

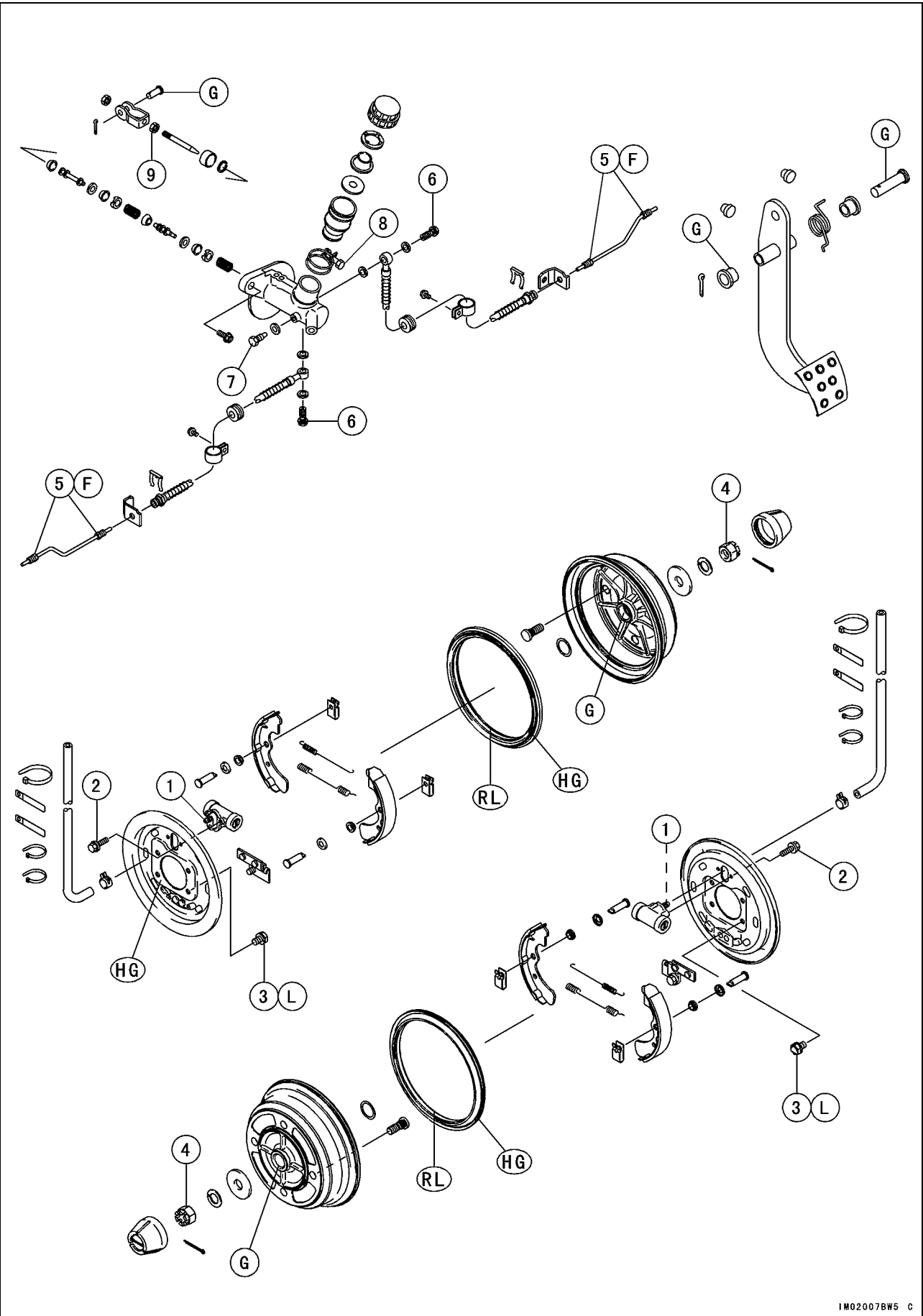
Brakes

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13-2 BRAKES

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Bleed Valves	5.9	0.60	52 in·lb	
2	Wheel Cylinder Mounting Bolts	11	1.1	95 in·lb	
3	Brake Panel Mounting Bolts	44	4.5	33	L
4	Front Axle Nuts	200	20	140	
5	Brake Pipe Nipples	18	1.8	13	F
6	Brake Hose Banjo Bolts	25	2.5	18	
7	Piston Stop Bolt	8.8	0.90	78 in·lb	
8	Reservoir Clamp Bolt	5.9	0.60	52 in·lb	
9	Push Rod Locknut	18	1.8	13	

F: Apply brake fluid.

G: Apply grease.

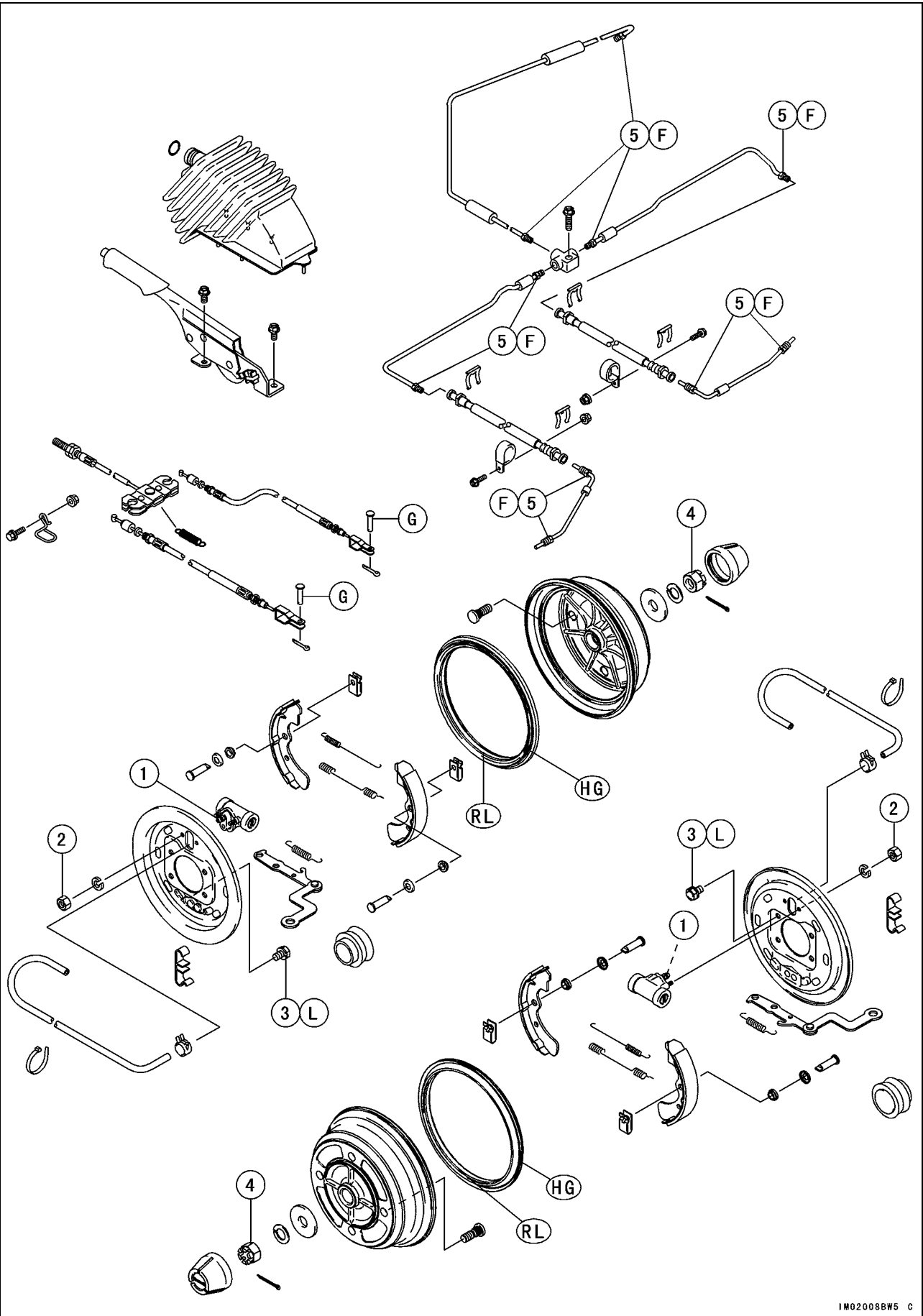
HG: Apply grease (Amoco Rykon Premium Grease No. 2 EP Green).

L: Apply a non-permanent locking agent.

RL: Apply rubber lubricating oil.

13-4 BRAKES

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Bleed Valves	5.9	0.60	52 in·lb	
2	Wheel Cylinder Mounting Nuts	7.8	0.80	69 in·lb	
3	Brake Panel Mounting Bolts	44	4.5	33	L
4	Rear Axle Nuts	300	31	220	
5	Brake Pipe Nipples	18	1.8	13	F

F: Apply brake fluid.

G: Apply grease.

HG: Apply grease (Amoco Rykon Premium Grease No. 2 EP Green).

RL: Apply rubber lubricating oil.

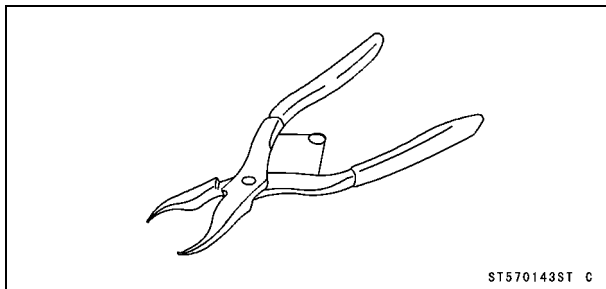
13-6 BRAKES

Specifications

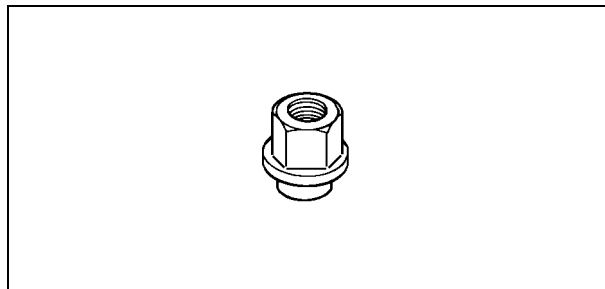
Item	Standard	Service Limit
Brake Fluid		
Type	DOT3	— — —
Fluid level	Between upper and lower level lines	— — —
Brake Pedal		
Brake pedal free play	2 ~ 10 mm (0.08 ~ 0.39 in.)	— — —
Brake Drums		
Brake drum inside diameter	180.000 ~ 180.160 mm (7.0866 ~ 7.0929 in.)	180.75 mm (7.116 in.)
Brake Panel Assemblies		
Brake shoe lining thickness	4.5 mm (0.18 in.)	1.0 mm (0.04 in.)
Parking Brake Lever and Cables		
Parking brake lever travel	8 ~ 12 notches (clicks) at 200 N (20 kgf, 44 lb)	— — —

Special Tools

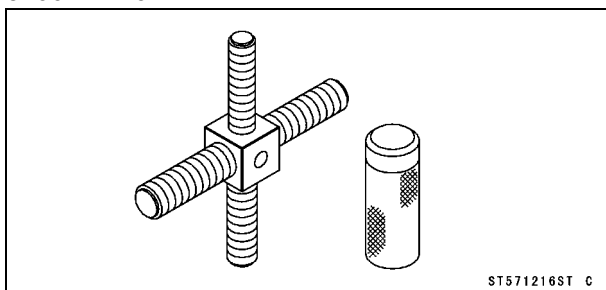
Inside Circlip Pliers:
57001-143



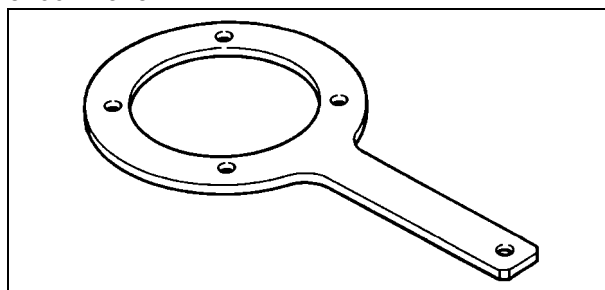
Brake Drum Pusher, M18 × 1.5:
57001-1261



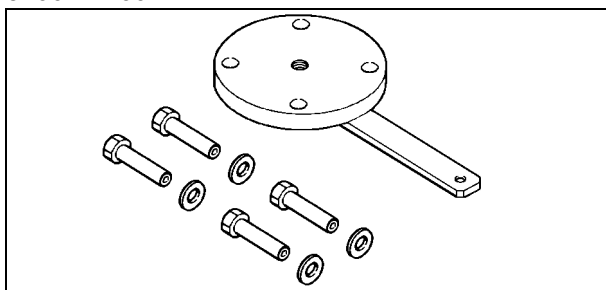
Rotor Puller, M16/M18/M20/M22 × 1.5:
57001-1216



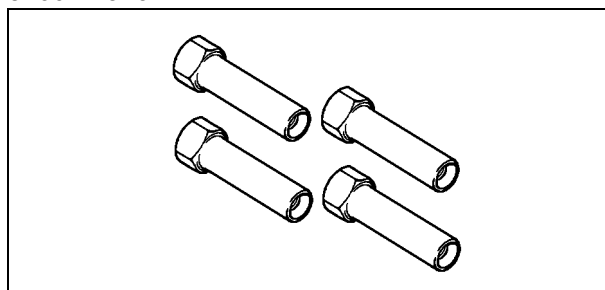
Brake Drum Holder:
57001-1325



Brake Drum Remover:
57001-1260



Brake Drum Remover Nuts:
57001-1326



13-8 BRAKES

Brake Fluid

Brake Fluid Recommendation

Use extra heavy-duty brake fluid only from a container marked DOT3.

Recommended Brake Fluid

Type: DOT3

⚠ WARNING

Never reuse old brake fluid.

Do not use fluid from a container that has been left unsealed or that has been open for a long time.

Do not mix two types and brands of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.

Don't leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.

Don't add or change the fluid in the rain or when a strong wind is blowing.

If any of the brake line fittings or the bleed valve is opened at any time, the AIR MUST BE BLED FROM THE BRAKE LINE.

CAUTION

Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely wiped up immediately.

Brake Fluid Level Inspection

- Refer to Brake Fluid Level Inspection in the Periodic Maintenance chapter.

Brake Fluid Changing

- Refer to Brake Fluid Changing in the Periodic Maintenance chapter.

Brake Fluid

Brake Line Air Bleeding

- Remove the maintenance cover.
- Check that there is plenty of fluid in the reservoir.

NOTE

○ *The fluid level must be checked several times during the bleeding operation and replenished as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.*

- With the reservoir cap off, slowly pump the brake pedal several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir. This bleeds the air from the master cylinder end of the line.
- Remove the wheel for extra clearance.
- Connect a clear plastic hose to the bleed valve at the wheel cylinder, running the other end of the hose into a container.

NOTE

○ *Start with the rear left or right wheel and finish with the front left or right wheel.*

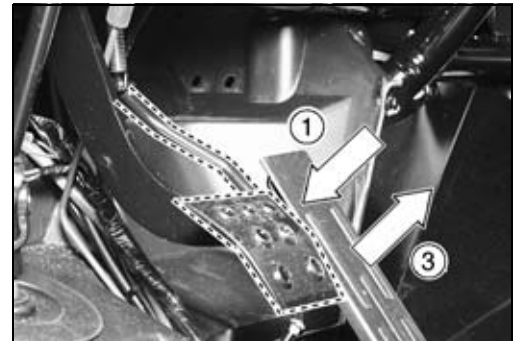
- Pump the brake pedal a few times until it becomes hard to pump. Hold the pedal in the down position. Quickly open (turn counterclockwise) and close the bleed valve. Then release the pedal. Repeat this operation until no more air can be seen coming out into the plastic hose.

1. Hold brake pedal applied.
2. Quickly open and close bleed valve.
3. Release brake pedal.

- Tighten:

Torque - Bleed Valves: 5.9 N·m (0.60 kgf·m, 52 in·lb)

- Repeat the previous step for each wheel.
- When air bleeding is finished, add fluid up to the upper level in the reservoir.
- Apply the brake forcefully for a few seconds, and check for fluid leakage around the fittings.
- Install the removed parts.



13-10 BRAKES

Brake Pedal and Master Cylinder

Brake Pedal Free Play Adjustment

- Refer to Brake Pedal Free Play Adjustment in the Periodic Maintenance chapter.

Master Cylinder Removal

- Remove:
 - Front Fender Upper (see Frame chapter)
 - Brake Hose Banjo Bolts [A]
 - Brake Pipe Nipple [B] (unscrew)
- Immediately wipe up any brake fluid that spills.

CAUTION

Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely wiped up immediately.

- Remove:
 - Master Cylinder Mounting Bolts [C]
 - Master Cylinder [D]

Master Cylinder Installation

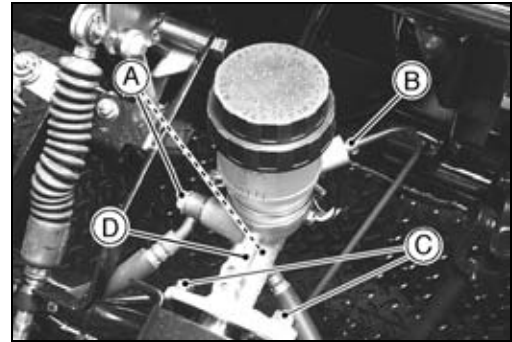
- Use a new flat washer on each side of the brake hose fitting.
- Apply brake fluid:
 - Brake Pipe Nipple Threads
- Tighten:
 - Torque - Brake Hose Banjo Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**
 - Brake Pipe Nipple: 18 N·m (1.8 kgf·m, 13 ft·lb)**
- Bleed the brake line after master cylinder installation.
- Adjust:
 - Brake Pedal Free Play Adjustment
- Check that the brake line has proper fluid pressure and no fluid leakage.

Master Cylinder Disassembly

- Refer to Brake Master Cylinder Cup and Dust Seal Replacement in the Periodic Maintenance chapter.

Master Cylinder Assembly

- Refer to Brake Master Cylinder Cup and Dust Seal Replacement in the Periodic Maintenance chapter.



Brake Pedal and Master Cylinder

Master Cylinder Inspection

- Check that there are no scratches, rust or pitting on the inside of the cylinder and on the outside of the piston.
- ★ If the cylinder or piston shows any damage, replace them.
- Inspect the primary cups and secondary cups.
- ★ If a cup is worn, damaged, softened (rotted), or swollen, replace it.
- ★ If fluid leakage is noted at the brake push rod, the secondary cup of the rear piston should be replaced.
- Check the dust cover for damage.
- ★ If it is damaged, replace it.
- Check that the relief and supply ports are not plugged.
- ★ If the small relief port becomes plugged, the brake shoes will drag on the drum. Blow the ports clean with compressed air.
- Check the piston return springs for any damage.
- ★ If the spring is damaged, replace it.

13-12 BRAKES

Brake Hoses and Pipes

Brake Hose and Pipe Inspection

- Refer to Brake Hose and Pipe Inspection in the Periodic Maintenance chapter.

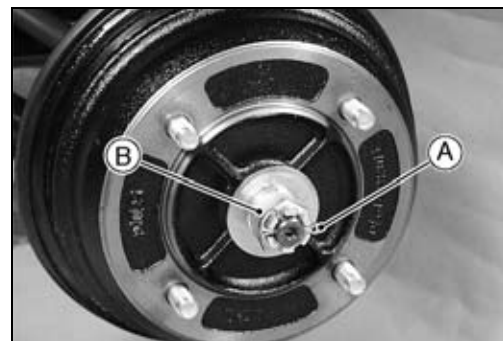
Brake Hose and Pipe Replacement

- Refer to Brake Hose and Pipe Replacement in the Periodic Maintenance chapter.

Brake Drums

Brake Drum Removal

- Remove:
 - Wheel (see Wheel Removal)
 - Cotter Pin [A]
 - Axle Nut [B]
- Loosen the axle nut, while applying the brake, and release the brake.



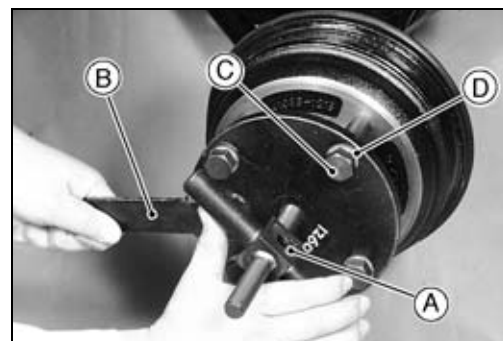
- The brake drums are press-fitted on the axles. Use the brake drum remover, stud nuts, and rotor puller (special tools) to remove the drums.
- Mount the brake drum remover on the drum studs with the stud nuts and washers (parts in the remover set).

Special Tools - Rotor Puller, M16/M18/M20/M22 × 1.5: 57001-1216 [A]

Brake Drum Remover: 57001-1260 [B]

Brake Drum Remover Nuts: 57001-1326 [C]

Washers [D]



Brake Drum Installation

- Observe the following procedure to install the brake drums. Replace the drum with a new one if its maximum press-fitting force (torque) is less than the service limit.

Drum Press-fitting Force (Torque)

Service Limit: 20 N·m (2.0 kgf·m, 14 ft·lb)

- Apply a molybdenum disulfide lubricant (grease or oil type, either will do) to the splines on the drum.
- Mount the brake drum holder [A] securely to the drum studs with the wheel nuts.
- Using the brake drum pusher [B], drive the drum onto the axle until the pusher stops.

Special Tools - Brake Drum Pusher, M18 × 1.5: 57001-1261

Brake Drum Holder: 57001-1325

- Apply a molybdenum disulfide lubricant (grease or oil type, either will do) to the threads and the seating face of the axle nut.
- Drive the drum further using the axle nut and washer instead of the pusher until the drum stops. At this time, use a torque wrench to turn the axle nut. Note the driving force (torque) of the nut.
- ★ The drum must be press-fitted on the axle. If the maximum torque for driving the nut is less than the service limit, the drum will not be tight enough and must be replaced.
- ★ If the maximum torque for driving the nut is more than the service limit, retighten the nut to the specified torque.
- Remove the brake drum holder.



13-14 BRAKES

Brake Drums

- Grease (Amoco Rykon Premium Grease No.2 EP Green):
Front Brake Drum Grease Seal Lips [A]
- Tighten:
- Do not press the drum bolts out.
- ★ If a drum bolt is damaged, replace the drum.

Torque - Front Axle Nuts: 200 N·m (20 kgf·m, 140 ft·lb)

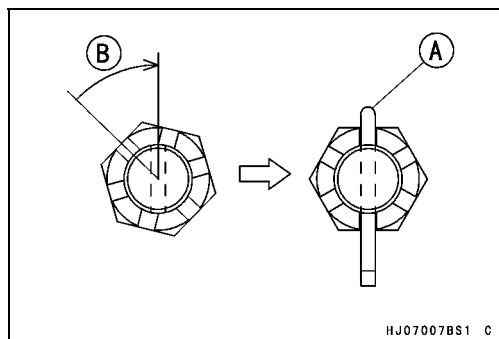
Rear Axle Nuts: 300 N·m (31 kgf·m, 220 ft·lb)



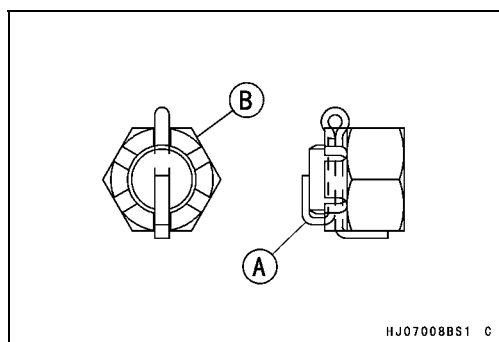
- Insert a new cotter pin [A].

NOTE

- When inserting the cotter pin, if the slots in the nut do not align with the cotter pin hole in the axle, tighten the nut clockwise [B] up to next alignment.
- It should be within 30 degree.
- Loosen once and tighten again when the slot goes past the nearest hole.



- Bend the cotter pin [A] over the nut [B].



Brake Drum Wear

- Refer to Brake Wear Inspection in the Periodic Maintenance chapter.

Brake Panel Assemblies

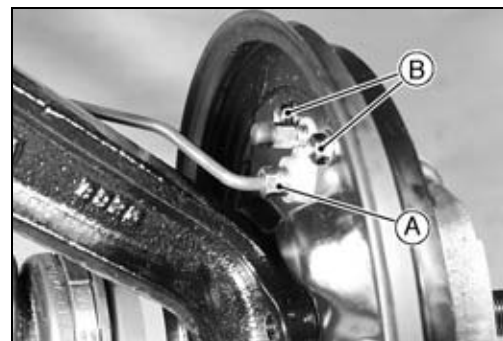
Brake Panel Removal

- Remove:
 - Brake Drum (see Brake Drum Removal)
 - Brake Pipe Nipple [A]
- Immediately wipe up any brake fluid that spills.

CAUTION

Brake fluid quickly ruins painted surfaces; any spilled fluid should be completely wiped up immediately.

- ★ Loosen the brake wheel cylinder mounting bolts [B] for the cylinder removal.
- ★ Remove the following for the brake panel assembly [A] removal.
 - Brake Panel Mounting Bolts [B]
 - Brake Panel Assembly

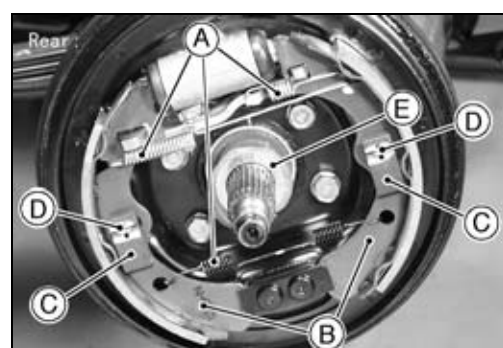
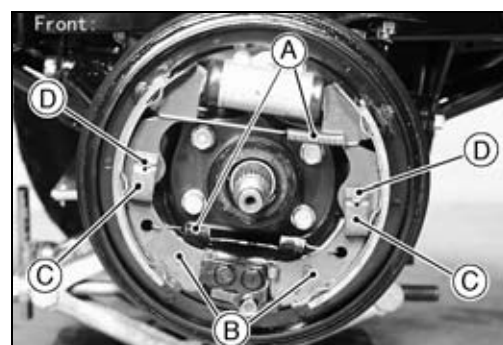
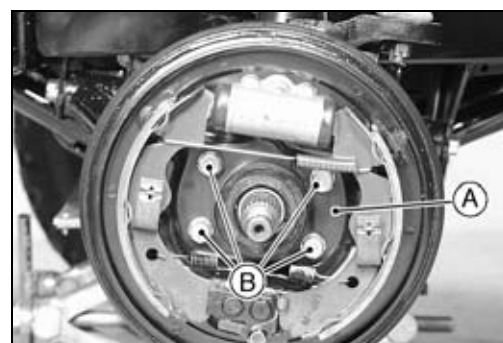


- Remove:
 - Brake Shoe Springs [A]
 - Brake Shoes [B]
- Push the shoe hold-down spring [C] and twist the pin [D] to remove them.

NOTE

○ Hold the brake shoes with a clean cloth to protect the linings from grease or dirt.

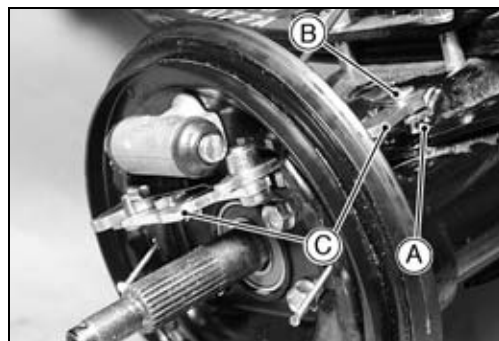
- Remove the collar [E] on the rear brake panel.



13-16 BRAKES

Brake Panel Assemblies

- Remove the following for the rear brake panel removal.
 - Cotter Pin [A]
 - Clevis Pin [B]
 - Parking Brake Lever Linkage [C]



- Remove:
 - Brake Panel Mounting Bolts [A]
 - Brake Panel [B]

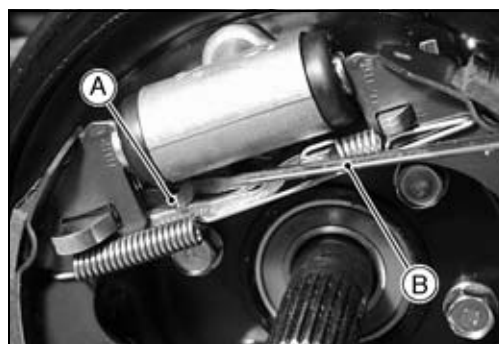


Brake Panel Installation

- Set the brake shoe clearance adjuster so that the drum can be re-installed on the panel assembly.
- Front brake; turn one of the wheel cylinder ends [A] while pushing it in. Keep the other end [B] from turning until both the ends of the pistons are back in the cylinder completely.



- Rear brake; pry the ratchet lever [A] with a screwdriver [B] to reset the shoe clearance adjuster in its original position [C].



Brake Panel Assemblies

- Grease (Amoco Rykon Premium Grease No. 2 EP Green):
Brake Panel Seating Surface
- Apply a non-permanent locking agent:
Brake Panel Mounting Bolts
- Apply brake fluid:
Brake Pipe Nipple Threads
- Tighten:

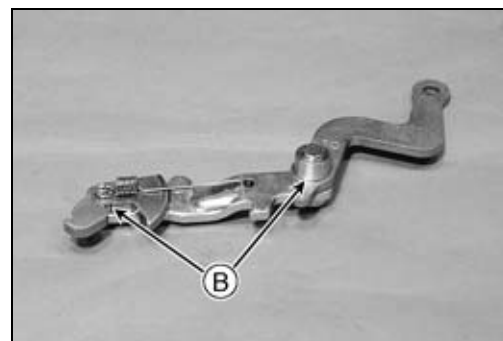
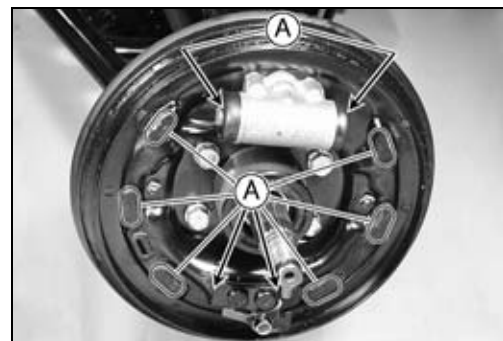
Torque - Wheel Cylinder Mounting Bolts: 11 N·m (1.1 kgf·m, 95 in·lb)

Wheel Cylinder Mounting Nuts: 7.8 N·m (0.80 kgf·m, 69 in·lb)

Brake Panel Mounting Bolts: 44 N·m (4.5 kgf·m, 33 ft·lb)

Brake Pipe Nipple: 18 N·m (1.8 kgf·m, 13 ft·lb)

- Grease [A]:
Brake Panel and Brake Shoe Contact Points
Wheel Cylinder Piston Ends
Brake Shoe Anchor Ends
- Grease (rear brake only) [B]:
Shoe Clearance Adjuster Pivots
Shoe Clearance Adjuster and Shoe Contact Points



- Bleed the brake line after drum installation.
- Check the brake system to be sure there is adequate braking power. Also be sure there is no brake drag, or fluid leakage.

⚠ WARNING

Do not attempt to drive the vehicle until a complete brake pedal motion is obtained by pumping the brake pedal until the brake shoes contact the drum operating the shoe clearance adjuster until brake shoe to brake drum contact is made. The brake will not function on the first application of the pedal if this is not done.

- Adjust:
Parking Brake Lever Travel Adjustment (see Parking Brake Lever Travel Adjustment)

13-18 BRAKES

Brake Panel Assemblies

Wheel Cylinder Assembly

- Before assembly, clean all parts including the wheel cylinder with brake fluid or alcohol, and apply brake fluid to the removed parts and the inner wall of the cylinder.

CAUTION

Use only brake fluid, isopropyl alcohol, or ethyl alcohol, for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, motor oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely, and will eventually deteriorate the rubber used in the brake.

Wheel Cylinder Inspection

- Check that there are no scratches, rust or pitting on the inside of the cylinder and on the outside of the piston.
- ★ If the cylinder or piston shows any damage, replace the cylinder.
- Inspect the cups.
- ★ If a cup is worn, damaged, softened (rotted), or swollen, replace the cylinder.
- ★ If fluid leakage is noted at the dust covers, the cylinder should be replaced to renew the cup.
- Check the dust covers for damage.
- ★ If they are damaged, replace the cylinder.
- Check the spring for any damage.
- ★ If the spring is damaged, replace the cylinder.
- Front brake only: Check the brake shoe clearance adjuster for damage.
- ★ If it shows any damage, replace the cylinder.

Dust Cover [A]

Piston [B]

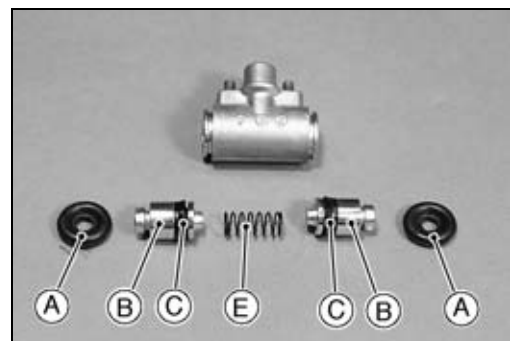
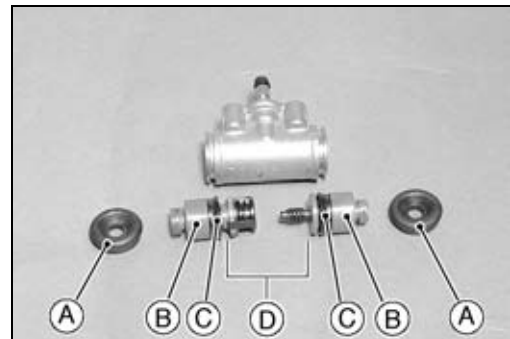
Cup [C]

Shoe Clearance Adjuster (Front) [D]

Spring (Rear) [E]

Brake Shoe Lining Wear

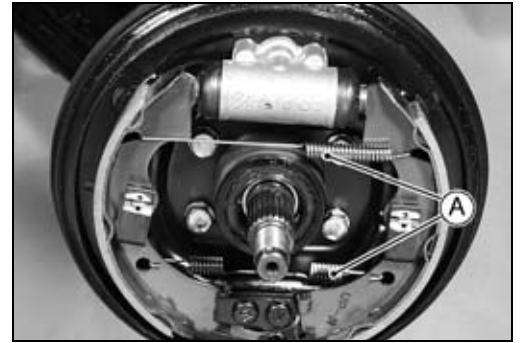
- Refer to Brake Wear Inspection in the Periodic Maintenance chapter.



Brake Panel Assemblies

Brake Shoe Spring Inspection

- Visually inspect the brake shoe springs [A] for breaks or distortion.
- ★ If the springs are damaged in any way, replace them.



13-20 BRAKES

Parking Brake Lever and Cables

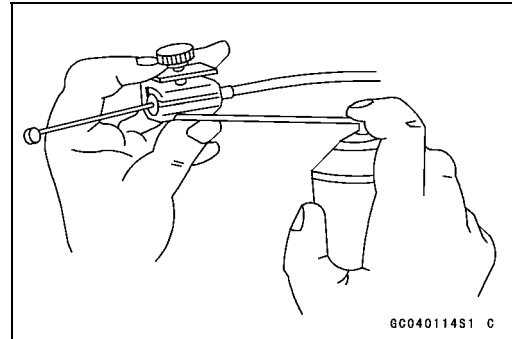
Parking Brake Lever Travel Adjustment

- Refer to Parking Brake Lever and Cables in the Periodic Maintenance chapter.

Parking Brake Cable Lubrication

Whenever the parking brake cables are removed, lubricate the cables as follows.

- Apply a thin coating of grease to the cable upper ends.
- Lubricate the cable by seeping the oil between the cable and cable housing.



Parking Brake Cable Inspection

- With the cable disconnected at both ends, the cable should move freely [A] within the cable housing.
- ★ If the cable does not move freely after lubricating, or if the cable is frayed, or if the cable housing is kinked, replace the cable.

