CHAPTER 6.
CHASSIS

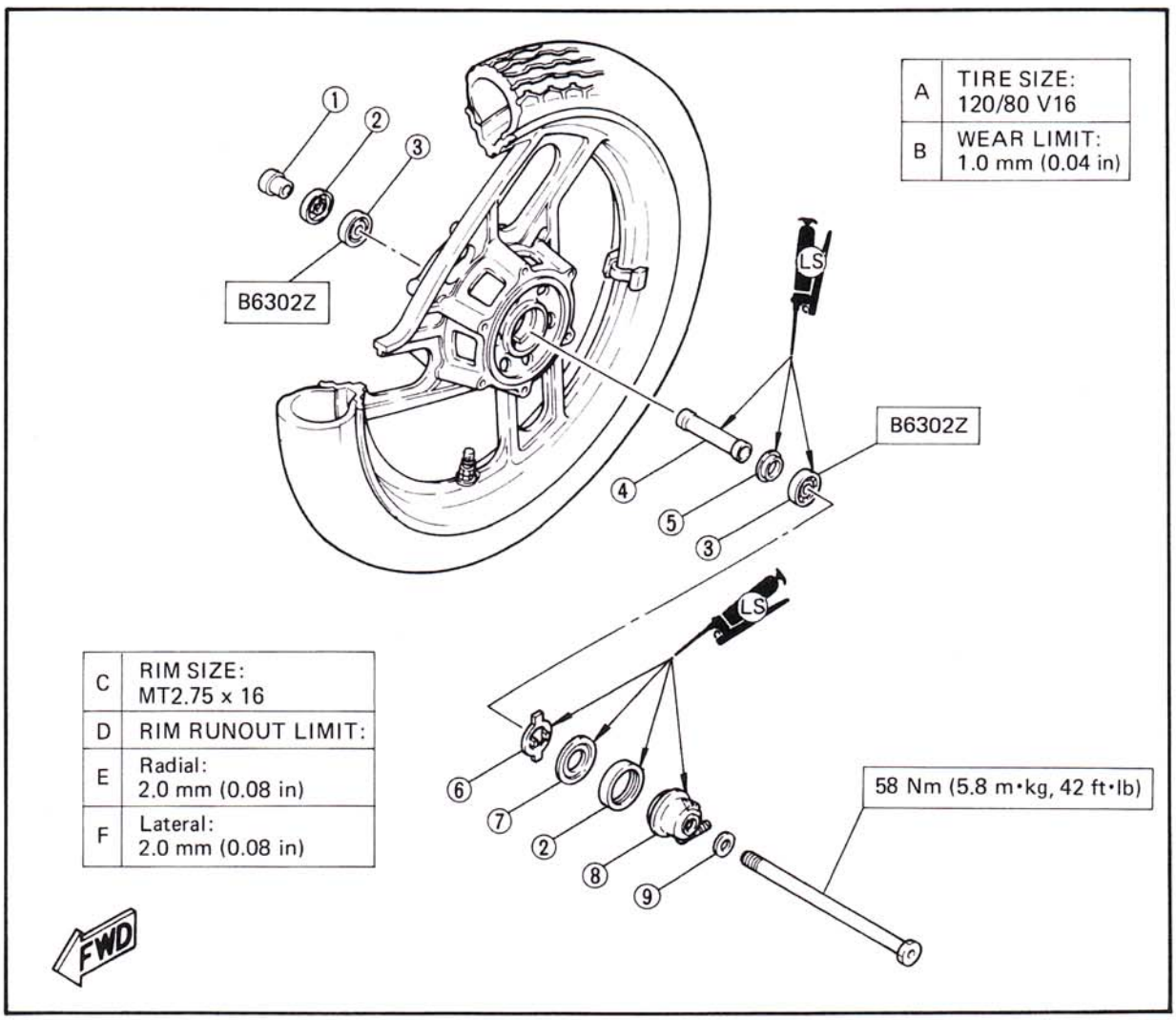
CHASSIS

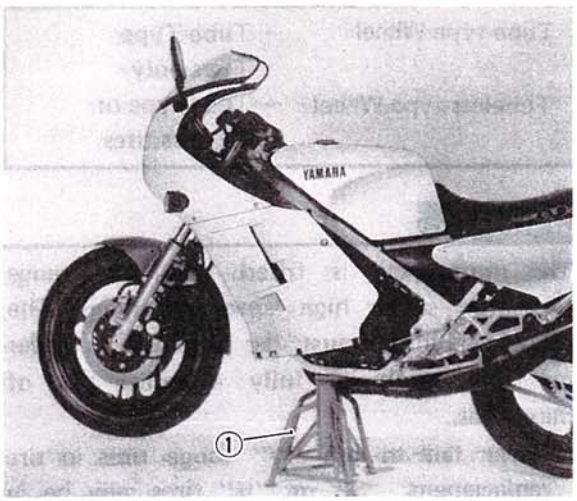
FRONT WHEEL

1. Collar
2. Oil seal
3. Bearing
4. Spacer
5. Spacer flange
6. Meter clutch
7. Clutch retainer
8. Gear unit
9. Washer

Basic weight: With oil and full fuel tank	199 kg (439 lb)	
Maximum load*	211 kg (465 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	196 kPa (2.0 kg/cm², 28 psi)	226 kPa (2.3 kg/cm², 32 psi)
90 kg (198 lb) ~ Maximum load*	226 kPa (2.3 kg/cm², 32 psi)	284 kPa (2.9 kg/cm², 42 psi)
High speed riding	226 kPa (2.3 kg/cm², 32 psi)	245 kPa (2.5 kg/cm², 36 psi)

*Load is the total weight of cargo, rider, passenger, and accessories.





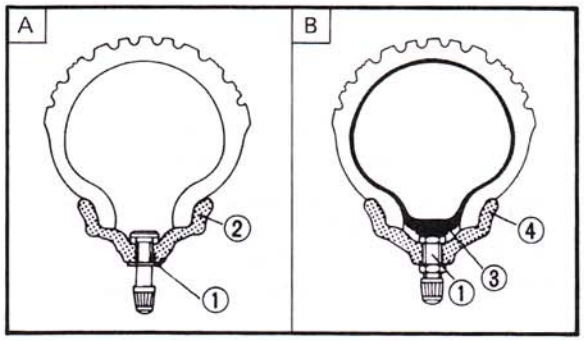
REMOVAL

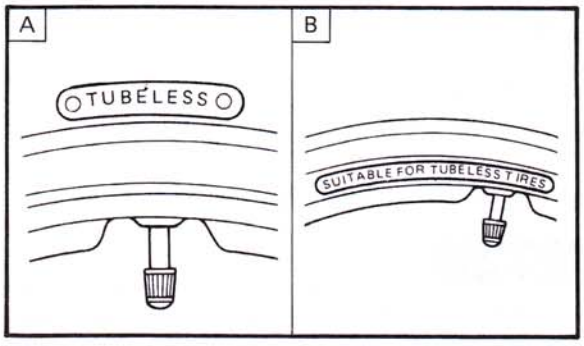
1. Remove:
   - Lower cowling
2. Place the motorcycle on a block or other suitable stand ① under the frame.
3. Remove:
   - Speedometer cable ②
   - Fork brace ③
   - Front fender ④
   - Brake caliper (One side only)

NOTE:

Do not squeeze the brake lever while the wheel if off the motorcycle.

4. Loosen:
   - Axle pinch bolts
5. Remove:
   - Front axle
   - Front wheel





TUBELESS TIRES AND CAST WHEELS

This motorcycle is equipped with cast wheels designed for either tube or tubeless tires. Tubeless tires are installed as standard equipment.

① Air valve
② Cast wheel (Tubeless wheel)
③ Tube
④ Cast wheel
[A] TUBELESS-TYPE TIRE
[B] TUBE-TYPE TIRE

WARNING:

Do not attempt to use tubeless tires on wheels designed for tube-type tires only. Sudden tire deflation and loss of control may occur causing possible injury.
Be sure to install the proper tube when using tube-type tires.

[A] TIRE
[B] WHEEL

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FRONT WHEEL

A	FRONT:	C	STANDARD TYPE		
D	Manufacture	E	Size	F	Type
Yokohama		120/80 V16		F101	

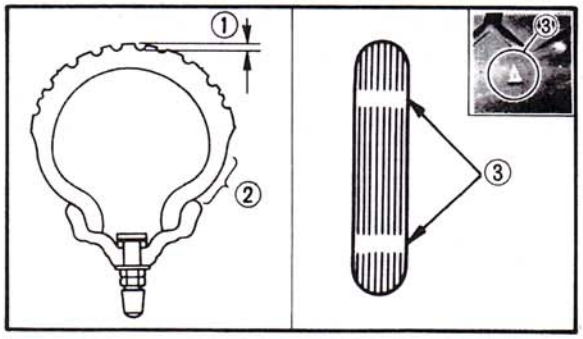
B	REAR:	C	STANDARD TIRE		
D	Manufacture	E	Size	F	Type
Yokohama		130/80 V18		R101	

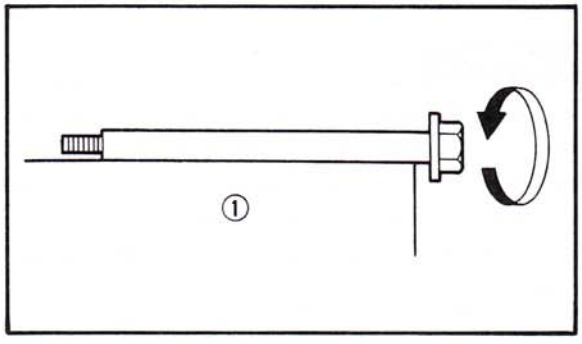
Tube-type Wheel	→ Tube-Type Tires only
Tubeless-type Wheel	→ Tube-type or Tubless tires

WARNING:

This motorcycle is fitted with "V" range tires (for super high speed running). The following points must be observed in order for you to make fully effective use of these tires.

- **Never fail to use "V" range tires in tire replacement. "S" or "H" tires may be in danger of bursting at super high-speeds.**
- **New tires have a relatively poor adhesion on the road surface so do not allow them to be subjected to high speed load from maximum speed until after a break-in run of approx. 100 km (60 mi).**
- **Before any high-speed runs, remember to allow a sufficient warm-up time for the tires.**
- **Always use the correct tire inflation pressure according to the operating conditions.**





INSPECTION

1. Inspect:
   - Tire
     Tire tread shows crosswise lines (minimum tread depth)/Cracks → Replace.

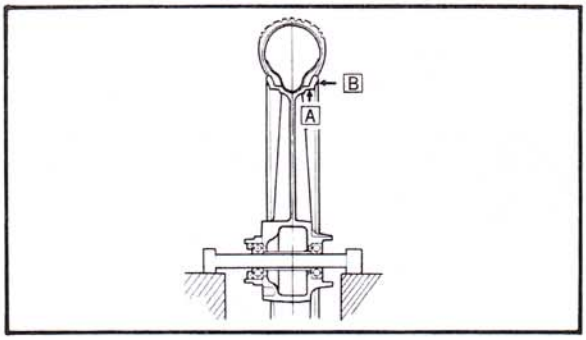
Minimum Tire Tread Depth:
1.0 mm (0.04 in)

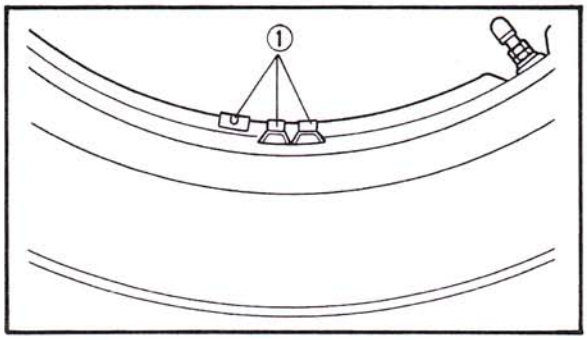
① Tread depth
② Sidewall
③ Wear indicator

2. Inspect:
   - Front axle
     Roll the axle on a flat surface ①
     Bends → Replace.

WARNING:

Do not attempt to straighten a bent axle.





3. Inspect:
   - Wheel
     Cracks/Bends/Warpage → Replace.
4. Measure:
   - Wheel runout
     Out of specification → Replace.

Rim Runout Limits:
Radial A: 2.0 mm (0.08 in)
Lateral B: 2.0 mm (0.08 in)

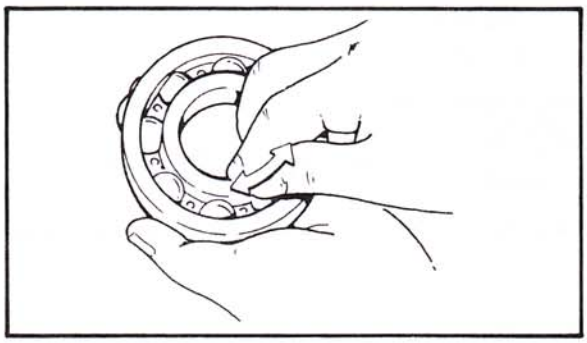
5. Check:
   - Wheel balance
     Out of balance → Adjust.

NOTE:
Balance wheels with the brake discs installed.

① Blancer weight

WARNING:
Ride conservatively after installing a tire to allow the tire to seat itself correctly on the rim.

CAUTION:
Be sure the valve stem locknut is tightened securely after repairing or replacing a tire and/or wheel.



6. Inspect:
   - Wheel bearings
     Bearings allow play in the wheel hub or wheel turns roughly → Replace.

Wheel bearing replacement steps:
- Clean the outside of the wheel hub.
- Drive out the bearing.

WARNING:
Eye protection is recommended when using striking tools.

- Install the new bearing by reversing the previous steps.

CAUTION:
Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.

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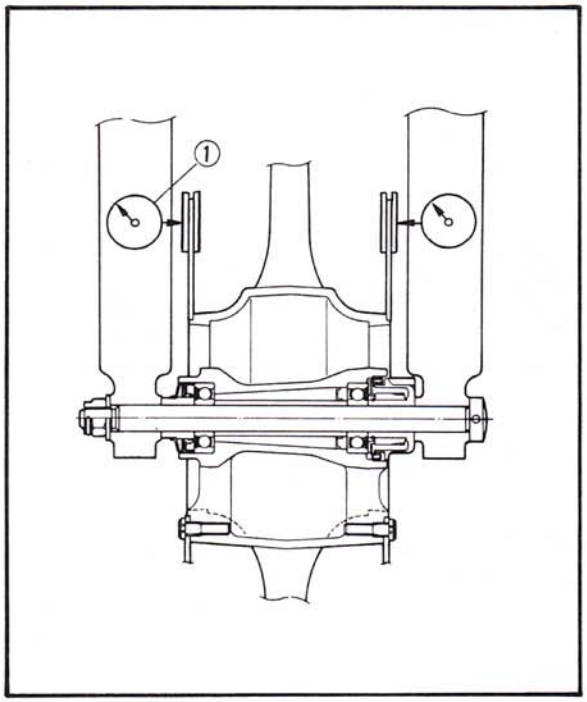
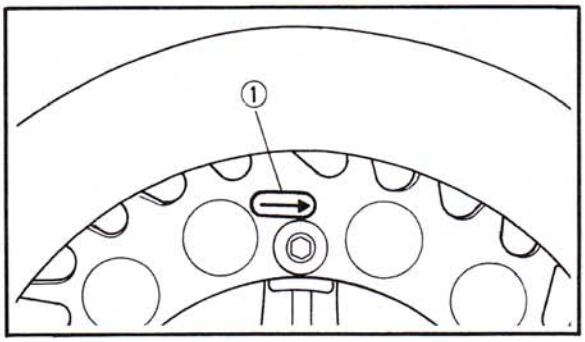


7. Inspect:
   - Brake disc
     Out of specification → Replace.

Maximum Deflection
(Front and Rear):
0.15 mm (0.006 in)
Minumum Disc Thickness:
Front: 7 mm (0.28 in)
Rear: 8 mm (0.31 in)

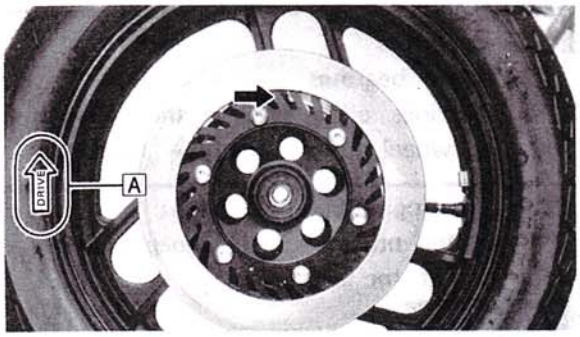
① Dial gauge



INSTALLATION

1. Install:
   - Brake discs

NOTE:
The arrow mark ① on the disc must point toward the rotating direction of the wheel.



2. Tighten:
   - Bolts

Brake Disc:
20 Nm (2.0 m·kg, 14 ft·lb)
LOCTITE®

A DRIVE

3. Install:
   - Front wheel
     Reverse removal steps.

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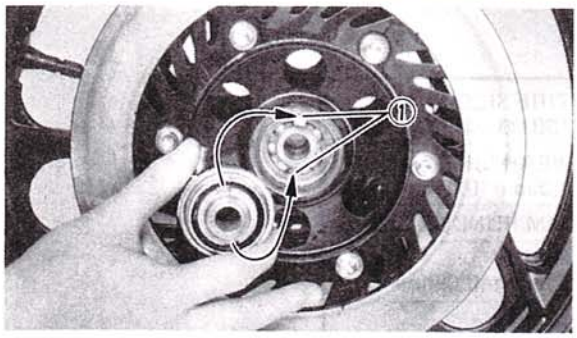
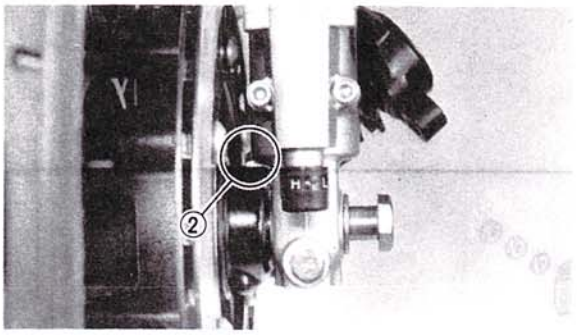




Note the following installation pionts:
- Lightly grease the front wheel oil seal lips and the gear teeth of the speedometer drive and driven gears.
  (Use lightweight lithium base grease.)
- Be sure that the two projections ① inside the wheel hub mesh with the two slots in the speedometer clutch assembly.
- Be sure that the projecting portion ② (torque stopper) of the speedometer housing is positioned correctly.
- Compress the front forks several times to confirm proper fork operation before tightening the pinch bolt.

4. Tighten:
   - Axle nut

Front Axle:
58 Nm (5.8 m·kg, 42 ft·lb)

5. Tighten:
   - Pinch bolts

Front Axle Pinch:
20 Nm (2.0 m·kg, 14 ft·lb)

6. Install:
   - Fork brace
   - Front fender

Front Fender:
9 Nm (0.9 m·kg, 6.5 ft·lb)

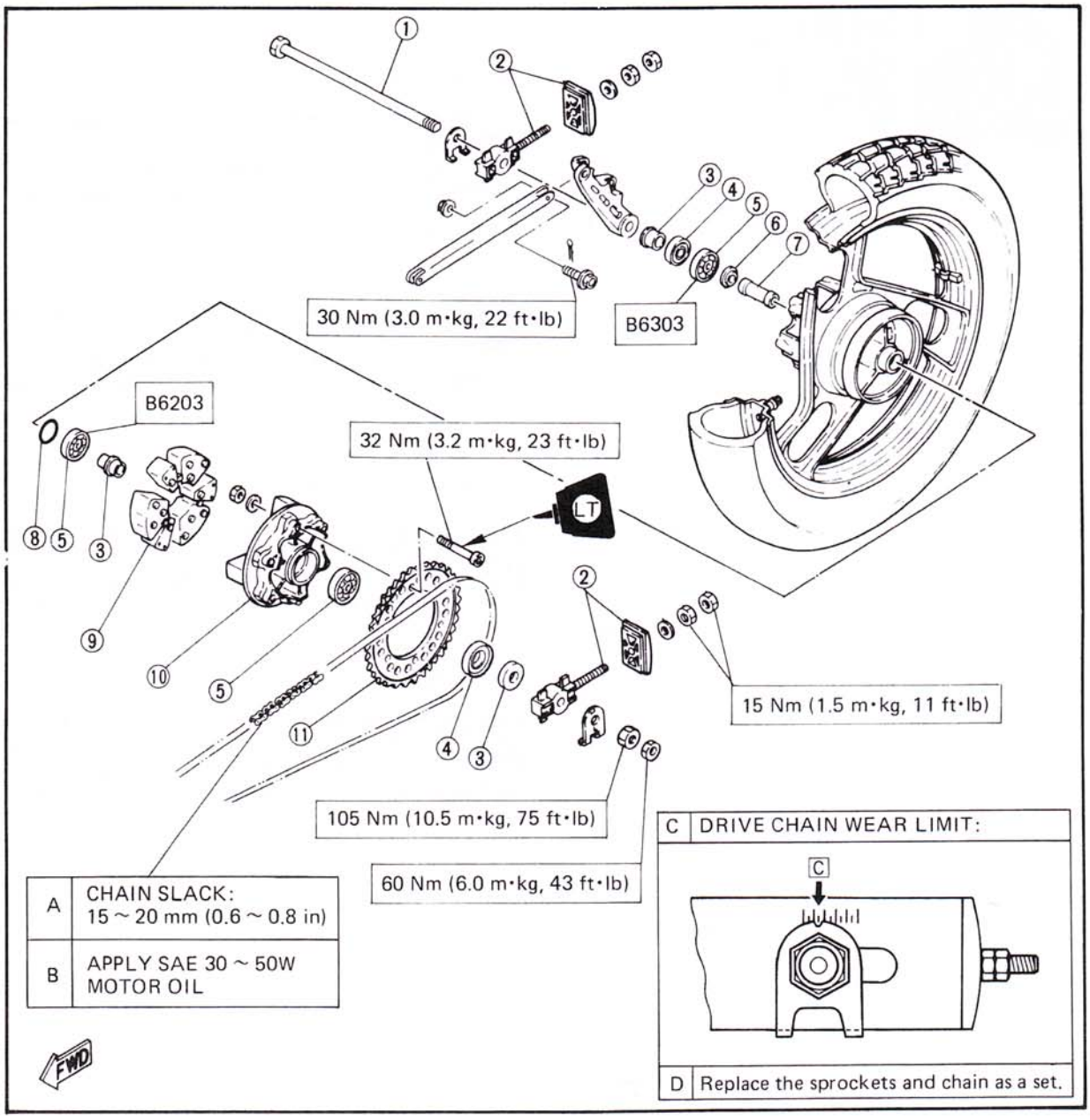
7. Install:
   - Brake calipers

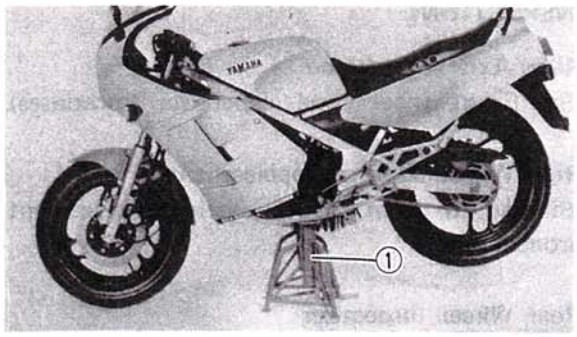
Brake Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)

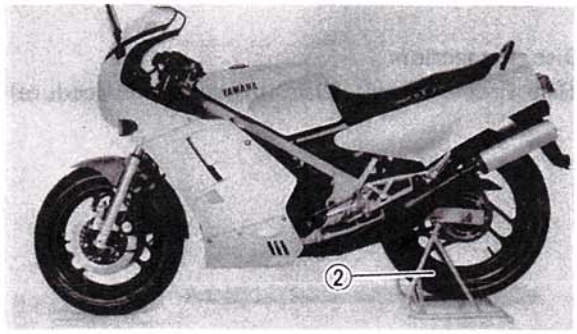
REAR WHEEL

1. Rear axle
2. Drive chain puller
3. Collar
4. Oil seal
5. Bearing
6. Spacer flange
7. Spacer
8. O-ring
9. Damper
10. Clutch hub
11. Driven sprocket (40T)

TIRE SIZE: 130/80 V18
WEAR LIMIT: 1.0 mm (0.04 in)
RIM RUNOUT LIMIT:
Radial: 2.0 mm (0.08 in)
Lateral: 2.0 mm (0.08 in)





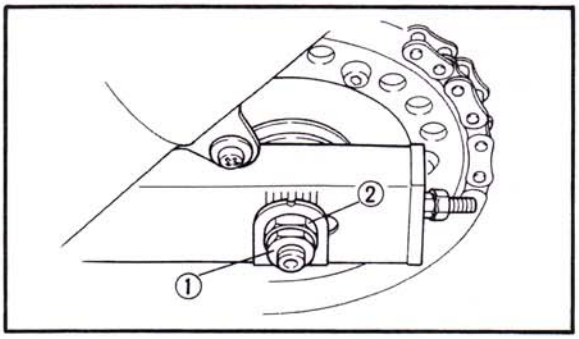


REMOVAL

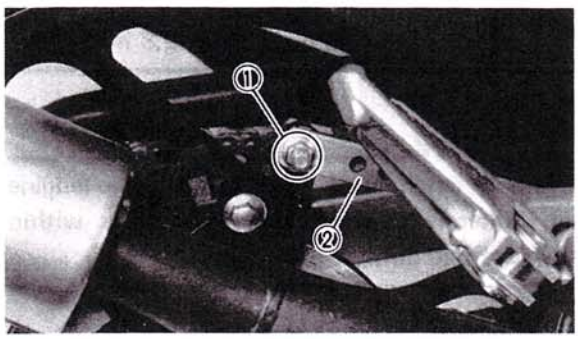
1. Remove:
   - Lower cowling
   - Mufflers (Lower cylinders)
2. Place the motorcycle on a block or other suitable stand ① under the frame.

   or

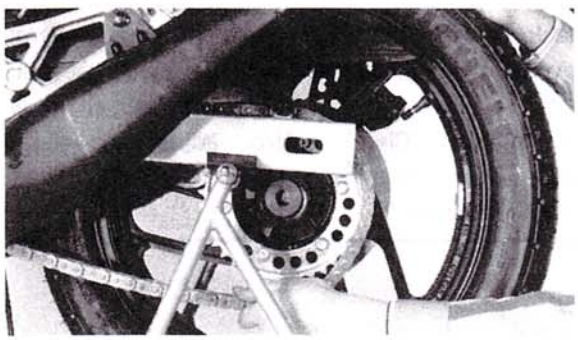
   Place the motorcycle on the Racing Stand (51X-W0780-00) ②.



3. Remove:
   - Lock nut ①
   - Axle nut ②



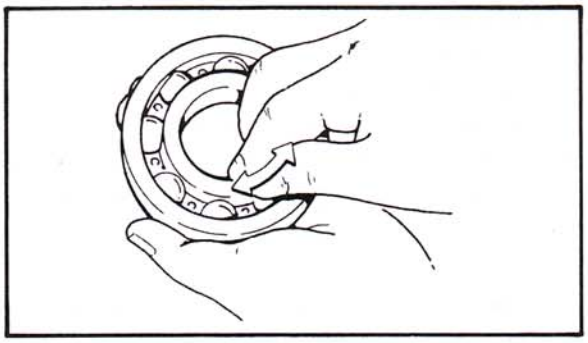
4. Remove:
   - Cotter pin ①
   - Tension bar ②
   - Rear axle shaft
5. Push the wheel forward and remove the drive chain.
6. Remove:
   - Rear wheel



NOTE:

Do not depress the brake pedal when the wheel is off the motorcycle as the brake pads will be forced shut.

REAR WHEEL



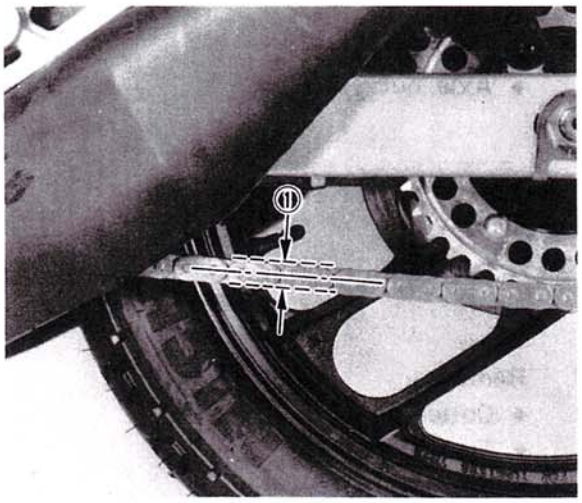
INSPECTION

Rear Axle Inspection
(See Front wheel, Axle Inspection Procedures)

Rear Wheel Bearing Replacement
(Similar to front wheel bearing replacement procedures)

Rear Wheel Inspection
(See Front Wheel, Inspection Procedures)

Disc Inspection
(See Front Wheel, Disc Inspection Procedure)



INSTALLATION

1. Install:
   - Rear wheel
   - Wheel axle

   Reverse the removal procedure.
2. Adjust:
   - Drive chain slack ①

   Refer to CHAPTER 2 for Drive Chain Slack Adjustment.

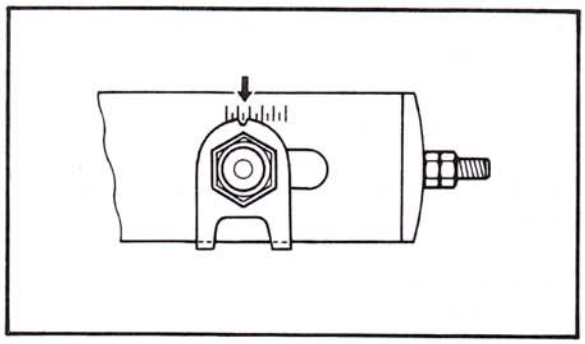
Drive Chain Slack ①:
15 ~ 20 mm (0.6 ~ 0.8 in)

CAUTION:

Excessive chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

NOTE:

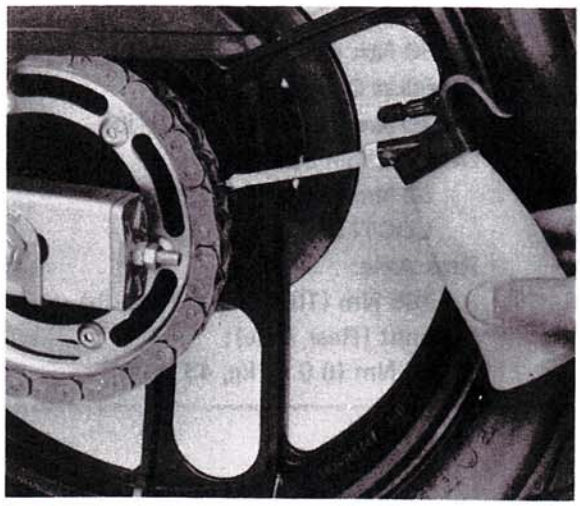
Before checking and/or adjusting the chain slack, rotate the rear wheel through several revolutions. Check the chain slack several times to find the point where the chain is the tightest. Check and/or adjust the chain slack where the rear wheel is in this "tight chain" position.



NOTE:
There are marks on each side of rear arm and on each chain puller; use them to check for proper alignment.

3. Check:
   - Alignment marks
     Out of specification → Replace sprockets and chain as a set.
4. Tighten:
   - Axle nut
   - Locknut (Axle nut)
   - Locknut (Chain puller)
   - Tension bar

Rear Axle:
105 Nm (10.5 m·kg, 75 ft·lb)
Rear Axle (Locknut):
60 Nm (6.0 m·kg, 43 ft·lb)
Tension Bar:
30 Nm (3.0 m·kg, 22 ft·lb)

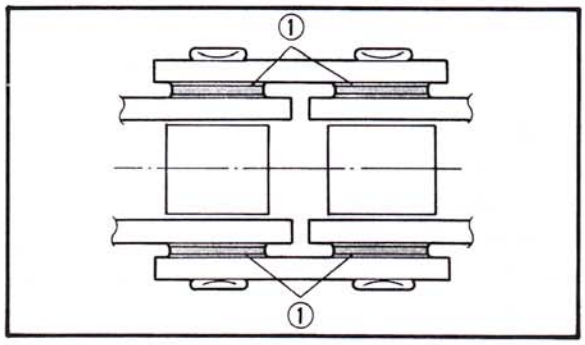


CAUTION:
Always use new cotter pins on the tension bar bolts.

DRIVE CHAIN LUBRICATION

The chain consists of many parts which work against each other. If the chain is not maintained properly, it will wear out rapidly, therefore, form the habit of periodically servicing the chain. This service is especially necessary when riding in dusty conditions.

This motorcycle has a drive chain with small rubber O-rings between the chain plates. Steam cleaning, high-pressure washes, and certain solvents can damage these O-rings. Use only kerosene to clean the drive chain. Wipe it dry, and thoroughtly lubricate it with SAE 30 ~ 50W motor oil. Do not use any other lubricants on the drive chain. They may contain solvents that could damage the O-rings ①.



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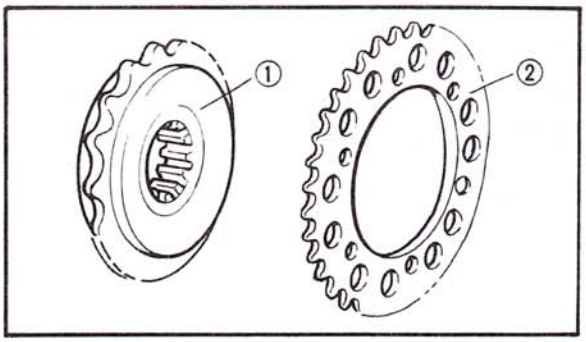
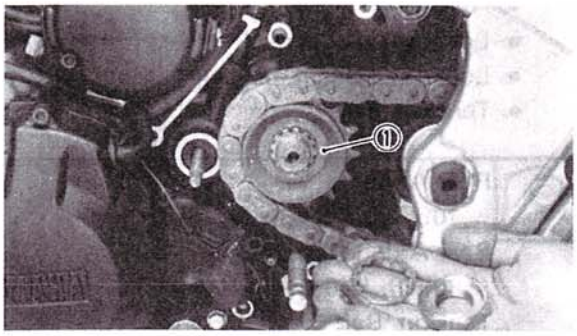
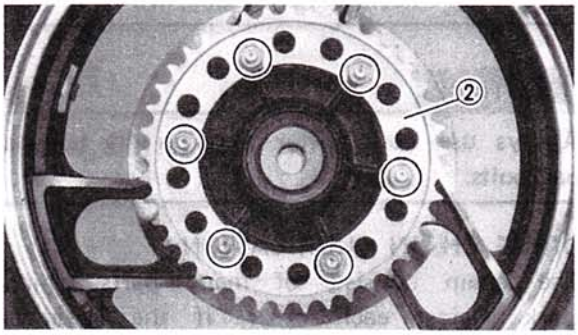






DRIVE AND DRIVEN CHAIN SPROCKETS

1. Inspect:
   - Sprocket teeth
     Wear/Bends/Damage → Replace.

NOTE:
Replace the sprockets and drive chain as a set.

① Drive sprocket
② Driven sprocket

2. Remove:
   - Drive sprocket ①
   - Driven sprocket ②
3. Install:
   - Drive sprocket (with a new lock washer)
   - Driven sprocket
4. Tighten:
   - All bolts and nuts

Drive Chain Sprocket:
90 Nm (9.0 m·kg, 65 ft·lb)
Sprocket Cover:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Driven Chain Sprocket:
32 Nm (3.2 m·kg, 23 ft·lb)
LOCTITE®
Rear Axle:
105 Nm (10.5 m·kg, 75 ft·lb)
Locknut (Rear Axle):
60 Nm (6.0 m·kg, 43 ft·lb)

6

FRONT AND REAR BRAKE

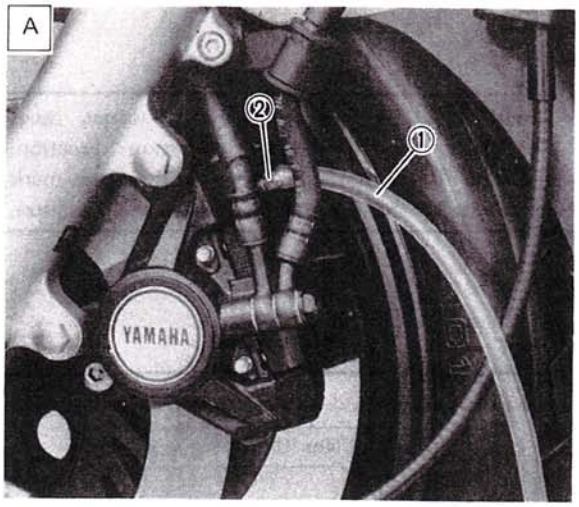
AIR BLEEDING

WARNING:

Bleed the brake system if:
- **The system has been disassembled.**
- **A brake hose has been loosened or removed.**
- **The brake fluid is very low.**
- **The brake operation is faulty.**

A dangerous loss of braking performance may occur if the brake system is not properly bled.

A



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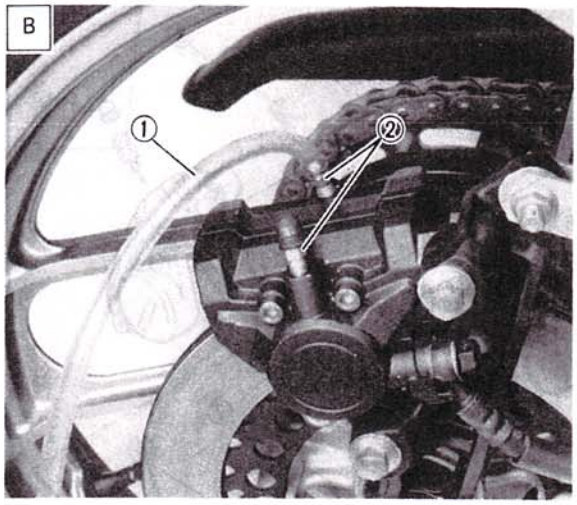

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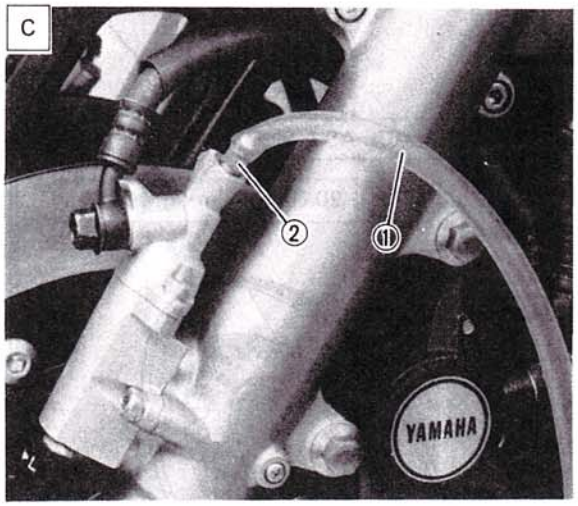

Air bleeding steps:

- Add proper brake fluid to the reservoir.
- Install the master cylinder cap. Be careful not to spill any fluid or allow the reservoir to overflow.
- Connect the clear plastic tube (4.5 mm 3/16 in inside dia.) ① tightely to the caliper bleed screw.
- Place the other end of the tube into a container.
- Slowly apply the brake lever or pedal several times.
- Pull the lever in or push down on the pedal. Hold the lever or pedal in position.
- Loosen the bleed screw ② and allow the lever or pedal to travel towards its limit.
- Tighten the bleed screw when the lever or pedal limit has been reached; then release the lever or pedal.
- Repeat the same steps until all of the air bubbles have been removed from the system.

Bleed Screw:
6 Nm (0.6 m·kg, 4.3 ft·lb)

NOTE:

If bleeding is difficult, it may be necessary to let the brake fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system have disappeared.

Brake Fluid:
DOT # 3

[A] FRONT
[A] REAR
[C] ANTI-DIVE

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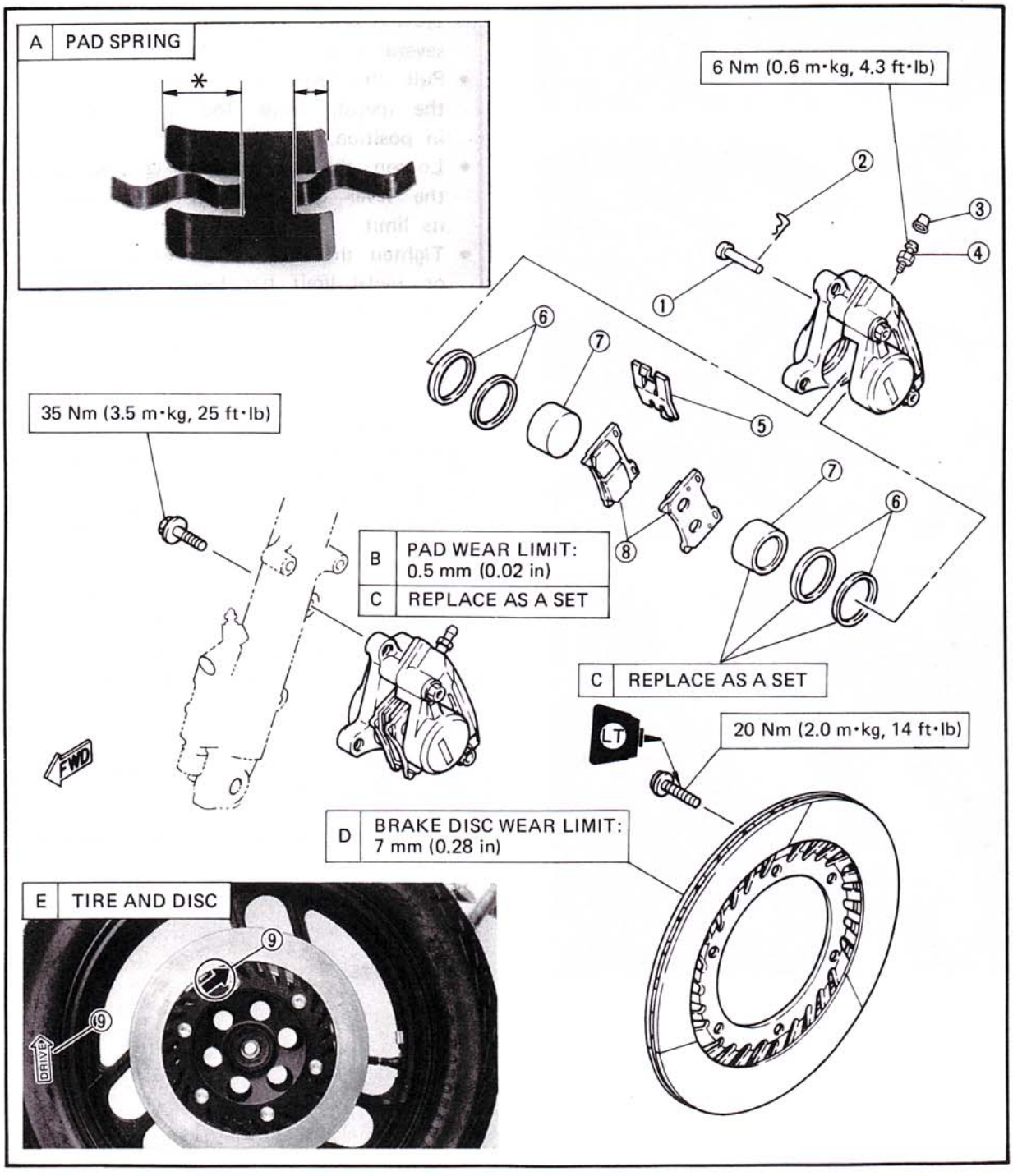
CALIPER PAD REPLACEMENT (FRONT)

1. Pin
2. Clip
3. Rubber cap
4. Bleed screw
5. Pad spring
6. Piston seal
7. Piston
8. Disc pad
9. Arrow mark

NOTE:
- Install the pad spring with its longer tangs * facing towards the disc rotation direction.
- Be sure to position the disc so its arrow mark ⑨ points in the direction of the wheel rotation.



Brake Inspection and Repair

Recommended Brake Component Replacement Schedule:	
Brake pads	As required
Piston seal, dust seal	Every two years
Brake hoses	Every four years
Brake fluid	Replace only when brakes are disassembled

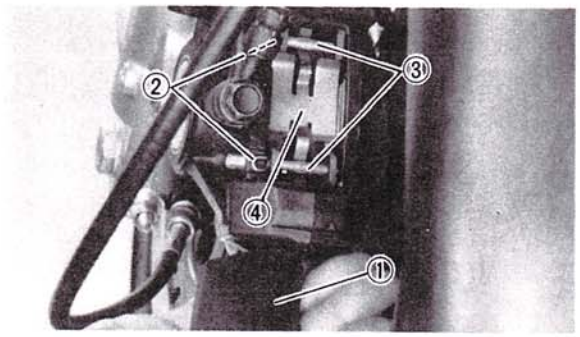
Caliper Pad Replacement

Front Brake:

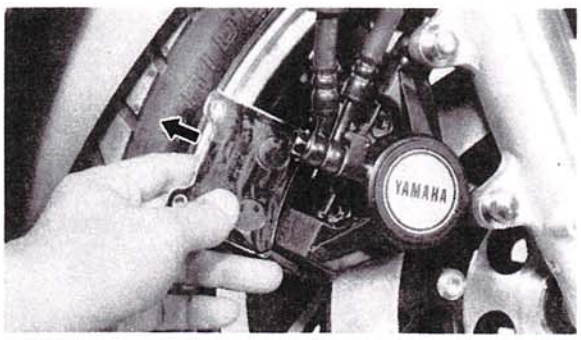
NOTE:

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

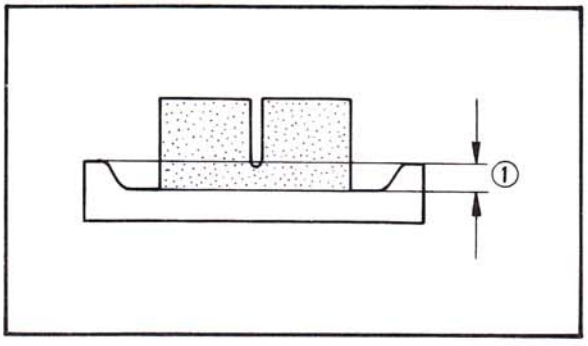
1. Remove:
   - Cover ①



2. Remove
   - Retaining clips ②
   - Retaining pins ③
   - Pad spring ④



3. Remove:
   - Pads



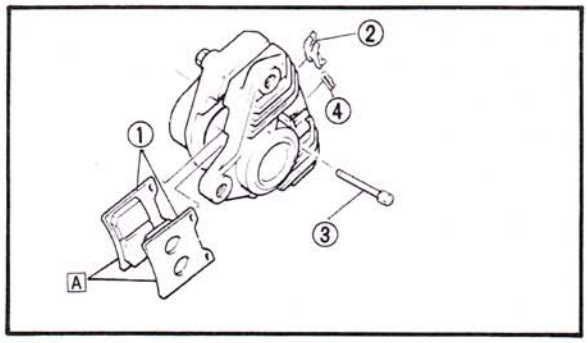
4. Measure:
   - Pads

   Out of specification → Replace.

NOTE:

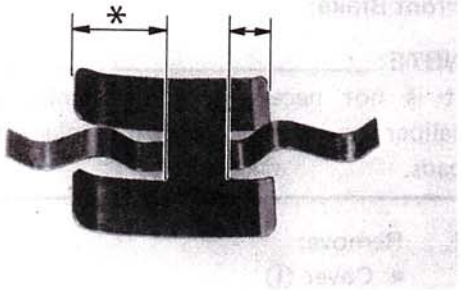
Replace the pads as a set if either is found to be worn to the wear limit.

Pad Wear Limit ①:
0.5 mm (0.02 in)



5. Install:
   - Pads (New) ①
   - Pad spring ②
   - Retaining pins ③
   - Clips ④
   - Cover

A REPLACE AS A SET



NOTE:

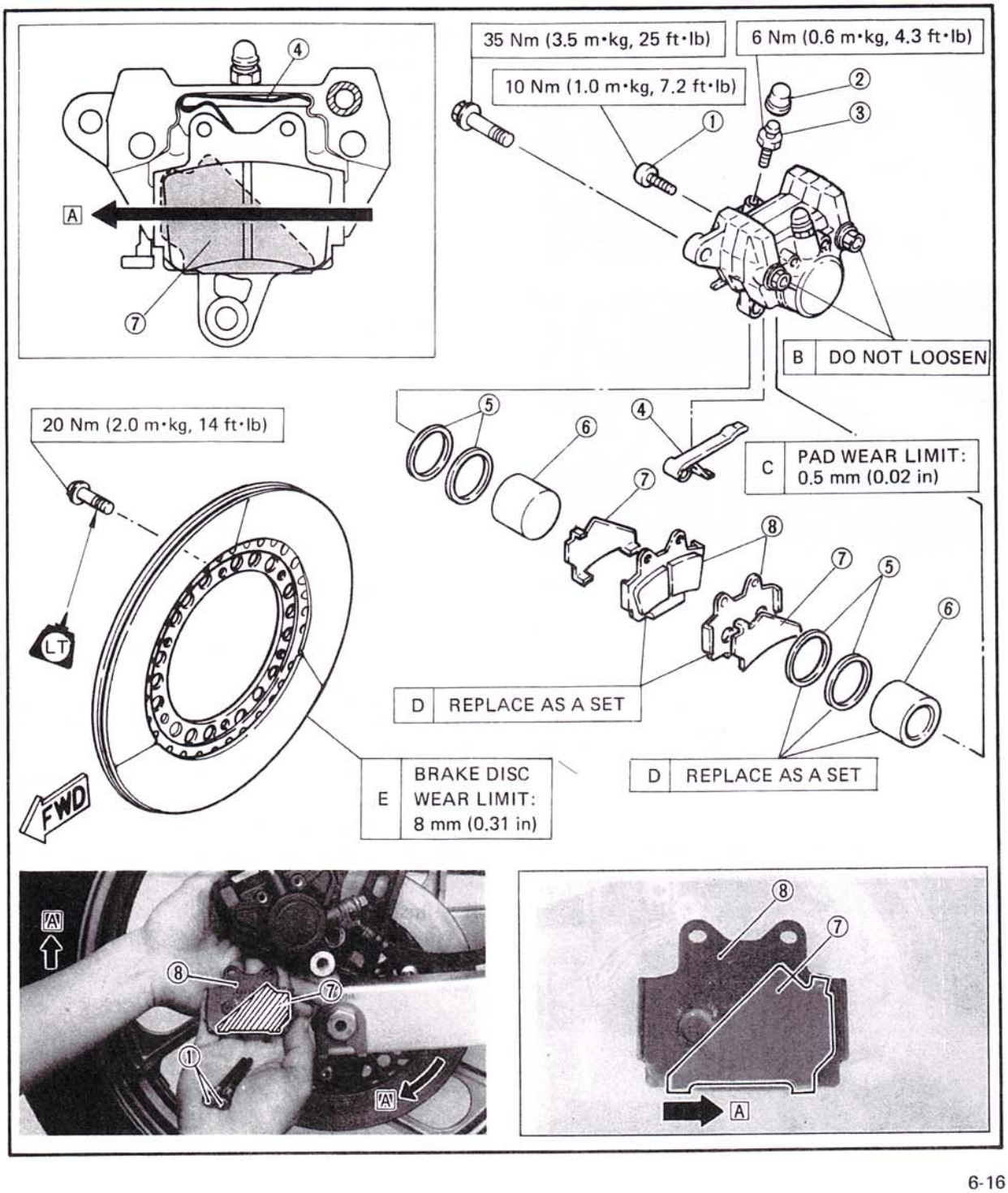
Install the pad spring with its longer tangs * facing towards the disc rotation direction.

6

CALIPER PAD REPLACEMENT (REAR)

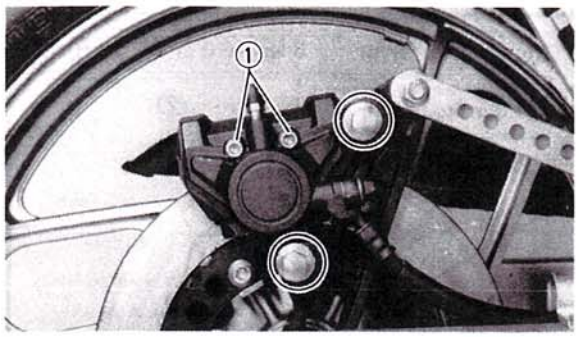
1. Retaining bolt
2. Rubber cap
3. Bleed screw
4. Pad spring
5. Piston seal
6. Piston
7. Shim
8. Disc pad

[A] DRIVE DIRECTION



Brake Inspection and Repair

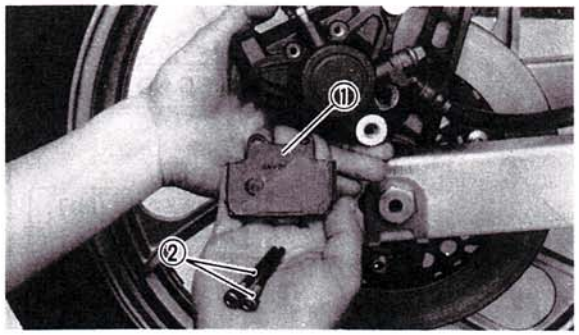
Recommended Brake Component Replacement Schedule:	
Brake pads	As required
Piston seal, dust seal	Every two years
Brake hoses	Every four years
Brake fluid	Replace only when brakes are disassembled



Caliper Pad Replacement

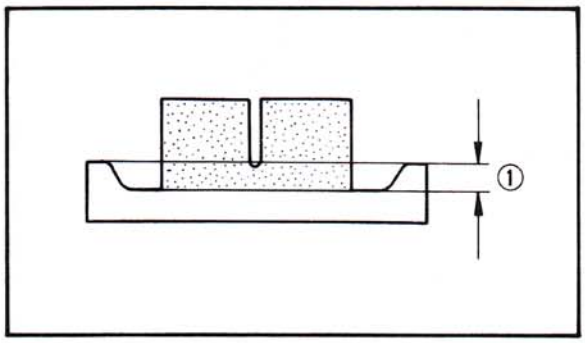
Rear Brake:

1. Remove:
   - Caliper
   - Retaining bolts ①



2. Remove:
   - Pads ①

② Retaining bolt

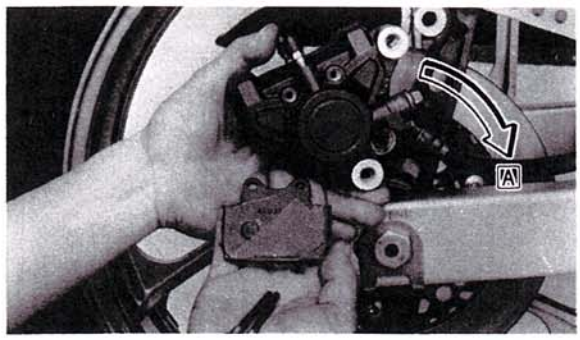


3. Measure:
   - Pads
     Out of specification → Replace.

NOTE:

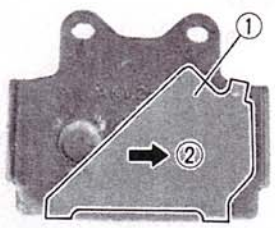
Replace the pads as a set if either is found to be worn to the wear limit.

Pad Wear Limit ①:
0.5 mm (0.02 in)



4. Install:
   - Pads (New)
   - Retaining bolts

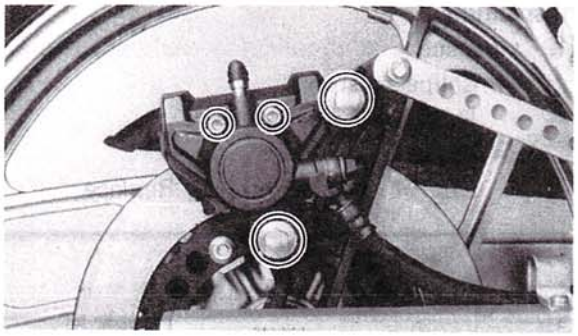
A DRIVE DIRECTION

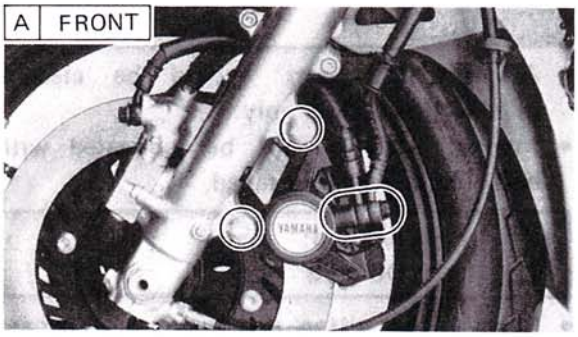


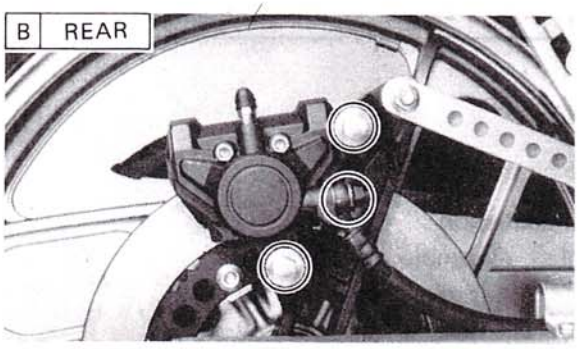
NOTE:
Insert the pads with their shims ① in the direction of the arrow ② .

5. Tighten:
   - Caliper
   - Retaining bolts

Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)
Retaining Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)



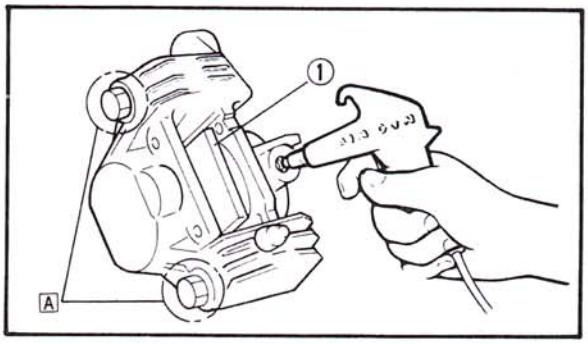




CALIPER DISASSEMBLY (FRONT AND REAR)

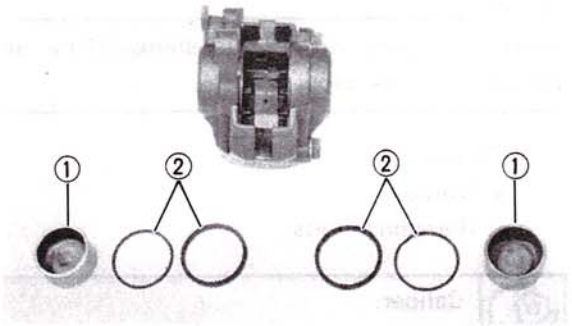
Disassembly

1. Remove:
   - Pads
   - Brake hoses
     Place the open hose end into a container and pump the old fluid out carefully.
   - Caliper
2. Remove:
   - Brake hose
     Place the open hose end into a container and pump the old fluid out carefully.
   - Caliper
   - Pads

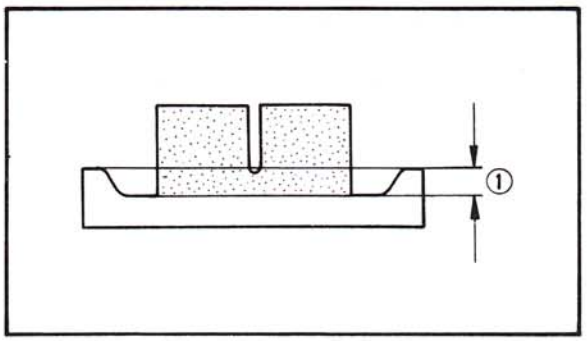


Caliper piston removal steps:
- Insert a piece of wooden board ① into the caliper to lock the right side piston.
- Blow compressed air into the hose joint opening to force out the left side piston from the caliper body.
- Repeat previous step to force out the right side piston from the caliper body.

A DO NOT LOOSEN



3. Remove:
   - Pistons ①
   - Piston seals ②



Inspection

1. Inspect:
   - Caliper piston
     Rust/Wear → Replace.
   - Brake pads
     Out of specification → Replace.

Pad Wear Limit ①:
0.5 mm (0.02 in)

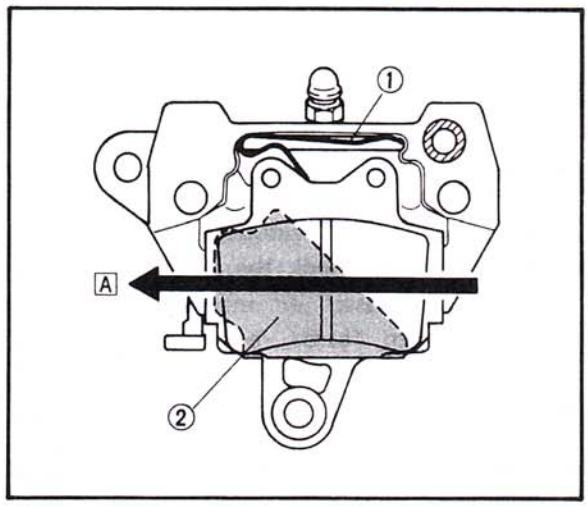
WARNING:

- **All internal parts should be cleaned in new brake fluid only.**
- **Internal parts should be lubricated with brake fluid when installed.**

Brake Fluid:
DOT #3

- **Replace the piston and piston seals whenever a caliper is disassembled.**

6

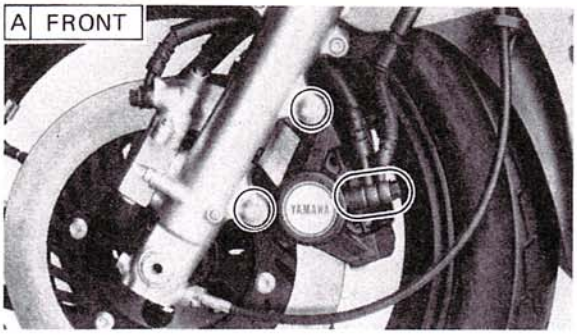


Installation

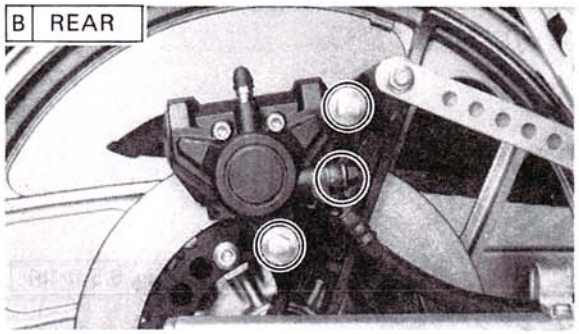
1. Assemble:
   - Brake caliper(s)
     Reverse disassembly steps.
2. Install:
   - Brake calipers
   - Hoses

① Pad spring
② Shim
A DRIVE DIRECTION

A FRONT



B REAR



3. Tighten:
   - Caliper bolts
   - Hose union bolts (with copper washers)

FRONT AND REAR:
Brake Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)
Brake Hose:
26 Nm (2.6 m·kg, 19 ft·lb)

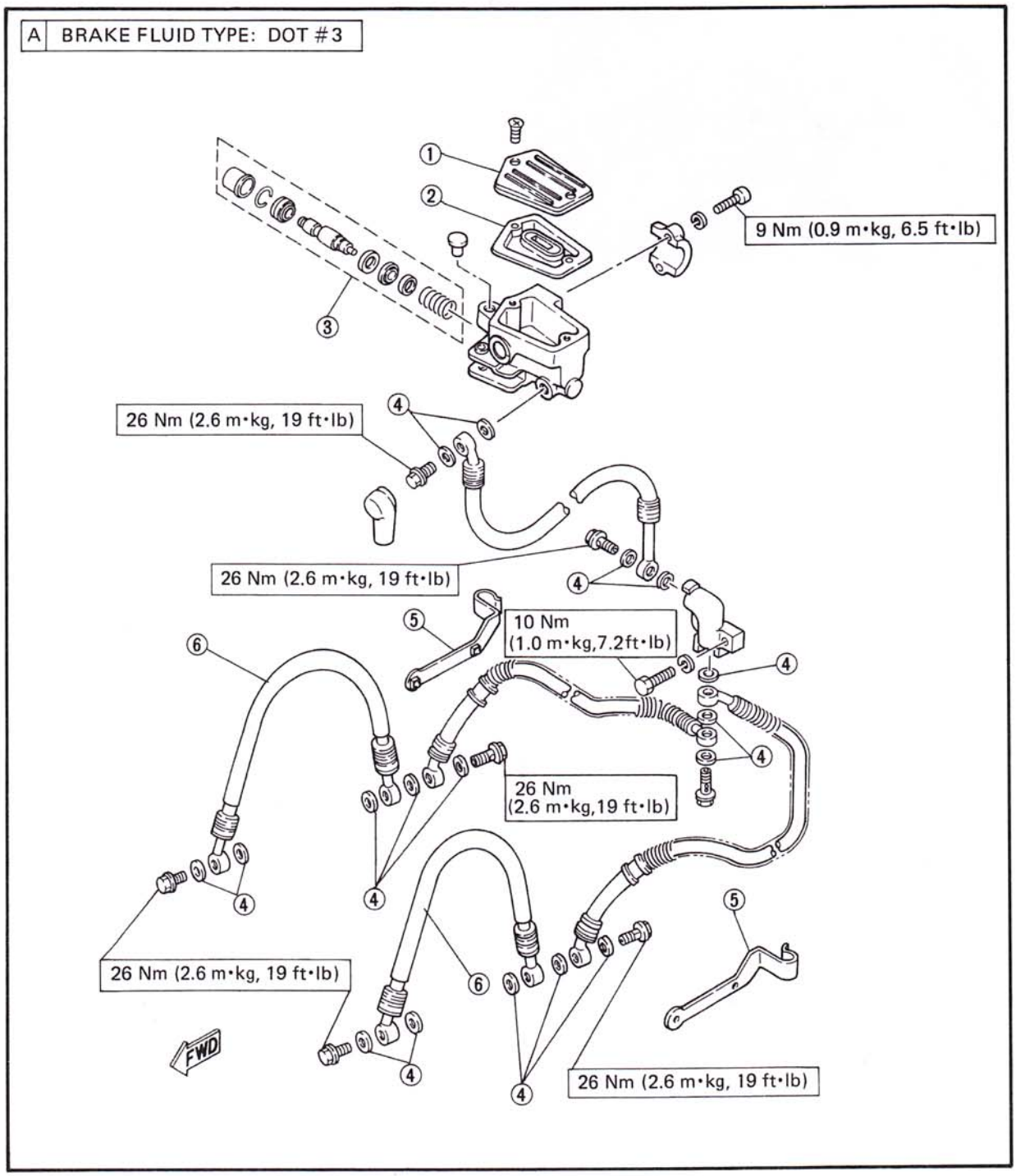
4. Bleed the air completely from the brake system.

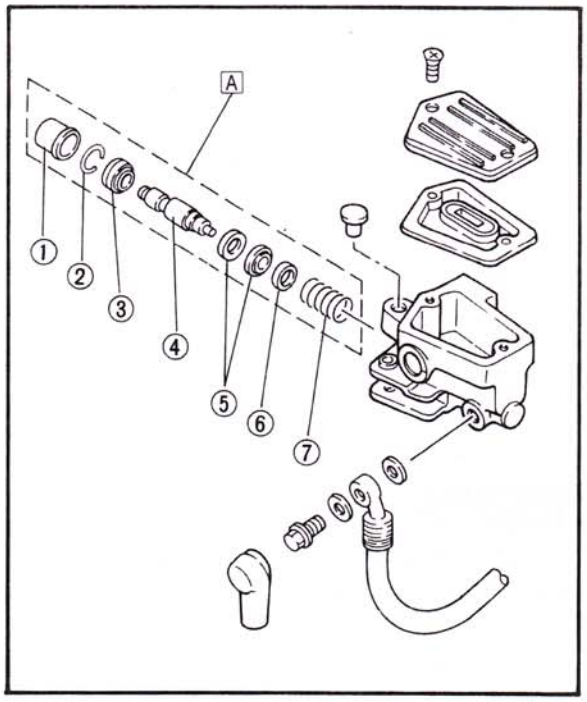
6

FRONT AND REAR BRAKE

BRAKE MASTER CYLINDER (FRONT)

1. Master cylinder cap
2. Rubber seal
3. Master cylinder kit
4. Copper washer
5. Brake hose holder
6. Brake hose (to Anti-Dive)

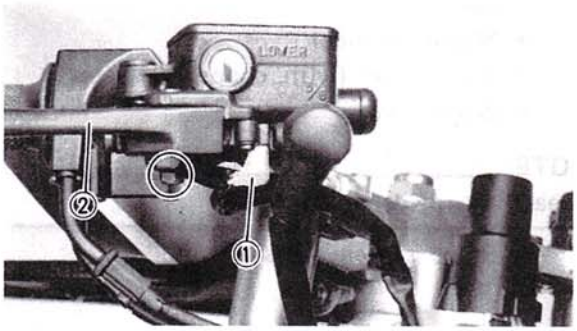




Master Cylinder Disassembly
Front Brake:

NOTE:
Drain the brake fluid before removing master cylinder.

① Dust boot
② Circlip
③ Piston cover
④ Piston
⑤ Piston cups
⑥ Spring seat
⑦ Return spring
A MASTER CYLINDER KIT (Replace as a set)

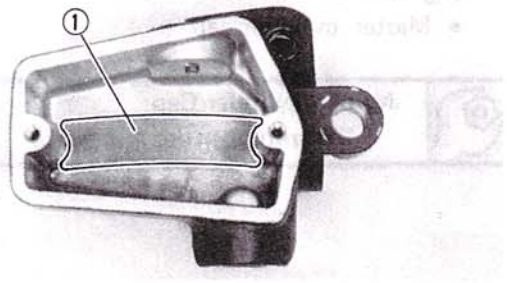


1. Remove:
   - Brake light switch leads ①
   - Brake lever ②
   - Lever spring
2. Disconnect:
   - Brake hose

   Drain the fluid.

3. Remove:
   - Master cylinder
   - Master cylinder cap

   Drain the excess fluid.
   - Dust boot
   - Circlip
   - Master cylinder kit



Inspection
1. Inspect:
   - Master cylinder body

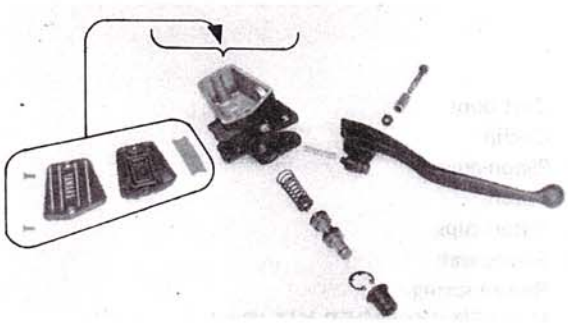
   Scratches/Wear → Replace.

NOTE:
Clean all passages with new brake fluid.

① Oil baffle plate

6

2. Inspect
   - Brake hoses
     Cracks/Wear/Damage → Replace.
   - Master cylinder kit
     Scratches/Wear → Replace.



Installation

1. Install:
   - Master cylinder kit

WARNING:

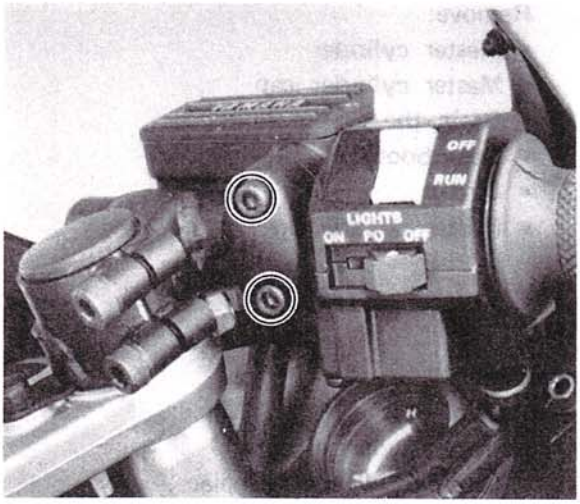
Internal ports should be lubricated with brake fluid when installed.

   - Circlip
   - Dust boot
2. Install:
   - Master cylinder
   - Brake hose (with copper washers)
   - Brake lever

NOTE:

Grease the pivot point.

   - Brake switch leads



3. Tighten:
   - Master cylinder bolts
   - Brake hose

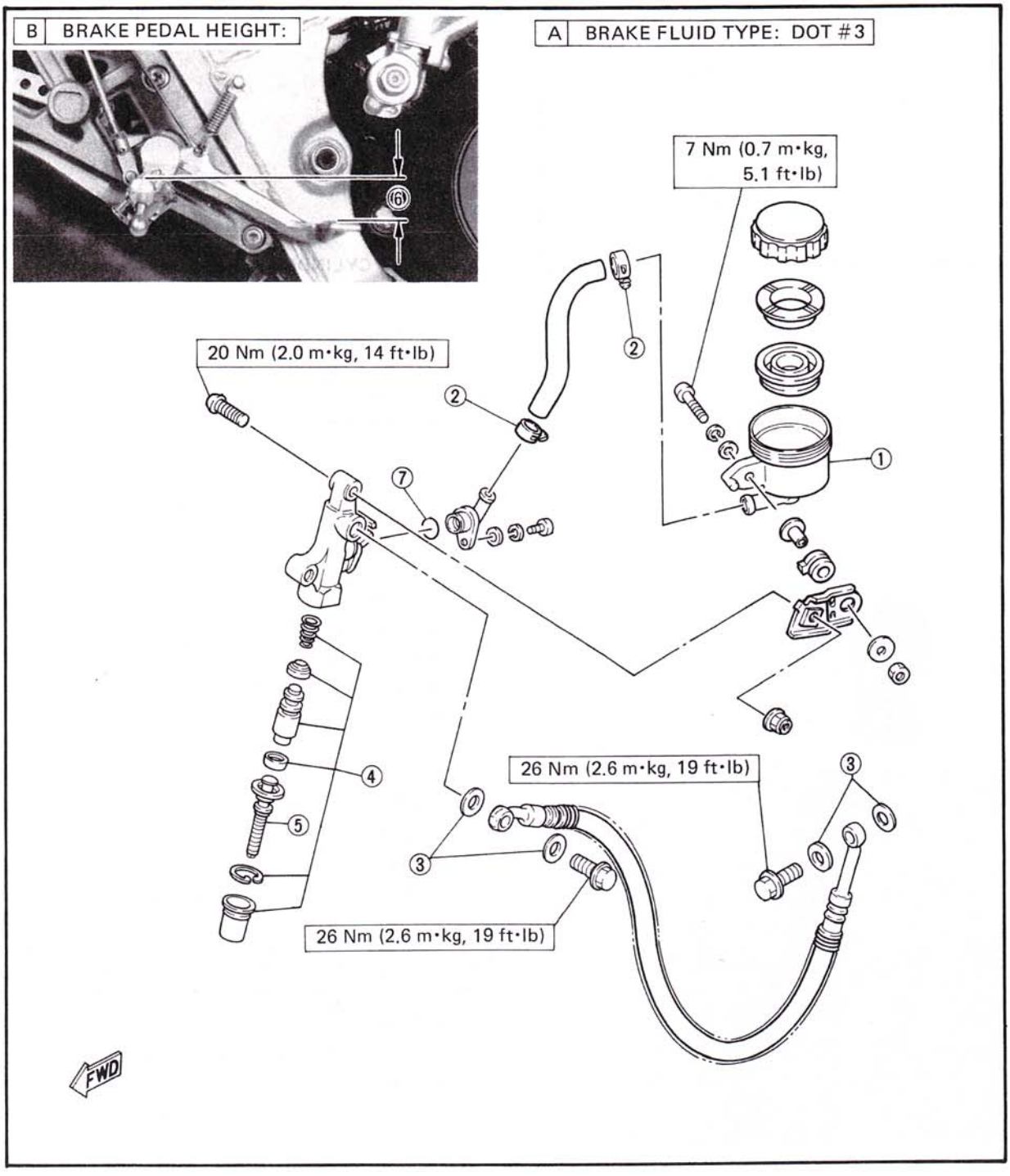
Master Cylinder:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Brake Hose:
26 Nm (2.6 m·kg, 19 ft·lb)

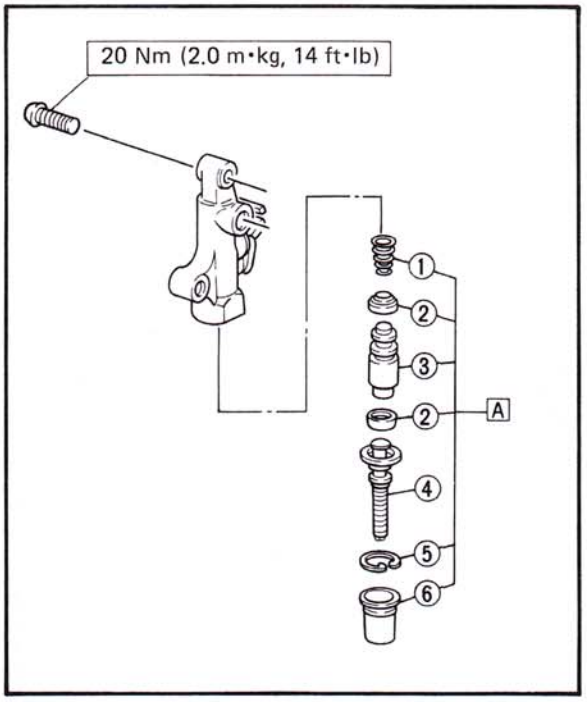
4. Bleed the air completely from the brake system.
5. Tighten:
   - Master cylinder cap

Master Cylinder Cap:
2 Nm (0.2 m·kg, 1.4 ft·lb)

BRAKE MASTER CYLINDER (REAR)

1. Reservoir tank
2. Band
3. Copper washer
4. Master cylinder kit
5. Adjusting rod (For brake pedal height)
6. 50 ~ 60 mm (2.0 ~ 2.4 in)
7. O-ring





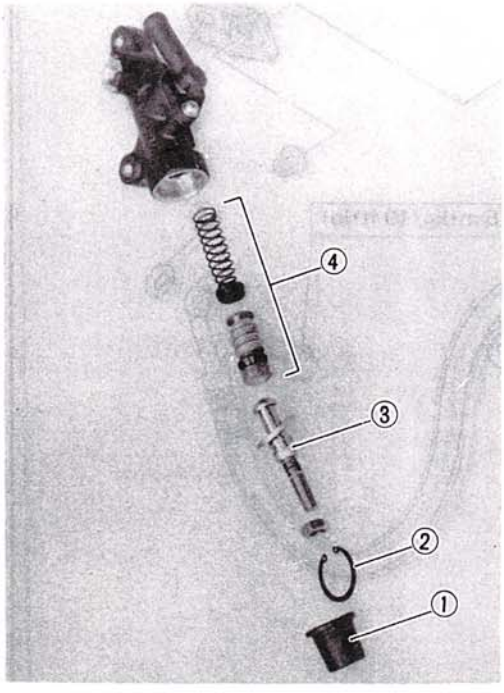
Master Cylinder Disassembly
Rear Brake:

NOTE:
Drain the brake fluid before removing master cylinder.

1. Remove:
   - Side cover (Right)
2. Disconnect:
   - Brake hose

① Spring
② Piston cup
③ Piston
④ Adjusting rod
⑤ Circlip
⑥ Dust boot
Ⓐ MASTER CYLINDER KIT (Replace as a set)

3. Remove:
   - Master cylinder
   - Fluid reservoir tank
4. Disconnect:
   - Tank hose

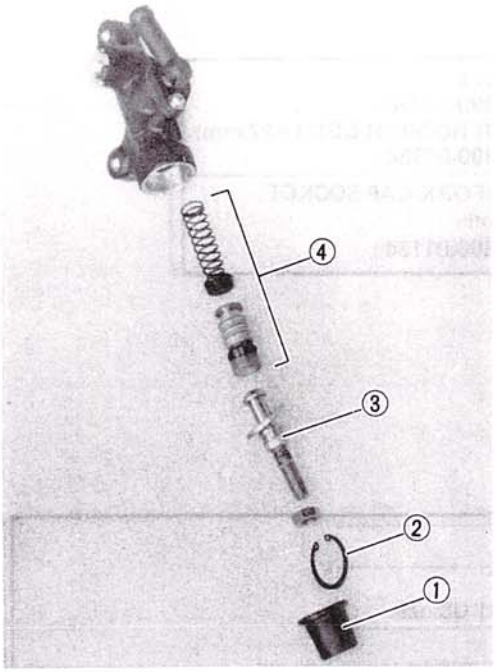


5. Remove:
   - Dust boot ①
   - Circlip ②
   - Adjusting rod ③
   - Master cylinder kit ④
     Drain the excess fluid.

Inspection
1. Inspect:
   - Master cylinder body
     Scratches/Wear → Replace.

NOTE:
Clean all passages with new brake fluid.

   - Brake hoses
     Cracks/Wear/Damage → Replace.
   - Master cylinder kit
     Scratches/Wear → Replace.



Installation

1. Install:
   - Master cylinder kit ④

WARNING:

Internal parts should be lubricated with brake fluid when installed.

   - Adjusting rod ③
   - Circlip ②
   - Dust boot ①
2. Install:
   - Master cylinder
   - Fluid reservoir tank
   - Brake hose (with copper washers)
3. Tighten:
   - Master cylinder
   - Fluid reservoir tank
   - Brake hose

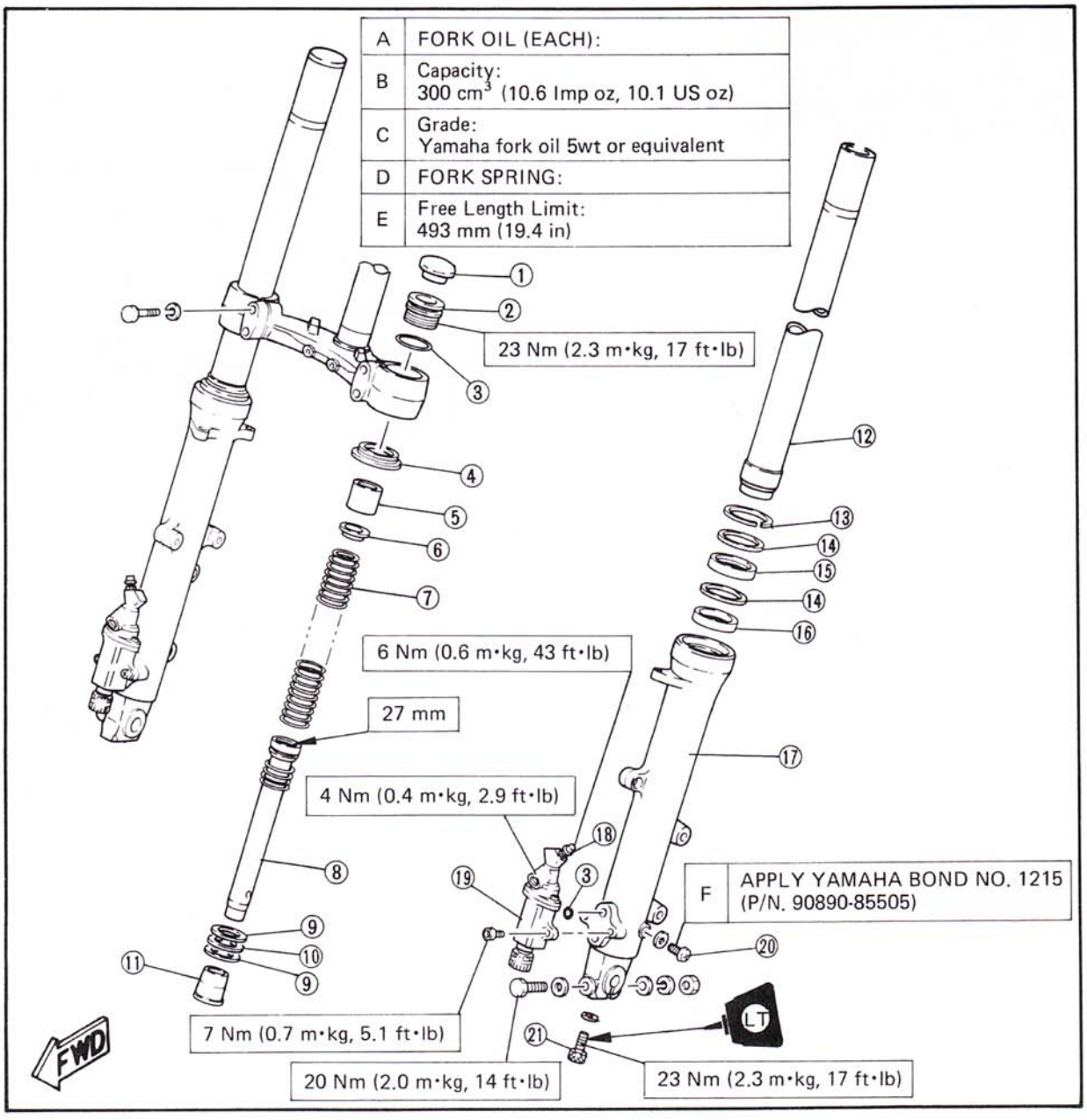
Master Cylinder:
20 Nm (2.0 m·kg, 14 ft·lb)
Fluid Reservoir Tank:
7 Nm (0.7 m·kg, 5.1 ft·lb)
Brake Hose:
26 Nm (2.6 m·kg, 19 ft·lb)

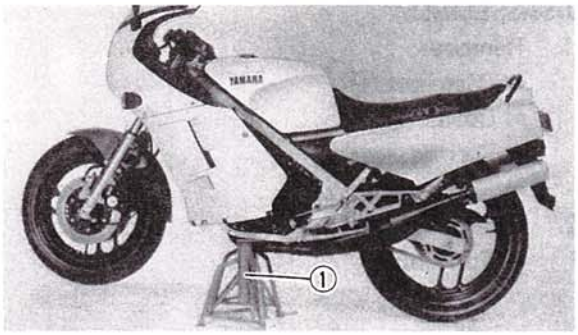
4. Bleed the air completely from the brake system.

FRONT FORK

1. Fork cap
2. Cap bolt
3. O-ring
4. Dust seal
5. Collar
6. Spring seat
7. Fork spring
8. Damper rod
9. Wave washer
10. Washer
11. Taper spindle
12. Inner fork tube
13. Circlip
14. Washer
15. Oil seal
16. Guide bushing
17. Outer fork tube
18. Plunger case
19. Anti-dive
20. Drain screw
21. Damper rod assembly bolt

T-HANDLE: P/N. 90890-01326 DAMPER ROD HOLDER (#27 mm) P/N. 90890-01388
FRONT FORK CAP SOCKET (#17 mm) P/N. 90890-01104



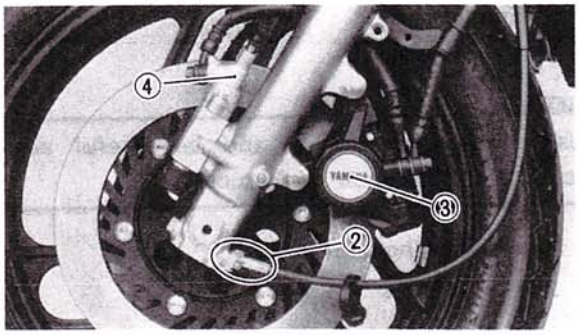


REMOVAL

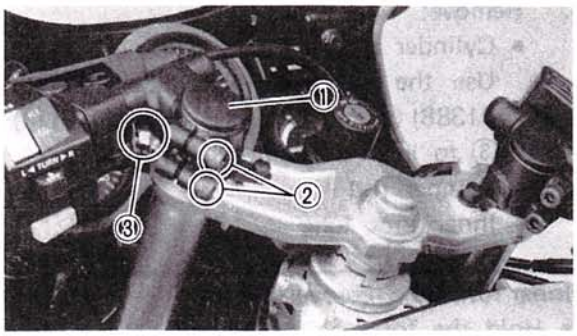
1. Remove:
   - Lower cowling
2. Place the motorcycle on a block or other suitable stand ① under the frame.

WARNING:

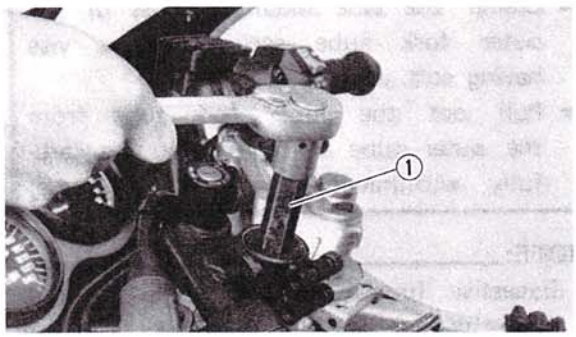
Securely support the motorcycle so it won't fall over when the front wheel and front forks are removed.



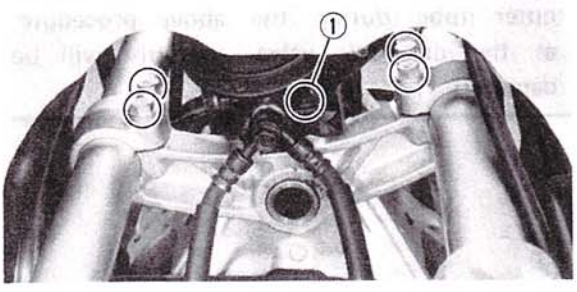
3. Remove:
   - Front fender
   - Speedometer cable ②
   - Brake calipers ③
   - Plunger case ④
   - Front wheel



4. Remove:
   - Fork caps ①
5. Loosen:
   - Pinch bolts (Handlebar) ②
   - Pinch bolts ③



6. Loosen:
   - Cap bolt
     Use the Front Fork Cap Socket (90890-01104) #17 mm ① .



7. Remove:
   - Brake hose joint ①
8. Loosen:
   - Pinch bolts (Underbracket)
9. Remove:
   - Fork(s)

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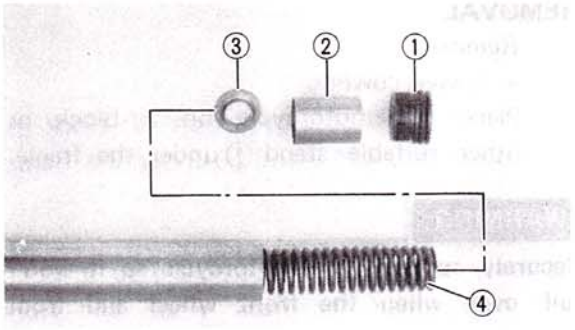

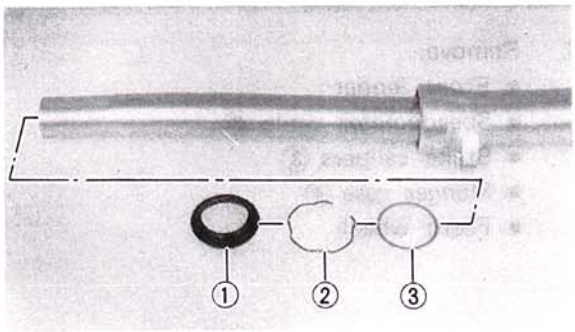

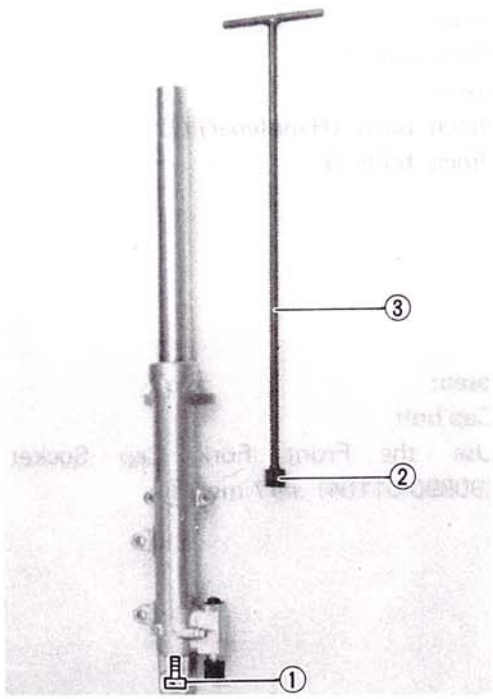

DISASSEMBLY

1. Remove:
   - Cap bolt ①
   - Collar ②
   - Spring seat ③
   - Fork spring ④
2. Drain:
   - Fork oil

3. Remove:
   - Dust seal ①

NOTE:
Use a thin screwdriver, and be careful not to scratch the inner fork tube.

   - Retaining clip ②
   - Washer ③

4. Remove:
   - Cylinder securing bolt ①
     Use the Damper Rod Holder (90890-01388) ② and T-Handle (90890-01326) ③ to lock the damper rod.
   - Damper rod
   - Inner fork tube

Inner fork tube removal steps:
- Hold the fork leg horizontally.
- Clamp the axle mounting boss of the outer fork tube securely in a vise having soft jaws.
- Pull out the inner fork tube from the outer tube by forcefully, but carefully, withdrawing the inner fork tube.

NOTE:
- Excessive force will damage the oil seal, plate washer and/or bushings. The oil seal and bushings must be replaced.
- Avoid bottoming the inner tube in the outer tube during the above procedure, as the oil lock valve assembly will be damaged.

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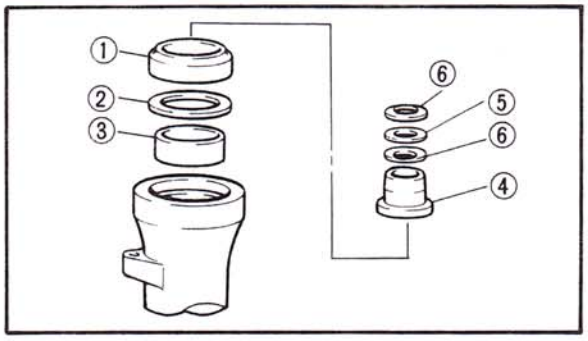
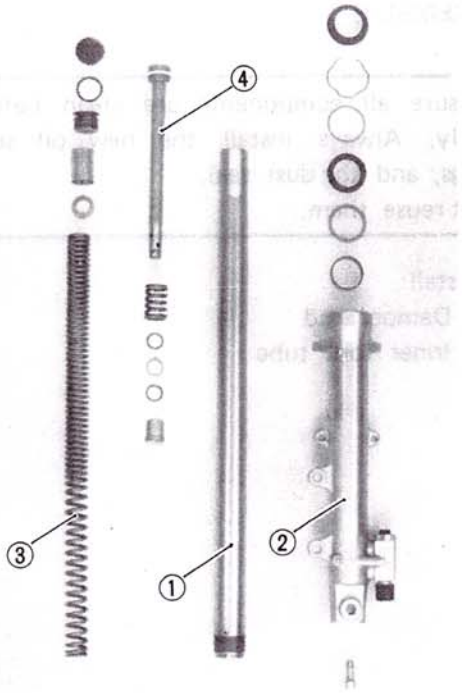


5. Remove:
   - Oil seal ①
   - Plate washer ②
   - Guide bushing ③
   - Taper spindle ④
   - Plate washer ⑤
   - Wave washers ⑥



INSPECTION

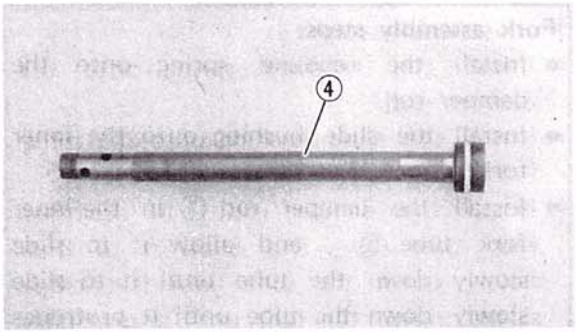
1. Inspect
   - Inner fork tube ①
     Scratches/Bends → Replace.

WARNING:

Do not attempt to straighten a bent inner fork tube as this may dangerously weaken the tube.

2. Inspect:
   - Outer fork tube ②
     Scratches/Bends/Damage → Replace.
   - Fork spring ③
     Out of specification → Replace.

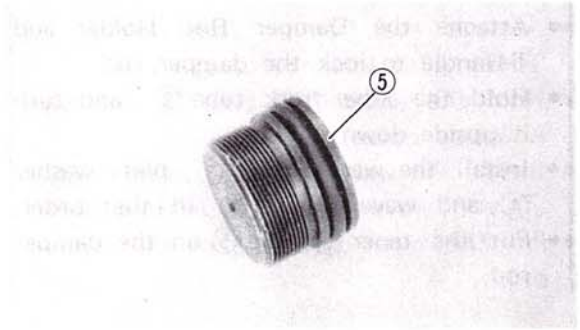
Fork Spring Free Length:
498 mm (19.6 in)
Minimum Free Length:
493 mm (19.4 in)



3. Inspect:
   - Damper rod ④
     Wear/Damage → Replace.

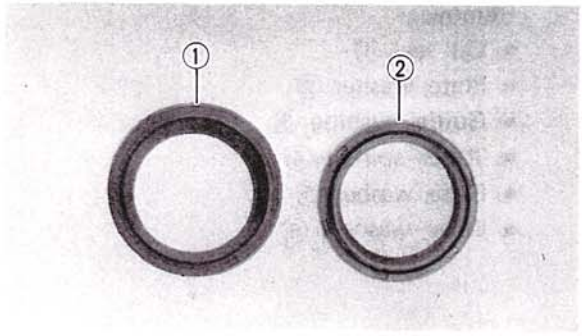
NOTE:

Blow out all oil passages with compressed air.



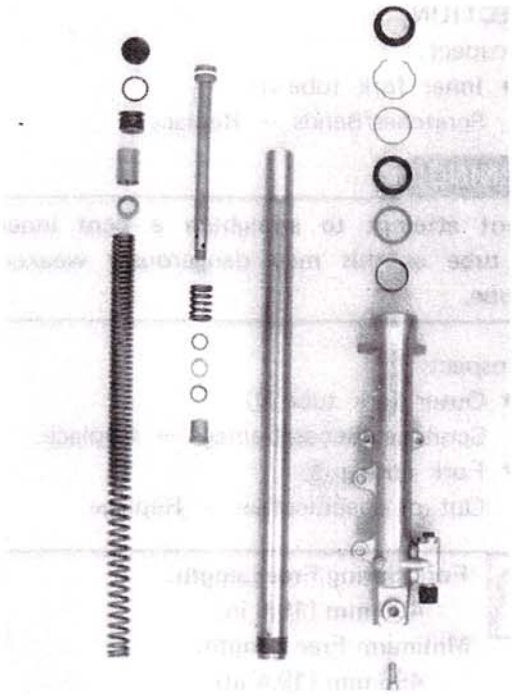
4. Inspect:
   - O-ring ⑤
     Wear/Cracks/Damage → Replace.

6



5. Inspect:
   - Seals
     Wear/Damage → Replace.

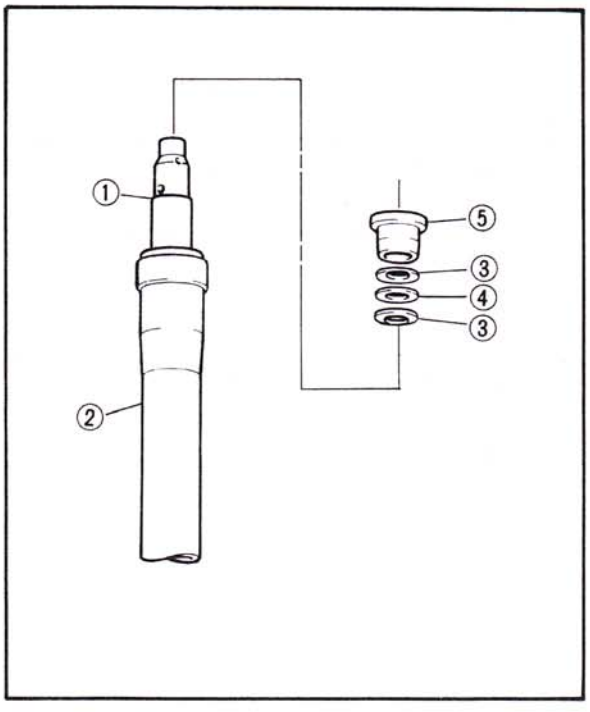
① Dust seal
② Oil seal



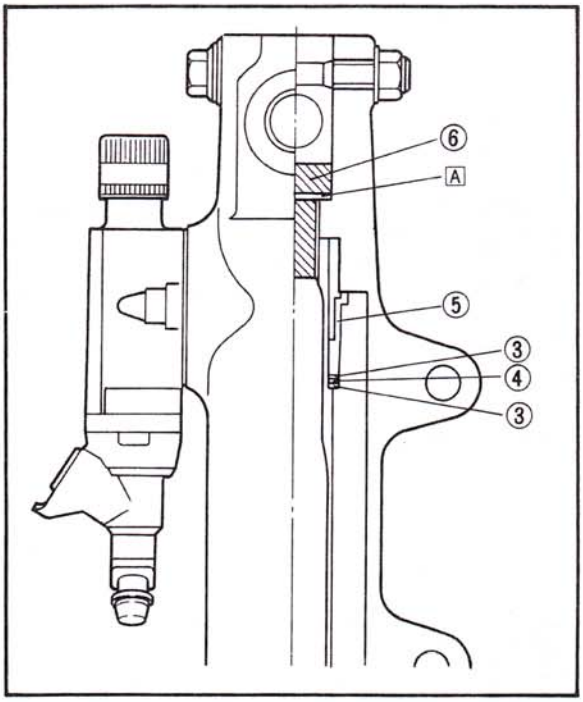
REASSEMBLY

NOTE:
Make sure all components are clean before assembly. Always install the new oil seal, bushings, and the dust seal.
Do not reuse them.

1. Install:
   - Damper rod
   - Inner fork tube



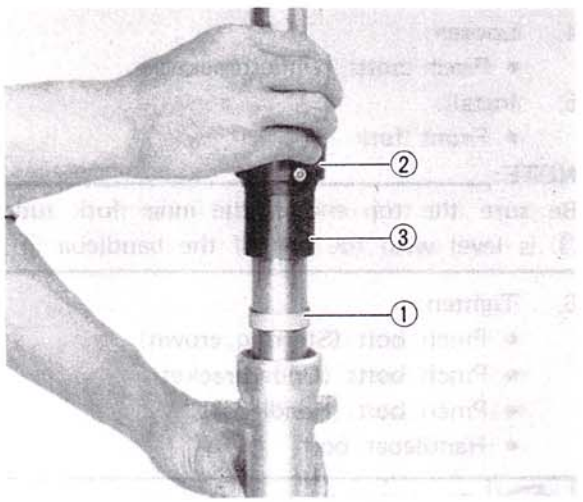
Fork assembly steps:
- Install the rebound spring onto the damper rod.
- Install the slide bushing onto the inner fork tube.
- Install the damper rod ① in the inner fork tube ② , and allow it to slide slowly down the tube until it to slide slowly down the tube until it protrudes from the bottom.
- Attache the Damper Rod Holder and T-Handle to lock the damper rod.
- Hold the inner fork tube ② , and turn it upside down.
- Install the wave washer ③ , plate washer ④ , and wave washer ③ , in that order.
- Put the taper spindle ⑤ on the damper rod.



- Hold one hand over the top of the inner fork tube, and carefully install the outer fork tube over the taper spindle.
- Apply LOCTITE® to the damper rod securing bolt ⑥ and tighten the bolt to the specification: use the Damper Rod Holder (90890-01388) and T-Handle (90890-01326).

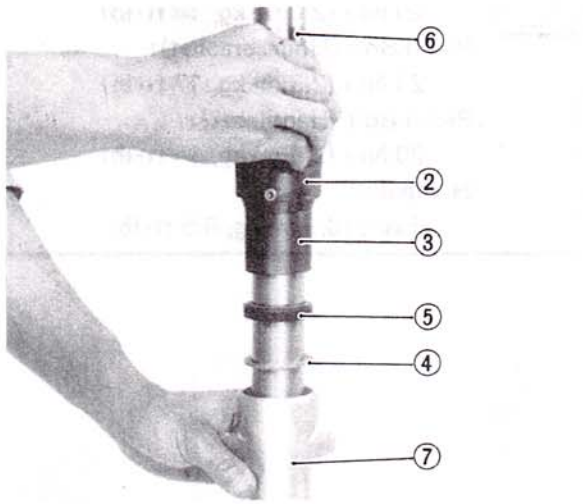
Damper Rod:
23 Nm (2.3 m·kg, 17 ft·lb)
LOCTITE®

Ⓐ Copper washer



2. Install:
   - Guide bushing ①
     Use the Fork Seal Driver Weight (90890-01367) ② and Adapter (90890-01381) ③.
   - Plate washer ④
   - Oil seal ⑤
     Use the Fork Seal Driver Weight (90890-01367) ② and Adapter (90890-01381) ③.
   - Washer
   - Circlip
   - Dust seal
3. Fill
   - Front fork

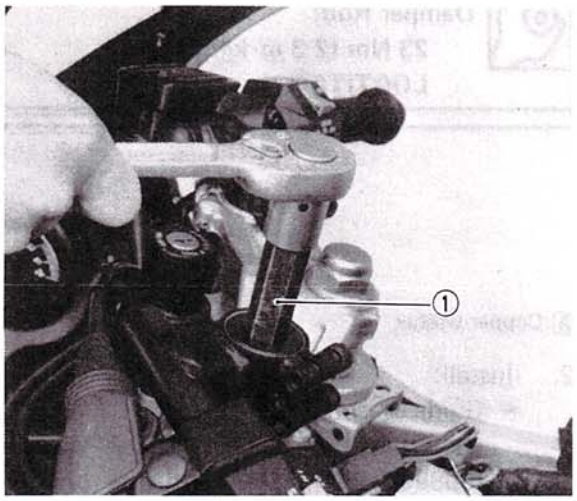
(Each):
300 cm³ (10.6 Imp oz, 10.1 US oz)
Yamaha Fork Oil 5wt or Equivalent
After filling, slowly pump the fork up and down to distribute oil.

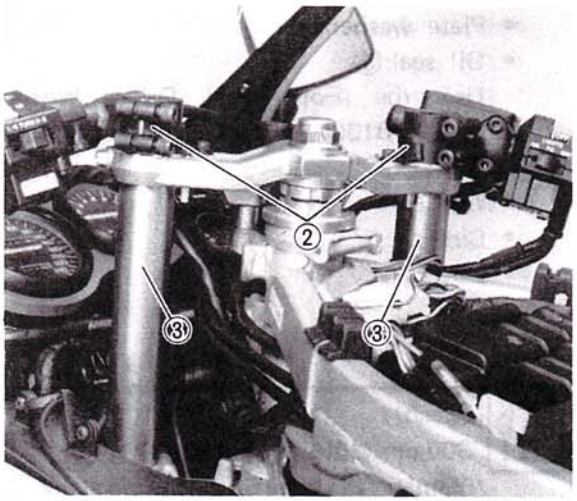


4. Install:
   - Fork spring
     (with smaller pitch side up)
   - Spring seat
   - Collar

⑥ Inner fork tube
⑦ Outer fork tube

6





INSTALLATION

1. Install:
   - Front fork(s)
2. Tighten:
   - Pinch bolts (Underbracket)

Underbracket:
23 Nm (2.3 m·kg, 17 ft·lb)

NOTE:
Do not tighten the steering crown pinch bolt.

3. Tighten:
   Cap bolt assembly
   Use the Front Fork Cap Socket (90890-01104) ① .

Cap Bolt:
23 Nm (2.3 m·kg, 17 ft·lb)

4. Loosen:
   - Pinch bolts (Underbracket)
5. Install:
   - Front fork

NOTE:
Be sure the top end of the inner fork tube ③ is level with the top of the handlebar ②.

6. Tighten:
   - Pinch bolt (Steering crown)
   - Pinch bolts (Underbracket)
   - Pinch bolt (Handlebar)
   - Handlebar bolt

Pinch Bolt (Steering Crown):
20 Nm (2.0 m·kg, 14 ft·lb)
Pinch Bolt (Underbracket):
23 Nm (2.3 m·kg, 17 ft·lb)
Pinch Bolt (Handlebar):
20 Nm (2.0 m·kg, 14 ft·lb)
Handlebar:
9 Nm (0.9 m·kg, 6.5 ft·lb)

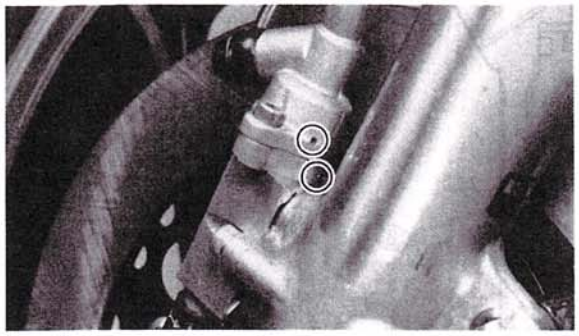
7. Install:
   - Fork caps
   - Bolt caps
   - Front wheel
   - Front fender
   - Brake calipers
   - Plunger case
   - Speedometer cable

WARNING:

Be sure inside of plunger case if free from any mineral oils. (i.e. engine or fork oil, etc.) before installing. These oils will deteriorate causing failure of the actuating piston O-ring and result in brake fluid leakage.

CAUTION:

After installing the plunger case, check for oil leakage.

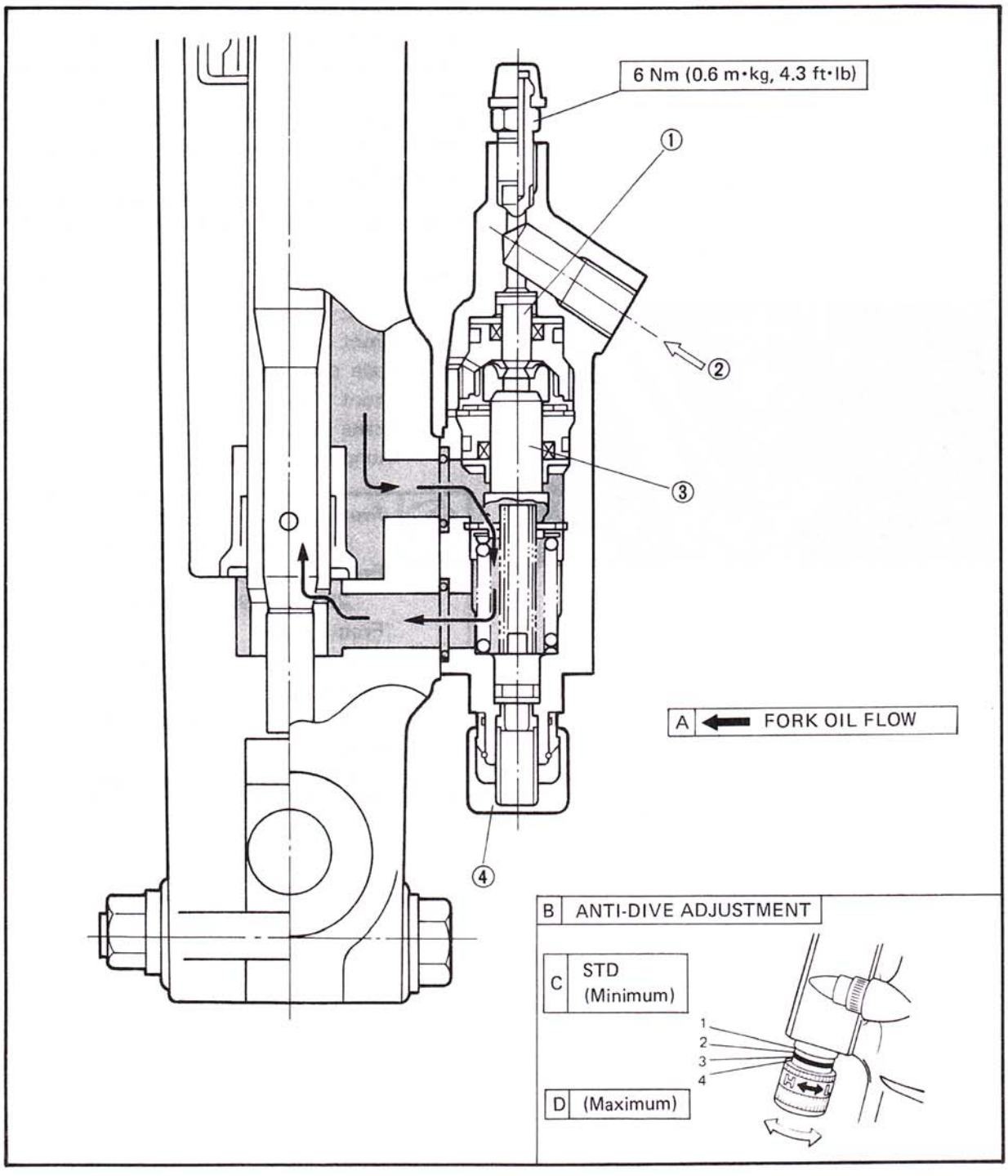


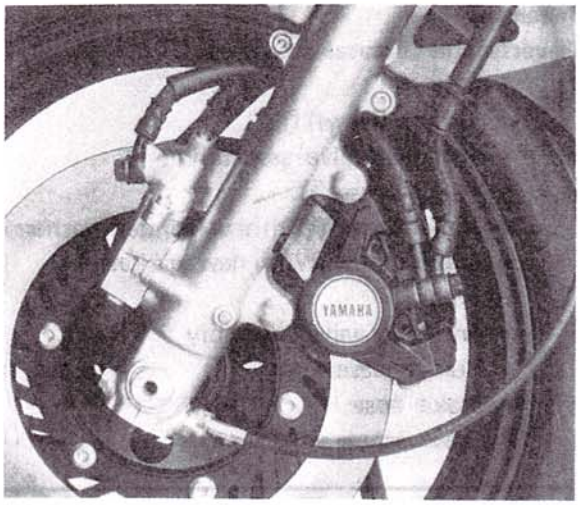
8. Tighten:
   - Front axle
   - Axle pinch bolt
   - Front fender
   - Brake caliper
   - Plunger case

Front Axle:
58 Nm (5.8 m·kg, 42 ft·lb)
Front Axle Pinch Bolt:
20 Nm (2.0 m·kg, 14 ft·lb)
Front Fender:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Brake Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)
Plunger Case:
4 Nm (0.4 m·kg, 2.9 ft·lb)

ANTI DIVE SYSTEM

1. Plunger
2. Brake fluid
3. Valve
4. Adjuster



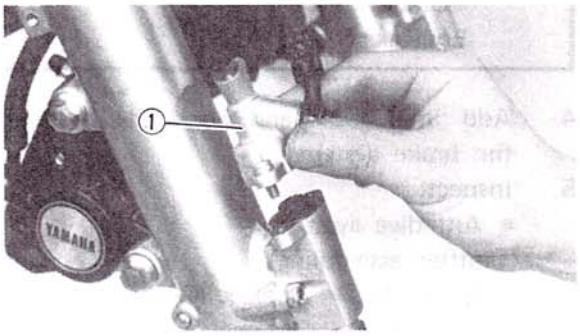


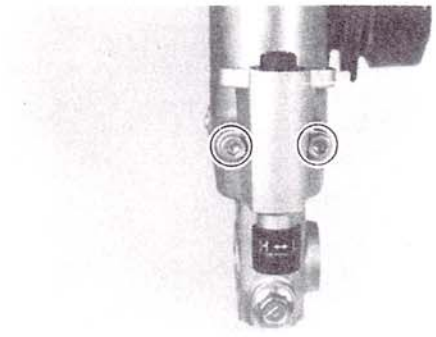
Inspection

Inspection steps:
- Apply the front brake for a few minutes and inspect the pipe joint and vent for brake fluid leakage.
- Inspect the fork for oil leakage.
- Turn the anti-dive adjusting bolt to the maximum position.
- Compress the front forks while applying the front brake. If the front forks compress easily, the anti-dive system may be damaged.

CAUTION:

It is not possible to disassemble the anti-dive valve assembly. Always replace with a new assembly.





Removal

CAUTION:

Drain the fork oil and brake fluid before removing any components.

1. Remove:
   - Drain screw
     Drain fork oil.
   - Brake hose
   - Plunger case ①
2. Remove:
   - Anti-dive valve assembly

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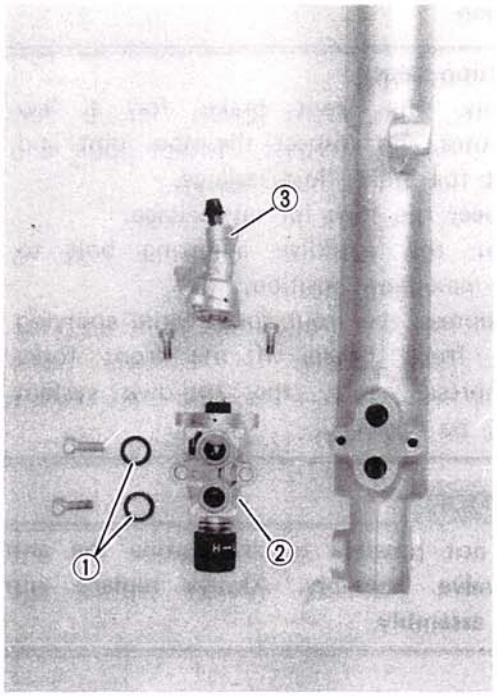


Assembly

Reverse the removal steps.

1. Install:
   - O-rings (New) ①
   - Anti-dive valve assembly ②
   - Plunger case ③
   - Brake hose (With new copper washers)
   - Drain screw (With new gasket)
2. Tighten:
   - Anti-dive valve assembly
   - Plunger case
   - Brake hose
   - Drain screw

Anti-Dive Valve Assembly:
7 Nm (0.7 m·kg, 5 ft·lb)
Plunger Case:
4 Nm (0.4 m·kg, 2.9 ft·lb)
Brake Hose:
26 Nm (2.6 m·kg, 19 ft·lb)
Drain Screw:
2 Nm (0.2 m·kg, 1.4 ft·lb)
YAMAHA BOND No. 1215
(P/N. 90890-85505)

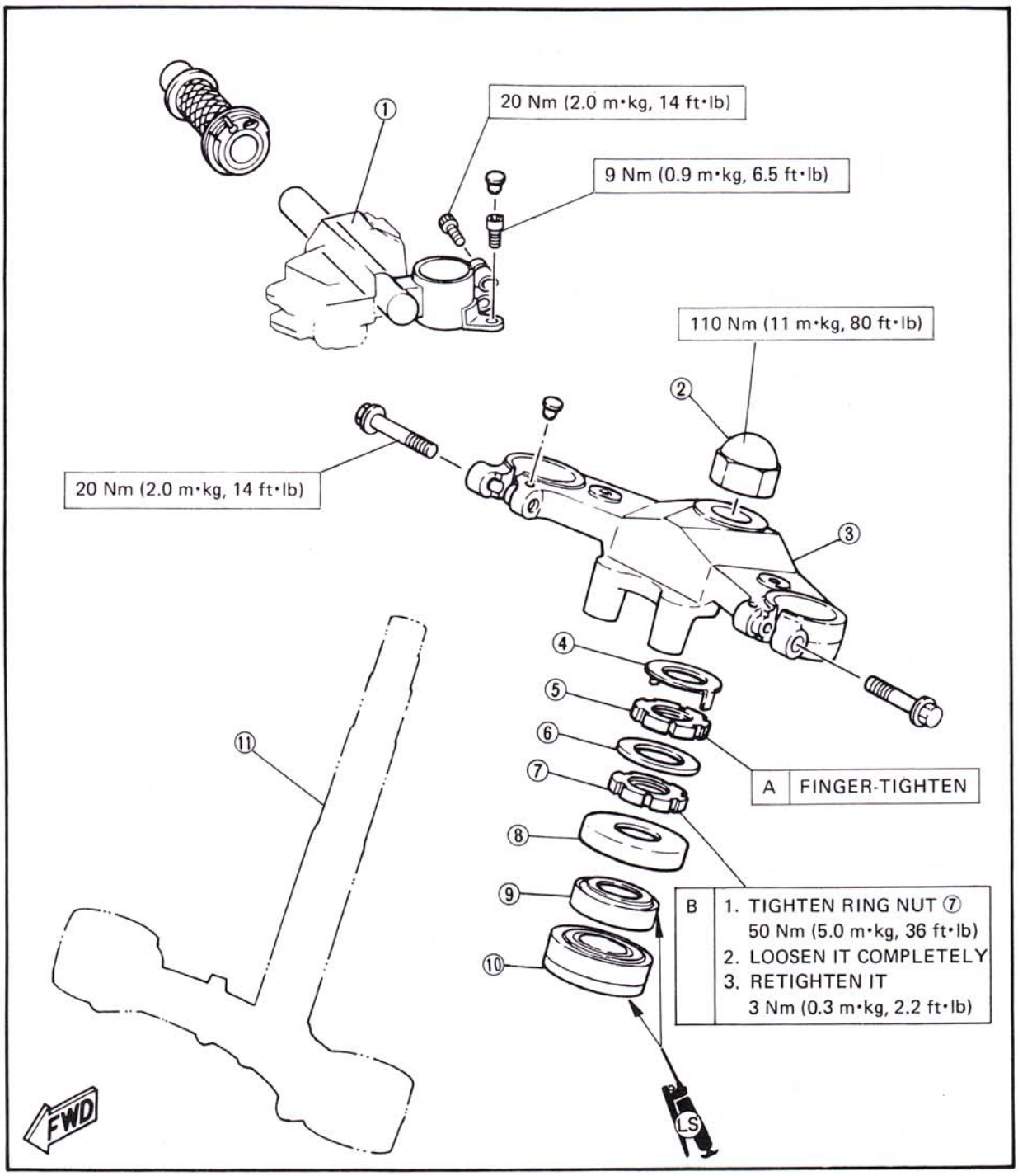
3. Fill:
   - Front fork

(Each):
300 cm³ (10.6 Imp oz, 10.1 US oz)
Yamaha Fork Oil 5wt or
Equivalent

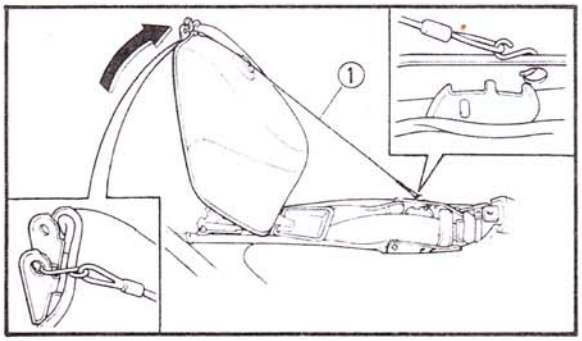
4. Add brake fluid and bleed the air from the brake system.
5. Inspect:
   - Anti-dive system
     (after assembling)
     Oil leadks → Replace O-rings.
     Still leaks → Replace anti-dive system.

STEERING HEAD

1. Handlebar
2. Nut
3. Steering crown
4. Lock washer
5. Ring nut (Upper)
6. Rubber washer
7. Ring nut (Lower)
8. Bearing cover
9. Bearing (Upper)
10. Bearing (Lower)
11. Steering stem

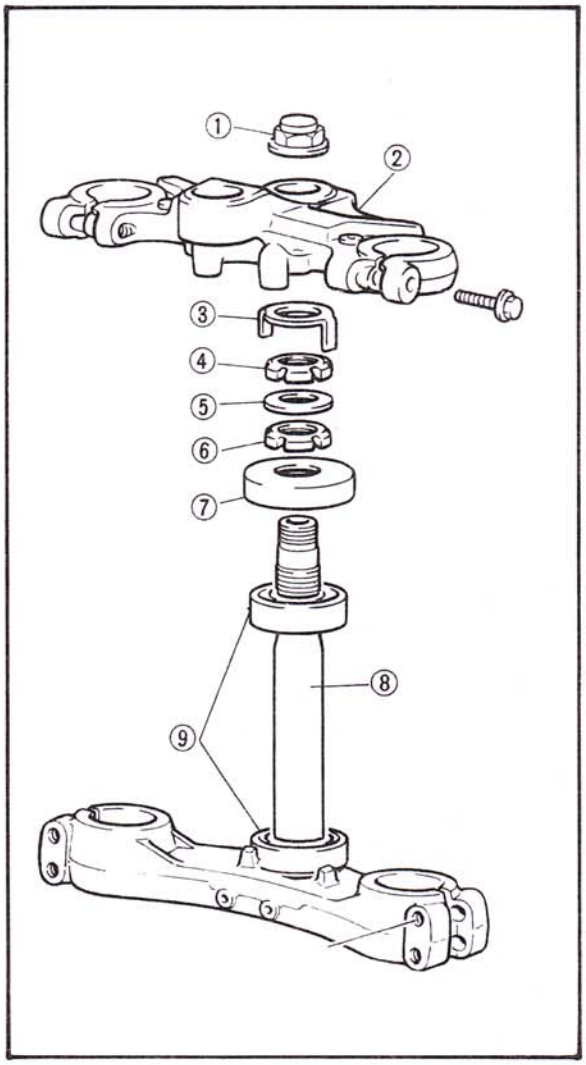


STEERING HEAD

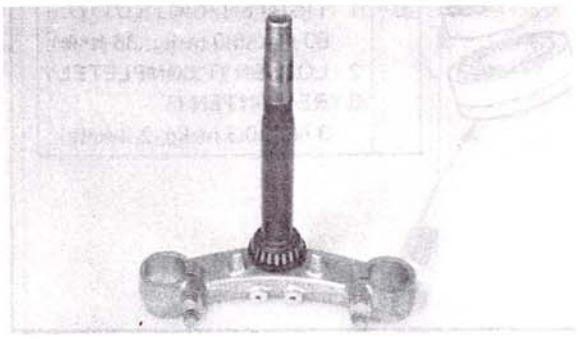


REMOVAL

1. Remove:
   - Bolt (Fuel tank)
2. Pull up the fuel tank. Use the fuel tank holding wire ① as shown.
3. Remove:
   - Front wheel
   - Front forks
   - Handlebars



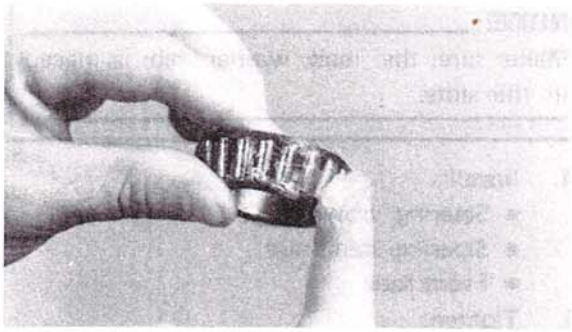
4. Remove:
   - Steering stem nut ①
   - Steering crown ②
   - Lock washer ③
   - Ring nut (Upper) ④
   - Washer ⑤
   - Ring nut (Lower) ⑥
   - Dust cover ⑦
     Remove while holding the steering stem.
   - Steering stem ⑧
   - Bearings ⑨



INSPECTION

1. Wash the bearings in a solvent.
2. Inspect:
   - Bearings
     Pitting/Damage → Replace.
   - Bearing race
     Pitting/Damage → Replace.

NOTE:
Always replace bearing and race as a set.



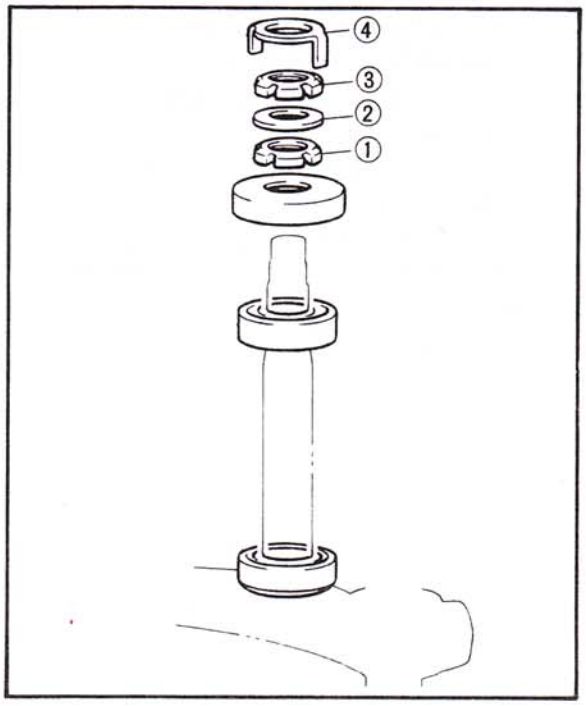
INTSTALLATION

1. Install:
   - Bearing races
     (into the steering head)
2. Grease the bearings and races.

Wheel Bearing Grease

3. Install:
   - Bearing (Lower)
     (onto the steering stem)
   - Steering stem
   - Bearing (Upper)
   - Dust cover
   - Ring nut (Lower)

NOTE:
The tapered side of ring nuts must face downward.



Steering head assembly steps:
- Tighten the ring nut ①.

Ring Nut (Lower):
50 Nm (5.0 m·kg, 36 ft·lb)

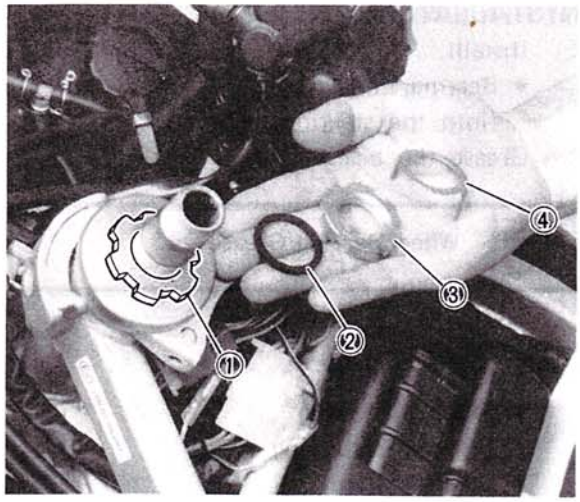
- Loosen the ring nut ① completely and retighten the ring nut to specification.

Ring Nut (Lower):
3 Nm (0.3 m·kg, 2.2 ft·lb)

WARNING:
Do not overtighten.

- Install the washer ②.
- Install the ring nut ③ and tighten it by hand and align slots of both ring nuts. If not aligned, hold the ring nut (Lower) and tighten the ring nut (Upper) until they are aligned.
- Install the lock washer ④.

6



NOTE:
Make sure the lock washer tab is placed in the slots.

4. Install:
   - Steering crown
   - Steering stem nut
   - Front fork
5. Tighten:
   - Steering stem nut

Steering Stem:
110 Nm (11 m·kg, 80 ft·lb)

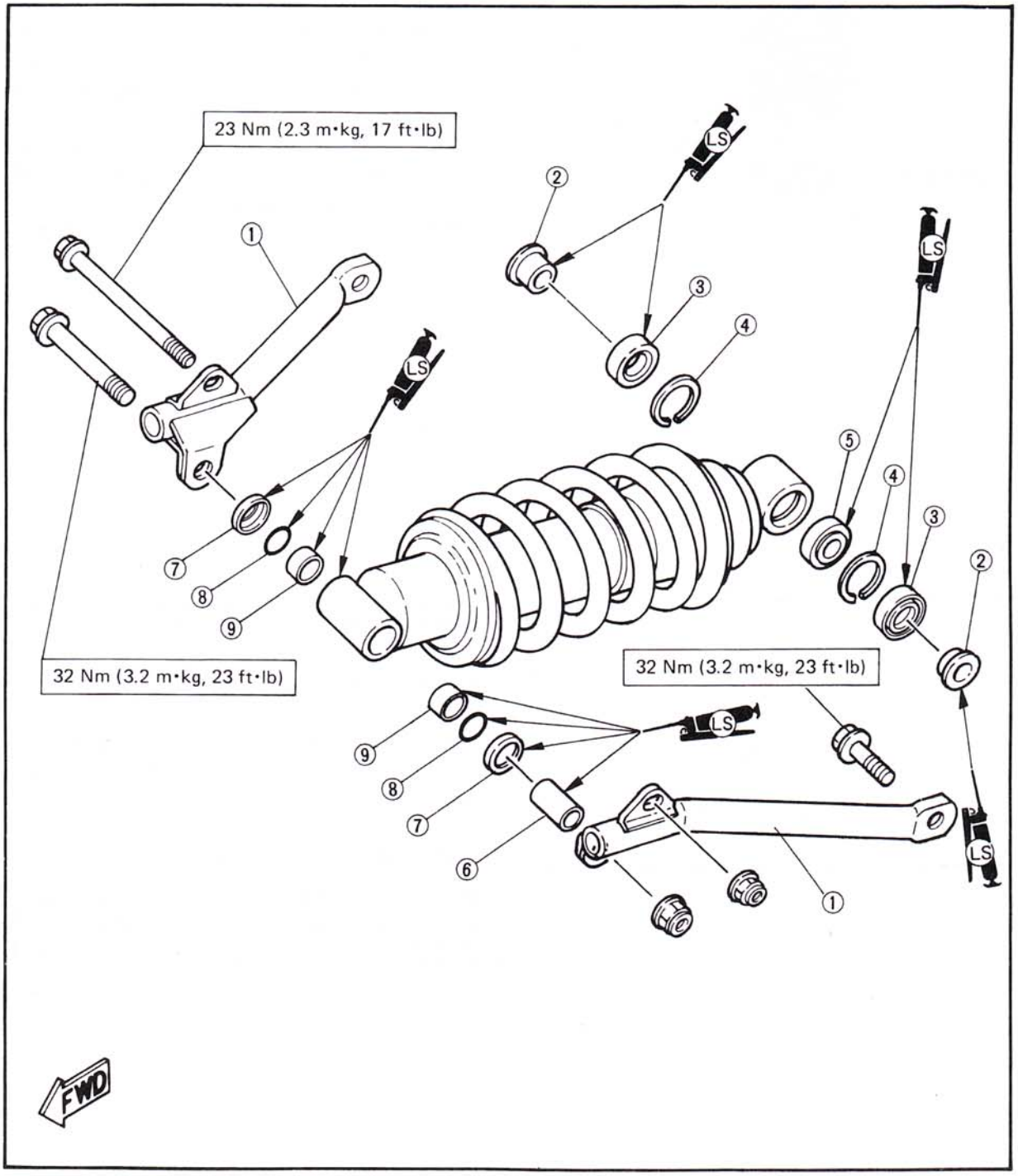
6. Install:
   - Brake hose holder
   - Calipers
   - Plunger case
   - Front wheel
   - Front fender
7. Tighten:
   - All bolts and nuts

Brake Hose Holder:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Pinch Bolts (Handlebar):
20 Nm (2.0 m·kg, 14 ft·lb)
Handlebar Bolt:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Front Axle:
58 Nm (5.8 m·kg, 42 ft·lb)
Front Axle Pinch Bolt:
20 Nm (2.0 m·kg, 14 ft·lb)
Plunger Case:
4 Nm (0.4 m·kg, 2.9 ft·lb)
Brake Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)

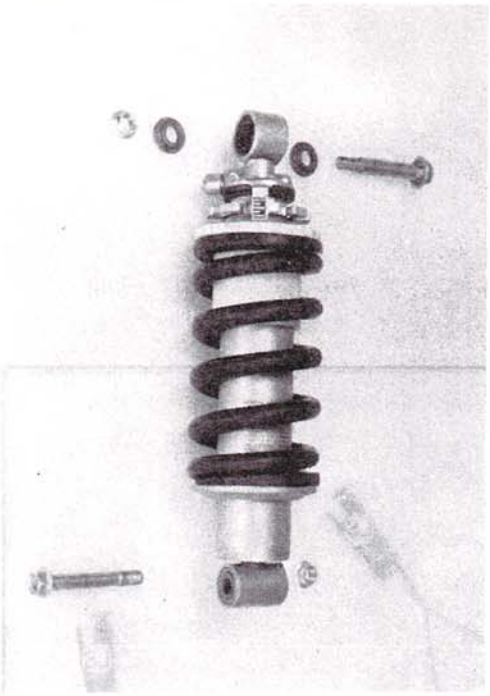
8. Install:
   - Fuel tank

REAR SHOCK ABSORBER

1. Tensionbar
2. Collar
3. Oil seal
4. Circlip
5. Bearing
6. Collar
7. Dust seal
8. O-ring
9. Bushing



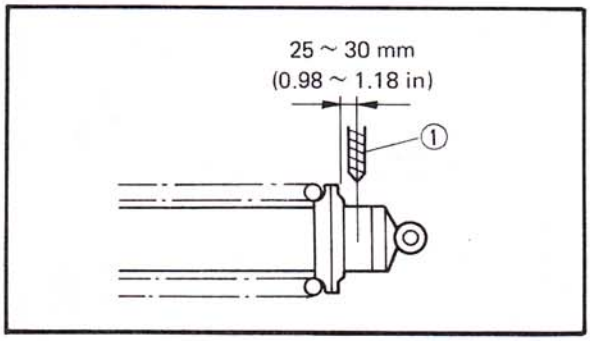
REAR SHOCK ABSORBER



WARNING:

This shock absorber contains highly compressed nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

1. **Do not tamper or attempt to open the cylinder assembly.**
2. **Do not subject shock absorber to an open flame or other high heat. This may cause the unit to explode due to excessive gas pressure.**
3. **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.**

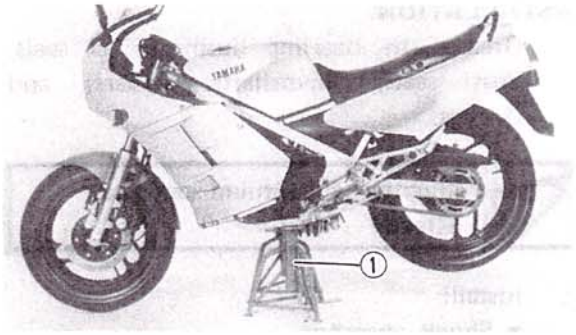


Shock absorber disposal steps:

Gas pressure must be released before disposing of shock absorber. To do so, drill ① a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the cylinder wall at a point 25 ~ 30 mm (0.98 ~ 1.18 in) under the spring seat.

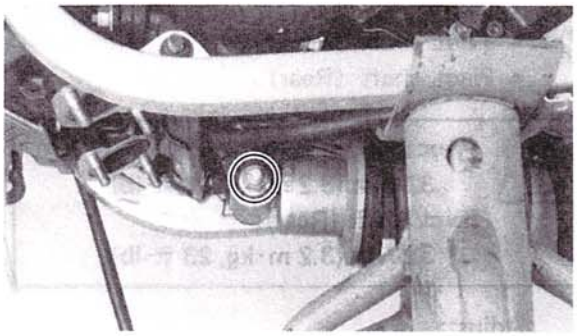
CAUTION:

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

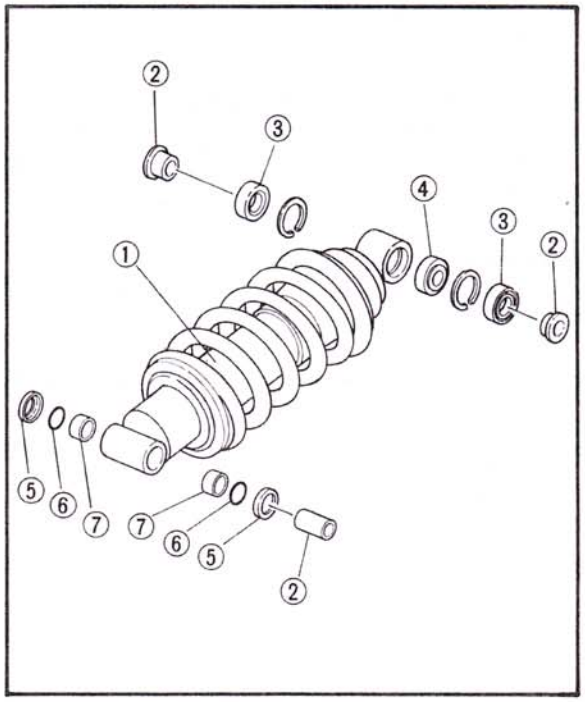


REMOVAL

1. Remove:
   - Lower cowling
   - Mufflers (Lower cylinders)
2. Place the motorcycle on a block or other suitable stand ① under the frame.



3. Remove:
   - Pivot shaft (Front)
   - Pivot shaft (Rear)
   - Shock absorber



INSPECTION

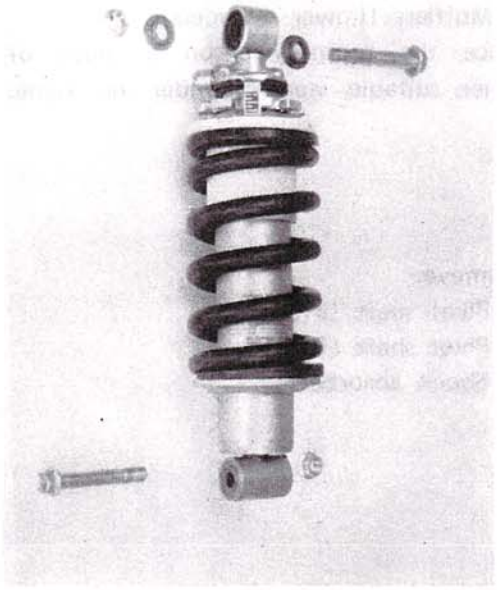
1. Inspect:
   - Shock absorber ①
     Oil leaks/Gas leaks/Damage → Replace.

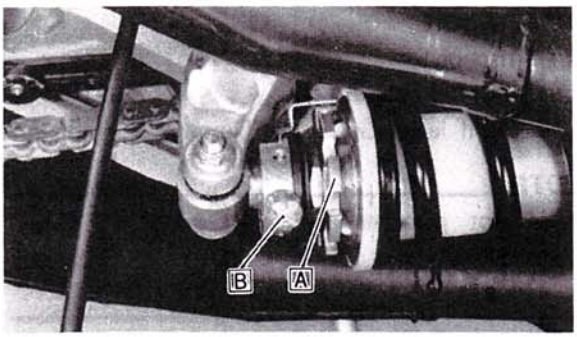
NOTE:

It is not possible to disassemble the shock absorber. Always replace with a new shock absorber.

- Collars ②
  Wear/Damage → Replace.
- Oil seals ③
  Wear/Damage → Replace.
- Bearing ④
  Pitting/Damage → Replace.
- Dust seals ⑤
  Wear/Damage → Replace.
- O-rings ⑥
  Wear/Damage → Replace.
- Bushings ⑦
  Wear/Damage → Replace.

6





INSTALLATION

1. Grease the bearing, bushings, oil seals, dust seals, pivotshafts, collars, and O-rings.

Lightweight Lithium-soap Base Grease

2. Install:
   - Shock absorber
3. Tighten:
   - Pivot shaft (Front)
   - Pivot shaft (Rear)

Pivot Shaft (Front):
32 Nm (3.2 m·kg, 23 ft·lb)
Pivot Shaft (Rear):
32 Nm (3.2 m·kg, 23 ft·lb)

4. Adjust:
   - Spring preload
   - Damper

[A] SPRING PRELOAD ADJUSTMENT:

	HARD				STD
Adjusting position	5	4	3	2	1

[B] DAMPING ADJUSTMENT:

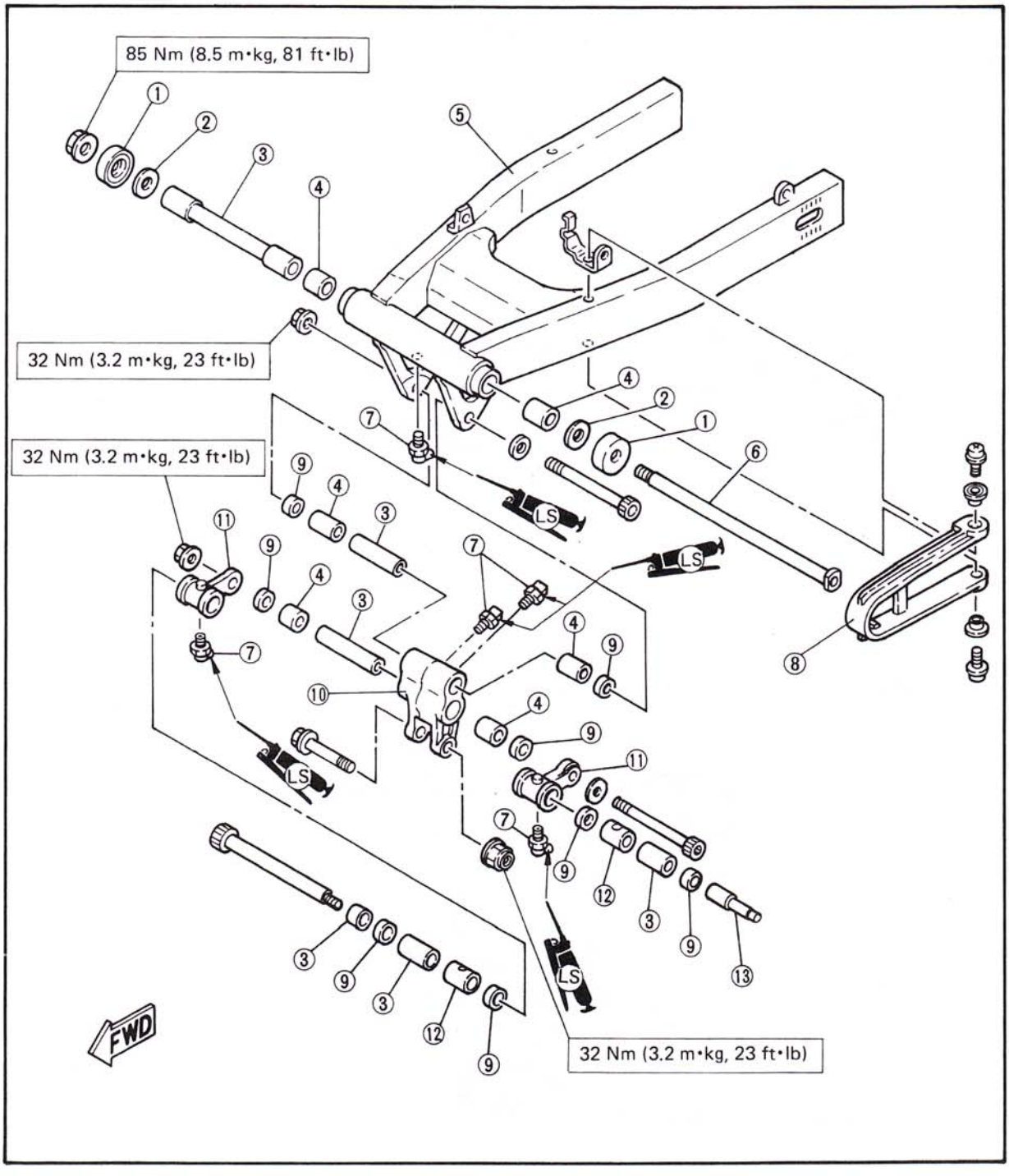
	HARD		STD	SOFT
Adjusting position	4	3	2	1

5. Install:
   - Mufflers
   - Lower cowling

6

SWINGARM AND RELAY ARM

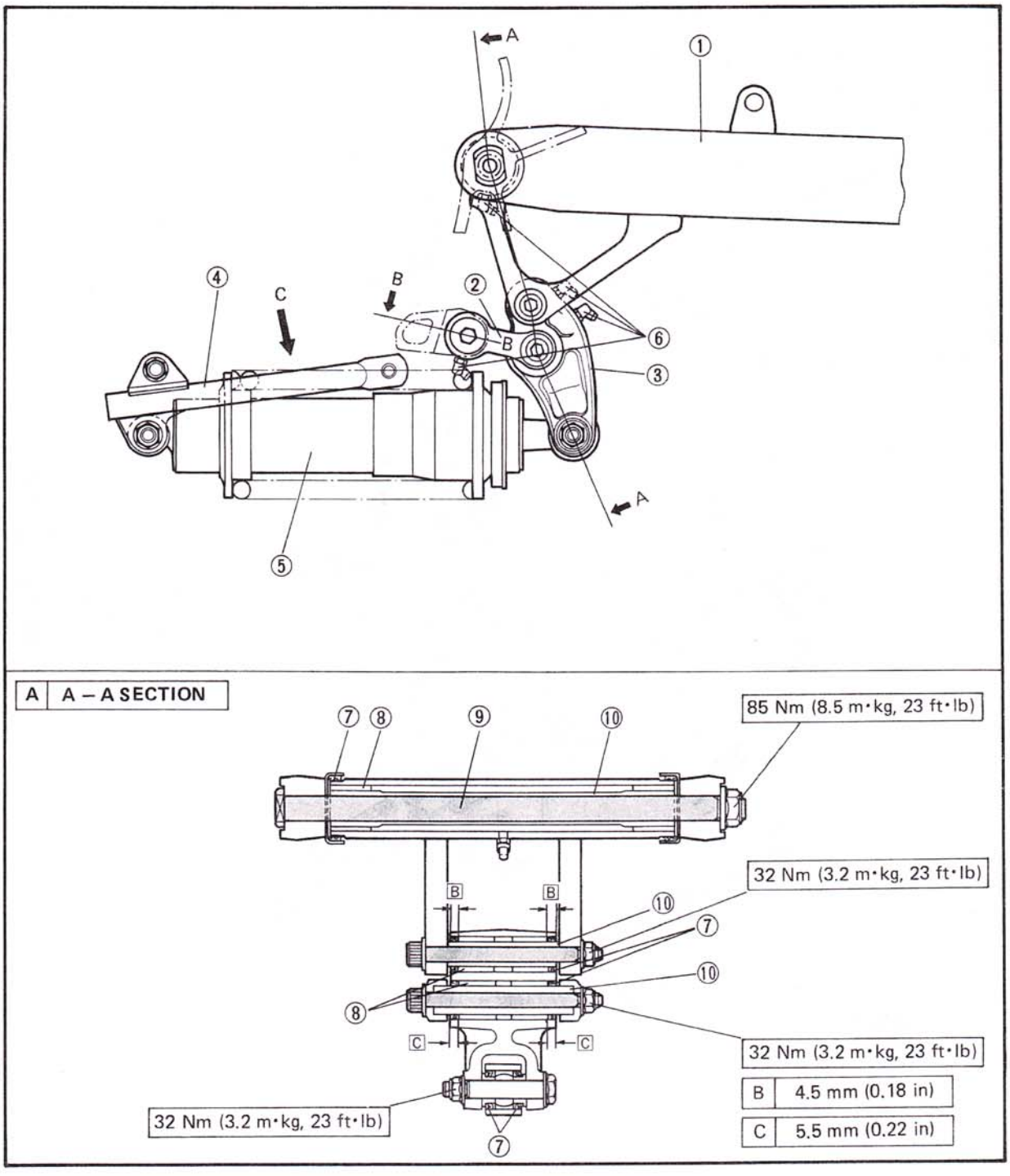
1. Thrust cover
2. Thrust washer
3. Collar
4. Bearing
5. Swing arm
6. Pivot shaft
7. Grease nipple
8. Chain protector
9. Oil seal
10. Relay arm 1
11. Relay arm 2
12. Bushing
13. Cap nut



SWINGARM AND RELAY ARM

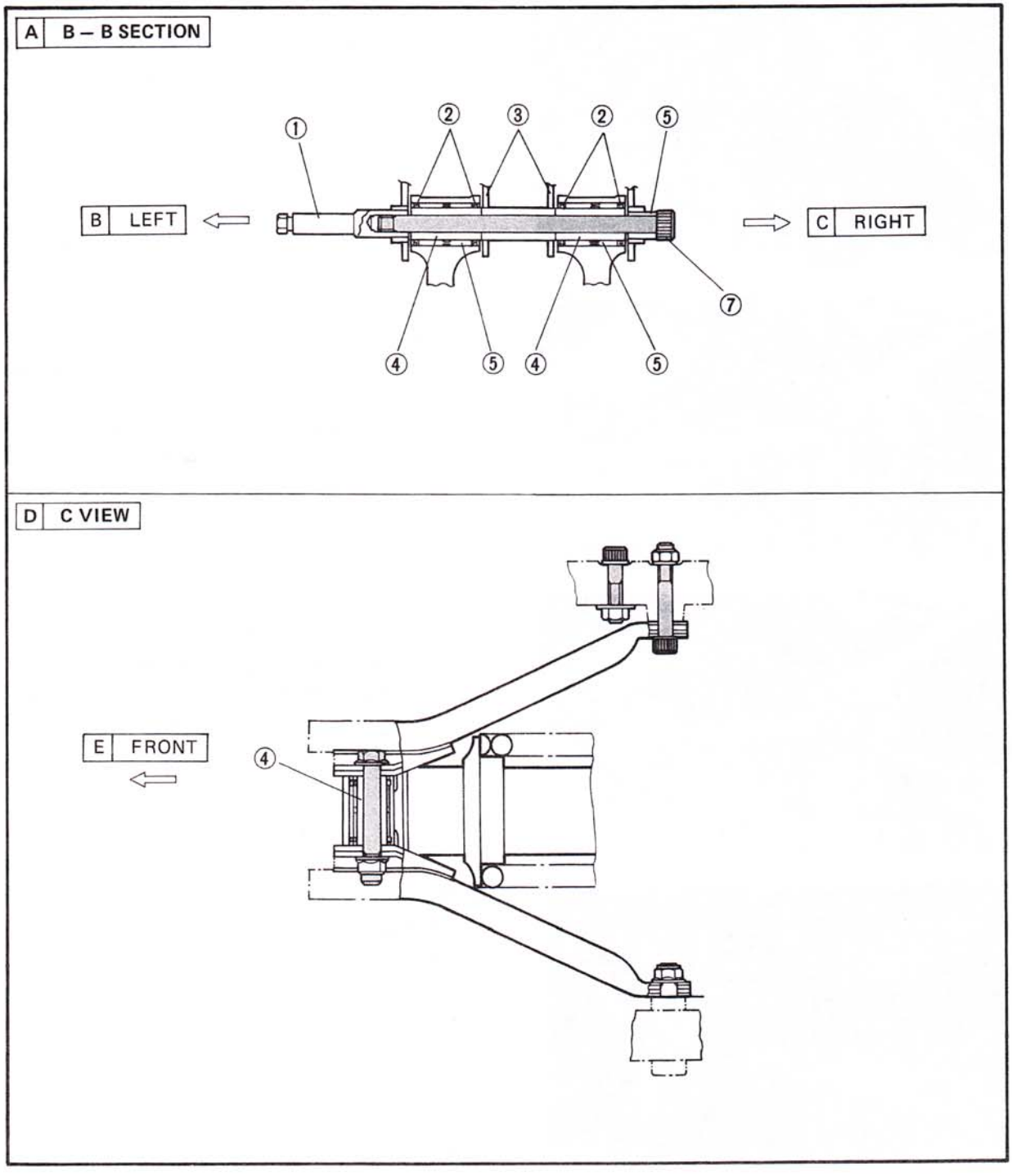
SWINGARM AND RELAY ARMS INSTALLATION (1)

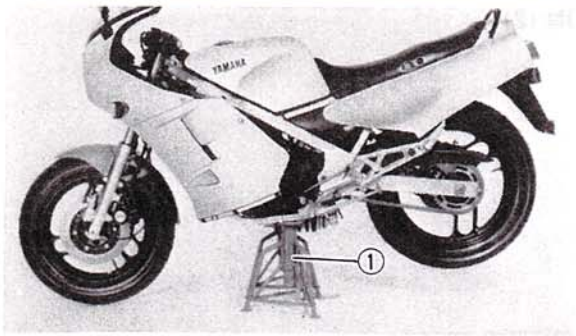
1. Swingarm
2. Relay arm 1
3. Relay arm 2
4. Tension bar
5. Rear shock absorber
6. Grease nipple
7. Oil seal
8. Bearing
9. Pivot shaft
10. Collar



SWINGARM AND RELAY ARMS INSTALLATION (2)

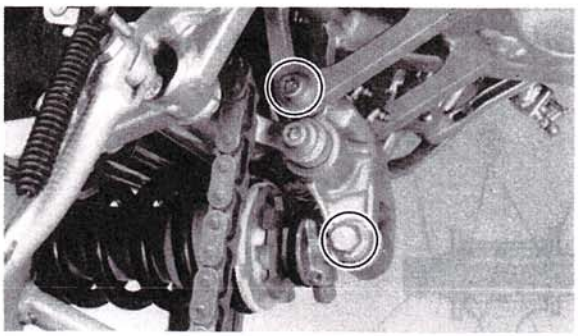
1. Cap nut
2. Oil seal
3. Frame
4. Collar
5. Busing



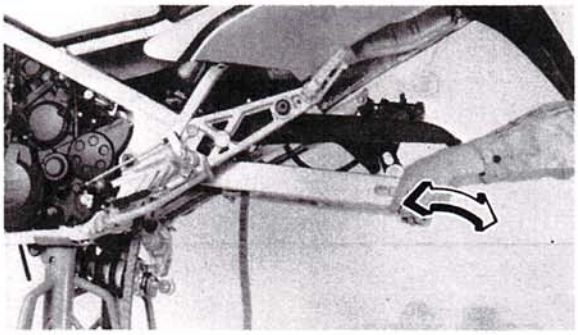


SWINGARM FREE PLAY INSPECTION

1. Remove:
   - Lower cowling
   - Mufflers (Lower cylinders)
2. Place the motorcycle on a block or other suitable stand ① under the frame.
3. Remove:
   - Rear wheel

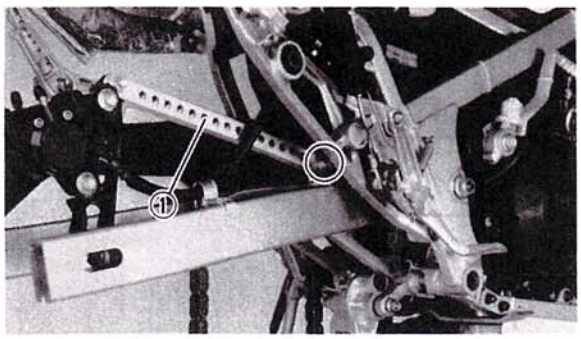


4. Remove:
   - Pivot shaft (Shock absorber rear)
   - Bolt (Swingarm – Relay arm 2)



5. Inspect:
   - Free play
     Try to move the swingarm from side to side.
     Noticeable free play → Replace bearings, thrust washers, collar, and thrust covers.

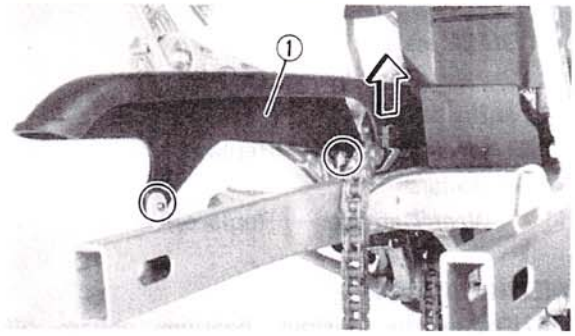
6. Check:
   - Swingarm movement
     Move the swingarm up and down.
     Unsmooth operation → Apply grease/ Replace bearings and collar.



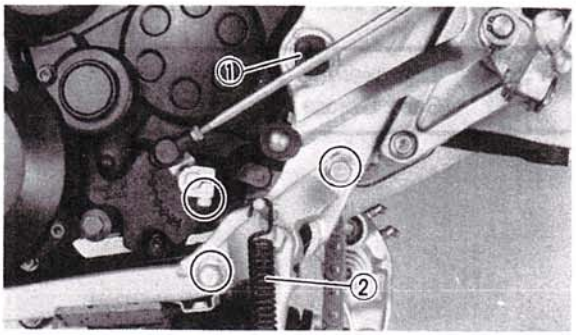
REMOVAL

1. Remove:
   - Bolt (Tension bar)

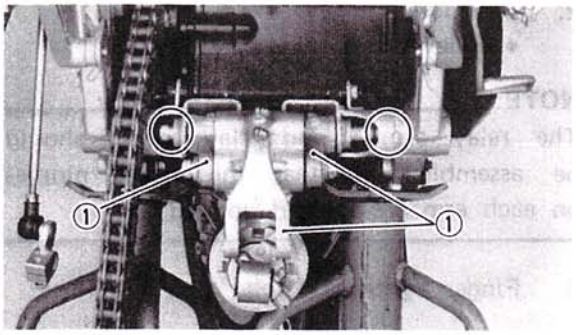
① Tension bar



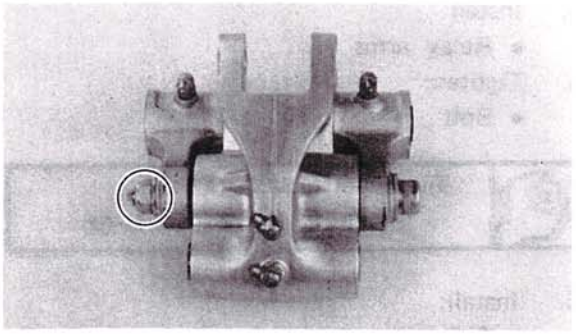
2. Remove:
   - Chain guard ①



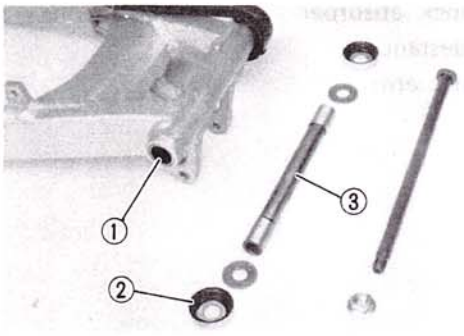
3. Remove:
   - Bolt (Shift arm)
   - Pivot shaft (Swingarm) ①
   - Swingarm
   - Sidestand ②



4. Remove:
   - Bolt (Relay arm 1 – Frame)
   - Relay arms ①



5. Remove:
   - Bolt (Relay arm 1 – Relay arm 2)



INSPECTION

1. Inspect:
   - Bearings ①
     Pitting/Damage → Replace.
   - Thrust covers ②
     Wear/Damage → Replace.
   - Collar ③
     Wear/Damage → Replace.

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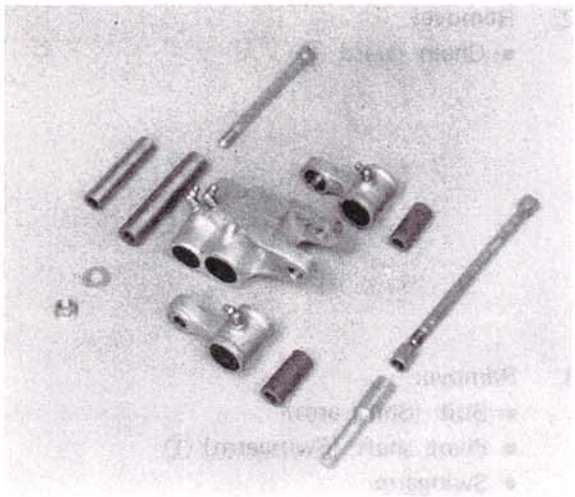
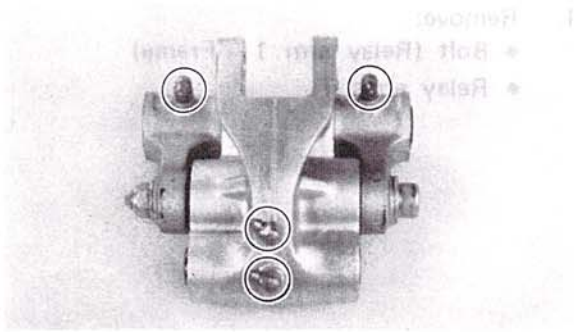


2. Inspect:
   - Oil seals
     Wear/Damage → Replace.
   - Bushings
     Wear/Damage → Replace.
   - Collars
     Wear/Damage → Replace.

INSTALLATION

1. Grease the busings, bearings, collars, oil seals thrust covers, and bolts.

	Lightweight Lithium-Soap Base Grease

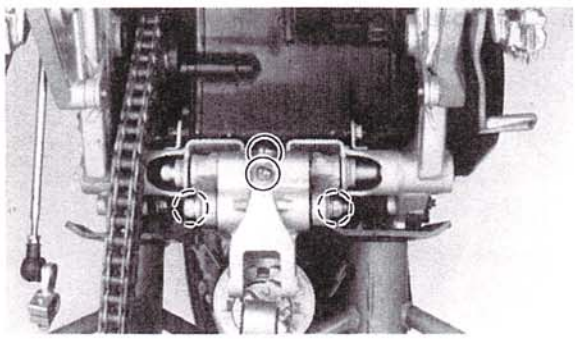


2. Assemble:
   - Relay arms

NOTE:

The relay arm ① and relay arm ② should be assembled so that the grease nipples on each arm are pointed upward.

3. Finger tighten the bolt.



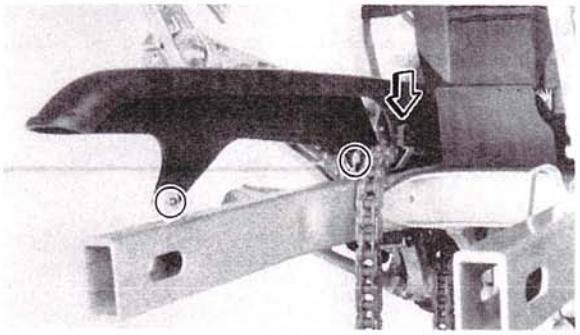
4. Install
   - Relay arms
5. Tighten:
   - Bolt

	Frame – Relay Arm 1: 32 Nm (3.2 m·kg, 23 ft·lb)

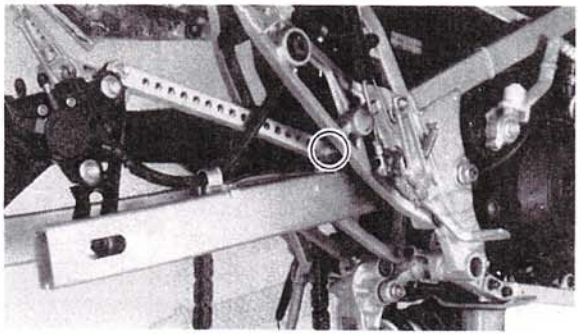
6. Install:
   - Swingarm
   - Shock absorber
   - Sidestand
   - Shift arm

7. Tighten:
   - Bolts

	Pivot Shaft (Swingarm): **85 Nm (8.5 m·kg, 81 ft·lb)** **Swingarm-Relay Arm 2:** **32 Nm (3.2 m·kg, 23 ft·lb)** **Shock Abserber-Relay arm 2:** **32 Nm (3.2 m·kg, 23 ft·lb)** **Sidestand:** **32 Nm (3.2 m·kg, 23 ft·lb)** **Shift Arm:** **10 Nm (1.0 m·kg, 7.2 ft·lb)**

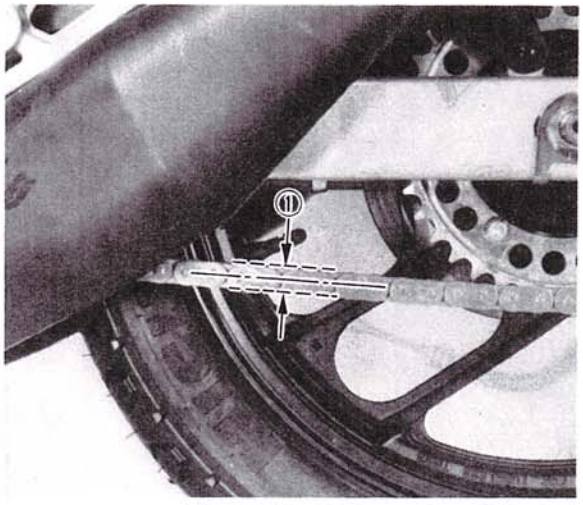


8. Instll:
   - Chain guard



9. Install:
   - Tension bar
   - Rear wheel
10. Tighten:
    - Bolts
    - Nut

	Tension Bar: **30 Nm (3.0 m·kg, 22 ft·lb)** **Rear Axle:** **105 Nm (10.5 m·kg, 75 ft·lb)** **Locknut (Rear axle):** **60 Nm (6.0 m·kg, 43 ft·lb)**



11. Adjust:
    - Drive chain

	Drive Chain Slack ①: **15 ~ 20 mm (0.6 ~ 0.8 in)**

12. Install:
    - Mufflers
    - Lower cowling

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CABLES AND FITTINGS

CABLE MAINTENANCE

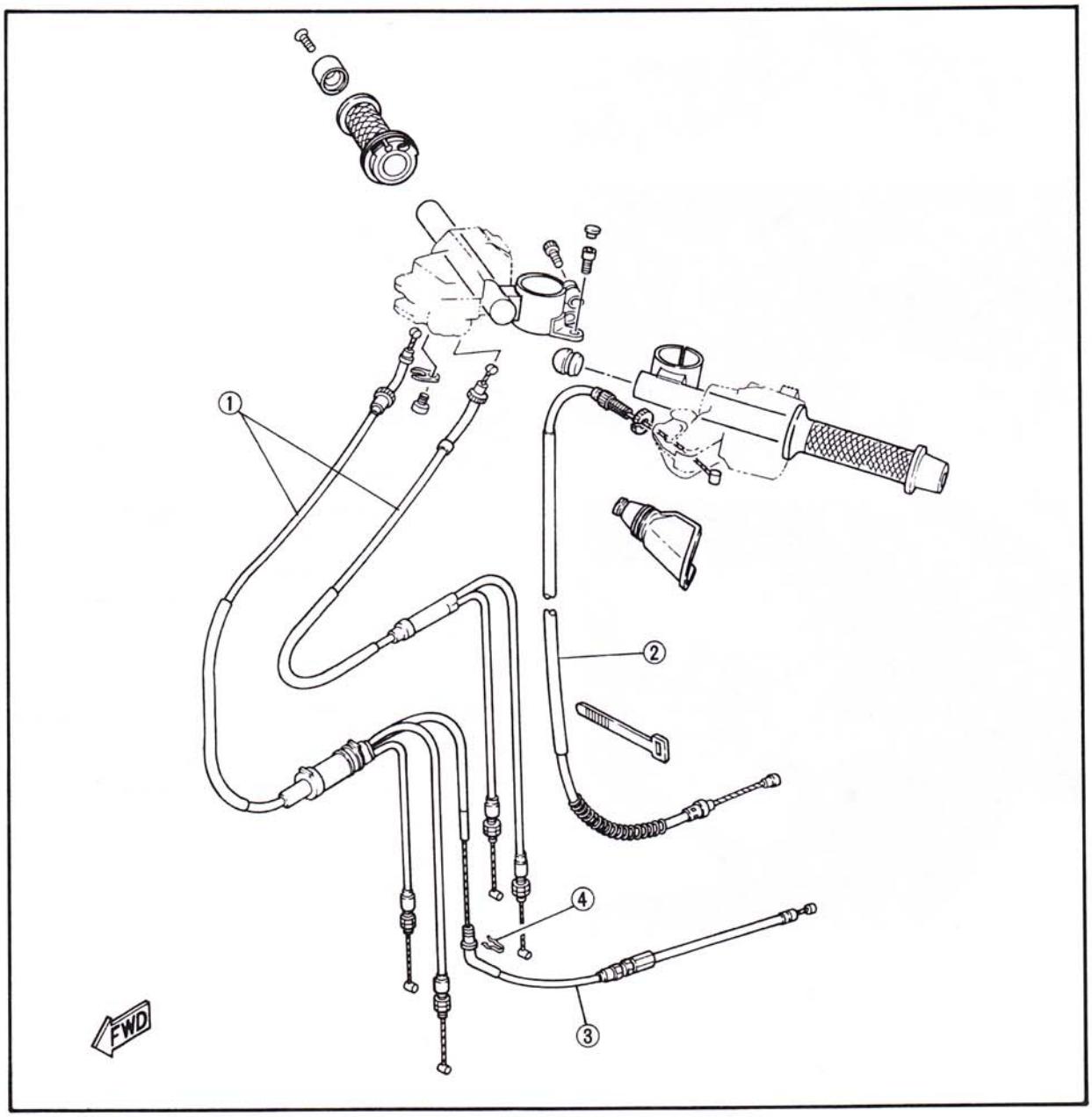
NOTE:

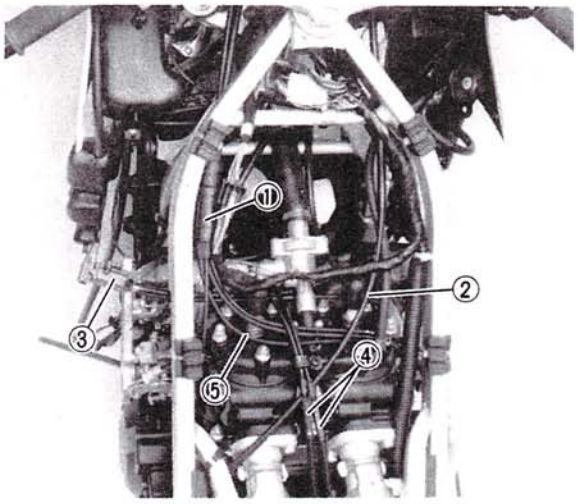
See "MAINTENANCE AND LUBRICATION" interval charts. Cable maintenance is primarily concerned with preventing deterioration and providing proper lubrication to allow the cable to move freely within its housing. Cable removal is straightforward and uncomplicated. Removal is not discussed within this section.

WARNING:

Cable routing is very important. For details of cable routing, see the "CABLE ROUTING" at the end of this manual. Improperly routed or adjusted cables may make the motorcycle unsafe for operation.

① Throttle cable
② Clutch cable
③ Oil pump cable
④ Circlip



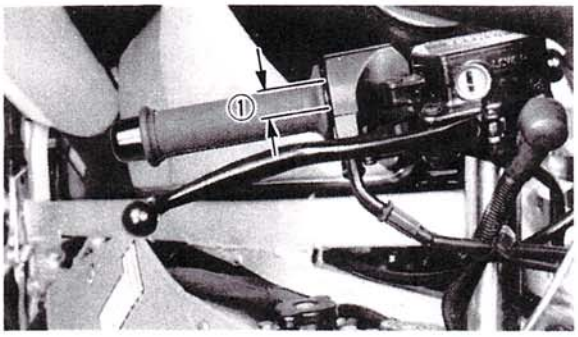


1. Remove:
   - Throttle cables ①
   - Clutch cable ②
   - Choke cable ③
   - YPVS cables ④
   - Speedometer cable
   - Oil pump cables ⑤
2. Check:
   - Cable free movement
     Obstruction→ Inspect for wear/Damage.
     Kinking/Frayed strands/Damage → Replace.
3. Lubricate the cable.

Cable lubrication steps:
- Hold the cable in a vertical position.
- Apply lubricant to the uppermost end of the cable.
- Maintain its vertical position until the oil flows to the bottom.
- Allow excess oil to drain, then reinstall the cable.

NOTE:
Choice of lubricant depends upon conditions and preferences. The use of a semi-drying chain and cable lubricant will perform adequately under most conditions.

Recommended Lubricant:
Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil



4. Install:
   - Cables
     Reverse the removal procedure.

NOTE:
Tighten the housing screws evenly to maintain an even gap between the two housing halves.

Throttle Cable Free Play ①:
3 ~ 7 mm (0.12 ~ 0.28 in)

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