Final Drive

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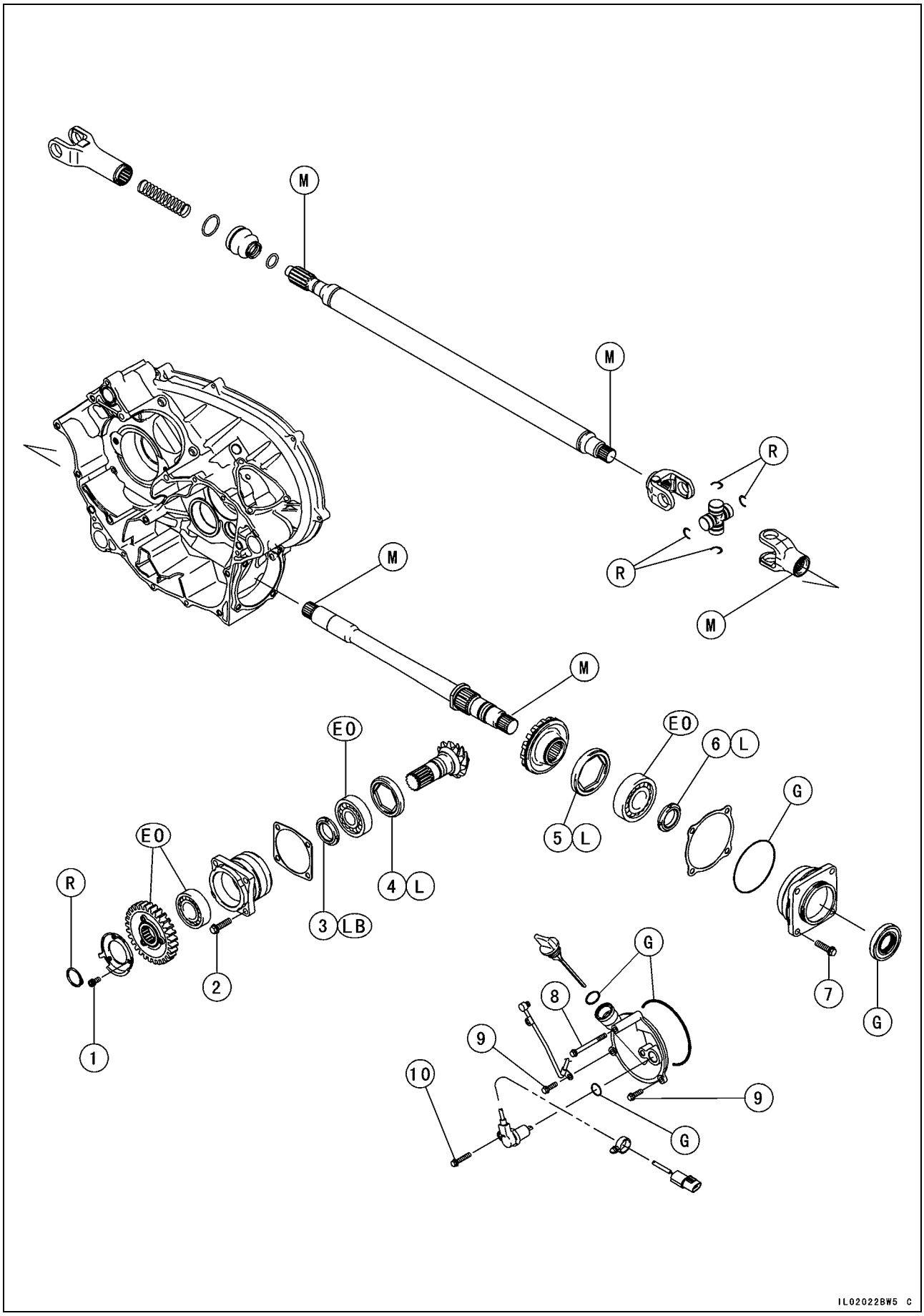
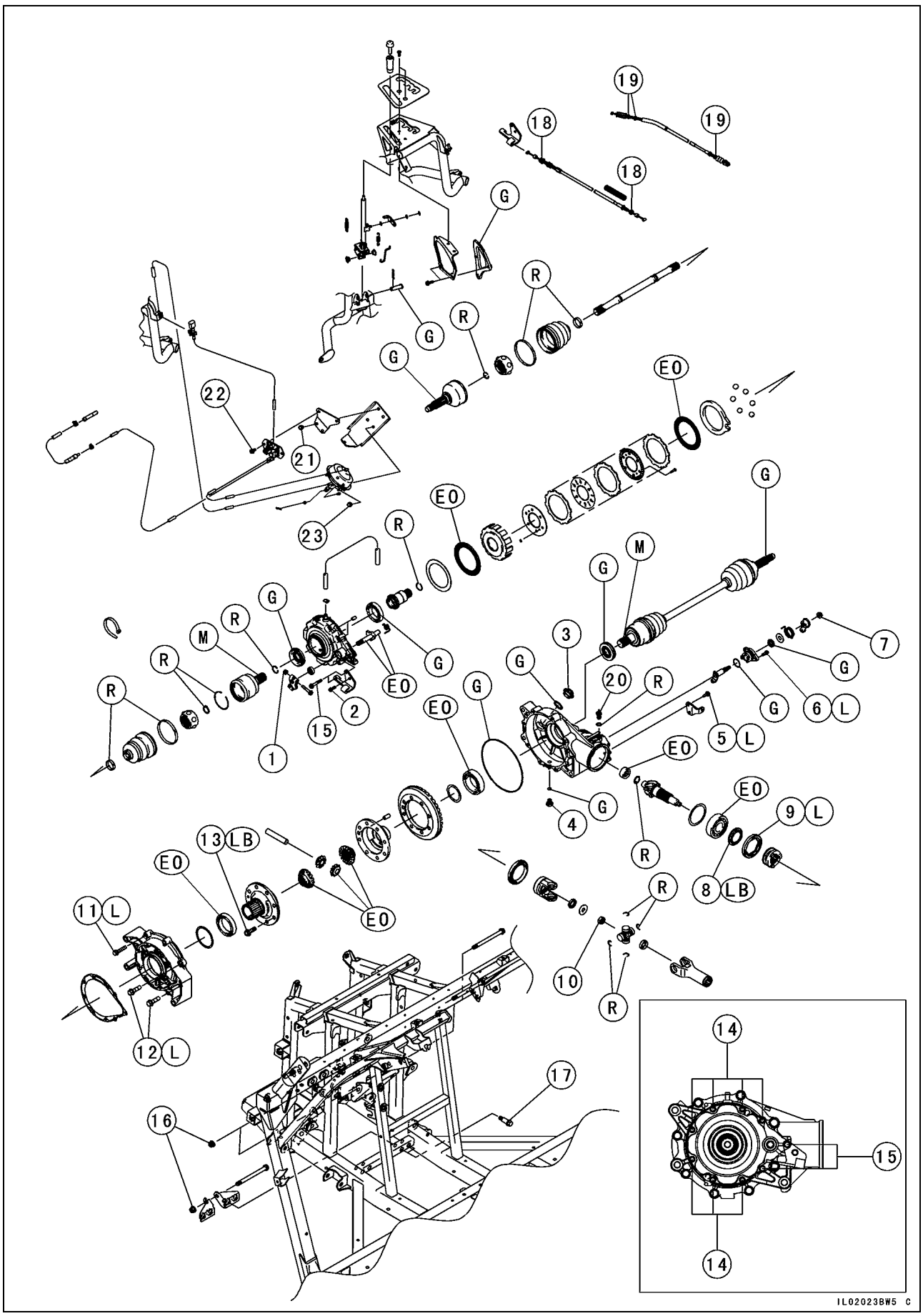


Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Rotor Mounting Bolts	12	1.2	104 in·lb	
2	Output Driven Bevel Gear Housing Bolts	26	2.7	20	
3	Bevel Gear Holder Nut	200	20	148	LB
4	Bearing Holder (M64)	120	12	87	L
5	Bearing Holder (M75)	250	25	184	L
6	Output Shaft Holder Nut	200	20	148	L
7	Output Drive Bevel Gear Housing Bolts	26	2.7	20	
8	Output Drive Bevel Gear Cover Bolt L = 65 mm (2.6 in.)	8.8	0.90	78 in·lb	
9	Output Drive Bevel Gear Cover Bolt L = 20 mm (0.8 in.)	8.8	0.90	78 in·lb	
10	Forward/Reverse Detecting Sensor Mounting Bolt	14.9	1.5	11	

EO: Apply engine oil.
G: Apply grease.
L: Apply a non-permanent locking agent.
LB: Apply a non-permanent locking agent (Three Bond TB2471,Blue).
M: Apply molybdenum disulfide grease.
R: Replacement Parts

Exploded View

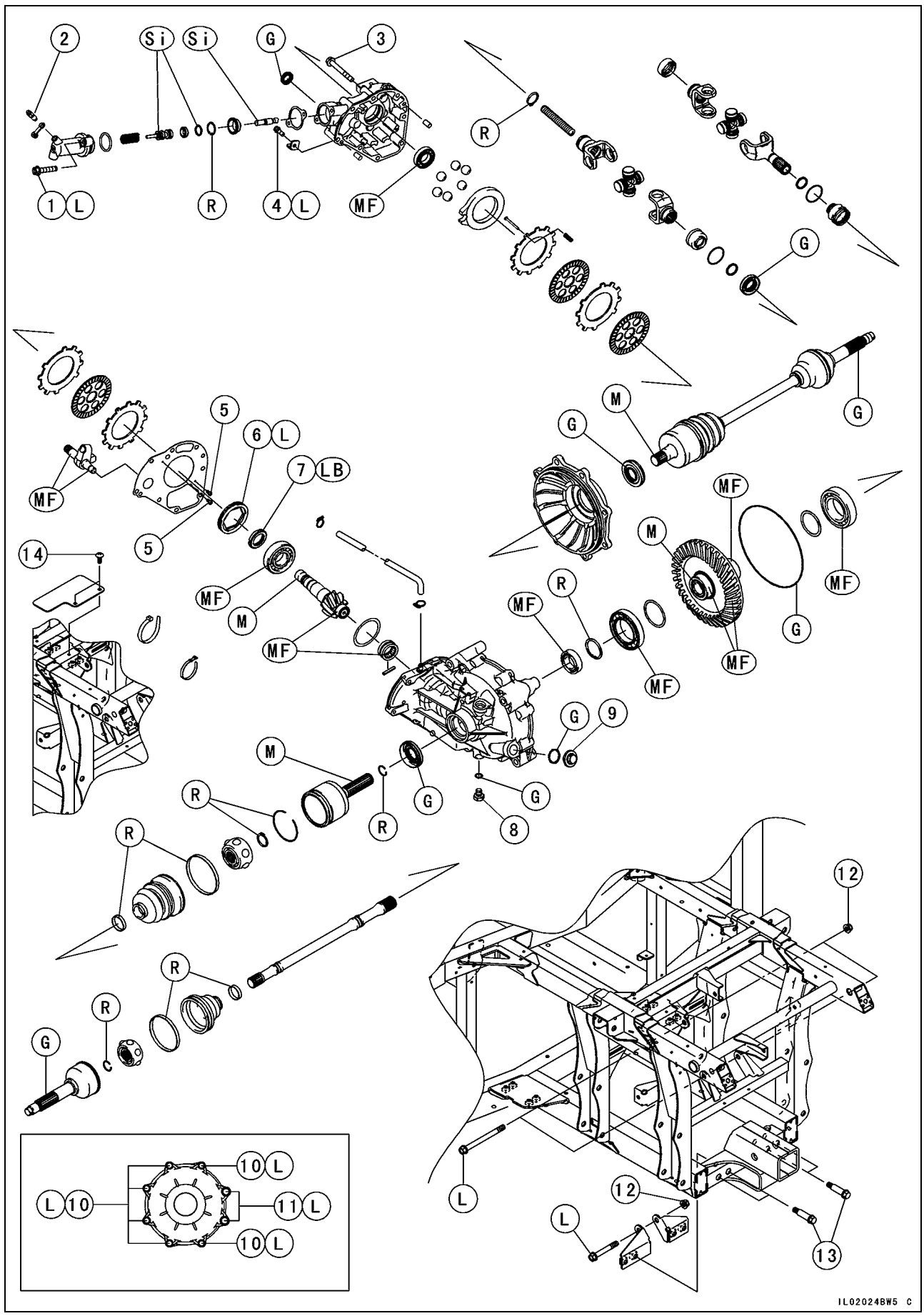


Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Differential Control Shift Shaft Lever Nut	8.8	0.90	78 in·lb	
2	Differential Shift Cable Holder Bolt	8.8	0.90	78 in·lb	
3	Front Final Gear Case Oil Filler Cap	29	3.0	22	
4	Front Final Gear Case Oil Drain Plug	15	1.5	11	
5	2WD/4WD Shift Cable Holder Bolts	8.8	0.90	78 in·lb	L
6	2WD/4WD Shift Shaft Cover Bolts	8.8	0.90	78 in·lb	L
7	2WD/4WD Shift Shaft Lever Nut	20	2.0	14	
8	Pinion Gear Bearing Holder Nut	200	20	148	LB
9	Pinion Gear Bearing Holder	250	25	184	L
10	Coupling Nut	35	3.6	26	
11	Front Final Gear Case Center Cover Bolts (M8)	24	2.4	18	L
12	Front Final Gear Case Center Cover Bolts (M10)	49	5.0	36	L
13	Ring Gear Bolts	57	5.8	42	LB
14	Front Final Gear Case Left Cover Bolts (M6, 35 mm)	8.8	0.90	78 in·lb	
15	Front Final Gear Case Left Cover Bolts (M6, 40 mm)	8.8	0.90	78 in·lb	
16	Front Final Gear Case Mounting Nuts	91	9.3	67	
17	Front Final Gear Case Bracket Bolts	91	9.3	67	
18	Differential Shift Cable Locknuts	10.8	1.1	95 in·lb	
19	2WD/4WD Shift Cable Locknuts	4.4	0.45	39 in·lb	
20	4WD Position Switch	15	1.5	11	
21	Vacuum Actuator Bracket Bolts	8.8	0.90	78 in·lb	
22	Solenoid Valve Bracket Bolts	8.8	0.90	78 in·lb	
23	Vacuum Actuator Mounting Bolts	8.8	0.90	78 in·lb	

EO: Apply engine oil.
G: Apply grease.
L: Apply a non-permanent locking agent.
LB: Apply a non-permanent locking agent (Three Bond TB2471,Blue).
M: Apply molybdenum disulfide grease.
R: Replacement Parts

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Rear Master Cylinder Mounting Bolts	27	2.8	20	L
2	Rear Master Cylinder Bleed Valve	5.4	0.55	48 in·lb	
3	Rear Final Gear Case Front Cover Bolts	24	2.4	18	
4	Spring Bracket Bolt	8.8	0.90	78 in·lb	L
5	Rear Final Gear Case Gasket Screws	1.3	0.13	12 in·lb	
6	Pinion Gear Bearing Holder	450	46	332	L
7	Pinion Gear Bearing Holder Nut	200	20	148	LB
8	Rear Final Gear Case Oil Drain Plug	15	1.5	11	
9	Rear Final Gear Case Oil Filler Cap	29	3.0	22	
10	Rear Final Gear Case Right Cover Bolts (M10)	49	5.0	36	L
11	Rear Final Gear Case Right Cover Bolts (M12)	94	9.6	69	L
12	Rear Final Gear Case Mounting Nuts	91	9.3	67	
13	Rear Final Gear Case Bracket Bolts	91	9.3	67	
14	Heat Guard Bolts	8.8	0.90	78 in·lb	

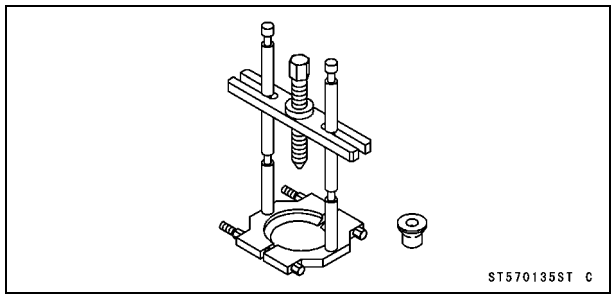
G: Apply grease.
L: Apply a non-permanent locking agent.
LB: Apply a non-permanent locking agent (Three Bond TB2471, Blue).
M: Apply molybdenum disulfide grease.
MF: Apply gear oil (MOBIL FLUID 424 or equivalent oil).
R: Replacement Parts
Si: Apply silicone grease.

Specifications

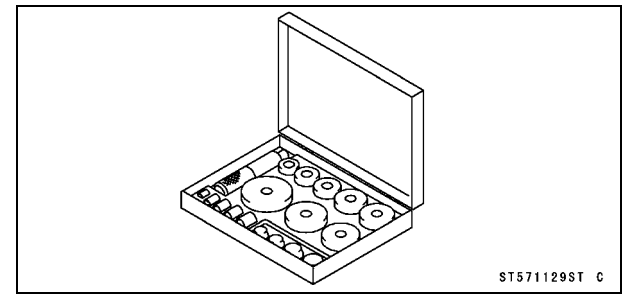
Item	Standard	Service Limit
Output Bevel Gear Case		
Output Bevel Gear Backlash	0.05 ~ 0.11 mm (0.002 ~ 0.004 in.) (at output drive shaft spline)	– – –
Front Final Gear Case		
Gear Case Oil (same engine oil):		
Type	API SF or SG	– – –
	API SH, SJ or SL with JASO MA	– – –
Viscosity	SAE 10W-40	– – –
Oil Level	Filler opening bottom	– – –
Capacity	0.9 L (0.95 US qt)	– – –
Coupling Bushing Inside Diameter	20.000 ~ 20.021 mm (0.7874 ~ 0.7882 in.)	20.051 mm (0.7894 in.)
LSD Clutch Torque:		
When differential shift lever is locked position (5 notches).	300 N·m (31 kgf·m, 221 ft·lb) or more	– – –
Bevel Gear Backlash	0.08 ~ 0.16 mm (0.003 ~ 0.006 in.) (at pinion gear spline)	– – –
Rear Final Gear Case		
Gear Case Oil:		
Type	MOBIL FLUID 424, CITGO TRANSGARD TRACTOR HYDRAULIC FLUID or EXXON HYDRAUL 560	– – –
Oil Level	Filler opening bottom	– – –
Capacity	1 L (1.06 US qt)	– – –
Rear Final Bevel Gear Backlash	0.05 ~ 0.11 mm (0.002 ~ 0.004 in.) (at pinion gear spline)	– – –

Special Tools

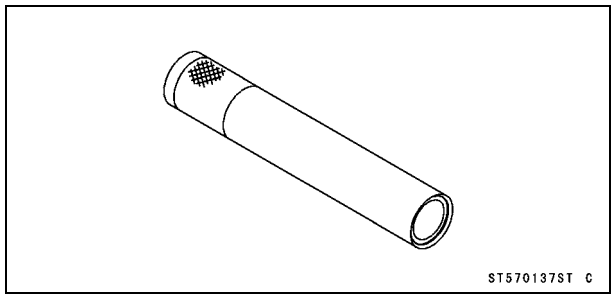
Bearing Puller:
57001-135



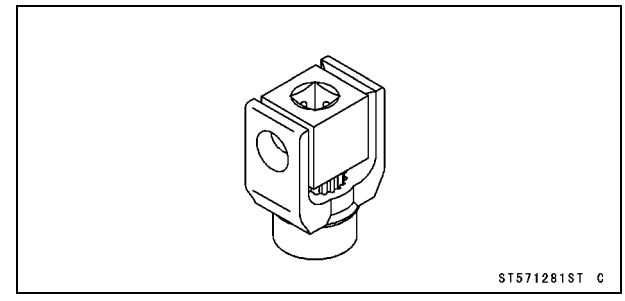
Bearing Driver Set:
57001-1129



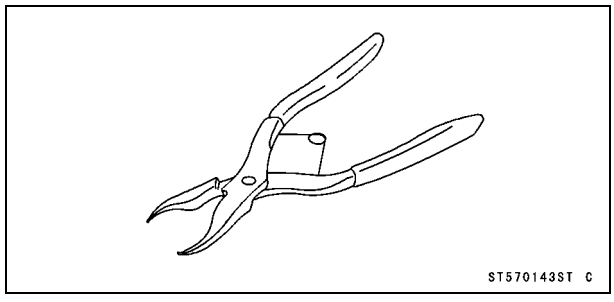
Steering Stem Bearing Driver:
57001-137



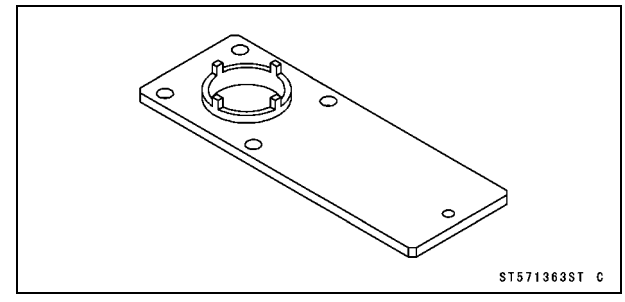
Pinion Gear Holder, m1.0:
57001-1281



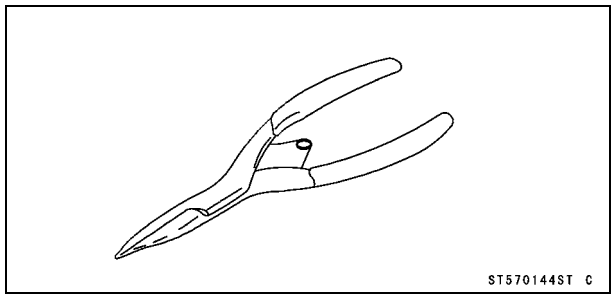
Inside Circlip Pliers:
57001-143



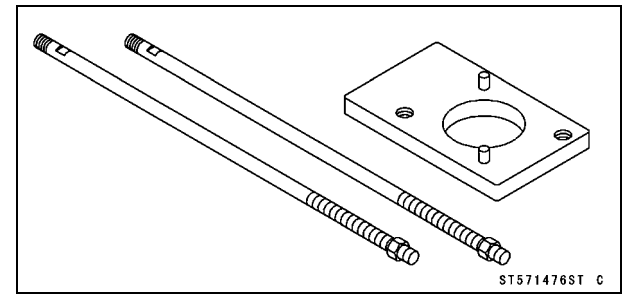
Socket Wrench:
57001-1363



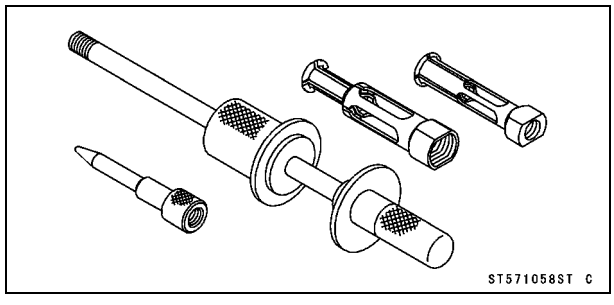
Outside Circlip Pliers:
57001-144



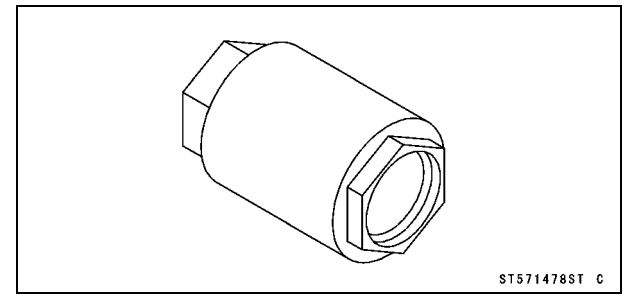
Holder & Guide Arbor:
57001-1476



Oil Seal & Bearing Remover:
57001-1058

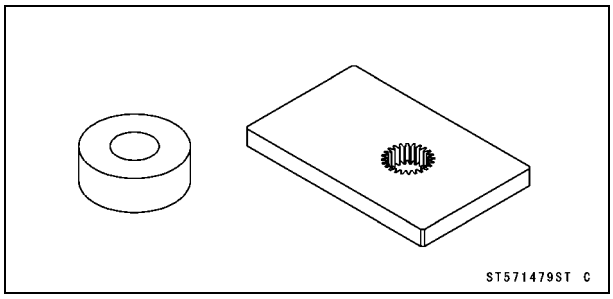


Socket Wrench, Hex 50:
57001-1478

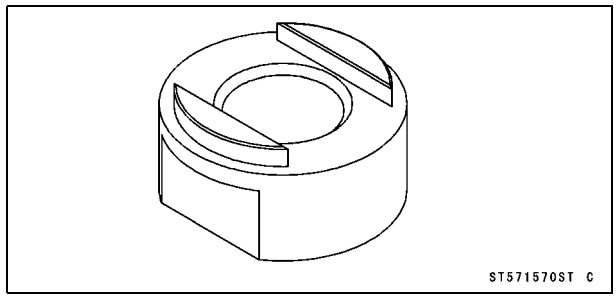


Special Tools

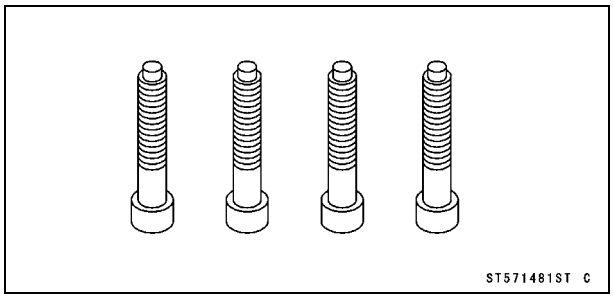
Output Shaft Holder & Spacer, m1.25:
57001-1479



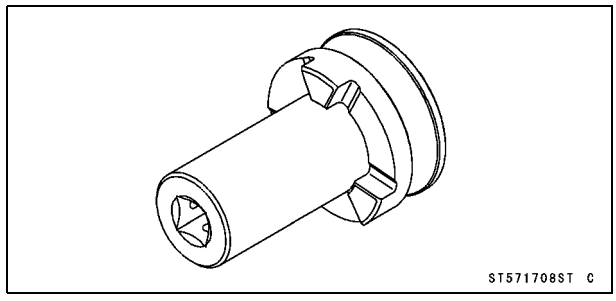
Output Shaft Holder:
57001-1570



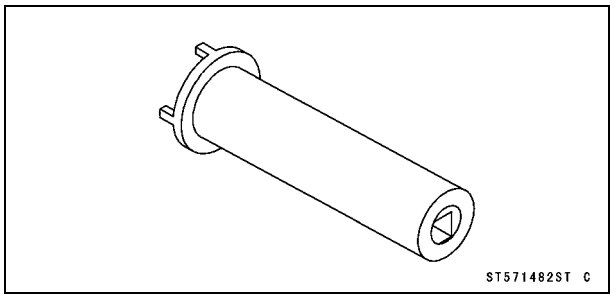
Nut Holding Bolts:
57001-1481



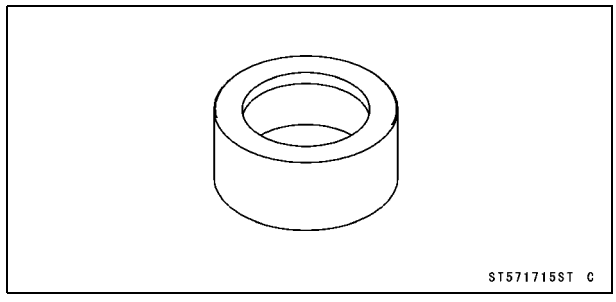
Pinion Gear Holder:
57001-1708



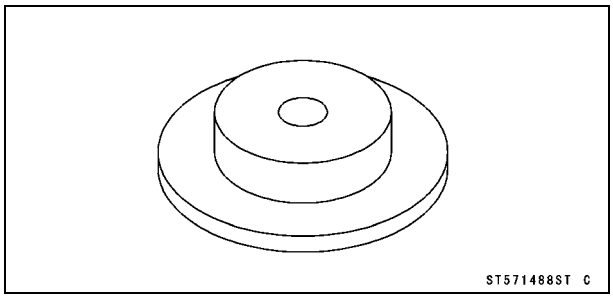
Socket Wrench:
57001-1482



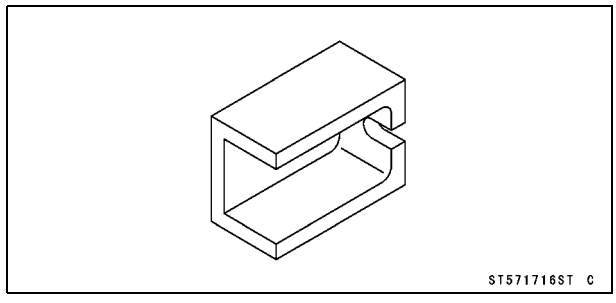
Oil Seal Driver:
57001-1715



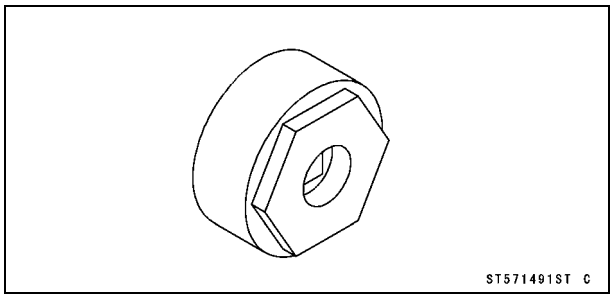
Bearing Driver, ϕ54.3:
57001-1488



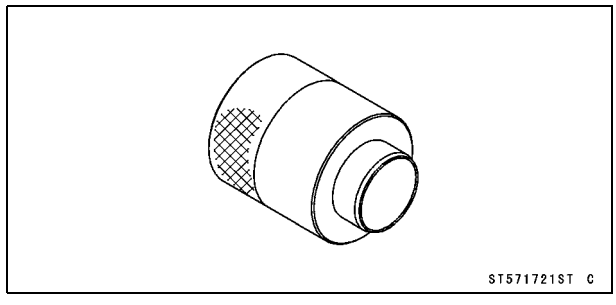
Cable Tension Adjusting Tool:
57001-1716



Hexagon Wench, Hex 41:
57001-1491

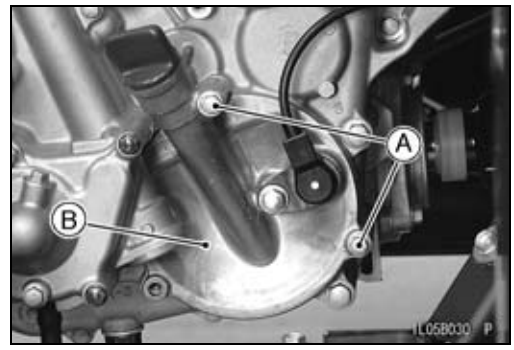


Oil Seal Guide:
57001-1721

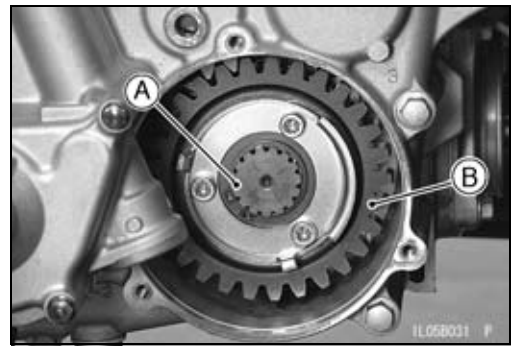


Output Bevel Gears

Output Drive Bevel Gear Removal

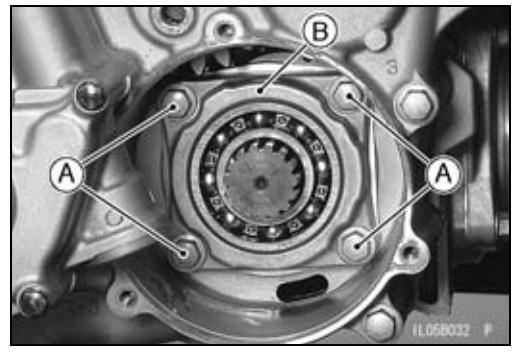


- Remove:
  Engine Oil (see Engine Oil Change in the Periodic Maintenance chapter)
- Remove:
  Left Cover (see Left Cover Removal in the Frame chapter)
  Engine Left Side Oil Pipe (Engine Outside) (see Oil Pipe Removal in the Engine Lubrication System chapter)
  Output Drive Bevel Gear Cover Bolts [A]
  Output Drive Bevel Gear Cover [B]



- Remove:
  Circlip [A]

  Special Tool - Outside Circlip Pliers: 57001-144
- Remove:
  Output Drive Idle Gear [B]

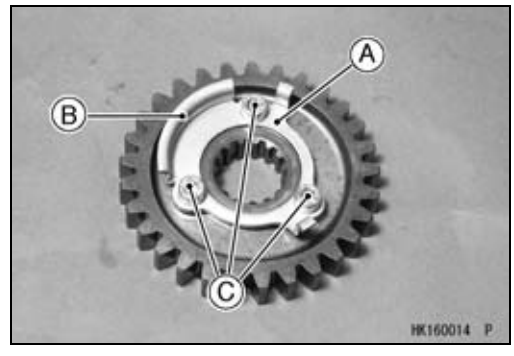


- Remove:
  Output Drive Bevel Gear Housing Bolts [A]
  Output Drive Bevel Gear Housing [B]

Output Drive Bevel Gear Installation

- Install the output drive bevel gear housing.
- Tighten:

  Torque - Output Drive Bevel Gear Housing Bolts: 26 N·m (2.7 kgf·m, 20 ft·lb)



- Install the rotor [A] so that the projections [B] face outward.
- Tighten:

  Torque - Rotor Mounting Bolts [C]: 12 N·m (1.2 kgf·m, 104 in·lb)
- Install:
  Output Drive Idle Gear
  New Circlip

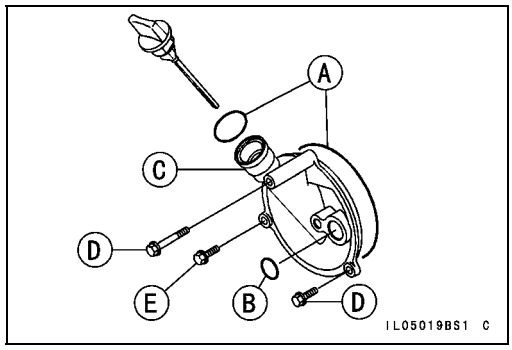
  Special Tool - Outside Circlip Pliers: 57001-144

Output Bevel Gears

- Apply grease:
  O-rings [A]
  O-ring [B] (If it is removed.)
- Install:
  Output Drive Bevel Gear Cover [C]
  Engine Left Side Oil Pipe (see Oil Pipe Installation in the Engine Lubrication System chapter)
- Tighten:

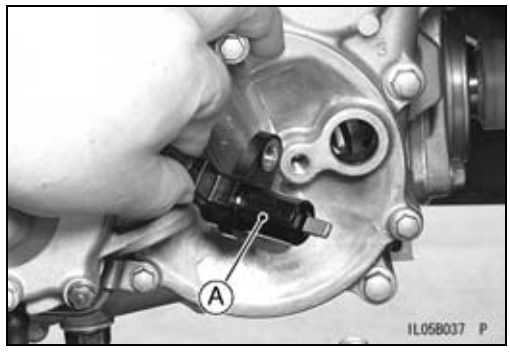
Torque - Output Drive Bevel Gear Cover Bolts [D]: 8.8 N·m (0.90 kgf·m, 78 in·lb)

○Tighten the cover bolt [E] with the oil pipe.



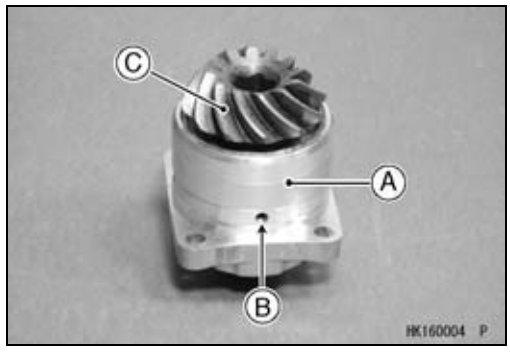
- When installing the forward/reverse detecting sensor [A], install it after the output drive bevel gear cover is installed:
- Tighten:

Torque - Forward/Reverse Detecting Sensor Mounting Bolt: 14.9 N·m (1.5 kgf·m, 11 ft·lb)



Output Drive Bevel Gear Disassembly

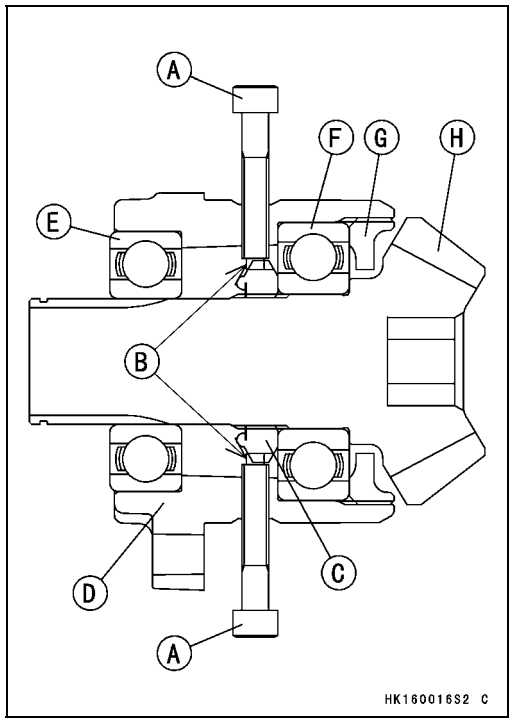
- Remove:
  Output Drive Bevel Gear Housing [A] (see Output Drive Bevel Gear Removal)
- Look through the hole [B] in the housing.
- Turn the bevel gear [C] until the groove of the output drive bevel gear holder nut is seen.



- Tighten the nut holding bolts [A] (4) securely into the grooves [B] of the bevel gear holder nut [C] in the output drive bevel gear housing.

Special Tool - Nut Holding Bolts: 57001-1481

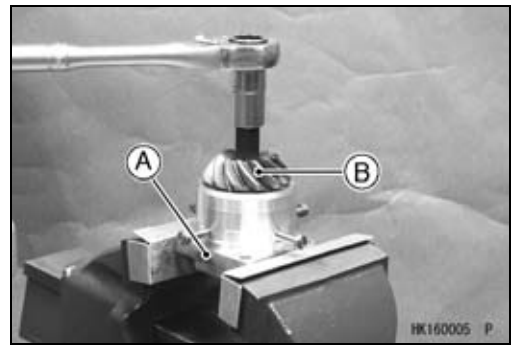
[D] Output Drive Bevel Gear Housing
[E] Outer Ball Bearing
[F] Inner Ball Bearing
[G] Bearing Holder
[H] Output Drive Bevel Gear



Output Bevel Gears

- Hold the output drive bevel gear housing [A] in a vise.
- Loosen the bevel gear [B] using an Allen wrench about four rotations.
- Remove one nut holding bolt, and look at through the hole.

★If the groove of the bevel gear holder nut is not seen, loosen the other three bolts.



- Drive the gear shaft end using a copper mallet until the grooves of the bearing holder nut can be seen again.
- Retighten the nut holding bolts (4) securely into the groove of the bevel gear holder nut in the output drive bevel gear housing.

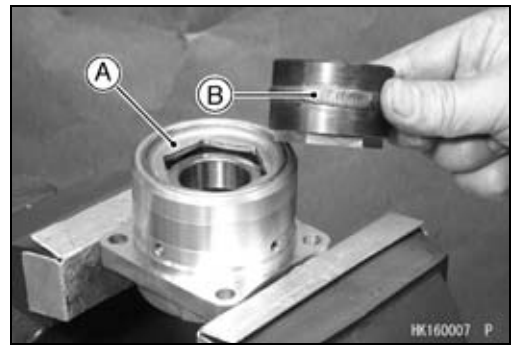
Special Tool - Nut Holding Bolts: 57001-1481

- Repeat the above procedure, and remove the bevel gear from the housing.

- Remove the bearing holder [A] using the hexagon wrench [B].

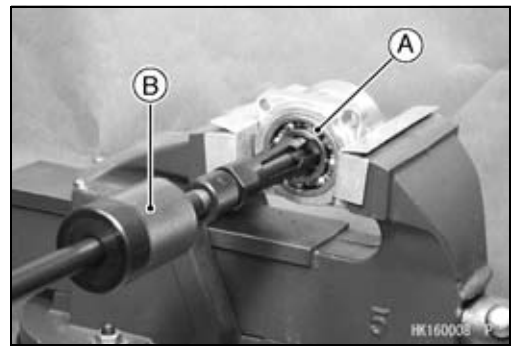
Special Tool - Hexagon Wrench, Hex 41: 57001-1491

○If it is difficult to break free the holder, apply the heat to it to softer the locking agent.



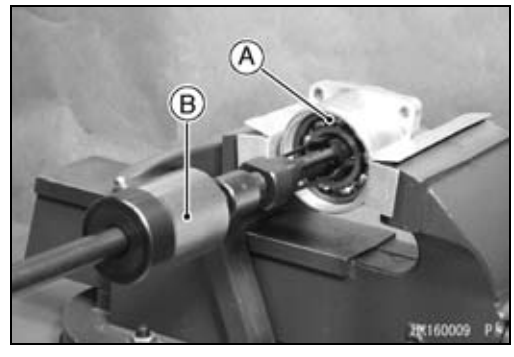
- Remove:
  Outer Ball Bearing [A]

Special Tool - Oil Seal & Bearing Remover [B]: 57001-1058



- Remove:
  Output Drive Bevel Gear Holder Nut
  Inner Ball Bearing [A]

Special Tool - Oil Seal & Bearing Remover [B]: 57001-1058

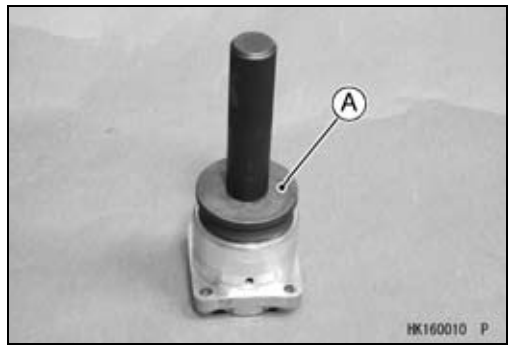


Output Bevel Gears

Output Drive Bevel Gear Assembly

- Press the new inner ball bearing until it is bottomed.

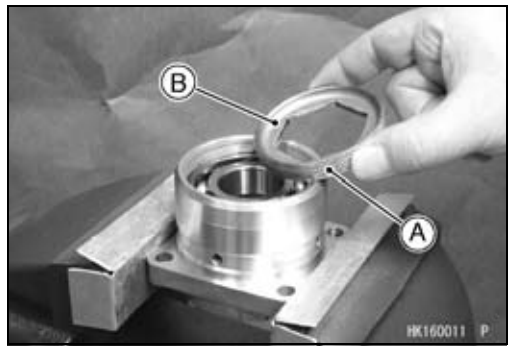
Special Tool - Bearing Driver Set [A]: 57001-1129



- Apply a non-permanent locking agent to the threads of the bearing holder [A] and tighten it so that the deep side [B] faces outward.

Torque - Bearing Holder: 120 N·m (12 kgf·m, 87 ft·lb)

- Press the output drive bevel gear until it is bottomed.

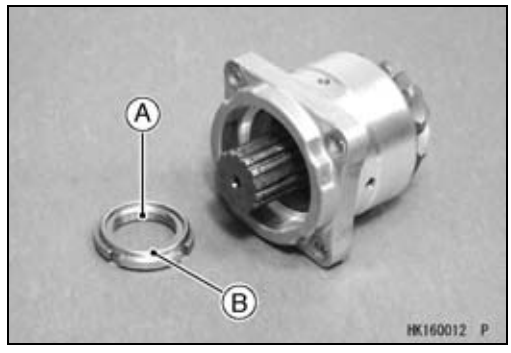


- Apply a non-permanent locking agent (Three Bond: TB2471 Blue) to the threads of the bevel gear holder nut [A] and tighten it so that the projection side [B] faces outward.

Special Tool - Socket Wrench [C]: 57001-1482

Torque - Bevel Gear Holder Nut: 200 N·m (20 kgf·m, 148 ft·lb)

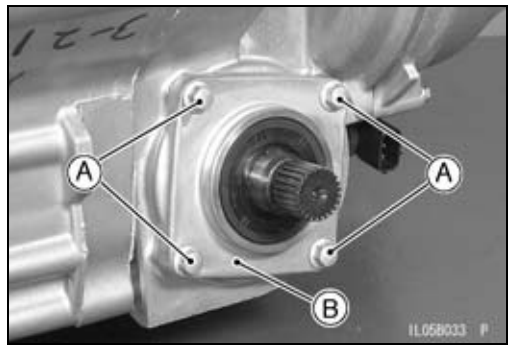
- Press the new outer ball bearing until it is bottomed.



Output Driven Bevel Gear Removal

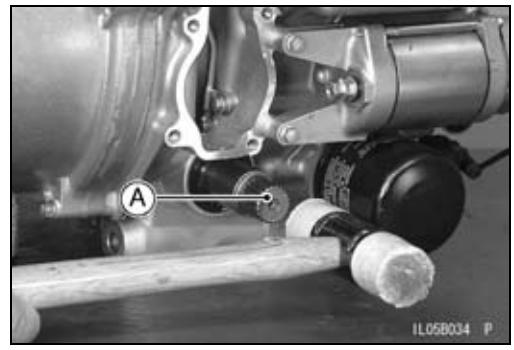
- Remove:

Engine (Engine Removal in the Engine Removal/Installation chapter)
Output Driven Bevel Gear Housing Bolts [A]
Output Driven Bevel Gear Housing [B]



Output Bevel Gears

○Tap lightly the front end [A] of the output driven bevel gear shaft using a plastic mallet.
○The output driven bevel gear shaft assembly comes off with the housing.



Output Driven Bevel Gear Installation

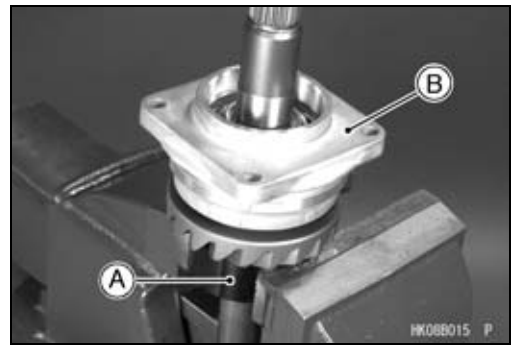
- Apply grease:
  O-ring [A]
- Install the output driven bevel gear shaft assembly.
- Tighten:

Torque - Output Driven Bevel Gear Housing Bolts: 26 N·m (2.7 kgf·m, 20 ft·lb)

Output Driven Bevel Gear Disassembly

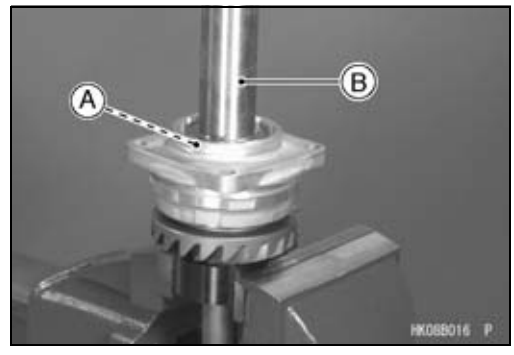
- Remove:
  Output Driven Bevel Gear Housing Assembly (see Output Driven Bevel Gear Removal)
  Oil Seal
- Hold the output shaft holder [A] in a vise, and set the housing assembly [B] on the holder.

Special Tool - Output Shaft Holder: 57001-1570

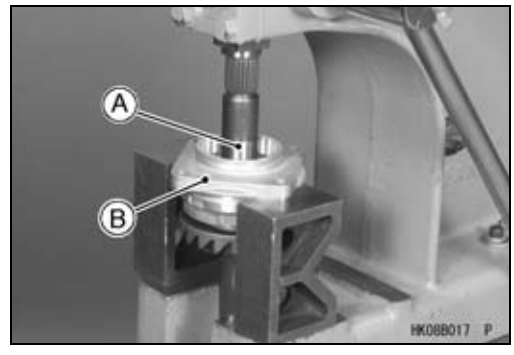


- Remove:
  Output Shaft Holder Nut [A]

Special Tool - Socket Wrench [B]: 57001-1482



- Remove the output shaft [A] from the housing [B] using a press.



Output Bevel Gears

- Hold the housing assembly [A] with the holder [B] in a vise.

  Special Tool - Holder & Guide Arbor: 57001-1476

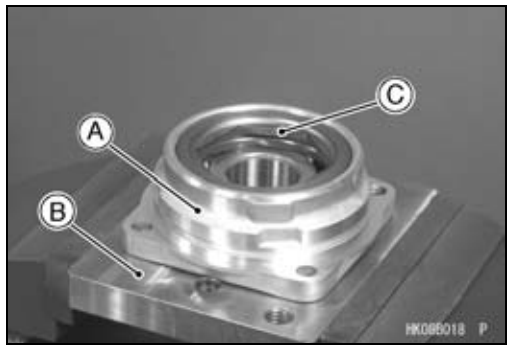
- Remove:
  Bearing Holder [C]

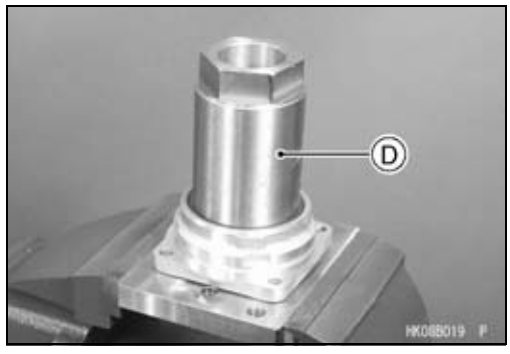
  Special Tool - Socket Wrench, Hex 50 [D]: 57001-1478

○If the holder seems too difficult to break free, apply heat to softer the locking agent.

- Remove:
  Ball Bearing

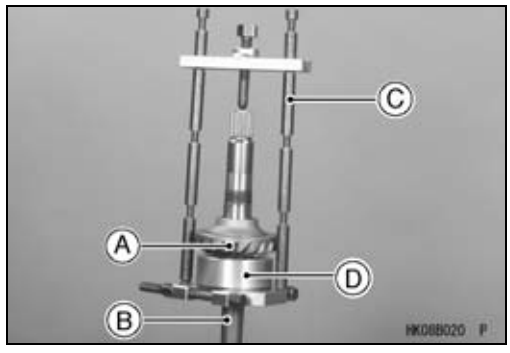
  Special Tool - Oil Seal & Bearing Remover: 57001-1058





- Remove the output driven bevel gear [A] from the output shaft [B] using the bearing puller [C] and spacer [D].

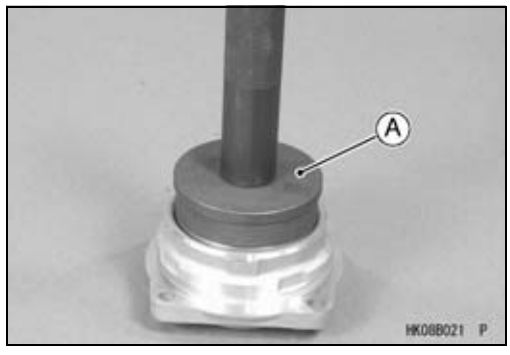
  Special Tools - Bearing Puller: 57001-135
  Output Shaft Holder & Spacer, m1.25: 57001 -1479



Output Driven Bevel Gear Assembly

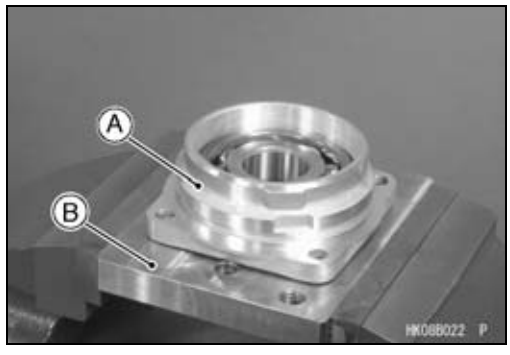
- Press the new ball bearing until it is bottomed.

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



- Hold the housing assembly [A] with the holder [B] in a vise.

  Special Tool - Holder & Guide Arbor: 57001-1476

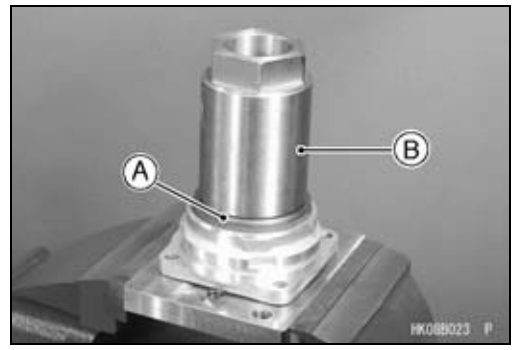


Output Bevel Gears

- Apply a non-permanent locking agent to the threads of the bearing holder [A] and tighten it.

  Special Tool - Socket Wrench, Hex 50 [B]: 57001-1478

  Torque - Bearing Holder: 250 N·m (25 kgf·m, 184 ft·lb)

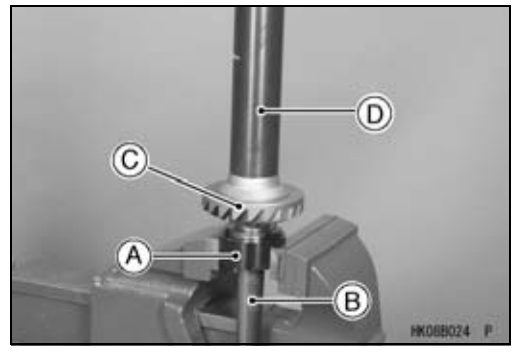


- Hold the output shaft holder [A] in a vise, and set the output shaft [B] on the holder.

  Special Tool - Output Shaft Holder: 57001-1570

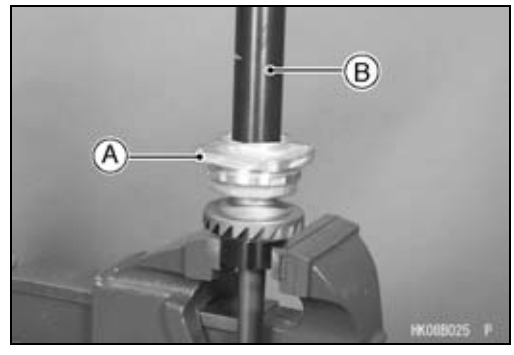
- Press the output driven bevel gear [C] using the steering stem bearing driver [D] until it is bottomed.

  Special Tool - Steering Stem Bearing Driver: 57001-137



- Press the housing assembly [A] using the steering stem bearing driver [B] until it is bottomed.

  Special Tool - Steering Stem Bearing Driver: 57001-137

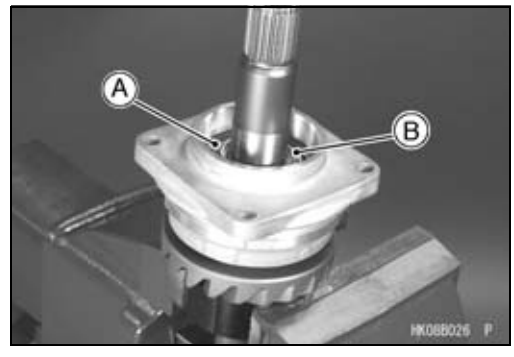


- Apply a non-permanent locking agent to the threads of the output shaft holder nut [A] and tighten it so that the projection side [B] faces outward.

  Special Tool - Socket Wrench: 57001-1482

  Torque - Output Shaft Holder Nut: 200 N·m (20 kgf·m, 148 ft·lb)

- Apply grease to the oil seal and press it so that it is flush with the end surface of the housing.

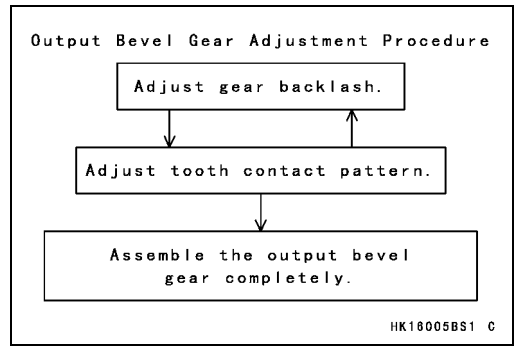


Output Bevel Gears Adjustment

The **backlash** and **tooth contact pattern** of the bevel gears must be correct to prevent the gears from making noise and being damaged.

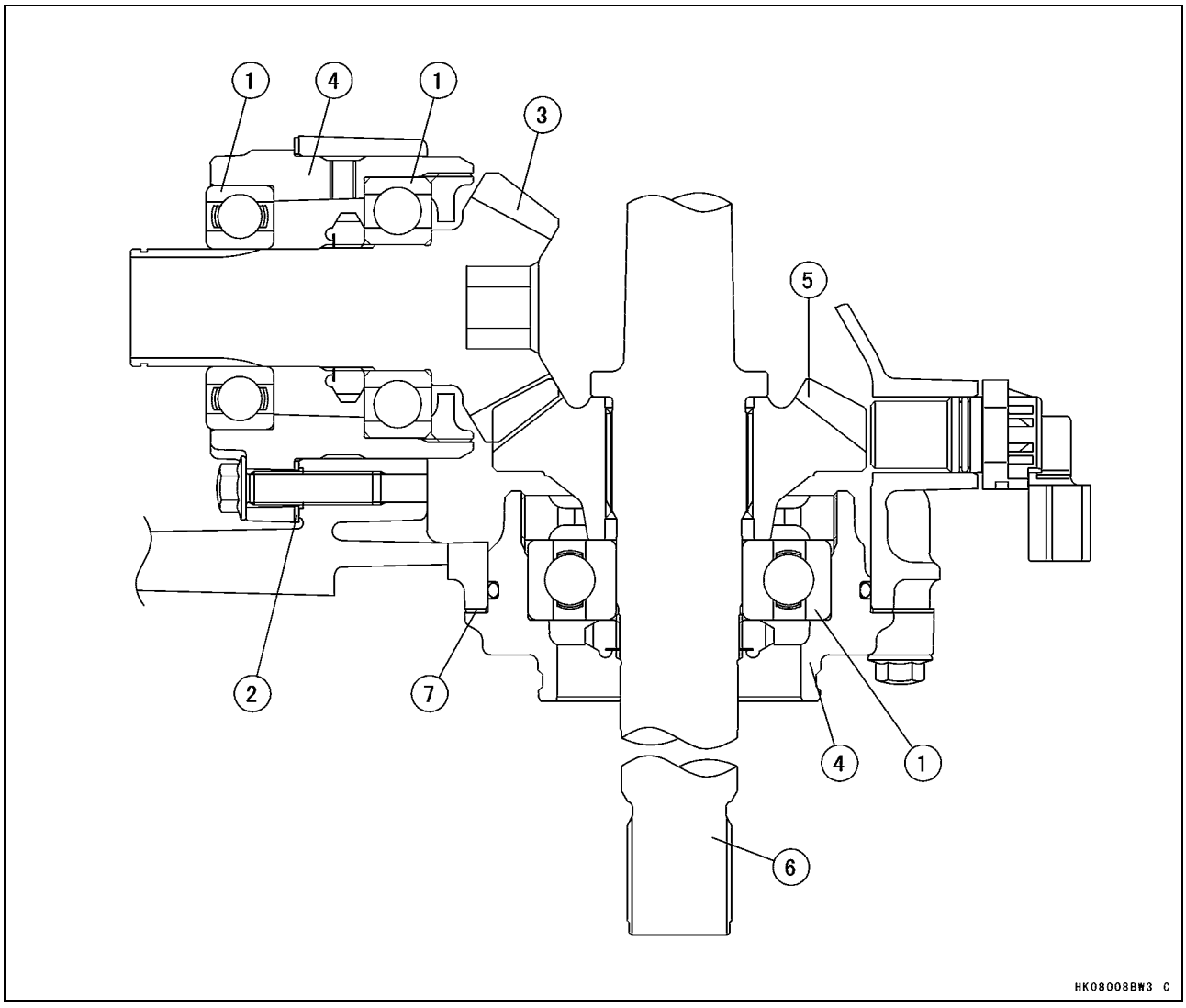
When replacing any one of the backlash-related parts, be sure to check and adjust the backlash and tooth contact. First adjust the backlash, and then tooth contact by replacing shims.

These two adjustments are of critical importance and must be carried out in the correct sequence, using the procedures shown.



Output Bevel Gears

Output Bevel Gear (Backlash-related Parts)



1. Ball Bearings
2. Drive Bevel Gear Shims
3. Output Drive Bevel Gear
4. Bearing Housings
5. Output Driven Bevel Gear
6. Output Driven Shaft
7. Driven Bevel Gear Shims

Drive Bevel Gear Shims for Tooth Contact Adjustment

Thickness	Part Number
0.15 mm (0.006 in.)	92180-1311
0.2 mm (0.008 in.)	92180-1312
0.5 mm (0.020 in.)	92180-1313
0.8 mm (0.031 in.)	92180-1314
1.0 mm (0.039 in.)	92180-1351
1.2 mm (0.047 in.)	92180-1352

Driven Bevel Gear Shims for Backlash Adjustment

Thickness	Part Number
0.15 mm (0.006 in.)	92180-1307
0.2 mm (0.008 in.)	92180-1308
0.5 mm (0.020 in.)	92180-1309
0.8 mm (0.031 in.)	92180-1310
1.0 mm (0.039 in.)	92180-1349
1.2 mm (0.047 in.)	92180-1350

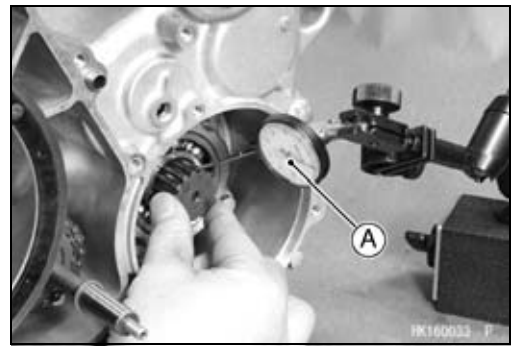
Output Bevel Gears

Bevel Gear Backlash Adjustment

○The amount of backlash is influenced by driven bevel gear position more than by drive bevel gear position.

● Remove the output drive idle gear (see Output Drive Bevel Gear Removal).

● Set up a dial gauge [A] against the output drive shaft spline groove to check gear backlash.



○To measure the backlash, turn the shaft clockwise and counterclockwise slightly so as not to move the mate gear. The difference between the highest and lowest gauge reading is the amount of backlash.

★If the backlash is not within the limit, replace the shim(s) at the driven bevel gear.

★Change the thickness a little at a time.

● Recheck the backlash, and readjust as necessary.

Output Bevel Gear Backlash
Standard: 0.05 ~ 0.11 mm (0.002 ~ 0.004 in.)
(at output drive shaft spline)

Tooth Contact Adjustment

○Tooth contact location is influenced by drive gear position more than by driven gear position.

● Clean any dirt and oil off the bevel gear teeth.

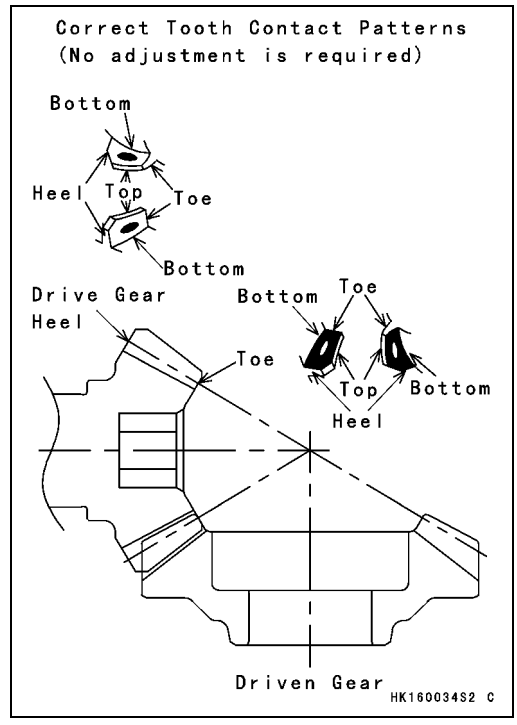
● Apply checking compound to 4 or 5 teeth on the output driven bevel gear.

NOTE

○*Apply checking compound to the teeth in a thin, even coat with a fairly stiff paint brush. If painted too thickly, the exact tooth pattern may not appear.*

○*The checking compound must be smooth and firm with the consistency of tooth paste.*

○*Special compounds are available at automotive supply stores for the purpose of checking differential gear tooth patterns and contact. Use this for checking the bevel gears.*



● Turn the output driven shaft for 3 or 4 turns in the drive and reverse (coast) directions, while creating a drag on the drive bevel gear shaft.

● Check the drive pattern and coast pattern of the bevel gear teeth. The tooth contact patterns of both drive and coast sides should be centrally located between the top and bottom of the tooth, and a little closer to the toe of the tooth.

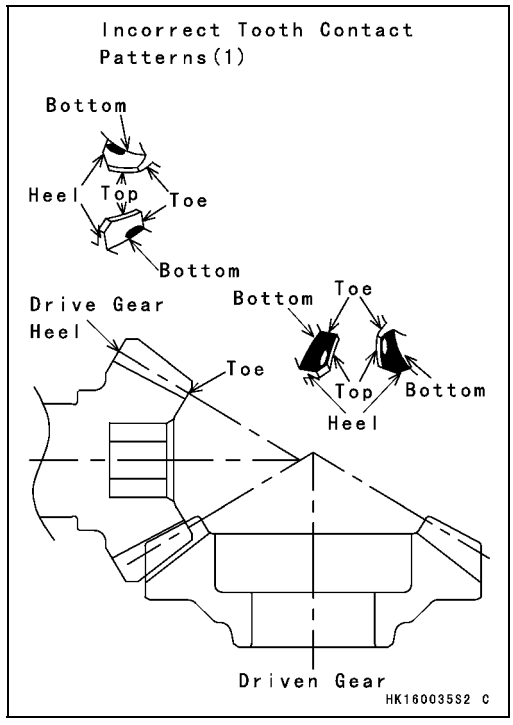
★If the tooth contact pattern is incorrect, replace the shim(s) at the drive bevel gear and shim(s) at the driven bevel gear, following the examples shown. Then erase the tooth contact patterns, and check them again. Also check the backlash every time the shims are replaced. Repeat the shim change procedure as necessary.

NOTE

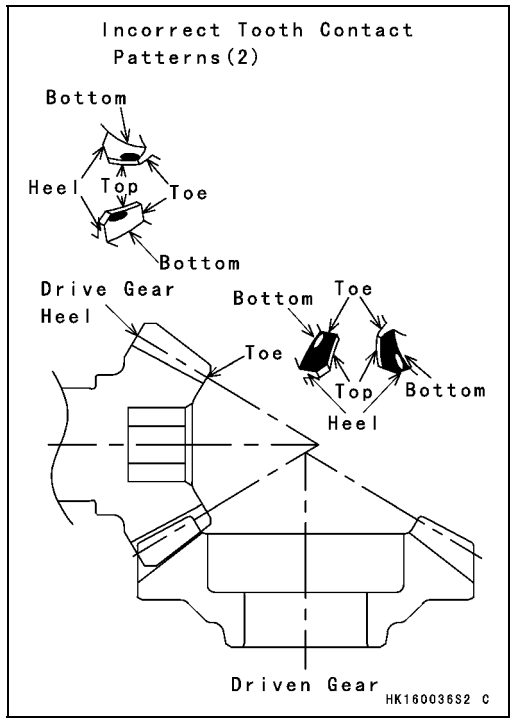
○*If the backlash is out of the standard range after changing shims, correct the backlash before checking the tooth contact pattern.*

Output Bevel Gears

Example 1: Decrease the thickness of the drive bevel gear shim(s) by 0.1 mm (0.004 in.), and/or increase the thickness of the driven bevel gear shim(s) by 0.1 mm (0.004 in.) to correct the pattern shown below. Repeat in 0.1 mm (0.004 in.) steps if necessary.



Example 2: Increase the thickness of the drive bevel gear shim(s) by 0.1 mm (0.004 in.), and/or decrease the thickness of the driven bevel gear shim(s) by 0.1 mm (0.004 in.) to correct the pattern shown below. Repeat in 0.1 mm (0.004 in.) steps if necessary.

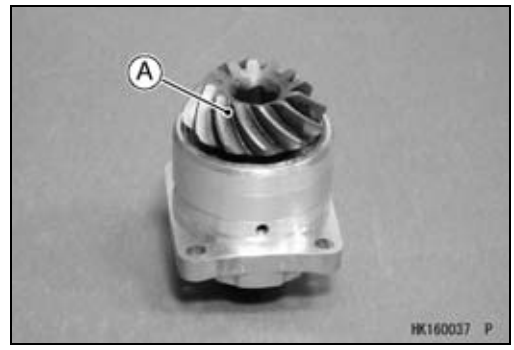


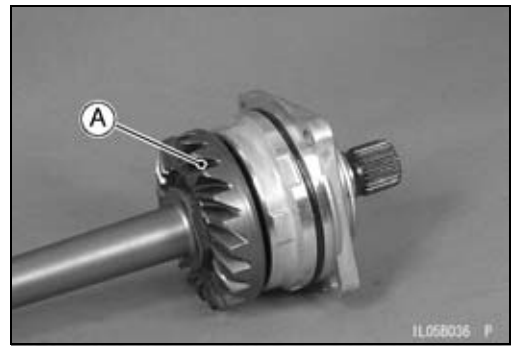
Output Bevel Gears

Bevel Gears Inspection

- Visually check the bevel gears [A] for scoring, chipping, or other damage.

★Replace the bevel gears as a set if either gear is damaged.

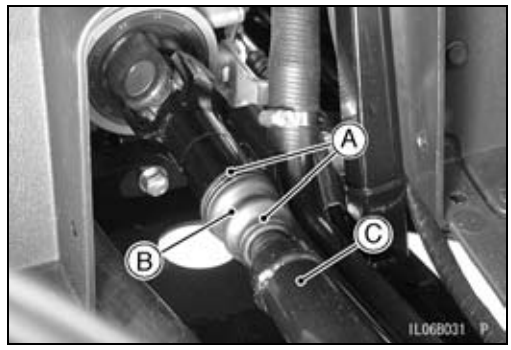




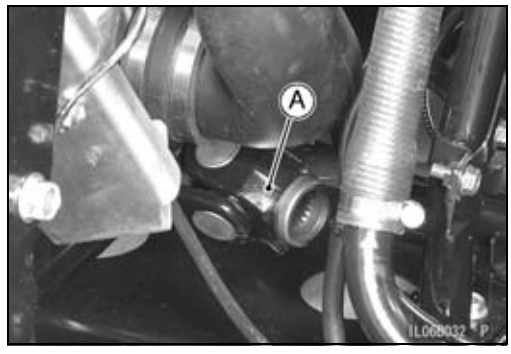
Front Propeller Shaft

Front Propeller Shaft Removal

- Remove:
  Seat Lower Cover (see Seat Lower Cover Removal in the Frame chapter)
- Slip the O-rings [A] off the grooves on the rubber boot [B].
- Push the front propeller shaft [C] forward, and remove the rear end from the universal joint.
- Remove the front propeller shaft and spring from the vehicle.



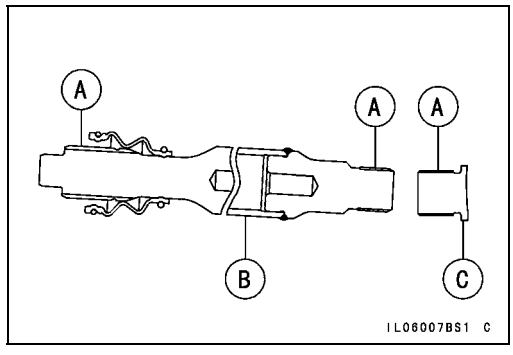
- Remove:
  Universal Joint [A]



Front Propeller Shaft Installation

- Wipe off any old grease on the splines of the following parts.
  Universal Joint of Front Final Gear Case
  Propeller Shaft
  Universal Joint
  Output Bevel Gear Shaft

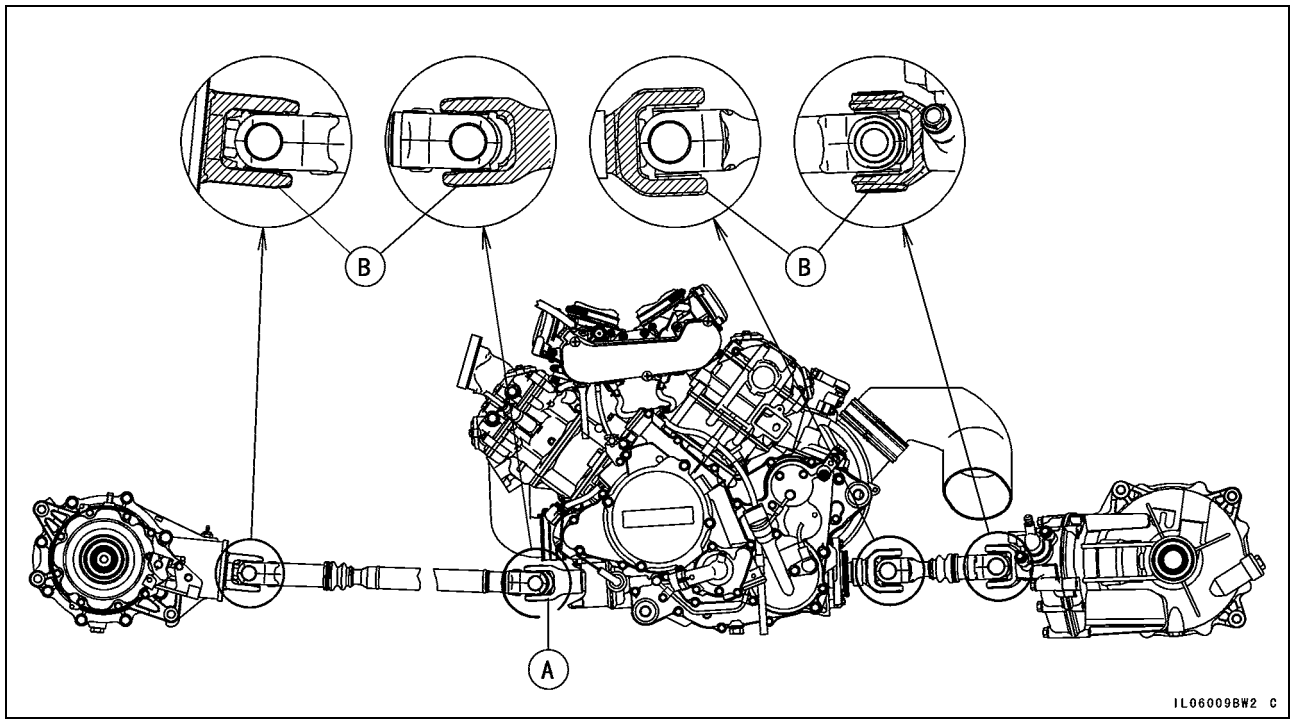
- Apply molybdenum disulfide grease to the splines [A] of the propeller shaft [B] and output bevel gear shaft [C].



Front Propeller Shaft

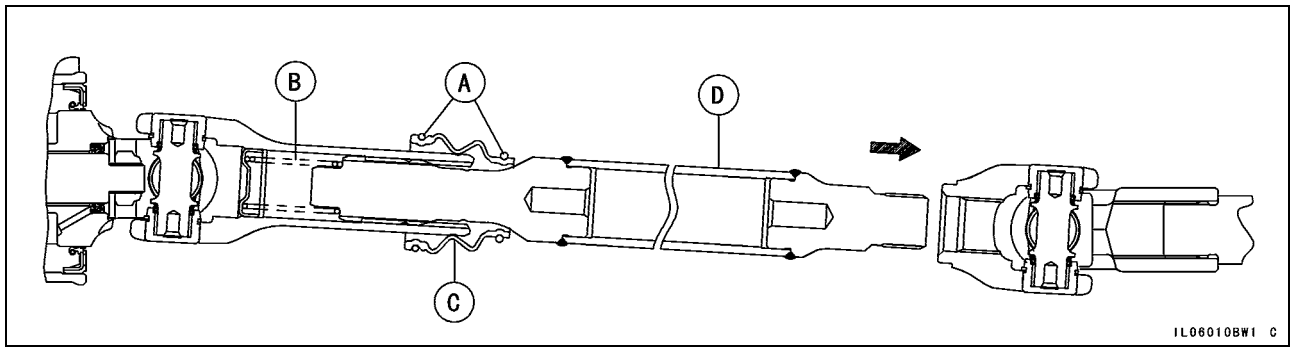
- Install:
  Universal Joint [A]

○Align each yoke [B] with the other yoke as shown in the figure.

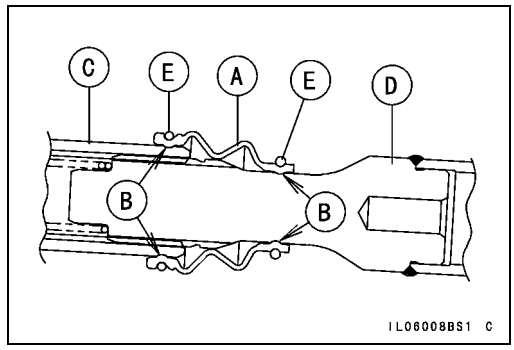


- Replace the O-rings [A] with new ones.
- Install:
  Spring [B]
  Boot [C]
  Propeller Shaft [D]

○Install the front end of the propeller shaft, and then install the rear end as shown in the figure.

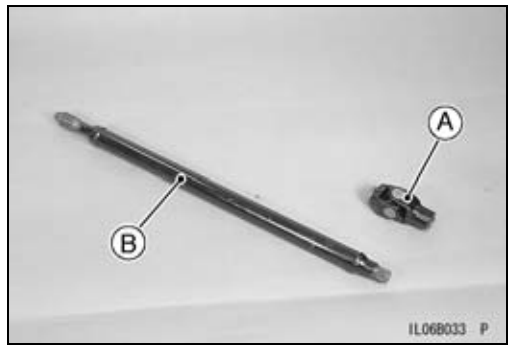


- Fit the boot [A] into the grooves [B] of the yoke [C] and propeller shaft [D].
- Fit the O-rings [E] into the grooves of the boot.



Front Propeller Shaft

Front Propeller Shaft Inspection



- Remove:
  Front Propeller Shaft (see Front Propeller Shaft Removal)
- Check that the universal joint [A] works smoothly without rattling or sticking.

★If it does rattle or stick, the universal joint is damaged. Replace the universal joint.

- Check the splines of the propeller shaft [B] and universal joint.

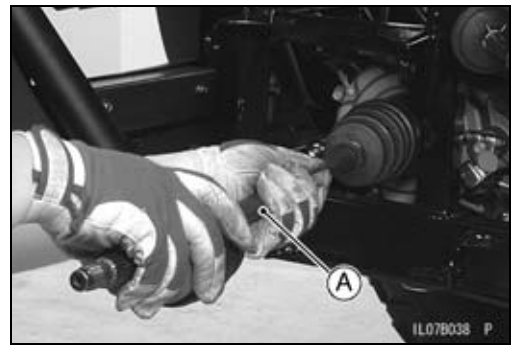
★If the splines are twisted or damaged in any way, replace the damaged parts.

- Also, inspect the splines in the universal joint of the front final gear case and the output bevel gear shaft.

★If the splines are badly worn, chipped, or loose, replace the damaged parts.

Front Axle

Front Axle Removal



- Drain the front final gear case oil (see Front Final Gear Case Oil Change in the Periodic Maintenance chapter).
- Remove:
  Front Wheel (see Wheel Removal in the Wheels/Tires chapter)
  Steering Knuckle (see Steering Knuckle Removal in the Steering chapter)
- Pull the front axle [A] in a straight line out of the front final gear case.

Front Axle Installation

- Wipe the old grease off the splines of the axle and the gear case oil seal.
- Visually inspect the splines of the axle.

★If they are badly worn or chipped, replace the axle with a new one.

- Apply molybdenum disulfide grease to the axle splines.
- Apply grease to the gear case oil seal.

- Push [A] the end of the front axle straght and install it in the gear case.

NOTE

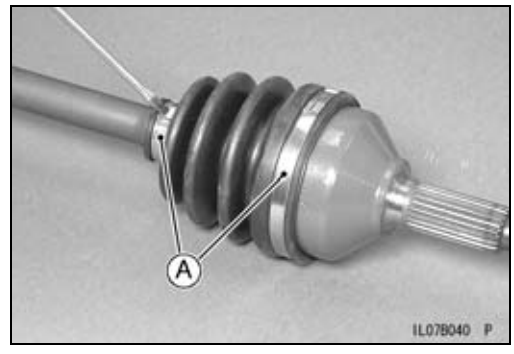
○*The axle shaft must not come off easily.*

Front Axle Joint Boot Inspection

- Refer to the Front Axle Joint Boot Inspection in the Periodic Maintenance chapter.

Front Axle Joint Boot Replacement

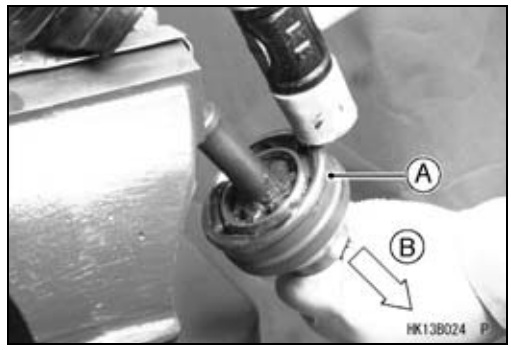
Outboard Joint Boot Removal



- Remove:
  Front Axle (see Front Axle Removal)
  Boot Bands [A]
- Scrap the removed boot bands.
- Slide the joint boot toward the inboard joint.

Front Axle

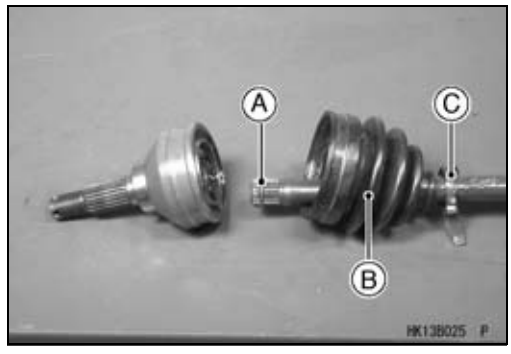
● Tap the bearing housing [A] straight [B] with a plastic hammer to separate it from the shaft.



CAUTION

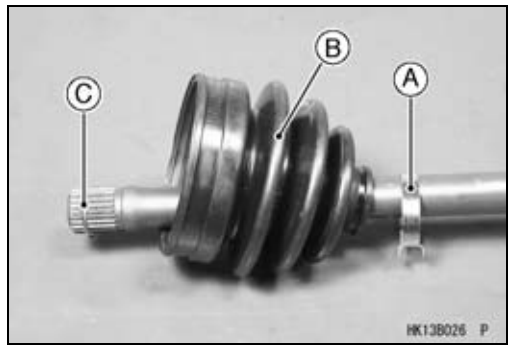
Do not tap on the cage. Be careful not get hurt when the housing comes out. If the splined portion of shaft cracked or damaged during disassembling of outboard joint, do not reuse the shaft.

● Remove:
Circlip [A]
Boot [B]
Small Band [C]



Outboard Joint Boot Installation

● Clean the axle shaft by wiping off the used grease on it.
● Wind the tape on the splines of the axle shaft in order to protect the joint boot.
● Install:
New Small Band [A]
New Boot [B]
○Apply the special grease slightly on the inside of the new boot small diameter, and install the boot on the axle shaft.

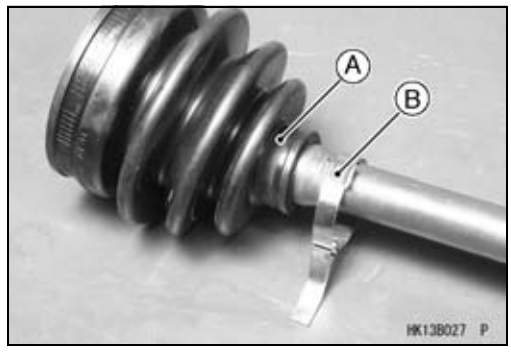


CAUTION

Only the special grease that is included with the boot kit can be applied to the boots.

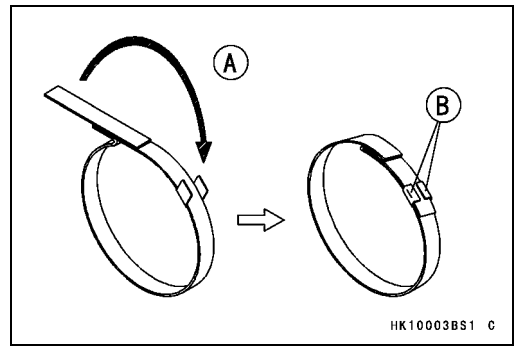
● Install:
New Circlip [C]

● Apply the special grease slightly on the part [A] of the band installation in order to make easy to install the boot band.
● Tighten the small boot band [B].



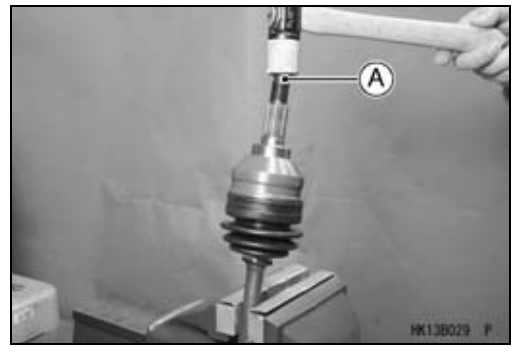
Front Axle

○Tighten the boot band [A] and bend the tangs [B] securely to hold down the end of the band.

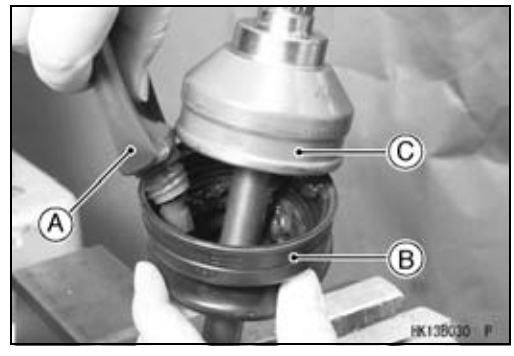


● Place the special grease tube nozzle in the bore of the housing and squeeze the tube [A] until the grease comes out from the joint bearing.

● Tap the shaft end [A] straight with a plastic hammer until it is locked by the circlip.

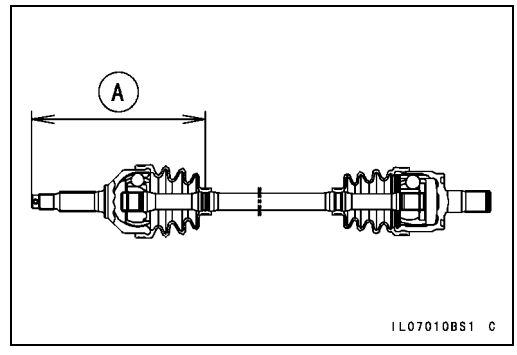


● Squeeze all of the special grease [A] into the new boot [B], and slide the boot onto the outboard joint [C].



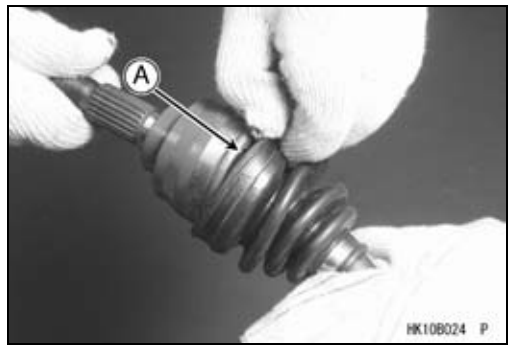
● Compress the axle assembly to the specified length while relieving the air pressure inside the inboard boot.
● Hold the axle at this setting.

Standard Length of Assembling:
Front Axle: 199 mm (7.83 in.) [A]



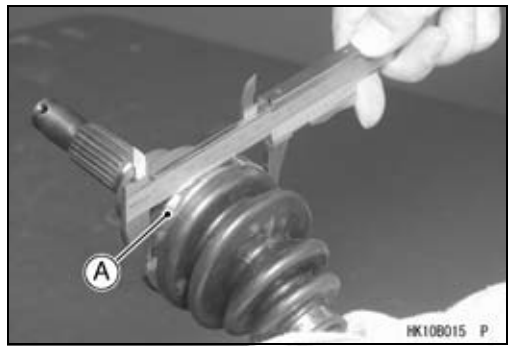
Front Axle

- Open the edge [A] of the boot in order to equalize the air pressures.



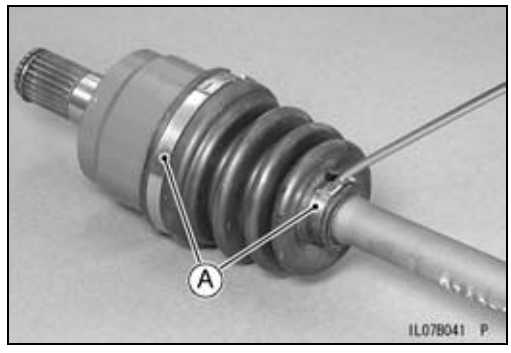
- Tighten the large band [A] and bend the tangs securely to hold down the end of the band.

Maximum Outside Diameter of Band: 85.3 mm (3.36 in.)
(After tightening the outside diameter)

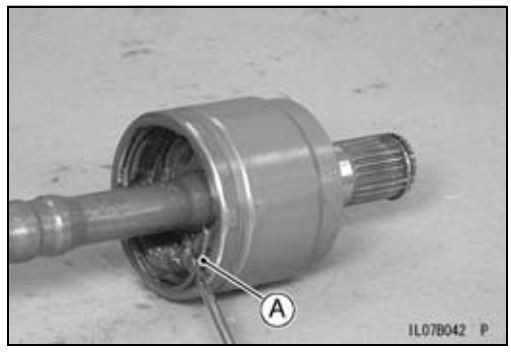


Inboard Joint Boot Removal

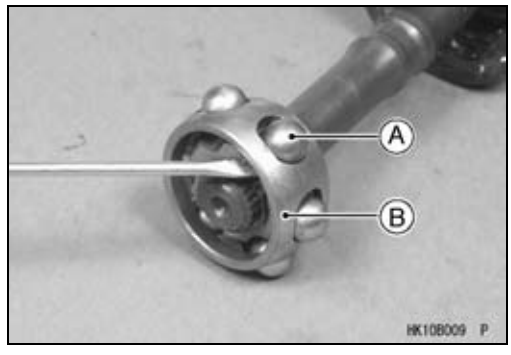
- Remove:
  Front Axle (see Front Axle Removal)
  Boot Bands [A]
- Scrap the removed boot bands.
- Slide the joint boot toward the outboard joint [B].



- Remove the retaining ring [A].
- Separate to the axle shaft.



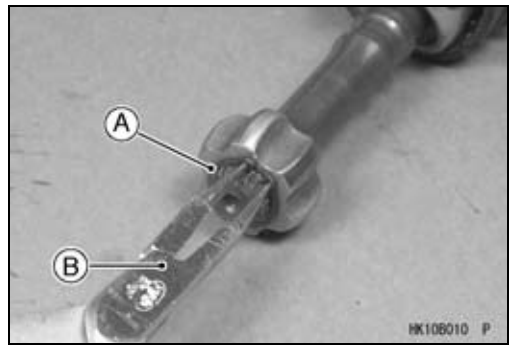
- Remove the steel balls [A].
- Slide the cage [B] toward the center of the axle.



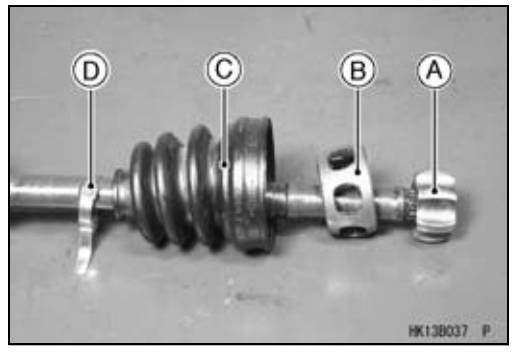
Front Axle

- Remove:
  Circlip [A]

Special Tool - Outside Circlip Pliers [B]: 57001-144

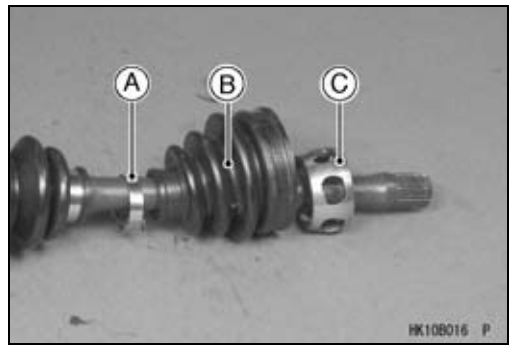


- Remove:
  Inner Race [A]
  Cage [B]
  Inboard Joint Boot [C]
  Boot Band [D]

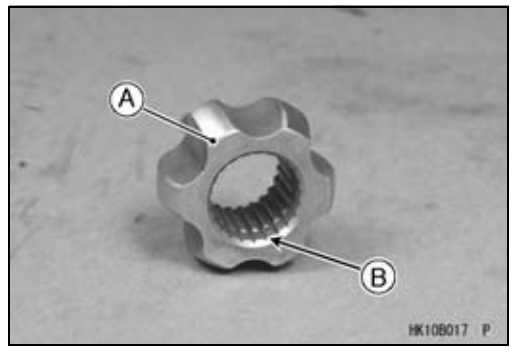


Inboard Joint Boot Installation

- Wind the tape on the splines of the axle shaft in order to protect the joint boot.
- Install:
  New Small Band [A]
  New Inboard Joint Boot [B]
  Cage [C]



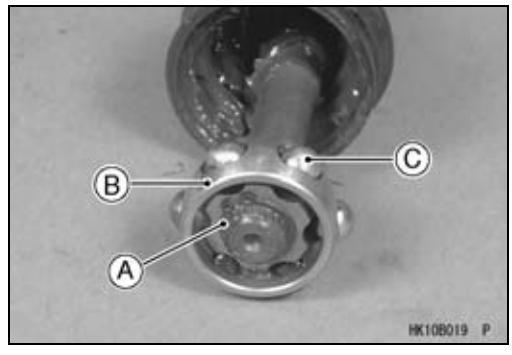
- Install the inner race [A] so that the flat side [B] faces outboard joint.



- Install:
  New Circlip [A]

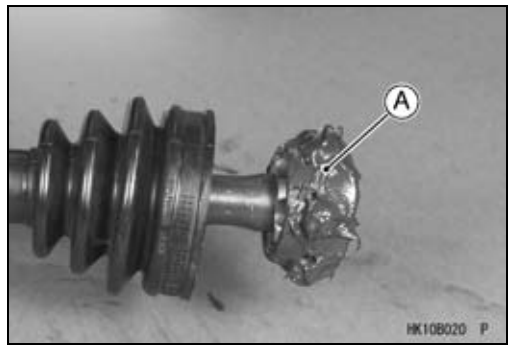
Special Tool - Outside Circlip Pliers: 57001-144

- Slide the cage [B] on the inner race and install the steel balls [C].

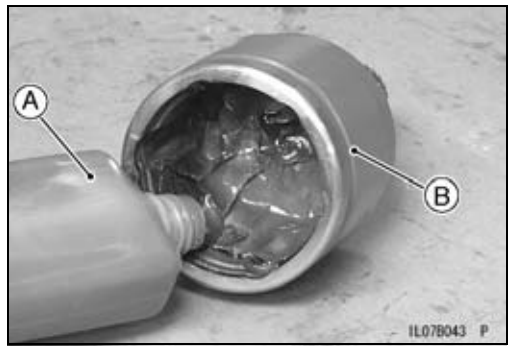


Front Axle

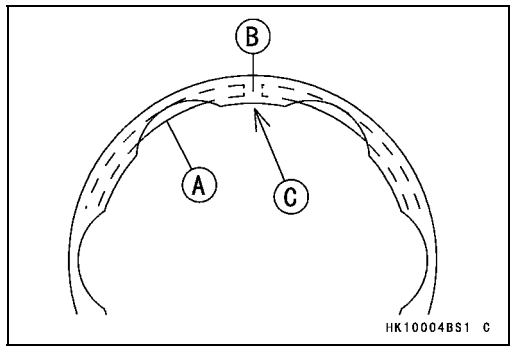
- Apply the special grease [A] to the steel balls and cage.



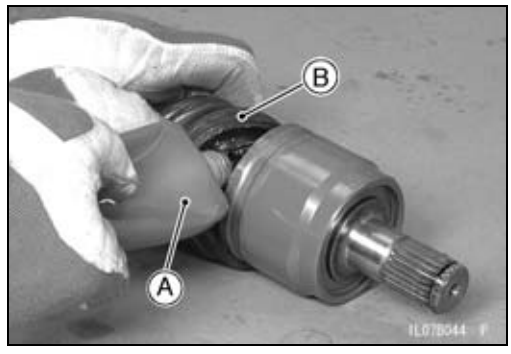
- Squeeze about half a tube of the special grease [A] into the bearing cup [B].



- Insert the balls and cage assembly in the bearing cup strongly.
- Install the new retaining ring [A] so that the opening [B] is aligned with one of the projections [C].



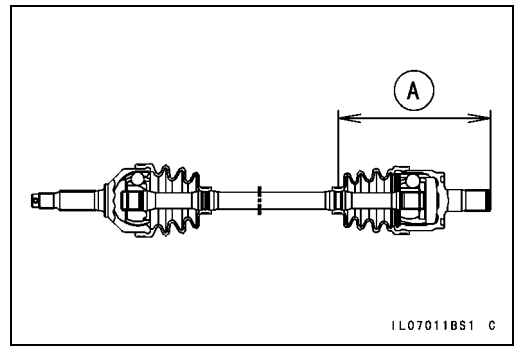
- Tighten the small band.
- Squeeze the remaining special grease [A] into the inboard joint boot [B].



Front Axle

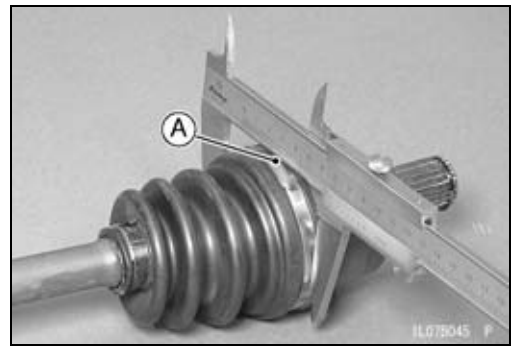
- Compress the axle assembly to the specified length while relieving the air pressure inside the inboard boot.
- Hold the axle at this setting.

Standard Length of Assembling
Front Axle: 174.6 mm (6.87 in.) [A]

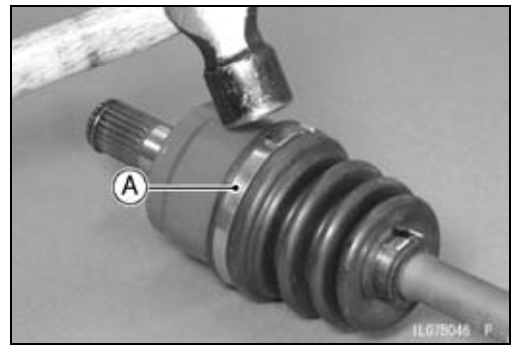


- Open the edge of the boot in order to eqalize the air pressures.
- Tighten the large band [A] and bend the tangs securely to hold down the end of the band.

Maximum Outside Diameter of Band: 79.7 mm (3.14 in.)
(After tightening the outside diameter)

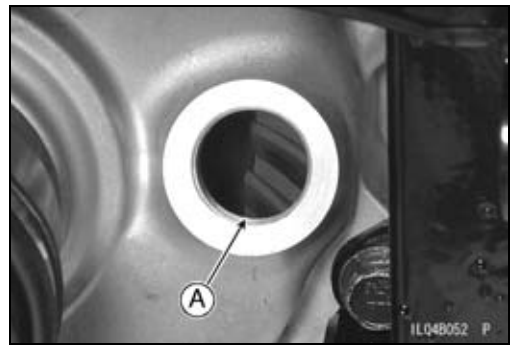


- While the band is held at the diameter above, tap down the tangs [A] of the clamp.



Front Final Gear Case

Front Final Gear Case Oil Level Inspection



- Park the vehicle so that it is level, both side-to-side and front-to-rear.
- Remove the filler cap.

CAUTION

Be careful not to allow any dirt or foreign materials to enter the gear case.

- Check the oil level. The oil level should come to the bottom of the filler opening [A].

★If it is insufficient, first check the front final gear case for oil leakage, remedy it if necessary, and add oil through the filler opening. Use the same type and brand of oil that is already in the final gear case.

- Be sure the O-ring is in place.
- Apply grease to the O-ring and tighten the filler cap.

Torque - Front Final Gear Case Oil Filler Cap: 29 N·m (3.0 kgf·m, 22 ft·lb)

Front Final Gear Case Oil Change

- Refer to the Front Final Gear Case Oil Change in the Periodic Maintenance chapter.

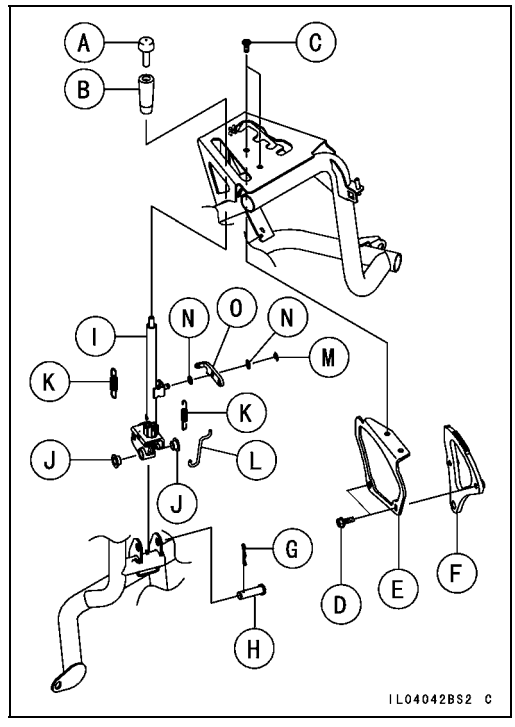
Differential Shift Lever Play Inspection

- Refer to the Differential Shift Lever Play Inspection in the Periodic Maintenance chapter.

Differential Shift Lever Play Adjustment

- Refer to the Differential Shift Lever Play Adjustment in the Periodic Maintenance chapter.

Differential Shift Lever Removal

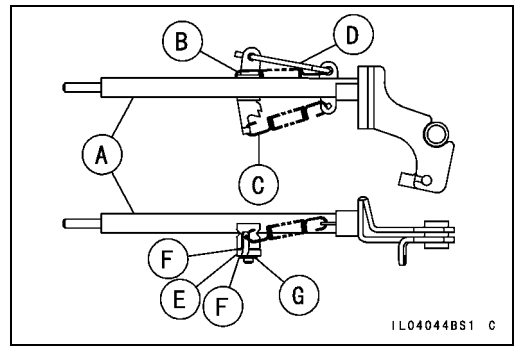


- Remove:

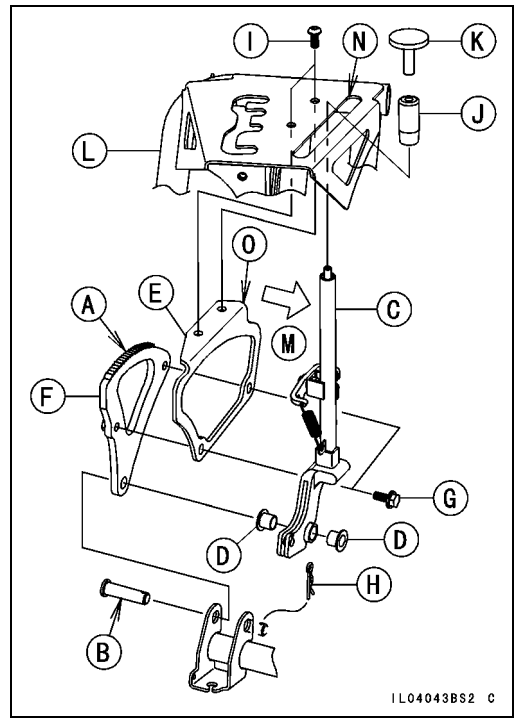
Center Bracket Assembly (see Center Bracket Removal in the Frame chapter)
Cap [A]
Damper [B]
Bolts [C]
Bolts [D]
Bracket [E]
Ratchet [F]
Snap Pin [G]
Pin [H]
Lever Assembly [I]
Bushings [J]
Springs [K]
Rod [L]
Circlip [M]
Washers [N]
Lever [O]

Front Final Gear Case

Differential Shift Lever Installation

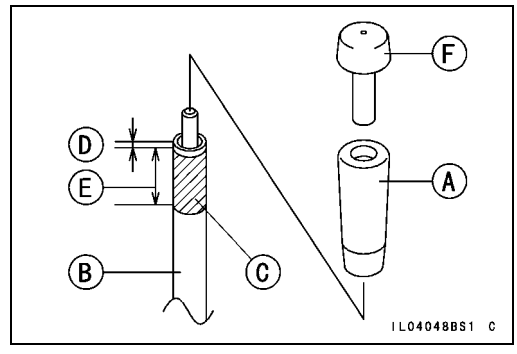


- Install:
  Lever Assembly [A]
  Spring [B]: Coil Length = 16 mm (0.63 in.)
  Spring [C]: Coil Length = 20 mm (0.79 in.)
  Rod [D]
  Lever [E]
  Washers [F]
  New Circlip [G]



- Apply Grease (Chevron Rykon Premium Grease EP NGI2):
  Teeth [A] of Ratchet
  Pin [B]
- Install:
  Lever Assembly [C]
  Bushings [D]
  Bracket [E]
  Ratchet [F]
  Bolts [G]
  Pin [B]
  Snap Pin [H]
  Bolts [I]
  Damper [J]
  Cap [K]
  Center Bracket Assembly [L] (see Center Bracket Installation in the Frame chapter)
- Tighten the bolts [I] with bracket [E] pushed to the arrow [M] direction.

○The line [N] shall be parallel to line [O].



- Install the damper [A] to the rod [B] of lever assembly as shown in the figure.
  Double Stick Tape [C]
  1 ~ 2 mm (0.04 ~ 0.08 in.) [D]
  40 mm (1.57 in.) [E]
  Cap [F]

Differential Shift Cable Installation

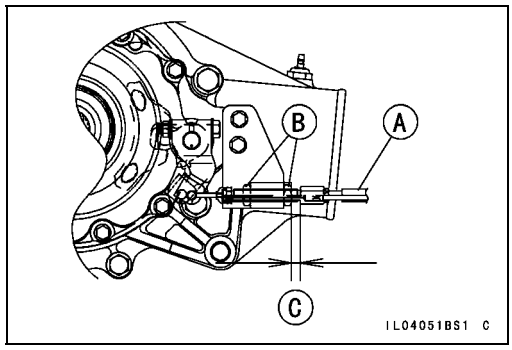
- Lubricate the differential shift cable before installation.
- Apply grease to the end of the cable.
- Route the cable correctly the according to the Cable, Wire, and Hose Routing in the Appendix chapter.

⚠ WARNING

Operation with an improperly adjusted, incorrectly routed, or damaged cable could result in an unsafe operating condition.

Front Final Gear Case

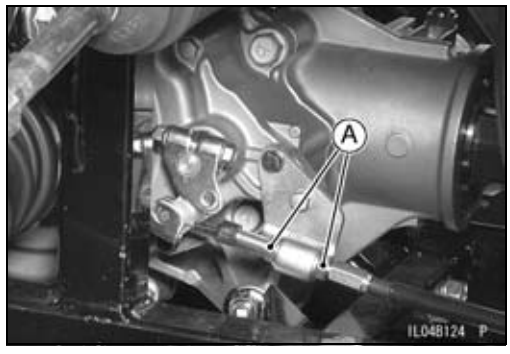
- When installing the new cable, set the cable as shown in the figure.
  Differential Shift Cable [A]
  Differential Shift Cable Locknuts [B]
  6.5 ±0.5 mm (0.26 ±0.02 in.) [C]



- Tighten:

Torque - Differential Shift Cable Locknuts [A]: 10.8 N·m (1.1 kgf·m, 95 in·lb)

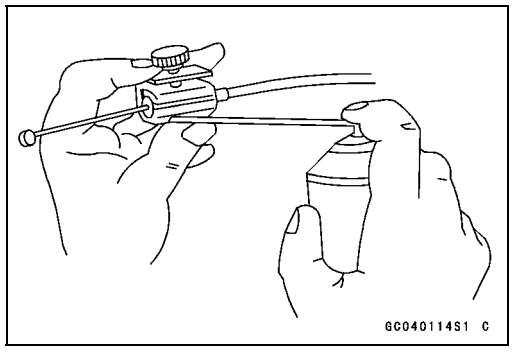
- Check the differential shift lever play (see Differential Shift Lever Play Inspection in the Periodic Maintenance chapter).



Differential Shift Cable Lubrication

Whenever the differential shift cable is removed, lubricate the cable as follows:

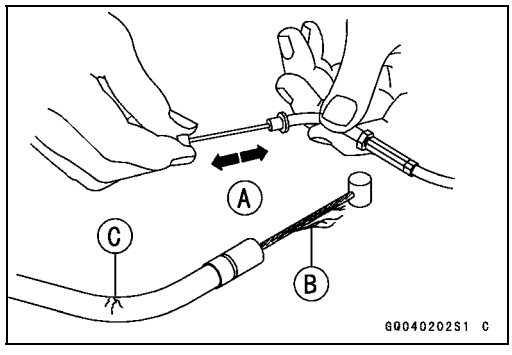
- Apply a small amount of multi-purpose grease to the cable (both ends).
- Lubricate the cable with a penetrating aerosol cable lubricant through the pressure cable luber.



Differential Shift Cable Inspection

- With the differential shift cable disconnected at both ends, the cable should move freely within the cable housing.

★ If the cable does not move freely [A] after lubricating, if the cable is frayed [B], or if the housing is kinked [C], replace the cable.

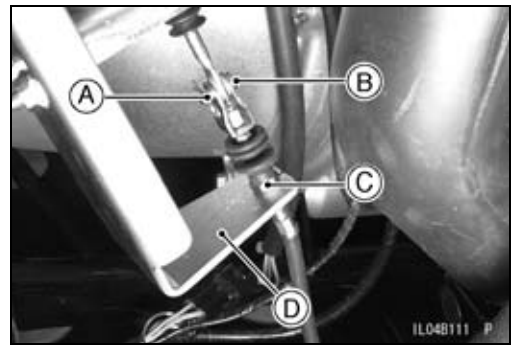


2WD/4WD Shift Cable Removal

- Remove:
  Seat Lower Cover (see Seat Lower Cover Removal in the Frame chapter)
  Right Bracket (see Right Bracket Removal in the Frame chapter)

Front Final Gear Case

- Remove:
  Snap Pin [A]
  Pin [B] and Washer
- Loosen the nut [C] and remove the 2WD/4WD shift cable from the bracket [D].



- Remove:
  2WD/4WD Shift Cable Locknuts [A]
  2WD/4WD Shift Cable End [B]
- Remove the 2WD/4WD shift cable from the frame.

2WD/4WD Shift Cable Installation

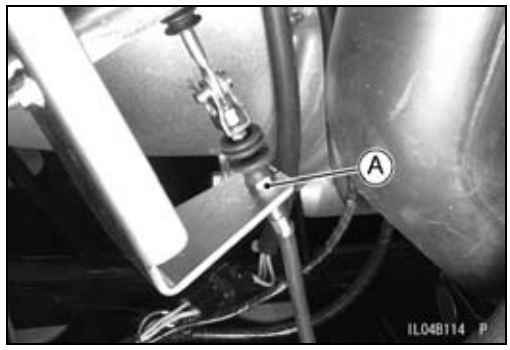
- Apply grease to the front end of the cable.
- Run the 2WD/4WD shift cable according to the Cable, Wire and Hose Routing section in the Appendix chapter.
- Install:
  2WD/4WD Shift Cable Rear End
  2WD/4WD Shift Cable Front End
  Pin and Washer
  Snap Pin
- Support the vehicle on a stand or a jack so that the all wheels are off the ground.
- Shift the transmission in neutral position.

- Remove:
  Vacuum Hose [A]

Front Final Gear Case

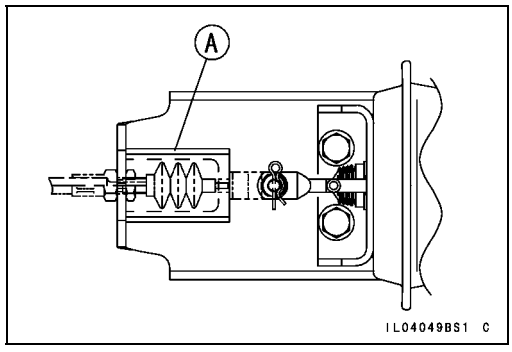
- Tighten:

Torque - 2WD/4WD Shift Cable Locknut [A]: 4.4 N·m (0.45 kgf·m, 39 in·lb)



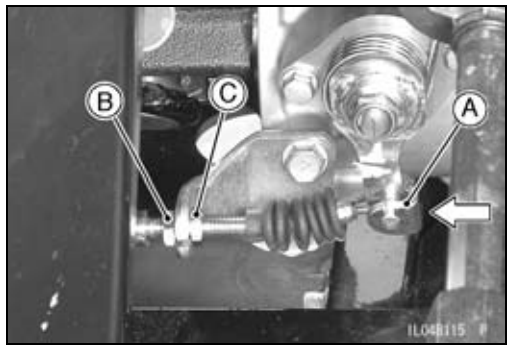
- Install the cable tension adjusting tool [A] on the cable and between the brackets as shown in the figure.

Special Tool - Cable Tension Adjusting Tool: 57001-1716

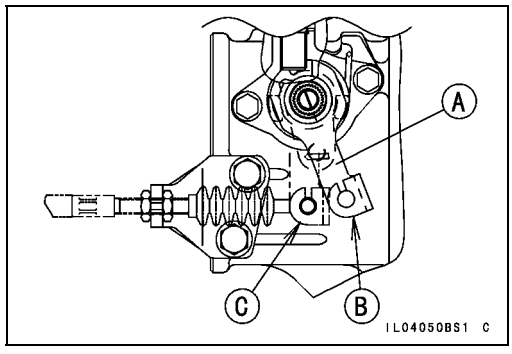


- Push the 2WD/4WD shift shaft lever [A] forward (4WD position) and make the engagement of the shifter maximum while turning the propeller shaft by hand.
- Turn the nut [B] with fingers and pull slightly the inner cable.
- Tighten:

Torque - 2WD/4WD Shift Cable Locknut [C]: 4.4 N·m (0.45 kgf·m, 39 in·lb)

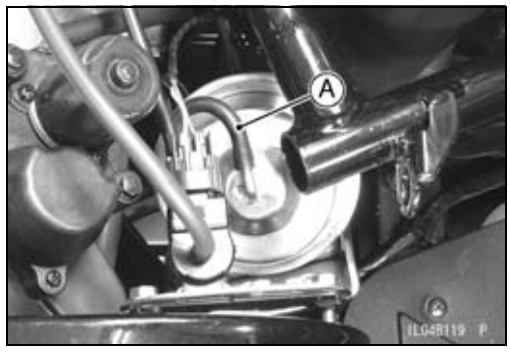


- Remove the cable tension adjusting tool.
- Confirm the 2WD/4WD shift shaft lever [A] return to 2WD position [B].
  4WD Position [C]
- Install the vacuum hose to the actuator.
- Install the removed parts.



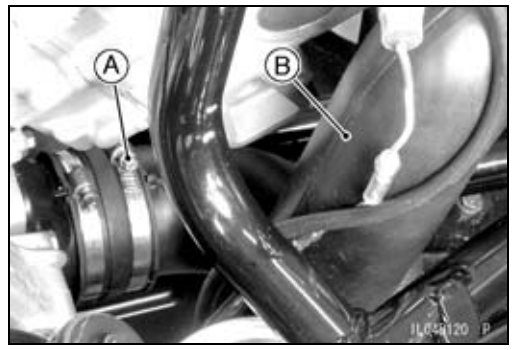
2WD/4WD Vacuum Actuator Removal

- Remove:
  Seat Lower Cover (see Seat Lower Cover Removal in the Frame chapter)
  Right Bracket (see Right Bracket Removal in the Frame chapter)
  Vacuum Hose [A]

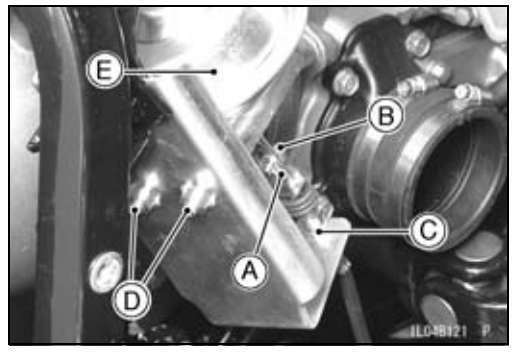


Front Final Gear Case

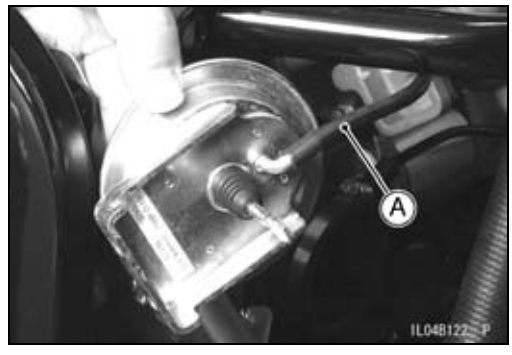
- Loosen the clamp screw [A] and duct [B].



- Remove:
  Snap Pin [A]
  Pin [B] and Washer
- Loosen the nut [C] and remove the 2WD/4WD shift cable from the bracket.
- Remove:
  2WD/4WD Vacuum Actuator Mounting Bolts [D]
  2WD/4WD Vacuum Actuator [E]



- Remove:
  Lower Hose [A]



2WD/4WD Vacuum Actuator Installation

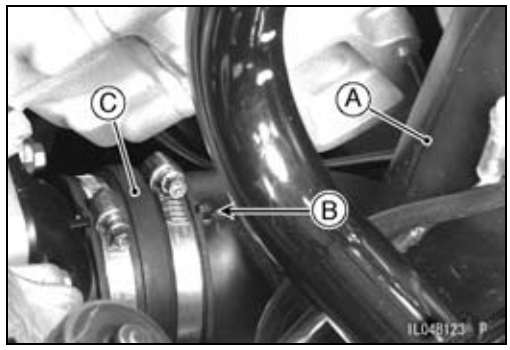
- Install:
  Lower Hose
- Install the 2WD/4WD vacuum actuator to the bracket and tighten the 2WD/4WD vacuum actuator mounting bolts.

Torque - 2WD/4WD Vacuum Actuator Mounting Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Install:
  2WD/4WD Shift Cable (see 2WD/4WD Shift Cable Installation)

Front Final Gear Case

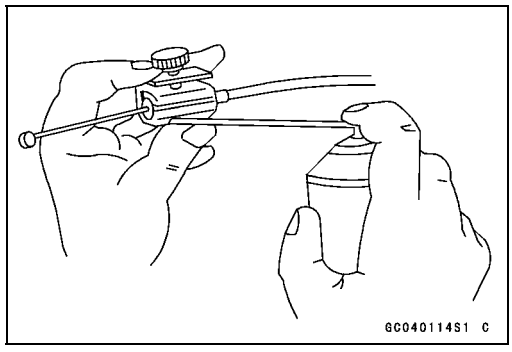
- Install the duct [A] so that the projection [B] of the duct inserts the groove of the rubber duct [C].
- Install the removed parts.



2WD/4WD Shift Cable Lubrication

Whenever the 2WD/4WD shift cable is removed, lubricate the cable as follows:

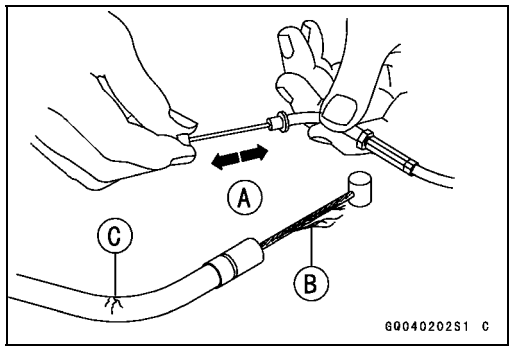
- Apply a small amount of multi-purpose grease to the cable (both ends).
- Lubricate the cable with a penetrating aerosol cable lubricant through the pressure cable luber.



2WD/4WD Shift Cable Inspection

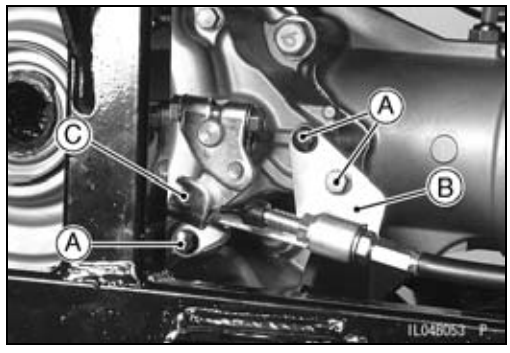
- With the 2WD/4WD shift cable disconnected at both ends, the cable should move freely within the cable housing.

★ If the cable does not move freely [A] after lubricating, if the cable is frayed [B], or if the housing is kinked [C], replace the cable.

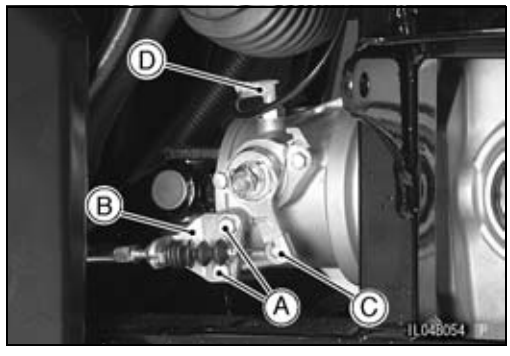


Front Final Gear Case Removal

- Drain the gear case oil (see Front Final Gear Case Oil Change in the Periodic Maintenance chapter).
- Remove:
  Front Bottom Guard (Front Bottom Guard Removal in the Frame chapter)
  Front Axles (see Front Axle Removal)
  Front Propeller Shaft (Front Propeller Shaft Removal)
  Differential Shift Cable Holder Bolts [A] and Cable Holder [B]
  Differential Shift Cable End [C]

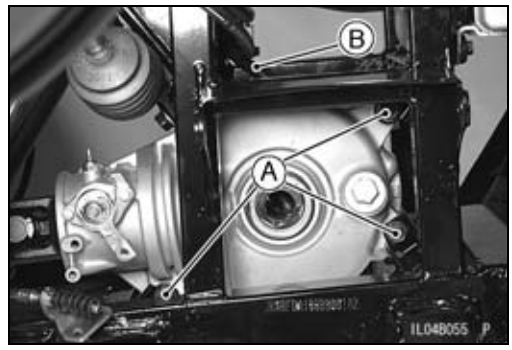


- Remove:
  Cable Holder Bolts [A] and Cable Holder [B]
  2WD/4WD Shift Cable End [C]
  2WD/4WD Shift Position Switch Lead Connector [D]

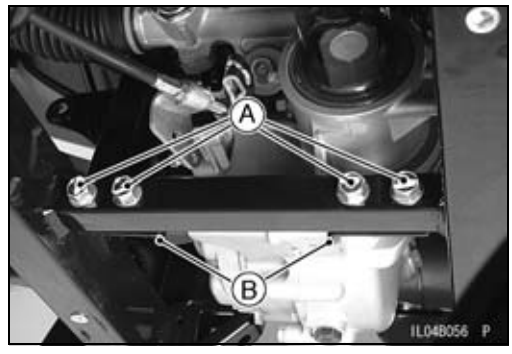


Front Final Gear Case

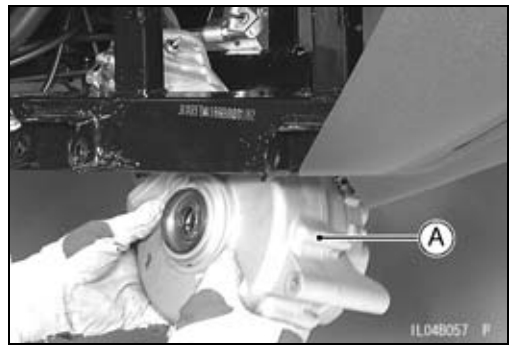
- Remove:
  Front Final Gear Case Mounting Bolts [A] and Nuts
  Breather Hose [B]



- Remove:
  Front Final Gear Case Bracket Bolts [A]
  Brackets [B]



- Remove front final gear case [A] from under the vehicle.



Front Final Gear Case Installation

- Install:
  Front Final Gear Case
  Front Side Bolts (2) and Nuts
  Front Final Gear Case Bracket and Bolts
  Rear Side Bolt and Nut
- Tighten:

Torque - Front Final Gear Case Bracket Bolts: 91 N·m (9.3 kgf·m, 67 ft·lb)
Front Final Gear Case Mounting Nuts: 91 N·m (9.3 kgf·m, 67 ft·lb)

- Install:
  Breather Hose
  2WD/4WD Shift Cable End (see 2WD/4WD Shift Cable Installation)
  2WD/4WD Shift Cable Holder and Bolts
  2WD/4WD Shift Position Switch Lead Connector
- Apply a non-permanent locking agent to the holder bolts.
- Tighten:

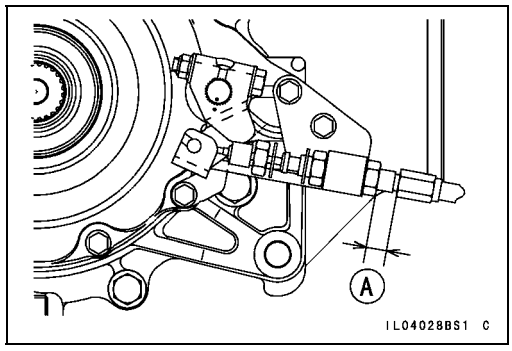
Torque - 2WD/4WD Shift Cable Holder Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

Front Final Gear Case

- Install:
  Differential Shift Cable End (see Variable Shift Cable Installation)
  Differential Shift Cable Holder and Bolts
- Tighten:

Torque - Front Final Gear Case Left Cover Bolts (M6): 8.8 N·m (0.90 kgf·m, 78 in·lb)
Differential Shift Cable Holder Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Install the differential shift cable so that the distance [A] between the nut and casing cap is 6 mm (0.24 in.).



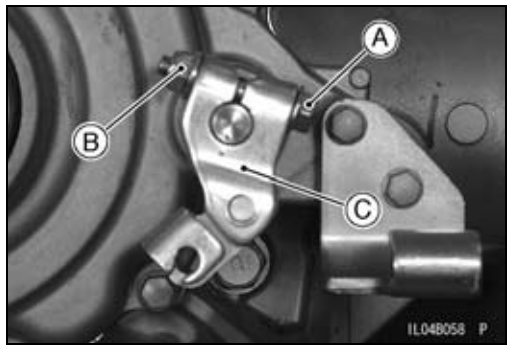
- Install the drain plug.
- Tighten:

Torque - Front Final Gear Case Oil Drain Plug: 15 N·m (1.5 kgf·m, 11 ft·lb)

- Install the removed parts.
- Fill the front final gear case with the specified oil (see Front Final Gear Case Oil Change in the Periodic Maintenance chapter)

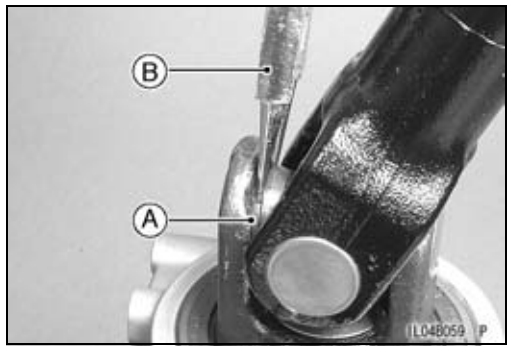
Front Final Gear Case Disassembly

- Remove:
  Front Final Gear Case (see Front Final Gear Case Removal)
  Differential Control Shift Shaft Lever Bolt [A] and Nut [B]
  Differential Control Shift Shaft Lever [C]



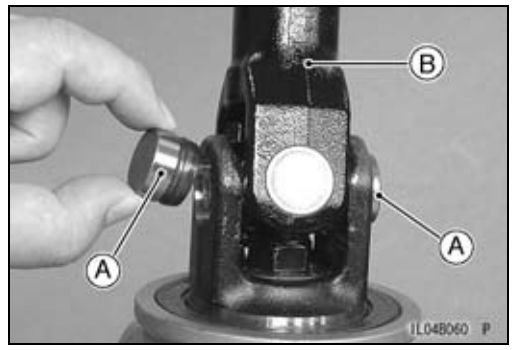
- Remove:
  Snap Rings [A] (both sides)

Special Tool - Outside Circlip Pliers [B]: 57001-144

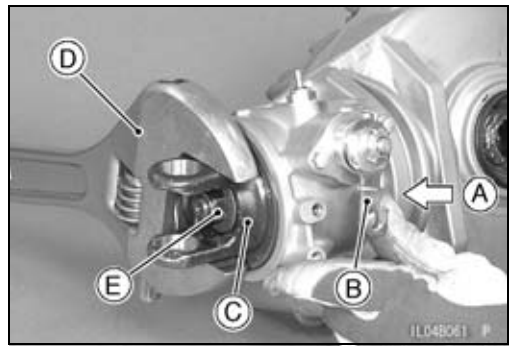


Front Final Gear Case

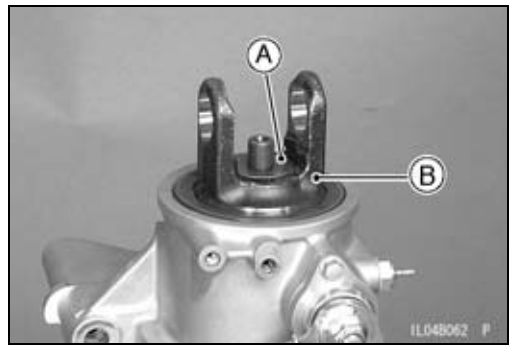
- Remove:
  Caps [A]
  Yoke [B]



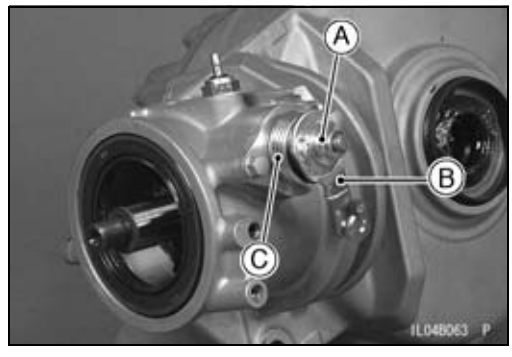
- Push [A] and hold the 2WD/4WD shift shaft lever [B].
- Hold the coupling [C] with a wrench [D].
- Remove:
  Coupling Nut [E]



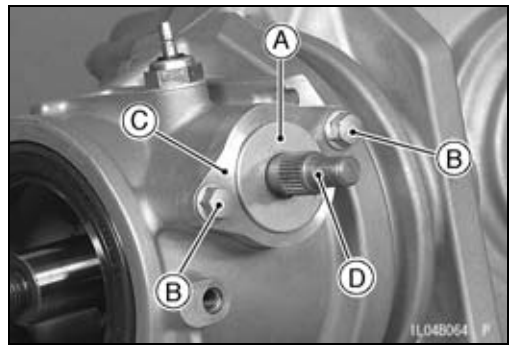
- Remove:
  Washer [A]
  Coupling [B]



- Remove:
  2WD/4WD Shift Shaft Lever Nut [A]
  2WD/4WD Shift Shaft Lever [B]
  Spring [C]

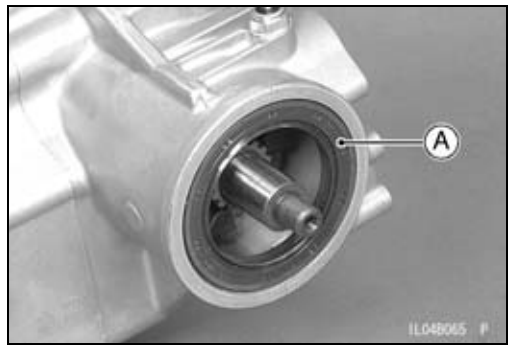


- Remove:
  Washer [A]
  2WD/4WD Shift Shaft Cover Bolts [B]
  2WD/4WD Shift Shaft Cover [C]
  2WD/4WD Shift Shaft [D]

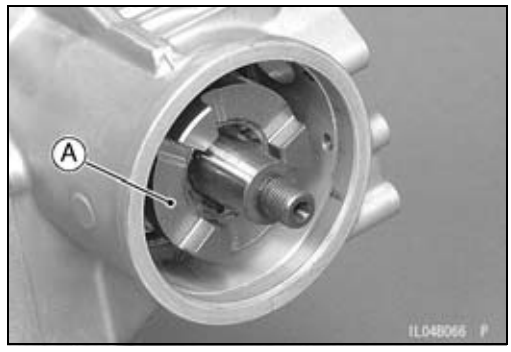


Front Final Gear Case

- Remove:
  Oil Seal [A]



- Remove:
  Shifter [A]

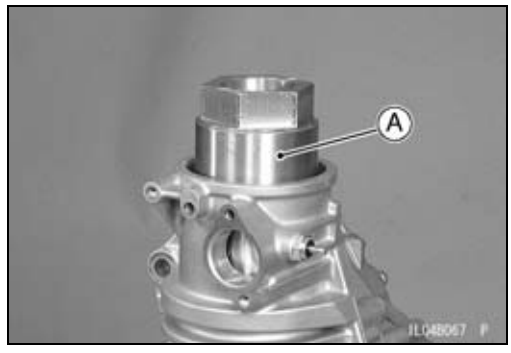


- Hold the front final gear case in a vice, and remove the bearing holder using the socket wrench [A].

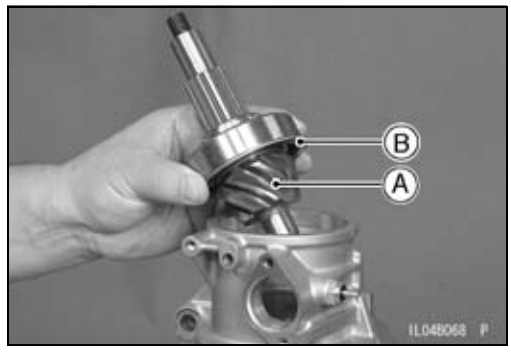
  Special Tool - Socket Wrench, Hex 50: 57001-1478

★If the holder seems too difficult to break free, apply heat to softer the locking agent.

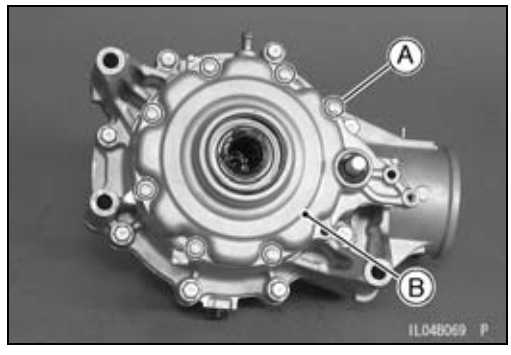
- Remove:
  Pinion Gear Bearing Holder



- Remove:
  Pinion Gear Unit [A]
  Shim(s) [B]

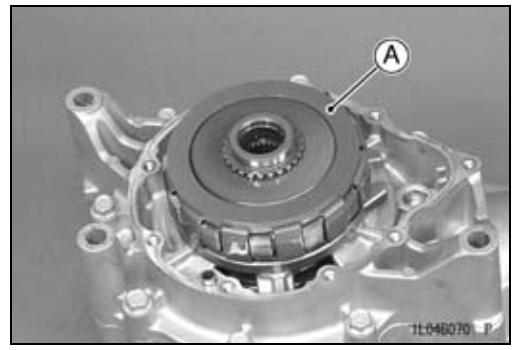


- Remove:
  Front Final Gear Case Left Cover Bolts [A]
  Front Final Gear Case Left Cover [B]
  Differential Control Shift Shaft
  Spring

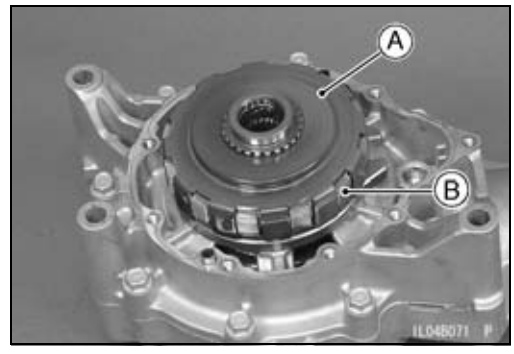


Front Final Gear Case

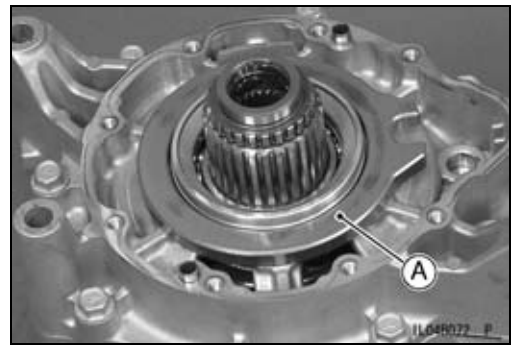
- Remove:
  Outer Disc [A]
  Needle Bearing



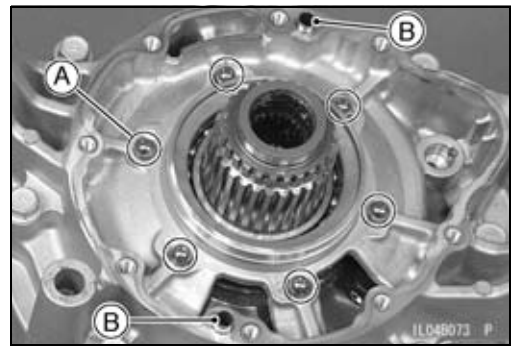
- Remove:
  Housing [A] and Differential Disc Assembly [B]
  Inner Disc
  Needle Bearing



- Remove:
  Cam Plate [A]

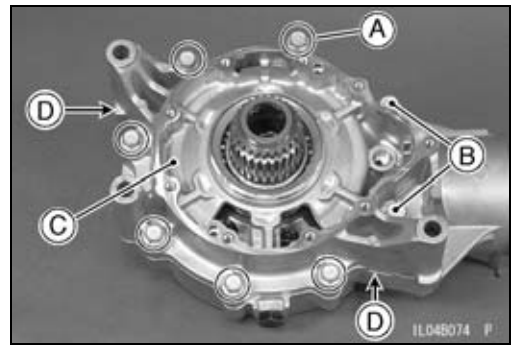


- Remove:
  Steel Balls [A]
  Dowel Pins [B]



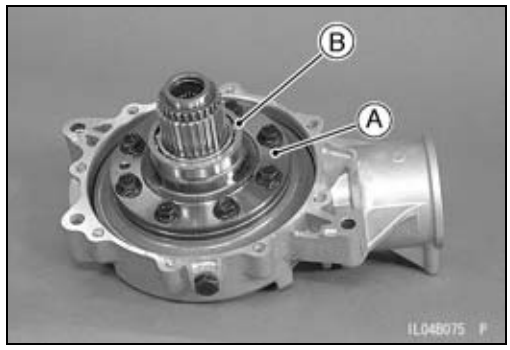
- Remove:
  Front Final Gear Case Center Cover Bolts (M8) [A]
  Front Final Gear Case Center Cover Bolts (M10) [B]
  Front Final Gear Case Center Cover [C]

○Using the pry points [D], remove the cover.



Front Final Gear Case

- Remove:
  Ring Gear Assembly [A]
  Shim(s) [B]



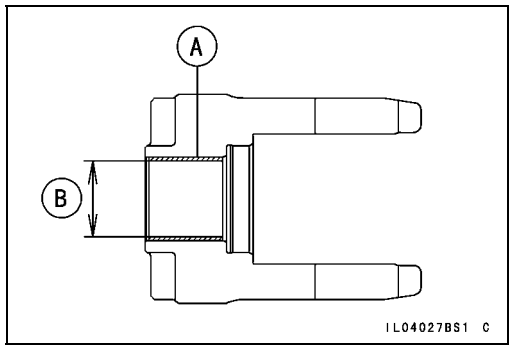
Front Final Gear Case Coupling Inspection

★If the coupling bushing [A] is damaged or worn, replace the front final gear case coupling.

Front Final Gear Case Coupling Bushing Inside Diameter [B]

Standard: 20.000 ~ 20.021 mm (0.7874 ~ 0.7882 in.)

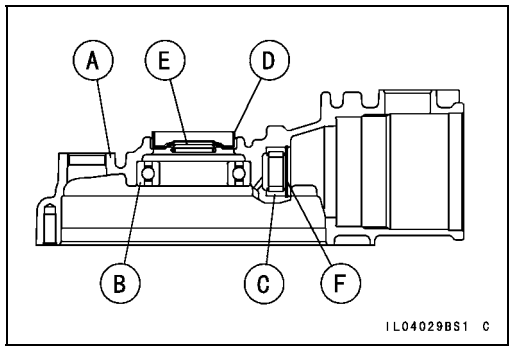
Service Limit: 20.051 mm (0.7894 in.)



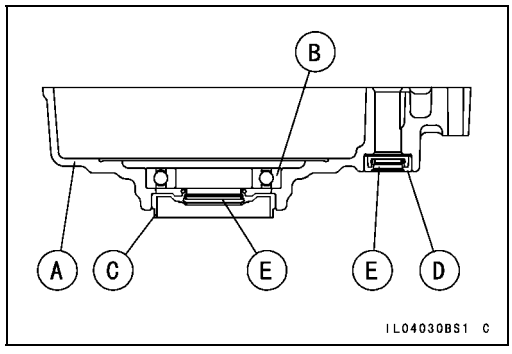
Front Final Gear Case Assembly

- Press the following parts in the right cover [A] until they are bottomed.
  Ball Bearing [B]
  Needle Bearing [C]
  Oil Seal [D]
- Apply grease to the oil seal lips [E].
- Install:
  Circlip [F]

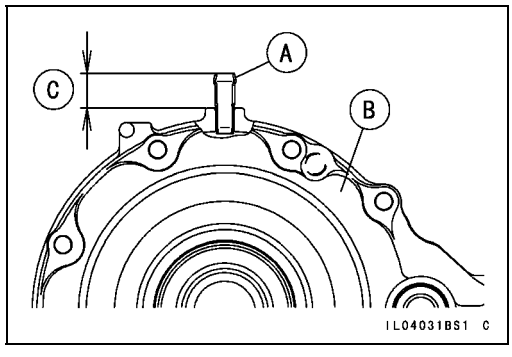
Special Tool - Inside Circlip Pliers: 57001-143



- Press the following parts in the left cover [A] until they are bottomed.
  Ball Bearing [B]
  Oil Seal [C]
- Press the oil seal [D] so that the surface is flush with the end of the hole.
- Apply grease to the oil seal lips [E].



- Press the fitting pipe [A] in the left cover [B] as shown in the figure.
  14 mm (0.55 in.) [C]



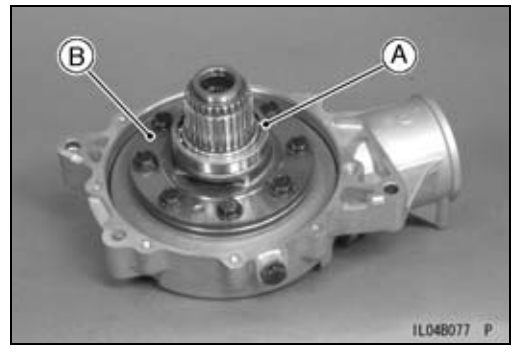
Front Final Gear Case

- Visually check the pinion gear and ring gear for scoring, chipping, or other damage.

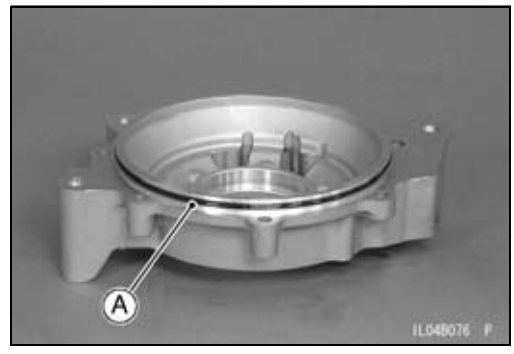
★Replace the bevel gear as a set if either gear is damaged since they are lapped as a set in the factory to get the best tooth contact.

- Refer to the gear backlash and tooth contact pattern (see Front Final Bevel Gear Adjustment).

- Apply engine oil to the teeth of the ring gear.
- Install:
  Shim(s) [A] (both sides)
  Ring Gear Assembly [B]

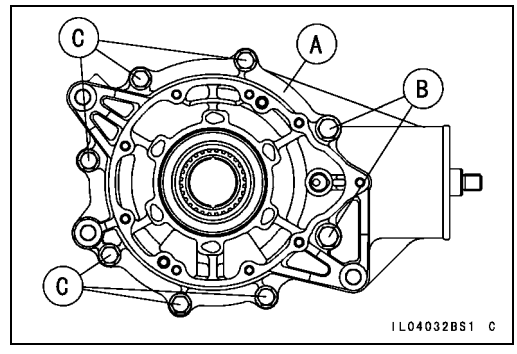


- Apply grease to the O-ring [A] on the front final gear case center cover.

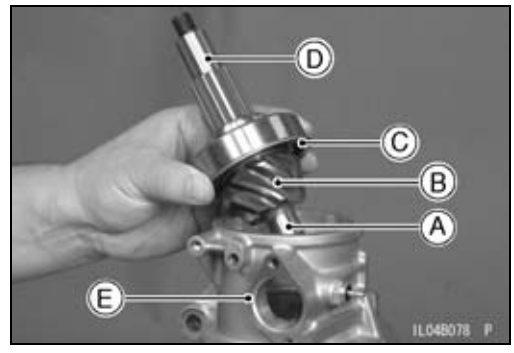


- Install:
  Front Final Gear Case Center Cover [A]
- Apply a non-permanent locking agent:
  Front Final Gear Case Center Cover Bolts (M10) [B]
  Front Final Gear Case Center Cover Bolts (M8) [C]
- Tighten:

Torque - Front Final Gear Case Center Cover Bolts (M10): 49 N·m (5.0 kgf·m, 36 ft·lb)
Front Final Gear Case Center Cover Bolts (M8): 24 N·m (2.4 kgf·m, 18 ft·lb)



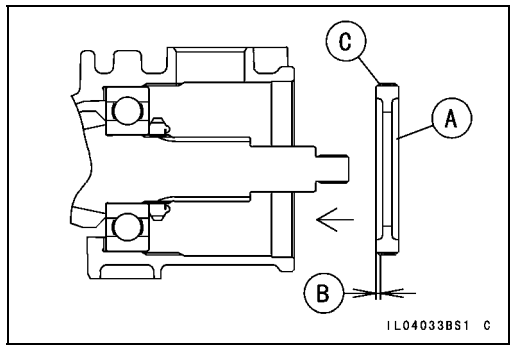
- Apply engine oil to the journal [A] and teeth [B].
- Insert the shim [C] and pinion gear unit [D] in the front final gear case right cover [E].



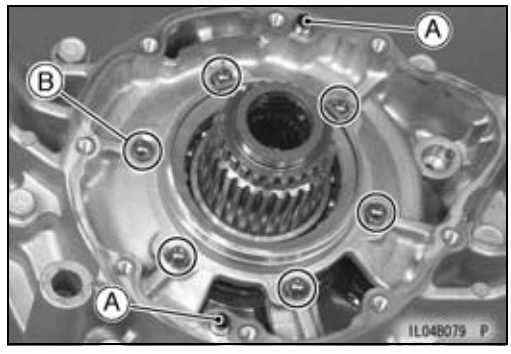
Front Final Gear Case

- Apply a non-permanent locking agent to the pinion gear bearing holder [A], but do not apply a non-permanent locking agent to one pitch [B] from the tip.
- Install the pinion gear bearing holder so that the no coating side [C] faces the bearing.
- Tighten:

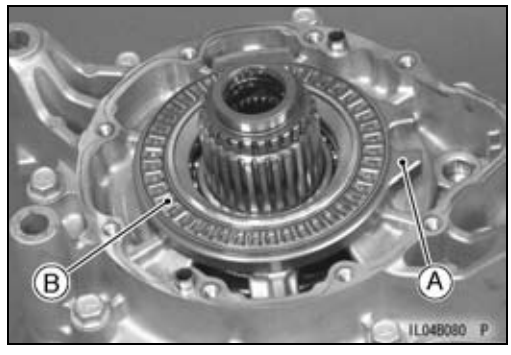
Torque - Pinion Gear Bearing Holder: 250 N·m (25 kgf·m, 184 ft·lb)



- Install:
  Dowel Pins [A]
  Steel Balls [B]

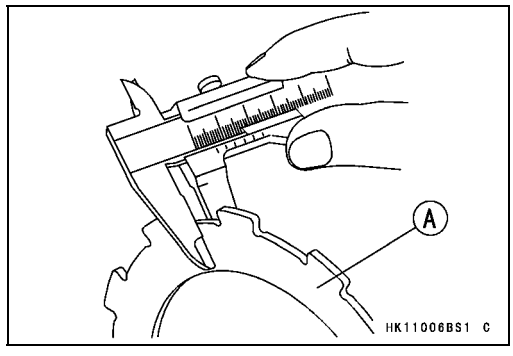


- Install:
  Cam Lever [A]
  Needle Bearing [B]
- Apply engine oil to the needle bearing.



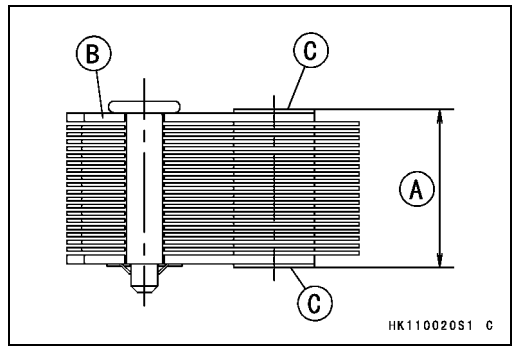
- Check the wear of the disc assembly as follows.

○Measure the thickness of the inner disc [A].



Front Final Gear Case

● Select the width [A] of the disc assembly [B] in accordance with the thickness of the inner disc, refer to the below table.



Thickness of Inner Disc Assembly	Width [A] of Disc Assembly
2.4 mm (0.0945 in.)	16.7 ~ 17.3 mm (0.6675 ~ 0.6811 in.)
1.8 mm (0.0709 in.)	17.31 ~ 17.9 mm (0.6815 ~ 0.7047 in.)
1.2 mm (0.0472 in.)	17.91 ~ 18.5 mm (0.7051 ~ 0.7283 in.)

○Measure the width of the disc assembly at three locations, and calculate average for three points.

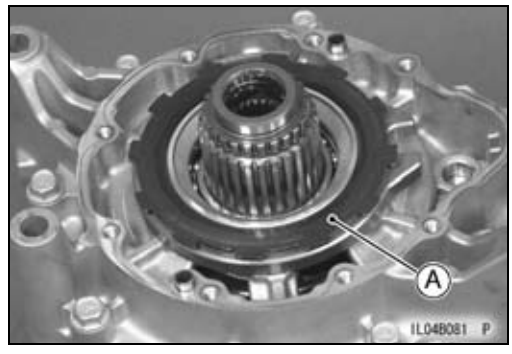
NOTE

○*Be careful not to damage the facing surface [C] on the outer plates.*

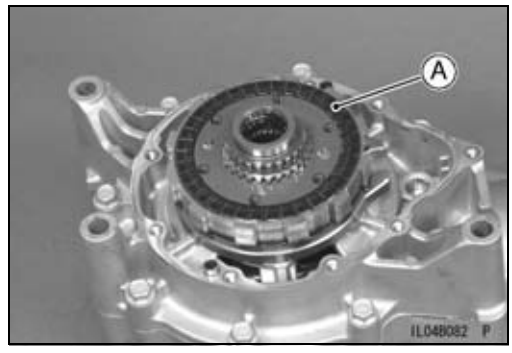
★If the width is within the specified range, install the inner disc and disc assembly.

★If the width is not within the specified range, replace the disc assembly.

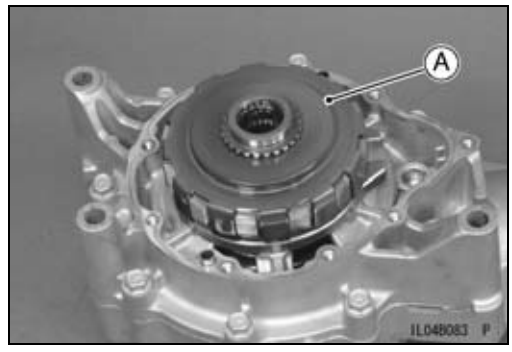
● Install:
Inner Disc [A]



● Install:
Disc Assembly [A]

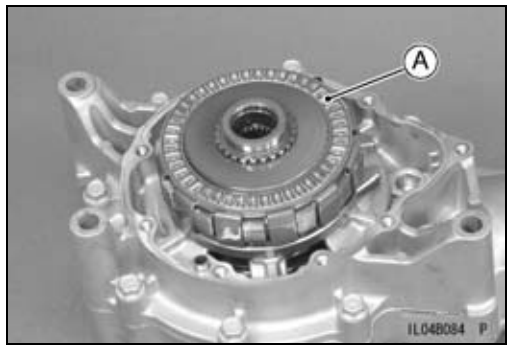


● Install:
Housing [A]

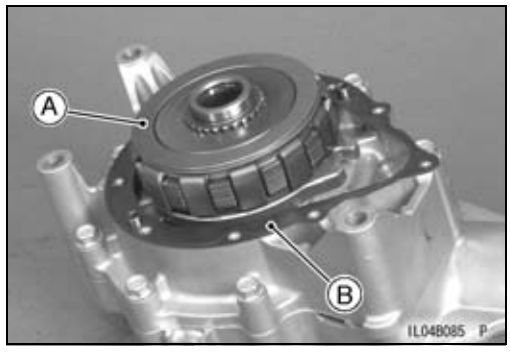


Front Final Gear Case

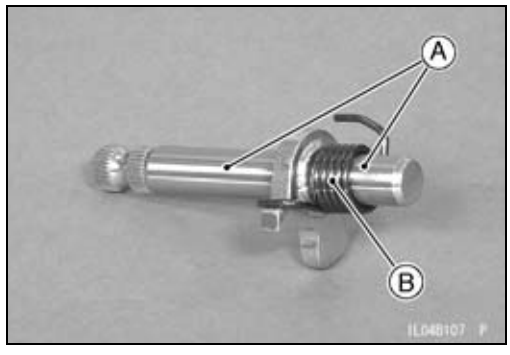
- Apply engine oil to the needle bearing [A].
- Install:
  Needle Bearing



- Install:
  Outer Disc [A]
  New Gasket [B]

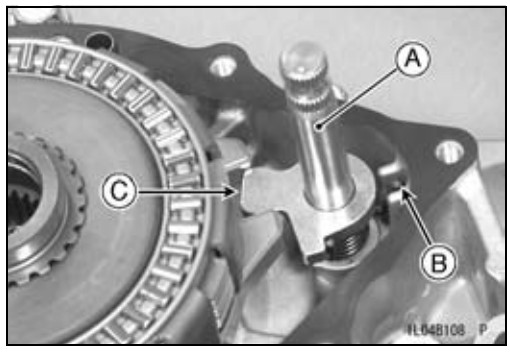


- Apply engine oil to the differential control shift shaft [A].
- Install the spring [B] as shown in the figure.



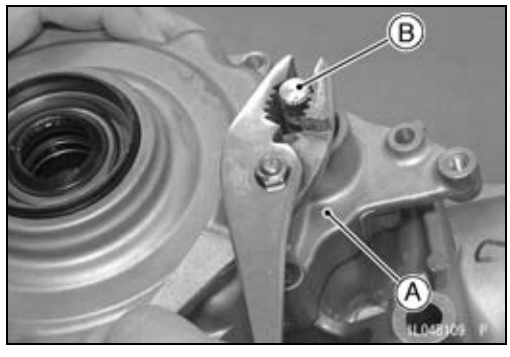
- Install the shaft [A] and spring in the front final gear case as shown in the figure.

○Insert the spring end into the slit [B] and insert the tab of the shift shaft into the groove [C] of the cam plate.



- Install:
  Front Final Gear Case Left Cover [A]

○To fix the cover turn the shaft [B] counterclockwise.

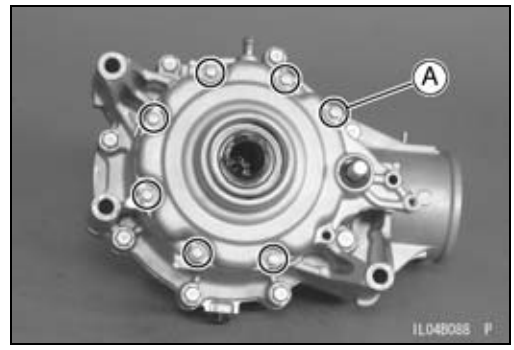


Front Final Gear Case

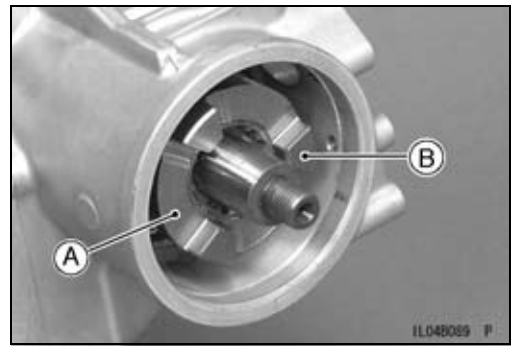
● Tighten:

Torque - Front Final Gear Case Left Cover Bolts (M6) [A]: 8.8 N·m (0.90 kgf·m, 78 in·lb)

L = 35 mm (1.4 in.)



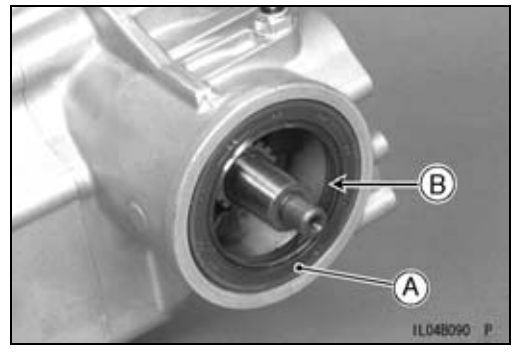
● Apply grease to the shifter splines and groove.
● Install:
Shifter [A]
○Face the dogs side [B] to outside.



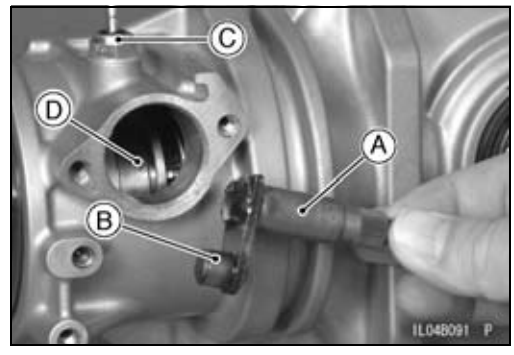
● Press the oil seal [A] in the front final gear case so that the oil seal surface is flush with the case end.

Special Tool - Oil Seal Driver,ϕ80: 57001-1715

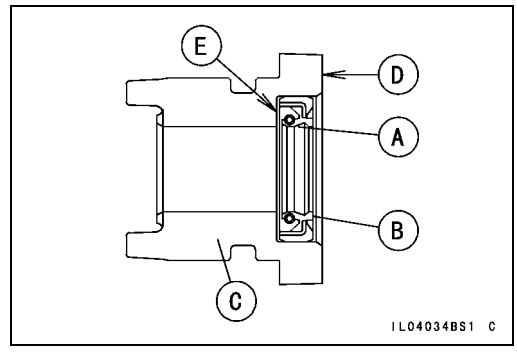
● Apply grease to the oil seal lip [B].



● Apply grease to the shaft [A] and pin [B] of the 2WD/4WD shift shaft lever.
● Insert the 2WD/4WD shift shaft lever so that the pin [B] is opposite side of the 2WD/4WD shift switch [C].
● Insert the pin into the groove [D] of the shifter.

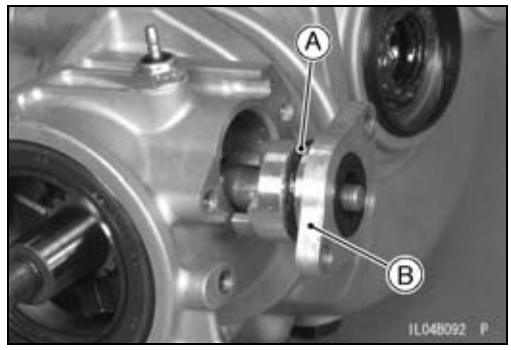


● Apply grease to the oil seal lip [A].
● Press the oil seal [B] in the 2WD/4WD shift shaft cover [C] to the specified position as shown in the figure.
○Do not protrude the oil seal from the surface [D].
○Do not contact the oil seal to the bottom [E].



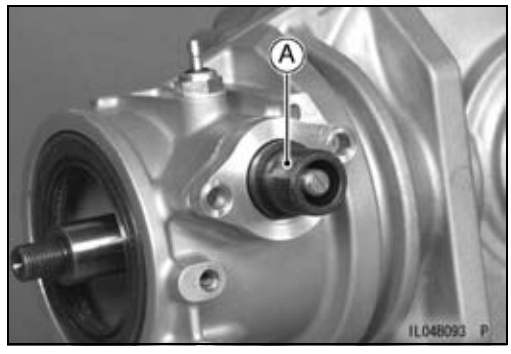
Front Final Gear Case

- Apply grease to the O-ring [A].
- Install:
  2WD/4WD Shift Shaft Cover [B]



○When installing the cover, use the oil seal guide [A] for protecting the oil seal.

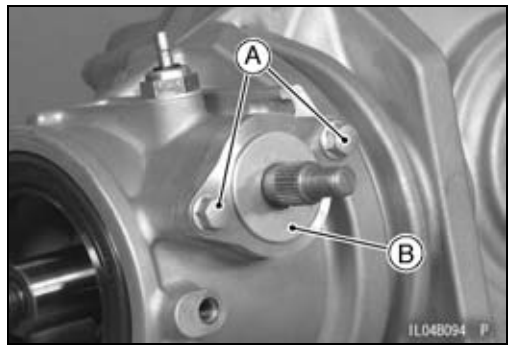
Special Tool - Oil Seal Guide: 57001-1721



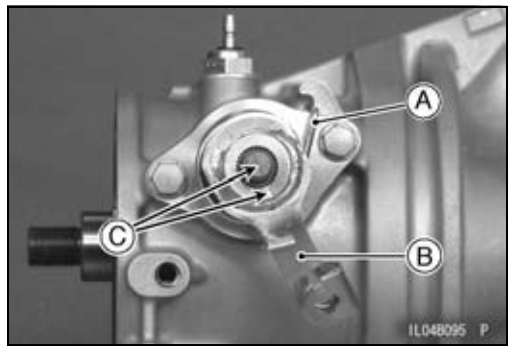
- Apply a non-permanent locking agent to the threads of the shift shaft cover bolts [A] and tighten them.

Torque - 2WD/4WD Shift Shaft Cover Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Install:
  Washer [B]

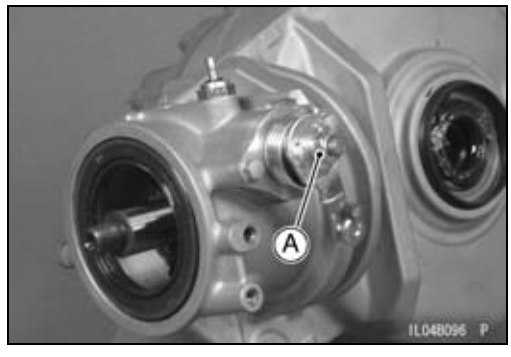


- Install:
  Spring [A]
  2WD/4WD Shift Shaft Lever [B]
- Align the lines [C] of the shaft and lever.



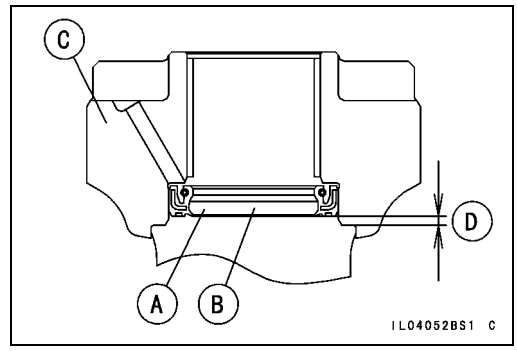
- Install:
  2WD/4WD Shift Shaft Lever Nut [A]
- Tighten:

Torque - 2WD/4WD Shift Shaft Lever Nut: 20 N·m (2.0 kgf·m, 14 ft·lb)

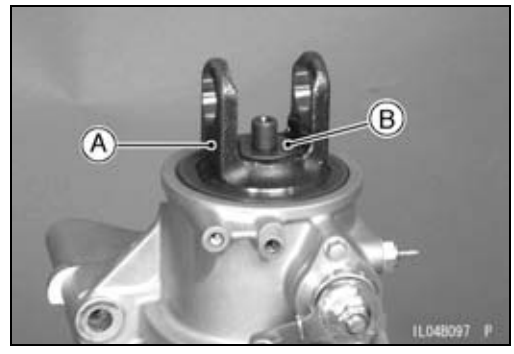


Front Final Gear Case

- Apply grease to the oil seal lip [A].
- Press the oil seal [B] in the coupling [C] as shown in the figure.
  1 ~ 1.5 mm (0.039 ~ 0.059 in.) [D]

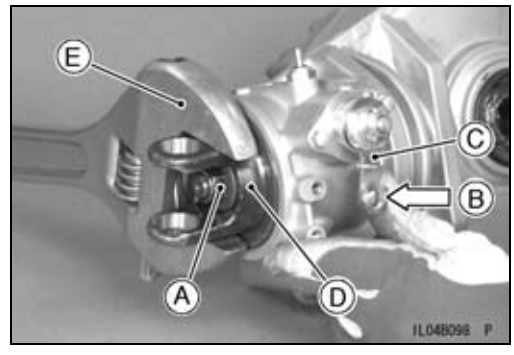


- Install:
  Coupling [A]
  Washer [B]

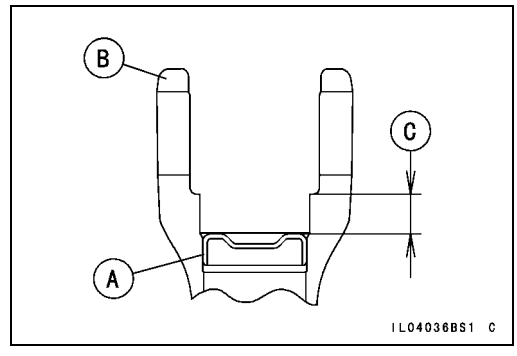


- Install:
  Coupling Nut [A]
- Push [B] and hold the 2WD/4WD shift shaft lever [C].
- Hold the coupling [D] with a wrench [E].
- Tighten:

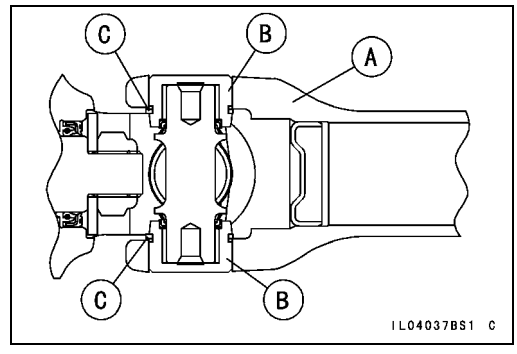
Torque - Coupling Nut: 35 N·m (3.6 kgf·m, 26 ft·lb)



- Press the plug [A] into the yoke [B] as shown in the figure.
  10.5 ±1 mm (0.413 ±0.039 in.) [C]



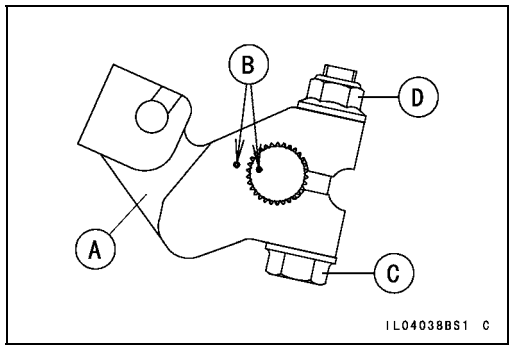
- Install:
  Yoke [A]
  Caps [B]
  New Snap Rings [C]



Front Final Gear Case

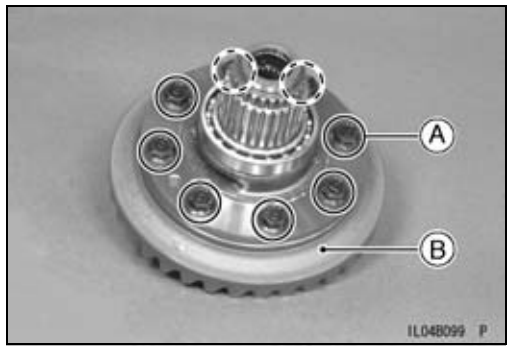
- Install:
  Differential Control Shift Shaft Lever [A]
- Align the punch marks [B] of the shaft and lever.
- Install:
  Differential Control Shift Shaft Lever Bolt [C] and Nut [D]
- Tighten:

Torque - Differential Control Shift Shaft Lever Nut: 8.8 N·m (0.90 kgf·m, 78 in·lb)

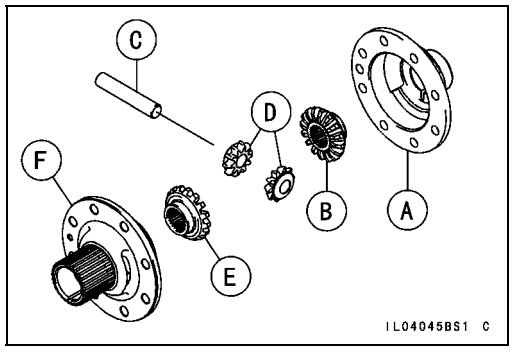


Ring Gear Disassembly

- Remove:
  Ring Gear Assembly (see Front Final Gear Case Disassembly)
  Ring Gear Bolts [A]
  Ring Gear [B]

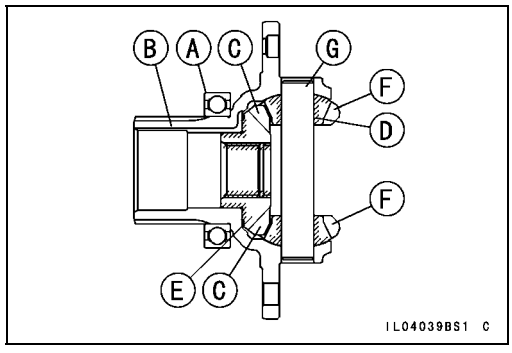


- Remove:
  Differential Gear Case Cover [A]
  Right Side Gear (16T) [B]
  Spider Gear Shaft [C]
  Spider Gears (10T) [D]
  Left Side Gear (16T) [E]
  Left Differential Gear Case [F]



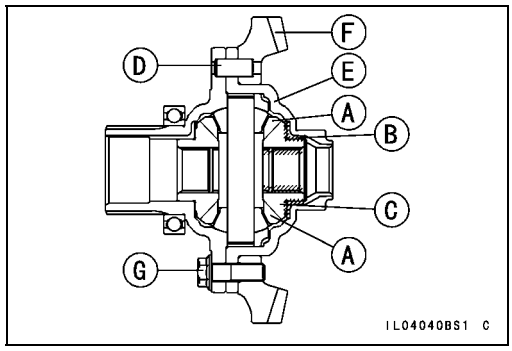
Ring Gear Assembly

- Press the bearing [A] on the left differential gear case [B] until it is bottomed.
- Apply engine oil to the teeth [C] of the gears.
- Apply molybdenum disulfide grease to the diagonal line parts [D].
- Install:
  Left Side Gear (16T)[E]
  Spider Gears (10T) [F]
  Spider Gear Shaft [G]



- Apply engine oil to the teeth [A] of the gear.
- Apply molybdenum disulfide grease to the diagonal line parts [B].
- Install:
  Right Side Gear (16T) [C]
  Pin [D]
  Differential Gear Case Cover [E]
  Ring Gear [F]
- Apply a non-permanent locking agent (Three Bond: TB2471 Blue) to the ring gear bolts [G], and tighten them.

Torque - Ring Gear Bolts: 57 N·m (5.8 kgf·m, 42 ft·lb)



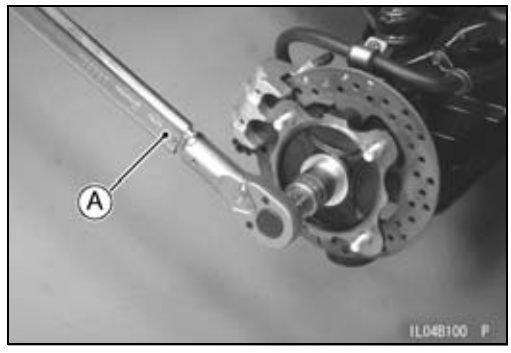
Front Final Gear Case

LSD Clutch Torque Inspection

★If the vehicle has the following symptoms, check the LSD (Limited Slip Differential) clutch torque.
-The steering wheel is hard to turn.
-The front final gear case overheats.
-Abnormal noises come from the front final gear case when rounding a curve.

- Ensure 2WD mode.
- Support the vehicle so that the front wheels are off the ground.
- Remove:
  Left Front Wheel (see Wheel Removal in the Wheels/Tires chapter)
  Front Axle Nut Cotter Pin
- Secure the right front wheel from rotating.
- Pull the differential shift lever (5 notches), and shift to the differential lock position.
- Measure the clutch torque using a torque wrench [A]. Turn the wrench evenly.

○The clutch torque is the mean torque reading during about a quarter turn of the wrench.



LSD Clutch Torque
Standard: 300 N·m (31 kgf·m, 211 ft·lb) or more

★If the clutch torque is out of the specified range, check the width of the disc assembly (see Front Final Gear Case Assembly).

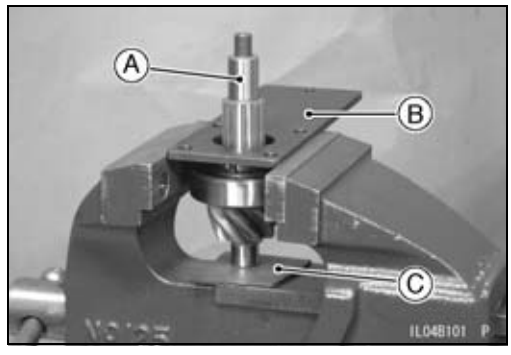
NOTE

○*The correct type of oil must be installed.*

Pinion Gear Unit Disassembly

- Remove:
  Pinion Gear Unit (see Front Final Gear Case Disassembly)
- Hold the pinion gear unit [A] with the socket wrench [B] in a vise and put the rubber mat [C] (1 mm or more) at the bottom of the unit.

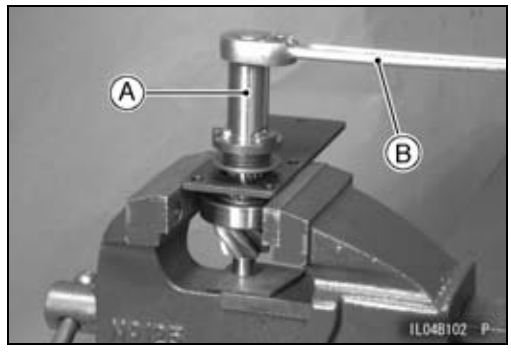
Special Tool - Socket Wrench: 57001-1363



- Loosen the pinion gear bearing holder nut a little with the pinion gear holder [A].

Special Tool - Pinion Gear Holder: 57001-1708

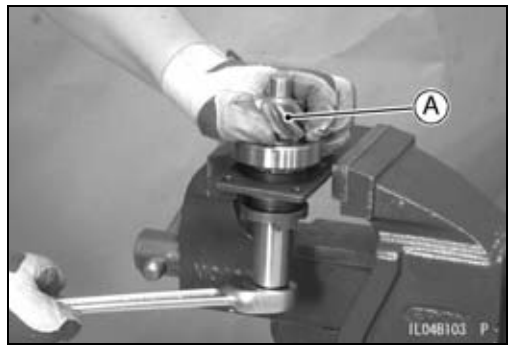
○Turn the wrench [B] clockwise a little.



Front Final Gear Case

- Set the pinion gear unit [A] upside down in a vise as shown in the figure.
- Hold the pinion gear unit and remove the pinion gear bearing holder nut.
- Remove the ball bearing if required.

Special Tool - Bearing Puller: 57001-135



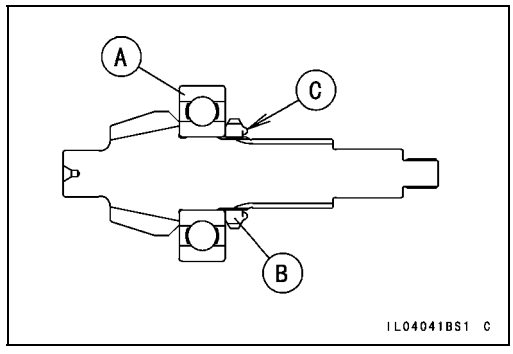
Pinion Gear Unit Assembly

- Visually inspect the bearing for abrasion, color change, or other damage.

★If there is any doubt as to the condition of a bearing, replace the bearing.

- Be sure to check and adjust the bevel gear backlash and tooth contact, when any of the backlash-related parts are replaced (see Front Final Bevel Gear Adjustment).

- Press the ball bearing [A] on the pinion gear until it is bottomed.
- Apply a non-permanent locking agent (Three Bond: TB2471 Blue) to the pinion gear bearing holder nut [B].
- Install the pinion gear bearing holder nut so that the projection [C] faces outward.

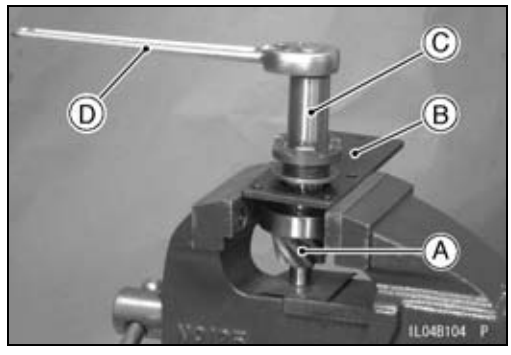


- Hold the pinion gear unit [A] with the socket wrench [B] in a vise (see Pinion Gear Unit Disassembly).

Special Tools - Socket Wrench: 57001-1363
Pinion Gear Holder [C]: 57001-1708

- Turn the wrench [D] counterclockwise and tighten the nut.

Torque - Pinion Gear Bearing Holder Nut: 200 N·m (20 kgf·m, 148 ft·lb)



Front Final Gear Case

Front Final Bevel Gear Adjustment

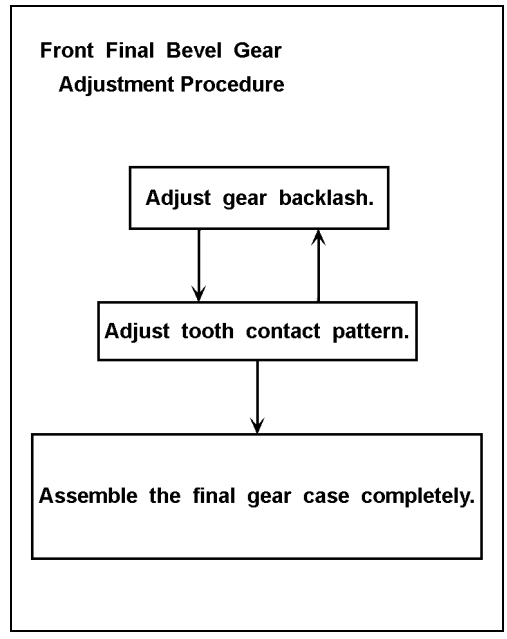
The **backlash** (distance one gear will move back and forth without moving the mate gear) and **tooth contact pattern** of the bevel gears must be correct to prevent the gears from making noise and being damaged.

Above two adjustments are of critical importance and must be carried out following the correct sequence and method.

- When any one of the backlash-related parts are replaced, check and adjust the bevel gear backlash, and tooth contact by replacing shims.

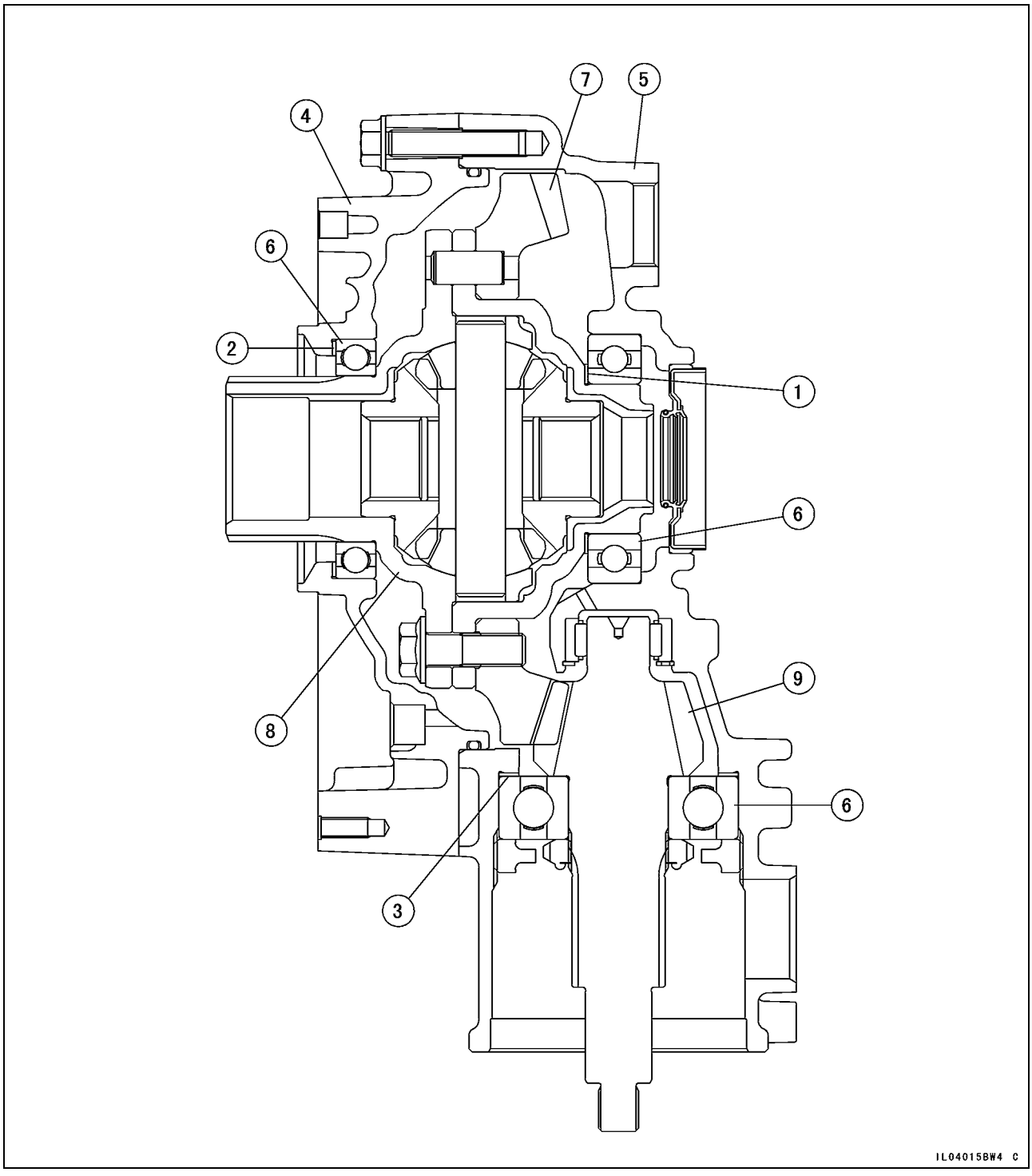
○The amount of backlash is influenced by the ring gear position more than by the pinion gear position.

○Tooth contact location is influenced by the pinion gear position more than by the ring gear position.



Front Final Gear Case

Front Final Gear Case (Backlash-related Parts)



1. Ring Gear Right Shim(s)
2. Ring Gear Left Shim(s)
3. Pinion Gear Shim(s)
4. Front Final Gear Case Center Cover
5. Front Final Gear Case Right Cover
6. Ball Bearings
7. Ring Gear
8. Ring Gear Assembly
9. Pinion Gear

Front Final Gear Case

1. Ring Gear Right Shims for Backlash Adjustment

Thickness	Parts Number
0.15 mm (0.006 in.)	92180-0260
0.2 mm (0.008 in.)	92180-0261
0.5 mm (0.020 in.)	92180-1207
0.8 mm (0.031 in.)	92180-0259
1.0 mm (0.039 in.)	92180-1205
1.2 mm (0.047 in.)	92180-0262

2. Ring Gear Left Shims for Backlasht Adjustment

Thickness	Parts Number
0.15 mm (0.006 in.)	92180-1390
0.2 mm (0.008 in.)	92180-1391
0.5 mm (0.020 in.)	92180-1392
0.7 mm (0.028 in.)	92180-1393
0.8 mm (0.031 in.)	92180-1394
0.9 mm (0.035 in.)	92180-1395
1.0 mm (0.039 in.)	92180-1396
1.1 mm (0.043 in.)	92180-1397
1.2 mm (0.047 in.)	92180-1398

3. Pinion Gear Shims for Tooth Contact Adjustment

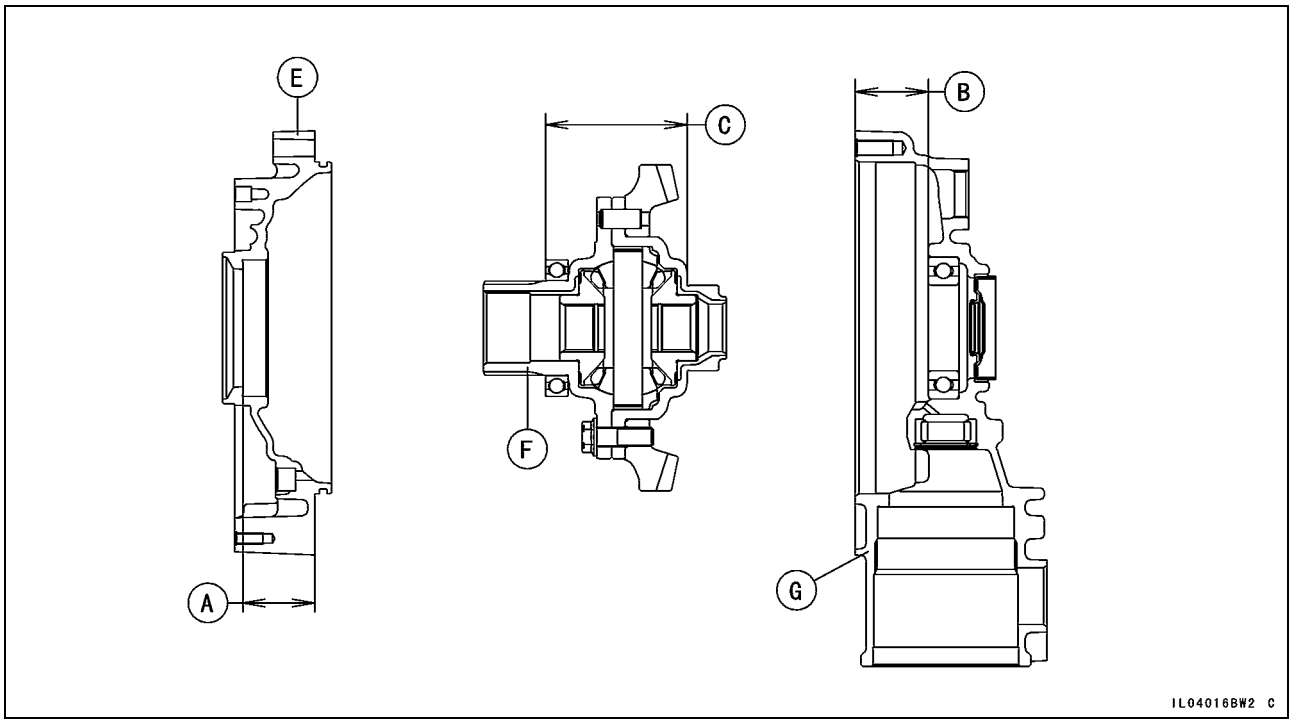
Thickness	Part Number
0.15 mm (0.006 in.)	92180-1423
0.2 mm (0.008 in.)	92180-1424
0.5 mm (0.020 in.)	92180-1425
0.8 mm (0.031 in.)	92180-1426
1.0 mm (0.039 in.)	92180-1427
1.2 mm (0.047 in.)	92180-1428

Front Final Gear Case

Front Final Gear Case Backlash Adjustment

- Clean dirt and oil off bevel gear teeth.
- Measure length [A], [B] and [C], and calculate the clearance [D] between the ring gear assembly and gear case covers.

  [D] = [A] + [B] – [C]



[E] Front Final Gear Case Center Cover
[F] Ring Gear Assembly
[G] Front Final Gear Case Right Cover

- Assemble the front final gear case (see Front Final Gear Case Assembly).

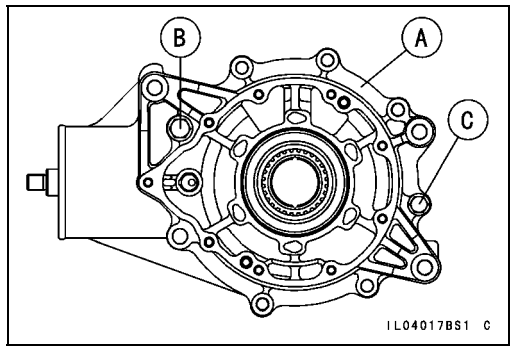
○It is not necessary to install the variable front differential control unit.

○When installing the pinion gear bearing holder, a non-permanent locking agent is not used.

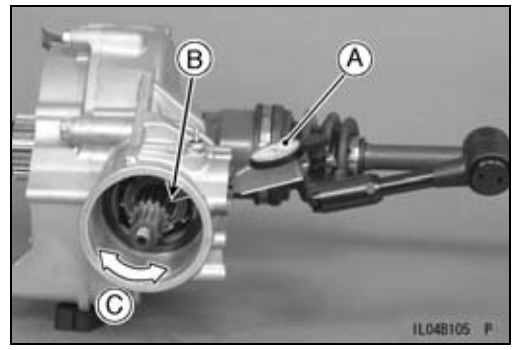
○Use the following two spare bolts when installing the front final gear case center cover [A].

M10 Bolt [B] L = 35 mm (1.38 in.), P = 1.25 mm (0.049 in.)

M8 Bolt [C] L = 40 mm (1.57 in.), P = 1.25 mm (0.049 in.)



Front Final Gear Case



- Temporarily install the right front axle in the gear case and hold it in a vise.
- Mount a dial gauge [A] so that the tip of the gauge is against the splined portion [B] of the pinion gear shaft.
- To measure backlash, turn the pinion gear shaft right and left [C] while holding the front axle steady. The difference between the highest and lowest gauge reading is the amount of backlash.

○Measure backlash at three locations (equally spaced on the splines).

Front Final Bevel Gear Backlash

Standard: 0.08 ~ 0.16 mm (0.003 ~ 0.006 in.)
(at pinion gear spline)

★If the backlash is not within the standard, replace the ring gear shims according to the below NOTE. To increase backlash, increase the thickness of the shim(s) [1] and decrease the thickness of the shim(s) [2]. To decrease backlash, decrease the thickness of the shim(s) [1] and increase the thickness of the shim(s) [2].

NOTE

○*The total of the ring gear shims, [1] and [2], should be less than [D] (the clearance between the ring gear assembly and gear case covers).*

○*Example:*

D = 2.34 mm →[1] + [2] = 2.30 mm

D = 2.26 mm →[1] + [2] = 2.25 mm

○The second decimal of the total of [1] and [2] should be .x0 or .x5 nearest of D.

- Recheck the backlash, and readjust if necessary.

Front Final Gear Case Tooth Contact Adjustment

- Clean any dirt and oil off the bevel gear teeth.
- Apply checking compound to 4 or 5 teeth on the pinion gear.

NOTE

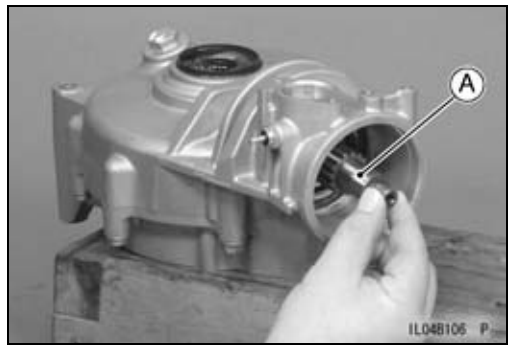
○*Apply checking compound to the teeth in a thin, even coat with a fairly stiff paint brush. If painted too thickly, the exact tooth pattern may not appear.*

○*The checking compound must be smooth and firm, with the consistency of tooth paste.*

○*Special compounds are available at automotive supply stores for the purpose of checking differential gear tooth patterns and contact. Use one of these for checking the bevel gears.*

Front Final Gear Case

- Assemble the front final gear case (see Front Final Gear Case Backlash Adjustment).
- Turn the pinion gear shaft [A] for one revolution in the drive and reverse (coast) direction, while creating a drag on the ring gear.
- Remove the ring gear and pinion gear unit to check the drive pattern and coast pattern of the bevel gear teeth.



○The tooth contact patterns of both (drive and coast) sides should be centrally located between the top and bottom of the tooth. The drive pattern can be a little closer to the toe and the coast pattern can be a somewhat longer and closer to the toe.

★If the tooth contact pattern is incorrect, replace the pinion gear shim(s), following the examples shown.

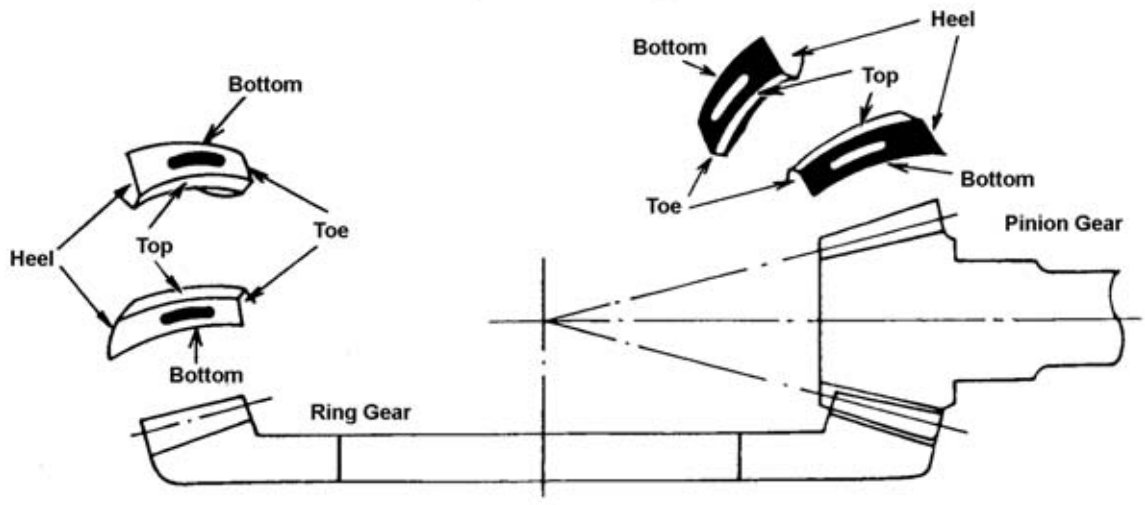
- Then erase the tooth contact patterns and check them again. Also check the backlash every time the shim(s) are replaced. Repeat the shim change procedure as necessary.

NOTE

○*If the backlash is out of the standard range after changing the pinion gear shim(s), change the ring gear shim(s) to correct the backlash before checking the tooth contact pattern.*

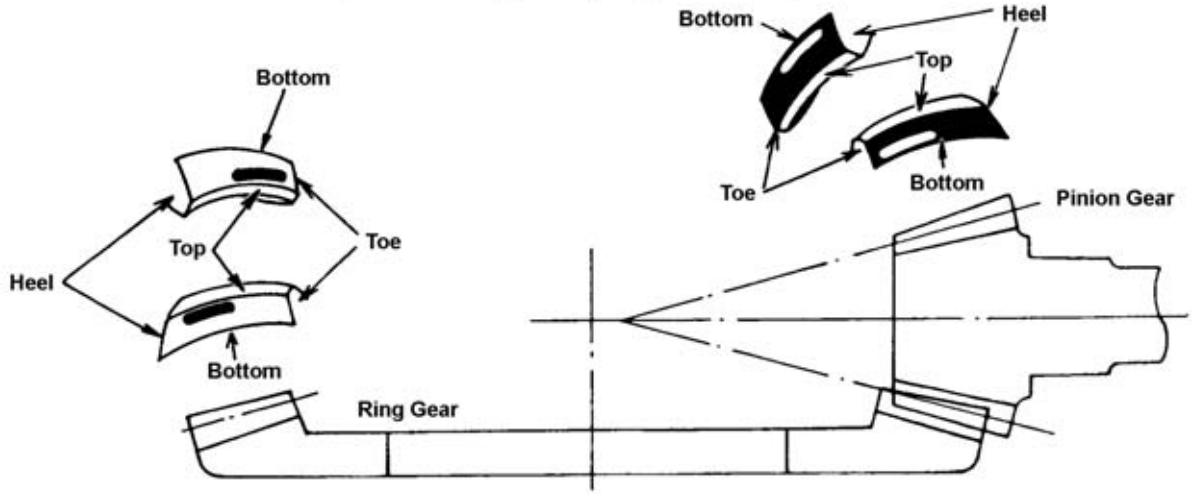
Front Final Gear Case

Correct Tooth Contact Pattern: No adjustment is required.

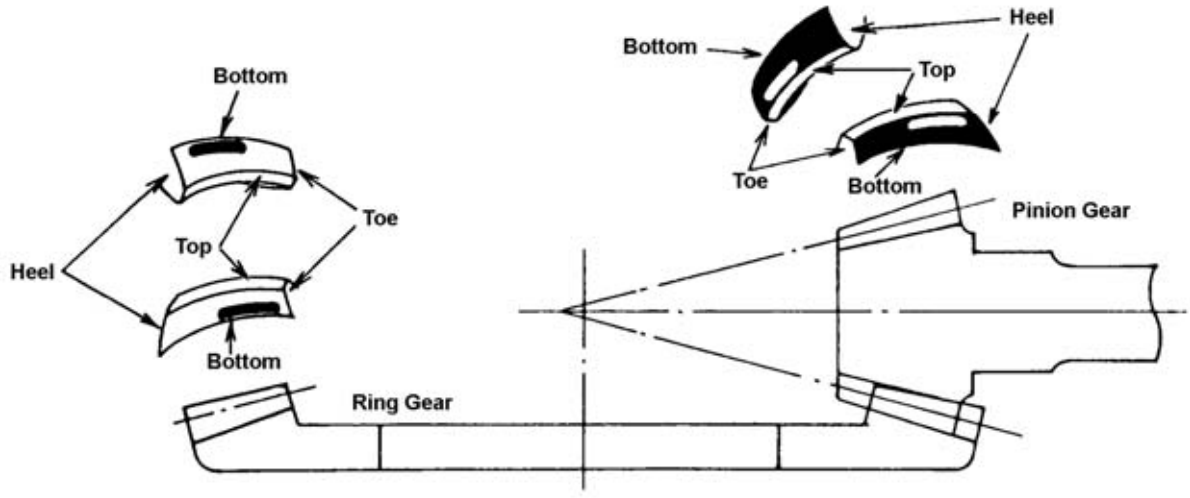


Incorrect Tooth Contact Patterns

Example 1 : Decrease the thickness of the pinion gear shim(s) by 0.1 mm (0.004 in.) to correct the pattern shown below. Repeat in 0.1 mm (0.004 in.) steps if necessary.



Example 2 : Increase the thickness of the pinion gear shim(s) by 0.1 mm (0.004 in.) to correct the pattern shown below. Repeat in 0.1 mm (0.004 in.) steps if necessary.



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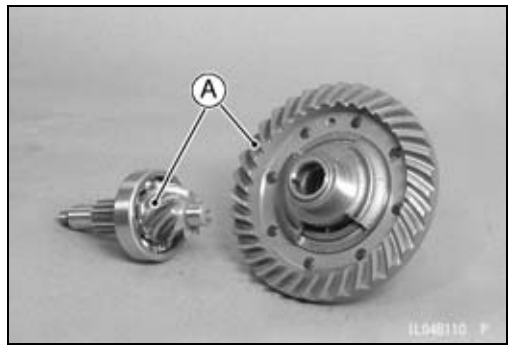
Front Final Gear Case

Bevel Gear Inspection

- Visually check the bevel gears [A] for scoring, chipping, or other damage.

★Replace the bevel gears as a set if either gear is damaged.



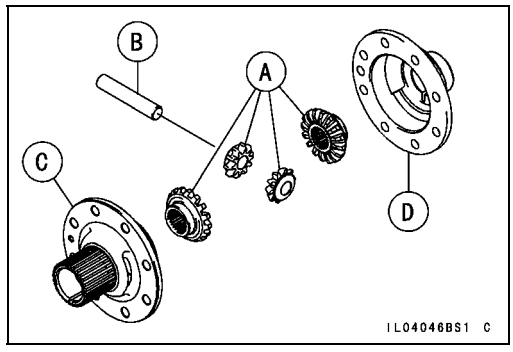
Differential Gear Inspection

- Visually check the differential gears [A] for scoring, chipping, or other damage.

★Replace the differential gears as a set if either gear is damaged.

- Also, inspect the differential gear shaft [B], gear case [C], and cover [D] where the differential gears rub.

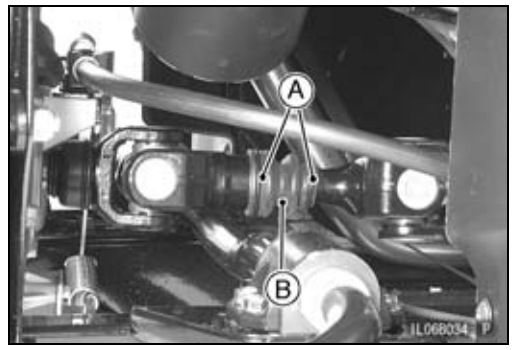
★If they are scored, discolored, or otherwise damaged, replace them as a set.



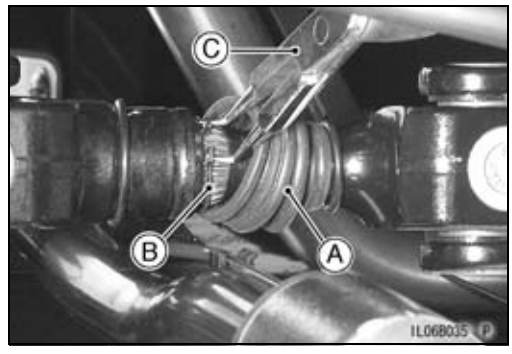
Rear Propeller Shaft

Rear Propeller Shaft Removal

- Remove:
  Right Rear Wheel (see Wheel Removal in the Wheels/Tires chapter)
- Slip the O-rings [A] off the grooves on the rubber boot [B].

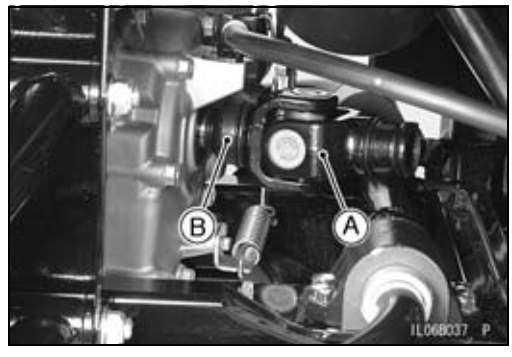


- Slide the boot [A] forward, and remove the circlip [B] with a suitable commercially circlip pliers [C].



- Push the rear propeller shaft [A] rearward, and remove the front end [B] from the output bevel gear shaft [C].
- Remove the rear propeller shaft and spring from the vehicle.

- Remove:
  Universal Joint [A]
  Boot [B] and O-rings



Rear Propeller Shaft Installation

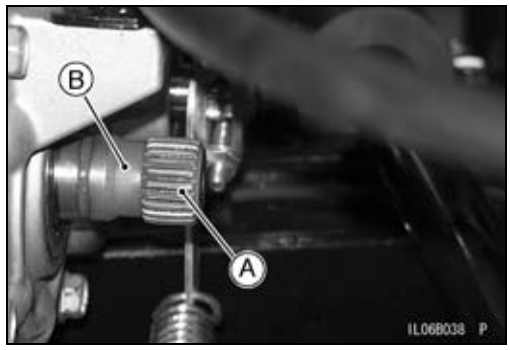
- Wipe off any old grease on the splines of the following parts.
  Output Bevel Gear Shaft
  Propeller Shaft
  Universal Joint
  Pinion Gear Shaft of Rear Final Gear Case
- Check the boots for damage.

★If any damage exists, replace it with a new one.

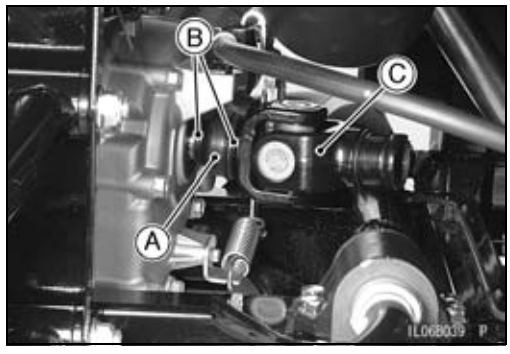
- Replace the O-rings with new ones.

Rear Propeller Shaft

- Apply molybdenum disulfide grease to the splines [A] of the pinion gear shaft [B] of rear final gear case.

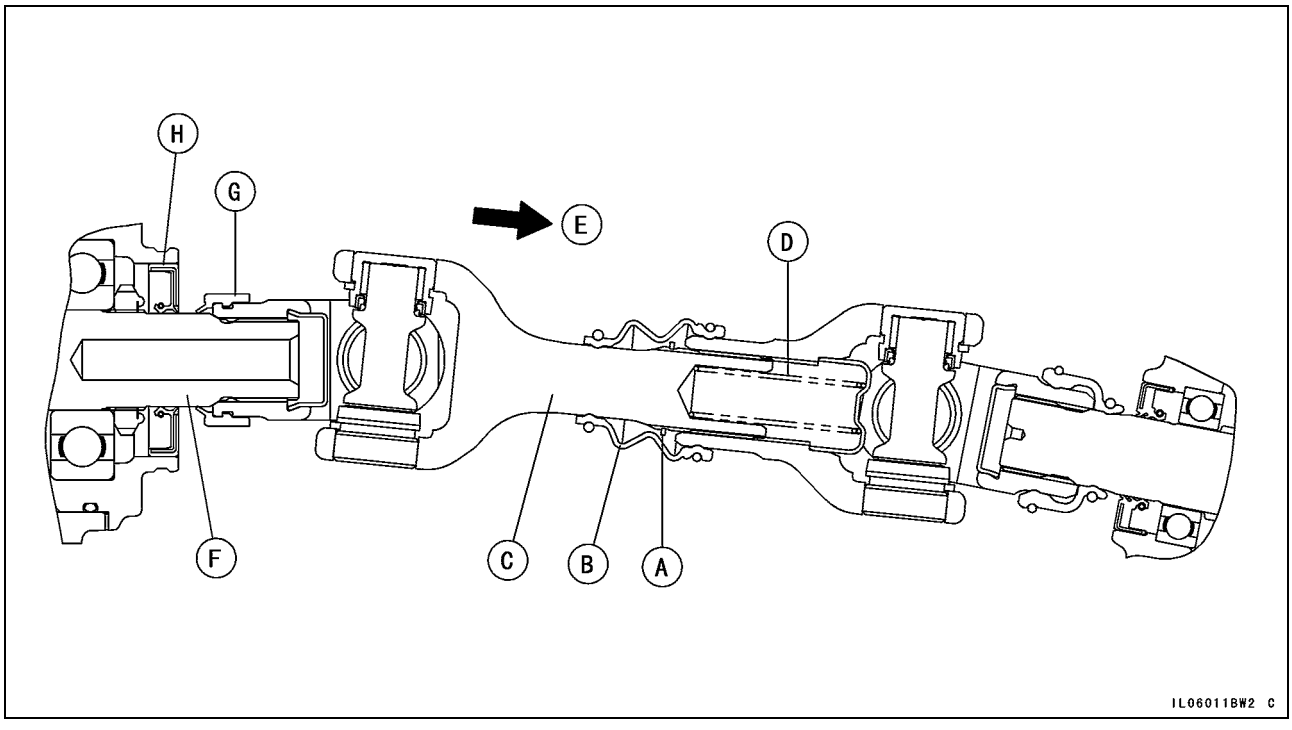


- Install:
  Boot [A]
  O-rings [B]
  Universal Joint [C]



- Install:
  New Circlip [A] (on the Rear Propeller Shaft)
  Boot [B] and New O-rings
  Rear Propeller Shaft [C]
  Spring [D]
- Align each yoke with the other yoke (see Front Propeller Shaft Installation).
- Push the rear propeller shaft rearward [E], and install the front end to the output bevel gear shaft [F].
- Install the circlip [A] into the groove of the propeller shaft.

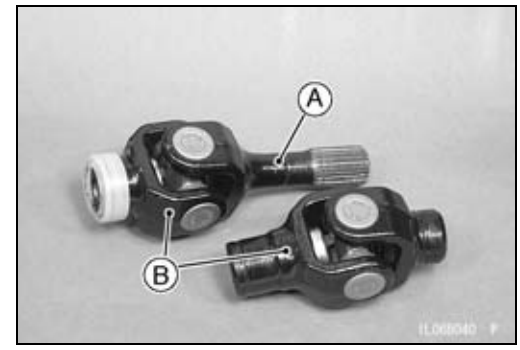
○Do not contact the boot [G] and oil seal [H].



- Fit the boots into the grooves of the yoke and shaft.
- Fit the O-rings into the grooves of the boot.

Rear Propeller Shaft

Rear Propeller Shaft Inspection



- Remove:
  Rear Propeller Shaft (see Rear Propeller Shaft Removal)
- Check that the universal joint [A] works smoothly without rattling or sticking.

★If it does rattle or stick, the universal joint is damaged. Replace the universal joint.

- Check the splines of the propeller shaft [B] and universal joint.

★If the splines are twisted or damaged in any way, replace the damaged parts.

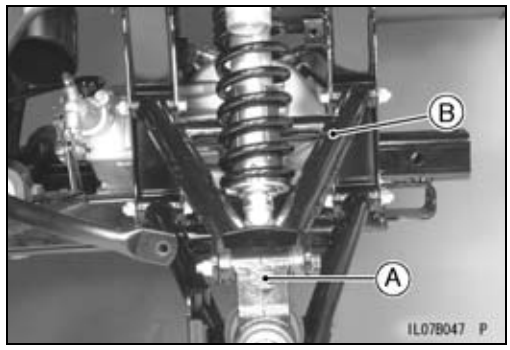
- Also, inspect the splines of output bevel gear shaft and pinion gear shaft of the rear final gear case.

★If the splines are badly worn, chipped, or loose, replace the damaged parts.

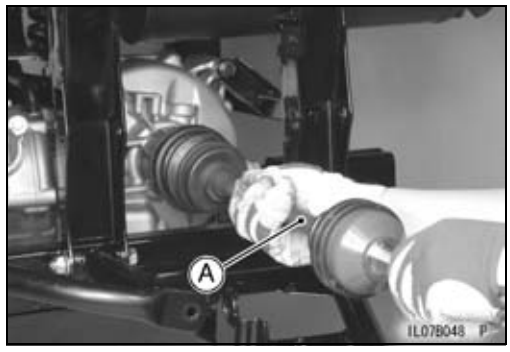
Rear Axle

Rear Axle Removal

- Drain the rear final gear case oil (see Rear Final Gear Case Oil Change in the Periodic Maintenance chapter).
- Remove:
  Rear Wheels (see Wheel Removal in the Wheels/Tires chapter)
  Stabilizer Joint (see Stabilizer Removal in the Suspension chapter)
  Rear Knuckle [A] (see Rear Knuckle Removal in the Suspension chapter)
  Upper Suspension Arm [B] (see Rear Suspension Arm Removal in the Suspension chapter)

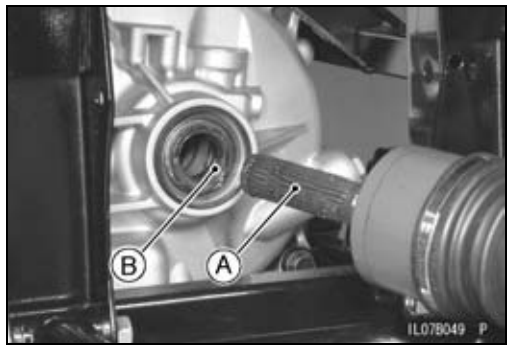


- Pull the rear axle [A] in a straight line out of the rear final gear case.



Rear Axle Installation

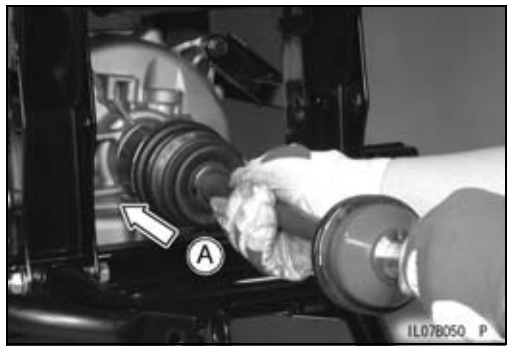
- Wipe off any old grease:
  Splines [A] of Axle
  Gear Case Oil Seal [B]
- Visually inspect the splines of the axle.
★ If they are badly worn or chipped, replace the axle with a new one.
- Apply molybdenum disulfide grease to the axle splines.
- Apply grease to the gear case oil seal lips.



- Push [A] the end of the rear axle straight and install the rear axle.

NOTE

○*The axle shaft must not come off easily.*



Rear Axle Joint Boot Inspection

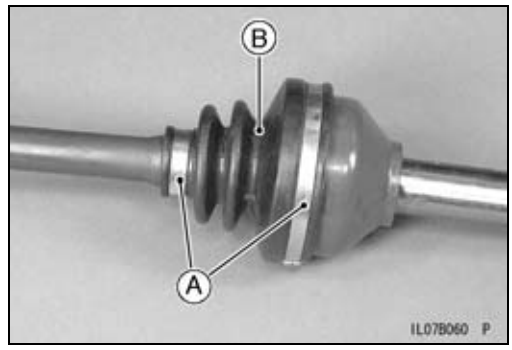
- Refer to the Axle Joint Boot Inspection in the Periodic Maintenance chapter.

Rear Axle

Rear Axle Joint Boot Replacement

Outboard Joint Boot Removal

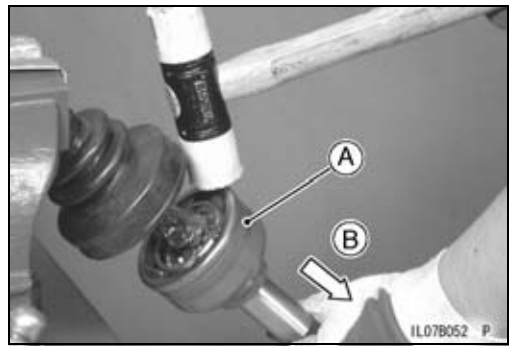
- Remove:
  Rear Axle (see Rear Axle Removal)
  Boot Bands [A]
- Scrap the removed boot bands.
- Slide the joint boot [B] toward the inboard joint.



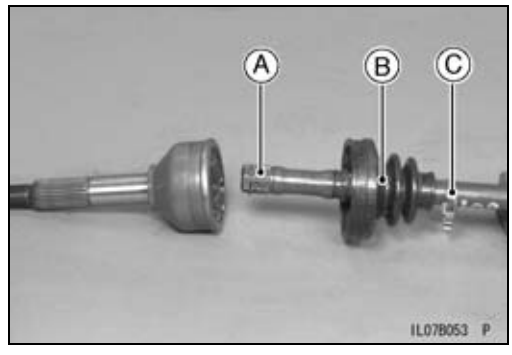
- Tap the bearing housing [A] straight [B] with a plastic hammer to separate it from the shaft.

CAUTION

Do not tap on the cage. Be careful not get hurt when the housing comes out. If the splined portion of shaft cracked or damaged during disassembling of outboard joint, do not reuse the shaft.



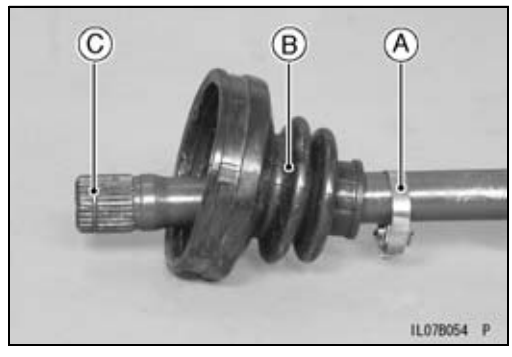
- Remove:
  Circlip [A]
  Boot [B]
  Small Band [C]



Outboard Joint Boot Installation

- Clean the axle shaft by wiping off the used grease on it.
- Wind the tape on the splines of the axle shaft in order to protect the joint boot.
- Install:
  New Small Band [A]
  New Boot [B]

○Apply the special grease slightly on the inside of the new boot small diameter, and install the boot on the axle shaft.



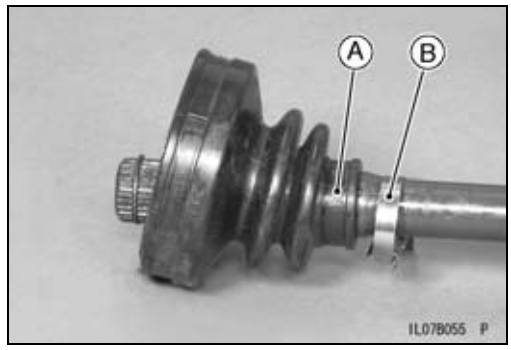
CAUTION

Only the special grease that is included with the boot kit can be applied to the boots.

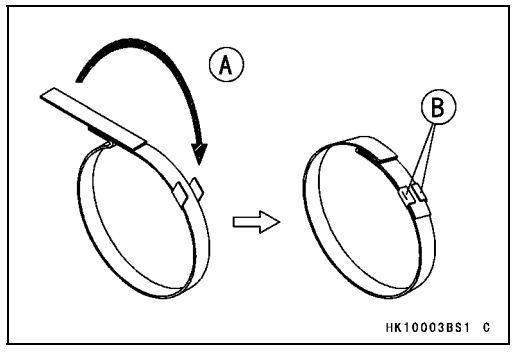
- Install:
  New Circlip [C]

Rear Axle

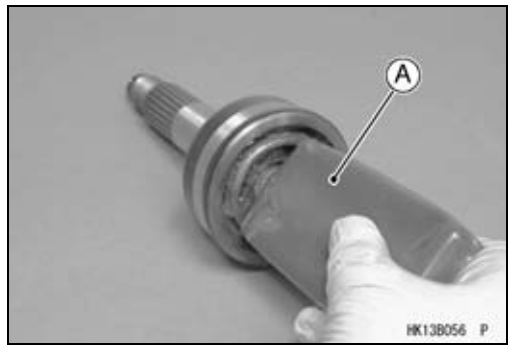
- Apply the special grease slightly on the part [A] of the band installation in order to make easy to install the boot band.
- Tighten the small boot band [B].



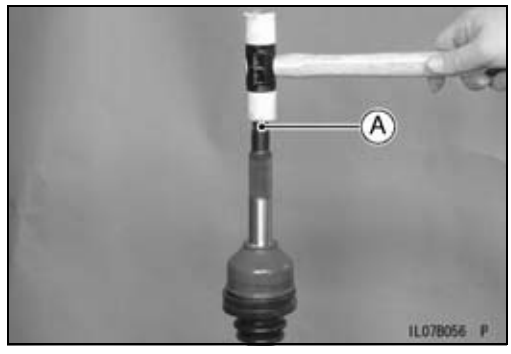
○Tighten the boot band [A] and bend the tangs [B] securely to hold down the end of the band.



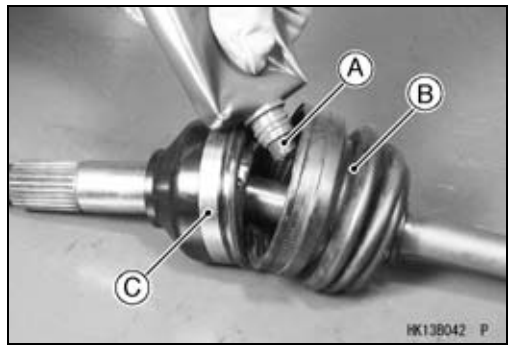
- Place the special grease tube nozzle in the bore of the housing and squeeze the tube [A] until the grease comes out from the joint bearing.



- Tap the shaft end [A] straight with a plastic hammer until it is locked by the circlip.



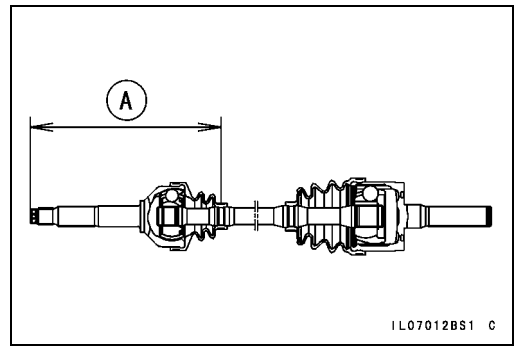
- Squeeze all of the special grease [A] into the new boot [B], and slide the boot onto the outboard joint [C].



Rear Axle

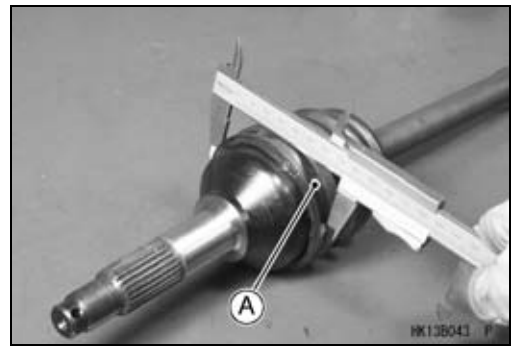
- Compress the axle assembly to the specified length while relieving the air pressure inside the outboard boot.
- Hold the axle at this setting.

Standard Length of Assembling:
Outboard: 228.9 mm (9.01 in.) [A]



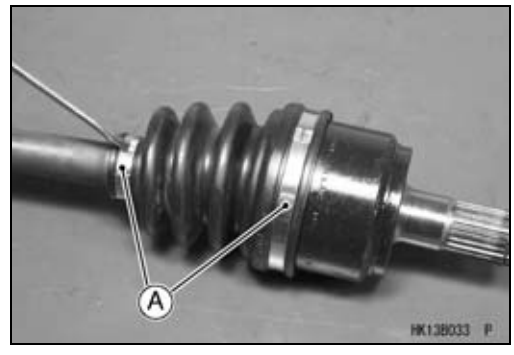
- Open the edge of the boot in order to equalize the air pressures.
- Tighten the large band [A] and bend the tangs securely to hold down the end of the band.

Maximum Outside Diameter of Band: 85.3 mm (3.36 in.)
(After tightening the outside diameter)

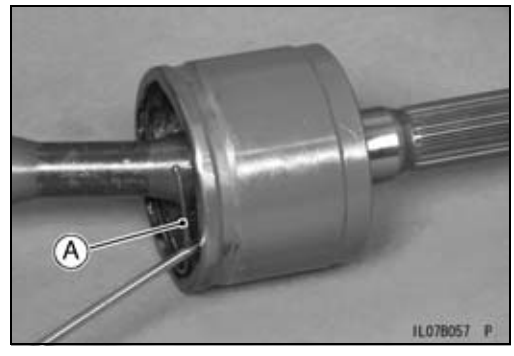


Inboard Joint Boot Removal

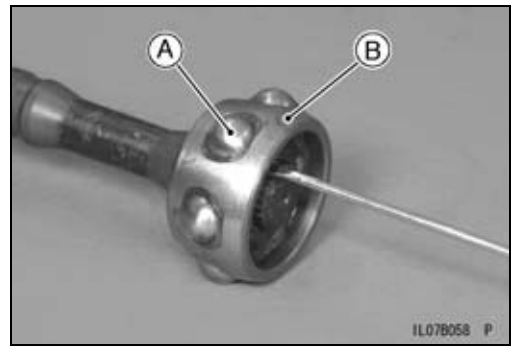
- Remove:
  Rear Axle (see Rear Axle Removal)
  Boot Bands [A]
- Scrap the removed boot bands.
- Slide the joint boot toward the outboard joint.



- Remove the retaining ring [A].
- Separate to the axle shaft.



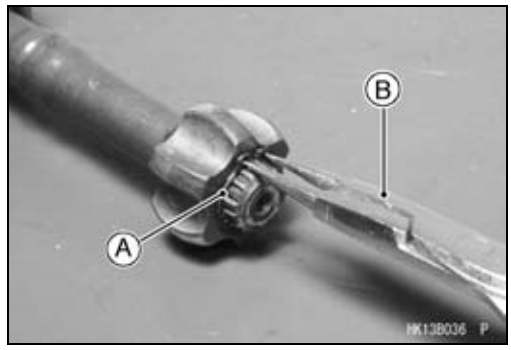
- Remove the steel balls [A].
- Slide the cage [B] toward the outboard joint.



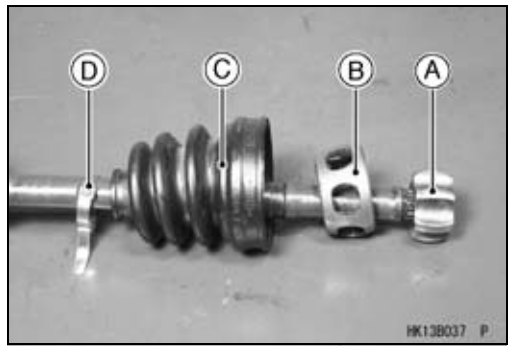
Rear Axle

- Remove:
  Circlip [A]

Special Tool - Outside Circlip Pliers [B]: 57001-144

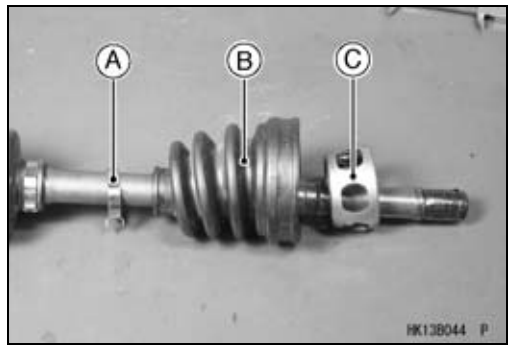


- Remove:
  Inner Race [A]
  Cage [B]
  Inboard Joint Boot [C]
  Boot Band [D]

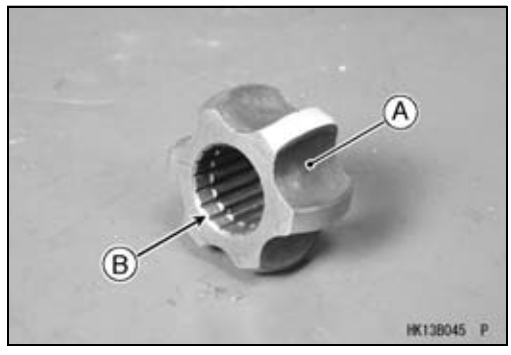


Inboard Joint Boot Installation

- Install:
  New Small Band [A]
  New Inboard Joint Boot [B]
  Cage [C]



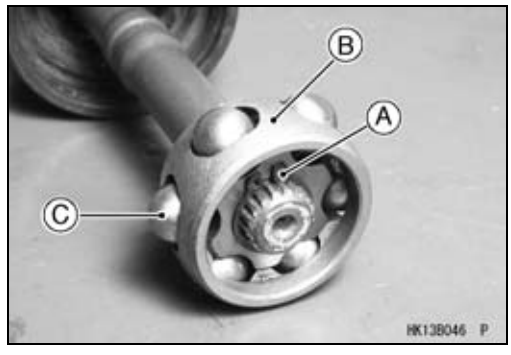
- Install the inner race [A] so that the flat side [B] faces outboard joint.



- Install:
  Circlip [A]

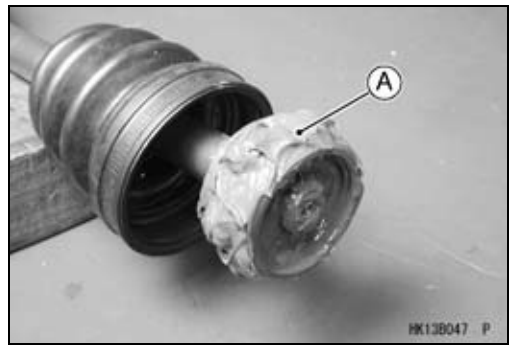
Special Tool - Outside Circlip Pliers: 57001-144

- Slide the cage [B] on the inner race and install the steel balls [C].



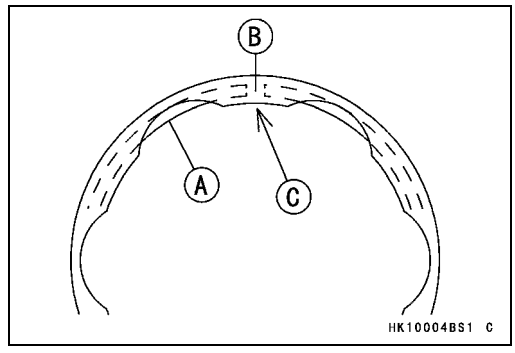
Rear Axle

- Apply the special grease [A] to the steel balls and cage.

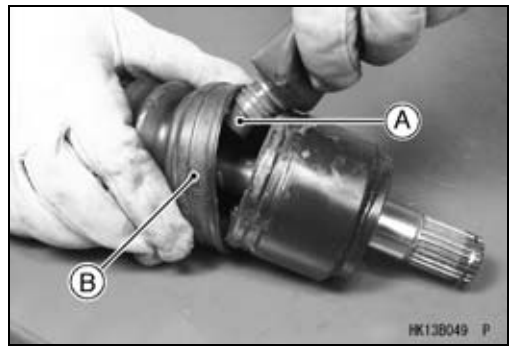


- Squeeze about half a tube of the special grease [A] into the bearing cup [B].

- Insert the balls and cage assembly in the bearing cup strongly.
- Install the new retaining ring [A] so that the opening [B] is aligned with one of the projections [C].



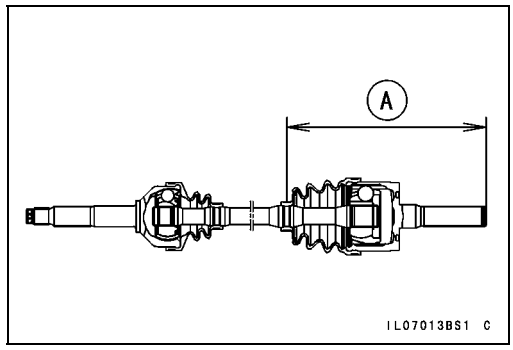
- Tighten the small band.
- Squeeze the remaining special grease [A] into the inboard joint boot [B].



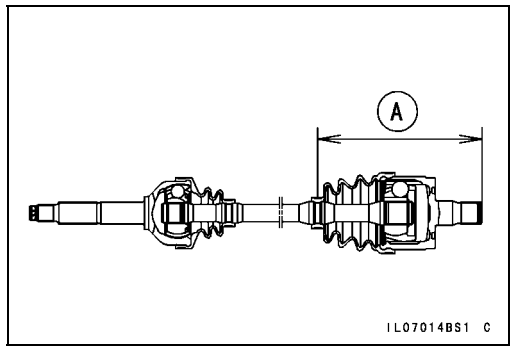
Rear Axle

- Compress the axle assembly to the specified length while relieving the air pressure inside the inboard boot.
- Hold the axle at this setting.

Standard Length of Assembling:
Left Rear Axle: 239.3 mm (9.42 in.) [A]



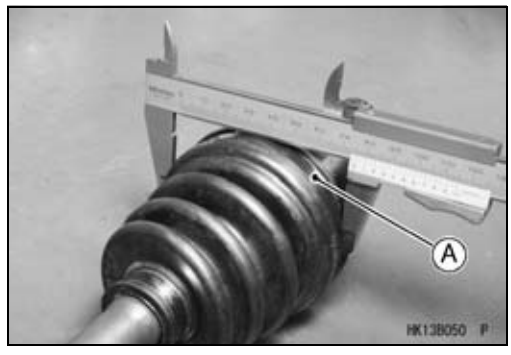
Right Rear Axle: 188.8 mm (7.43 in) [A]



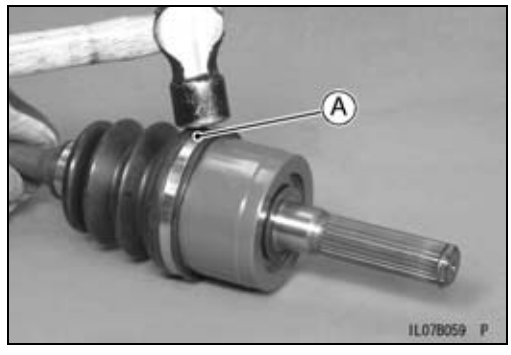
- Open the edge of the boot in order to eqalize the air pressures.
- Tighten the large band [A].

○Assemble it the same as the outboard joint boot, noting this setting;

Maximum Outside Diameter of Band: 94.6 mm (3.72 in.)
(After tightening the outside diameter)



- While the band is held at the diameter above, tap down the tangs [A] of the band.



Rear Final Gear Case

Rear Final Gear Case Oil Level Inspection

- Park the vehicle so that it is level, both side-to-side and front-to-rear.
- Remove the filler cap.

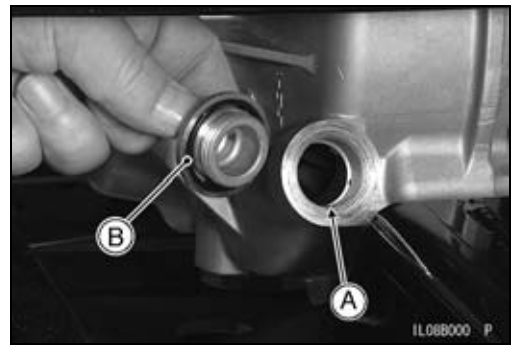
CAUTION
Be careful not to allow any dirt or foreign materials to enter the gear case.

- Check the oil level. The oil level should come to the bottom of the filler opening [A].

★If it is insufficient, first check the rear final gear case for oil leakage, remedy it if necessary, and add oil through the filler opening. Use the same type and brand of oil that is already in the final gear case.

- Apply grease to the O-ring [B].
- Be sure the O-ring is in place.

Torque - Rear Final Gear Case Oil Filler Cap: 29 N·m (3.0 kgf·m, 22 ft·lb)



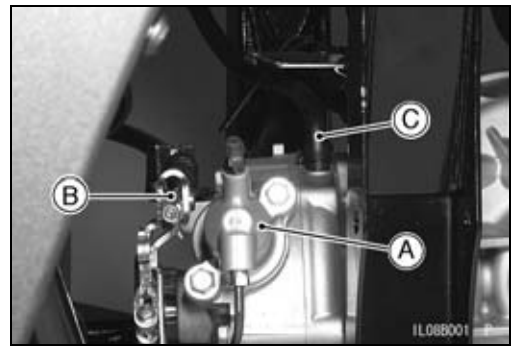
Rear Final Gear Case Oil Change

- Refer to the Rear Final Gear Case Oil Change in the Periodic Maintenance chapter.

Rear Final Gear Case Removal

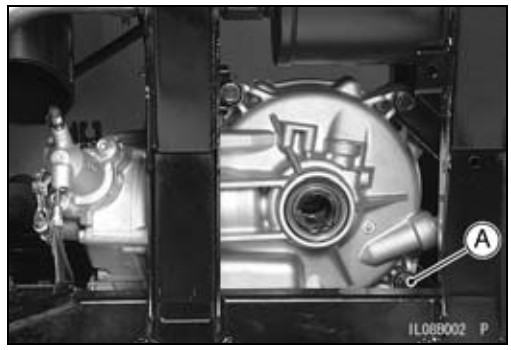
- Remove:
  Rear Bottom Guard (see Rear Bottom Guard Removal in the Frame chapter)
  Rear Suspension Arm (see Rear Suspension Arm in the Suspension chapter)
  Rear Axles (see Rear Axle Removal)
  Rear Propeller Shaft (see Rear Propeller Shaft Removal)

- Remove:
  Rear Brake Master Cylinder [A] (see Rear Brake Master Cylinder Removal in the Brakes chapter)
  Brake Cable Rear End [B]
  Breather Hose [C]

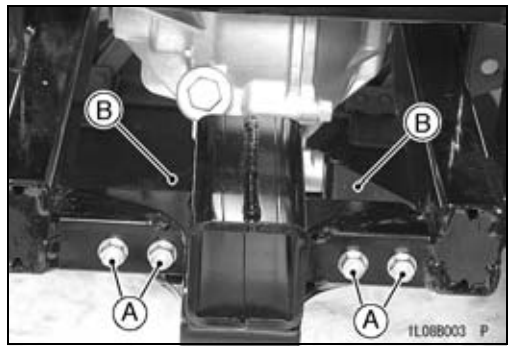


Rear Final Gear Case

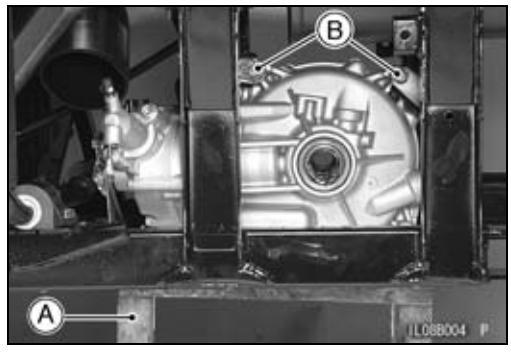
- Remove:
  Rear Final Gear Case Bolt [A] and Nut



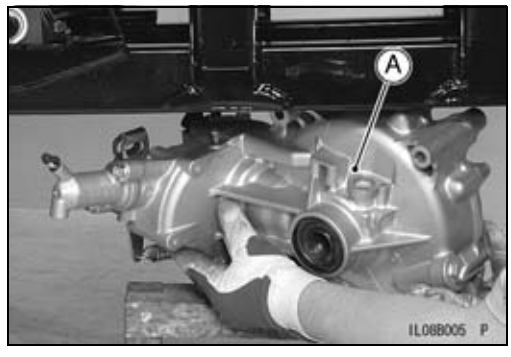
- Remove:
  Rear Final Gear Case Bracket Bolts [A]
  Rear Final Gear Case Brackets [B]



- Support the rear final gear case with a suitable jack and/or stand [A].
- Remove:
  Rear Final Gear Case Bolts [B] and Nuts

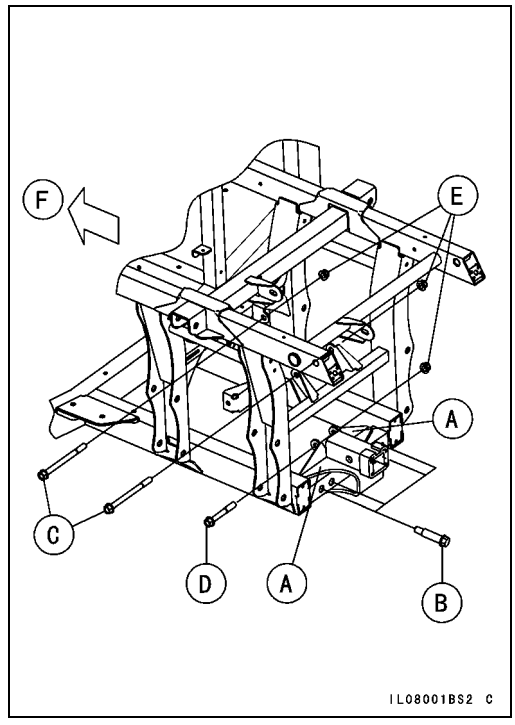


- Remove:
  Rear Final Gear Case [A]



Rear Final Gear Case

Rear Final Gear Case Installation



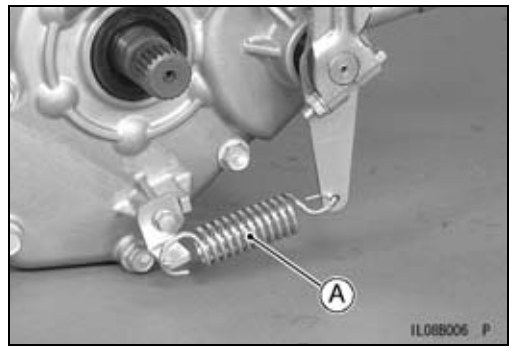
- Install:
  Rear Final Gear Case
  Bracket [A]
  Bracket Bolts [B]
- Apply a non-permanent locking agent to the rear final gear case bolts.
- Install:
  Rear Final Gear Case Bolts [C], L=120 mm (4.72 in.)
  Rear Final Gear Case Bolts [D], L=70 mm (2.76 in.)
- Tighten:

Torque - Rear Final Gear Case Bracket Bolts: 91 N·m (9.3 kgf·m, 67 ft·lb)
Rear Final Gear Case Mounting Nuts [E]: 91 N·m (9.3 kgf·m, 67 ft·lb)

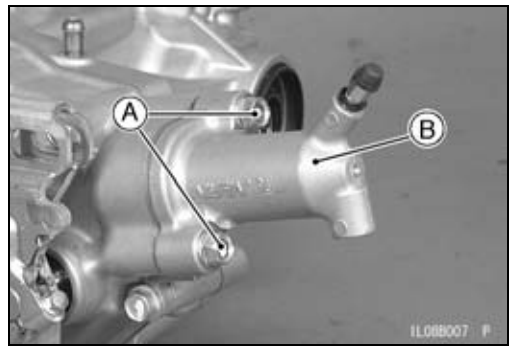
[F] Front

- Install:
  Removed Parts (see applicable chapters)

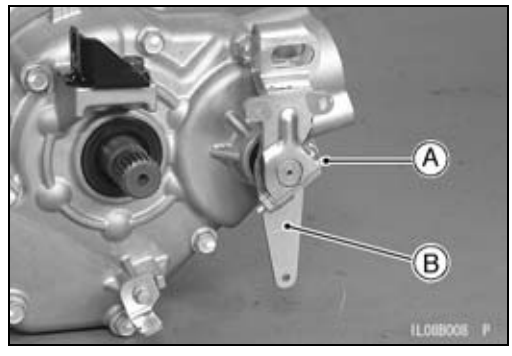
Rear Final Gear Case Disassembly



- Remove:
  Rear Final Gear Case (see Rear Final Gear Case Removal)
  Spring [A]



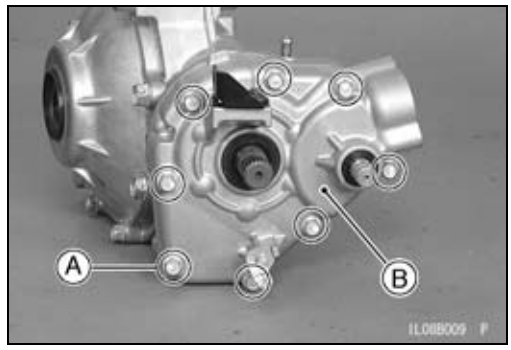
- Remove:
  Master Cylinder Mounting Bolts [A]
  Master Cylinder [B]



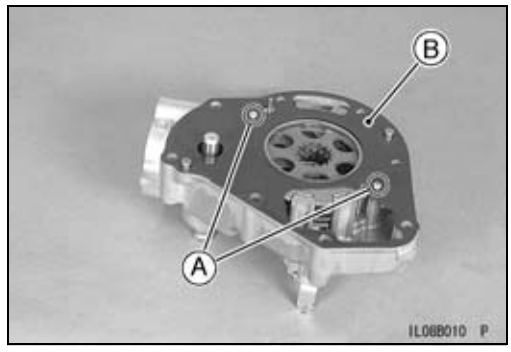
- Remove:
  Bolt [A] and Nut
  Brake Cam Lever [B]

Rear Final Gear Case

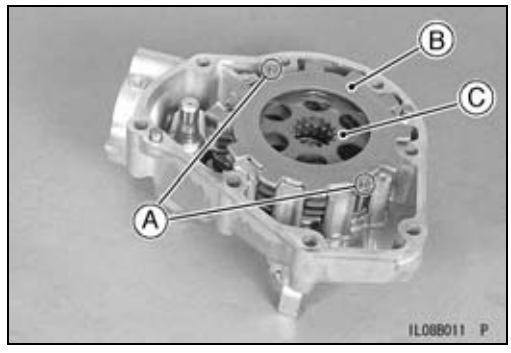
- Remove:
  Rear Final Gear Case Front Cover Bolts [A]
  Rear Final Gear Case Front Cover [B]



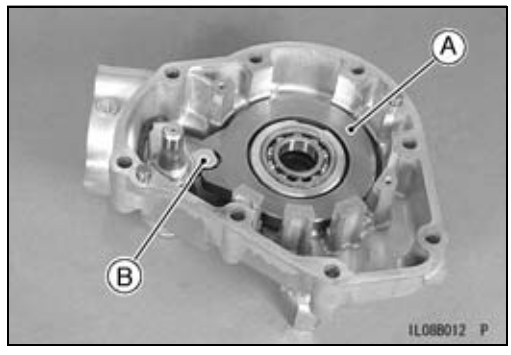
- Remove:
  Gasket Screws [A]
  Gasket [B]



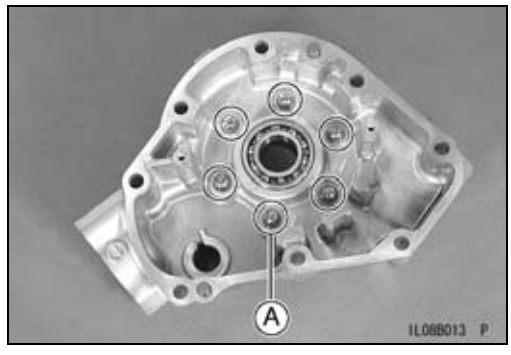
- Remove:
  Set Pins [A], Steel Plates [B] and Friction Plates [C]



- Remove:
  Brake Cam Plate [A]
  Brake Camshaft [B]

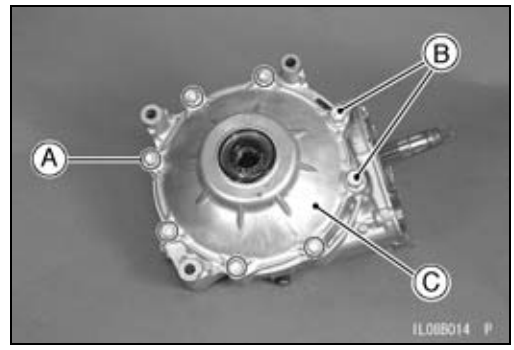


- Remove:
  Steel Balls [A]

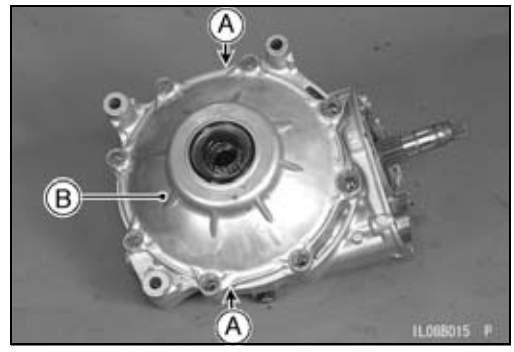


Rear Final Gear Case

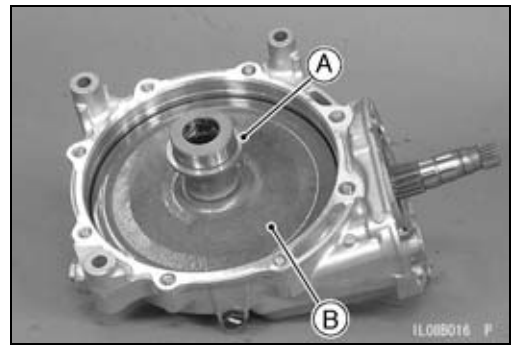
- Remove:
  Rear Final Gear Case Right Cover Bolts (M10) [A]
  Rear Final Gear Case Right Cover Bolts (M12) [B]
  Rear Final Gear Case Right Cover [C]



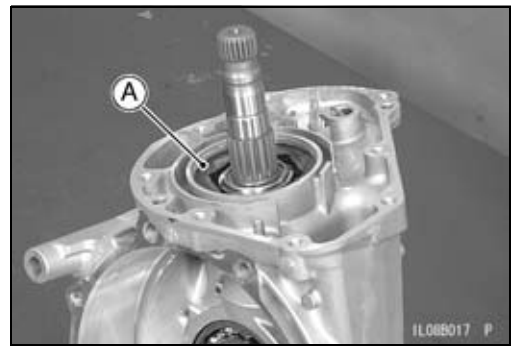
- Using the pry points [A], remove the rear final gear case right cover [B].



- Remove:
  Shims [A] (both sides)
  Ring Gear [B]



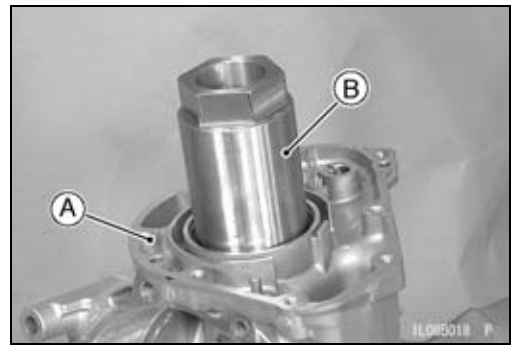
- Remove:
  Pinion Gear Bearing Holder [A]



○Hold the rear final gear case [A] in a vise, and remove the bearing holder using the socket wrench [B].

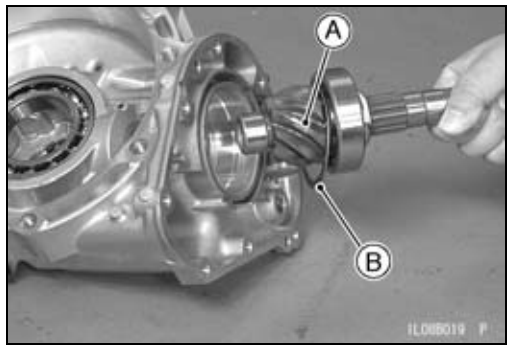
Special Tool - Socket Wrench, Hex 50: 57001-1478

○If it is difficult to break free the holder, apply the heat to it to softer the locking agent.

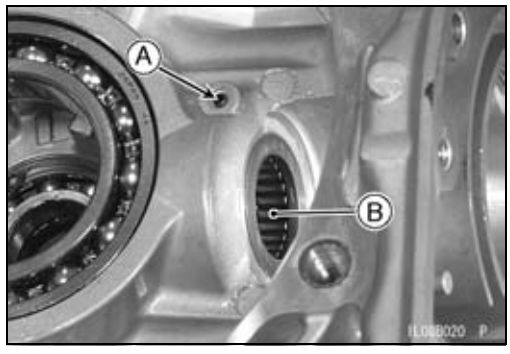


Rear Final Gear Case

- Remove:
  Pinion Gear Unit [A]
  Shim(s) [B]



- Drill out the spring pin [A] with a drill bit of the 3 mm (0.12 in) diameter and remove it.
- Remove the needle bearing [B].

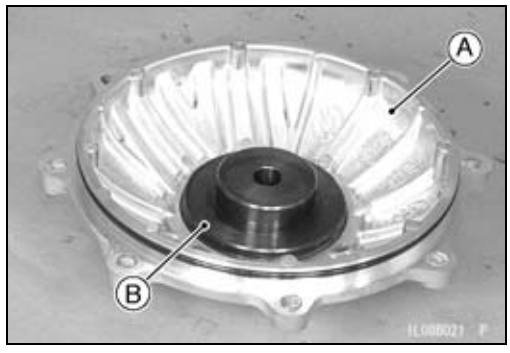


Rear Final Gear Case Right Cover Assembly

[A] Rear Final Gear Case Right Cover

- Press:
  Ball Bearing (until bottomed)

Special Tool - Bearing Driver, ϕ54.3 [B]: 57001-1488

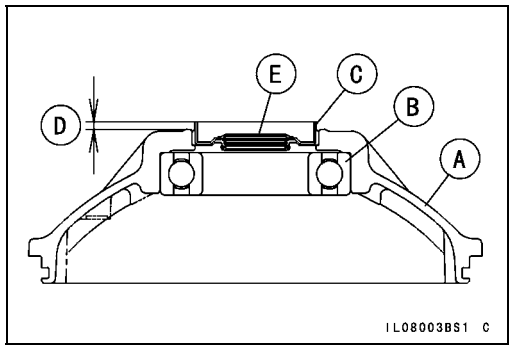


[A] Rear Final Gear Case Right Cover
[B] Ball Bearing

- Press the oil seal [C] so that the projecting distance is 3.5 mm (0.14 in.) [D] as shown in the figure.

Special Tool - Bearing Driver Set: 57001-1129

- Apply Grease:
  Oil Seal Lips [E]



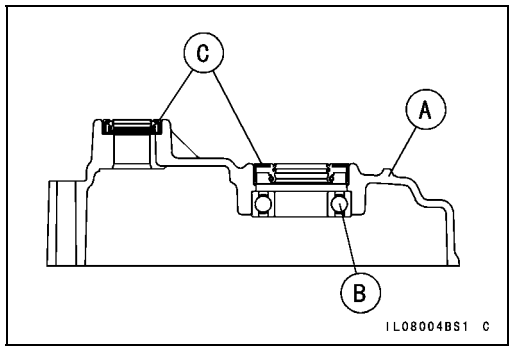
Rear Final Gear Case Front Cover Assembly

[A] Rear Final Gear Case Front Cover

- Press:
  Ball Bearing [B] (until bottomed)

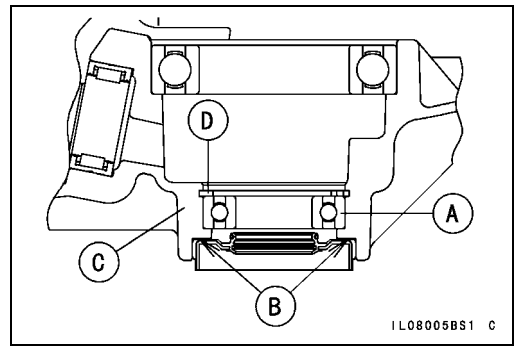
Special Tool - Bearing Driver Set: 57001-1129

- Press the faces of the oil seals [C] are flush with the ends of the housing.
- Apply Grease:
  Oil Seal Lips



Rear Final Gear Case

Rear Final Gear Case Assembly



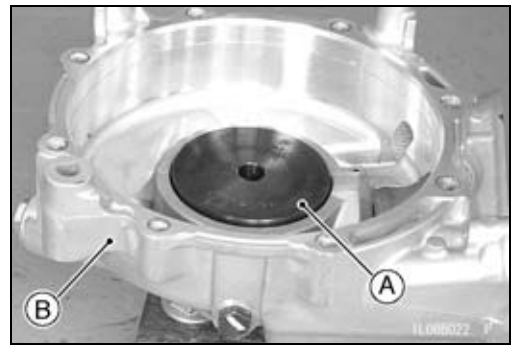
- Apply specified oil to the bearings.
- Press:
  Ball Bearing [A] (until bottomed)

  Special Tool - Bearing Driver Set: 57001-1129

○When pressing the bearing, support the face [B] of the rear final gear case [C] with a suitable block or press the bearing with less than 5 ton.

- Install:
  New Circlip [D]

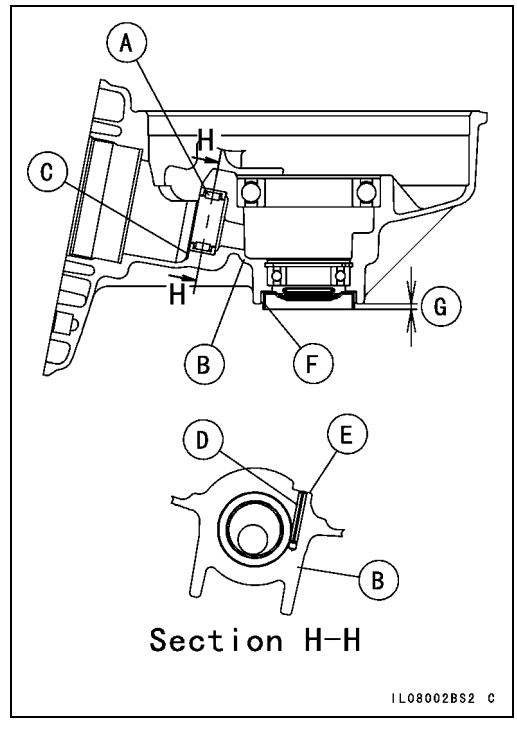
  Special Tool - Inside Circlip Pliers: 57001-143



- Press:
  Ball Bearing (until bottomed)

  Special Tool - Baring Driver, ϕ54.3 [A]: 57001-1488

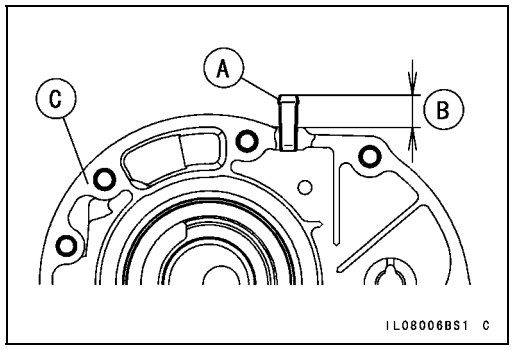
  [B] Rear Final Gear Case



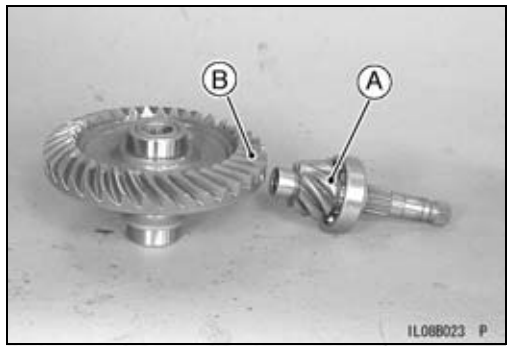
- Press the needle bearing [A] in the rear final gear case [B] so that the surface is flush with the case end [C].
- Press the pin [D] in the rear final gear case so that the surface is flush with the case end [E].
- Press the oil seal [F] so that the projecting distance is 3.5 mm (0.14 in.) [G] as shown in the figure.
- Apply grease:
  Oil Seal Lip

Rear Final Gear Case

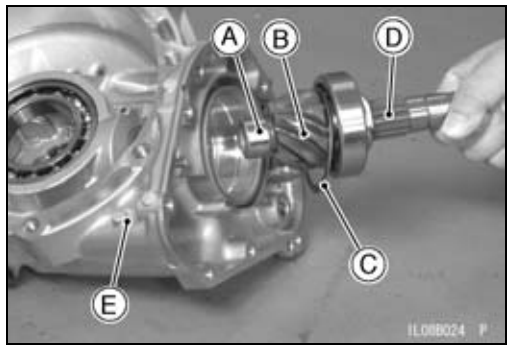
- Press the fitting [A] so that the projecting distance is 14 mm (0.55 in.) [B] as shown in the figure.
  [C] Rear Final Gear Case



- Visually check the pinion gear [A] and ring gear [B] for scoring, chipping, or other damage.
- ★Replace the bevel gear as a set if either gear is damaged since they are lapped as a set in the factory to get the best tooth contact.
- Be sure to check and adjust the bevel gear backlash and tooth contact when any of the backlash-related parts are replaced (see Rear Final Bevel Gear Adjustment).

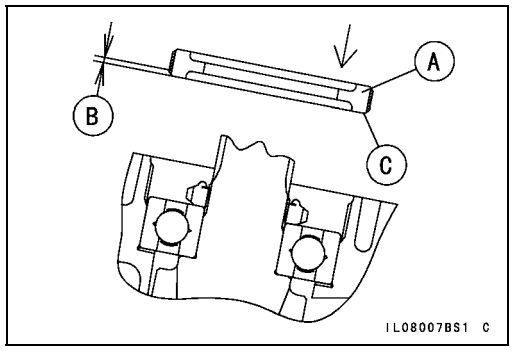


- Apply specified oil to the journal [A] and teeth [B].
- Insert the shim [C] and pinion gear unit [D] in the rear final gear case [E].

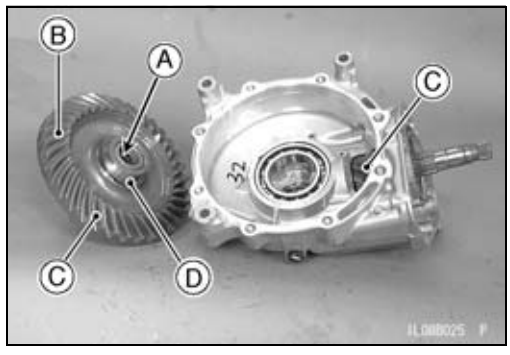


- Apply a non-permanent locking agent to the pinion gear bearing holder [A], but do not apply a non-permanent locking agent to one pitch [B] from the tip.
- Install the pinion gear bearing holder so that the no coating side [C] faces the bearing.
- Tighten:

Torque - Pinion Gear Bearing Holder: 450 N·m (46kgf·m, 332 ft·lb)

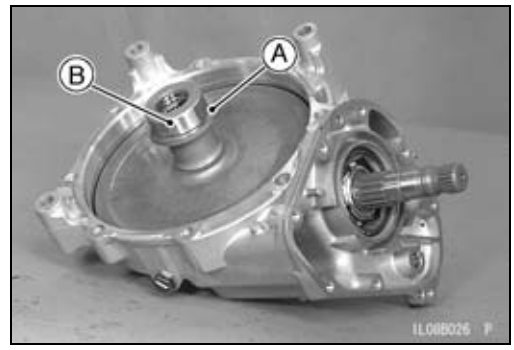


- Apply molybdenum disulfide grease to the spline [A] in the ring gear [B].
- Apply specified oil to the journal and teeth [C].
- Install:
  Shim [D]
  Ring Gear

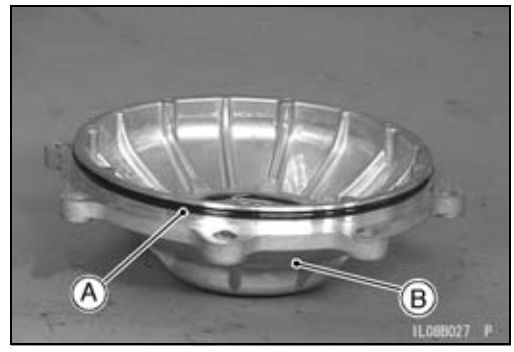


Rear Final Gear Case

- Install:
  Shim [A]
- Apply specified oil to the journal [B].

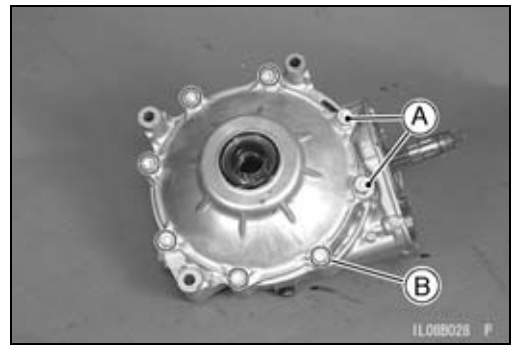


- Apply grease to the O-ring [A] and install the rear final gear case right cover [B].



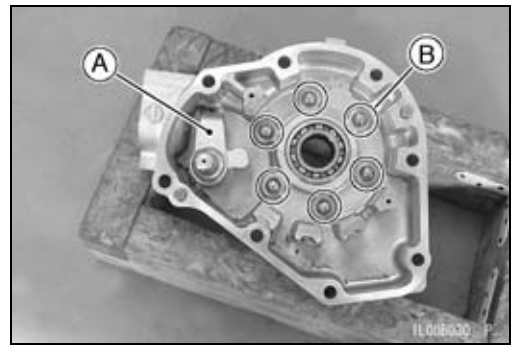
- Apply a non-permanent locking agent to the rear final gear case right cover bolts.
- Tighten:

Torque - Rear Final Gear Case Right Cover Bolts (M12) [A]:
94 N·m (9.6 kgf·m, 69 ft·lb)
Rear Final Gear Case Right Cover Bolts (M10) [B]:
49 N·m (5.0 kgf·m, 36 ft·lb)



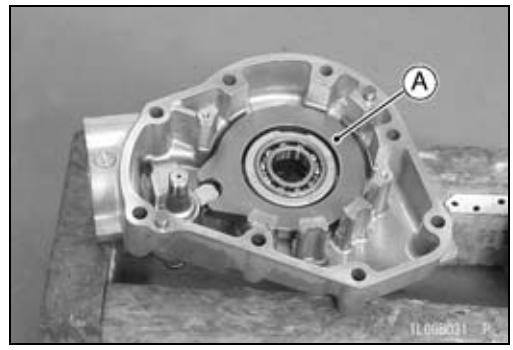
- Apply specified oil to the journal [A] of the brake camshaft.

- Install:
  Brake Camshaft [A]
  Steel Balls [B]

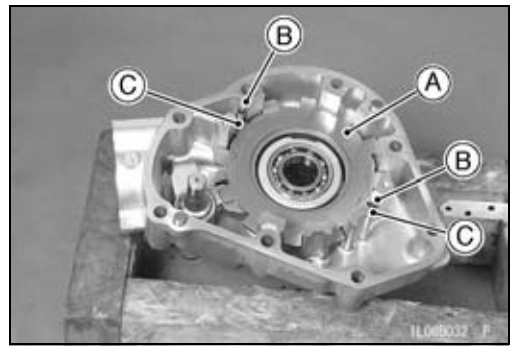


Rear Final Gear Case

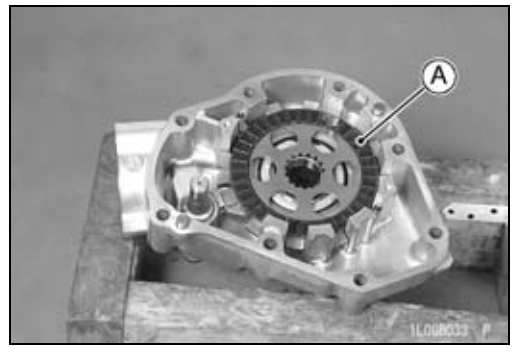
● Install the brake cam plate [A] so that the recess side faces to steel balls.



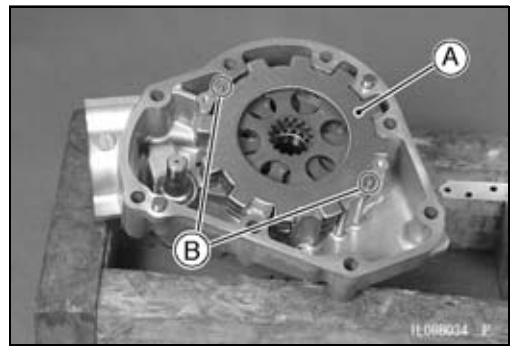
● Install:
Steel Plate [A] (P/No. 41080-1483, two holes) (as shown in the gigure)
Set Pins [B] and Springs [C]



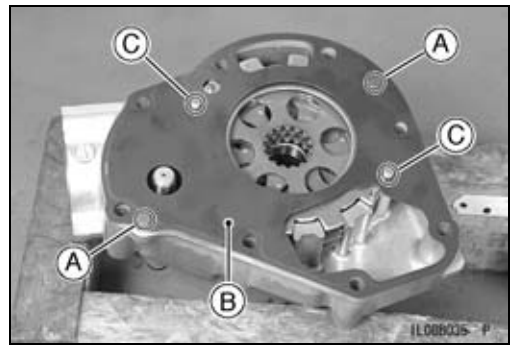
● Install (alternately):
Friction Plates [A]
Steel Plates (P/No. 41080-1484, without hole)



● Install:
Steel Plate [A] (P/No. 41080-1483, two holes)
○Insert the pins [B] into the holes of the steel plate.



● Install:
Dowel Pins [A]
New Gasket [B]
● Tighten:
Torque - Rear Final Gear Case Gasket Screws [C]: 1.3 N·m (0.13 kgf·m, 12 in·lb)



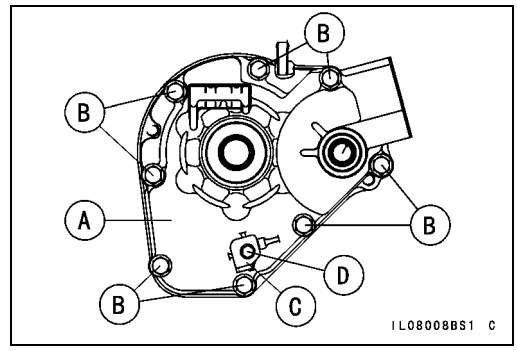
Rear Final Gear Case

● Install:
Rear Final Gear Case Front Cover [A]
● Tighten:

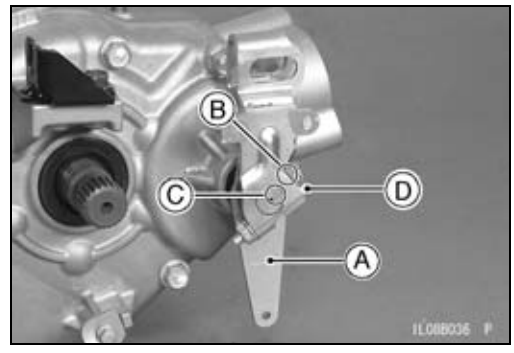
Torque - Rear Final Gear Case Front Cover Bolts [B]: 24 N·m (2.4 kgf·m, 18 ft·lb)

● Install:
Spring Bracket [C]
● Apply a non-permanent locking agent to the spring bracket bolt [D].
● Tighten:

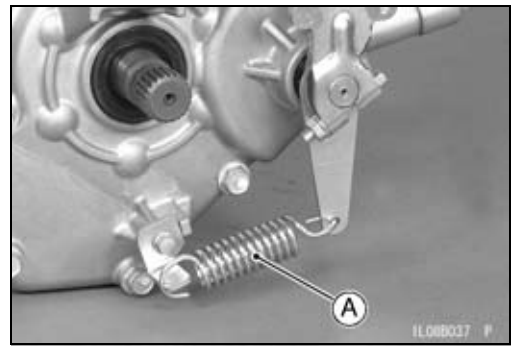
Torque - Spring Bracket Bolt: 8.8 N·m (0.90 kgf·m, 78 in·lb)



● Install:
Brake Cam Lever [A]
○Align the punch mark [B] of the brake cam lever with the punch mark [C] of the brake camshaft.
● Install:
Bolt [D] and Nut



● Install:
Spring [A]



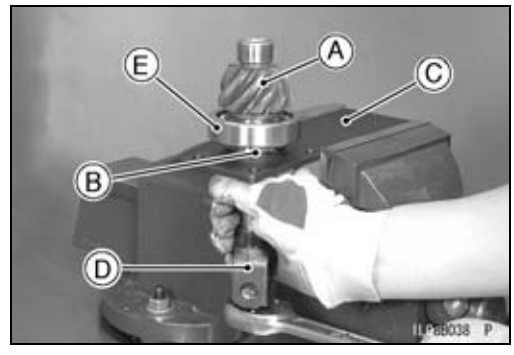
Pinion Gear Unit Disassembly

● Remove:
Pinion Gear Unit [A] (see Rear Final Gear Case Disassembly)
● Hold the pinion gear bearing holder nut [B] with the socket wrench [C] in a vise, and loosen the pinion gear shaft using the pinion gear holder [D].

Special Tools - Socket Wrench: 57001-1363
Pinion Gear Holder, m1.0: 57001-1281

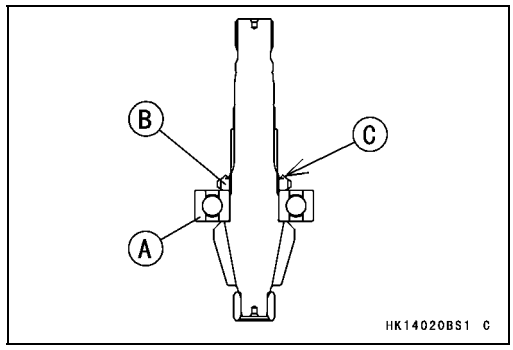
● Remove the ball bearing [E] as necessary.

Special Tool - Bearing Puller: 57001-135



Rear Final Gear Case

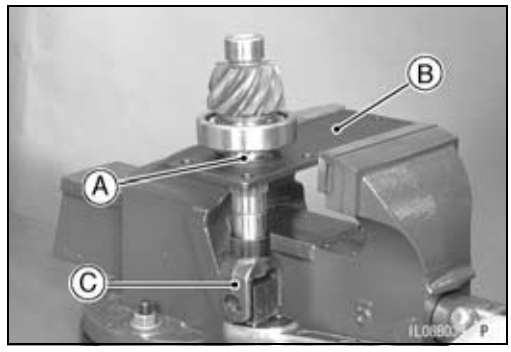
Pinion Gear Unit Assembly



- Visually inspect the bearing for abrasion, color change, or other damage.

★If there is any doubt as to the condition of a bearing, replace the bearing.

- Be sure to check and adjust the bevel gear backlash and tooth contact, when any of the backlash-related parts are replaced (see Rear Final Bevel Gear Adjustment).
- Press the bearing [A] on the pinion gear until it is bottomed.
- Install the pinion gear bearing holder nut [B] so that the projection [C] faces outward.



- Apply a non-permanent locking agent (Three Bond: TB2471 Blue) to the pinion gear bearing holder nut [A], and tighten it.

Special Tools - Socket Wrench [B]: 57001-1363
Pinion Gear Holder, m1.0 [C]: 57001-1281

Torque - Pinion Gear Bearing Holder Nut: 200 N·m (20 kgf·m, 148 ft·lb)

Rear Final Bevel Gear Adjustment

○The **backlash** and **tooth contact pattern** of the bevel gears must be correct to prevent the gears from making noise and being damaged.

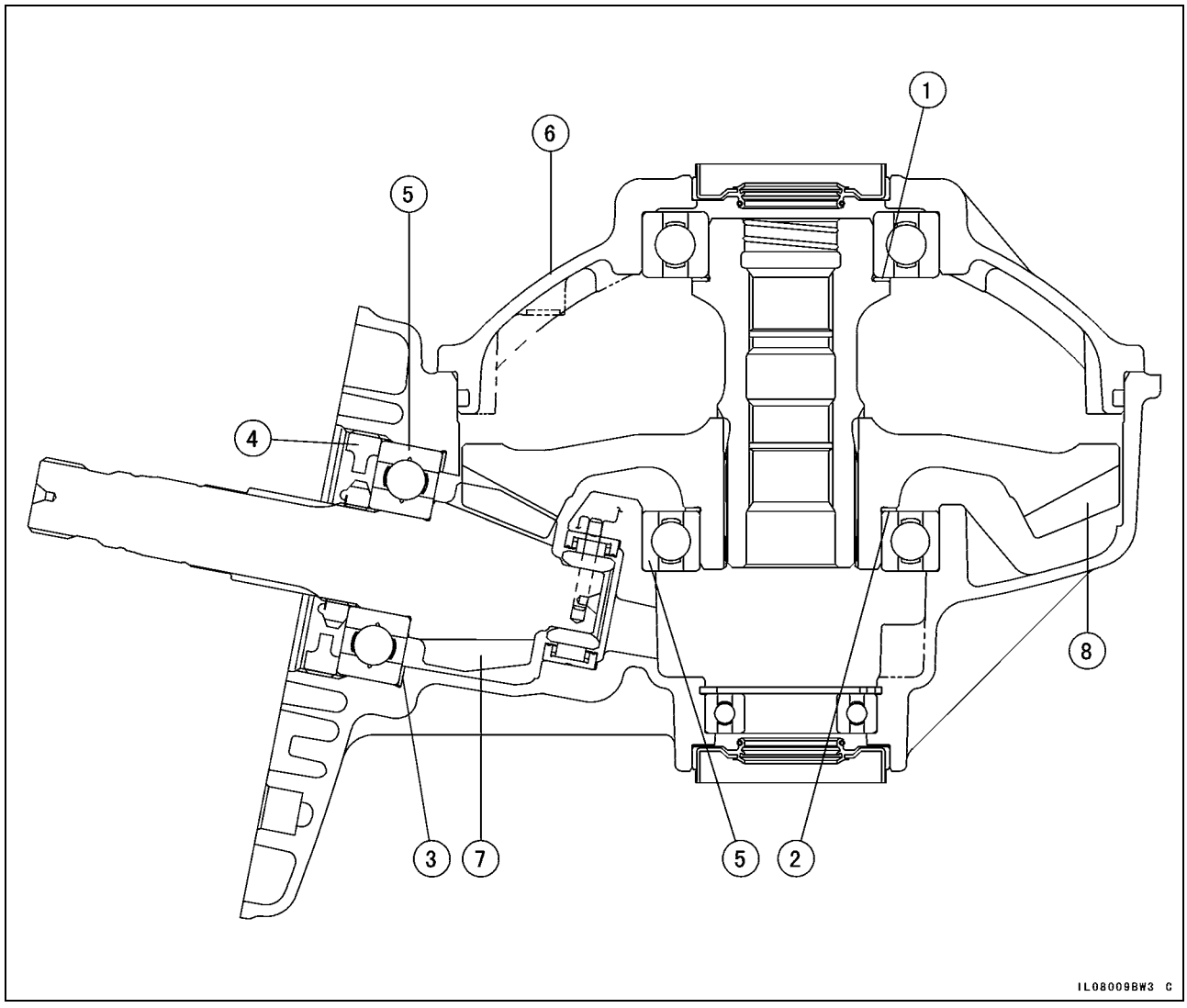
- After replacing any of the backlash-related parts, be sure to check and adjust the backlash and tooth contact of the bevel gears. First, adjust backlash, and then tooth contact by replacing shims.

○The amount of backlash is influenced by the ring gear position more than by the pinion gear position.

○Tooth contact locations is influenced by the pinion gear position more than by the ring gear position.

Rear Final Gear Case

Rear Final Gear Case (Backlash-related Parts)



1. Ring Gear Shim(s)
2. Ring Gear Shim(s)
3. Pinion Gear Shim(s)
4. Pinion Gear Bearing Holder
5. Ball Bearings
6. Gear Case Right Cover
7. Pinion Gear
8. Ring Gear

Rear Final Gear Case

1. Ring Gear Shims for Backlash Adjustment

Thickness	Part Number
0.15 mm (0.006 in.)	92180-0248
0.2 mm (0.008 in.)	92180-0247
0.5 mm (0.020 in.)	92180-0246
0.8 mm (0.031 in.)	92180-0245
1.0 mm (0.039 in.)	92180-0244
1.2 mm (0.047 in.)	92180-0243

2. Ring Gear Shims for Backlash Adjustment

Thickness	Part Number
0.15 mm (0.006 in.)	92180-1417
0.2 mm (0.008 in.)	92180-1418
0.5 mm (0.020 in.)	92180-1419
0.8 mm (0.031 in.)	92180-1420
1.0 mm (0.039 in.)	92180-1421
1.2 mm (0.047 in.)	92180-1422

3. Pinion Gear Shims for Tooth Contact Adjustment

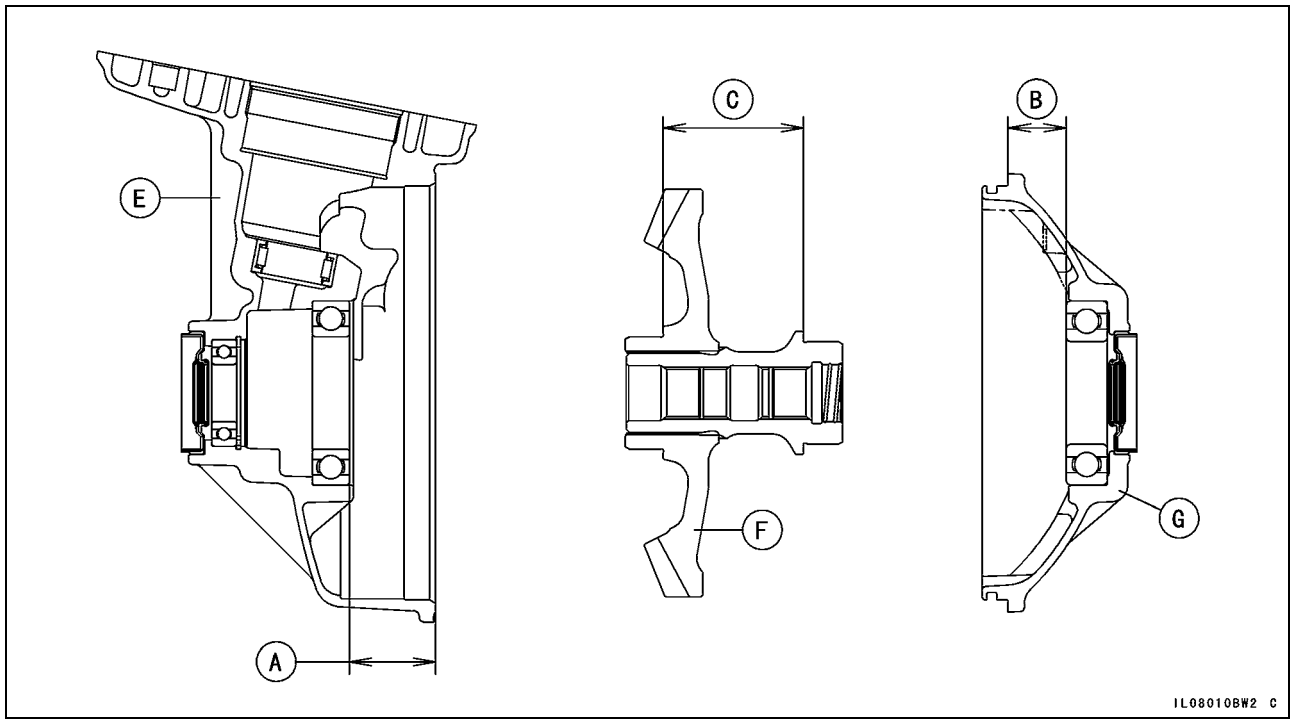
Thickness	Part Number
0.15 mm (0.006 in.)	92180-1423
0.2 mm (0.008 in.)	92180-1424
0.5 mm (0.020 in.)	92180-1425
0.8 mm (0.031 in.)	92180-1426
1.0 mm (0.039 in.)	92180-1427
1.2 mm (0.047 in.)	92180-1428

Rear Final Gear Case

Rear Final Gear Case Backlash Adjustment

- Clean dirt and oil off bevel gear teeth.
- Measure length [A], [B] and [C], and calculate the clearance [D] between the ring gear assembly and gear case covers.

  [D] = [A] + [B] – [C]



[E] Rear Final Gear Case
[F] Ring Gear Assembly
[G] Rear Final Gear Case Right Cover

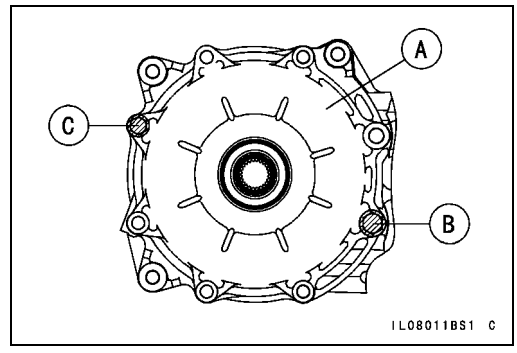
- Assemble the rear final gear case (see Rear Final Gear Case Assembly).

○When installing the pinion gear bearing holder, a non-permanent locking agent is not used.

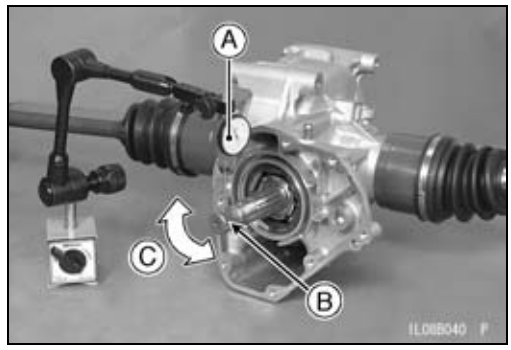
○Use the following two spare bolts when installing the rear final gear case right cover [A].

M12 Bolt [B] L = 35 mm (1.38 in.), P = 1.25 mm (0.049 in.)

M10 Bolt [C] L = 35 mm (1.38 in.), P = 1.25 mm (0.049 in.)



Rear Final Gear Case



- Temporarily install the rear axles in the gear case and hold them.
- Mount a dial gauge [A] so that the tip of the gauge is against the splined portion [B] of the pinion gear shaft.
- To measure backlash, turn the pinion gear shaft right and left [C] while holding the rear axles steady. The difference between the highest and lowest gauge reading is the amount of backlash.

○Measure backlash at three locations (equally spaced on the splines).

Rear Final Bevel Gear Backlash

Standard: 0.05 ~ 0.11 mm (0.002 ~ 0.004 in.)
(at pinion gear spline)

★If the backlash is not within the standard, replace the ring gear shims according to the below NOTE. To increase backlash, decrease the thickness of the shim(s) [1] and increase the thickness of the shim(s) [2]. To decrease backlash, increase the thickness of the shim(s) [1] and decrease the thickness of the shim(s) [2].

NOTE

○*The total of the ring gear shims, [1] and [2], should be less than [D] (the clearance between the ring gear assembly and gear case covers).*

○*Example:*

D = 2.34 mm →[1] + [2] = 2.30 mm

D = 2.26 mm →[1] + [2] = 2.25 mm

○The second decimal of the total of [1] and [2] should be .×0 or .×5 nearest of D.

- Recheck the backlash, and readjust if necessary.

Tooth Contact Adjustment

- Clean any dirt and oil off the bevel gear teeth.
- Apply checking compound to 4 or 5 teeth of the pinion gear.

NOTE

○*Apply checking compound to the teeth in a thin, even coat with a fairly stiff paint brush. If painted too thickly, the exact tooth pattern may not appear.*

○*The checking compound must be smooth and firm, with the consistency of tooth paste.*

○*Special compounds are available at automotive supply stores for the purpose of checking gear tooth patterns and contact. Use one of these for checking the bevel gears.*

Rear Final Gear Case

- Assemble the rear final gear case (see Rear Final Gear Case Assembly).
- Turn the pinion gear for one revolution in the drive and reverse (coast) direction, while creating drag on the ring gear.
- Remove the ring gear and pinion gear unit to check the drive pattern and coast pattern of the bevel gear teeth.

○The tooth contact patterns of both (drive and coast) sides should be centrally located between the top and bottom of the tooth. The drive pattern can be a little closer to the toe and the coast pattern can be a somewhat longer and closer to the toe.

★If the tooth contact pattern is incorrect, replace the pinion gear shim(s), following the examples shown (see Front Final Gear Case Tooth Contact Adjustment).

- Then erase the tooth contact patterns, and check them again. Also check the backlash every time the shim(s) are replaced. Repeat the shim change procedure as necessary.

NOTE

○*If the backlash is out of the standard range after changing the pinion gear shim(s), change the ring gear shim(s) to correct the backlash before checking the tooth contact pattern.*

Bearing and Oil Seal

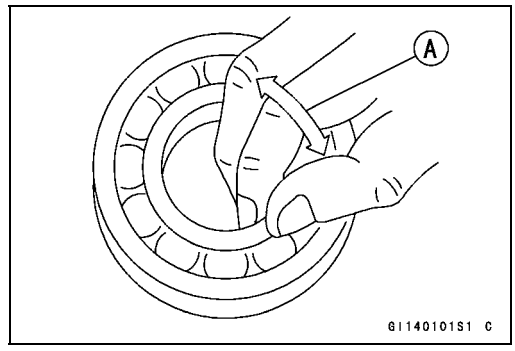
Ball or Needle Bearing Inspection

Since the bearings are made to extremely close tolerances, the clearance cannot normally be measured.

CAUTION
Do not remove any bearings for inspection except the right rear axle bearing.

- Turn each bearing in the case or hub back and forth [A] while checking for plays, roughness, or binding.

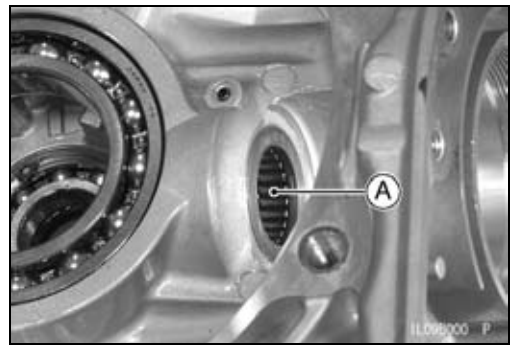
★If bearing play, roughness, or binding is found, replace the bearing.



- Check the needle bearings [A].

○The rollers in the 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 the bearing is damaged, replace the bearing.

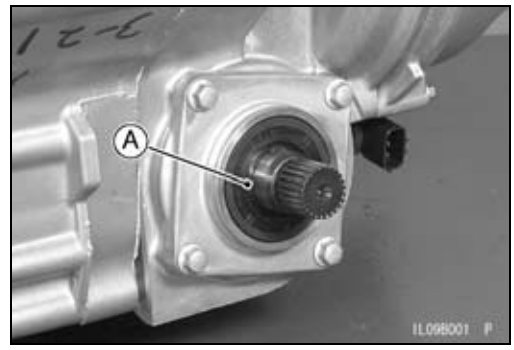


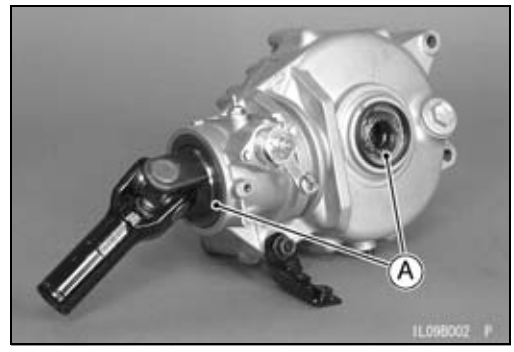
Bearing and Oil Seal

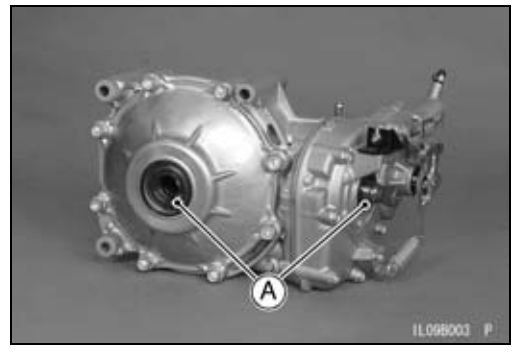
Oil Seal Inspection

- Inspect the oil seals [A].

★Replace any if the lips are misshapen, discolored (indicating that the rubber has deteriorated), hardened, or been otherwise damaged.







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