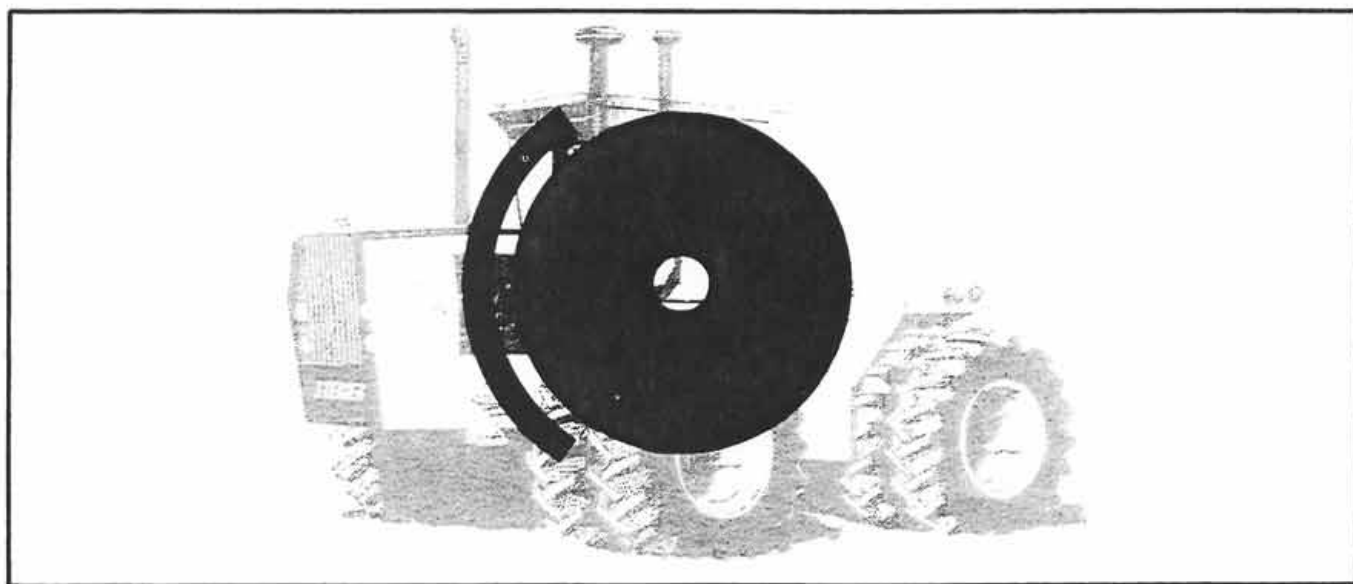




**"ST" SERIES I, II, & III WC, BC, C & P
BRAKE SYSTEM**

SERVICE MANUAL



IMMEDIATE ACTION LETTER REFERENCE:

No/Date

1 _____ 4 _____ 7 _____

2 _____ 5 _____ 8 _____

3 _____ 6 _____ 9 _____

SERVICE NEWS REFERENCE:

No/Date

1 _____ 4 _____ 7 _____

2 _____ 5 _____ 8 _____

3 _____ 6 _____ 9 _____

SERVICE BULLETIN REFERENCE:

No/Date

1 _____ 4 _____ 7 _____

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3 _____ 6 _____ 9 _____

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Suggested Safety Practices

The nature of every type of service that you do demands that you pay attention to your work all of the time. Unlike machines, you have the ability to think and reason to avoid serious risk you cannot afford. In the instructions that follow you should apply some of these standard precautions.

- Place the tractor in a properly equipped work area which has been furnished with the needed tooling. For example, overhead hoists and chains rated to lift and carry the components you work on.
- Clean the tractor before working on it. It will be safer and easier to service.
- Let the tractor cool if needed before working on it, or begin working on a non-affected area of the tractor.
- Keep your workspace organized. A cluttered shop is dangerous and will reduce your efficiency.
- Remove the key so the engine cannot be started accidentally. If you don't, you may be inviting trouble.
- Prevent tractor movement - block the wheels. Perform the following operations on a level surface only!
- Follow approved methods described herein for a successful job.
- Avoid wearing jewelry and loose clothing. They can cause you to have a serious accident.
- Always have a fire extinguisher available and in operating order. Know how to use it.
- Handle heavy parts with proper lifting fixtures and with a lot of respect!
- If cutting must be done with a torch, wear face, eye and clothing protection intended for such work. Remove and/or protect against any flammable materials.
- DO NOT work on the tractor with the engine running unless specifically instructed to do so.
- DO NOT allow bystanders to linger near your work. They may be unaware of hazards.
- Be sure someone can help in an emergency. On a very involved project it may be unwise to work alone.
- NEVER operate the tractor without brakes.
- DO NOT allow inexperienced personnel to operate, service or repair equipment.

Single Disc Brake System

General Information:

The early style Steiger Single Disc Brake System is used on Series I, Series II and Series III Steiger Tractors that are equipped with the single speed transfer case.

Mounting location and parts arrangements will vary among early and later models of tractors, therefore, only the latest Steiger Tractor Parts Manuals should be consulted when ordering parts. This will help ensure optimum braking performance and brake life.

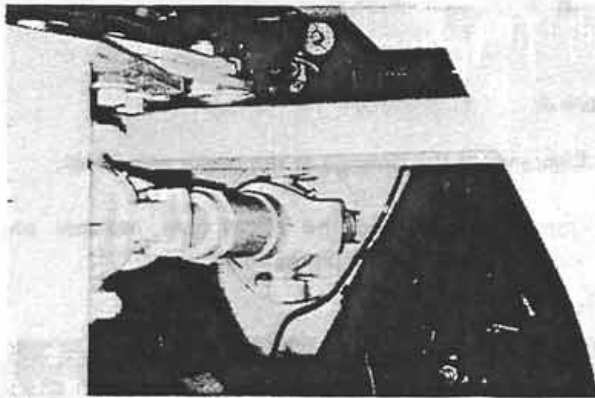


Figure 1:

Braking force is accomplished by means of one or two calipers mounted to utilize a single brake disc (Fig. 1).

The park brake caliper is cable operated from the operator's compartment by either an over-center lever arrangement or a locking-type brake cable, depending on the tractor model. When the park brake is applied, a cam lever on the caliper compresses the pads against both sides of the brake disc by means of actuator pins in the bores of the

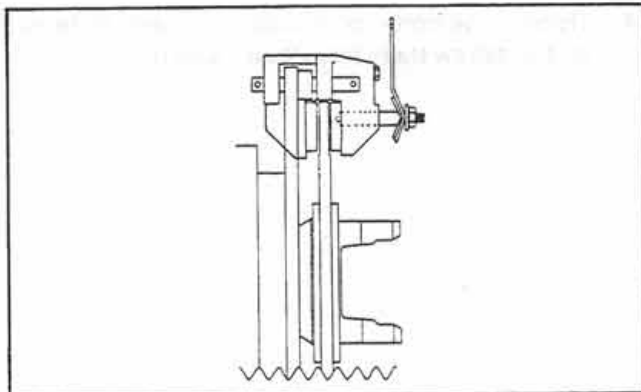


Figure 2:

rear casting (Fig. 2). The caliper assembly is mounted on slide rods to permit fore and aft caliper movement, therefore, allowing uniform clamping of the disc.

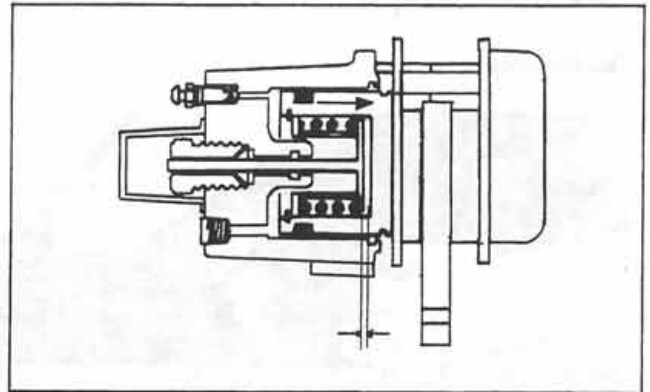


Figure 3:

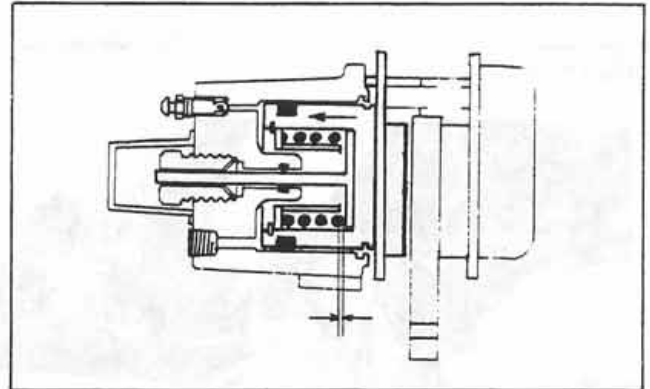


Figure 4:

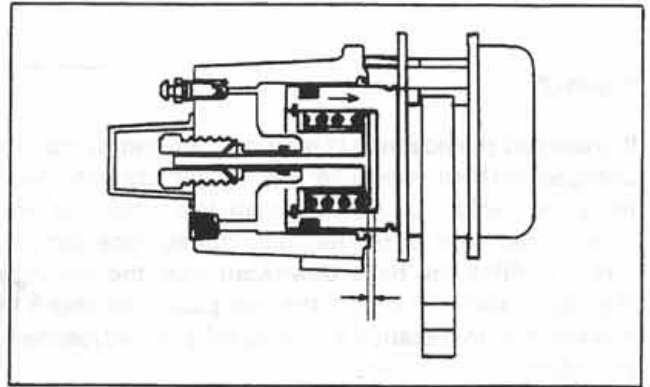


Figure 5:

Main Brake Caliper

The single piston Hydraulic Caliper receives fluid under pressure from the brake master cylinder. Fluid pressure then forces the piston forward to compress the linings against the disc (Fig. 3). As the brake pedal pressure is released, a retractor assembly inside the piston pulls the piston rearward for more pad to disc clearance (Fig. 4). As the brake pads wear, the pad to disc clearance still remains the same because the retractor pin will creep slightly in the collet when the spring travel limit has been obtained (Fig. 5). This caliper assembly is mounted to the brake hangers through studs thus allowing fore and aft caliper movement similar to that described previously. Later production tractors employ two (2) hydraulic calipers on a single rotating disc.

Single Disc Brake System

Park Brake Caliper

Pad Replacement

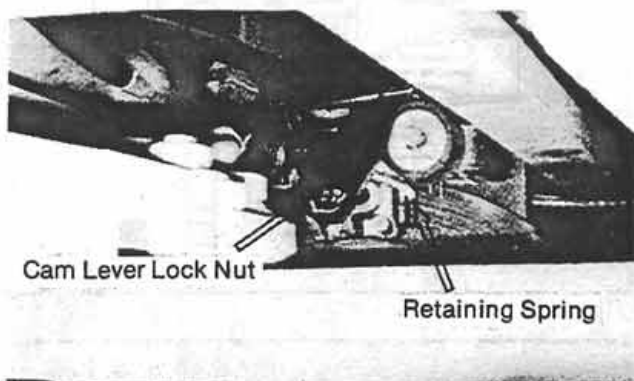


Figure 1:

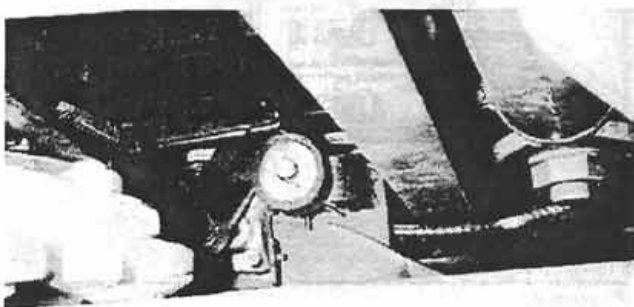


Figure 2:

If brake pad replacement is required, the pad(s) may be changed without removing the caliper assembly(ies) from the tractor. Loosen the cam lever lock nut and unlatch each end of the retaining spring, one per pad (Fig. 1). Slide the pads downward past the castings (Fig. 2). Install and secure the new pads. See step 5 in reassembly, installation and adjusting for adjustment procedures.

Removal and Disassembly

Due to wide application of the mechanical park brake caliper, removal methods may vary somewhat because of design changes of structural components (frames, weldments, etc.) and/or engine options available. Engine length will affect the park brake caliper location to nearby components.

Despite the various caliper mounting arrangements, methods used for removal and installation are basically universal.

1. Remove the switch key to prevent accidental start-up of the engine, and chock the wheels to prevent movement of the tractor.

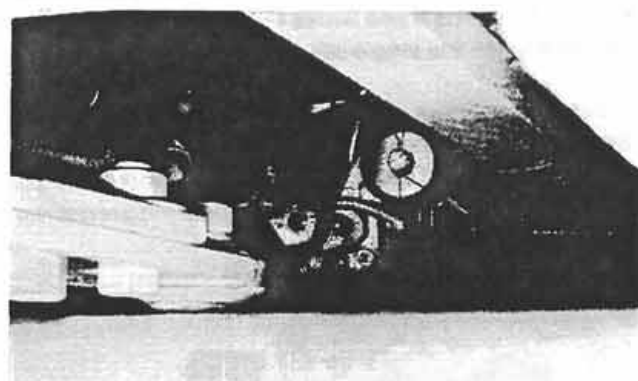


Figure 3:

2. Disconnect the linkage at the brake cam lever.
3. Completely remove the brake cam, washer and lock nut from the caliper assembly (Fig. 3).

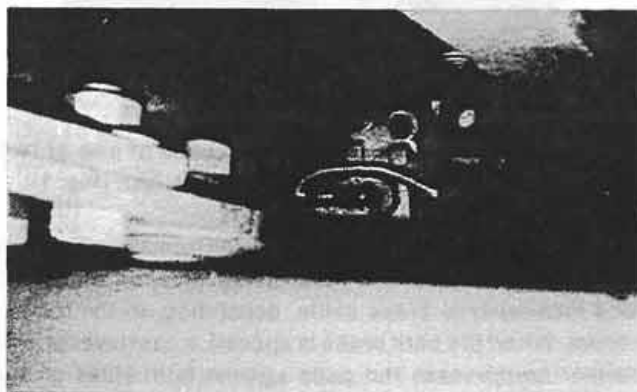


Figure 4:

4. Remove the cotter pins from the brake slide rods and withdraw them from their bores (Fig. 4).

Single Disc Brake System

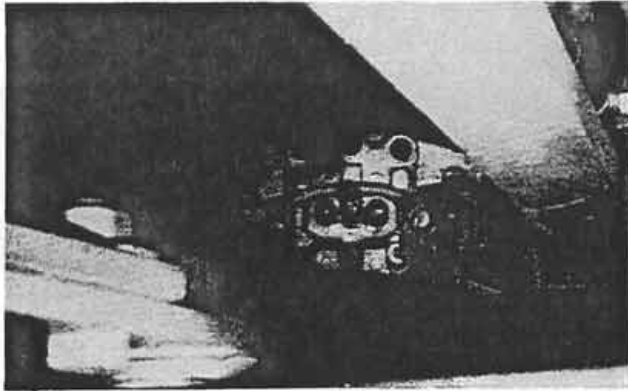


Figure 5:

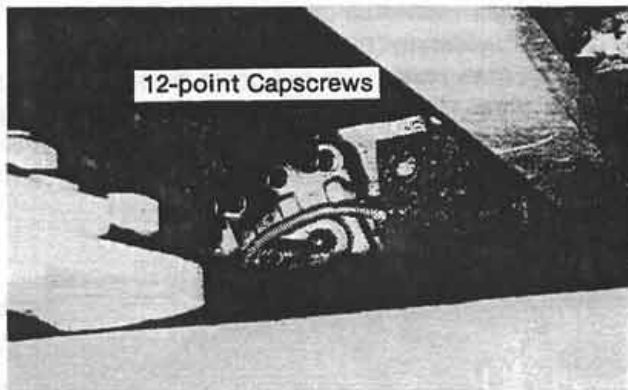


Figure 6:

5. Remove the caliper assembly from the brake mount weldment (Fig. 5). In some cases clearance is limited so the caliper assembly cannot be removed intact. When this is encountered, remove the three 12-point capscrews (Fig. 6) which fasten the caliper castings together, and remove the castings individually.

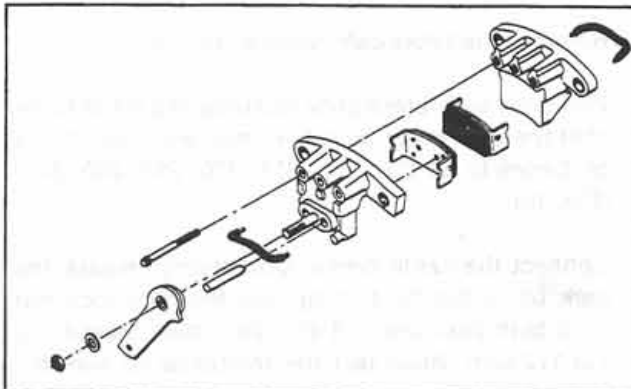


Figure 7:

6. Remove the remaining parts from the castings and inspect them (Fig. 7).

Inspection

1. If necessary, clean all parts to be inspected. Carefully check for cracked, broken or otherwise damaged parts and replace as needed.

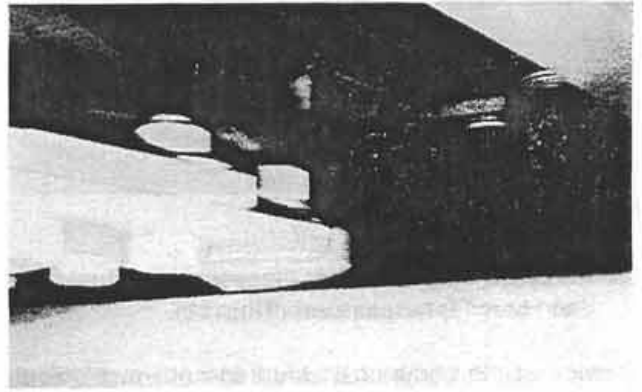


Figure 8:

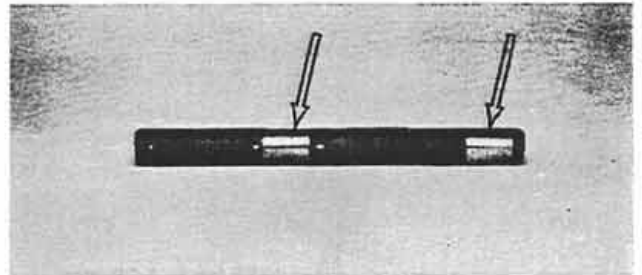


Figure 9:

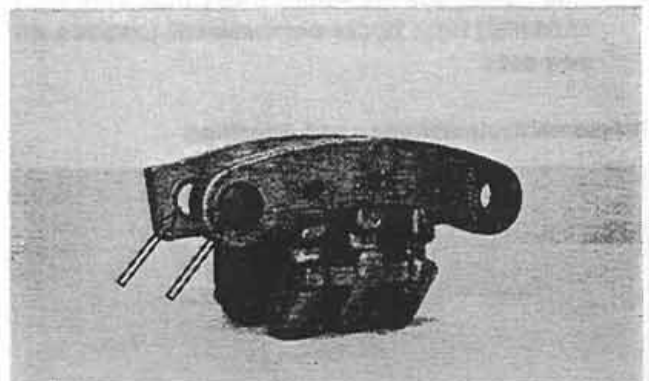


Figure 10:

2. On the brake caliper mounting arrangement, check for worn pin bores of the weldment plate (Fig. 8), slide rods (Fig. 9) and slide rod bores of the caliper castings (Fig. 10).

Single Disc Brake System

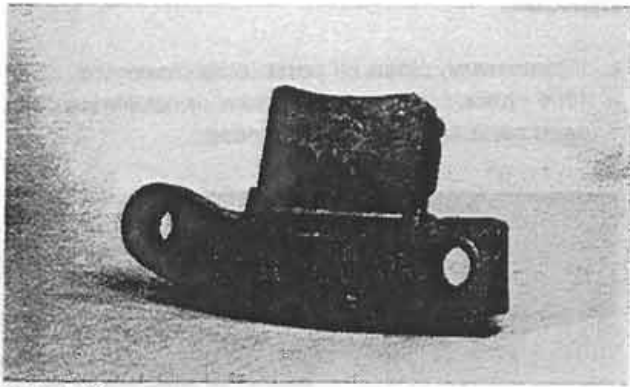


Figure 11:

3. In the cam side casting, inspect the actuator pins and bores for excess wear (Fig. 11).

Threads of the brake cam stud and nut must display full thread height and depth.

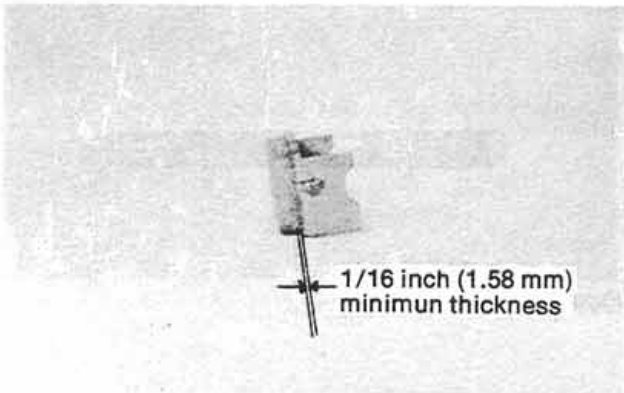


Figure 12:

4. If the brake pads are worn to less than 1/16 inch (1.58 MM) (Fig. 12), or worn unevenly, replace with new pads.

Reassembly, Installation and Adjusting

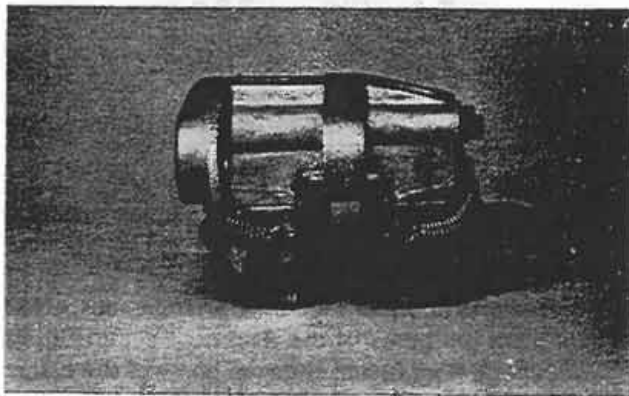


Figure 13:

1. Fit each casting with its appropriate parts (Fig. 13). The cam may be left off at this point.

Revised May, 1982

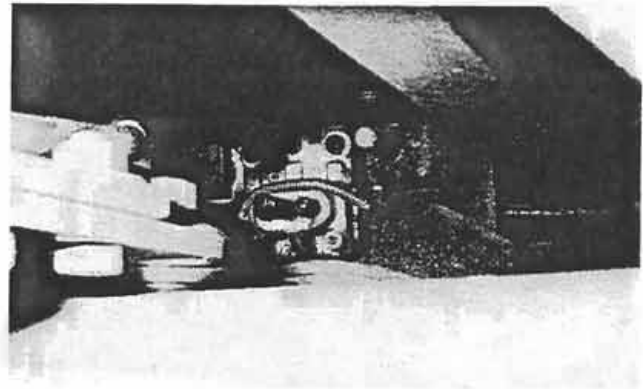


Figure 14:

2. Mount the individual caliper castings to the brake mount weldment (Fig. 14). This will ensure alignment of the brake slide rod bores before installing the three 12-point cap screws thus eliminating possible binding on the brake slide rods. Torque the three 12-point cap screws to 34 lb. ft. (4.70 Kg/M).

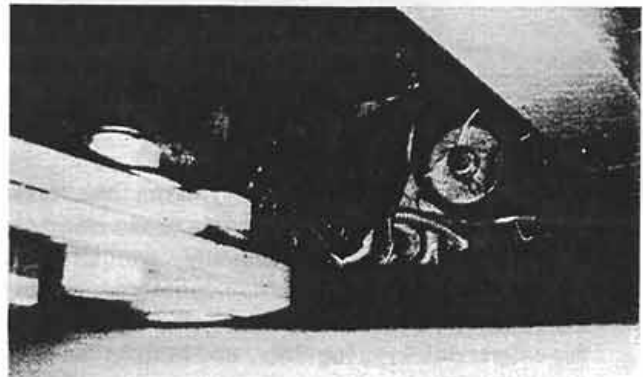


Figure 15:

3. Reinstall the brake cam, washer and nut.
4. Withdraw each brake slide rod (one at a time) to install the grommets (and link lever with link straps on Series III ST 220, 250, 251, 270, 310, 320, 325) (Fig. 15).
5. Connect the cable clevis. Completely release the park brake handle and tighten the cam lock nut until both pads contact the disc, then loosen the nut 1/2 turn. Road test the tractor to be sure the brake pads do not rub the disc. Test braking performance before returning the tractor to normal service.

Single Disc Brake System

Single Piston Hydraulic Brake Caliper

Pad Replacement

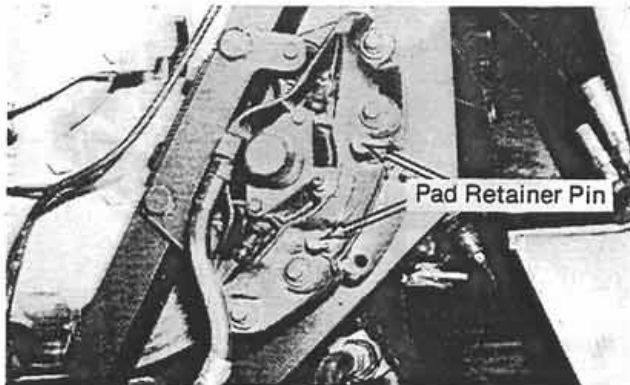


Figure 1:

If replacement of only the brake pads is required, remove the pad retainer pins and withdraw the worn pads (Fig. 1).

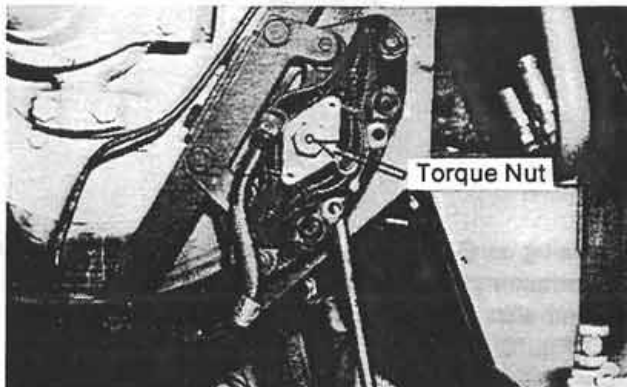


Figure 2:

Before new pads can be installed, remove the stamped cover, loosen the retracting mechanism torque nut and bottom the piston in its bore (Fig. 2).

Install the new pads and retainer pins as per instructions given in Reassembly, Installation and Adjusting.

Removal and Disassembly

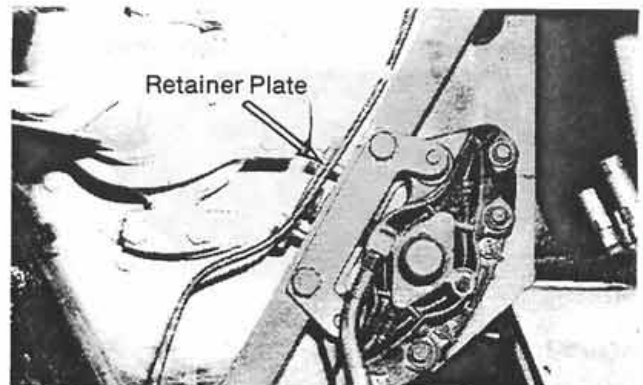


Figure 3:

1. Disconnect and quickly cap the brake line(s), and loosen the spring retainer (Fig. 3).

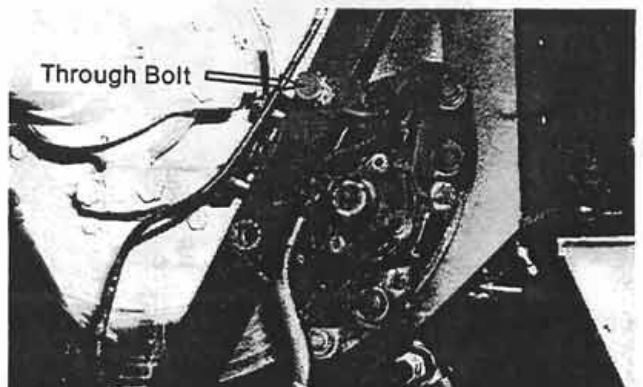


Figure 4:

2. Remove the pair of through-bolts at the brake hangers and mount bar (Fig. 4). The caliper assembly with hangers will then be free for removal.

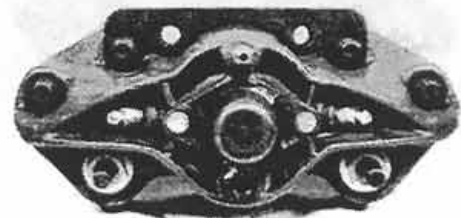


Figure 5:

3. Remove the brake pad retainer pins and brake pads (Fig. 5).

Single Disc Brake System

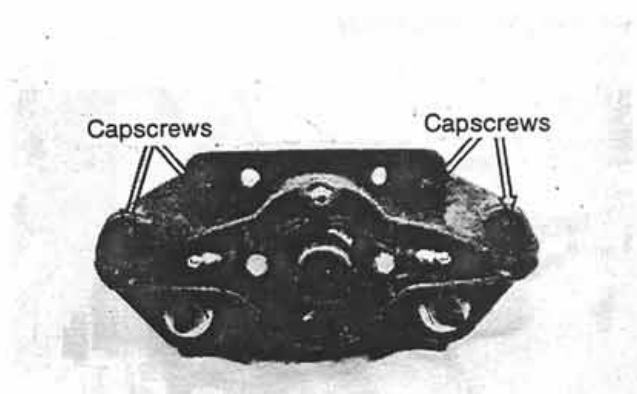


Figure 6:

4. Using a 3/8 inch 12-point socket, remove the four (4) capscrews which fasten the caliper castings together (Fig. 6).

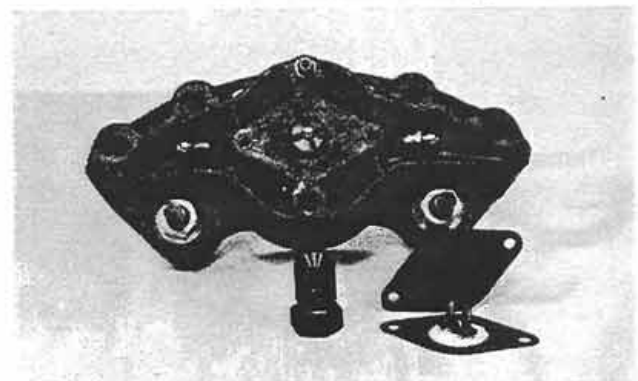


Figure 7:

5. For removal of the piston, remove the stamped cover, the retracting mechanism torque nut and collet with its washer from the rear of the piston side casting (Fig. 7).

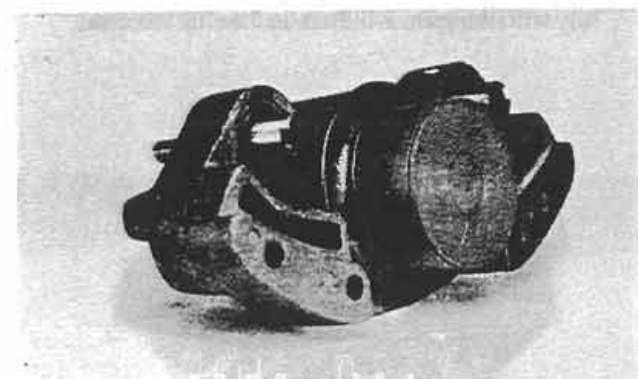


Figure 8:

6. If the piston cannot be grasped and pulled from its bore, use a soft punch and CAREFULLY tap on the retractor pin end of the piston. As the piston is removed, slide the dust boot toward the casting (Fig. 8).

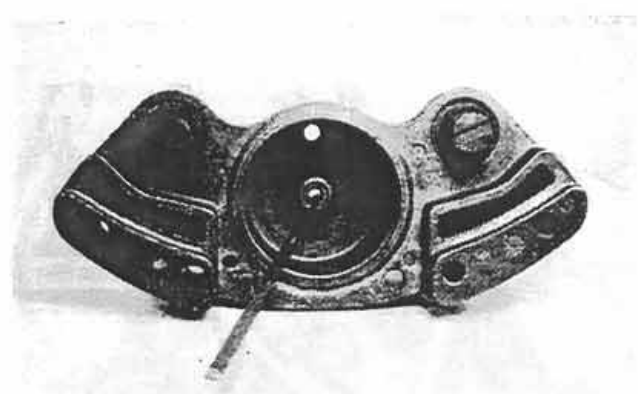


Figure 9:

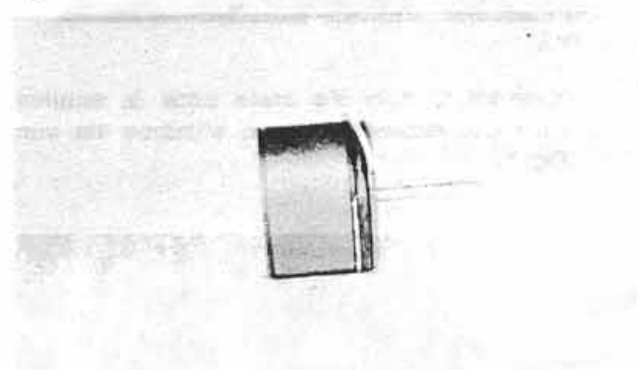


Figure 10:

7. Using an O-ring pick, remove the O-rings from the retractor pin bore of the piston side casting (Fig. 9) and also from the outside diameter of the piston (Fig. 10).

NOTE: DO NOT disassemble the piston, for it is under high spring pressure.

Inspection

1. If necessary, clean all parts to be inspected. Carefully check for cracked, broken or otherwise damaged parts and replace as needed. NOTE: The piston side casting is not serviced separately. If replacement is required, a new sub-assembly should be used.
2. Replace the piston side casting if the piston bore is pitted, scratched, grooved or out of round.

Single Disc Brake System

Reassembly, Installation and Adjusting

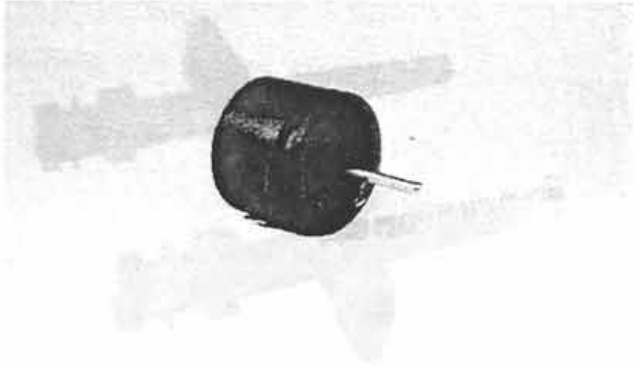


Figure 11:

3. Examine the piston assembly, and replace as an assembly if it is pitted in the O-ring groove area (Fig. 11), out of round, if the retractor pin is scored or bent or if the retractor spring in the piston is broken.



Figure 12:

4. On the brake caliper mounting group, check the stud surfaces and brake hanger bores for wear (Fig. 12). If worn more than .015 inch (.38 MM) from new dimensions, replacement is needed.

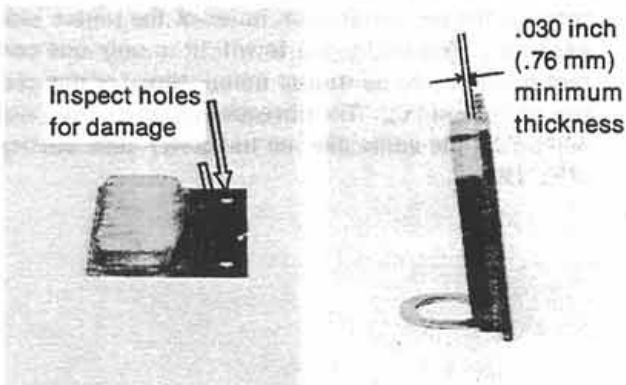


Figure 13:

5. If the brake pads are worn to less than .030 inch (.76 MM), worn unevenly or otherwise damaged, new brake pads must be installed (Fig. 13).

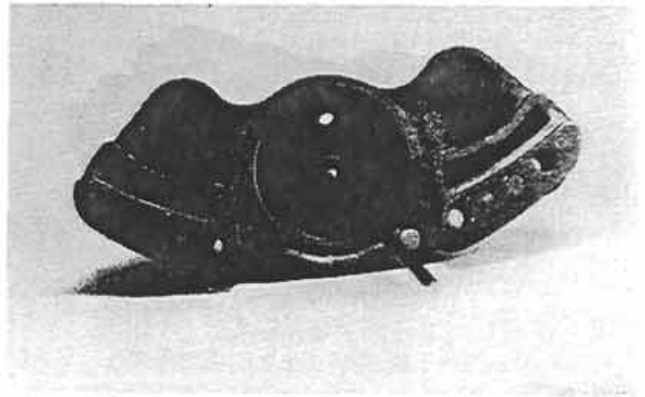


Figure 14:

1. Lubricate the bores of the piston side casting with brake fluid (DO NOT USE OIL OR GREASE). Carefully insert a new O-ring in the groove of the retractor pin bore (Fig. 14).

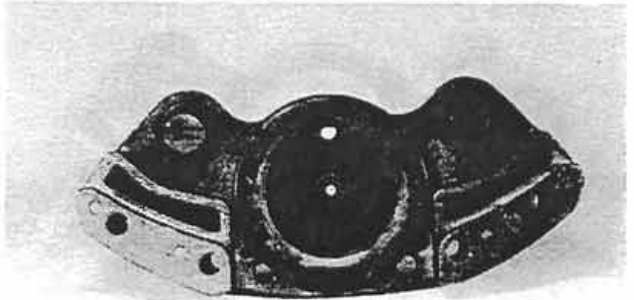


Figure 15:

2. Fit the lip of the dust boot into the groove near the edge of the piston bore (Fig. 15).

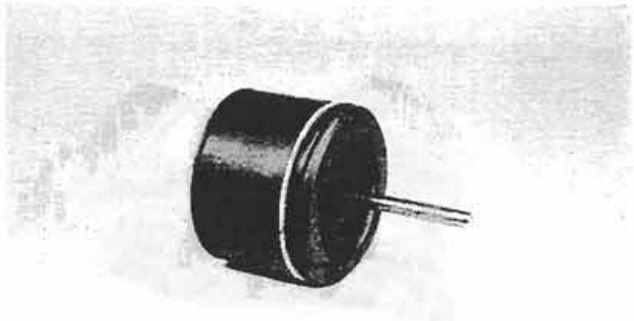


Figure 16:

3. Install the O-ring and back-up washer in the seal groove of the piston, with the back-up washer nearest the pad end of the piston (Fig. 16).

Single Disc Brake System

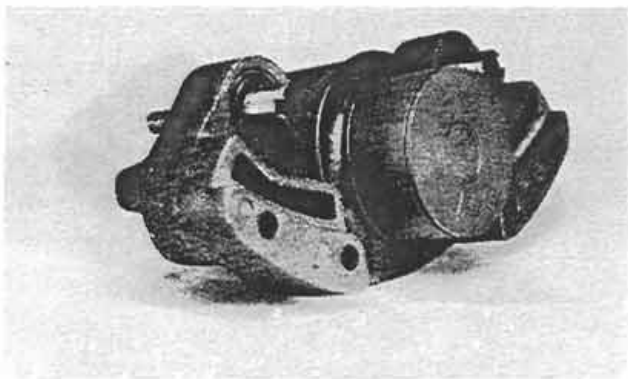


Figure 17:

4. Lubricate the piston and its seals with brake fluid and start it in the bore of the piston side casting while repositioning the dust boot over the piston (Fig. 17). (DO NOT USE OIL OR GREASE!)

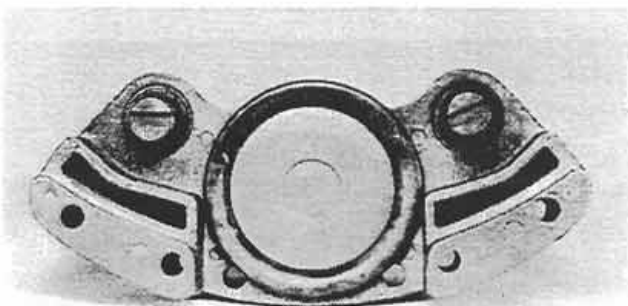


Figure 18:

5. Bottom the piston in its bore and fit the outer lip of the dust boot into the small groove near the pad end of the piston (Fig. 18).



Figure 19:

6. From the rear of the piston/casting subassembly, install the flat washer, collet and torque nut over the retractor pin (Fig. 19). Torque the nut to 40 lb. ft. (5.5 Kg/M) and replace the cover.



Figure 20:

7. On each of the new pad retainer pins, assemble a flat washer, then a rubber bushing and then guide both pins through the two inside holes of the bridge plate (Fig. 20).
8. Rest the piston side assembly on a clean flat surface, with the six through holes on top.

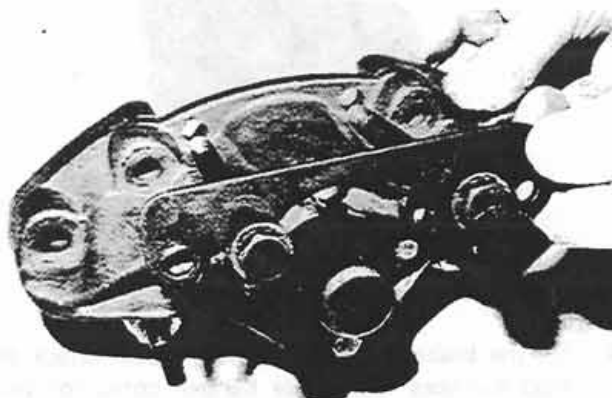


Figure 21:

9. Insert the pins (already intact with the bridge plate) through the two innermost holes of the piston side assembly. The bridge plate will fit in only one correct position; its contours match those of the piston side housing. The threaded ends of the pins will be on the same side as the carrier side casting (Fig. 21).

Single Disc Brake System

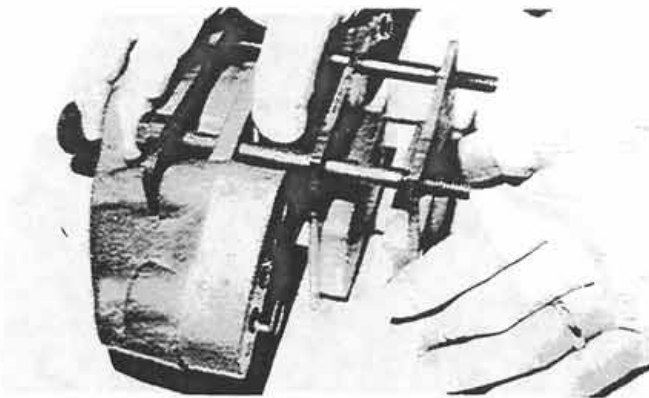


Figure 22:

10. Install the two new pads and holder assemblies onto the pins with the friction faces in contact with each other (Fig. 22).

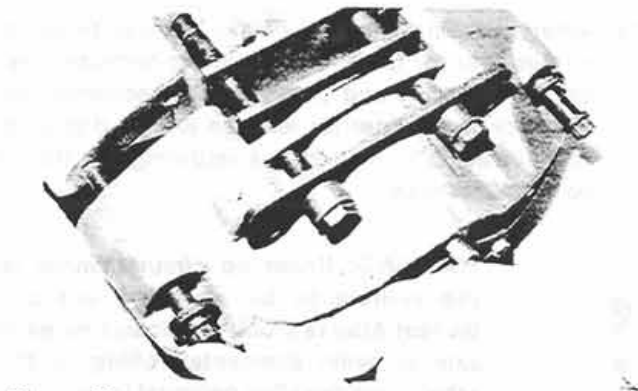


Figure 23:

11. Install the carrier side casting onto the pins and secure it by installing two of the twelve-point retaining bolts with washers at the outermost two holes of the caliper assembly (Fig. 23). Tighten only after all bolts have been started.

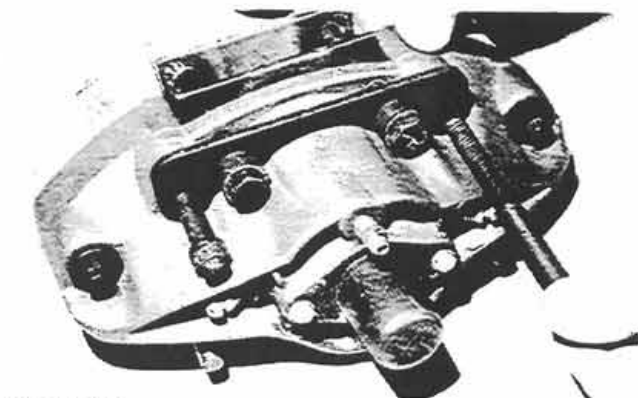


Figure 24:

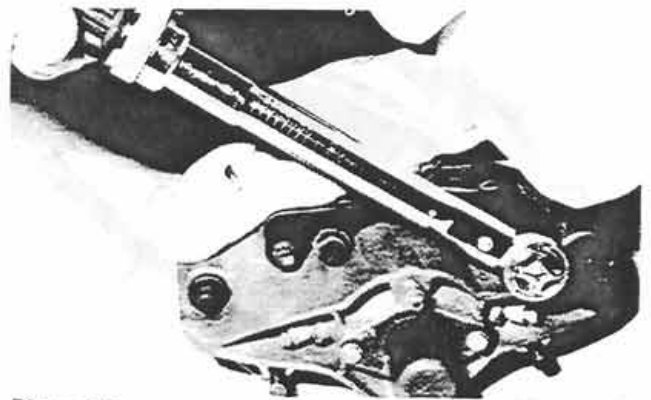


Figure 25:

12. Install the remaining two twelve-point bolts (without washers) through the outermost two holes of the bridge plate (Fig. 24). After carefully aligning to avoid binding of the bolt threads, torque the bolts to 44 lb. ft. (6.08 Kg/M). The inner set of twelve-point bolts should be torqued before the outer set (Fig. 25).

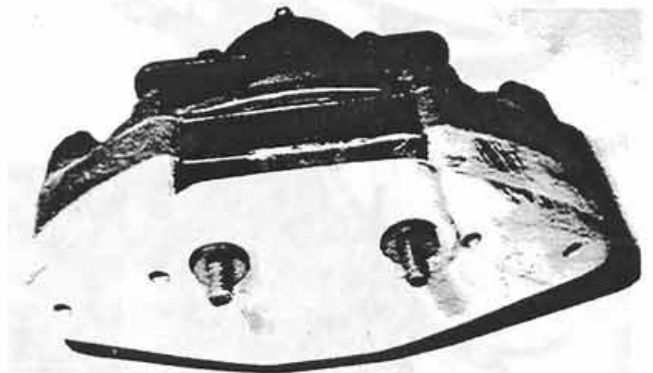


Figure 26:

13. Install a rubber bushing and a flanged nut on each of the threaded ends of the pad retaining pins protruding through the carrier side casting. The rubber bushing will fit in a recess in the carrier side casting (Fig. 26).

Single Disc Brake System

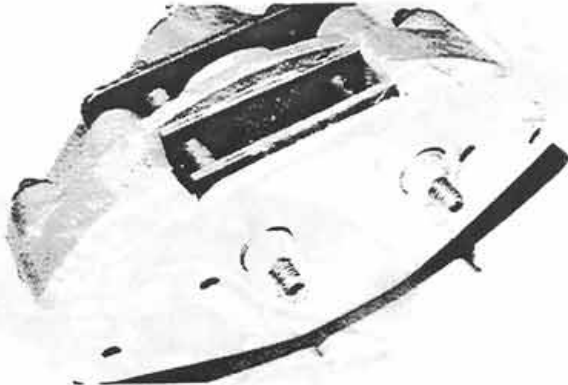


Figure 27:

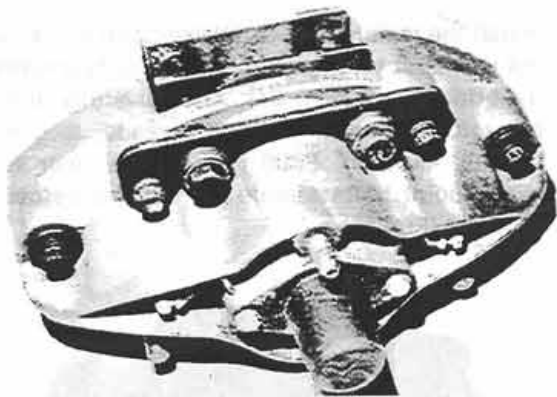


Figure 28:

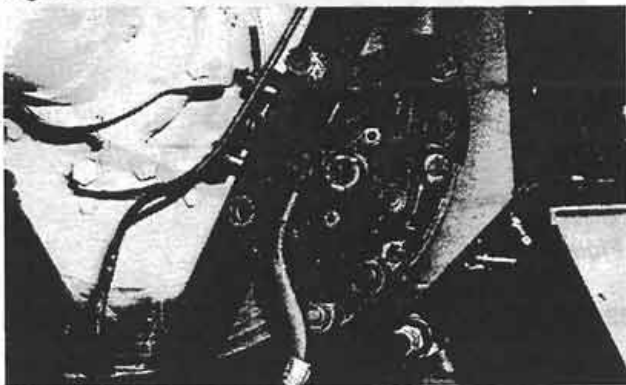


Figure 29:

Observe the rubber bushings as the flanged nut is tightened on the pin, and tighten the nut until the rubber bushing starts to extrude past the flanged nut face (Fig. 27). There will be a slight bulging of the rubber bushing on the opposite end of the pin (Fig. 28).

14. Install the brake assembly with through bolts and hangers (Fig. 29), and ensure that the plunger, spring and retainer plate are fitted to the brake bar.

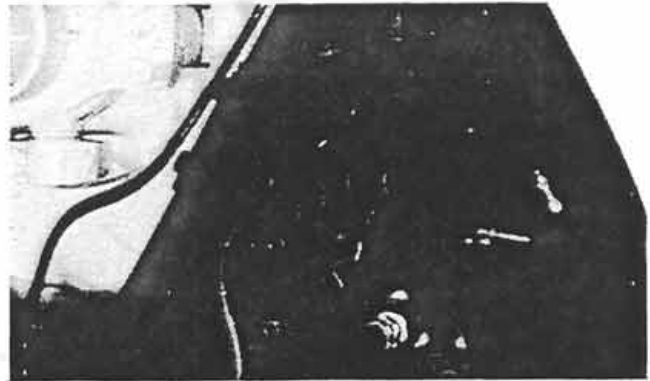


Figure 30:

15. After making the necessary line connections, bleed air from the brake system and refill the master cylinder fluid as required (Fig. 30).
16. After pumping the pedal hard several times to ensure that the brake is functioning correctly, test drive the tractor and check braking performance. Recheck the caliper for leakage and/or dragging, and correct if needed before returning the tractor to normal service.



WARNING: Under no circumstances is the vehicle to be operated without brakes! Always block the wheels on each axle to avoid accidental rolling of the vehicle and possible personal injury.

Single Disc Brake System

Master Cylinder

Removal and Disassembly



Figure 1:

1. Disconnect electrical wiring at the brake pressure switch, the brake line from the fitting (and cap the line) (Fig. 1). Loosen the fill cap with a wrench if necessary.

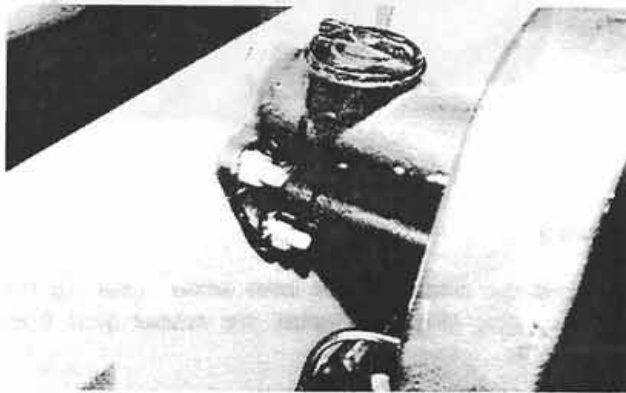


Figure 2:

2. Remove the three (3) self-locking hexagon nuts from the cylinder mount flange (Fig. 2), and pull the unit forward.



Figure 3:

3. Remove the fill cap and pour the fluid into a waste container. Remove the rubber dust boot from the rear of the cylinder to expose the snap ring and piston (Fig. 3).

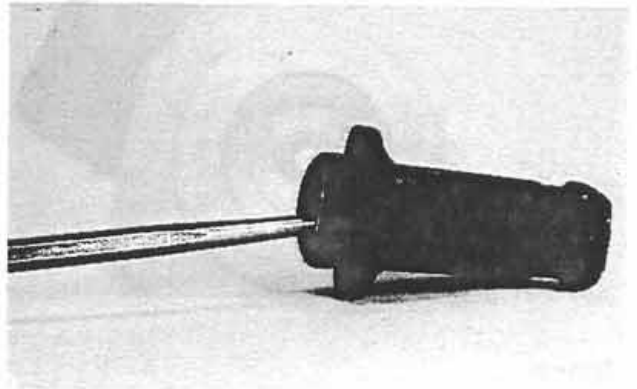


Figure 4:

4. Using a snap ring pliers or screwdriver (depending on the type of snap ring used), remove the snap ring while holding the piston inward against spring pressure (Fig. 4).



Figure 5:

5. The piston should be free to come out (Fig. 5). If it does not, light tapping on the cylinder body or working the piston in and out should gradually free it.

Single Disc Brake System

Inspection and Repair

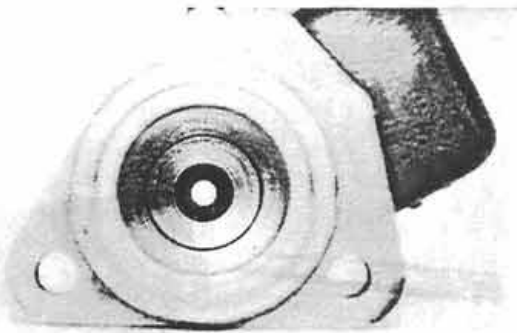


Figure 6:

1. Thoroughly clean the master cylinder housing and fill cap, then blow dry with compressed air.
2. Examine the bore of the master cylinder (Fig. 6). If only light scratches or pitting are present, they may be removed with a small brake cylinder hone.

IMPORTANT: After honing operations, again thoroughly clean and dry the master cylinder.

If the scratches or pitting cannot be removed by light honing, replace the housing or entire assembly.

Reassembly and Installation

1. Lubricate the housing bore and the piston/seal assembly with clean brake fluid. (DO NOT USE OIL OR GREASE.)



Figure 7:

2. Carefully install the spring and piston seal assembly into the cylinder bore. As the piston seal approaches the snap ring groove of the cylinder housing (Fig. 7), wobble the piston until the seal works into the bore.

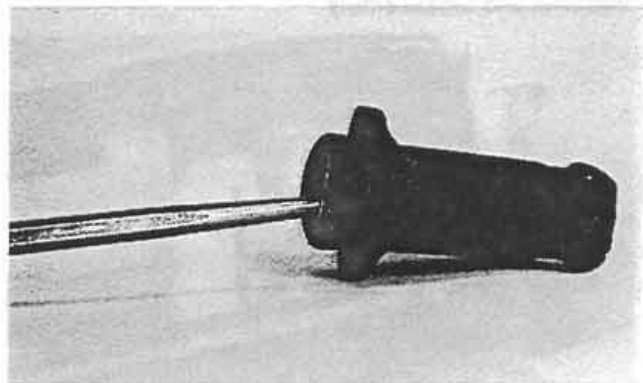


Figure 8:

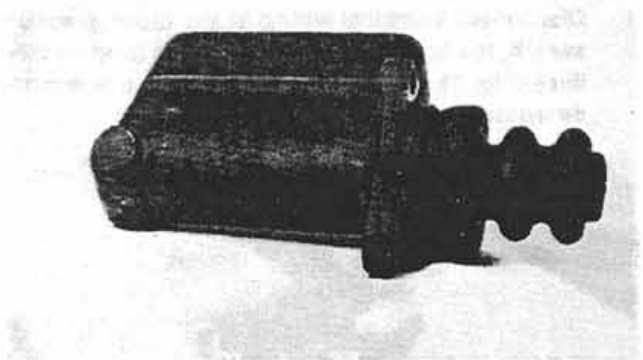


Figure 9:

3. Hold the piston in the bore while installing the snap ring (Fig. 8). Install the rubber dust boot (Fig. 9).

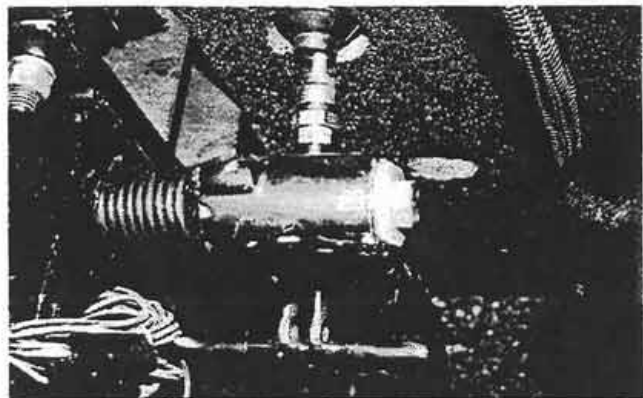


Figure 10:

4. Guide the pedal push rod through the dust boot and fasten the cylinder to the cab (Fig. 10). Reconnect the push rod and clevis at the brake pedal, if it was previously removed.

Single Disc Brake System



Figure 11:

5. Reconnect the brake line and brake switch wires (Fig. 11).
6. Fill the master cylinder fluid reservoir and bleed the brake system. Refill the reservoir after bleeding is completed.

Testing and Adjusting

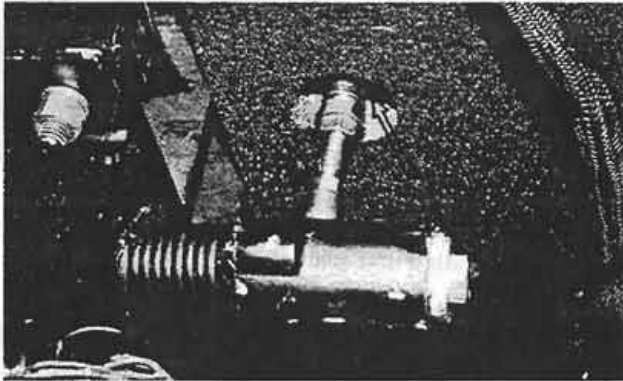


Figure 12:

1. Apply moderate pedal pressure for several minutes to see if the piston seal will leak. If leakage is present it can be observed when the rubber dust boot is loosened from the rear of the cylinder (Fig. 12).

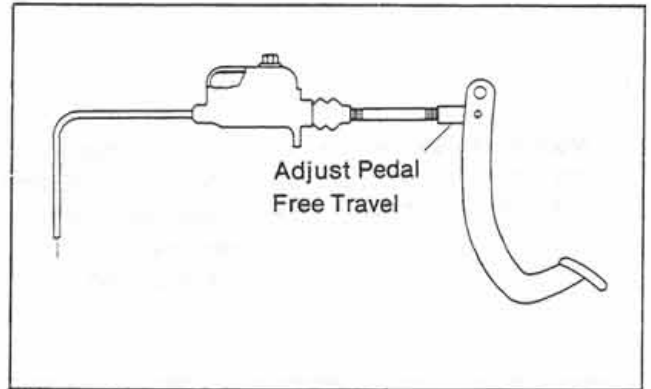


Figure 13:

2. Adjust the pushrod to allow some free play between the pedal and piston. After zero clearance, one full turn of the pushrod into the yoke is appropriate (Fig. 13).

Brake Disc

Inspection

Inspect the brake disc with the disc mounted on its drive flange to determine if replacement is needed.

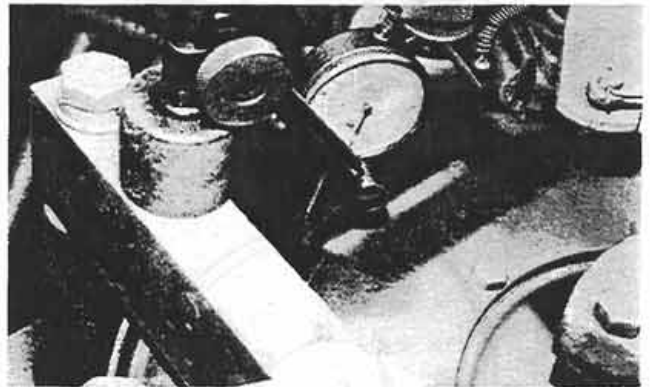


Figure 1:

1. With the upper driveline disconnected, mount a dial indicator on one of the brake mount bars (Fig. 1) and turn the brake disc to check for excessive runout. If runout exceeds .030 inch (.76 MM), replace the brake disc.

Single Disc Brake System

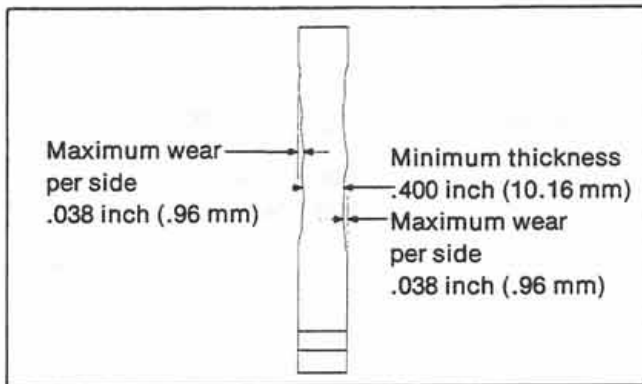


Figure 2:

2. Measure the brake disc for wear (Fig. 2), and if worn to less than .400 inch (10.16 MM), tapered more than .038 inch (.96 MM) along its wear path, or displays large grooves deeper than .038 inch (.96 MM), then replace the brake disc.

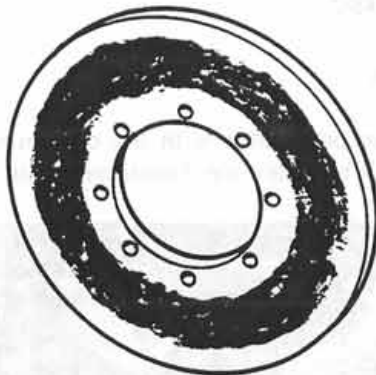


Figure 3:

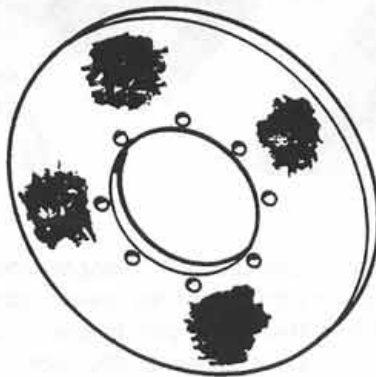


Figure 4:

3. Observe the finish of the brake disc. It should be smooth enough to eliminate a grinding action on the brake pads. The finish of the brake disc should be uniform throughout the entire circumference (Fig. 3). If spotted heavily with "welded" brake pad material (Fig. 4), replace the brake disc.

Removal

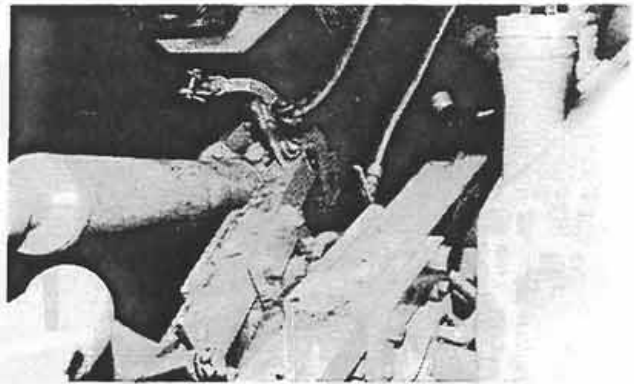


Figure 5:

1. Remove the brake mount bar(s) intact with caliper assemblies and lines still connected (Fig. 5).



Figure 6:

2. Disconnect the upper driveline at the transmission output flange and swing it aside (Fig. 6).

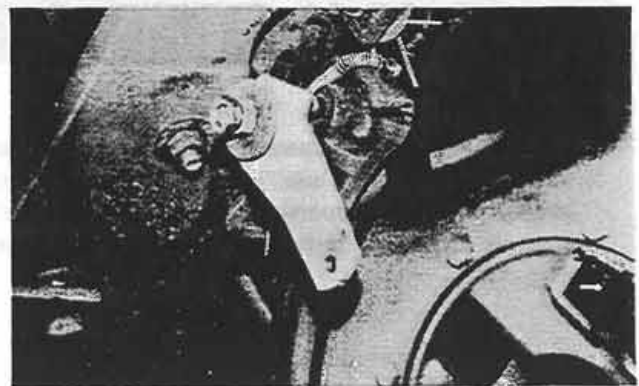


Figure 7:

3. Loosen the cam lock nut on the park brake caliper to allow extra clearance when removing the disc (Fig. 7).

Single Disc Brake System

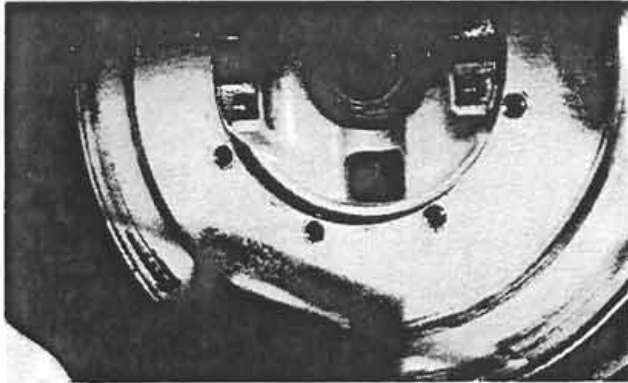


Figure 8:

4. Remove the capscrews that retain the disc to the transmission output yoke. Pull the bottom of the disc rearward then lower it enough to clear the park brake caliper (Fig. 8).

Installation

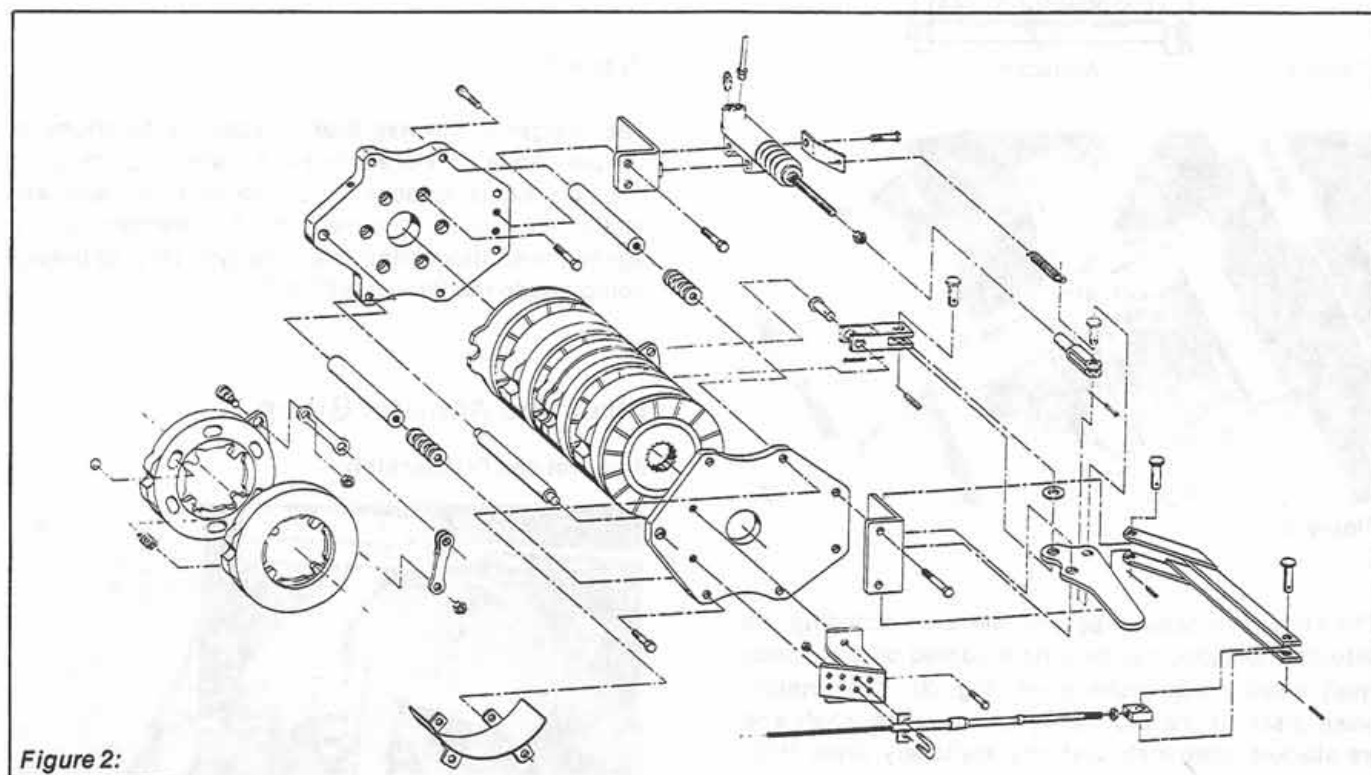
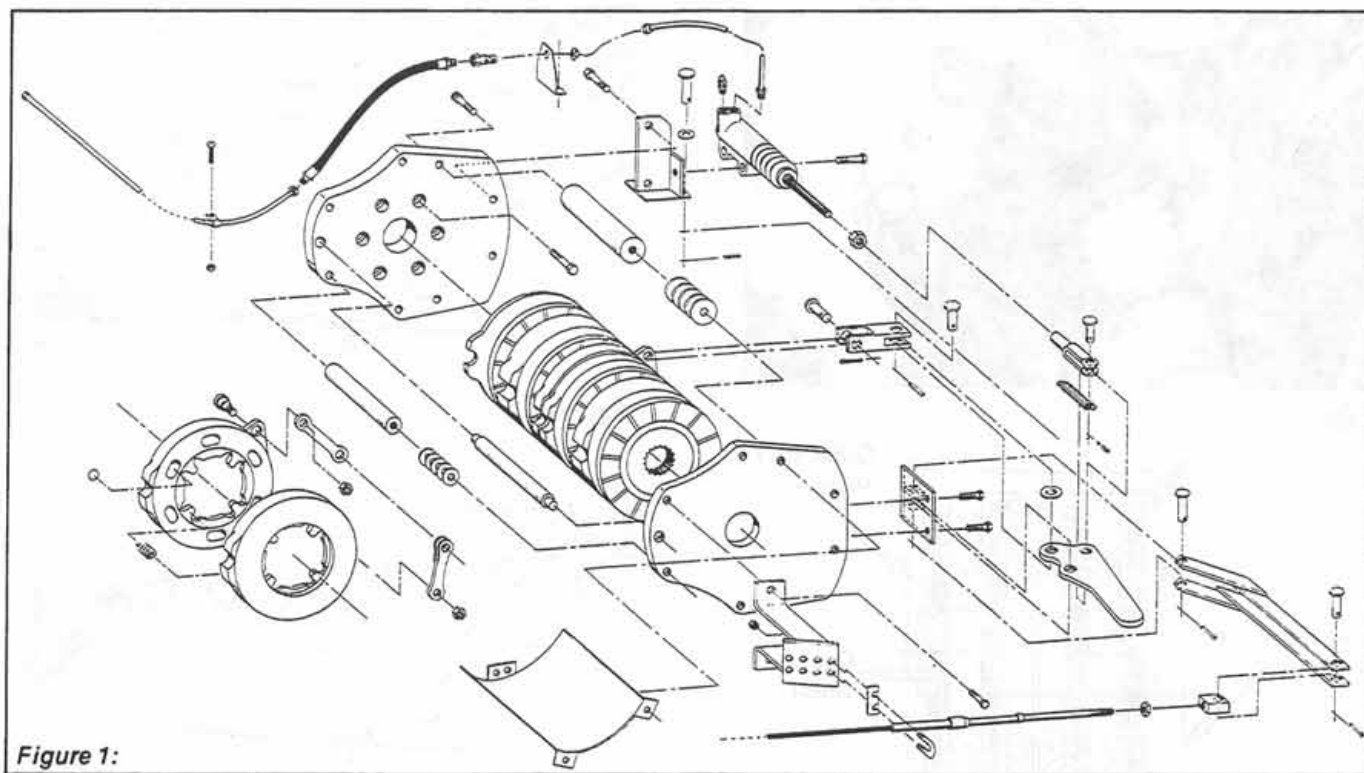
1. After installation of the brake disc, driveline, brake mount bars and calipers, adjust the park brake (see Park Brake Caliper, Reassembly Installation and Adjusting, step 5).
2. If the brake disc (and/or brake pads) were replaced, the pistons in the hydraulic calipers must be bottomed in their bores. (See Single Piston Hydraulic Brake Caliper section.)

Series III "ST" BC, C & P

Multi Disc Brake System

Under Serial No 2001

General Information



The Steiger Multi-Disc Brake System is used only on the Steiger Tractors that employ the two-speed transfer case. The brake design will depend on the transfer case model used. For instance, in comparing the models C, E and F transfer cases, note that the model C unit has an offset center shaft (Fig. 1) while the models E and F

do not (Fig. 2). Though design variations are present, operating principles and repair procedures are identical. All repair procedures on the brake can be done with the transfer case in the tractor.

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Multi Disc Brake System

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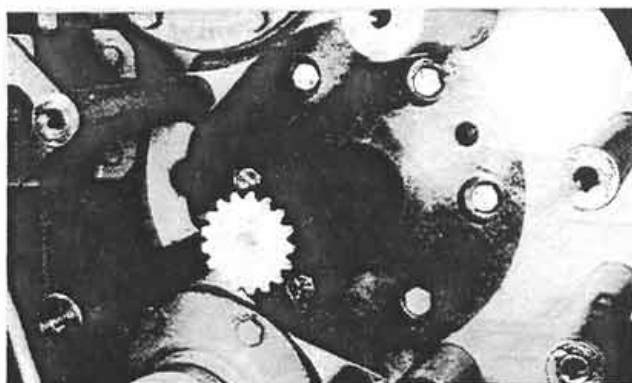


Figure 3:

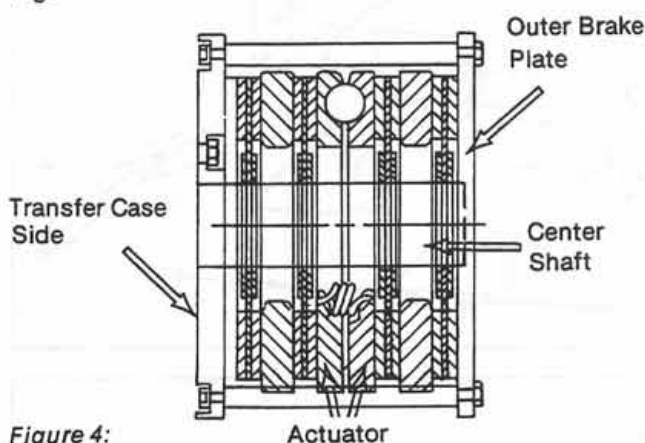


Figure 4:

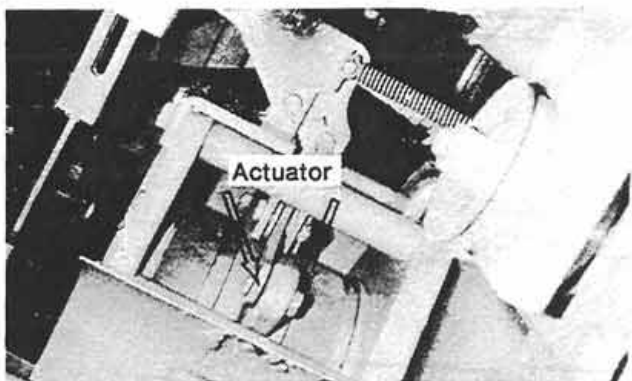


Figure 5:

The stationary brake disc arrangement, including the actuator, is supported by pins mounted on the center shaft bearing cap/brake plate (Fig. 3). The rotating brake discs fit the protruding spline center shaft and are stacked alternately with the stationary discs (Fig. 4). The actuator assembly is located in the center of the brake disc arrangement (Fig. 5), and is connected mechanically to a hydraulic slave cylinder. Whenever the slave cylinder is activated, the actuator plates spread and contact the brake discs. As further pressure is applied, braking forces are greatly increased due to the self-energizing effect of the actuator assembly.

Revised May, 1982

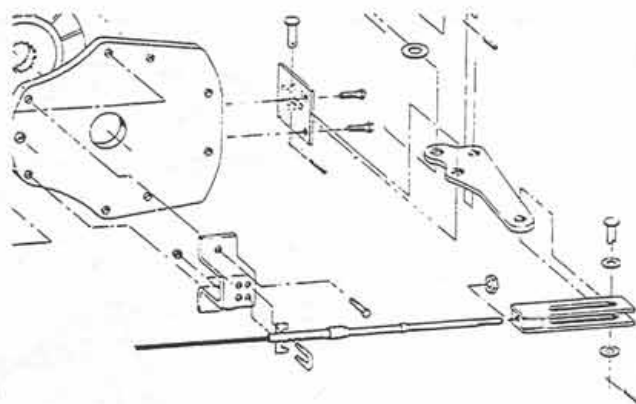


Figure 6:

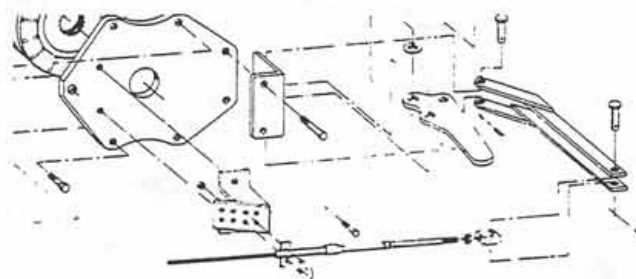


Figure 7:

The Steiger Multi-Disc Brake Assembly functions as the park brake as well as the main brake. Application of the park brake is done by a locking-type cable and sliding yoke/bracket connected to the mechanical linkage to the actuator. Note the early type (Fig. 6) linkage compared to the later type (Fig. 7).

Discs and Actuator Group

Removal and Disassembly

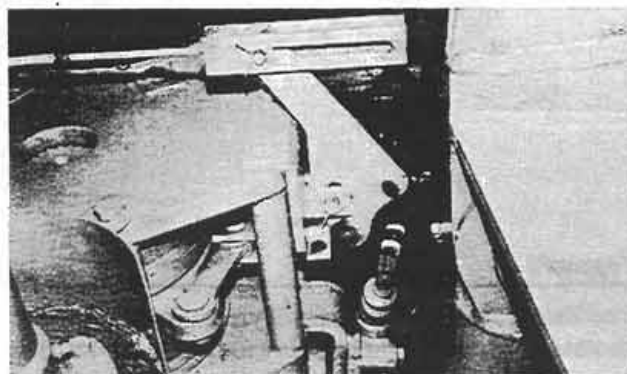


Figure 1:

1. Disconnect the actuator yoke and push rod clevis from the lever (Fig. 1).

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Multi Disc Brake System

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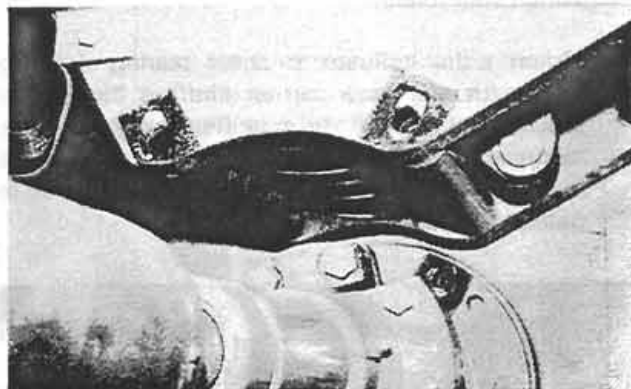


Figure 2:



Figure 3:

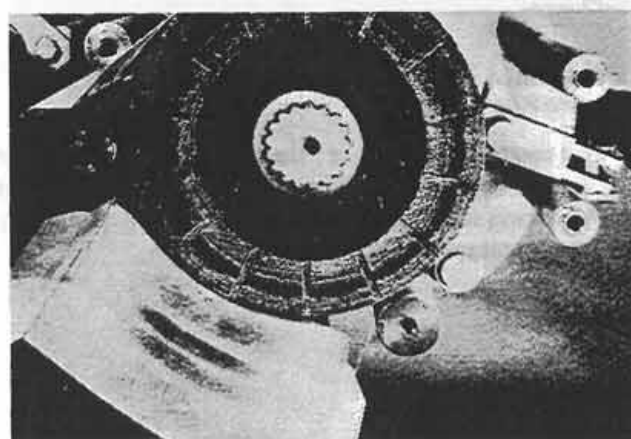
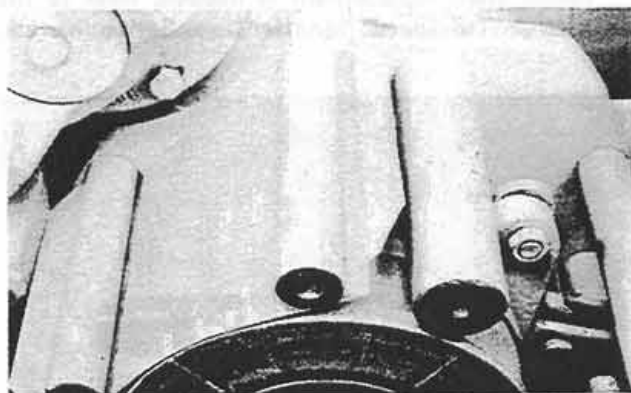


Figure 4:

Revised May, 1982

2. Remove the brake shields if the bolt-on type is used (Fig. 2). Remove the park brake cable and bracket from the outer brake plate (Fig. 3), then remove the outer brake plate. If the slip-in type brake shields are used (Fig. 4), remove at this time.
3. Carefully remove the brake discs individually to maintain the same order if they are to be reused.

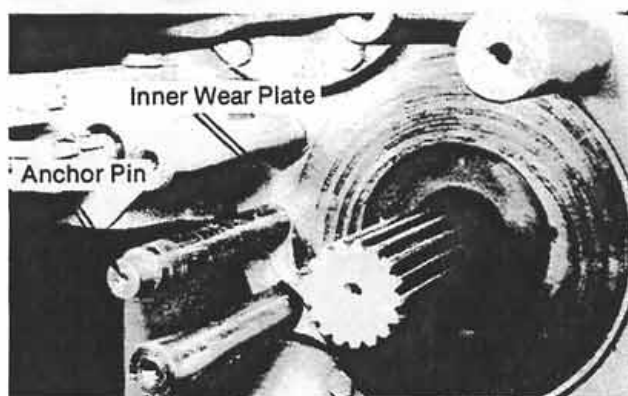


Figure 5:

4. Remove the anchor pin and inner wear plate (Fig. 5) from the bearing cap/brake plate assembly.

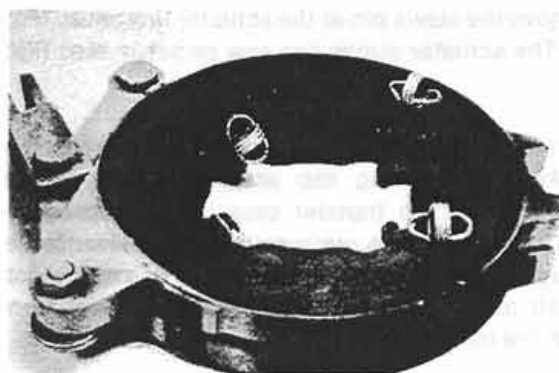


Figure 6:

5. Release the actuator return springs (Fig. 6), then

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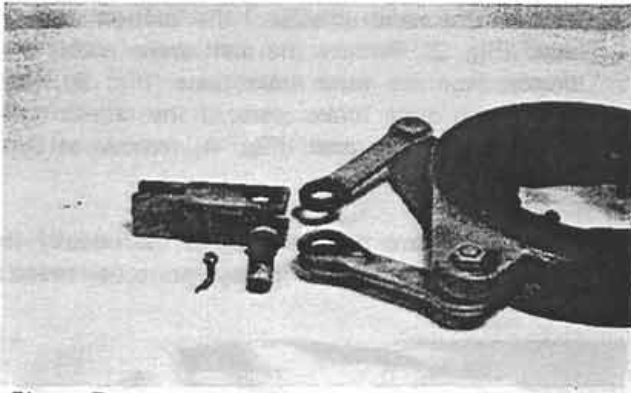


Figure 7:



Figure 8:

remove the clevis pin at the actuator link ends (Fig. 7). The actuator plates can now be separated (Fig. 8).

6. If removal of the support pins is required, the brake plate/bearing cap assembly must be removed from the transfer case before capscrews can be loosened to remove the pins. Refer to the Steiger two-speed transfer case service manual for repair procedures, however, repairs may be done with the transfer case in the tractor chassis.

Inspection and Repair

1. Mount a dial indicator to check bearing clearance of the transfer case center shaft. If the bearing clearance is out of the specified range, or if the center shaft oil seal is leaking, refer to the Steiger Two-Speed Transfer Case Service Manual for repair procedures.

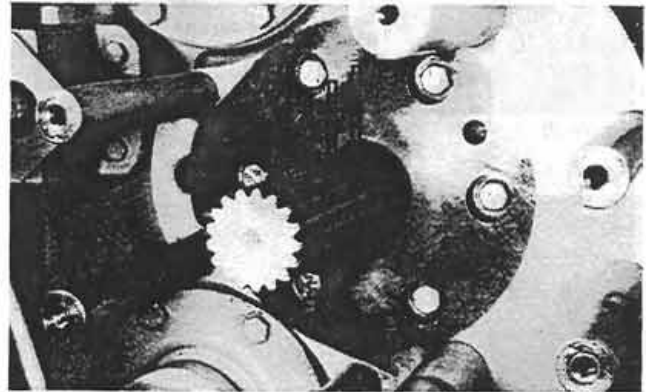


Figure 9:

2. Inspect the splines of the protruding center shaft for wearing at the four (4) disc fitting areas (Fig. 9). If wearing is severe enough to let the brake discs hang-up, the center shaft must be replaced. If center shaft replacement is needed, refer to the Steiger Two-Speed Transfer Case Service Manual.

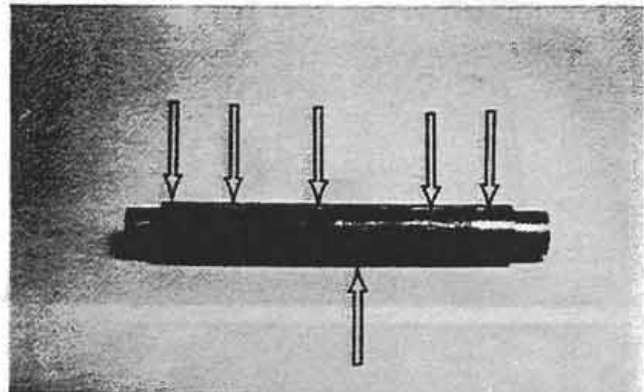


Figure 10:

3. Inspect the surface of the anchor pin at point of stationary brake plate contact (Fig. 10). Replace if wearing is severe enough to cause the stationary brake plates to hang-up.

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Under Serial No 2001



Figure 11:

4. Inspect the stationary brake plates for cracks, wear and finish appearance. If cracked or worn far enough so new brake discs will not fit properly on the used stationary plates, replace the stationary plates. The finish should be smooth and uniform throughout the disc wear faces (Fig. 11). If the wear surfaces are heavily grooved or display roughness which would grind the lining material from the rotating discs, replacement of the stationary disc(s) is required.

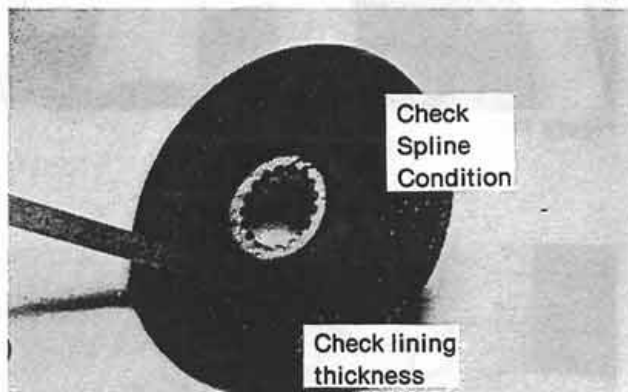


Figure 12:

5. Inspect the rotating brake discs for lining thickness and splined hub condition. Disc(s) should be replaced when lining material surface is less than 1/16 inch (1.58 MM) from the disc backing plate (Fig. 12), or if the hub splines are worn to the point of excess looseness on the center shaft.

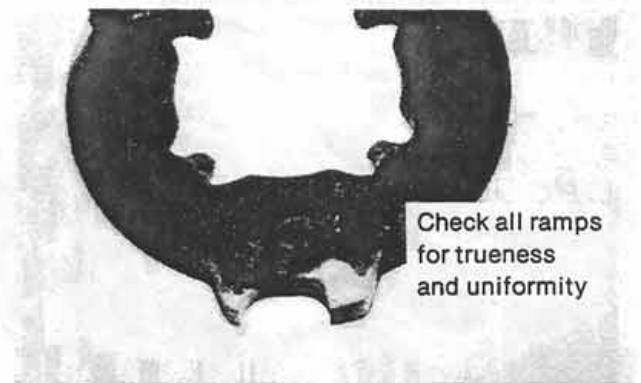


Figure 13:

6. With the actuator disassembled, inspect the wear faces as described in step 4. Proceed by inspecting the ramps of actuator plates (Fig. 13). If "pockets" are worn into the ramp surfaces, replace the disc(s) as required.

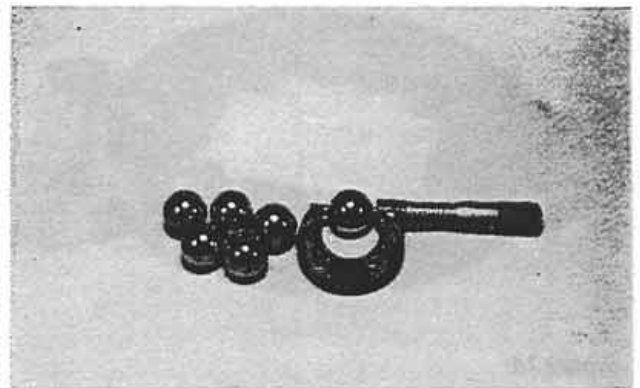


Figure 14:

7. Measure the actuator balls to insure roundness and equal size (Fig. 14). If out of round or badly pitted, replace all the balls in the actuator assembly.

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Reassembly, Installation and Adjusting

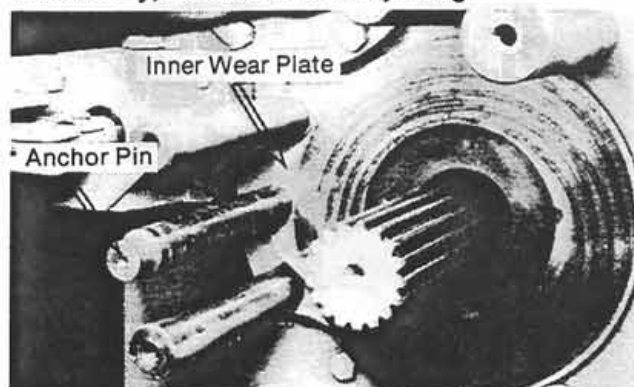


Figure 15:

1. With the brake plate/bearing cap with support pins already mounted, install the anchor pin and inner wear plate with its grooved side facing the transfer case (Fig. 15).



Figure 16:

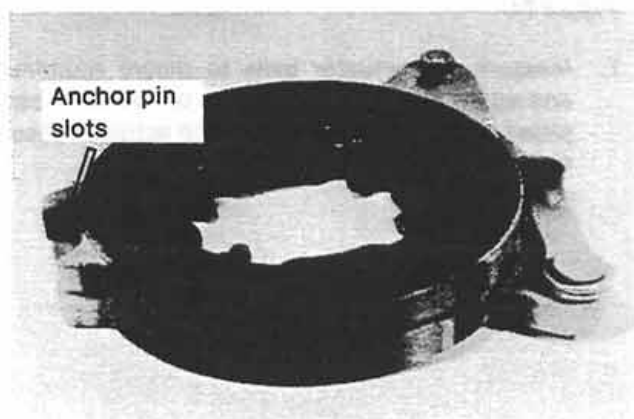


Figure 17:

2. Assemble the actuator by laying the first plate face down. Install the balls in the ramps (Fig. 16). Position the second plate onto the balls ensuring that the anchor pin slots are near each other (Fig. 17).

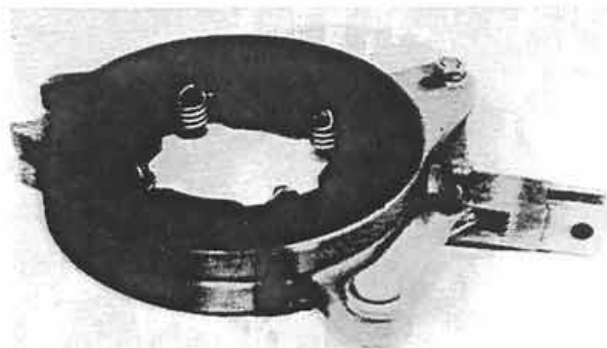


Figure 18:

Install the actuator return springs and reconnect the link ends with the clevis pin and yoke block (Fig. 18).

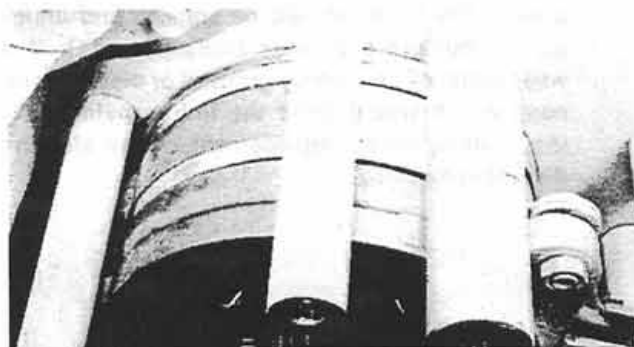


Figure 19:

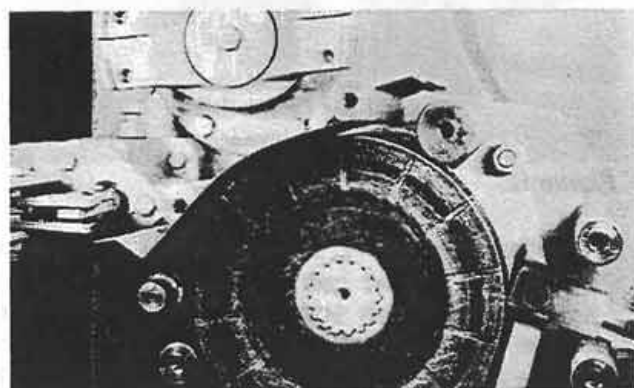


Figure 20:

3. Install a brake disc, stationary plate, brake disc, actuator assembly (Fig. 19), disc, stationary plate, brake disc, slip-in shields, if used and outer brake plate in the order given (Fig. 20). If reassembly is done with reusable parts, maintain the order in which they were removed. Connect the brake lever, slave cylinder and park brake cable. If the slip-in type brake shields are used, install at this time.

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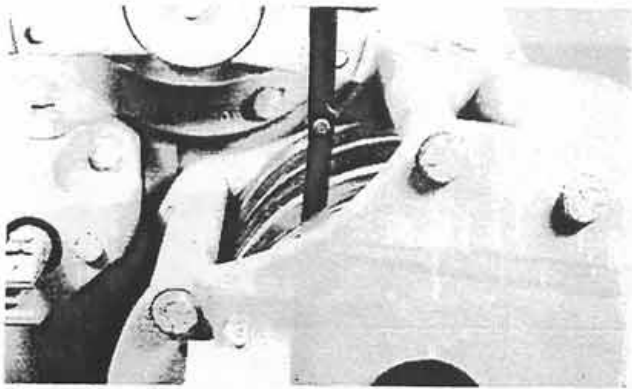


Figure 21:

4. After installing the outer brake plate, the brake is adjusted to a minimum clearance of .090 inch (2.28 MM) between the brake disc stack and the outside plate (Fig. 21) by adjusting the length of the threaded rod on the slave cylinder.

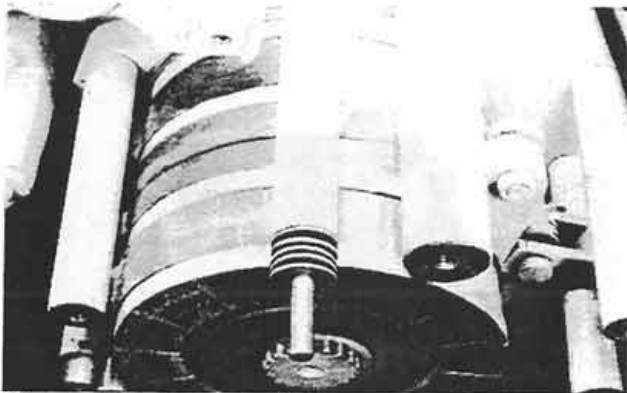


Figure 22:

NOTE: Later production brakes have shorter support pins to allow the use of shims to compensate for disc and plate wear (Fig. 22).

If an entire new brake is being installed along with the shim kit, then five shims are installed on each pin.

If the shim kit is being installed with a used brake then a shim adjustment may already be necessary. Assemble the brake using five shims on each pin and follow the brake adjustment instructions.



Figure 23:

5. The brake should be adjusted by removing shims when the travel distance measured between the actuating discs (Fig. 23) is from .170 inch (4.31 MM) to a maximum of .200 inch (5.08 MM) when the brake is activated from a fully relaxed position to a fully applied position. The park brake can be applied to hold the brake in the applied position.

Normally, the removal of one shim from each pin should be sufficient to restore the brake to the optimum working range. There are a total of five shims that can eventually be removed. At no time should the shim removal result in a travel distance of less than .090 inch. When using shims on the support pins, they must be of equal total thickness on ALL pins. If bolt-on brake shields are used, install at this time.

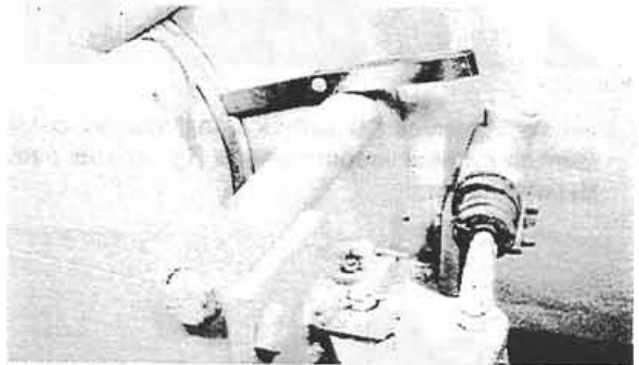


Figure 24:

6. Torque the outer brake plate capscrews to 58 lb. ft. (8.02 Kg/M). After shim removal and reassembly have been completed, the brake should be adjusted to a minimum clearance of .090 inch (2.28 MM) between the outside plate and brake disc stack by adjusting the length of the threaded rod on the slave cylinder (Fig. 24).
7. Test drive the tractor after repairs and/or adjustments have been completed to ensure proper brake operation and performance.

Series III "ST" BC, C & P

Multi Disc Brake System

Under Serial No 2001

Master Cylinder

Removal and Disassembly



Figure 1:

1. Disconnect the electrical wiring at the brake pressure switch, and the brake line from the fitting (then cap the line) (Fig. 1). Loosen the fill cap with a wrench if necessary.



Figure 2:

2. Remove the three (3) self-locking hexagon nuts from the cylinder mount flange (Fig. 2) and pull the unit forward.

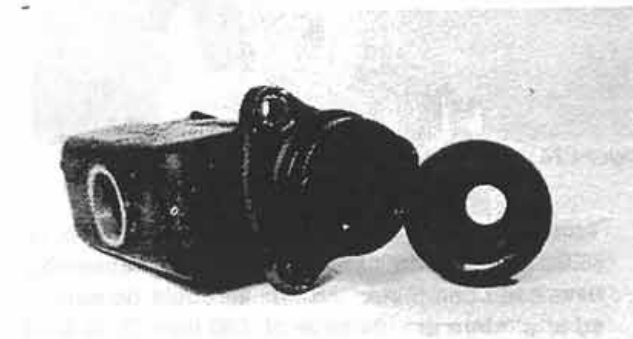


Figure 3:

3. Remove the fill cap and pour the fluid into a waste container. Remove the rubber dust boot from the rear of the cylinder to expose the snap ring and piston (Fig. 3).

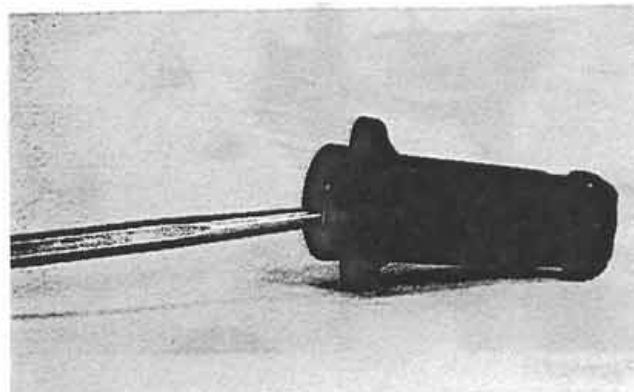


Figure 4:

4. Using a snap ring pliers or screwdriver (depending on the type of snap ring used), remove the snap ring while holding the piston inward against spring pressure (Fig. 4).

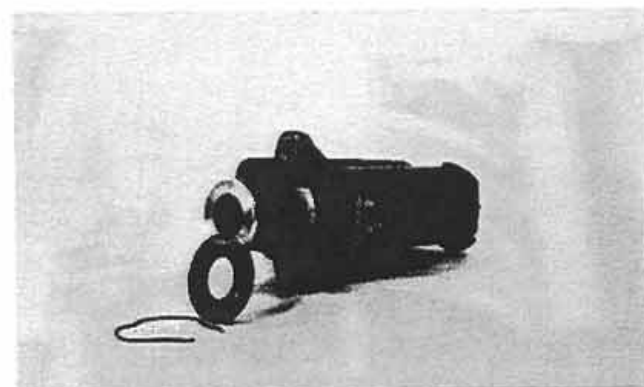


Figure 5:

5. The piston should be free to come out (Fig. 5). If it does not, light tapping on the cylinder body or working the piston in and out should gradually free it.

Series III "ST" BC, C & P

Multi Disc Brake System

Under Serial No 2001

Inspection

1. Thoroughly clean the master cylinder housing and fill cap, then blow dry with compressed air.

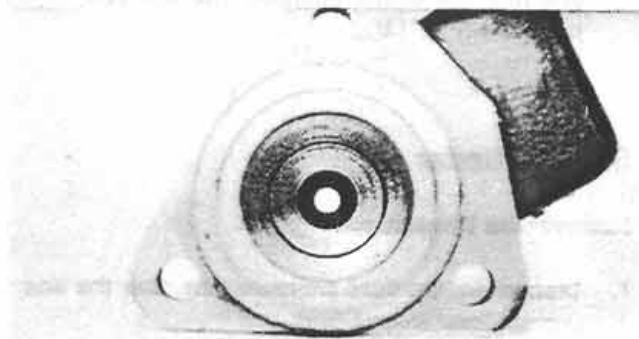


Figure 6:

2. Examine the bore of the master cylinder (Fig. 6). If only light scratches or pitting are present, they may be removed with a small brake cylinder hone.

IMPORTANT: After honing operations, again thoroughly clean and dry the master cylinder.

If the scratches or pitting cannot be removed by light honing, replace the housing or entire assembly.

Reassembly and Installation

1. Lubricate the housing bore and the piston/seal assembly with clean brake fluid. (DO NOT USE OIL OR GREASE.)

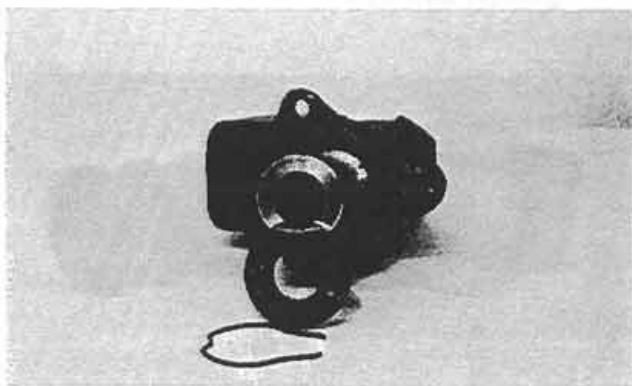


Figure 7:

2. Carefully install the spring and piston seal assembly into the cylinder bore. As the piston seal approaches the snap ring groove of the cylinder housing (Fig. 7), wobble the piston until the seal works into the bore.

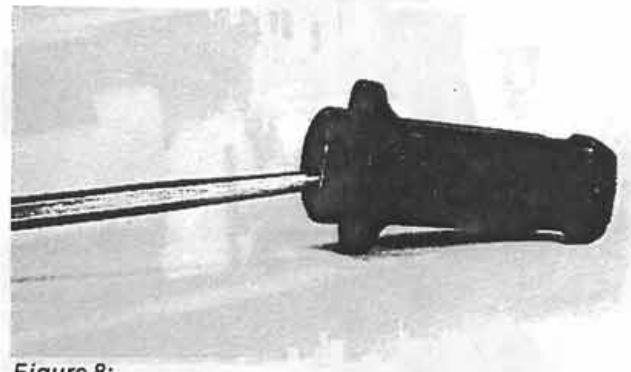


Figure 8:

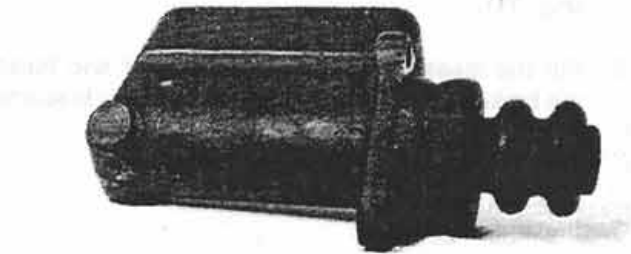


Figure 9:

3. Hold the piston in the bore while installing the snap ring (Fig. 8). Install the rubber dust boot (Fig. 9).

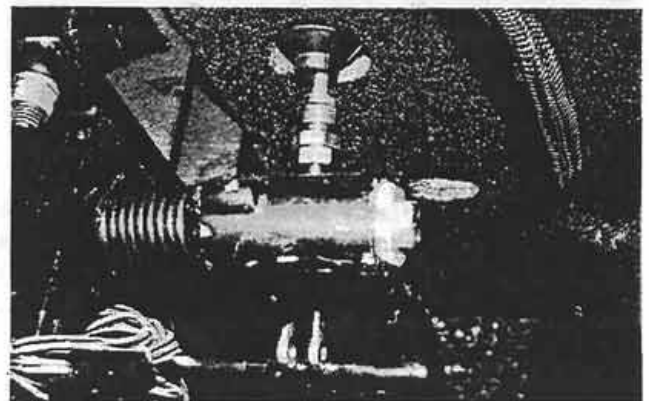


Figure 10:

4. Guide the pedal push rod through the dust boot and fasten the cylinder to the cab (Fig. 10). Reconnect the pushrod and clevis at the brake pedal, if it was previously removed.

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Multi Disc Brake System

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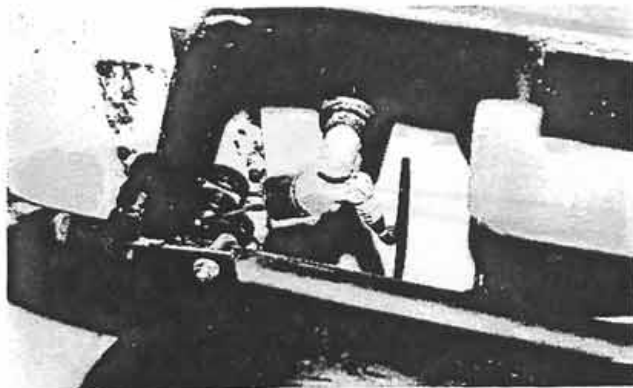


Figure 11:

5. Reconnect the brake line and brake switch wires (Fig. 11).
6. Fill the master cylinder fluid reservoir and bleed the brake system. Refill the reservoir after bleeding is completed.

Testing and Adjusting

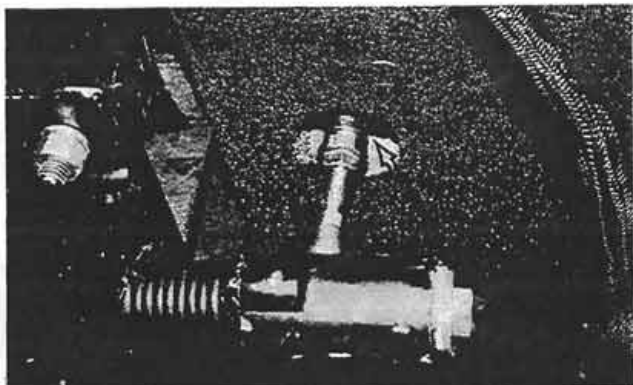


Figure 12:

1. Apply moderate pedal pressure for several minutes to see if the piston seal will leak. If leakage is present, it can be observed when the rubber dust boot is loosened from the rear of the cylinder (Fig. 12).

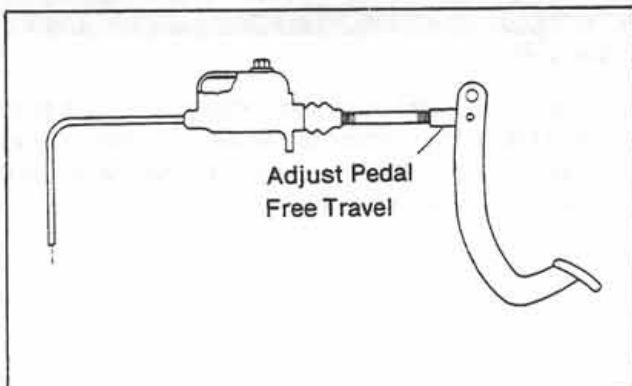


Figure 13:

2. Adjust the pushrod to allow some free play between the pedal and piston. After zero clearance, one full turn of the pushrod into the yoke is appropriate (Fig. 13).

Slave Cylinder

Removal and Disassembly

1. Disconnect the fluid pressure line. Cap the line to prevent total loss of fluid.

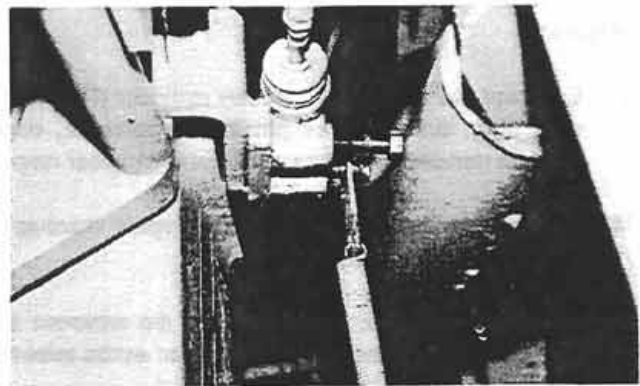


Figure 1:

2. Remove the two (2) through bolts fastening the slave cylinder to its mounting bracket (Fig. 1), and remove the unit by pulling the rubber boot from the pushrod/clevis assembly.
3. Empty the fluid into a waste container while pushing the piston inward.

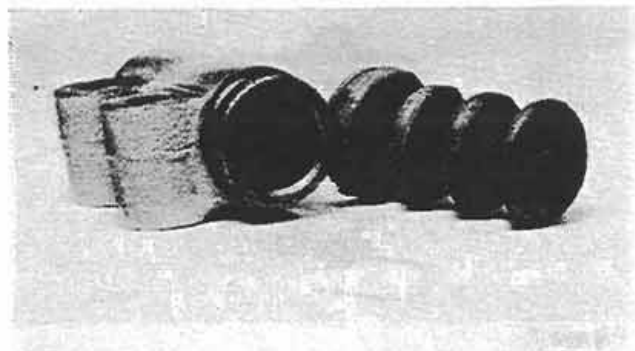


Figure 2:

4. Remove the rubber boot for access to the snap ring and piston (Fig. 2).

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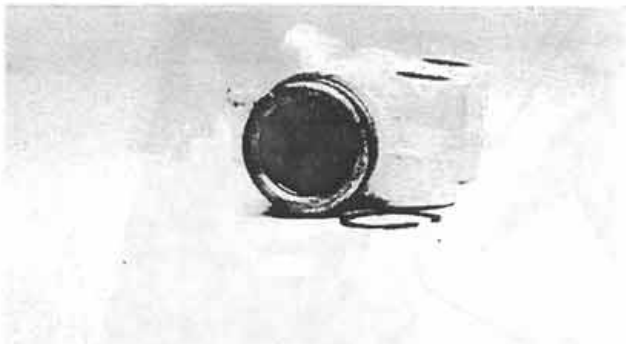


Figure 3:

5. Using a snap ring pliers or screwdriver (depending on the type of snap ring used), remove the snap ring (Fig. 3).

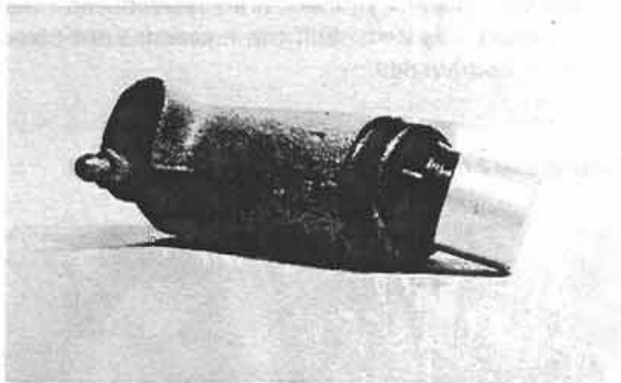
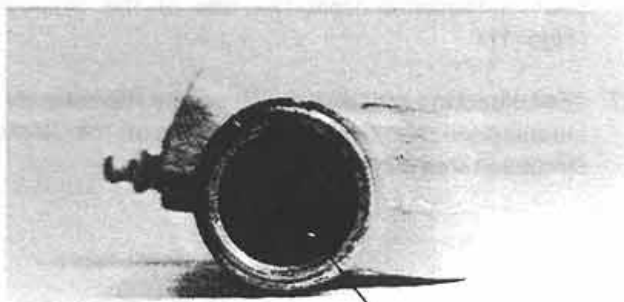


Figure 4:

6. The piston should be free to come out (Fig. 4). If it does not, light tapping on the cylinder body or working the piston in and out should gradually free it.

Inspection and Repairs

1. Thoroughly clean the cylinder housing and fill cap, then blow dry with compressed air.



Inspect Bore
Condition

Figure 5:

2. Examine the bore of the cylinder (Fig. 5). If only light scratches or pitting are present, they may be removed with a small brake cylinder hone.

IMPORTANT: After honing operations, again thoroughly clean and dry the slave cylinder.

3. If the scratches or pitting cannot be removed by light honing, replace the housing or entire assembly.

Reassembly and Installation

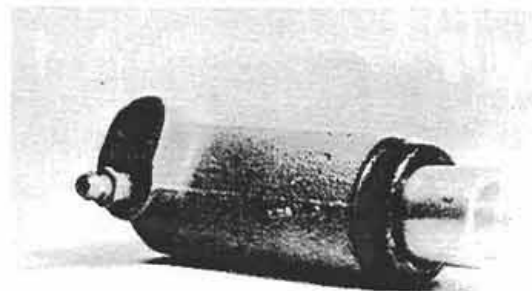


Figure 6:

1. Lubricate the housing bore and the piston/seal assembly with clean brake fluid. (DO NOT USE OIL OR GREASE.)
2. Carefully install the piston/seal assembly into the cylinder bore. As the piston seal approaches the snap ring groove of the cylinder housing (Fig. 6), wobble the piston until the seal works into the bore.

Series III "ST" BC, C & P

Multi Disc Brake System

Under Serial No 2001



Figure 7:

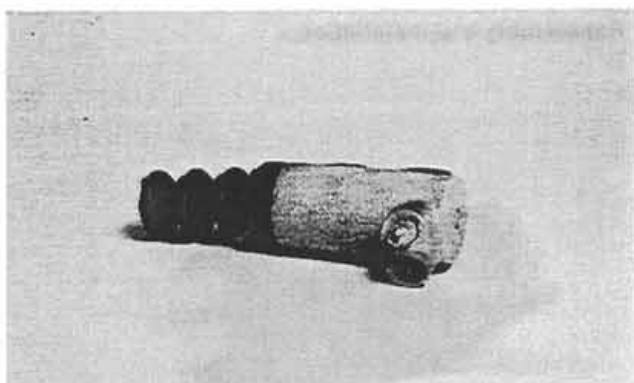


Figure 8:

3. Insert the piston in the bore. Install the snap ring (Fig. 7) and the rubber dust boot (Fig. 8).

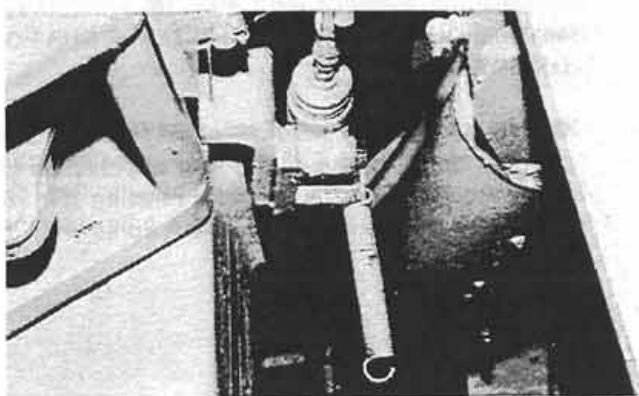


Figure 9:

4. Guide the pushrod through the dust boot and fasten the cylinder to the mount bracket and torque the through bolts (Fig. 9) to 38 lb. ft. (5.25 kg/M).

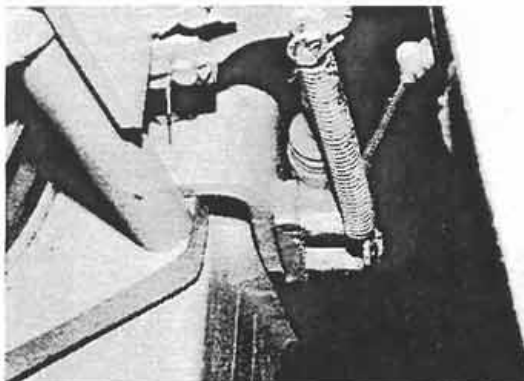


Figure 10:

5. Reconnect the brake line and return spring (Fig. 10).
6. Fill the master cylinder fluid reservoir and bleed the brake system. Refill the reservoir after bleeding is completed.

Testing and Adjusting



Figure 11:

1. Apply moderate pedal pressure for several minutes to see if the piston seal will leak. If leakage is present, it can be observed when the rubber dust boot is loosened from the rear of the cylinder (Fig. 11).
2. For adjusting procedures refer to the Reassembly, Installation and Adjusting section of the Brake Group in this service manual.