

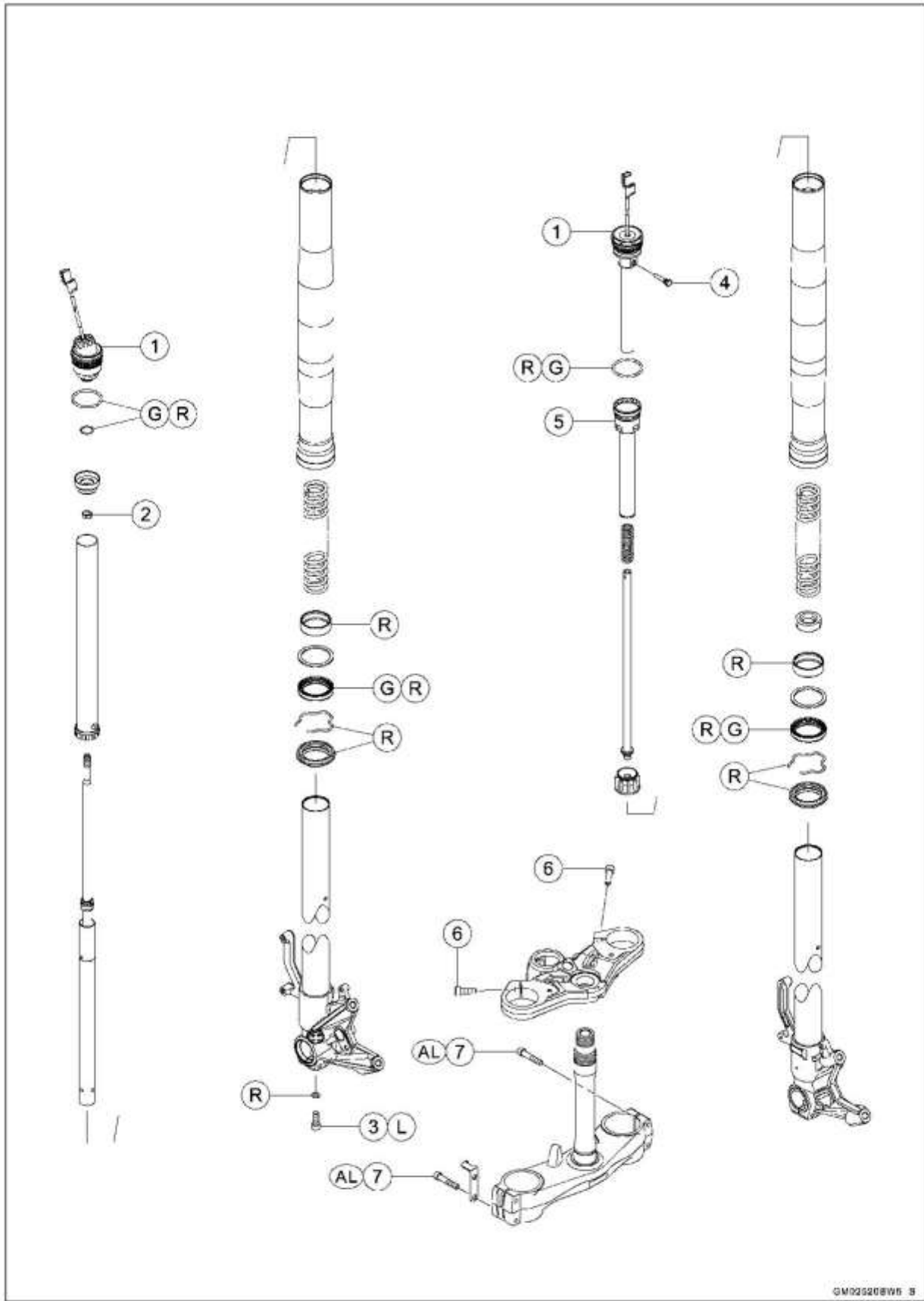
Suspension

Table of Contents

Exploded View	13-2
Specifications	13-6
Special Tools	13-7
Front Fork	13-9
Spring Preload Adjustment (Right Side)	13-9
Front Fork Removal (Each Fork Leg)	13-9
Front Fork Installation (Each Fork Leg)	13-11
Front Fork Oil Change	13-12
Front Fork Disassembly	13-19
Front Fork Assembly	13-21
Inner Tube, Outer Tube Inspection	13-22
Dust Seal Inspection	13-23
Spring Tension Inspection	13-23
Rear Shock Absorber	13-24
Rear Shock Absorber Removal	13-24
Rear Shock Absorber Installation	13-26
Rear Shock Absorber Inspection	13-26
Rear Shock Absorber Scrapping	13-26
Kawasaki Electronic Control Suspension (KECS)	13-27
Front Fork Stroke Sensor Replacement	13-27
Front Fork Solenoid Coil Replacement	13-27
Rear Shock Absorber Spring Preload Actuator/Position Sensor Replacement	13-27
Rear Shock Absorber Stroke Sensor Replacement	13-27
Rear Shock Absorber Solenoid Coil Removal	13-28
Rear Shock Absorber Solenoid Coil Installation	13-28
KECS ECU Removal	13-28
KECS ECU Installation	13-29
Swingarm	13-30
Swingarm Removal	13-30
Swingarm Installation	13-30
Swingarm Bearing Removal	13-31
Swingarm Bearing Installation	13-32
Swingarm Bearing, Sleeve Inspection	13-33
Swingarm Bearing Lubrication	13-33
Chain Guide Inspection	13-33
Tie-Rod, Rocker Arm	13-34
Tie-Rod Removal	13-34
Tie-Rod Installation	13-34
Rocker Arm Removal	13-35
Rocker Arm Installation	13-35
Tie-Rod and Rocker Arm Bearing Removal	13-36
Tie-Rod and Rocker Arm Bearing Installation	13-36
Rocker Arm/Tie-Rod Bearing, Sleeve Inspection	13-37
Rocker Arm/Tie-Rod Bearing Lubrication	13-37

13-2 SUSPENSION

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Front Fork Top Plugs	35	3.6	26	
2	Piston Rod Nut	20	2.0	15	
3	Front Fork Bottom Allen Bolt	20	2.0	15	L
4	Stop Bolt	7.0	0.71	62 in·lb	
5	Piston Rod Guide Case	90	9.2	66	
6	Upper Front Fork Clamp Bolts	20	2.0	15	
7	Lower Front Fork Clamp Bolts	23	2.3	17	AL

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.

G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Rear Shock Absorber Bracket Nuts	35	3.6	26	R
2	Upper Rear Shock Absorber Nut	35	3.6	26	R
3	Tie-Rod Nuts	35	3.6	26	R
4	Lower Rear Shock Absorber Nut	35	3.6	26	R
5	Solenoid Coil Lead Clamp Screws	2.0	0.20	18 in·lb	
6	Rear Shock Absorber Solenoid Coil	15	1.5	11 ft·lb	
7	Swingarm Pivot Shaft Nut	110	11.2	81.1	
8	Rocker Arm Nut	35	3.6	26	R

G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

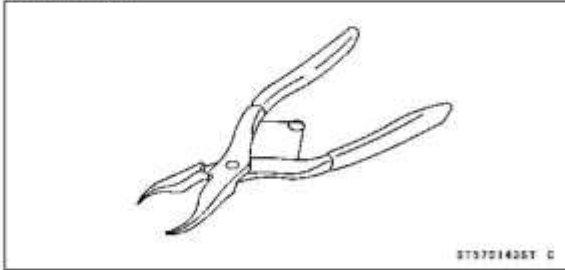
13-6 SUSPENSION

Specifications

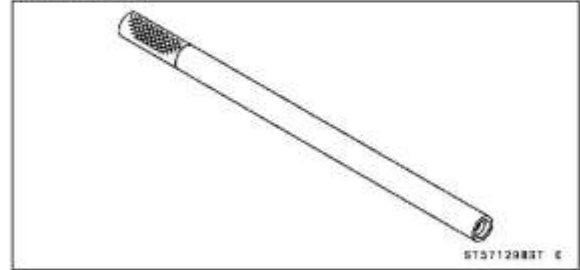
Item	Standard
Front Fork (Per One Unit) Fork Inner Tube Diameter Air Pressure Spring Preload Setting Suspension Oil Amount: Left Front Fork: When Changing Oil After Disassembly and Completely Dry Right Front Fork : When Changing Oil After Disassembly and Completely Dry Fork Oil Level: Left Front Fork Right Front Fork Fork Spring Free Length	$\phi 43$ mm (1.7 in.) Atmospheric pressure (non-adjustable) 6 turns in from the fully counterclockwise position (Usable Range: 0 \longleftrightarrow 15 turns in) Kawasaki SS-47 or equivalent Approx. 450 mL (15.2 US oz.) 528 \pm 2.5 mL (17.9 \pm 0.08 US oz.) Approx. 495 mL (16.7 US oz.) 579 \pm 2.5 mL (19.6 \pm 0.08 US oz.) 74 \pm 2 mm (2.9 \pm 0.08 in.) (Fully Compressed, with spring, below from top of outer tube) 110 \pm 2 mm (4.3 \pm 0.08 in.) (Fully Compressed, with spring and collars, below from top of outer tube) 300.4 mm (11.83 in.) (Service Limit: 295 mm (11.6 in.))
Rear Shock Absorber Gas Pressure	980 ~ 1 280 kPa (10.00 ~ 13.06 kgf/cm ² , 142.1 ~ 185.6 psi, non-adjustable)

Special Tools

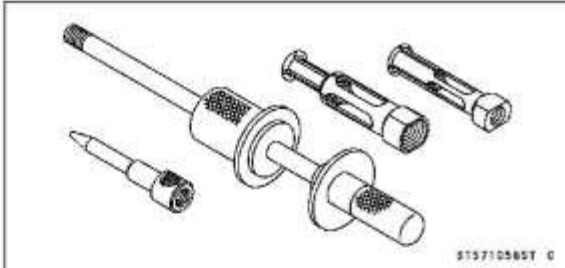
Inside Circlip Pliers:
57001-143



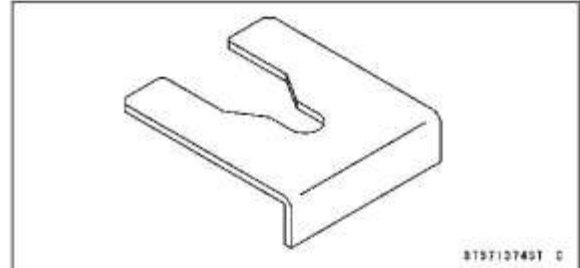
Fork Piston Rod Puller, M10 × 1.0:
57001-1298



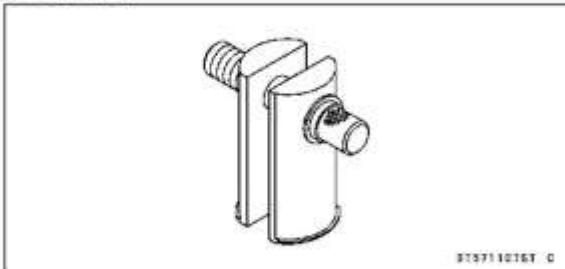
Oil Seal & Bearing Remover:
57001-1058



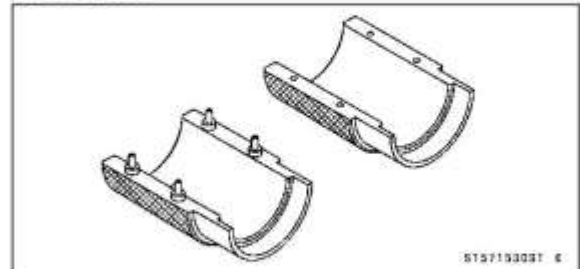
Fork Spring Stopper:
57001-1374



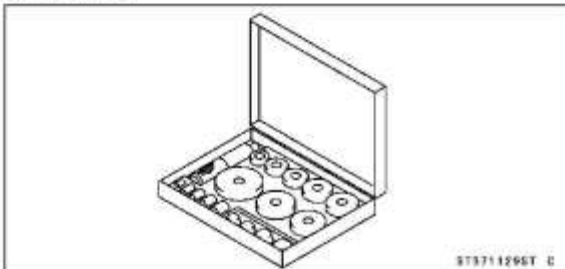
Head Pipe Outer Race Remover ID > 37 mm:
57001-1107



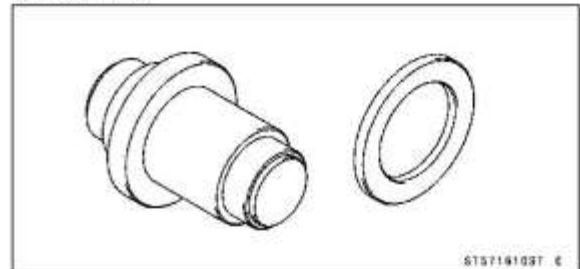
Fork Oil Seal Driver, φ43:
57001-1530



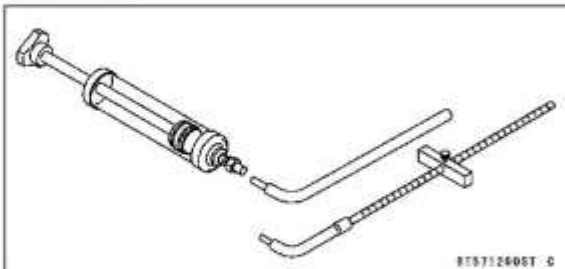
Bearing Driver Set:
57001-1129



Needle Bearing Driver, φ28:
57001-1610



Fork Oil Level Gauge:
57001-1290



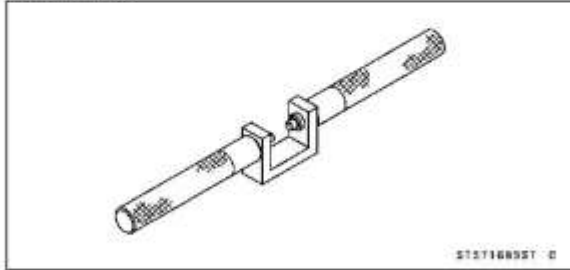
Needle Bearing Driver, φ20 & Spacer, φ28:
57001-1678



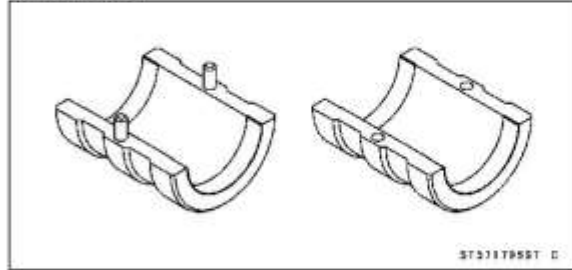
13-8 SUSPENSION

Special Tools

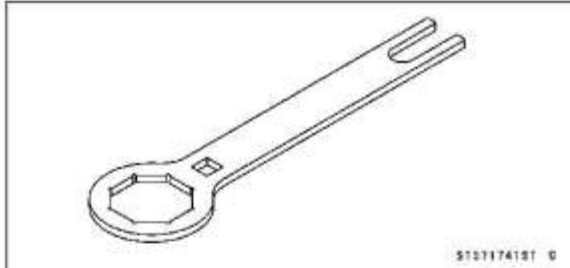
Fork Spring Compressor:
57001-1685



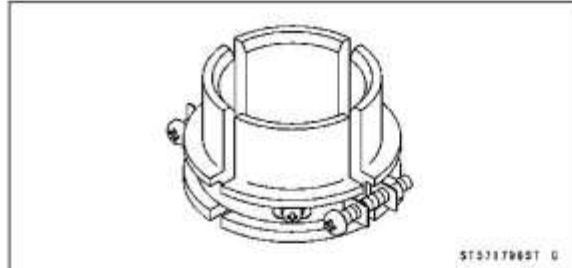
Fork Oil Seal Driver Weight, $\phi 26 \sim \phi 46$:
57001-1795



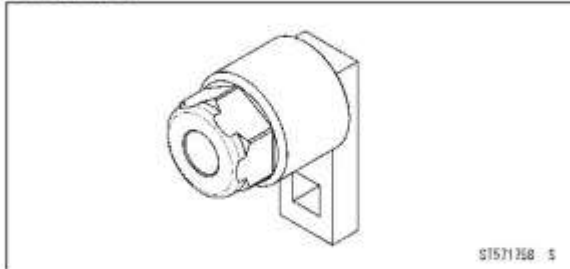
Top Plug Wrench (45 mm):
57001-1741



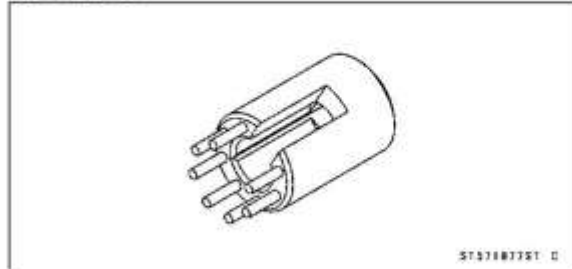
Fork Oil Seal Driver Attachment, $\phi 36 \sim \phi 46$:
57001-1798



Rod Guide Case Wrench, 35 mm:
57001-1758



Solenoid Coil Attachment:
57001-1877



Front Fork

Spring Preload Adjustment (Right Side)

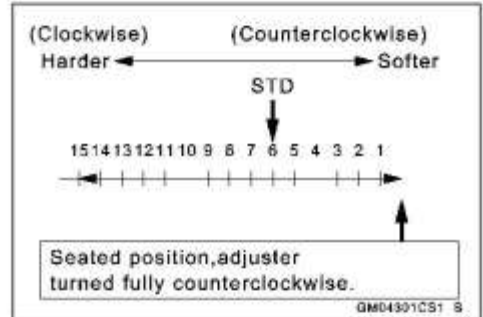
- To adjust the spring preload, turn the spring preload adjuster [A].
- The standard adjuster setting is the **6 turns in** from the fully counterclockwise position.



- The spring preload can be left soft for average riding. But it should be adjusted harder for high speed riding or riding with a passenger. If the spring action feels too soft or too stiff, adjust it in accordance with the following table.

Spring Action

Adjuster Position	Damping Force	Setting	Load	Road	Speed
0	Weak	Soft	Light	Good	Low
↑	↑	↑	↑	↑	↑
↓	↓	↓	↓	↓	↓
15 turns in	Strong	Hard	Heavy	Bad	High



NOTICE

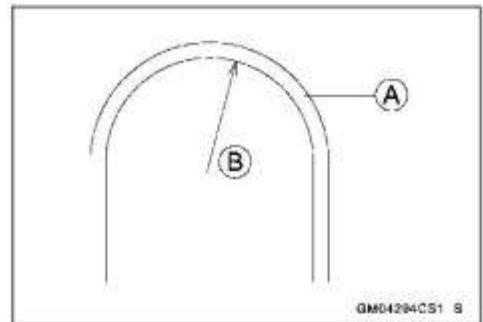
Do not force the spring preload adjuster beyond the fully seated position, or the adjusting mechanism may be damaged.

Front Fork Removal (Each Fork Leg)

- Remove:
Upper Fairing (see Upper Fairing Removal(15-18))

NOTE

- The bending radius of the stroke sensor and solenoid coil leads [A] shall not be smaller than 10 mm (0.39 in.) [B].



13-10 SUSPENSION

Front Fork

(Left Front Fork)

- Disconnect the front fork solenoid coil lead connector [A].



- Open the clamps [A].



- Remove the band [A].

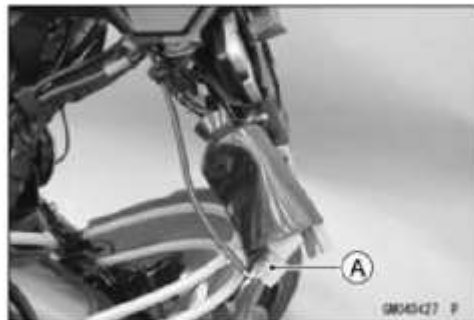


(Right Front Fork)

- Remove the band [A].

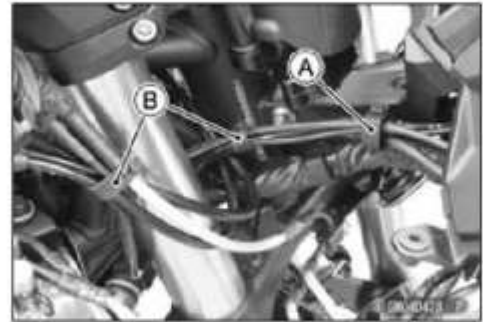


- Disconnect the front fork stroke sensor lead connector [A].



Front Fork

- Open the clamp [A].
- Remove the bands [B].



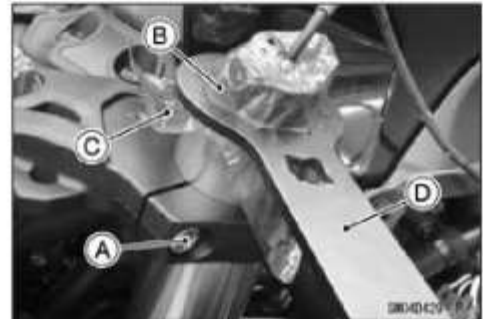
- Remove:
 - Handlebars (see [Handlebar Removal\(14-11\)](#))
- ★ If the fork leg is to be disassembled, loosen the upper front fork clamp bolt [A] and the front fork top plug [B].

NOTE

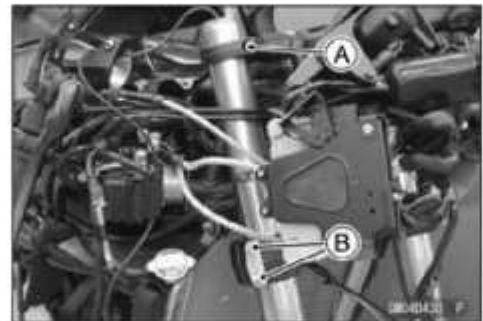
○ Loosen the top plug after loosening the upper front fork clamp bolt.

- Place a plastic bag [C] over the top plug to protect the top plug.

Special Tool - Top Plug Wrench (45 mm) [D]: 57001-1741



- Remove:
 - Front Wheel (see [Front Wheel Removal\(10-6\)](#))
 - Front Fender (see [Front Fender Removal\(15-28\)](#))
- Loosen:
 - Upper Front Fork Clamp Bolt [A]
 - Lower Front Fork Clamp Bolts [B]
- To prevent falling away, support the front fork when loosening the clamp bolts.
- With a twisting motion, work the fork leg down and out.



Front Fork Installation (Each Fork Leg)

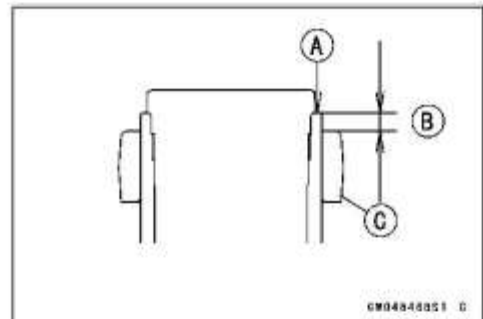
- Install the fork so that the top plug end [A] of the outer tube as shown.
 - 24 mm (0.94 in.) [B]
 - Steering Stem Head [C]
- Tighten:
 - Torque - Lower Front Fork Clamp Bolts: 23 N·m (2.3 kgf·m, 17 ft·lb)**

NOTE

○ Tighten the two lower front fork clamp bolts alternately two times to ensure even tightening torque.

- Place a plastic bag over the top plug to protect the plug.
- Tighten:

Torque - Front Fork Top Plugs: 35 N·m (3.6 kgf·m, 26 ft·lb)

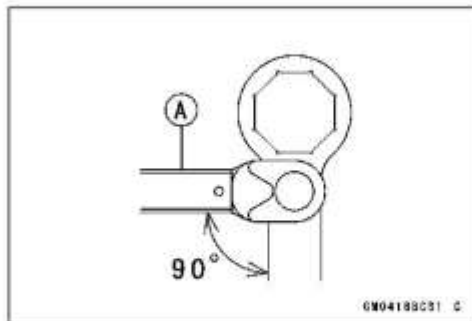


13-12 SUSPENSION

Front Fork

NOTE

- Tighten the front fork top plug before tightening the handlebar clamp bolt and upper front fork clamp bolt.
- To obtain the correct tightening torque with your torque wrench [A], install it to the special tool as shown.



- Tighten:
Torque - Upper Front Fork Clamp Bolts: 20 N·m (2.0 kgf·m, 15 ft·lb)
- Install:
Handlebars (see [Handlebar Installation\(14-13\)](#))
- Run the front fork leads correctly (see [Cable, Wire, and Hose Routing section \(18-2\)](#)).
- Install the removed parts.

Front Fork Oil Change (Left Front Fork)

- Remove the front fork (see [Front Fork Removal \(Each Fork Leg\)\(13-9\)](#)).
- Hold the fork leg with a vise.
- Place a plastic bag [A] over the top plug to protect the top plug.
- Using the wrench [B], unscrew the top plug [C] out of the outer tube.

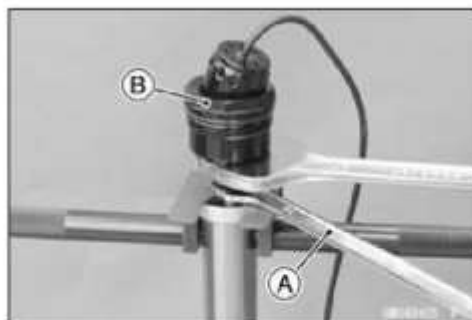
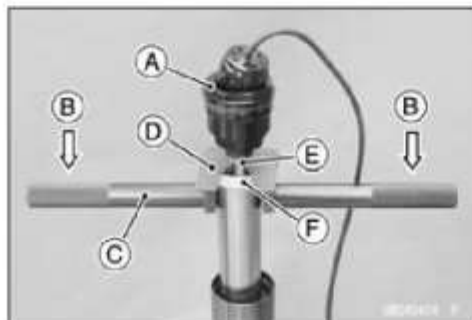
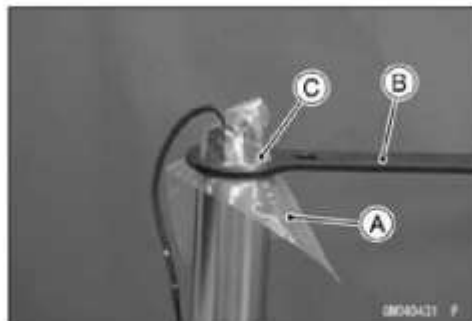
Special Tool - Top Plug Wrench (45 mm): 57001-1741

- While holding up the top plug [A] by one person, push down [B] the fork spring compressor [C] and insert the fork spring stopper [D] between the piston rod nut [E] and the stopper [F].

Special Tools - Fork Spring Stopper: 57001-1374

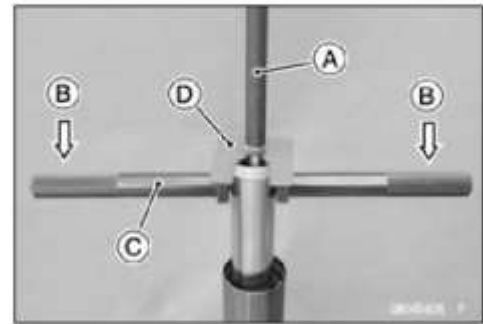
Fork Spring Compressor: 57001-1685

- Holding the piston rod nut with a wrench [A], remove the top plug [B].

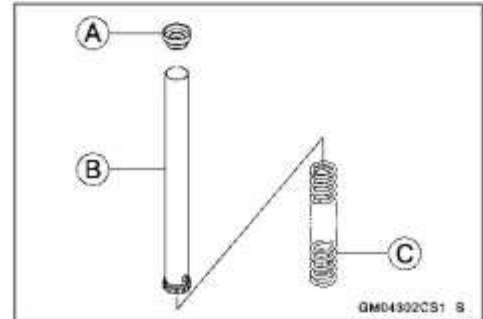


Front Fork

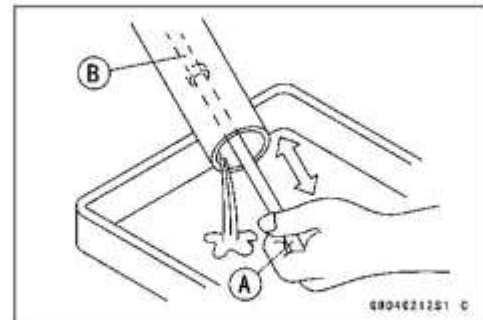
- Clean the inside of the fork piston rod puller [A].
Special Tool - Fork Piston Rod Puller, M10 × 1.0: 57001-1298
- Install the fork piston rod puller onto the end of the piston rod.
- While holding up the piston rod puller by one person, push down [B] the fork spring compressor [C], and pull out the fork spring stopper [D].
- Remove the fork spring compressor.



- Remove:
 Stopper [A]
 Collar [B]
 Fork Spring [C]



- Drain the fork oil into a suitable container.
- Using the piston rod puller [A], pump the piston rod [B] up and down at least 10 times to expel the oil from the fork.



- Hold the fork tube upright, press the outer tube [A] and the piston rod all the way down.
- Pour in the type and amount of fork oil specified.

Suspension Oil - SS47 (1L): 44091-0010

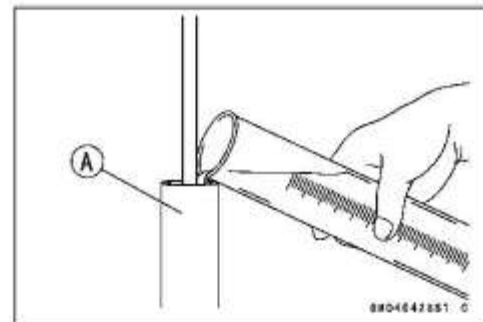
Amount (Per Side):

When changing oil:

Approx. 450 mL (15.2 US oz.)

After disassembly and completely dry:

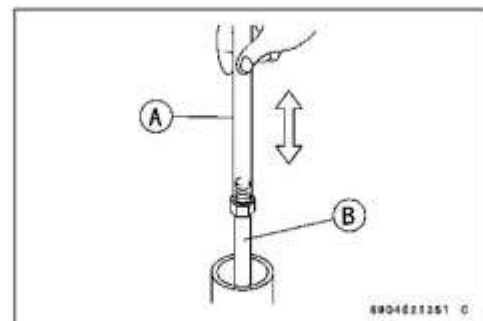
528 ±2.5 mL (17.9 ±0.08 US oz.)



- Measure the oil level as follows.
- Hold the inner tube vertically in a vise.
- Using the piston rod puller [A], move the piston rod [B] up and down slowly more than 10 times in order to expel all the air from the fork oil.

Special Tool - Fork Piston Rod Puller, M10 × 1.0: 57001-1298

- Remove the piston rod puller slowly.



13-14 SUSPENSION

Front Fork

- Wait until the oil level settles.
- Install the fork spring.
- With the fork fully compressed, insert a tape measure or rod into the inner tube, and measure the distance from the top of the outer tube to the oil.

Oil Level (fully compressed, with spring)

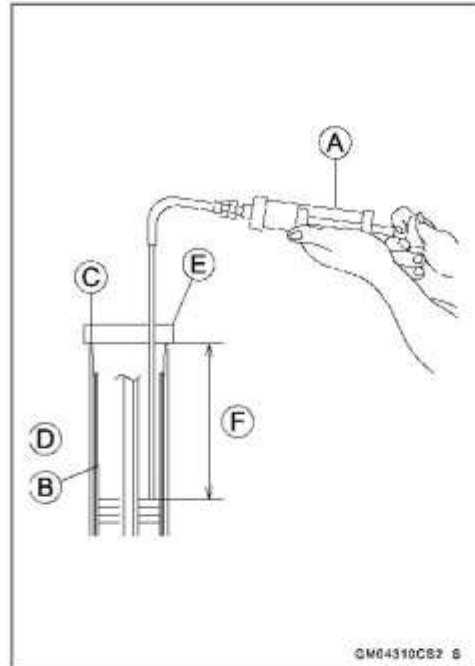
Standard: 74 ±2 mm (2.9 ±0.08 in.)

NOTE

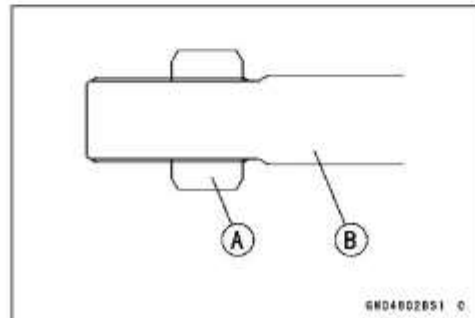
- Fork oil level may also be measured using the fork oil level gauge [A].

Special Tool - Fork Oil Level Gauge: 57001-1290

- With the fork fully compressed and with fork spring, insert the gauge tube into the inner tube [B] and position the stopper across the top end [C] of the outer tube [D].
- Set the gauge stopper [E] so that its lower side shows the oil level distance specified [F].
- Pull the handle slowly to pump out the excess oil until the oil no longer comes out.
- ★ If no oil is pumped out, there is insufficient oil in the inner tube. Pour in enough oil, then pump out the excess oil as shown above.

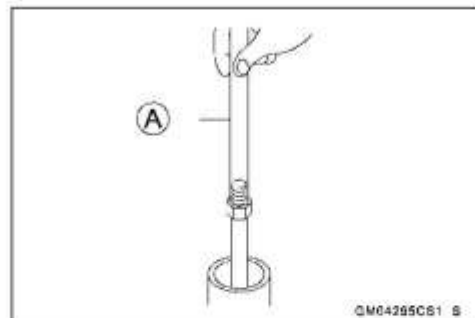


- Screw on the rod nut [A] fully to the piston rod [B].
- Pull up the piston rod until the top position.



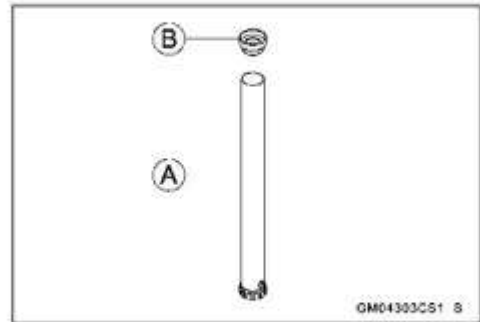
- Screw the fork piston rod puller [A] onto the end of the piston rod and hold it until it is removed.

Special Tool - Fork Piston Rod Puller, M10 × 1.0: 57001-1298

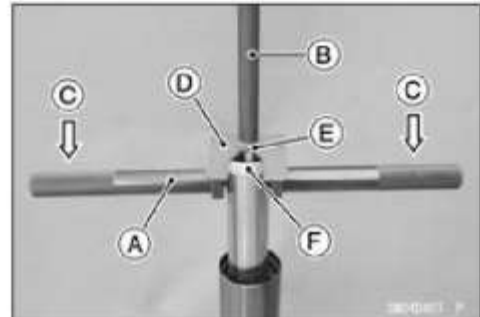


Front Fork

- Install:
Collar [A]
Stopper [B]

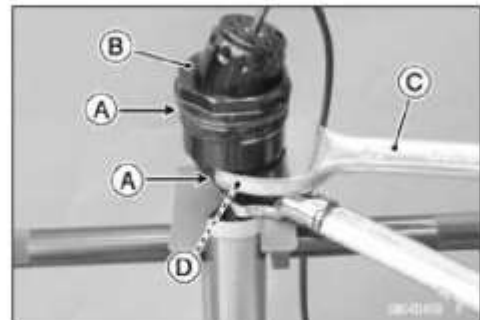


- Install the fork spring compressor [A] to the holes of collar.
Special Tool - Fork Spring Compressor: 57001-1685
- While holding up the piston rod puller [B] by one person, push down [C] the fork spring compressor and inset the fork spring stopper [D] between the piston rod nut [E] and the stopper [F].



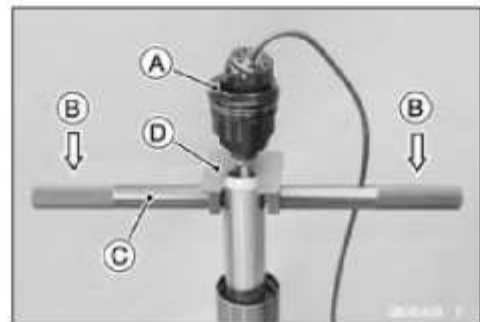
- **Special Tool - Fork Spring Stopper: 57001-1374**
- Remove the piston rod puller slowly.

- Replace the O-rings [A] with new ones.
- Apply grease to the O-rings.
- Screw in the top plug [B] until stop onto the piston rod.
- Holding the top plug with a wrench [C], tighten the piston rod nut [D].



Torque - Piston Rod Nut: 20 N·m (2.0 kgf·m, 15 ft·lb)

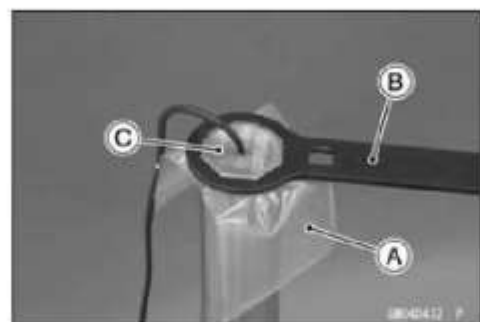
- While holding up the top plug [A] by one person, push down [B] the fork spring compressor [C], and pull out the fork spring stopper [D].
- Remove the fork spring compressor.
- Raise the outer tube and screw the top plug into it.
- Install the front fork (see Front Fork Installation (Each Fork Leg)(13-11)).



(Right Front Fork)

- Remove the front fork (see Front Fork Removal (Each Fork Leg)(13-9)).
- Hold the fork leg with a vise.
- Place a plastic bag [A] over the top plug to protect the top plug.
- Using the wrench [B], unscrew the top plug [C] out of the outer tube.

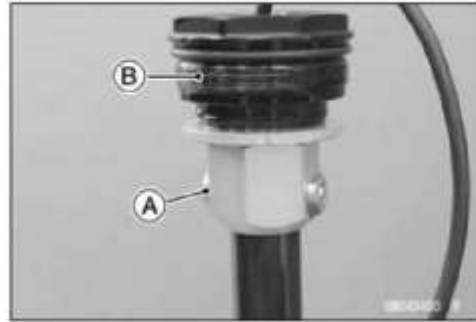
Special Tool - Top Plug Wrench (45 mm): 57001-1741



13-16 SUSPENSION

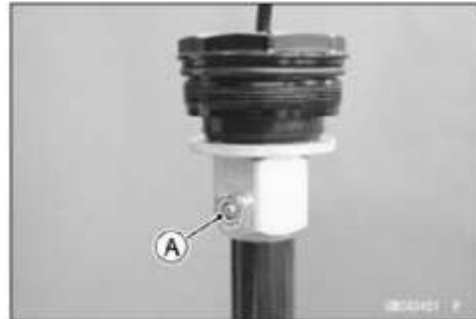
Front Fork

- Remove:
 - Stop Bolt [A]
 - Top Plug Assembly [B]



NOTICE

Do not remove the nut [A]. The top plug assembly could be damaged.



- Using the rod guide case wrench [A], remove the piston rod guide case from the inner tube.
Special Tool - Rod Guide Case Wrench, 35 mm: 57001-1758

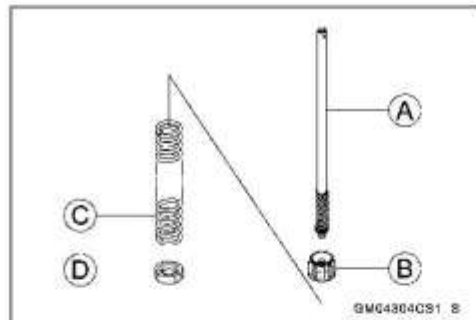
NOTICE

A socket of piston rod guide case is shallow (4 mm) and therefore be sure to check that the wrench (Special Tool: 57001-1758) is securely seated on the piston rod guide case.

When loosening the piston rod guide case. If the wrench is not securely seated on it, the piston rod guide case may break.



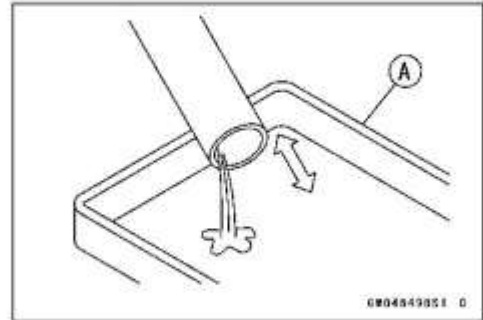
- Remove:
 - Piston Rod Assy [A]
 - Upper Collar [B]
 - Fork Spring [C]
 - Lower Collar [D]



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Front Fork

- Drain the fork oil into a suitable container [A].
- Pump the outer tube up and down at least 10 times to expel the oil from the fork.



- Hold the fork tube upright, press the outer tube [A].
- Pour in the type and amount of fork oil specified.

Suspension Oil - SS47 (1L): 44091-0010

Amount (Per Side):

When changing oil:

Approx. 495 mL (16.7 US oz.)

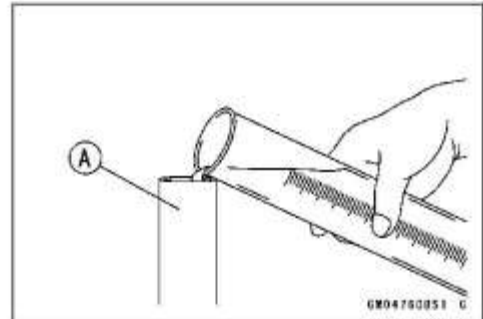
After disassembly and completely dry:

579 ±2.5 mL (19.6 ±0.08 US oz.)

- Move the outer tube up and down (about 20 mm (0.79 in.)) more than 10 times in order to expel the air from the fork oil.
- Measure the oil level as follows.
 - Hold the inner tube vertically in a vise.
 - Wait until the oil level settles.
 - Install the lower collar, fork spring and upper collar.
 - With the fork fully compressed, insert a tape measure or rod into the inner tube, and measure the distance from the top of the outer tube to the oil.

Oil Level (fully compressed, with spring and collars)

Standard: 110 ±2 mm (4.3 ±0.08 in.)



13-18 SUSPENSION

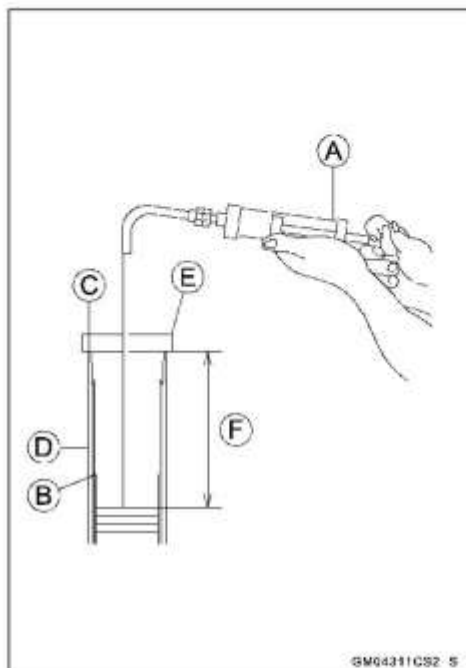
Front Fork

NOTE

○Fork oil level may also be measured using the fork oil level gauge [A].

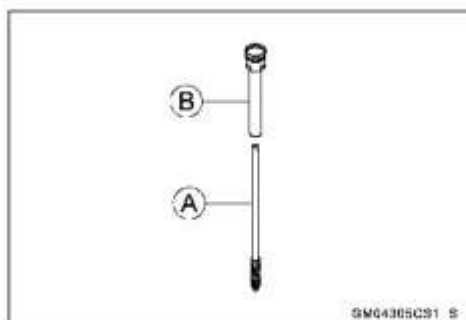
Special Tool - Fork Oil Level Gauge: 57001-1290

- With the fork fully compressed and with collars and fork spring, insert the gauge tube into the inner tube [B] and position the stopper across the top end [C] of the outer tube [D].
- Set the gauge stopper [E] so that its lower side shows the oil level distance specified [F].
- Pull the handle slowly to pump out the excess oil until the oil no longer comes out.
- ★ If no oil is pumped out, there is insufficient oil in the inner tube. Pour in enough oil, then pump out the excess oil as shown above.



● Install:

- Piston Rod Assy [A]
- Piston Rod Guide Case [B]



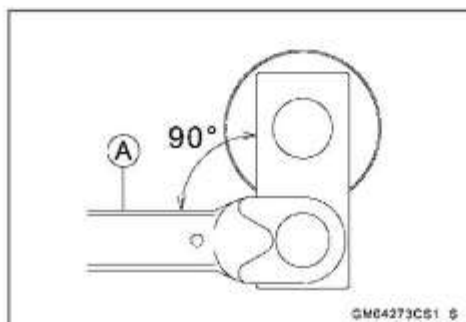
- Hold the inner tube bottom by a vise.
- Using rod guide case wrench, tighten the piston rod guide case to the inner tube.

Special Tool - Rod Guide Case Wrench, 35 mm: 57001-1758

Torque - Piston Rod Guide Case: 90 N·m (9.2 kgf·m, 66 ft·lb)

NOTE

○To obtain the correct tightening torque with your torque wrench [A], install the special tool as shown.



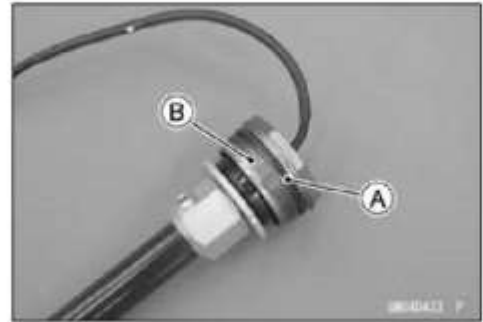
NOTICE

A socket of piston rod guide case is shallow (4 mm) and therefore be sure to check that the wrench (Special Tool: 57001-1758) is securely seated on the piston rod guide case.

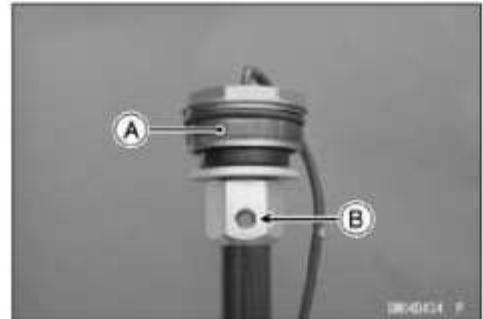
When tightening the piston rod guide case. If the wrench is not securely seated on it, the piston rod guide case may break.

Front Fork

- Replace the O-ring [A] on the top plug [B] with a new one.
- Apply grease to the new O-ring.



- Insert the top plug assembly [A] in the piston rod guide case.
- Align the holes [B] of the push rod and top plug assembly.

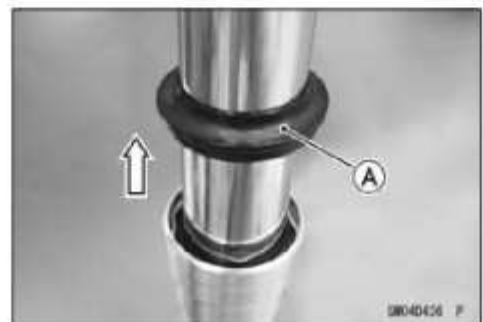


- Tighten:
 - Torque - Stop Bolt [A]: 7.0 N·m (0.71 kgf·m, 62 in·lb)**
- Raise the outer tube and screw the top plug into it.
- Install the front fork (see [Front Fork Installation \(Each Fork Leg\)\(13-11\)](#)).

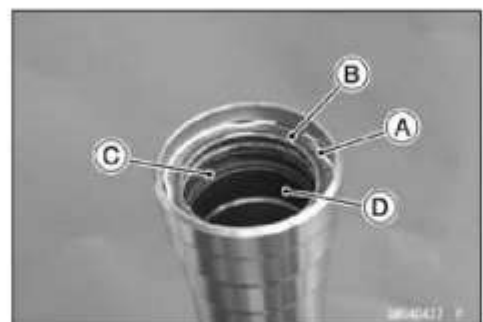


Front Fork Disassembly

- Remove the front fork (see [Front Fork Removal \(Each Fork Leg\)\(13-9\)](#)).
- Drain the fork oil (see [Front Fork Oil Change\(13-12\)](#)).
- Remove the dust seal [A] from the outer tube.
- Separate the outer tube from the inner tube.



- Remove:
 - Retaining Ring [A]
 - Oil Seal [B]
 - Spacer [C]
- ★ If necessary, remove the guide bushing [D] as follows.

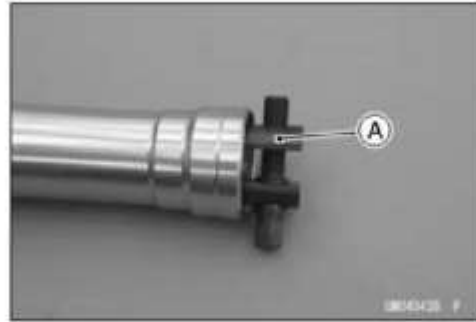


13-20 SUSPENSION

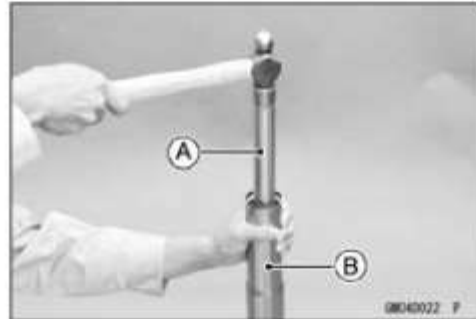
Front Fork

- Install the head pipe outer race remover [A].

**Special Tool - Head Pipe Outer Race Remover ID > 37 mm:
57001-1107**

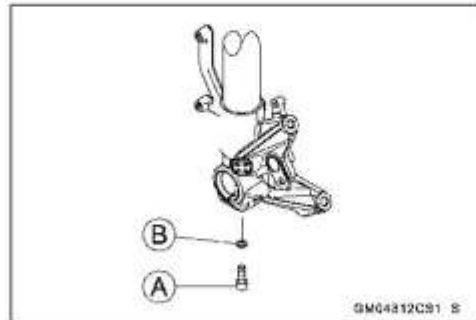


- Prepare a suitable arbor [A].
Length: About 500 mm (19.7 in.)
Diameter: About 30 mm (1.2 in.)
- Insert the arbor.
- Holding the outer tube [B], remove the guide bushing by tapping the arbor.
- Take care not to scratch the inner wall of the outer tube.

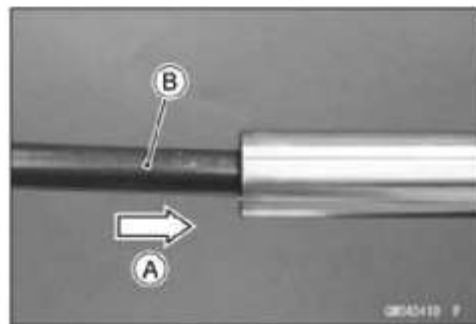


(Left Front Fork)

- Set the fork leg inverted.
- Loosen the bottom Allen bolt [A].
- Remove the Allen bolt and gasket [B].

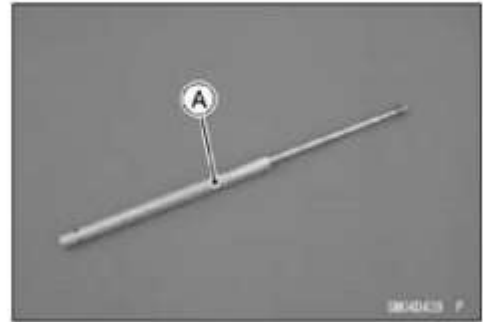


- While push [A] the cylinder unit with a suitable pipe [B] if necessary, remove the bottom Allen bolt.



Front Fork

- Remove the cylinder unit [A] from the inner tube.
- Do not disassemble the cylinder unit.

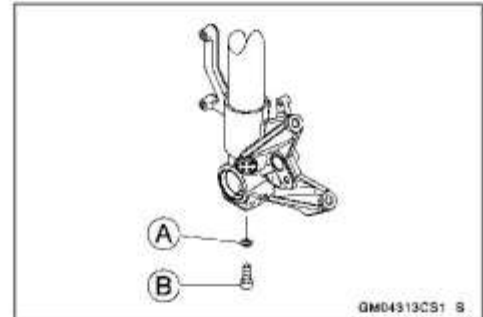


Front Fork Assembly (Left Front Fork)

- Insert the cylinder unit into the inner tube.
- Replace the bottom Allen bolt gasket [A] with a new one.
- Apply a non-permanent locking agent to the threads of the front fork bottom Allen bolt [B].
- Tighten:

Torque - Left Front Fork Bottom Allen Bolt: 20 N·m (2.0 kgf·m, 15 ft·lb)

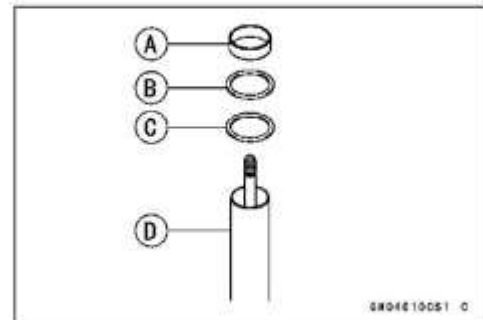
- While push the cylinder unit with a suitable pipe if necessary, tighten the bottom Allen bolt.



- When installing the guide bushing [A], prepare a suitable spacer [B] in the same size as the spacer [C] of front fork.

Spacer – 44 × 54 × 2 mm (1.7 × 2.1 × 0.08 in.);
92026-0165

- Insert the spacers and the guide bushing to the inner tube [D], and insert the inner tube to the outer tube temporarily.



- Install the fork oil seal driver attachment [A], and install the guide bushing [B] with the fork oil seal driver weight until it is bottomed.

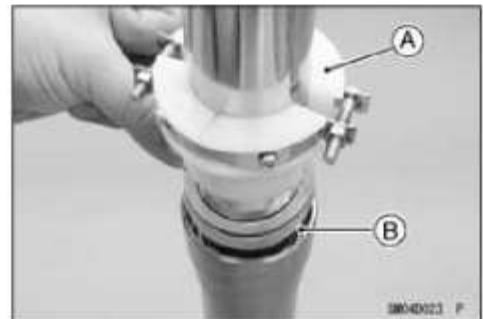
**Special Tools - Fork Oil Seal Driver Weight, $\phi 26 \sim \phi 46$:
57001-1795**

**Fork Oil Seal Driver Attachment, $\phi 36 \sim \phi 46$:
57001-1798**

NOTE

○ When installing the guide bushing, the "fork oil seal driver, $\phi 43$ " (57001-1530) cannot use.

- Pull out the inner tube and remove the special tools and added spacer.



13-22 SUSPENSION

Front Fork

- Replace the oil seal [A] and dust seal with new ones.
 - Apply grease to the oil seal lips.
 - Place an oil coated plastic bag [B] over the end of the inner tube and holes [C] to protect the oil seal and dust seal [D].
 - The inner tube hole has a sharp edge that cut out the sealing lip of the seals as they are pushed down over the inner tube.
 - Install the following parts onto the inner tube.
 - Dust Seal
 - Retaining Ring [E]
 - Oil Seal
 - Spacer [F]
 - Apply grease to the outer circumference of the oil seal.
 - Insert the inner tube to the outer tube.
 - Press the oil seal by using the fork oil seal driver.
- Special Tools - Fork Oil Seal Driver Weight, $\phi 26 \sim \phi 46$ [A]: 57001-1795**
Fork Oil Seal Driver Attachment, $\phi 36 \sim \phi 46$ [B]: 57001-1798
or Fork Oil Seal Driver, $\phi 43$: 57001-1530
- Install the retaining ring and dust seal onto the outer tube.
 - Pour in the specified type of oil (see Front Fork Oil Change(13-12)).

Inner Tube, Outer Tube Inspection

- Visually inspect the inner tube [A].
- ★If there is any damage, replace the inner tube. Since damage to the inner tube damages the oil seal and dust seal, replace the oil seal and dust seal whenever the inner tube is replaced.

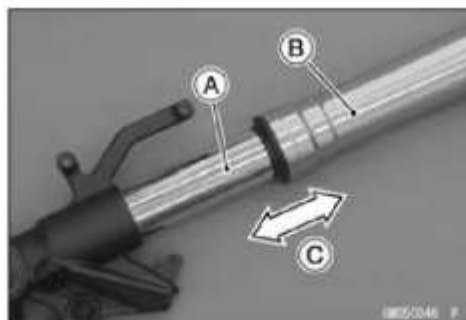
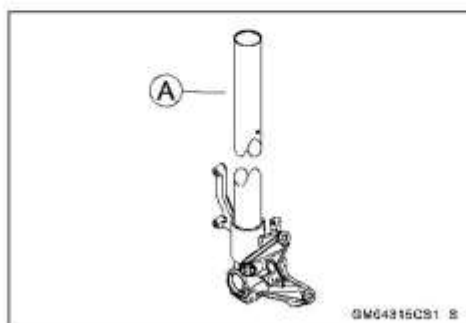
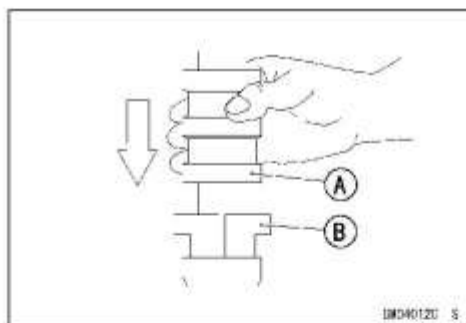
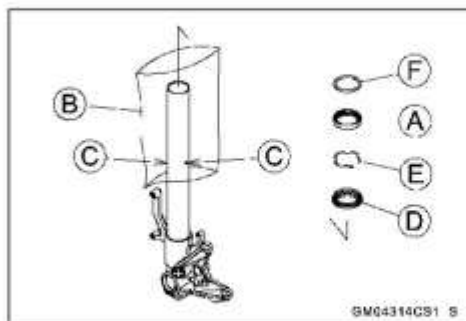
NOTICE

If the inner tube is badly bent or creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.

- Temporarily assemble the inner tube [A] and outer tube [B], and pump [C] them back and forth manually to check for smooth operation.
- ★If you feel binding or catching, the inner and outer tubes must be replaced.

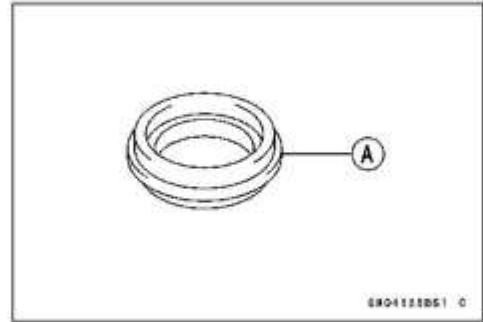
WARNING

A straightened inner or outer fork tube may fall in use, possibly causing an accident resulting in serious injury or death. Replace a badly bent or damaged inner or outer tube and inspect the other tube carefully before reusing it.

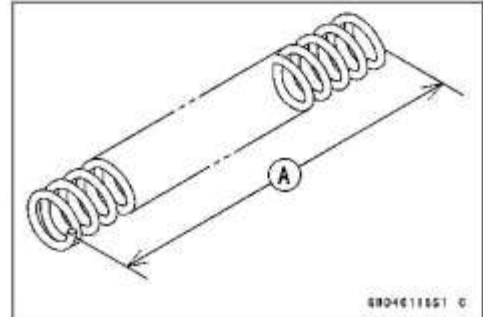


Front Fork**Dust Seal Inspection**

- Inspect the dust seal [A] for any signs of deterioration or damage.
- ★ Replace it if necessary.

**Spring Tension Inspection**

- Since a spring becomes shorter as it weakens, check its free length [A] to determine its condition.
- ★ If the spring of either fork leg is shorter than the service limit, it must be replaced. If the length of a replacement spring and that of the remaining spring vary greatly, the remaining spring should also be replaced in order to keep the fork legs balanced for motorcycle stability.

**Spring Free Length**

Standard: 300.4 mm (11.83 in.)

Service Limit: 295 mm (11.6 in.)

13-24 SUSPENSION

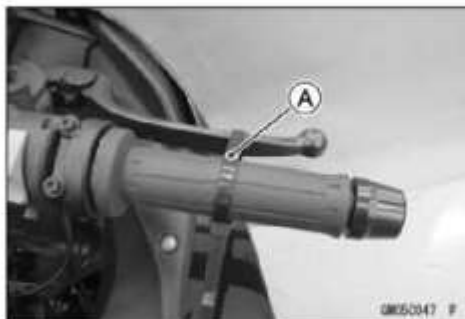
Rear Shock Absorber

Rear Shock Absorber Removal

- Raise the rear wheel off the ground with the center stand.
- Squeeze the brake lever slowly and hold it with a band [A].

 **WARNING**

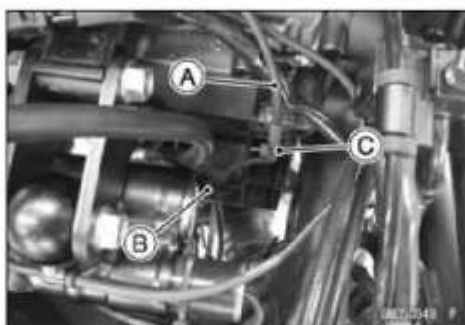
Be sure to hold the front brake when removing the shock absorber, or the motorcycle may fall over. It could cause an accident and injury.



- Remove:
 - Fuel Tank (see Fuel Tank Removal(3-75))
 - Radiator (see Radiator and Radiator Fan Removal(4-15))
 - Exhaust Pipe (see Exhaust Pipe Removal(5-38))
 - Bolt [A] and Stopper
 - Footpeg Bracket Bolts [B]
- Move the footpeg bracket forward.

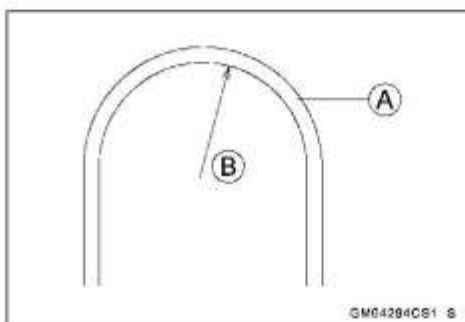


- Remove the rear shock absorber stroke sensor lead [A] from the clamp [B] and band [C].

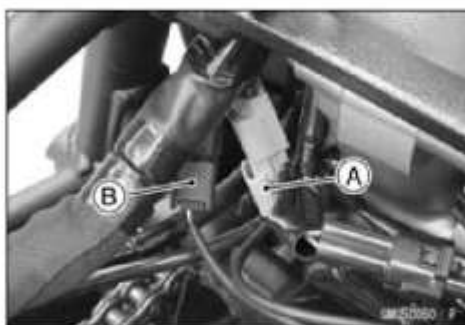


NOTE

○ The bending radius of the stroke sensor and solenoid coil leads [A] shall not be smaller than 10 mm (0.39 in.) [B].

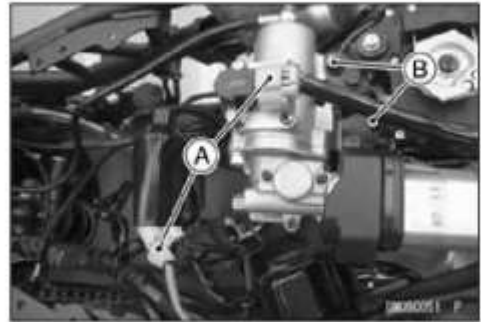


- Remove:
 - Rear Shock Absorber Stroke Sensor Lead Connector [A]
 - Rear Shock Absorber Solenoid Coil Lead Connector [B]



Rear Shock Absorber

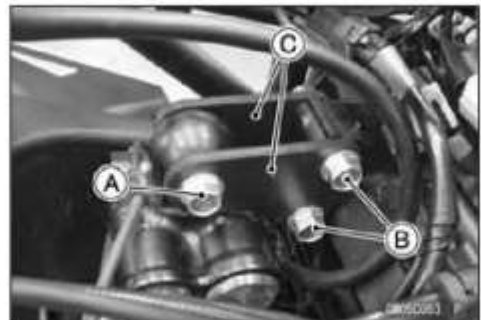
- Remove:
Rear Shock Absorber Spring Preload Actuator Lead Connectors [A]
Rear Shock Absorber Spring Preload Actuator Bolts [B]



- Remove:
Lower Rear Shock Absorber Bolt [A] and Nut
○When removing the lower rear shock absorber bolt, lift up the rear wheel a little.



- Remove:
Upper Rear Shock Absorber Bolt [A] and Nut
Rear Shock Absorber Bracket Bolts [B], Nuts and Brackets [C]
- Remove the rear shock absorber with rear shock absorber spring preload actuator upward.



NOTICE

Do not loosen the bolts [A]. The shock absorber could be damaged.



13-26 SUSPENSION

Rear Shock Absorber

Rear Shock Absorber Installation

- Installation is the reverse of removal.
- Replace the rear shock absorber and bracket nuts with new ones.
- Install:
 - Rear Shock Absorber with Rear Shock Absorber Spring Preload Actuator
 - Lower Rear Shock Absorber Bolt and Nut (temporarily)
 - Rear Shock Absorber Bracket, Bolts and Nuts
 - Upper Rear Shock Absorber Bolt and Nut
- Tighten:
 - Torque - Rear Shock Absorber Bracket Nuts: 35 N·m (3.6 kgf·m, 26 ft·lb)**
 - Rear Shock Absorber Nuts: 35 N·m (3.6 kgf·m, 26 ft·lb)**
- Install the removed parts.
- Run the rear shock absorber leads correctly (see Cable, Wire, and Hose Routing section (18-2)).

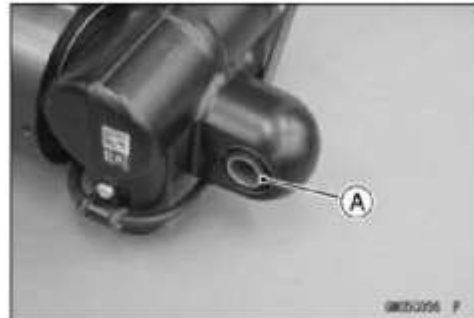
Rear Shock Absorber Inspection

- Remove the rear shock absorber (see Rear Shock Absorber Removal(13-24)).
- Visually inspect the following items.
 - Oil Leakage
 - Crack or Dent
- ★ If there is any damage to the rear shock absorber, replace it.
- Visually inspect the rubber bushing [A].
- ★ If it show any signs of damage, replace it.

Rear Shock Absorber Scrapping

WARNING

Since the rear shock absorber contains nitrogen gas, do not incinerate the rear shock absorber without first releasing the gas or it may explode. Before a rear shock absorber is scrapped, drill a hole at the point [A] shown to release the nitrogen gas completely. Wear safety glasses when drilling the hole, as the gas may blow out bits of drilled metal when the hole opens.

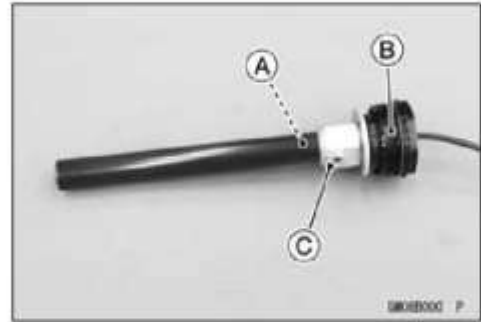


Kawasaki Electronic Control Suspension (KECS)

Front Fork Stroke Sensor Replacement**NOTICE**

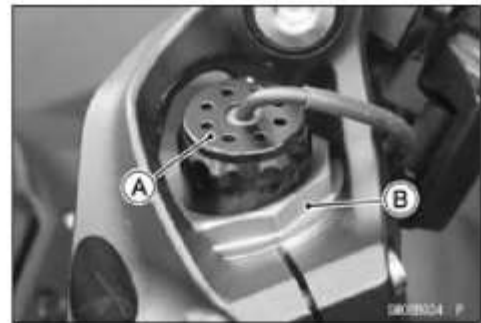
The front fork stroke sensor [A] unites with the front fork top plug [B].
Do not remove the nut [C] and front fork stroke sensor. The top plug assembly could be damaged.

- Replace the front fork stroke sensor as an assembly of the top plug assembly.
- Refer to the Front Fork Oil Change for the replacement of the front fork stroke sensor (right top plug assembly) (see Front Fork Oil Change(13-12)).

**Front Fork Solenoid Coil Replacement****NOTICE**

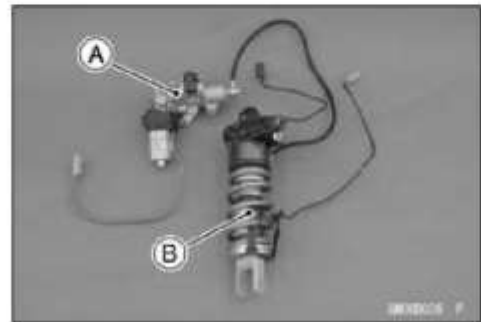
The front fork solenoid coil [A] unites with the front fork top plug [B].
Do not remove the front fork solenoid coil. The top plug assembly could be damaged.

- Replace the front fork solenoid coil as an assembly of the top plug assembly.
- Refer to the Front Fork Oil Change for the replacement of the front fork solenoid coil (left top plug assembly) (see Front Fork Oil Change(13-12)).

**Rear Shock Absorber Spring Preload Actuator/Position Sensor Replacement****NOTICE**

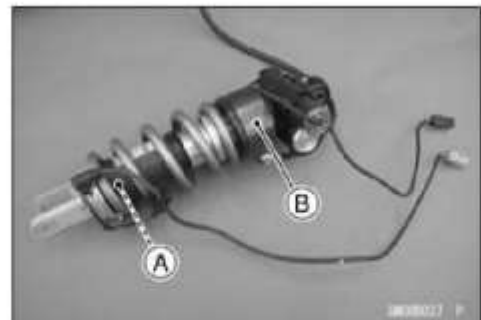
The rear shock absorber spring preload actuator/position sensor [A] unites with the rear shock absorber [B].
Do not remove the rear shock absorber spring preload actuator/position sensor. The rear shock absorber assembly could be damaged.

- Replace the rear shock absorber spring preload actuator/position sensor as an assembly of the rear shock absorber assembly.

**Rear Shock Absorber Stroke Sensor Replacement****NOTICE**

The rear shock absorber stroke sensor [A] unites with the rear shock absorber [B].
Do not remove the rear shock absorber stroke sensor. The rear shock absorber assembly could be damaged.

- Replace the rear shock absorber stroke sensor as an assembly of the rear shock absorber assembly.

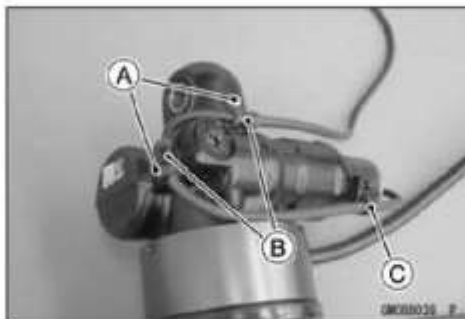


13-28 SUSPENSION

Kawasaki Electronic Control Suspension (KECS)

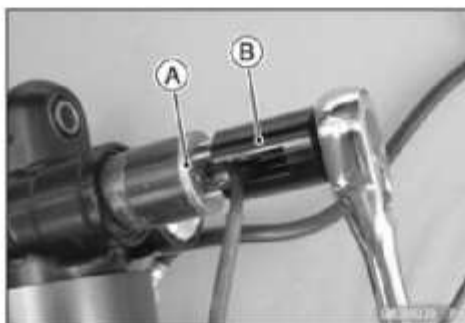
Rear Shock Absorber Solenoid Coil Removal

- Remove rear shock absorber from the frame (see [Rear Shock Absorber Removal\(13-24\)](#)).
- Remove:
 - Solenoid Coil Lead Clamp Screws [A] and Clamps [B]
 - Band [C]



- Hold the rear shock absorber with a vise.
- Remove the rear shock absorber solenoid coil [A] using the solenoid coil attachment [B].

Special Tool - Solenoid Coil Attachment: 57001-1877



Rear Shock Absorber Solenoid Coil Installation

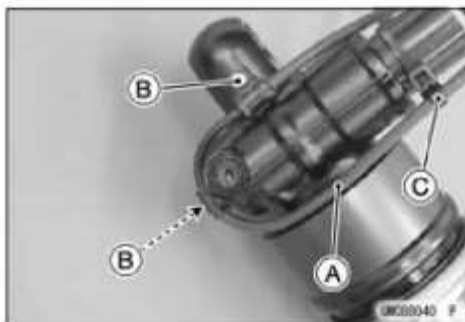
- Clean off any oil on the inside [A] of the rear shock absorber solenoid coil [B] and dry it.
- Install the rear shock absorber and tighten it using the solenoid coil attachment.

Special Tool - Solenoid Coil Attachment: 57001-1877

Torque - Rear Shock Absorber Solenoid Coil: 15 N·m (1.5 kgf·m, 11 ft·lb)

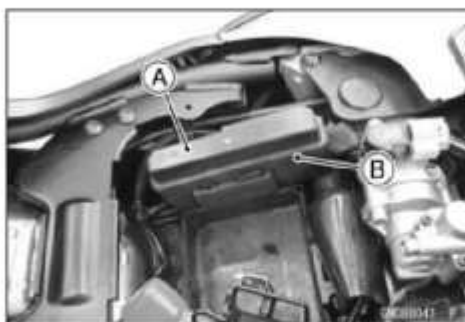


- Install the rear shock absorber solenoid coil lead [A].
- Tighten:
 - Torque - Solenoid Coil Lead Clamp Screws [B]: 2.0 N·m (0.20 kgf·m, 18 in·lb)
- Fix the solenoid coil lead with a band [C].



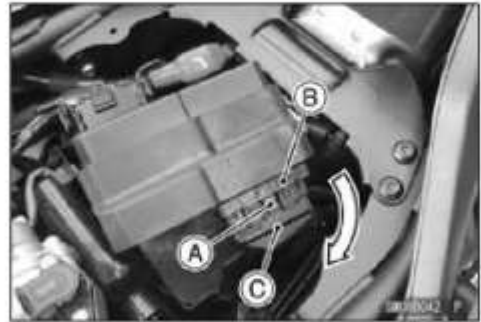
KECS ECU Removal

- Remove:
 - Battery (see [Battery Removal\(16-28\)](#))
- Remove the KECS ECU [A] with rubber damper [B] from the rear fender.



Kawasaki Electronic Control Suspension (KECS)

- Push the stopper [A] and open the lever [B].
- Disconnect the harness connector [C] from the KECS ECU lead connector.



KECS ECU Installation

- Installation is the reverse of removal.
- Install the removed parts.

13-30 SUSPENSION

Swingarm

Swingarm Removal

- Loosen:
 - Swingarm Mounting Plate Nut (Upper) [A]
 - Swingarm Mounting Plate Bolt (Lower) [B]
 - Swingarm Pivot Shaft Nut [C]
- Remove:
 - Engine Sprocket (see [Engine Sprocket Removal\(11-10\)](#))
 - Rocker Arm (see [Rocker Arm Removal\(13-35\)](#))
 - Mud Guard (see [Mud Guard Removal\(15-35\)](#))
 - Rear Axle and Bearing Housing (see [Bearing Housing Removal\(11-16\)](#))
- Remove the bolts [A] to free the brake hose and rear wheel rotation sensor lead.
- Remove:
 - Swingarm Pivot Shaft, Nut and Washers
 - Swingarm [B]

NOTE

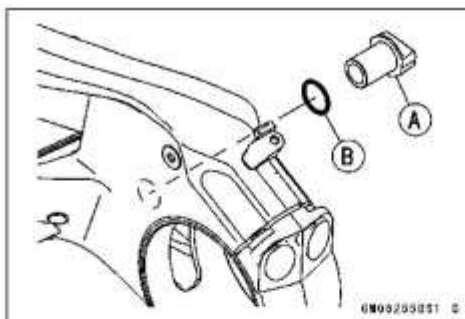
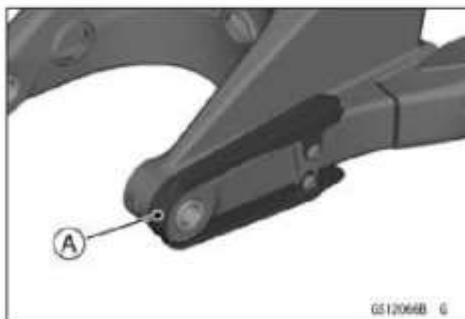
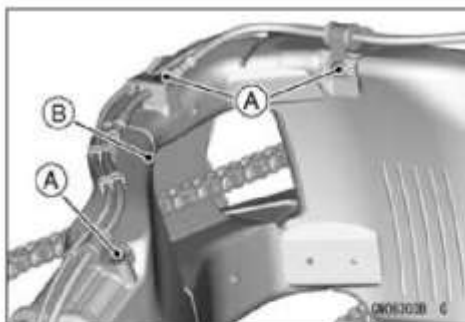
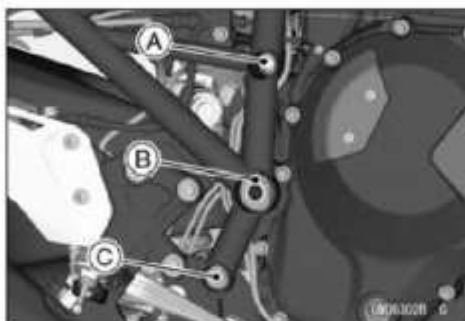
○ Since the swingarm bearings are packed with grease, cleaning is not required. The bearing that was cleaned should be replacing.

Swingarm Installation

NOTE

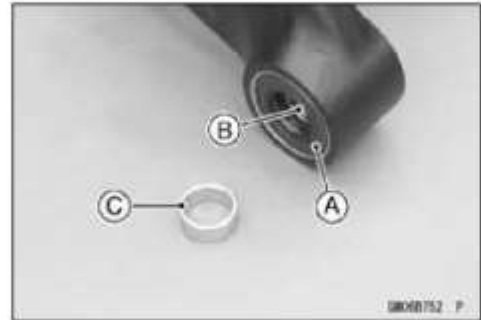
○ Since the swingarm bearings are packed with grease, cleaning is not required. The bearing that was cleaned should be replacing.

- Visually inspect the chain guide [A].
- ★ Replace the chain guide if it shows any signs of abnormal wear or damage.
- Visually inspect the caliper holder guide [A].
- ★ Replace the caliper holder guide and O-ring [B] if the guide shows any signs of abnormal wear or damage.
- Apply grease to the O-ring.
- Insert the caliper holder guide until it clicks.



Swingarm

- Apply grease to the lips of the grease seals [A].
- Be sure to install the grease seals and sleeve [B] to the swingarm.
- Fit the collar [C] on the grease seal of the left side.

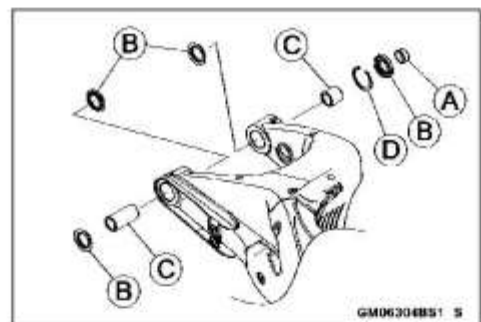


- Replace the swingarm mounting plate nut (upper) with a new one.
- Apply a non-permanent locking agent to the swingarm mounting plate bolt (lower).
- Install:
 - Swingarm
 - Swingarm Pivot Shaft, Washers and Nut
 - Swingarm Mounting Plate Bolt (Upper) and Nut
 - Swingarm Mounting Plate Bolt (Lower)
- Insert the swingarm pivot shaft from the left side.
- Tighten:
 - Torque - Swingarm Pivot Shaft Nut: 110 N·m (11.2 kgf·m, 81.1 ft·lb)**
 - Swingarm Mounting Plate Nut (Upper): 45 N·m (4.6 kgf·m, 33 ft·lb)**
 - Swingarm Mounting Plate Bolt (Lower): 45 N·m (4.6 kgf·m, 33 ft·lb)**
- Move the swingarm up and down to check for abnormal friction.
- Retighten the center stand bolts and nuts ([see Center Stand Installation\(15-40\)](#)).
- Install the removed parts.

Swingarm Bearing Removal

- Remove:
 - Swingarm ([see Swingarm Removal\(13-30\)](#))
 - Collar [A]
 - Grease Seals [B]
 - Sleeve [C]
 - Circlip [D]

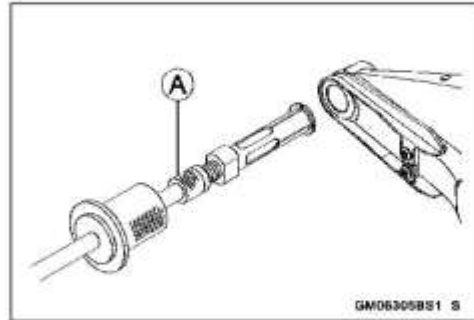
Special Tool - Inside Circlip Pliers: 57001-143



13-32 SUSPENSION

Swingarm

- Remove the ball bearing and needle bearings.
Special Tool - Oil Seal & Bearing Remover [A]: 57001-1058



Swingarm Bearing Installation

- Replace the needle bearings, ball bearing, grease seals and circlip with new ones.

NOTE

Install the needle and ball bearings so that their marked sides face outward.

- On the right side [A], press in the ball bearing [B] until it is bottomed.

Special Tool - Bearing Driver Set: 57001-1129

Left Side [C]

- On both sides, press in the needle bearings [D] as shown.
5.6 ±0.4 mm (0.22 ±0.02 in.) [E]

Special Tools - Needle Bearing Driver, φ28: 57001-1610
Needle Bearing Driver, φ20 & Spacer, φ28: 57001-1678

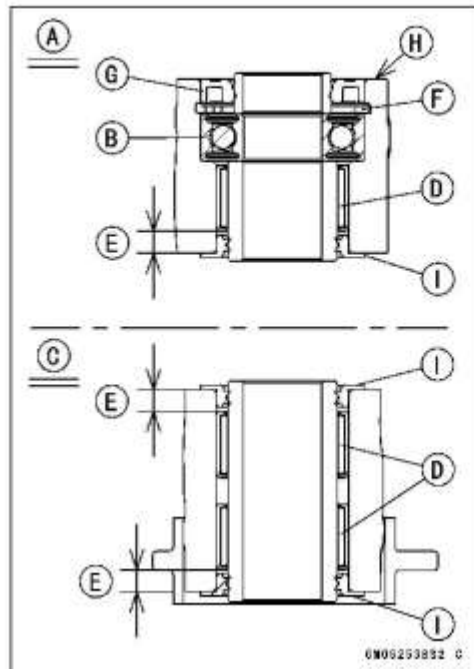
- On the right side, install the circlip [F].

Special Tool - Inside Circlip Pliers: 57001-143

- On the right side, press in the grease seal [G] so that its surface is flush with the swingarm [H].
- On both sides, press in the grease seals [I] until they are bottomed.

Special Tool - Bearing Driver Set: 57001-1129

- Apply grease to the grease seal lips.



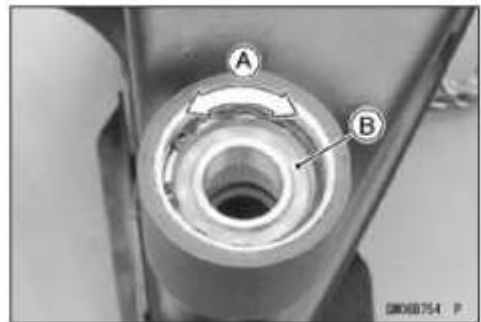
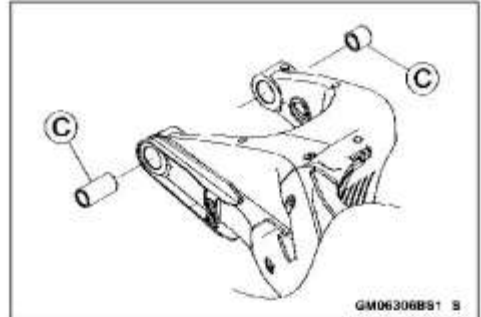
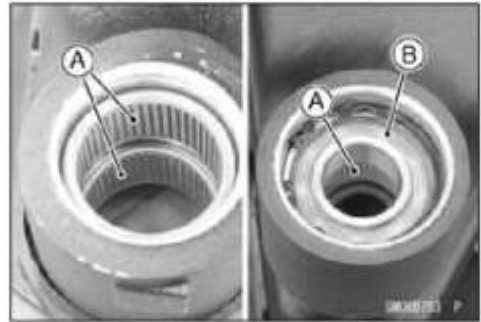
Swingarm

Swingarm Bearing, Sleeve Inspection

NOTICE

Do not remove the bearings for inspection. Removal may damage them.

- Inspect the needle bearings [A] and ball bearing [B] that are installed in the swingarm.
 - The rollers and balls in a bearing normally wear very little, and wear is difficult to measure. Instead of measuring, visually inspect the bearing for abrasion, discoloration, or other damage.
 - ★ If the needle bearing and sleeve [C] show any signs of abnormal wear, discoloration, or damage, replace them as a set.
-
- Turn the bearing in the swingarm back and forth [A] while checking for plays, roughness, or binding.
 - ★ If bearing play, roughness, or binding is found, replace the bearing.
 - Examine the bearing seal [B] for tears or leakage.
 - ★ If the seal is torn or is leaking, replace the bearing.



Swingarm Bearing Lubrication

NOTE

○ Since the bearings are packed with grease and sealed, lubrication is not required.

Chain Guide Inspection

- Refer to the Chain Guide Wear Inspection ([see Chain Guide Wear Inspection\(2-46\)](#)).

13-34 SUSPENSION

Tie-Rod, Rocker Arm

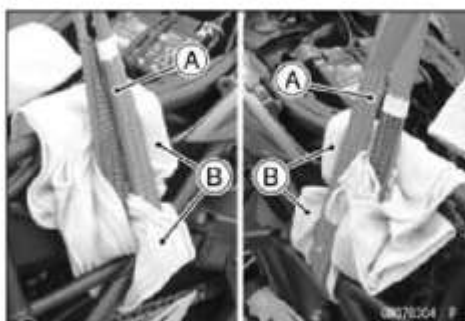
Tie-Rod Removal

- Support the front of the motorcycle with the stand.

⚠ WARNING

When raising the rear wheel off the ground and removing part(s) from the motorcycle, be sure to support the front of the motorcycle, or the motorcycle may fall over. It could cause an accident and injury.

- Remove:
Exhaust Pipe (see Exhaust Pipe Removal(5-38))
- Loosen:
Tie-Rod Bolts and Nuts [A]
- Remove:
Fuel Tank Covers (see Fuel Tank Cover Removal(15-26))
- Raise the rear wheel off the ground with webbing slings [A].
- Hang the webbing slings to the frame as shown.
- Protect the vehicle using suitable clothes [B].
- Remove:
Tie-Rod Bolts and Nuts
Tie-Rods



Tie-Rod Installation

- Lubricate the tie-rod bearings if necessary (see Rear Suspension Lubrication(2-61)).
- Replace the tie-rod nuts with new ones.
- Install the tie-rod, bolts and nuts temporarily.
- When installing the tie-rod, position it so that the arrow mark [A] is outside and points upward.
- Insert the bolts from the right side.
- Remove the webbing slings.

NOTE

○ When tightening the tie-rod nuts, lower the rear wheel to the ground.

- Tighten:
Torque - Tie-Rod Nuts: 35 N·m (3.6 kgf·m, 26 ft·lb)
- After tightening, check that the bolt ends protrude from the nuts.
- Install the removed parts.



Tie-Rod, Rocker Arm

Rocker Arm Removal

- Support the front of the motorcycle with the stand.

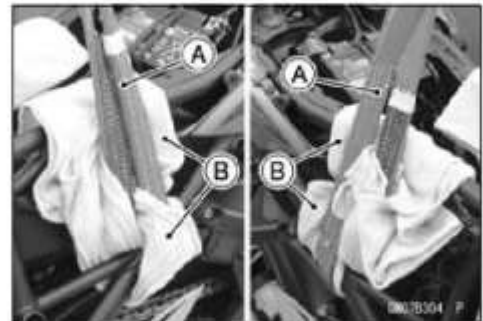
WARNING

When raising the rear wheel off the ground and removing part(s) from the motorcycle, be sure to support the front of the motorcycle, or the motorcycle may fall over. It could cause an accident and injury.

- Remove:
 - Exhaust Pipe (see Exhaust Pipe Removal(5-38))
- Loosen:
 - Lower Rear Shock Absorber Bolt and Nut [A]
 - Rear Tie-Rod Bolt and Nut [B]
 - Rocker Arm Bolt and Nut [C]



- Remove:
 - Fuel Tank Covers (see Fuel Tank Cover Removal(15-26))
- Raise the rear wheel off the ground with webbing slings [A].
- Hang the webbing slings to the frame as shown.
- Protect the vehicle using suitable clothes [B].
- Remove:
 - Lower Rear Shock Absorber Bolt and Nut
 - Rear Tie-Rod Bolt and Nut
 - Rocker Arm Bolt and Nut
 - Rocker Arm



NOTE

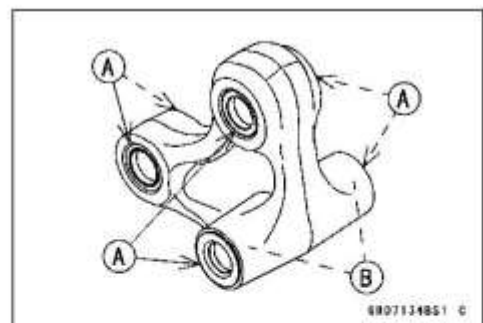
- Since the rocker arm bearings are packed with grease, cleaning is not required. The bearing that was cleaned should be replacing.

Rocker Arm Installation

NOTE

- Since the rocker arm bearings are packed with grease, cleaning is not required. The bearing that was cleaned should be replacing.

- Apply grease to the grease seal lips [A].
- Apply grease to the needle bearings [B] for the tie-rod bolt.
- Replace the following nuts with new ones.
 - Rocker Arm Nut
 - Rear Tie-Rod Nut
 - Lower Rear Shock Absorber Nut



13-36 SUSPENSION

Tie-Rod, Rocker Arm

- Install the rocker arm, bolts and nuts temporarily.
- Insert the bolts from the right side.
- Remove the webbing slings.

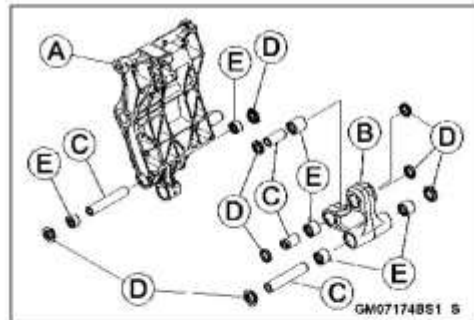
NOTE

○ When tightening the nuts, lower the rear wheel to the ground.

- Tighten:
 - Torque - Rocker Arm Nut: 35 N·m (3.6 kgf·m, 26 ft·lb)
 - Tie-Rod Nut: 35 N·m (3.6 kgf·m, 26 ft·lb)
 - Lower Rear Shock Absorber Nut: 35 N·m (3.6 kgf·m, 26 ft·lb)
- After tightening, check that the bolt ends protrude from the nuts.
- Install the removed parts.

Tie-Rod and Rocker Arm Bearing Removal

- Remove:
 - Swingarm Mounting Plate [A] (see Engine Removal(8-4))
 - Rocker Arm [B] (see Rocker Arm Removal(13-35))
 - Sleeves [C]
 - Grease Seals [D]
- Remove the needle bearings [E] using a suitable tool.



Tie-Rod and Rocker Arm Bearing Installation

- Replace the needle bearing and grease seals with new ones.
- Install the needle bearings.
- The installing positions are as shown.
- Install the needle bearings for the rear shock absorber portion and swingarm portion from the marked side of the rocker arm.

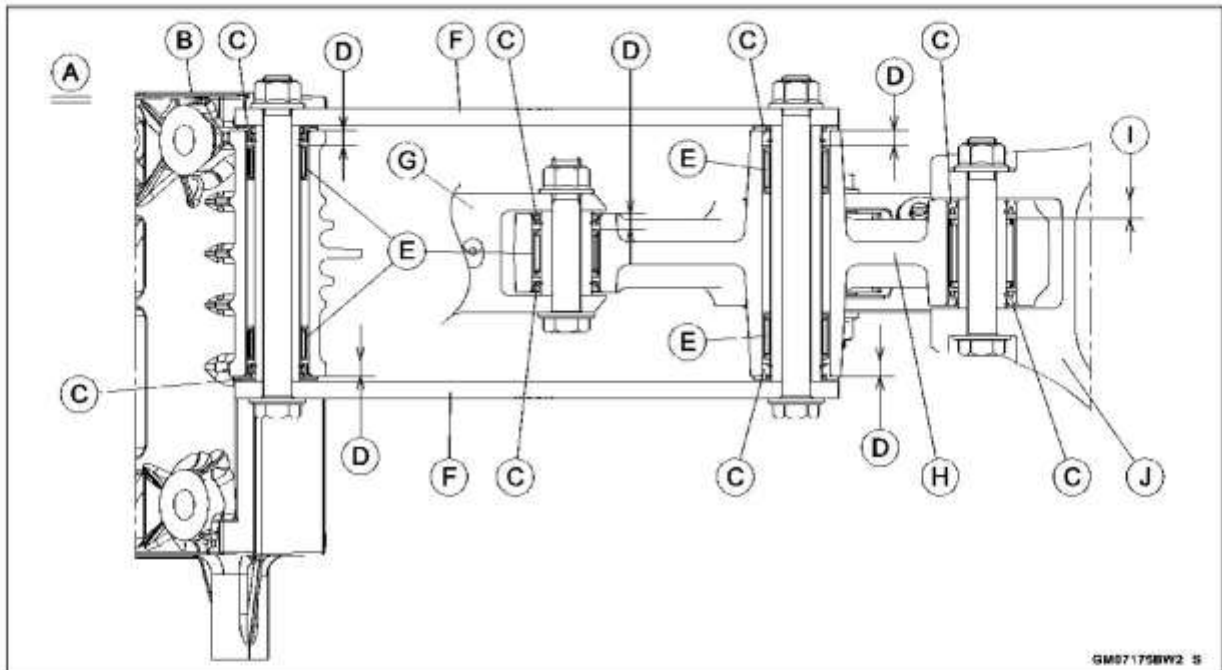
Special Tool - Bearing Driver Set: 57001-1129

NOTE

○ Install the needle bearings so that the marked side faces outward.

- Apply grease to the needle bearing of the swingarm mounting plate.
- Apply plenty of grease to the lips of the grease seals.
- Install the grease seals.

Tie-Rod, Rocker Arm



Viewed from Bottom [A]
 Swingarm Mounting Bracket [B]
 Grease Seals [C]
 5.5 ± 0.4 mm (0.22 ± 0.02 in.) [D]
 Needle Bearings [E]

Tie-Rods [F]
 Rear Shock Absorber [G]
 Rocker Arm [H]
 6.0 ± 0.4 mm (0.24 ± 0.02 in.) [I]
 Swingarm [J]

Rocker Arm/Tie-Rod Bearing, Sleeve Inspection**NOTICE**

Do not remove the bearings for inspection. Removal may damage them.

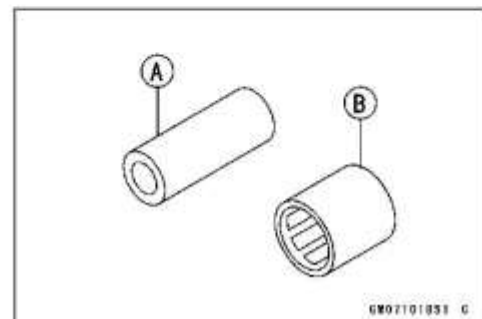
- Visually inspect the rocker arm, tie-rod sleeves [A] and needle bearings [B].
- The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing for abrasion, color change, or other damage.
- ★ If there is any doubt as to the condition of any of the needle bearings or sleeve, replace the sleeve and needle bearings as a set.

Rocker Arm/Tie-Rod Bearing Lubrication

- Refer to the Rear Suspension Lubrication (see Rear Suspension Lubrication(2-61)).

NOTE

○ Since the bearings other than the bearings on the swingarm mounting plate are packed with grease, lubrication is not required.



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