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SECTION 6 - DRIVE SYSTEM

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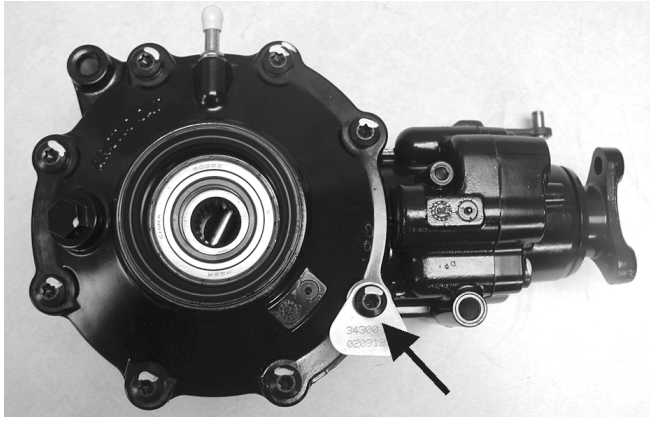
Drive System

■ NOTE: Some photographs and illustrations used in this section are used for clarity purposes only and are not designed to depict actual conditions.

General Information

All gear cases are tagged beneath a cover bolt. This tag is marked with a production date code, sequence code, and a ratio code.



CD017A

A. A "6" on the lower-right corner indicates a 3.6:1 gear set ratio (10:36 teeth).

B. A "1" on the lower-right corner indicates a 3.1:1 gear set ratio (11:34 teeth).

The die-cast aluminum housings have been assembled with thread-rolling screws (trilobular). When assembling with these screws, start the screws carefully into the housing; then use the following torque values.

Size	New Housing	Reassembled Housing
M6 (Torx T-30 Recess)	1.1-1.3 kg-m (8-9.5 ft-lb)	0.9-1.2 kg-m (6.5-9 ft-lb)
M8 (Torx T-40 Recess)	3.5-4.3 kg-m (25-31 ft-lb)	2.9-3.5 kg-m (21-25 ft-lb)
M10 (Torx T-50 Recess)	5.1-6.3 kg-m (37-45.5 ft-lb)	4.3-5.3 kg-m (31-38 ft-lb)

SPECIFICATIONS

Specific specifications regarding the the gear cases (capacities, lubricant type, etc.) can be found in Section 1 of this manual.

Ring Gear Backlash	0.28-0.38 mm (0.011-0.015 in.)
Ring Gear End Play	0.1-0.2 mm (0.004-0.008 in.)

SPECIAL TOOLS

A number of special tools must be available to the technician when servicing the gear case.

Description	p/n
Boot Clamp Pliers	0444-120
Pinion Gear/Shaft Removal Tool	0444-127
Slide Hammer w/CV Joint Attachment	0444-123
CV Joint Attachment (Only)	0444-119
Internal Hex Socket (48 mm)	0444-104

■ NOTE: Special tools are available from the Arctic Cat Service Parts Department.

TROUBLESHOOTING

If a noise is heard from the gear case area, it can be difficult to locate and/or diagnose. If the noise is related to wheel speed, but not to engine RPM, the problem is probably in the final drive or engine/transmission bevel gear set. When a problem is localized, a number of inspections must be made to pinpoint that problem. The most obvious of the inspections include CV boots, wheel and hub nut tightness, wheel bearing damage, gear case lubricant contamination, low lubricant level, seal leakage at the input shaft, CV joints, or selector arm.

■ NOTE: Small metallic particles will collect on the magnetic drain plug as a normal part of break-in and will also give a metallic cast to drained lubricant. Contamination would include large particles or water which gives a "milky" look to the lubricant.

■ NOTE: Lubricant on a new pinion housing assembly could be grease. If the front of the gear case is leaking at the rear drive boot, wipe excess lubricant from the bottom of the pinion housing; then operate the ATV for a period of time. Inspect the pinion housing area for any signs of leakage. If lubricant is again on the bottom of the pinion housing, the seal must be replaced.

Additional troubleshooting could include the following.

- Binding/abrupt motion: CV boot torn (grease loss, foreign object damage, broken cage); gear lubricant loss or not filled (bearing seizure, broken gear teeth, seal leakage, bladder or hose leakage, missing filler/drain plug).
- Noise from drive system: wheel or gear case bearing damage, improper gear backlash, improper assembly, low or no gear case lubricant.
- Lockup: gear case lubricant loss or not filled, water contamination causing bearing seizure.

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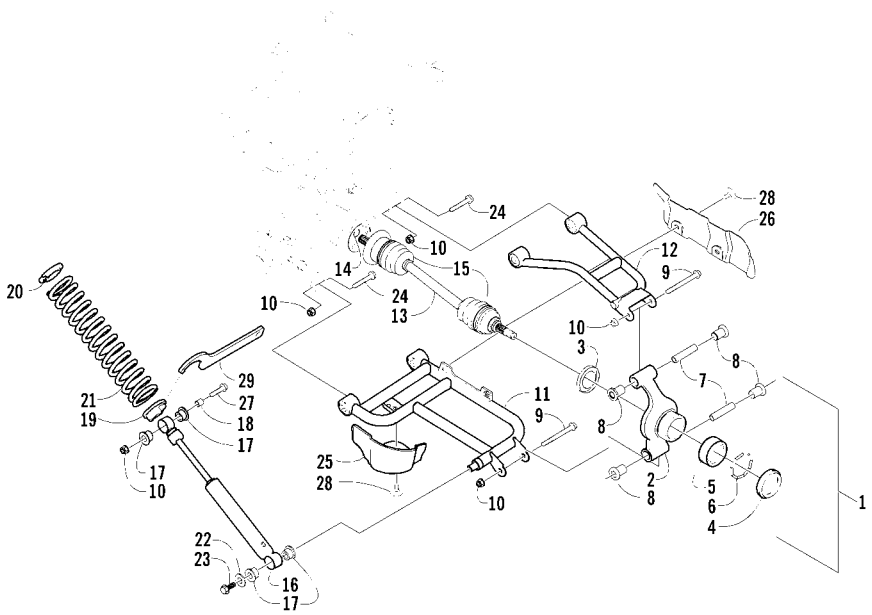
Rear Suspension/Rear Drive Assembly Schematics

REAR SUSPENSION/AXLE ASSEMBLY - FULLY INDEPENDENT SUSPENSION

KEY

1. Knuckle
2. Knuckle
3. Seal
4. Seal
5. Wheel Bearing
6. Clip
7. Collar
8. Bushing
9. Cap Screw
10. Lock Nut
11. A-Arm
12. Rear Arm
13. Axle
14. Clip
15. Boot Repair Kit
16. Shock Absorber
17. Bushing
18. Sleeve
19. Adjuster Cam
20. Retainer
21. Spring
22. Washer
23. Cap Screw
24. Cap Screw
25. Boot Guard
26. Boot Guard
27. Cap Screw
28. Body Screw
29. Spanner Wrench



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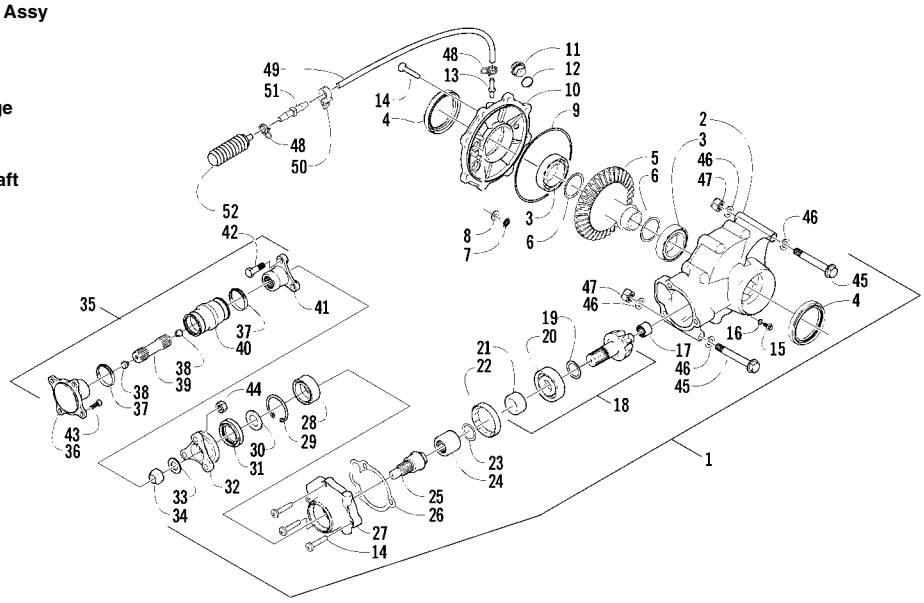
6

REAR DRIVE GEAR CASE ASSEMBLY - FULLY INDEPENDENT SUSPENSION

KEY

1. Gear Case Assy
2. Housing
3. Bearing
4. Seal
5. Ring Gear
6. Shim
7. Thrust Button
8. Shim
9. O-Ring
10. Cover
11. Filler Plug
12. O-Ring
13. Fitting
14. Self-Tapping Screw
15. Magnetic Plug
16. O-Ring
17. Bearing
18. Pinion Gear Assy
19. Shim
20. Bearing
21. Collar
22. Lock Collar
23. Wave Washer
24. Collar
25. Thrust Shaft
26. Gasket
27. Pinion Housing
28. Bearing
29. Retaining Ring
30. Spacer
31. Seal
32. Drive Flange Assy
33. Washer
34. Nut
35. Coupler
36. Output Flange
37. Clamp
38. Bumper
39. Propeller Shaft
40. Boot
41. Input Flange
42. Cap Screw
43. Cap Screw
44. Lock Nut
45. Bolt
46. Washer
47. Lock Nut
48. Clamp
49. Vent Hose
50. Clip
51. Vent Fitting
52. Bladder



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Front Differential
(FIS Models)

■ **NOTE: To remove the rear gear case on 400/500 FIS models, see Rear Gear Case (400/500 FIS Models) in this section.**

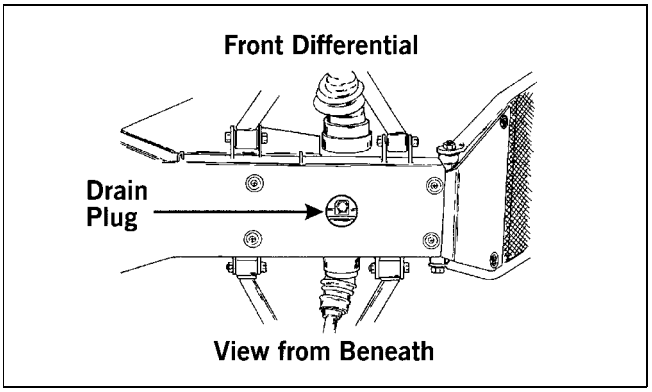
REMOVING DIFFERENTIAL

1. Secure the ATV on a support stand to elevate the wheels.

⚠ WARNING

Make sure the ATV is solidly supported on the support stand to avoid injury.

2. Remove the drain plug and drain the gear lubricant into a drain pan; then reinstall the plug.



ATV0082A

3. Remove the front wheels.
4. Remove the boot guards.

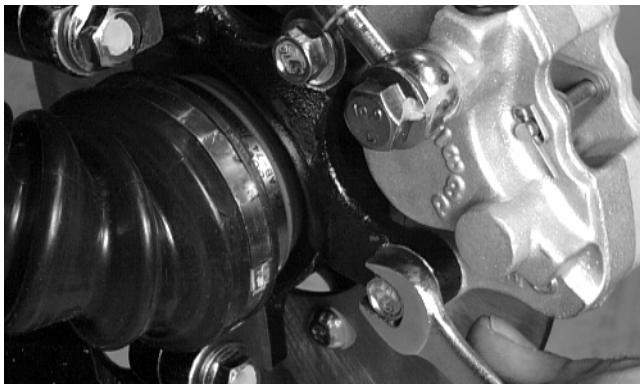
AF934

5. Pump up the hand brake; then engage the brake lever lock.
6. Remove the cotter pin securing the hex nut; then remove the hex nut and washer. Release the brake lever lock.

CD008

■ **NOTE: It is not necessary to remove the brake hoses from the calipers for this procedure.**

7. Remove the brake calipers. Account for the cap screws.



AF894D

8. Remove the tie rod cotter pins and discard the pins.

AF895D

9. Remove the tie rod lock nuts.

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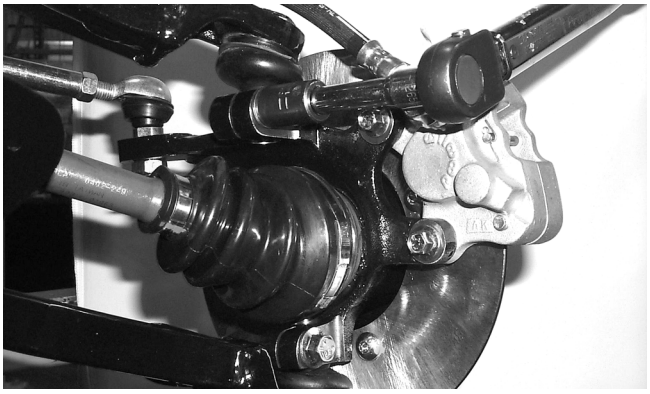
AF896D

10. Remove the upper ball joint cap screws taking care not to strip the threads on the ball joint shaft; then using a rubber mallet, tap the end of the axle and free it from the knuckle assembly.



AF628D

11. Pull the steering knuckle away from the axle taking care not to damage the seals with the axle end.

12. Support the axle to not allow it to drop or hang.

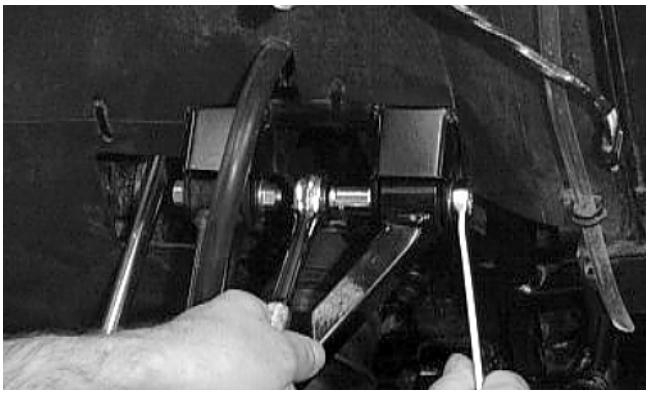
⚠ CAUTION

The axle must be supported. If the axle is allowed to drop or hang, damage to the inner CV joint may occur.

13. Remove the lower shock bolts. Account for the lock nuts; then move the shocks aside and secure them with a strap.

AF897D

14. Remove the upper A-arm lock nuts and cap screws; then remove the A-arms.

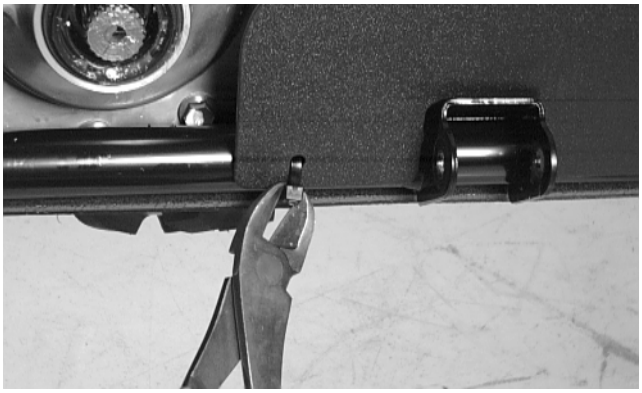


AF610D

15. Using a slide hammer, remove the front axles.

AF899D

16. Remove the inner fender panels.



AF902D

■ NOTE: To remove the panels, there will be a torx-head screw and three cable ties per side.

17. Remove the rubber coupler cap screws. Account for the six cap screws and lock nuts.

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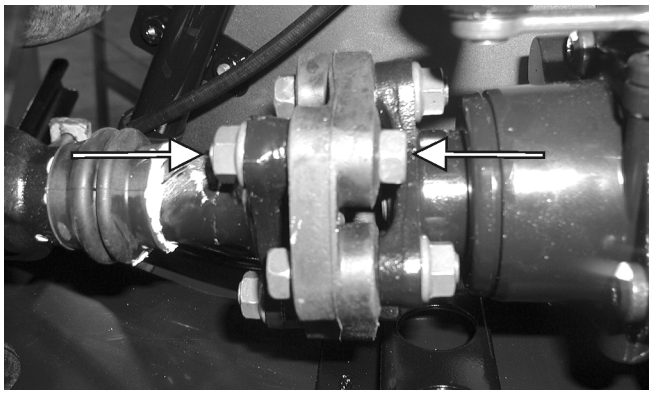
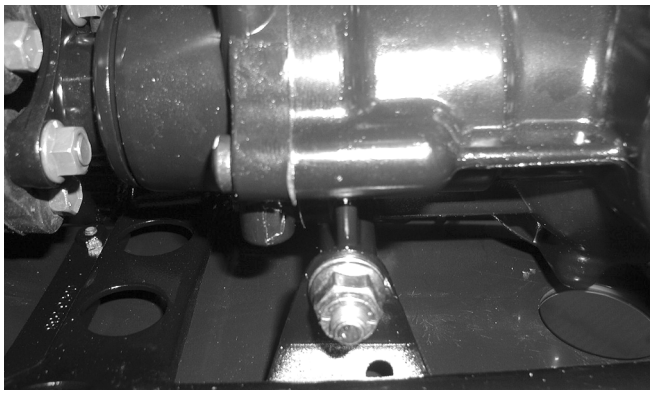


CD025A

18. Remove the lower differential mounting cap screw. Account for a lock nut and washers.



CD026

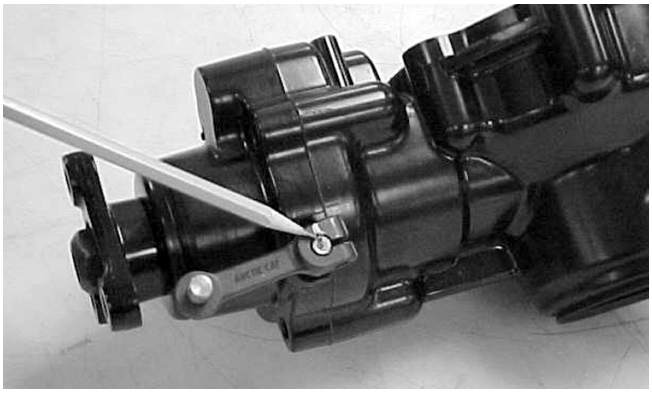
19. Remove the upper differential mounting cap screws.

CD016

20. Remove the differential from the frame.

21. Using an 8 mm wrench, remove the cap screw securing the 4-wheel drive selector arm.

■ NOTE: Prior to removing the selector arm, make a mark on the selector arm and on the splined shaft to ensure that the arm is properly positioned on the shaft during installing.

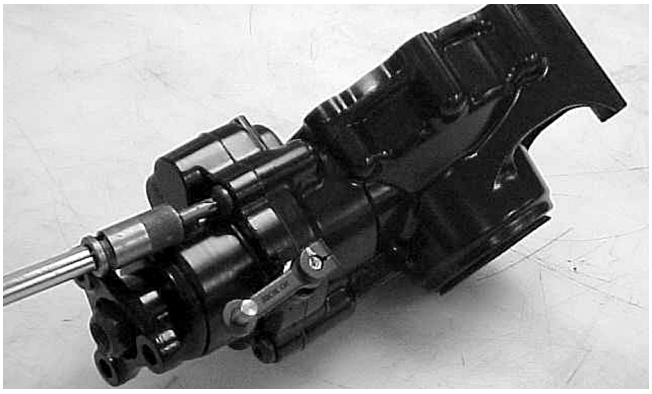


AF976

Disassembling Input Shaft

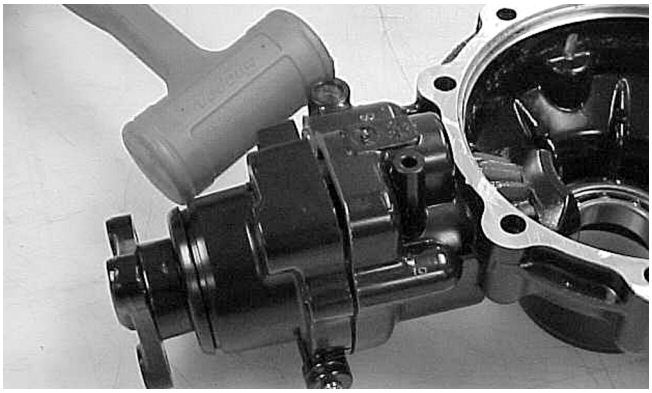
■ NOTE: This procedure can be performed on a rear FIS gear case; however, some components may vary from model to model. The technician should use discretion and sound judgment.

1. Using a T-40 torx wrench, remove the cap screws securing the input shaft housing cover.



AF975

2. Using a rubber mallet, remove the cover. Account for a gasket. Remove the fork, collar, and spring. Note the location of all the components for assembling purposes.



AF977

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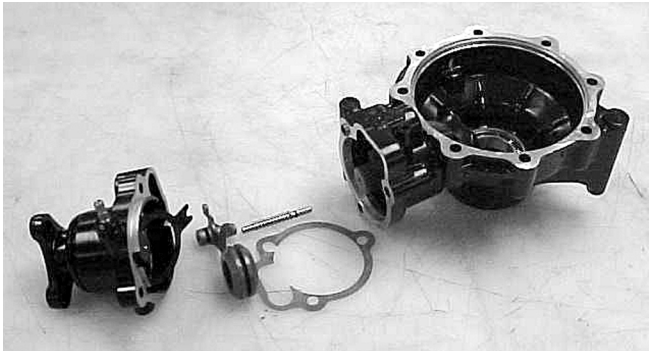


AF978

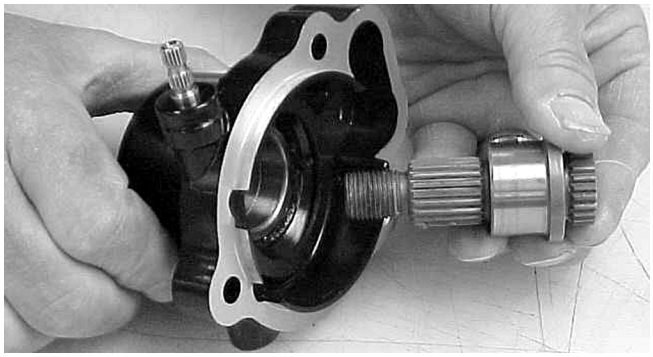
3. Using an impact wrench and a 24 mm socket, remove the nut securing the flange to the input shaft.

AF979

4. Remove the flange from the input shaft and account for a washer.

AF980

5. Remove the input shaft from the housing.



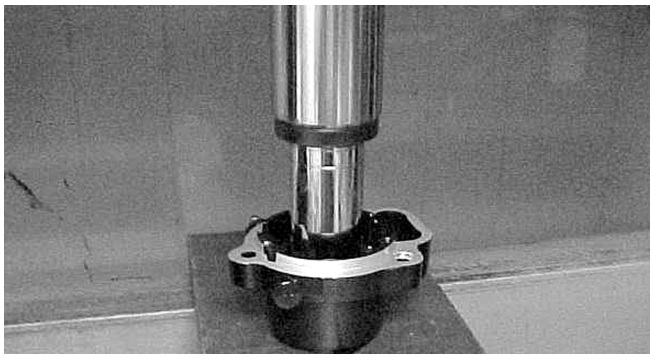
AF981

6. Using a seal removal tool, remove the input shaft seal. Account for a spacer.

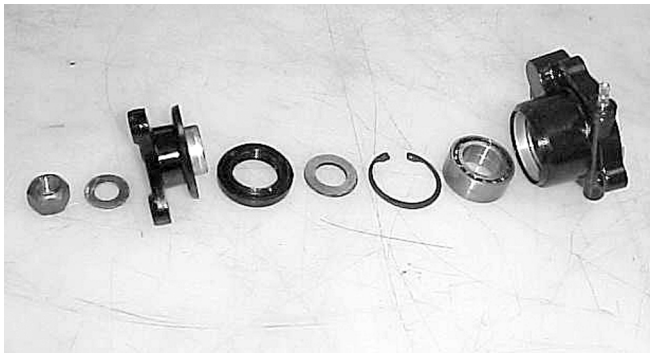
AF982

7. Remove the snap ring securing the input shaft bearing; then place the input shaft housing in a press and remove the bearing.

AF983



AF984



AF986

6

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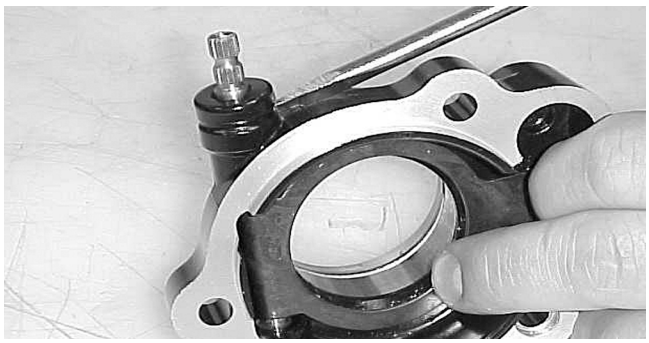
8. Remove the shift lever seal cover; then using a hook and pick set, remove the shift lever seal.



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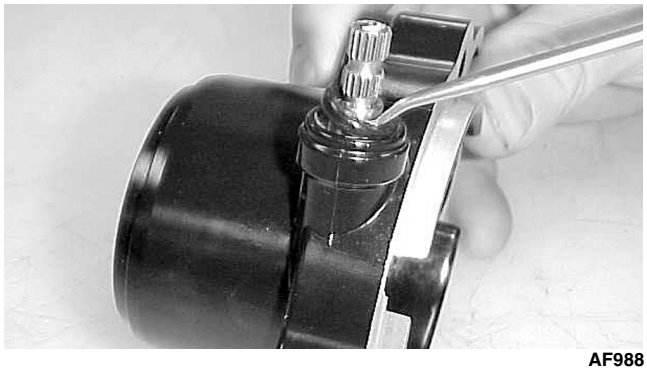


AF988

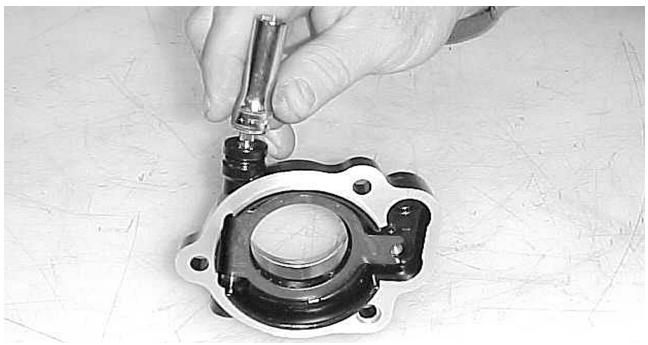
■ **NOTE: Do not remove the shift lever.**

Assembling Input Shaft

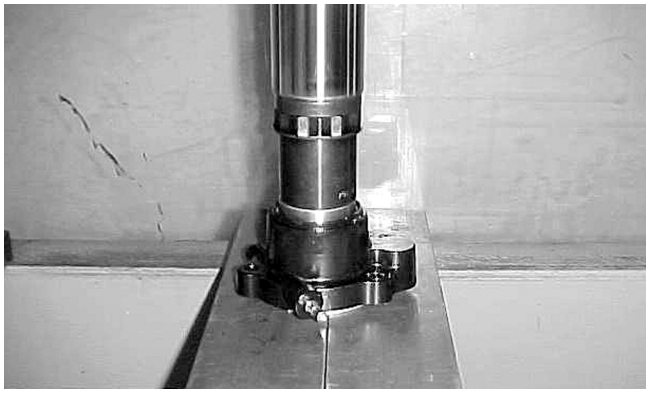
1. Apply grease to the lips of the shift lever seal; then install the seal making sure the lipped side faces to the inside.

AF990

2. Install the seal cover.



3. Place the input shaft housing in a press and install the input shaft bearing. Secure the bearing with the existing snap ring making sure the sharp edge of the snap ring faces to the outside.



AF993

AF994

4. Install the large diameter spacer; then install the input shaft seal making sure it is flush with the edge of the housing.

AF995

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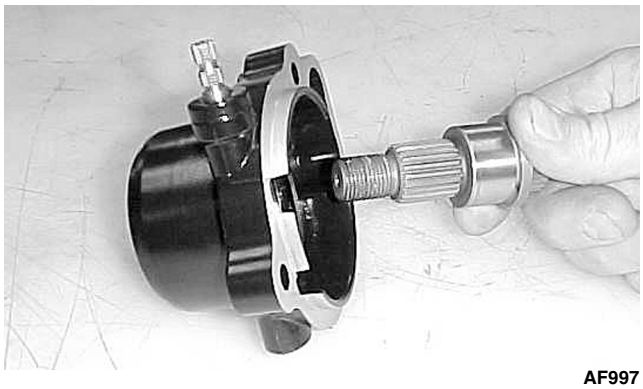
AF996

5. Install the input shaft into the housing; then install the input shaft flange.



AF997

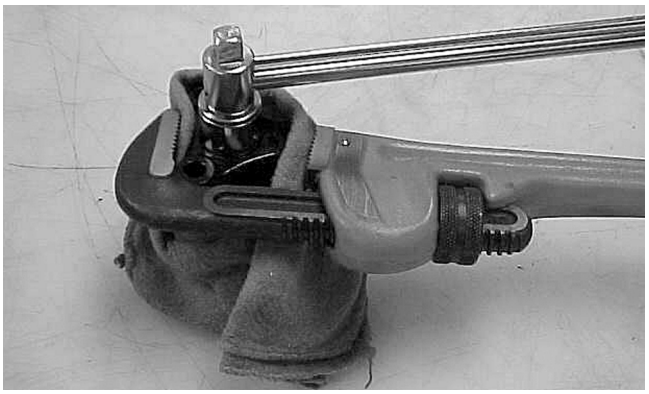
AF999

6. Apply Three Bond Sealant 1104 to the inside of the remaining washer; then install the washer onto the input shaft.

CC872

7. Apply red Loctite #271 to the threads of the input shaft nut; then secure the flange to the input shaft housing. Tighten to 10.4 kg-m (75 ft-lb).

CC873



CC874

■ NOTE: When using a vise or a pipe wrench to secure the input shaft housing while tightening the nut, make sure to protect the input shaft housing with a rag or suitable substitute.

Disassembling Pinion Gear

■ NOTE: This procedure can be performed on a rear FIS gear case; however, some components may vary from model to model. The technician should use discretion and sound judgment.

1. Using a T-40 torx wrench, remove the cap screws securing the differential cover. Account for and make note of the ID tag location for assembling purposes.

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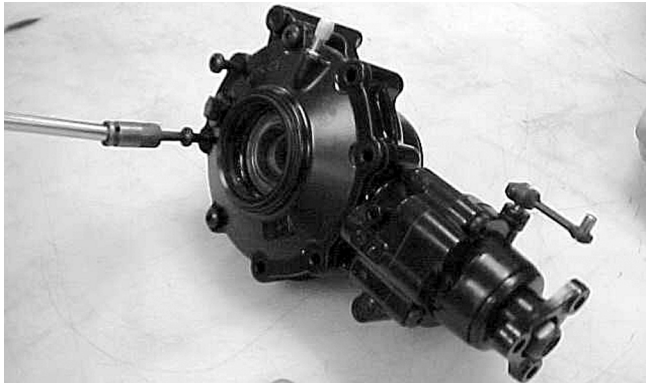
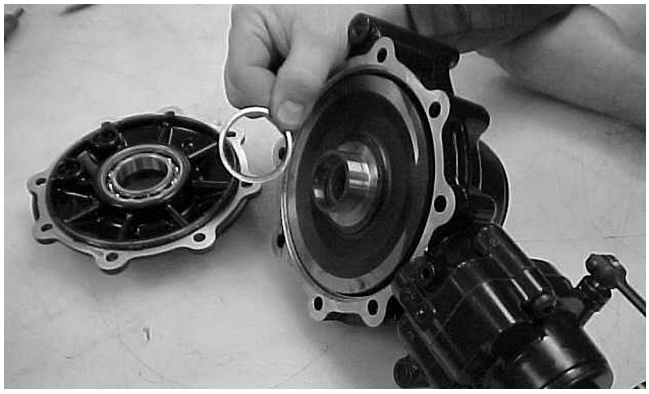


AF970

2. Using a wide pry bar, carefully remove the differential cover. Account for an O-ring and shim. Mark the shim as left-side.

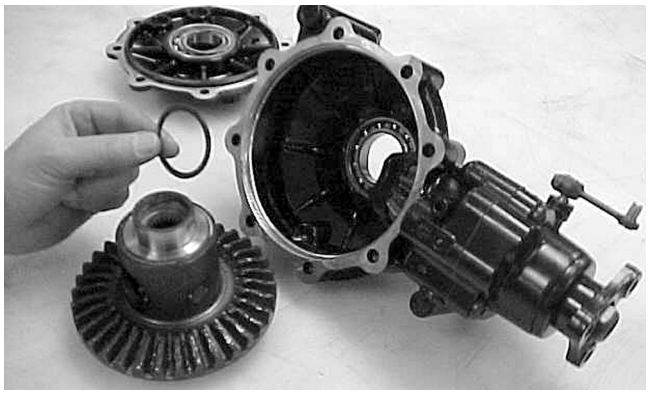
AF971



AF972

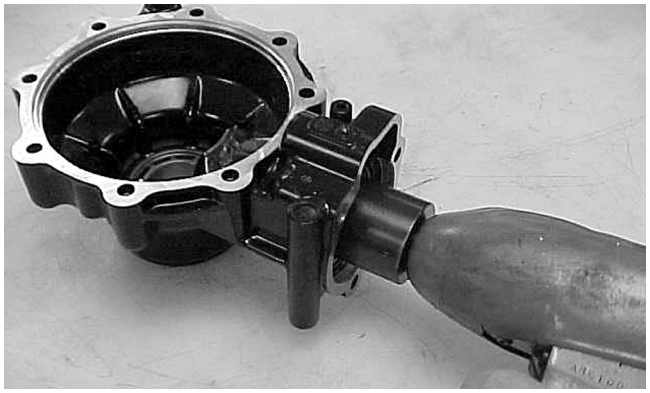
■ NOTE: If the cover is difficult to remove, pry on the cover in more than one recessed location.

3. Remove the ring gear spider assembly and account for a shim. Mark the shim as right-side.



AF973

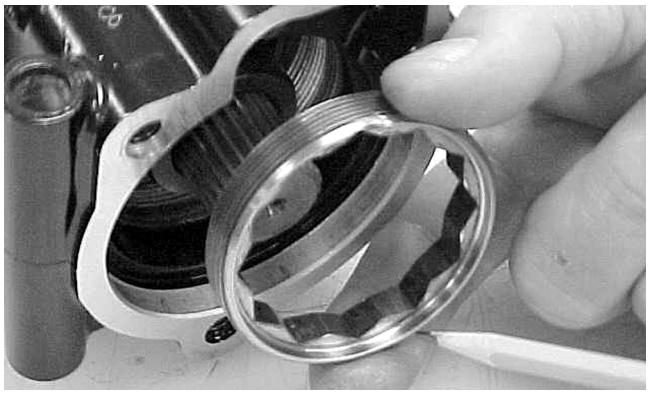
4. Using a T-40 torx driver, remove the input shaft housing.



CC875

5. Using the 48 mm Internal Hex Socket (p/n 0444-104), remove the nut securing the pinion gear assembly.

■ NOTE: On a front differential, the nut has right-hand threads. On a rear gear case, the nut has left-hand threads.



CC876

6. Using the Pinion Gear/Shaft Removal Tool (p/n 0444-127), and a hammer, remove the pinion gear from the housing.

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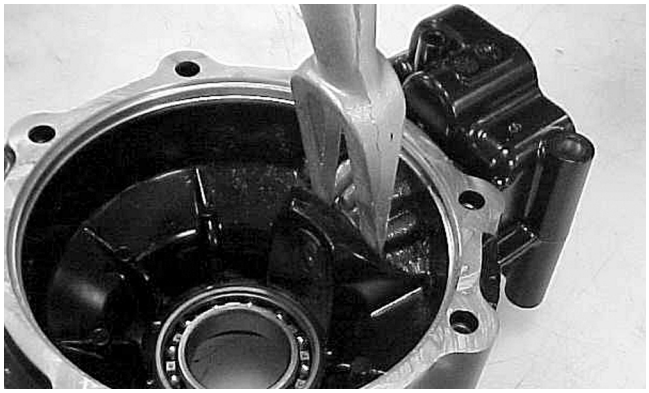

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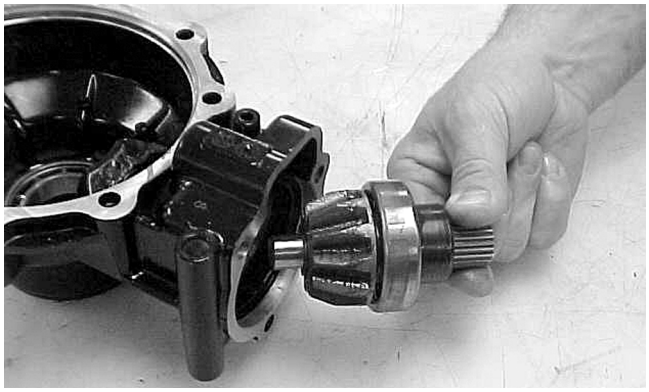
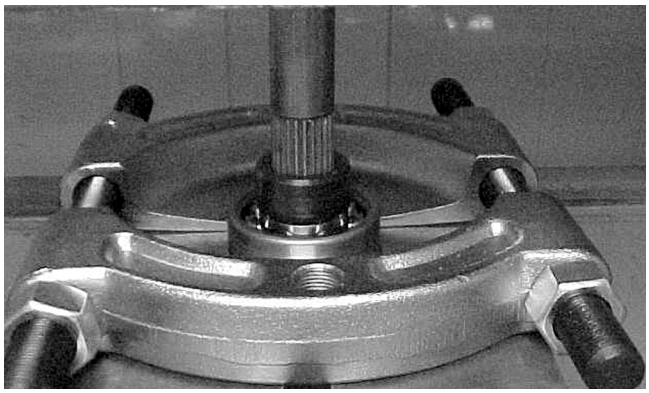


CC878

7. Secure the pinion gear in a bearing puller; then remove the pinion bearing using a press. Account for a collar, a bearing, and a shim.



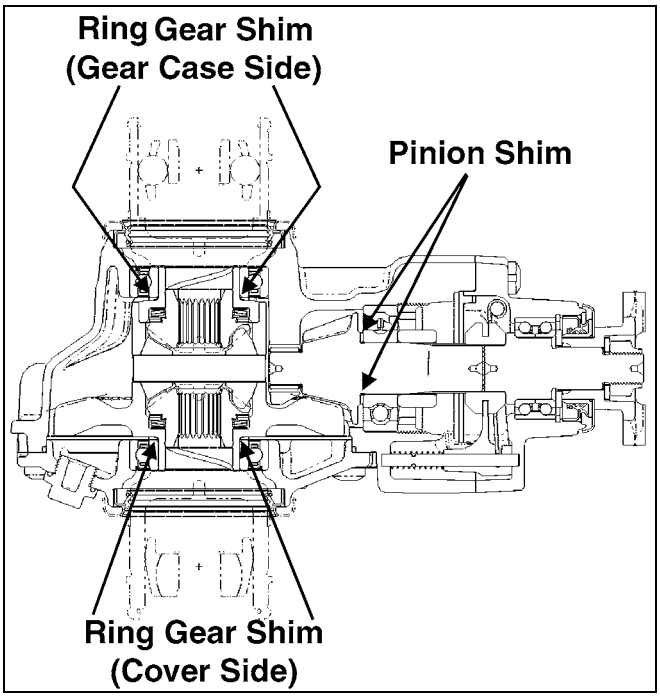
CC879

CC880

■ **NOTE: If gears are being replaced, use the existing shims. The numbers are scribed onto the gears: the ring gear has the number on the opposite side of the gears, and the pinion gear has the number on the end of the pinion gear shaft by the splines. If no number is present, it should be considered as being in the O category.**

■ **NOTE: If the housing is being replaced, proceed to the following Shimming Procedure/Shim Selection sub-section.**

Shimming Procedure/Shim Selection



502-119A

1. Press bearings into bores by outer ring to hard contact with seat.

2. Note the following shim selections (shims are nominally 1.5 mm/0.060 in. thick):

6

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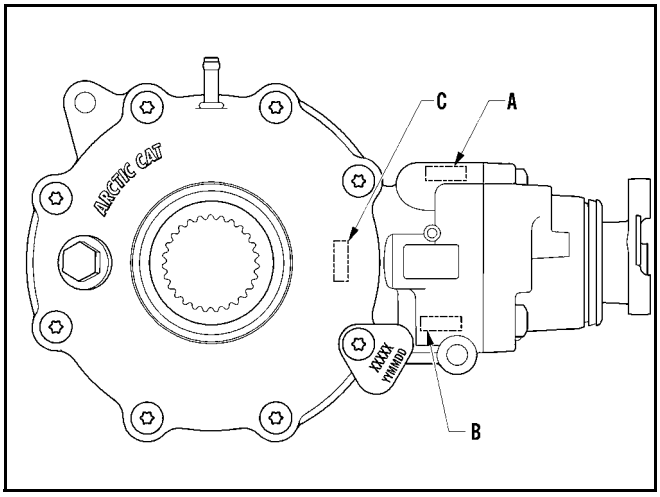
A. Pinion Gear Sub-Assembly - add the value (A) on the gear case housing with 1.5 mm (0.060 in.); then subtract the value on the 10-tooth pinion gear. This will give you the proper shim thickness.

B. Cover Side - add the value (B) on the gear case housing to the value (C) on the gear case cover; then add 1.5 mm (0.060 in.). This will give you the proper shim thickness.

C. Gear Case Side - install a 1.3-1.4 mm (0.050-0.055 in.) shim and tighten the bolts to 3.5-4.3 kg-m (25-31 ft-lb). Verify backlash to be within a range of 0.28-0.38 mm (0.011-0.015 in.) and end-play to be within a range of 0.10-0.20 mm (0.004-0.008 in.). If not within specification range, reselect shim until backlash specification range can be verified.



738-268A

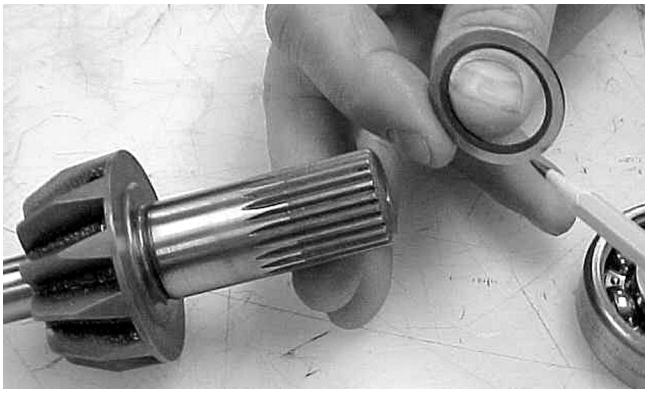
3. Apply molybdenum disulfide grease to all oil seal lips.

4. Prelubricate journal on pinion assembly with SAE 80W-90 hypoid gear lubricant prior to pressing assembly into gear case housing.

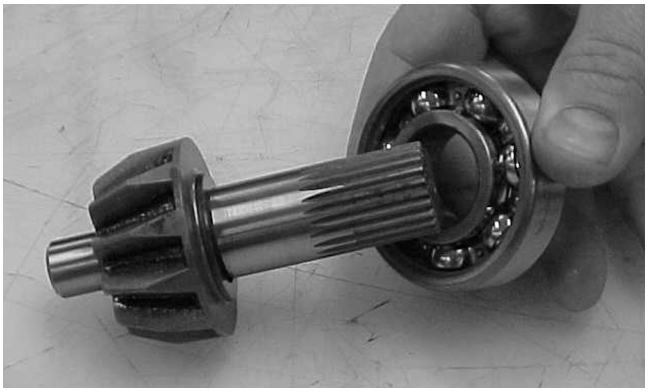
5. Tighten lock collar to 16.6 kg-m (120 ft-lb) and deform/lock edge approximately 1.5 mm (0.060 in.) into lower oil channel.

Assembling Pinion Gear

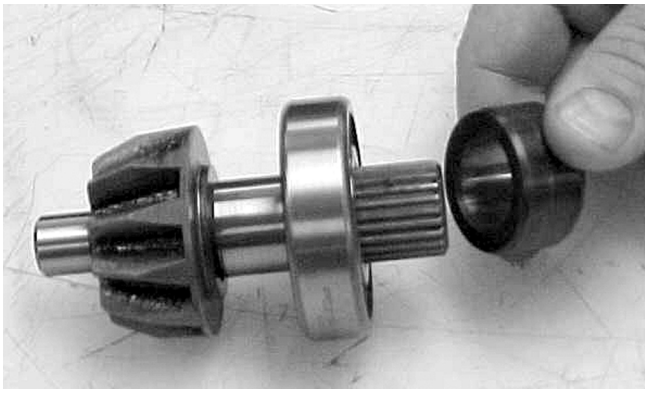
1. Place the shim (with the chamfer side toward the inside) onto the pinion shaft; then install the bearing onto the pinion shaft. Install the pinion shaft collar.



CC881



CC882



CC883

2. Place the pinion assembly in a bearing puller; then install the bearing using a press.

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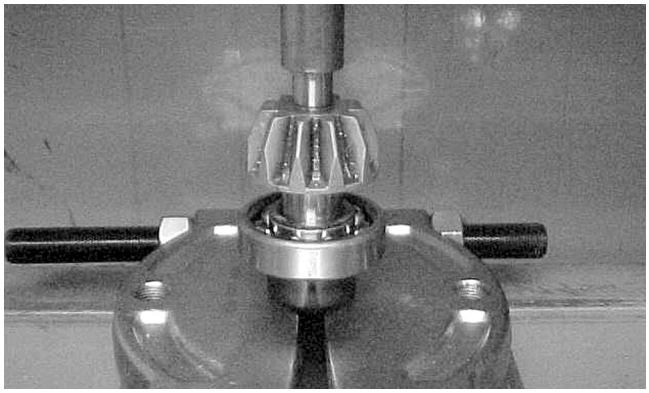
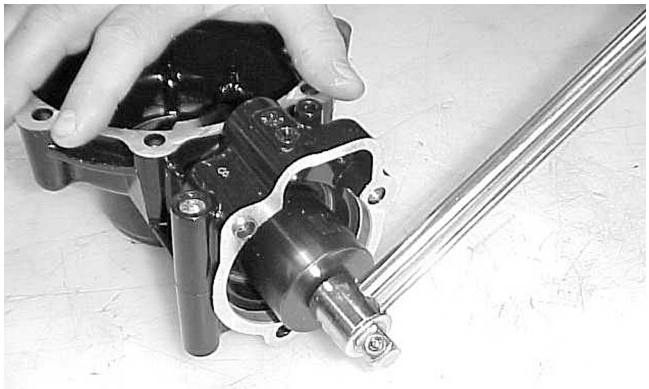


CC884

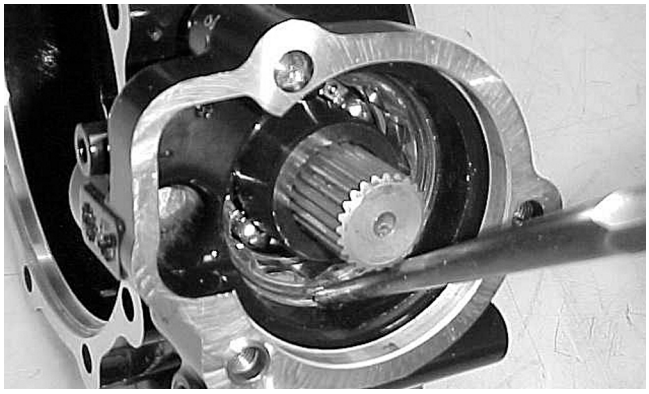
3. Install the pinion gear assembly into the housing. Using the 48 mm Internal Hex Socket (p/n 0444-104), secure the pinion gear assembly with the existing nut. Tighten to 17.3 kg-m (125 ft-lb).

■NOTE: On a front differential, the nut has right-hand threads. On a rear gear case, the nut has left-hand threads.



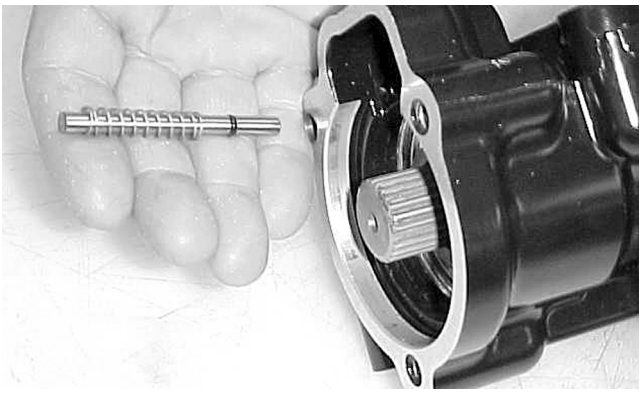
CC890

4. Place a punch on the edge of the nut in the oil gallery area; then using a hammer, stake the nut to ensure that the nut will remain securely tightened.



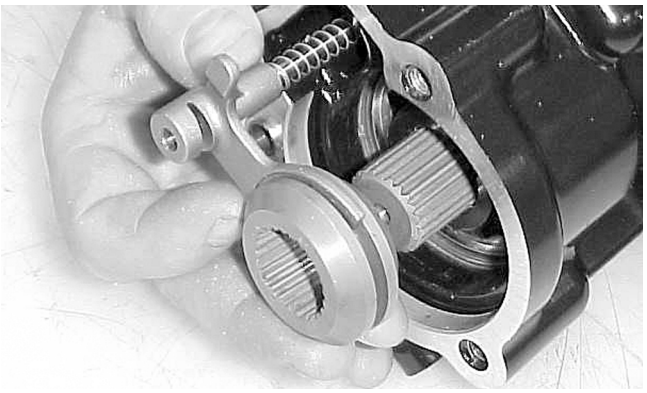
CC891

5. Install the shift fork shaft w/spring into the gear housing making sure the shaft O-ring is positioned to the inside.



CC892

6. Install the shift fork assembly making sure the fork leg is facing upward. Apply a small amount of oil to the gasket; then install the gasket.



CC893

7. Place the input shaft assembly onto the gear housing; then secure with the existing cap screws. Tighten to 2.9-3.5 kg-m (21-25 ft-lb).

■NOTE: If a new gear housing is being installed, tighten the cap screws to 3.5-4.3 kg-m (25-31 ft-lb).

CC894

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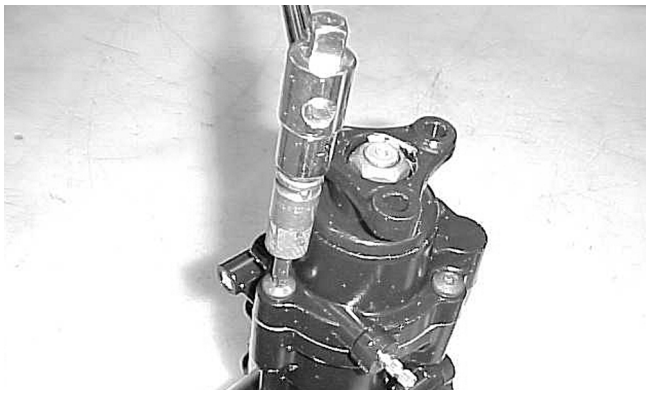
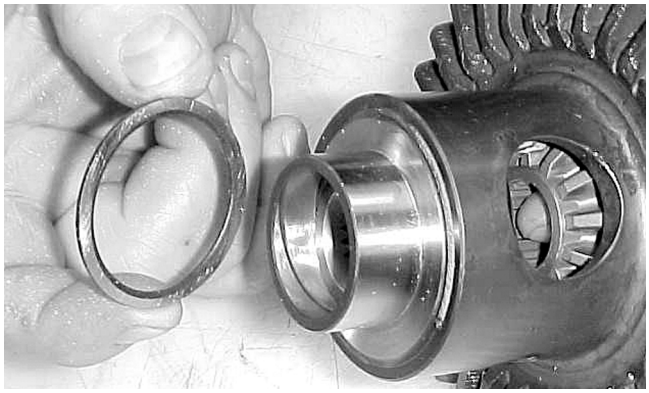


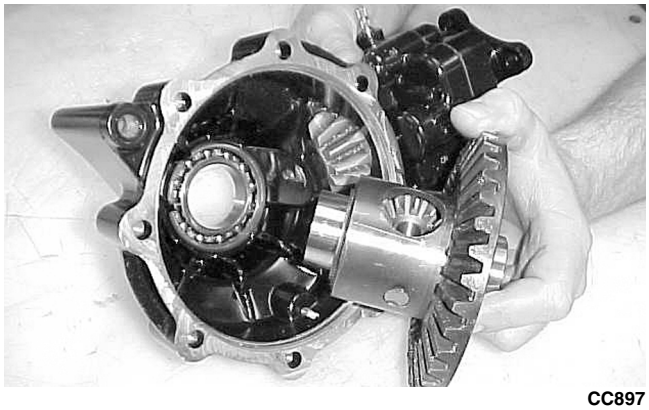
CC895

8. Install the proper shim onto the ring gear spider assembly making sure the chamfer side of the shim is facing toward the ring gear. Install the ring gear in the housing; then install the outside shim with the chamfer side of the shim toward the ring gear.

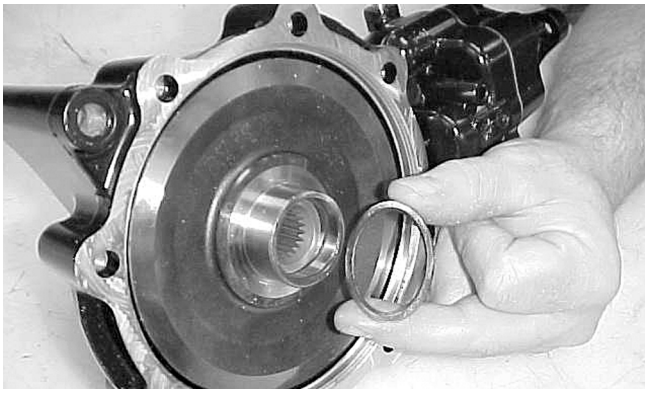
■ NOTE: The spider and ring gear assembly must be replaced as a complete unit.



CC896



CC897

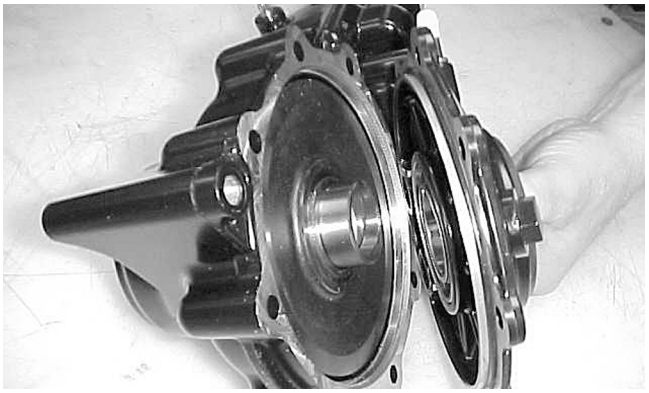


CC898

9. Making sure the O-ring is properly positioned on the differential cover, install the differential cover with existing hardware. Account for the ID tag. Tighten the cap screws to 2.9-3.5 kg-m, (21-25 ft-lb).

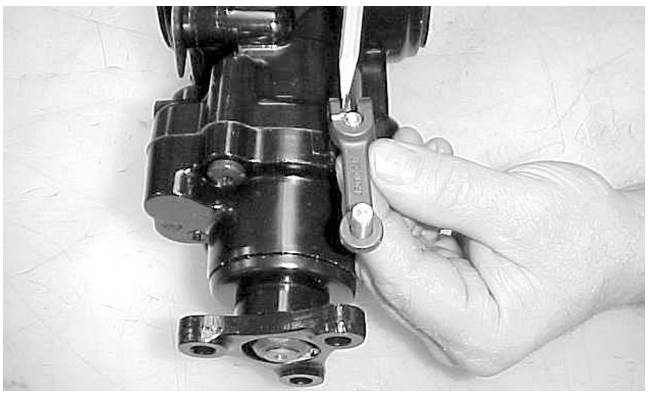
■ NOTE: Grease can be applied to the O-ring for ease of assembling.

■ NOTE: If a new gear housing is being installed, tighten the cap screws to 3.5-4.3 kg-m (25-31 ft-lb).



CC903

10. Install the selector arm making sure the marks on the splined shaft and the selector arm align. Secure with existing machine screw.



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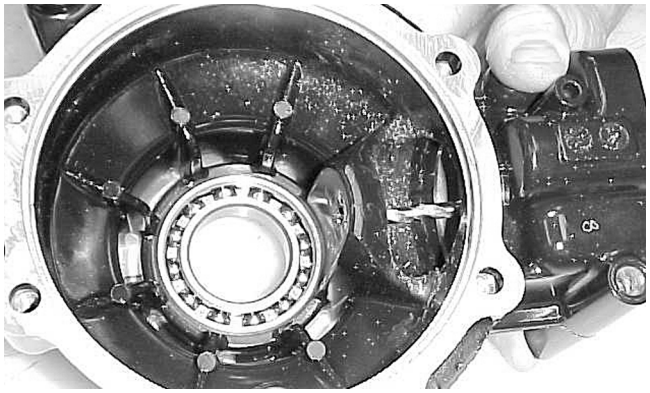
CC904

Removing Needle Bearing

■NOTE: Removing the needle bearing is rarely necessary. Avoid removing the needle bearing unless the bearing is clearly damaged.

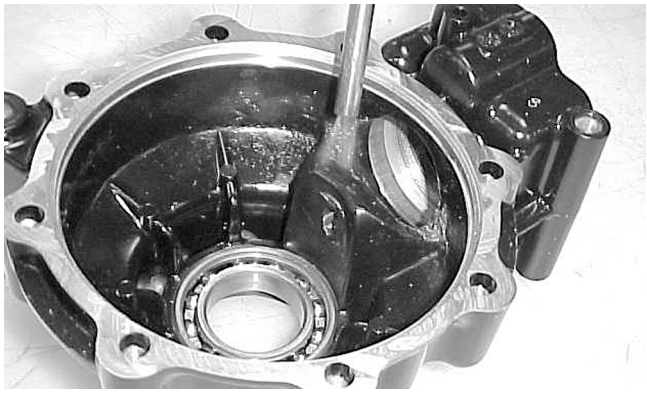
■NOTE: This procedure can be performed on a rear FIS gear case; however, some components may vary from model to model. The technician should use discretion and sound judgment.

1. Place a 6.35 mm (1/4 in.) drill bit on the inside surface of the needle bearing (against the bottom side); then drill through the pinion shaft needle bearing housing.



CC885

2. Using a propane torch, heat the area surrounding the needle bearing to approximately 300°.



CC886

3. Using a flat-nosed punch, drive the bearing out of the housing.

CC887

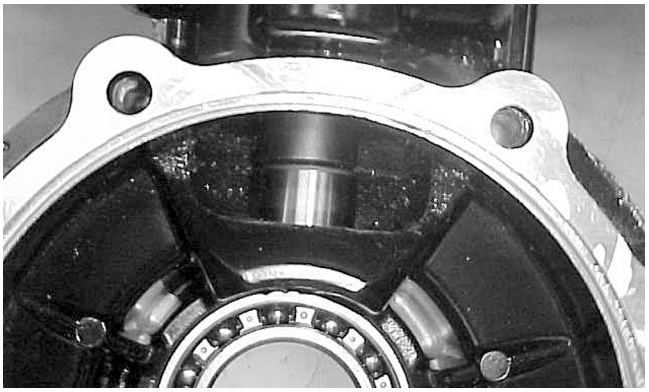
Installing Needle Bearing

1. Place the new bearing into the housing.

CC888

2. Using a suitable driver, install the needle bearing into the housing making sure the bearing is seated.

■NOTE: Do not push the bearing too far into the housing.



CC889

3. Install the pinion shaft and secure with the existing 48 mm nut. Tighten to 17.3 kg-m (125 ft-lb).

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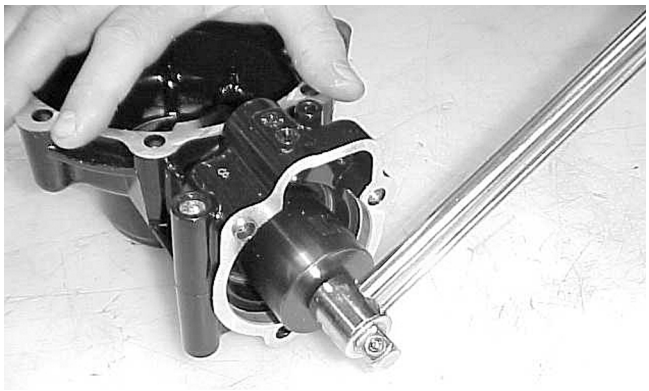
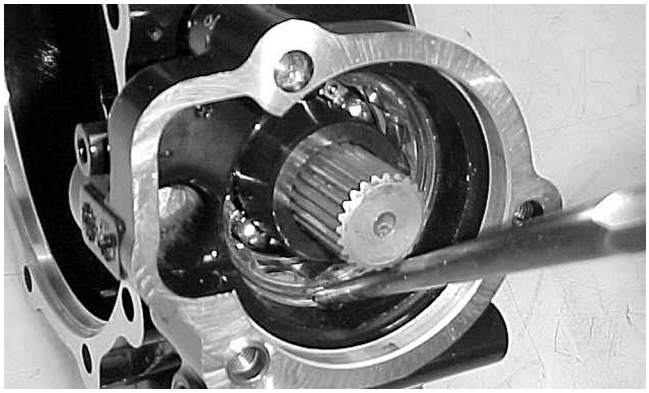


CC890

4. Place a punch on the edge of the nut in the oil gallery area; then using a hammer, stake the nut to ensure that the nut will remain securely tightened.



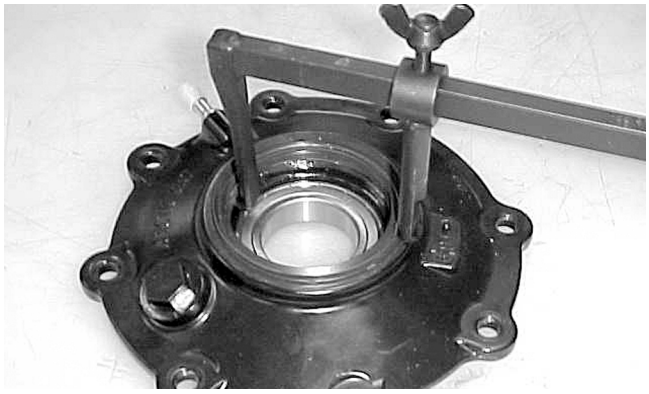
CC891

5. Install the input shaft housing.

Removing/Installing Axle Seal

■ NOTE: This procedure can be performed on a rear FIS gear case; however, some components may vary from model to model. The technician sould use discretion and sound judgment.

1. Remove the seal using a seal removal tool.

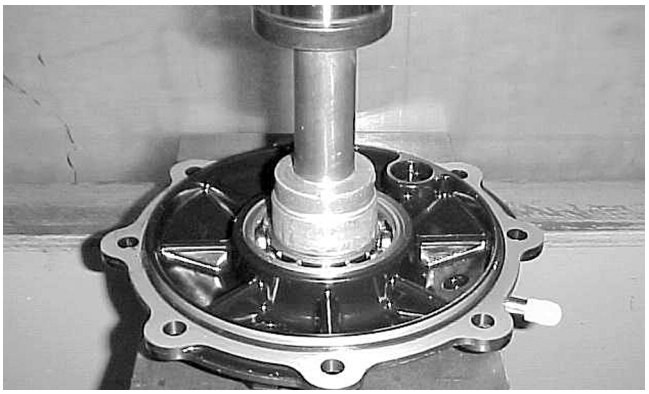


CC899

2. Using a press, remove the bearing.

CC900

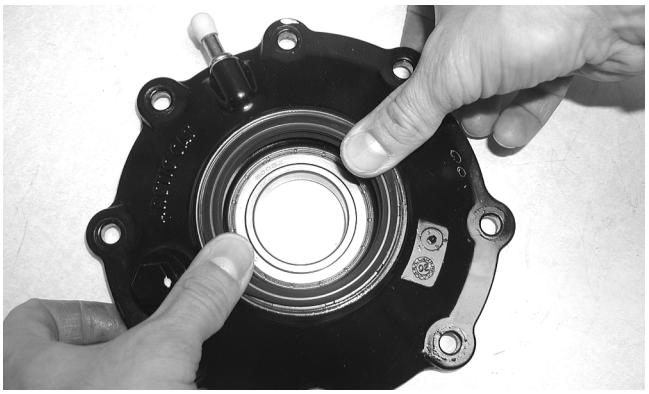
3. Using a press, install the new axle bearing into the housing.



CC901

■ NOTE: Prior to installing the seal, apply grease to the seal outside diameter.

4. Install the seal into the housing pressing evenly on the outside edge until the seal is seated.



CD018

5. Repeat steps 1-4 for the opposite side.

INSTALLING DIFFERENTIAL

1. Place the differential into position on the frame and install the cap screws, washers, and flex-lock nuts. Tighten to 6.2 kg-m (45 ft-lb)

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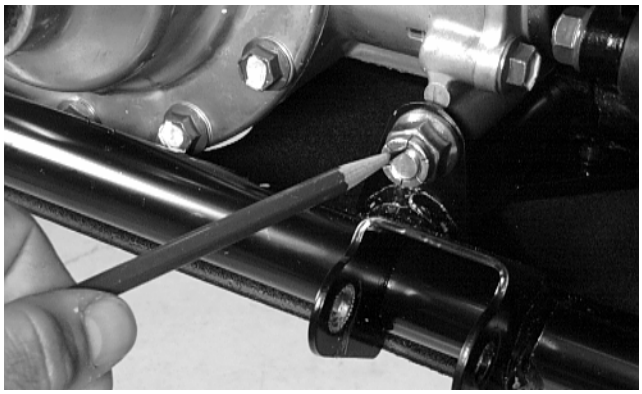
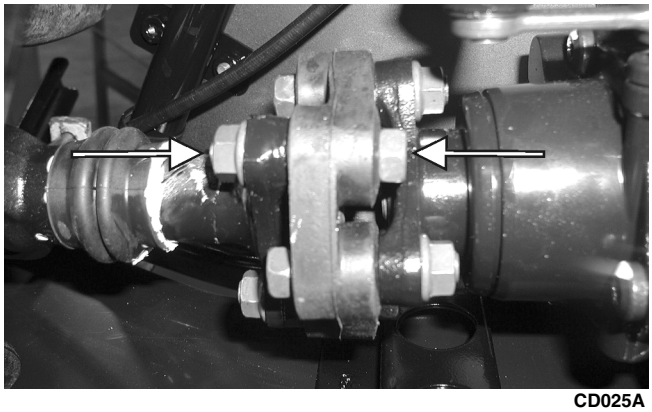
AF905D



AF904D

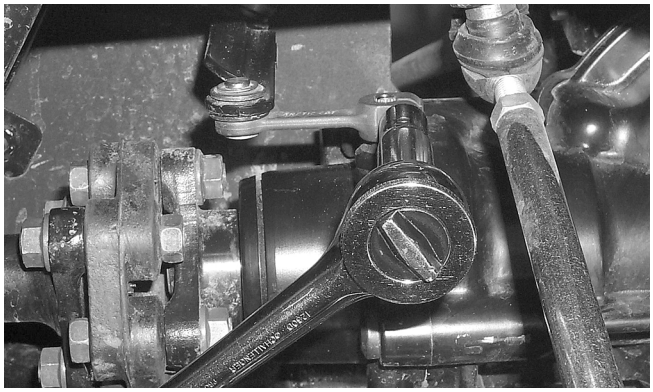
2. Secure the front driveshaft (rubber coupler) with cap screws (coated with red Loctite #271) and lock nuts. Tighten to 5.5 kg-m (40 ft-lb).



CD025A

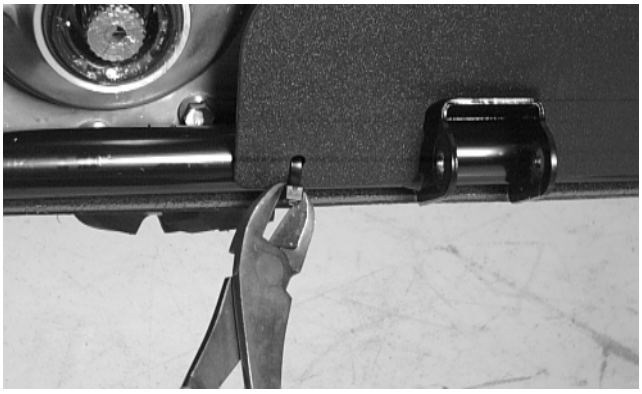
3. Pour 275 ml (9.3 fl oz) of SAE 80W-90 hypoid lubricant into the differential and install the filler plug. Tighten to 2.2 kg-m (16 ft-lb).

4. Install the selector arm making sure the marks made during removing align.



AF930

5. Install the inner fender panels.

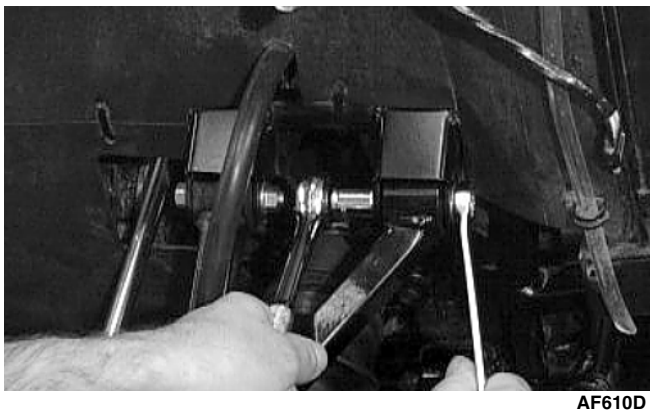


AF902D

■ **NOTE: To secure the side panels, use a torx-head screw and three cable ties per side.**

6. Install the front axles.

7. Secure the upper A-arms with cap screws and lock nuts. Tighten to 4.8 kg-m (35 ft-lb).



AF610D

8. Install the boot guards.

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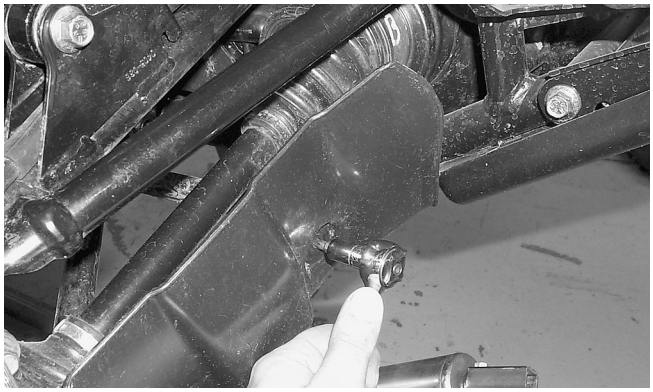
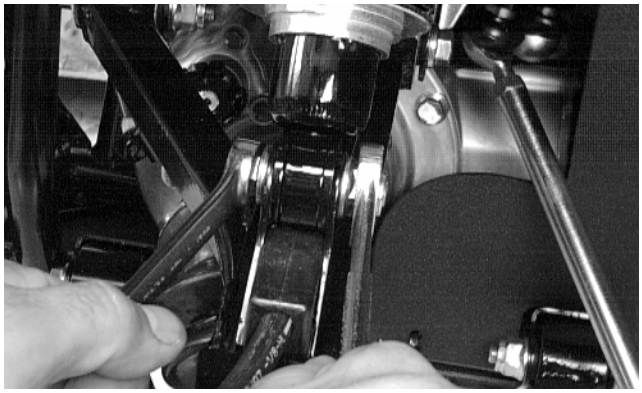


AF934

9. Secure the lower shock eyelets with cap screws and lock nuts. Tighten to 4.8 kg-m (35 ft-lb).



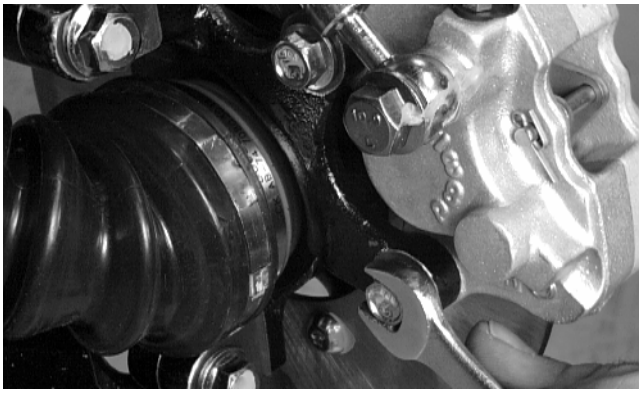
AF897D

10. Secure the tie rods with the lock nuts. Tighten securely; then install and spread the cotter pins.

AF896D

AF895D

11. Install the brake calipers. Secure with the cap screws tightened to 2.8 kg-m (20 ft-lb).



AF894D

12. Install the wheels and tighten to 5.5 kg-m (40 ft-lb).

13. Remove the ATV from the support stand.

Drive Axles

REMOVING REAR DRIVE AXLE (Fully Independent Suspension)

1. Secure the ATV on a support stand to elevate the wheels.

⚠ WARNING

Make sure the ATV is solidly supported on the support stand to avoid injury.

2. Pump up the hand brake; then engage the brake lever lock.

3. Remove the wheel.

4. Remove the cotter pin securing the hex nut; then remove the hex nut and rubber washer. Release the brake lever lock.

CD008

5. Remove the two brake calipers (right side only).

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■ **NOTE: Do not allow the brake calipers to hang from their cable/hose.**

⚠ CAUTION

The calipers should be supported. If the calipers are allowed to hang from the cable/hose, damage may occur.

6. Slide the hub out of the knuckle and set aside.

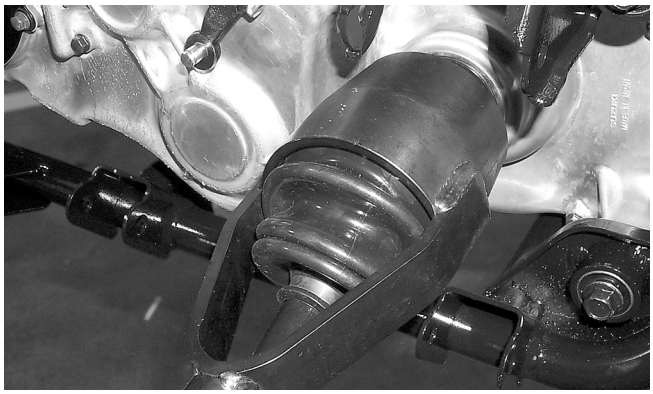
7. Remove the cap screw and lock nut securing the knuckle to the upper A-arm. Discard the lock nut.

AF936

■ **NOTE: Never reuse a lock nut. Once a lock nut has been removed, it must be replaced with a new lock nut.**

8. While holding the drive axle stationary, pull the top of the knuckle out and down until it is free of the drive axle.

9. Place a drain pan under the ATV to contain any oil leakage; then using a slide hammer, remove the drive axle.



AF935

REMOVING FRONT DRIVE AXLE (4x4 Models)

1. Secure the ATV on a support stand to elevate the wheels.

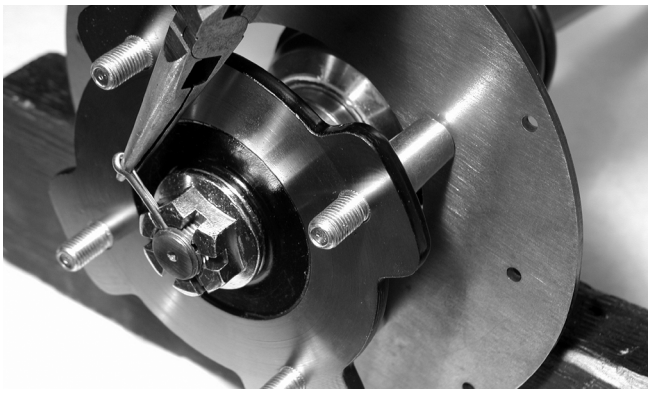
⚠ WARNING

Make sure the ATV is solidly supported on the support stand to avoid injury.

2. Pump up the hand brake; then engage the brake lever lock.

3. Remove the wheel.

4. Remove the cotter pin securing the hex nut; then remove the hex nut and washer. Release the brake lever lock.



CD008

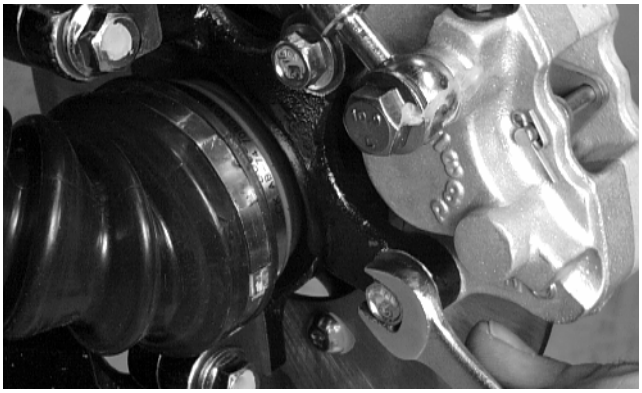
■ **NOTE: It is not necessary to remove the brake hose from the caliper for this procedure.**

5. Remove the brake caliper.

■ **NOTE: Support the caliper. Do not allow the caliper to hang from its hose.**

⚠ CAUTION

The caliper should be supported. If the caliper is allowed to hang from its hose, damage may occur.



AF894D

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6. Slide the hub w/brake disc out of the steering knuckle and set aside.

7. Remove the tie rod from the steering knuckle.

AF896D

8. Remove the cap screw and lock nut securing the lower shock eyelet to the upper A-arm. Discard the lock nut.

■ NOTE: Never reuse a lock nut. Once a lock nut has been removed, it must be replaced with a new lock nut.

9. Remove the cap screw securing the upper A-arm ball joint to the steering knuckle; then disengage the ball joint from the knuckle.

10. While holding the drive axle stationary, pull the top of the steering knuckle out and down until it is free of the drive axle.

11. Place a drain pan under the ATV to contain any oil leakage; then using a slide hammer, remove the drive axle.

AF899D

CLEANING AND INSPECTING

■ NOTE: Always clean and inspect the drive axle components to determine if any service or replacement is necessary.

1. Using a clean towel, wipe away any oil or grease from the axle components.

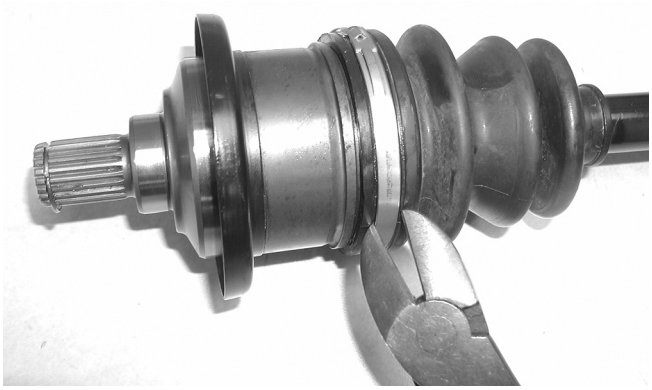
CD019

2. Inspect boots for any tears, cracks, or deterioration.

■ NOTE: If a boot is damaged in any way, it must be replaced with a boot kit.

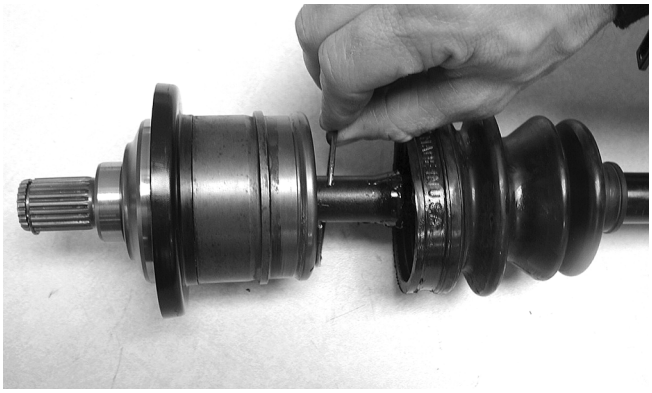
DISASSEMBLING AXLES

1. Using a side-cutters (or suitable substitute), remove the large clamp from the boot.



CD020

2. Wipe away excess grease to access the retaining ring. Using an awl or circlip pliers, remove the circlip.



CD021

3. Using a snap ring pliers, remove the circlip securing the bearing ring to the shaft. Note the direction of the bearing for assembling purposes.

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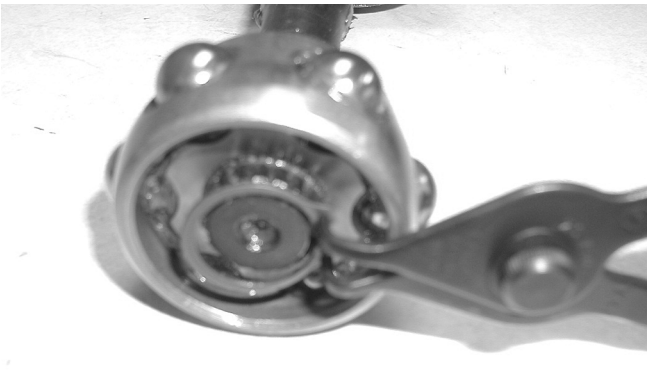


CD023

4. Note the difference inside each bearing ring end for assembling purposes; then remove the bearing ring.

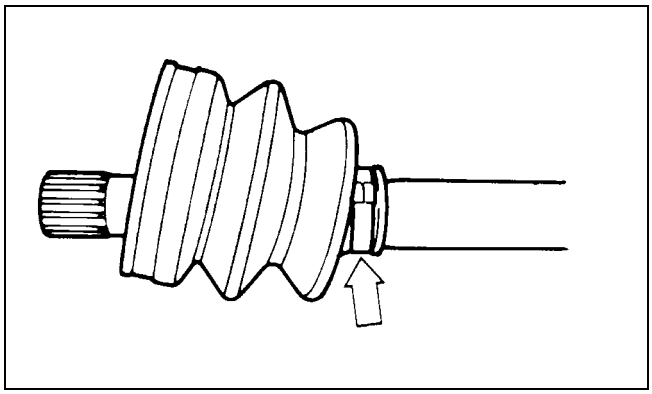
■ NOTE: The recess of the bearing must face toward the housing.

CD022

5. Inspect the splines of the shaft, the bearing ring, and the housing for damage.

■ NOTE: If any damage is apparent to the splines, the bearing ring, and/or the housing, the drive axle must be replaced as an assembly.

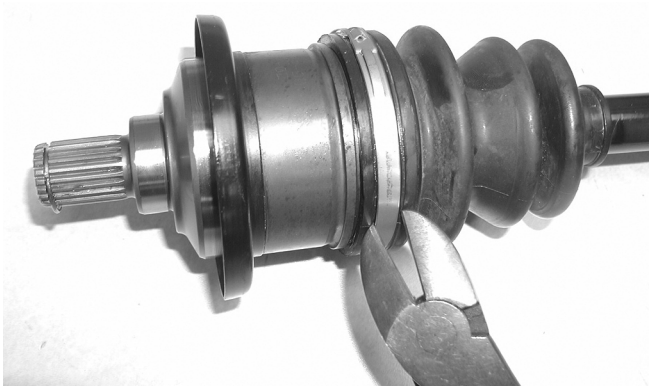
6. Using a side-cutters (or suitable substitute), remove the small clamp from the shaft.



ATV-1048

■ NOTE: At this point if the outer boot is damaged, continue with step 7.

7. Using a side-cutters (or suitable substitute), remove both outer boot clamps from the shaft. Note the position of the different-sized clamps for assembling purposes.



CD020

8. Apply grease from the kit into the knuckles and the new outer boot.

■ NOTE: The large grease pack is for the inner drive axle bearing and boot assembly.

9. Slide the new outer boot onto the shaft with the new clamps positioned as shown. Note the different-sized clamps from removal.

■ NOTE: The boot is positioned correctly when the small end of the boot seats down into the recessed groove.

10. Using Boot Clamp Pliers (p/n 0444-120), secure both outer boot clamps.

⚠ CAUTION

It is important that the clamps are positioned correctly or they may loosen when in motion.

CD024

ASSEMBLING AXLES

1. Install the inner boot with the small clamp making sure the ends of the clamp are positioned correctly.

■ NOTE: The boot is positioned correctly when the small end of the boot seats down into the recessed groove.

6

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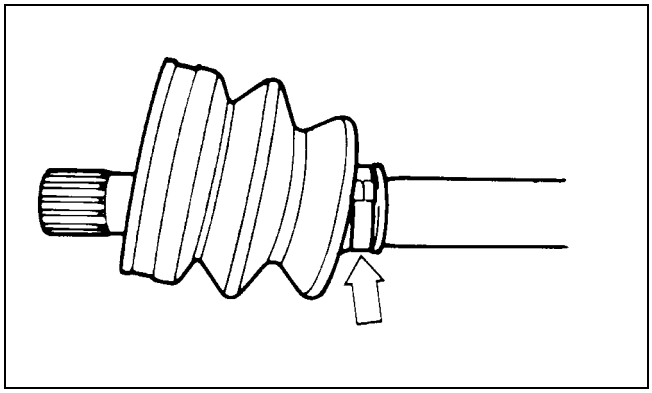
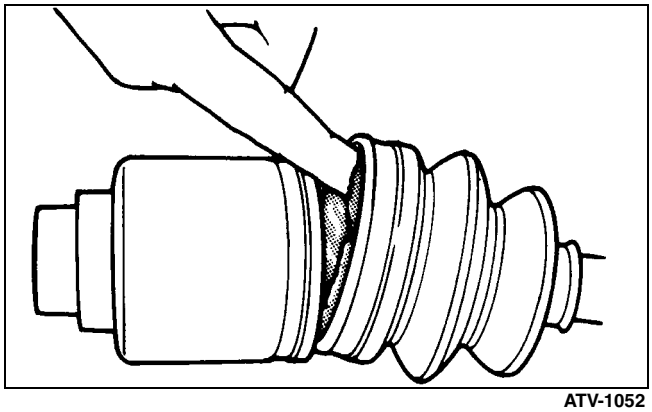
2. Using the boot clamp pliers, secure the small clamp of the inner boot.



ATV-1048

3. Apply grease from the kit onto the bearing ring making sure grease is on both the inner and outer sides; then apply the remainder of the grease into the housing and boot.

■NOTE: The large grease pack is for the inner drive axle bearing and boot assembly.



ATV-1052

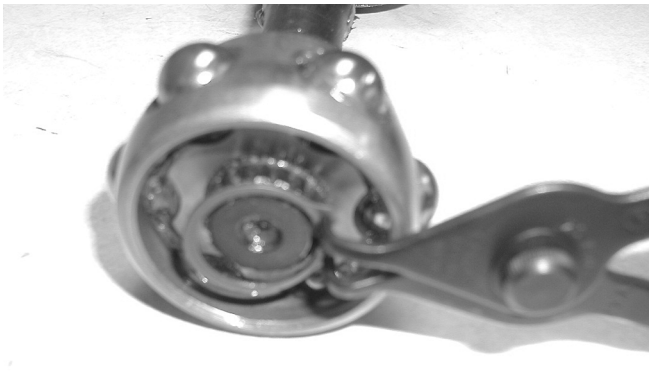
4. Install the bearing onto the shaft making sure the recess of the bearing is facing the housing.

CD022

⚠ CAUTION

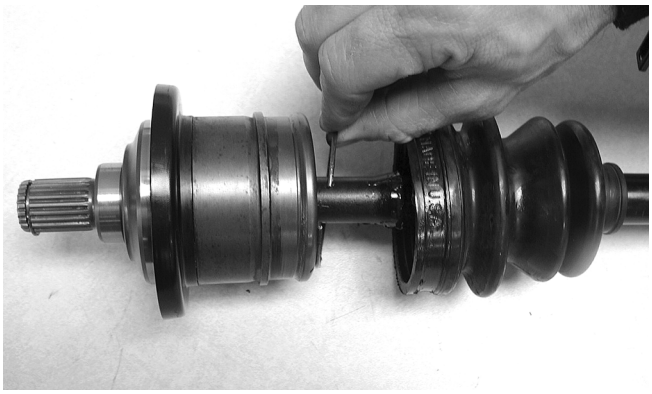
The bearing ring must go onto the shaft with the side without splines facing toward the small clamp of the inner boot or severe damage will result.

5. Secure the bearing ring with the circlip making sure the sharp side of the circlip faces away from the boot.



CD023

6. Making sure the marks made during disassembling align, slide the housing over the bearing ring; then install the circlip.



CD021

7. Slide the boot over the housing; then using the boot clamp pliers, secure the boot with the clamp.

CD024

8. Inspect the axle components for correct positioning of the four clamps. Also, inspect the boots for being correctly positioned on the shaft.

INSTALLING REAR DRIVE AXLE (Fully Independent Suspension)

1. Slide the drive axle into place in the gear case.

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■ NOTE: To assure proper seating of the axle, give it a light pull; the axle should remain "clipped" in place.

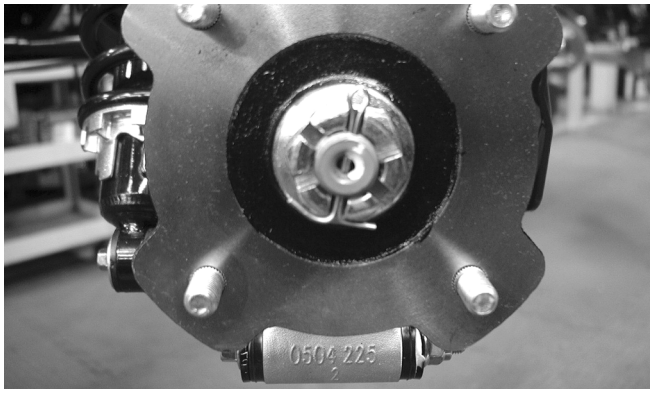
2. Swing the knuckle up and onto the drive axle; then place the knuckle into place in the upper A-arm. Secure the knuckle to the A-arm with a cap screw and a new lock nut. Tighten to 4.8 kg-m (35 ft-lb).

3. Place the hub into position on the axle followed by a washer and hex nut. Tighten the hex nut finger-tight at this time.

4. If the brake calipers were removed, position them on the knuckle and secure with existing cap screws. Tighten the auxiliary brake caliper cap screws to 2.1 kg-m (15 ft-lb). Tighten the hydraulic brake caliper cap screws to 2.8 kg-m (20 ft-lb).

5. Pump up the hand brake lever; then engage the brake lever lock.

6. Tighten the hub hex nut (from step 3) to 10.4 kg-m (75 ft-lb); then install and spread a new cotter pin making sure each side of the pin is flush to the hub nut.



CD027

7. Install the wheel. Tighten to 5.5 kg-m (40 ft-lb).

8. Remove the ATV from the support stand and release the brake lever lock.

9. Check the engine/transmission oil level and add oil as necessary.

INSTALLING FRONT DRIVE AXLE (4x4 Models)

1. Position the drive axle in the gear case and steering knuckle; then insert the upper A-arm ball joint into the steering knuckle. Secure with a cap screw tightened to 4.8 kg-m (35 ft-lb).

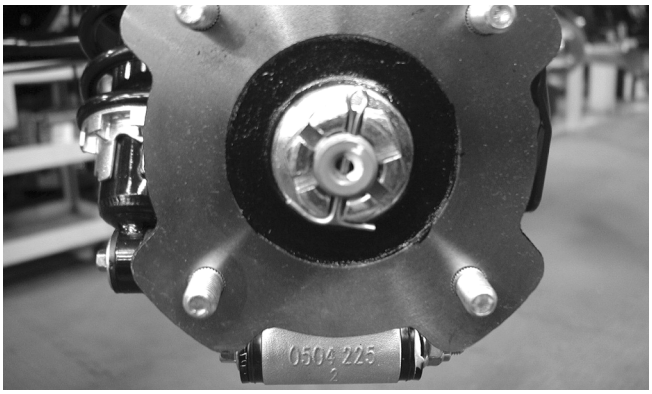
2. Place the brake hose into position on the upper A-arm; then secure the lower shock eyelet to the A-arm with a cap screw and a new lock nut. Tighten to 4.8 kg-m (35 ft-lb).

3. Secure the tie rod to the steering knuckle with a new lock nut. Tighten securely; then install and spread a new cotter pin.

4. Slide the hub w/brake disc into position in the steering knuckle followed by a washer and hex nut. Tighten finger-tight at this time.

5. Install the brake caliper on the steering knuckle. Tighten to 2.8 kg-m (20 ft-lb); then pump up the hand brake lever and engage the brake lever lock.

6. Tighten the hub hex nut (from step 4) to 10.4 kg-m (75 ft-lb); then install and spread a new cotter pin making sure each side of the pin is flush to the hub nut.

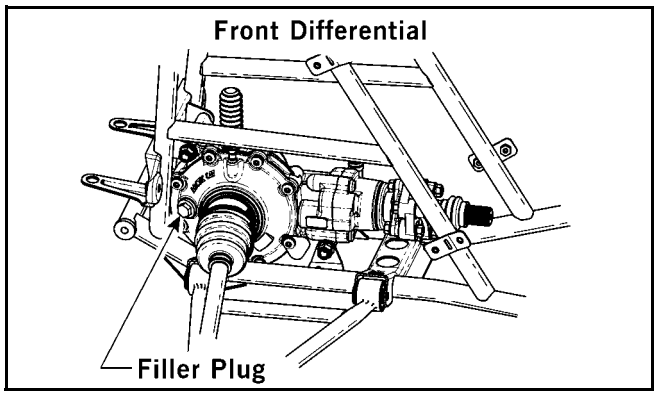


CD027

7. Install the wheel and tighten to 5.5 kg-m (40 ft-lb).

8. Remove the ATV from the support stand and release the brake lever lock.

9. Check the front differential oil level and add oil as necessary.



0736-568

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ACT - Rear Suspension

REMOVING

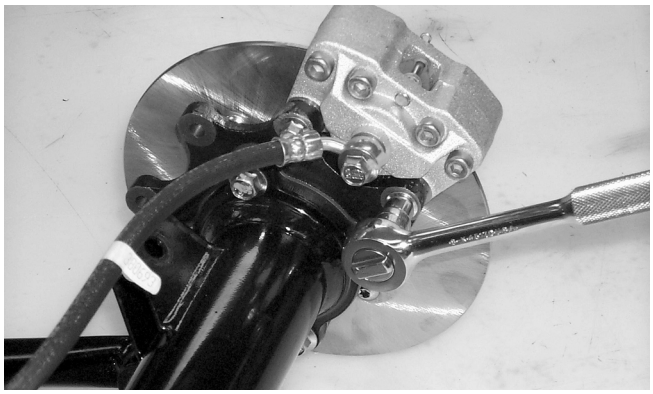
1. Place the ATV on a support stand (positioned just in front of and behind the footrest on each side) so the wheels are off the floor.

⚠ WARNING

Make sure the ATV is solidly supported on the support stand to avoid injury.

2. Remove the rear wheels.

3. Remove the cap screws securing the brake calipers to the bearing housing; then remove the calipers and lay aside.



CC783

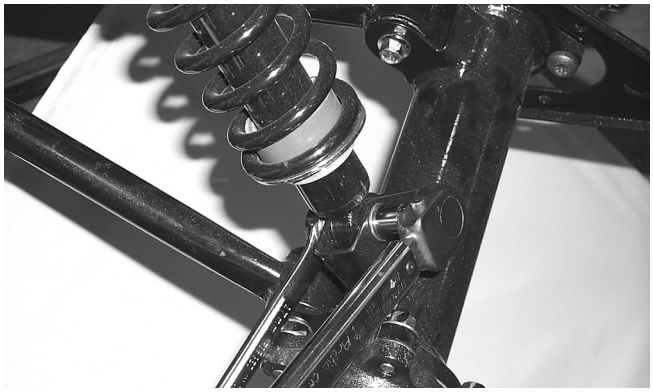
⚠ CAUTION

Care should be taken not to damage the brake cable/hose when laying the calipers aside. Do not allow the calipers to hang from the brake cable/hose.

4. Remove the lower shock absorber cap screws and hex nuts; then disengage the shock absorbers from the axle housings.

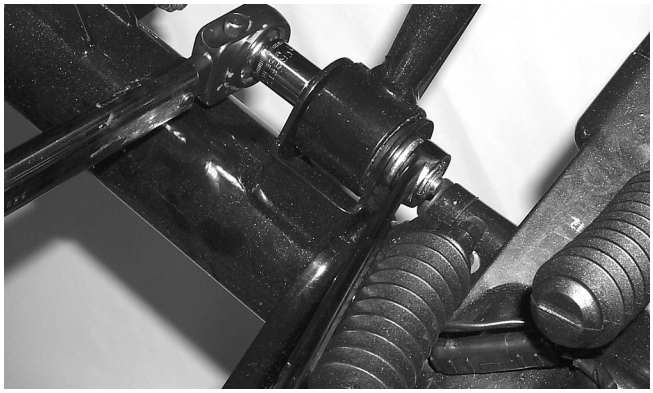
⚠ CAUTION

Ensure that the rear gear case is properly supported BEFORE removing the shock absorber assemblies.



AF772D

5. Remove the four cap screws and nuts securing the rear of the swing arm(s) to the axle housing.

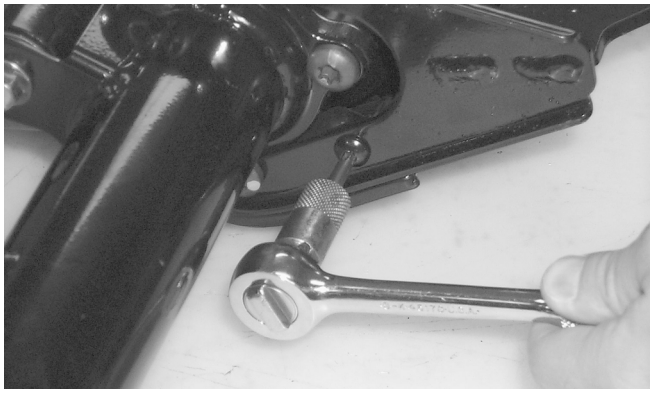


AF697D

6. Maneuver the axle assembly rearward allowing the propeller shaft to disengage and the final drive boot to separate from the drive housing.

DISASSEMBLING

1. Remove the cap screws securing the gear case panel; then remove the panel from the gear case.



CC762

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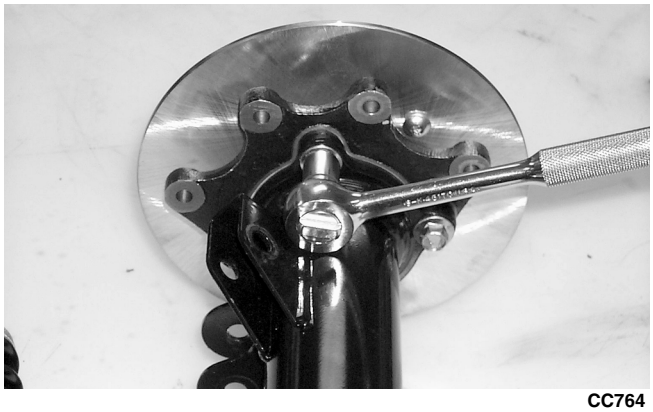
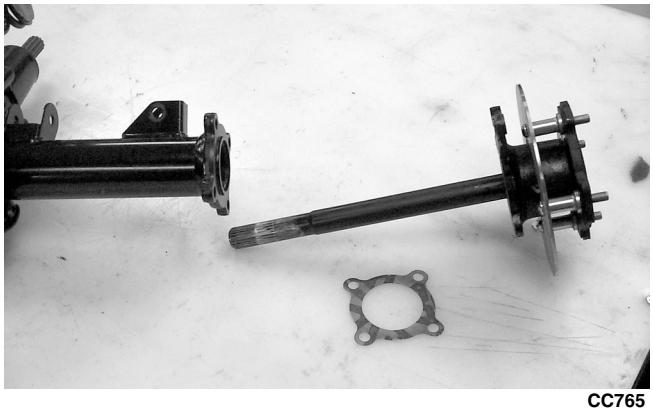
CC763

2. Remove the cap screws securing the axle assembly to the axle housing; then remove the axle assembly from the housing. Account for a gasket.

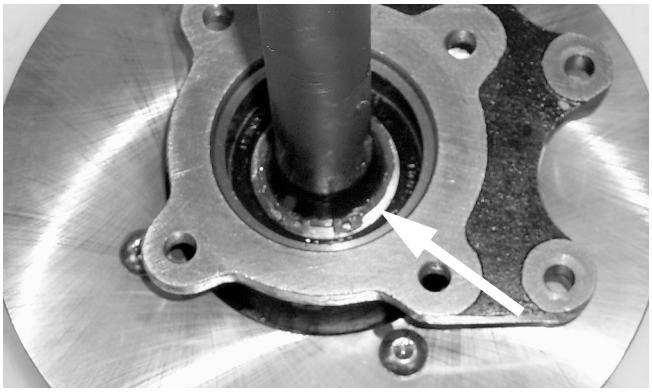


CC764



CC765

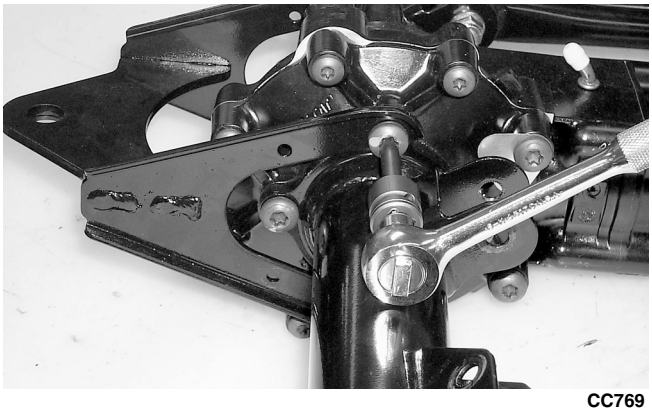
3. Remove the snap ring securing the bearing housing to the axle shaft; then slide the bearing housing off the shaft.



CC768A

4. Remove the four cap screws securing the hitch to the gear case; then remove the hitch.

■ NOTE: Note that these cap screws are 37 mm (1.5 in.) in length for installing purposes.



CC769

5. Remove the two cap screws securing each axle housing to the gear case.

■ NOTE: Note that these cap screws are 33 mm (1.3 in.) in length for installing purposes.

CC770

6. Remove the axle housing from the gear case. Account for a gasket.

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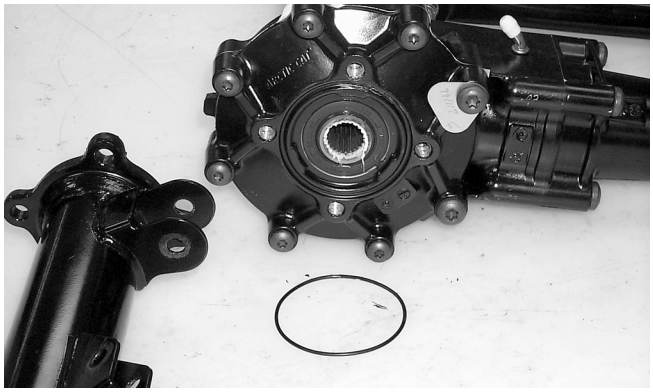


CC771

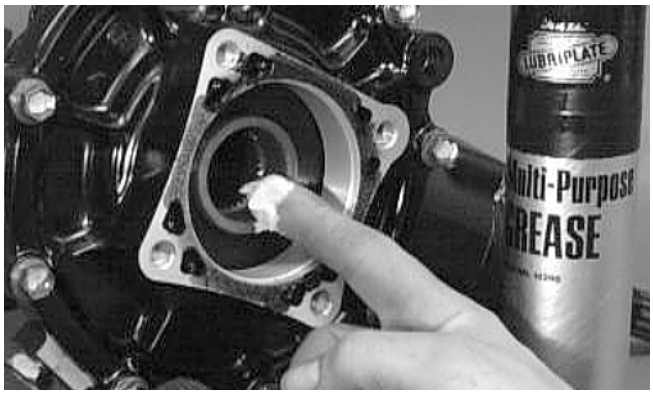
CLEANING AND INSPECTING

■NOTE: Whenever a part is worn excessively, cracked, or damaged in any way, replacement is necessary.

1. Clean all external components.
2. Inspect the case for leaks or damage.
3. Inspect splines for wear.
4. Inspect the seal for damage.
5. Inspect housing mounting bosses for wear or elongated holes.
6. Inspect the frame welds for cracking or bending.
7. Inspect the rear drive and plug threads for stripping or damage.
8. Inspect the axle bearings. Rotate the bearings by hand, and if any roughness or binding is noted, replace the bearings.

ASSEMBLING

1. Grease the splines of the ring gear.



AF705D

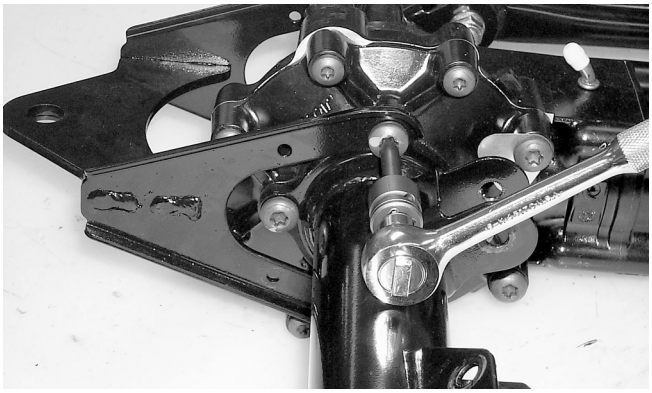
2. Make sure the rear gear case/axle housing O-ring is properly positioned; then secure the axle housing to the rear gear case with two 33 mm (1.3 in.) cap screws. Tighten to 4.3-5.3 kg-m (31-38 ft-lb).

■NOTE: If a new gear housing is being installed,tighten the cap screws to 5.1-6.3 kg-m (37-45.5 ft-lb).

CC770

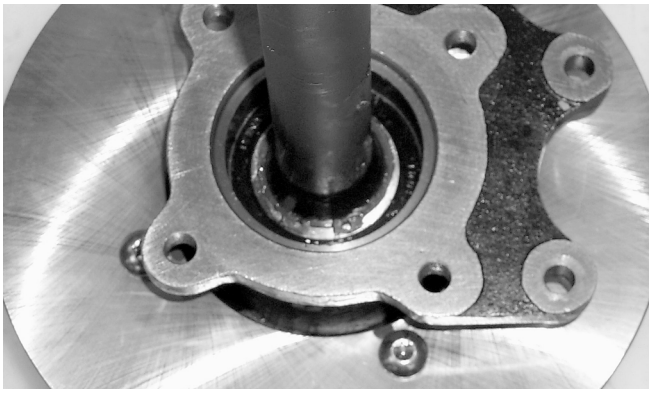
3. Secure the axle housing to the rear gear case with four 37 mm (1.5 in.) cap screws. Tighten to 4.3-5.3 kg-m (31-38 ft-lb).

■NOTE: If a new gear housing is being installed, tighten the cap screws to 5.1-6.3 kg-m (37-45.5 ft-lb).



CC769

4. Lightly grease the bearing housing seal; then slide the bearing housing onto the axle shaft. Secure with the snap ring.



CC768

5. Place the axle gasket on the axle housing. Rotate the axle shaft slightly to ensure proper engagement with the gear case splines.

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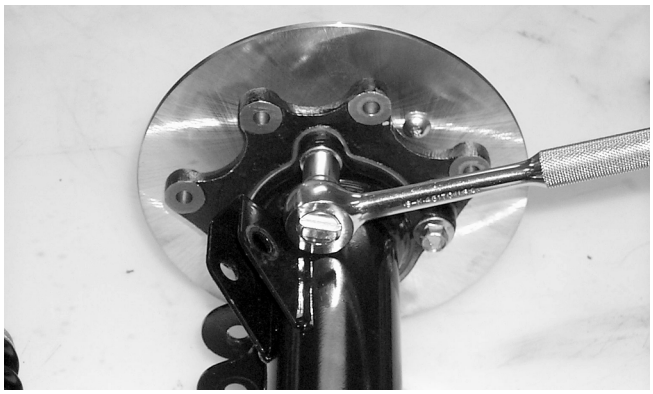
6. Rotate the bearing housing until the brake caliper mounting holes are on the top side; then secure the axle retainer assembly/axle assembly to the axle housing with four cap screws. Tighten to 5.5 kg-m (40 ft-lb).

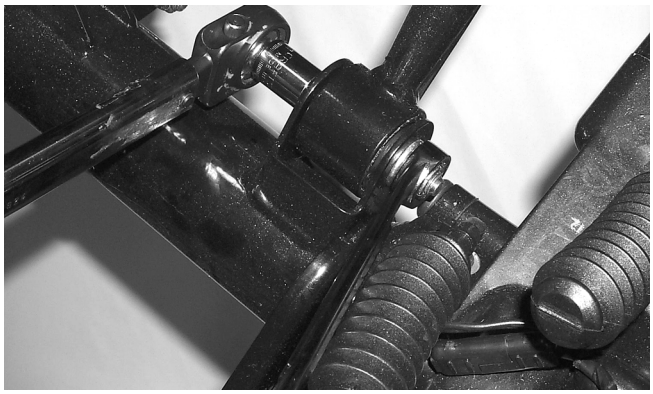


CC764

INSTALLING

1. Maneuver the axle assembly forward making sure propeller shaft splines engage properly and the final drive boot is positioned over the drive housing.

2. Place the rear of the swing arm(s) into position on the axle housings and case; then secure with four cap screws and hex nuts. Tighten to 4.8 kg-m (35 ft-lb).



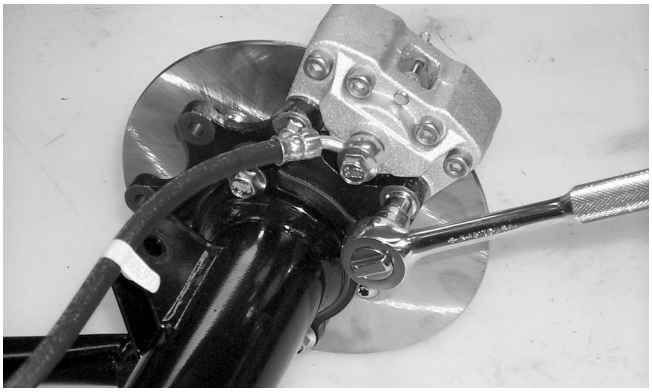
AF697D

3. Place the shock absorber into the frame mounts and secure using the cap screws and hex nuts tightened to 4.8 kg-m (35 ft-lb).

⚠ CAUTION

Do not tighten nuts beyond the 4.8 kg-m (35 ft-lb) specification or the shock eyelet or mount WILL be damaged.

4. Place the brake calipers into position on the axle retainer assembly; then secure with the cap screws. Tighten the auxiliary caliper to 2.1 kg-m (15 ft-lb) and the hydraulic caliper to 2.8 kg-m (20 ft-lb).

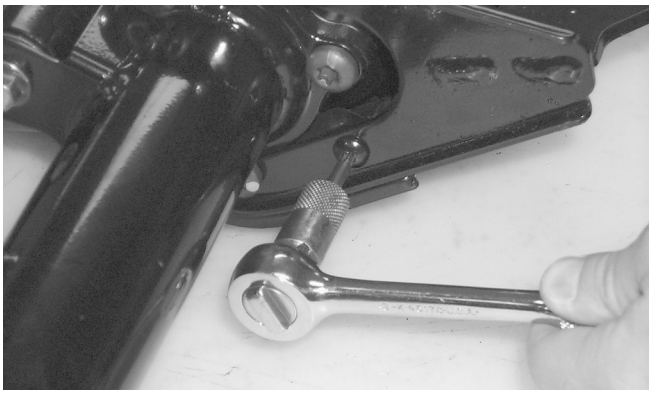


CC783

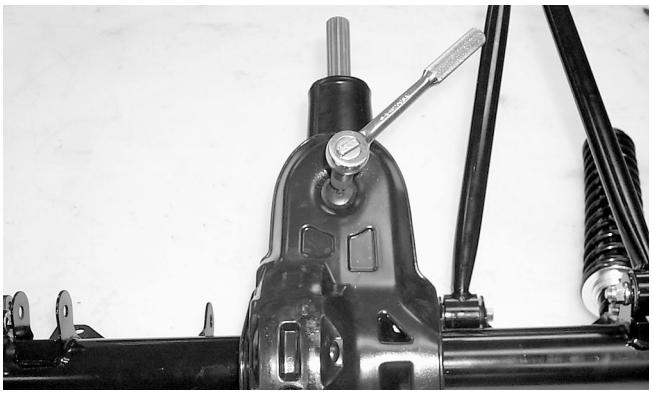
⚠ CAUTION

Care should be taken not to damage or kink the brake cable/hose when installing the calipers.

5. Place the gear case panel into position and secure with the three cap screws. Tighten securely.



CC762



CC763

6. Install the wheels and tighten to 5.5 kg-m (40 ft-lb).

7. Remove the ATV from the support stand.

■ NOTE: Check all fasteners for tightness and check the brakes for proper operation before test riding.

6

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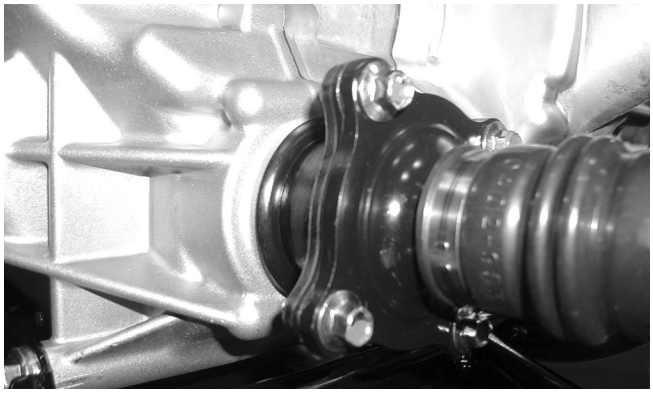
Rear Gear Case
(400/500 FIS Models)

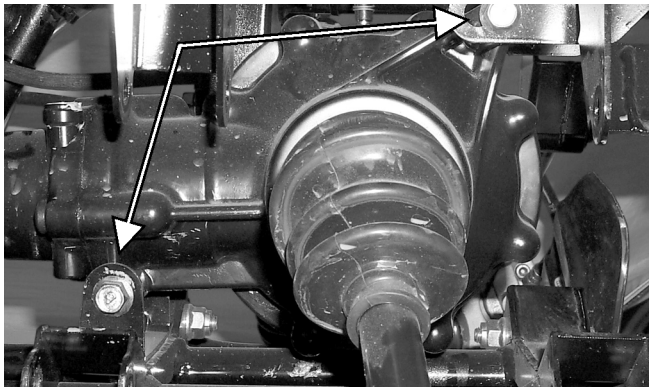
REMOVING

1. Remove the left-side rear A-arms (see Rear A-Arms in Section 7).
2. Remove both of the rear drive axles (see Drive Axles in this section).
3. Remove the four cap screws securing the engine output shaft to the rear gear case input flange.



CD028

4. Remove the two cap screws and lock nuts securing the rear gear case to the frame; then remove the gear case through the left side.



AF960A

☞ AT THIS POINT

For servicing the input shaft, pinion gear, needle bearing, and axle seal on FIS models, see Front Differential (FIS Models) in this section.

INSTALLING

1. Slide the gear case into position through the left side of the frame; then secure it to the frame with cap screws and lock nuts. Tighten to 4.3-5.3 kg-m (31-38 ft-lb).

■ NOTE: If a new gear housing is being installed, tighten the cap screws to 5.1-6.3 kg-m (37-45.5 ft-lb).

2. Secure the engine output shaft to the rear gear case input flange with three cap screws (coated with red Loctite #271) and lock nuts. Tighten to 4.8 kg-m (35 ft-lb).
3. Install the rear drive axles (see Drive Axles in this section).
4. Install the left-side rear A-arms (see Rear A-Arms in Section 7).

Hub

REMOVING

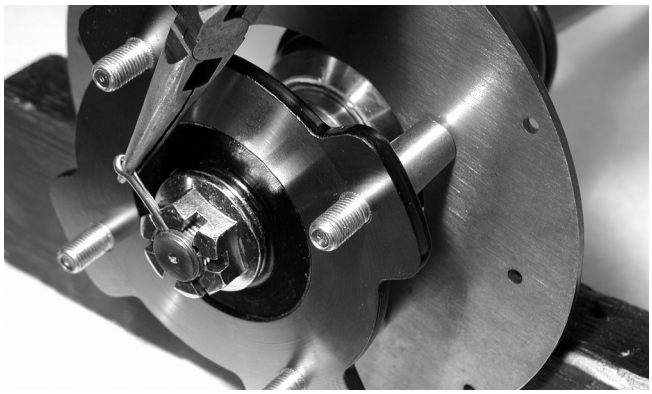
1. Secure the ATV on a support stand to elevate the wheel; then remove the wheel.

⚠ WARNING

Make sure the ATV is solidly supported on the support stand to avoid injury.

2. Remove the cotter pin from the nut.

■ NOTE: During assembly, new cotter pins should be installed.



CD008

3. Remove the nut securing the hub. Account for a washer and a hub seal.

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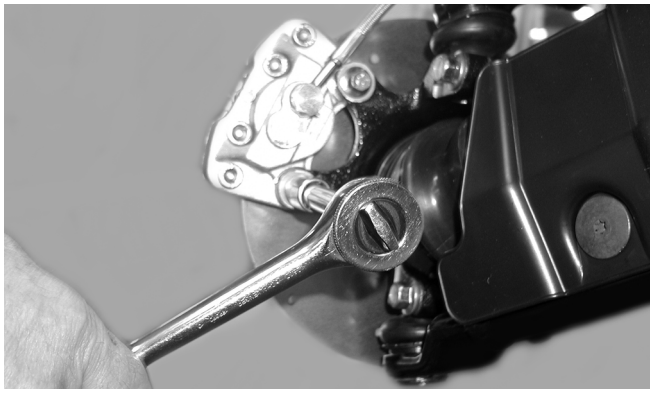
CD010

4. Remove the brake caliper.



CD007

5. Remove the hub assembly.
6. Remove the four cap screws securing the brake disc.

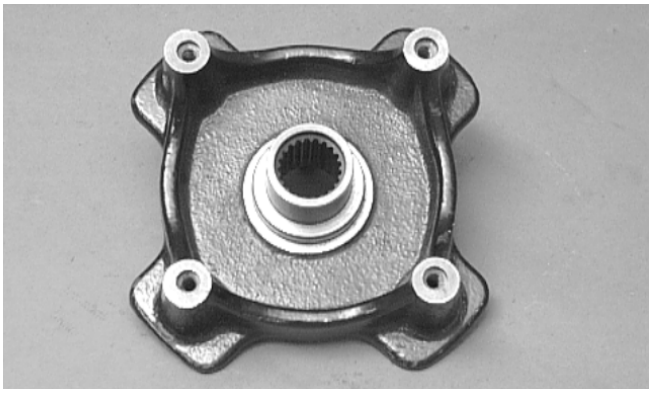
CLEANING AND INSPECTING

■NOTE: Whenever a part is worn excessively, cracked, or damaged in any way, replacement is necessary.

1. Clean all hub components.
2. Inspect all threads for stripping or damage.
3. Inspect the brake disc for cracks or warping.
4. Inspect the sealing area of the hub for pits.
5. Inspect the hub splines for signs of wear.
6. Inspect the hub for cracks.

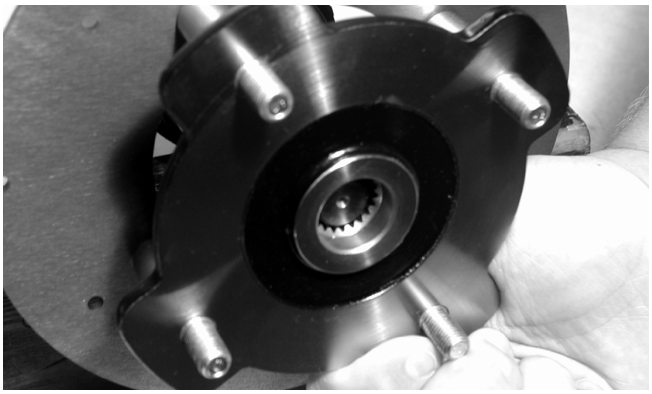
INSTALLING

1. Secure the brake disc to the hub with the four cap screws coated with blue Loctite #243. Tighten to 2.1 kg-m (15 ft-lb).
2. Apply grease to hub sealing area and on the splines.



AF736D

3. Install the hub assembly onto the splines of the shaft.



CD009

4. Insert the hub seal onto the shaft; then position it into the hub.

CD010

5. Place the washer onto the shaft; then secure the hub assembly with the nut. Tighten only until snug.
6. Secure the brake caliper to the knuckle with the two cap screws. Tighten the auxiliary caliper to 2.1 kg-m (15 ft-lb). Tighten the hydraulic caliper to 2.8 kg-m (20 ft-lb).

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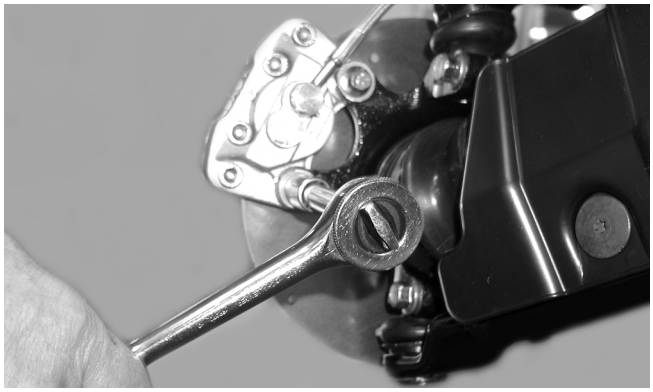
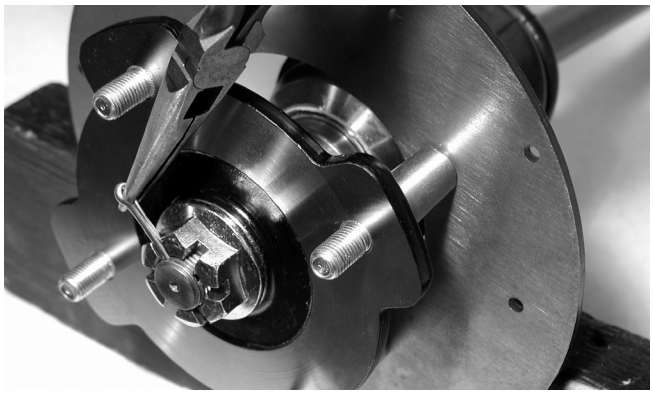


CD007

7. Tighten the hub nut (from step 5) to 10.4 kg-m (75 ft-lb); then install and spread a new cotter pin making sure each side of the pin is flush to the hub nut.



CD008

8. Install the wheel and tighten to 5.5 kg-m (40 ft-lb).

CD006

9. Remove the ATV from the support stand.

Hydraulic Brake Caliper

■ **NOTE: The brake caliper is a non-serviceable component; it must be replaced as an assembly.**

REMOVING/DISASSEMBLING

1. Secure the ATV on a support stand to elevate the wheel; then remove the wheel.

⚠ WARNING

Make sure the ATV is solidly supported on the support stand to avoid injury.

2. Drain the brake fluid from the entire hydraulic system (reservoir, hoses, and caliper).

AF637D

⚠ CAUTION

Brake fluid is highly corrosive. Do not spill brake fluid on any surface of the ATV and do not reuse brake fluid.

3. Remove the brake hose from the caliper; then remove the caliper.

AF636D

CLEANING AND INSPECTING

1. Clean all caliper components (except the brake pads) with parts-cleaning solvent.
2. Inspect the brake pads for damage and excessive wear.

■ **NOTE: For measuring brake pads, see Section 2.**

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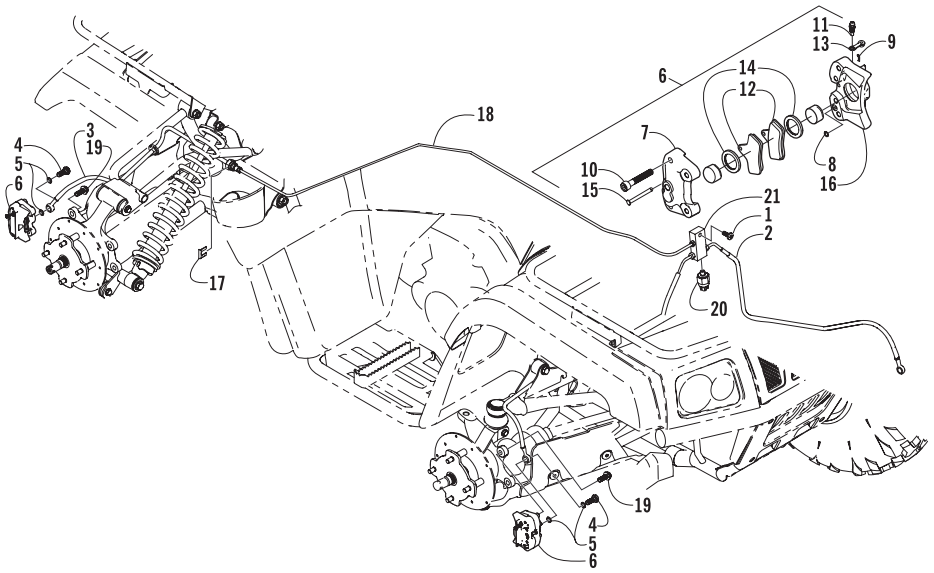
400/500 FIS

KEY
1. Cap Screw
2. Hose - Front
3. Hose - Rear
4. Oil Bolt
5. Crush Washer
6. Caliper
7. Housing
8. O-Ring
9. Cotter Pin
10. Cap Screw
11. Bleeder Valve Cap
12. Brake Pad
13. Bleeder Valve
14. O-Ring
15. Pin
16. Housing
17. Clip
18. Tube - Rear
19. Cap Screw
20. Pressure Switch
21. Junction Block



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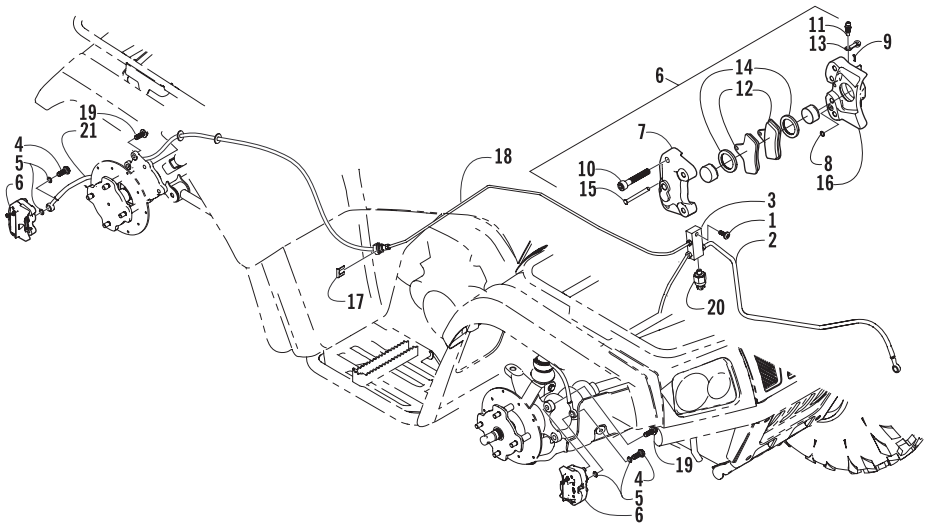
400/500 ACT

KEY
1. Cap Screw
2. Front Hose
3. Junction Block
4. Oil Bolt
5. Crush Washer
6. Caliper Assy
7. Housing
8. O-Ring
9. Cotter Pin
10. Cap Screw
11. Bleeder Valve Cap
12. Brake Pad
13. Bleeder Valve
14. O-Ring
15. Pin
16. Housing
17. Clip
18. Rear Tube
19. Cap Screw
20. Pressure Switch
21. Rear Hose



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