

# JET PUMP

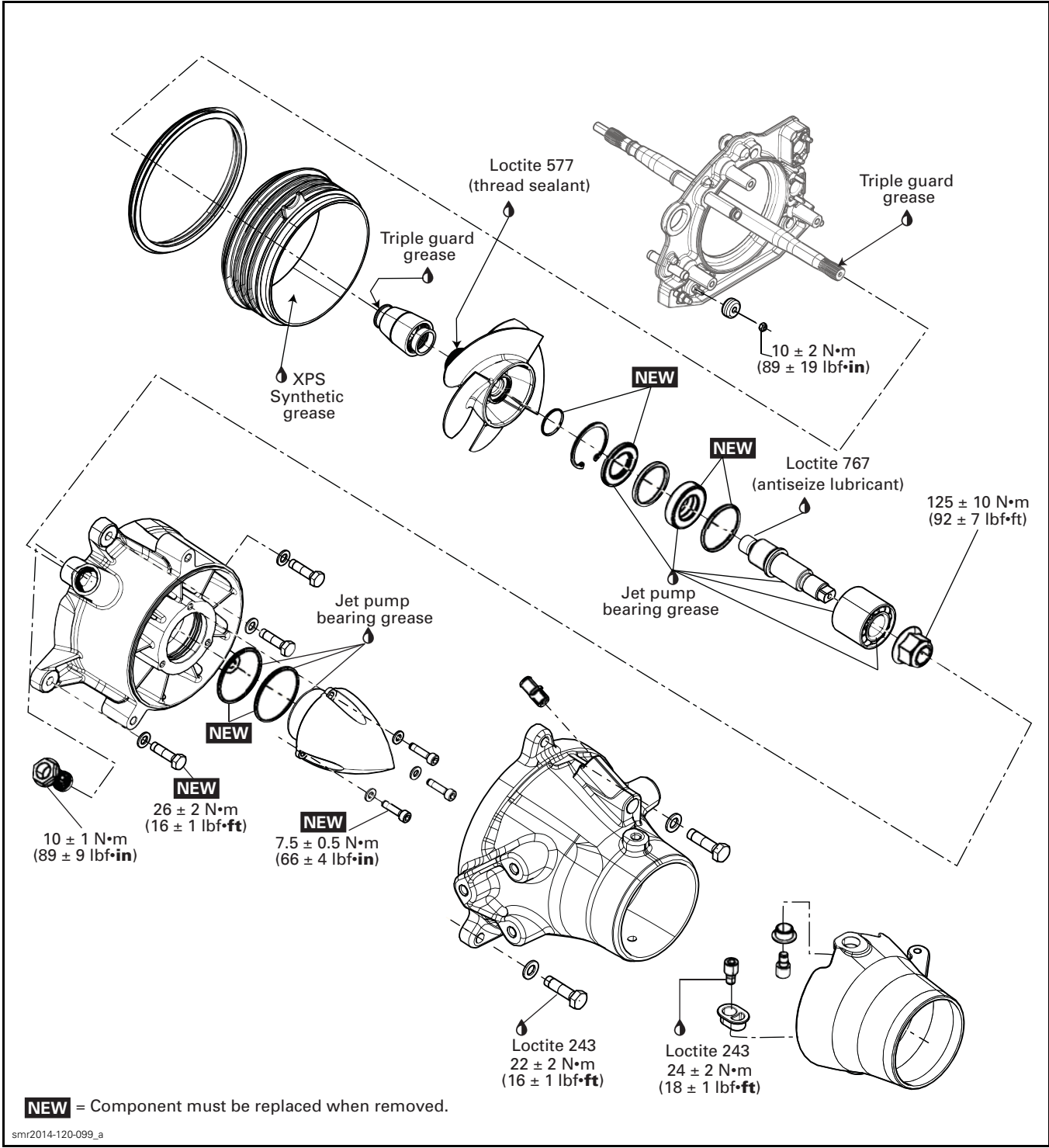
## SERVICE TOOLS

| Description                       | Part Number       | Page         |
|-----------------------------------|-------------------|--------------|
| ENGINE ALIGNMENT PLATE .....      | 529 036 278 ..... | 5            |
| IMPELLER SHAFT BEARING TOOL ..... | 529 036 168 ..... | 12–13        |
| IMPELLER SHAFT BEARING TOOL ..... | 529 036 279 ..... | 13           |
| IMPELLER SHAFT PUSHER.....        | 529 035 955 ..... | 11, 13       |
| PRESSURE CAP .....                | 529 036 283 ..... | 4            |
| PTO ADAPTER .....                 | 529 036 273 ..... | 9–10, 12, 15 |
| VACUUM/PRESSURE PUMP .....        | 529 021 800 ..... | 4            |

## SERVICE PRODUCTS

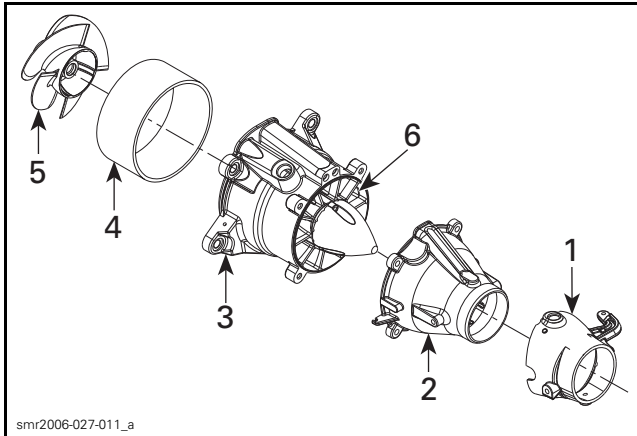
| Description                             | Part Number       | Page  |
|-----------------------------------------|-------------------|-------|
| JET PUMP BEARING GREASE .....           | 293 550 032 ..... | 14–15 |
| LOCTITE 243 (BLUE).....                 | 293 800 060 ..... | 7     |
| LOCTITE 577 (THREAD SEALANT) .....      | 293 800 050 ..... | 10    |
| LOCTITE 767 (ANTISEIZE LUBRICANT) ..... | 293 800 070 ..... | 9     |
| PULLEY FLANGE CLEANER .....             | 413 711 809 ..... | 6     |
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| XPS SYNTHETIC GREASE.....               | 293 550 010 ..... | 6, 10 |

Subsection 03 (JET PUMP)



## GENERAL

### JET PUMP MAIN COMPONENTS



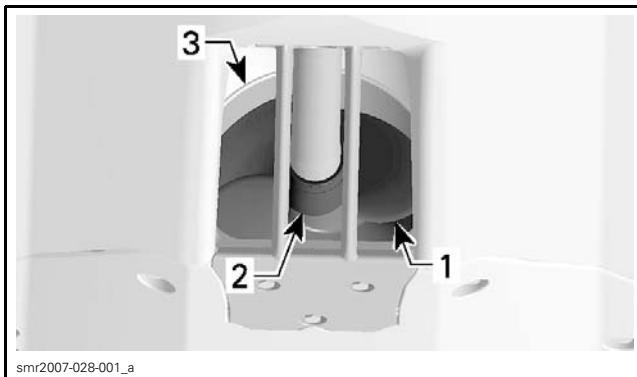
#### TYPICAL

1. Nozzle
2. Venturi
3. Jet pump housing
4. Wear ring
5. Impeller
6. Stator

## INSPECTION

### IMPELLER CONDITION

Condition of impeller, impeller boot and wear ring can be quickly checked from underneath the watercraft. With the vehicle on the trailer, use a flashlight to visually inspect them through the inlet grate.



#### TYPICAL — UNDERNEATH HULL

1. Impeller
2. Impeller boot
3. Wear ring

### IMPELLER/WEAR RING CLEARANCE

This clearance is critical for jet pump performance. To check clearance, remove jet pump.

Using a feeler gauge, measure clearance between impeller blade tip and wear ring. Measure each blade at its center.



#### TYPICAL

| MODEL      | MAXIMUM WEAR CLEARANCE |
|------------|------------------------|
| All models | 0.35 mm (.014 in)      |

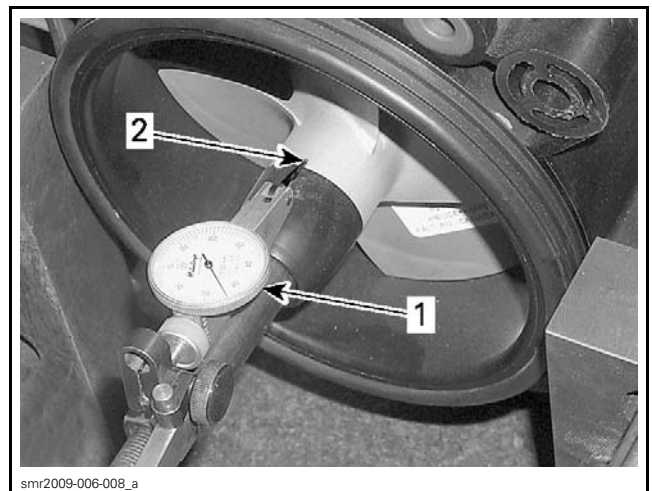
### IMPELLER SHAFT RADIAL PLAY

Radial play is critical for jet pump life span.

To check radial play, remove jet pump.

Make sure impeller shaft turns freely and smoothly.

1. Retain housing in a soft jaw vise making sure not to damage housing lug.
2. Set a dial gauge and position its tip onto metal end, close to the end of the impeller hub.
3. Move shaft end up and down. Difference between highest and lowest dial gauge reading is radial play.



#### TYPICAL — MEASURING IMPELLER SHAFT RADIAL PLAY

1. Dial gauge
2. Measure close to impeller hub end

Subsection 03 (JET PUMP)

| RADIAL PLAY |
|-------------|
| 0 mm (0 in) |

Excessive play can come either from worn bearing or damaged jet pump housing bearing surface.

LEAK TEST

Whenever performing any type of repair on the jet pump, a leak test should be carried out.

Proceed as follows:

- 1. Remove impeller cover. Refer to *IMPELLER COVER* in this subsection.
- 2. Remove impeller. Refer to *IMPELLER*.
- 3. Install the PRESSURE CAP (P/N 529 036 283) on pump housing.



PRESSURE CAP

- 4. Connect the VACUUM/PRESSURE PUMP (P/N 529 021 800) to the pressure cap fitting.



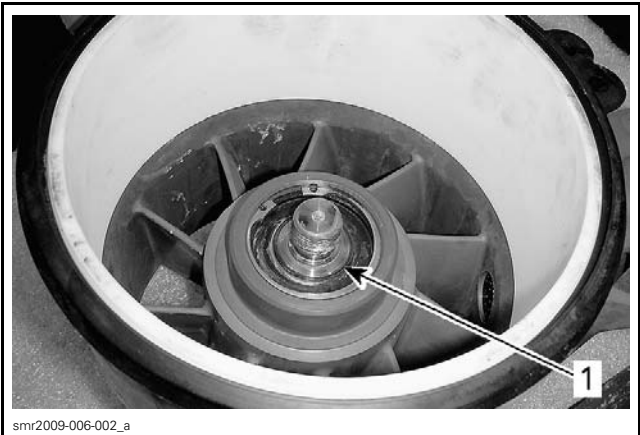
TYPICAL

- 5. Pressurize pump.

| LEAK TEST PRESSURE      |
|-------------------------|
| Maximum 70 kPa (10 PSI) |

- 6. Pump must maintain this pressure for at least 5 minutes.
  - If there is a pressure drop, spray soapy water around cover. If there are no bubbles, impeller shaft and impeller shaft seal must be replaced. Jet pump unit has to be disassembled.

**NOTE:** If there is 2 or 3 bubbles coming out from the seal on the impeller side is acceptable. Leaks from other areas must be repaired.



TYPICAL

1. Small leak here is acceptable

**NOTICE** Repair any leak. Failure to correct a leak will lead to premature wear of pump components.

- 7. Disconnect pump and remove pressure cap.
- 8. Reinstall impeller cover. Refer to *IMPELLER COVER* in this subsection.

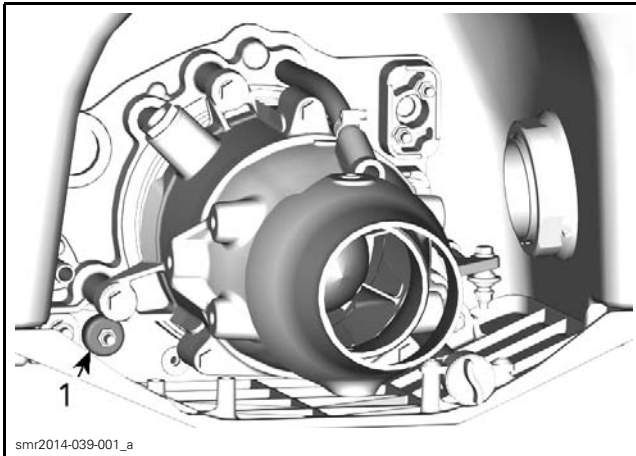
## PROCEDURES

**NOTE:** Whenever removing a part, visually check for damage such as: corrosion, cracks, split, break, porosity, cavitation, deformation, distortion, heating discoloration, wear pattern, defective plating, missing or broken balls in ball bearing, water damage diagnosed by black-colored spots on metal parts, etc. Replace any damaged parts. As a quick check, manually feel clearance and end play, where applicable, to detect excessive wear.

## SACRIFICIAL ANODE

### Sacrificial Anode Inspection

Check for wear. If worn more than half, replace anode.



1. Sacrificial anode location

### Sacrificial Anode Removal

Unscrew sacrificial anode retaining nut and remove anode.

### Sacrificial Anode Installation

Installation is the reverse of the removal procedure.

Torque anode retaining nut as specified in exploded view.

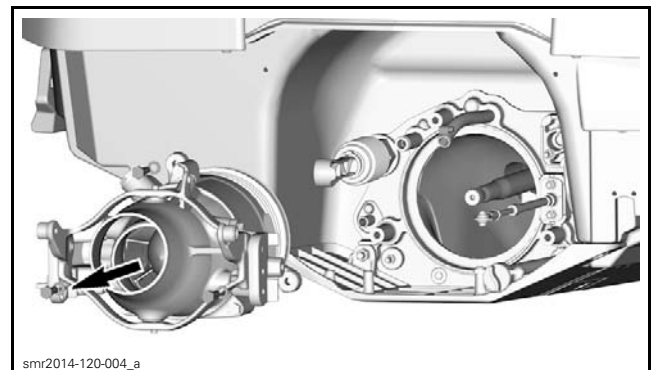
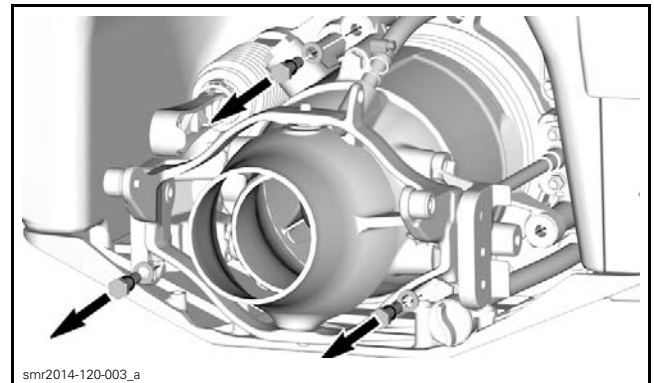
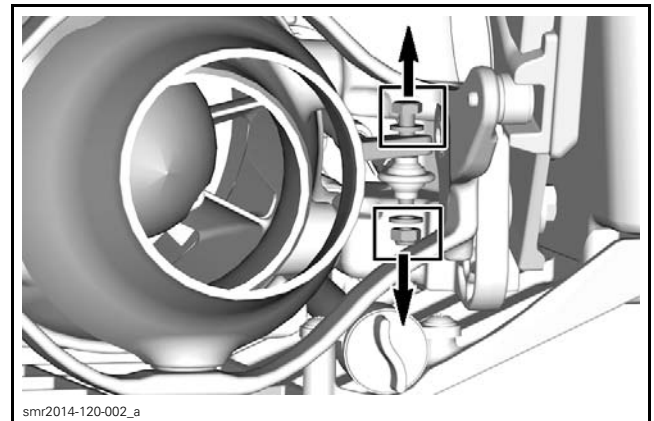
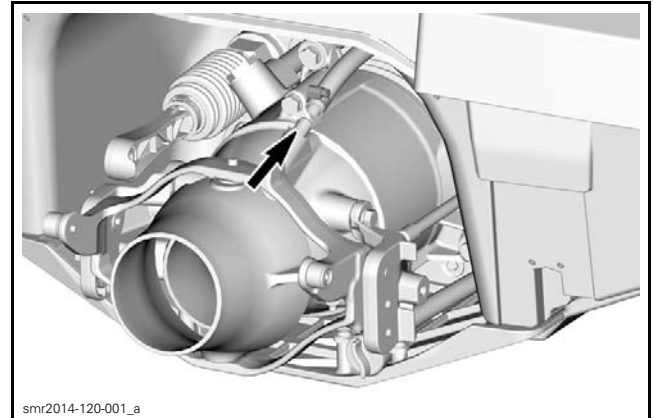
## JET PUMP HOUSING

**NOTE:** The jet pump housing can be removed as an assembly with the venturi and nozzle. This is the preferred procedure when either the drive shaft or engine removal is required.

### Jet Pump Housing Removal

Remove iBR gate. Refer to *iBR SYSTEM* subsection.

Follow image sequence.

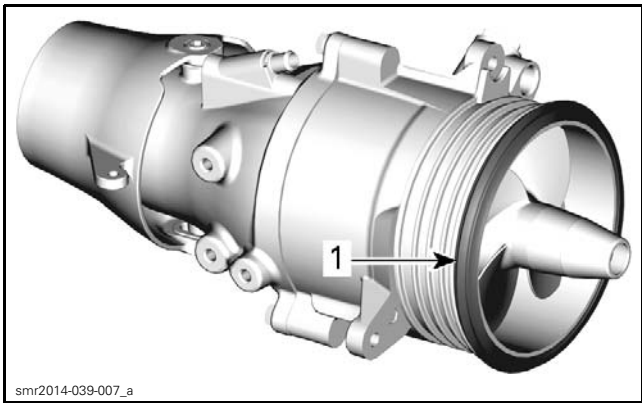


Temporarily fasten the ENGINE ALIGNMENT PLATE (P/N 529 036 278) to pump support to support drive shaft and avoid PTO oil seal damage.



Jet Pump Housing Inspection and Cleaning

- 1. Visually inspect jet pump housing. Pay attention to the stator. Ensure the assembly is clean and free of any debris and defects.
- 2. Ensure the elastomer seal is in good condition. Replace as required.



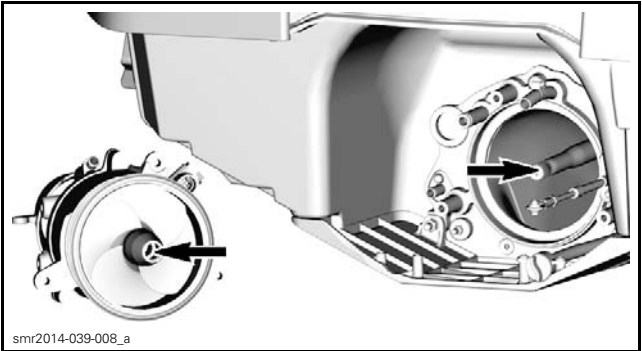
1. Elastomer seal

Jet Pump Housing Installation

Brush and clean impeller splines and drive shaft splines with PULLEY FLANGE CLEANER (P/N 413 711 809) or equivalent. Splines must be free of any residue.

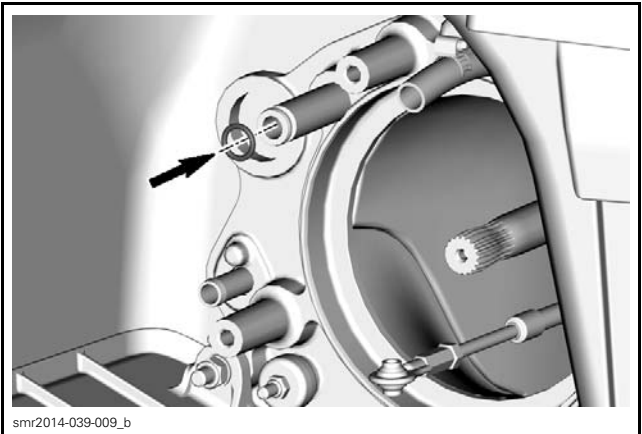
Lubricate drive shaft splines, impeller splines and the inside of the impeller boot with TRIPLE-GUARD GREASE (P/N 296 000 329).

Ensure the elastomer seal is properly installed on the wear ring.



CLEANING AND LUBRICATION POINTS

Install a new O-ring



Reverse removal procedure.

Generously apply TRIPLE-GUARD GREASE (P/N 296 000 329) on drive shaft splines.

**NOTE:** Slightly lubricate wear ring with XPS SYNTHETIC GREASE (P/N 293 550 010) to minimize friction during initial impeller start.

Install jet pump.

**NOTE:** If necessary, wiggle jet pump to engage drive shaft splines in impeller.

| TIGHTENING TORQUE                        |                                          |
|------------------------------------------|------------------------------------------|
| NEW M8 jet pump housing retaining screws | 26 N•m ± 2 N•m<br>(19 lbf•ft ± 1 lbf•ft) |

NOZZLE

Nozzle Removal

Remove iBR gate support. Refer to *iBR SYSTEM* subsection.

Steering Nozzle Inspection

Inspect steering nozzle for cracks, wear, deformation, and other damages.

Inspect bushings for wear or other damage.

Replace parts as required.

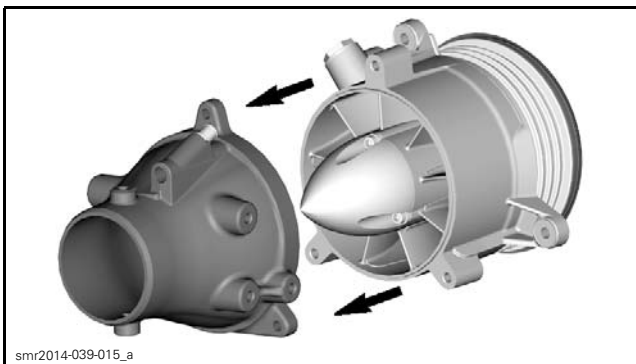
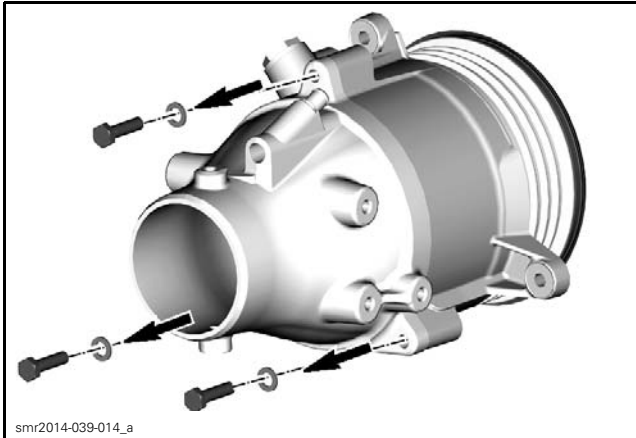
## Nozzle Installation

Reverse removal procedure. Refer to *iBR SYSTEM* subsection.

Apply LOCTITE 243 (BLUE) (P/N 293 800 060) on screw threads (or use new self-locking screws).

## VENTURI

### Venturi Removal



### Venturi Installation

Reverse removal procedure.

Apply LOCTITE 243 (BLUE) (P/N 293 800 060) on threads of venturi retaining screws (or install new self-locking screws).

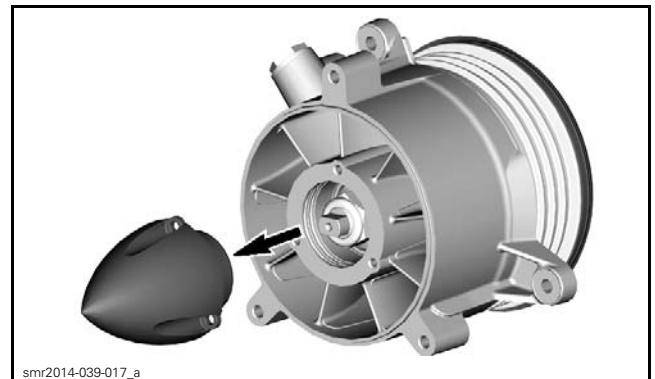
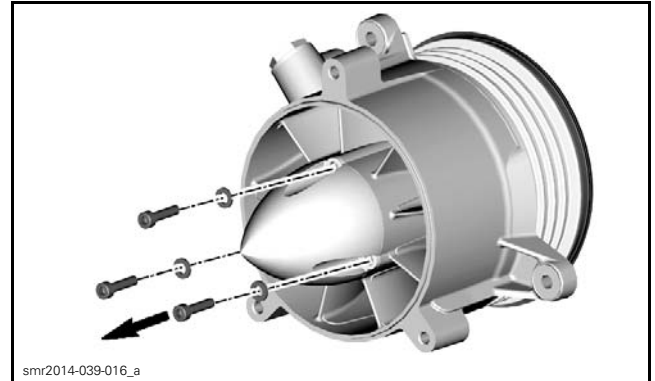
Install venturi screws and flat washers.

| TIGHTENING TORQUE        |                                          |
|--------------------------|------------------------------------------|
| Venturi retaining screws | 22 N•m ± 2 N•m<br>(16 lbf•ft ± 1 lbf•ft) |

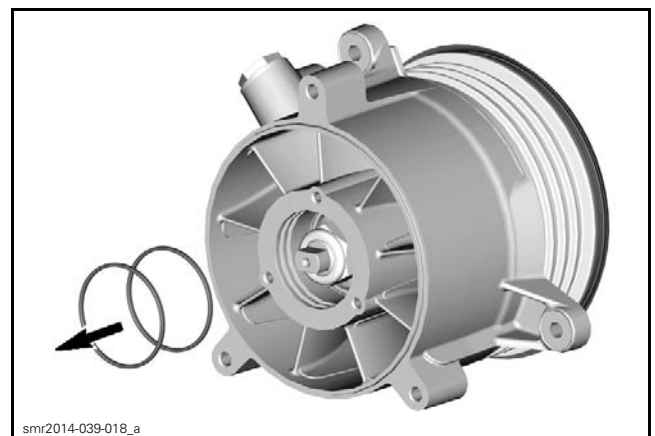
## IMPELLER COVER

### Impeller Cover Removal

1. Remove the venturi. Refer to *VENTURI*.



2. With pump housing in vertical position, remove and discard the 3 retaining screws.

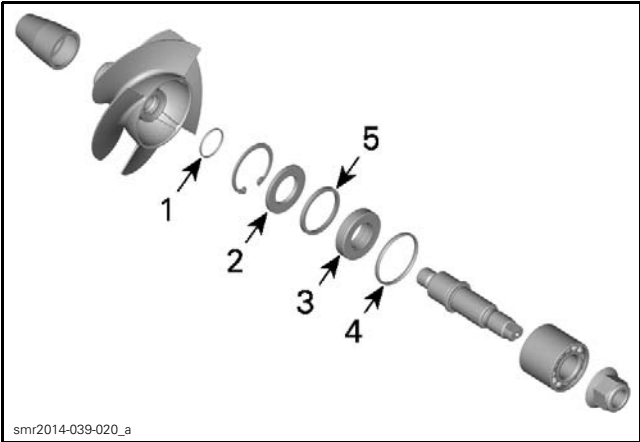


### Impeller Cover Inspection

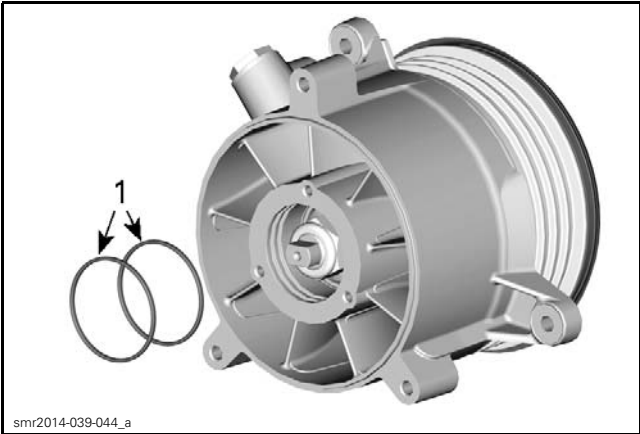
Check for presence of water in cover and bearing area. If water is found:

- Replace impeller and pump housing O-rings. Refer to *IMPELLER SHAFT AND BEARING*.
- Replace impeller shaft seals. Refer to *IMPELLER SHAFT AND BEARING*.
- Replace impeller cover O-rings and/or impeller cover. Refer to *IMPELLER COVER*.

Subsection 03 (JET PUMP)



- 1. Impeller O-ring
- 2. Outer impeller shaft seal
- 3. Inner impeller shaft seal
- 4. Pump housing O-ring
- 5. Spacer



- 1. Impeller cover O-rings

Perform a leak test. Refer to *LEAK TEST* in this subsection.

Impeller Cover Installation

- 1. Install new O-rings in their respective grooves.
- 2. Reverse removal procedure.

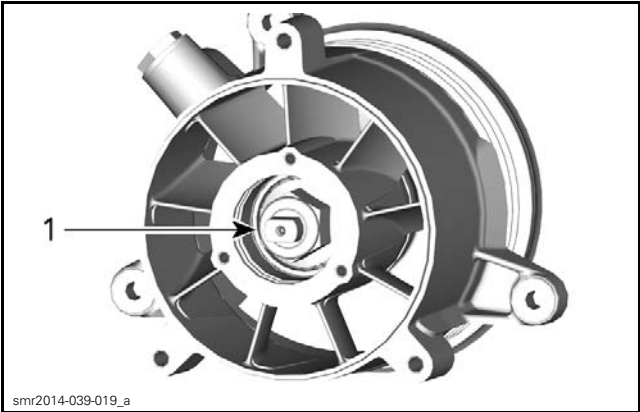
**NOTE:** Push cover against pump housing while alternately tightening screws. Make sure O-rings are positioned and greased correctly and they are not damaged when pushing the cover.

| TIGHTENING TORQUE                      |                                             |
|----------------------------------------|---------------------------------------------|
| NEW M6 impeller cover retaining screws | 7.5 N•m ± 0.5 N•m<br>(66 lbf•in ± 4 lbf•in) |

IMPELLER

Impeller Removal

**NOTE:** If impeller shaft is to be disassembled, loosen the impeller shaft nut prior to removing the impeller.

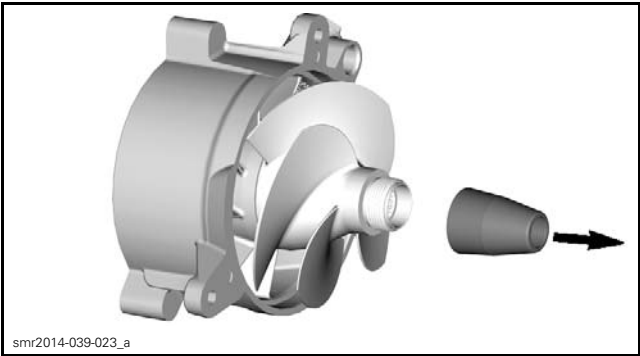
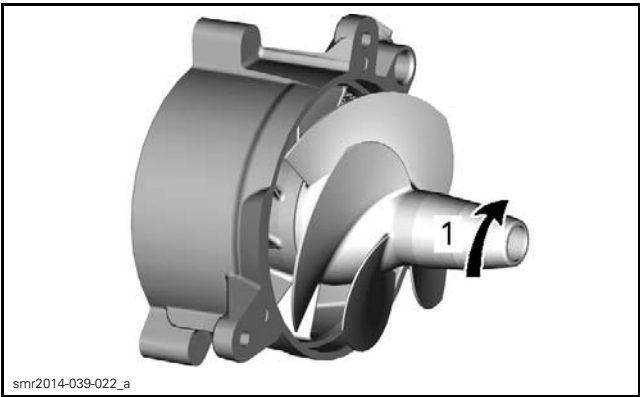


- 1. Impeller shaft nut

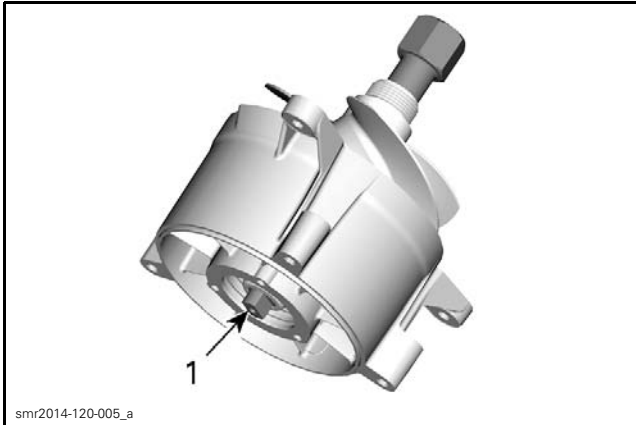
- 1. Remove jet pump from the watercraft. Refer to *JET PUMP HOUSING*.
- 2. Remove impeller cover. Refer to *IMPELLER COVER*.
- 3. Remove wear ring. Refer to *WEAR RING*.

**NOTICE** Remove impeller boot by turning it clockwise (LH threads).

**NOTE:** The impeller boot is the only component with LH threads.



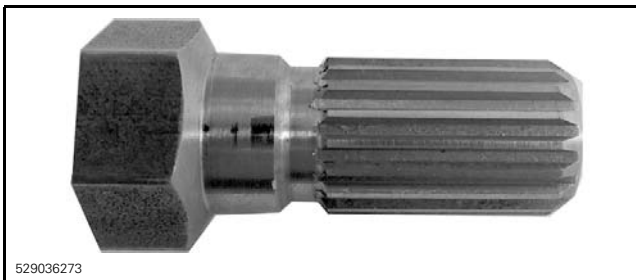
- 4. Mount the flat sides of impeller shaft in a vise.



**TYPICAL**  
1. Flat side

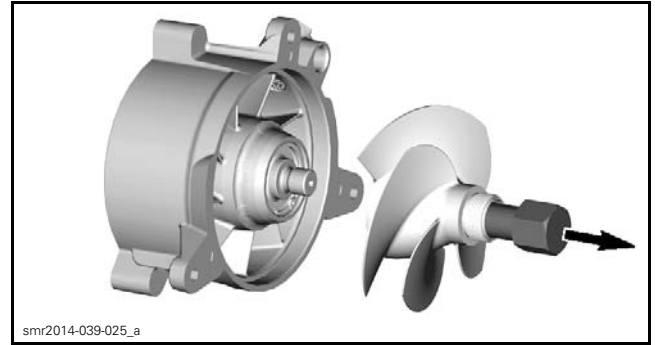
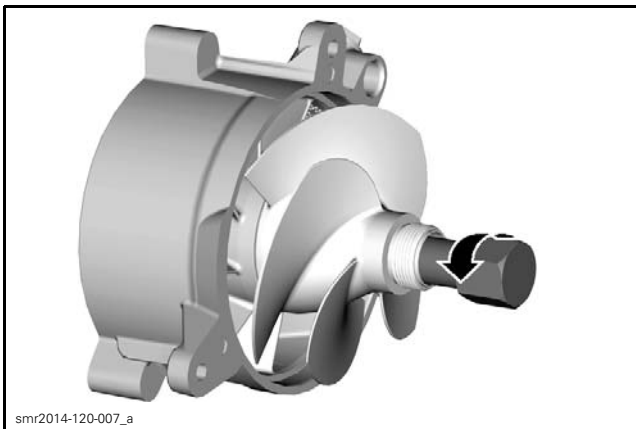
5. Unscrew the impeller using the required tool.

| REQUIRED TOOL                 |
|-------------------------------|
| PTO ADAPTER (P/N 529 036 273) |

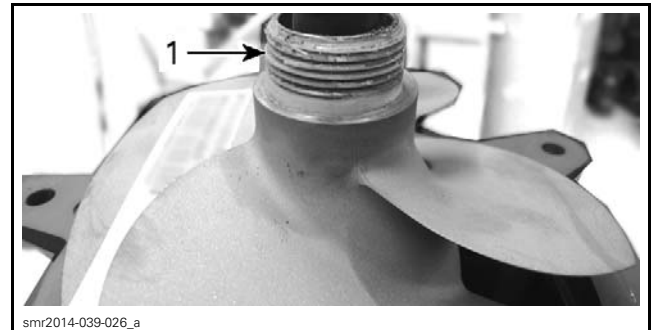


**NOTE:** It may be necessary to heat the impeller to ease removal.

**NOTICE** Never use an impact wrench to loosen impeller.

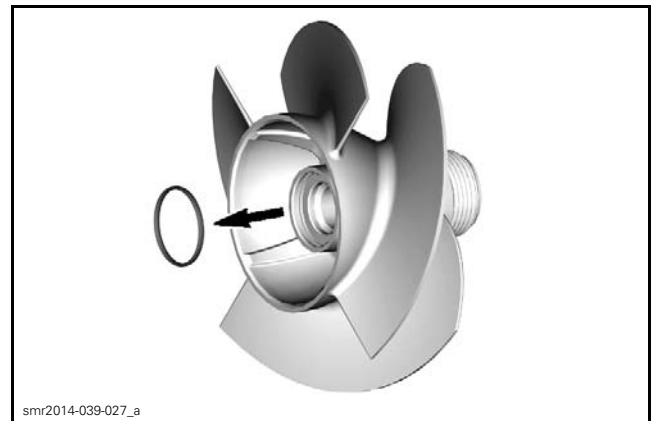


6. Clean impeller to boot threads.



**IMPELLER**  
1. Impeller to boot threads

7. Discard impeller O-ring.

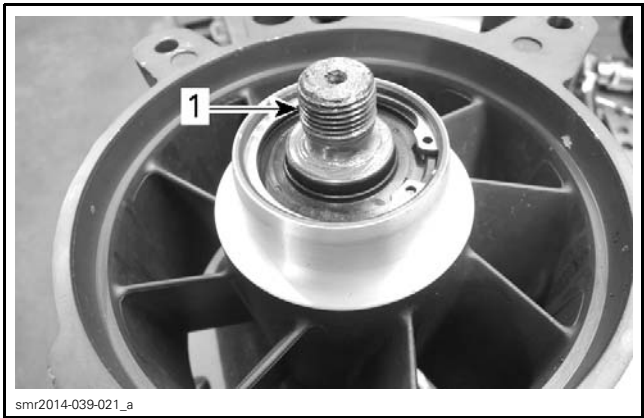


## Impeller Installation

Reverse removal procedure.

1. Install a new impeller O-ring.
2. Apply LOCTITE 767 (ANTISEIZE LUBRICANT) (P/N 293 800 070) on threads of impeller shaft.

Subsection 03 (JET PUMP)



1. Antiseize lubricant

| TIGHTENING TORQUE |                                            |
|-------------------|--------------------------------------------|
| Impeller          | 125 N•m ± 10 N•m<br>(92 lbf•ft ± 7 lbf•ft) |

**NOTICE** Never use an impact wrench to tighten impeller shaft.

- 3. Apply LOCTITE 577 (THREAD SEALANT) (P/N 293 800 050) on impeller to boot threads.
- 4. Apply TRIPLE-GUARD GREASE (P/N 296 000 329) inside impeller boot.
- 5. Install impeller boot on impeller and tighten counterclockwise.

WEAR RING

Wear Ring Inspection

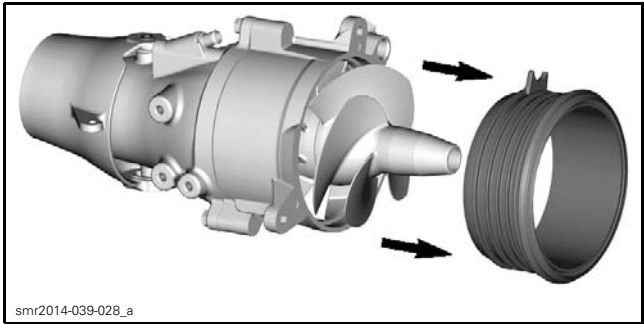
Check wear ring for:

- Deep scratches
- Irregular surface
- Any apparent damage.

Check *IMPELLER/WEAR RING CLEARANCE*, see procedure at the beginning of this subsection.

Wear Ring Removal

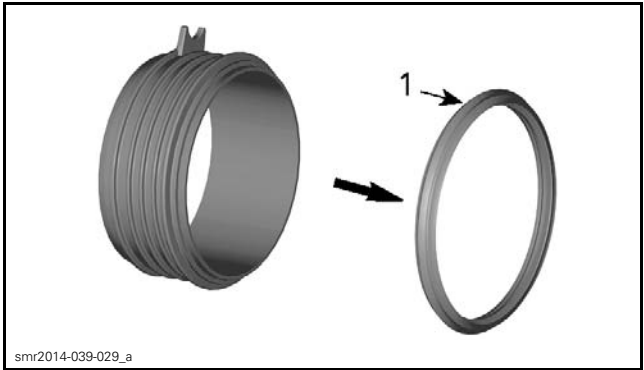
Remove jet pump from watercraft. Refer to *JET PUMP HOUSING*.



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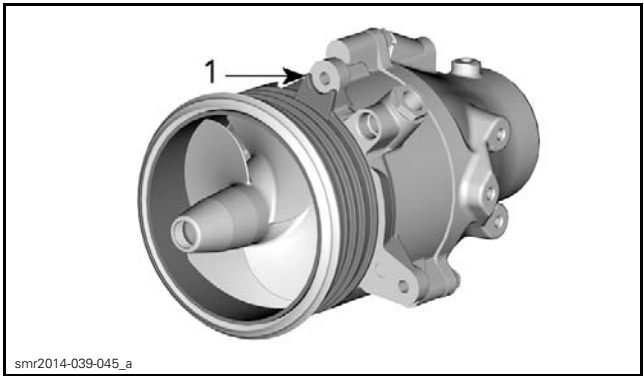
Wear Ring Installation

Check wear ring elastomer seal condition. Replace if necessary.



1. Wear ring elastomer seal

Align anti rotation tab on wear ring with jet pump housing.



WEAR RING POSITION

1. Anti rotation tab

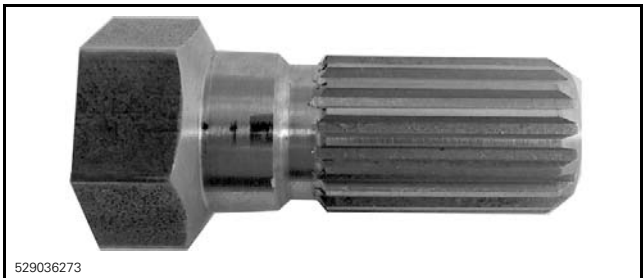
Apply XPS SYNTHETIC GREASE (P/N 293 550 010) on the wear ring surface.

IMPELLER SHAFT AND BEARING

Impeller Shaft and Bearing Removal

- 1. Remove impeller cover. Refer to *IMPELLER COVER* in this subsection.

| REQUIRED TOOL                 |
|-------------------------------|
| PTO ADAPTER (P/N 529 036 273) |



529036273

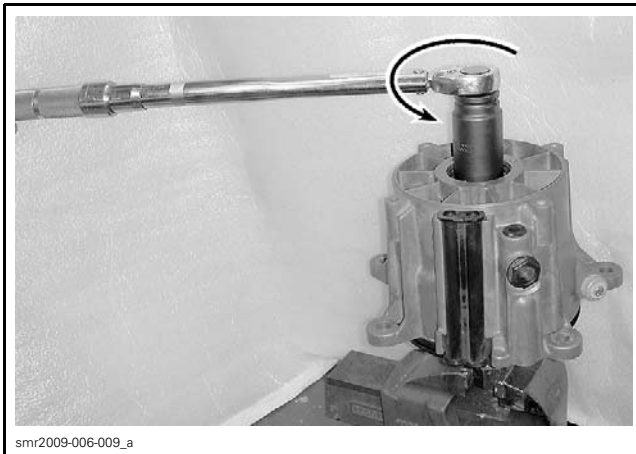


2. Install jet pump housing over impeller remover/installer tool.



3. Using a 30 mm socket, unscrew the impeller shaft nut.

4. Remove impeller shaft nut.

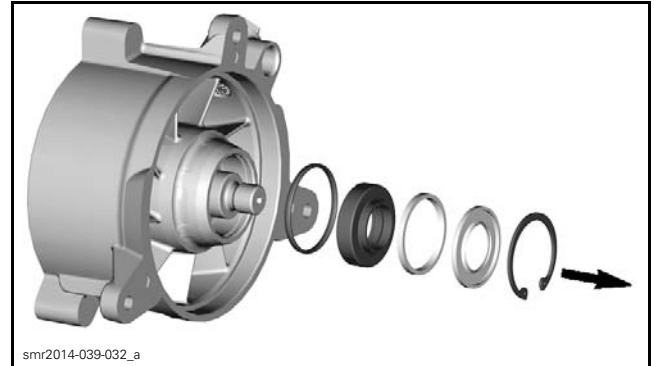


**TYPICAL**

**NOTE:** If impeller loosens instead of shaft nut, refer to *IMPELLER SHAFT NUT REMOVAL IF IMPELLER HAS LOOSENED* further in this procedure.

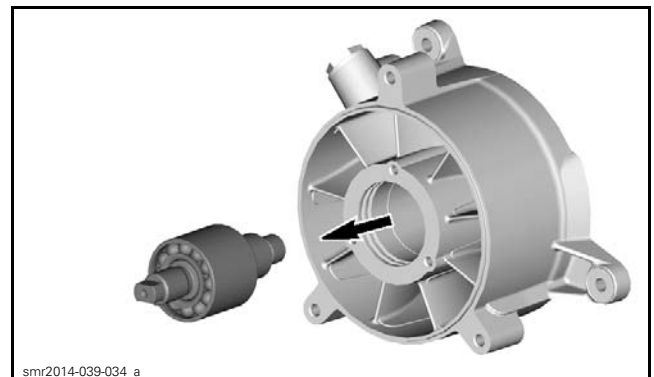
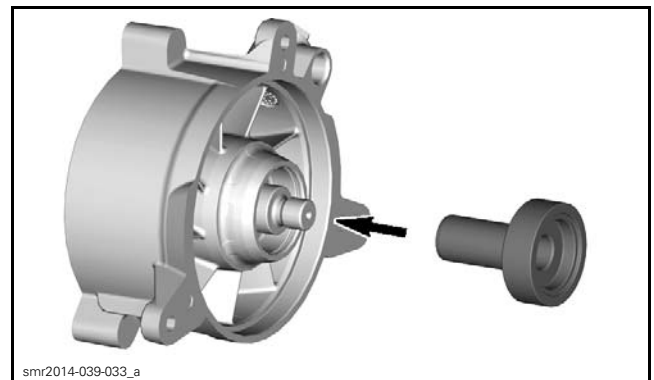
5. Remove impeller. Refer to *IMPELLER*.

6. From the impeller side, remove circlip, seals, spacer and O-ring from jet pump housing.



#### REQUIRED TOOL

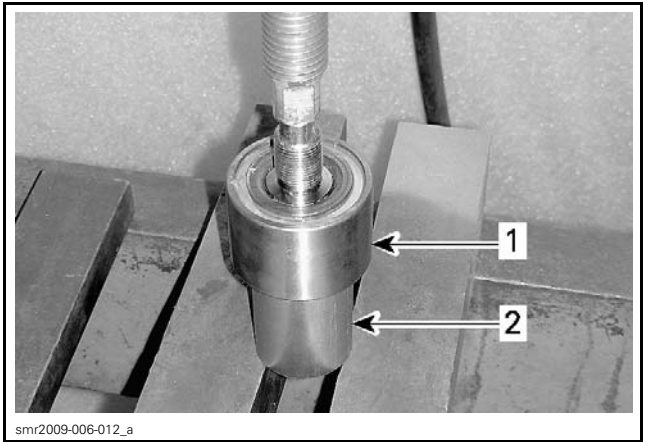
IMPELLER SHAFT PUSHER (P/N 529 035 955)



7. Use the required tool to press bearing off impeller shaft.

Subsection 03 (JET PUMP)

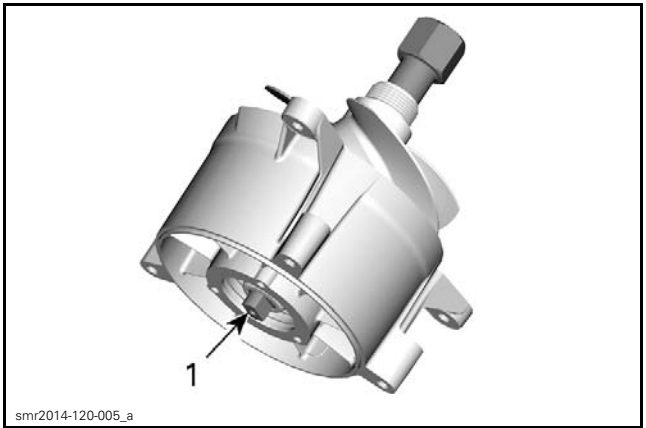
| REQUIRED TOOL                                    |
|--------------------------------------------------|
| IMPELLER SHAFT BEARING TOOL<br>(P/N 529 036 168) |



TYPICAL  
1. Impeller shaft and bearing  
2. Impeller shaft bearing tool on INNER race

Impeller Shaft Nut Removal if Impeller Has Loosened

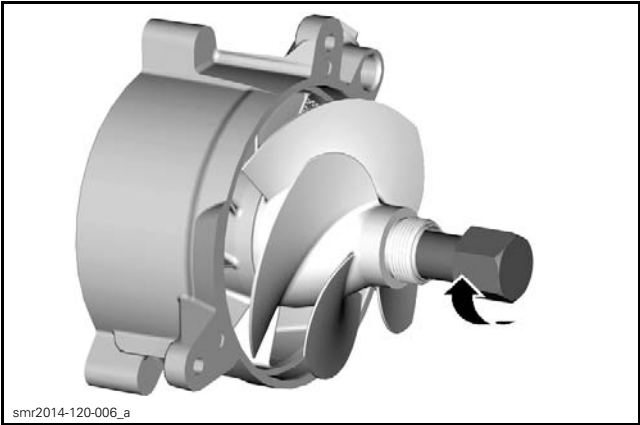
1. Turn pump upside down and mount the flat sides of impeller shaft in a vise.



TYPICAL  
1. Flat side

| REQUIRED TOOL                 |
|-------------------------------|
| PTO ADAPTER (P/N 529 036 273) |

2. Torque impeller more than impeller shaft nut.



TYPICAL

3. Turn pump upside down and retry unscrewing impeller shaft nut.



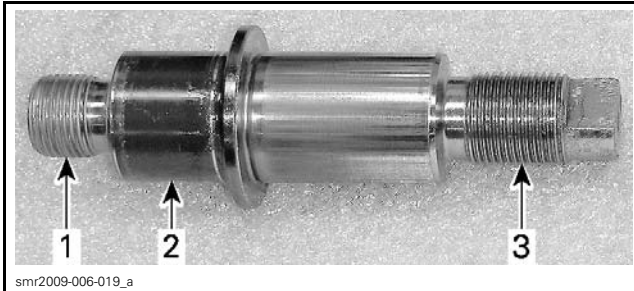
TYPICAL

4. If impeller still loosens instead of nut, retighten impeller more and retry. Repeat until nut loosens.  
5. Remove impeller as described in this subsection.  
6. Return to *IMPELLER SHAFT AND BEARING REMOVAL* main procedure.

Impeller Shaft and Bearing Inspection

With your finger nail, feel seal lip contact surface on shaft. If any irregular surface is found, replace shaft and seals.

Check condition of shaft threads.



**TYPICAL**

1. Threads
2. Seal lip contact surface
3. Threads

Inspect ball bearing for corrosion.

## Impeller Shaft and Bearing Installation

### Bearing Installation

The installation is essentially the reverse of the removal procedure. However, pay attention to the following.

1. Using the required tool on the bearing inner race, press the bearing on the impeller shaft.

| REQUIRED TOOL                                    |
|--------------------------------------------------|
| IMPELLER SHAFT BEARING TOOL<br>(P/N 529 036 168) |

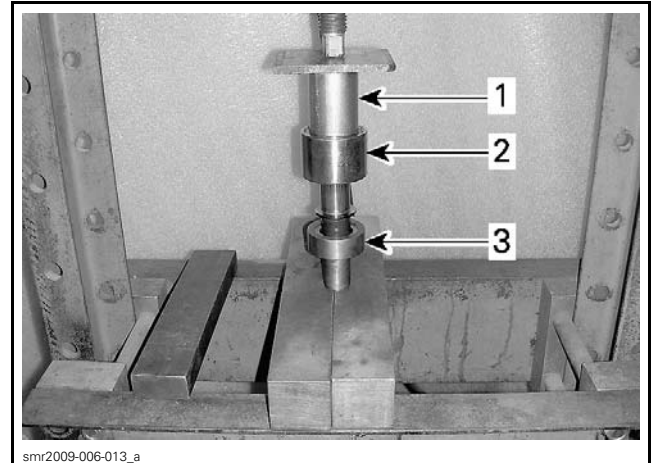


2. Use the required tool to protect the impeller shaft threads.

| REQUIRED TOOL                           |
|-----------------------------------------|
| IMPELLER SHAFT PUSHER (P/N 529 035 955) |



**NOTE:** The bearing can be installed in either direction.



**TYPICAL**

1. Impeller shaft bearing tool on INNER race
2. Impeller shaft and bearing
3. Impeller shaft installer/pusher tool

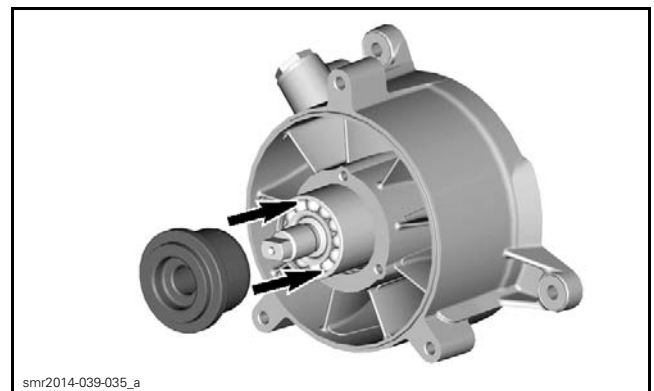
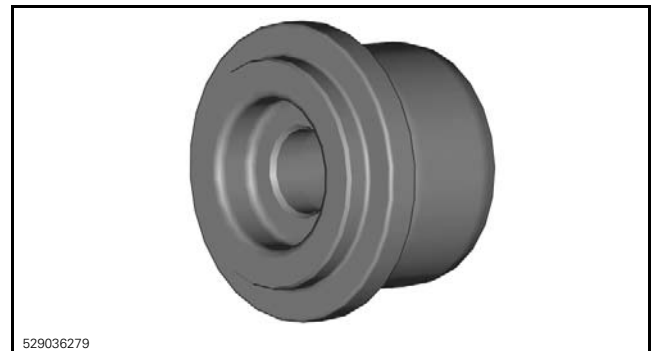
3. Press bearing until it bottoms.

### Impeller Shaft Installation

**NOTE:** Ensure there is no O-ring in pump housing on the impeller cover side.

1. From the impeller cover side of pump, press impeller shaft assembly into housing.

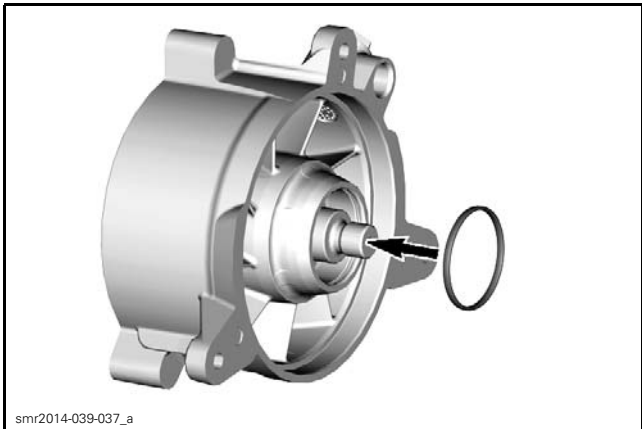
| REQUIRED TOOL                                    |
|--------------------------------------------------|
| IMPELLER SHAFT BEARING TOOL<br>(P/N 529 036 279) |



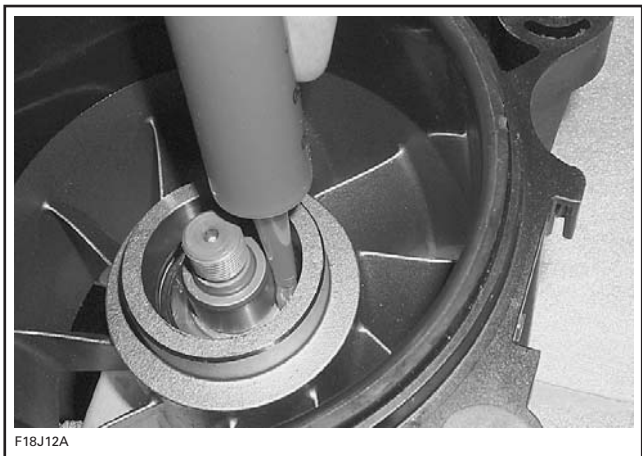
Subsection 03 (JET PUMP)



- NOTE:** Ensure impeller shaft turns freely and smoothly.
- 2. Turn pump upside down.
  - 3. Coat shaft surface with JET PUMP BEARING GREASE (P/N 293 550 032).
  - 4. Install a **NEW** O-ring at bottom.



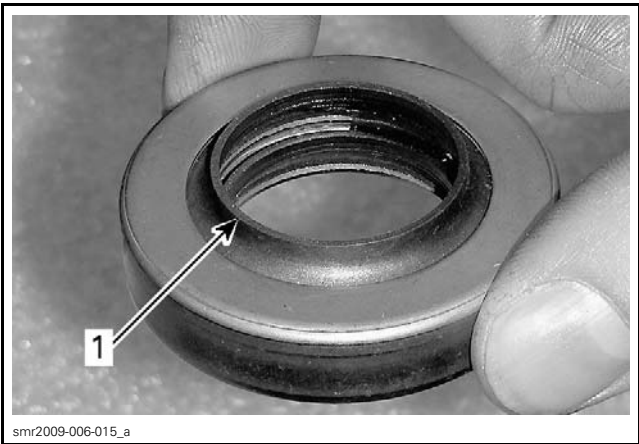
- 5. Apply 4 ml (.1 U.S. oz) of JET PUMP BEARING GREASE (P/N 293 550 032) on bearing.



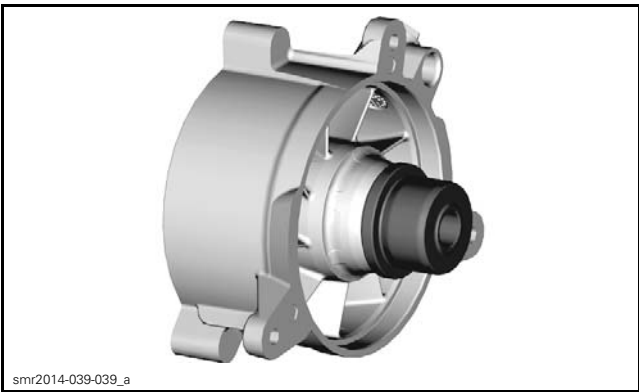
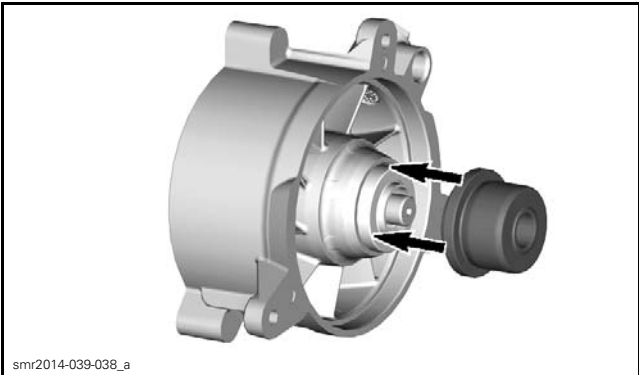
TYPICAL

| REQUIRED TOOL |
|---------------|
| 529036279     |

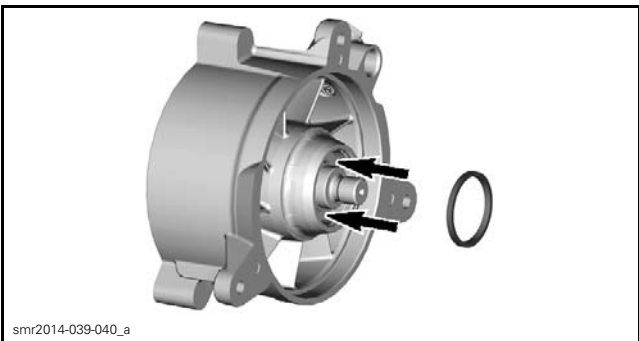
- 6. Install a **NEW** double lip seal. Make sure seal lip are facing upwards.



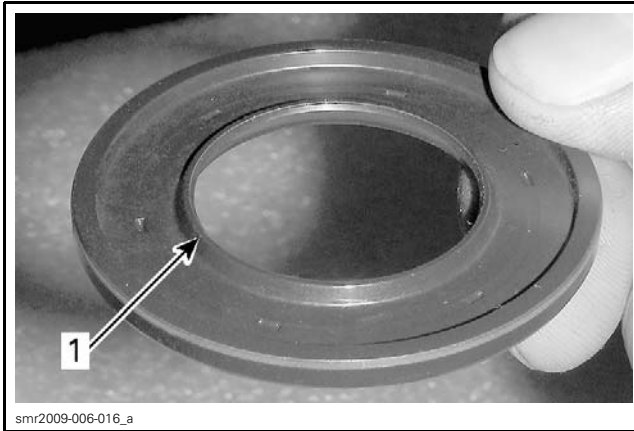
- 1. Seal lip up



- 7. Install spacer.

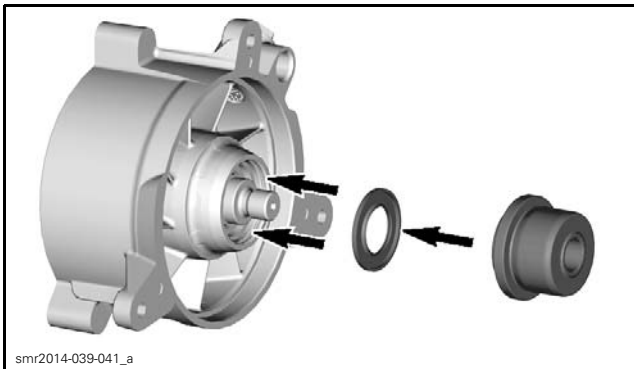


- 8. Install **NEW** outer impeller shaft seal.

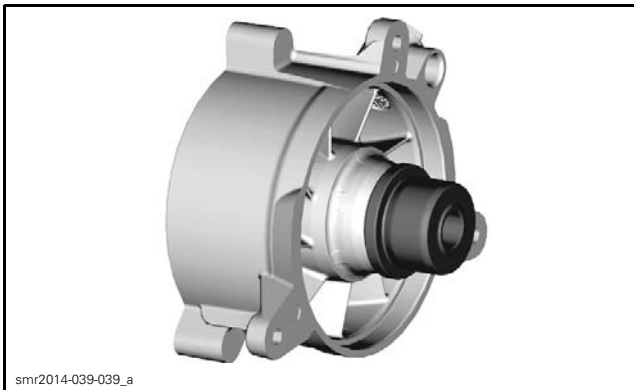


smr2009-006-016\_a

1. Seal lip facing up

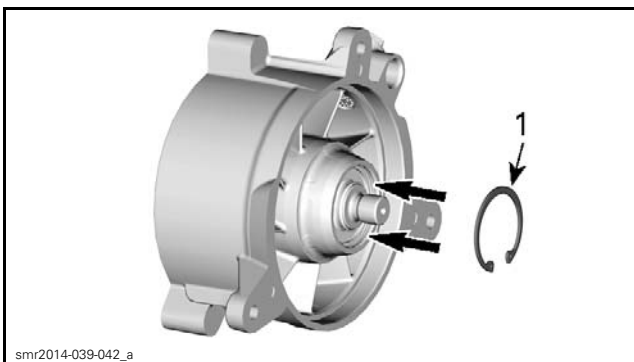


smr2014-039-041\_a



smr2014-039-039\_a

9. Install circlip.

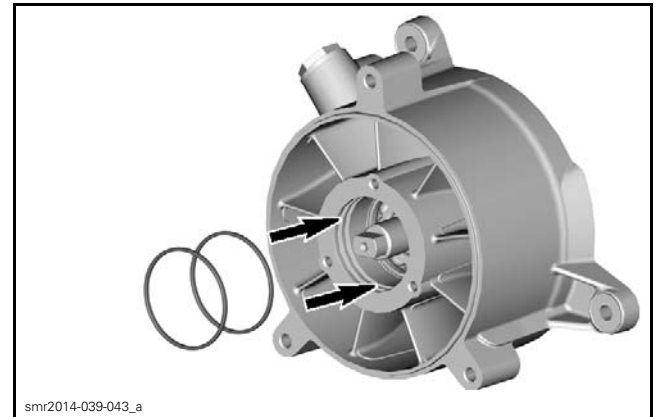


smr2014-039-042\_a

TYPICAL  
1. Circlip

10. Turn pump upside down.

11. Install the two impeller cover O-rings in pump housing.



smr2014-039-043\_a

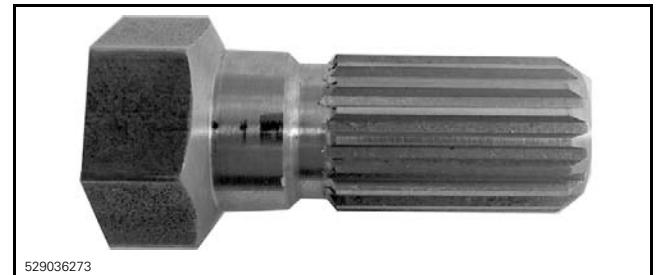
12. Before installing any other parts, pressurize jet pump to insure proper seal installation. Refer to *LEAK TEST* in this subsection.

13. Install impeller. Refer to *IMPELLER*.

14. Mount required tool in a vise.

## REQUIRED TOOL

PTO ADAPTER (P/N 529 036 273)



529036273

15. Using a 30 mm socket, screw the impeller shaft nut on clockwise.

## TIGHTENING TORQUE

M20 impeller shaft nut

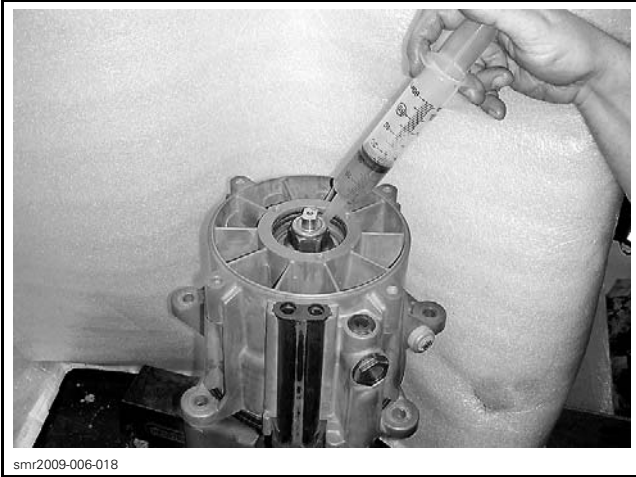
125 N•m ± 10 N•m  
(92 lbf•ft ± 7 lbf•ft)

16. Apply 9 ml (.3 U.S. oz) of JET PUMP BEARING GREASE (P/N 293 550 032) on the bearing (nut side).

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## Subsection 03 (JET PUMP)

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*TYPICAL*

17. Install the impeller cover. Refer to *IMPELLER COVER*.