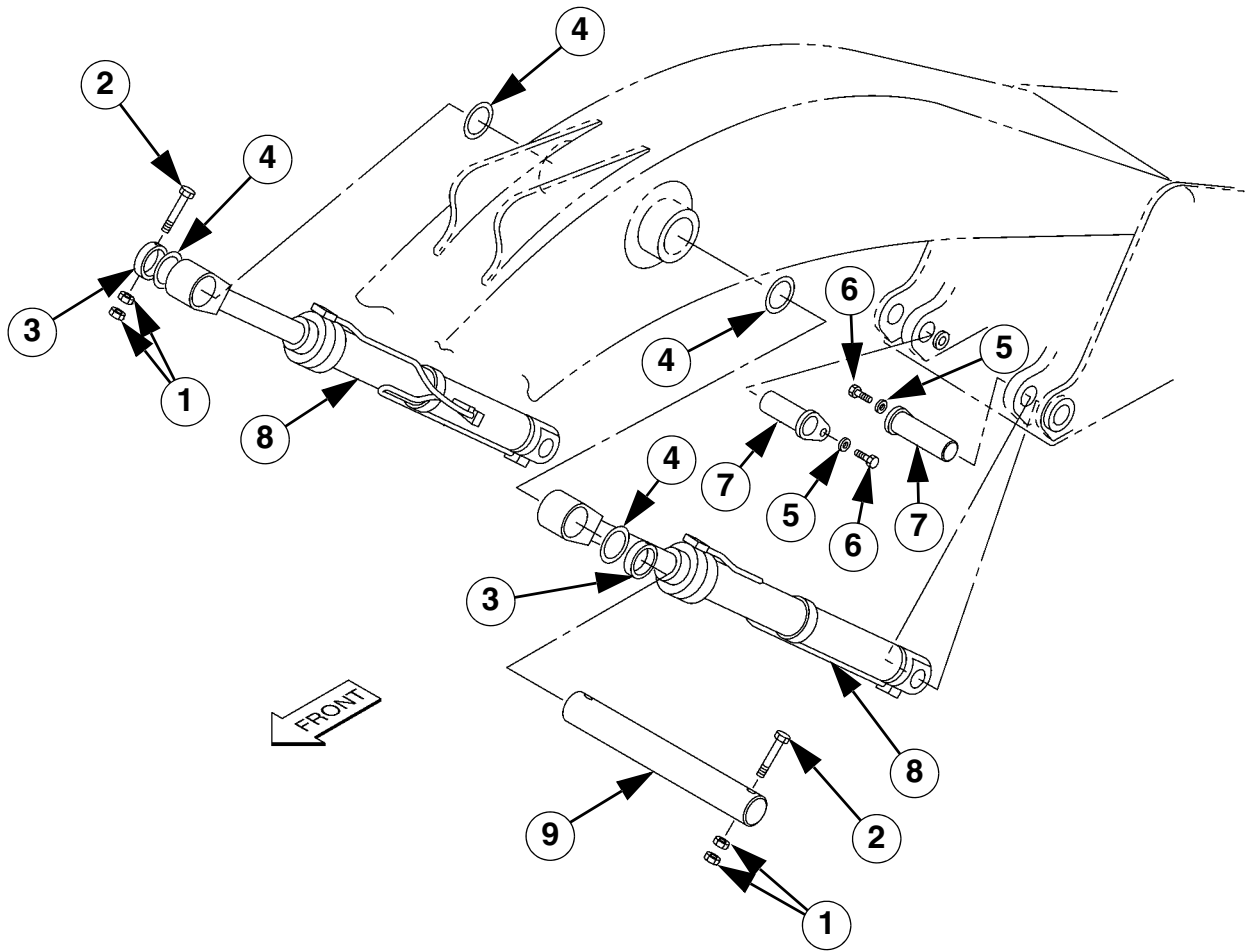


# BOOM CYLINDER

## Description



- 1 NUT
- 2 SCREW
- 3 LOCKING BUSHING
- 4 SHIM
- 5 WASHER

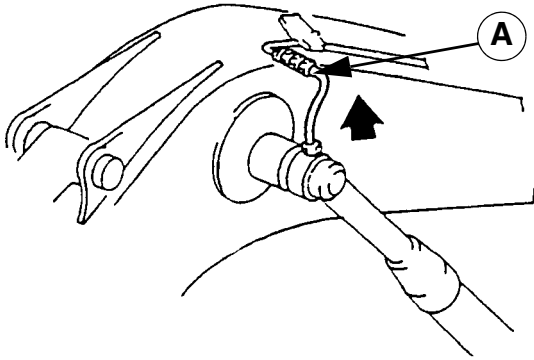
- 6 SCREW
- 7 SHAFT
- 8 BOOM CYLINDER
- 9 SHAFT

CS02B563

## Removal

**NOTE:** The numbers within brackets in the following steps refer to the boom cylinder schematic on page 3.

### STEP 1

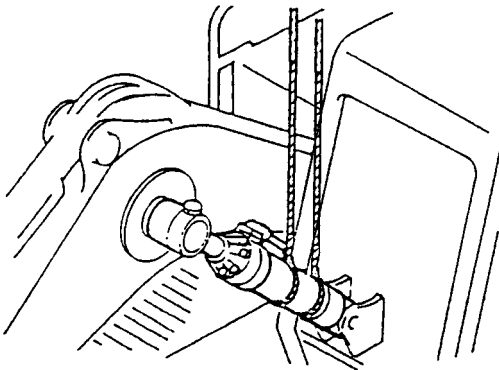


JS00577A

Disconnect the lubrication hose (A) from the boom cylinder.

**NOTE:** Lift the cylinder carefully, the cylinder is heavy, its weight has to be balanced with slings during lifting.

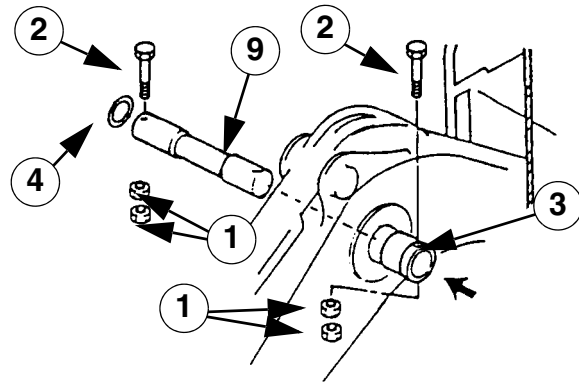
### STEP 2



JS00578A

Attach a suitable lifting device to the boom cylinder. Use the total movement to get sufficient support during removal of the boom cylinder.

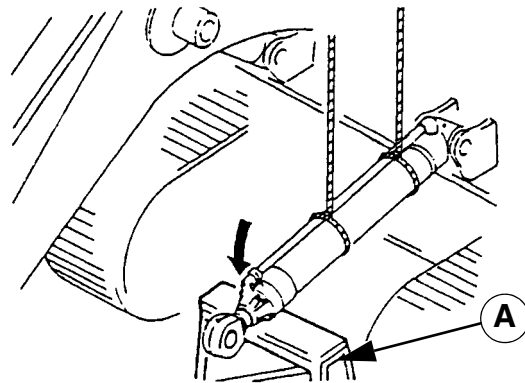
### STEP 3



JS00579A

Remove the nuts (1) and the screws (2). Remove the screws from the shaft (9) and the locking rings (3). Push the shaft far enough so that it does not interfere with the removal of the boom cylinder. Remove the shims (4) and the locking rings.

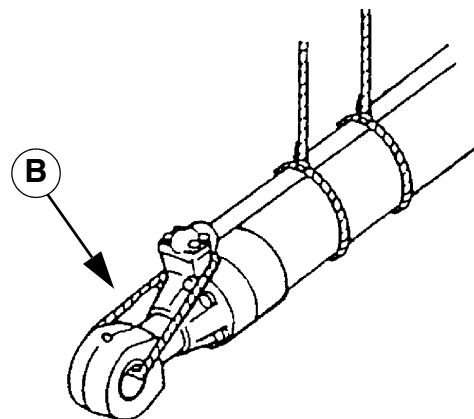
### STEP 4



JS00580A

Install a support (A) in front of the boom cylinder. Lower the front of the boom cylinder on the support.

### STEP 5

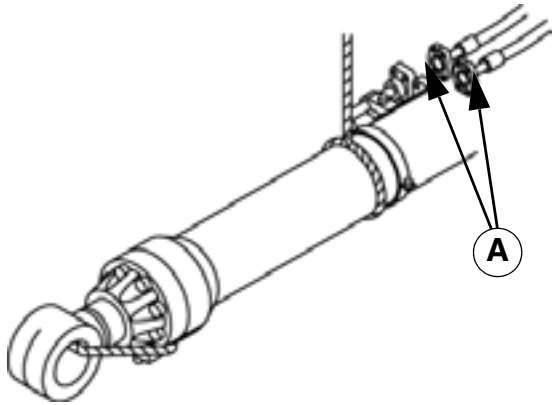


JS00581A

Attach a sling (B) to hold the cylinder rod to the cylinder barrel.

**STEP 6**

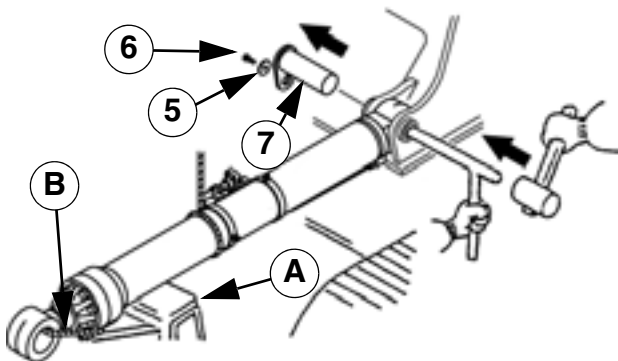
Start the vacuum pump.

**STEP 7**

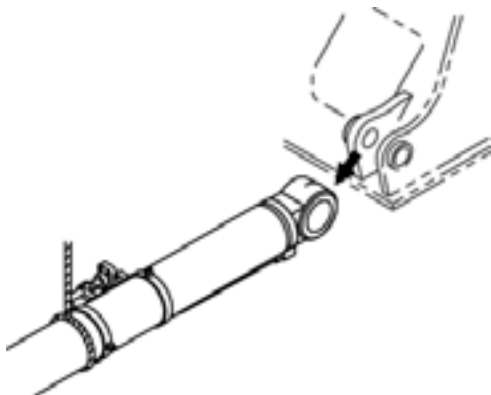
Disconnect the hydraulic supply hoses (A) from the boom cylinder.

**STEP 8**

Plug the hoses with plugs and the unions with caps. Stop the vacuum pump.

**STEP 9**

Remove the screw (6) and the washer (5).  
Remove the shaft (7), using a steel bar and hammer.



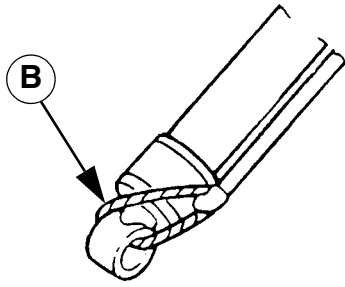
Carefully lift the boom cylinder and move it away from the machine. Place the boom cylinder on suitable supports. Remove the sling that holds the cylinder rod to the cylinder barrel.

**STEP 10**

Repeat steps 1 to 9 to remove the other cylinder.

## Installation

### STEP 1

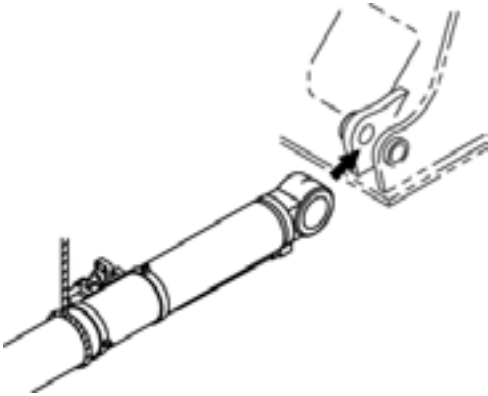


Attach a suitable sling (B) to the boom cylinder to hold the cylinder rod to the cylinder barrel.

JS00586A

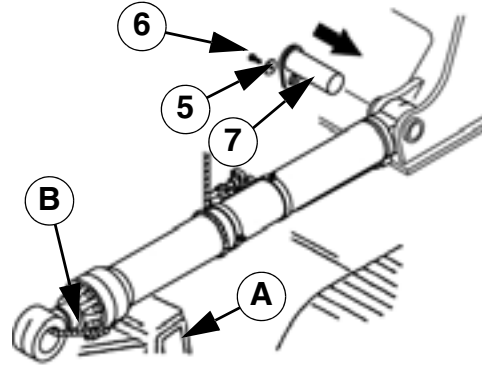
**NOTE:** Lift the cylinder carefully. The cylinder is heavy, its weight has to be balanced with slings during lifting.

### STEP 2

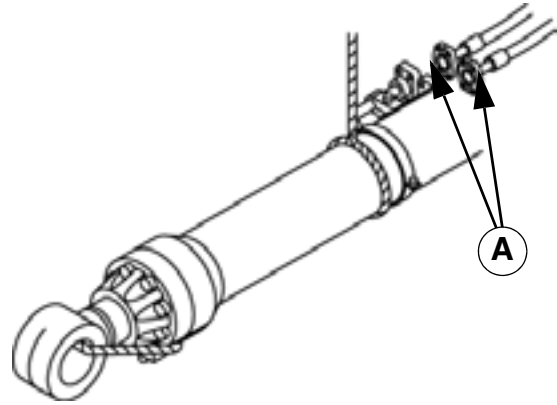


Using a suitable lifting device, lift the boom cylinder. Align the boom cylinder with the mounting brackets of the frame. Place a suitable support under the boom cylinder to support it.

### STEP 3

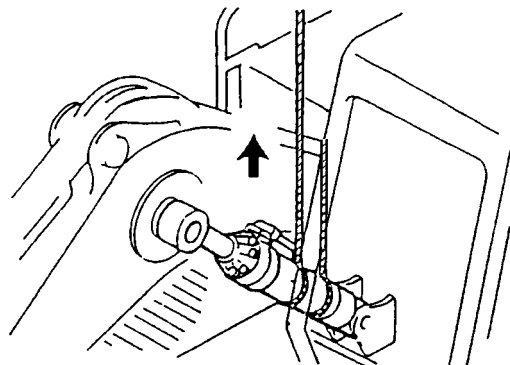


Install the shaft (7) using washers (5) and screws (6). Using a strip thickness gauge, check that there is a clearance of 1 to 3.5 mm (0.05 to 0.11 in) between the mounting bracket and the mounting ring of the cylinder barrel. If necessary, remove the screw, the shaft and add one or more shim(s) as required in order to get the correct clearance. Install the pin and the screw.



Start the vacuum pump. Remove the plugs from the hydraulic hoses (A) and the caps from the unions. Connect the two hydraulic supply hoses on the boom cylinder.

### STEP 4

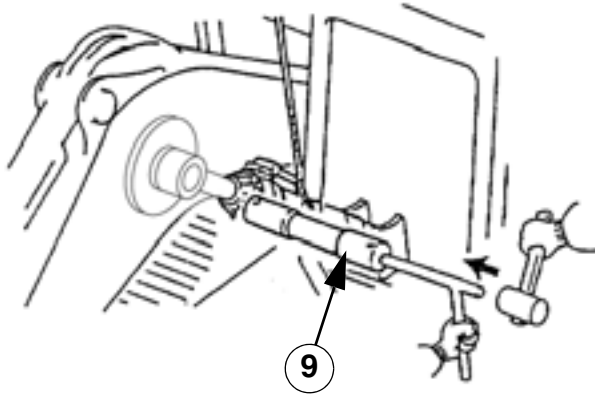


Lift the boom cylinder and align the rod end of the cylinder with the mounting ports of the boom.

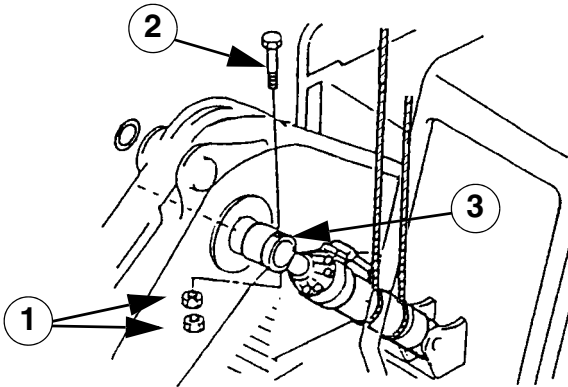
JS00590A

### STEP 5

Repeat steps 1 to 6 to install the second boom cylinder.

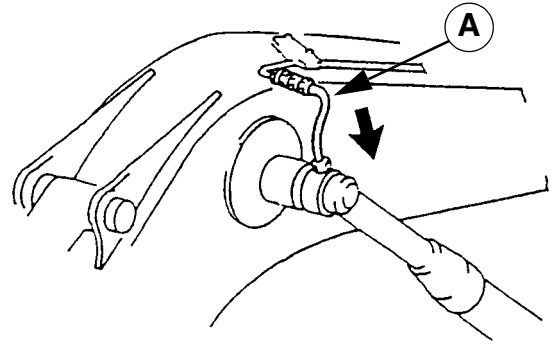
**STEP 6**

Install the pin (9) and the shims (4).

**STEP 7**

Install the locking bushings (3). Install the screws (2) through the locking rings and the shaft. Using a set of spacer rings, check that there is a clearance of 1 to 3.5 mm (0.05 to 0.11 in) between the mounting bracket and the mounting ring of the cylinder rod. If necessary, remove the screws and the pin and add or remove one or more shim (s) as required to obtain the correct clearance. Install the pin and the screws. Install the first nut (1) on the screw and tighten until the nut touches the locking ring. Unscrew the nut by a quarter of a turn and, using two wrenches, install the second nut (1) to lock the first nut in position. Remove the sling from the boom cylinder.

JS00592A

**STEP 8**

Connect the lubrication hose (A) to the boom cylinders.

JS00656A

**STEP 9**

Remove the vacuum pump and bleed the air from the boom cylinders (see Section 8000).

**STEP 10**

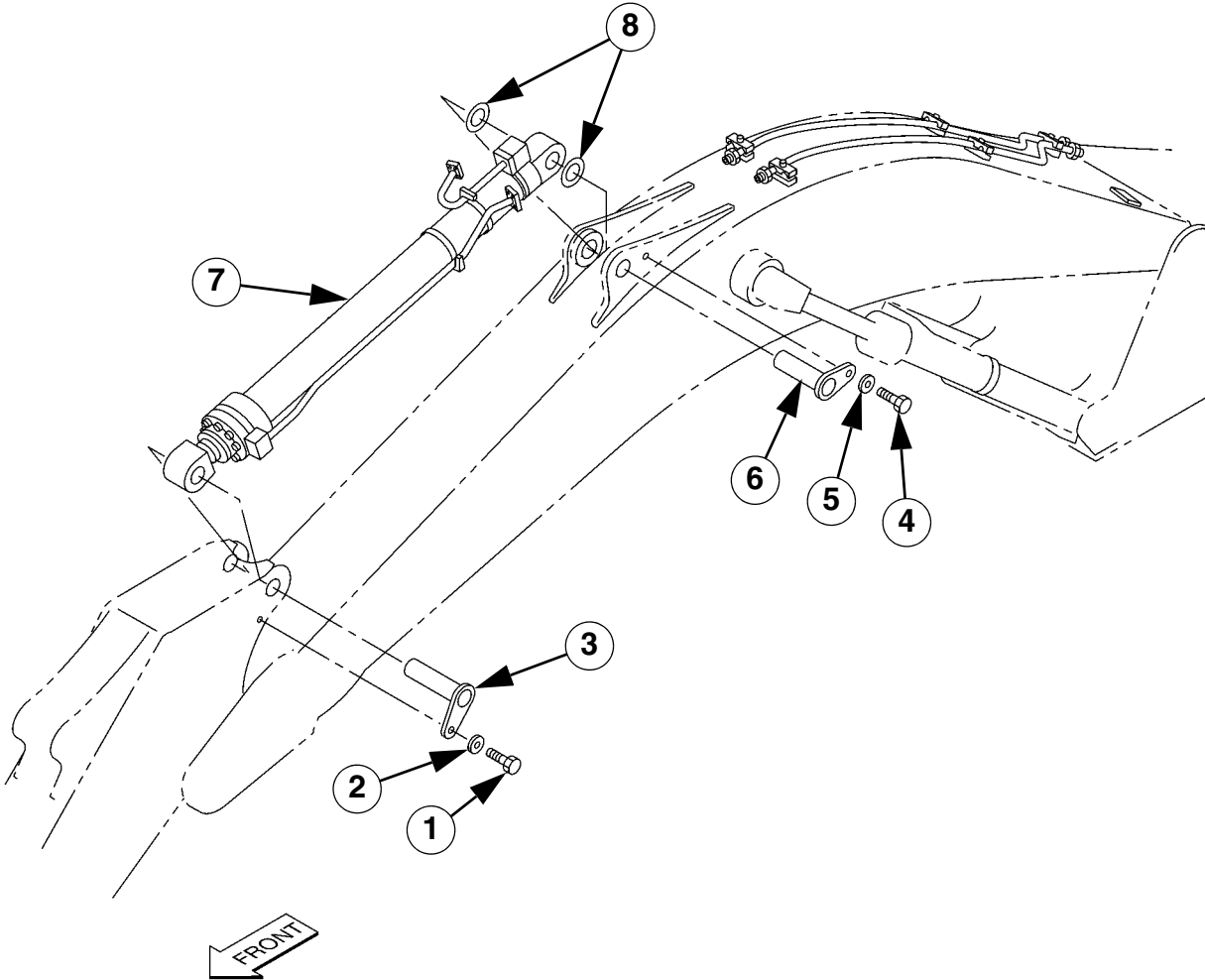
Check the hydraulic fluid level in the reservoir. Top up as required.

**STEP 11**

Lubricate the linkages.

# DIPPER CYLINDER

## Description



- 1 SCREW
- 2 WASHER
- 3 PIN
- 4 SCREW

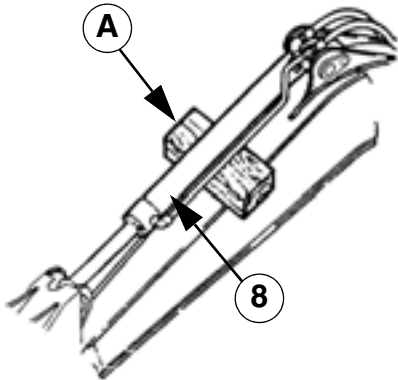
- 5 WASHER
- 6 PIN
- 7 DIPPER CYLINDER
- 8 SHIM

CS02B564

## Removal

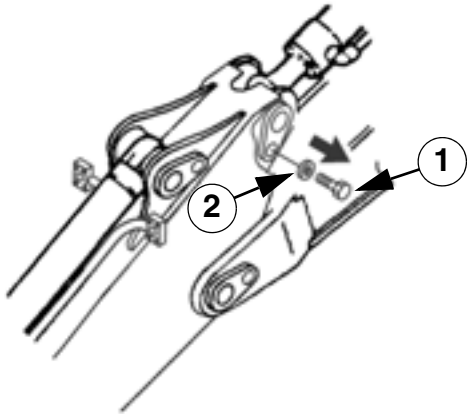
**NOTE:** The numbers within brackets in the following steps refer to the dipper cylinder schematic on page 8.

### STEP 1



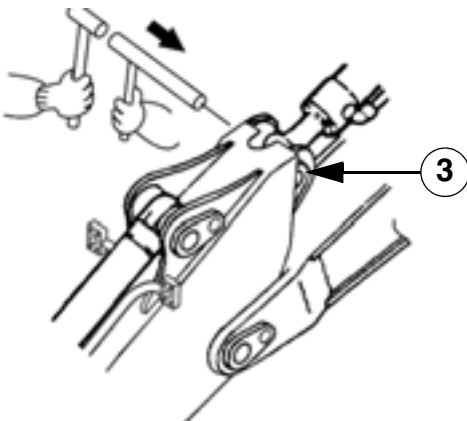
Place a wooden shim (A) under the dipper cylinder (8).

### STEP 2



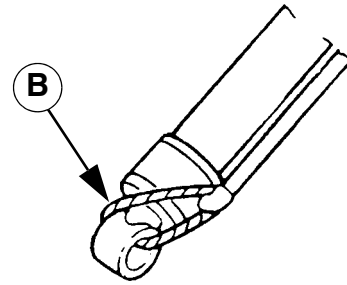
Remove the screw (1) and the washer (2).

### STEP 3



Remove the shaft (3) using a steel bar and hammer.

### STEP 4



Attach a suitable sling (B) to hold the cylinder rod to the cylinder barrel.

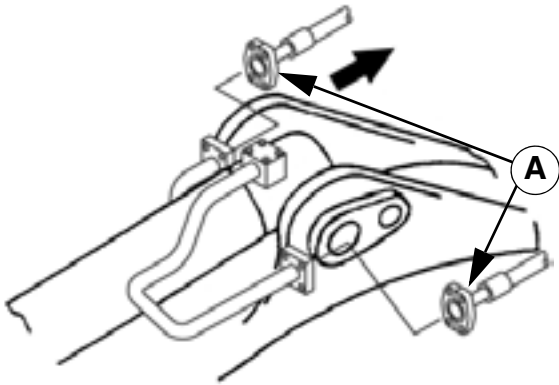
JS00586A

8005-10

### STEP 5

Start the vacuum pump.

### STEP 6

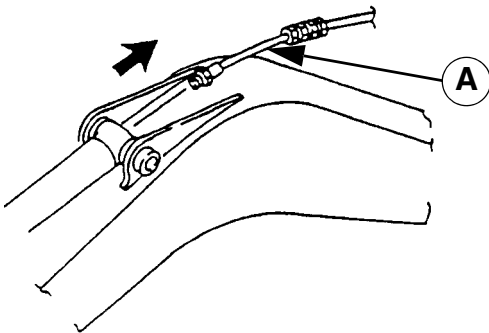


Disconnect the two hydraulic supply hoses (A) from the dipper cylinder.

### STEP 7

Plug the hydraulic hoses with plugs and the unions with caps. Stop the vacuum pump.

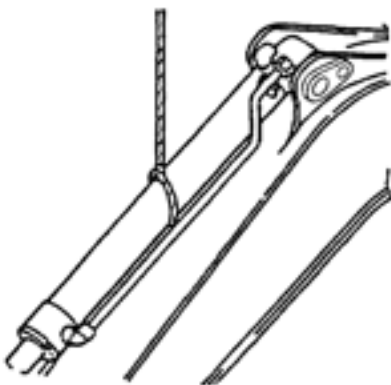
### STEP 8



Disconnect the lubrication hose (A) from the dipper cylinder. JS00599A

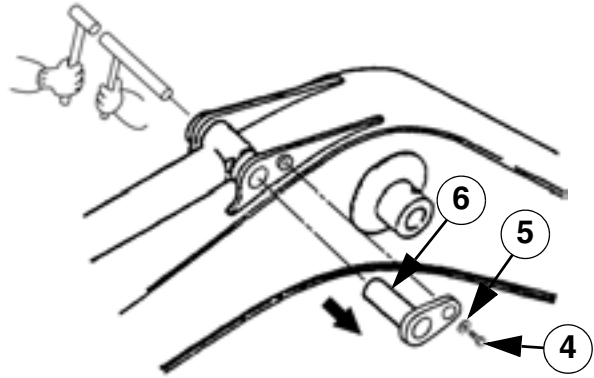
**NOTE:** Lift the cylinder carefully, the cylinder is heavy, its weight has to be balanced with slings during lifting.

### STEP 9



Attach a suitable lifting device to the dipper cylinder. Use the total movement to get sufficient support during removal of the dipper cylinder.

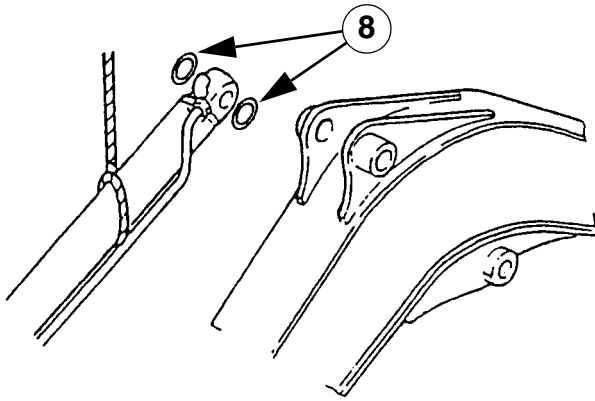
### STEP 10



Remove the screw (4) and the washer (5). Remove the shaft (6), using a steel bar and hammer.



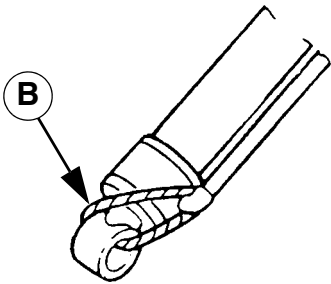
**STEP 11**



JS00602A

Carefully lift the dipper cylinder and move it away from the dipper. Remove the shims (8). Place the dipper cylinder on suitable supports.

**STEP 12**

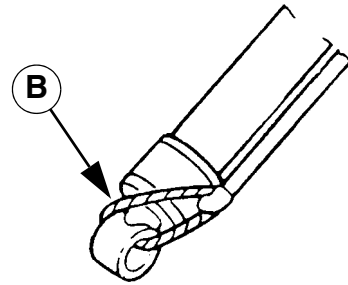


JS00586A

Remove the sling (B) that holds the cylinder rod to the cylinder barrel.

**Installation**

**STEP 1**

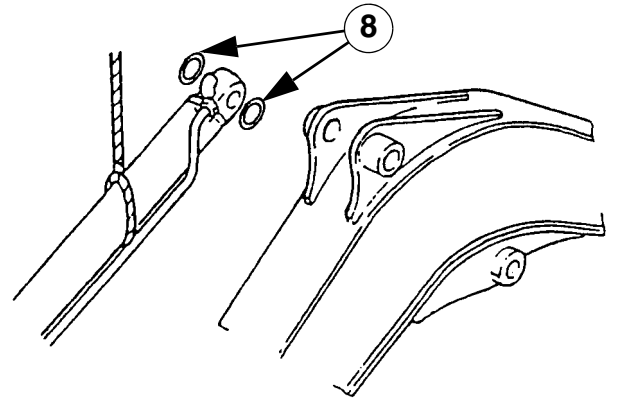


JS00586A

Attach a suitable sling (B) to the dipper cylinder to hold the cylinder rod to the cylinder barrel.

**NOTE:** Lift the cylinder carefully, the cylinder is heavy, its weight has to be balanced with slings during lifting.

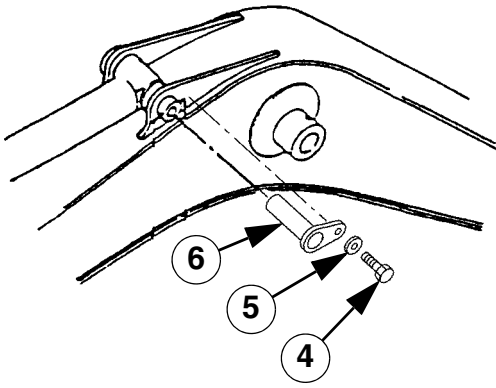
**STEP 2**



JS00602A

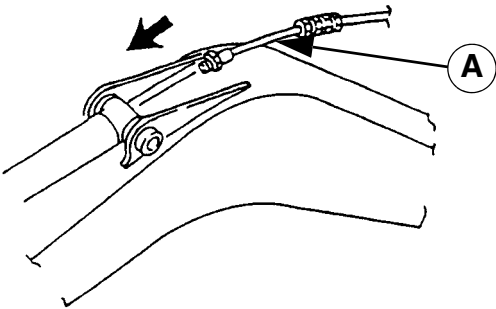
Attach a suitable lifting device to the dipper cylinder, lift the dipper cylinder and bring it in position. Align the dipper cylinder mounting ports with the boom brackets and install the shims (8).

**STEP 3**



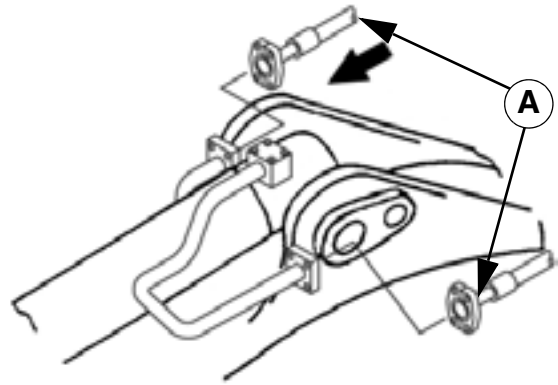
CS02B567  
 Install the shaft (6) using washers (5) and screws (4). Using a set of spacer rings, check that there is a clearance of 1 to 3 mm (0.03 to 0.11 in) between the mounting bracket and the mounting ring of the cylinder barrel. If necessary, remove the screw, the shaft and add or remove one or more shim(s) (8) as required in order to get the correct clearance. Install the pin and the screw.

**STEP 4**



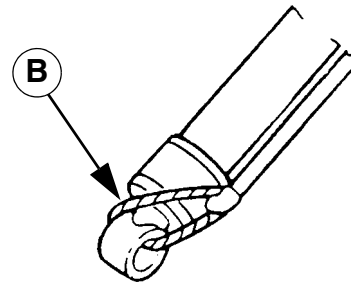
JS00604A  
 Connect the lubrication hose (A) to the dipper cylinder.

**STEP 5**



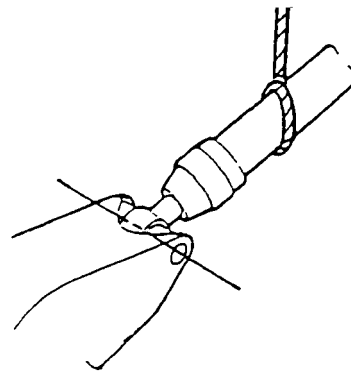
Start the vacuum pump. Remove the plugs from the hydraulic hoses (A) and the caps from the unions. Connect the hydraulic supply hoses on the dipper cylinder.

**STEP 6**

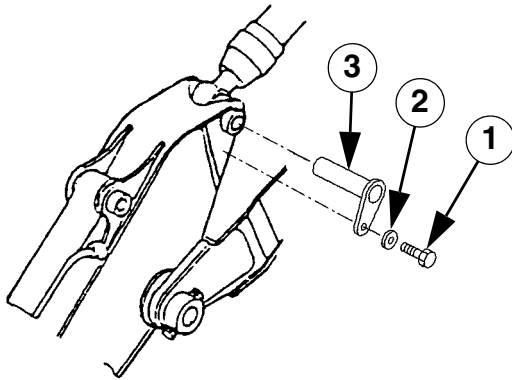


JS00586A  
 Remove the sling (B) that holds the cylinder rod to the cylinder barrel.

**STEP 7**



JS00606A  
 Align the dipper cylinder mounting ports with the dipper ports.

**STEP 8**

CS02B566

Install the shaft (3), the washer (2) and the screw (1). Using a set of spacer rings, check that there is a clearance of 4.5 to 5.5 mm (0.17 to 0.21 in) between the mounting bracket and the mounting ring of the cylinder rod. If necessary, remove the screw and the shaft and add one or more shim(s) as required in order to get the correct clearance. Install the pin and the screw.

**STEP 9**

Remove the vacuum pump and bleed the air from the dipper cylinder (see Section 8000).

**STEP 10**

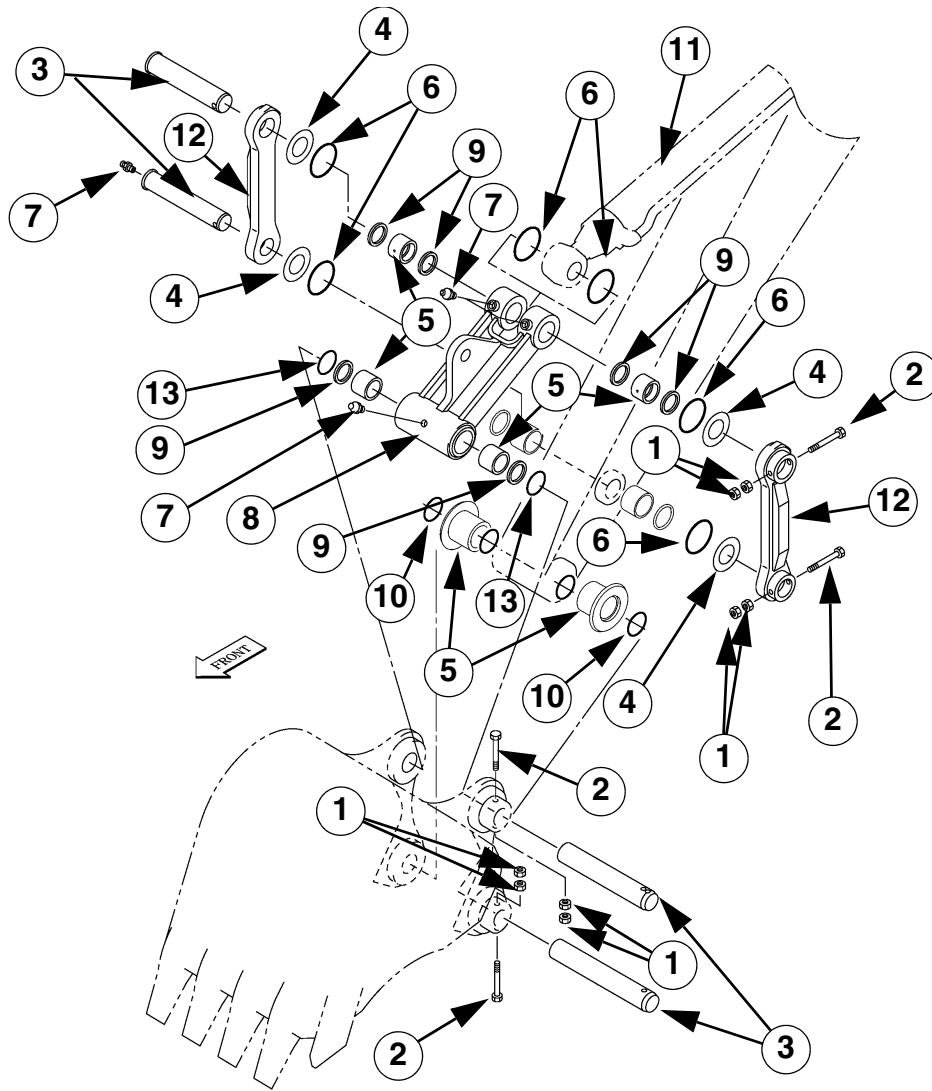
Check the hydraulic fluid level in the reservoir. Top up as required.

**STEP 11**

Lubricate the linkages.

# BUCKET CYLINDER

## Description



- 1 NUT
- 2 SCREW
- 3 SHAFT
- 4 SHIM
- 5 BUSHING
- 6 O-RING

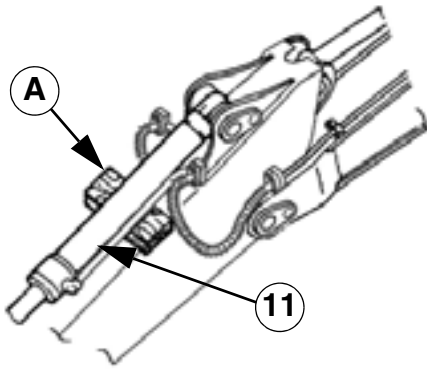
- 7 NIPPLE
- 8 LINK
- 9 SEAL
- 10 O-RING
- 11 BUCKET CYLINDER
- 12 COMPENSATOR
- 13 O-RING

CRPH06C012G

## Removal

**NOTE:** The numbers within brackets in the following steps refer to the bucket cylinder diagram on page 14.

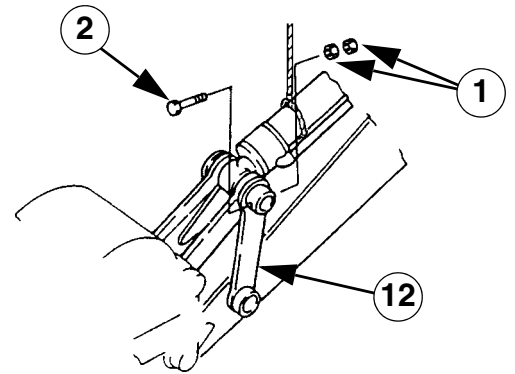
### STEP 1



Place a wooden shim (A) under the bucket cylinder (11).

**NOTE:** Lift the cylinder carefully, the cylinder is heavy, its weight has to be balanced with slings during lifting.

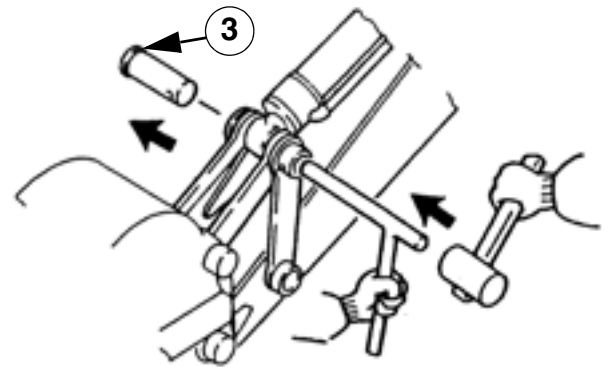
### STEP 2



Remove the nuts (1) from the screw (2) and remove the screw from the compensator (12).

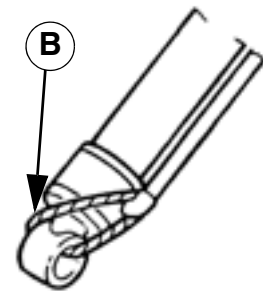
JS00609A

### STEP 3



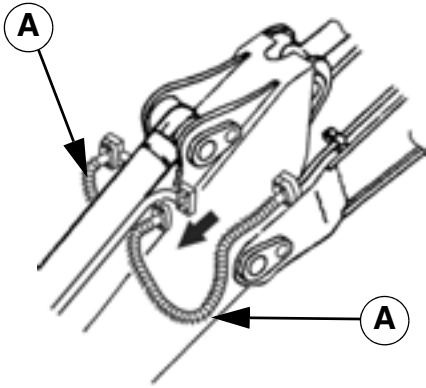
Remove the shaft (3), using a steel bar and hammer.

### STEP 4



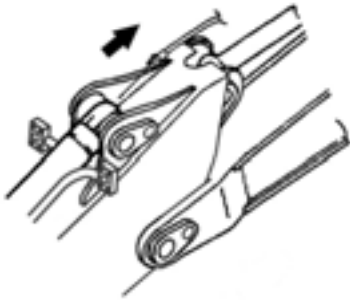
Attach a suitable sling (B) to the bucket cylinder to hold the cylinder rod to the cylinder barrel.

**STEP 5**



Start the vacuum pump. Disconnect the two hydraulic hoses (A) from the bucket cylinder. Plug the hydraulic hoses with plugs and the unions with caps. Stop the vacuum pump.

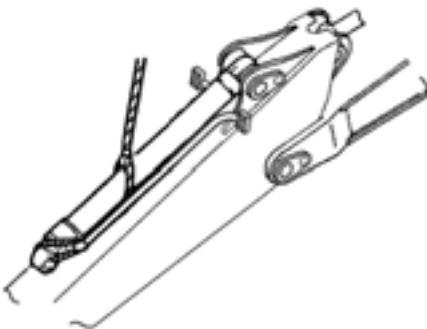
**STEP 6**



Remove the grease hose.

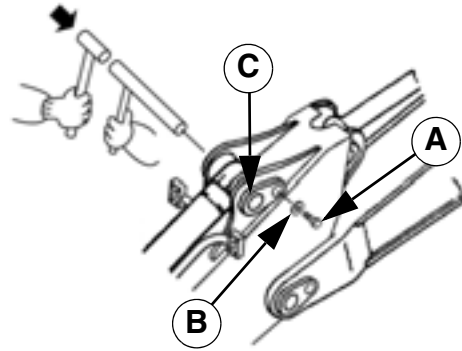
**NOTE:** Remove the wooden shim when the bucket cylinder is raised.

**STEP 7**



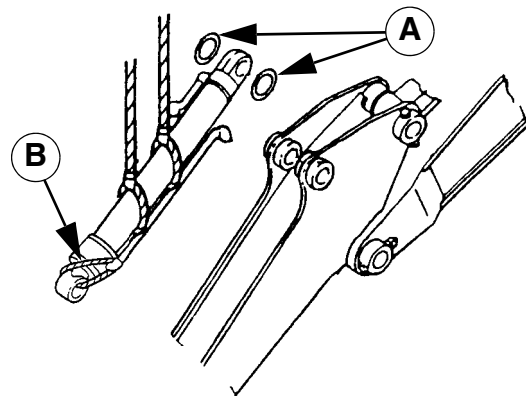
Lift bucket cylinder, using a sling.

**STEP 8**



Remove the screw (A) and the washer (B). Remove the shaft (C) from the dipper.

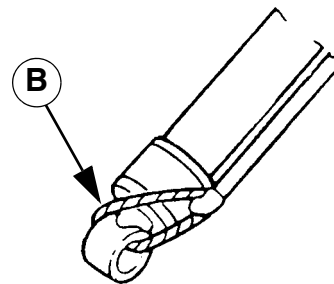
**STEP 9**



Carefully lift the bucket cylinder and move it away from the dipper. Remove the shims (A). Place the bucket cylinder on suitable supports.

JS00614A

**STEP 10**



Remove the sling (B) that holds the cylinder rod to the cylinder barrel.

JS00586A