SEA-DOO®

BRP

2009
SHOP MANUAL SUPPLEMENT

4-TEC™ Series

This Supplement must be used in conjunction with the 2008 Shop Manual P/N 219 100 313.

219 100 369

2009 Shop Manual Supplement

4-TEC™ Series

SEA-DOO BRP

Legal deposit:
National Library of Quebec
National Library of Canada 2009

Printed in Canada

Technical Publications
Bombardier Recreational Products Inc. (BRP)
Valcourt (Quebec) Canada

TABLE OF CONTENTS

SAFETY NOTICE II

INTRODUCTION III
GENERAL INFORMATION III

01 MAINTENANCE
01 – MAINTENANCE CHART 3
03 – STORAGE PROCEDURE 5
PROCEDURES 5
PROPULSION SYSTEM 5
ENGINE 5

06 ELECTRICAL SYSTEM
02 – CHARGING SYSTEM 7
PROCEDURES 7
BATTERY 7

07 PROPULSION
01 – JET PUMP 11
INSPECTION 13
LEAK TEST 13
PROCEDURES 13
IMPELLER COVER 14
IMPELLER 15
IMPELLER SHAFT AND BEARING 18
02 – DRIVE SYSTEM 25
GENERAL 27
MAINTENANCE 27
CORROSION PROTECTION 27
TROUBLESHOOTING 27
DIAGNOSTIC TIPS 27
PROCEDURES 28
DRIVE SHAFT 28
SEALING RING 32

10 TECHNICAL SPECIFICATIONS
01 – 1503 ENGINE (130 HP) 35
02 – 1503 ENGINE (155 HP) 41
03 – 1503 ENGINE (215 HP) 47
04 – 1503 ENGINE (255 HP) 53

SAFETY NOTICE

This Supplement has been prepared as a guide to correctly service and repair specific systems for the 2009 SEA-DOO® watercraft as described in the model list in the *INTRODUCTION*.

This edition was primarily published to be used by watercraft mechanical technicians who are already familiar with all service procedures relating to BRP made watercraft. Mechanical technicians should attend training courses given by BRPTI.

Please note that the instructions will apply only if proper hand tools and special service tools are used.

This supplement uses technical terms which may be slightly different from the ones used in the *PARTS CATALOG*.

It is understood that this manual may be translated into another language. In the event of any discrepancy, the English version shall prevail.

The content depicts parts and/or procedures applicable to the particular product at time of writing. *SERVICE* and *WARRANTY BULLETINS* may be published to update the content of this supplement. Make sure to read and understand these.

In addition, the sole purpose of the illustrations throughout this supplement, is to assist identification of the general configuration of the parts. They are not to be interpreted as technical drawings or exact replicas of the parts.

The use of BRP parts is most strongly recommended when considering replacement of any component. Dealer and/or distributor assistance should be sought in case of doubt.

The engines and the corresponding components identified in this document should not be utilized on product(s) other than those mentioned in this document.

⚠ WARNING

Unless otherwise specified, engine should be turned OFF and cold for all maintenance and repair procedures.

This supplement emphasizes particular information denoted by the wording and symbols:

⚠ WARNING

Identifies an instruction which, if not followed, could cause serious personal injury including possibility of death.

⚠ CAUTION Denotes an instruction which, if not followed, could severely damage vehicle components.

NOTE: Indicates supplementary information needed to fully complete an instruction.

Although the mere reading of such information does not eliminate the hazard, your understanding of the information will promote its correct use. Always use common shop safety practice.

BRP disclaims liability for all damages and/or injuries resulting from the improper use of the contents. We strongly recommend that any services be carried out and/or verified by a highly skilled professional mechanic. It is understood that certain modifications may render use of the vehicle illegal under existing federal, provincial and state regulations.

INTRODUCTION

GENERAL INFORMATION

This 2009 Shop Manual Supplement must be used in conjunction with the *2008 SEA-DOO SHOP MANUAL 4-TEC SERIES* (P/N 219 100 313). Refer to the 2008 manual when a particular system is not covered in this supplement.

The information and component/system descriptions contained in this supplement are correct at time of writing. BRP however, maintains a policy of continuous improvement of its products without imposing upon itself any obligation to install them on products previously manufactured.

Due to late changes, there may be some differences between the manufactured product and the description and/or specifications in this document.

BRP reserves the right at any time to discontinue or change specifications, designs, features, models or equipment without incurring obligation.

2009 WAKE Model

Refer to the GTI models in the 2008 Shop Manual except for the ballast and the wake pylon.

2009 WAKE PRO Model

Refer to the WAKE models in the 2008 Shop Manual.

MODEL LIST

This Supplement covers the following BRP made 2009 SEA-DOO watercraft models.

MODEL	COLOR	ENGINE	MODEL NUMBER
GTI	REGAL RED	1503 Naturally Aspirated (130 HP)	239A, 239B
GTI Rental	REGAL RED	1503 Naturally Aspirated (130 HP)	259B
GTI SE	BLUE ABYSS	1503 Naturally Aspirated (130 HP)	249A, 249B
GTI SE	BLUE ABYSS	1503 Naturally Aspirated (155 HP)	309A, 309B,
WAKE	VIPER RED	1503 Naturally Aspirated (155 HP)	359A, 359B
GTX	COSMOS BLUE	1503 Naturally Aspirated (155 HP)	149A, 149B
GTX	COSMOS BLUE	1503 Supercharged Intercooled (215 HP)	339A, 339B
WAKE PRO	DEEP BLACK	1503 Supercharged Intercooled (215 HP)	269A, 269B
RXP	YELLOW	1503 Supercharged Intercooled (215 HP)	219A, 219B
RXP-X	HYPER SILVER	1503 Supercharged Intercooled (255 HP)	329A
RXP-X RS	HYPER SILVER	1503 Supercharged Intercooled (255 HP)	329A
RXT	YELLOW/DEEP BLACK	1503 Supercharged Intercooled (215 HP)	179A, 179B 179C, 179D
RXT-X	HYPER SILVER	1503 Supercharged Intercooled (255 HP)	319A
RXT-X RS	HYPER SILVER	1503 Supercharged Intercooled (255 HP)	319B

MAINTENANCE CHART

The schedule should be adjusted according to operating conditions and use.

NOTE: The chart gives an equivalence between number of hours and months/year. Perform the maintenance operation to whatever time comes first.

IMPORTANT: Watercraft rental operations or intensive use of watercraft, will require greater frequency of inspection and maintenance.

4-TEC MODELS						
A: Adjust C: Clean I: Inspect L: Lubricate R: Replace	FIRST 10 HOURS	EVERY 25 HOURS OR 3 MONTHS	EVERY 50 HOURS OR 6 MONTHS	EVERY 100 HOURS OR 1 YEAR	EVERY 200 HOURS OR 2 YEAR	
PART/TASK						REFER TO
ENGINE						
Engine oil and filter	R			R (1)		*LUBRICATION SYSTEM*
Rubber mounts	I			I		*ENGINE REMOVAL/INSTALLATION*
Exhaust system (2)	I			I, C (3)		*EXHAUST SYSTEM*
Supercharger clutch	(4)					*SUPERCHARGER*
Lubrication/corrosion protection			L			*STORAGE PROCEDURES*
COOLING SYSTEM						
Hose and fasteners	I					*COOLING SYSTEM*
Coolant	I				R	
FUEL SYSTEM						
Throttle cable	I			I (1)		*STEERING SYSTEM*
Throttle body (IMPORTANT: see (5))	I			L		*ELECTRONIC FUEL INJECTION (EFI)*
Fuel cap, filler neck, fuel tank, fuel lines and connections	I			I		*FUEL TANK/FUEL PUMP*
Fuel system leak test	I			I		
Fuel tank straps	I			I		
AIR INTAKE SYSTEM						
Air intake silencer	I			I		*AIR INTAKE SYSTEM*
Intercooler (255 engines)				I, C		*INTERCOOLER (255 ENGINES)*
ELECTRICAL SYSTEM						
Spark plug	I			I	R	*IGNITION SYSTEM*
Electrical connections and fastening (ignition system, starting system, fuel injectors etc.)	I			I		*ELECTRICAL SYSTEM*
Digitally Encoded Security System (D.E.S.S.)	I			I		*DIGITALLY ENCODED SECURITY SYSTEM*
Monitoring beeper	I			I		*GAUGE/FUSES*
Battery and fasteners	I			I		*CHARGING SYSTEM*

4-TEC MODELS						
A: Adjust C: Clean I: Inspect L: Lubricate R: Replace	FIRST 10 HOURS	EVERY 25 HOURS OR 3 MONTHS	EVERY 50 HOURS OR 6 MONTHS	EVERY 100 HOURS OR 1 YEAR	EVERY 200 HOURS OR 2 YEAR	
PART/TASK						REFER TO
ENGINE MANAGEMENT SYSTEM						
EMS sensors				I		*ENGINE MANAGEMENT SYSTEM*
EMS fault codes	I			I		
STEERING SYSTEM						
Steering cable and connections	I			I		*STEERING SYSTEM*
Steering nozzle bushings	I			I		
Off-power assisted steering (O.P.A.S.)	I			I		*OFF-POWER ASSISTED STEERING SYSTEM (O.P.A.S.)*
PROPULSION SYSTEM						
Carbon ring and rubber boot (drive shaft)	I			I		*DRIVE SYSTEM*
Reverse system, cable and connections	I			I		*REVERSE SYSTEM*
VTS (Variable Trim System) (if so equipped)	I			I		*VARIABLE TRIM SYSTEM (VTS)*
Drive shaft/impeller splines				I, L		*JET PUMP and DRIVE SYSTEM*
Impeller boot	I			I		*JET PUMP*
Impeller shaft seal and O-ring				I (1)		
Impeller and wear ring clearance	I			I		
Sacrificial anode	(6)					
HULL/BODY						
Ride plate and water intake grate	I			I		*BODY/HULL*
Drain plugs (inside bilge), check for obstructions	I			I		
Hull	I			I		
Ski/wakeboard post and fasteners	I					

(1) In fresh water, perform for storage period or after 100 hours of use whichever comes first. In salt water use, lubricate drive shaft as indicated to protect it from corrosion.

(2) Including intercooler on supercharged models.

(3) Daily flushing in salt water or foul water use.

(4) The supercharger requires replacement when the MAINTENANCE SUPERCHARGER message is displayed on the information center, at every 100 hours of operation or earlier depending on the riding style (speed, engine RPM's, water conditions). This is determined by the engine management system. The supercharger will need to be replaced within 5 hours of the message display by an authorized Sea-doo dealer.

(5) IMPORTANT: When used in salt water, the throttle body lubrication is highly recommended after every 10 hours of use. Failure to perform lubrication will result in damage to the throttle body.

6) In salt water use.

STORAGE PROCEDURE

PROCEDURES

PROPULSION SYSTEM

Drive Shaft Corrosion Protection

No protection against corrosion is required since the drive shaft is rubber-coated.

ENGINE

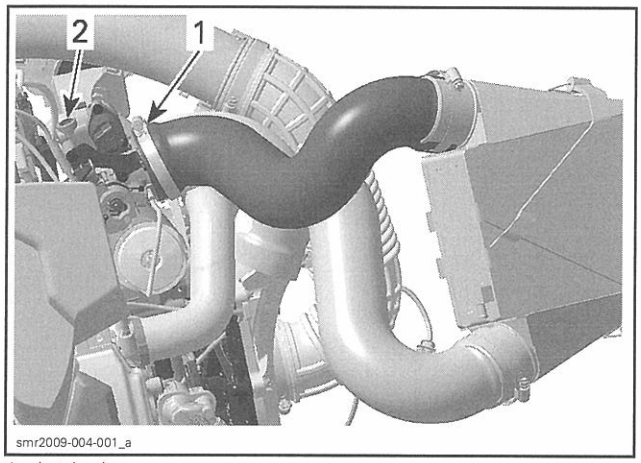
Intercooler Protection

255 Engine

It is important to expel any trapped water that may have accumulated from condensation in the external intercooler.

Proceed as follows:

1. Removed the intake hose from throttle body.

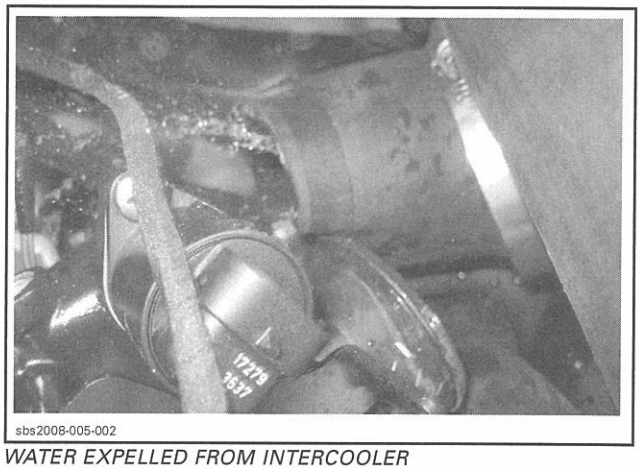


smr2009-004-001_a

1. *Intake hose*
2. *Throttle body*

2. Start engine and rev up to 4000 RPMs several times.

NOTE: Water will be expelled from intercooler.


sbs2008-005-002

WATER EXPELLED FROM INTERCOOLER

3. Stop engine.
4. Liberally lubricate throttle body inside and out.
5. Clean off any lubrication on the throttle body intake hose flange.
6. Install air intake hose to the throttle body.

CHARGING SYSTEM

PROCEDURES

BATTERY

Battery Removal

All Models except GTI Rental and GTX 130/155

⚠ WARNING

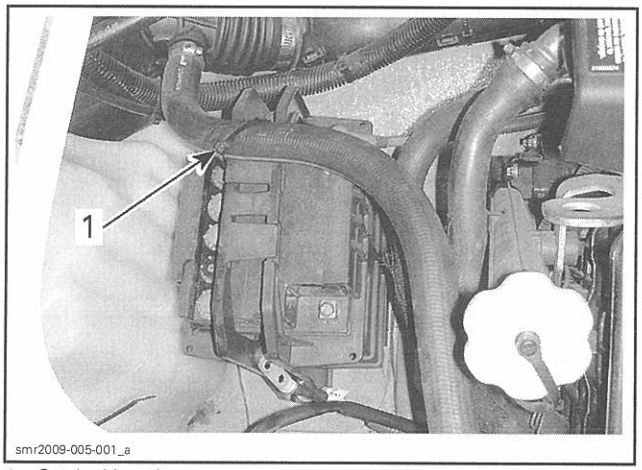
The BLACK negative battery cable must always be disconnected first and reconnected last. Never charge or boost battery while installed in watercraft.

Disconnect the BLACK negative cable first.

Disconnect the RED positive cable last.

Disconnect the vent line from the battery.

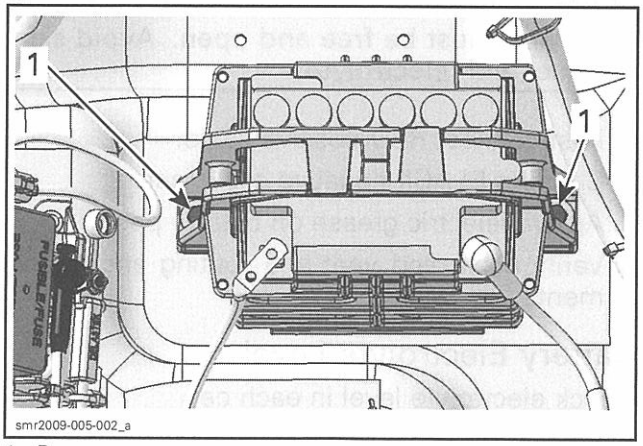
Cut locking tie on blow-by hose if applicable.



smr2009-005-001_a

1. Cut locking tie

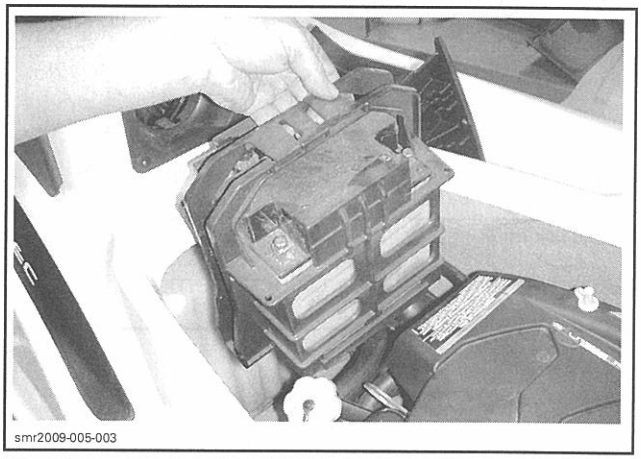
Remove screws retaining battery holder in hull.



smr2009-005-002_a

1. Remove screws

Grab battery holder and remove battery from watercraft being careful not to lean it so that electrolyte flows out of battery vent fitting.



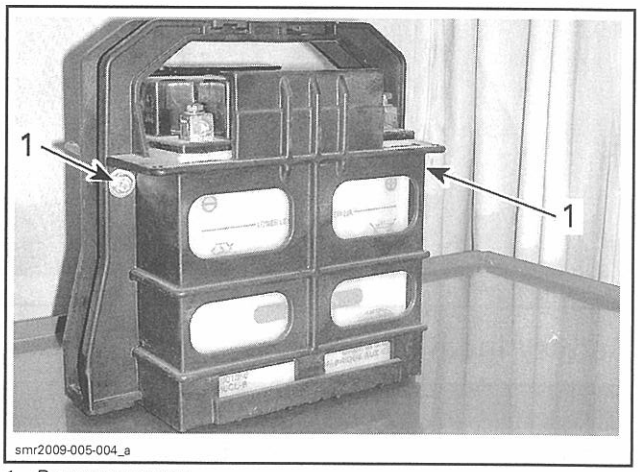
smr2009-005-003

⚠ WARNING

Electrolyte is poisonous and corrosive. Avoid contact with eyes, skin and clothing. Wear a suitable pair of non-absorbent gloves when removing the battery by hand. Rinse any affected area with clear running water for at least 15 minutes, then seek professional medical attention.

⚠ CAUTION **Should any electrolyte spillage occur, immediately wash off area with a solution of baking soda and water, then rinse thoroughly.**

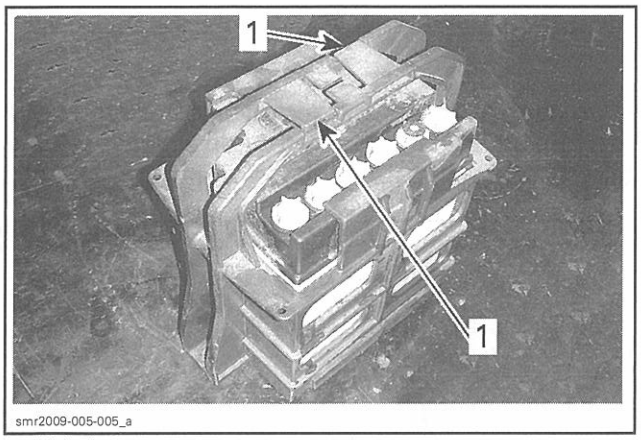
Remove retaining screws from battery holder.



smr2009-005-004_a

1. Remove screws

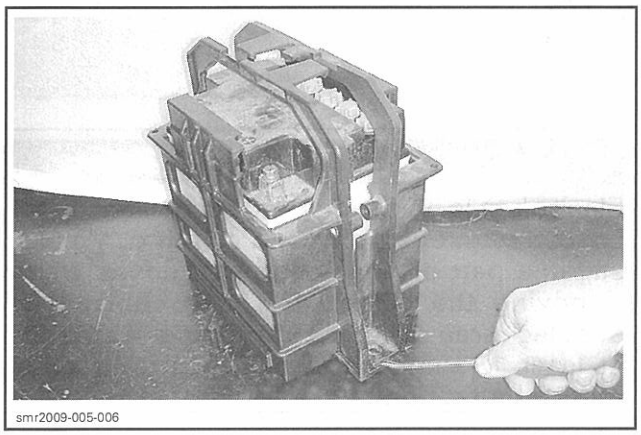
Unlock the upper tabs then slightly open battery holder.



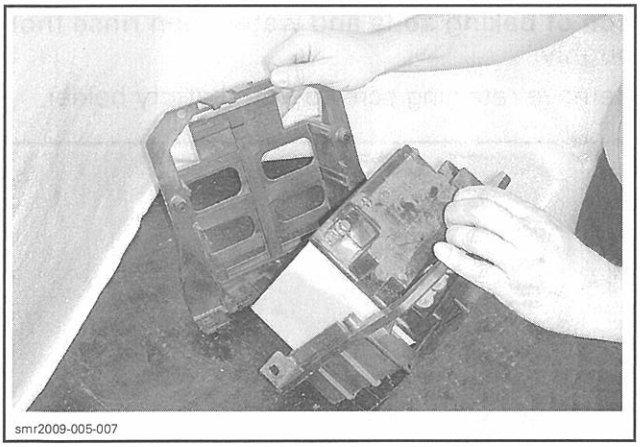
smr2009-005-005_a

1. Unlock here

Separate lower tabs to unlock them.


smr2009-005-006

Remove battery holder from battery.


smr2009-005-007

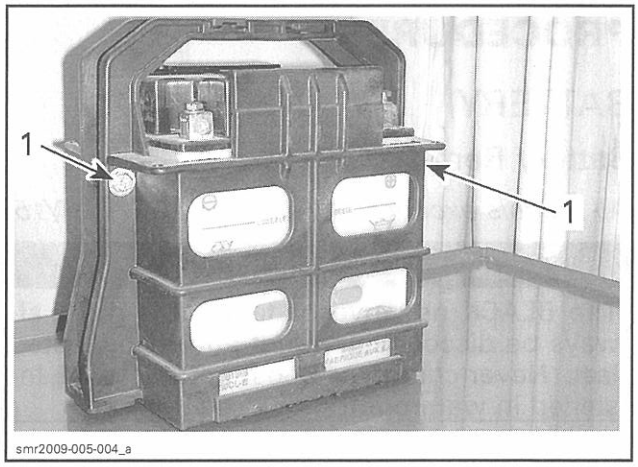
Battery Installation

⚠ WARNING

Always connect battery cables in the specified order, RED positive cable first, BLACK negative cable last.

Install battery in its holder.

Secure battery holder with its retaining screws.

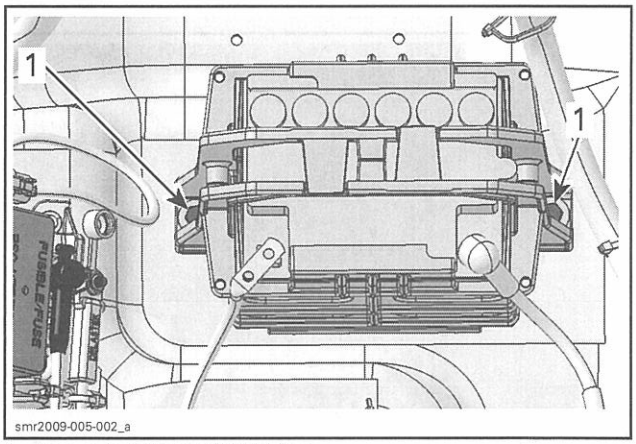


smr2009-005-004_a

*1. Torque to 6 N•m (53 lbf•**in**)*

Install battery holder into hull.

Secure battery holder with NEW screws.



smr2009-005-002_a

*1. Torque to 14 N•m (124 lbf•**in**)*

Connect vent line to battery. Ensure vent line is not kinked or obstructed.

⚠ WARNING

Vent line must be free and open. Avoid skin contact with electrolyte.

1. First connect RED positive cable.
2. Connect BLACK negative cable last.
3. Apply dielectric grease on battery posts.
4. Verify cable and vent line routing and attachments.

Battery Electrolyte Level

Check electrolyte level in each cell.

⚠ CAUTION Electrolyte level is critical for proper operation and life span of battery. Always keep level within upper and lower marks at all times.

Remove caps and add distilled water up to the upper fill level line as necessary.

Hand tighten caps.

Use a 20 mm (3/4 in) socket and tighten an additional 1/4 turn.

⚠ CAUTION Using any other tool could damage the plastic caps.

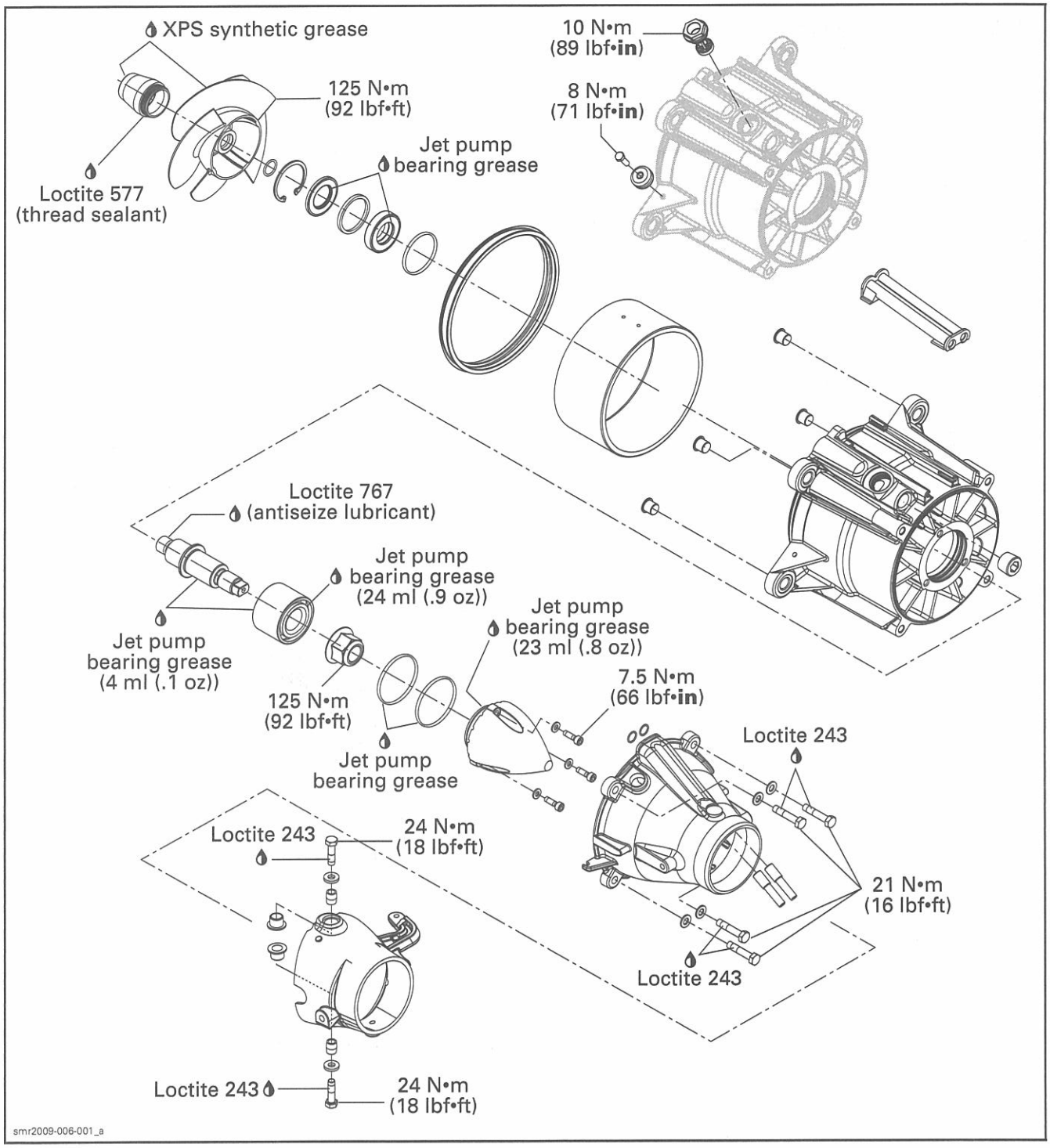
JET PUMP

SERVICE TOOLS

Description	Part Number	Page
IMPELLER REMOVER/INSTALLER	529 035 820	16–18, 23
IMPELLER REMOVER/INSTALLER	529 035 956	16–18, 23
IMPELLER SHAFT BEARING TOOL	529 036 168	19–21
IMPELLER SHAFT PUSHER	529 035 955	19–20
PRESSURE CAP	529 036 172	13
SEAL/BEARING PUSHER	529 035 819	21
VACUUM/PRESSURE PUMP	529 021 800	13

SERVICE PRODUCTS

Description	Part Number	Page
JET PUMP BEARING GREASE	293 550 032	15, 21, 23
LOCTITE 767 (ANTISEIZE LUBRICANT)	293 800 070	17
XPS LUBE	293 600 016	17
XPS SYNTHETIC GREASE	293 550 010	17



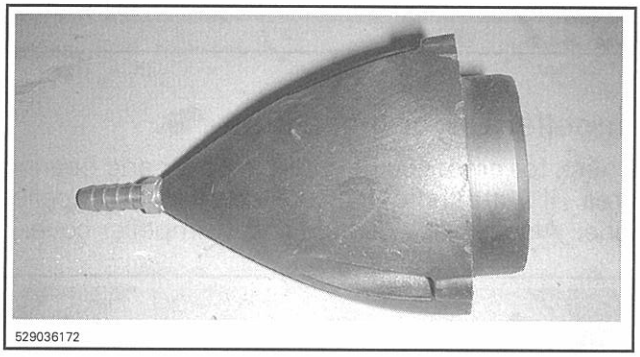
INSPECTION

LEAK TEST

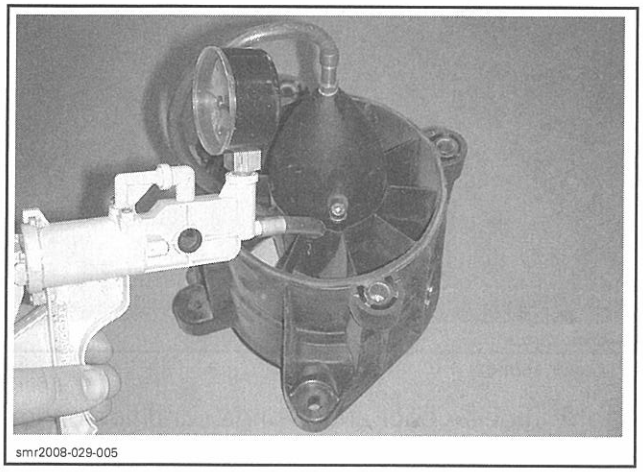
Whenever doing any type of repair on jet pump, a leak test should be done to check for leakage.

Proceed as follows:

1. Remove impeller cover. Refer to *IMPELLER COVER* in this subsection.
2. Install the PRESSURE CAP (P/N 529 036 172) on pump housing.



3. Connect the VACUUM/PRESSURE PUMP (P/N 529 021 800) to fitting.



4. Pressurize pump.

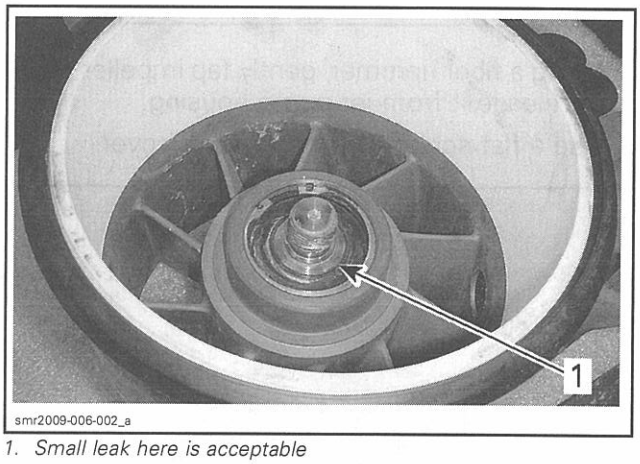
LEAK TEST PRESSURE
Maximum 70 kPa (10 PSI)

5. Pump must maintain this pressure for at least 5 minutes.

⚠ CAUTION Repair any leak, failure to correct a leak will lead to premature wear of pump components.

NOTE: If there is a pressure drop, spray soapy water around cover. If there are no bubbles, impeller shaft, impeller shaft seal, or jet pump housing is leaking through porosity and has to be replaced. Jet pump unit has to be disassembled.

NOTE: There may be 2 or 3 bubbles coming out from the the seal on the impeller side. This small leak is acceptable. Leaks from other areas must be repaired.



1. Small leak here is acceptable

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

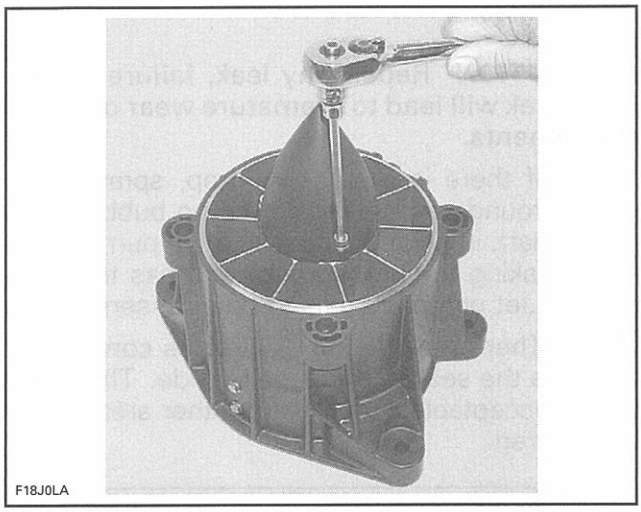
PROCEDURES

NOTE: Whenever removing a part, visually check for damage such as: corrosion, crack, 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. Renew any damaged part. As a quick check, manually feel clearance and end play, where applicable, to detect excessive wear.

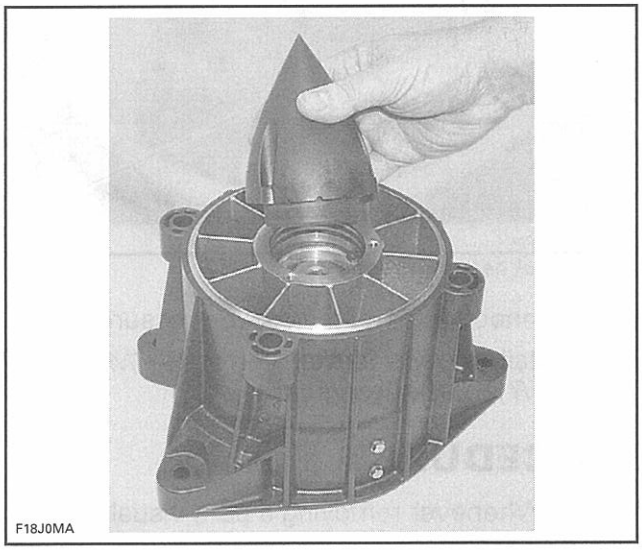
IMPELLER COVER

Impeller Cover Removal

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

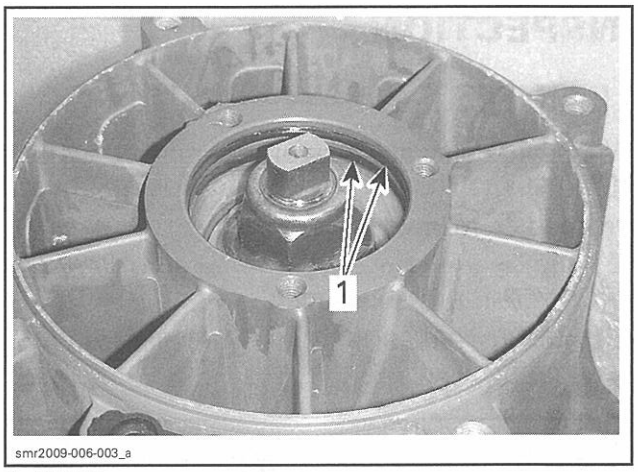

F18J0LA

2. Using a fiber hammer, gently tap impeller cover to release it from jet pump housing.
3. Use a flat screwdriver to remove cover.


F18J0MA

TYPICAL

4. Remove both O-rings.

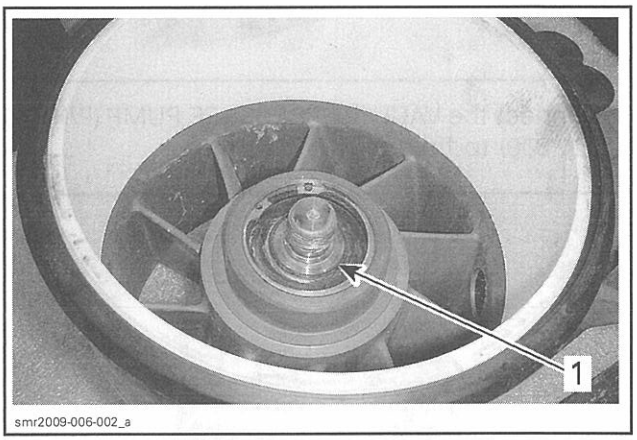


smr2009-006-003_a

1. O-rings

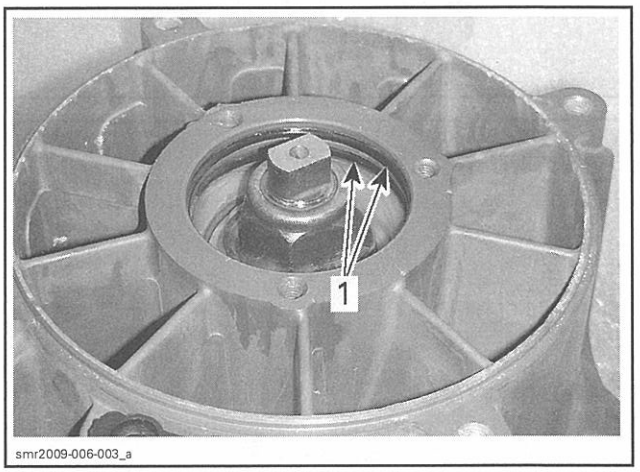
Impeller Cover Inspection

Check for presence of water in cover and bearing area. If water is found, replace seals on impeller side. Also replace O-rings and/or impeller cover.



smr2009-006-002_a

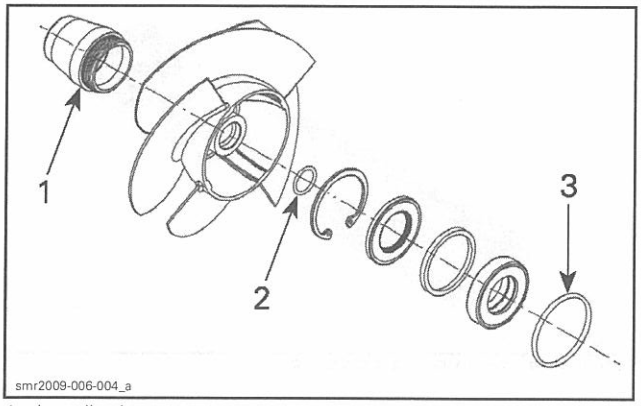
1. Seal on impeller side



smr2009-006-003_a

1. Cover O-rings

Check impeller boot and O-rings condition on impeller. Replace as required.

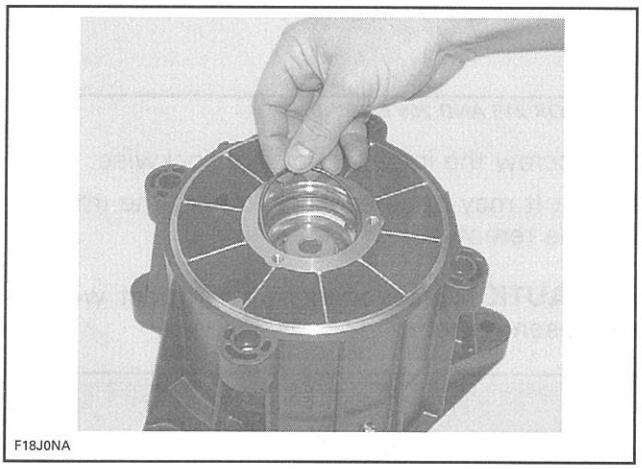


1. *Impeller boot*
2. *Impeller O-ring*
3. *Pump housing O-ring*

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

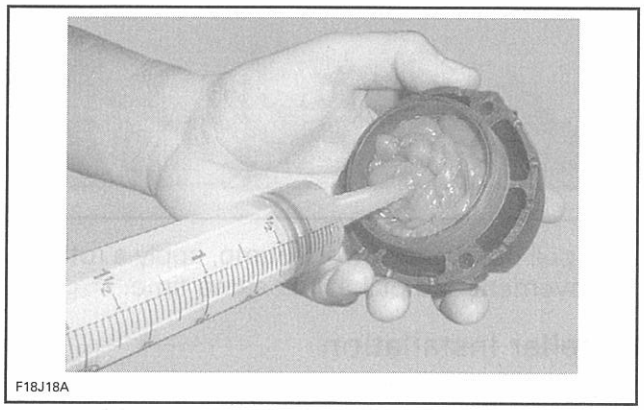
Impeller Cover Installation

1. Install O-rings in their respective groove.



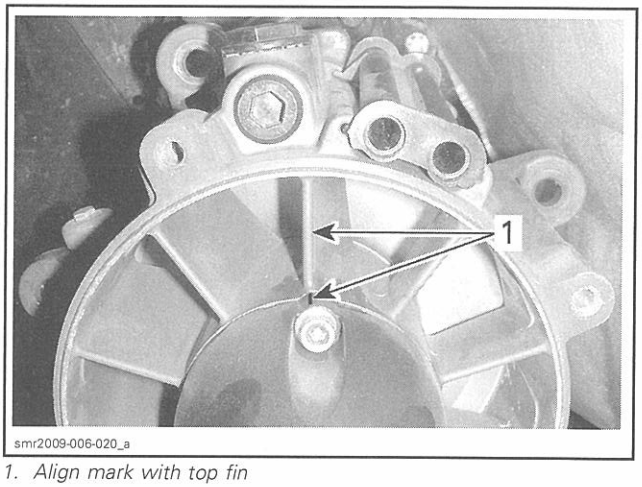
TYPICAL

2. Put 23 ml (.8 U.S. oz) of JET PUMP BEARING GREASE (P/N 293 550 032) in cover.



TYPICAL

3. Install impeller cover by aligning the cover index mark with the pump top fin as shown.



1. *Align mark with top fin*

4. Secure cover with NEW self-locking screws.
5. Torque screws to 7.5 N•m (66 lbf•ft).

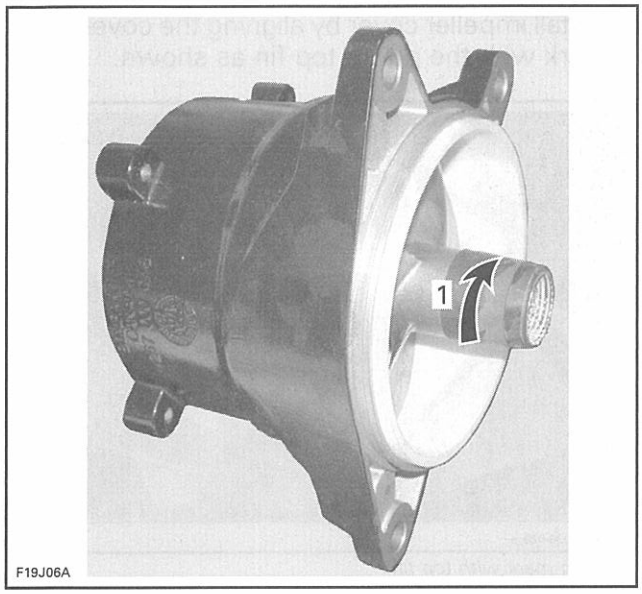
NOTE: Push cover against pump housing while alternately tightening screws. Make sure O-rings are positioned correctly and they are not damaged when pushing the cover.

IMPELLER

Impeller Removal

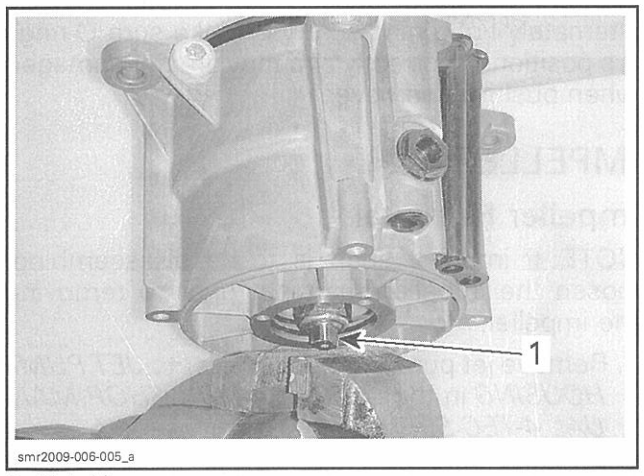
NOTE: If impeller shaft is to be disassembled, loosen the impeller shaft nut prior to removing the impeller.

1. Remove jet pump housing. Refer to *JET PUMP HOUSING* in the *2008 SEA-DOO SHOP MANUAL 4-TEC SERIES*.
2. Remove impeller cover. Refer to *IMPELLER COVER* in this subsection.
3. Remove impeller boot by turning it clockwise (LH threads).



1. Unscrew clockwise

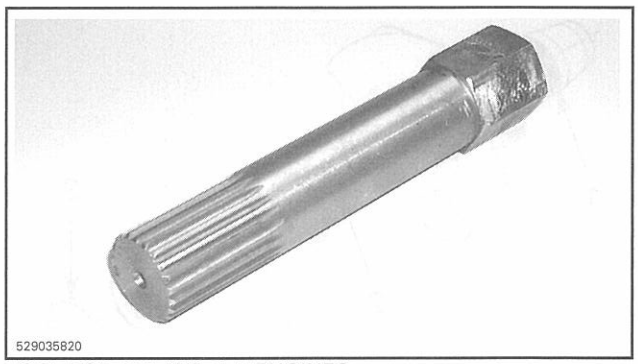
4. Mount the flat sides of impeller shaft in a vise.



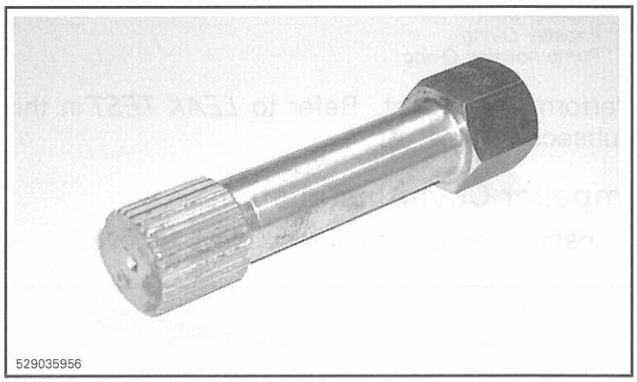
1. Flat side

5. Mount the proper impeller remover/installer in impeller.

MODEL	TOOL
130 and 155 engines	IMPELLER REMOVER/INSTALLER (P/N 529 035 820)
215 and 255 engines	IMPELLER REMOVER/INSTALLER (P/N 529 035 956)



TOOL FOR 130 AND 155 ENGINES

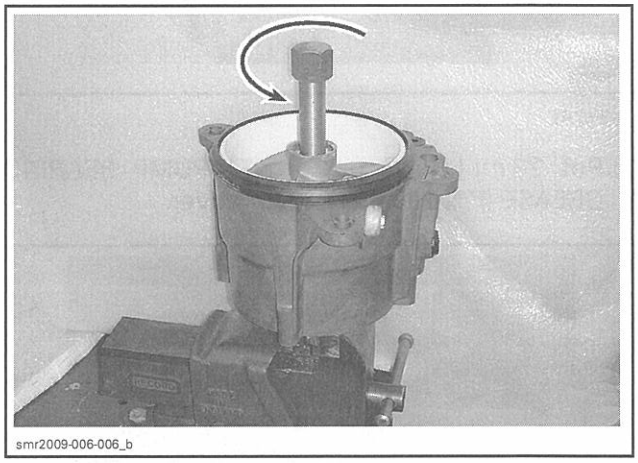


TOOL FOR 215 AND 255 ENGINE

6. Unscrew the impeller counterclockwise.

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

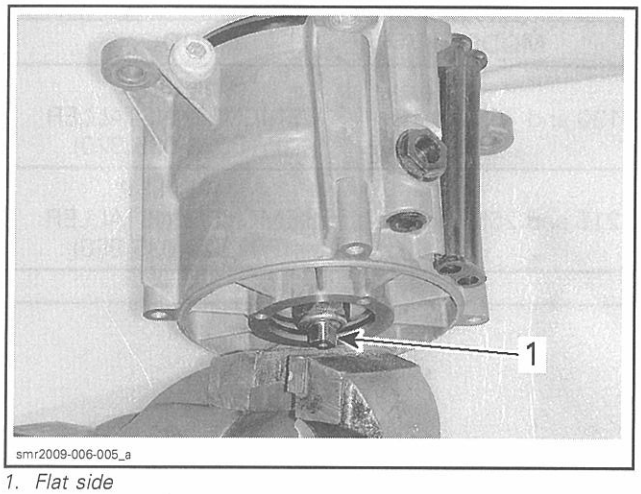
⚠ **CAUTION** Never use any impact wrench to loosen impeller.



7. To pull out impeller from pump, apply a rotating movement and pull at the same time.

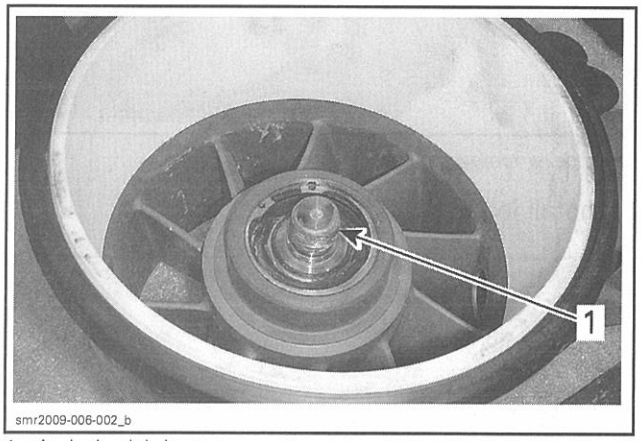
Impeller Installation

1. Mount the flat sides of impeller shaft in a vise.



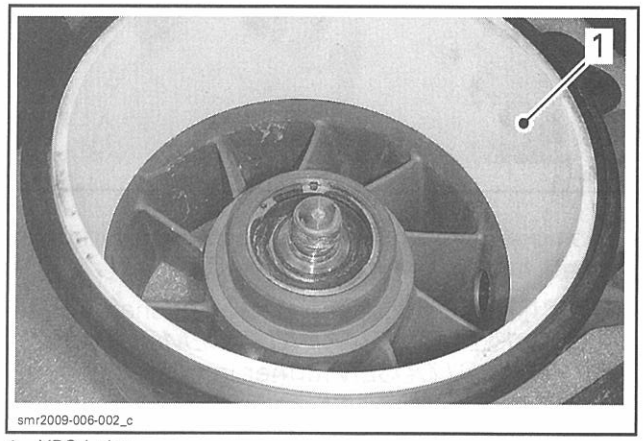
1. Flat side

2. Apply LOCTITE 767 (ANTISEIZE LUBRICANT) (P/N 293 800 070) on threads of impeller shaft.



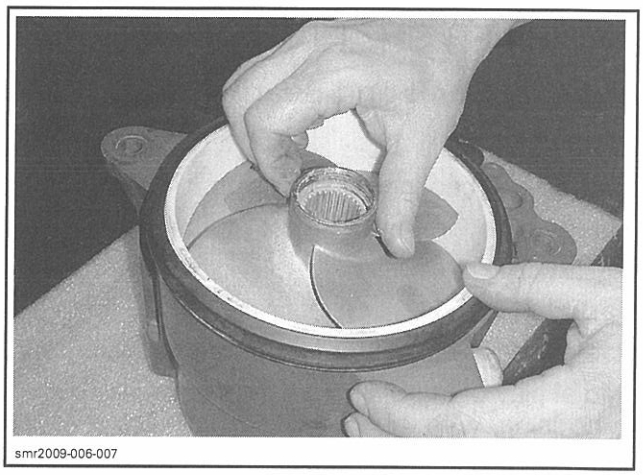
1. Antiseize lubricant

3. Apply XPS LUBE (P/N 293 600 016) on the wear ring surface.



1. XPS Lube

4. Start screwing the impeller on its shaft.

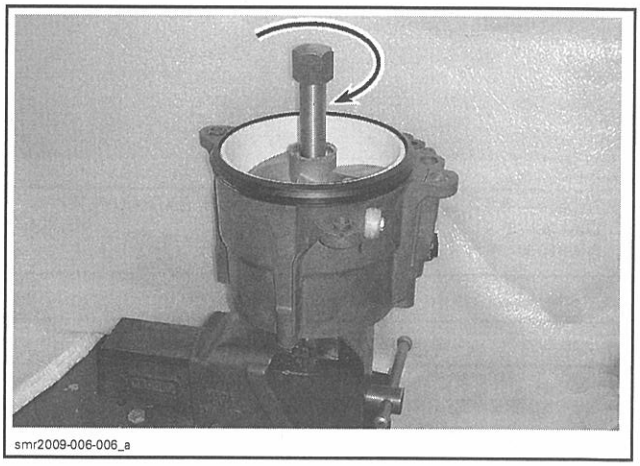


5. Mount the proper impeller remover/installer in impeller.

MODEL	TOOL
130 and 155 engines	IMPELLER REMOVER/INSTALLER (P/N 529 035 820)
215 and 255 engines	IMPELLER REMOVER/INSTALLER (P/N 529 035 956)

6. Torque impeller shaft to 125 N•m (92 lbf•ft) then remove tool.

⚠ CAUTION Never use any impact wrench to tighten impeller shaft.



7. Apply XPS SYNTHETIC GREASE (P/N 293 550 010) on impeller boot threads.
8. Install impeller boot to impeller and tighten counterclockwise.

IMPELLER SHAFT AND BEARING

Impeller Shaft and Bearing Inspection

Wear

Inspect ball bearing for corrosion.

Make sure impeller shaft turns freely and smoothly.

Radial Play

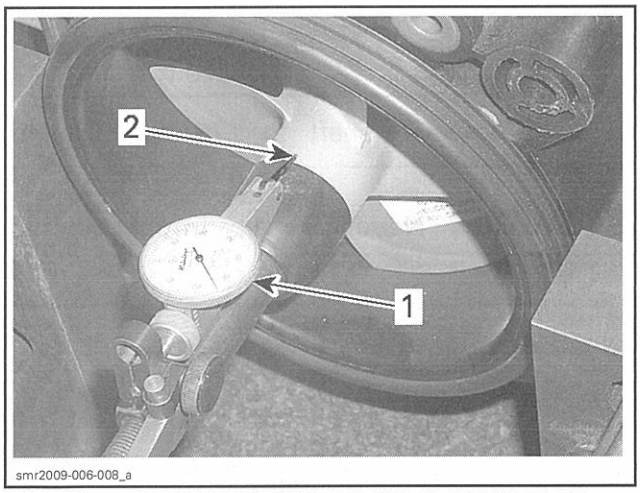
Radial play is critical for jet pump life span.

Radial play of impeller shaft is checked with shaft in housing, with the impeller installed.

Retain housing in a soft jaw vise making sure not to damage housing lug.

Set a dial gauge and position its tip onto metal end, close to the end of the impeller hub.

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*

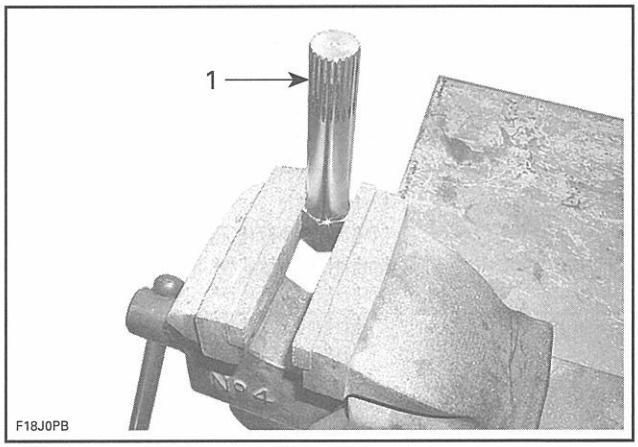
RADIAL PLAY
0 mm (0 in)

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

Impeller Shaft and Bearing Removal

1. Remove impeller cover. Refer to *IMPELLER COVER* in this subsection.
2. Mount the proper impeller remover/installer in a vise.

MODEL	TOOL
130 and 155 engines	IMPELLER REMOVER/INSTALLER (P/N 529 035 820)
215 and 255 engines	IMPELLER REMOVER/INSTALLER (P/N 529 035 956)

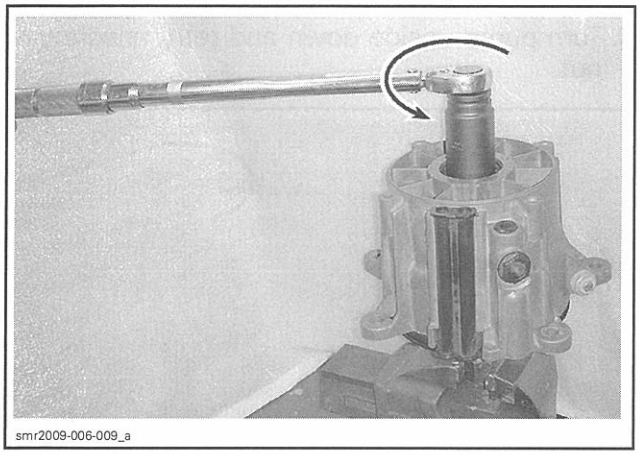


1. Impeller remover/installer

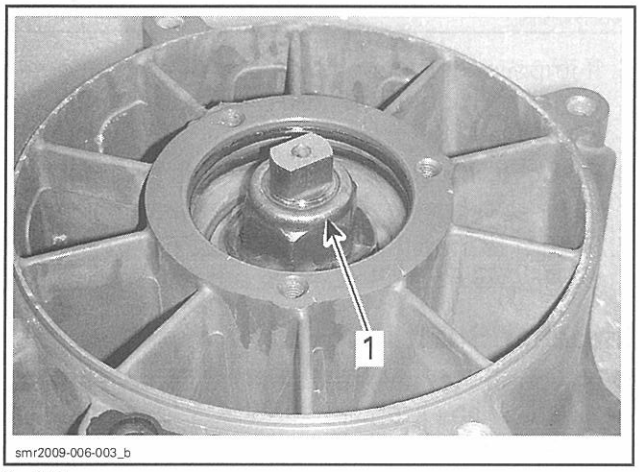
3. Install jet pump housing over this tool.

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

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


smr2009-006-009_a

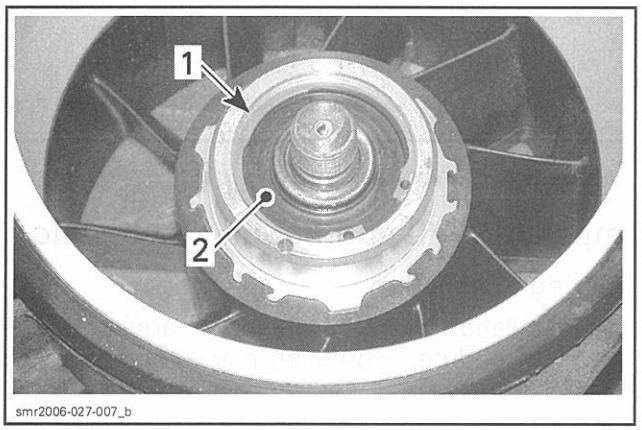
5. Remove nut.



smr2009-006-003_b

1. Nut

6. Remove impeller as described in this subsection.
7. From the impeller side, remove circlip, seals, spacer and O-ring.

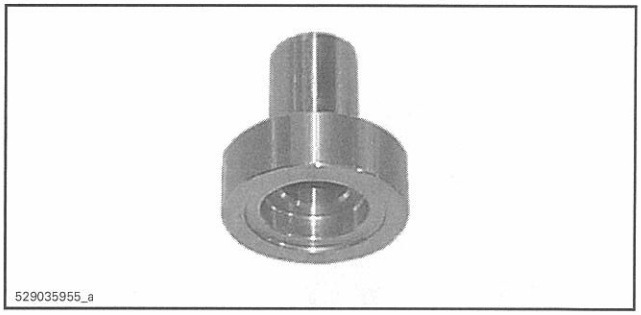


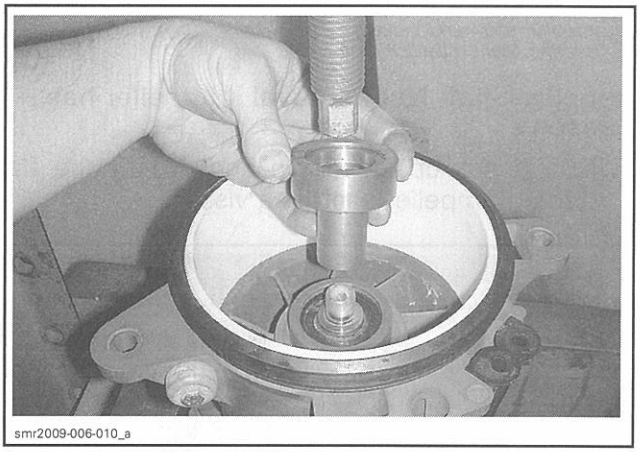
smr2006-027-007_b

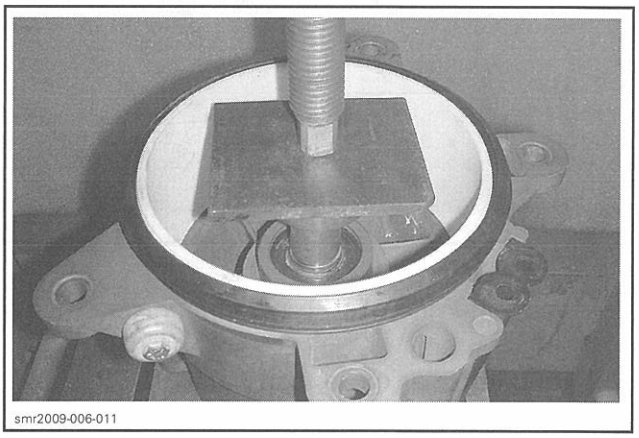
1. Circlip
2. Seal

8. Use the IMPELLER SHAFT PUSHER (P/N 529 035 955) to press out impeller shaft of pump housing.

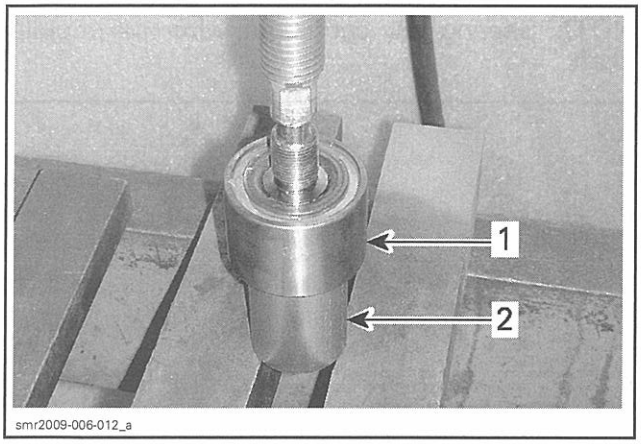
NOTE: Bearing will come out with the impeller shaft.


529035955_a


smr2009-006-010_a


smr2009-006-011

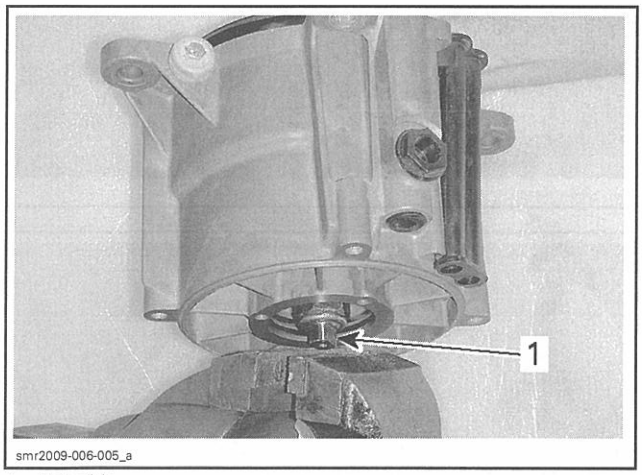
9. Use the IMPELLER SHAFT BEARING TOOL (P/N 529 036 168) to press out bearing from impeller shaft.



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

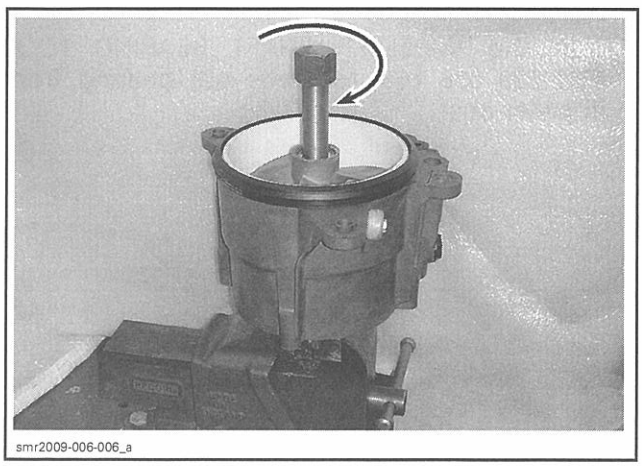
Impeller Shaft Nut Removal if Impeller has Loosen

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

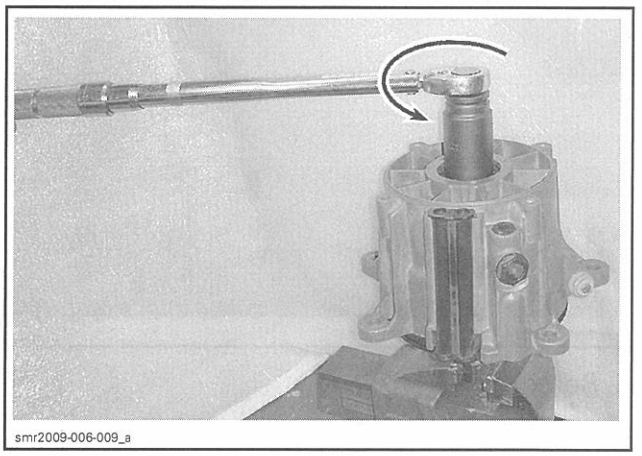


1. Flat side

2. Mount the impeller remover/installer in impeller.
3. Torque impeller more than nut.



4. Turn pump upside down and retry unscrewing nut.

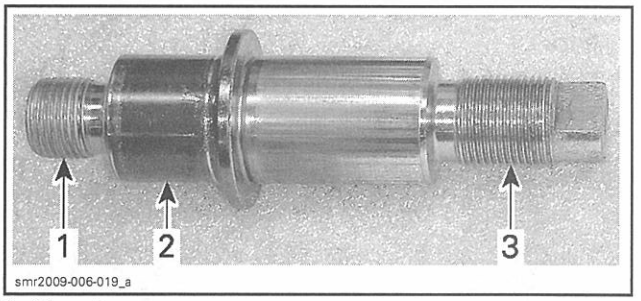


5. If impeller still loosens instead of nut, retighten impeller more and retry. Repeat until nut loosens.
6. Remove impeller as described in this subsection.
7. Return to step 7 in the *IMPELLER SHAFT AND BEARING REMOVAL* main procedure.

Impeller Shaft Inspection

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

Check shaft threads condition.



1. Threads
2. Seal lips contact surface

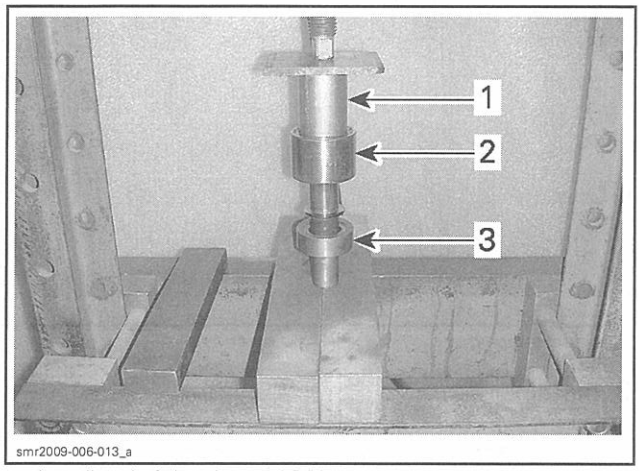
Impeller Shaft and Bearing Installation

Bearing Installation

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

1. Using the IMPELLER SHAFT BEARING TOOL (P/N 529 036 168) press the bearing by its inner race on the impeller shaft.
2. Use the IMPELLER SHAFT PUSHER (P/N 529 035 955) to protect the impeller shaft threads.

NOTE: The bearing can be installed in either direction.



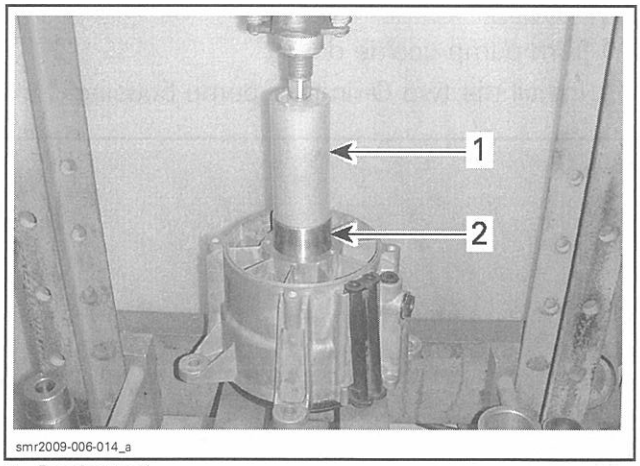
1. *Impeller shaft bearing tool P/N 529 036 168 on INNER race*
2. *Impeller shaft and bearing*
3. *Impeller shaft installer/pusher tool P/N 529 035 955*

3. Press bearing until it bottoms.

Impeller Shaft Installation

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

1. From the outlet side of pump, press impeller shaft assembly into housing using the IMPELLER SHAFT BEARING TOOL (P/N 529 036 168).

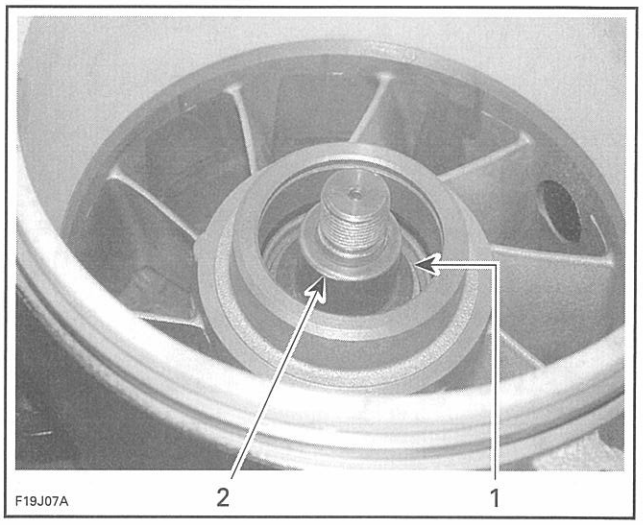


1. *Bearing tool*
2. *Impeller shaft and bearing*

2. Press bearing until it bottoms.

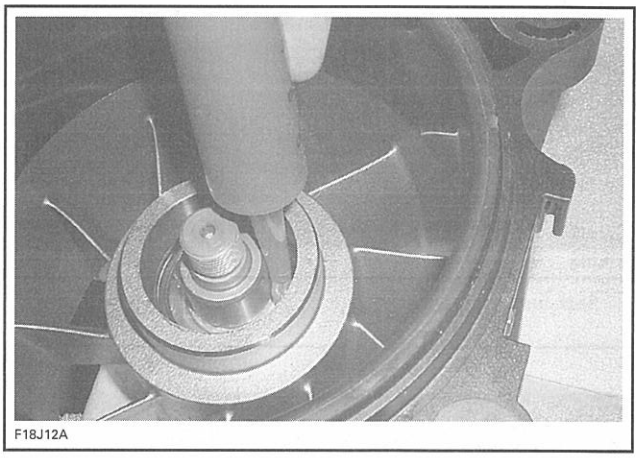
NOTE: Make sure impeller shaft turns freely and smoothly.

3. Turn pump upside down.
4. Coat shaft surface with JET PUMP BEARING GREASE (P/N 293 550 032).
5. Install O-ring at bottom.

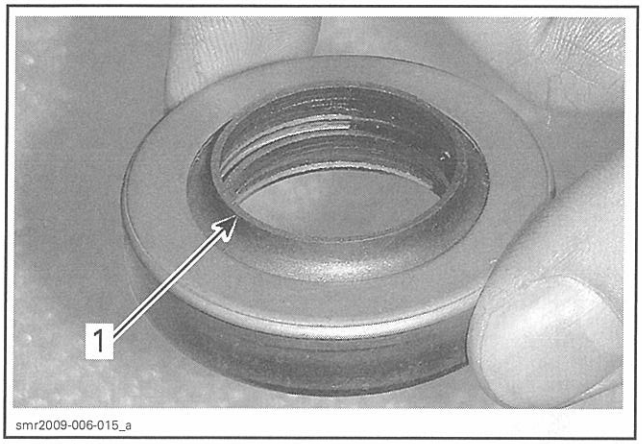


1. *O-ring at bottom*
2. *Coat surface*

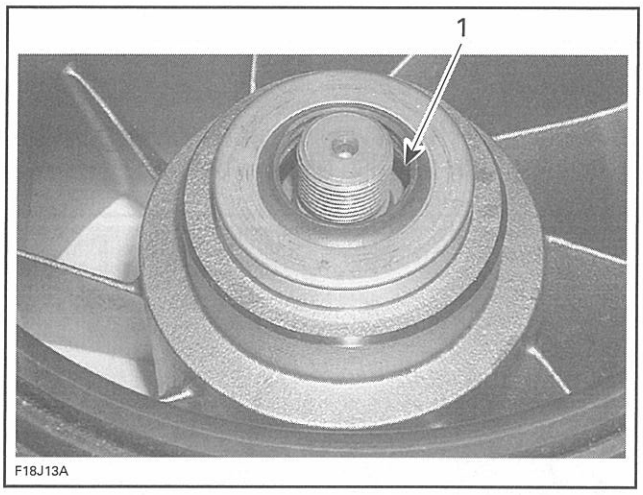
6. Apply 4 ml (.1 U.S. oz) of JET PUMP BEARING GREASE (P/N 293 550 032) on bearing.



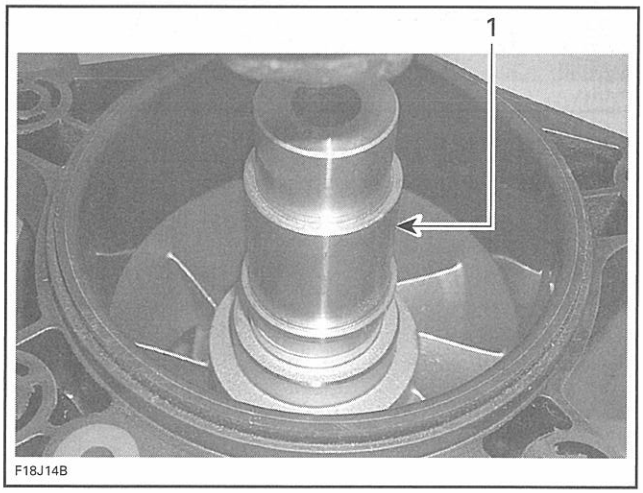
7. Press a NEW double lip seal using the SEAL/BEARING PUSHER (P/N 529 035 819) until seal bottoms. Make sure seal lips are facing up.



1. Seal lip

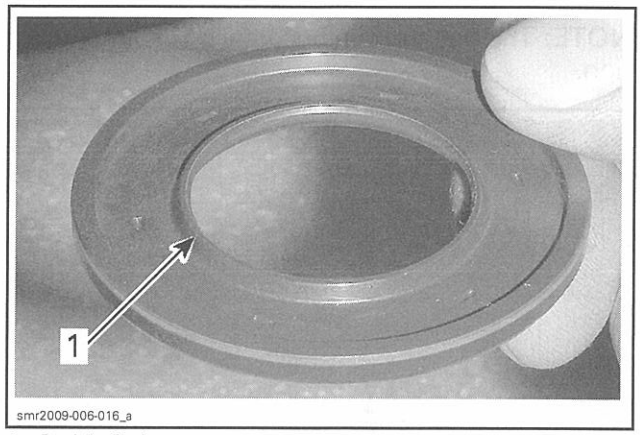


1. Seal lips facing up



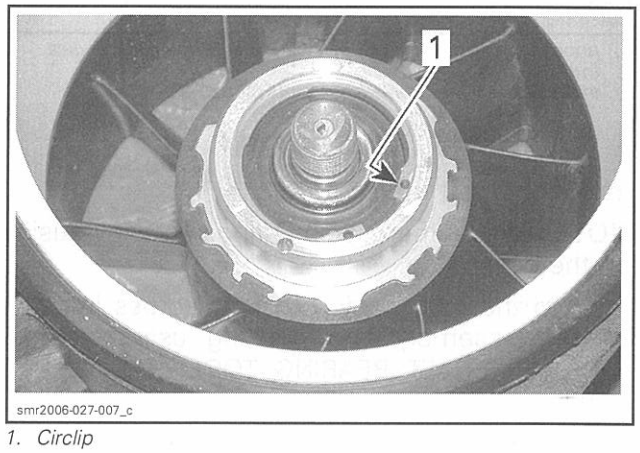
1. Seal/bearing pusher

8. Install spacer and then the other seal (thin). Ensure seal lip is facing up.



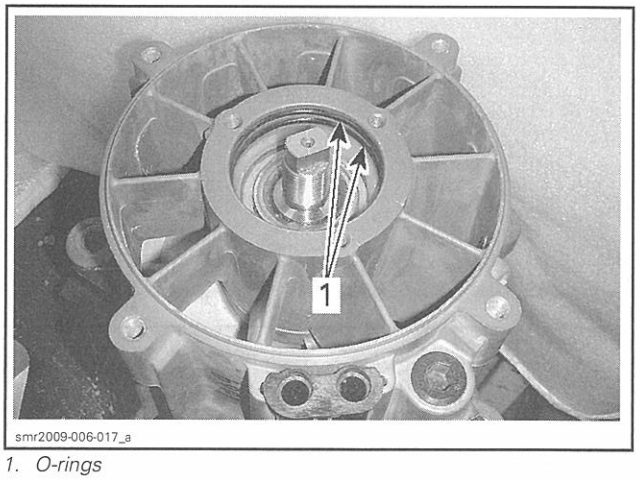
1. Seal lip facing up

9. Install circlip.



1. Circlip

10. Turn pump upside down.
11. Install the two O-rings in pump housing.

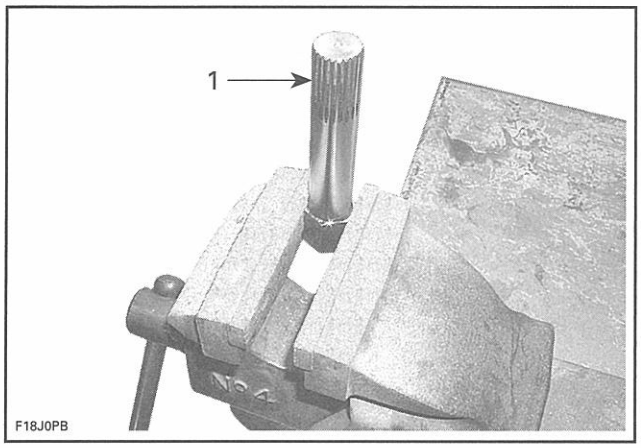


1. O-rings

12. Before installing any other parts, pressurized jet pump to insure proper seal installation. Refer to *LEAK TEST* in this subsection.
13. Install impeller. Refer to *IMPELLER* in this subsection.

14. Mount the proper impeller remover/installer in a vise.

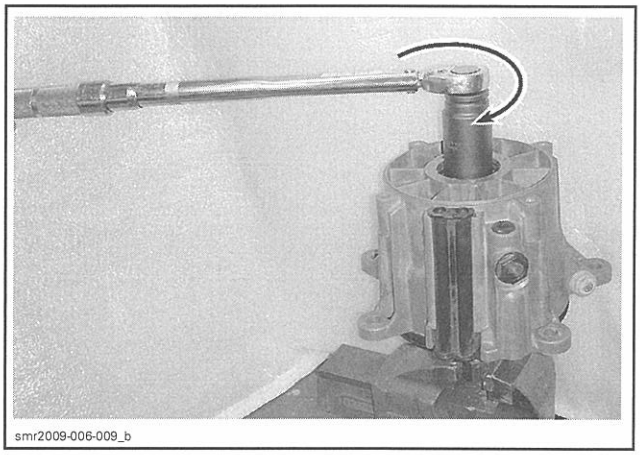
MODEL	TOOL
130 and 155 engines	IMPELLER REMOVER/INSTALLER (P/N 529 035 820)
215 and 255 engines	IMPELLER REMOVER/INSTALLER (P/N 529 035 956)



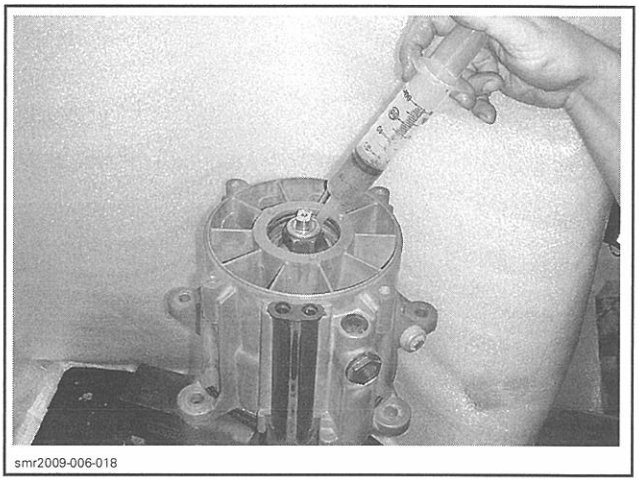
1. Impeller remover/installer

15. Install jet pump housing over this tool.

16. Using a 30 mm socket, screw the impeller shaft nut clockwise.
17. Torque nut to 125 N•m (92 lbf•ft).



18. Apply 24 ml (.8 U.S. oz) of JET PUMP BEARING GREASE (P/N 293 550 032) on the bearing (nut side).



19. Install the impeller cover. Refer to *IMPELLER COVER* in this subsection.

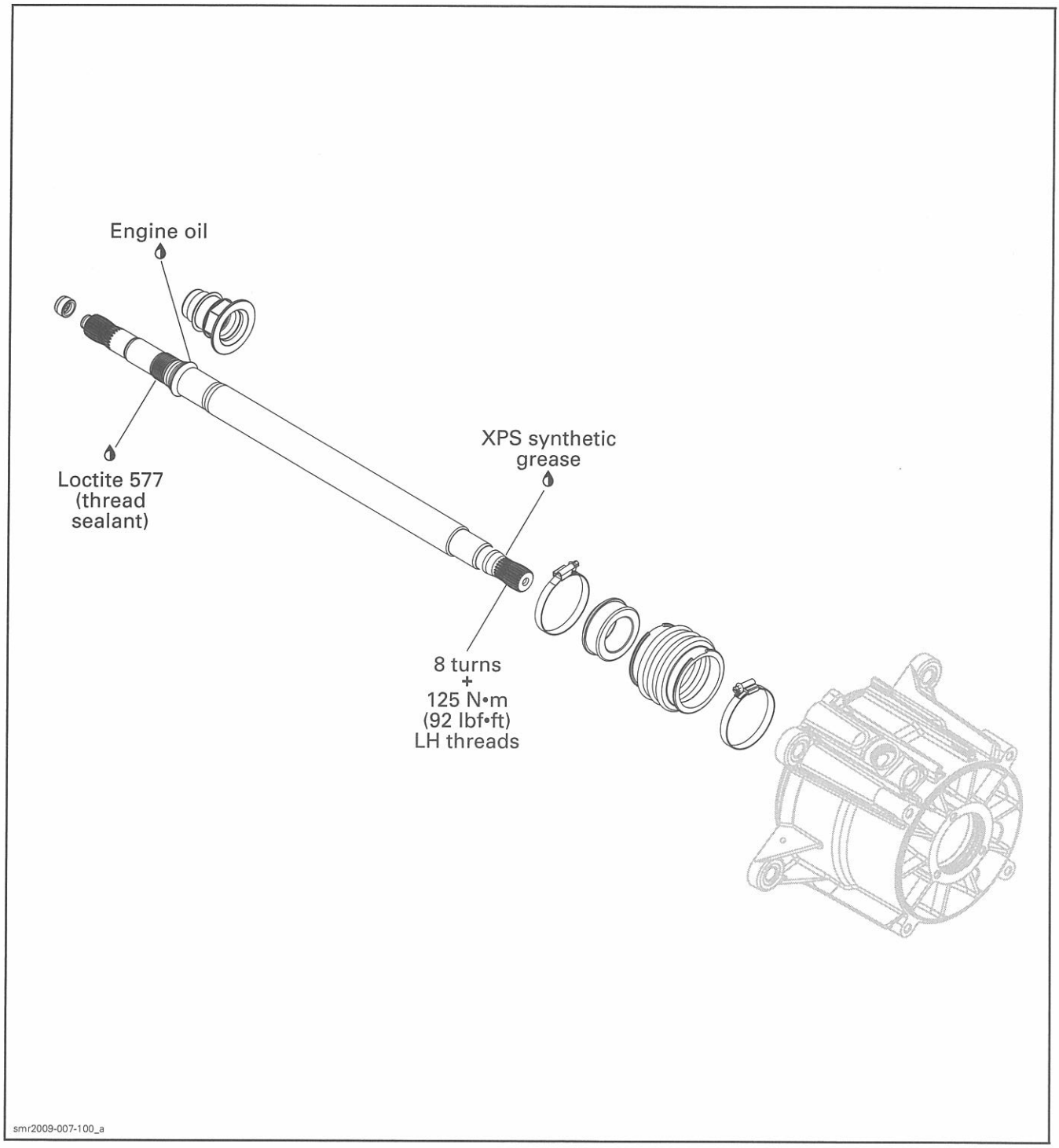
DRIVE SYSTEM

SERVICE TOOLS

Description	Part Number	Page
DRIVE SHAFT ADAPTER	529 035 985	28, 31
DRIVE SHAFT WRENCH	529 036 167	28, 31

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 577 (THREAD SEALANT)	293 800 050	30
PULLEY FLANGE CLEANER	413 711 809	29



GENERAL

Jet pump must be removed to replace any components of the drive system. Refer to *JET PUMP* for removal procedure.

During assembly/installation, use torque values and service products as in the exploded view.

Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

⚠ WARNING

Torque wrench tightening specifications must be strictly adhered to.
Locking devices (e.g.: locking tabs, elastic stop nuts, self-locking fasteners, cotter pins, etc.) must be replaced with new one.

MAINTENANCE

CORROSION PROTECTION

No protection against corrosion is required since the drive shaft is rubber-coated.

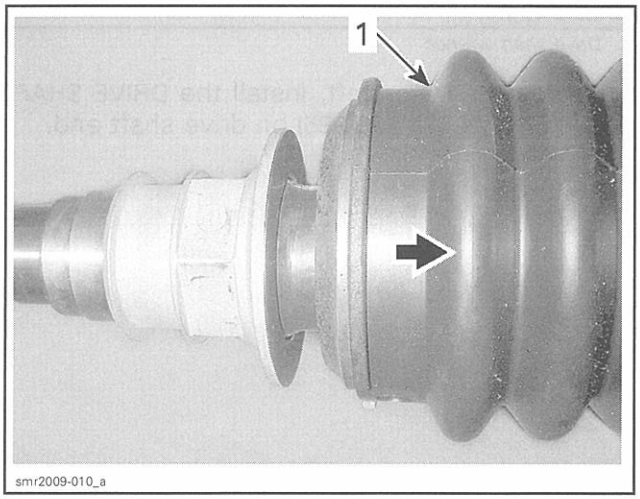
TROUBLESHOOTING

DIAGNOSTIC TIPS

Leaks at PTO Seal

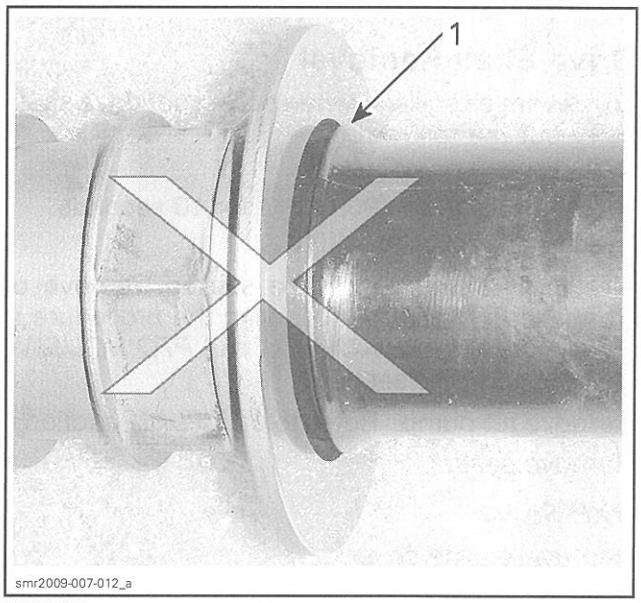
If water enters engine or oil leaks from engine at PTO seal, check if drive shaft is fully engaged in sealing ring.

Compress the drive shaft boot to visually check for proper contact.

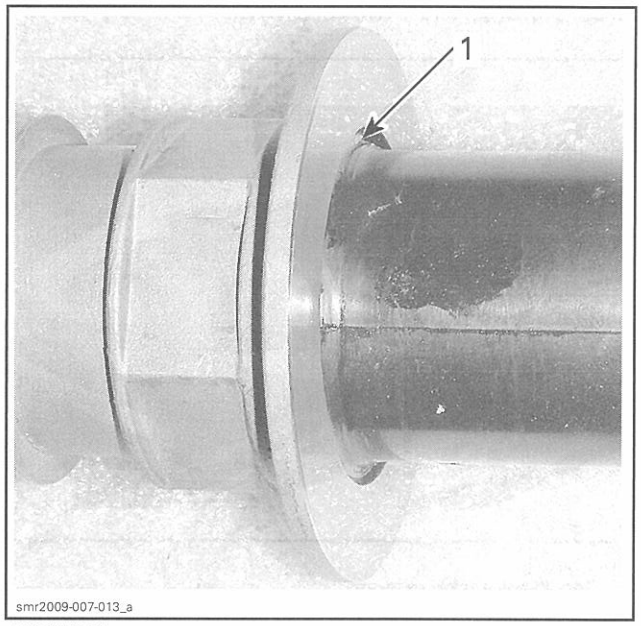


1. Drive shaft boot

Rubber sealing lip of drive shaft must be fully engaged into flange of sealing ring.



WRONG
1. Rubber sealing lip NOT fully engaged



CORRECT
1. Rubber sealing lip fully engaged

NOTE: If drive shaft boot cannot be compressed enough for the inspection, remove jet pump and torque drive shaft. If it does not work, remove drive shaft and inspect drive shaft threads. Refer to *DRIVE SHAFT* in this subsection.

PROCEDURES

DRIVE SHAFT

Drive Shaft Removal

To prevent oil spillage when pulling out drive shaft, carry out the following:

- Start engine.
- Bring engine to 4000 RPM for 10 seconds.
- Stop engine at this RPM.

NOTE: If engine cannot be started, remove oil from the PTO area by following the procedure in *PTO HOUSING REMOVAL* of the *PTO HOUSING AND MAGNETO* section.

Remove jet pump. Refer to *JET PUMP* section.

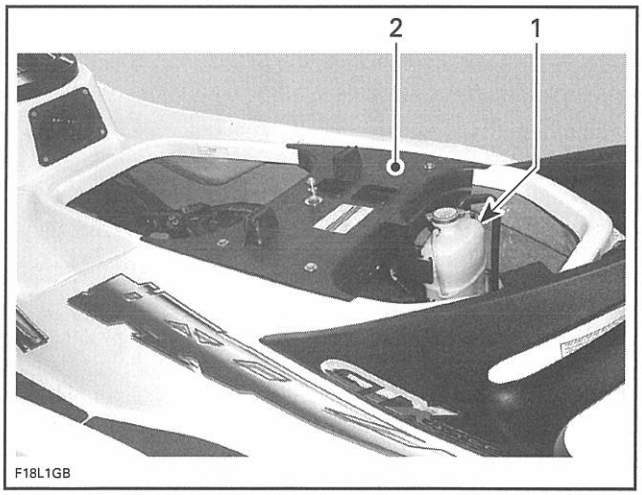
Remove seat(s).

RXP Series

Remove engine cover.

GTX Series and RXT Series

Detach coolant expansion reservoir from vent tube support then move away.



TYPICAL
1. *Detach expansion reservoir*
2. *Remove vent tube support*

Detach vent tube.

Remove vent tube support.

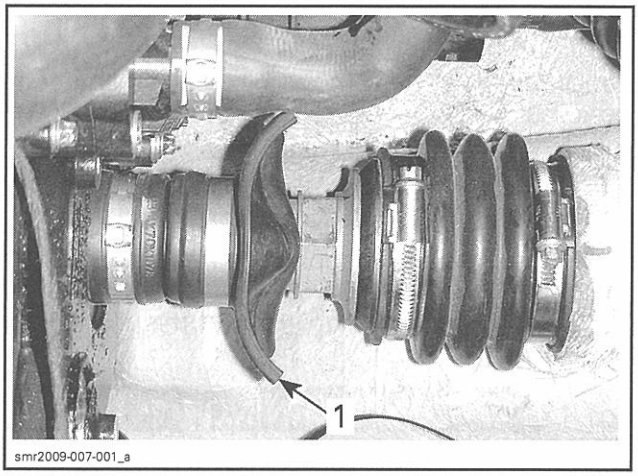
255 Engines

Detach the muffler hose and move it aside to make room.

Remove the intercooler air inlet and air outlet hoses.

All Models

Lift rubber protector to expose PTO seal.

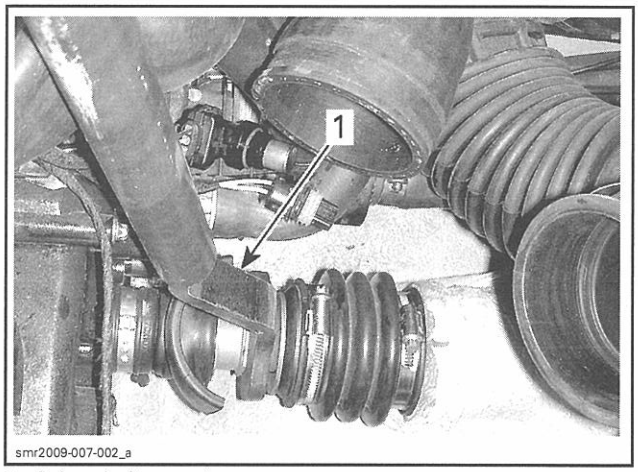


1. *Rubber protector*

Remove all spark plugs from engine. Refer to *IGNITION SYSTEM*.

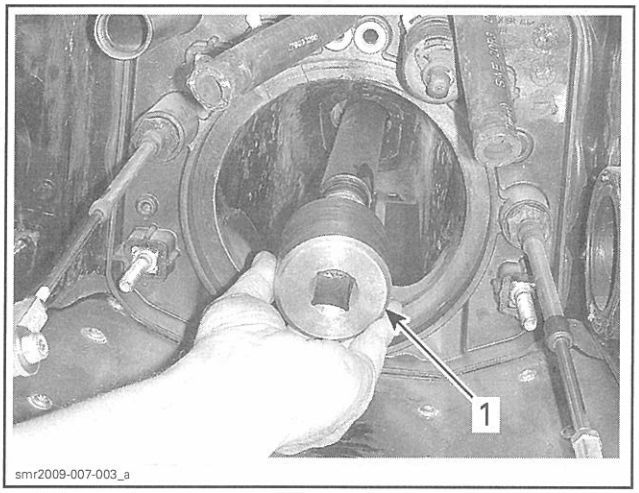
NOTE: Spark plug removal will ease engine rotation for drive shaft removal.

In engine compartment, install the DRIVE SHAFT WRENCH (P/N 529 036 167) on the hexagon of sealing ring.



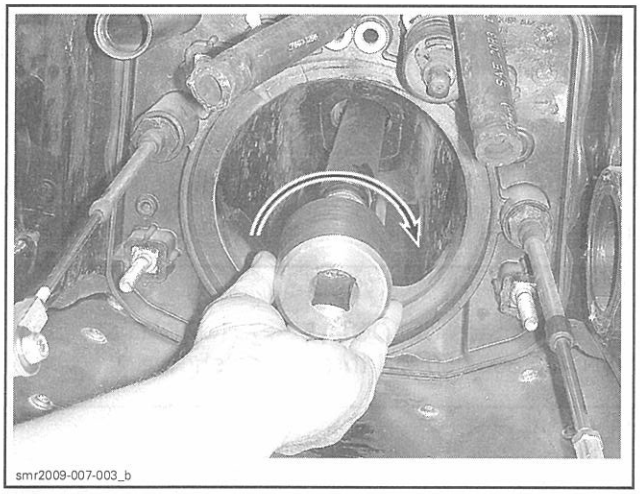
1. *Drive shaft wrench*

From rear of watercraft, install the DRIVE SHAFT ADAPTER (P/N 529 035 985) on drive shaft end.



1. Drive shaft adapter

While someone hold the drive shaft wrench in engine compartment, unscrew drive shaft **clockwise** (LH threads).



⚠ CAUTION Ensure to unscrew clockwise on LH threads (opposite of usual threads).

Place rags under PTO housing to prevent spillage. If spillage occurs, clean immediately with the PULLEY FLANGE CLEANER (P/N 413 711 809) to prevent oil stains.

Pull out drive shaft.

NOTE: A slight jerk to the rear may be required to remove the drive shaft from the PTO seal.

Remove sealing ring. Refer to *SEALING RING* in this subsection.

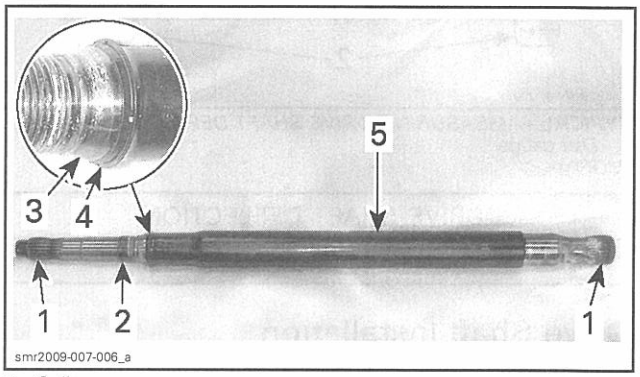
Drive Shaft Inspection

Inspect condition of drive shaft splines, taper surface and threads. If damage is found, replace drive shaft.

Carefully inspect the rubber sealing lip condition. Damage would allow water to enter engine or oil to leave engine. If damaged, replace drive shaft.

⚠ CAUTION The rubber sealing lip is critical for proper sealing of engine at drive shaft connection into engine.

Inspect the rubber coating of drive shaft. If cracked or otherwise damaged, shaft corrosion will occur.

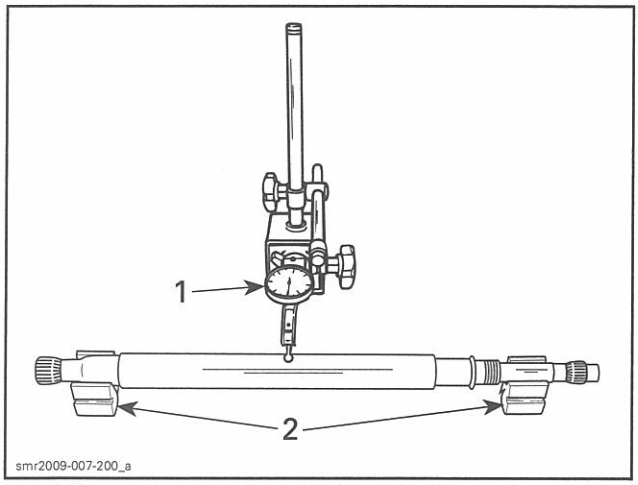


1. Splines
2. Threads
3. Taper
4. Rubber sealing lip
5. Rubber coating

Measure drive shaft deflection. Excessive deflection could cause vibration and damage to drive shaft splines, impeller or PTO seal.

Place drive shaft on V-blocks and set-up a dial gauge in center of shaft. Slowly rotate shaft; difference between highest and lowest dial gauge reading is deflection. Refer to the following illustration.

IMPORTANT: When rotating drive shaft and reading the deflection, the gauge needle will bump on the molding flash mark. This is a normal situation, ignore this deflection peak.



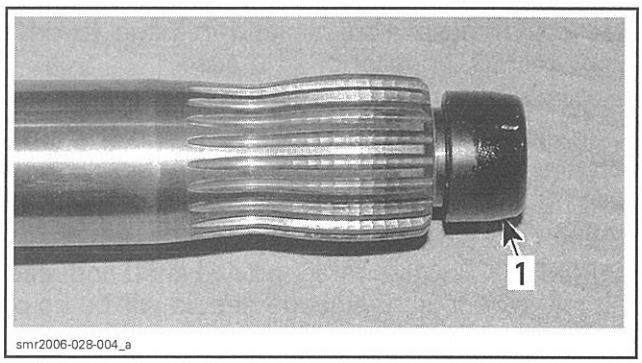
TYPICAL — MEASURING DRIVE SHAFT DEFLECTION
1. *Dial gauge*
2. *V-blocks*

DRIVE SHAFT DEFLECTION
Maximun .75 mm (.03 in)

Drive Shaft Installation

Install sealing ring. Refer to *SEALING RING* subsection.

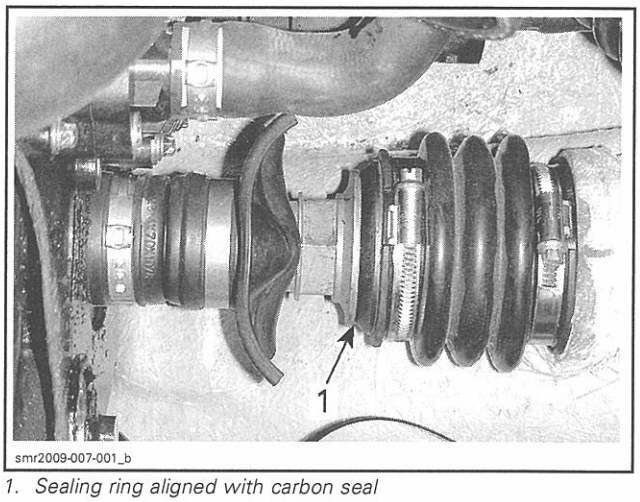
Remove the damper at the end of drive shaft and replace it with a NEW one.



1. *Damper*

Wipe clean the sealing ring and the carbon seal contact surfaces.

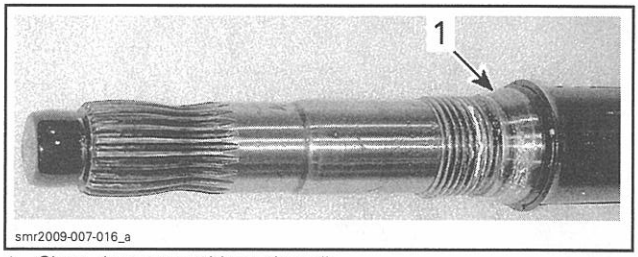
Properly align sealing ring with carbon seal.



1. *Sealing ring aligned with carbon seal*

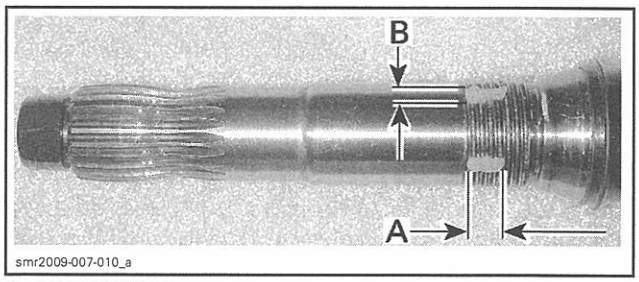
Wipe clean the threads and the taper surface of drive shaft.

Apply engine oil on the taper surface of drive shaft.



1. *Clean then coat with engine oil*

Apply 2 beads of LOCTITE 577 (THREAD SEALANT) (P/N 293 800 050) on threads as shown.



A. *First 5 threads*
B. *3 mm (1/8 in)*

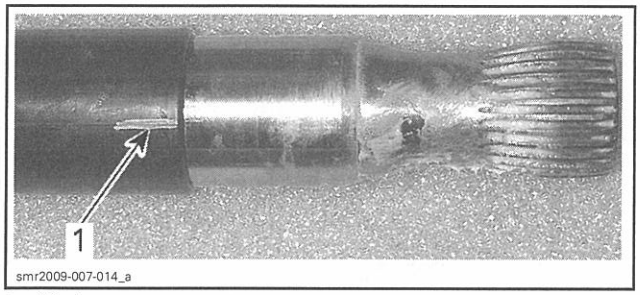
From rear of watercraft, engage drive shaft through the drive shaft boot.

Continue pushing drive shaft towards engine carefully guiding it in the into sealing ring, in PTO seal and finally in crankshaft splines.

NOTE: It may be necessary to move sealing ring and PTO seal up and down to position them in the same axis as the drive shaft.

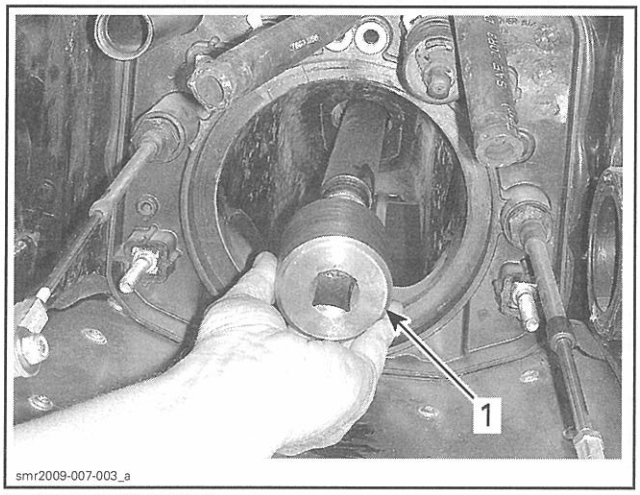
NOTE: If drive shaft does not enter into the PTO seal, check engine alignment.

Trace a mark on drive shaft to count the turns the drive shaft will be rotated to fully engage drive shaft.



1. Mark

Install the DRIVE SHAFT ADAPTER (P/N 529 035 985) on drive shaft end.

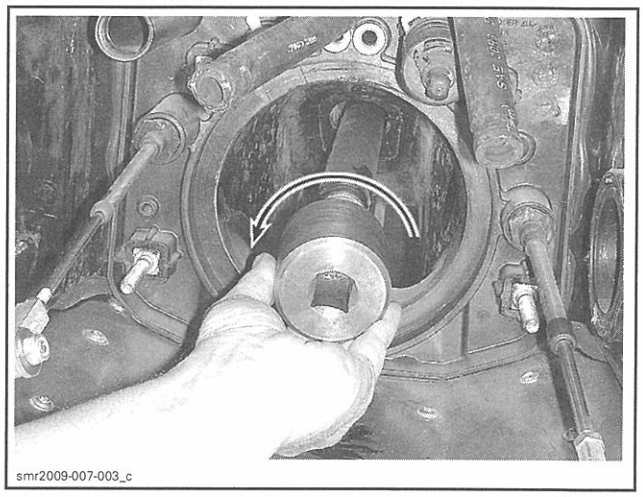


1. Drive shaft adapter

NOTE: Make sure all spark plugs are removed from engine.

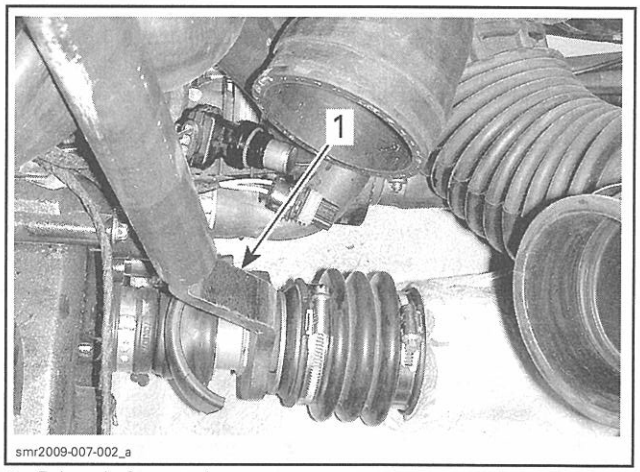
⚠ CAUTION Removing spark plugs help to engage threads more easily thus preventing cross-threads.

Carefully rotate drive shaft **counterclockwise** (LH threads) to engage threads in sealing ring. Be careful not to cross-thread.



Rotate drive shaft 1-1/2 to 2 turns then try pulling drive shaft out to ensure it is engaged.

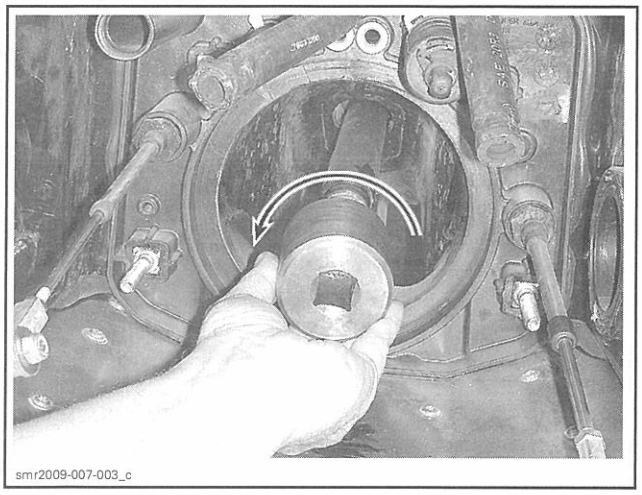
In engine compartment, install the DRIVE SHAFT WRENCH (P/N 529 036 167) on the hexagon of sealing ring.



1. Drive shaft wrench

While someone hold the drive shaft wrench in engine compartment, continue screwing drive shaft **counterclockwise** (LH threads) for to a total of 8 turns.

IMPORTANT: The number of turns is only a reference to give you an idea of the drive shaft engagement in the sealing ring. It is useful if you suspect cross-threading. When the number of turns has been reached, the torque is mandatory to properly secure the drive shaft.


smr2009-007-003_c

Torque drive shaft to 125 N•m (92 lbf•ft).

Reposition rubber protector above sealing ring.

Install jet pump. Refer to *JET PUMP* section.

Check engine oil level. Refill as necessary.

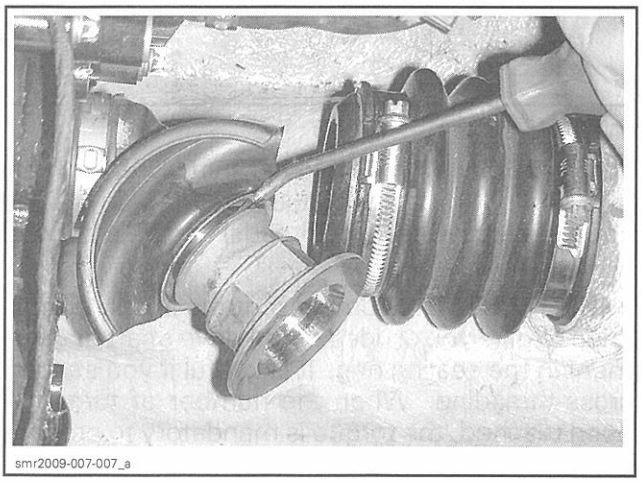
Run watercraft then ensure there is no oil leak in PTO seal area.

SEALING RING

Sealing Ring Removal

Remove drive shaft. Refer to *DRIVE SHAFT* in this subsection.

Carefully pry out sealing ring from PTO seal working alternately from side to side while retaining PTO seal.

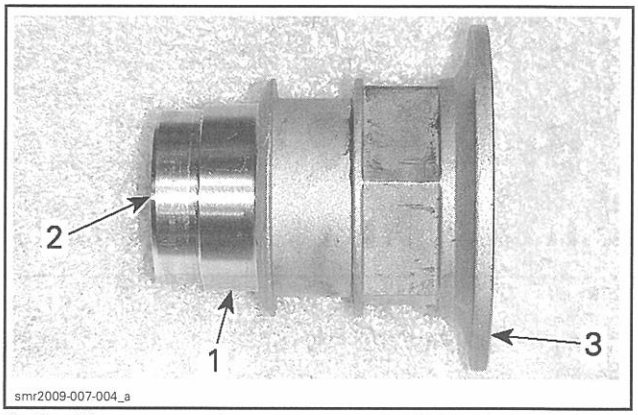

smr2009-007-007_a

Sealing Ring Inspection

Inspect condition of threads, taper surfaces, carbon seal contact surface and seal lip contact surface. If damage is found, replace sealing ring.

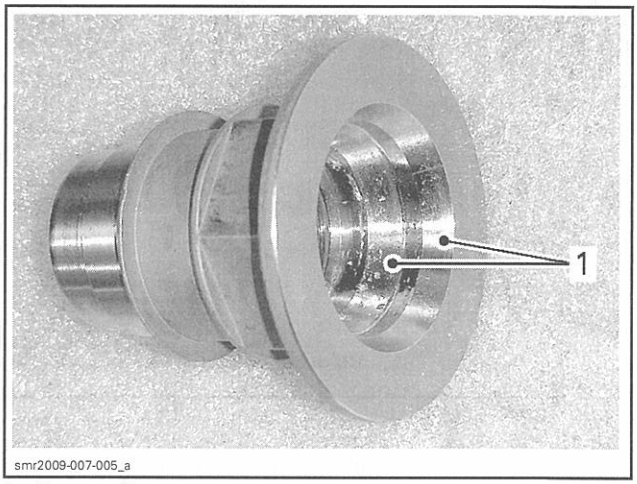
Sealing Ring Cleaning

Clean the following sealing ring surfaces and threads.



smr2009-007-004_a

1. *Seal lip contact surface*
2. *Threads (inside)*
3. *Carbon seal contact surface*



smr2009-007-005_a

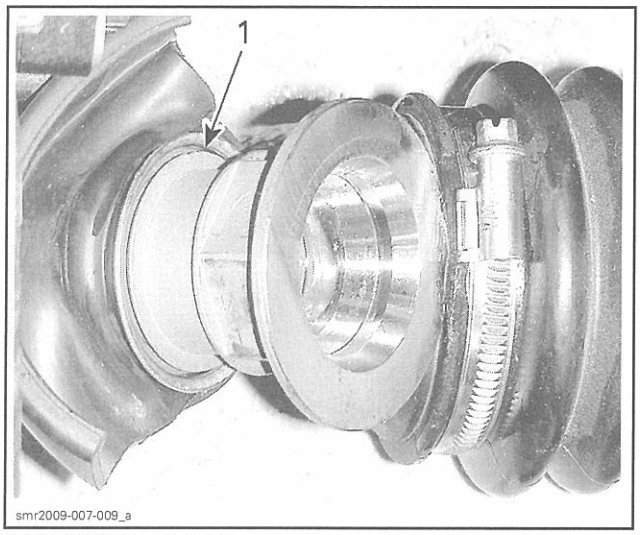
1. *Taper surfaces*

Sealing Ring Installation

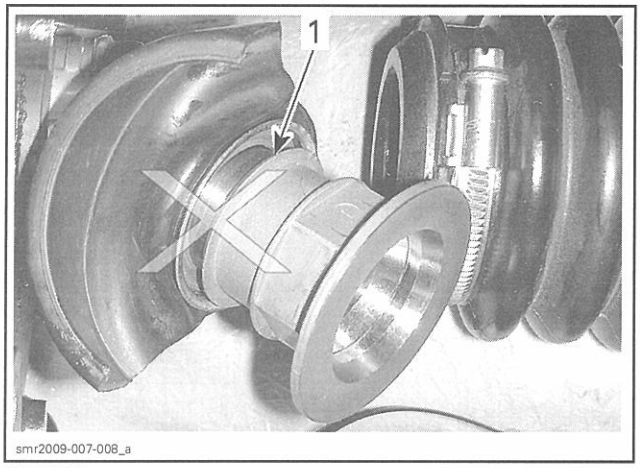
Carefully insert sealing ring into PTO seal.

Ensure sealing ring is completely inserted into PTO seal.

NOTE: Its flange must be flush with the PTO seal flange.



CORRECT
1. Sealing ring fully inserted into PTO seal



WRONG
1. Sealing ring incompletely inserted into PTO seal

1503 ENGINE (130 HP)

MODEL				GTI	GTI SE	GTI (RENTAL)
ENGINE						
Engine type				ROTAX 1503 4-TEC, 4-stroke, Single Over Head Camshaft (SOHC)		
Induction				Naturally aspirated		
Number of cylinders				3		
Number of valves				12 valves with hydraulic lifters (no adjustment)		
Bore		Standard	mm (in)	100 (3.9)		
		1st Oversize	mm (in)	100.25 (3.95)		
Stroke			mm (in)	63.4 (2.49)		
Displacement			cm^3 (in^3)	1493.8 (91)		
Compression ratio				10.6:1		
Maximum HP RPM			RPM	7300 ± 50		
Lubrication		Type		Dry sump (2 oil pumps). Replaceable oil filter. Water-cooled oil cooler		
		Oil type		XPS summer grade oil (P/N 293 600 121) or use a 5W 40 engine oil meeting the requirements for API service classification SM, SL or SJ		
		Capacity	L (U.S. qt)	3 (3.2) oil change w/filter 4.5 (4.8) total		
Intake valve opening				10° BTDC		
Intake valve closing				50° ABDC		
Exhaust valve opening				50° BBDC		
Exhaust valve closing				10° ATDC		
Valve stem diameter	Intake	New	mm (in)	5.961 to 5.975 (.2347 to .2352)		
		Wear limit	mm (in)	5.930 (.2330)		
	Exhaust	New	mm (in)	5.946 to 5.960 (.2341 to .2346)		
		Wear limit	mm (in)	5.930 (.2330)		
Valve guide diameter		New	mm (in)	5.990 to 6.010 (.2358 to .2366)		
		Wear limit	mm (in)	6.060 (.2386)		
Valve spring free length	Inner	New	mm (in)	41.02 (1.615)		
		Wear limit	mm (in)	38.80 (1.499)		
	Outer	New	mm (in)	45.45 (1.789)		
		Wear limit	mm (in)	43.00 (1.693)		
Valve seat contact width	Intake	New	mm (in)	1.10 to 1.30 (.043 to .051)		
		Wear limit	mm (in)	1.60 (.063)		
	Exhaust	New	mm (in)	1.25 to 1.55 (.049 to .061)		
		Wear limit	mm (in)	1.80 (.071)		
Rocker arm inner diameter		New	mm (in)	20.000 to 20.020 (.7874 to .7882)		
		Wear limit	mm (in)	20.030 (.7886)		
Rocker arm shaft diameter		New	mm (in)	19.980 to 19.990 (.7866 to .7870)		
		Wear limit	mm (in)	19.960 (.7858)		
Cylinder head maximum warpage		Service limit	mm (in)	0.15 (.006)		

MODEL				GTI	GTI SE	GTI (RENTAL)
ENGINE (cont'd)						
Piston ring type		1st		Upper compression ring, rectangular		
		2nd		Lower compression ring, tapered face		
		3rd		Oil scraper ring		
Ring end gap	Rectangular	New	mm (in)	0.30 to 0.50 (.012 to .020)		
	Taper-face	New	mm (in)	0.30 to 0.50 (.012 to .020)		
	Oil scraper ring	New	mm (in)	0.30 to 0.50 (.012 to .020)		
	All	Wear limit	mm (in)	1.50 (.059)		
Ring/piston groove clearance	Rectangular	New	mm (in)	0.020 to 0.070 (.0008 to .0028)		
	Taper-face	New	mm (in)	0.015 to 0.060 (.0006 to .0024)		
	Oil scraper ring	New	mm (in)	0.020 to 0.055 (.0008 to .0021)		
	All	Wear limit	mm (in)	0.15 (.006)		
Piston/cylinder wall clearance		New	mm (in)	0.024 to 0.056 (.0010 to .0022)		
		Wear limit	mm (in)	0.100 (.0039)		
Cylinder taper		Wear limit	mm (in)	0.100 (.0039)		
Cylinder out of round (maximum)			mm (in)	0.015 (.0006)		
Camshaft bearing journal diameter	Front	New	mm (in)	24.939 to 24.960 (.9818 to .9827)		
		Wear limit	mm (in)	24.910 (.9807)		
	PTO and center	New	mm (in)	39.890 to 39.900 (1.5705 to 1.5709)		
		Wear limit	mm (in)	39.880 (1.5701)		
Camshaft bearing inner diameter	Front	New	mm (in)	25.000 to 25.010 (.9842 to .9846)		
		Wear limit	mm (in)	25.020 (.9850)		
	PTO and center	New	mm (in)	40.000 to 40.010 (1.5748 to 1.5752)		
		Wear limit	mm (in)	40.020 (1.5756)		
Cam lobe height	Intake	New	mm (in)	31.480 to 31.590 (1.2394 to 1.2437)		
		Wear limit	mm (in)	31.430 (1.2374)		
	Exhaust	New	mm (in)	31.690 to 31.800 (1.2476 to 1.2520)		
		Wear limit	mm (in)	31.650 (1.2461)		
Crankshaft deflection		Maximum	mm (in)	0.05 (.002)		
Crankshaft axial clearance		New	mm (in)	0.080 to 0.220 (.0031 to .0087)		
		Wear limit	mm (in)	0.35 (.014)		
Crankshaft bearing journal diameter		New	mm (in)	49.991 to 50.000 (1.9681 to 1.9685)		
		Wear limit	mm (in)	49.950 (1.9665)		
Crankshaft radial clearance		Wear limit	mm (in)	0.007 (.0028)		
Connecting rod big end diameter		Service limit	mm (in)	45.080 (1.7740)		
Connecting rod big end radial play		Service limit	mm (in)	0.090 (.0035)		
Connecting rod big end axial play		New	mm (in)	0.135 to 0.287 (.0053 to .0113)		
		Wear limit	mm (in)	0.500 (.0197)		
Connecting rod small end diameter		New	mm (in)	23.010 to 23.020 (.9059 to .9063)		
		Wear limit	mm (in)	23.070 (.9080)		
Piston pin diameter		New	mm (in)	22.996 to 23.000 (.9053 to .9055)		
		Wear limit	mm (in)	22.990 (.9051)		
Connecting rod small end radial play		Wear limit	mm (in)	0.080 (.0035)		

MODEL				GTI	GTI SE	GTI (RENTAL)
ENGINE (cont'd)						
Balance shaft journal diameter	New		mm (in)	31.980 to 32.000 (1.2591 to 1.2598)		
	Wear limit		mm (in)	31.950 (1.2579)		
Balance shaft radial clearance	Wear limit		mm (in)	0.070 (.0028)		
Balance shaft axial clearance	New		mm (in)	0.020 to 0.250 (.0008 to .0098)		
ENGINE COOLING SYSTEM						
Type				Closed loop cooling system		
Coolant				Ethylene-glycol and distilled water (50%/50%). Use premix coolant from BRP or a coolant specially formulated for aluminum engines		
Cooling system capacity			L (U.S. qt)	5.5 (5.8) total		
Thermostat			°C (°F)	87 (188)		
Monitoring beeper setting			°C (°F)	100 (212)		
EXHAUST SYSTEM						
Type				Water cooled/water injected (opened loop). Direct flow from jet pump		
Intake spark arrester				Tubular, wire screen		
Water injection in muffler			mm (in)	3 x 3.5 (.138) on exhaust pipe 1 x 3.5 (.138) on muffler		
ELECTRICAL SYSTEM						
Magneto generator output				360 W @ 6000 RPM		
Stator			Ω	0.1 to 1.0		
Battery				12 V, 30 A•h		
Ignition system type				IDI (inductive discharge ignition)		
Ignition timing				Variable (electronically controlled)		
Spark plug	Make and type			NGK DCPR8E		
	Gap		mm (in)	0.7 to 0.8 (.028 to .031)		
Ignition coil	Primary		Ω	0.85 to 1.15		
	Secondary		KΩ	9.5 to 13.5		
Engine RPM limiter setting			RPM	7650		
Fuse	Information center		A	3		
	Beeper		A	3		
	Depth sounder		A	3 (installed but not in use)		
	Fuel level		A	3		
	VTS		A	7.5 (installed but not in use)		
	Fuel pump		A	10		
	Ignition coil and injection		A	3 x 10		
	TOPS		A	3		
	Diagnostic tool		A	15		
	Starter solenoid		A	10		
	CAPS		A	3		
	Charging system		A	30		
	Battery		A	30		

Section 10 TECHNICAL SPECIFICATIONS
Subsection 01 (1503 ENGINE (130 HP))

MODEL			GTI	GTI SE	GTI (RENTAL)
FUEL SYSTEM					
Fuel injection type			ROTAX EMS (Engine Management System). Multipoint fuel injection. Single throttle body (52 mm)		
Fuel pressure		kPa (PSI)	290 to 310 (42 to 45)		
Fuel injector	Quantity		3		
Fuel type	Inside North America ((RON + MON)/2)		87 or higher		
	Outside North America (RON)		92 or higher		
Fuel tank (including reserve)		L (U.S. gal)	60 (15.9)		
Fuel tank reserve (from low level signal)		L (U.S. gal)	15 (4)		
Idle speed		± 50 RPM	1750 (not adjustable)		
PROPULSION SYSTEM					
Jet pump type			Axial flow single stage		
Jet pump grease type			Jet pump bearing grease (P/N 293 550 032)		
Impeller rotation (seen from rear)			Counterclockwise		
Transmission			Direct drive		
Coupling type			Crowned splines		
Reverse system			Yes		
O.P.A.S. system			Fixed		
Steering nozzle pivoting angle			20°		
Minimum required water level		cm (in)	90 (35) underneath the lowest rear portion of hull		
Drive shaft deflection (maximum)		mm (in)	0.75 (.030)		
Impeller outside diameter		mm (in)	155.5 ± 0.06 (6.122 ± .0024)		
Impeller/wear ring clearance	New	mm (in)	0 to 0.23 (0 to .009)		0.7 (.028) minimum
	Wear limit	mm (in)	0.35 (.0138)		0.8 (.032)
Impeller shaft end play (new)			0		
Impeller shaft side play			0		
Impeller pitch			11°/18°		
WEIGHT AND LOADING CAPACITY					
Dry mass		kg (lb)	333 (735)	338 (745)	333 (735)
Number of passenger (driver incl.)			3		
Load limit (passenger and 10 kg (22 lb) luggage)		kg (lb)	272 (600)		
DIMENSIONS					
Overall length		cm (in)	322.5 (127)		
Overall width		cm (in)	124.5 (49)		
Overall height		cm (in)	117 (46)		

MODEL		GTI	GTI SE	GTI (RENTAL)
MATERIALS				
Hull		Composite fiberglass		
Inlet grate		Nylon		
Steering cover		Thermoplastic		
Impeller material		Stainless steel		
Impeller housing/stator		Aluminum/aluminum		
Venturi		Aluminum		
Nozzle		Aluminum		
Fuel tank		Polyethylene		
Seat		Polyurethane/foam		
PERFORMANCE				
Estimated pump power kW (HP)		46.3 (62)		
Maximum fuel consumption at wide open throttle L/h (U.S. gal/h)		40.8 (10.8)		
Cruising time at full throttle	Fuel tank without reserve	± 70 minutes		
	Fuel tank reserve (from low level signal)	± 21 minutes		

1503 ENGINE (155 HP)

MODEL				GTI SE	GTX	WAKE
ENGINE						
Engine type				ROTAX 1503 4-TEC, 4-stroke, Single Over Head Camshaft (SOHC)		
Induction				Naturally aspirated		
Number of cylinders				3		
Number of valves				12 valves with hydraulic lifters (no adjustment)		
Bore		Standard	mm (in)	100 (3.9)		
		1st Oversize	mm (in)	100.25 (3.95)		
Stroke			mm (in)	63.4 (2.49)		
Displacement			cm^3 (in^3)	1493.8 (91)		
Compression ratio				10.6:1		
Maximum HP RPM			RPM	7300 ± 50		
Lubrication		Type		Dry sump (2 oil pumps). Replaceable oil filter. Water-cooled oil cooler		
		Oil type		XPS summer grade oil (P/N 293 600 121) or use a 5W 40 engine oil meeting the requirements for API service classification SM, SL or SJ		
		Capacity	L (U.S. qt)	3 (3.2) oil change w/filter 4.5 (4.8) total		
Intake valve opening				0° BTDC		
Intake valve closing				50 ABDC		
Exhaust valve opening				50° BBDC		
Exhaust valve closing				0° ATDC		
Valve stem diameter	Intake	New	mm (in)	5.961 to 5.975 (.2347 to .2352)		
		Wear limit	mm (in)	5.930 (.2330)		
	Exhaust	New	mm (in)	5.946 to 5.960 (.2341 to .2346)		
		Wear limit	mm (in)	5.930 (.2330)		
Valve guide diameter		New	mm (in)	5.990 to 6.010 (.2358 to .2366)		
		Wear limit	mm (in)	6.060 (.2386)		
Valve spring free length	Inner	New	mm (in)	41.02 (1.615)		
		Wear limit	mm (in)	38.80 (1.499)		
	Outer	New	mm (in)	45.45 (1.789)		
		Wear limit	mm (in)	43.00 (1.693)		
Valve seat contact width	Intake	New	mm (in)	1.10 to 1.30 (.043 to .051)		
		Wear limit	mm (in)	1.60 (.063)		
	Exhaust	New	mm (in)	1.25 to 1.55 (.049 to .061)		
		Wear limit	mm (in)	1.80 (.071)		
Rocker arm inner diameter		New	mm (in)	20.000 to 20.020 (.7874 to .7882)		
		Wear limit	mm (in)	20.030 (.7886)		
Rocker arm shaft diameter		New	mm (in)	19.980 to 19.990 (.7866 to .7870)		
		Wear limit	mm (in)	19.960 (.7858)		
Cylinder head maximum warpage		Service limit	mm (in)	0.15 (.006)		

MODEL				GTI SE	GTX	WAKE
ENGINE (cont'd)						
Piston ring type		1st		Upper compression ring, rectangular		
		2nd		Lower compression ring, tapered face		
		3rd		Oil scraper ring		
Ring end gap	Rectangular	New	mm (in)	0.30 to 0.50 (.012 to .020)		
	Taper-face	New	mm (in)	0.30 to 0.50 (.012 to .020)		
	Oil scraper ring	New	mm (in)	0.30 to 0.50 (.012 to .020)		
	All	Wear limit	mm (in)	1.50 (.059)		
Ring/piston groove clearance	Rectangular	New	mm (in)	0.020 to 0.070 (.0008 to .0028)		
	Taper-face	New	mm (in)	0.0150 to 0.060 (.0006 to .0024)		
	Oil scraper ring	New	mm (in)	0.020 to 0.055 (.0008 to .0021)		
	All	Wear limit	mm (in)	0.15 (.006)		
Piston/cylinder wall clearance		New	mm (in)	0.024 to 0.056 (.0010 to .0022)		
		Wear limit	mm (in)	0.100 (.0039)		
Cylinder taper		Wear limit	mm (in)	0.100 (.0039)		
Cylinder out of round (maximum)			mm (in)	0.015 (.0006)		
Camshaft bearing journal diameter	Front	New	mm (in)	24.939 to 24.960 (.9818 to .9827)		
		Wear limit	mm (in)	24.910 (.9807)		
	PTO and center	New	mm (in)	39.890 to 39.900 (1.5705 to 1.5709)		
		Wear limit	mm (in)	39.880 (1.5701)		
Camshaft bearing inner diameter	Front	New	mm (in)	25.000 to 25.010 (.9842 to .9846)		
		Wear limit	mm (in)	25.020 (.9850)		
	PTO and center	New	mm (in)	40.000 to 40.010 (1.5748 to 1.5752)		
		Wear limit	mm (in)	40.020 (1.5756)		
Cam lobe height	Intake	New	mm (in)	31.480 to 31.590 (1.2394 to 1.2437)		
		Wear limit	mm (in)	31.430 (1.2374)		
	Exhaust	New	mm (in)	31.690 to 31.800 (1.2476 to 1.2520)		
		Wear limit	mm (in)	31.650 (1.2461)		
Crankshaft deflection		Maximum	mm (in)	0.050 (.002)		
Crankshaft axial clearance		New	mm (in)	0.080 to 0.220 (.0031 to .0087)		
		Wear limit	mm (in)	0.35 (.014)		
Crankshaft bearing journal diameter		New	mm (in)	49.9910 to 50.000 (1.9681 to 1.9685)		
		Wear limit	mm (in)	49.950 (1.9665)		
Crankshaft radial clearance		Wear limit	mm (in)	0.007 (.0028)		
Connecting rod big end diameter		Service limit	mm (in)	45.080 (1.7740)		
Connecting rod big end radial play		Service limit	mm (in)	0.090 (.0035)		
Connecting rod big end axial play		New	mm (in)	0.135 to 0.287 (.0053 to .0113)		
		Wear limit	mm (in)	0.500 (.0197)		
Connecting rod small end diameter		New	mm (in)	23.010 to 23.020 (.9059 to .9063)		
		Wear limit	mm (in)	23.070 (.9080)		
Connecting rod small end radial play		Wear limit	mm (in)	0.080 (.0035)		

MODEL			GTI SE	GTX	WAKE
ENGINE (cont'd)					
Piston pin diameter	New	mm (in)	22.996 to 23.000 (.9053 to .9055)		
	Wear limit	mm (in)	22.990 (.9051)		
Balance shaft journal diameter	New	mm (in)	31.980 to 32.000 (1.2591 to 1.2598)		
	Wear limit	mm (in)	31.950 (1.2579)		
Balance shaft radial clearance	Wear limit	mm (in)	0.070 (.0028)		
Balance shaft axial clearance	New	mm (in)	0.020 to 0.250 (.0008 to .0098)		
ENGINE COOLING SYSTEM					
Type			Closed loop cooling system		
Coolant			Ethylene-glycol and distilled water (50%/50%). Use premix coolant from BRP or a coolant specially formulated for aluminum engines		
Cooling system capacity		L (U.S. qt)	5.5 (5.8) total		
Thermostat		°C (°F)	87 (188)		
Monitoring beeper setting		°C (°F)	100 (212)		
EXHAUST SYSTEM					
Type			Water cooled/water injected (opened loop). Direct flow from jet pump		
Intake spark arrester			Tubular, wire screen		
Water injection in muffler		mm (in)	3 x 3.5 (.138) on exhaust pipe 1 x 3.5 (.138) on muffler		
ELECTRICAL SYSTEM					
Magneto generator output			360 W @ 6000 RPM		
Stator		Ω	0.1 to 1.0		
Battery			12 V, 30 A•h		
Ignition system type			IDI (inductive discharge ignition)		
Ignition timing			Variable (electronically controlled)		
Spark plug	Make and type		NGK DCPR8E		
	Gap	mm (in)	0.7 to 0.8 (.028 to .031)		
Ignition coil	Primary	Ω	0.85 to 1.15		
	Secondary	KΩ	9.5 to 13.5		
Engine RPM limiter setting		RPM	7750		

MODEL			GTI SE	GTX	WAKE
ELECTRICAL SYSTEM (cont'd)					
Fuse	Information center	A	3		
	Beeper	A	3		
	Depth sounder	A	3		
	Fuel level	A	3		
	VTS	A	7.5		
			Not used	Not used	Not Used
	Fuel pump	A	10		
	Ignition coil and injection	A	3 x 10		
	TOPS	A	3		
	Diagnostic tool	A	15		
	Starter solenoid	A	10		
	CAPS	A	3		
	Charging system	A	30		
	Battery	A	30		
FUEL SYSTEM					
Fuel injection type			ROTAX EMS (Engine Management System). Multipoint fuel injection. Single throttle body (52 mm)		
Fuel pressure		kPa (PSI)	290 to 310 (42 to 45)		
Fuel injector	Quantity		3		
Fuel type	Inside North America ((RON + MON)/2)		87 or higher		
	Outside North America (RON)		92 or higher		
Fuel tank (including reserve)		L (U.S. gal)	60 (15.9)		
Fuel tank reserve (from low level signal)		L (U.S. gal)	15 (4)		
Idle speed		± 50 RPM	1800 (not adjustable)		
PROPULSION SYSTEM					
Jet pump type			Axial flow single stage		
Jet pump grease type			Jet pump bearing grease (P/N 293 550 032)		
Impeller rotation (seen from rear)			Counterclockwise		
Transmission			Direct drive		
Coupling type			Crowned splines		
Reverse system			Yes		
O.P.A.S. system			Fixed	25.4 mm (1 in) stroke	Fixed
Steering nozzle pivoting angle			20°		
Minimum required water level		cm (in)	90 (35) underneath the lowest rear portion of hull		
Drive shaft deflection (maximum)		mm (in)	0.75 (.030)		
Impeller outside diameter		mm (in)	155.5 ± 0.06 (6.122 ± .0024)		
Impeller/wear ring clearance	New	mm (in)	0 to 0.23 (0 to .009)		
	Wear limit	mm (in)	0.35 (.0138)		
Impeller shaft end play (new)			0		
Impeller shaft side play			0		
Impeller pitch			10°/21°		

MODEL		GTI SE	GTX	WAKE
WEIGHT AND LOADING CAPACITY				
Dry mass kg (lb)		338 (745)	355 (783)	339 (748)
Number of passenger (driver incl.)		3		
Load limit (passenger and 10 kg (22 lb) luggage) kg (lb)		272 (600)		
DIMENSIONS				
Overall length cm (in)		322.5 (127)	331 (130)	322.5 (127)
Overall width cm (in)		124.5 (49)	122 (48)	124.5 (49)
Overall height cm (in)		117 (46)	120 (47)	117 (46)
MATERIALS				
Hull		Composite fiberglass		
Inlet grate		Nylon	Aluminum	Nylon
Steering cover		Thermoplastic		
Impeller material		Stainless steel		
Impeller housing/stator		Aluminum		
Venturi		Aluminum		
Nozzle		Aluminum		
Fuel tank		Polyethylene		
Seat		Polyurethane/foam		
PERFORMANCE				
Estimated pump power kW (HP)		52.6 (70.5)		
Maximum fuel consumption at wide open throttle L/h (U.S. gal/h)		43.1 (11.4)		
Cruising time at full throttle	Fuel tank without reserve	± 63 minutes		
	Fuel tank reserve (from low level signal)	± 20 minutes		

1503 ENGINE (215 HP)

MODEL				GTX	WAKE PRO	RXT	RXP
ENGINE							
Engine type				ROTAX 1503 4-TEC, 4-stroke, Single Over Head Camshaft (SOHC)			
Induction				Supercharged intercooled			
Number of cylinders				3			
Number of valves				12 valves with hydraulic lifters (no adjustment)			
Bore		Standard	mm (in)	100 (3.9)			
		1st Oversize	mm (in)	100.25 (3.95)			
Stroke			mm (in)	63.4 (2.49)			
Displacement			cm^3 (in^3)	1493.8 (91)			
Compression ratio				8.4:1			
Maximum HP RPM			RPM	8000			
Lubrication		Type		Dry sump (2 oil pumps). Replaceable oil filter. Water-cooled oil cooler			
		Oil type		XPS summer grade oil (P/N 293 600 121) or use a 5W 40 engine oil compatible with wet clutches			
		Capacity	L (U.S. qt)	3 (3.2) oil change w/filter 4.5 (4.8) total			
Intake valve opening				0° BTDC			
Intake valve closing				50 ABDC			
Exhaust valve opening				50° BBDC			
Exhaust valve closing				0° ATDC			
Valve stem diameter	Intake	New	mm (in)	5.961 to 5.975 (.2347 to .2352)			
		Wear limit	mm (in)	5.930 (.2330)			
	Exhaust	New	mm (in)	5.946 to 5.960 (.2341 to .2346)			
		Wear limit	mm (in)	5.930 (.2330)			
Valve guide diameter		New	mm (in)	5.990 to 6.010 (.2358 to .2366)			
		Wear limit	mm (in)	6.060 (.2386)			
Valve spring free length	Inner	New	mm (in)	41.02 (1.615)			
		Wear limit	mm (in)	38.80 (1.499)			
	Outer	New	mm (in)	45.45 (1.789)			
		Wear limit	mm (in)	43.00 (1.693)			
Valve seat contact width	Intake	New	mm (in)	1.10 to 1.30 (.043 to .051)			
		Wear limit	mm (in)	1.60 (.063)			
	Exhaust	New	mm (in)	1.25 to 1.55 (.049 to .061)			
		Wear limit	mm (in)	1.80 (.071)			
Rocker arm inner diameter		New	mm (in)	20.000 to 20.020 (.7874 to .7882)			
		Wear limit	mm (in)	20.030 (.7886)			
Rocker arm shaft diameter		New	mm (in)	19.980 to 19.990 (.7866 to .7870)			
		Wear limit	mm (in)	19.960 (.7858)			
Cylinder head maximum warpage		Service limit	mm (in)	0.15 (.006)			

MODEL				GTX	WAKE PRO	RXT	RXP
ENGINE (cont'd)							
Piston ring type		1st		Upper compression ring, rectangular			
		2nd		Lower compression ring, tapered face			
		3rd		Oil scraper ring			
Ring end gap	Rectangular	New	mm (in)	0.30 to 0.50 (.012 to .020)			
	Taper-face	New	mm (in)	0.30 to 0.50 (.012 to .020)			
	Oil scraper ring	New	mm (in)	0.30 to 0.50 (.012 to .020)			
	All	Wear limit	mm (in)	1.50 (.059)			
Ring/piston groove clearance	Rectangular	New	mm (in)	0.020 to 0.070 (.0008 to .0028)			
	Taper-face	New	mm (in)	0.020 to 0.060 (.0008 to .0024)			
	Oil scraper ring	New	mm (in)	0.020 to 0.055 (.0008 to .0021)			
	All	Wear limit	mm (in)	0.15 (.006)			
Piston/cylinder wall clearance		New	mm (in)	0.024 to 0.056 (.0010 to .0022)			
		Wear limit	mm (in)	0.100 (.0039)			
Cylinder taper		Wear limit	mm (in)	0.100 (.0039)			
Cylinder out of round (maximum)			mm (in)	0.015 (.0006)			
Camshaft bearing journal diameter	Front	New	mm (in)	24.939 to 24.960 (.9818 to .9827)			
		Wear limit	mm (in)	24.910 (.9807)			
	PTO and center	New	mm (in)	39.890 to 39.900 (1.5705 to 1.5709)			
		Wear limit	mm (in)	39.880 (1.5701)			
Camshaft bearing inner diameter	Front	New	mm (in)	25.000 to 25.010 (.9842 to .9846)			
		Wear limit	mm (in)	25.020 (.9850)			
	PTO and center	New	mm (in)	40.000 to 40.010 (1.5748 to 1.5752)			
		Wear limit	mm (in)	40.020 (1.5756)			
Cam lobe height	Intake	New	mm (in)	31.690 to 31.800 (1.2476 to 1.2520)			
		Wear limit	mm (in)	31.650 (1.2461)			
	Exhaust	New	mm (in)	31.480 to 31.590 (1.2394 to 1.2437)			
		Wear limit	mm (in)	31.430 (1.2374)			
Crankshaft deflection		Maximum	mm (in)	0.05 (.002)			
Crankshaft axial clearance		New	mm (in)	0.080 to 0.220 (.0031 to .0087)			
		Wear limit	mm (in)	0.35 (.014)			
Crankshaft bearing journal diameter		New	mm (in)	49.991 to 50.000 (1.9681 to 1.9685)			
		Wear limit	mm (in)	49.950 (1.9665)			
Crankshaft radial clearance		Wear limit	mm (in)	0.007 (.0028)			
Connecting rod big end diameter		Service limit	mm (in)	45.080 (1.7740)			
Connecting rod big end radial play		Service limit	mm (in)	0.090 (.0035)			
Connecting rod big end axial play		New	mm (in)	0.135 to 0.287 (.0053 to .0113)			
		Wear limit	mm (in)	0.500 (.0197)			
Connecting rod small end diameter		New	mm (in)	23.010 to 23.020 (.9059 to .9063)			
		Wear limit	mm (in)	23.070 (.9080)			
Connecting rod small end radial play		Wear limit	mm (in)	0.080 (.0035)			

MODEL			GTX	WAKE PRO	RXT	RXP
ENGINE (cont'd)						
Piston pin diameter	New	mm (in)	22.996 to 23.000 (.9053 to .9055)			
	Wear limit	mm (in)	22.990 (.9051)			
Balance shaft journal diameter	New	mm (in)	31.980 to 32.000 (1.2591 to 1.2598)			
	Wear limit	mm (in)	31.950 (1.2579)			
Balance shaft radial clearance	Wear limit	mm (in)	0.070 (.0028)			
Balance shaft axial clearance	New	mm (in)	0.020 to 0.250 (.0008 to .0098)			
Supercharger shaft driven plate journal depth	New	mm (in)	14.460 to 14.500 (.5692 to .5709)			
	Wear limit	mm (in)	14.600 (.5748)			
Supercharger drive gear thickness	New	mm (in)	11.000 to 11.050 (.4331 to .4350)			
	Wear limit	mm (in)	10.900 (.4291)			
Supercharger lock washer thickness	New	mm (in)	4.050 to 4.150 (.1594 to .1634)			
	Wear limit	mm (in)	3.950 (.1555)			
Supercharger spring washer package height (uncompressed)	New	mm (in)	10.900 to 10.700 (.4291 to .4213)			
	Wear limit	mm (in)	10.200 (.4016)			
ENGINE COOLING SYSTEM						
Type			Closed loop cooling system			
Coolant			Ethylene-glycol and distilled water (50%/50%). Use premix coolant from BRP or a coolant specially formulated for aluminum engines			
Cooling system capacity		L (U.S. qt)	5.5 (5.8) total			
Thermostat		°C (°F)	87 (188)			
Monitoring beeper setting		°C (°F)	100 (212)			
EXHAUST SYSTEM						
Type			Water cooled/water injected (opened loop). Direct flow from jet pump			
Intake spark arrester			Tubular, wire screen			
Water injection in muffler		mm (in)	3 x 3.5 (.138) on exhaust pipe 1 x 3.5 (.138) on muffler			
ELECTRICAL SYSTEM						
Magneto generator output			360 W @ 6000 RPM			
Stator		Ω	0.1 to 1.0			
Battery			12 V, 30 A•h			
Ignition system type			IDI (inductive discharge ignition)			
Ignition timing			Variable (electronically controlled)			
Spark plug	Make and type		NGK DCPR8E			
	Gap	mm (in)	0.7 to 0.8 (.028 to .031)			
Ignition coil	Primary	Ω	0.85 to 1.15			
	Secondary	KΩ	9.5 to 13.5			
Engine RPM limiter setting		RPM	8300			

MODEL			GTX	WAKE PRO	RXT	RXP
ELECTRICAL SYSTEM (cont'd)						
Fuse	Information center	A	3			
	Beeper	A	3			
	Depth sounder	A	3 (installed but not in use)			
	Fuel level	A	3			
	VTS	A	7.5			
			Not used	Used	Not used	Used
	Fuel pump	A	10			
	Ignition coil and injection	A	3 x 10			
	TOPS	A	3			
	Diagnostic tool	A	15			
	Starter solenoid	A	10			
	CAPS	A	3			
	Charging system	A	30			
	Battery	A	30			
FUEL SYSTEM						
Fuel injection type			ROTAX EMS (Engine Management System). Multipoint fuel injection. Single throttle body (52 mm)			
Fuel pressure		kPa (PSI)	386 to 414 (56 to 60)			
Fuel injector	Quantity		3			
Fuel type	Inside North America ((RON + MON)/2)		91 or higher			
	Outside North America (RON)		95 or higher			
Fuel tank (including reserve)		L (U.S. gal)	60 (15.9)			
Fuel tank reserve (from low level signal)		L (U.S. gal)	15 (4)			
Idle speed		± 50 RPM	1800 (not adjustable)			
PROPULSION SYSTEM						
Jet pump type			Axial flow single stage			
Jet pump grease type			Jet pump bearing grease (P/N 293 550 032)			
Impeller rotation (seen from rear)			Counterclockwise			
Transmission			Direct drive			
Coupling type			Crowned splines			
Reverse system			Yes			
O.P.A.S. system			25.4 mm (1 in) stroke			Fixed
Steering nozzle pivoting angle			20°			
Minimum required water level		cm (in)	90 (35) underneath the lowest rear portion of hull			
Drive shaft deflection (maximum)		mm (in)	0.75 (.030)			
Impeller outside diameter		mm (in)	159 ± 0.06 (6.260 ± .0024)			
Impeller/wear ring clearance	New	mm (in)	0 to 0.23 (0 to .009)			
	Wear limit	mm (in)	0.35 (.0138)			
Impeller shaft end play (new)			0			
Impeller shaft side play			0			
Impeller pitch			10°/21°			

MODEL		GTX	WAKE PRO	RXT	RXP
WEIGHT AND LOADING CAPACITY					
Dry mass kg (lb)		364 (803)	384 (847)	364 (801)	353 (779)
Number of passenger (driver incl.)		3			2
Load limit (passenger and 10 kg (22 lb) luggage) kg (lb)		272 (600)			181 (400)
DIMENSIONS					
Overall length cm (in)		331 (130)			307 (121)
Overall width cm (in)		122 (48)			
Overall height cm (in)		120 (47)			118 (46.6)
MATERIALS					
Hull		Composite fiberglass			
Inlet grate		Aluminum			
Steering cover		Thermoplastic			
Impeller material		Stainless steel			
Impeller housing/stator		Aluminum/aluminum			
Venturi		Aluminum			
Nozzle		Aluminum			
Fuel tank		Polyethylene			
Seat		Polyurethane/foam			
PERFORMANCE					
Estimated pump power kW (HP)		85 (114)			77.5 (104)
Maximum fuel consumption at wide open throttle L/h (U.S. gal/h)		69 (18.2)			
Cruising time at full throttle	Fuel tank without reserve	± 40 minutes			
	Fuel tank reserve (from low level signal)	± 13 minutes			

1503 ENGINE (255 HP)

MODEL				RXT-X/X RS	RXP-X/X RS
ENGINE					
Engine type				ROTAX 1503 4-TEC, 4-stroke, Single Over Head Camshaft (SOHC)	
Induction				Supercharged intercooled	
Number of cylinders				3	
Number of valves				12 valves with hydraulic lifters (no adjustment)	
Bore		Standard	mm (in)	100 (3.9)	
		1st Oversize	mm (in)	100.25 (3.95)	
Stroke			mm (in)	63.4 (2.49)	
Displacement			cm^3 (in^3)	1493.8 (91)	
Compression ratio				8.4:1	
Maximum HP RPM			RPM	8000	
Lubrication		Type		Dry sump (2 oil pumps). Replaceable oil filter. Water-cooled oil cooler	
		Oil type		XPS summer grade oil (P/N 293 600 121) or use a 5W 40 engine oil compatible with wet clutches	
		Capacity	L (U.S. qt)	3 (3.2) oil change w/filter 4.5 (4.8) total	
Intake valve opening				0° BTDC	
Intake valve closing				50° ABDC	
Exhaust valve opening				50° BBDC	
Exhaust valve closing				0° ATDC	
Valve stem diameter	Intake	New	mm (in)	5.961 to 5.975 (.2347 to .2352)	
		Wear limit	mm (in)	5.930 (.2330)	
	Exhaust	New	mm (in)	5.946 to 5.960 (.2341 to .2346)	
		Wear limit	mm (in)	5.930 (.2330)	
Valve guide diameter		New	mm (in)	5.990 to 6.010 (.2358 to .2366)	
		Wear limit	mm (in)	6.060 (.2386)	
Valve spring free length	Inner	New	mm (in)	41.02 (1.615)	
		Wear limit	mm (in)	38.80 (1.499)	
	Outer	New	mm (in)	45.45 (1.789)	
		Wear limit	mm (in)	43.00 (1.693)	
Valve seat contact width	Intake	New	mm (in)	1.10 to 1.30 (.043 to .051)	
		Wear limit	mm (in)	1.60 (.063)	
	Exhaust	New	mm (in)	1.25 to 1.55 (.049 to .061)	
		Wear limit	mm (in)	1.80 (.071)	
Rocker arm inner diameter		New	mm (in)	20.000 to 20.020 (.7874 to .7882)	
		Wear limit	mm (in)	20.030 (.7886)	
Rocker arm shaft diameter		New	mm (in)	19.980 to 19.990 (.7866 to .7870)	
		Wear limit	mm (in)	19.960 (.7858)	
Cylinder head maximum warpage		Service limit	mm (in)	0.15 (.006)	

MODEL				RXT-X/X RS	RXP-X/X RS
ENGINE (cont'd)					
Piston ring type		1st		Upper compression ring, rectangular	
		2nd		Lower compression ring, tapered face	
		3rd		Oil scraper ring	
Ring end gap	Rectangular	New	mm (in)	0.30 to 0.50 (.012 to .020)	
	Taper-face	New	mm (in)	0.30 to 0.50 (.012 to .020)	
	Oil scraper ring	New	mm (in)	0.30 to 0.50 (.012 to .020)	
	All	Wear limit	mm (in)	1.50 (.059)	
Ring/piston groove clearance	Rectangular	New	mm (in)	0.020 to 0.070 (.0008 to .0028)	
	Taper-face	New	mm (in)	0.020 to 0.060 (.0008 to .0024)	
	Oil scraper ring	New	mm (in)	0.020 to 0.055 (.0008 to .0021)	
	All	Wear limit	mm (in)	0.15 (.006)	
Piston/cylinder wall clearance		New	mm (in)	0.024 to 0.056 (.0010 to .0022)	
		Wear limit	mm (in)	0.100 (.0039)	
Cylinder taper		Wear limit	mm (in)	0.100 (.0039)	
Cylinder out of round (maximum)			mm (in)	0.015 (.0006)	
Camshaft bearing journal diameter	Front	New	mm (in)	24.939 to 24.960 (.9818 to .9827)	
		Wear limit	mm (in)	24.910 (.9807)	
	PTO and center	New	mm (in)	39.890 to 39.900 (1.5705 to 1.5709)	
		Wear limit	mm (in)	39.880 (1.5701)	
Camshaft bearing inner diameter	Front	New	mm (in)	25.000 to 25.010 (.9842 to .9846)	
		Wear limit	mm (in)	25.020 (.9850)	
	PTO and center	New	mm (in)	40.000 to 40.010 (1.5748 to 1.5752)	
		Wear limit	mm (in)	40.020 (1.5756)	
Cam lobe height	Intake	New	mm (in)	31.690 to 31.800 (1.2476 to 1.2520)	
		Wear limit	mm (in)	31.650 (1.2461)	
	Exhaust	New	mm (in)	31.480 to 31.590 (1.2394 to 1.2437)	
		Wear limit	mm (in)	31.430 (1.2374)	
Crankshaft deflection		Maximum	mm (in)	0.05 (.002)	
Crankshaft axial clearance		New	mm (in)	0.080 to 0.220 (.0031 to .0087)	
		Wear limit	mm (in)	0.35 (.014)	
Crankshaft bearing journal diameter		New	mm (in)	49.991 to 50.000 (1.9681 to 1.9685)	
		Wear limit	mm (in)	49.950 (1.9665)	
Crankshaft radial clearance		Wear limit	mm (in)	0.007 (.0028)	
Connecting rod big end diameter		Service limit	mm (in)	45.080 (1.7740)	
Connecting rod big end radial play		Service limit	mm (in)	0.090 (.0035)	
Connecting rod big end axial play		New	mm (in)	0.135 to 0.287 (.0053 to .0113)	
		Wear limit	mm (in)	0.500 (.0197)	
Connecting rod small end diameter		New	mm (in)	23.010 to 23.020 (.9059 to .9063)	
		Wear limit	mm (in)	23.070 (.9080)	
Connecting rod small end radial play		Wear limit	mm (in)	0.080 (.0035)	

MODEL			RXT-X/X RS	RXP-X/X RS
ENGINE (cont'd)				
Piston pin diameter	New	mm (in)	22.996 to 23.000 (.9053 to .9055)	
	Wear limit	mm (in)	22.990 (.9051)	
Balance shaft journal diameter	New	mm (in)	31.980 to 32.000 (1.2591 to 1.2598)	
	Wear limit	mm (in)	31.950 (1.2579)	
Balance shaft radial clearance	Wear limit	mm (in)	0.070 (.0028)	
Balance shaft axial clearance	New	mm (in)	0.020 to 0.250 (.0008 to .0098)	
Supercharger shaft driven plate journal depth	New	mm (in)	14.460 to 14.500 (.5692 to .5709)	
	Wear limit	mm (in)	14.600 (.5748)	
Supercharger drive gear thickness	New	mm (in)	11.000 to 11.050 (.4331 to .4350)	
	Wear limit	mm (in)	10.900 (.4291)	
Supercharger lock washer thickness	New	mm (in)	4.050 to 4.150 (.1594 to .1634)	
	Wear limit	mm (in)	3.950 (.1555)	
Supercharger spring washer package height (uncompressed)	New	mm (in)	10.900 to 10.700 (.4291 to .4213)	
	Wear limit	mm (in)	10.200 (.4016)	
ENGINE COOLING SYSTEM				
Type			Closed loop cooling system	
Coolant			Ethylene-glycol and distilled water (50%/50%). Use premix coolant from BRP or a coolant specially formulated for aluminum engines	
Cooling system capacity		L (U.S. qt)	5.5 (5.8) total	
Thermostat		°C (°F)	87 (188)	
Monitoring beeper setting		°C (°F)	100 (212)	
EXHAUST SYSTEM				
Type			Water cooled/water injected (opened loop). Direct flow from jet pump	
Intake spark arrester			Tubular, wire screen	
Water injection in muffler		mm (in)	3 x 3.5 (.138) on exhaust pipe 1 x 3.5 (.138) on muffler	
ELECTRICAL SYSTEM				
Magneto generator output			360 W @ 6000 RPM	
Stator		Ω	0.1 to 1.0	
Battery			12 V, 30 A•h	
Ignition system type			IDI (inductive discharge ignition)	
Ignition timing			Variable (electronically controlled)	
Spark plug	Make and type		NGK DCPR8E	
	Gap	mm (in)	0.7 to 0.8 (.028 to .031)	
Ignition coil	Primary	Ω	0.85 to 1.15	
	Secondary	KΩ	9.5 to 13.5	
Engine RPM limiter setting		RPM	8300	

MODEL			RXT-X/X RS	RXP-X/X RS
ELECTRICAL SYSTEM (cont'd)				
Fuse	Information center	A	3	
	Beeper	A	3	
	Depth sounder	A	3 (installed but not in use)	
	Fuel level	A	3	
	VTS	A	7.5	
	Fuel pump	A	10	
	Ignition coil and injection	A	3 x 10	
	TOPS	A	3	
	Diagnostic tool	A	15	
	Starter solenoid	A	10	
	CAPS	A	3	
	Charging system	A	30	
	Battery	A	30	
FUEL SYSTEM				
Fuel injection type			ROTAX EMS (Engine Management System). Multipoint fuel injection. Single throttle body (52 mm)	
Fuel pressure		kPa (PSI)	386 to 414 (56 to 60)	
Fuel injector	Quantity		3	
Fuel type	Inside North America ((RON + MON)/2)		91 or higher	
	Outside North America (RON)		95 or higher	
Fuel tank (including reserve)		L (U.S. gal)	60 (15.9)	
Fuel tank reserve (from low level signal)		L (U.S. gal)	15 (4)	
Idle speed		± 50 RPM	1800 (not adjustable)	
PROPULSION SYSTEM				
Jet pump type			Axial flow single stage	
Jet pump grease type			Jet pump bearing grease (P/N 293 550 032)	
Impeller rotation (seen from rear)			Counterclockwise	
Transmission			Direct drive	
Coupling type			Crowned splines	
Reverse system			Yes	
O.P.A.S. system			25.4 mm (1 in) stroke	Fixed
Steering nozzle pivoting angle			20°	
Minimum required water level		cm (in)	90 (35) underneath the lowest rear portion of hull	
Drive shaft deflection (maximum)		mm (in)	0.75 (.030)	
Impeller outside diameter		mm (in)	159 ± 0.06 (6.260 ± .0024)	
Impeller/wear ring clearance	New	mm (in)	0 to 0.23 (0 to .009)	
	Wear limit	mm (in)	0.35 (.0138)	
Impeller shaft end play (new)			0	
Impeller shaft side play			0	
Impeller pitch			14°/25°	

MODEL		RXT-X/X RS	RXP-X/X RS
WEIGHT AND LOADING CAPACITY			
Dry mass kg (lb)		366 (808)	356 (785)
Number of passenger (driver incl.)		3	2
Load limit (passenger and 10 kg (22 lb) luggage) kg (lb)		272 (600)	181 (400)
DIMENSIONS			
Overall length cm (in)		331 (130)	307 (121)
Overall width cm (in)		122 (48)	
Overall height cm (in)		118 (46.6)	116 (45.8)
MATERIALS			
Hull		Composite fiberglass	
Inlet grate		Aluminum	
Steering cover		Thermoplastic	
Impeller material		Stainless steel	
Impeller housing/stator		Aluminum/aluminum	
Venturi		Aluminum	
Nozzle		Aluminum	
Fuel tank		Polyethylene	
Seat		Polyurethane/foam	
PERFORMANCE			
Estimated pump power kW (HP)		93 (125)	89 (119)
Maximum fuel consumption at wide open throttle L/h (U.S. gal/h)		75.8 (19.5)	
Cruising time at full throttle	Fuel tank without reserve	± 37 minutes	
	Fuel tank reserve (from low level signal)	± 12 minutes	

219 100 369 CA

2009 4-TEC SERIES SHOP MANUAL SUPPLEMENT / ENGLISH
SUPPLÉMENT MANUEL DE RÉP. SÉRIE 4-TEC 2009 / ANGLAIS

FAIT AU / MADE IN CANADA U/M:P.C.