REAR SUSPENSION

Service information

- Workstand or a box is required to support the motorcycle.
- Use genuine Honda bolts for the rear suspension linkage and shock absorber pivot and mounting; ordinary bolts lack adequate strength for these applications. Also take note of the installation direction of these bolts since they must be installed correctly.
- For optimum suspension performance and linkage component service life, the swingarm and shock linkage pivot bearings (along with related seals and collars) should be disassembled, cleaned, inspected for wear and lubricated with multipurpose grease NLGI No. 2 (Molybdenum disulfide MoS2 (additive) each 3 races or 7.5 hours of running.
- Optional rear wheel sprockets, drive chain and shock springs are available. Refer to Optional Parts List (page 10).
- Rear shock absorber service can be done after sub frame is removed.

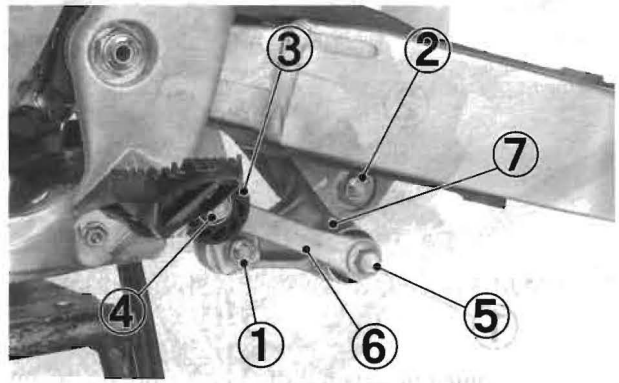
⚠ WARNING

- ***The shock absorber contains nitrogen gas under high pressure. Do not allow fire or heat near the shock absorber.***
- ***Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber.***
- ***The shock absorber has a gas-filled reservoir. Use only nitrogen to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.***

Removal

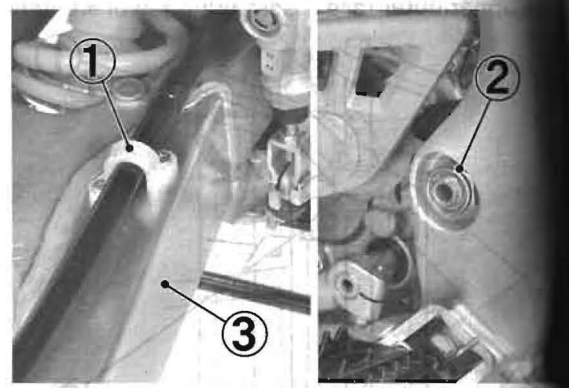
Raise the rear wheel off the ground with workstand or a box under the engine.
Remove the following:
— Rear wheel (page 145).
— Rear brake caliper (page 149).
— Brake pedal (page 152).

Remove the following:
— Shock absorber lower mounting bolt/nut.
— Shock arm to swingarm bolt.
— Drive chain roller.
— Shock link to frame bolt.
— Shock link to shock arm bolt.
— Shock link and shock arm.



(1) SHOCK ABSORBER LOWER MOUNTING BOLT/NUT
(2) SHOCK ARM TO SWINGARM BOLT/NUT
(3) DRIVE CHAIN ROLLER
(4) SHOCK LINK TO FRAME BOLT/NUT
(5) SHOCK LINK TO SHOCK ARM BOLT/NUT
(6) SHOCK LINK
(7) SHOCK ARM

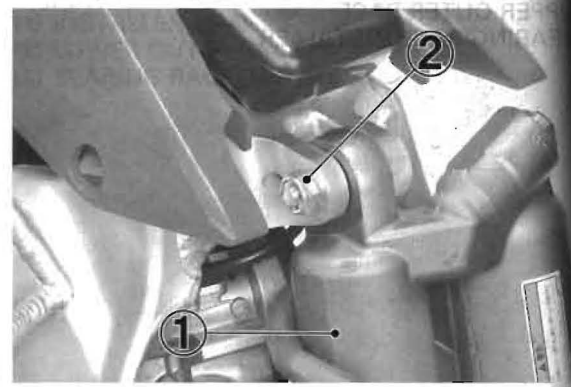
Remove the following:
— Brake hose guide.
— Swingarm pivot bolt/nut and swingarm as



(1) BRAKE HOSE GUIDE
(2) SWINGARM PIVOT BOLT/NUT (3) SWING

Remove the subframe (page 18).
Remove the shock absorber upper mounting bol and shock absorber.

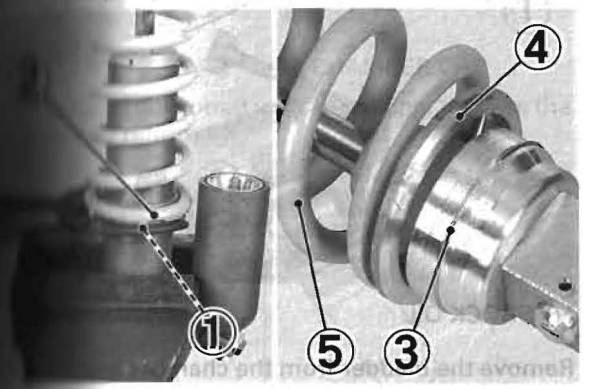
NOTE:
- If you are going to remove the shock spring, lo the spring's lock nut at this time.



(1) SHOCK ABSORBER
(2) UPPER MOUNTING BOLT/NUT

shock mount in a vise with soft jaws towel.

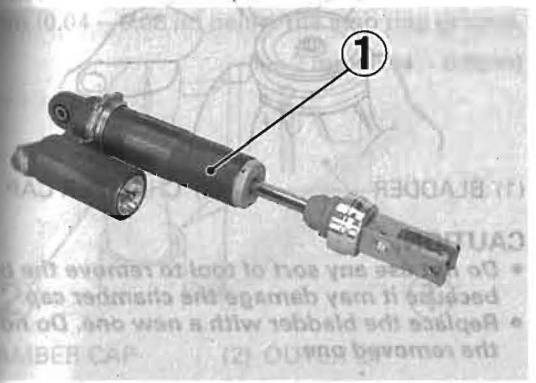
lock nut and adjusting nut.
shock from the vise.
stopper ring, spring seat and spring.
spring for damage.



LOCK NUT (2) ADJUSTING NUT
STOPPER RING (4) SPRING SEAT (5) SPRING

Damper inspection

Visually inspect the damper unit, oil leaks or other damage. Replace the damper unit if necessary.

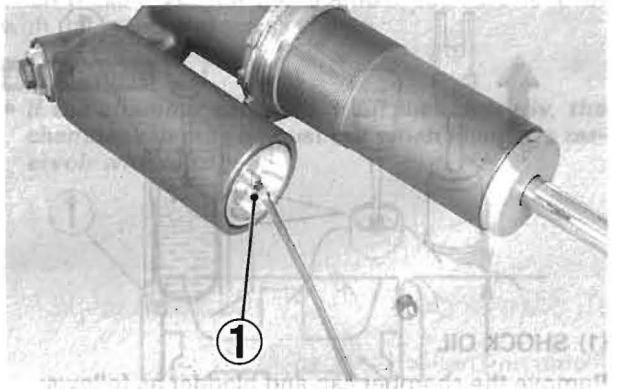


(1) DAMPER UNIT

Release the nitrogen from the reservoir by depressing the valve core. Do not remove the valve until pressure is released.

⚠ WARNING

- ***Point the valve away from you to prevent debris getting in your eyes.***
- ***Before disposal of the shock absorber, release the nitrogen by pressing the valve core. Then remove the valve from the shock absorber.***



(1) VALVE CORE

Bladder replacement

NOTE:
- Replace the bladder if oil is present around the chamber cap or if oil spills out when the nitrogen is released from the reservoir.
- Release the nitrogen pressure before drain the oil from the damper.

⚠ WARNING

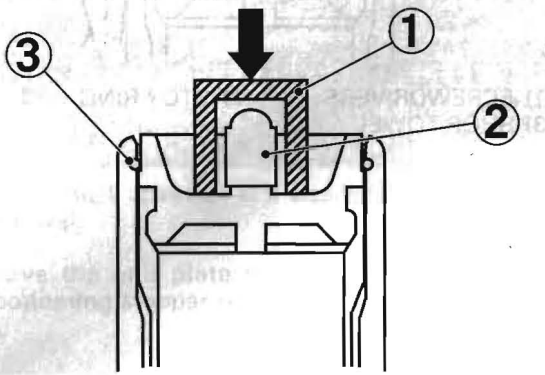
- ***Release all nitrogen pressure before disassembly; otherwise the chamber cap will be under significant pressure and could cause serious injury or disassembly.***
- ***Wear protective clothing and face guard to protect against injury and prevent debris from getting in your eyes.***

Remove the valve core from the valve.
Put a suitable tool on the chamber cap and push in it with the chamber cap until you have good access to the stop ring.

NOTE:
- Push the chamber cap in the minimum amount necessary.

CAUTION:

- ***To avoid damage the thread of the valve, install the cap on the gas valve.***

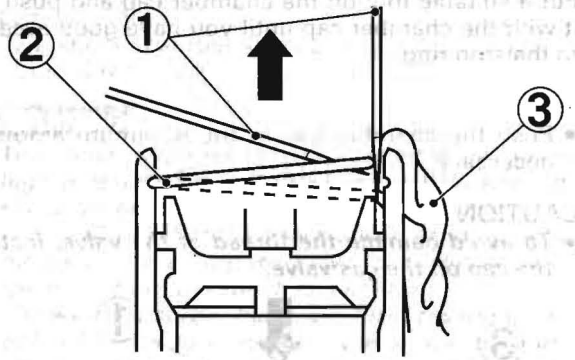


(1) SUITABLE TOOL (2) VALVE CAP
(3) STOP RING

You'll need two small screwdrivers to remove the stop ring.
The stop ring groove in reservoir is ramped toward the inside to give the stop ring a square shoulder to seat it securely.

CAUTION:
- ***To avoid damage to the inside surfaces of the reservoir, cover the screwdriver with shop towel.***

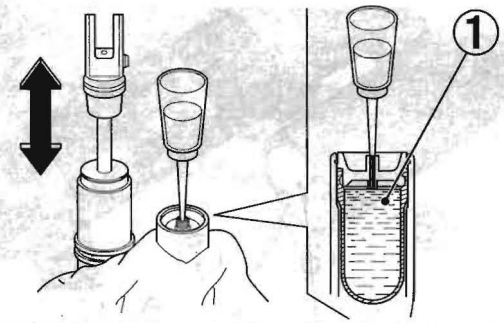
To remove the stop ring, first push one end of the stop ring out of its groove, then slip the second screwdriver between the stop ring and the reservoir to act as a ramp. Now, use the other screwdriver to pull the stop ring completely out.
Check if there are burrs in the groove of the reservoir case.
If the burrs are in the groove, remove all of them and refinish the groove surface.



(1) SCREWDRIVERS (2) STOP RING
(3) SHOP TOWEL

Hold the shock absorber in a vise with soft jaws or a shop towel.

Using a suitable squeeze bottle, fill the inside of the bladder with the recommended shock oil while slowly pumping the damper rod.
Slowly pump the damper rod until no air bubbles appear in the valve core hole, then pull the damper rod all the way.
Install the valve core securely.



(1) SHOCK OIL

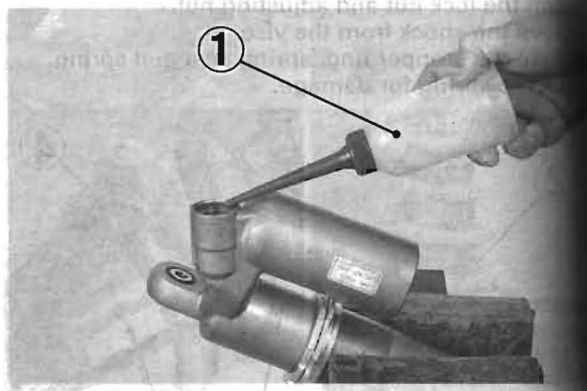
Remove the chamber cap and bladder as follows:
1. Wrap a shop towel around the chamber cap.
   Compress the damper rod slowly to force the chamber cap out.

⚠ WARNING
- ***The chamber cap will be removed with hydraulic pressure so its force can be significant if containing the air in the bladder. Wear protective clothing and face guard to against pop out the cap.***

2. Place the damper with the damping adjuster facing-up.
   Remove the damping adjuster.
3. Fill the damper with the recommended shock oil through the damping adjuster hole while pulling the damper rod.
4. Reinstall the damping adjuster after filling the damper.

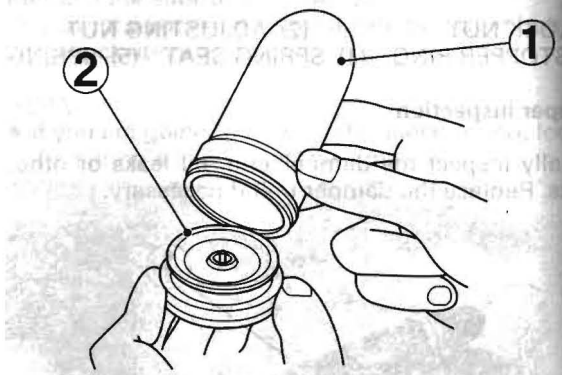
NOTE:
- The damper must be kept upright to prevent oil from leaking out of the damper.

5. Place the damper with the chamber cap facing
6. Repeat the step 1 to 5 until the chamber cap is moved from the reservoir.



(1) SHOCK OIL

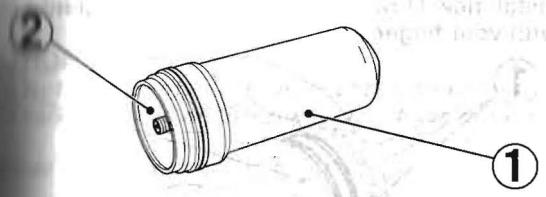
Remove the bladder from the chamber cap.



(1) BLADDER (2) CHAMBER CAP

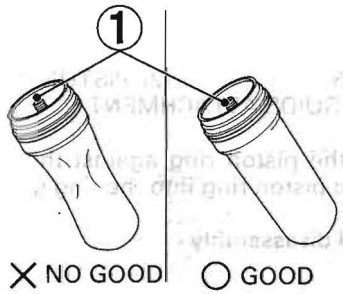
CAUTION:
- ***Do not use any sort of tool to remove the bladder, because it may damage the chamber cap.***
- ***Replace the bladder with a new one. Do not reuse the removed one.***

…ll the bladder to the chamber cap.



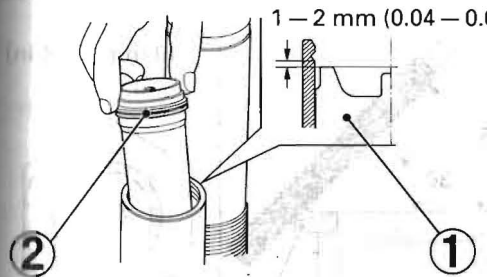
(1) BLADDER (2) CHAMBER CAP

…bladder is distorted when installing, depress the …core to reform it.



(1) VALVE CORE

…n the inside of the reservoir and fill the reservoir …h the recommended shock oil.
…ly shock oil to outer lip of the bladder, and care- …y push the chamber cap into the reservoir to about … mm (0.04 — 0.08 in) below the stop ring groove.



(1) CHAMBER CAP (2) OUTER LIP

Install the stop ring to the groove of the reservoir securely. Fill the reservoir with low-pressure compressed air until 49 kPa (0.5 kgf/cm², 7.1 psi) to seat the chamber cap on the stop ring all the way around.

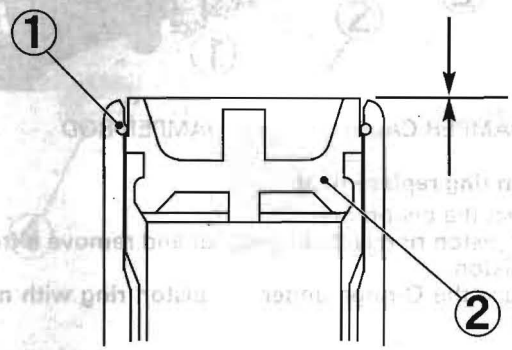
⚠ WARNING

- ***Be sure the stop ring is seated in the ring groove all the way around or the camber cap can come apart when riding the motorcycle.***

Then make sure that the chamber cap face is level with the reservoir face as shown.

⚠ WARNING

- ***If the chamber cap pulled out incompletely, the chamber cap may be bust out when filling the reservoir with nitrogen.***



(1) STOP RING (2) CHAMBER CAP

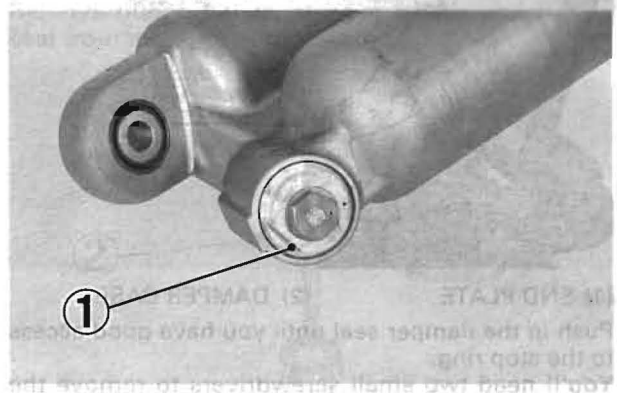
Bleed the air from the shock absorber (page 136).
Fill the reservoir with specified pressure nitrogen (page 137).

Damper disassembly

⚠ WARNING

- ***Point the valve away from you to prevent debris getting in your eyes.***
- ***Before disposal of the shock absorber, release the nitrogen from the reservoir and then remove the valve.***

Depress the valve core to release the nitrogen from the reservoir.
Remove the damping adjuster.

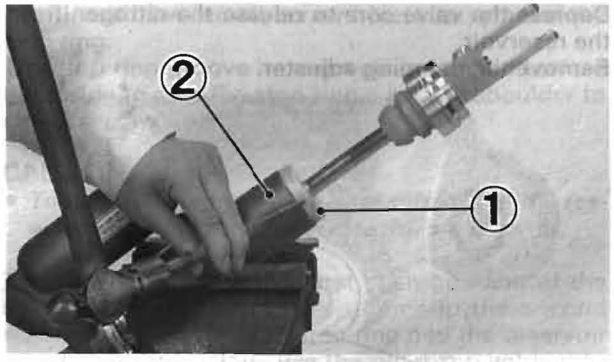


(1) DAMPING ADJUSTER

Drain most of the oil from the damper and reservoir, pumping the damper in-and-out several times.

Hold the shock absorber in a vise with soft jaws or a shop towel.

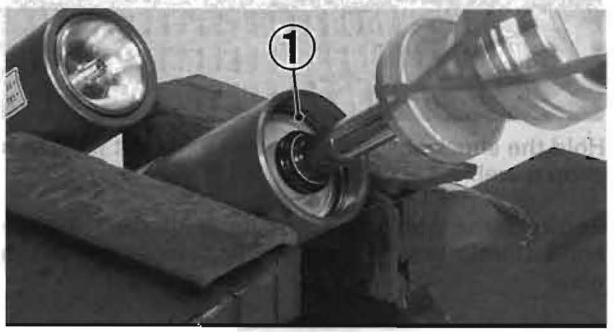
Remove the end plate and tape or tie it to the antibottoming stopper rubber, so it won't get in the way.



(1) END PLATE (2) DAMPER CASE

Push in the damper seal until you have good access to the stop ring.
You'll need two small screwdrivers to remove the stop ring.
The stop ring groove in the damper case is ramped towards the inside to give the stop ring a square shoulder to seat it securely.
To remove the stop ring, first push one end of the stop ring out of its groove, then slip the second screwdriver between the stop ring and the damper case to act as a ramp. Now, use the other screwdriver to pull the stop ring completely out.

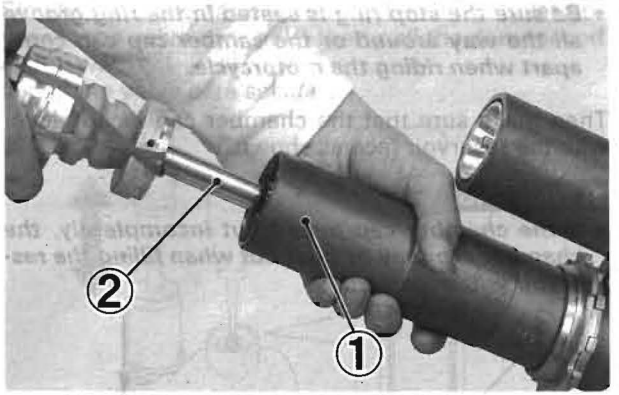
NOTE:
- Check the stop ring groove for burrs. If any burrs are found, remove them before pulling the damper rod assembly out of the case.



(1) STOP RING

Remove the shock absorber from the vise.
Carefully pull the damper rod assembly out of the damper case.

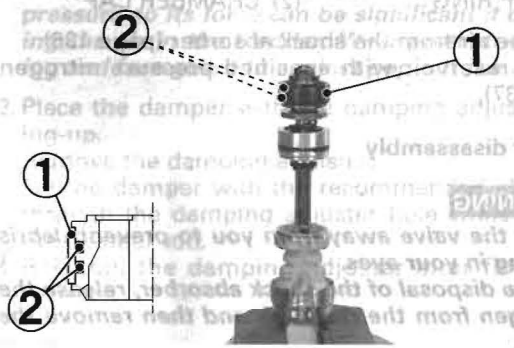
CAUTION:
- ***Burrs will damage the damper rod piston ring.***



(1) DAMPER CASE (2) DAMPER ROD

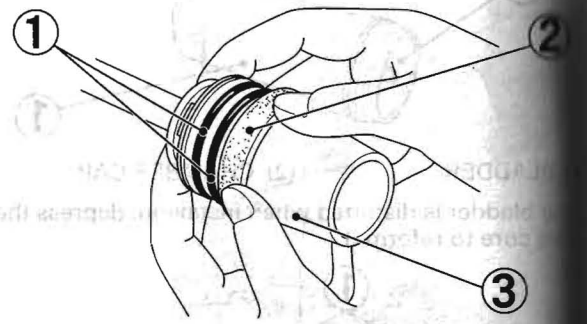
Piston ring replacement

Inspect the piston ring.
If the piston ring is damaged, cut and remove it from the piston.
Replace the O-rings under the piston ring with new ones.



(1) PISTON RING (2) O-RINGS

Place the slider guide attachment over the piston and install new O-rings and a new piston ring into place with your finger.



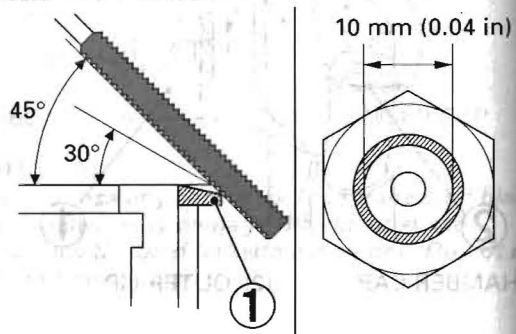
(1) O-RINGS (2) PISTON RING
(3) SLIDER GUIDE ATTACHMENT

Compress the piston ring against the ring groove and seat the piston ring into the ring groove.

Damper rod disassembly

CAUTION:
- ***To keep lint or dirt from getting onto damper rod parts, do not wear gloves while working on the damper rod.***
- ***Be careful to grind so that the O.D. of the rod end is about 10 mm (0.4 in) and not to over grind.***

Unstake the damper rod end nut with a grinder as shown.



(1) GRIND AREA

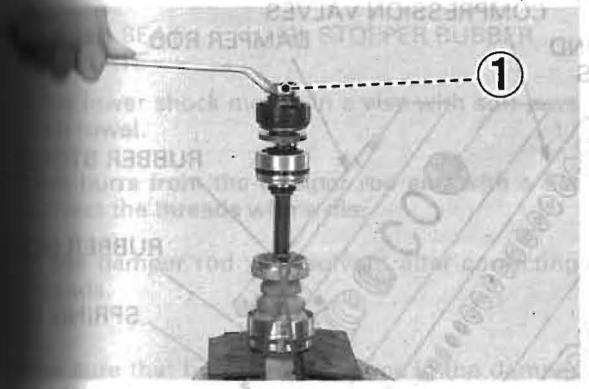
damper rod in a vise with soft jaws or a

not over tighten the lower shock mount.
careful not to distort the lower shock mount.

the end nut and discard it.

damper rod is cracked or damaged when re- the end nut, replace the damper rod as- with a new one.

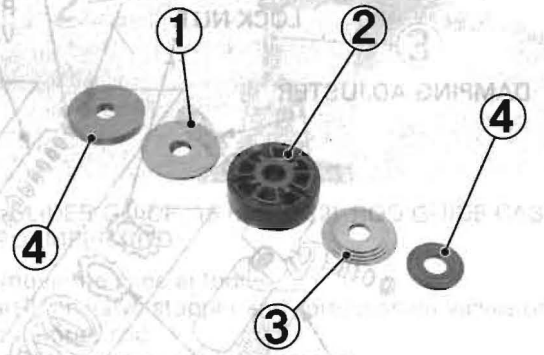
all the burrs from the end of the damper



END NUT

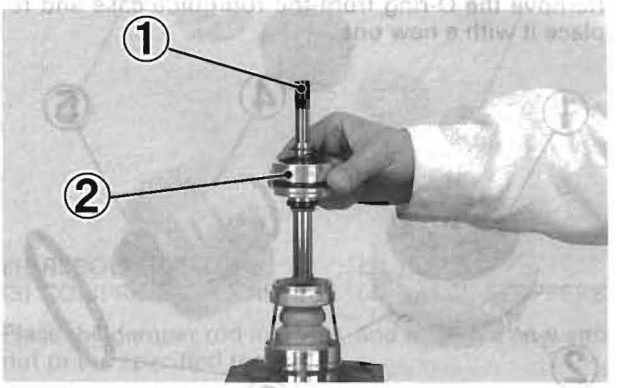
Remove the damper rod from the vise.
Remove the valves, valve stopper, rebound valves and piston from the damper rod.
Remove the compression valves and valve stopper.

NOTE:
- Pass a piece of thin wire through the removed valves to ensure correct reassembly.
- Keep dust and abrasives away from all damper rod parts.
- Thoroughly clean the valves in solvent, if they have been disassembled and separated.
- Be careful not to get solvent on the O-ring, piston ring and dust seal.
- The valve arrangement and number of valves shown is typical.



(1) REBOUND VALVES (2) PISTON
(3) COMPRESSION VALVES (4) VALVE STOPPERS

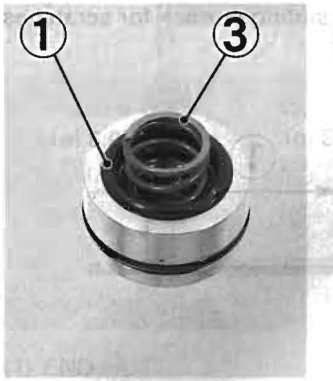
Wrap the top threads of the damper rod with tape.
Remove the rod guide case from the damper rod.
Remove the end plate, stopper rubber and rubber seat from the damper rod.

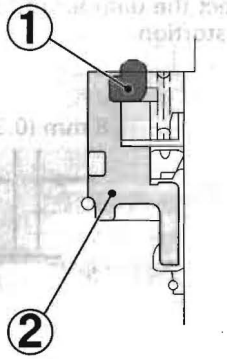


(1) TAPE (2) ROD GUIDE CASE

Rod guide case inspection

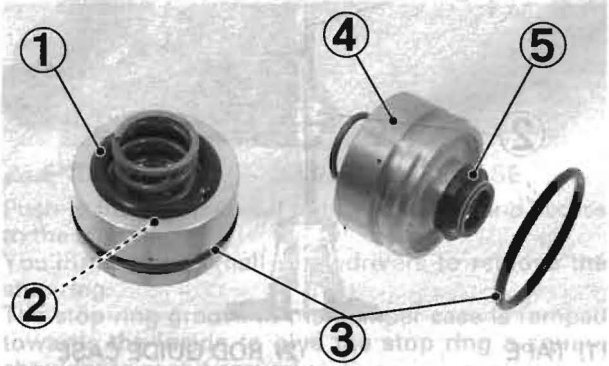
Inspect the rebound rubber for wear or damage and replace the rod guide case with a new one.
Inspect the rebound spring for fatigue or damage and replace it if necessary.





(1) REBOUND RUBBER (2) ROD GUIDE CASE
(3) SPRING

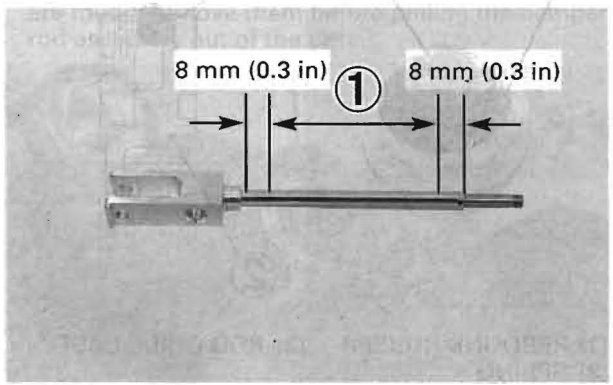
Inspect the dust seal lips for wear, scratches or damage and replace the rod guide case with a new one.
Visually inspect the rod guide case metal.
If the metal is worn so that the copper surface appears, replace the rod guide case with a new one.
Remove the O-ring from the rod guide case and replace it with a new one.



(1) REBOUND RUBBER
(2) ROD GUIDE CASE METAL (3) O-RING
(4) ROD GUIDE CASE (5) DUST SEAL

Damper rod inspection

Inspect the damper rod sliding surface for scratches or distortion.

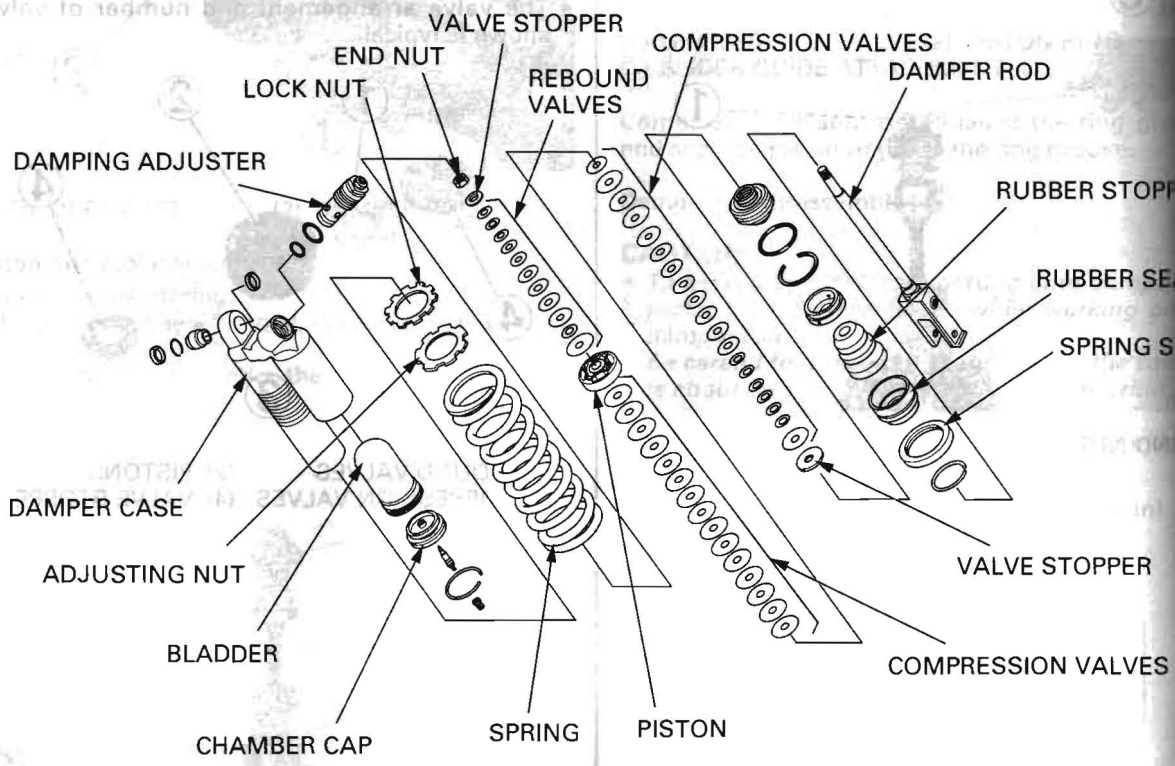


(1) SLIDING SURFACE

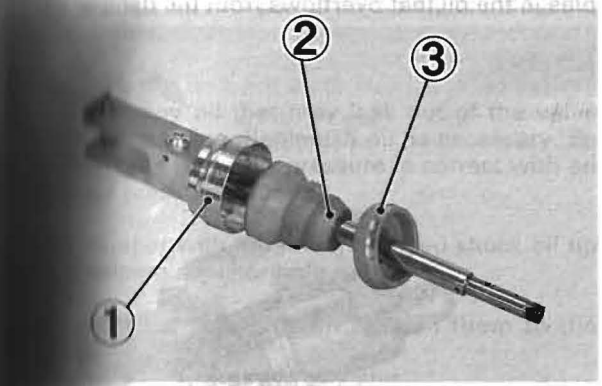
Damper assembly

Before assembly, wash all parts with solvent and blow dry with compressed air.
Check that there is no dust or lint on any of the parts.

NOTE:
- Never assemble valves which might have got dusty or otherwise contaminated during the disassembly process. Disassemble them, thoroughly clean with solvent before assembly.
- Use added care to avoid getting solvent on the rings and seals.
- Do not disassemble the rebound damping adjuster on the lower mount.
- The valve arrangement and number of valves may differ from those shown.



the rubber seat, stopper rubber and end plate.



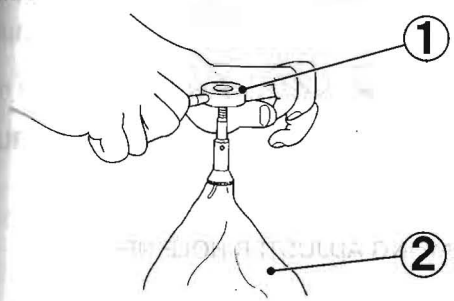
R SEAT (2) STOPPER RUBBER
D PLATE

the lower shock mount in a vise with soft jaws
soft towel.

ove burrs from the damper rod end with a file
rrect the threads with a die.

n the damper rod with solvent after correcting
threads.

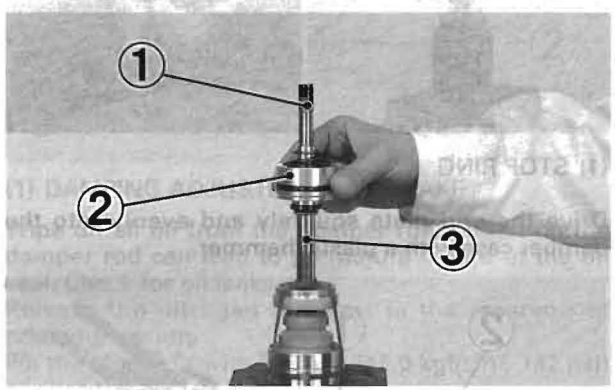
ake sure that burrs are not stuck in the damper
I.D.



(1) DIE, 12 × 1.25 mm (2) SOFT JAWS

Install the special tool onto the damper rod.
Install the spring and rod guide case over the damper rod with rebound spring facing up.

NOTE:
- The rod guide case seal is filled with grease.
- Be careful not to remove grease from the seal.
- Be careful not to damage the dust seal lip or turn it inside out.

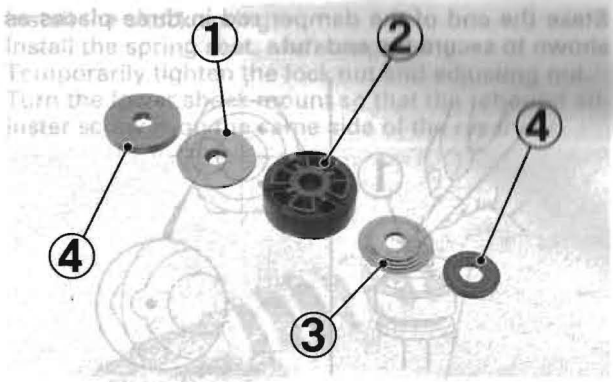


(1) SLIDER GUIDE, 16 mm (2) ROD GUIDE CASE
(3) DAMPER ROD

Remove the special tool.
Install the valve stopper and compression valves onto the damper rod.
Install the piston onto the damper rod.

Install the rebound valves and valve stopper.

NOTE:
- Do not install the end washer except using new damper rod.
- Note the installation direction of the piston and valves.
- Be careful not to bind the valves when installing the piston onto the damper rod. Also, check that they are concentric with the damper rod.
- The valve arrangement and number of valves may differ from those shown.

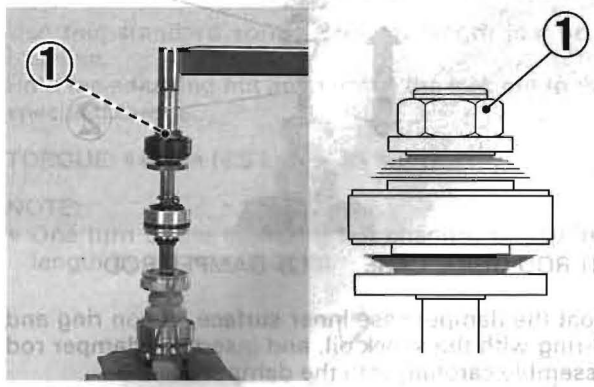


(1) REBOUND VALVES (2) PISTON
(3) COMPRESSION VALVES (4) VALVE STOPPERS

Place the damper rod in a vise, and tighten a new end nut to the specified torque.

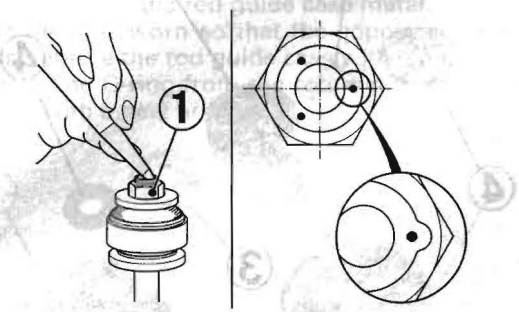
TORQUE: 37 N·m (3.8 kgf·m, 27 lbf·ft)

NOTE:
- To prevent damage to the lower mount, use a shop towel or a vise having soft jaws.



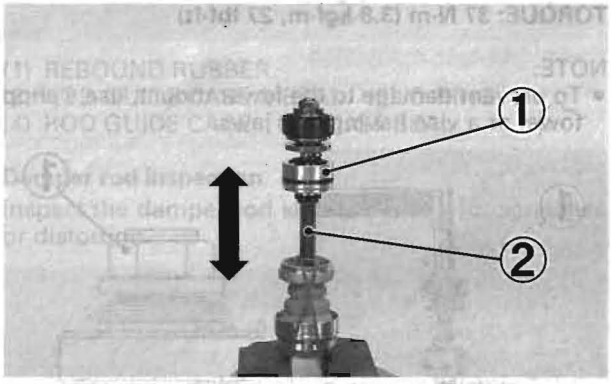
(1) END NUT

Stake the end of the damper rod in three places as shown to secure the end nut.



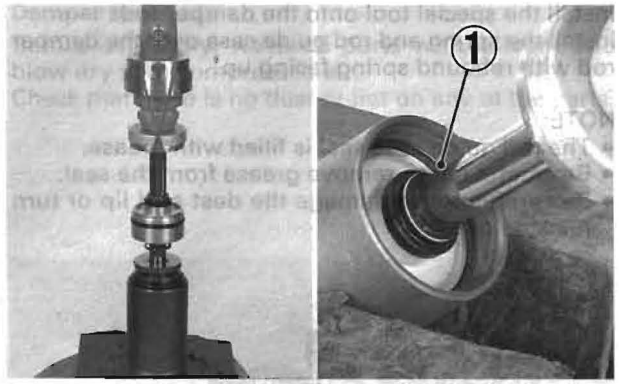
(1) DAMPER ROD NUT

Coat the damper rod with shock oil.
Check the rod guide case for smooth movement by sliding it up and down fully.



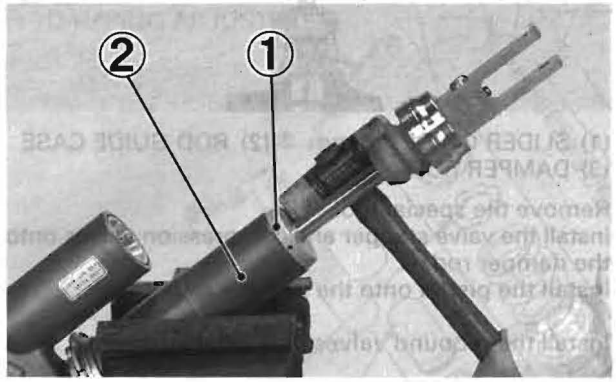
(1) ROD GUIDE CASE (2) DAMPER ROD

Coat the damper case inner surface, piston ring and O-ring with the shock oil, and insert the damper rod assembly carefully into the damper case.
Install the stop ring into the groove in the damper case.



(1) STOP RING

Drive the end plate squarely and evenly into the damper case with a plastic hammer.



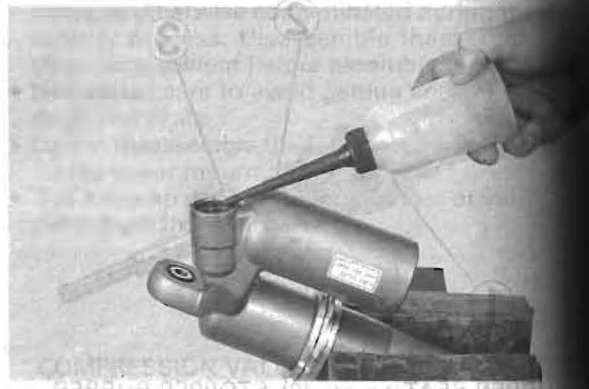
(1) END PLATE (2) DAMPER CASE

NOTE:
- Make sure the rod guide case is attached to the stop ring by pulling the damper rod out all the way.

Hold the upper shock absorber mount in a vise.
Fill the damper case and reservoir with the recommended oil through the damping adjuster hole.

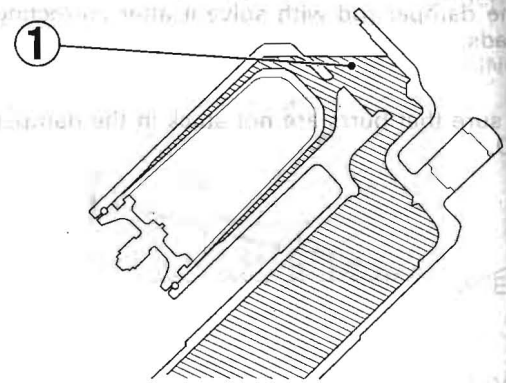
RECOMMENDED SHOCK OIL: SS 25
SHOCK OIL CAPACITY:
395 cm³ (13.4 US oz, 13.9 Imp oz)

Slowly pump the damper rod until there are no bubbles in the oil that overflows from the damper case.



Remove the damper unit from the vise.
Add the recommended oil up to the damping adjuster hole neck as shown.

NOTE:
- Hold the damping adjuster hole facing up and turn the damper unit as shown to bleed the air from the reservoir completely.



(1) DAMPING ADJUSTER HOLE NECK

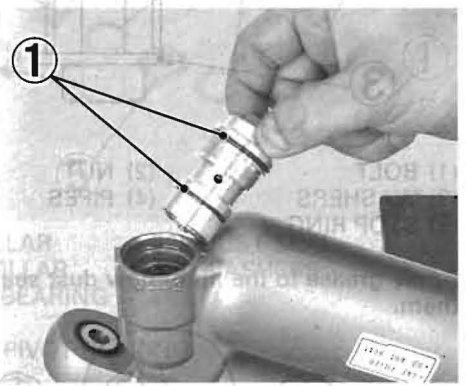
NOTE:
- Do not let oil flow out of the reservoir.

arily charge the reservoir with
(0.5 kgf/cm², 7.1 psi) of air slowly to inflate the
inside.

for any oil that may leak out of the valve
pressurizing. Replenish oil as necessary. Be
that the reservoir pressure is correct with an
pressure gauge.

damper with the recommended shock oil up
damping adjuster hole neck.

oil to new O-rings and install them to the
adjuster.
install the damping adjuster.

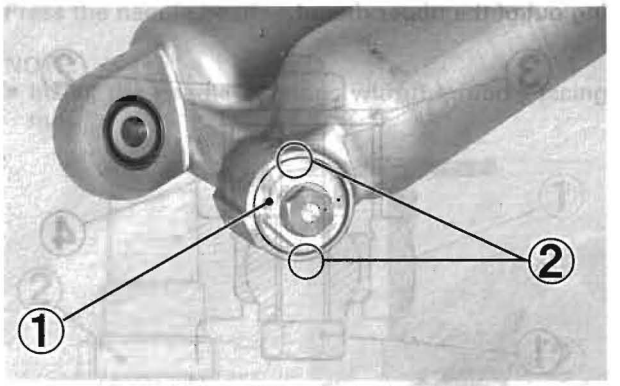


RINGS

the damping adjuster to the specified torque.

UE: 29 N·m (3.0 kgf·m, 22 lbf·ft)

Stake the damping adjuster as shown.



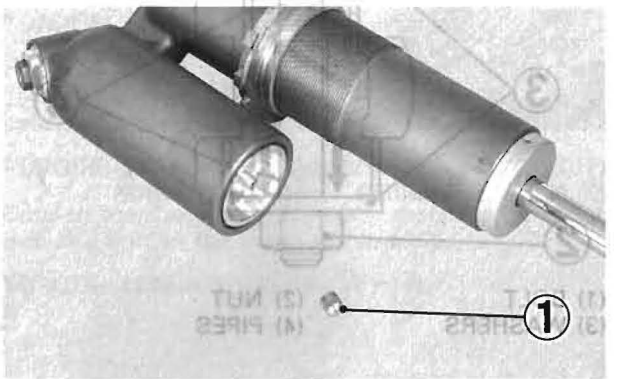
(1) DAMPING ADJUSTER (2) STAKE

Wipe off all oil from the damper rod; oil left on the damper rod can lead to premature failure of the oil seal. Check for oil leaks.
Release the nitrogen that was in the reservoir at precompression.
Fill the reservoir with 980 kPa (10.0 kgf/cm², 142 psi) of nitrogen gas.

⚠ WARNING

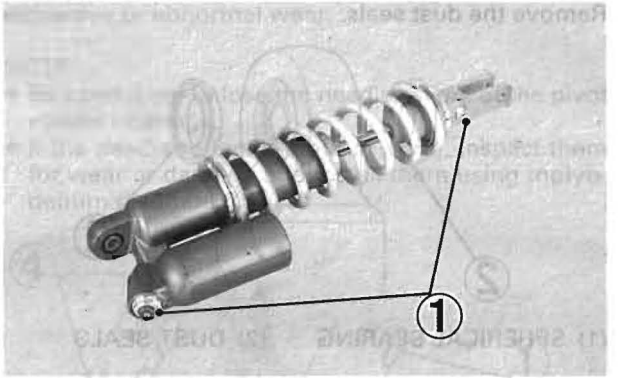
- ***The shock absorber is fitted with a gas-filled reservoir. Use only nitrogen gas to pressurize the shock absorber. The use of an unstable gas can cause a fire or explosion resulting in serious injury.***

Install the valve cap.



(1) VALVE CAP

Install the shock spring.
Install the spring seat, and stopper ring.
Temporarily tighten the lock nut and adjusting nut.
Turn the lower shock mount so that the rebound adjuster screw is on the same side of the reservoir.



(1) SAME SIDE

Turn the spring adjusting nut until the spring length is the specified standard length (see page 30).

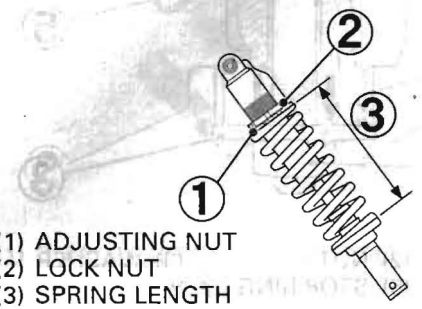
STANDARD SPRING LENGTH: 260.1 mm (10.24 in)

Use this standard spring preload length just as a baseline.
Hold the adjusting nut and tighten the lock nut to the specified torque.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)

NOTE:

- One turn of the adjusting nut changes the spring length by 1.5 mm (0.06 in)



(1) ADJUSTING NUT
(2) LOCK NUT
(3) SPRING LENGTH