# CHAPTER 7 BRAKES

## 7.1 SPECIFICATIONS

| Front Brake Caliper | | |
|---|---|---|
| **Item** | **Standard** | **Service Limit** |
| Brake Pad Friction material Thickness | 0.157"/ 4mm | 0.04"/ 1mm |
| B rake Disc Thickness | 0.150- 0.164"/3.810- 4.166m m | 0.140"/3 .556m m |
| Brake Disc Thickness Variance Between Measurements | - | 0.002 "/ .051m m |
| B rake Disc Run out | - | 0.005 "/ .12 7m m |
| **Rear Brake Caliper** | | |
| **Item** | **Standard** | **Service Limit** |
| Brake Pad Friction material Thickness | 0.236"/ 6mm | 0.04"/ 1mm |
| Brake Disc Thickness | 0.177-0.187"/4.496-4.750m m | 0.167"/4.242mm |
| Brake Disc Thickness Variance Between Measurements | - | 0.002 "/ 0.051m m |
| Brake Disc Run out | - | 0.005 "/ 0.12 7m m |

## 7.2 TORQUE

| Item | Torque (ft. lbs. except where noted*) | Torque (Nm ) |
|---|---|---|
| Front Caliper Mounting Bolts | 18.0 | 25 |
| Rear Caliper Mounting Bolts | 18 .0 | 25 |
| Master Cylinder Mounting Bolts | *55 in. lbs | 6.0 |
| Master Cylinder Reservoir Cover Bolts | *5 in. lbs | .6 |
| Hand Brake Hose Banjo Bolt | 15 .0 | 21 |
| Front Brake Disc | 18 .0 | 2 5 |
| Front Wheel Mounting Nuts | 15 .0 | 21 |

## 7.3 BRAKE SYSTEM SERVICE NOTES

- It is strongly recommended always change the caliper and (or) the master cylinder as an assembly. The parts inside maybe not interchangeable due to different brake manufactures and (or) different brake type.
- Do not over – fill the master cylinder fluid reservoir.
- Make sure the brake lever and pedal returns freely and completely.
- Check and adjust master cylinder reservoir fluid level after pad service.
- Make sure atmospheric vent on reservoir is unobstructed.

- Adjust foot brake after pad service.
- Test for brake drag after any brake system service and investigate cause if brake drag is evident.
- Make sure caliper moves freely on guide pins (where applicable) .
- Inspect caliper piston seals for foreign material that could prevent caliper pistons from returning freely.
- Perform a brake burnishing procedure after install new pads to maximize service life.

## 7.4 BURNISHING PROCEDURE

Brake pads (both hydraulic and mechanical) must be burnished to achieve full braking effectiveness. Braking distance will be extended until brake pads are properly burnished. To properly burnish the brake pads, use the following procedure.

1. Choose an area large enough to safely accelerate the ATV to 50 km/h (30 mph ) and to brake to a stop.
2. Using hi gear, accelerate to 50 km/h (30 mph); then compress brake lever (pedal) to decelerate to 0-8km/h (5 mph).
3. Repeat procedure on each brake system 20 times until brake pads are burnished.

(4. Adjust the mechanical parking brake (if necessary).)

5. Verify that the brake light illuminates when the hand lever is compressed or the brake pedal is depressed.

**WARNING**

Failure to properly burnish the brake pads could lead to premature brake pad wear or brake loss. Brake loss can result in severe injury.

## 7.5 FLUID REPLACEMENT/BLEEDING PROCEDURE

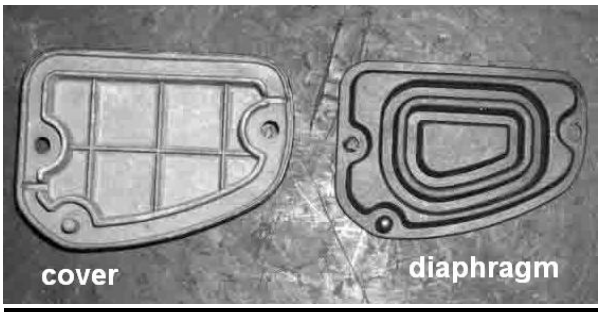
**NOTE :** When bleeding the brakes or replacing the fluid always start with the caliper farthest from the master cylinder.

**CAUTION**

Always wear safety glasses.

**CAUTION**

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




## BRAKE BLEEDING-FLUID CHANGE

This procedure should be used to change fluid or bleed brakes during regular maintenance.

1. Clean reservoir cover thoroughly.
2. Remove screws, cover and diaphragm

from reservoir.

3. Inspect vent slots in cover and remove any debris or blockage.
4. If changing fluid, remove old fluid from reservoir with a brake fluid pump or similar tool.

**NOTE:** Do not remove brake lever when reservoir fluid level is low.

5. Add brake fluid up to the indicated MAX level on the reservoir.
6. Begin bleeding procedure with the caliper that is farthest from the m aster cylinder. Install a box end wrench on the caliper bleeder screw. Attach a clean, clear hose to the fitting and place the other end in a clean container. Be sure the hose fits tightly on the fitting.

**NOTE:** Fluid may be forced from supply port when brake lever is pumped. Place diaphragm in reservoir to prevent spills. Do not install cover.

**DOT 3 Brake Fluid**

Reservoir Cover Torque
5 in. lbs. (.6 Nm )

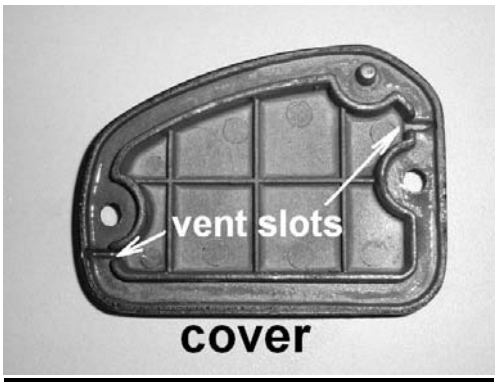
7. Slowly pump brake lever (D) until pressure builds and holds.
8. While maintaining lever pressure, open bleeder screw. Close bleeder screw and release brake lever.

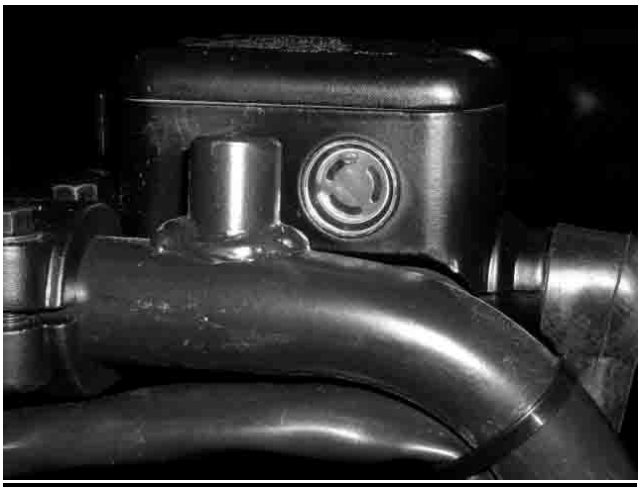
**NOTE:** Do not release lever before bleeder screw is tight or air m ay be draw n into caliper.

**NOTE:** In some versions of brake, there are 2 hydraulic circulates in one caliper for foot brake and hand brake. Make sure you bleed the right circulate.

9. Repeat procedure until clean fluid appears in bleeder hose and al air has been purged. Add fluid as necessary to maintain level in reservoir.

CAUTION:
Maintain at least 1/2 " (13mm of brake fluid in the reservoir to prevent air from entering the



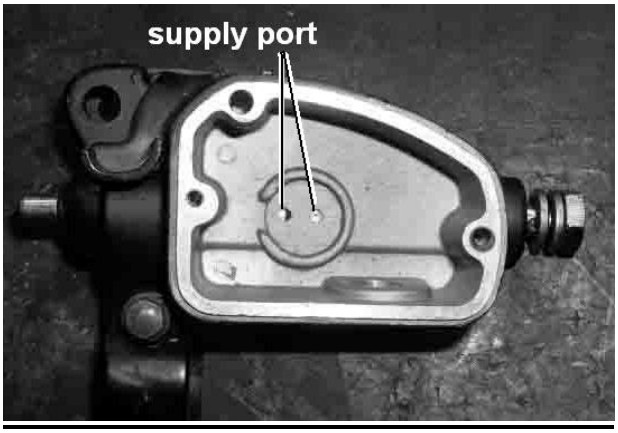
master cylinder.

10. Tighten bleeder screw securely and remove bleeder hose.
11. Repeat procedure steps 5- 9 for the remaining caliper (s).
12. Add brake fluid to MAX level on reservoir.

**Master Cylinder Fluid Level:**

**MAX level or**
**Sight glass must look dark, if sight glass is clear, fluid level is too low.**

13. Install diaphragm, cover and screws. Tighten screws to specification.
14. Field test machine at low speed before putting into service. Check for proper braking action and lever reserve. With lever firmly applied, lever reserve should be no less than 1/2 " (13mm ) from handlebar.
15. Check brake system for fluid leaks and inspect al hoses and lines for wear or abrasion. Replace hose if w ear or abrasion is found.





## 7.6 HAND BRAKE MASTER CYLINDER REMOVAL/ INSPECTION /INSTALLATION

**CAUTION:** The master cylinder is a non-serviceable Component; it must be replaced as an assembly.

**NOTE:** If any special service needed, contact the ATV manufacture via the agent for the parts and special instruction.

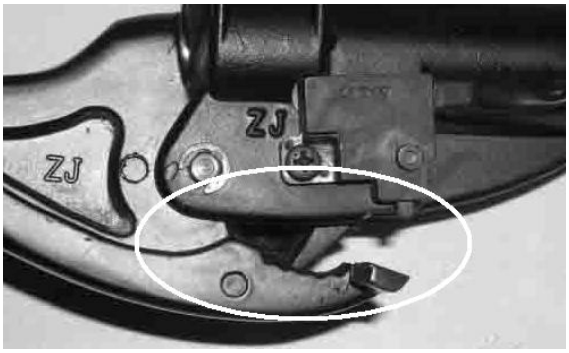
**REMOVAL**

1. Clean master cylinder and reservoir assembly. Make sure you have a clean work area to disassemble brake components.
2. Place a shop towel under brake hose connection at m aster cylinder. Loosen bolt, remove bolt and sealing washers.

**CAUTION**

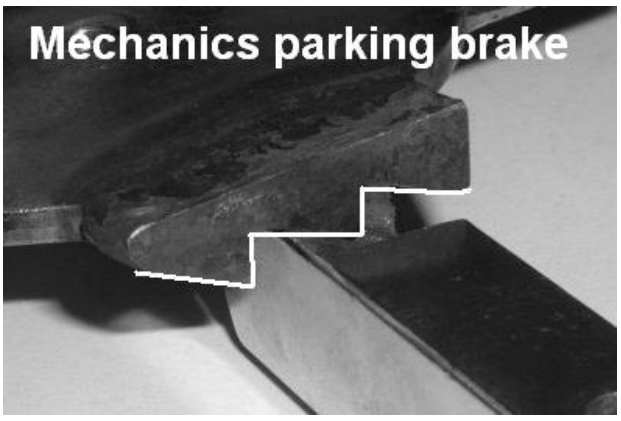
Brake fluid will damage finished surfaces. Do not allow brake fluid to come in contact with finished surfaces.

3. Remove master cylinder from handlebars.




**INSPECTION**

Inspect parking brake for wear. If teeth or locking cam are worn, replace lever and test the parking performance, if any locking problem exists, Replace the master cylinder as an assembly. **NOTE:** Mechanics parking brake is equipped for new Europe model.




**INSTALLATION**

1. Install master cylinder on handlebars. Torque mounting bolts to 55 in. lbs. (6 N m).

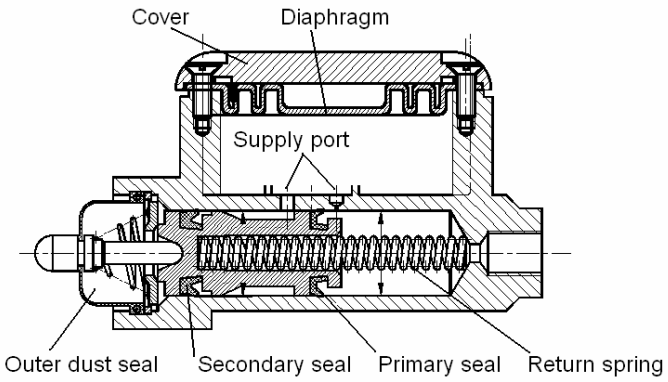
**NOTE: To** speed up the brake bleeding procedure the m aster cylinder can be purged of air before brake hose is attached. Fill with DOT3 brake fluid and pump lever slowly two to three times with finger over the outlet end to purge master cylinder of air.

2. Place new sealing washers on each side of hand brake hose and torque bolt to specification.

**Master Cylinder Mounting**
**Bolt Torque 55 in. lbs . (6 N m)**

**Brake Line Banjo Bolt Torque**
**15 ft. lbs. (21 Nm )**

3. Fill reservoir with **DOT 3** fluid.
4. Follow bleeding procedure, Check all connections for leaks and repair if necessary.




## 7.7 FRONT PAD REMOVAL / INSPECTION / INSTALLATION

**NOTE:** The brake pads should be replaced as a set.

### REMOVAL

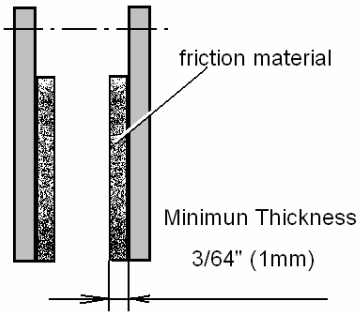
1. Elevate and support front of ATV safely.

**CAUT ION:** Use care w hen supporting vehicle so that it does not tip or fall. Severe injury m ay occur if machine tips or falls.

2. Remove the front wheel.
3. Remove caliper from mounting bracket.
4. Push caliper piston into caliper bore slowly using a C-clamp or locking pliers with pads installed.

**NOTE:** Brake fluid will be forced through compensating port into master cylinder fluid reservoir when piston is pushed back into caliper. Remove excess fluid from reservoir as required.

5. Push mounting bracket inward and slip outer brake pad past edge. Remove inner pad.
6. Measure the thickness of the pad material. Replace pads if worn beyond the service limit.




### INSPECTION

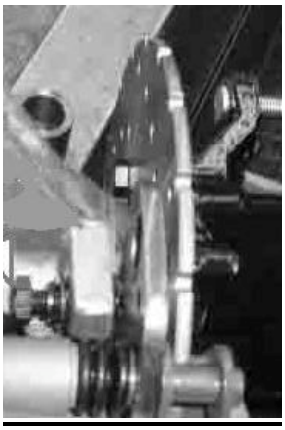
Measure the thickness of the pad friction material. Replace pads if worn beyond the service limit.

Service Limit 0.3/64"(1 mm)

### INSTALLATION

1. Lubricate mounting bracket pins with a light film of All Season Grease, and install rubber dust boots.
2. Compress mounting bracket and make sure dust boots are fully seated. Install pads with friction material facing each other. Be sure pads and disc are free of dirt or grease.
Front Caliper Mounting Bolts Torque 18 ft. lbs. (25 Nm )
3. Install caliper on hub strut, and torque mounting bolts.
4. Slowly pump the brake lever until pressure has been built up. Maintain at least 1/2 ". (13 mm) of brake fluid in the reservoir to prevent air from entering the brake system.
5. Install the adjuster screw and turn clockwise until stationary pad contacts disc, then back off 1/2 turn (counter clockwise).
6. Install reservoir cap.
**Hand and (or) Foot Brake Master Cylinder(s) Fluid Level:**
**Between MIN and M AX lines**
7. Install wheels and torque wheel nuts, test and burnish.
See **BURNISHING PROCEDURE**

## 7.8 FRONT DISC INSPECTION / REMOVAL / REPLACEMENT



**INSPECTION**
1. Visually inspect the brake disc for nicks, scratches, or damage.
2. Measure the disc thickness at 8 different points around the pad contact surface using a 0-1" micrometer and a dial indicator. Replace disc if worn beyond service limit.

Brake Disc Thickness
New0.150-0.164"(3.810-4.166mm)
Service Lim it 0.140"/3 .556 mm
Brake Disc Thickness Variance
Service Limit 0.002 " (0.051mm)
difference between measurements
Brake Disc Runout
Service Lim it 0.005" (0.127 mm)

**REMOVAL/ REPLACEMENT**

1. Removal caliper and hub. Apply heat to the hub in the area of the brake disc mounting bolts to soften the bolt locking agent.
2. Remove bolts and disc.
3. Clean mating surface of disc and hub.
4. Install new disc on hub.
5. and tighten to specified.

**CAUTION:** Always use new brake disc mounting bolts.

Front Brake Disc Mounting Bolt Torque :
18 ft. lbs. (25 Nm )

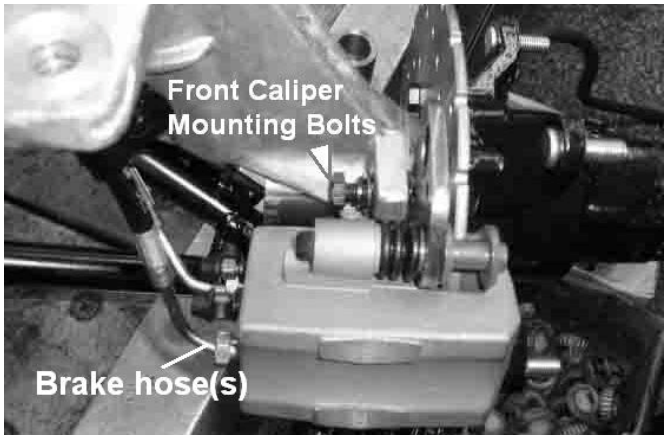
## 7.9 FRONT CALIPER REMOVAL/ INSPECTION / INSTALLATION

**CAUTION:** The caliper is a non-serviceable Component; it must be replaced as an assembly.

**NOTE:** If any special service needed, contact the ATV manufacture via the agent for the parts and special instruction.

**REMOVAL**

1. Remove wheel, remove caliper from the strut.
2. Loosen and remove brake hose(s) to caliper. Place a container under caliper to catch fluid draining.




**INSPECTION**

Inspect caliper body for nicks, scratches or worn. Replace caliper as an assembly if any problem exists.

**INSTALLATION**

1. Install caliper on hub strut, Apply Loctite™ 242 to screw threads and Install new bolts.

Front Caliper Mounting Bolt Torque
18 ft. lbs. (25 Nm )

2. Install brake hose and tighten securely.

**NOTE:** In some versions of brake, there are 2 hydraulic circulates (for foot brake and hand brake) in one caliper. Make sure you install the right hose.

3. Bleeding and Install wheels, If new brake pads are installed, burnishing procedure should be performed. See **BURNISHING PROCEDURE,** And field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, recheck assembly and installation.

## 7.10 REAR BRAKE PAD REMOVAL/ INSPECTION / INSTALLATION

**NOTE:** The brake pads should be replaced as a set.

**REMOVAL and INSPECTION**

1. Remove caliper mounting bolts and lift caliper off of disc.

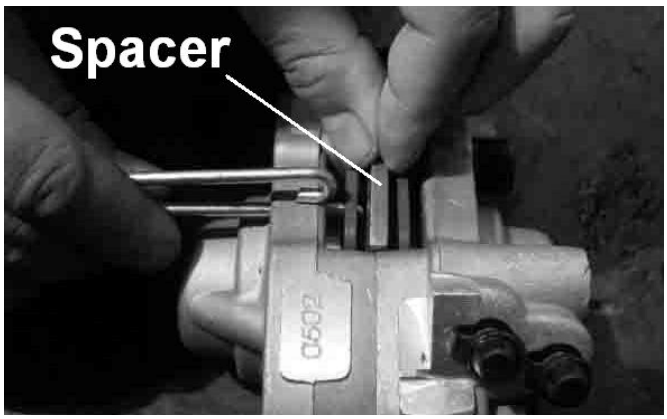
**NOTE.** When removing caliper, be careful not to damage brake hose . Support caliper so as not to kink or bend brake hose.

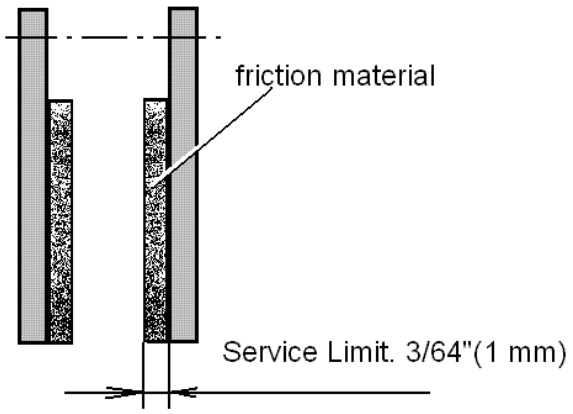
2. Push caliper pistons into caliper bore slowly with pads installed.

**NOTE:** Brake fluid will be forced through compensating port into m aster cylinder fluid reservoir when piston is pushed back into caliper. Remove excess fluid from reservoir as required.

3. Remove brake pad retaining pin, and pad spacer.

**NOTE:** Do not over spread this spring pin a-part farther than necessary to remove it.
4. Clean.
5. Measure the thickness of the pad friction material. Replace pads if worn beyond the service limit.
Rear Brake Pad Service Limit 0.3/64"(1 mm)




**INSTALLATION**
1. Install new pads in caliper body. Be sure to put spacer between pads.
2. Install caliper and torque mounting bolts.
Brake Caliper Torque: 18 ft. lbs. (25 Nm )
3. Slowly pump the brake lever until pressure has been built up. Maintain at least 1/2 " (13 mm) of brake fluid in the reservoir to prevent air from entering the master cylinder.
**Hand and (or) Foot Brake Master Cylinder(s) Fluid Level:**
**Between MIN and M AX lines**
4. Install wheels, burnishing procedure should be performed. See **BURNISHING PROCEDURE,** And field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, recheck assembly and installation.


## 7.11 REAR CALIPER REMOVAL/ INSPECTION/ INSTALLATION

**CAUTION:** The caliper is a non-serviceable Component; it must be replaced as an assembly.
**NOTE:** If any special service needed, contact the ATV manufacture via the agent for the parts and special instruction.
1. Clean caliper area.
2. Using a flare nut wrench, remove hose(s). Place a container to catch brake fluid draining from brake hose.

3. Remove caliper.
4. Remove brake pad as described above.
5. Inspect surface of caliper for nicks, scratches or damage and replace if necessary.
6. Install brake pads in caliper body with friction material facing each other, with the spacer between the pads. Install retaining pin through outer pad, pad spacer and inner pad.
7. Install caliper and torque mounting bolts.

**Caliper Mounting Bolt/ Caliper body Bolt Torque:**

**18 ft. lbs. (25 Nm)**

8. Install brake hose and tighten to specified torque.

**Banjo Bolt Torque: 15 ft. lbs. (21 Nm)**

**NOTE:** In some versions of brake, there are 2 hydraulic circulates (for foot brake and hand brake) in one caliper. Make sure you install the right hose.

9. Bleed.
10. Field test unit for proper braking action before putting into service. Inspect for fluid leaks and firm brakes. Make sure the brake is not dragging when lever is released. If the brake drags, recheck assembly and installation.


## 7.12 REAR BRAKE DISC INSPECTION / REMOVAL / REPLACEMENT

**INSPECTION**

1. Visually inspect the brake disc for nicks, scratches, or damage.
2. Measure the disc thickness at 8 different points around the pad contact surface using a 0-1" micrometer and a dial indicator. Replace disc if worn beyond service limit.

Brake Disc Thickness

New 0.177-0.187"(4.496-4.750mm)

Service Lim it 0.167"(4.242 mm)

Brake Disc Thickness Variance

Service Limit 0.002 " (0.051mm)

difference between measurements

Brake Disc Runout

Service Lim it 0.005" (0.127 mm)

**REMOVAL/ REPLACEMENT**

1. Removal wheel/ hub and caliper.
2. Remove bolts and disc from the flange.
3. Clean mating surface of disc and hub.
4. Install new disc on flange.
5. Tighten to specified.

**CAUTION:** Always use new brake disc mounting bolts.

Rear Brake Disc Mounting Bolt Torque :

18 ft. lbs. (25 Nm )