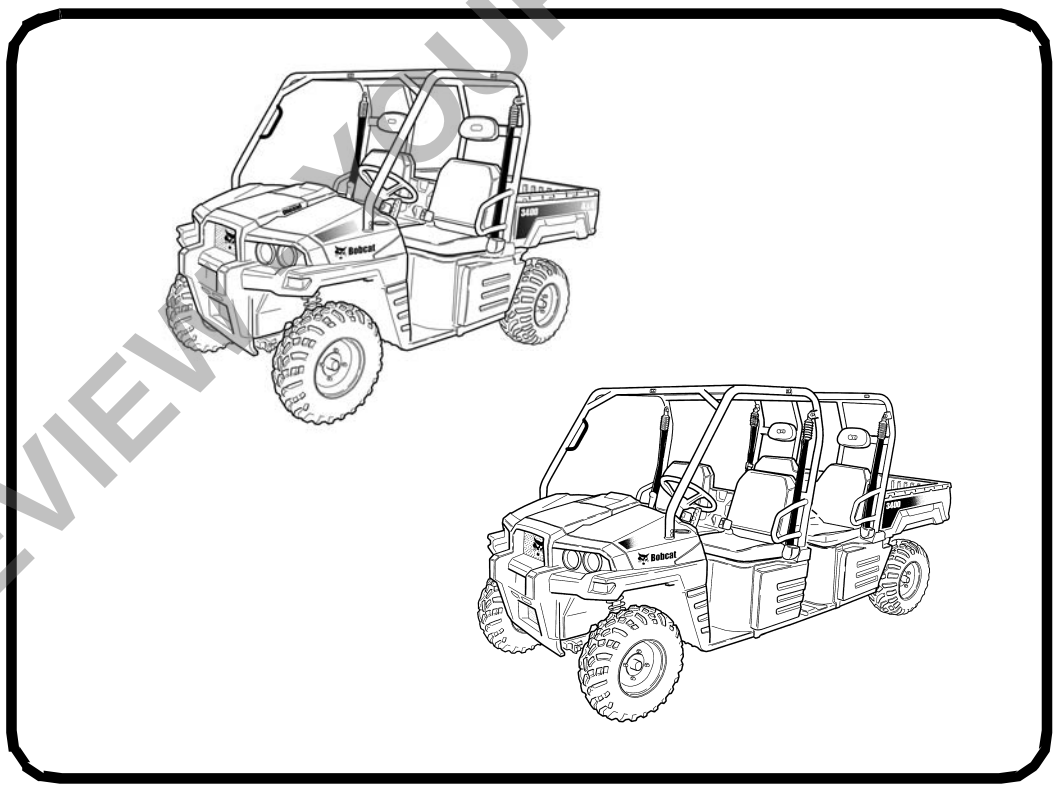
Bobcat®

Service Manual
3400, 3400XL Utility Vehicle

S/N AJNU11001 & Above
S/N AJNW11001 & Above



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6989606 (4-11)

Printed in U.S.A.

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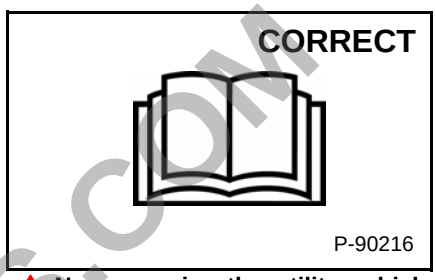
MAINTENANCE SAFETY

WARNING

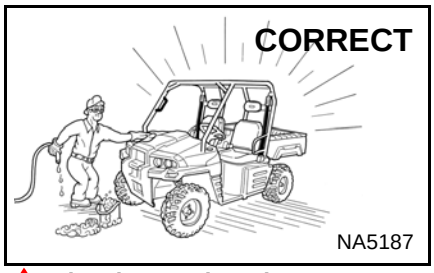
Instructions are necessary before operating or servicing the utility vehicle. Read and understand the Operation & Maintenance Manual and signs (decals) on utility vehicle. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2859-0510

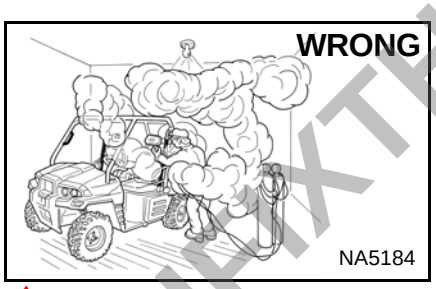
Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.



Never service the utility vehicle without instructions.



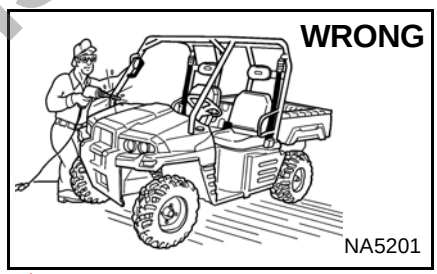
Cleaning and maintenance are required daily.



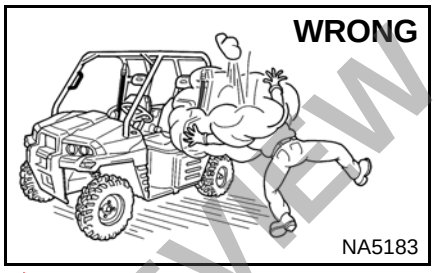
Have good ventilation when welding or grinding painted parts.

Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.

Avoid exhaust fume leaks which can kill without warning. Exhaust system must be tightly sealed.



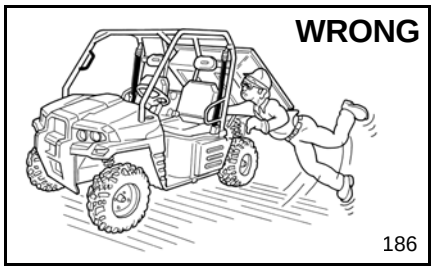
Never modify equipment or add attachments and accessories not approved by Bobcat Company.



Stop, cool and clean engine of flammable materials before checking fluids.

Never service or adjust utility vehicle with the engine running unless instructed to do so in the manual.

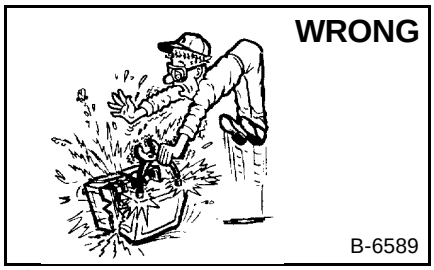
Never fill fuel tank with engine running, while smoking or when near open flame.



Keep body, jewelry and clothing away from moving parts, electrical contact, hot parts and exhaust.

Wear eye protection to guard from battery acid, compressed springs, fluids under pressure and flying debris when engines are running or tools are used. Use eye protection approved for type of welding.

Keep access doors closed except for service.



Lead-acid batteries produce flammable and explosive gases.

Keep arcs, sparks, flames and lighted tobacco away from batteries.

Batteries contain acid which burns eyes or skin on contact. Wear protective clothing. If acid contacts body, flush well with water. For eye contact, flush well and get immediate medical attention.

Maintenance procedures which are given in the Operation & Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedures which are **not** in the Operation & Maintenance Manual must be performed **ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL. Always use genuine Bobcat replacement parts.**

MSW41-0510

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WIRE COLOR LEGEND

RED	RED
BLACK	BLK
WHITE	WHT
BROWN	BRN
ORANGE	ORG
YELLOW	YEL
PURPLE	PUR
PINK	PNK
GRAY	GRY
TAN	TAN
LIGHT BLUE	LBU
DARK BLUE	DBU
LIGHT GREEN	GRN
DARK GREEN	DGN

Fuel Pump BRN
Fuel Solenoid BRN
Engine Speed Sensor BRN
Transmission Switch BRN
Fan Motor BRN
Power Port BRN
Turf Solenoid Driver BRN
Front Attachment Switch BRN

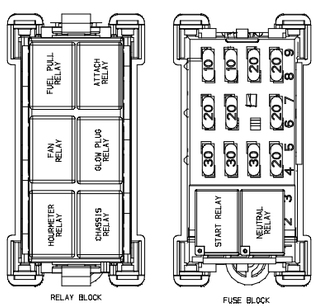
Chassis Relay BRN
Box Lift Switch BRN
Box Lift Switch BRN
Start Solenoid Diode BRN
Vehicle Speed Sensor BRN
Fuel Solenoid Diode BRN
VCM Pin 13 — VCM Pin 13 BRN
Brake Pressure Switch BRN
Attachment Relay BRN

GROUNDS

Head Light Switch BRN
Tail Light BRN
Drive Mode Switch BRN
Park Brake Switch BRN
Drive Mode Switch BRN
Hourmeter BRN
Right High Beam BRN
Right Low Beam BRN
Left Low Beam BRN
Left High Beam BRN

VEHICLE CONTROL MODULE (VCM)

Pin	Function
1	Diesel – Glow Plug Relay
2	Thermister
3	Engine Temperature Light
4	Fan Relay
5	Engine Speed Sensor
6	AWD (4x4) Coil
7	Switched B+
8	Ground Speed
9	Rear Differential Driver
10	Identification
11	Thermister & Ident Com
12	Fuel Pull Sol. & Fuel Pump Relay
13	Ground
14	Turf Mode
15	Parking Brake
16	Glow Plugs



Printed In U.S.A.

ALTERNATOR
GRY — FUSIBLE LINK #3 — RED — B
B A — WHT/RED — EXCITATION
LBU — FUSIBLE LINK #1 — RED
20 AMP CIRCUIT BREAKER
RED/WHT — RED/WHT

ORG/WHT — (SWITCHED POWER)
BRN — (GRD)
(UNSWITCHED POWER)
TERMINAL BLOCK
BATTERY
FRAME GRD
STARTER B M S WHT/RED
WHT/RED — WHT/RED
BRN — ORG — BRN
BRAKE PRESSURE SWITCH
ORG

START RELAY D3
C1 RED/WHT — WHT/RED
C3 RED/WHT — ORG
D1

FAN RELAY
B3 RED/WHT — B5 ORG/BLK
B1 ORG — B2 ORG
VCM Pin 4
FAN MOTOR
BRN — B A B A — M

OIL PRESSURE SWITCH
PNK — OIL PRESSURE LIGHT — PNK — RED/YEL

HOURMETER RELAY
C4 ORG — HOURMETER — BRN
C3 ORG
PNK — C2 ORG — C1

ORG
ORG

#2 FUSIBLE LINK
GRY — RED
UNSWITCHED POWER 10A
C8 C9 WHT/RED

WHT/RED — 6 4 2 1 — C455 — 6 4 2 1 — WHT/RED
ORG — ORG
WHT/RED — WHT/RED

I — B — ST
START RUN OFF
IGNITION SWITCH

RED/GRN
TURF SOLENOID DRIVER
RED — A B C — RED/GRN
GRN — A B C — DGN/WHT — VCM Pin 9
BRN — A B C — BRN
RED — A B — A B — RED
LBL — A B — A B — LBL
A = SOL +
B = SOL -
REAR DIFFERENTIAL SOLENOID (POWERED TO UNLOCK DIFF)

VEHICLE SPEED SENSOR
PWR GRD SIG — A B C — A B C — ORG — BRN — GRN/RED — VCM Pin 8
HALL-EFFECT SENSOR

ENGINE SPEED SENSOR
PWR GRD SIG — A B C — A B C — ORG — BRN — YEL/RED — VCM Pin 5
HALL-EFFECT SENSOR

ENGINE COOLANT SENDER
77°F (25° C) = 29.8 ohm
248° F (120° C) = 1.22 ohm
t — 1 2 — 1 2 — PUR — PUR — VCM Pin 10
PUR — VCM Pin 11
YEL — VCM Pin 2

FUEL PULL 30A
C4 C5 ORG — A2
FUEL PULL RELAY
A3 RED — A5 WHT
A1 GRN — VCM Pin 12
ORG — RED — BRN — P2 P3 P1 — HOLD — 24.5 Ohm — FUEL SOLENOID — PULL — 0.33 Ohm

ORG — BRN — P2 P1 — P — FUEL PUMP

GLOW PLUG 30A
RED — B4 B5
GLOW PLUG RELAY
E3 RED — E5 BLK/RED
E2 ORG — E1 YEL/PUR
GLOW PLUGS — HR — VCM Pin 1
VCM Pin 7 — ORG

DRIVE 20A A5 — RED/GRN

DRIVE MODE SWITCH
RED/GRN — 2 — 1 — WHT/DGN — VCM Pin 14
3 — GRY
BRN — 5 — 4
6
BRN — 7 — 8 — RED/YEL

VCM Pin 6
NEUTRAL RELAY
A1 BRN/WHT — B2 BRN/WHT
ORG — A3 DGN/WHT — B1
BRN/WHT — GRY — A B C D — A B C D — BRN/WHT — GRY
AWD (4X4) HUB SOLENOID

PARK BRAKE SWITCH
B A B A — ORG/RED — BRN
ORG/RED — VCM Pin 15
VCM Pin 3
ORG

RED/GRN — PUR — BACK-UP ALARM (IF EQUIPPED)

CHASSIS RELAY (SWITCHED POWER)
D3 RED — D5 WHT
D2 ORG — D1 BRN
LIGHTS 20A
WHT — A4 — A9 RED/YEL
GLOW PLUG LIGHT
VCM Pin 16 — RED/YEL

RED/YEL
LIGHT SWITCH
1 2 3 4 5 6 7 8
DGR — LEFT LOW BEAM — RIGHT
BRN — RED/YEL — YEL — LEFT HIGH BEAM — RIGHT
BRN — RED/YEL

DGN/WHT
OPEN — A
PUR — B
DGN/WHT — D
WHT/DBL — E
DBL/RED — F
BRN — C
REVERSE
NEUTRAL
LOW
HIGH

RED/YEL — P3 P2 P1
BRN — P3 P2 P1
ORG — P3 P2 P1

RED/YEL ORG/RED DBL/WHT PUR DGN/WHT WHT/DBL DBL/RED RED/YEL
A B C D E F G H
BRAKE TEMP R N L H
INDICATOR PANEL

BOX LIFT MOTOR
M — A B — A B — DBL/WHT — DGR/WHT
BOX LIFT SWITCH (OPTIONAL)
2 — 1 — RED/DBL — BRN
4 — 3 — BRN — RED/DBL
5 — 6
7 — 8
BOX LIFT (OPTION) 20A
B9 — B8 WHT
ACCESSORY (SWITCHED POWER) 20A
A8 A7 — C3 — C2 ORG/WHT
BRN — ORG/WHT
12V POWER PORT

TAIL LIGHTS
A B C — A B C
A B C — A B C

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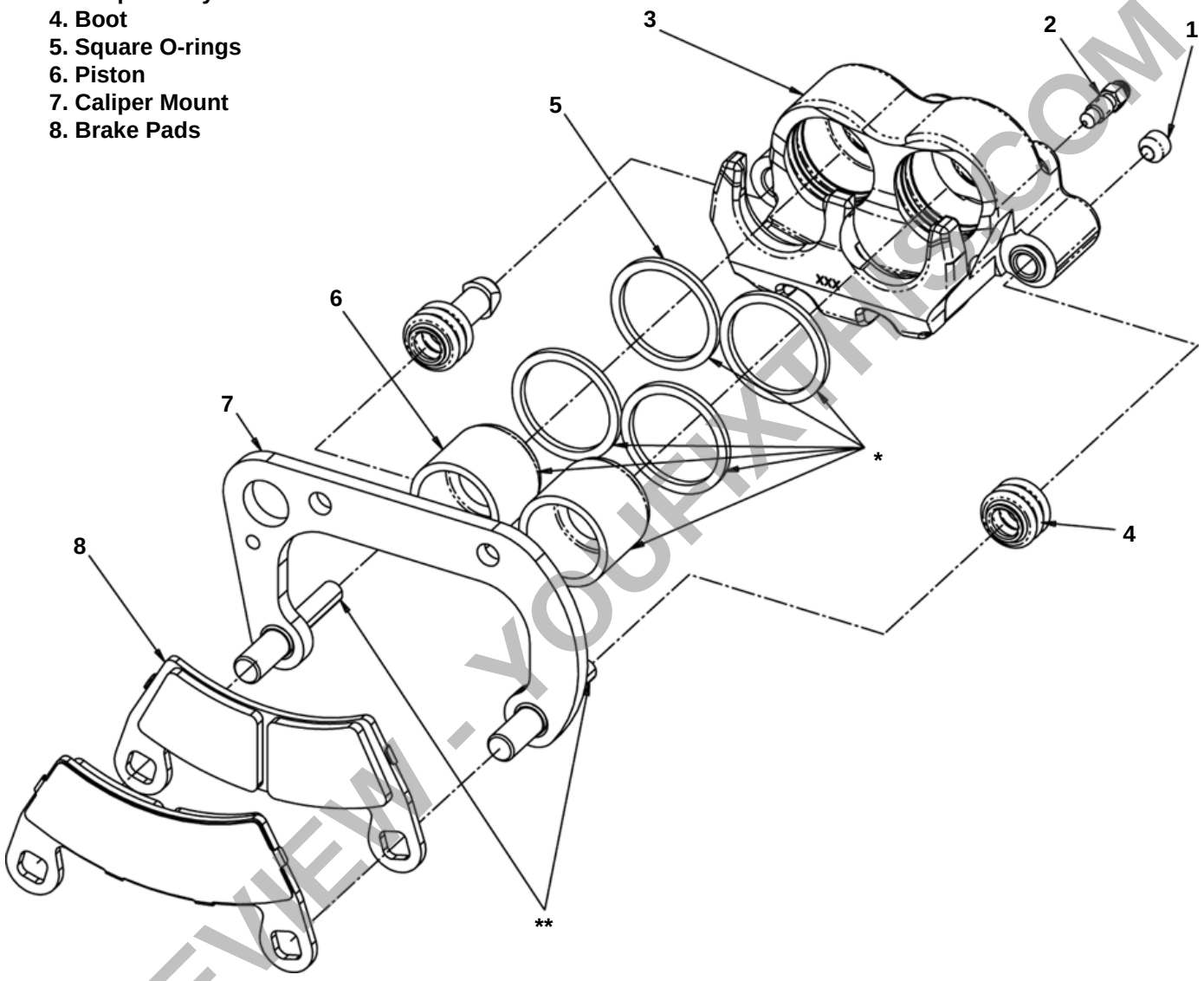
WIRING SCHEMATIC

3400 (S/N AJNU11001 AND ABOVE)
3400XL (S/N AJNW11001 AND ABOVE)

(PRINTED SEPTEMBER 2010)
V-1404

Caliper Parts Identification

1. Socket Set Screw
2. Bleeder Screw
3. Caliper Assy.
4. Boot
5. Square O-rings
6. Piston
7. Caliper Mount
8. Brake Pads



* Apply Bobcat DOT 4 Brake Fluid
** Apply Bobcat All Purpose Grease

P100209

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TORQUE SPECIFICATIONS FOR BOLTS

Torque For General SAE Bolts

The following table shows standard torque specifications for bolts with zinc phosphate coating. Bolts purchased from Bobcat Company that have zinc phosphate coating are specified by the letter H following the part number.

Thread size		sae grade 5	sae grade 8
N•m (in-lb)	0.250	9,0 - 10,2 (80 - 90)	12,4 - 13,6 (110 - 120)
	0.3125	20,3 - 22,6 (180 - 200)	24,2 - 27,1 (215 - 240)
N•m (ft-lb)	0.375	34 - 38 (25 - 28)	47 - 54 (35 - 40)
	0.4375	54 - 61 (40 - 45)	81 - 88 (60 - 65)
	0.500	88 - 95 (65 - 70)	122 - 136 (90 - 100)
	0.5625	122 - 136 (90 - 100)	170 - 190 (125 - 140)
	0.625	170 - 190 (125 - 140)	240 - 260 (175 - 190)
	0.750	300 - 330 (220 - 245)	410 - 450 (300 - 330)
	0.875	450 - 490 (330 - 360)	645 - 710 (475 - 525)
	1.000	645 - 710 (475 - 525)	985 - 1085 (725 - 800)
	1.125	880 - 975 (650 - 720)	1425 - 1600 (1050 - 1175)
	1.250	1200 - 1360 (900 - 1000)	2000 - 2200 (1475 - 1625)
	1.375	1630 - 1830 (1200 - 1350)	2720 - 2980 (2000 - 2200)
	1.500	2040 - 2240 (1500 - 1650)	3530 - 3870 (2600 - 2850)
	1.625	2720 - 2980 (2000 - 2200)	4680 - 5150 (3450 - 3800)
	1.750	3390 - 3730 (2500 - 2750)	5830 - 6500 (4300 - 4900)
	1.875	4270 - 4750 (3150 - 3500)	5830 - 6500 (5500 - 6100)
	2.000	5150 - 5700 (3800 - 4200)	8800 - 9800 (6500 - 7200)

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Troubleshooting

TROUBLE SYMPTOM				CAUSE: Engine System: Improper Intake / Exhaust Valve Clearance	Compression Leakage From Valve Seat	Intake / Exhaust Valve Seizure	Cylinder Head Gasket Blowout	Seized Or Broken Piston Ring	Worn Piston Ring, Piston Or Cylinder	Seized Crankpin Metal Or Bearing	Improper Arrangement Of Piston Ring Gaps
Starting Problem	Engine Does Not Start			■		■		■	■	■	
	Engine Starts But Stops Soon	Exhaust Smoke	None	■							■
			Little								
			Much			■		■	■		
Insufficient Engine Output	Exhaust Color		Ordinary	■	■	■	■				
			White						■		■
			Black		■	■					
Poor Exhaust Color	During Work		White						■		
			Black		■	■					
High Knocking Sound During Combustion											
Abnormal Engine Sound				■	■			■		■	
Uneven Combustion Sound											
Engine Surging	During Idling							■		■	
	During Work Operation					■				■	
Excessive Engine Vibration						■		■		■	
Difficulty In Returning To Low Speed											
Excessive Fuel Consumption					■						
Engine Oil	Excessive Oil Consumption							■	■		■
	Dilution By Diesel Fuel					■		■	■		
	Oil With Water						■				
	Low Oil Pressure										
Excessive Blow-by Gas					■	■		■	■	■	■
Engine Coolant	Overheat						■	■			
	Low Coolant Temperature										
Air Intake	Pressure Drop			■	■	■					
	Pressure Rise										
Exhaust Temperature Rise				■	■			■			
Corrective Action				Adjust the Valve Clearance.	Lap the Valve Seat.	Correct or Replace Intake / Exhaust Valve.	Replace the Gasket.	Replace the Piston Ring.	Perform Honing and Use Oversize Parts.	Repair or Replace.	Correct the Ring Joint Positions.

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LIFTING AND BLOCKING THE UTILITY VEHICLE

Procedure

For service work under the utility vehicle, or to remove the wheels, always support the utility vehicle with jackstands or blocks of adequate capacity for weight of utility vehicle (See Performance on Page SPEC-10-3.)

Always park the utility vehicle on a flat level surface.

Engage the park brake. Stop the engine and put the gear selector in gear.

If removing wheel(s), loosen the wheel nuts slightly before lifting the vehicle.

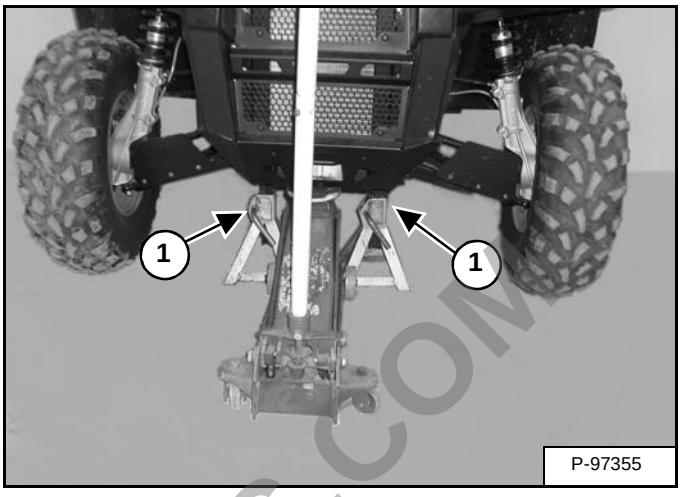
⚠ WARNING

AVOID INJURY OR DEATH

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

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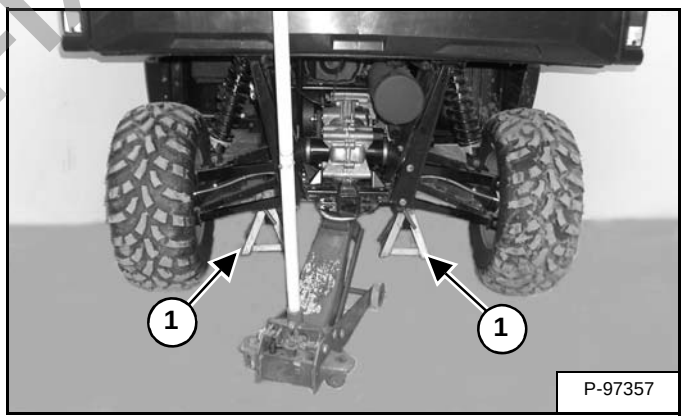
Figure 10-10-1



Place the jackstands (Item 1) **[Figure 10-10-1]** under the frame at the front of the utility vehicle.

NOTE: When lifting the utility vehicle, place the jack under front frame [Figure 10-10-1].

Figure 10-10-2



Place the jackstands (Item 1) **[Figure 10-10-2]** under the rear frame of the utility vehicle.

NOTE: When lifting the utility vehicle, place the jack under the rear frame [Figure 10-10-2].

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Performance

Load Capacity	3400	3400XL
Cargo Box Load (Maximum)	500 kg (1100 lb)	500 kg (1100 lb)
Vehicle Rated Capacity (Includes: cargo box load, weight of occupant(s), and the weight of any accessories)	725 kg (1600 lb)	840 kg (1850 lb)
Total Rated Capacity (Includes: the Vehicle Rated Capacity and the tow weight)	1406 kg (3100 lb)	1520 kg (3350 lb)
Trailer Hitch Tongue Weight (Max)	68 kg (150 lb)	68 kg (150 lb)
Tow Capacity (Includes the Weight of Trailer)	680 kg (1500 lb)	680 kg (1500 lb)
Hitch Type	Standard 2 inch Receiver	Standard 2 inch Receiver
Operating Weight	646 kg (1423 lb)	760 kg (1676 lb)
Operating Slope Limit	15° Maximum	15° Maximum
Travel Speed - Low Gear - High Gear - Reverse	 0 - 24 km/h (0 - 15 mph) 0 - 48 km/h (0 - 30 mph) 0 - 24 km/h (0 - 15 mph)	 0 - 24 km/h (0 - 15 mph) 0 - 48 km/h (0 - 30 mph) 0 - 24 km/h (0 - 15 mph)

Controls

Vehicle Steering	Steering Wheel
Engine	Foot pedal engine speed control; key-type starter switch.
Brake Pedal	Foot pedal activates four wheel disc brakes.
Parking Brake	Lever applied, mechanically activated disc brake.

Engine

Make / Model	Yanmar 3TNM72-APL
Fuel / Cooling	Diesel Fuel / Liquid
Horsepower (SAE Net)	17,9 kW (24 hp) @ 3600 rpm
Torque (SAE Net)	53,6 N•m (39.5 ft-lb) @ 2500 rpm
Type Of Cycle	4 - Stroke
Air Induction	Naturally Aspirated
Low Idle rpm	1075 +/- 50 rpm
High Idle rpm	3775 +/- 75 rpm
Number of Cylinders	3
Displacement	0,904 L (55.1 in^3)
Bore / Stroke	72,0 / 74 mm (2.83 / 2.91 in)
Lubrication	Forced Lubrication With Trochoid Pump
Crankcase Ventilation	Closed Breather
Air Pre-Cleaner	Cleanable and replaceable fiber cartridge
Air Cleaner	Replaceable dry paper cartridge
Engine Coolant	Ethylene Glycol / Water Mixture

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Parts Identification (Cont'd)

REF.	QTY.	DESCRIPTION
1.	2	Plug, M18
2.	1	Plug w / Magnet, M18
3.	19	Screw, M8
4.	2	Screw, M6
5.	4	Screw, M10
6.	4	Screw, M6
7.	1	Nut, Nylon Lock, 5/16 - 24
8.	1	Nut, M18
9.	1	Washer, Thrust
10.	1	Washer, Thrust
11.	1	Washer, Belleville
12.	2	Dowel Pin
13.	1	E-Ring
14.	2	Retaining Ring
15.	1	Retaining Ring
16.	1	Retaining Ring
17.	1	Retaining Ring
18.	1	Retaining Ring
19.	1	Retaining Ring
20.	1	Retaining Ring
21.	1	Washer, Thrust
22.	1	Washer, Thrust
23.	2	Shim
24.	1	Shim
25.	1	Washer, Thrust
26.	1	Shim
27.	1	Shim
28.	6	Washer, Belleville
29.	1	Washer, Thrust
30.	1	Collar
31.	3	Ball Bearing
32.	1	Ball Bearing
33.	1	Ball Bearing
34.	1	Ball Bearing
35.	1	Ball Bearing
36.	1	Needle Bearing
37.	1	Ball Bearing
38.	1	Needle Bearing
39.	1	Needle Bearing
40.	1	Ball Bearing
41.	1	Flanged Bearing
42.	1	Compression Spring
43.	1	Compression Spring
44.	1	Wave Spring
45.	1	Compression Spring
46.	1	Gearcase, Cover
47.	1	Gearcase, Main
48.	1	Bell Housing
49.	1	Gear, Sector 38T
50.	1	Detent Bullet
51.	1	Cup, Belleville
52.	1	Thrust Spacer, Compensator
53.	1	Output Shaft
54.	1	Reverse Shaft, 56T
55.	1	Input Shaft, 25T
56.	1	Gear, Compensator
57.	1	Gear, Compensator
58.	1	Gear, Helical, 39T
59.	2	Vent Tube
60.	1	Gear, 67T
61.	1	Sprocket, 48T
62.	1	Sprocket, 23T
63.	1	Shift Shaft, Bellcrank
64.	1	Rail, Shift Shaft
65.	1	Detent Plug
66.	1	Engagement Dog, Low
67.	1	Engagement Dog, Reverse / Low
68.	1	Shaft, Compensator
69.	1	Shift Fork
70.	1	Engagement Dog, High
71.	2	Pipe, Knock
72.	1	Shift Fork
73.	1	Switch Shaft
74.	1	Sprocket
75.	1	Bellcrank, 15T Spline
76.	1	Oil Deflector
77.	1	Bearing Cover
78.	1	Plug, Vent Cap
79.	1	Silent Chain
80.	1	Silent Chain
81.	1	Switch, Rotary
82.	1	O-ring
83.	1	O-ring
84.	1	O-ring
85.	2	Seal, Triple Lip
86.	1	O-ring
87.	1	O-ring
88.	2	Seal, Triple Lip
89.	1	Seal, Triple Lip
90.	1	Speed Sensor
91.	1	Coupler
92.	1	Front Output, Subassembly
93.	1	Primary Shaft, Subassembly

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Shift Cable Inspecting

Shift cable adjustment is necessary when any of the following is noticed:

- Noise on deceleration.
- Inability to engage a gear
- Excessive gear clash (noise).
- Gear selector is moving out of desired range.

Inspect the shift cable, clevis pins, and pivot bushings and replace if worn or damaged. Check the cable adjustment per the following procedure:

Figure 20-30-4

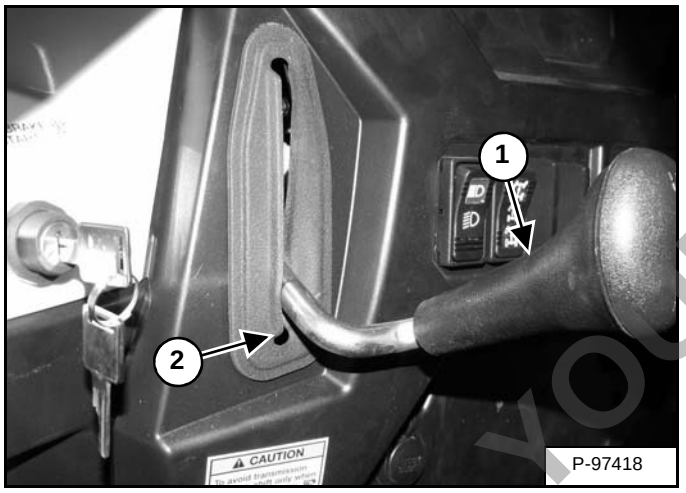
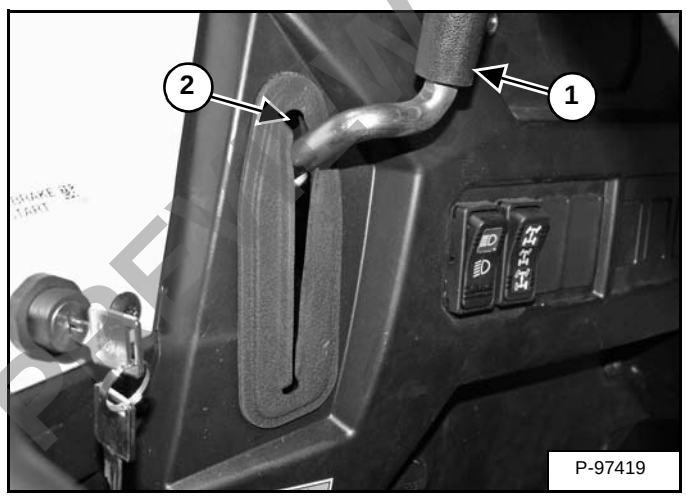


Figure 20-30-5



1. Stop the vehicle on flat level surface, engage the park brake and stop the engine.

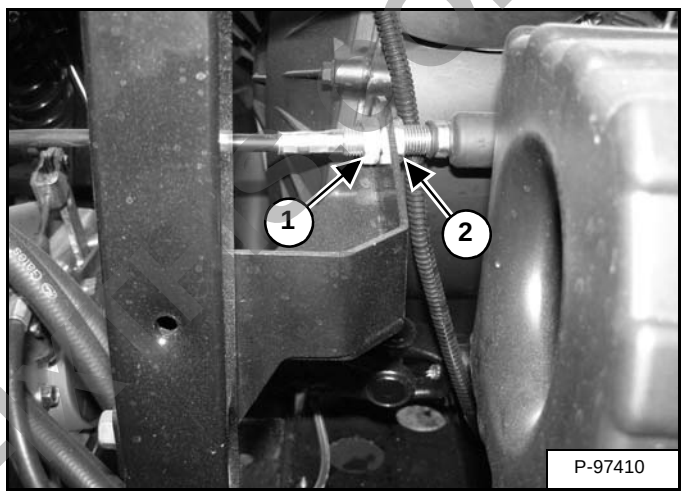
2. Move the gear select lever (Item 1) to the reverse position. Make sure the lever (Item 1) is not contacting the bottom of the shift slot (Item 2) **[Figure 20-30-4]**.

3. Move the gear select lever (Item 1) to the high range position. Make sure the lever (Item 1) is not contacting the top of the shift slot (Item 2) **[Figure 20-30-5]**.

If there is any contact at either the bottom (Item 2) **[Figure 20-30-4]** or the top (Item 2) **[Figure 20-30-5]** of the gear selector shift slot, the shift cable will need to be adjusted. Do the following:

Shift Cable Adjustment

Figure 20-30-6



1. Loosen the jam nuts (Item 1 and 2) **[Figure 20-30-6]**

2. Rotate the two jam nuts (Item 1 and 2) **[Figure 20-30-6]**, as needed, to move the gear selector lever up or down so the lever does not contact the slot at either the bottom or top position.

3. Evenly tighten the two jam nuts (Item 1 and 2) **[Figure 20-30-6]** until tight to the cable mount.

4. Check operation of the gear selector. Start the engine. With the gear selector in neutral (the N light will be illuminated), slowly increase engine speed. No utility vehicle movement should occur and no gear clash noise detected. Shift into low gear (the L light will be illuminated), slowly increase the engine speed to check forward travel. Move gear selector to the reverse position (the R light will be illuminated), slowly increase engine speed to check reverse travel.

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FINAL DRIVE

Description

Care should be exercised during drive shaft removal or when servicing CV joints. Drive shaft components are precision parts.

Cleanliness and following these instructions is very important to ensure proper shaft function and a normal service life.

- The complete drive shaft and joint should be handled by getting hold of the interconnecting shaft to avoid disassembly or potential damage to the drive shaft joints.
- Over-angling of joints beyond their capacity could result in boot or joint damage.
- Make sure surface-ground areas and splines of shaft are protected during handling to avoid damage.
- Do not allow boots to come in contact with sharp edges or hot engine and exhaust components.
- Drive shaft is not to be used as a lever arm to position other suspension components.
- Never use a hammer or sharp tools to remove or to install boot clamps.
- Be sure joints are thoroughly clean and that the proper amount and type of grease is used to refill when joint boots are replaced and when joints are cleaned.

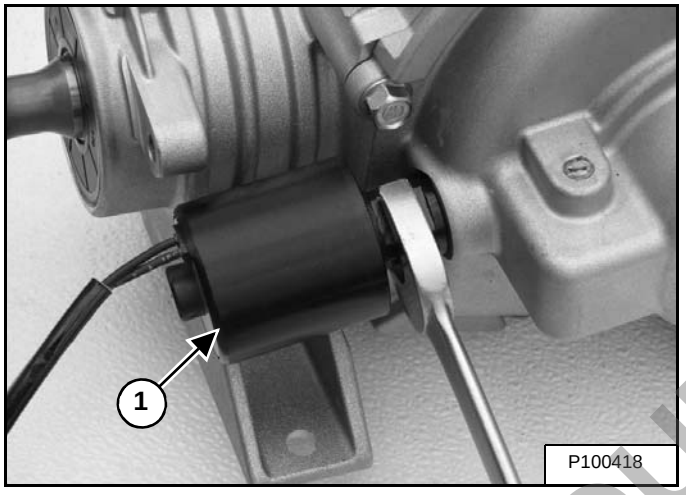
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Rear Gearcase Disassembly

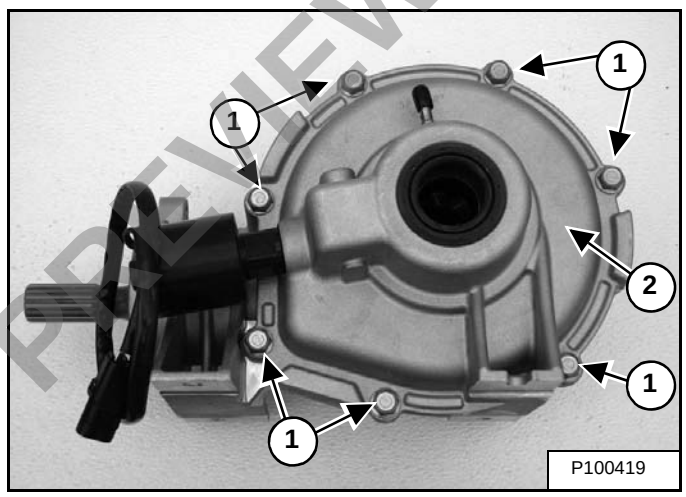
Note: The pinion gear assembly is NOT intended to be disassembled from the case, as it requires special OEM tooling in order to properly reassemble. If there is any damage to the pinion gear, bearings or case, the assembly must be replaced. Pinion and ring gear shimming information is NOT provided due to OEM manufacturing requirements.

Figure 20-60-157



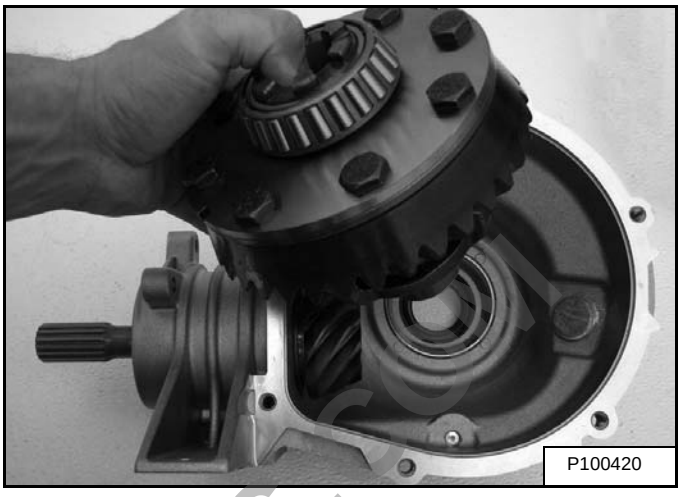
Remove the differential solenoid (Item 1) **[Figure 20-60-157]** from the gearcase cover if servicing the solenoid, shift lever, shift lever spring, or shift yoke. If none of these items are being serviced, the solenoid can remain installed in the gearcase cover.

Figure 20-60-158



Remove the bolts (Item 1) and remove the cover (Item 2) **[Figure 20-60-158]** from the housing.

Figure 20-60-159



Remove the differential assembly from the housing **[Figure 20-60-159]**.

Figure 20-60-160



Inspect the bevel gear teeth (Item 1) **[Figure 20-60-160]** for chipped, worn, or broken teeth.

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Troubleshooting

The following troubleshooting chart is provided for assistance in locating and correcting problems. Many of the recommended procedures must be done by authorized Bobcat Service Personnel only.

WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2408-0801

PROBLEM	CAUSE
Battery will not take a charge.	1, 2, 3, 4, 5
Alternator will not charge.	1, 2, 4, 5
Starter will not turn the engine.	2, 3, 4, 6, 7, 8, 9

KEY TO CORRECT THE CAUSE
1. Alternator belt is loose or damaged. 2. Battery connections are dirty or loose. 3. Battery is damaged. 4. The cable and wire connection are not making good contact. 5. The alternator is damaged. 6. The engine is locked. 7. The starter is damaged. 8. The wiring or solenoid is damaged. 9. Check the fuses.

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Specifications (Cont'd)

Oil Pump

Item		Factory Specification	Allowable Limit
Engine oil pressure at 5500 rpm (Engine Hot)	At rated speed	289,6 - 441,3 kPa (1,38 bar) (42 - 64 psi)	
Outer Rotor Outside Clearance		0,10 - 0,16 mm (0.0039 - 0.0063 in)	0,25 mm (0.0098 in)
Outer Rotor Side Clearance		0,05 - 0,10 mm (0.0019 - 0.0039 in)	0,15 mm (0.0059 in)
Outer Rotor To Inner Rotor Tip Clearance			0,16 mm (0.0063 in)

Thrust Bearing

Item	Factory Specification	Limit
Crankshaft End Play - All Models	0,111 - 0,250 mm (00044 - 0.0098 in)	0,28 mm (0.0110 in)
Bearing Thickness	1,930 - 1,980 mm (0.0760 - 0.0780 in)	1,850 mm (0.0728 in)

Thermostat

Valve opening temperature at beginning	70 - 73°C (157 - 163°F)
Opened completely (height 8,0 mm (0.315 in)	85°C (185°F)

Radiator

Radiator Tightness	Retain 68,9 kPa (0,69 bar) (10 psi) for five minutes or longer
Radiator Cap Pressure	89,6 kPa (0,90 bar) (13 psi)

Ignition Timing

Ignition timing (BTDC)	28° - 32° Before top dead center @ 5,000 rpm

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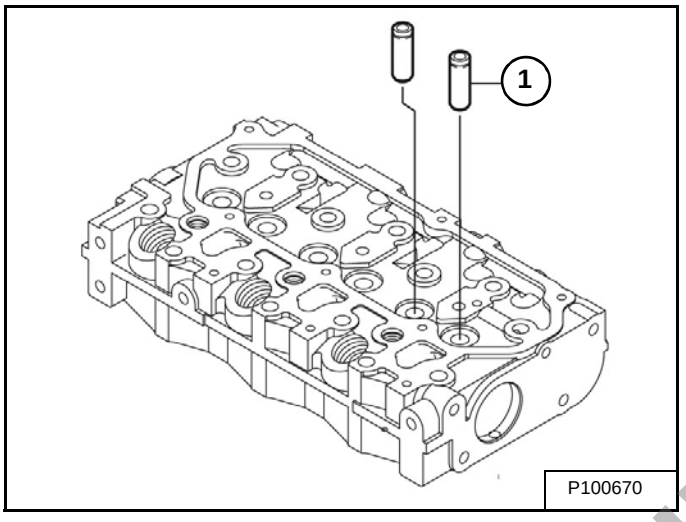
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Intake And Exhaust Valves (Cont'd)

Removal Of Valve Guides

NOTE: Removal of valve guides should be postponed until inspection and measurement procedures have been performed.

Figure 50-80-7



If the valve guides are not within specifications, use a drift pin and hammer to drive the valve guides (Item 1) **[Figure 50-80-7]** out of the cylinder head.

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