

**Utility Vehicle  
2200**

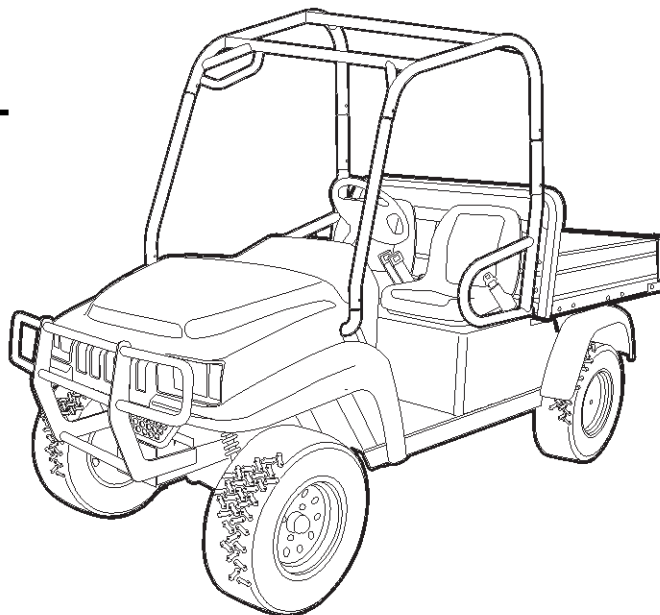


**Bobcat®**

**Service  
Manual**



**S/N 235311001-D to 235312999-D  
S/N 235211001-G to 235212999-G**



Dealer Copy -- Not for Resale



## FOREWORD

---

Bobcat vehicles are designed and built to provide the ultimate in performance efficiency; however, proper maintenance and repair are essential for achieving maximum service life and continued safe and reliable operation.

This manual provides detailed information for the maintenance and repair of Bobcat 2200 Utility vehicle, and should be thoroughly reviewed prior to servicing the vehicles. The procedures provided must be properly implemented, and the DANGER, WARNING, and CAUTION statements must be heeded.

This manual was written for the trained technician who already possesses knowledge and skills in electrical and mechanical repair. If the technician does not have such knowledge and skills, attempted service or repairs to the vehicle may render the vehicle unsafe. For this reason, Bobcat advises that all repairs and/or service be performed by an authorized Bobcat distributor/dealer representative or by a Bobcat factory-trained technician.

It is the policy of Bobcat, Inc. to assist its distributors and dealers in continually updating their service knowledge and facilities so they can provide prompt and efficient service for vehicle owners. Regional technical representatives, vehicle service seminars, periodic service bulletins, maintenance and service manuals, and other service publications also represent Bobcat's continuing commitment to customer support.

This manual covers all aspects of typical vehicle service; however, unique situations sometimes occur when servicing a vehicle. If it appears that a service question is not answered in this manual, you may write to us at: Bobcat, Inc.; P.O. Box 204658; Augusta, GA 30917; Attention: Technical Services, or contact a Bobcat Technical Service Representative at (706) 863-3000, ext. 3580.

Copyright © 2004, 2007, 2008

This manual effective September 20, 2004.

Dealer Copy -- Not for Resale

## **WARNING**

- **Read Section 1 – Safety before attempting any service on this vehicle.**
- **Before servicing vehicle, read complete section(s) and any referenced information that may be relevant to the service or repair to be performed.**

**NOTE:** *This manual represents the most current information at the time of publication. Bobcat, Inc., is continually working to further improve our vehicles and other products. These improvements may affect servicing procedures. Any modification and/or significant change in specifications or procedures will be forwarded to all Bobcat dealers and will, when applicable, appear in future editions of this manual.*

*Damage to a vehicle or component thereof not resulting from a defect or that occurs due to unreasonable or unintended use, overloading, abuse, or neglect (including failure to provide reasonable or necessary maintenance as instructed in the vehicle owner's manual), accident or alteration, including increasing vehicle speed beyond factory specifications or modifications that affect the stability of the vehicle or the operation thereof, will void the warranty.*

*Bobcat, Inc., reserves the right to change specifications and designs at any time without notice and without incurring any obligation or liability whatsoever.*

*There are no warranties expressed or implied in this manual. See the limited warranty found in the vehicle owner's manual or write to Bobcat, Inc., P.O. Box 204658, Augusta, GA 30917-4658 USA, Attention: Warranty Department.*

# CONTENTS

---

## SECTION 1 – SAFETY

---

General Warning .....	1-1
-----------------------	-----

## SECTION 2 – VEHICLE SPECIFICATIONS

---

## SECTION 3 – GENERAL INFORMATION

---

General Information .....	3-1
Model Identification .....	3-1
Storage .....	3-2
Preparing the Vehicle for Extended Storage .....	3-2
Returning the Stored Vehicle to Service .....	3-3

## SECTION 4 – BODY AND TRIM

---

Cleaning the Vehicle .....	4-1
Seat Cleaning .....	4-1
Front Body Repair .....	4-2
Abrasions and Haze .....	4-2
Light Scratches .....	4-2
Large Scratches and Abrasions .....	4-2
Front Body Components .....	4-2
Instrument Panel Removal .....	4-2
Instrument Panel Installation .....	4-4
Dashboard Removal .....	4-4
Dashboard Installation .....	4-4
Front Body Removal .....	4-5
Front Body Installation .....	4-5
Front Fender Removal .....	4-5
Front Fender Installation .....	4-5
Roll-Over Protective Structure (ROPS) .....	4-5
ROPS Removal .....	4-6
ROPS Installation .....	4-6

Dealer Copy -- Not for Resale

Seat .....	4-7
Seat Removal .....	4-7
Seat Adjustment .....	4-7
Seat Installation .....	4-7
Seat Frame Removal .....	4-7
Seat Frame Installation .....	4-7
Safety Belts .....	4-8
Safety Belt Removal .....	4-8
Safety Belt Installation .....	4-8
Cargo Bed With Electric Lift .....	4-9
Testing the Bed Lift Motor .....	4-9
Bed Lift Motor Removal .....	4-9
Bed Lift Motor Installation .....	4-9
Cargo Bed Removal .....	4-10
Cargo Bed Installation .....	4-10
Rear Fender .....	4-10
Rear Fender Removal .....	4-10
Rear Fender Installation .....	4-10
Floor Mat .....	4-11
Floor Mat Removal .....	4-11
Floor Mat Installation .....	4-11

## **SECTION 5 – ACCELERATOR AND BRAKE PEDAL ASSEMBLIES**

---

Accelerator Pedal .....	5-1
Accelerator Pedal Removal .....	5-1
Accelerator Pedal Installation .....	5-2
Accelerator Pedal and RPM Adjustment .....	5-2
Brake Pedal .....	5-3
Brake Pedal Removal .....	5-3
Brake Pedal Installation .....	5-3
Brake Pedal Adjustment .....	5-4
Park Brake Pedal .....	5-4
Park Brake Pedal Removal .....	5-4
Park Brake Pedal Installation .....	5-4
Park Brake Cable Installation .....	5-5
Park Brake Cable Adjustment .....	5-5

## **SECTION 6 – HYDRAULIC AND PARK BRAKE SYSTEMS**

---

Brake System Inspection .....	6-1
Brake System Troubleshooting .....	6-3

Brake Pads and Caliper .....	6-5
Front Brake Pad and Caliper Removal .....	6-5
Front Brake Pad and Caliper Installation .....	6-7
Rear Brake Pad and Caliper Removal .....	6-8
Rear Brake Pad and Caliper Installation .....	6-9
Brake Disc and Hub .....	6-10
Front Wheel Disc and Hub Removal .....	6-10
Front Wheel Disc and Hub Installation .....	6-14
Rear Wheel Disc Removal .....	6-15
Rear Wheel Disc Installation .....	6-16
Front Brake Line Removal .....	6-17
Front Brake Line Installation .....	6-17
Rear Brake Line Removal .....	6-18
Rear Brake Line Installation .....	6-19
Filling the Hydraulic System .....	6-20
Reservoir Removal .....	6-20
Reservoir Installation .....	6-20
Master Cylinder Removal .....	6-21
Master Cylinder Installation .....	6-22
Bleeding the Hydraulic Brake System .....	6-22
Purging the Hydraulic System .....	6-23
Park Brake System .....	6-23
Park Brake Adjustment .....	6-23
Park Brake Cable Adjustment .....	6-24
Park Brake Wheel Cables .....	6-24
Front Park Brake Cable Removal .....	6-26
Front Park Brake Cable Installation .....	6-27

## **SECTION 7 – STEERING AND FRONT SUSPENSION**

---

Steering Wheel .....	7-1
Steering Wheel Removal .....	7-1
Steering Wheel Installation .....	7-2
Steering Column .....	7-2
Steering Column Removal .....	7-2
Steering Column Installation .....	7-3
Rack and Pinion .....	7-3
Rack and Pinion Removal .....	7-3
Rack and Pinion Installation .....	7-4
Rack and Pinion Disassembly .....	7-5
Rack and Pinion Assembly .....	7-9
Wheel Alignment .....	7-11

Front Suspension Components .....	7-13
Steering Upright Removal .....	7-13
Upper A-Arm Removal .....	7-15
Upper A-Arm Installation .....	7-16
Lower A-Arm Removal .....	7-16
Lower A-Arm Installation .....	7-18
Front Coil-Over Shock Absorber Removal .....	7-18
Front Coil-Over Shock Absorber Installation .....	7-19
Steering Upright Installation .....	7-20

## **SECTION 8 – WHEELS AND TIRES**

---

General Information .....	8-1
Wheels .....	8-2
Wheel Removal .....	8-2
Wheel Installation .....	8-2
Tires .....	8-2
Tire Removal .....	8-2
Tire Installation .....	8-2

## **SECTION 9 – REAR SUSPENSION**

---

Rear Coil-Over Shock Absorber .....	9-1
Swing Arms .....	9-2
Swing Arm Removal .....	9-2
Swing Arm Installation .....	9-3

## **SECTION 10 – PERIODIC MAINTENANCE**

---

Periodic Service Schedule .....	10-1
Brake Fluid Reservoir .....	10-6
Brake Fluid .....	10-6
Engine Oil .....	10-6
Oil Pressure – Gasoline Engine .....	10-6
Engine Oil Level Check .....	10-7
Engine Oil and Filter Change .....	10-7
Oil Viscosity .....	10-11
Gearcase Lubrication .....	10-11
Lubrication Level Check for Front Differential, Transmission, and Rear Differential .....	10-11
Lubrication Change for Front Differential, Transmission, and Rear Differential .....	10-11
Engine Coolant – Diesel Vehicles .....	10-13
Engine Coolant Level Check .....	10-13



Fueling Instructions .....	10-13
Draining Water from Fuel Filter .....	10-15
Battery .....	10-15

## **SECTION 11A – TROUBLESHOOTING AND ELECTRICAL SYSTEM: GASOLINE VEHICLES**

---

Troubleshooting Guide .....	11a-1
Wiring Diagram .....	11a-6
Test Procedures .....	11a-8
Index of Test Procedures .....	11a-8

## **SECTION 11B – TROUBLESHOOTING AND ELECTRICAL SYSTEM: DIESEL VEHICLES**

---

Troubleshooting Guide .....	11b-1
Wiring Diagram .....	11b-6
Test Procedures .....	11b-8
Index of Test Procedures .....	11b-8

## **SECTION 12A – ELECTRICAL COMPONENTS: GASOLINE VEHICLES**

---

Starter and Starter Solenoid .....	12a-1
Relays .....	12a-1
Neutral Switch .....	12a-2
Carburetor Solenoid .....	12a-2
Voltage Regulator .....	12a-3
Instrument Panel .....	12a-4
Key Switch .....	12a-5
Fuse .....	12a-6
Reverse Warning Buzzer .....	12a-7
Reverse Warning Buzzer Limit Switch .....	12a-7
Low Oil Warning Light .....	12a-9
Fuel Gauge/Hour Meter .....	12a-10
Fuel Level Sending Unit .....	12a-11
Ignition Coil and Charge Coil .....	12a-11
Charge Coil .....	12a-11
Oil Pressure Sensor .....	12a-11
Light Switch .....	12a-13
Wire Harness Diodes .....	12a-13
Bed Lift Switch .....	12a-14
Bed Lift Circuit Breaker .....	12a-15
General Information .....	12a-16

## SECTION 12B – ELECTRICAL COMPONENTS: DIESEL VEHICLES

---

Starter and Starter Solenoid .....	12b-1
Relays .....	12b-1
Neutral Switch .....	12b-2
Fuel Solenoid .....	12b-2
50-Amp Circuit Breaker .....	12b-3
Instrument Panel .....	12b-4
Key Switch .....	12b-5
Fuse .....	12b-6
Reverse Warning Buzzer .....	12b-7
Low Oil Warning Light .....	12b-9
Fuel Gauge/Hour Meter .....	12b-10
Electric Fuel Pump .....	12b-11
Fuel Level Sending Unit .....	12b-11
Alternator .....	12b-12
Headlights .....	12b-14
Light Switch .....	12b-15
Thermostat Switch .....	12b-16
Fan Motor .....	12b-17
Wire Harness Diodes .....	12b-18
Bed Lift Switch .....	12b-18
Bed Lift Circuit Breaker .....	12b-19
Battery .....	12b-20
General Information .....	12b-20

## SECTION 13A – GASOLINE ENGINE, MUFFLER, FUEL SYSTEM, AND CLUTCHES

---

Gasoline Engine .....	13a-1
Engine Removal .....	13a-1
Engine Installation .....	13a-3
Exhaust System .....	13a-5
Muffler Removal .....	13a-5
Intermediate Pipe Removal .....	13a-5
Intermediate Pipe Installation .....	13a-6
Muffler Installation .....	13a-6

Fuel System .....	13a-7
Carburetor .....	13a-7
Main Jet Elevation/Size Chart .....	13a-8
Fuel Filter .....	13a-8
Fuel Pump .....	13a-8
Fuel Level Sending Unit .....	13a-10
Fuel Tank .....	13a-13
Fuel Lines .....	13a-15
Fuel Shut-Off Valve .....	13a-16
Oil Filter Hoses .....	13a-17
Engine Control Linkages .....	13a-18
Accelerator Cable .....	13a-18
Governor Guard .....	13a-21
Governor Cable .....	13a-21
Accelerator Cable Retention Clip Adjustment .....	13a-22
Ground Speed (Transmission) Governor Arm Adjustment .....	13a-23
Engine Governor Arm .....	13a-25
Engine RPM Adjustment .....	13a-25
Choke and Air Intake System .....	13a-26
Air Filter Replacement .....	13a-26
Choke Cable Removal .....	13a-27
Choke Cable Installation .....	13a-28
Air Canister Removal .....	13a-28
Air Canister Installation .....	13a-29
Air Filter Intake Hose Removal .....	13a-29
Air Filter Intake Hose Installation .....	13a-30
Air Filter Outlet Hose Removal .....	13a-30
Air Filter Outlet Hose Installation .....	13a-31
Clutches .....	13a-31
Clutch Troubleshooting .....	13a-32
Drive Belt .....	13a-32
Drive Clutch .....	13a-33
Driven Clutch .....	13a-37
Clutch Cover .....	13a-40

## **SECTION 13B – DIESEL ENGINE, MUFFLER, FUEL SYSTEM, AND CLUTCHES**

---

Diesel Engine .....	13b-1
Engine Removal .....	13b-1
Engine Installation .....	13b-4

Exhaust System .....	13b-6
Muffler Removal .....	13b-6
Intermediate Pipe Removal .....	13b-6
Manifold Pipe Removal .....	13b-7
Manifold Pipe Installation .....	13b-7
Intermediate Pipe Installation .....	13b-7
Muffler Installation .....	13b-8
Fuel System .....	13b-9
Fuel Line Hose Replacement .....	13b-9
Fuel Filter Replacement .....	13b-9
Draining Water from the Secondary Fuel Filter .....	13b-9
Electric Fuel Pump .....	13b-12
Fuel Level Sending Unit .....	13b-14
Fuel Tank .....	13b-17
Fuel Lines .....	13b-20
Engine Control Linkages .....	13b-21
Accelerator Cable .....	13b-21
Engine RPM Adjustment .....	13b-22
Air Intake System .....	13b-25
Air Filter Replacement .....	13b-25
Air Canister Removal .....	13b-26
Air Canister Installation .....	13b-26
Air Filter Intake Hose Removal .....	13b-26
Air Filter Intake Hose Installation .....	13b-27
Air Filter Outlet Hose Removal .....	13b-28
Air Filter Outlet Hose Installation .....	13b-28
Clutches .....	13b-28
Clutch Troubleshooting .....	13b-29
Drive Belt .....	13b-30
Drive Clutch .....	13b-31
Driven Clutch .....	13b-35
Clutch Cover .....	13b-37

## **SECTION 14 – DRIVETRAIN COMPONENTS**

---

Half Shafts .....	14-1
Half Shaft Removal .....	14-1
Half Shaft Installation .....	14-3
Front Differential .....	14-4
Front Differential Removal .....	14-4
Front Differential Installation .....	14-6

Front Driveshaft .....	14-6
Front Driveshaft Removal .....	14-6
Front Driveshaft Installation .....	14-7
Rear Receiver Hitch .....	14-7
Rear Receiver Hitch Removal .....	14-7
Rear Receiver Hitch Installation .....	14-7
Rear Axle .....	14-8
Rear Axle Removal .....	14-8
Rear Axle Installation .....	14-10
Rear Driveshaft .....	14-11
Rear Driveshaft Removal .....	14-11
Rear Driveshaft Installation .....	14-12
Transmission .....	14-12
Troubleshooting .....	14-12
Transmission Removal .....	14-15
Transmission Installation .....	14-17
Forward/Reverse Shifter Cable .....	14-18
Forward/Reverse Shifter Handle .....	14-21
Rear Differential and Axles .....	14-22
Rear Differential Removal .....	14-22
Rear Axle Shafts and Wheel Bearings .....	14-23
Rear Differential Installation .....	14-23

## **SECTION 15 – RADIATOR AND COOLANT SYSTEM (DIESEL)**

---

General Information .....	15-1
Engine Coolant Check .....	15-1
Engine Coolant Change .....	15-1
Coolant Reservoir Removal .....	15-3
Coolant Reservoir Installation .....	15-4
Radiator .....	15-4
Radiator Removal .....	15-4
Radiator Installation .....	15-8
Coolant Pipe Weldment (Steel) .....	15-8
Coolant Pipe Weldment Removal .....	15-8
Coolant Pipe Weldment Installation .....	15-9

## **SECTION 16 – TRANSMISSION MODELS 420317 AND 420682**

---

General Information .....	16-1
Model Identification .....	16-1
Service Fixture .....	16-1

Transmission Removal .....	16-2
Transmission Disassembly .....	16-2
Input Shaft Disassembly .....	16-8
Input Shaft Assembly .....	16-8
Intermediate Shaft Disassembly .....	16-8
Output Shaft Disassembly .....	16-12
Shifter Shaft Removal .....	16-13
Shifter Shaft Installation .....	16-14
Case Inspection .....	16-14
Shaft Seal Removal .....	16-15
Shaft Seal Installation .....	16-15
Output Shaft Assembly .....	16-15
Intermediate Shaft Assembly .....	16-18
Intermediate and Output Shaft Assembly .....	16-22
Transmission Assembly .....	16-23
Transmission Installation .....	16-27

**SECTION 17 – FRONT DIFFERENTIAL MODELS 6203-01-139-S AND 6203-01-189-S**

---

General Information .....	17-1
Axle Half Shaft Removal .....	17-1
Front Differential Removal .....	17-2
Tools Required For This Section .....	17-3
Front Differential Coil And Output Cover .....	17-3
Coil and Output Cover Removal .....	17-3
Coil and Output Cover Installation .....	17-6
Front Differential .....	17-8
Front Differential Disassembly .....	17-8
Front Differential Assembly .....	17-14
Front Differential Installation .....	17-18
Axle Half Shaft Installation .....	17-18

**SECTION 18 – REAR DIFFERENTIAL MODELS 420366 AND 420851**

---

General Information .....	18-1
Rear Differential Disassembly .....	18-2
Pinion Gear Removal .....	18-4
Ring Gear Removal .....	18-6
Clutch Carrier Assembly .....	18-7
Ring Gear Installation .....	18-8
Pinion Gear Installation .....	18-9
Rear Differential Assembly .....	18-9

Axle Shafts and Differential Installation ..... 18-11

**SECTION 19 – KUBOTA D722 DIESEL ENGINE MANUAL**

---

**SECTION 20 – HONDA GX 620 GASOLINE ENGINE MANUAL**

---

**SECTION i – INDEX**

---

Dealer Copy -- Not for Resale





# SECTION 1 – SAFETY

---

To ensure the safety of those servicing these vehicles, and to protect the vehicles from damage resulting from improper service or maintenance, the procedures in this manual must be followed. It is important to note that throughout this manual there are statements contained within headings labeled DANGER, WARNING, CAUTION, or NOTE. These special statements relate to specific safety issues, and must be read, understood, and heeded before proceeding.

## **⚠ DANGER**

- A DANGER indicates an immediate hazard that will result in severe personal injury or death.

## **⚠ WARNING**

- A WARNING indicates an immediate hazard that could result in severe personal injury or death.

## **⚠ CAUTION**

- A CAUTION with the safety alert symbol indicates a hazard or unsafe practice that could result in minor personal injury.

## **CAUTION**

- A CAUTION without the safety alert symbol indicates a potentially hazardous situation that could result in property damage.

## GENERAL WARNING

---

The following safety statements must be heeded whenever the vehicle is being operated, repaired, or serviced. Service technicians should become familiar with these safety statements, which can be found throughout this manual. Also, other specific safety statements appear throughout this manual and on the vehicle.

## **⚠ DANGER**

- **Battery – Explosive gases! Do not smoke. Keep sparks and flames away from the vehicle and service area. Ventilate when charging or operating vehicle in an enclosed area. Wear a full face shield and rubber gloves when working on or near batteries.**
- **Battery – Poison! Contains acid! Causes severe burns. Avoid contact with skin, eyes, or clothing. Antidotes:**
  - **External: Flush with water. Call a physician immediately.**
  - **Internal: Drink large quantities of milk or water. Follow with milk of magnesia or vegetable oil. Call a physician immediately.**
  - **Eyes: Flush with water for 15 minutes. Call a physician immediately.**
- **Gasoline/Diesel – Flammable! Explosive! Do not smoke. Keep sparks and flames away from the vehicle and service area. Service only in a well-ventilated area.**
- **Do not operate engine in an enclosed area without proper ventilation. The engine produces carbon monoxide, which is an odorless, deadly poison.**

** WARNING**

- Follow the procedures exactly as stated in this manual, and heed all **DANGER**, **WARNING**, and **CAUTION** statements in this manual as well as those on the vehicle.
- Only trained technicians should service or repair the vehicle. Anyone doing even simple repairs or service should have knowledge and experience in electrical and mechanical repair. The appropriate instructions must be used when performing maintenance, service, or accessory installation.
- Prior to servicing the vehicle or leaving the vehicle unattended, turn the key switch **OFF**, remove the key, and place the Forward/Reverse handle in the **NEUTRAL** position. Chock the wheels when servicing the vehicle.
- To avoid unintentionally starting the vehicle:
  - Disconnect battery cables, negative (-) cable first (Figure 1-2, Page 1-3).
  - Gasoline vehicles only: Disconnect the spark plug wires from the spark plugs.
- Frame ground – Do not allow tools or other metal objects to contact frame when disconnecting battery cables or other electrical wiring. Do not allow a positive wire to touch the vehicle frame, engine, or any other metal component.
- Wear safety glasses or approved eye protection when servicing the vehicle. Wear a full face shield and rubber gloves when working on or near batteries.
- Do not wear loose clothing or jewelry such as rings, watches, chains, etc., when servicing the vehicle.
- Moving parts! Do not attempt to service the vehicle while it is running.
- Hot! Do not attempt to service hot engine or exhaust system. Failure to heed this warning could result in severe burns.
- Use insulated tools when working near batteries or electrical connections. Use extreme caution to avoid shorting of components or wiring.
- Check the vehicle owner's manual for proper location of all vehicle safety and operation decals and make sure they are in place and are easy to read.
- Any modification or change to the vehicle that affects the stability or handling of the vehicle, or increases maximum vehicle speed beyond factory specifications, could result in severe personal injury or death.
- Lift only one end of the vehicle at a time. Use a suitable lifting device (chain hoist or hydraulic floor jack) with 1000 lb. (454 kg) minimum lifting capacity. Do not use lifting device to hold vehicle in raised position. Use approved jack stands of proper weight capacity to support the vehicle and chock the wheels that remain on the floor. When not performing a test or service procedure that requires movement of the wheels, lock the brakes.
- When servicing the vehicle with part of the vehicle on jack stands, do not operate the engine with the Forward/Reverse handle in either the **FORWARD** or **REVERSE** position. The all-wheel drive system will engage any wheel(s) with traction. See Figure 1-1, Page 1-3.

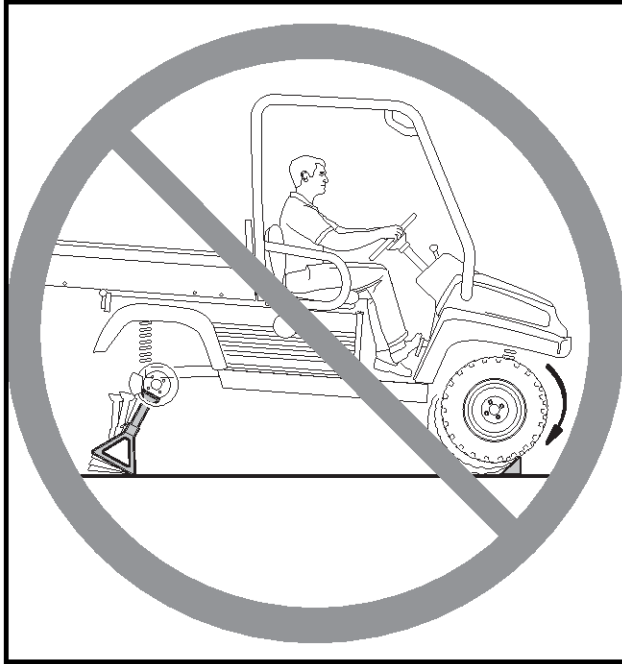


Figure 1-1 All-Wheel Drive Warning

- If wires are removed or replaced, make sure wiring and wire harness are properly routed and secured. Failure to properly route and secure wiring could result in vehicle malfunction, property damage, personal injury, or death.
- For vehicles with cargo beds, remove all cargo before raising the bed or servicing the vehicle. If the vehicle is equipped with a prop rod, ensure that it is securely engaged while bed is raised. Do not close bed until all persons are clear of cargo bed area. Keep hands clear of all crush areas. Do not drop cargo bed; lower gently and keep entire body clear. Failure to heed this warning could result in severe personal injury or death.
- Improper use of the vehicle or failure to properly maintain it could result in decreased vehicle performance, severe personal injury, or death.
- Do not leave children unattended on vehicle.

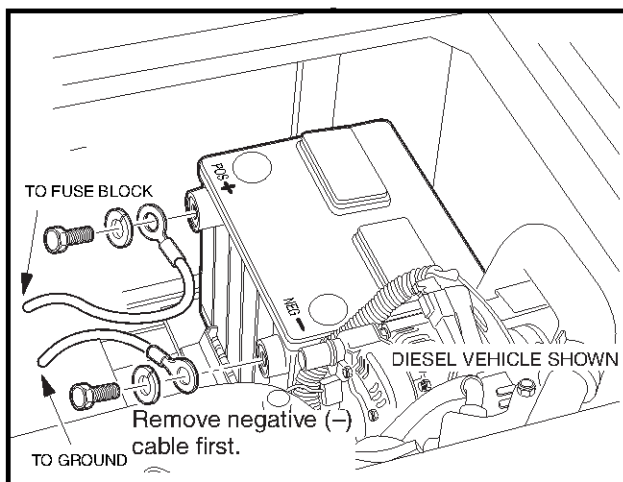


Figure 1-2 Battery



