

Utility Vehicle

2200

2200S

2300



Bobcat®

Service Manual

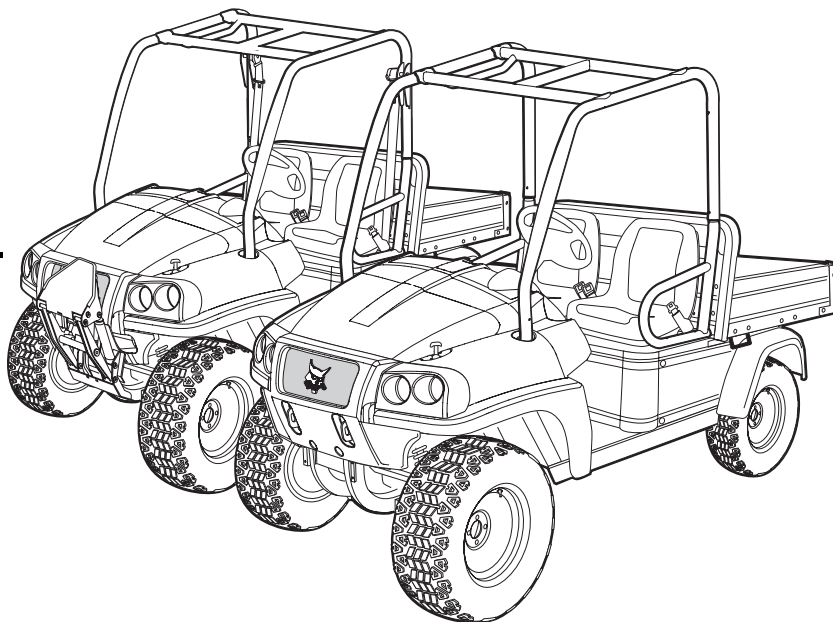
S/N A59Z11001 & ABOVE (2200 DIESEL)

S/N A59Y11001 & ABOVE (2200 GASOLINE)

S/N A5A111001 & ABOVE (2200S DIESEL)

S/N A5A011001 & ABOVE (2200S GASOLINE)

S/N A59W11001 & ABOVE (2300 DIESEL)



 **Ingersoll Rand**
Compact Vehicle Technologies

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 the Bobcat 2200, 2200S and Bobcat 2300 vehicles, 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 Company advises that all repairs and/or service be performed by an authorized Bobcat 2200 and 2200S distributor/dealer representative or by a Bobcat factory-trained technician.

It is the policy of Bobcat Company 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 Company'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: P.O. Box 204658; Augusta, GA 30917; Attention: Technical Services, or contact a Technical Service Representative at (706) 863-3000, ext. 3580.

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This manual effective June 19, 2006.

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 Company is continually working to further improve its 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 2200 and 2200S 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 Company 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 Operation and Maintenance Manual.

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SECTION i – INDEX

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.
- The diameter of all tires on the vehicle must be equal, otherwise the all-wheel drive system will not operate as intended and could result in severe personal injury or death. Never install tires of different diameters on the vehicle.
- 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.

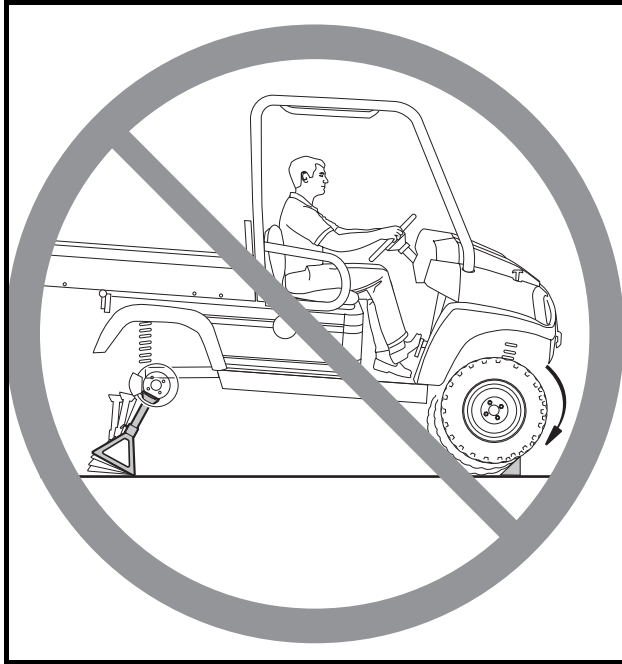


Figure 1-1 All-Wheel Drive Warning

- 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.

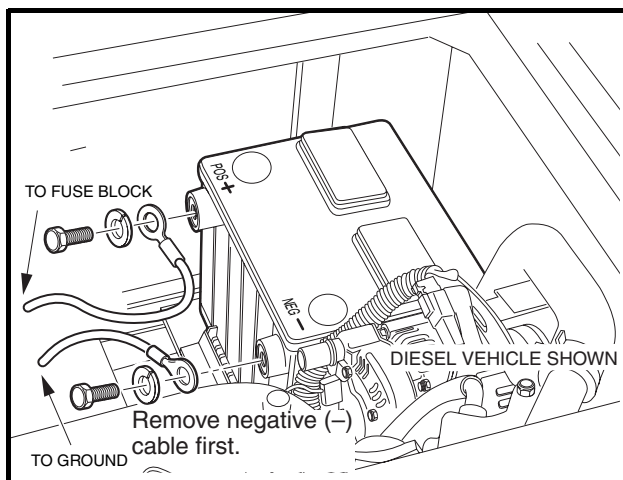


Figure 1-2 Battery

SECTION 2A – VEHICLE SPECIFICATIONS: HONDA GAS & KUBOTA DIESEL POWERED

2200 AND 2200S SPECIFICATIONS

SPECIFICATIONS	Bobcat 2200	Bobcat 2200	Bobcat 2200S	Bobcat 2200S
POWER SOURCE	Gasoline	Diesel	Gasoline	Diesel
Engine: 4-cycle OHV, 614 cc, 20.0 maximum HP @3600 rpm (per SAE J 1940/1349), twin-cylinder, air-cooled, with pressure lubrication system	.		.	
Engine: 4-cycle OHV, 719 cc, 20.0 maximum HP @3600 rpm (per SAE J 1940/1349), three-cylinder, liquid-cooled, with pressure lubrication system		.		.
Fuel system: Side-draft carburetor with float bowl, fixed jets, fuel filters, and impulse fuel pump	.		.	
Fuel system: Mechanical injection, fuel water separator, fuel filters, and electric fuel pump		.		.
Governor: (Honda Engine) Automatic ground-speed sensing, internally geared in transmission	.		.	
Governor: internal to engine, mechanical, centrifugal ball		.		.
Ignition: Transistorized magneto	.		.	
Ignition: Compression		.		.
Transmission: Forward and reverse with neutral (4.98:1 forward, 7.79:1 reverse)	.	.	.	.
Electrical system: 12 volt, 500 cca at 0 °F (-17.8 °C), 650 at 32 °F (0 °C). 105-minute reserve capacity and 35-amp charging capacity	.	.	.	.
Torque converter: Automatic, variable-speed, dry type	.	.	.	.
STEERING/SUSPENSION/BRAKES				
Suspension: Front: Independent double A-arms with coil-over shock absorbers Rear: Swing arms with coil-over shock absorbers	.	.	.	.
Steering: Self-adjusting rack and pinion, Ackerman	.	.	.	.
Brakes: Hydraulic brake system – brake pads and discs on each wheel with separate foot-operated park brake	.	.	.	.
BODY/CHASSIS				
Frame/Chassis: Box tube aluminum	.	.	.	.
Side and rear body: Plastic	.	.	.	.
Cargo bed: Powder-coated steel	.	.	.	.
Front body: Geloy XTWM206	.	.	.	.
Tires: All Terrain: 25 x 10.5 – 12 front and rear; tubeless, 4-ply rated load range Mud: 25 x 11 – 12 front and rear; tubeless, 4-ply rated load range	.	.	.	.
DIMENSIONS/WEIGHT				
<i>NOTE: Items marked with an asterisk (*) indicate approximate values.</i>				
*Overall length (box bed configuration, without brushguard):	122 in. (309.9 cm)		154 in. (391.2 cm)	
Overall width: without mirror with mirror	58.5 in. (148.5 cm) 63.6 in. (161.5 cm)			
*Overall height (with ROPS): with mud tires with all-terrain tires	82.3 in. (209 cm)		80.3 in. (203.8 cm)	
Wheelbase	81.5 in. (207 cm)		114 in. (289.5 cm)	
Specifications continued on next page...				

SPECIFICATIONS	Bobcat 2200	Bobcat 2200	Bobcat 2200S	Bobcat 2200S
	Gasoline	Diesel	Gasoline	Diesel
DIMENSIONS/WEIGHT, CONTINUED				
Ground clearance: under differential	8.2 in. (20.8 cm)			
Front and rear wheel tread	48.8 in. (124 cm)			
*Weight: 2-passenger gasoline with electric bed lift, mud tires, and without brush guard 2-passenger diesel with electric bed lift, mud tires, and brush guard 4-passenger gasoline with all-terrain tires 4-passenger diesel with all-terrain tires	1450 lb. (657.6 kg)	1597 lb. (724.2 kg)	1630 lb. (739.2 kg)	1734 lb. (786.4 kg)
Forward speed	25 mph (40 km/h)			
Governed RPM	3825			
Turning Radius	138 in. (350.5 cm)		204 in. (518.2 cm)	
Load bed height	34 in. (86.4 cm)			
Load bed size (box bed inside dimensions)	48.0 x 49.8 x 10.9 in. (122 x 127 x 28 cm) (15.3 cubic feet)			
Maximum payload capacity (level surface only)	800 lb. (363 kg) High capacity option: 1050 lb. (476 kg)		800 lb. (363 kg)	
Vehicle rated capacity (payload, driver, and passenger; level surface only)	1200 lb. (544 kg) High capacity option: 1450 lb (658 kg)		1600 lb. (725.5 kg)	
Maximum gross vehicle weight (fully loaded vehicle, including accessories)	2750 lb. (1247 kg) High capacity option: 3012 lb. (1366 kg)		3350 lb. (1519.1 kg)	
Standard seating capacity	2		4	
LIQUID CAPACITIES				
Engine (Honda) crankcase with filter: SAE 10W-30, API classification SJ	1 qt. and 25 oz (1.7 L)		1 qt. and 25 oz. (1.7 L)	
Engine crankcase with filter: SAE 10W-30, API classification CF		3 qt. (2.8 L)		3 qt. (2.8 L)
Front differential: Bobcat Trans/Differential Fluid P/N 6687120	5 oz. (150 mL)			
Rear differential: Bobcat Trans/Differential Fluid P/N 6687120	20 oz. (600 mL)			
Transmission: Bobcat Trans/Differential Fluid P/N 6687120	20 oz. (600 mL)			
Engine coolant: mixture of 55% propylene glycol and 45% water	n/a	2 gal. (7.8 L)	n/a	2.25 gal. (8.5 L)
Brake fluid: DOT 5 (silicone) brake fluid	8 oz. (240 ml)		17.9 oz. (530 ml)	
Fuel tank: unleaded gasoline	6.5 gallons (24.6 L)		6.5 gallons (24.6 L)	
Fuel tank: diesel grade no.2 with cetane rating of 45 or higher		6.5 gallons (24.6 L)		6.5 gallons (24.6 L)
TIRE PRESSURE				
All-terrain tread and mud tires	20 - 22 psi (1.38 - 1.52 Bars)			

2300 SPECIFICATIONS

SPECIFICATIONS	Bobcat 2300
POWER SOURCE	Diesel
Engine: 4-cycle OHV, 719 cc, 20.0 maximum HP @3600 rpm (per SAE J 1940/1349), three-cylinder, liquid-cooled, with pressure lubrication system	•
Fuel system: Mechanical injection, fuel water separator, fuel filters, and electric fuel pump	•
Governor: internal to engine, mechanical, centrifugal ball	•
Ignition: Compression	•
Transmission: Forward and reverse with neutral (5.39:1 forward, 7.79:1 reverse)	•
Electrical system: 12 volt, 500 cca at 0 °F (-17.8 °C), 650 at 32 °F (0 °C). 105-minute reserve capacity and 60-amp charging capacity	•
Torque converter: Automatic, variable-speed, dry type	•
STEERING/SUSPENSION/BRAKES	
Suspension: Front: Independent double A-arms with coil-over shock absorbers Rear: Swing arms with coil-over shock absorbers	•
Steering: Self-adjusting rack and pinion, Ackerman	•
Brakes: Hydraulic brake system – brake pads and discs on each wheel with separate foot-operated park brake	•
BODY/CHASSIS	
Frame/Chassis: Box tube aluminum	•
Side and rear body: Plastic	•
Cargo bed: Powder-coated steel	•
Front body: Geloy XTWM206	•
Tires: All Terrain: 25 x 10.5 – 12 front and rear; tubeless, 4-ply rated load range Mud: 25 x 11 – 12 front and rear; tubeless, 4-ply rated load range	•
DIMENSIONS/WEIGHT	
Overall length with cylinders “stored” and no attachment arm or interface with attachment arm and interface and both cylinder fully retracted with both cylinders in position for maximum overall vehicle length	121 in. (307 cm) 136 in. (345 cm) 155 in. (394 cm)
Overall width:	57.8 in. (147 cm)
Overall height (with ROPS)	78.75 in. (200 cm)
Wheelbase	82 in. (208.3 cm)
Ground clearance: under differential under floorboard	7.3 in. (18.5cm) 11.1 in. (28 cm)
Front wheel tread	48.25 in. (122.5 cm)
Rear wheel tread	48.63 in. (123.5 cm)
Weight (with all-terrain tires)	1800 lb. (815 kg)
Forward speed	25 mph (40 kph)
Governed RPM	3825
Turning radius (per SAE J 695)	23 ft-10 in.
Load bed height	32.5 in. (83 cm)
DIMENSIONS/WEIGHT continued on next page...	

SPECIFICATIONS	Bobcat 2300
DIMENSIONS/WEIGHT, CONTINUED	
Load bed size (box bed inside dimensions)	48.0 x 49.8 x 10.9 in. (122 x 127 x28 cm) (15.3 cubic feet)
Maximum payload capacity (level surface only)	800 lb. (363 kg)
Vehicle rated capacity (payload, driver, and passenger; level surface only)	1200 lb. (544 kg)
Maximum attachment arm load (includes attachment weight plus attachment load)	500 lb. (227 kg)
Maximum gross vehicle weight (fully loaded vehicle, including accessories)	3200 lb. (1451 kg)
Standard seating capacity	2
LIQUID CAPACITIES	
Engine crankcase with filter: SAE 10W-30, API classification CF	3 qt. (2.8 L)
Front differential: Bobcat Trans/Differential Fluid (P/N 6687120)	5 oz. (150 mL)
Rear differential: Bobcat Trans/Differential Fluid (P/N 6687120)	20 oz. (600 mL)
Transmission: Bobcat Trans/Differential Fluid (P/N 6687120)	20 oz. (600 mL)
Engine coolant: mixture of 55% propylene glycol and 45% water	2 gal. (7.8 L)
Brake fluid: DOT 5 (silicone) brake fluid	8 oz. (240 mL)
Fuel tank: diesel grade no.2 with cetane rating of 45 or higher	6.5 gallons (24.6 L)
Hydraulic fluid: Bobcat Hydraulic Fluid	1.3 gallons (5.0 L)
TIRE PRESSURE	
All-terrain tread and mud tires	20-22 psi (1.38 - 1.52 Bars)

SECTION 2B – VEHICLE SPECIFICATIONS: KAWASAKI GAS & KUBOTA DIESEL POWERED

2200 AND 2200S SPECIFICATIONS

SPECIFICATIONS	2200	2200	2200S	2200S
POWER SOURCE	Gasoline	Diesel	Gasoline	Diesel
Engine: (Kawasaki) 4-cycle OHV, 675 cc, 23.0 maximum HP @3600 rpm (per SAE J 1940/1349), twin-cylinder, air-cooled, with pressure lubrication system	•		•	
Engine: 4-cycle OHV, 719 cc, 20.0 maximum HP @3600 rpm (per SAE J 1940/1349), three-cylinder, liquid-cooled, with pressure lubrication system		•		•
Fuel system: Side-draft carburetor with float bowl, fixed jets, fuel filters, and impulse fuel pump	•		•	
Fuel system: Mechanical injection, fuel water separator, fuel filters, and electric fuel pump		•		•
Governor (Kawasaki engine): internal to engine, centrifugal ball	•		•	
Governor: internal to engine, mechanical, centrifugal ball		•		•
Ignition: Transistorized magneto	•		•	
Ignition: Compression		•		•
Transmission: Forward and reverse with neutral (5.39:1 forward, 7.79:1 reverse)	•	•	•	•
Electrical system: 12 volt, 500 cca at 0 °F (-17.8 °C), 650 at 32 °F (0 °C). 105-minute reserve capacity and 35-amp charging capacity	•	•	•	•
Torque converter: Automatic, variable-speed, dry type	•	•	•	•
STEERING/SUSPENSION/BRAKES				
Suspension: Front: Independent double A-arms with coil-over shock absorbers Rear: Swing arms with coil-over shock absorbers	•	•	•	•
Steering: Self-adjusting rack and pinion, Ackerman	•	•	•	•
Brakes: Hydraulic brake system – brake pads and discs on each wheel with separate foot-operated park brake	•	•	•	•
BODY/CHASSIS				
Frame/Chassis: Box tube aluminum	•	•	•	•
Side and rear body: Plastic	•	•	•	•
Cargo bed: Powder-coated steel	•	•	•	•
Front body: Gelyo XTWM206	•	•	•	•
Tires: All Terrain: 25 x 10.5 – 12 front and rear; tubeless, 4-ply rated load range Mud: 25 x 11 – 12 front and rear; tubeless, 4-ply rated load range	•	•	•	•
DIMENSIONS/WEIGHT				
<i>NOTE: Items marked with an asterisk (*) indicate approximate values.</i>				
*Overall length (box bed configuration, without brushguard):	122 in. (309.9 cm)		154 in. (391.2 cm)	
Overall width: without mirror with mirror	58.5 in. (148.5 cm) 63.6 in. (161.5 cm)			
*Overall height (with ROPS): with mud tires with all-terrain tires	82.3 in. (209 cm)		80.3 in. (203.8 cm)	
Wheelbase	81.5 in. (207 cm)		114 in. (289.5 cm)	
Specifications continued on next page...				



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SPECIFICATIONS	2200	2200	2200S	2200S
	Gasoline	Diesel	Gasoline	Diesel
DIMENSIONS/WEIGHT, CONTINUED				
Ground clearance: under differential	8.2 in. (20.8 cm)			
Front and rear wheel tread	48.8 in. (124 cm)			
*Weight: 2-passenger gasoline with electric bed lift, mud tires, and without brush guard 2-passenger diesel with electric bed lift, mud tires, and brush guard 4-passenger gasoline with all-terrain tires 4-passenger diesel with all-terrain tires	1450 lb. (657.6 kg)	1597 lb. (724.2 kg)	1630 lb. (739.2 kg)	1734 lb. (786.4 kg)
Forward speed	25 mph (40 km/h)			
Governed RPM	3825			
Turning Radius	138 in. (350.5 cm)		204 in. (518.2 cm)	
Load bed height	34 in. (86.4 cm)			
Load bed size (box bed inside dimensions)	48.0 x 49.8 x 10.9 in. (122 x 127 x 28 cm) (15.3 cubic feet)			
Maximum payload capacity (level surface only)	800 lb. (363 kg) High capacity option: 1050 lb. (476 kg)		800 lb. (363 kg)	
Vehicle rated capacity (payload, driver, and passenger; level surface only)	1200 lb. (544 kg) High capacity option: 1450 lb (658 kg)		1600 lb. (725.5 kg)	
Maximum gross vehicle weight (fully loaded vehicle, including accessories)	2750 lb. (1247 kg) High capacity option: 3012 lb. (1366 kg)		3350 lb. (1519.1 kg)	
Standard seating capacity	2		4	
LIQUID CAPACITIES				
Engine (Kawasaki) crankcase with filter: SAE 10W-30, API classification SJ	1 qt. and 19 oz. (1.5 L)		1 qt. and 19 oz. (1.5 L)	
Engine crankcase with filter: SAE 10W-30, API classification CF		3 qt. (2.8 L)		3 qt. (2.8 L)
Front differential: Bobcat Trans/Differential Fluid P/N 6687120	5 oz. (150 mL)			
Rear differential: Bobcat Trans/Differential Fluid P/N 6687120	20 oz. (600 mL)			
Transmission: Bobcat Trans/Differential Fluid P/N 6687120	20 oz. (600 mL)			
Engine coolant: mixture of 55% propylene glycol and 45% water	n/a	2 gal. (7.8 L)	n/a	2.25 gal. (8.5 L)
Brake fluid: DOT 5 (silicone) brake fluid	8 oz. (240 ml)		17.9 oz. (530 ml)	
Fuel tank: unleaded gasoline	6.5 gallons (24.6 L)		6.5 gallons (24.6 L)	
Fuel tank: diesel grade no.2 with cetane rating of 45 or higher		6.5 gallons (24.6 L)		6.5 gallons (24.6 L)
TIRE PRESSURE				
All-terrain tread and mud tires	20 - 22 psi (1.38 - 1.52 Bars)			

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