

13. REAR WHEEL/BRAKE/SUSPENSION

SERVICE INFORMATION	13-1	SHOCK ABSORBER	13-12
TROUBLESHOOTING	13-2	SHOCK LINKAGE	13-15
REAR WHEEL	13-3	SWING ARM	13-18
REAR BRAKE	13-9		

SERVICE INFORMATION

GENERAL

- A box or work stand is required to support the motorcycle.
- Use genuine suspension linkage and shock absorber pivot/mount bolts. Note installation direction of the bolts.

⚠ WARNING

- *The shock absorber contains nitrogen under high pressure. Do not allow fire or heat near the shock absorber. Before disposal of the shock absorber, release the nitrogen (see page 13-14).*
- *Inhaled asbestos fibers have been found to cause respiratory disease and cancer. Never use an air hose or dry brush to clean brake assemblies.*
- *In the United States, use an OSHA-approved vacuum cleaner or alternate method approved by OSHA designed to minimize the hazard caused by airborne asbestos fibers.*

SPECIFICATION

ITEM		STANDARD	SERVICE LIMIT
Rear wheel runout	Radial	—	2.0 mm (0.08 in)
	Axial	—	2.0 mm (0.08 in)
Rear axle runout		—	0.2 mm (0.01 in)
Rear brake drum I.D.		130.0 mm (5.12 in)	131.0 mm (5.16 in)
Rear brake shoe thickness		4.0 mm (0.16 in)	2.0 mm (0.08 in)
Shock absorber spring free length		237.5 mm (9.35 in)	235.1 mm (9.26 in)
Rear suspension damper compression		33 kg (72.8 lb)	28 kg (61.7 lb)

TORQUE VALUES

Driven sprocket nut	46 N·m (4.6 kg-m, 33 ft-lb) Apply oil to the threads
Rear axle nut	95 N·m (9.5 kg-m, 69 ft-lb)
Brake arm nut	10 N·m (1.0 kg-m, 7 ft-lb)
Shock absorber spring lock nut	90 N·m (9.0 kg-m, 65 ft-lb)
Shock absorber upper mount nut	75 N·m (7.5 kg-m, 54 ft-lb)
Shock absorber lower mount bolt	45 N·m (4.5 kg-m, 32 ft-lb)
Shock arm-to-shock link nut	45 N·m (4.5 kg-m, 32 ft-lb)
Shock link-to-swing arm nut	45 N·m (4.5 kg-m, 32 ft-lb)
Shock arm-to-frame nut	45 N·m (4.5 kg-m, 32 ft-lb)
Swing arm pivot nut	110 N·m (11.0 kg-m, 80 ft-lb)

TOOLS

Special

Driver shaft	07946—MJ00100	} Not available in U.S.A.
Needle bearing remover	07931—MA70000	
Bearing remover, 20 mm	07936—3710600	
Remover handle	07936—3710100	
Remover sliding weight	07936—3710200	

REAR WHEEL/BRAKE/SUSPENSION

Common

Bearing remover head, 17 mm	07746-0050500	} or equivalent commercially available in U.S.A.
Bearing remover shaft	07746-0050100	
Driver	07749-0010000	
Attachment, 37 x 40 mm	07746-0010200	
Pilot, 17 mm	07746-0040400	
Attachment, 42 x 47 mm	07746-0010300	
Attachment, 24 x 26 mm	07746-0010700	
Pilot, 20 mm	07746-0040500	
Pilot, 22 mm	07746-0041000	

TROUBLESHOOTING

Wobble or vibration in motorcycle

- Bent rim
- Loose wheel bearing(s)
- Loose or bent spokes
- Damaged tire
- Axle not tightened properly
- Swing arm pivot bearing worn
- Chain adjusters not adjusted equally

Soft suspension

- Weak spring
- Improper shock absorber spring preload

Hard suspension

- Improper shock absorber spring preload
- Bent damper rod
- Swing arm pivot bearings damaged
- Bent frame or swing arm

Suspension noise

- Faulty damper
- Loose fasteners
- Worn suspension linkage pivot bearing(s)

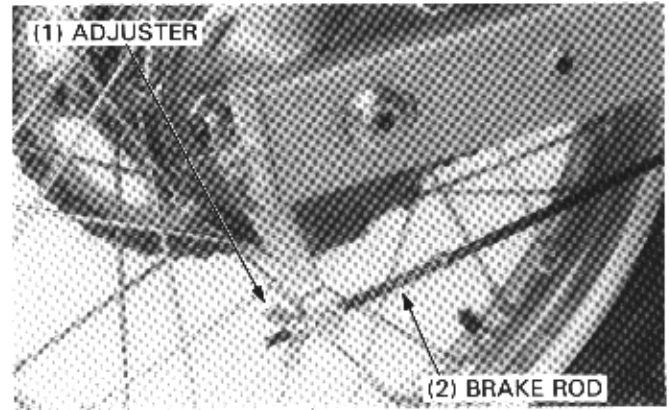
Poor brake performance

- Improper brake adjustment
- Worn brake shoes
- Brake linings oily, greasy or dirty
- Worn brake cam
- Worn brake drum
- Brake arm serrations improperly engaged
- Brake shoes worn at cam contact area

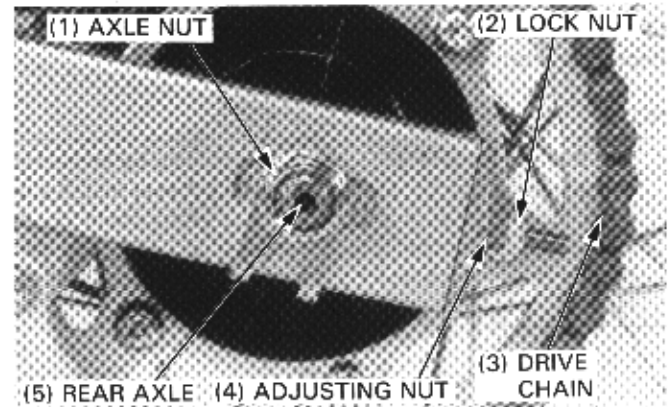
REAR WHEEL

REMOVAL

Raise the rear wheel off the ground by placing a box or work stand under the engine.
Remove the adjuster from the brake rod.
Disconnect the brake rod from the brake arm.



Remove the axle nut and loosen the drive chain adjuster lock nut and adjusting nut.
Move the rear wheel forward all the way and detach the drive chain from the driven sprocket.
Remove the rear axle and rear wheel.

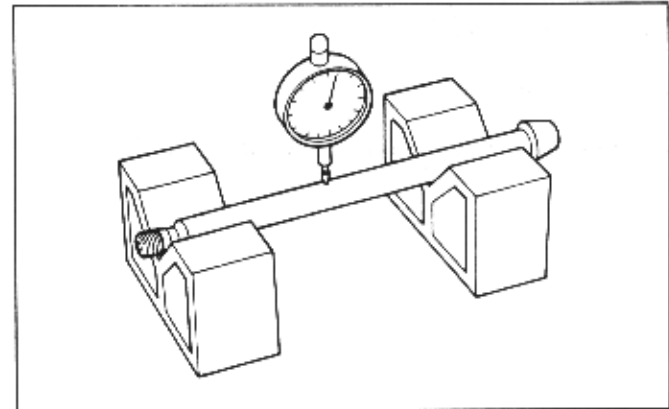


Remove the rear brake panel from the rear wheel.

INSPECTION

Set the axle on V blocks and measure the runout.
The actual runout is 1/2 of the total indicator reading.

SERVICE LIMIT: 0.2 mm (0.01 in)

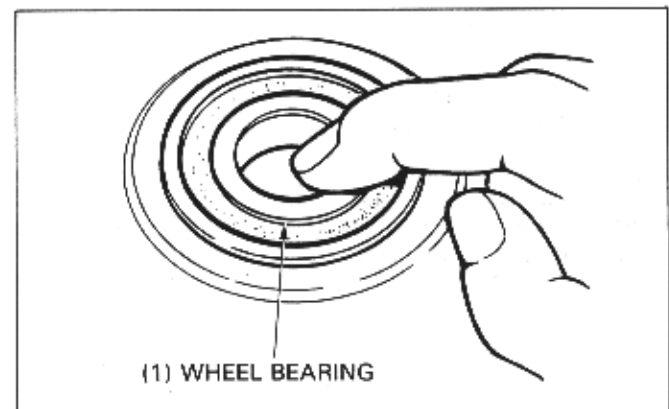


Turn the inner race of each bearing with your finger.
The bearings should turn smoothly and quietly.
Also check that the bearing outer race fits tightly in the hub.
Remove and discard the bearings if the races do not turn smoothly, quietly, or if they fit loosely in the hub.

NOTE

- Replace wheel bearings in pairs.

For bearing replacement, see page 13-6.



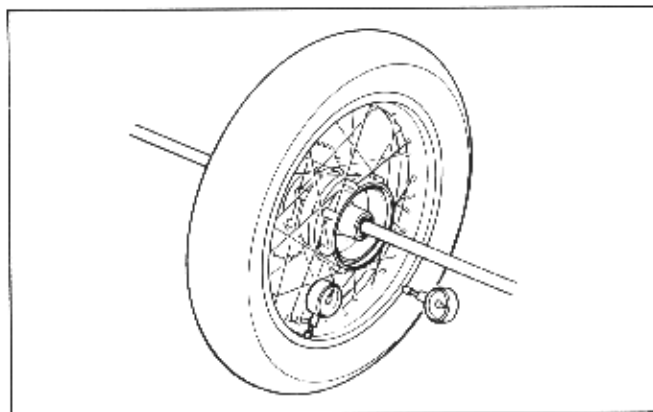
REAR WHEEL/BRAKE/SUSPENSION

Check the rim runout by placing the wheel on a truing stand. Turn the wheel by hand and measure the runout using a dial indicator.

SERVICE LIMITS:

RADIAL: 2.0 mm (0.08 in)

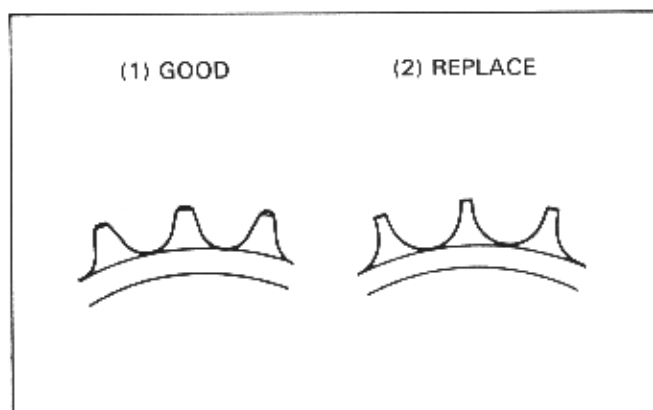
AXIAL: 2.0 mm (0.08 in)



Check the condition of the final driven sprocket teeth. Replace a worn or damaged sprocket.

NOTE

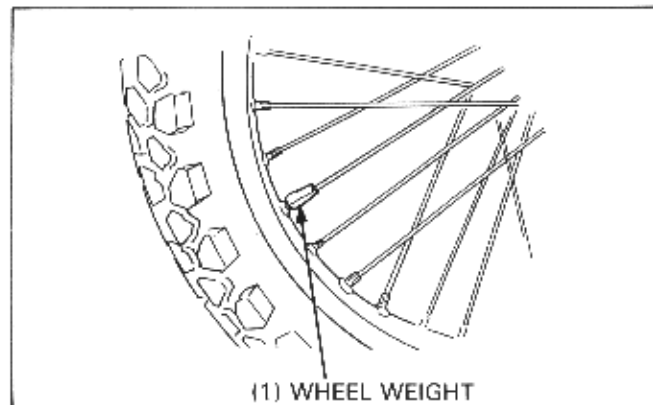
- The drive chain and drive sprocket must also be inspected if the driven sprocket is worn or damaged. Never install a new drive chain on worn sprockets or a worn chain on new sprockets. Both chain and sprocket must be in good condition or the new replacement chain or sprockets will wear rapidly.



WHEEL BALANCING

Refer to page 12-6.

Do not add the wheel weight more than 60 grams.

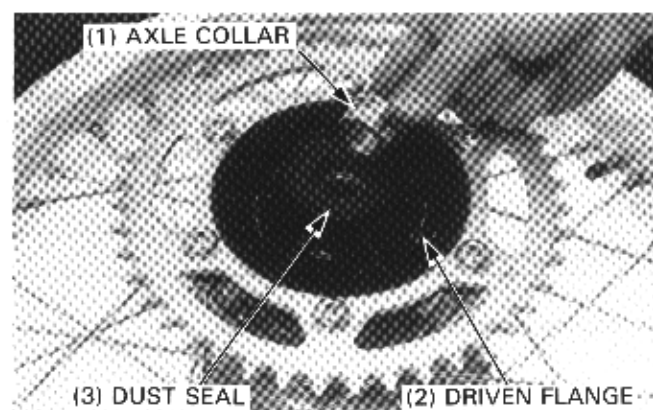


DISASSEMBLY

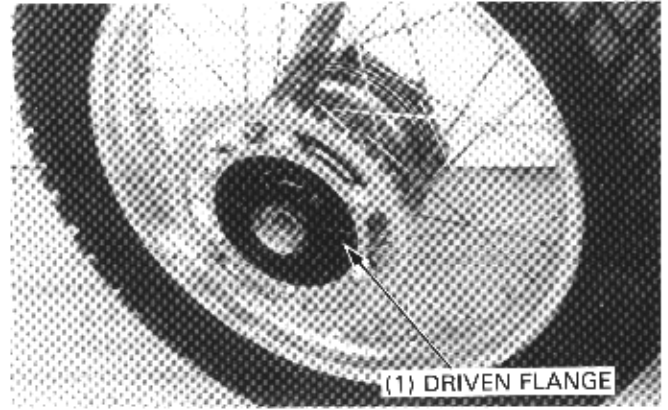
Remove the axle collar and dust seal.
Remove the final driven flange.

NOTE

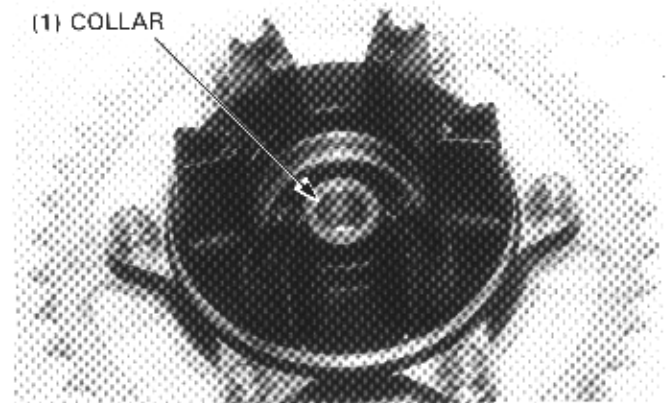
- When removing the driven sprocket, loosen the sprocket bolt with the driven flange installed.



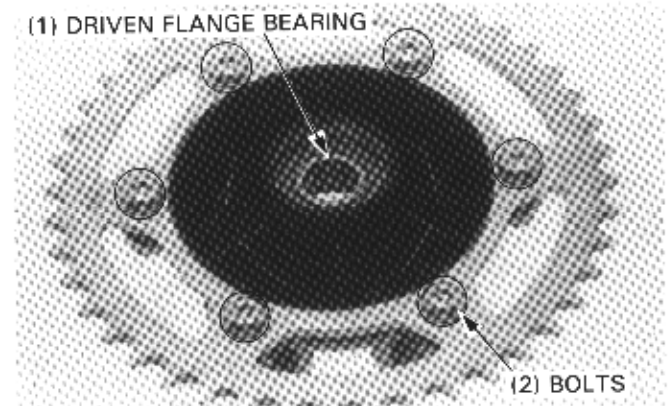
If the driven flange fits tightly in the hub, drive it out by tapping several locations.



When replacing the driven flange bearing, remove the collar from the bearing.



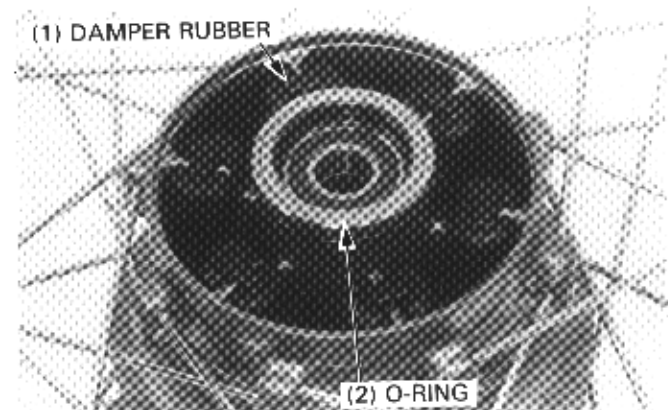
Drive out the driven flange bearing, if necessary.
Remove the driven sprocket from the driven flange, if necessary.



Remove the damper rubbers.

Replace the damper rubbers if they are damaged or deteriorated.

Remove the O-ring.



REAR WHEEL/BRAKE/SUSPENSION

Drive out the wheel bearings and the distance collar.

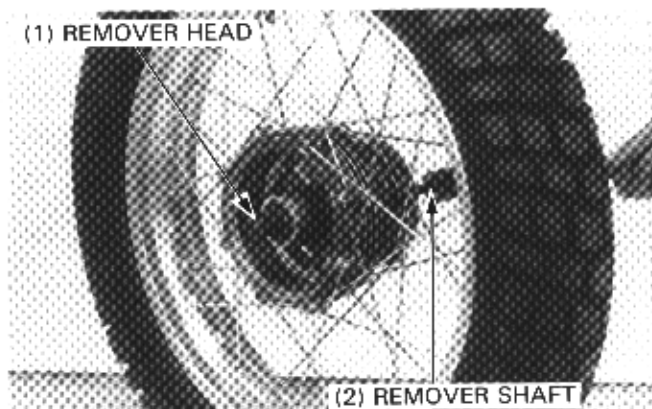
NOTE

- If the bearings are removed, they should be replaced with new ones.

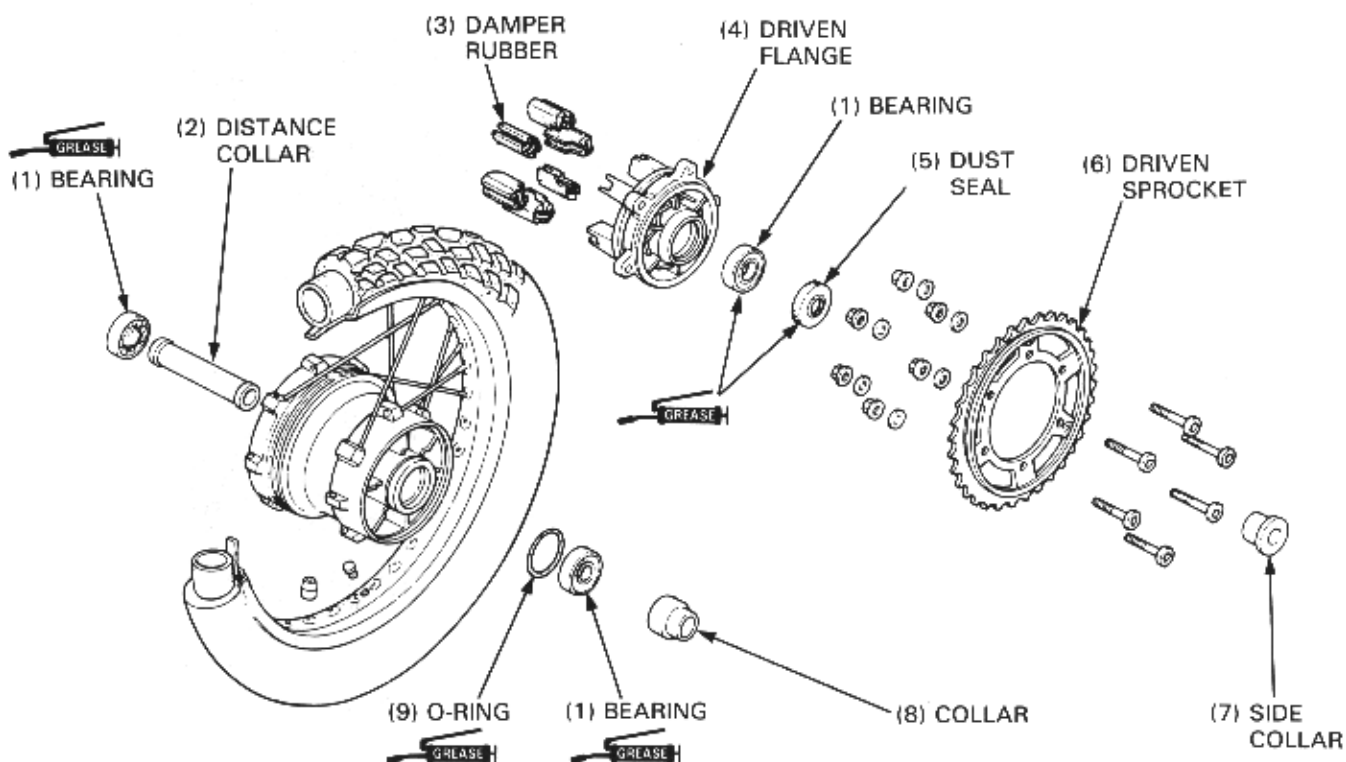
TOOLS:

Bearing remover head, 17 mm 07746-0050500
or equivalent commercially
available in U.S.A.

Bearing remover shaft 07746-0050100
or equivalent commercially
available in U.S.A.



ASSEMBLY



Place the rim and tire on the work bench.

Adjust the position so that the distance from the right end surface of the hub to the side of rim is 8 mm (0.3 in) as shown.

Tighten the spokes in 2 or 3 progressive steps.

TORQUE: 4 N·m (0.4 kg-m, 3 ft-lb)

TOOL:

Spoke wrench C, 5.8 x 6.1 mm 07701-0020300
or equivalent commercially
available in U.S.A.

Install the rim band, rim lock, tube and the tire with its directional arrow mark pointing in the direction of normal rotation for forward motion.

Tighten the rim lock.

TORQUE: 13 N·m (1.3 kg-m, 9.4 ft-lb)

Check the wheel rim runout as shown on page 13-4, and adjust as required.

Pack the bearing cavities with grease.

Drive in the right bearing with the sealed side of the bearing facing out away from the center of the hub.

Be careful not to tilt the bearing while driving it into the hub and make sure that it is fully seated.

Install the distance collar in the hub, then drive in the left bearing with its sealed side facing out.

⚠ WARNING

- Grease on the brake drum reduces stopping power. Keep grease off the brake drum.

TOOLS:

Driver 07749-0010000
Attachment, 37 x 40 mm 07746-0010200
Pilot, 17 mm 07746-0040400

Pack a new driven flange bearing with grease, then drive it into the driven flange with its sealed end facing out.

TOOLS:

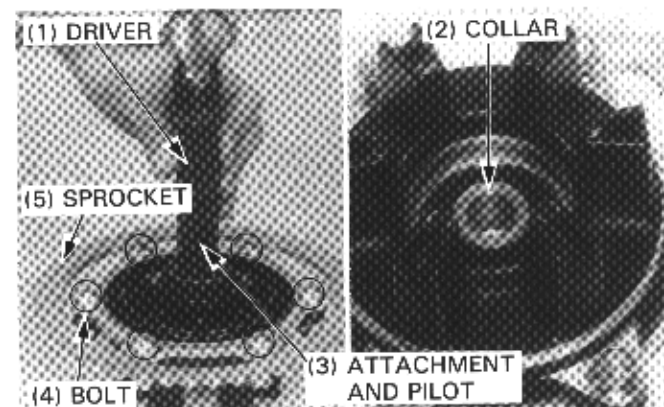
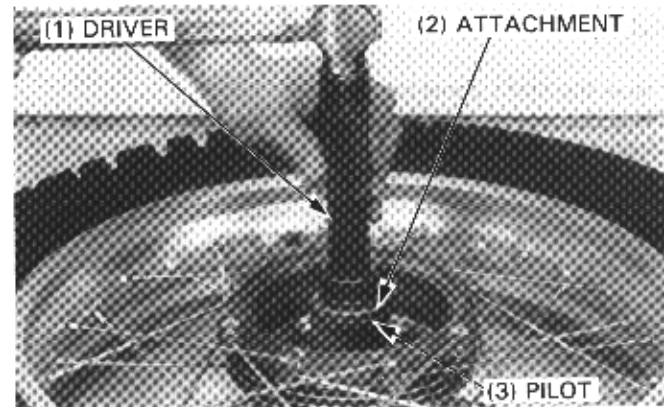
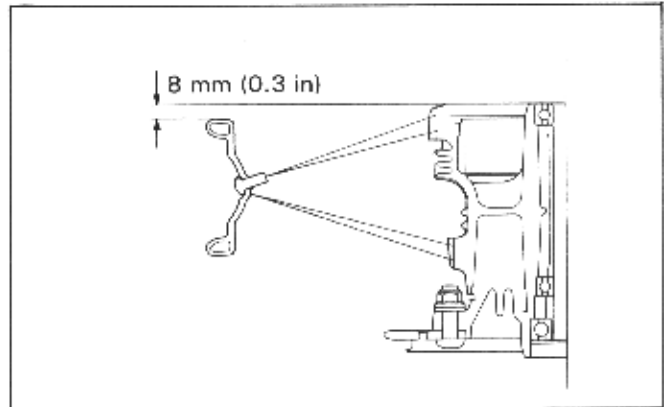
Driver 07749-0010000
Attachment, 42 x 47 mm 07746-0010300
Pilot, 20 mm 07746-0040500

Install the collar onto the driven flange bearing.

If the driven sprocket was removed, install it with the teeth number facing out.

Apply oil to the threads of the driven sprocket bolts and tighten the sprocket nuts to the specified torque.

TORQUE: 46 N·m (4.6 kg-m, 33 ft-lb)

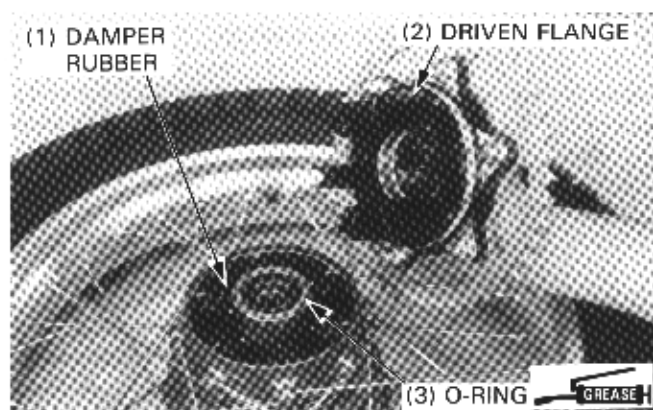


REAR WHEEL/BRAKE/SUSPENSION

Install the damper rubbers.

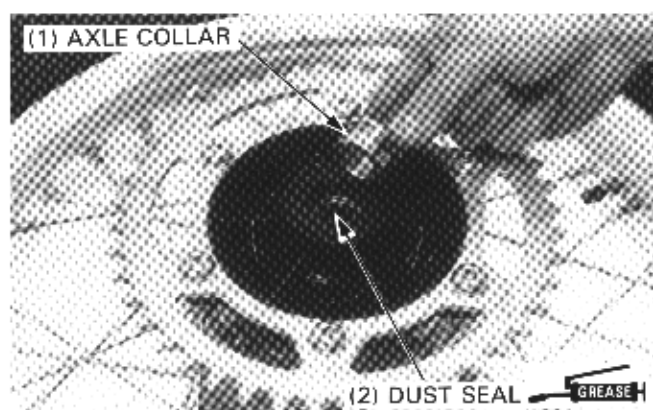
Apply grease to a new O-ring and install it onto the groove of the wheel hub.

Install the driven flange.



Apply grease to the dust seal lip and install it.

Install the axle collar.

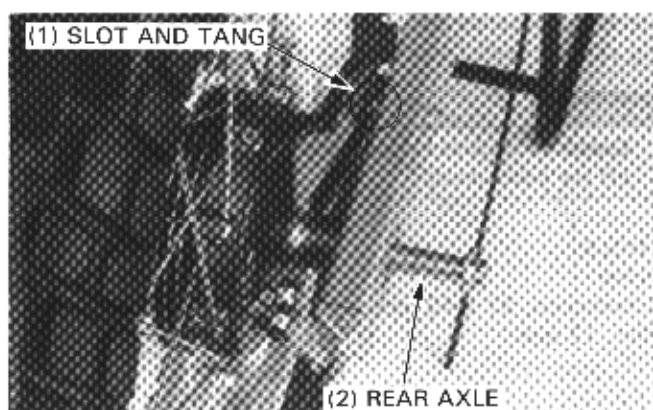


INSTALLATION

Install the brake panel on the wheel hub.

Place the rear wheel between the swing arm and rail the drive chain over the driven sprocket.

Lift the rear wheel and insert the tang on the swing arm into the slot in the brake panel, then insert the rear axle from right side through swing arm.

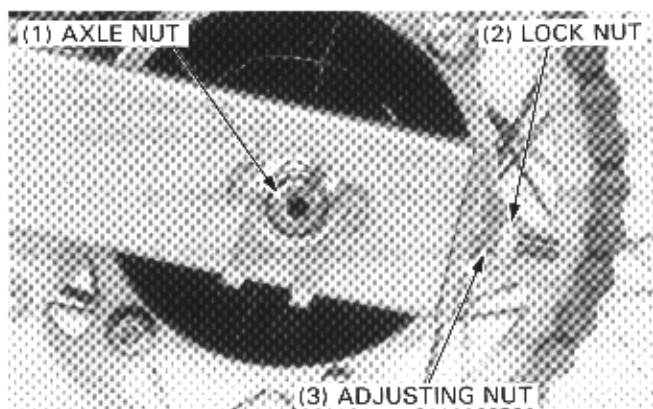


Loosely install the axle nut.

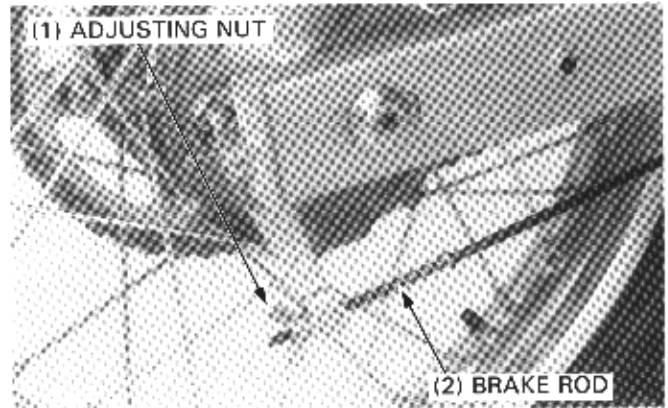
Adjust the drive chain (page 3-8).

Tighten the rear axle nut.

TORQUE: 90 N·m (9.0 kg-m, 65 ft-lb)



Connect the brake rod to the brake arm and install the adjusting nut.
Adjust the rear brake pedal free play (page 3-11).

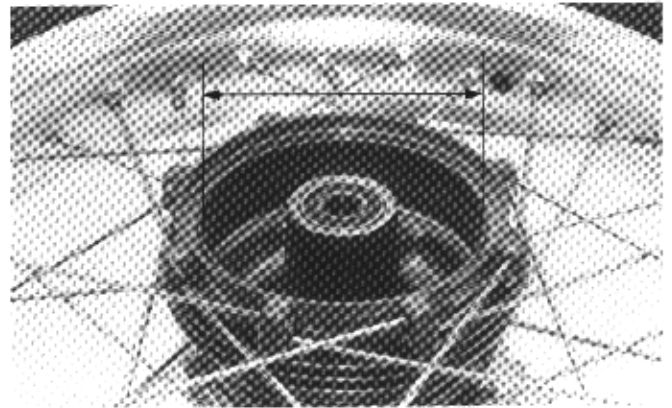


REAR BRAKE

INSPECTION

Remove the rear wheel (page 13-3).
Remove the rear brake panel.
Measure the rear brake drum I.D.

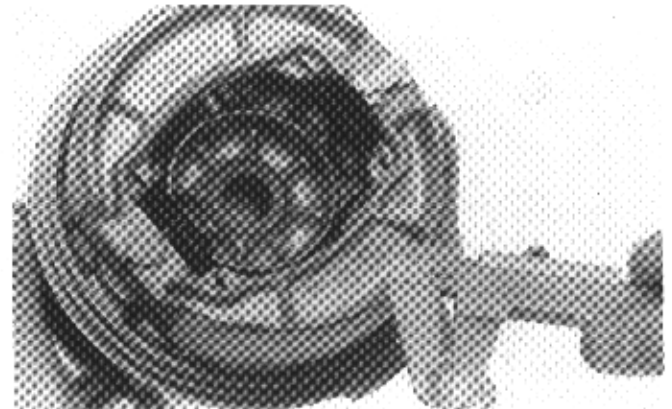
SERVICE LIMIT: 131 mm (5.16 in)



Measure the rear brake lining thickness.

SERVICE LIMIT: 2.0 mm (0.08 in)

Replace the brake shoes if thinner than the service limit.

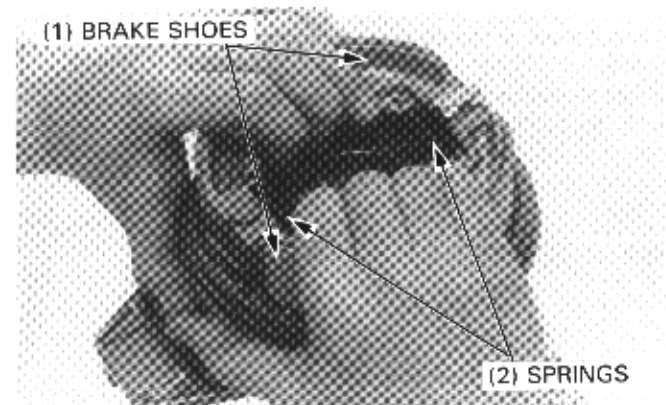


DISASSEMBLY

Remove the brake shoes and springs from the brake panel.

NOTE

- Mark the shoes to indicate their original positions before removing them.

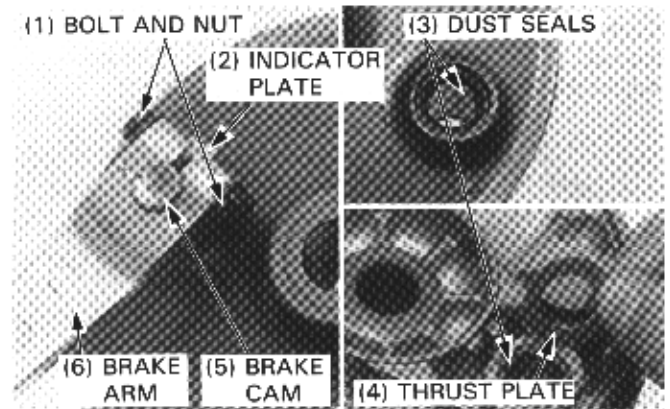


REAR WHEEL/BRAKE/SUSPENSION

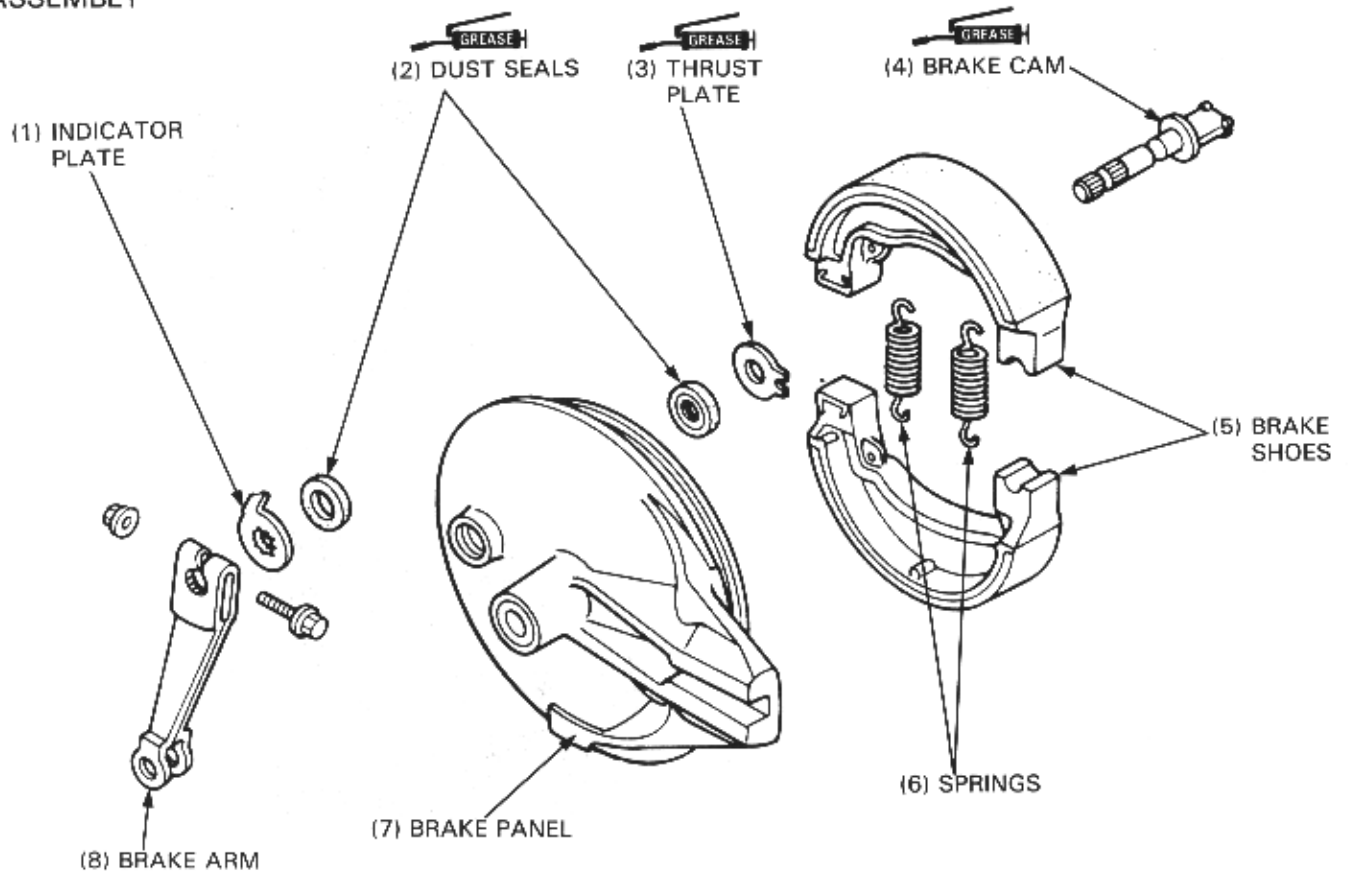
Remove the following parts from the brake panel:

- Bolt nut, and brake arm
- Indicator plate
- Brake cam
- Thrust plate
- Dust seals

Clean all parts thoroughly.

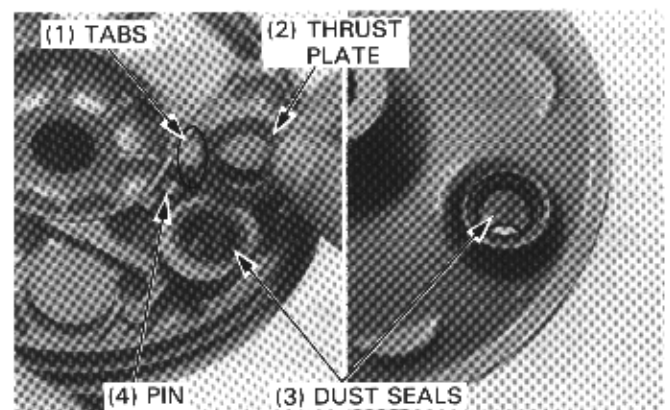


ASSEMBLY



Apply grease to the dust seals, and install them into the brake panel.

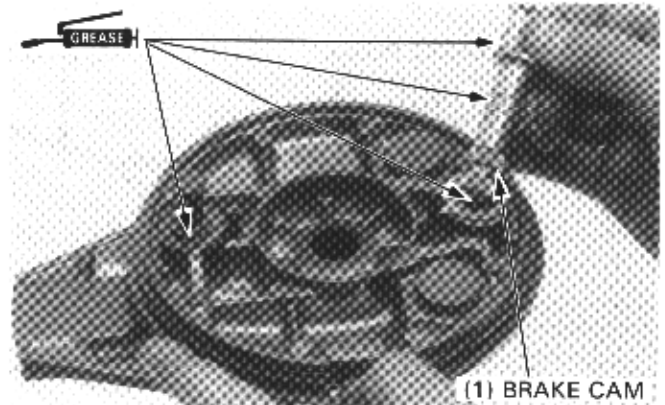
Install the thrust plate by aligning the pin on the brake panel with the slot in the plate.



Apply grease to the brake cam and install it.
Apply grease to the anchor pin and thrust plate.

⚠ WARNING

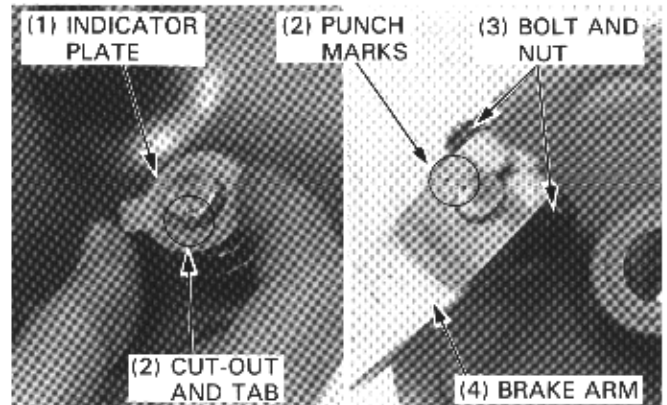
- Grease on the brake linings will reduce stopping power. Keep grease off the brake linings. Wipe excess grease off the cam and anchor pin.



Install the indicator plate onto the brake cam, aligning its tab with cut-out on the brake cam.

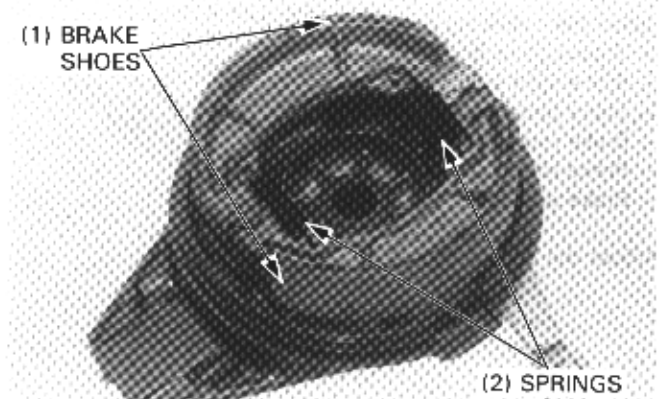
Install the brake arm by aligning the punch marks.
Install the bolt and tighten the nut to the specified torque.

TORQUE: 10 N·m (1.0 kg-m, 7 ft-lb)



Position the brake shoes in their original positions and install the springs.

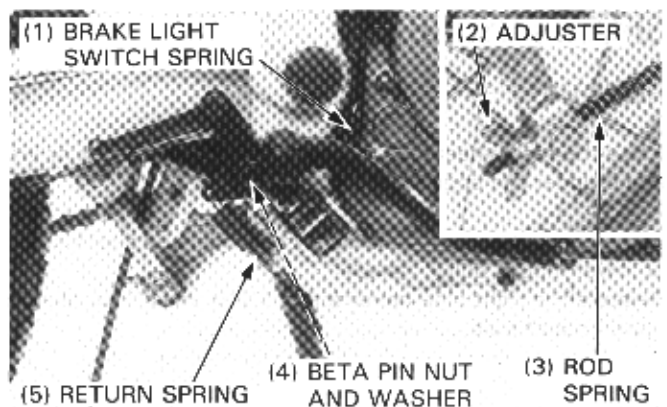
Check the rear brake assembly for smooth operation by moving the brake arm.

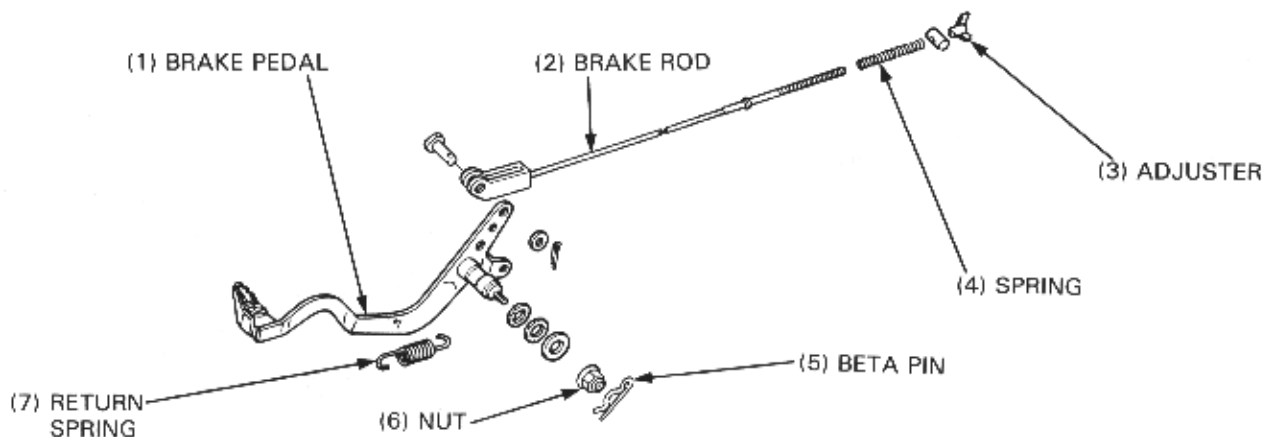


BRAKE PEDAL REMOVAL/INSTALLATION

Remove the following parts:

- Brake adjuster
- Brake rod from the brake arm
- Brake rod spring
- Brake pedal return spring
- Brake light switch spring
- Beta pin, nut and washer
- Brake pedal





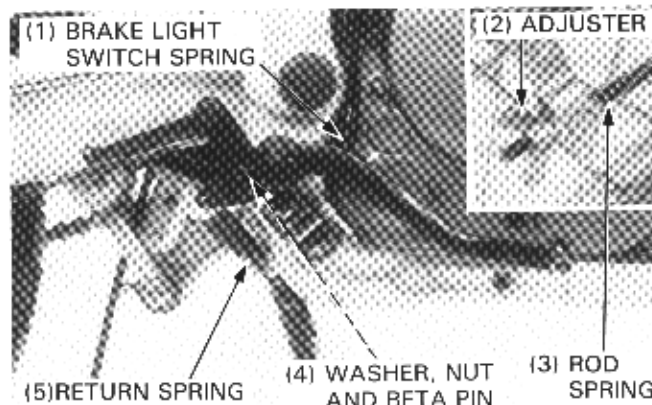
Apply grease to the dust seal lips and brake pedal pivot, and install the brake pedal.



Install the following parts:

- Washer, nut and beta pin
- Brake light switch spring
- Brake pedal return spring
- Brake rod spring
- Brake rod to the brake arm
- Brake adjuster

Adjust the brake pedal free play (page 3-11).



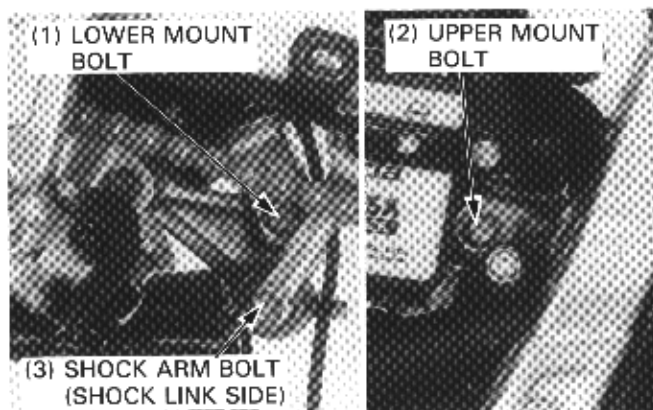
SHOCK ABSORBER

REMOVAL

Raise the rear wheel off the ground by placing a box or work stand under the engine.

Remove the shock arm bolt (shock link side) and shock absorber lower mount bolt.

Remove the right side cover (page 15-2) and shock absorber upper mount bolt.

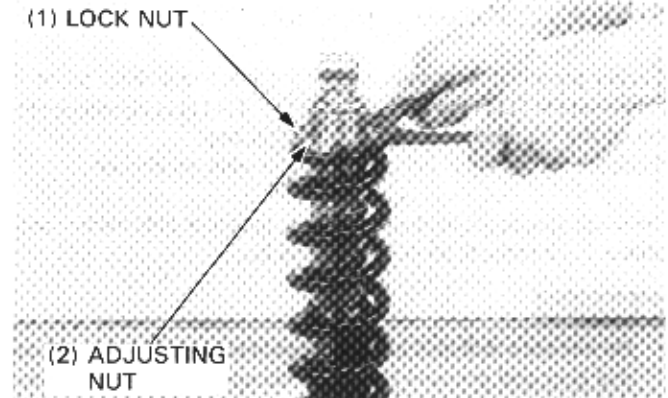


DISASSEMBLY

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

Remove the lock nut and adjusting nut.

Remove the shock spring.

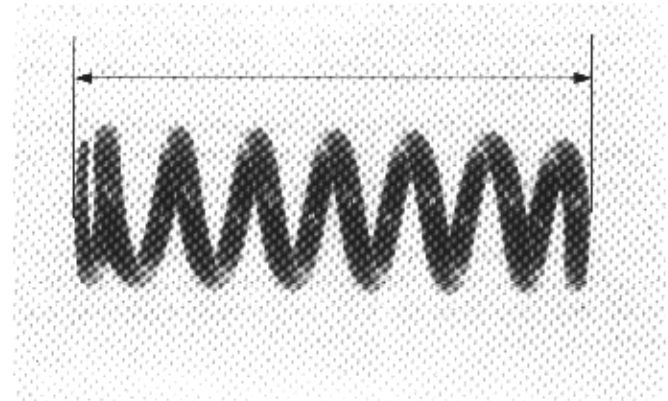


Check the spring for damage, and measure the spring free length.

SERVICE LIMIT: 235.1 mm (9.26 in)

⚠ WARNING

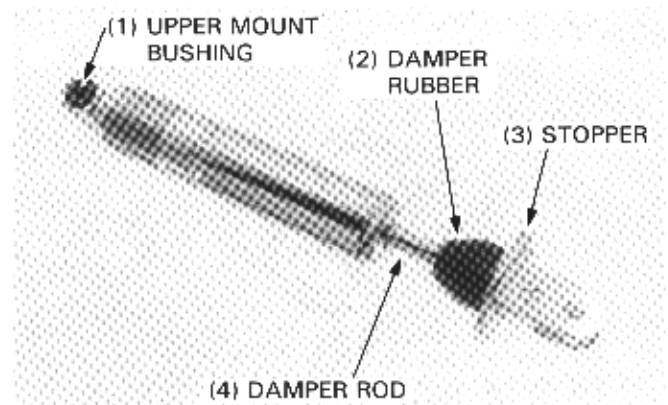
- *The damper unit is filled with nitrogen gas under high pressure, do not try to disassemble.*



Check the damper unit for oil leaks or other damage and the damper rod for trueness.

Check the spring seat stopper, spring seat, spring guide and damper rubber for wear or damage.

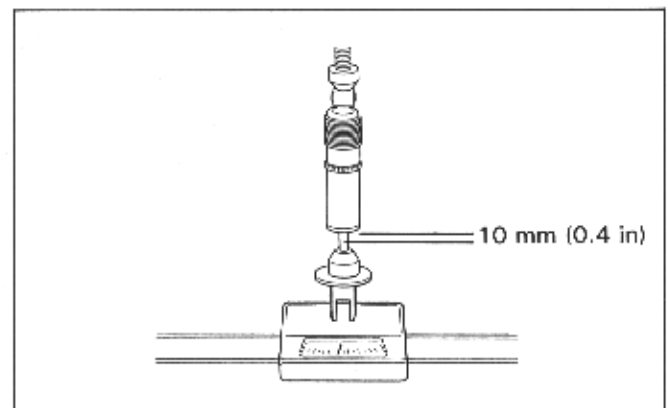
Check the upper mount bushing for wear or damage.



Mark the 10 mm position as shown of the damper rod. Place the damper rod on a scale and measure the force required to compress the damper 10 mm (0.4 in).

COMPRESSION FORCE: 33 kg (72.8 lb)

If the force required is less than 28 kg (61.7 lb), gas is leaking. Examine the damper rod and replace the damper unit if it is bent or scored.



REAR WHEEL/BRAKE/SUSPENSION

SHOCK ABSORBER DISPOSAL PROCEDURE

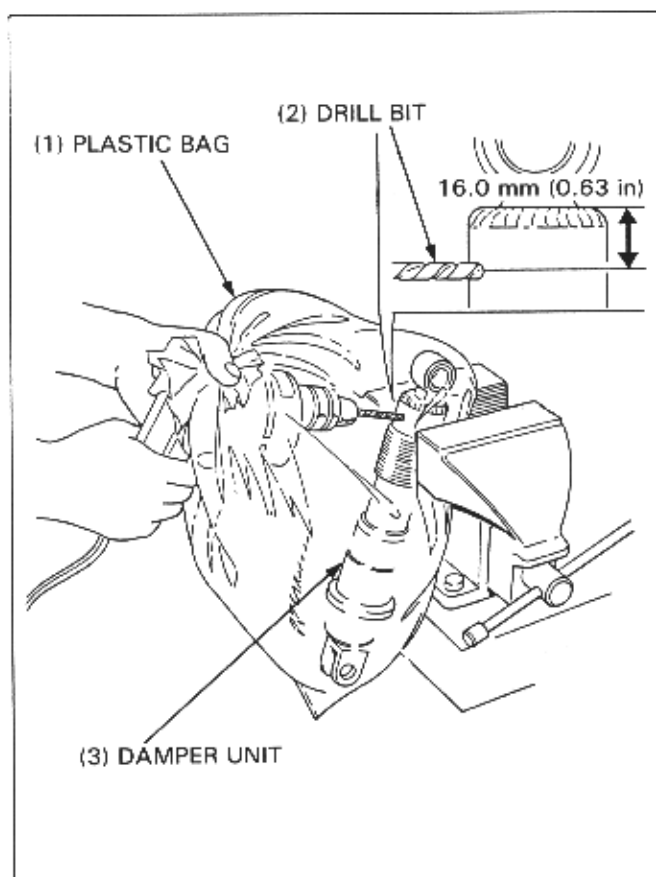
Center punch the damper case to mark the drilling point, approximately 16.0 mm (0.63 in) from the top surface. Wrap the damper unit inside a plastic bag. Support the damper unit upright in a vise as shown.

Through the open end of the bag, insert a drill motor with a sharp 2–3 mm (5/64–1/8 in) drill bit.

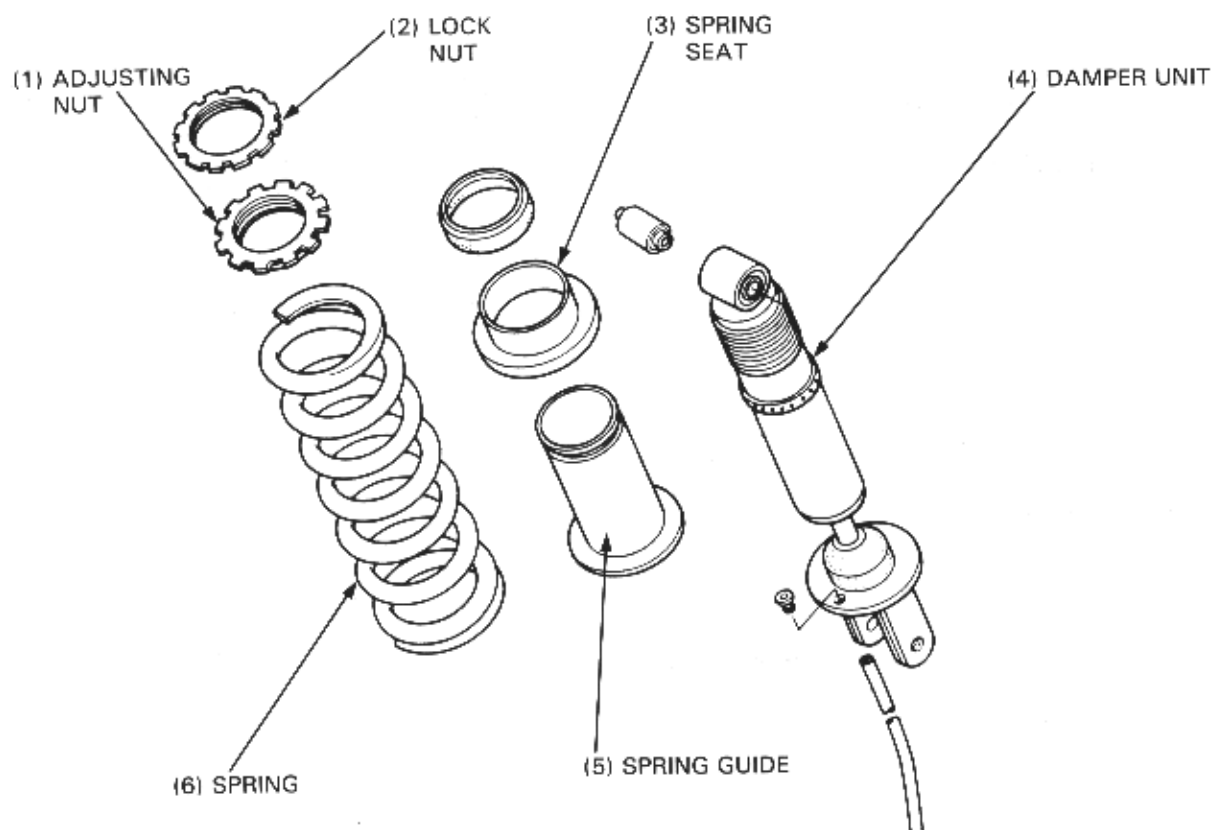
⚠ WARNING

- Do not use a dull drill bit which could cause a build-up of excessive heat and pressure inside the damper, leading to explosion and severe personal injury.
- The shock absorber contains nitrogen gas and oil under high pressure. Do not drill any farther down the damper case than the measurement given above, or you may drill into the oil chamber; oil escaping under high pressure may cause serious personal injury.
- Always wear eye protection to avoid getting metal shavings in your eyes when the gas pressure is released. The plastic bag is only intended to shield you from the escaping gas.

Hold the bag around the drill motor and briefly run the drill motor inside the bag; this will inflate the bag with air from the motor and help keep the bag from getting caught in the bit when you start.



ASSEMBLY



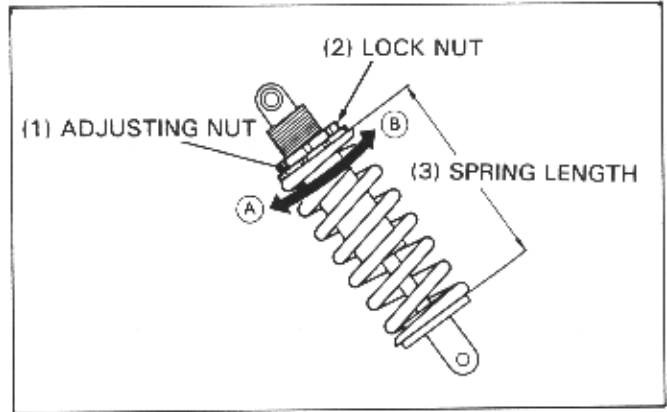
Install the spring, adjusting nut and lock nut.
Turn the spring adjusting nut until the spring length is as specified.

- A: DECREASE THE SPRING LENGTH
B: INCREASE THE SPRING LENGTH

STANDARD SPRING LENGTH: 237.5 mm (9.35 in)
MAXIMUM LENGTH: 239.9 mm (9.44 in)
MINIMUM LENGTH: 235.1 mm (9.26 in)

NOTE

- One turn of the adjusting nut changes the spring length by 1.5 mm.



Hold the shock absorber upper mount in a vice with soft jaws or a shop towel.
Using pin spanners, tighten the lock nut while holding the adjusting nut.

TORQUE: 90 N·m (9.0 kg-m, 65 ft-lb)

Install the breather tube to the seat stopper.

Install the shock absorber to the frame with the breather tube toward the rear.
Install and tighten the shock absorber upper mount bolt and nut.

TORQUE: 75 N·m (7.5 kg-m, 54 ft-lb)

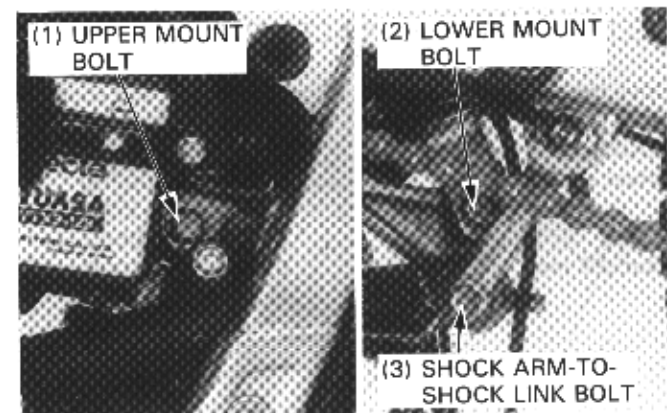
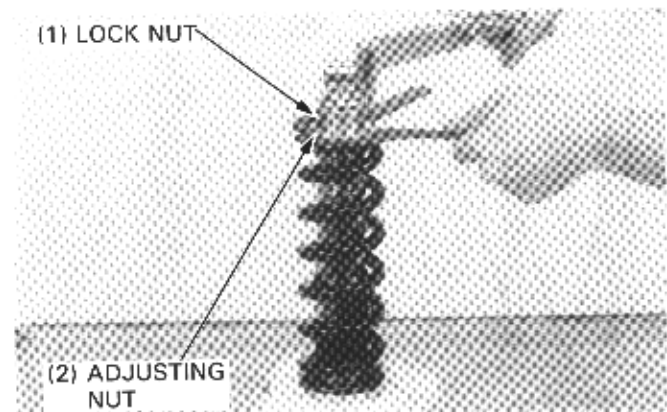
Install and tighten the shock absorber lower mount bolt.

TORQUE: 45 N·m (4.5 kg-m, 32 ft-lb)

Install and tighten the shock arm-to-shock link bolt.

TORQUE: 45 N·m (4.5 kg-m, 32 ft-lb)

Install the right side cover (page 15-2).
Check the operation of the shock absorber (page 3-14).



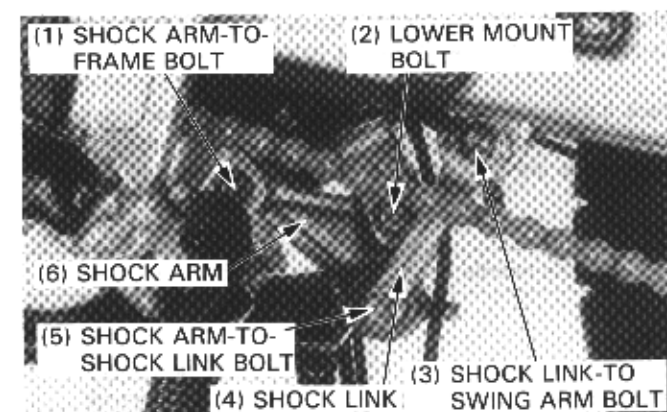
SHOCK LINKAGE

REMOVAL

Raise the rear wheel off the ground by placing a work stand or box under the engine.

Remove the following components:

- Shock arm-to-shock link bolt
- Shock link-to-swing arm bolt
- Shock link
- Shock absorber lower mount bolt
- Shock arm-to-frame bolt
- Shock arm



REAR WHEEL/BRAKE/SUSPENSION

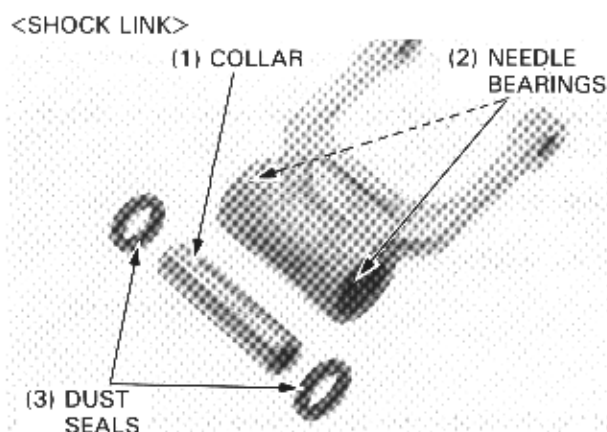
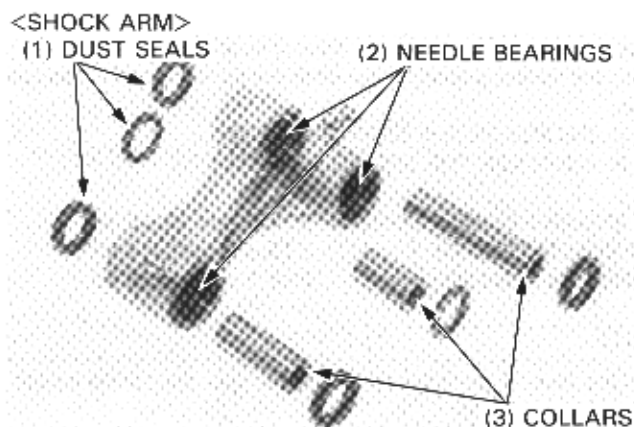
INSPECTION

Inspect the dust seals, collars and needle bearings.

Replace them if they have score marks, scratches, or excessive or abnormal wear.

NOTE

- Be careful not to lose the needle rollers of the shock arm and link pivot needle bearings.
- If the needle rollers are out of place, inspect them for wear or damage and install into place using molybdenum disulfide grease.



NEEDLE BEARING REPLACEMENT

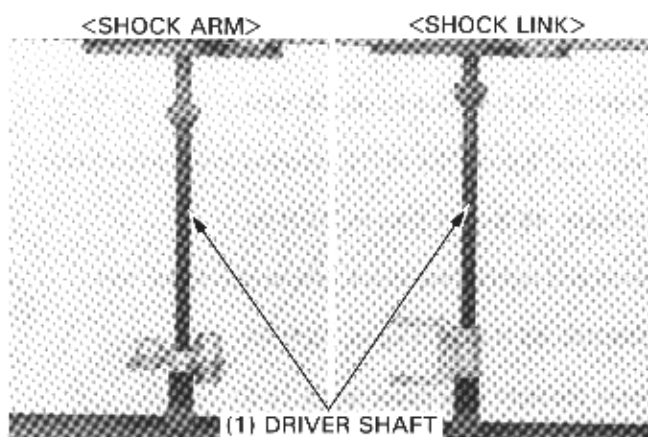
Drive the needle bearings out of the shock arm and shock link.

TOOLS:

Driver shaft
or

Driver
Pilot, 22 mm

07946—MJ00100
Not available in U.S.A.
07749—0010000
07746—0041000



SHOCK ABSORBER LOWER MOUNT BOLT PIVOT AND SHOCK ARM-TO-SHOCK LINK BOLT PIVOT

Pack a new needle bearings with multi purpose grease. Press the needle bearings into the shock arm until the bearing outer ends are on a level with the shock arm inner edges.

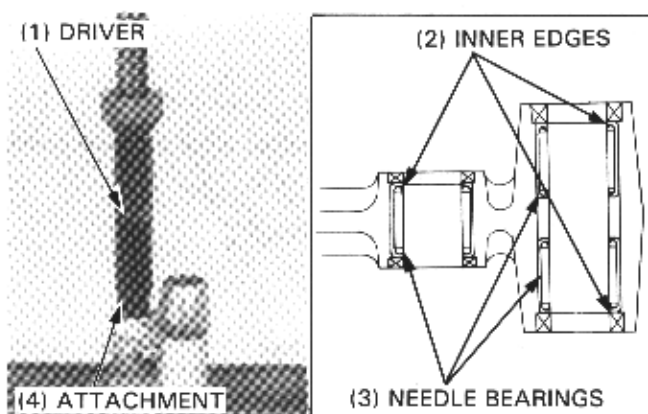
NOTE

- Press the needle bearing on the stamped end.

TOOLS:

Driver
Attachment, 24 x 26 mm

07749—0010000
07746—0010700



SHOCK ARM-TO-FRAME BOLT PIVOT

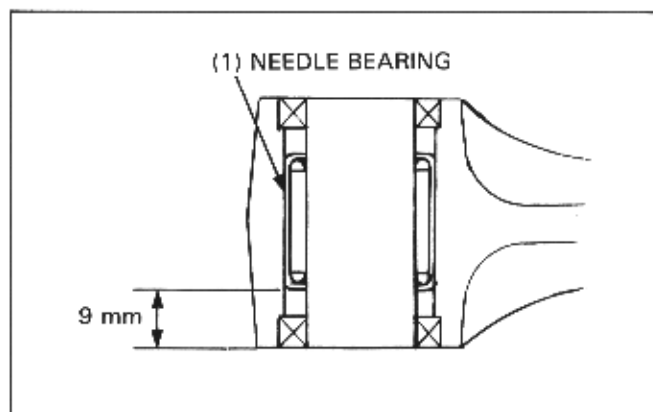
Pack a new needle bearing with multi purpose grease. Measuring with a vernier caliper, press the needle bearing into the shock arm 9 mm (0.35 in) below the outer edge of the shock arm.

NOTE

- Press the needle bearing on the stamped end.

TOOLS:

Driver 07749-0010000
Attachment, 24 x 26 mm 07746-0010700



SHOCK LINK-TO-SWING ARM BOLT PIVOT

Pack a new needle bearings with multi purpose grease. Fill the space between needle bearings with grease.

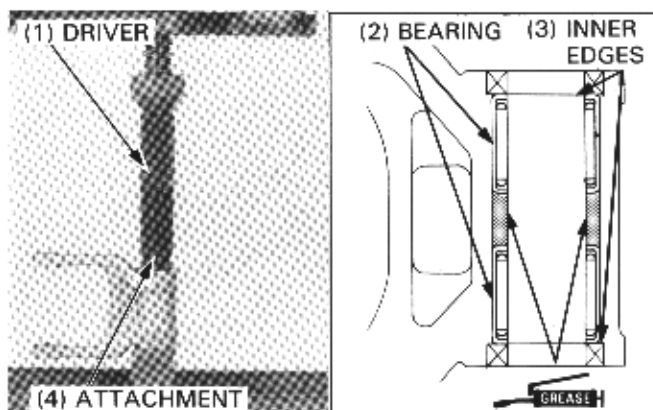
Press the needle bearings into the shock link until the bearing outer ends are on a level with the shock link inner edges.

NOTE

- Press the needle bearing on the stamped end.

TOOLS:

Driver 07749-0010000
Attachment, 24 x 26 mm 07746-0010700

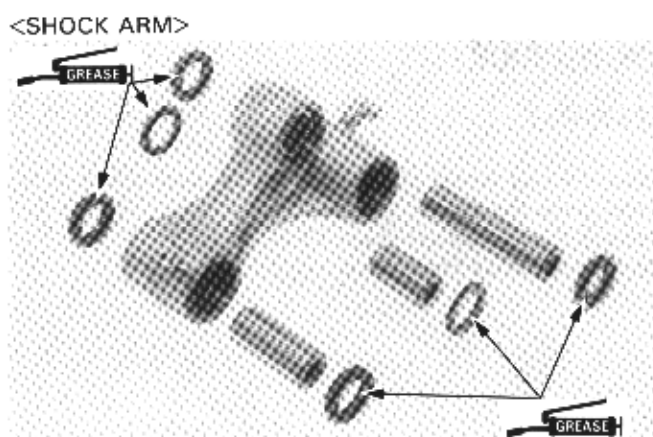


INSTALLATION

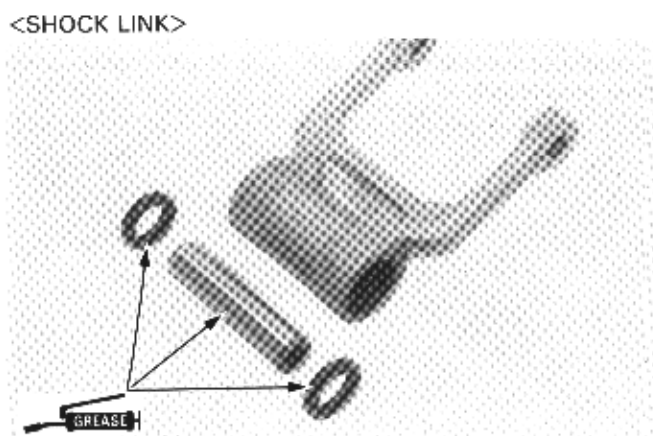
NOTE

- Make sure that the needle rollers of the needle bearings are in position before installing the pivot collars.

Apply multi purpose grease to the shock arm pivot collar surfaces and dust seal lips. Install the collars and dust seals into the shock arm.



Apply multi purpose grease to the shock link pivot collar surfaces and dust seal lips. Install the collars and dust seals into the shock link.

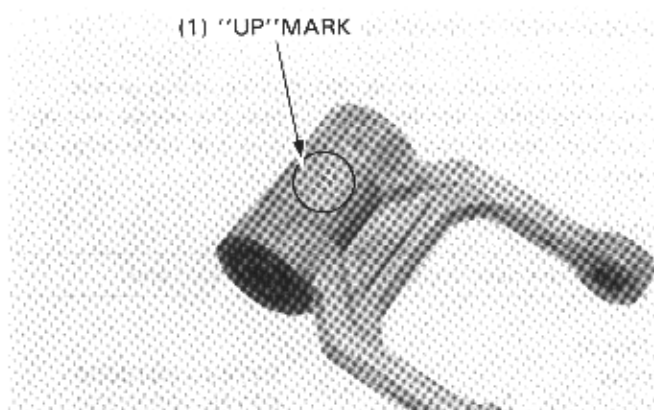


REAR WHEEL/BRAKE/SUSPENSION

Install the shock arm and shock link, and loosely install each bolt and nut.

NOTE

- Install the shock link with the "UP" mark facing up.



Tighten each bolt and nut to the specified torque.

TORQUE:

Shock link-to-swing arm nut:

45 N·m (4.5 kg-m, 32 ft-lb)

Shock absorber lower mount bolt:

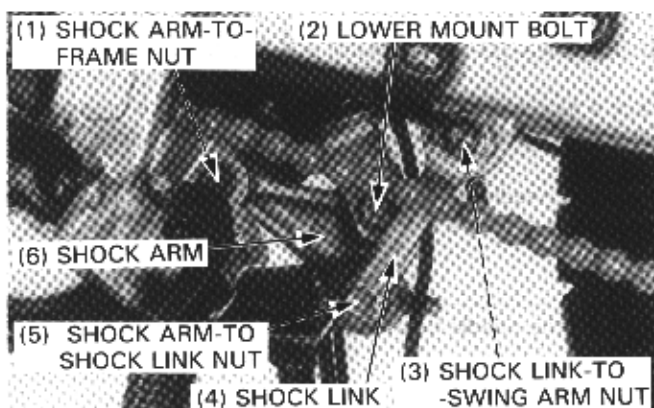
45 N·m (4.5 kg-m, 32 ft-lb)

Shock arm-to-shock link nut:

45 N·m (4.5 kg-m, 32 ft-lb)

Shock arm-to-frame nut:

45 N·m (4.5 kg-m, 32 ft-lb)



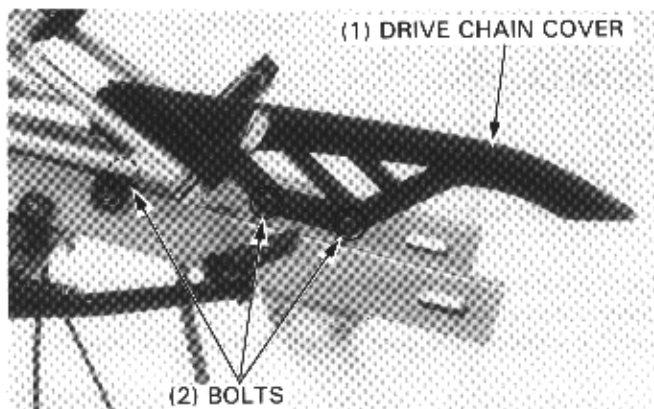
SWING ARM

REMOVAL

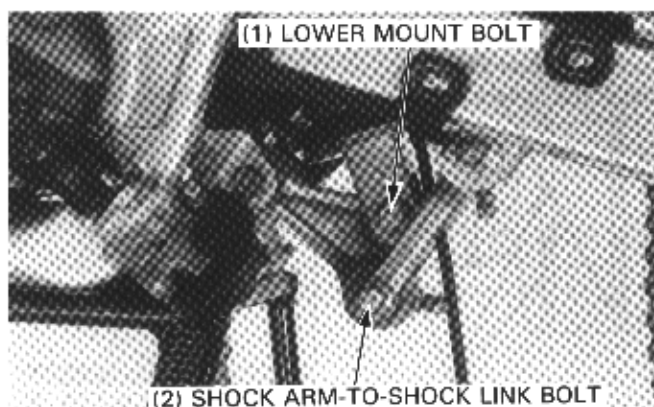
Raise the rear wheel off the ground by placing box or work stand under the engine.

Remove the rear wheel (page 13-3).

Remove the drive chain cover.

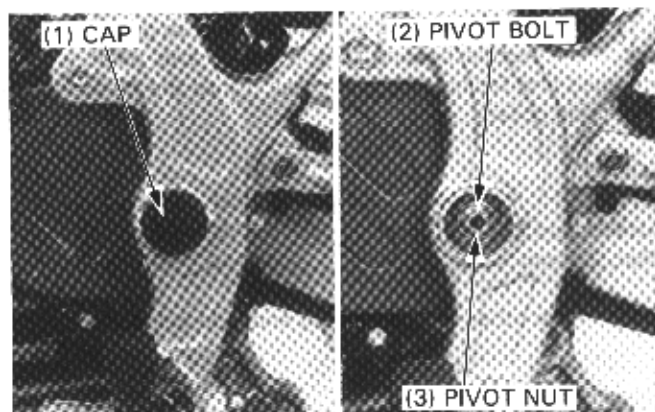


Remove the shock arm-to-shock link bolt and shock absorber lower mount bolt.



Remove the following parts:

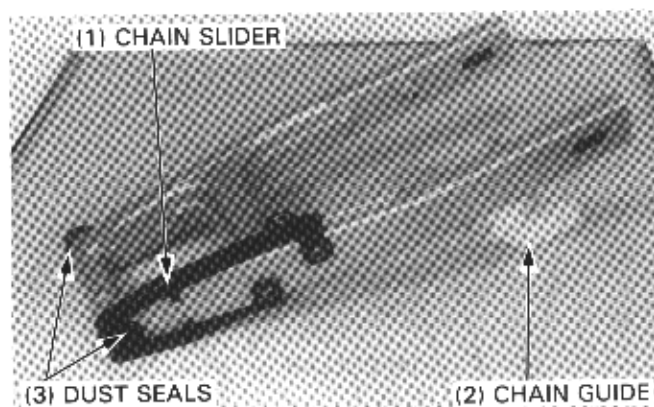
- Swing arm pivot cap
- Swing arm pivot nut and bolt
- Swing arm



DISASSEMBLY

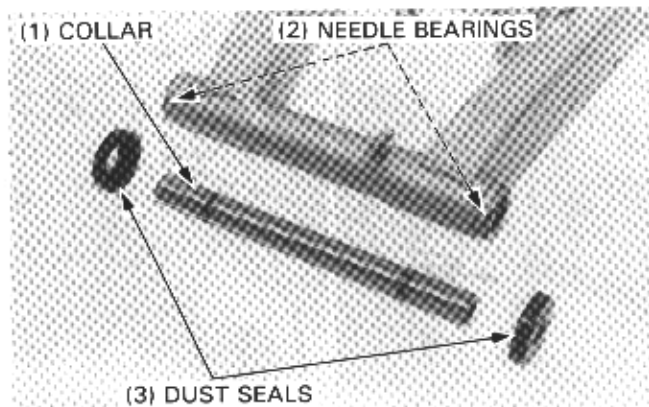
Remove the following parts from the swing arm.

- Dust seals
- Swing arm pivot collar
- Drive chain slider
- Drive chain guide



INSPECTION

Inspect the dust seals, pivot collar and needle bearings for wear or damage. Replace them if they have score marks, scratches, or excessive or abnormal wear.



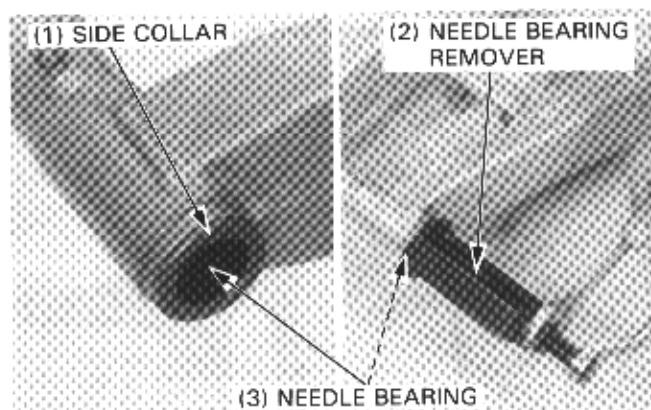
PIVOT BEARING REPLACEMENT

Remove the pivot side collars.

Set the needle bearing remover, screw out the pivot bearings and discard them.

TOOL:

Needle bearing remover	07931—MA70000
or	
Bearing remover, 20 mm	07936—3710600
Remover handle	07936—3710100
Remover sliding weight	07936—3710200



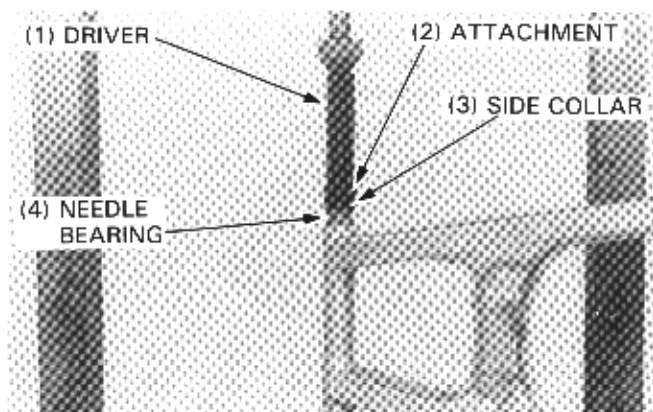
REAR WHEEL/BRAKE/SUSPENSION

Pack new needle bearings with multi purpose grease. Install the needle bearing to the swing arm pivot with the stamped end facing out, and press it into the pivot with the pivot side collar.

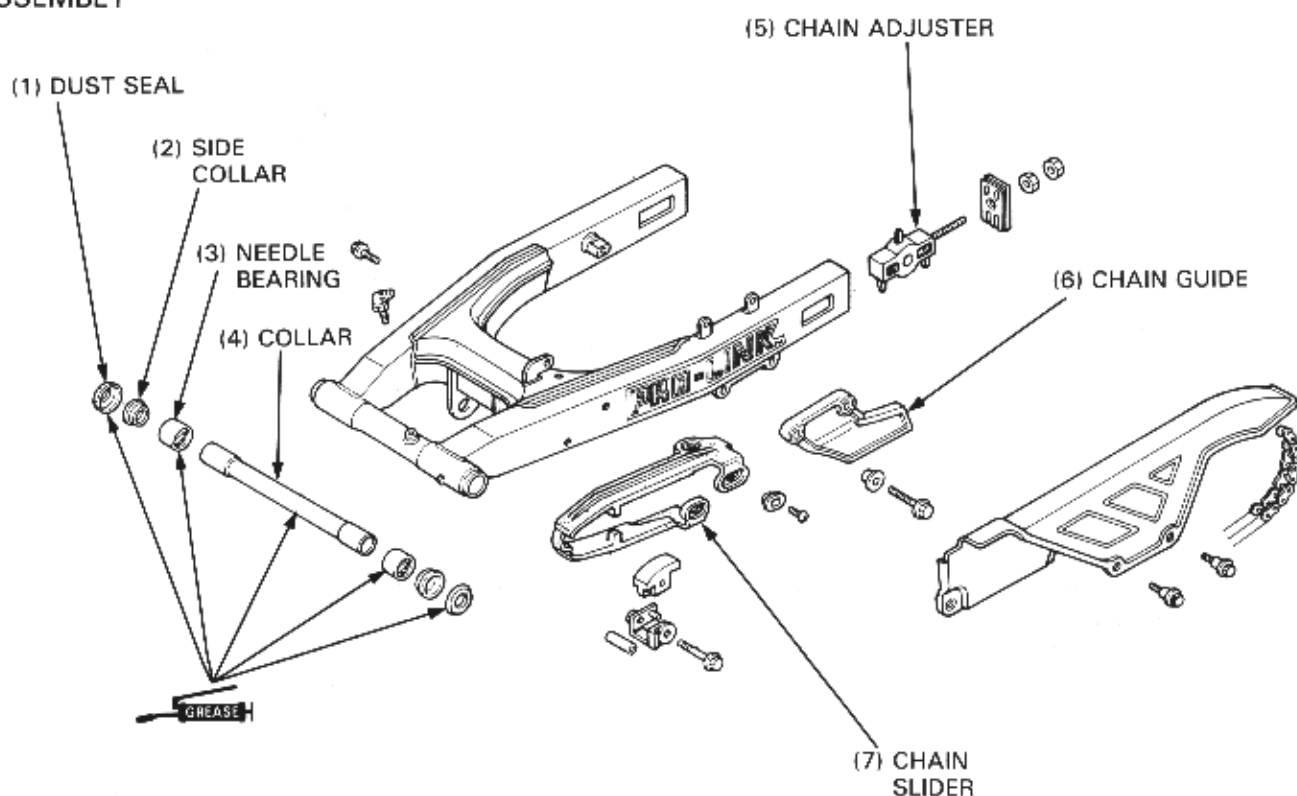
TOOLS:

Driver	07749-0010000
Attachment, 24 x 26 mm	07746-0010700
Pilot, 20 mm	07746-0040500

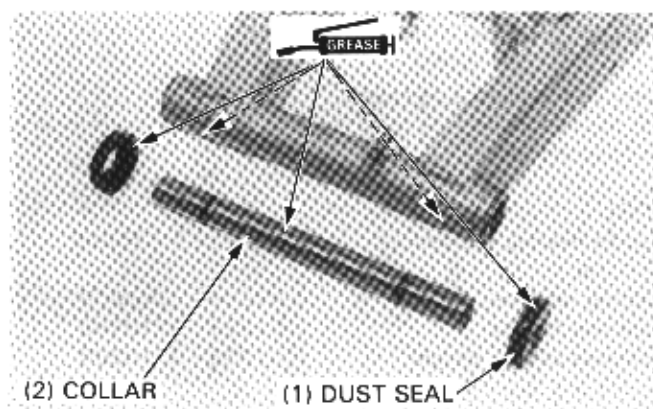
Press in the other needle bearing and side collar.



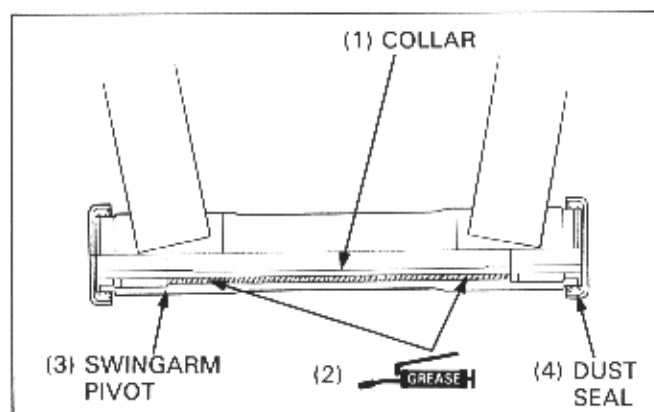
ASSEMBLY



Apply grease to the pivot collar and dust seal lips.

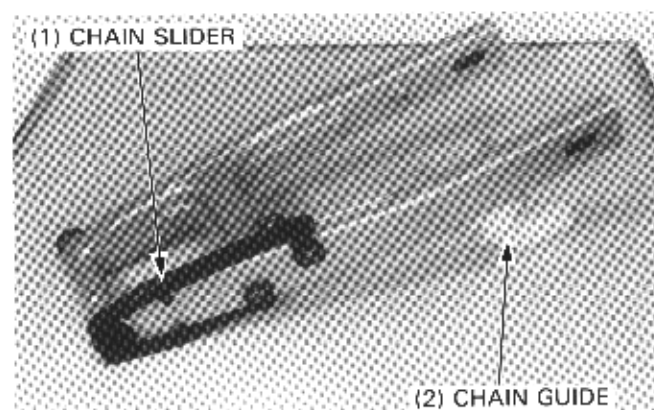


Install the collar and dust seals.



Install the following parts to the swing arm:

- Drive chain slider
- Drive chain guide



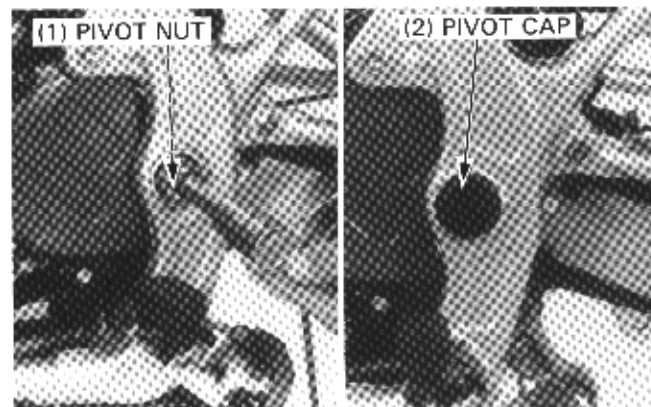
Install the swing arm to the frame.

From the right side, insert the swing arm pivot bolt through the swing arm.

Install and tighten the swing arm pivot nut.

TORQUE: 110 N·m (11.0 kg-m, 80 ft-lb)

Install the swing arm pivot cap.

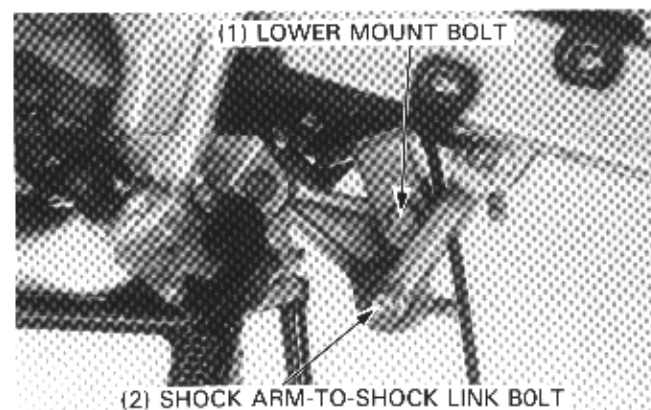


Install and tighten the shock absorber lower mount bolt.

TORQUE: 45 N·m (4.5 kg-m, 32 ft-lb)

Install the shock arm-to-shock link bolt and nut, and tighten the nut.

TORQUE: 45 N·m (4.5 kg-m, 32 ft-lb)



REAR WHEEL/BRAKE/SUSPENSION

Install the drive chain cover.

Install the rear wheel (page 13-8).

