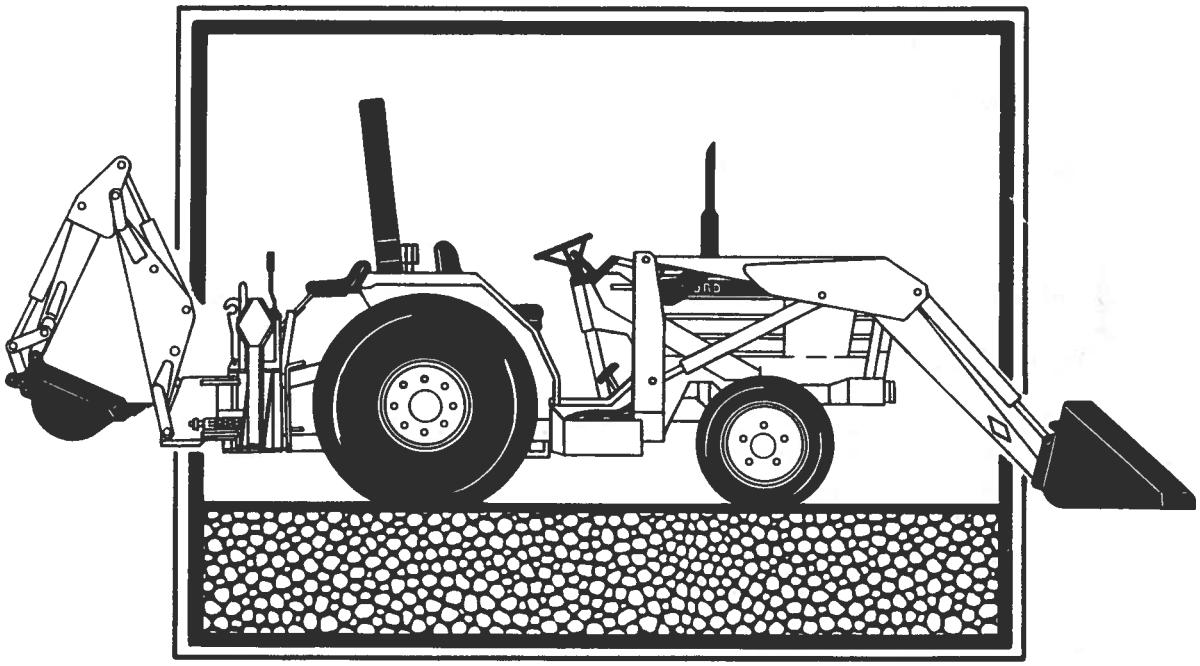
BRADCO®

OM360
REV. 4

315 LOADER
MD2 SERIES BACKHOES

FORD 1920 TRACTOR



4813

10-24-94-4

OPERATOR'S MANUAL

75260

BRADCO ®
P.O. Box 266 · Delhi, Iowa 52223 USA
(319) 922-2981 ·(800) 922-2981
Fax 319-922-2130
A Division of ATI Incorporated

TABLE OF CONTENTS

4540 1-10-89

TO THE OWNER

GENERAL COMMENTS

Congratulations on the purchase of your new loader and backhoe! These units were carefully designed and manufactured to give you many years of dependable service. These units will require some minor maintenance (such as cleaning and lubricating) to keep them in top working condition. Be sure to observe all maintenance procedures and safety precautions in this manual and on the safety decals located on the tractor, loader, and backhoe.

ABOUT THIS MANUAL

Read this manual before using the equipment. This manual has been designed to help you to do a better, safer job. Read this manual carefully and become familiar with the operating procedures before attempting to operate your new equipment. **Remember, never let anyone operate these units without first reading the "Safety Precautions" and "Operating Instructions" sections of this manual (see sections B and G respectively).**

SERVICE

When servicing these units, remember to use only manufacturer replacement parts. Substitute parts may not meet the standards required for safe, dependable operation.

To facilitate parts ordering, record the model and serial number of your backhoe and loader in the space provided on this page. Backhoe information may be obtained from the backhoe identification plate located on the left side of the console assembly cover. Loader information may be obtained from the loader identification plate located on the upper cross tube of the loader arm frame.

BACKHOE MODEL_____ SERIAL NO._____

LOADER MODEL_____ SERIAL NO._____

Your parts dealer needs this information to insure that you receive the correct parts or attachments for your specific backhoe and loader.

SAFETY ALERT SYMBOL

This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

THE OPERATOR

A careful operator is the best operator. Most accidents can be avoided by taking certain precautions. The following precautions are suggested here to help prevent accidents. Read and take these safety precautions before operating the tractor, loader or backhoe. Make sure that the equipment is operated only by responsible individuals with the proper instruction. The operator should be familiar with the controls, all safety precautions, and all potential hazards.

This is the "Safety Alert Symbol" used by this industry.

Remember, when you see this symbol it means: ATTENTION BECOME ALERT! YOUR SAFETY IS INVOLVED! This symbol with it's appropriate warnings are scattered throughout this book. Be sure all operators read them before using the backhoe.

BEFORE YOU START

1. READ THE ENTIRE TRACTOR OPERATOR'S, LOADER/BACKHOE OPERATOR'S, AND F.I.E.I. SAFETY MANUALS BEFORE EVER ATTEMPTING TO USE THE EQUIPMENT. THIS KNOWLEDGE IS NECESSARY FOR SAFE OPERATION.

2. Wear appropriate clothing such as a hard hat, safety glasses, steel toed shoes, ear plugs, etc. Do not wear loose fitting clothing which could get caught on the equipment, or in moving parts.

3. Know your equipment before you try to operate it. Know it's capacities, capabilities, and limitations concerning load, braking, steering, etc. Know how to read all guages and use all controls.

4. Familiarize yourself with the work site before you begin. Locate all underground cables, gas and water lines, etc. Check for clearance of all overhead telephone and power lines. Contact with such systems could cause severe injury and death.

5. Block off work area from bystanders, livestock, etc. Allow plenty of room for backhoe reach and swing.

6. Use the proper mounting technique to avoid falling. Always use steps and hand rails provided and keep them clean. Never try to mount moving equipment.

7. Use your seatbelt and ROPS (Roll Over Protective Structure) when operating your tractor. Keep belt and ROPS in good repair. Do not modify the ROPS or seatbelt. Do not remove ROPS or seatbelt. Overturning equipment without proper ROPS and seatbelt can result in death.

8. Do not use seatbelt if there are no ROPS. You could be pinned if the tractor overturns.

9. Test all controls, lighting and safety systems for proper operation. Never operate equipment that is not functioning properly.

10. Follow the tractor manufacturer's recommended starting procedures. Never start equipment from any position other than the operator's seat.

TRANSPORTING THE UNIT

1. Always make sure your unit is properly equipped for roadway travel. Check turn signals, road lights, brake lights, etc.

2. Familiarize yourself with all local traffic regulations regarding such equipment.

3. Be sure to use the swing/boom transport lock when transporting a backhoe. Failure to do so could allow the backhoe to swing from side to side causing an unstable condition.

4. Allow for the height of the unit when going under wires, overpasses, etc.

5. Use a Slow Moving Vehical sign when traveling on public roads.

6. Be considerate of traffic behind you. Pull over and allow traffic to pass safely if it backs up.

7. Do not drive close to ditches, excavations, etc. A cave in could result.

8. Use caution at railway crossings and when traveling over rough terrain. Reduce speed and know your minimum stopping distance.

9. Check your tractor operator's manual for proper towing technique before towing the unit behind another vehicle or on a trailer.

10. Follow the tractor manufacturer's recommended shut down procedure. Be sure to set parking brakes, lower or lock all buckets and shut off engine before dismounting.

11. Use steps and hand rails when dismounting. Never dismount while machine is still moving.

WORKING WITH THE UNIT

1. Follow all safety decals on equipment. Keep them clean and replace them if they become worn or hard to read.

2. Pay attention to the job at hand. Do not let your mind lose concentration on what you are doing. Watch out for others who may not be watching out for themselves.

3. Do not carry passengers on the equipment. There is no safe place for a passenger to ride. They could fall and be crushed.

4. Never operate equipment by standing up on, or beside the unit. Operate only from the proper operator's seat.

5. Never let an unqualified person operate the equipment.

6. Never operate the unit with covers or shields removed.

7. Stay clear of any PTO shaft. You could become caught in a rotating shaft and be severely injured or killed.

8. Never leave the unit running unattended. Always follow proper shut down procedures.

9. Never lift or carry a load over the heads of others or the passenger compartment of another vehicle.

10. Be cautious when working in rough or soft terrain. Avoid drop offs, steep slopes, etc.

11. Use your equipment only for it's designed and intended use. Do not use it to pull things, as a battering ram, as a lift for personnel, or attach ropes and chains to the unit.

12. Be familiar with all pinch and wrap points on the unit. Avoid contact with these areas. Severe injury such as a lost limb could result.

13. Carry all buckets low for maximum stability and visibility

14. Keep the swing/boom transport lock in locked position whenever backhoe is not in use.

15. Use caution when operating by an excavation or when under cutting a bank to avoid cave in.

16. Avoid full reach and swinging the backhoe bucket to the downhill side, when operating on a slope. Tipping could result.

17. Do not dig close to stabilizers, the ground could collapse from under the backhoe.

18. Do not lift loads in excess of backhoe capacity.

MAINTENANCE

1. Never work on equipment while it is running. Block up equipment, set hand brake, and lower bucket and stabilizers before performing repairs.

2. Never make hydraulic repairs while the system is under pressure, or the cylinders are under load. Injury or death could result. Lower hydraulicly supported loads before performing maintenance.

3. Observe proper maintenance schedules and repairs to keep unit in safe working order.

4. Always wear safety goggles or glasses when working on equipment.

5. Use a brass drift and hammer when pressing out pins to prevent the pin from shattering.

6. Attach a warning tag on the controls of any equipment that is not in proper working order.

7. Keep machine clean of mud, oil, and grease to keep controls and surfaces from becoming slippery.

8. Do not smoke when handling flammable chemicals and refueling. Allow room in the gas tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.

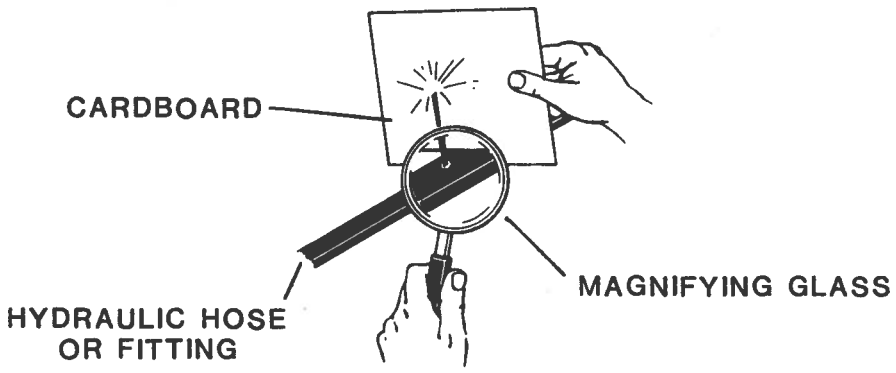
9. Do not adjust relief valve setting. This valve is factory set and should be adjusted only by a qualified service person. Incorrect valve setting could result in equipment damage and/or personal injury.

10. Disconnect the battery before performing electrical work.

WARNING! Escaping fluid under pressure can have sufficient force to penetrate the skin causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks.

Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.

If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research immediately to determine proper treatment.



SAFETY PRECAUTIONS

FRONT END LOADER

THE OPERATOR

A careful operator is the best operator. Most accidents can be avoided by taking certain precautions. The following precautions are suggested here to help prevent accidents. Read and understand these safety precautions before operating the loader. Make sure the equipment is operated only by responsible individuals with the proper instruction. The operator should be familiar with the controls and all safety precautions.

This is the "Safety Alert Symbol" used by this industry.

Remember, when you see this symbol it means: **ATTENTION BECOME ALERT! YOUR SAFETY IS INVOLVED!** This symbol with it's appropriate warnings are scattered throughout this book. Be sure all operators read them before using the loader.

GENERAL

1. **READ THE ENTIRE TRACTOR OPERATOR'S, LOADER OPERATOR'S AND EMI SAFETY MANUALS BEFORE EVER ATTEMPTING TO USE THE EQUIPMENT.** THIS KNOWLEDGE IS NECESSARY FOR SAFE OPERATION.
2. **Wear appropriate clothing** such as a hard hat, safety glasses, steel toed shoes, ear plugs, etc. Do not wear loose fitting clothing which could get caught on the equipment, or in moving parts.

TRACTOR

1. **Operator loader only from tractor operator's seat.**
2. **Do not carry passengers** on the equipment. Only one person - the operator - should be allowed on the unit while it is in operation.
3. **If operating the unit with a loader and without a backhoe**, make certain the unit has an adequate wheel ballast and/or rear counterweight.
4. **Always lower the bucket to the ground**, stop the engine and set the park brakes before leaving the operator's seat.

LOADER

1. **Do not lift or carry anybody with loader**.
2. **Avoid overhead wires** and obstacles when the loader is raised. Contacting electric lines can cause electrocution.
3. **Never allow anyone to get under the loader bucket** or reach through the lift arms when the bucket is raised.
4. **Do not use the loader bucket as a battering ram**.
5. **Do not walk or work under a raised loader** or bucket unless it is securely blocked or held in position.

SAFETY PRECAUTIONS

FRONT END LOADER

OPERATING THE LOADER

1. Reduce boomlift speed when raising loader bucket to full height.
2. Block off work area from bystanders, livestock, etc.
3. Carry the loader bucket low at all times. Especially when working on a side hill, or backing up an incline.
4. Exercise caution when operating the loader with a raised, loaded bucket or fork.
5. Travel slowly and use caution when working in rough or soft terrain. Do not drive the unit near the edge of a ditch, gully, or excavation. Use care when operating on steep grades to maintain control. Always carry the bucket as low as possible.

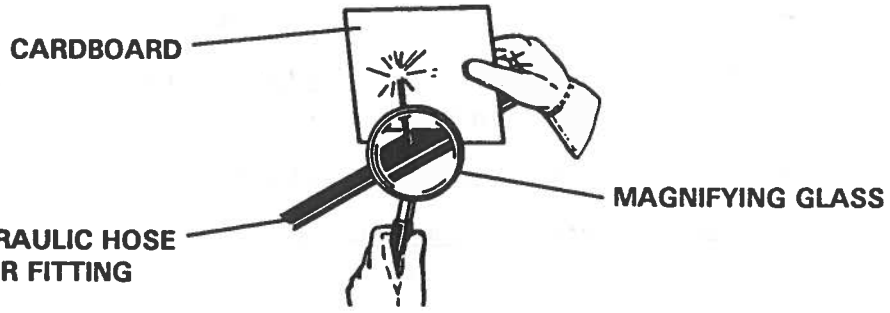
MAINTENANCE

1. Do not oil, grease, or adjust the unit while it is in motion.
2. Do not change relief valve settings - they are factory set for best loader performance and safety.
3. When driving connecting pins in or out, use care to guard against injury from particles that may chip off the pin or object used in striking the pin.

WARNING! **Escaping fluid under pressure can have sufficient force to penetrate the skin causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands to search for suspected leaks.**

Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.

If injured by injected fluid, see a doctor at once. If you doctor is not familiar with this type of injury, ask him to research immediately to determine proper treatment.



6289
1-11-94

SAFETY PRECAUTIONS

TAKE NOTE! THIS SAFETY ALERT SYMBOL FOUND THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.

THIS SYMBOL MEANS:

ATTENTION!

BECOME ALERT!

YOUR SAFETY IS INVOLVED!

SIGNAL WORDS: Note the use of signal words DANGER, WARNING, and CAUTION with the safety messages. The appropriate signal word for each has been selected using the following guidelines:

DANGER: Indicates an imminently hazardous situation which, if not avoided, will result death or serious injury. This signal word is to be limited to the most extreme situations, **typically for machine components which, for functional purposes, cannot be guarded.**

WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury, and **includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.**

CAUTION: Indicates a potentially hazardous situation which, if not avoided, **may result in minor or moderate injury. It may also be used to alert against unsafe practices.**

INTERNATIONAL SYMBOLS

As a guide to the operation of your equipment, various international symbols have been utilized on the instruments and controls. The symbols are shown below with an indication of their meaning.


Engine speed


Hours recorded


Engine water temperature


Lights


Horn


Engine oil pressure


Hazard warning


Axle connect


Axle disconnect


Continuously variable


Increase

Decrease

Diesel fuel

Creeper range

High range

Low range


Alternator charge


Power take-off (on)


Power take-off (off)


"Tortoise," slow or minimum setting


"Hare," fast or maximum setting


Caution

Control lever operating direction


Rock shaft (raised)


Rock shaft (lowered)


Remote cylinder (extended)


Remote cylinder (retracted)


Remote cylinder (FLOAT)


Differential lock


Read operators manual

Neutral


Forward


Reverse

PREOPERATION

TRACTOR-LOADER-BACKHOE

GENERAL INFORMATION

The purpose of this manual is to assist you in setting up, operating and maintaining your loader and backhoe. Read it carefully. It furnishes information and instructions that will help you achieve years of dependable performance.

Right and left when referred to in this manual are determined by whether reference is being made to the tractor and loader or to the backhoe. Tractor and loader right and left are determined from the tractor operator's control position facing forward. Backhoe right and left are determined from the backhoe operator's control position facing the bucket.

NOTE: The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the backhoes and loaders as may be necessary without notification.

PREPARING THE TRACTOR

WARNING!  **Never let anyone operate the tractor, loader, or backhoe without first reading the "Safety Precautions" and "Operating Instructions" sections of this manual (see Sections B and G respectively). Always choose hard, level ground to park the tractor on and set the brake so that the tractor cannot roll.**

Position the tractor hydraulic lift arms to the fully lowered position before stopping the tractor engine and removing the ignition key. Leave the hydraulic lever in this position and proceed to remove the tractor drawbar, or position it in it's shortest setting. Remove any attachments from the tractor that could interfear with the loader-backhoe mounting kit installation (such as any blades, or a trencher, etc). Be sure to use a ROPS on your tractor for operator safety and protection.

MOUNTING KITS

Basic loaders and backhoes are shipped complete, each with it's appropriate bucket. However, to mount the loader and or backhoe to the tractor, a mounting kit (for the tractor) is required. Also, several bucket options are available for the loader and backhoe. Refer to the tables on the following page for proper identifications of loader, backhoe, mounting kit, and bucket options.

PREOPERATION

TRACTOR-LOADER-BACKHOE
FORD 1920 TRACTORS

BACKHOE MOUNTING & HYDRAULIC KITS

FORD 1920 TRACTOR	BASIC BACKHOE	MOUNTING KIT	HYDRAULIC KIT	POWER DIG BUCKETS
W/ATI ROPS & Loader	8,9,& 11MD2	68388	68100	12" - 68112 16" - 68116 18" - 68118
W/FORD ROPS & ATI Loader	8,9,& 11MD2	69156	68100	20" - 68120 24" - 68124
W/FORD ROPS & Loader	8,9,& 11MD2	69132	69151	
W/FORD ROPS & ATI Loader W/.88" Pins	8,9,& 11MD2	67573(1)	68100	

(1) Mounting Kit #67573 has been discontinued but is listed for parts ordering purposes

Additional bucket sizes (non-standard) available on request

LOADER MOUNTING & HYDRAULIC KITS

FORD 1920 TRACTOR	BASIC LOADER	MOUNTING KIT	HYDRAULIC KIT	BUCKET OPTIONS
W/ATI ROPS & Backhoe	315	68388	68100	60"-68338(2 70"-68421(2 60"-68139(3
W/FORD ROPS & Backhoe	315	69156	68100	
W/FORD ROPS Loader Only	315	69154	W/Pump 69150 ITP 69275	
W/FORD ROPS & Backhoe W/.88" Pins	315(4)	67573(1)	68100	

(1) Mounting Kit #67573 has been discontinued but is listed for parts ordering purposes
(2) Uses 1.06" Dia. Pins
(3) Uses .88" Dia. Pins
(4) 315 loader with .88" dia. pins has been discontinued but is listed for parts ordering purposes

Additional bucket sizes (non-standard) available on request

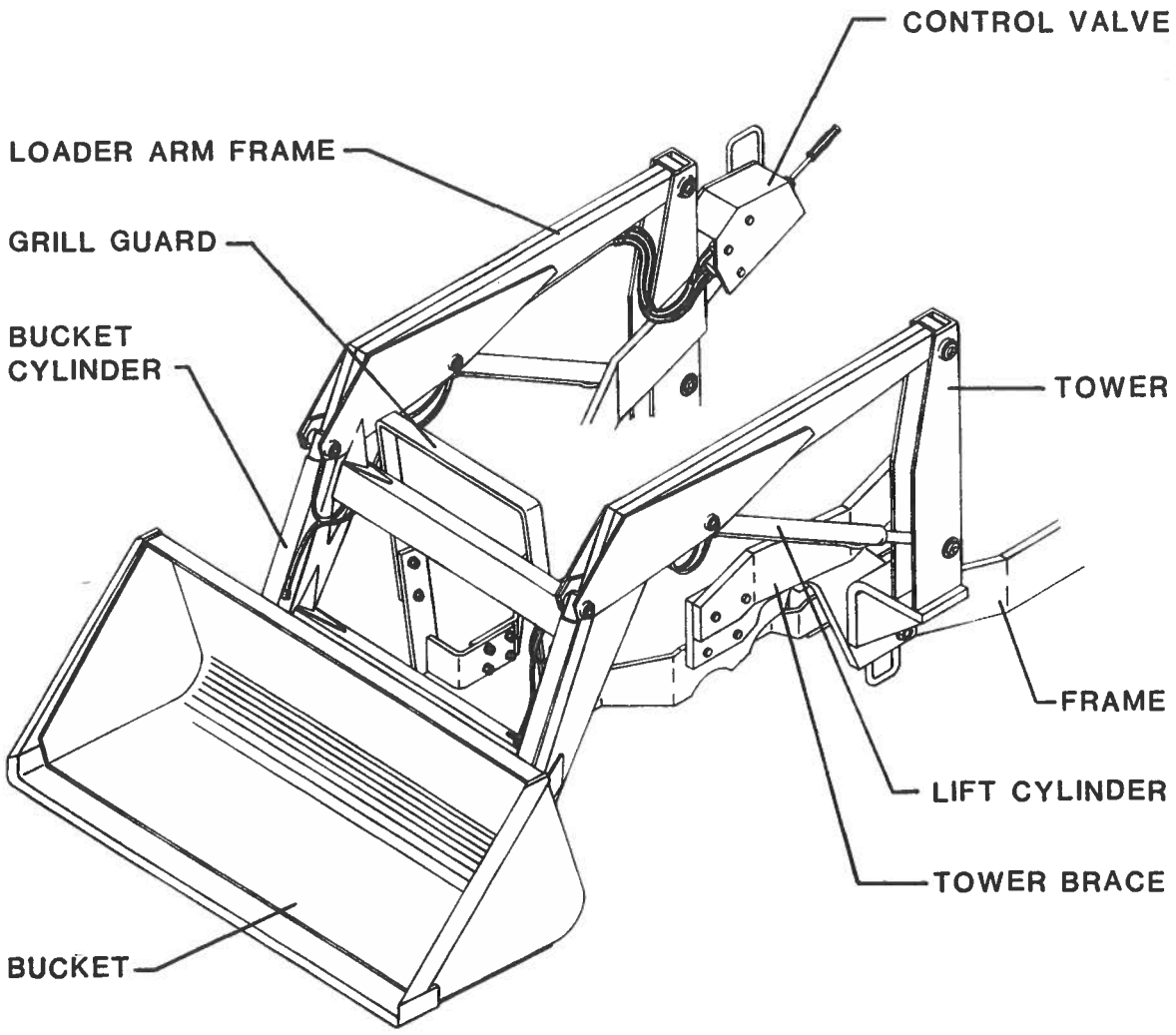
4814 2-27-90-2

PREOPERATION

LOADER MAJOR COMPONENT NOMENCLATURE
315 LOADER

GENERAL INFORMATION

Throughout this manual, reference is made to various loader components. The purpose of this page is to acquaint you with the varoius names of these components. This knowledge will be helpful when reading through this manual or when ordering service parts.

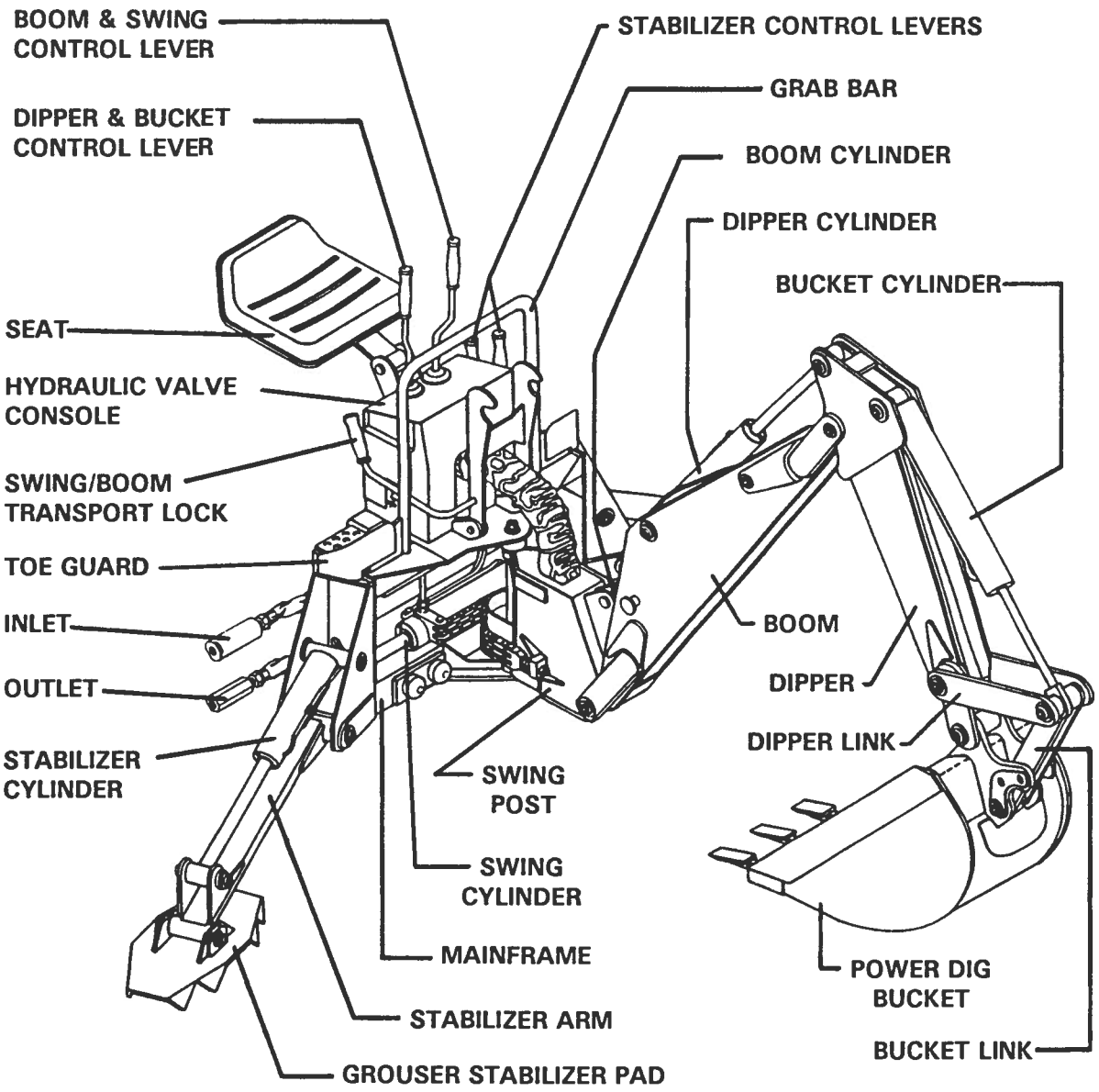


PRE-OPERATION

BACKHOE MAJOR COMPONENT NOMENCLATURE

GENERAL INFORMATION

Throughout this manual, reference is made to various backhoe components. The purpose of this page is to acquaint you with the various names of these components. This knowledge will be helpful when reading through this manual or when ordering service parts.

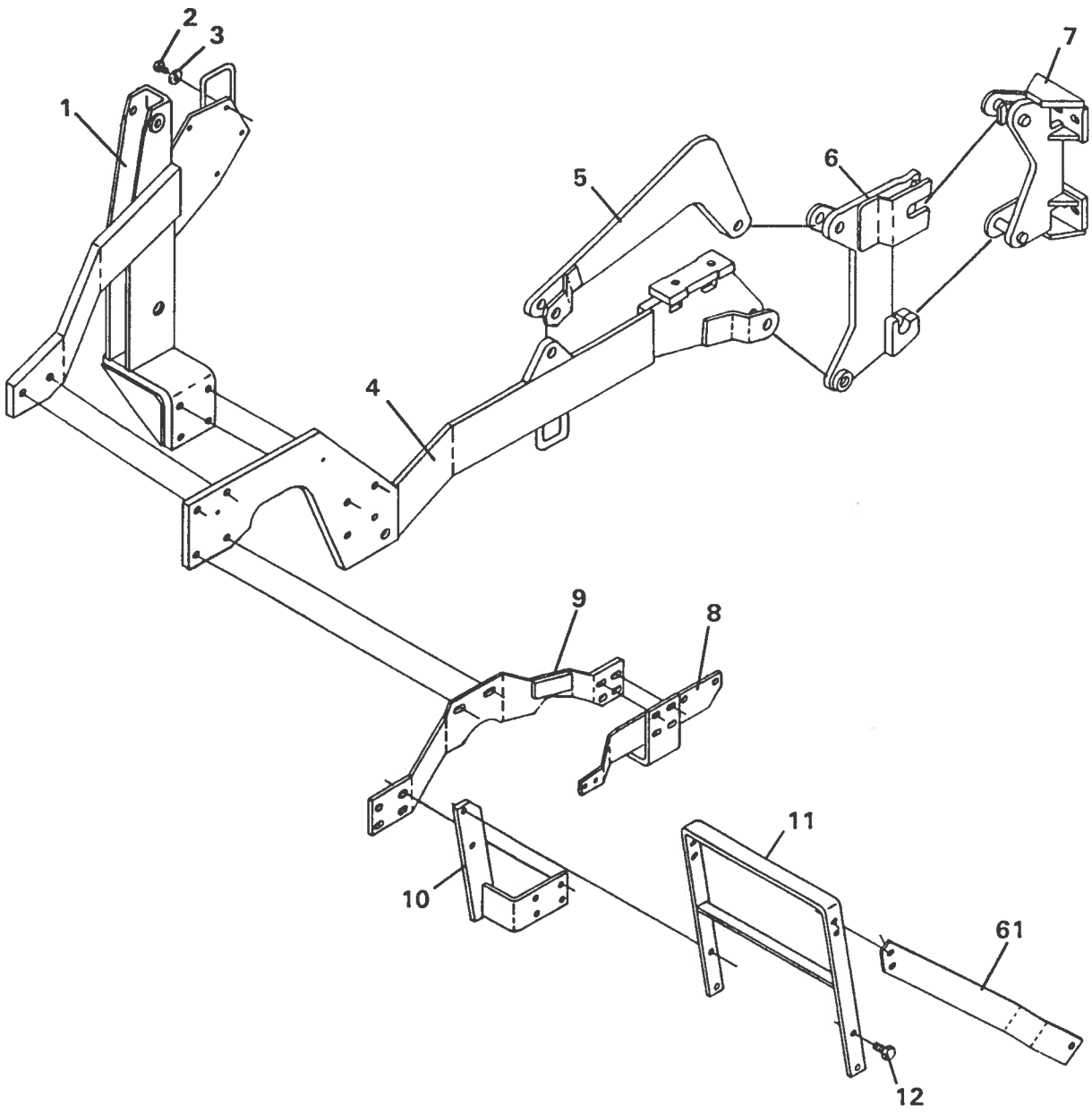


3871
4-14-94-4

MOUNTING KIT INSTALLATION

LOADER/BACKHOE MOUNTING KIT #68388
FORD 1920 WITH ATI ROPS

DIAGRAM 1 OF 3



MOUNTING KIT INSTALLATION

LOADER / BACKHOE MOUNTING KIT #68388
FORD 1920 WITH ATI ROPS

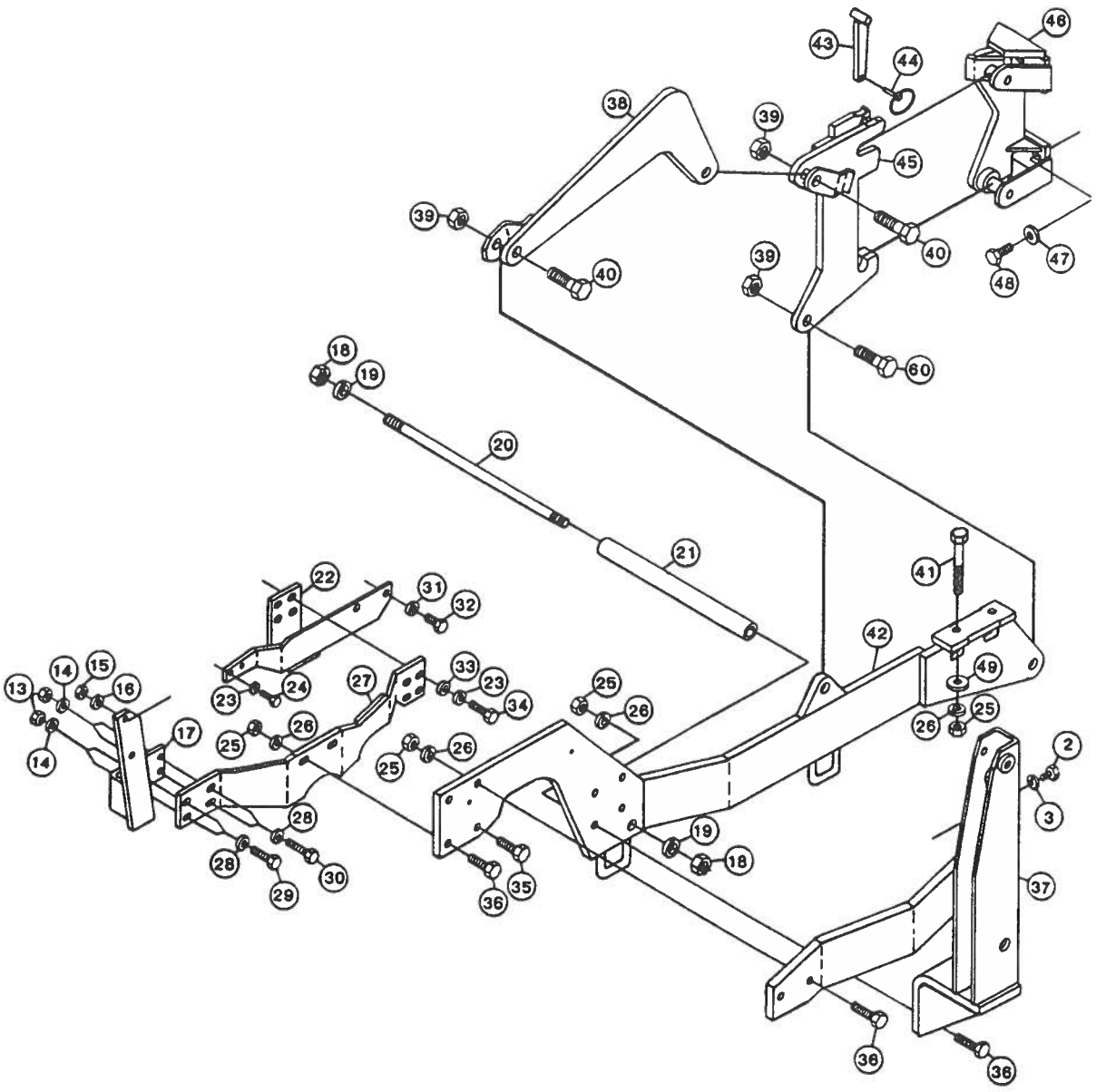
LIST 1 OF 3

NO	REQ'D	PART NO.	DESCRIPTION
1	1	68345	Right Tower
2	4	1043	.38" UNC X 1.00" Hex Capscrew
3	4	1503	.38" Lock Washer
4	1	67574	Right Frame
5	1	67577	Right Strut
6	1	70306	Right Quick-Tach
7	1	67675	Left Backhoe Mount
8	1	68313	Right Reinforcement
9	1	67988	Right Side Rail
10	1	68099	Right Grill Mount
11	1	68096	Grill Guard
12	4	1116	.62" UNC X 2.00" Hex Capscrew
61	1	80265	Right Brace
	1	80266	Left Brace
	4	1115	.62" UNC X 1.75" Hex Capscrew
	8	1517	.62" Flat Washer
	4	1506	.62" Lock Washer
	4	1230	.62" UNC Hex Nut

MOUNTING KIT INSTALLATION

LOADER/BACKHOE MOUNTING KIT #68388
FORD 1920 WITH ATI ROPS

DIAGRAM 2 OF 3



MOUNTING KIT INSTALLATION

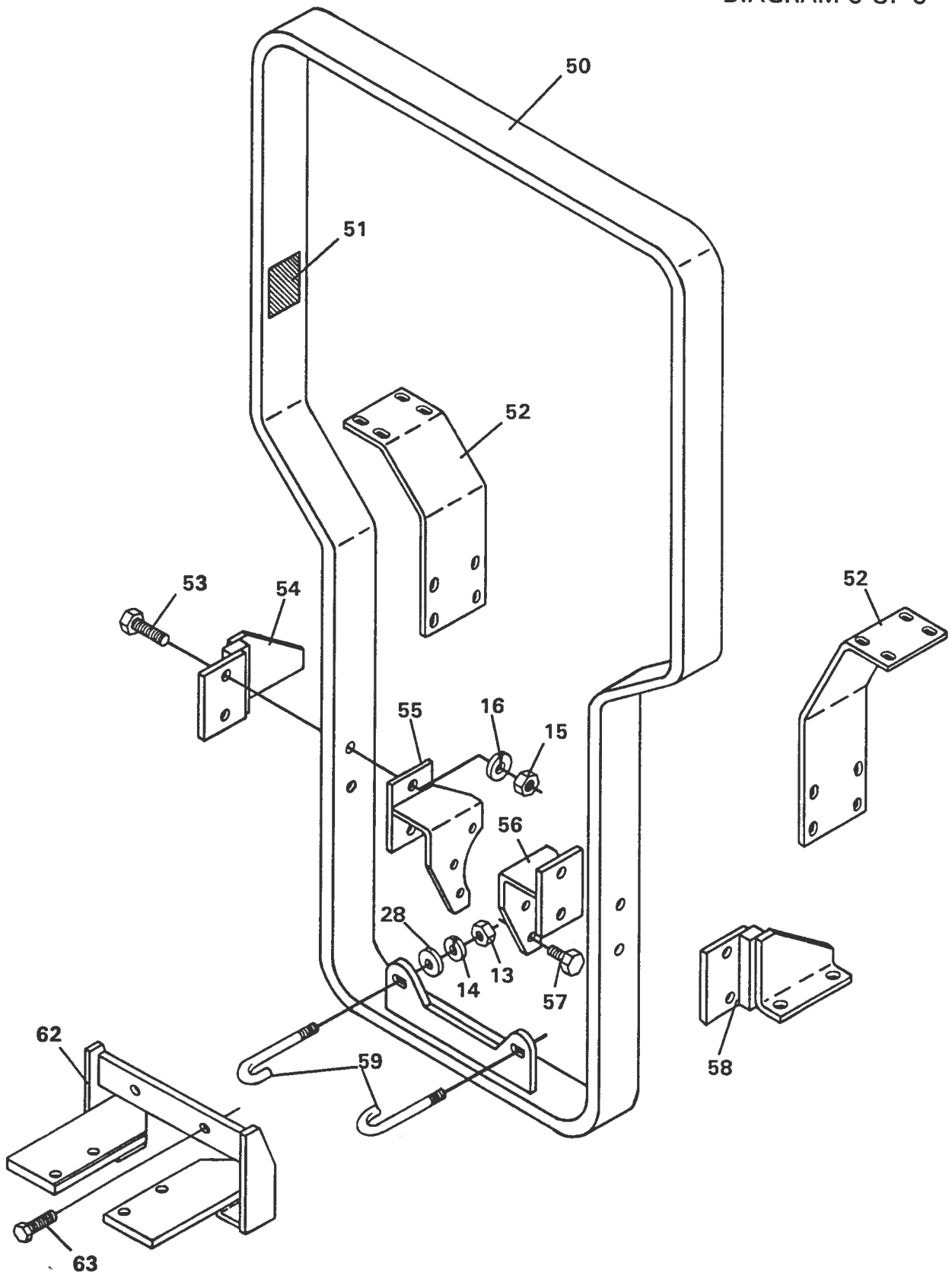
LOADER / BACKHOE MOUNTING KIT #68388
FORD 1920 WITH ATI ROPS

NO	REQ'D	PART NO.	DESCRIPTION
2	4	1043	.38" UNC X 1.00" Hex Capscrew
3	4	1503	.38" Lock Washer
13	8	1228	.50" UNC Hex Nut
14	8	1505	.50" Lock Washer
15	4	1230	.62" UNC Hex Nut
16	4	1506	.62" Lock Washer
17	1	68098	Left Grill Mount
18	2	1904	1.00" - 14 UNS Hex Nut
19	2	1509	1.00" Lock Washer
20	1	68059	Tie Rod
21	1	68097	Spacer Pipe
22	1	68314	Left Reinforcement
23	12	2534	14mm Lock Washer
24	4	2610	M14 X 50mm Capscrew DIN 960 (1.50 P)
25	20	1231	.75" UNC Hex Nut
26	20	1507	.75" Lock Washer
27	1	67987	Left Side Rail
28	8	1516	.50" Flat Washer
29	4	1094	.50" UNC X 2.50" Hex Capscrew
30	4	1096	.50" UNC X 3.00" Hex Capscrew
31	4	2535	16mm Lock Washer
32	4	2605	M16 X 40mm Capscrew DIN 933 (2.00 P)
33	8	2514	14mm Flat Washer
34	8	2650	M14 X 65mm Capscrew DIN 960 (1.50 P)
35	2	1141	.75" UNC X 2.50" Hex Capscrew
36	14	1142	.75" UNC X 2.75" Hex Capscrew
37	1	68346	Left Tower
38	1	67578	Left Strut
39	6	1541	1.00" UNC Lock Nut
40	4	1191	1.00" UNC X 3.50" Hex Capscrew
41	4	1701	.75" UNC X 6.50" Hex Capscrew - Grade 8
42	1	67575	Left Frame
43	2	59852	Wedge
44	2	6626	Klik Pin
45	1	70307	Left Quick-Tach
46	1	67676	Right Backhoe Mount
47	8	1649	.75" Hard Flat Washer
48	8	1137	.75" UNC X 1.50" Hex Capscrew
49	4	1518	.75" Flat Washer
60	2	1193	1.00" UNC X 4.00" Hex Capscrew

MOUNTING KIT INSTALLATION

LOADER/BACKHOE MOUNTING KIT #68388
FORD 1920 WITH ATI ROPS

DIAGRAM 3 OF 3



MOUNTING KIT INSTALLATION

LOADER / BACKHOE MOUNTING KIT #68388
FORD 1920 WITH ATI ROPS

LIST 3 OF 3

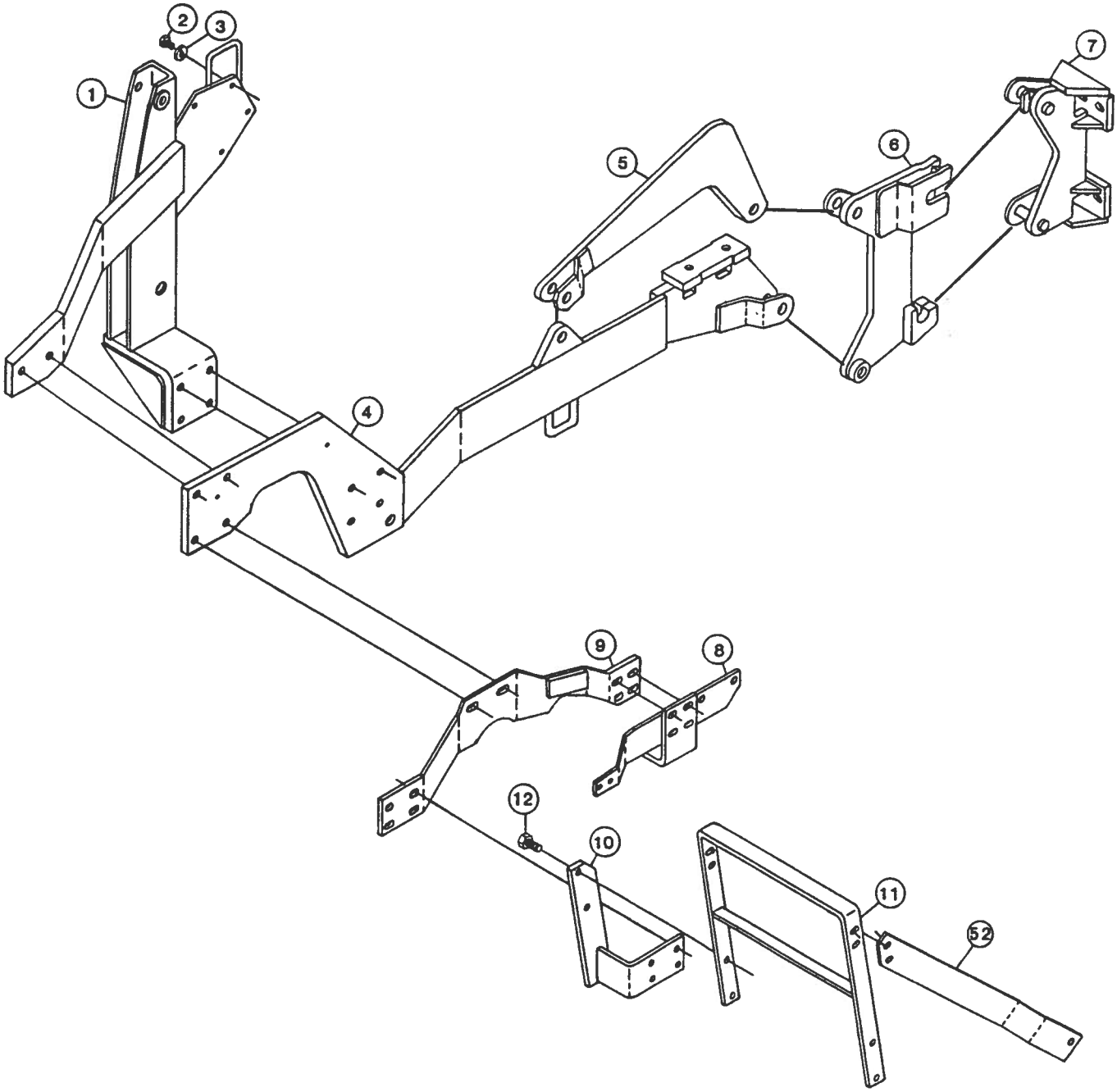
NO	REQ'D	PART NO.	DESCRIPTION
13	2	1228	.50" UNC Hex Nut
14	2	1505	.50" Lock Washer
15	4	1230	.62" UNC Hex Nut
16	4	1506	.62" Lock Washer
28	2	1516	.50" Flat Washer
50	1	69265	ROPS
51	1	69270	Certification Tag
52	2	69262	Fender Brace
53	4	1120	.62" UNC X 3.00" Hex Capscrew
54	1	69263	Left Axle Bracket
55	1	67744	Left Differential Bracket
56	1	67743	Right Differential Bracket
57	6	2636	M12 x 30mm Capscrew
58	1	69264	Right Axle Bracket
59	2	64923	J-Bolt
62	1	81980*	ROPS Mounting Bracket
63	4	2649	M16 X 45mm Capscrew

*NOTE: ROPS mounting bracket #81980 is used on tractors with a stationary drawbar mount ONLY. It is NOT used on tractors with a swinging drawbar mount.

MOUNTING KIT INSTALLATION

LOADER/BACKHOE MOUNTING KIT #69156
FORD 1920 WITH FORD ROPS

DIAGRAM 1 OF 2



MOUNTING KIT INSTALLATION

LOADER / BACKHOE MOUNTING KIT #69156
FORD 1920 WITH FORD ROPS

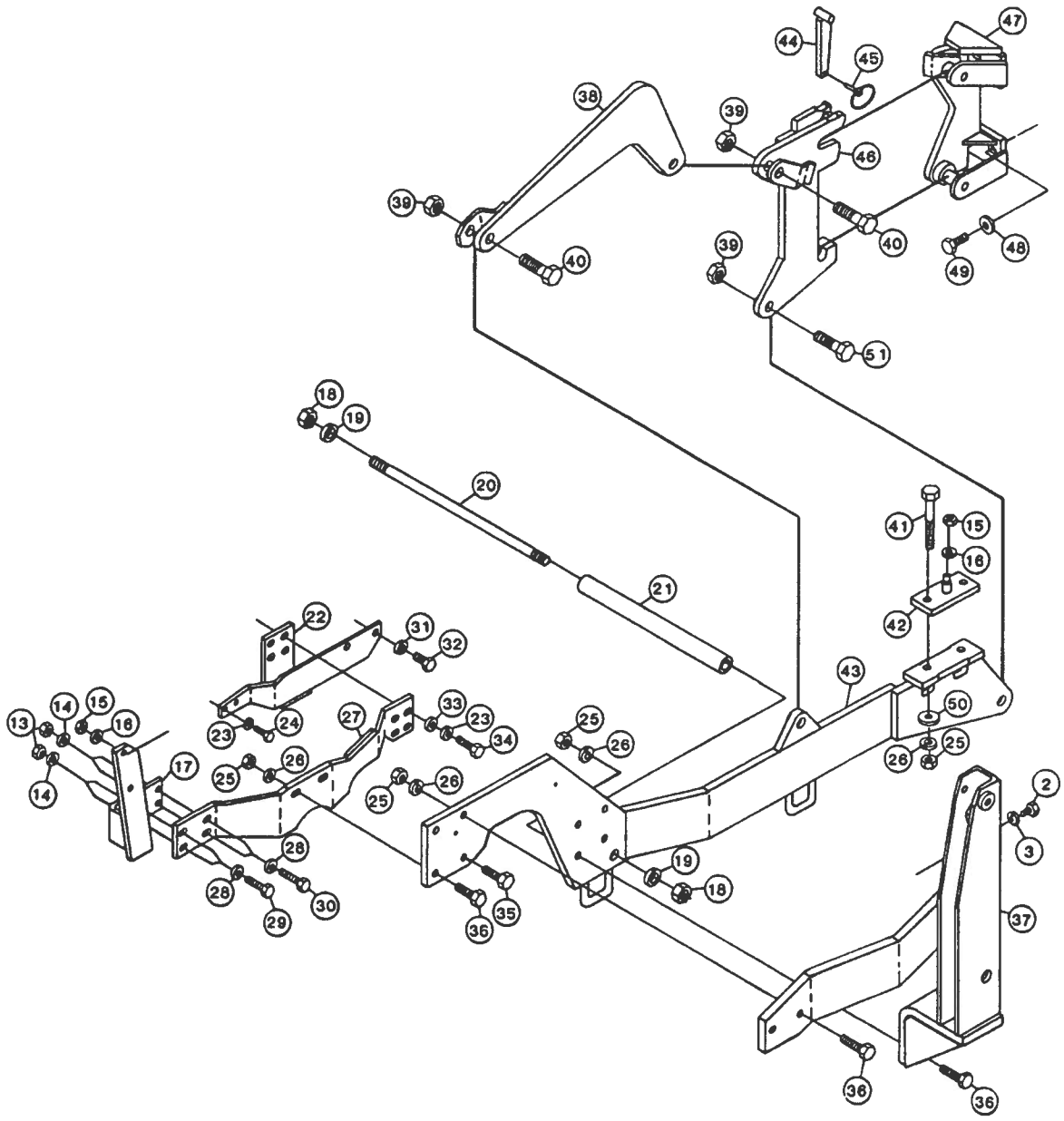
LIST 1 OF 2

NO	REQ'D	PART NO.	DESCRIPTION
1	1	68345	Right Tower
2	4	1043	.38" UNC X 1.00" Hex Capscrew
3	4	1503	.38" Lock Washer
4	1	67574	Right Frame
5	1	67577	Right Strut
6	1	70306	Right Quick-Tach
7	1	67675	Left Backhoe Mount
8	1	68313	Right Reinforcement
9	1	67988	Right Side Rail
10	1	68099	Right Grill Mount
11	1	68096	Grill Guard
12	4	1116	.62" UNC X 2.00" Hex Capscrew
52	1	80265	Right Brace
	1	80266	Left Brace
	4	1115	.62" UNC X 1.75" Hex Capscrew
	8	1517	.62" Flat Washer
	4	1506	.62" Lock Washer
	4	1230	.62" UNC Hex Nut

MOUNTING KIT INSTALLATION

LOADER/BACKHOE MOUNTING KIT #69156
FORD 1920 WITH FORD ROPS

DIAGRAM 2 OF 2



MOUNTING KIT INSTALLATION

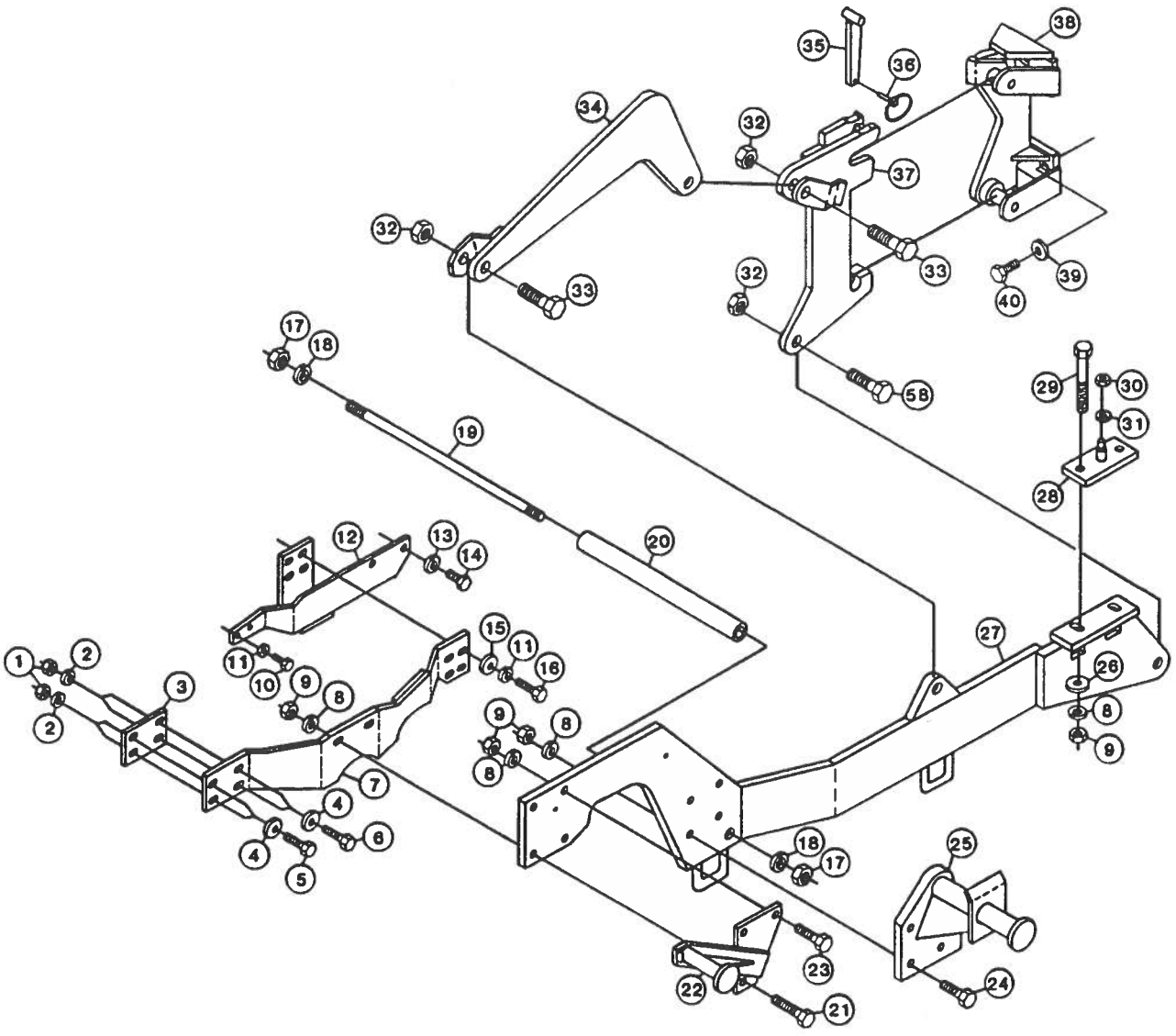
LOADER / BACKHOE MOUNTING KIT #69156
FORD 1920 WITH FORD ROPS

NO	REQ'D	PART NO.	DESCRIPTION
2	4	1043	.38" UNC X 1.00" Hex Capscrew
3	4	1503	.38" Lock Washer
13	8	1228	.50" UNC Hex Nut
14	8	1505	.50" Lock Washer
15	4	1230	.62" UNC Hex Nut
16	6	1506	.62" Lock Washer
17	1	68098	Left Grill Mount
18	2	1904	1.00" - 14 UNS Hex Nut
19	2	1509	1.00" Lock Washer
20	1	68059	Tie Rod
21	1	68097	Spacer Pipe
22	1	68314	Left Reinforcement
23	12	2534	14mm Lock Washer
24	4	2610	M14 X 50mm Capscrew DIN 960 (1.50 P)
25	20	1231	.75" UNC Hex Nut
26	20	1507	.75" Lock Washer
27	1	67987	Left Side Rail
28	8	1516	.50" Flat Washer
29	4	1094	.50" UNC X 2.50" Hex Capscrew
30	4	1096	.50" UNC X 3.00" Hex Capscrew
31	4	2535	16mm Lock Washer
32	4	2605	M16 X 40mm Capscrew DIN 933 (2.00 P)
33	8	2514	14mm Flat Washer
34	8	2650	M14 X 65mm Capscrew DIN 960 (1.50 P)
35	2	1141	.75" UNC X 2.50" Hex Capscrew
36	14	1142	.75" UNC X 2.75" Hex Capscrew
37	1	68346	Left Tower
38	1	67578	Left Strut
39	6	1541	1.00" UNC Lock Nut
40	4	1191	1.00" UNC X 3.50" Hex Capscrew
41	4	1701	.75" UNC X 6.50" Hex Capscrew - Grade 8
42	2	67991	Top Axle Plate
43	1	67575	Left Frame
44	2	59852	Wedge
45	2	6626	Klik Pin
46	1	70307	Left Quick-Tach
47	1	67676	Right Backhoe Mount
48	8	1649	.75" Hard Flat Washer
49	8	1137	.75" UNC X 1.50" Hex Capscrew
50	4	1518	.75" Flat Washer
51	2	1193	1.00" UNC X 4.00" Hex Capscrew

MOUNTING KIT INSTALLATION

LOADER/BACKHOE MOUNTING KIT
BACKHOE HALF #69668 & TRACTOR HALF #69669
FORD 1920 WITH FORD ROPS AND LOADER

DIAGRAM 1 OF 3



MOUNTING KIT INSTALLATION

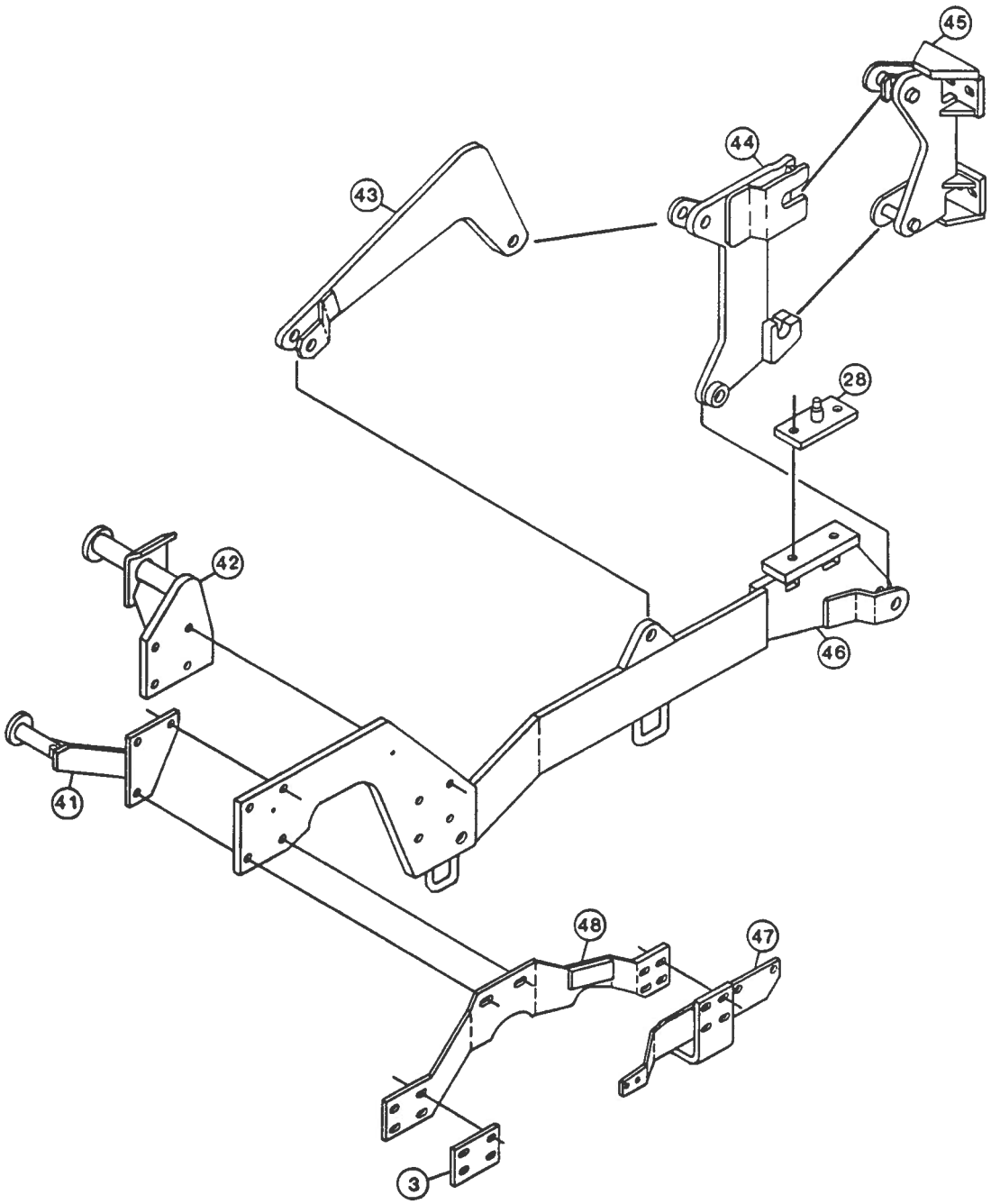
LOADER/BACKHOE MOUNTING KIT
BACKHOE HALF #69668 & TRACTOR HALF #69669
FORD 1920 WITH FORD ROPS AND LOADER

NO	REQ'D	PART NO.	DESCRIPTION
1	8	1228	.50" UNC Hex Nut
2	8	1505	.50" Lock Washer
3	1	69137	Spacer Plate
4	8	1516	.50" Flat Washer
5	4	1094	.50" UNC X 2.50" Hex Capscrew
6	4	1096	.50" UNC X 3.00" Hex Capscrew
7	1	67987	Left Side Rail
8	20	1507	.75" Lock Washer
9	20	1231	.75" UNC Hex Nut
10	4	2646	M14 X 45mm Hex Capscrew
11	4	2534	14mm Lock Washer
12	1	68314	Left Reinforcement
13	4	2535	16mm Lock Washer
14	4	2605	M16 X 40mm Hex Capscrew
15	8	2514	14mm Flat Washer
16	8	2650	M14 X 65mm Hex Capscrew
17	2	1904	1.00" 14 UNF Hex Nut
18	2	1509	1.00" Lock Washer
19	1	68059	Tie Rod
20	1	68097	Spacer Pipe
21	2	1143	.75" UNC X 3.00" Hex Capscrew
22	1	69136	Left Front Mount
23	6	1141	.75" UNC X 2.50" Hex Capscrew
24	8	1142	.75" UNC X 2.75" Hex Capscrew
25	1	69134	Left Tower Mount
26	4	1518	.75" Flat Washer
27	1	67575	Left Frame
28	1	67991	Top Axle Plate
29	4	1701	.75" UNC X 6.50" Hex Capscrew Grade 8
30	2	1230	.62" UNC Hex Nut
31	2	1506	.62" Lock Washer
32	6	1541	1.00" UNC Lock Nut
33	4	1191	1.00" UNC X 3.50" Hex Capscrew
34	1	67578	Left Strut
35	2	59852	Wedge
36	2	6626	Klik Pin
37	1	70307	Left Quick-Tach
38	1	67676	Right Backhoe Mount
39	8	1649	.75" Hard Flat Washer
40	8	1137	.75" UNC X 1.50" Hex Capscrew
58	2	1193	1.00" UNC X 4.00" Hex Capscrew

MOUNTING KIT INSTALLATION

LOADER/BACKHOE MOUNTING KIT
BACKHOE HALF #69668 & TRACTOR HALF #69669
FORD 1920 WITH FORD ROPS AND LOADER

DIAGRAM 2 OF 3



MOUNTING KIT INSTALLATION

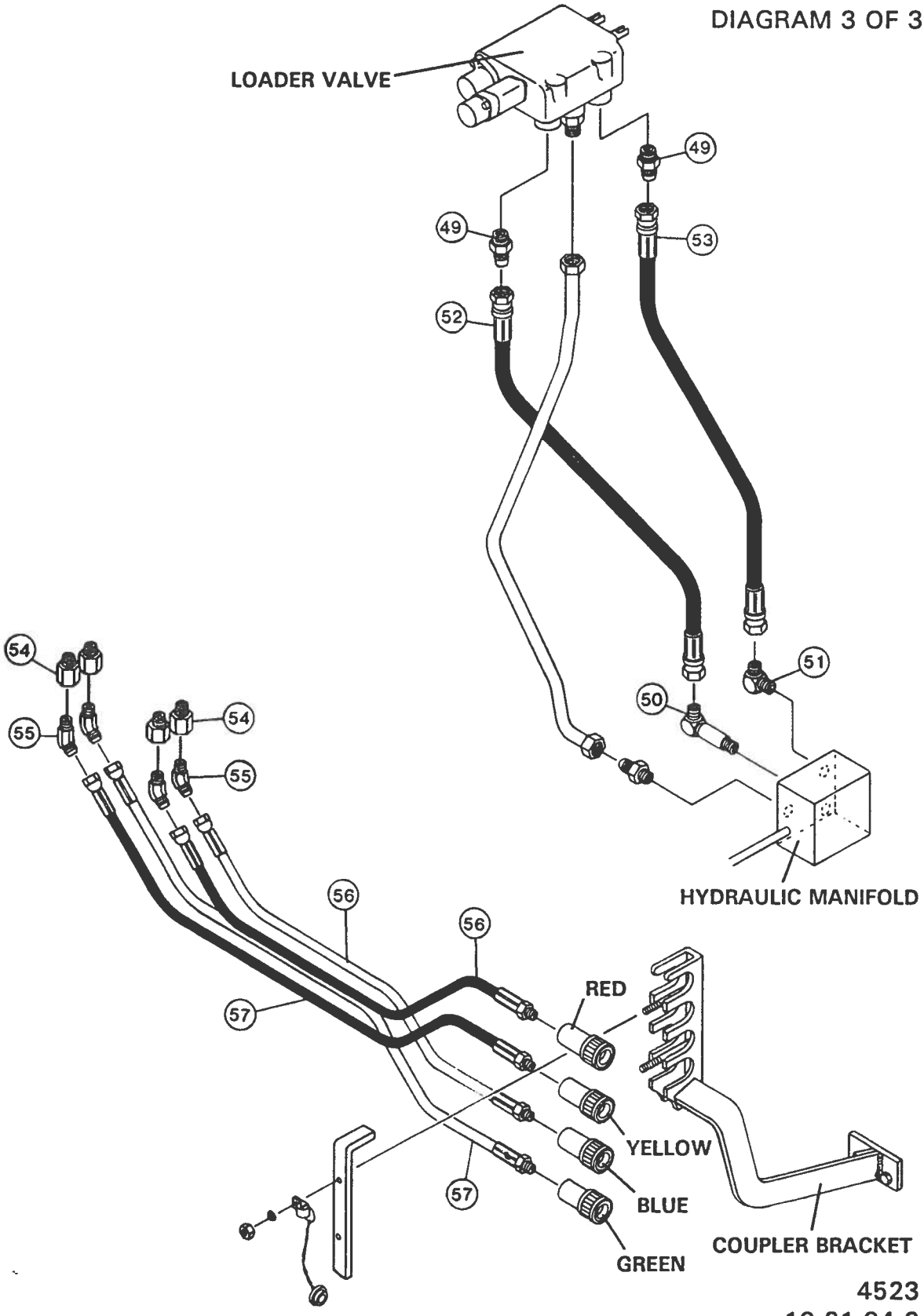
LOADER/BACKHOE MOUNTING KIT
BACKHOE HALF #69668 & TRACTOR HALF #69669
FORD 1920 WITH FORD ROPS AND LOADER

NO	REQ'D	PART NO.	DESCRIPTION
3	1	69137	Spacer Plate
28	1	67991	Top Axle Plate
41	1	69135	Right Front Mount
42	1	69133	Right Tower Mount
43	1	67577	Right Strut
44	1	70306	Right Quick-Tach
45	1	67675	Left Backhoe Mount
46	1	67574	Right Frame
47	1	68313	Right Reinforcement
48	1	67988	Right Side Rail

MOUNTING KIT INSTALLATION

LOADER/BACKHOE MOUNTING KIT
BACKHOE HALF #69668 & TRACTOR HALF #69669
FORD 1920 WITH FORD ROPS AND LOADER

DIAGRAM 3 OF 3



4523
10-21-94-2

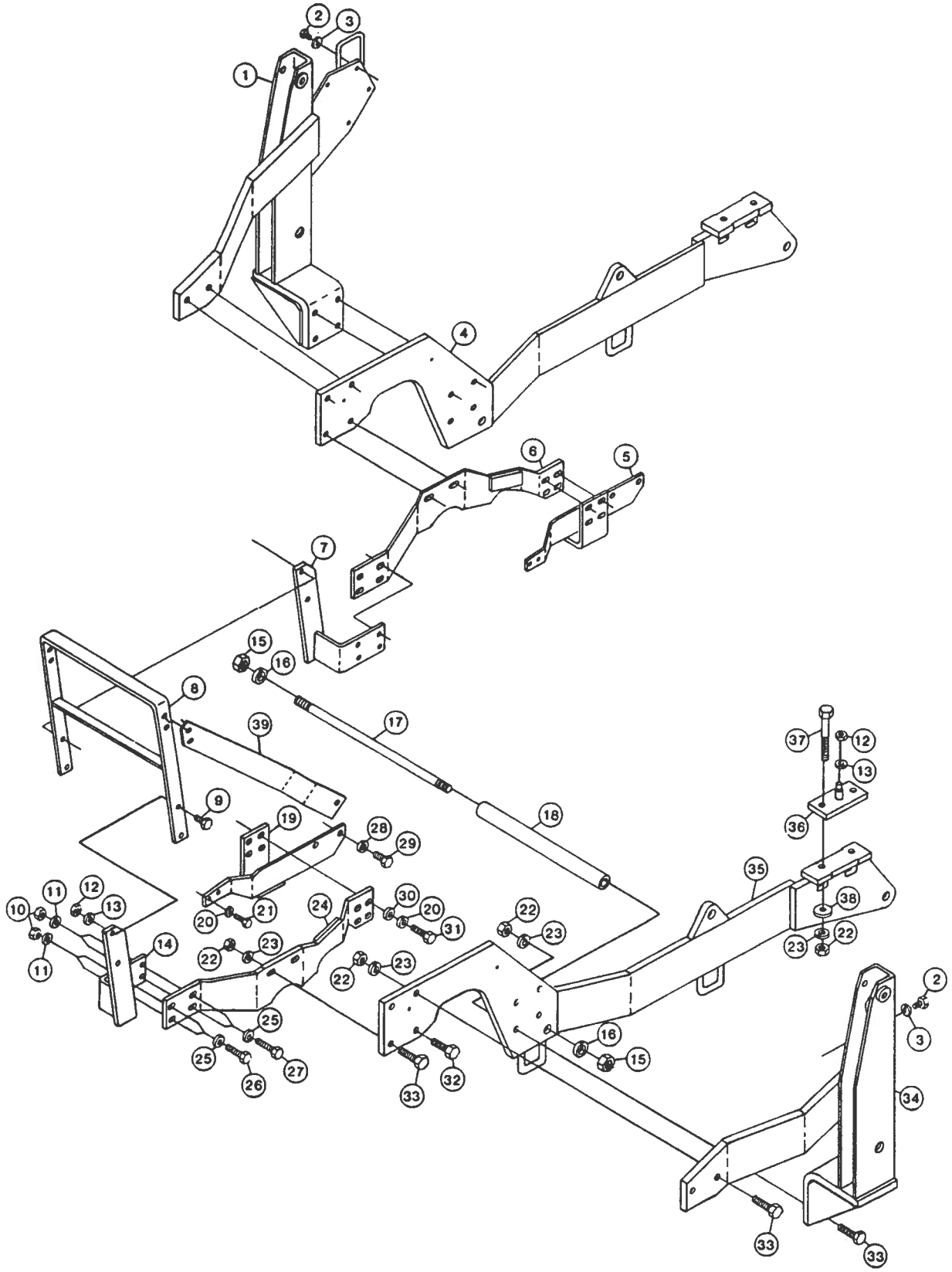
MOUNTING KIT INSTALLATION

LOADER/BACKHOE MOUNTING KIT
BACKHOE HALF #69668 & TRACTOR HALF #69669
FORD 1920 WITH FORD ROPS AND LOADER

NO	REQ'D	PART NO.	DESCRIPTION
49	2	3103	Straight Adapter 8MBo-8MJ
50	1	3325	90° Long Neck Elbow 6MP-8MJ
51	1	3139	90° Elbow 6MP-8MJ
52	1	35335	Hose .50" X 26" (SAE 100R2-2Wire) 8FJX - 8FJX
53	1	35433	Hose .50" X 24" (SAE 100R2-2Wire) 8FJX - 8FJX
54	4	3461	Straight Adapter 6MBo-6FP
55	4	3120	45° Adapter 6MP-6MJ
56	2	37051	Hose .38" X 40" (SAE 100R2-2Wire) 6FJX - 6MP
57	2	37052	Hose .38" X 42" (SAE 100R2-2Wire) 6FJX - 6MP

MOUNTING KIT INSTALLATION

LOADER MOUNTING KIT #69154
FORD 1920 WITH FORD ROPS



4529
10-21-94-3

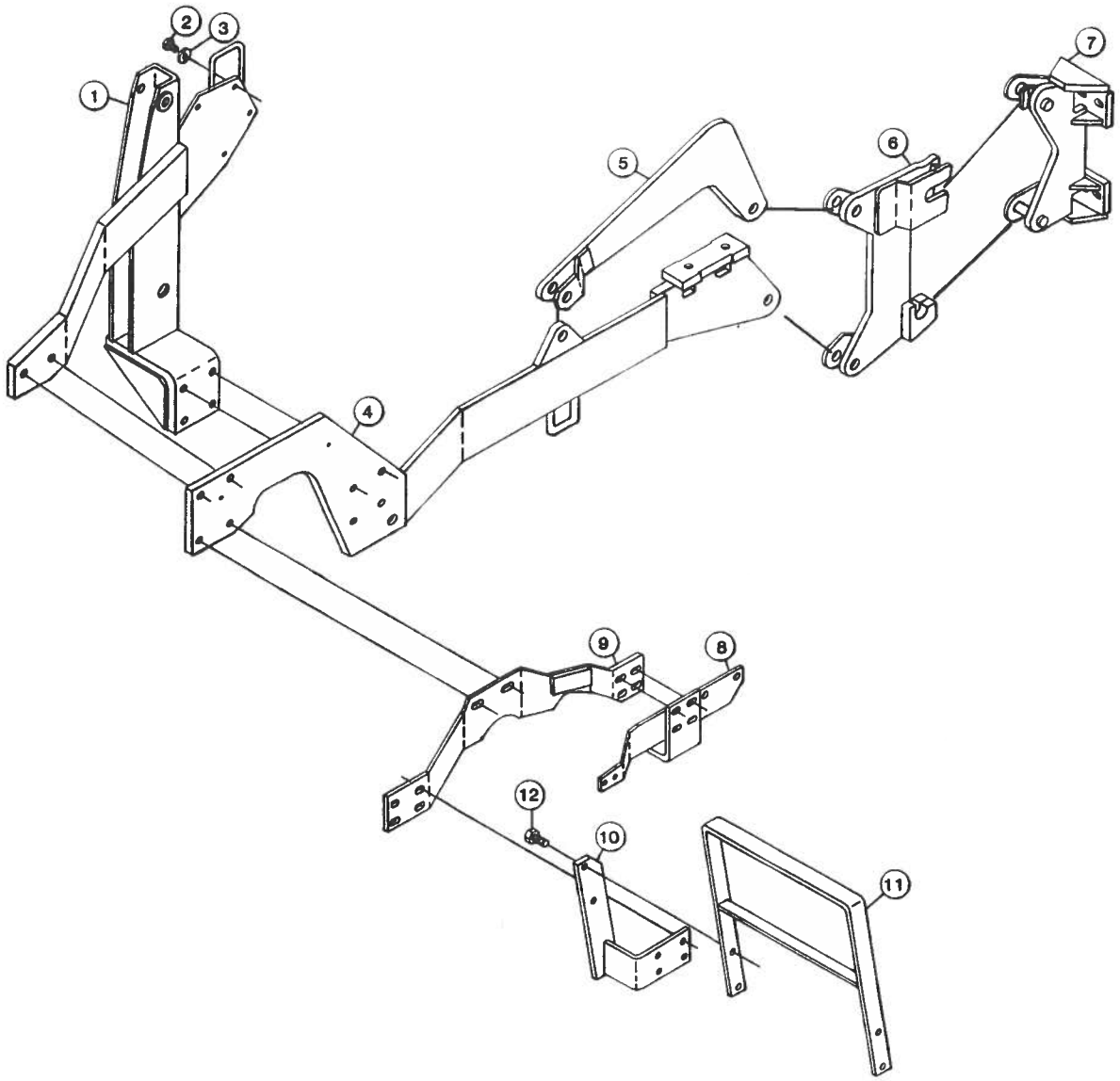
MOUNTING KIT INSTALLATION

LOADER MOUNTING KIT #69154
FORD 1920 WITH FORD ROPS

NO	REQ'D	PART NO.	DESCRIPTION
1	1	68345	Right Tower
2	8	1043	.38" UNC X 1.00" Hex Capscrew
3	8	1503	.38" Lock Washer
4	1	67574	Right Frame
5	1	68313	Right Reinforcement
6	1	67988	Right Side Rail
7	1	68099	Right Grill Mount
8	1	68096	Grill Guard
9	4	1116	.62" UNC X 2.00" Hex Capscrew
10	8	1228	.50" UNC Hex Nut
11	8	1505	.50" Lock Washer
12	6	1230	.62" UNC Hex Nut
13	6	1506	.62" Lock Washer
14	1	68098	Left Grill Mount
15	2	1904	1.00" - 14 UNS Hex Nut
16	2	1509	1.00" Lock Washer
17	1	68059	Tie Rod
18	1	68097	Spacer Pipe
19	1	68314	Left Reinforcement
20	12	2534	14mm Lock Washer
21	4	2610	M14 X 50mm Capscrew DIN 960 (1.50 P)
22	20	1231	.75" UNC Hex Nut
23	20	1507	.75" Lock Washer
24	1	67987	Left Side Rail
25	8	1516	.50" Flat Washer
26	4	1094	.50" UNC X 2.50" Hex Capscrew
27	4	1096	.50" UNC X 3.00" Hex Capscrew
28	4	2535	16mm Lock Washer
29	4	2605	M16 X 40mm Capscrew DIN 933 (2.00 P)
30	8	2514	14mm Flat Washer
31	8	2650	M14 X 65mm Capscrew DIN 960 (1.50 P)
32	2	1141	.75" UNC X 2.50" Hex Capscrew
33	14	1142	.75" UNC X 2.75" Hex Capscrew
34	1	68346	Left Tower
35	1	67575	Left Frame
36	2	67991	Top Axle Plate
37	4	1701	.75" UNC X 6.50" Hex Capscrew - Grade 8
38	4	1518	.75" Flat Washer
39	1	80265	Right Brace
	1	80266	Left Brace
	4	1115	.62" UNC X 1.75" Hex Capscrew
	8	1517	.62" Flat Washer
	4	1506	.62" Lock Washer
	4	1230	.62" UNC Hex Nut

MOUNTING KIT INSTALLATION

.88" PIN LOADER/BACKHOE MOUNTING KIT #67573
FORD 1920 WITH FORD ROPS DIAGRAM 1 OF 2



MOUNTING KIT INSTALLATION

.88" PIN LOADER/BACKHOE MOUNTING KIT #67573
FORD 1920 WITH FORD ROPS

LIST 1 OF 2

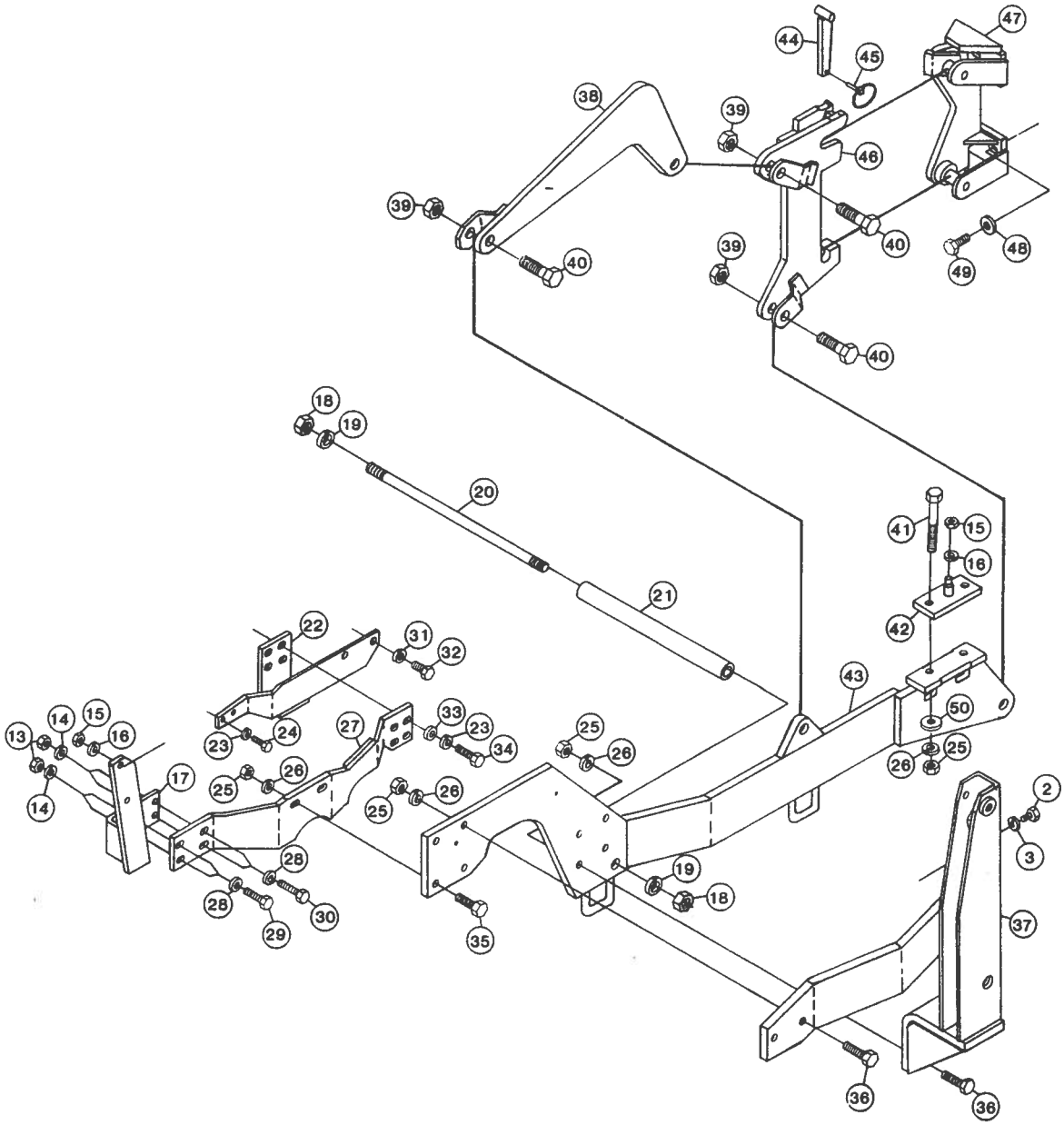
NO.	REQ'D	PART NO.	DESCRIPTION
1	1	68102	Right Tower
2	4	1043	.38" UNC X 1.00" Capscrew
3	4	1503	.38" Lock Washer
4	1	67574	Right Frame
5	1	67577	Right Strut
6	1	59838	Right Quick-Tach
7	1	67675	Left Backhoe Mount
8	1	68313	Right Reinforcement
9	1	67988	Right Side Rail
10	1	68099	Right Grill Mount
11	1	68096	Grill Guard
12	4	1114	.62" UNC X 1.50" Hex Capscrew

4532 12-27-88

MOUNTING KIT INSTALLATION

.88" PIN LOADER/BACKHOE MOUNTING KIT #67573

FORD 1920 WITH FORD ROPS DIAGRAM 2 OF 2



MOUNTING KIT INSTALLATION

.88" PIN LOADER/BACKHOE MOUNTING KIT #67573
FORD 1920 WITH FORD ROPS LIST 2 OF 2

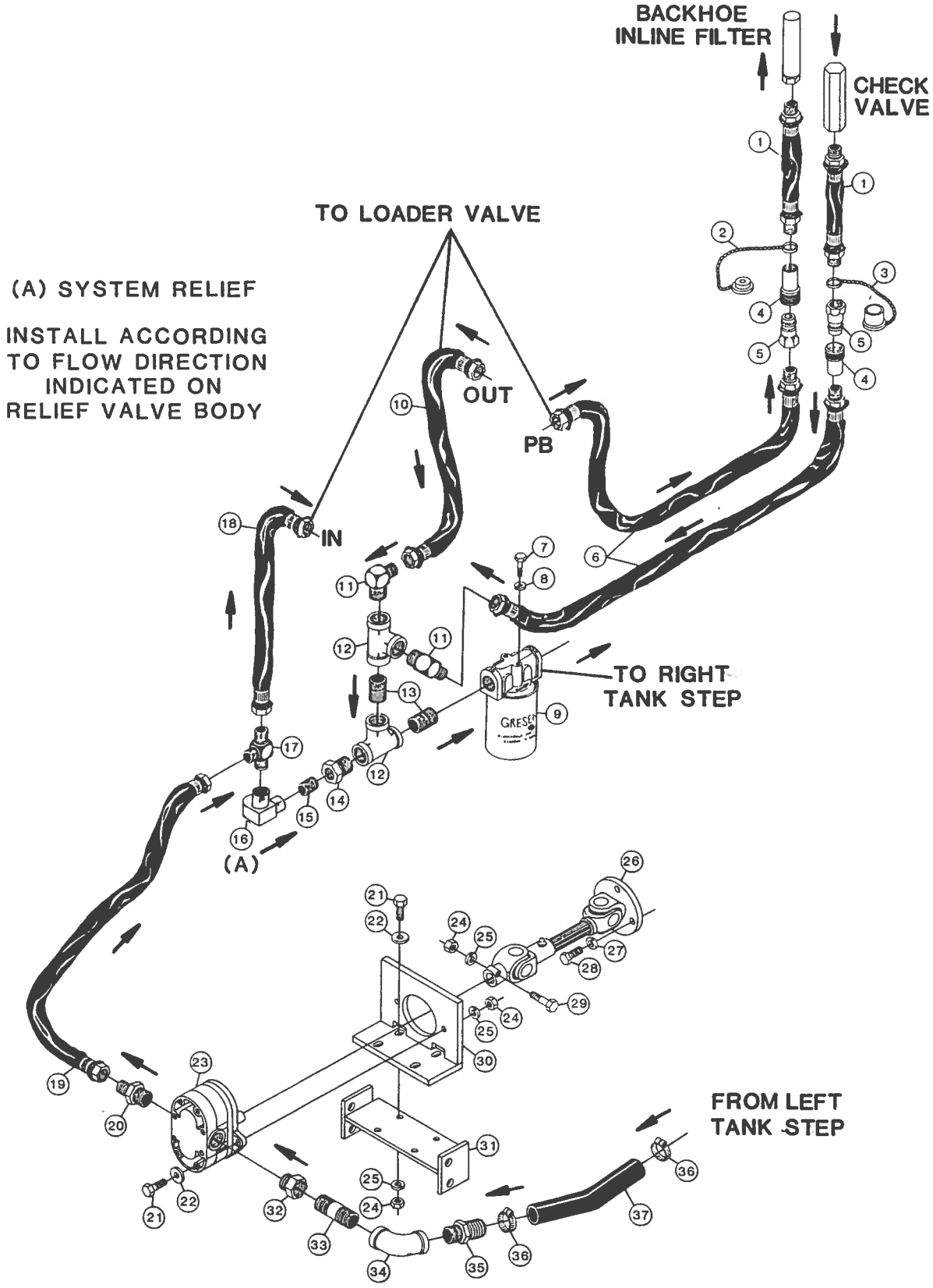
NO.	REQ'D	PART NO.	DESCRIPTION
2	4	1043	.38" UNC X 1.00" Capscrew
3	4	1503	.38" Lock Washer
13	8	1228	.50" UNC Hex Nut
14	8	1505	.50" Lock Washer
15	6	1230	.62" UNC Hex Nut
16	6	1506	.62" Lock Washer
17	1	68098	Left Grill Mount
18	2	1483	1.00" -14 UNS Hex Nut
19	2	1509	1.00" Lock Washer
20	1	68059	Tie Rod
21	1	68097	Spacer Pipe
22	1	68314	Left Reinforcement
23	12	2534	14mm Lock Washer
24	4	2646	M14 X 45mm DIN 961 (1.50 P) Capscrew
25	20	1231	.75" UNC Hex Nut
26	20	1507	.75" Lock Washer
27	1	67987	Left Side Rail
28	8	1516	.50" Flat Washer
29	4	1094	.50" UNC X 2.50" Hex Capscrew
30	4	1096	.50" X 3.00" UNC Hex Capscrew
31	4	2535	16mm Lock Washer
32	4	2605	M16 X 40mm (2.00 P) DIN 933 Hex Capscrew
33	8	2514	14mm Flat Washer
34	8	2650	M14 X 65mm (1.50 P) DIN 960 Hex Capscrew
35	4	1141	.75" UNC X 2.50" Hex Capscrew
36	12	1142	.75" UNC X 2.75" Hex Capscrew
37	1	68101	Left Tower
38	1	67578	Left Strut
39	6	1541	1.00" UNC Lock Nut
40	6	1191	1.00" UNC X 3.50" Hex Capscrew
41	4	1701	.75" X 6.50" UNC Hex Capscrew Grade 8
42	2	67991	Top Axle Plate
43	1	67575	Left Frame
44	2	59852	Wedge
45	2	6626	Klik Pin
46	1	59839	Left Quick-Tach
47	1	67676	Right Backhoe Mount
48	8	1649	.75" Hard Flat Washer
49	8	1137	.75" UNC X 1.50" Hex Capscrew
50	4	1518	.75" Flat Washer

4534 12-27-88

MOUNTING KIT INSTALLATION

LOADER/BACKHOE HYDRAULIC KIT #68100
FORD 1920 WITH ATI 315 LOADER

DIA. 1 OF 2



MOUNTING KIT INSTALLATION

LOADER/BACKHOE HYDRAULIC KIT #68100
FORD 1920 WITH ATI 315 LOADER

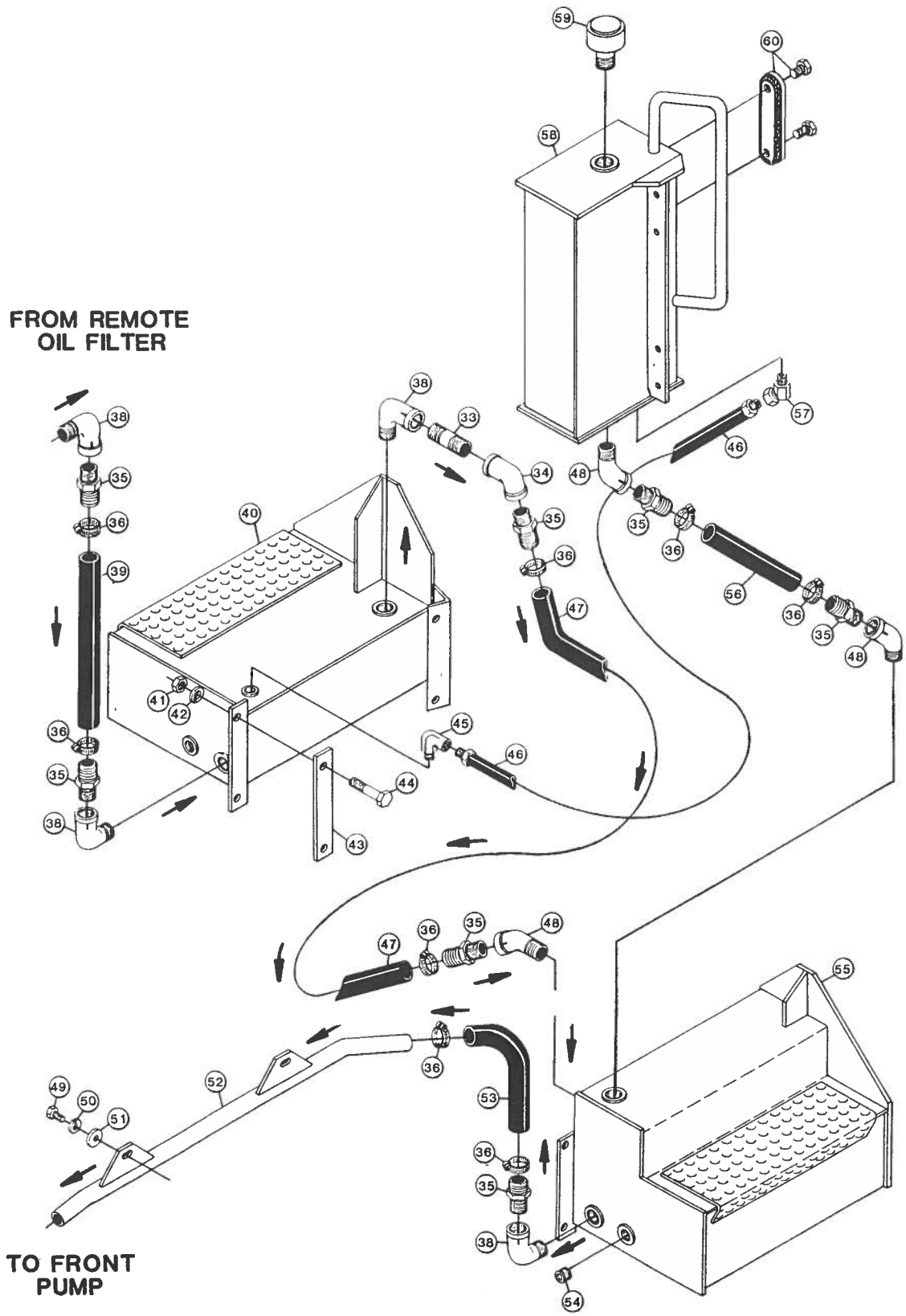
NO	REQ'D	PART NO.	DESCRIPTION
1	2	35728	Hose Assembly .50" X 10" (SAE 100R2-2Wire) 8MP-8MP-HS
2	1	51754	Dust Plug
3	1	51753	Dust Cap
4	2	51338	Female Coupler #8
5	2	51339	Male Coupler #8
6	2	35793	Hose Assembly .50" X 80" (SAE 100R2-2Wire) 8FJX-8MP-HS
7	2	1003	.25" UNC X 1.00" Hex Capscrew
8	2	1501	.25" Lock Washer
9	1	4997	Filter w/Housing
		4996	Replacement Filter
10	1	35779	Hose Assembly .50" X 18" (SAE 100R2-2Wire) 8FJX-8FJX-HS
11	2	3065	90° Elbow
12	2	3068	Female Tee
13	2	3062	Close Nipple .75" NPT
14	1	3049	Bushing
15	1	3211	Close Nipple .50" NPT
16	1	45616	Relief Valve Housing
	1	45624	Relief Valve Cartridge @ 2400 PSI
17	1	3327	Male Tee
18	1	35416	Hose Assembly .50" X 22" (SAE 100R2-2Wire) 8FJX-8FJX-HS
19	1	37005	Hose Assembly .50" X 36" (SAE 100R2-2Wire) 8FJX-8FJX-HS
20	1	3270	SAE O'Ring Boss
21	6	1044	.38" UNC X 1.25" Hex Capscrew
22	6	1514	.38" Flat Washer
23	1	59303	Pump
24	7	1226	.38" UNC Hex Nut
25	7	1503	.38" Lock Washer
26	1	67974	U-Joint Drive Shaft Assembly
27	3	2533	12mm Lock Washer
28	3	2636	M12 X 30mm Hex Capscrew
29	1	1046	.38" UNC X 1.75" Hex Capscrew
30	1	52303	Pump Bracket
31	1	68083	Front Pump Bracket
32	1	3124	SAE O'Ring Boss
33	1	3288	Nipple .75" X 3.00"
34	1	3074	45° Elbow .75"
35	1	3053	Hose Barb
36	2	6490	#20 Hose Clamp
37	1	37007	Suction Hose 1.00" x10"

IMPORTANT: The arrows used on this diagram show the direction of hydraulic flow through the hydraulic kit. This flow pattern must be maintained for proper operation of the backhoe. Improper hose routing could result in possible damage to the backhoe or tractor.

MOUNTING KIT INSTALLATION

LOADER/BACKHOE HYDRAULIC KIT #68100
FORD 1920 WITH ATI 315 LOADER

DIA. 2 OF 2



MOUNTING KIT INSTALLATION

LOADER/BACKHOE HYDRAULIC KIT #68100
FORD 1920 WITH ATI 315 LOADER

LIST 2 OF 2

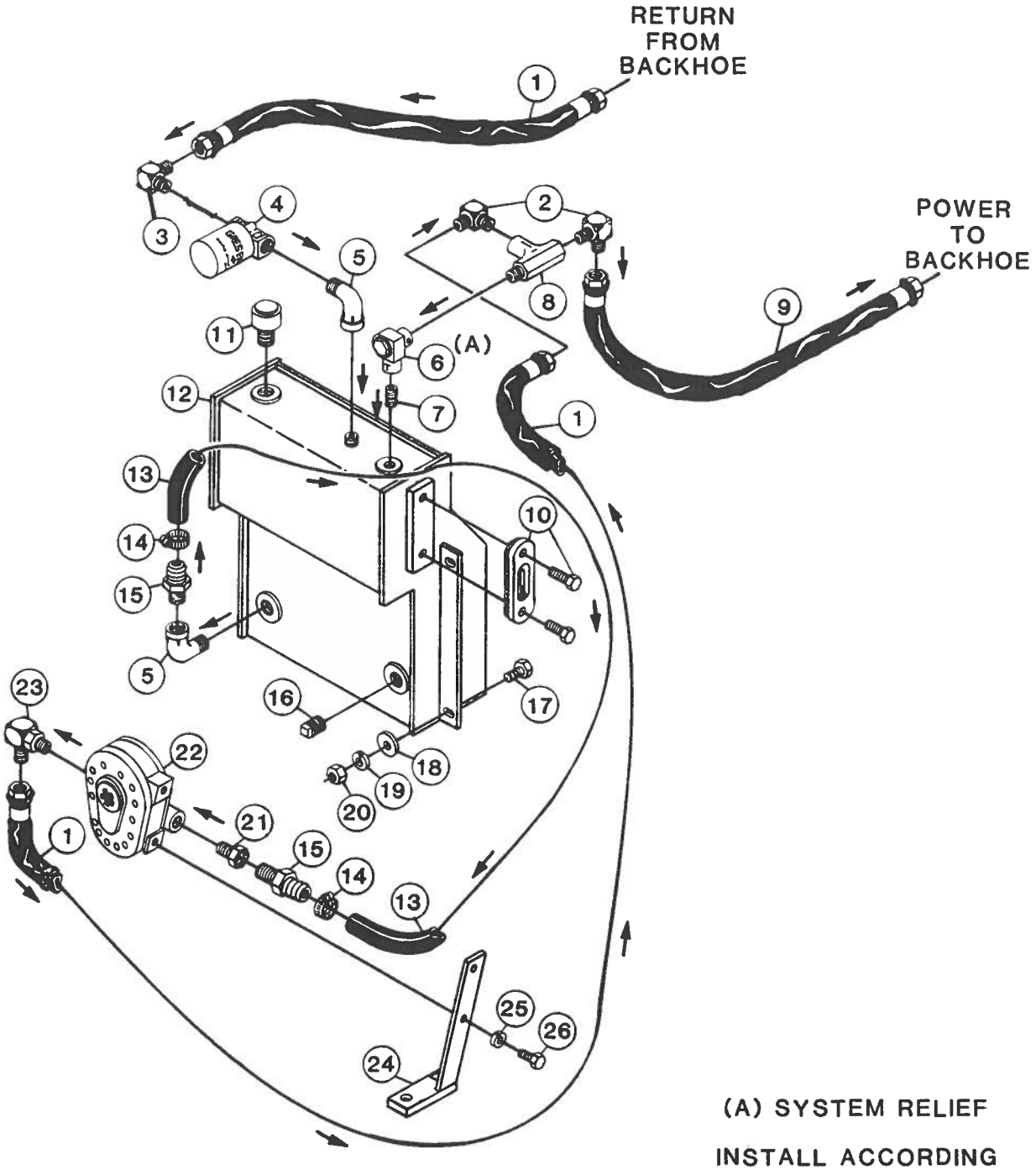
NO	REQ'D	PART NO.	DESCRIPTION
33	1	3288	Nipple .75" X 3.00"
34	1	3074	45° Elbow .75"
35	7	3053	Hose Barb
36	8	6490	#20 Hose Clamp
38	4	3076	90° Street Elbow
39	1	37009	Suction Hose 1.00" X 13.50"
40	1	68086	Right Tank Step
	1	40118	Non-Slip Surface Decal
41	8	1228	.50" UNC Hex Nut
42	8	1505	.50" Lock Washer
43	4	68308	Plate
44	8	1094	.50" UNC X 2.50" Hex Capscrew
45	1	3171	90° Street Elbow
46	1	3526	Hose Assembly .25" X 45" (SAE 100R2-2Wire) 4MP-4MP
47	1	35055	Suction Hose 1.00" X 31"
48	3	3195	45° Street Elbow
49	2	1022	.31" UNC X 1.00" Hex Capscrew
50	2	1502	.31" Lock Washer
51	2	1513	.31" Flat Washer
52	1	68094	Suction Pipe
53	1	37008	Suction Hose 1.00" X 9.50"
54	2	3035	Pipe Plug .50"
55	1	68085	Left Tank Step
	1	40118	Non-Slip Surface Decal
56	1	37006	Suction Hose 1.00" X 8"
57	1	3118	45° Adaptor 4MP-4FJX
58	1	68084	Left Side Tank
59	1	54645	Breather Cap
60	1	51045	Site and Temp Guage

IMPORTANT: The arrows used on this diagram show the direction of hydraulic flow through the hydraulic kit. This flow pattern must be maintained for proper operation of the backhoe. Improper hose routing could result in possible damage to the backhoe or tractor.

E

MOUNTING KIT INSTALLATION

BACKHOE HYDRAULIC KIT #69151
FORD 1920 WITH PTO



(A) SYSTEM RELIEF

INSTALL ACCORDING TO FLOW DIRECTION INDICATED ON RELIEF VALVE BODY

MOUNTING KIT INSTALLATION

BACKHOE HYDRAULIC KIT #69151
FORD 1920 WITH PTO

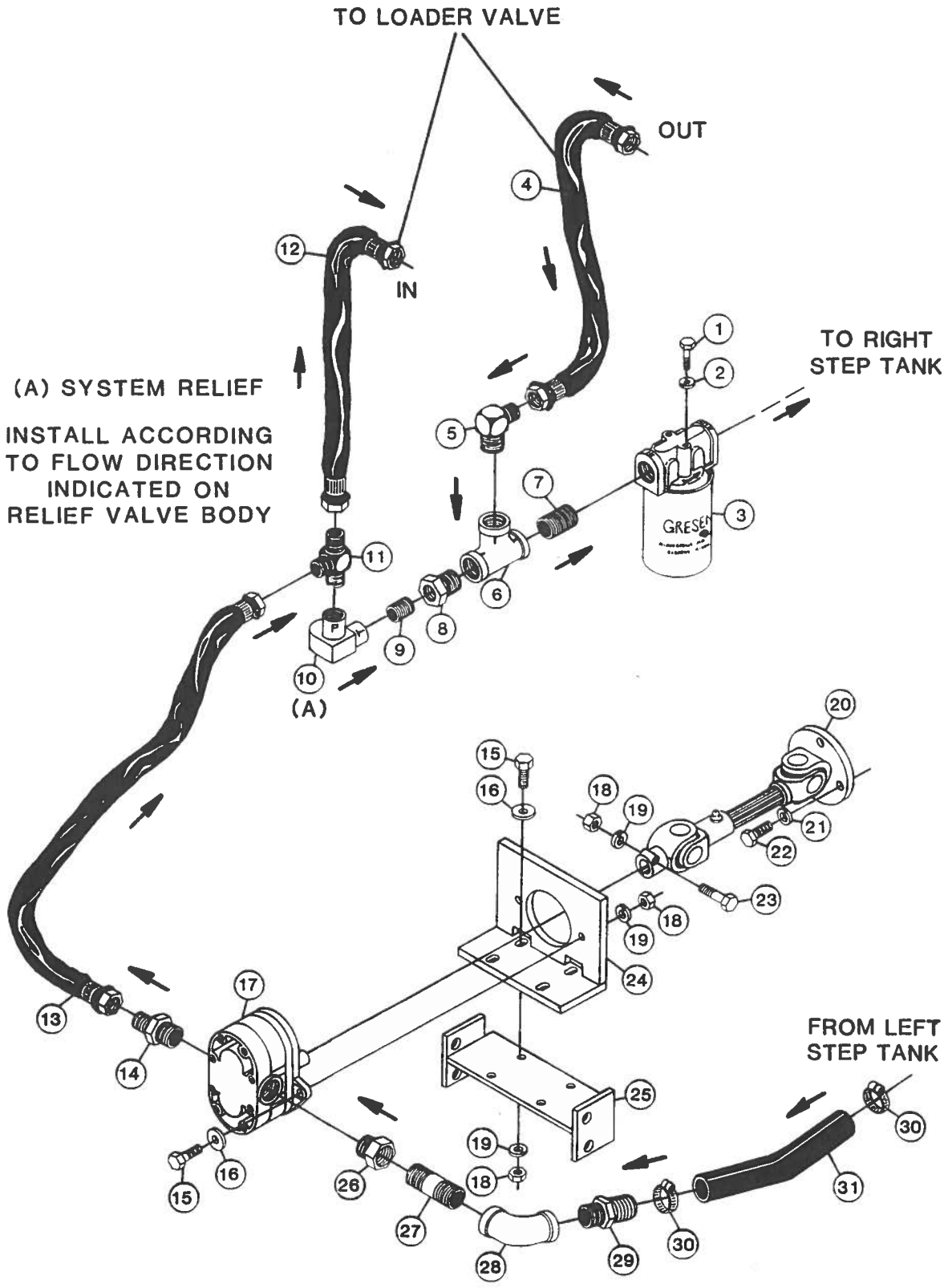
NO	REQ'D	PART NO.	DESCRIPTION
1	2	35393	Hose Assembly .50" X 52" (SAE 100R2-2Wire) 8FJX-8FJX-HS
2	2	3071	90° Adaptor 8MP-8MJIC
3	1	3065	90° Adaptor 12MP-8MJ
4	1	4997	Oil Filter w/Housing
		4996	Replacement Filter
5	2	3076	90° Street Elbow .75" NPT
6	1	45616	Relief Valve Housing
	1	45620	Relief Valve Cartridge @ 2000 PSI
7	1	3211	Close Nipple .50"
8	1	3212	Tee 8MP-8FP-8FP
9	1	37037	Hose Assembly .50" X 60" (SAE 100R2-2Wire) 8FJX-8FJX-HS
10	1	51045	Site and Temperature Gauge
11	1	54645	Filtered Breather Cap
12	1	69159	PTO Tank
13	1	37036	Suction Hose 1.00" X 50"
14	2	6490	Hose Clamp
15	2	3053	Hose Barb
16	1	3467	Pipe Plug .75"
17	4	1090	.50" UNC X 1.50" Hex Capscrew
18	4	1516	.50" Flat Washer
19	4	1505	.50" Lock Washer
20	4	1228	.50" UNC Hex Nut
21	1	3449	Bushing 12FP-16MBo
22	1	51698	Pump
23	1	3316	90° Adaptor 12MBo-8MJIC
24	1	69185	PTO Torque Arm
25	2	1503	.38" Lock Washer
26	2	1043	.38" UNC X 1.00" Hex Capscrew

IMPORTANT: The arrows used on this diagram show the direction of hydraulic flow through the hydraulic kit. This flow pattern must be maintained for proper operation of the backhoe. Improper hose routing could result in possible damage to the backhoe or tractor.

MOUNTING KIT INSTALLATION

LOADER HYDRAULIC KIT #69150
FORD 1920 WITH ATI 315 LOADER

DIA. 1 OF 2



MOUNTING KIT INSTALLATION

LOADER HYDRAULIC KIT #69150
FORD 1920 WITH ATI 315 LOADER

LIST 1 OF 2

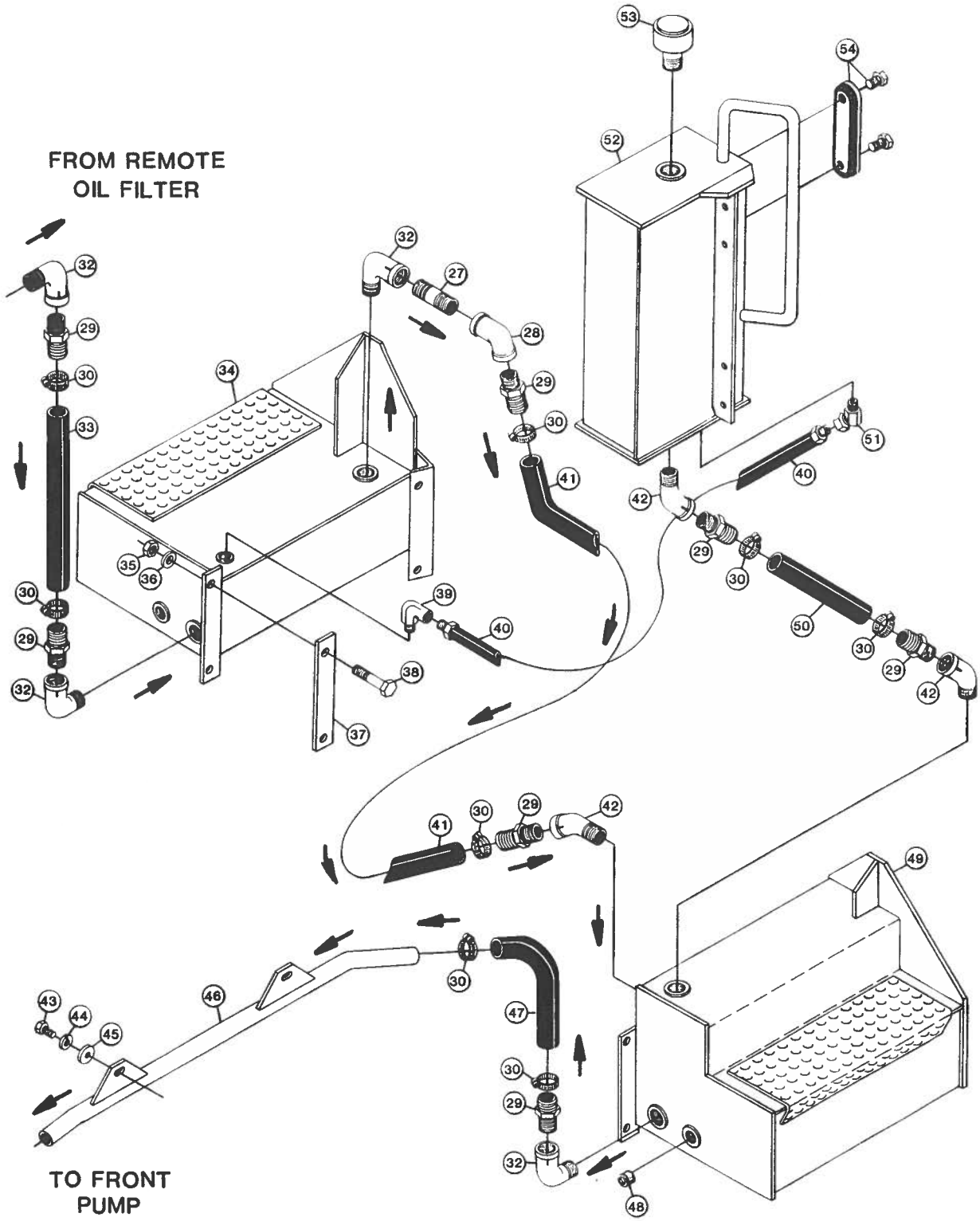
NO	REQ'D	PART NO.	DESCRIPTION
1	2	1003	.25" UNC X 1.00" Hex Capscrew
2	2	1501	.25" Lock Washer
3	1	4997	Filter w/Housing
		4996	Replacement Filter
4	1	35779	Hose Assembly .50" X 18" (SAE 100R2-2Wire) 8FJX-8FJX-HS
5	1	3065	90° Elbow
6	1	3068	Female Tee
7	1	3062	Close Nipple .75" NPT
8	1	3049	Bushing
9	1	3211	Close Nipple .50" NPT
10	1	45616	Relief Valve Housing
	1	45624	Relief Valve Cartridge @ 2400 PSI
11	1	3327	Male Tee
12	1	35416	Hose Assembly .50" X 22" (SAE 100R2-2Wire) 8FJX-8FJX-HS
13	1	37005	Hose Assembly .50" X 36" (SAE 100R2-2Wire) 8FJX-8FJX-HS
14	1	3270	SAE O'Ring Boss
15	6	1044	.38" UNC X 1.25" Hex Capscrew
16	6	1514	.38" Flat Washer
17	1	59303	Pump
18	7	1226	.38" UNC Hex Nut
19	7	1503	.38" Lock Washer
20	1	67974	U-Joint Drive Shaft Assembly
21	3	2533	12mm Lock Washer
22	3	2636	M12 X 30mm Hex Capscrew
23	1	1046	.38" UNC X 1.75" Hex Capscrew
24	1	52303	Pump Bracket
25	1	68083	Front Pump Bracket
26	1	3124	SAE O'Ring Boss
27	1	3288	Nipple .75" X 3.00"
28	1	3074	45° Elbow .75"
29	1	3053	Hose Barb
30	2	6490	Hose Clamp
31	1	37007	1.00" Suction Hose

IMPORTANT: The arrows used on this diagram show the direction of hydraulic flow through the hydraulic kit. This flow pattern must be maintained for proper operation of the backhoe. Improper hose routing could result in possible damage to the backhoe or tractor.

MOUNTING KIT INSTALLATION

LOADER HYDRAULIC KIT #69150
FORD 1920 WITH ATI 315 LOADER

DIA. 2 OF 2



MOUNTING KIT INSTALLATION

LOADER HYDRAULIC KIT #69150
FORD 1920 WITH ATI 315 LOADER

LIST 2 OF 2

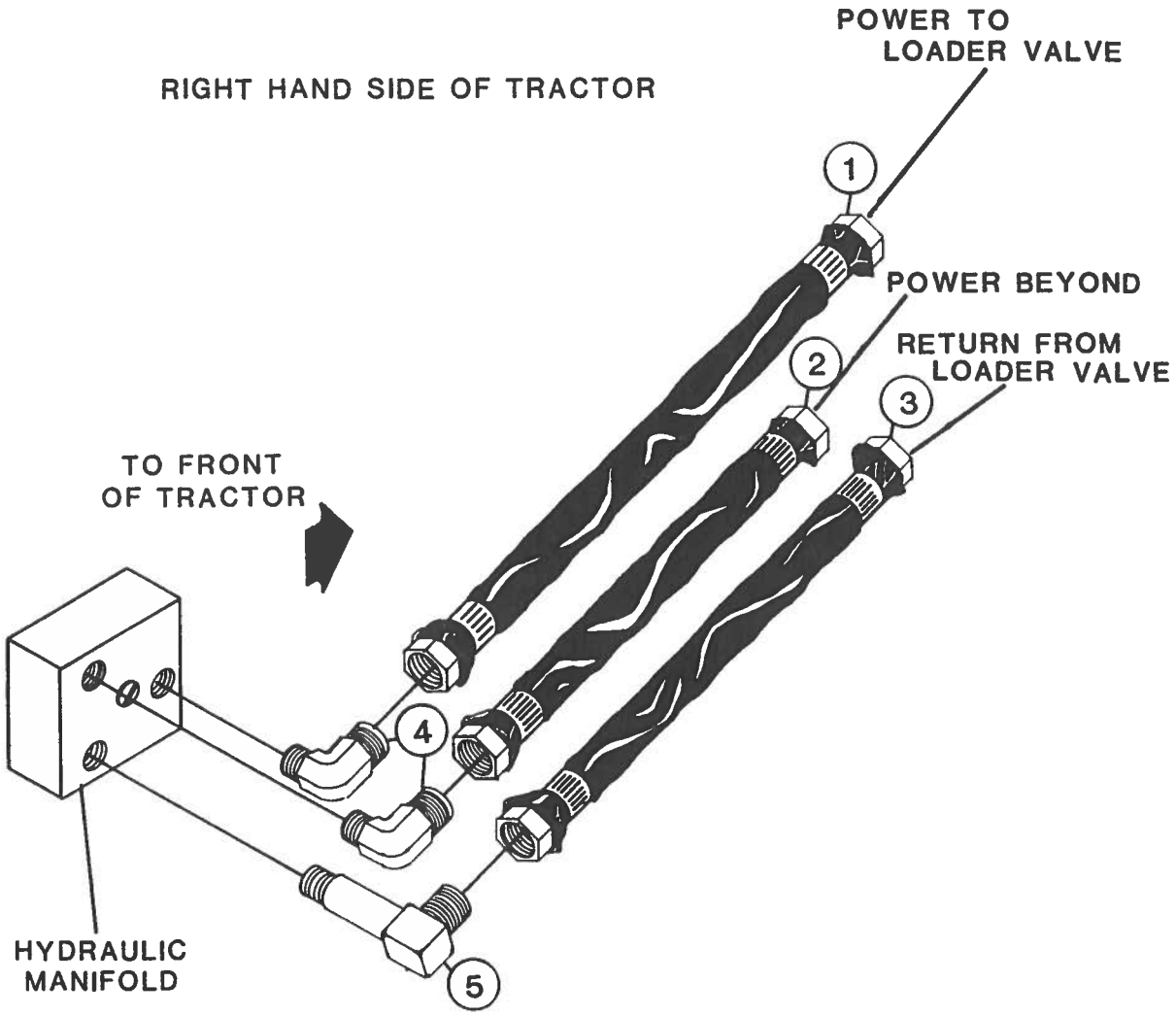
NO.	REQ'D	PART NO.	DESCRIPTION
27	1	3288	.75" X 3.00" Nipple
28	1	3074	.75" 45° Elbow
29	7	3053	Hose Barb
30	8	6490	Hose Clamp
32	4	3076	90° Street Elbow
33	1	37009	1.00" ID X 13.50" Suction Hose
34	1	68086	Right Tank Step
35	8	1228	.50" UNC Nut
36	8	1505	.50" Lock Washer
37	4	68308	Plate
38	8	1094	.50" UNC X 2.50" Capscrew
39	1	3171	90° Street Elbow
40	1	3526	Hose .25" X 45" (SAE 100R1-1Wire) 4MP-4MP
41	1	35055	1.00" ID X 31" Suction Hose
42	3	3195	45° Street Elbow
43	2	1022	.31" UNC X 1.00" Capscrew
44	2	1502	.31" Lock Washer
45	2	1513	.31" Flat Washer
46	1	68094	Suction Pipe
47	1	37008	1.00" ID X 9.50" Suction Hose
48	2	3035	.50" Pipe Plug
49	1	68085	Left Tank Step
50	1	37006	1.00" ID X 8" Suction Hose
51	1	3118	45° Adaptor 4MP-4FPX
52	1	68084	Left Side Tank
53	1	54645	Breather Cap
54	1	51045	Site & Temperature Cauge

4528 12-27-88

IMPORTANT: The arrows used on this diagram show the direction of hydraulic flow through the hydraulic kit. This flow pattern must be maintained for proper operation of the backhoe. Improper hose routing could result in possible damage to the backhoe or tractor.

MOUNTING KIT INSTALLATION

LOADER HYDRAULIC KIT #69275
FORD 1920 WITH 315 LOADER



MOUNTING KIT INSTALLATION

LOADER HYDRAULIC KIT #69275
FORD 1920 WITH 315 LOADER

NO.	REQ'D	PART NO.	DESCRIPTION
1	1	35589	Hose Assembly .50" X 40" (SAE 100R2-2Wire) 8FJX-8FJX-HS
2	1	35635	Hose Assembly .50" X 30" (SAE 100R2-2Wire) 8FJX-8FJX-HS
3	1	35168	Hose Assembly .50" X 34" (SAE 100R2-2Wire) 8FJX-8FJX-HS
4	2	3139	6MP-8MJIC 90° Adaptor
5	1	3325	6MP-8MJIC 90° Adaptor (Long)

4479 11-4-88

MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

GENERAL INFORMATION

The Ford tractor requires a mounting kit to adapt the tractor for backhoe and/or loader use. The following instructions are provided to help you install the appropriate mounting kit on your Ford 1920 tractor.

Find the corresponding backhoe/loader mounting kit diagram and parts list (located at the front of this section) for the mounting kit you have received. Study the diagram and familiarize yourself with the names of the various parts. This knowledge will assist you in understanding these instructions. Read the complete mounting instructions that follow before you begin. Read all safety warnings before operating the unit.

NOTE: The following instructions are designed to cover all combinations of backhoe and loader mounting kits offered for the Ford 1920. Due to the wide variety of kits available, these instructions may seem somewhat general in their nature. If there is any question that a particular step applies to your situation, refer back to your corresponding mounting kit diagram and note if the parts described in the step are shown therein. If not, proceed to the next step. Be sure to read each step to insure that no important proceedures are missed.

MOUNTING INSTRUCTIONS

1. If the tractor has any attachments on it such as a loader, blade, backhoe, etc., remove them now.

2. Place the tractor on a hard level surface. Set the parking brake and lower the 3-point hitch as far as it will go. If possible, raise the tractor and place it on jackstands with the wheels removed. Unbolt and remove the lower side steps.

3. While you can use the 3-point hitch system with the mounting kit, you may wish to remove it so you will not have to work around it. Reguardless of whether you remove the hitch or not, remove the top link and adjust the drawbar to it's shortest length.

   IMPORTANT: When using the Ford loader, the Ford 1920 requires certain modifications to it's hydraulic system before installing the ATI backhoe mounting kit. These modifications are not necessary if using the ATI loader. These modifications do not change the flow pattern of the hydraulic system, but rather allow flexibility and clearance for the backhoe mounting structures. If you are using the Ford loader, follow steps 4 through 16. If you are not using the Ford loader, proceed to step 17.

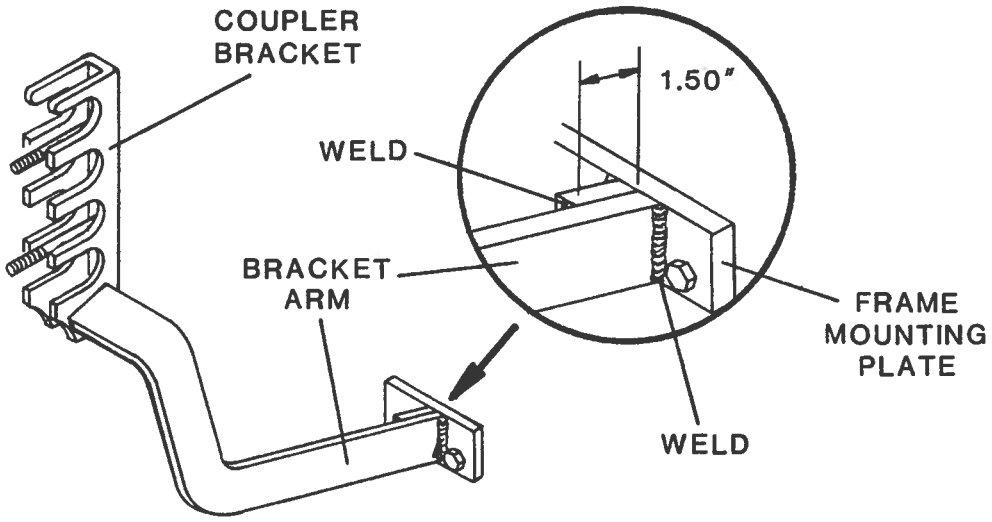
MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

4. Remove the bracket located at the right front of the tractor that holds the four quick-couplers in a vertical row.

5. Cut the arm of the bracket 1.50" from where the arm meets the frame mounting plate. See Figure (1)

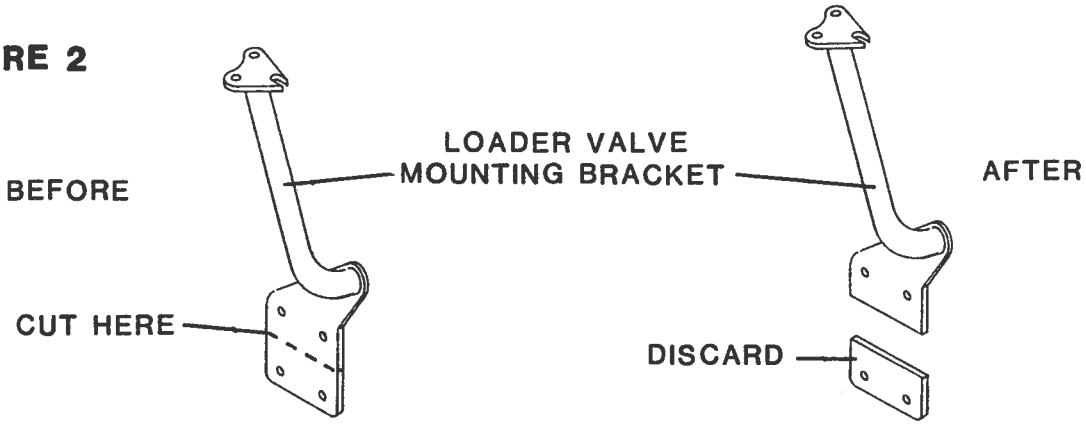
FIGURE 1



6. Position the arm in front of the stub that was left in step two, up against the frame mounting plate and lap weld. Reinstall the bracket securely. If done properly, the couplers should be 1.50" closer to the tractor. See Figure (1)

7. Remove the four forward running hydraulic lines and their fittings from the loader valve, these parts will not be reused. Remove the three remaining hydraulic tubes and fittings and remove the valve from the bracket. Remove the loader valve mounting bracket and cut the bracket in two, half way between the upper and lower mounting holes. See Figure (2)

FIGURE 2



MOUNTING KIT INSTALLATION

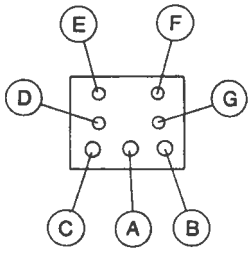
FORD 1920 TRACTORS

8. Reinstall the bracket as before and secure using the original mounting hardware. Reinstall the valve (without the hydraulic lines). Discard the lower portion you cut off.

9. Remove the steel hydraulic lines and fittings from the hydraulic manifold that run from ports "B" and "C" of the valve and manifold. See Figures (3), (4), and (5).

FIGURE 3

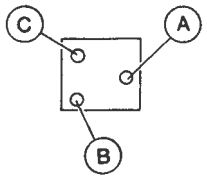
UNDERSIDE VIEW OF LOADER VALVE



TO FRONT OF TRACTOR

FIGURE 4

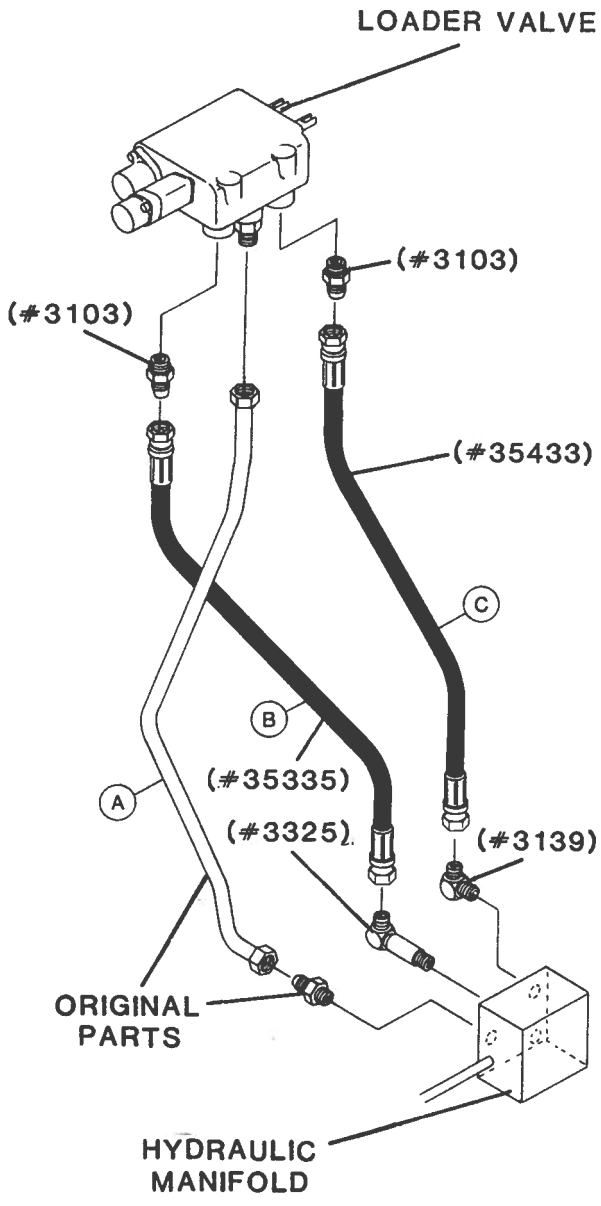
RIGHT SIDE VIEW HYDRAULIC MANIFOLD



TO FRONT OF TRACTOR

FIGURE 5

LEFT SIDE VIEW



MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

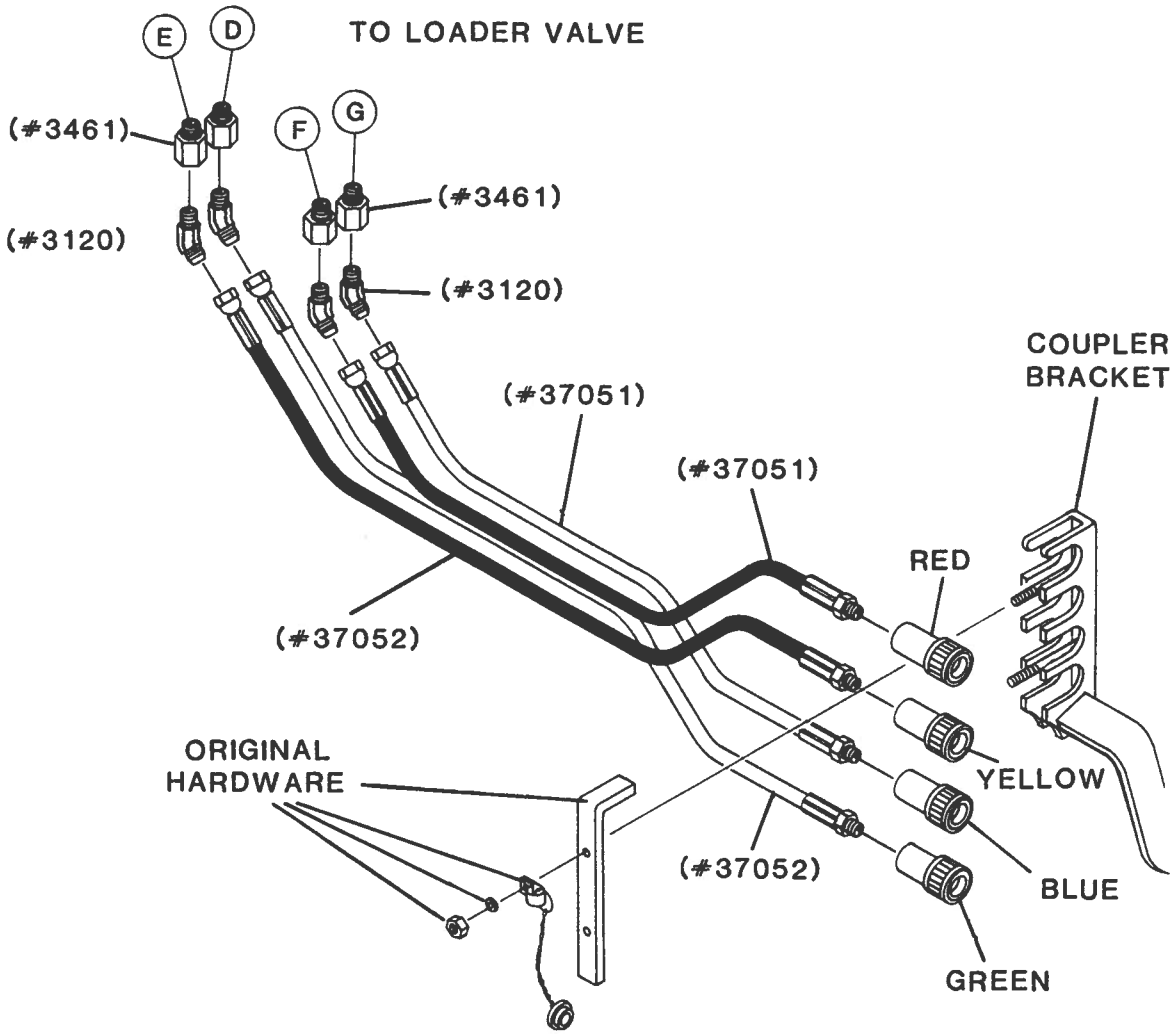
10. Install the 2 straight adaptors (#3103) in ports "B" and "C" of the loader valve.

11. Install the standard 90° elbow (#3139) in port "C" of the manifold. Install the long neck 90° elbow (#3325) in port "B" of the manifold.

12. Reinstall the original hydraulic tube and fittings to connect the "A" ports. Install hose #35433 to connect the "C" ports. Install hose #35335 to connect the "B" ports.

13. Install the four straight adaptors (#3461) into the loader valve ports "D", "E", "F", and "G". See Figure (6)

FIGURE 6



MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

14. Install the four 45° elbows (#3120) into the straight adaptors you installed in step 13. Turn the elbows so that the ends face forward.

15. Install 1 hose #37052 into the elbow at port "D".
Install 1 hose #37051 into the elbow at port "G"
Install 1 hose #37052 into the elbow at port "E".
Install 1 hose #37051 into the elbow at port "F".
See figures (3) and (6)

16. Install the original couplers onto the new hose ends and reinstall in the coupler bracket at the front of the tractor. Be sure to keep the color code and order of decent of the couplers the same as original. See Figure (6)

    Installation of the loader hydraulic modification components is now complete.

17. Install the left (#68314) and right (#68313) reinforcements loosely using the (4) 16mm X 40mm hex capscrews and 16mm lock washers provided at the rear of the mounts. Use (4) M14 X 45mm hex capscrews and (4) 14mm lock washers at the front of the mounts. It may be helpful to run a tap through the trator frame holes first to clean them of any paint, burrs,etc. See Figure (7)

18. Loosely fasten the left (#67987) and right (#67988) side rails at the rear to the upright portions of the left and right reinforcements using the (8) M14 X 65mm capscrews, 14mm lock washers, and 14mm flat washers provided. The capscrews will pass through the reinforcements and into the tapped holes in the tractor frames. See Figure (7)

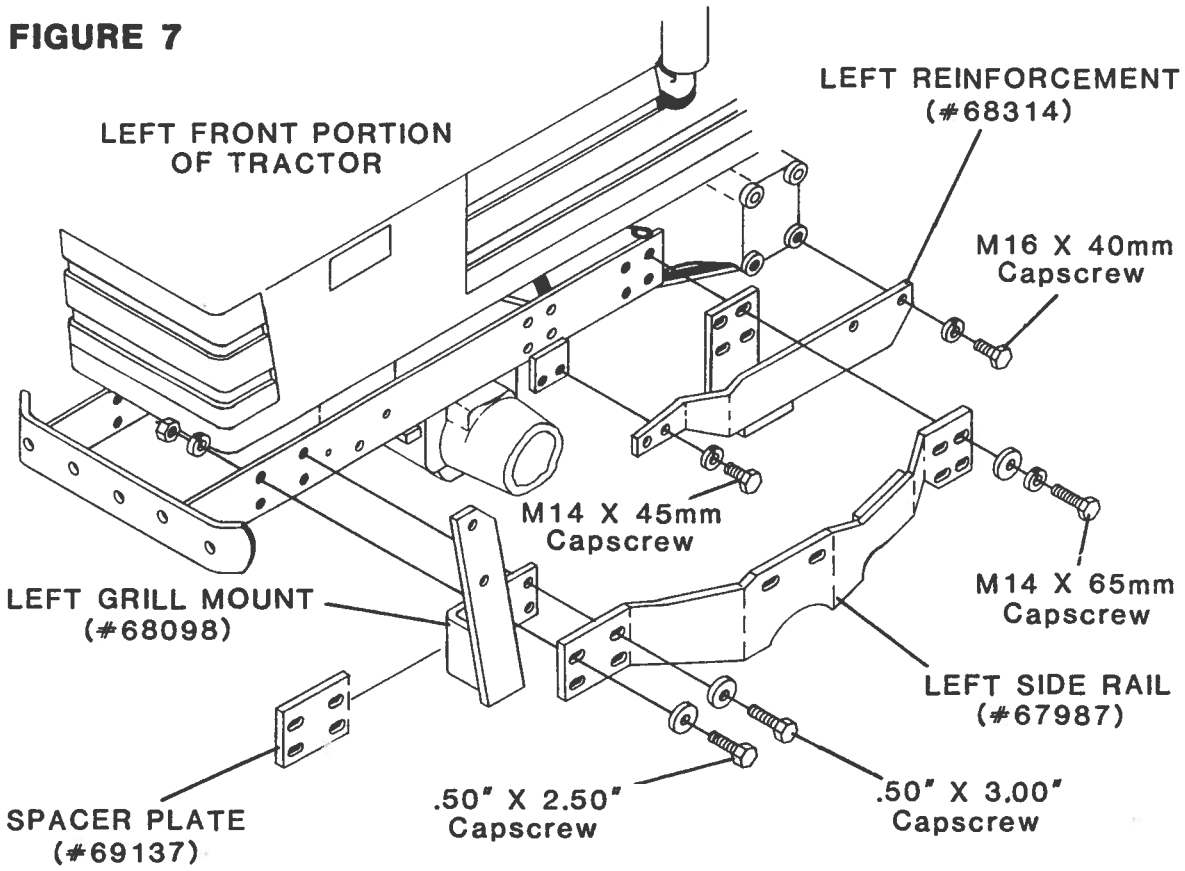
19. Now slip the left grill mount (#68098) in between the tractor frame and the front of the left side rail. Loosely fasten the side rail and grill mount to the tractor frame using the two front most mounting holes and (2) .50" UNC X 2.50" capscrews, .50" flat washers, lock washers, and hex nuts provided. See Figure (7)

20. Repeat step 19 for the right side using the right grill mount (#68099).

MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

FIGURE 7



21. If your unit does not use an hydraulic kit with a front pump, you will skip steps 22 through 29 and in steps 19 and 20 substitute (2) spacer plates (#69137) for the left and right grill mounts, and install the (4) .50" X 3.00" capscrews, .50" flat washers, lock washers, and hex nuts supplied in the remaining holes at the front of the side rails. See Figure (7)

22. If your unit uses a hydraulic kit with a front mounted hydraulic pump, install the pump now. Start by securely fastening the pump bracket (#52303) to the front pump bracket (#68083) using (4) .38" UNC X 1.25" capscrews, .38" flat washers, lock washers and nuts supplied. See Figure (8)

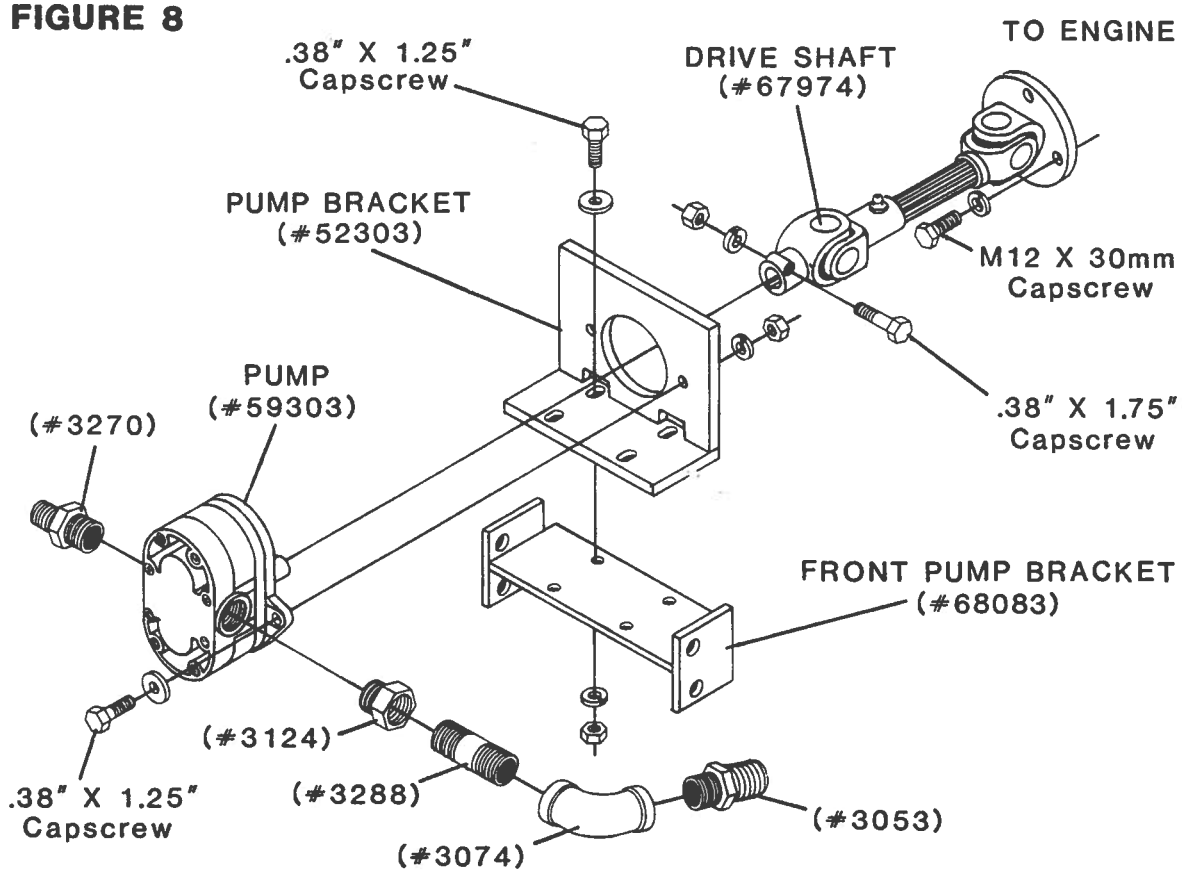
23. Securely fasten the pump (#59303) to the pump bracket using (2) .38" UNC X 1.25" capscrews, .38" flat washers, lock washers, and nuts. See Figure (8)

24. Install the SAE O-ring boss (#3124), .75" X 3.00" nipple (#3288), .75" 45° elbow (#3074), hose barb (#3053), and SAE O-ring boss (#3270) into the pump. See Figure (8)

MOUNTING KIT INSTALLATION

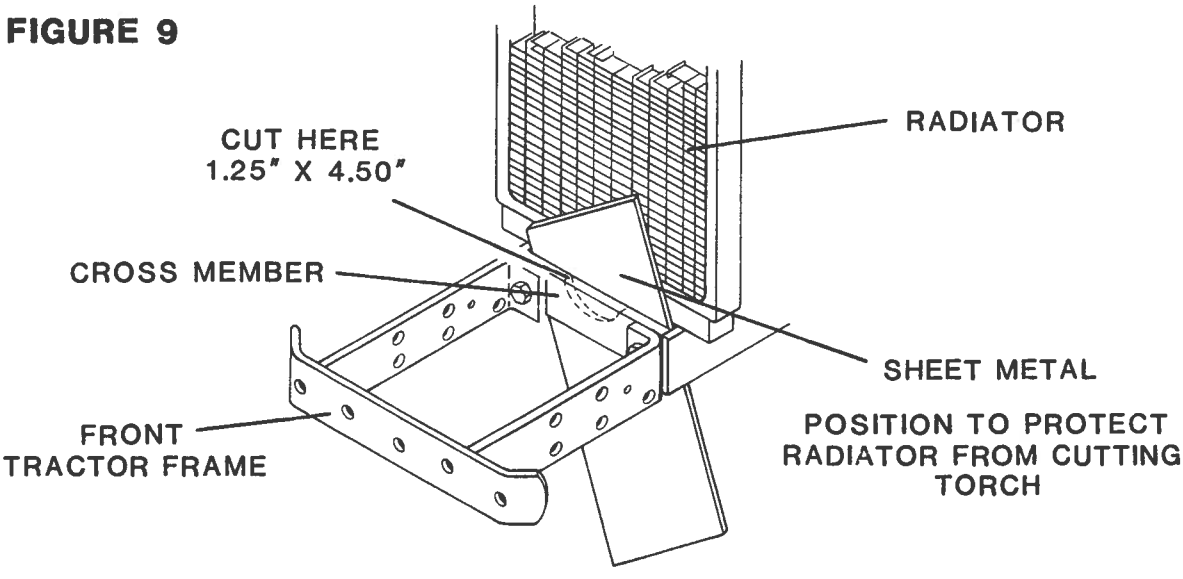
FORD 1920 TRACTORS

FIGURE 8



25. There is a double plated cross member that runs between the tractor frame rails just ahead of the radiator. You will have to take a cutting torch and cut a notch in the brace 1.25" deep and 4.50" wide from the top center of the bracket. Use a piece of sheet metal to shield the radiator from the torch flames. See Figure (9)

FIGURE 9



MOUNTING KIT INSTALLATION

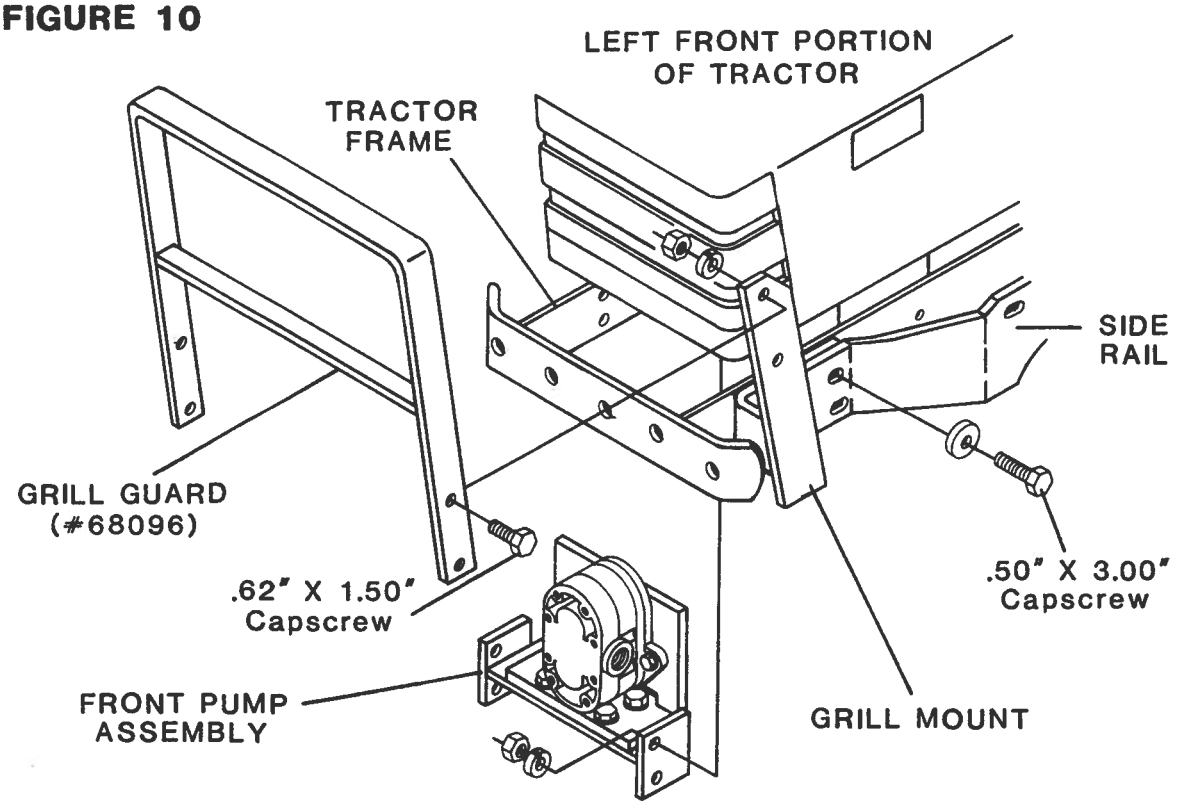
FORD 1920 TRACTORS

IMPORTANT: This step is critical. The drive shaft assembly must pass over this bracket and under the notch provided in the radiator. Without proper clearance the drive shaft will hit either the bracket or radiator or both, causing damage to the parts involved. When the pump is installed properly you will have just enough clearance for the shaft. After the mounting and hydraulic kits are installed, check the shaft clearance before ever engaging the shaft to ensure that clearance is adequate.

26. Fasten the mounting plate of the drive shaft assembly (#67974) to the front of the engine crank shaft using the (3) M12 X 30mm capscrews and 12mm lock washers provided. See Figure (8)

27. Now slide the front pump assembly up in between the tractor frames while sliding the yoke of the drive shaft assembly over the pump shaft. Line up the front pump bracket holes with the appropriate holes in the tractor frame and the remaining pairs of front mounting holes in the grill mounts and side rails. Loosely fasten with (4) .50" X 3.00" UNC capscrews, .50" flat washers, lock washers, and hex nuts supplied in the mounting kit. See Figure (10)

FIGURE 10



MOUNTING KIT INSTALLATION

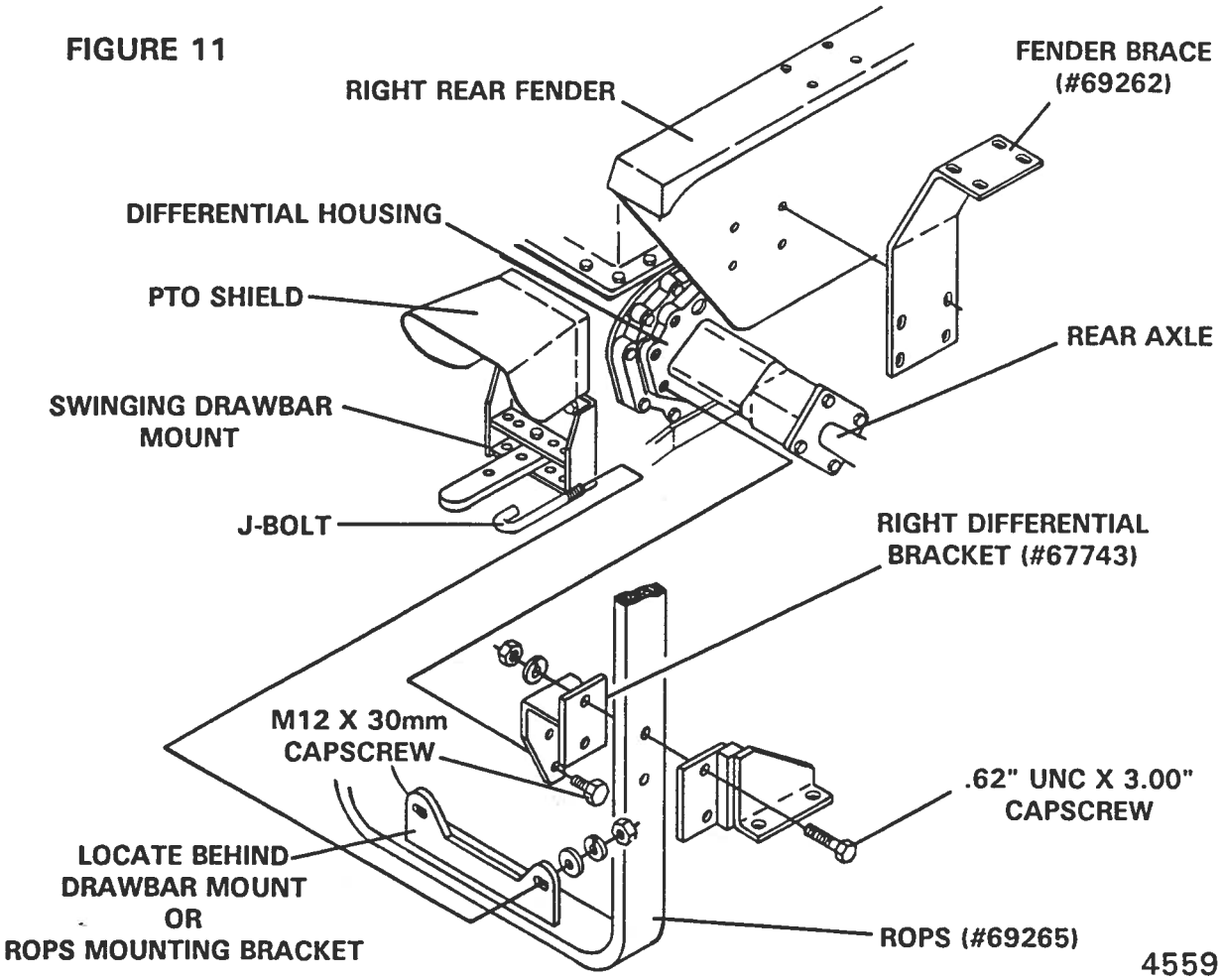
FORD 1920 TRACTORS

28. Adjust the length of the drive shaft to provide smooth operation and install the .38" UNC X 1.75" capscrew, .38" lock washer, and hex nut from the hydraulic kit to lock the drive shaft length. Lubricate the drive shaft before operating. (See Section L)

29. Install the grill guard (#68096), if so equipped, on over the grill mounts and fasten with (4) .62" UNC X 1.50" capscrews, .62" lock washers, and hex nuts. Tighten all hardware installed thus far. (See Figure 10)

30. If your unit uses the Ford ROPS, proceed to step 34. If your unit uses the ATI ROPS, install them now. Start by disconnecting the 3-point hitch check chains from the rear axle brackets. Remove the fender to rear axle brackets. Remove the original inner fender braces that run from the inside top of the fender down to and on top of the rear axle with new shorter fender braces (#69262). Use the original mounting hardware. (Note: The new fender braces do not fasten over the axle.) (See Figure 11)

FIGURE 11



4559
10-24-94-2

MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

31. Loosely fasten the left (#67744) and right (#67743) differential brackets to their appropriate sides of the differential housing behind the rear axle. Use the (6) M12 X 30mm capscrews provided. NOTE: It may help to run a tap through the mounting holes in the differential housing to clean them of any paint, burrs, etc. (See Figure 11)

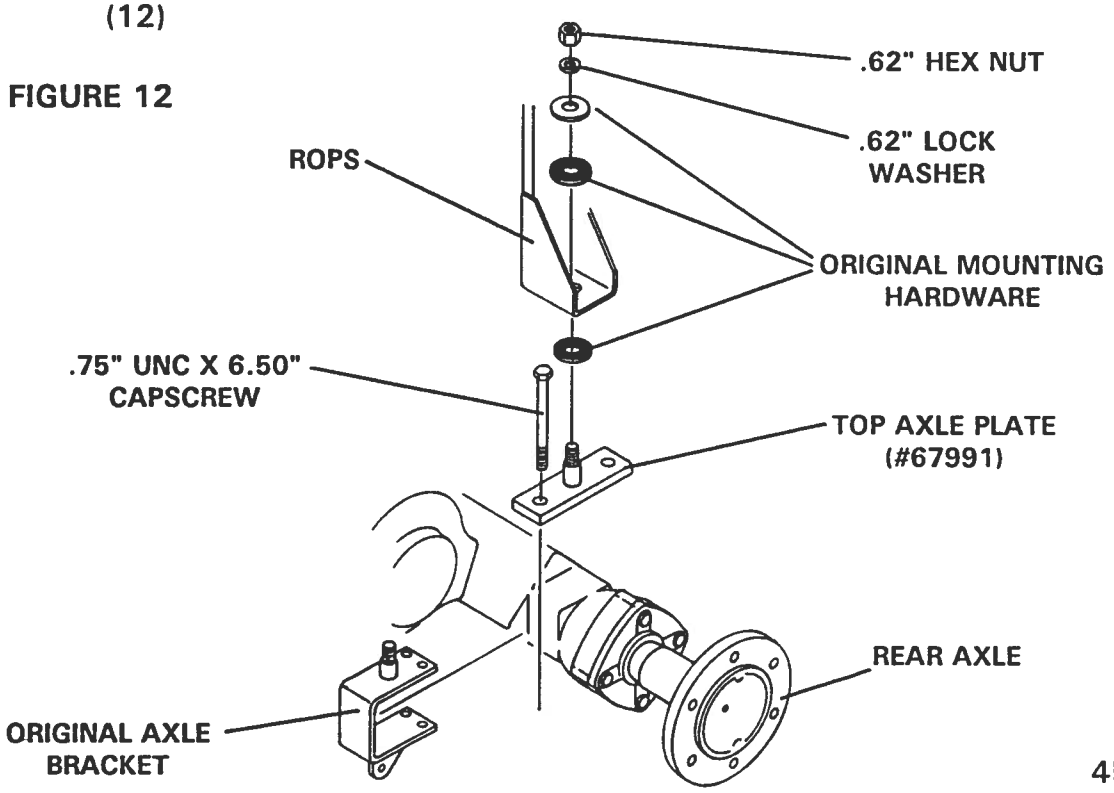
NOTE: On tractors not equipped with a swinging drawbar mount install ROPS mounting bracket (#81980) over the stationary drawbar mount and secure in place with the M16 X 45mm capscrews provided.

32. With an assistant, lift the ROPS (#69265) into place, hooking the bottom mounting plate in behind either the swinging drawbar mount or the ROPS mounting bracket. While holding the ROPS up, fasten the left (#69263) and right (#69264) axle brackets to the ROPS by inserting the (4) .62" UNC X 3.00" capscrews through the axle brackets, through the ROPS, and through the upright portions of the differential brackets. Secure with the .62" lock washers and hex nuts supplied. See Figure (11)

33. Hook the J-bolts (#64923) around the sides of either the swinging drawbar mount or the ROPS mounting bracket and through the bottom mounting plate of the ROPS. Loosely fasten with .50" flat washers, lock washers and hex nuts. Proceed to step 35. See Figure (11)

34. On units using the Ford ROPS, disconnect the 3-point hitch check chains from the rear axle brackets. Remove the rear axle brackets and insert the new top axle plates (#67991) between the ROPS and axle. See Figure (12)

FIGURE 12

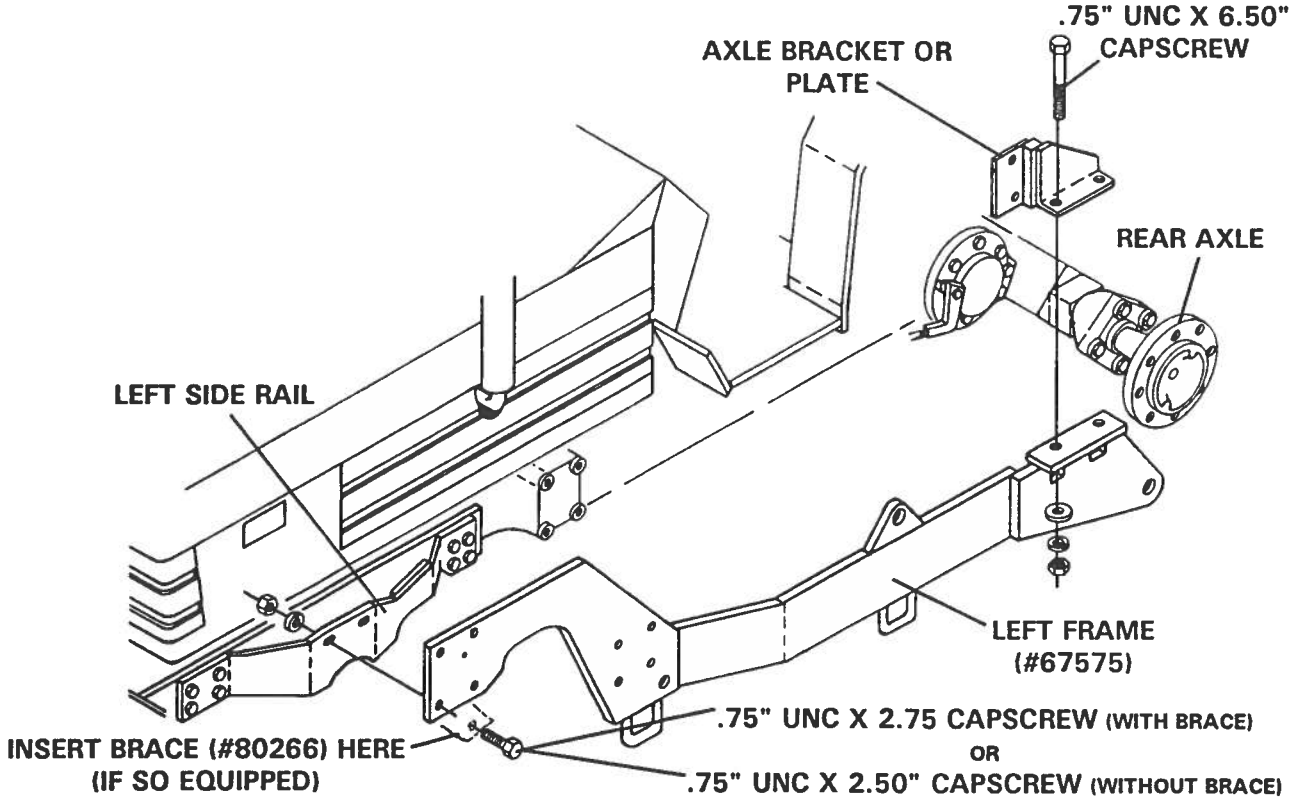


4560
10-24-94-2

MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

35. Install the left brace (#80266) to the inside of the grill guard (#68098) (if so equipped) using (2) .62" UNC X 1.75" capscrews, (4) flat washers, lock washers and hex nuts supplied. With an assistant, lift the left frame (#67575) into place under the rear axle and up against the middle of the left side rail at the front. Loosely fasten the frame to the side rail using the lower pair of mounting holes at the front. Install (1) .75" UNC X 2.50" capscrew in the second of the two mounting holes followed by .75" lock washer and hex nut. Position the left brace (#80266) (if so equipped) on the outside of the first mounting hole and install (1) .75" UNC X 2.75" capscrew, lock washer and hex nut. (Use (1) .75" UNC X 2.50" capscrew if your mounting kit does not include a grill guard.) Attach the back of the left frame to the bottom of the rear axle by inserting (2) .75" UNC X 6.50" capscrews through the top axle bracket or plate, past the axle and through the mounting plate of the frame. Attach loosely with .75" flat washers, lock washers, and hex nuts. See Figure (13)



36. Repeat step 35 for the right side using right frame (#67574) and right brace (#80265), if so equipped.

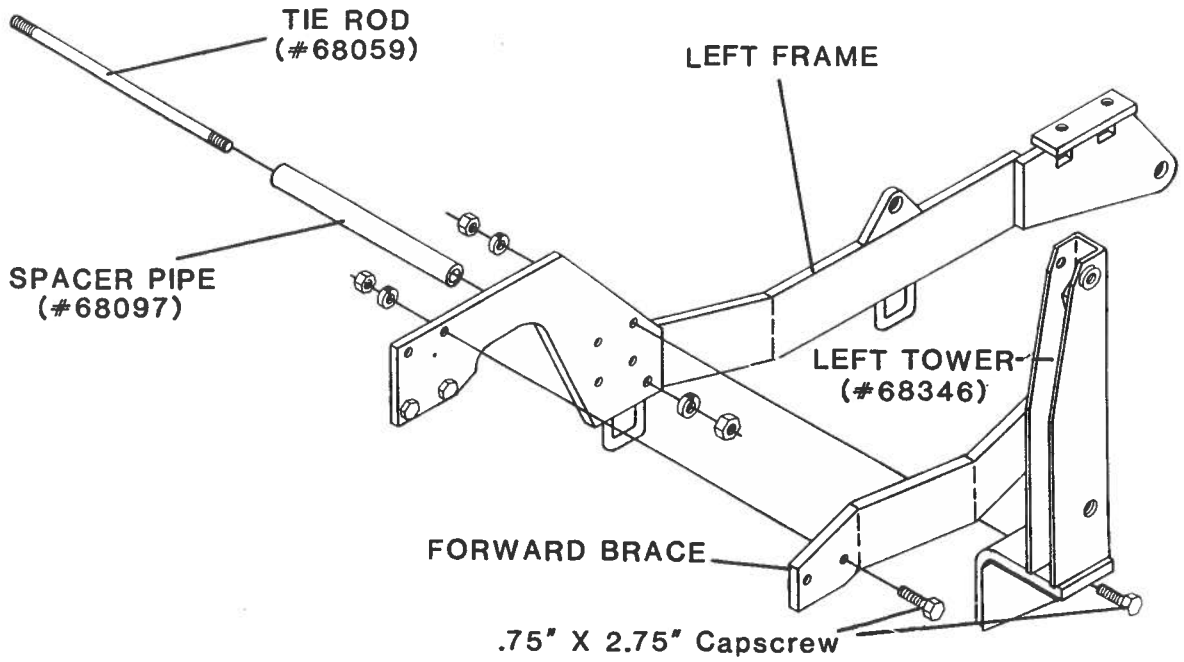
37. Slide the spacer pipe (#68097) in place between the left and right frame, with the tube ends over the large holes in the frames where they kick up to clear the front axle. Slide the tie rod (#68059) through one frame, spacer tube, and through the second frame. Secure with a 1.00" lock washer, and hex nut on each end. (See Figure 12)

MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

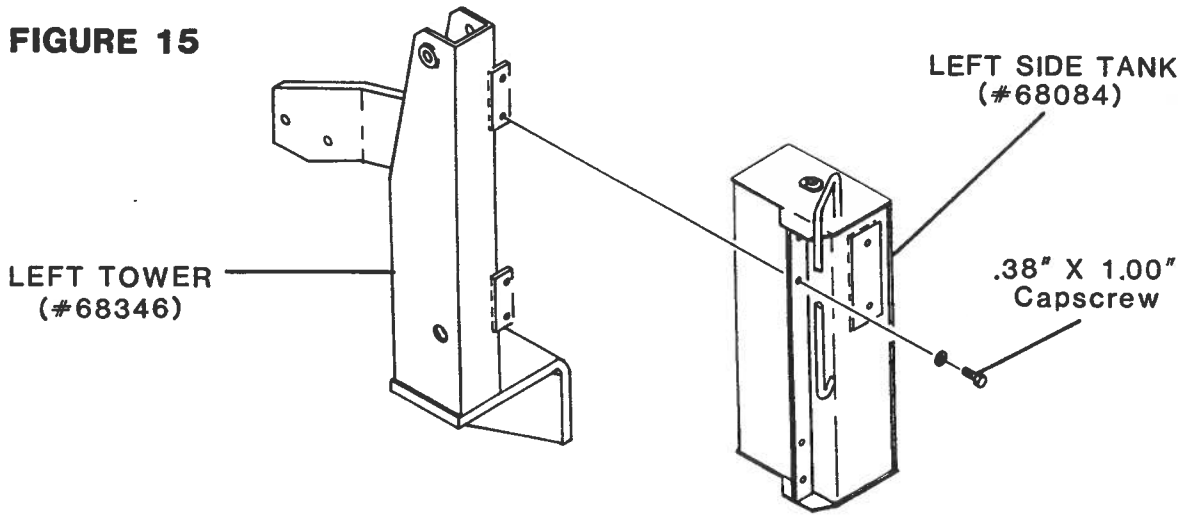
38. On units that use the Ford loader, proceed to step 41. On units with an ATI loader, install the left (#68346) and right (68345) tower to the left and right frame. Secure the bottom of the towers above the spacer tube/ tie rod mounting location on the frames with (4) .75" UNC X 2.75" capscrews, .75" lock washers and hex nuts per side. Attach the forward brace of the towers to the top front portion of the frames with (2) .75"UNC X 2.75" capscrews, .75" lock washers and hex nuts per side. See Figure (14)

FIGURE 14



39. From the hydraulic kit, install the left side tank (#68084) to the back of the left tower with the (4) .38" UNC X 1.00" capscrews and lock washers from the mounting kit. See Figure (15)

FIGURE 15

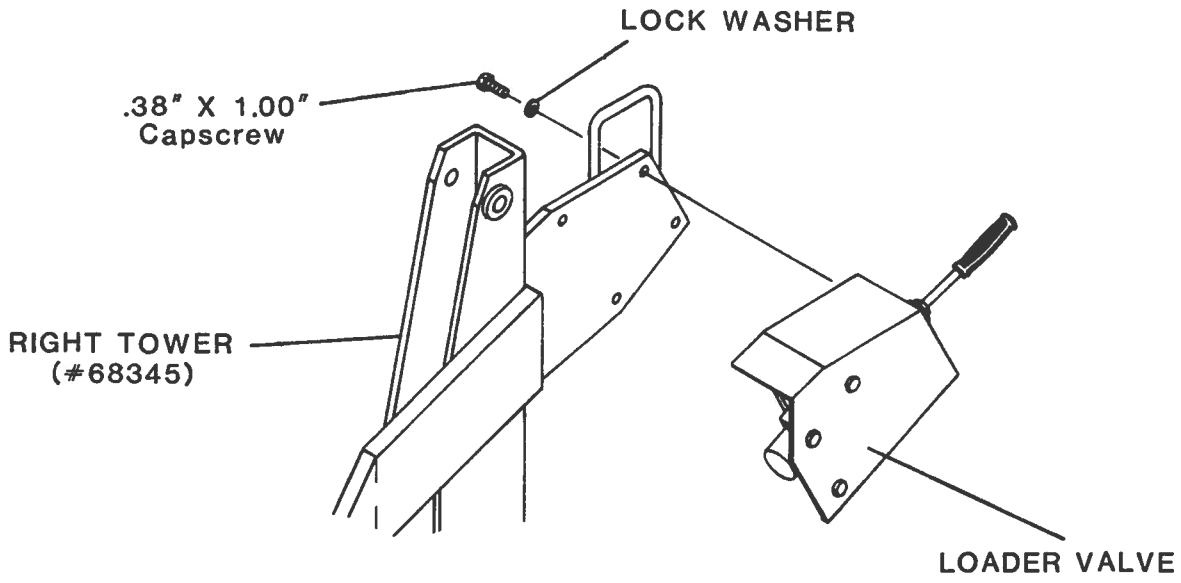


MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

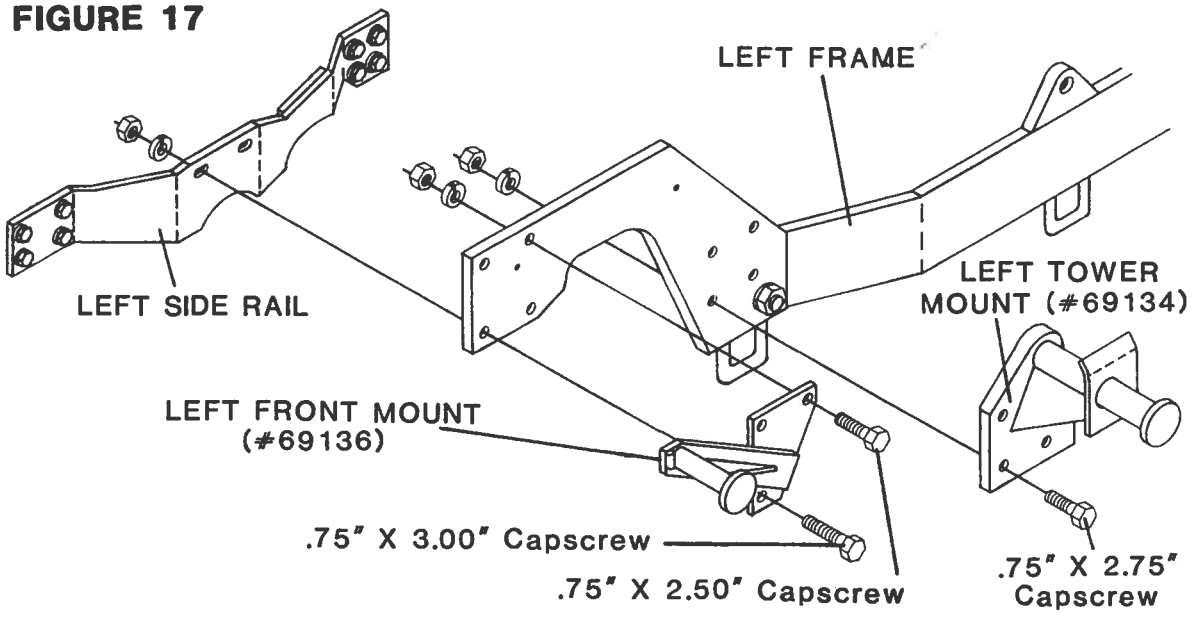
40. Attach the loader valve to the right tower with the (4) .38" UNC X 1.00" capscrews and .38" lock washers. See Figure (16) Proceed to step 43.

FIGURE 16



41. On units using the Ford loader, in place of the left and right towers, install the left (#69134) and right (#69133) tower mounts to the frames above the spacer tube/tie rod mounting location with (4) .75" UNC X 2.75" capscrews, .75" lock washers, and hex nuts per side. See Figure (17)

FIGURE 17



MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

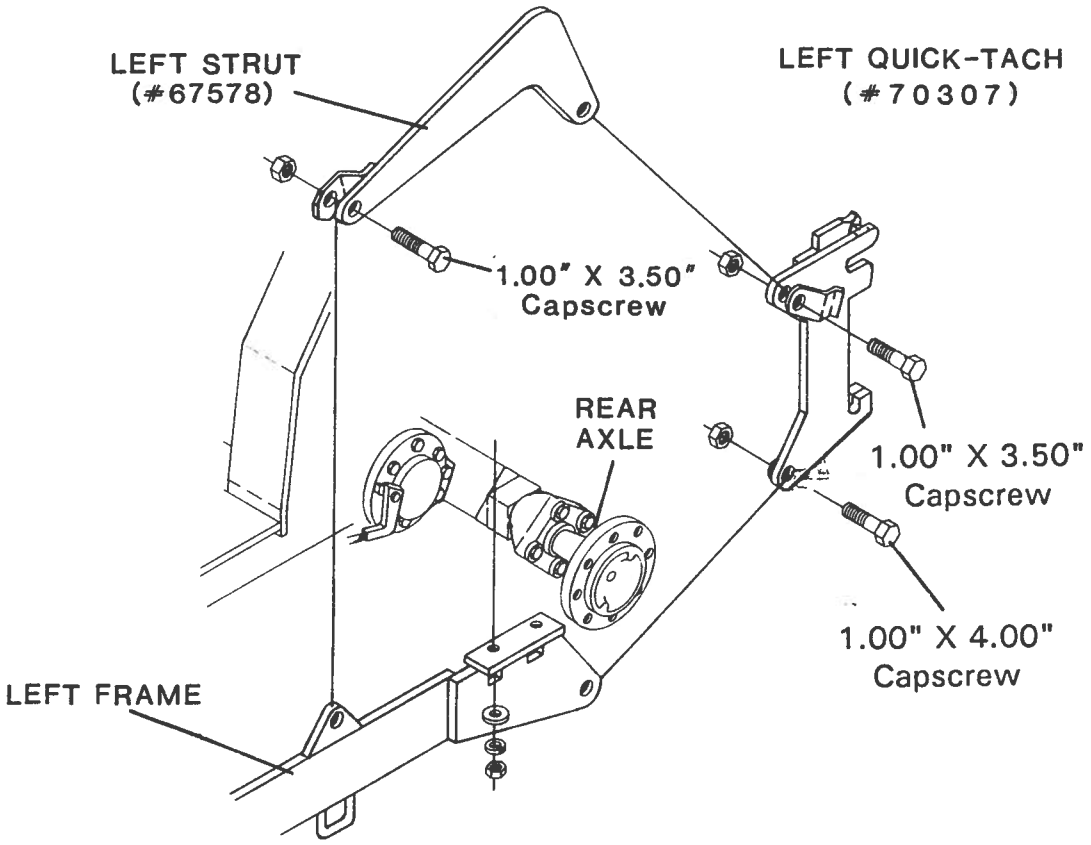
42. On units with the Ford loader, the tower braces are replaced with left (#69136) and right (#69135) front mounts. Secure the mounts to the top front of the frames with (2) .75" UNC X 2.50" capscrews, (1) .75" UNC X 3.00" capscrew, (3) .75" lock washers, and hex nuts per side. See Figure (17)

43. On units with Ford ROPS install (1) .62" lock washer and hex nut (per side) on the top axle plates, using the original rubber cushions in their original location. See Figure (12)

44. On units with backhoes, place the front end of the left strut (#67578) over the mounting ear of the left frame and secure with (1) 1.00" X 3.50" hex capscrew and lock nut. See Figure (18)

45. Place the lower mount of the left quick-tach (#70307) into the rear mounting ear of the frame and secure with (1) 1.00" X 4.00" capscrew and lock nut. See Figure (18)

FIGURE 18



MOUNTING KIT INSTALLATION

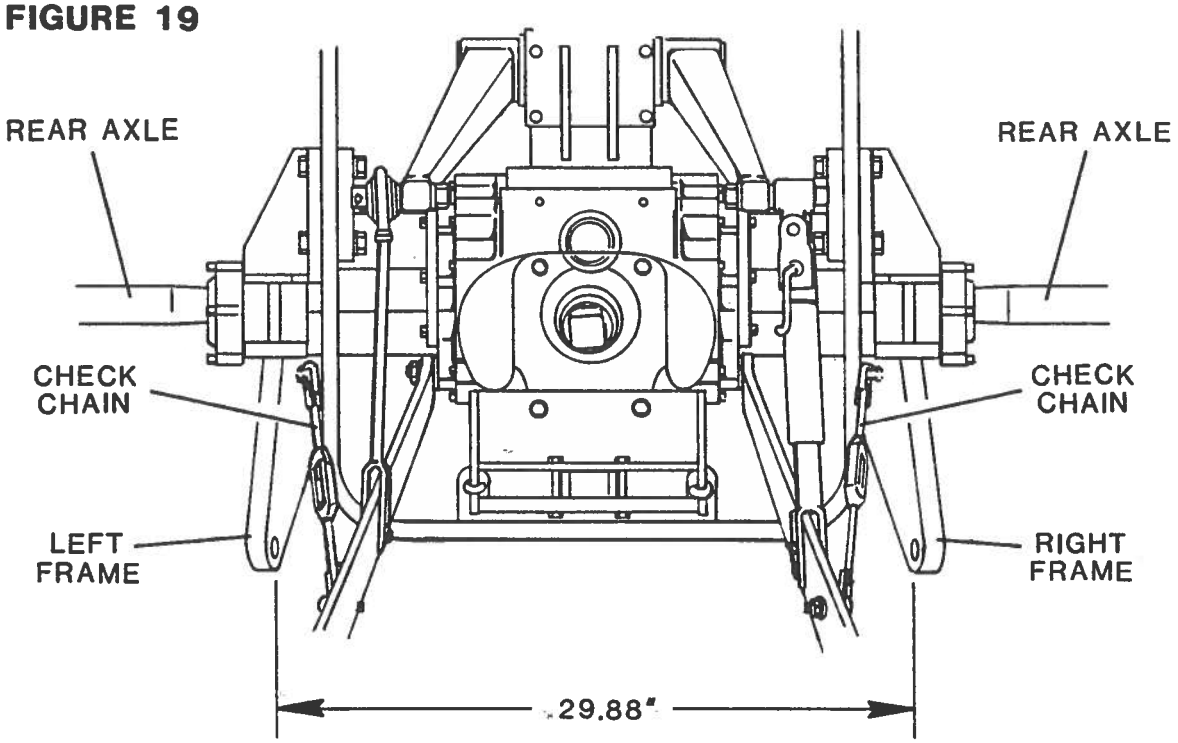
FORD 1920 TRACTORS

46. Now hold the quick-tach upright and slip the end of the left strut into the upper mount of the quick-tach and secure with (1) 1.00" UNC X 3.50" capscrew and lock nut. See Figure (18)

47. Repeat steps 44 through 46 for the right side using right strut (#67577) and right quick-tach (#70306).

48. At this point tighten all mounting hardware. Some hardware and mounts may need to be loosened and adjusted when mounting the loader and backhoe for the first time. The right and left frames should be spaced 29.88" apart from the inside of the frames for backhoe attachment. Attach the 3-point hitch check chains to the brackets provided on the frames. See Figure (19)

FIGURE 19



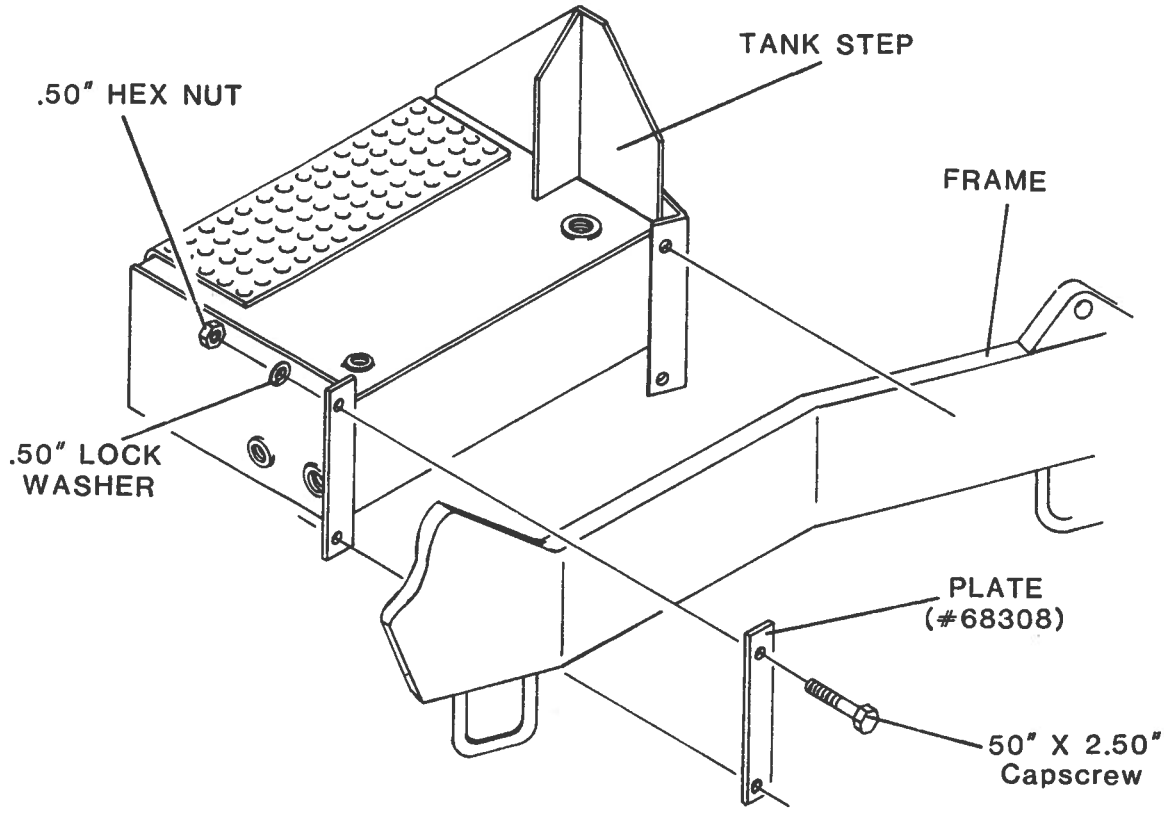
(INSIDE EAR NOT SHOWN)

49. On units that use hydraulic kits with tank steps, loosely clamp the tank steps to their prospective frames with the plates (#68308) and .50" X 2.50" capscrews, .50" lock washers, and hex nuts supplied in the hydraulic kit. Securely tighten the tanks into position after the rest of the hydraulic kit is installed. Position the tanks so that they do not interfere with any linkage or pinch any lines, but still allow the operator to use them as steps in mounting the tractor. See Figure (20)

MOUNTING KIT INSTALLATION

FORD 1920 TRACTORS

FIGURE 20



On units that do not use tank steps, reinstall the original steps.

50. Finish installing the hydraulic kit. Be sure that the flow pattern shown on your hydraulic kit diagram is followed. DO NOT route hoses in such a matter that could cause them to be pinched, kinked, or damaged in any way.

Mounting kit installation is now complete. Be sure to check and tighten all mounting bolts after four hours of operation. The 3-point hitch can be used with the mounting kit installed. Simply remove the backhoe and reinstall the 3-point hitch as originally equipped.

LOADER INSTALLATION

FORD 1920 TRACTORS
315 LOADERS

GENERAL INFORMATION

The following instructions will help you to mount your loader onto the Ford 1920 tractor. You must install the mounting kit prior to installing the loader. Therefore if you have not installed the mounting kit, turn to Section E and do it now.

Remember to read all safety warnings, decals, and operating instructions before operating the tractor or loader.

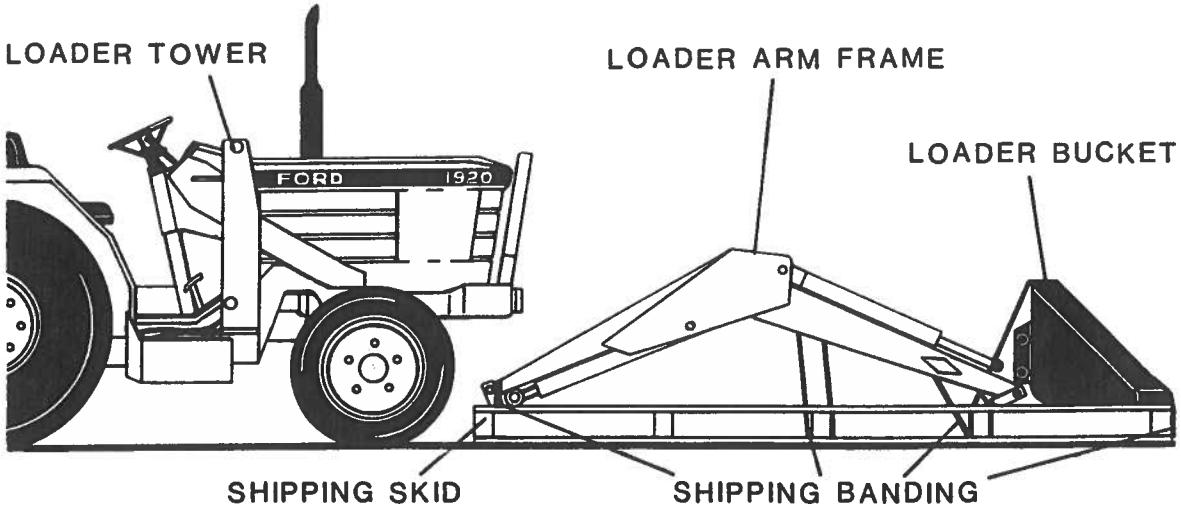
MOUNTING INSTRUCTIONS

1. Remove the steel shipping banding from around the loader and skid.

2. Position the tractor behind the skid, as close as possible. Set the parking brake and turn the engine off. See Figure (1)

WARNING! **Use your seatbelt and ROPS (Roll Over Protective Structure) when operating your tractor. Keep belt and ROPS in good repair. DO NOT modify the ROPS or seatbelt. DO NOT remove ROPS or seatbelt. Overturning the tractor without proper ROPS and seatbelt can result in death.**

FIGURE 1



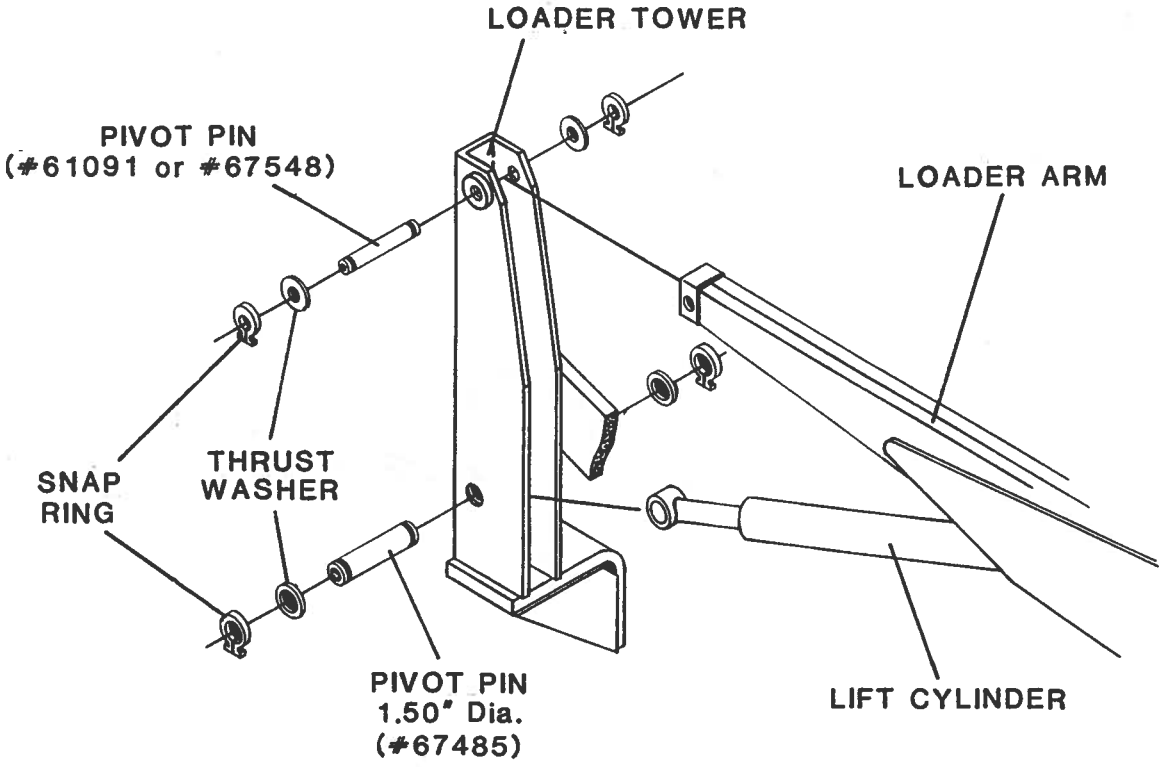
3. With one person on each side of the loader frame, lift the frame and position the tower ends of the frame arms into the channels of the mounting towers. See Figure (2)

LOADER INSTALLATION

FORD 1920 TRACTORS
315 LOADERS

4. Align the holes in the loader arms with the top holes in the towers. Install the pivot pins (#61091 or #67548) depending on which size of pin your unit was supplied with. Secure with thrust washers and snap rings supplied. See Figure (2)

FIGURE 2



5. Position the rod end of the lift cylinders into the towers. Align the hole in the rod ends with the corresponding holes in the towers and secure with pins (#67485), thrust washers, and snap rings. See Figure (2)

6. Complete the hydraulic hookups by connecting the 4 hydraulic lines coming off the right loader arm to their appropriate ports on the loader valve. See Figure (3)

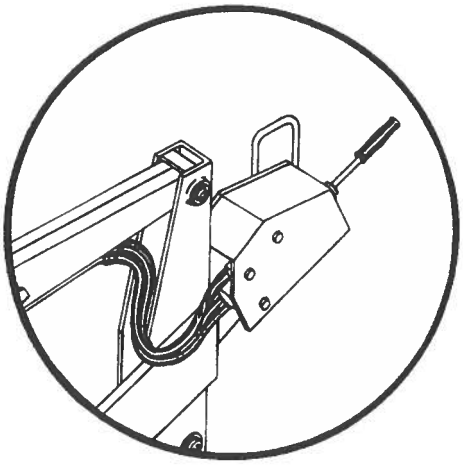
7. Now move the tractor with the loader arm frame up behind the loader bucket. Use the loader control to position the bucket ends of the loader arms in between the bucket mounting brackets. Align the loader arm holes with the lower set of mounting holes on the bucket. Secure the bucket with the pivot pins (#61091 or #67548), thrust washers, and snap rings provided. See Figure (4)

LOADER INSTALLATION

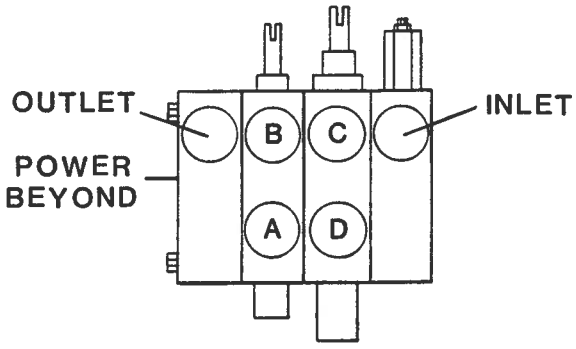
FORD 1920 TRACTORS
315 LOADERS

FIGURE 3

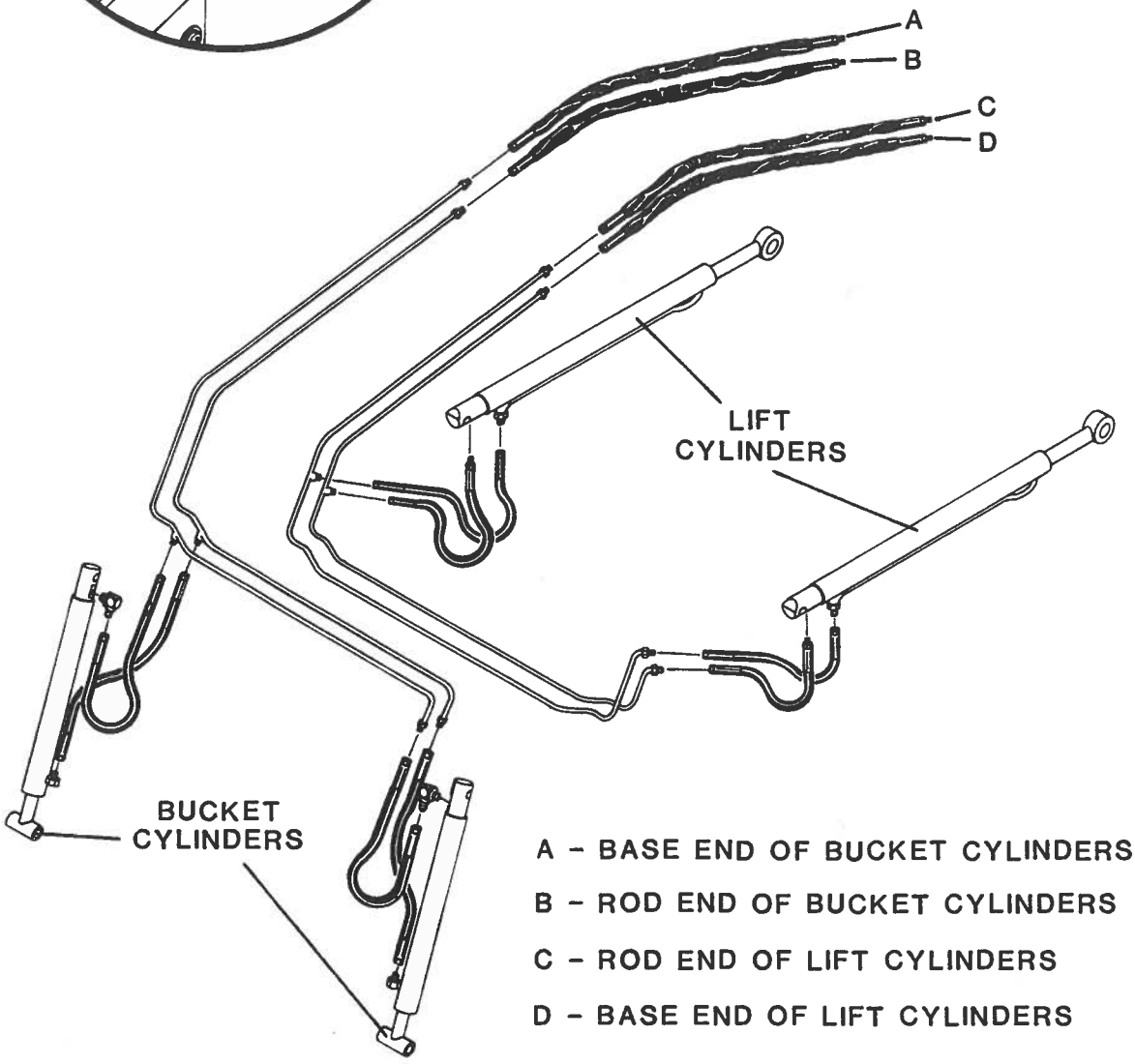
ROUTE HOSES BETWEEN TOWER AND TRACTOR



LOADER VALVE



CONNECT HOSES TO CORRESPONDING CONTROL VALVE PORTS



A – BASE END OF BUCKET CYLINDERS

B – ROD END OF BUCKET CYLINDERS

C – ROD END OF LIFT CYLINDERS

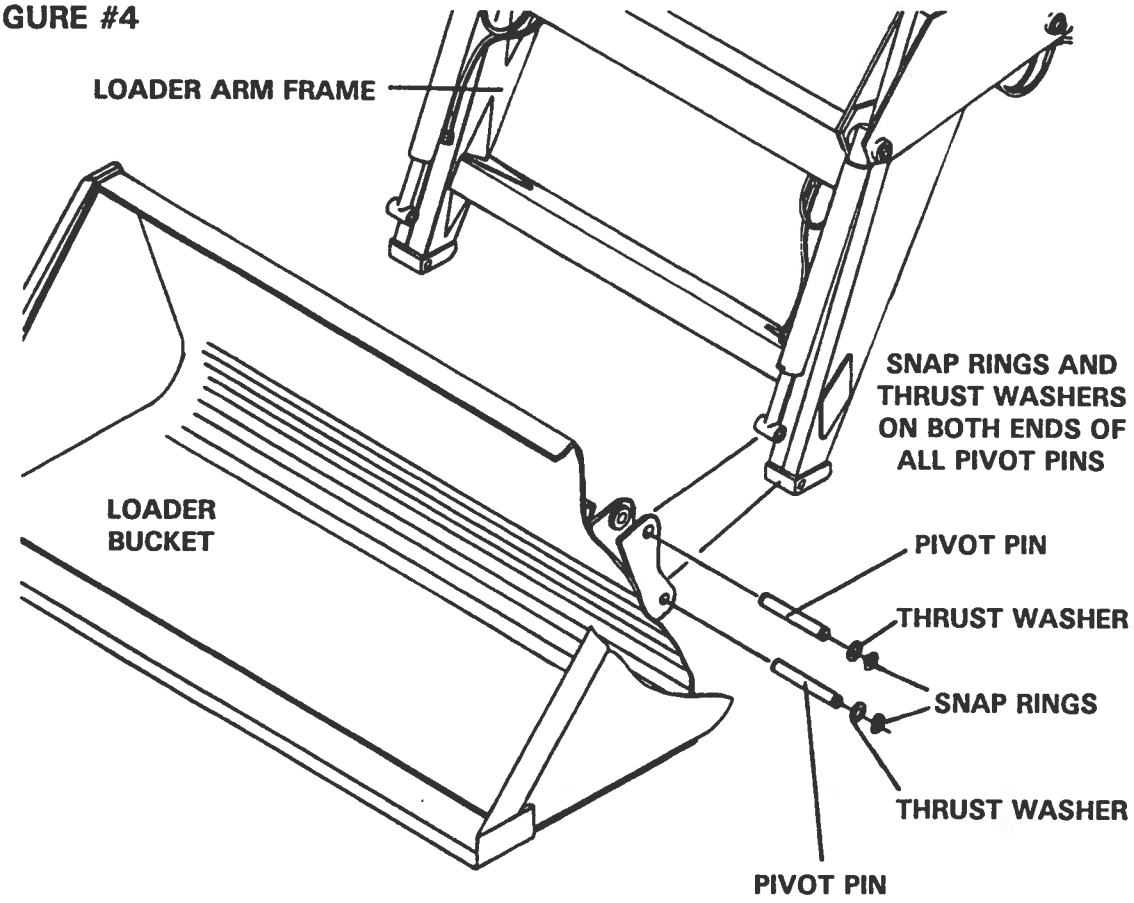
D – BASE END OF LIFT CYLINDERS

4569 1-10-89

LOADER INSTALLATION

315 LOADER

FIGURE #4



8. Position the rod end of the bucket cylinders in place between the bucket mounting brackets. Align the holes in the tod ends with the bucket holes and secure with the pivot pins, thrust washers and snap rings provides. See Figure #4

9. Now lift the bucket with the loader high enough to clear the shipping skid and back the tractor from over the skid. Discard the skid and banding.

10. Raise the loader high enough to give adequate ground clearance. Position the lever into the hold position. Complete the predelivery check list located in the back of this manual (Section R). Loader installation is now complete.

WARNING! BEFORE OPERATING A TRACTOR WITH A LOADER, REAR COUNTERWEIGHT MUST BE ADDED.

Weight can be added to the rear of the tractor by filling the rear tires with liquid ballast, installing wheel weights or 3-point hitch counterweight.

BACKHOE INSTALLATION

FORD 1920 TRACTORS
MD2 SERIES BACKHOES

GENERAL INFORMATION

The following instructions will help to mount your backhoe onto the Ford 1920 tractor. You must install the mounting kit prior to installing the backhoe. Therefore if you have not installed the mounting kit, turn to Section E and do it now.

Remember to read all safety warnings, decals, and operating instructions before operating the tractor or backhoe.

MOUNTING INSTRUCTIONS

1. Remove the steel shipping banding from around the backhoe and skid. See Figure (1)

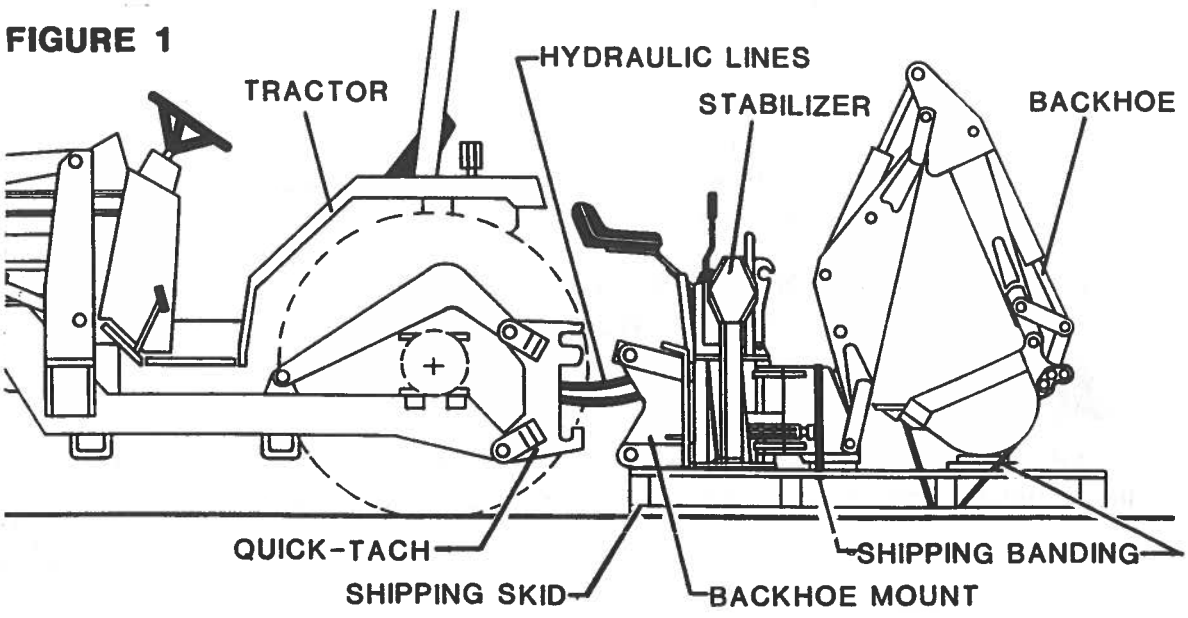
2. Position the tractor to within one foot of the backhoe. Set the parking brake and turn the engine off. See Figure (1)

WARNING! **Use your seatbelt and ROPS (Roll Over Potective Structure) when operating your tractor. Keep belt and ROPS in good repair. DO NOT modify the ROPS or seatbelt. DO NOT remove ROPS or seatbelt. Overturning the tractor without proper ROPS and seatbelt can result in death.**

Always be sure to check that the path of the tractor is clear of all people and objects before backing.

3. Check the position of the tractor 3-point hitch lower links. They must be fully lowered at this time. Also be sure to remove the top link and drawbar from the tractor.

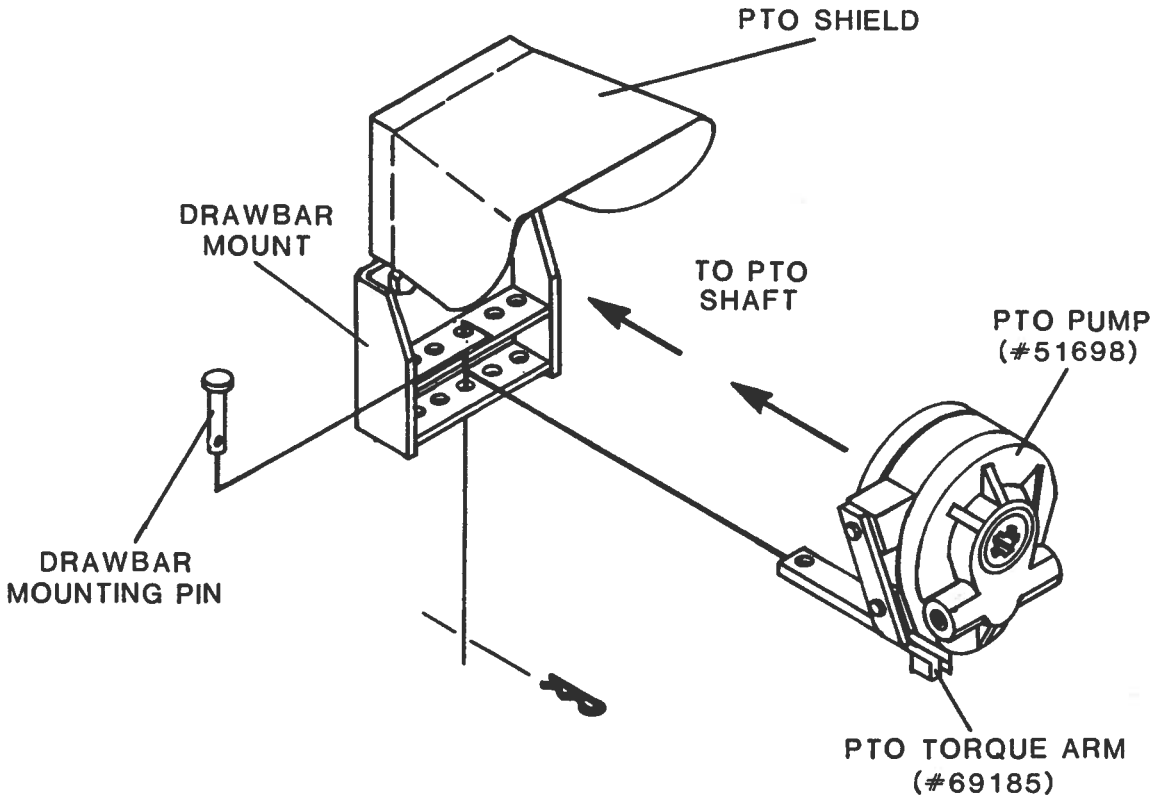
FIGURE 1



4. Complete the hydraulic plumbing to connect the pressure and return hoses between the backhoe and tractor. Your hydraulic kit may have been partially installed at the factory. To finish the installation follow the hydraulic kit parts diagrams located in Section E. Finish the hydraulic hook-up as indicated, paying particular attention to the hydraulic flow arrows. Make sure the final hydraulic flow will follow the arrows.

NOTE: Some mounting kits come complete with a PTO pump (#51698). To mount the pump, bolt the PTO torque arm (#69185) to the pump with the .38" X 1.00" capscrews and lock washers supplied. Remove the plastic PTO shaft cover (not the shield) from the tractor. Slide the PTO pump over the PTO shaft while sliding the torque arm into the drawbar mounting. Fasten in place with the original drawbar mounting pin. See Figure (2)

FIGURE 2



IMPORTANT: After you hook-up the hydraulic system, always check the system for leaks by the method described at the end of Section B. Make sure hoses are run in such a fashion as to avoid pinching or chafing which could cause pre-mature failure.

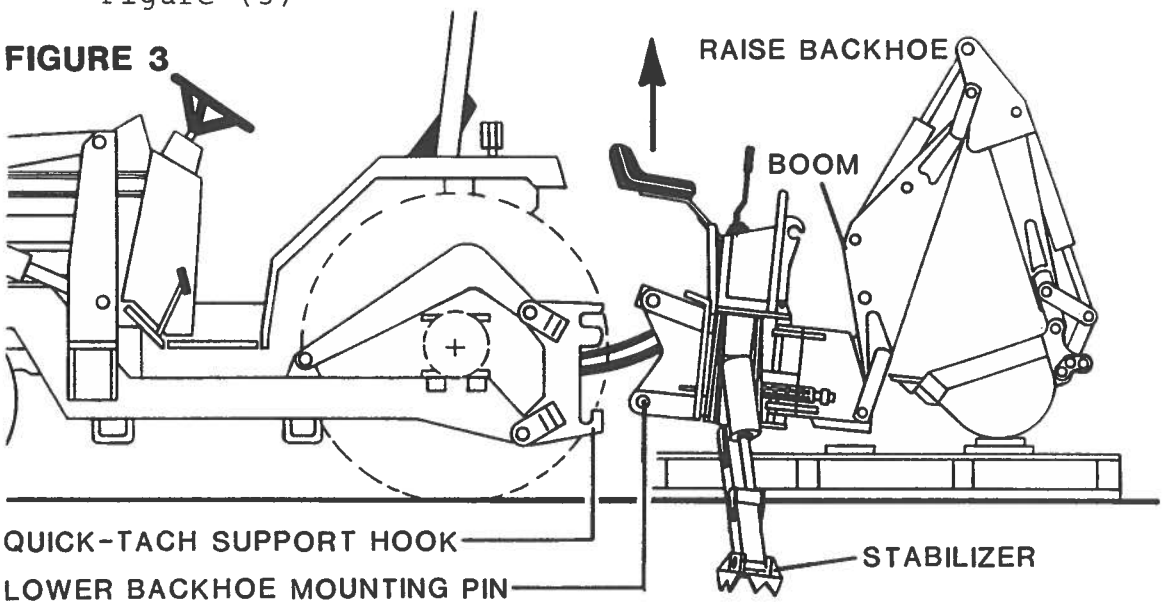
BACKHOE INSTALLATION

FORD 1920 TRACTORS
MD2 SERIES BACKHOES

5. Start the engine and raise the backhoe with the stabilizers. See Figure (3)

6. Continue raising the backhoe by alternately operating the boom and stabilizers until the lower backhoe mounting pins on the backhoe mounts are higher than the backhoe quick-tach support hooks on the tractor. See Figure (3)

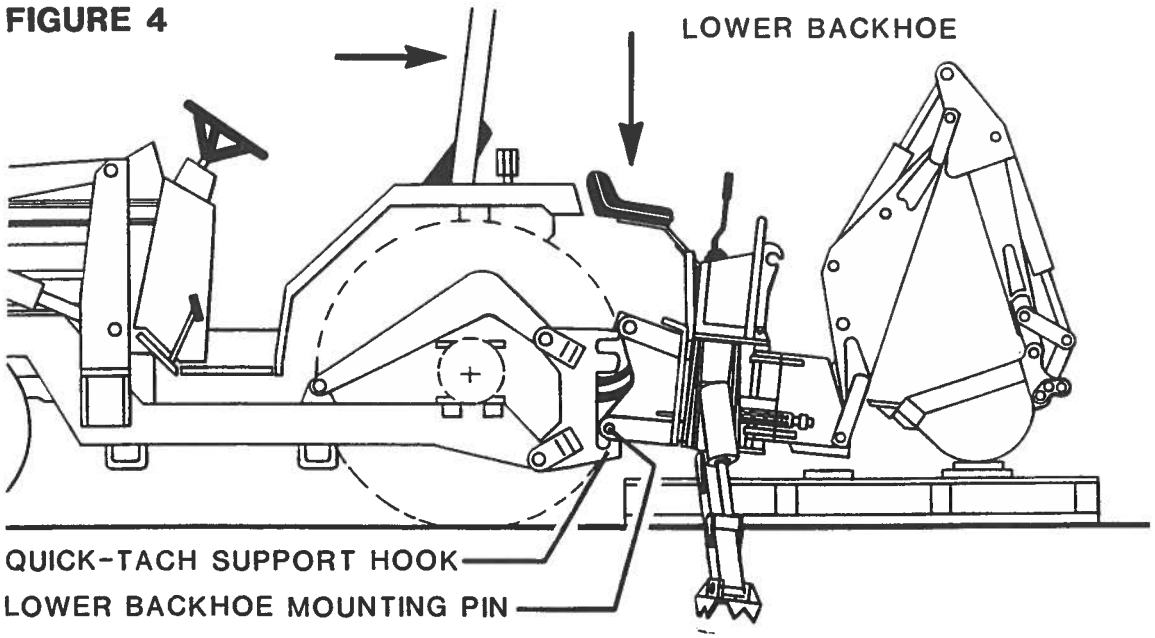
FIGURE 3



7. Back the tractor until the quick-tach support hooks are directly beneath the lower mounting pins on the backhoe mounts. See Figure (4)

8. Lower the backhoe onto the lower support hooks using the stabilizers. See Figure (4)

FIGURE 4

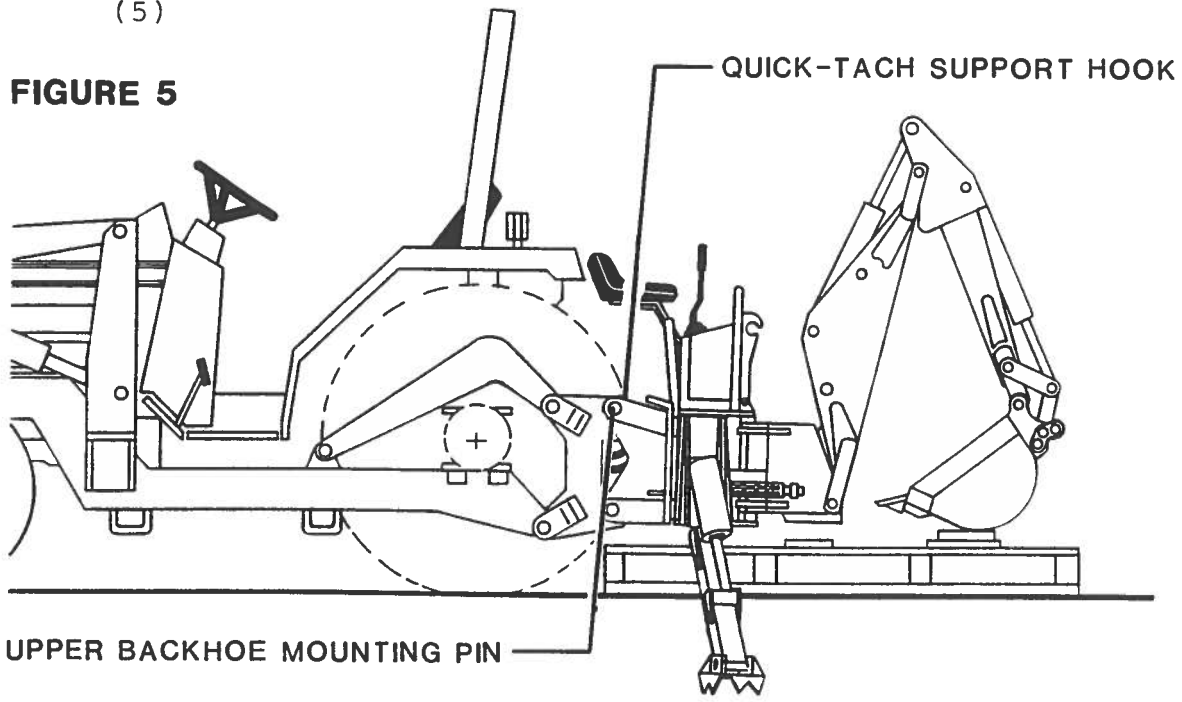


BACKHOE INSTALLATION

FORD 1920 TRACTORS
MD2 SERIES BACKHOES

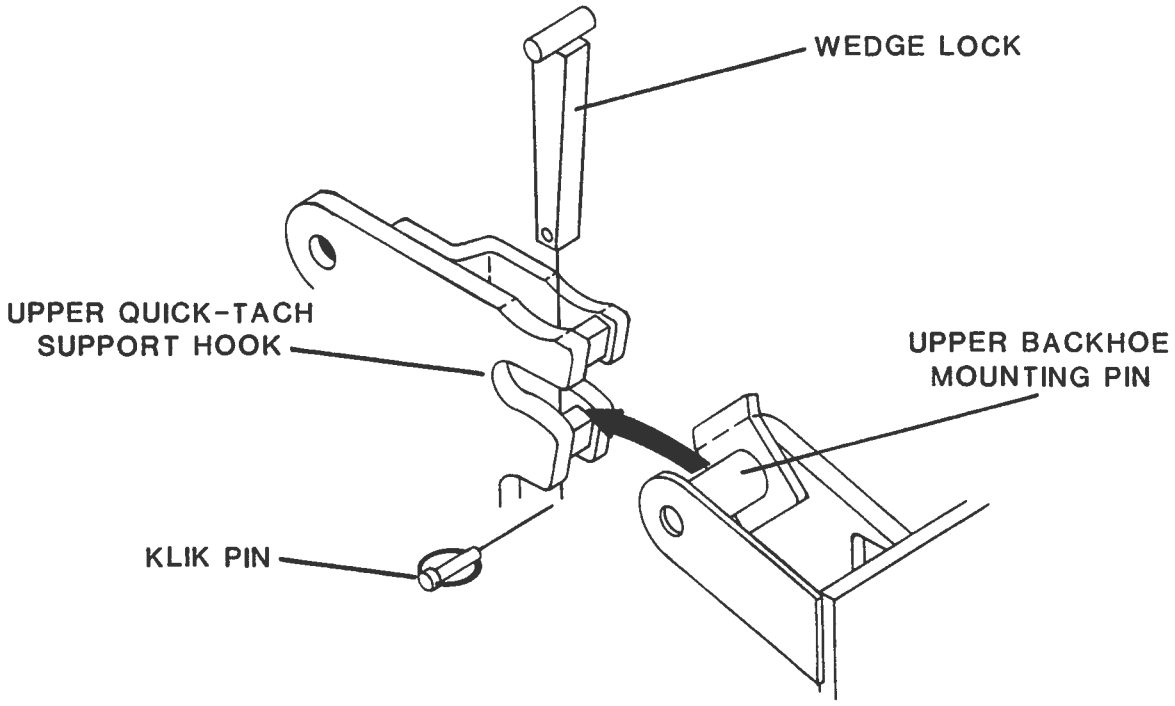
9. Use the boom control to roll the backhoe mounting pins into the upper quick-tach support hooks. See Figure (5)

FIGURE 5



10. Install the left and right wedge locks (#5985) through their accompanying holes in the upper quick-tach support hooks thereby locking the backhoe onto the tractor. Install the wedge klik pins (#6626). See Figures (6) and (7)

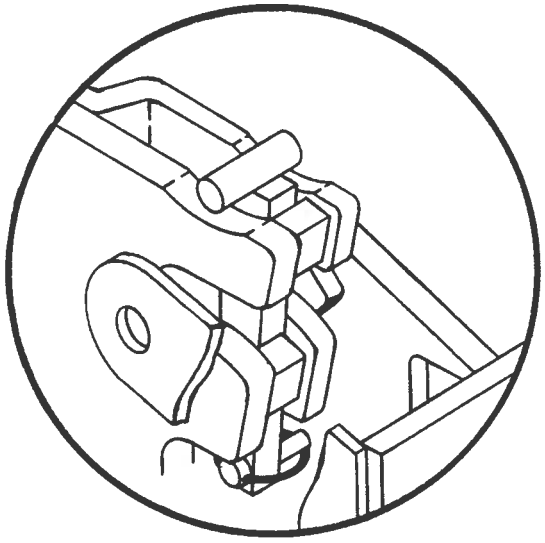
FIGURE 6



BACKHOE INSTALLATION

FORD 1920 TRACTORS
MD2 SERIES BACKHOES

FIGURE 7



STEP 10
COMPLETED

11. Check the hydraulic hoses to make certain they are not pinched or stressed. It may be necessary to loosen some of the hydraulic fittings and rotate the hoses to allow them to lay properly.

12. Remove the SMV sign from the back of the tractor and install it in the SMV clip on the dipper unit.

13. Raise the boom, dipper, and stabilizers. Latch the swing/boom transport lock.

14. Complete the predelivery check list located in the back of this manual (Section R). Backhoe installation is now complete.

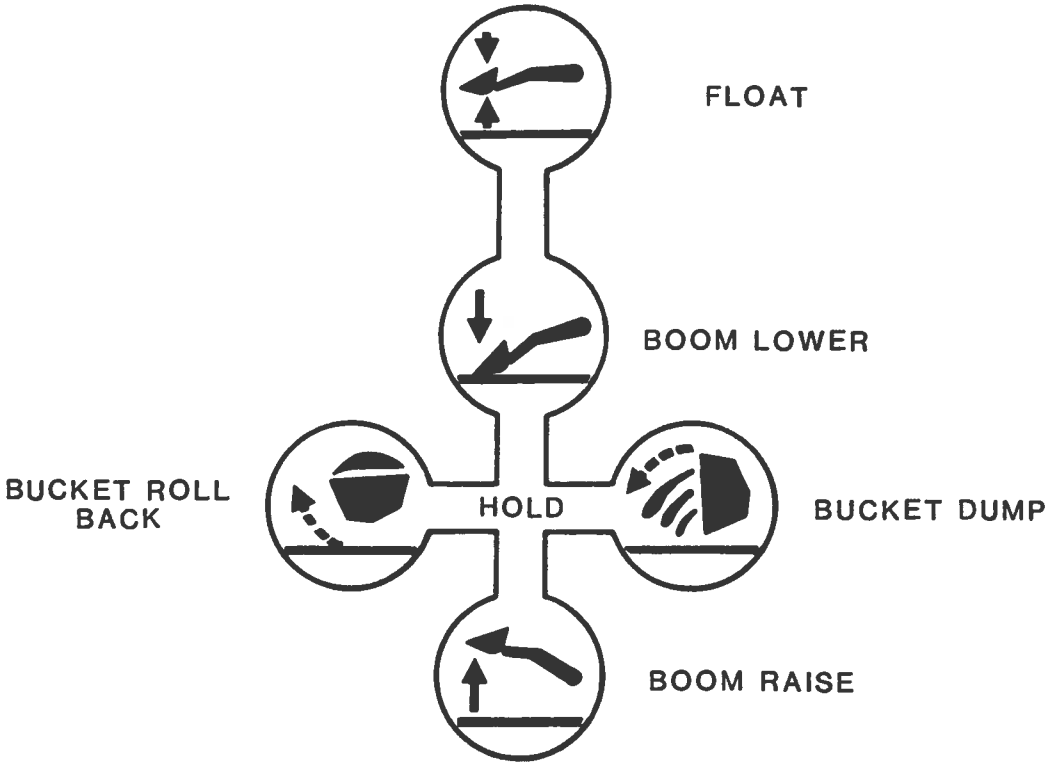
OPERATING INSTRUCTIONS

LOADER CONTROL

GENERAL INFORMATION

The loader control lever has six positions, boom raise, hold, bucket roll back, bucket dump, boom lower, and float. The information contained below will help you become familiar with the operation of the control lever. Read the safety precautions (Section B) of this manual before attempting to use the loader. Remember, right and left when referred to on this page are determined by the operator's position seated at the tractor controls facing forward.

CAUTION! **The boom assembly if raised can be lowered any time the lever is moved to float or lower position, whether the engine is running or not. Always lower the boom to the ground when it is not in use.**



BOOM RAISE POSITION

To raise the boom, pull the lever back. The lever will return to HOLD when released.

HOLD POSITION

The control lever, when not in the detented float position, will automatically return to HOLD when released. The loader boom will remain stationary in the position that it is in when the lever is placed in hold.

4576 1-10-89

OPERATING INSTRUCTIONS

LOADER CONTROL

BUCKET ROLL BACK POSITION

To roll the bucket back, move the lever to the left. The lever will return to HOLD when released.

BUCKET DUMP POSITION

To dump the bucket, move the lever to the right. The lever will return to HOLD when released.

BOOM LOWER POSITION

Push the lever part way forward to lower the boom. The lever will automatically return to HOLD when releasd.

FLOAT POSITION

Push the lever all the way forward for FLOAT position. This position is detented so the lever must be moved manually out of the position. No hydraulic pressure is applied to the boom cylinders while in FLOAT. Use FLOAT position to follow the contour of the ground when traveling.

IMPORTANT: When cylinders reach the fully extended position, release the control lever to the HOLD position to keep fluid from by-passing through the relief valve and over-heating.

The speed with which the boom or bucket moves depends upon the movement of the loader control lever. Moving the lever completely into a position will cause the fastest movement of the boom or bucket. A partial movement (feathering) of the control will slow the action.

IMPORTANT: When it is necessary to lift a heavy load to a high position and then lower it to another position before dumping, be sure to operate the control valve very carefully. Do not suddenly thrust the valve wide open and jerk it completely closed. The heavy load will gain momentum downward when the control valve is released; then when the valve is suddenly closed the loader's mechanical travel is halted, but the momentum of the heavy load continues, resulting in dangerous bouncing of the load on the booms. Overcome this by slowly cracking or opening the control valve; this will release the fluid gradually and by doing so will ease the load down to the lower position desired.

Diagonal movements of the lever with the right hand permit the operator to raise the boom and close the bucket or lower the boom and level the bucket at the same time, while operating the tractor with the left hand.

OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
FRONT END LOADERS

GENERAL INFORMATION

The front end loader mainly serves two basic functions. Probably the most common is that of moving material from one location to another. This may include moving spoil from an excavation to a stockpile, loading stockpiled materials onto a truck, removing rubble from the job site, etc. The other main function of the loader is that of grading an area. The basic technique for performing these functions will be discussed on the following pages. We present this information here to help you get the most efficiency out of your loader.

CAUTION!

Never let anyone operate the loader without first reading all safety warnings, decals, and operating instructions. Lack of operating and safety knowledge could prove fatal.

Always be prepared to stop. Loader work usually requires a lot of shuttling back and forth across the job site. Look out for fellow workers on the job site that might not be looking out for themselves.

Use your seatbelt and ROPS (Roll Over Protective Structure) when operating your tractor. Keep belt and ROPS in good repair. DO NOT modify the ROPS or seatbelt. DO NOT remove ROPS or seatbelt. Overturning the tractor without proper ROPS and seatbelt can result in death.

Always leave the loader bucket down on the ground when not in use.

REMOVING MATERIAL

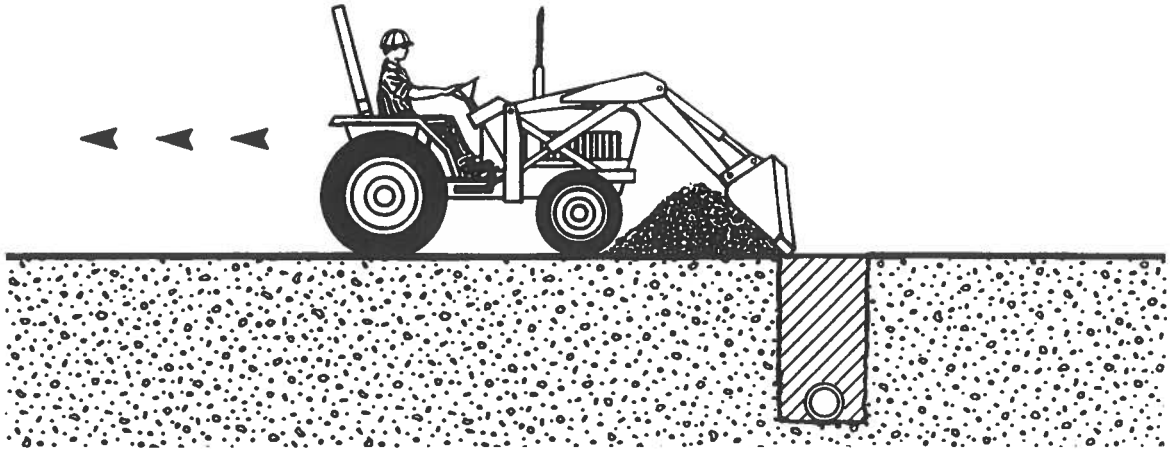
Probably the most common use of the front end loader is the removal of material from the job site. This will usually involve removing spoil from an excavation or stockpile and transferring it to another stockpile or loading it onto a truck to be halled away.

When removing spoil from an excavation, such as from beside an open trench, care must be taken to remove the spoil without letting it fall back into the trench. Start by first pulling the spoil back away from the trench. To do this, lift the loader arms, then drive the tractor forward until the bucket extends past the pile. Lower the lift arms to trap the spoil between the bucket and the front of the tractor. Now with the tractor in reverse, pull the spoil back approximately ten feet. Continue this procedure until all the spoil is pulled clear of the trench.

OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
FRONT END LOADERS

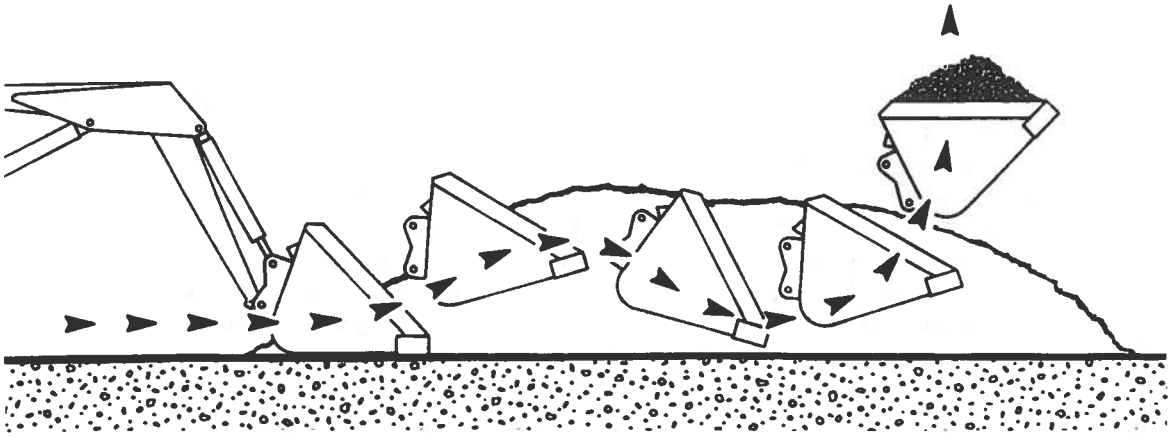
REMOVING MATERIAL (CONTINUED)



LOADING THE BUCKET

It would be impractical to drag the material from place to place around the job site, therefore it is important to learn how to load the bucket properly. To get the most efficiency out of the loader, some sort of back-up for the stockpile is preferred. This may consist of a wall, or more commonly the stockpile itself. The back-up holds the spoil from moving forward when the loader bucket is driven into it. This will allow the bucket edge to penetrate the pile and fill the bucket instead of just shoving the pile forward.

To load soft material such as loose soil, start with the bucket flat on the ground. Now apply as much power as possible to the tractor (without spinning the tires) and drive into the pile at such an angle that the bucket corners contact the pile at the same time. As the bucket enters the pile the bucket is tipped back and raised slightly. Now tip the bucket down slightly while still applying as much power as possible to the rear wheels.

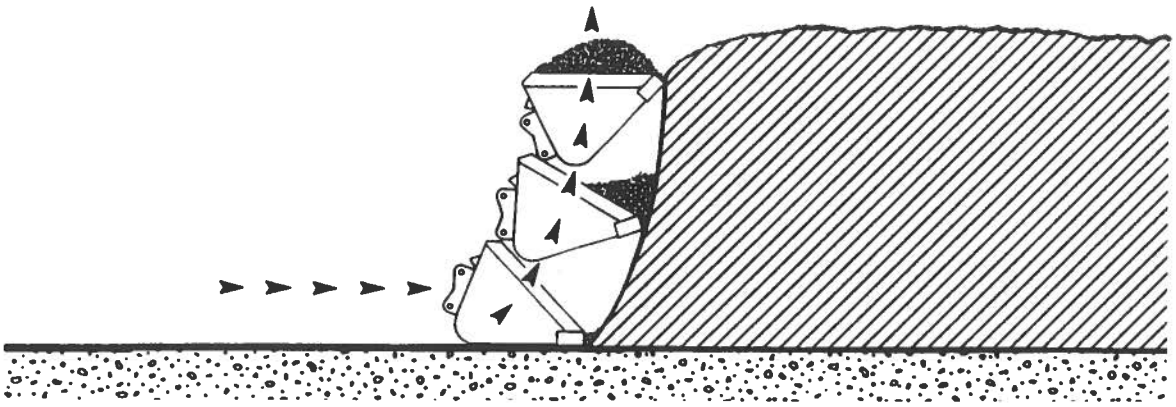


LOADING THE BUCKET (CONTINUED)

The front wheels may raise slightly, this will provide maximum rear wheel traction and bucket penetration. Rolling the bucket like this will push the spoil to the back of the bucket and help the bucket penetrate the pile. This in turn provides maximum filling of the bucket. As the bucket is filled, roll the bucket back and lift the loader arms to level the load and clear the pile.

If you are loading from a larger (higher) pile, take your first buckets from high in the pile, then take your cuts from lower down. This will keep the weight on the bottom of the pile down to the minimum and make bucket penetration easier.

When loading harder material, such as hard or packed soil, you should first try a scrapping motion. Do this by approaching the pile as before, and then lifting the loader arms and curling the bucket back in one smooth stroke upon contacting the pile. If this technique does not work, you will have to use a backhoe to break down the pile first and then load the material with the loader as before.



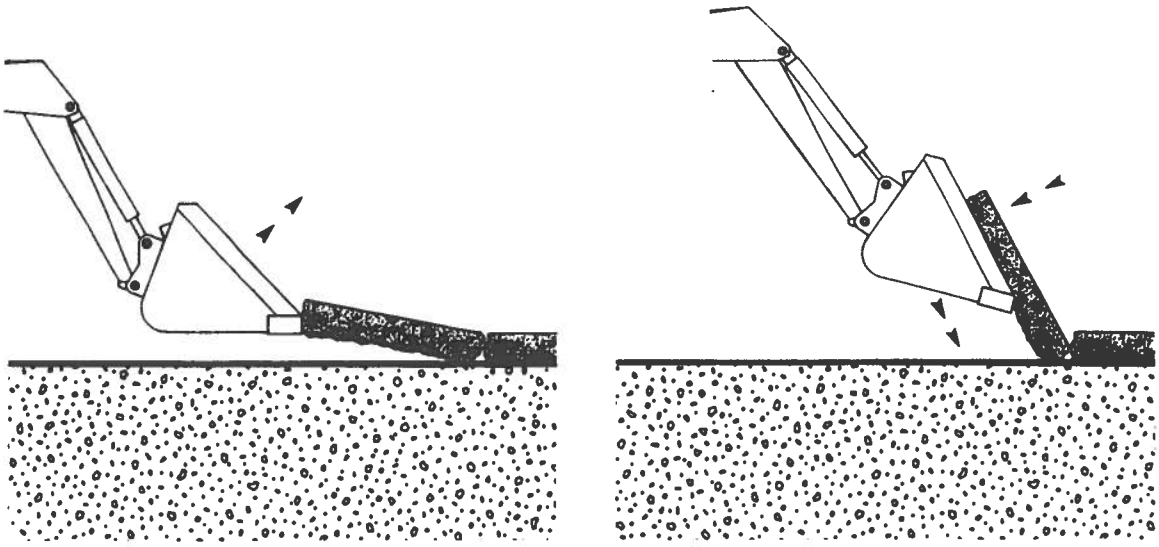
If you are loading rock or rubble with the loader the technique is the same as with soft material. It should be noted however, that such rubble is easier to load if the size of the rubble is kept to a minimum. The pile itself should be stacked as low as possible.

Large objects, such as large pieces of concrete, can be lifted and moved with the loader. It should be noted that extreme care should be used. First, push the object up against a back-up of some sort. Then hook the lip of the bucket under the edge of the object. Lift the object to approximately a 60° angle and then work the bucket down and under the object. Once the bucket edge works past the center of gravity of the object, the bucket can be rolled back to let the object rest on or in the bucket.

OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
FRONT END LOADERS

LOADING THE BUCKET (CONTINUED)



CATUION! **Never lift an oversized object with a bucket higher than the front of the tractor. If the object is raised above the front of the tractor it could slide off the bucket, down the loader arms, and into the operator.**

Never try to load oversized objects on anything but level ground.

Always move slowly and with caution when transporting an oversized object to prevent it from being jarred out of the bucket.

SHUTTLING

Once the bucket is loaded it will inevitably be shuttled (transported) to another area and dumped. There are some things to remember when shuttling a load.

Always keep the bucket as low as possible. The lower the bucket is the more stable the tractor will be. You do not however want the load so low that you risk hitting the ground with the bucket when going over bumps or up inclines.

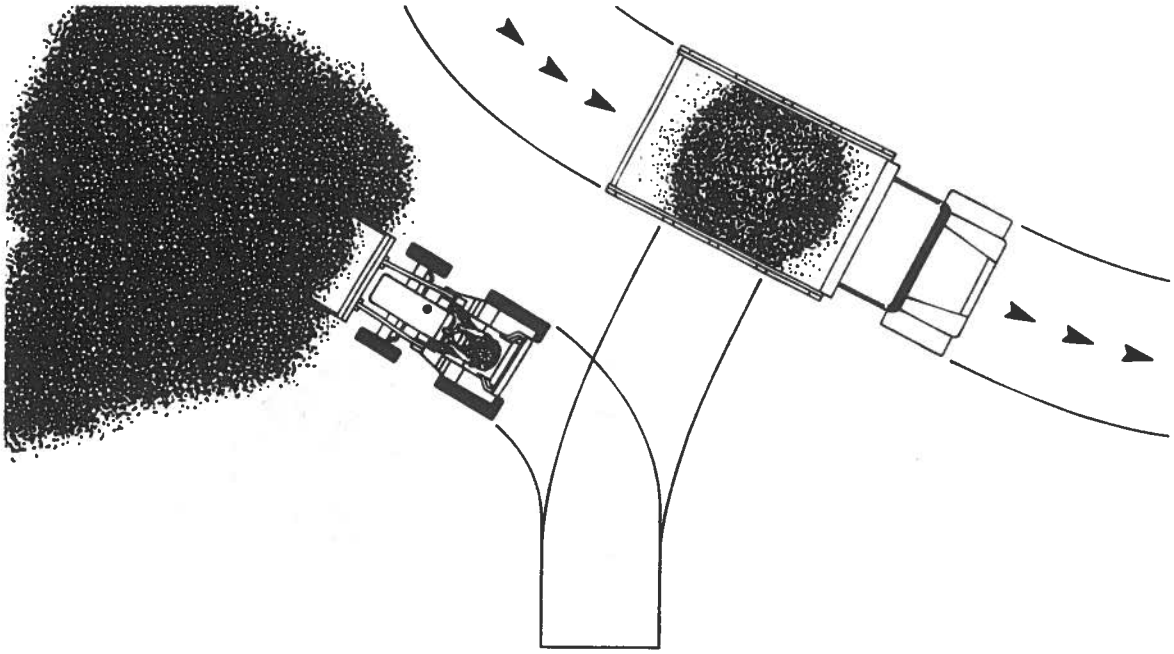
Observe the shuttle path and make a mental note of any obstructions that will have to be moved or avoided. Also keep the path as smooth as possible. Do this by back-dragging the route on return trips to smooth out developing ruts or bumps. Give the bucket a couple of quick shakes when dumping to avoid loose material falling out onto the shuttle path.

OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
FRONT END LOADERS

LOADING TRUCKS

When loading material onto trucks for removal, take the time to figure out the most efficient and safest method of loading. Try to route the trucks in a way that will allow them to drive through the site, and not have to waste time backing up. Arrange the loading area in such a way that loader movement is kept to a minimum, and that loading can be done on firm level ground.



CAUTION! **Never load a vehicle in such a way that the loader bucket passes over the operator's compartment of the vehicle being loaded. Falling material from the bucket could result in damage to the vehicle or injury to it's occupants.**

Use caution when approaching the vehicle. Be sure the bucket will clear the sides of the vehicle before and after it is dumped. Avoid pulling the tractor so far foreward that the front of the tractor contacts the vehicle.

STOCKPILING

Often material will be stockpiled instead of immediately removed. Locate the stockpile in such a way that it is easy to add or remove material from the pile. Keep in mind that other activities may be going on around the job site before the pile is moved. Make sure the stockpile location will not interfere with the work of others.

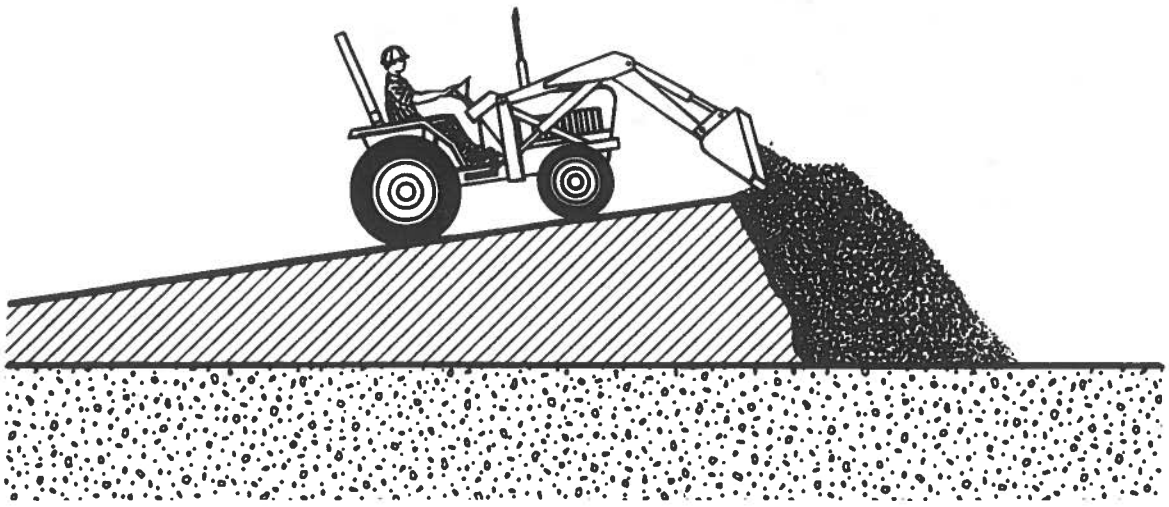
OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
FRONT END LOADERS

STOCKPILING (CONTINUED)

Try to position the stockpile so that there is adequate backup for later loading and removal. Start the pile at the farthest end of the stockpile location to avoid having to drive around the pile to unload later.

If space is at a premium, it may be beneficial to make a "two story" stockpile. This is accomplished by creating a ramp as the material is unloaded to elevate the loader and allow it to create higher piles. The pile is built by starting the ramp first and continually dumping material over the end of the ramp to build the ramp and pile. When backing down the pile, backdrag the bucket to smooth and compact the ramp so it can safely support the loader.



CAUTION! **Keep the slope of the ramp small so that tractor control can be maintained when traveling on the ramp.**

Avoid the edges of the ramp. Material on the edge will always remain soft and will not support the loader's weight. Driving on the edge could cause the tractor to sink in the soft material and become stuck or tip over. For safety, make the ramp 1½ times the tractor width.

GRADING

We have covered the basics of moving material with the loader. The other main purpose of the loader is for grading (this includes compacting). The basic idea behind grading is to remove material from the high areas and use it to fill in the low spots until the desired landscape has been achieved.

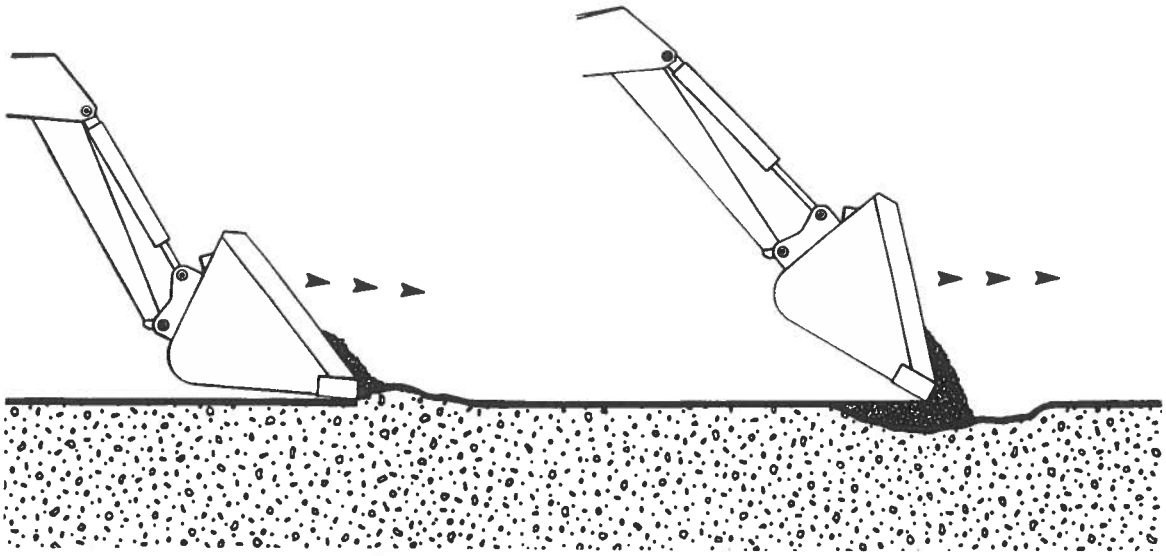
GRADING (CONTINUED)

It should be noted that the loader is best left for grading on basically flat surfaces. The unit has a relatively high center of gravity. This high center of gravity results in an unstable condition when operating on slopes. Work on sloped terrains is best left for other equipment.

When making cuts you should visually study the terrain and decide how much material you will have to remove and what approach you will need to get the desired cut. Also take note of where you will need fill and how much you will need.

The approach to the cut is critical since the cutting edge angle of the loader bucket is not adjustable. You may have to take several cuts so the tractor can run at the proper angle to make the desired finished cut.

Areas that are low will require fill material. It should be noted that any spot that is filled will require about one third the fill depth of addition material to allow for compaction.

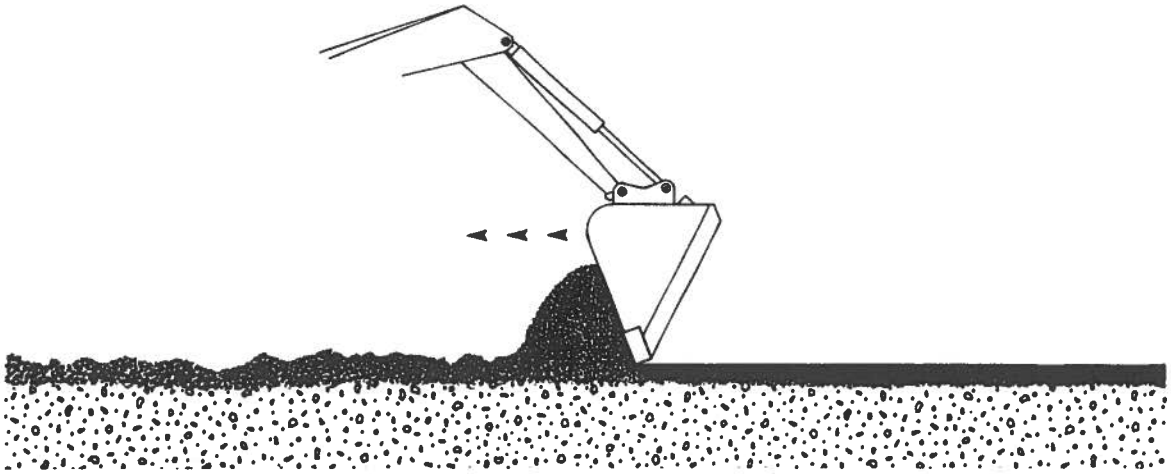


Once the rough grading has been completed, the finish grading can be started. This may be accomplished by first taking a bucket about 1/3 full and resting it flat on the ground. Move the tractor forward slowly. To cut out a high spot, tip the bucket forward slightly. Tip the bucket up slightly to fill in the low spots. After a pass has been completed, backdrag the area with the bucket tipped forward and using it's back edge. Backdragging is best done in float position to keep the hydraulic pressure and the weight of the tractor off the bucket.

OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
FRONT END LOADERS

GRADING (CONTINUED)

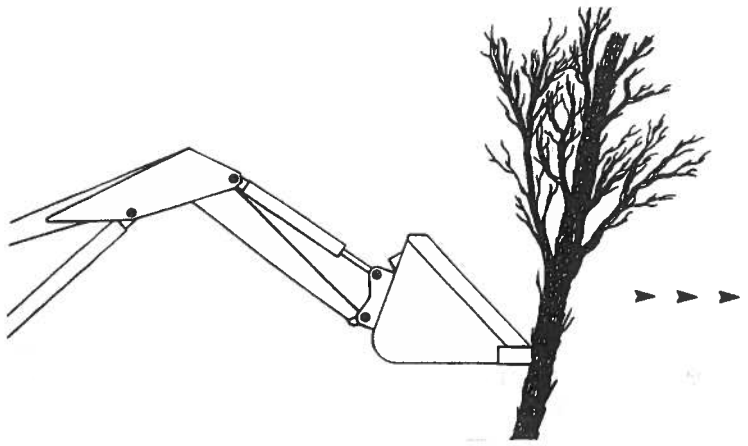


COMPACTING

The whole time you are shuttling over the job site you are compacting the soil with the tires. Some areas with considerable fill will require repeated compacting between layers to ensure solid ground. The best way to compact soil is to make sure it is damp first. Water acts as a lubricant allowing the soil particals to slide together and better compact. Make sure the soil is evenly moistened. It should be damp, but not muddy.

SMALL TREE REMOVAL

Small trees can be removed with the loader. To do so, raise the bucket high to obtain good leverage. Make contact gently to reduce the impact to the operator and equipment. The bucket must be positioned with the bottom paralled with The ground. Push with the cutting edge of the bucket. Do not push with the top of the bucket.

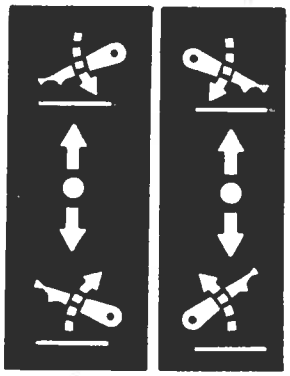


OPERATING INSTRUCTIONS

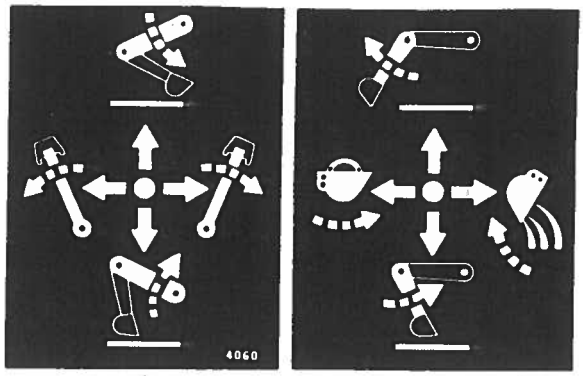
CONTROLS

GENERAL INFORMATION

Your backhoe is operated by four different control levers. Two are for stabilizer operation and the other two operate the swing, boom, dipper, and bucket functions. The information contained below will help you become familar with the operation of each control lever. Read the safety precautions (Section B) of this manual before attempting to use the backhoe. Remember, right and left when referred to on this page are determined by the operator's position seated at the backhoe controls facing the bucket.



LEFT RIGHT
STABILIZERS



BOOM/SWING DIPPER/BUCKET
CONTROL LEVERS

BACKHOE STABILIZER LEVERS

Moving the stabilizer lever(s) forward will bring the backhoe stabilizer (s) "Down". Moving the stabilizer lever(s) rearward will raise the backhoe stabilizers "Up". Both stabilizers are required to be down for proper stability of the backhoe when in operation.

BOOM/SWING LEVER (LEFT HAND LEVER)

Pushing the boom/swing lever forward will "Lower" the boom dipstick and bucket. Pulling the lever rearward will "Lift" the boom, dipstick, and bucket.

Pushing the boom/swing lever to the left will swing the boom and bucket to the "Left". Pushing the lever to" the right will swing the boom, and bucket to the "Right".

DIPPER/BUCKET LEVER (RIGHT HAND LEVER)

Pushing the dipper/bucket lever forward will move the dipstick and bucket "Out" or away from the operator. Pulling the lever rearward will move (crowd) the dipper and bucket "In" or toward the operator.

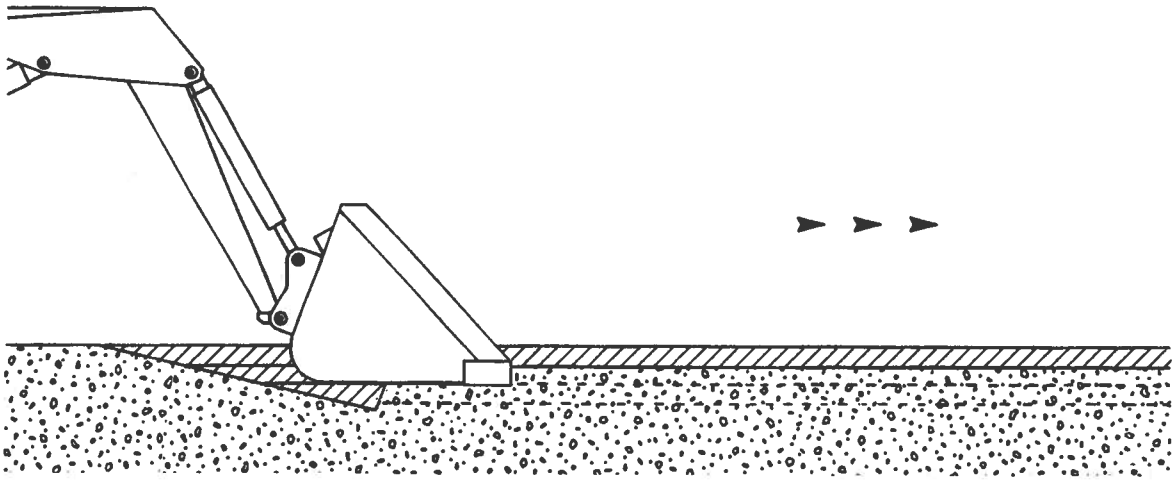
Pushing the dipper/bucket lever to the left will "Fill" or curl the bucket (move inward). Pushing the lever to the right will "Dump" the bucket (move outward).

OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
FRONT END LOADERS

DIGGING WITH THE LOADER

The loader can also be used to rip or peal ground. This is often done in winter to remove the frozen top soil. Start by tilting the bucket slightly forward, lower the bucket and make about a 6 foot long cut. Break-out cleanly. Now level the bucket and make a cut about 2" deep starting at the notch you just cut. Adjust the bucket when the tires roll into the excavation. Continue to make 2" cuts until the desired depth is reached. Feather the bucket control to maintain an even cut during each pass.



OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
ATTACHMENT TYPE BACKHOES

GENERAL INFORMATION

When operating the backhoe, smoothness of technique should be strived for at all times. Smoothness will come with experience and practice at feathering the controls. Establish a flowing digging cycle to increase operator efficiency and save unnecessary wear on the machine.

Observe the following points to obtain the best results and to fully utilize the digging force of the backhoe.

WARNING!

Operate the backhoe only when seated at the controls. Any other method could result in serious personal injury or death.

Never attempt to drive the tractor when seated at the backhoe controls.

Do not raise the tractor hydraulic 3-point lift arms, as binding could result in hydraulic system failure.

Check the prospective digging area for hidden utility lines before operating the backhoe or when in doubt of their location, contact the local utility companies. When operating the backhoe in an area where utilities are expected to be present, throttle the backhoe down and proceed with caution. If you feel the backhoe bucket made contact with anything out of the ordinary, stop digging at once. Have the obstruction checked by hand. If a utility line has been damaged, contact the affected utility at once.

BEFORE YOU START DIGGING

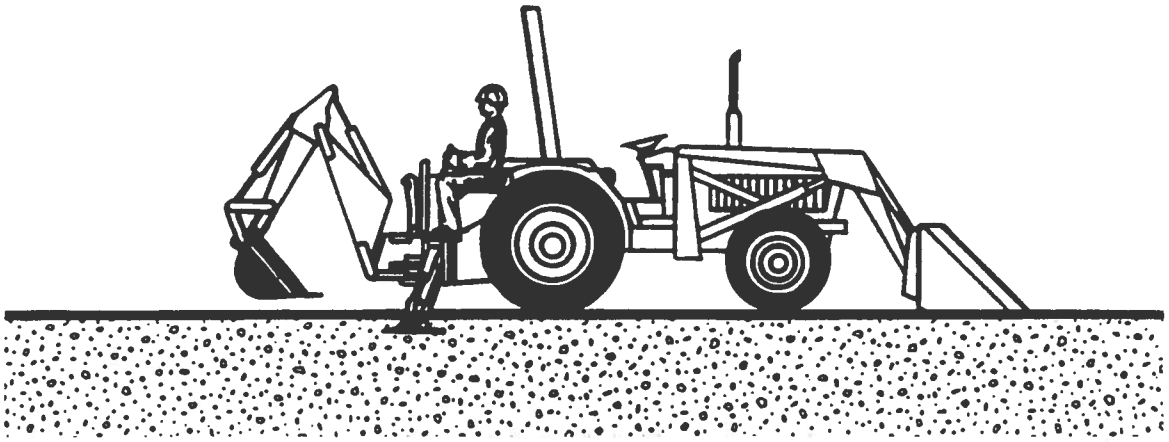
Before any excavating is started, it is always a good idea to plan out the job first. Various things need to be considered and taken into account prior to the actual digging. The operator should inspect the job site and take notice of any potential hazards in the area. He should have a complete understanding of the tasks he is expected to preform. Figure out what will be done with the spoil (excavated soil), will it be used to backfill or be trucked out? What are the soil conditions like? Will you have to work around others? Etc.

Once you have become familiar with the job site and understand the job requirements, it is time to set up for the actual digging. Position the backhoe in such a way as to minimize repositioning the unit and to maximize digging efficiency. Consider the placement of spoil and position the backhoe to be able to dig the maximum amount of soil, accurately, while leaving enough room for the spoil removed to be piled in the desired area.

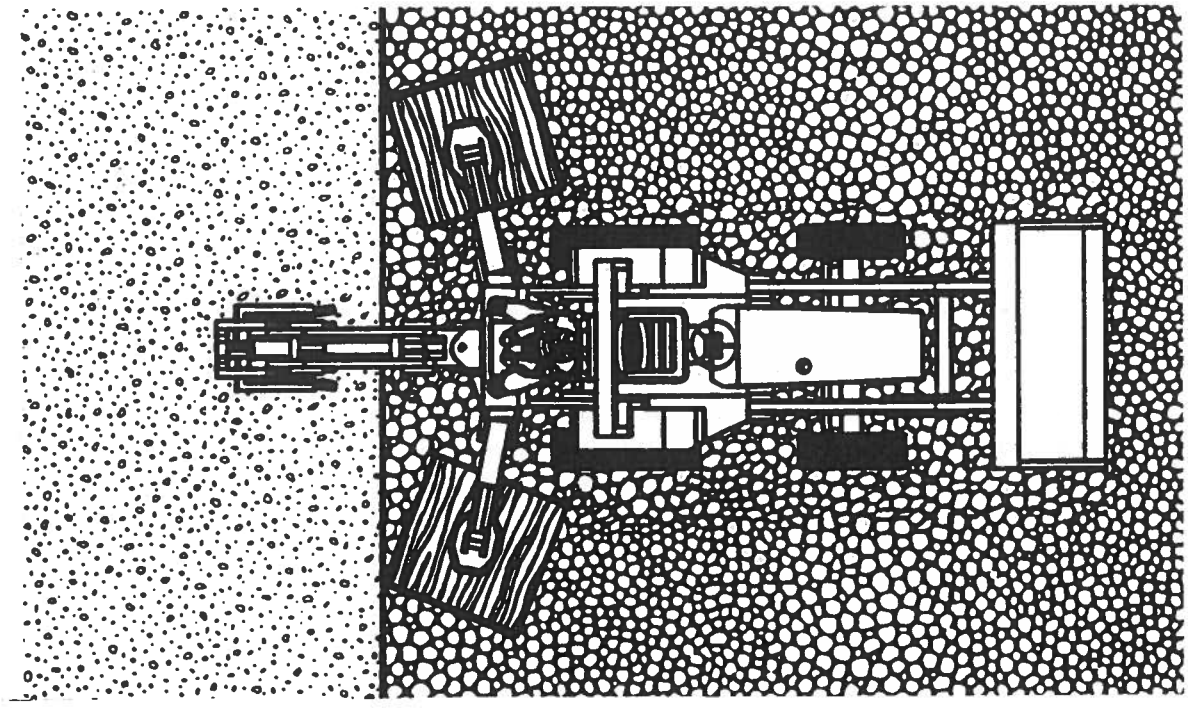
OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
ATTACHMENT TYPE BACKHOES

BEFORE YOU START DIGGING (CONTINUED)



Once the unit is positioned, lower the stabilizers to the ground. The tires should still be supporting most of the vechicle weight with the stabilizers relieving only part of the weight, and mainly acting to give the unit a wider base for increased stability and to keep the unit from moving or bouncing with backhoe use. The front end loader should also be lowered if the unit is so equipped. The vehicle should at no time be supported by the stabilizers and loader with any of its' wheels off the ground. Severe damage to the vehicle could result. When operating the unit on a delicate surface (such as concrete, or stone work) or on sandy, loose, or soft ground place plywood under the stabilizers to help distribute the load over a wider area.

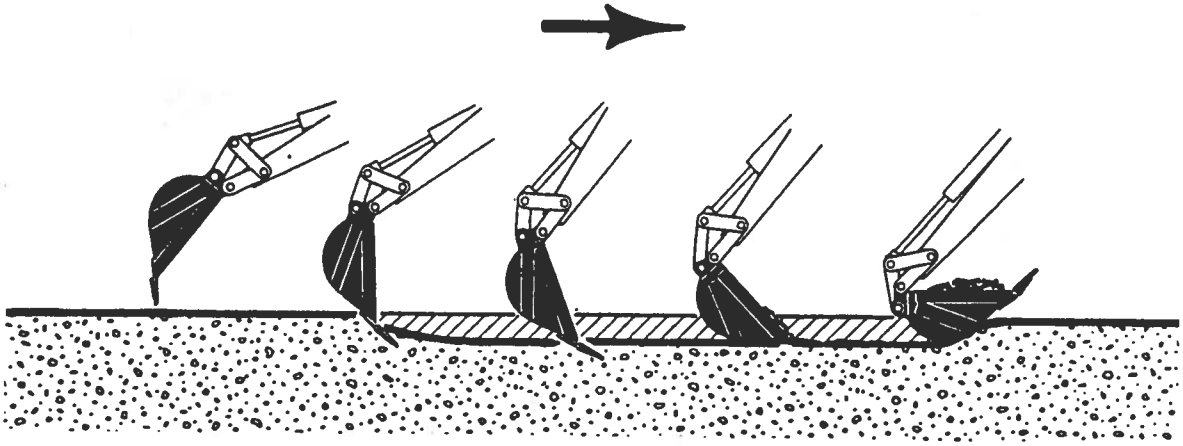


OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
ATTACHMENT TYPE BACKHOES

BASIC DIGGING TECHNIQUE

When starting an excavation, make the first cut of each section shallow, being careful to follow the exact layout of the excavation. The reason for the shallow cut is to minimize damage to the sod and to facilitate replacement. These first cuts are also important because they will act as guides for the remaining cuts, thus getting the first few cuts as accurate as possible will help in keeping all future cuts accurate.



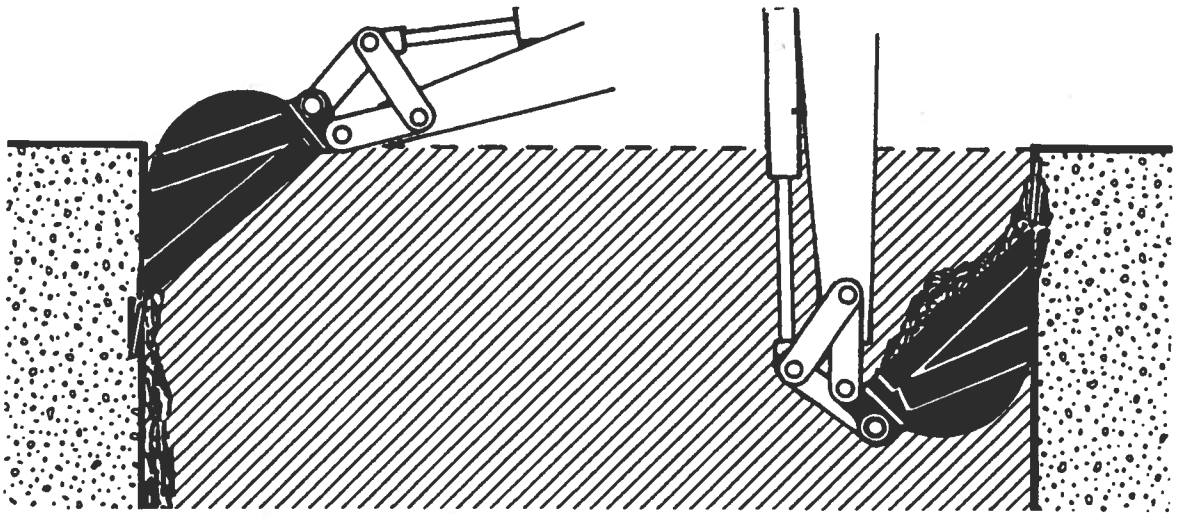
When digging with the backhoe, extend the boom, dipper and bucket out, away from the operation. Lower the boom and dipper to start the digging process. The bucket teeth should be at a 30° to 45° entry angle. As the digging starts, curl the bucket until the cutting edge is level with the horizon. Crowd the bucket in toward the operator working the bucket lever to keep the bucket level. As the bucket moves toward the operator, manipulate the boom lever to keep the cut level. At the end of the digging cycle, crowd the dipper out and completely curl the bucket while lifting it from the excavation. Once you have cleared the excavation, swing the bucket to the spoil pile. Start to dump the bucket before the pile is approached. Once the bucket is empty, swing the unit back to the excavation, positioning the bucket and dipper for the next cut in the process. The whole digging process should be one smooth cycle that is repeated until the excavation is completed.

When the excavation has been dug to within six inches of the finished bottom, clear and touch up the sides of the excavation. Use the flat sides of the bucket to scrape off any high spots. Dislodge any exposed rocks if they seem loose. When finishing walls, finish the far wall by curling the bucket out, crowding the dipper out, and forcing the bucket down. To finish the closest wall, lift the bucket up and curl it in.

OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
ATTACHMENT TYPE BACKHOES

BASIC DIGGING TECHNIQUES (CONTINUED)

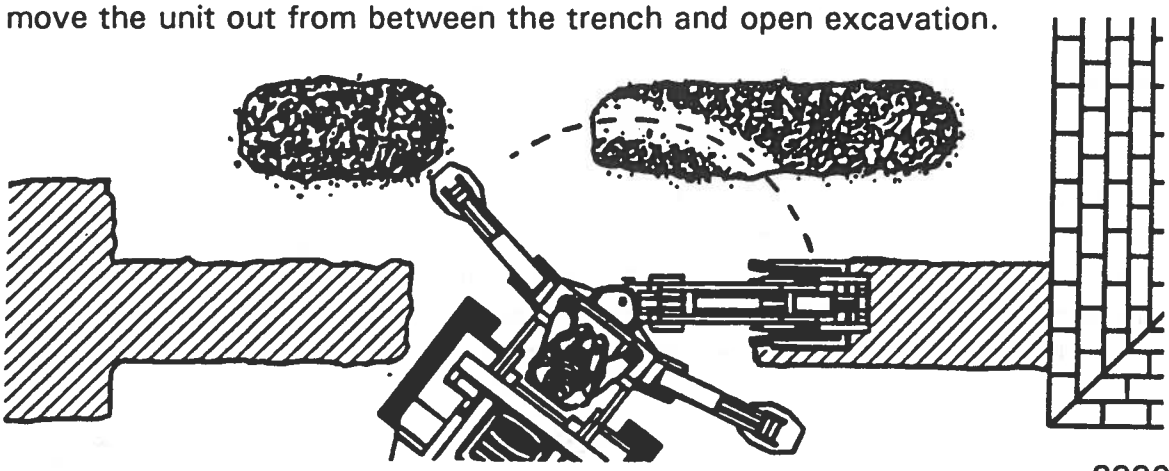


Once the sides are cleaned up, finish grading the bottom of the excavation. This is done by making the remaining cuts long and shallow, concentrating on making them level and smooth. Remove any remaining spoil. Check the excavation bottom for depth and levelness, making any adjusting cuts as needed.

The basic steps just listed at the same regardless of the excavation. All other digging jobs are simply variations of this basic procedure. Remember to make your cuts in smooth cycles. This will reduce operator fatigue and machine wear while increasing productivity and efficiency.

SPECIAL APPLICATIONS
TRENCHING BETWEEN A BUILDING AND AN OPEN EXCAVATION

Start the trench at the building and trench toward the open excavation. Dig toward the open excavation until there is just enough room to move the unit out from between the trench and open excavation.

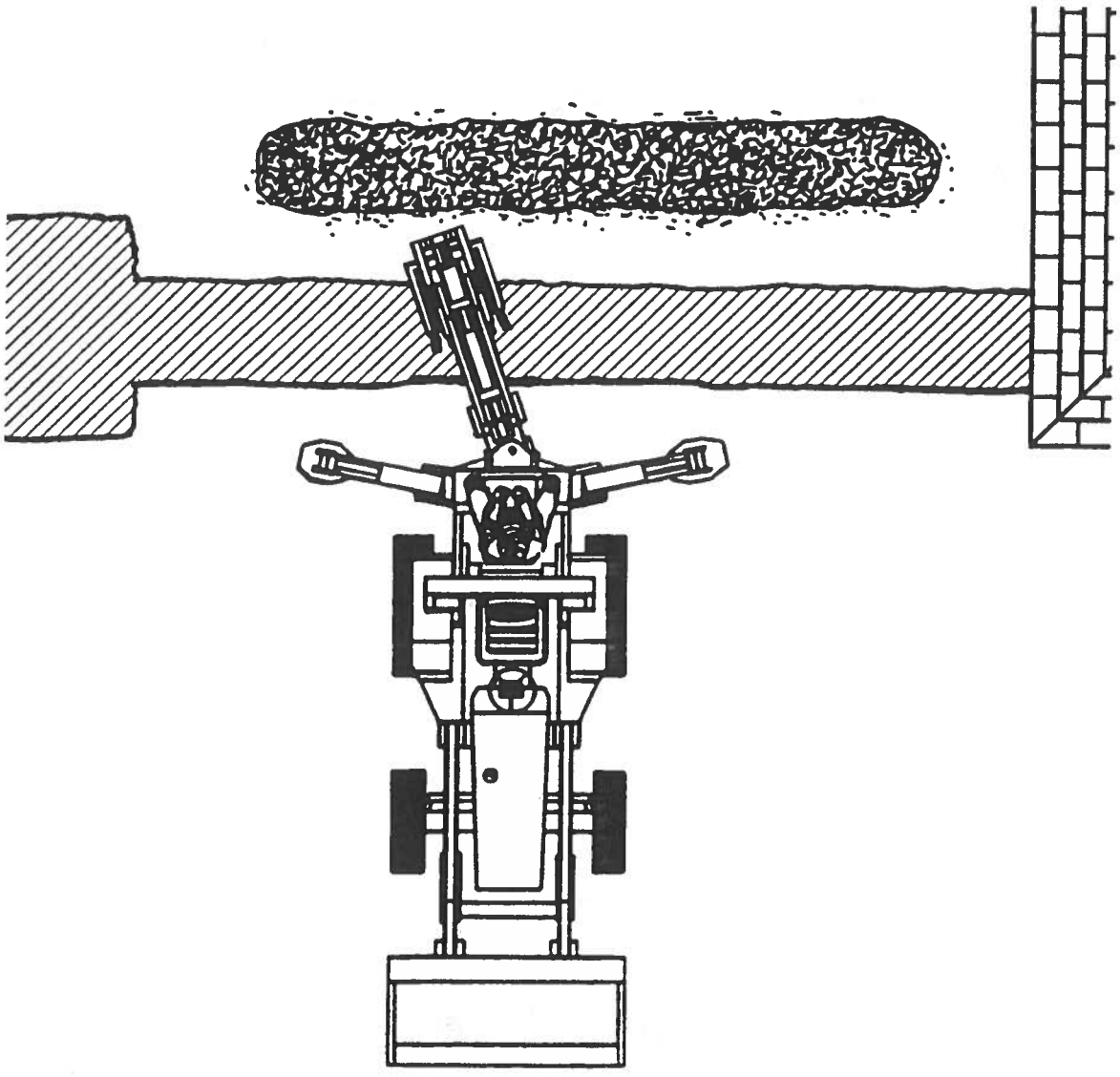


OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
ATTACHMENT TYPE BACKHOES

TRENCHING BETWEEN A BUILDING AND AN OPEN EXCAVATION (CONTINUED)

Position the unit so the backhoe swing post is over the centerline of the trench connection. Dig with the backhoe at extreme swing positions, and in as close to the stabilizers as possible. Pile the soil on the opposite side of the trenches.

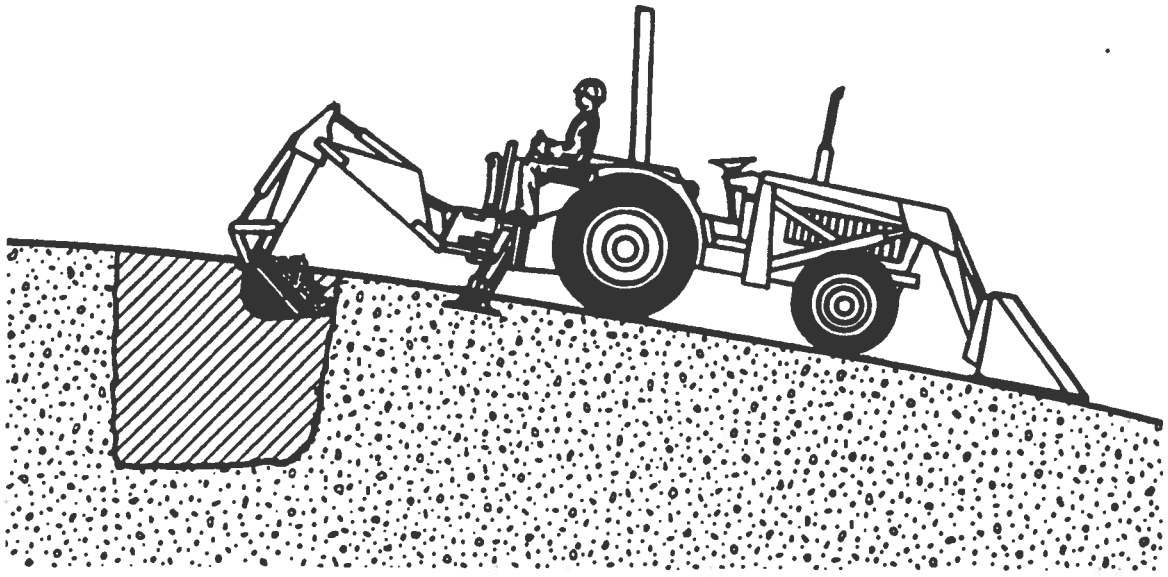


Position the unit forward so the two trenches can be connected. Pile the spoil on the opposite side of the trench.

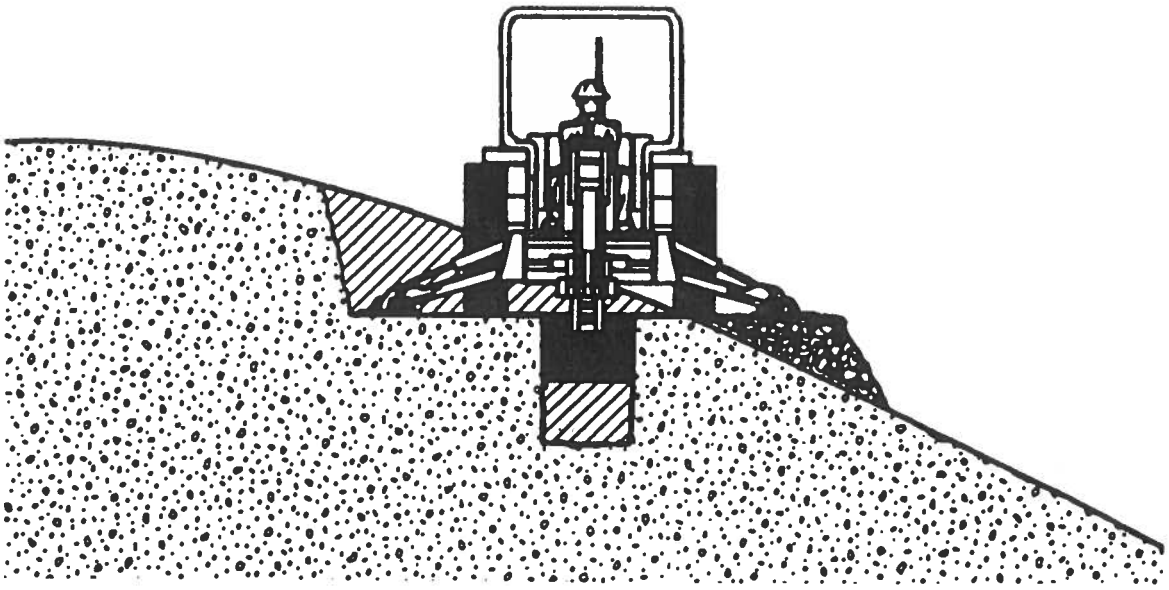
OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
ATTACHMENT TYPE BACKHOES

EXCAVATING ON SLOPES



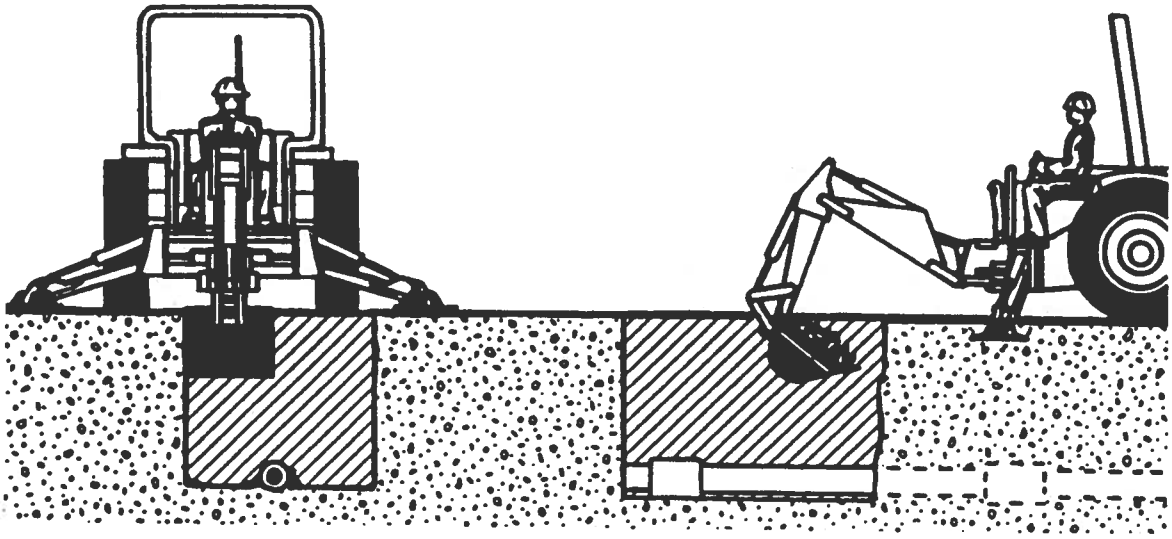
When digging on slopes always face the backhoe upgrade whenever possible. It may be necessary to cut a level surface in the hill for the backhoe to sit in when operating on slopes. This will allow the backhoe to sit level for digging the main excavation. Pile the spoil from the surface downhill. When digging the main excavation, pile the spoil uphill.



OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
ATTACHMENT TYPE BACKHOES

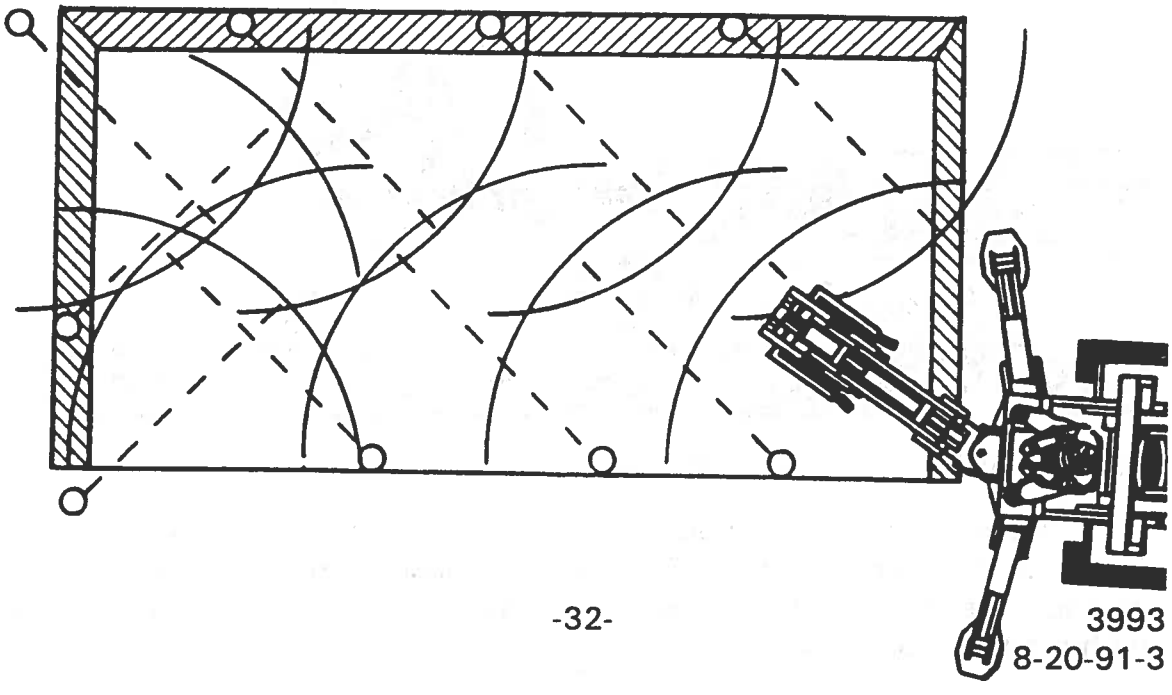
PIPELINE LEAK REPAIR



To check for pipeline leaks, start by digging a bellhole about six feet wide and ten feet long. Then, dig lengthwise along the pipeline to locate the leak. Once the leak is located, position the unit to dig at grade level on both sides of the pipeline. If a section of pipe is to be replaced, strip the soil from both ends of the bellhole. Enlarge the hole enough to allow the workmen adequate working space in the leak area.

DIGGING STRAIGHT WALL SHALLOW BASEMENTS

Begin at one corner, and remove as much material as possible to grade level. Reset the unit forward and continue digging to the grade level. Progress around the edge of the basement, finishing each corner as you come to it.



OPERATING INSTRUCTIONS

OPERATING TECHNIQUES
ATTACHMENT TYPE BACKHOES

MISCELLANEOUS - BACKFILLING

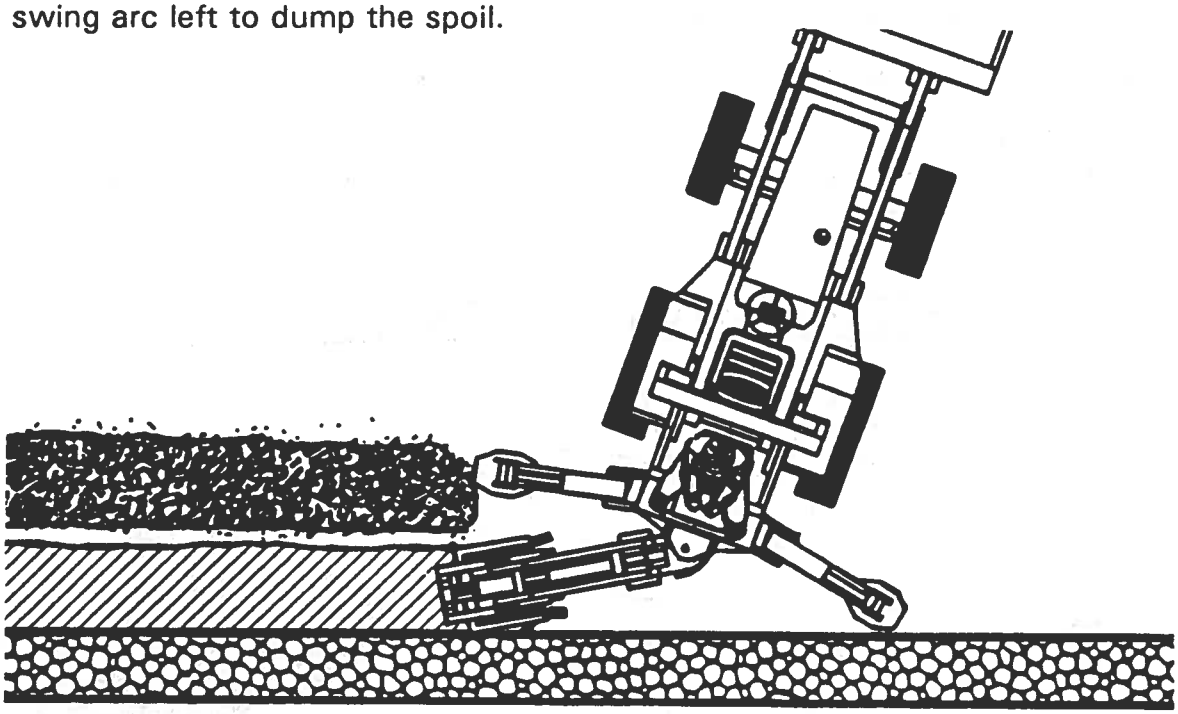
To backfill an excavation, lower the extended bucket into the spoil pile. Curl the bucket and lift it clear of the spoil pile. Swing the bucket to the excavation and extend the bucket. Return the bucket to the spoil pile and continue the cycle until the job is completed.

IMPORTANT: Do not backfill by using the swing circuit and dragging the bucket sideways. Doing so could cause damage to the dipper, boom, and swing cylinders or mainframe.

IMPORTANT: Avoid constant jarring or hammering contact between the spoil pile and the loaded bucket as this may cause premature wear to the backhoe pins and bushings.

MISCELLANEOUS - EXCAVATING BY A WALL

To excavate by a wall, where the wall will interfere with the stabilizer placement, move the backhoe in at an angle to the wall. Concentrate on getting the swing pin as close to the wall as possible while leaving enough swing arc left to dump the spoil.



MISCELLANEOUS - HARD GROUND OPERATION

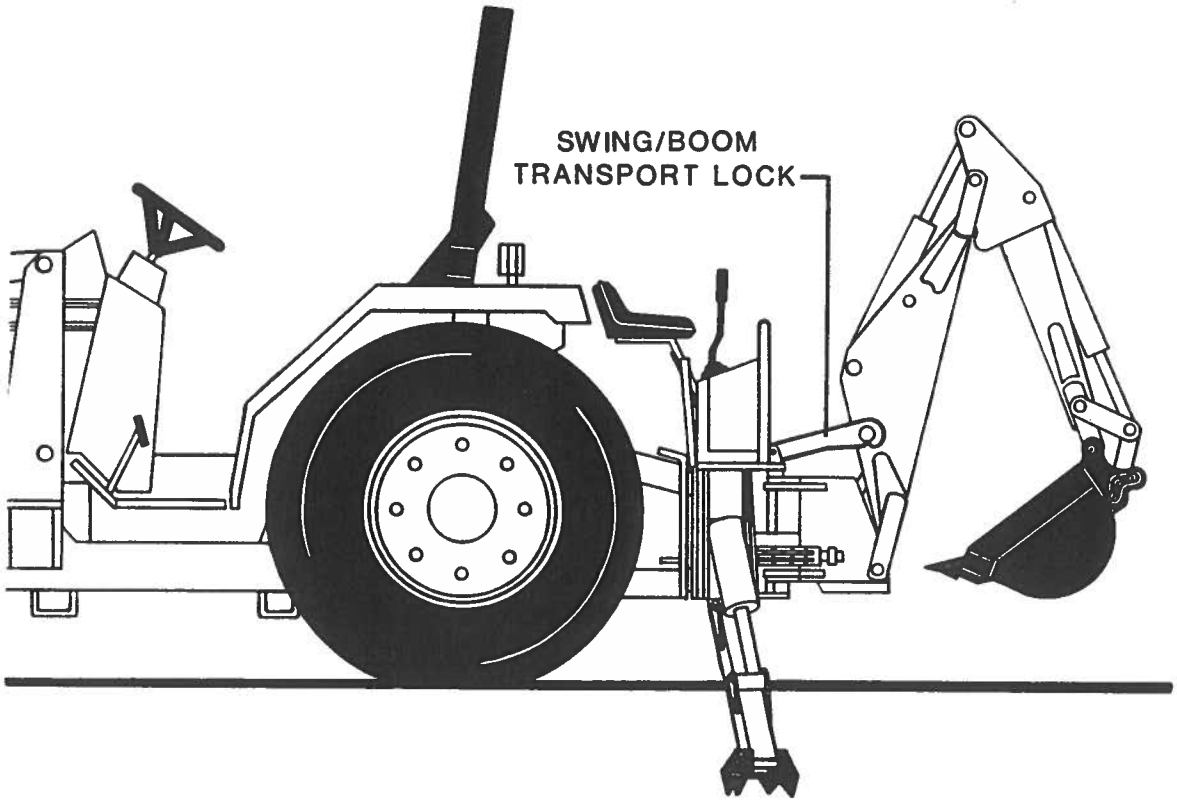
When digging in hard ground, it may be necessary to decrease the bucket angle of entry to the point where the back of the bucket almost contacts the ground. It may also be necessary to apply downward pressure with the boom on the bucket.

OPERATING INSTRUCTIONS

TRANSPORTING
MD2 SERIES BACKHOES

GENERAL INFORMATION

Follow the simple steps listed below when preparing the backhoe for transportation between work sites. Read and follow the safety precautions for backhoe transporting listed in Section B of this manual before moving the backhoe.



1. Before transporting the backhoe, position the boom, dipper and bucket as shown above.

2. Latch the swing/boom transport lock.

3. Raise all stabilizers.

CAUTION! **Be sure to install a SMV (Slow Moving Vehicle) sign on the backhoe dipper before attempting to transport the backhoe.**

When transporting the backhoe on a road or highway at night or during the day, use accessory lights and devices for adequate warning to the operators of other vehicles. In this regard, check local government regulations.

Always drive slowly over uneven terrain to avoid tipping the backhoe.

LUBRICATION

GENERAL INFORMATION

Economical and efficient operation of any machine is dependent upon regular and proper lubrication of all moving parts with a quality lubricant. Neglect leads to reduced efficiency, heavy draft, wear, breakdown, and needless replacement parts.

All parts provided with grease fittings should be lubricated as indicated. If any grease fittings are missing, replace them immediately. Clean all fittings thoroughly before using grease gun.

IMPORTANT: Avoid excessive greasing. Dirt collects on exposed grease and greatly increases wear. After greasing, wipe off excessive grease from fittings.

LUBRICATION SYMBOLS

The following symbols are used on the lubrication diagram printed on the next page. They are reproduced here with their meanings for your convenience.

Lubricate daily or every 8 hours of operation, whichever comes first, with SAE Multi-Purpose Lubricant or an equivalent SAE Multi-Purpose type grease.

Lubricate every 100 hours of operation with SAE Multi-Purpose grease.

Lubricate roller chain periodically with a chain lubricant.

CAUTION! **Shut off vehicle engine before lubricating equipment.**

NOTE: If your unit was shipped with a PTO pump or front pump, it is important to use the correct type of hydraulic fluid for your unit. Proper fluid will ensure that your unit performs to its' designed capabilities. Hydraulic fluid should have an SUS viscosity at 100°F of between 1100 and 2500, and an SUS viscosity at 210°F between 92.7 and 154. Viscosity index should be between 95 and 98. Pour point should be -12C/10F. We recommend Sunvis 999, 9112, 9135, or 9150.

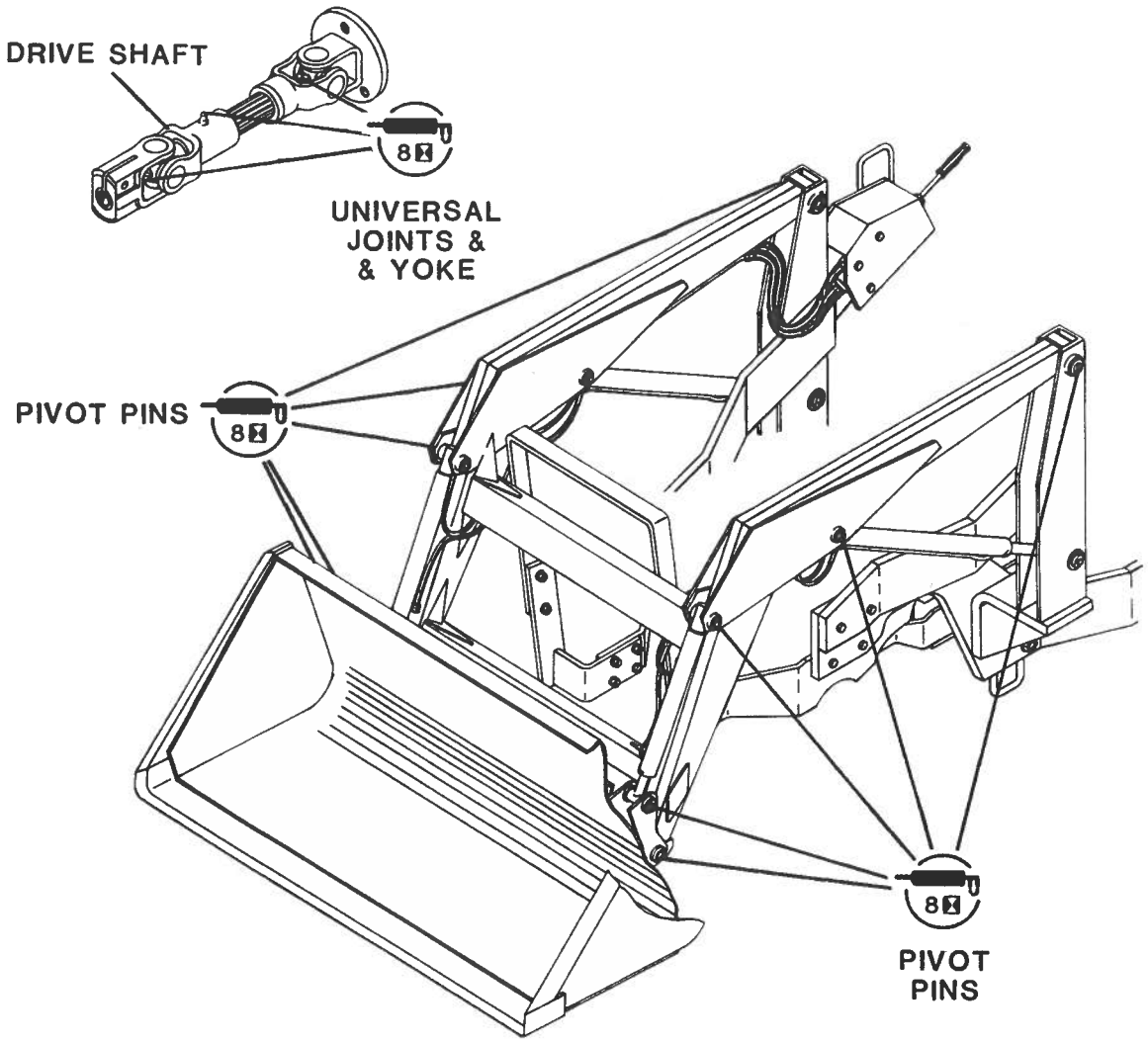
LUBRICATION

315 LOADER

LOADER LUBRICATION DIAGRAM

The following diagram is provided to help you locate all the points on your loader that need lubricating. Be sure to follow the lubrication intervals as noted by the lubrication symbols used on this page. Always replace any missing grease fittings as soon as possible.

If your unit came with an hydraulic fluid reservoir (PTO tank), check the reservoir fluid level before operating the loader. Fill the reservoir as necessary with a good quality hydraulic fluid. Replace the original filter after the first 2½ hours of operation. Change subsequent filters every 75 hours.



IMPORTANT: Your loader has ten grease zerks. If your unit has a front pump with a crank driven drive shaft, you will have to grease the shaft. There is a grease zerk in the center of each universal joint on the shaft, and one in the side of the sliding yoke. Grease <u>all</u> zerks after each eight hour operating interval.

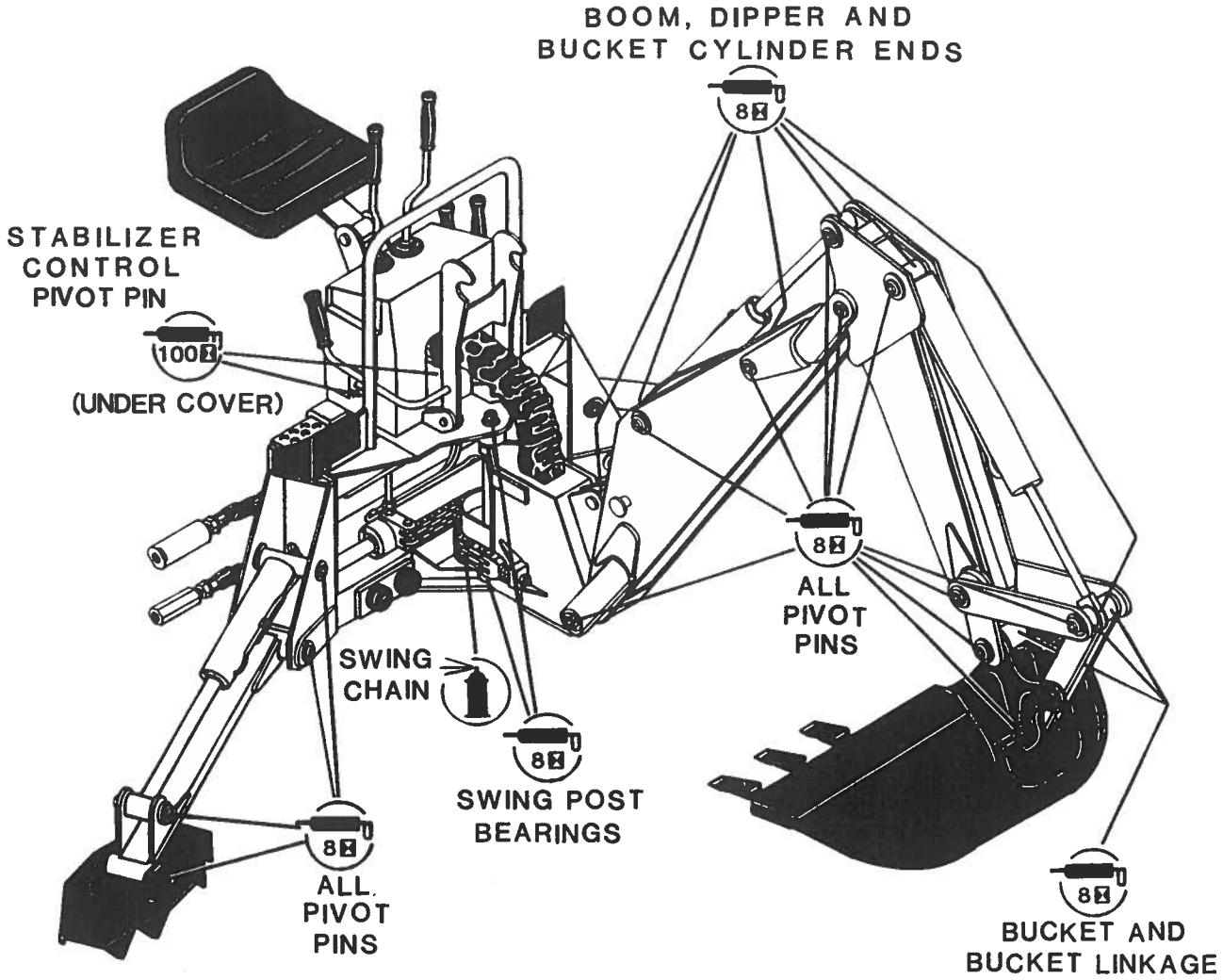
LUBRICATION

MD2 SERIES BACKHOES

BACKHOE LUBRICATION DIAGRAM

The following diagram is provided to help you locate all the points on your backhoe that need lubricating. Be sure to follow the lubrication intervals as noted by the lubrication symbols used on this page. Always replace any missing grease fittings as soon as possible.

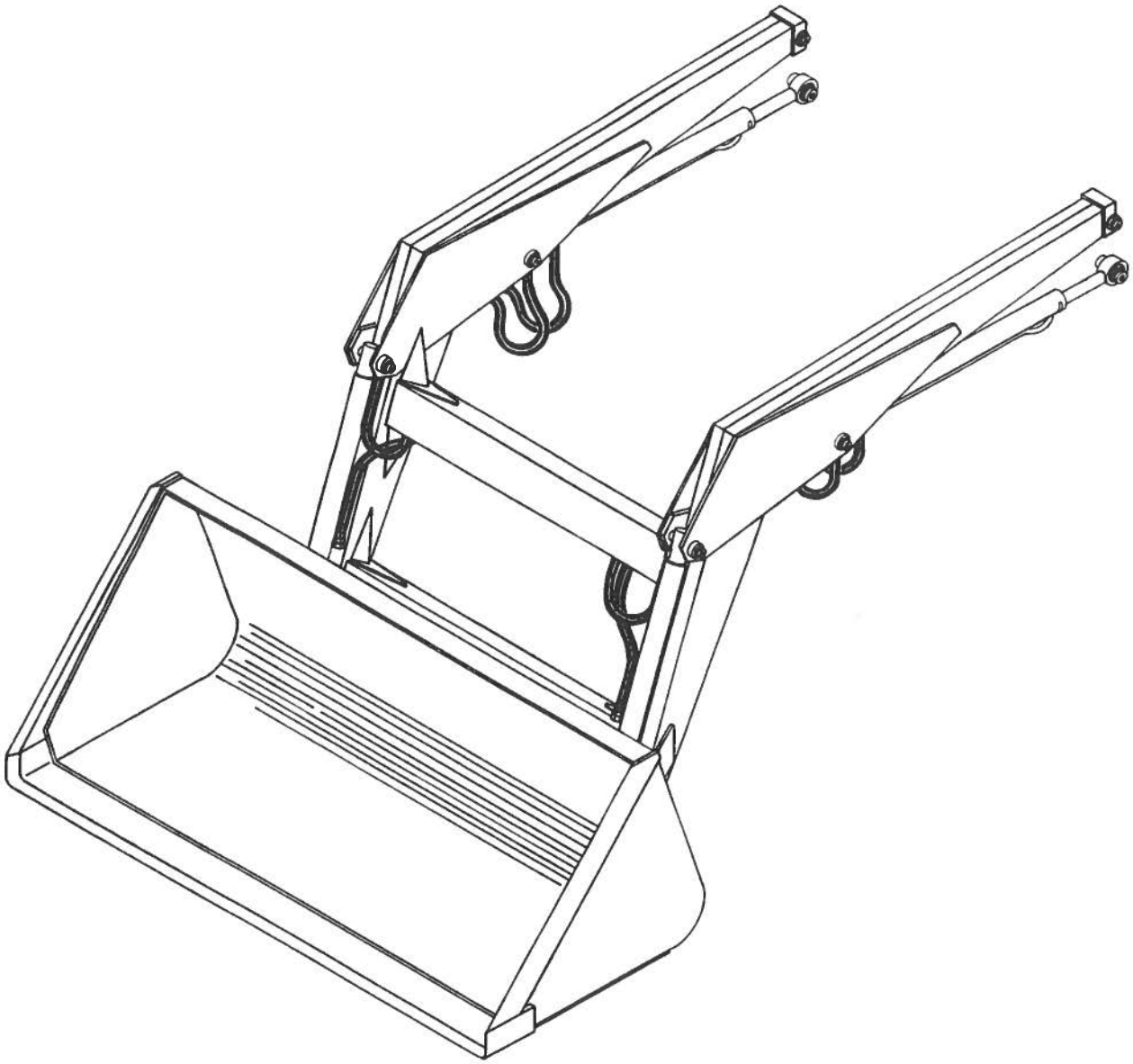
If your unit came with an hydraulic fluid reservoir (PTO tank), check the reservoir fluid level before operating the backhoe. Fill the reservoir as necessary with a good quality hydraulic fluid. Replace the original filter after the first 2½ hours of operation. Change subsequent filters every 75 hours.



IMPORTANT Grease all zerks after each eight hour operating interval. The boom, dipper, and bucket cylinders have two zerks each. One zerk in the rod end and one in the base end. The swing post has two bearings (one at the top and one at the base) that are lubricated by separate zerks. All boom, dipper, and bucket pivot pins have two zerks (one in each end). Both zerks must be greased for proper pin and bushing lubrication.

LOADER ASSEMBLY

315 LOADER

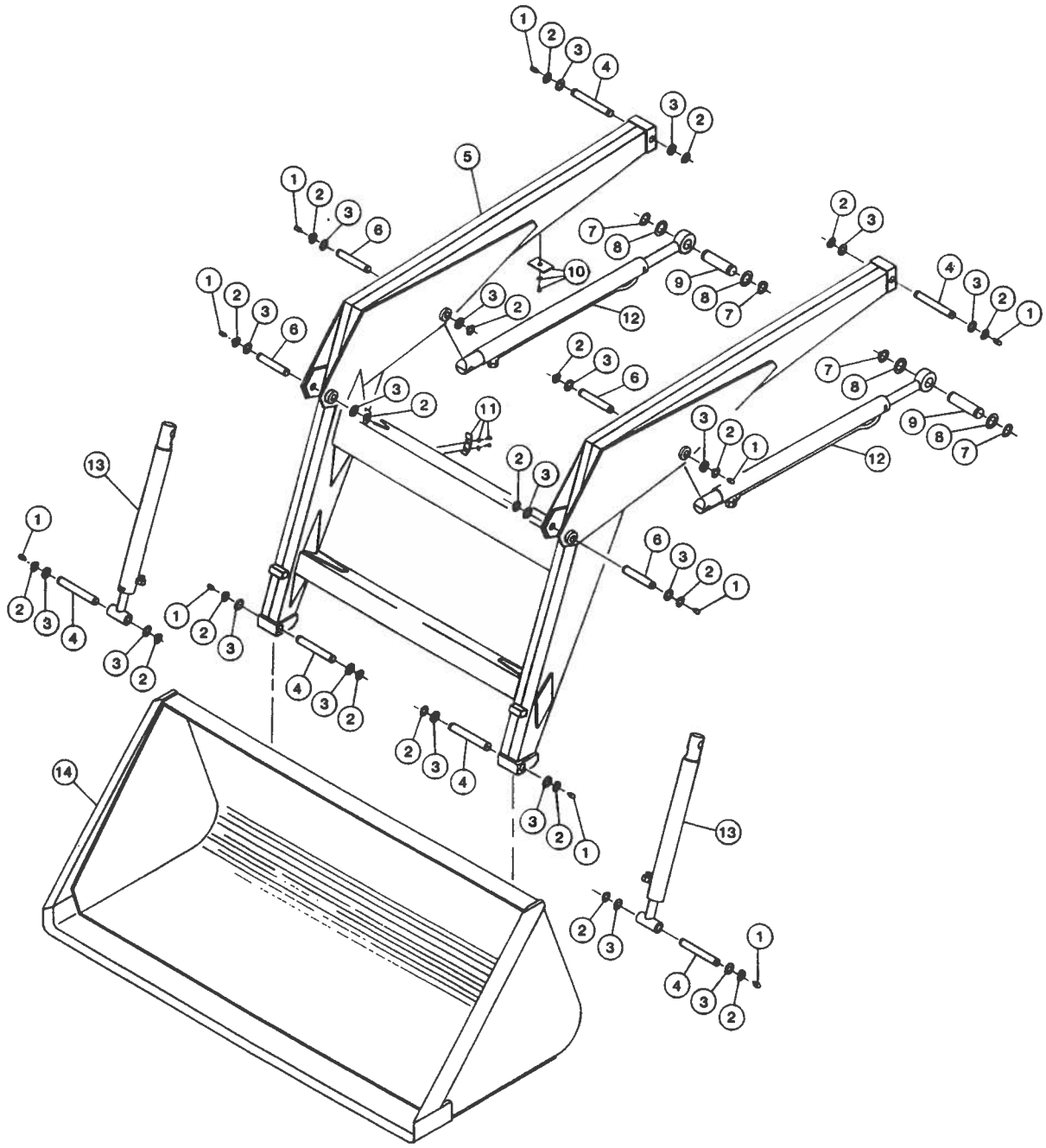


5105 2-27-90

LOADER ASSEMBLY

315 LOADER
ASSEMBLY #68344

DIAGRAM 1 OF 2



4458 11-1-88

LOADER ASSEMBLY

315 LOADER
ASSEMBLY #68344

LIST 1 OF 2

NO.	REQ'D	PART NO.	DESCRIPTION
1	10	6616	Grease Zerk
2	20	1738	1.06" Snap Ring
3	20	61079	1.06" Thrust Washer
4	6	61091	Pin
5	1	68399	Loader Arm Frame
6	4	68398	Pin
7	4	1684	1.50" Snap Ring
8	4	68057	1.50" Thrust Washer
9	2	67485	Lift Cylinder Pin
10	1	68132	Tube Clamp
	1	1501	.25" UNC Lock Washer
	1	1783	.25" UNC X 1.75" Self Tapping Screw
11	2	51675	Hose Retainer
	4	1501	.25" UNC Lock Washer
	4	1783	.25" UNC X 1.75" Self Tapping Screw
12	2	68341	Lift Cylinder
13	2	68326	Bucket Cylinder
14	1	VARIES	Bucket-Sold Separately, Not Included In Assembly #68344

4459 11-1-88

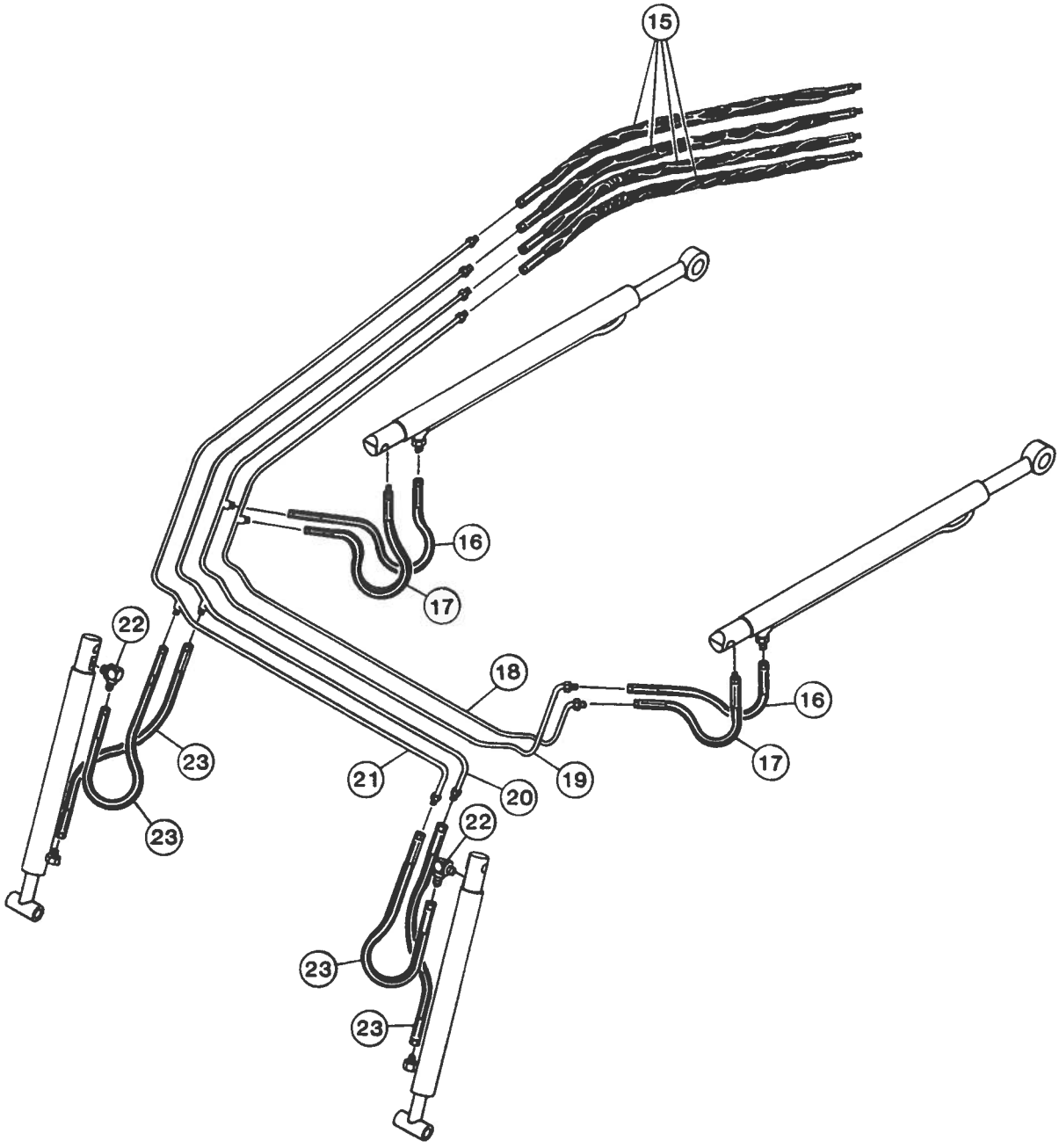
LOADER ASSEMBLY

315 LOADER

ASSEMBLY #68344

DIAGRAM 2 OF 2

4460 11-1-88



LOADER ASSEMBLY

315 LOADER

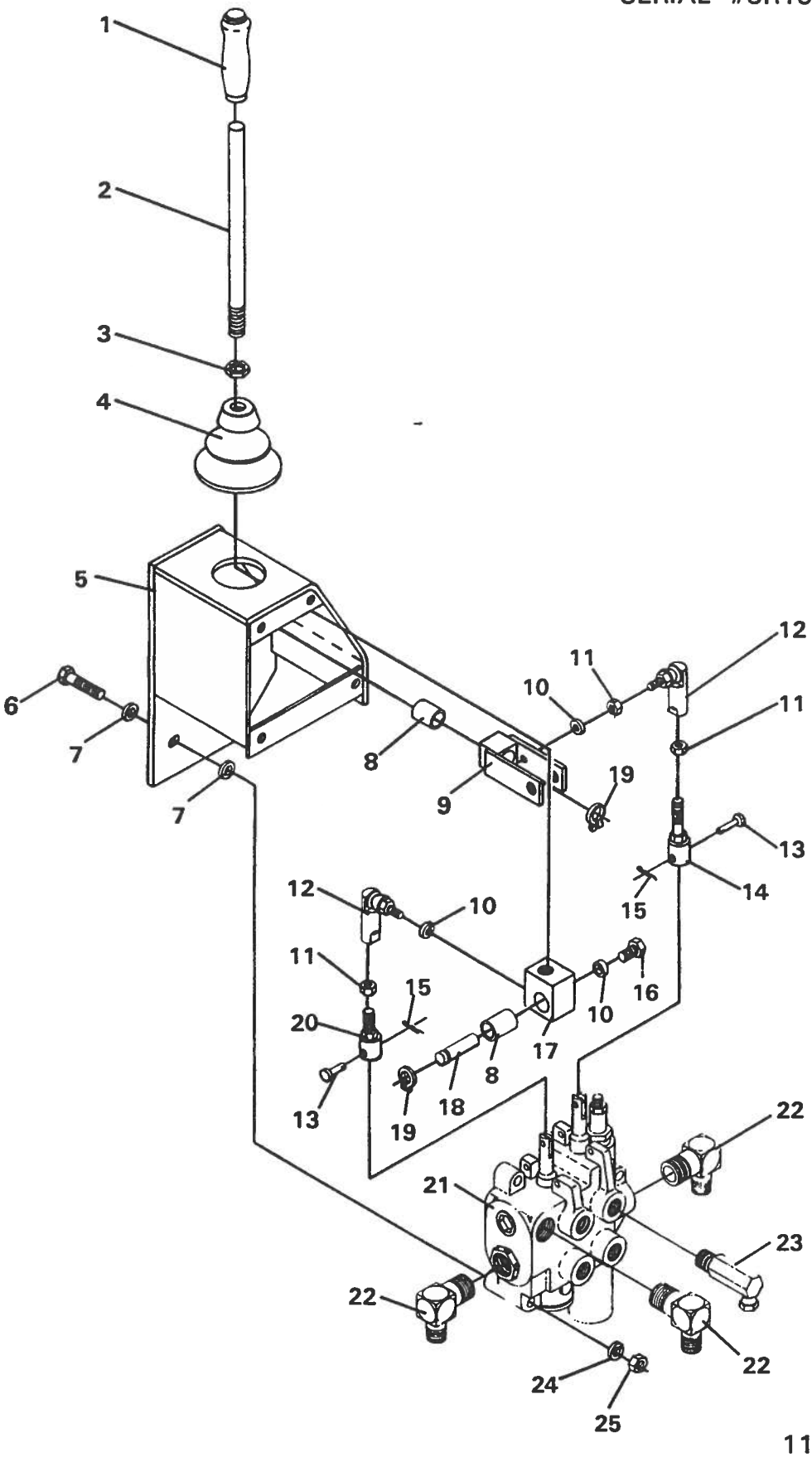
ASSEMBLY #68344 **LIST 2 OF 2**

NO.	REQ'D	PART NO.	DESCRIPTION
15	4	35985	Hose Assembly .25" X 36" (SAE 100R2-2Wire) 4MP-6FJX-HS
16	2	37016	Hose .25" X 15" (SAE 100R2-2Wire) 6FJX-6FJX
17	2	37015	Hose .25" X 15" (SAE 100R2-2Wire) 4MBo-6FJX
18	1	68626	Lift Cylinder Hydraulic Tube (Raise)
19	1	68625	Lift Cylinder Hydraulic Tube (Lower)
20	1	68624	Bucket Cylinder Hydraulic Tube (Curl)
21	1	68623	Bucket Cylinder Hydraulic Tube (Dump)
22	2	3417	4MBo-6MJIC 90° Adaptor
23	4	37017	Hose .25" X 21" (SAE 100R2-2Wire) 6FJX-6FJX

LOADER ASSEMBLY

CONTROL VALVE
ASSEMBLY #80270

SERIAL #3R198 & UP



5953
11-23-92

LOADER ASSEMBLY

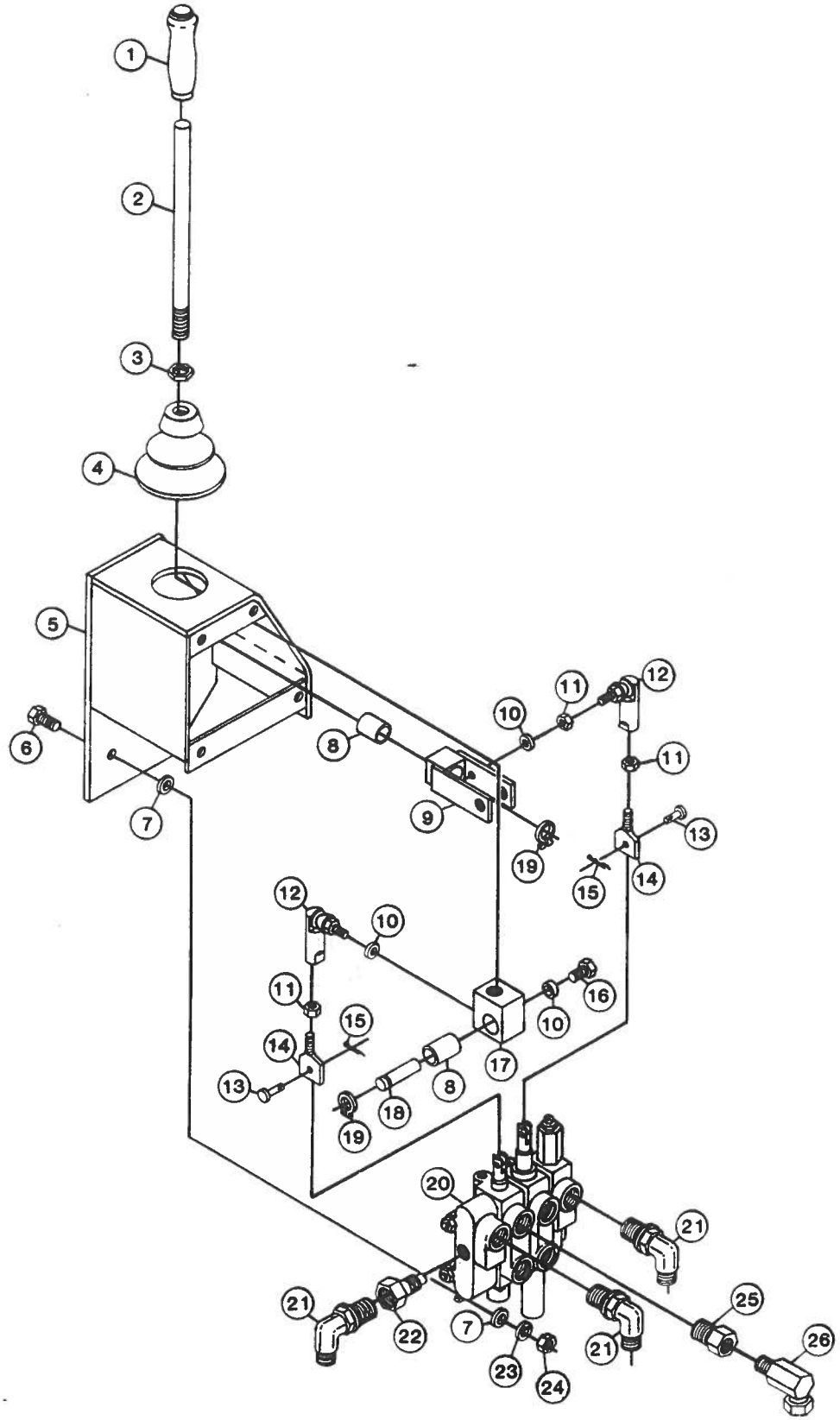
CONTROL VALVE
ASSEMBLY #80270

SERIAL #3R198 & UP

NO	REQ'D	PART NO.	DESCRIPTION
1	1	5655	Handle Grip
2	1	51471	Handle
3	1	1244	.62" UNC Hex Jam Nut
4	1	9010	Boot
5	1	68081	Valve Box
6	3	1049	.38" UNC X 2.50" Hex Capscrew
7	6	1514	.38" Flat Washer
8	2	6961	Bronze Pivot Bushing
9	1	51473	Yoke
10	3	1525	.38" SAE Hard Flat Washer
11	3	1476	.38" UNF Hex Nut
12	2	5545	Ball Joint
13	2	51654	.25" Dia. X 1.25" Clevis Pin
14	1	51469	Connector - Short
15	2	1612	Cotter Pin .09" X .50"
16	1	1292	.38" UNF X .75" Hex Capscrew
17	1	6272	Pivot Block
18	1	6271	Pivot Pin
19	2	6274	Retaining Ring
20	1	51470	Connector - Long
21	1	80389	2-Spool Gresen MonoBlock Valve
22	3	3065	90° Male Connector
23	4	3152	90° Hose Adapter
24	3	1503	.38" Lock Washer
25	3	1226	.38" UNC Hex Nut

LOADER ASSEMBLY

CONTROL VALVE
ASSEMBLY #68080



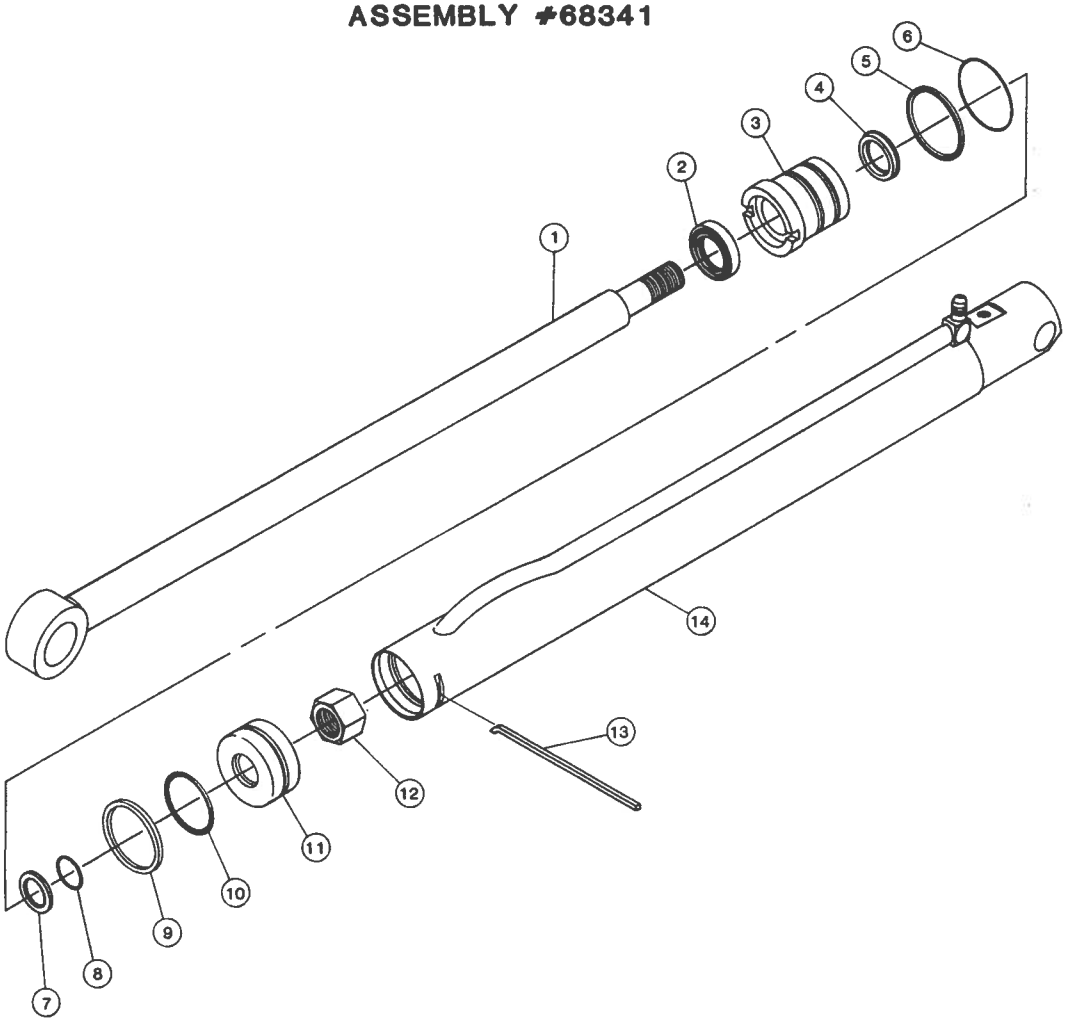
LOADER ASSEMBLY

CONTROL VALVE ASSEMBLY #68080

NO.	REQ'D	PART NO.	DESCRIPTION
1	1	5655	Handle Grip
2	1	51471	Handle
3	1	1244	.62" UNC Hex Jam Nut
4	1	9010	Boot
5	1	68081	Valve Box
6	3	1023	.31" UNC X 1.25"Hex Capscrew
7	6	1513	.31" Flat Washer
8	2	6961	Bronze Pivot Bushing
9	1	51473	Yoke
10	3	1525	.38" SAE Flat Washer
11	3	1476	.38" UNF Hex Nut
12	2	5545	Ball Joint
13	2	1757	.31" Dia. X .88" Clevis Pin
14	2	68079	Spade Connector
15	2	1611	12" X 1.00" Cotter Pin
16	1	1292	.38" UNF X .75" Hex Capscrew
17	1	6272	Pivot Block
18	1	6271	Pivot Pin
19	2	6274	Retaining Ring
20	1	61886	2-Spool Hidrover Valve, CH-121 Main Relief @ 2250 PSI
21	3	3283	90° SAE O-Ring Adaptor 10MB-8MJ
22	1	45320	Power Beyond Plug Kit
23	3	1502	.31" Lock Washer
24	3	1225	.31" UNC Hex Nut
25	4	3368	SAE O-Ring Bushing 8MB-4FP
26	4	3069	90° .25" Swivel Elbow 4MP-4FPX

LOADER ASSEMBLY

LIFT CYLINDER
ASSEMBLY #68341

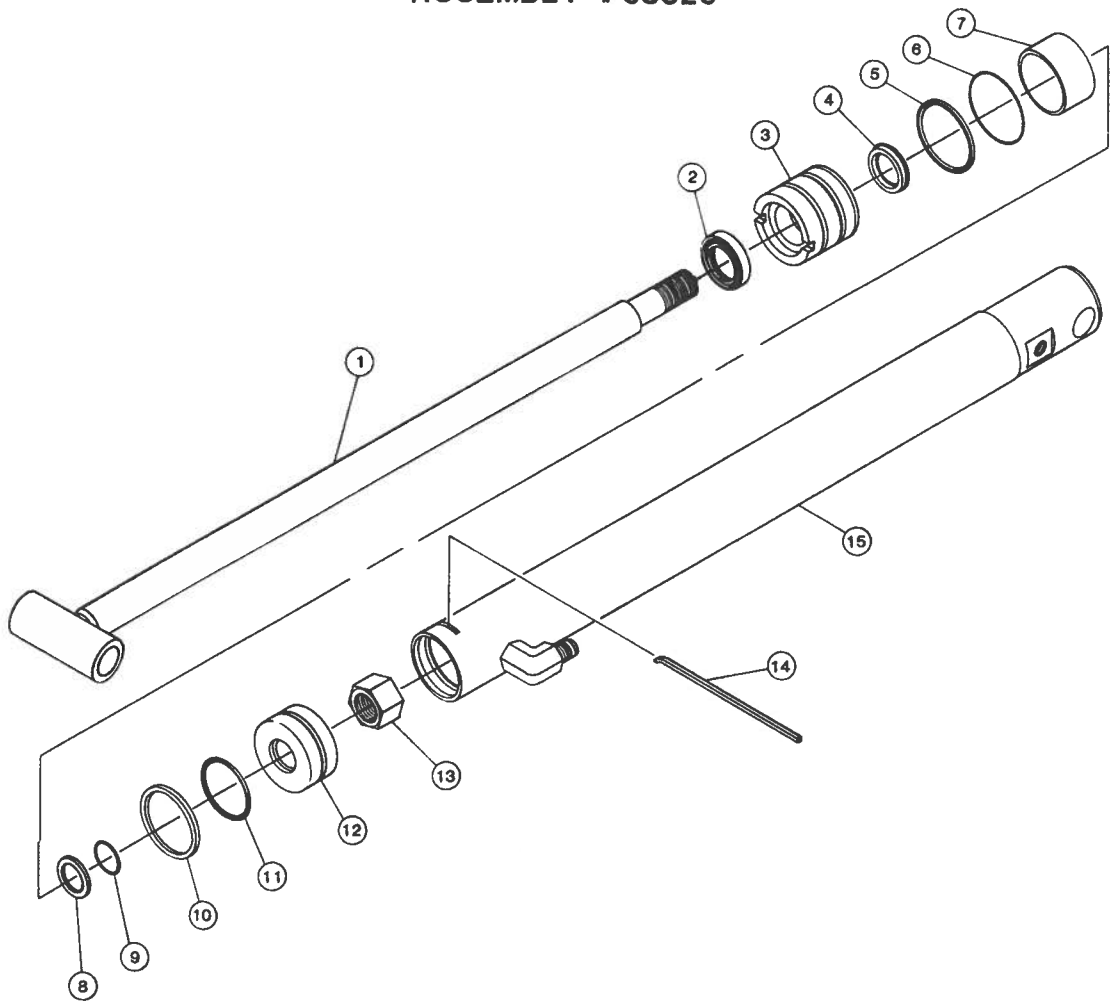


NO.	REQ'D	PART NO.	DESCRIPTION
1	1	68650	Cylinder Rod
2	1	4974*	Rod Wiper
3	1	57330	Cylinder Gland
4	1	45219*	Cylinder Rod Seal
5	1	4634*	Back-Up Washer
6	1	4633*	O-Ring
7	1	52644	Washer
8	1	4635*	O-Ring
9	1	4636*	Teflon Piston Ring
10	1	4637*	O-Ring
11	1	6992	Piston
12	1	1482	Hex Nut
13	1	7164*	Gland Retaining Rod/Ring
14	1	68342	Cylinder Tube

NOTE: Seal Kit #45136 includes all parts marked with an asterisk (*). Parts are not sold separately.

LOADER ASSEMBLY

BUCKET CYLINDER
ASSEMBLY #68326



NO.	REQ'D	PART NO.	DESCRIPTION
1	1	68329	Cylinder Rod
2	1	4981*	Rod Wiper
3	1	64891	Cylinder Gland
4	1	45262*	Cylinder Rod Seal
5	1	4634*	Back-Up Washer
6	1	4633*	O-Ring
7	1	51324	Spacer
8	1	52644	Washer
9	1	4635*	O-Ring
10	1	4636*	Teflon Piston Ring
11	1	4637*	O-Ring
12	1	6992	Piston
13	1	1482	Hex Nut
14	1	7164*	Gland Retaining Rod/Ring
15	1	68327	Cylinder Tube

NOTE: Seal Kit #45261 includes all parts marked with an asterisk (*). Parts are not sold separately.

GENERAL INFORMATION

Regular maintenance is the key to long equipment life and safe operation. Maintenance requirements have been reduced to an absolute minimum. However, it is very important that these maintenance functions be performed as described below.

EVERY 8 HOURS OF OPERATION

Grease all swivel points (ram and base end of all cylinders) thoroughly. Excessive wear and even mechanical damage to pins and cylinders can result from inadequate lubrication. Use a multi-purpose grease.

Lubricate all grease fittings with a multi-purpose grease. For grease locations, refer to the lubrication chart in Section H. Lubricate the swing chains with a spray chain lubricant.

EVERY 40 HOURS OF OPERATION

Check hydraulic reservoir fluid level. If oil is low, check all lines, fittings, and control valve for signs of leakage.

IMPORTANT: Hydraulic fluid level should be checked with backhoe in transport position.

WARNING! **Escaping hydraulic/diesel fluid under pressure can penetrate the skin causing serious injury.**

DO NOT use your hand to check for leaks. Use a piece of cardboard or paper to search for leaks.

Stop engine and relieve pressure before connecting or disconnecting lines.

Tighten all connections before starting engine or pressurizing line.

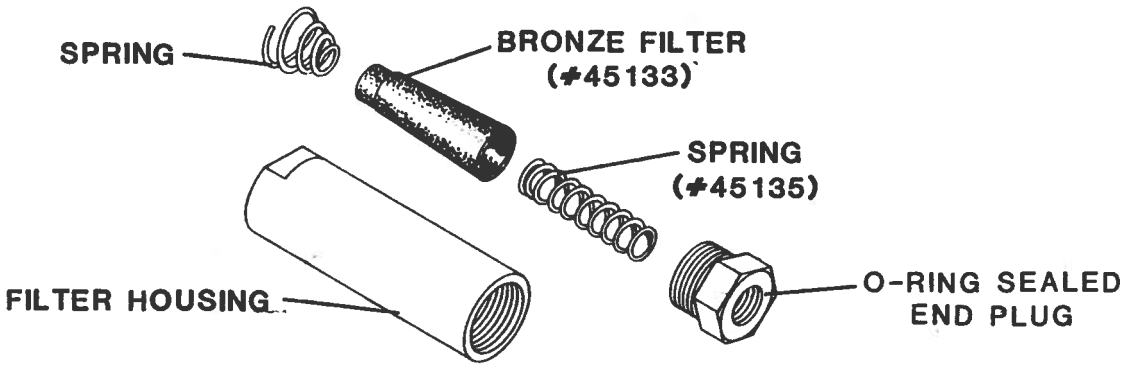
If any hydraulic/diesel fluid is injected onto the skin, obtain medical attention immediately or gangrene or other serious injury may result.

Physically check all pins, bushings, cotter pins, nuts, etc., for signs of wear or loose fit. Tighten as required, replacing where necessary. (Bolts, pins may vibrate loose during operation.) Clean equipment of all dirt, oil, and excess grease. This will assist you in making visual inspection and help avoid overlooking worn or damaged components.

EVERY 200 HOURS OF OPERATION

Pressure relief valve should be checked by a qualified technician to assure operation at designated pressure level.

On units equipped with an inline filter (part no. 45132) remove the 25 micron sintered bronze filter element from the filter housing and clean it in solvent. Replace the element if it is difficult to blow through after cleaning. Be careful not to damage the O-ring seal when assembling and disassembling the filter.



CONTROL VALVE

The hydraulic control valve maintenance is normally limited to the replacement of "O-ring" seals, cleaning and the replacement of valve sections or relief valve cartridges.

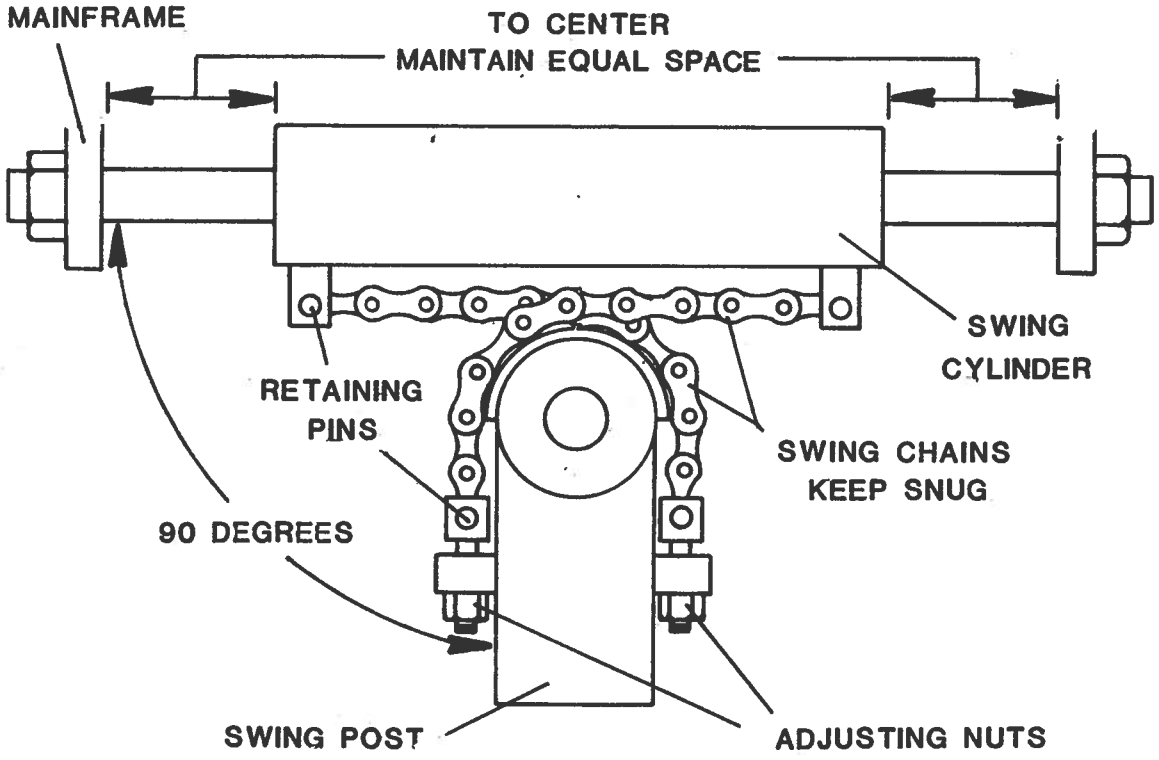
The most common cause of premature wear and malfunctioning of hydraulic system components is the ingress of contaminant and incorrect high pressure inlet and low pressure return connections (cavitation).

Observe a high standard of cleanliness when doing valve maintenance. Use clean oil and clean container when adding oil for hydraulic purposes.

SWING CHAIN ADJUSTMENT

When you first receive your backhoe, and periodically thereafter, it will be necessary to adjust the swing chains. Keeping the chains in proper adjustment is essential to allow full boom swing in both directions.

IMPORTANT: Failure to keep the chains adjusted properly can result in the swing cylinder hitting the side of the mainframe on full swing causing damage to the cylinder.



To adjust the swing chains, center the swing cylinder in the mainframe. The swing post should be perpendicular to the swing cylinder. If the swing post is not perpendicular to the swing cylinder, tighten the adjusting nut on the side of the swing post that has the greater angle between it and the cylinder rod while simultaneously loosening the other adjusting nut. Continue this procedure until the boom is perpendicular to the cylinder rod.

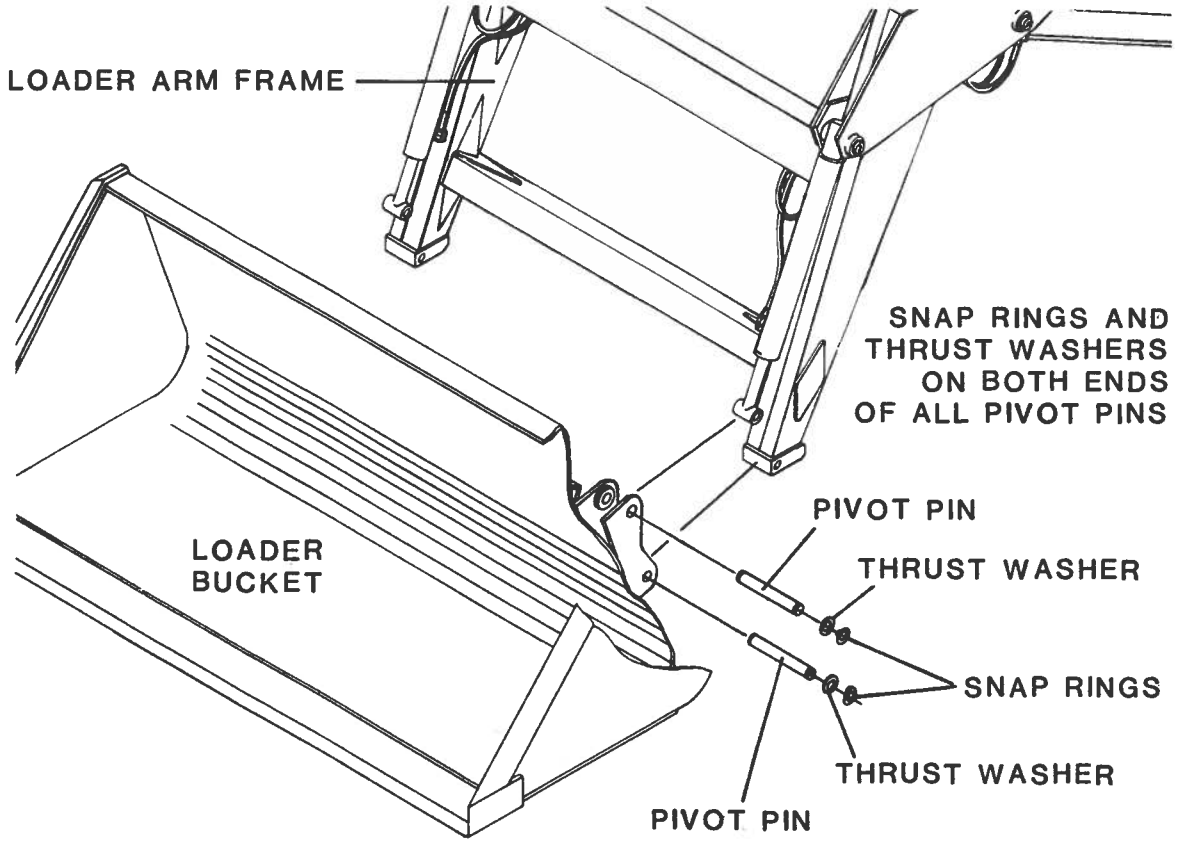
SWING CHAIN REPLACEMENT

To replace a swing chain, remove the cotter pins and retaining pins located at each end of the chain and remove chain. Lubricate the new chain with chain lubricant and install. Secure with origional retaining pins and new cotter pins.

BUCKET
FRONT END LOADER

CHANGING BUCKETS

In time, you may need to replace the loader bucket if it becomes damaged or worn-out. Replacement is a simple procedure. We list it here for your convenience.



1. Remove the old bucket by first lowering it onto the ground. Now remove the snap rings and washers from the pivot pins that connect the bucket to the bucket cylinders and loader arm frame.

2. Drive the bucket pins out using a brass drift.

3. Remove the old bucket.

4. Now move the tractor with the loader arm frame up behind the new loader bucket. Use the loader control to position the bucket ends of the loader arms in between the bucket mounting brackets. Align the loader arm holes with the lower set of mounting holes on the bucket. Secure the bucket with the original pivot pins, thrust washers and snap rings.

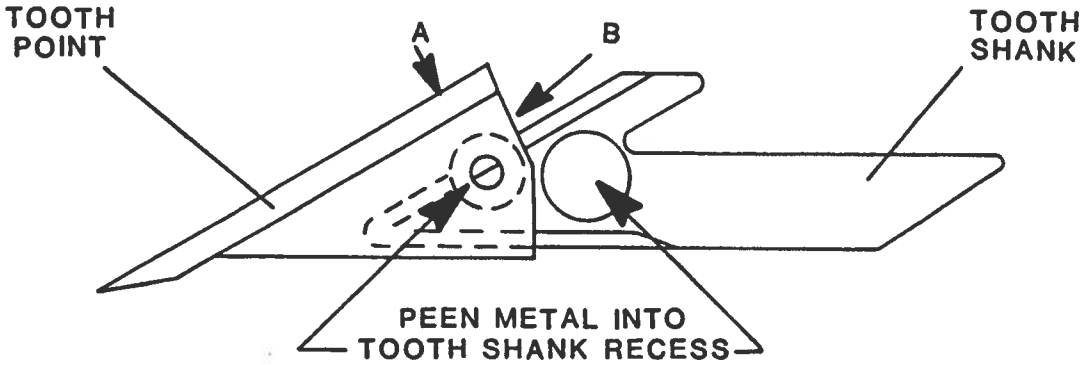
5. Position the rod end of the bucket cylinders in place between the bucket mounting brackets. Align the holes in the rod ends with the upper bucket holes and secure with the original pins, thrust washers, and snap rings.

MAINTENANCE

POWER DIG BUCKET

REPLACING BUCKET TOOTH POINTS

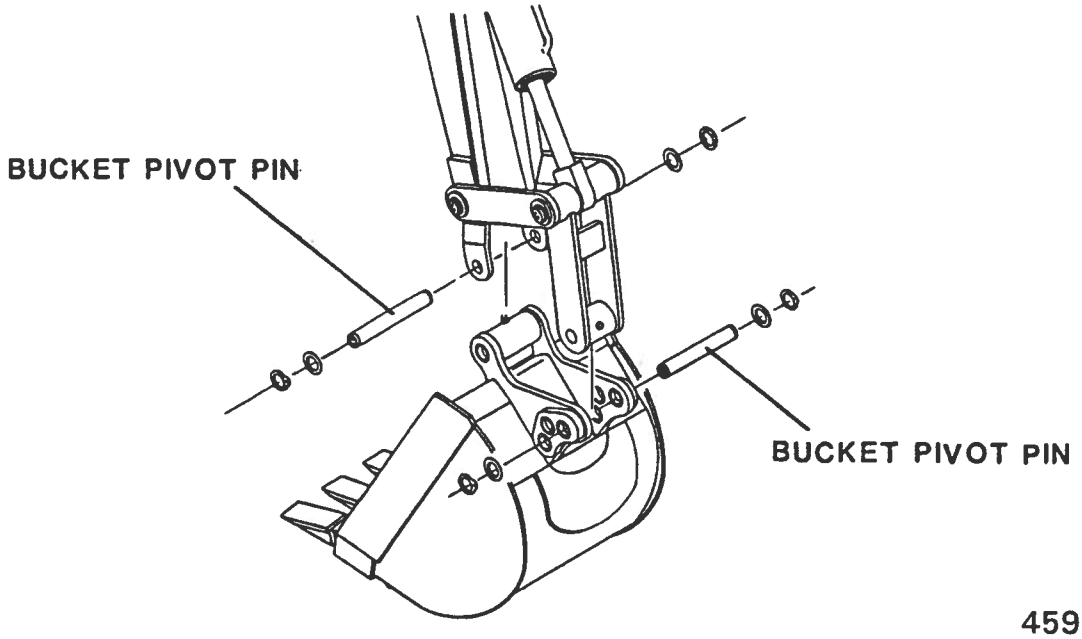
The bucket teeth are self-sharpening and require little attention; however, the points on the bucket teeth shanks can be replaced when they become worn or broken.



A tooth point can be removed from the welded tooth shank by hammering at "A" on the tooth point or by driving a chisel at "B" just between the tooth point box section and the tooth shank. Install the new point and anchor it to the tooth by peening at the location shown.

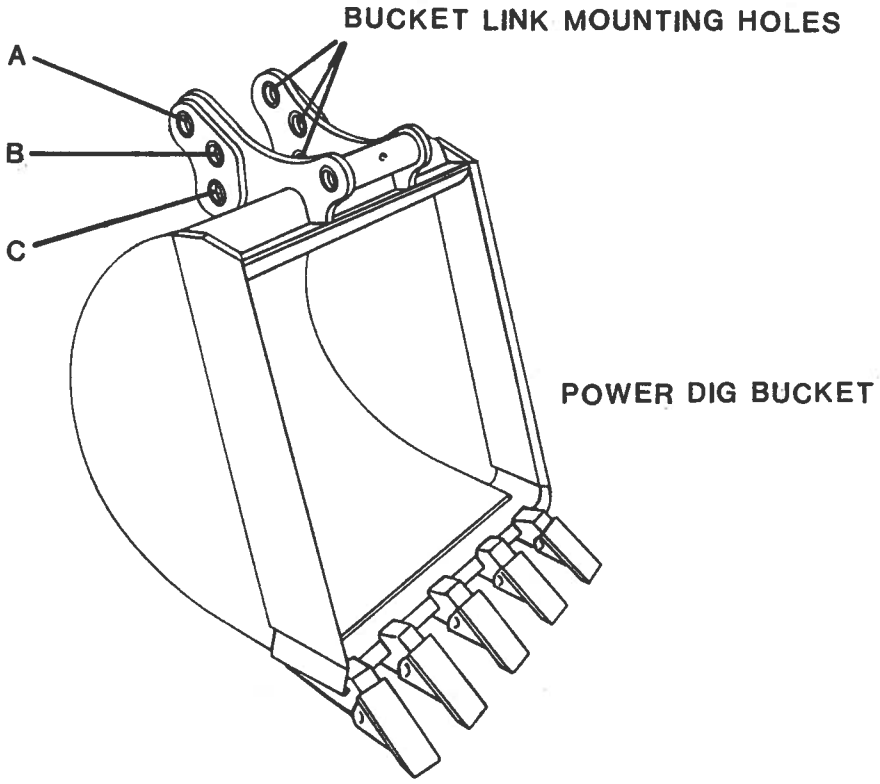
CHANGING BUCKETS

The bucket is connected to the dipper and bucket link with snap ring style pins. To change buckets, remove snap rings, washers, and bucket pivot pins as shown. Remove the old bucket and position the new bucket in its place. Install the pivot pins and secure with washers and snap rings. Lubricate all bucket and bucket link grease fittings before operating.



DIGGING POSITIONS

Power dig buckets may be installed in any one of three different digging positions. By using the different pairs of bucket link mounting holes, digging charactoristics of the backhoe can be changed to suit the working conditions.



Position A is the power digging position for maximum digging force in hard ground. This position will give you a 20 percent increase in digging power over the standard position.

Position B is the truck loading position. It gives greater ease of spoil removal with a higher dump height than the standard or power dig position.

Position C is the standard digging position. When the bucket is mounted in this position, it will have 180° of rotation.

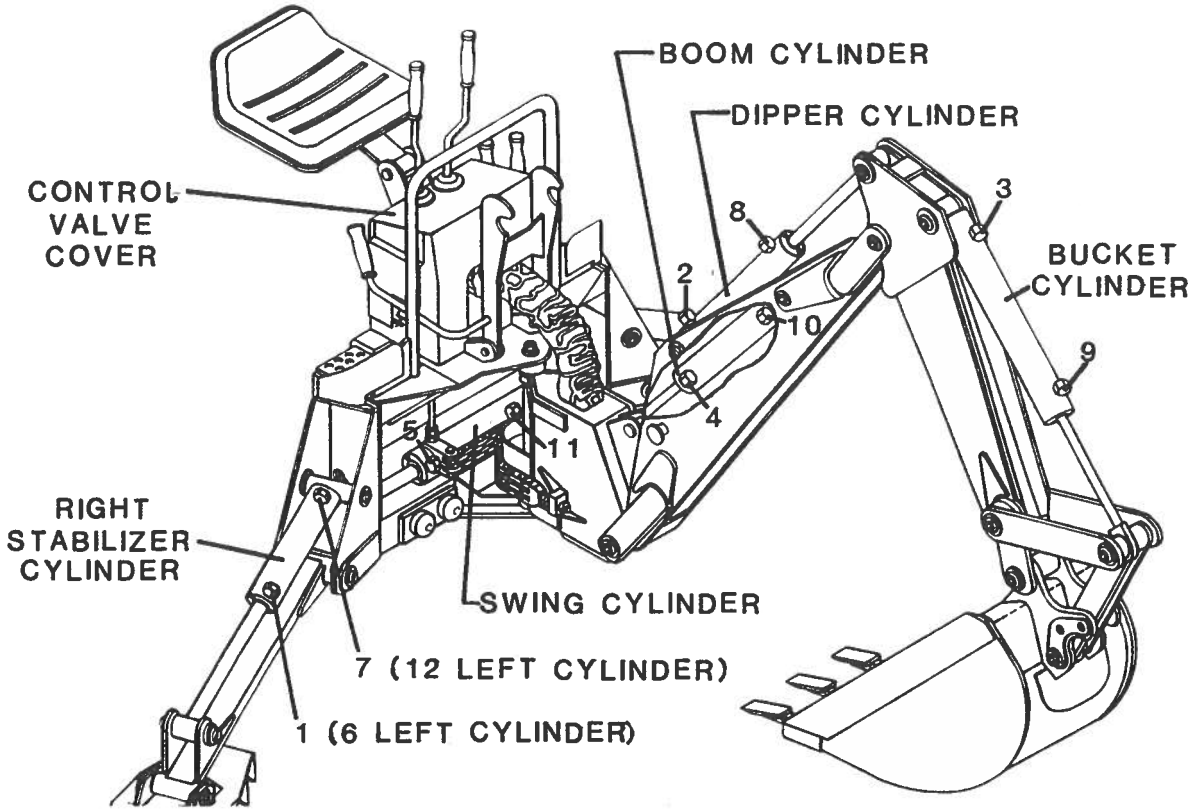
Digging positions are easily changed by removing the bucket link pivot pin from the bucket. Realign the hole in the bucket link with the correct holes in the bucket for the desired results. Install the pivot pin and secure it with the original washers and snap rings and your ready to go.

A special bell hole link is required to achieve a true bell hole position. This part is available from your dealer.

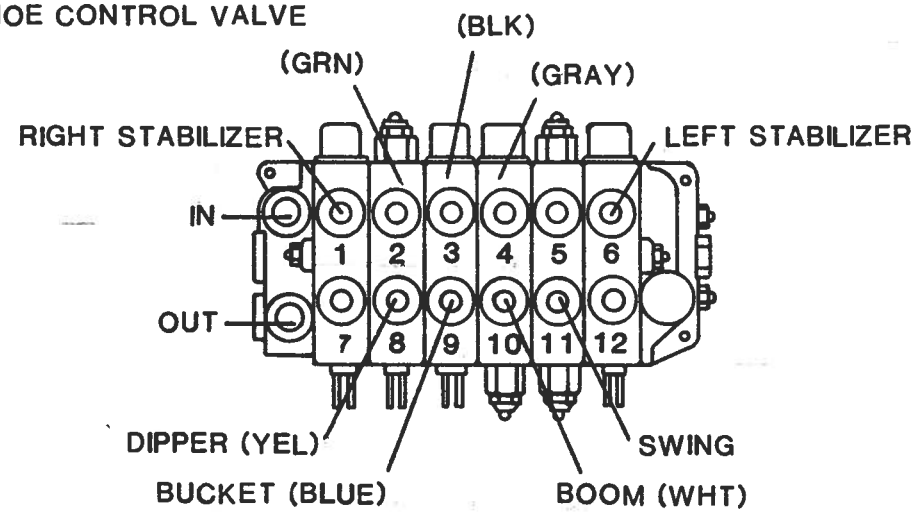
GENERAL INFORMATION

The purpose of this page is to show the hydraulic hose routing between the backhoe control valve and the various backhoe hydraulic cylinders. This information is helpful when trouble shooting cylinder and control valve related problems. Simply match the number of the hydraulic cylinder port (shown in the top diagram), to the corresponding number on the backhoe control valve (shown in the bottom diagram).

BACKHOE CYLINDERS



BACKHOE CONTROL VALVE



MAINTENANCE INSTRUCTIONS
CYLINDER SEAL REPLACE

GENERAL INFORMATION

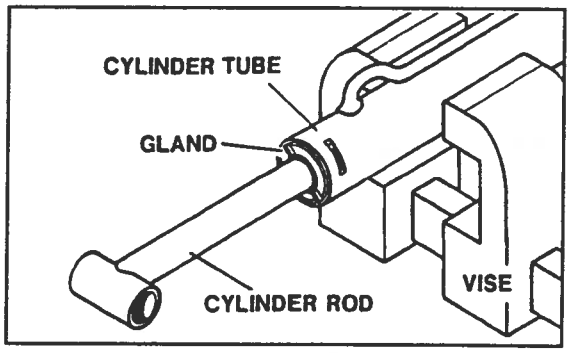
The following information is provided to assist you in the event you should need to repair or rebuild a hydraulic cylinder. When working on hydraulic cylinders, make sure that the work area and tools are clean and free of dirt to prevent contamination of the hydraulic system and damage to the hydraulic cylinders. Always protect the active part of the cylinder rod (the chrome section). Nicks or scratches on the surface of the rod could result in cylinder failure. Clean all parts thoroughly with a cleaning solvent before reassembly.

DISASSEMBLY PROCEDURE

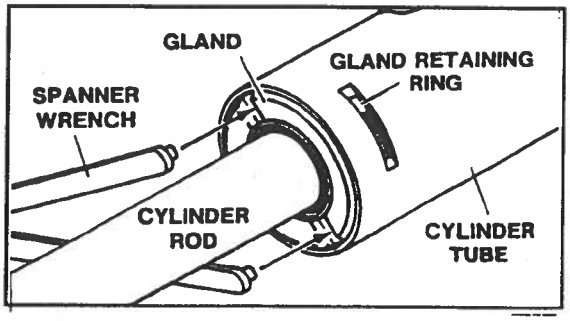
IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

RETAINING RING TYPE GLAND

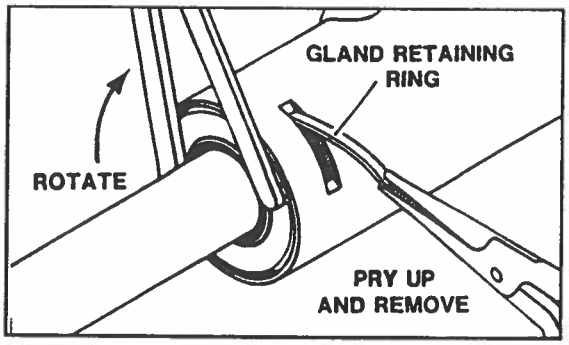
1. Mount the cylinder tube securely in a vise. **CAUTION:** Do not clamp too tight and distort the tube.



2. Rotate the gland with a spanner wrench (available from your dealer) until the gland retaining ring appears in the milled slot.

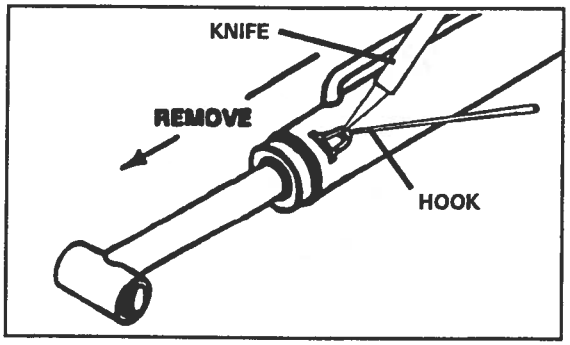


Pry up the end of the gland retaining ring with a pointed tool. Rotate the

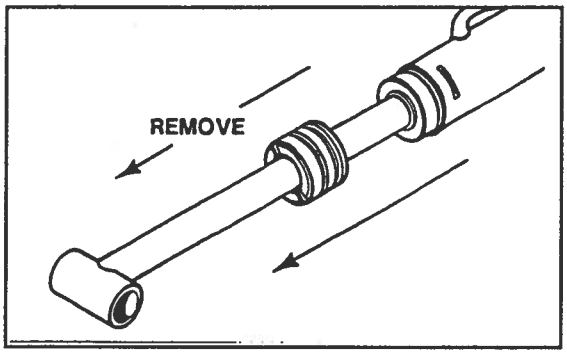


gland with a spanner wrench while removing the retaining ring.

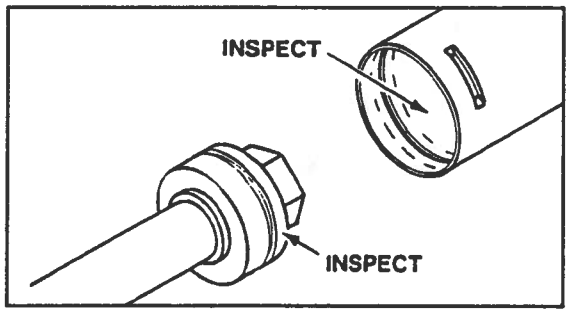
NOTE: On cylinders with gland retaining rings, the gland and piston seal(s) can be pulled out and cut as they appear in the milled slot during disassembly. After cutting, pull them on out through the milled slot.



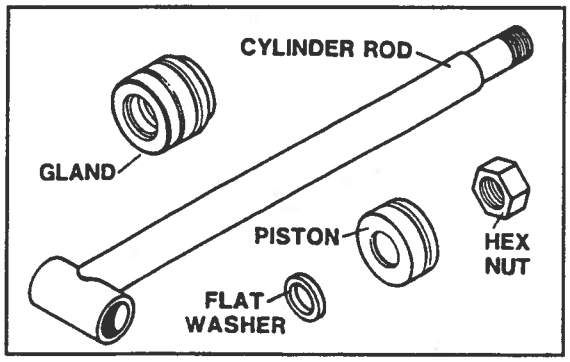
3. Pull the cylinder rod from the cylinder tube.



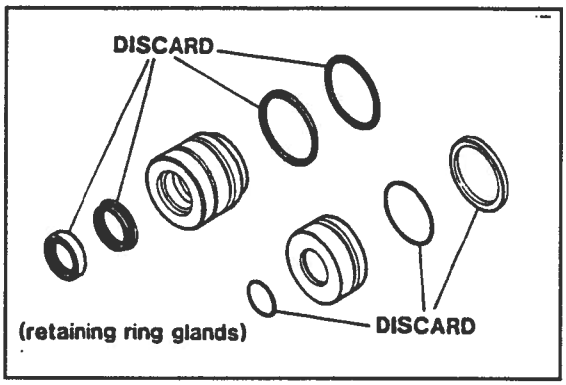
4. Inspect the piston and the bore of the cylinder tube for deep scratches or galling. If damaged, the piston and cylinder tube must be replaced.



5. Remove the hex nut, piston, flat washer or spacer tube (if so equipped), and gland from the cylinder rod. If the cylinder rod is rusty, scratched, or bent, it must be replaced.

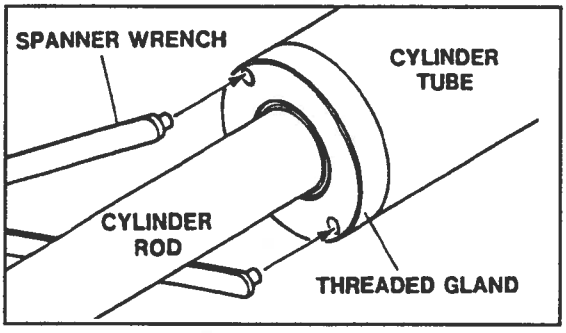


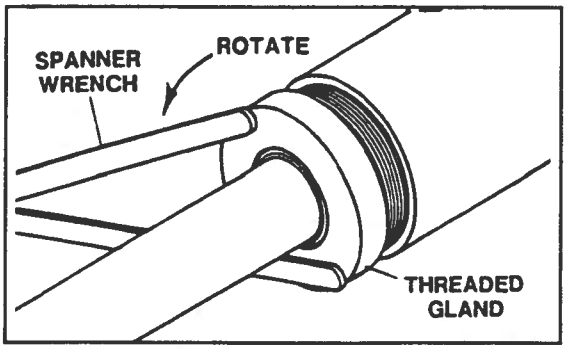
6. Remove and discard all old seals.



THREADED TYPE GLAND

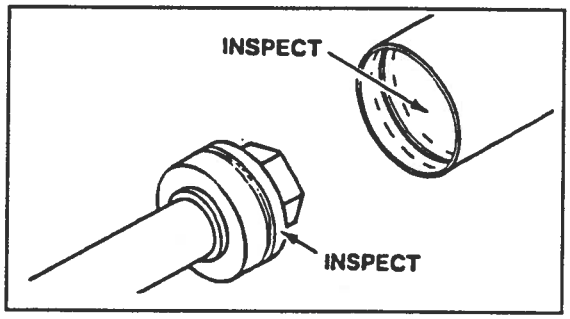
1. Rotate the gland with a spanner wrench counter-clockwise until the gland is free of the cylinder tube.



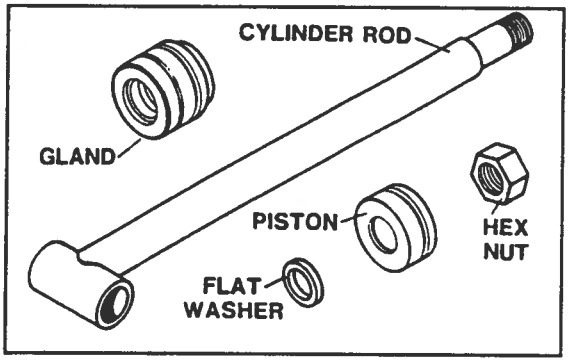


2. Pull the cylinder rod from the cylinder tube same as shown with the retaining ring type gland.

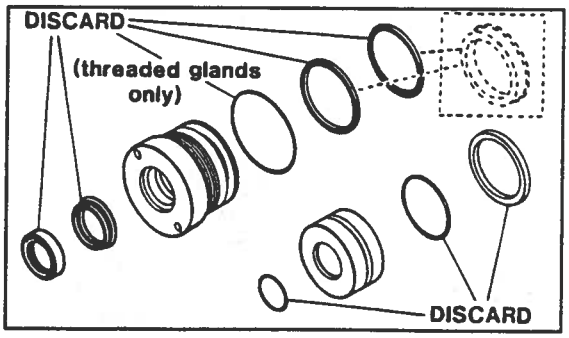
3. Inspect the piston and the bore of the cylinder tube for deep scratches or galling. If damaged, the piston and cylinder tube must be replaced.



4. Remove the hex nut, piston, flat washer or spacer tube (if so equipped), and gland from the cylinder rod. If the cylinder rod is rusty, scratched, or bent, it must be replaced.



5. Remove and discard all the old seals.

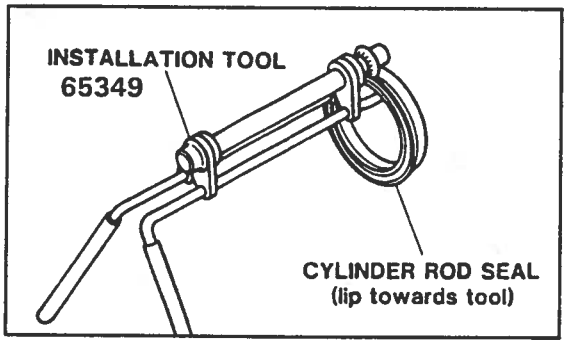


ASSEMBLY PROCEDURE

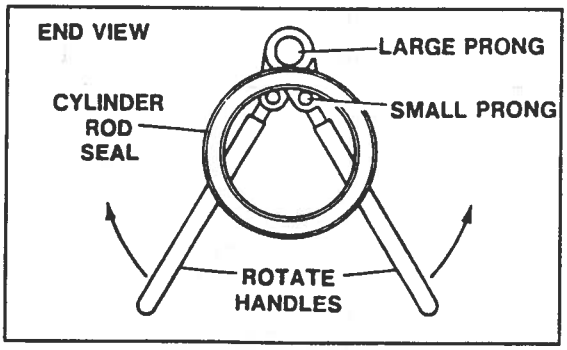
GENERAL

IMPORTANT: Replace all seals even if they do not appear to be damaged. Failure to replace all seals may result in premature cylinder failure.

1. Install the cylinder rod seal in the gland first. Be carefull not to damage the seal in the process as it is somewhat difficult to install.
A special installation tool is available to help with installing the seal. Simply fit the end of the tool over the seal so that the large prong of the tool is on the outside of the seal, and the two smaller prongs on the inside. The lip of the seal should be facing towards the tool.

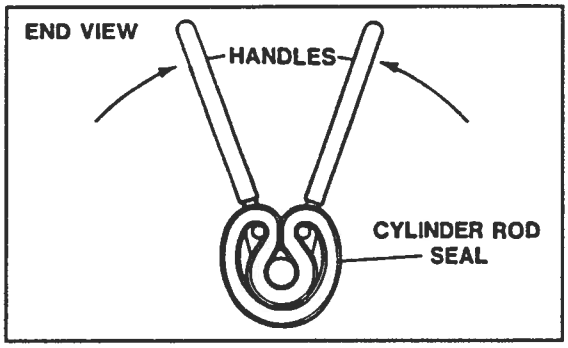


Rotate the handles on the tool around to wrap the seal around the end of the tool.

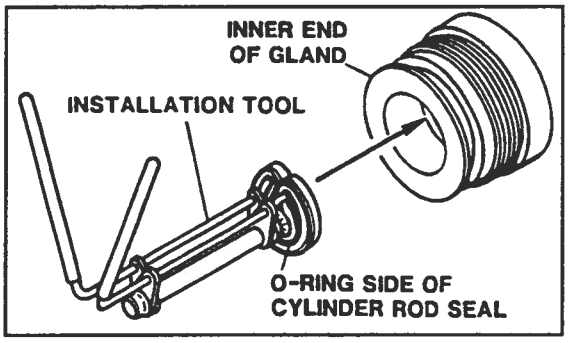


MAINTENANCE INSTRUCTIONS

CYLINDER SEAL REPLACE



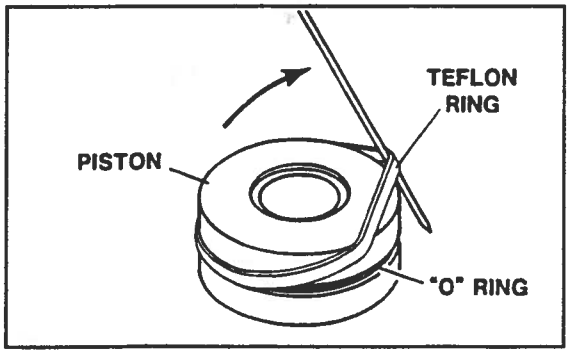
Now insert the seal into the gland from the inner end. Position the seal in it's groove, and release and remove the tool. Press the seal into its seat the rest of the way by hand.



NOTE: Threaded gland is shown above for reference.

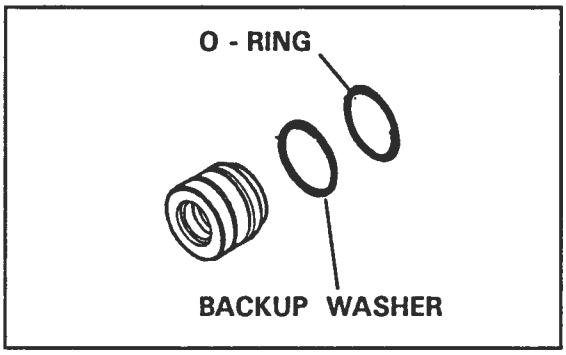
2. Install the new piston ring, rod wiper, O-rings, and backup washers if applicable on the piston

Be careful not to damage the seals. Caution must be used when installing the piston ring. The ring must be stretched carefully over the piston with a smooth, round, pointed tool.

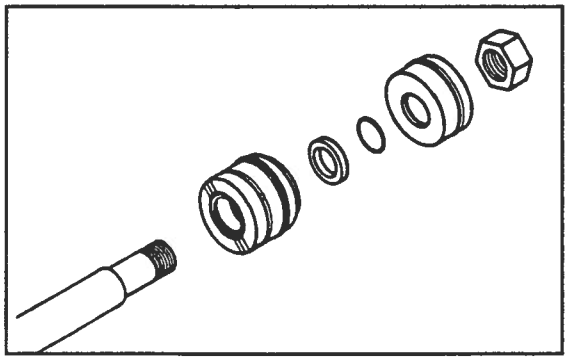


RETAINING RING TYPE GLAND

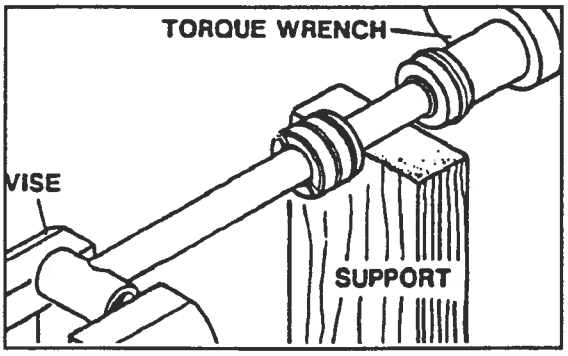
1. After installing the internal gland seal, install the external O-ring and backup washer.



2. Slide the gland onto the cylinder rod being careful not to damage the rod wiper. Then install the spacer, or flat washer (if so equipped), small O-ring, piston, and hex nut onto the end of the cylinder rod.

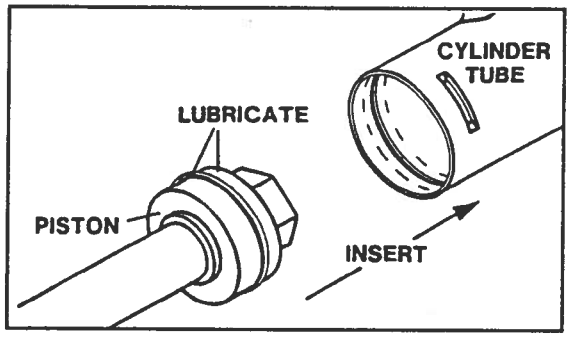


3. Secure the cylinder rod (mounting end) in a vise, with a support at it's center. Torque the nut to the amount



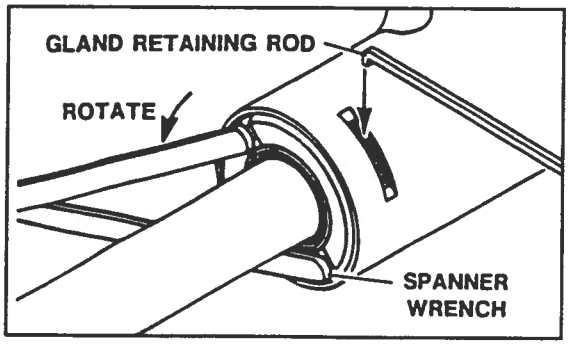
shown on the chart for the thread diameter of the cylinder rod.(see chart) **IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.**

4. Apply a lubricant (such as Lubriplate #105) to the piston and teflon ring. Insert the cylinder rod assembly into the cylinder tube.

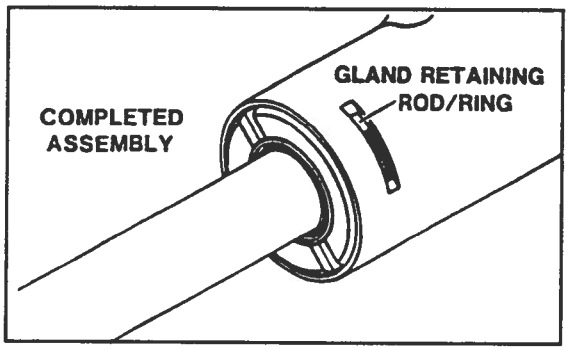


IMPORTANT: Ensure that the piston ring fits squarely into the cylinder tube and piston groove, otherwise the ring may be damaged and a leak will occur.

5. Rotate the gland with a spanner wrench until the hole (drilled into the retaining slot of the gland) appears in the milled slot of the cylinder tube. Insert the hooked end of the gland retaining rod into the hole.



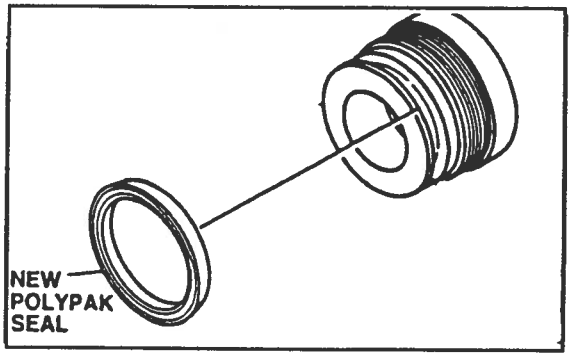
Rotate the gland until the gland retaining rod forms a ring between the gland and the cylinder tube.
When complete, the bent end of the gland retainer ring should be hidden (not turned so it is exposed in the slot) to prevent it from popping out.



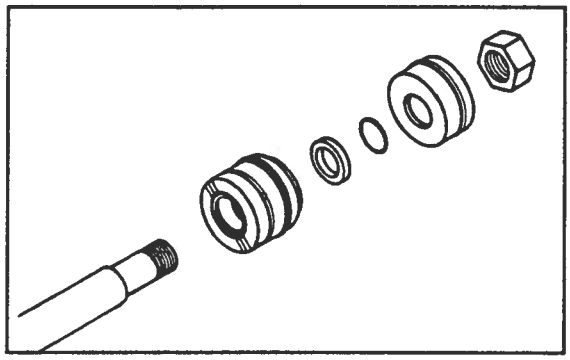
THREADED TYPE GLAND

1. After installing the rod seal inside the gland as shown in the general instructions, install the external seal.

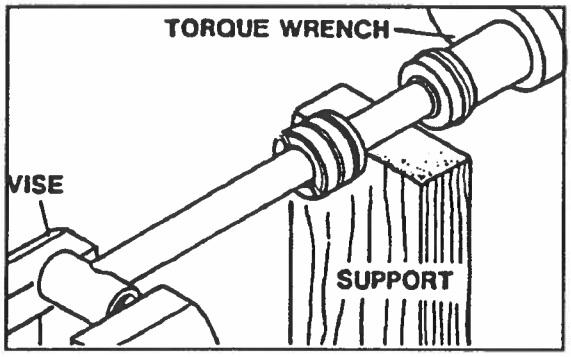
NOTE: Threaded glands may have been equipped with a separate O-ring and backup washer system or a polypak (all-in-one) type seal. Current seal kits contain a polypak (all-in-one) type seal to replace the discarded seal types on <u>all threaded glands</u>.



2. Slide the gland onto the cylinder rod being careful not to damage the rod wiper. Then install the spacer, or flat washer (if so equipped), small O-ring, piston, and hex nut onto the end of the cylinder rod.



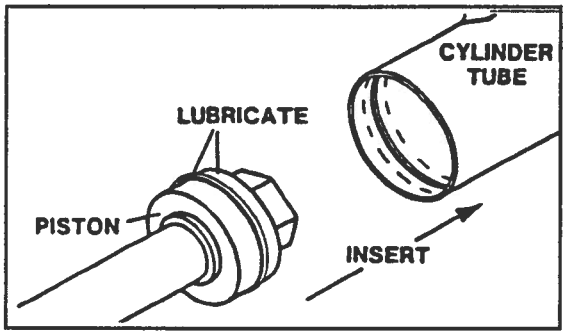
3. Secure the cylinder rod (mounting end) in a vise, with a support at it's center. Torque the nut to the amount shown for the thread diameter of the cylinder rod (see chart).



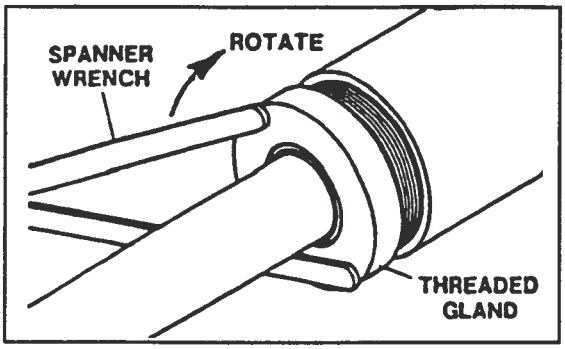
IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

4. Apply a lubricant (such as Lubriplate #105) to the piston and teflon ring. Insert the cylinder rod assembly into the cylinder tube.

INPORTANT: Ensure that the piston ring fits squarely into the cylinder tube and piston groove, otherwise the ring may be damaged and a leak will occur.



5. Use a spanner wrench to rotate the gland clockwise into the cylinder. Continue to rotate the gland with the spanner wrench until it is tight.



NOTE: Seal kits will service all backhoe cylinders of similar bore size and rod diameter.

<u>WARNING!</u> Cylinders serviced in the field are to be tested for leakage prior to the hoe being placed in work. Failure to test rebuilt cylinders could result in damage to the cylinder and/or backhoe, cause severe personal injury, or even death.

MAINTENANCE INSTRUCTIONS

CYLINDER SEAL REPLACE

TORQUE SPECIFICATION CHART

Use the following torque values when tightening the nuts on the cylinder rod threads.

Thread Diameter	POUNDS - FEET	
	Minimum	Maximum
7/8 "	150	200
* 1 "	230	325
1-1/8 "	350	480
1-1/4 "	490	670
1-3/8 "	670	900

*** 1" Thread Diameter WITH 1.25" Rod Diameter..... Min. 230 ft. lbs. ..... Max. 250 ft. lbs.**

BACKHOE REMOVAL AND STORAGE

FORD 1920 TRACTOR

BACKHOE REMOVAL

To remove the backhoe, just follow the simple procedure outlined below. Remember, always position the tractor on hard, level ground when the backhoe is to be removed.

1. Lower the stabilizers and bucket to the ground to support the weight of the backhoe.

2. Remove the left and right wedge locks from the upper quick-tach support hooks.

3. By operating the boom, dipper, and bucket controls, lower the front end of the backhoe to roll the upper backhoe mounting pins out of the upper quick-tach support hooks.

4. Lift the lower backhoe mounting pins from the lower quick-tach support hooks by raising the rear of the backhoe with the stabilizers.

5. Once the backhoe has cleared the tractor, pull the tractor forward, out from under the backhoe.

   IMPORTANT: Do not pull the tractor so far forward that you put a strain on the hydraulic lines and risk damaging the lines.

6. Raise the stabilizers until the backhoe is resting on the ground. Level the backhoe using the boom control.

7. Stop the tractor engine. Relieve the hydraulic pressure from the hoses by working the backhoe control levers.

   IMPORTANT: Do not restart the engine until Step 8 has been completed. The hydraulic circuits may be open and oil loss could result if the engine is started.

8. Disconnect the PTO pump from the PTO shaft if so equipped. If your particular backhoe does not use an external PTO pump, then disconnect the backhoe power and return lines from the tractor, Connect the tractor power and return hose couplers together. This allows oil from the loader valve to circulate back to the reservoir. Connect the backhoe pressure and return hose couplers together to keep out foreign particles.

BACKHOE STORAGE

To prepare the backhoe for storage, wash off all dirt and grime from the unit. Coat the exposed portions of the cylinder rods with grease. Lubricate the swing chain and all grease fittings. Make sure the backhoe hydraulic system is sealed against contaminates entering the unit. Store the backhoe in a clean, dry place with a cover over it.

4594 1-10-89

TROUBLE SHOOTING

FRONT END LOADERS

PROBLEM	POSSIBLE CAUSE	REMEDY
Loader works slow or will not lift or dump	Engine speed to slow	Open throttle
	Air in hydraulic system	Cycle cylinders to purge system of air
	Low oil supply	Check and fill
	Hydraulic oil too heavy	Drain system and replace with proper oil and new filter
	Oil too cold	Warm oil with engine at idle speed
	Plugged oil filter	Replace filter element
	Plugged or leaking hydraulic line	Inspect all hydraulic lines and hoses and clean or replace as necessary
	Improper hose hook-up	Consult loader and hydraulic kit diagrams and reinstall properly
	Relief valve malfunction	Have relief valve checked and serviced by an authorized service person
	Hydraulic pump damaged or worn	Test pump volume and pressure, replace pump if necessary
	Internal cylinder leak	Replace or rebuild with new seals
	Bent piston rod	Inspect cylinders, rebuild with new rod and seals
	Control valve not shifting properly	Inspect control valve and linkage for loose or bent parts and repair or replace
	Faulty valve	Rebuild or replace as necessary

4595 1-10-89

TROUBLE SHOOTING

FRONT END LOADERS

PROBLEM	POSSIBLE CAUSE	REMEDY
Bucket fails to stay raised	Broken or leaking hydraulic line	Inspect hydraulic lines, hoses, and fittings for leaks. Clean, replace, or tighten accordingly
	Dirty oil	Drain system and refill with fresh oil and new filter
	Internal cylinder leak	Replace or rebuild with new seals
	Faulty control valve	Inspect valve and rebuild or replace

PROBLEM	POSSIBLE CAUSE	REMEDY
Loader chatters/ vibrates when raising or lowering	Hydraulic oil level to low	Check level and fill if needed
	Air in hydraulic system	Cycle cylinders to purge system of air
	Air leak in hydraulic pump inlet line	Inspect inlet lines and fittings for leaks, replace, or tighten as necessary

PROBLEM	POSSIBLE CAUSE	REMEDY
Oil loss - External oil leakage	Loose hydraulic fitting	Check and tighten fittings
	Damaged-leaking hydraulic line or hose	Inspect and replace as necessary
	Faulty cylinder seals	Replace or rebuild with new seals
	Faulty valve O-ring	Rebuild valve with new O-rings

PROBLEM	POSSIBLE CAUSE	REMEDY
Oil overheating	Dirty oil	Drain system and replace with fresh oil and filter

FRONT END LOADERS

PROBLEM	POSSIBLE CAUSE	REMEDY
Oil overheating	Control valve held open too long	Return control to neutral position when not in use
	Valve going over relief constantly	Check hoses for proper hook-up. Have relief valve check and adjusted by a qualified service person
	Oil too light for warm weather use	Use recommended oil
	Engine running too fast	Reduce throttle

PROBLEM	POSSIBLE CAUSE	REMEDY
Control valve sticking	Dirty valve	Clean valve
	Valve section tie bolts too tight	Torque to proper specifications
	Rusty or scored linkage	Lubricate or replace as necessary
	Return spring broken or binding	Replace spring
	Foreign matter in spool bore	Disassemble and clean valve. Re-build with new seals

PROBLEM	POSSIBLE CAUSE	REMEDY
Insufficient lift capacity	Load is greater than loader lift capacity	See specifications for maximum lift capacity. Do not try to exceed capacity
	Worn or damaged hydraulic pump	Repair or replace as necessary
	Internal oil leakage	Check cylinders and valve, replace or rebuild with new seals as necessary

TROUBLE SHOOTING

FRONT END LOADERS

PROBLEM	POSSIBLE CAUSE	REMEDY
Insufficient lift capacity	Faulty control valve operation	Inspect valve and linkage for proper operation. Repair or adjust as necessary
	Relief valve set for too low a pressure	Have relief valve checked and serviced by an authorized service person

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
Backhoe fails to lift or swing	Low oil supply	Add oil
	Improper hose hookup	Check hydraulic diagram; reinstall properly
	Worn control valve section	Replace section
	Pump damaged or worn	Replace pump
	Broken hydraulic line	Check for leaks and replace line
	Jammed swing linkage	Remove interference
	Bent piston rod	Replace or repair cylinder
Backhoe lifting or swinging too slowly	Cold oil	Warm oil with engine at idle speed
	Engine speed too slow	Open throttle
	Oil leaking past control valve	Replace or repair worn section
	Oil to heavy	Use recommended oil
	Pump damaged or worn	Replace or repair pump
	Oil leaking past cylinder packings	Replace packings
	Dirty oil filter	Replace filter
	Faulty relief valve	Clean or replace

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
Backhoe fails to hold up load	Broken or leaking lines	Replace broken hose and check for leaks
	Dirty oil	Drain and refill oil, replace filter
	Oil leaking past cylinder packings	Replace packings
	Oil leaking past control valve	Replace or repair worn section
	Faulty relief valve	Clean or replace
Oil heating	Dirty oil	Drain and refill oil, replace filter
	Partially plugged inlet filter	Clean filter element
	Control valve held open too long	Return control to neutral position when not in use
	Worn pump	Replace pump
	Relief valve set too low	Set valve correctly
	Oil too light in hot weather	Use recommended oil
	Engine running too fast	Reduce throttle
	Damaged oil lines	Replace damaged lines
	Poor operating technique causing excessive oil flow over relief valve	Learn smooth operating methods

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
External leakage	Control valve tie bolts loose	Torque bolts to 20 ft.lbs.
	Damaged O-rings between valve sections	Repair control valve
	Damaged O-rings on valve spools	Repair control valve
	Cylinder seals damaged	Repair cylinder
	Damaged O-rings on valve drop check	Repair control valve
	Broken oil lines	Replace hose and check for leaks
Swing cylinder malfunctioning	Oil leaking past packing or seals	Replace packing or seals
	Faulty relief valve	Clean or replace
Control valve sticking or working hard	Dirty valve	Clean valve
	Scored bore or bent spool	Replace valve section
	Control linkage misaligned	Correct misalignment
	Control valve tie bolts too tight	Tighten bolts only to 20 ft.lbs.
	Return spring binding or broken	Replace spring
	Foreign matter in spool bore	Clean valve

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
Backhoe operating speed becomes progressively slower and less powerful. Over heating of oil occurs.	Plugged inline oil filter	Clean or replace filter
Chattering, thumping or fluttering relief valves	One or more circuit valves set at the same pressure as the main relief	Adjust relief valve to proper setting

BOLT TORQUE SPECIFICATIONS

GENERAL TORQUE SPECIFICATION TABLE

Use the following torques when special torques are not given. These values apply to fasteners as received from supplier, dry, or when lubricated with normal engine oil. They do not apply if special graphited or moly disulphide greases or other extreme pressure lubricants are used. This applies to both UNF and UNC threads. Remember to always use grade five or better when replacing bolts.

SEE Grade No.		2				5				8 *			
Bolt head identification marks as per grade NOTE: Manufacturing Marks Will Vary													
Bolt Size		Torque Pounds Feet		Torque Newton-Meters		Torque Pounds Feet		Torque Newton-Meters		Torque Pounds Feet		Torque Newton Meters	
Inches	Millimeters	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/4	6.35	5	6	6.8	8.13	9	11	12.2	14.9	12	15	16.3	30.3
5/16	7.94	10	12	13.6	16.3	17	20.5	23.1	27.8	24	29	32.5	39.3
3/8	9.53	20	23	27.1	31.2	35	42	47.5	57.0	45	54	61.0	73.2
7/16	11.11	30	25	40.7	47.4	54	64	73.2	86.8	70	84	94.9	113.9
1/2	12.70	45	52	61.0	70.5	80	96	108.5	130.2	110	132	149.2	179.0
9/16	14.29	65	75	88.1	101.6	110	132	149.2	179.0	160	192	217.0	260.4
5/8	15.88	95	105	128.7	142.3	150	180	203.4	244.1	220	264	298.3	358.0
3/4	19.05	150	185	203.3	250.7	270	324	366.1	439.3	380	456	515.3	618.3
7/8	22.23	160	200	216.8	271.0	400	480	542.4	650.9	600	720	813.6	976.3
1	25.40	250	300	338.8	406.5	580	696	786.5	943.8	900	1080	1220.4	1464.5
1-1/8	25.58	—		—		800	880	1084.8	1193.3	1280	1440	1735.7	1952.6
1-1/4	31.75	—		—		1120	1240	1518.7	1681.4	1820	2000	2467.9	2712.0
1-3/8	34.93	—		—		1460	1680	1979.8	2278.1	2380	2720	3227.3	3688.3
1-1/2	38.10	—		—		1940	2200	2630.6	2983.2	3160	3560	4285.0	4827.4

* Thick nuts must be used with Grade 8 bolts.

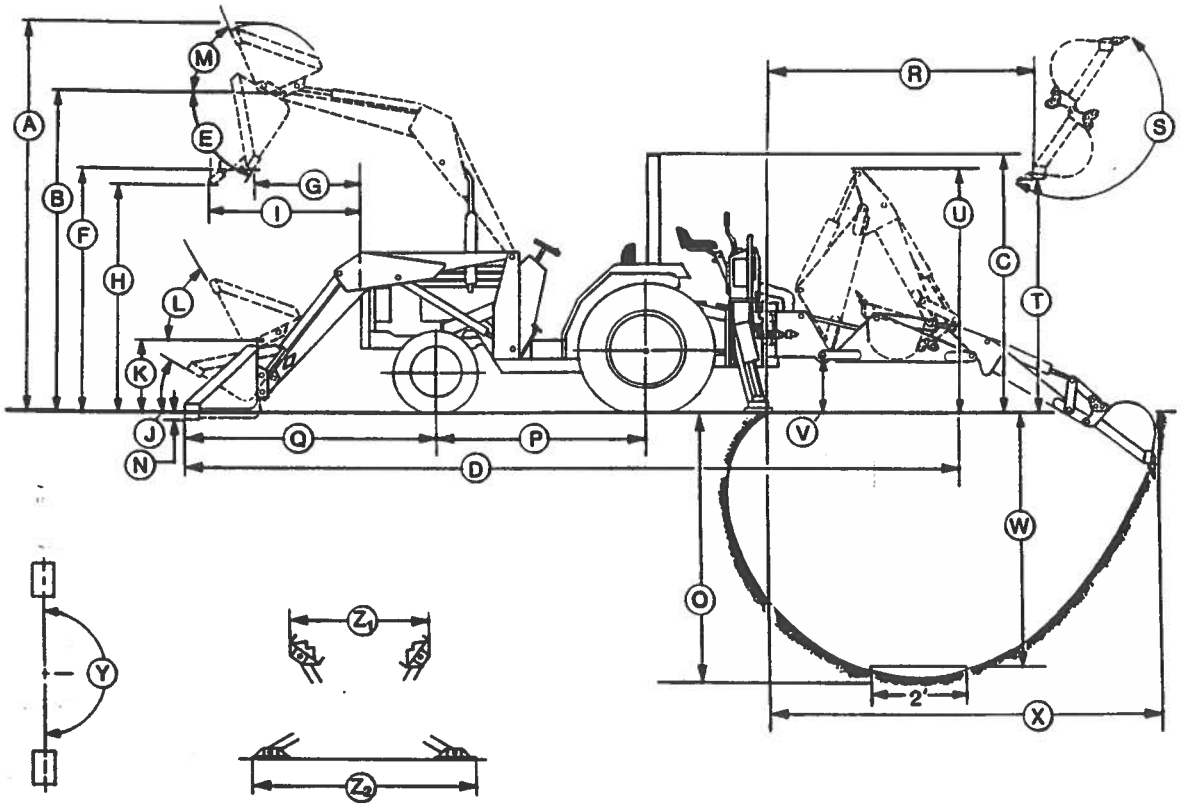
METRIC BOLT TORQUE SPECIFICATIONS

Size of screw	Grade No.	Coarse thread Pitch (mm)	Coarse thread Pounds Feet	Coarse thread Newton-Meters	Fine thread Pitch (mm)	Fine thread Pounds Feet	Fine thread Newton-Meters
M6	4T (4)	1.0	3.6–5.8	4.9–7.9	—	–	–
	7T (7)		5.8–9.4	7.9–12.7		–	–
	8T (8) (11)		7.2–10	9.8–13.6		–	–
M8	4T	1.25	7.2–14	9.8–19	1.0	12–17	16.3–23
	7T		17–22	23–29.8		19–27	25.7–36.6
	8T		20–26	27.1–35.2		22–31	29.8–42
M10	4T	1.5	20–25	27.1–33.9	1.25	20–29	27.1–39.3
	7T		34–40	46.1–54.2		35–47	47.4–63.7
	8T		38–46	51.5–62.3		40–52	54.2–70.5
M12	4T	1.75	28–34	37.9–46.1	1.25	31–41	42–55.6
	7T		51–59	69.1–79.9		56–68	75.9–92.1
	8T		57–66	77.2–89.4		62–75	84–101.6
M14	4T	2.0	49–56	66.4–75.9	1.5	52–64	70.5–86.7
	7T		81–93	109.8–126		90–106	122–143.6
	8T		96–109	130.1–147.7		107–124	145–168
M16	4T	2.0	67–77	90.8–104.3	1.5	69–83	93.5–112.5
	7T		116–130	157.2–176.2		120–138	162.6–187
	8T		129–145	174.8–196.5		140–158	189.7–214.1
M18	4T	2.0	88–100	119.2–136	1.5	100–117	136–158.5
	7T		150–168	203.3–227.6		177–199	239.8–269.6
	8T		175–194	237.1–262.9		202–231	273.7–313
M20	4T	2.5	108–130	146.3–176.2	1.5	132–150	178.9–203.3
	7T		186–205	252–277.8		206–242	279.1–327.9
	8T		213–249	288.6–337.4		246–289	333.3–391.6

SPECIFICATIONS

FORD 1920 TRACTOR
BRADCO 315 LOADER & MD2 SERIES BACKHOES

TLB DIMENSIONS



SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE AND WITHOUT LIABILITY THEREFOR. WHENEVER APPLICABLE SPECIFICATIONS ARE IN ACCORDANCE WITH ICED AND SAE STANDARDS.

TLB SPECIFICATIONS TABLE

	DESCRIPTION	8MD2	9MD2	11MD2
A.	Overall Operating Height (Fully Raised)..	132.00"	132.00"	132.00"
B.	Height To Hinge Pin (Fully Raised).....	102.00"	102.00"	102.00"
C.	Overall Height - Ford ROPS.....	87.00"	87.00"	87.00"
	ATI ROPS.....	97.00"	97.00"	97.00"
D.	Transport Length.....	N/A	N/A	N/A
E.	Dump Angle.....	40°	40°	40°
F.	Dump Height (At 40°).....	76.50"	76.50"	76.50"
G.	Reach (Fully Raised At 40°).....	25.00"	25.00"	25.00"
H.	Specified Height At 45° Dump Angle.....	68.50"	68.50"	68.50"
I.	Reach (At Specified Height).....	27.25"	27.50"	27.50"
J.	Maximum Rollback (At Ground).....	15°	15°	15°
K.	Carry Position.....	16.50"	16.50"	16.50"
L.	Maximum Rollback (At Carry Position).....	24.00"	24.00"	24.00"

SPECIFICATIONS

FORD 1920 TRACTOR
BRADCO 315 LOADER & MD2 SERIES BACKHOES

TLB SPECIFICATIONS TABLE CONT.

	DESCRIPTION	8MD2	9MD2	11MD2
M.	Maximum Rollback (Fully Raised)..	115°	115°	115°
N.	Digging Depth.....	5"	5"	5"
O.	Maximum Digging Depth.....	98"	115"	139"
P.	Wheelbase.....	70"	70"	70"
Q.	Reach With Bucket On Ground.....	66"	66"	66"
R.	Loading Reach.....	53"	57"	80"
S.	Bucket Rotation.....	180°	180°	180°
T.	Loading Height At 60°.....	74"	68"	106"
U.	Transport Height.....	74"	86"	97"
V.	Boom Pivot Height.....	12"	12"	12"
W.	Digging Depth (2' Flat Bottom)...	97"	112"	137"
X.	Reach From Swing Pivot.....	136"	151"	174"
Y.	Swing Arc.....	180°	180°	180°
Z_1	Stabilizer Spread (Up) Transport.	65"	65"	65"
Z_2	Stabilizer Spread (Down) Working.	103"	103"	103"

ADDITIONAL LOADER SPECIFICATIONS

Overall Width.....	64"
Bucket Width.....	60" & 70"
Ground Clearance.....	14"
Thread Gage.....Front 45-50"..Rear..	50"
Maximum Grading Angle.....	100°
Bucket Capacity Per SAE J742b	
60" Bucket.....	15 Cu.Ft.
70" Bucket.....	15.6 Cu.Ft.
Operating Weight (Tractor & Loader).....	4960#
Raising Time.....	3.14 Sec.
Lowering Time.....	3.07 Sec.
Dump Time.....	1.90 Sec.
Rollback Time.....	2.78 Sec.
Breadout Force At 2250 PSI.....	2550#
Lift Capacity (Maximum Height).....	1250#

(Loaders - Per SAE J732)

ADDITIONAL BACKHOE SPECIFICATIONS

	8MD2	9MD2	11MD2
Digging Force SAE Rating			
Bucket Lbf.....	4399#	4399#	4399#
Dipper Lbf.....	1874#	2065#	2340#
Operating Pressure (Rated PSI)..	2250#	2250#	2250#
Hydraulic Flow Requirement GPM..	8-12	8-12	8-12
Weight Lbs. Approx.....	1155#	1322#	1353#
(Basic Hoe With 12" Bucket)			

CYLINDER AND BUCKET SPECIFICATIONS
315 LOADER

CYLINDER SPECIFICATIONS TABLE

CYLINDERS	315
Bucket Cylinder	
Cylinder #.....	**68326**
Bore.....	2.00"
Stroke.....	15.06"
Rod Diameter.....	1.12"
Lift Cylinder	
Cylinder #.....	**68341**
Bore.....	2.00"
Stroke.....	21.25"
Rod Diameter.....	1.25"

BUCKET SPECIFICATIONS TABLE

STANDARD HEAVY DUTY BUCKETS			
Bucket Number	Width (Inches)	SAE Heaped (Cap. Cu. Ft.)	Weight (Lbs.)
68139	60"	15.00	NA
68338	60"	15.00	NA
68421	70"	15.60	NA

SPECIFICATIONS

CYLINDER AND BUCKET SPECIFICATIONS
MD2 SERIES BACKHOE

CYLINDER SPECIFICATIONS TABLE

CYLINDERS	8MD2	9MD2	11MD2
Bucket Cylinder			
Cylinder #	**64521**	**64521**	**64521**
Bore	2.75"	2.75"	2.75"
Stroke	17.56"	17.56"	17.56"
Rod Diameter	1.75"	1.75"	1.75"
Dipper Cylinder			
Cylinder #	**68269**	**68270**	**68271**
Bore	2.75"	2.75"	3.00"
Stroke	16.00"	20.31"	21.00"
Rod Diameter	1.75"	1.75"	1.75"
Boom Cylinder			
Cylinder #	**68266**	**68267**	**68268**
Bore	2.75"	2.75"	3.00"
Stroke	20.06"	20.31"	21.00"
Rod Diameter	1.25"	1.25"	1.50"
Swing Cylinder			
Cylinder #	**64895**	**64895**	**64895**
Bore	2.50"	2.50"	2.50"
Stroke	11.62"	11.62"	11.62"
Rod Diameter	1.25"	1.25"	1.25"
Stabilizer Cylinder			
Cylinder #	**61863**	**61863**	**61863**
Bore	3.25"	3.25"	3.25"
Stroke	11.88"	11.88"	11.88"
Rod Diameter	1.50"	1.50"	1.50"

BUCKET SPECIFICATIONS TABLE

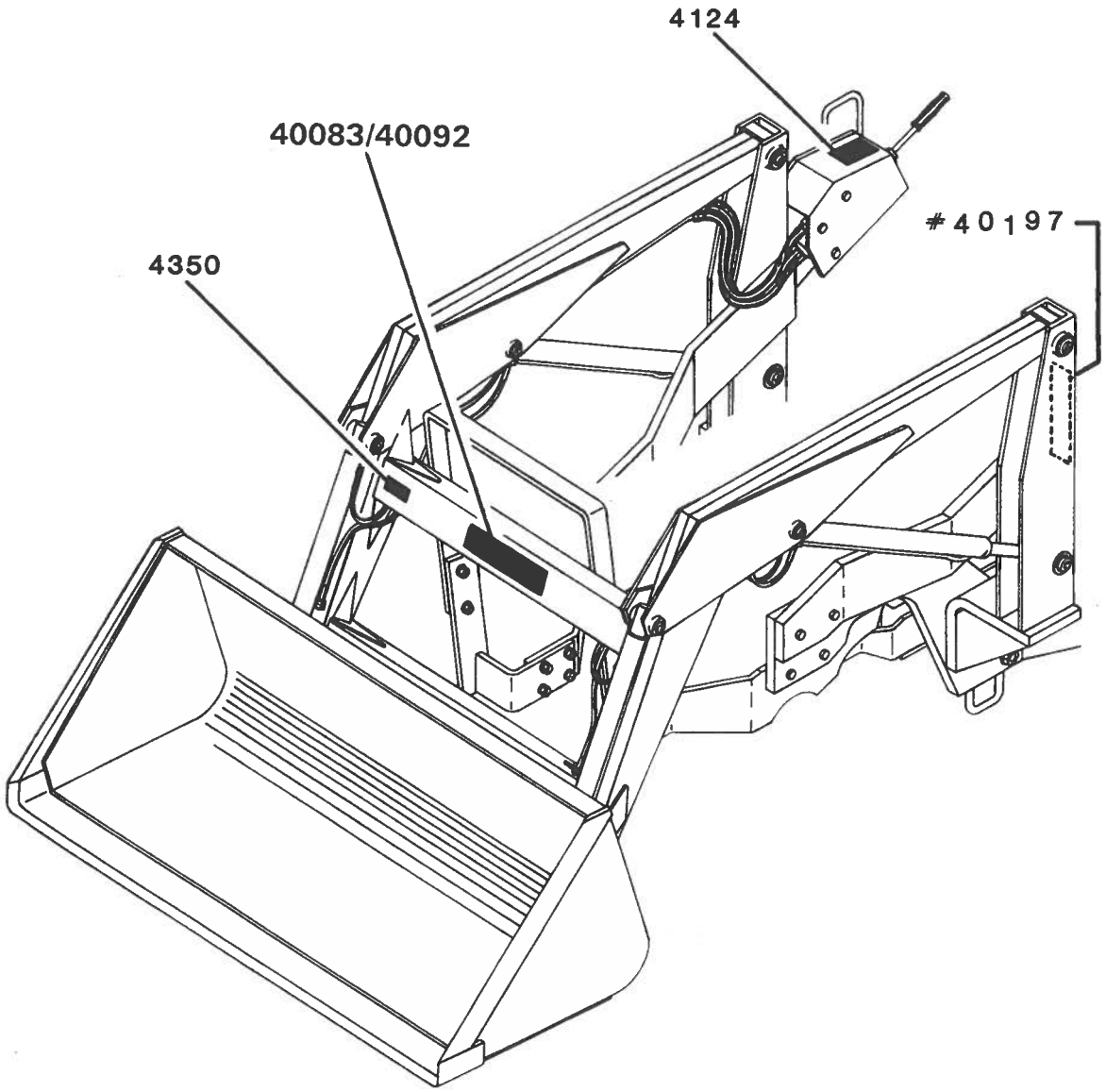
POWER DIG BUCKETS		
Width (Inches)	SAE Heaped (Cap. Cu. Ft.)	Weight (Lbs.)
12"	1.83	**125**
16"	2.56	**139**
18"	2.98	**147**
20"	3.40	**153**
24"	4.32	**170**

DECALS

DECAL PLACEMENT
315 LOADER

GENERAL INFORMATION

The diagram on this page shows the location of all the decals used on the 315 loader. The decals are identified by their part numbers, with reductions of the actual decals located on the following pages. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the loader.



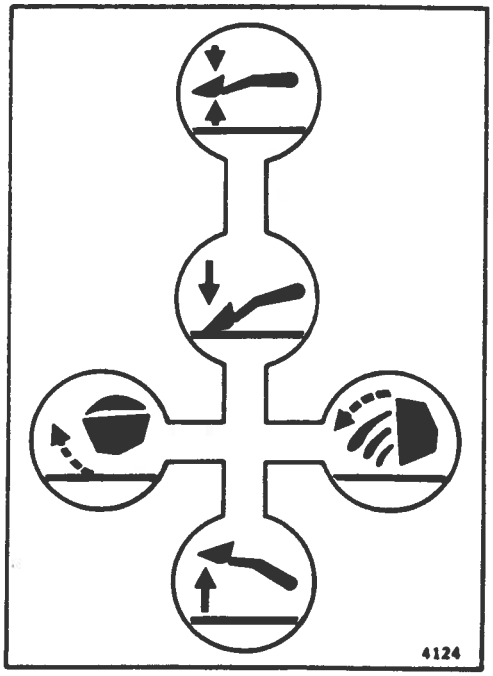
DECALS

315 LOADER

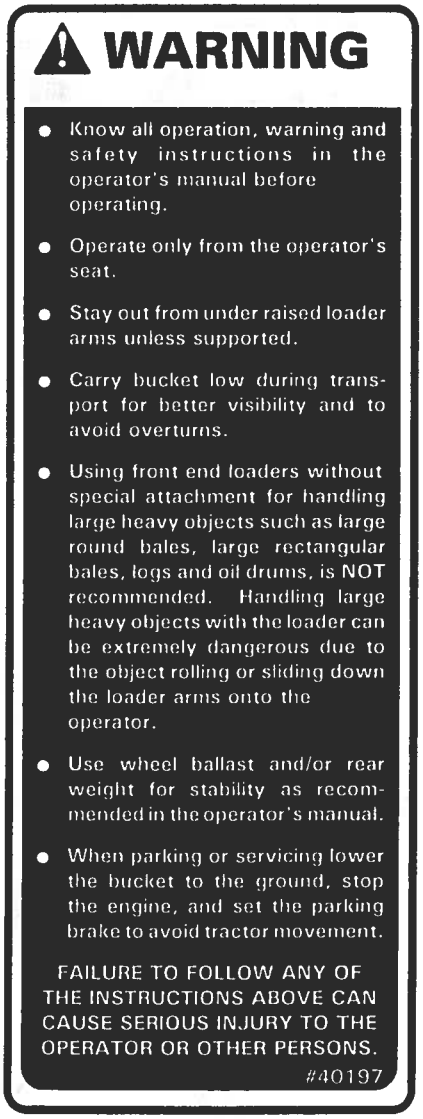
BRADCO

BRADCO LOGO
PART #40083 - BLACK
PART #40092 - WHITE

ATI SERIAL NO. TAG
PART #4350



LOADER OPERATING CONTROL
PART #4124



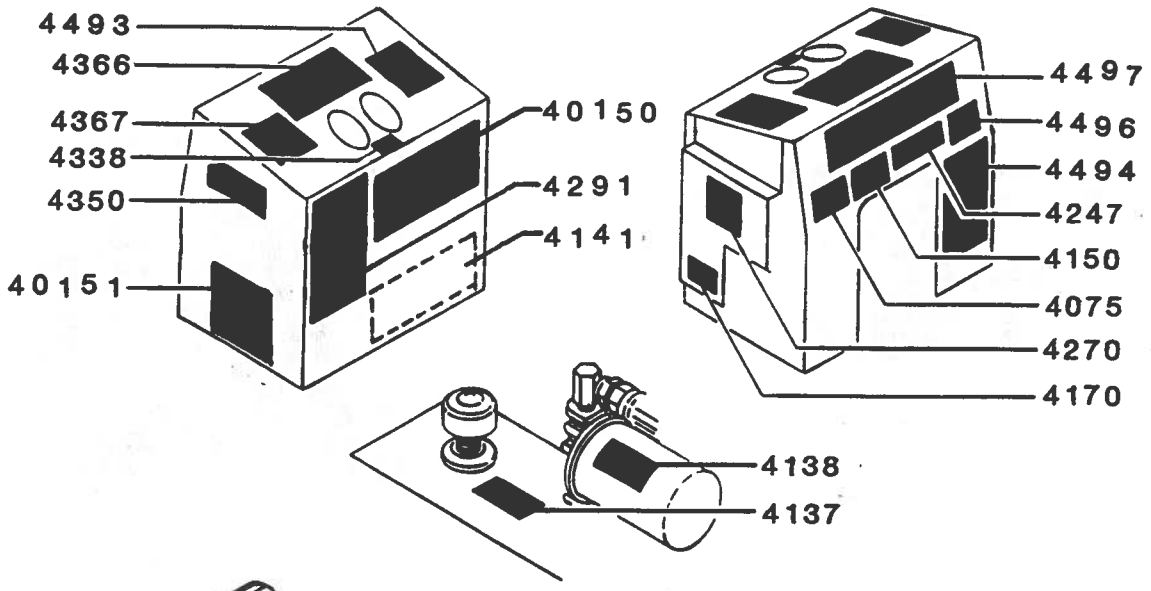
WARNING! LOADER INSTRUCTIONS
PART #40197

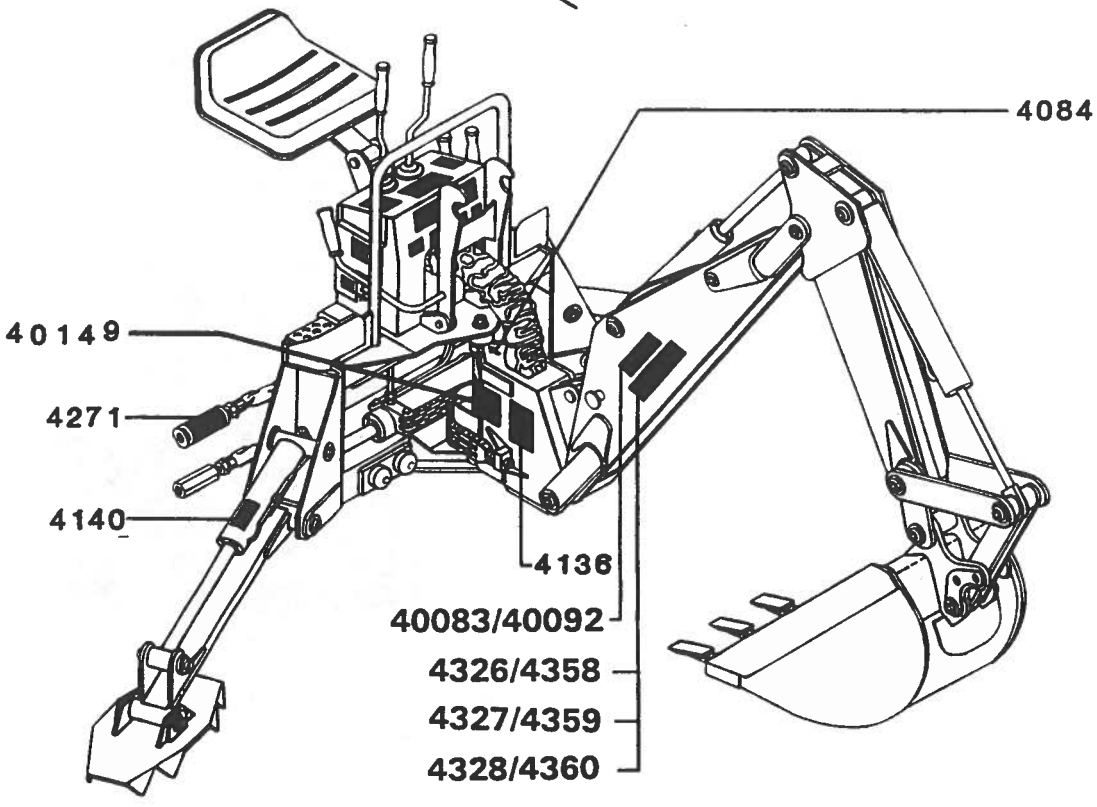
DECALS

DECAL PLACEMENT
MD2 SERIES BACKHOES

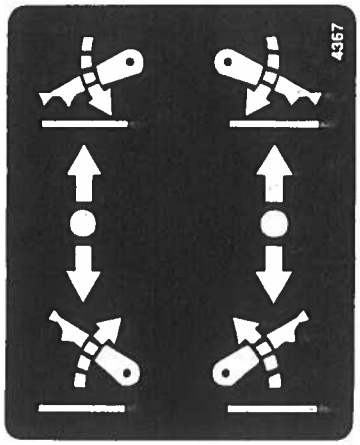
GENERAL INFORMATION

The diagrams on this page show the location of all the decals used on the MD2 backhoe. The decals are identified by their part numbers, with reductions of the actual decals located on the following pages. Use this information to order replacements for lost or damaged decals. Be sure to read all decals before operating the backhoe. They contain information you need to know for both safety and backhoe longevity.

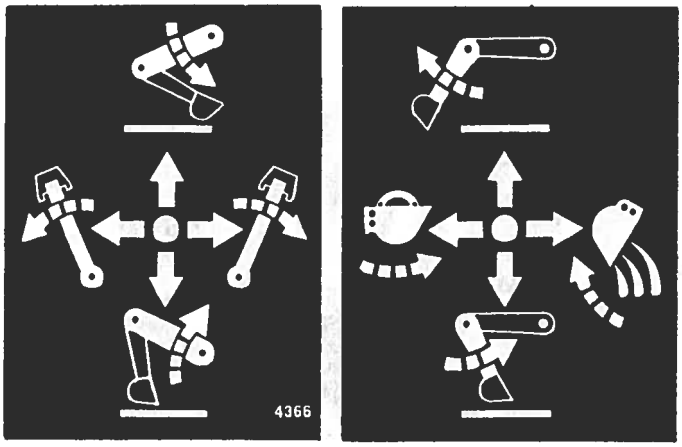




DECALS



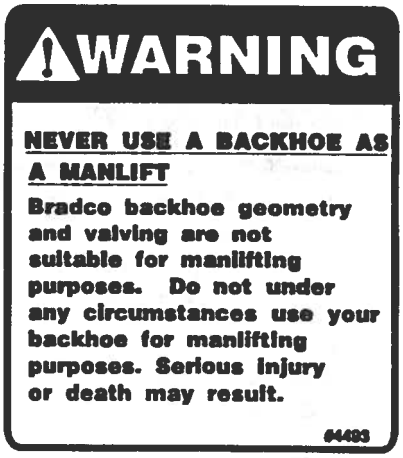
STABILIZER CONTROLS
PART #4367



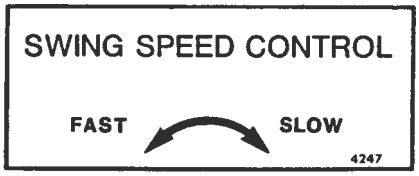
OPERATING CONTROLS
PART #4366

MADE IN USA
PART #4338

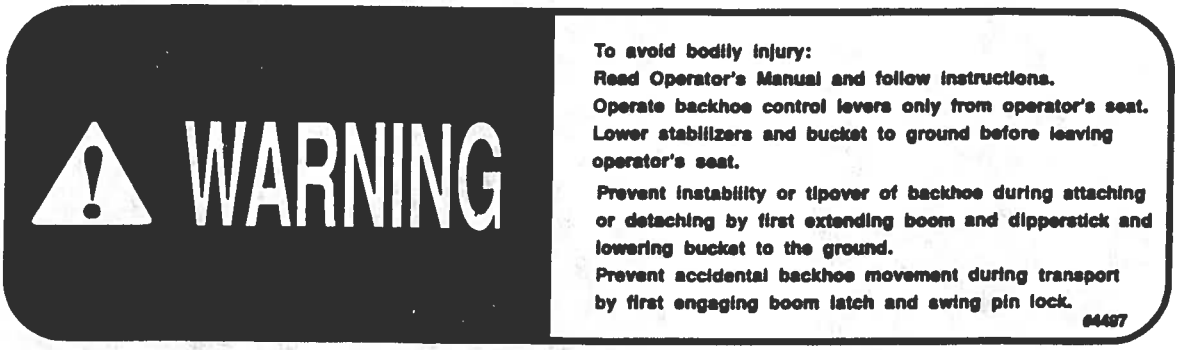
ATI SERIAL NO. TAG
PART #4350



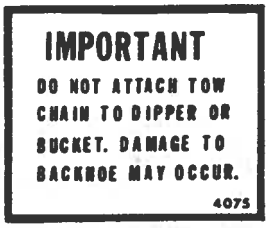
MANLIFT WARNING
PART #4493



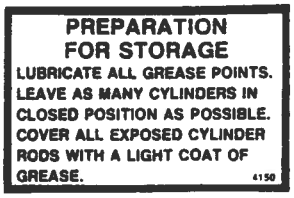
SWING SPEED CONTROL
PART #4247
(OPTIONAL)



BODILY INJURY WARNING
PART #4497

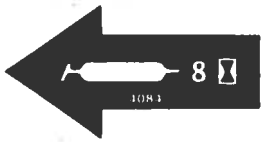


TOW CHAIN CAUTION
PART #4075

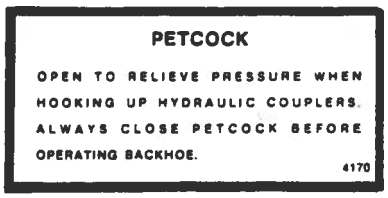


PREP. FOR STORAGE
PART #4150

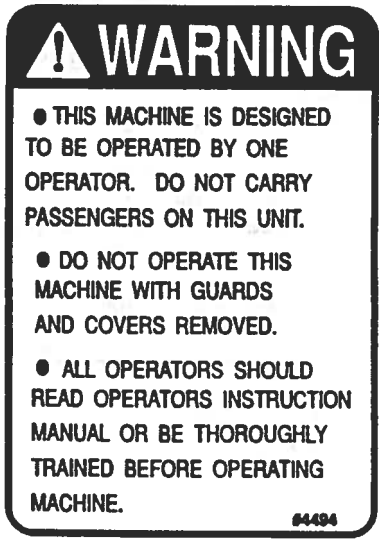
SWING POST
CAUTION
PART #4496



GREASE 8 HOURS
PART #4084
(2 REQ.)



PETCOCK OPERATION
PART #4170
(OPTIONAL)



OPERATOR'S WARNING
PART #4494

DECALS

NOTICE

TO BACKHOE OWNERS

Backhoes are heavy and impose heavy loads to the axle and wheel assemblies. Always keep wheel tread setting at the narrowest setting available.

-To avoid premature failure of axles or wheels. 4270

BACKHOE OWNER'S NOTICE
PART #4270

IMPORTANT

The backhoe bucket is capable of contacting this stabilizer and/or cylinder. Carefull operation will avoid backhoe damage. 4140

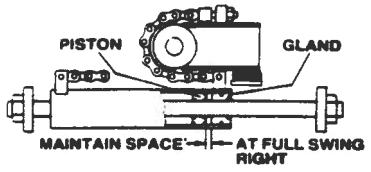
BUCKET CONTACT WARNING
PART #4140
(2 REQ.)

IMPORTANT
ORIGINAL FILTER
REPLACE AFTER
2 1/2 HOURS USE
4138

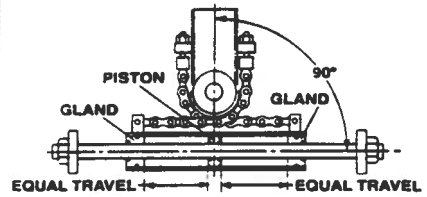
ORIGINAL FILTER
PART #4138

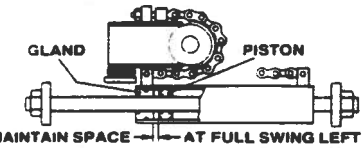
SWING CHAIN ADJUSTMENT

MUST PROVIDE THE FOLLOWING CONDITIONS



KEEP CHAINS SNUG





4136

SWING CHAIN ADJUSTMENT
PART #4136

IMPORTANT
CHANGE OIL FILTER
EVERY 75 HOURS USE
4137

CHANGE OIL FILTER
PART #4137

8MD2

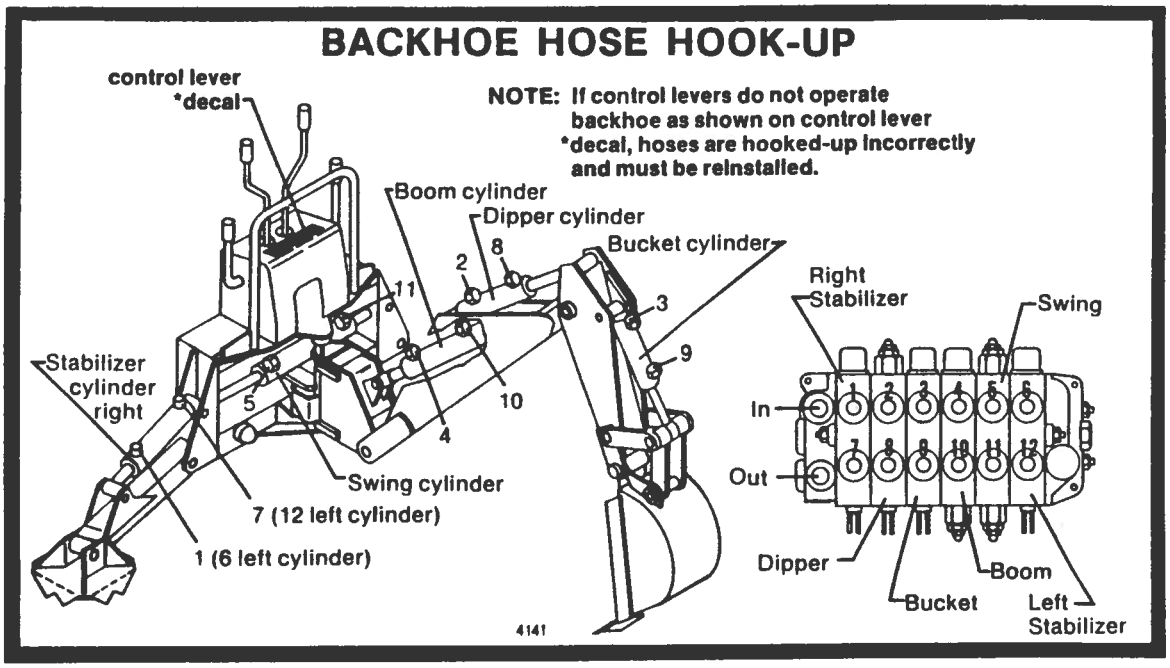
8MD2 MODEL NO. (2 REQ.)
PART #4326 - BLACK
PART #4358 - WHITE

9MD2

9MD2 MODEL NO. (2 REQ.)
PART #4327 - BLACK
PART #4359 - WHITE

11MD2

11MD2 MODEL NO. (2 REQ.)
PART #4328 - BLACK
PART #4360 - WHITE



BACKHOE HOSE HOOK-UP
PART #4141
LOCATED INSIDE VALVE COVER

BRADCO

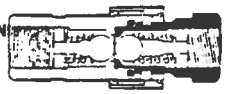
BRADCO LOGO (2 REQ.)
PART #40083 - BLACK
PART #40092 - WHITE

HYDRAULIC QUICK COUPLER HOOK-UP

RECOMMENDED PRACTICE AND DEFINITIONS.

1. Always install quick couplers so the oil flows out of the male tip and into the female coupler.

FEMALE SHOWN CLEAR



FLOW DIRECTION

MALE SHOWN SHADED

2. Quick couplers must be fully engaged to provide full freeflow. There are several reasons that may cause the coupler not to fully engage.

A. Dirt may block the male tip from engaging.
B. The coupler or male tip may be damaged or worn.
C. The coupler halves may not be matched to fully open the valve when the coupler is engaged. (The dimension from the face of a male tip to the locking groove must match the corresponding coupler.)
D. Some couplers with poppet style valve may not connect with ball type.

3. Coupler lock-up--Some quick couplers which may not have a "positive valve stop" or "Valve shield" feature may have a problem called "Lock Up" or "Flow Checking." This occurs when a valve closes during flow conditions, usually in return lines subjected to high surge flows, such as when quickly lowering a backhoe boom.

Surge flows -- A dramatic, almost instantaneous increase in fluid flow.

NOTE: All couplers or halves supplied with our units have positive valve stop feature. Both coupler and male tip must have the feature or lock up may occur.

SUGGESTED PRACTICE

1. If possible, always use quick couplers, pairs or identical make (brand) and model or style numbers when coupling hoses.

2. Be sure the brand or model used does not include the design feature to prevent "flow checking", or "lock up" during surge flow conditions.

3. Always be scrupulously clean when coupling quick couplers.

4. After coupling, perform first backhoe operations at engine idle to ascertain proper flow exists. NOTE: Many of our models of backhoes include a relief valve vented to atmosphere (small tube down the back) which will vent excessive return flow oil pressure to the air. If you see oil squirting out of the vent, check for a restricted return flow coupling.

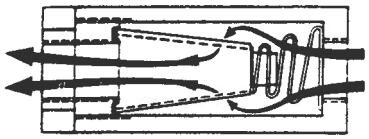
What if: 4291

In the event the coupler is blocked, even for just a instant, causing excessive back pressure build up in the valve assembly, you may experience valve failure. This will usually show up as stretched tie bolts, leaking spool seals or a ruptured casting.

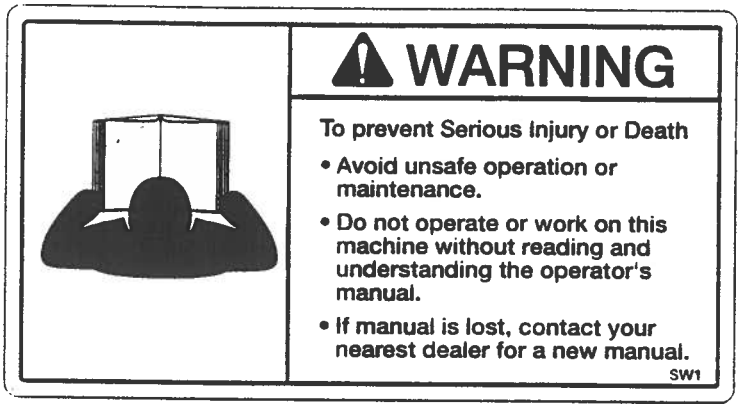
QUICK-COUPLER
PART #4291

SERVICE INFORMATION 4271

THIS IS AN INLINE 25 MICRON SINTERED BRONZE FILTER. IF PLUGGED OR PARTIALLY FILLED IT WILL REDUCE BACKHOE PERFORMANCE. REMOVE AND WASH OUT REGULARLY. REPLACE ELEMENT #45133 IF DIFFICULT TO BLOW THROUGH AFTER WASHING. SEE FULL INSTRUCTIONS IN THE OWNERS MANUAL.



INLINE FILTER
PART #4271



WARNING! READ MANUAL
PART #40150

WARNING! HIGH PRESSURE FLUID
PART #40151

DANGER! PINCH POINTS
PART #40149 (2 req'd)

R R

PREDELIVERY CHECKLIST

TRACTOR-LOADER-BACKHOE

GENERAL INFORMATION

The following is a list of areas that should be inspected by the dealer prior to delivery of the loader and backhoe to the customer. The customer should check the list and make sure that the dealer has completed the inspection. Completion of this check list will help insure that the customer recieves the loader and backhoe in complete working order, ready to install.

4607 1-10-89

PREDELIVERY CHECKLIST - CHECK AND ADJUST AS NECESSARY

1. ___ Check the hydraulic system for correct hydraulic fluid level.

2. ___ Check and lubricate the loader and backhoe if necessary. See "Lubrication", Section H.

3. ___ Visually inspect the loader and backhoe for bent, loose, cracked, damaged or missing parts. Check for any other irregularities.

4. ___ Remove paint from finished (chrome) surfaces of cylinders and valve spools.

5. ___ Loader and backhoe control levers operate in accordance with the control lever decals.

6. ___ Run cylinders through their full cycle to purge any air from the system.

7. ___ Check all hydraulic connections for leaks and all hoses for proper positioning to reduce chafing and binding.

8. ___ Check system relief valve pressure and compare and adjust to reommended operating pressure listed in the "Specifications" section, Section P.

9. ___ Check loader and backhoe attachment bolts for tightness. Retighten after the first eight working hours, and after every forty working hour interval thereafter. See "Bolt Torque", Section O.

10. ___ Make sure decals are not damaged or missing and are in their correct location. See "Decals", Section Q.

11. ___ Complete and return the manufacturer's "Warranty Validation Form" and sign your dealership predelivery checklist.

12. ___ Operator to read the FIEI Loader/Backhoe Safety Manual provided, before operating the equipment.

S S

LIMITED WARRANTY

EFFECTIVE MARCH 1, 1986

All new unused American Trencher products are warranted to be free from defects in materials or workmanship which may cause failure under normal usage and service when used for the purpose intended.

In the event of failure within 12 months from initial retail sale, lease or rental date (excluding cable, ground engaging parts such as sprockets, digging chain, bearings, teeth, tamping and demolition heads, and blade cutting edges), if after examination, American Trencher determines failure was due to defective material and/or workmanship, parts will be repaired or replaced by American Trencher. American Trencher may request defective part or parts be returned prepaid to them for inspection at their place of business at Delhi, Iowa, or to a location specified by American Trencher.

Any claims under this warranty must be made within fifteen (15) days after the Buyer learns of the facts upon which such claim is based. All claims not made in writing and received by American Trencher within the time period specified above shall be deemed waived.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED AND THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL AMERICAN TRENCHER BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGE.

AMERICAN TRENCHER'S LIABILITY FOR ANY AND ALL LOSSES AND DAMAGES TO BUYER, RESULTING FROM ANY CAUSE WHATSOEVER, INCLUDING AMERICAN TRENCHER'S NEGLIGENCE, IRRESPECTIVE OF WHETHER SUCH DEFECTS ARE DISCOVERABLE OR LATENT, SHALL IN NO EVENT EXCEED THE PURCHASE PRICE OF THE PARTICULAR PRODUCTS WITH RESPECT TO WHICH LOSSES OR DAMAGES ARE CLAIMED, OR, AT THE ELECTION OF AMERICAN TRENCHER, THE REPAIR OR REPLACEMENT OF DEFECTIVE OR DAMAGED PRODUCTS.