relay



10550

Connector Part Information	• 12129716 • 4-Way F MP Series 280 (GRY)		
Pin	**Wire Color**	**Circuit No.**	**Function**
30	BRN	8008	Operator Field Duty Cycle Signal
85	PNK	8002	UBEC Cavity A3
86	BLK	150	Ground
87	RED/BLK	8009	24V Battery Voltage

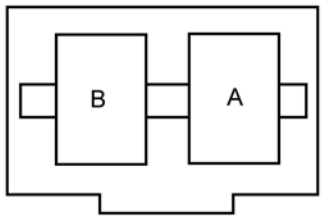
24V Trailer Fuse



10567

Connector Part Information	• 12010105 • 2-Way F Auto Fuse Holder		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	RED/BLK	8009	24V Battery Voltage
B	RED/WHT	802	Trailer Connector Supply Voltage

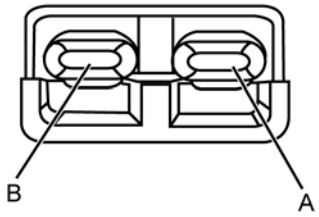
24V Auxiliary Fuse



10567

Connector Part Information	• 12010105 • 2-Way F Auto Fuse Holder		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	RED/BLK	8009	24V Battery Voltage
B	RED/BLK	8009	24V Feed (Not Used)

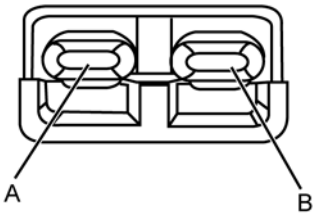
Multi-Mount Winch Vehicle Connector - Front



10804

Connector Part Information	• TX017639 • 2-Way (RED)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK/RED	1	Positive
B	BLK	150	Negative

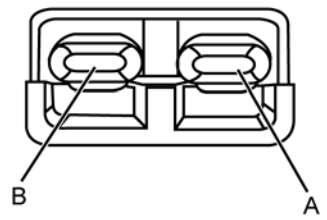
Multi-Mount Winch Connector



10805

Connector Part Information	• TX017639 or TX017640 • 2-Way (RED)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK	150	Negative
B	BLK/RED	1	Positive

Multi-Mount Winch Vehicle Connector - Rear



10804

Connector Part Information	• TX017640 • 2-Way (RED)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK/RED	1	Positive
B	BLK	150	Negative

Diagnostic Information and Procedures

Symptom List

Note: For vehicle no start condition, refer to Diagnostic System Check in Engine Controls – 6.6L in the 2003 C/K Truck Service Manual.

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- Voltmeter Lamp Inoperative
- Battery Equalizer Inoperative
- Voltmeter Inoperative
- 24V Generator Noise Diagnosis
- 24V Generator Inoperative
- Battery Inspection Test

Voltmeter Lamp Inoperative

Voltmeter Lamp Inoperative

Step	Action	Yes	No
Schematic Reference: Engine Electrical			
1	Did you review the Charging System Description and Operation?	Go to Step 2	Go to Description and Operation
2	Connect a test lamp between cavity A of the voltmeter bulb and ground. Does the test lamp illuminate?	Go to Step 3	Go to Step 4
3	Connect a self-powered test lamp to cavity B and ground. Does the test lamp illuminate?	Go to Step 5	Go to Step 6
4	Locate and repair the open or high resistance in circuit 9. Did you complete the repair?	Go to Step 7	—
5	Replace the voltmeter bulb. Did you complete the replacement?	Go to Step 7	—
6	Locate and repair the open or high resistance in circuit 150. Did you complete the repair?	Go to Step 7	—
7	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Battery Equalizer Inoperative

Diagnostic Aids

If the +12V voltage is normal and the STATUS INDICATOR is OFF, the batteries are equalized and the equalizer is waiting for a 12V load. Turn ON a 12V load and the STATUS INDICATOR should turn ON. If it does there is no problem with equalizer.

Battery Equalizer Inoperative

Step	Action	Yes	No
1	Did you review the Charging System Description and Operation?	Go to Step 2	Go to Description and Operation
2	Connect a test lamp between the 12V terminal of the equalizer and ground. Does the test lamp illuminate?	Go to Step 3	Go to Step 4
3	Connect a test lamp between the 24V terminal and ground. Does the test lamp illuminate?	Go to Step 6	Go to Step 5
4	Connect a test lamp between the output side of the 12V circuit breaker and ground. Does the test lamp illuminate?	Go to Step 8	Go to Step 9
5	Connect a test lamp between the output side of the 24V circuit breaker and ground. Does the test lamp illuminate?	Go to Step 11	Refer to Step 9
6	Connect a self-powered test lamp to the ground terminal and ground. Does the test lamp illuminate?	Go to Step 7	Go to Step 13
7	Replace the battery equalizer. Did you complete the replacement?	Go to Step 14	—
8	Locate and repair the open or high resistance in circuit 152. Did you complete the repair?	Go to Step 14	—
9	Connect a test lamp on the input side of the circuit breaker and ground. Does the test lamp illuminate?	Go to Step 10	Go to Step 12
10	Locate the source of the overload and replace the circuit breaker. Did you complete the repair?	Go to Step 14	—
11	Locate and repair the open or high resistance in circuit 900 between the equalizer and the circuit breaker. Did you complete the repair?	Go to Step 14	—
12	Locate and repair the open or high resistance in the power feed circuit. Did you complete the repair?	Go to Step 14	—
13	Locate and repair the open or high resistance in circuit 150. Did you complete the repair?	Go to Step 14	—
14	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Voltmeter Inoperative

Diagnostic Aids

The 24V Battery must be fully charged before testing the voltmeter for proper operation. Refer to Battery Inspection/Test (24V).

Voltmeter Inoperative

Step	Action	Yes	No
Schematic Reference: Engine Electrical			
1	Did you review the Charging System Description and Operation?	Go to Step 2	Go to Description and Operation
2	With the ignition on, connect a test lamp between cavity A of the voltmeter and ground. Does the test lamp illuminate?	Go to Step 3	Go to Step 4
3	Connect a test lamp between cavity B of the voltmeter and ground. Does the test lamp illuminate?	Go to Step 5	Go to Step 6
4	Connect a test lamp between cavity 30 of the voltmeter relay and ground. Does the test lamp illuminate?	Go to Step 7	Go to Step 8
5	Locate and repair the open in circuit 150. Did you complete the repair?	Go to Step 15	—
6	Replace the voltmeter. Did you complete the repair?	Go to Step 15	—
7	Locate and repair the open or high resistance in circuit 8008. Did you complete the repair?	Go to Step 15	—
8	Connect a test lamp between cavity 87 and ground. Does the test lamp illuminate?	Go to Step 10	Go to Step 9
9	Locate and repair the open or high resistance in circuit 8009. Did you find and correct the condition?	Go to Step 15	Go to 24V Generator Inoperative
10	Connect a test lamp between cavity 85 of the voltmeter relay and ground. Does the test lamp illuminate?	Go to Step 11	Go to Step 14
11	Connect a test lamp between cavity 86 and ground. Does the test lamp illuminate?	Go to Step 13	Go to Step 12
12	Replace the voltmeter relay. Did you complete the replacement?	Go to Step 15	—
13	Locate or repair the open or high resistance in circuit 150. Did you complete the repair?	Go to Step 15	—
14	Locate and repair the open or high resistance in circuit 8002. Did you complete the repair?	Go to Step 15	—
15	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

24V Generator Noise Diagnosis

Diagnostic Aids

Noise from a generator may be due to electrical or mechanical noise. Electrical noise or magnetic whine usually varies with the electrical load placed on the generator and is a normal operating characteristic of all generators. When diagnosing a noisy generator, it is important to remember that loose or misaligned components around the generator may transmit the noise into the passenger compartment and that replacing the generator may not solve the problem.

24V Generator Noise Diagnosis

Step	Action	Yes	No
1	Test the generator for proper operation using the generator tester. Refer to Charging System Test in Engine Electrical in 2003 C/K Truck Service Manual. Is the generator operating properly?	Go to Step 2	Go to Step 10
2	1. Start the engine. Verify that the noise can be heard. 2. Turn OFF the engine. 3. Disconnect the 4-way connector from the generator. 4. Start the engine. 5. Listen for the noise. Has the noise stopped?	Go to Step 10	Go to Step 3
3	1. Turn OFF the engine. 2. Remove the drive belt. Refer to Drive Belt Replacement in Engine Mechanical 6.6 L in 2003 C/K Truck Service Manual. 3. Spin the generator pulley by hand. Does the generator shaft spin smoothly and without any roughness or grinding noise?	Go to Step 4	Go to Step 10
4	Inspect the generator for a loose pulley and/or pulley nut. Is the generator pulley or pulley nut loose?	Go to Step 10	Go to Step 5
5	Inspect the generator for the following conditions: • Strained or stretched electrical connections. • Hoses or other vehicle equipment resting on the generator, which may cause the noise to be transmitted into the passenger compartment. Are any electrical connections pulling on the generator or are any hoses, etc. resting on the generator?	Go to Step 6	Go to Step 7
6	1. Reroute the electrical connections to relieve the tension. 2. Reroute the hoses, etc. away from the generator. 3. Start the engine. Has the noise decreased or stopped?	System OK	Go to Step 7
7	Inspect the drive belt for proper tension. Refer to Drive Belt Tensioner Diagnosis in Engine Mechanical 6.6 L in 2003 C/K Truck Service Manual. Is the drive belt loose?	Go to Step 8	Go to Step 9

24V Generator Noise Diagnosis (cont'd)

Step	Action	Yes	No
8	1. Replace the drive belt tensioner. Refer to Drive Belt Tensioner Replacement in Engine Mechanical – 6.6L in 2003 C/K Truck Service Manual. 2. Start the engine. Has the noise decreased or stopped?	System OK	Go to Step 10
9	Compare the vehicle with a known good vehicle. Do both vehicles make the same noise?	System OK	Go to Step 10
10	**Important:** If no definite generator problems were found, be sure that all other possible sources of objectionable noise are eliminated before replacing the generator. Replacing the generator may not change the noise level if the noise is a normal characteristic of the generator or the generator mounting. Replace the generator. Refer to 24V Generator Replacement. Has the noise decreased or stopped?	Go to Step 11	—
11	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

24V Generator Inoperative

24V Generator Inoperative

Step	Action	Value(s)	Yes	No
Schematic Reference: Engine Electrical				
1	Did you review the Charging System Description and Operation?	—	Go to Step 2	Go to Description and Operation
2	Using a DMM, measure the voltage across the 24V battery terminals. Is the voltage between the specified voltage?	18.0-28.5V	Go to Step 3	Go to Battery Inspection Test (24V)
3	1. Start the engine. 2. Using a DMM, measure the voltage between the generator terminal B and ground. Is the voltage greater than the specified value?	7V	Go to Step 4	Go to Step 6
4	Using a DMM, measure the voltage from the BATT terminal and ground. Is the voltage greater than the specified voltage?	7V	Go to Step 5	Go to Step 7
5	Connect a test lamp between ground terminal of the generator and battery negative. Does the test lamp illuminate?	—	Go to Step 8	Go to Step 10
6	Connect a test lamp between terminal 30 of the 24V relay and ground. Does the test lamp illuminate?	—	Go to Step 9	Go to Step 11

24V Generator Inoperative (cont'd)

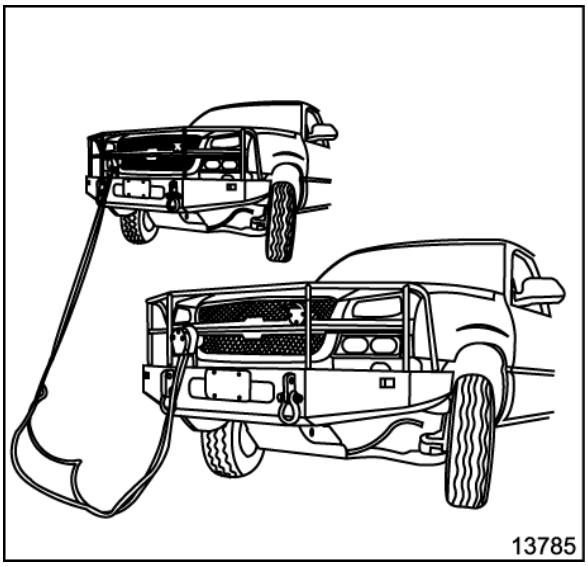
Step	Action	Value(s)	Yes	No
7	Repair the generator voltage circuit for an open or high resistance. Did you complete the repair?	—	Go to Step 17	—
8	Test the generator ground circuit for an open or high resistance. Did you find and correct the condition?	—	Go to Step 17	Go to Step 10
9	Repair the generator field circuit for an open or high resistance. Did you complete the repair?	—	Go to Step 17	—
10	Replace the generator. Refer to 24V Generator Replacement. Did you complete the replacement?	—	Go to Step 17	—
11	Connect a test lamp between terminal 85 and ground. Did the test lamp illuminate?	—	Go to Step 12	Go to Step 14
12	Connect a test lamp between terminal 86 and ground. Did the test lamp illuminate?	—	Go to Step 16	Go to Step 14
13	Repair the 24V relay control voltage circuit for an open or high resistance. Did you complete the repair?	—	Go to Step 17	—
14	Connect a test lamp between terminal 87 of the 24V relay and ground. Did the test lamp illuminate?	—	Go to Step 15	Go to Step 13
15	Replace the 24V relay. Refer to Relay Replacement – 24V Generator. Did you complete the replacement?	—	Go to Step 17	—
16	Repair the 24V relay ground control circuit for an open or high resistance. Did you complete the repair?	—	Go to Step 17	—
17	Operate the system in order to verify the repair. Did you correct the condition?	—	System OK	Go to Step 2

Battery Inspection/Test (24V)

For testing the dual batteries or 24V battery use Out of Vehicle test for each battery. Refer to Battery Inspection/Test in Engine Electrical in 2003 C/K Truck Service Manual.

Repair Instructions

Jump Starting in Case of Emergency

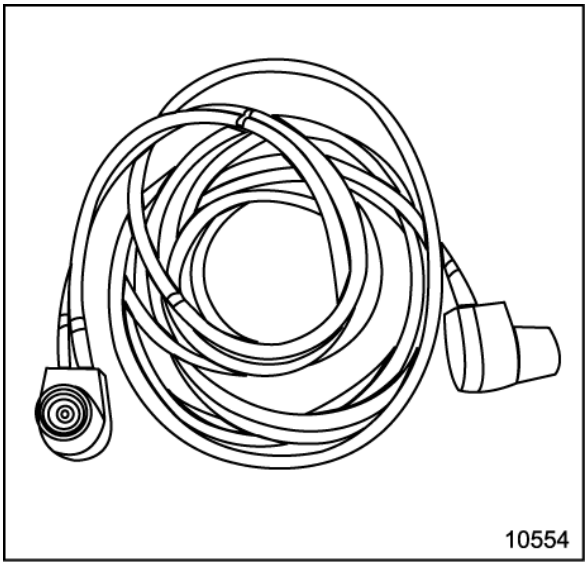


If the battery (or batteries) on the vehicle has run down and the vehicle will not start, you may want to use another vehicle to provide power to start the vehicle.

The NATO term for this system is Slave receptacle. In the event the system must be replaced, refer to Slave Receptacle Replacement in Bumpers.

NATO Slave Cables are the only recommended method of jump starting similar vehicles.

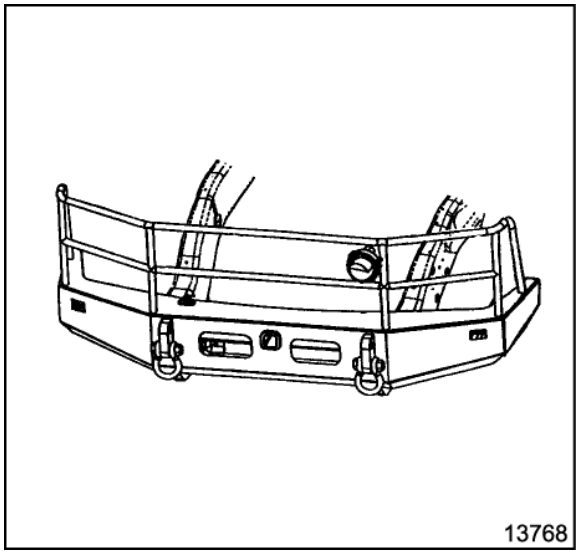
Slave Starting



Caution: Batteries can hurt you. They can be dangerous because they contain acid that can burn you. They contain gas that can explode or ignite. They contain enough electricity to burn you. If you don't follow these steps exactly some or all of these things can hurt you.

Notice: Ignoring these steps could result in costly damage to the vehicle. Trying to start your vehicle by pushing or pulling it won't work and it could damage your vehicle.

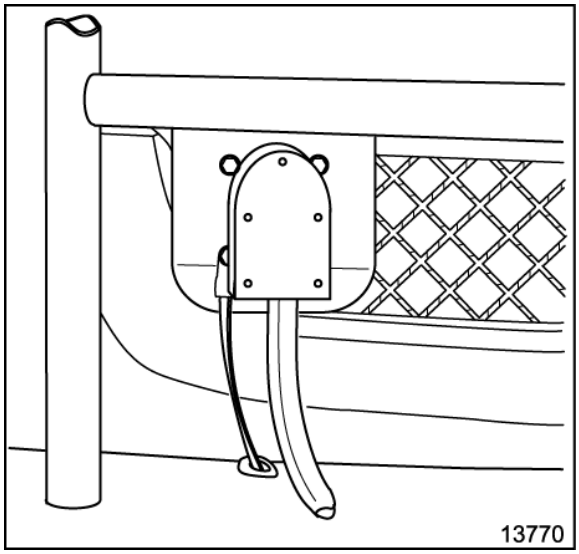
You should always use the NATO Slave Receptacle and Slave Cable when performing this operation.



1. Position the vehicles close enough so the slave cable can reach, but be sure the vehicles are not touching each other. If they are, it could cause a ground connection. You would not be able to start your vehicle, and the bad grounding could damage the electrical systems. To avoid the possibility of the vehicles rolling, set the parking brake firmly on both vehicles involved in the jump start procedure. Put the automatic transmission in PARK (P). Be sure the transfer case is not in NEUTRAL (N).
2. Turn OFF the ignition on both vehicles. Unplug unnecessary accessories plugged into the cigarette lighter or accessory power outlets. Turn OFF all lamps that aren't needed as well as radios. This will avoid sparks and help save both batteries.
3. Locate the slave receptacles on both vehicles.

Caution: Using a open flame near a battery can cause battery gas to explode. People have been hurt doing this, and some have been blinded. Use a flashlight if you need more light. Be sure the batteries have enough water. You don't need to add water to the Optima battery (or batteries) installed in every vehicle. But if a battery has filler caps, be sure the right amount of fluid is there. If it is low add water to take care of that first. If you don't explosive gas could be present. Don't get it on you. If you accidentally get it in your eyes or on your skin, flush the place with water and get medical help immediately.

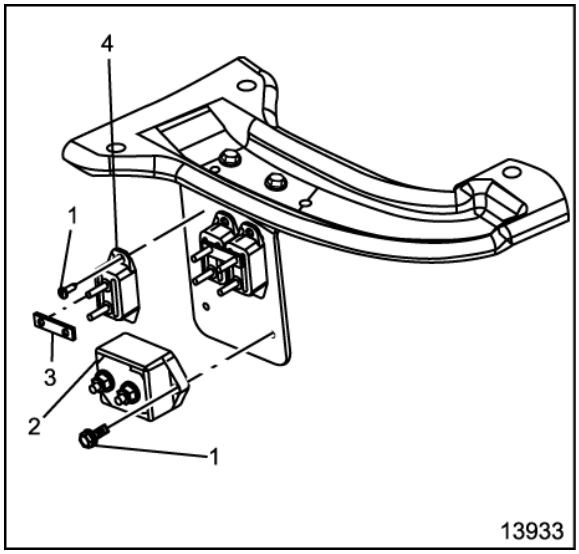
Caution: Fans or other moving engine parts can injure you badly. Keep your hands away from moving parts once the engine is running.



4. Connect the slave cable to the vehicle with the dead battery.
5. Start the vehicle with the good batteries.
6. Connect the slave cable to the vehicle with the good battery.
7. Allow the vehicle with the dead battery to charge for 10 minutes.

Note: It may take up to 30 minutes to charge the battery depending on its state of charge.

8. Start the vehicle with the dead battery.
9. Remove the slave cable in the reverse order that it was installed. Take care not to let the cables touch a metal surface.



Circuit Breaker Replacement – 12V or 24V

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure.
2. Remove the nuts holding the wires to the circuit breaker and remove the wires.

Note: Note the location of wires for reassembly.

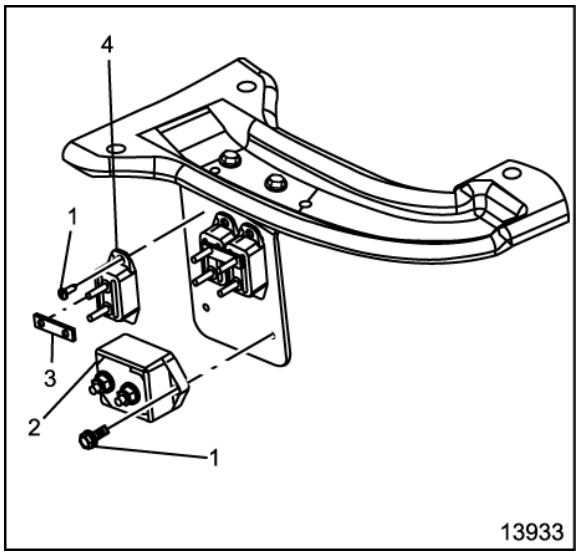
3. Remove the 2 bolts (1), holding the 12V (4) or 24V (2) circuit breaker to the fender support.
4. Remove the 12V (4) or 24V (2) circuit breaker.

Installation Procedure

1. Install the 12V (4) or 24V (2) circuit breaker to the fender support with the 2 bolts (1).

Note: Install 24V circuit breaker with auxiliary contact up.

2. Install the wires to the circuit breaker with the two nuts.
3. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure.

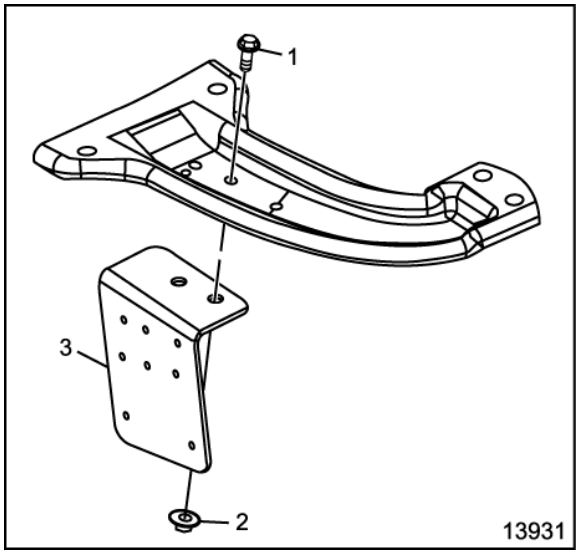


Circuit Breaker Bracket Replacement

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

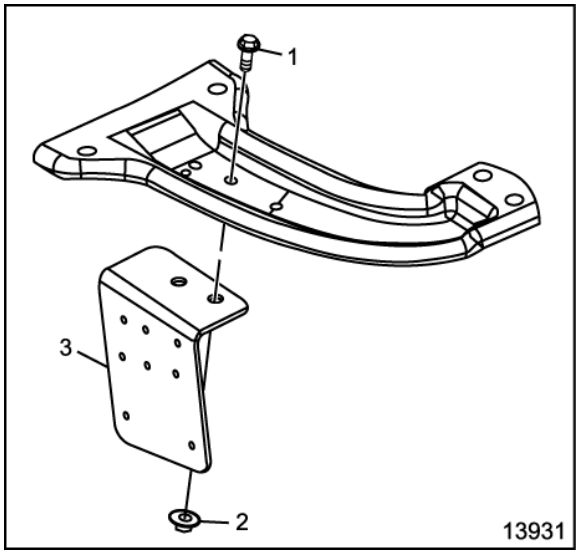
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure.
2. Remove the circuit breakers. Refer to Circuit Breaker Replacement – 12V or 24V.
3. Remove the retainers (1, 2) attaching the bracket (3) to the fender/cowl support.

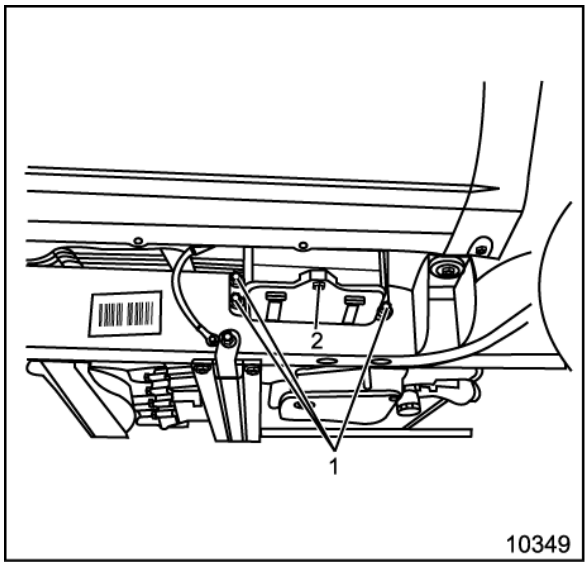


Installation Procedure

Notice: Refer to Fastener Notice in Cautions and Notices.

1. Install the bracket (3) to the fender/cowl and tighten the retainers (1, 2).
   Tighten
   Tighten bracket bolts to 6 N•m (53 lb in).
2. Install the circuit breakers. Refer to Circuit Breaker Replacement – 12V or 24V.
3. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure.





Battery Tray/Battery Replacement

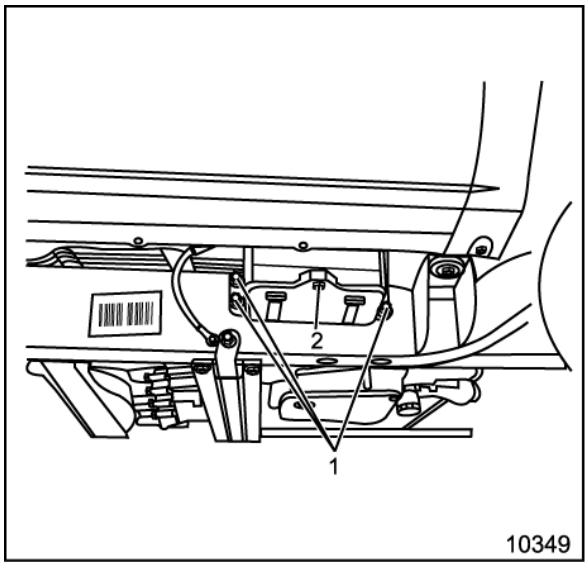
Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure.
2. Loosen the bolts (1). Push up the battery tray (2) and remove from frame.

Caution: Do not let the battery posts touch the frame.

3. Unsnap the positive battery cable cover.
4. Remove the negative and positive battery cables.
5. Remove the retainer bolt and remove battery.



Installation Procedure

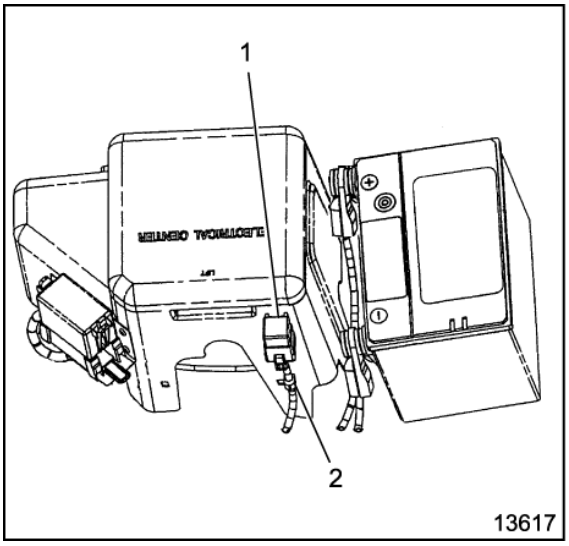
1. Install the battery in tray.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the battery retainer and tighten bolt.
   Tighten
   Tighten retainer bolt to 25 N•m (18 lb ft).
3. Install the positive and negative cables and tighten.
   Tighten
   Tighten cables to 17 N•m (13 lb ft).
4. Snap the positive battery cable cover closed.

Caution: Do not let the battery posts touch the frame.

5. Lift the battery tray onto the bolts on the frame and tighten.
6. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure.

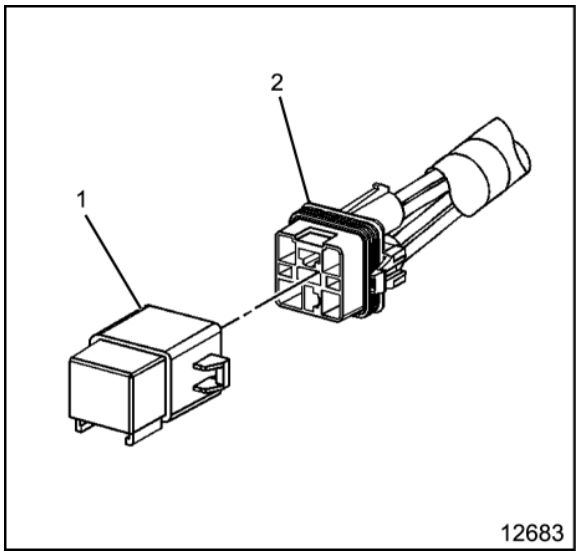


Relay Replacement – 24V Generator

Removal Procedure

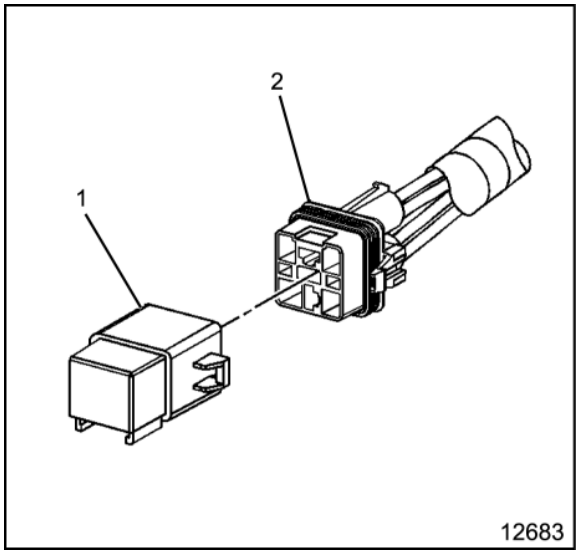
1. Release the clip (2) securing the wiring harness to the underhood electrical center housing.
2. Remove the 24V relay (1) from the underhood electrical center housing.

3. Remove the connector position assurance (CPA) devices or secondary locks.
4. Separate the relay (1) from the wiring harness connector (2).

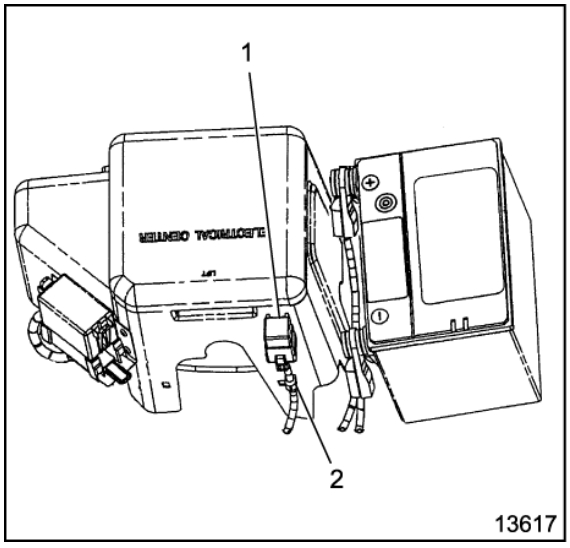


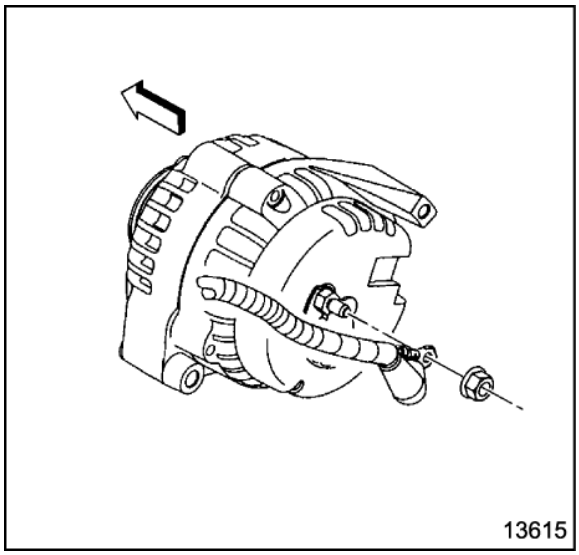
Installation Procedure

1. Connect the relay (1) to the wiring harness connector (2).
2. Install any connector position assurance (CPA) devices or secondary locks.



3. Install the 24V relay (1) onto the underhood junction block.
4. Secure the wiring harness to the clip (2).



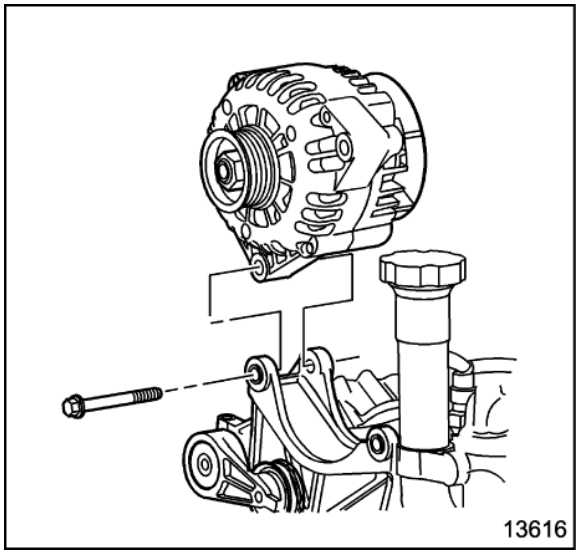


24V Generator Replacement

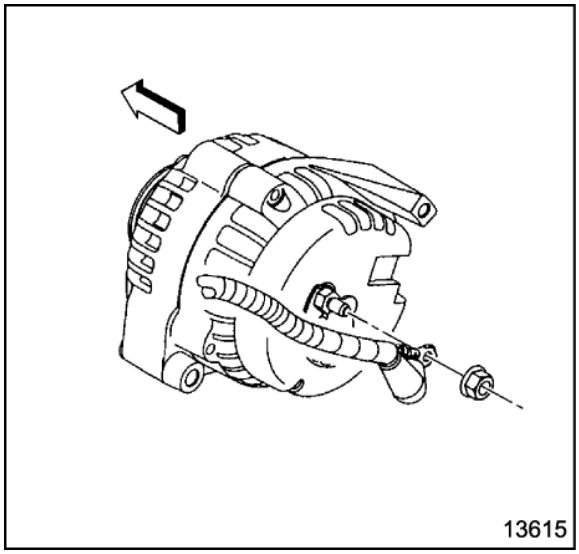
Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure.
2. Remove the drive belt. Refer to Drive Belt Replacement in Engine Mechanical – 6.6L in the 2003 C/K Truck Service Manual.
3. Disconnect the generator electrical connector.
4. Remove the cable from the output stud.



5. Remove the generator bolts.
6. Remove the generator from the vehicle.



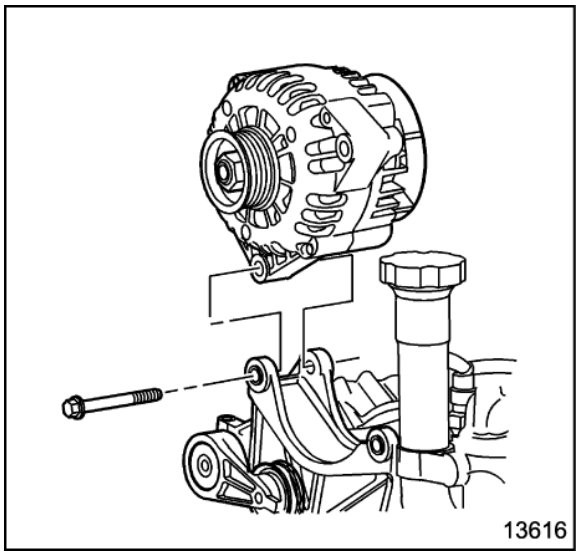
Installation Procedure

1. Install the cable onto the output stud of the generator.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the nut onto the output stud.
   Tighten
   Tighten output stud to 9 N•m (80 lb in).

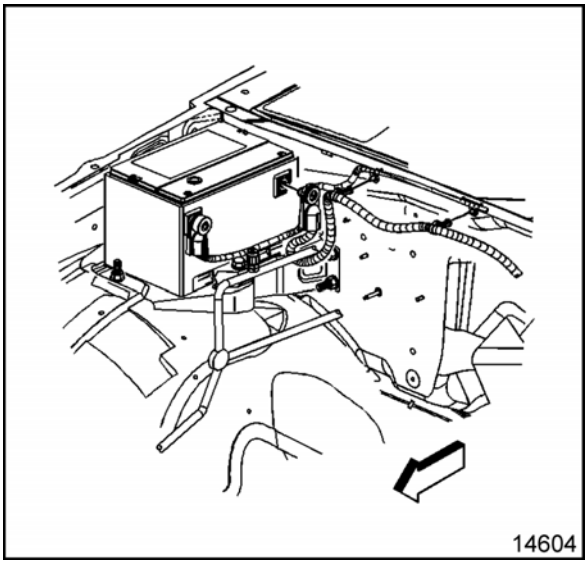
3. Install the generator into the mounting bracket.
4. Install the generator bolts.
   Tighten
   Tighten generator bolts to 50 N•m (37 lb ft).
5. Connect the generator electrical connector.
6. Install the drive belt. Refer to Drive Belt Replacement in Engine Mechanical – 6.6L in the 2003 C/K Truck Service Manual.
7. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure.



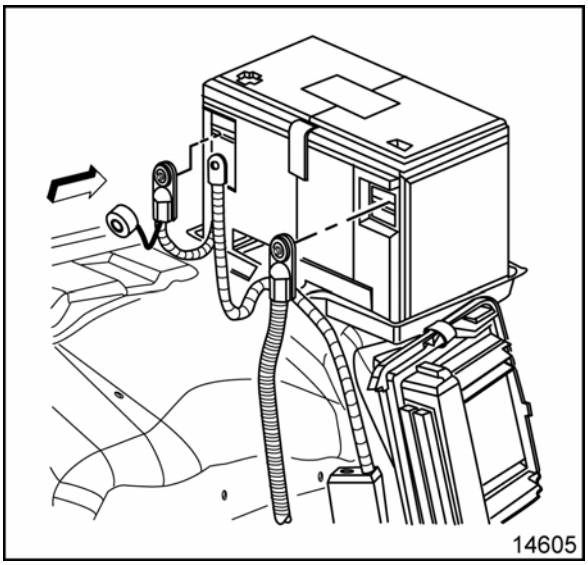
Battery Cable Disconnect/Connect Procedure

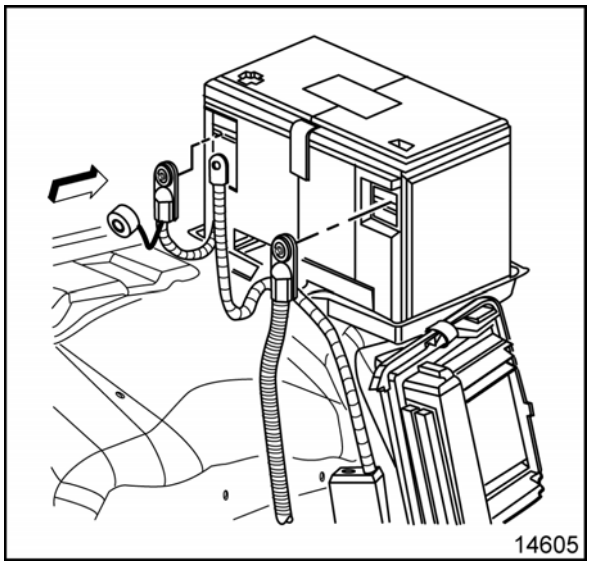
Removal Procedure

1. Turn OFF all the lamps and accessories.
2. Turn OFF the ignition.
3. Remove the negative cable from the frame mounted battery.
4. Remove the battery negative cable from the right underhood battery.



5. Remove the negative cable of the 24V battery.
6. Remove the positive cable of the 24V battery.





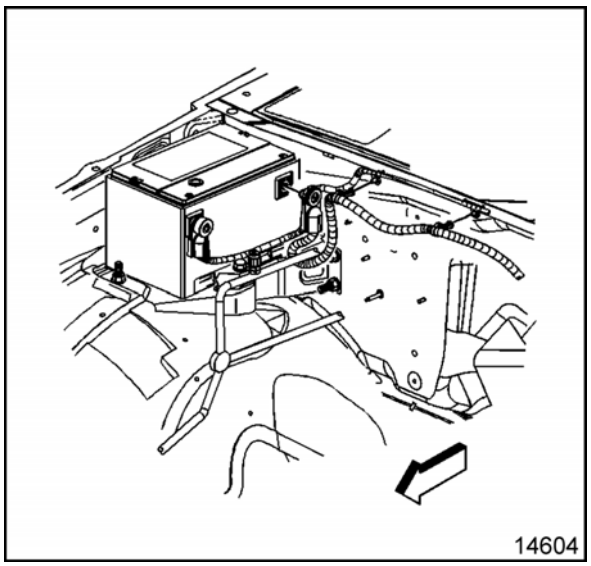
Installation Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

Notice: Refer to Fastener Notice in Cautions and Notices

Important: Clean any existing corrosion from the battery terminal bolt flange and the battery cable end.

1. Install the positive cable to the 24V battery.
2. Install the battery ground negative cable to the 24V battery.
   Tighten
   Tighten the bolt to 17 N•m (13 lb ft).
3. Install the negative battery cable to the right underhood battery.
   Tighten
   Tighten the bolt to 17 N•m (13 lb ft).



4. Install the negative cable of the frame mounted battery.
   Tighten
   Tighten the bolt to 17 N•m (13 lb ft).

Description and Operation

Battery Description (12V and 24V)

The engine electrical options include the slave receptacle, battery equalizer, and a three-battery power system.

The two batteries in series provide 24V of power, which is isolated by the power equalizer and controlled by the circuit breakers. These step the power down to 12V from 24V. Greater power is needed for the higher load used by optional radio communications, or for compatibility with other slave receptacles on other vehicles.

Refer to in the 2003 C/K Truck Service Manual for further details. Refer to Replacement procedures in this manual for repairs on various electrical components.

Maintenance

The 24V power system makes each vehicle capable of accepting a power boost through its slave receptacle from any vehicle similarly equipped. This 24V system requires specific maintenance.

Note: Repairs in this manual are limited to the specific military equipment included in the LSSV options most commonly ordered.

Charging System Description and Circuit Operation

Charging

The LSSV vehicles are equipped with a 24V generator. The 24V generator's electronics are isolated from the chassis ground. The 24V configuration provides sufficient capacity and reserve for 24V loads. Electrical loads can be connected indefinitely while the engine is running and a limited time when engine was OFF. The 24V battery must be above 7 volts in order for the generator to turn ON. The generator features permanently lubricated bearings. Service should only include the tightening of mounting components. Otherwise the generator is replaced as a complete unit.

Battery Equalizer

The primary function of the Battery Equalizer is to maintain battery balance or equalization charge in a predominately 24V system which requires clean, regulated 12V power. The Battery Equalizer can deliver up to 100 amps of continuous, clean 12V current for practically any 12V load, such as two-way radios, navigations blackout lighting and other military options.

24V Voltmeter

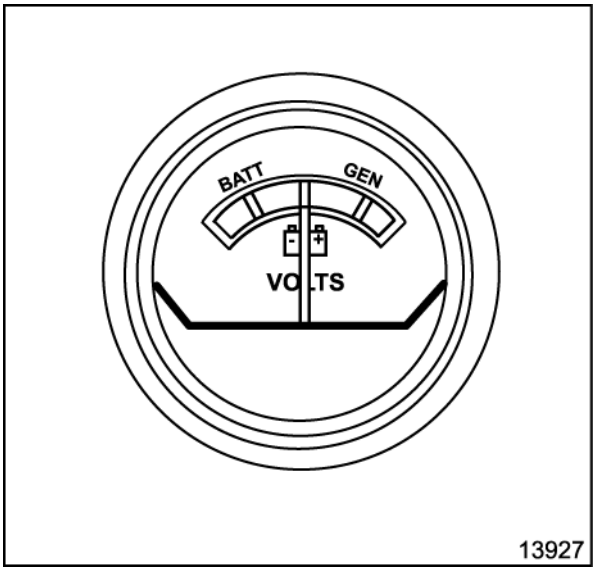
A voltmeter is installed to monitor the status of the 24-volt battery and the 24-volt generator.

Voltage is available through circuit 901 (ORN) wire of the voltmeter relay. When the ignition switch is placed in the ON position voltage is applied to the power converter 24V regulator that provides voltage to the voltmeter relay. The voltmeter is grounded at G200 through the convenience center.

Color graduations as viewed from the front of the meter from left to right are as follows:

- Minimum voltage to activate the pointer is 18.0-volts
- Red/Yellow Break Point 22.0-volts
- Yellow/Green Break Point 26.0-volts
- Small Hack Mark (in green) 28.5-volts

The voltmeter needle should be in the green band during normal load operation. During no load situation the voltmeter needle should be between the yellow and green bands.



BLANK

Section 8

Body and Accessories

Wiring Systems

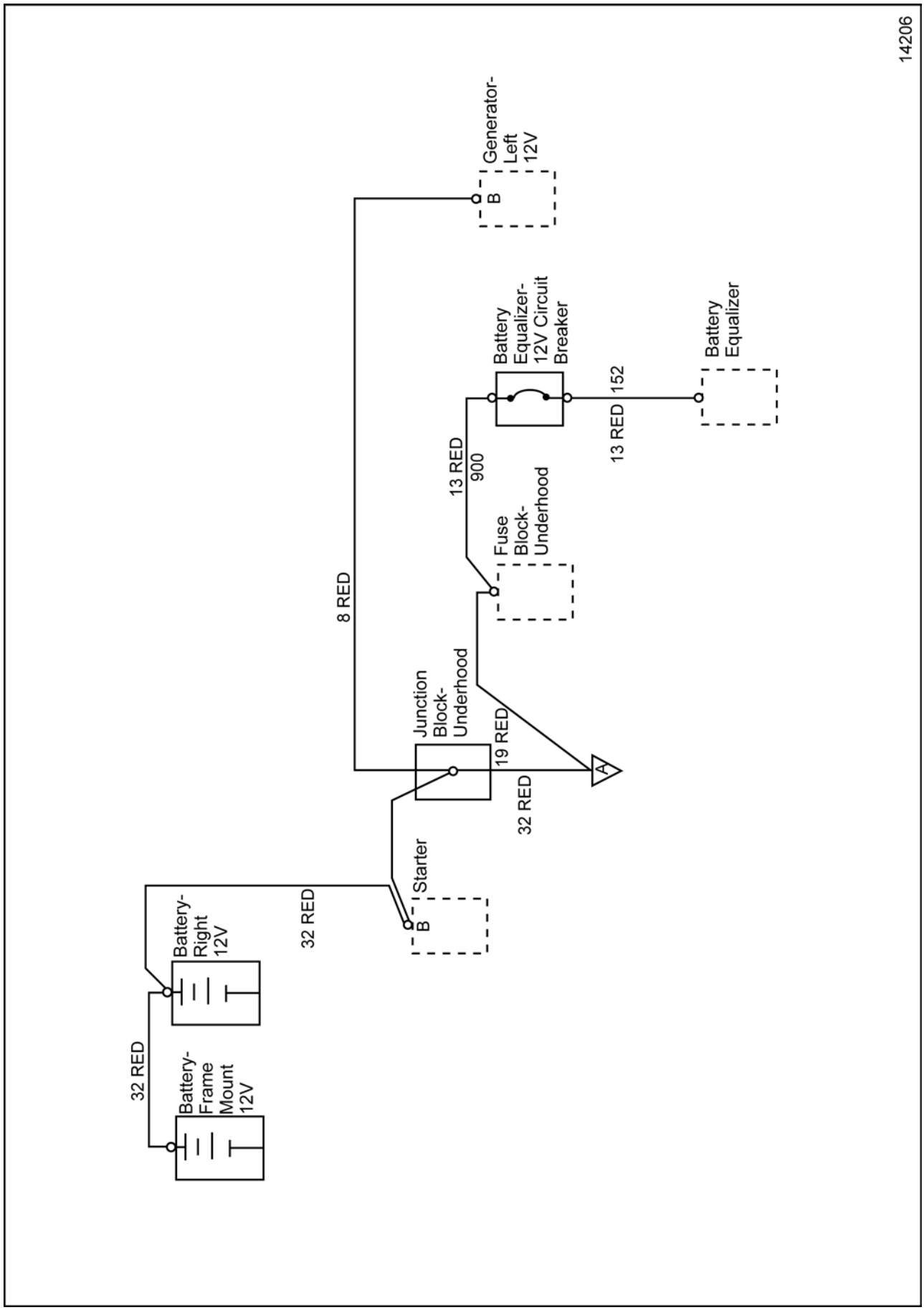
Specifications

Fastener Tightening Specifications

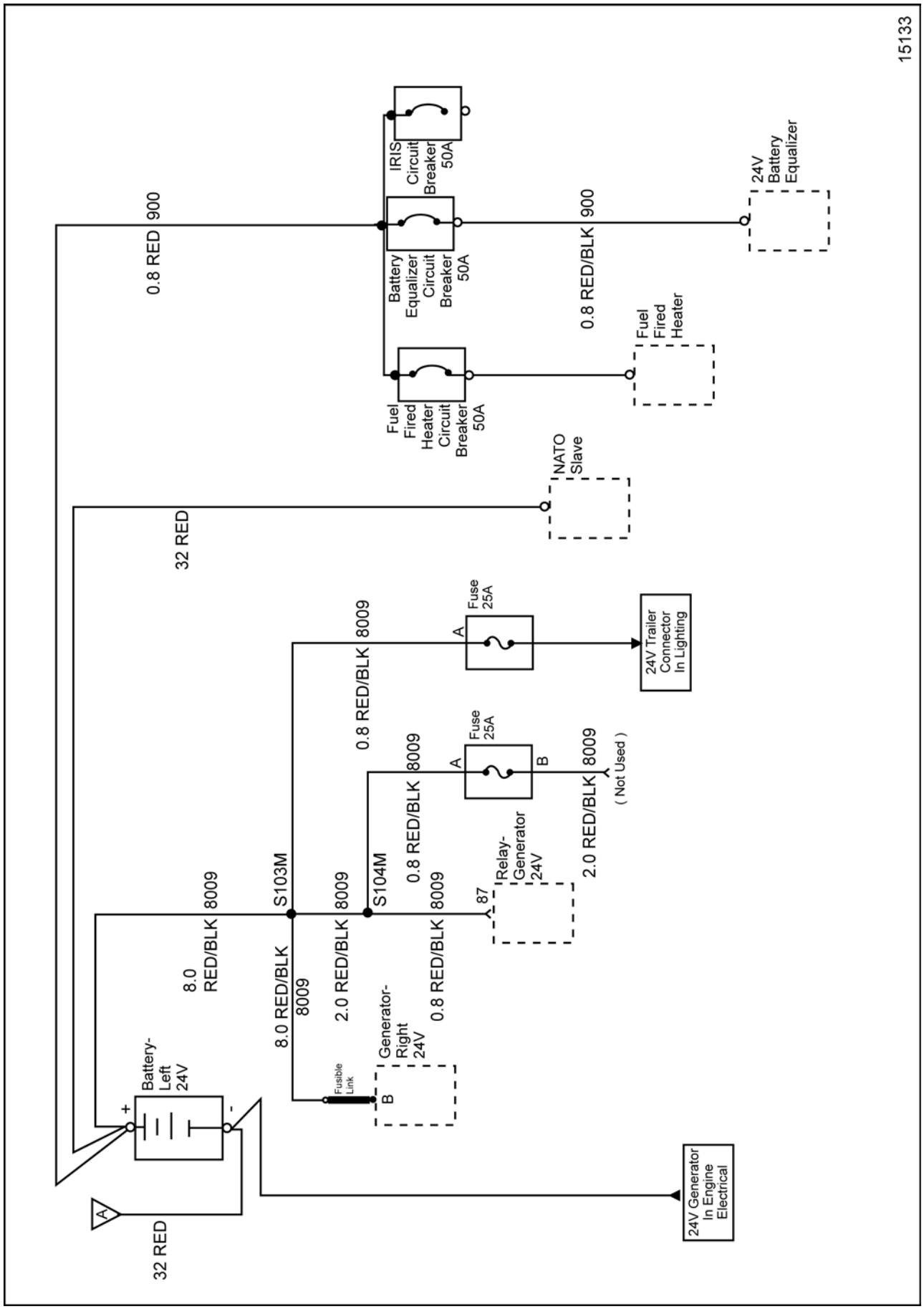
Application	Specification	
	Metric	English
Battery Cable Connections	17 N•m	13 lb ft
Fender Brace Bolts	25 N•m	18 lb ft
Front Winch Ground Cable Bolt	34 N•m	25 lb ft
Junction Block Nut	9 N•m	80 lb in
Rear Winch Junction Block Nut	9 N•m	80 lb in
Trailer Connector Bolts	5 N•m	44 lb in
Winch Connector Bolt	5-8 N•m	44-71 lb in
Winch Harness Clamp Bolt	18-29 N•m	13-21 lb ft

Schematic and Routing Diagrams

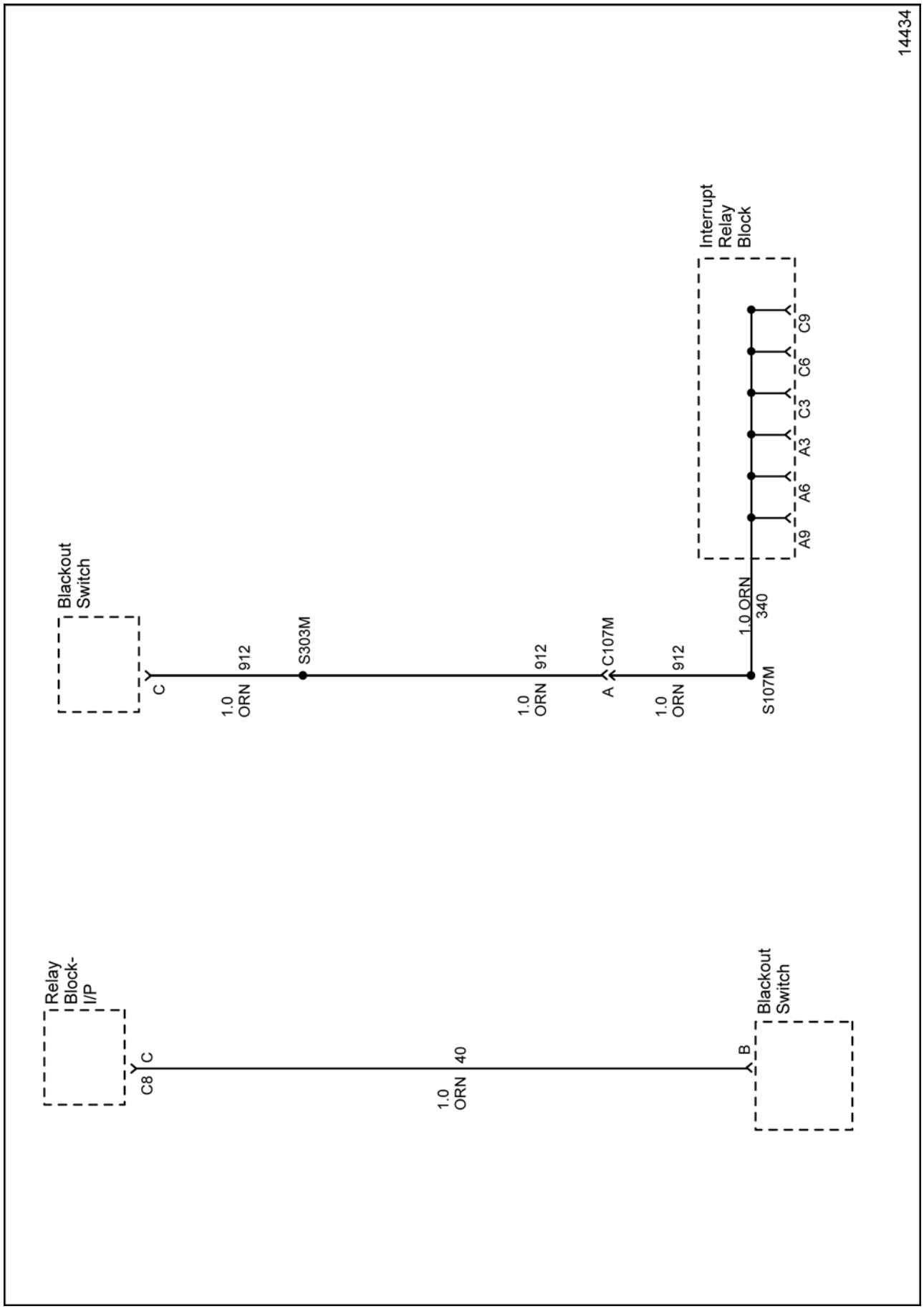
Power Distribution Schematics
Power Distribution 12V



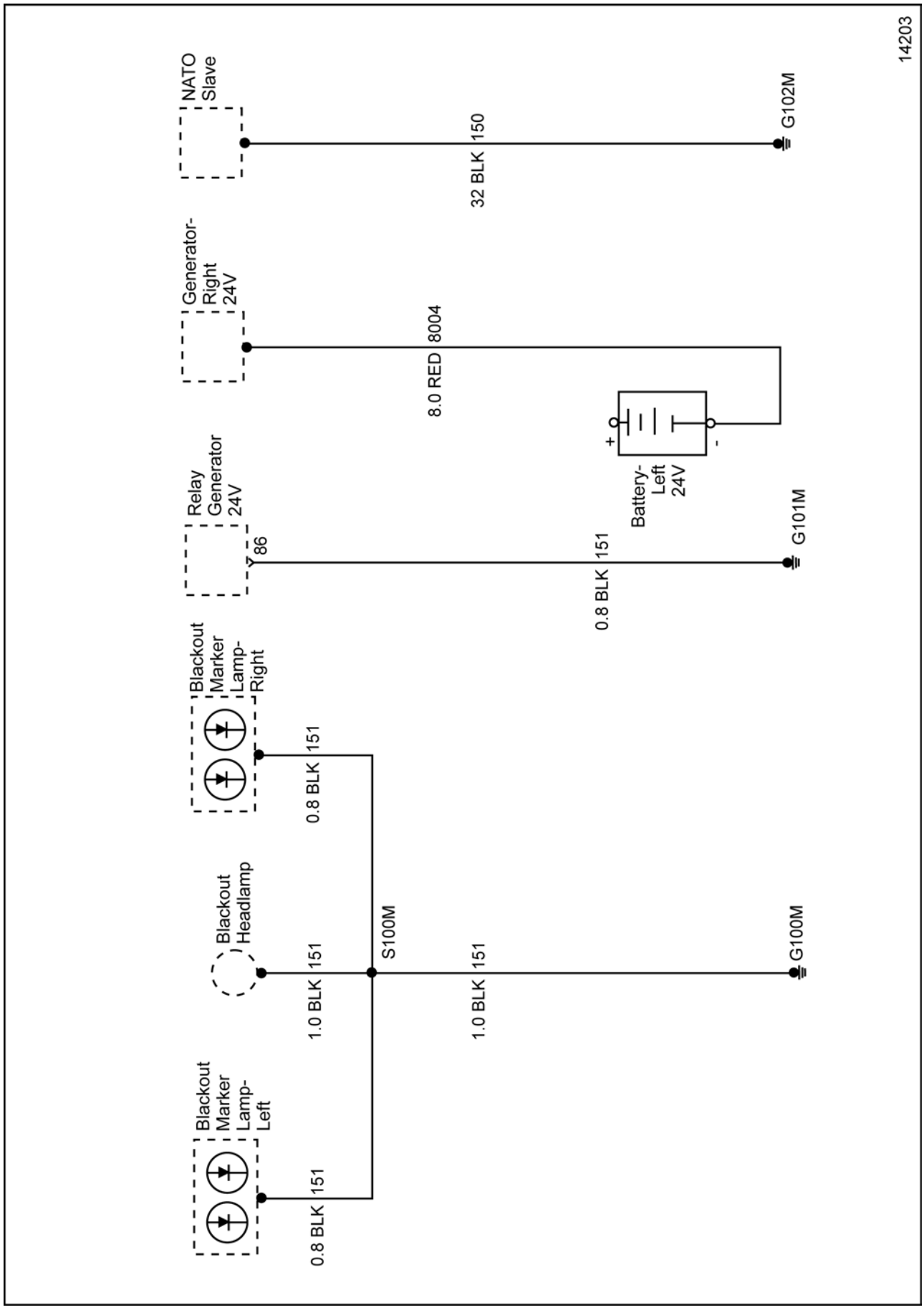
Power Distribution 24V



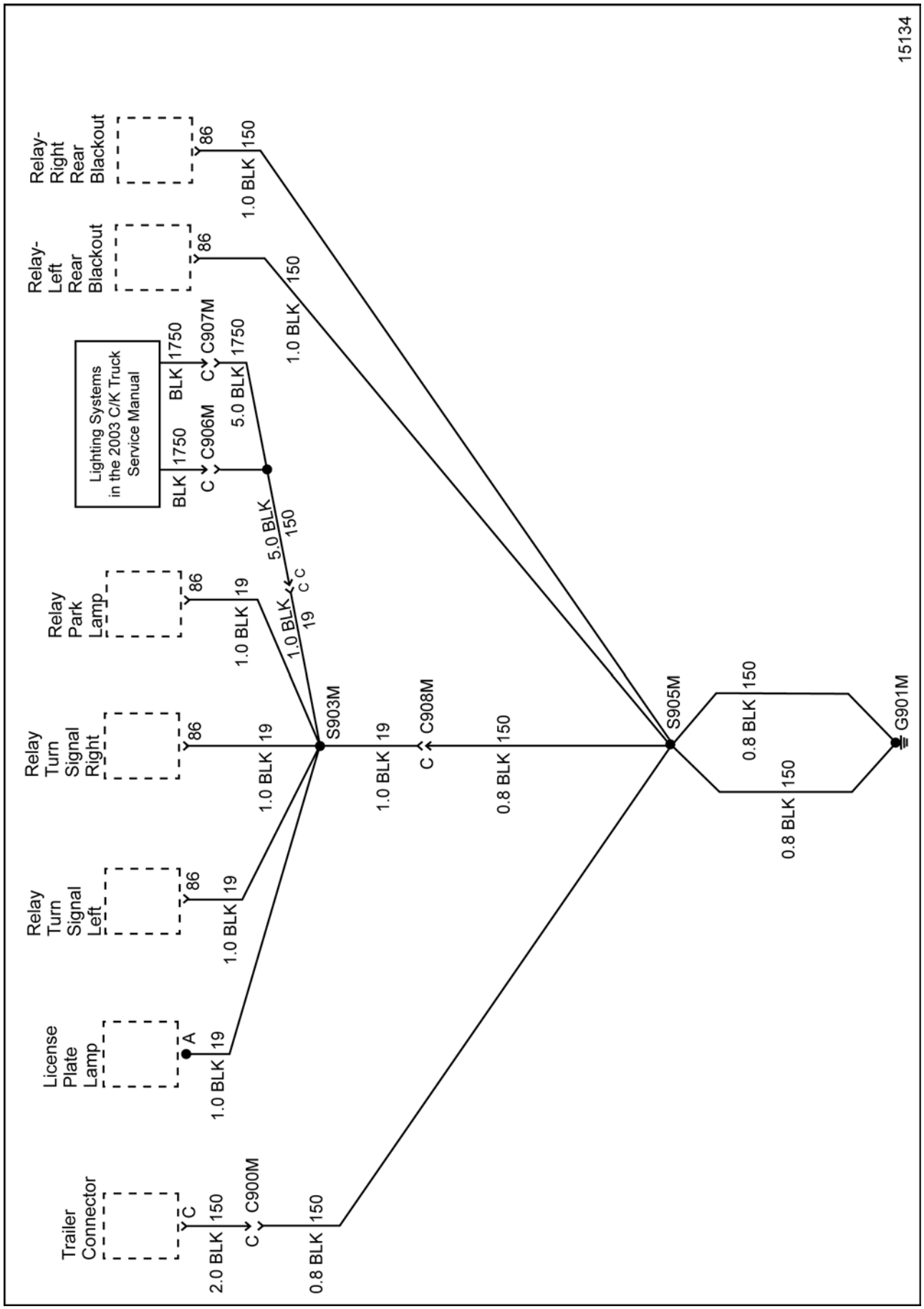
Power Distribution Relay Block



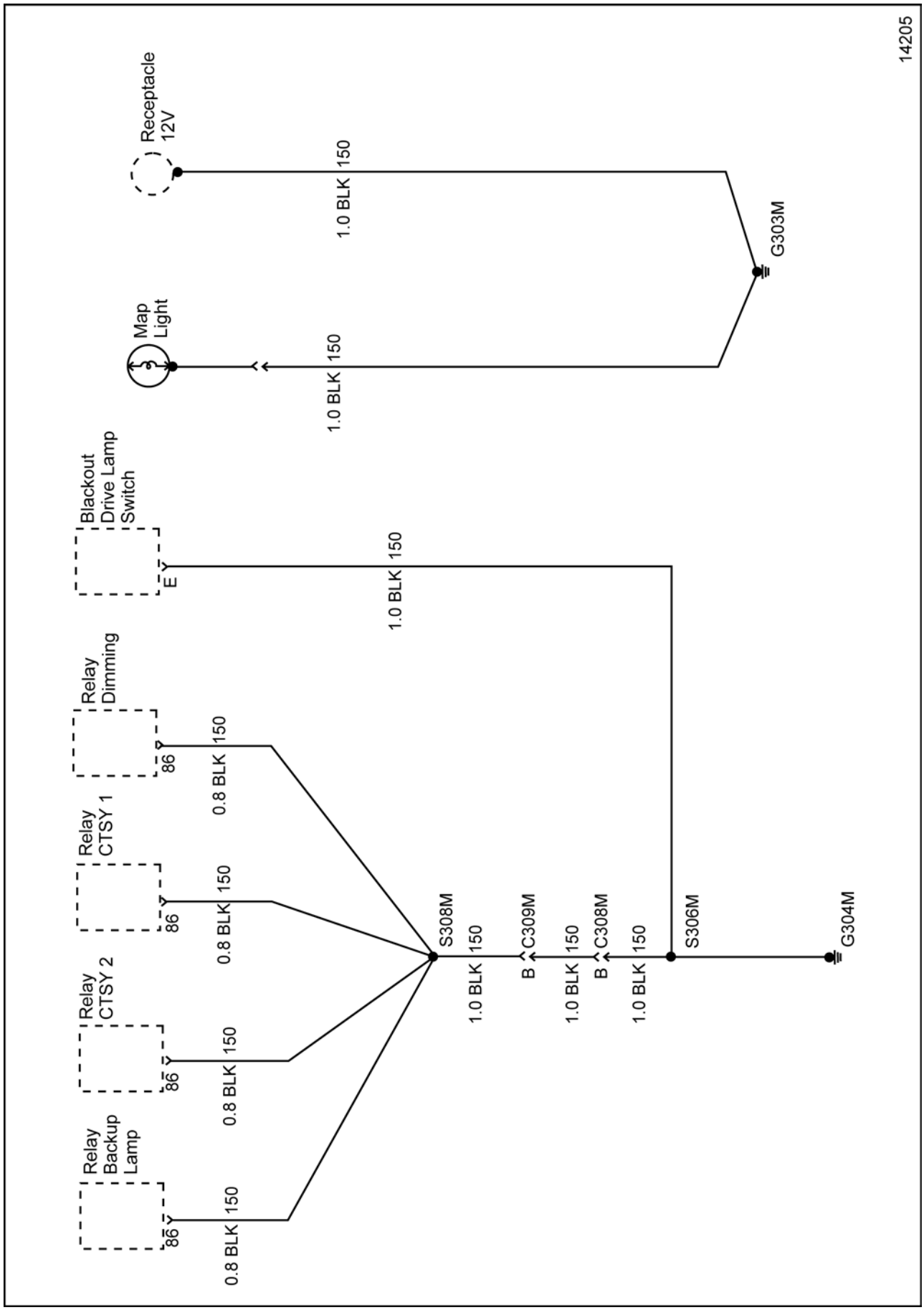
Ground Distribution
Ground Distribution (G100M, G101M, G102M)



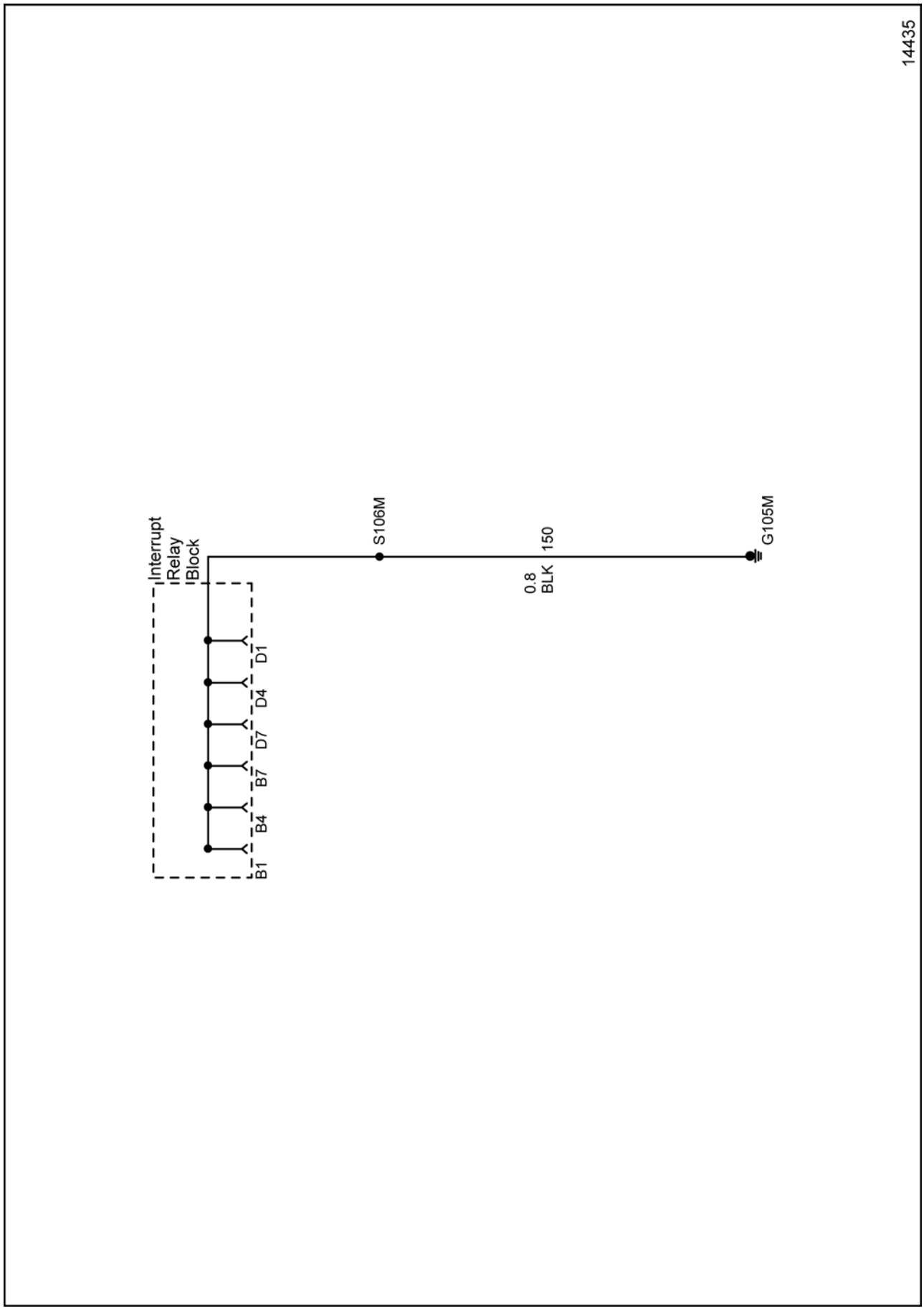
Ground Distribution (G901M)



Ground Distribution (G303M, G304M)



Ground Distribution Relay Block



Component Locator

Master Electrical Component List

Name	Location	Locator View	Connector End View
Backup Lamp Relay	Inline on the interrupt harness under the I/P	___	___
Blackout (B/O) Control Relay	Inline on the auxiliary I/P harness	___	Lighting Connector End Views in Lighting Systems
Blackout (B/O) Headlamp	On the left side of the bumper brush guard	Lighting Component Views in Lighting Systems	Lighting Connector End Views in Lighting Systems
Blackout (B/O) Marker Lamp, LF	In the left side of the front bumper	Lighting Component Views in Lighting Systems	Lighting Connector End Views in Lighting Systems
Blackout (B/O) Marker Lamp, RF	In the left side of the front bumper	Lighting Component Views in Lighting Systems	Lighting Connector End Views in Lighting Systems
Blackout (B/O) Service Drive Switch	In the center lower I/P next to the 24V meter	Lighting Component Views in Lighting Systems	Lighting Connector End Views in Lighting Systems
Blackout (B/O) Stop/Marker Lamp, LR	In the left side of the rear bumper	Lighting Component Views in Lighting Systems	Lighting Connector End Views in Lighting Systems
Blackout (B/O) Stop/Marker Lamp, RR	In the right side of the rear bumper	Lighting Component Views in Lighting Systems	Lighting Connector End Views in Lighting Systems
Blackout (B/O) Switch (Headlamp)	In the center lower I/P next to the 24V meter	Engine Electrical Component Views in Engine Electrical	Lighting Connector End Views in Lighting Systems
Battery - 12V	Outside of frame rail under passenger seat	___	___
Battery - 12V	At the right rear engine compartment	___	___
Battery - 24V	At the left front of the engine compartment	___	___
Battery Booster Connector (NATO)	On the right side of the bumper brush guard	Engine Electrical Component Views in Engine Electrical	___
Battery Equalizer	Rear body panel, behind the seat	___	___
Circuit Breaker 12V	In the engine compartment, on the left fender brace	Engine Electrical Component Views in Engine Electrical	___
Circuit Breaker 24V	In the engine compartment, on the left fender brace	Engine Electrical Component Views in Engine Electrical	___
CTSY 1 and 2 Relay	Inline on the interrupt harness under the I/P	___	___

Master Electrical Component List (cont'd)

Name	Location	Locator View	Connector End View
DRL Relay	Interrupt relay block RH engine compartment	Lighting Systems Component Views in Lighting Systems	___
Fuel Fired Heater	Under the air cleaner housing	Engine Cooling Component Views in Engine Cooling	Engine Cooling Connector End Views in Engine Cooling
Fuel Fired Heater Switch	In the left side of the I/P Bezel	___	___
Generator – 24V	The right front of Engine	___	___
Generator Relay – 24V	On the cover of the underhood fuse block	___	___
Generator – Fuses 24V	In the engine compartment inline with the 24V generator harness	___	___
Headlamp Hi and Low Beam Relay	Interrupt relay block RH engine compartment	___	Engine Cooling Connector End Views in Engine Cooling
Horn Relay	___	___	___
Junction Block	Left of RH battery	Engine Electrical Component Views in Engine Electrical	___
Park Lamp Relay	Interrupt relay block RH engine compartment	___	Engine Cooling Connector End Views in Engine Cooling
Trailer Harness Connector 12 Pin	Near the center of the rear bumper	Lighting Systems Component Views in Lighting Systems	Lighting Systems Connector End Views in Lighting Systems
24 Voltmeter Lamp	Mounted in the lower center of the I/P	Engine Electrical Component Views in Engine Electrical	Engine Electrical Connector End Views in Engine Electrical
C100M (1 Cavity)	Front left of the front bumper for left front blackout (B/O) marker	___	Inline Harness Connector End Views in Wiring Systems
C101M (1 Cavity)	Front right of the front bumper for right front blackout (B/O) marker	___	Inline Harness Connector End Views in Wiring Systems
C102M (1 Cavity)	Front left center of grille for blackout (B/O) headlamp	___	Inline Harness Connector End Views in Wiring Systems
C103M (2 Cavities)	Left side of engine compartment for front lighting harness	___	Inline Harness Connector End Views in Wiring Systems
C104M (1 Cavity)	Engine compartment	___	Inline Harness Connector End Views in Wiring Systems
C105M (4 Cavities)	Engine compartment by Underhood fuse block	___	Inline Harness Connector End Views in Wiring Systems

Master Electrical Component List (cont'd)

Name	Location	Locator View	Connector End View
C106M (3 Cavities)	Engine compartment by Underhood fuse block	___	Inline Harness Connector End Views in Wiring Systems
C107M (1 Cavity)	Engine compartment by Underhood fuse block	___	Inline Harness Connector End Views in Wiring Systems
C108M (2 Cavities)	Left rear frame rail towards rear of the vehicle	___	Inline Harness Connector End Views in Wiring Systems
C109M (1 Cavity)	Left rear frame rail towards rear of the vehicle	___	Inline Harness Connector End Views in Wiring Systems
C110M (1 Cavity)	Engine compartment by Underhood fuse block	___	Inline Harness Connector End Views in Wiring Systems
C301M (2 Cavities)	Under I/P for topper lamp	___	Inline Harness Connector End Views in Wiring Systems
C302M (2 Cavities)	Under I/P for brake lamps	___	Inline Harness Connector End Views in Wiring Systems
C304M (2 Cavities)	Blackout (B/O) panel for voltmeter	___	Inline Harness Connector End Views in Wiring Systems
C305M (2 Cavities)	Under I/P for CTSY interrupt	___	Inline Harness Connector End Views in Wiring Systems
C306M (1 Cavity)	Under I/P for backup lamps	___	Inline Harness Connector End Views in Wiring Systems
C307M (7 Cavities)	Under I/P Dimming Relay	___	Inline Harness Connector End Views in Wiring Systems
C308M (2 Cavities)	Under I/P for blackout (B/O) switch	___	Inline Harness Connector End Views in Wiring Systems
C309M (2 Cavities)	Under I/P in the relay harness	___	Inline Harness Connector End Views in Wiring Systems
C900M (3 Cavities)	Rear bumper for trailer connector	___	Inline Harness Connector End Views in Wiring Systems
C901M (3 Cavities)	Rear bumper for trailer connector	___	Inline Harness Connector End Views in Wiring Systems

Master Electrical Component List (cont'd)

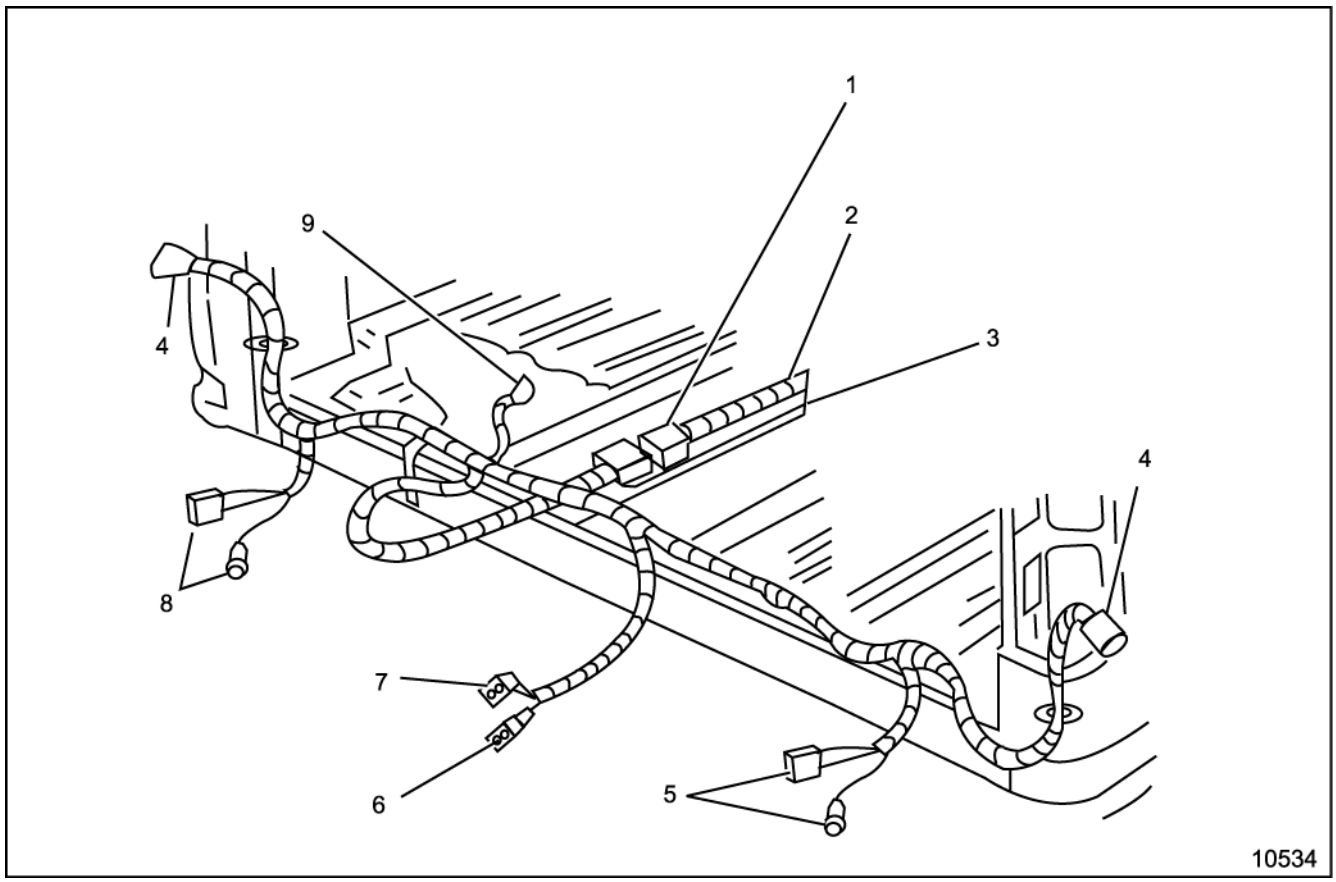
Name	Location	Locator View	Connector End View
C902M (2 Cavities)	Rear bumper for right blackout (B/O) marker	___	Inline Harness Connector End Views in Wiring Systems
C903M (2 Cavities)	Rear bumper for left blackout (B/O) marker	___	Inline Harness Connector End Views in Wiring Systems
C904M (2 Cavities)	Right rear behind taillamp	___	Inline Harness Connector End Views in Wiring Systems
C905M (4 Cavities)	Rear of vehicle for trailer connector	___	Inline Harness Connector End Views in Wiring Systems
C906M (4 Cavities)	Rear of vehicle for trailer connector	___	Inline Harness Connector End Views in Wiring Systems
C907M (4 Cavities)	Rear of vehicle for trailer connector	___	Inline Harness Connector End Views in Wiring Systems
C908M (4 Cavities)	Rear of vehicle for trailer connector	___	Inline Harness Connector End Views in Wiring Systems
C909M (1 Cavity)	Rear bumper for B/O relay	___	Inline Harness Connector End Views in Wiring Systems
G100M	In the front blackout (B/O) harness front of vehicle	___	___
G101M	In the 24V generator harness	___	___
G102M	Lower right side of engine block	___	___
G103M	Right side of engine block	___	___
G104M	Left side of bulkhead next to the power brake booster	___	___
G105M	Left side of bulkhead next to the power brake booster	___	___
G106M	Lower left side of engine block		
G301M	Right outer side of frame rail	___	___
G304M	Under left side of I/P	___	___
G901M	In the rear blackout (B/O) harness at the rear of the vehicle	___	___
G902M	Right side of the rear bumper	___	___
G903M	Left side of the rear bumper	___	___
S100M	In front bracket wiring harness behind front bumper	___	___
S101M	In front blackout (B/O) wiring harness behind front bumper	___	___

Master Electrical Component List (cont'd)

Name	Location	Locator View	Connector End View
S102M	In the front blackout (B/O) harness at front bumper	—	—
S103M	In the 24V generator harness in the engine compartment	—	—
S104M	In the 24V generator harness in the engine compartment	—	—
S105M	In the 24V generator harness in the engine compartment	—	—
S106M	In the relay block harness next to the Underhood fuse block	—	—
S107M	In the relay block harness next to the Underhood fuse block	—	—
S301M	In the voltage regulator harness under the I/P	—	—
S303M	In I/P wiring harness under I/P	—	—
S304M	In I/P wiring harness under I/P	—	—
S306M	In the relay block harness next to the Underhood fuse block	—	—
S307M	In the relay block harness next to the Underhood fuse block	—	—
S308M	In the interrupt relay harness under the I/P	—	—
S309M	In the interrupt relay harness under the I/P	—	—
S310M	In the interrupt relay harness under the I/P	—	—
S311M	In the interrupt relay harness under the I/P	—	—
S312M	In the interrupt relay harness under the I/P	—	—
S313M	In the I/P harness under the I/P	—	—
S901M	In the rear blackout (B/O) harness at rear bumper	—	—
S902M	In the rear blackout (B/O) harness at rear bumper	—	—
S903M	In the trailer harness at rear bumper	—	—
S904M	In the rear trailer harness at rear bumper	—	—
S905M	In the rear blackout (B/O) harness at the rear bumper	—	—
S906M	In the extension lamp harness behind the left rear taillamp	—	—
S907M	In the rear blackout (B/O) harness at the rear bumper	—	—
S908M	In the trailer harness at rear bumper	—	—

Power and Grounding Component Views

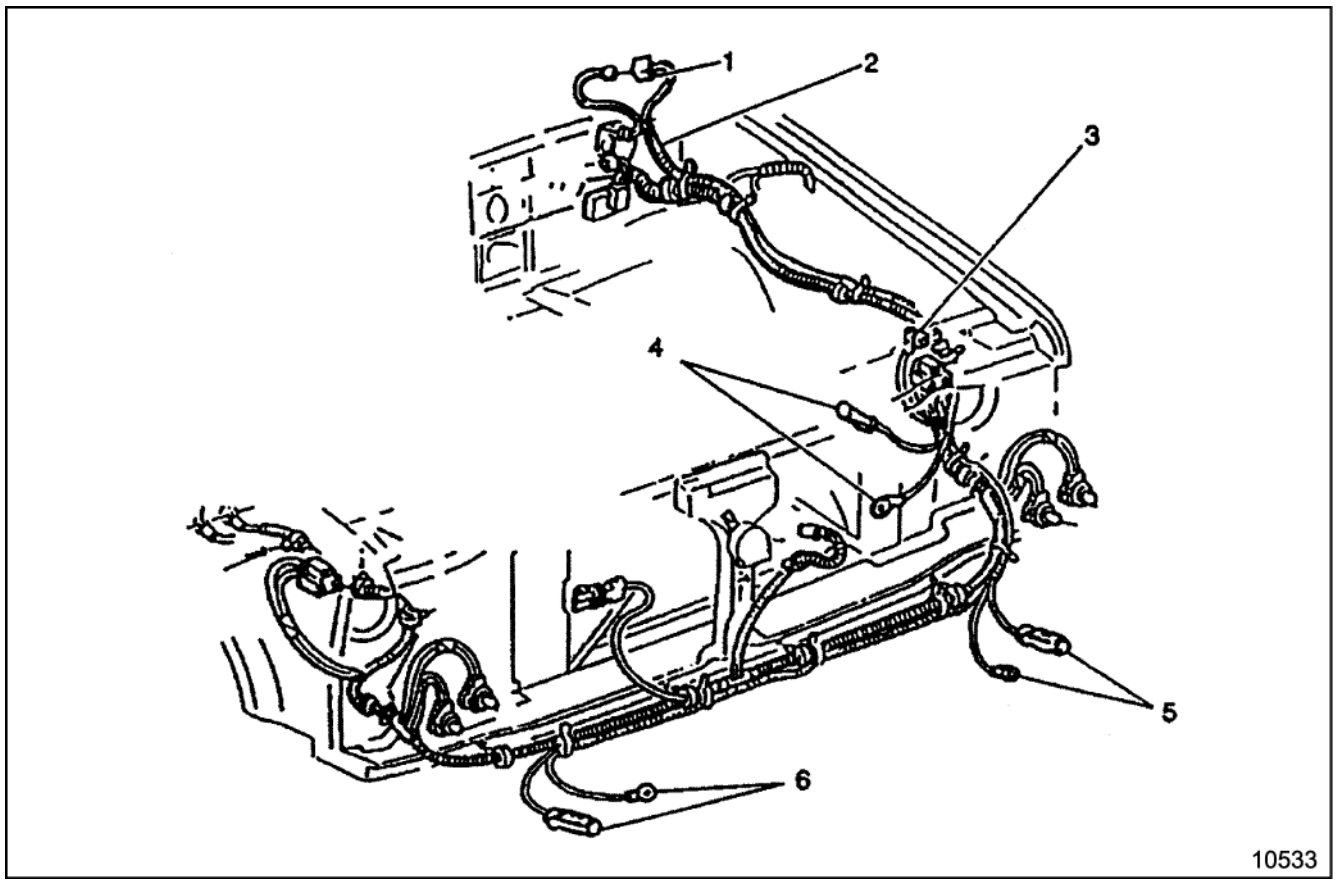
Rear Lamp Harness



Legend

(1) C908M
(2) Auxiliary Rear Lamp Extension Harness
(3) Rear of Vehicle
(4) Rear Taillamp Connectors
(5) C902M
(6) C901M
(7) C900M
(8) C903M
(9) G901M

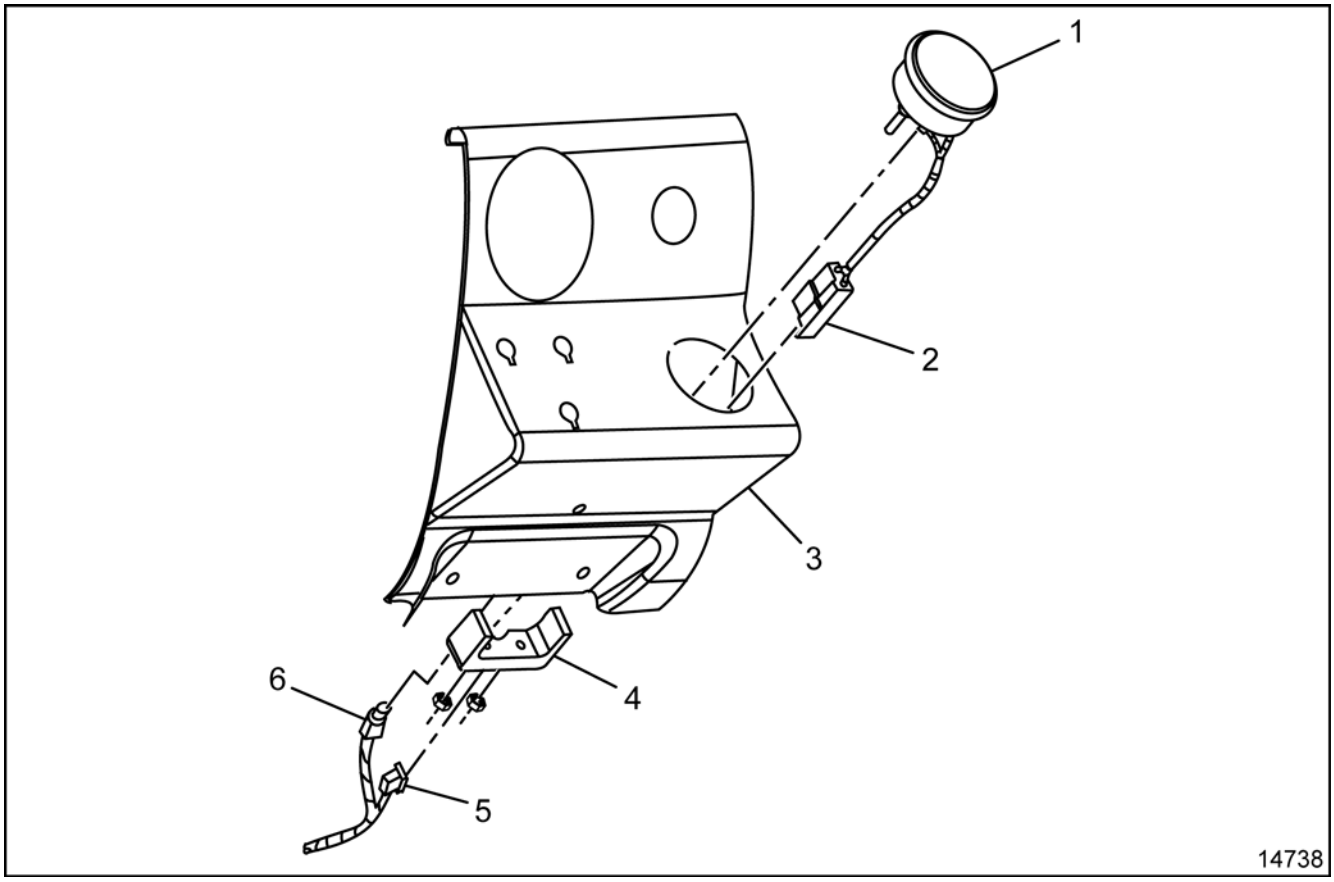
Forward Blackout (B/O) Lamp Harness



Legend

(1) I/P Wiring Harness	(4) C102M
(2) Forward Lamp Harness	(5) C101M
(3) G100M	(6) C100M

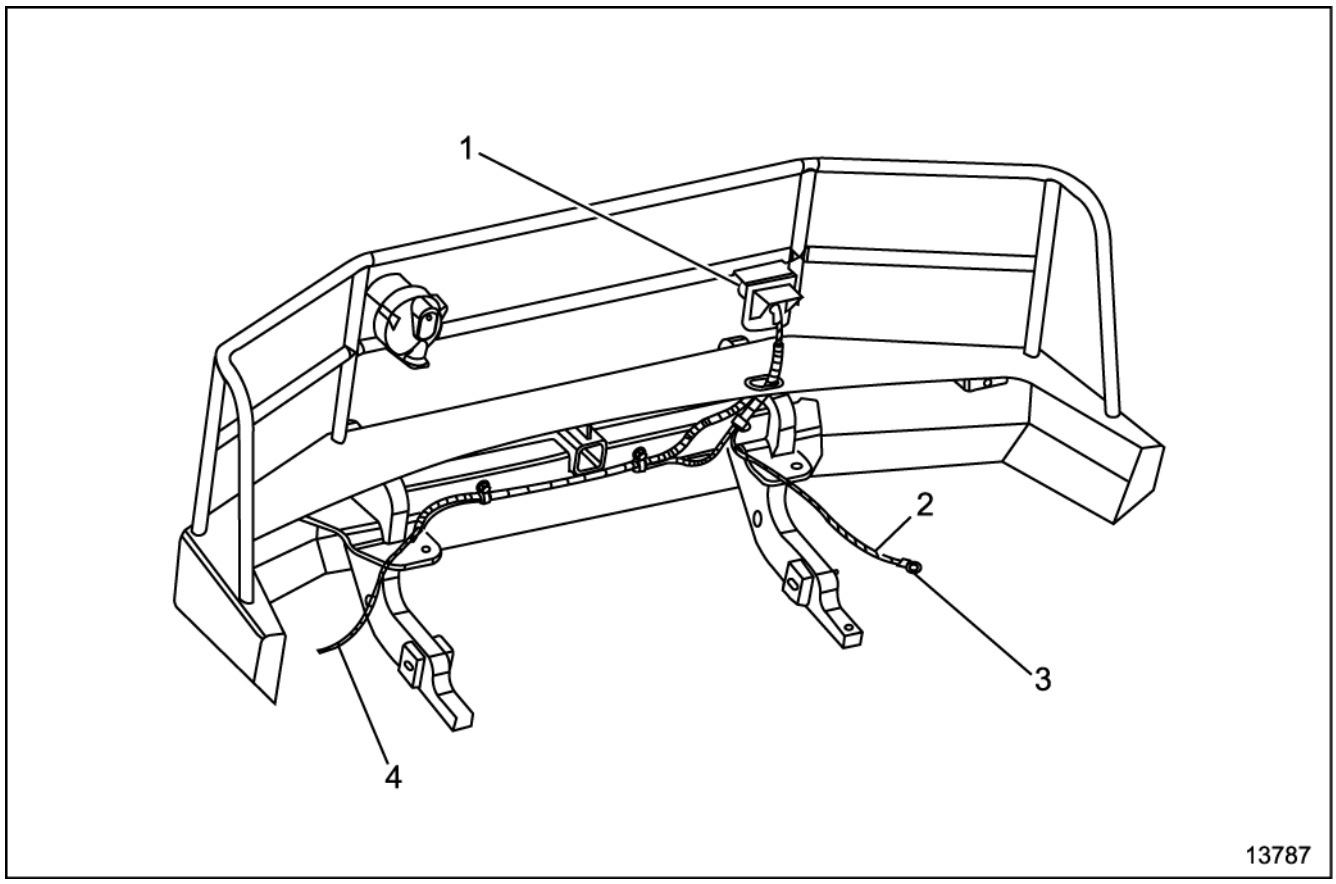
Voltmeter and Lamp



Legend

(1) Voltmeter (24V)
(2) Voltmeter Connector
(3) Mounting Bracket
(4) Bracket
(5) Harness Connector
(6) Voltmeter Illumination Bulb

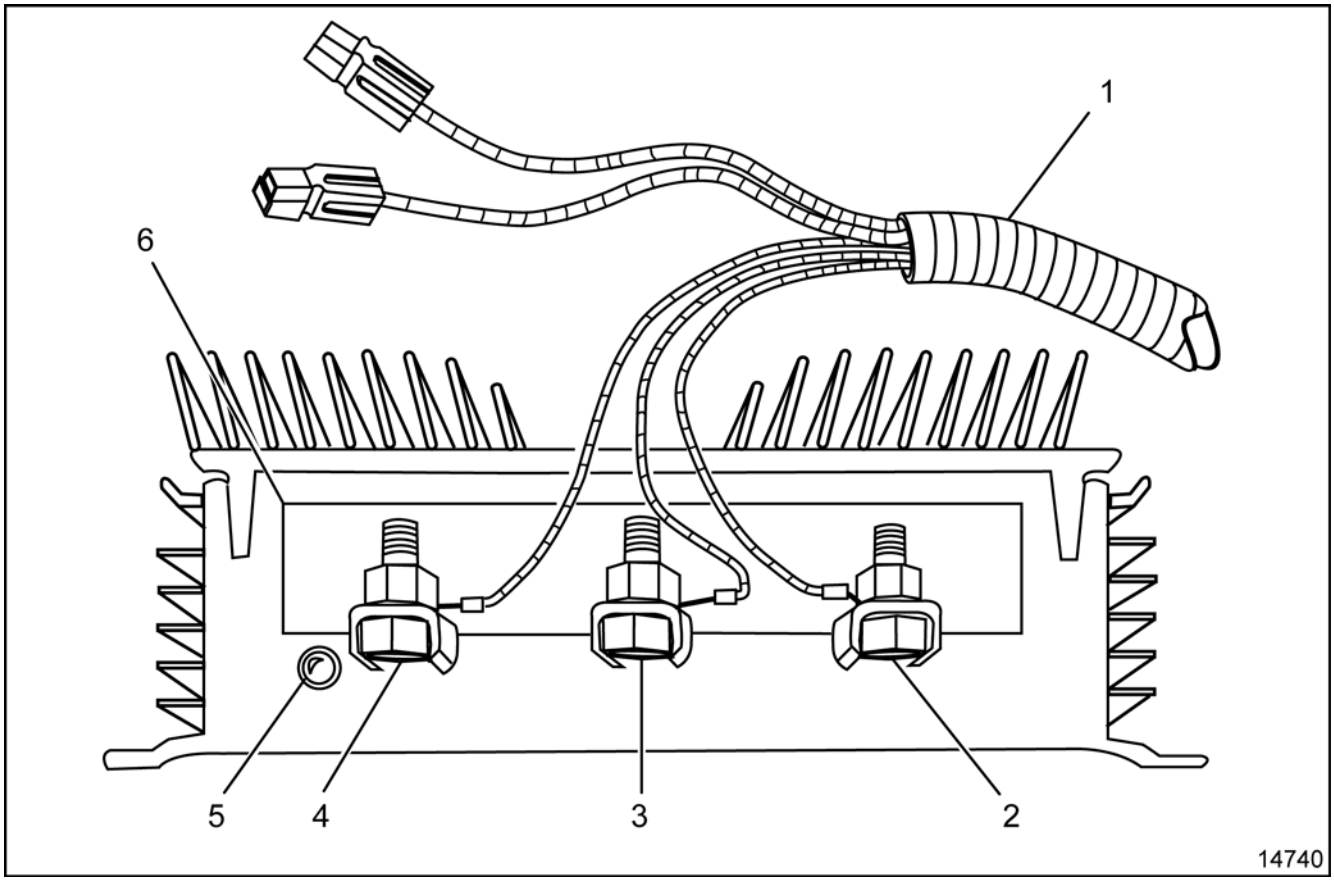
Slave Receptacle Harness Routing



Legend

(1) Slave Receptacle
(2) Negative Cable
(3) Negative Connection to Engine Block
(4) Positive Cable to Junction Block

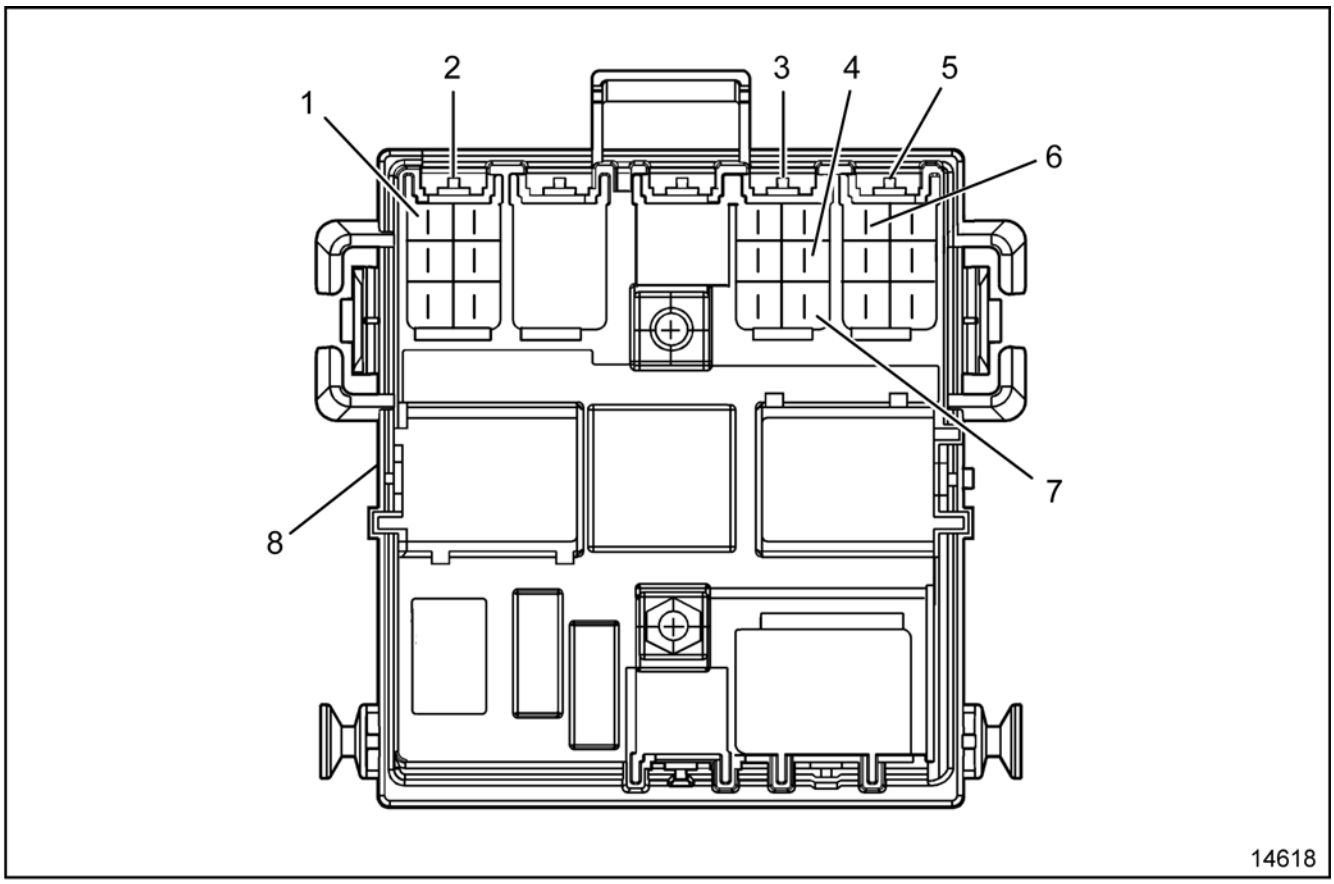
Battery Equalizer



Legend

(1) Battery Equalizer Harness
(2) Ground Terminal (Black Wire)
(3) 12V Connection (Red Wire)
(4) 24V Connection (Black/Red Wire)
(5) LED Status Indicator
(6) Battery Equalizer

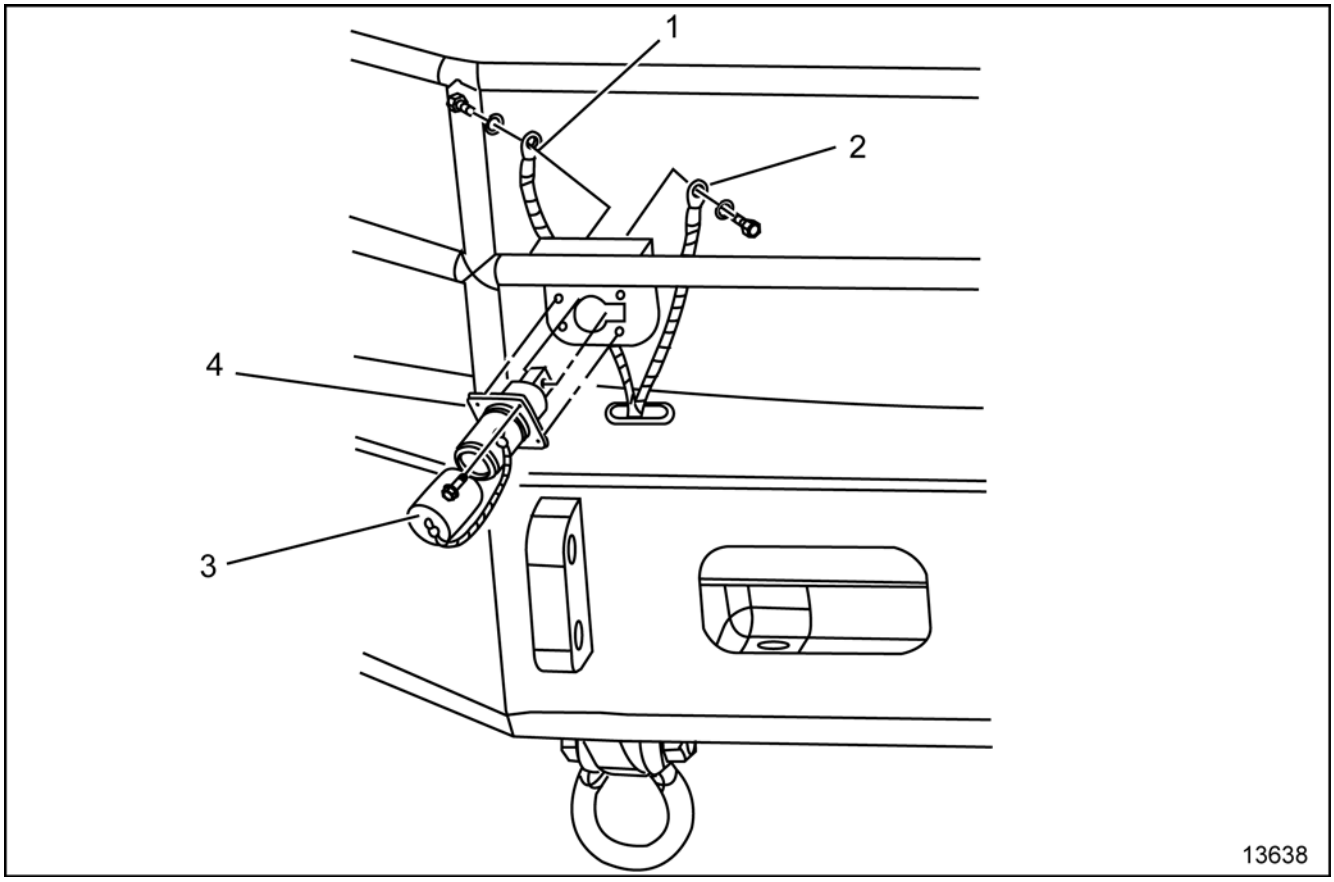
Relay Block – I/P



Legend

(1) Cavity C – Blackout (B/O) Switch
(2) C8 – Connector Location
(3) C5 – Connector Location
(4) E – 24V Meter Ground
(5) C4 – Connector Location
(6) Cavity D – Map/Receptacle
(7) Cavity F – 24V Meter
(8) Relay Block – I/P

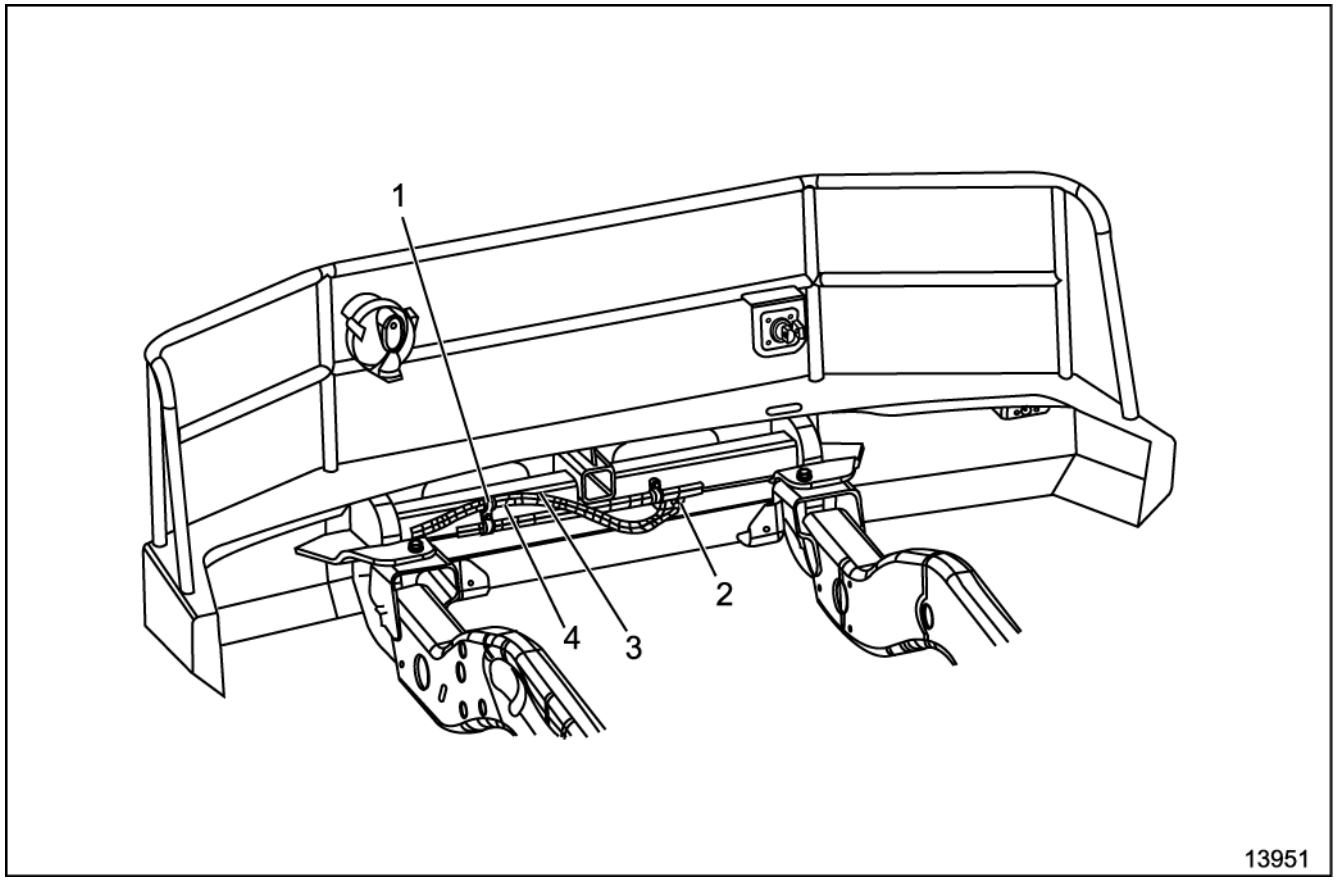
Slave Receptacle Assembly



Legend

(1) Battery Negative Ground (Black)
(2) Battery Positive Ground (Red)
(3) Slave Receptacle Cover
(4) Slave Receptacle

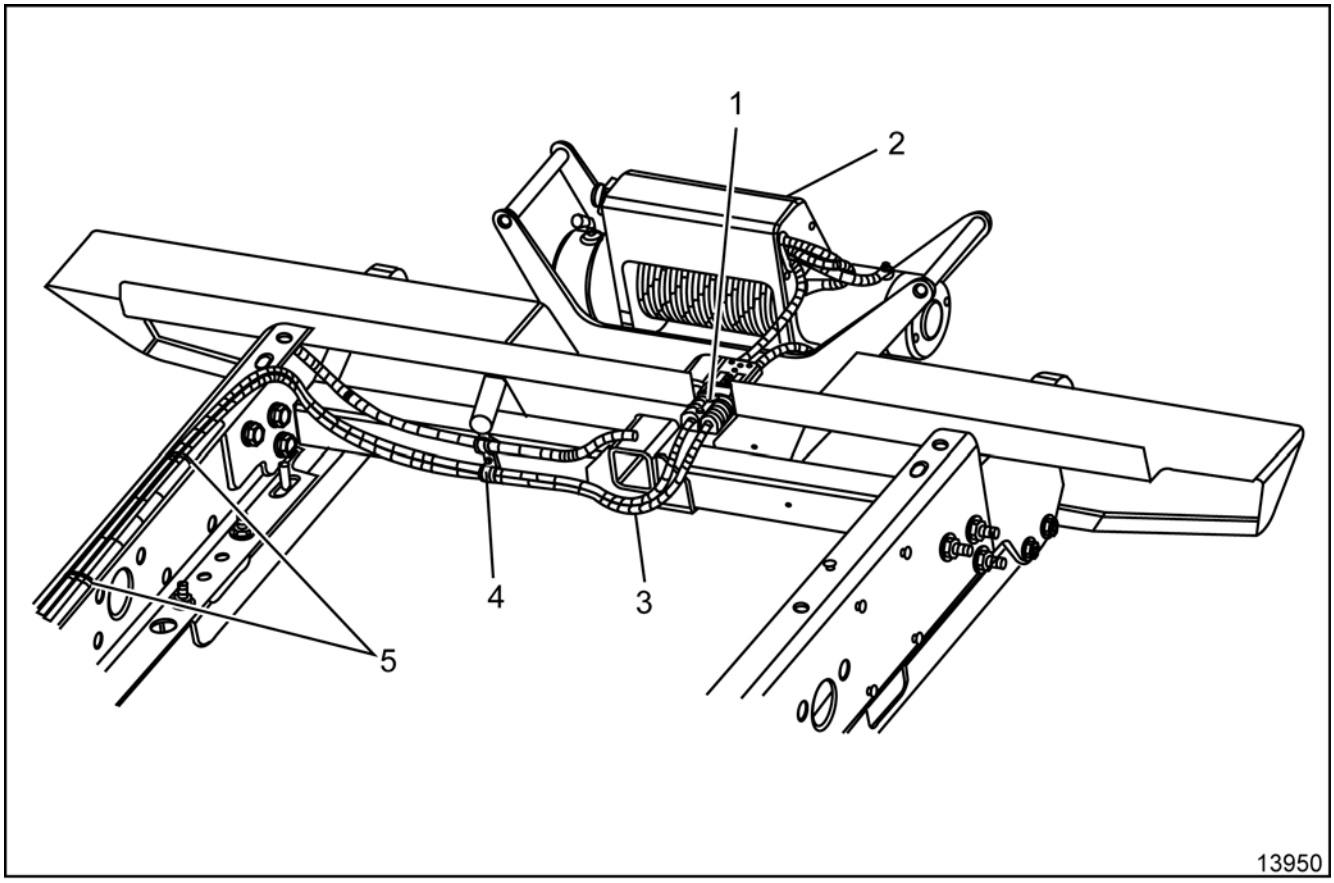
Front Winch Harness Routing



Legend

(1) Harness Clamp
(2) Front Winch Connector
(3) Positive Winch Cable to Junction Block
(4) Negative Winch Cable to Engine Block

Winch Harness Routing Rear

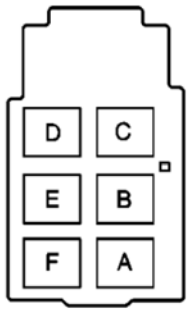


Legend

(1) Winch Connector
(2) Multi-Mount Winch
(3) Harness to Junction Block
(4) Harness Clamp
(5) Wiring Harness Straps

Electrical Center Identification Views

Relay Block - I/P C5

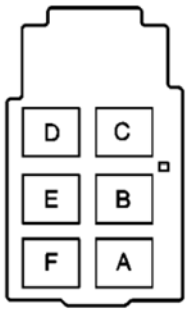


1560

Connector Part Information	• 12193928 • 6-Way F Metri-Pack 280 Series Flexlock (GRY)

Pin	Wire Color	Circuit No.	Function
A	___	___	Not Used
B	PPL/WHT	1382	LED Dimming Signal (ZX3)
	PPL/WHT	1382	LED Dimming Signal (5G4/5X7/5Y0/TRW)
C	TAN/WHT	1384	Selective Ride Control Switch Signal (ZX3)
D	PNK	739	Ignition 1 Voltage (ZX3)
E	BLK	150	Ground
F	BRN	9	24V Meter Supply Voltage

Relay Block - I/P C8



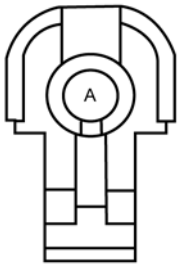
1560

Connector Part Information	• 12193922 • 6-Way F Metri-Pack 280 Series Flexlock (CRM)

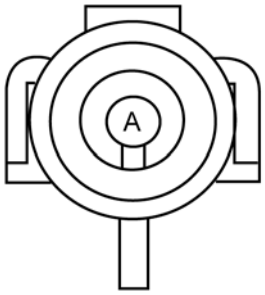
Pin	Wire Color	Circuit No.	Function
A	ORN	2340	Battery Positive Voltage (5G4/TRW)
B	___	___	Not Used
C	ORN	40	Blackout (B/O) Service Switch
D	___	___	Not Used
E	ORN	4540	Battery Positive Voltage (5G4/5X7/5Y0/TRW)
F	BLK	1050	Ground (TRW)

Inline Harness Connector End Views

Inline Harness Connector C100M



10561

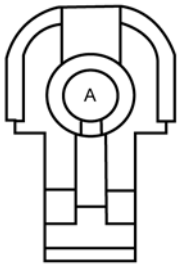


10565

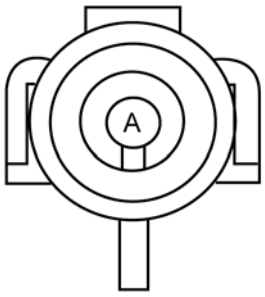
Connector Part Information	• 12015791 • 1-Way F Weather Pack (BLK)	Connector Part Information	• 12010996 • 1-Way M Weather Pack (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	BRN/WHT	900	Blackout (B/O) Marker Lamp (RF)	A	BLK	___	Blackout (B/O) Marker Lamp (RF)

Inline Harness Connector C101M



10561

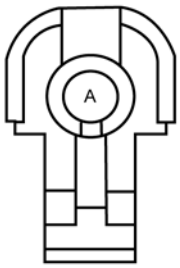


10565

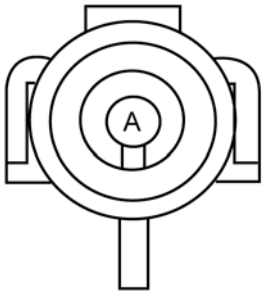
Connector Part Information	• 12015791 • 1-Way F Weather Pack (BLK)	Connector Part Information	• 12010996 • 1-Way M Weather Pack (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	BRN/WHT	900	Blackout (B/O) Marker Lamp (LF)	A	BLK	___	Blackout (B/O) Marker Lamp (LF)

Inline Harness Connector C102M



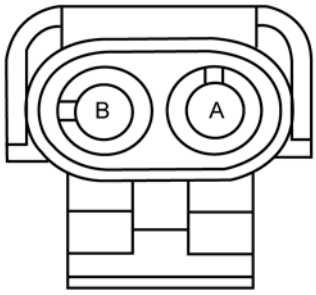
10561



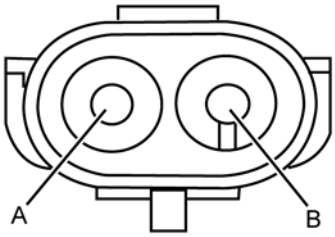
10565

Connector Part Information		• 12015791 • 1-Way F Weather Pack (BLK)		Connector Part Information		• 12010996 • 1-Way M Weather Pack (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	BLK	___	Blackout (B/O) Headlamp Voltage	A	TAN/WHT	901	Blackout (B/O) Headlamp Voltage

Inline Harness Connector C103M



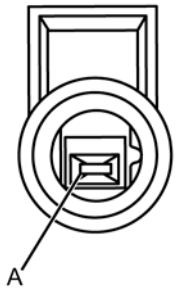
10573



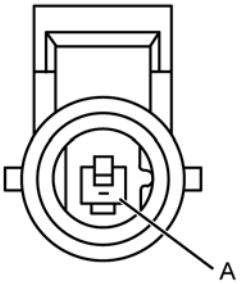
10574

Connector Part Information		• 12010972 • 2-Way F Weather Pack SHD (BLK)		Connector Part Information		• 12015793 • 2-Way M Weather Pack TWR (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	TAN/WHT	901	Blackout (B/O) Head Lamp	A	TAN/WHT	901	Blackout (B/O) Head Lamp
B	BRN/ WHT	900	Blackout (B/O) Marker Lamps	B	BRN/ WHT	900	Blackout (B/O) Marker Lamps

Inline Harness Connector C104M



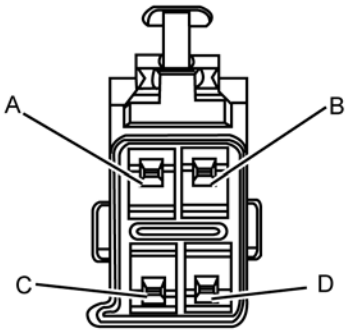
14630



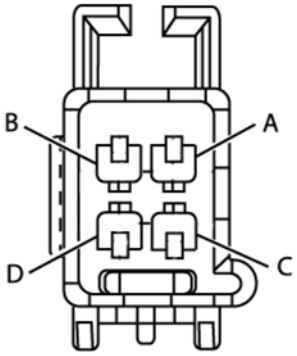
14631

Connector Part Information		• 12065172 • 1-Way F Weather Pack MP 280		Connector Part Information		• 12065171 • 1-Way M Weather Pack MP 280	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	BRN	8008	Voltmeter Voltage	A	BRN	8008	Voltmeter Voltage

Inline Harness Connector C105M



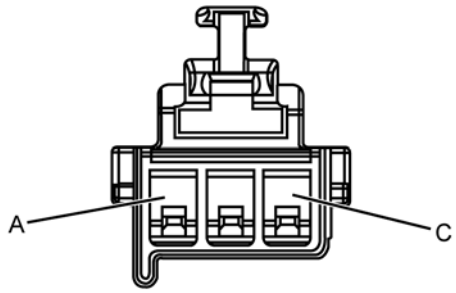
10792



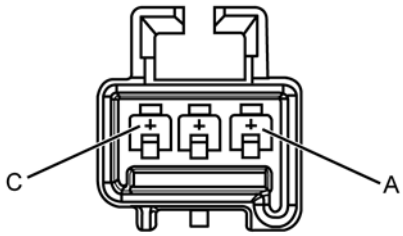
10791

Connector Part Information		• 12129136 • 4-Way F Flex-Lock 280 Series (BLK)		Connector Part Information		• 12129135 • 4-Way M M/P 280 Series (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	WHT	1080	Park Lamps	A	WHT	1080	Park Lamps
B	BLK/WHT	1969	Head Lamps (Hi Beam)	B	BLK/WHT	1969	Head Lamps (Hi Beam)
C	PNK/WHT	1970	Head Lamp (Low Beam)	C	PNK/WHT	1970	Head Lamp (Low Beam)
D	PNK	639	Turn Signals	D	PNK	639	Turn Signals

Inline Harness Connector C106M



14632

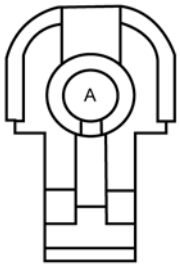


14633

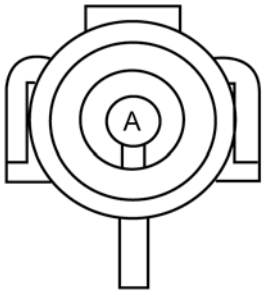
Connector Part Information	• 12129489 • 3-Way F M/P Flex-Lock 280 Series (BLK)	Connector Part Information	• 12129490 • 3-Way M/P 280 Series (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	LT GRN/BLK	592	DRL	A	LT GRN/BLK	592	DRL
B	DK GRN	1329	Horn	B	DK GRN	1329	Horn
C	ORN	304	Radio	C	ORN	304	Radio

Inline Harness Connector C107M



10561

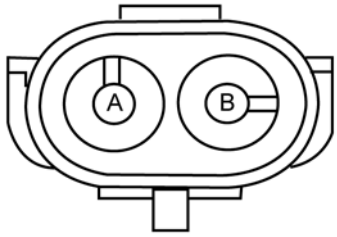


10565

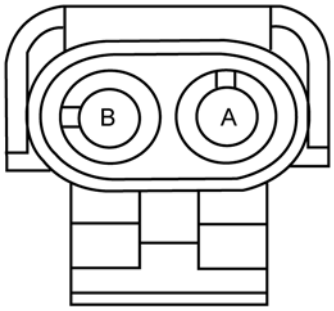
Connector Part Information	• 12015791 • 1-Way F Weather Pack (BLK)	Connector Part Information	• 12010996 • 1-Way M Weather Pack (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	ORN	912	Power to Relay Module	A	ORN	912	Power to Relay Module

Inline Harness Connector C108M



10572

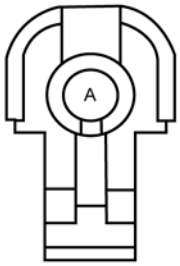


10571

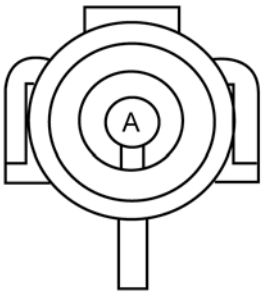
Connector Part Information	• 12105792 • 2-Way F Weather Pack TWR (BLK)	Connector Part Information	• 12010973 • 2-Way M Weather Pack TWR (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	BRN/WHT	900	Rear Marker Lamp Voltage	A	BRN/WHT	900	Rear Marker Lamp Voltage
B	DK GRN/WHT	902	Rear Stoplamp Voltage	B	DK GRN/WHT	902	Rear Stoplamp Voltage

Inline Harness Connector C109M



10561

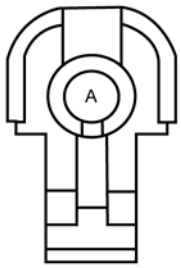


10565

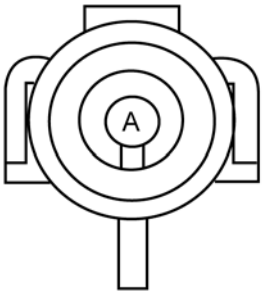
Connector Part Information	• 12015791 • 1-Way F Weather Pack (BLK)	Connector Part Information	• 12010996 • 1-Way M Weather Pack (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	RED	802	24V Generator	A	RED	802	24V Generator

Inline Harness Connector C110M



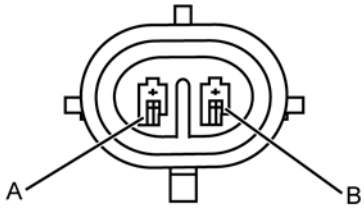
10561



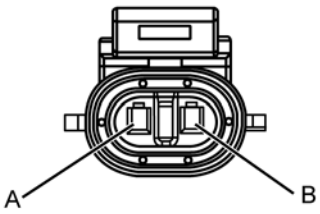
10565

Connector Part Information		• 12015791 • 1-Way F Weather Pack (BLK)		Connector Part Information		• 12010996 • 1-Way M Weather Pack (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	RED	802	24V Generator	A	RED	802	24V Generator

Inline Harness Connector C301M



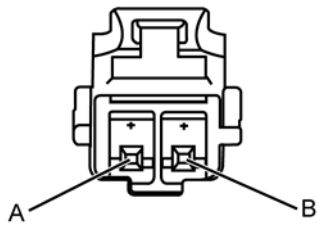
14634



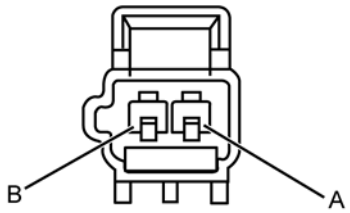
14635

Connector Part Information		• 12052641 • 2-Way F M/P 150 Series		Connector Part Information		• 12162000 • 2-Way M M/P 150 Series	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	BRN/WHT	803	To Rear Topper Dome Switch	A	BRN	800	From Front Topper Dome Switch
B	BRN	800	To Rear Topper Dome Switch	B	BRN/WHT	803	From Front Topper Dome Switch

Inline Harness Connector C302M



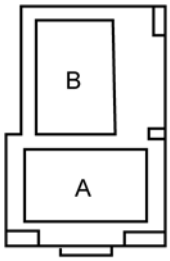
14637



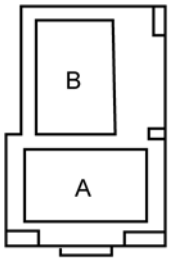
14636

Connector Part Information		• 12129081 • 2-Way F Flex-Lock 280 Series (BLK)		Connector Part Information		• 12129155 • 2-Way M M/P 280 Series (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	WHT	17	Brake Light Switch	A	WHT	17	Blackout (B/O) Service Switch
B	___	___	Not Used	B	___	___	Not Used

Inline Harness Connector C304M



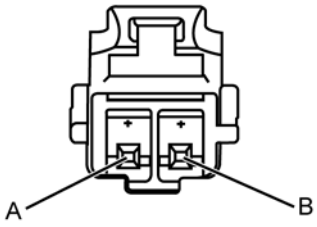
10547



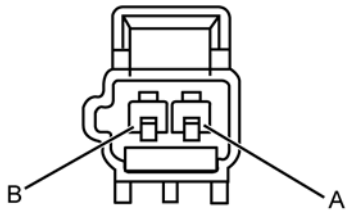
10547

Connector Part Information		• 02973781 • 2-Way F Series 280 (BLK)		Connector Part Information		• 02984883 • 2-Way M Series 280 (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	BRN	8008	Voltmeter Feed	A	BRN	8008	Voltmeter Feed
B	BLK	150	Ground	B	BLK	150	Ground

Inline Harness Connector C305M



14637

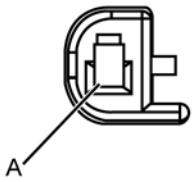


14636

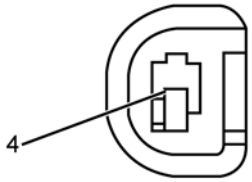
Connector Part Information	• 12129081 • 2-Way F Flex-Lock 280 Series (BLK)	Connector Part Information	• 12129155 • 2-Way M M/P 280 Series (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	GRY/BLK	690	CTSY Supply Voltage	A	GRY/BLK	690	CTSY Supply Voltage
B	ORN/BLK	1732	Inadvertent Power Supply Voltage	B	ORN/BLK	1732	Inadvertent Power Supply Voltage

Inline Harness Connector C306M



14629

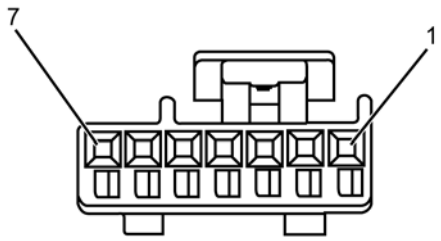


10796

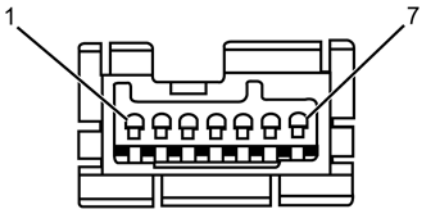
Connector Part Information	• 12047682 • 1-Way F M/P 150 Series (BLK)	Connector Part Information	• 12047683 • 1-Way M M/P 150 Series (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	LT GRN	24	Backup Lamp Supply Voltage	A	LT GRN	24	Backup Lamp Supply Voltage

Inline Harness Connector C307M



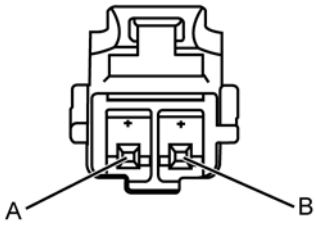
14628



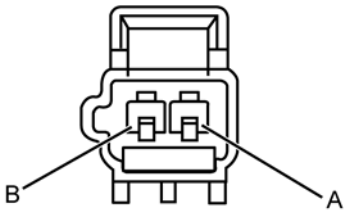
14627

Connector Part Information	• 12065873 • 7-Way F M/P 100			Connector Part Information	• 12065874 • 7-Way M M/P 100		
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
1	GRY	1056	Dimmer Switch 5V Reference Voltage from Dimming Relay	1	GRY	1056	Dimmer Switch 5V Reference Voltage from Dimming Relay
2	ORN/BLK	2090	Dimmer Switch Signal from Dimming Relay	2	ORN/WHT	2090	Dimmer Switch Signal from Dimming Relay
3	GRY/BLK	2226	Dimmer Switch Low Reference from Dimming Relay	3	GRY/BLK	2226	Dimmer Switch Signal from Dimming Relay
4	___	___	Not Used	4	___	___	Not Used
5	GRY	1056	Dimmer Switch 5V Reference Voltage from BCM	5	GRY	1056	Dimmer Switch 5V Reference Voltage from BCM
6	YEL/BLK	2090	Dimmer Switch Signal from BCM	6	YEL/BLK	2090	Dimmer Switch Signal from BCM
7	GRY/BLK	2226	Dimmer Switch Signal from BCM	7	GRY/BLK	2226	Dimmer Switch Signal from BCM

Inline Harness Connector C308M



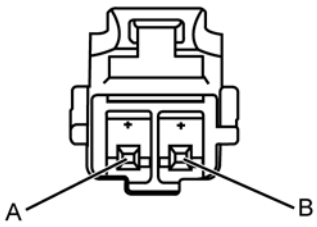
14637



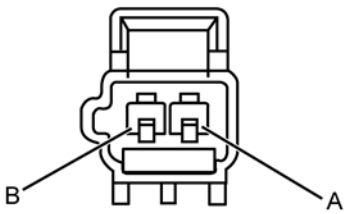
14636

Connector Part Information		• 12129081 • 2-Way F Flex-Lock 280 Series (BLK)		Connector Part Information		• 12129155 • 2-Way M M/P 280 Series (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	RED	912	Blackout (B/O) Service Switch Voltage	A	ORN	912	Blackout (B/O) Service Switch Voltage
B	BLK	150	Ground	B	BLK	150	Ground

Inline Harness Connector C309M



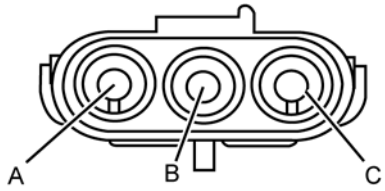
14637



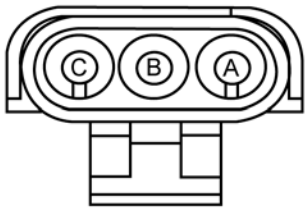
14636

Connector Part Information		• 12129081 • 2-Way F Flex-Lock 280 Series (BLK)		Connector Part Information		• 12129155 • 2-Way M M/P 280 Series (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	RED	912	Dimming Relay Voltage	A	RED	912	Dimming Relay Voltage
B	BLK	150	Ground	B	BLK	150	Ground

Inline Harness Connector C900M



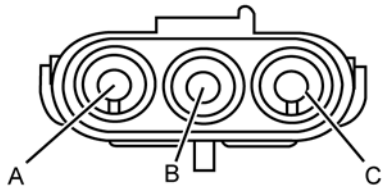
10581



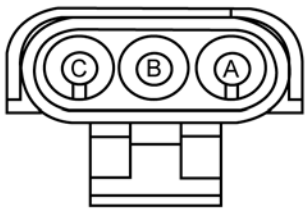
10582

Connector Part Information	• 12010717 • 3-Way F Weather Pack TWR (BLK)			Connector Part Information	• 12015793 • 3-Way M Weather Pack TWR (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	BRN	30	Blackout (B/O) Marker Lamps	A	BRN	900	Blackout (B/O) Marker Lamps
B	YEL	18	S/T Lamp Feed (Left)	B	YEL	18	S/T Lamp Feed (Left)
C	BLK	150	Ground	C	BLK	150	Ground

Inline Harness Connector C901M



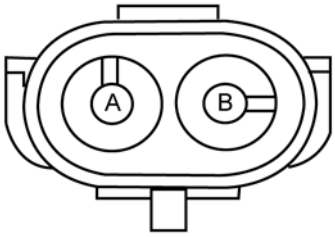
10581



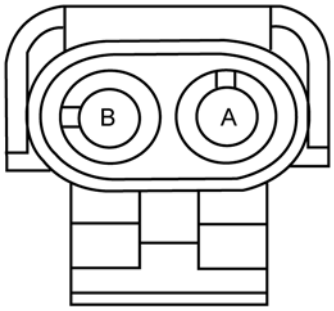
10582

Connector Part Information	• 12010717 • 3-Way F Weather Pack SHD (BLK)			Connector Part Information	• 12015793 • 3-Way M Weather Pack SHD (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	BRN	9	Park Lamp Feed	A	BRN	9	Park Lamp Feed
B	DK GRN	902	Blackout (B/O) Stoplamps	B	GRN	902	Blackout (B/O) Stoplamps
C	DK GRN	19	S/T Lamps (Right)	D	DK GRN	19	S/T Lamps (Right)

Inline Harness Connector C902M



10572

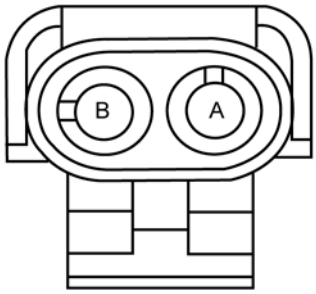


10571

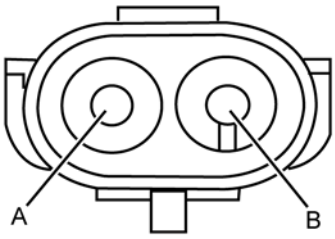
Connector Part Information	• 12015792 • 2-Way F Weather Pack TWR (BLK)	Connector Part Information	• 12010973 • 3-Way M Weather Pack TWR (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	DK GRN/ WHT	902	Right Rear Blackout (B/O) Stoplamps	A	DK GRN/ WHT	902	Right Rear Blackout (B/O) Stoplamps
B	BRN/WHT	900	Right Rear Blackout (B/O) Marker Lamps	B	BRN/WHT	900	Right Rear Blackout (B/O) Marker Lamps

Inline Harness Connector C903M



10573

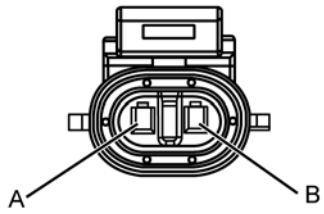


10574

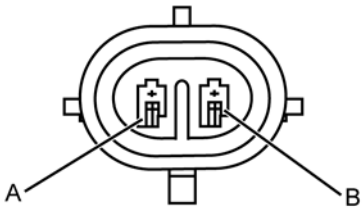
Connector Part Information	• 12015792 • 2-Way F Weather Pack TWR (BLK)	Connector Part Information	• 12010973 • 2-Way M Weather Pack SHD (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	DK GRN/ WHT	902	Left Rear Blackout (B/O) Stoplamps	A	DK GRN/ WHT	902	Left Rear Blackout (B/O) Stoplamps
B	BRN/WHT	900	Left Rear Blackout (B/O) Marker Lamps	B	BRN/WHT	900	Left Rear Blackout (B/O) Marker Lamps

Inline Harness Connector C904M



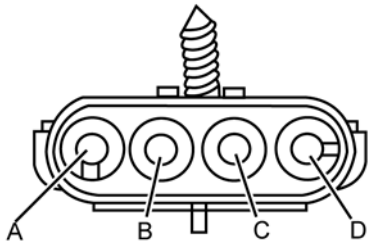
14635



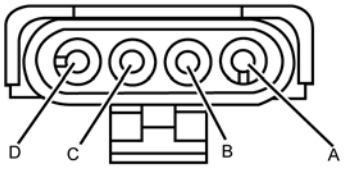
14634

Connector Part Information		• 12052641 • 2-Way F MP 150 Series		Connector Part Information		• 12162000 • 2-Way M MP 150 Series	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	BLK	1050	CHML Voltage	A	RED	1620	CHML Voltage
B	BLU	1050	Ground	B	BLK	1050	Ground

Inline Harness Connector C905M



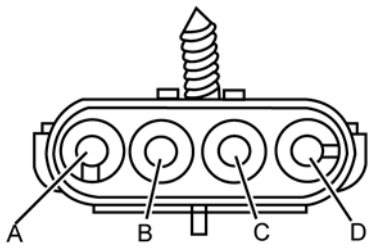
10583



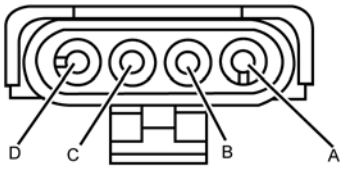
10584

Connector Part Information		• 12020832 • 4-Way F Weather Pack TWR (BLK)		Connector Part Information		• 12020830 • 4-Way M Weather Pack SHD (BLK)	
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	BRN	915	Park Lamps	A	BRN	9	Park Lamps
B	YEL	18	S/T Lamps (Left)	B	YEL	18	S/T Lamps (Left)
C	BLK	19	Ground	C	BLK	150	Ground
D	GRN	916	S/T Lamps (Right)	D	DK GRN	19	S/T Lamps (Right)

Inline Harness Connector C906M



10583

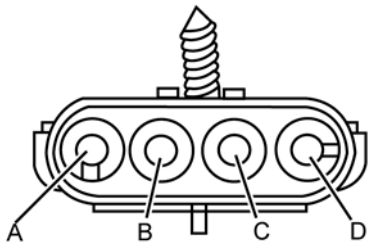


10584

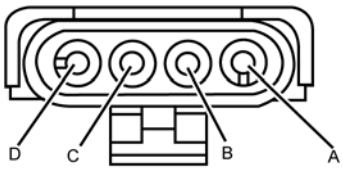
Connector Part Information	• 12020832 • 4-Way F Weather Pack TWR (BLK)	Connector Part Information	• 12020830 • 4-Way M Weather Pack SHD (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	BRN	2109	Park Lamps	A	BRN	2109	Park Lamps
B	YEL	1618	S/T Lamps (Left)	B	YEL	1618	S/T Lamps (Left)
C	BLK	1750	Ground	C	BLK	1750	Ground
D	DK GRN	1619	S/T Lamps (Right)	D	DK GRN	1619	S/T Lamps (Right)

Inline Harness Connector C907M



10583

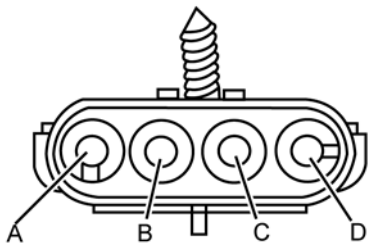


10584

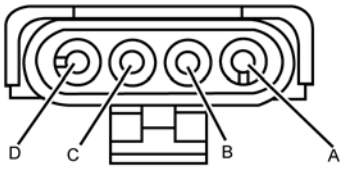
Connector Part Information	• 12020832 • 4-Way F Weather Pack TWR (BLK)	Connector Part Information	• 12020830 • 4-Way M Weather Pack SHD (BLK)

Pin	Wire Color	Circuit No.	Function	Pin	Wire Color	Circuit No.	Function
A	BRN	2109	Park Lamps	A	BRN	2109	Park Lamps
B	YEL	1618	S/T Lamps (Left)	B	YEL	1618	S/T Lamps (Left)
C	BLK	1750	Ground	C	BLK	1750	Ground
D	DK GRN	1619	S/T Lamps (Right)	D	DK GRN	1619	S/T Lamps (Right)

Inline Harness Connector C908M



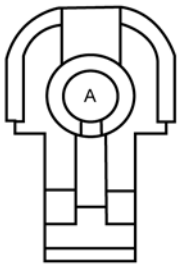
10583



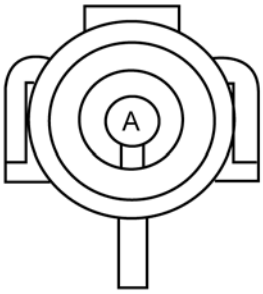
10584

Connector Part Information	• 12020832 • 4-Way F Weather Pack TWR (BLK)			Connector Part Information	• 12020830 • 4-Way M Weather Pack SHD (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	BRN	9	Park Lamps	A	BRN	915	Park Lamps
B	YEL	18	S/T Lamps (Left)	B	YEL	18	S/T Lamps (Left)
C	BLK	150	Ground	C	BLK	19	Ground
D	DK GRN	19	S/T Lamps (Right)	D	GRN	916	S/T Lamps (Right)

Inline Harness Connector C909M



10561



10565

Connector Part Information	• 12015791 • 1-Way F Weather Pack (BLK)			Connector Part Information	• 12010996 • 1-Way M Weather Pack (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**	**Pin**	**Wire Color**	**Circuit No.**	**Function**
A	RED	87	Power to Trailer Relays	A	RED	802	Power to Trailer Relays

Repair Instructions

Auxiliary Lamp Harness Replacement – Front

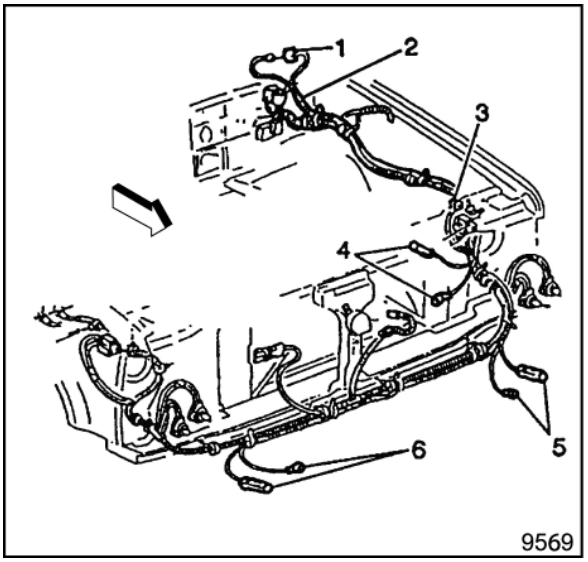
Removal Procedure

1. Remove the radiator grille.
2. Remove the filler panel.
3. Trace the auxiliary harness connections to the original harness.

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

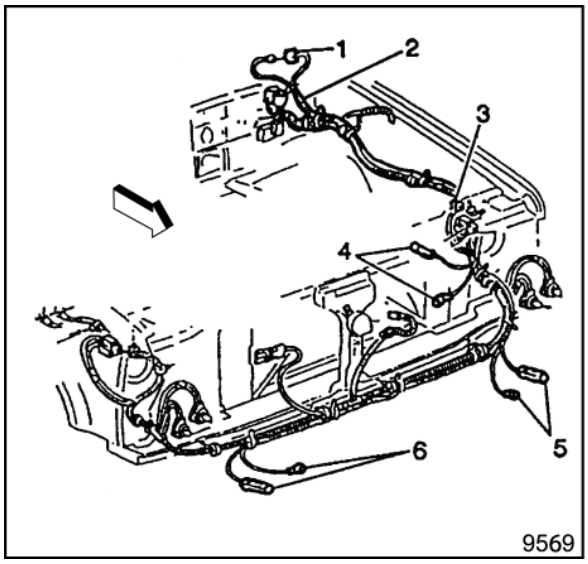
4. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.

5. Remove the connector from the right hand (6) and left hand (5) blackout (B/O) marker lamp (5) and the ground nut to the ground lead and all wiring harness straps connecting the auxiliary harness.
6. Remove connector (4) and ground from blackout (B/O) headlamp mounting stud.
7. Trace the auxiliary harness under the washer fluid reservoir and remove the wiring harness strap along the fender interior.
8. Trace the auxiliary harness under the battery tray area and remove the wrap.
9. Remove the forward auxiliary harness (2) from the vehicle.
10. Remove the wiring harness straps near the bulkhead and disconnect the forward connector of the auxiliary harness from the
auxiliary I/P harness connector and wiring harness strap holding it to the harness connector.

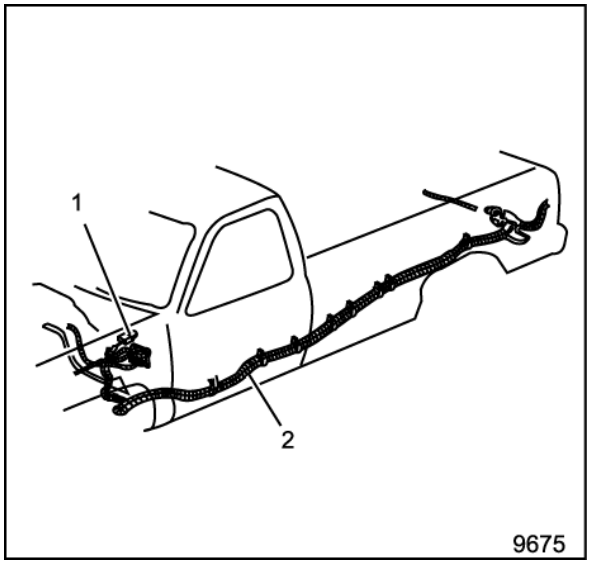


Installation Procedure

1. Connect the forward connector of the auxiliary harness to the auxiliary I/P harness connector and attach the wiring harness straps.
2. Install the forward auxiliary harness (2) to the vehicle.
3. Install the auxiliary harness under the battery tray area and install the wiring harness strap.
4. Install the auxiliary harness under the washer fluid reservoir area and install the wiring harness strap along the fender interior.
5. Install the connector to the right hand (6) and left hand (5) blackout (B/O) marker lamp (5) and the ground nut to the ground lead and all wiring harness straps connecting the auxiliary harness.



6. Install connector (4) and the ground to blackout (B/O) headlamp mounting stud.
7. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
8. Install the filler panel.
9. Install the auxiliary harness connections to the original harness.
10. Install the radiator grille.



Auxiliary Lamp Extension Harness Replacement – Rear

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

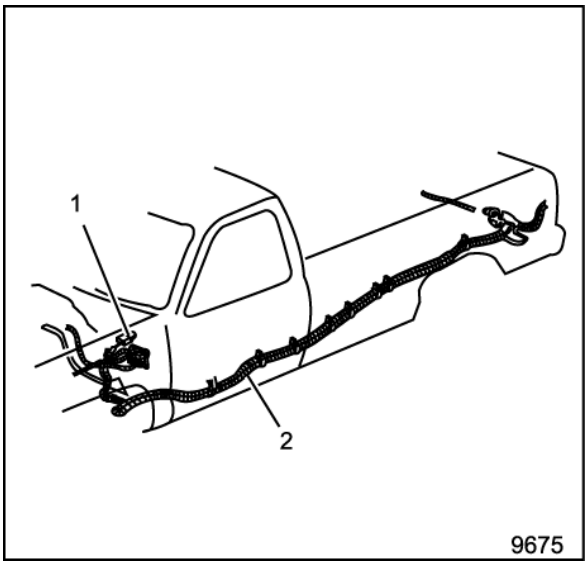
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Access the auxiliary rear lamp extension harness from the engine compartment at the left side of the bulkhead.
3. Remove the connector (1) from the I/P auxiliary harness and wiring harness strap connecting to the forward lamp harness.

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

4. Raise and support the vehicle on a hoist.
5. Trace the auxiliary rear lamp harness extension along the path of the existing harness and vehicle frame.
6. Remove the connector to the rear lamp harness.

Installation Procedure

1. Install the connector to the rear lamp harness.
2. Install the auxiliary rear lamp harness extension along the path of the existing harness and vehicle frame.
3. Remove supports and lower the vehicle.
4. Install the connector (1) to the I/P auxiliary harness and wiring harness strap holding to the forward lamp harness.
5. Install the auxiliary rear lamp extension harness to the engine compartment location at the left side of the bulkhead.
6. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.

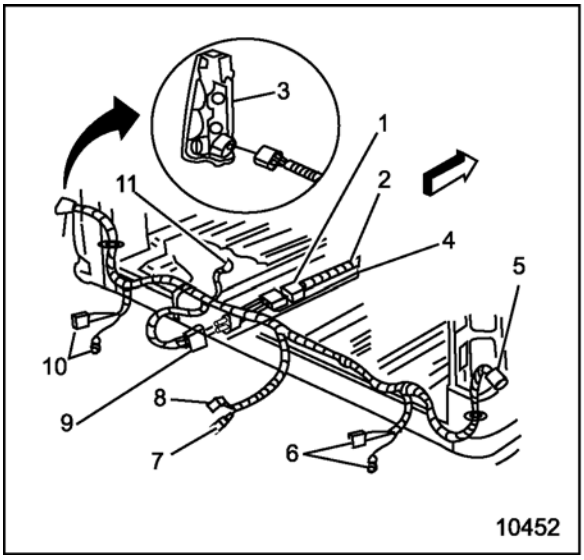


Lamp Harness Replacement – Rear

Removal Procedure

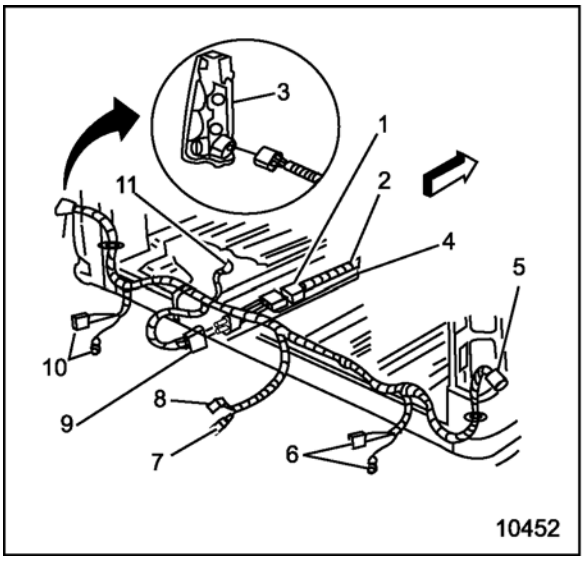
Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

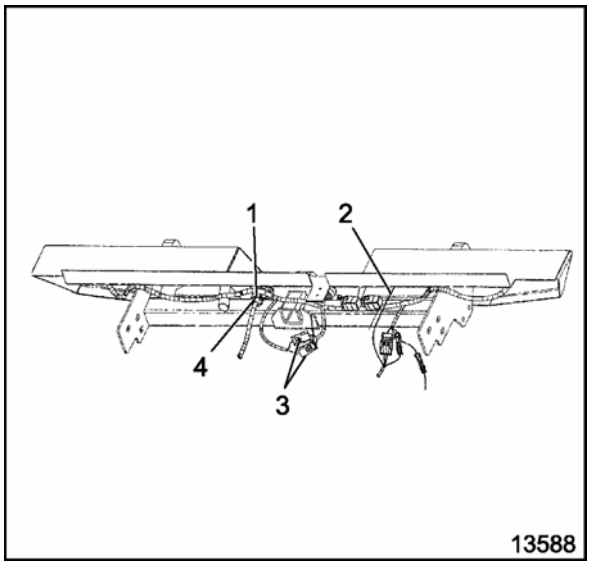
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the rear lamp harness connector from the taillamp connector.
3. Remove the ground lead and connector for the blackout (B/O) marker lamp.
4. Remove the vehicle ground lead bolt, washer and harness ground.
5. Remove the rear lamp harness connector from the auxiliary rear lamp extension harness.
6. Remove the rear lamp harness connector from the rear lamp extension harness.
7. Remove the 2 rear lamp harness connectors (7, 8) from the trailer jumper.



Installation Procedure

1. Install the rear lamp harness connector to the taillamp connectors.
2. Install the ground lead nut, ground lead and connector to the blackout (B/O) marker lamp.
3. Install the two-rear lamp harness connectors (7, 8) to the trailer jumper.
4. Install the rear lamp harness connector to the auxiliary rear lamp extension harness.
5. Install the vehicle ground lead bolt, washer and harness ground.
6. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



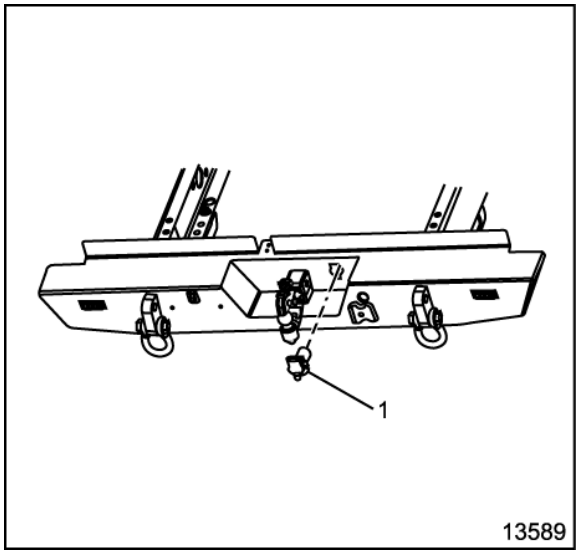


Commercial Trailer Connector Replacement

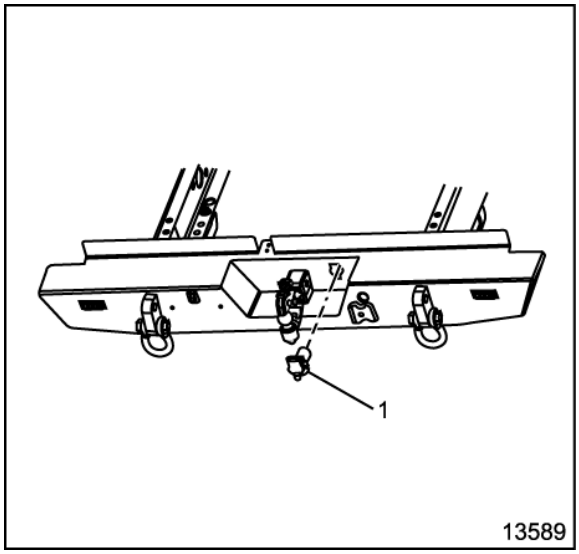
Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Disconnect the harness connector (4) from the trailer connectors (1).



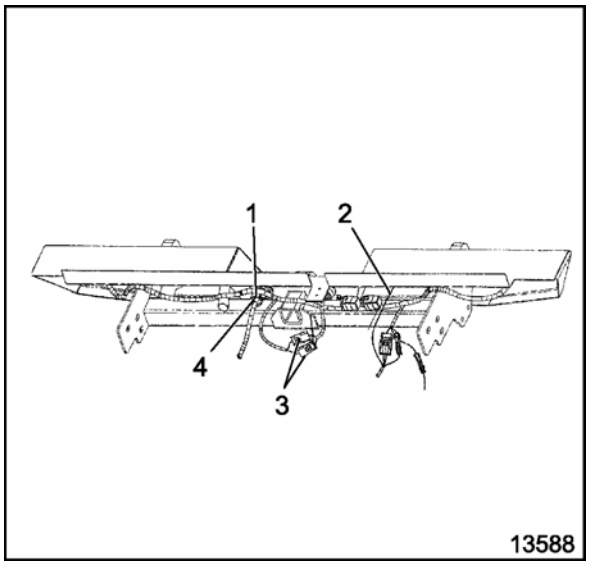
3. Release the lock tabs, turn the connector (1) and pull out from the bumper.



Installation Procedure

1. Install the connector (1) into the opening in bumper.
2. Turn the connector until lock tabs engage.

3. Connect the harness connector (4) into the trailer lamp connector (1).
4. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.

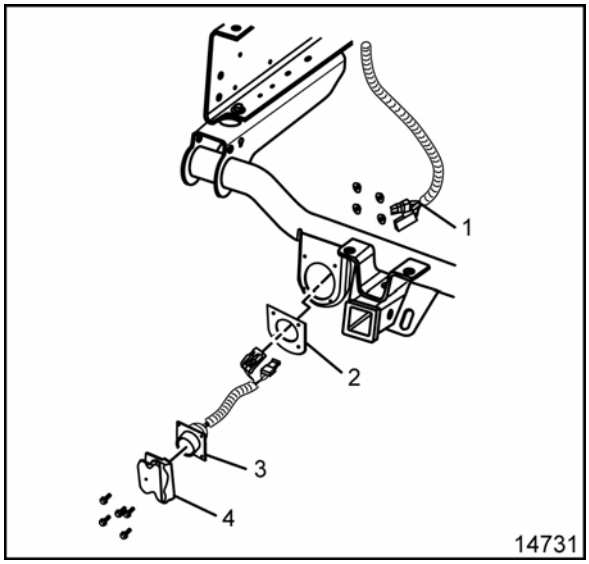


Military Trailer Connector Replacement (Factory Bumper)

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Disconnect the trailer harness connectors (1).
3. Remove the fasteners securing the connector to the trailer hitch.
4. Remove the cover (4) and trailer connector (3) and mounting plate (2).



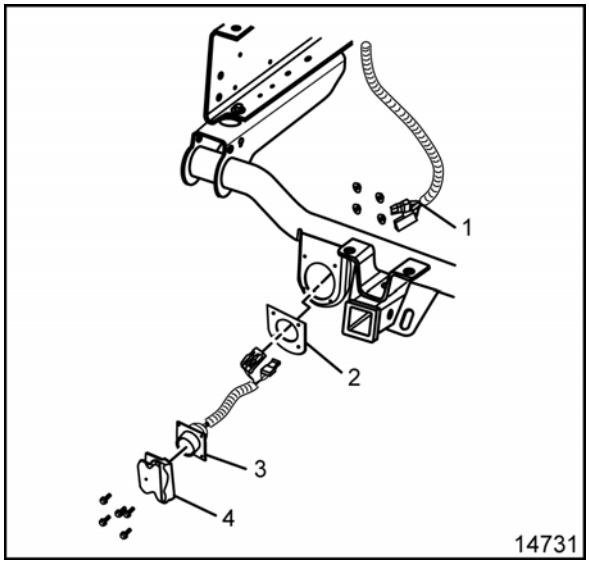
Installation Procedure

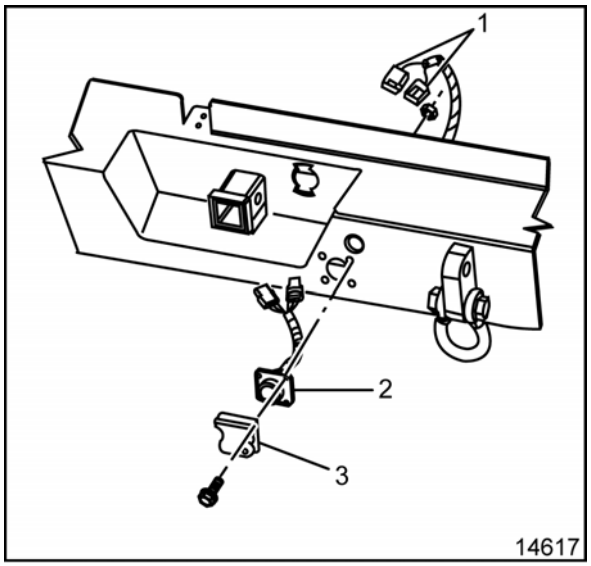
Note: Connector harness depression is positioned at 3 o'clock.

1. Install the mounting plate (2), trailer connector (3) and cover (4) onto the trailer hitch.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the fasteners to secure the cover and connector to the bumper.
   Tighten
   Tighten connector bolts to 5 N•m (44 lb in).
3. Connect the harness connectors (1).
4. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



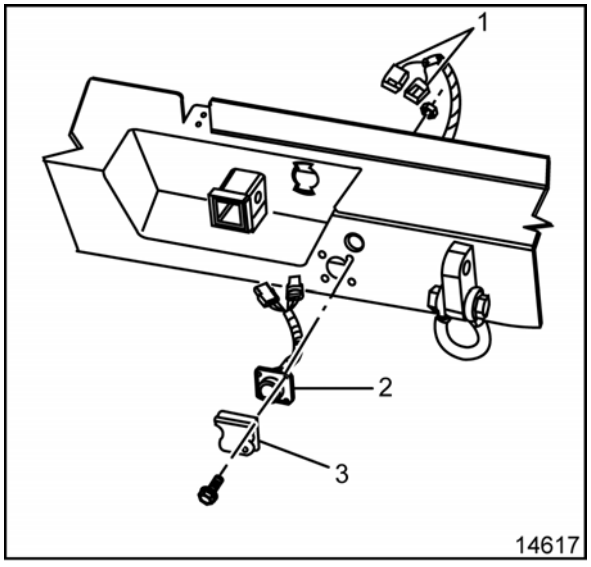


Military Trailer Connector Replacement

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Disconnect the trailer harness connectors (1).
3. Remove the fasteners securing the connector to the bumper.
4. Remove the cover (3) and trailer connector (2).

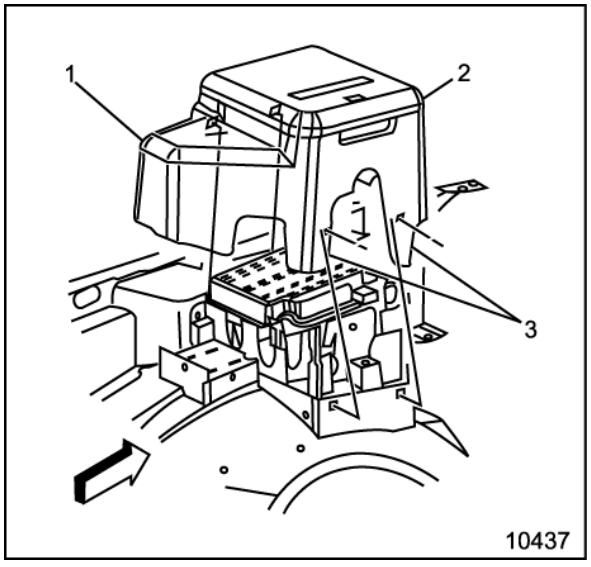


Installation Procedure

1. Install the trailer connector (2) and cover (3) onto the bumper.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the fasteners to secure the cover and connector to the bumper.
   Tighten
   Tighten connector bolts to 5 N•m (44 lb in).
3. Connect the harness connectors (1).
4. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



Relay Mounting Bracket Replacement

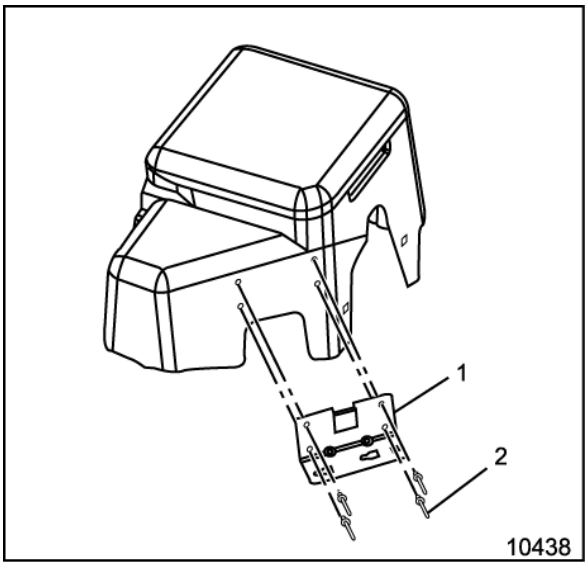
Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the left fender upper brace.
3. Remove top cover (2).
4. Remove the electrical center cover assembly (1) by lifting the cover outwards to clear the tabs (3).

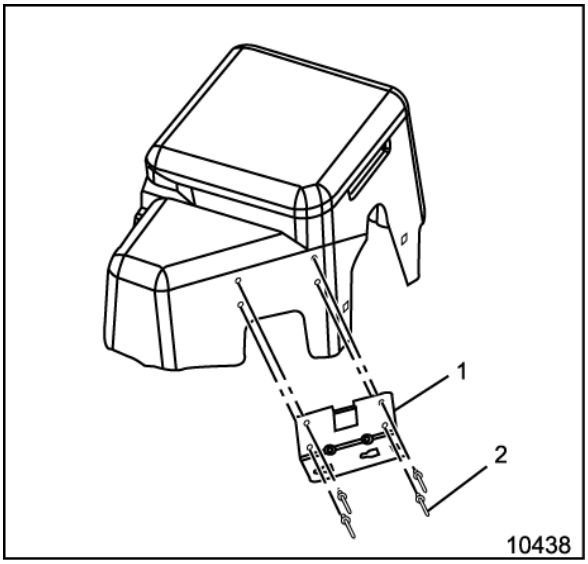
Caution: Refer to Eye Protection Caution in Cautions and Notices.

5. Drill out the rivets (2) and remove bracket (1).



Installation Procedure

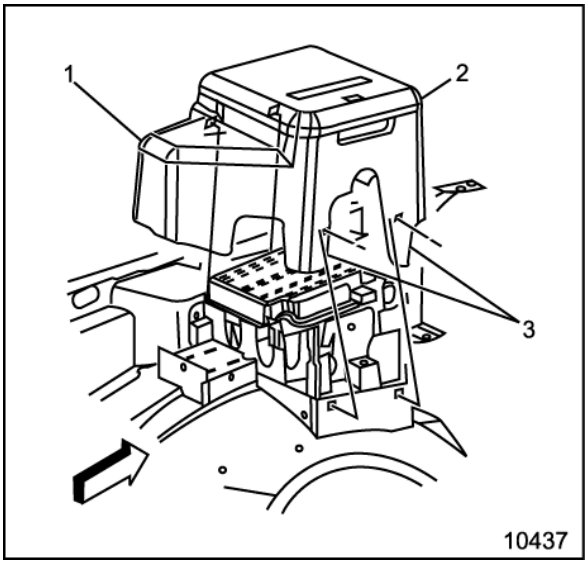
1. Rivet the bracket (1) to the electrical center cover.

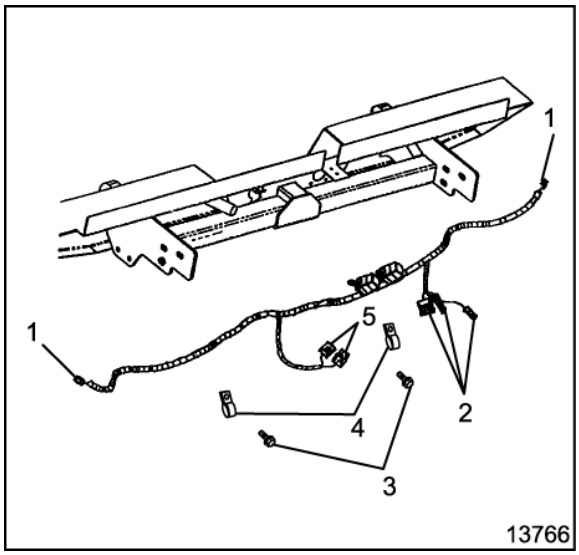


2. Set the electrical center block in its resting position until the tabs (3) lock into place.
3. Install the lower part of the cover (1).
4. Install the upper cover (2).
5. Install the fender upper brace.

Notice: Refer to Fastener Notice in Cautions and Notices.

6. Install the upper brace fasteners.
   Tighten
   Tighten the fasteners to 25 N•m (18 lb ft).
7. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



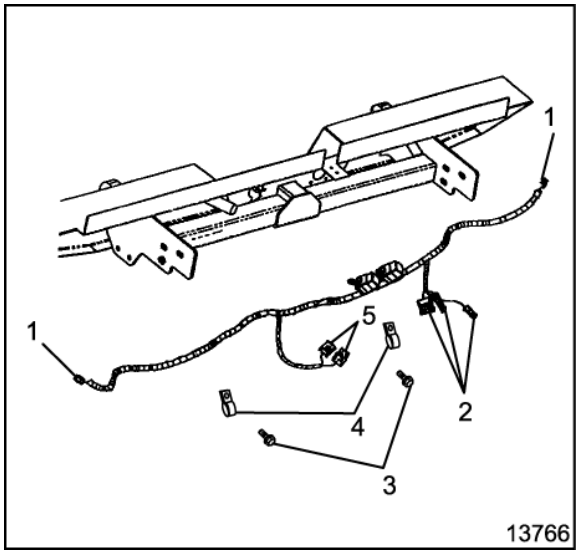


Blackout (B/O) and Trailer Harness Replacement – Rear

Removal Procedure

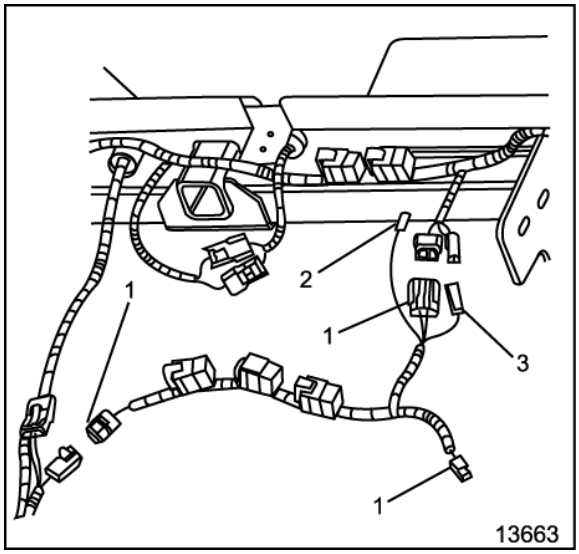
Caution: Refer to Battery Disconnect Caution in Caution and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Disconnect the 2, 24V trailer harness connectors (5) from the 24V trailer connector harness.
3. Disconnect the 3 blackout (B/O) and trailer harness connectors (2).
4. Disconnect the 2 blackout (B/O) marker lamp connectors (1) from the blackout (B/O) marker lamps.
5. Remove the 2 bolts (3) and 2 clamps (4) from the blackout (B/O) and the trailer harness.
6. Remove the blackout (B/O) and the trailer harness from the bumper assembly.



Installation Procedure

1. Position the blackout (B/O) and the trailer harness onto the bumper in the same routing location as removed.
2. Install the 2 clamps (4) and the 2 bolts (3) to the blackout (B/O) and trailer harness.
3. Connect the 2 blackout (B/O) marker lamp connectors (1) to the blackout (B/O) marker lamps.
4. Connect the 3 blackout (B/O) and the trailer harness connectors (2).
5. Connect the 2, 24 trailer harness connectors (5) to the 24V trailer harness.
6. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



12V and 24V Harness Replacement

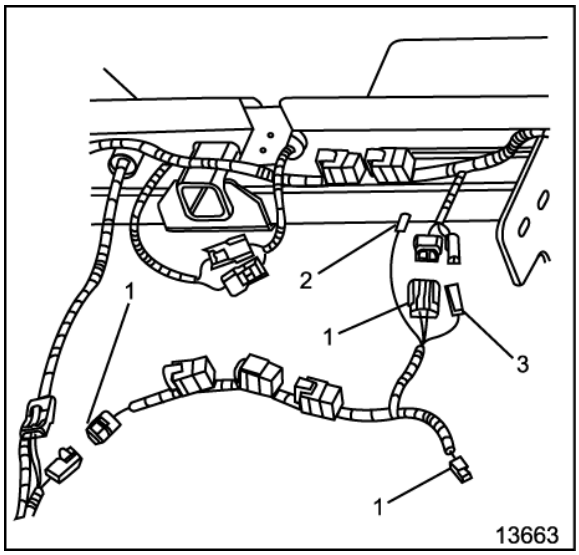
Removal Procedure

Caution: Refer to Battery Disconnect Caution in Caution and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Disconnect the 12V and the 24V harness connector (1) from the blackout (B/O) and the trailer harness connectors.
3. Disconnect the license plate lamp connector (2) from the license plate lamp.
4. Disconnect the blackout (B/O) connector (3) from the blackout (B/O) and trailer harness connector.
5. Remove the 12V to 24V harness from the vehicle.

Installation Procedure

1. Install the 12V to 24V wiring harness in the same routing location as removed.
2. Connect the blackout (B/O) connector (3) from the 12V and 24V harness to the blackout (B/O) and trailer harness connector.
3. Connect the license plate lamp connector (2) from the 12V to 24V harness to the license plate lamp.
4. Connect the 12V to 24V harness connector (1) to the blackout (B/O) and the trailer harness connector.
5. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



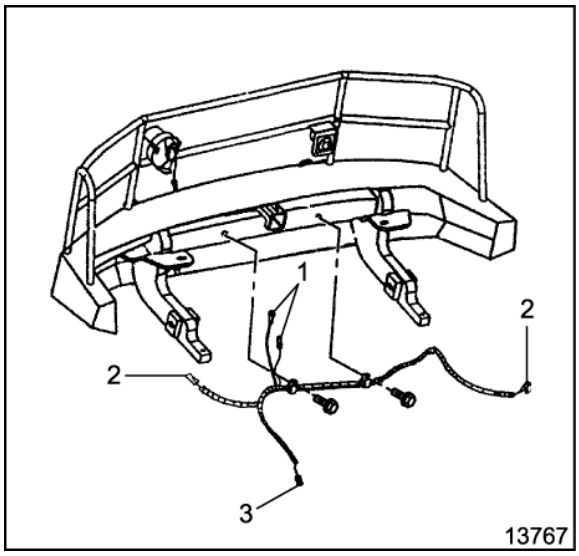
Blackout (B/O) Lamp Wiring Harness – Front

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Caution and Notices.

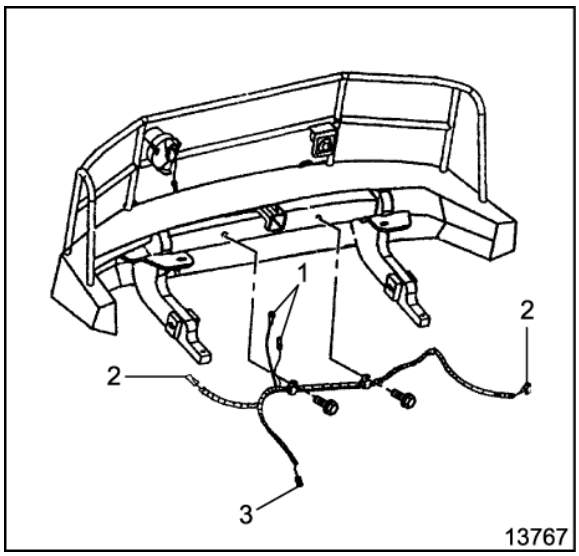
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Disconnect the blackout (B/O) headlamp connectors (1) from the blackout (B/O) headlamp.
3. Disconnect the blackout (B/O) marker lamp connectors (2) from the blackout (B/O) marker lamp.
4. Trace the blackout (B/O) lamp harness connector (3) to the main harness connector.
5. Disconnect the blackout (B/O) lamp harness connector (3) to the main harness connector.
6. Remove the wiring harness from the vehicle.

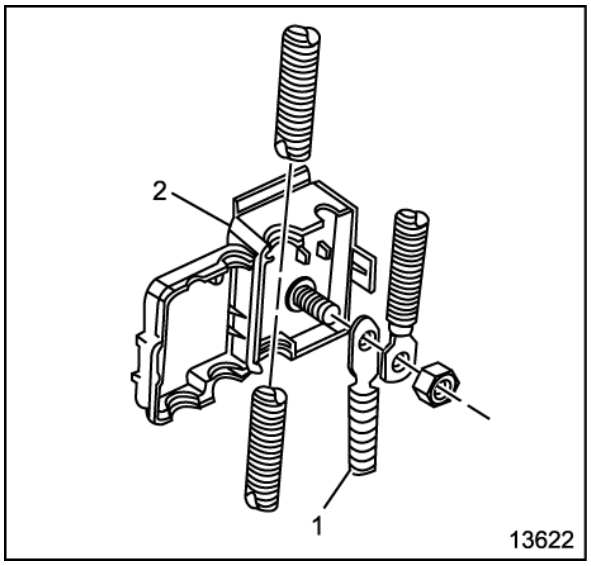
Important: Note routing wiring harness for installation.



Installation Procedure

1. Position the blackout (B/O) lamp wiring harness onto the vehicle in the same routing location as removed.
2. Connect the blackout (B/O) lamp harness connector (3) to the main harness connector.
3. Connect the blackout (B/O) marker lamp connectors (2) to the blackout (B/O) marker lamps.
4. Connect the blackout (B/O) headlamp connectors (1) to the blackout (B/O) headlamp.
5. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



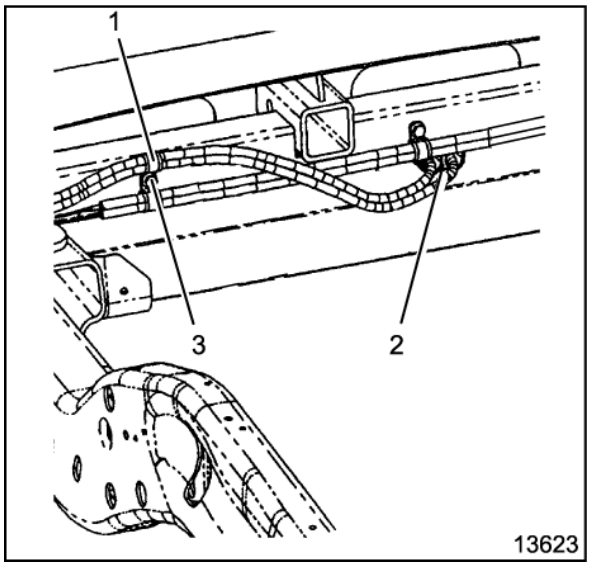


Winch Connector/Harness Replacement – Front

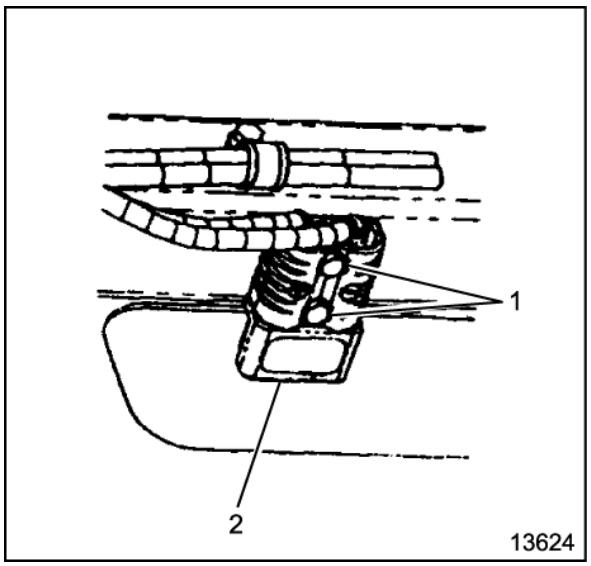
Removal Procedure

Caution: Refer to Battery Disconnect Caution in Caution and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the positive cable (1) from the junction block (2).



3. Remove the negative cable from the engine block.
4. Remove any wiring harness straps securing the cable to the vehicle.
5. Remove the bolt (3) and clamp (1) from the connector/harness (2).



6. Remove the bolts (1) from the winch connector (2).
7. Remove connector/harness from vehicle.

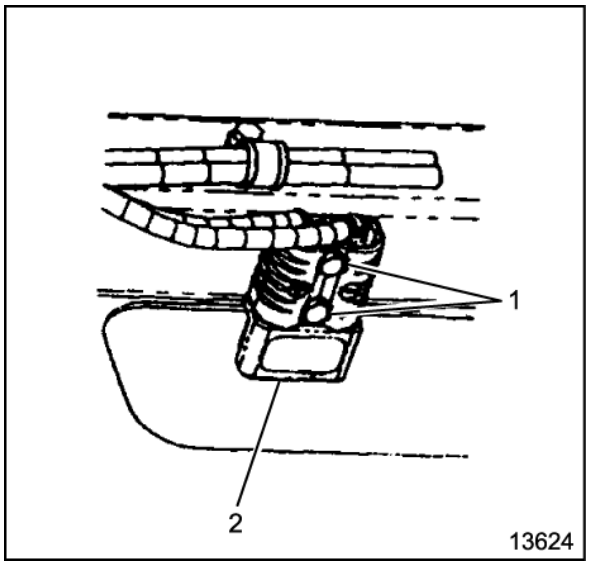
Important: Note cable routing for installation.

Installation Procedure

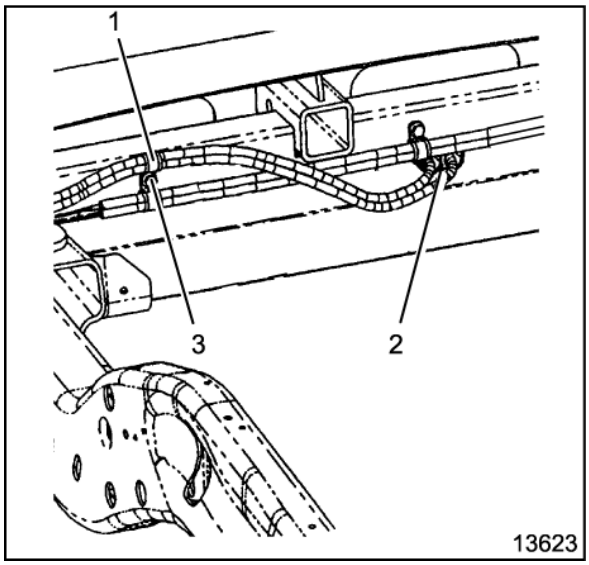
1. Install connector/harness to the vehicle in the same routing as removed.

Notice: Refer to Fastener Notice in Cautions and Notices.

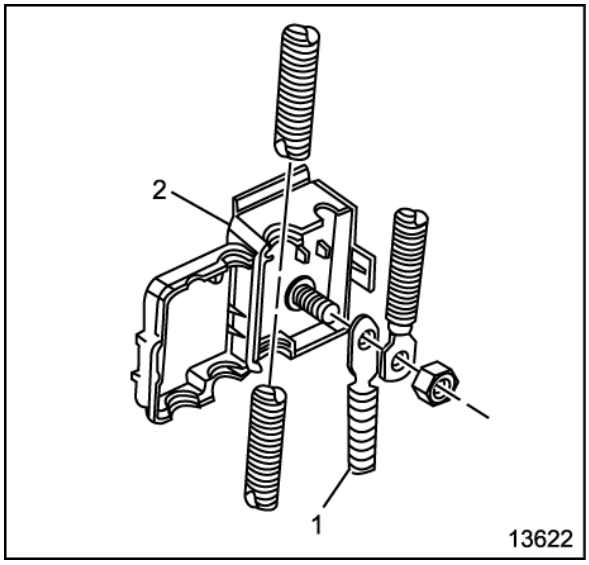
2. Position the connector (2) on the bumper and install bolts (1).
   Tighten
   Tighten the connector bolts to 5-8 N•m (44-71 lb in).

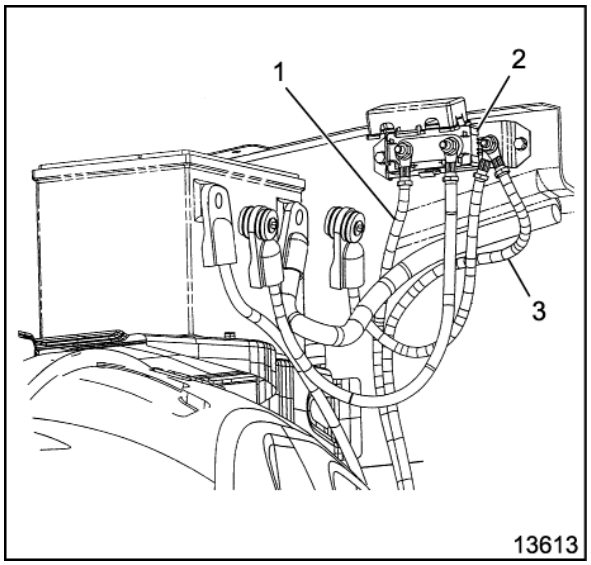


3. Install the clamp (1) onto the cables.
4. Install the bolt (3) securing clamp to bumper.
   Tighten
   Tighten the clamp bolt to 18-29 N•m (13-21 lb ft).



5. Install the negative cable to the engine and the fastening bolt.
   Tighten
   Tighten the negative cable bolt to 34 N•m (25 lb ft).
6. Install the positive cable (1) to the junction block (2).
   Tighten
   Tighten the junction block nut to 9 N•m (80 lb in).
7. Install connector/harness to vehicle in original location using wiring harness straps.
8. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



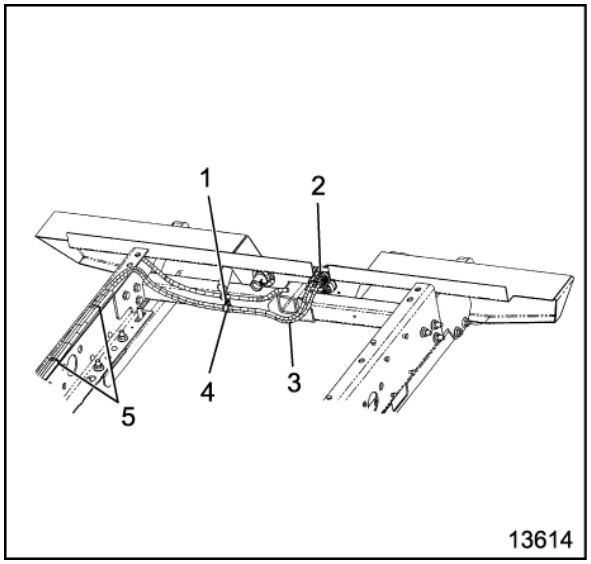


Winch Connector/Harness Replacement – Rear

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Caution and Notices.

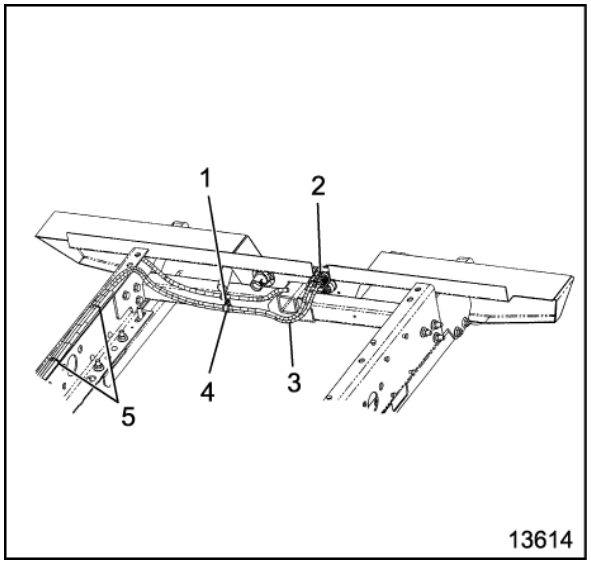
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the negative cable (3) from the junction block (2).
3. Remove the positive cable (1) from the junction block (2).



4. Remove the wiring harness strap(s) securing the cable.

Important: Note cable routing for installation.

5. Remove the clamp bolt (1) and clamp (4) from cable.
6. Remove the bolt (2) securing cable connector to the bracket.
7. Remove the cable (3) from the vehicle.



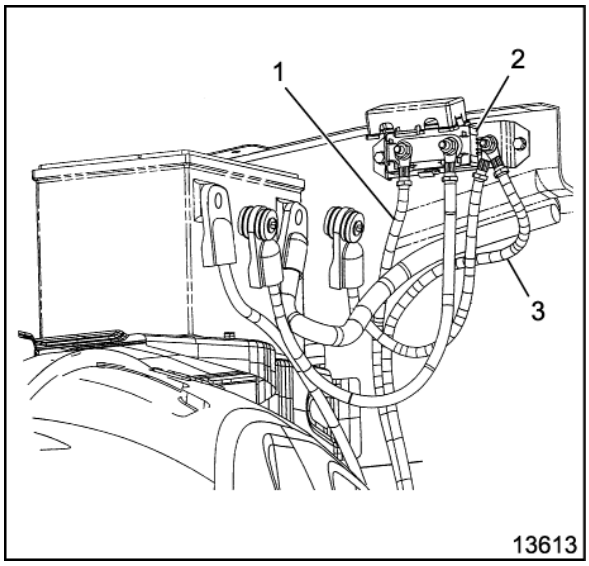
Installation Procedure

1. Install the cable (3) onto the vehicle in the same location as removed.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the connector onto the bracket and secure with bolt (2).
   Tighten
   Tighten the connector bolt to 5-8 N•m (44-71 lb in).
3. Install the clamp (4) and secure with bolt (1).
   Tighten
   Tighten clamp bolt to 18-29 N•m (13-21 lb ft).
4. Working from the rear to the front of the vehicle install wiring harness straps (5).

5. Install the positive cable (1) to the junction block (2).
6. Install the negative cable (3) to the junction block (2).
   Tighten
   Tighten junction block nuts to 9 N•m (80 lb in).
7. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



Description and Operation

Wiring Description

Several changes offered by the military options require new wiring configurations. Auxiliary wiring attaches to the original wiring providing power to the following items:

- Blackout (B/O) Lighting
- 24V System
- Battery Equalizer
- Circuit Breakers and Relays
- Slave Receptacle
- Winch

All auxiliary harnesses are outlined in schematics. Several are described in repair procedures in this manual.

Access to fuses can be found under the dash and under the hood.

Lighting Systems

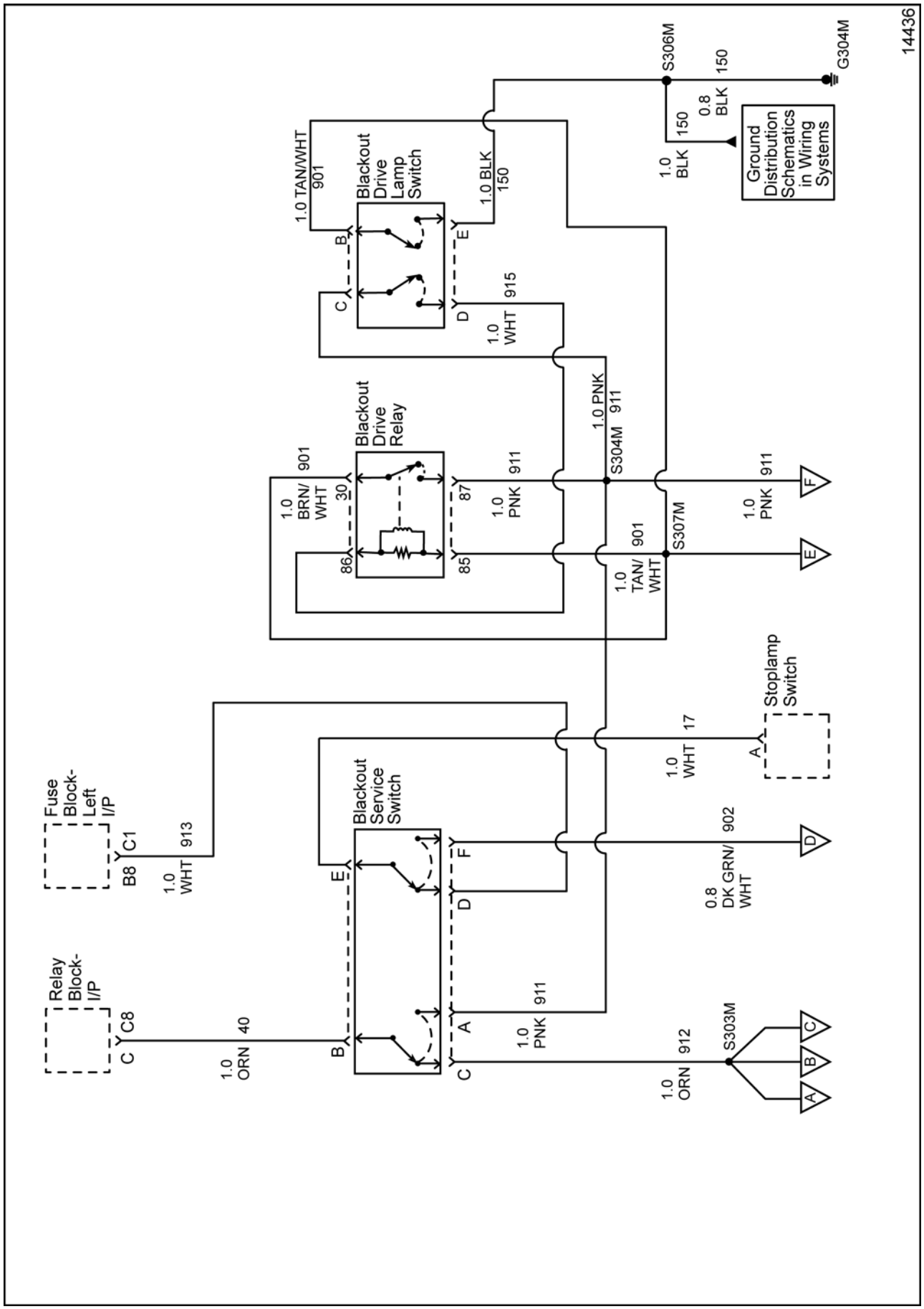
Specifications

Fastener Tightening Specifications

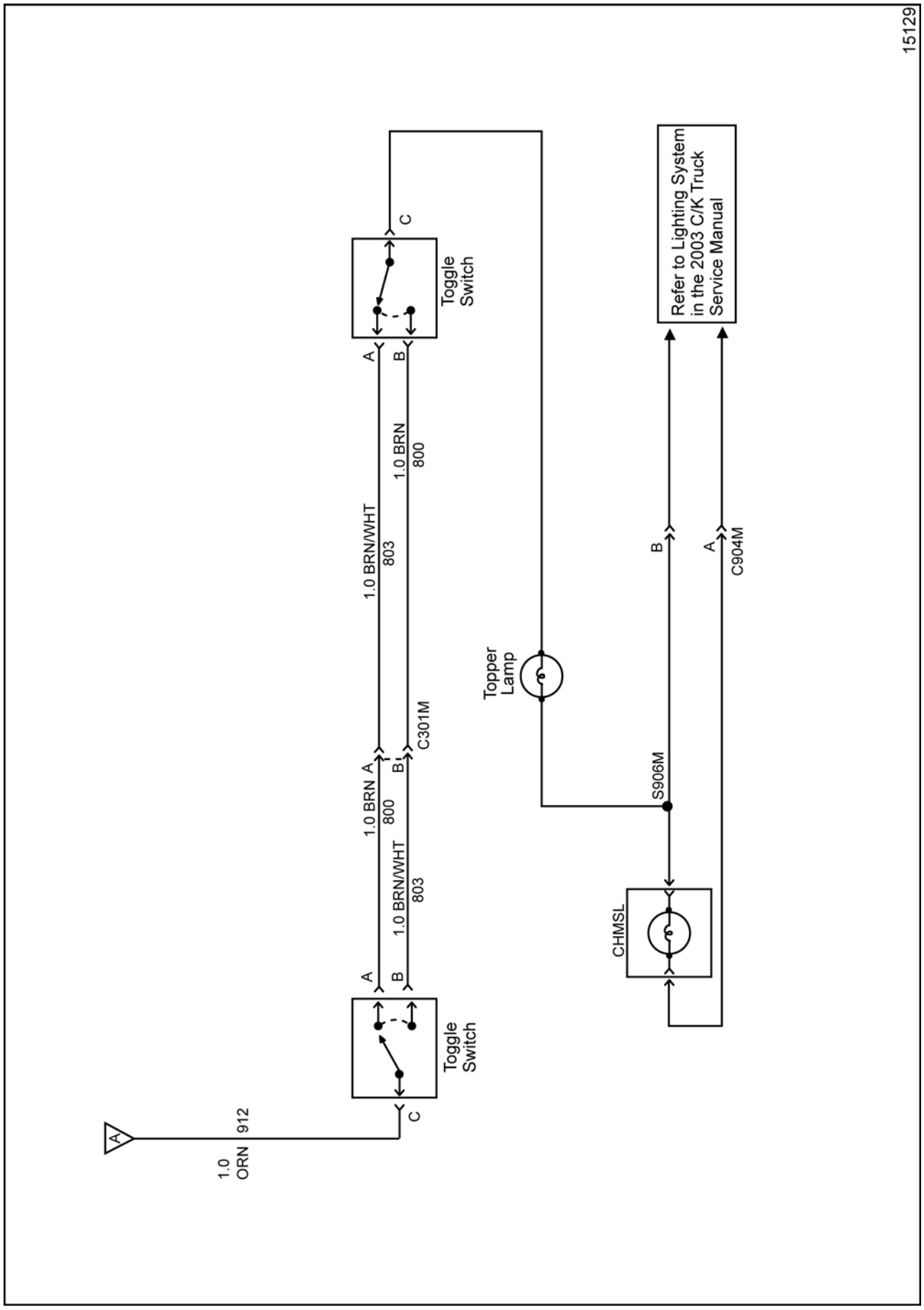
Application	Specification	
	Metric	English
Blackout (B/O) Headlamp Stud Nut	10 N•m	7 lb ft
Front Blackout (B/O) Marker Lamp Nuts	2 N•m	18 lb in
Rear Blackout (B/O) Lamp Nuts	2 N•m	18 lb in

Schematic and Routing Diagrams

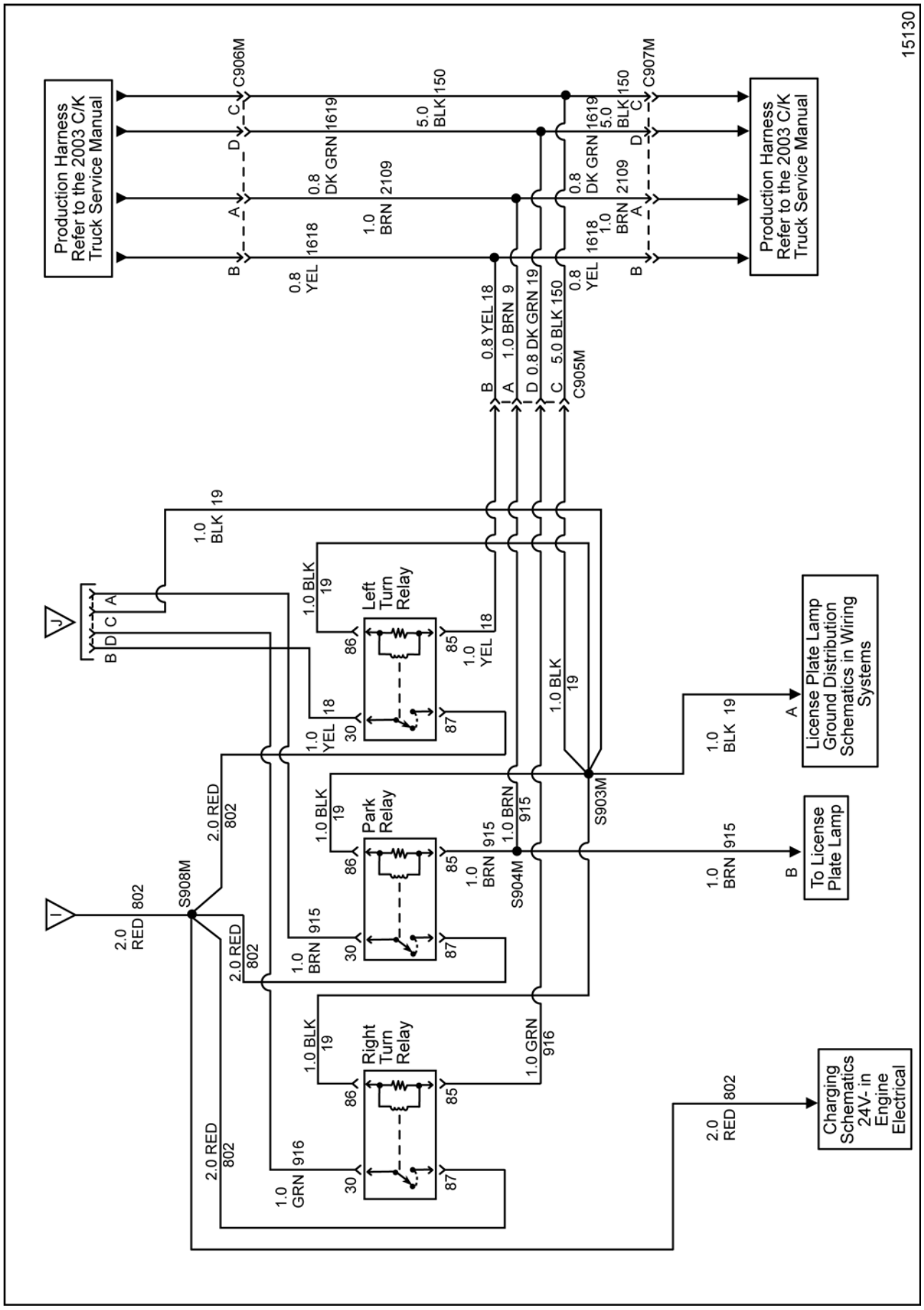
Blackout (B/O) Light Controls



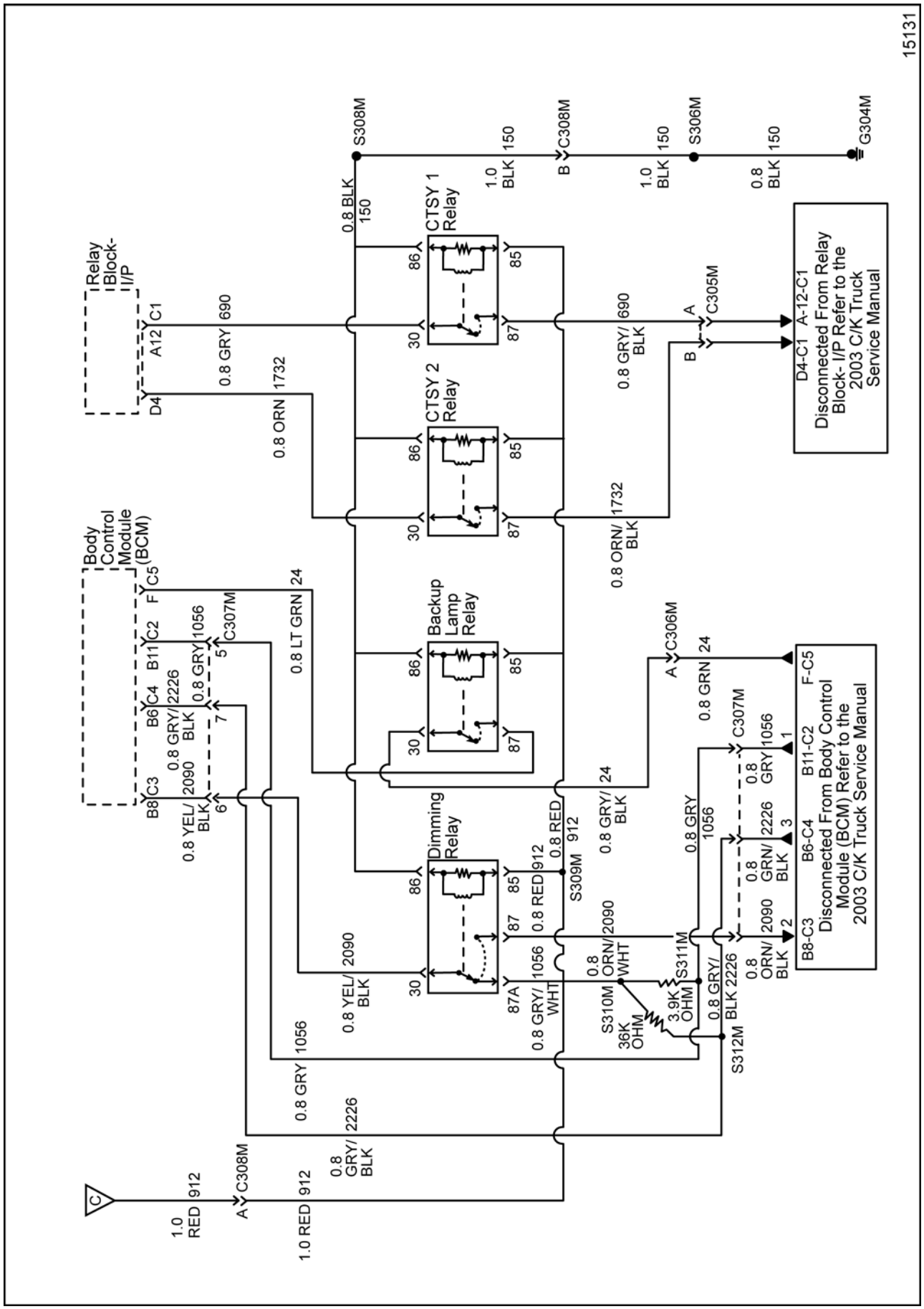
Topper Lighting



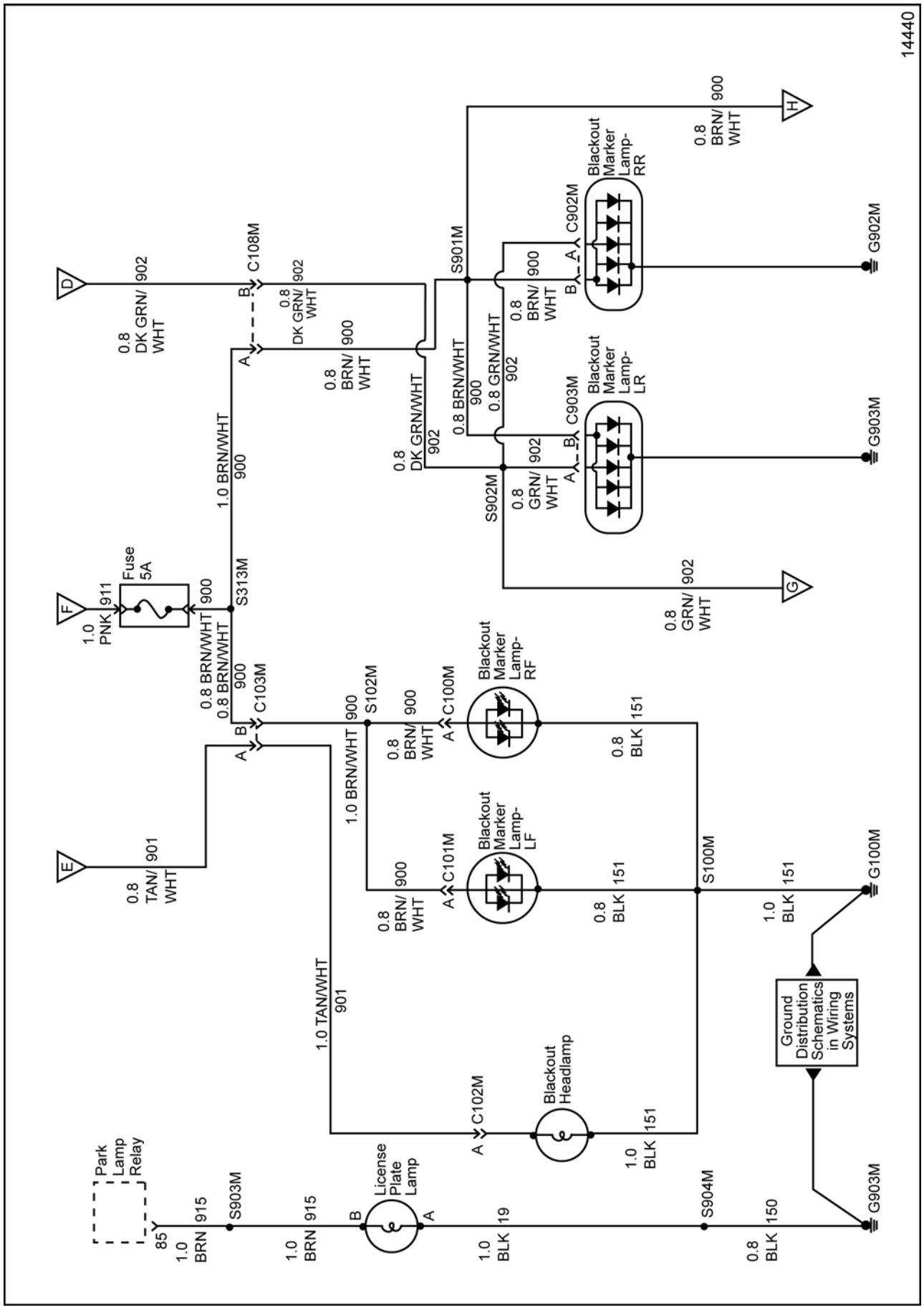
Relays (Underhood Fuse Block)



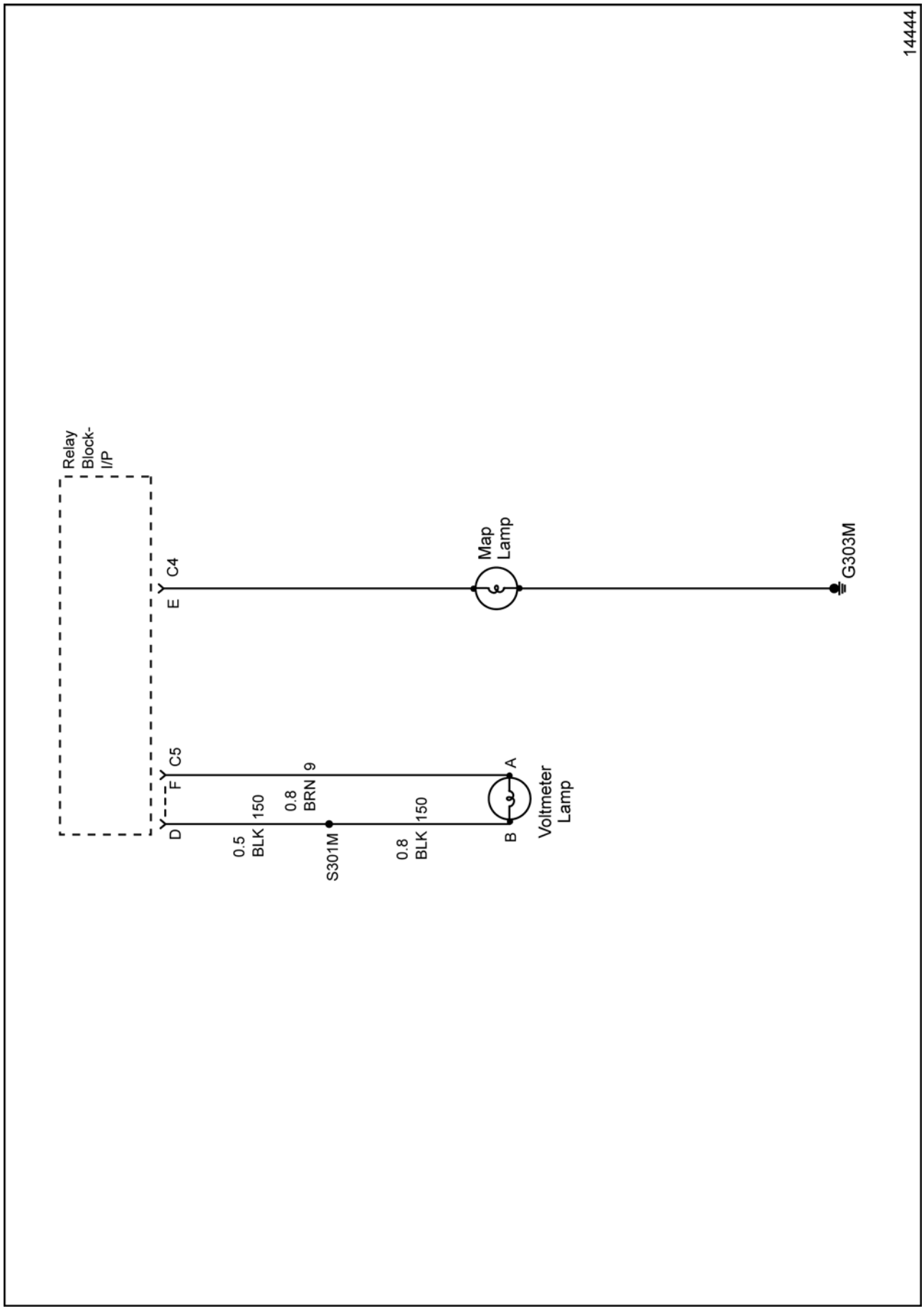
Interrupt Relays (I/P Fuse Block)



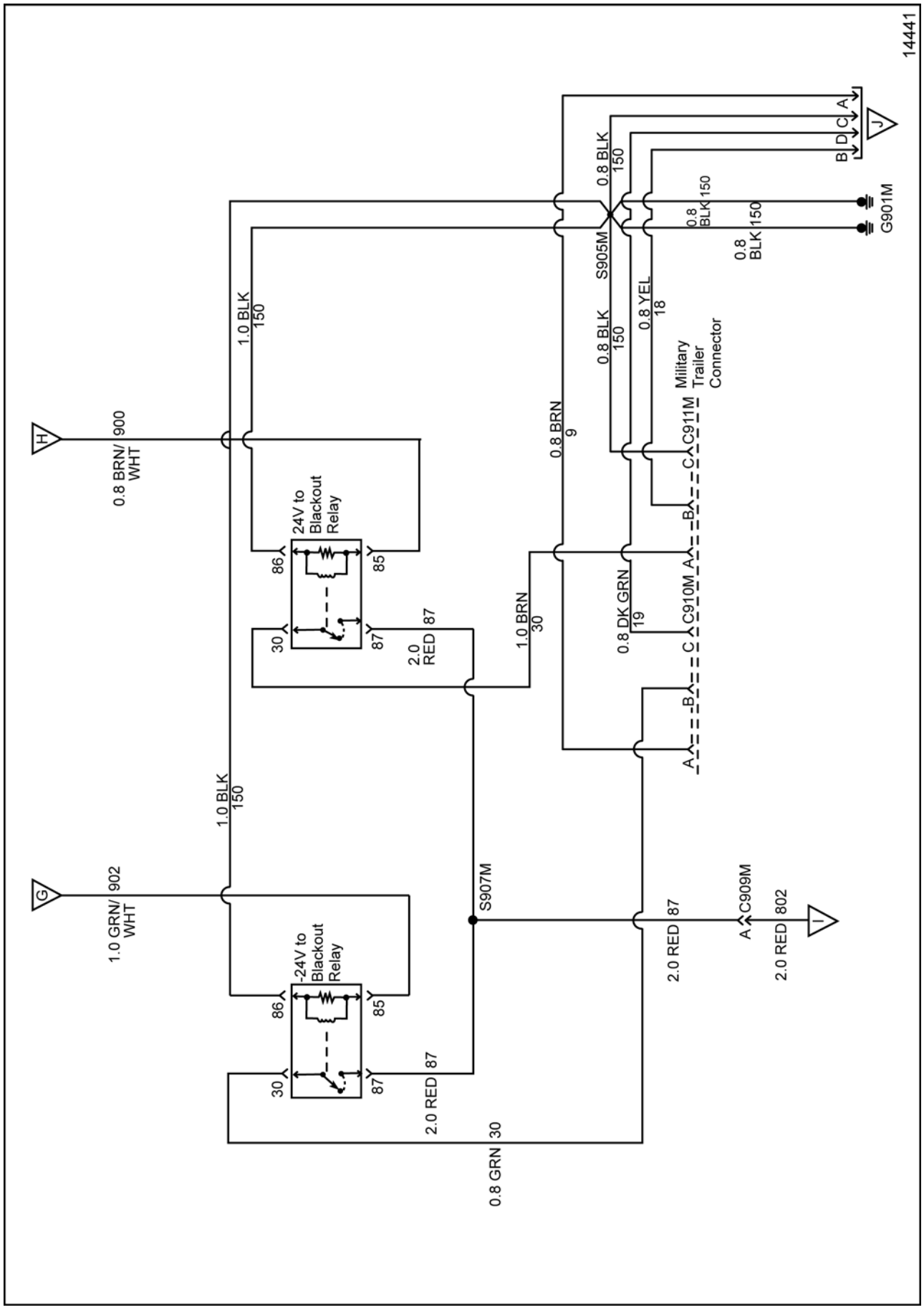
External Lighting



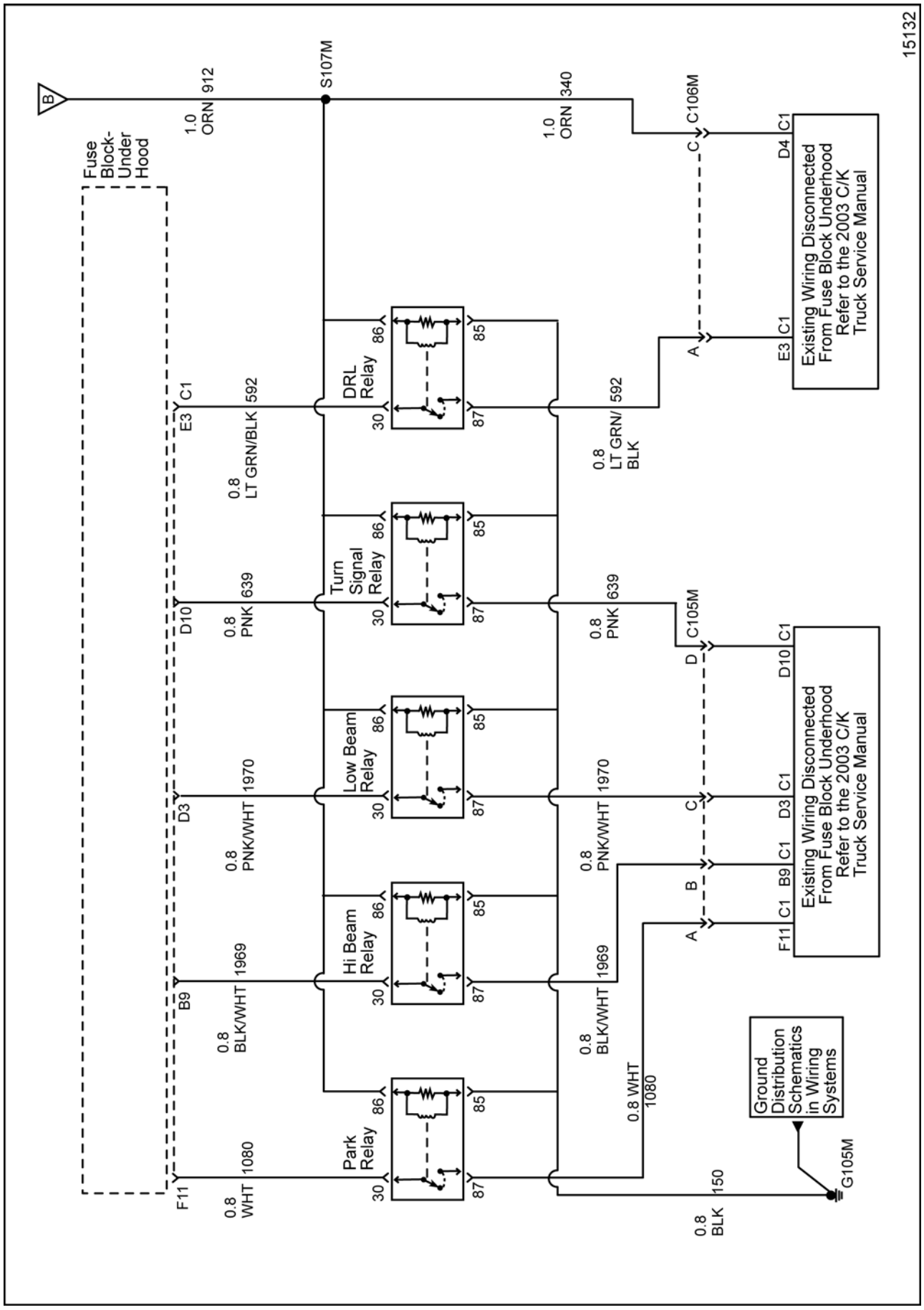
Interior Lighting



Trailer Wiring



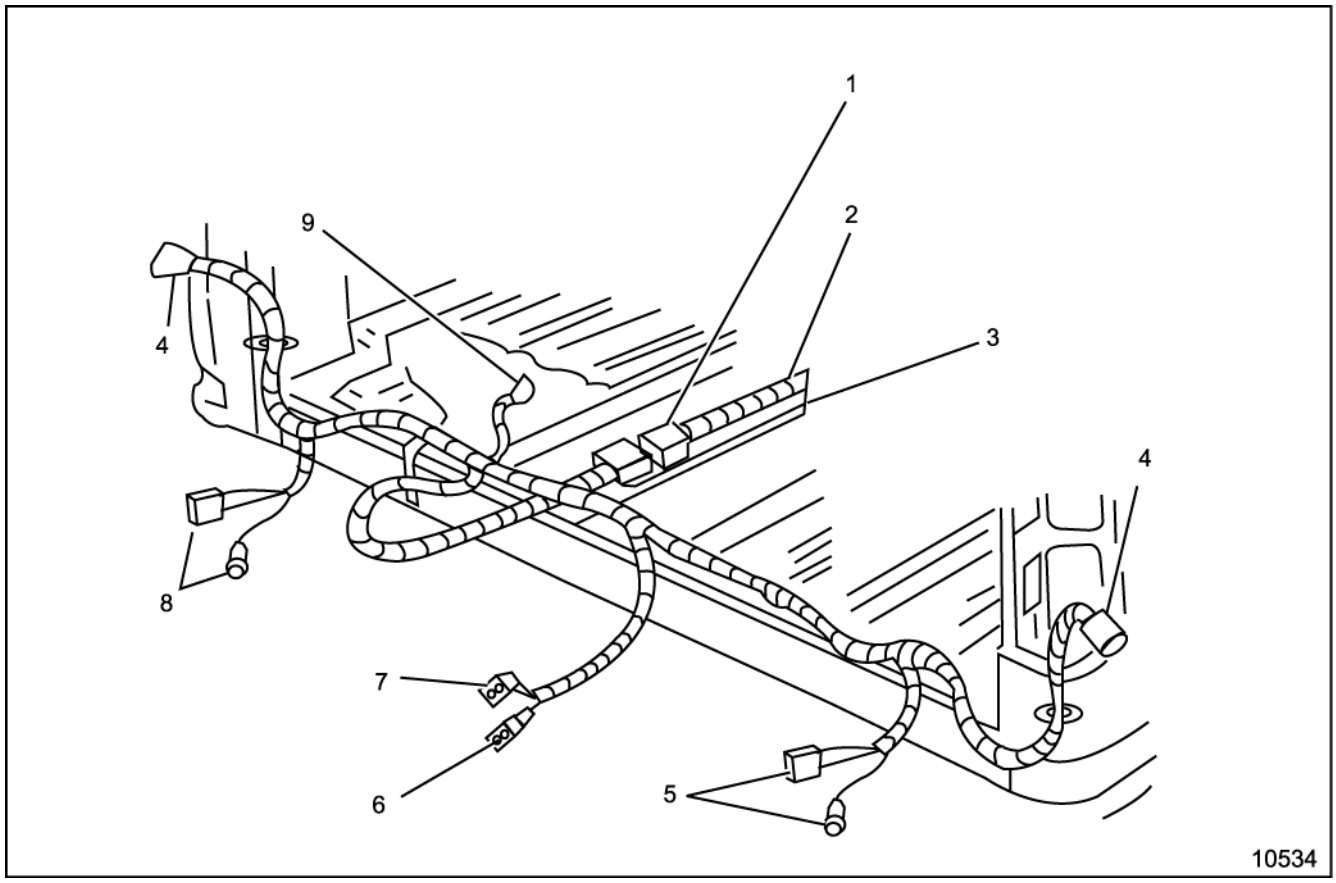
Rear Relay Harness



Component Locator

Lighting Systems Component Views

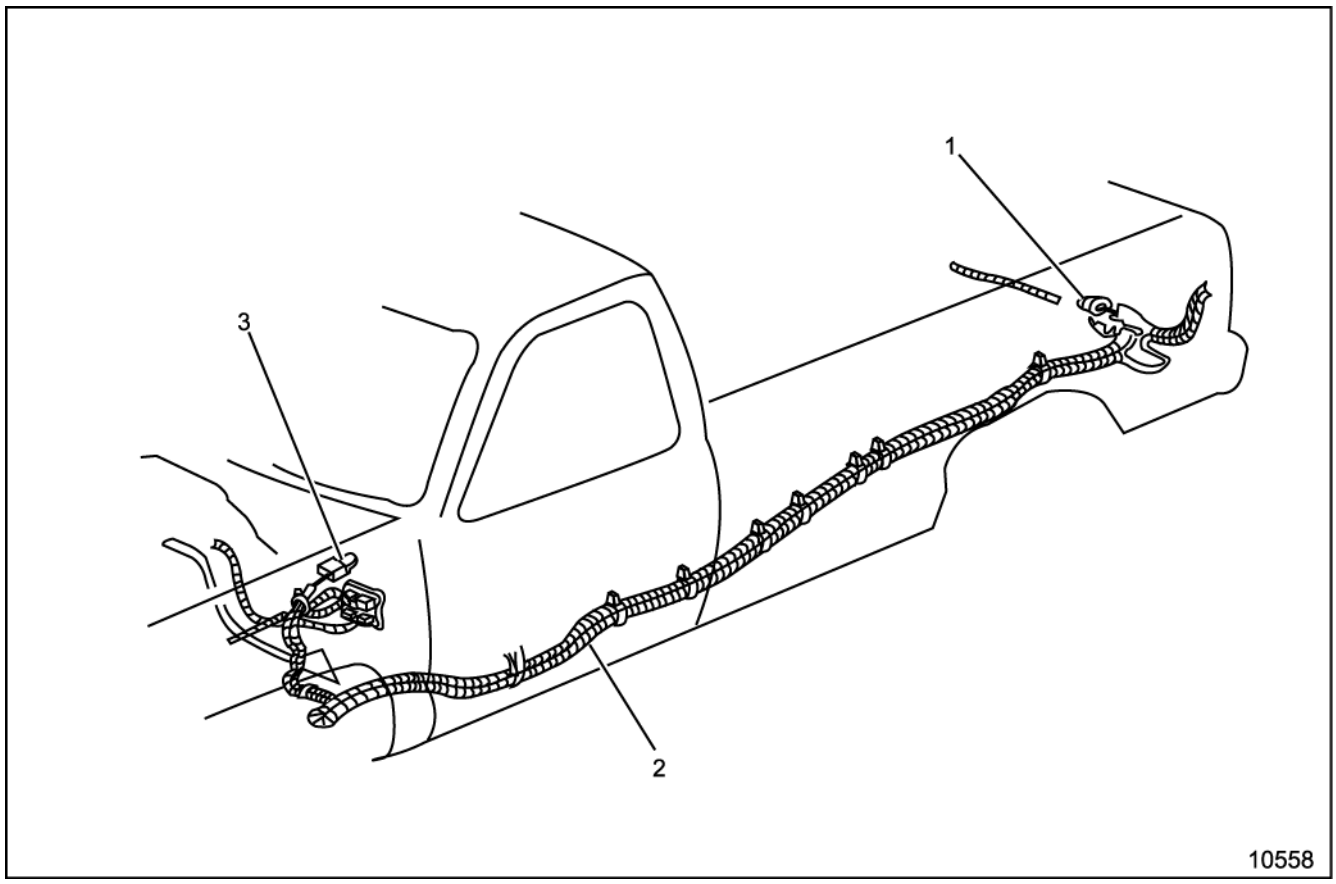
Rear Lamp Harness



Legend

(1) C908M
(2) Auxiliary Rear Lamp Extension Harness
(3) Rear of Vehicle
(4) Taillamp
(5) To Blackout (B/O) Marker Lamp, RH
(6) Military Trailer Connector
(7) Military Trailer Connector
(8) To Blackout (B/O) Marker Lamp, LH
(9) G901M

Auxiliary Rear Lamp Harness



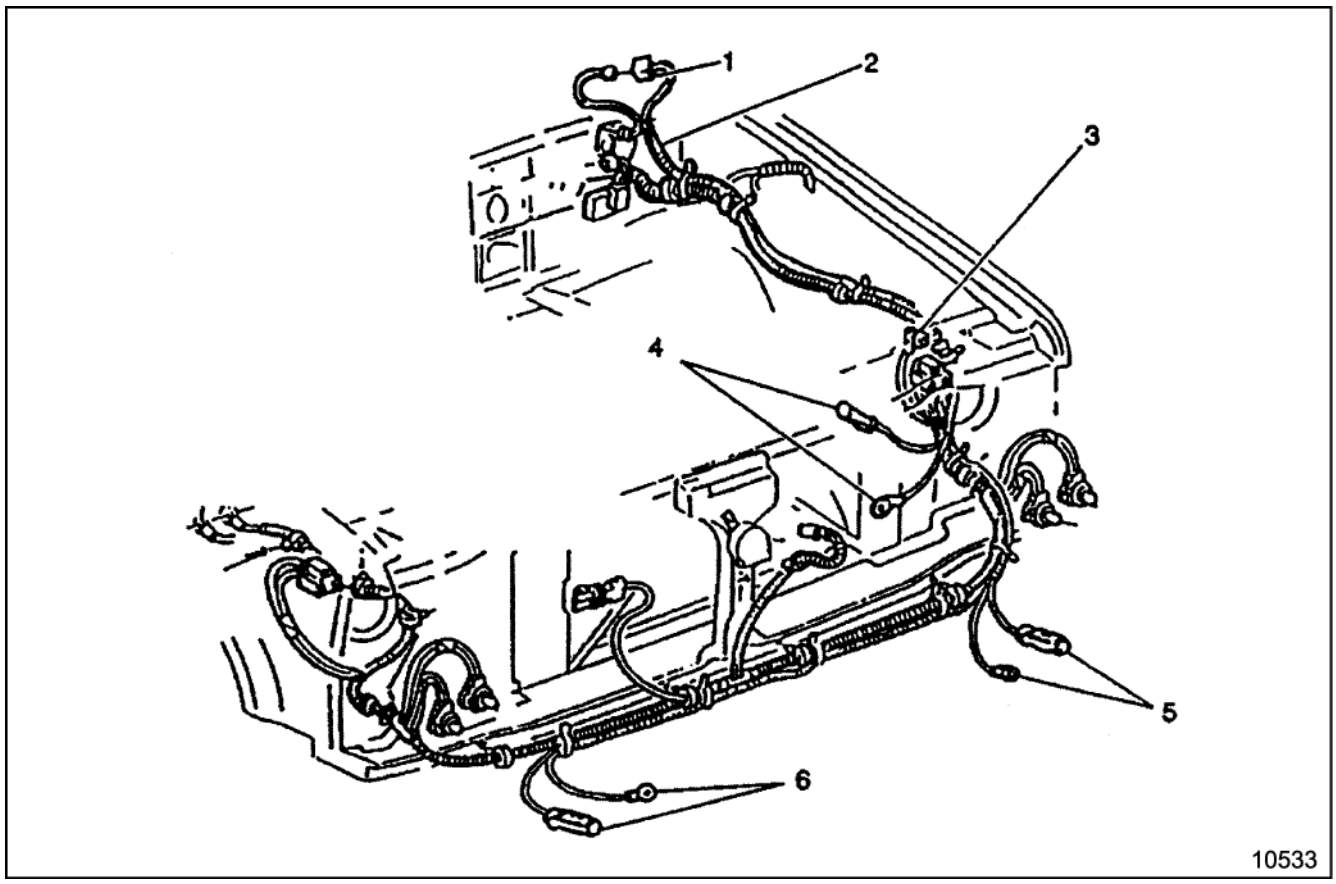
Legend

(1) C908M

(2) Auxiliary Rear Lamp Harness

(3) I/P Wiring Harness

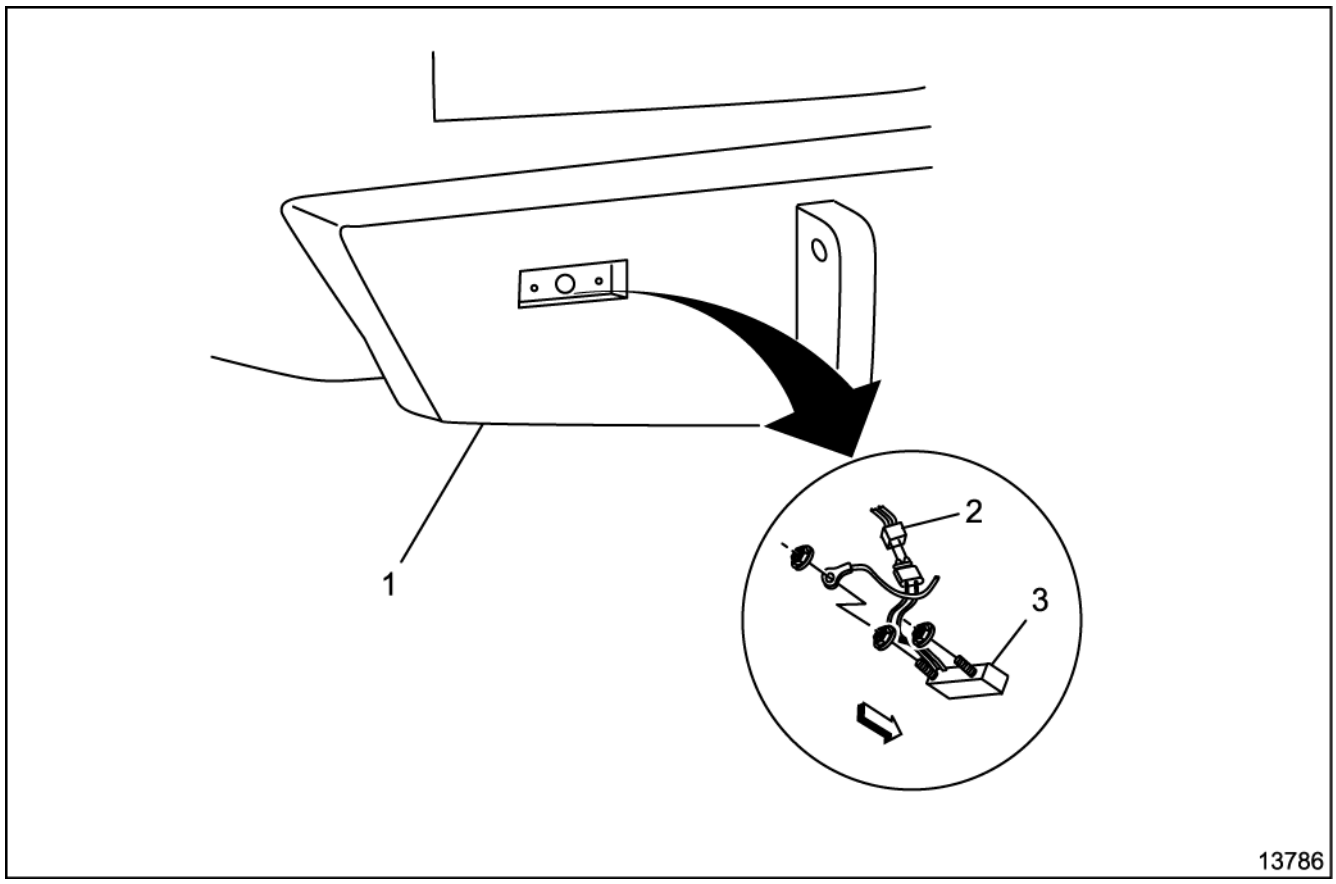
Forward Blackout (B/O) Lamp Harness



Legend

(1) I/P Wiring Harness
(2) Forward Lamp Harness
(3) Forward Lamp Harness Ground
(4) To Blackout (B/O) Headlamp
(5) To Blackout (B/O) Marker Lamp, LF
(6) To Blackout (B/O) Marker Lamp, RF

Rear Blackout (B/O) Lamps



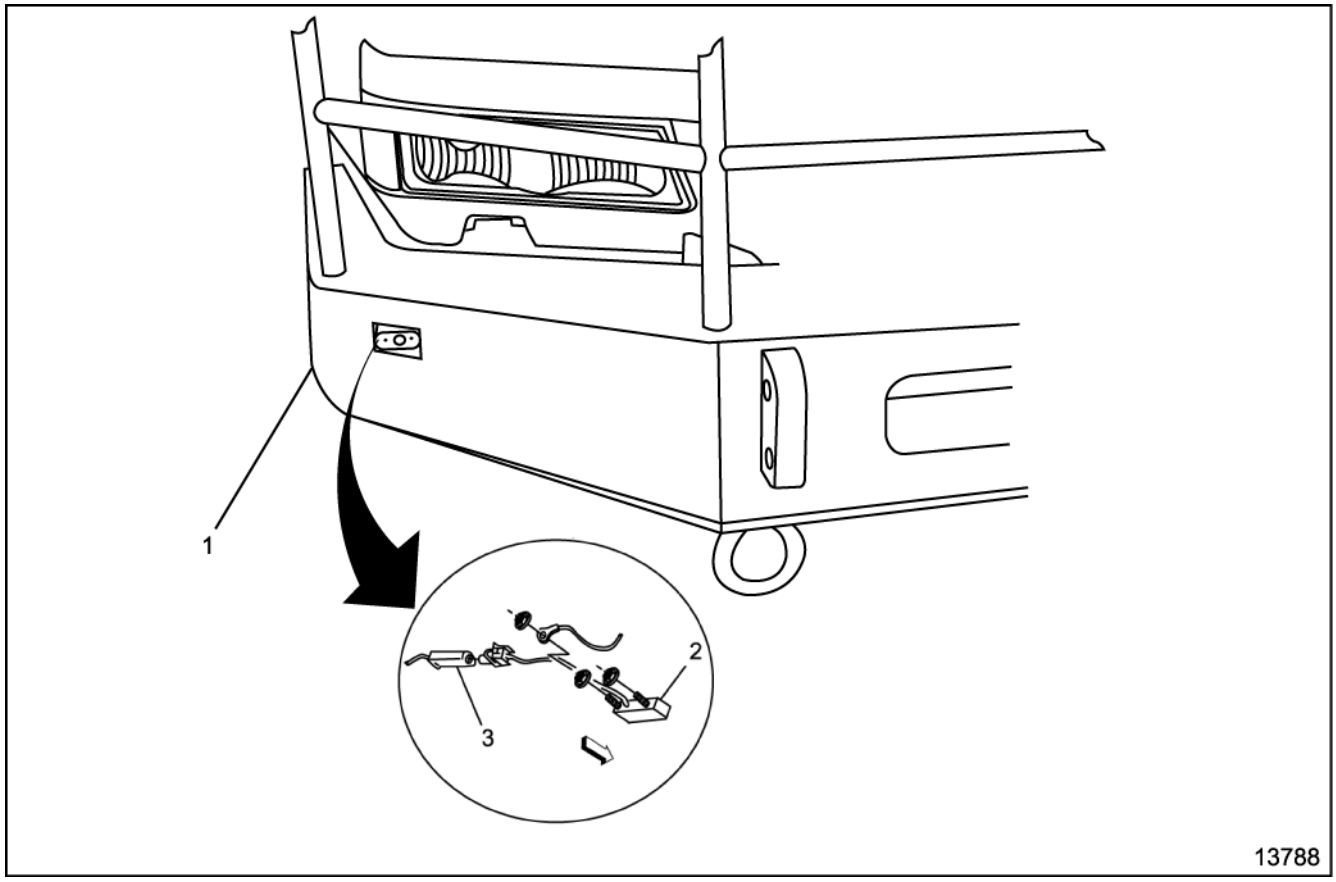
Legend

(1) Rear Bumper

(2) Lamp Harness Connector

(3) Blackout (B/O) Lamp Assembly

Front Blackout (B/O) Marker Lamps



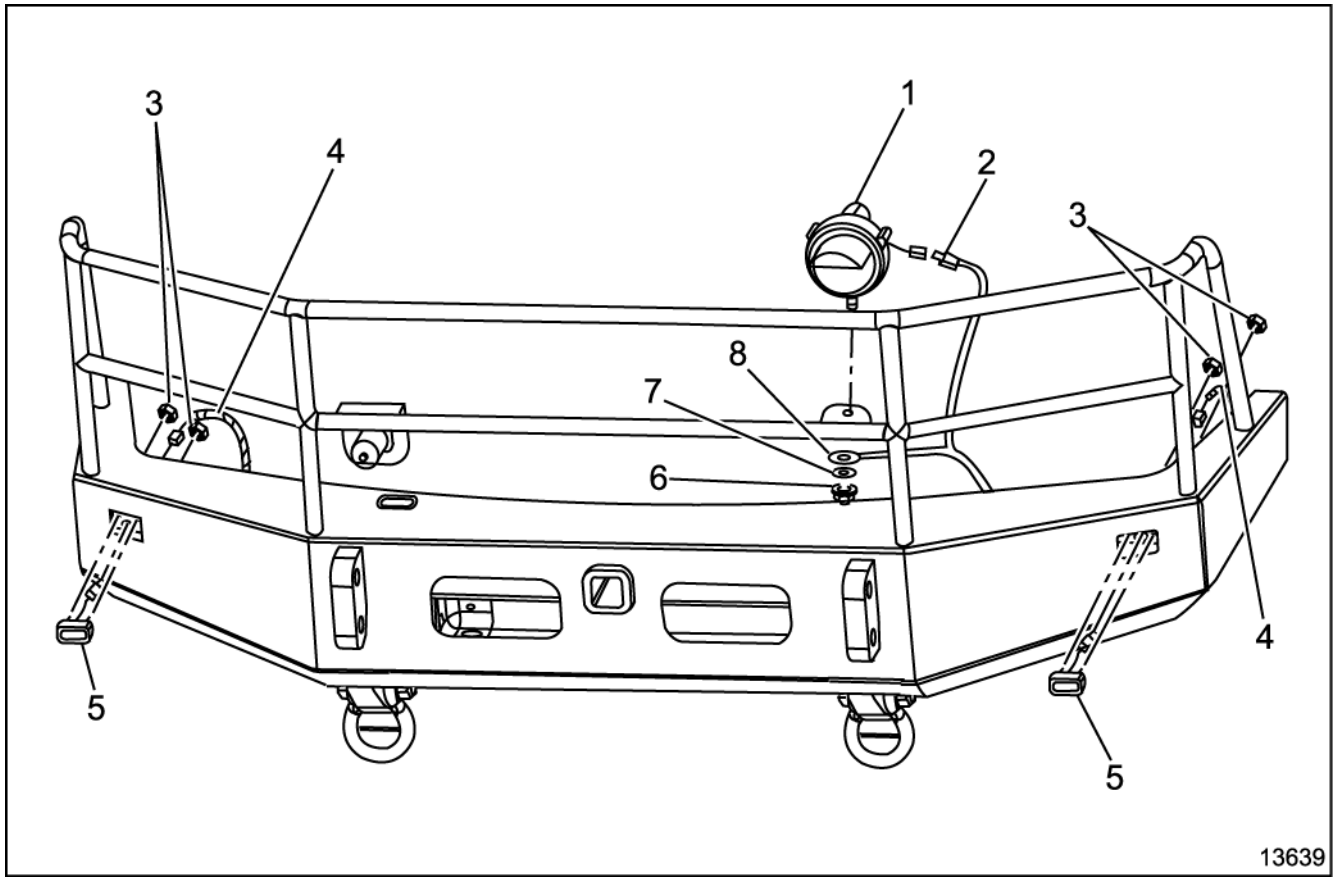
Legend

(1) Front Bumper

(2) Blackout (B/O) Lamp Assembly

(3) Forward Lamp Harness

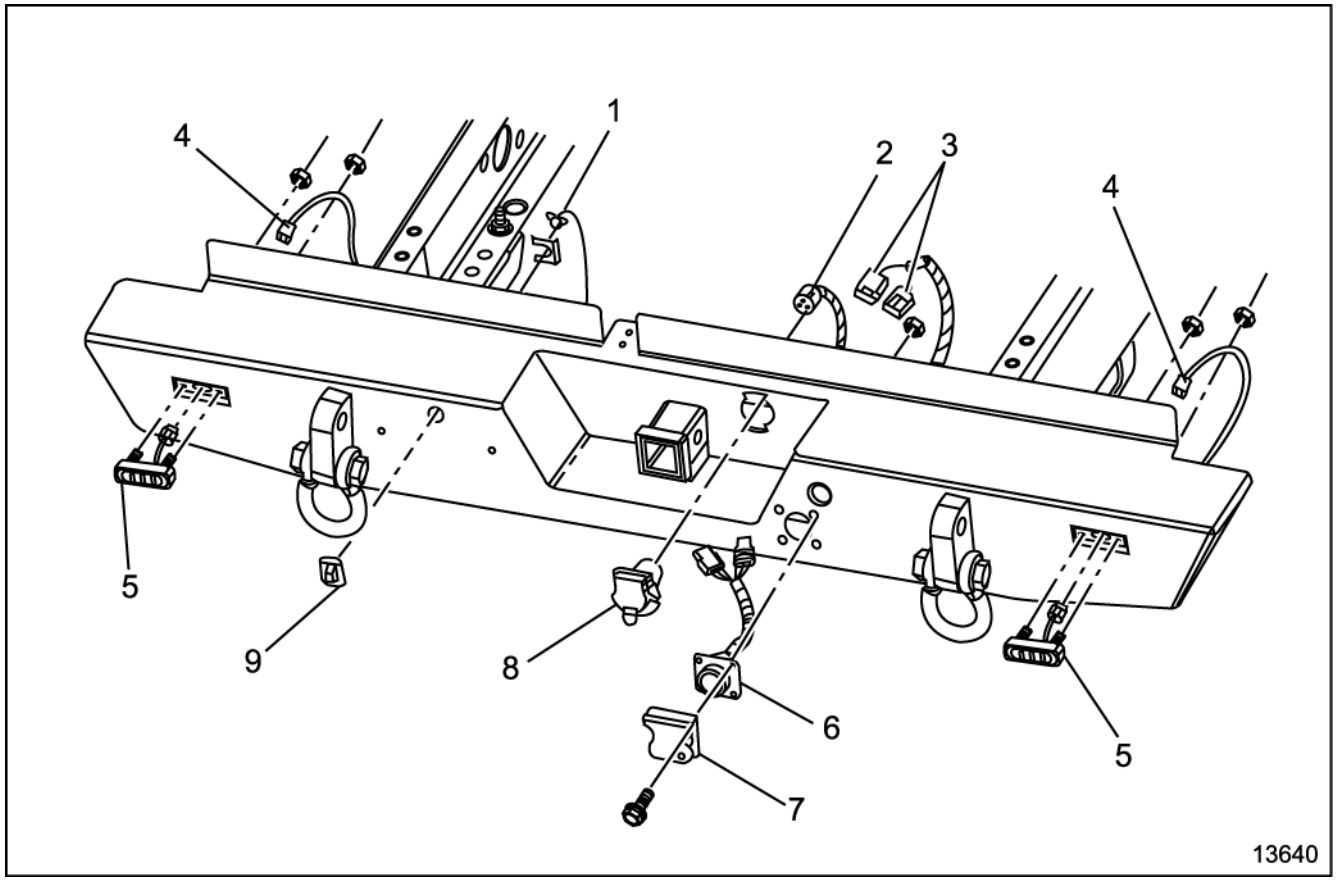
Front Lighting



Legend

(1) Blackout (B/O) Headlamp
(2) Headlamp Harness Connector
(3) Blackout (B/O) Marker Lamp Fastening Nuts
(4) Marker Lamp Harness Connector
(5) Marker Lamps
(6) Headlamp Fastening Nut
(7) Washer
(8) Headlamp Ground Lead

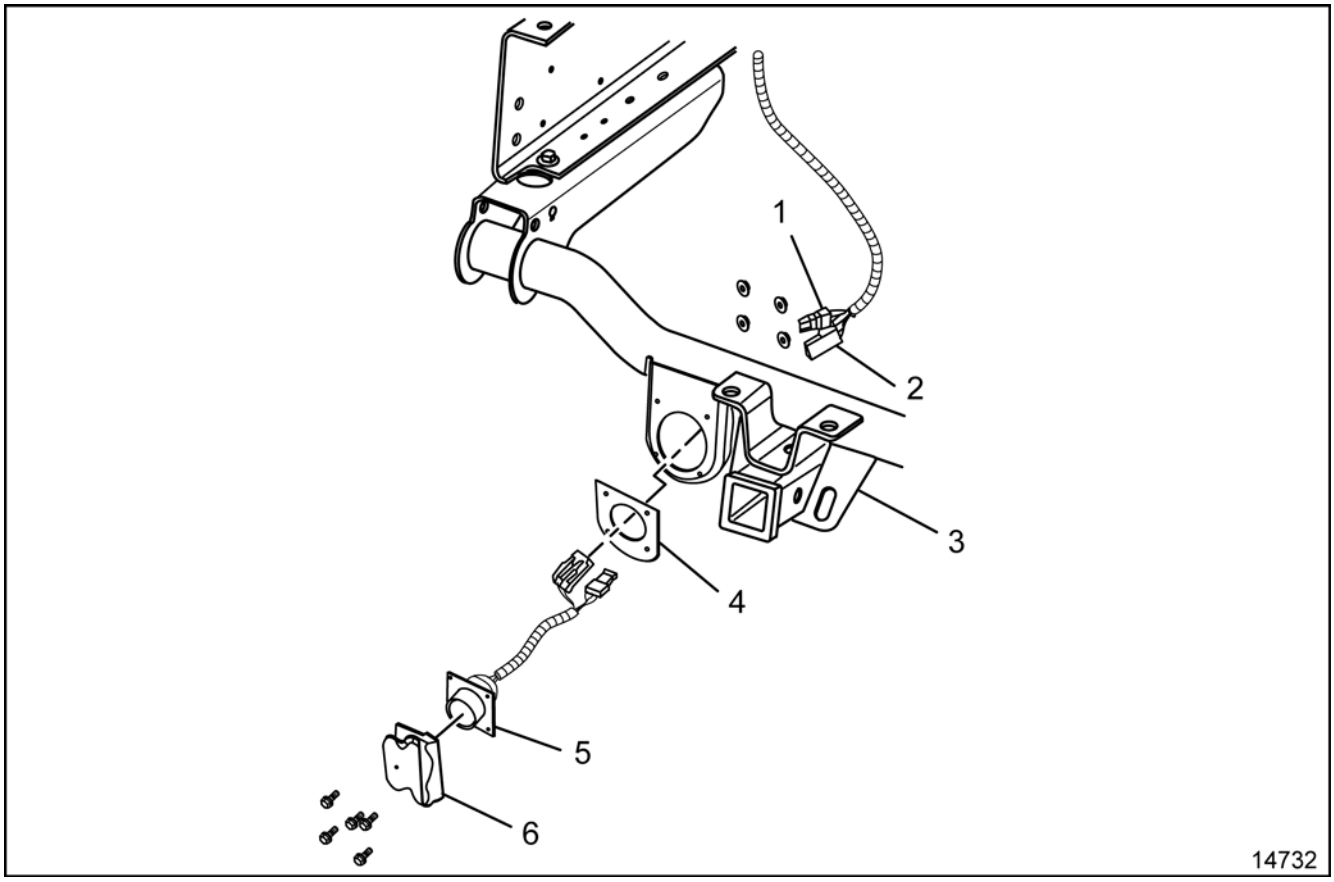
Rear Lighting



Legend

(1) License Plate Lamp
(2) Trailer Harness Connector (Commercial)
(3) Trailer Harness Connector (Military)
(4) Maker Lamp Harness Connections
(5) Blackout (B/O) Marker Lamps
(6) Trailer Connector (Military)
(7) Trailer Connector Cover
(8) Trailer Connector (Commercial)
(9) License Plate Lamp

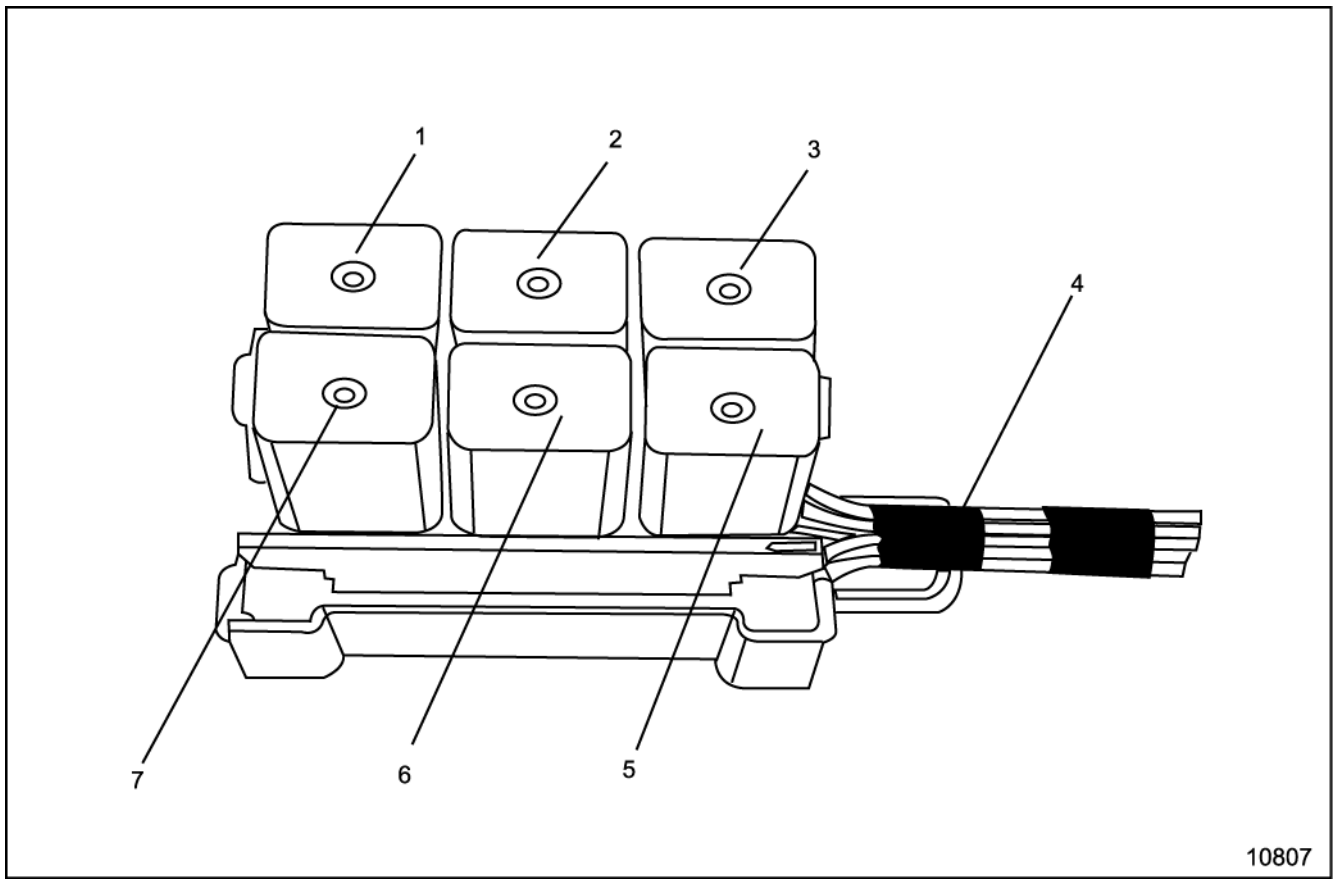
Trailer Wiring Harness Factory Bumper



Legend

(1) Harness Connector
(2) Harness Connector
(3) Hitch Receiver
(4) Mounting Plate
(5) Trailer Connector
(6) Connector Cover

Relay Block

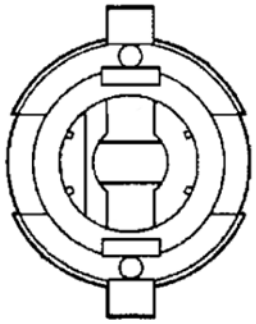


Legend

(1) Turn Signal Relay
(2) Park Lamp Relay
(3) Headlamp Hi-Beam Relay
(4) Harness TX017860
(5) Headlamp Low-Beam Relay
(6) DRL Relay
(7) Horn Relay

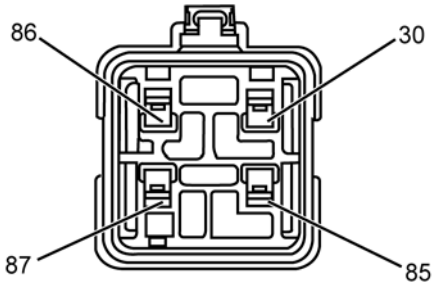
Lighting Systems Connector End Views

License Plate Lamp



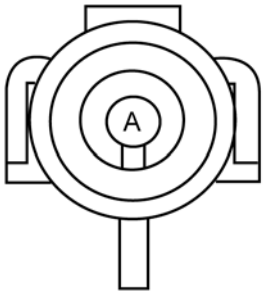
Connector Part Information	• 12010946 • 1-Way M Weather Pack (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BLK	19	Ground
B	BRN	915	Lamp Voltage

Blackout (B/O) Control Relay



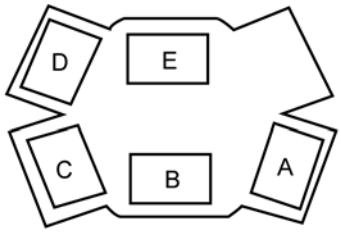
Connector Part Information	• 12129716 • 4-Way F M/P Series 280 (GRY)		
Pin	**Wire Color**	**Circuit No.**	**Function**
86	WHT	915	Blackout (B/O) Relay Feed from Blackout (B/O) Control Switch
85	TAN/WHT	901	Blackout (B/O) Drive Lamp
87	PNK	911	Power to Blackout (B/O) Controls
30	BRN/WHT	901	Blackout (B/O) Drive Lamp

Blackout (B/O) Headlamp



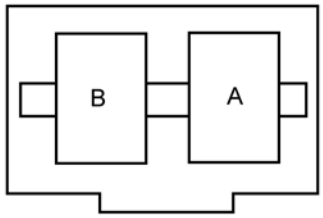
Connector Part Information	• 12010996 • 1-Way M Weather Pack (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	TAN/WHT	901	Blackout (B/O) Driver Lamps

Blackout (B/O) Drive Lamp Switch



Connector Part Information	• 08911352 • 5-Way F Series 56 (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	___	___	Not Used
B	TAN/ WHT	901	Blackout (B/O) Drive Lamp
C	PNK	911	Power to Blackout (B/O) Control Switch to Blackout (B/O) Relay Feed
D	WHT	915	Blackout (B/O) Control Relay
E	BLK	150	Ground

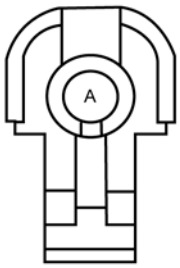
Blackout (B/O) Lamps Fuse



10567

Connector Part Information	• 12010105 • 2-Way M Weather Pack (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BRN/WHT	900	Voltage to Blackout (B/O) Marker Lamps
B	PNK	911	Voltage from Blackout (B/O) Controls

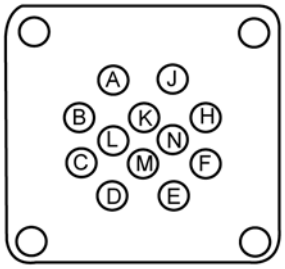
Blackout (B/O) Marker Lamp (Front)



10561

Connector Part Information	• 12015791 • 1-Way F Weather Pack (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BRN/WHT	900	Blackout (B/O) Marker Lamps

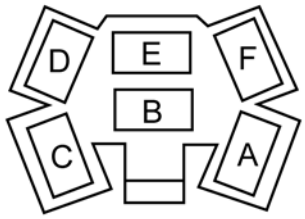
Trailer Lamp Connector



10562

Connector Part Information	• 08917884 • 12-Way Weather Pack (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	BRN	900	Blackout (B/O) Marker Lamps
B	YEL	18	Brake/Taillamp Feed
C	BRN	900	Blackout (B/O) Control Circuits
D	BLK	913	Service Stoplamps
E	BRN	17	Stoplamp Switch Output
F	PPL	902	Blackout (B/O) Brakelamps
H	BRN	900	Blackout (B/O) Brakelamp
J	PPL	19	Brake/Taillamp Feed, RR
K-N	___	___	Not Used

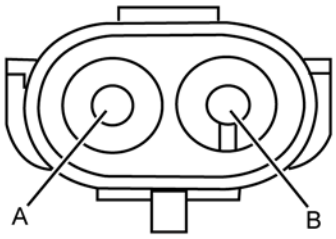
Service Lamp Switch



10563

Connector Part Information	• 08917695 • 6-Way F M/P Series 280 (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	PNK	911	Power to Blackout (B/O) Control
B	ORN	40	Junction Block-Body
C	ORN	912	Blackout (B/O) Control Circuits
D	WHT	913	Service Stoplamps
E	WHT	17	Stoplamp Switch Output
F	DK GRN/ WHT	902	Blackout (B/O) Stoplamps

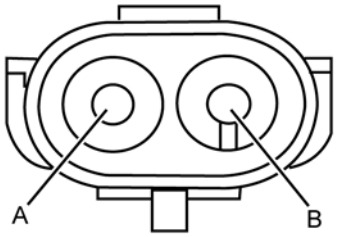
Blackout (B/O) Lamps (Right Rear)



10574

Connector Part Information	• 12010973 • 2-Way M Weather Pack (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	GRN/ WHT	902	Blackout (B/O) Stoplamp
B	BRN/ WHT	900	Blackout (B/O) Marker Lamp

Blackout (B/O) Lamps (Left Rear)



10574

Connector Part Information	• 12010973 • 2-Way M Weather Pack (BLK)		
Pin	**Wire Color**	**Circuit No.**	**Function**
A	GRN/ WHT	902	Blackout (B/O) Stoplamp
B	BRN/ WHT	900	Blackout (B/O) Marker Lamp

Diagnostic Information and Procedures

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- Blackout (B/O) Headlamp Inoperative
- Blackout (B/O) Headlamp Always On
- Headlamps Operate in Blackout (B/O) Mode
- Backup Lamps Inoperative
- Blackout (B/O) Stoplamps Inoperative
- Blackout (B/O) Marker Lamps Inoperative
- Blackout (B/O) Marker Lamps Always On
- DRL Operate in Blackout (B/O) Mode
- Backup Lamps Operate in Blackout (B/O) Mode
- Park Lamps Operate in Blackout (B/O) Mode
- CTSY Lamps Operate in Blackout (B/O) Mode
- Turn Signals Operate in Blackout (B/O) Mode
- Hi Beam Headlamps Operate in Blackout (B/O) Mode
- Low Beam Headlamps Operate in Blackout (B/O) Mode

Blackout (B/O) Headlamp Inoperative

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	Inspect condition of fuses. If fuse is open, locate and repair source of overload and replace fuse. Did you find and correct the condition?	Go to Step 20	Go to Step 3
3	1. Place blackout (B/O) service switch in blackout (B/O) mode. 2. Turn ON blackout (B/O) headlamp switch. 3. Connect a test lamp to circuit 901 (TAN/WHT) at connector C192 cavity A of the blackout (B/O) headlamp and ground. Does the test lamp illuminate?	Go to Step 4	Go to Step 7
4	1. Disconnect the blackout (B/O) lamp. 2. Connect a self-powered test lamp at circuit 151(BLK) and ground. Does the test lamp illuminate?	Go to Step 6	Go to Step 5
5	Locate and repair open circuit 151 (BLK) between blackout (B/O) headlamp and G113. Did you complete the repair?	Go to Step 20	—
6	Replace blackout (B/O) headlamp bulb. Did you complete the replacement?	Go to Step 20	—
7	1. Place blackout (B/O) switch to ON position. 2. Connect a test lamp at circuit 901 (TAN/WHT) wire between blackout (B/O) control relay cavity 85 connector C216 and ground. Does the test lamp illuminate?	Go to Step 8	Go to Step 9

Blackout (B/O) Headlamp Inoperative (cont'd)

Step	Action	Yes	No
8	Locate and repair open in circuit 901 (TAN/WHT) wire between blackout (B/O) lamp cavity A and blackout (B/O) control relay cavity 85 connector C216. Did you complete the repair?	Go to Step 20	—
9	Connect a test lamp at circuit 911 (PNK) wire between blackout (B/O) control relay cavity 87 and ground. Does the test lamp illuminate?	Go to Step 10	Go to Step 11
10	Connect test lamp at circuit 915 (WHT) wire cavity 86 and cavity 87 of the blackout (B/O) control relay. Does the test lamp illuminate?	Go to Step 13	Go to Step 15
11	Connect a test lamp from blackout (B/O) service switch cavity A circuit 911 (PNK) and ground. Does the test lamp illuminate?	Go to Step 12	Go to Step 14
12	Locate and repair open in circuit 911 (PNK) between blackout (B/O) service lamp switch and blackout (B/O) control relay. Did you complete the repair?	Go to Step 20	—
13	Replace blackout (B/O) control relay. Did you complete the replacement?	Go to Step 20	—
14	Connect a test lamp from the blackout (B/O) service switch at cavity B circuit 40 (ORN) and ground. Does the test lamp illuminate?	Go to Step 19	Go to Step 18
15	1. Disconnect blackout (B/O) headlamp switch. 2. Connect a self-powered test lamp between blackout (B/O) headlamp switch cavity E circuit 150 (BLK) and ground. Does the test lamp illuminate?	Go to Step 16	Go to Step 17
16	Replace blackout (B/O) headlamp switch. Did you complete the replacement?	Go to Step 20	—
17	Locate and repair open in circuit 150 (BLK) wire between blackout (B/O) headlamp switch and ground. Did you complete the repair?	Go to Step 20	—
18	Locate and repair open in circuit 40 (ORN) wire between connector C241and blackout (B/O) service lamp switch cavity B. Did you complete the repair?	Go to Step 20	—
19	Replace blackout (B/O) service switch. Did you complete the replacement?	Go to Step 20	—
20	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Blackout (B/O) Headlamp Always On

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go Description and Operation
2	Place blackout (B/O) drive lamp switch in OFF mode. Connect a test lamp between blackout (B/O) drive lamp switch cavity B circuit 901 (PNK) to ground. Does the test lamp illuminate?	Go to Step 3	Go to Step 4
3	Replace blackout (B/O) drive lamp switch. Did you complete the replacement?	Go to Step 5	—
4	Repair short to power in circuit 901 or inoperable blackout (B/O) control relay. Did you find and correct the condition?	Go to Step 5	—
5	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Headlamps Operate in Blackout (B/O) Mode

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Place blackout (B/O) service switch into the blackout (B/O) mode. 2. Connect a test lamp from cavity 85 at the blackout (B/O) lighting control relay and ground. Does the test lamp illuminate?	Go to Step 4	Go to Step 3
3	Replace blackout (B/O) control relay. Did you complete the replacement?	Go to Step 5	—
4	Replace blackout (B/O) service switch. Did you complete the replacement?	Go to Step 5	—
5	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Backup Lamps Inoperative

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	Is only one backup lamp inoperative?	Go to Step 3	Go to Step 4

Backup Lamps Inoperative (cont'd)

Step	Action	Yes	No
3	Test the backup lamp supply voltage circuit of the inoperative bulb for high resistance, an open, or a short to ground. Did you find and correct the condition?	Go to Step 17	Go to Step 5
4	1. Inspect the condition of the backup lamp fuses. 2. If the fuse is open, locate and repair the source of the overload and replace fuse. Did you find and correct the condition?	Go to Step 17	Go to Step 6
5	Test the ground circuit of the inoperative bulb for high resistance or an open. Did you find and correct the condition?	Go to Step 17	Go to Step 13
6	Connect a test lamp between connector C1 cavity C of the junction block – rear lamps and ground. Does the test lamp illuminate?	Go to Step 7	Go to Step 9
7	Connect a test lamp between connector C1 cavity E and ground. Does the test lamp illuminate?	Go to Step 8	Go to Step 13
8	Locate and repair the open or high resistance in the ground circuit. Did you complete the repair?	Go to Step 17	—
9	Connect a test lamp between cavity 30 of the interrupt relay and ground. Does the test lamp illuminate?	Go to Step 10	Go to Step 11
10	Locate and repair the open in circuit 24. Did you complete the repair?	Go to Step 17	—
11	Connect a test lamp between cavity 87 of the interrupt relay and ground. Does the test lamp illuminate?	Go to Step 14	Go to Step 12
12	Connect a test lamp between cavity F of the backup lamp switch and ground. Does the test lamp illuminate?	Go to Step 15	Go to Step 16
13	Replace the bulbs. Did you complete the repair?	Go to Step 17	—
14	Replace the interrupt relay. Did you complete the repair?	Go to Step 17	—
15	Locate and repair the open or high resistance in circuit 1524 or 24. Did you complete the repair?	Go to Step 17	—
16	Replace the backup lamp switch. Did you complete the replacement?	Go to Step 17	—
17	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Stoplamps Inoperative

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	Observe the stoplamps while pressing the brake pedal. Does the system operate normally?	Go to Testing for Electrical Intermittents in Wiring Systems of the 2003 C/K Truck Service Manual	Go to Step 3
3	Inspect the fuse(s), check for damaged or corroded inline connectors, check for broken or partially broken wires inside insulation and properly installed aftermarket equipment. Did you find the condition?	Go to Step 4	Go to Step 5
4	Make necessary repairs. Did you complete the repairs?	Go to Step 15	—
5	Are all the stoplamps inoperative?	Go to Step 6	Go to Step 8
6	1. Disconnect blackout (B/O) service lamp switch. 2. Connect test lamp between circuit 913 (WHT) cavity D wire and ground. Does the test light illuminate?	Go to Step 10	Go to Step 7
7	Locate and repair the open or high resistance in circuit 913. Did you correct the condition?	Go to Step 15	—
8	Test the supply voltage circuit of the inoperative lamp for high resistance, an open, or a short to ground. Refer to Circuit Testing, and Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 15	Go to Step 9
9	Test the ground circuit of the inoperative lamp for high resistance, an open. Refer to Circuit Testing, and Wiring Repairs in Wiring Systems. Did you find and correct the condition?	Go to Step 15	Go to Step 14
10	Using a fused jumper, connect cavity D to cavity F of the blackout (B/O) service lamp switch connector. Do the brake lamps illuminate?	Go to Step 11	Go to Step 12
11	Replace blackout (B/O) service lamp switch. Did you complete the replacement?	Go to Step 15	—
12	Connect a test lamp between terminal A of the rear B/O stoplamps and ground. Did the test lamp illuminate?	Go to Step 14	Go to Step 13
13	Locate and repair the open or high resistance in circuit 902. Did you correct the condition?	Go to Step 15	—
14	Replace the blackout (B/O) stoplamp(s). Did you complete the replacement?	Go to Step 15	—

Stoplamps Inoperative (cont'd)

Step	Action	Yes	No
15	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Blackout (B/O) Marker Lamps Inoperative

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	Verify that the marker lamps are inoperative. Do the marker lamps operate normally?	Go to Testing for Electrical Intermittents in Wiring Systems of the 2003 C/K Truck Service Manual	Go to Step 3
3	Are all marker lamps inoperative?	Go to Step 4	Go to Step 8
4	Inspect the fuse(s), check for corroded inline connectors, check for broken or partially broken wires inside insulation, and for properly installed aftermarket equipment. Did you find the condition?	Go to Step 5	Go to Step 6
5	Make necessary repairs. Did you complete the repairs?	Go to Step 14	—
6	1. Place blackout (B/O) service switch in blackout (B/O) mode. 2. Connect a test lamp at cavity A circuit 911 (PNK) wire at blackout (B/O) service drive switch and ground. Does the test lamp illuminate?	Go to Step 7	Go to Step 14
7	Connect a test lamp between inline fuse cavity B circuit 911 (PNK) wire and ground. Does the test lamp illuminate?	Go to Step 11	Go to Step 10
8	Test the supply circuit of the inoperative lamp for high resistance, an open. Refer to Circuit Testing, and Wiring Repairs in Wiring Systems in the 2003 C/K Truck Service Manual. Did you find and correct the condition?	Go to Step 18	Go to Step 9
9	Test the ground circuit of the inoperative lamp for high resistance, an open. Refer to Circuit Testing, and Wiring Repairs in Wiring Systems in the 2003 C/K Truck Service Manual. Did you find and correct the condition?	Go to Step 18	Go to Step 12
10	Locate and repair open in circuit 911 (PNK) wire between inline fuse B and blackout (B/O) service drive switch. Did you complete the repair?	Go to Step 18	—

Blackout (B/O) Marker Lamps Inoperative (cont'd)

Step	Action	Yes	No
11	Disconnect blackout (B/O) marker lamp(s) and connect test lamp between cavity A circuit 900 (BRN/WHT) front and circuit 900 (BRN/WHT) rear to ground. Does the test lamp illuminate?	Go to Step 12	Go to Step 13
12	Replace blackout (B/O) marker lamp(s) assembly. Did you complete the replacement?	Go to Step 18	—
13	Locate and repair open in circuit 900 (BRN/WHT) front and circuit 900 (BRN/WHT) rear wire between inline fuse and blackout (B/O) marker lamp assembly. Did you complete the repair?	Go to Step 18	—
14	Connect a test lamp between blackout (B/O) service switch to circuit 40 (ORN) cavity B and ground. Does the test lamp illuminate?	Go to Step 15	Go to Step 16
15	Replace blackout (B/O) service switch. Did you complete the replacement?	Go to Step 18	—
16	Connect a test lamp at I/P relay block connector C8 cavity C circuit 40 (ORN) wire and ground. Does the test lamp illuminate?	Go to Step 17	Refer to the 2003 C/K Truck Service Manual
17	Locate and repair open in circuit 40 (ORN) wire between I/P relay block connector C8 cavity C and blackout (B/O) service drive switch. Did you complete the repair?	Go to Step 18	—
18	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Blackout (B/O) Marker Lamps Always On

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	Verify that the marker lamps are always on. Do the marker lamps operate normally?	Go to Testing for Electrical Intermittents in Wiring Systems of the 2003 C/K Truck Service Manual	Go to Step 3
3	1. Disconnect blackout (B/O) service switch. 2. Connect a test lamp between circuit 911 (PNK) cavity A wire and ground. Does the test lamp illuminate?	Go to Step 4	Go to Step 5

Blackout (B/O) Marker Lamps Always On (cont'd)

Step	Action	Yes	No
4	Repair short to power in circuit 911 (PNK) or circuit 900 (BRN/WHT) wire(s) between blackout (B/O) service switch and blackout (B/O) marker lamps. Did you complete the repair?	Go to Step 6	—
5	Replace blackout (B/O) service switch. Did you complete the replacement?	Go to Step 6	—
6	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

DRL Operate in Blackout (B/O) Mode

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Place the blackout (B/O) service switch in the blackout (B/O) mode. 2. Connect a test lamp at cavity C of the blackout (B/O) switch and ground. Does the test light illuminate?	Go to Step 3	Go to Step 6
3	1. Disconnect the blackout (B/O) service switch connector from the switch. 2. Connect a test lamp at cavity C of the connector and ground. Does the test lamp illuminate?	Go to Step 5	Go to Step 4
4	Replace the blackout (B/O) service switch. Did you complete the replacement?	Go to Step 9	—
5	Locate and repair the short to voltage on circuit 912 (ORN). Did you complete the repair?	Go to Step 9	—
6	Remove DRL interrupt relay from the relay module. Are the DRLs illuminated?	Go to Step 8	Go to Step 7
7	Replace the DRL relay. Did you complete the replacement?	Go to Step 9	—
8	Locate and repair the short to voltage on circuit 592 (LT GRN/BLK). Did you complete the repair?	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Backup Lamps Operate in Blackout (B/O) Mode

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Place the blackout (B/O) service switch in the blackout (B/O) mode. 2. Connect a test lamp at cavity C of the blackout (B/O) switch and ground. Does the test light illuminate?	Go to Step 3	Go to Step 6
3	1. Disconnect the blackout (B/O) service switch connector form the switch. 2. Connect a test lamp at cavity C of the connector and ground. Does the test lamp illuminate?	Go to Step 5	Go to Step 4
4	Replace the blackout (B/O) service switch. Did you complete the replacement?	Go to Step 9	—
5	Locate and repair the short to voltage on circuit 912 (ORN). Did you complete the repair?	Go to Step 9	—
6	Remove the backup lamp interrupt relay from the relay module. Are the backup lamps illuminated?	Go to Step 8	Go to Step 7
7	Replace the backup interrupt relay. Did you complete the replacement?	Go to Step 9	—
8	Locate and repair the short to voltage on circuit 24 (GRN/BLK). Did you complete the repair?	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Park Lamps Operate in Blackout (B/O) Mode

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Place the blackout (B/O) service switch in the blackout (B/O) mode. 2. Connect a test lamp at cavity C of the blackout (B/O) switch and ground. Does the test light illuminate?	Go to Step 3	Go to Step 6

Park Lamps Operate in Blackout (B/O) Mode (cont'd)

Step	Action	Yes	No
3	1. Disconnect the blackout (B/O) service switch connector from the switch. 2. Connect a test lamp at cavity C of the connector and ground. Does the test light illuminate?	Go to Step 5	Go to Step 4
4	Replace the blackout (B/O) service switch. Did you complete the replacement?	Go to Step 9	—
5	Locate and repair the short to voltage on circuit 912 (ORN). Did you complete the repair?	Go to Step 9	—
6	Remove the park lamp interrupt relay from the relay module. Are the park lamps illuminated?	Go to Step 8	Go to Step 7
7	Replace the park lamp interrupt relay. Did you complete the replacement?	Go to Step 9	—
8	Locate and repair the short to voltage on circuit 1080 (WHT). Did you complete the repair?	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

CTSY Lamps Operate in Blackout (B/O) Mode

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Place the blackout (B/O) service lamp switch in the blackout (B/O) mode. 2. Connect a test lamp at cavity C of the blackout (B/O) switch and ground. Does the test light illuminate?	Go to Step 3	Go to Step 6
3	1. Disconnect the blackout (B/O) service switch connector from the switch. 2. Connect a test lamp at cavity C of the connector and ground. Does the test light illuminate?	Go to Step 5	Go to Step 4
4	Replace the blackout (B/O) service switch. Did you complete the replacement?	Go to Step 9	—
5	Locate and repair the short to voltage on circuit 912 (ORN). Did you complete the repair?	Go to Step 9	—

CTSY Lamps Operate in Blackout (B/O) Mode (cont'd)

Step	Action	Yes	No
6	Remove the CTSY 1 interrupt relay from the relay module. Are the CTSY lamps illuminated?	Go to Step 8	Go to Step 7
7	Replace the CTSY 1 interrupt relay. Did you complete the replacement?	Go to Step 9	—
8	Locate and repair the short to voltage on circuit 690 (GRY/BLK). Did you complete the repair?	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Turn Signals Operate in Blackout (B/O) Mode

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Place the blackout (B/O) service switch in the blackout (B/O) mode. 2. Connect a test lamp at cavity C of the blackout (B/O) switch and ground. Does the test light illuminate?	Go to Step 3	Go to Step 6
3	1. Disconnect the blackout (B/O) service switch connector from the switch. 2. Connect a test lamp at cavity C of the connector and ground. Does the test light illuminate?	Go to Step 5	Go to Step 4
4	Replace the blackout (B/O) service switch. Did you complete the replacement?	Go to Step 9	—
5	Locate and repair the short to voltage on circuit 912 (ORN). Did you complete the repair?	Go to Step 9	—
6	Remove the turn signal interrupt relay. Do the turn signals operate?	Go to Step 8	Go to Step 7
7	Replace the turn signal interrupt relay. Did you complete the replacement?	Go to Step 9	—
8	Locate and repair the short to voltage on circuit 639 (PNK). Did you complete the repair?	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Hi Beam Headlamps Operate in Blackout (B/O) Mode

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Place the blackout (B/O) service switch in the blackout (B/O) mode. 2. Connect a test lamp at cavity C of the blackout (B/O) switch and ground. Does the test light illuminate?	Go to Step 3	Go to Step 6
3	1. Disconnect the blackout (B/O) service switch connector from the switch. 2. Connect a test lamp at cavity C of the connector and ground. Does the test light illuminate?	Go to Step 5	Go to Step 4
4	Replace the blackout (B/O) service switch. Did you complete the replacement?	Go to Step 9	—
5	Locate and repair the short to voltage on circuit 912 (ORN). Did you complete the repair?	Go to Step 9	—
6	Remove the backup lamp interrupt relay from the relay module. Are the backup lamps illuminated?	Go to Step 8	Go to Step 7
7	Replace the backup interrupt relay. Did you complete the replacement?	Go to Step 9	—
8	Locate and repair the short to voltage on circuit 1969 (BLK/WHT). Did you complete the repair?	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Low Beam Headlamps Operate in Blackout (B/O) Mode

Step	Action	Yes	No
Schematic Reference: Lighting Systems Schematics			
1	Did you review Blackout (B/O) Lighting Description and Operation?	Go to Step 2	Go to Description and Operation
2	1. Place the blackout (B/O) service switch in the blackout (B/O) mode. 2. Connect a test lamp at cavity C of the blackout (B/O) switch and ground. Does the test light illuminate?	Go to Step 3	Go to Step 6

Low Beam Headlamps Operate in Blackout (B/O) Mode (cont'd)

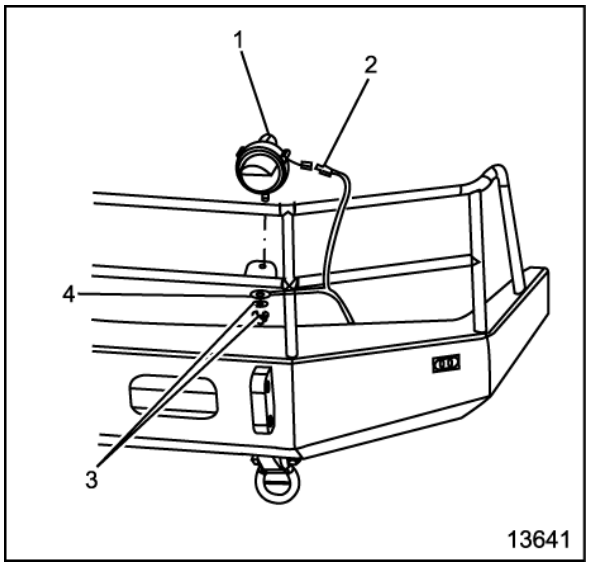
Step	Action	Yes	No
3	1. Disconnect the blackout (B/O) service switch connector from the switch. 2. Connect a test lamp at cavity C of the connector and ground. Does the test light illuminate?	Go to Step 5	Go to Step 4
4	Replace the blackout (B/O) service switch. Did you complete the replacement?	Go to Step 9	—
5	Locate and repair the short to voltage on circuit 912 (ORN). Did you complete the repair?	Go to Step 9	—
6	Remove the backup lamp interrupt relay from the relay module. Are the backup lamps illuminated?	Go to Step 8	Go to Step 7
7	Replace the backup interrupt relay. Did you complete the replacement?	Go to Step 9	—
8	Locate and repair the short to voltage on circuit 1970 (PNK/WHT). Did you complete the repair?	Go to Step 9	—
9	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

Repair Instructions

Headlamp Replacement – Blackout (B/O)

Removal Procedure

1. Remove the nut and washer (3) from the lamp stud at the base of the mounting bracket.
2. Remove the ground lead (4) by sliding it off the stud.
3. Remove the auxiliary wiring harness connector (2) by releasing the connector tab.
4. Remove the blackout (B/O) lamp assembly (1) from the mounting bracket.

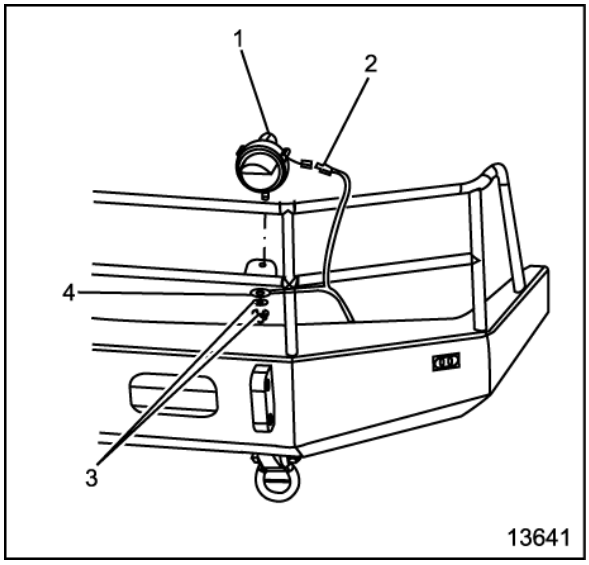


Installation Procedure

1. Install the blackout (B/O) lamp assembly (1) to the mounting bracket.
2. Install the auxiliary wiring harness connector (2).
3. Install the ground lead (4) by sliding on the stud.

Notice: Refer to Fastener Notice in Cautions and Notices.

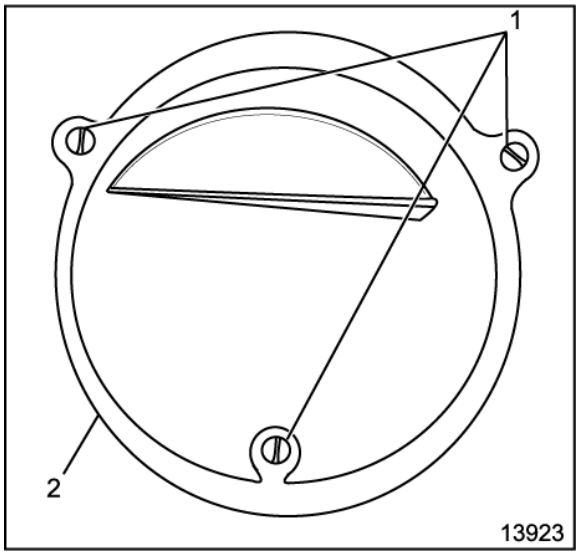
4. Install the washer and nut (3) to the lamp stud.
   Tighten
   Tighten the nut to 10 N•m (7 lb ft).

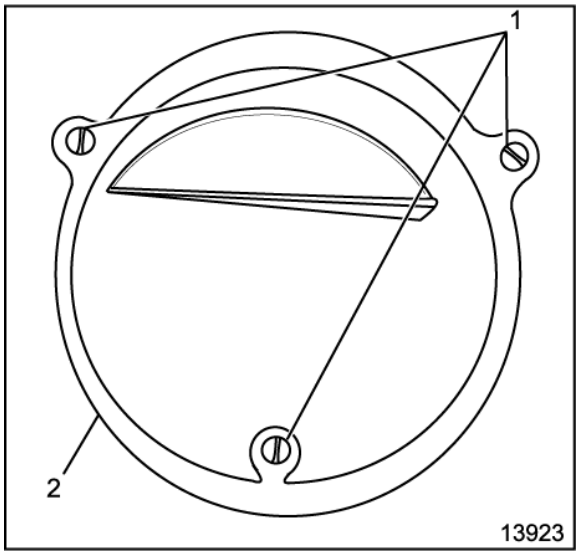


Headlamp Bulb Replacement – Blackout (B/O)

Removal Procedure

1. Remove the screws (1) holding the lens cap to the assembly.
2. Remove the lens cap (2) and O-ring.
3. Remove the bulb.





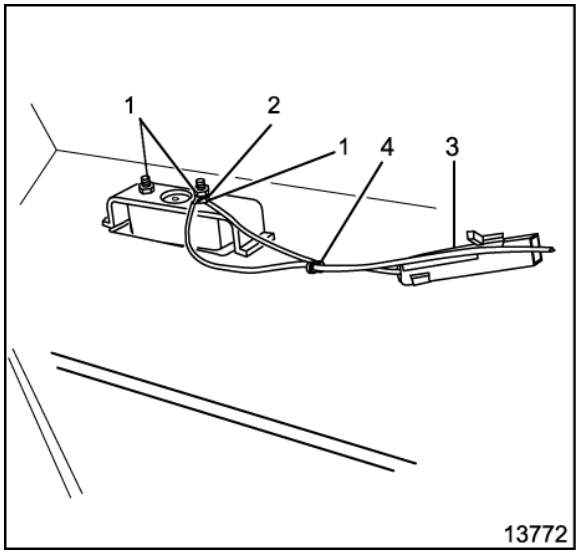
Installation Procedure

Important: Use a standard 1073 bulb for replacement.

1. Install the new bulb in the assembly.

Notice: The O-ring installation must be a proper fit.

2. Install the O-ring with the lens cover (2).
3. Install the 3 screws (1) to the assembly.

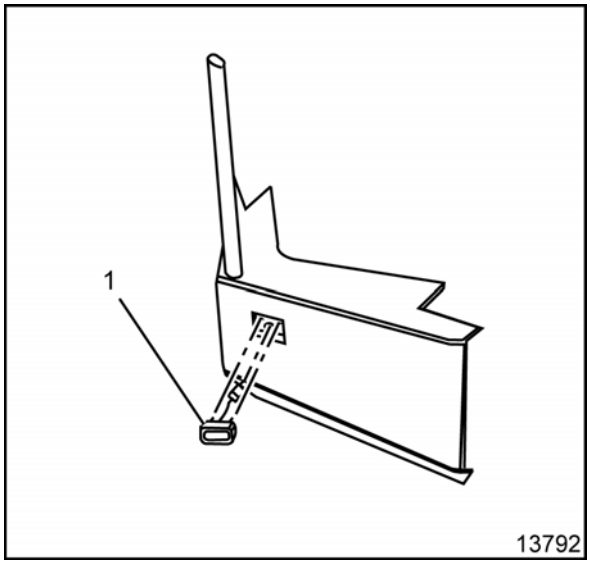


Marker Lamp Replacement – Front Blackout (B/O)

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

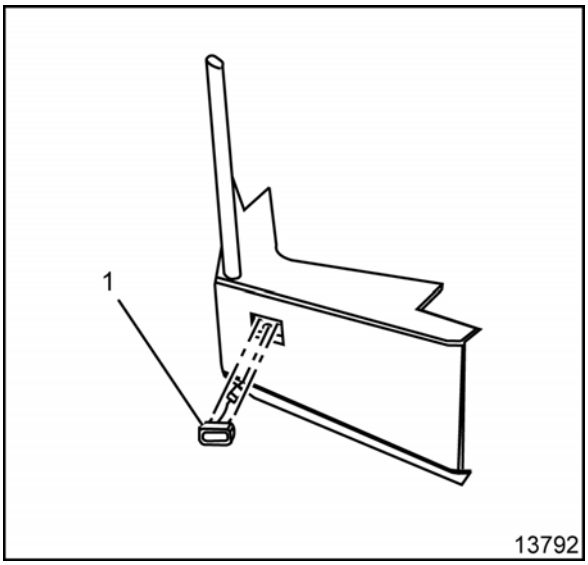
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove wiring harness strap (4) from the marker lamp harness.
3. Remove the harness connector (3) by releasing the connector tab.
4. Remove the nuts (1) and the ground connector (2) from the marker lamp.



5. Remove the blackout (B/O) marker lamp assembly (1) from the bumper.

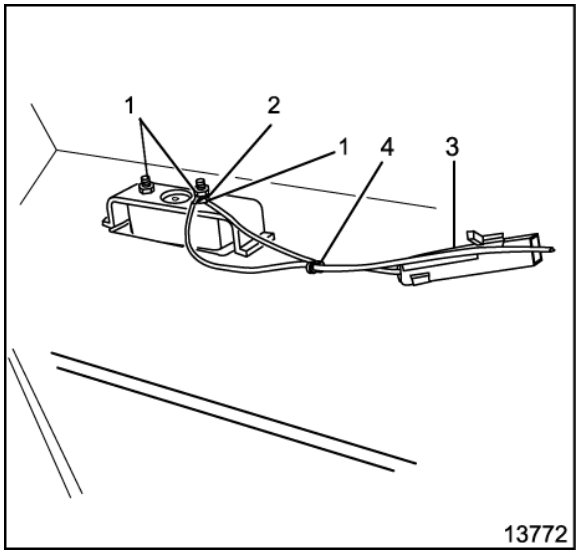
Installation Procedure

1. Install the marker lamp (1) into the front bumper opening.



Notice: Refer to Fastener Notice in Cautions and Notices.

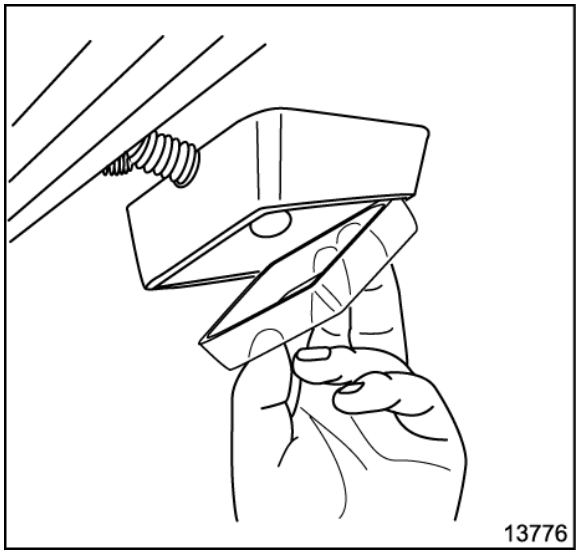
2. Install the nuts (1) and the ground connector (2) onto the maker lamp studs.
   Tighten
   Tighten marker lamp nuts to 2 N•m (18 lb in).
3. Install the harness connector (2) to the marker lamp connector.
4. Secure the harness in the original mounting location-using wiring harness straps.
5. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.

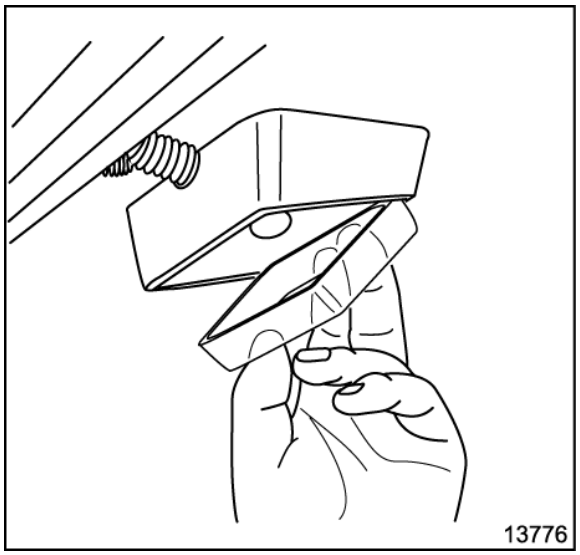


Dome Lamp Bulb Replacement

Removal Procedure

1. Press in on the sides of the lens to release the lens tabs.
2. Remove the bulb from the lamp socket.

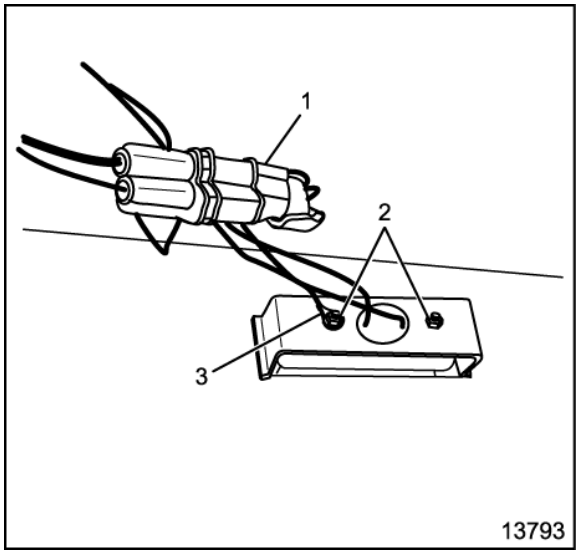




Installation Procedure

Important: Use 194 bulb for replacement.

1. Install the bulb into the lamp socket.
2. Install the lens into the lamp push until fully seated.

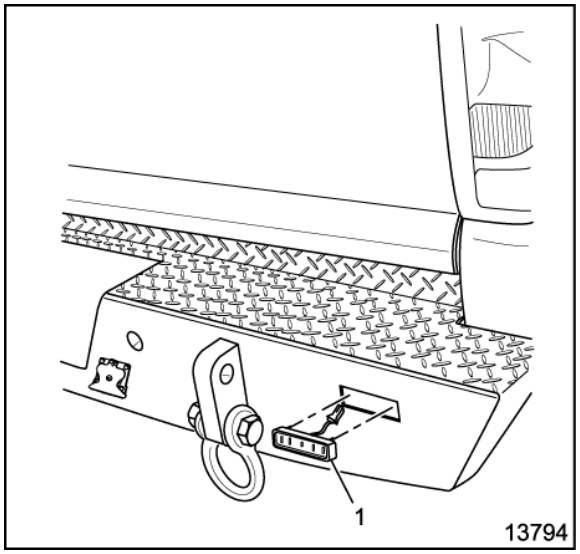


Marker Lamp Replacement – Rear

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Caution and Notices.

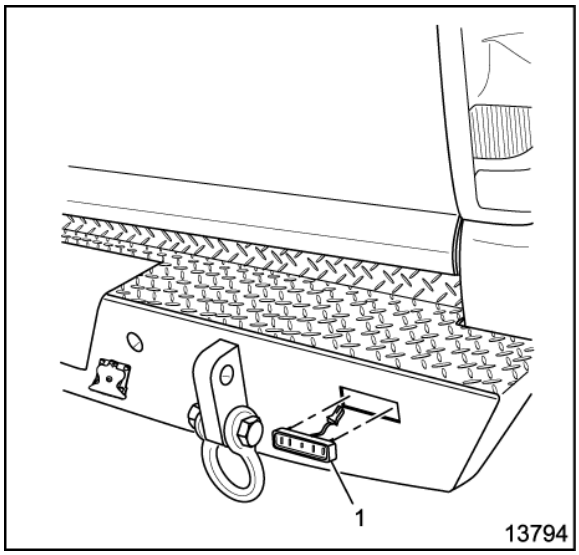
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the wiring harness strap from the marker lamp harness.
3. Disconnect the marker lamp harness connector (1) by releasing the locking tab.
4. Remove the nuts (2) and the ground connector (3) from the rear of the bumper.



5. Remove the marker lamp (1) from the bumper.

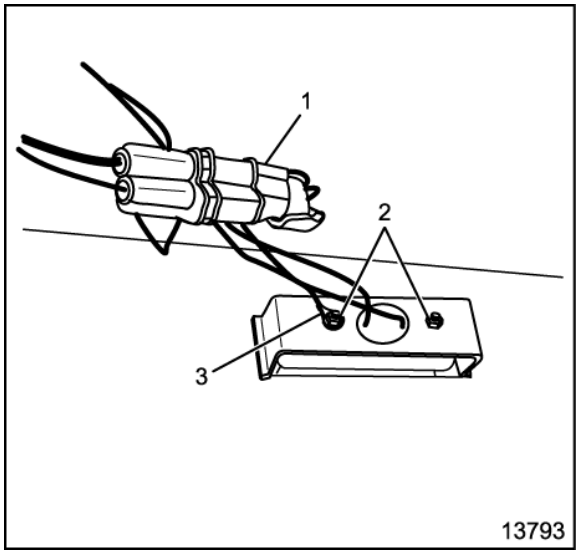
Installation Procedure

1. Position the marker lamp (1) onto the bumper.



Notice: Refer to Fastener Notice in Caution and Notices.

2. Install the nuts (2) and the ground connector (3) onto the mounting studs.
   Tighten
   Tighten the nuts to 2 N•m (18 lb in).
3. Connect the harness connector (1) to the marker lamp connector.
4. Install the harness into the original mounting location using the wiring harness straps.
5. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.

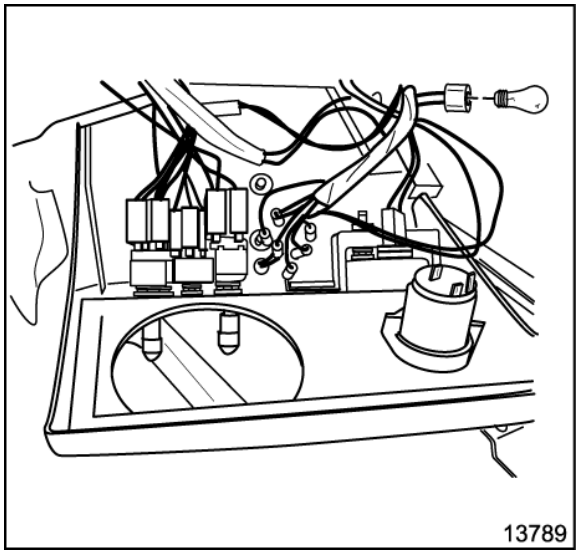


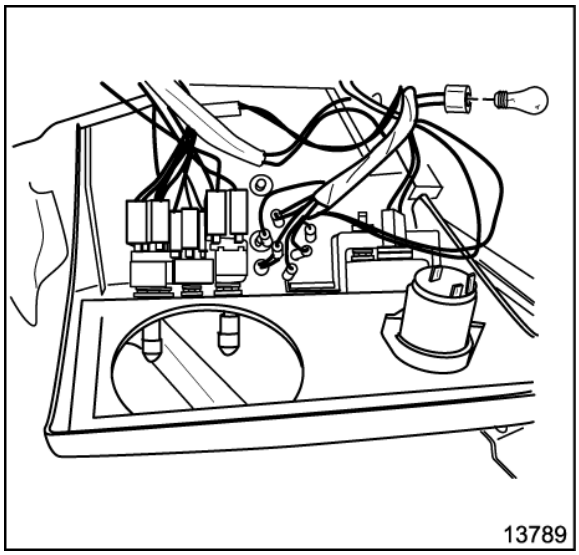
I/P Compartment Lamp Replacement - Voltmeter

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Caution and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the voltmeter/switch panel. Refer to Voltmeter/Blackout (B/O) Switch Panel Replacement in Instrument Panel, Gages and Console.
3. Remove the voltmeter lamp socket from the back of the voltmeter.
4. Remove the bulb from the voltmeter socket.

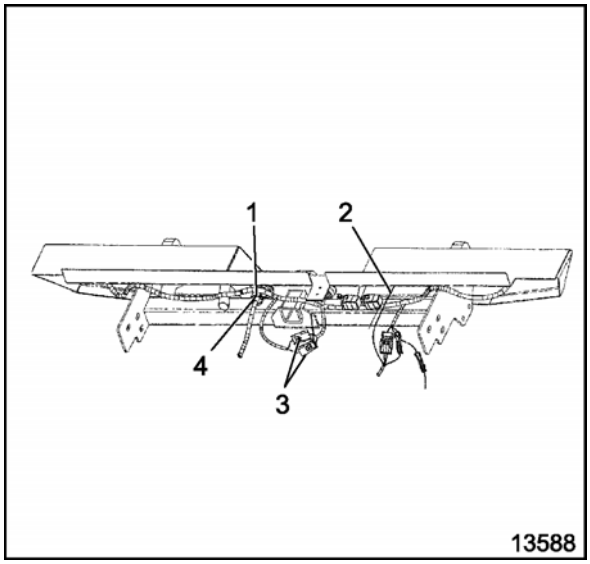




Installation Procedure

Important: Use a standard 194 bulb for replacement.

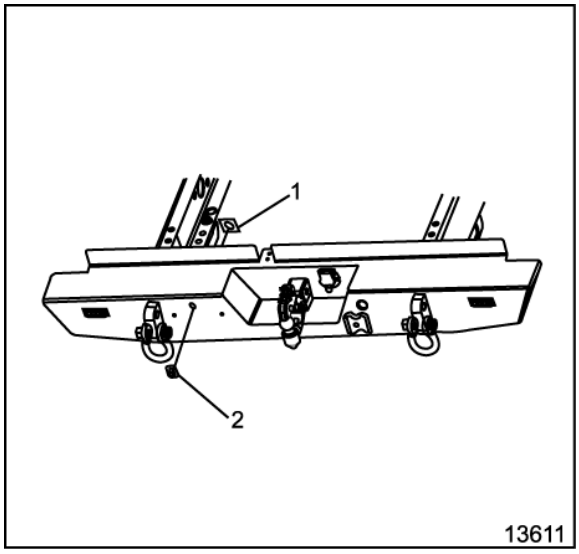
1. Install the bulb into the voltmeter socket.
2. Install the lamp socket into the voltmeter.
3. Install the voltmeter/switch panel. Refer to Voltmeter/Blackout (B/O) Switch Panel Replacement in Instrument Panel, Gages and Console.
4. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



License Plate Lamp Replacement

Removal Procedure

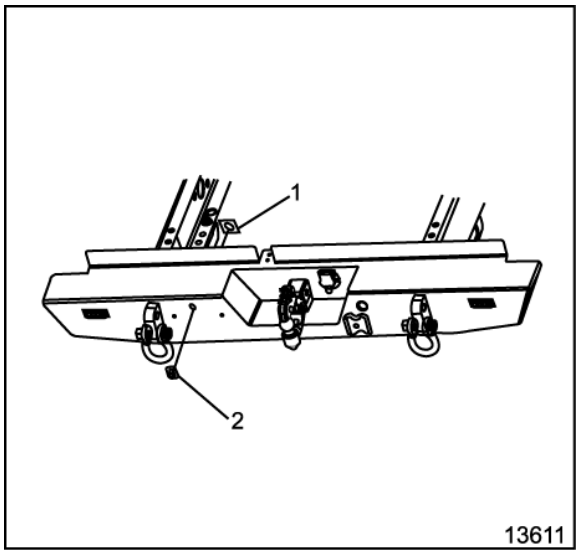
1. Ensure the headlamp switch is in the OFF position.
2. Remove the bulb socket and bulb from the back of the lamp (2).



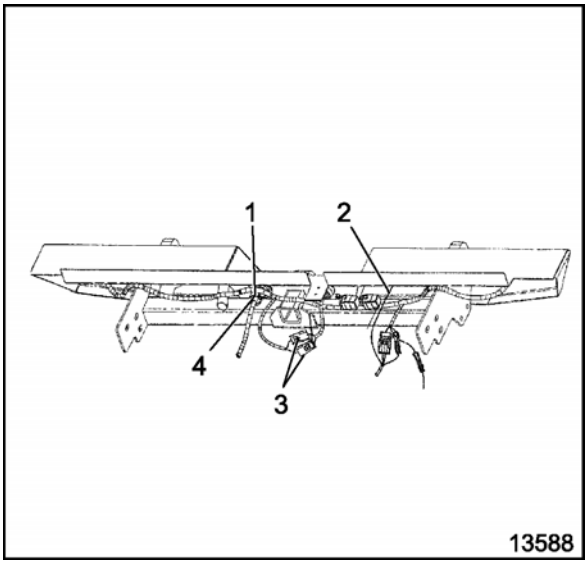
3. Slide the retainer clip (1) off of the license plate lamp (2).
4. Remove the license plate lamp (2) from the bumper.

Installation Procedure

1. Install the license plate lamp (2) into the opening of the bumper.
2. Hold the lamp and slide the retainer (1) onto the back of the lamp (2).



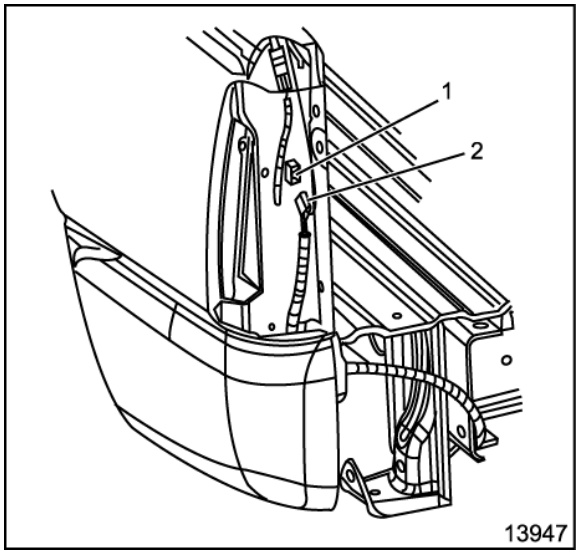
3. Install the wiring connector (2) to the back of the lamp.

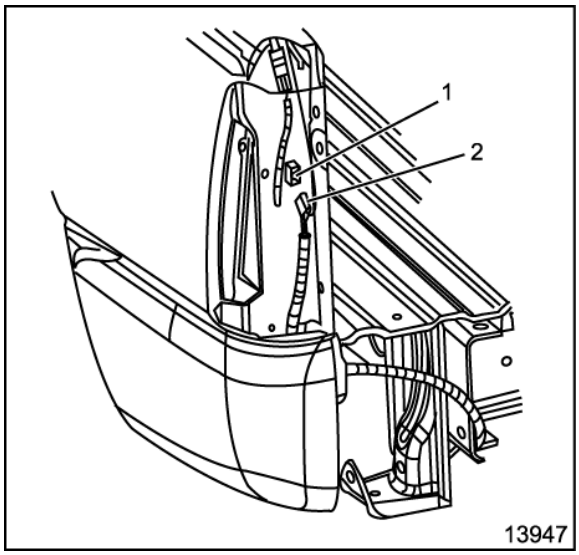


Topper Dome Lamp Switch Replacement – Rear

Removal Procedure

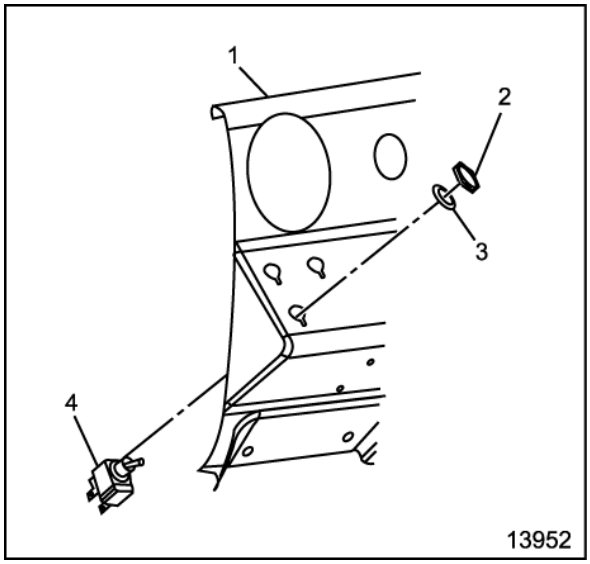
1. Remove the left rear tail/turn signal lamp. Refer to Tail/Turn Signal Lamp Replacement except step side in 2003 C/K Truck Service Manual.
2. Remove the connector (2) from the switch.
3. From inside the cargo area remove the nut from the switch.
4. Remove the switch (1) from the vehicle.





Installation Procedure

1. Install the switch (1) into the vehicle.
2. From inside the cargo area install the nut onto the switch.
3. Install the connector (2) onto the switch.
4. Install the left rear tail/turn signal lamp. Refer to Tail/Turn Signal Lamp Replacement except step side in the 2003 C/K Truck Service Manual.

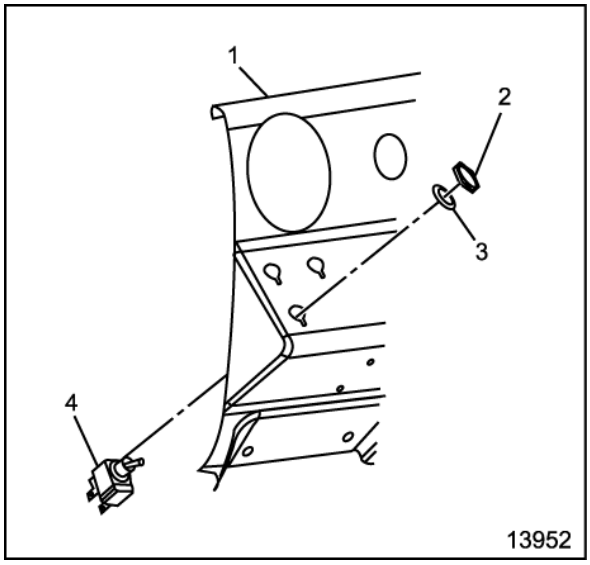


Topper Dome Lamp Switch Replacement – Front

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Caution and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the voltmeter, blackout (B/O) switch panel. Refer to Voltmeter/Blackout (B/O) Switch Panel Replacement.
3. Remove the nut (2) and washer (3) from the switch.
4. Remove the switch (4) from the panel (1).



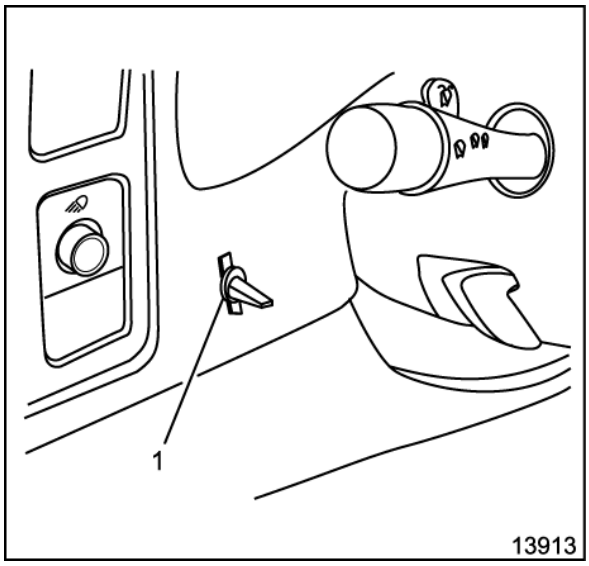
Installation Procedure

1. Install the switch (4) into the panel (1).

Notice: Refer to Fastener Notice in Caution and Notices.

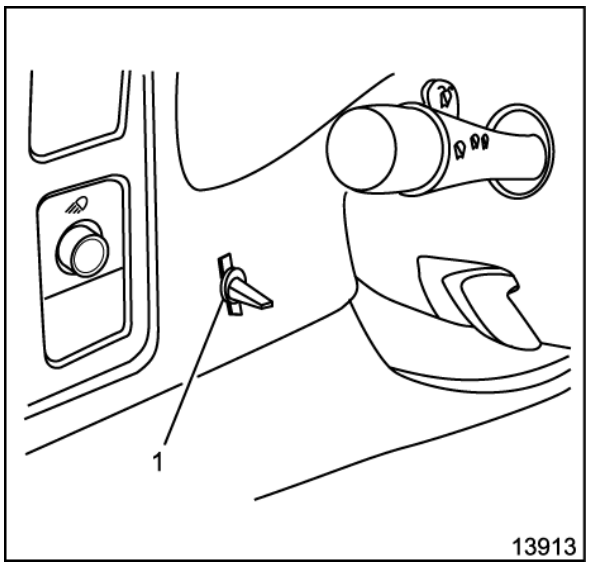
2. Install the washer (3) and nut (2), tighten.
3. Install the voltmeter, blackout (B/O) switch panel. Refer to Voltmeter/Blackout (B/O) Switch Panel Replacement.
4. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.

Topper Dome Lamp Switch Replacement (w/o Blackout (B/O))



Removal Procedure

1. Remove the I/P bezel. Refer to Bezel Replacement in Instrument Panel, Gages and Console in 2003 C/K Truck Service Manual.
2. Remove the electrical connections from the back of the switch.
3. Remove the switch nut (1) and remove the switch from the bezel.



Installation Procedure

1. Install the switch into the opening in the bezel and install nut (1).
2. Install electrical connectors in the same location as removed.
3. Install the I/P bezel. Refer to Bezel Replacement in Instrument Panel, Gages and Console in 2003 C/K Truck Service Manual.

Description and Operation

Blackout (B/O) Lighting Circuit Operation

Voltage for connector C8 the blackout (B/O) marker lamps is supplied through the accessory voltage circuit YEL (243) located in the I/P relay center. From there the ORN (40) wire supplies voltage to the blackout (B/O) service drive switch. When the blackout (B/O) service switch is placed in blackout (B/O) mode, voltage is applied to PNK (911) wire to inline fuse B. Voltage is then applied to the BRN/WHT (900) wire for front blackout (B/O) marker lamps and BRN/WHT (900) wire for rear blackout (B/O) marker lamps. Ground for the front blackout (B/O) marker lamps is supplied through G113 for the front and G401 and G402 for the rear.

The blackout (B/O) stoplamps voltage is supplied through stop LP fuse ORN (1540) wire to the TCC/stoplamp switch at all times. When the brake pedal is depressed the stoplamp switch is closed and powers the WHT (17) wire to the blackout (B/O) service drive switch. When in blackout (B/O) mode, voltage is applied from the DK GRN/WHT (902) wire to the blackout (B/O) stoplamps. The blackout (B/O) stoplamps receive constant ground through G401 and G402.

Blackout (B/O) Lighting Description

This section focuses on the function and service of the blackout (B/O) headlamp, the front and rear blackout (B/O) marker lamps, the service/blackout (B/O) lamp switch and the voltmeter lamp. All other lamps are covered in the 2003 C/K Truck Owner Manual. As military options the blackout (B/O) lamps provide a stealthy, low illumination alternative to standard lighting systems, also available on these vehicles. The blackout (B/O) headlamp is identical on these vehicles. The front blackout (B/O) marker lamps are mounted in the bumper of all vehicles. The rear blackout (B/O) marker lamps are arranged in the same relative positions on each of the rear bumpers.

The voltmeter lamp provides illumination to the voltmeter mounted in the dash.

The service/blackout (B/O) lamp switches, mounted at the lower center dash, control blackout (B/O) lamp and standard lamp functions. A pair of toggles operates these switches. The blackout (B/O) drive toggle is mounted on the right. When the service light toggle is moved up to the ON position it activates all service lights and enables all normal service light functions elsewhere to be turned ON if needed. When moved to the ALL OFF position this toggle shuts off all lamps and auxiliary lamps. When the switch is moved to blackout (B/O) ON only the blackout (B/O) lighting will work, which includes the blackout (B/O) markers, front and rear, and the blackout (B/O) headlamp. Within the rear marker lamps are separate color markers. Yellow will illuminate for the brakes and red will illuminate for drive mode. The front markers illuminate in yellow. (The horn is inoperative while the blackout (B/O) toggle is in the ON position.) All warning lamps in the I/P remain functional regardless of the toggle position. If the vehicle is parked for over 24 hours place the service switch in ALL OFF.

To operate the blackout (B/O) drive light switch pull it out and up to the ON position; this will activate the front blackout (B/O) headlamp. This will occur provided the service light/blackout (B/O) switch remains in the ON or down position. Pulling the left blackout (B/O) drive light switch out and down to the OFF position will turn it OFF. Releasing the switch from ON or OFF will cause it to return to the center position automatically.

The following Exterior/Interior lights function tables are for the service light/blackout (B/O) control switch and determines under what conditions various exterior and interior lighting functions activate. Additional details are found in the 2003 C/K Truck Owner Manual.

Topper Dome Lamp Circuit Description

When the ignition switch is ON, voltage is supplied from the blackout (B/O) switch to the interior toggle switch on circuit 912 (ORN). The voltage leaves the switch on circuit 800 (BRN) or 803 (BRN/WHT) pending on the switches position. The voltage on these circuit goes to the rear toggle switch then to the topper dome lamp. The lamp is ground on the chimsel circuit.

Topper Dome Lamp Description

The topper dome lamp is controlled by two 3-way switches and a lamp mounted switch. The interior switch is mounted in the blackout (B/O) switch panel and the other is mounted on the left rear of the pickup bed. The switch mounted on the lamp must be in the ON position for the two 3-way switches to operate the lamp.

Function Tables

Exterior Lights

Exterior Lamp or Device	Service Switch	Blackout (B/O) Drive Light Switch
Headlamps and Taillamps	ON	OFF
Fog Lamps	ON	OFF
Parking Lamps	ON	OFF
Front/Rear Side Marker Lamps	ON	OFF
Marker Lamps: Roof, Fender and Endgate	ON	OFF
Brakelamps	ON	OFF
Back-up Lamps	ON	OFF
License Plate Lamp	ON	OFF
Front/Rear Turn Signals	ON	OFF
Hazard Warning Lamps	ON	ON/OFF
Cargo Lamp	ON	OFF
Horn	ON	OFF
Front/Rear Blackout (B/O) Marker Lamps	B/O	ON/OFF
Blackout (B/O) Stoplamps	B/O	ON/OFF
Blackout (B/O) Drive Lamp (Headlamp)	B/O	ON

Interior Lights

Interior Lamp or Device	Service Switch	Blackout (B/O) Drive Light Switch
Instrument Panel/Switch Illumination	ON	OFF
Radio/Clock ILLUMINATION	ON	OFF
Headlamp High-Beam Indicator	ON	OFF
Turn Signal/Hazard Warning Indicators	ON	OFF
Four-Wheel-Drive Indicator	ON	OFF
Dome/Courtesy Lamps	ON	OFF
Glove Compartment Lamp	ON	OFF
Underhood Lamp	ON	OFF
Warning Chime: Headlamps On, Safety Belt and Key in Ignition	ON	ON/OFF

Interior Lights

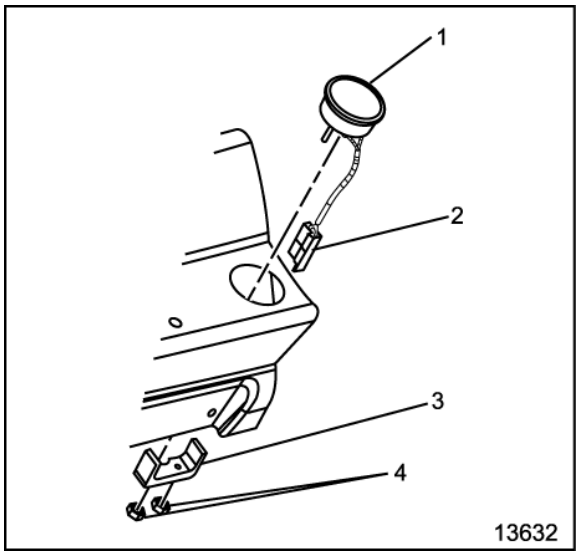
Mechanical Device	Service Switch	Blackout (B/O) Drive Light Switch
Brake-Transmission Shift Interlock (BTSI)	ON	ON/OFF
Torque Converter Lockup Clutch	ON	ON/OFF

Instrument Panel, Gages and Console

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Blackout (B/O) Switch Nuts	2.8 N•m	24 lb in
Blackout (B/O) Switch Panel Bolts	7-9 N•m	61-79 lb in
Voltmeter Nuts	2.8 N•m	24 lb in



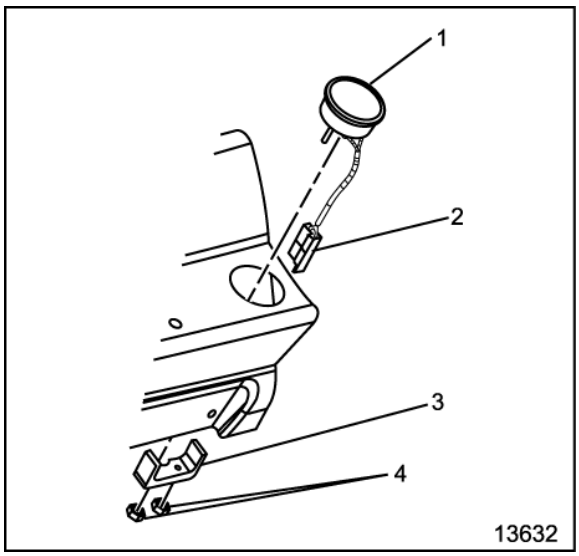
Repair Instructions

Voltmeter Replacement

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the voltmeter, blackout (B/O) switch panel. Refer to Voltmeter/Blackout (B/O) Switch Panel Replacement.
3. Remove the nut (4) from the back of the voltmeter.
4. Remove the gage bracket (3) and remove the voltmeter (1) from the switch panel.

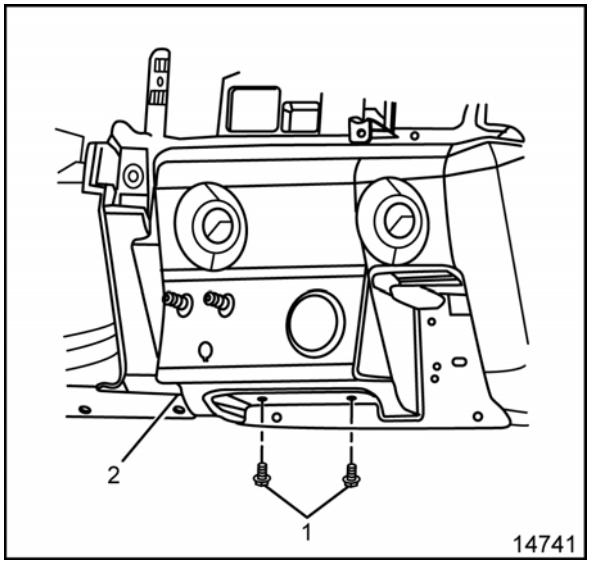


Installation Procedure

1. Install the voltmeter (1) into the switch panel opening.
2. Install bracket (3) on back of voltmeter.

Notice: Refer to Fastener Notice in Cautions and Notices.

3. Install nuts (4) on the voltmeter studs.
   Tighten
   Tighten nuts to 2.8 N•m (24 lb in).
4. Install the voltmeter blackout (B/O) switch panel. Refer to Voltmeter/Blackout (B/O) Switch Panel Replacement.
5. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



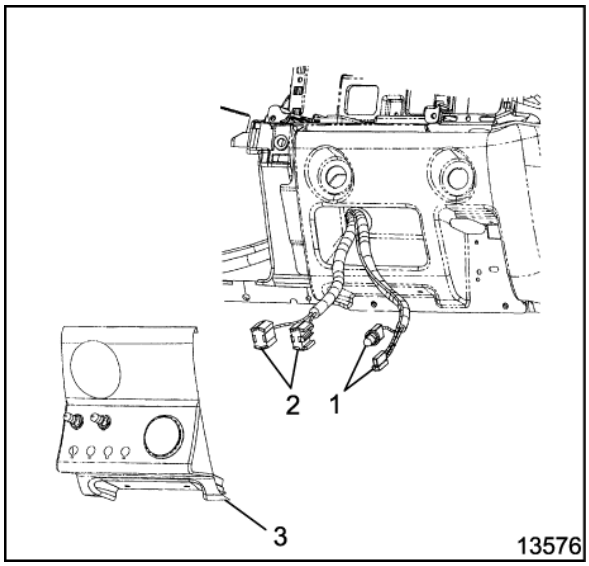
Voltmeter/Blackout (B/O) Switch Panel Replacement

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

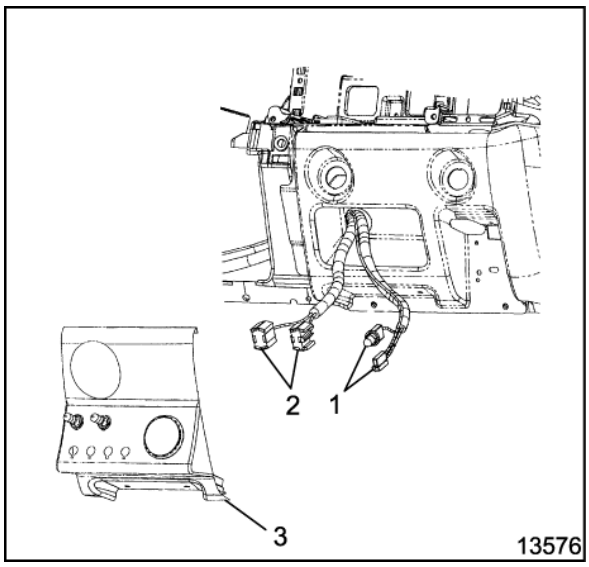
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the fasteners (1) from the switch panel.
3. Move the switch panel (2) out far enough to gain access to the harness connections.

4. Disconnect the 24V meter bulb and harness connectors (1) from the meter.
5. Disconnect the blackout (B/O) harness connectors (2) from the switches.
6. Disconnect the power receptacle.
7. Disconnect the siren switch.
8. Disconnect the map light.
9. Remove panel (3) from the vehicle.
10. Remove the parts from the switch panel. Refer to Voltmeter Replacement or Blackout (B/O) Switch Replacement.



Installation Procedure

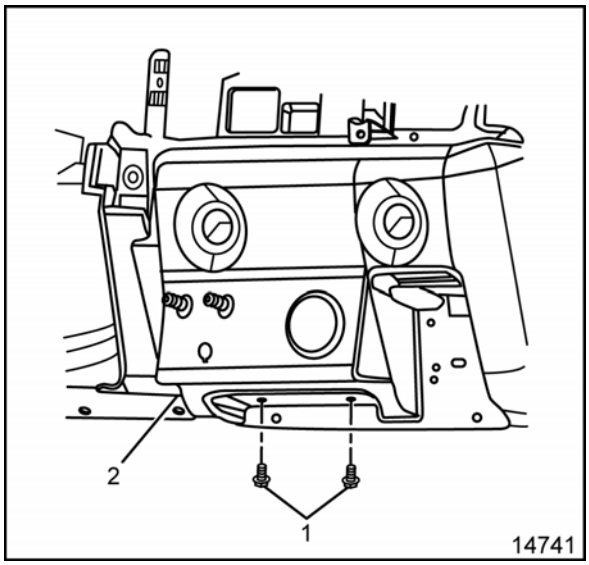
1. Install the parts removed from the switch panel. Refer to Voltmeter Replacement or Blackout (B/O) Switch Replacement.
2. Install the connectors (2) to the blackout (B/O) switches
3. Install the connector and bulb (1) to the 24V gage.
4. Connect the power receptacle.
5. Connect the siren switch.
6. Connect the map light.

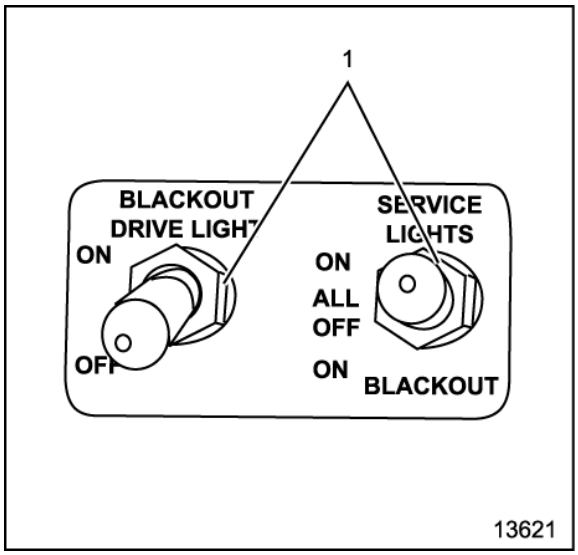


7. Install the switch panel (2) onto the dash.

Notice: Refer to Fastener Notice in Cautions and Notices.

8. Install the fasteners (1) and tighten.
   Tighten
   Tighten switch panel bolts to 7-9 N•m (61-79 lb in).



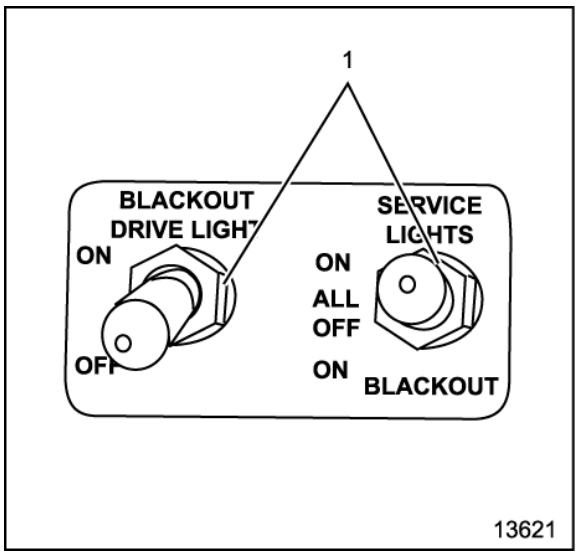


Blackout (B/O) Switch Replacement

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the voltmeter, blackout (B/O) switch panel. Refer to Voltmeter/Blackout (B/O) Switch Panel Replacement.
3. Remove the nuts (1) and washers holding the blackout (B/O) switches.
4. Remove the keyed washers from the I/P mounting panel and pull the switches out.



Installation Procedure

1. Install the switches through the switch panel.
2. Install the keyed washers on the switches.

Notice: Refer to Fastener Notice in Cautions and Notices.

3. Install the 2 washers and nuts (1) on the switch panel.
   Tighten
   Tighten the 2 nuts to 2.8 N•m (24 lb in).
4. Install the voltmeter, blackout (B/O) switch panel. Refer to Voltmeter/Blackout (B/O) Switch Panel Replacement in Instrument Panel.
5. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.

Description and Operation

Instrument Panel and Gages Description

The instrument panel has been modified with a panel mounted below the accessory power outlets. This panel houses the blackout (B/O) lighting auxiliary switches and 24V meter. The instrument panel houses auxiliary harnesses as well as standard indicators.

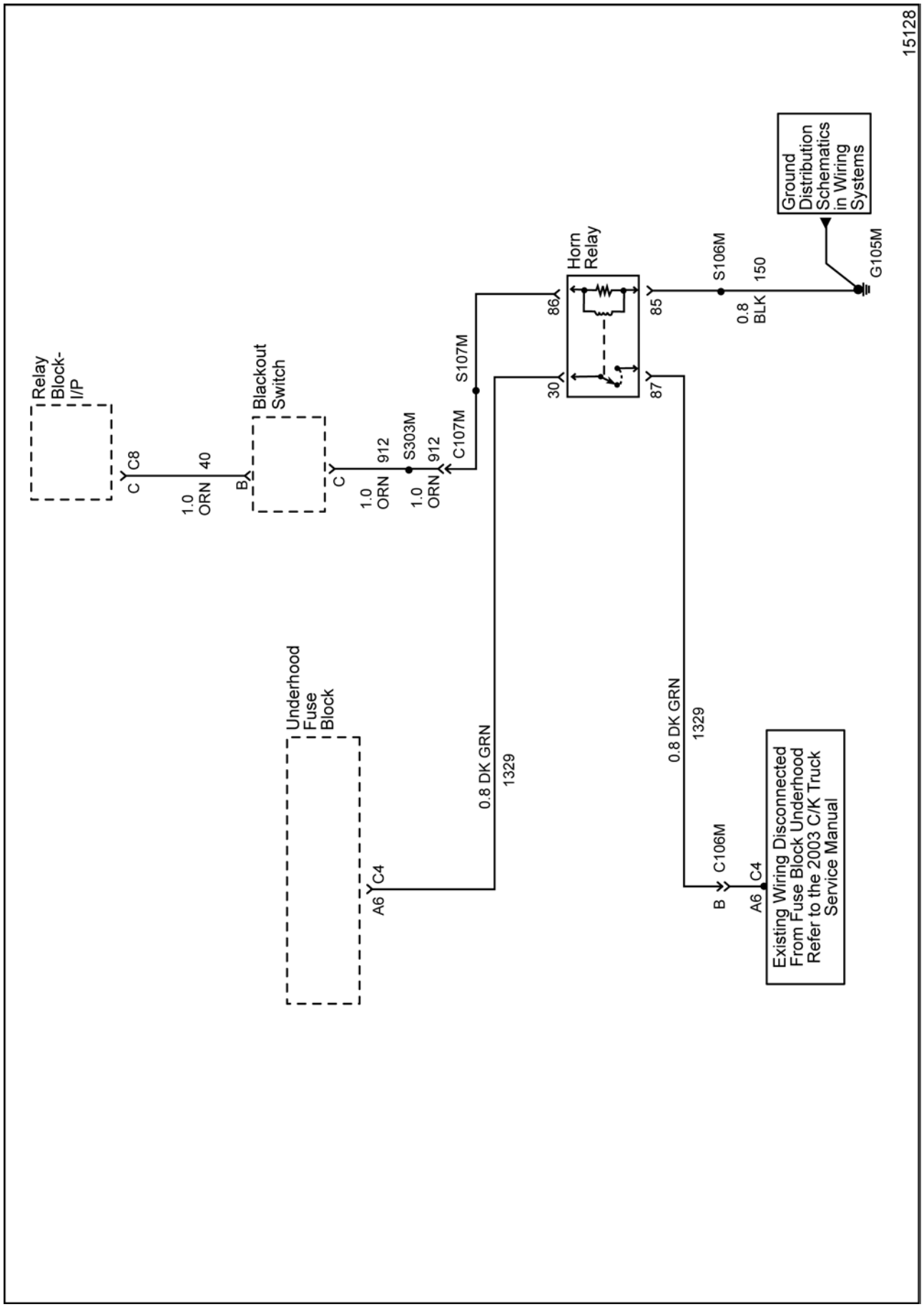
Some modifications have been made to the instrument panel to accommodate auxiliary harness connections and convenience/fuse centers.

BLANK

Horns

Schematic and Routing Diagrams

Horns


15128
Relay Block-I/P
C8
C
40
1.0 ORN
B
Blackout Switch
C
912
1.0 ORN
S303M
912
1.0 ORN
C107M
S107M
Underhood Fuse Block
A6
C4
0.8 DK GRN
1329
86
30
Horn Relay
85
87
S106M
0.8 BLK
150
G105M
Ground Distribution Schematics in Wiring Systems
0.8 DK GRN
1329
B
C106M
A6
C4
Existing Wiring Disconnected From Fuse Block Underhood Refer to the 2003 C/K Truck Service Manual

Diagnostic Information and Procedures

Symptom List

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- Horns Inoperative
- Horns Operate in Blackout (B/O) Mode

Horns Inoperative

Step	Action	Yes	No
Schematic Reference: Horn Schematics			
1	Did you review Horns Description and Operation?	Go to Step 2	Go to Description and Operation
2	Depress the horn switch. Does either horn operate?	Go to Horns Inoperative – One Horn in Horns of the 2003 C/K Truck Service Manual	Go to Step 3
3	1. Remove the horn interrupt relay. 2. Connect a jumper between terminal 30 and 87 of the relay block. 3. Depress the horn switch. Does the horn operate?	Go to Step 4	Go to Horns Inoperative in Horns of the 2003 C/K Truck Service Manual
4	Connect a test lamp between terminal 86 of the relay block and ground. Does the test lamp illuminate?	Go to Step 6	Go to Step 5
5	Connect a test lamp between terminal C of the blackout (B/O) service switch and ground. Does the test lamp illuminate?	Go to Step 7	Go to Step 8
6	Connect a test lamp between terminal 85 of the relay block and ground. Does the test lamp illuminate?	Go to Step 9	Go to Step 10
7	Repair the open or high resistance in the (ORN) circuit 912. Did you complete the repair?	Go to Step 13	—
8	Connect a test lamp between terminal B of the blackout (B/O) service switch and ground. Does the test lamp illuminate?	Go to Step 11	Go to Step 12
9	Repair the open or high resistance in the (BLK) circuit 150. Did you complete the repair?	Go to Step 13	—
10	Replace the horn interrupt relay. Did you complete the repair?	Go to Step 13	—
11	Replace the blackout (B/O) service switch. Did you complete the replacement?	Go to Step 13	—

Horns Inoperative (cont'd)

Step	Action	Yes	No
12	Repair the open or high resistance in the (ORN) circuit 40. Did you complete the repair?	Go to Step 13	—
13	Verify the system operation. Do the horns operate properly?	System OK	Go to Step 2

Horns Operate in Blackout (B/O) Mode

Step	Action	Yes	No
Schematic Reference: Horn Schematics			
1	Did you review Horns Description and Operation?	Go to Step 2	Go to Description and Operation
2	Connect a test lamp between terminal 86 of the horn interrupt relay block and ground. Does the test lamp illuminate?	Go to Step 4	Go to Step 3
3	Replace the horn interrupt relay. Did you complete the replacement?	Go to Step 7	—
4	1. Disconnect the blackout (B/O) service switch and ground. 2. Connect a test lamp between cavity C of the blackout (B/O) switch connector and ground. Does the test lamp illuminate?	Go to Step 6	Go to Step 5
5	Replace the blackout (B/O) service lamp switch. Did you complete the replacement?	Go to Step 7	—
6	Repair the short to voltage in the (ORN) circuit 912. Did you complete the repair?	Go to Step 7	—
7	Verify the system operation. Do the horns operate properly?	System OK	Go to Step 2

Description and Operation

Horn with Blackout (B/O) Control Circuit Operation

Voltage is applied at all times to the horn relay through the 15A horn fuse in the Underhood fuse block. The blackout (B/O) service drive switch is used to control the horn relay. Power is applied through ORN (circuit 40) to the blackout (B/O) service drive switch which is a normally closed switch. When the horn switch is depressed, the horn switch contacts close, providing a ground to the coil of the horn relay. When the coil of the relay is grounded, the relay energizes and the contacts close, applying battery voltage directly to the LH and RH horn. Because the horns are grounded at Ground (G112) the horns will sound as long as the horn switch is depressed.

The blackout (B/O) service drive switch is used to disable the horn relay when placed in the blackout (B/O) mode. When the blackout (B/O) service drive switch is in the ON position, power to the horn relay is disrupted leaving the horns inoperative.

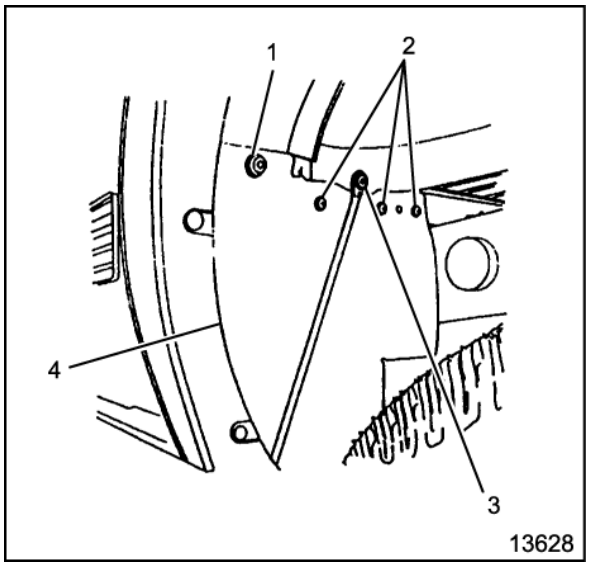
BLANK

Exterior Trim

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Mud Flap Brace Bolts	25 N•m	18 lb ft
Mud Flap Screws	4 N•m	35 lb in



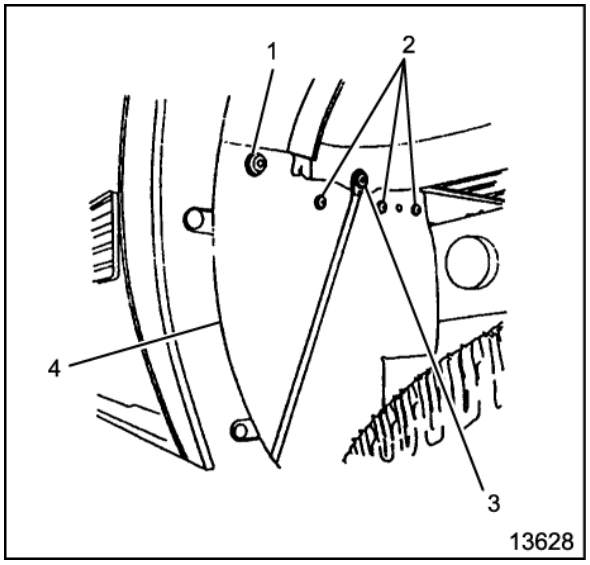
Repair Instructions

Rear Mud Flap Replacement

Removal Procedure

Caution: Refer to Vehicle Lifting Caution in Cautions and Notices.

1. Raise and support the vehicle.
2. Remove the brace bolt (3).
3. Remove the plastic retainer (1).
4. Remove the screws (2).
5. Remove the mud flap (4) from the vehicle.



Installation Procedure

1. Install the mud flap (4) to the vehicle.
2. Install the plastic retainer (1).

Notice: Refer to Fastener Notice in Cautions and Notices.

3. Install the brace bolt (3).
   Tighten
   Tighten the brace bolt to 25 N•m (18 lb ft).
4. Install the screws (2).
   Tighten
   Tighten the screws to 4 N•m (35 lb in).
5. Remove the supports and lower the vehicle.

Description and Operation

Exterior Trim Description

The military vehicles may be equipped with rear mud flaps to prevent brake damage when exposed to off road conditions.

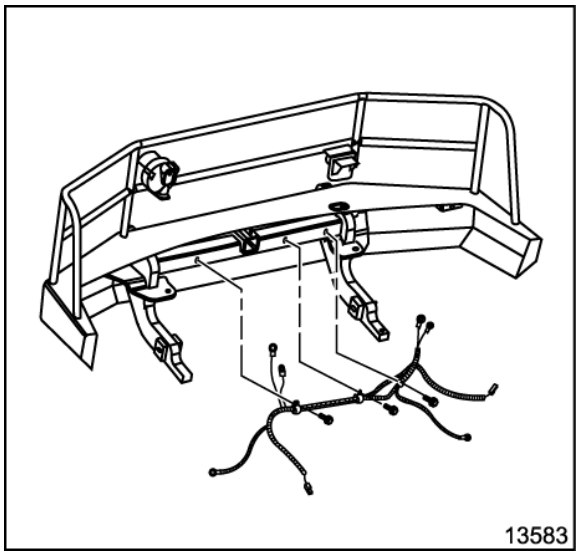
BLANK

Bumpers

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Bumper Center Bolts	122 N•m	90 lb ft
Front Bumper Lower Support Bolts	77 N•m	57 lb ft
Front Bumper Upper Support Bolts	31 N•m	23 lb ft
Front Clevis Bolts	200 N•m	148 lb ft
Rear Bumper Reinforcement to Bumper Bolts	79 N•m	59 lb ft
Rear Bumper Reinforcement to Frame Bolts	117 N•m	87 lb ft
Rear Bumper Side Frame Bolts	117 N•m	87 lb ft
Rear Bumper Side Reinforcement Bolts	79 N•m	59 lb ft
Rear Clevis Bolts	200 N•m	148 lb ft
Rear Clevis Mount Bolts (Factory Bumper)	78 N•m	58 lb ft
Slave Receptacle Mounting Bolts	7-9 N•m	61-79 lb in
Slave Start Harness Connections	6 N•m	53 lb in
Winch Bolts	47-54 N•m	35-40 lb ft
Winch Mount to Bracket Bolts	67-88 N•m	49-65 lb ft
Winch Mount to Bumper Bolts	200 N•m	148 lb ft
Winch Receiver Bolts	120-145 N•m	89-107 lb ft



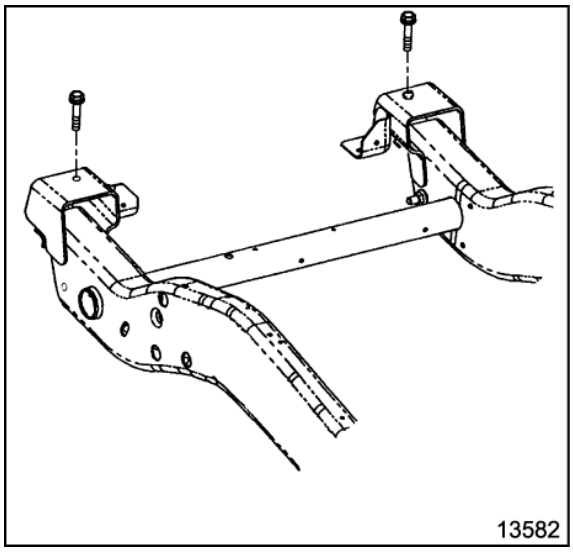
Repair Instructions

Bumper Replacement - Front

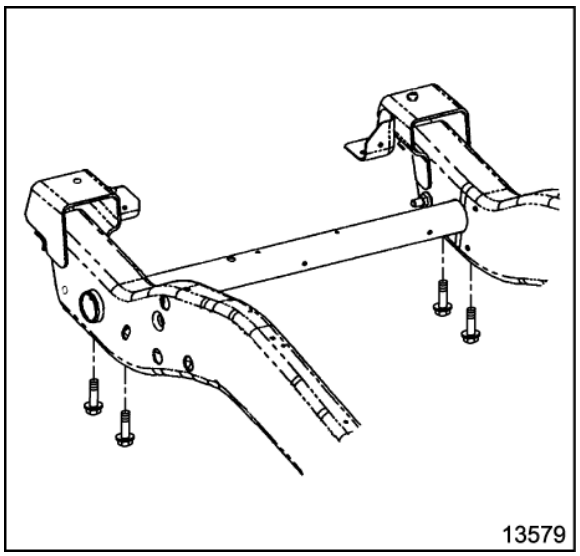
Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the blackout (B/O) headlamp (if equipped). Refer to Headlamp Replacement – Blackout (B/O) in Lighting Systems.
3. Remove the slave receptacle (if equipped). Refer to Slave Receptacle Replacement.
4. Remove the blackout (B/O) marker lamp (if equipped). Refer to Marker Lamp Replacement – Front Blackout (B/O) in Lighting Systems.
5. Remove the 3 bolts and the 3 clamps securing the slave receptacle harness and the blackout (B/O) harness from the bumper assembly.

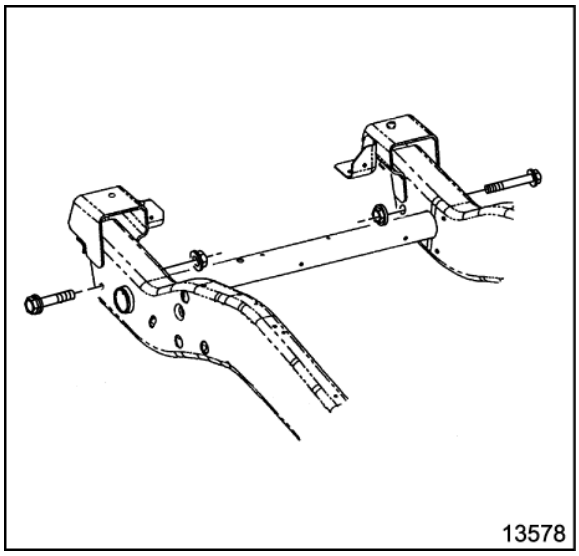


6. Remove the winch connector (if equipped). Refer to Winch Connector/Harness Replacement – Front in Wiring Systems.
7. Remove the front winch mount. Refer to Permanent Winch Mount Replacement.
8. Support the bumper assembly using an approved support system.
9. Remove the 2 bolts from the upper bumper supports.

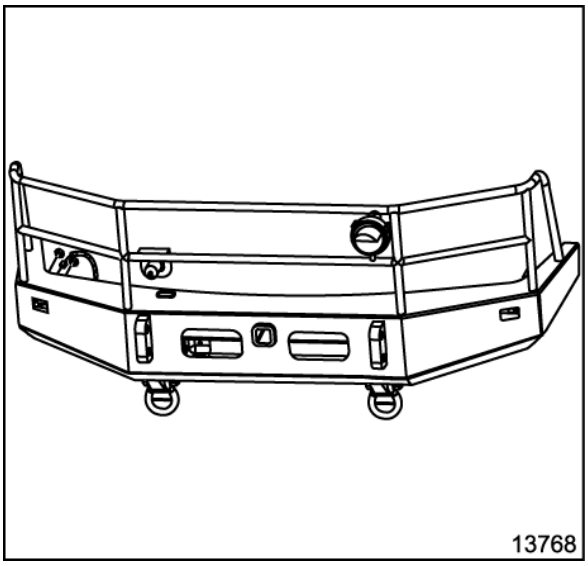


10. Remove the 4 bolts from the lower supports.

11. Remove the 2 bolts and the 2 nuts from the center bumper supports.

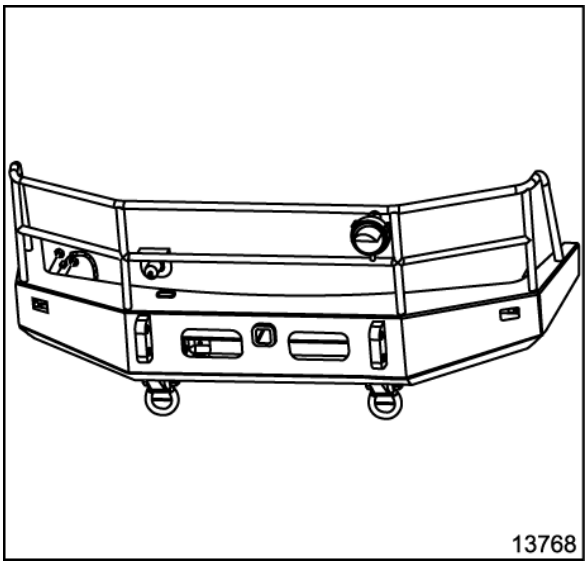


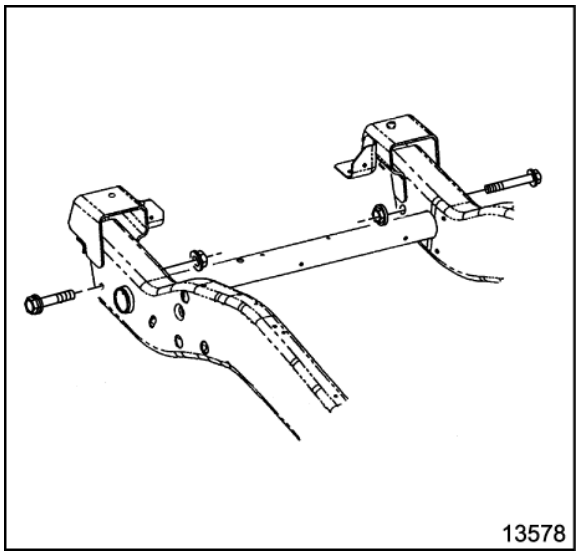
12. Using the aid of an assistant, remove the bumper assembly from the vehicle.
13. Remove the clevis/tie downs. Refer to Clevis/Tie Down Replacement – Front.



Installation Procedure

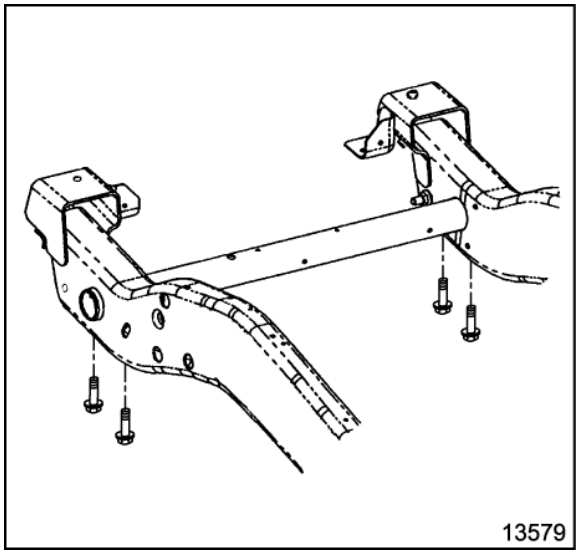
1. Install the clevis/tie downs onto the bumper. Refer to Clevis/Tie Down Replacement – Front.
2. Support the bumper assembly by using an approved support system.
3. Using the aid of an assistant, position the bumper assembly onto the vehicle.



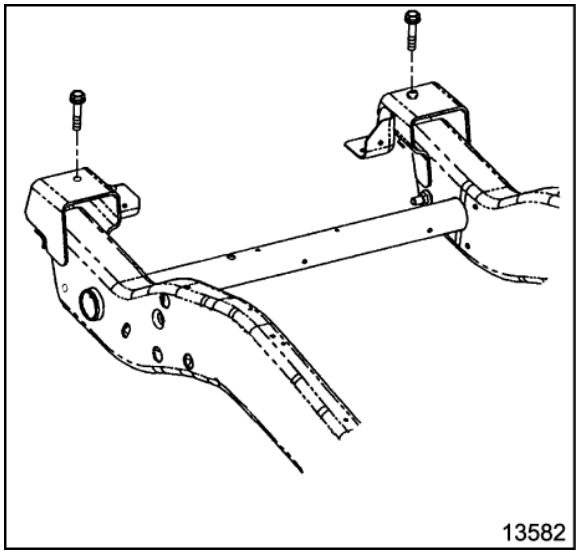


Notice: Refer to Fastener Notice in Cautions and Notices.

4. Install the 2 bolts and 2 nuts onto the center bumper supports.
   Tighten
   Tighten the center bumper support bolts to 122 N•m (90 lb ft).

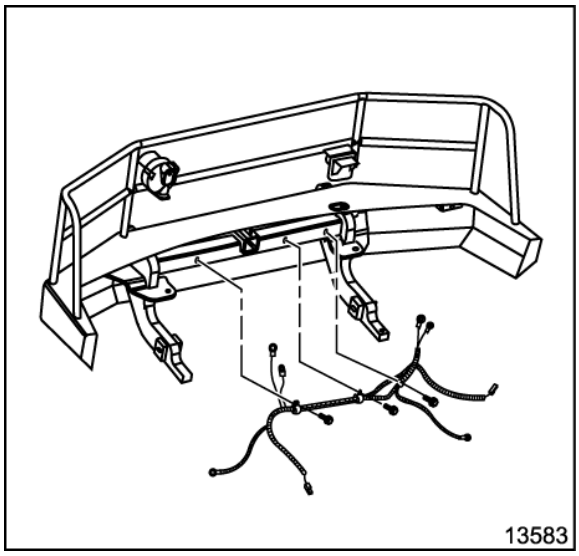


5. Install the 4 bolts onto the lower bumper supports.
   Tighten
   Tighten the lower bumper support bolts to 77 N•m (57 lb ft).



6. Install the 2 bolts onto the upper bumper supports.
   Tighten
   Tighten the upper bumper support bolts to 31 N•m (23 lb ft).
7. Install the front winch mount. Refer to Permanent Winch Mount Replacement.

8. Install the 3 bolts and the 3 clamps onto the blackout (B/O) harness, the slave receptacle and the bumper assembly.
9. Install the blackout (B/O) marker lamps onto the bumper. Refer to Marker Lamp Replacement – Front Blackout (B/O) in Lighting Systems.
10. Install the slave receptacle onto the bumper. Refer to Slave Receptacle Replacement.
11. Install the blackout (B/O) headlamp onto the bumper. Refer to Headlamp Replacement – Blackout (B/O) in Lighting Systems.
12. Install the front winch connector. Refer to Winch Connector/Harness Replacement – Front in Wiring Systems.
13. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.

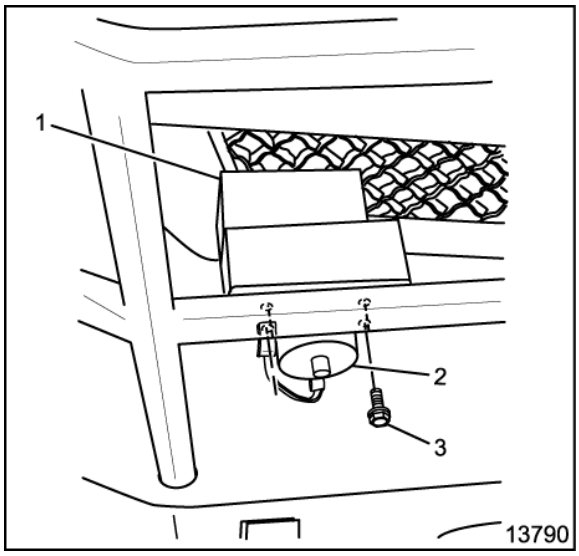


Slave Receptacle Replacement

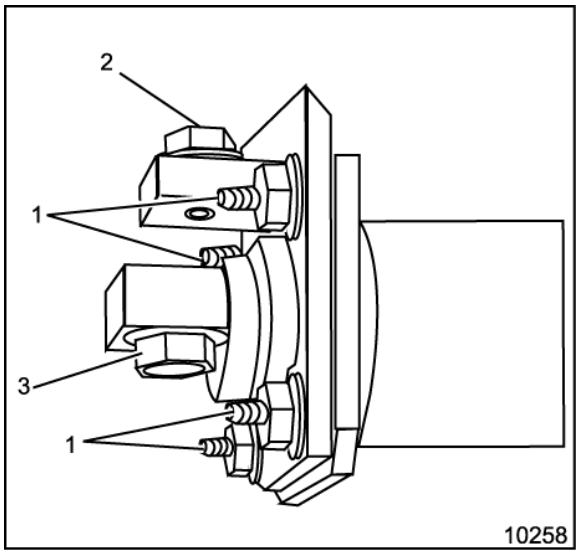
Removal Procedure

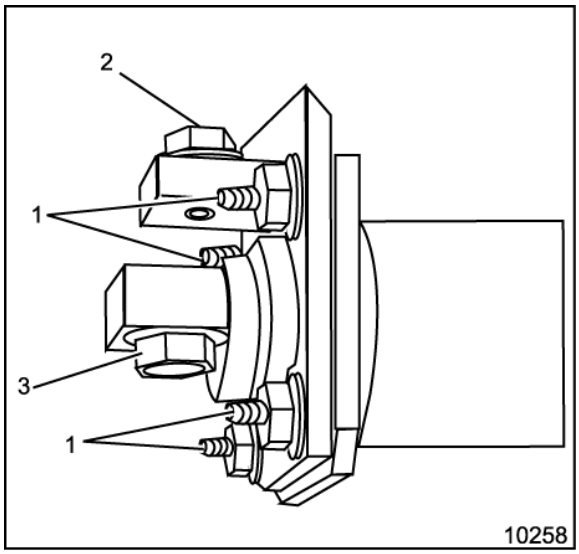
Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the fasteners (3) securing the slave receptacle to the slave receptacle cover (2) and connect the bracket (1).
3. Remove the slave receptacle cover (2).



4. Disconnect the negative cable connections (2).
5. Remove the rubber cover from the rear of the positive cable connection.
6. Disconnect the positive cable connection (3).
7. Remove the slave receptacle and the gasket from the bracket.





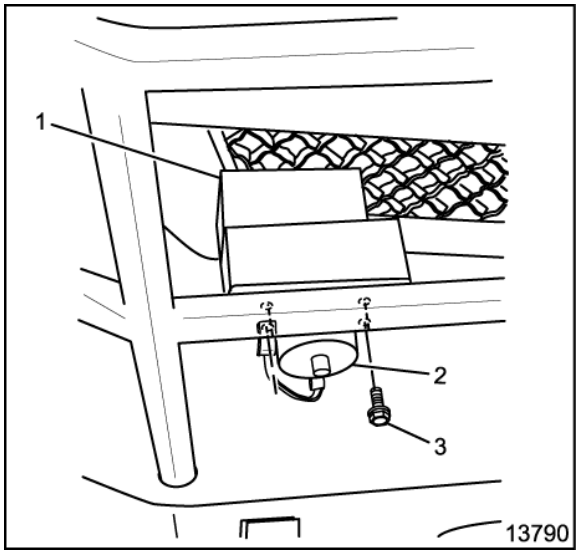
Installation Procedure

Notice: The gasket must mount to the square back of the slave start connector assembly.

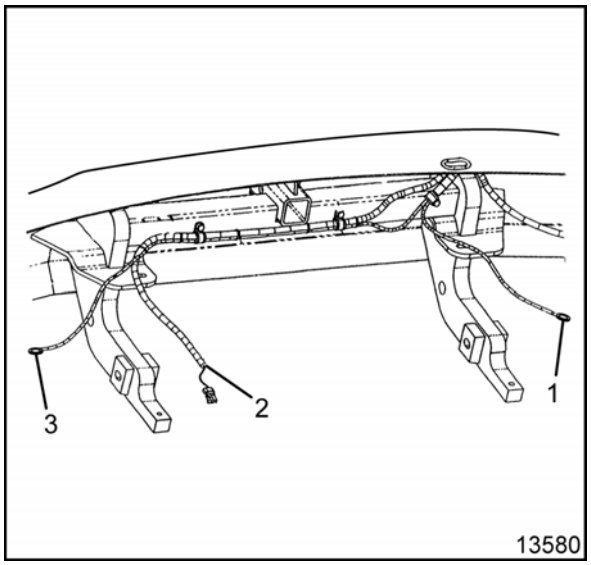
1. Position the slave receptacle with the gasket onto the bracket.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the positive cable onto the connection (3).
3. Install the negative cable onto the connection (2).
   Tighten
   - Tighten positive connections to 6 N•m (53 lb in).
   - Tighten negative connections to 6 N•m (53 lb in).



4. Install the rubber cover onto the rear of the positive cable connection.
5. Position the slave receptacle cover onto the rear of the bracket.
6. Install the fasteners (3) onto the slave receptacle (2) and the slave receptacle rear connector cover (1).
   Tighten
   Tighten bolts to 7-9 N•m (61-79 lb in).
7. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



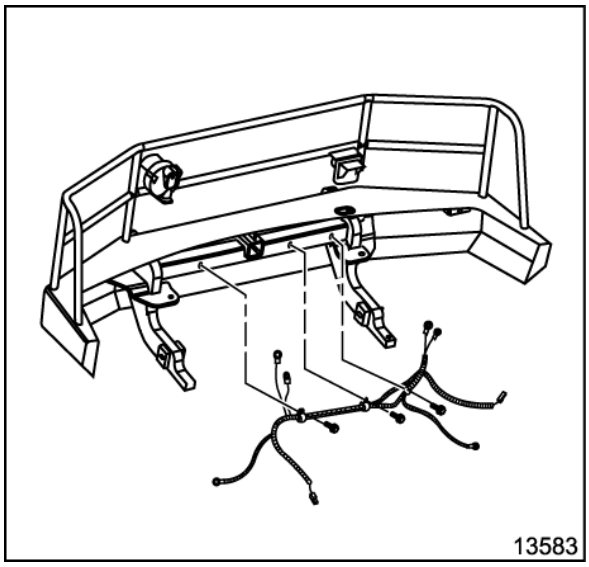
Slave Receptacle Harness Replacement

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

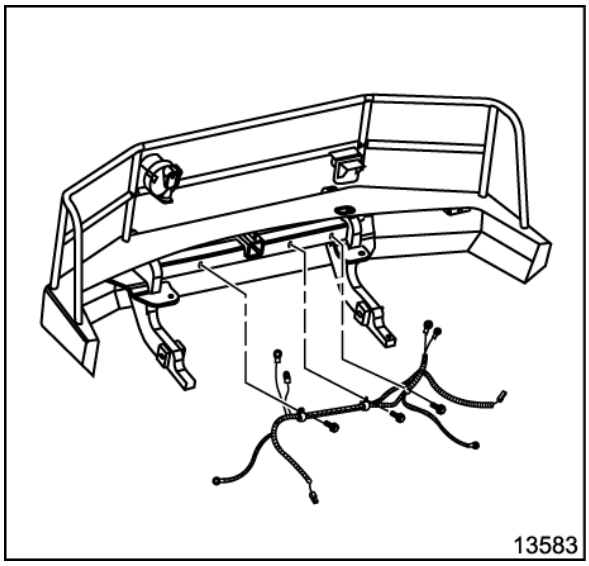
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Trace the negative slave receptacle cable (1) to the cable ground connection.
3. Disconnect the negative slave receptacle ground cable from the ground connection.
4. Trace the positive slave receptacle cable (3) to the 24V battery connection.
5. Disconnect the positive slave receptacle cable (3) to the 24V battery connection.

6. Disconnect the slave receptacle connectors from the slave receptacle. Refer to Slave Receptacle Replacement.
7. Remove the fasteners from the clamps securing the slave receptacle harness and the blackout (B/O) harness.
8. Remove the slave receptacle harness from the bumper assembly.

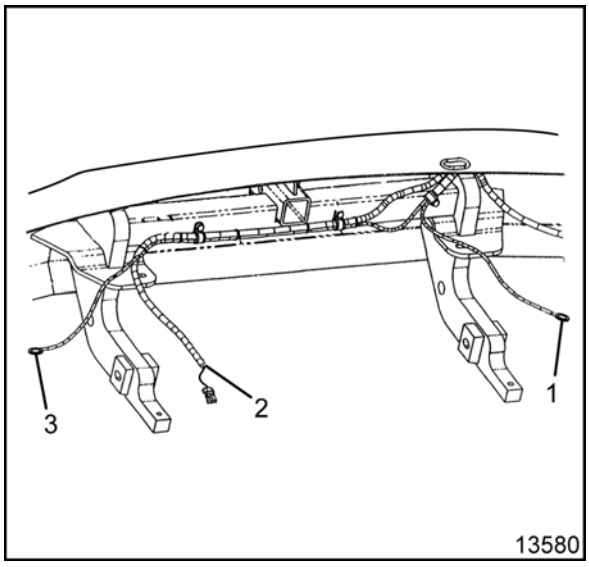


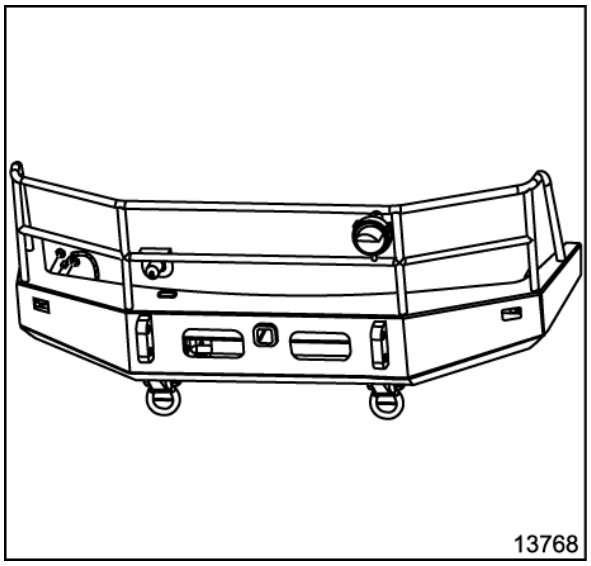
Installation Procedure

1. Position the slave receptacle harness onto the bumper assembly.
2. Install the 3 clamps and the fasteners onto the slave receptacle harness and the blackout (B/O) harness.
3. Connect the slave receptacle connectors to the slave receptacle. Refer to Slave Receptacle Replacement.
4. Install the positive slave receptacle cable in the same routing location as removed.



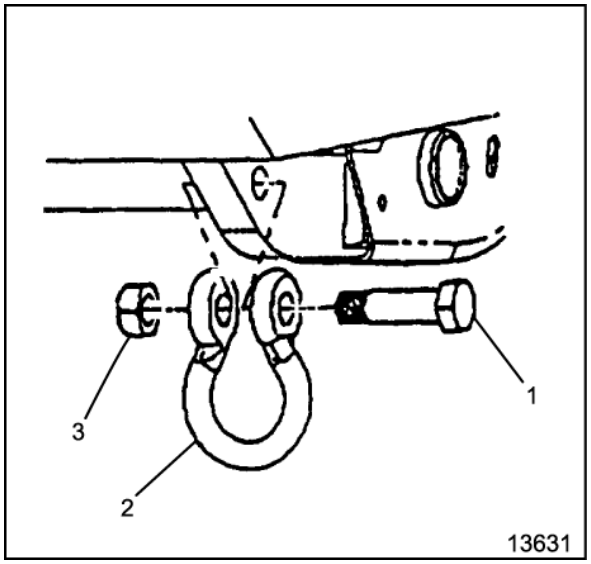
5. Connect the positive slave receptacle cable connector (3) to the 24V battery connection.
6. Install the negative slave receptacle cable in the same routing location as removed.
7. Connect the negative slave receptacle connector (1) to the cable ground connection.
8. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.





Radiator Grille Brush Guard Replacement

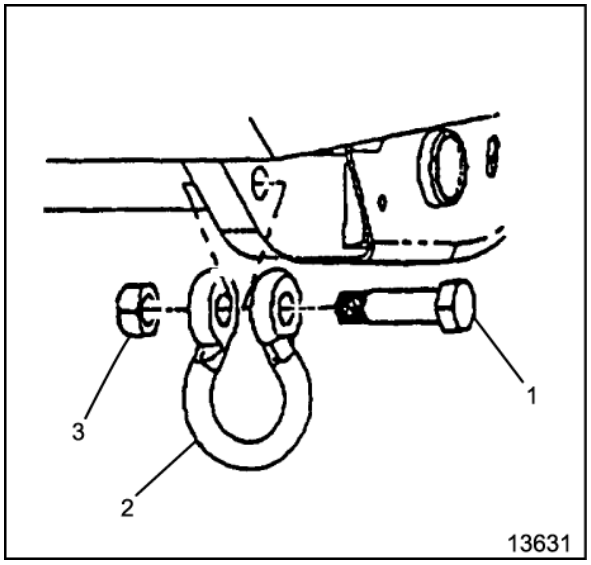
Note: The grille brush guard and front bumper are replaced as a unit. If damaged refer to Bumper Replacement – Front.



Clevis/Tie Down Replacement – Front

Removal Procedure

1. Remove the bolt (1) and nut (3).
2. Remove the clevis (2) from the mount.



Installation Procedure

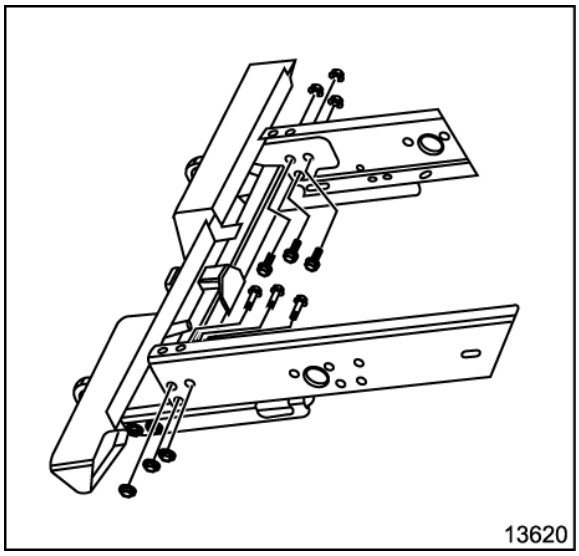
1. Install the clevis (2) to the mount.

Notice: Refer to Fastener Notice in Cautions and Notices.

Notice: Clevis must move once torqued. Do not over torque.

2. Install the bolt (1) and nut (3).
   Tighten
   Tighten nut and bolt to 200 N•m (148 lb ft).

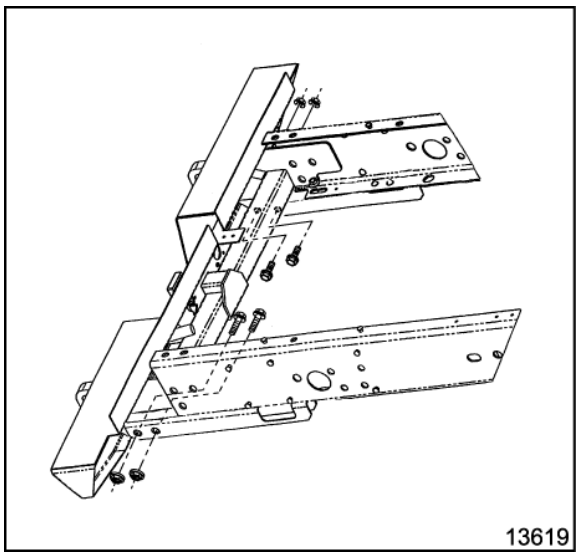
Bumper Replacement – Rear



Removal Procedure

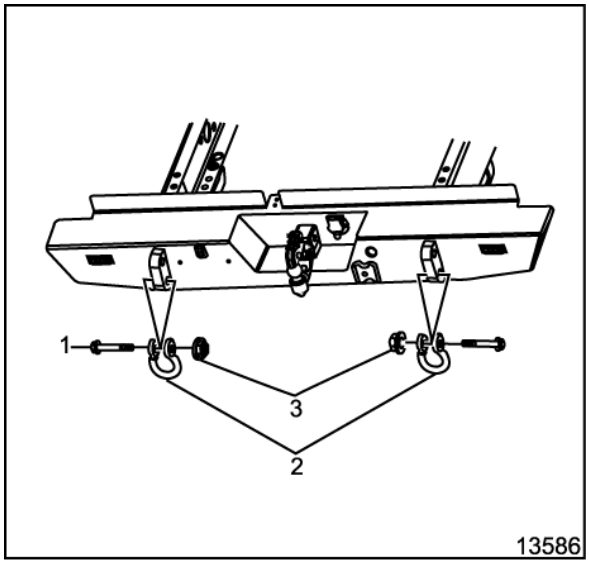
Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

1. Remove the negative battery cable of the right battery and the 12V and 24V cables of the left battery.
2. Remove the pintle hook. Refer to Pintle Hook Replacement.
3. Disconnect the trailer wiring harness. Refer to Blackout (B/O) and Trailer Harness Replacement – Rear in Wiring Systems.
4. Remove the winch connector (if equipped). Refer to Winch Connector/Harness Replacement – Rear in Wiring Systems.
5. Support the rear bumper using an approved support system.
6. Remove the 6 side frame rail to bracket bolts.

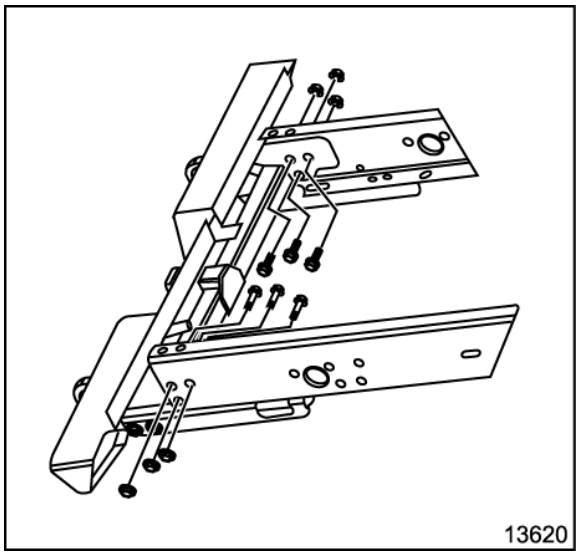


7. Remove the 4 bumper reinforcement bolts.
8. Using the aid of an assistant, remove the rear bumper from the vehicle.
9. Remove the trailer wiring harness from the rear bumper. Refer to Blackout (B/O) and Trailer Harness Replacement – Rear in Wiring Systems.
10. Remove the blackout (B/O) marker lamps. Refer to Marker Lamp Replacement – Rear in Lighting Systems.
11. Remove the military trailer connector. Refer to Military Trailer Connector Replacement in Wiring Systems.
12. Remove the commercial trailer connector. Refer to Commercial Trailer Connector Replacement in Wiring Systems.
13. Remove the clevis/tie down. Refer to Clevis/Tie Down Replacement – Rear.

Installation Procedure



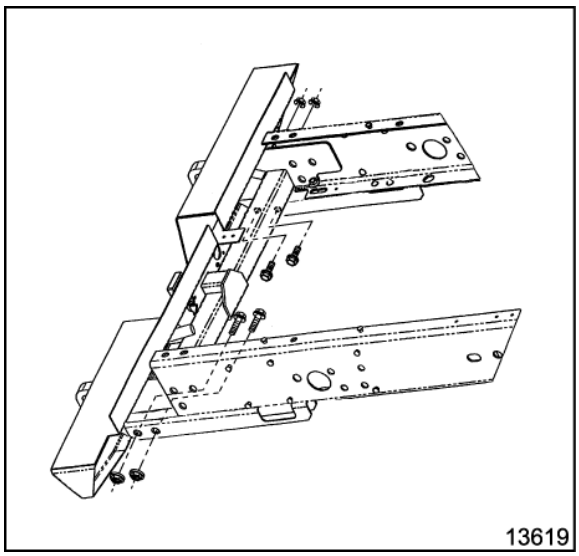
1. Install the clevis/tie down (2). Refer to Clevis/Tie Down Replacement – Rear.
2. Install the blackout (B/O) marker lamps. Refer to Marker Lamp Replacement – Rear in Lighting Systems.
3. Install the military trailer connector. Refer to Military Trailer Connector Replacement in Wiring Systems.
4. Install the commercial trailer connector. Refer to Commercial Trailer Connector Replacement in Wiring Systems.
5. Install the trailer wiring harness. Refer to Blackout (B/O) and Trailer Harness Replacement – Rear in Wiring Systems.
6. Support the rear bumper using an approved support system.
7. Using the aid of an assistant, position the rear bumper onto the vehicle.



Notice: Refer to Fastener Notice in Cautions and Notices.

8. Install the 6 side frame rail to bracket bolts/nuts.

Note: Do not tighten at this time.

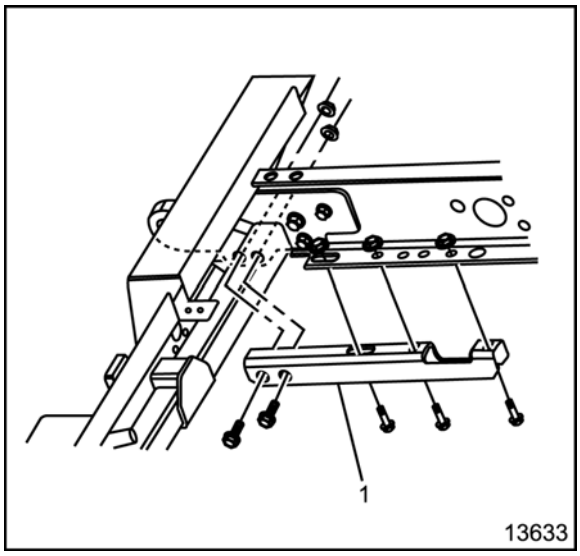


9. Install the 4 bumper reinforcement bolts.

Important: Tighten the rear bumper mounting bolts in the following sequence.

- Tighten the 6 side frame rail bracket bolts/nuts to 117 N•m (87 lb ft).
- Tighten the 4 side bumper reinforcement bracket bolts/nuts to 79 N•m (59 lb ft).

10. Connect the trailer wiring harness. Refer to Blackout (B/O) and Trailer Harness Replacement – Rear in Wiring System.
11. Install the winch connector. Refer to Winch Connector/Harness Replacement – Rear in Wiring Systems.
12. Remove the support.
13. Connect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
14. Install the pintle hook. Refer to Pintle Hook Replacement.

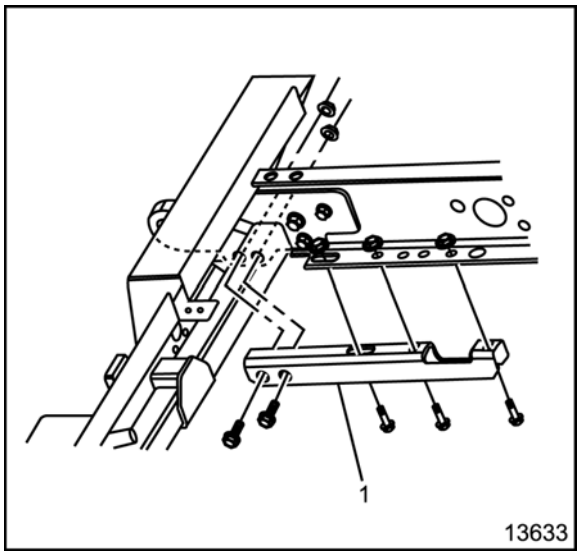


Bumper Reinforcement – Rear

Removal Procedure

1. Remove the 2 rear bumper bracket nuts/bolts.
2. Remove the 3 rear bumper reinforcement to frame nuts/bolts.
3. Remove the rear bumper reinforcement bracket (1).

Installation Procedure



1. Position the rear bumper reinforcement bracket (1) onto the vehicle.
2. Install the 2 bumper reinforcement to bracket nuts/bolts.

Note: Do not tighten at this time.

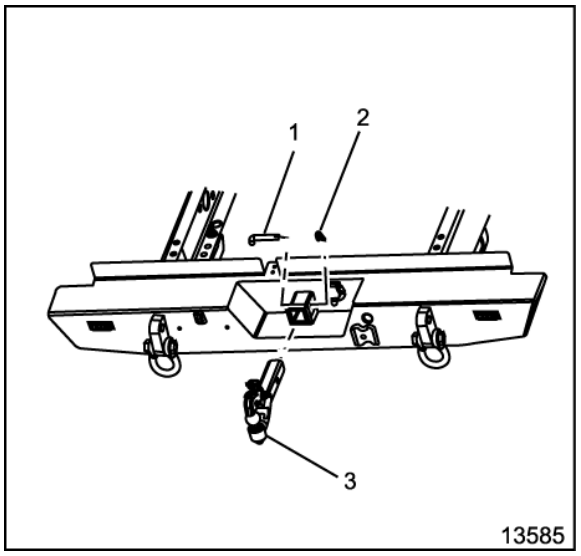
3. Remove the 3 bumper reinforcement to frame nuts/bolts.

Important: Tighten the rear bumper reinforcement in the following sequence.

- Tighten the 3 bumper reinforcement to frame nuts/bolts to 117 N•m (87 lb ft).
- Tighten the 2 side bumper reinforcement bracket bolts/nuts to 79 N•m (59 lb ft). Repeat for opposite side.

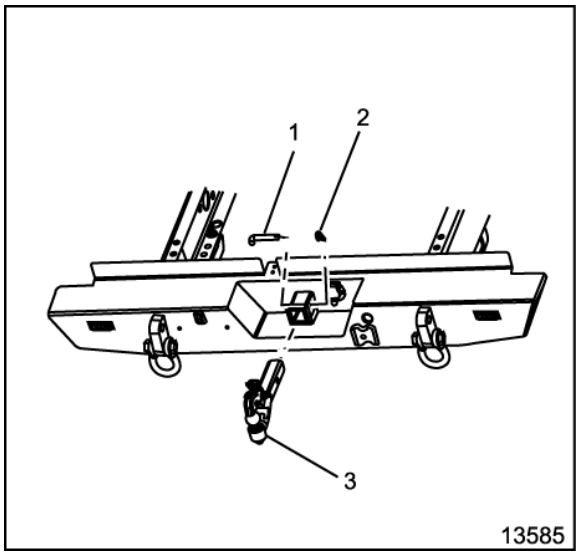
Pintle Hook Replacement

Removal Procedure

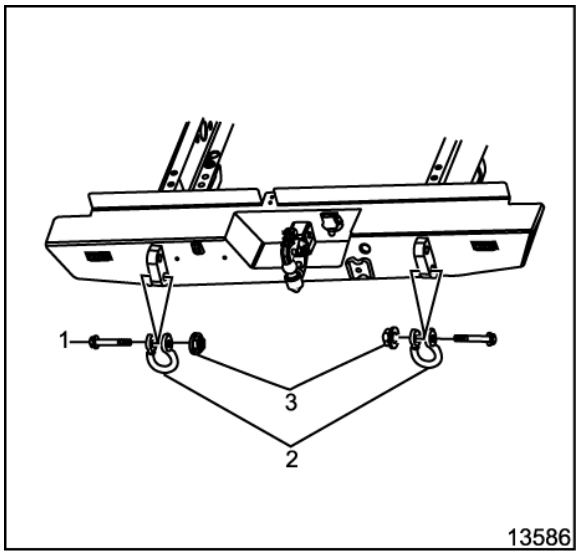


1. Remove the spring clip (2) from the retaining pin.
2. Remove the retaining pin (1) from the receiver.
3. Pull the pintle hook (3) out of the receiver.

Installation Procedure



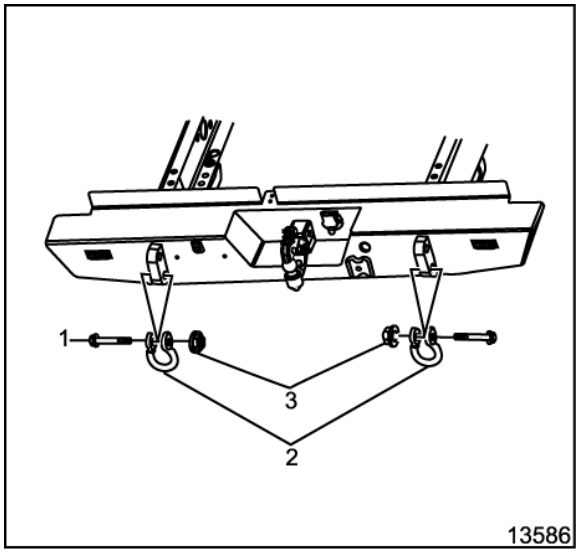
1. Clean any debris out of the receiver.
2. Push pintle hook (3) into receiver until holes line up.
3. Install retaining pin (1) into hole.
4. Install spring clip (2) into retaining pin.



Clevis/Tie Down Replacement – Rear Military Bumper

Removal Procedure

1. Remove the nut (3) and bolt (1).
2. Remove the clevis (2) from frame.



Installation Procedure

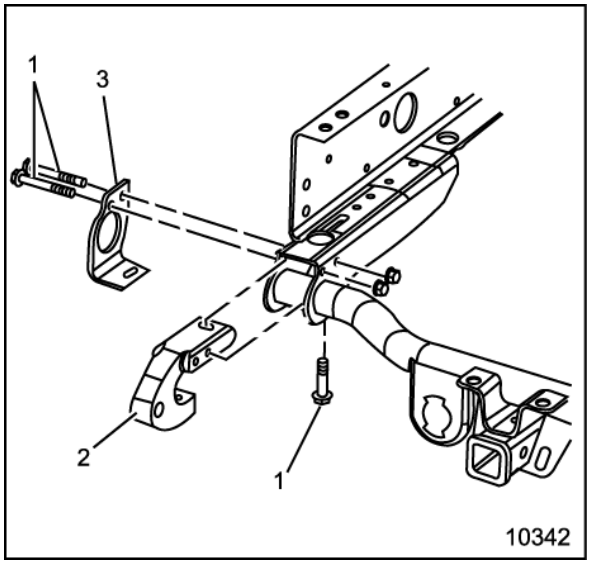
1. Install the clevis (2) to frame.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bolt (1) and nut (3).

Notice: Clevis must move once torqued. Do not over torque.

3. **Tighten**
   Tighten the nut and bolt to 200 N•m (148 lb ft).



Clevis/Tie Down Support Replacement – Rear Factory Bumper

Removal Procedure

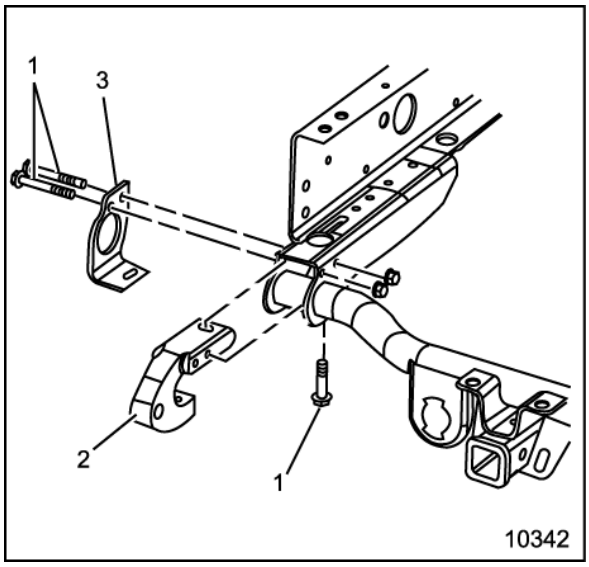
1. Remove the rear bumper. Refer to Bumper Replacement – Rear.
2. Remove the clevis. Refer to Clevis/Tie Down Replacement – Rear.
3. Remove the bolts (1), washers and nuts holding the tie down bracket to the (2) receiver mount.
4. Remove the tie down bracket (2).

Installation Procedure

1. Install the tie down bracket (2), aligning the bolt holes.

Notice: Refer to Fastener Notice in Cautions and Notices.

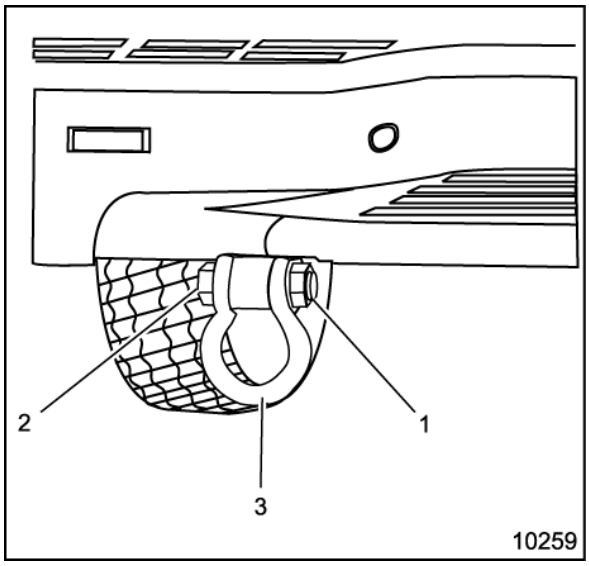
2. Install the brace (3) and bolts (1).
   Tighten
   Tighten the bolts to 78 N•m (58 lb ft).
3. Install the rear bumper. Refer to Bumper Replacement – Rear.



Clevis/Tie Down Replacement – Rear Factory Bumper

Removal Procedure

1. Remove the nut (1) and bolt (2).
2. Remove the clevis (3) from frame.



Installation Procedure

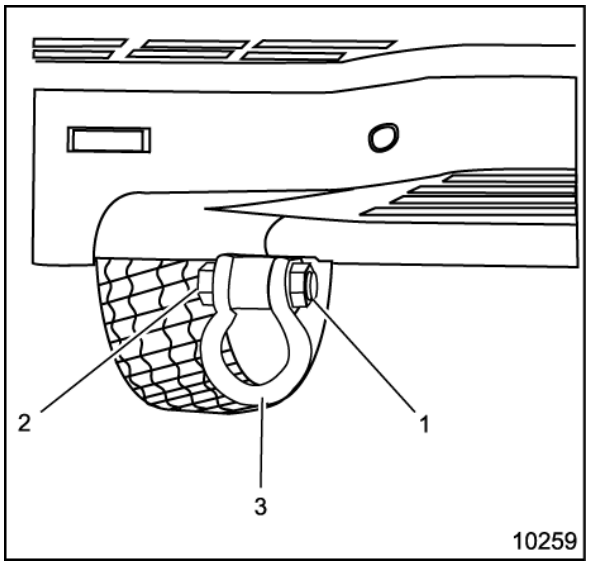
1. Install the clevis (3) to frame.

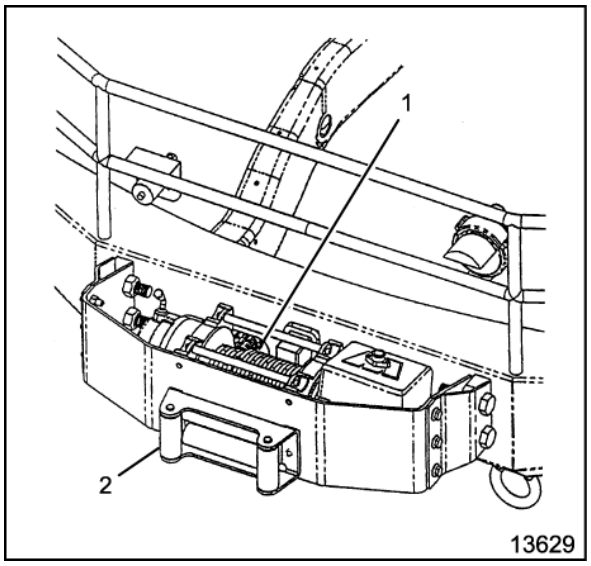
Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bolt (2) and nut (1) and tighten.

Notice: Clevis must move once torqued. Do not over torque.

Tighten
Tighten the nut and bolt to 200 N•m (148 lb ft).

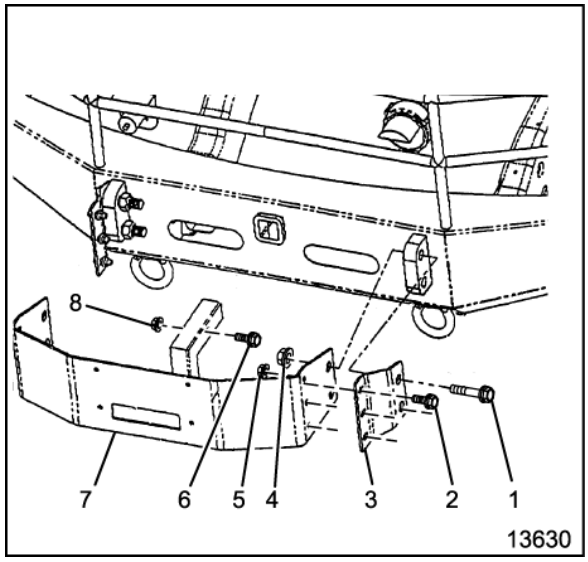




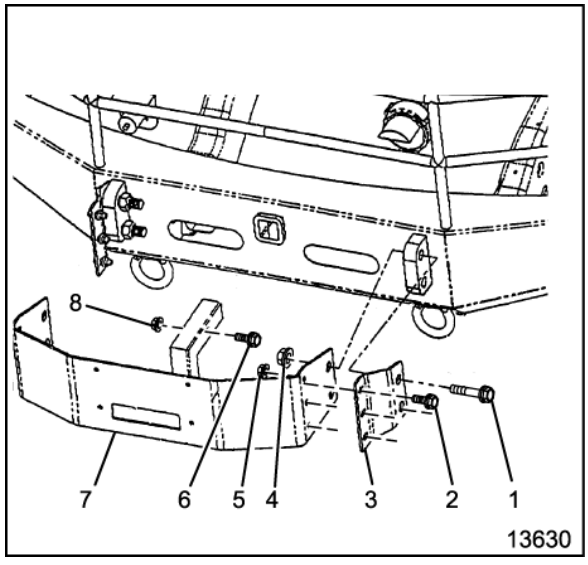
Permanent Winch Mount Replacement

Removal Procedure

1. Remove the winch (1) from the vehicle. Refer to Winch Replacement – Permanent Mount.
2. Remove the roller fairlead (2) from the winch mount.



3. Remove the 3 bolts (2) and 3 nuts (5). Repeat step for other side.
4. Remove the 2 bolts (1) and 2 nuts (4). Repeat step for other side.
5. Remove side bracket (3). Repeat step for other side.
6. Remove bolt (6) and nut (8).
7. Remove winch mount (7) from bumper by sliding out of receiver.



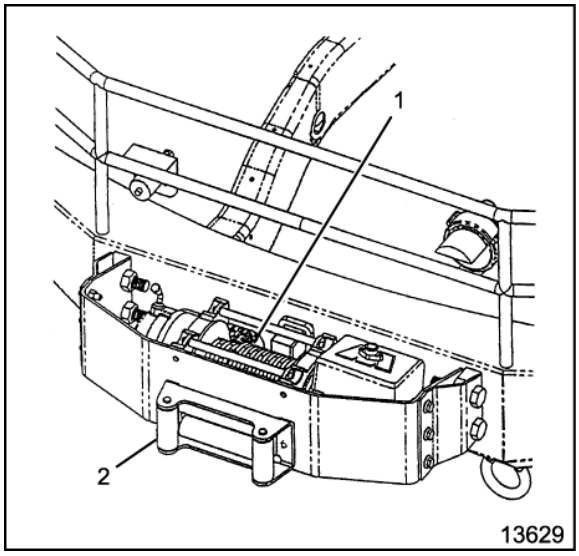
Installation Procedure

1. Remove any debris from receiver opening in bumper.
2. Install winch mount (7) into receiver until holes line up.

Notice: Refer to Fastener Notice in Cautions and Notices.

3. Install the bolt (6) and nut (8) throw the receiver.
   Tighten
   Tighten the nut and bolt to 120-145 N•m (89-107 lb ft).
4. Position the bracket (3) onto the vehicle and install bolts (2) and nuts (5). Repeat step for other side.
   Tighten
   Tighten bracket bolts and nuts to 67-88 N•m (49-65 lb ft).
5. Install bolts (1) and nuts (4) throw bumper and mount. Repeat step for other side.
   Tighten
   Tighten bolts and nuts to 200 N•m (148 lb ft).

6. Install the roller fairlead (2) onto the winch mount.
7. Install the winch (1). Refer to Winch Replacement – Permanent Mount.

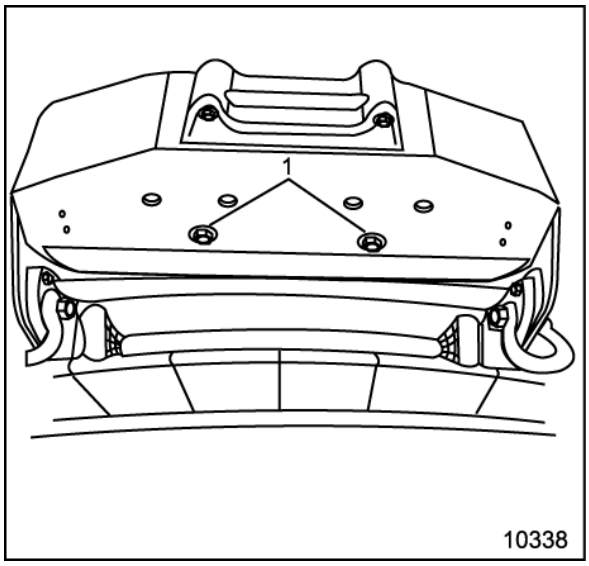


Winch Replacement – Permanent Mount

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

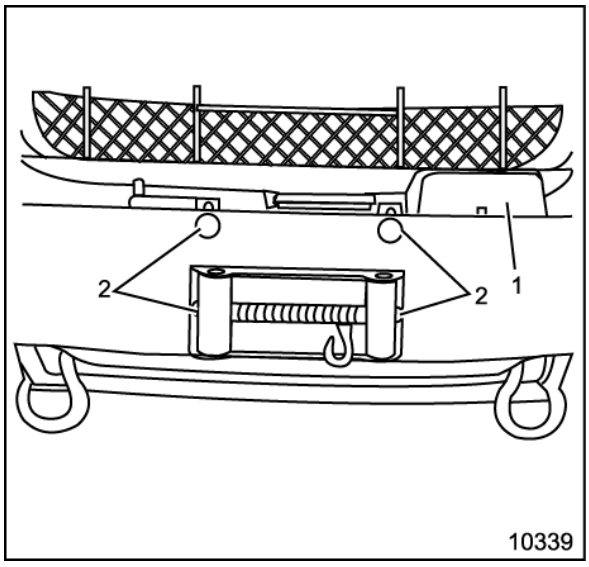
1. Disconnect the batteries. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the 2 lower bolts (1).

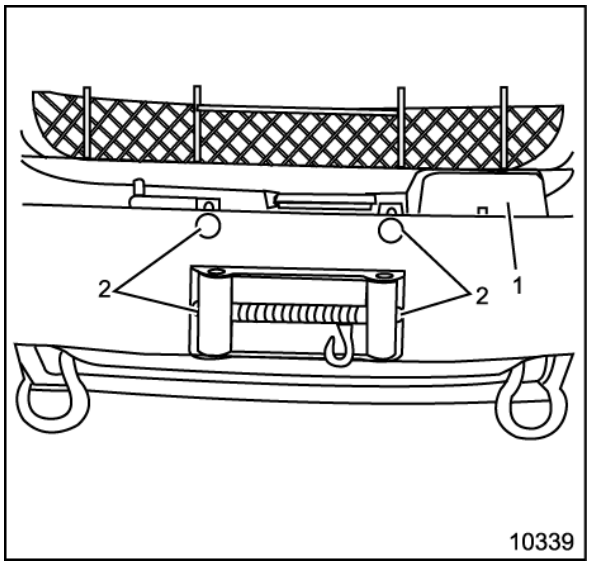


3. Remove winch cover (1).
4. Remove positive and negative cable connection from winch.

Important: Note cable routing for installation.

5. Remove the bolts (2) from the front of the winch mount.
6. Remove cable from fairlead. Remove fairlead.
7. Lift winch out of mount.



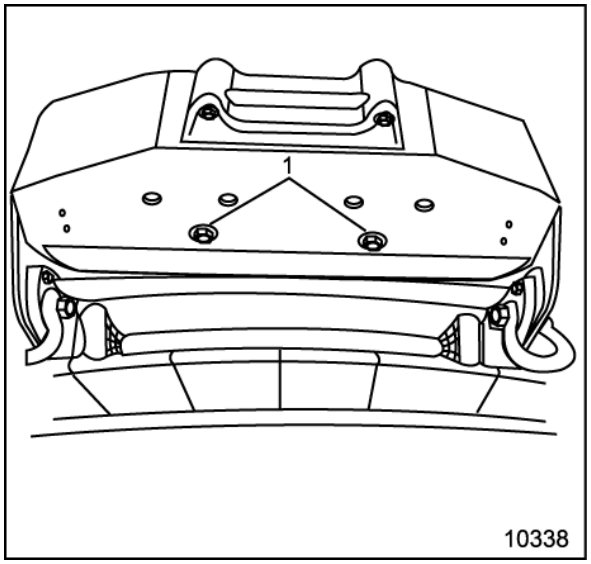


Installation Procedure

1. Install winch mount. Verify routing position of positive and negative cables.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Position fairlead on front of mount and install winch bolts (2).
   Tighten
   Tighten bolts to 47-54 N•m (35-40 lb ft).
3. Install positive and negative cable and tighten.
4. Install top winch cover (1).



5. Install lower winch bolts (1) and tighten.
   Tighten
   Tighten bolts to 47-54 N•m (35-40 lb ft).
6. Connect the batteries. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.

Description and Operation

Bumpers

The equipment described includes all bumper assemblies' front and rear that are offered for the military vehicles. The bumper components provided in this military package are rugged and durable and are designed for the rigors of limited off-road conditions. Repairs on these items include the clevis tie downs and pintle hooks. The repair of some sub-assemblies requires removal of the rear bumpers for access while others require removal of electrical components and lamp harness connections.

Winch

The winch mounts, permanent and multi-mount, have been added to the Pickup models. Refer to applicable procedures for information or the Owner Manual Supplement for how to use the winch.

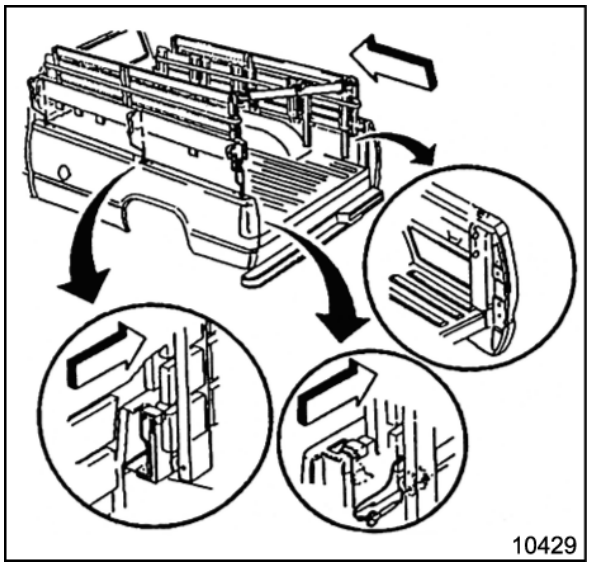
BLANK

Seats

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Seat Bolts	88 N•m	65 lb ft



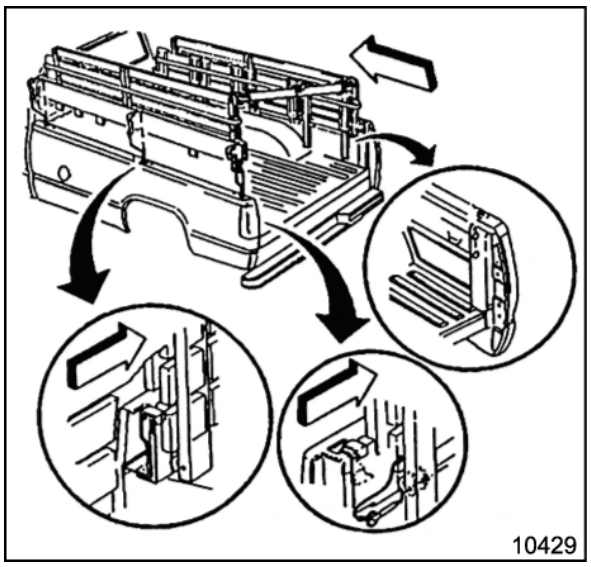
Repair Instructions

Seat Replacement – Troop

Removal Procedure

Notice: Note the clamp and stud arrangement for installation later.

1. Remove the 2 bolts, nuts and clamps holding the seat assembly to the box rail.
2. Fold the seat section to the seatback and install the tether pins to the locking holes for easy removal.
3. Remove the 2 bolts and nylock nuts from the end of the rail.
4. Remove the troop seat assembly.



Installation Procedure

Notice: The left and right seat assemblies are not interchangeable. Match the mounting hole pattern of the seat assembly before attempting to install.

1. Unfold the third seat back (from the cab) down.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. When properly aligned, install the 2 bolts, screws and nuts to the end of the rail.
   Tighten
   Tighten the bolts to 88 N•m (65 lb ft).
3. Install the 2 clamps, bolts and nuts holding the seat assembly to the holes within the openings at the middle and forward end of the box rail.
   Tighten
   Tighten the bolts to 88 N•m (65 lb ft).

Description and Operation

Folding Rear Seat

The troop seats provide 2 benches with seating for up to 4 troops on each side. Each bench is anchored by 3 sets of fasteners to each box rail. The seats can be folded up using tether pins to afford more cargo space. They are equipped with a safety strap which should be hooked across the rear end of the box when occupied. Refer to the 2003 LSSV Operator's Manual Supplement for further details.

Seat Covers

Seat covers are installed on the interior seats to protect the vehicle's interior and are green or tan in color. They allow full function of the seat controls and seat belts.

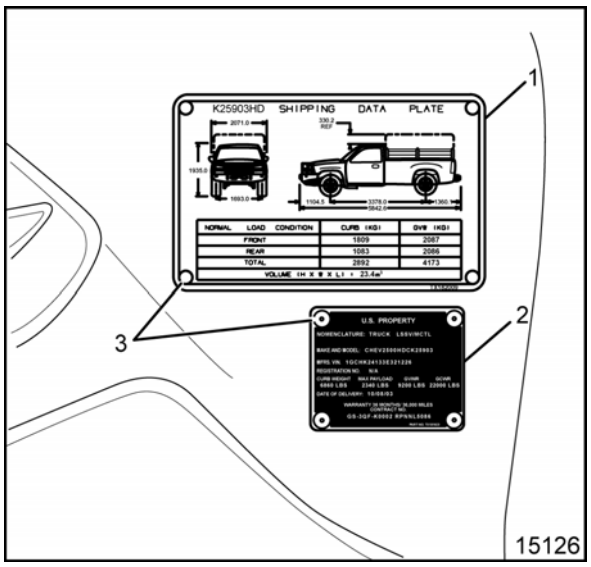
BLANK

Interior Trim

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Equalizer Bracket to Vehicle Bolts	6-10 N•m	53-88 lb in
Equalizer Connections	12 N•m	110 lb in
Equalizer Cover Bolts	6-10 N•m	53-88 lb in
Equalizer to Bracket Bolts	6-10 N•m	53-88 lb in
Floor Mount Weapons Bolts	8 N•m	70 lb in
Lower Weapons Mount Bolts	8 N•m	70 lb in
Upper Weapons Mount Bolts	8 N•m	70 lb in

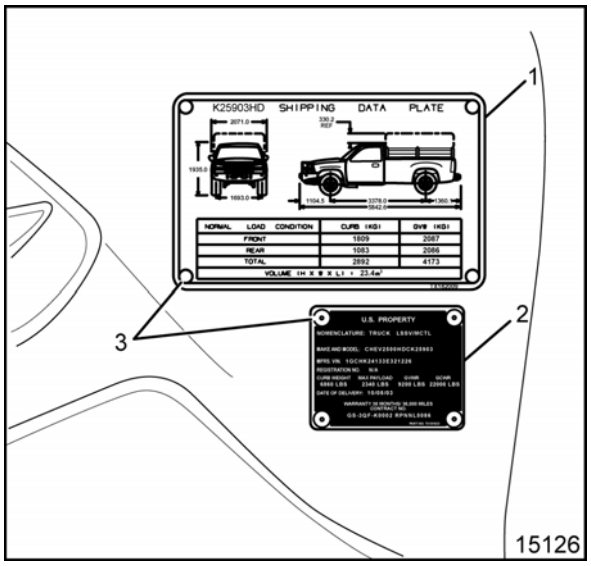


Repair Instructions

Government Vehicle Data Plate Replacement

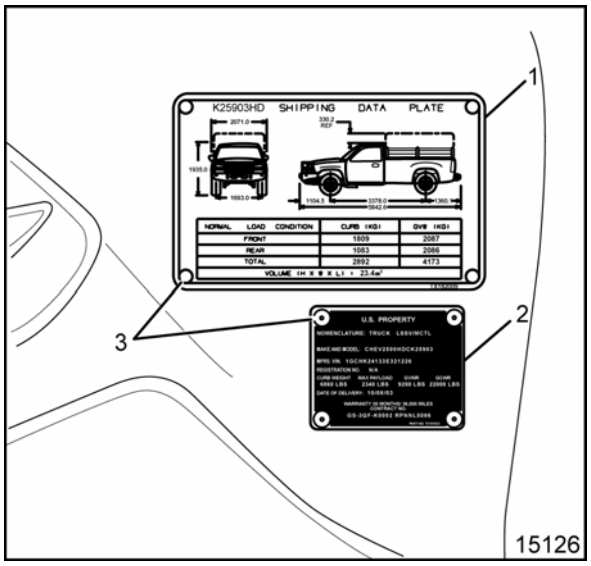
Removal Procedure

1. Drill out the 4 rivets (3).
2. Remove the data plate (2).



Installation Procedure

1. Install the plate (2) to the original holes.
2. Install the new rivets (3).



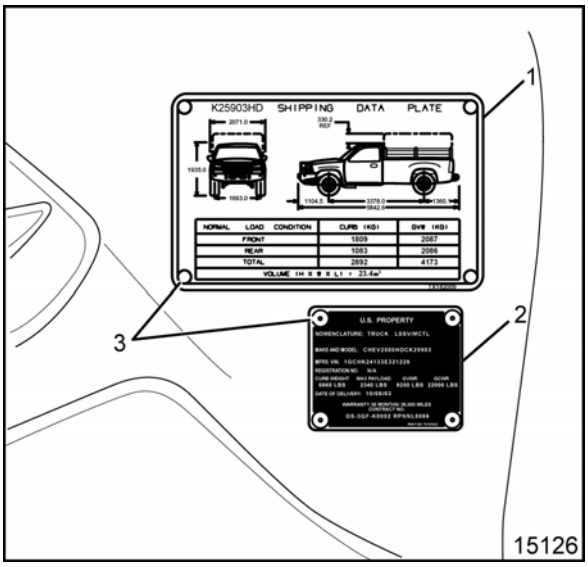
Shipping Data Plate Replacement

Removal Procedure

1. Drill out the 4 rivets (3).
2. Remove the data plate (1).

Installation Procedure

1. Install the data plate (1) to the original holes.
2. Install the new rivets (3).

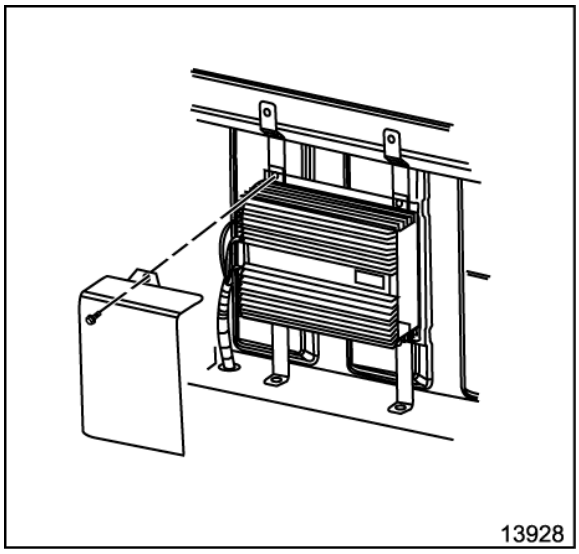


Battery Equalizer/Bracket Replacement

Removal Procedure

Caution: Refer to Battery Disconnect Caution in Cautions and Notices.

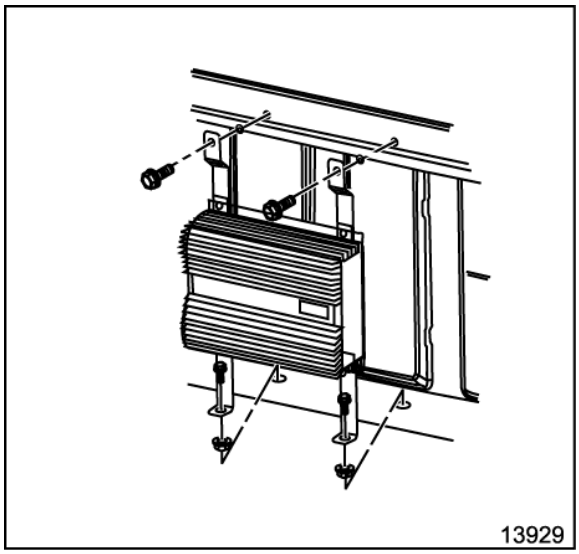
1. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.
2. Remove the rear seat back. Refer to Seat Replacement – Rear 60/40 Split in Seats of the 2003 C/K Truck Service Manual.
3. Remove the equalizer cover from the mounting bracket.

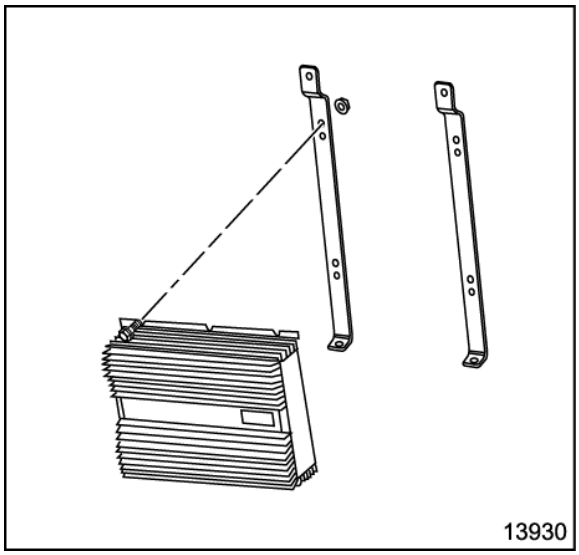


4. Remove the wiring harness connection from the equalizer.

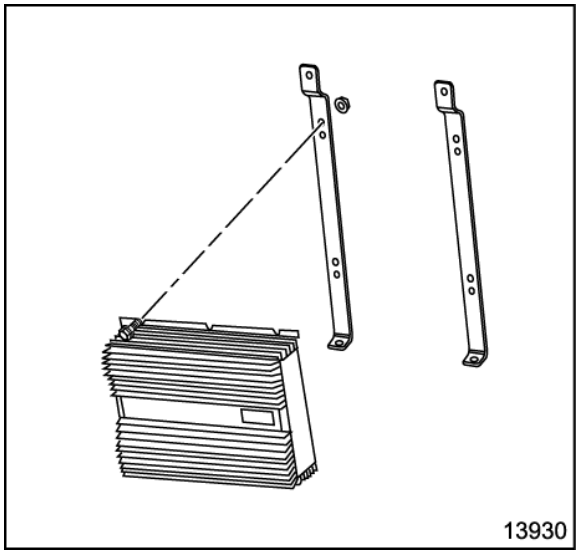
Important: Note location of the wiring on the equalizer for reassembly.

5. Remove the left rear trim panel. Refer to Trim Panel Replacement – Rear Quarter Crew Cab in Interior Trim in the 2003 C/K Truck Service Manual.
6. Remove the air outlet duct.
7. Remove the bolts securing the equalizer bracket to the rear cab wall.





8. Remove the equalizer assembly from the vehicle.
9. Remove the bolts securing the equalizer to brackets.

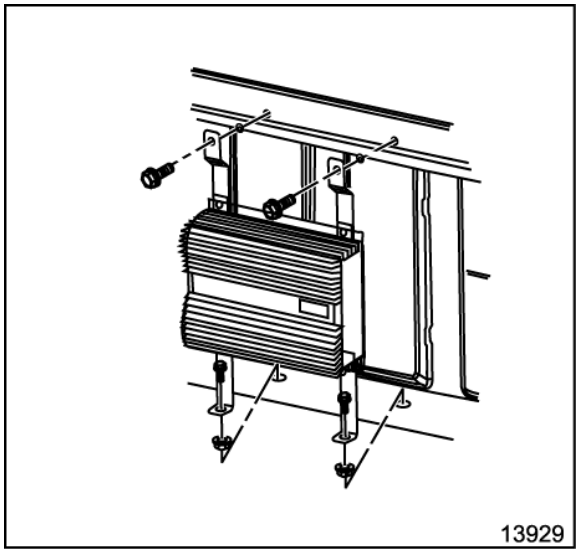


Installation Procedure

1. Install the brackets to the equalizer.

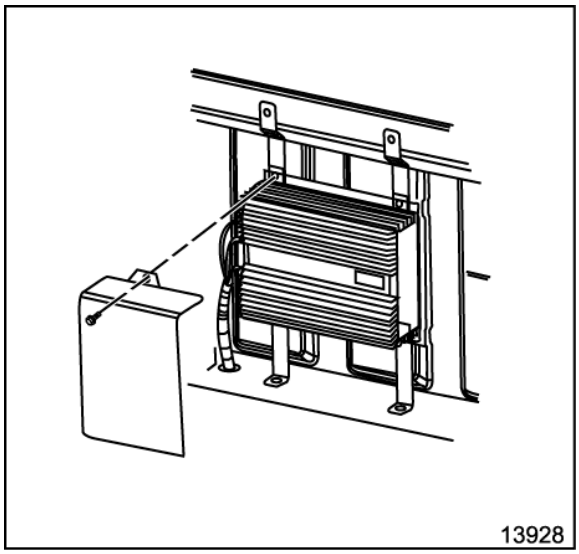
Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bracket bolts.
   Tighten
   Tighten bracket bolts to 6-10 N•m (53-88 lb in).
3. Install the assembly into the vehicle.



4. Install the bolts securing the equalizer to the rear cab wall.
   Tighten
   Tighten the equalizer bolts to 6-10 N•m (53-88 lb in).
5. Install the air outlet duct.
6. Install the left rear trim panel. Refer to Trim Panel Replacement – Rear Quarter Crew Cab in Interior Trim in the 2003 C/K Truck Service Manual.
7. Install the wiring harness connection to the equalizer in the same location as removed.
   Tighten
   Tighten the wiring connection to 12 N•m (110 lb in).

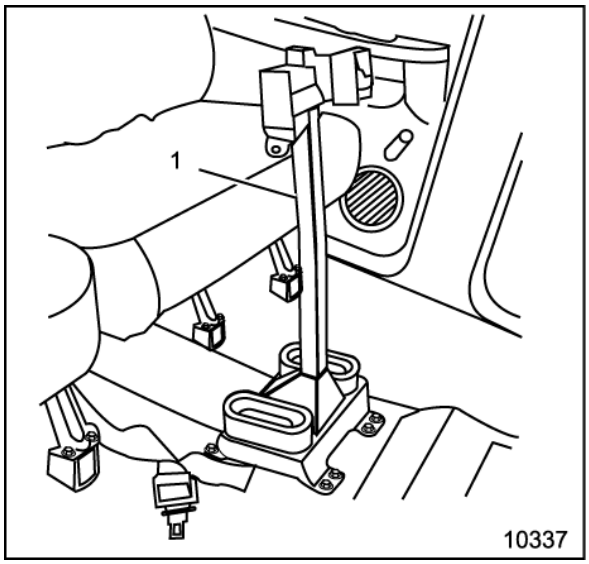
8. Install the equalizer cover.
9. Install the equalizer cover bolt.
   Tighten
   Tighten the cover bolts to 6-10 N•m (53-88 lb in).
10. Install the rear seat back. Refer to Seat Replacement – Rear 60/40 Split in the 2003 C/K Truck Service Manual.
11. Disconnect the battery cables. Refer to Battery Cable Disconnect/Connect Procedure in Engine Electrical.



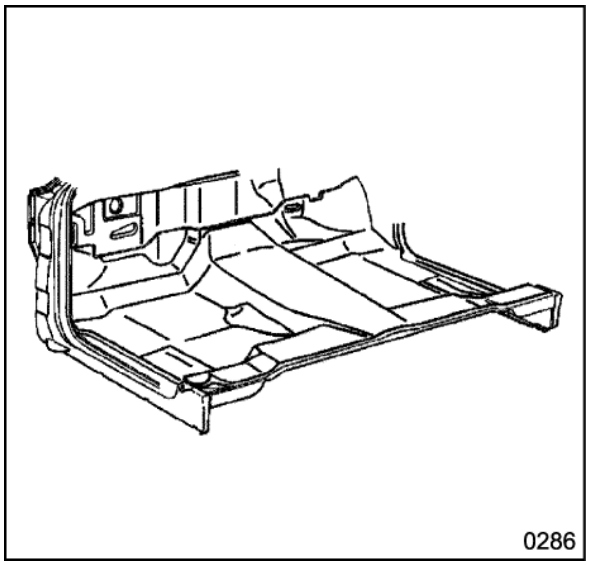
Floor Mat Replacement

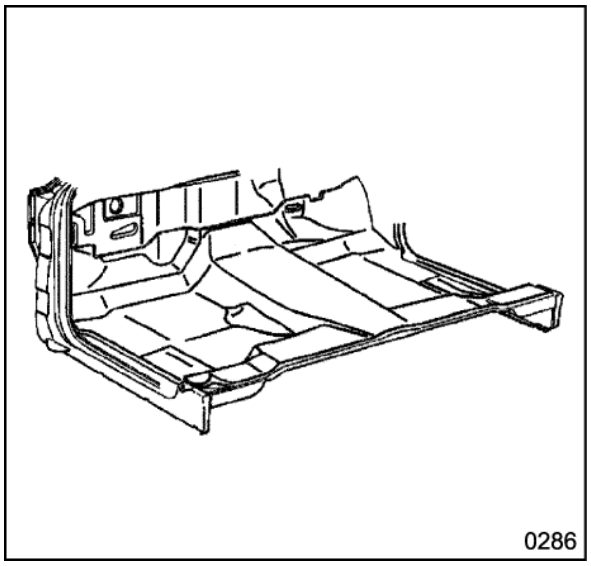
Removal Procedure

1. Remove bolts securing weapons mount (1) and remove mount.



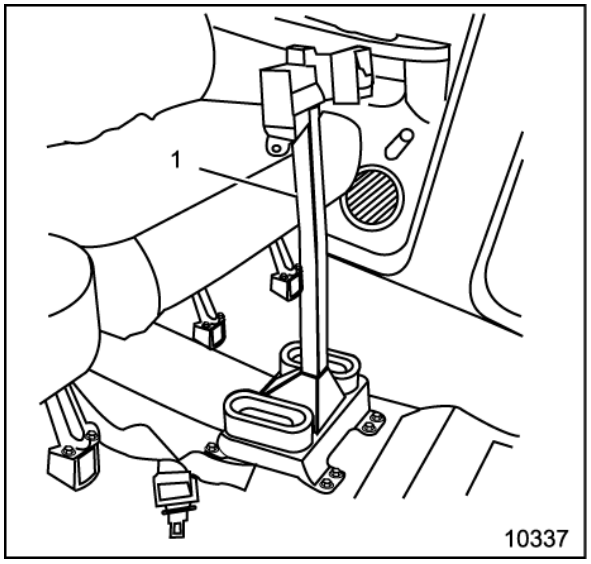
2. Remove floor mat. Refer to Carpet Replacement – Front and Carpet Replacement – Front in 2003 C/K Truck Service Manual.





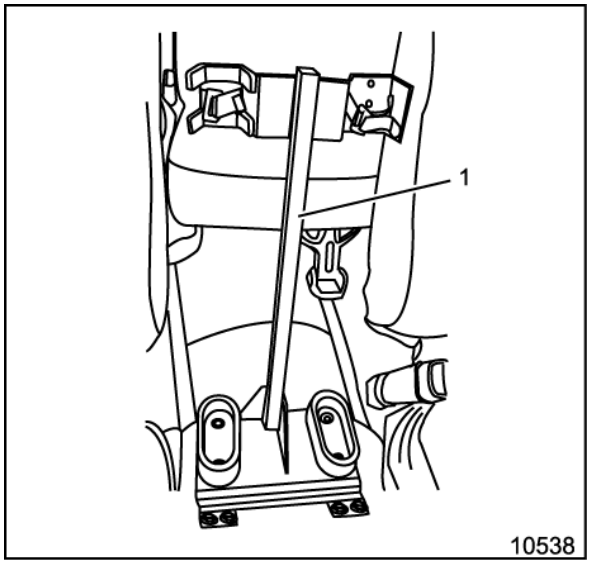
Installation Procedure

1. Using the old floor mat as a template cut weapons mount holes in the new floor mat.
2. Install the floor mat. Refer to Carpet Replacement – Front and Carpet Replacement – Front in 2003 C/K Truck Service Manual.



Notice: Refer to Fastener Notice in Cautions and Notices.

3. Install weapons mount (1) and install bolts.
   Tighten
   Tighten bolts to 8 N•m (70 lb in).



Weapons Mount Replacement – Floor Mount

Removal Procedure

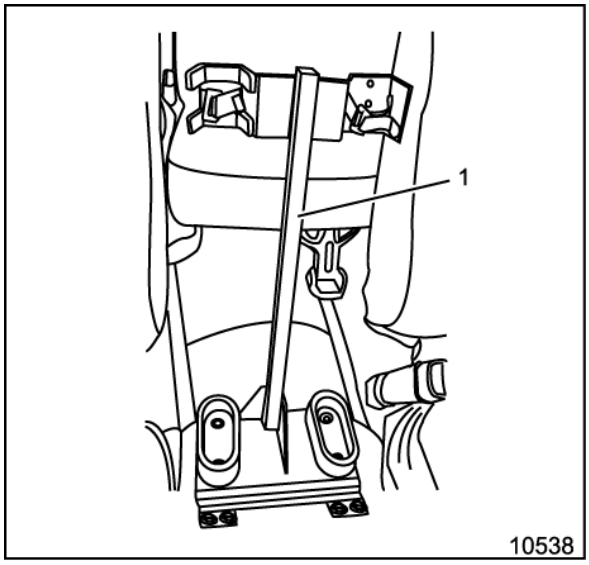
1. Remove bolts securing weapons mount to the floor.
2. Remove weapons mount (1) from vehicle.

Installation Procedure

1. Install weapons mount (1) on floor aligning fastener holes.

Notice: Refer to Fastener Notice in Cautions and Notices.

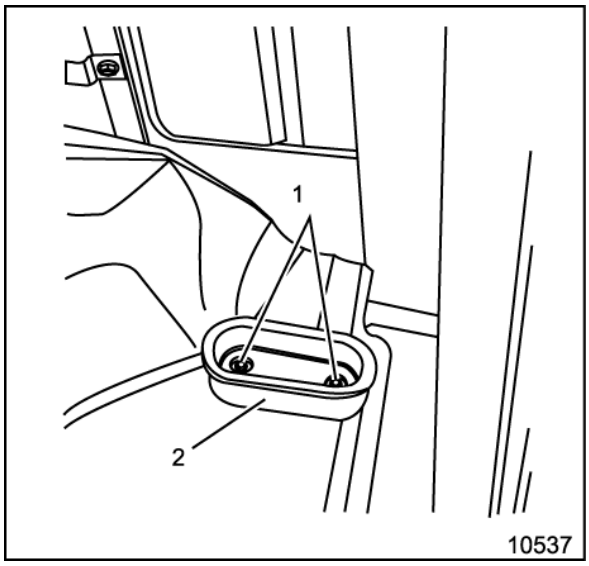
2. Install bolts in the mount and tighten.
   Tighten
   Tighten bolts to 8 N•m (70 lb in).



Weapons Support Replacement – Lower

Removal Procedure

1. Remove the 2 bolts (1) holding the support to the floor.
2. Remove the support (2).

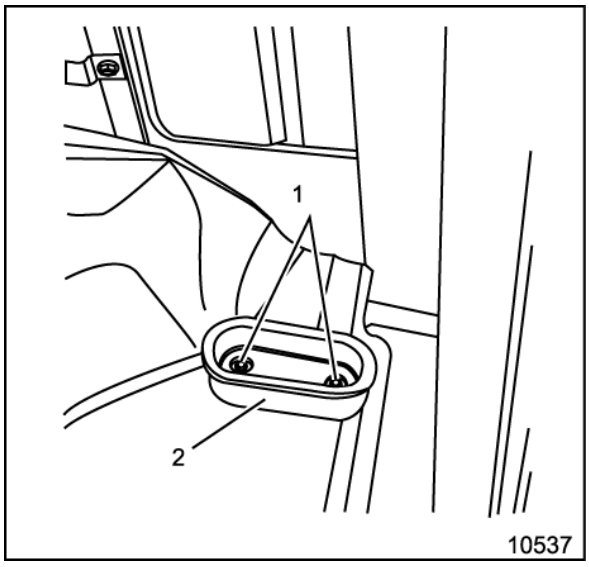


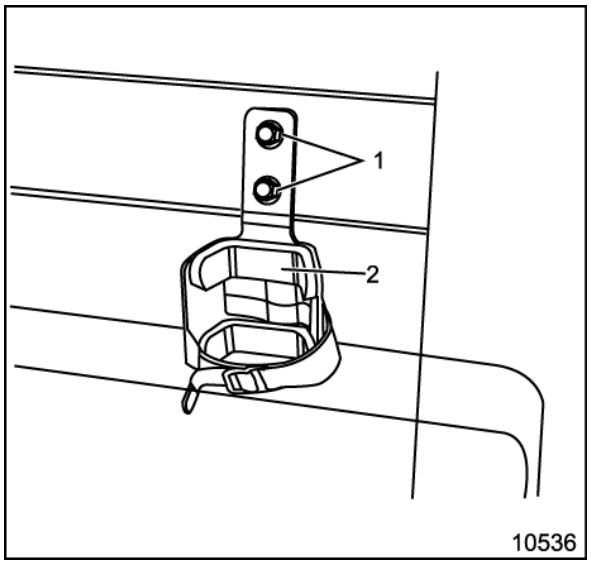
Installation Procedure

1. Install the support (2) by aligning the bolts holes.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the 2 bolts (1) holding the support to the floor, tighten.
   Tighten
   Tighten the 2 bolts to 8 N•m (70 lb in).

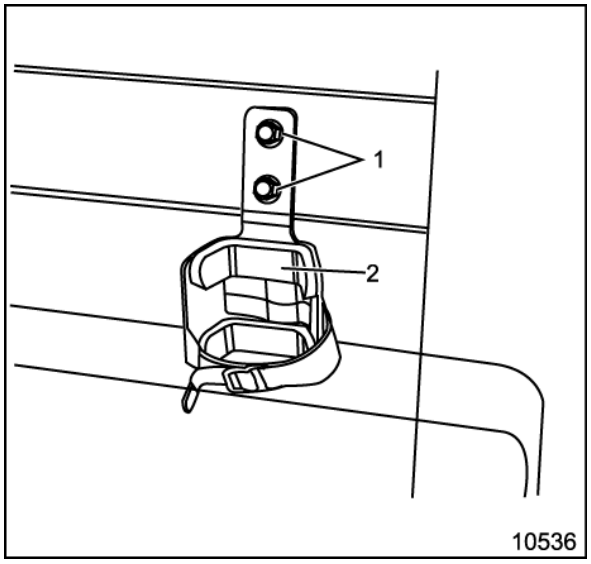




Weapons Mount Replacement – Upper

Removal Procedure

1. Remove the bolts (1) holding the upper mount to the inner body.
2. Remove the upper weapons mount (2).



Installation Procedure

1. Install the upper weapons mount assembly (2) by aligning to the body side inner upper panel.

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bolts (1) to the assembly.
   Tighten
   Tighten the bolts to 8 N•m (70 lb in).

Description and Operation

Interior Description

The interior trim options for these vehicles include special weapons supports for the M14 and M16 firearms as well as the battery equalizer.

Refer to the 2003 LSSV Operator's Manual Supplement for weapon mount operation and use.

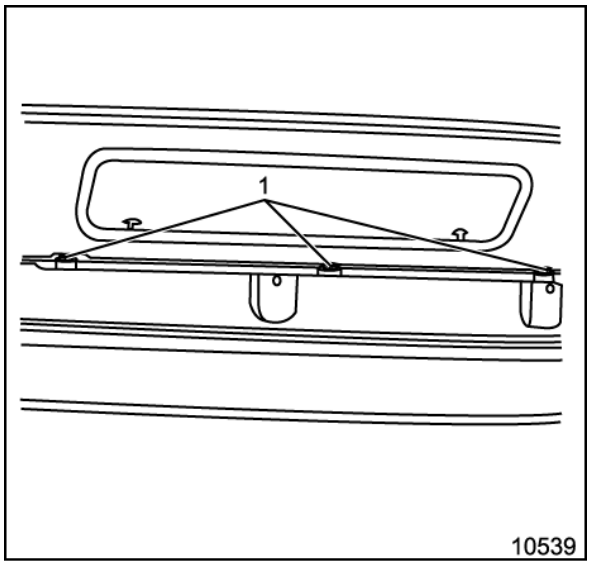
BLANK

Body Rear End

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Cargo Cover Bow Strap Retaining Nuts	5 N•m	44 lb in
Cargo Cover Front End Rail Bolts	8 N•m	70 lb in
Cargo Cover Rail and Hinge/Upward Bolts	8 N•m	70 lb in
Cargo Cover Rail Outside Bolts	26 N•m	19 lb ft
Cargo Cover Strut Bolts	5 N•m	44 lb in
Cargo Tie Down Eye Bolts	47-65 N•m	35-48 lb ft
Fiberglass Top Bolts	30-40 N•m	22-30 lb ft

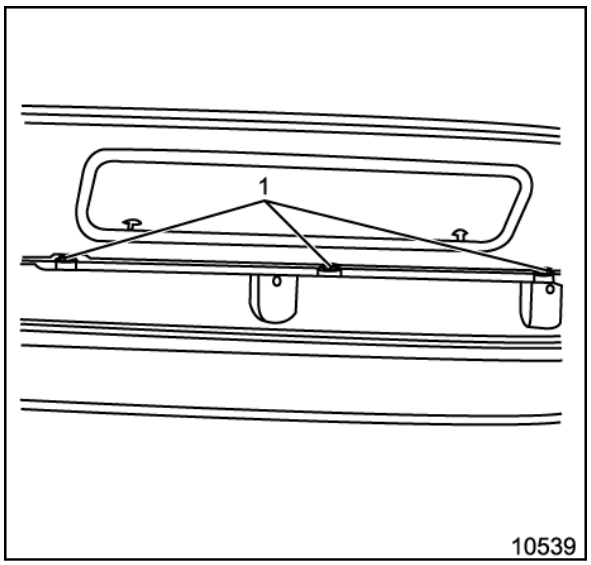


Repair Instructions

Fiberglass Top Replacement

Removal Procedure

1. Remove electrical connection for the light.
2. Remove the bolts (1) securing cap to bed rails.
3. With the aid of an assistant, remove the top from the vehicle.
4. Remove old foam tape from bed rails.

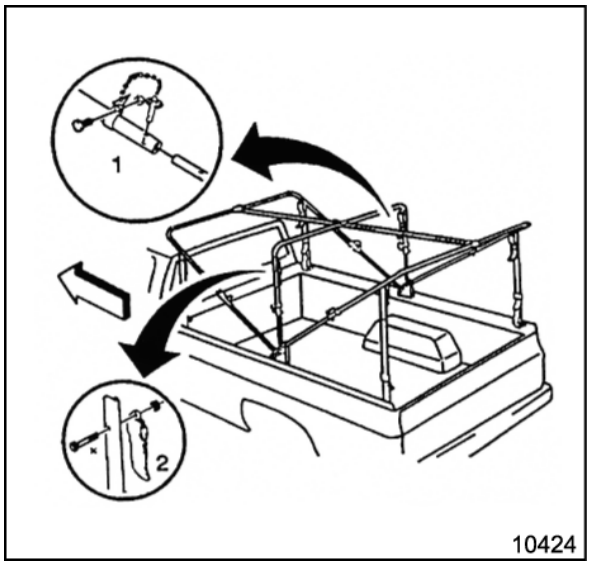


Installation Procedure

1. Install new foam tape to bed rails.
2. With the aid of an assistant, place the top on the bed rails.

Notice: Refer to Fastener Notice in Cautions and Notices.

3. Install the bolts (1) and tighten.
   Tighten
   Tighten bolts to 30-40 N•m (22-30 lb ft).
4. Connect the electrical connection for light.

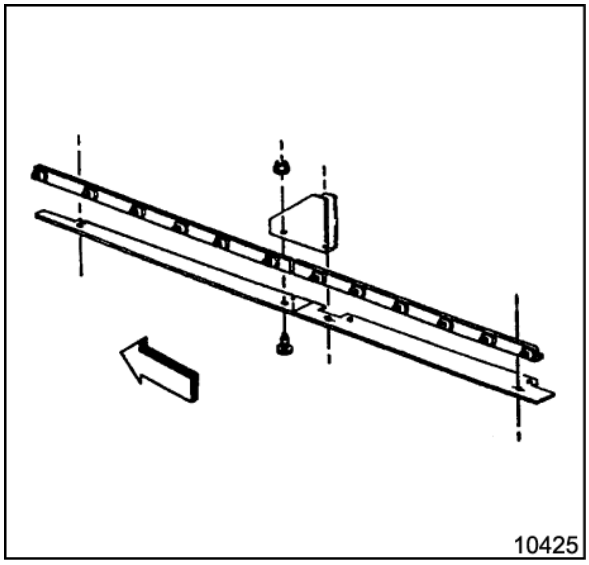


Cargo Cover Side Rail and Hinge Replacement

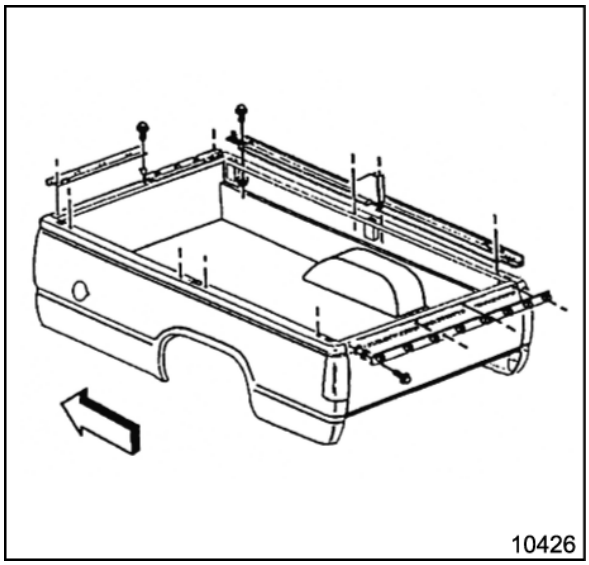
Removal Procedure

1. Remove the cargo cover, the top bows and side struts. Refer to Cargo Cover Top Bows Replacement and Cargo Cover Strut Replacement.
2. Remove the troop seats. Refer to Seat Replacement – Troop in Seats.

3. Remove the 4 bolts and nuts holding the 2 rail adapter plates to the side rail.
4. Remove the 2 bolts and nuts holding the bow hinge bracket.
5. Remove the side rail and adapter rail.
6. Remove the bow hinge bracket.

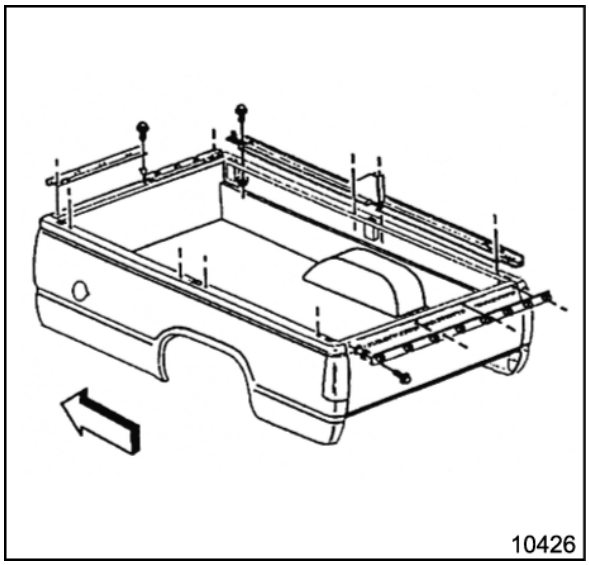


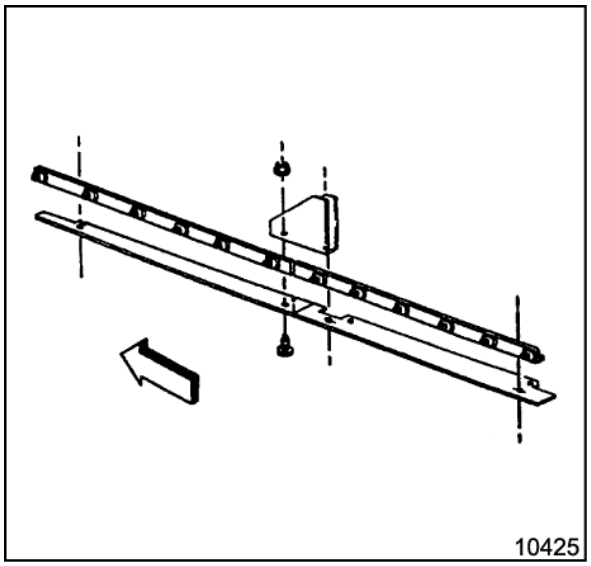
7. Remove the side rail.
8. Remove the side rail adapter.
9. Drill out the 4 existing rivnuts (if damaged) from the box rail.



Installation Procedure

1. Apply 2 sided foam tape to the underside of the rails and to the edges of the mounting holes.
2. Install rivnuts to the existing holes (if damaged) using a rivnut installer.

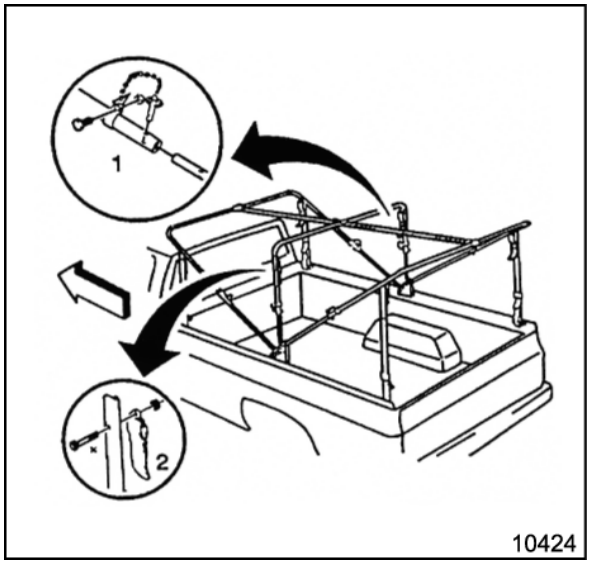




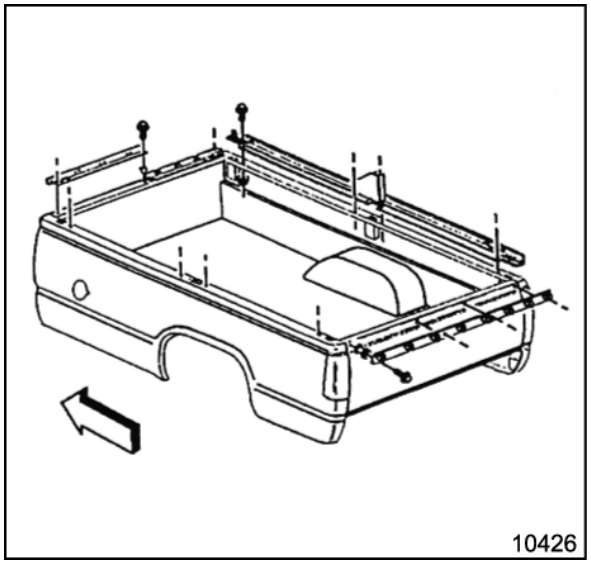
Notice: Do not use the jack nuts supplied in the kit. Use rivnuts (TX016183) instead.

Notice: Refer to Fastener Notice in Cautions and Notices.

3. Install the side rail over the adapter plates, with the 2 outside bolts and the 2 upward facing bracket bolts and nuts.
   Tighten
   - Tighten the 2 outside bolts to 26 N•m (19 lb ft).
   - Tighten the 2 upward facing bolts to 8 N•m (70 lb in).



4. Install side rail adapter plates, front and rear, by aligning the bolt holes to the holes in the box.
5. Install the troop seats. Refer to Seat Replacement – Troop in Seats.
6. Install the side struts, top bows and cargo cover. Refer to Cargo Cover Strut Replacement and Cargo Cover Top Bows Replacement.



Cargo Cover Front End Rail Replacement

Removal Procedure

1. Remove the cargo cover from the front of the cargo cover assembly. Refer to Cargo Cover Replacement.
2. Remove the 4 bolts from the front end rails as needed.
3. Remove the 4 rivnuts by drilling out (if damaged).

Installation Procedure

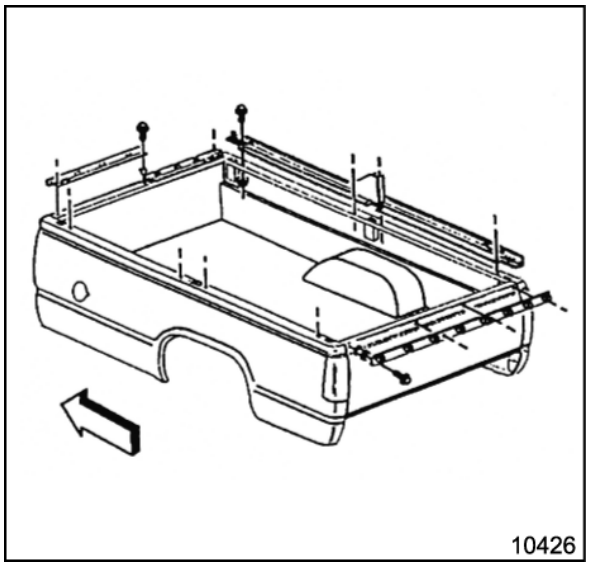
1. Apply 2 sided foam tape to the underside of the rails and to the edges of the mounting holes.

Notice: Do not use the jack nuts supplied in the kit. Use rivnuts instead.

2. Install the 4 rivnuts (if damaged) to the mounting holes using a rivnut installer.

Notice: Refer to Fastener Notice in Cautions and Notices.

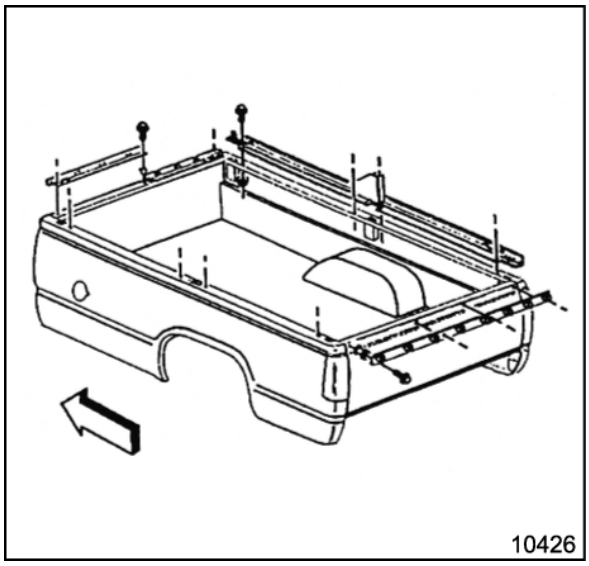
3. Install the 2 front end rails to the front end of the box with 4 bolts over the 4 rivnuts.
   Tighten
   Tighten the 4 bolts to 8 N•m (70 lb in).
4. Install the front of the cargo cover to the front end rail as needed. Refer to Cargo Cover Replacement.



Cargo Cover Rear End Rail Replacement

Removal Procedure

1. Remove the cargo cover from the end gate side of the cargo cover assembly. Refer to Cargo Cover Replacement.
2. Remove the 4 bolts from the end gate rail as needed.
3. Remove the 4 rivnuts by drilling out (if damaged).



Installation Procedure

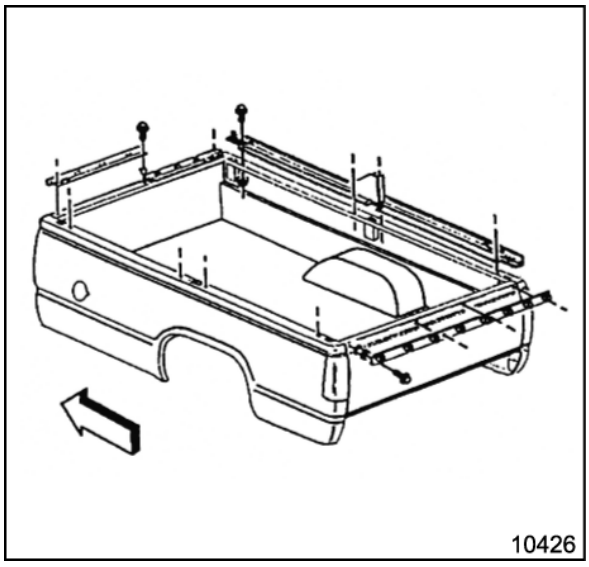
1. Apply 2 sided foam tape to the underside of the rail and to the edges of the mounting holes.

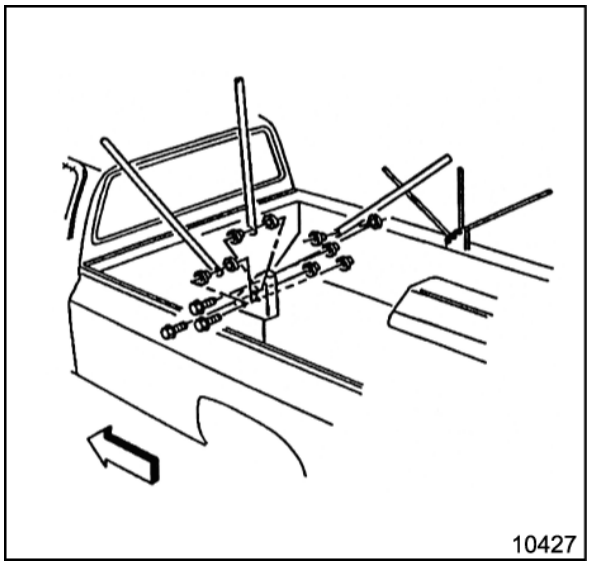
Notice: Do not use the jack nuts supplied in the kit. Use rivnuts instead.

2. Install the 4 rivnuts (if damaged) to the mounting holes using a rivnut installer.

Notice: Refer to Fastener Notice in Cautions and Notices.

3. Install the end gate rail over the 4 rivnuts with 4 bolts.
   Tighten
   Tighten the 4 bolts to 8 N•m (70 lb in).
4. Install the cargo cover to the rear end as needed. Refer to Cargo Cover Replacement.

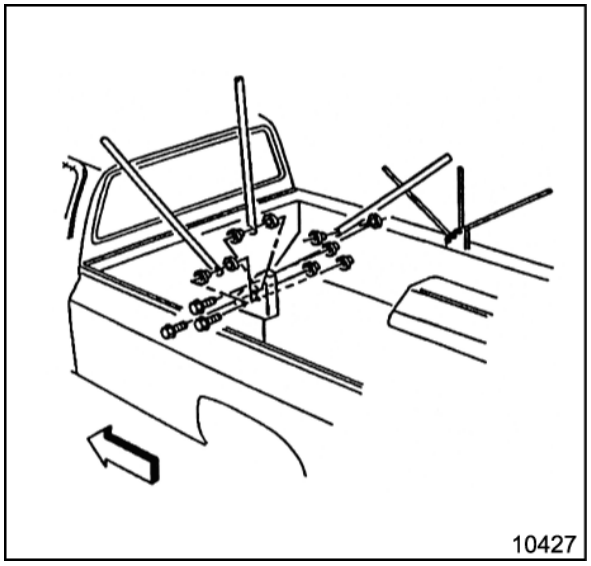




Cargo Cover Strut Replacement

Removal Procedure

1. Remove the cargo cover and top bows. Refer to Cargo Cover Replacement and Cargo Cover Top Bows Replacement.
2. Remove the 3 front strut bolts holding the three side struts to the hinge bracket.
3. Remove the 6 nylock nuts.
4. Remove the 3 side struts with the 6 plastic bushings. (Replace if damaged.)

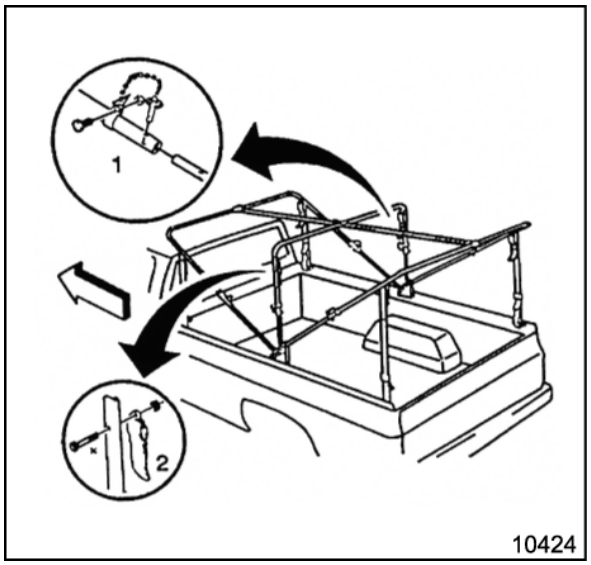


Installation Procedure

1. Install the 2 plastic bushings, 1 to the inside and 1 to the outside of the base hole of each side strut.
2. Install the front strut 857.25 mm (33.75 in) inside the base of the hinge bracket at the first hole. Use a nylock nut on the inboard side and a bolt on the outboard side of the bracket.
3. Install the center strut 571.50 mm (22.5 in) inside the bracket at the mid-level hole with a nylock and bolt in similar fashion.

Notice: Refer to Fastener Notice in Cautions and Notices.

4. Install the rear strut 821.43 mm (32.34 in) at the top hole with the nylock and bolt in similar fashion.
   Tighten
   Tighten the strut bolt to 5 N•m (44 lb in).
5. Install the cargo cover and top bows. Refer to Cargo Cover Replacement and Cargo Cover Top Bows Replacement.

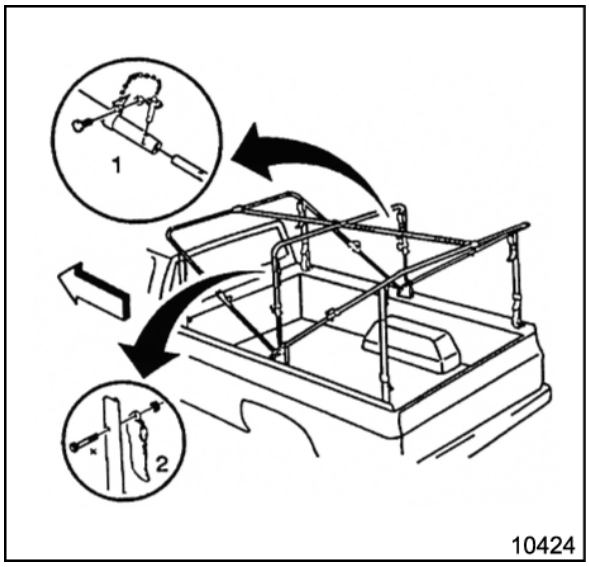


Cargo Cover Top Bows Replacement

Removal Procedure

1. Remove the cargo cover. Refer to Cargo Cover Replacement.
2. Remove the strap tensioners from the front and rear top bows by withdrawing from the side rail loop.
3. Remove the 6 pins (1) holding the 3 top bows to the 6 side struts.
4. Remove the 3 top bows from the struts.
5. Slide the strap off each top bow. Remove the bows from the vehicle.

Installation Procedure



1. Slide the strap onto the top bows at the center.
2. Attach the retainer pin (1) assembly as shown at the base of each bow end.

Notice: Refer to Fastener Notice in Cautions and Notices.

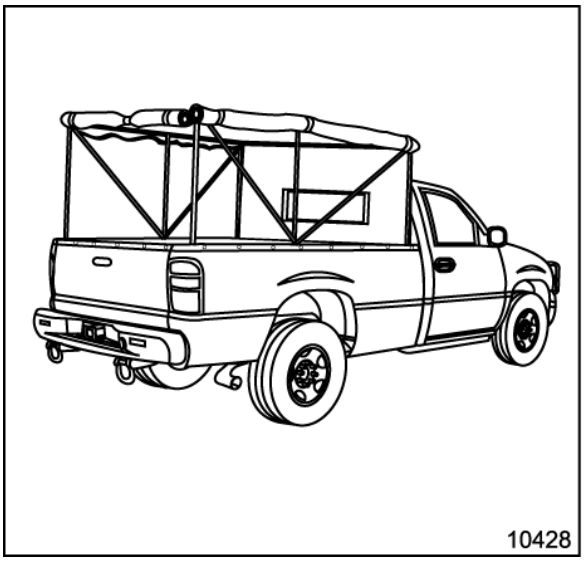
3. Attach the retainer cover strap assembly to the holes on both the left and right sides of the center top bow as shown. Attach the straps to the inboard sides of each with a nut.
   Tighten
   Tighten the 2 cover strap retaining nuts to 5 N•m (44 lb in).
4. Slide the front roof bow onto the front struts and install the pins into the bow/strut holes.
5. Slide the center roof bow on the center struts and install the pins into the bow/strut holes.
6. Slide the rear roof bow onto the rear struts and install the pins into the bow/strut holes.
7. Install the strap tensioners to the front and rear top bows by threading them through the retainer loop of the side rail.

Note: The buckle should face inboard.

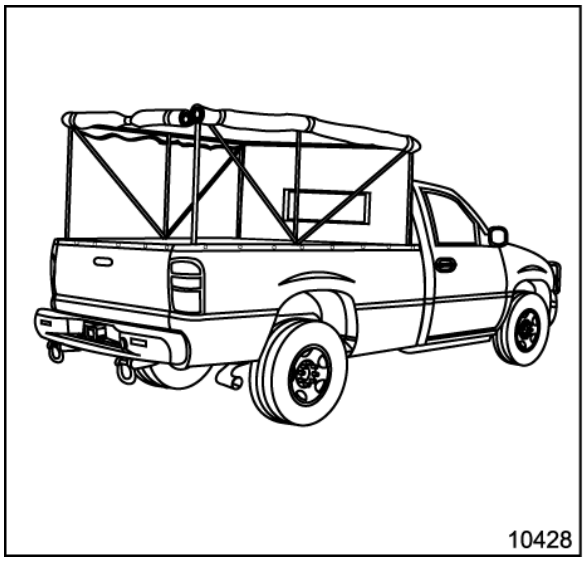
8. Install the cargo cover. Refer to Cargo Cover Replacement.

Cargo Cover Replacement

Removal Procedure



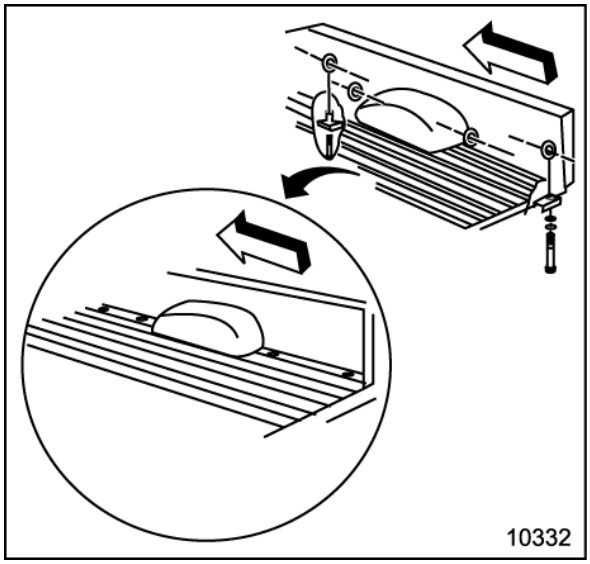
1. Pull apart the Velcro corners of the front and rear flaps and roll the cargo cover up over the top.
2. Remove the cargo cover from the side rail and end gate retainers by releasing tension and removing hook. Pull cover free.
3. Untie, release or unbuckle all cover retainers.
4. Remove the cargo cover.



Installation Procedure

Important: All trailing edges must fall to the proper length at each side of the box rail. All tether ties must appear on the interior. Provide adequate slack between the bow straps and the cover. The new cover will be a tighter fit.

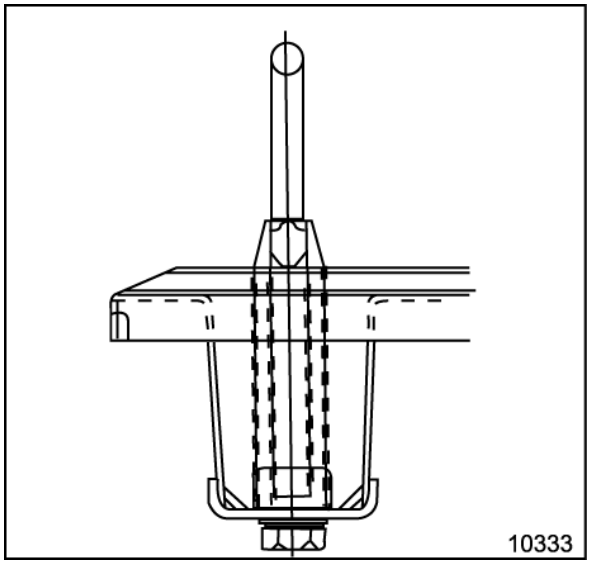
1. Install the cargo cover to the top bows and align so that the Velcro strips are at the corners.
2. Install or attach all interior retainers to the bows, struts and loops.
3. Press the Velcro flaps down.
4. Install the cover to the front, end and side in hooks and pull strap at the base of the cover as needed.



Cargo Tie Down Eye Replacement

Removal Procedure

1. Remove the large washer/small-large washer combination and a bolt, depending on the order of arrangement.
2. Remove the damaged cargo eye(s) from the pickup box.



Installation Procedure

1. Install the cargo eye(s) in the mounting hole(s).

Notice: Refer to Fastener Notice in Cautions and Notices.

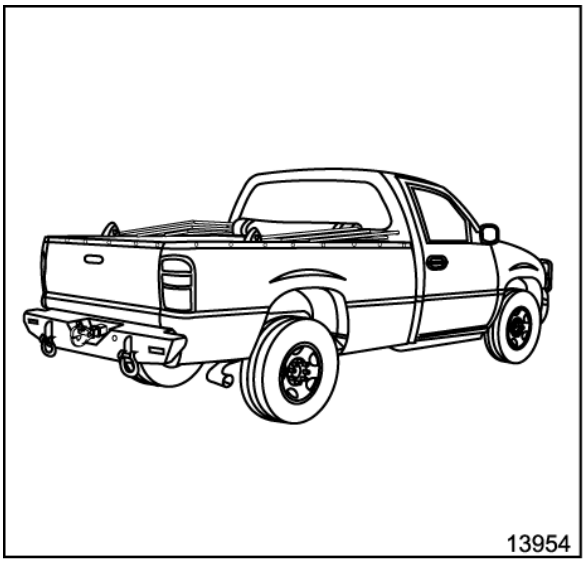
2. Install the reinforced anchor bolt assembly and tighten.
   Tighten
   Tighten the bolt assemblies to 47-65 N•m (35-48 lb ft).

Cargo Cover Stowage Replacement

1. Release the front and rear support straps.
2. From the rear of the vehicle, push the bows and canvas forward, folding the canvas around the bows.

Note: The cover may also be folded neatly and stored behind the seat in the cab.

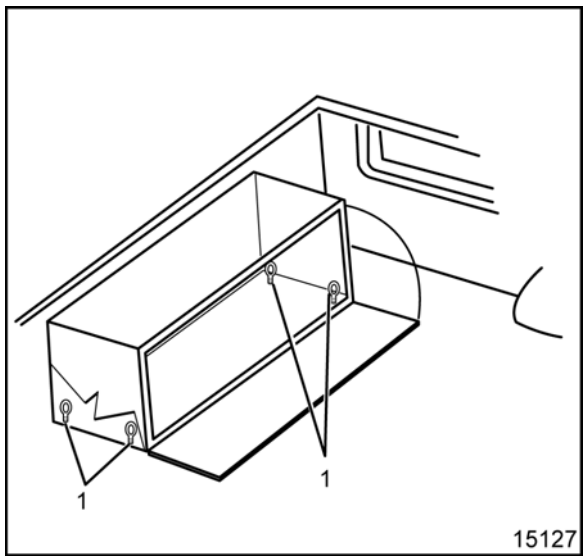
3. Completely fold the bows down against the front of the cargo box and secure them with the front straps.



Winch Storage Box Replacement

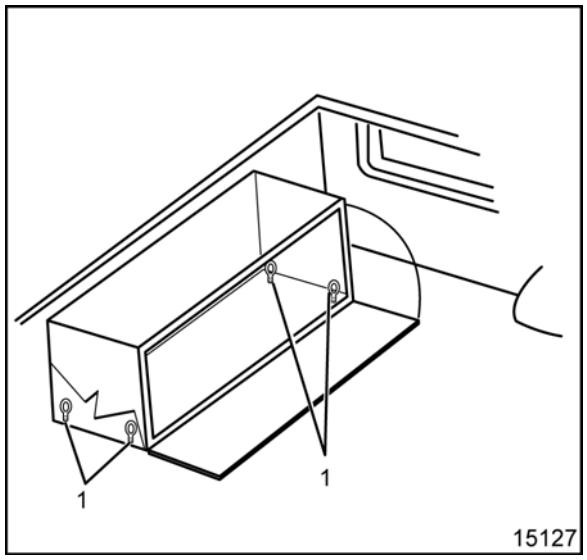
Removal Procedure

1. Open the storage box to gain access to the fasteners.
2. Remove the fasteners (1) securing the storage box to the bed floor.



Installation Procedure

1. Install the storage box into position on the bed floor.
2. Install the fasteners (1) and tighten.



Description and Operation

Body Rear End

The pickup vehicle is equipped with several military options including a cargo cover, troop seats (left and right), tie down eyes and fiberglass top.

Cargo Cover

The cargo cover is a rain resistant canvas top cover supported by bows and struts and attached by rails to the cargo box. It can be buttoned down with hooks and snaps or Velcro closed. It may also be rolled up with straps or folded and stowed while not in use.

Cargo Cover Cleaning

Mildewy areas should be cleaned by scrubbing with a dry brush. Never use solvents. If necessary to use water to remove dirt, it should not be used until the mildew has been removed. After removing the mildew, examine the fabric and look for deterioration. If the canvas has deteriorated replace it.

Fiberglass Top

The fiberglass top is a hard top cover supported by the bed rails and has side and back windows that are able to open and lock. Refer to the 2003 Owner's Manual Supplement for further details.

Tie Down Eyes

The tie down eyes are metal eyelets bolted into the box bed with reinforced hardware. They are used to secure equipment to the box floor and have a maximum vertical resistance rating of 300 kg (660 lbs) and a maximum horizontal resistance rating of 200 kg (450 lbs).

Paint/Coatings

Paint Codes

Exterior and Interior Colors

Location/Color	Fed.-std.-595 B	PPG No.
Green	34094	CA 8211 / I 5086
Blue	*	*
White	*	*

* Refer to the 2003 C/K Truck Service Manual or Vehicle SPID Label.

For specific paint/coating details, contact PPG Automotive Coatings at 1-818-549-7772.

Repair Instructions

Exterior Painting

Metal Refinishing

1. Remove all exterior ornament and emblems from the panel to be painted.
2. Prepare all metal surfaces to be painted.

Note: Cut paint at door seals, remove or mask over door seals.

3. Repaint all exterior metal with lusterless camouflage green paint. Refer to Exterior and Interior Colors Chart for current paint part number.

Important: This is not CARC (Chemical Agent Resistant Coating) paint, the recommended supplier is PPG.

4. Remove masking tape.

Notice: Exercise care when removing masking and handling vehicle after repainting, to avoid marks and dirt on the new paint. It is very difficult to clean up without leaving noticeable damage.

Grille Refinishing

Procedure

Note: Ensure that all chrome areas have 100% coverage.

1. Using a course refinishing material, scuff the surface of the grille.
2. Using etching primer, prepare the surface of the grille for the finish coat.
3. Repaint al exterior metal with lusterless camouflage green paint. Refer to Exterior and Interior Colors Chart for current paint part number.

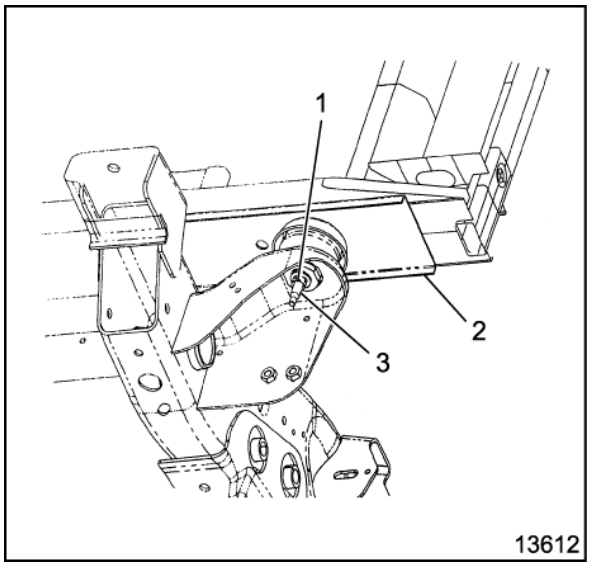
Important: This is not CARC paint, the recommended suppler is PPG.

Frame and Underbody

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Body Mount Nuts	85 N•m	63 lb ft



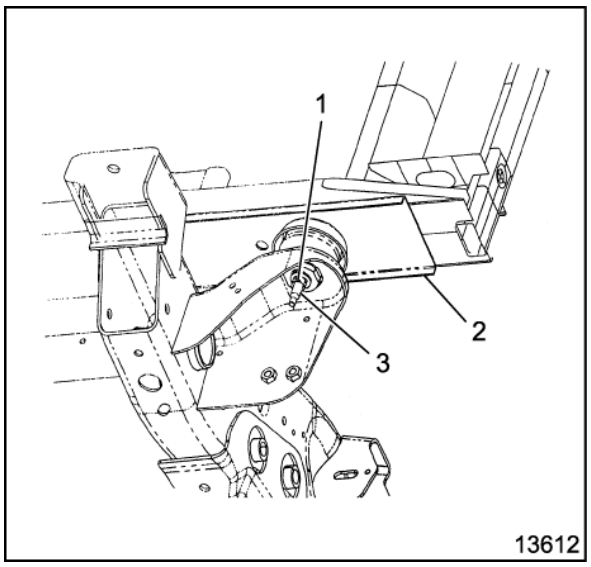
Repair Instructions

Cab Reinforcement Plate Replacement

Removal Procedure

Note: Left side shown, right side similar.

1. Remove the radiator support body mount nut (1) and bolt (3).
2. Loosen all other cab body mount nuts.
3. Raise and support the front of the cab enough to remove the reinforcement plate (2).



Installation Procedure

1. Raise and support the front of the cab enough to install the reinforcement plate (2).

Notice: Refer to Fastener Notice in Cautions and Notices.

2. Install the bolt (3) and the nut (1) lower to the cab.
   Tighten
   Tighten the body mount nuts 85 N•m (63 lb ft).

Description and Operation

Frame and Underbody Description

Reinforcement Brackets

Reinforcement brackets are used to minimize structural damage cause by severe off-road conditions. The reinforcement brackets minimize or lessen the concentration of stress in small areas of the radiator and fender support areas.

BLANK

A

B

C

D

E

F

G

H

I

J

L

M

P

R

S

T

V

W

SERVICE MANUAL

2003

Light Service Support Vehicle
LSSV

GM Defense