

# Owner's Manual

---

## 416 & 417 LOADERS

### INSTALLATION AND MAINTENANCE INSTRUCTIONS

**Model Number 416 & 417**

Model 416 (S/N 10626 & Above)

Model 417 (S/N 10996 & Above)

**Important:**  
**Read Safety Rules and Instructions Carefully**

Thank you for purchasing an American-built product

**CUB CADET CORPORATION • P. O. BOX 360930 • CLEVELAND, OHIO 44136**

## TO THE OWNER:

Read this manual before operating your Cub Cadet loader. The information presented will prepare you to do a better and safer job. Keep this manual handy for ready reference.

The loader you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate the unit as specified. Observe all safety information in this manual and safety decals on the loader and tractor.

For service, your authorized Cub Cadet dealer has trained mechanics, genuine Cub Cadet service parts, and the necessary tools and equipment to handle all your needs.

Use only genuine Cub Cadet service parts. Substitute parts will void the warranty and may not meet standards required for safe and satisfactory operation. Record the serial number of your loader in the space provided:

Model: 590-417-100 Date Purchased: \_\_\_\_\_

Serial Number: (located on the left-hand inside knee plate) 13525

Provide this information to your dealer to obtain correct repair parts.

Throughout this manual, the term **IMPORTANT** is used to indicate that failure to observe can cause damage to equipment. The terms **CAUTION**, **WARNING** and **DANGER** are used in conjunction with the Safety-Alert Symbol, (a triangle with an exclamation mark), to indicate the degree of hazard for items of personal safety.



The Safety-Alert Symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



Denotes a reminder of safety practices or directs attention to unsafe practices which could result in personal injury if proper precautions are not taken.



Denotes a hazard exists which can result in injury or death if proper precautions are not taken.



Denotes an extreme intrinsic hazard exists which would result in high probability of death or irreparable injury if proper precautions are not taken.

# TABLE OF CONTENTS

INTRODUCTION .....	Inside Front Cover
GENERAL INFORMATION .....	1
SPECIFICATIONS .....	2
SAFETY RULES .....	3-4
SAFETY DECALS .....	5
OPERATION .....	6
ASSEMBLY .....	10
MOUNTING & DISMOUNTING LOADER .....	16
MAINTENANCE .....	17
TROUBLE SHOOTING .....	20-21
SERVICE .....	22
INDEX TO PARTS LISTS .....	24
INDEX .....	33

## GENERAL INFORMATION

The purpose of this manual is to assist you in operating and maintaining your loader. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance. These instructions have been compiled from extensive field experience and engineering data. Some information may be general in nature due to unknown and varying operating conditions. However, through experience and these instructions, you should be able to develop procedures suitable to your particular situation.

The illustrations and data used in this manual were current at the time of printing, but due to possible inline production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machines as may be necessary without notification.

Throughout this manual, references are made to right and left direction. These are determined by standing behind the equipment facing the direction of forward travel.

# SPECIFICATIONS

Specifications will vary with tractor, tire size, hydraulic system and bucket used. The specifications are given for a loader equipped with 60" material bucket on the Model 417, and 48" material bucket on the Model 416.

	<u>Model 416</u>	<u>Model 417</u>
A* MAXIMUM LIFT HEIGHT	84" (213 cm)	101" (257 cm)
B* CLEARANCE WITH ATTACHMENT DUMPED	63" (160 cm)	81" (206 cm)
C* REACH AT MAXIMUM HEIGHT	23" (58 cm)	23" (58 cm)
D* MAXIMUM DUMP ANGLE	45°	45°
E* REACH WITH ATTACHMENT ON GROUND	54" (137 cm)	61" (155 cm)
F* ATTACHMENT ROLLBACK ANGLE	22°	20°
G* DIGGING DEPTH	4" (10 cm)	6" (15 cm)
H* OVERALL HEIGHT IN CARRYING POSITION	45" (114 cm)	52" (132 cm)
L* LENGTH OF ATTACHMENT	21" (53 cm)	23" (58 cm)
W* LIFT CAPACITY TO FULL HEIGHT	630# / 286 kg.	1,100# / 499 kg
T* BREAKAWAY CAPACITY	1,050# / 454 kg.	1,875# / 850 kg.
RAISING TIME TO FULL HEIGHT	3.5 sec.	6.0 sec.
LOWERING TIME	2 sec.	3.5 sec.
DUMP	2.5 sec.	3.5 sec.
ATTACHMENT ROLLBACK TIME	1.0 sec.	2.5 sec.
Rated At	1500 PSI / 5 GPM (.043 Orifice)	2000 PSI / 7 GPM (Main) 1650 PSI / 7 GPM (Lift)
RECOMMENDED TRACTOR HP	11 to 20 HP	20 to 35 HP

	<u>BUCKET CAPACITY</u>	<u>STRUCK</u>	<u>HEAPED</u>
MODEL 416	48"	6.4 cu. ft. (.18 cu. meter)	8.0 cu. ft. (.23 cu. meter)
MODEL 417	60"	10.0 cu. ft. (.28 cu. meter)	12.7 cu. ft. (.36 cu. meter)

	<u>Model 416</u>	<u>Model 417</u>
CYLINDERS		
Lift	1.5" (3.8 cm)	2" (5.1 cm)
Bucket	1.5" (3.8 cm)	2" (5.1 cm)

Hoses: Meets or exceeds SAE 100 RI Single Wire Braid

Fittings: SAE O-Ring and JIC 37° Flare

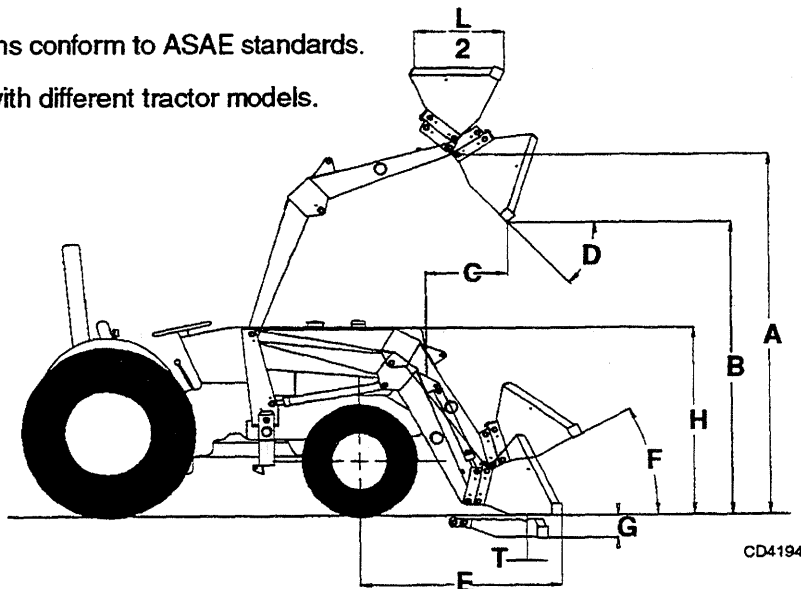
Oil: Tractor System: As recommended by tractor Owner's Manual

Valves: 416 – 2 Spool Parallel Valve, Power Beyond

417 – 2 Spool Parallel Valve, Power Beyond w/ regenerative bucket circuit.

NOTE: All specifications conform to ASAE standards.

\* Specifications vary with different tractor models.



# SAFETY RULES



**ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



Safety is a primary concern in the design and manufacture of our products. Unfortunately, our efforts to provide safe equipment can be wiped out by a single careless act of an operator.

In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

It has been said *"The best safety device is an informed, careful operator."* We ask you to be that kind of an operator.

The designed and tested safety of this equipment depends on it being operated within the limitations as explained in this manual.

## TRAINING

- Safety instructions are important! Read this manual, the tractor manual and all safety rules.
- Know your controls and how to stop engine and attachment quickly in an emergency.
- Operators must be instructed in and be capable of the safe operation of the equipment, its attachments and all controls. Do not allow anyone to operate this equipment without proper instructions.
- Keep hands and body away from pressurized lines. Use paper or cardboard, not body parts to check for leaks. Hydraulic fluid (oil) under pressure will penetrate skin causing serious injury.
- Make sure that all operating and service personnel know that in the event hydraulic fluid penetrates skin, it must be surgically removed within a few hours by a doctor familiar with this form of injury, or gangrene may result.
- Do not allow children or untrained persons to operate equipment.

## PREPARATION

- Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hands, hearing and head.

■ Ensure loader is properly attached, adjusted and in good operating condition.

■ Tractor must be equipped with a Roll Over Protective System (ROPS). When using loader, keep foldable ROPS up and fasten the seat belt prior to starting the engine.

■ Ensure all safety decals are installed and in good condition. (See Safety Decals section.)

■ Add recommended wheel ballast or rear weight to provide good stability.

■ Move the wheels to the tractor manufacturer's widest recommended setting to increase stability.

■ For better stability, use the tractor with wide front axle setting.

## OPERATIONAL SAFETY

- Improper use of a loader can cause serious injury or death.
- Do not allow riders. Do not lift or carry anybody on the loader or in the bucket or attachment.
- Keep bystanders away from equipment while it is in operation.
- Never allow anyone to get under the loader bucket or reach through the lift arms when the bucket is raised.
- Do not walk or work under a raised loader or bucket or attachment.
- Avoid overhead wires and obstacles when the loader is raised. Contacting electric lines can cause electrocution.
- Do not tamper with the relief valve setting. The relief valve is pre-set at the factory. Changing the setting can cause overloading of the loader and tractor and serious operator injury may result.
- Do not modify or alter or permit anyone else to modify or alter the loader or any of its components or any loader function.
- Exercise caution when operating the loader with a raised loaded bucket or fork.
- Operate only in daylight or good artificial light.

*(Safety Rules continued on next page)*

# SAFETY RULES



**ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



*(Safety Rules continued from previous page)*

- Always comply with all state and local lighting and marking requirements.
- Always sit in tractor seat when operating controls or starting engine. Place transmission in park or neutral, engage brake and ensure all other controls are disengaged before starting tractor engine.
- Look down and to the rear and make sure area is clear before operating in reverse.
- Move and turn the tractor at low speeds.
- Do not operate on steep slopes.
- Do not stop, start or change directions suddenly on slopes.
- Use extreme care and reduce ground speed on slopes and rough terrain.
- Watch for hidden hazards on the terrain during operation.
- Avoid loose fill, rocks, and holes. They can be dangerous for loader operation or movement.
- Allow for loader length when making turns.
- Stop the loader arms gradually when lowering or lifting.
- Use caution when handling loose or shiftable loads.
- Carry loader arms at low position during transport.
- Lower loader bucket to ground, stop engine, set parking brake and remove key before dismounting tractor.
- The model 416 and 417 loaders are not equipped with any method to prevent objects such as round bales, posts, logs, etc. from rolling back onto the operator.
  - Do not carry posts, logs, round hay bales, and other similar large objects that can fall out of loader bucket.
  - Serious injury or death can result if objects fall from bucket.

- Always protect yourself by:
  - Never lifting the loader higher than necessary to clear the ground when moving.
  - Ballasting the tractor rear to compensate for the load.
  - Never lifting large objects with equipment that does not have an anti-rollback device.

## MAINTENANCE SAFETY

- Always wear relatively tight and belted clothing to avoid entanglement in moving parts. Wear sturdy, rough-soled work shoes and protective equipment for eyes, hands, hearing and head.
- Never work under a raised loader. Always lower loader to ground for service or maintenance.
- Keep all persons away from operator control area while performing adjustments, service or maintenance.
- Tighten all bolts, nuts and screws, and check that all cotter pins are installed securely to ensure equipment is in a safe condition before operating.
- Ensure all safety decals are installed and in good condition. (See Safety Decals section.)
- When servicing or replacing pins in cylinder ends, buckets, etc., always use a brass drift and hammer. Failure to do so could result in injury from flying metal fragments.
- Do not disconnect hydraulic lines until machine is securely in lowest position and system pressure is released by operating valve.

## STORAGE

- Make sure all parked loaders are on a hard, level surface. Engage all safety devices.
- Do not loosen hydraulic fittings or hoses while loader is in stored position.
- Do not climb or lean on loader stored on stand.

# SAFETY DECALS



**ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!**



**Replace Immediately If Damaged!**

*NOTE:* Loader safety decals are located on the back of the left upright. Replace any decal that is damaged or illegible. Replacement decals are available from your dealer.

1

## INSTRUCTIONS

### TO REMOVE LOADER

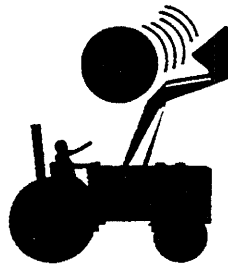
1. PARK TRACTOR ON LEVEL SURFACE WITH BUCKET FLAT ON GROUND.
2. REMOVE STAND FROM STORAGE AND PIN TO BOOM CROSS TUBE AND BUCKET BACKSHEET.
3. LOOSEN LOCK DOWN NUTS. REMOVE REAR MOUNTING PINS.
4. REVERSE TRACTOR UNTIL LOADER IS FREE OF REAR MOUNT.
5. ROLL BACK BUCKET TO RAISE UPRIGHTS FROM REAR MOUNTS UNTIL FRONT TIRES WILL PASS UNDER THEM.
6. SHUT OFF ENGINE, DISCONNECT HYDRAULICS, THEN BACK AWAY.

### TO MOUNT LOADER

1. DRIVE INTO LOADER SLOWLY.
2. SHUT OFF ENGINE, CONNECT HYDRAULICS.
3. ACTUATE VALVE TO TIP BUCKET AND LOWER UPRIGHTS INTO REAR MOUNTS.
4. CAREFULLY DRIVE FORWARD UNTIL LOADER IS IN POSITION. SHUT OFF ENGINE AND SET BRAKES.
5. INSTALL REAR MOUNTING PINS. TIGHTEN LOCK DOWN NUTS. DO NOT OVERTIGHTEN.
6. REMOVE STAND AND PIN INTO STORAGE.



**DANGER**



1. LOAD ON RAISED BUCKET OR FORK CAN FALL OR ROLL BACK ONTO OPERATOR CAUSING SERIOUS INJURY OR DEATH.
2. USE CLAMPING DEVICES OR ATTACHMENTS FOR HANDLING LARGE LOADS SUCH AS ROUND BALES, POSTS, ETC.
3. USE ONLY RECOMMENDED ATTACHMENTS LISTED IN OPERATORS MANUAL.

2

3



**CAUTION**

### LOADER SAFETY GUIDES

1. MOVE AND TURN TRACTOR AT LOW SPEEDS.
2. CARRY LOADER ARMS AT A LOW POSITION DURING TRANSPORT.
3. LOWER LOADER ARMS, STOP ENGINE AND LOCK BRAKES BEFORE LEAVING OPERATOR SEAT.
4. DO NOT STAND OR WORK UNDER RAISED LOADER.
5. ADD RECOMMENDED WHEEL BALLAST OR REAR WEIGHT FOR STABILITY.
6. MOVE WHEELS TO WIDEST RECOMMENDED SETTINGS TO INCREASE STABILITY.
7. DO NOT CLIMB OR LEAN ON LOADER STORED ON STAND.
8. OBSERVE SAFETY RECOMMENDATIONS IN LOADER INSTRUCTION MANUAL.

# OPERATION

## PREPARING TRACTOR

Before operating the loader, for optimum stability, additional weight should be added to the rear of the tractor with rear wheel weights or liquid ballast. Refer to your tractor operator's manual for weighting information.

The tractor rear wheels should be moved to the tractor manufacturer's widest recommended settings to increase the stability of the tractor.

## OPERATING LOADER

The loader should be operated with the tractor engine running at a safe RPM. Excessive speeds are dangerous, and may cause bucket spillage and unnecessary strain on the tractor and loader.

## FILLING THE BUCKET

Approach and enter the pile with a level bucket. See Figure 1.

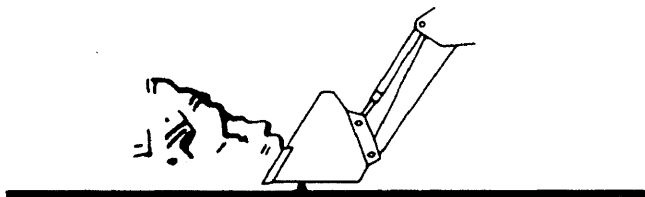


Figure 1

Loaders with single handle controls, ease lever back and toward you to lift and rollback the bucket. See Figure 2.

### 1-LEVER CONTROL

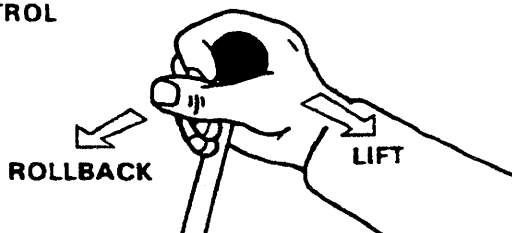


Figure 2

The lift and rollback of the bucket will increase efficiency because a level bucket throughout the lifting cycle resists bucket lift and increases break-away effort. See Figure 3.

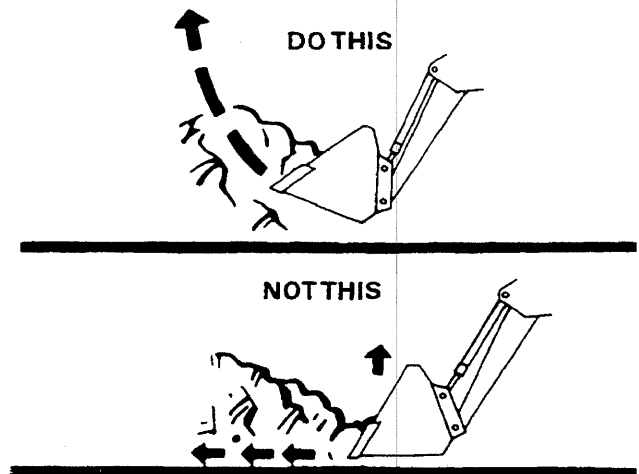


Figure 3

NOTE: Do not be concerned if the bucket is not completely filled during each pass. Maximum productivity is determined by the amount of material loaded in a given period of time. Time is lost if two or more attempts are made to fill the bucket on each pass.

## LIFTING THE LOAD

When lifting the load, keep the bucket positioned to avoid spillage. See Figure 4.

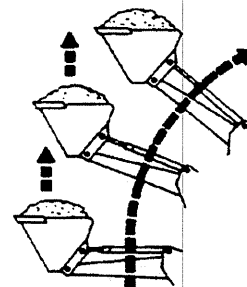


Figure 4



## CAUTION

■ Do not attempt to lift bucket loads in excess of the loader capacity.

## CARRYING THE LOAD

Position the bucket just below the level of the tractor hood for maximum stability and visibility, whether the bucket is loaded or empty. See Figure 5.



Figure 5



Use extreme care when operating the loader on a slope, keep the bucket as low as possible. This keeps the bucket and tractor center of gravity low and will provide maximum tractor stability. See Figure 6.

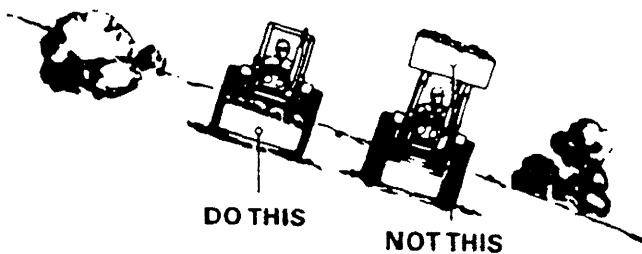


Figure 6

## CAUTION

■ Operating the loader on a hillside is dangerous. Extreme care is recommended to avoid overturn.

When transporting the load, keep the bucket as low as possible to avoid tipping, in case a wheel drops in a rut. See Figure 7.

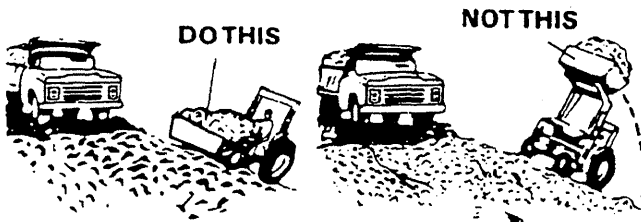


Figure 7

## DUMPING THE BUCKET

Lift the bucket high enough to clear the side of the vehicle. Move the tractor in as close to the side of the vehicle as possible, then dump the bucket. See Figure 8.

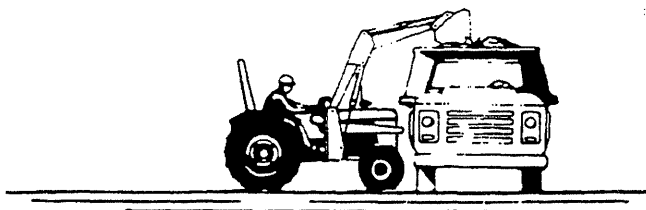


Figure 8

## LOWERING BUCKET

After the bucket is dumped, back away from the vehicle while lowering and rolling back the bucket. See Figure 9.

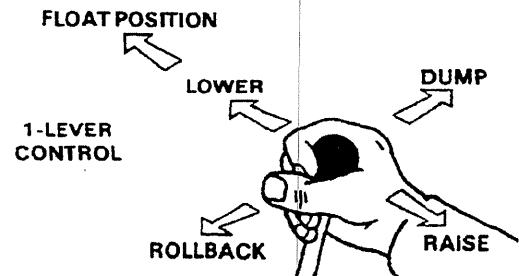


Figure 9

## OPERATING WITH FLOAT CONTROL

During hard surface operation, keep the bucket level and put the lift control in the float position to permit the bucket to float on the working surface. If hydraulic down pressure is exerted on the bucket, it will wear faster than normal. See Figure 10.

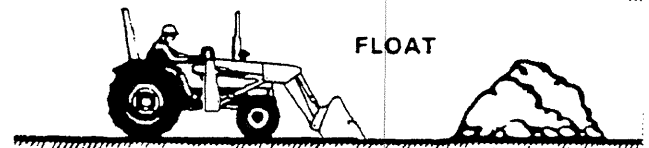


Figure 10

The float will also prevent the mixing of surface material with stockpile material. The float position will reduce the chance of surface gouging when removing snow or other material, or when working with a blade. See Figure 11.

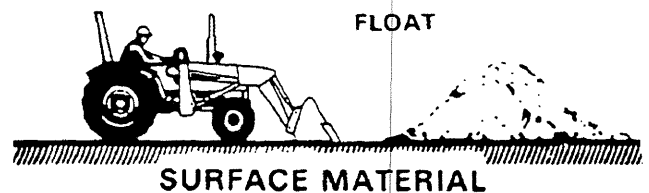


Figure 11

## LOADING FROM A BANK

Exercise caution when undercutting high banks. Dirt slides can be dangerous. Load from as low as possible for maximum efficiency. Loader lift and break-away capacity diminish as loading height is increased.

If the pile sides are too high and liable to cause cave-in, use the loader to break down the sides until a slot can be cut over the top. See Figure 12.

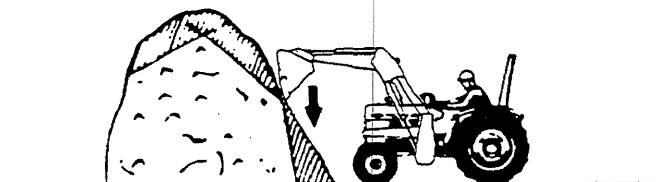


Figure 12

Another method for large dirt piles is to build a ramp approach to the pile. See Figure 13.

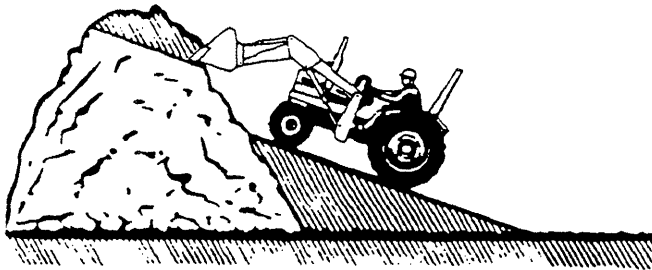


Figure 13

It's important to keep the bucket level when approaching a bank or pile. This will help prevent gouging in the work area. See Figure 14.

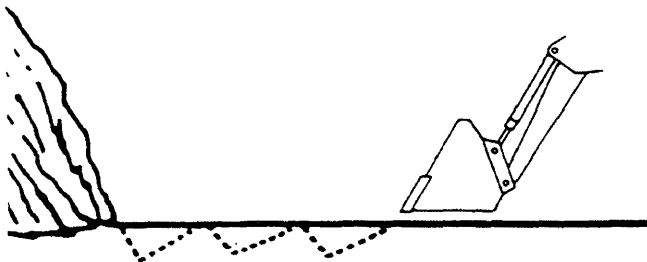


Figure 14

## PEELING AND SCRAPING

Use a slight bucket angle, travel forward, and hold the lift control forward to start the cut. Make a short, 5 inch to 8 inch angle cut and break-out cleanly. See Figure 15.

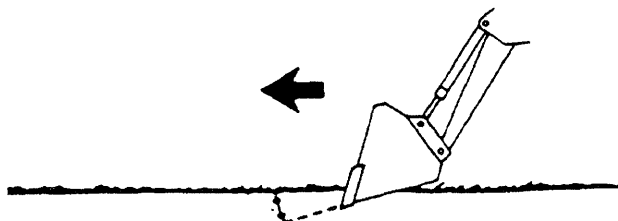


Figure 15

With the bucket level, start a cut at the notch approximately 2 inches deep. Hold the depth by feathering the bucket control to adjust the cutting lip up or down. When the front tires enter the notch, adjust the lift cylinder to maintain proper depth. See Figure 16.

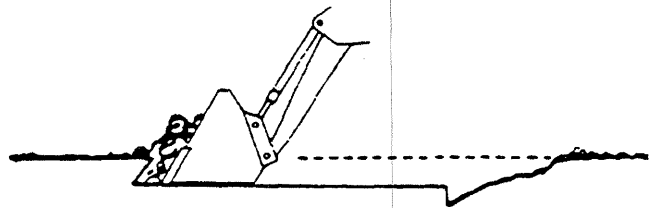


Figure 16

Make additional passes until the desired depth is reached. During each pass, only use the bucket control while at working depth. This will allow you to concentrate on controlling the bucket angle to maintain a precise cut. See Figure 17.



Figure 17

## LOADING LOW TRUCKS OR SPREADERS FROM A PILE

For faster loading, minimize the angle of turn and length of run between pile and spreader. See Figure 18.

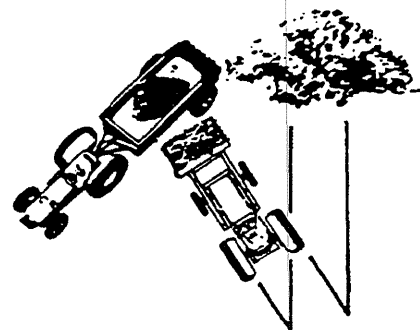


Figure 18

Backgrade occasionally with a loaded bucket to keep the working surface free of ruts and holes. Also, hold the lift control forward so the full weight of the bucket is scraping the ground. Use the heel of the bucket. See Figure 19.

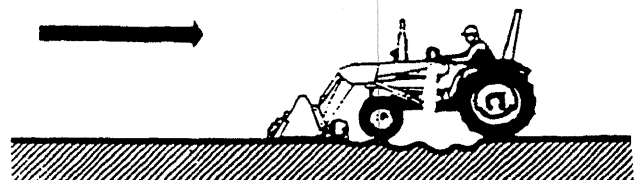


Figure 19

## BACKFILLING

Approach the pile with a flat bucket. See Figure 20.

Poor methods actually move no more dirt and make it more difficult to hold a level grade.

DO THIS

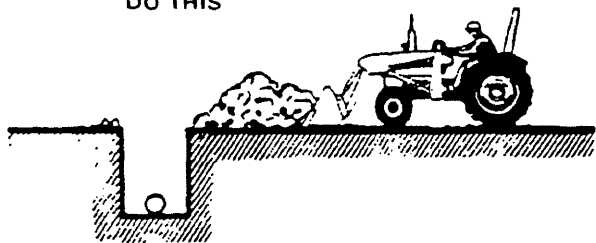


Figure 20

Do not use the bucket in the dumped position for bulldozing. This method, shown below, will impose severe shock loadings on the dump linkage, the bucket cylinder, and the tractor. See Figure 21.

Leave dirt in the bucket because dumping on each pass wastes time.

Operate at right angles to the ditch. Take as big a bite as the tractor can handle without lugging down.

Leave dirt which drifts over the side of the bucket for final clean-up.

Pile dirt on the high side for easier backfilling on a slope.

NOT THIS

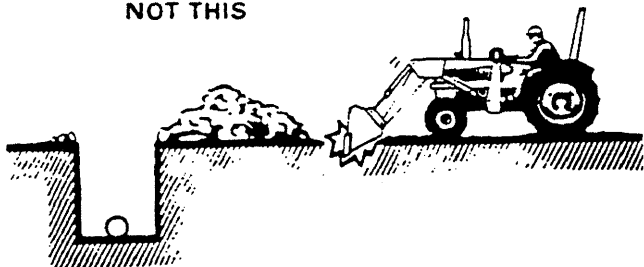


Figure 21

## BACKBLADING

Position the bucket at an angle of less than 45° and backup slowly. See Figure 22.

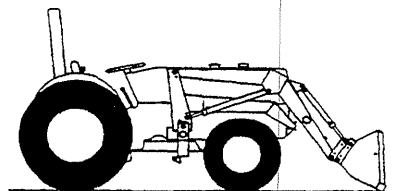


Figure 22

Backblading with bucket tilted too far may result in damage to tilt cylinders and void warranty. See Figure 23.

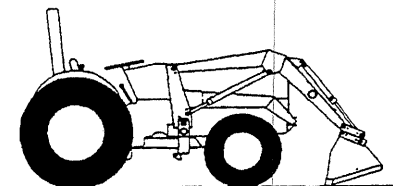


Figure 23

## HANDLING LARGE HEAVY OBJECTS

### WARNING

■ The model 416 and 417 loaders are not equipped with any method to prevent objects such as round bales, posts, logs, etc. from rolling back onto the operator.

- Do not carry posts, logs, round hay bales, and other similar large objects that can fall out of loader bucket.
- Serious injury or death can result if objects fall from bucket.

■ Always protect yourself by:

- Never lifting the loader higher than necessary to clear the ground when moving.
- Ballasting the tractor rear to compensate for the load.
- Never lifting large objects with equipment that does not have an anti-rollback device.

# ASSEMBLY

## INSTALLATION INSTRUCTIONS

### Model 416 Loader Installation

(for Model 417, skip to page 13)

Model 416 loader fits Cub Cadet tractor models 7192, 7194 and 7195 only. Please read these instructions carefully before starting the installation. Follow the directions and refer to the illustrations as needed throughout the installation procedure.

#### Mounting the Loader (Figure 24)

Attach the front mount (2) to the front frame member of the tractor using 1/2 NC x 1-1/4" capscrews, nuts and lockwashers. Tighten all front mount fasteners securely.

Use M14 x 2 x 40mm capscrews and lockwashers to fasten the right (3) and left (4) rear mounts to the mounting pad located on the sides of the tractor clutch housing. If tractor is already equipped with mid-mount mower, remove the spacer plate between the mower bracket and the clutch housing before installing the

rear mounts. Reinstall the mower brackets over the loader mounts and tighten securely.

Use an overhead lifting device to raise the loader off the shipping pallet. Reposition the loader before lifting it up onto the loader mounting brackets. The loader is in place on the tractor when it engages the front mount and rests on the rear mounts.

Insert hitch pins through the rear mounts and secure with hairpin cotter. Tighten the lock down bolt to create a rigid connection between the loader and the mounting. Use the Faspin (1) in the front mount to complete the loader attachment.

#### Attaching the Bucket (Figure 25)

Loosen and remove the capscrews securing the tab pins (2) in the bucket brackets. Remove the pins from the bucket before lifting it into position at the front of the loader boom. Pin the bucket to the boom using the lower holes. Use the upper holes for connecting the tilt cylinders to the bucket. Secure tab pins using capscrews and locknuts (4 & 3) removed earlier.

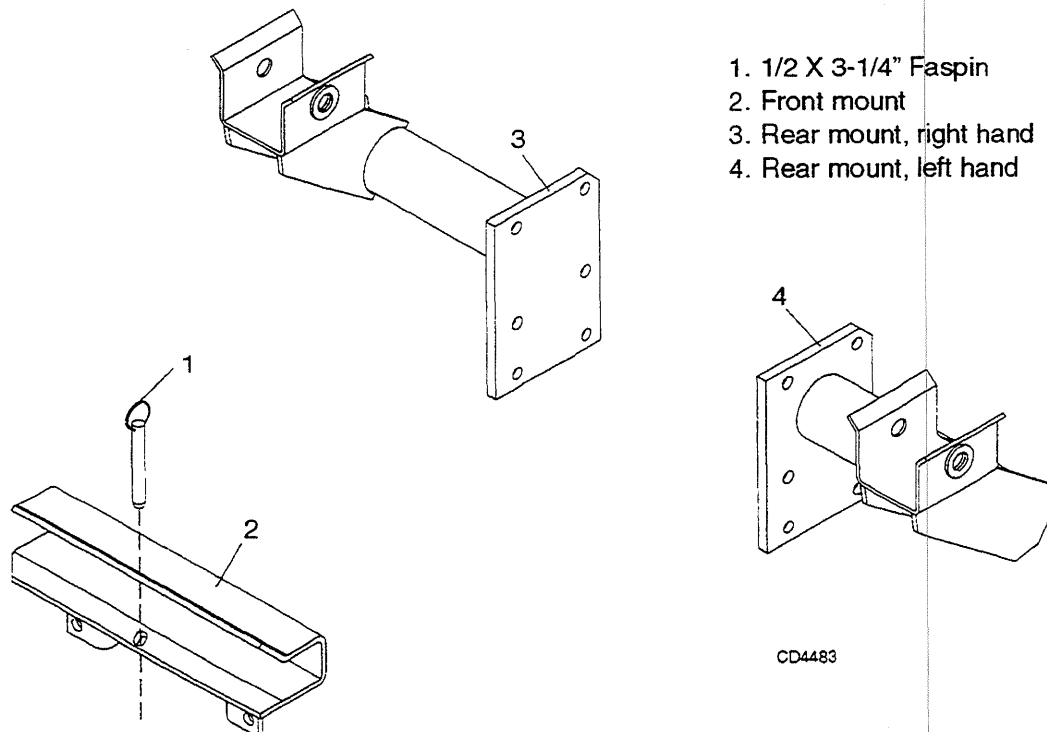
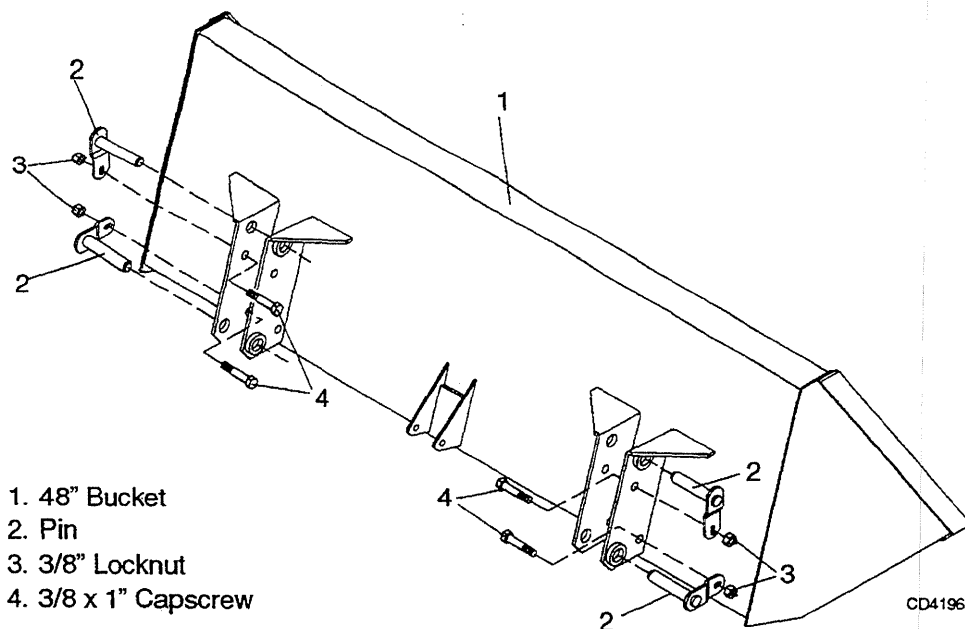


Figure 24. Front and Rear Mounts – Model 416



**Figure 25. Attaching 48" Bucket**

### Assembling the Valve and Hoses (Figure 26)

Fasten valve mounting bracket to the holes in the rear of the right loader upright using 3/8 x 1" capscrews, lockwashers and nuts. This bracket should be mounted so the valve will be between the loader upright and tractor.

Insert 90° adjustable elbow (1) into power beyond port of valve. Connect the longer hydraulic hoses to all three port fittings and tighten the connections.

Remove two 1/4" hex nuts and lockwashers from the back side of the valve cover. Attach the valve and cover to the valve mounting bracket using extreme

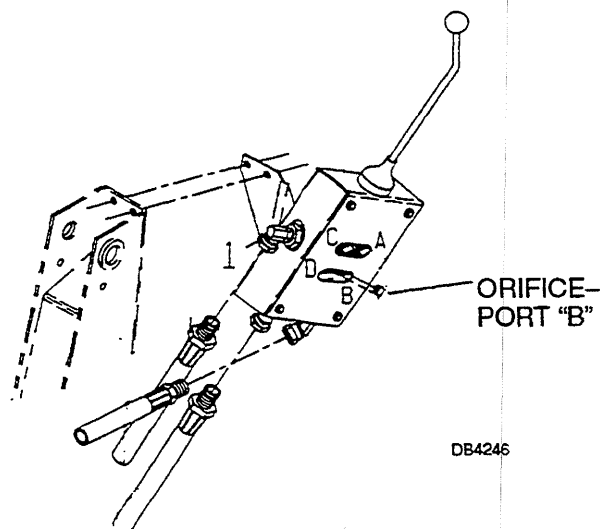
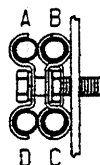
care to avoid dislodging the capscrews. (Use the middle of the three holes available at the lower corner of the valve bracket.) Replace the hex nuts and lockwashers and tighten firmly.

**NOTE:** If capscrews become dislodged or cannot be tightened, it will be necessary to remove the end cover to gain access.

Next, connect the 90° end of the shorter hoses to the workports of the valve. Install orifice in port "B" with the feet out before connecting hose. Connect the opposite end of each hose to the appropriate feedline on the loader boom. (Check the diagram carefully to determine appropriate connection.) Tighten hose connections before proceeding.

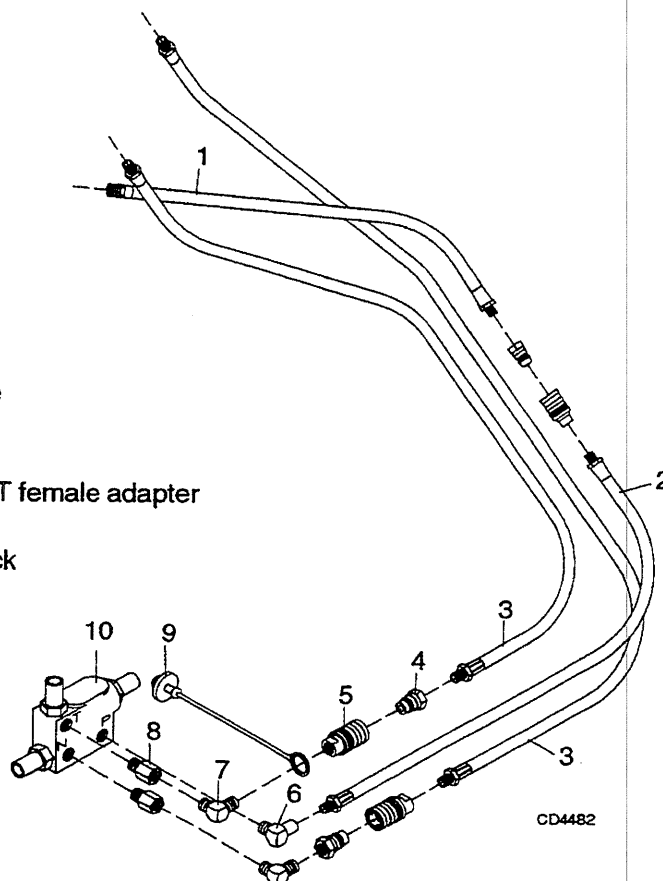
1. Adjustable elbow

A – Bucket Dump  
B – Bucket Rollback  
C – Boom Down  
D – Boom Up



**Figure 26. Assembling Valves and Hoses – Model 416**

1. Hydraulic hose, L22
2. Hydraulic hose, L28
3. Hydraulic hose, L50
4. Quick coupler – male
5. Quick coupler – female
6. 90° Adapter
7. 90° Male pipe elbow
8. Male 3/8 ISO – 3/8 NPT female adapter
9. Dust plug, blue
10. Hydraulic manifold block



**Figure 27. Connecting the Hydraulics – Model 416 (S/N 10626 & Above)**

### Connecting the Hydraulics (Figure 27)

Locate the hydraulic manifold block (10) located below the right foot platform of the tractor. NOTE: This block has a switch between the ports labeled “N” and “P.” Turn this switch to the “S” position for loader operation.

Remove the socket head pipe plug labeled “P” from the manifold block and replace with an adapter elbow (6), short hydraulic hose (2), and the female end of a quick coupler (5). Turn the male end of a quick coupler (4) onto the end of another short hydraulic hose (1), and connect it to the 45° elbow at the loader valve. Then couple the two short hoses together.

NOTE: Use a good thread sealant on all pipe threads to prevent leaks.

Remove the socket head plug labeled “N.” Replace it with a straight adapter (8), elbow (7) and the male end of a quick coupler (4). Repeat the same procedure for the port labeled “T” except install a female coupler (5) and a rubber plug (9).

Connect the two longer hoses (3) to the remaining ports of the loader valve. Turn a female coupler (5) onto the hose leading from the 90° adapter at the power beyond port of the valve and then couple it to the male coupler at the “N” port of the hydraulic manifold. Turn a male coupler (4) onto the remaining hose and connect it to the coupler at the “T” port.

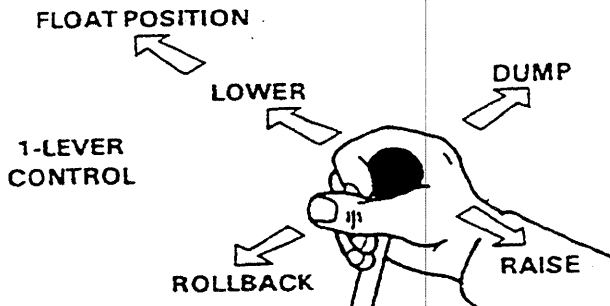
NOTE: When the loader is removed from the tractor, it will be necessary to couple the short hose (2) in a

loop to the male coupler at the “N” port of the manifold to power the 3-point hitch and prevent blocking of the hydraulic circuit. Use the rubber (9) in the open female coupler to prevent dirt from getting into it.

Start the tractor engine and actuate the loader until the hydraulic lines are purged of air. Check the hydraulic fluid level and fill as required. Refer to the tractor owner’s manual for hydraulic specifications and instructions.

The action of the joystick valve handle should provide the following functions when operating the loader.

- A. Handle forward – Boom down
- B. Handle forward to limit – Float position
- C. Handle back – Boom up
- D. Handle right – Tilt or dump
- E. Handle left – Rollback



**Figure 28. Valve Handle Functions**

Loosen the clamp which secures the level gauge rod to the right tilt cylinder and adjust it slightly if necessary. Level the loader bucket and mark the gauge rod at the appropriate point that it extends past its guide tube. Use paint or a durable marker that the operator will be able to see indefinitely.

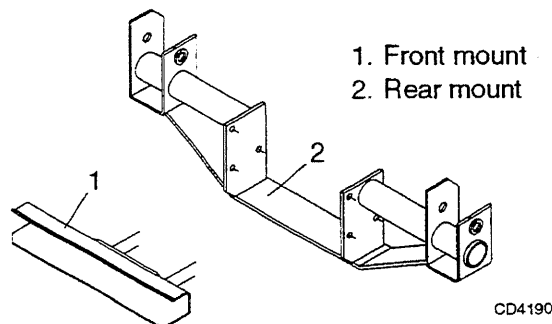
## IMPORTANT

■ When the loader is removed from the tractor and the hoses are uncoupled from the manifold adapter block, the flow control switch must be turned back to the "O" position. Failure to switch will cause blockage of the tractor hydraulic system, resulting in an inoperable 3-point hitch and potential damage to the hydraulic pump.

## Model 417 Loader Installation

Model 417 loader fits Cub Cadet tractor models 7232, 7234, 7235, 7272, 7274 and 7275 only. Please read these instructions carefully before starting the installation. Follow the directions and refer to the illustrations as needed throughout the installation procedure.

### Mounting the Loader (Figure 29)



**Figure 29. Loader Mounts – Model 417**

Remove the front end weights, if so equipped, and the front weight bracket from the tractor. Attach the front mount (1) to the front frame member of the tractor using the four metric capscrews, nuts and lockwashers

removed from the weight bracket. Tighten all front mount fasteners securely.

Adjust the operator foot platform toward the center of the tractor by turning the rubber cushioned mounting bolt. This bolt is located below the foot platform, one per side, near the clutch and brake pedals. Loosen the locknut and turn the bolt in as far as possible on both sides of the tractor.

Use M14 x 2 x 30mm capscrews and lockwashers to fasten rear mount (2) to mounting pad located on the tractor clutch housing. (The rear mount must be lifted at an angle up above the foot platform and then allowed to settle into place.) If the tractor is already equipped with a mid-mount mower, remove the brackets attached to the mounting pads on the clutch housing and discard spacers before installing rear mount (2).

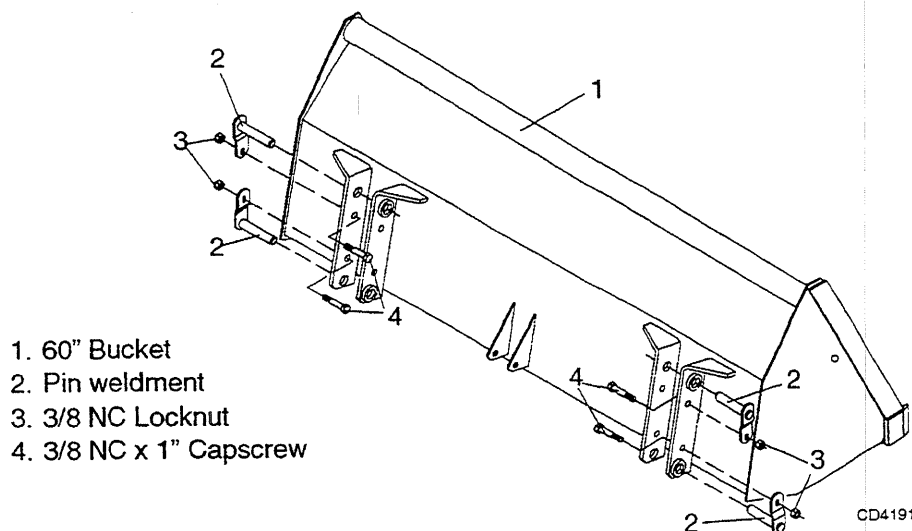
Reinstall the mower brackets over the loader mount using M14 x 2 x 40mm capscrews which were removed earlier. NOTE: Installation of the rear mount (2) may be hampered by interference with the hydraulic manifold block on the right side. Loosen hose clamp and remove socket head pipe plug if necessary.

Use an overhead lifting device to raise the loader off the shipping pallet. Reposition the loader before lifting it up onto the loader mounting brackets. The loader is in place on the tractor when it engages the front mount (1) and rests on the rear mounts (2).

Insert hitch pins through rear mounts (2) and secure with hairpin cotter. Tighten the lockdown bolt to create a rigid connection between the loader and the mounting. Finally, check all loader mounting fasteners and tighten securely.

### Attaching the Bucket (Figure 30)

Loosen and remove the capscrews securing the tab pins in the bucket brackets. Remove the pins from the bucket before lifting it into position at the front of the loader boom. Pin the bucket to the boom using the lower holes. Use the upper holes for connecting the tilt cylinders to the bucket. Secure tab pins using capscrews and locknuts removed earlier.



**Figure 30. Attaching 60" Bucket**

## Assembling Valve and Hoses – Model 417 (Figure 31)

Open the cartons containing the valve assembly and hydraulic components. Remove the end cover (8) from the valve enclosure to gain access and then remove the two 1/4" hex nuts and lockwashers from the back side. Attach the valve mounting bracket (7) and replace the hex nuts and lockwashers. There is a choice of three hole locations in the valve bracket and you **must** use the hole at the corner.

Insert the 90° adjustable elbow (9) into the power beyond port of valve and the four straight adapters (11) into the work ports. Tighten these fittings securely. Connect the three longer hydraulic hoses (1) to all three of the inlet and outlet ports. Then, replace the end cover onto the valve enclosure.

Fasten the valve bracket to the holes located in the rear of the right loader upright using 3/8 NC x 1" capscrews, lockwashers and hex nuts. The valve should be located between the loader upright and the tractor, just above the loader frame.

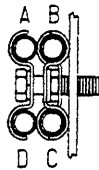
Attach the tees (12) to the straight adapters at ports C and D in the control valve. Connect the short hoses (13) with the straight ends to the tees. Route them up and forward to attach to loader feedlines C and D. (See diagram for more information.)

Connect two short hoses with curved ends (10) to ports A and B in the control valve. Then, attach opposite end to loader feedlines A and B. Tighten these hose connections at this point.

Locate and remove the pipe plugs from the relief valve (14). Apply a thread sealer to one of the plugs and tighten it into port X. Screw a swivel elbow (17) into the remaining ports Y and Z after applying a good thread sealer.

Attach the relief valve to the right loader frame at the mounting pad provided using 1/4 NC x 1-3/4" capscrews and lockwashers (15 & 16). Position relief valve with adjustment stem upward and ports down as shown. Connect a short hose from the tee at port D to the swivel elbow at port Y and the remaining hose between the tee at port C and port Z. Check and tighten all hose connections before proceeding.

- A – Bucket Dump
- B – Bucket Rollback
- C – Boom Down
- D – Boom Up



- 1. Hydraulic hoses – long
- 7. Valve mounting bracket
- 8. Valve enclosure end cover
- 9. 90° Elbow
- 10. Short hoses with curved ends
- 11. Straight adapters
- 12. Tees
- 13. Short hoses
- 14. Relief valve
- 15. Lockwasher
- 16. 1/4 NC x 1-3/4" Capscrew
- 17. Swivel elbow

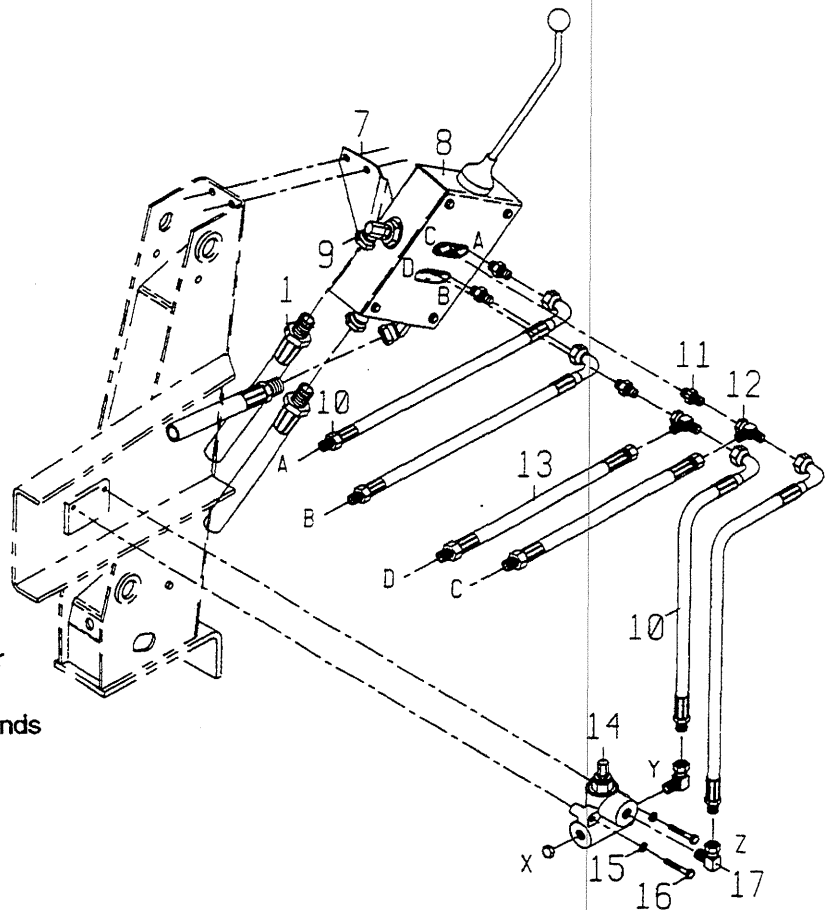


Figure 31. Assembling Valves and Hoses – Model 417

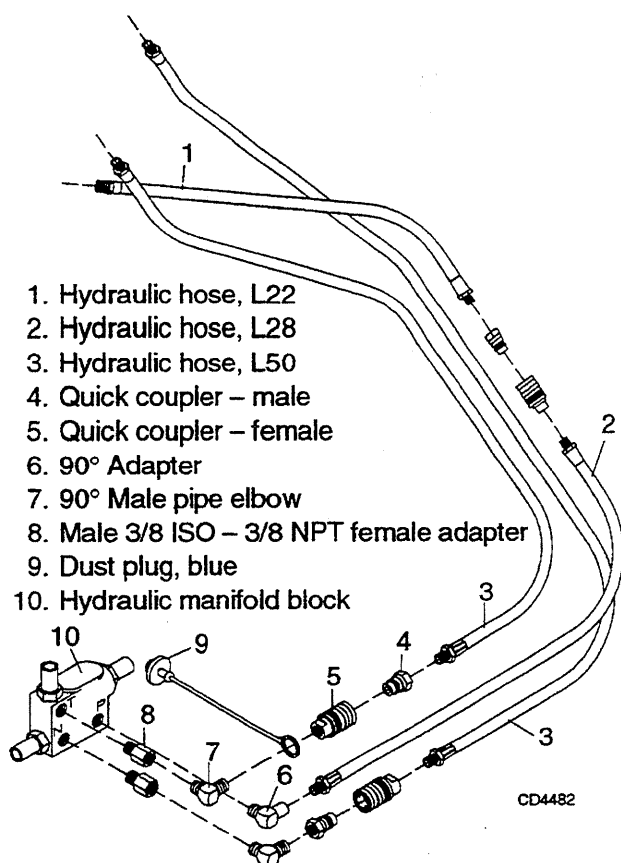


## Connecting the Hydraulics – Model 417 (Figure 32)

Locate the hydraulic manifold block (10) located below the right foot platform of the tractor. NOTE: This block has a switch between the ports labeled "N" and "P." Turn this switch to the "S" position for loader operation.

Remove the socket head pipe plug labeled "P" from the manifold block and replace with an adapter elbow (6), short hydraulic hose (2), and the female end of a quick coupler (5). Turn the male end of a quick coupler (4) onto the end of another short hydraulic hose (1), and connect it to the 45° elbow at the loader valve. Then couple the two short hoses together.

NOTE: Use a good thread sealant on all pipe threads to prevent leaks.



**Figure 32. Connecting Hydraulics – Model 417**  
(S/N 10996 & Above)

Remove the socket head plug labeled "N." Replace it with a straight adapter (8), elbow (7) and the male end of a quick coupler (4). Repeat the same procedure for the port labeled "T" except install a female coupler (5) and a rubber plug (9).

Connect the two longer hoses (3) to the remaining ports of the loader valve. Turn a female coupler (5) onto the

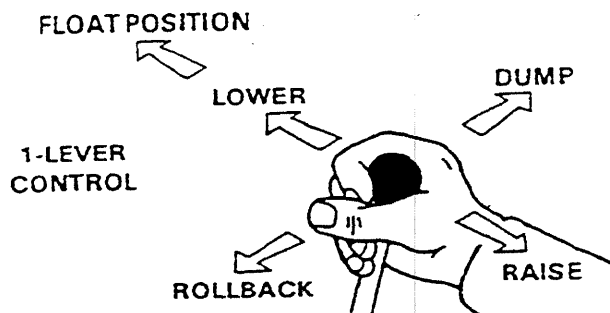
hose leading from the 90° adapter at the power beyond port of the valve and then couple it to the male coupler at the "N" port of the hydraulic manifold. Turn a male coupler (4) onto the remaining hose and connect it to the coupler at the "T" port.

NOTE: When the loader is removed from the tractor, it will be necessary to couple the short hose (2) in a loop to the male coupler at the "N" port of the manifold to power the 3-point hitch and prevent blocking of the hydraulic circuit. Use the rubber (9) in the open female coupler to prevent dirt from getting into it.

Start the tractor engine and actuate the loader until the hydraulic lines are purged of air. Check the hydraulic fluid level and fill as required. Refer to the tractor owner's manual for hydraulic specifications and instructions.

The action of the joystick valve handle should provide the following functions when operating the loader:

- A. Handle forward – Boom down
- B. Handle forward to limit – Float position
- C. Handle back – Boom up
- D. Handle right – Tilt or dump
- E. Handle left – Rollback



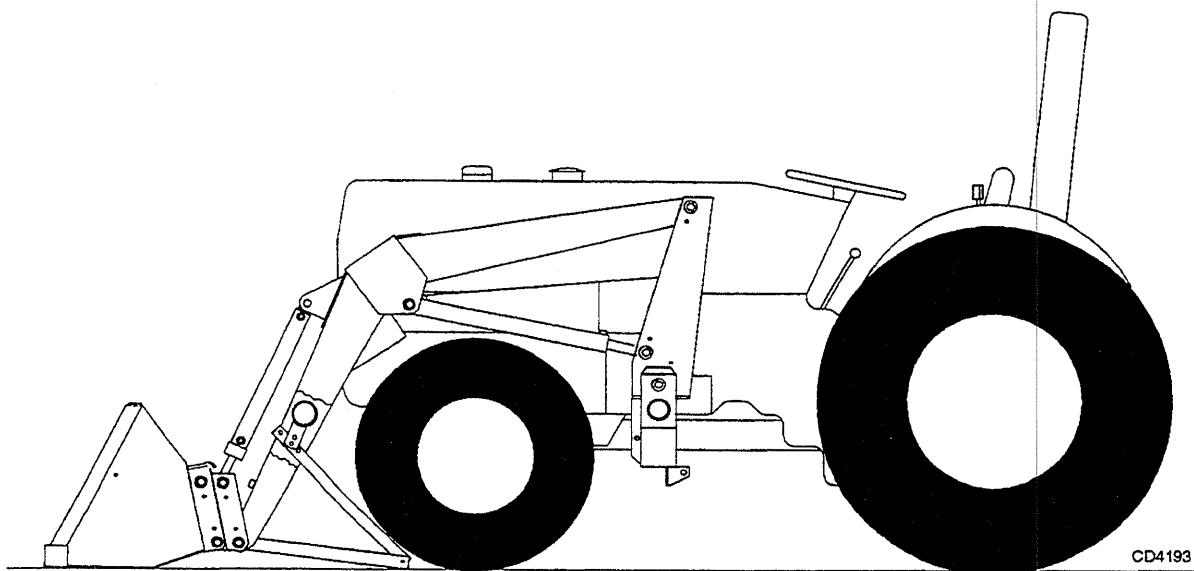
**Figure 33. Valve Handle Functions**

Loosen the clamp which secures the level gauge rod to the right tilt cylinder and adjust it slightly if necessary. Level the loader bucket and mark the gauge rod at the appropriate point that it extends past its guide tube. Use paint or a durable marker that the operator will be able to see indefinitely.

## IMPORTANT

■ When the loader is removed from the tractor and the hoses are uncoupled from the manifold adapter block, the flow control switch must be turned back to the "O" position. Failure to switch will cause blockage of the tractor hydraulic system, resulting in an inoperable 3-point hitch and potential damage to the hydraulic pump.

# MOUNTING & DISMOUNTING LOADER



**Figure 34. Mounting Loader to Tractor**

## MOUNTING PROCEDURE

Drive tractor up to loader and shut engine off. Relieve hydraulic pressure in tractor system.

Connect hydraulic hoses between tractor and loader. If necessary, turn on tractor hydraulics.

Start tractor engine. Activate the bucket cylinders to raise or lower the loader uprights. Activate the lift cylinders to raise or lower the rails.

Carefully drive tractor forward until the front crossbar is engaged in the front mount channel. Lower the uprights into the rear mounts.

Install rear mounting pins and tighten the lockdown nuts. Do not overtighten.

Remove stand; pin into storage position.

## LOADER DISMOUNT

Park tractor on level surface with bucket flat on the ground.

Remove pin from boom crossbar end and remove stand.

Pin the wide section of the stand to the loader crossbar and narrow section to the bucket.

Loosen lockdown nuts at lower front of uprights and remove rear mounting pins.

Reverse the tractor until the loader is free of the rear mounts.

Retract bucket cylinders to raise the loader uprights over front tractor tires.

Shut off tractor, release all hydraulic pressure, and disconnect hydraulic hoses from tractor. Shut off tractor hydraulics and connect hoses together to complete tractor hydraulic circuit when necessary.

Start tractor engine and back tractor clear of loader.

Do not climb or lean on loader stored on stand.



## WARNING

■ Bucket must be attached to loader boom frame before removing loader from the tractor, or loader may tip down, causing damage to the loader or tractor, and operator injury.



## CAUTION

■ Tilt cylinders must be collapsed completely when loader is transported with no attachment on loader, or tilt cylinder rods may be damaged.

# MAINTENANCE

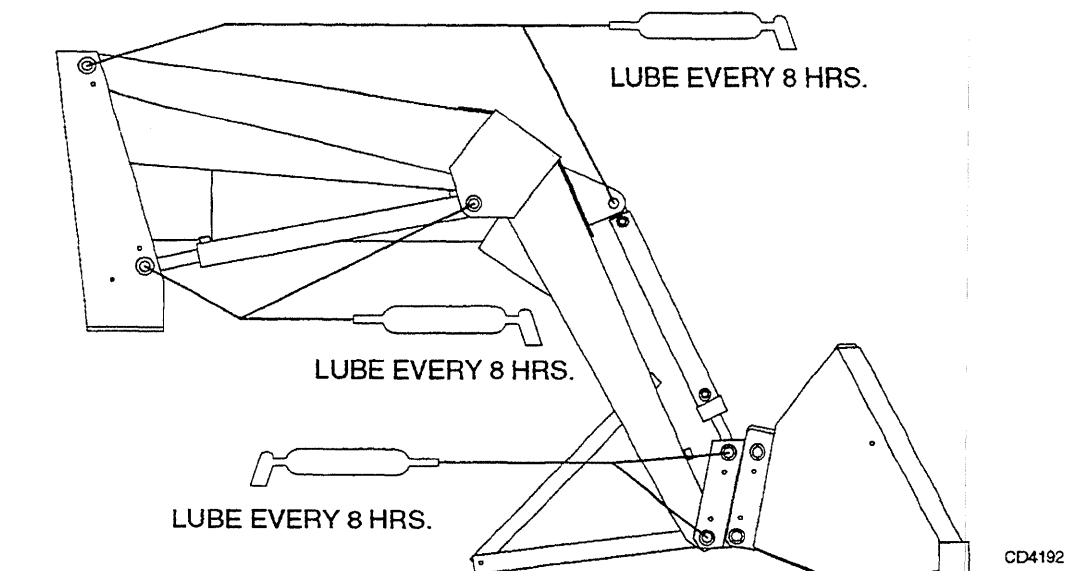


Figure 35. Lubrication Points

Regular maintenance of the loader and hydraulic system will insure maximum loader efficiency and long life.

## WARNING

- Never work under a raised loader. Always lower loader to ground for service or maintenance.

## DAILY MAINTENANCE

- Check the level of hydraulic oil in the tractor before starting each day's operation. If necessary, add oil as recommended in your tractor operator's manual.

## IMPORTANT

- When adding oil to the tractor reservoir, always use hydraulic oil as specified for your model tractor.
- After every eight hours of operation, lubricate the grease fittings at each end of each lift boom arm and at the rod and base end of each lift and bucket cylinder.
- After every ten hours of operation, check all hardware and tighten where required.
- Replace hoses immediately if they are damaged by a cut or scrape, extruded at the fittings, or leaking. Hydraulic oil leaks should be repaired promptly to avoid loss of oil and serious personal injury from escaping oil.

## CAUTION

- Keep hands and body away from pressurized lines. Use paper or cardboard, not body parts to check for leaks. Hydraulic fluid (oil) under pressure will penetrate skin causing serious injury.
- Make sure that all operating and service personnel know that in the event hydraulic fluid penetrates skin, it must be surgically removed within a few hours by a doctor familiar with this form of injury, or gangrene may result.

## OIL PRESSURE CHECK

Follow the following procedure to check if the loader is operating at the correct hydraulic pressure:

Obtain a pressure gauge that registers 3000 PSI in 50 PSI increments.

Install the pressure gauge into the hydraulic line connecting the loader valve to the base port of the bucket cylinders.

Start the tractor engine and adjust the throttle so the engine is running at operating RPM.

Push bucket control lever to pressurize the hydraulic line with the gauge attached. Hold the control until the cylinders reach the fully extended position. Holding the control with the cylinders fully extended will give you the hydraulic system pressure on the gauge.

If the pressure is not correct (416 loader: 1500 psi, or 417 loader: 2000 psi), contact an authorized service department.

## BOLT TORQUE

After every ten (10) hours of operation, check all hardware and tighten where required.

### SAE Series Torque Chart

DO NOT use these values if a different torque value or tightening procedure is listed for a specific application. Torque values listed are for general use only.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fastener threads are clean and you properly start thread engagement. This will prevent them from failing when tightening.

Bolt Diameter "A"	Wrench Size	MARKING ON HEAD					
		SAE 2		SAE 5		SAE 8	
		N-m	(Lbs.-Ft.)	N-m	(Lbs.-Ft.)	N-m	(Lbs.-Ft.)
3/8"	9/16"	24	(18)	41	(30)	54	(40)
7/16"	5/8"	41	(30)	68	(50)	95	(70)
1/2"	3/4"	61	(45)	102	(75)	142	(105)
9/16"	13/16"	88	(65)	142	(105)	203	(150)
5/8"	15/16"	122	(90)	197	(145)	278	(205)
3/4"	1-1/8"	217	(160)	353	(260)	495	(365)
7/8"	1-5/16"	224	(165)	563	(415)	800	(590)
1"	1-1/2"	332	(245)	848	(625)	1193	(880)
1-1/4"	1-7/8"	665	(490)	1492	(1100)	2393	(1765)

### Metric Series Torque Chart



#### CAUTION

Use only metric tools on metric hardware. Other tools may not fit properly. They may slip and cause injury.

DO NOT use these values if a different torque value or tightening procedure is listed for a specific application. Torque values listed are for general use only.

Fasteners should be replaced with the same or higher grade. If higher grade fasteners are used, these should only be tightened to the strength of the original.

Make sure fastener threads are clean and you properly start thread engagement. This will prevent them from failing when tightening.

Bolt Diameter "A"	Wrench Size	MARKING ON HEAD			
		8.8		10.9	
		N-m	(Lbs.-Ft.)	N-m	(Lbs.-Ft.)
5 mm	8 mm	6	(4.5)	9	(6.5)
6 mm	10 mm	10	(7.5)	15	(11)
8 mm	13 mm	25	(18)	35	(26)
10 mm	16 mm	50	(37)	75	(55)
12 mm	18 mm	85	(63)	130	(97)
16 mm	24 mm	215	(159)	315	(232)
20 mm	30 mm	435	(321)	620	(457)
24 mm	36 mm	750	(553)	1070	(789)
30 mm	46 mm	1495	(1103)	2130	(1571)

# NOTES

# TROUBLE SHOOTING

<b><u>PROBLEM</u></b>	<b><u>POSSIBLE CAUSE</u></b>	<b><u>SOLUTION</u></b>
Jerky Operation	Air in hydraulic system	Cycle cylinders several times to purge system of air.
	Cold hydraulic oil	Run engine to warm oil.
	Low hydraulic oil level	Add oil to level specified.
	Poor oil circulation	Change oil filter and clean screen in tractor hydraulic system.
	Worn or damaged hydraulic pump	Repair or replace pump.
	Air leak in pump inlet line	Check, tighten or replace inlet line.
Slow Operation	Faulty valve	Repair or replace valve.
	Air in hydraulic system	Cycle lift cylinders and bucket cylinders several times to free system from air.
	Hydraulic oil too heavy	Change to proper oil.
	Oil filter plugged	Clean and replace filter.
	Slow engine speed	Increase engine speed rate.
	Cylinder piston seals leaking	Install seal repair kit.
	Remote valve out of adjustment or malfunctioning	Adjust, repair or replace.
	Tractor hydraulic pump malfunctioning	Repair or replace pump.
Oil Leaks	Hydraulic couplers not completely engaged	Connect hydraulic couplers.
	Loose hose connections	Tighten fittings. Use thread sealer on pipe (tapered) threads.
	Fittings or hoses defective	Replace defective parts.
	Hydraulic cylinder seals worn or damaged	Install seal repair kit.
Cannot Raise Load	Remote valve components worn or damaged	Repair and/or replace.
	Low oil supply	Check oil level.
	Bucket overloaded	Try lighter load.

*(Continued on next page)*

# TROUBLE SHOOTING

<b><u>PROBLEM</u></b>	<b><u>POSSIBLE CAUSE</u></b>	<b><u>SOLUTION</u></b>
Cannot Raise Load (Continued)	Nose pieces not fully engaged in couplers	Recouple hoses.
	Cylinder piston seal leakage	Install seal repair kit.
	Remote valve out of adjustment or malfunctioning	Repair or replace.
	Tractor valve not open to provide circuit to auxiliary valve	Open tractor valve. Be sure pressure is to inlet side of auxiliary valve.
	Hydraulic pump malfunctioning	Repair or replace.
	Load is greater than boom lift cap	Check loader specifications.
Bucket or Boom Leaks Down from "Hold" Position	Leaks in hydraulic circuits	Tighten loose fittings. Use thread sealer on pipe (tapered) threads.
	Cylinder piston seals leaking	Install seal repair kit.
	Remote valve worn or damaged	Repair.
	Tractor valve worn or damaged	Repair.
Cannot Lower Boom	Nose pieces not fully engaged in couplers	Recouple hoses.
Loss of Bucket Tilt Control When Lever is Pushed Completely Forward	Tractor lever in "Float" position	Use float lockout control to prevent lever from being moved to "Float" position.
Couplers Hard to Hook Up	Pressure in circuit	Place control levers in "Float" when connecting.
Boom & Bucket Operation Does Not Correspond To Control Lever Position	Improperly connected hydraulic couplers	Connect hydraulic couplers correctly.
	Hoses improperly connected	Connect hoses properly.
Excessive Wear on Bucket Cutting Edge and Wear Pads	Bucket is tilted too far forward and is riding on cutting edge	Keep bottom of bucket parallel to ground. Use rod gauge to indicate level bucket position.
	Excessive down pressure when cleaning feedlots and working on concrete	Use "Float" position on boom lift control lever.
Bucket Tines Bend or Break	Only a few tines used to pick up load	Be sure to distribute load on bucket evenly.

# SERVICE

## CYLINDER SERVICE

The cylinders are designed to be reliable and easy to service. If a cylinder should malfunction during the warranty period, return the complete cylinder assembly, without disassembling, to your authorized service department or contact your authorized service department for instructions. Unauthorized disassembly of a cylinder in the warranty period will VOID WARRANTY.

## CYLINDER REPAIR PROCEDURE – MODEL 416 LOADER

FOLLOW THESE PROCEDURES TO REPAIR LIFT AND BUCKET CYLINDERS ON MODEL 416 LOADERS:

Remove the snap ring (13) from the inside of the tube on the rod end and pull the rod assembly out of the tube. Be careful not to scratch the rod when removing the snap ring.

Turn the nut (5) off of the rod (3) and remove the piston (4) and the seal retainer (2).

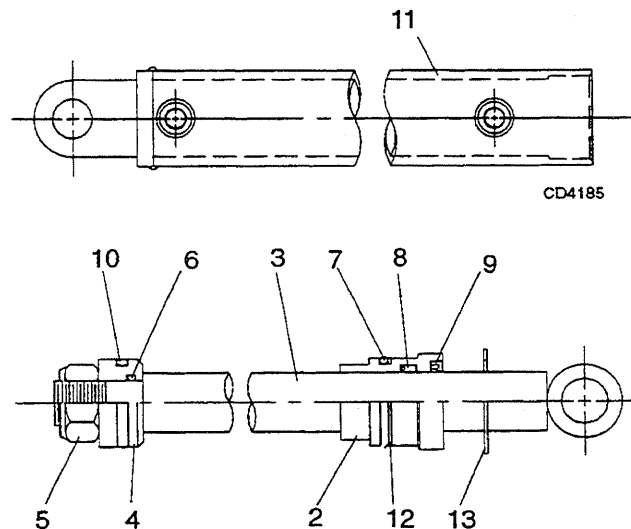
Remove all seals and wash all parts in solvent and blow dry with air. KEEP PARTS CLEAN!

Inspect the cylinder tube and rod for roughness, scratches or scoring. Small scratches may be removed with very fine crocus cloth. Replace cylinder tube or rod if roughness is excessive. SEALS WILL NOT GIVE SATISFACTORY SERVICE LIFE WHEN USED WITH ROUGH CYLINDER TUBE OR ROD.

Install U-ring (8) to inside groove of seal retainer (2) with the lips in. Slide the back-up ring (12) and the O-ring (7) into the outside groove on the seal retainer. Place the wiper ring (9) in the groove on the large end of the seal retainer. Lubricate the seals and slide the seal retainer (2) onto the rod.

Install the O-ring (6) into the inside groove of the piston (4) and the piston seal (10) into the outside groove of the piston (4). Lubricate the O-ring and slide the piston on the rod. Turn the nut (5) on the rod and torque to 150-160 lbs.-ft. torque.

Lubricate the seals and slide the rod assembly into the tube, and install the snap ring (13). Assembly is complete.

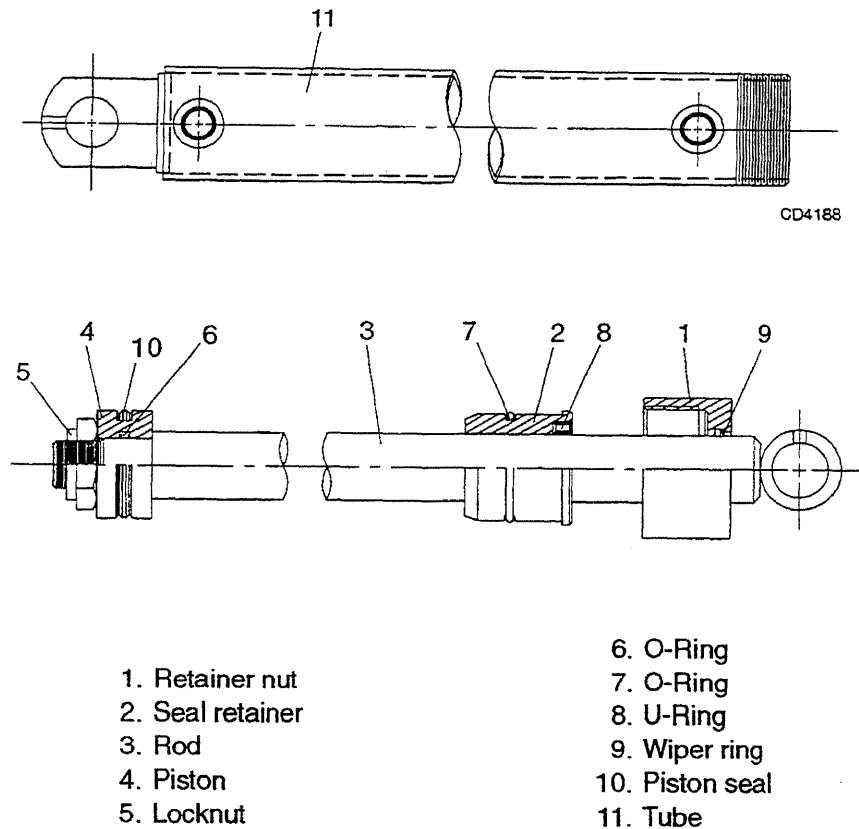


- 2. Seal retainer
- 3. Rod
- 4. Piston
- 5. Locknut
- 6. O-Ring
- 7. O-Ring

- 8. U-Ring
- 9. Wiper ring
- 10. Piston seal
- 11. Tube
- 12. Back-up ring
- 13. Snap ring

Figure 36. Cylinder Repair - Model 416





**Figure 37. Cylinder Repair - Model 417**

## **CYLINDER REPAIR PROCEDURE – MODEL 417 LOADER**

FOLLOW THESE PROCEDURES TO REPAIR LIFT AND BUCKET CYLINDERS ON MODEL 417 LOADERS:

Remove cylinder from loader and clean thoroughly.

Turn the end cap (1) off of the cylinder tube and pull the rod assembly out of the tube.

Turn the locknut (5) off of the rod (3) and remove the piston (4), the seal retainer (2) and the retainer nut (1).

Remove the seals and wash all parts in solvent and blow dry with air. **KEEP PARTS CLEAN!**

Inspect the cylinder tube and rod for roughness, scratches or scoring. Small scratches may be removed with very fine crocus cloth. Replace cylinder

tube or rod if roughness is excessive. SEALS WILL NOT GIVE SATISFACTORY SERVICE LIFE WHEN USED WITH ROUGH CYLINDER TUBE OR ROD.

Install wiper ring (9) into the retainer nut (1). Slide the retainer nut (1) onto the rod (3).

Place U-ring (8) into the seal retainer (2) with the lips extending toward the seal retainer. Slide the O-ring (7) into the outside groove on the seal retainer (2). Slide the seal retainer onto the rod (3).

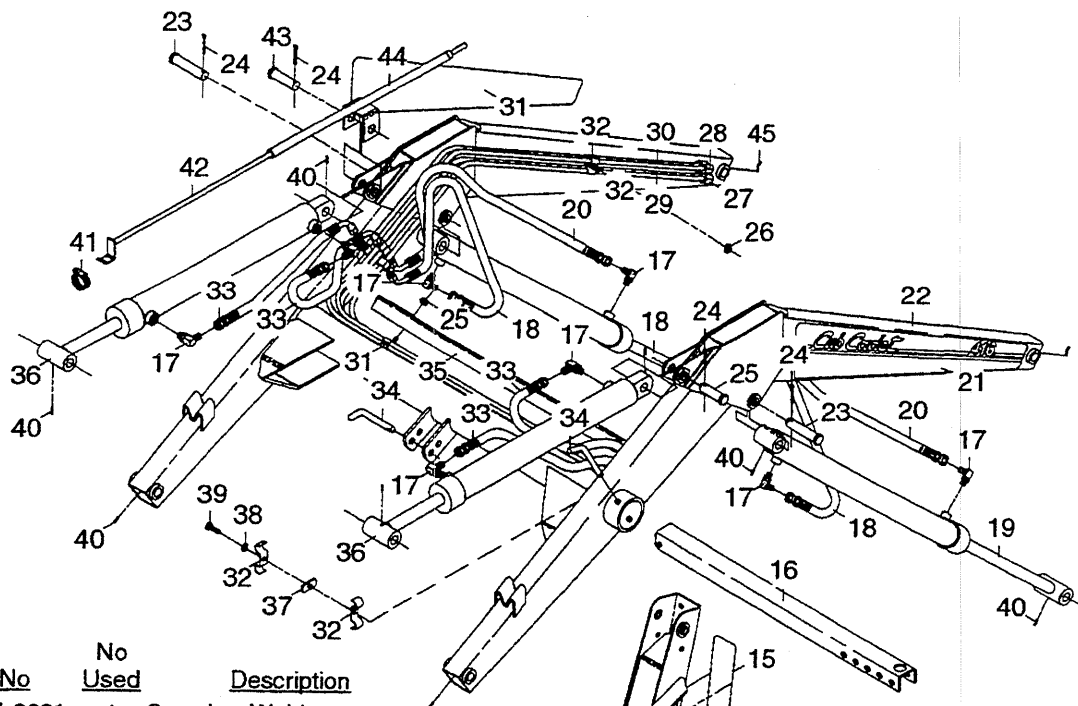
Install the O-ring (6) into the inside groove of the piston (4) and the piston seal (10) into the outside groove of the piston (4). Lubricate the O-ring and slide the piston (4) onto the rod (3). Install the locknut (5) and tighten to 150-160 lbs.-ft. torque.

Lubricate the seals lightly and install the rod assembly into the cylinder tube. A small ring compressor may be required. Tighten the retainer nut (1) to 100-105 lbs.-ft. torque. Assembly is complete.

## INDEX TO PARTS LISTS

416 LOADER .....	25
417 LOADER .....	26
416 & 417 HYDRAULIC CIRCUIT .....	27
416 BUCKET .....	28
417 BUCKET .....	28
416 SINGLE HANDLE CONTROL VALVE .....	29
417 SINGLE HANDLE CONTROL VALVE .....	30
416 & 417 CYLINDERS .....	31
416 & 417 HYDRAULIC HOSES & FITTINGS .....	32

# 416 LOADER



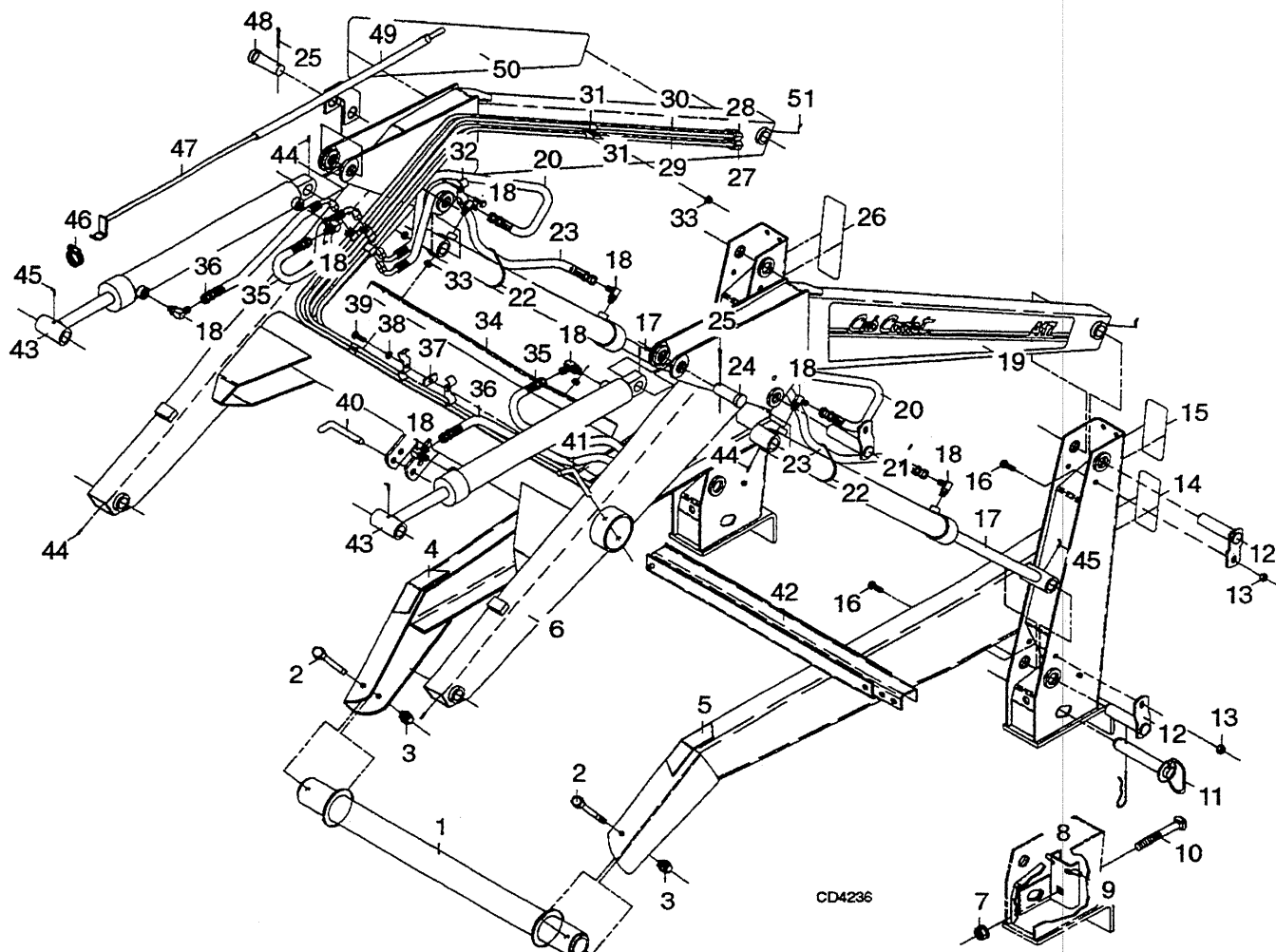
CD4235

Ref No	Part No	No Used	Description
1	WM-6631	1	Crossbar Weldment
2	WM-30-2131	4	1/2 NC Hex Flange Nut
3	WM-30-0328	2	1/2 x 3 Capscrew
4	WM-34280	1	Main frame assembly - RH
5	WM-34279	1	Main frame assembly - LH
6	WM-6622	2	Channel - Retainer
7	WM-30-1134	2	1/2 x 3-1/2 Carriage Bolt
8	WM-48-9040	2	Hitch Pin, 3/4 x 4

9	WM-5522	4	Pin Weldment
10	WM-30-2077	4	3/8 NC Locknut
11	WM-39-5037	2	Hole Plug
12	WM-26-0346	1	Danger decal
13	WM-26-0200	1	Decal - Caution
14	WM-30-0152	4	3/8 NC x 1 Capscrew
15	WM-26-0324	1	Instruction Decal
16	WM-30382	1	Stand Weldment
17	WM-31-3036	8	90° Adjustable Elbow
18	WM-36-0190	2	Hydraulic Hose - 24"
19	WM-21-0036	2	Lift Cylinder Assembly
20	WM-36-0191	2	Hydraulic Hose - 34"
21	WM-26-0342	1	Decal - 416
22	WM-34278	1	Boom frame assembly
23	WM-30-4072	2	Clevis Pin
24	WM-48-0004	4	3/16 x 1-1/2 Cotter pin
25	WM-30-4055	1	Clevis Pin - 3/4 x 2-1/8
26	WM-30-2055	3	5/16 NC Flange head locknut
27	WM-21-6073	1	Feedline #3
28	WM-21-6071	1	Feedline #1
29	WM-21-6074	1	Feedline #4
30	WM-21-6072	1	Feedline #2

Ref No	Part No	No Used	Description
31	WM-26-0343	1	Decal - 416
32	WM-48-0265	8	Feedline clamp
33	WM-36-0189	4	Hydraulic hose - 14"
34	WM-21-5291	2	Bent Pull Pin
35	WM-37181	1	Feedline cover
36	WM-21-0035	2	Tilt Cylinder Assembly
37	WM-30-5000	1	5/16 NC Tab weld nut
38	WM-30-3100	1	5/16 Lockwasher
39	WM-30-0100	1	5/16 x 3/4 Capscrew
40	WM-48-7501	10	1/4-28 Lube fitting
41	WM-48-0263	1	Hose Clamp - 5/8 - 1-1/2
42	WM-6884	1	Rod Weldment
43	WM-30-4077	1	Clevis Pin
44	WM-6887	1	Tube Weldment
45	WM-48-7503	2	1/4-28 x 45 Lube fitting

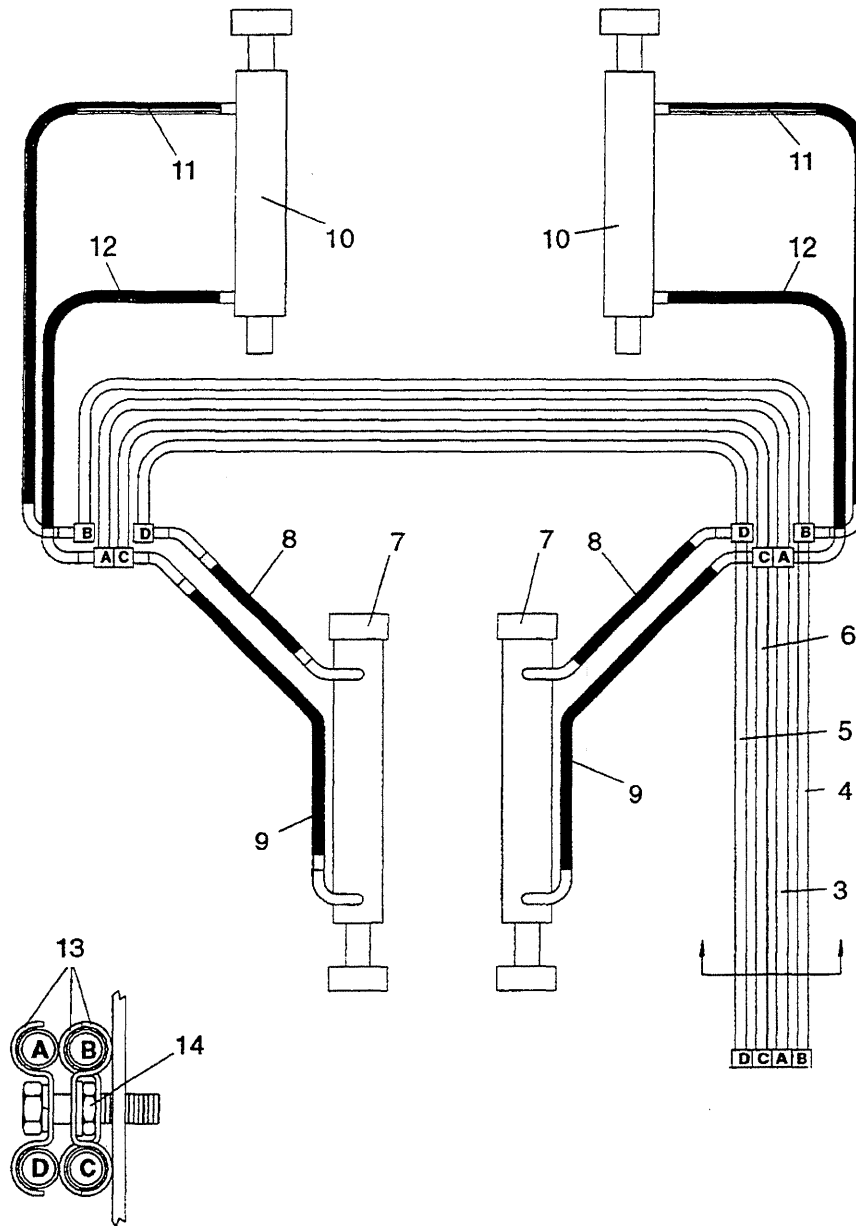
# 417 LOADER



Ref No	Part No	No Used	Description
1	WM-32018	1	Crossbar Weldment
2	WM-30-0457	2	5/8 NC x 3-3/4 Capscrew
3	WM-30-2179	4	5/8 NC Locknut
4	WM-32588	1	Main frame assembly - RH
5	WM-32587	1	Main frame assembly - LH
6	WM-32589	1	Boom frame assembly
7	WM-30-2186	2	5/8 NC Locknut - Flange Head
8	WM-32013	2	Retainer Channel
9	WM-32014	2	Pin (Must be Welded)
10	WM-30-1135	2	5/8 NC x 5 Carriage bolt, plated
11	WM-48-9075	2	Handle Hitch Pin
12	WM-32059	4	Pin weldment
13	WM-30-2077	6	3/8 NC Lockpin
14	WM-26-0346	1	Danger decal
15	WM-26-0200	1	Decal - Caution
16	WM-30-0152	6	3/8 NC x 1 Capscrew
17	WM-32371	2	Cylinder Assembly Lift
18	WM-31-3036	8	90° Adjustable elbow
19	WM-26-0344	1	Decal - 417
20	WM-36-0143	2	Pressure Hose - L-28
21	WM-32060	2	Pin weldment
22	WM-39-5017	2	Plastic Tie
23	WM-36-0144	2	Pressure Hose - L-40
24	WM-30-4062	1	Clevis Pin - 1 x 2-19/64
25	WM-48-0004	2	3/16 x 1-1/2 Cotter pin

Ref No	Part No	No Used	Description
26	WM-26-0324	1	Instruction Decal
27	WM-21-5252	1	Feedline #3
28	WM-21-5250	1	Feedline #1
29	WM-21-5253	1	Feedline #4
30	WM-21-5251	1	Feedline #2
31	WM-48-0258	8	Feedline Clamp
32	WM-48-0252	1	Feedline Clamp
33	WM-30-2055	5	5/16 NC Locknut, flange head
34	WM-37181	1	Feedline Cover
35	WM-36-0141	2	Pressure Hose L-15
36	WM-36-0142	2	Pressure Hose L-20
37	WM-30-5000	1	Tab Weld Nut
38	WM-30-3100	1	5/16 Lockwasher
39	WM-30-0100	3	5/16 NC x 3/4 Capscrew
40	WM-21-5291	1	Bent Pull Pin w/Hair Pin Cotter
41	WM-21-5299	1	Bent Pull Pin w/Hair Pin Cotter
42	WM-30381	1	Stand Weldment
43	WM-32368	2	Cylinder Assembly - Tilt
44	WM-48-7501	6	1/4-28 Lube fitting
45	WM-48-7500	4	1/4-28 x 90° Lube fitting
46	WM-48-0263	1	Hose Clamp - 5/8 - 1-1/2
47	WM-31215	1	Rod weldment
48	WM-30-4078	1	Clevis Pin - 1 x 2-35/64
49	WM-31217	1	Tube Weldment
50	WM-26-0345	1	Decal 417
51	WM-48-7503	2	1/4-28 x 45 Lube fitting

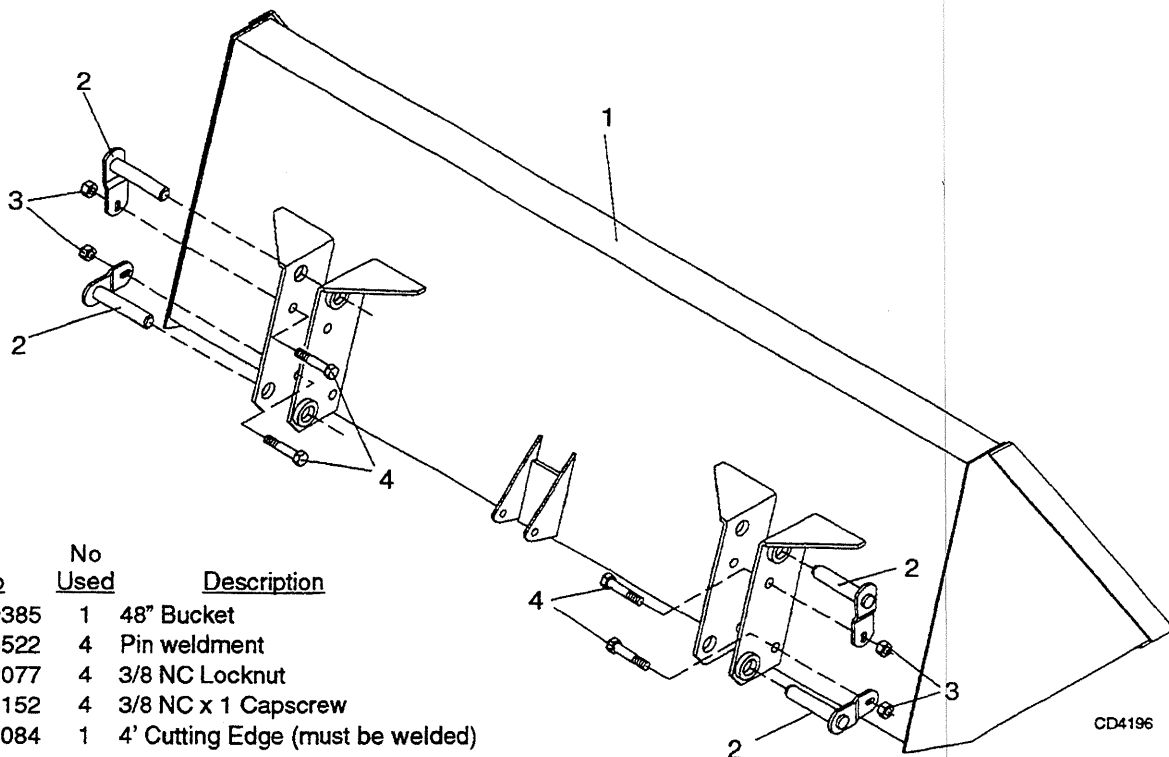
## 416 & 417 HYDRAULIC CIRCUIT



CD4189

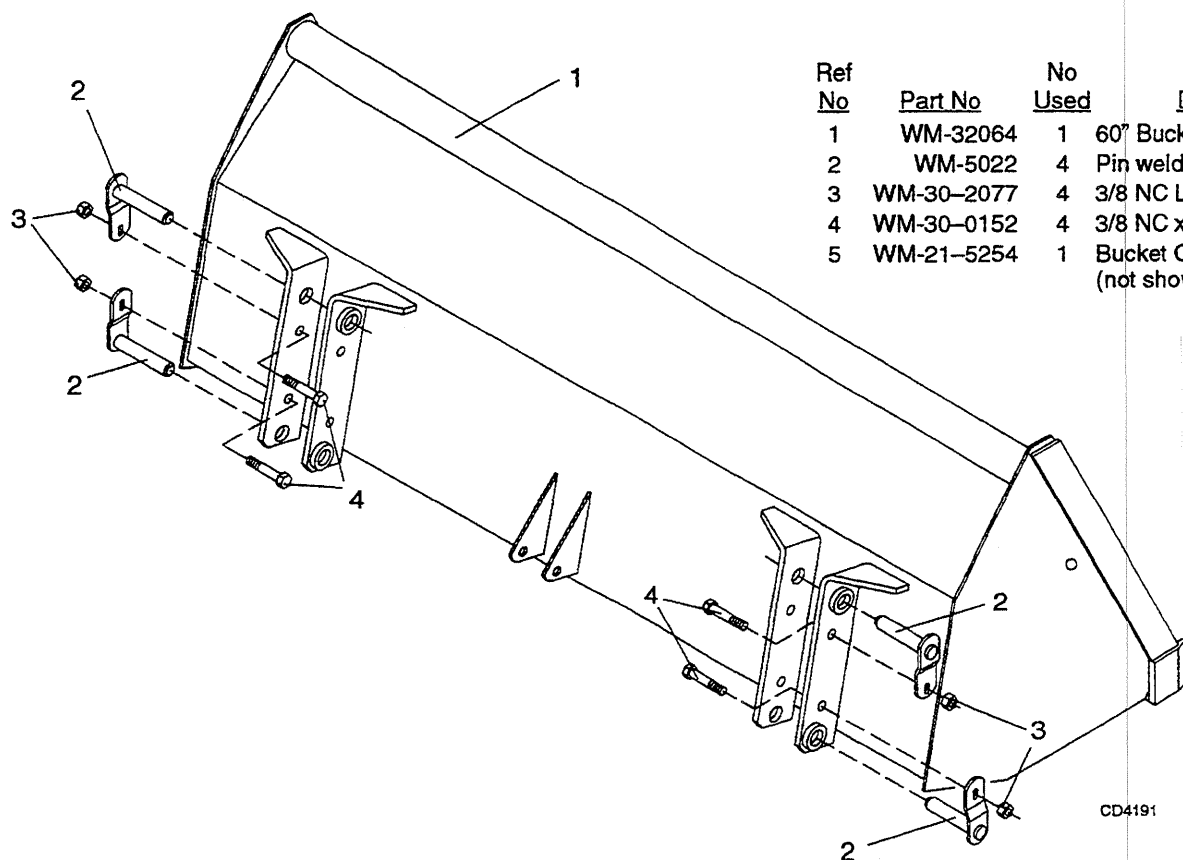
Ref No	416 Part No	No Used	417 Part No	Description
3	WM-21-6071	1	WM-21-5250	Feedline #1
4	WM-21-6072	1	WM-21-5251	Feedline #2
5	WM-21-6073	1	WM-21-5252	Feedline #3
6	WM-21-6074	1	WM-21-5253	Feedline #4
7	WM-21-0036	2	WM-32371	Lift Cylinder
8	WM-36-0190	2	WM-36-0143	Hydraulic Hose
9	WM-36-0191	2	WM-36-0144	Hydraulic Hose
10	WM-21-0035	2	WM-32368	Tilt Cylinder
11	WM-36-0189	2	WM-36-0142	Hydraulic Hose
12	WM-36-0189	2	WM-36-0142	Hydraulic Hose
13	WM-8-0265	8	WM-42-0258	Feedline Clamp
14	WM-30-5000	1	WM-30-5000	Tab Weld Nut - 5/16 NC

## 416 BUCKET



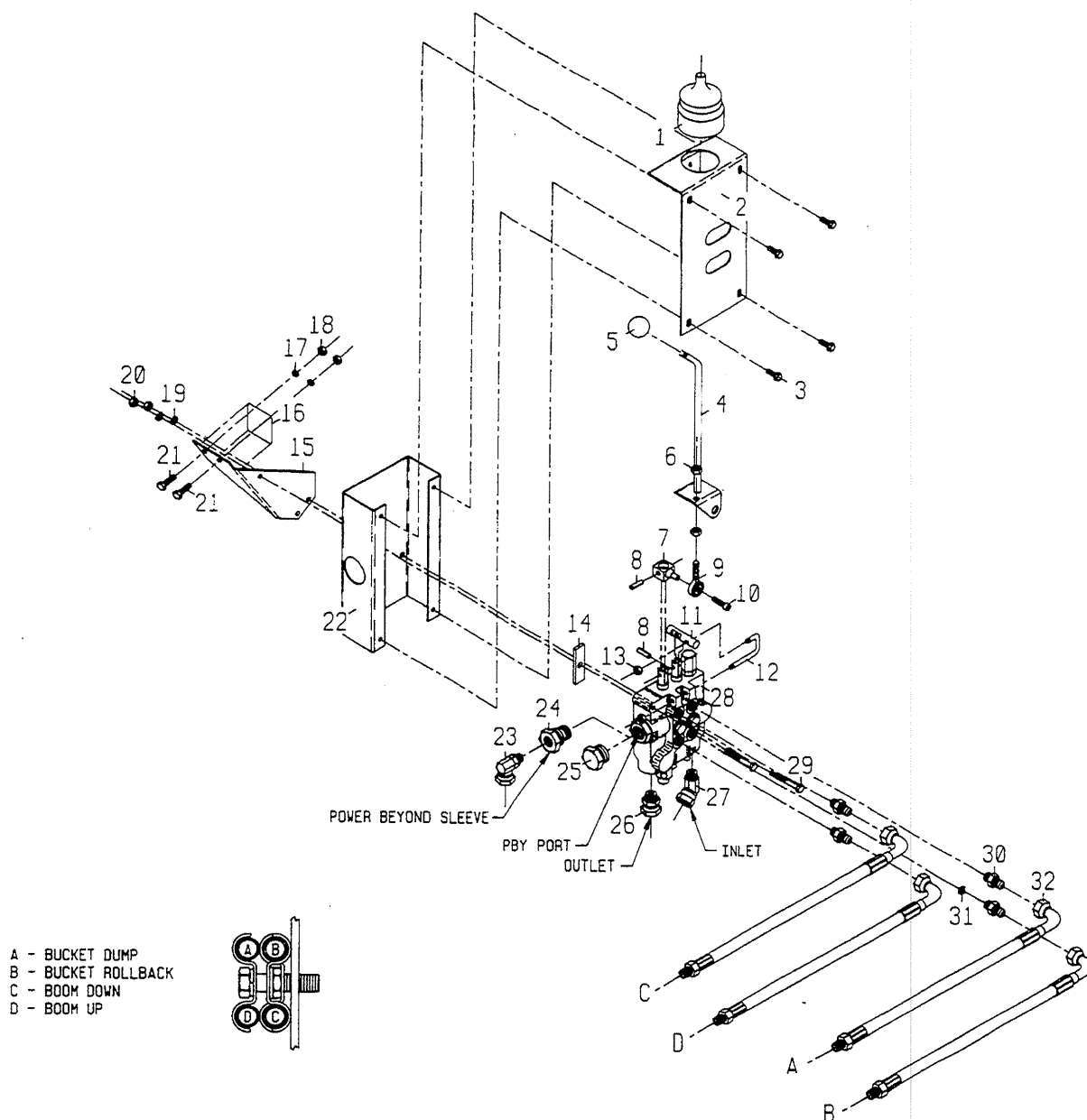
Ref No	Part No	No Used	Description
1	WM-30385	1	48" Bucket
2	WM-5522	4	Pin weldment
3	WM-30-2077	4	3/8 NC Locknut
4	WM-30-0152	4	3/8 NC x 1 Capscrew
5	WM-21-5084	1	4' Cutting Edge (must be welded)

## 417 BUCKET



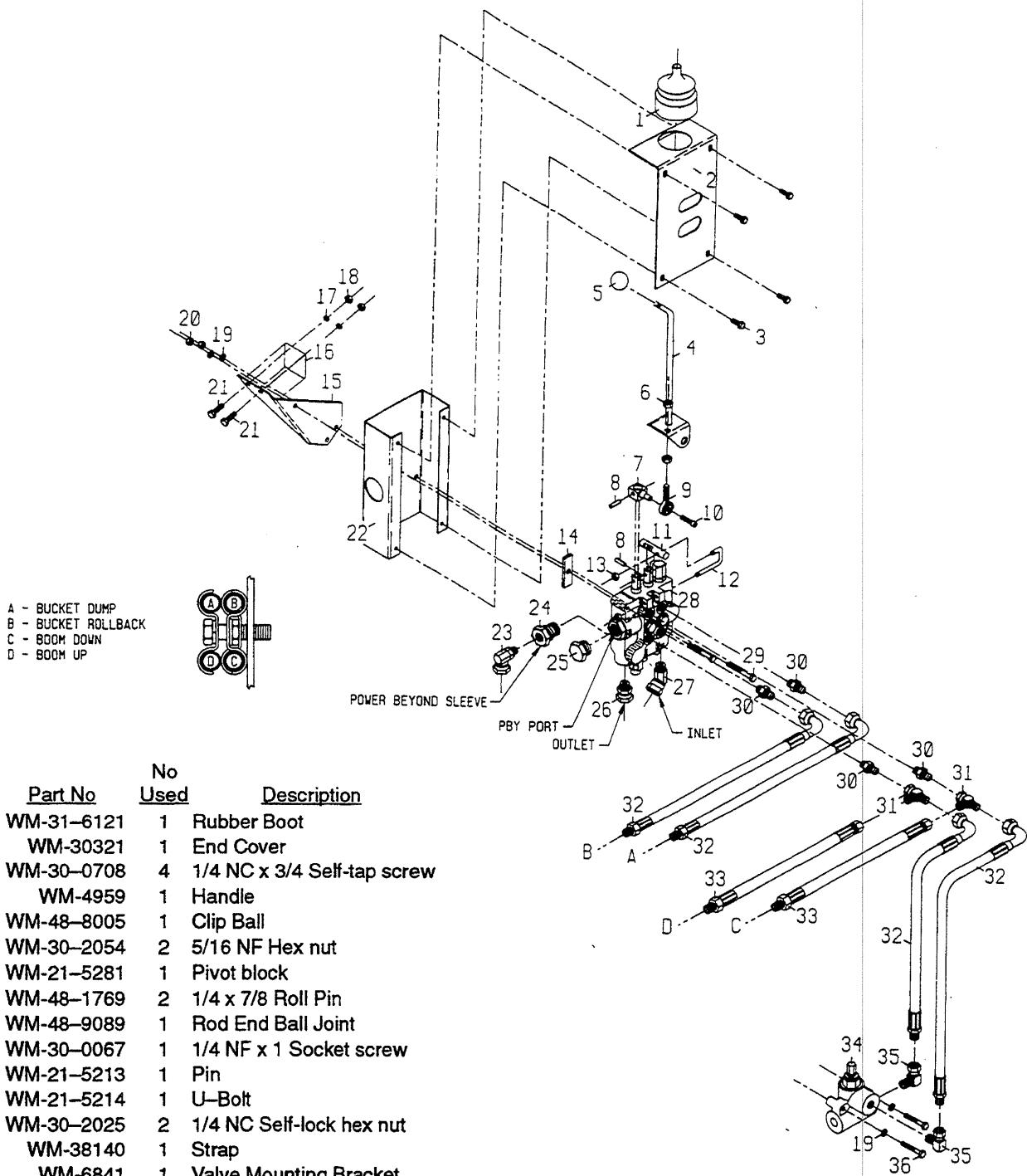
Ref No	Part No	No Used	Description
1	WM-32064	1	60" Bucket
2	WM-5022	4	Pin weldment
3	WM-30-2077	4	3/8 NC Locknut
4	WM-30-0152	4	3/8 NC x 1 Capscrew
5	WM-21-5254	1	Bucket Cutting Edge (not shown)

# SINGLE HANDLE CONTROL VALVE - MODEL 416



Ref No	Part No	No Used	Description	Ref No	Part No	No Used	Description
1	WM-31-6121	1	Rubber Boot <i>NEW R/W WM-34-6121</i>	17	WM-30-3150	2	3/8 Lockwasher
2	WM-30321	1	End Cover	18	WM-30-2076	2	3/8 NC Hex nut
3	WM-30-0708	4	1/4 NC x 3/4 Self-tap screw	19	WM-30-3050	4	1/4 Lockwasher
4	WM-4959	1	Handle	20	WM-30-2026	2	1/4 NC Hex nut
5	WM-48-8005	1	Clip Ball	21	WM-30-0152	2	3/8 NC x 1 Capscrew
6	WM-30-2054	2	5/16 NF Hex nut	22	WM-30320	1	Valve Cover
7	WM-21-5281	1	Pivot block	23	WM-31-3043	1	90° Elbow
8	WM-48-1769	2	1/4 x 7/8 Roll Pin	24	WM-34-6083	1	Power Beyond Sleeve
9	WM-48-9089	1	Rod End Ball Joint	25	WM-31-0012	1	Cap Plug
10	WM-30-0067	1	1/4 x 1 Socket Capscrew	26	WM-31-5050	1	Straight Adapter
11	WM-21-5213	1	Pin	27	WM-31-3047	1	45° Adjustable Female Pipe Swivel
12	WM-21-5214	1	U-Bolt	28	WM-34-6081	1	Valve
13	WM-30-2025	2	1/4 NC Self-lock hex nut	29	WM-30-0068	2	1/4 NC x 2-1/4 Capscrew
14	WM-38140	1	Strap	30	WM-31-5044	4	Straight adapter
15	WM-6841	1	Valve Mounting Bracket	31	WM-34-6137	1	Plate orifice
16	WM-26-0274	1	Decal - Control Valve	32	WM-36-0198	4	Hydraulic hose - L18

# SINGLE HANDLE CONTROL VALVE – MODEL 417

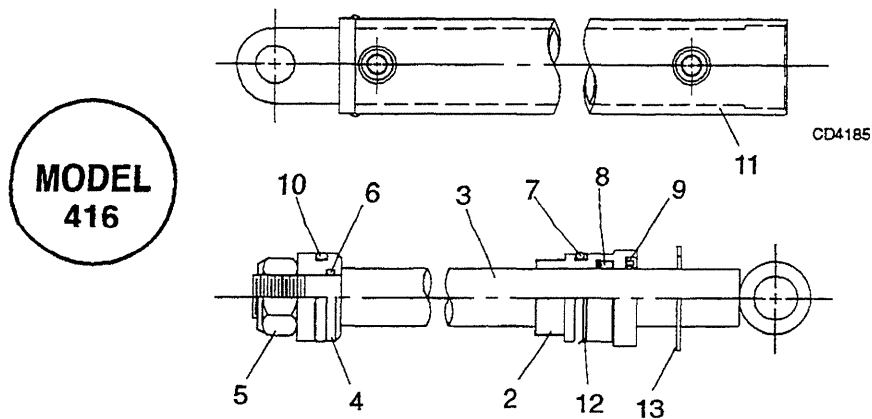


Ref No	Part No	No Used	Description
1	WM-31-6121	1	Rubber Boot
2	WM-30321	1	End Cover
3	WM-30-0708	4	1/4 NC x 3/4 Self-tap screw
4	WM-4959	1	Handle
5	WM-48-8005	1	Clip Ball
6	WM-30-2054	2	5/16 NF Hex nut
7	WM-21-5281	1	Pivot block
8	WM-48-1769	2	1/4 x 7/8 Roll Pin
9	WM-48-9089	1	Rod End Ball Joint
10	WM-30-0067	1	1/4 NF x 1 Socket screw
11	WM-21-5213	1	Pin
12	WM-21-5214	1	U-Bolt
13	WM-30-2025	2	1/4 NC Self-lock hex nut
14	WM-38140	1	Strap
15	WM-6841	1	Valve Mounting Bracket
16	WM-26-0274	1	Decal - Control Valve
17	WM-30-3150	2	3/8 Lockwasher
18	WM-30-2076	2	3/8 NC Hex nut
19	WM-30-3050	4	1/4 Lockwasher
20	WM-30-2026	2	1/4 NC Hex nut
21	WM-30-0152	2	3/8 NC x 1 Capscrew
22	WM-30320	1	Valve Cover
23	WM-31-3043	1	90° Elbow
24	WM-34-6083	1	Power Beyond Sleeve
25	WM-31-0012	1	Cap Plug
26	WM-31-5050	1	Straight Adapter
27	WM-31-3047	1	45° Adjustable Female Pipe Swivel

Ref No	Part No	No Used	Description
28	WM-34-6100	1	Valve
29	WM-30-0068	2	1/4 NC x 2-1/4 Capscrew
30	WM-31-5044	2	Straight adapter
31	WM-31-2017	2	Swivel tee
32	WM-36-0070	4	Pressure hose - L18
33	WM-36-0207	4	Hydraulic hose - L18
34	WM-34-6162	1	Hydraulic relief valve
35	WM-31-3053	2	90° Swivel elbow
36	WM-30-0062	2	1/4 NC x 1-3/4 Capscrew



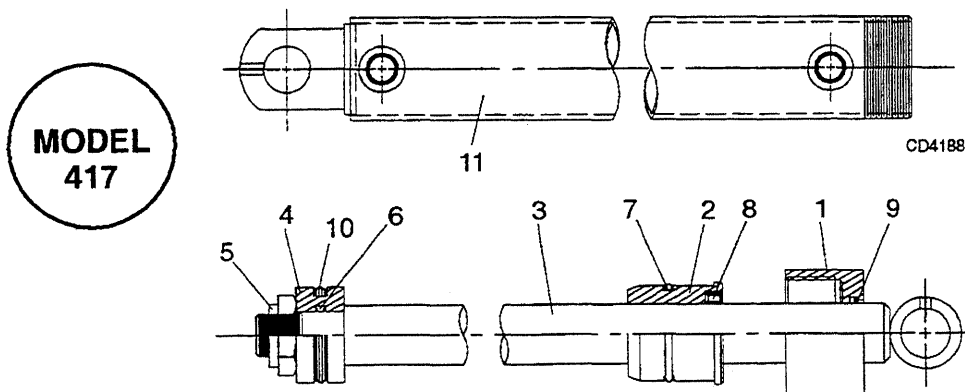
## 416 & 417 CYLINDERS



TILT CYLINDER		Ref No	Description	LIFT CYLINDER	
Model 416	Model 417			Model 416	Model 417
Part No	Part No			Part No	Part No
WM-21-0035	WM-32368	—	Complete cylinder	WM-21-0036	WM-32371
—†	WM-5660	1	Retainer nut	—†	WM-5684
—†	WM-30354	2	Seal retainer	—†	WM-30360
—†	WM-32041	3	Rod	—†	WM-32049
—†	WM-32369	4	Piston	—†	WM-32372
—†	WM-30-2208	5	Locknut	—†	WM-30-2260
ISK*	WM-44-1002	6	O-Ring	ISK*	WM-44-1003
ISK*	WM-44-1005	7	O-Ring	ISK*	WM-44-1005
ISK*	WM-44-1553	8	U-Ring	ISK*	WM-44-1520
ISK*	WM-44-1555	9	Wiper ring	ISK*	WM-44-1517
ISK*	WM-44-1625	10	Piston seal	ISK*	WM-44-1625
N/A	WM-32038	11	Tube	N/A	WM-32045
ISK*	Not Used	12	Back-up ring	ISK*	Not Used
ISK*	Not Used	13	Snap ring	ISK*	Not Used
WM-44-1622	WM-32418	14	Seal kit	WM-44-1622	WM-32419

† Not Serviced

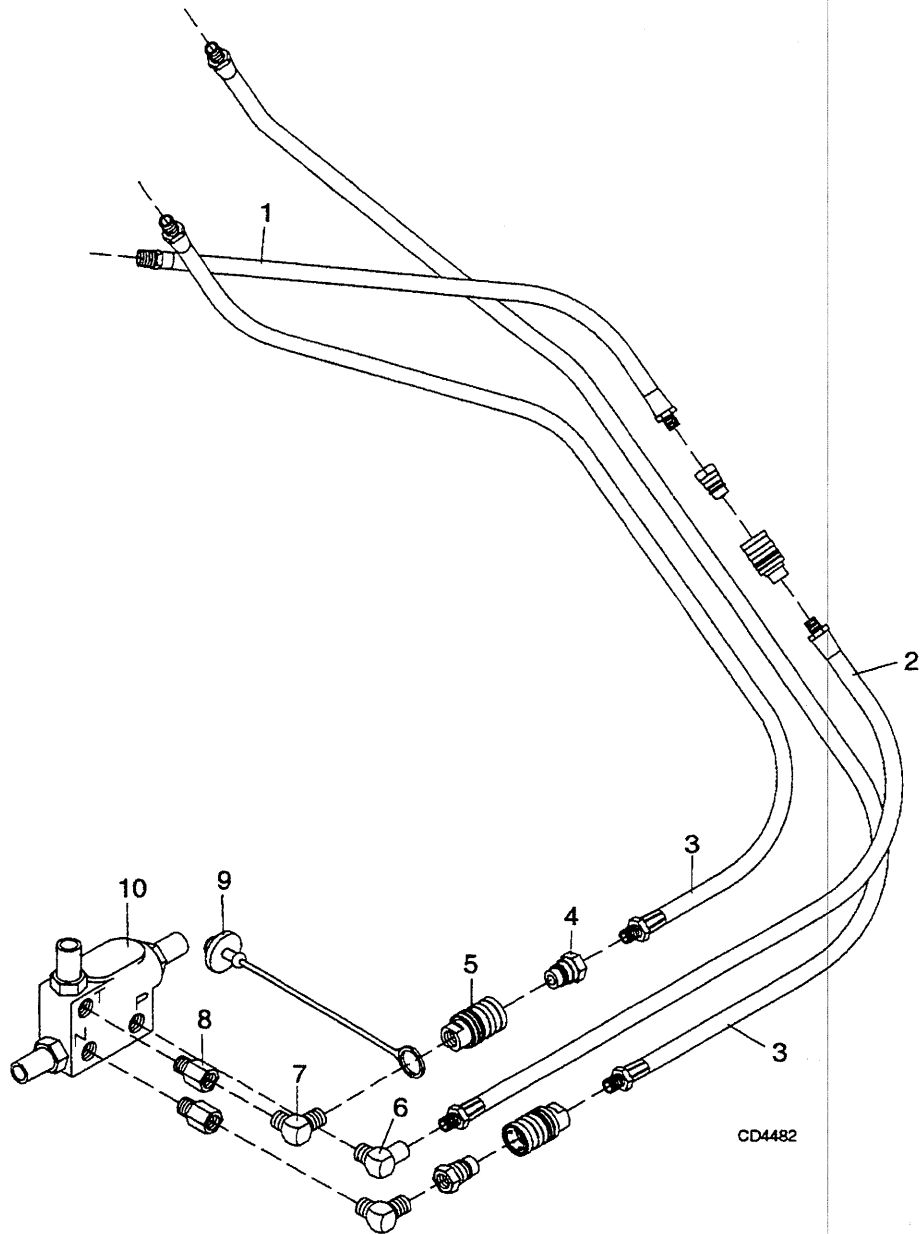
\* Included in Seal Kit (14)



## 416 & 417 HYDRAULIC HOSES & FITTINGS

(Model 416: S/N 10626 & Above;

Model 417: S/N 10996 & Above)

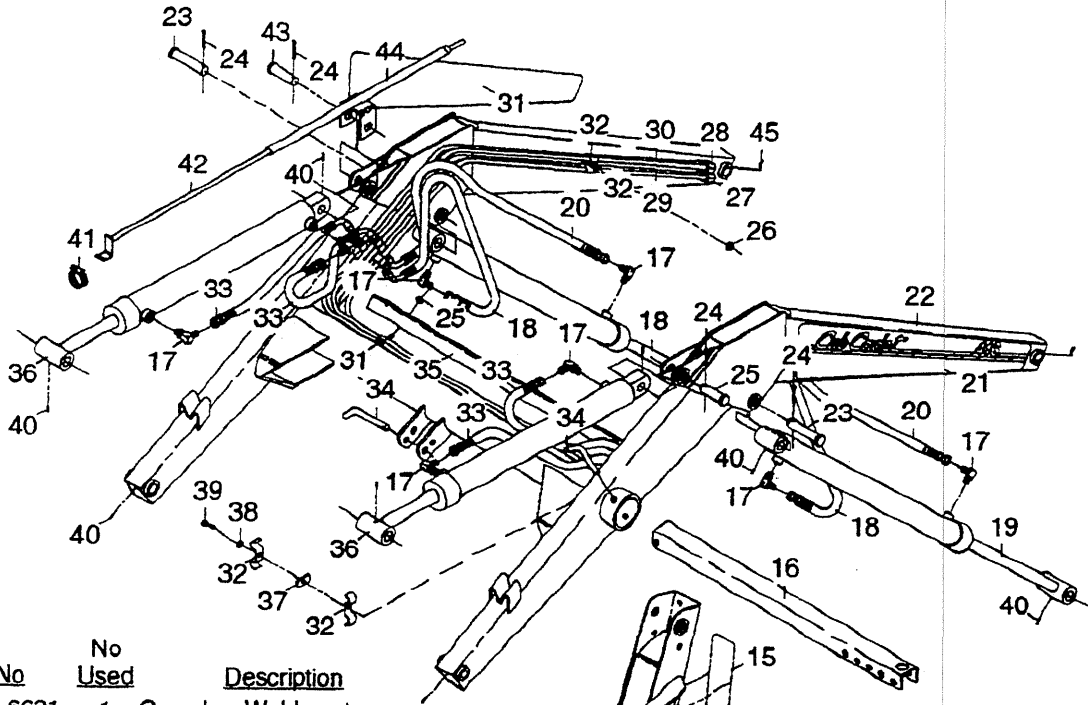


Ref No	Part No	No Used	Description
1	WM36-0023	1	Hydraulic hose, L22
2	WM36-0001	1	Hydraulic hose, L28
3	WM36-0093	2	Hydraulic hose, L50
4	WM31-6007	3	Quick coupler, male
5	WM31-6007	3	Quick coupler, female
6	WM31-6029	1	90° Adapter
7	WM31-3010	2	90° Male pipe elbow
8	WM31-5045	2	Male 3/8 ISO - 3/8 NPT female adapter
9	WM39-5060	1	Dust plug, blue
10	—	1	Hydraulic manifold block

# **416 & 417 LOADERS INDEX TO PARTS LISTS**

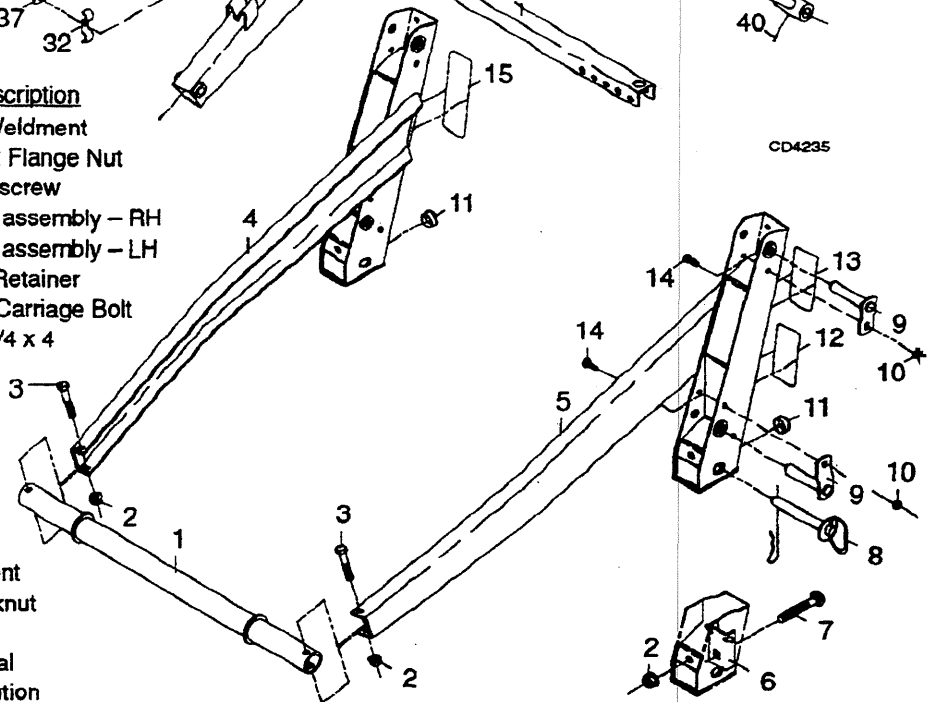
416 LOADER .....	2
417 LOADER .....	3
416 & 417 HYDRAULIC CIRCUIT .....	4
416 BUCKET .....	5
417 BUCKET .....	5
416 SINGLE HANDLE CONTROL VALVE .....	6
417 SINGLE HANDLE CONTROL VALVE .....	7
416 & 417 CYLINDERS .....	8

# 416 LOADER



CD4235

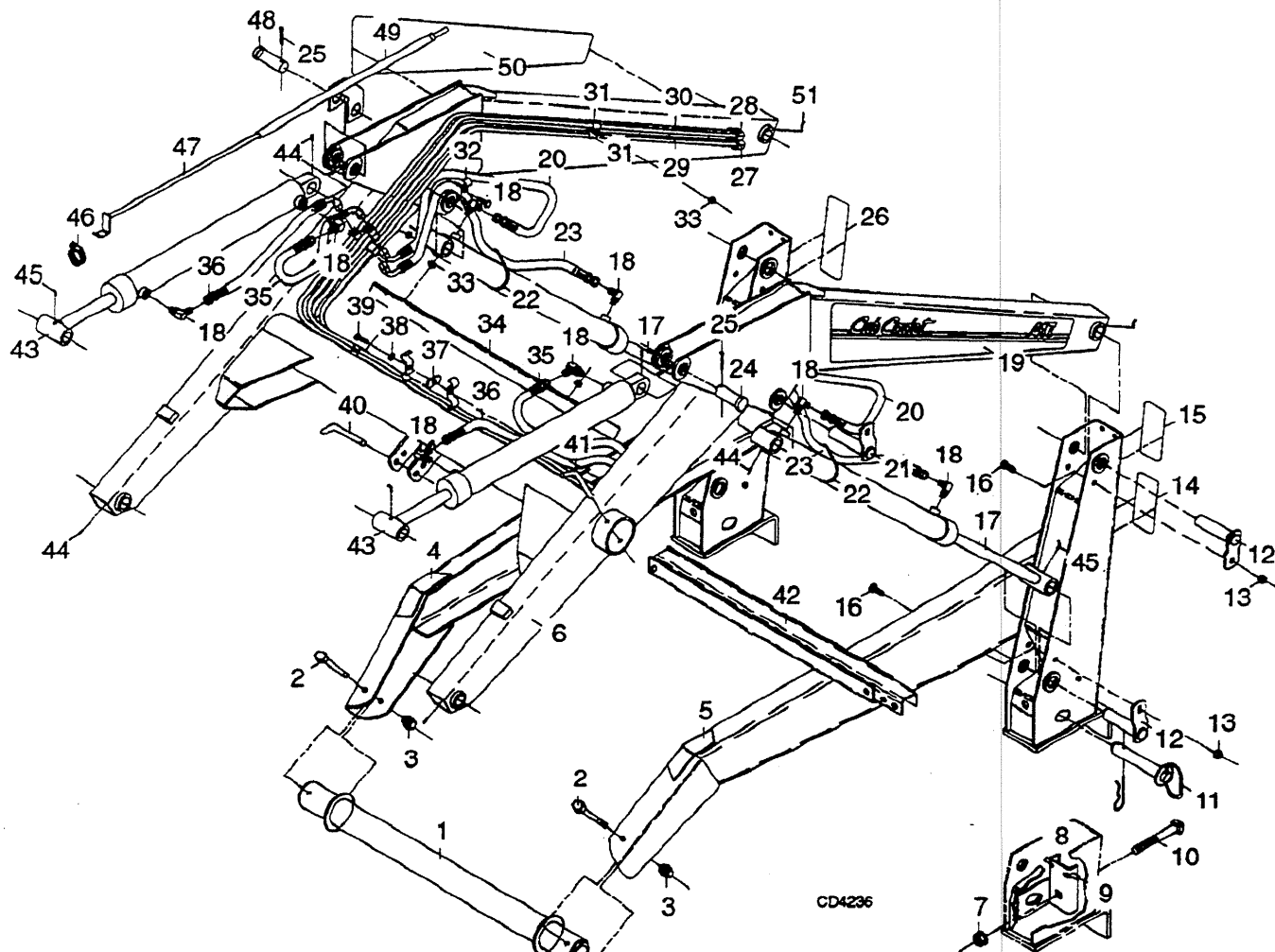
Ref No	Part No	No Used	Description
1	WM-6631	1	Crossbar Weldment
2	WM-30-2131	4	1/2 NC Hex Flange Nut
3	WM-30-0328	2	1/2 x 3 Capscrew
4	WM-34280	1	Main frame assembly - RH
5	WM-34279	1	Main frame assembly - LH
6	WM-6622	2	Channel - Retainer
7	WM-30-1134	2	1/2 x 3-1/2 Carriage Bolt
8	WM-48-9040	2	Hitch Pin, 3/4 x 4



9	WM-5522	4	Pin Weldment
10	WM-30-2077	4	3/8 NC Locknut
11	WM-39-5037	2	Hole Plug
12	WM-26-0346	1	Danger decal
13	WM-26-0200	1	Decal - Caution
14	WM-30-0152	4	3/8 NC x 1 Capscrew
15	WM-26-0324	1	Instruction Decal
16	WM-30382	1	Stand Weldment
17	WM-31-3036	8	90° Adjustable Elbow
18	WM-36-0190	2	Hydraulic Hose - 24"
19	WM-21-0036	2	Lift Cylinder Assembly
20	WM-36-0191	2	Hydraulic Hose - 34"
21	WM-26-0342	1	Decal - 416
22	WM-34278	1	Boom frame assembly
23	WM-30-4072	2	Clevis Pin
24	WM-48-0004	4	3/16 x 1-1/2 Cotter pin
25	WM-30-4055	1	Clevis Pin - 3/4 x 2-1/8
26	WM-30-2055	3	5/16 NC Flange head locknut
27	WM-21-6073	1	Feedline #3
28	WM-21-6071	1	Feedline #1
29	WM-21-6074	1	Feedline #4
30	WM-21-6072	1	Feedline #2

Ref No	Part No	No Used	Description
31	WM-26-0343	1	Decal - 416
32	WM-48-0265	8	Feedline clamp
33	WM-36-0189	4	Hydraulic hose - 14"
34	WM-21-5291	2	Bent Pull Pin
35	WM-37181	1	Feedline cover
36	WM-21-0035	2	Tilt Cylinder Assembly
37	WM-30-5000	1	5/16 NC Tab weld nut
38	WM-30-3100	1	5/16 Lockwasher
39	WM-30-0100	1	5/16 x 3/4 Capscrew
40	WM-48-7501	10	1/4-28 Lube fitting
41	WM-48-0263	1	Hose Clamp - 5/8 - 1-1/2
42	WM-6884	1	Rod Weldment
43	WM-30-4077	1	Clevis Pin
44	WM-6887	1	Tube Weldment
45	WM-48-7503	2	1/4-28 x 45 Lube fitting

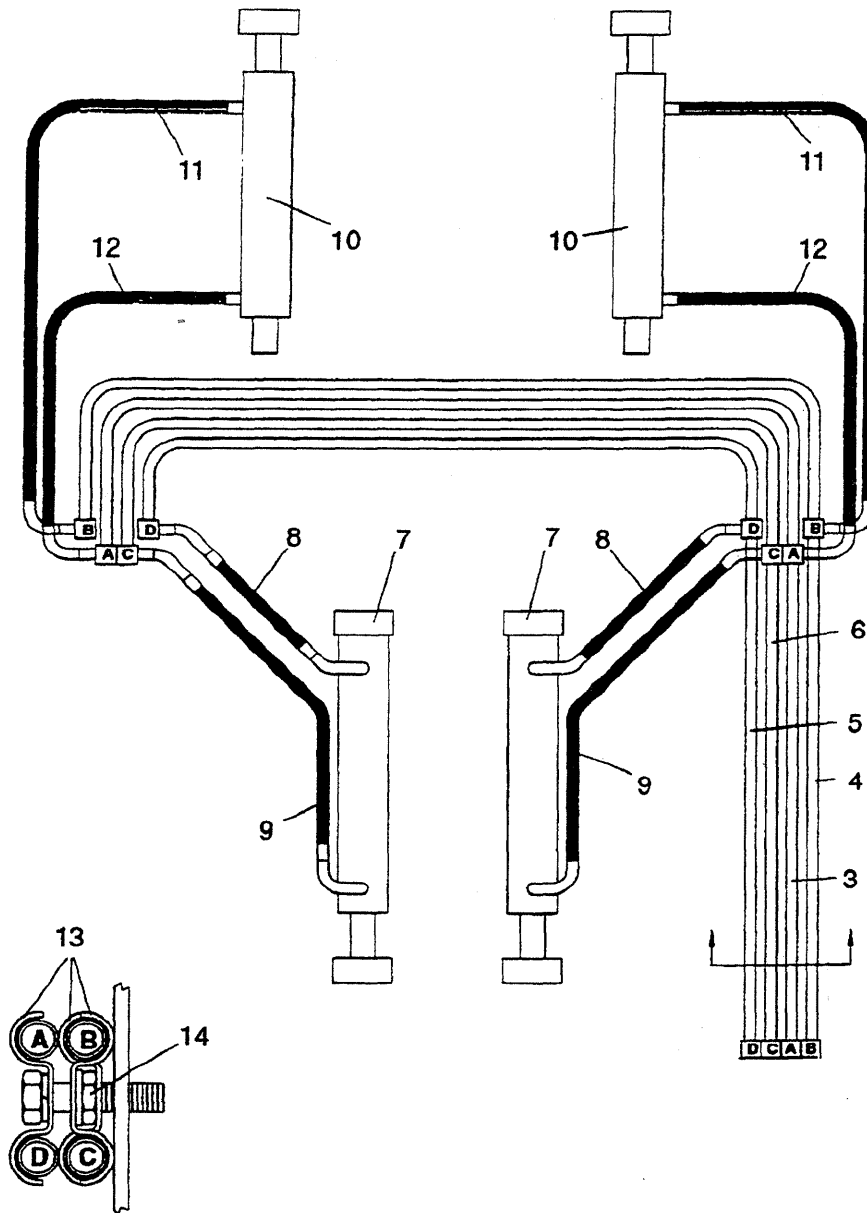
# 417 LOADER



Ref No	Part No	No Used	Description
1	WM-32018	1	Crossbar Weldment
2	WM-30-0457	2	5/8 NC x 3-3/4 Capscrew
3	WM-30-2179	4	5/8 NC Locknut
4	WM-32588	1	Main frame assembly - RH
5	WM-32587	1	Main frame assembly - LH
6	WM-32589	1	Boom frame assembly
7	WM-30-2186	2	5/8 NC Locknut - Flange Head
8	WM-32013	2	Retainer Channel
9	WM-32014	2	Pin (Must be Welded)
10	WM-30-1135	2	5/8 NC x 5 Carriage bolt, plated
11	WM-48-9075	2	Handle Hitch Pin
12	WM-32059	4	Pin weldment
13	WM-30-2077	6	3/8 NC Lockpin
14	WM-26-0346	1	Danger decal
15	WM-26-0200	1	Decal - Caution
16	WM-30-0152	6	3/8 NC x 1 Capscrew
17	WM-32371	2	Cylinder Assembly Lift
18	WM-31-3036	8	90° Adjustable elbow
19	WM-26-0344	1	Decal - 417
20	WM-36-0143	2	Pressure Hose - L-28
21	WM-32060	2	Pin weldment
22	WM-39-5017	2	Plastic Tie
23	WM-36-0144	2	Pressure Hose - L-40
24	WM-30-4062	1	Clevis Pin - 1 x 2-19/64
25	WM-48-0004	2	3/16 x 1-1/2 Cotter pin

Ref No	Part No	No Used	Description
26	WM-26-0324	1	Instruction Decal
27	WM-21-5252	1	Feedline #3
28	WM-21-5250	1	Feedline #1
29	WM-21-5253	1	Feedline #4
30	WM-21-5251	1	Feedline #2
31	WM-48-0258	8	Feedline Clamp
32	WM-48-0252	1	Feedline Clamp
33	WM-30-2055	5	5/16 NC Locknut, flange head
34	WM-37181	1	Feedline Cover
35	WM-36-0141	2	Pressure Hose L-15
36	WM-36-0142	2	Pressure Hose L-20
37	WM-30-5000	1	Tab Weld Nut
38	WM-30-3100	1	5/16 Lockwasher
39	WM-30-0100	3	5/16 NC x 3/4 Capscrew
40	WM-21-5291	1	Bent Pull Pin w/Hair Pin Cotter
41	WM-21-5299	1	Bent Pull Pin w/Hair Pin Cotter
42	WM-30381	1	Stand Weldment
43	WM-32368	2	Cylinder Assembly - Tilt
44	WM-48-7501	6	1/4-28 Lube fitting
45	WM-48-7500	4	1/4-28 x 90° Lube fitting
46	WM-48-0263	1	Hose Clamp - 5/8 - 1-1/2
47	WM-31215	1	Rod weldment
48	WM-30-4078	1	Clevis Pin - 1 x 2-35/64
49	WM-31217	1	Tube Weldment
50	WM-26-0345	1	Decal 417
51	WM-48-7503	2	1/4-28 x 45 Lube fitting

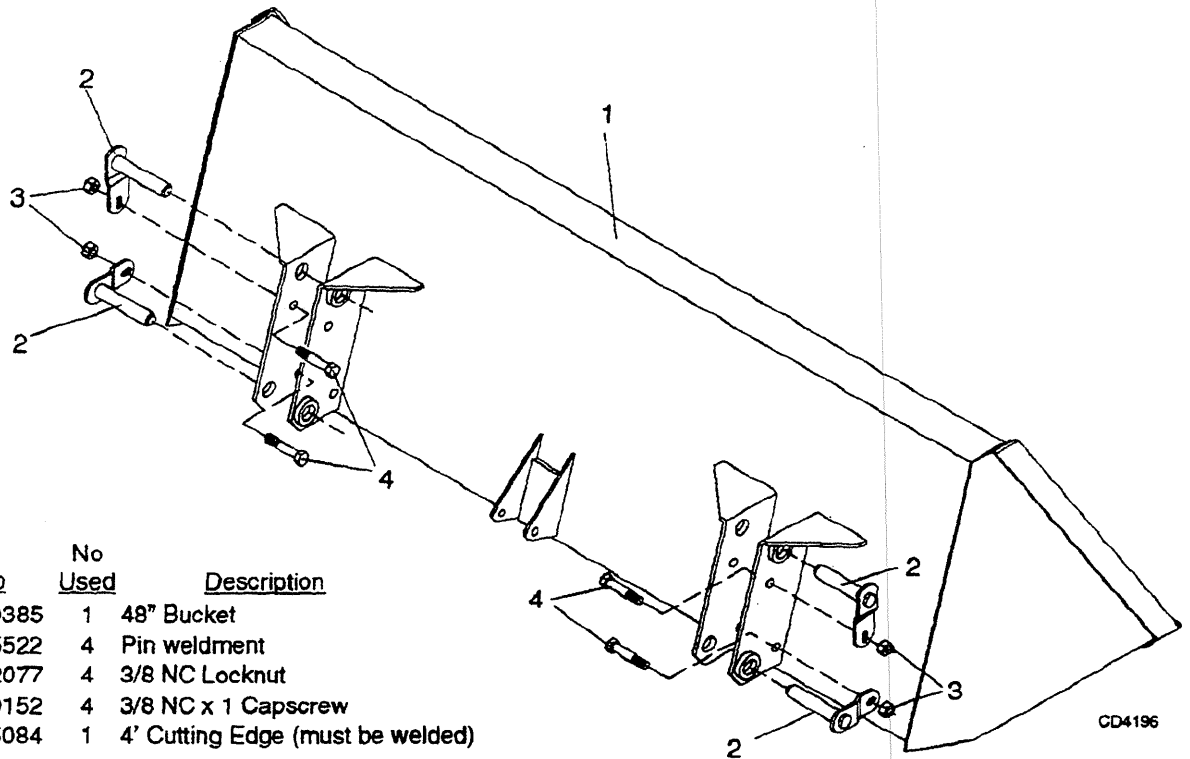
## 416 & 417 HYDRAULIC CIRCUIT



CD4189

Ref No	416 Part No	No Used	417 Part No	Description
3	WM-21-6071	1	WM-21-5250	Feedline #1
4	WM-21-6072	1	WM-21-5251	Feedline #2
5	WM-21-6073	1	WM-21-5252	Feedline #3
6	WM-21-6074	1	WM-21-5253	Feedline #4
7	WM-21-0036	2	WM-32371	Lift Cylinder
8	WM-36-0190	2	WM-36-0143	Hydraulic Hose
9	WM-36-0191	2	WM-36-0144	Hydraulic Hose
10	WM-21-0035	2	WM-32368	Tilt Cylinder
11	WM-36-0189	2	WM-36-0142	Hydraulic Hose
12	WM-36-0189	2	WM-36-0142	Hydraulic Hose
13	WM-8-0265	8	WM-42-0258	Feedline Clamp
14	WM-30-5000	1	WM-30-5000	Tab Weld Nut - 5/16 NC

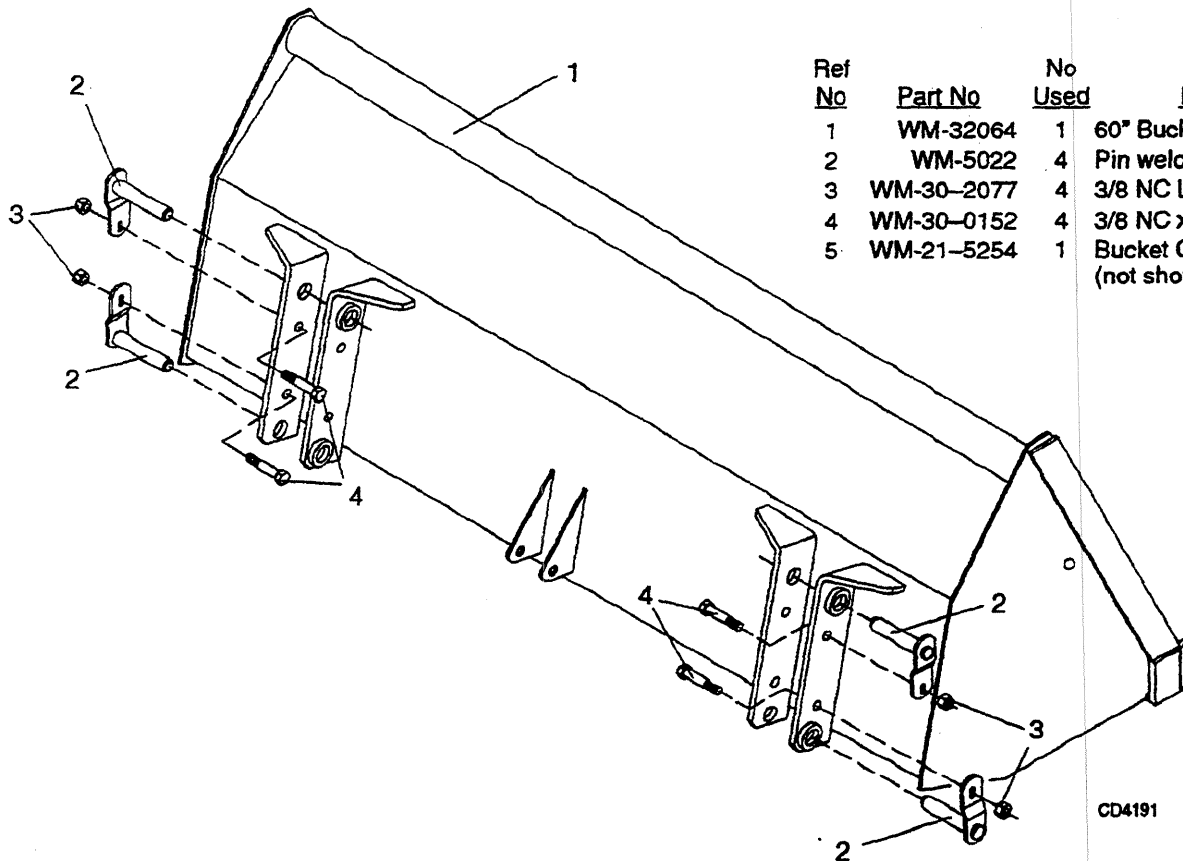
## 416 BUCKET



Ref No	Part No	No Used	Description
1	WM-30385	1	48" Bucket
2	WM-5522	4	Pin weldment
3	WM-30-2077	4	3/8 NC Locknut
4	WM-30-0152	4	3/8 NC x 1 Capscrew
5	WM-21-5084	1	4' Cutting Edge (must be welded)

CD4196

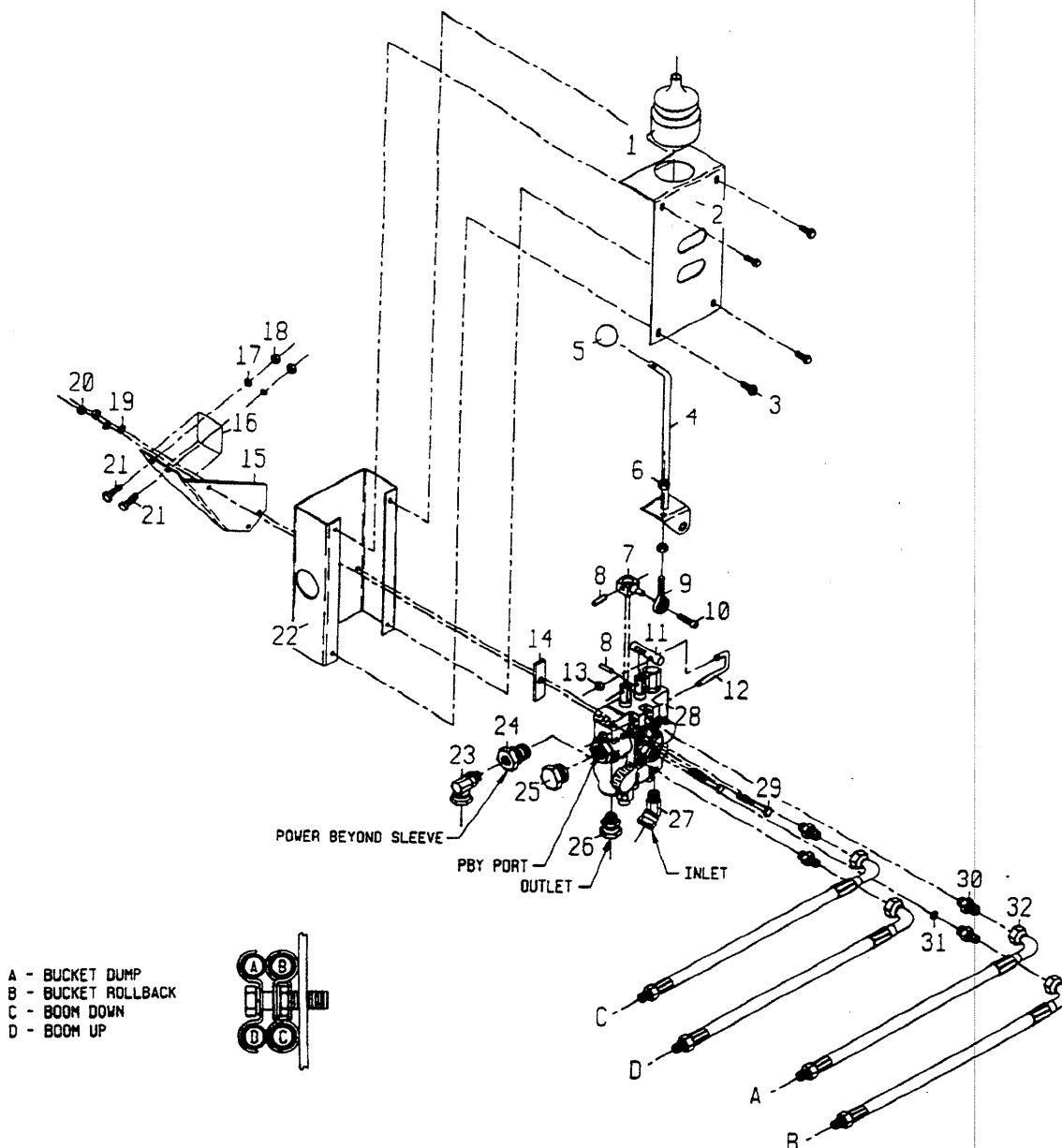
## 417 BUCKET



Ref No	Part No	No Used	Description
1	WM-32064	1	60" Bucket
2	WM-5022	4	Pin weldment
3	WM-30-2077	4	3/8 NC Locknut
4	WM-30-0152	4	3/8 NC x 1 Capscrew
5	WM-21-5254	1	Bucket Cutting Edge (not shown)

CD4191

# SINGLE HANDLE CONTROL VALVE – MODEL 416

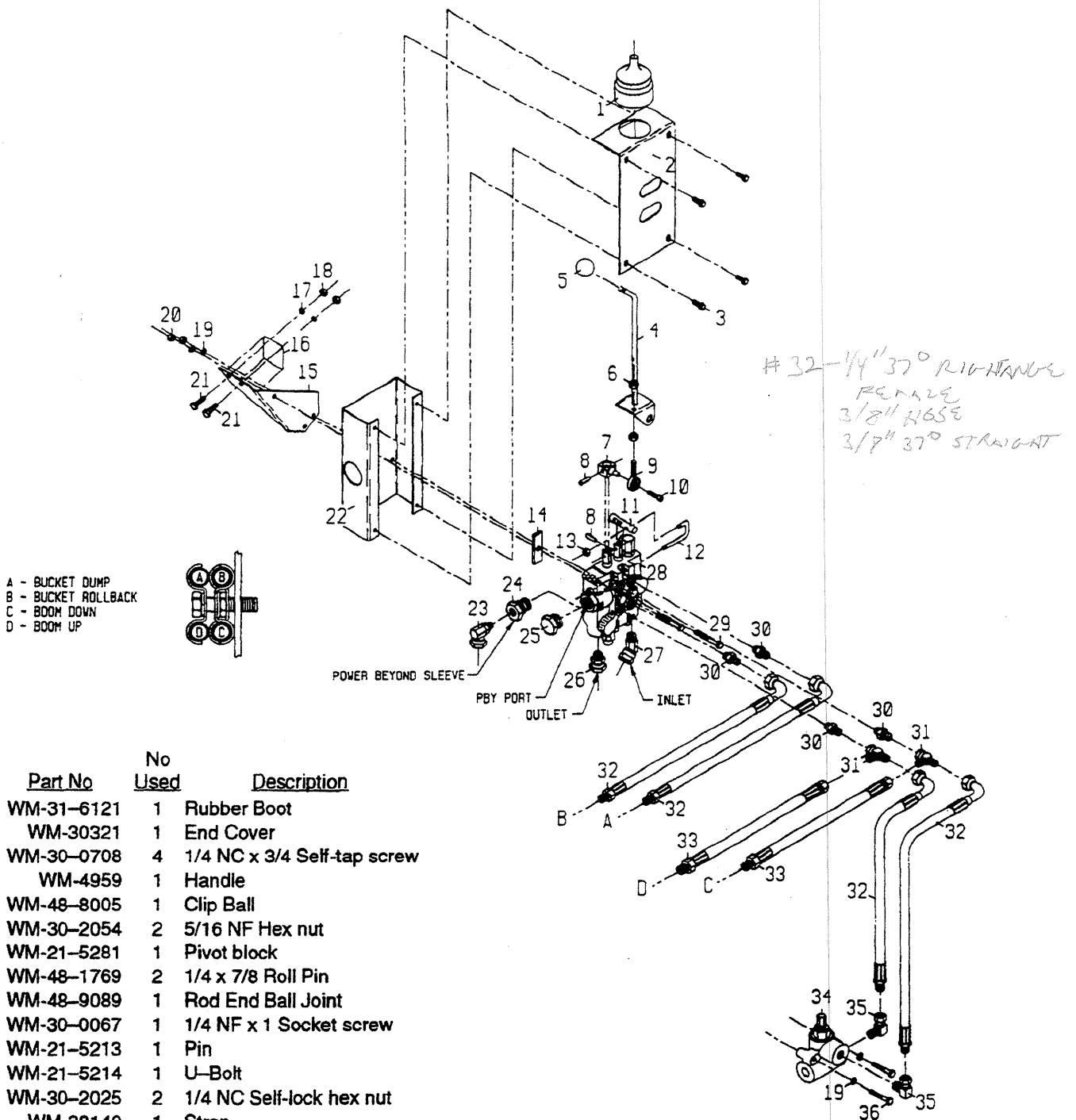


Ref No	Part No	No Used	Description
1	WM-31-6121	1	Rubber Boot
2	WM-30321	1	End Cover
3	WM-30-0708	4	1/4 NC x 3/4 Self-tap screw
4	WM-4959	1	Handle
5	WM-48-8005	1	Clip Ball
6	WM-30-2054	2	5/16 NF Hex nut
7	WM-21-5281	1	Pivot block
8	WM-48-1769	2	1/4 x 7/8 Roll Pin
9	WM-48-9089	1	Rod End Ball Joint
10	WM-30-0067	1	1/4 x 1 Socket Capscrew
11	WM-21-5213	1	Pin
12	WM-21-5214	1	U-Bolt
13	WM-30-2025	2	1/4 NC Self-lock hex nut
14	WM-38140	1	Strap
15	WM-6841	1	Valve Mounting Bracket
16	WM-26-0274	1	Decal - Control Valve

Ref No	Part No	No Used	Description
17	WM-30-3150	2	3/8 Lockwasher
18	WM-30-2076	2	3/8 NC Hex nut
19	WM-30-3050	4	1/4 Lockwasher
20	WM-30-2026	2	1/4 NC Hex nut
21	WM-30-0152	2	3/8 NC x 1 Capscrew
22	WM-30320	1	Valve Cover
23	WM-31-3043	1	90° Elbow
24	WM-34-6083	1	Power Beyond Sleeve
25	WM-31-0012	1	Cap Plug
26	WM-31-5050	1	Straight Adapter
27	WM-31-3047	1	45° Adjustable Female Pipe Swivel
28	WM-34-6081	1	Valve
29	WM-30-0068	2	1/4 NC x 2-1/4 Capscrew
30	WM-31-5044	4	Straight adapter
31	WM-34-6137	1	Plate orifice
32	WM-36-0198	4	Hydraulic hose - L18



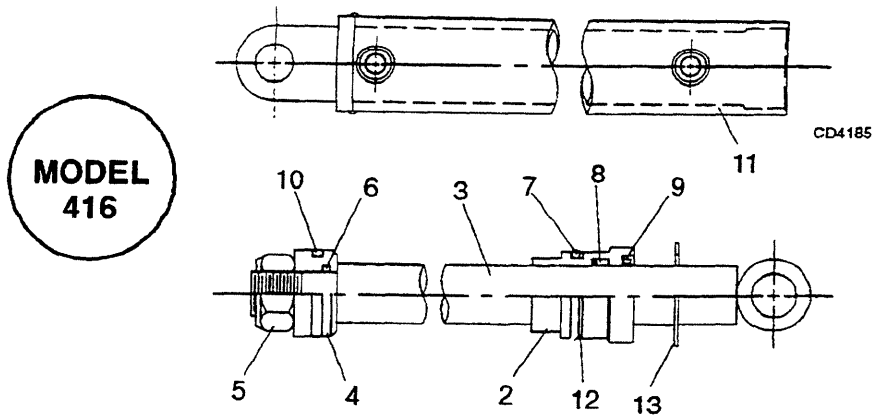
# SINGLE HANDLE CONTROL VALVE - MODEL 417



Ref No	Part No	No Used	Description
1	WM-31-6121	1	Rubber Boot
2	WM-30321	1	End Cover
3	WM-30-0708	4	1/4 NC x 3/4 Self-tap screw
4	WM-4959	1	Handle
5	WM-48-8005	1	Clip Ball
6	WM-30-2054	2	5/16 NF Hex nut
7	WM-21-5281	1	Pivot block
8	WM-48-1769	2	1/4 x 7/8 Roll Pin
9	WM-48-9089	1	Rod End Ball Joint
10	WM-30-0067	1	1/4 NF x 1 Socket screw
11	WM-21-5213	1	Pin
12	WM-21-5214	1	U-Bolt
13	WM-30-2025	2	1/4 NC Self-lock hex nut
14	WM-38140	1	Strap
15	WM-6841	1	Valve Mounting Bracket
16	WM-26-0274	1	Decal - Control Valve
17	WM-30-3150	2	3/8 Lockwasher
18	WM-30-2076	2	3/8 NC Hex nut
19	WM-30-3050	4	1/4 Lockwasher
20	WM-30-2026	2	1/4 NC Hex nut
21	WM-30-0152	2	3/8 NC x 1 Capscrew
22	WM-30320	1	Valve Cover
23	WM-31-3043	1	90° Elbow
24	WM-34-6083	1	Power Beyond Sleeve
25	WM-31-0012	1	Cap Plug
26	WM-31-5050	1	Straight Adapter
27	WM-31-3047	1	45° Adjustable Female Pipe Swivel

Ref No	Part No	No Used	Description
28	WM-34-6100	1	Valve
29	WM-30-0068	2	1/4 NC x 2-1/4 Capscrew
30	WM-31-5044	2	Straight adapter
31	WM-31-2017	2	Swivel tee
32	WM-36-0070	4	Pressure hose - L18
33	WM-36-0207	4	Hydraulic hose - L18
34	WM-34-6162	1	Hydraulic relief valve
35	WM-31-3053	2	90° Swivel elbow
36	WM-30-0062	2	1/4 NC x 1-3/4 Capscrew

## 416 & 417 CYLINDERS



TILT CYLINDER		Ref No	Description	LIFT CYLINDER	
Model 416	Model 417			Model 416	Model 417
Part No	Part No			Part No	Part No
WM-21-0035	WM-32368	—	Complete cylinder	WM-21-0036	WM-32371
—†	WM-5660	1	Retainer nut	—†	WM-5684
—†	WM-30354	2	Seal retainer	—†	WM-30360
—†	WM-32041	3	Rod	—†	WM-32049
—†	WM-32369	4	Piston	—†	WM-32372
—†	WM-30-2208	5	Locknut	—†	WM-30-2260
ISK*	WM-44-1002	6	O-Ring	ISK*	WM-44-1003
ISK*	WM-44-1005	7	O-Ring	ISK*	WM-44-1005
ISK*	WM-44-1553	8	U-Ring	ISK*	WM-44-1520
ISK*	WM-44-1555	9	Wiper ring	ISK*	WM-44-1517
ISK*	WM-44-1625	10	Piston seal	ISK*	WM-44-1625
N/A	WM-32038	11	Tube	N/A	WM-32045
ISK*	Not Used	12	Back-up ring	ISK*	Not Used
ISK*	Not Used	13	Snap ring	ISK*	Not Used
WM-44-1622	WM-32418	14	Seal kit	WM-44-1622	WM-32419

† Not Serviced

\* Included in Seal Kit (14)

