

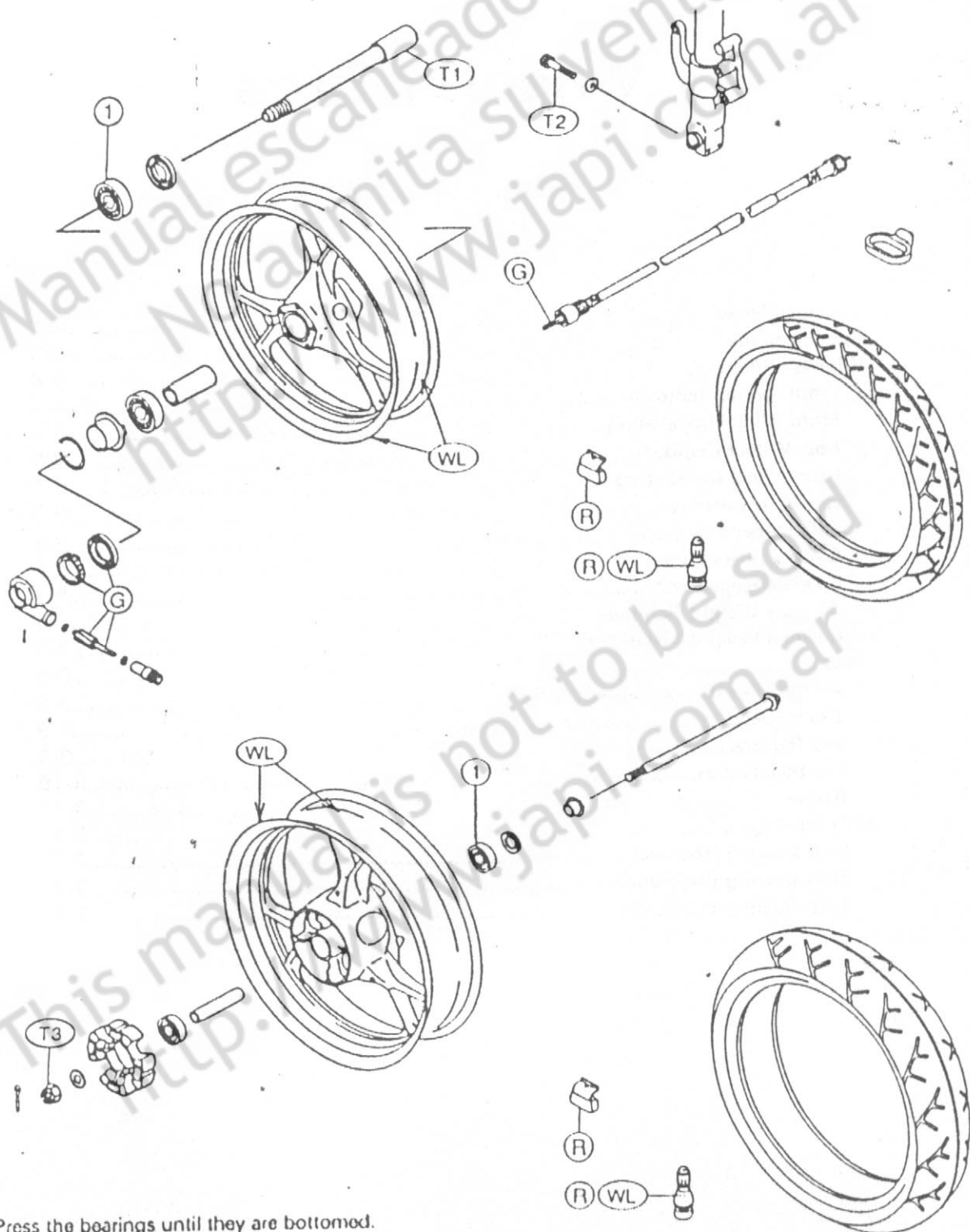
Wheels / Tires

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9-2 WHEELS / TIRES

Exploded View



1. Press the bearings until they are bottomed.

G : Apply grease.

R : Replacement Parts

WL : Apply soap and water solution or rubber lubricant.

T1 : 110 N·m (11.0 kg·m)

T2 : 23 N·m (2.3 kg·m)

T3 : 88 N·m (9.0 kg·m)

Specifications

Item	Standard	Service Limit
Wheels (Rims):		
Rim runout: Axial	---	TIR 0.5 mm
Radial	---	TIR 0.8 mm
Axle runout/100 mm	TIR 0.05 mm or less	TIR 0.2 mm
Wheel balance	less than 10 g	---
Balance weights	10 g, 20 g, 30 g	---
Tires:		
Air pressure (when cold):		
Front	200 kPa (2.00 kg/cm ² , 28 psi)	---
Rear	200 kPa (2.00 kg/cm ² , 28 psi)	---
Tread depth:		
Front	4.1 mm	1 mm
Rear	6.0 mm	Up to 130 km/h (80 mph): 2 mm
		Over 130 km/h (80 mph): 3 mm
Standard tires:		
Front: Make, Type	DUNLOP, K855 FG (tubeless)	---
Size	110/70 R17 54H	---
Rear: Make, Type	DUNLOP, K855 M (tubeless)	---
Size	140/60 R18 64H	---

Special Tools — Inside Circlop Pliers: 57001-143
 Rim Protector: 57001-1063
 Bead Breaker Assembly: 57001-1072
 Bearing Driver Set: 57001-1129
 Jack: 57001-1238
 Bearing Remover Shaft, $\Phi 9$: 57001-1265
 Bearing Remover Head, $\Phi 15 \times \Phi 17$: 57001-1267
 Bearing Remover Head, $\Phi 20 \times \Phi 22$: 57001-1293

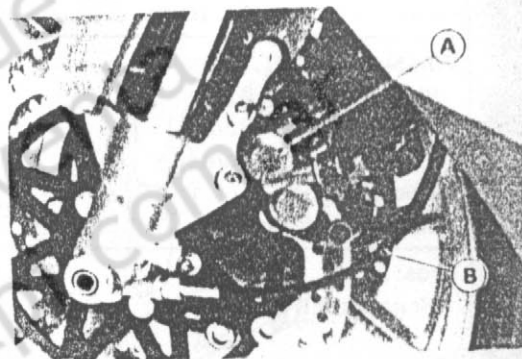
9-4 WHEELS / TIRES

Wheels (Rims)

Front Wheel Removal

- Remove:

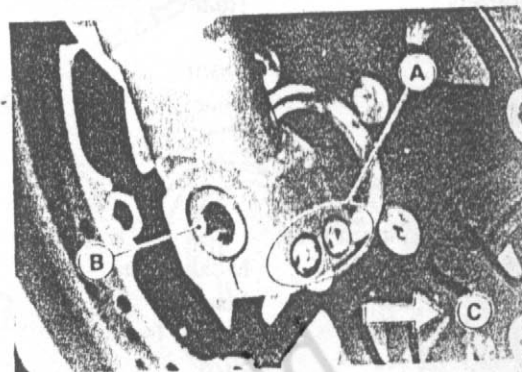
- Lower Fairing (see Frame chapter)
- Brake Caliper [A] Mounting Bolts
- Speedometer Cable [B] Lower End



- Loosen:

- Right Side Axle Clamp Bolts [A]
- Axle [B]

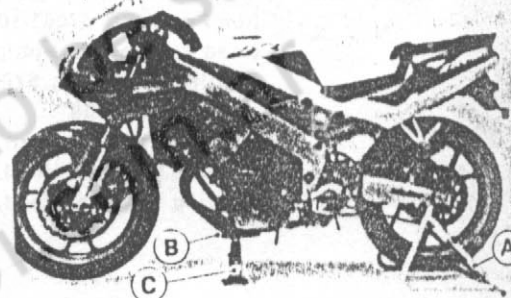
[C] Front



- Raise the front wheel off the ground.

- Stand [A]
- Wooden Board [B]
- Jack [C]

- Pull out the axle to the right and drop the front wheel out of the forks.

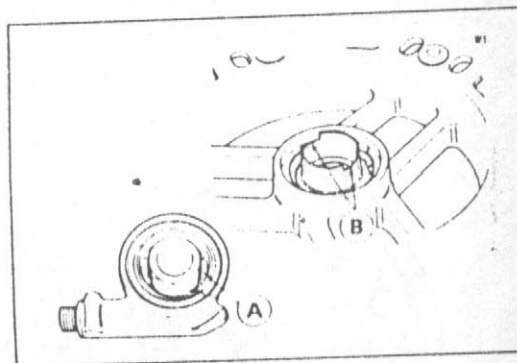


CAUTION

Do not lay the wheel down on one of the discs. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

Front Wheel Installation

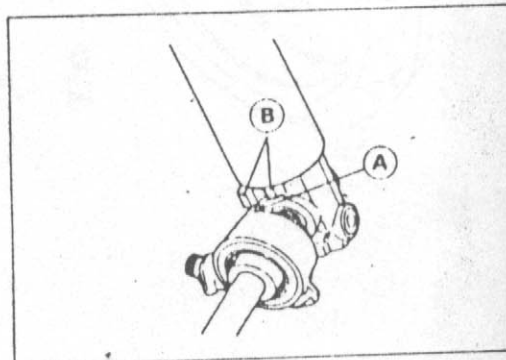
- Install the speedometer gear housing so that its projections [A] fit into the gear drive notches [B] in the wheel hub.



- Fit the collar on the right side of the hub.
- Fit the speedometer gear housing stop [A] in the fork leg stops [B]
- Tighten the axle nut and axle clamp bolt

Torque - Front Axle: 110 N-m (11.0 kg-m)
Front Axle Clamp Bolts: 23 N-m (2.3 kg-m)

- Install the front brake caliper (see Brakes chapter)
- Check the front brake.



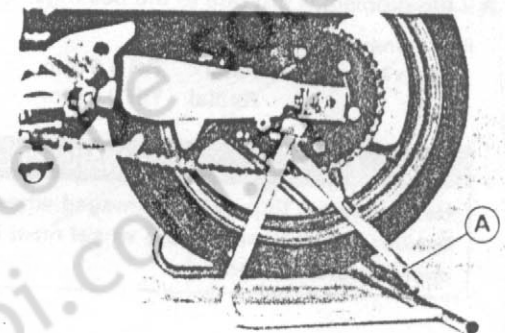
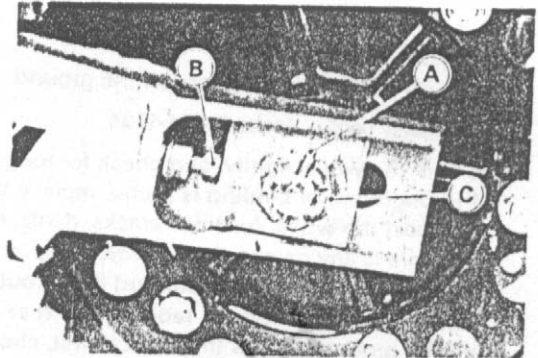
WARNING

Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.

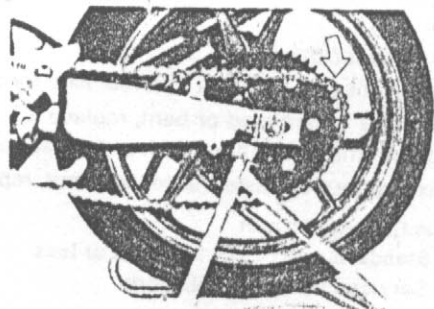
Rear Wheel Removal

- Remove:
 - Cotter Pin [A]
 - Chain Adjuster [B] (Full Loosen)
 - Axle Nut [C]

- Using a suitable stand [A], raise the rear wheel off the ground
- Remove the rear axle.



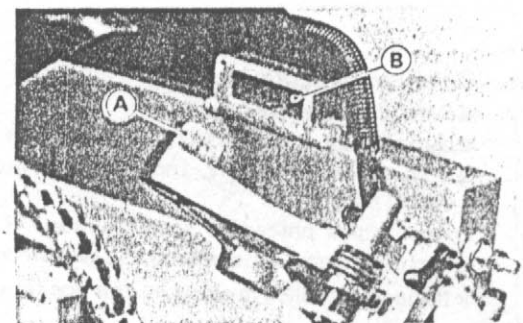
- Remove the drive chain from the rear sprocket toward the left
- Move the rear wheel back and remove the wheel from the rear caliper.
- Remove the rear wheel.

**CAUTION**

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

Rear Wheel Installation

- Engage the drive chain with the rear sprocket
- Fit the projection [A] on the caliper bracket into the groove [B] in the swingarm.
- Insert the axle from the right side of the wheel, and tighten the axle nut.



Torque - Rear Axle Nut: 88 N-m (9.0 kg-m)

- Replace the cotter pin with a new one.
- Adjust the drive chain slack after installation (see Final Drive chapter).
- Check the rear brake.

⚠ WARNING

Do not attempt to drive the motorcycle until a full brake pedal is obtained by pumping the brake pedal until the pads are against the disc. The brake will not function on the first application of the pedal if this is not done.

Wheel Inspection

- Raise the front/rear wheel off the ground.

Special Tool - Jack: 57001-1238

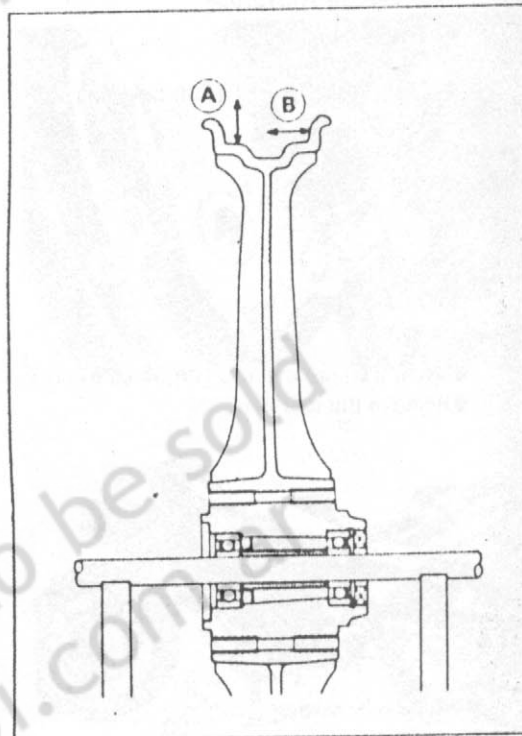
- Spin the wheel lightly, and check for roughness or binding.
- ★ If roughness or binding is found, replace the hub bearings.
- Inspect the wheel for small cracks, dents, bending, or warp.
- ★ If there is any damage to the wheel, replace the wheel.
- Remove the wheel, and support it without the tire by the axle.
- Measure the rim runout, radial [A] and axial [B], with a dial gauge.
- ★ If rim runout exceeds the service limit, check the hub bearings.
- ★ If the problem is not due to the bearings, replace the wheel.

Rim Runout

Service Limit:	Axial	TIR 0.5 mm
	Radial	TIR 0.8 mm

⚠ WARNING

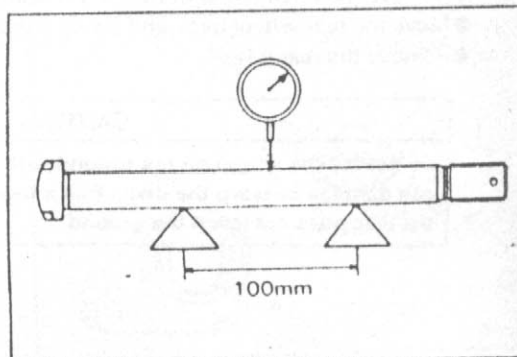
Never attempt to repair a damaged wheel. If there is any damage besides wheel bearings, the wheel must be replaced to insure safe operational condition.

**Axle Inspection**

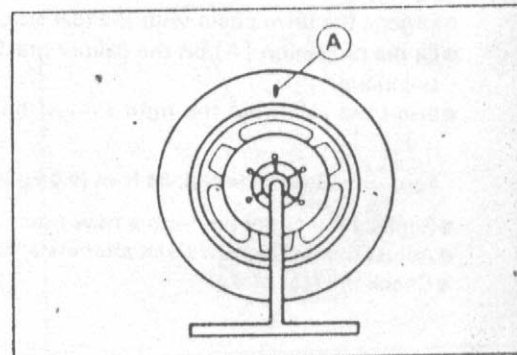
- Visually inspect the front and rear axle for damages.
- ★ If the axle is damaged or bent, replace it.
- Measure the axle runout with a dial gauge.
- ★ If axle runout exceeds the service limit, replace the axle.

Axle Runout/100 mm

Standard:	TIR 0.05 mm or less
Service Limit:	TIR 0.2 mm

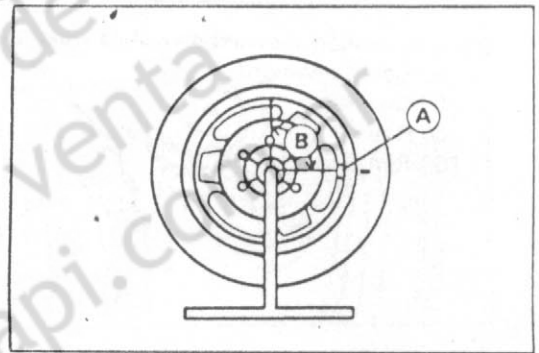
**Balance Inspection**

- Remove the wheel.
- Support the wheel so that it can be spun freely.
- Spin the wheel lightly, and mark [A] the wheel at the top when the wheel stops.
- Repeat this procedure several times. If the wheel stops of its own accord in various positions, it is well balanced.
- ★ If the wheel always stops in one position, adjust the wheel balance.



Balance Adjustment

- ★ If the wheel always stops in one position, provisionally attach a balance weight [A] on the rim at the marking using adhesive tape.
- Rotate the wheel $\frac{1}{4}$ turn [B], and see whether or not the wheel stops in this position. If it does, the correct balance weight is being used.
- ★ If the wheel rotates and the weight goes up, replace the weight with the next heavier size. If the wheel rotates and the weight goes down, replace the weight with the next lighter size. Repeat these steps until the wheel remains at rest after being rotated $\frac{1}{4}$ turn.
- Rotate the wheel another $\frac{1}{4}$ turn and then another $\frac{1}{4}$ turn to see if the wheel is correctly balanced.
- Repeat the entire procedure as many times as necessary to achieve correct wheel balance.
- Permanently install the balance weight.

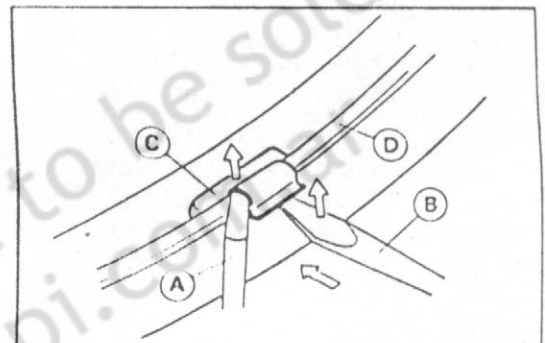


Balance Weight

Part Number	Weight(grams)
41075-1056	10
41075-1057	20
41075-1058	30

Balance Weight Removal

- Remove the balance weight as follows.
- Insert a regular tip screw driver [A] in the clip part.
- Insert one more screw driver [B] between the rim surface and the clip.
- While pulling up with the screw drivers, remove the balance weight [C].
- [D] shows the rib.



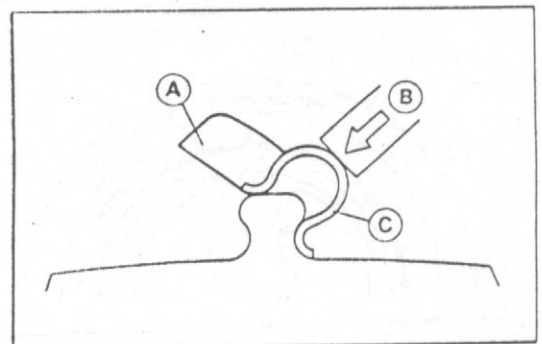
Balance Weight Installation

- Check if the weight portion has any play on the clip plate.
- ★ If it does, discard it.

⚠ WARNING

If the balance weight has any play on the rim, the clip of the weight has been stretched. Replace the loose balance weight. Do not reuse used balance weight. Unbalanced wheels can create an unsafe riding condition.

- Install the balance weight on the rib of the rim center, but if an unbalanced position is on the spoke part, the balance weight must be installed on both sides of the spoke.
- Install one to three pieces of the balance weights on the rib to get correct wheel balance.
- Put on the balance weight [A] on the rib and press [B] or lightly hammering the clip part [C] with a suitable bar until the clip seats.
- Check that the weight and clip portions are fully seated on the rim surfaces.



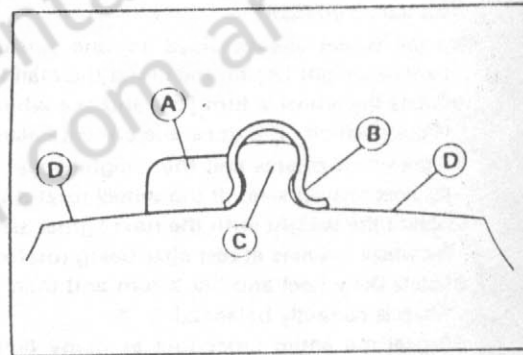
○The illustration shows the balance weight after installation.

[A] Balance Weight

[B] Clip Part

[C] Rib

[D] Rim Surfaces



Tires

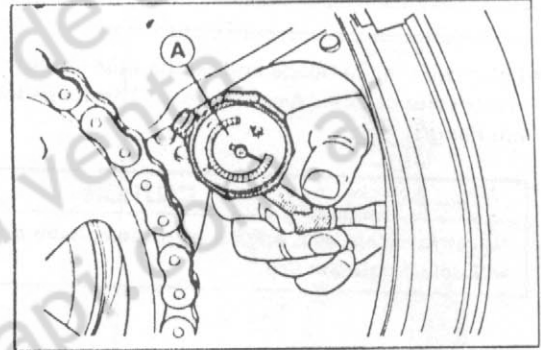
Air Pressure Inspection/Adjustment

- Measure the tire air pressure with an air pressure gauge [A] when the tires are cold.

★ Adjust the tire air pressure according to the specifications if necessary.

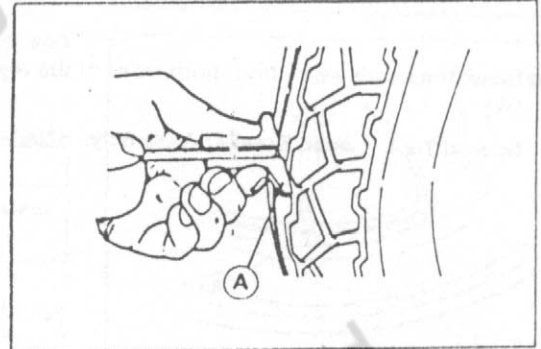
Air Pressure (when cold)

Front, Rear	200 kPa (2.00 kg/cm ² , 28 psi)
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Tire Inspection

- Remove any imbedded stones or other foreign particles from the tread.
 - Visually inspect the tire for cracks and cuts, replacing the tire in case of damage. Swelling or high spots indicate internal damage, requiring tire replacement.
 - Measure the tread depth at the center of the tread with a depth gauge [A]. Since the tire may wear unevenly, take measurement at several places.
- ★ If any measurement is less than the service limit, replace the tire.



Tread Depth

Front:

Standard: 4.1 mm

Service Limit: 1 mm

Rear:

Standard: 6.0 mm

Service Limit: 2 mm (Up to 130 km/h)

3 mm (Over 130 km/h)

⚠ WARNING

To ensure safe handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure.

NOTE

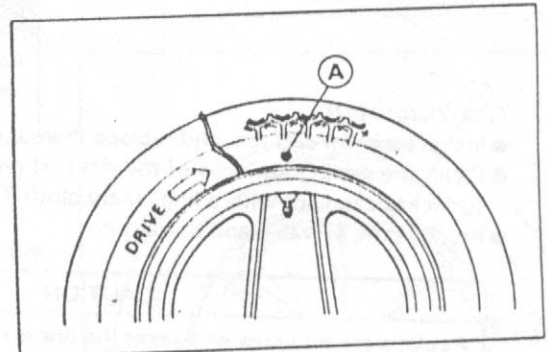
- Check and balance the wheel when a tire is replaced with a new one.

Tire Removal

CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

- Remove the wheel.
- To maintain wheel balance, mark [A] the valve stem position on the tire with chalk so that the tire can be reinstalled in the same position.
- Take out the valve core to let out the air.



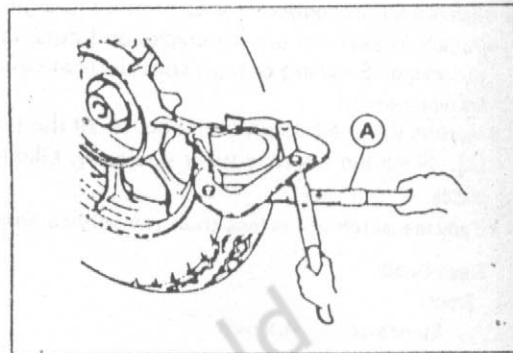
- Lubricate the tire beads and rim flanges on both sides with a soap and water solution or rubber lubricant. This helps the tire beads slip off the rim flanges.

CAUTION

Never lubricate with engine oil or petroleum distillates because they will deteriorate the tire.

- Break the beads away from both sides of the rim with the bead breaker [A]

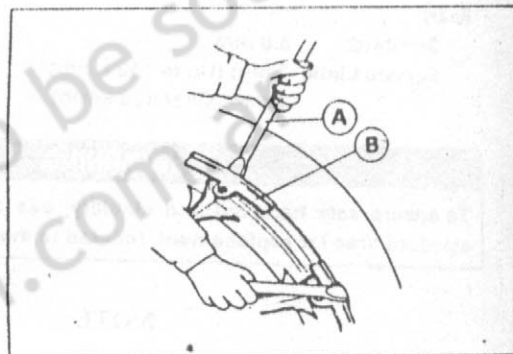
Special Tool - Bead Breaker Assembly: 57001-1072



- Step on the side of the tire opposite valve stem, and pry the tire off the rim with the tire iron [A] of the bead breaker protecting the rim with rim protectors [B].

Special Tools - Rim Protector: 57001-1063

Bead Breaker Assembly: 57001-1072

**CAUTION**

Be careful not to scratch the inner liner and air sealing surfaces of the rim and tire with the tire irons. A scratched inner liner or sealing surface may allow air to leak.

- After removing the bead on one side, remove the other bead from the same side.
- Remove the rim from the tire.
- Remove the rim protectors from the rim.

Tire Installation

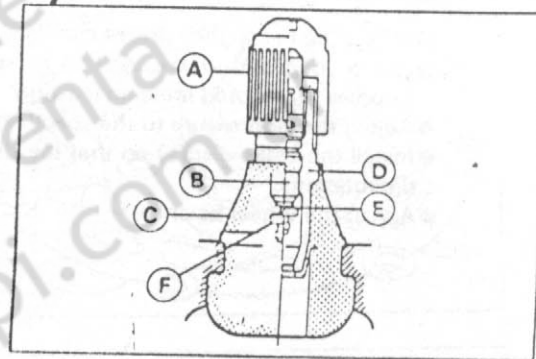
- Inspect the rim and tire, and replace them if necessary.
- Clean the sealing surfaces of the rim and tire, and smooth the sealing surfaces of the rim with a fine emery cloth if necessary.
- Remove the air valve and discard it.

CAUTION

Replace the air valve whenever the tire is replaced.
Do not reuse the air valve.

- Install a new valve in the rim.

- [A] Valve Cap
- [B] Valve Core
- [C] Stem Seal
- [D] Valve Stem
- [E] Valve Seat
- [F] Valve Opened

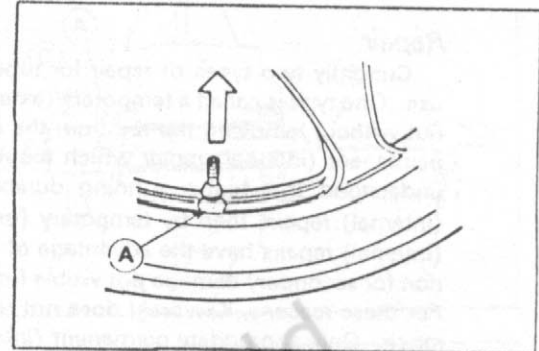


- Remove the valve cap, lubricate the stem seal [A] with a soap and water solution or rubber lubricant, and pull the valve stem through the rim from the inside out until it snaps into place.

CAUTION

Do not use engine oil or petroleum distillates to lubricate the stem because they will deteriorate the rubber.

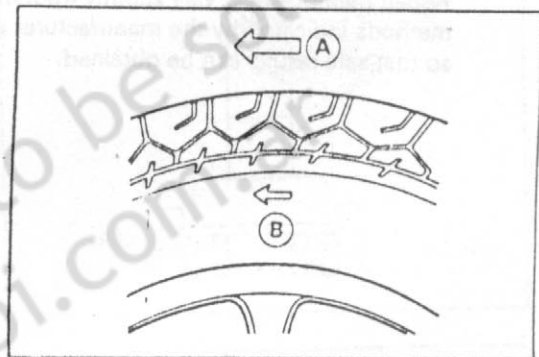
- Apply a soap and water solution, or rubber lubricant to the rim flange and tire beads.



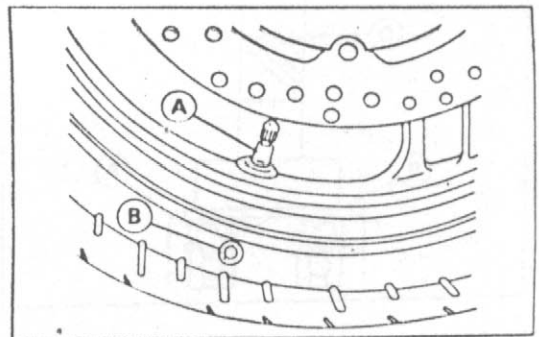
- Check the tire rotation mark on the front and rear tires and install them on the rim accordingly.

NOTE

- The direction of the tire rotation [A] is shown by an arrow [B] on the tire sidewall.



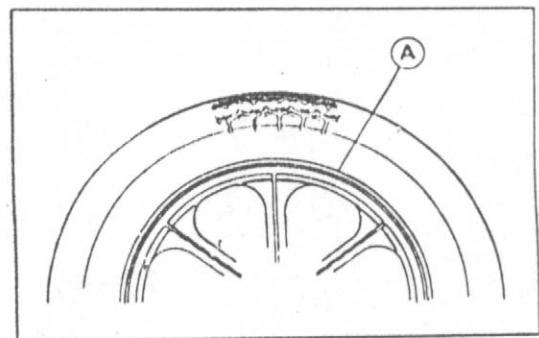
- Position the tire on the rim so that the valve [A] is at the tire balance mark [B] (the chalk mark made during removal, or the yellow paint mark on a new tire).
- Install the tire on the rim using a suitable commercially available tire changer.
- Lubricate the tire beads and rim flanges with a soap and water solution or rubber lubricant to help seat the tire beads in the sealing surfaces of the rim while inflating the tire.
- Center the rim in the tire beads, and inflate the tire with compressed air until the tire beads seat in the sealing surfaces.



WARNING

Be sure to install the valve core whenever inflating the tire, and do not inflate the tire to more than 400 kPa (4.0 kg/cm², 57 psi). Overinflation can explode the tire with possibility of injury and loss of life.

- Check to see that the rim lines [A] on both sides of the tire sidewalls are parallel with the rim flanges.
- ★ If the rim flanges and tire sidewall rim lines are not parallel, remove the valve core.
- Lubricate the rim flanges and tire beads.
- Install the valve core and inflate the tire again.
- After the tire beads seat in the rim flanges, check for air leaks.



- Inflate the tire slightly above standard inflation.
- Use a soap and water solution or submerge the tire, and check for bubbles that would indicate leakage.
- Adjust the air pressure to the specified pressure.
- Install the brake disc(s) so that the disc rotation mark aligns with the tire rotation.
- Adjust the wheel balance.

Repair

Currently two types of repair for tubeless tires have come into wide use. One type is called a temporary (external) repair which can be carried out without removing the tire from the rim, and the other type is called permanent (internal) repair which requires tire removal. It is generally understood that higher running durability is obtained by permanent (internal) repairs than by temporary (external) ones. Also, permanent (internal) repairs have the advantage of permitting a thorough examination for secondary damage not visible from external inspection of the tire. For these reasons, Kawasaki does not recommend temporary (external) repair. Only appropriate permanent (internal) repairs are recommended. Repair methods may vary slightly from make to make. Follow the repair methods indicated by the manufacturer of the repair tools and materials so that safe results can be obtained.

Hub Bearing

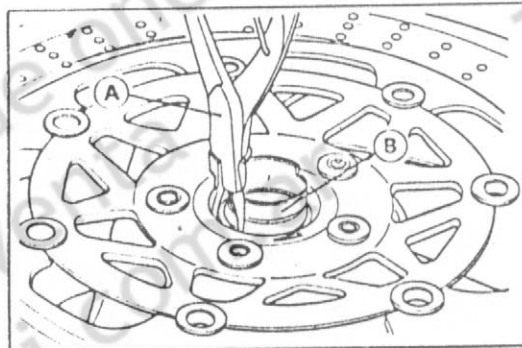
Hub Bearing Removal

- Remove the wheel, and take out the following.

Collars
Coupling (out of rear hub)
Grease Seals
Circlips

Special Tool - Inside Circlip Pliers: 57001-143 [A]

Speedometer Gear Drive [B] (out of front hub)



- Take the bearings [A] out of the hub

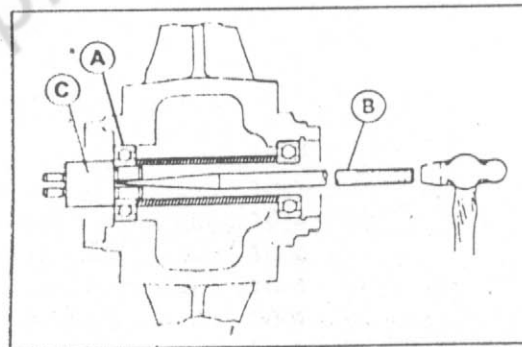
CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

Special Tools - Bearing Remover Shaft, $\Phi 9$: 57001-1265 [B]

Bearing Remover Head, $\Phi 15 \times \Phi 17$: 57001-1267 [C]

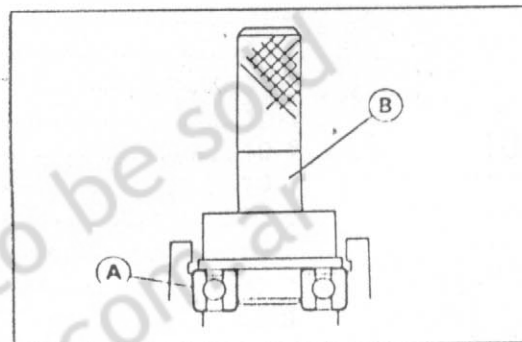
Bearing Remover Head, $\Phi 20 \times \Phi 22$: 57001-1293



Hub Bearing Installation

- Before installing the wheel bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.
- Replace the bearings with new ones.
- Press in the right bearings [A] (front and rear) first until they are bottomed.

Special Tool - Bearing Driver Set: 57001-1129 [B]



NOTE

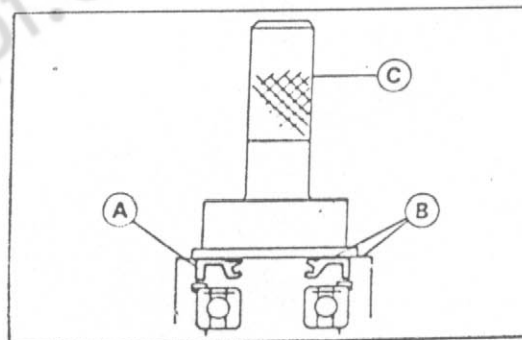
Install the bearings so that the marked side faces out

- Replace the circlips with new ones.

Special Tool - Inside Circlip Pliers: 57001-143

- Replace the grease seals with new ones.
- Press in the grease seals [A] so that seal surface is flush [B] with the end of the hole.
- Apply high temperature grease to the grease seal lips.

Special Tool - Bearing Driver Set: 57001-1129 [C]



Hub Bearing Inspection

NOTE

It is not necessary to remove any bearings for inspection. If any bearings are removed, they will need to be replaced with new ones.

- Spin it by hand to check its condition.
- ★ If it is noisy, does not spin smoothly, or has any rough spots, it must be replaced.
- Examine the bearing seal for tears or leakage.
- ★ If the seal is torn or is leaking, replace the bearing.

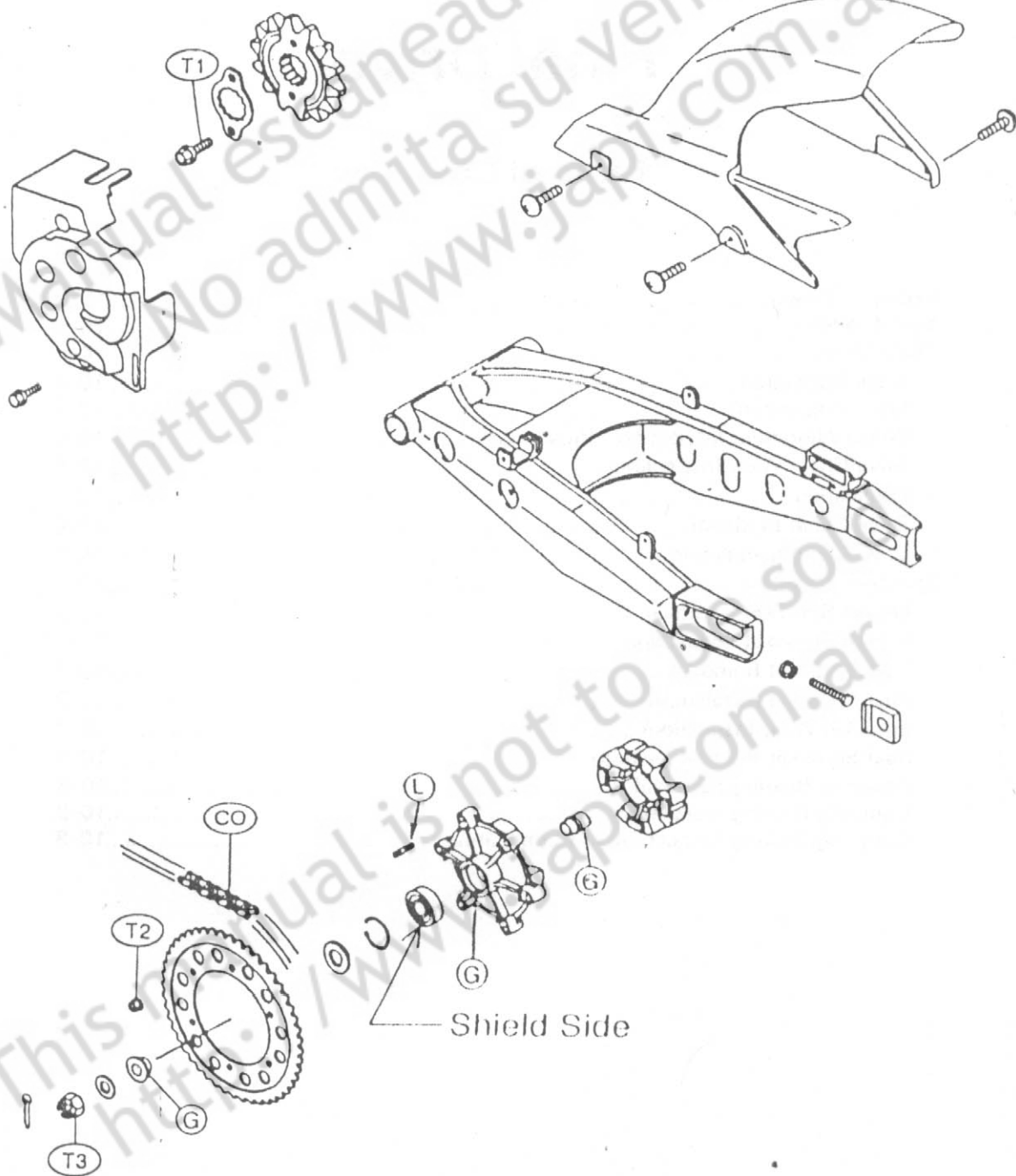
Final Drive

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10-2 FINAL DRIVE

Exploded View



G : Apply grease.
 L : Apply a non-permanent locking agent.
 CO: Apply chain oil.

T1 : 98 N·m (1.0 kg·m)
 T2 : 59 N·m (6.0 kg·m)
 T3 : 88 N·m (9.0 kg·m)

Specifications

Item	Standard	Service Limit
Drive Chain:		
Standard chain		
Make	DAIDO	---
Type	DID 520V2, Endless	---
Link	110 links	---
Chain slack	7 ~ 15 mm	Too tight: more than 15 mm Too loose: less than 7 mm
20-link length	317.5 ~ 318.2 mm	323 mm
Sprockets:		
Rear sprocket warp	TIR 0.4 mm or less	TIR 0.5 mm

Special Tools – Inside Circlip Pliers: 57001-143
Bearing Driver Set: 57001-1129

This manual is not to be sold
<http://www.japi.com.ar>

10-4 FINAL DRIVE

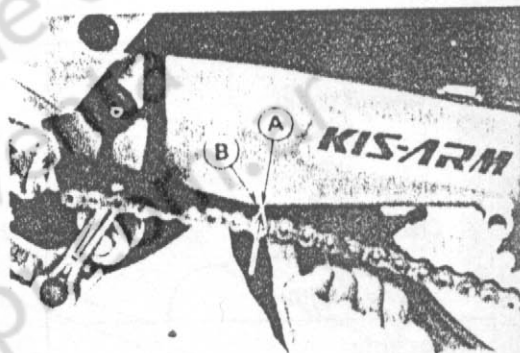
Drive Chain

Slack Inspection

NOTE

- Check the slack with the motorcycle setting on its side stand.
- Clean the chain if it is dirty, and lubricate it if it appears dry.

- Check the wheel alignment (see Wheel Alignment Inspection)
- Rotate the rear wheel to find the position where the chain is tightest
- Push up the chain at the bottom [B] of the swingarm, measure the distance (chain slack) [A] from the chain upper end to the swingarm.
- ★ If the chain slack exceeds the standard, adjust it.

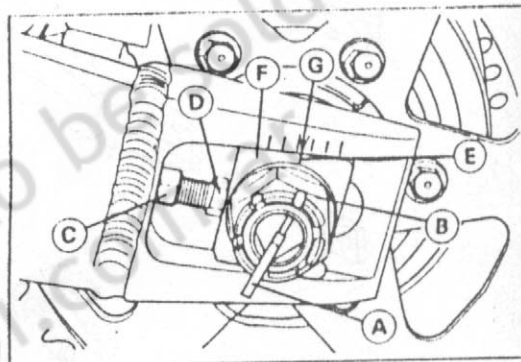


Chain Slack

Standard:	7 ~ 15 mm
Too Tight:	more than 15 mm
Too Loose:	less than 7mm

Slack Adjustment

- Remove the cotter pin [A], and loosen the axle nut [B].
- Loosen the both chain adjuster locknuts [C].
- ★ If the chain is too loose, turn out the left and right chain adjuster [D] evenly.
- ★ If the chain is too tight, turn in the left and right chain adjusters evenly, and kick the wheel forward.
- Turn both chain adjusters evenly until the drive chain has the correct amount of slack. To keep the chain and wheel properly aligned, the notch [E] on the left wheel alignment indicator [F] should align with the same swingarm mark or position [G] that the right indicator notch aligns with.



⚠ WARNING

Misalignment of the wheel will result in abnormal wear and may result in an unsafe riding condition.

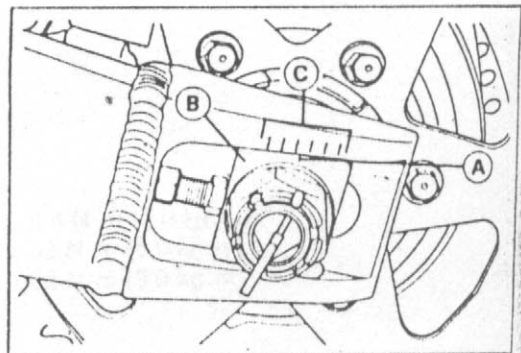
- Tighten both chain adjuster locknuts securely
- Tighten the axle nut.
Torque — Rear Axle Nut 88 N·m (9.0 kg·m)
- Turn the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Insert a new cotter pin and spread its ends.

Wheel Alignment Inspection Adjustment

- Check that the notch [A] on the left alignment indicator [B] aligns with the same swingarm mark or position [C] that the right alignment indicator notch aligns with.
- ★ If they are not, adjust the chain slack and align the wheel alignment (see Slack Adjustment).

NOTE

- Wheel alignment can be also be checked using the straightedge or string method.

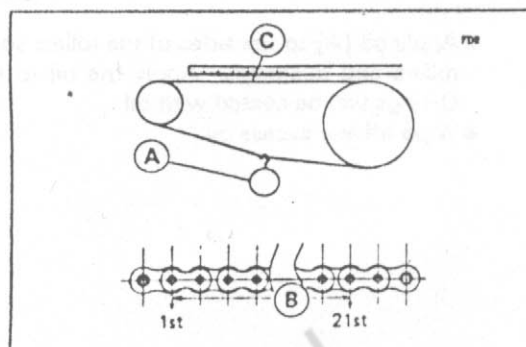


⚠ WARNING

Misalignment of the wheel will result in abnormal wear, and may result in an unsafe riding condition.

Drive Chain Wear Inspection

- Remove:
 - Chain Cover
- Rotate the rear wheel to inspect the drive chain for damaged rollers, and loose pins and links.
- ★ If there is any irregularity, replace the drive chain.
- ★ Lubricate the drive chain if it appears dry.
- Stretch the chain taut by hanging a 98 N (10 kg, 20 lb) weight [A] on the chain.
- Measure the length of 20 links [B] on the straight part [C] of the chain from the pin center of the 1st pin to the pin center of the 21st pin. Since the chain may wear unevenly, take measurements at several places.
- ★ If any measurements exceed the service limit, replace the chain. Also, replace the front and rear sprockets when the drive chain is replaced.

**Drive Chain 20-link Length**

Standard:	317.5 ~ 318.2 mm
Service Limit:	323 mm

⚠ WARNING

If the drive chain wear exceeds the service limit, replace the chain or an unsafe riding condition may result. A chain that breaks or jumps off the sprockets could snag on the engine sprocket or lock the rear wheel, severely damaging the motorcycle and causing it to go out of control.

For safety, use only the standard chain. It is an endless type and should not be cut for installation.

Lubrication

- The chain should be lubricated with a lubricant which will both prevent the exterior from rusting and also absorb shock and reduce friction in the interior of the chain.
- ★ If the chain is especially dirty, it should be washed in diesel oil or kerosene, and afterward soaked in a heavy oil. Shake the chain while it is in the oil so that oil will penetrate to the inside of each roller.
- An effective, good quality lubricant specially formulated for chains is best for regular chain lubrication.
- ★ If a special lubricant is not available, a heavy oil such as SAE 90 is preferred to a lighter oil because it will stay on the chain longer and provide better lubrication.

CAUTION

The O-rings between the side plates seal in the lubricant between the pin and the bushing. To avoid damaging the O-rings and resultant loss of lubricant, observe the following rules.

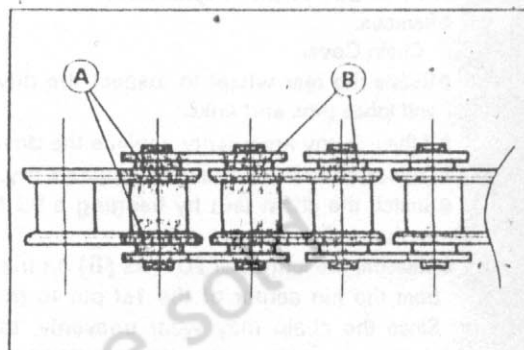
Use only kerosene or diesel oil for cleaning an O-ring drive chain.

Any other cleaning solution such as gasoline or trichloroethylene will cause deterioration and swelling of the O-ring.

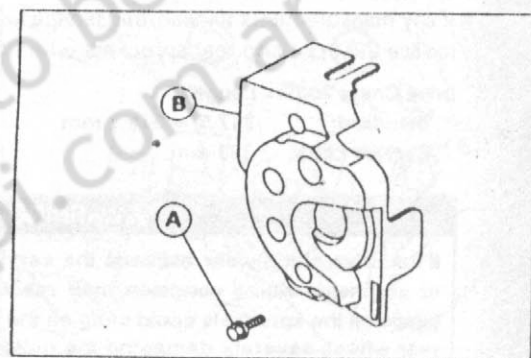
Immediately blow the chain dry with compressed air after cleaning.

Complete cleaning and drying the chain within 10 minutes.

- Apply oil [A] to the sides of the rollers so that oil will penetrate to the rollers and bushings. Apply the oil to the O-rings [B] so that the O-rings will be coated with oil.
- Wipe off any excess oil.

**Drive Chain Removal**

- Remove:
 - Rear Wheel (see Wheels/Tires chapter)
 - Engine Sprocket Cover Bolts [A]
 - Engine Sprocket Cover [B]
 - Swingarm (see Suspension chapter)
 - Drive Chain

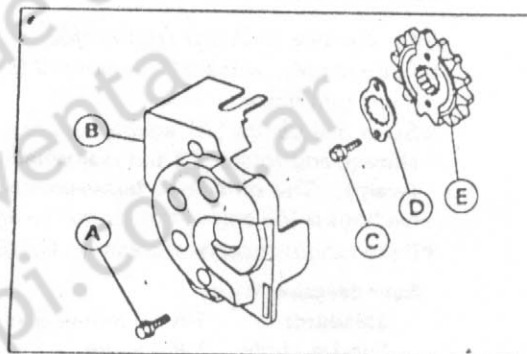
**Drive Chain Installation**

- Install:
 - Swingarm (see Suspension chapter)
 - Rear Wheel (see Wheels/Tires chapter)
- Adjust the chain slack after installing the chain (see Slack Adjustment).

Sprocket, Coupling

Engine Sprocket Removal

- Maximize the drive chain slack (see Drive Chain Slack Adjustment).
- Remove:
 - Engine Sprocket Cover Bolts [A]
 - Engine Sprocket Cover [B]
 - Engine Sprocket Mounting Bolts [C]
 - Holding Plate [D]
- Pull the engine sprocket [E] off the output shaft along with the chain.
- Remove the engine sprocket.



Engine Sprocket Installation

- Replace the axle cotter pin with a new one.
- Install the engine sprocket onto the output shaft with the drive chain engaged.
- Flat side of the sprocket may be faced out
- Tighten:

Torque – Engine Sprocket Mounting Bolts : 9.8 N-m (1.0 kg-m)

- Adjust the drive chain slack after installing the sprocket (see Slack Adjustment).

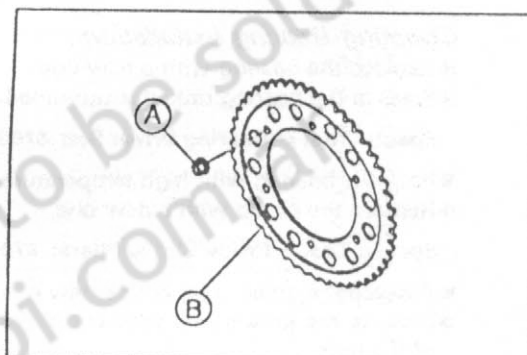
Rear Sprocket Removal

- Remove the rear wheel (see Wheel/Tires-chapter).

CAUTION

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

- Remove the rear sprocket nuts [A].
- Remove the rear sprocket [B].

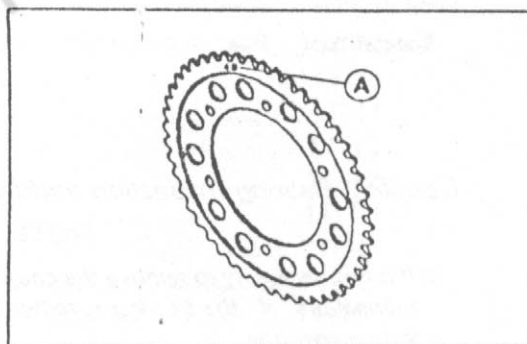


Rear Sprocket Installation

- Install the sprocket facing the tooth number marking [A] outward.
- Tighten the rear sprocket nuts.

Torque – Rear Sprocket Nuts : 59 N-m (6.0 kg-m)

- Install the rear wheel (see Wheels/ Tires chapter).



Sprocket Wear Inspection

- Visually inspect the engine and rear sprocket teeth for wear and damage.

★ If the teeth are worn as illustrated, replace the sprocket, and inspect the drive chain wear (see Drive Chain Wear Inspection).

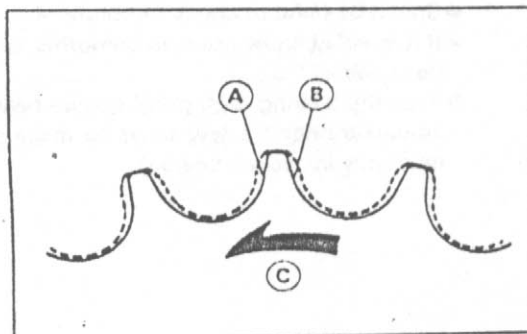
[A] Worn Tooth (Engine Sprocket)

[B] Worn Tooth (Rear Sprocket)

[C] Direction of Rotation

NOTE

If a sprocket requires replacement, the chain is probably worn also. When replacing a sprocket, inspect the chain.



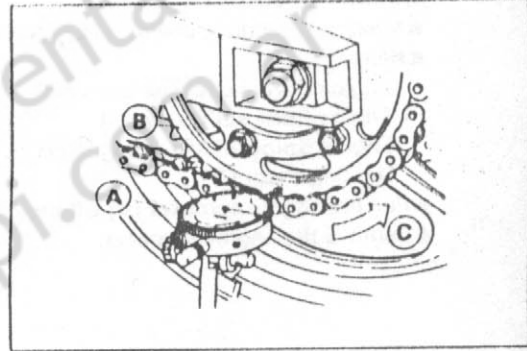
Rear Sprocket Warp Inspection

- Raise the rear wheel off the ground (see Wheels/Tires chapter) so that it will turn freely.
- Set a dial gauge [A] against the rear sprocket [B] near the teeth as shown, and rotate [C] the rear wheel to measure the sprocket runout (warp). The difference between the highest and lowest dial gauge readings is the amount of runout (warp).

★ If the runout exceeds the service limit, replace the rear sprocket.

Rear Sprocket Warp

Standard:	TIR 0.4 mm or less
Service Limit:	TIR 0.5 mm



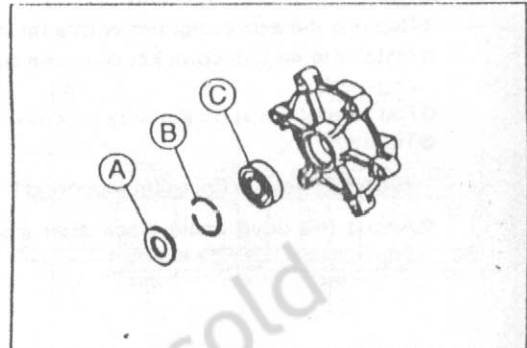
Coupling Bearing Removal

- Remove:
 - Coupling
 - Grease Seal [A]
 - Circlip [B]

Special Tool – Inside Circlip Pliers: 57001-143

- Remove the bearing [C] by tapping from the wheel side.

Special Tool – Bearing Driver Set: 57001-1129



Coupling Bearing Installation

- Replace the bearing with a new one.
- Press in the bearing until it is bottomed.

Special Tool – Bearing Driver Set: 57001-1129

- Pack the bearing with high temperature grease.
- Replace the circlip with a new one.

Special Tool – Inside Circlip Pliers: 57001-143

- Replace the grease seal with a new one.
- Press in the grease seal so that the seal surface is flush with the end of the hole.
- Apply high temperature grease to the grease seal lips

Special Tool – Bearing Driver Set: 57001-1129

Coupling Bearing Inspection and Lubrication

NOTE

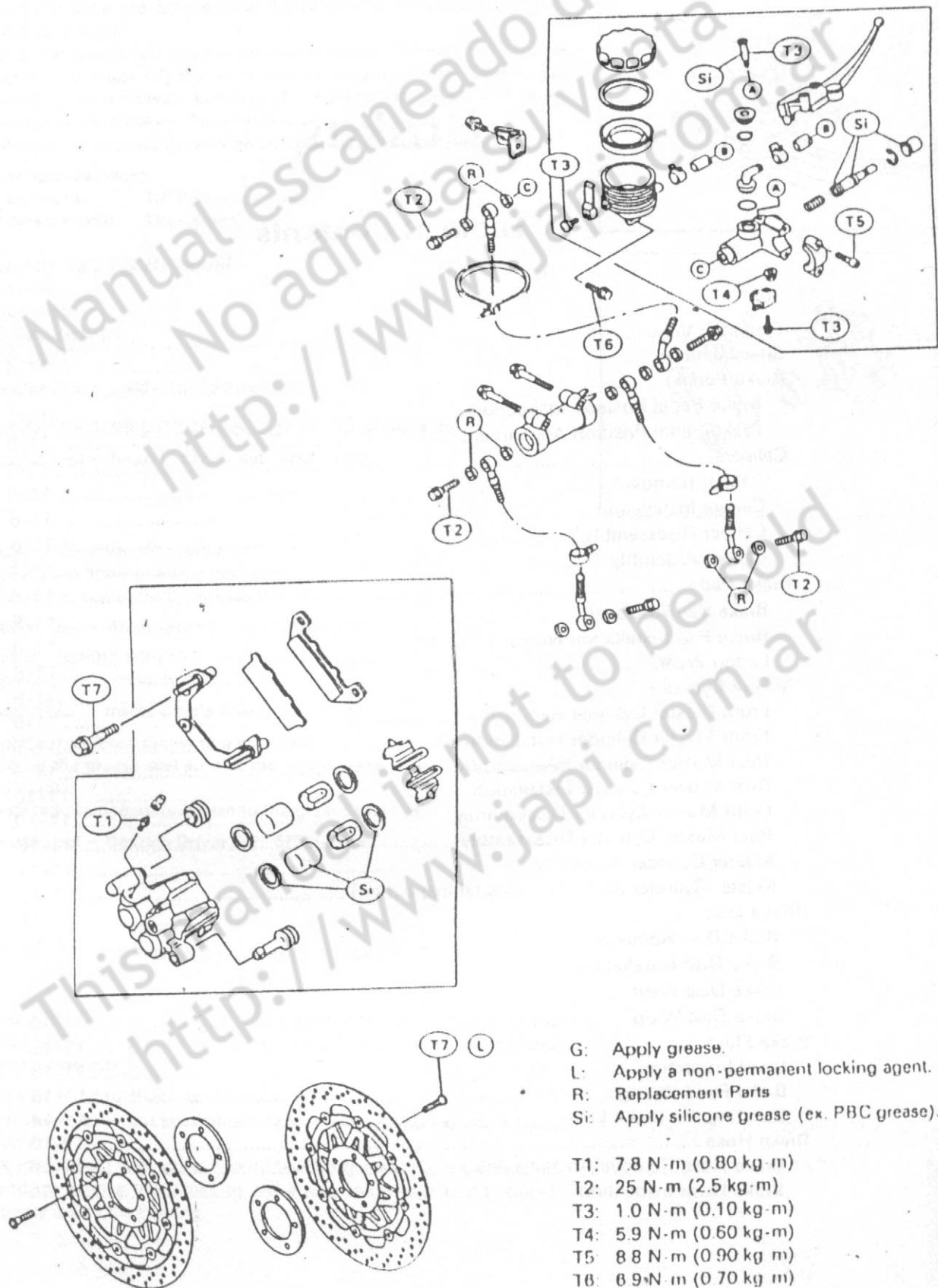
It is not necessary to remove the coupling bearing for inspection and lubrication. If the bearing is removed, it will need to be replaced with a new one.

- Spin it by hand to check its condition.
- ★ If it is noisy, does not spin smoothly, or has any rough spots, it must be replaced.
- Pack the bearing with good quality bearing grease. Turn the bearing around by hand a few times to make sure the grease is distributed uniformly inside the bearing.

Brakes

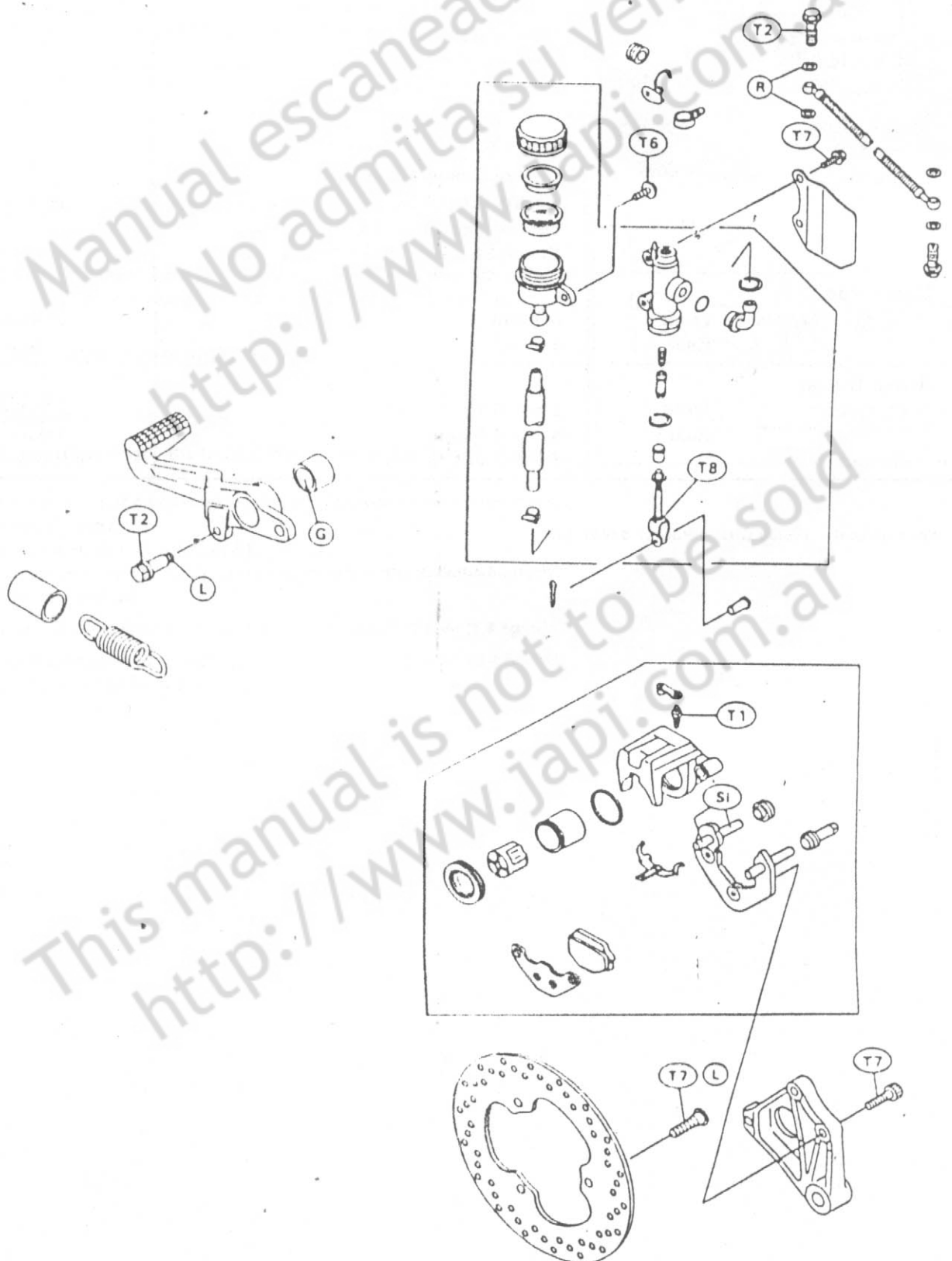
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- G: Apply grease.
 L: Apply a non-permanent locking agent.
 R: Replacement Parts
 Si: Apply silicone grease (ex. PBC grease).

- T1: 7.8 N·m (0.80 kg·m)
 T2: 25 N·m (2.5 kg·m)
 T3: 1.0 N·m (0.10 kg·m)
 T4: 5.9 N·m (0.60 kg·m)
 T5: 8.8 N·m (0.90 kg·m)
 T6: 6.9 N·m (0.70 kg·m)
 T7: 23 N·m (2.3 kg·m)
 T8: 18 N·m (1.8 kg·m)



Specifications

Item	Standard	Service Limit
Brake Lever, Brake Pedal: Brake lever position Brake lever free play Pedal free play Pedal position	4-way adjustable (to suit rider) Non-adjustable Non-adjustable About 55 mm below footpeg top	--- --- --- ---
Brake Fluid: Grade Brand (recommended)	D.O.T.4 Castrol Girling-Universal Castrol G1 (LMA) Castrol Disc Brake Fluid Check Shock Premium Heavy Duty	--- --- --- --- ---
Brake Pads: Lining thickness: Front Rear	4.3 mm 4.5 mm	1 mm 1 mm
Brake Discs: Thickness: Front Rear Runout	3.8 ~ 4.1 mm 4.3 ~ 4.6 mm TIR 0.2 mm or less	3.5 mm 4.0 mm TIR 0.3 mm

Special Tool - Inside Circlip/Pliers: 57001-143

Brake Pedal

Brake Pedal Position Inspection

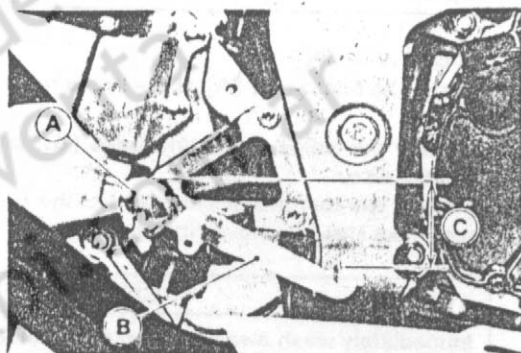
- Check that the brake pedal [B] is in the correct position.

[A] Footpeg

Pedal Position [C]

Standard: About 55 mm below top of footpeg

- ★ If it is incorrect, adjust the brake pedal position.



Brake Pedal Position Adjustment

NOTE

○ Usually it is not necessary to adjust the pedal position, but always adjust it when the master cylinder is disassembled or pedal position is incorrect.

- Measure the length indicated in the figure

Length [A]

Standard: 67 ± 1 mm

- ★ If it is specified length, the brake pedal may be deformed or incorrectly installed.

- ★ If it is not within the specified length, adjust the push rod in the master cylinder as following.

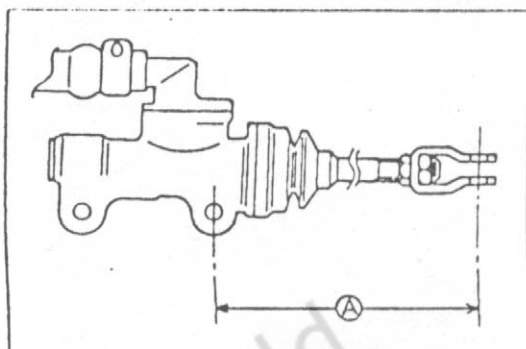
○ Loosen the push rod locknut [B].

○ Turn the hex head [C] of the push rod to obtain the specified length.

○ Tighten the locknut.

Torque - Rear Master Cylinder Push Rod Locknut: 18 N·m (1.8 kg·m)

- Check the brake light switch operation (see Rear Brake Light Switch Adjustment in Electrical System chapter)



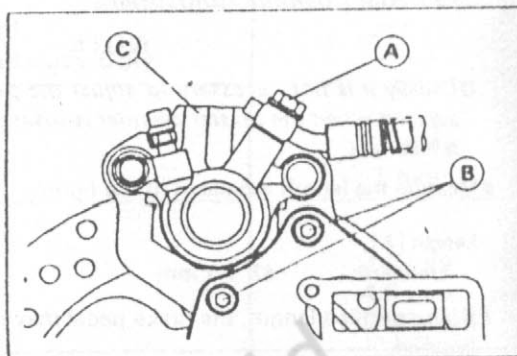
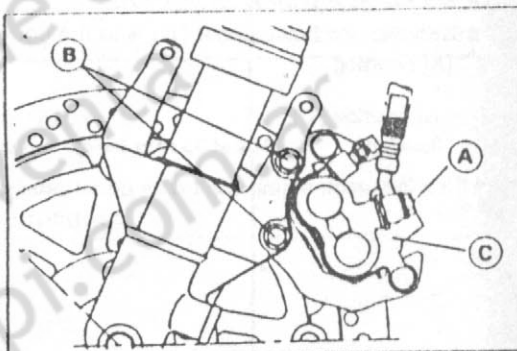
Calipers

Caliper Removal

- Loosen the banjo bolt [A] at the brake hose lower end, and tighten it loosely.
- Unscrew the caliper mounting bolts [B], and detach the caliper [C] from the disc.
- Unscrew the banjo bolt and remove the brake hose from the caliper (see Brake Hose Removal/Installation).

CAUTION

Immediately wash away any brake fluid that spills.

*Caliper Installation*

- Install the caliper and brake hose lower end.
- Replace the washers that are on each side of hose fitting with new ones.
- Tighten the caliper mounting bolts and banjo bolt.

Torque – Caliper Mounting Bolts (Front, Rear): 23 N-m (2.3 kg-m)
 Brake Hose Banjo Bolt: 25 N-m (2.5 kg-m)

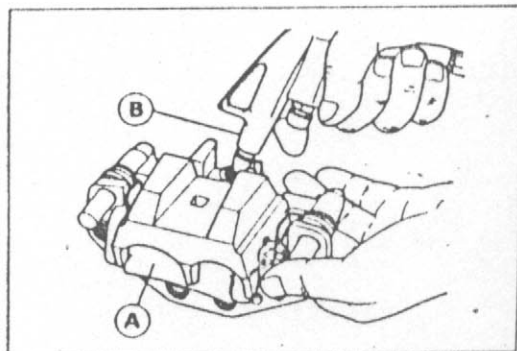
- Check the fluid level in the brake reservoirs.
- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, not brake drag, and no fluid leakage.

WARNING

Do not attempt to drive the motorcycle until a full brake lever or pedal is obtained by pumping the brake lever or pedal until the pads are against the disc. The brakes will not function on the first application of the lever or pedal if this is not done.

Caliper Disassembly

- Remove:
 - Caliper (see Caliper Removal)
 - Brake Pads (see Brake Pad Removal)
 - Anti-rattle Spring
 - Piston Insulators
- Using compressed air, remove the piston.
- Cover the caliper opening with a clean, heavy cloth [A].
- Remove the piston by lightly applying compressed air [B] to where the brake line fits into the caliper.



⚠ WARNING

To avoid serious injury, never place your fingers or palm inside the caliper opening. If you apply compressed air into the caliper, the piston may crush your hand or fingers.

- Remove the dust seal and fluid seal.
- Remove the bleed valve and rubber cap.

NOTE

If compressed air is not available, do as follows with the brake hose connected to the caliper.

- Prepare a container for brake fluid, and perform the work above it.
- Remove the pads and anti-rattle spring.
- Pump the brake lever or pedal to remove the caliper piston.

Caliper Assembly

- Clean the caliper parts except for the pads.

CAUTION

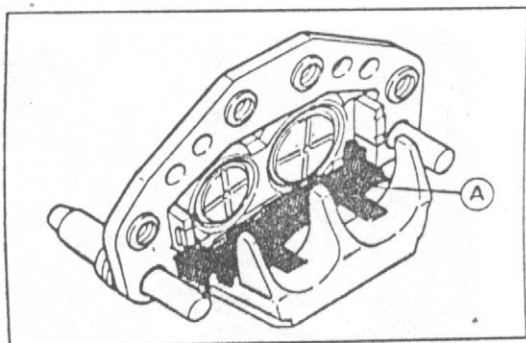
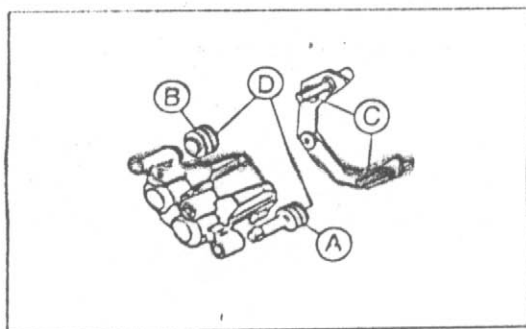
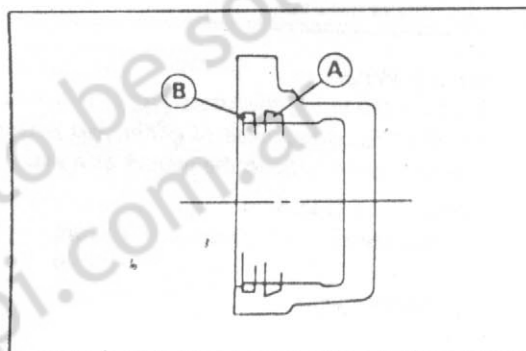
For cleaning the parts, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol.

- Install the bleed valve and rubber cap.

Torque - Bleed Valves : 7.8 N·m (0.80 kg·m)

- Replace the fluid seals [A] with new ones
- Apply brake fluid to the fluid seals, and install them into the cylinders by hand.
- Replace the dust seals [B] with new ones if they are damaged
- Apply brake fluid to the dust seals, and install them into the cylinders by hand.
- Apply brake fluid to the outside of the pistons, and push them into each cylinder by hand.
- Replace the shaft rubber friction boot [A] and dust cover [B] if they are damaged
- Apply a thin coat of PBC (Poly Butyl Cupryl) grease to the caliper holder shafts [C] and holder holes [D] (PBC is a special high temperature, water-resistance grease).

- Install the anti-rattle spring [A] in the caliper as shown
- Install the piston insulator.
- Install the pads (see Brake Pad Installation)
- Wipe up any spilled brake fluid on the caliper with wet cloth

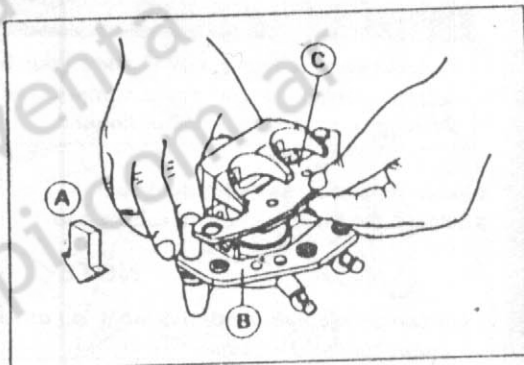


11-8 BRAKES

Brake Pads

Brake Pad Removal

- Unscrew the caliper mounting bolts.
- Detach the caliper from the disc.
- Take the piston side pad out of the caliper holder.
- Push [A] the caliper holder [B] toward the piston, and then remove another pad [C] from the caliper holder shaft.



Brake Pad Installation Notes

- Push the caliper pistons in by hand as far as they will go.
- Install the anti-rattle spring in place.
- Install the piston side pad first, and then another pad.
- Install the caliper (see Caliper Installation).

WARNING

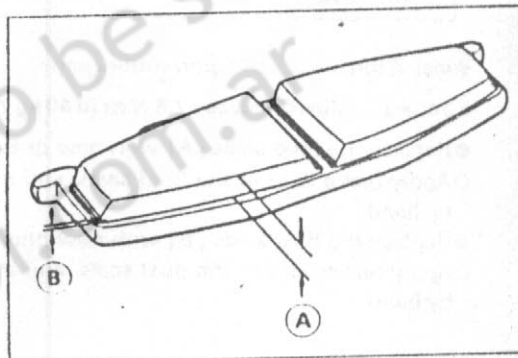
Do not attempt to drive the motorcycle until a full brake lever is obtained by pumping the brake lever until the pads are against the disc. The brake will not function on the first application of the lever if this is not done.

Lining Wear

- Check the lining thickness [A] of the pads in each caliper
- ★ If the lining thickness of either pad is less than the service limit [B], replace both pads in the caliper as a set.

Pad Lining Thickness

Standard:	Front	4.3 mm
	Rear	4.5 mm
Service Limit		1 mm



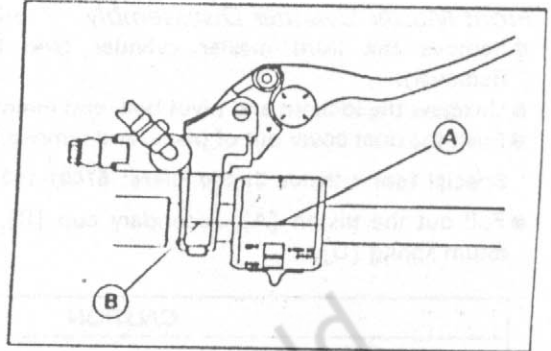
Master Cylinder

Front Master Cylinder Removal

- Disconnect the front brake light switch connectors.
- Remove the banjo bolt to disconnect the brake hose from the master cylinder. (see Brake Hose Removal/Installation).
- Unscrew the clamp bolts, and take off the master cylinder as an assembly with the reservoir, brake lever, and brake switch installed.

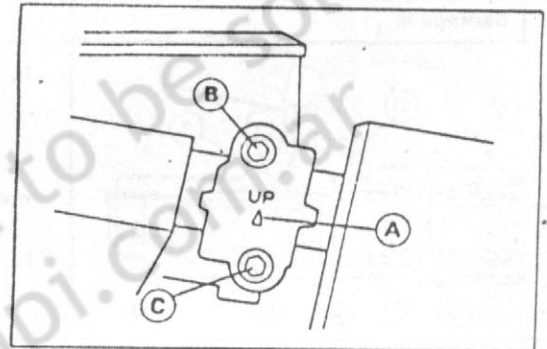
Front Master Cylinder Installation

- Install the front master cylinder so that the mating surface [A] of the switch housing is aligned with the mating surface [B] of the master cylinder clamp to level the reservoir.



- The master cylinder clamp must be installed with the arrow mark [A] upward.
- Tighten the upper clamp bolt [B] first, and then the lower clamp bolt [C]. There will be a gap at the lower part of the clamp after tightening.

Torque - Front Master Cylinder Clamp Bolts: 8.8 N-m (0.90 kg-m)



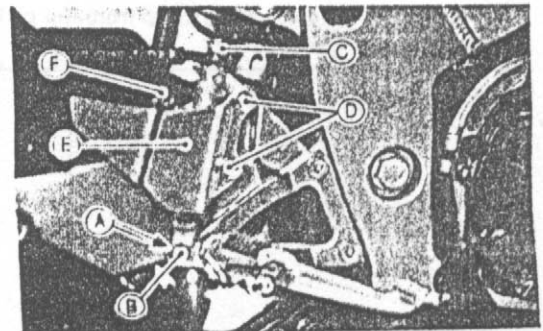
- Replace the washers that are on each side of the hose fitting with new ones.
- Tighten the brake hose banjo bolt.

Torque - Brake Hose Banjo Bolt 25 N-m (2.5 kg-m)

- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

Rear Master Cylinder Removal

- Remove:
 - Cotter Pin [A]
 - Joint Pin [B]
 - Brake Hose Banjo Bolt [C]
 - Master Cylinder Mounting Bolts [D] and Cover [E]
 - Reservoir Hose Lower End [F]
- Rear Master Cylinder



Rear Master Cylinder Installation

- Replace the cotter pin with a new one.
- Replace the washers that are on each side of hose fitting with new ones.
- Tighten the following bolts.

Torque – Rear Master Cylinder Mounting Bolts: 23 N-m (2.3 kg-m)
Brake Hose Banjo Bolt: 25 N-m (2.5 kg-m)

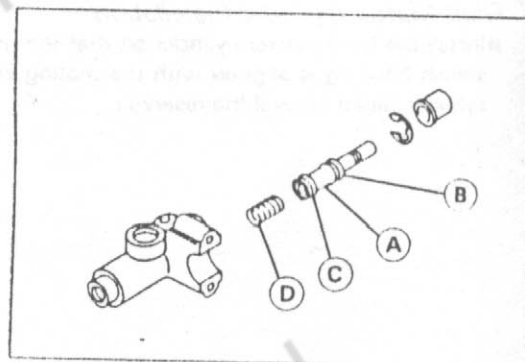
- Bleed the brake line (see Bleeding the Brake Line).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

Front Master Cylinder Disassembly

- Remove the front master cylinder (see Front Master Cylinder Removal).
- Unscrew the locknut and pivot bolt, and remove the brake lever.
- Push the dust cover out of place, and remove the circlip.

Special Tool – Inside Circlip Pliers: 57001-143

- Pull out the piston [A], secondary cup [B], primary cup [C], and return spring [D].

**CAUTION**

Do not remove the secondary cup from the piston since removal will damage it.

Rear Master Cylinder Disassembly

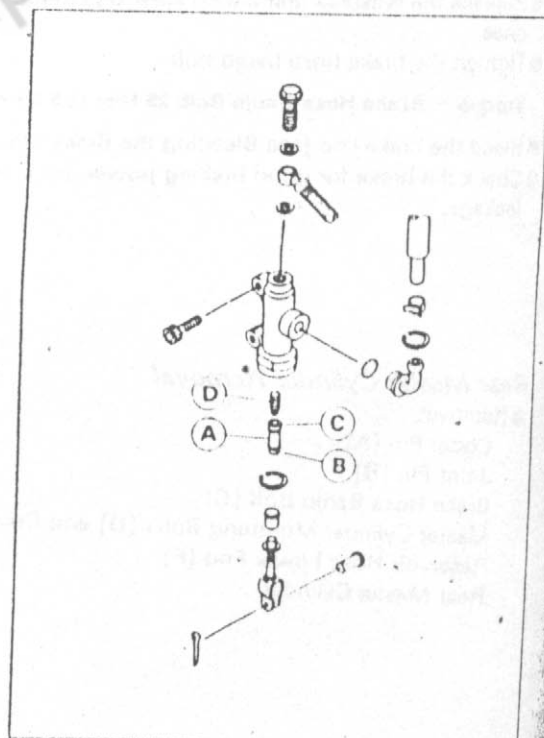
- Remove the rear master cylinder (see Rear Master Cylinder Removal).
- Slide the dust cover on the push rod out of place, and remove the circlip.

Special Tool – Inside Circlip Pliers: 57001-143

- Pull out the push rod with the piston stop.
- Take off the piston [A], secondary cup [B], primary cup [C], and return spring [D].

CAUTION

Do not remove the secondary cup from the piston since removal will damage it.



Master Cylinder Assembly

- Before assembly, clean all parts including the master cylinder with brake fluid or alcohol.

CAUTION

Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine 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 disc brake.

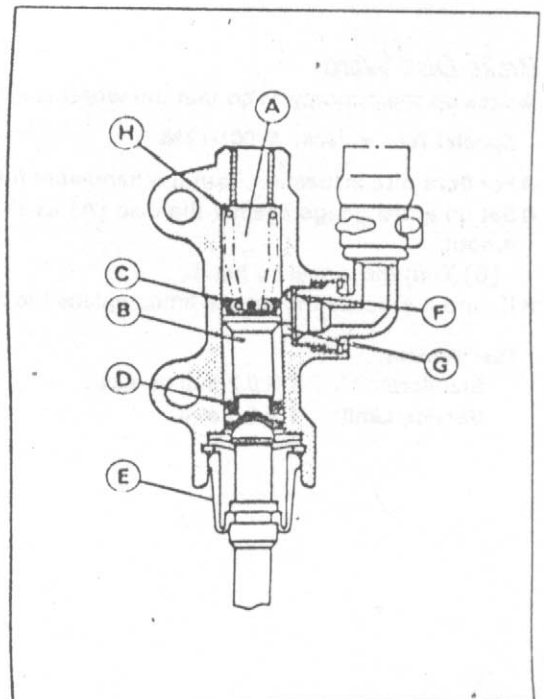
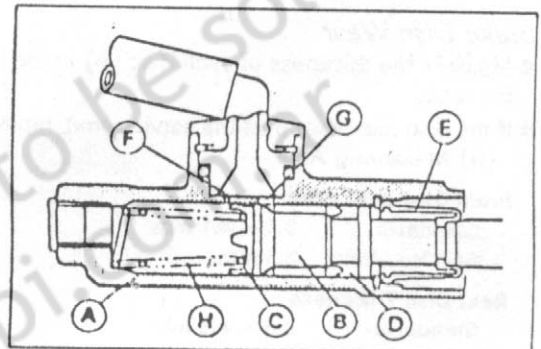
- Apply brake fluid to the removed parts and to the inner wall of the cylinder.
- Take care not to scratch the piston or the inner wall of the cylinder.
- Tighten the brake lever pivot bolt and the locknut.

Torque - Brake Lever Pivot Bolt: 1.0 N-m (0.10 kg-m)

Brake Lever Pivot Bolt Locknut: 5.9 N-m (0.60 kg-m)

Master Cylinder Inspection (Visual Inspection)

- Disassemble the front and rear master cylinders.
- Check that there are no scratches, rust or pitting on the inner wall of each master cylinder [A] and on the outside of each piston [B].
- ★ If a master cylinder or piston shows any damage, replace them.
- Inspect the primary [C] and secondary [D] cups
- ★ If a cup is worn, damaged softened (rotted), or swollen, the piston assembly should be replaced to renew the cups
- ★ If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cups
- Check the dust covers [E] for damage
- ★ If they are damaged, replace them.
- Check that relief [F] and supply [G] ports are not plugged.
- ★ If the relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.
- Check the piston return springs [H] for any damage
- ★ If the springs are damaged, replace them.



Brake Disc

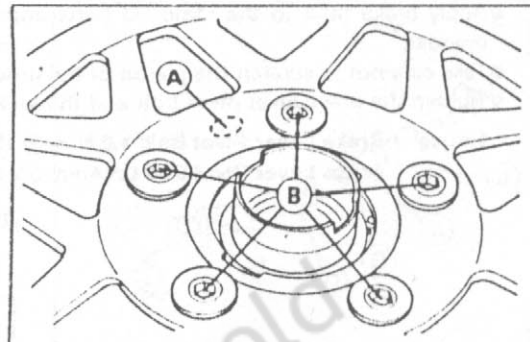
Brake Disc Removal

- Remove the wheel (see Wheels/Tires chapter).
- Unscrew the mounting bolts, and take off the disc.

Brake Disc Installation

- Install the disc on the wheel so that the marked side [A] faces out.
- Apply a non-permanent locking agent to the threads of the mounting bolts [B], and tighten them.

Torque — Brake Disc Mounting bolts: 23 N-m (2.3 kg-m)

*Brake Disc Wear*

- Measure the thickness of each disc [A] at the point where it has worn the most.

★ If the disc has worn past the service limit, replace it.

[B] Measuring Area

Front Disc Thickness

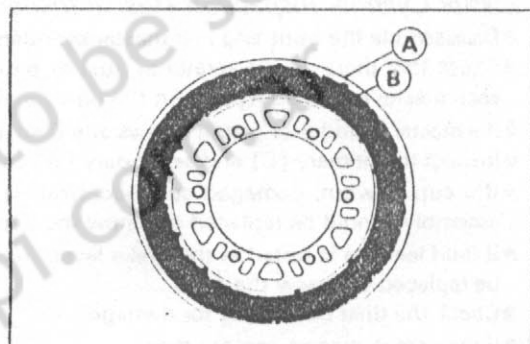
Standard: 3.8 ~ 4.1 mm

Service Limit: 3.5 mm

Rear Disc Thickness

Standard: 4.3 ~ 4.6 mm

Service Limit: 4.0 mm

*Brake Disc Warp*

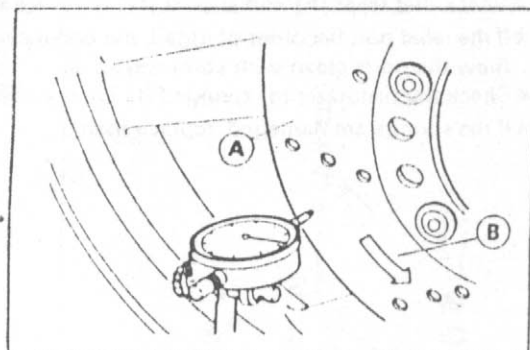
- Jack up the motorcycle so that the wheel is off the ground.

Special Tool — Jack: 57001-1238

- For front disc inspection, turn the handlebar fully to one side.
- Set up a dial gauge against the disc [A] as shown and measure disc runout.

[B] Turn the wheel by hand.

★ If runout exceeds the service limit, replace the disc.

**Disc Runout**

Standard: TIR 0.2 mm or less

Service Limit: TIR 0.3 mm

Brake Fluid

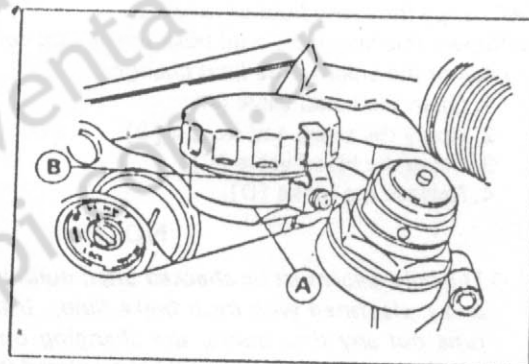
Level Inspection

- Check that the brake fluid level in the front brake reservoir is above the lower level line [A].

NOTE

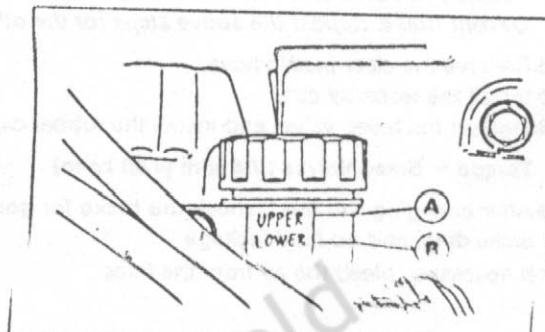
○ Hold the reservoir horizontal by turning the handlebar when checking brake fluid level.

- ★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [B].



- Check that the brake fluid level in the rear brake reservoir is between the upper [A] and the lower [B] level lines.

- ★ If the fluid level is lower than the lower level line, remove the side cover and fill the reservoir to the upper level line.



⚠ WARNING

Change the brake fluid in the brake line completely if the brake fluid must be refilled but the type and brand of the brake fluid that is already in the system is not recommended. Otherwise, the brake may stop the master cylinder and become inoperative.

Recommended Disc Brake Fluid

Grade: D.O.T.4

Brand: Castrol Girling-Universal

Castrol GT (LMA)

Castrol Disc Brake Fluid

Check Shock Premium Heavy Duty

Brake Fluid Change

NOTE

○ The procedure to change the front brake fluid is as follows.
Changing the rear brake fluid is the same as for the front brake.

- Level the brake fluid reservoir.
- Remove the reservoir cap.
- Remove the rubber cap from the bleed valve on the caliper.
- Attach a clear plastic hose to the bleed valve, and run the other end of the hose into a container.
- Fill the reservoir with fresh specified brake fluid

- Change the brake fluid as follows:

○ Repeat this operation until fresh brake fluid comes out from the plastic hose or the color of the fluid changes.

1. Open the bleed valve [A].
2. Apply the brake and hold it [B].
3. Close the bleed valve [C].
4. Release the brake [D].

NOTE

○ The fluid level must be checked often during the changing operation and replenished with fresh brake fluid. If the fluid in the reservoir runs out any time during the changing operation, the brakes will need to be bled since air will have entered the brake line.

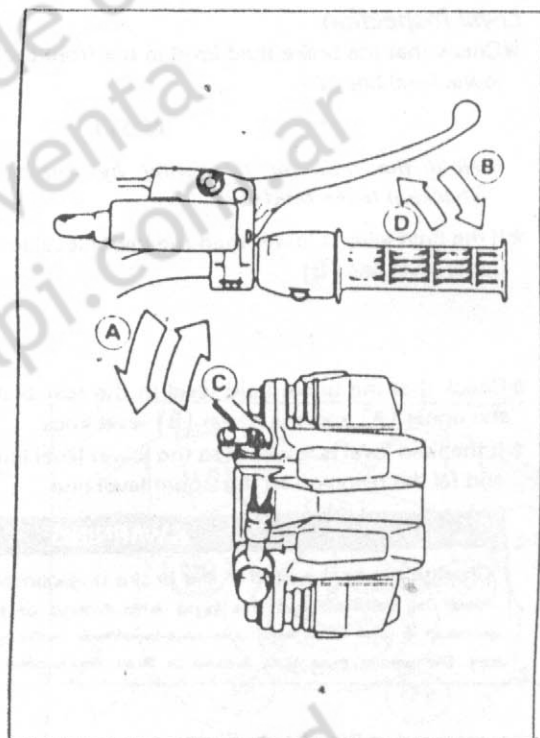
○ Front Brake: Repeat the above steps for the other caliper.

- Remove the clear plastic hose.
- Install the reservoir cap.
- Tighten the bleed valve, and install the rubber cap.

Torque – Bleed Valves : 7.8 N-m (0.80 kg-m)

- After changing the fluid, check the brake for good braking power, no brake drag, and no fluid leakage.

★ If necessary, bleed the air from the lines.



Bleeding the Brake Line

The brake fluid has a very low compression coefficient so that almost all the movement of the brake lever or pedal is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake lines, brake lever or pedal movement will be partially used in compressing the air. This will make the lever or pedal feel spongy, and there will be a loss in braking power.

WARNING

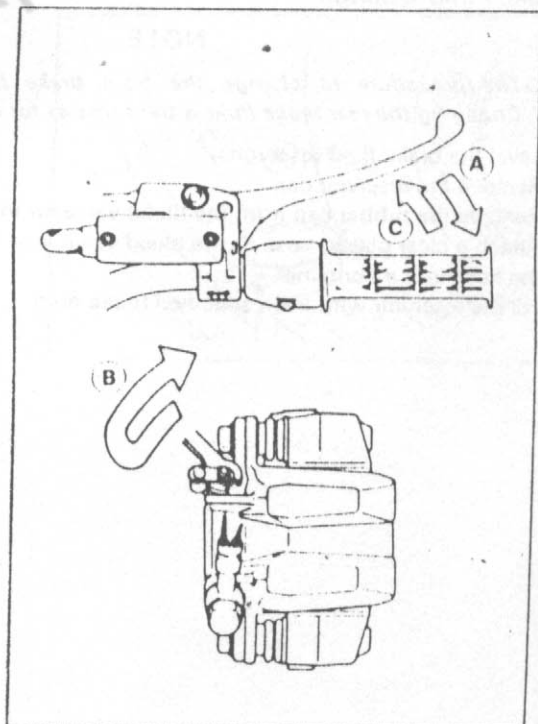
Be sure to bleed the air from the brake line whenever brake lever or pedal action feels soft or spongy after the brake fluid is changed, or whenever a brake line fitting has been loosened for any reason.

NOTE

○ The procedure to bleed the front brake line is as follows. Bleeding the rear brake line is the same as for the front brake.

- Remove the reservoir cap, and fill the reservoir with fresh brake fluid to the upper level line in the reservoir.
- With the reservoir cap off, slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir.
- Bleed the air completely from the master cylinder by this operation.
- Install the reservoir cap.
- Remove the rubber cap from the bleed valve on the caliper.
- Attach a clear plastic hose to the bleed valve, and run the other end of the hose into a container.
- Bleed the brake line and the caliper as follows:
- Repeat this operation until no more air can be seen coming out into the plastic hose.

1. Pump the brake lever until it becomes hard, and apply the brake and hold it [A].
2. Quickly open and close [B] the bleed valve while holding the brake applied.
3. Release the brake [C].



NOTE

○ The fluid level must be checked often during the bleeding operation and replenished with fresh brake fluid 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.

○ Tap the brake hose lightly from the caliper to the reservoir for more complete bleeding.

○ Front Brake: Repeat the above steps for the other caliper.

- Remove the clear plastic hose.
- Tighten the bleed valve, and install the rubber cap.

Torque - Bleed Valves : 7.8 N-m (0.80 kg-m)

- Check the fluid level.
- After bleeding is done, check the brake for good braking power, no brake drag, and no fluid leakage.

WARNING

When working with the disc brake, observe the precautions listed below.

1. Never reuse old brake fluid.
2. Do not use fluid from a container that has been left unsealed or that has been open for a long time.
3. 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.
4. Don't leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.
5. Don't change the fluid in the rain or when a strong wind is blowing.
6. Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine 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 disc brake.
7. When handling the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high-flash point solvent. Do not use one which will leave an oily residue. Replace the pads with new ones if they cannot be cleaned satisfactorily.
8. Brake fluid quickly ruins painted surfaces, any spilled fluid should be completely wiped up immediately.
9. 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.**

Brake Hose

Brake Hose Removal/Installation

CAUTION
Brake fluid quickly ruins painted or plastic surfaces; any spilled fluid should be completely wiped up immediately with wet cloth.

- When removing the brake hose, take care not to spill the brake fluid on the painted or plastic parts.
- When removing the brake hose, temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- There are washers on each side of the brake hose fitting. Replace them with new ones when installing.
- When installing the hoses, avoid sharp bending, kinking, flattening or twisting, and route the hoses according to Hose Routing section in General Information chapter.
- Tighten the banjo bolts at the hose fittings.

Torque – Brake Hose Banjo Bolts: 25 N-m (2.5 kg-m)

- Bleed the brake line after installing the brake hose (see Bleeding the Brake Line).

Brake Hose Inspection

- The high pressure inside the brake line can cause fluid to leak or the hose to burst if the line is not properly maintained. Bend and twist the rubber hose while examining it.
- ★ Replace it if any cracks or bulges are noticed.