

SUPERCHARGER (215 AND 260 ENGINES)

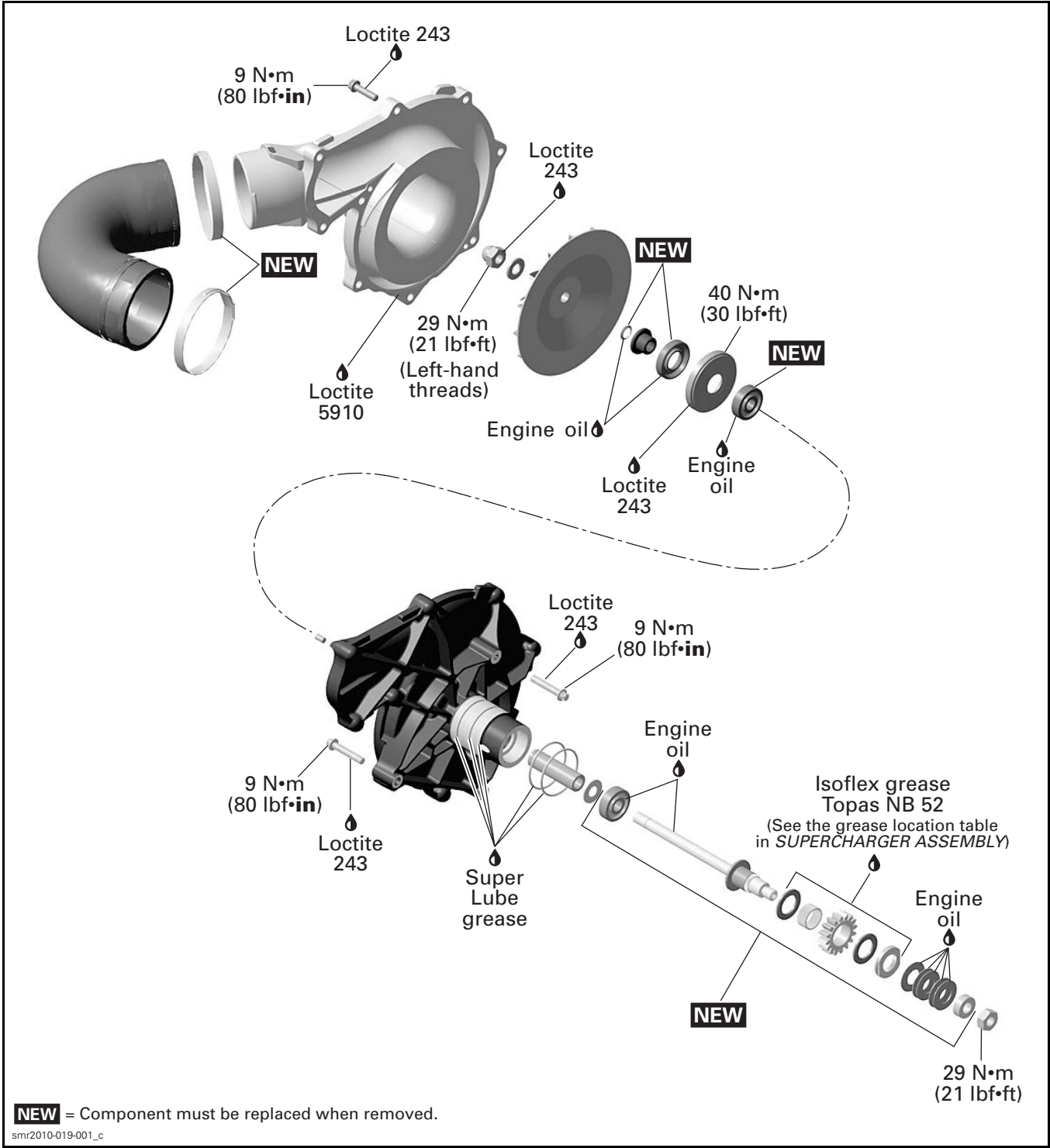
SERVICE TOOLS

Description	Part Number	Page
4-PIN SOCKET	529 035 948	8, 11
BEARING SUPPORT/PUSHER	529 035 950	10–11
CAMSHAFT LOCKING TOOL.....	529 035 839	3
NEEDLE BEARING PUSHER.....	529 036 237	13
SUPERCHARGER GEAR HOLDER.....	529 036 025	4
SUPERCHARGER RETAINING KEY.....	529 036 027	7–8, 14
SUPPORT PLATE.....	529 035 947	4, 7, 10–11
TORX ADAPTER.....	529 035 938	6, 15

SERVICE PRODUCTS

Description	Part Number	Page
ISOFLEX GREASE TOPAS NB 52	293 550 021	12
LOCTITE 243 (BLUE).....	293 800 060	11–12, 14–15
LOCTITE 5910	293 800 081	14
SUPER LUBE GREASE.....	293 550 030	15

Subsection XX (SUPERCHARGER (215 AND 260 ENGINES))



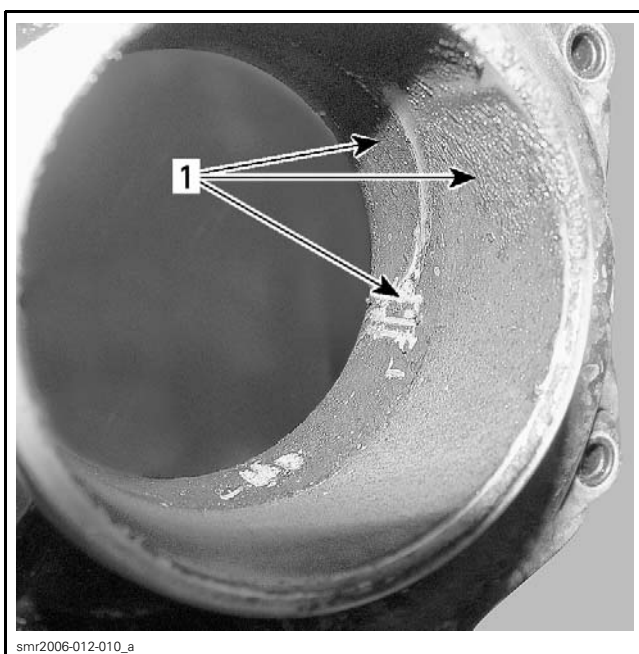
INSPECTION

SUPERCHARGER INLET CLEANLINESS

NOTE: A lower than usual maximum RPM at full throttle might be caused by a dirty supercharger inlet.

To access supercharger. Refer to *SUPERCHARGER ACCESS* in this subsection.

Visually inspect supercharger inlet side for oil, salt or any other deposits.



1. Dirt here

If dirt is found, proceed as follows.

1. Remove supercharger and perform the clutch slipping moment test. Inspect bearings and friction clutch. Replace bearings and clutch components as necessary.

2. Separate supercharger housing.

NOTE: Since supercharger is disassembled, it is recommended to completely inspect it.

3. Clean internal housing and turbine using a brush and cleaning solvent to get rid of oil deposits.

4. Blow dry with compressed air.

NOTICE Do not let turbine spin when using compressed air.

5. Complete usual assembly procedures as described in this subsection.

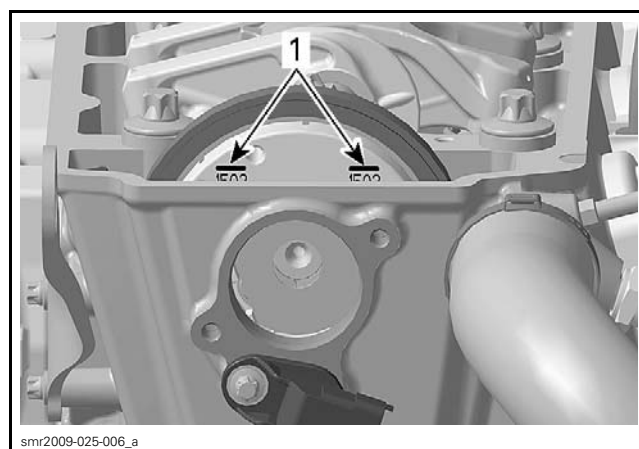
SUPERCHARGER CLUTCH SLIPPING MOMENT (ON ENGINE)

To access supercharger. Refer to *SUPERCHARGER ACCESS* in this subsection.

Remove cylinder head cover, refer to *CYLINDER HEAD* subsection.

Remove spark plugs.

Turn engine by rotating the supercharger nut counterclockwise until the position lines on oil separator cover are lined up as shown in the following illustration.

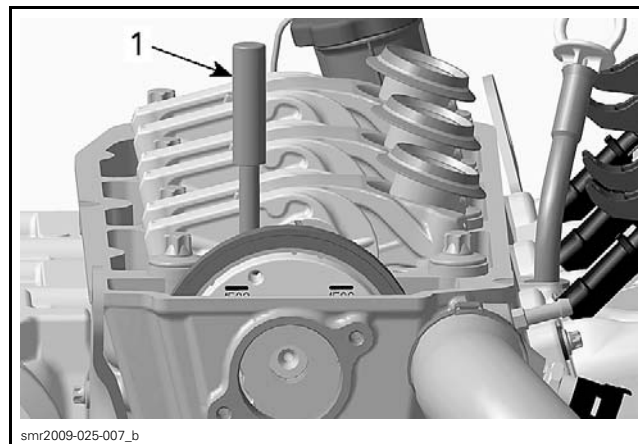


1. Position lines

Lock camshaft to prevent camshaft rotation while checking slipping moment of supercharger.

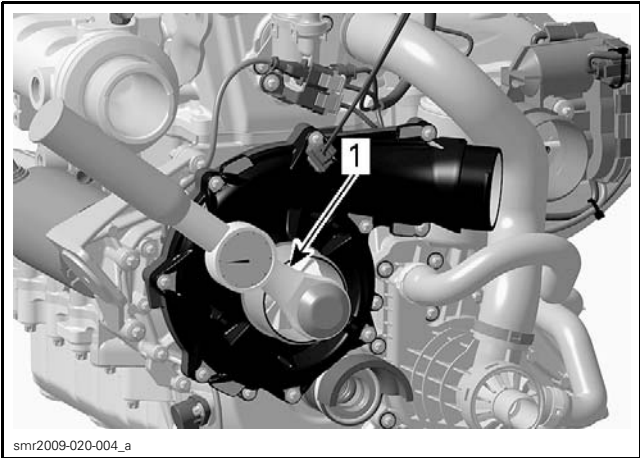
REQUIRED TOOL

CAMSHAFT LOCKING TOOL
(P/N 529 035 839)



1. Camshaft locking tool

Check slipping moment counterclockwise by using a torque wrench with actual torque viewer. A mirror is useful to see the viewer.



1. Torque wrench

NOTE: Before checking the supercharger slipping moment on a new or rebuilt supercharger, it is recommended to turn the clutch for a minimum of 3 complete revolutions. This will dissipate grease or oil on the friction shims for a precise reading. Supercharger should start to turn at a torque within the specified values.

SLIPPING MOMENT (NEW SUPERCHARGER)
9 N•m to 14 N•m (80 lbf•in to 124 lbf•in)
SLIPPING MOMENT (BREAK-IN SUPERCHARGER)
8 N•m to 12 N•m (71 lbf•in to 106 lbf•in)

If the torque is not within specifications, repair supercharger clutch. Verify supercharger clutch components as per *SUPERCHARGER INSPECTION* in this subsection.

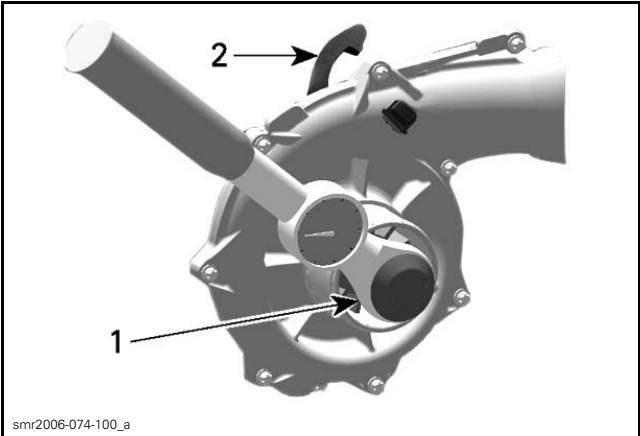
SUPERCHARGER CLUTCH SLIPPING MOMENT (BENCH TEST)

Mount supercharger on support plate.
Hold supercharger gear with supercharger gear holder.

REQUIRED TOOLS	
SUPPORT PLATE (P/N 529 035 947)	
SUPERCHARGER GEAR HOLDER (P/N 529 036 025)	



Check slipping moment counterclockwise by using a torque wrench with a viewer.



1. Torque wrench
2. Gear holder

NOTE: Before checking the supercharger slipping moment on a new or rebuilt supercharger, it is recommended to turn the clutch for a minimum of 3 complete revolutions. This will dissipate grease or oil on the friction shims for a proper reading. Supercharger should start to turn at a torque within the specified values.

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TROUBLESHOOTING

The following is provided to help in diagnosing the probable source of troubles. It is a guideline and it should not be assumed to list all possible problems.

Always check for fault codes. If a fault code is detected, service the fault code first. Refer to *DIAGNOSTIC AND FAULT CODES* subsection.

ENGINE WILL NOT START (ENGINE DOES NOT TURN OVER)

1. Supercharger seized or obstructed
 - Inspect and repair supercharger.

ENGINE LACKS ACCELERATION OR POWER (DOES NOT REACH MAXIMUM RPM)

1. Supercharger inlet is dirty
 - Check and clean supercharger inlet.
 - Check engine oil. Siphon excess of oil.
2. Supercharger slipping clutch defective
 - Check slipping clutch moment.
 - Repair supercharger if out of specification.

PROCEDURES

SUPERCHARGER

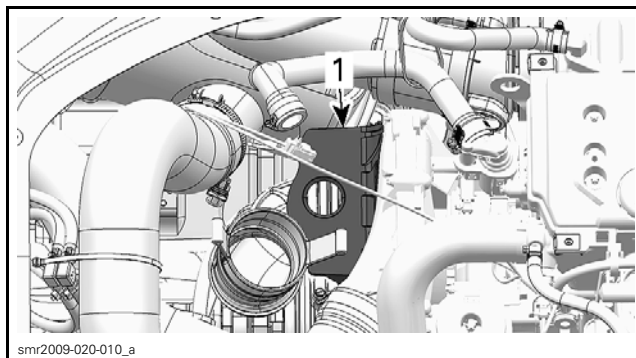
Supercharger Access

On models with suspension, remove the moving deck. Refer to *BODY (RXT, GTX AND WAKE PRO)* subsection for proper procedure.

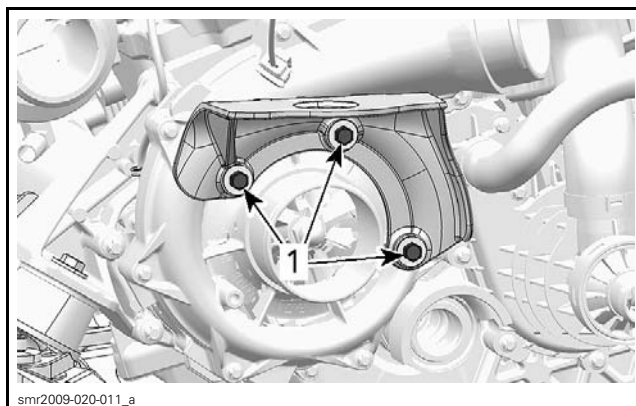
Remove the air intake silencer. Refer to the appropriate subsection according to model:

- *AIR INTAKE SYSTEM (MODELS WITHOUT SUSPENSION)*
- *AIR INTAKE SYSTEM (MODELS WITH SUSPENSION).*

Remove the air intake silencer support.



1. Air intake silencer support

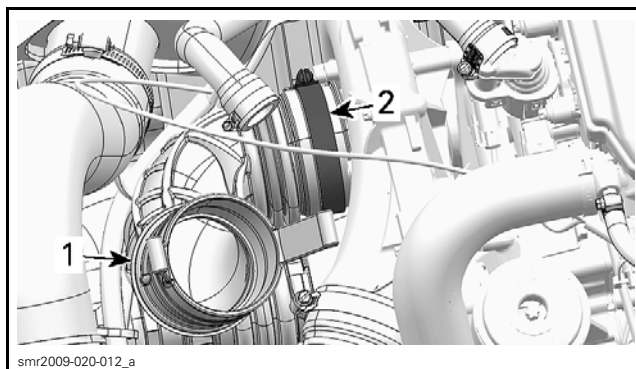


MANY PARTS REMOVED FOR CLARITY PURPOSE

1. Support screws

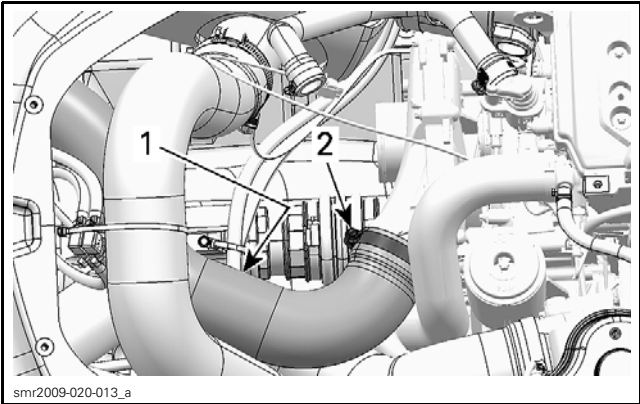
Supercharger Removal

Remove air inlet and outlet hoses from supercharger.



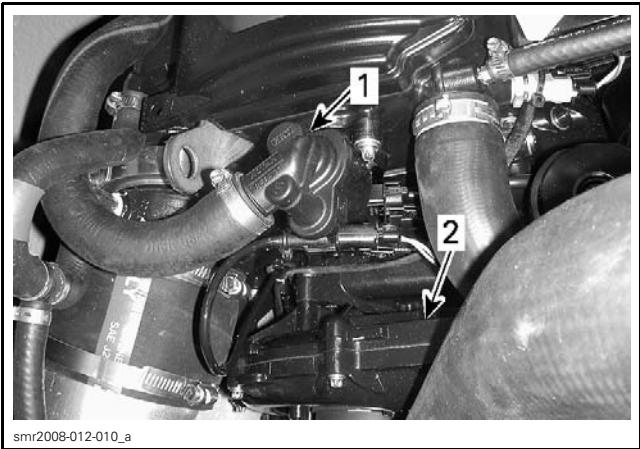
1. Air inlet hose
2. Hose clamp

Subsection XX (SUPERCHARGER (215 AND 260 ENGINES))



- 1. Air outlet hose
- 2. Hose clamp

Unscrew blow-by valve screws and move it aside to make room.



- 1. Blow-by valve
- 2. Supercharger

Using a marker, trace a mark on rubber adapter and exhaust pipe.



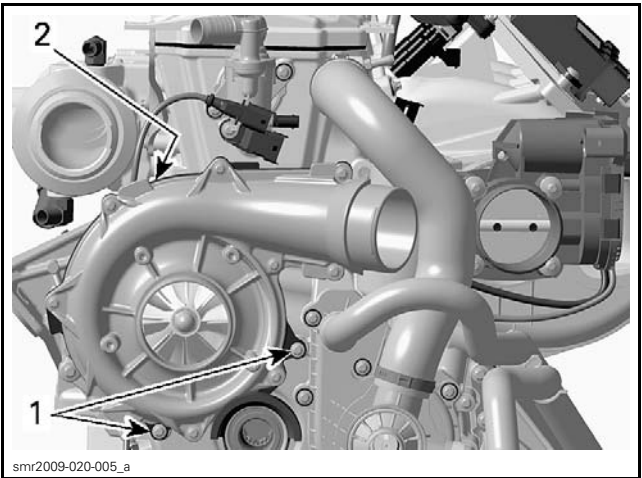
- 1. Rubber adapter
- 2. Exhaust pipe

Loosen clamp securing rubber adapter to exhaust pipe.

Detach muffler strap.

Move muffler back (± 5 cm (2 in)).

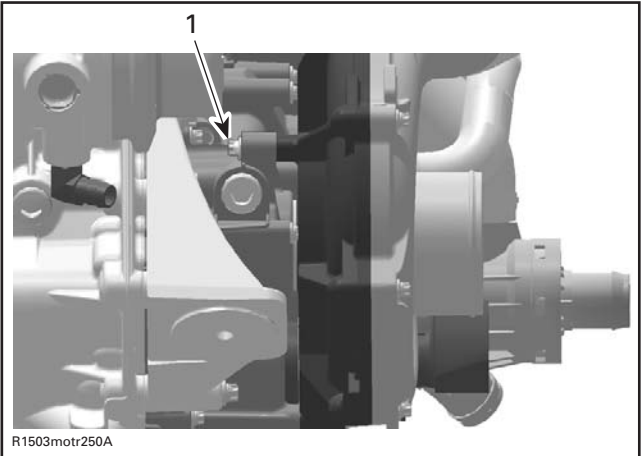
Remove retaining screws and pull out the supercharger.



- 1. Retaining screws
- 2. Upper retaining screw (hidden behind the supercharger)

NOTE: Use the following tool to remove the upper retaining screw.

REQUIRED TOOL	
TORX ADAPTER (P/N 529 035 938)	



- 1. Upper retaining screw

Supercharger Disassembly

NOTICE Be scrupulous when working on supercharger parts. Supercharger rotation reaches 45 000 RPM. Any modification, improper repair, assembly or damage on the parts, may result in damage of the supercharger. Strictly follow the described procedures.

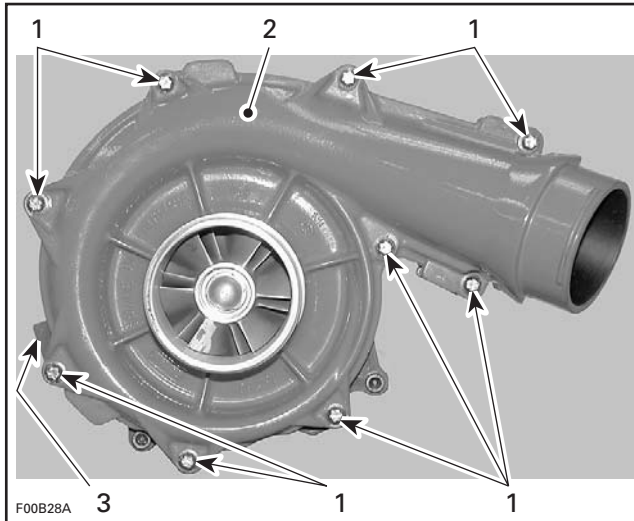
- 1. Secure the supercharger on its support plate.

REQUIRED TOOL

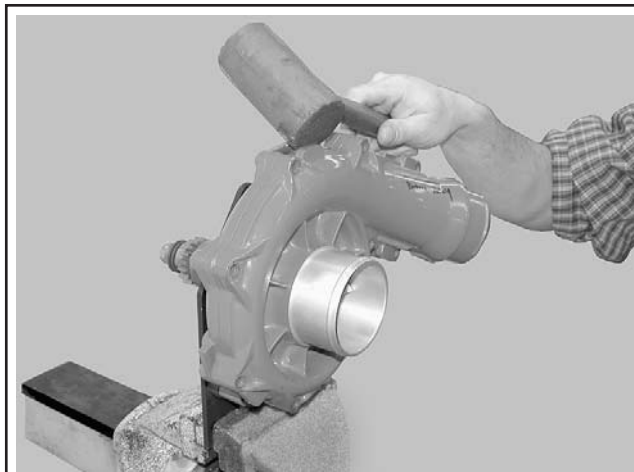
SUPPORT PLATE
(P/N 529 035 947)



2. Take apart supercharger housing.



1. Retaining screws
2. Housing half (intake side)
3. Housing half (engine side)

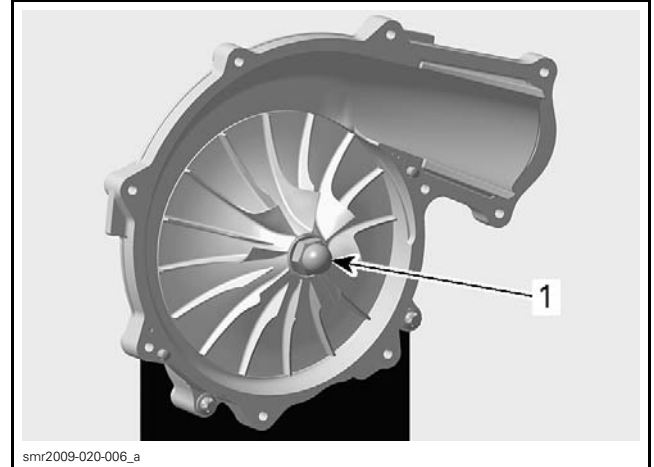


F00B29A
PLASTIC HAMMER

3. Loosen cap nut (turn **clockwise**) on supercharger shaft turbine side.

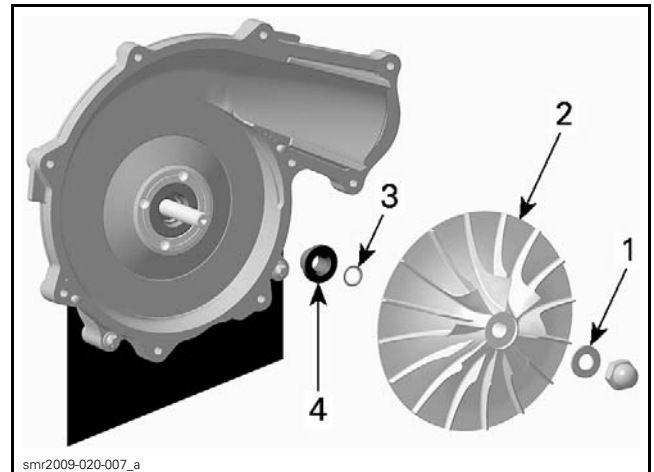
REQUIRED TOOL

SUPERCHARGER RETAINING KEY
(P/N 529 036 027)



1. Cap nut (left-hand thread)

4. Remove washer, turbine, O-ring and step collar from supercharger shaft.



1. Washer
2. Turbine
3. O-ring
4. Step collar

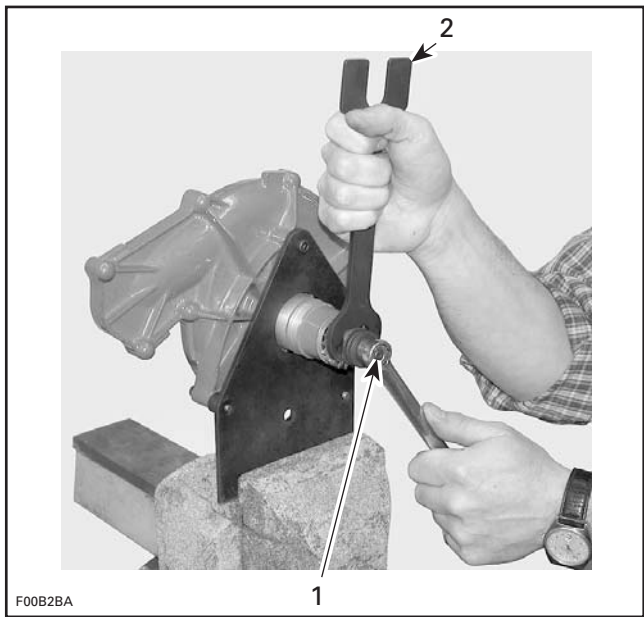
5. Loosen nut on supercharger shaft engine side (turn **counterclockwise**).

REQUIRED TOOL

SUPERCHARGER RETAINING KEY
(P/N 529 036 027)

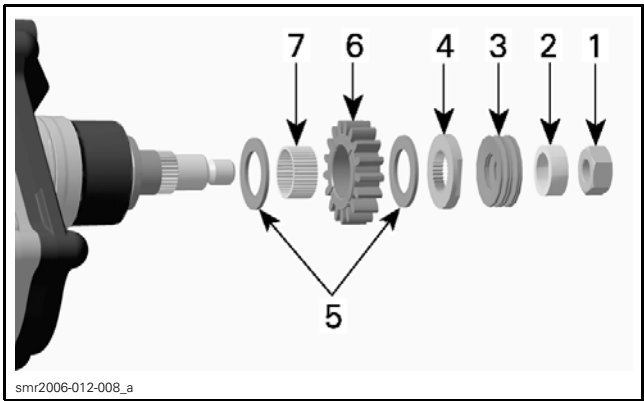


Subsection XX (SUPERCHARGER (215 AND 260 ENGINES))



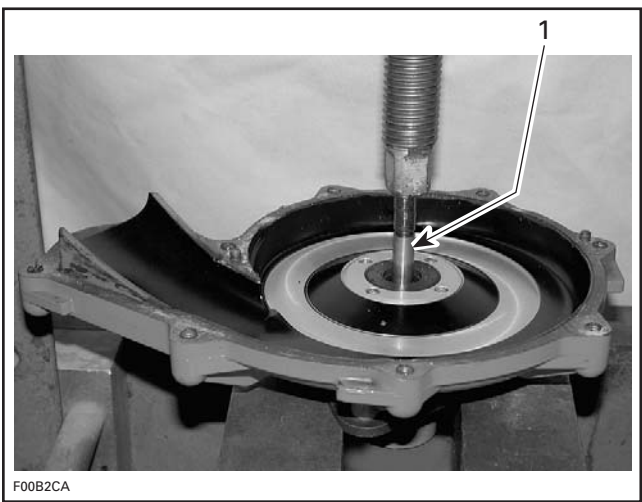
- 1. Nut
- 2. Retaining key

6. Remove L-ring, spring washers, lock washer, drive gear and needle pins by turning the supercharger upside down. Discard all needle pins.



- 1. Nut
- 2. L-ring
- 3. Spring washers (5x)
- 4. Lock washer
- 5. Friction shims
- 6. Drive gear
- 7. Needle pins (discard all)

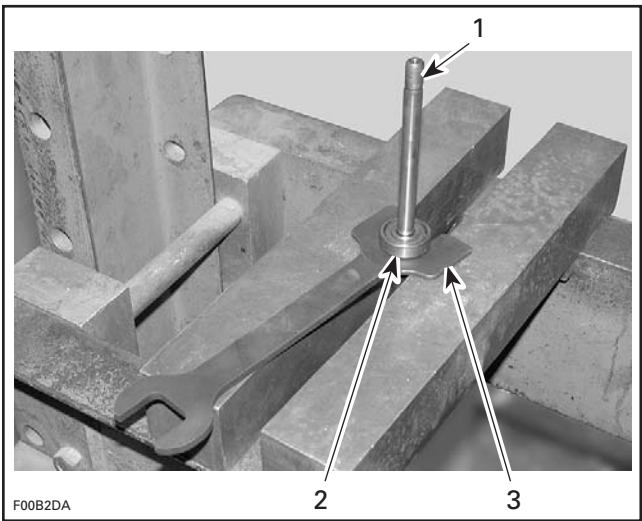
7. Carefully push out supercharger shaft towards engine side by using a press.



- 1. Supercharger shaft

8. Press out ball bearing from supercharger shaft by using a press.

REQUIRED TOOL	
SUPERCHARGER RETAINING KEY (P/N 529 036 027)	

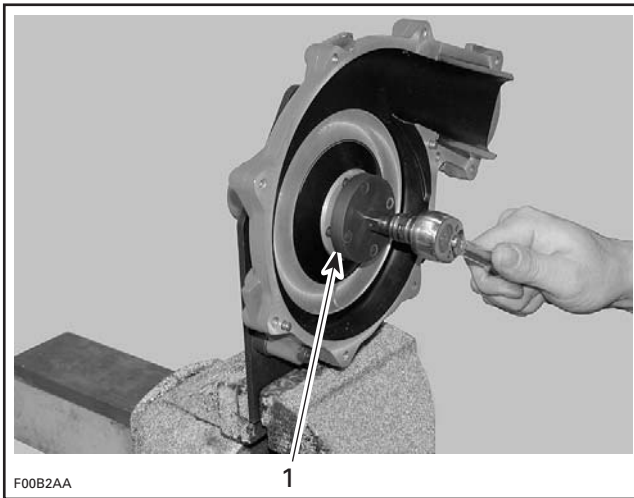


- 1. Supercharger shaft
- 2. Ball bearing
- 3. Retaining key

9. Remove retaining disc with seal from housing half (engine side).

REQUIRED TOOL	
4-PIN SOCKET (P/N 529 035 948)	

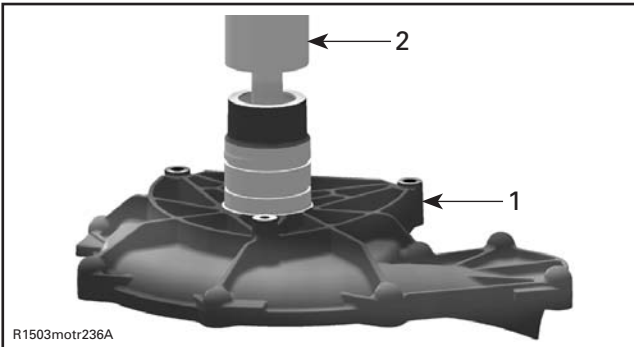
NOTE: It may be necessary to heat the housing with a heat gun to release the retaining disc.



1. 4-pin socket

10. Discard the oil seal.

11. Remove and discard ball bearing from supercharger housing half (engine side) by using a press and a suitable bearing pusher.



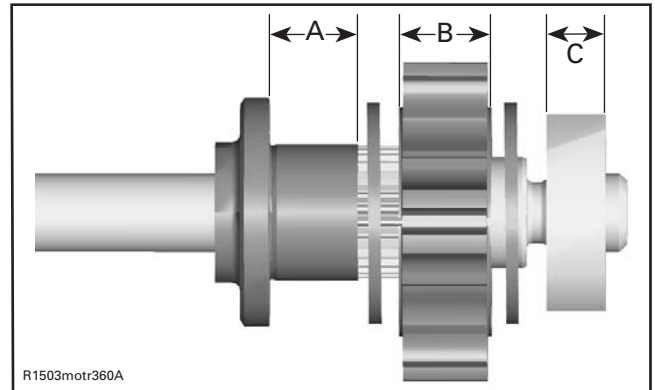
1. Supercharger housing half (engine side)
2. Bearing pusher

Supercharger Inspection

Supercharger Clutch Components and Gear

Check the wear limit on drive gear, lock washer and driven plate on supercharger shaft. Check drive gear for cracks.

NOTE: If parts are worn out or damaged, repair supercharger only by using supercharger repair kit.



A. Driven plate journal depth
B. Drive gear thickness
C. Lock washer thickness

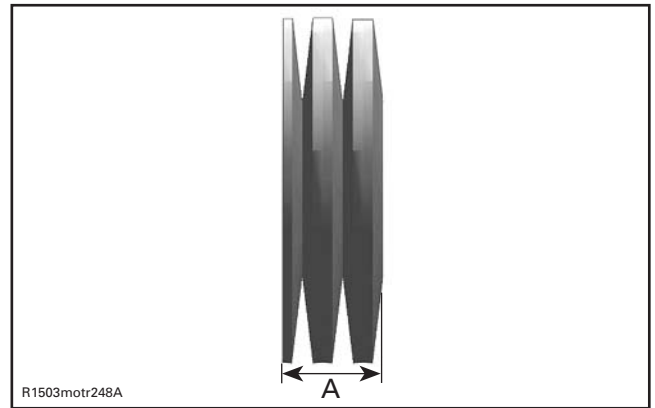
DRIVEN PLATE JOURNAL DEPTH	
NEW	14.460 mm to 14.500 mm (.5693 in to .5709 in)
SERVICE LIMIT	14.600 mm (.5748 in)

DRIVE GEAR THICKNESS	
NEW	11.000 mm to 11.050 mm (.4331 in to .435 in)
SERVICE LIMIT	10.900 mm (.4291 in)

LOCK WASHER THICKNESS	
NEW	4.050 mm to 4.150 mm (.1594 in to .1634 in)
SERVICE LIMIT	3.950 mm (.1555 in)

Spring Washer

Put spring washer package together as it is assembled on the supercharger shaft. Measure the height of the unloaded spring washer package.



A. Spring washer package height

SPRING WASHER PACKAGE HEIGHT	
NEW	10.7 mm to 10.9 mm (.4213 in to .4291 in)
SERVICE LIMIT	10.2 mm (.4016 in)

Supercharger Assembly

NOTICE Every time when supercharger shaft has been removed, both ball bearings have to be replaced.

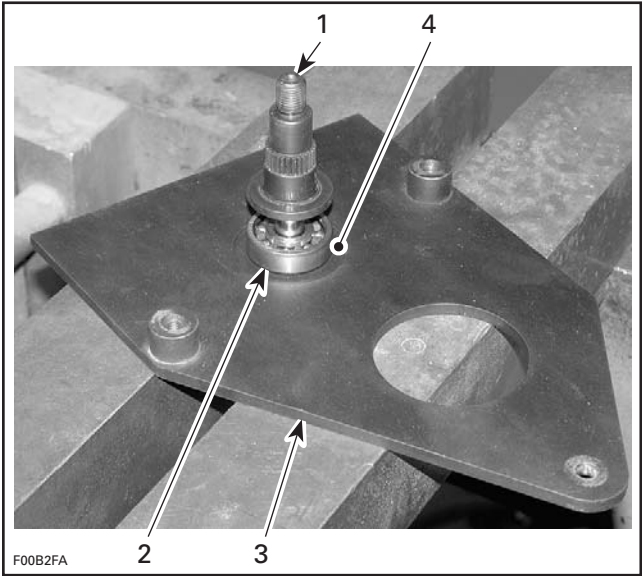
NOTICE Both ball bearings have to be installed with cages facing turbine side.

- 1. Install ball bearing on supercharger shaft. Hold bearing using the following tool.
 - 1.1 Apply enough engine oil on **NEW** ball bearing.
 - 1.2 Press the bearing. Use the following tool to hold the bearing.

REQUIRED TOOL	
SUPPORT PLATE (P/N 529 035 947)	

NOTICE Ensure to position ball bearing against protrusion of support plate for the installation. This way, the installation pressure will be applied to the inner race and will not be transmitted to the bearing balls which would otherwise shorten the bearing life.

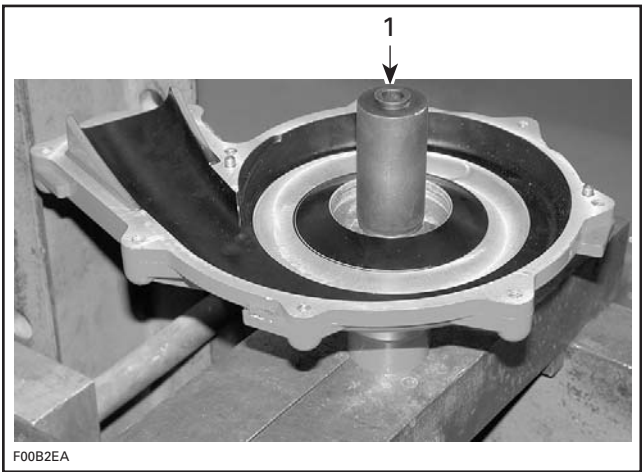
NOTICE To install ball bearings and supercharger shaft always use a press, never use any beating force like a hammer.



- 1. Supercharger shaft
- 2. Ball bearing
- 3. Bearing support plate
- 4. Protrusion of support plate on this side (underneath inner race)

- 2. Press in the ball bearing in supercharger housing half (engine side).
 - 2.1 Apply enough engine oil on **NEW** ball bearing.
 - 2.2 Press the bearing using the following tool.

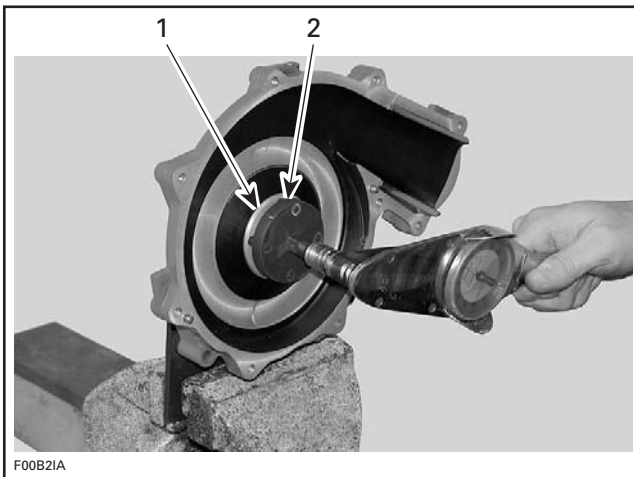
REQUIRED TOOL	
BEARING SUPPORT/PUSHER (P/N 529 035 950)	



- 1. Bearing support/pusher
- 3. Secure the supercharger housing plate (engine side) in a vice.

REQUIRED TOOL	
SUPPORT PLATE (P/N 529 035 947)	

4. Apply LOCTITE 243 (BLUE) (P/N 293 800 060) on retaining disc. If a new retaining disc is used, the threads are coated with a self-locking product.
5. Install the retaining disc in supercharger housing half.



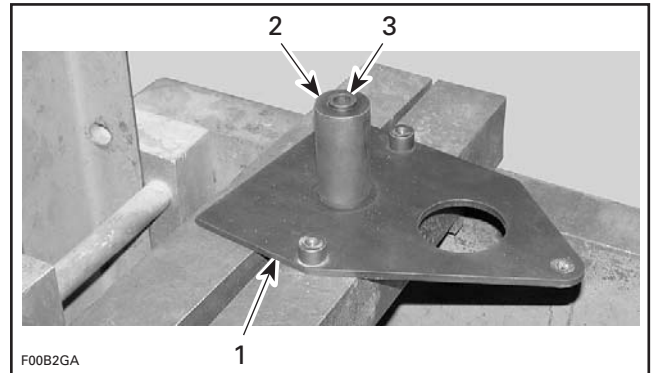
1. Retaining disc
2. 4-pin socket

REQUIRED TOOL	
4-PIN SOCKET (P/N 529 035 948)	

TIGHTENING TORQUE	
Retaining disc	40 N•m (30 lbf•ft)

6. Press supercharger shaft in housing half (engine side).
- 6.1 Properly support bearing using the following tools under supercharger housing half.

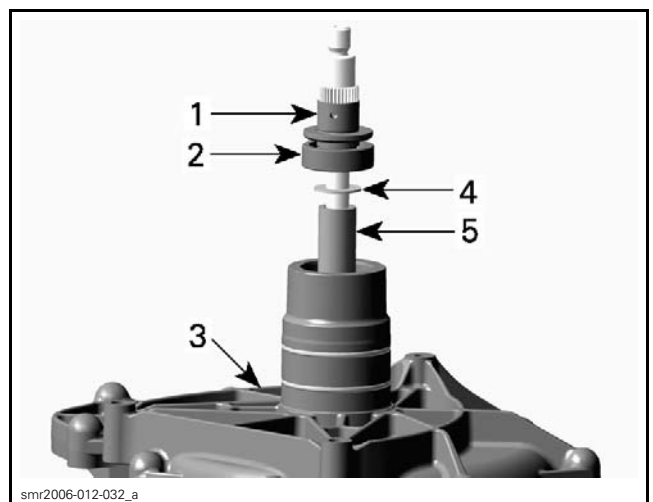
REQUIRED TOOLS	
SUPPORT PLATE (P/N 529 035 947)	
BEARING SUPPORT/PUSHER (P/N 529 035 950)	



1. Support plate
2. Bearing support/pusher
3. Protrusion here

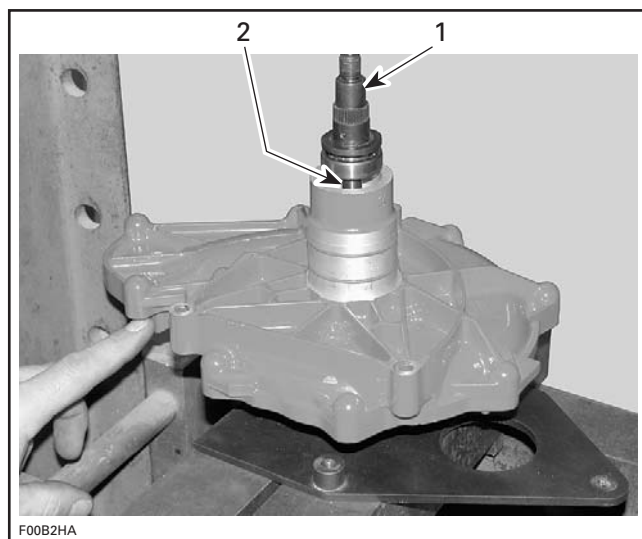
NOTICE Before pressing in the supercharger shaft, be sure to properly support the inner race of ball bearing in supercharger housing half with the recommended tool. This way, the installation pressure will be applied to the inner race and will not be transmitted to the bearing balls which would otherwise shorten the bearing life.

- 6.2 Apply heat outside of the housing with a heat gun to expand its diameter prior to inserting the shaft. Ensure there is no O-ring on the housing half prior to heating.
- 6.3 Apply engine oil on supercharger shaft. Press shaft with thrust washer and distance sleeve together in supercharger housing half.



1. Compressor shaft
2. Ball bearing
3. Supercharger housing half
4. Thrust washer
5. Distance sleeve

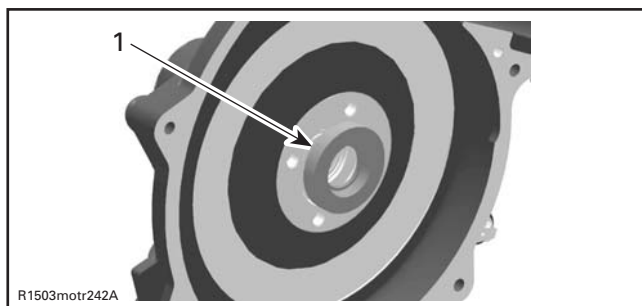
Subsection XX (SUPERCHARGER (215 AND 260 ENGINES))



1. Supercharger shaft
2. Distance sleeve

7. Apply engine oil on seal and push into retaining disc by hand.

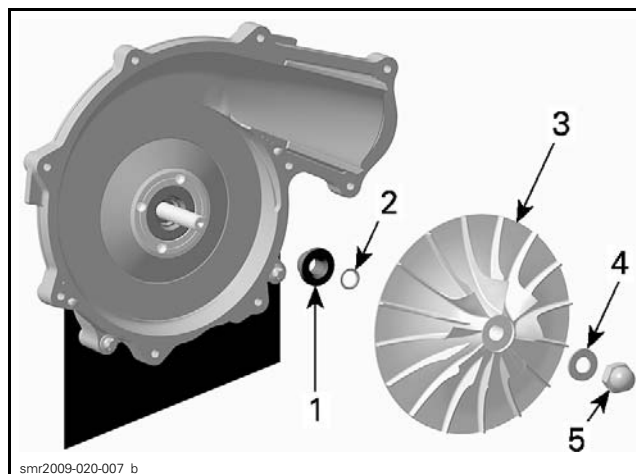
NOTE: Always use a **NEW** oil seal when assembling the supercharger.



1. Oil seal

8. Install step collar, O-ring, turbine and washer on supercharger shaft. Apply LOCTITE 243 (BLUE) (P/N 293 800 060) on cap nut and temporary finger tight cap nut.

NOTE: The cap nut on the supercharger shaft has a left-handed thread. The Loctite has to be applied in a small dose into the nut.



1. Step collar
2. O-ring
3. Turbine
4. Washer
5. Cap nut

Complete installation of supercharger shaft, engine side as follows:

NOTICE It is of the utmost importance that all parts be absolutely clean. The compressor shaft spins at up to 45 000 RPM and any debris could cause a failure.

9. Prepare the following parts for assembly by applying ISOFLEX GREASE TOPAS NB 52 (P/N 293 550 021) as shown in the next illustrations.

NOTICE No other grease can be used, otherwise damage to needle bearing will occur.

Shaft (needle bearing seat and collar)	
Drive gear (inner diameter)	
Friction shims (inner diameter and both sides)	
Lock washer (inner splines and friction shim thrust surface)	

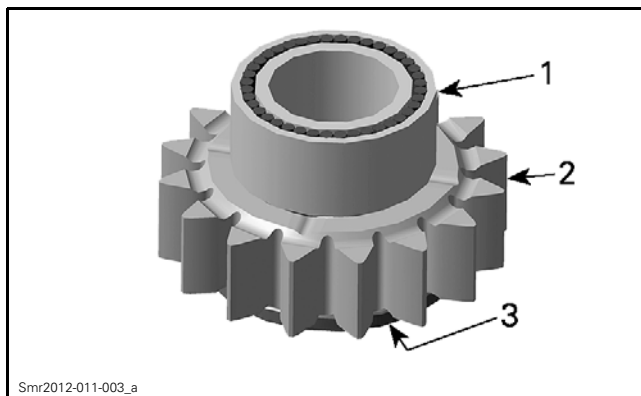
10. Put the first friction shim on a workbench.

NOTICE Manipulate friction shims with care, those parts are sensitive.

11. Put the drive gear on the friction shim.

12. Install the **NEW** needle bearing in drive gear.

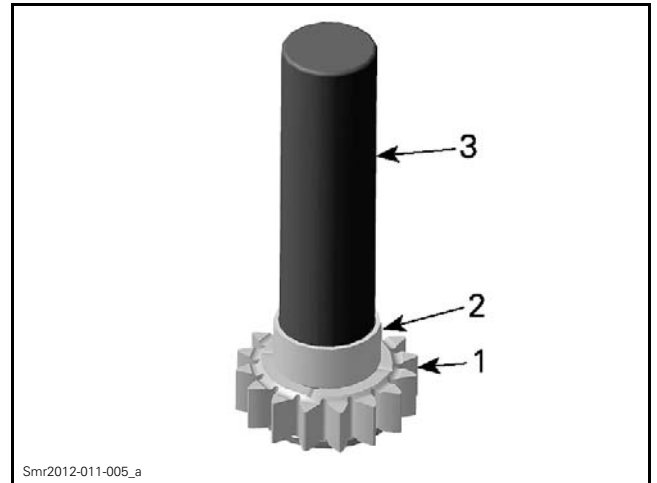
12.1 Position the needle bearing on the drive gear.



1. Needle bearing
2. Drive gear
3. Friction shim

12.2 Push the needle pins with inner plastic cage into the drive gear.

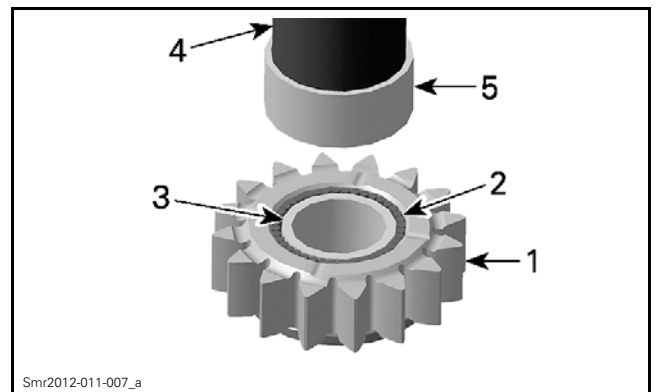
REQUIRED TOOL	
NEEDLE BEARING PUSHER (P/N 529 036 237)	



1. Drive gear
2. Outer plastic cage
3. Needle bearing pusher

12.3 Remove needle bearing pusher and discard outer plastic cage.

12.4 Check if all 40 needle pins are in place.

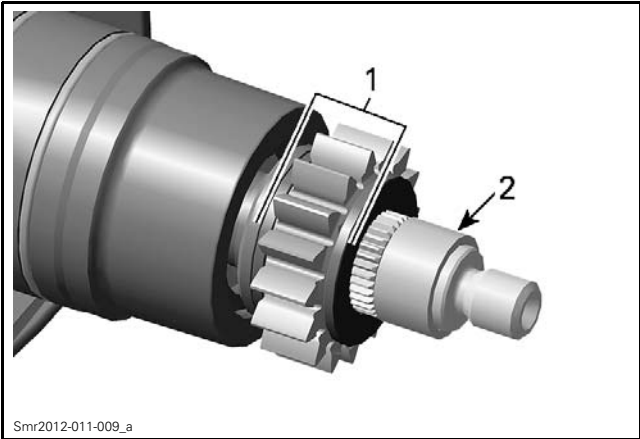


1. Drive gear
2. 40 needle pins
3. Inner plastic cage
4. Needle bearing pusher
5. Outer plastic cage

13. Place the second friction shim on the drive gear.

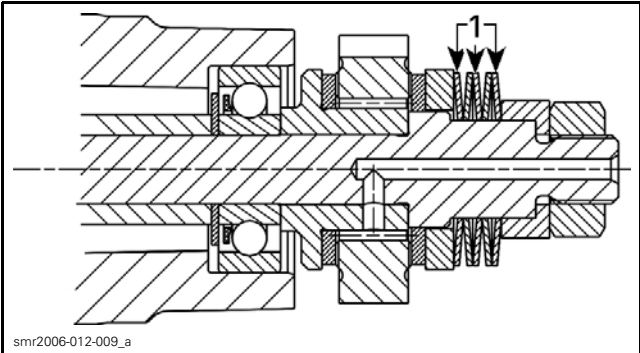
14. Install the package consisting of friction shim, drive gear with needle bearing and friction shim on the hub side of the compressor shaft.

NOTE: The inner plastic cage is pushed out upon installation on compressor shaft.



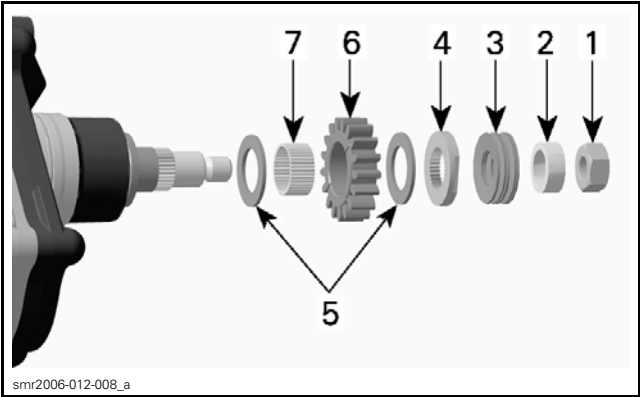
1. Package of friction shims, drive gear and needle bearing
 2. Inner plastic cage
15. Discard the inner plastic cage and install the lock washer.
16. Apply engine oil to the spring washers.
17. Position the spring washers as per illustration.

NOTICE When installing the spring washers, take care of the exact installation direction of the washers.



1. Spring washers
18. Install the L-ring on the compressor shaft.
19. Apply LOCTITE 243 (BLUE) (P/N 293 800 060) on the hexagonal nut threads.

TIGHTENING TORQUE	
Hexagonal nut	29 N•m (21 lbf•ft)



1. Nut
2. L-ring
3. Spring washers
4. Lock washer
5. Friction shims
6. Drive gear
7. Needle bearing

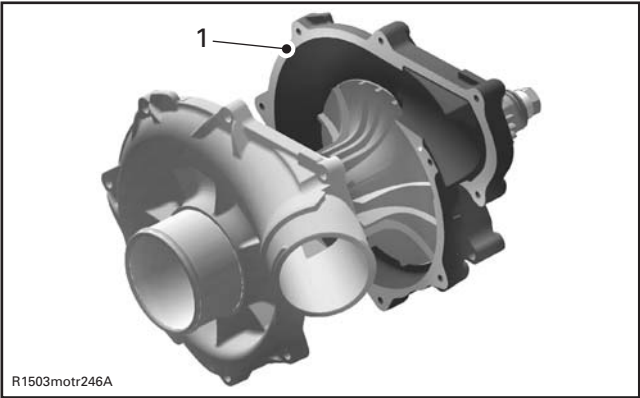
NOTE: The L-ring will preload the spring washers.

20. Hold the lock washer of the supercharger shaft (engine side) and tighten the cap nut.

REQUIRED TOOL	
SUPERCHARGER RETAINING KEY (P/N 529 036 027)	

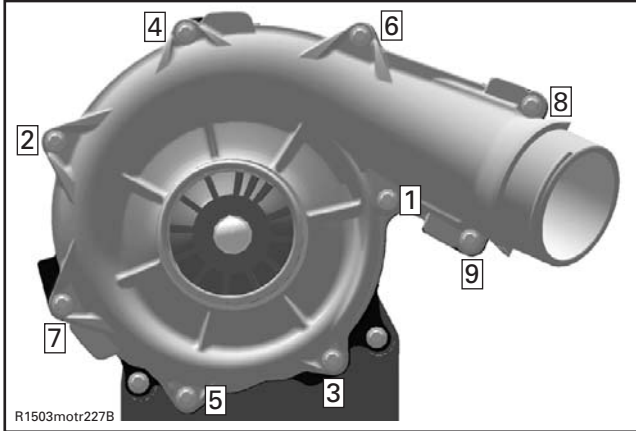
TIGHTENING TORQUE	
Cap nut	29 N•m (21 lbf•ft)

21. Apply LOCTITE 5910 (P/N 293 800 081) on supercharger housing sealing surface.



1. Apply Loctite 5910 on sealing surface
22. Assemble supercharger housing halves.
- 22.1 Apply LOCTITE 243 (BLUE) (P/N 293 800 060) on retaining screws.
- 22.2 Tighten supercharger housing halves screws according to the following sequence.

TIGHTENING TORQUE	
Supercharger housing halves screws	9 N•m (80 lbf•in)



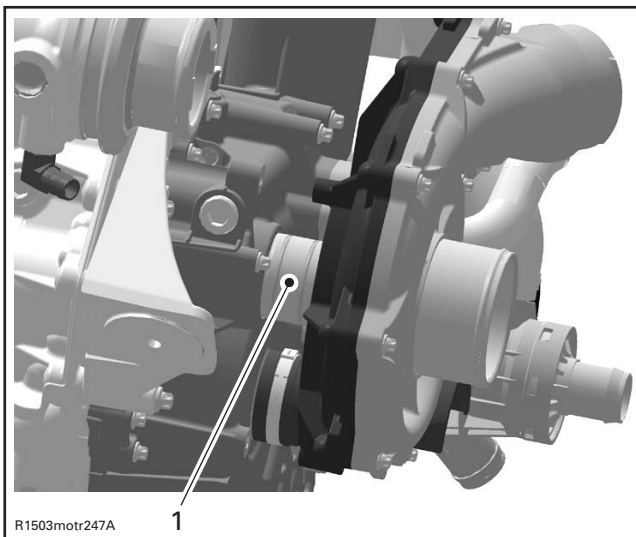
SUPERCHARGER TIGHTENING SEQUENCE

23. Verify the clutch slipping moment. Refer to *SUPERCHARGER CLUTCH SLIPPING MOMENT (BENCH TEST)* in this subsection.

Supercharger Installation

1. Grease sealing surface between supercharger and PTO housing with SUPER LUBE GREASE (P/N 293 550 030).

NOTE: Ensure O-rings are installed.



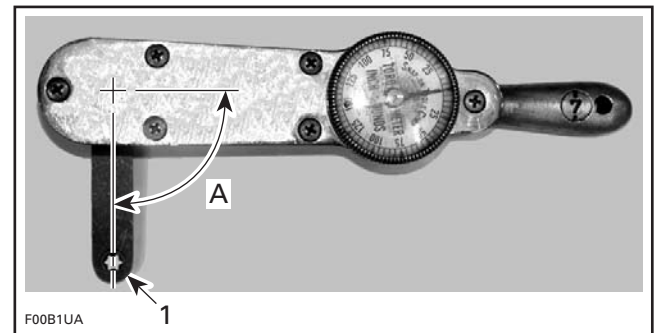
1. Super Lube grease

2. Install supercharger on PTO housing.
3. Apply LOCTITE 243 (BLUE) (P/N 293 800 060) on the retaining screws.
4. Tighten supercharger retaining screws to specifications.

TIGHTENING TORQUE	
Supercharger retaining screws	9 N•m (80 lbf•in)

NOTE: For the upper retaining screw the following tool must be used mounted 90° to torque wrench.

REQUIRED TOOL	
TORX ADAPTER (P/N 529 035 938)	



1. Torx adapter perpendicular to torque wrench
- A. 90°

NOTICE Not installing the tool as shown will change the torque applied to the screw.

5. After complete installation of the supercharger, the slipping moment has to be rechecked. Refer to *SUPERCHARGER CLUTCH SLIPPING MOMENT (ON ENGINE)* at the beginning of this subsection.