SERVICE MANUAL BULLETIN

This Service Manual Bulletin is prepared by the Publications Department of New Flyer Industries Canada ULC. Refer to details below.

SMB-151

ISSUE DATE: Jul 16 2015

APPLICABILITY					
VEHICLE LENGTH	☐ 30ft.	☐ 35ft.	☐ 40ft.	☐ 60ft.	■ ALL
VEHICLE TYPE	☐ High Floor	☐ Low Floor	☐ Invero®	■ Xcelsior®	☐ ALL
FUEL TYPE	☐ Diesel ☐ Diesel/Electric	☐ Electric ☐ Gas/Electric	☐ CNG ☐ Fuel Cell	☐ LNG	■ ALL
SUBJECT	Front & Rear Disc Brake Installation				
SECTION TITLE	1 - Front Axle & Suspension 2 - Rear Axle & Suspension				
DETAILS	This bulletin provides additional revised OEM information on various installations pertaining to the front and rear disc brakes. Refer to your New Flyer Service Manual for complete information. This information supersedes any prior information on this subject already provided in your New Flyer Service Manuals. Make this Service Bulletin available to service personnel to inform them of changed information.				

1. FRONT & REAR BRAKE SYSTEM

1.1. Installation

CAUTION

Due to the danger of injury when working with heavy components, ALWAYS use assistance when moving or lifting the wheel hub.

1.1.1. Mounting the Wheel Hub

Apply a light coat of Molykote-D paste in the wheel hub bearing seat area and on the axle stub. Apply paste on the machined surface of the stub where the hub bearings are seated except 3/4" of inner bearing seat.

1.1.2. Disc Brakes Specifications & Wear Limits

Brake Pad Clearance..... 0.024 to 0.043" (0.6 to 1.1 mm)

Brake Pad Thickness (min)..... 0.08" (2.0 mm)

1.1.3. Automatic Adjustment Inspection

CAUTION

The installed adjuster adapter must be used when turning the adjuster. The adjuster adapter is designed with a shear point so as to prevent excessive force from being applied to the internal adjustment mechanism and causing possible damage.

1. Remove the protective cap from the adjuster by pulling on the tab. Do not use a screwdriver or similar tool to remove the cap, as damage to the sealing lip could occur.

CAUTION

NEVER turn adjuster without shear adapter being installed. If the shear torque of the shear adapter is exceeded, it is designed to fail. If shear adapter fails, try again using a new (unused) shear adapter. With a second failure of the shear adapter, the caliper must be exchanged since internal damage is present.

DO NOT use an open-ended wrench as this may damage the adapter.

2. Rotate the adjuster adapter one half turn (approx. 3 clicks) counter-clockwise using a 10 mm wrench. See “Fig. 1: Checking Adjuster Movement” on page 3.
3. Position a 10 mm box end wrench on the adjuster adapter so that the wrench is positioned close to the vertical position.
4. Actuate the brake treadle 5 times with approximately 30 psi (2 bar) brake application pressure and note the movement of the installed wrench.
5. The wrench should move in a clockwise direction in response to each brake application, until clearance is taken up.

☞NOTE:

The angle of turn or movement of the wrench decreases or slows as the number of steps rises.

6. Replace the brake caliper if the automatic adjuster does not operate properly. Improper operation is indicated by either:
   a. No movement.
   b. Movement on the first brake application only.
   c. Moves CCW then CW on each brake application.
7. Lubricate seal lip and reinstall protective cap. Position the tab so that it will be accessible for future removal and not be obscured by the brake chamber.

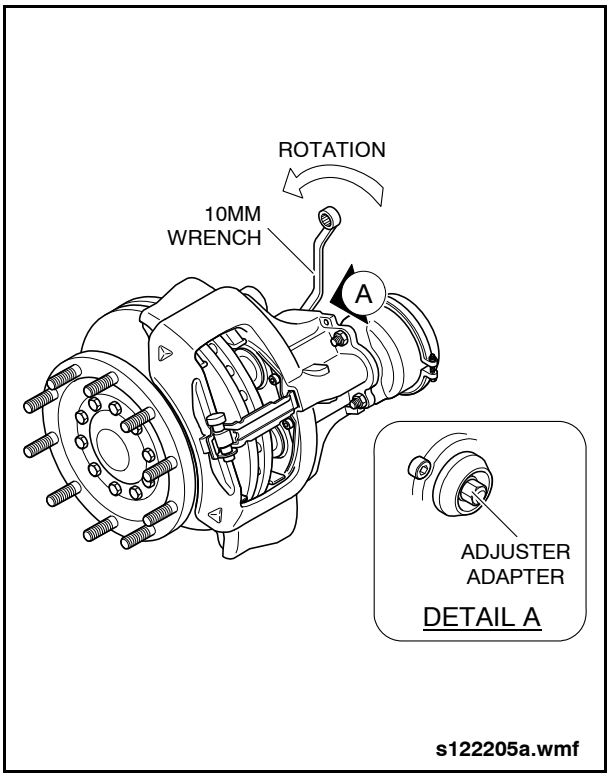


Fig. 1: Checking Adjuster Movement

1.1.4. Caliper Guide Pin Inspection

☞NOTE:

Worn caliper guide pins will result in excessive movement in the caliper assembly relative to the brake carrier. Use the following procedure to determine if excessive wear is present:

1. Remove worn brake pads and temporarily replace with a set of new pads during this procedure. Refer to your New Flyer Service Manual for removal procedure.

☞NOTE:

Perform brake pad inspection on the removed pad. Refer to your New Flyer Service Manual for procedure. Replace pads as necessary or reinstall existing pads.

2. Push the caliper inward fully the pull the caliper outward fully. Movement of the caliper on the guide pins should be smooth throughout the full range of movement (approximately 1.0" (25 mm)). Replace the caliper guide pins if the full range of movement cannot be achieved or if excessive force is required to move the caliper.
3. Check for excessive play in the caliper guide pins as follows:
   a. Pull the caliper fully outward.
   b. Mount a dial indicator (Items 29 & 69 from special tools list) on the steering knuckle with the indicator tip resting on the leading edge of the brake caliper. Apply pressure to the brake caliper in an upward direction. Zero the dial gauge. See “Fig. 2: Measuring Guide Pin Play” on page 3.
   c. Apply pressure to the brake caliper leading edge in a downward direction and read the dial gauge. Replace guide pins if reading exceeds 0.079" (2.0 mm). Refer to your New Flyer Service Manual for replacement procedure.

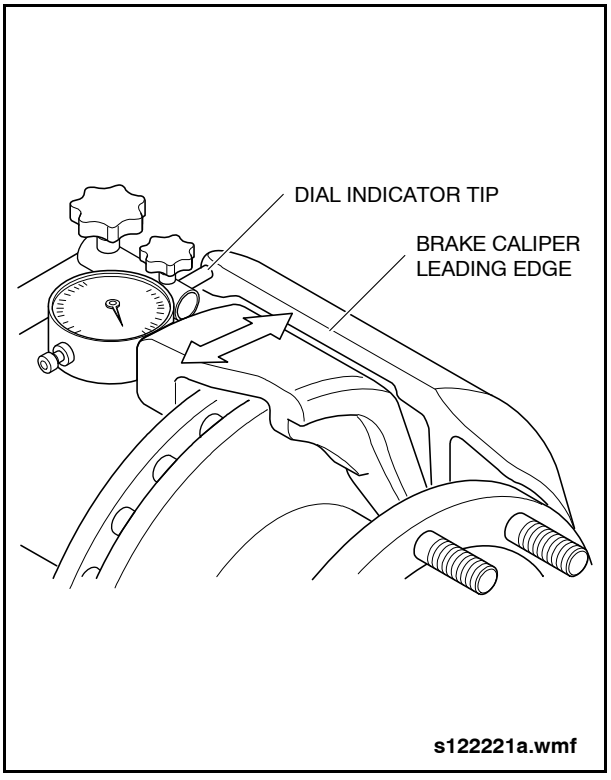


Fig. 2: Measuring Guide Pin Play

1.1.4.1. Installation

CAUTION

DO NOT grease the brake pad guides as this will cause abraded material from brake pad to accumulate and prevent smooth movement of the brake pads in the guide.

1. Push the brake caliper inward against the stop and insert the inboard brake pad. See “Fig. 3: Brake Pad Installation” on page 5.
2. Pull the brake caliper outward against the stop and insert the outboard brake pad.
3. Insert the wear sensor cable into the groove of each pad. The wear indicators snap into place in the holes in the pad material.

NOTE:

Ensure that the longer end of the wear sensor harness is inserted into the outboard brake pad.

NOTE:

The wear sensor cable should be replaced any time a brake wear condition has been detected. Typically the wear sensor will be abraded and damaged whenever it triggers a worn brake pad condition. It is also recommended that the wear sensor cable be replaced whenever the disc brake pads are renewed.

4. Install the brake pad retainer as follows:
   a. Insert the inboard end of the pad retainer into the groove and apply sufficient downward pressure to allow insertion of the retaining pin. See “Fig. 4: Brake Pad Retainer Installation” on page 5.
   b. Insert new retaining pin and secure with new washer and spring clip.
5. Attach the wear sensor harness guide to the brake pad retainer and clip the sensor harness to secure it.
6. Install the wear sensor harness protection plate onto the brake pad retainer.
7. Attach the wear sensor harness to the brake caliper using the original mounting bolt and nut. Apply medium strength threadlocker, such as Loctite-242, to the threads of the nut.

NOTE:

If the round sensor connector between the wear sensor harness and the extension harness is unplugged during the removal procedure, check that the rubber seal is not damaged or deformed. Ensure the wear sensor connector is properly pushed into the cable extension connector upon re installation. The cable extension connector has locking tabs which lock in position when the sensor's plug is inserted correctly.

CAUTION

A damaged seal or improperly seated connector will not provide a watertight seal between the sensor connector and the extension cable connector. Penetration of water can lead to corrosion on connector pins and cause sensor failure.

8. Adjust the brake pad clearance as follows:
   a. Use the adjuster adapter and turn the adjuster clockwise until the pads touch the brake disc surface.
   b. Turn the adjuster back three notches as confirmed by audible clicks.
   c. Actuate the brakes 10 times with minimum 30 psi (2 bar) applied brake pressure. This action will automatically take up any clearance and provide the desired running clearance.
   d. Verify the actual clearance by prying against the inboard brake pad backing plate and using a feeler gauge to measure clearance between the backing plate and tappet. Clearance should be 0.027 to 0.047" (0.7 to 1.2 mm).
9. Lower the vehicle and perform road test to verify satisfactory operation of the brakes.

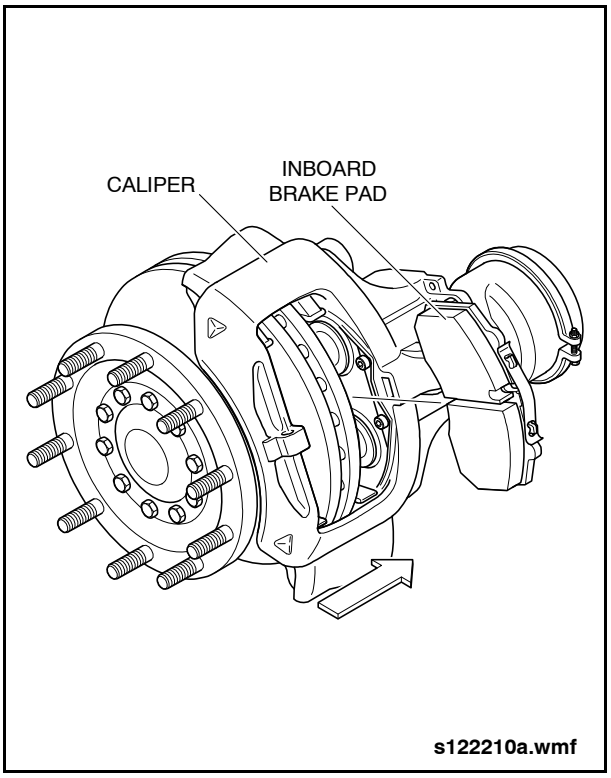


Fig. 3: Brake Pad Installation

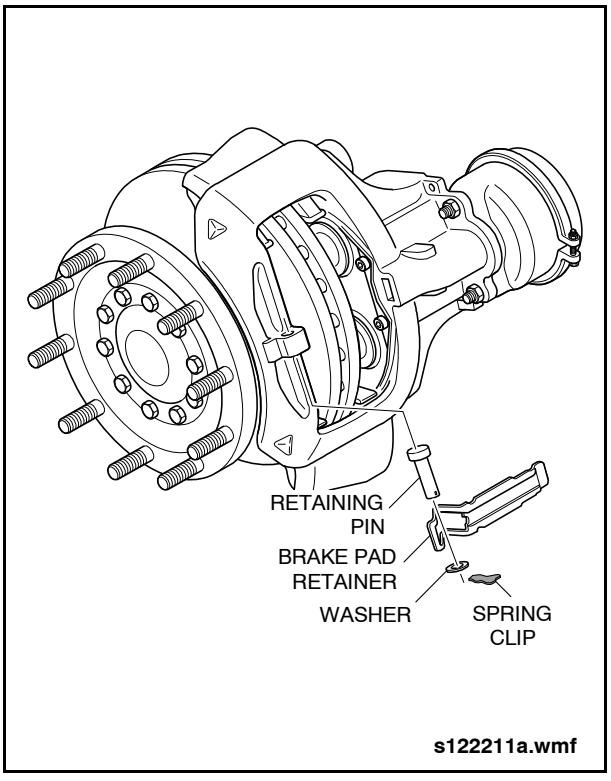


Fig. 4: Brake Pad Retainer Installation

1.1.5. Tappet Rubber Boot Inspection

CAUTION

DO NOT adjust the tappets beyond 1.18" (30 mm) as measured from the surface of the caliper to the tappet thrust face. Turning any further will result in irreparable damage to the adjuster adapter. Penetration of dirt and moisture into the interior of the brake will lead to corrosion and impair the function of the clamping mechanism and the adjusting mechanism.

1. Remove the brake pads. Refer to your New Flyer Service Manual for removal procedure.
2. Rotate the adjuster clockwise until the tappets extend approximately 1.18" (30) from the caliper surface. This will allow full extension of the tappet rubber boot for a proper visual inspection. See “Fig. 5: Tappet & Rubber Boot Inspection” on page 6.
3. Inspect the rubber boot for proper seating, wear, cuts, or deterioration. Replace rubber boots as necessary. Refer to your New Flyer Service Manual for replacement procedure
4. Inspect the tappet thrust surface for scoring, corrosion, or other damage. Replace tappets as necessary. Refer to your New Flyer Service Manual for replacement procedure.

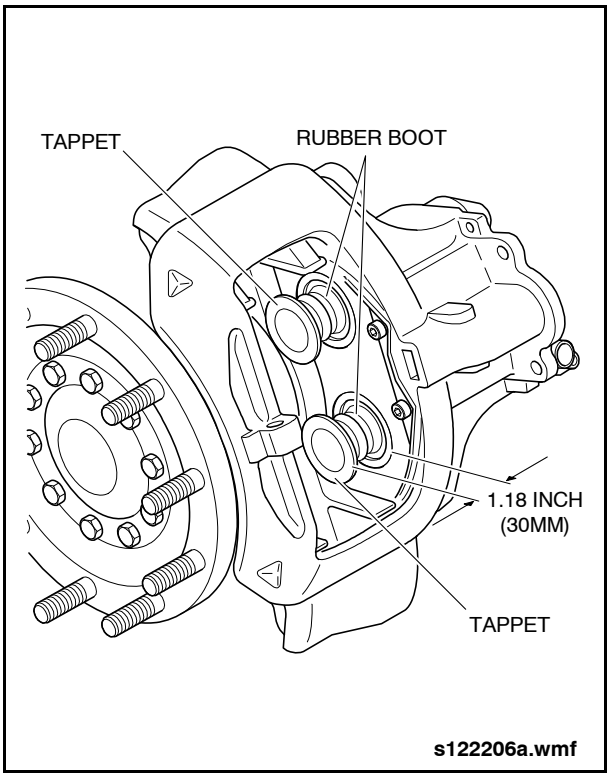


Fig. 5: Tappet & Rubber Boot Inspection

1.1.5.1. Installation

☞NOTE:

This procedure can be performed with the caliper mounted to the axle or on a work bench. The special tools used contain two different length bolts depending on the method used. For installation on a work bench, use the longer bolt. For on-vehicle installation, use the shorter bolt.

1. Rotate the adjuster counter-clockwise until the threaded tubes are fully retracted within the caliper bore.
2. Thread the long forcing bolt into the installer sleeve (Item 82 from special tools list). See “Fig. 6: Installing Inner Seal” on page 7.
3. Place the new inner seal onto the press-in bushing (Item 83 from special tools list).
4. Place the assembled press-in bushing and inner seal into the installer sleeve. Use the forcing bolt to press the inner seal against the stop in the brake caliper.
5. Rotate the adjuster clockwise until the end of the threaded sleeve extends 0.59" (15 mm) from the caliper surface.

☞NOTE:

The inner seal must not turn.

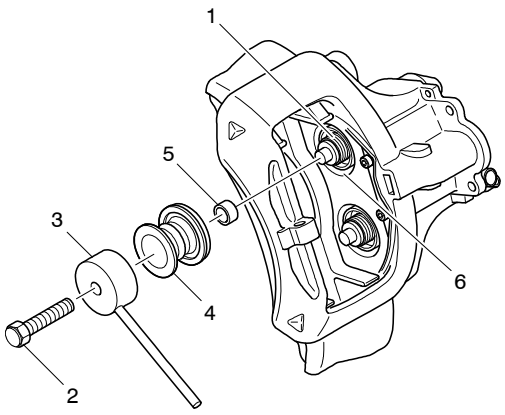
6. Apply grease, supplied in the repair kit, onto the end of the threaded sleeves and install new bushings.
7. Turn the adjuster counter-clockwise until the threaded sleeves are fully retracted within the caliper bore.

8. Place the tappet and rubber boot onto the bushing.

☞NOTE:

Ensure the seal seat is clean and free from grease before installing the rubber boot into the seal seat.

9. Hold the installer sleeve (Item 82 from special tools list) against the rubber boot and use the long forcing bolt to press the rubber boot against the stop in the seat. See “Fig. 7: Installing Tappet & Rubber Boot” on page 7.
10. Reverse the position of the installer sleeve so that the open end is facing away from the tappet and boot assembly and the head of the forcing bolt is facing the tappet. See “Fig. 8: Seating Tappet Against Stop” on page 7.
11. Use the forcing bolt to press the tappet up against the stop on the threaded sleeve.
12. Install the brake pads. Refer to your New Flyer Service Manual for installation procedure.



1. Threaded Tube
2. Forcing Bolt
3. Installer Sleeve
4. Tappet & Rubber Boot
5. Bushing
6. Seal Seat

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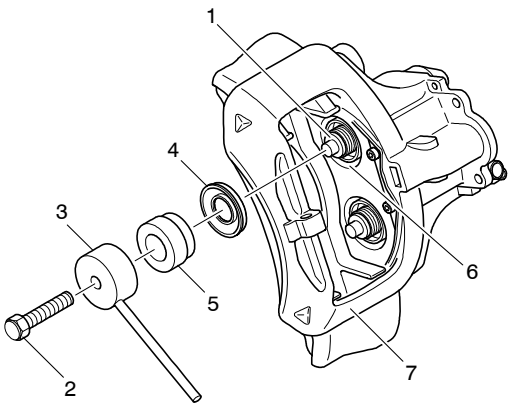
Fig. 7: Installing Tappet & Rubber Boot



1. Threaded Tube
2. Forcing Bolt
3. Installer Sleeve
4. Inner Seal
5. Press-In Plate
6. Seal Seat
7. Brake Caliper

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Fig. 6: Installing Inner Seal

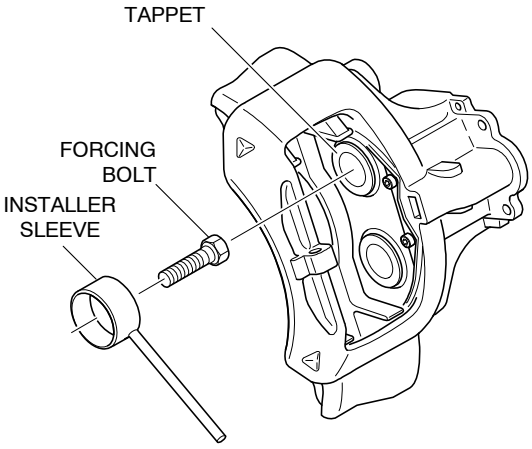

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Fig. 8: Seating Tappet Against Stop