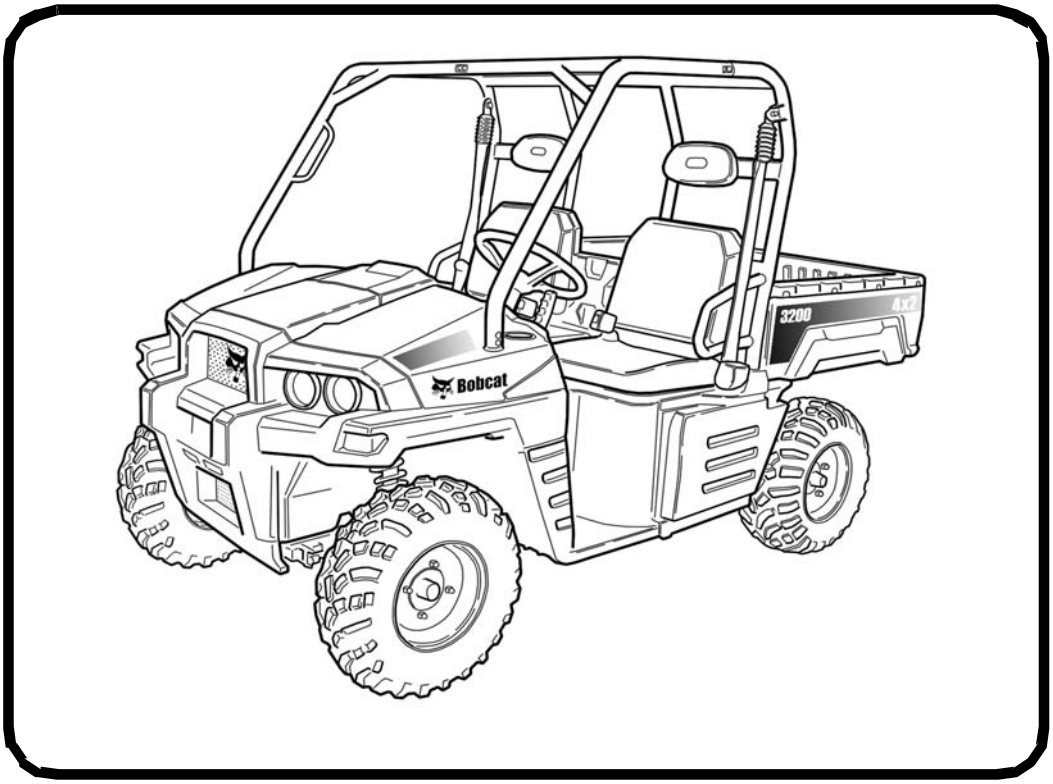
Bobcat®

Service Manual
3200 Utility Vehicle

S/N AJNS11001 & Above



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Printed in U.S.A.

SAFETY INSTRUCTIONS

Safety Alert Symbol

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

WARNING

Operator must have instructions before operating the utility vehicle. Untrained operators can cause injury or death.

W-2855-0510

IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the utility vehicle.

I-2317-0510

DANGER

The signal word DANGER on the utility vehicle and in the manuals indicates a hazardous situation which, if not avoided, will result in death or serious injury.

D-1022-0510

WARNING

The signal word WARNING on the utility vehicle and in the manuals indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

W-2856-0510

The following publications provide information on the safe use and maintenance of the Bobcat utility vehicle and attachments:

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the vehicle is in safe operating condition.
- The Operation & Maintenance Manual delivered with the vehicle or attachment contains operating information as well as routine maintenance and service procedures. It is a part of the vehicle and can be stored in a container provided on the vehicle. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.
- Safety signs (decals) instruct on the safe operation and care of your Bobcat utility vehicle or attachment. The signs and their locations are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat dealer.
- An Operator's Handbook fastened to the operator cab. It's brief instructions are convenient to the operator. The handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.
- The Service Manual and Parts Manual are available from your dealer for use by mechanics to do shop-type service and repair work.
- The Utility Vehicle Operator Training Course is available through your local dealer or at **www.training.bobcat.com** or **www.bobcat.com**. This course is intended to provide rules and practices of correct operation of the Utility Vehicle. The course is available in English and Spanish versions.
- The Utility Vehicle Safety Video is available from your Bobcat dealer or at **www.training.bobcat.com** or **www.bobcat.com**.

SI UV-0510 SM

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-10-2.)

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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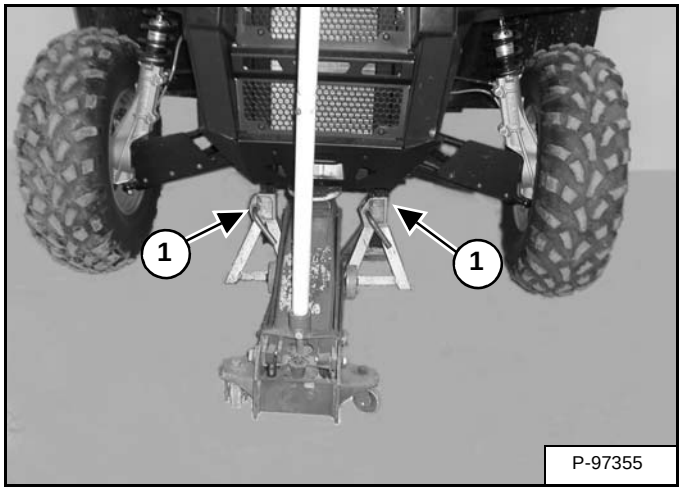
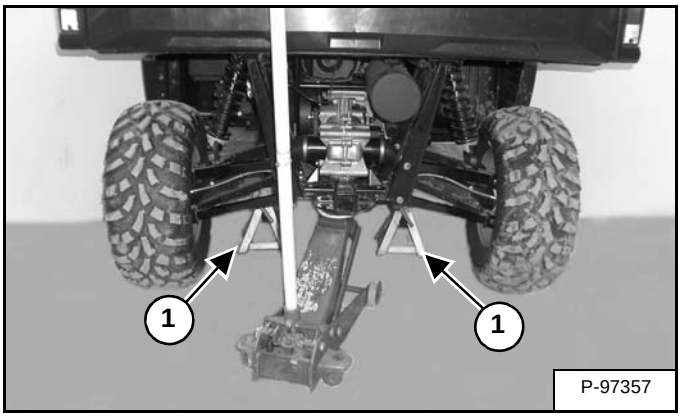
Figure 10-10-1



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].

AIR CLEANER SERVICE

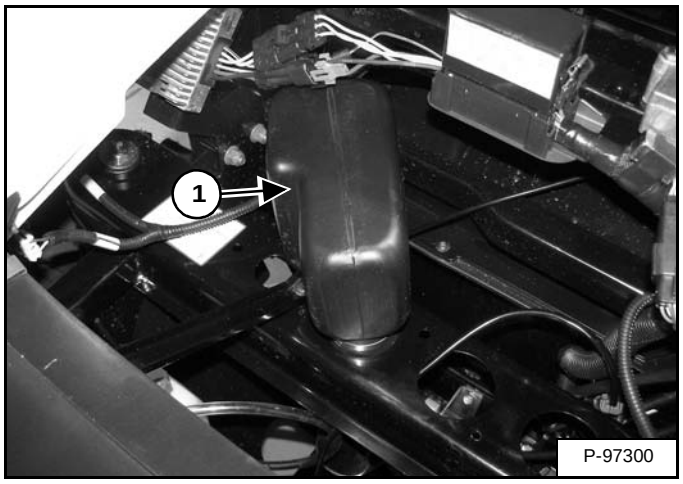
Pre-Filter Element

For the correct service interval of the pre-filter element (See SERVICE SCHEDULE on Page 10-50-1.)

The intake air pre-filter is located under the front cover. The pre-filter traps larger particles before the air reaches the main engine air filter.

Removal

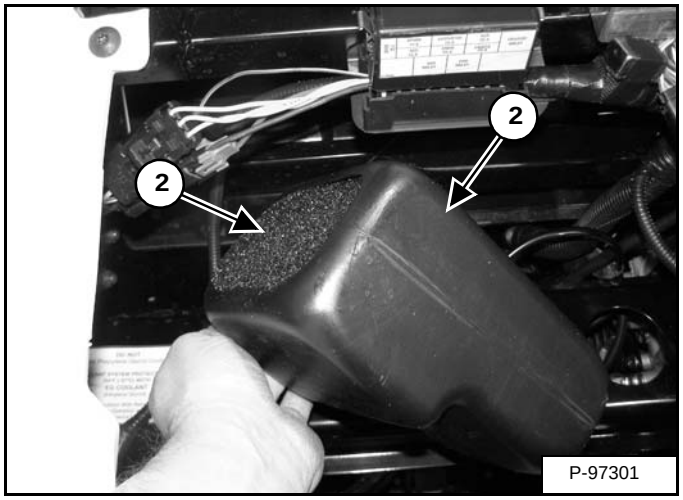
Figure 10-60-1



Remove the front cover.

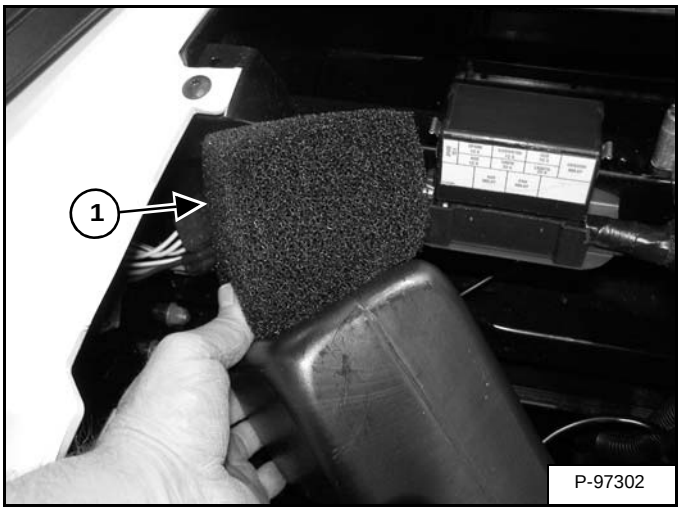
The pre-filter box (Item 1) **[Figure 10-60-1]** is connected to a rubber hose so the box can be relocated to access the element.

Figure 10-60-2



Rotate the box (Item 1) back to access the pre-filter element (Item 2) **[Figure 10-60-2]** for removal.

Figure 10-60-3



NOTE: The fiber pre-filter element must be gently removed from the box to avoid tearing or damaging the element. Inspect the element for damage. If any damage is found, replace the element.

Reach into the box and squeeze the pre-filter element (Item 1) **[Figure 10-60-3]** to collapse it to aid in removal.

DO NOT used compressed air to clean the pre-filter box. Use a clean damp cloth and wipe out the inside of the box.

Cleaning Element

If the element is dirty, clean it with a high flash point solvent, followed by hot soapy water. Rinse and dry the filter element thoroughly. Inspect element for tears or damage. Replace if necessary.

Installation

Squeeze the element (Item 1) **[Figure 10-60-3]** and insert into the box. Make sure the element is properly installed so that it fits snugly back into the box.

Reposition the box (Item 1) **[Figure 10-60-1]** back to its original location.

Reinstall the front cover.

Oil Pump Priming Procedure

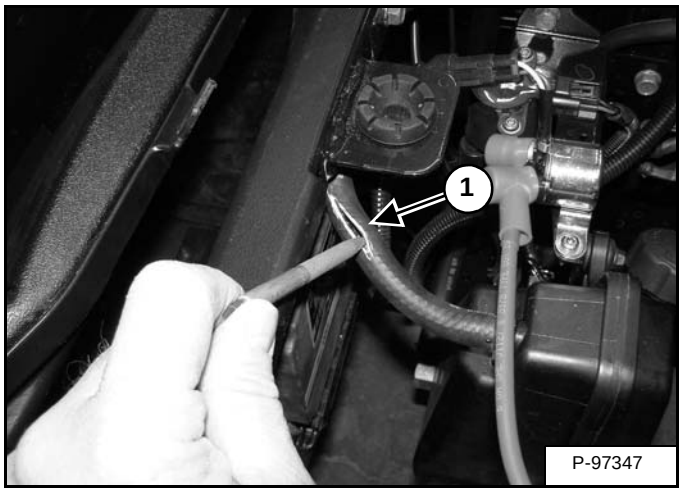
NOTE: The oil pump priming procedure must be performed whenever the oil hose connection between the oil tank and oil pump inlet hose has been disconnected.

Park the vehicle on a flat and level surface.

Move the gear selector to the neutral position, engage the park brake and stop the engine.

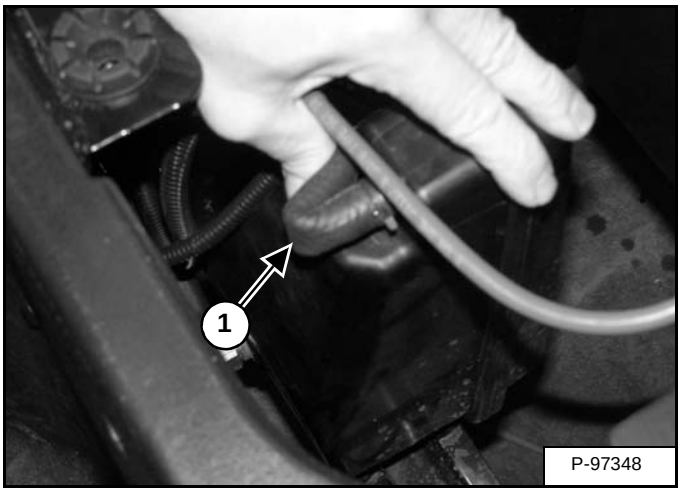
Remove the seat. (See OPERATOR SEAT on Page 30-20-1.)

Figure 10-90-6



NOTE: The oil reservoir vent hose has a pressure relief slit (Item 1) [Figure 10-90-6] cut into the hose from the factory. If replacing this hose, make sure that there is a slit in this hose for proper venting.

Figure 10-90-7



Clamp or pinch off the vent hose approximately two inches from the oil tank (Item 1) **[Figure 10-90-7]** (to avoid the end of the tank fitting), and before the vent hose pressure relief slit (Item 1) **[Figure 10-90-6]**.

Start the engine and run the engine for 10 to 20 seconds. Stop the engine.

Remove the clamp or stop pinching off the hose (Item 1) **[Figure 10-90-7]** and position it back to its original location. The oil pump will now be properly primed and ready for field operation.

NOTE: If the system is primed properly you should hear some air release when the vent hose is unclamped. If not, the system has not primed properly. Repeat the process if necessary.

UTILITY VEHICLE STORAGE AND RETURN TO SERVICE

Storage

Sometimes it may be necessary to store your utility vehicle for an extend period of time. Below is a list of items to perform before storage.

- Thoroughly clean the utility vehicle including the engine compartment.
- Lubricate the utility vehicle as shown in the Operation & Maintenance Manual.
- Replace worn or damaged parts.
- Park the utility vehicle in a dry protected shelter.
- Fill the fuel tank and put fuel stabilizer in the fuel tank. Run the engine 15 - 20 minutes to circulate the stabilizer through the fuel system. (Follow the instructions on the fuel stabilizer container.)

NOTE: If fuel system additive is not used to stabilize the fuel, the fuel system should be completely drained. The engine run until it stops on its own.

- Drain and flush the cooling system. Refill with premixed coolant.
- Replace all fluids and filters (engine, transmission, front gear case, etc.).
- Inspect and clean or replace air filters. Clean the air baffles.
- Put blocks under the frame to remove weight from the tires.
- Remove the spark plug. Using a squeeze bottle and a clear plastic hose, add 2 - 3 tablespoons of engine oil through the spark plug hole. Reinstall the spark plug and torque properly.
- With the spark plug wire removed, turn the engine over several times to force the oil around the cylinder walls and the piston rings leaving a protective film.
- Apply dielectric grease to the inside of the spark plug cap and reinstall on the spark plug.
- Put all controls in neutral position.
- Remove the battery. Be sure the electrolyte level is correct then charge the battery. Store it in a cool, dry place above freezing temperatures and charge it periodically during storage.
- Cover the exhaust pipe opening.
- Tag the utility vehicle to indicate that it is in storage condition.
- Store in a dry, well ventilated area. Do not use plastic or a coated cover over the vehicle. They do not allow enough ventilation to prevent condensation, and may promote corrosion and oxidation.

Return To Service

After the utility vehicle has been in storage, it is necessary to follow a list of items to return the utility vehicle to service.

- Check the engine and transmission oil levels; check coolant level.
- Install a fully charged battery.
- Make sure the spark plug is properly torqued.
- Lubricate the utility vehicle as shown in the Operation & Maintenance Manual.
- Check tire inflation and remove blocks from under frame.
- Remove cover from exhaust pipe opening.
- If the fuel system was drained, add fuel.
- Perform the items listed on daily Inspection.
- Start the engine and let run for a few minutes while observing the instrument panels and systems for correct operation.
- Operate utility vehicle, check for correct function.
- Stop the engine and check for leaks. Repair as needed.

Noise Troubleshooting

Dirt or dust buildup on the brake pads and disc is the most common cause of brake noise (squeal caused by vibration). If cleaning does not reduce the occurrence of brake noise, Permatex™ Disc Brake Quiet can be applied to the back of the pads. Follow directions on the package. This will keep pads in contact with caliper piston(s) to reduce the chance of squeaks caused by dirt or dust.

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.

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BRAKE NOISE TROUBLESHOOTING	
POSSIBLE CAUSE	SOLUTION
Dirt, dust or imbedded material on pads or disc	Spray disc and pads with CRC Brakeleen™ or an equivalent non-flammable aerosol brake cleaner. Remove pads and / or disc hub to clean imbedded material from disc or pads.
Pad(s) dragging on disc (noise or premature pad wear) because of improper adjustment	Adjust pad stop (front calipers)
Master cylinder reservoir overfilled	Set to proper level
Master cylinder compensating port restricted	Clean compensating port
Master cylinder piston not returning completely	Inspect. Repair as necessary
Caliper piston(s) not returning	Clean piston(s) seal
Operating error (riding the brake)	Educate operator
Loose wheel hub or bearings	Check wheel and hub for abnormal movement
Brake disc warped or excessively worn	Replace disc
Brake disc misaligned or loose	Inspect and repair as necessary
Noise is from other source (axle, hub, disc or wheel)	If noise does not change when brake is applied check other sources. Inspect and repair as necessary
Wrong pad for conditions	Change to a softer or harder pad

BRAKE (FRONT)

Pad Removal

Lift and block the machine. (See Procedure on Page 10-10-1.)

⚠ WARNING

Use care when supporting vehicle so that it does not tip or fall. Severe injury may occur if machine tips or falls.

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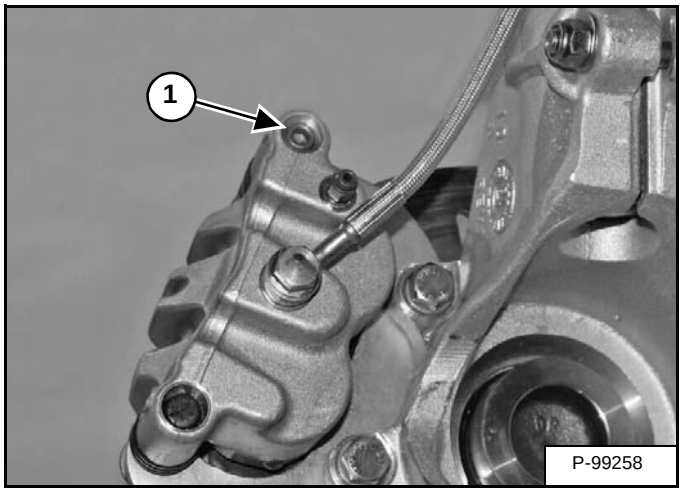
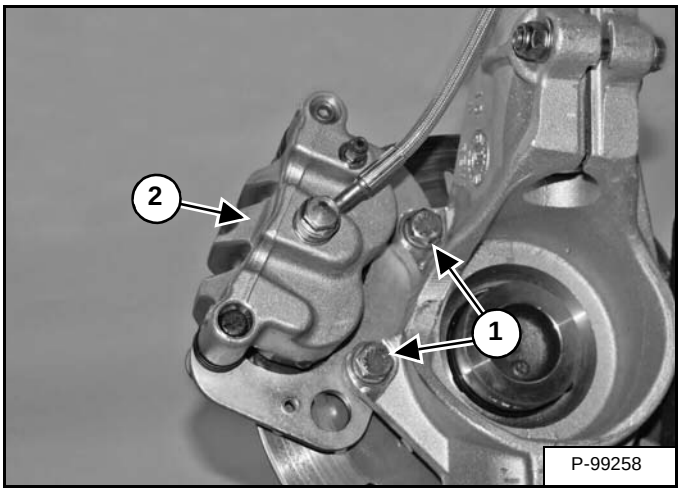
Remove the tire assembly. (See TIRE MAINTENANCE on Page 10-120-1.)

Figure 20-11-1



Loosen the pad adjuster screw (Item 1) **[Figure 20-11-1]** 2 - 3 turns.

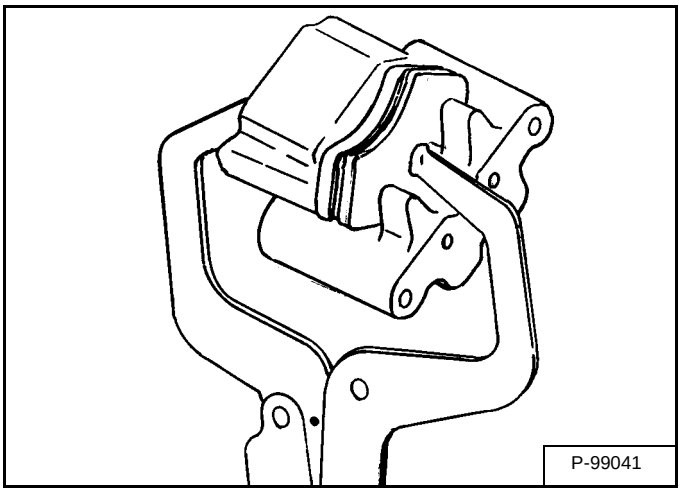
Figure 20-11-2



Remove the upper and lower caliper mounting bolts, lock washers and washers (Item 1) and remove the caliper (Item 2) **[Figure 20-11-2]** from the front hub.

NOTE: When removing caliper, use care not to damage brake line. Support caliper to avoid kinking or bending brake line.

Figure 20-11-3



Push caliper piston into caliper bore slowly using a C-clamp or locking pliers with pads installed **[Figure 20-11-3]**.

NOTE: Brake fluid will be forced through the compensating port into master cylinder fluid reservoir when piston is pushed back into caliper. Remove excess fluid from reservoir as required.

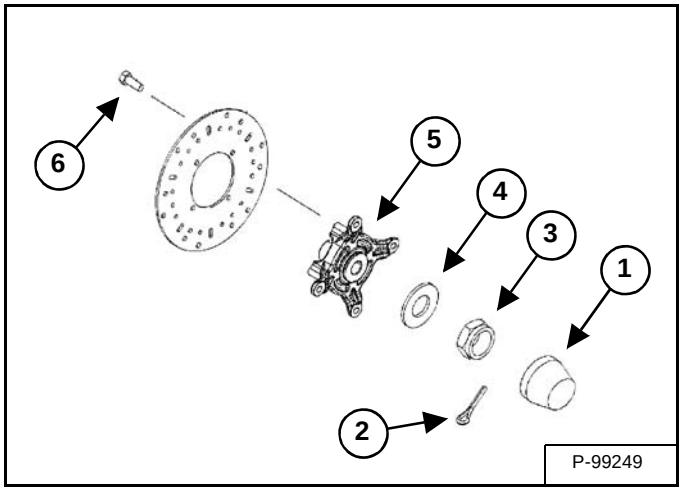
Disc Removal And Installation

Lift and block the machine. (See Procedure on Page 10-10-1.)

Remove the front brake caliper. (See Caliper Removal on Page 20-11-4.)

NOTE: Do not remove the brake line from the caliper.

Figure 20-11-23



Remove dust cap (Item 1), cotter pin (Item 2), castle nut (Item 3) and washers (Item 4) **[Figure 20-11-23]**.

Remove the wheel hub assembly (Item 5) from the vehicle and remove the four bolts (Item 6) **[Figure 20-11-23]** retaining the disc to the hub.

IMPORTANT

Always use new brake disc mounting bolts. The bolts have a pre-applied locking agent which is destroyed upon removal.

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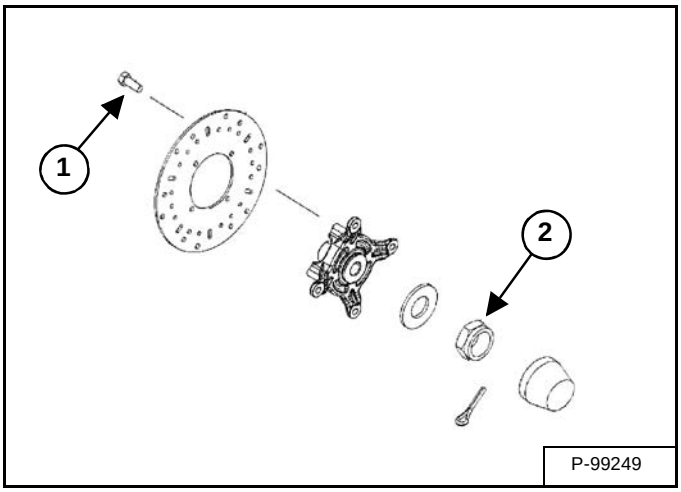
Figure 20-11-24



Clean the wheel hub mating surface and install new disc on wheel hub. Tighten new bolts (Item 1) **[Figure 20-11-24]** to 18 ft.-lb. (24 N•m) torque.

Install wheel hub assembly, washers, and castle nut (Item 1) **[Figure 20-11-24]**. Tighten the castle nut to 60 ft.-lb. (81 N•m) and install a new cotter pin before installing the dust cap.

Install front brake caliper. (See Caliper Installation on Page 20-11-9.) Follow bleeding procedure. (See Bleeding / Fluid Removal And Installation on Page 20-10-9.)

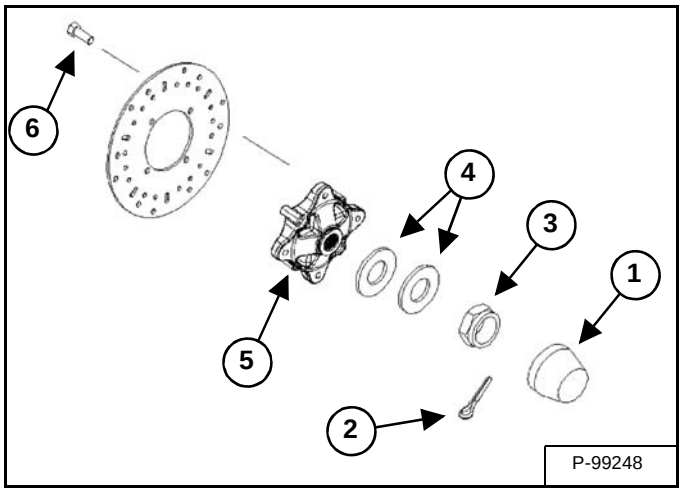
Field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when pedal is released. If the brake drags, re-check assembly and installation.

Disc Removal And Installation

Lift and block the machine. (See Procedure on Page 10-10-1.)

Remove the Rear brake caliper. (See Caliper Removal on Page 20-12-3.)

Figure 20-12-17



Remove dust cap (Item 1), cotter pin (Item 2), castle nut (Item 3) and washers (Item 4) **[Figure 20-12-17]**.

Remove the wheel hub assembly (Item 5) from the vehicle and remove the four bolts (Item 6) **[Figure 20-12-17]** retaining the disc to the hub.

IMPORTANT

Always use new brake disc mounting bolts. The bolts have a pre-applied locking agent which is destroyed upon removal.

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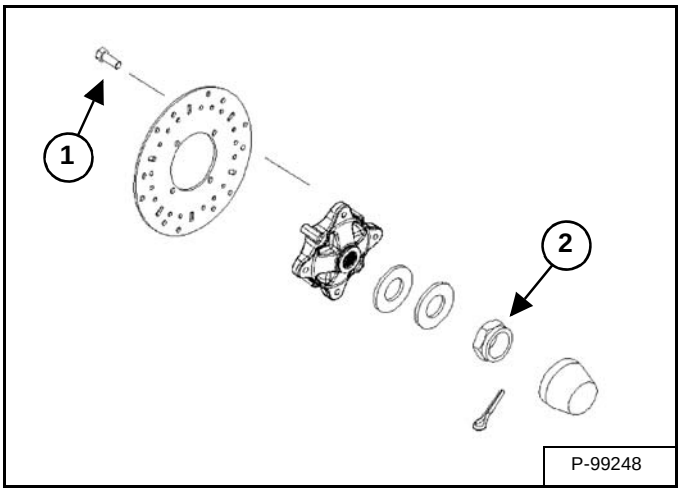
Figure 20-12-18



Clean the wheel hub mating surface and install new disc on wheel hub. Tighten new bolts (Item 1) **[Figure 20-12-18]** to 28 ft.-lb. (38 N•m) torque.

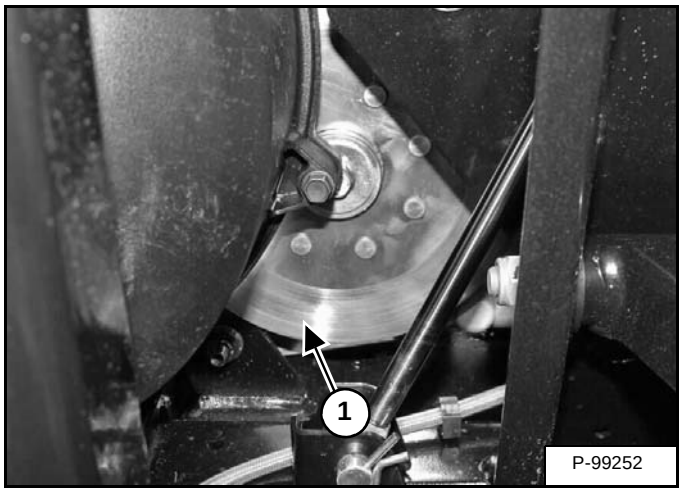
Install wheel hub assembly, washers, and castle nut (Item 2) **[Figure 20-12-18]**. Tighten the castle nut to 110 ft.-lb. (150 N•m) torque and install a new cotter pin before installing the dust cap.

Install Rear brake caliper. (See Caliper Installation on Page 20-12-7.) Follow bleeding procedure. (See Bleeding / Fluid Removal And Installation on Page 20-10-9.)

Field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when pedal is released. If the brake drags, re-check assembly and installation.

Disc Inspection

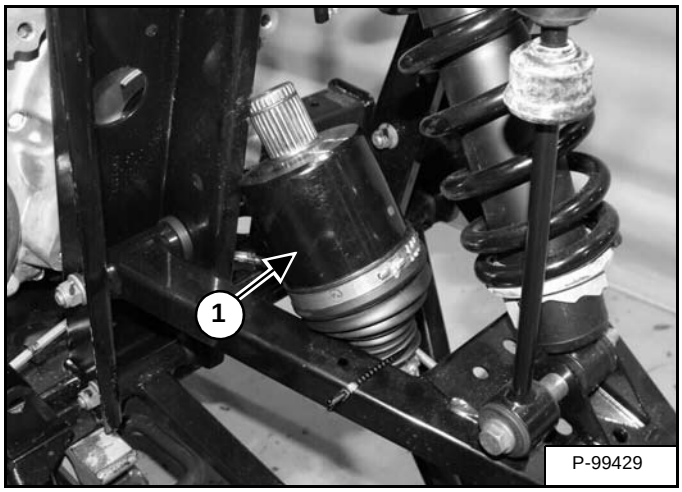
Figure 20-20-17



Measure the parking brake disc (Item 1) **[Figure 20-20-17]** with a micrometer. If the thickness of the disc is less than specified, replace the disc assembly.

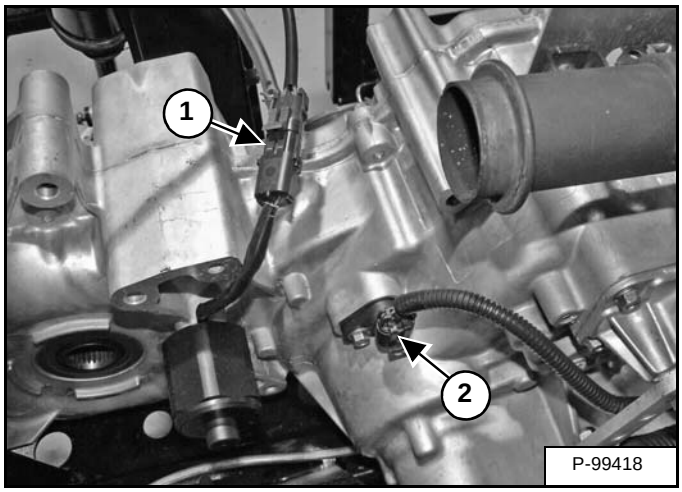
Removal And Installation (Cont'd)

Figure 20-30-17



Retain each rear CV shaft (Item 1) **[Figure 20-30-17]** to the upper A-arm to keep them out of the way during transmission removal.

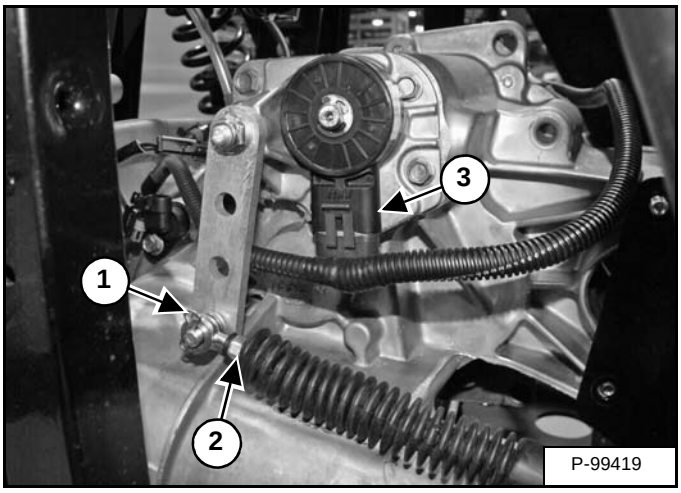
Figure 20-30-18



Disconnect the rear differential solenoid connector (Item 1) **[Figure 20-30-18]** from the harness.

Disconnect the harness (Item 1) **[Figure 20-30-18]** from the speed sensor.

Figure 20-30-19

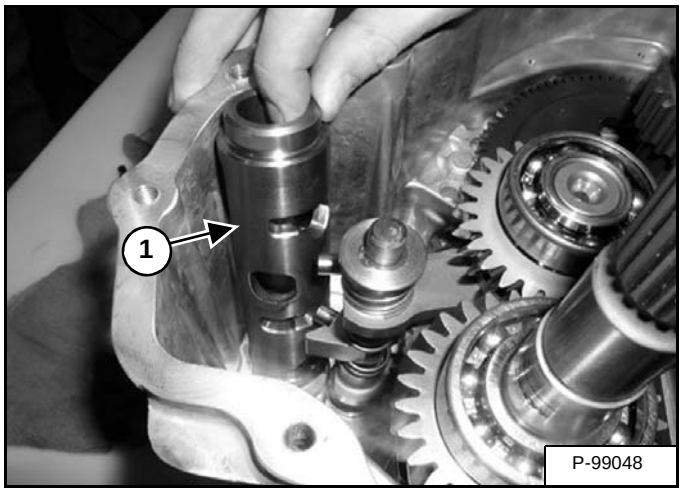


Remove the clip and pin (Item 1) and remove the shift cable (Item 2) **[Figure 20-30-19]** from the transmission bell crank.

Disconnect the harness from the gear selector switch (Item 3) **[Figure 20-30-19]**.

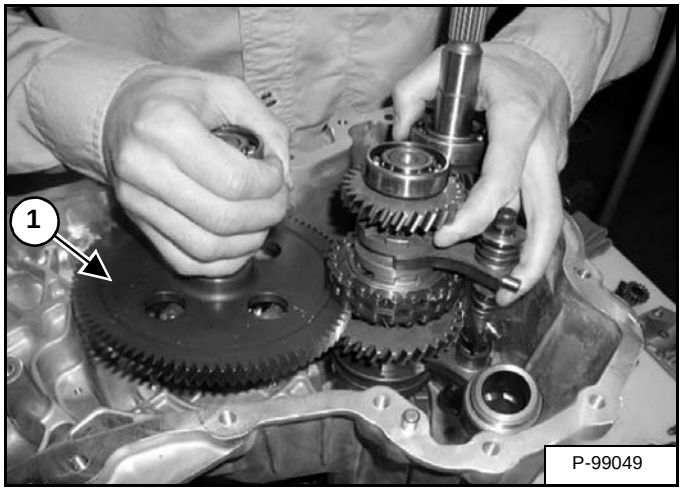
Disassembly (Cont'd)

Figure 20-30-41



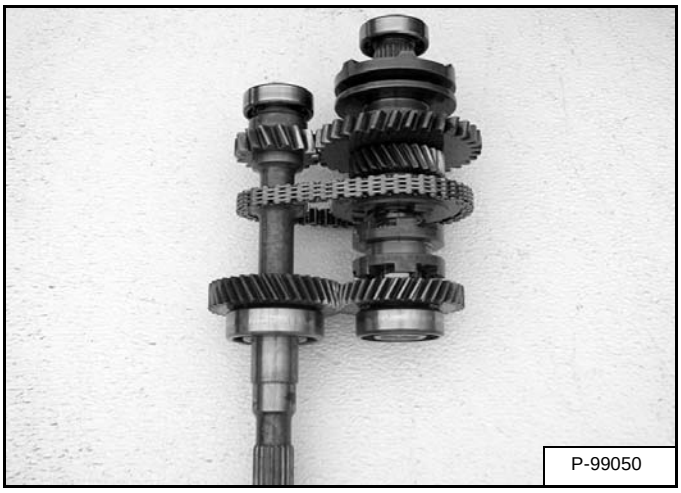
Remove the shift drum (Item 1) **[Figure 20-30-41]** from the gearcase by moving the drum up and to the right to clear the shift shaft.

Figure 20-30-42



Remove the output gear (Item 1) **[Figure 20-30-42]** and gear cluster assembly from the gearcase by pulling both assemblies straight up.

Figure 20-30-43



Place the gear cluster assembly on a clean surface for inspection **[Figure 20-30-43]**.

DRIVE BELT

Removal

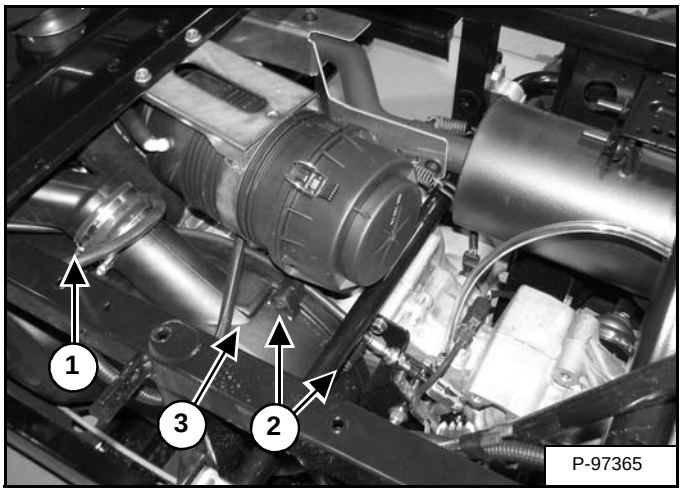
Stop the machine on a flat level surface. Engage the parking brake, put the gear selector in gear (L) and stop the engine.

Allow the belt and clutches to cool.

Raise the cargo box.

Disconnect the negative battery cable.

Figure 20-40-1

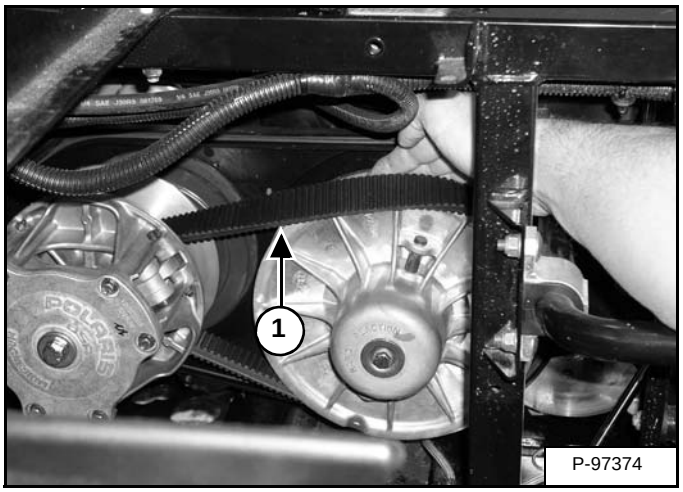


NOTE: Mark the drive belt rotation. If reusing the existing belt, it must be reinstalled so that it rotates in the same direction.

Loosen the clamp (Item 1) **[Figure 20-40-1]**.

Remove the eight bolts (Item 2) and the CVT outer cover (Item 3) **[Figure 20-40-1]**.

Figure 20-40-2



NOTE: Do not allow the belt to be twisted or turned inside out. This damages the internal belt cords and may cause the belt to flip (invert) during usage. If this happens, the belt must be replaced.

IMPORTANT

Do not use any type of tool to remove the drive belt from the clutches or drive belt and / or clutch damage may occur.

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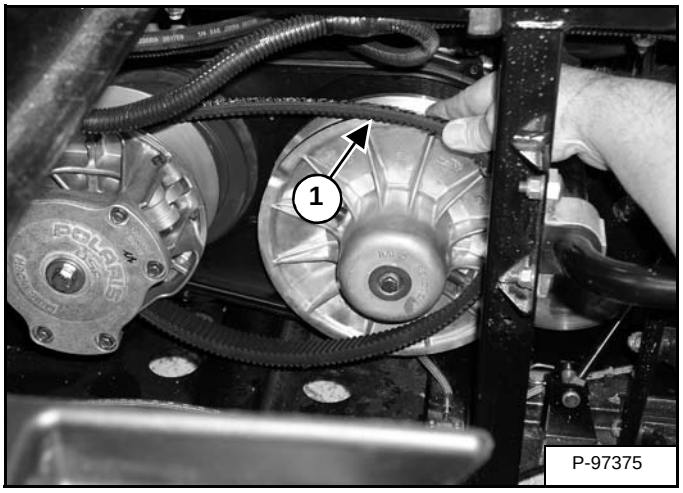
Pull upward and rearward on the belt to open the driven clutch sheaves.

Pull out and down on the belt (Item 1) **[Figure 20-40-2]** to slip the belt over the driven clutch outer sheave.

Figure 20-40-3



Remove the belt from the drive clutch **[Figure 20-40-3]**.

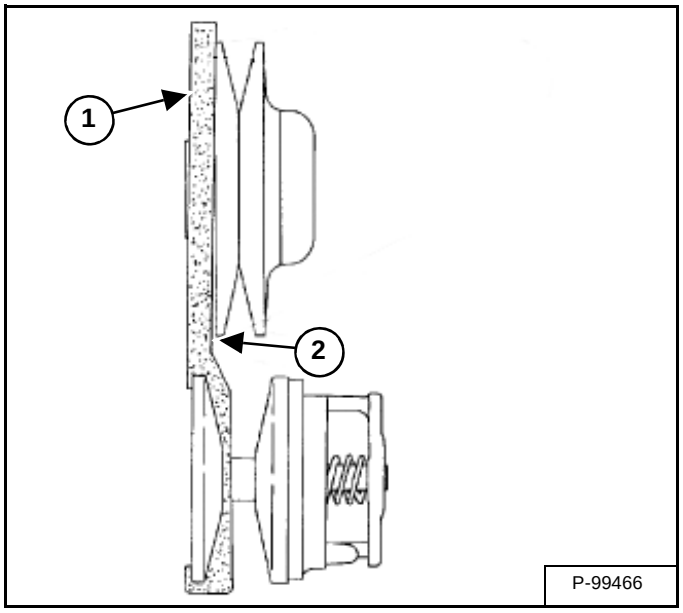
Clutch Alignment

Remove the outer CVT cover. (See CVT (Outer) Cover Removal And Installation on Page 20-50-7.)

Remove the drive belt. (See Removal on Page 20-40-1.)

Order clutch alignment tool (PN 2870654).

Figure 20-50-8



Install the clutch alignment tool (Item 1) **[Figure 20-50-8]** as shown.

With tool touching rear of driven clutch inner sheave, the distance at (Item 2) **[Figure 20-50-8]** should be 1/8 inch.

If the distance is greater than 1/8 in. or less than 1/16 in., clutch alignment must be adjusted as follows:

Remove the drive clutch. (See Removal And Installation on Page 20-51-1.)

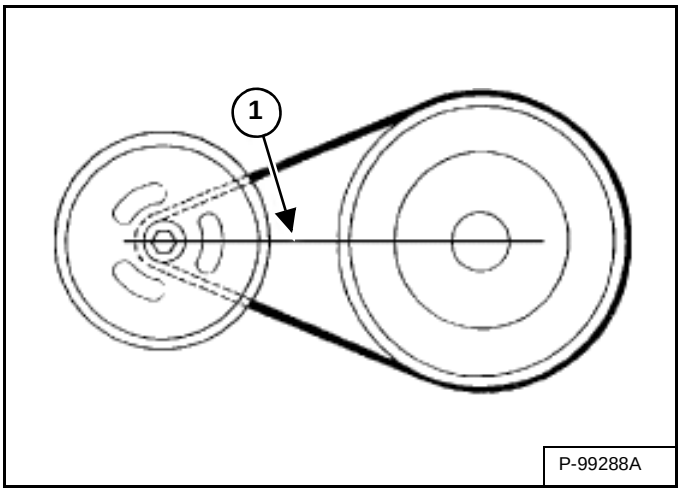
Remove the driven clutch. (See Removal And Installation on Page 20-52-1.)

Remove the Inner CVT cover. (See CVT (Inner) Cover Removal And Installation on Page 20-50-8.)

Loosen all engine mounts. Move front of engine to the right or left slightly until alignment is correct.

Tighten engine mounts and verify alignment is correct.

Figure 20-50-9

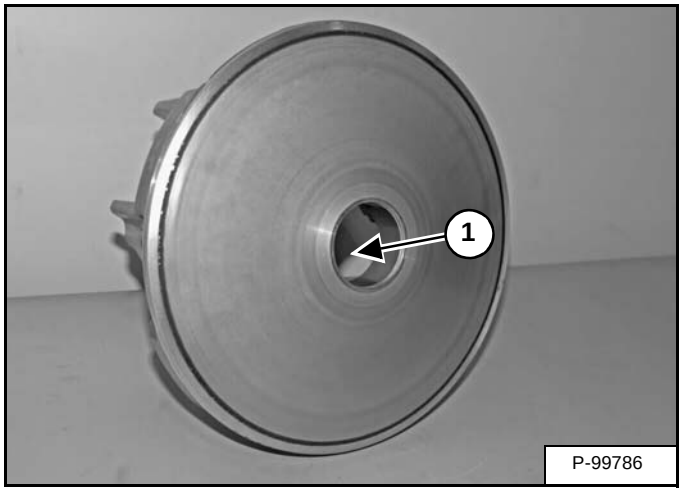


Measure belt deflection and measure offset both above and below centerline (Item 1) **[Figure 20-50-9]**. Adjust if necessary. (See Clutch Offset on Page 20-50-10.)

NOTE: On some models, minor adjustments can be made by adding shims between the frame and front lower left engine mount to increase the distance at (Item 1). If a shim is present, it can be removed to decrease the distance at (Item 1) [Figure 20-50-9].

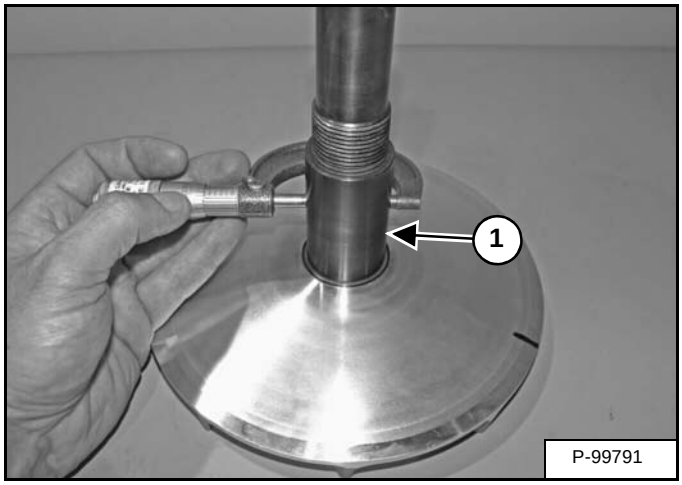
Disassembly (Cont'd)

Figure 20-51-20



Inspect the Teflon™ coating on the moveable sheave bushing (Item 1) **[Figure 20-51-20]**. Replace the cover bushing if more brass then Teflon™ is visible on the bushing. (See Moveable Sheave Bushing Removal And Installation on Page 20-51-10.)

Figure 20-51-21



Inspect the surface of the shaft (Item 1) **[Figure 20-51-21]** for pitting, grooves or damage. Measure the outside diameter of the shaft. If there is more than 0.002 in. (0,0508 mm) difference on the shaft or any wear or damage is present, replace the drive clutch assembly.

Disassembly

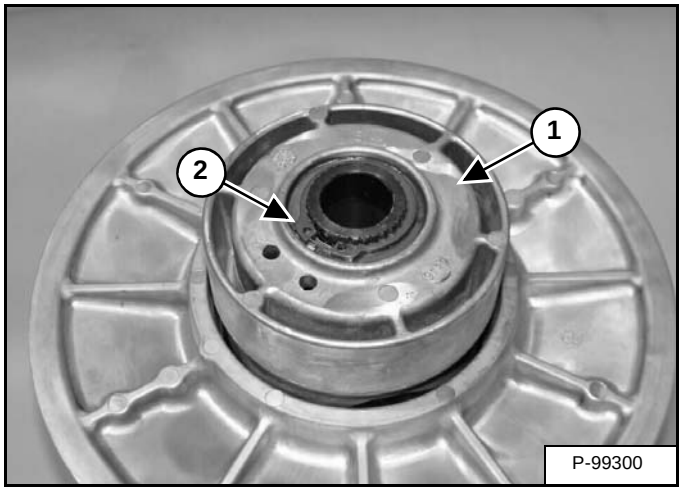
⚠ WARNING

Wear safety glasses to prevent eye injury when any of the following conditions exist:

- **Pressurized fluids and springs or other stored energy components.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

W-2505-0604

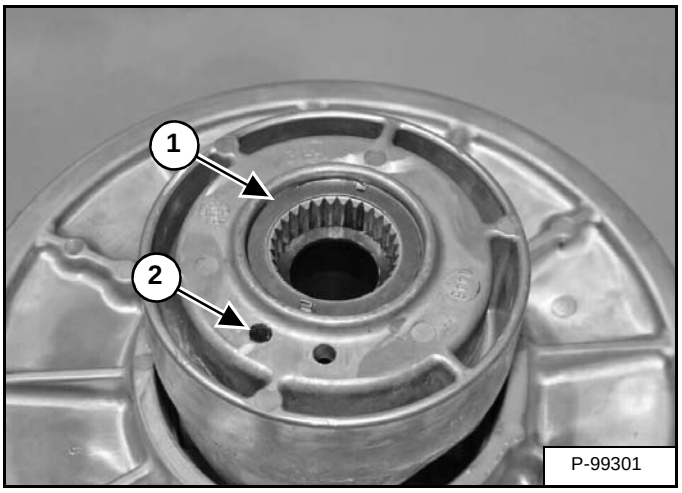
Figure 20-52-4



Apply and hold downward pressure on the helix (Item 1) **[Figure 20-52-4]**.

Remove snap ring (Item 2) **[Figure 20-52-4]**.

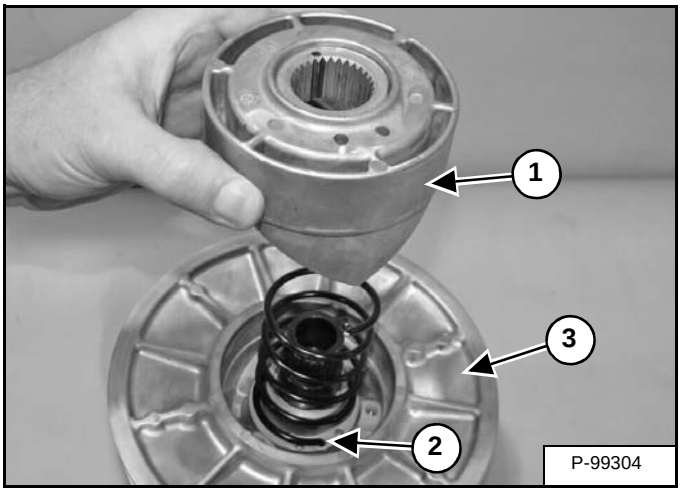
Figure 20-52-5



Remove snap ring retainer (Item 1) **[Figure 20-52-5]**.

Note the location of the spring (Item 2) **[Figure 20-52-5]** on the helix.

Figure 20-52-6



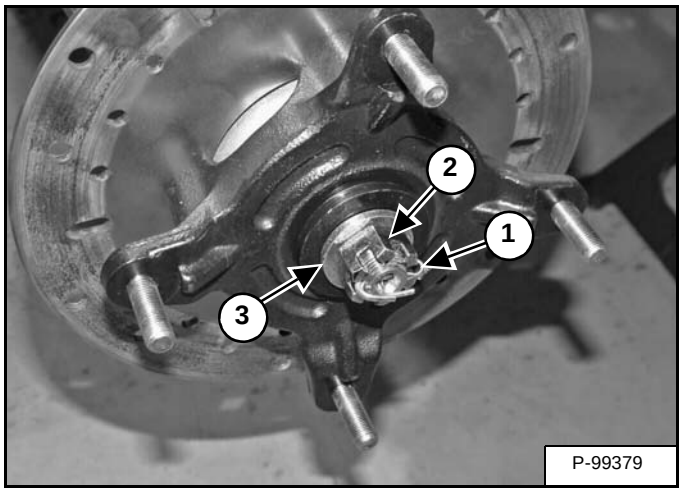
Remove the helix (Item 1) and note the location of the spring (Item 2) in the moveable sheave (Item 3) **[Figure 20-52-6]**.

Remove the spring.

Check alignment of tabs on spring (Item 2) **[Figure 20-52-6]**. Replace spring if tabs are misaligned or the spring coils are distorted.

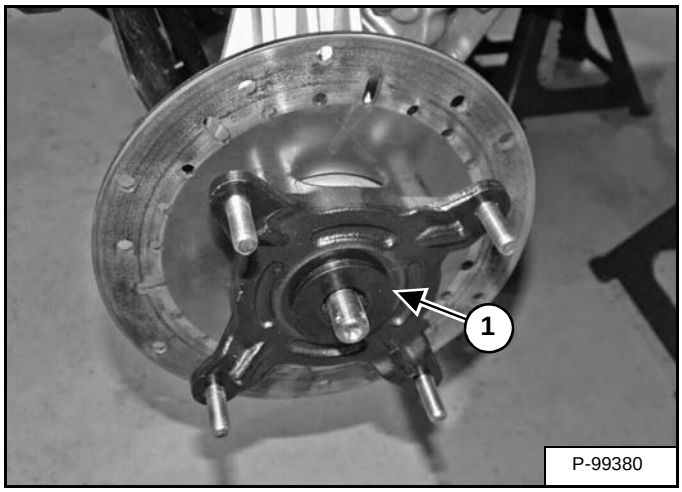
Front Hub And Spindle Removal (Cont'd)

Figure 20-60-4



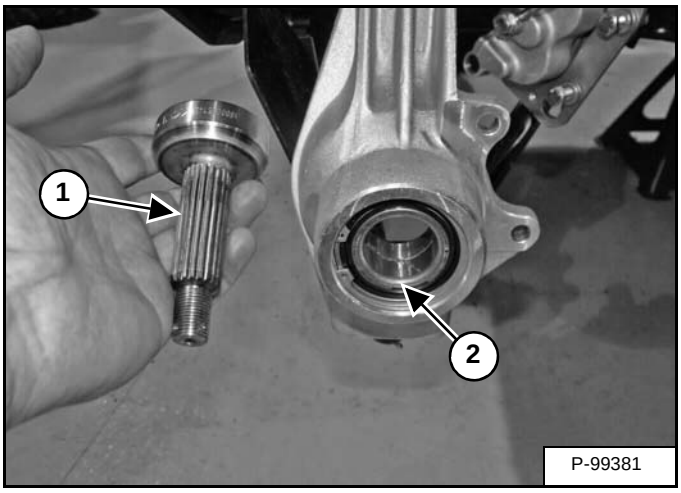
Remove the cotter pin (Item 1), castle nut (Item 2) and washers (Item 3) **[Figure 20-60-4]**.

Figure 20-60-5



Remove the hub assembly (Item 1) **[Figure 20-60-5]**.

Figure 20-60-6

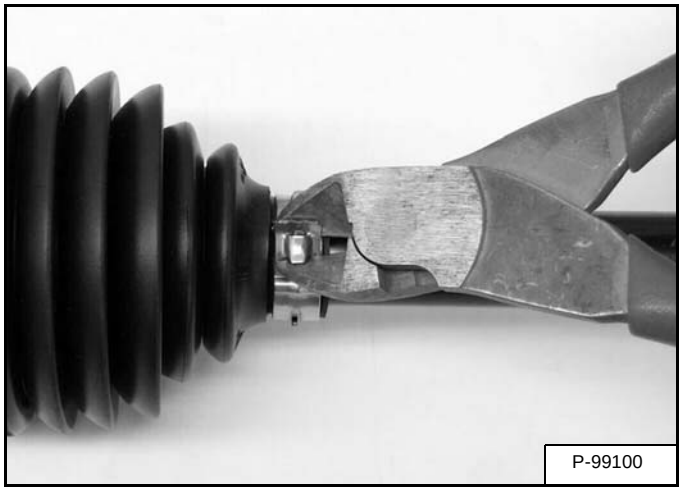


Remove the spindle (Item 1) from the backside of the strut. Rotate each bearing (Item 2) **[Figure 20-60-6]** by hand and check for smooth rotation. Visually inspect bearing for moisture, dirt, or corrosion. Replace bearing if moisture, dirt, corrosion, or roughness is evident. Inspect the spindle splines for wear.

Outer CV Joint And Boot Removal And Installation

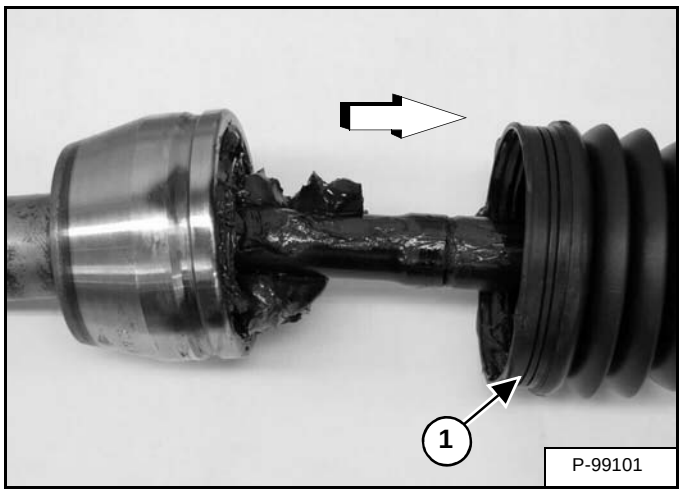
Order Axle Boot Clamp Tool (Mel 1644).

Figure 20-60-35



Using a side cutters, cut away and discard the boot clamps **[Figure 20-60-35]**.

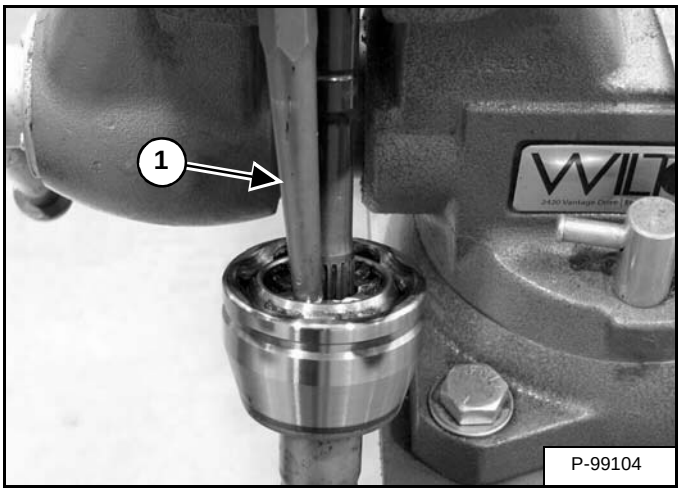
Figure 20-60-36



Remove the large end of the boot (Item 1) **[Figure 20-60-36]** from the CV joint and slide the boot down the shaft.

Clean the grease from the face of the joint.

Figure 20-60-37

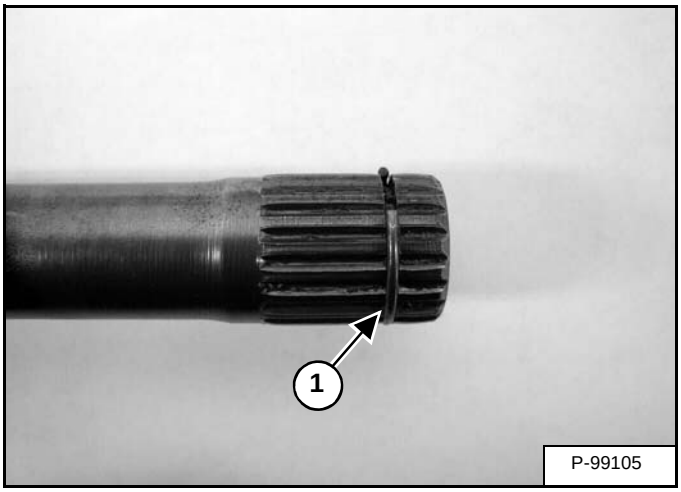


Place the drive shaft in a soft-jawed vise.

Using a soft-faced hammer, or brass drift (Item 1) **[Figure 20-60-37]**, strike the inner race of the joint to drive the joint off the drive shaft. Be sure to tap evenly around the joint to prevent binding.

NOTE: Tap on inner race only!

Figure 20-60-38



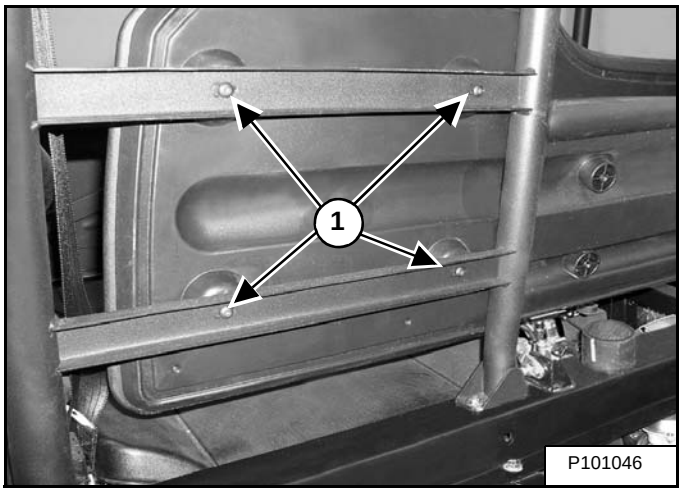
Make sure the circlip (Item 1) **[Figure 20-60-38]** is on the shaft and not left in the joint.

Remove the CV boot from the shaft.

OPERATOR SEAT

Seat Back Removal And Installation

Figure 30-20-1



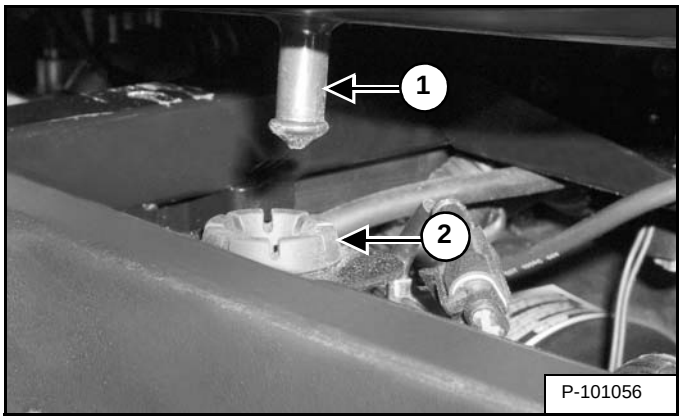
Remove the four screws (Item 1) **[Figure 30-20-1]** that secure the back (both sides).

Installation: Tighten the screws to 18 - 20 in.-lb. (2 - 2,5 N•m) torque.

Remove the seat back.

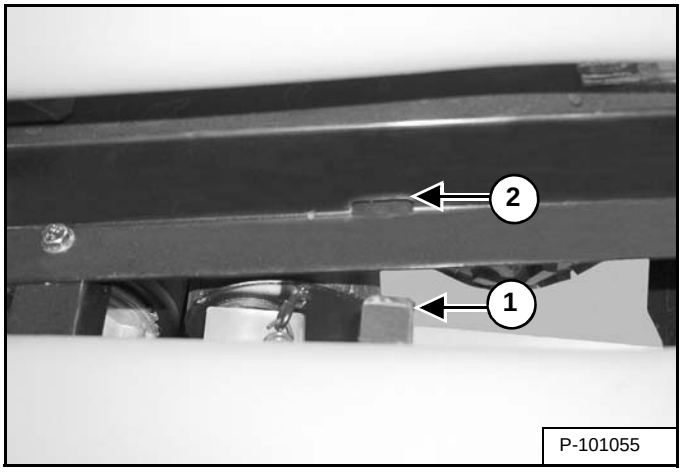
Seat Base Removal And Installation

Figure 30-20-2



Pull up the front of the seat until the guide pin (Item 1) is free from the grommet (Item 2) **[Figure 30-20-2]**.

Figure 30-20-3



Slide the seat forward until the two tabs (Item 1) are free from the notch (Item 2) **[Figure 30-20-3]** in the frame.

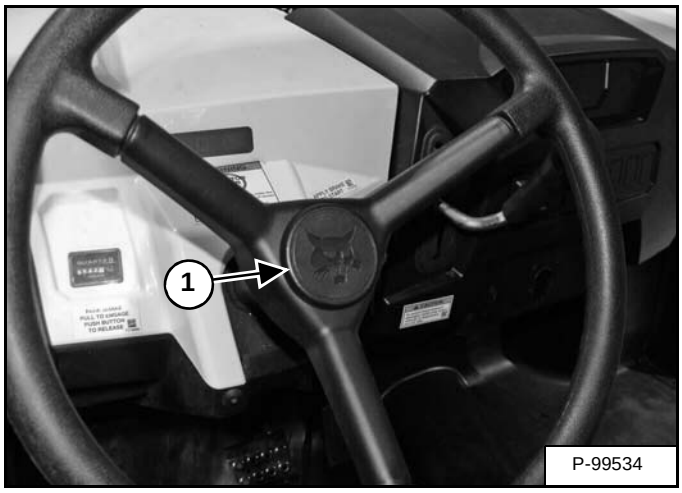
Remove seat base.

STEERING COLUMN

Removal And Installation

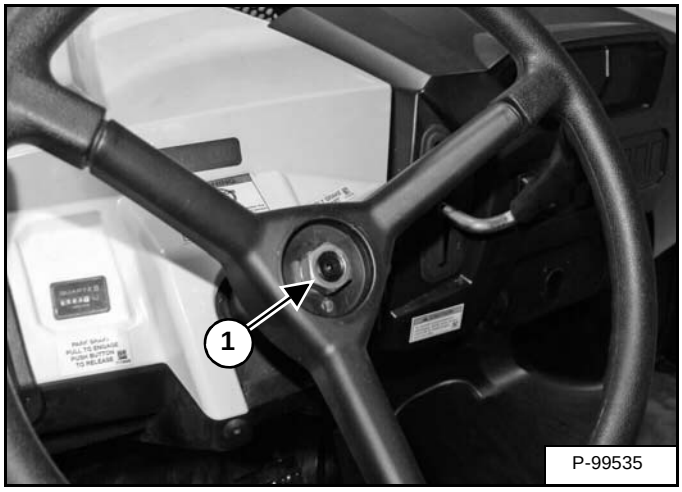
Remove the front access cover. (See Front Access Cover Removal And Installation on Page 30-30-1.)

Figure 30-60-1



Remove the steering wheel nut cover (Item 1) **[Figure 30-60-1]**.

Figure 30-60-2

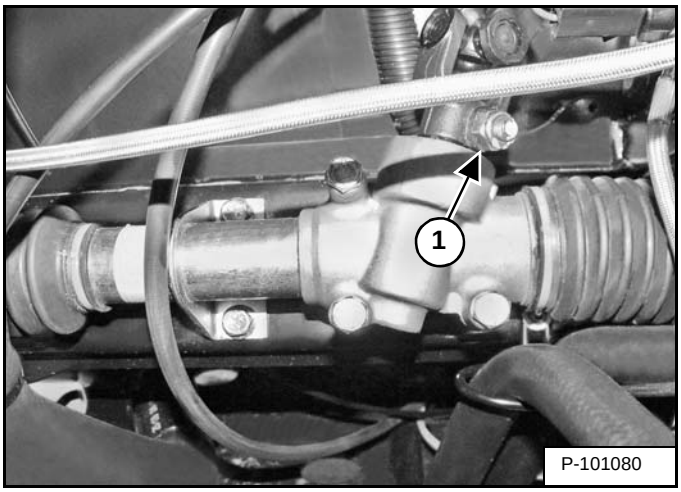


Remove the nut (Item 1) **[Figure 30-60-2]** from the steering wheel.

Remove the steering wheel.

Installation: Apply Loctite® and tighten the nut to 28 ft.-lb. (38 N•m) torque.

Figure 30-60-3



Remove the nut (Item 1) **[Figure 30-60-3]** from the coupler.

Installation: Tighten the bolt to 30 ft.-lb. (41 N•m) torque.

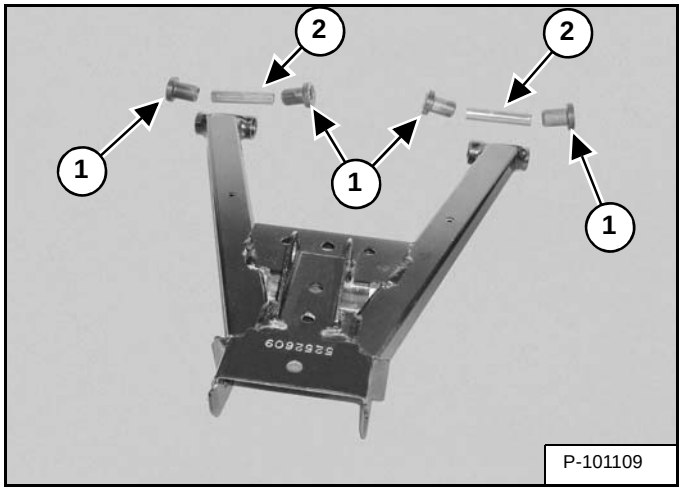
Installation: Apply Loctite® 242 or equivalent thread locker to the threads of the bolt when installing.

Slide the steering column towards the floor to remove from the dash.

Inspection

NOTE: The inspection procedure is the same for all control arms.

Figure 30-100-9

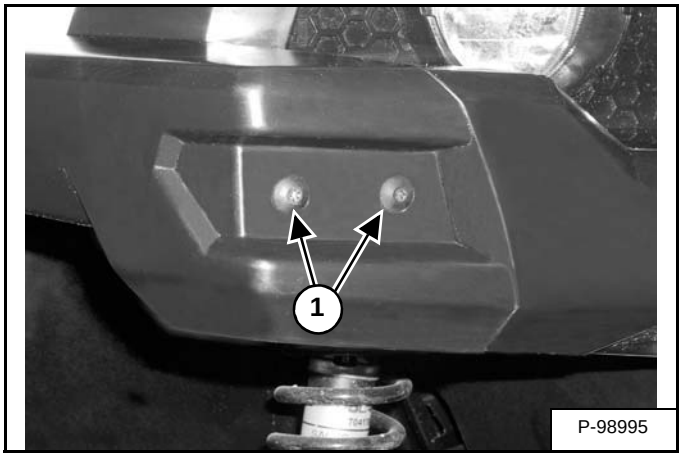


Inspect the bushings (Item 1) and shaft (Item 2) **[Figure 30-100-9]** for wear or damage and replace as needed.

Flare Removal And Installation

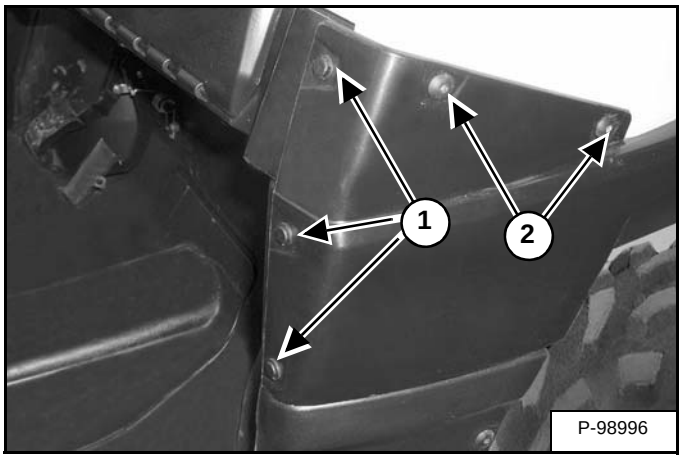
NOTE: Right flare shown. Procedures are the same for the left side.

Figure 30-140-8



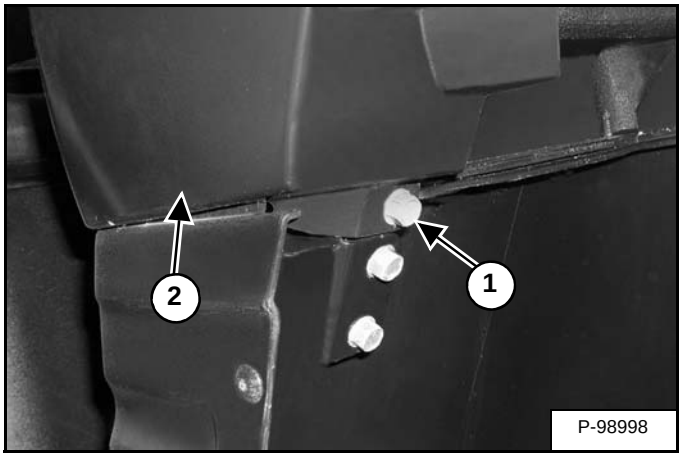
Remove the two screws (Item 1) **[Figure 30-140-8]**.

Figure 30-140-9



Remove the plastic rivets (Item 1) and two screws (Item 2) **[Figure 30-140-9]**.

Figure 30-140-10



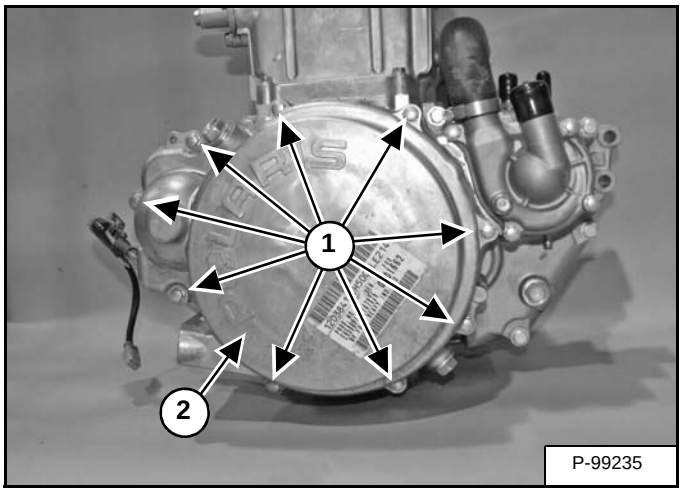
Remove the bolt (Item 1) and fender flare (Item 2) **[Figure 30-140-10]**.

Description

The utility vehicle has a 12 volt, negative ground charging system. The electrical system is protected by fuses and relays. The fuses will protect the electrical system when there is an electrical overload which could lead to burned up harness or machine damage. The reason for the overload must be found and corrected before starting the engine again.

Stator Plate Assembly Removal

Figure 40-30-4

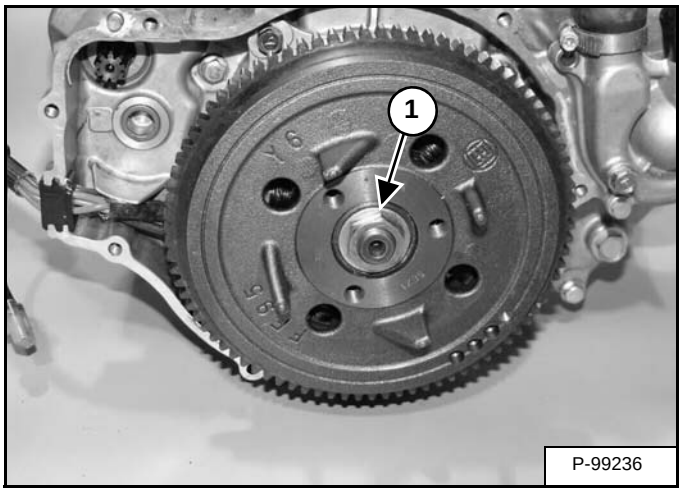


Remove the magneto housing bolts (Item 1) **[Figure 40-30-4]**.

NOTE: Engine shown removed for photo clarity. The procedure can be accomplished in the machine.

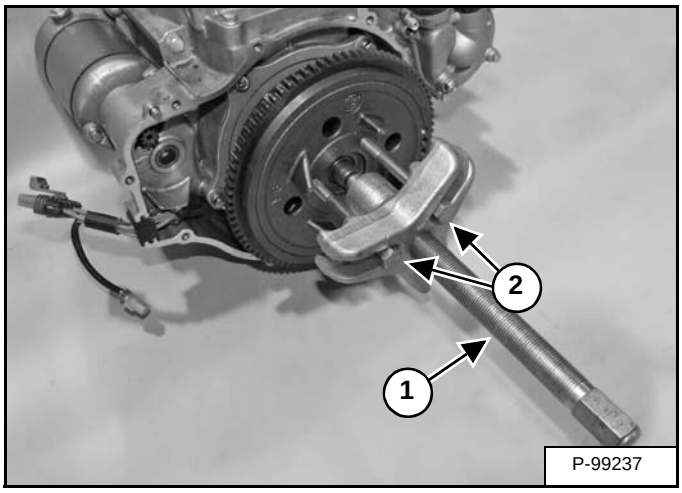
Remove the magneto housing (Item 2) **[Figure 40-30-4]**.

Figure 40-30-5



Remove the flywheel nut (Item 1) **[Figure 40-30-5]** and washer.

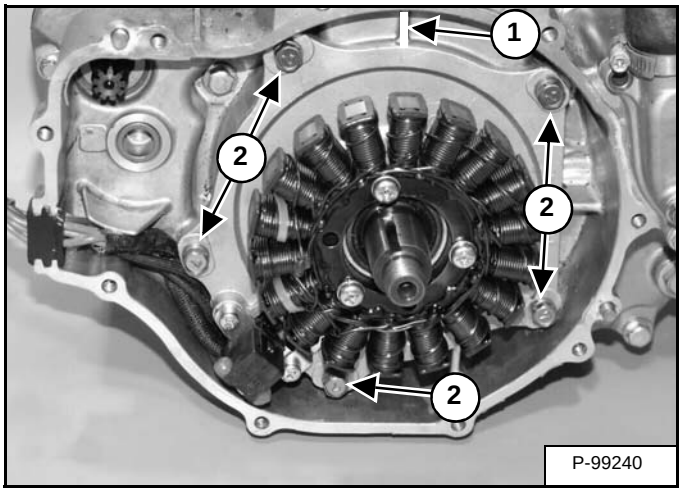
Figure 40-30-6



Install a flywheel puller (Item 1) **[Figure 40-30-6]**.

Do not thread the puller bolts (Item 2) **[Figure 40-30-6]** more than 0.25 in. (0,635 cm) into the flywheel or stator coils may be damaged.

Figure 40-30-7



Mark the position of the stator plate and crankcase (Item 1).

Remove the bolts (Item 2) **[Figure 40-30-7]**.

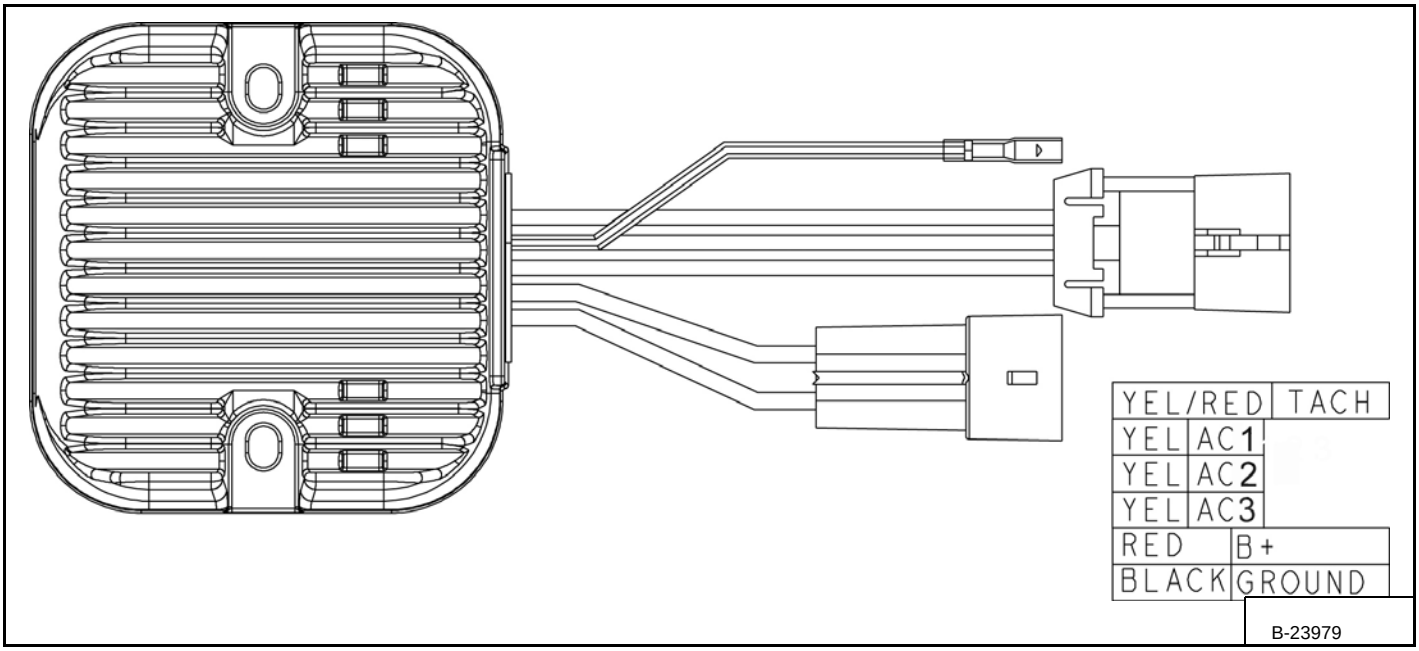
Remove the stator plate assembly.

REGULATOR / RECTIFIER

Testing

Remove the regulator / rectifier.

NOTE: The regulator / rectifier must be cool for accurate testing.



RED LEAD	BLACK LEAD	RESULT
AC - 1 (3-wire connector)	AC - 2 (3-wire connector)	Open Circuit
AC - 2 (3-wire connector)	AC - 3 (3-wire connector)	Open Circuit
AC - 1 (3-wire connector)	AC - 3 (3-wire connector)	Open Circuit
AC - 2 (3-wire connector)	AC - 1 (3-wire connector)	Open Circuit
AC - 3 (3-wire connector)	AC - 1 (3-wire connector)	Open Circuit
AC - 3 (3-wire connector)	AC - 2 (3-wire connector)	Open Circuit
RED Battery + (2-wire connector)	BLACK Ground (2-wire connector)	Open Circuit
BLACK Ground (2-wire connector)	RED Battery + (2-wire connector)	2300mV to 2400mV
BLACK Ground (2-wire connector)	Regulator / Rectifier Case	Closed Circuit (continuity)
BLACK Ground (2-wire connector)	Any Phase	Open Circuit
AC - 1 (3-wire connector)	BLACK Ground (2-wire connector)	Open Circuit
AC - 2 (3-wire connector)	BLACK Ground (2-wire connector)	2200mV to 2300mV
AC - 3 (3-wire connector)	BLACK Ground (2-wire connector)	Open Circuit
RED Battery + (2-wire connector)	Any Phase	Open Circuit
AC - 1 (3-wire connector)	RED Battery + (2-wire connector)	400mV to 500mV
AC - 2 (3-wire connector)	RED Battery + (2-wire connector)	400mV to 500mV
AC - 3 (3-wire connector)	RED Battery + (2-wire connector)	400mV to 500mV


Bobcat®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Specifications (Engine Model EH460PLE040)

Cylinder Head

Item	Factory Specification	Allowable Limit
Cylinder Warpage Limit		0.002 in. (0,05 mm)
Standard Height	3.855 in. (97,92 mm)	-
Compression Pressure	50 - 90 PSI 3,45 - 6,21 bar	-

Valves

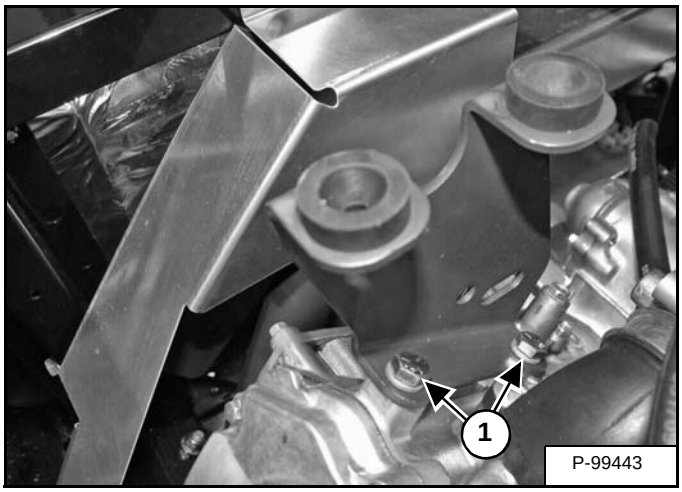
Item		Factory Specification	Allowable Limit
Valve Seat Contacting Width	IN. EX.	0.028 in. (0,7 mm) 0.039 in. (1,0 mm)	0.055 in. (1,4 mm) 0.071 in. (1,8 mm)
Valve (Margin Thickness)	IN. EX.	0.039 in. (1,0 mm) 0.047 in. (1,2 mm)	0.031 in. (0,8 mm) 0.031 in. (0,8 mm)
Valve Stem O.D.	IN.	0.2343 - 0.2348 in. (5,950 - 5,965 mm)	-
	EX.	0.2341 - 0.2346 in. (5,945 - 5,960 mm)	-
Valve (Stem Oil Clearance)	IN.	0.0014 - 0.0024 in. (0,035 - 0,062 mm)	0.0059 in. (0,15 mm)
	EX.	0.0016 - 0.0026 in. (0,040 - 0,067 mm)	0.0059 in. (0,15 mm)
Valve (Overall Length)	IN. EX.	3.976 in. (101,0 mm) 3.984 in. (101,2 mm)	-
Valve Guide I.D.		0.2362 - 0.2367 in. (6,0 - 6,012 mm)	-
Valve Guide (Protrusion Above Head)		0.689 - 0.709 in. (17,5 - 18,0 mm)	-

Valve Springs

Item	Factory Specification	Allowable Limit
Valve Spring (Overall Length)	1.654 in. (42,0 mm)	1.575 in. (40,0 mm)
Valve Spring (Squareness)	0.075 in. (1,9 mm)	-

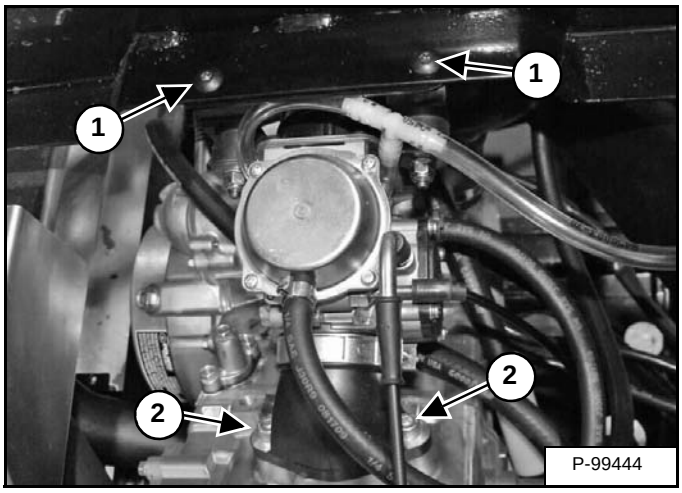
Engine Removal And Installation (Cont'd)

Figure 50-10-4



Remove the two bolts (Item 1) and remove the seat base support bracket (Item 2) **[Figure 50-10-4]**.

Figure 50-10-5



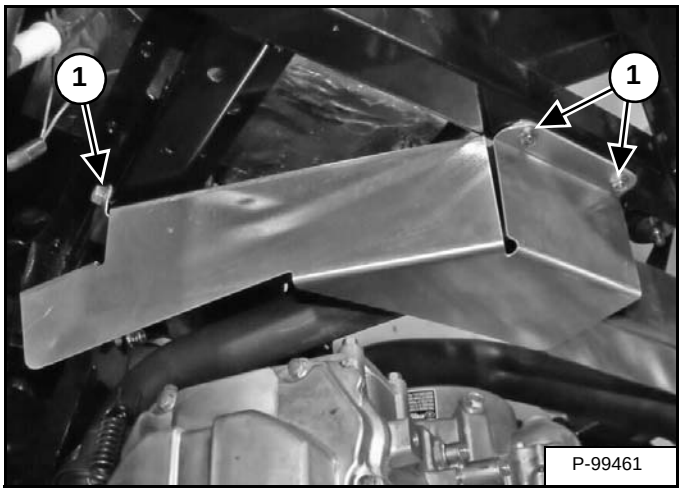
Remove the two bolts (Item 1) **[Figure 50-10-5]** which secure the carburator dampening bracket.

Remove the two bolts (Item 2) **[Figure 50-10-5]** from the carburator flange.

Move the carburetor assembly out of the way.

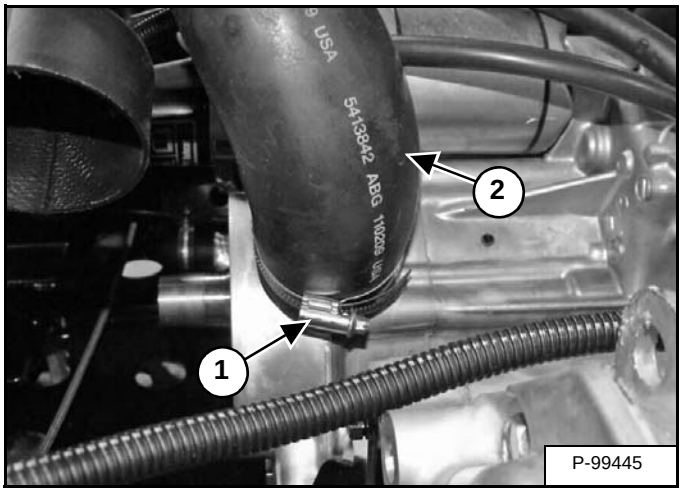
Cover the intake manifold with tape or insert a shop towel to prevent dirt from entering the intake port.

Figure 50-10-6



Remove the three screws (Item 1) and remove the exhaust shield (Item 2) **[Figure 50-10-6]** from the vehicle.

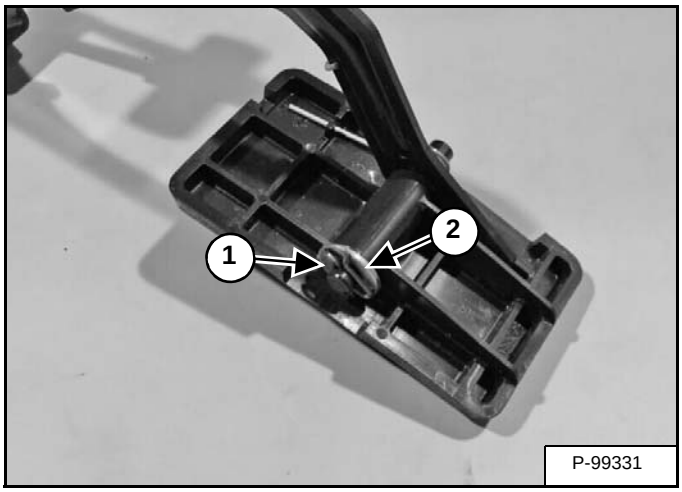
Figure 50-10-7



Loosen the clamp (Item 1) and remove the CVT inlet hose (Item 2) **[Figure 50-10-7]** from the vehicle.

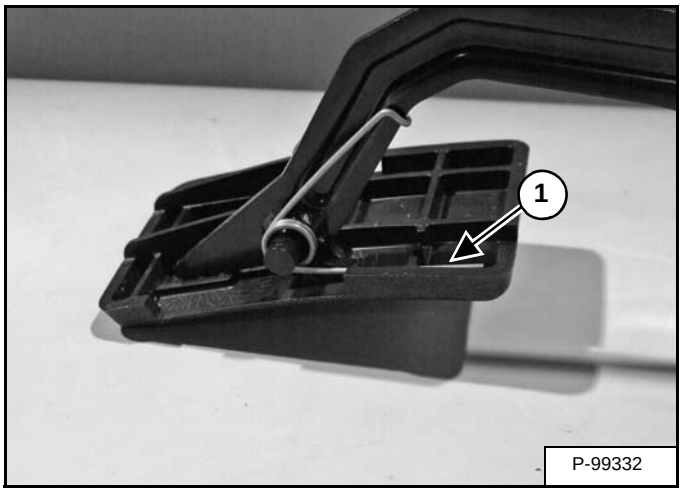
Throttle Pedal Removal And Installation (Cont'd)

Figure 50-20-5



Remove the clip (Item 1) and washer (Item 2) **[Figure 50-20-5]**.

Figure 50-20-6



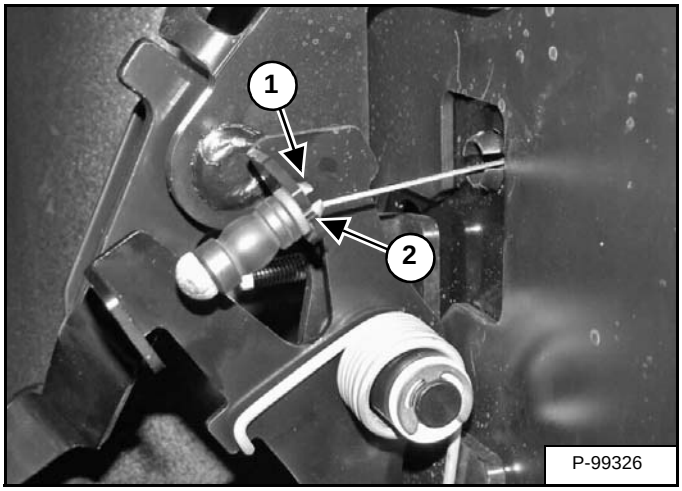
Lift the spring (Item 1) and remove the pedal (Item 2) **[Figure 50-20-6]**.

Check all components for wear or damage and replace as needed.

Throttle Cable Removal And Installation

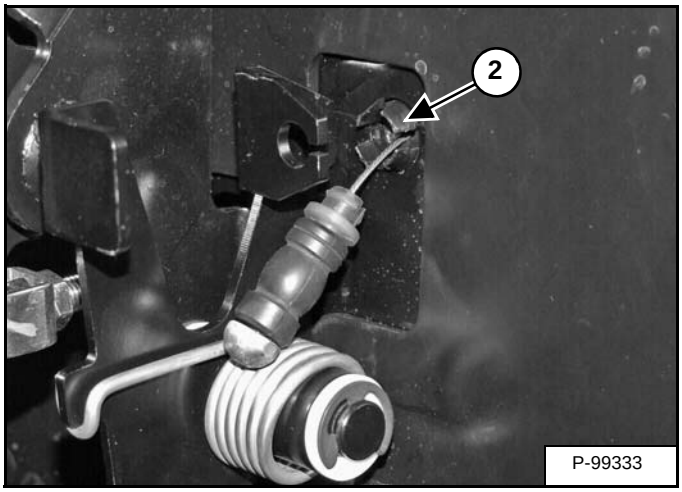
Remove the seat.

Figure 50-20-7



Compress the tabs (Item 1) and remove the cable through the slot (Item 2) **[Figure 50-20-7]**.

Figure 50-20-8

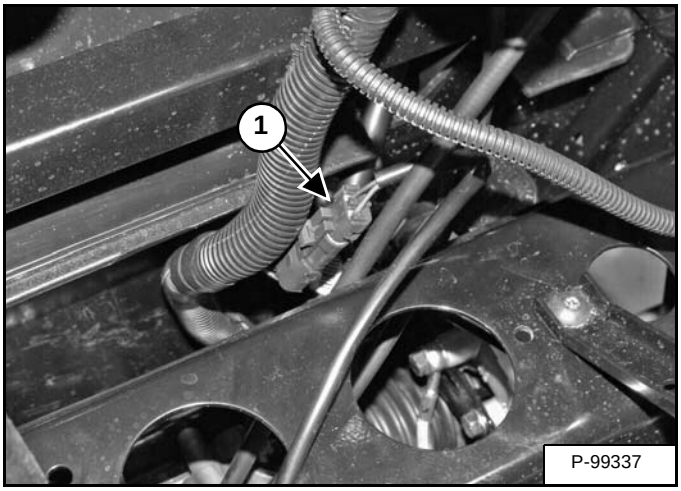


Compress the tabs (Item 1) **[Figure 50-20-8]** and feed the cable through the hole.

Cooling Fan Removal And Installation

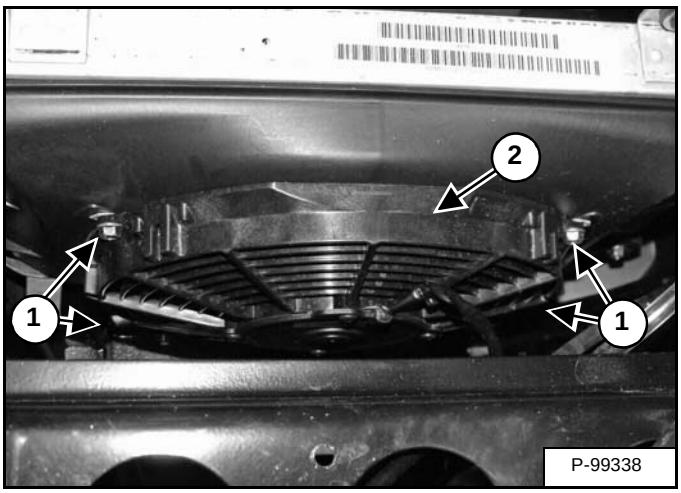
Remove the hood.

Figure 50-50-8



Disconnect the cooling fan electrical connector (Item 1) **[Figure 50-50-8]**.

Figure 50-50-9



Remove the four bolts (Item 1) securing the cooling fan (Item 2) **[Figure 50-50-9]** to the shroud.

Remove the cooling fan.


Bobcat®

Choke Cable Adjustment

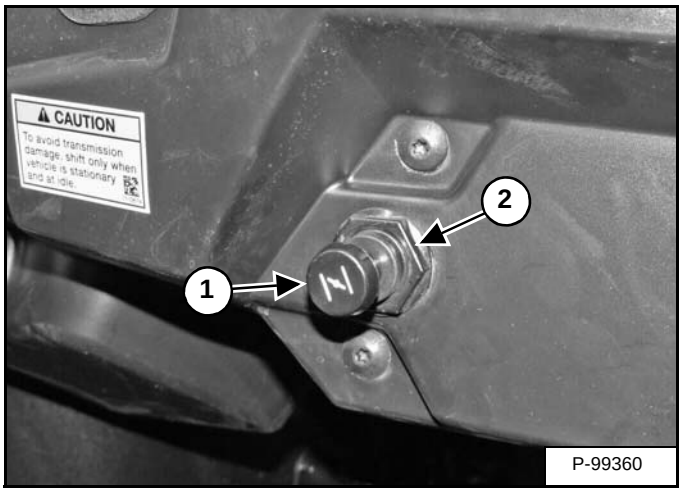
With the choke control pushed in, the choke plunger must be seated on the fuel passage way in the carburetor. If the plunger is not seated on the fuel passage way inside the carburetor (not enough cable freeplay), the engine will flood and run too rich, causing plug fouling and poor performance.

If cable slack is excessive, the choke fuel passage will not open far enough, which may cause cold starting difficulty. Also, the half - choke position used for intermittent applications will not function properly.

Remove the seat. (See OPERATOR SEAT on Page 30-20-1.)

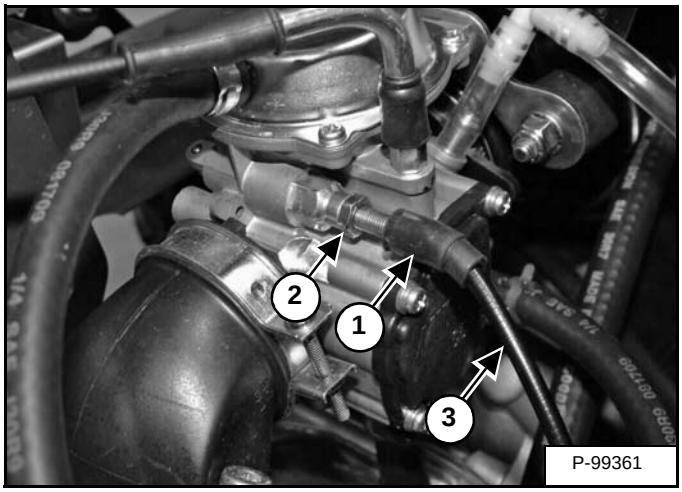
Remove the front cover.

Figure 50-70-11



Push the choke knob (Item 1) **[Figure 50-70-11]** to the full off position.

Figure 50-70-12



Slide the boot (Item 1) **[Figure 50-70-12]** off the cable adjuster.

Loosen the adjustment locking nut (Item 2) **[Figure 50-70-12]** and the plastic nut (Item 2) **[Figure 50-70-11]**.

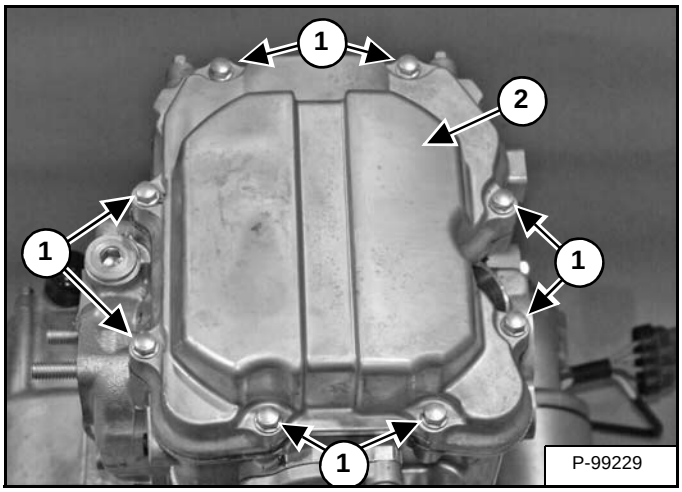
Turn the cable (Item 3) **[Figure 50-70-12]** in until the knob (Item 1) **[Figure 50-70-11]** just begins to push out. The choke plunger is now fully seated inside the carburetor.

Make sure the choke knob is all the way in then tighten the adjustment locking nut (Item 2) **[Figure 50-70-12]** and the plastic nut (Item 2) **[Figure 50-70-11]**.

Slide the boot (Item 1) **[Figure 50-70-12]** to its original position.

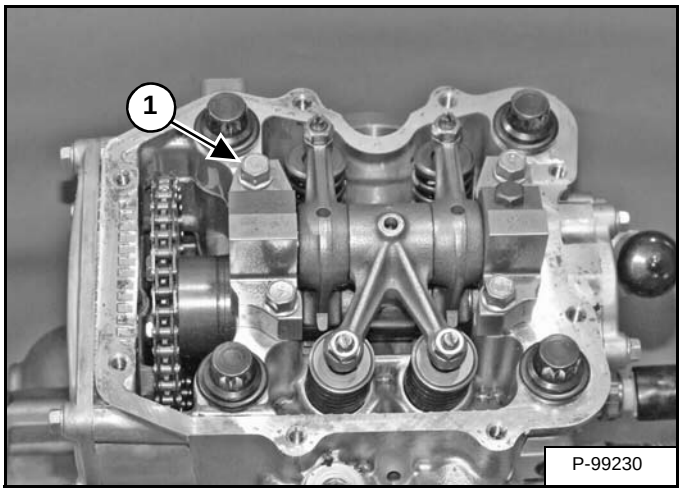
Rocker Shaft / Rocker Arm Assembly Removal

Figure 50-80-10



Remove the bolts (Item 1), cover (Item 2) **[Figure 50-80-10]** and gasket.

Figure 50-80-11

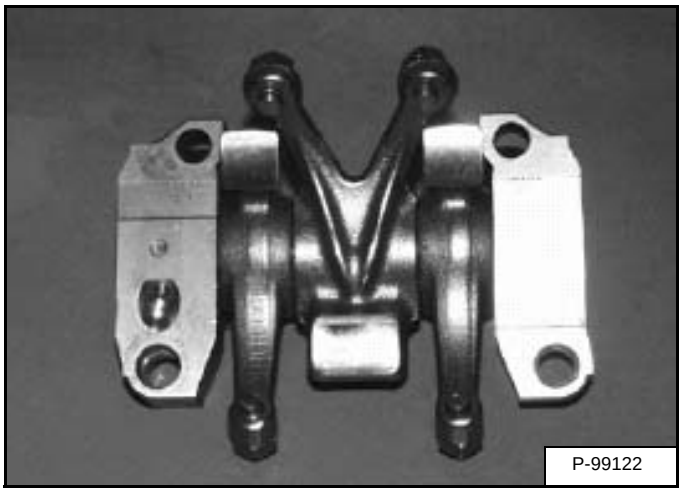


Remove the rocker shaft support tower bolts (Item 1) **[Figure 50-80-11]**.

Remove the rocker shaft / rocker arm assembly from the head.

Rocker Arm / Shaft Inspection

Figure 50-80-12



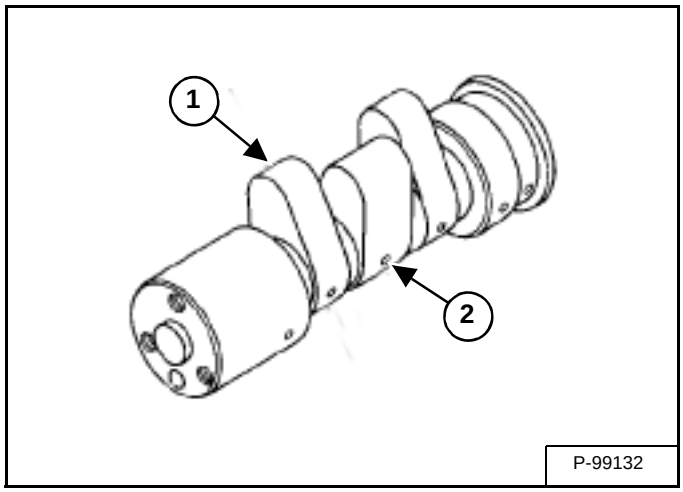
Mark or tag the rocker arms to keep them in order for assembly **[Figure 50-80-12]**.

Inspect each rocker arm cam follower surface. If there is any damage or uneven wear, replace the rocker arm.

NOTE: Always inspect the camshaft lobe if rocker arms are worn or damaged.

Camshaft Inspection

Figure 50-80-34



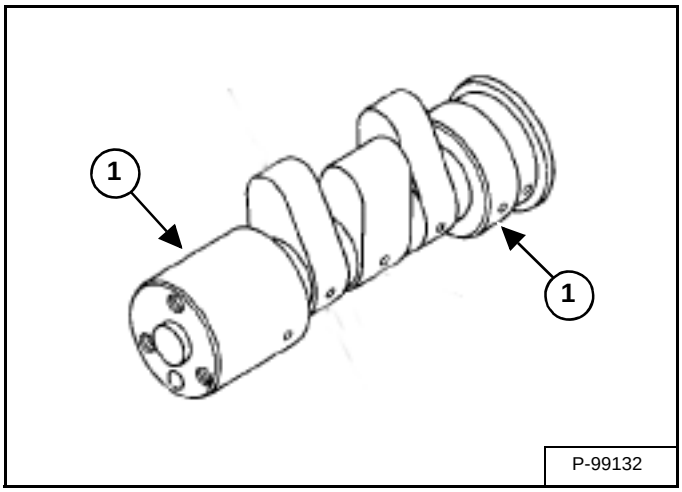
Visually inspect each cam lobe (Item 1) **[Figure 50-80-34]** for wear, chafing or damage.

Thoroughly clean the cam shaft, making sure the oil feed holes (Item 2) **[Figure 50-80-34]** are not obstructed.

Measure height of each cam lobe using a micrometer. Compare to specifications.

Cam Lobe Height (Intake & Exhaust)	Factory spec.	1.2884 - 1.2924 in. (32,726 - 32,826 mm)
	Allowable limit	1.2766 in. (32,426 mm)

Figure 50-80-35



Measure camshaft journal outside diameter (Item 1) **[Figure 50-80-35]**.

Camshaft Journal O.D. Mag & PTO End	1.4935 - 1.4941 in. (37,935 - 37,950 mm)

Measure the I.D. of camshaft journal bore.

Camshaft Journal Bore I.D. Mag & PTO End	1.4963 - 1.4970 in. (38,005 - 38,025 mm)

Calculate the oil clearance by subtracting journal O.D. from journal bore I.D. Compare to specifications.

Camshaft Oil Clearance	Factory spec.	0.0022 - 0.0035 in. (0,055 - 0,090 mm)
	Allowable limit	0.0039 in. (0,10 mm)

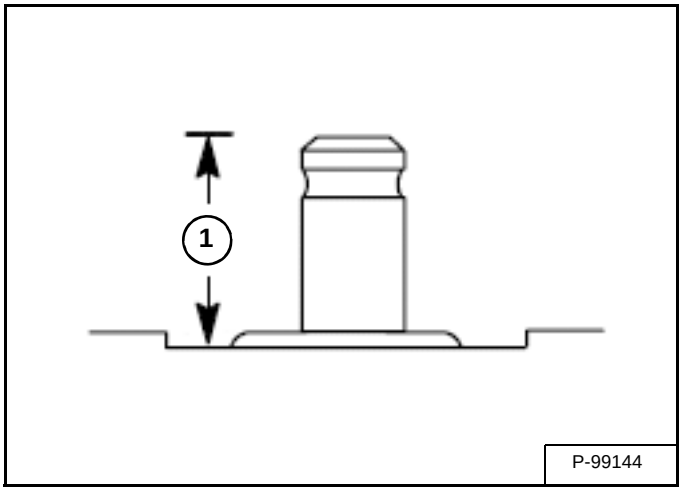
NOTE: Replace camshaft if damaged or if any part is worn past the service limit.

NOTE: Replace cylinder head if camshaft journal bore is damaged or worn excessively.

Valve Seat Reconditioning (Cont'd)

Valve Guide Removal And Installation (Cont'd)

Figure 50-80-55



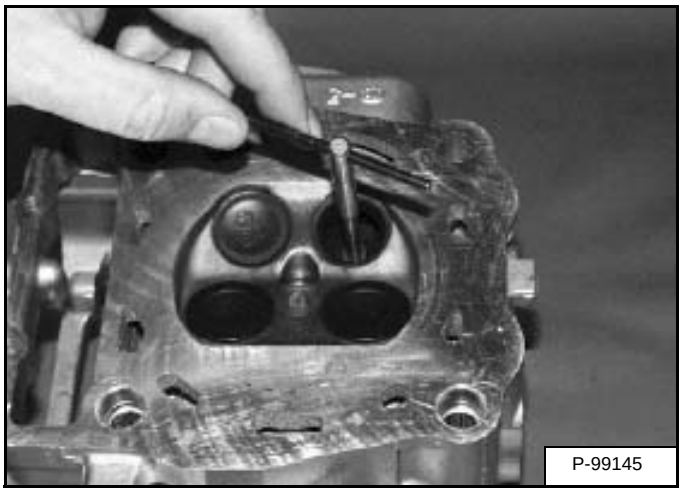
Place a new guide in the valve guide installation tool and press guide in to proper depth. Check height of each guide above the cylinder head (Item 1) **[Figure 50-80-55]**.

Valve Guide Height	0.689 - 0.709 in. (17,5 - 18,0 mm)

NOTE: The guide can also be driven in to the proper depth. Inspect the guide closely for cracks or damage if a driver is used.

Reaming The Valve Guide

Figure 50-80-56



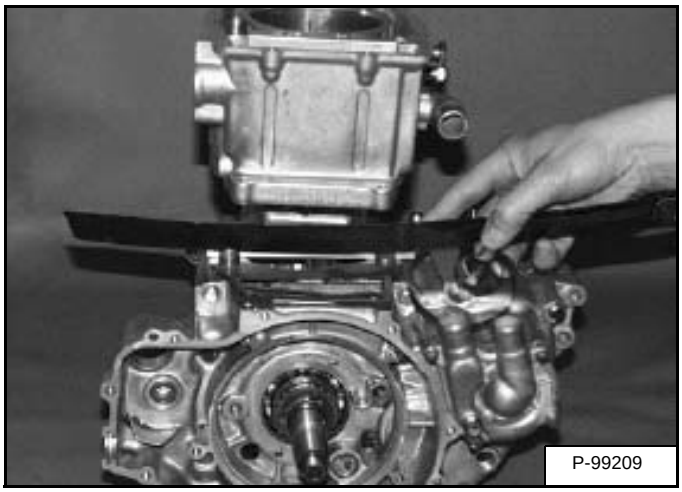
Allow cylinder head to cool to room temperature. Apply cutting oil to the reamer. Guides should be reamed from the valve spring side of the cylinder head. Ream each guide to size by turning the reamer clockwise continually. Continue to rotate reamer clockwise during removal of the tool **[Figure 50-80-56]**.

Clean guides thoroughly with hot soapy water and a nylon brush. Rinse and dry with compressed air. Apply clean engine oil to guides.

Install pilot into valve guide.

Cylinder Installation (Cont'd)

Figure 50-80-76



Remove the ring compressor and support blocks **[Figure 50-80-76]**.

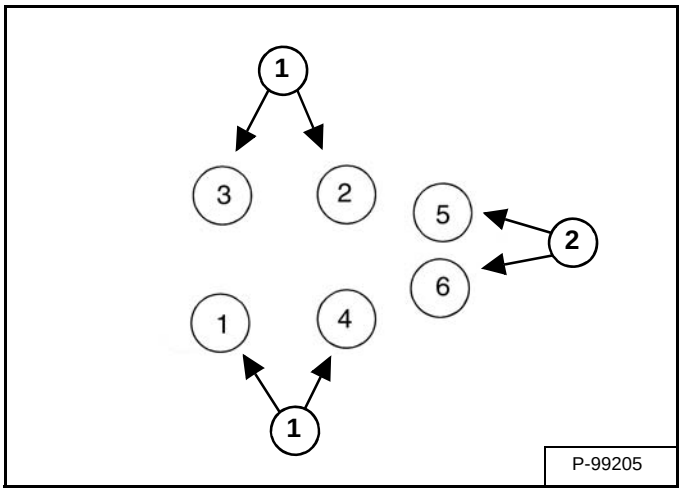
Push the cylinder downward until fully seated on the base gasket.

Apply a light film of oil to the threads and flange surface of the cylinder mounting bolts.

Install all four bolts finger tight. Rotate the engine and position the piston at BDC.

NOTE: If cam chain is installed, hold it up while rotating the engine to avoid damage to the chain, drive sprocket teeth, or tensioner blade.

Figure 50-80-77



Tighten the four 10 mm cylinder bolts (Item 1) in three steps in a criss cross pattern to 46 ft.-lb. (62 N•m) torque.

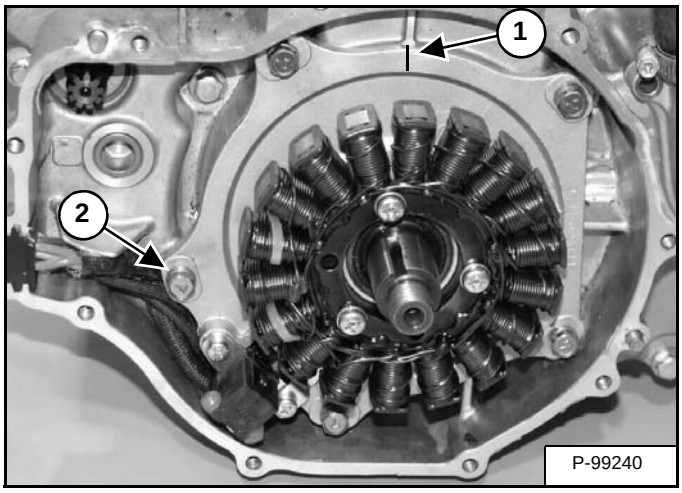
Install the two 6 mm bolts (Item 2) **[Figure 50-80-77]** and tighten to 6 ft.-lb. (8 N•m) torque.

Stator Removal / Inspection

NOTE: The stator can be removed and installed with the engine in the frame.

Remove the flywheel. (See Flywheel Removal And Installation on Page 50-80-43.)

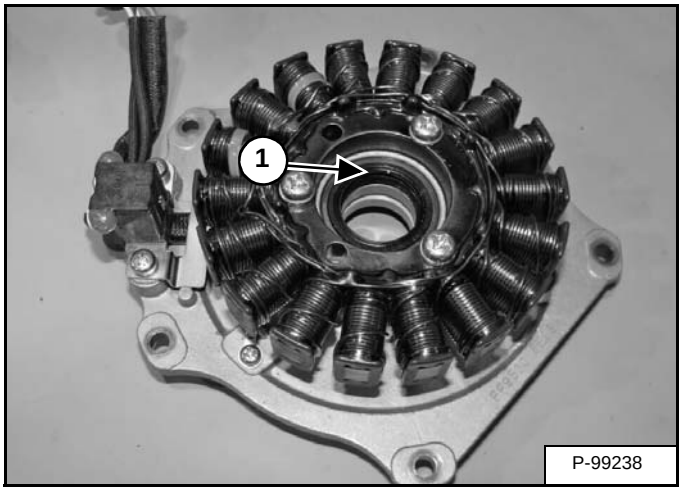
Figure 50-80-96



Place a mark on stator plate (Item 1) for correct orientation when assembling.

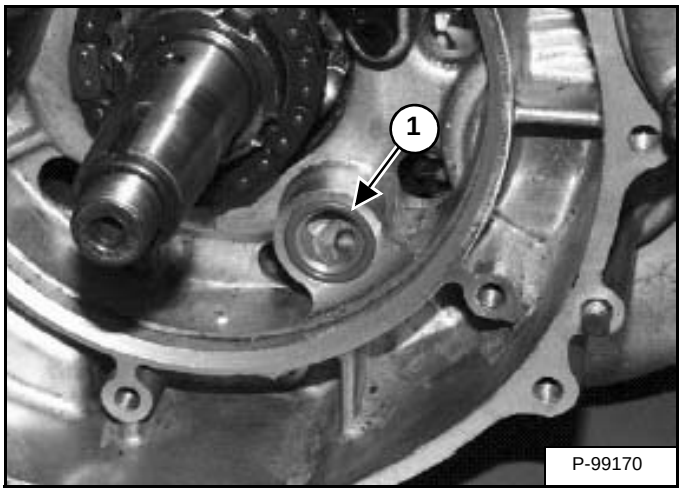
Remove bolts and carefully remove stator assembly, being careful not to damage crankshaft bushing on stator plate.

Figure 50-80-97



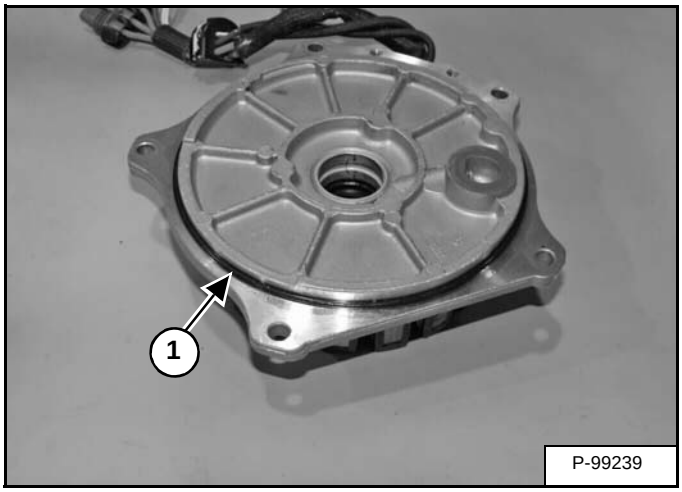
Replace crankshaft seal (Item 1) **[Figure 50-80-97]**.

Figure 50-80-98



Remove the oil passage O-ring (Item 1) **[Figure 50-80-98]**.

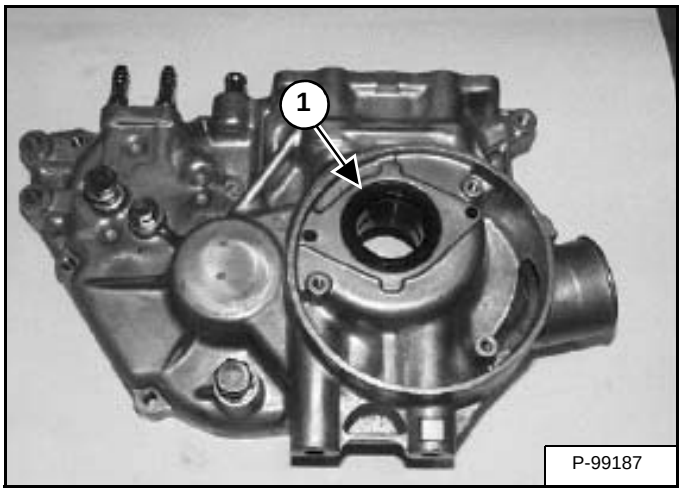
Figure 50-80-99



Remove large sealing O-ring from outer edge of stator plate (Item 1) **[Figure 50-80-99]**.

Crankcase Bearing Inspection

Figure 50-80-125



Remove the seal (Item 1) **[Figure 50-80-125]** from the PTO side crankcase.

Inspect the crankshaft main bearings, balancer shaft bearings and pump shaft bearing.

NOTE: Due to extremely close tolerances and minimal wear, the bearings must be inspected visually, and by feel. Look for signs of discoloration, scoring or galling. Turn the inner race of each bearing. The bearings should turn smoothly and quietly. The outer race of each bearing should fit tightly in the crankcase. The inner race should be firm with minimal side to side movement and no detectable up and down movement.

Support the crankcase and drive or press the main bearings out of each crankcase.

To remove balancer shaft bearings and pump shaft bearing use a blind hole bearing puller.

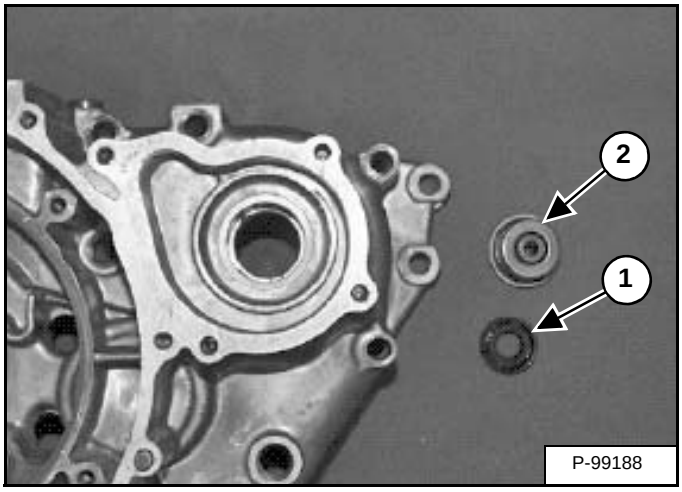
NOTE: Bearings are stressed during the removal process and should not be re-used!

Oil Seal / Mechanical Seal Removal (Engine Disassembled)

NOTE: The water pump mechanical seal can be removed without removing the engine. (See Water Pump Mechanical Seal Removal (Engine Installed) on Page 50-50-7.)

Replace the pump shaft seal and water pump mechanical seal whenever the crankcase is disassembled.

Figure 50-80-126



Remove the pump shaft bearing from the Magneto (right hand) side crankcase.

Pry out the oil seal (Item 1) **[Figure 50-80-126]**, noting the direction of installation with the spring side facing IN (toward inside of case).

Drive the water pump mechanical seal (Item 2) **[Figure 50-80-126]** out of the crankcase from inside to outside.

NOTE: The new mechanical seal must be installed after the crankcases are assembled, using a special tool. (See Water Pump Mechanical Seal Installation on Page 50-80-55.)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