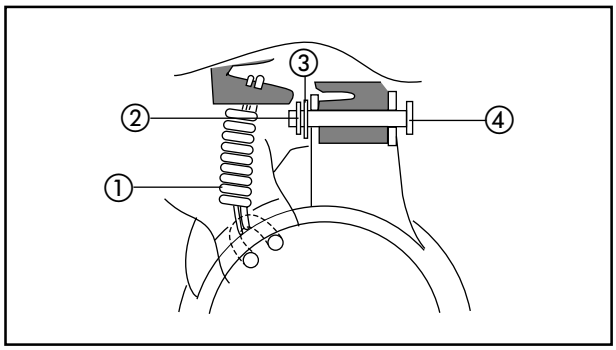
ENGINE DISASSEMBLY

REAR WHEEL

1. Remove :
• Rear wheel
Refer to chapter 7 "REAR WHEEL"



CENTERSTAND

1. Remove :
• Spring ①
• Clip ②
• Plate washer ③
• Axle ④
• Center stand

CYLINDER HEAD AND CYLINDER

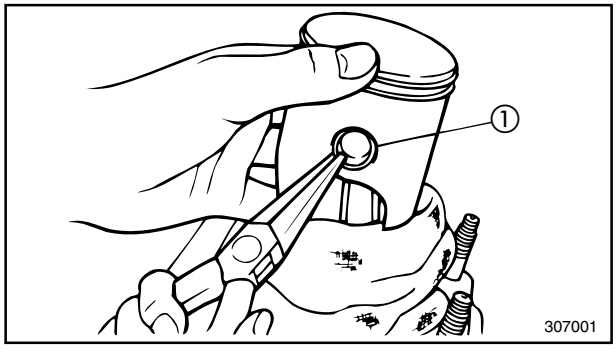
1. Remove :
• Cylinder head
• Cylinder head gasket

NOTE:

- Before loosening the cylinder head nuts, loosen the spark plug.
- Loosen the cylinder head nuts crosswise 1/4 of a turn each before removing them.

2. Remove :
• Cylinder
• Cylinder gasket

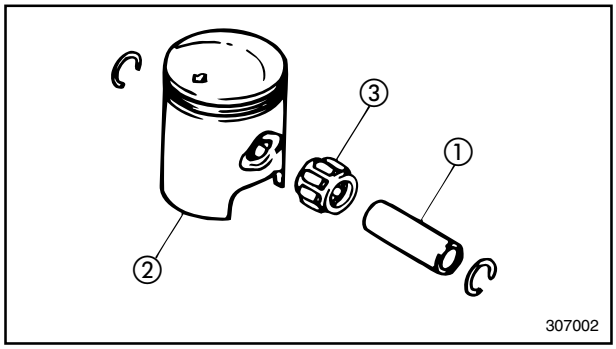
PISTON PIN AND PISTON



1. Remove :
• Piston pin clip ①

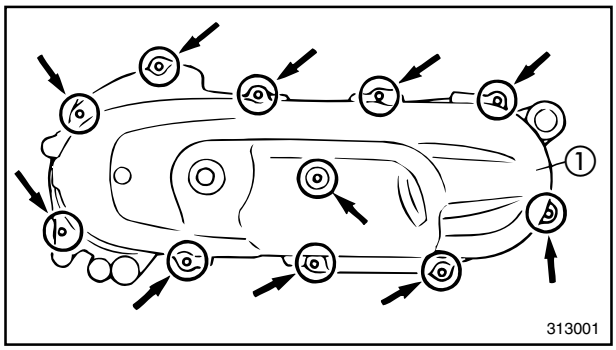
NOTE:

Before removing the piston pin clip, cover the crankcase with a clean rag, so that the clip cannot accidentally fall into the crankcase.

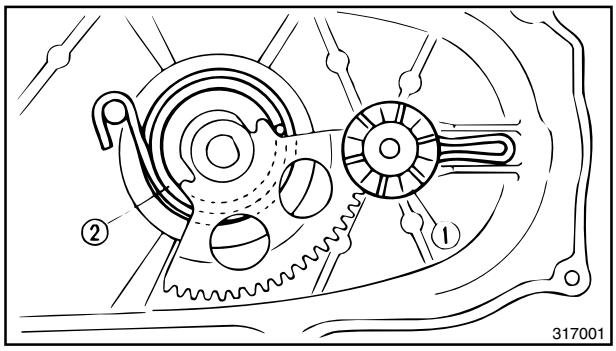


2. Remove :
• Piston pin ①
• Piston ②
• Piston pin bearing ③

CAUTION:
Do not use a hammer to drive out the piston pin.



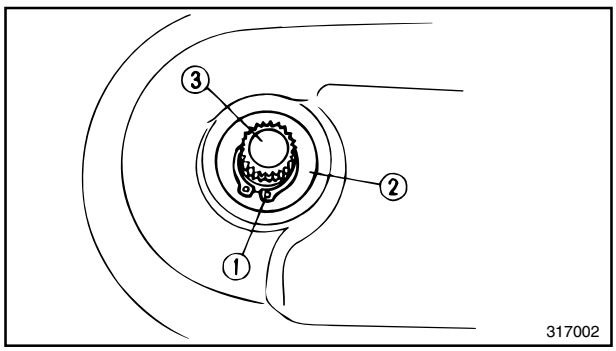
KICKSTARTER
1. Remove :
• Kick crank
• Transmission cover ① (left)



2. Remove :
• Kick pinion gear ①

NOTE:
To remove the kick pinion gear, push down the kick crank.

3 Unhook :
• Kick return spring ②



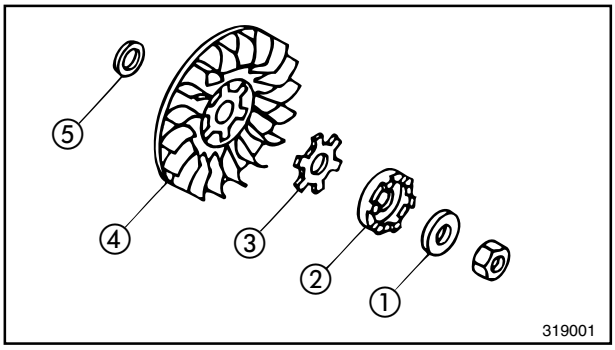
4. Remove :
• Circlips ①
• Plate washer ②
• Kick shaft ③

PRIMARY SHEAVE

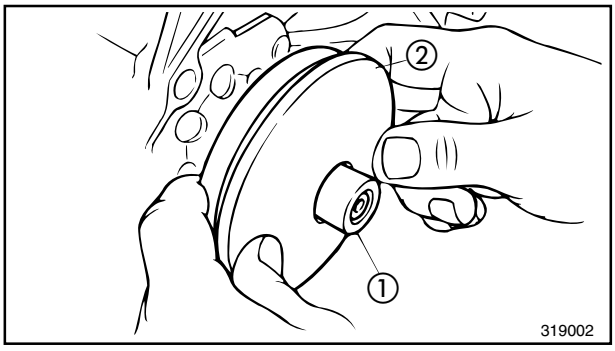
1. Remove :
• Oil pump housing
2. Remove :
• Nut (primary sheave)

NOTE:
To loosen the primary sheave nut hold the CDI magneto with a flywheel holder ②.

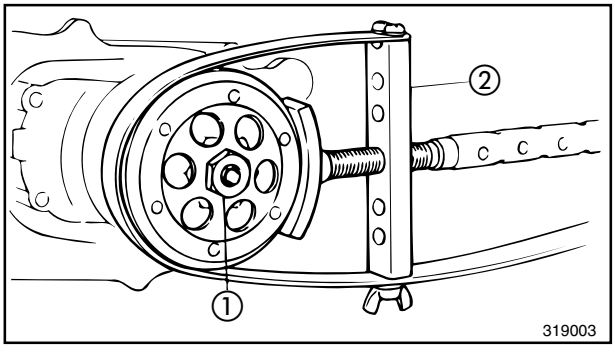
	Flywheel holder : **90890-01235**



3. Remove :
• Washer ①
• Ratchet ②
• Special washer ③
• Fixed primary sheave ④
• Washer ⑤
• V-belt



4. Remove :
• Spacer ①
• Primary sliding sheave ②

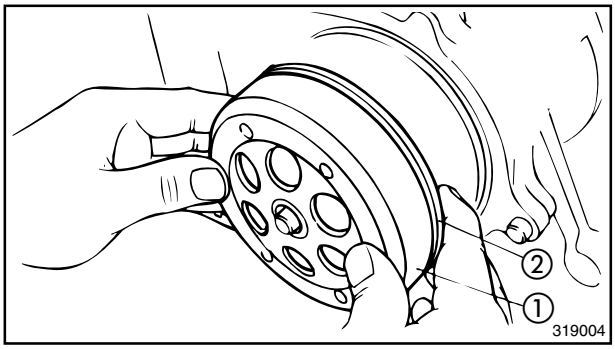


SECONDARY SHEAVE

1. Remove :
• Nut ① (secondary sheave)

NOTE:
Hold the secondary sheave with a sheave holder ② to loosen the nut.

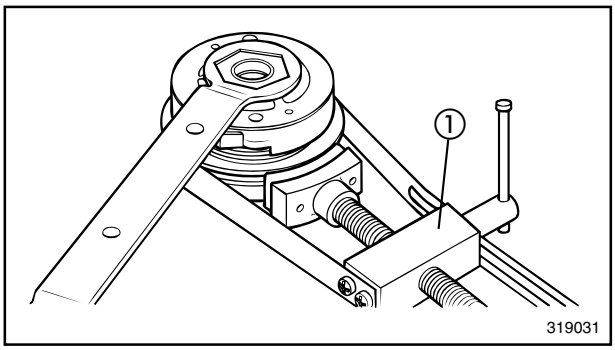
	Sheave holder : **90890-01701**



2. Remove :
• Clutch housing ①
• Secondary sheave ②
• Crankcase cover gasket
• Dowel pins

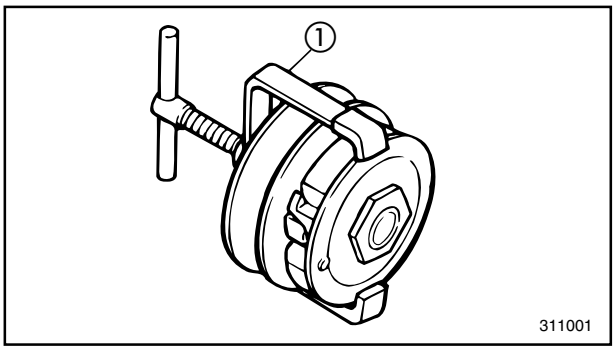
3. Attach :
• Sheave holder ①
• Nut wrench (41 mm)

Sheave holder :
90890-01701



4. Loosen :
• Clutch securing nut

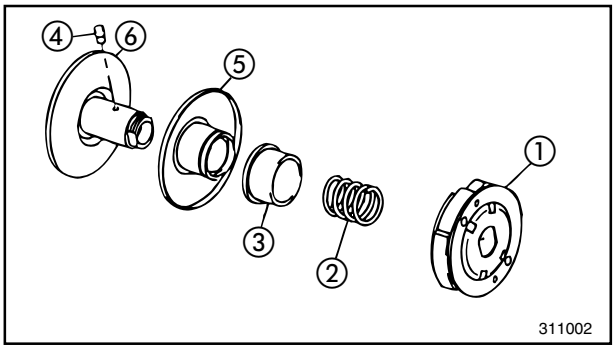
⚠ WARNING
Loosen the nut but do not remove it yet.



5. Attach :
• Clutch spring holder ①

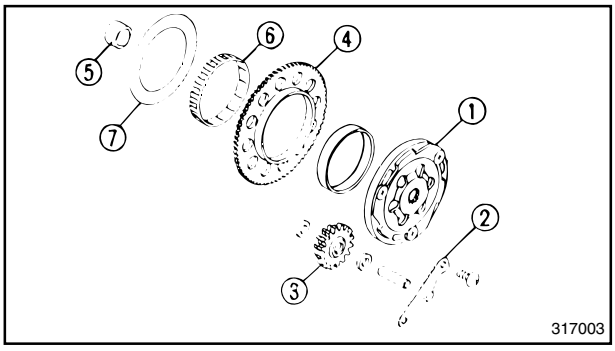
NOTE:
Compress the secondary sheave using the clutch spring holder ①.

Clutch spring holder :
90890-01337



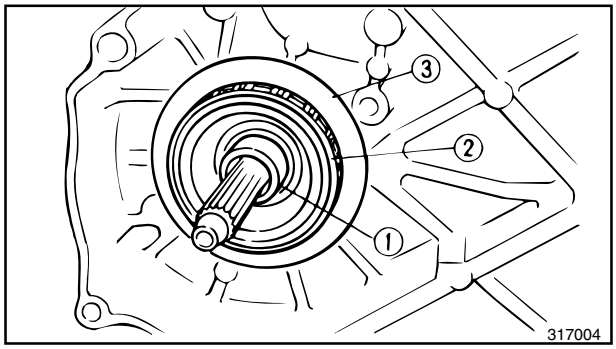
6. Remove :
• Clutch securing nut

7. Remove :
• Clutch assembly ①
• Clutch spring ②
• Spring seat ③
• Guide pin ④
• Secondary sliding sheave ⑤
• Secondary fixed sheave ⑥

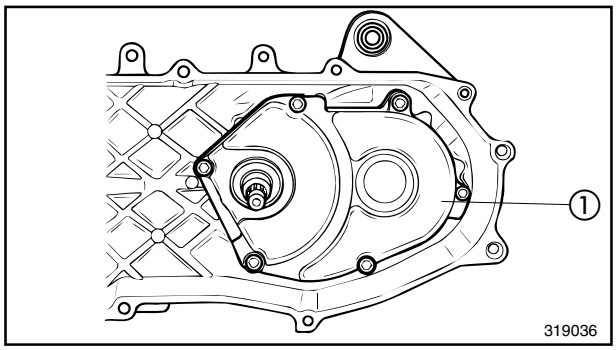


STARTER SYSTEM

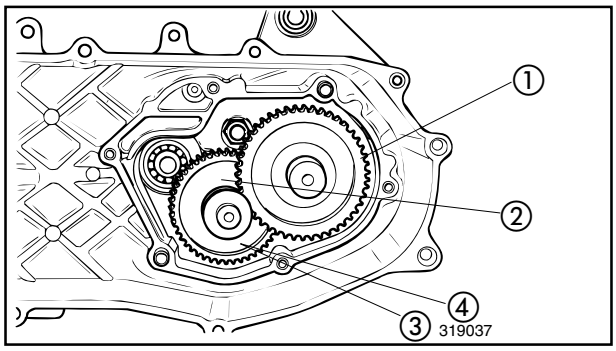
1. Remove :
• Starter clutch assembly ①
• Plate ② (idle gear)
• Idle gear ③
• Starter wheel gear ④
• Spacer ⑤
• Bearing ⑥
• Washer ⑦



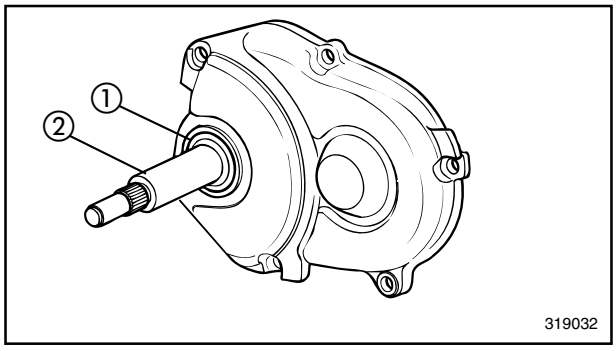
2. Remove :
• Spacer ①
• Bearing ②
• Washer ③
• Starter motor



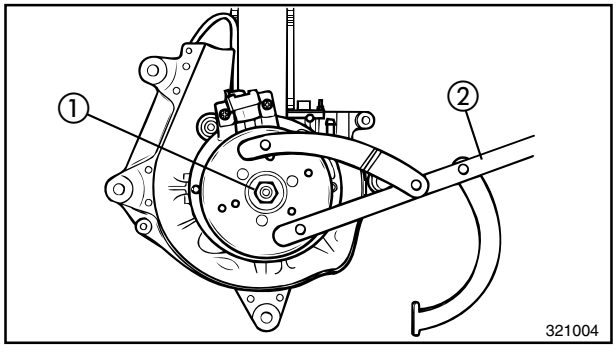
TRANSMISSION
1. Remove :
• Transmission case ①
• Gasket
• Dowel pins



2. Remove :
• Main shaft ①
• Drive shaft ②
• Plate washer ③
• Conical spring washer ④



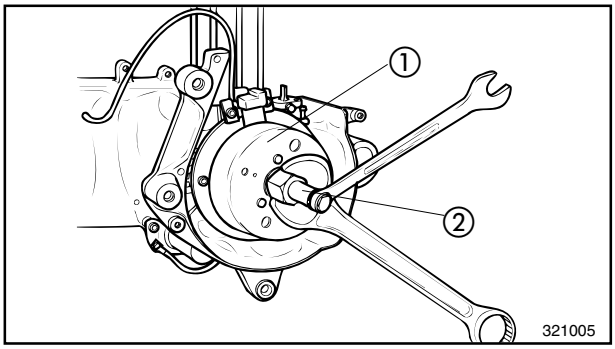
3. Remove :
• Oil seal ①
• Secondary sheave axle ②



CDI MAGNETO
1. Remove :
• Nut ① (rotor)
• Plate washer

NOTE:
Hold the rotor using a flywheel holder ② to loosen the nut.

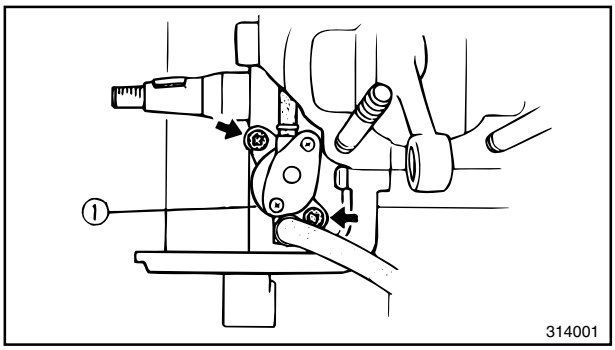
	Flywheel holder : **90890-01235**



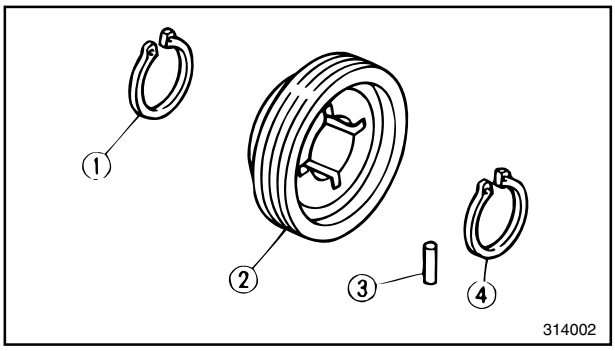
2. Remove :
• Rotor ①
• Woodruff key
Use the flywheel puller ②

Flywheel puller :
90890-01189

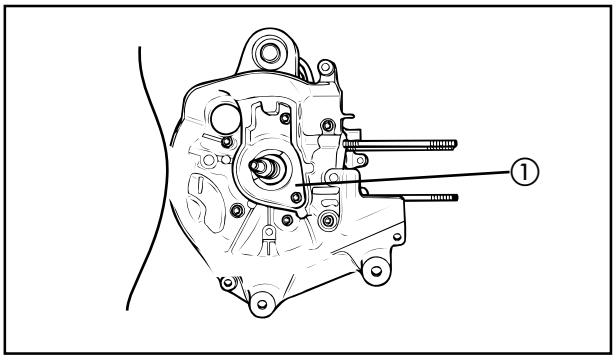
• Stator assembly
• Gasket



AUTOLUBE OIL PUMP
1. Remove :
• Autolube oil pump ①

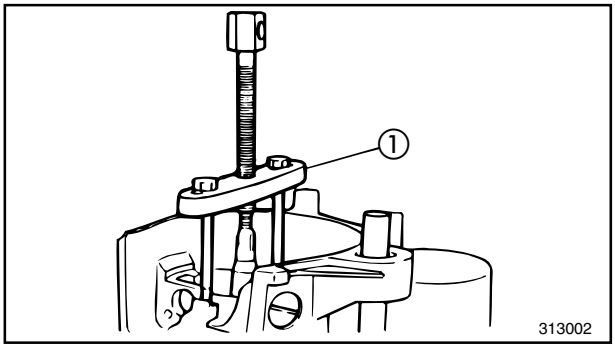


2. Remove :
• Circlips ①
• Pump drive gear ②
• Pin ③
• Circlip ④



CRANKCASE AND CRANKSHAFT
1. Remove :
• Oil seal stopper ①
• Screws (crankcase)

NOTE:
Loosen each screw one quart of a turn before beginning to remove them.



2. Attach :
• Crankcase separating tool ①

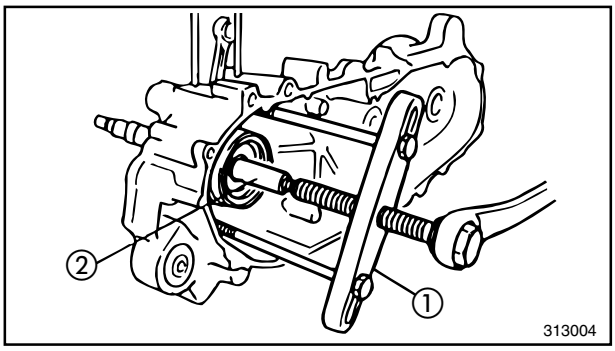
Crankcase separating tool :
90890-01135

NOTE:
Fully tighten the tool holding bolts. Insure that the tool body is parallel with the case. If necessary,

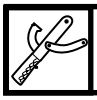
loosen one screw as much as required to level the tool body.

3. Remove :
• Crankcase (right)
As pressure is applied, keep tapping carefully on the engine mounting bosses.

CAUTION:
Use a soft hammer to tap on the case. Tap only on reinforced spots of the case. Never tap on the gasket mating surfaces. Work slowly and carefully. Make sure the cases separate evenly. If one end "hangs up" take the pressure off the push screw, realign the cases and the tool and start again. If the cases do not separate at all, check for a remaining case screw or fitting. Do not force.

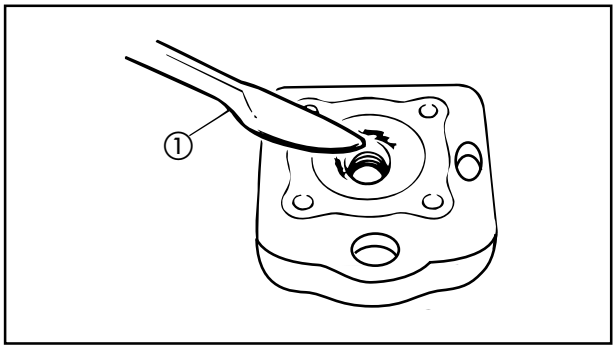


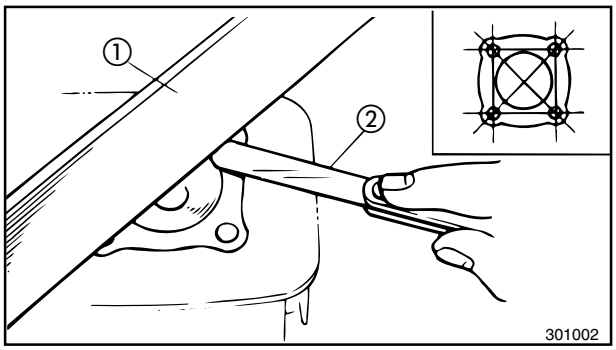
4. Attach :
• Crankcase separating tool ①

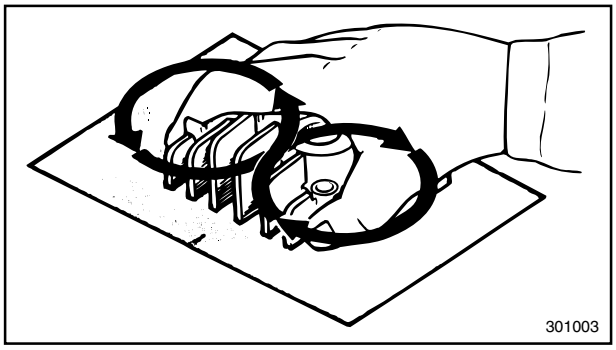


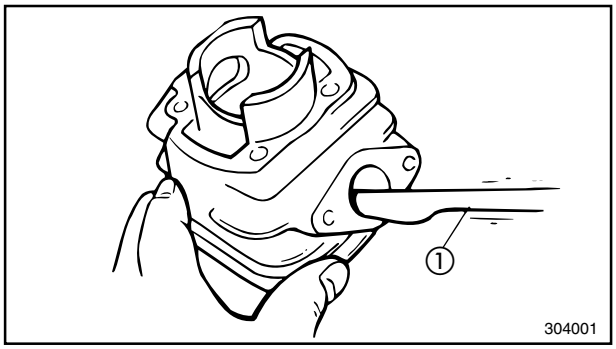
Crankcase separating tool :
90890-01135

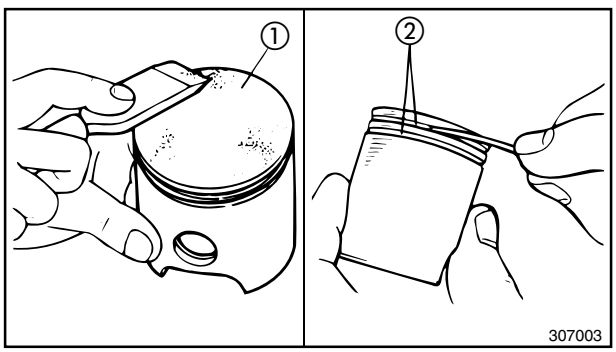
5. Remove :
• Crankshaft ②











INSPECTION AND REPAIR

CYLINDER HEAD

1. Eliminate :
• Carbon deposits
Use a rounded scraper ①

NOTE:
Take care to avoid damaging the spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminum.

2. Inspect :
• Cylinder head warpage
Out of specification → Re-surface.

****

Warpage measurement and re-surfacement steps :

- Attach a straight edge ① and a thickness gauge ② to the cylinder head.
- Measure the warpage limit.

Warpage limit :
0.02 mm (0.0078 in)

- If the warpage is out of specification, re-surface the cylinder head.

NOTE:
Rotate the head several times to avoid removing too much material from one side.

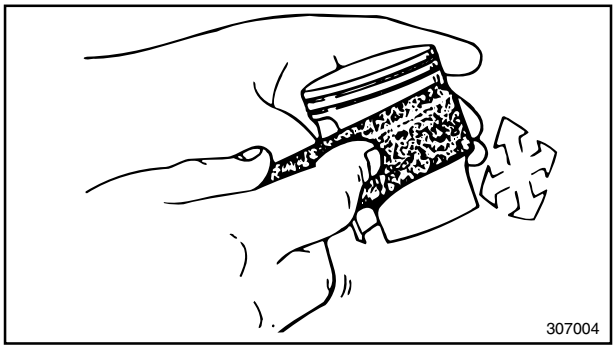
****

CYLINDER AND PISTON

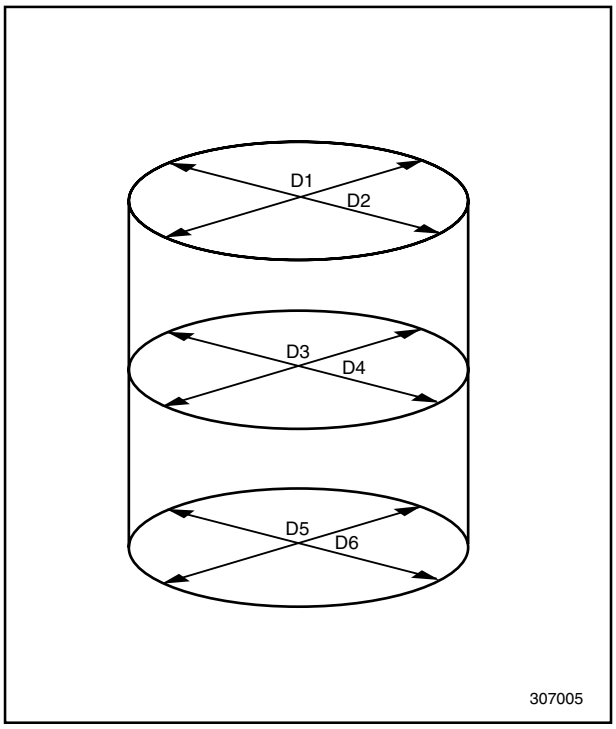
1. Eliminate :
• Carbon deposits
Use a rounded scraper ①
2. Inspect :
• Cylinder wall
Wear/Scratches → Replace.

3. Eliminate :
• Carbon deposits
From the piston crown ① and ring grooves ②.
4. Remove :
• Score marks and lacquer deposits
From the sides of piston.

NOTE:
Sand in a crisscross pattern. Do not sand excessively.



5. Inspect :
• Piston wall
Wear/Scratches/Damage → Replace.



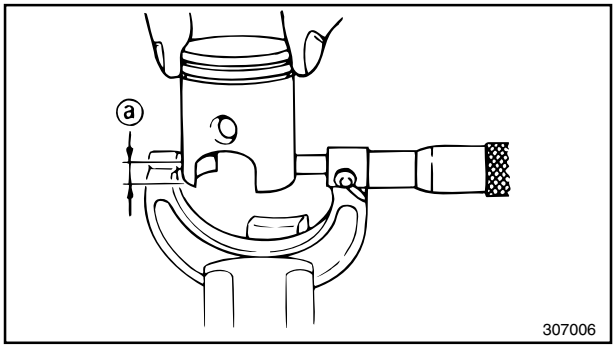
6. Measure :
• Piston to cylinder clearance
****

Piston to cylinder clearance measurement steps :
First step :
● Measure the cylinder bore “C” with a cylinder bore gauge.

NOTE:
Measure the cylinder bore “C” in parallel to and at right angles to the crankshaft. Then, calculate the average of the measurements.

	Standard	Wear limit
Cylinder Bore “C”	**39.99 ~ 40.01mm (1.574 ~ 1.575 in)**	**40.10 mm (1.579 in)**
Taper "T"	_	**0,05mm (0.0019 in)**
C = Maximum D T = (Maximum D_1,D_3 or D_5) - (Maximum D_2,D_4 or D_6)		

● If out of specification, replace cylinder, piston and piston rings as a set.



2nd step :
● Measure the piston skirt diameter “P” with a micrometer.
@ 5 mm (0.20 in) from the piston bottom edge.

Piston Size :
Standard :
39.957 ~ 39.977 mm
(1.5731 ~ 1.5738 in)

● If out of specification, replace piston and piston rings as a set.

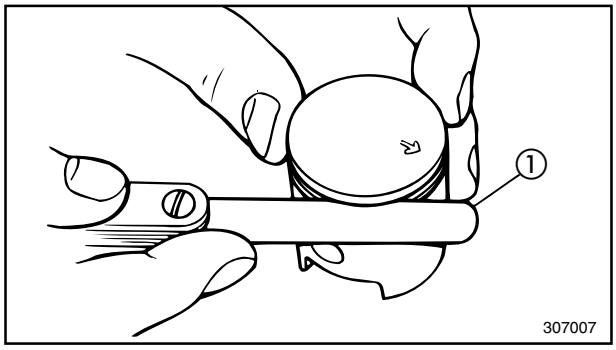
3rd step :
● Calculate the piston-to-cylinder clearance with following formula:

Piston-to cylinder clearance =
Cylinder Bore "C" –
Piston Skirt Diameter "P"

● If out of specification, replace cylinder, piston and piston rings as a set.

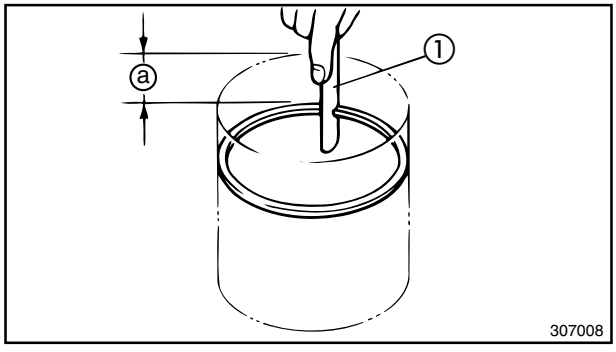
Piston-to-cylinder clearance :
0.029 ~ 0.042 mm
(0.0011 ~ 0.0016 in)
Wear limit : 0.1 mm (0.004 in)

****



PISTON RINGS
1. Measure :
• Side clearance
Out of specification → Replace piston and/or rings.
Use a Feeler Gauge ①

	Standard	Limit
Top ring	0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)	0.10 mm (0.004 in)
2nd ring	0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)	0.10 mm (0.004 in)



2. Install :
• Piston ring
• Into the cylinder
Push the ring with the piston crown.

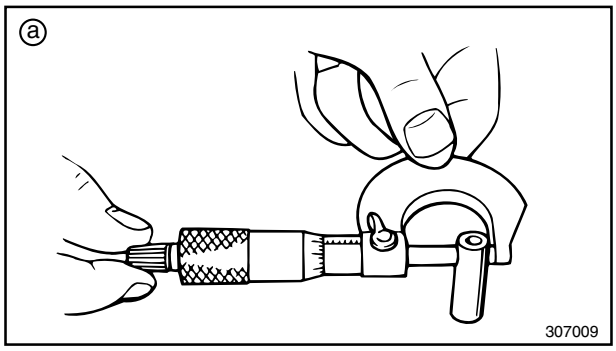
3. Measure :
• End gap
Out of specification → Replace rings as a set.
Use a Feeler Gauge ①

	Standard	Limit
Top ring	0.15 ~ 0.30 mm (0.005 ~ 0.011 in)	0.70 mm (0.028 in)
2nd ring	0.15 ~ 0.30 mm (0.005 ~ 0.011 in)	0.70 mm (0.028 in)

@ Measuring Point 20 mm (0.8 in)

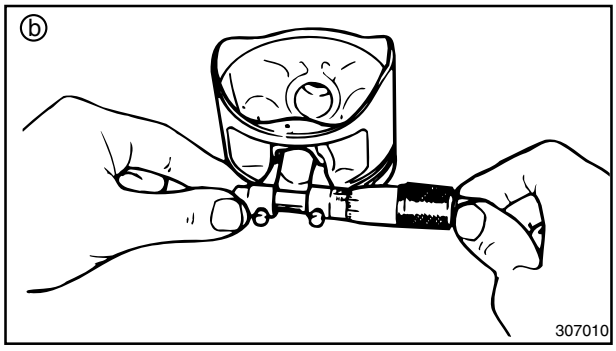
PISTON PIN AND PISTON PIN BEARING

1. Inspect :
• Piston pin
Blue discoloration/Groove → Replace, then inspect lubrication system.



2. Measure :
• Outside diameter (piston pin)
Out of specification → Replace.

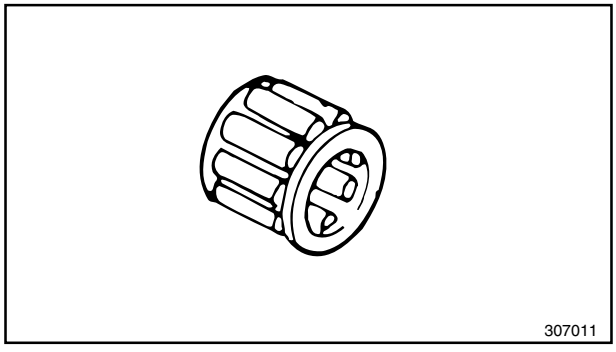
Outside diameter (piston pin) :
9.996 ~ 10.000 mm
(0.3935 ~ 0.3937 in)



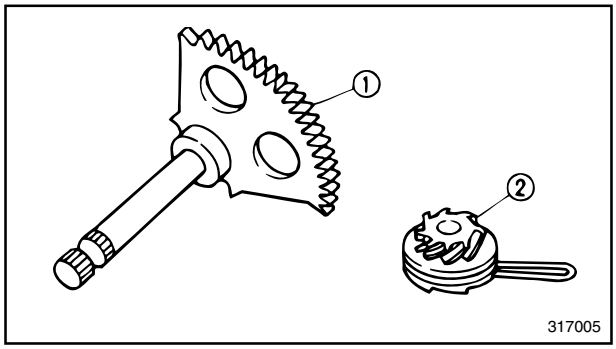
3. Measure :
• Piston pin-to-piston clearance
Out of specification → Replace piston.

Piston pin-to-piston clearance =
Bore (piston pin) b -
Outside diameter (piston pin) a

Piston pin-to-piston clearance :
0.004 ~ 0.019 mm
(0.0002 ~ 0.0008 in)
<Limit : 0.07 mm (0.028 in)>

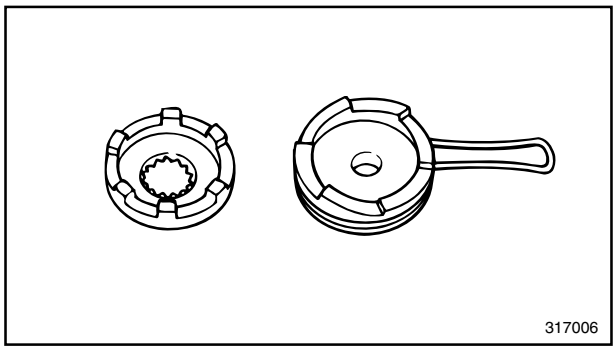


4. Inspect :
• Bearing (piston pin)
Pitting/Damage → Replace

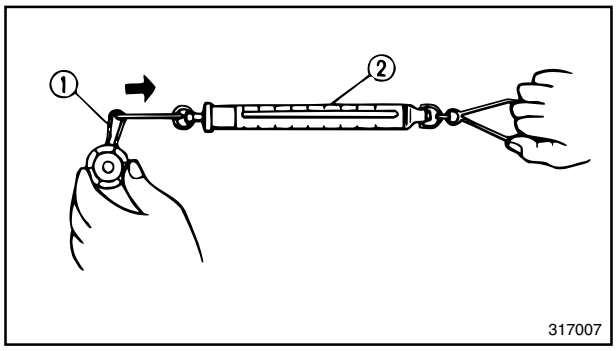


KICK STARTER

1. Inspect :
• Kick gear teeth ①
• Kick pinion gear teeth ②
Burrs/Chips/Roughness/Wear → Replace.

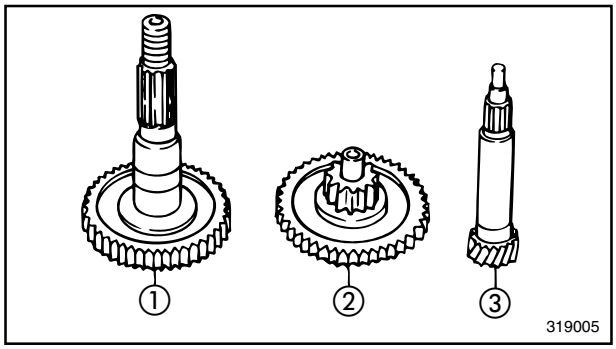


2. Inspect :
• Mating dogs (kick pinion gear and one-way clutch)
Rounded edges/Damage → Replace.



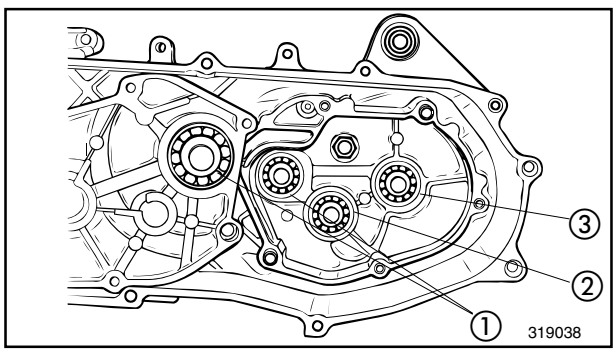
3. Measure :
• Clip tension (kick pinion gear) ①
Out of specification → Replace.
Use a spring balance ②.

Standard tension :
150 ~ 250 g (5.3 ~ 8.8 oz.)



TRANSMISSION

1. Inspect :
• Drive axle ①
• Main axle ②
• Secondary sheave axle ③
Burrs/Chips/Roughness/Wear → Replace.

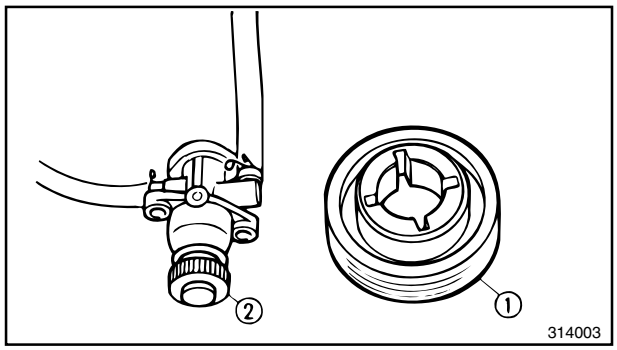


2. Inspect :
• Secondary sheave axle bearing ①
• Main axle bearing ②
• Drive axle bearing ③
Spin the bearing inner race.
Excessive play/Roughness → Replace.
Pitting/Damage → Replace.

AUTOLUBE PUMP

Wear or an internal malfunction may cause the pump output to vary from the factory setting. This situation is, however, extremely rare. If improper output is suspected, inspect the following:

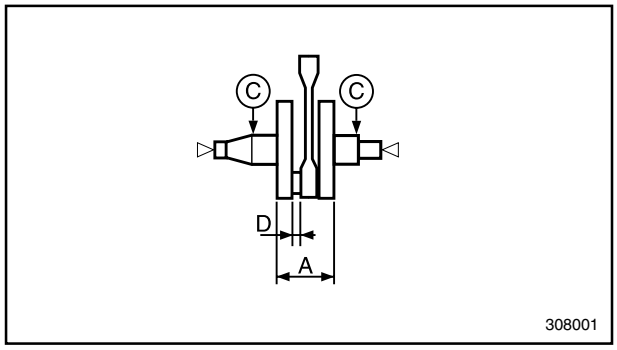
1. Inspect :
• Delivery line
  Obstructions → Blow out.
• O-ring
  Wear/Damage → Replace.



2. Inspect :
• Autolube pump drive gear teeth ①
• Autolube pump driven gear teeth ②
  Pitting/Wear/Damage → Replace.

CRANKSHAFT

1. Measure :
• Crankshaft width "A"
• Runout limit “C”
• Connecting rod big end side clearance “D”
Use V-blocks, dial gauge and thickness gauge.



Crankshaft width "A" :
37.90 ~ 37.95 mm
(1.492 ~ 1.494 in)
Runout limit “C” :
0.03 mm (0.0012 in)
Connecting rod big end side clearance “D” :
0.2 ~ 0.5 mm (0.008 ~ 0.02 in)

PRIMARY SHEAVE

1. Inspect :
• Primary sliding sheave ①
• Primary fixed sheave ②
  Wear/Cracks/Scratch/Damage → Replace.