

SECTION BR

Brake System**Table of Contents**

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General Instructions

Always refer to the correct PARTS MANUAL in accordance with the specific model and serial number indicated on the serial tag plate of your vehicle. This is essential to locating and ordering the correct components that were used during that particular manufacturing period when the ARGO was built. It is also very helpful using the illustrations to clearly see and define the component being referred to. If components are no longer listed in your Spare Parts Price List (Distributors and Dealers Only), generally the superseded section will indicate which part(s) replaces it. All parts manuals are available in PDF format on CD.

WARNING

Detailed information on standard workshop and safety procedures, and general servicing operations is not included in this manual, which has been prepared to assist qualified service personnel. ODG assumes no responsibility or liability for PERSONAL INJURY or VEHICLE DAMAGE which results from any servicing procedure performed, including those instructions outlined in this manual. Before performing a servicing operation, an individual must have determined to his/her satisfaction that a personal injury or vehicle damage will not result from the servicing procedure or tools selected.

WARNING

All brake work should be performed by a qualified mechanic. Braking/Steering ability and vehicle performance will be seriously impaired if the braking system is not properly adjusted or maintained. Property damage and/or injury or death may result to the operator.

WARNING

Hydraulic fluid can cause serious irritation to skin and eyes. In case of contact, flush thoroughly with water and contact a doctor if eyes have been exposed.

CAUTION

Use only Dot 5 Silicon Brake Fluid in the hydraulic brake system. Use of other brake fluids may damage components and could void warranty on the brake system. Never allow dirt, water, used brake fluid or any other contaminants to enter the hydraulic brake system. Also, never combine different types of brake fluids keeping in mind they may be incompatible with each other.

Brake System Maintenance

CAUTION

Regular maintenance of the brake system is essential to both good vehicle performance and personal safety. Poorly maintained brakes can result in a decrease in braking/steering efficiency, vehicle performance or damaged brake discs.

Maintenance Schedule

1. Every 100 hours of vehicle operation, perform the servicing procedure, **Brake Pad Inspection** (Mechanical).
2. Every 25 hours of vehicle operation, Perform the servicing procedure, **Brake Pad Inspection** (hydraulic).
3. Every 50 hours of vehicle operation, Perform the servicing procedure, **Inspect Brake Fluid Level/Condition**.

NOTE

The intervals shown in the Argo Maintenance Schedule Chart (found in the General Information section of this service manual) are based on average operating conditions. Vehicles which are subject to more severe use, wet or dusty conditions, will require more frequent servicing.

NOTE

Please refer to the appropriate illustrated parts manual for the vehicle being serviced. The parts manual is identified with either the vehicle's model number, serial number or both written on the front cover.

Hydraulic Brakes

General

Although the hydraulic brake system is self adjusting, the following require periodic attention:

Brake Fluid Level (Steering Brake Master Cylinders)

After every 50 hours of operation, check the brake fluid level by removing the master cylinder covers.

IMPORTANT

Thoroughly clean the master cylinder cover and surrounding area before removal.

The master cylinders are mounted tilted slightly back. When adding fluid, fill until the shallowest end of the fluid level in the well is approximately 1/2" from the top lip of the master cylinder. *Figure 1*

If the brake fluid is below this level:

1. Add only fresh clean SILICONE - DOT 5 BRAKE FLUID (ARGO Part No. 126-19) to the correct level.
2. Replace the cover on each master cylinder, making sure the rubber gaskets are properly seated before tightening the cover screws. Tighten snug by hand only.

CAUTION

Do not overfill the brake master cylinders. Overfilling can cause seal damage.

Use only SILICONE - DOT5 BRAKE FLUID. Other brake fluid is not compatible with ARGO brake components and operating temperatures. Use of other fluids will void the warranty and may cause loss of brakes or steering.

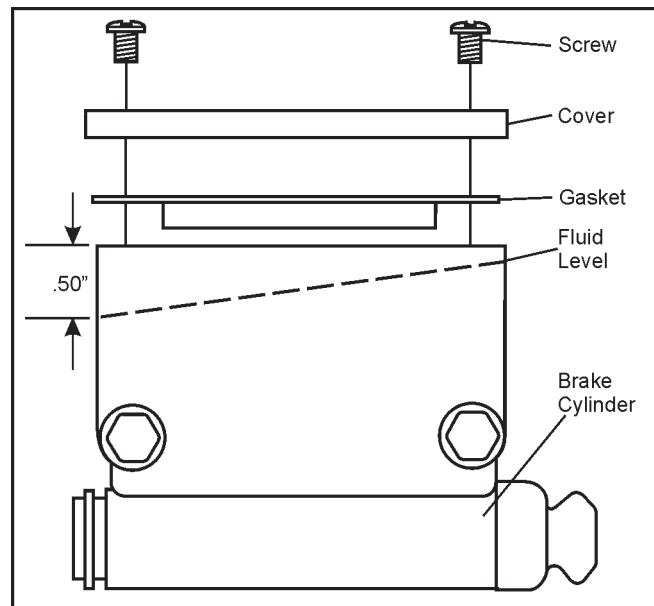
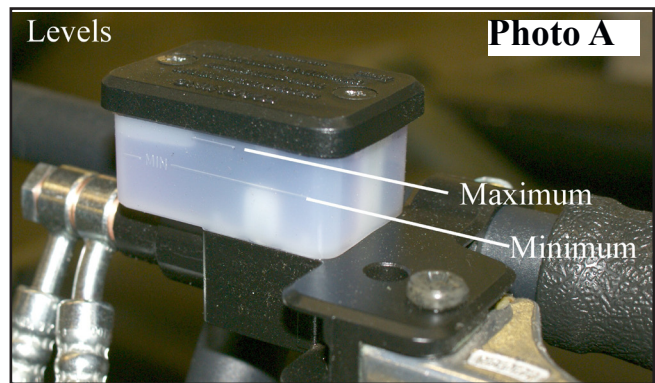


Figure 1

Brake Fluid Level (Service Brake Master Cylinder)

The ARGO HDi is equipped with a hydraulic handbrake system. This consists of an independent set of hydraulic brake calipers and brake discs. The master cylinder is mounted on the left side steering bar. **The master cylinder is not serviceable nor replaceable. Complete hand brake/master cylinder assembly must be replaced.** *Photo A*



Monitor the hand brake fluid on a regular basis. The master cylinder well is translucent and the fluid level is visible to the eye without removing the cover. Ensure the level is to the “top” level mark. *Photo A.* Inspect all brake hoses and brake fittings at both hand brake and hydraulic calipers for any signs of brake fluid leaks.

IMPORTANT

If the cover needs to be removed to replenish or service the system, thoroughly clean the cover and surrounding area before removing to avoid any contamination to the brake system

The inherent stability of Silicone DOT 5 Brake Fluid reduces the need for frequent brake fluid replacement. Inspect the fluid for degradation during normal fluid level inspections (see **Brake Fluid Inspection**). The brake fluid system should be drained, flushed and refilled with fresh brake fluid if any abnormalities are evident. Perform the servicing procedure, **Changing the Brake Fluid**. If particles are evident in the fluid, drain the system, overhaul the master cylinder and the brake caliper before flushing and refilling. Perform the Servicing Procedure, **Bleeding the Steering Brake System**.

NOTE

Spilled brake fluid is environmentally damaging. Proper disposal is required.

Hydraulic Brake Pad Inspection (Steering Brakes)

Inspect the brake pads after every 25 hours of operation. Worn, glazed or contaminated brake pads affect the efficiency of the brake system. To inspect the pads, Perform the Servicing Procedure, **Remove the Firewall**.

With the fire wall removed, both hydraulic brake calipers are visible. Each steering brake caliper has 2 brake pads which are secured by cotter pins (Figure 1). Inspect all 4 brake pads.

Replace the pads when:

- the brake lining material molded to each metal backing plate is worn to 0.10" thickness. (Figure 2).
- the pads are glazed and brake performance is affected.
- the pads are contaminated with lubricant, and brake performance is affected.

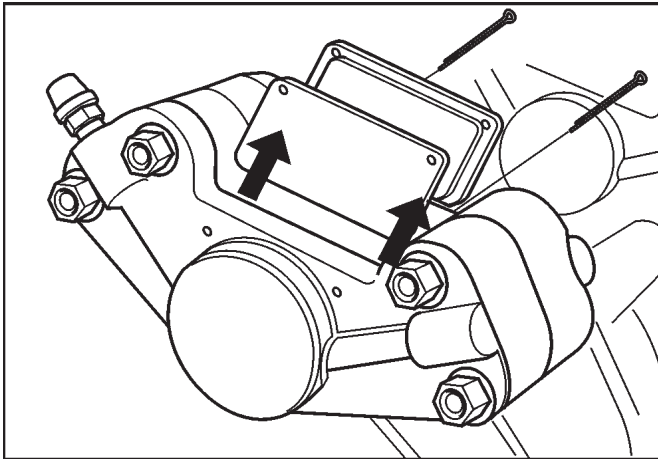


Figure 1

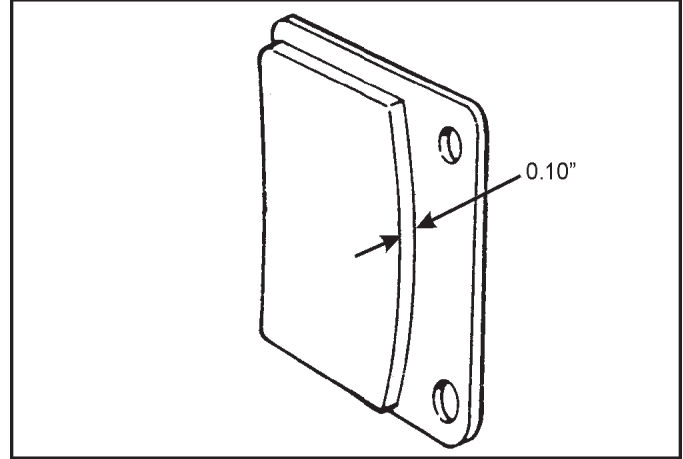


Figure 2

Removing the Steering Brake Pads (Gremica Calipers)

Avengers Manufactured Prior to Serial No. 21245

Avengers manufactured prior to the above serial number were built with Grimeca Brake Calipers. The design of this caliper requires it to be removed from the transmission to allow the pads to be slipped out through the front of the caliper. The following procedure applies to these earlier models.

1. Perform the servicing procedure, **Removing the Firewall**, in section VB of this service guide.
2. Raise the vehicle off the ground.
3. Line up the hole provided in the brake disc, with the 2 socket head mounting bolts that secure the hydraulic brake caliper to the transmission housing. To do this you will need to rotate the tires by hand until they are lined up for each one. *Photo 1*

WARNING

NEVER attempt to align these with the engine running and in gear.

NOTE

You may leave the brake fluid line connected to the caliper.

*The left hand caliper requires the removal of the drive belt and driven clutch to access the mounting bolts to the transmission. Refer to, **Removing the Driven Clutch**, and **Removing the Drive Belt**, in Section CS of this service guide.*

4. Remove the 2 socket head fasteners and flat washers (later models utilize lockwashers).

Photo 1 Slide the caliper from the brake disc.

5. Remove the two (2) cotter pins securing the brake pads in the caliper. *Photo 2*

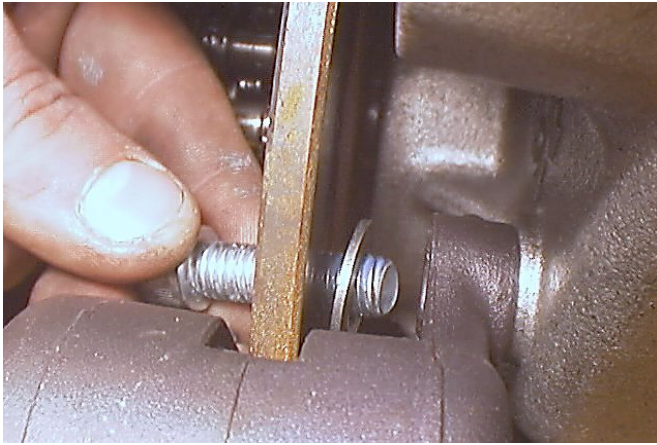


Photo 1

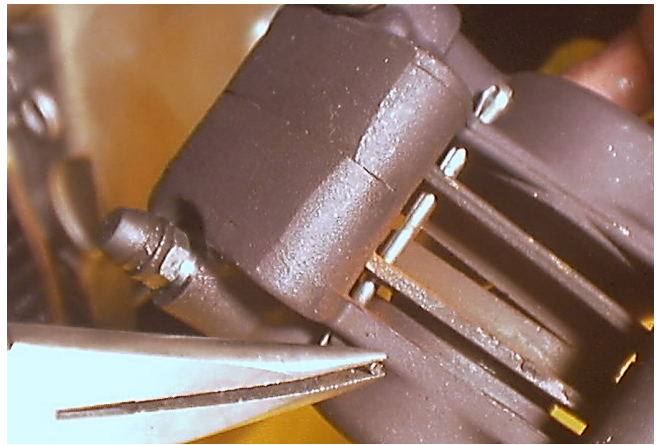


Photo 2

6. Slide the pads forward and out of the calipers. *Photo 3*

7. Perform the procedure, **Hydraulic Brake Pad Inspection**.

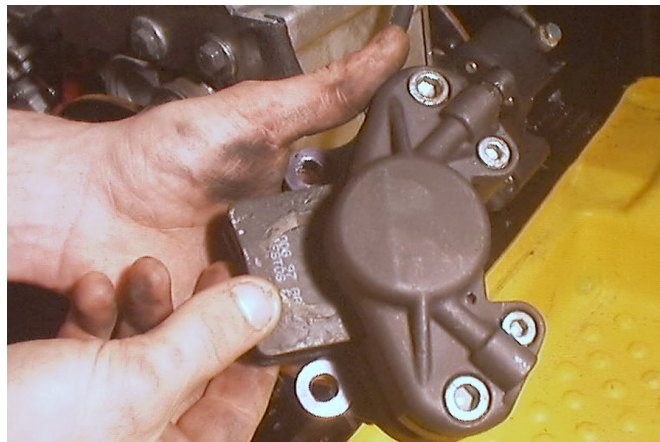


Photo 3

Installing Steering Brake Pads (Gremica Calipers)

Vehicles Manufactured prior to Serial No. 21245

NOTE

When replacing brake pads, always use new cotter pins.

NOTE

Before installing new pads, use brake cleaner on rotor and caliper to remove contaminants and oil.

CAUTION

When replacing worn or contaminated pads, replace both pads in the brake caliper assembly even if both pads do not require replacing. Using one new and one old brake pad in a caliper assembly may provide poor braking/steering performance.

1. Slip the new pads into the caliper. Install and bend the cotter pins to secure the new pads in place. *Photo 3*

NOTE

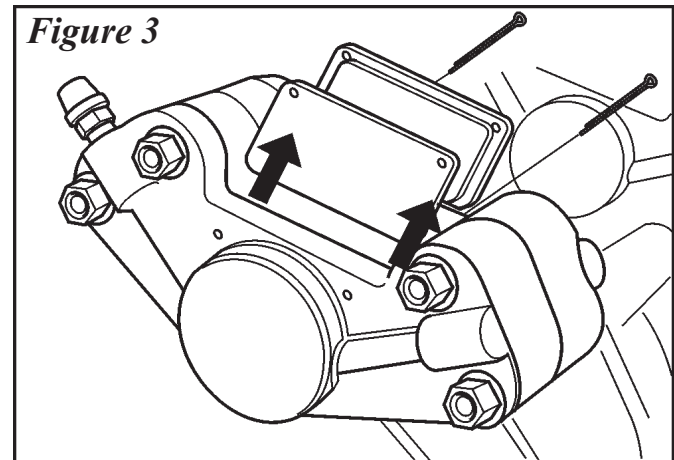
Before installing the pads into the caliper, make sure that the brake caliper pistons are pushed back into the caliper housing as far as possible. This will ensure that the new pads can be spread far enough apart from each other to accommodate the thickness of the brake disc when the caliper is slipped back into position and remounted to the transmission.

2. Remount the caliper to the transmission by aligning the access hole in the brake disc with that of the threaded mounting boss on the transmission. LOCTITE the threads of the 2 socket head mounting bolts with blue LOCTITE 243, and secure the caliper (with the 2 flat washers or lockwashers in place) to the transmission. Torque to specifications.

Removing the Steering Brake Pads (Knott Calipers)

Avengers Manufactured From Serial No. 21245

Brake pads are easily replaced by removing the 2 cotter pins securing them within the brake caliper assembly and pulling each pad up and out of the caliper. See **Figure 3**. Pistons have to be pushed back in first, to allow clearance for the new pads. Slip the new pads into the caliper and install 2 new cotter pins bending the ends over to secure the pads in position. Pump the steering handle bar a few times to the left and to the right to build up proper pressure and to locate the pads in the caliper assembly.



Installing Steering Brake Pads (Knott Calipers) Vehicles From Serial No. 21245

NOTE

When replacing brake pads, always use new cotter pins.

CAUTION

When replacing worn or contaminated pads, replace both pads in the brake caliper assembly even if both pads do not require replacing. Using one new and one old brake pad in a caliper assembly may provide poor braking/steering performance.

1. Slip the new pads into the caliper. Install and bend the cotter pins to secure the new pads in place. *Photo 3*

NOTE

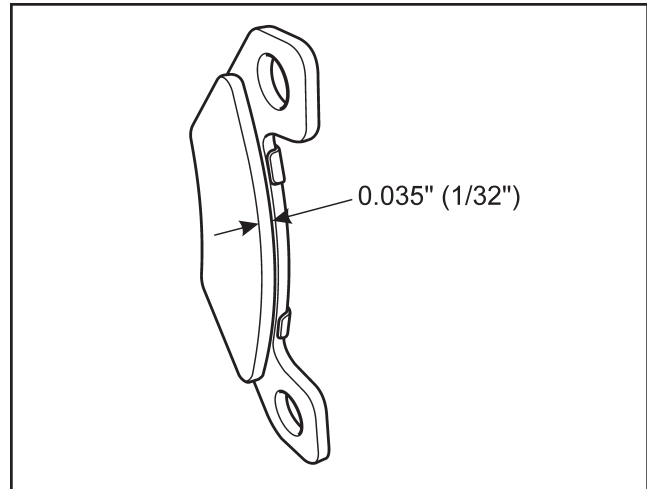
Before installing the pads into the caliper, make sure that the brake caliper pistons are pushed back into the caliper housing as far as possible. This will ensure that the new pads can be spread far enough apart from each other to accommodate the thickness of the brake disc when the caliper is slipped back into position and remounted to the transmission.

Brake Pad Inspection Procedure (HDi - Service Brake Pads)

Inspect the brake pads after every 25 hours of operation. Worn, glazed or contaminated brake pads affect the efficiency of the brake system. To inspect the pads, first remove the firewall. With the firewall removed, both handbrake hydraulic brake calipers are visible. Each caliper has 2 brake pads which are secured by (2) 3/8" Socket Head bolts. Inspect all 4 brake pads.

Replace the pads when:

- the brake lining material molded to each metal backing plate is worn to 0.035" (1/32") thickness. (Figure 7-19c).
- the pads are glazed and brake performance is affected.
- the pads are contaminated with lubricant, and brake performance is affected.



Removing the Service Brake Pads (HDi)

1. Perform the Servicing Procedure, **Removing the Firewall**
2. Locate and remove the two (2) fasteners securing the Service Brake Caliper to the mounting Bracket. *Photo 4*
3. Slide the service brake pads from the caliper. *Photo 5*

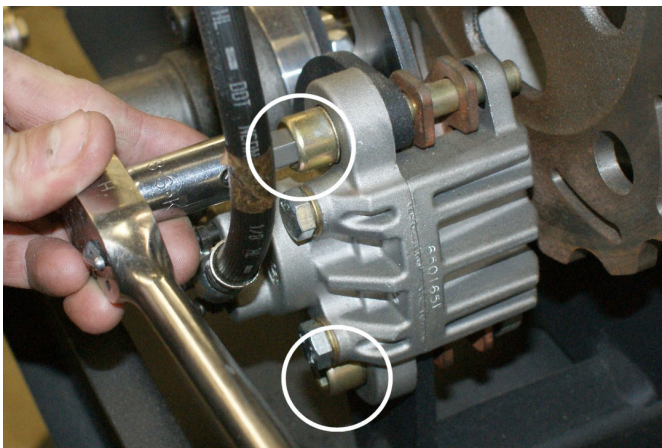


Photo 4

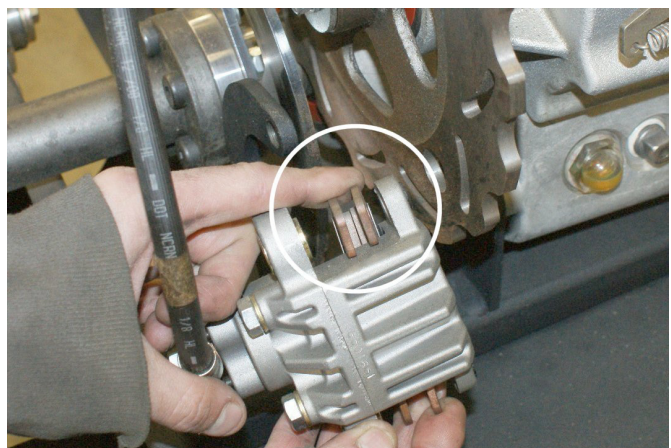


Photo 5

4. Perform the Servicing Procedure, **Brake Pad Inspection (HDi - Service Brake Pads)**.

Installing the Service Brake Pads (HDi)

NOTE

Before installing new pads, use brake cleaner on components before re-assembly to remove oil and other contaminants.

CAUTION

Ensure the brake pads are NOT installed backwards. The pad side must be installed towards the brake disc. The brake pads utilize a black coloured anti-squeal coating on the opposite side of the pad which could be mistaken for the pad surface.

1. Place Service Brake Pads into caliper and spread apart while slipping over the Service Brake Disc. Apply Blue LOCTITE 243 to the threads of the shoulder bolts and re-mount the caliper back to the brackets. Torque to specifications.

Brake Pad Bedding In Process

Bedding in of the service brakes is recommended by the brake pad manufacturer to obtain maximum performance and wear from the brake pads. Each time a new set of pads is replaced, the following procedure is advised.

1. Ensure that the service brake system has been bled to provide maximum braking.
2. For this procedure select an area that is open and flat, such as an empty parking lot.
3. Drive the Argo at a speed of approximately 20kph. While continuing to apply throttle, gradually apply the service brake, slowing your speed down to 10kph, then release the brake and accelerate back to 20kph. Repeat a total of 10 times. Do not wait between cycles to let brakes cool. *Do not bring the Argo to a full stop (unless required for safety reasons).*

IMPORTANT

The brakes may smell and some smoke could be present. Bringing the Argo, to a full stop when the brakes are hot may cause the brake pad to imprint itself on the rotor. If this happens it will cause vibration and poor brake performance.

CAUTION

As the brake components will be extremely hot at this point.

5. After the 10 cycles are complete shut down the Argo and allow at least 30 minutes for the brakes to cool down.
6. Once the brakes have sufficiently cooled down, repeat the entire process a second time following steps 1-3.
7. The bedding in procedure is now complete

Hydraulic Brake Calipers

Maintenance Schedule - Inspect every 50 hrs of vehicle operation

CAUTION

The brakes must be inspected regularly by a qualified authorized Argo dealer/mechanic. Damaged or leaking calipers can seriously impair the ARGO steering/braking capability. Severe personal injury or property damage could result from a damaged or poorly adjusted brake system.

Inspect the calipers for the conditions listed in the following chart and then perform the recommended servicing procedures.

Condition	Corrective Action	Servicing Procedure	Page
Cracked or Broken Calipers	Replace Immediately	Hydraulic Brake Caliper Removal	BR-10
Broken or Missing CotterPins		Brake Caliper Service and Repair	BR-11
		Hydraulic Caliper Installation	BR-14
Hydraulic Fluid Leakage	Inspect Caliper Casting and "O" Ring	Hydraulic Brake Caliper Removal	BR-10
		Brake Caliper Service and Repair	BR-11
	Inspect Hoses and Connections	Inspecting the Hydraulic Brake line Hydraulic Caliper Installation	BR-26 BR-14

Remove Hydraulic Brake Caliper

IMPORTANT

Argo Avengers have been manufactured with two brands of brake calipers during specific build periods. Earlier vehicles (Avengers manufactured prior to serial no. 21245), utilized a Gremica brand caliper (typically black in colour). Current models use Knott brand calipers (typically silver in colour). The following procedure illustrates a Gremica rebuild. Keep in mind, the following steps can be used for the Knott caliper rebuild as well. Order the correct O-Ring kit according to the brand caliper used on the vehicle being serviced.

1. Perform the servicing procedure **Removing the Firewall (Quick Release)** in section VB.
2. Raise the vehicle off the ground.
3. Disconnect the brake line at the caliper. Be aware of the brake fluid present in the system. Use a rag or small container to collect any initial fluid that may drain from the master cylinder until you can raise and secure the brake line high enough to stop the flow of fluid.
4. Line up the hole provided in the brake disc, with the socket head mounting bolts that secure the hydraulic brake caliper to the transmission housing. To do this you will need to rotate the tires by hand until they are lined up. Remove the 2 fasteners and flat washers (later models use lockwashers). Slide the caliper from the disc. *Photos 6 & 7*

WARNING

NEVER attempt to align these with the engine running and in gear.

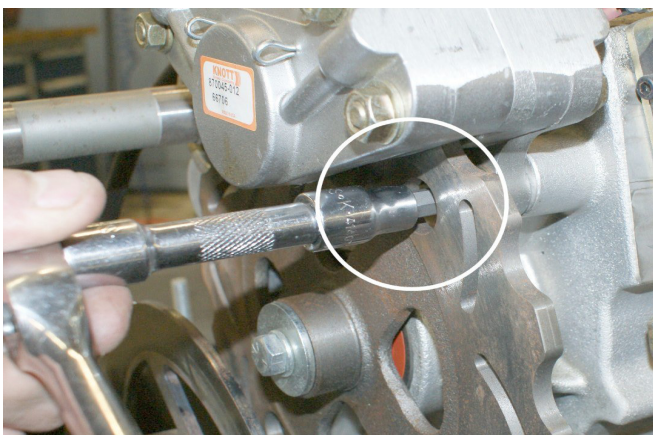


Photo 6

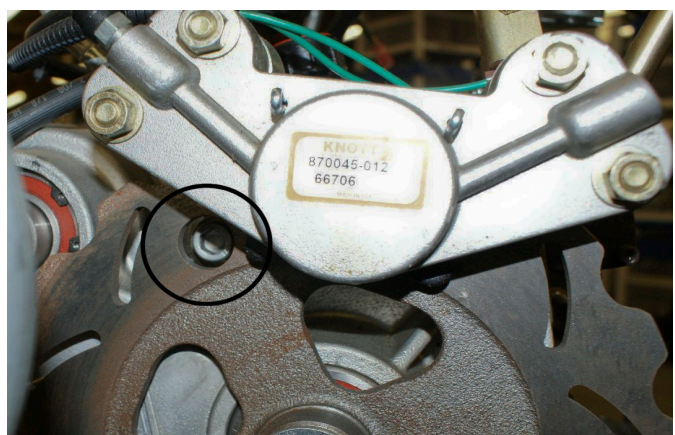


Photo 7

NOTE

The left hand caliper requires the removal of the drive belt and driven clutch to access the mounting bolts at the transmission. Refer to **Removing the Driven Clutch** in Section CS of this service guide.

NOTE

When removing the caliper from the transmission, take note of any shims that may have been used between the caliper and transmission mounting boss. Earlier models may have employed shims to correctly align the calipers with the brake discs. Ensure that these are reinstalled upon remounting the caliper.

5. Remove the caliper to a clean workbench.

Hydraulic Brake Caliper Disassembly

1. Perform the servicing procedure, **Remove Hydraulic Brake Caliper**.
2. Work on a CLEAN dry surface. Locate and remove the 2 cotter pins securing the pads in the caliper and remove the brake pads.
3. Remove the piston from each half by applying compressed air (Max. 20 psi or less), to the hydraulic hose inlet. Place a rag in between the caliper to absorb the shock of the piston when it pops from the caliper. *Photo 8*

CAUTION

Always wear eye protection when using compressed air. Caliper parts could fly apart causing serious injury.

NOTE

Depending on the manufacturing date of the vehicle being serviced, the caliper halves may be secured together by either (4) Socket Head mounting Bolts (Gremica calipers), or (4) Hex Head Bolts, Flat Washers & Nuts (Knott calipers).

4. Place the caliper into an aluminum jawed vise. In the example shown, remove the socket head bolts that secure the caliper halves together. *Photo 9*



Photo 8

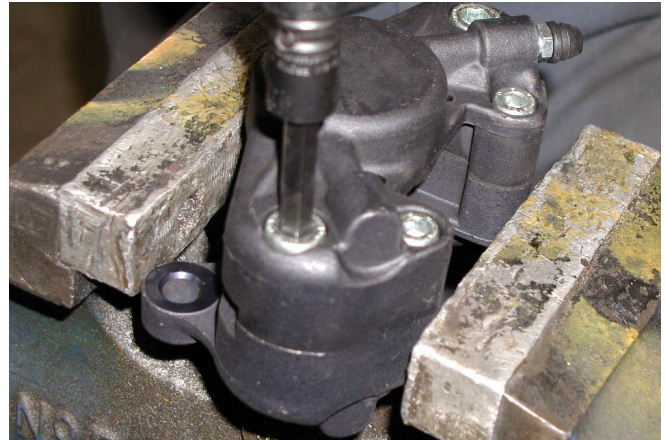


Photo 9

5. Take the caliper assembly from the vise and separate the 2 halves. *Photo 10*
6. Lift the piston seals and small “O” ring from the caliper halves and discard. *Photos 11 & 12*
7. Remove the bleed screws and check the steel ball from the caliper casting. *Photo 13*
8. Clean all components in a varsol bath, then a mild soap solution. Use compressed air to blow out the caliper castings. This will free up any dirt or other contaminants you could not reach with the cloth.



Photo 10



Photo 11



Photo 12



Photo 13

9. Wipe all components with a lint free cloth or use compressed air to dry.
10. Thoroughly inspect all the components. Replace any worn, cracked, broken or missing parts.
11. Inspect both piston chambers for any pitting, scratching, scarring or rust. Replace pistons with new, or the entire caliper assembly if necessary.

Hydraulic Brake Caliper Reassembly

1. Begin with all the components on a clean work surface.
2. Lubricate all rubber component parts with fresh DOT 5 Silicon Brake Fluid

WARNING

Do not allow brake fluid to contact your eyes, clothes, or painted surfaces. Brake fluid is extremely corrosive and can cause severe personal injury. Wear protective eye goggles, gloves and clothing. If brake fluid contacts your eyes, consult a physician immediately.

CAUTION

When reassembling the caliper, work with clean hands, tools, and parts. Perform the reassembly on a clean, neat surface. Dirt or contaminants on component parts will cause a reduction in brake efficiency and may damage the brake components. Ensure the correct O-Ring Kit for your BRAND of caliper (Gremica or Knott). Refer to your illustrated parts manual for correct part number.

3. Place the caliper castings on a clean workbench so that the interior is facing up.

Photo 14

4. Insert the rubber seals into each half of the caliper casting. *Photo 15*



Photo 14



Photo 15

CAUTION

Do not scratch or tear the seals during installation. Any damaged seal must be replaced immediately.

5. Insert the pistons so that the cavity side is facing up.
6. Place the one half caliper into the aluminum jawed vise being careful not to damage it by overtightening it. Locate the oil journal which requires the small "O" ring. Place the "O" ring over the hole making sure that the flat edge of the ring is facing down.

Photo 16

7. Place the other half caliper to the one secured in the vise making sure that the oil journal of the top half is aligned with the previously installed "O" ring in the lower half.

Photo 17



Photo 16



Photo 17

NOTE

*Knott Calipers are secured together by four (4) Hex Head Cap Screws, Eight (8) Flat Washers, and four (4) Fin Hex Nuts. **Photo A***

8. Reinstall the Socket Head Cap Screws (Gremica Calipers) which hold the caliper assembly together. Use blue LOCTITE 243 on the threads of the fasteners. Torque the bolts to the specified torque. **Photo 18**
9. Place the check ball and bleed screw back into the threaded mount of the caliper casting. **Photo 19.** Cap with the rubber plug.

**Photo A****Photo 18****Photo 19**

10. Slide the brake pads into the calipers and secure with 2 new cotter pins.

Hydraulic Brake Caliper Installation**NOTE**

Before installing new calipers, use brake cleaner on components before re-assembly to remove oil and other contaminants.

11. Remount the caliper to the transmission by aligning the access hole in the brake disc with that of the threaded mounting boss on the transmission. LOCTITE the threads of the 2 socket head mounting bolts with blue LOCTITE 243 and secure the caliper (with the two (2) flat washers or lockwashers) to the transmission. **Photos 21 & 22.** Torque to specifications.

NOTE

When re-installing the calipers to the transmission, ensure any shims that may have been used between the caliper and transmission mounting boss are re-installed. Earlier models may have employed shims to correctly align the calipers with the brake discs.

WARNING

NEVER attempt to align these with the engine running and in gear.

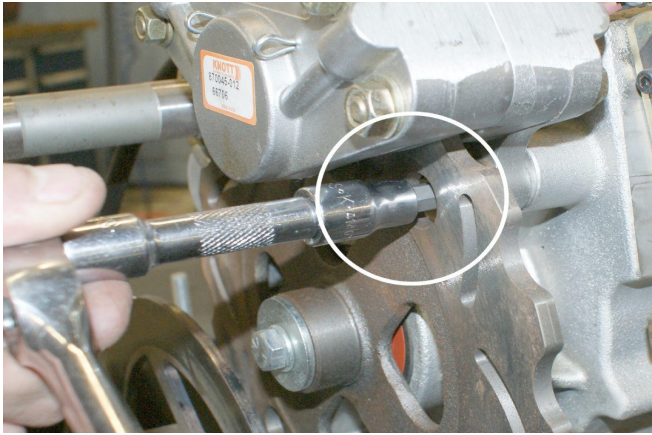


Photo 21

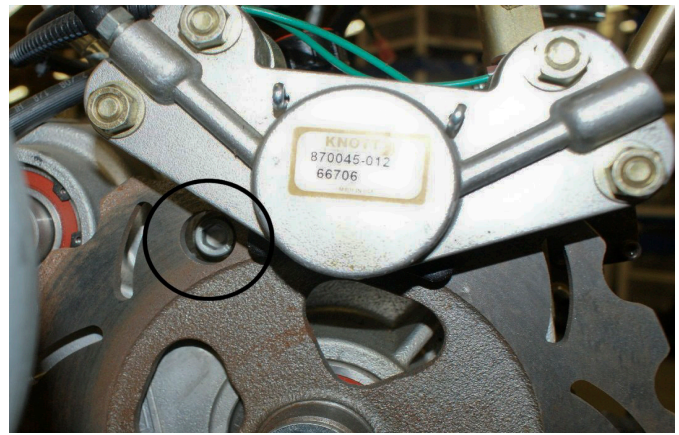


Photo 22

12. Re-attach the brake line at master cylinder. *Photo 23*

NOTE

Always use new copper washer seals at all brake line connections.

13. Perform the servicing procedure, **Bleeding the Hydraulic Brake System.**

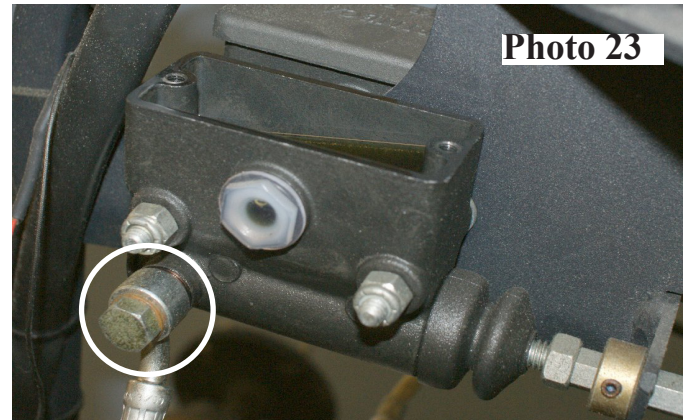


Photo 23

Removing the Master Cylinder

CAUTION

Clean around the Master Cylinder lid area of any dirt and debris before removing the master cylinder covers. This will prevent dirt from contaminating the brake system. Contaminants in the brake fluid can damage components or cause premature wear.

This will result in a loss of braking/steering effectiveness.

NOTE

To rebuild a master cylinder, removal of the component is necessary to ensure a clean and thorough job.

IMPORTANT

Argo Avengers have been manufactured with two brands of Master Cylinders during specific build periods. See chart below for information on what brand your Argo was manufactured with. The following procedure illustrates a Gremica Master Cylinder-rebuild. Keep in mind, the following steps can be used for the Knott caliper rebuild as well. Order the correct O-Ring kit according to the brand Master Cylinder used on the vehicle being serviced.

Avengers Manufactured prior to Serial Number 22388	Gremica Master Cylinders
Avengers Manufactured from Serial Number 22388	Knott Master Cylinders
Avengers Manufactured from Serial Number 23663	Gremica Master Cylinders

1. Remove the covers from the master cylinders and empty the cylinders of their content. **Photo 24** If you have access to a vacuum style hand pump, this works well for sucking the fluid from the reservoirs. If this is not an option, disconnect the brake hose from the caliper and allow the reservoir to drain through the hose into a container. Pumping the steering levers speed up the draining process.
2. Disconnect the brake line at the master cylinders. **Photo 25**
3. There are 2 bolts that hold the master cylinders to their mounting bracket. These are secured by 2 nylon locknuts. Remove the 2 nylon locknuts and remove the master cylinders from the vehicle to a clean work bench. **Photo 26**

NOTE

Be aware of the plunger pins and rubber boots attached to the master cylinders. Remove these to a workbench to prevent them from dropping into the lower body of the vehicle. A new rubber boot is supplied with the master cylinder O-ring kit and must be replaced when rebuilding a master cylinder.

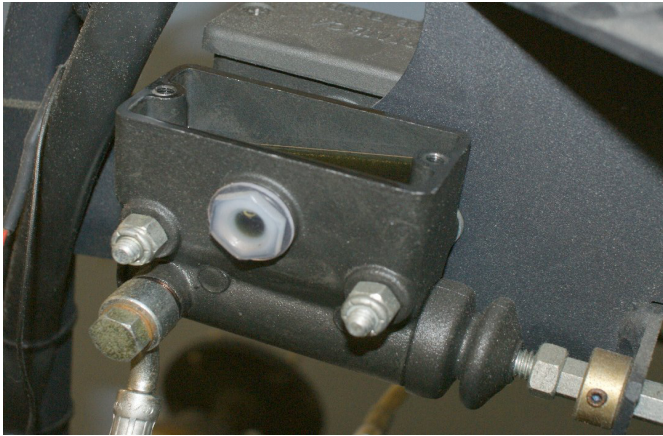


Photo 24

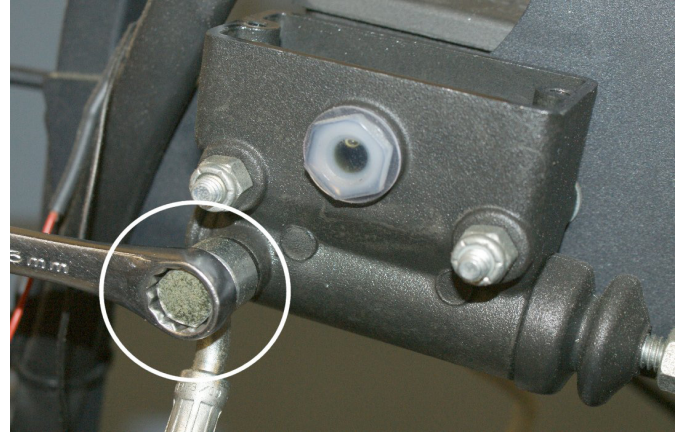


Photo 25



Photo 26



Photo 27

Disassembling the Master Cylinder (Gremica - typically black in colour)

1. Perform the servicing procedure, Master Cylinder Removal
2. Pull the piston and compression spring from the master cylinder. *Photo 27*

CAUTION

Do not use a gripping tool to pull out the piston as this will scratch or damage the surface. Use fingers only to pull out the piston. If this does not work, reinstall gasket and cylinder cover and blow compressed air (Low Pressure 20 psi or less) through the fluid inlet hole.

3. Slide the primary and secondary seals off the piston. Discard the old seals.

CAUTION

Do not scratch the piston when removing the seals.

4. Clean all components with alcohol or a mild soap solution. Use compressed air to blow out the master cylinder castings. This will free up any dirt or other contaminants you could not reach with the cloth.

Master Cylinder Servicing & Inspection

NOTE

Use only genuine ARGO parts.

1. Thoroughly inspect all components of the master cylinder assembly and replace any worn, cracked or broken parts.
2. Inspect the condition of the piston. Replace the piston **immediately** if it is:
 - ◆ Scratched
 - ◆ Pitted
 - ◆ rusted
 - ◆ scored in any way
- 2(a) Inspect the condition of the master cylinder housing. Replace immediately if:
 - ◆ the piston bore is scratched, pitted or rusted
 - ◆ the casing is cracked
 - ◆ the fluid inlet hole is stripped
3. Lubricate all component parts with clean fresh Dot 5 Silicon Brake Fluid.
4. Before assembly, a *new* rubber boot and *new* primary and secondary seals are required. These are available in the replacement assembly **Master Cylinder O- Ring Kit**.

Master Cylinder Re-assembly

IMPORTANT

When re-assembling the Master Cylinder, work with clean hands, tools, and parts. Perform the re-assembly on a clean, neat surface. Dirt or contaminants on component parts will cause a reduction in brake efficiency and may damage the brake components. Ensure the correct O-Ring Kit for your BRAND of Master Cylinder (Gremica or Knott). Refer to your illustrated parts manual for correct part number.

1. Slide the new primary and secondary seals on to the piston. Orient as in *Photo 28*.

CAUTION

Do not damage the seals during the installation. Ensure secondary seal is not twisted when seated to the groove.

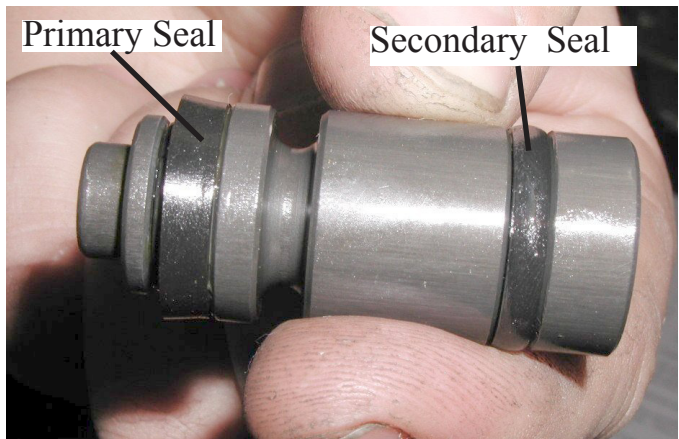


Photo 28



Photo 29

2. Install the compression spring to the brake plunger. *Photo 29*
3. Install the spring & plunger into the piston bore. Slide the end with the primary seal in first. *Photo 30*



Photo 30



Photo 31

4. Temporarily install the cover and gasket onto the master cylinder reservoir.

Master Cylinder Installation

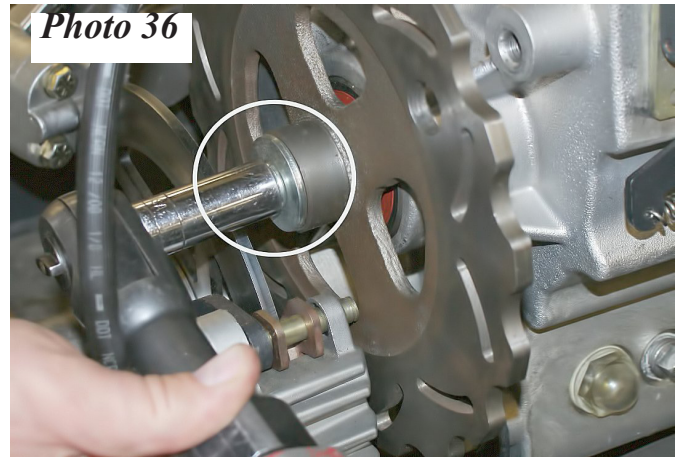
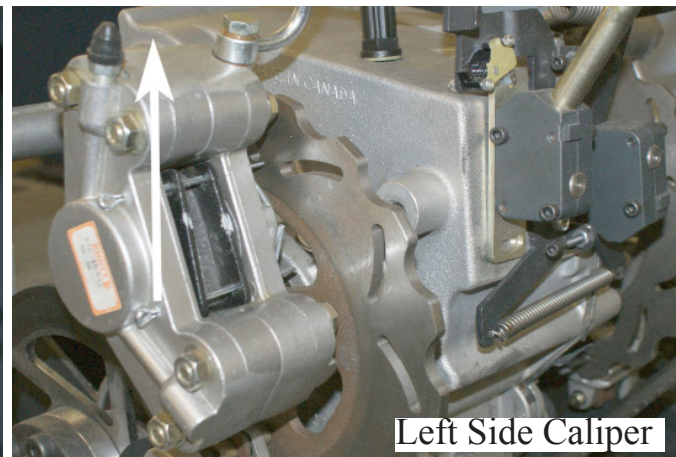
1. Line up the holes in the mounting bracket with those of the master cylinder and insert the 2 mounting bolts. *Photo 31*
2. Reinstall the nylon locknuts and tighten to anchor the master cylinders into position.
3. Reconnect the brake lines to the master cylinders. Always use new copper washer seals on the banjo bolts. Torque to specifications.
4. Refill the master cylinders using **DOT 5 Brake Fluid**. Use of other types of brake fluids or combining different types of brake fluids, may result in damage to steering/braking components or seriously impair the way in which the vehicle performs.
5. Perform the servicing procedure, **Bleeding the Hydraulic Brake System** below.

Bleeding the Hydraulic Brake System (HDi)

IMPORTANT

The position at which the brake calipers are mounted on both 34-100 and 34-200 transmissions is less than ideal for optimum bleeding and purging of air from the system. In order to bleed and purge all air from the brake system successfully, the calipers should be removed and remounted vertically. Ensure also master cylinders are level. This may require raising the back end of the vehicle slightly. Please refer to the following procedure to ensure a properly bled brake system.

1. Perform the servicing procedures, **Remove Hydraulic Brake Caliper**, (remove drive belt & driven clutch for left hand brake caliper).
2. Remove the brake disc fastener securing the brake disc to the output shaft. *Photo 36*
3. Reattach the caliper to the brake disc at the lower mounting hole (with the previously removed fastener) so that the caliper is now in the upright position. *Photo 37 & 38*

*Photo 37**Photo 38*

4. Remove and remount the right hand brake caliper as described previously for the left hand brake caliper. *Photo 39 & 40*

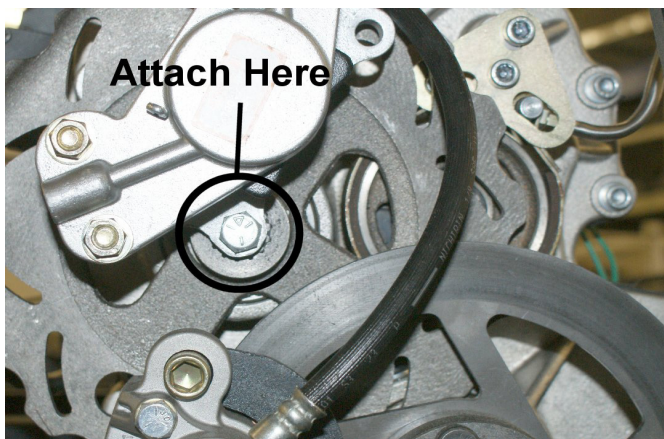
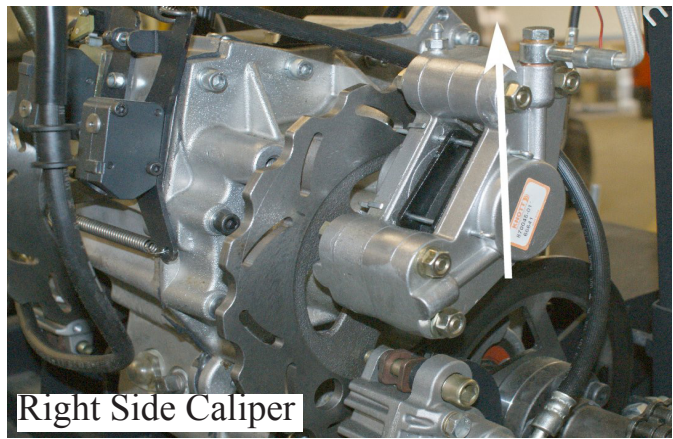


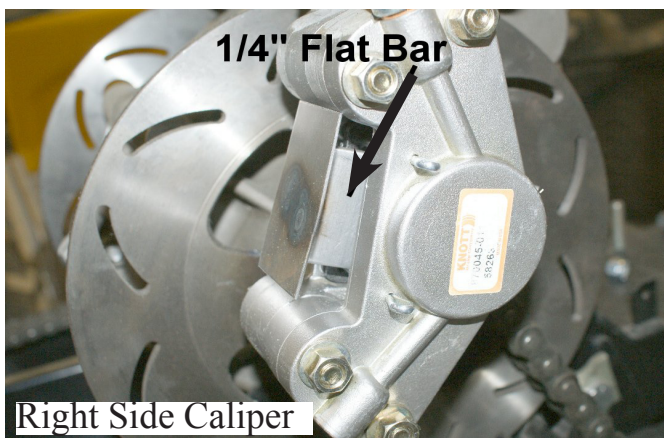
Photo 39



Right Side Caliper

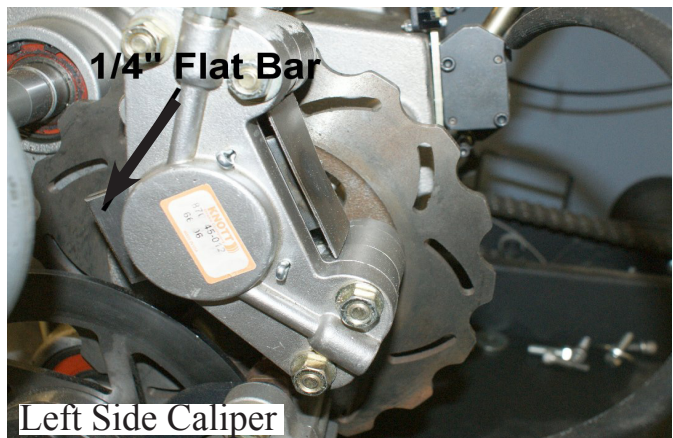
Photo 40

5. Insert a piece of .250" Flat Bar between the pads to simulate the thickness of the brake disc. *Photos 41 & 42*



Right Side Caliper

Photo 41



Left Side Caliper

Photo 42

Bleeding the Brakes

1. Remove master cylinder covers and add DOT 5 (ONLY) brake fluid as necessary.
2. Remove the rubber plug from the bleed screw at the brake caliper.
3. With the bleed screw still tight, purge any air from the system by pumping the steering handles slowly. When there are no longer visible signs of air bubbles observed in the master cylinder, replenish it with more fluid to bring it back up to the top of the window.
4. Next, apply steady pressure to the steering lever until the brake is fully engaged. Hold the steering lever in this position and slowly loosen the caliper bleeding screw 1/4 turn. Open the bleed screw only enough to slowly release fluid out of the screw. If there is any air still present in the system, it will be noticeable through this screw with a slight "spitting" of fluid. Re-tighten the screw and once again pump the brake system *slowly* a few more times. Apply pressure to the steering lever again and hold. Open the bleed

screw gradually until fluid slowly releases. Repeat this procedure until the fluid coming from the bleed screw is a full stream with no visible signs of air in the system.

NOTE

Catch any purged fluid at the caliper bleed screw with a rag or small container of some sort.

5. Replenish the master cylinder to the top of the viewing window and secure the cover and rubber gasket.
6. Clean any stray brake fluid that might have found its way on to the brake disc with brake cleaner. Brake fluid on the brake disc can seriously affect braking capabilities of the ARGO vehicle.
7. Pump the steering levers a few times to build up proper pressure and locate the pads in the caliper assembly.
8. Remove the caliper from the temporary upright position and remount back to the original location by performing the service procedure, **Hydraulic Brake Caliper Installation**. **REMEMBER TO RE-INSTALL BRAKE DISC FASTENER**. Reapply blue 243 LOCTITE to fastener threads and torque to specifications.

Bleeding the Hydraulic Brake System (Avenger 700 and 750 HDi)

IMPORTANT

The position at which the brake calipers are mounted on both 34-100 and 34-200 transmissions, is less than ideal for optimum bleeding and purging of air from the brake system. In order to bleed and purge all air from the brake system successfully, the calipers should be removed and remounted vertically. Ensure also master cylinders are level. This may require raising the back end of the vehicle slightly. Please refer to the following procedure to ensure a properly bled brake system.

NOTE

*Both LEFT & RIGHT brake calipers need to be mounted to the **right hand side** brake disc location to bleed properly.*

1. Perform the servicing procedure, **Remove Hydraulic Brake Caliper, (remove drive belt & driven clutch if removing the left hand brake caliper)**.
2. Remove the brake disc fastener from the RIGHT HAND SIDE brake disc. *Photo 43*
3. Reattach the caliper to the brake disc with the fastener previously removed.

*** Earlier manufactured vehicles without parking brake caliper assembly attached:**
Space out with a minimal amount of flat washers to clear idler chain. *Photo 44*

*** Later models with parking brake calipers attached:**

Requires a 2.0" 3/8-24 bolt to attach the caliper to the brake disc and more spacing to clear

the idler chains. *Photo 44A*

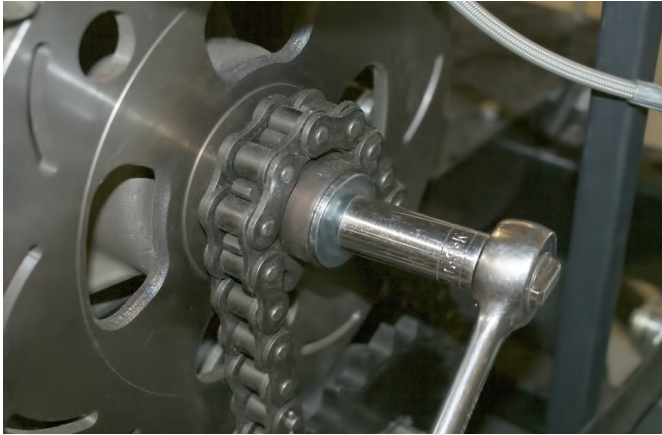
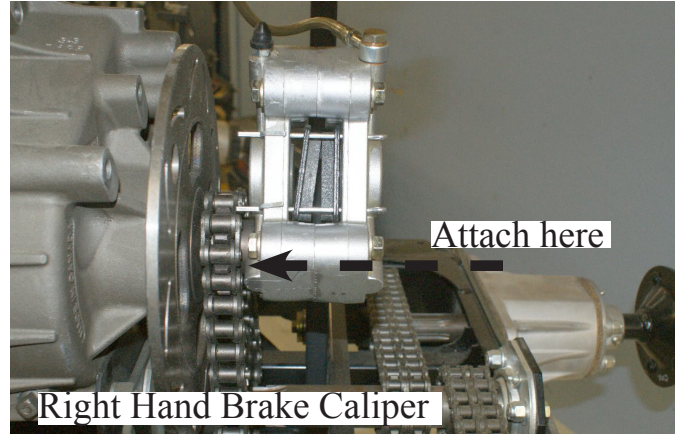


Photo 43



Right Hand Brake Caliper

Photo 44

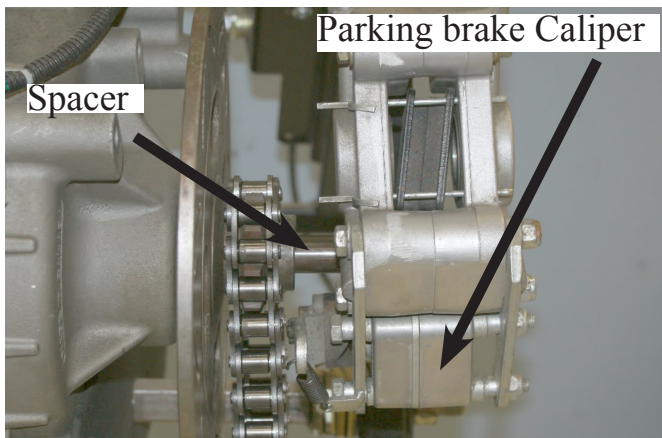


Photo 44A

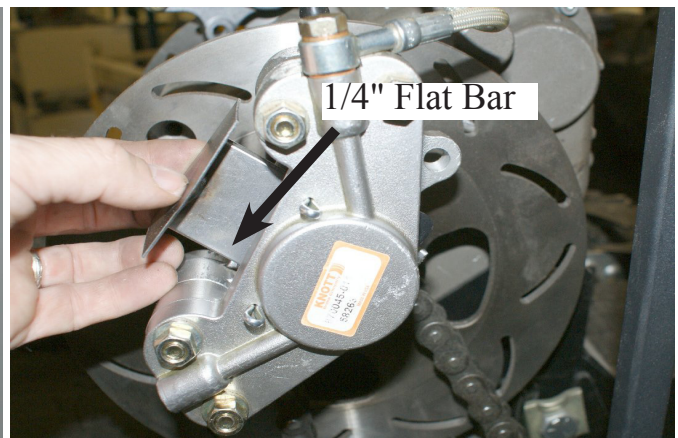


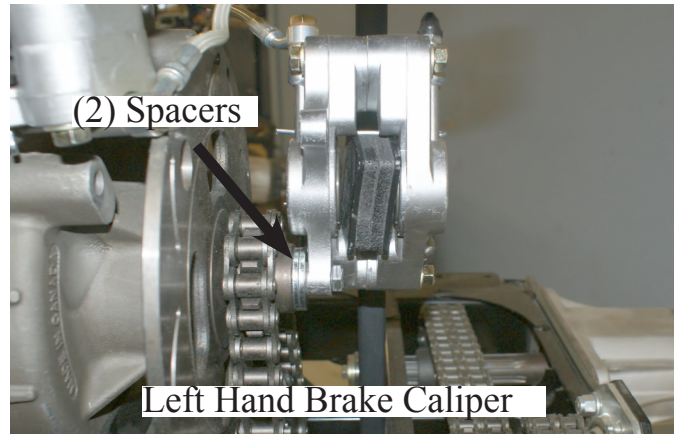
Photo 45

4. Insert a piece of .250" Flat Bar between the pads to simulate the thickness of the brake disc. *Photos 45.*
5. Perform the servicing procedure, **Bleeding the Brakes.**
6. Remove the caliper from the brake disc and remount back to the original location.
7. Apply blue 243 LOCTITE to the brake disc bolt and reinstall to secure brake disc. Torque to specifications.

Left Hand Brake Caliper

8. Route the Left side brake caliper over to the right side of the transmission to mount it to the right side brake disc. The caliper will need to be mounted backwards to have the mounting holes closest to the brake disc. Mount using enough washers to space it out from the idler chains. *Photo 46*

Photo 46



9. Insert a piece of .250" Flat Bar between the pads to simulate the thickness of the brake disc. *Photo 47.*
10. Perform the servicing procedure, **Bleeding the Brakes.**
11. Remove the caliper from the brake disc and remount back to the original location.

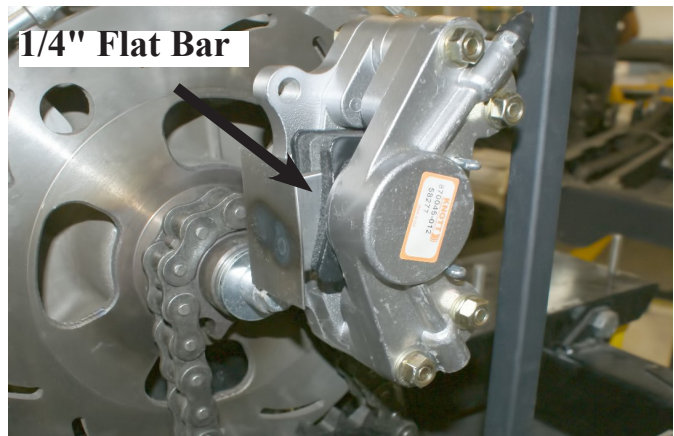


Photo 47

NOTE

Before installing new calipers, use brake cleaner on components before re-assembly to remove oil and other contaminants.

12. Apply blue 243 LOCTITE to the brake disc bolt and reinstall to secure brake disc. Torque to specifications.

Brake Fluid Inspection

WARNING

Do not allow brake fluid to contact your eyes, clothes, or painted surfaces. Brake fluid is extremely corrosive and can cause severe personal injury. Wear protective eye goggles, gloves and clothing. If brake fluid contacts your eyes, consult a physician immediately.

CAUTION

Regular inspection of the brake fluid is very important. Low fluid levels can cause a reduction or loss in braking ability; high fluid levels, or brake fluid contaminated with oil, dirt, or water, can damage the seals or other component parts of the hydraulic brake system.

Inspecting the Brake Fluid Condition

Maintenance Schedule- Inspect every 50 hours of vehicle operation.

Use only Dot 5 silicon brake fluid. Other brake fluids may not be compatible with ARGO brake components and operating temperatures.

1. Locate the master cylinder in the engine compartment. It is located at the top of the transmission.

NOTE

To access the master cylinder cover, remove the hood assembly. You can then remove the cover screws with a screwdriver

2. Clean the casing and lid of the master cylinder. This will prevent dirt or other contaminants from entering the reservoir.
3. Using a screwdriver, unfasten the cover screws and remove the cylinder cover and gasket.

Inspect the condition of the brake fluid and replace if:

- ◆ the fluid appears cloudy
- ◆ the fluid appears discoloured
- ◆ the fluid contains particles of dirt, rust, water, or other contaminants
- ◆ the level is below the viewing window

If any of these conditions are noted, perform the servicing procedure, **Changing the Brake Fluid** below.

Changing the Brake Fluid (Steering Brakes)

CAUTION

Clean the master cylinder casing and fittings. This will prevent dirt from contaminating the brake system. Contaminants in the brake fluid can damage components or cause premature wear to them. This will result in a loss of braking effectiveness.

1. To drain and replenish the brake system you will need to remove the firewall of the vehicle. Perform the servicing procedure, **Removing the Firewall** for your particular model in Section VB of this service guide.
2. Remove the engine hood to access the master cylinders. Remove both covers using the appropriate screwdriver.
3. Locate the bleed screw on the hydraulic brake caliper. Slowly loosen the brake caliper bleed screw and gently pump the steering lever to purge the brake fluid from the system. Catch the used brake fluid at the bleed screw with a container for disposal later.
4. Continue to pump the fluid from the system while monitoring the master cylinder. Repeatedly replenish the master cylinder while pumping the old fluid from the system.
5. When the old fluid at the rear bleed screw appears to be replaced by fresh fluid, perform the servicing procedure, **Bleeding the Hydraulic Brake System**.

NOTE

Use brake cleaner on components before re-assembly to remove oil and other contaminants.

6. Add brake fluid to the master cylinder as necessary, to a level just above the viewing window, and secure the cover.

Changing the Brake Fluid (Service Brakes)

1. Locate the bleed screw on the hydraulic service brake caliper. **Photo 48**. Slowly loosen the brake caliper bleed screw and gently squeeze the brake lever to purge the brake fluid from the system. Catch the used brake fluid at the bleed screw with a container for disposal later.
2. Continue to pump the fluid from the system while monitoring the master cylinder. Repeatedly replenish the master cylinder while pumping the old fluid from the system.

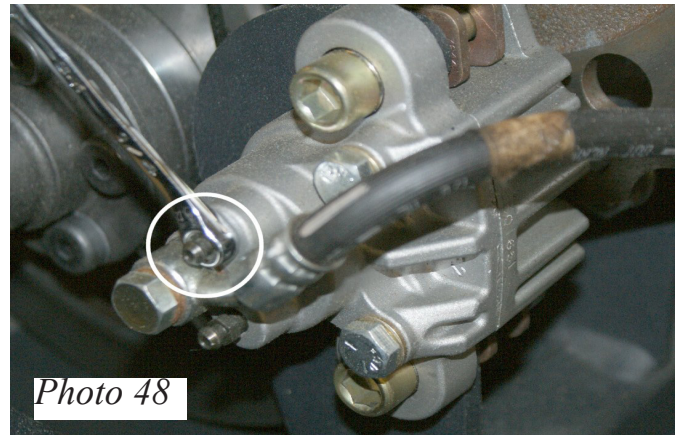
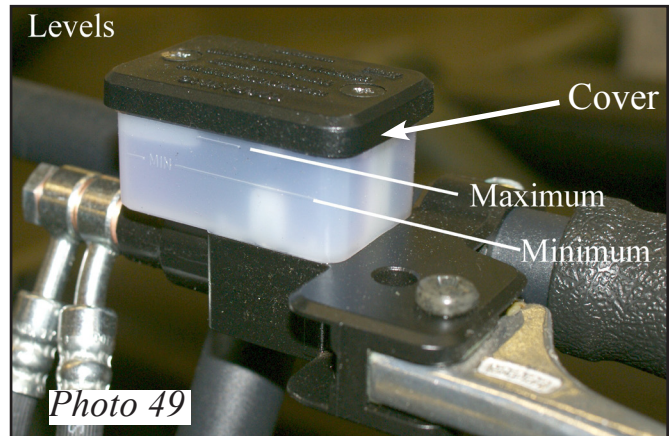


Photo 48

Disassembling the Service Brake Calipers

1. Remove the service brake master cylinder cover (located on the left hand steering bar) and remove the fluid from the bowl. Use a vacuum type pump. **Photo 49**



2. Loosen the brake line banjo bolt at the service brake caliper. **Photo 50**
3. Locate and remove the two (2) fasteners securing the Service Brake Caliper to the mounting Bracket. **Photo 51**

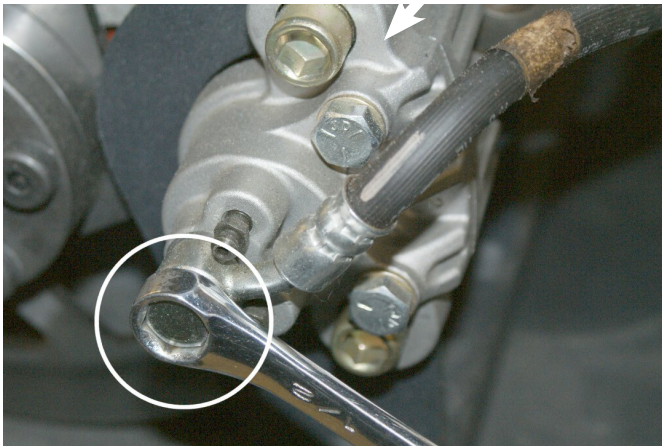


Photo 50

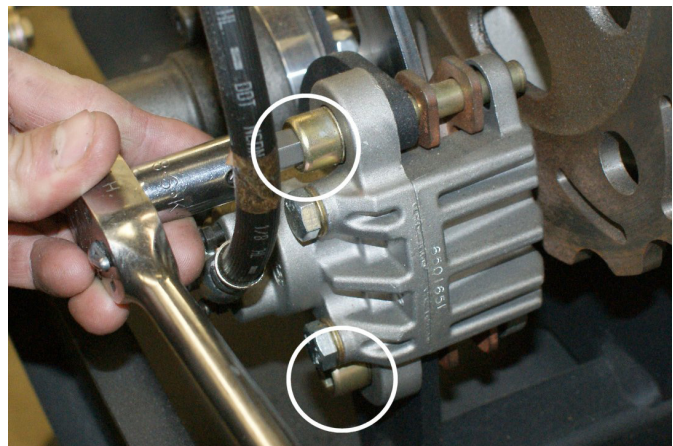


Photo 51

4. Completely disconnect the brake line from the service brake caliper and remove the caliper to a clean work surface. Set the brake pads aside.
5. Remove one of the bleeder screws from the caliper. **Photo 52**
6. Using an air nozzle, SLOWLY apply some compressed air to the empty bleeder screw area while plugging the open brake line hole with a large flat washer under thumb. **Photo 53.** Slowly force air to push the piston from the piston cavity.

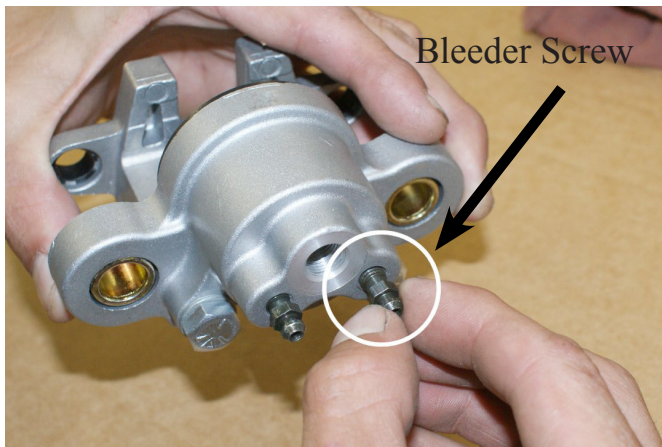


Photo 52

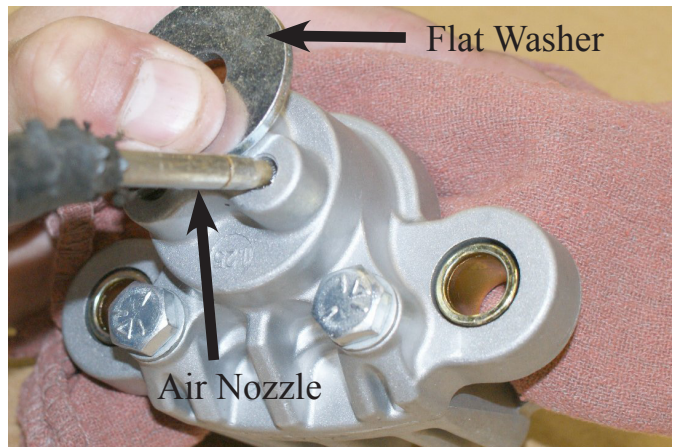


Photo 53

7. Remove the two fasteners securing the caliper halves together and separate. *Photo 54 & 55*



Photo 54

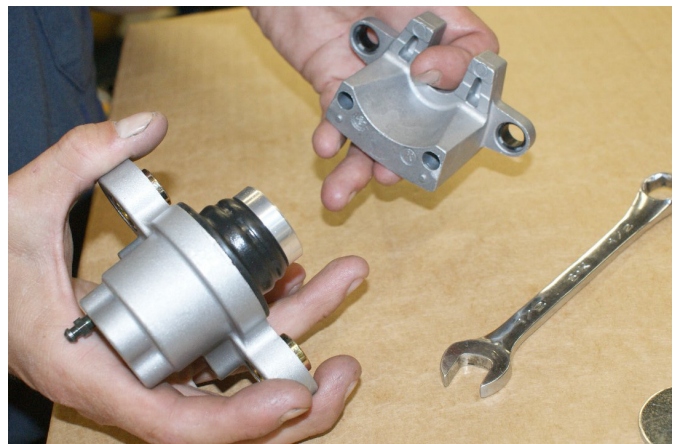


Photo 55

8. Remove the piston from the caliper. Pry and pull the seal along with piston. *Photo 56 & 57*
9. Strip the seal from piston. *Photo 58*



Photo 56

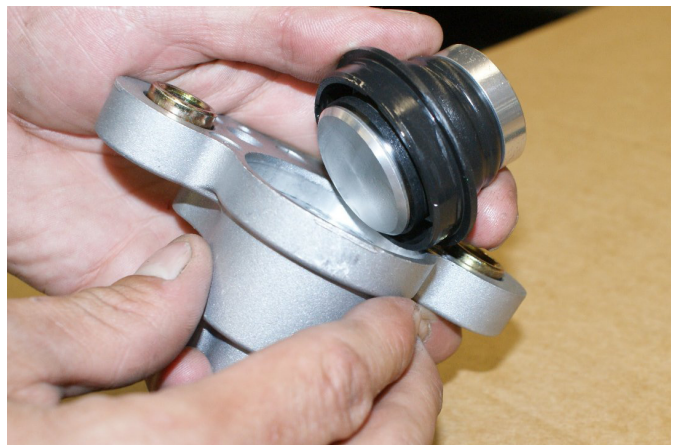


Photo 57



Photo 58



Photo 59

10. Remove bushings from the mounting bolt caliper holes and remove a rubber O-Ring beneath each. *Photo 59 & 60*

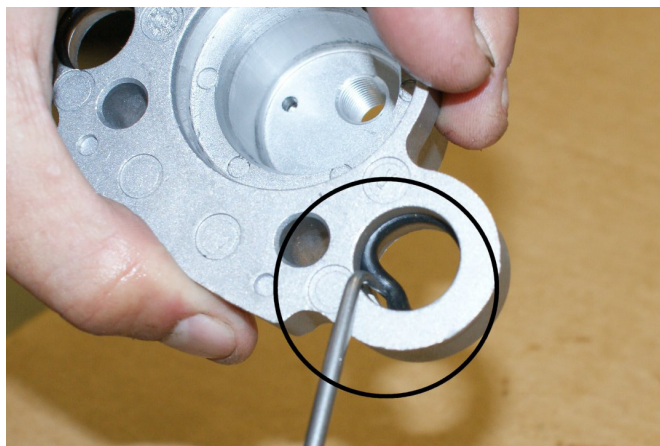


Photo 60

11. Wipe all components with a lint free cloth or use compressed air to dry.

12. Thoroughly inspect all the components. Replace any worn, cracked, broken or missing parts.
13. Inspect piston chamber for any pitting, scratching, scarring or rust. Replace piston with new one that comes with kit or the entire caliper assembly if necessary.

Re-Assembling the Service Brake Calipers

1. Lubricate all component parts with clean fresh Dot 5 Silicon Brake Fluid.
2. Install kit supplied rubber O-Rings into each of the two mounting hole areas on the half caliper. *Photo 50*



Photo 50

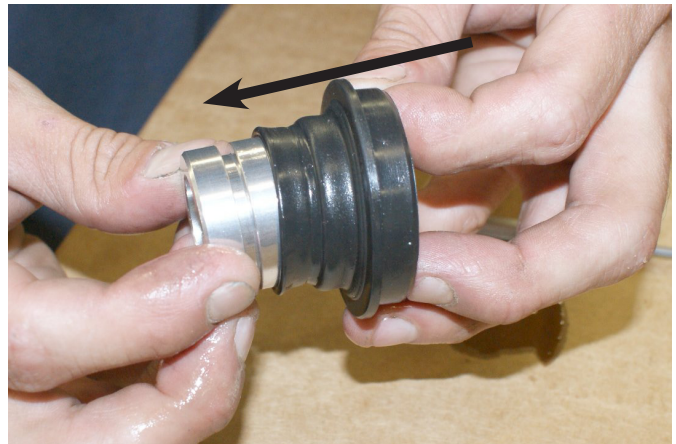


Photo 51

3. Assemble the piston to the rubber boot/seal by pushing it from the bottom up. Rubber O-Ring is at the bottom. *Photo 51*
4. Once the piston is pushed through the rubber boot, collapse the boot around the piston. *Photo 52*



Photo 52

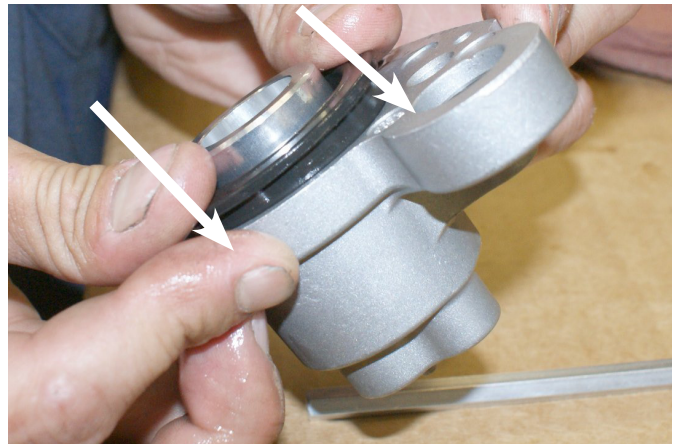


Photo 53

5. Lubricate both piston and boot/seal with fresh Dot 5 brake fluid. Push into the caliper bore. The piston is a tight tolerance with the bore. Ensure you push square and evenly into the bore. **DO NOT FORCE!** You should be able to install by hand only. *Photo 53.*

- Lubricate and install mounting hole bushings to O-Rings installed in Step 2. *Photo 54*
- Assemble the caliper back together and torque to specifications. *Photo 55*

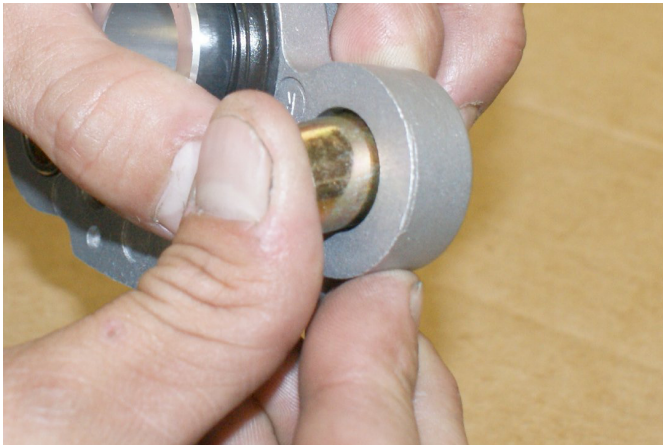


Photo 54

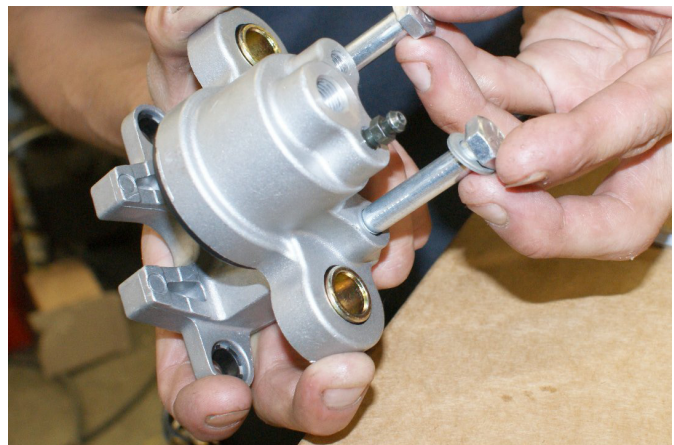


Photo 55

- Loosely re-attach the brake line to the Service Brake Caliper (*Photo 56*) and assemble the caliper and brake pads back to the vehicle. *Photo 57*. Torque mounting bolts to specifications.

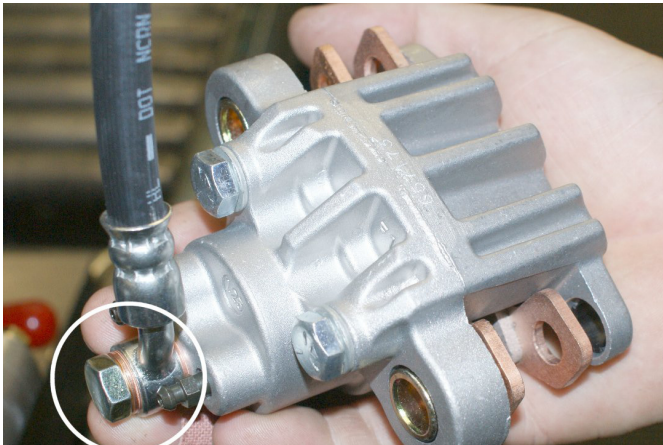


Photo 56

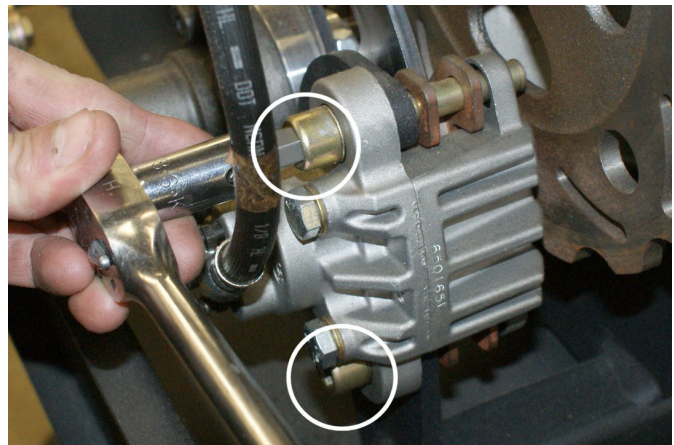


Photo 57

NOTE

Use brake cleaner on components before re-assembly to remove oil and other contaminants.

CAUTION

Ensure the brake pads are NOT installed backwards. The pad side must be installed towards the brake disc. The brake pads utilize a black coloured anti-squeal coating on the opposite side of the pad which could be mistaken for the pad surface.

9. Torque the brake line banjo bolt to specifications. **USE NEW COPPER WASHERS ON THE BANJO BOLT.**

Bleeding the Hydraulic Brake System (Service Brakes)

1. Remove master cylinder cover and add DOT 5(ONLY) brake fluid as necessary.

2. With the bleed screw still tight, purge any air from the system by pumping the brake lever slowly. When there are no longer visible signs of air bubbles observed in the master cylinder, replenish it with more fluid to bring it back up to the top of the full level line.

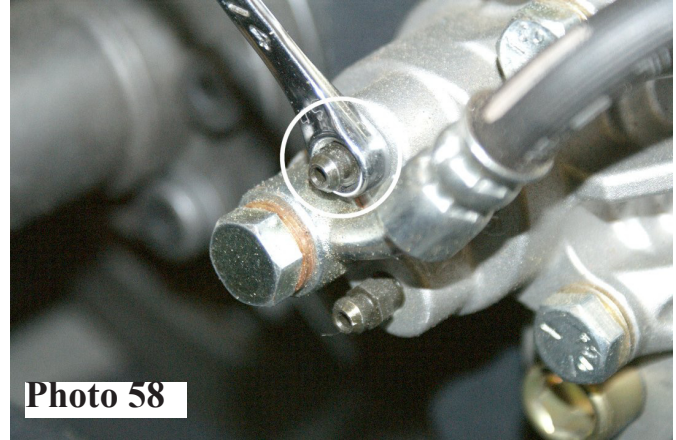


Photo 58

3. Next, apply steady pressure to the brake lever until the brake is fully engaged.

Hold the brake lever in this position and slowly loosen the caliper bleed screw 1/4 turn.

Photo 58 Open the bleed screw only enough to slowly release fluid out of the screw. If there is any air still present in the system, it will be noticeable through this screw with a slight “spitting” of fluid. Re-tighten the screw and once again pump the brake system *slowly* a few more times. Apply pressure to the brake lever again and hold. Open the bleed screw gradually until fluid slowly releases. Repeat this procedure until the fluid coming from the bleed screw is a full stream with no visible signs of air in the system.

NOTE

Catch any purged fluid at the caliper bleed screw with a rag or small container of some sort.

NOTE

Use brake cleaner on components before re-assembly to remove oil and other contaminants.

4. Replenish the master cylinder to the top level mark and secure the cover and rubber gasket.
5. Clean any stray brake fluid. **Brake fluid is extremely corrosive.** Reinstall the cover and pump the brake lever a few times to build up proper pressure and locate the pads in the caliper assembly.

Hydraulic Brake Plunger Pin Adjustment

IMPORTANT

It is critical that the master cylinder pistons are adjusted properly when the steering handlebars are in the centred position. Overheating of the brake system could occur due to the piston being adjusted too far in. This could cause a drag on the system and a possible brake lockup or brake fade. On the other hand, the piston being adjusted too far out increases the distance the piston is required to travel to provide brake pressure. This can result in the steering arm contacting and/or bending the plunger pin guide tab resulting in compromised system operation.

1. Remove the firewall.
2. Loosen the set screw securing the collar to the plunger pin. *Photo 59* This will free the collar to slide along the pin.

IMPORTANT

Both left and right steering arms should be back to their rear most limit before the plunger pin adjustment is made. *Photo 60*

NOTE

750 EFI and 700 models also require that you loosen off the hand brake cable across the two steering arms to ensure they are back to their rear most limit.

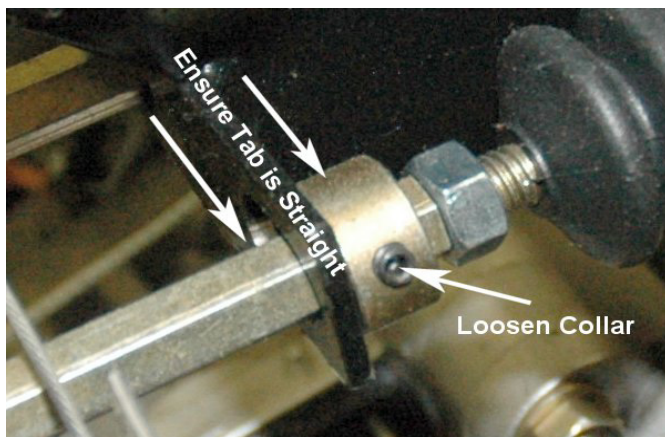


Photo 59

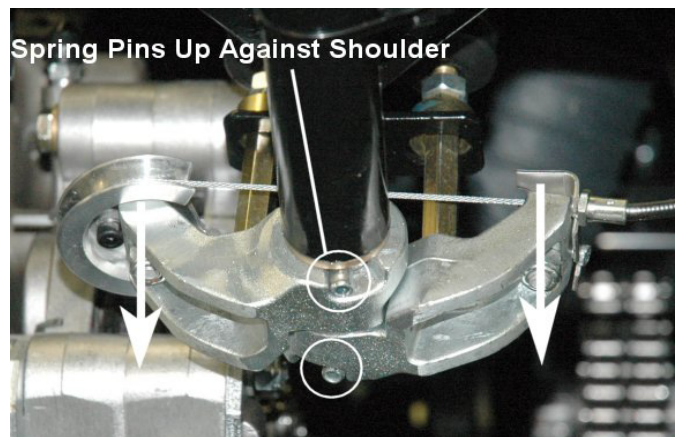


Photo 60

Plunger Pin Adjustment

3. Sitting in the vehicle driver's seat, ensure that the steering handle bar is parallel with the dash. Plunger pins should be in contact at the back with the steering arms. Place the collar tightly up against the welded tab stop and secure the set screw with blue LOCTITE 243.

IMPORTANT

Ensure the tab stops that the collars come into contact with are not bent in any way (*Photo 59*). This will affect how the plunger pin sits when the opposite brake is applied. Any deformity in the tab could cause the plunger pin to become misaligned with its own steering arm during the application of the opposite brake.

4. Thread the plunger pins until the master cylinder plunger piston is flush with the casting of the master cylinder. *Photo 61* Re-tighten all plunger pin jam nuts and reinstall rubber boot.

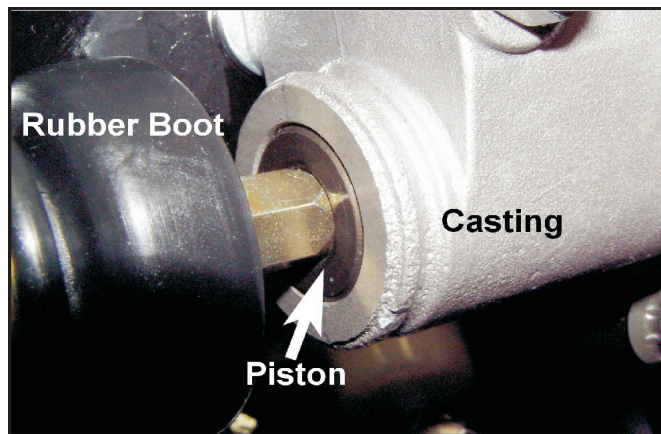


Photo 61

Hydraulic Brake Hoses Maintenance Schedule

Inspect every 25 hrs. of vehicle operation.

1. Inspect the condition of the hydraulic hoses. Replace them if:
 - the hoses are cracked or punctured
 - brake fluid leakage is noted on the hose, nearby assemblies, or around hose fittings
2. Perform the servicing procedure, **Replacing the Hydraulic Brake Hoses**, below

Replacing the Hydraulic Brake Hoses**IMPORTANT**

Clean the master cylinder casing and the caliper casting and fittings. This will prevent dirt from contaminating the brake system. Contaminants in the brake fluid can damage components or cause a loss in braking or steering effectiveness.

1. Remove cover and gasket seal from the master cylinder reservoir.
2. Disconnect the hose from the caliper. Place a catch tray under the free end of the hydraulic hose and allow the hose and master cylinder reservoir to drain.

3. Disconnect the hydraulic hose from the master cylinder.
4. Replace the hose.
5. Reconnect the hydraulic hose to the master cylinder. Make sure both copper washer seals have been replaced with new ones at the banjo bolts. Torque to specifications.
6. Perform the servicing procedure, **Bleeding the Hydraulic Brake System**.

Brake Disc Inspection

Maintenance Schedule - Inspect every 50 hrs. of vehicle operation.

IMPORTANT

Badly worn brake pads, or abnormal use of the vehicle, can cause serious damage to the brake discs. Inspect the brake discs for the condition listed in the chart below, and perform the recommended servicing procedures.

Always refer to the PARTS MANUAL that corresponds to the specific model and serial number indicated on the serial tag plate of your vehicle. This is essential to locating and ordering the correct components that were used during that particular manufacturing period.

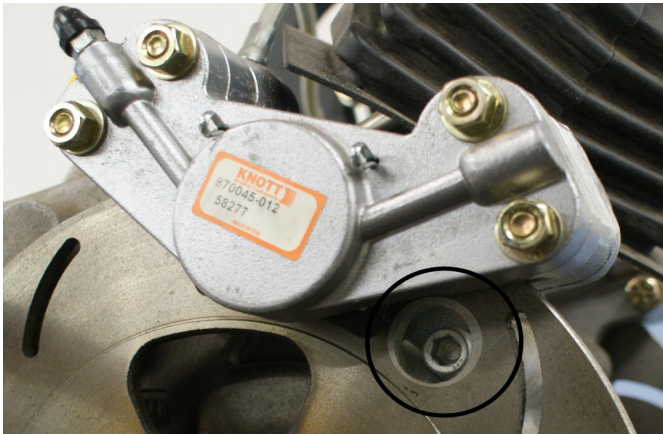
Brake Disc Condition	Corrective Action	Servicing Procedure
Rust or pitting Bends or cracks Scratches or scoring Broken or worn sprocket teeth	Replace Immediately	1. Brake Disc Removal 2. Brake Disc Installation
Glazing Oil or grease contamination	Clean	1. Brake Disc Removal 2. Brake Disc Installation

Removing a Brake Disc (Models with 34-100 Transmission)

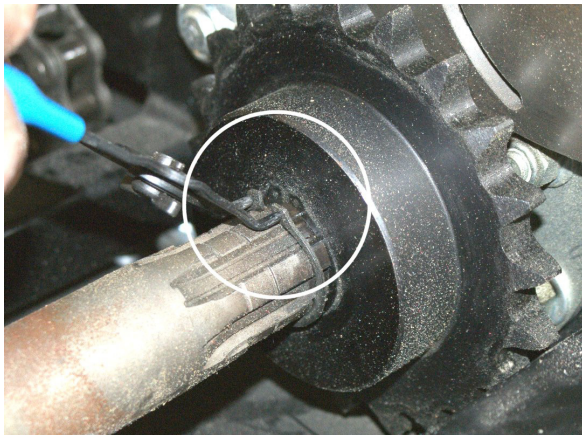
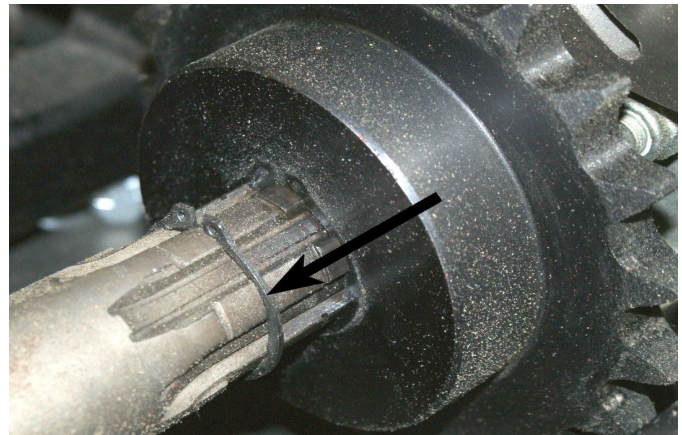
1. Perform the servicing procedure, **Removing the Front Floor Pan**
2. Perform the servicing procedure, **Removing the Firewall**.
3. Raise vehicle off the ground to rotate the tires. Rotate tires until brake disc access hole is aligned with the socket head fasteners of the brake caliper. *Photo 62 & 63*

NOTE

If removing the LEFT side brake disc you will need to remove both Drive Belt and Driven Clutch to successfully work on and remove the brake disc.

*Photo 62**Photo 63.*

4. Perform the servicing procedure, **Removing the Idler Chain**
5. Locate the outer retaining ring at Idler Sprocket and remove from groove. Slide it away from the sprocket. Slide sprocket up against retaining ring. *Photo 64 & 65*

*Photo 64**Photo 65*

6. Remove the fastener and flat washer securing the Brake Disc to the Output Shaft. *Photo 66*
7. Slide the Brake Disc from the Output Shaft. *Photo 67*



Photo 66



Photo 67

8. Perform the servicing procedure, **Brake Disc Inspection**.

Installing a Brake Disc (Models with 34-100 Transmission)

1. Apply anti-seize compound to the spline of the output shaft.
2. Align the splines of the brake disc with those of the output shaft and slide the brake disc on to seat up against the shoulder. *Photo 68*

IMPORTANT

The brake disc should slide on by hand. Do NOT force or hammer to install.

3. Secure with the bolt and flat washer. Torque to specifications *Photo 69*

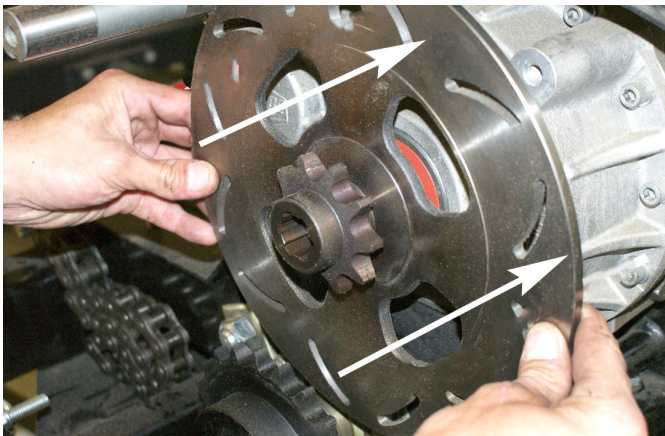
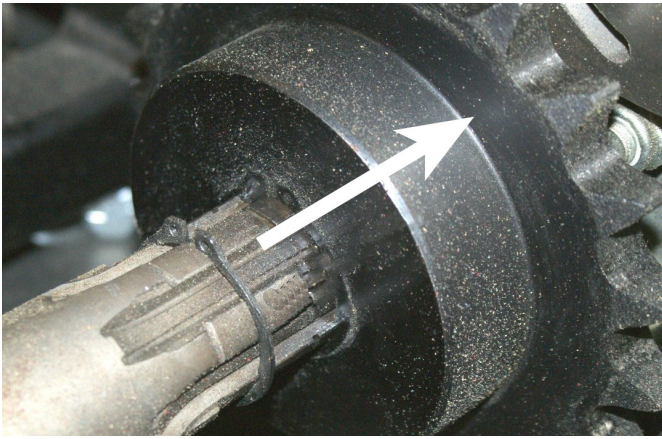
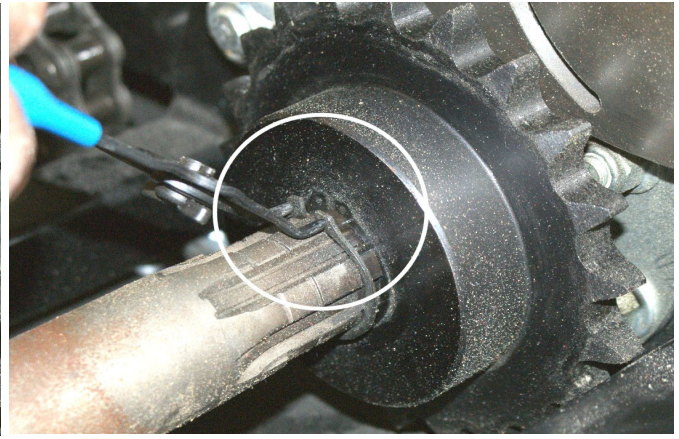


Photo 68



Photo 69

4. Slide the idler shaft sprocket back into position and seat the retaining ring back to the original groove. *Photo 70 & 71*

*Photo 70**Photo 71*

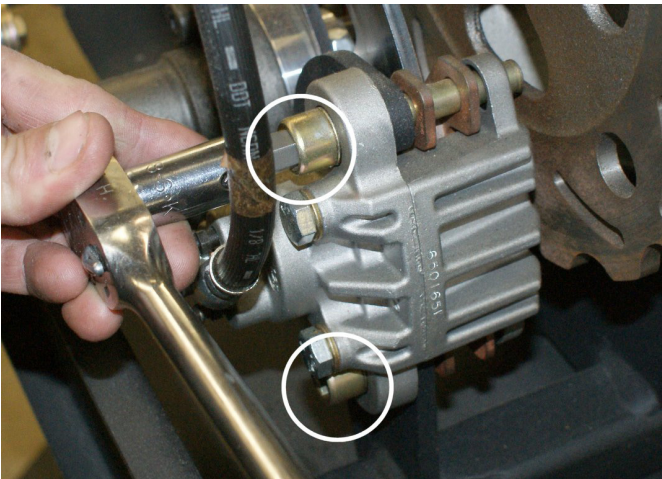
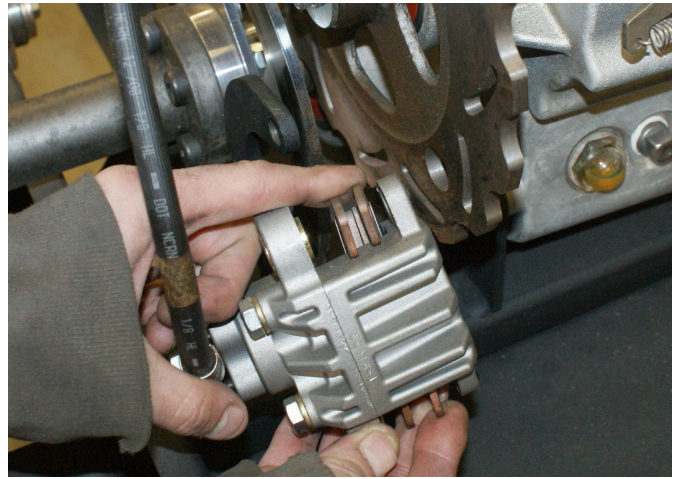
5. Perform the servicing procedure, **Installing the Idler Chain**

Removing Steering Brake Disc (HDi)

IMPORTANT

Refer to your illustrated parts manual for correct hardware identification and location. Refer to **Vehicle Torque Chart** for all specified torques.

1. Remove the two (2) fasteners securing either left or right hand side Service Brake Caliper at the brake bracket. *Photo 79*

*Photo 79**Photo 80*

2. Pull the caliper assembly from the mounting bracket. There is no need to disconnect the brake line from the caliper. *Photos 80 & 81*

NOTE

Removal of left hand steering brake disc requires the removal of Drive Belt & Driven Clutch.

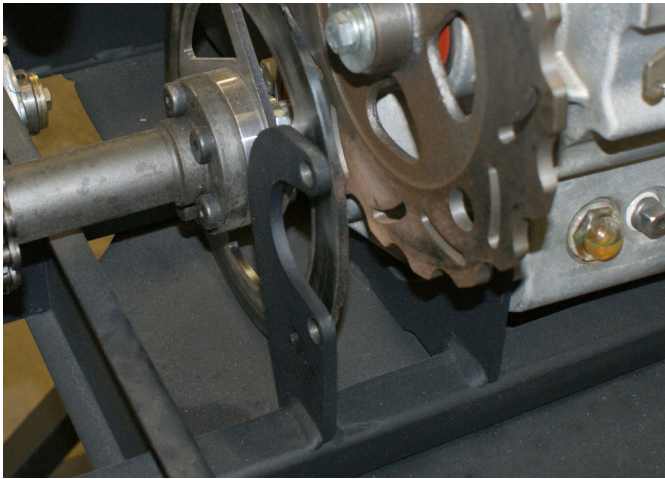


Photo 81

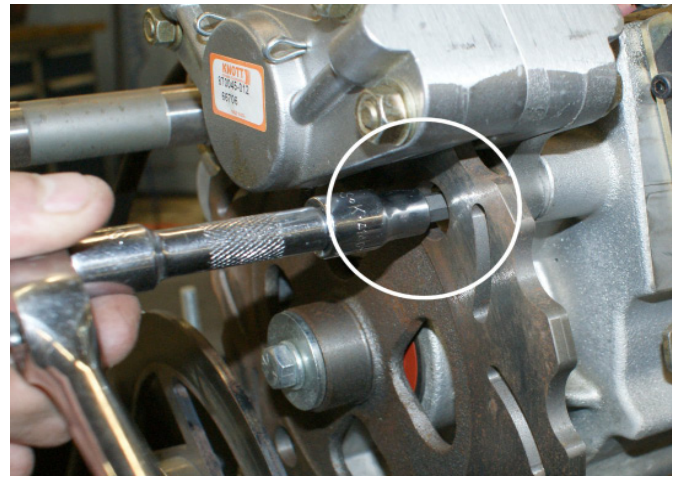


Photo 82

3. Rotate the Steering Brake Disc until the access hole in the disc is aligned with the brake fastener that secures it to the transmission. Remove the fastener. *Photo 82*
4. Rotate the brake disc to align it with the second fastener securing the brake caliper. *Photo 83*
5. Remove the second fastener. *Photo 84*

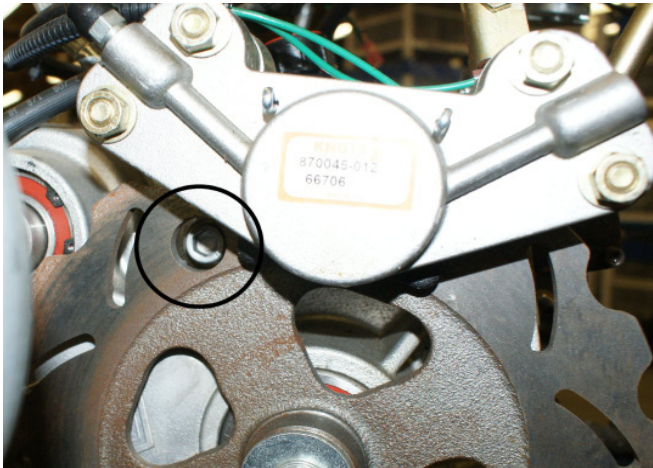


Photo 83

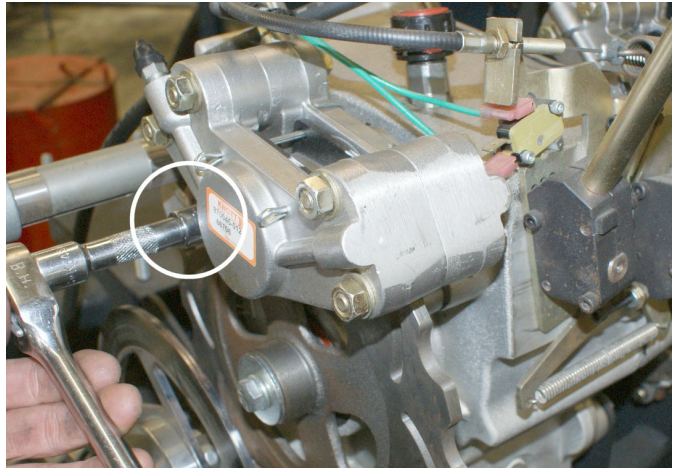


Photo 84

6. Slide the Steering Brake Caliper from the disc. There is no need to disconnect the brake line from the caliper. *Photo 85 & 86*

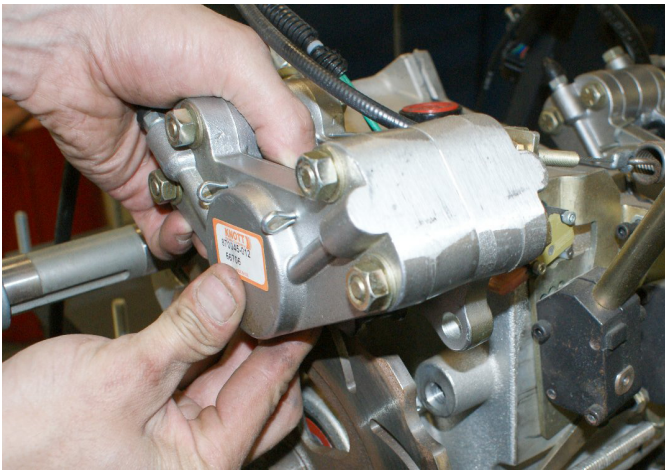


Photo 85

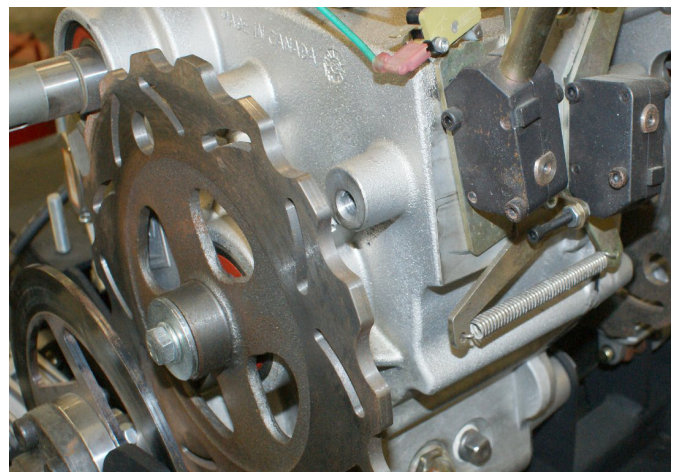


Photo 86

7. Remove one fastener from the inner Idler Shaft Coupler and Service Disc Brake. *Photo 87*

NOTE

There is a lockwasher and locking nut to the inside of the fastener which will need to be held with an open end wrench.

8. Remove the fastener securing the Steering Brake Disc to the output shaft. *Photo 88*

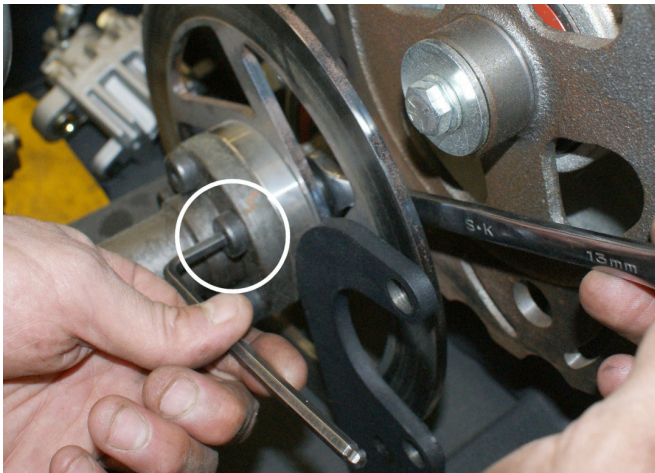


Photo 87

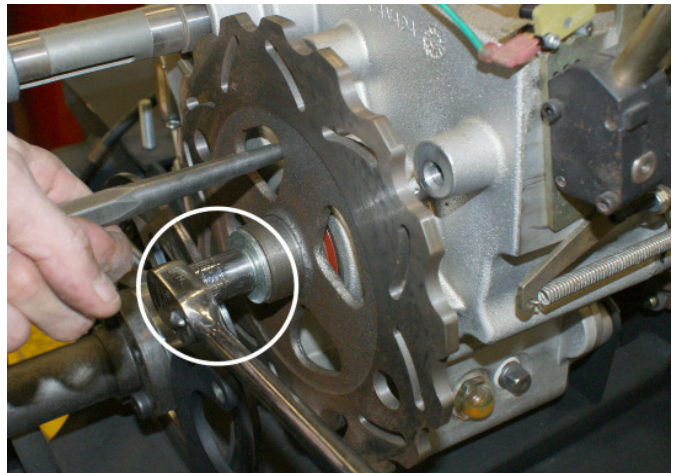


Photo 88

9. Rotate the Steering Brake Disc until one of the scalloped areas aligns with the fastener previously removed in step 7. *Photo 89*

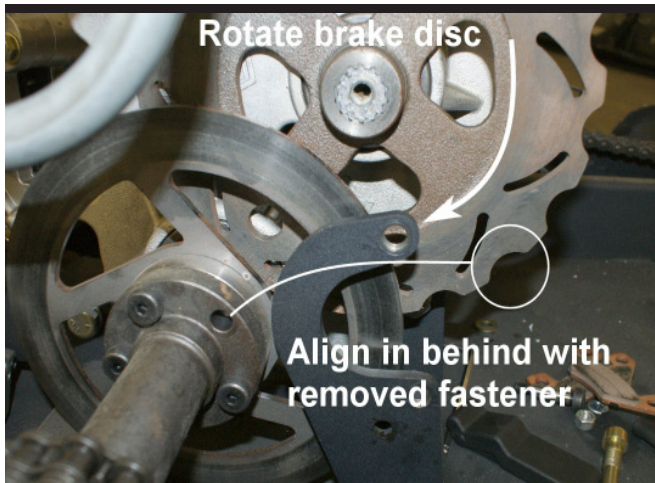


Photo 89

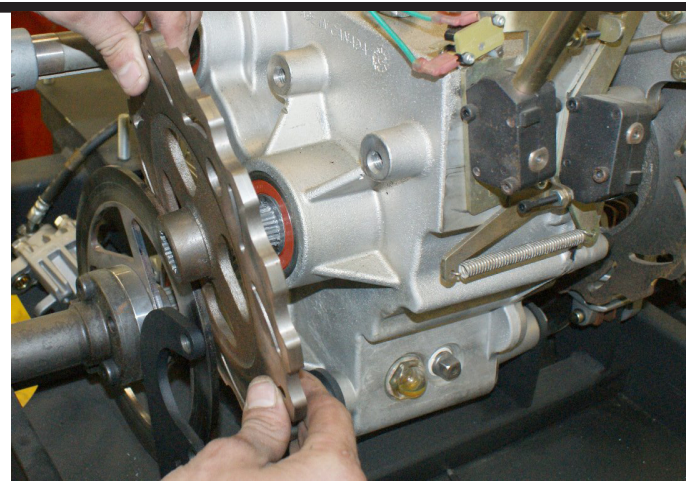


Photo 90

10. Slide the brake disc from the output shaft and free of the transmission. *Photo 90*

11. Perform the servicing procedure, **Brake Disc Inspection**.

Installing the Steering Brake Disc (HDi)

12. Apply anti-sieze compound to the splined output shaft and install the Steering Brake Disc securely up against the shoulder of the output shaft. *Photo 91*

NOTE

Use brake cleaner on components before re-assembly to remove oil and other contaminants.

IMPORTANT

The brake disc should slide on by hand. Do NOT force or hammer to install.

13. Install the Steering Brake Caliper. Spread the brake pads apart as you slide it over the brake disc. *Photo 92*

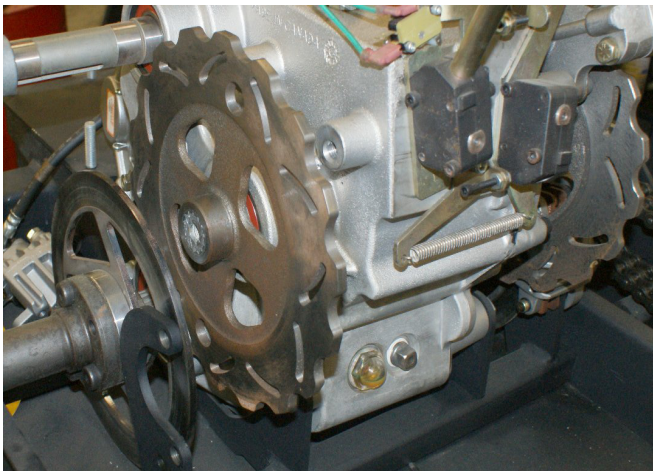


Photo 91

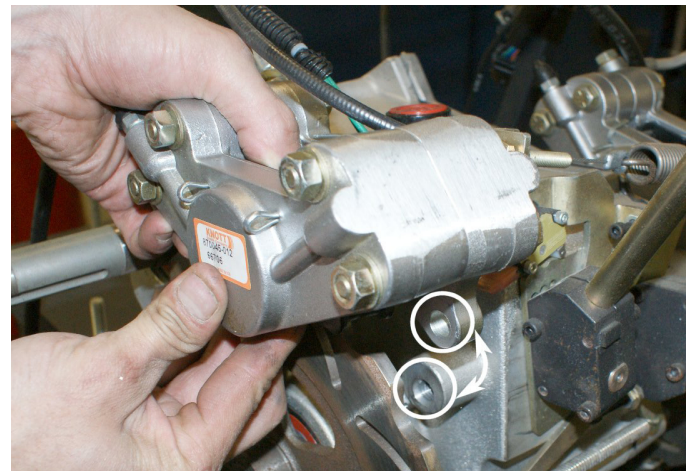


Photo 92

- Align the mounting ears of the caliper with mounting bosses on transmission housing.
Photo 93
- Secure the caliper by applying Blue 243 LOCTITE to threads of the two (2) fasteners and mounting it to the transmission (along with a lockwasher). Torque to specifications. *Photos 94*



Photo 93

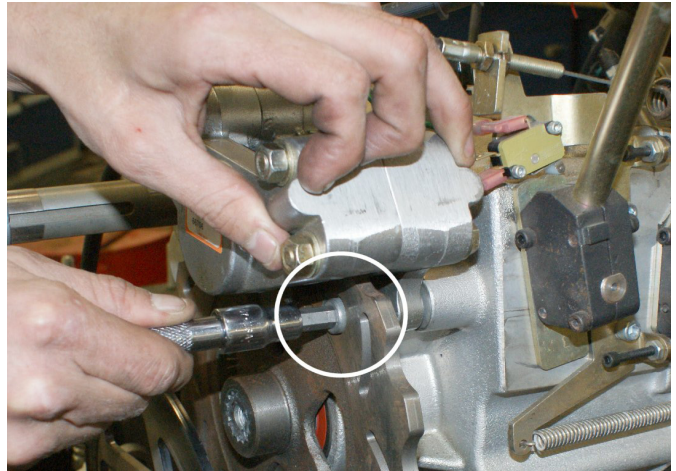


Photo 94

- Blue LOCTITE the hardware required to secure the brake disc and torque to specifications. *Photos 96 & 97*

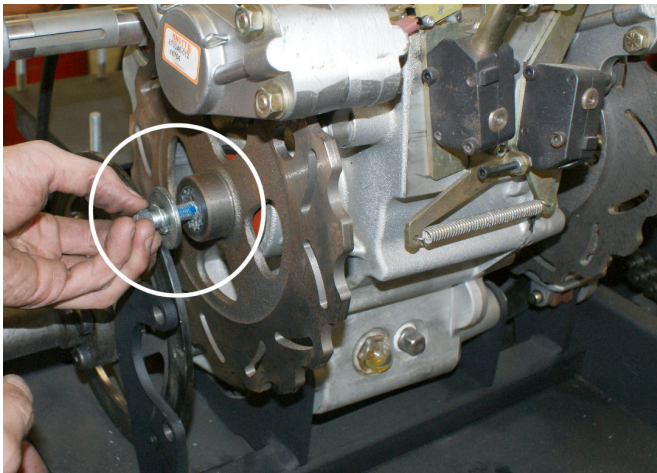


Photo 96

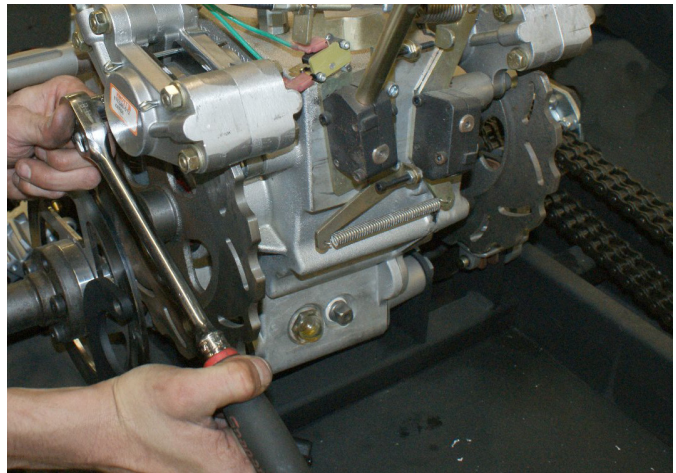


Photo 97

- Reinstall the fastener to Idler Shaft Coupler removed in Step 7 and torque to specifications.

IMPORTANT

Ensure that the fastener has had Blue 243 LOCTITE applied to the threads and that the lockwasher has been reinstalled along with the locknut to the inside. Torque to specifications. *Photo 98 & 99*

18. Locate the Service Brake Caliper bracket and reassemble the Service Brake Caliper securely into place. *Photo 100*

19. Torque to Specifications. *Photo 101*

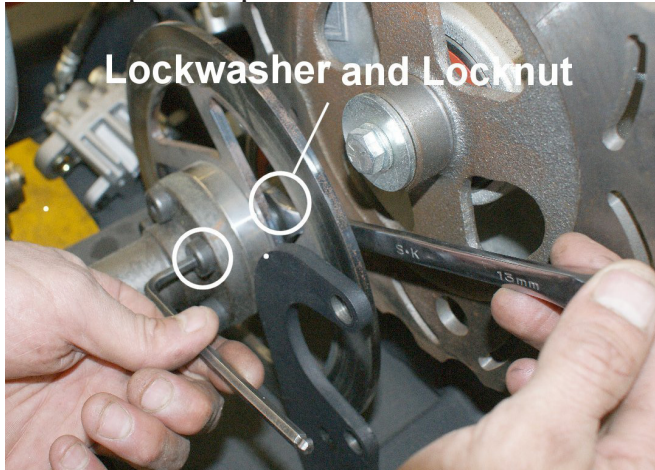


Photo 98

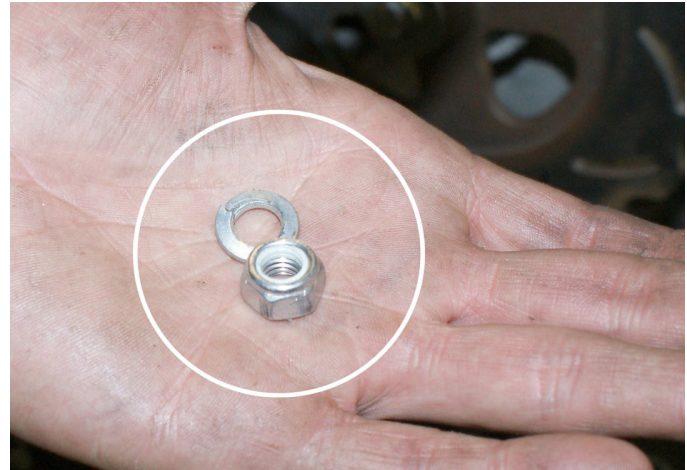


Photo 99

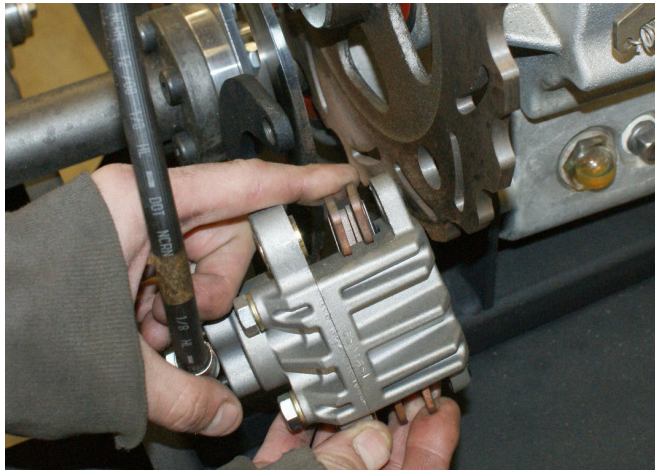


Photo 100

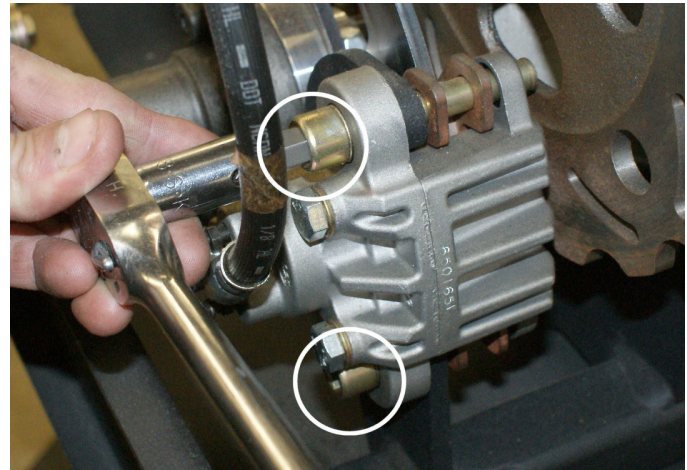


Photo 101

Removing the Emergency/Parking Band Brake (HDi) prior to serial # P34521 & D17577. See page BR-53 for serial numbers from P34521 & D17577

1. Perform the servicing procedure, **Removing Steering Brake Disc (HDi)** for **RIGHT HAND** side steering brake disc.
2. Locate the Emergency/Parking Band Brake Assembly and remove the hardware securing it to the transmission. *Photo 102*

IMPORTANT

Be aware of the Spacer Washers used to the inside of the mounting bolts, *Photo 103* There are three (3) located on each mounting bolt. Exercise caution to prevent from falling into drive train below.

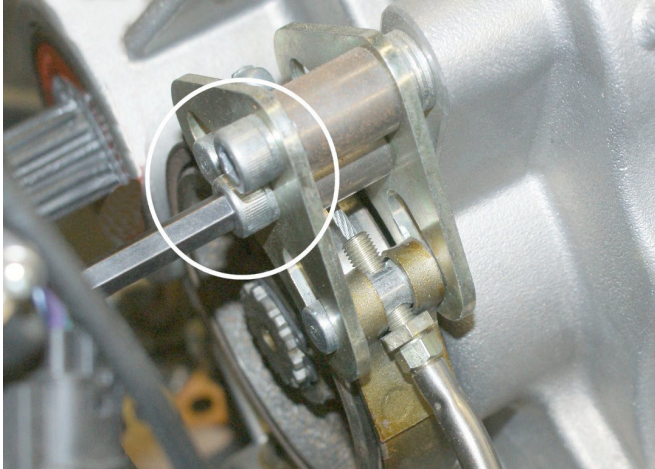


Photo 102

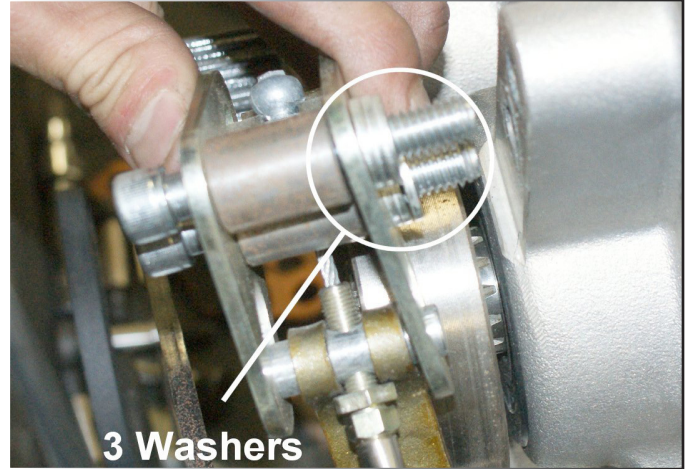


Photo 103

3. Slip the band brake out of the mounting assembly while keeping the mounting assembly intact. *Photos 104*
4. Remove the cable from the brake band by removing the two slotted pins. *Photo 105*



Photo 104

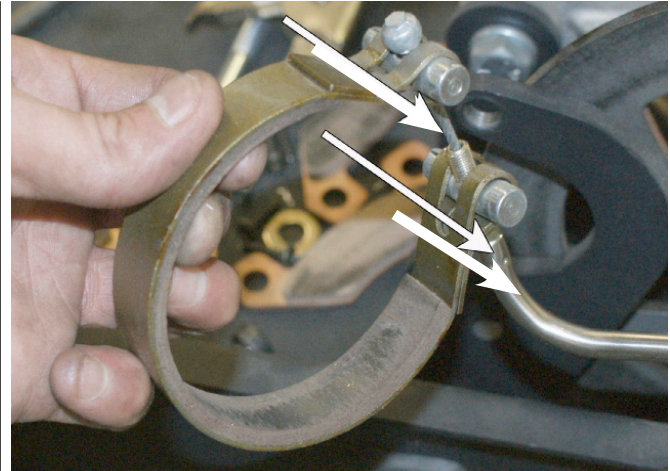


Photo 105

Installing the Emergency/Parking Band Brake (HDi)

1. Locate and install the Emergency/Parking Brake Cable to the Brake Band assembly. Lay inner cable across the open ends of brake band and insert two slotted pins to secure the cable. Insert pins with slot facing to the right. *Photo 106*
2. Spread the mounting bracket plates apart just enough to insert the pins into the slots of the brake band. *Photo 107*

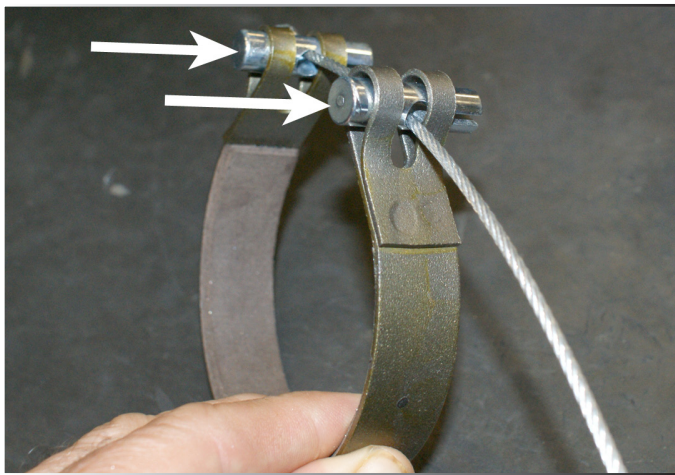


Photo 106

IMPORTANT

Please ensure all Spacer Washers are in place on the Mounting Bolts before re-attaching to the transmission housing. There are three (3) Spacers per bolt.

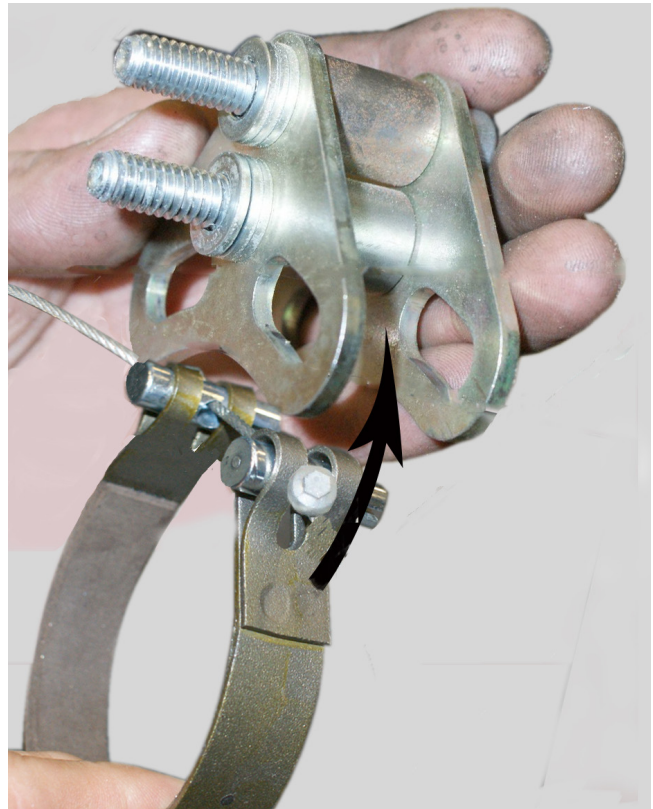


Photo 107

NOTE

Use brake cleaner on components before re-assembly to remove oil and other contaminants.

- Slip the Band Brake over the E Brake Drum and secure to the transmission with the two (2) Bolts. Torque to specifications. *Photo 108 & 109*

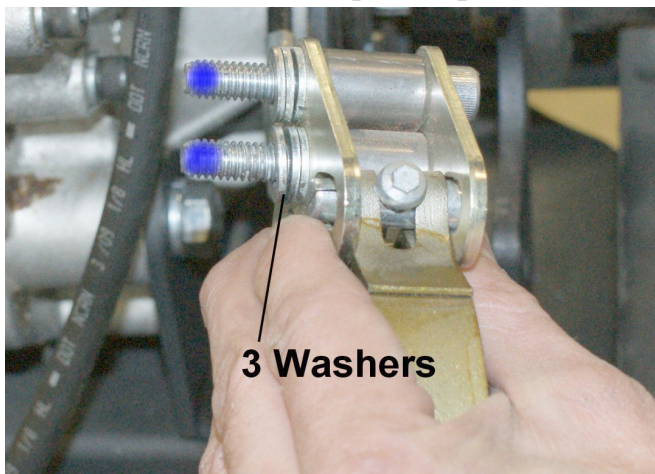


Photo 108

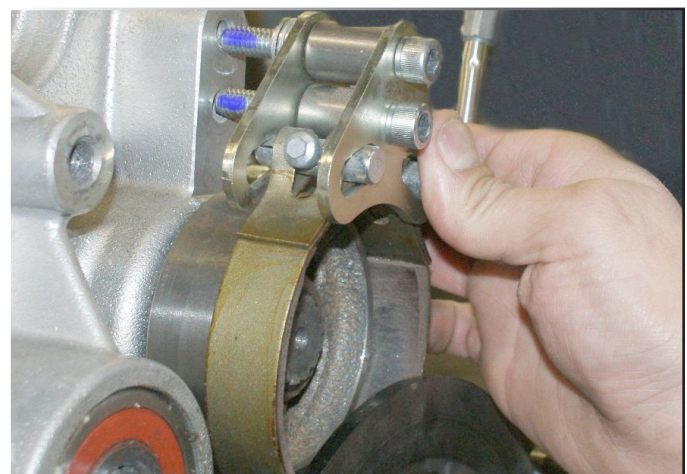


Photo 109

4. Apply anti-seize compound to the steering brake shaft and reinstall the Steering Brake Disc. Torque to specifications.
5. Re-install fastener back to the inner Idler Shaft Coupler and Service Disc Brake. **Photos 110 & 111.** Torque to specifications.
6. Locate the Service Brake Caliper bracket and reassemble the Service Brake Caliper securely into place. **Photo 112**
7. Torque to Specifications. **Photo 113**



Photo 110



Photo 111

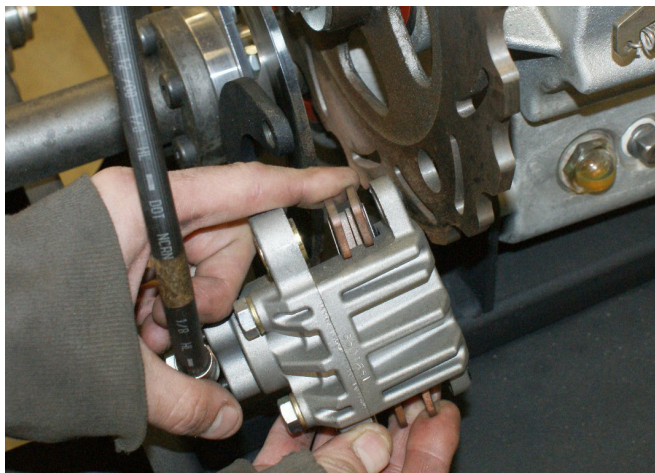


Photo 112

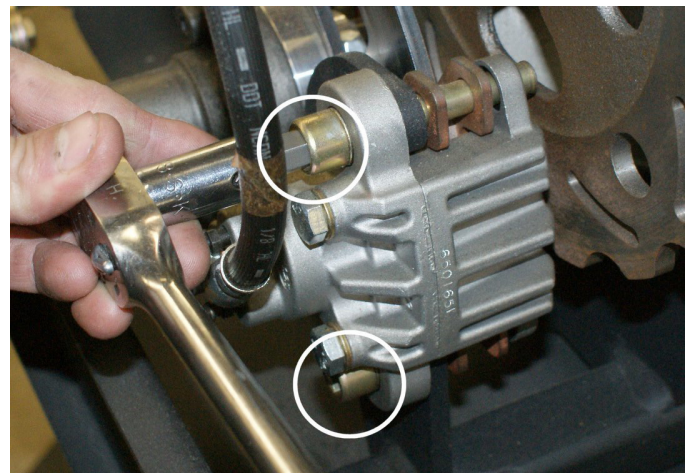
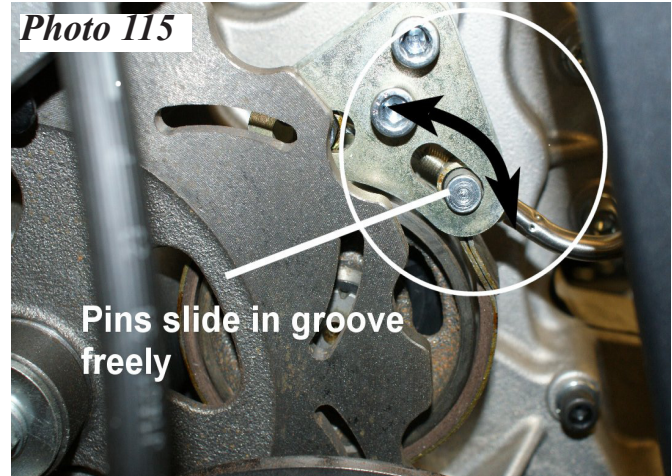
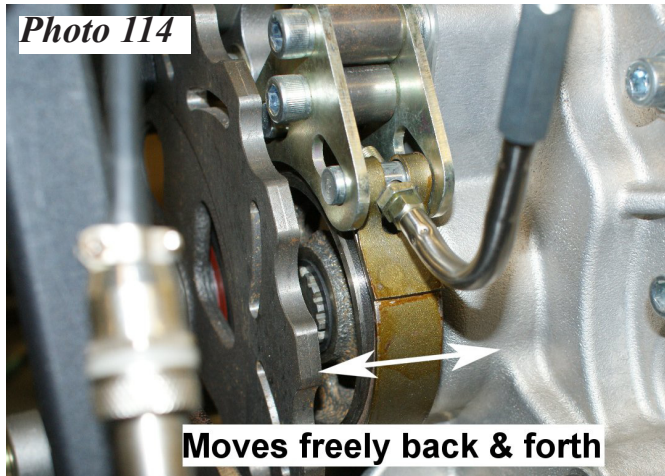


Photo 113

Emergency/Park Band Brake Adjustment (HDi/HD Models)

1. There are 8 positions on the hand brake lever. The cable should be adjusted to have the 5th position (click) as fully engaged with normal firm effort (extra effort required for 6th).
2. Reaching into the vehicle to the band brake (with the lever fully down), you should be able to grab the bottom of the band and wiggle it back and forth on the drum. It shouldn't feel tight. **Photo 114**

3. You should also be able to grab the metal “J” bend at the end of the cable where the adjusting nut is and move it up and down, essentially moving the band and pins in the mounting bracket slots. This shouldn’t feel tight either. *Photo 115*

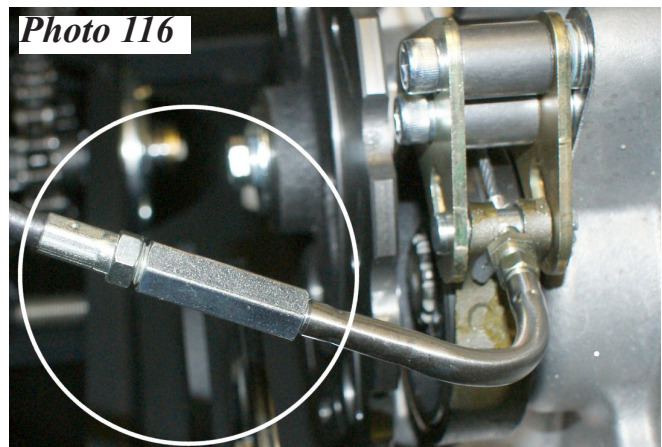


IMPORTANT

If the band is too tight it will drag and the operator may experience a sluggish vehicle and notice smoke coming from the engine compartment. An unpleasant smell as the band brake rubs against the drum may also occur. The band will wear out prematurely.

4. If the 5th position (click) does not provide the full engagement with normal firm effort (extra effort for the 6th), after checking the band brake as described above, adjust the cable accordingly. Loosen jam nut at cable and thread out as needed.

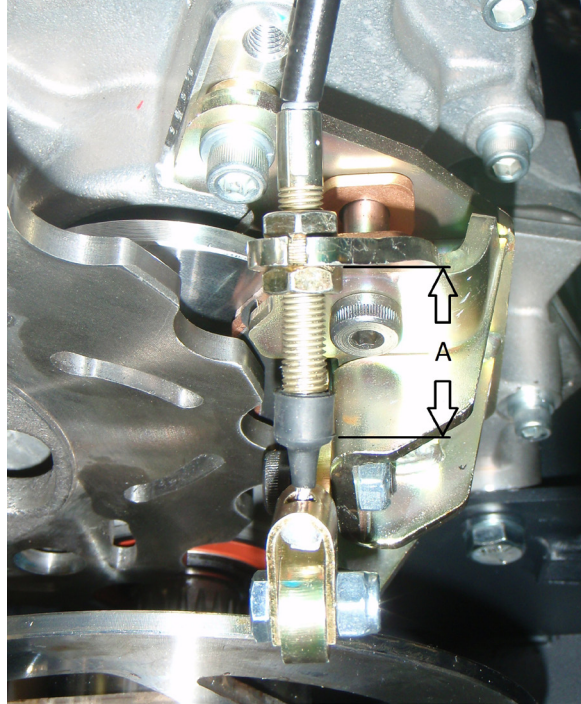
Photo 116



Emergency/Park Disc Brake Adjustment (HDi/HD) - From January 2013

There are 8 positions on the hand brake lever. The cable should be adjusted to have the 5th position (click) as fully engaged with normal firm effort (extra effort required for 6th). A properly adjusted cable with the hand lever fully down should allow the parking brake disk to turn easily between the pads while rocking the vehicle slightly back and forth. If the cable is too tight the brake will be engaged and the operator may experience a sluggish vehicle and cause

the pads to wear prematurely. If the 5th position (click) does not provide full engagement with normal firm effort (extra effort for the 6th) adjust the cable accordingly. Loosen the jam nut at the caliper and adjust as needed. Reduce distance "A" to provide more braking force or increase distance "A" if brake does not turn freely.



Removing Emergency/Park Disc Brake and Pads (from serial # P34521 & D17577)

1. Perform servicing procedure steps 1 thru 11 of **Removing Emergency/Park Band Brake and Drum (prior to serial # K34038)** on page BR-48
2. Remove retaining ring securing parking brake disc to shaft. *Photo 1*
3. Remove (2) two bolts securing brake bracket to transmission. Be aware of spacers at each mounting bolt. *Photo 2*

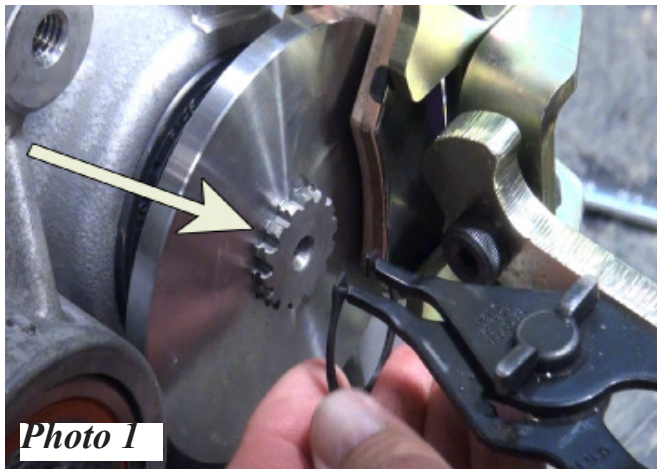


Photo 1

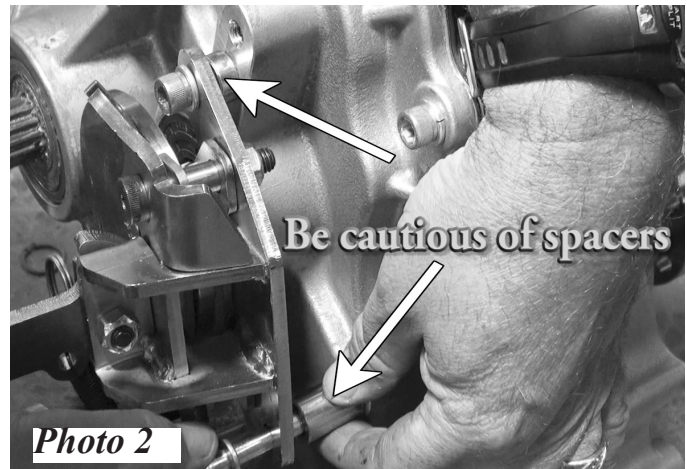


Photo 2

4. Remove brake bracket and brake disc simultaneously. *Photo 3*
5. Set brake bracket to a clean work surface to remove brake pads. *Photo 4*



Photo 3

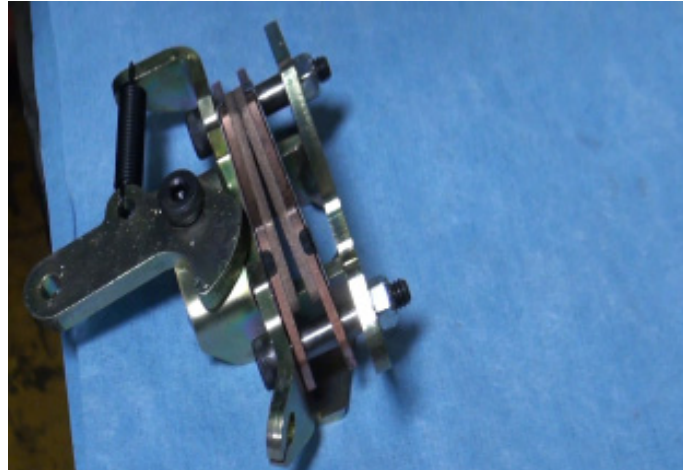


Photo 4

6. Remove both stover nuts securing brake pad bolts. *Photo 5*
7. Slip pads from bracket. *Photo 6*



Photo 5

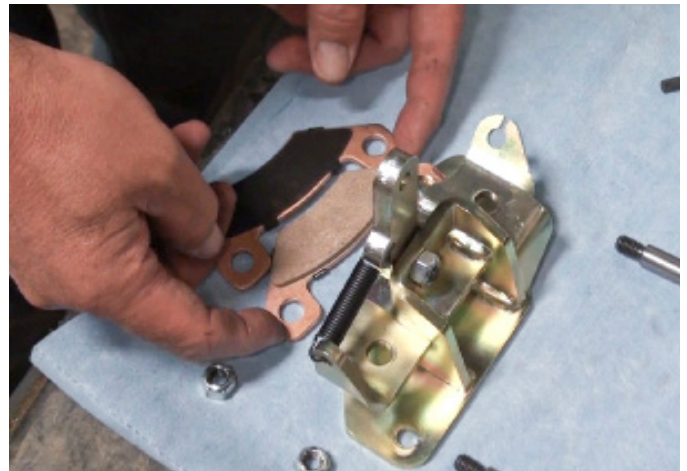
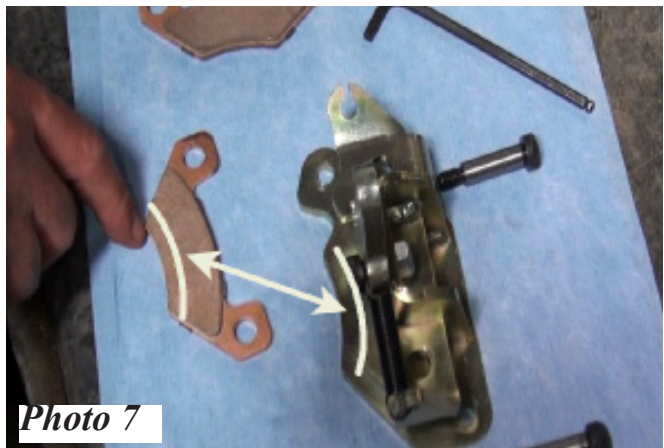


Photo 6

8. Install new pads, matching the concave of the brake pads with the concave of the brake bracket. *Photo 7*



9. Install shoulder bolts and secure new pads with stover nuts. *Photo 8*

10. Ensure cable connections are secure at bracket. *Photo 9*

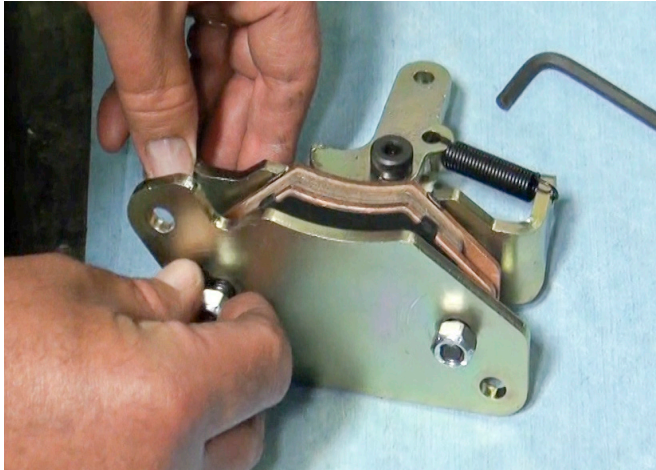


Photo 8



Photo 9

11. Locate mounting hardware and spacers to remount bracket to transmission. *Photo 10*

12. Locate brake disc and observe shoulder side of disc. *Photo 11*

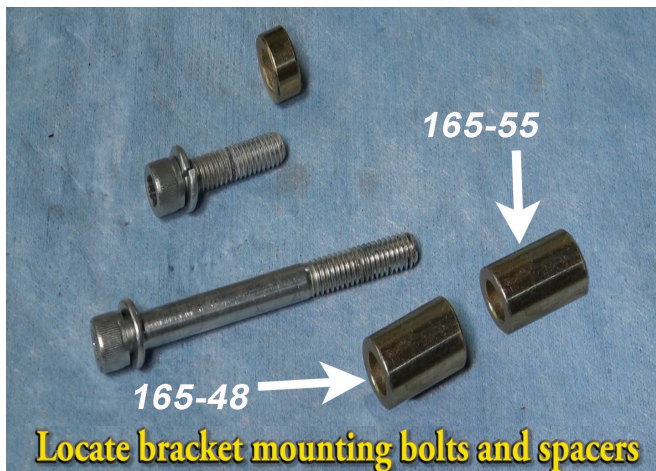
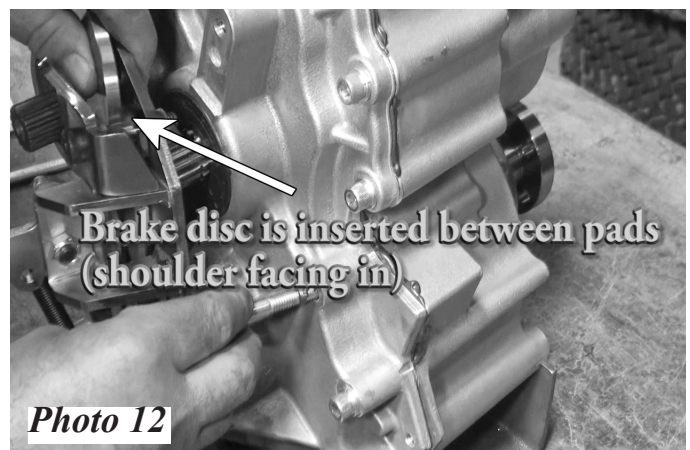


Photo 10



Photo 11

13. Insert the brake disc between the brake pads with shoulder of disc facing in towards transmission. Install bracket and disc simultaneously inserting the longer lower bolt into the transmission housing first. Apply 243 Blue LOCTITE to threads of mounting bolt. **Photos 12 & 13**



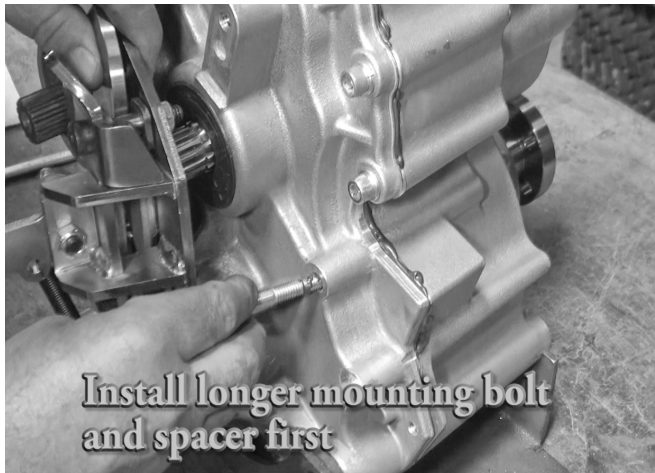


Photo 13



Photo 14

14. Apply blue 243 LOCTITE to top (shorter) mounting bolt and install (with spacer) to brake bracket. *Photo 14*. Secure mounting bolts.
15. Secure parking disc brake with retaining ring. *Photo 15*
16. Ensure parking cable at linkage is secure. *Photo 16*



Photo 15

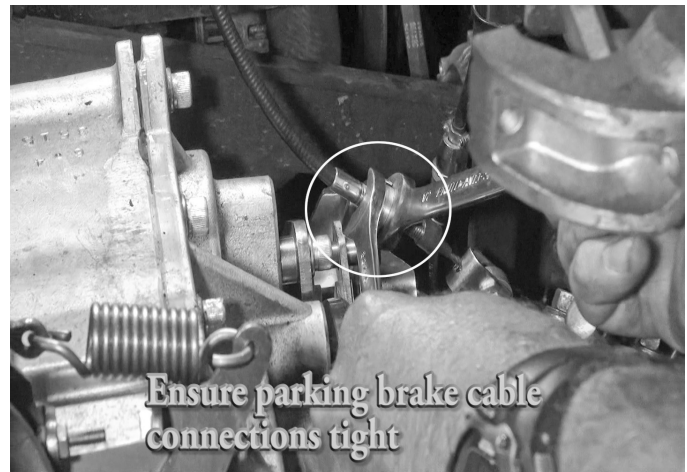


Photo 16

17. Re-install steering brake disc. Ensure machined concave area of disc, aligns with mounting bolt on caliper to avoid interference when slipping the disc back on to the shaft. *Photo 17*

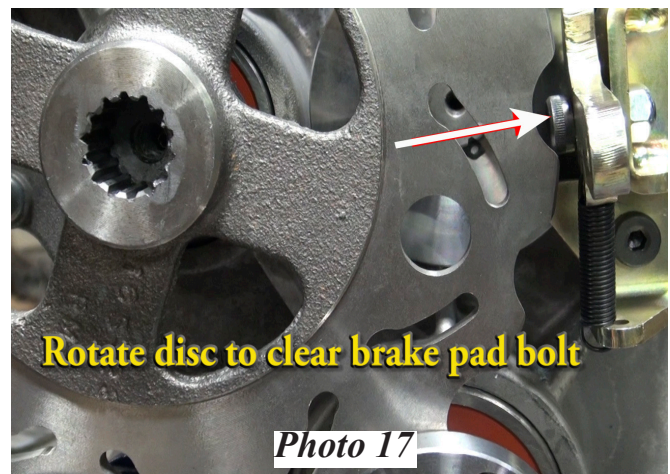


Photo 17

18. Apply blue 243 LOCTITE to the threads of the steering brake disc mounting bolt and install. Torque to specifications. *Photo 18*

19. Re-install nut and lockwasher to coupler bolt removed in earlier steps and torque to specifications. *Photo 19*



Photo 18



Photo 19

20. Reinstall steering brake caliper. Apply blue 243 LOCTITE to mounting bolts and torque to specifications. *Photo 20*

21. Reinstall service brake caliper. Apply blue 243 LOCTITE to mounting bolts and torque to specifications. *Photo 21*

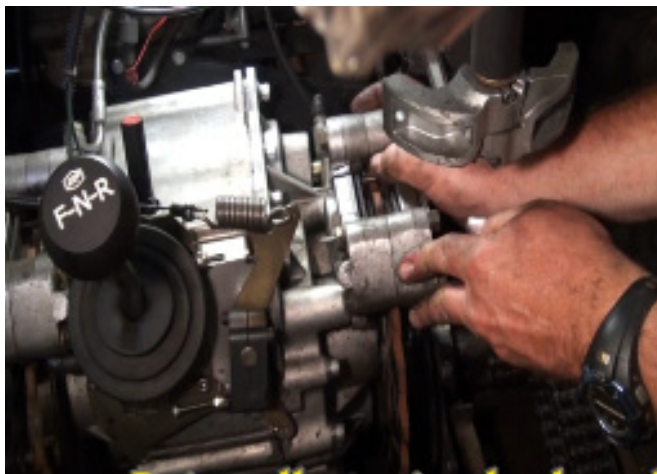


Photo 20



Photo 21

22. Re-check all work and proceed to firewall and floor pan installation.

Emergency/Parking Brake Adjustment (750EFI/700 Models)

NOTE

Both left and righthand side emergency/parking brake caliper pads should be changed in pairs. Do not attempt to just replace one side. The emergency/parking brake system has been factory adjusted to ensure proper braking effectiveness. However, before the vehicle is used for the first time, and after every 25 hours of operation, the adjustment of the brake must be inspected.

CAUTION

If the emergency/parking brake system is adjusted too tight when the lever is in the down position, overheating of the brake system will occur due to drag between brake pads and brake discs.

1. Remove the firewall.
2. Ensure the parking brake lever is fully down.
3. Locate the 850-72 Parking Brake Adjustment Bracket attached to the top of the transmission. *Photo 117* Adjust to remove any slack in the cable that may be present between the brake lever, and the brake cams at the emergency/parking brake calipers. This may require physically pulling down on the equalizer flat bar to ensure all slack is eliminated. *Photo 118*

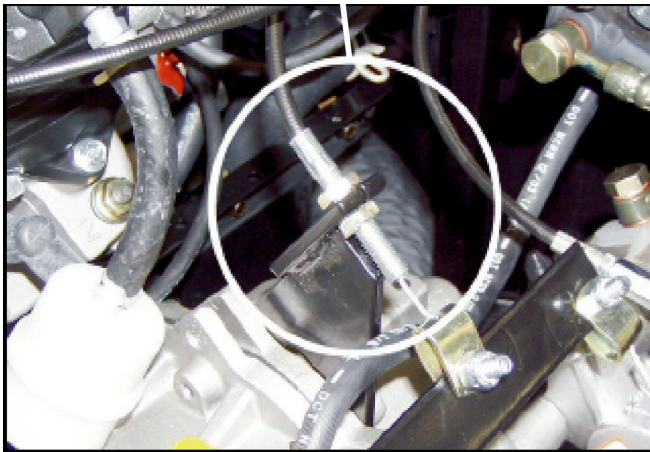


Photo 117

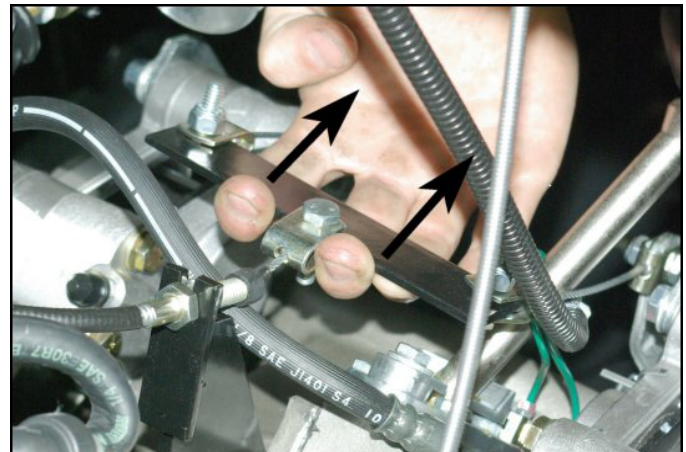


Photo 118

4. Adjust the cable at the transmission until the cam levers are actually starting to pre-load the return springs and the cam lever actuation pin on the caliper, is centered in the "v-groove" of the cam. *Photo 119*
5. Locate the castle nut at the mechanical brake cam lever and remove the cotter pin. *Photo 120*

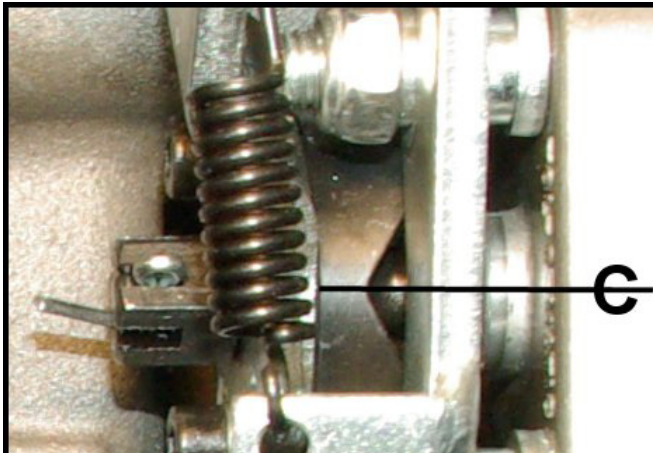


Photo 119

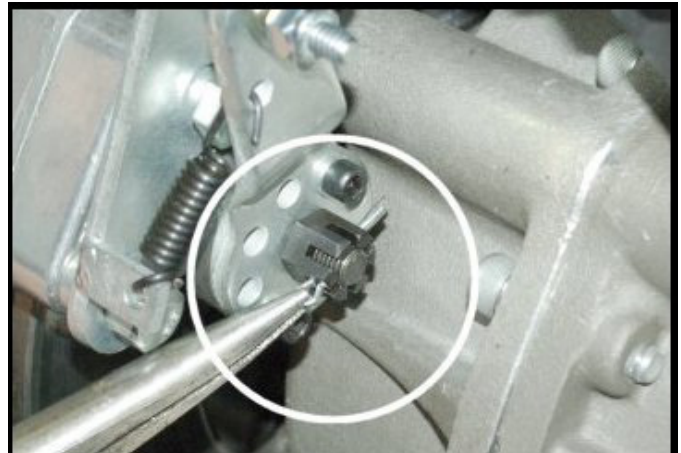


Photo 120

6. Loosen the castle nut until it can be threaded by hand.
7. Using a 0.004" feeler gauge or a piece of regular photo copy paper (such as used for these instructions), slip it between the emergency/parking brake pad and brake disc. Ensure that you push the opposite side pad up against the brake disc before setting this gap.
8. Slowly hand tighten the castle nut until the feeler gauge (or piece of paper), becomes snug between the pad and brake disc.
9. Back off the castle nut just enough for a new cotter pin to be installed. The feeler gauge (or piece of paper), should pull out at this point with just the slightest bit of resistance.
10. Lock down jam nuts at the parking brake adjustment bracket on the transmission.
11. Check to ensure that the brakes are NOT engaged when the Brake Lever is in the down & off position.
12. Check for drag by driving without activating any brakes for about 100 feet. Stop and check for heat on the brake discs. They should both be cool (or no hotter than the beginning of the test). Adjust if necessary.
13. Check the effectiveness of the parking brake by parking the Argo on the steepest hill encountered and by loading it to it's maximum working load. The parking brake should hold the Argo from moving.
14. Check the effectiveness of the emergency brake by activating it while coasting down a slight grade. The Argo should come to a controlled stop without pulling left or right. Re-adjust the brakes if necessary.
15. The emergency/parking brake should be checked for proper adjustment every 25 hours. Note: Oil on the brake disc caused by improper chain oiling can permanently reduce the effectiveness of all brake systems.

Parking/Emergency Brake Disassembly (Mechanical Caliper)

NOTE

Both left and righthand side emergency/parking brake caliper pads should be changed in pairs. Do not attempt to just replace one side.

1. Locate the emergency/parking brake caliper attached to the main brake caliper. **Photo 121** (Left hand side example).
2. Locate the castle nut at the brake cam lever and remove the cotter pin and castle nut. **Photo 122**.

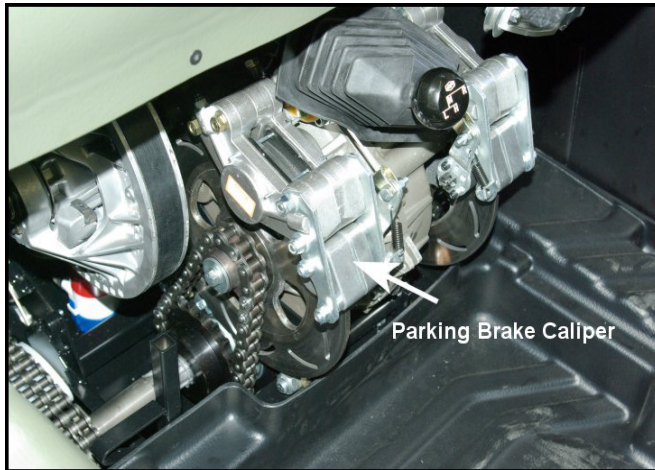


Photo 121



Photo 122

3. Using both hands, remove the brake lever assembly from the Brake Housing - Live Side and disconnect spring. **Photo 123**.
4. Remove the two (2) mounting bolts holding the caliper assembly together. **Photo 124**

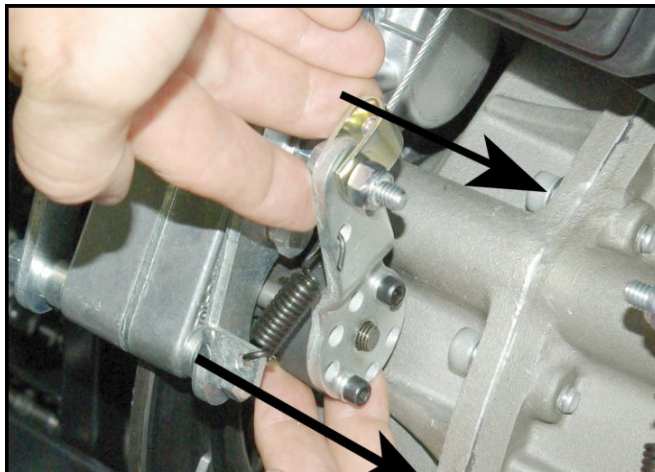


Photo 123

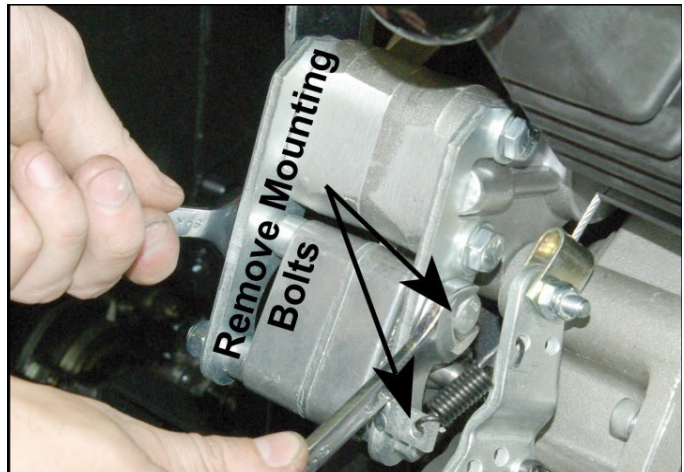


Photo 124

5. Split and remove the caliper assembly. **Photo 125** Take note of all spacers, shims and washers within the assembly. Refer to your illustrated parts list in your Argo Parts manual for all locations of these components.

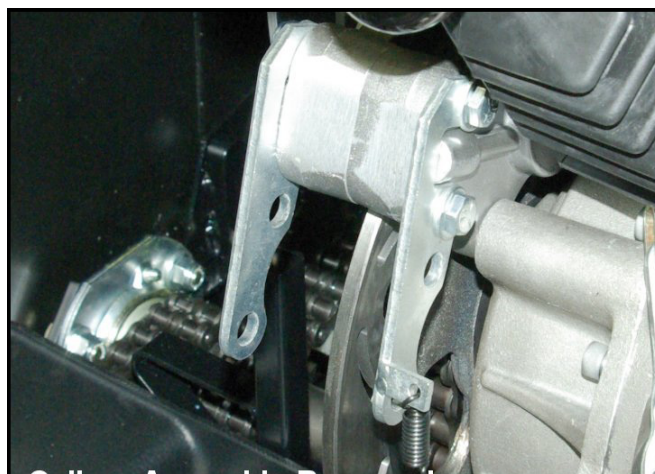


Photo 125

6. Locate the 850-84 Dead Side Brake Housing and remove the screw securing the brake puck. Remove the brake puck and discard. **Photo 126**
7. Locate the Live Side Brake Housing and turn upside down to remove 2nd brake pad from the housing cavity. Please note that there is also a washer placed beneath the brake pad.
8. Lay out both Dead Side and Live Side Brake housings with new brake pads. **Photo 127.**

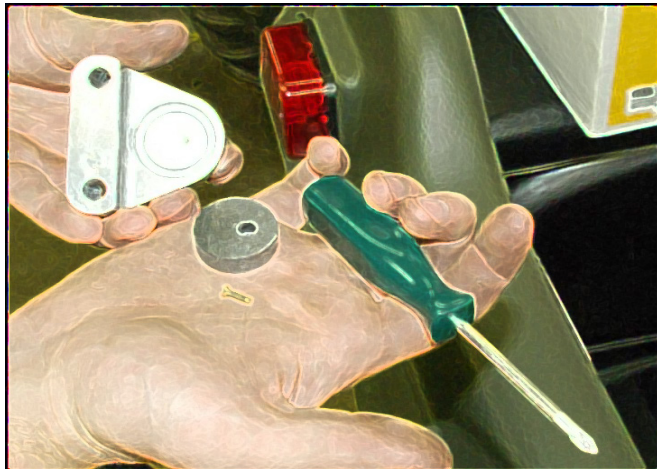


Photo 126

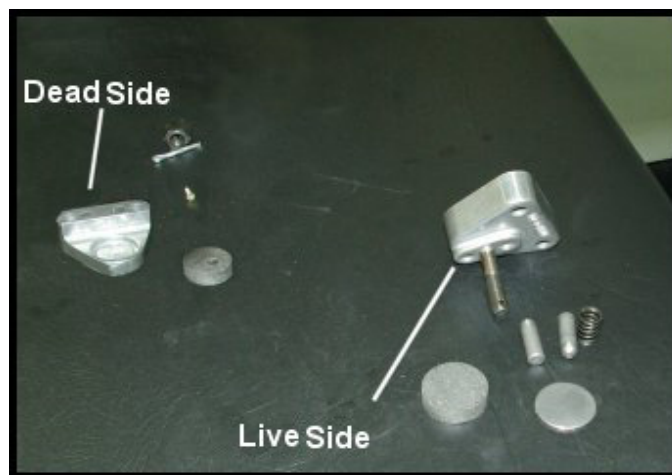


Photo 127

9. Install the new brake pad to the dead side housing and secure with screw. Apply some Blue LOCTITE 243 to the threads of the screw before installing.

10. Locate the live side brake housing and slip the shim washer into the cavity first (*Photo 128*), before installing the brake pad.
11. Install the second brake pad to the top of the previously installed shim.



Photo 128

Reassembling the Emergency/Parking Brake Caliper to the Vehicle

NOTE

The following example illustrates the assembly of the left hand side Emergency/Parking-Brake Caliper.

NOTE

Use brake cleaner on components before re-assembly to remove oil and other contaminants.

IMPORTANT

Mounting bolts for both calipers are always inserted facing to the left with the head of the mounting bolt on the right hand side of the caliper. Refer to *Photos A & B* for correct orientation of mounting bolts as well as washer & shim locations.

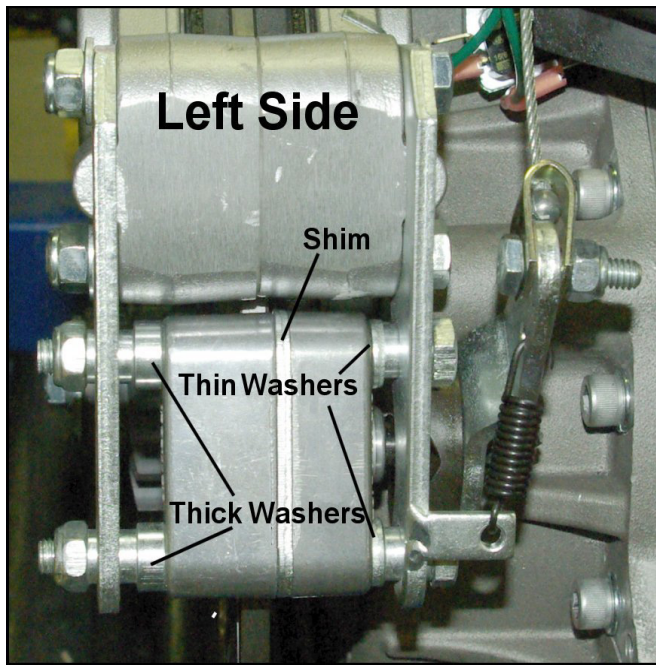


Photo A

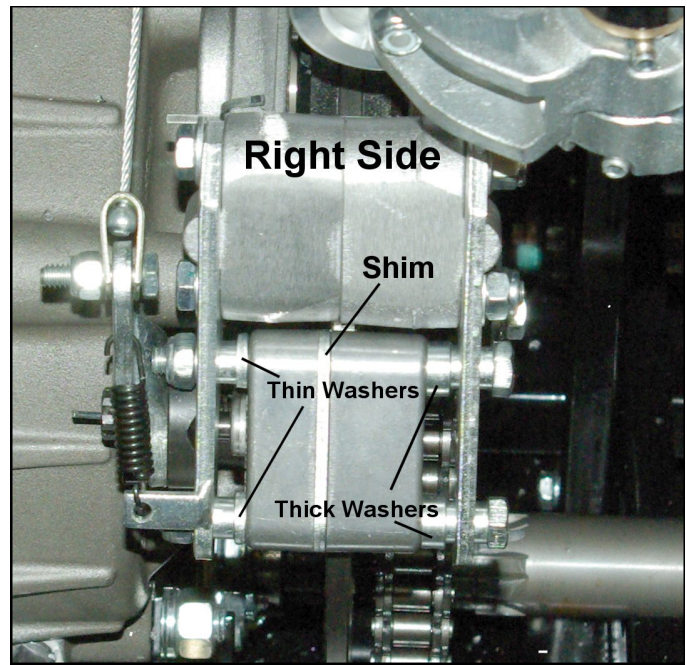


Photo B

12. Install the live side housing to the inside of the brake disc. Insert (2) mounting bolts with spacers to the head of each bolt. Place a thin washer (to each bolt) on the inside of the mounting bracket. *Photo 129.*
13. Install the shim plate over the (2) mounting bolts. *Photo 130*
14. Next, install (2) thick washers to the mounting bolts along with the dead side housing which is placed to the outside of the brake disc. *Photo 131*
15. Install (2) more spacers to the ends of the mounting bolts. *Photo 132*

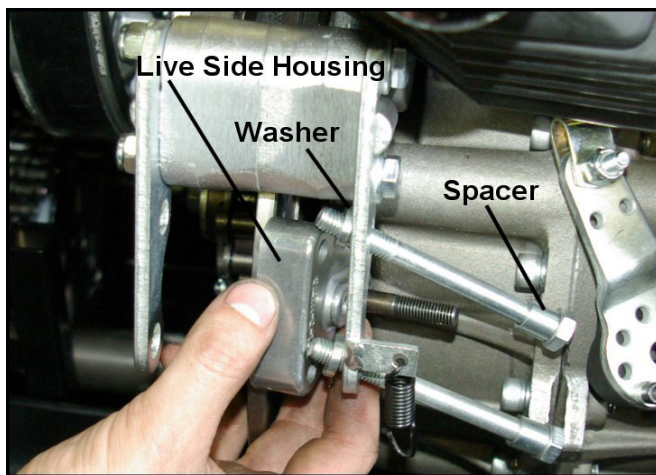


Photo 129

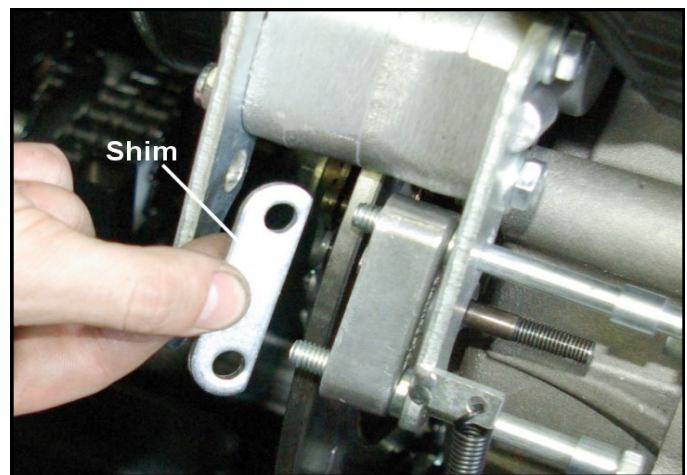


Photo 130

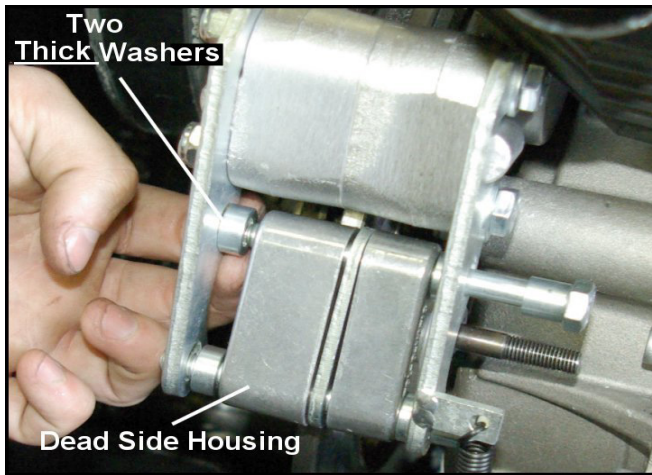


Photo 131

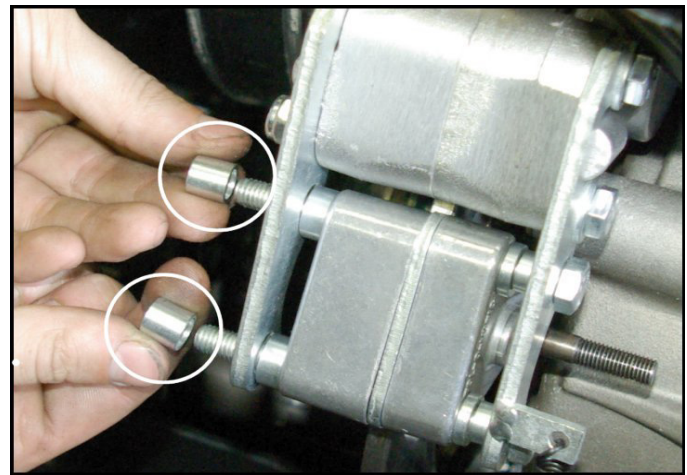


Photo 132

16. Secure with the nylon locknuts and torque to specifications. *Photo 133*

17. Install the compression spring to the stud of the live side housing. *Photo 134*

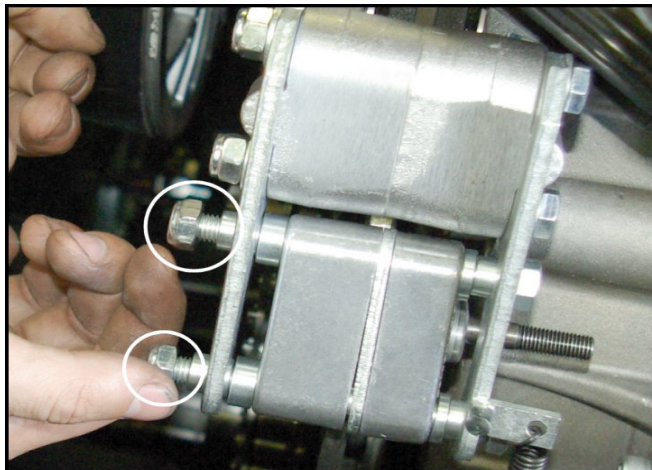


Photo 133



Photo 134

18. Install the (2) dowel pins to the cavities of the live side housing (rounded side facing out). *Photo 135*.

19. Locate the brake lever assembly and reattach the extension spring to the hole provided. If the spring was completely removed, it should be attached first to the tab on the mounting bracket, then to the cam lever. *Photo 136*

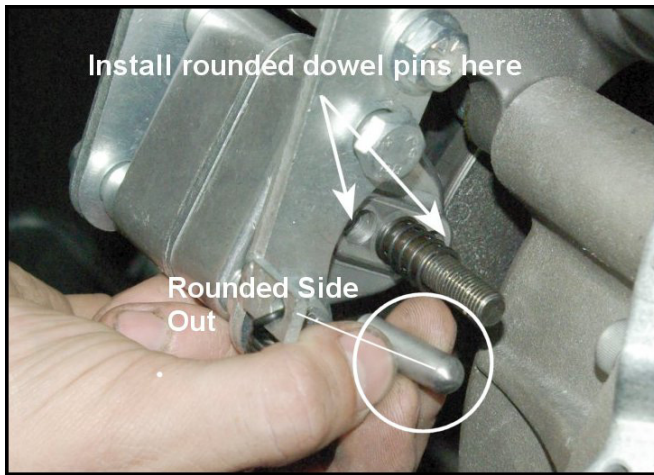


Photo 135

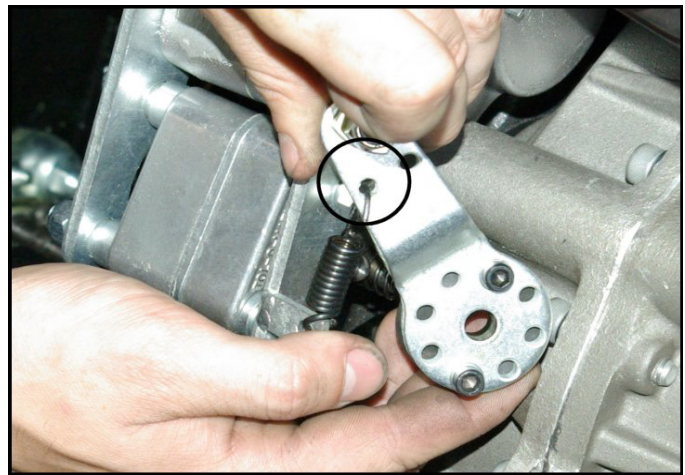


Photo 136

20. Install the lever to the stud of the live side housing. *Photo 137*

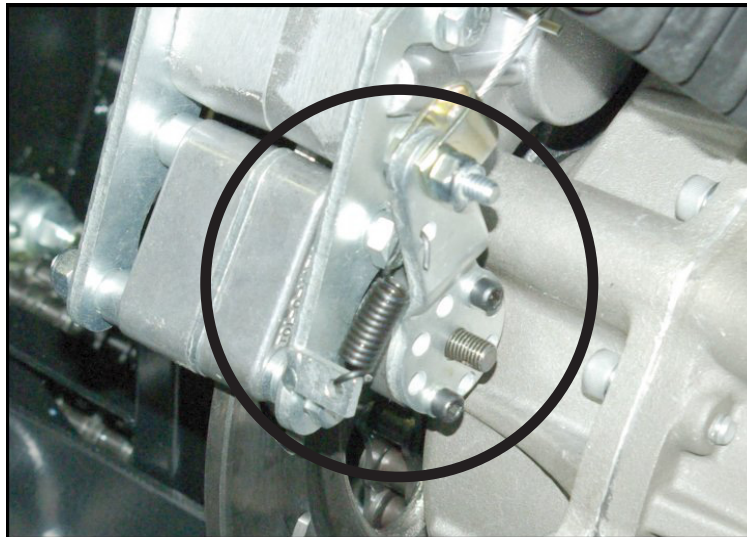


Photo 137

21. Start the castle nut but do not tighten down yet.
22. Perform the servicing procedure, **Emergency/Park Band Brake Adjustment (750EFI/700 Models)**

Removing the Service Brake Disc

1. Perform the servicing procedure, **Removing the Floor Pan.**
2. Perform the servicing procedure, **Removing the Front Floor Pan.**
3. Remove the (2) fasteners securing the Service Brake Caliper to caliper bracket. *Photo 138 & 139*

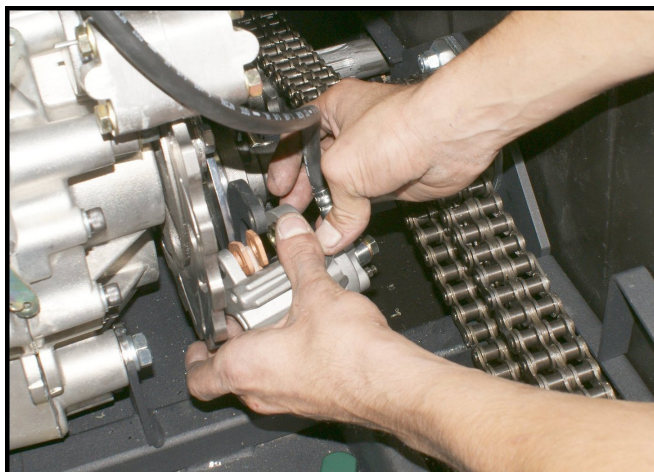


Photo 138

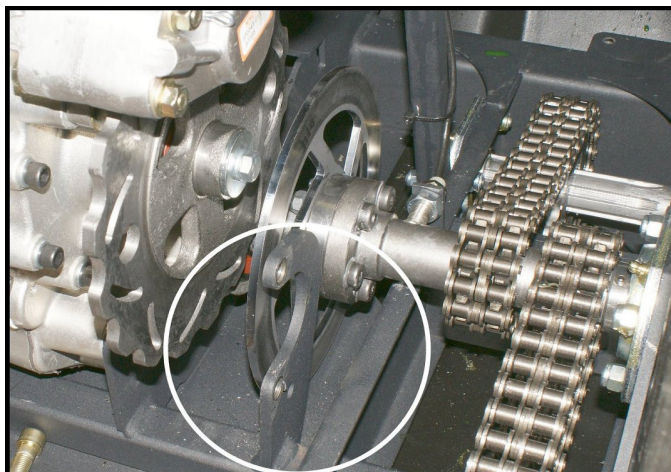


Photo 139

4. Remove both Front and Mid Front Chains connected to the Output Shaft Assembly. *Photo 140 & 141*. Refer to servicing procedure, **Removing a Drive Chain** if necessary.

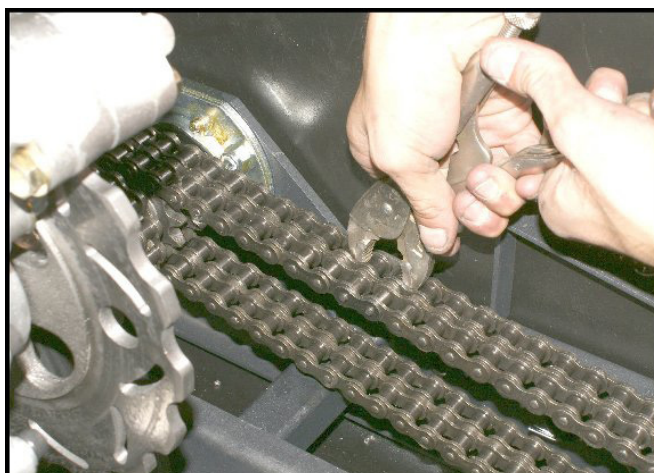


Photo 140

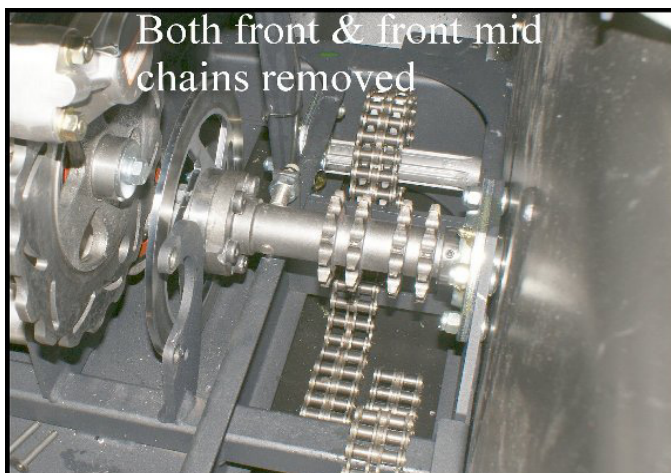


Photo 141

5. Remove the five (5) fasteners securing the Output Shaft Assembly to the Output Shaft Coupler. There is a nut to the inside of each fastener. *Photo 142 & 143*
6. Locate the (2) set screws at the outer bearing and loosen. *Photo 144*
7. Loosen off each nut at the outer bearing flange. *Photo 145*



Photo 142

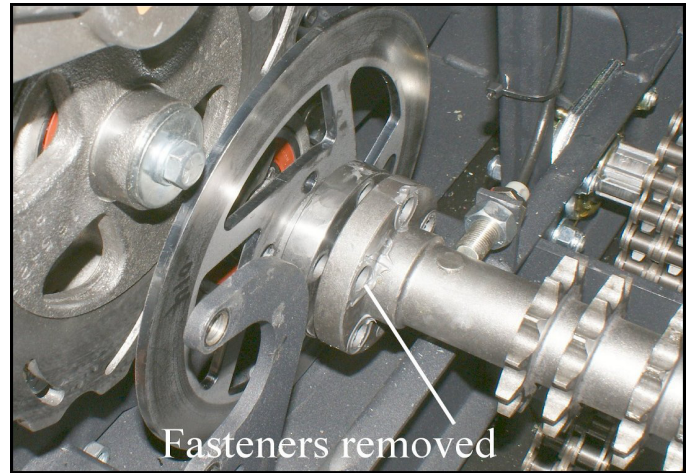


Photo 143

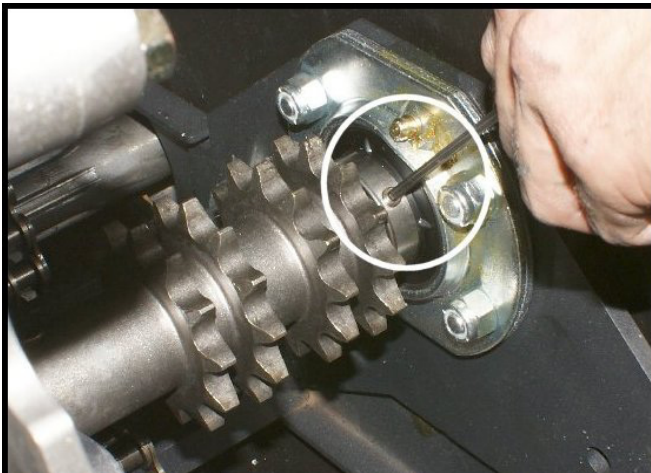


Photo 144

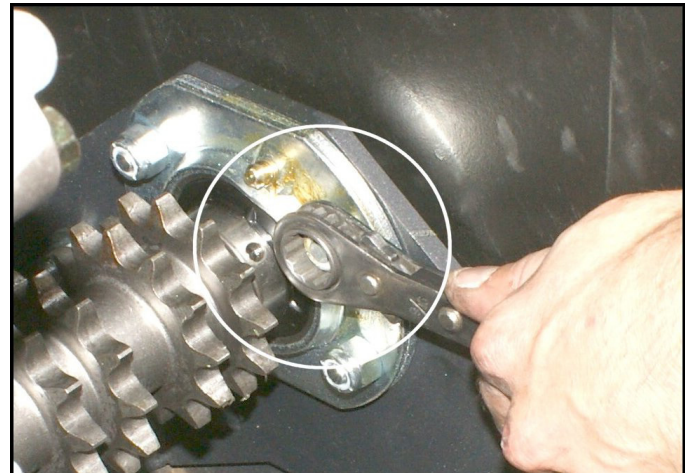


Photo 145

8. Tilt Output Shaft Assembly up and slide out of Outer Bearing to remove from vehicle.

Photo 146

9. Remove the Speedo Sensor as it will interfere when removing Output Shaft Coupler.

Photo 147

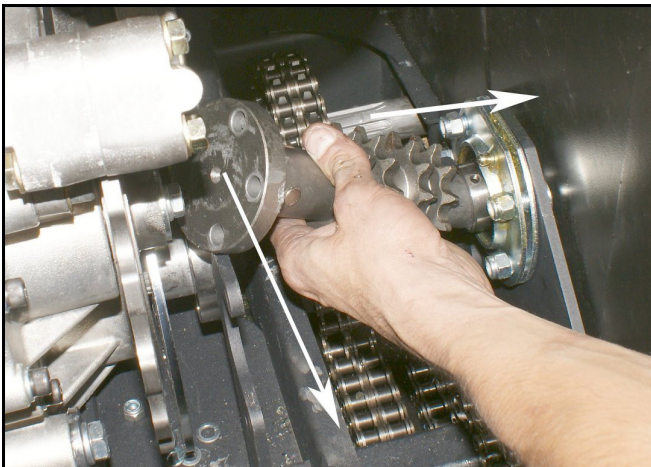


Photo 146

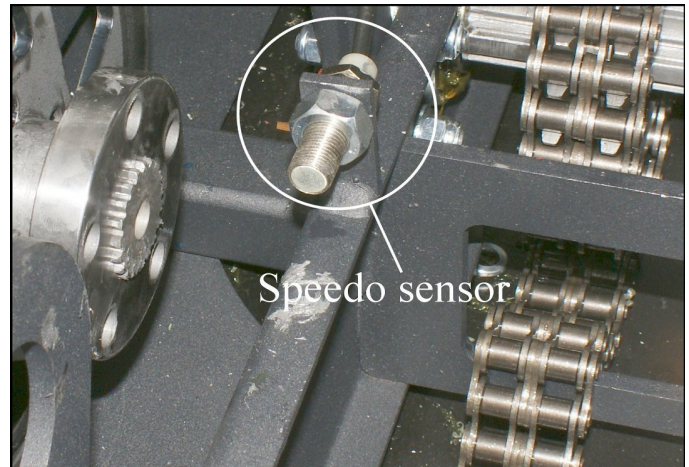
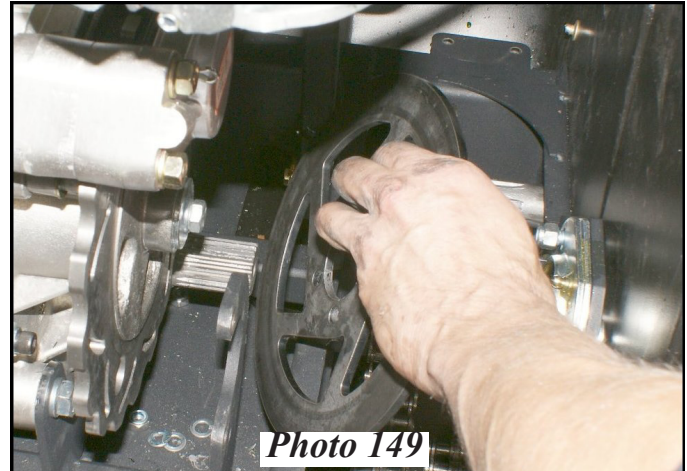
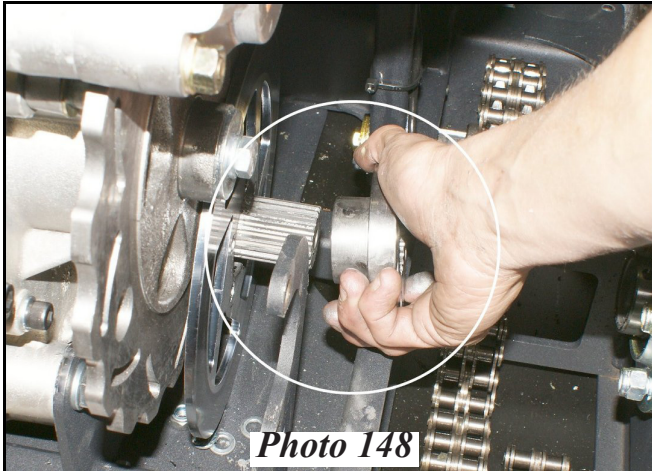


Photo 147

10. Slide Output Shaft Coupler from splined Output Shaft. *Photo 148*

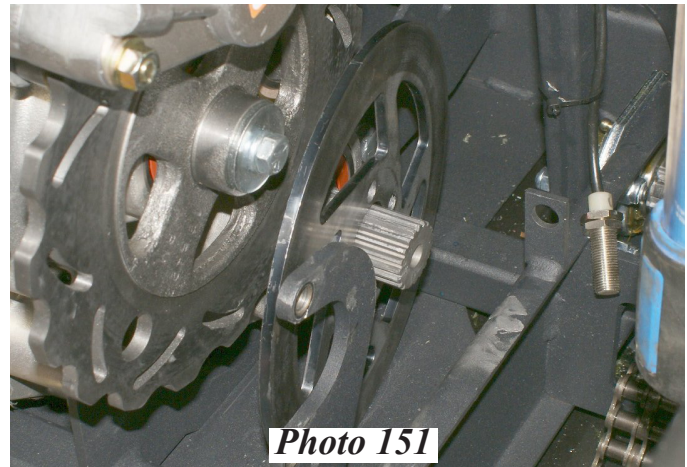
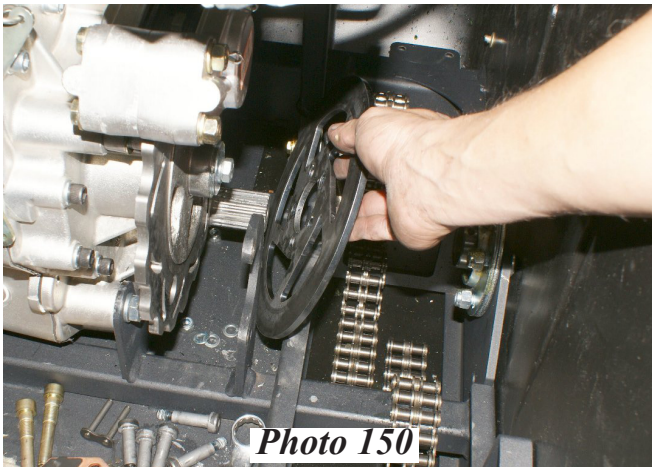
11. Remove Service Brake Disc. *Photo 149*



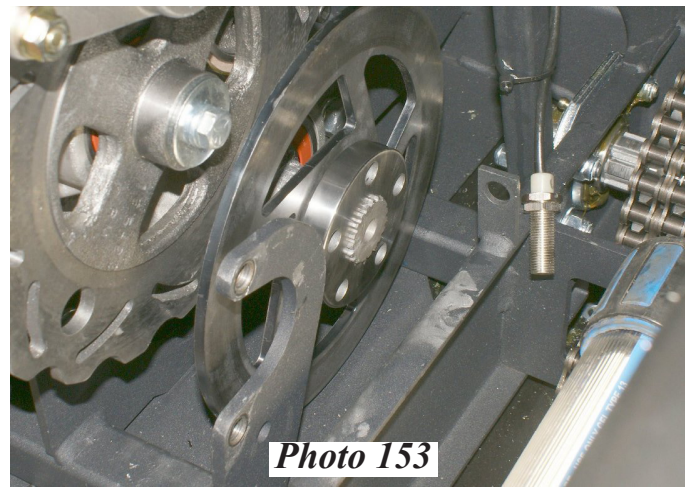
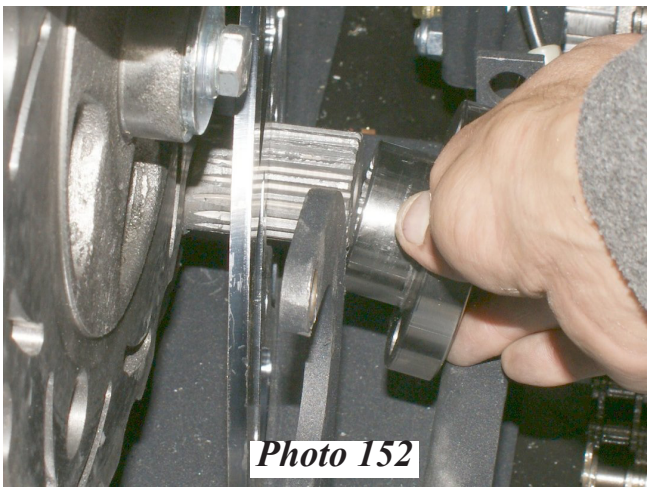
12. Perform the servicing procedure, **Brake Disc Inspection.**

Installing the Service Brake Disc

1. Slip the Service Brake Disc over the splined Output Shaft. *Photo 150 & 151*



2. Apply anti-seize to spline of Output Shaft and install coupler up against the Brake Disc *Photo 152 & 153.*



3. Insert the Output Shaft Assembly into Outer Bearing by tilting it upwards and then levelling out to connect to Output Shaft Coupler. *Photos 154 & 155*

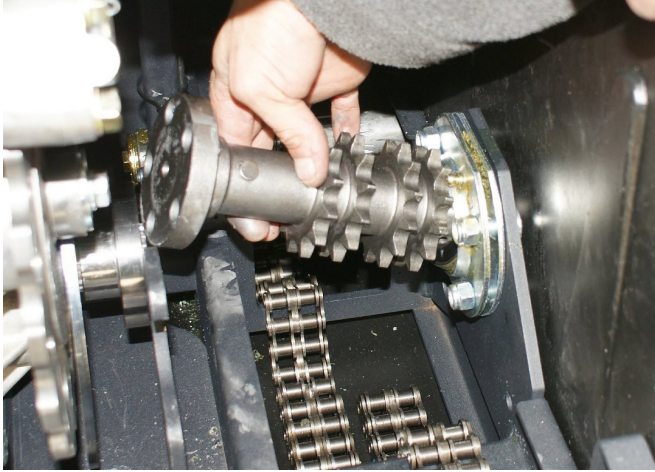


Photo 154

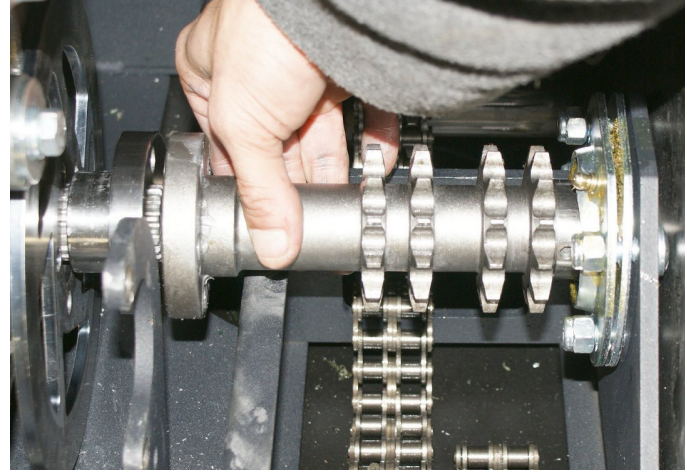


Photo 155

4. Install the five (5) fasteners required to connect Output shaft Assembly to Coupler and torque to specifications. *Photo 156*

IMPORTANT

Apply anti-seize compound to the shoulder part of all fasteners and ensure all have had Blue 243 LOCTITE applied to the threads and that the lockwasher has been re-installed along with the locknut to the inside. Torque to specifications.

5. Apply Blue 243 LOCTITE to the outer bearing set screws and install them into the bearing collar. Ensure they are aligned with the countersink in the Output Shaft Assembly. *Photo 157*

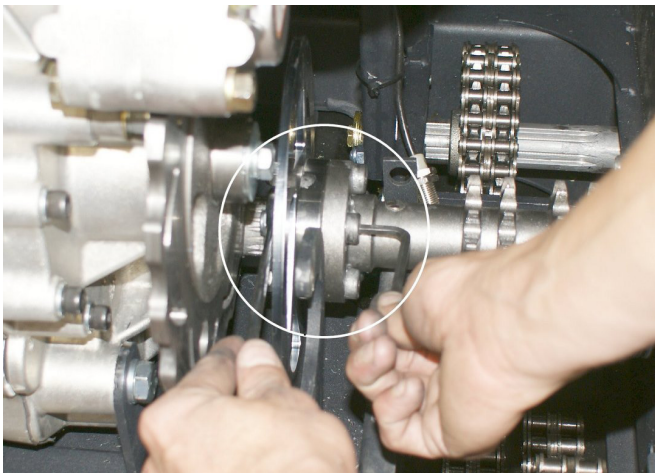


Photo 156



Photo 157

6. Tighten down all Bearing Flange Locknuts and the Outer Bearing. Torque to specifications *Photo 158*
7. Perform the servicing procedure, **Installing a Drive Chain.** *Photo 159 & 160*

8. Reinstall the Speedo Sensor and set gap between sensor and pickup. Set gap between 1/8" and 3/8" *Photo 161*
9. Reinstall Service Brake Caliper to Caliper Bracket and torque to specifications. *Photo 162.*

NOTE

Use brake cleaner on components before re-assembly to remove oil and other contaminants.

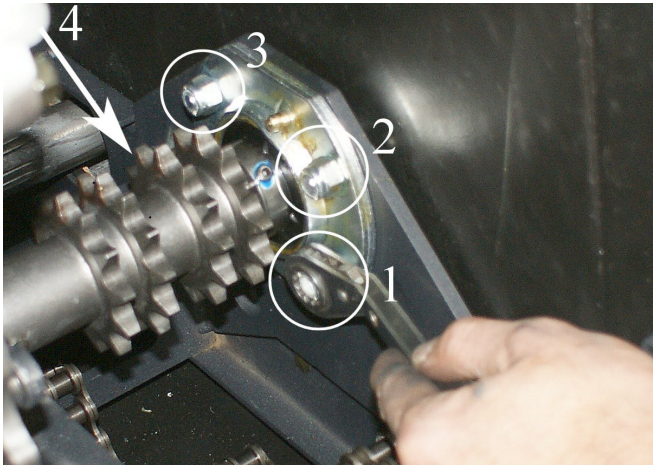


Photo 158

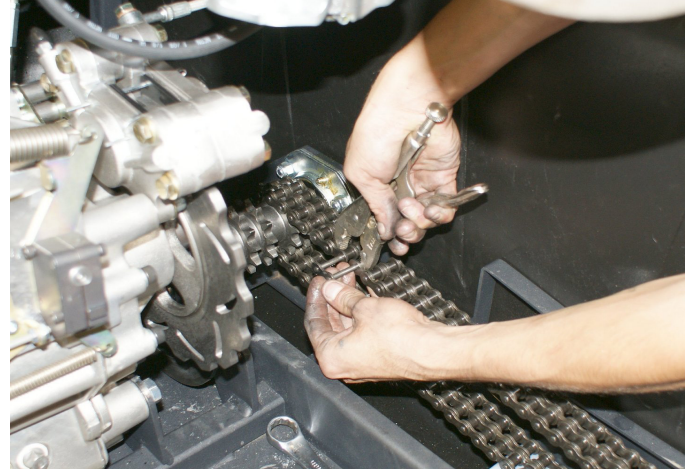


Photo 159

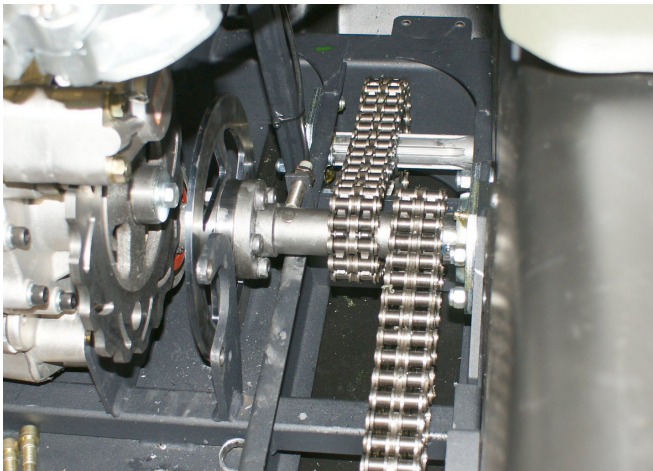


Photo 160

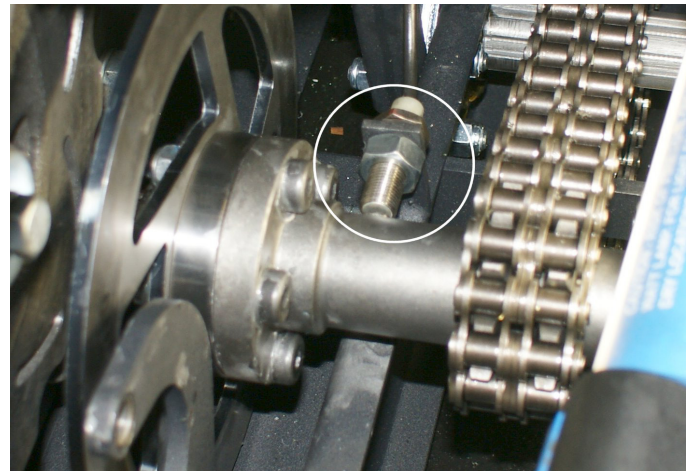


Photo 161

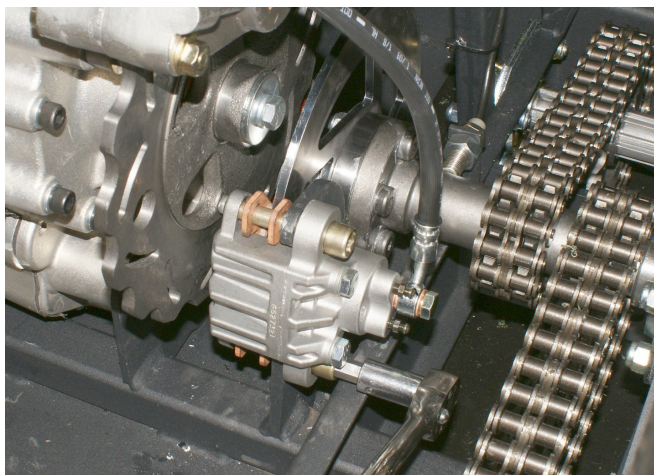


Photo 162

Disassembling the Moto Cross Style Steering Column

1. Perform the servicing procedure, **Removing the Firewall**.
2. Cut the tie wrap securing cables to the steering column.
3. Remove the (4) fasteners securing the steering bar to the steering column assembly.

Photo 163



Photo 163

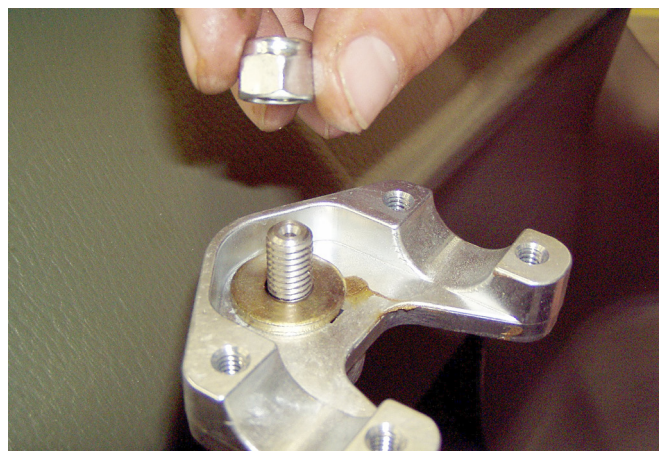


Photo 164

4. Remove the Nylon Locknut and Flat Washer from the top of the Lower Handle Bar Clamp. Discard the nylon locknut. *Photo 164*

5. Remove the Lower Handle Bar Clamp from the steering shaft. *Photo 165*

IMPORTANT

Be aware of the small key(s) installed into the steering shaft and ensure they are installed when reassembling the steering system.

6. Disconnect the hand brake lever cable at the steering arms.
7. Apply pressure to the left hand side plunger pin by pushing on the steering arm with the palm of your hand and insert a shim between the locking collar and the welded tab stop. *Photo 166*. Repeat on the right hand side master cylinder. *Following this procedure will ensure that there is no interference between the plunger pins and steering arms, when sliding the shaft from the steering column.*
8. Slip the Steering Shaft from the Steering Column Assembly. *Photo 167*

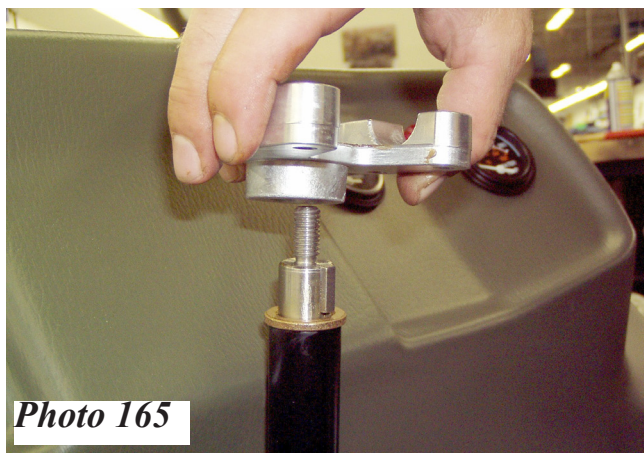


Photo 165

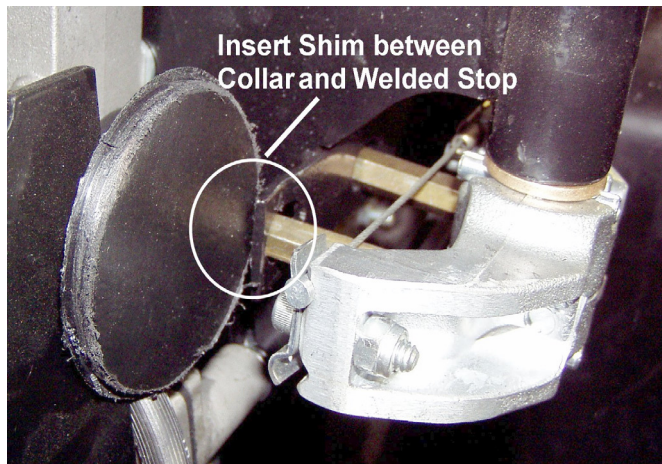


Photo 166

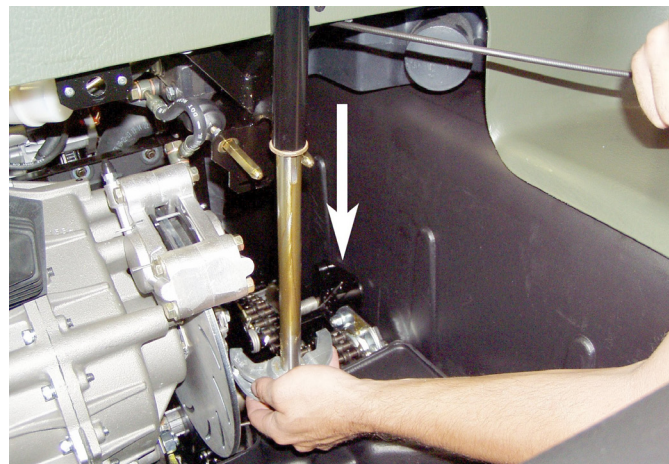


Photo 167

Disassembling the Steering Shaft - Avenger Models Only - Prior to 22441

- i. Place the Steering Shaft on a clean work bench and remove the 4 roll pins. *Photo 168*
Slide each steering arm and centering spring from the shaft.

NOTE

(1) Retaining Ring is located between the (2) Steering Arms.

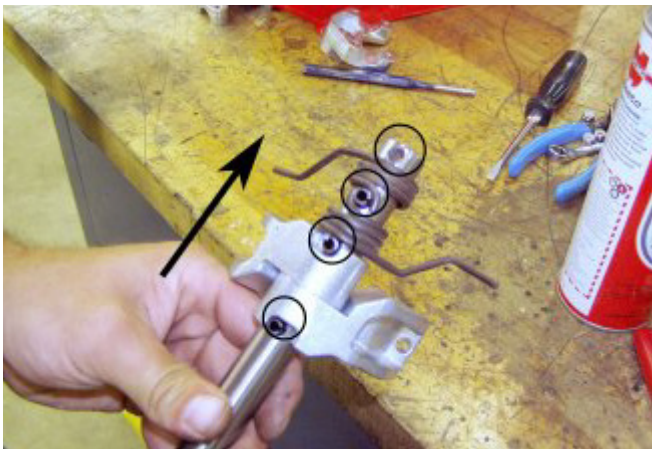


Photo 168

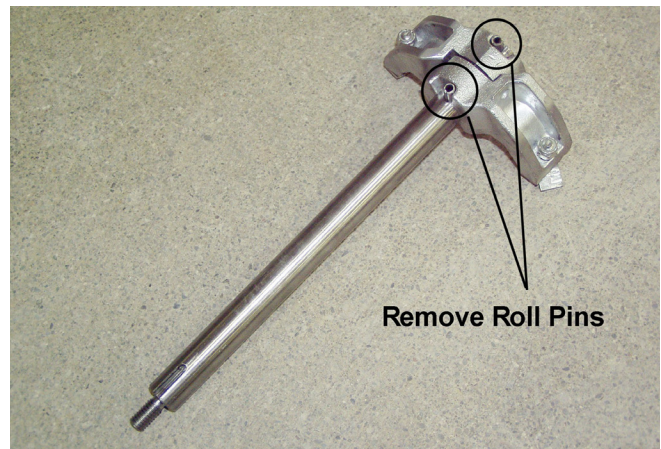


Photo 169

Vehicles manufactured from 22441

- i. Remove the (2) Spring Pins and Steering Arms from the Steering Shaft. **Photo 169**
A Retaining Ring is located between the (2) steering arms.

Reassembling Steering Column - Prior to 22441

- i. Install the Spring Pin into the Steering Shaft at the 4th hole from the end. **Photo 171**
The roll pin should be installed such that the slot of the pin is parallel with the shaft, and an equal amount of pin protrudes on each side of the shaft. **Photo 172**



Photo 171

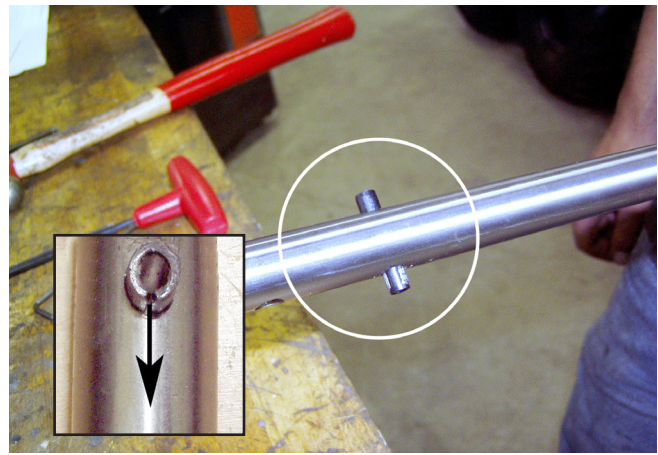


Photo 172

- ii. Slip the first Steering Arm on to the Steering Shaft, followed by the Retaining Ring, seating it to the groove on the shaft. Install the second Steering Arm. Orient them as illustrated in **Photo 173**
- iii. Install the 2nd Spring Pin, followed by a centering spring. Install the 3rd Spring Pin, followed by a 2nd centering spring and 4th Spring Pin. **Photo 174 & 175**

NOTE

Please observe the orientation of the free end of the springs. Each is pointing in the same direction as the steering arms. **Photo 176**

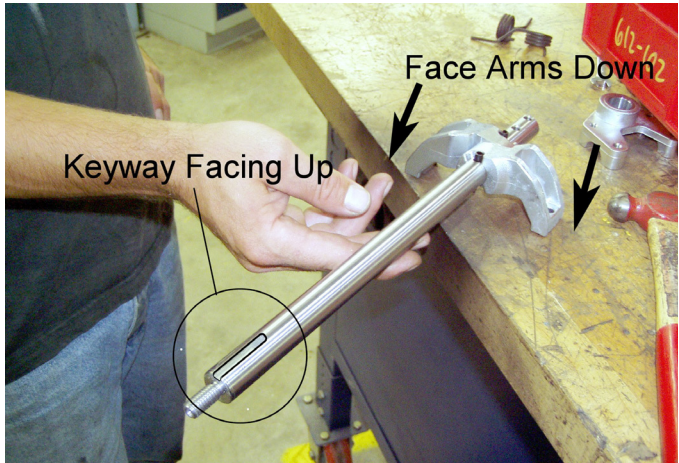


Photo 173



Photo 174



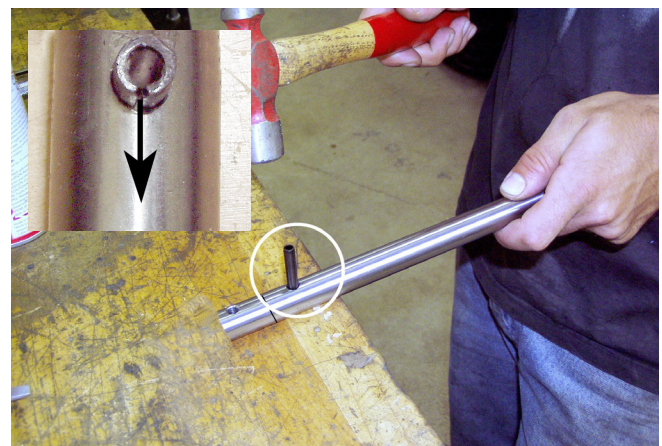
Photo 175



Photo 176

Vehicles manufactured from 22441

- i. Install the Spring Pin at the 2nd hole from the end on the Steering Shaft. *The roll pin should be installed such that the slot of the pin is parallel to the shaft, and an equal amount of pin protrudes on each side of the shaft.* **Photo 177**
- ii. Slip a steering arm on to the shaft and up against the previously installed Spring Pin.



- iii. Next, install a Retaining Ring to the machined groove on the Steering Shaft. This retaining ring will be located between the 2 steering arms.
- iv. Install the second steering arm and last spring pin. **Photo 178**. Orient as in **Photo 179**



Photo 178

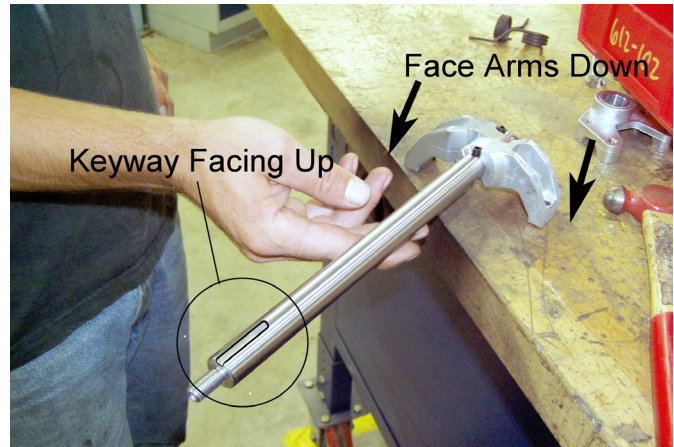


Photo 179

9. Apply some axle grease to the length of the Steering Shaft, **Photo ST-180**, and insert it from the bottom up, into the Steering Column Assembly with the small keyway facing towards you. **Photo 181**



Photo 180

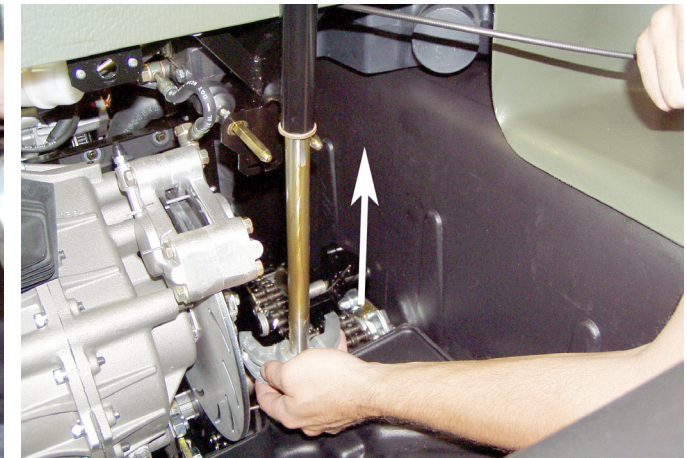


Photo 181

10. Place the key to the end of the Steering Shaft. **Photo 182**. Vehicles manufactured from serial numbers **23535** utilize 2 keyways and 2 keys.
11. Align the keyway(s) of the Lower Handle Bar Clamp with that of the previously installed key(s) and assemble to the Steering Shaft. **Photos 183 & 184**

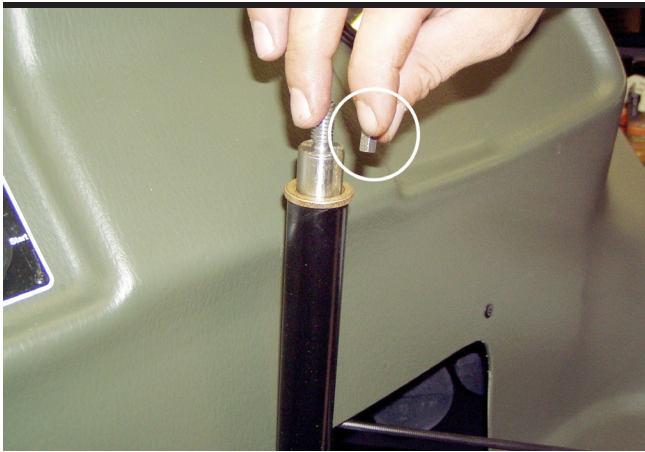


Photo 182

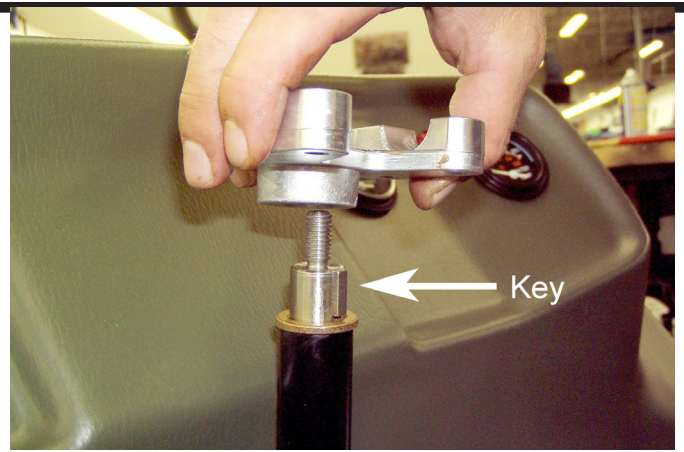


Photo 183



Photo 184

12. Install a Flat Washer and a *new* 117-29 Nylon Locknut to the threaded end of the steering shaft. *Photo 185*
13. Tighten down the Nylon Locknut snug. Back off the Locknut just enough to allow the Flat Washer below to be turned by hand. Do not overtighten. Ensure the shaft turns freely with minimal end play. *Photo 186*

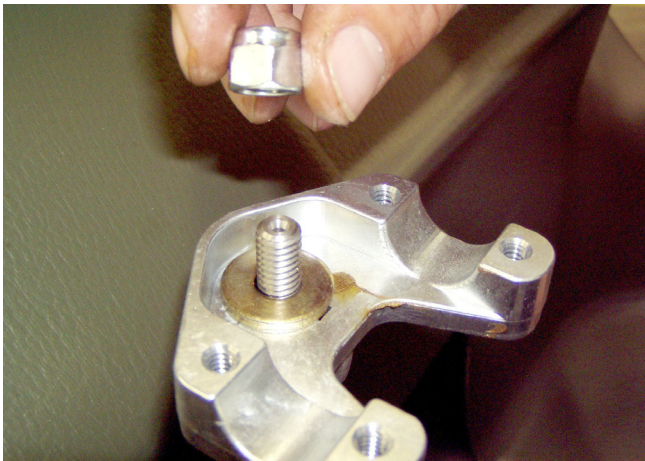


Photo 185

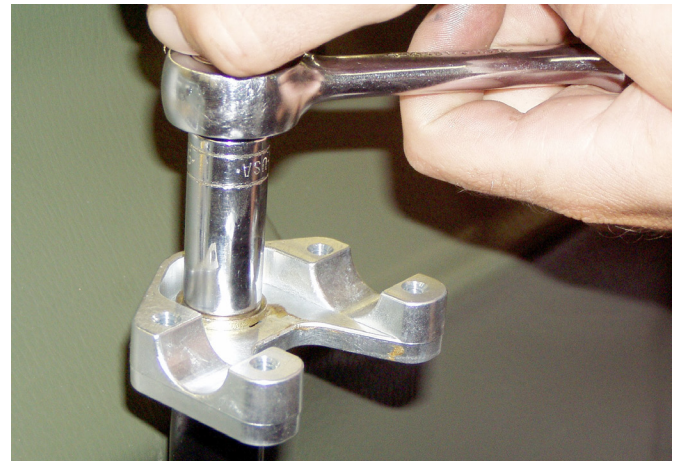


Photo 186

14. Set the Handle Bar assembly into place and cover with the Upper Handle Bar Clamp. The Handle Bar clamp is secured into place with (4) fasteners. Tighten down the fasteners in an "X" pattern indifferent to starting location at a torque specification of 10 - 12 Ft. LBS (13.5 - 16N.m) *Photo 187*



Photo 187

15. Apply firm pressure to handle bars in each steering direction to seat the roll pins.
16. Reattach the hand brake lever cable across the two brake steering arms.
17. Perform the servicing procedure, **Hydraulic Plunger Pin Adjustment.**

