



**Hydraulic Cylinder
Compact Tractors
Service Manual 9-99832**

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SERVICING THE DOUBLE-ACTING MODEL H26 THREE POINT HITCH

Cylinder Part Number C15771 and Double Acting Model H30 Hydraulic Lift Cylinder, Part Number C16134.

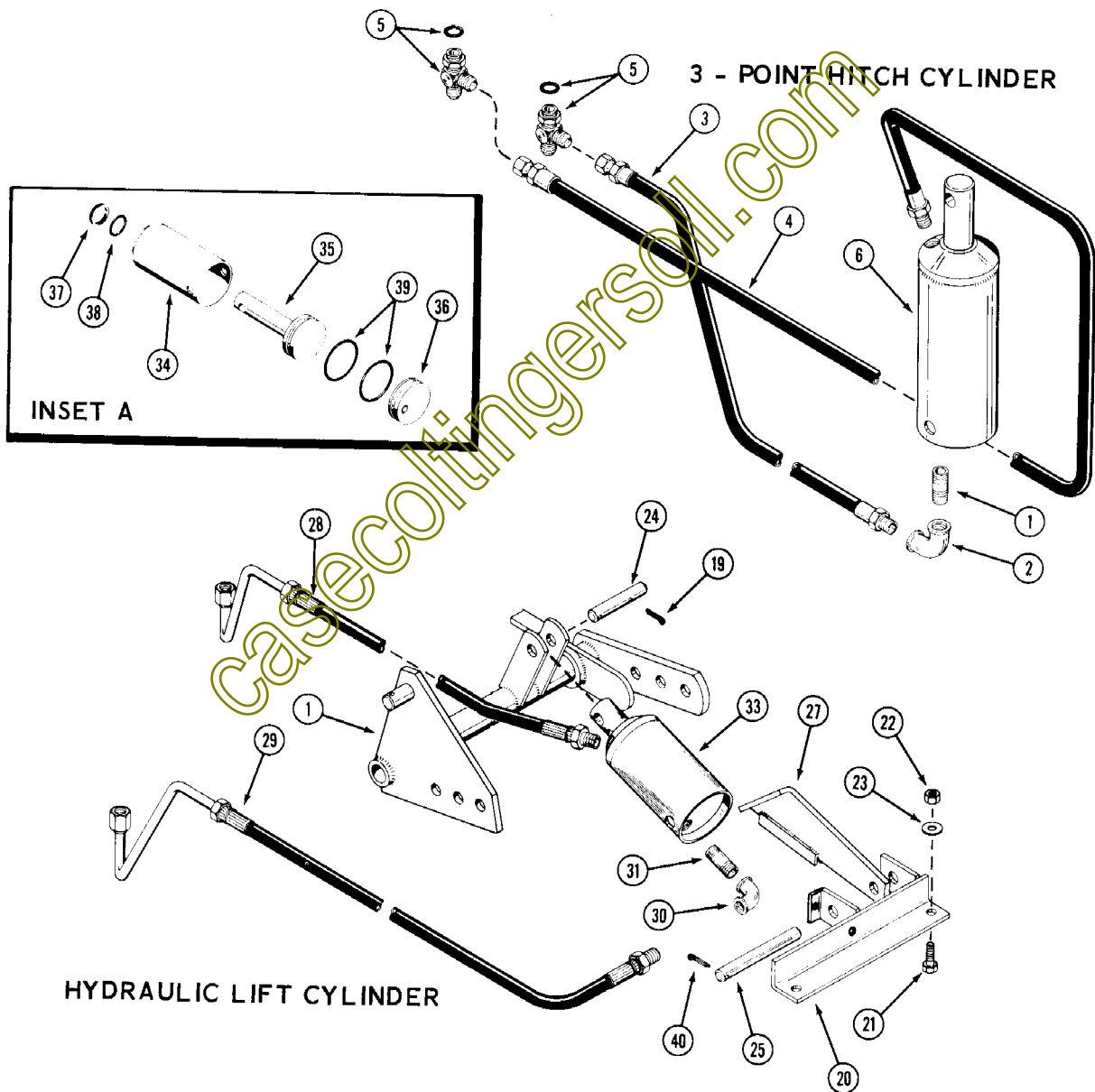
NOTE Double Acting Cylinder, Part Number C 16134 is used on Model 220, 222, 442 and 444 tractors above S/N 9646800 equipped with hydraulic lift.

REMOVAL AND DISASSEMBLY

1. Three Point Hitch Cylinder:

a. With the cylinder in the "closed" position disconnect the hoses (3) and (4) at the control valve fittings (5). Cover or plug the exposed fittings to keep out dirt.

b. Remove the mounting pins from the piston rod and tube ends of the cylinder and remove the cylinder assembly from the hitch.



2. Hydraulic Lift Cylinder:

a. With the cylinder in the "extended" position and the tractor lift lever tied or blocked in the raised position, disconnect the two hose-tube assemblies (28) and (29) from the control valve fittings (5). Cover or plug the exposed fittings to keep out dirt.

b. Remove the mounting pin (24) from the piston rod end of the cylinder.

c. Tie up the height adjusting arm (27) to keep it in place, remove the pin (25) and remove the cylinder.

3. For convenience, remove the hoses from the cylinder and cover or plug the exposed ports to keep out dirt.

4. After draining the cylinder, and cleaning paint and/or rust from inside the base end of the cylinder tube, push or tap the piston assembly (35) and end cap (36) through the base end of the cylinder. See Inset "A".

5. Remove and discard wiper ring (37), "O" ring (38) and "O" rings (39).

INSPECTION

1. Thoroughly clean and air dry all parts before inspection. Remove all paint from the inside base end of the cylinder tube.

2. Inspect the cylinder tube and piston rod assembly for score marks or scratches. Light scratches may be removed with a hone or crocus cloth. If scratches cannot be polished out, the affected part must be replaced since the "O"

rings will be quickly damaged and leakage will result.

3. To prevent the possibility of damaging the piston and end cap "O" rings during assembly, break the inside sharp edges of the two mounting pin holes in the cylinder tube with crocus cloth. Also check the base of the tube for burrs or sharp edges.

ASSEMBLY AND INSTALLATION

1. Dip all new seals in clean oil.

2. Install new "O" ring (38) in the cylinder tube.

3. Install new wiper seal (37) in the cylinder tube, lip side out.

4. Install a new "O" ring (39) on the piston (35).

5. Install new "O" ring (39) on the end cap (36).

6. Apply a light coat of grease to the inside of the cylinder tube and the O.D. of the piston and end cap with particular attention to the area of the mounting pin holes and the "O" rings.

7. Carefully install the rod and piston assembly into the cylinder tube making certain the "O" ring is not nicked by the mounting pin holes.

NOTE If an "O" ring particle is observed in either of cylinder tube mounting pin holes following installation of the piston assembly, the piston must be removed, a new "O" ring installed and step 3 under "Inspection" repeated.

8. Carefully install the end cap (36) in the same manner just far enough to permit installation of the mounting pin. Refer to "NOTE" following paragraph 7.

9. Either repaint or heavily grease the lower inside end of the cylinder tube to prevent subsequent corrosion.

10. Three Point Hitch Cylinder:

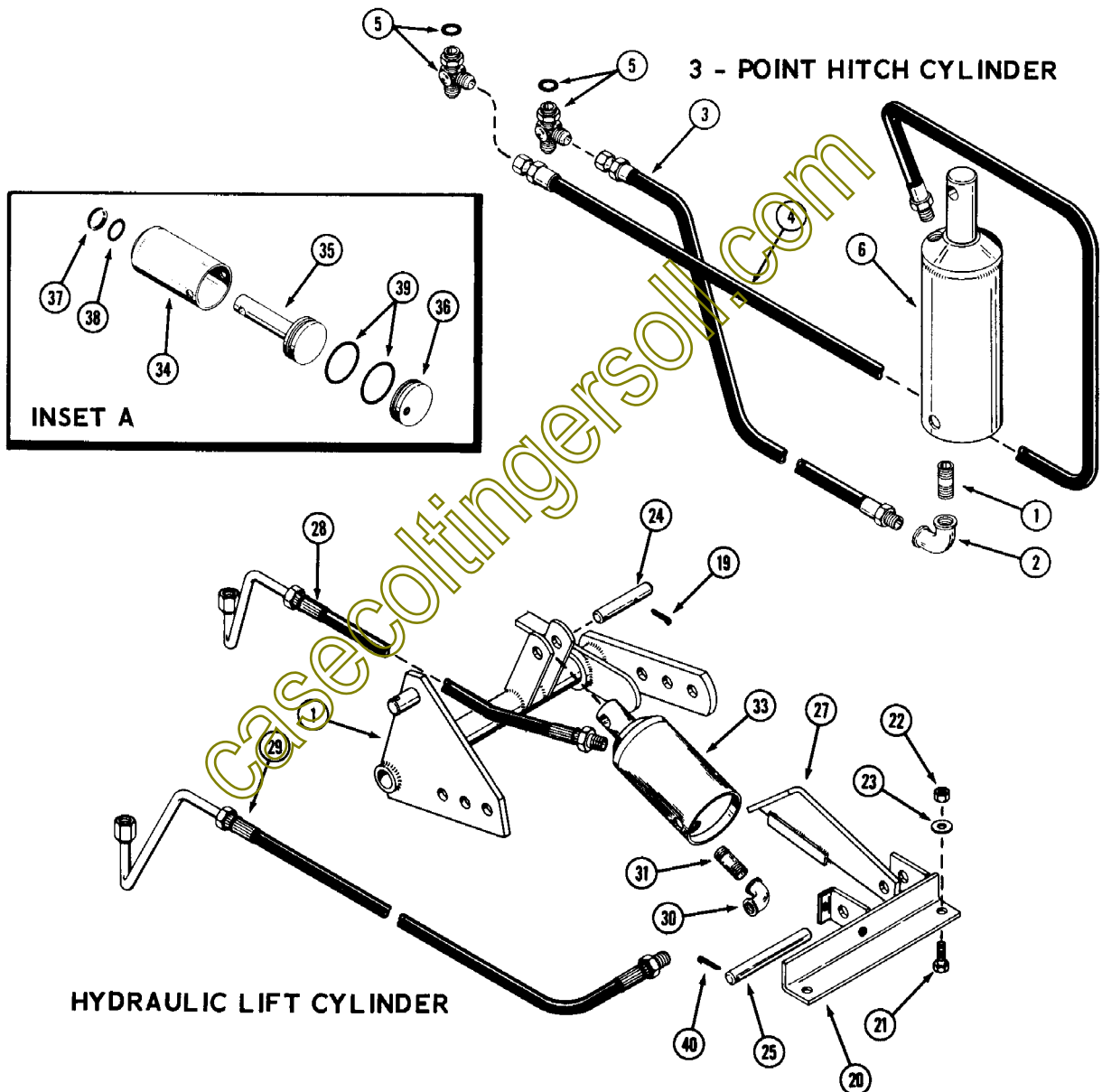
a. Reconnect the hoses (3) and (4) to the cylinder. The "longer" hose is connected to the port at the rod end of the cylinder.

b. Connect the cylinder to the hitch cylinder alignment the cotter pin on the lower mounting pin must be installed

between the cylinder tube and the right hand mounting lug. Connect the hoses to the control valve fittings (5).

11. Hydraulic Lift Cylinder:

a. Connect the hoses (28) and (29) to the cylinder. The "shorter" hose is connected to the port at the rod end of the cylinder. When tightened, the tube ends of the hoses must face straight upward as illustrated with the cylinder in the position it will be installed on the tractor.



b. With the cylinder somewhat forward from its normal position, thread the hose and tube assemblies through between the steering support and the upper right side frame rail.

c. With the cylinder rod "fully" extended and "positioned between" its mounting lugs, install the mounting pins, first through the tube and then the rod.

d. Connect the tube ends of the hoses to the control valve fittings.

12. After operating cylinders to full open and closed positions several times, check oil level in hydraulic reservoir. Add as necessary, using SAE 20W-40 motor oil to bring level to between two and three inches from the top of the reservoir filler pipe. Cylinders must be in the "closed" position when checking oil level.

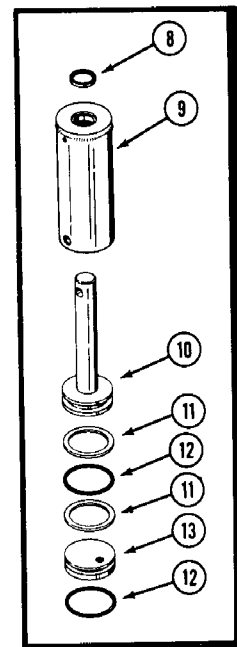
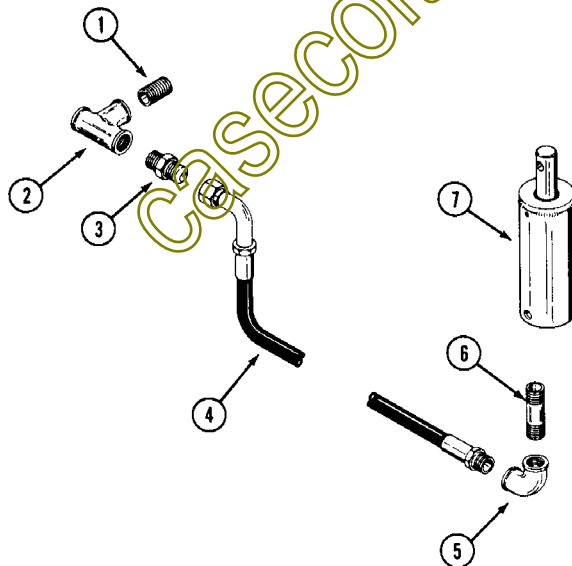
SERVICING THE SINGLE-ACTING MODEL F26 THREE-POINT HITCH CYLINDER, PART NUMBER C14700

REMOVAL AND DISASSEMBLY

1. With the cylinder in the closed position, disconnect the hose and tube assembly (4) from the lift valve at connection (3). Cover the exposed fittings to prevent foreign material from entering the lines.
2. Disconnect the two mounting pins and remove the cylinder assembly from the hitch.
3. For convenience the hose may be disconnected from the elbow (5) at the base

of the cylinder. Clean paint and/or rust from inside the base end of the cylinder tube.

4. After draining the cylinder, push or tap the piston assembly (10) and end cap (13) through the base end of the cylinder.
5. Remove and discard wiper ring (8), back up washers (11) and "O" rings (12).



INSPECTION

1. Thoroughly clean and air dry all parts before inspection.
2. Inspect the cylinder tube and piston rod assembly for score marks or scratches. Light scratches may be removed with a hone or crocus cloth. If scratches cannot be polished out, the affected part must be replaced since the "O" rings will be quickly damaged and leakage will result.
3. To prevent the possibility of damaging the piston and end cap "O" rings during assembly, break the inside sharp edges of the two mounting pin holes in the cylinder tube with crocus cloth. Also check the base of the tube for burrs or sharp edges.

ASSEMBLY AND INSTALLATION

1. Dip all new seals in clean oil.
 2. Install new wiper seal (8) into cylinder tube, lip side out.
 3. Install new "O" ring (12) and back up washers (11) on piston.
 4. Place new "O" ring (12) on end cap.
 5. Apply a light coat of grease to inside of the cylinder tube and the O.D. of the piston with particular attention to the area of the mounting pin holes and the "O" ring.
 6. Carefully install the rod and piston assembly into the cylinder tube making certain the "O" ring is not nicked by the mounting pin holes.
 7. Carefully install the end cap in the same manner just far enough to permit installation of the mounting pin.
 8. Either repaint or heavily grease the lower inside end of the cylinder tube to prevent subsequent corrosion.
 9. Connect the cylinder to the hitch with the two mounting pins. For proper cylinder alignment the cotter pin on the lower mounting pin must be installed between the cylinder tube and the right hand mounting lug.
 10. Reconnect the hose and tube assembly (4) to the cylinder and control valve fittings.
 11. After operating cylinder to full open and closed positions several times, check oil level in hydraulic reservoir. Add as necessary, using SAE 20W-40 motor oil, to bring the level to between two and three inches from the top of the reservoir filler pipe. Cylinder(s) must be in the "closed" position when checking oil level.
- NOTE** If an "O" ring particle is observed in either of the cylinder tube mounting pin holes following installation of the piston assembly, the piston must be removed, a new "O" ring installed and step 3 under "Inspection" repeated.

SERVICING THE DOUBLE-ACTING MODEL E25 and F30
HYDRAULIC LIFT CYLINDER, PART NUMBER C12676

NOTE

This cylinder is used on the Model E25 Hydraulic Lift Kit for all Model 155 and 195 tractors and the F30 Hydraulic Lift Kit for Model 220, 222, 442 and 444 tractors prior to serial number 9646800.

REMOVAL AND DISASSEMBLY

1. With the cylinder in the closed position, disconnect the two hoses from the street elbows on the cylinder.
2. Disconnect the clevis pin from the rod end of the cylinder.
3. Remove the retainer ring from the pin at the cylinder base and remove the cylinder.
4. Remove the street elbows from the cylinder heads (2) and (3) and drain the cylinder.
5. Pull the piston rod assembly (1) and cylinder head (2) out of the tube.
6. Turn the clevis (5) off the piston rod (1) and remove the cylinder head (3).
7. Remove and discard all "O" rings (6) and (7), and back up washers (8).

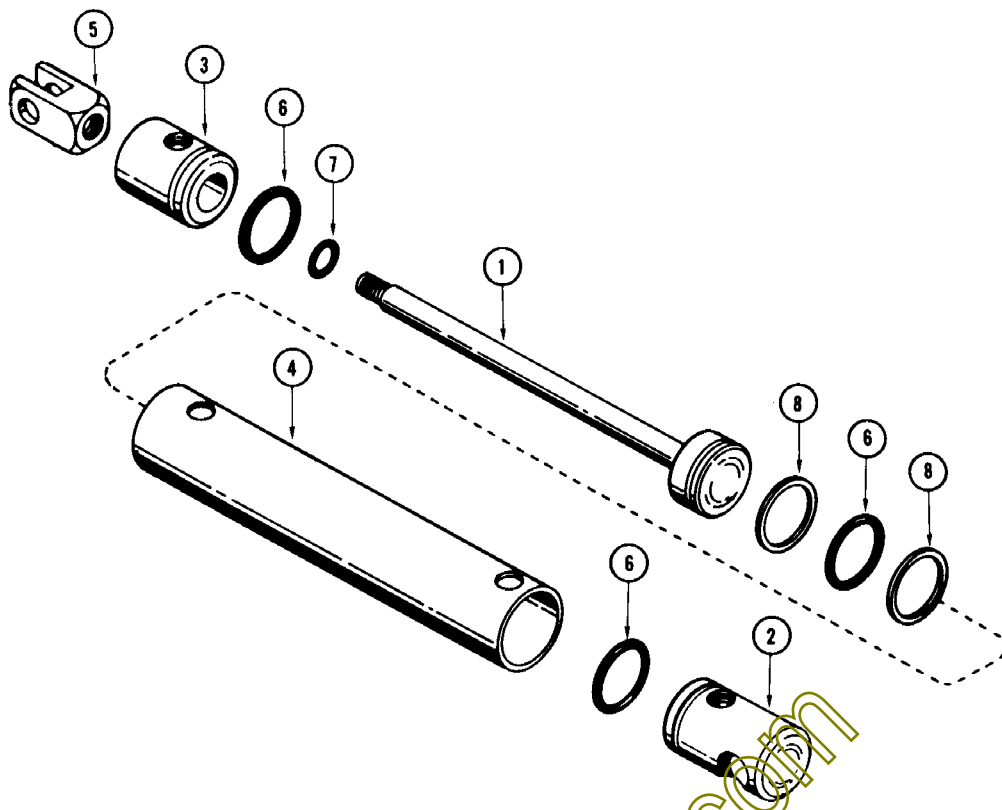
INSPECTION

1. Thoroughly clean and air dry all parts before inspection.
2. Inspect the cylinder tube and piston rod assembly for scratches or score marks. Light scratches may be removed with a hone or crocus cloth. If scratches cannot be polished out, the affected part must be replaced since the new "O" rings will be quickly damaged and leakage will result.
3. Inspect the bore of the cylinder head (3) for scratches or wear. If the bore is worn, the head must be replaced since leakage will result.

NOTE If the bore is worn egg shaped, check for interference between the cylinder and tractor such as the frame or pump suction line which may be exerting side load. Interference should be evidenced by rub marks on the tube.

NOTE Model 220, 222, 442, 444 tractors between serial number 9641000 and 9646800 used both part number 218-5065 and C 17236 fittings at the suction (R.H.) port of the pump. The 218-5065 fitting is 1-7/8" long and the C 17236 is 1-5/8" long. The shorter C 17236 fitting can be installed to provide an increase in clearance between the cylinder and the tube. As an alternate this oil line can be slightly flattened to provide cylinder clearance.

4. To prevent the possibility of damaging the piston and cylinder head seals during assembly, break the inside sharp edges of the street elbow holes in the tube with crocus cloth. Also check the ends of the tube for burrs or sharp edges.



ASSEMBLY AND INSTALLATION

1. Dip all new seals in clean oil.
 2. Install new "O" rings (6) and (7) on the head (3). Install new "O" rings (6) on the head (2).
 3. Place the head (3) onto the piston rod and install the clevis (5) with loctite.
 4. Install new back up washers (8) and "O" ring (6) on the piston.
 5. Apply a light coat of grease to the inside of the cylinder tube, O.D. of the piston and O.D. of the heads with particular attention to the area of the seals and tube ports.
 6. Carefully place the piston assembly into the end of the tube which has the port located 1" from the end. Carefully insert the heads (2) and (3) so the ports are in line with the ports in the tube. Make certain none of the "O" rings (6) are nicked by the tube ports.
 7. Using pipe thread sealer or teflon tape, connect the street elbows to the cylinder ports.
 8. Install the cylinder on the tractor and connect the hoses to the street elbows.
 9. After operating cylinder to full open and closed position several times, check oil level in hydraulic reservoir. Add as necessary, using SAE 20W-40 motor oil, to bring level to between two and three inches from the top of the reservoir filler pipe. Cylinder(s) must be in the "closed" position when checking oil level.
- NOTE** If an "O" ring particle is observed in either of the tube ports following installation of the piston and heads, the affected part(s) must be removed new "O" ring (s) installed and step 4 under "Inspection" repeated.
- NOTE** The street elbow port at the rod end of the cylinder should be in line with the piston rod when tightened. Install the street elbow at the base so it will be facing slightly toward the inside of the piston rod when the cylinder is mounted on the tractor.

SERVICING THE DOUBLE ACTING LOADER LIFT ARM AND BUCKET CYLINDERS

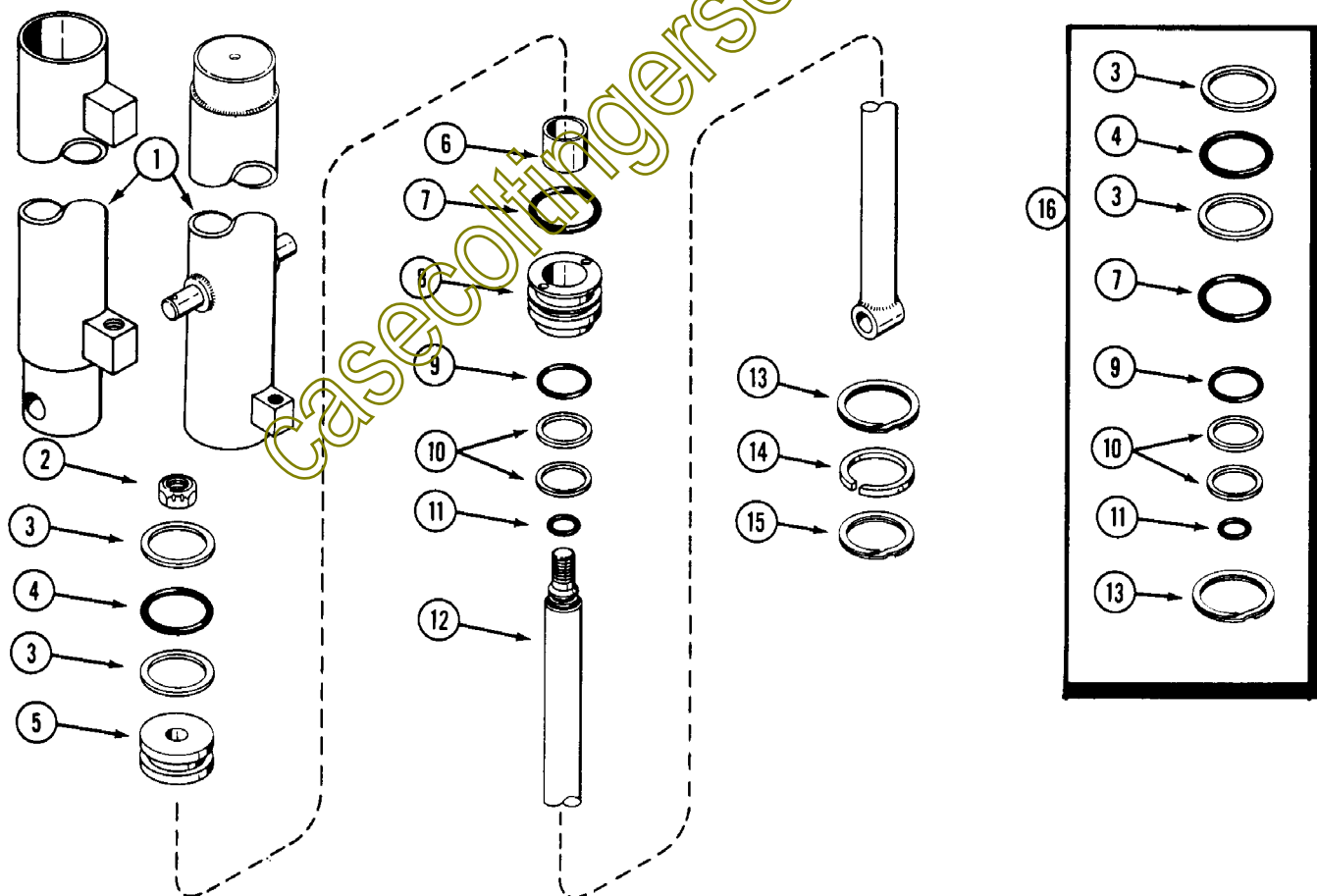
PART NUMBERS CII527 AND CII528

REMOVAL

1. Put lift arms and bucket in down position and be sure the cylinders are all in a relaxed position.
2. Disconnect the two hoses from the cylinder and plug ends to prevent dirt entry.
3. Remove pins from both ends of cylinder and remove cylinder. To remove tube end of bucket cylinder, remove the two pins from the ends of the bucket cylinder links and spread links.

DISASSEMBLY

1. Remove spiral ring (15) from cylinder head. (8)
2. Push rod and cylinder head into tube far enough to remove the spacer ring (14) from the end of the tube, remove spacer.
3. Remove spiral ring (13) from inside tube.
4. Anchor the pin end of the tube, and pull the rod out.
5. Remove nut (2) from end of rod (12).
6. Remove piston (5) from end of rod. This is pulled off the end of the bucket cylinder rod but must be unscrewed from the left cylinder rod.
 - a. Remove "O" ring seal (4) from piston.
 - b. Remove composition backup washer (3) from piston.
7. Pull cylinder head (8) off of rod end.
 - a. Remove "O" ring (7) from outer circumference of head (8).
 - b. Remove outer rod wiper (10) from inside circumference of head (8).
 - c. Remove "O" ring (9) from below bottom rod wiper (10).
 - d. Remove bottom rod wiper. (10)
8. Remove "O" ring (11) from end of rod.



INSPECTION

1. Thoroughly clean and air dry all parts before inspection.
2. Inspect the cylinder tube and piston rod assembly for scratches, dents or score marks. Light scratches may be removed with a hone or crocus cloth.

If scratches cannot be polished out, the affected part must be replaced or the "O" rings will be quickly damaged and leakage will result.

3. Inspect the cylinder head bushing (6) wear and replace if necessary.

ASSEMBLY

1. Dip all new seals in clean oil.

2. Cylinder head (8).

- a. Install one rod wiper (10) into the inner groove, in head (8) (the one closest to the bronze bushing), with the lip facing the bushing. (6)
- b. Install "O" ring (9) between wiper (10) and bushing. (6)
- c. Install second rod wiper (10) in outer groove with lip facing out.
- d. Install "O" ring in groove on outer circumference of head.

3. Slide head (8) onto rod (12) with spiral ring groove toward pin hole end of rod.

4. Install "O" ring (11) in groove and threaded end of rod. (12)

5. Piston Assembly. (5)

- a. Stretch backup washer (3) on outer circumference of piston (5), rough side toward "O" ring. (4)
- b. Roll "O" ring (4) into groove.
- c. Stretch second backup washer (3) into other side of "O" ring (4)

- d. Work backup washers (3) into groove.

6. Screw piston (5) on rod so that counterbore in piston goes over shoulder and "O" ring on rod. On bucket cylinder, piston is merely pushed on in the same manner.

7. Screw nut (2) onto end of rod, tighten nut and stake end of rod.

8. Push rod (12) into tube (1) being careful not to damage backup washers (3) and "O" rings (4) and (7) on piston and cylinder head.

9. Install spiral ring (13) in groove inside of tube.

10. Install spacer ring. (14)

11. Pull rod out of tube as far as possible to expose spiral ring groove in cylinder head, and install spiral ring. (15)

DKSBB

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