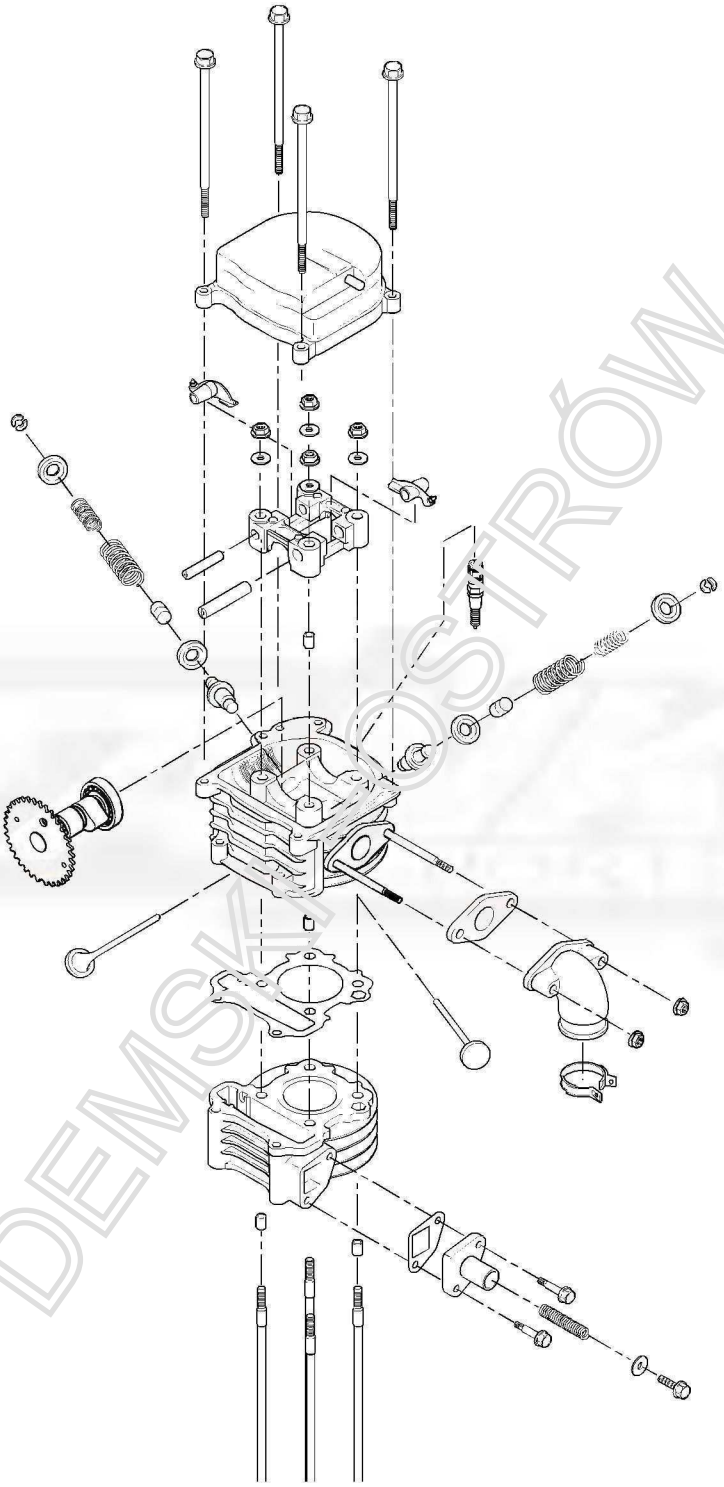
# 7. Cylinder Head Valve



# 7. Cylinder Head Valve



## Important Information

•When working on the cylinder head and valve train, always use engine oil to lubricate sliding parts when assembling. Never assemble dry parts into the valve train.

•The camshaft is lubricated by engine oil supplied via an oil passage in the cylinder head. Make sure that this passage is clean and open when you reassemble the head.

•When measuring parts to determine wear, wash the parts with solvent and dry them in order to get accurate measurements.

•When disassembling the valve components, keep them in order and reinstall them in the reverse order.

| Item | | Standard valve | Used Limit |
|---|---|---|---|
| Valve gap (cold) | IN | (0.04) 0.05 | — |
| | EX | (0.04) 0.05 | — |
| Cylinder head compressed pressure | | 15kg/cm$^2$-600rpm | — |
| Cylinder head surface twisting | | | 0.05 |
| Camshaft cover angle height | IN | 25,761 | 25.681 |
| | EX | 25,604 | 25.24 |
| Valve rocker arm inner diameter | IN | 10,000-10.015 | 10.10 |
| | EX | 10,000-10.015 | 10.10 |
| Valve rocker arm bearing outer diameter | IN | 9,972-9,987 | 9.91 |
| | EX | 9,972-9,987 | 9.91 |
| Valve seat angle | IN | 1.0 | 1.8 |
| | EX | 1.0 | 1.8 |
| Valve bar outer diameter | IN | 4,975-4,900 | 4.9 |
| | EX | 4.955-4,970 | 4.9 |
| Valve guide pipe inner diameter | IN | 5,000-5,012 | 5.3 |
| | EX | 5,000-5,012 | 5.3 |
| Gap between valve bar and guide pipe | IN | 0.010-0.037 | 0.08 |
| | EX | 0.030-0.057 | 0.10 |
| Valve spring | Inner spring | 29.1 | 26.1 |
| | Outer spring | 33.5 | 30.5 |

# 7. Cylinder Head Valve

**Torque Value**
- Camshaft bolt 16 ft lbs
- Lubricate threads with oil
- Valve gap adjusting screw cap 7 ft lbs


**General tools**
- Valve spring compressor
- 45 degrees IN/EX
- Valve seat reamer 24.5mm
- Plane reamer 30 degrees IN
- Valve seat reamer25mm
- Plane reamer 32 degrees EX
- Valve seat reamer 22mm
- Plane reamer 60 degrees IN/EX
- Valve seat reamer 26mm
- Reamer damping fixture 5mm


**Special tools**
- Valve spring compressor accessories
- Valve gap regulatory spanner
- Valve guide screwdriver
- Valve guide reamer

**Trouble Diagnosis**
- Confirm poor operation of cylinder head by measuring pressure or by noise produced by engine upper end.

**Slow Speed Hitch**
Compression pressure too low
Bad valve gap
Burning or curving of valve
Bad valve timing
Broken valve spring
Bad valve seat
Leakage of cylinder head gasket
Warped cylinder head surface or cracking
Bad spark plug

**Compression Pressure Too High**
- Too much carbon buildup in combustion chamber

**White Smoke from Exhaust Pipe**
- Wearing of valve guide
- Broken oil seal

**Abnormal Noise**
- Bad valve gap
- Broken or burning of valve or valve spring
- Wearing and breaking of camshaft
- Wearing of inner chain adjusting plate
- Wearing of cam shaft and valve rocker arm

# 7. Cylinder Head Valve

**Disassembling of Camshaft**

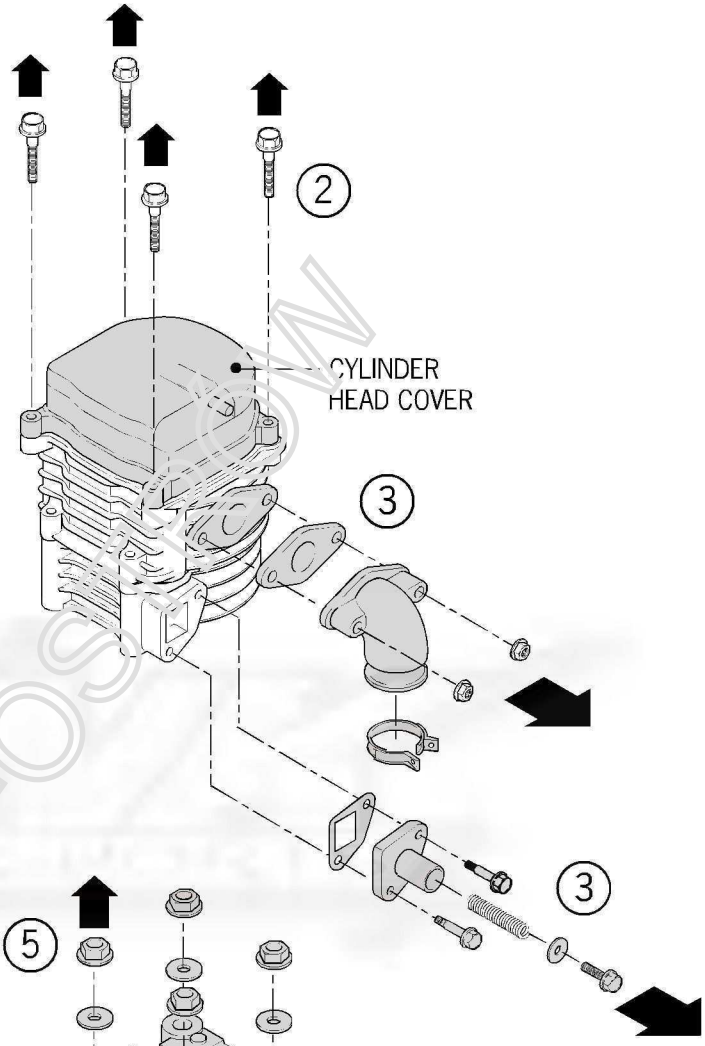
1. Disassemble middle cover. (2-2)

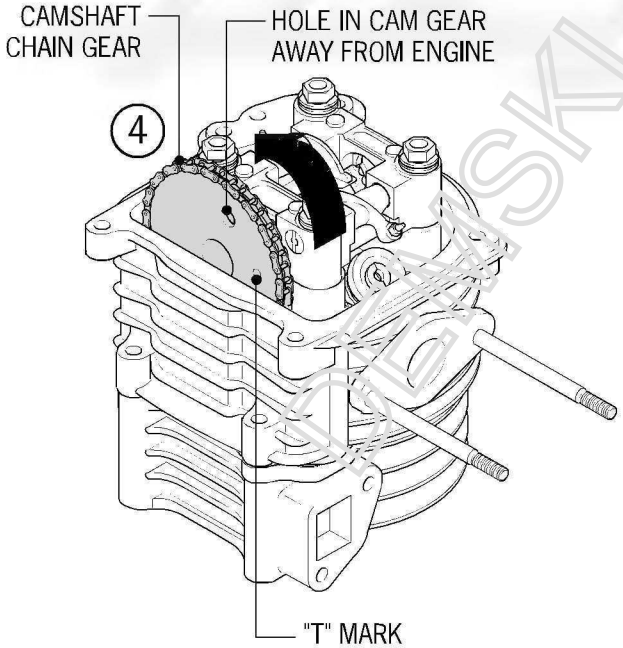
2. Remove four bolts and two nuts, take off valve cover.

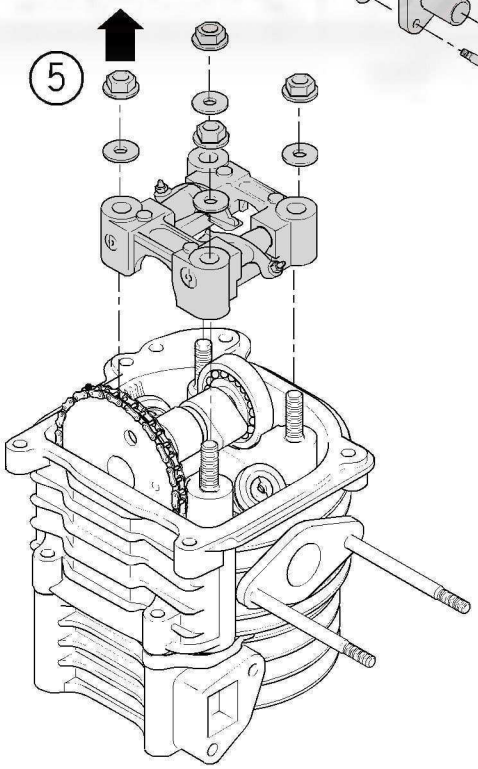
3. Disassemble cam chair adjusting bolt and spring.

4. Use the kick-start lever to slowly turn engine until "T" mark on flywheel lines up with indicator on crankcase. Check position of camshaft to find if both valves are closed. The hole in the cam gear should be away from the engine. If this is not correct, rotate the crank one revolution to achieve this alignment.

5. Remove four bolts and remove camshaft caps.



# 7. Cylinder Head Valve

6. Remove rocker arms and pivots.

7. Remove camshaft gear from camshaft chain.

8. Remove camshaft.

9. Check Camshaft

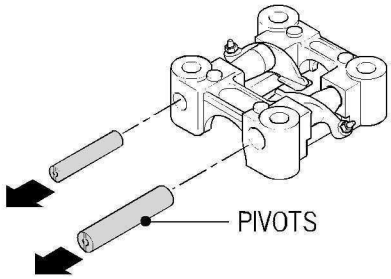
10. Check cam lift.
    - •Use limit: IN: 25.681mm below change
    - •EX: 25.524mm below change

11. Check surface of cam lobes for weary surface breakdown, scuffing or cracking.

12. Check camshaft and bearing for loose fit or damage.

13. If any excessive wear or damage is found, replace the camshaft.

6a

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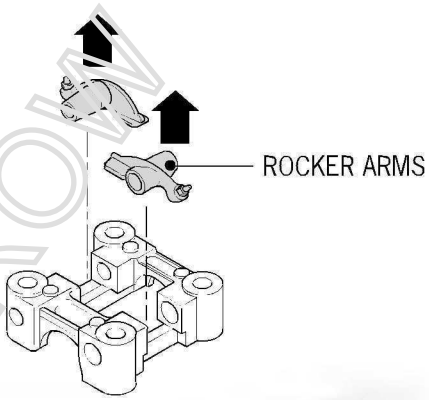


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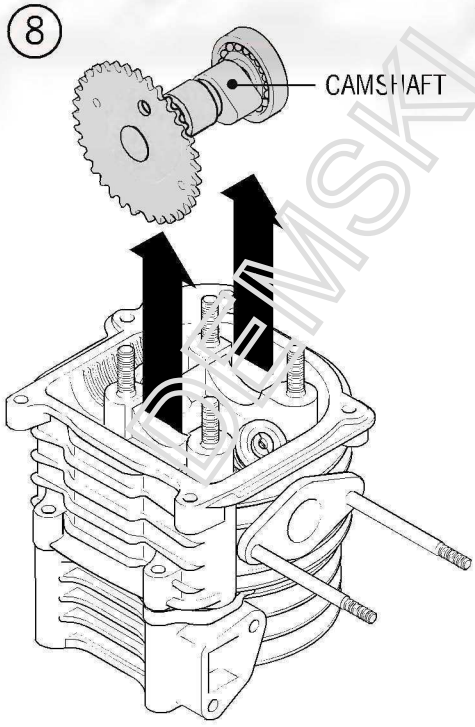


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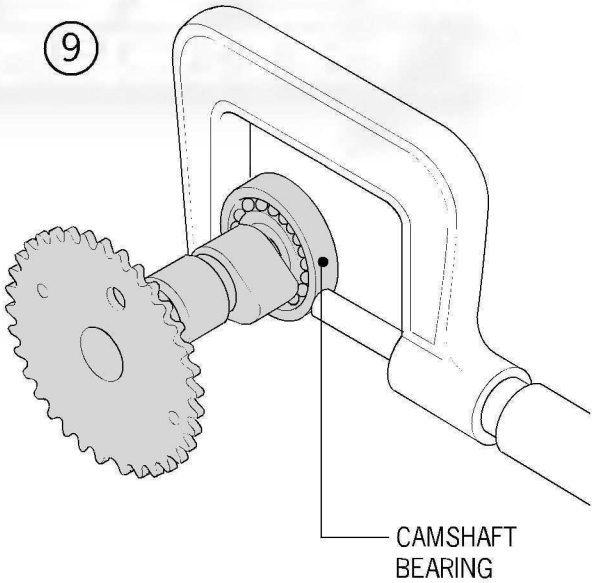


# 7. Cylinder Head Valve

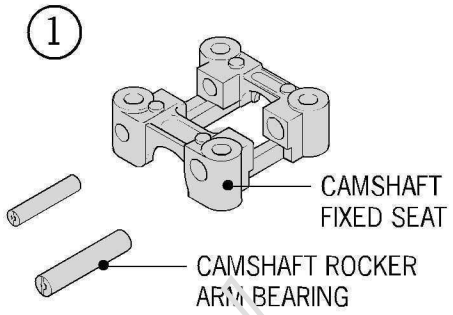
MEMO

# 7. Cylinder Head Valve

### Checking of Camshaft Bearing Rocker Arm

1. Check if camshaft bearing fixed seat and camshaft rocker arm and camshaft rocker bearing is worn or broken.

2. Measure outer diameter of camshaft bearing fixed seat and camshaft rocker arm. Used limit: 9.91mm (.390 in.). Change if worn larger.

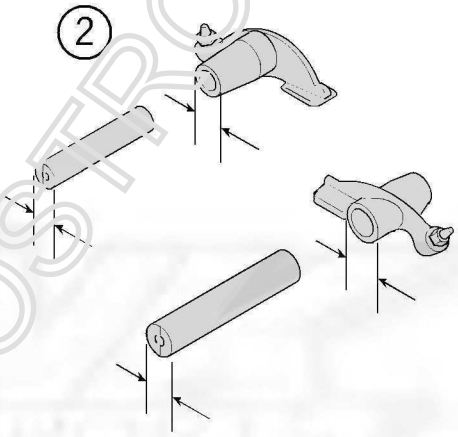



- Inner diameter of camshaft rocker arm. Used limit: 10.10mm (.398 in.). Change if worn larger.

- Outer diameter of camshaft rocker arm bearing and camshaft rocker arm. Used limit: 9.91mm (.390 in.).Change if worn larger.

- The gap between camshaft rocker arm and camshaft rocker arm bearing.

  Used limit: 0.10mm (.004 in.). Change if worn larger.




### Disassembly of Cylinder Head

1. Remove camshaft bearing. (7-4)
2. Remove carburetor (5-4)
3. Remove exhaust pipe. (2-4)
3. Remove inlet manifold

# 7. Cylinder Head Valve

4. Remove fan cover.

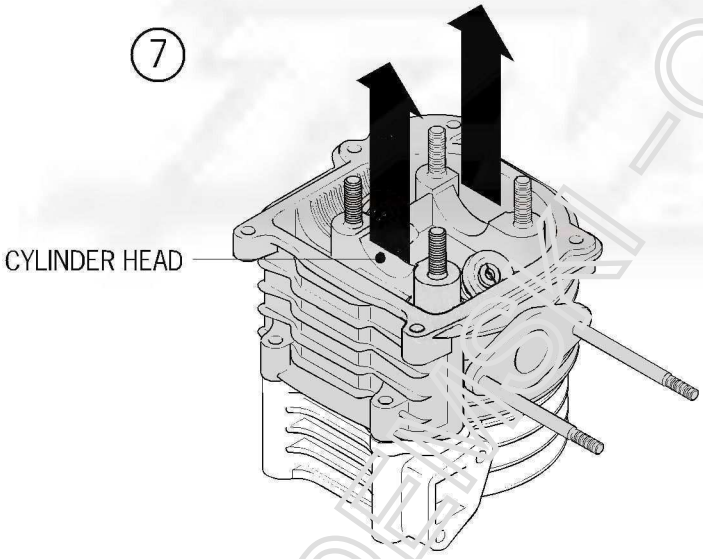
5. Remove bolt and screw of engine cover.

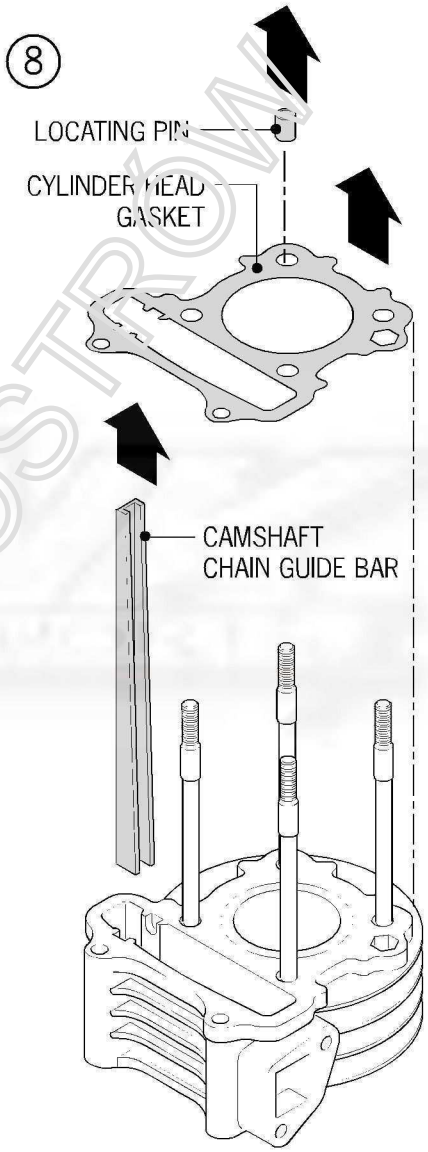
6. Disassemble and remove engine cover.

7. Pull up on cylinder head to break gasket and slide off cylinder stands.

8. Take off location pin and cylinder head gasket.

9. Take off camshaft chain guide bar.



# 7. Cylinder Head Valve

### Breaking Down of Cylinder Head

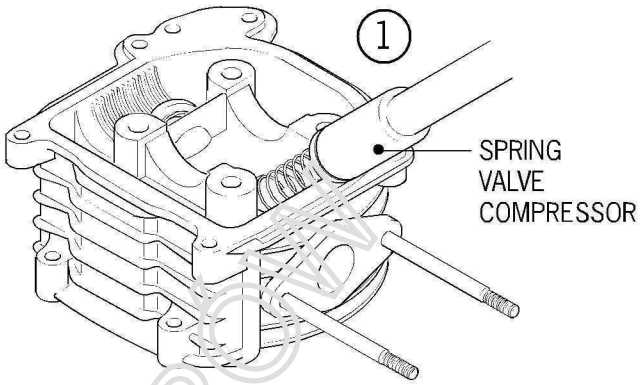
1. Use valve spring compressor to take off lock clip and supporter and valve spring, spring seat valve.

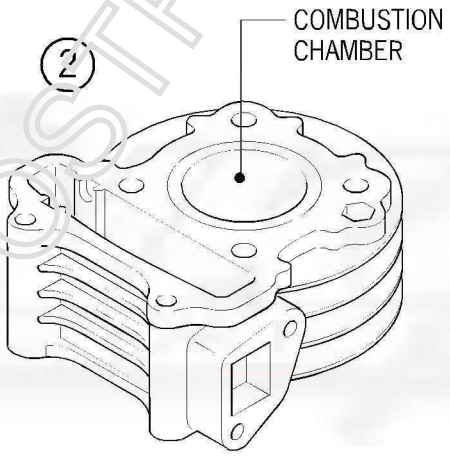
◉ Place parts in sequence after disassembling and assemble in reverse order during reassembly.

2. Clean carbon deposits from combustion chamber.

3. Remove gasket material on cylinder head surface.

◉ Don't damage cylinder head sealing surface.



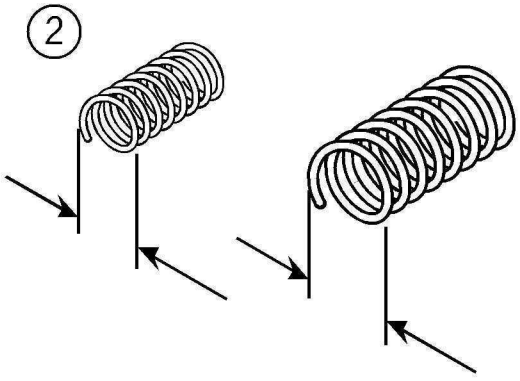




### Checking Cylinder Head

1. Check spark plug hole for damage.
2. Check valve spring seats for alignment.

Used limit: 0.05mm (.002 in.) above align
•Measure length of inner and outer springs.

Used limit:
•Change if inner spring below 26.1mm (1.03 in.).
•Change if outer spring is below 30.5mm (1.2 in.).



# 7. Cylinder Head Valve

### Valve and Valve Guide

1. Check if valve is beat, burnt or broken.

2. Check if valve and valve guide are blocked.

3. Measure every valve stem's outer diameter.
   •Used limit: Change if below 4.9mm.

Remove carbon deposits from valve guide using a reamer.

SPECIAL TOOLS

Rotate reamer in proper direction and do not stop rotation to push in or pull out.

4. Measure inner diameter of every valve guide.

Used limit:
IN: Change if above 5.3mm.
EX: Change if above 5.3mm.

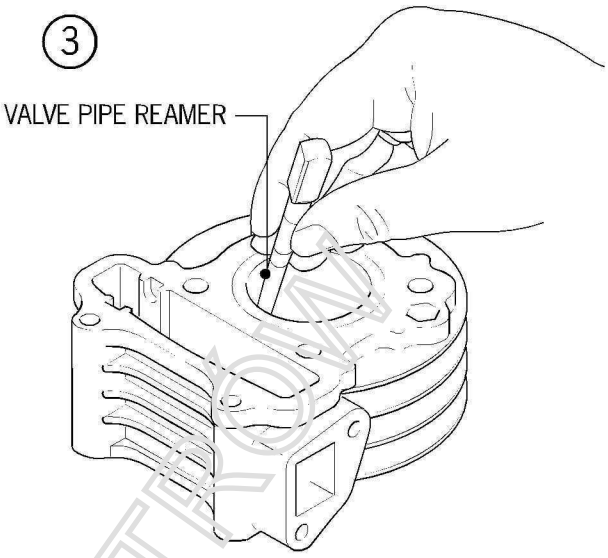
### Valve guide replacement

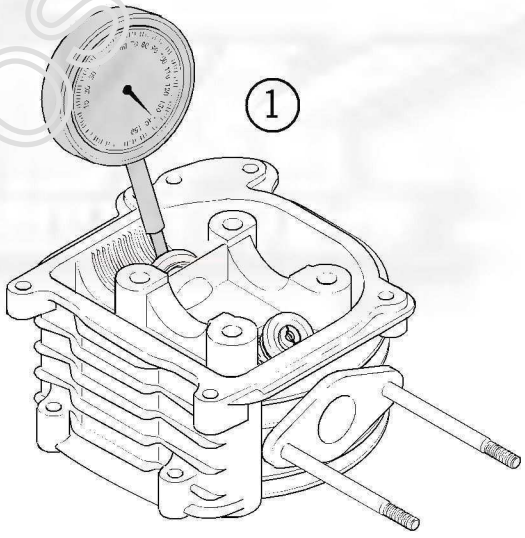
1. Operate cylinder at the temperature of about 100˚C-15˚C 212˚F.

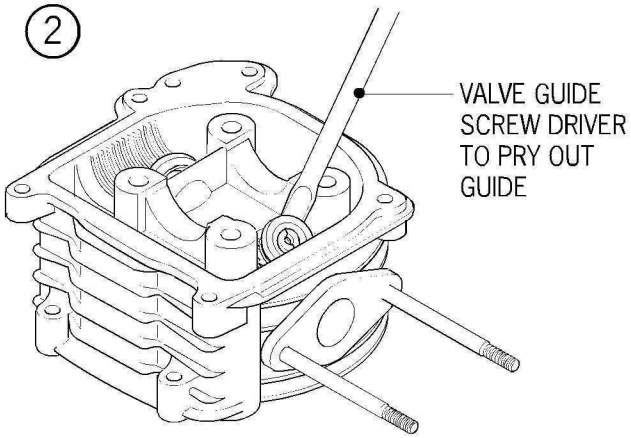
Heat cylinder head quickly and evenly to prevent warping.

2. Press, cut or pry out the valve guide.

Be careful to not damage cylinder head surface.



# 7. Cylinder Head Valve

3. Press in the new valve guide. Spread engine oil on new o-ring and build up new valve guide pipe. Make sure cylinder head is still warm when pressing in new guides.

4. Size valve guide with reamer after installing.

Use cutting oil on reamer. Rotate reamer in proper direction and do not stop rotation to punch in or pull out.

5. Clean cylinder head and get rid of cut bits of metal and dust.

SPECIAL TOOLS

Special tools
- Valve guide pipe reamer
- Valve Seat Checking and Correcting
- Valve Seat Checking

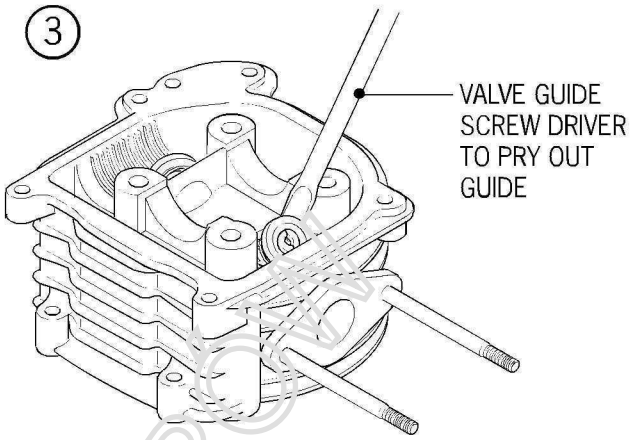
6. Remove carbon deposit from combustion chamber valves.

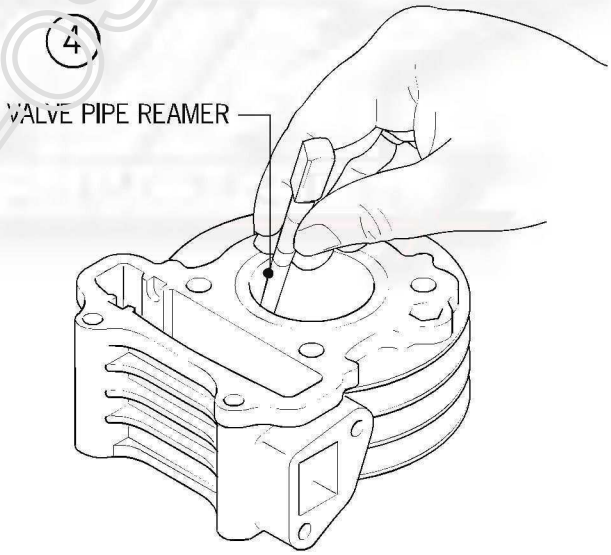
7. Spread emery on seat surface between valve and valve seat. Use polishing bar to wear in valve.

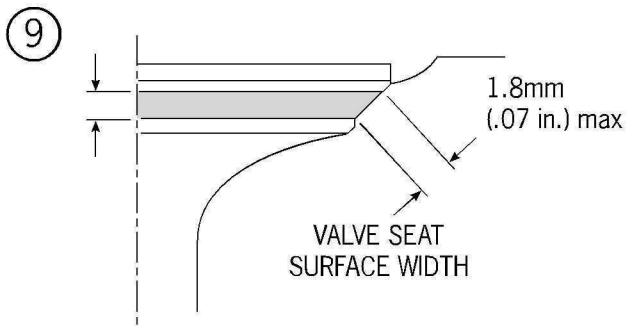
8. Take out valve and check valve seat surface. Change if valve surface is course or facial polished.

*Valve seat surface width checking*
*Used limit: above 1.8mm (.07 in.) correct.*

9. Correct valve seat with chamfered tool if surface width is not even, too wide or too narrow.



# 7. Cylinder Head Valve

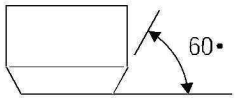
### Valve Seat Chamfer Cutting Tools

Refer to valve chamfered tool handbook for details.

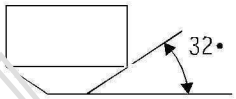
1. Press and rotate with 4-5kg 10-12 lb force to polish and cut when correcting.

Use chamfered tool after spreading engine oil on it.

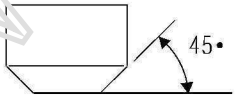
IN, EX: (30mm)




IN, EX: (32mm)

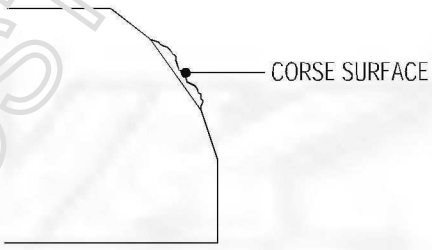


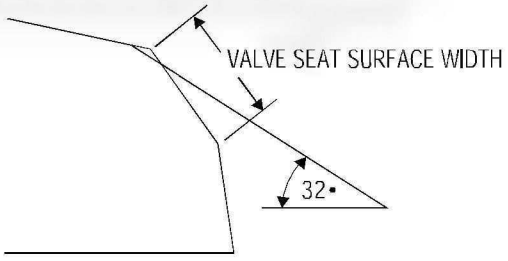

IN: (24.5mm)
EX: (27.5mm)

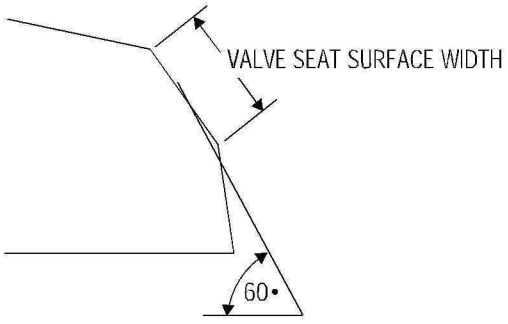



### Valve Seat Cutting

1. Do not polish or cut excessively.
2. Cut primary surface with 450 cutting head.
3. Chamfer inner edge with 320 cutting head.
4. Correct inner surface by sixty-degree chamfered tool.



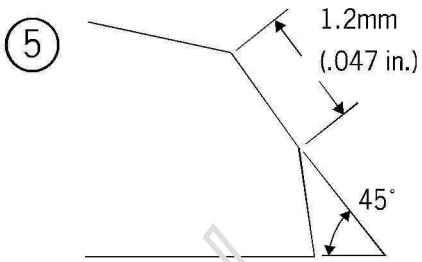



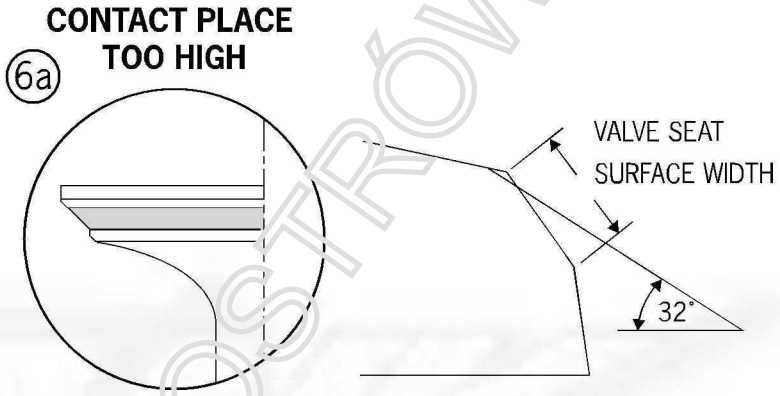
# 7. Cylinder Head Valve

5. Trim valve seat to assigned seat width and valve seat width with 45 degree chamfered cutting tool.

Standard valve: 1.0 mm (.393 in.)
Check contact place of valve seat.

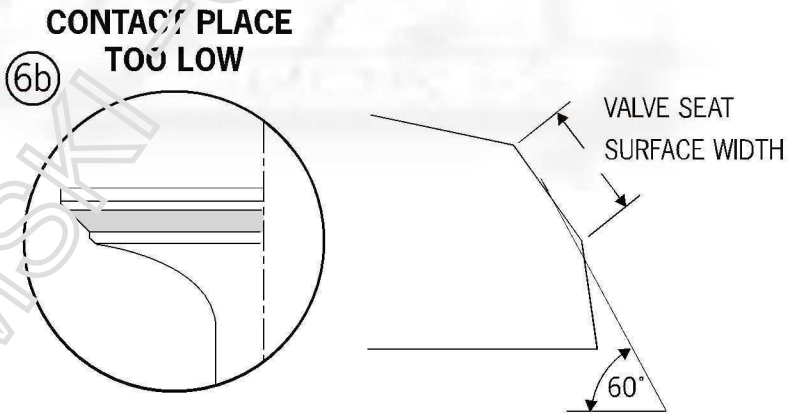



6. Polish with 30-degree chamfered cutting tool if he contact place is too high. Trim to assigned width with 45-degree chamfered cutting tool. Polish valve contact surface with emery and polishing bar after correcting bar.




7. Wash and clean cylinder and valve after polishing and grinding.

◎ Rotate and press softly when polishing. Don't put emery into valve and valve guide pipe when polishing.




8. Spread red ink on 45-degree seat surface and confirm if the center of the contact surface of the valve is even after correction.

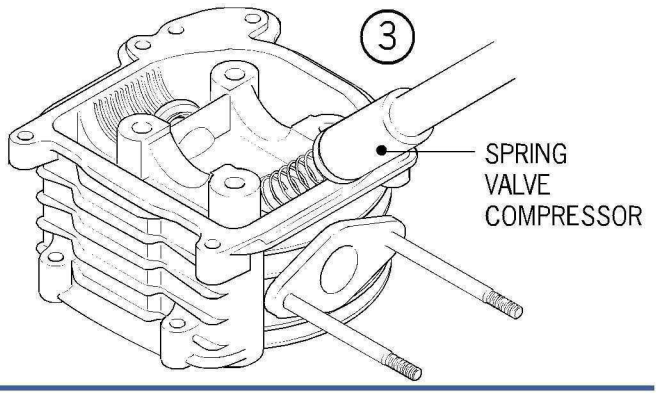
**Building Up of Cylinder Head**

1. Build Up Spring Seat

◎ Use new oil seals when reassembling.

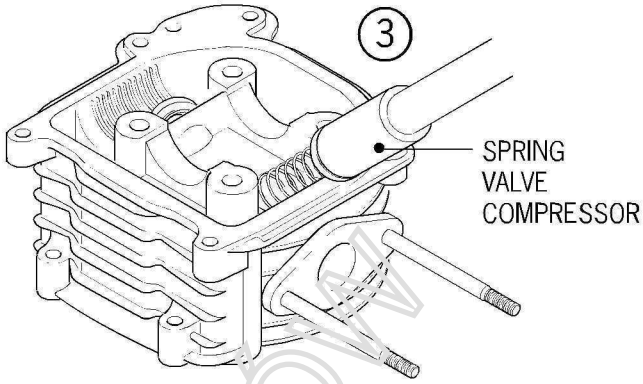
2. Spread engine oil on valve stem and put into valve guide.

3. Build up inner and outer valve spring and put in valve collar using spring compressor.



# 7. Cylinder Head Valve

4. Use valve spring compressor accessory to make valve contact with valve collar. Tap with plastic mallet two or three times, softly, on the ends of the valve to seat collars.



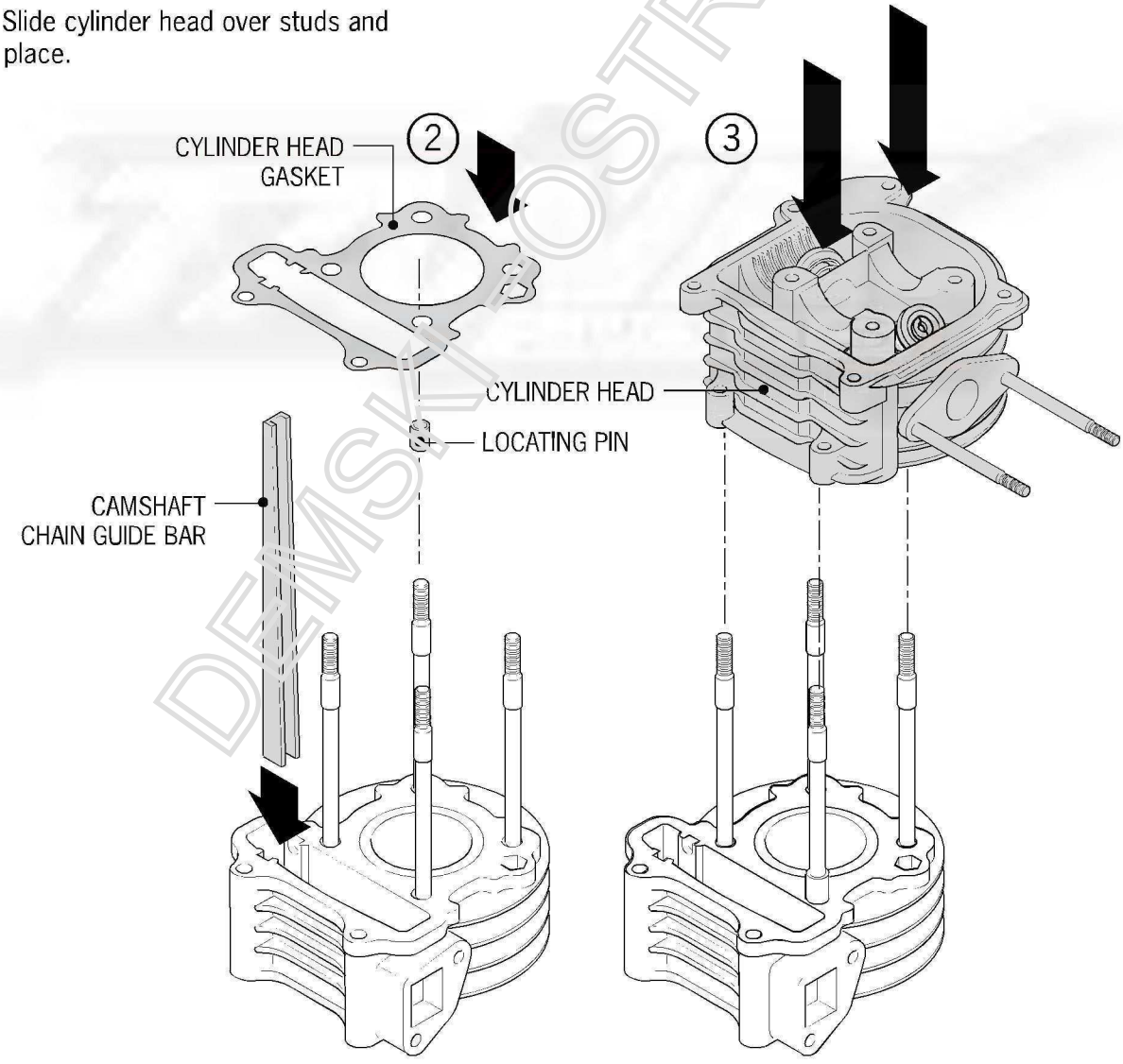

When using mallet, be careful to not damage valves.

**Installing Cylinder Head**

1. Install locating pin and gasket.

2. Install cam chain adjuster plate.

3. Slide cylinder head over studs and into place.



# 7. Cylinder Head Valve

**Camshaft Assembly**

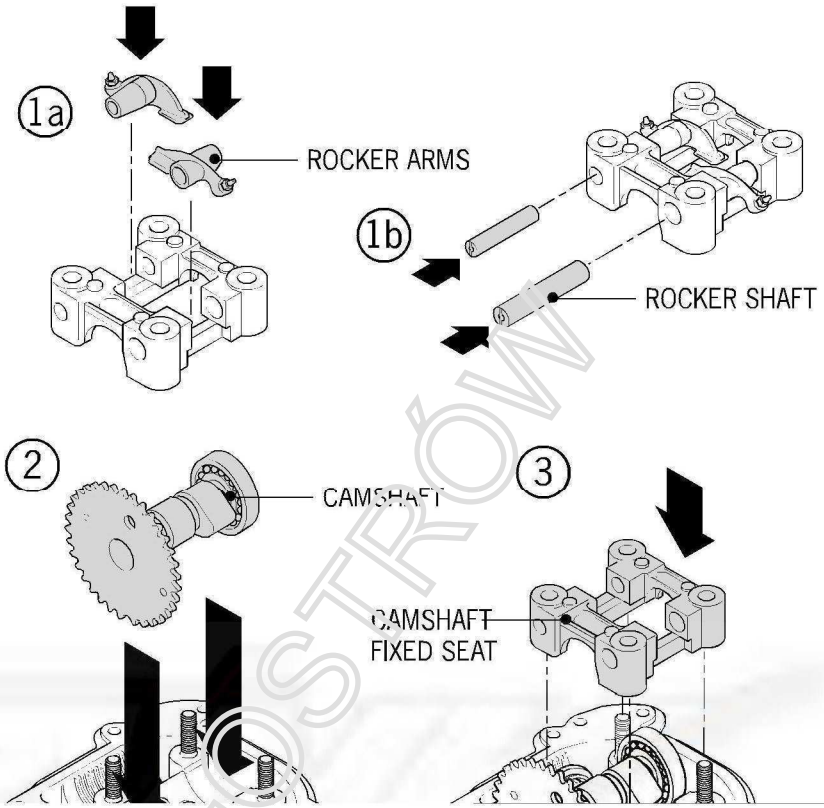
1. Assemble rocker arm and rocker shaft.

◎ Make alignment between shaft end and fixed screw bolt hole of camshaft seat when valve rocker shaft is assembled.

2. Install the camshaft into the cylinder head. Seat the camshaft into the fixed seat and check alignment.

3. Install camshaft fixed seat.

4. Rotate flywheel and align "T" mark on flywheel

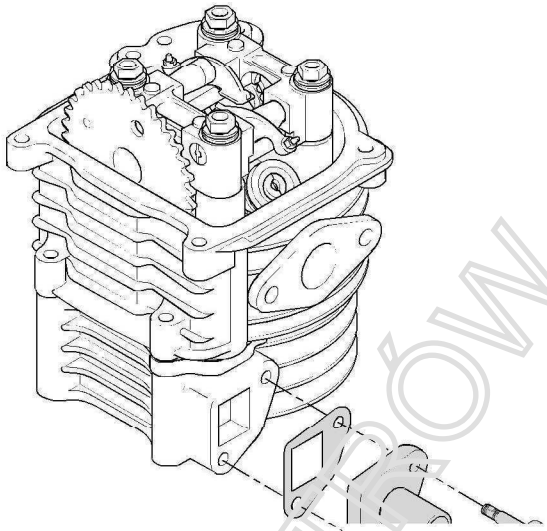


# 7. Cylinder Head Valve

### Camshaft Chain Regulator Assembling

1. First, build up camshaft chain regulator and spacer. Second, lock two fixed bolts. Third, put spring into camshaft chain regulator. Last, assemble the o-ring and fixed bolt.

Press down regulator master jaw and drive down driving bar when camshaft chain regulator is assembled.



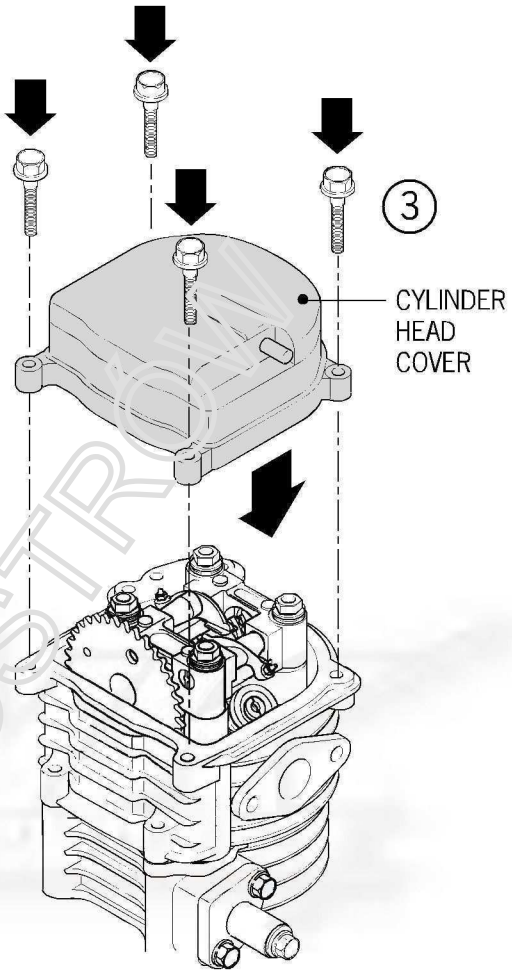
# 7. Cylinder Head Valve

3. Lock fixed screw bolt of cylinder head cover.

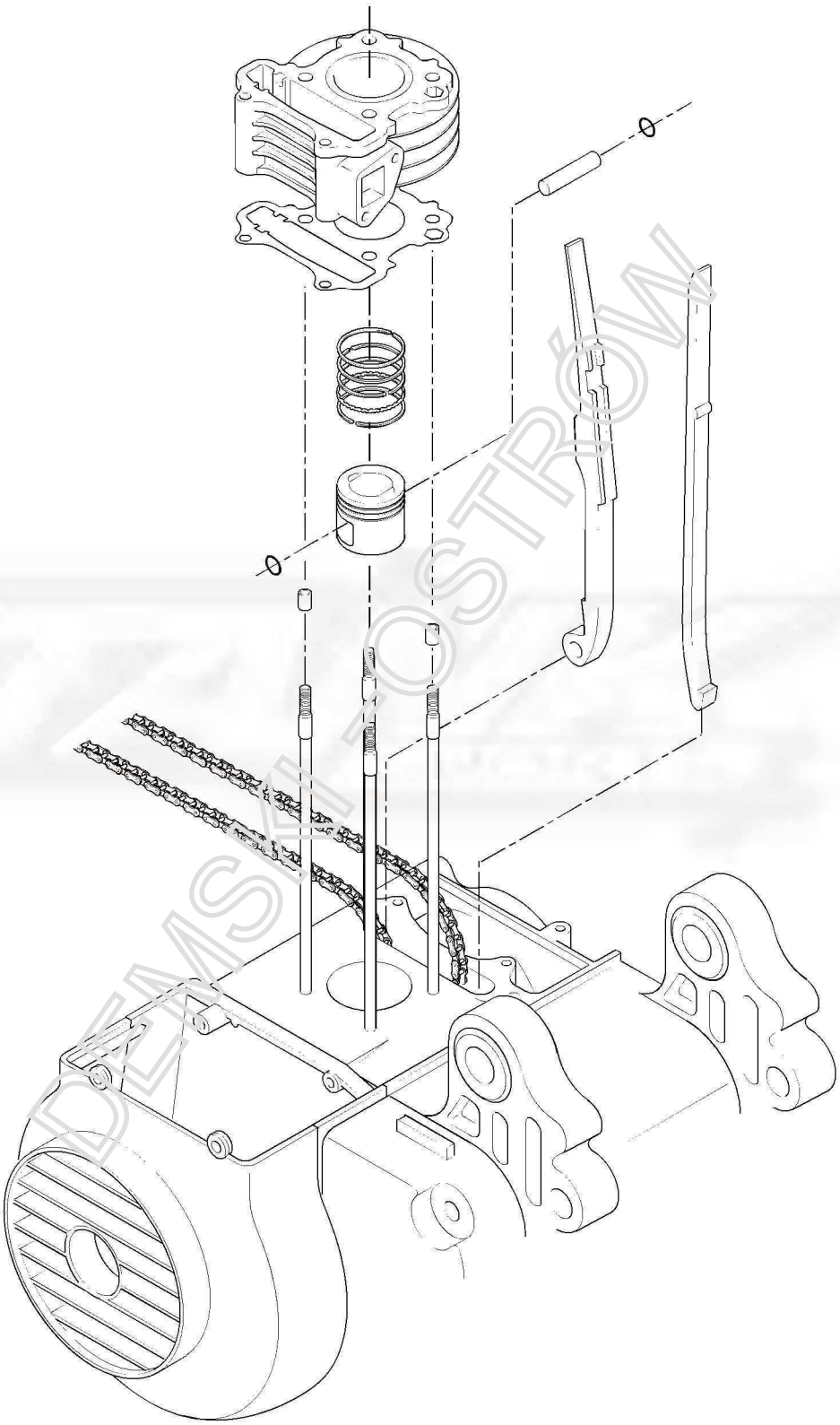
*Torsion valve: 0.8-1.2 kg-m*

4. Spread grease on threading position of camshaft fixed seat screw bolt.

5. Lock two or three times at diagonal of camshaft fixed seat screw cap.



# 8. Cylinder and Piston



# 8. Cylinder and Piston



## Important Points

•The work on the cylinder and piston can be done on the engine without complete disassembly.
•After taking them apart, clean and dry the cylinder and piston with the compressed air before measuring and testing.

unit: mm

| Item | | | Normal size | Max. Service Allowance |
|---|---|---|---|---|
| Cylinder | ID | | (0.04) 0.05 | 39.10 |
| | Distortion | | — | 0.05 |
| | Cylindricity | | — | 0.05 |
| | Out-of-roundness | | — | 0.05 |
| Piston | Clearance between the ring and the ring groove | | 0.015-0.055 | 0.09 |
| | | | 0.015-0.055 | 0.09 |
| | Compressed gap | | 0.08-0.20 | 0.45 |
| | | | 0.05-0.20 | 0.45 |
| | | | 0.20-0.70 | — |
| Piston ring | OD of piston | | 38.980-38.780 | 38.7 |
| | Check point of OD | | 9mm away from skirt | — |
| | Clearance between piston and cylinder | | 0.010-0.040 | 0.1 |
| | ID of the piston pin hole | | 13.002-13.008 | 13.04 |
| OD of the piston pin | | | 12.994-13.000 | 12.96 |
| Clearance between the piston pin and the hole | | | 0.002-0.014 | 0.02 |
| ID of the small end of the connecting rod | | | 13.016-13.034 | 13.06 |



**Troubleshooting**

•In case of difficulty starting or unsteady running at low speeds, check if there is white smoke coming out of the air hole pipe of the crankcase. If that is the case, the piston ring is worn, burnt or broken.

**Low Compression Pressure**

•The piston ring is worn, burnt or broken.
•The piston/cylinder is worn or damaged.

**Compression Pressure is Too High**

•Carbon deposits on the piston and the combustion chamber.

**White Smoke Coming Out of the Exhaust Pipe**

•The piston ring is worn or damaged.
•The piston/cylinder is worn or damaged.

Knocking Noise by the Piston

•The cylinder, the piston or the piston ring is worn.
•The piston pin and its hole are worn.

# 8. Cylinder and Piston

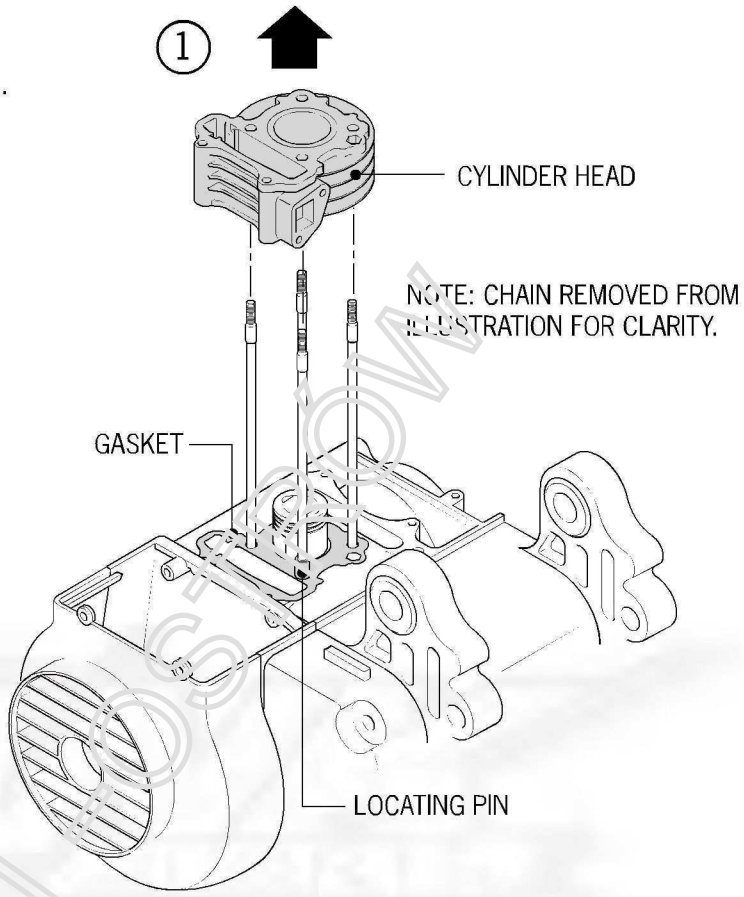
### Removing the Cylinder

1. Detach the cylinder head (refer to 7-6).

2. Remove the chain guide of the cam chain.

3. Remove the cylinder.

4. Remove the cylinder gasket and the locating pin from the top of the cylinder and the base of the cylinder.




### Removing the Piston

1. Remove the piston pin snap ring.

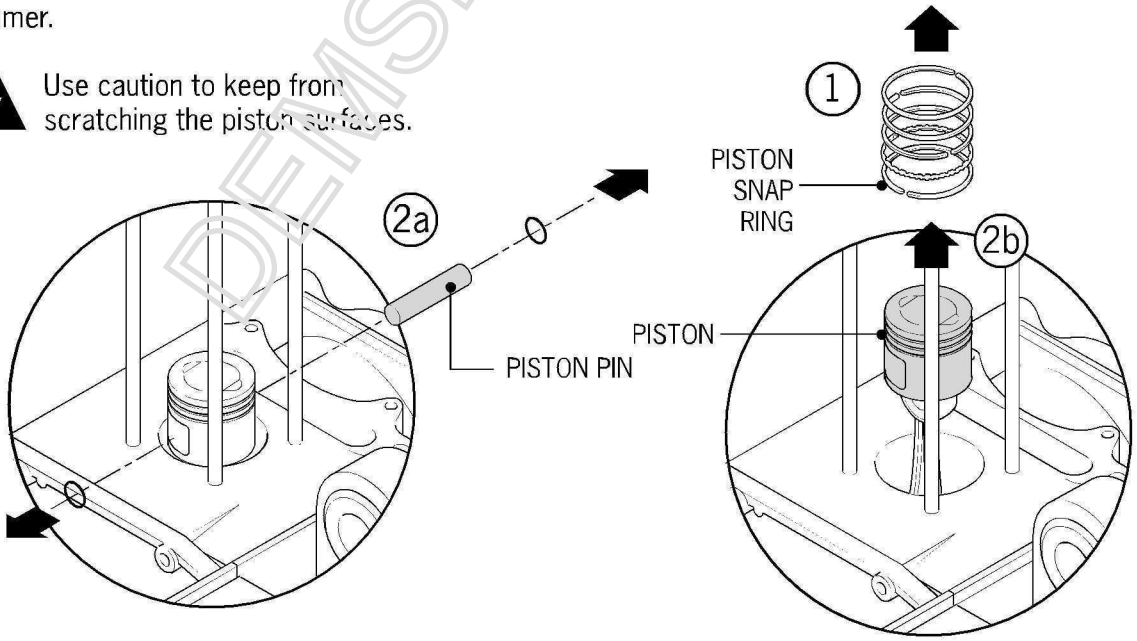
**Attention:**
Don't drop the snap ring into the crankcase.

2. Take out the piston pin and then the piston.

3. Push the piston pin from the side opposite the removed snap ring.

4. Use a small punch or drift pin if necessary and top gently with a soft-faced bummer.

Use caution to keep from scratching the piston surfaces.



# 8. Cylinder and Piston

Checking the piston, the piston pin and the piston ring.

**Attention:**
Don't damage or break the ring.

1. Remove all of the carbon deposits from the ring groove.

2. Mount the ring and measure the clearance of the ring groove.

   Maximum service allowance:
   The top ring: Replace when it goes beyond 0.09mm (.035 in.).

   The second ring: Replace when it goes beyond 0.09mm (.035 in.).

3. Remove the piston rings.
Install the piston rings into the bottom of the cylinder.

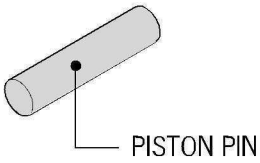
**Attention:**
Use the piston head to press the rings into place in the cylinder.

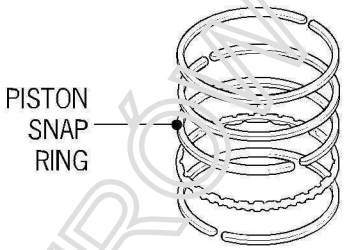
4. Measure the piston ring gap in bore.

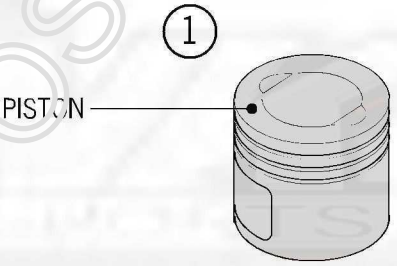
   Maximum service allowance:
   Replace when it goes beyond 0.45mm (.018 in.).

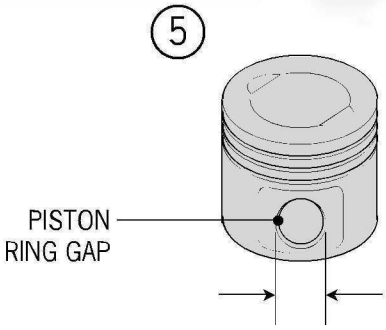
5. Measure the ID of the piston pin hole.

   Maximum service allowance:
   Replace when it goes beyond 13.04mm (.51 in.).



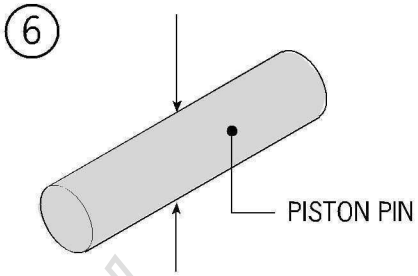



# 8. Cylinder and Piston

6. Measure the OD of the piston pin.

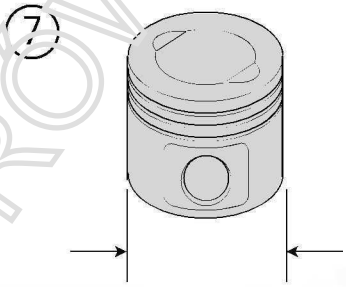
*Maximum service allowance:*
*Replace when it is below 12.96 mm, (.51 in.).*




7. Measure the OD of the piston.

**Attention:**
Measure it in a position which forms 90 degree with the center of the piston pin and which is 9mm away from the skirt.

*Maximum service allowance:*
*Replace when it is below 38.7 mm (1.52 in.).*




8. Measure the clearance between the piston pin and the pin hole.

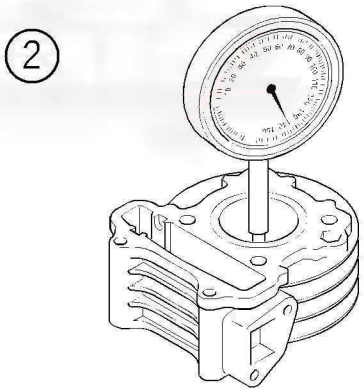
*Maximum service allowance:*
*Replace when it goes beyond 0.02 mm (.0008 in.).*

**Checking the Cylinder**

1. Check whether it's scratched, worn or damaged in its inner surface.

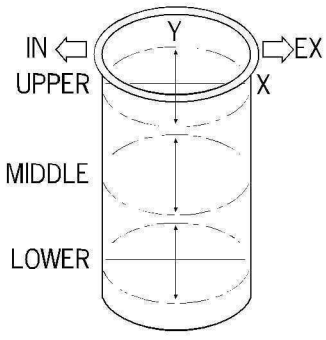
2. Measure its ID in three positions (upper, middle and lower) which form 90 degrees (x-y direction) with the piston hole.

*Maximum service allowance:*
*Repair or replace when it goes beyond 0.1mm (.004 in.).*
*The difference between X and Y directions is out-of-roundness.*




The cylindricity is the ID difference (between X and Y directions), measuring at three positions (upper, middle and lower). The largest measured value will be considered the result. This indicates a taper of the cylinder.

*Maximum service allowance:*
*Out-of-roundness:*
*Repair or replace when it goes beyond 0.05mm (.002 in.).*
*Cylindricity:*
*Repair or replace when it goes beyond 0.05mm (.002 in.).*



# 8. Cylinder and Piston

3. Check the distortion of the cylinder.

Maximum service allowance:
Repair or replace when it goes beyond 0.05mm (.002 in.).

4. Measure the ID of the small end of the connecting rod.

Maximum service allowance:
Replace when it goes beyond 13.06mm (.51 in.).

**Attention:**
Don't scratch the piston or break the piston ring.

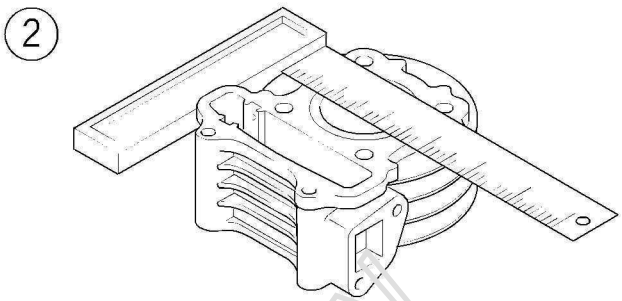
When replacing the ring, keep the surface with the "T" mark up.

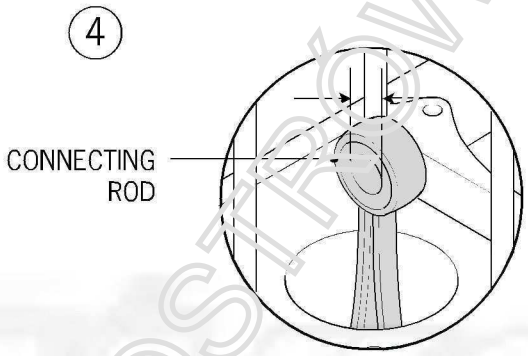
After assembling, make sure that the ring can be turned freely in the ring groove.

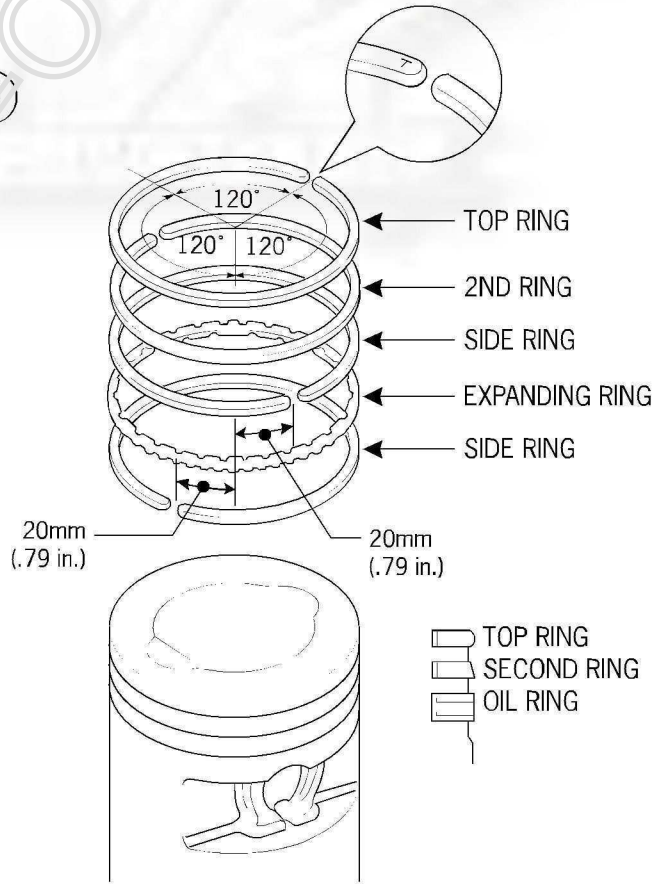
5. Lightly coat the rings with engine oil before installing them on the piston.

6. Make sure to keep ring end gaps rotated at 120° increments.

7. Cover piston and rings with a light coat of engine oil.



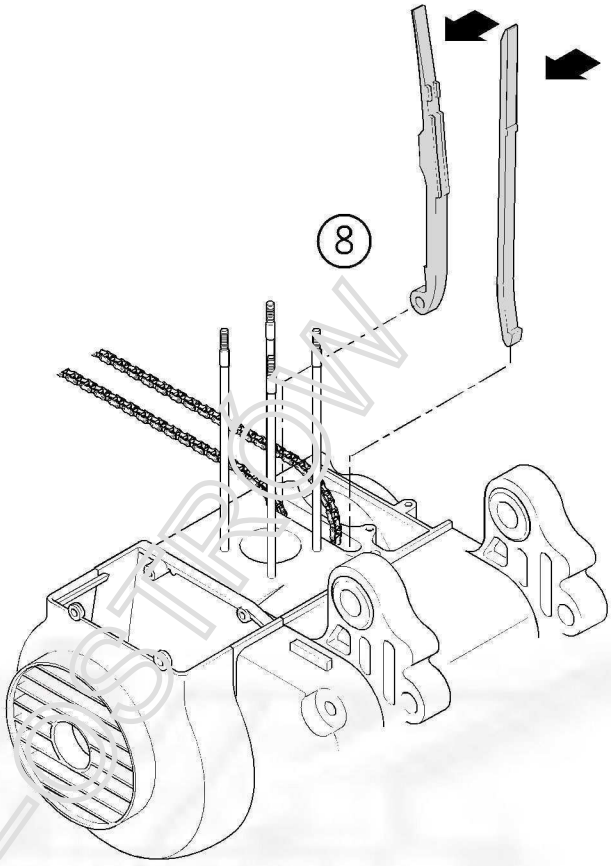



# 8. Cylinder and Piston

8. Install the chain guide lever of the cam.

**Attention:**
Make sure that the lug of the guide lever enters the notch of the cylinder.




### Assembling the Piston

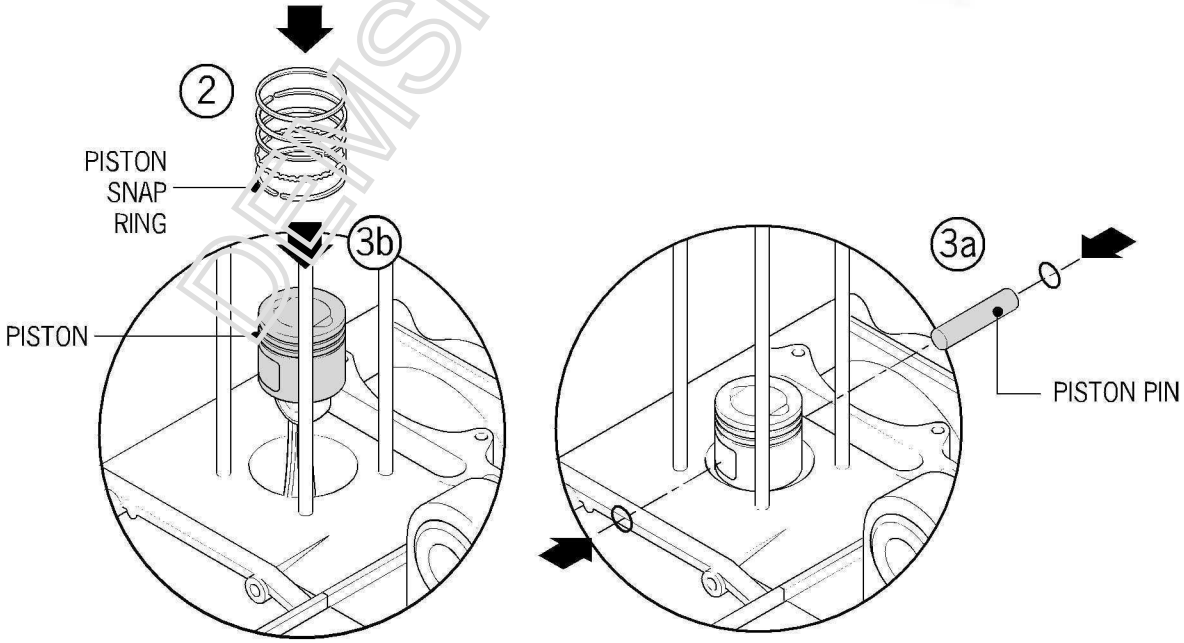
1. Scrape away the gasket adhering on the surface of the crankcase.

**Attention:**
Be sure not to let any matter drop into the crankcase.

2. Assemble the piston and the piston pin.

**Attention:**
When assembling, keep the mark "in" (on the top of the piston) toward the inlet valve.

Be sure not to let the piston pin snap ring fall into the crankcase. Use a cloth to keep debris out of the crankcase.



# 8. Cylinder and Piston

### Assembling the Cylinder

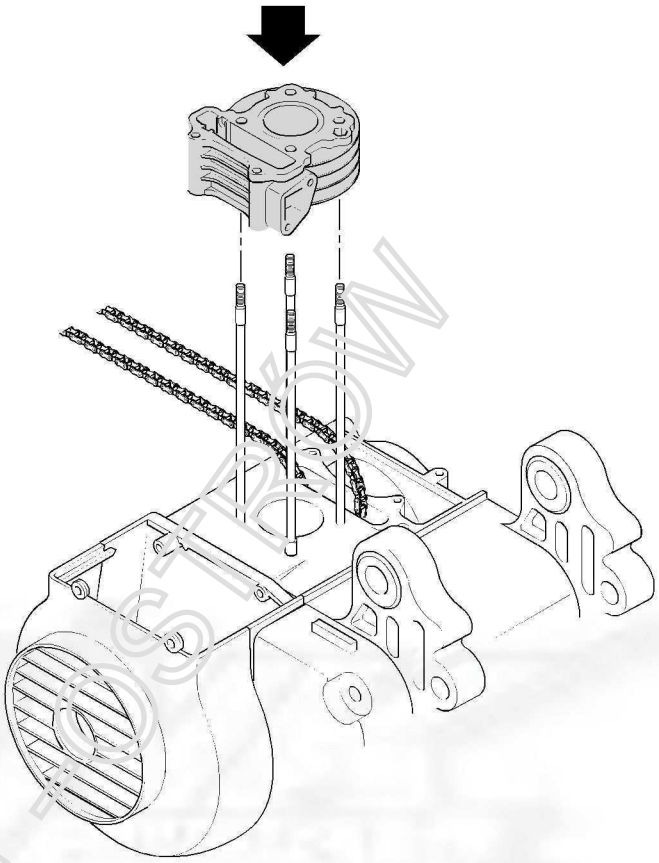
3. Install the locating pin and the gasket to the crankcase.

4. Coat the inner surface of the cylinder, the piston and the piston ring with oil.

5. When assembling the piston rings, they must be compressed into the cylinder.

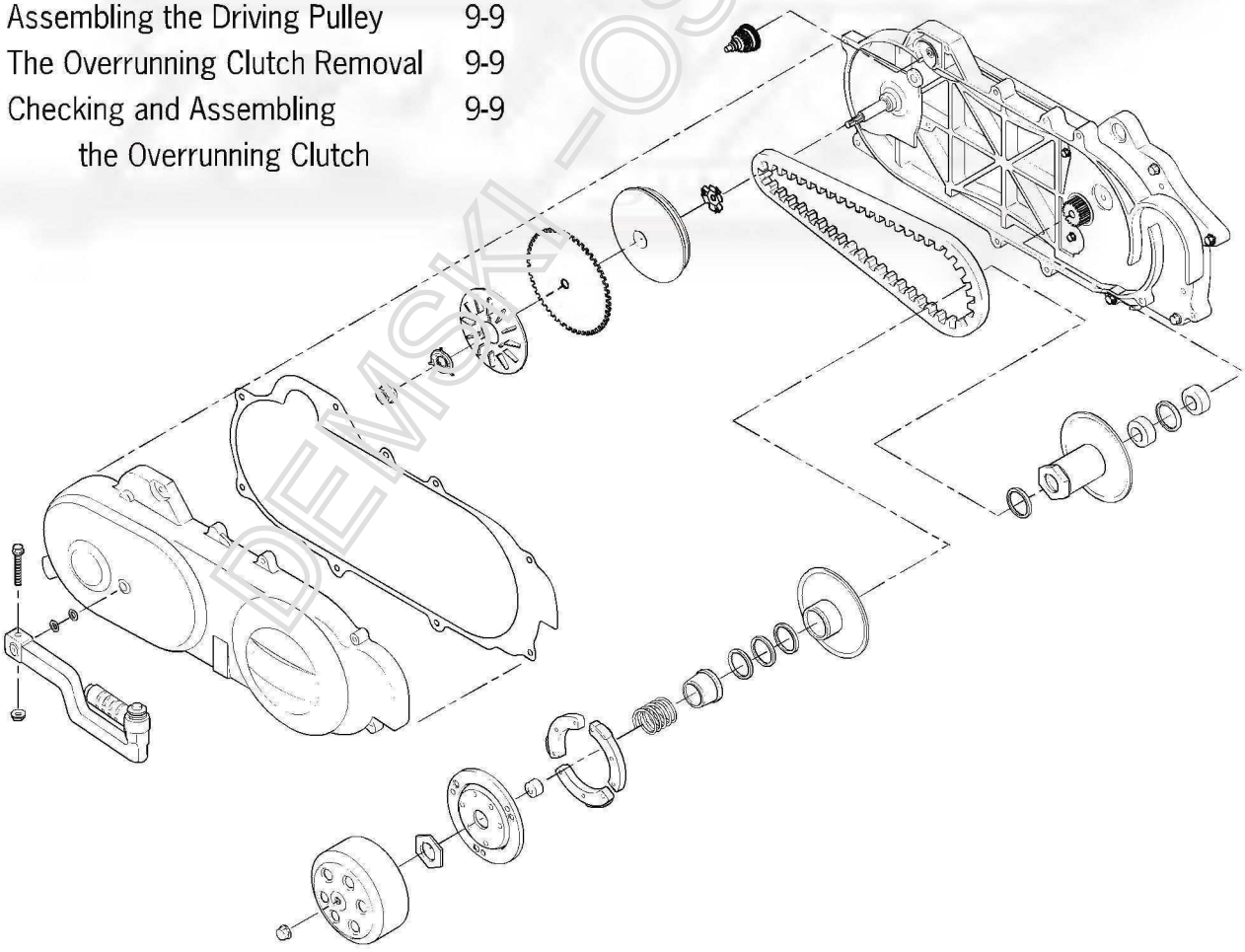
**Attention:**
Don't damage or break the piston ring.

Be sure not to make the position of the ring gap point to the inlet and outlet valves and parallel with the piston ring.



# 9. Driving Belt Device & The Starting Lever





# 9. Driving Belt Device & The Starting Lever

## Important Points

•This chapter is about the driving unit, the clutch/driven unit and the starting lever.

•The work on them can be done on the engine, without the disassembly.

•The surface of the driving belt and the drive units are not allowed to have oil adhering to them. If there is any, remove it to minimize the slip between the belt and the drive units.

**Tech Criterion**

| Item | Normal Size | Max. Serice Allowable |
|---|---|---|
| ID of the sleeve of the sliding driving plate | 23.989-24.05- | 24.24 |
| OD of the hub of the sliding driving plate | 20.010-22.025 | 19.97 |
| Width of the driving belt | 18 | 17 |
| Thickness of the clutch brake lining | | 2.0 |
| ID of the clutch housing | 107.0 107.22 | 107.5 |
| Free length of the driven belt spring | 98.1 | 107.5 |
| OD of the driving plate | 33.9e5-33.985 | 92.8 |
| ID of the sliding driving plate | 34.0-34.25 | 34.06 |
| OD of the roller | 13.0 | 12.4 |

**Torque**

The nut of the driving plate
3.8kg/m 28ft lbs
The nut of the clutch housing
5.5kg/m 40ft lbs
The bolt of the driving plate
0.3kg/m 40in lbs
The nut of the clutch/driving plate
0.45kg/m 40in lbs


•Universal stand


•Compressing device for clutch spring
•Socket (39mm) for
Socket (39mm) for the fix nut
•Bearing driver

**Troubleshooting**

The motorcycle doesn't run after the engine is started
•The driving belt is worn
•The driving plate is broken
•The brake lining is worn or broken
•The spring of the driven plate is fractured

**Sudden breakdown during running**
•The spring of the brake lining is fractured

**Power can't develop fully**
•The driving belt is worn
•Distortion of the driven belt spring
•The roller is worn
•The driving plate surface is dirty

# 9. Driving Belt Device & The Starting Lever

**Detaching the Left Crankcase Cover**

1. Unlock the clip for the air tube for the driving belt.

2. Remove eight bolts and then take off the left crankcase cover and the locating pin.

3. Check whether the gasket is damaged or fractured.

**Removing the Starting Pivot**

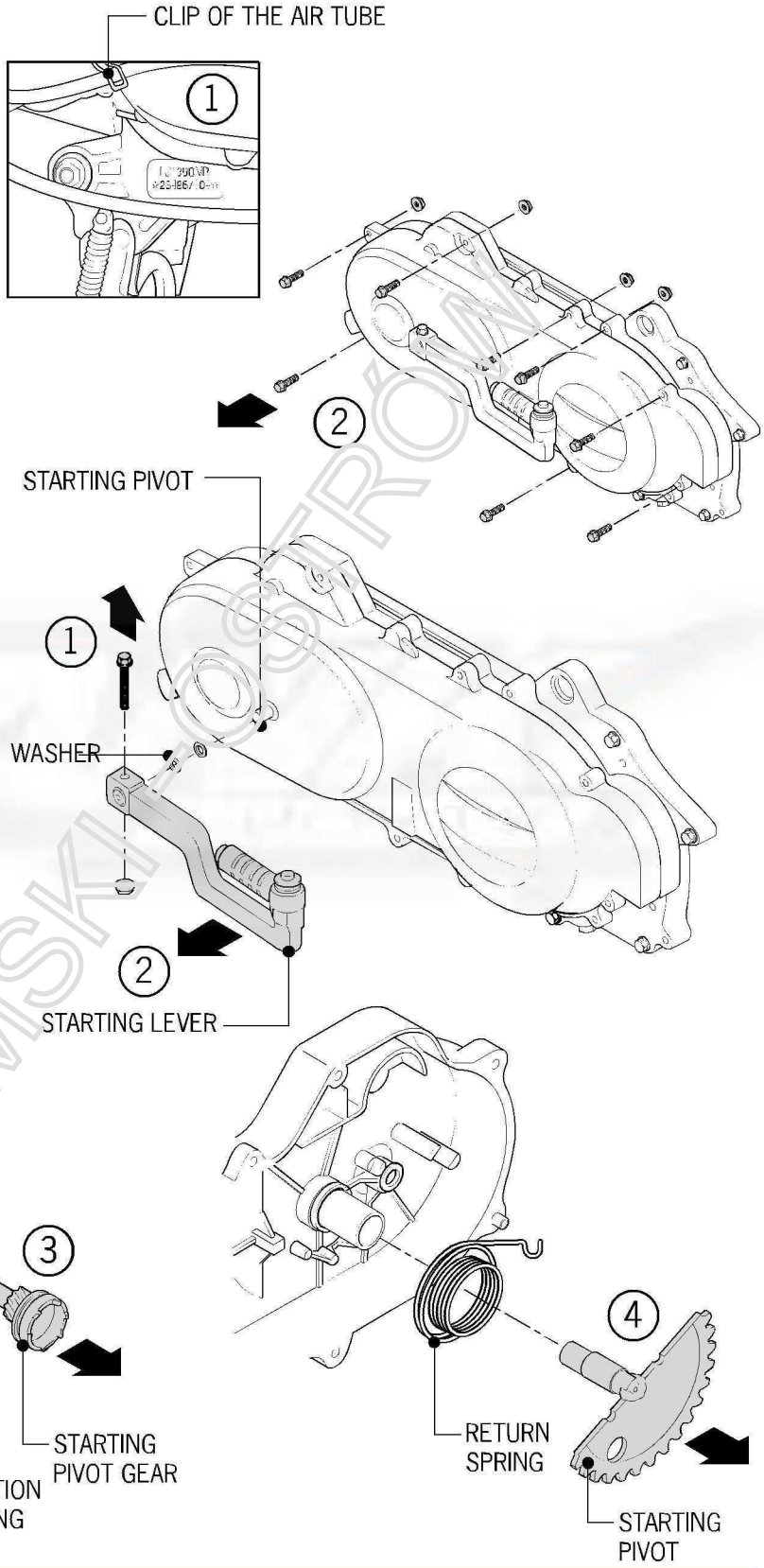
1. Remove the starting lever from the pivot.

2. Remove the retainer and the washer from the starting pivot.

3. Turn the starting pivot gently and remove the driving gear and the friction spring together.

4. Remove the starting pivot and the return spring.

5. Detach the starting pivot sleeve.



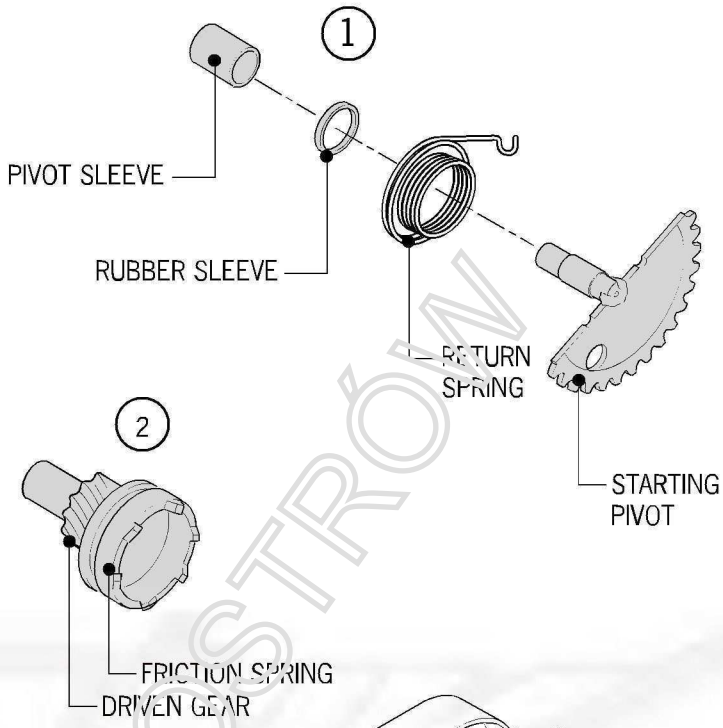
# 9. Driving Belt Device & The Starting Lever

### Checking the Starting Pivot

1. Check if the pivot and the gear are worn. Check if there is any softness of the starting return spring. Check if there is any excessive wear on the pivot sleeve.

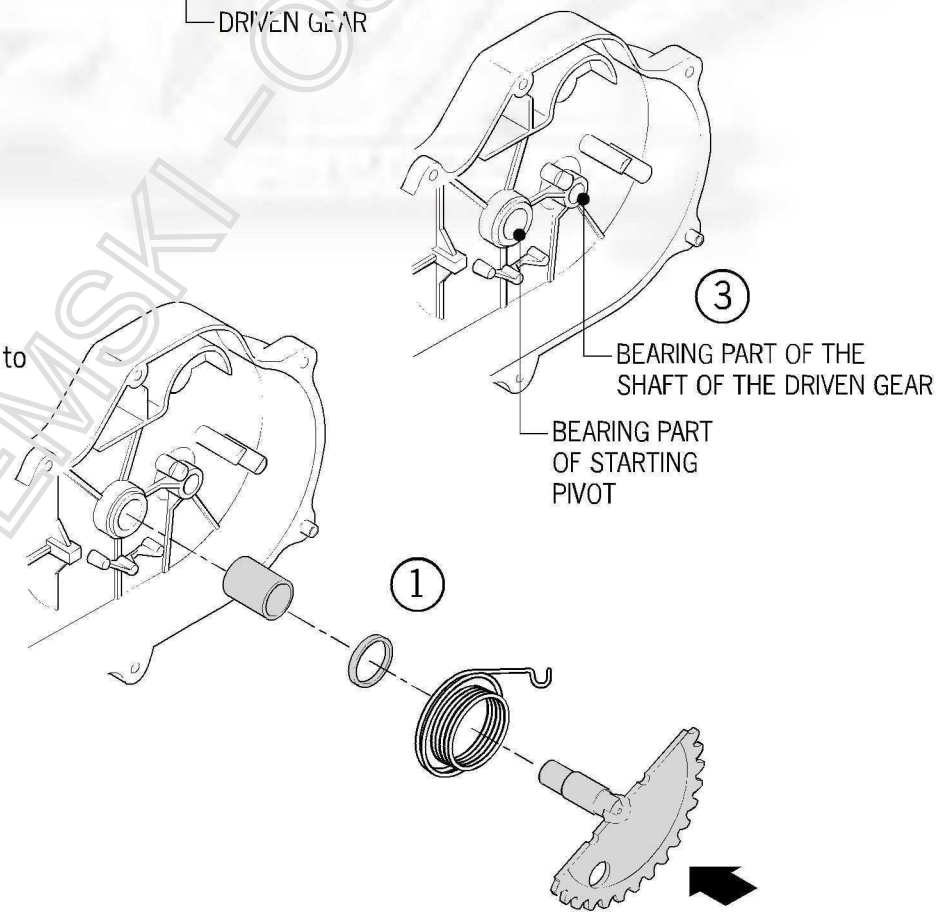
2. Check if the driven gear is worn or has failed. Check if the friction spring is worn or fractured.

3. Check if there is any excessive wear on the bearing part of the starting pivot and of the shaft of the driven gear. Replace any parts showing excessive or unusual wear.




### Installing the Starting Assembly

1. Install the starting pivot sleeve and the return spring to the crankcase cover.



# 9. Driving Belt Device & The Starting Lever

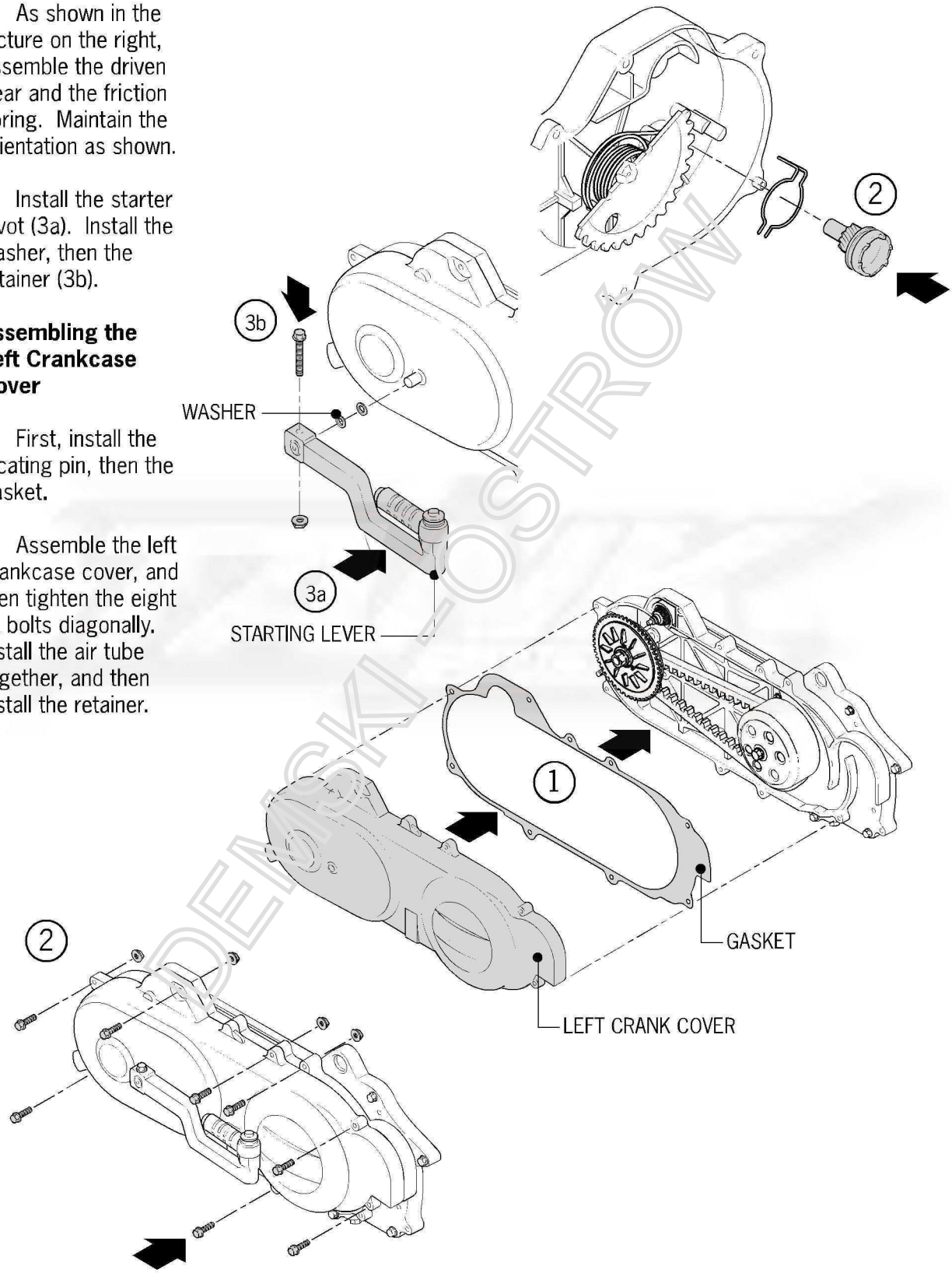
2. As shown in the picture on the right, assemble the driven gear and the friction spring. Maintain the orientation as shown.

3. Install the starter pivot (3a). Install the washer, then the retainer (3b).

**Assembling the Left Crankcase Cover**

1. First, install the locating pin, then the gasket.

2. Assemble the left crankcase cover, and then tighten the eight fix bolts diagonally. Install the air tube together, and then install the retainer.

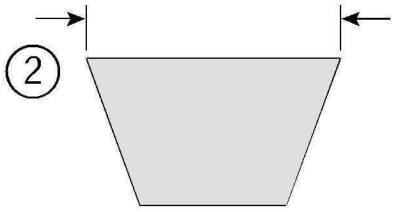


# 9. Driving Belt Device & The Starting Lever

### Checking the Driving Belt

1. Detach the left crankcase cover.

2. Check if the driving belt is cracked, frayed, or if there is abnormal wear. Measure the width of the belt. Maximum service allowance: 17mm (.7 in.).



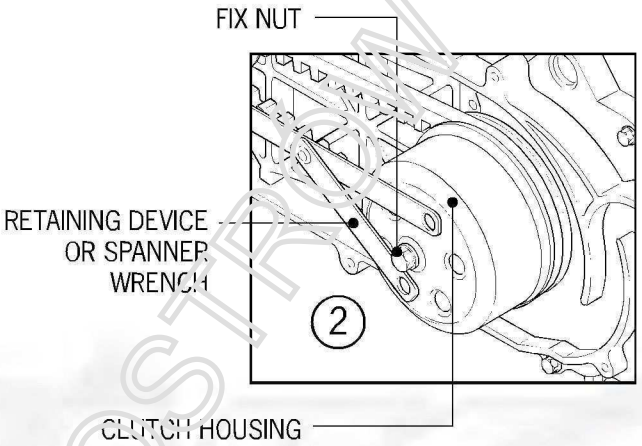

### Replacing the Driving Belt

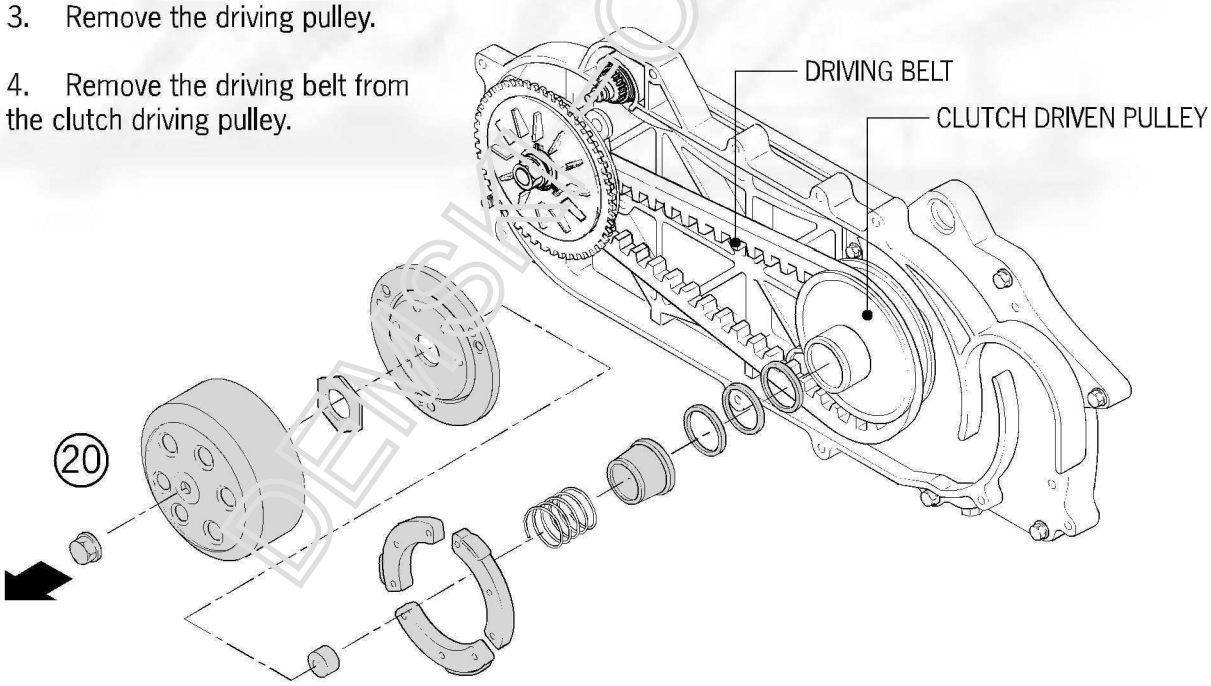
1. Remove the eight fix bolts, then remove he crankcase cover.

2. Remove driving pulley. Use a retaining device to hold the driving pulley and screw out of the 10mm (.39 in.) bolt.

3. Remove the driving pulley.

4. Remove the driving belt from the clutch driving pulley.



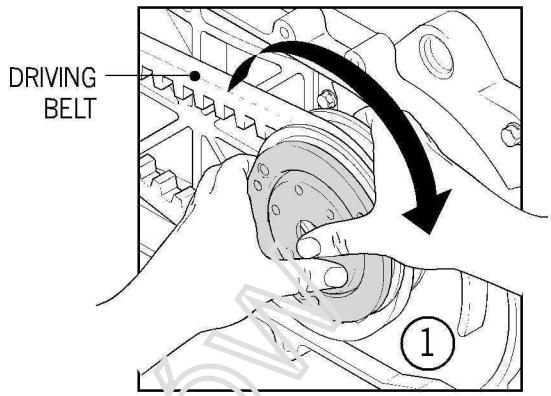
# 9. Driving Belt Device & The Starting Lever

### Assembling the Driving Belt

1. Turn the driving pulley clockwise to keep the notches of the belt in expanded condition. Then install the new driving belt.

2. Install the driving belt on the driving pulley. Install the driving pulley, the starting ratchet and 10mm (.39 in.) washer. Then install and tighten the nut. Torque: 3,8kg/m 28ft lbs

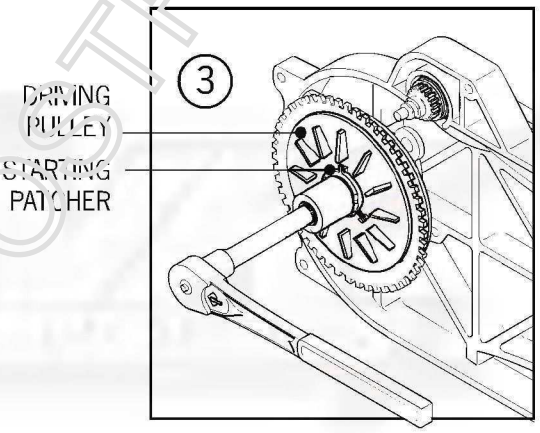
**Attention:**
During assembly, be sure to align the splints of the driving unit with those on the crank shaft with the ratchet.




### The Driving Pulley-Dismounting

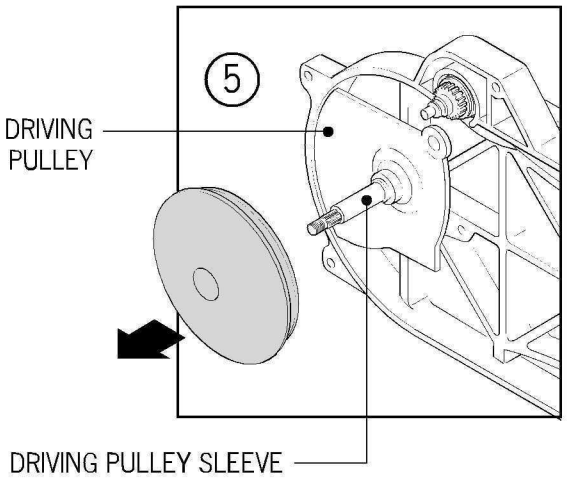
3. Use a retaining device or spanner wrench to hold the driving pulley.

4. Screw out the 10mm (.39 in.) nut, and then remove the ratchet, the 10mm (.39 in.) nut and the driving pulley.




### Taking the Driving Pulley Apart

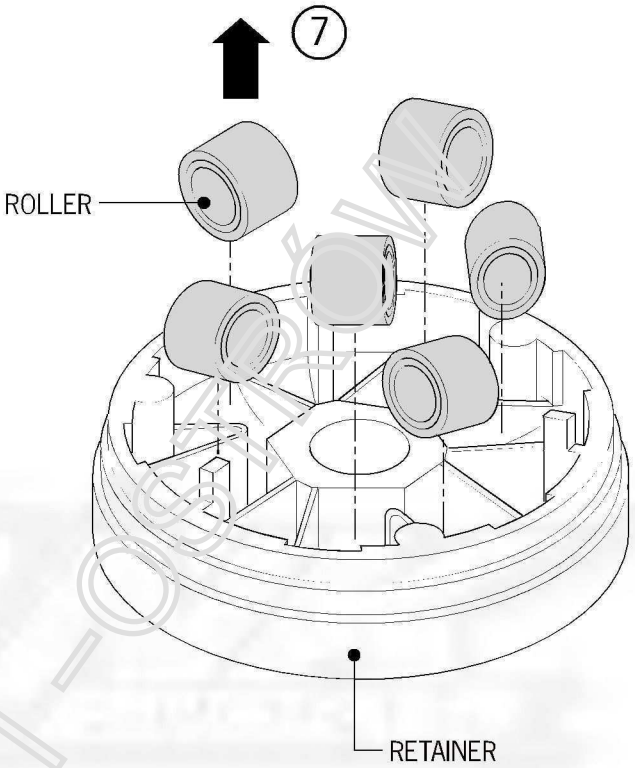
5. Remove the driving pulley and the sleeve from the crankshaft.



# 9. Driving Belt Device & The Starting Lever

6. Remove the retainer.

7. Remove the rollers.



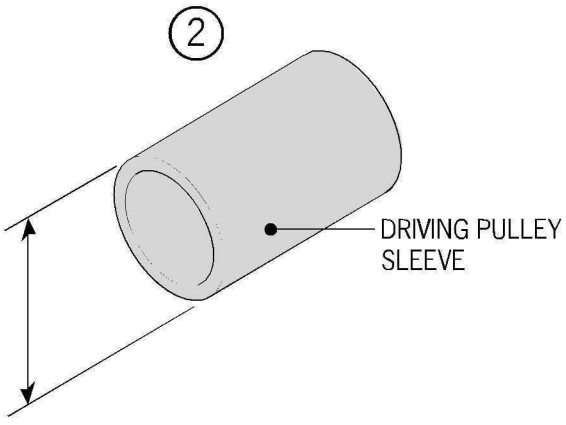

**Checking the driving pulley**

1. Check the wear of the rollers. Measure the OD of the roller.

*Maximum service allowance. Replace when it is below 12.4mm (.47 in.).*

2. Check the wear of the driving pulley sleeve. Measure the OD of the moving section of the sleeve.

*Maximum service allowance: Replace when it is below 33.94mm (1.37 in.).*



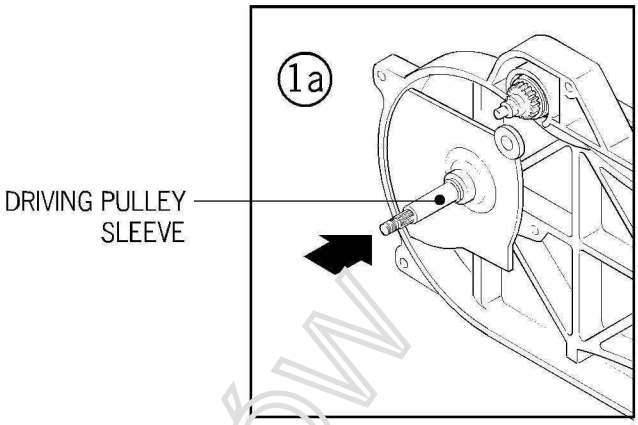
# 9. Driving Belt Device & The Starting Lever

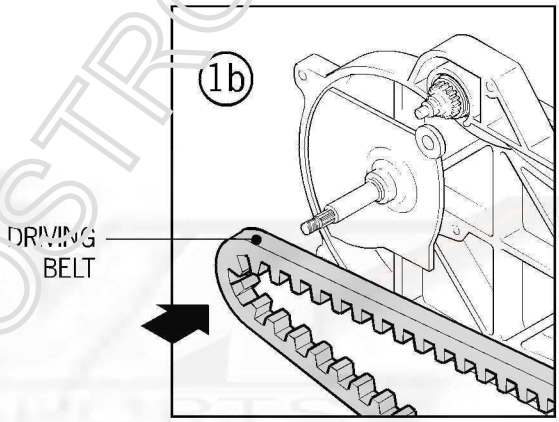
## Driving Pulley

Install the driving pulley sleeve and the driving pulley on the crankshaft (1a). Install the driving belt on the crankshaft (1b). Install the driving pulley and the washer (1c).

*Tighten 10mm (.39 in.) nut.*
*Torque: 3.8kg/m 28ft lbs*

**Attention:**
There mustn't be any grease on the surface of the driven belt and the driving pulley.



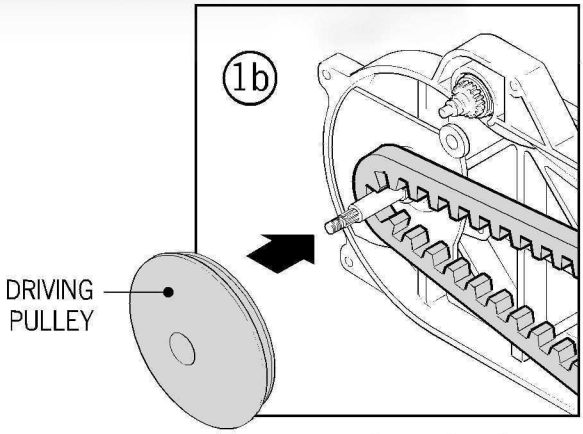




### The Overrunning Clutch (Starter Pinion) Removal

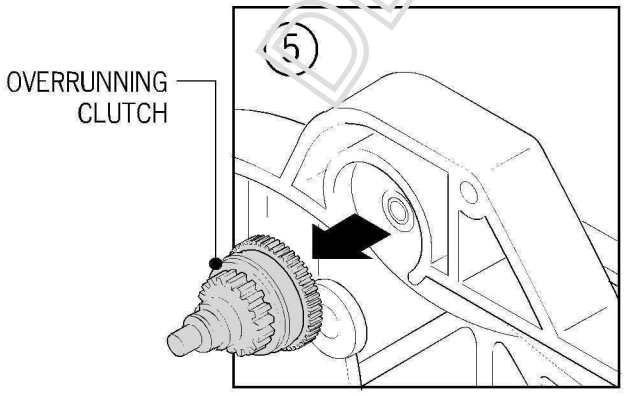
2. Remove the left crankcase cover .
3. Remove the driving pulley.
4. Remove the seat of the overrunning clutch.
5. Remove the overrunning clutch.

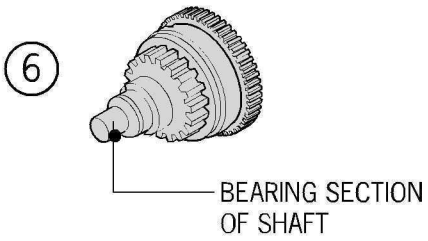
### Checking and Assembling

6. Check if the bearing part of the overrunning clutch shaft is worn.
7. Check if the clutch runs smoothly.
8. Check the wear of the gear and the bearing part of the shaft.
9. Coat the bearing part of the clutch shaft with a bit of grease.
10. Assemble it in the opposite sequence of removal.




**Overrunning Clutch**



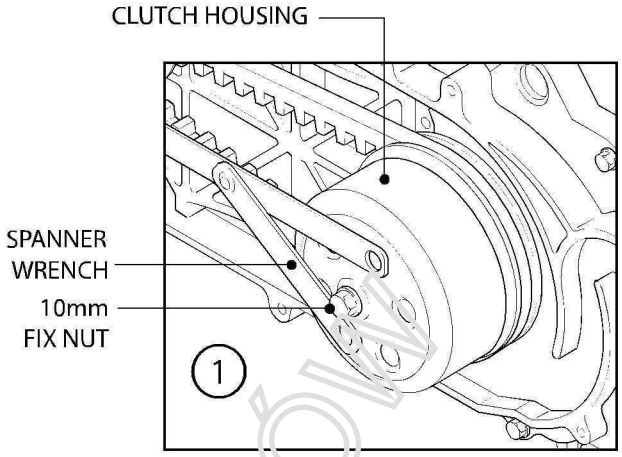



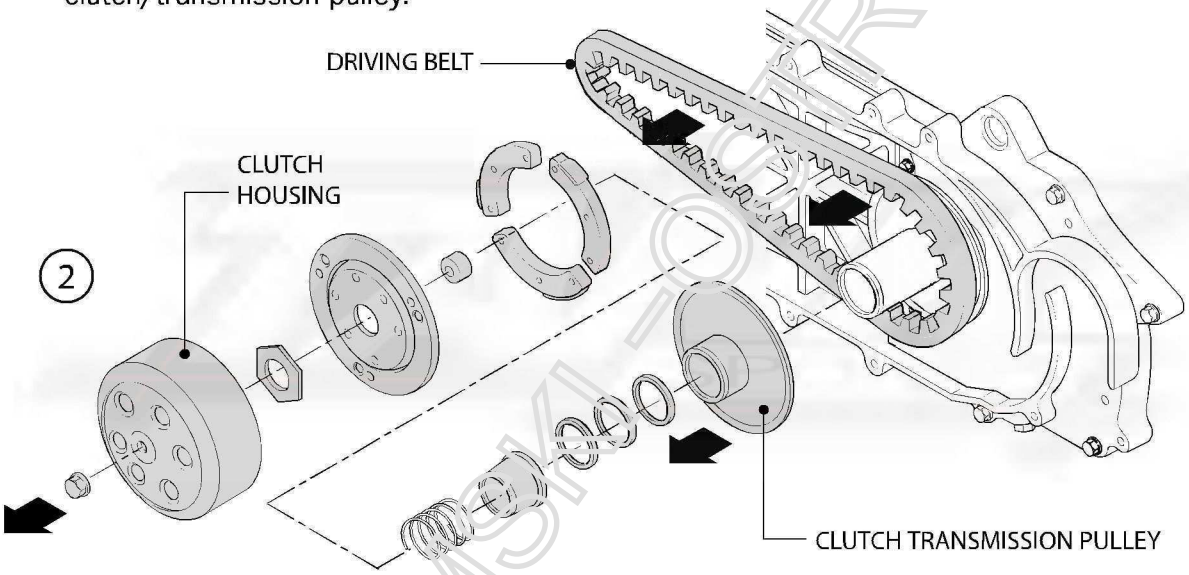
# 9. Driving Belt Device & The Starting Lever

### The Clutch/Transmission Pulley Removing the Clutch/Transmission Pulley

1. Remove the driving pulley. Then use a spanner wrench to hold the clutch housing to screw out the 10mm (.39 in.) nut.

2. Remove the clutch housing. Remove the clutch/transmission pulley. Remove the driving belt from the clutch/transmission pulley.



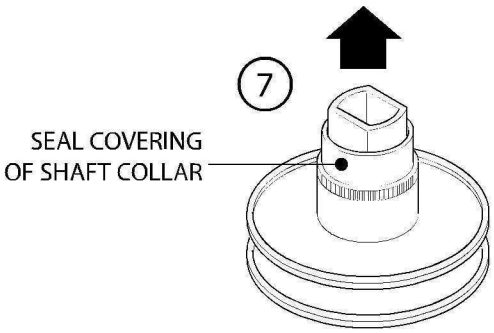




### Disassembling the Clutch/Transmission Pulley

5. Use a spring compressor for the clutch spring to press down the transmission pulley spring to remove the special nut (28mm, 1.102 in.).

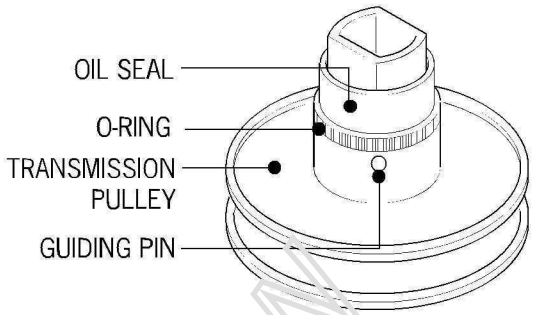
6. Remove the clutch spring.

7. Remove the sealing cover of the shaft collar.



# 9. Driving Belt Device & The Starting Lever

8. Remove the guide rolling pin from the transmission pulley assembly, and then take out the o-ring and the oil seal.




**Checking the Clutch Transmission Pulley**

1. Check the wear of the clutch housing. Measure the ID of the clutch housing.

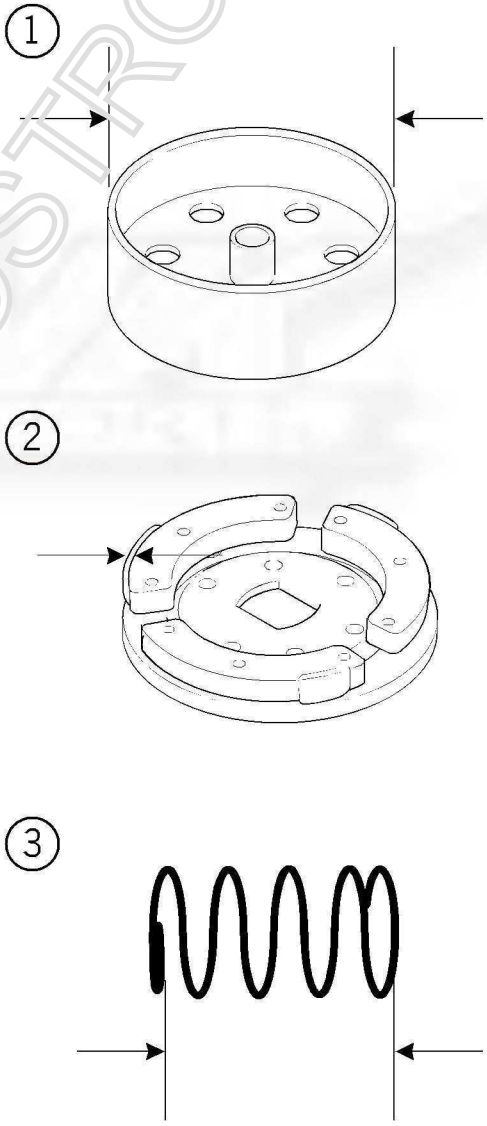
*Maximum service allowance: Replace when it goes beyond 107.5mm (4.23 in.).*

2. Check the wear of the clutch lining. Measure the thickness of the lining.

*Maximum service allowance: Replace, when it is below 2.0mm (.078 in.).*

3. Measure the free length of the transmission pulley spring.

*Maximum service allowance: Replace when it below 92.8mm (3.65).*



# 9. Driving Belt Device & The Starting Lever

4. Check the wear of the transmission pulley. Measure the OD of the pulley.

*Maximum service allowance:*
*Replace when it is below 19.97mm (.79 in.).*

5. Check the wear of the transmission pulley. Measure the ID of the pulley.

*Maximum service allowance:*
*Replace when it goes beyond 24.24mm (.95 in.).*

6. Check if the guide rolling pin is excessively worn or unevenly worn.
Replace as necessary.

**Replacing the transmission pulley and the bearing**

1. Check the needle bearing for wear or excessive free play, gritty feel or noise. Replace as necessary.

2. Check the housing bearing for wear. Remove the retainer and take out the housing bearing.

3. Drive in the new housing bearing keeping the lid side up.

**Attention:**
Grease new bearings when installing. Grease able to resist > 230°.