Keep With Loader Operator's Manual

GRAPPLE FORK KIT

CONTENTS

INTRODUCTION

Grapple fork kit can be installed using tools ordinarily available. Shut off tractor engine and engage tractor brakes during installation.

Tractor must be equipped with a valve which will be available for grapple fork hydraulics or use electronic third function kit option.

THE FOLLOWING INTENDED USE STATEMENTS ARE SUGGESTED TO HELP PREVENT ACCIDENTS

1. Using a front end loader without special attachments for handling large heavy objects, such as large round or rectangular bales, logs, fertilizer bags and liquid containers is **NOT RECOMMENDED**.
2. Handling large heavy objects can be extremely dangerous due to:
   - Danger of rolling tractor over.
   - Danger of upending tractor.
   - Danger of object falling or sliding down loader arms to operator.
3. If you must perform above work, protect yourself by:
   - Use proper attachment.
   - Never lift loader higher than necessary to clear ground when moving.
   - Ballast tractor rear to compensate for load.
   - Never lift large objects with equipment that does not have an anti rollback device.
   - Move slowly and carefully avoiding rough terrain.
4. By properly balancing tractor, equipping tractor with falling object protective structure (FOPS) and exercising caution the loader with grapple fork attachment can be used to handle large round or rectangular bales and loose bulky material like hay and silage. Do not attempt to use loader to handle

OPERATING GRAPPLE FORK

Operation of your tractor and loader with grapple fork option requires some same basic considerations as operation with a bucket, plus two new requirements: you now have to operate a grapple fork while already operating your tractor and loader; and you must also take into account additional space requirements (added length and height) needed because of attached grapple fork.

● INTENDED USE

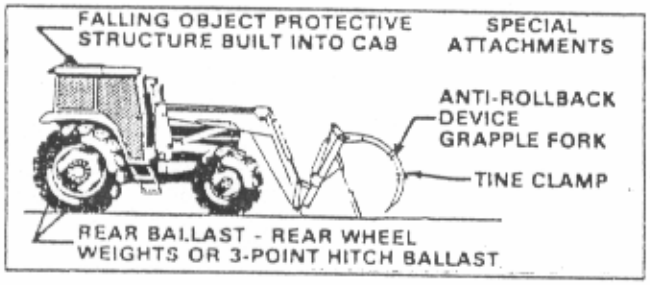
Use of this loader without special attachments for handling large heavy objects such as large round or rectangular bales, logs and oil drums is NOT RECOMMENDED.

Handling large heavy objects can be extremely dangerous due to:

- Danger of rolling tractor over.
- Danger of upending tractor.
- Danger of objects rolling or sliding down loader arms onto operator.

If you must perform any work listed above, protect yourself by:

- Never lift load higher than necessary to clear ground when moving.
- Ballast tractor rear to compensate for load.
- Never lift large objects with equipment that does not have an anti-rollback device.
- Move slowly and carefully, avoiding rough terrain.

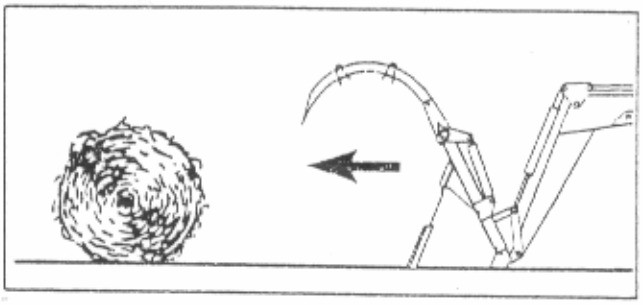


Using special attachments as shown, and exercising caution, your loader can be used to handle large round or rectangular bales and loose bulky materials like hay and silage. Do not attempt to use loader to handle logs, fertilizer bags or liquid containers since such use is NOT RECOMMENDED.

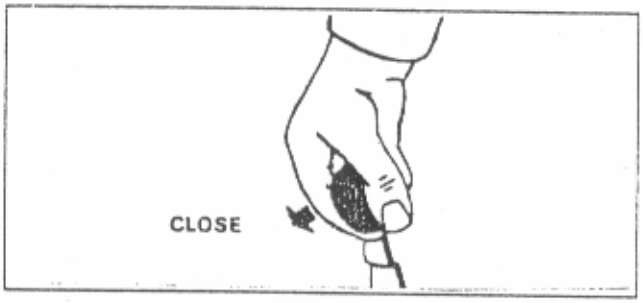
NOTE: *It is recommended to use both tine clamps if your grapple fork is to be used for handling round or rectangular bales. Using only one clamp may work better for loose hay or silage, allowing tines to penetrate better. Additional tine clamps are optional. Keep each grapple fork tine clamp securely fastened to grapple fork tines at all times.*

● GRASPING ROUND BALES

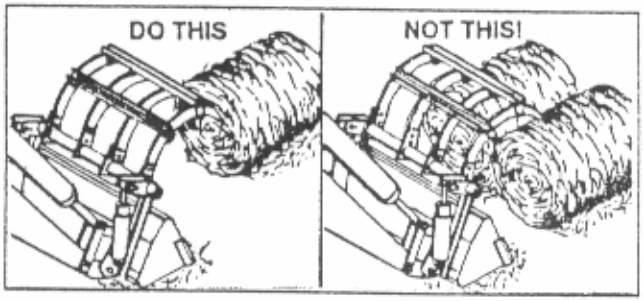
Approach bale with grapple fork open and bucket level. Use loader float position if bale is on ground.



Ease valve control lever for grapple fork forward to close grapple fork around bale.

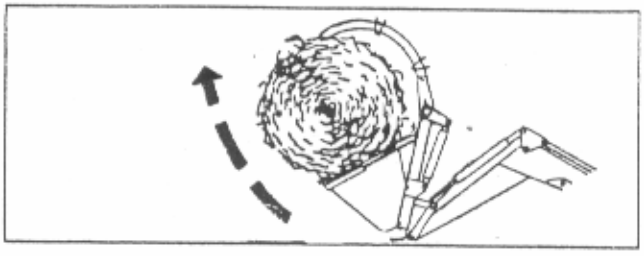


NOTE: *While large round bales are best grasped as shown above, they may also be grasped from either end if necessary. DO NOT ATTEMPT TO LIFT MORE THAN ONE LARGE ROUND BALE AT A TIME as this can cause overloading of loader or tractor or cause unstable conditions.*

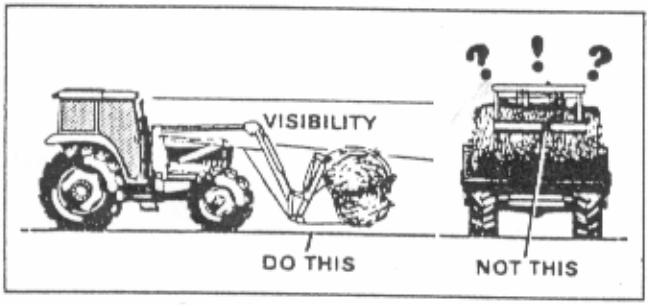


● LIFTING AND CARRYING LOAD

Ease both loader control levers back to lift and roll bucket back.

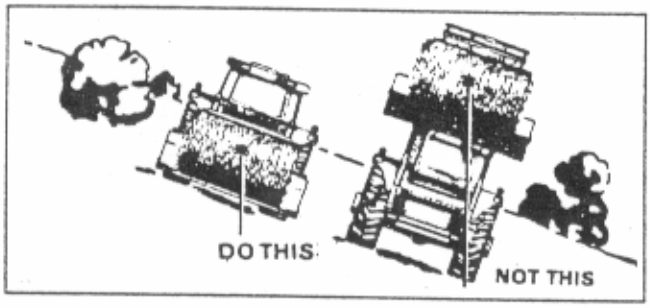


Position bucket just below level of tractor hood for maximum stabilibility and visibility whether bucket is loaded or empty.

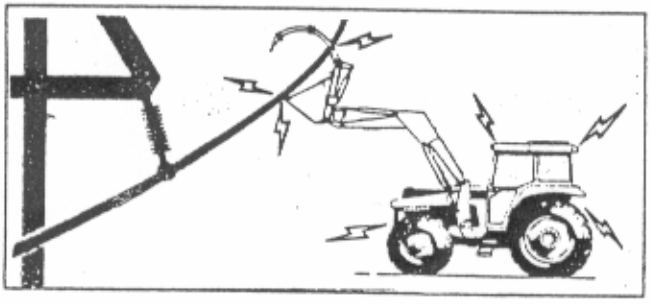


Use extreme care when operating a loader on a slope, carry load as low as possible. This keeps center of gravity for bale, tractor and loader low and will provide maximum tractor stability.

CAUTION: *Operating a loader on a hillside is dangerous. Extreme care is recommended to avoid overturns.*



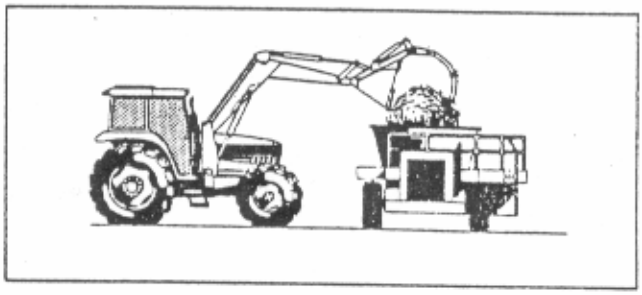
Even on level ground, transport bucket and load as low as possible to avoid tipping in case a wheel drops in a rut and to avoid power lines.



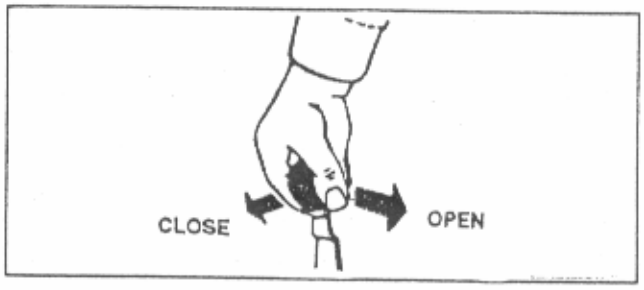
WARNING: *Keep bucket, grapple fork and loader boom clear of overhead lines. Allowing loader boom or any attachments to contact overhead power lines may electrify entire tractor and electrocute (kill) operator.*

- **LOADING INTO TUB GRINDER**

Lift bucket high enough to clear tub grinder sides. Move tractor toward tub grinder to position load near center. Extend bucket cylinders to position bucket in dump attitude.



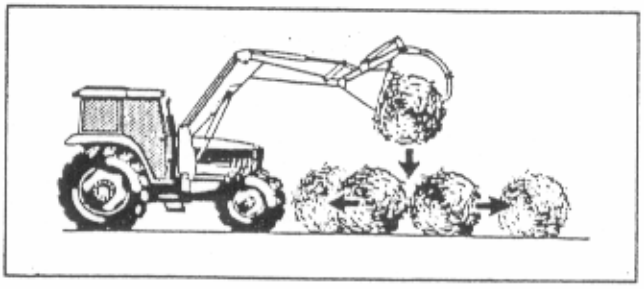
Gradually open grapple fork tines, allowing material to drop into tub grinder. For round bales, it may be necessary to gradually set bale into tub grinder to avoid shock loading tub grinder due to bale weight and to avoid sudden load on grinder mechanism.



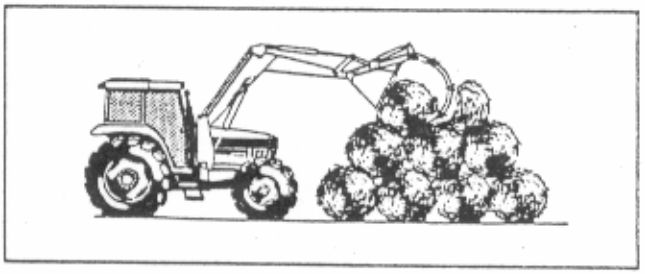
Roll bucket back, close grapple fork and back tractor away from tub grinder, then lower loader boom after dumping.

- **STACKING BALES**

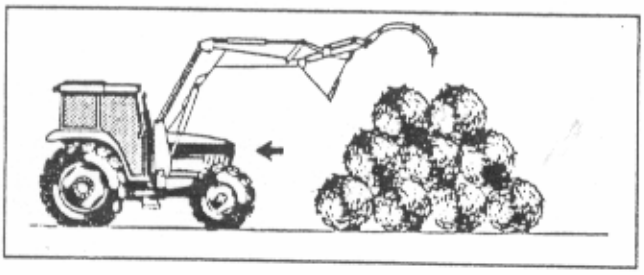
WARNING: *Because of size and weight of large bales, extreme care must be taken in handling them. Be aware of forces acting on stacked bales due to gravity and keep workers far from zones of potential hazard from shifting or falling bales. DO NOT ALLOW BYSTANDERS!*



Use loader and grapple fork to gently position bale on stack, then release bale while removing bucket and fork.

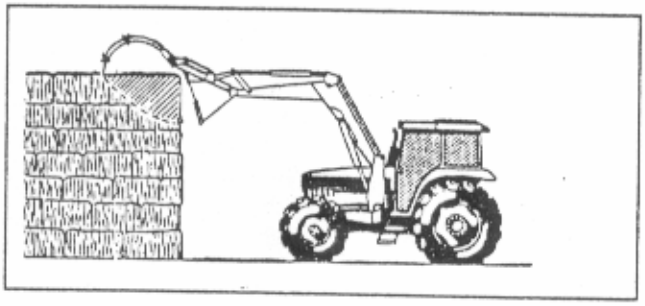


Slowly back tractor away from stack.



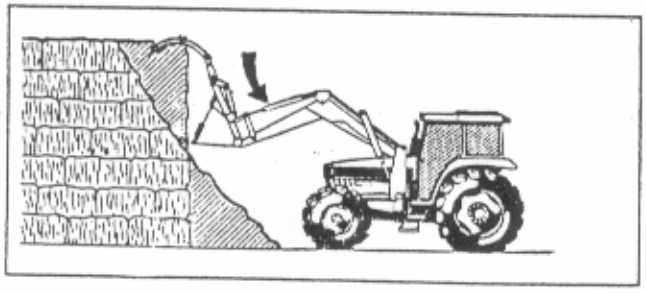
- **LOADING FROM A STACK, BUNKER SILO OR PIT SILO**

Choose forward gear that provides sufficient ground speed for loading.

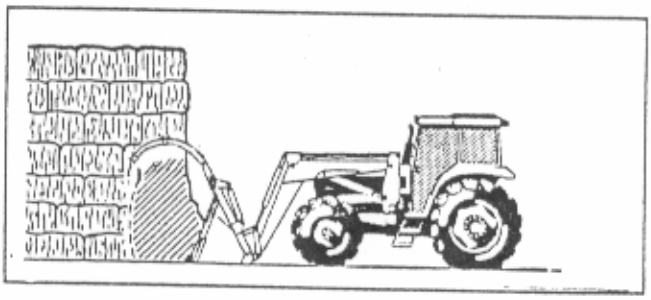


Touch pile as near as possible to top with bucket positioned in dump attitude and grapple fork open. Close grapple fork while maneuvering bucket to grasp loose material.

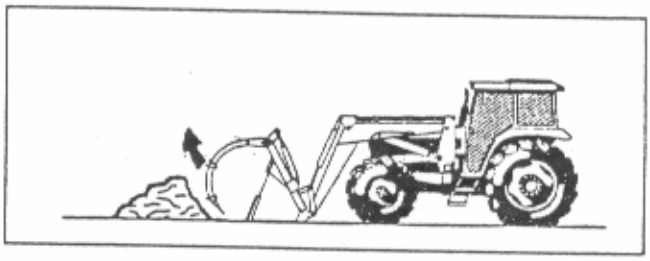
CAUTION: *Loader lift and break-away capacity diminish as loader height is increased. Care must be taken not to grasp more material than your loader can safely support.*



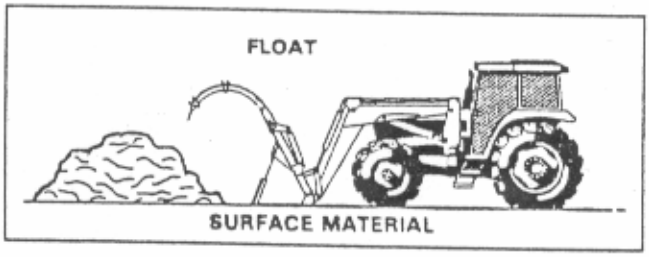
An alternate method is to use your loader and grapple fork to knock material down from top of pile so it can be loaded from ground.



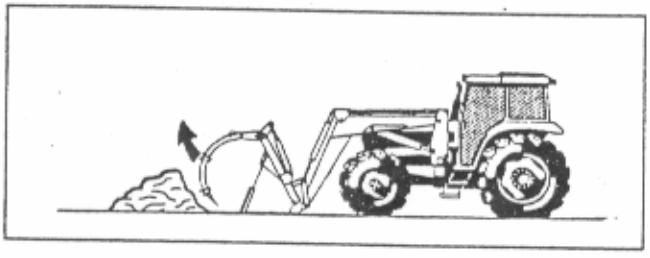
Exercise caution when undercutting a high pile. Avalanching material can be dangerous.



When loading material from ground, keep a level bucket and use lift control float position. If hydraulic down pressure is exerted on a bucket, it will wear faster than normal. Keep bucket level when approaching pile.



Keeping a level bucket and using loader float will reducesurface gouging and mixing surface material with stockpile material.



When a sufficient amount of material has accumulated in front of bucket, close grapple fork to grasp material and curl bucket.

PARTS LIST - GRAPPLE FORK (Figures 1& 2)

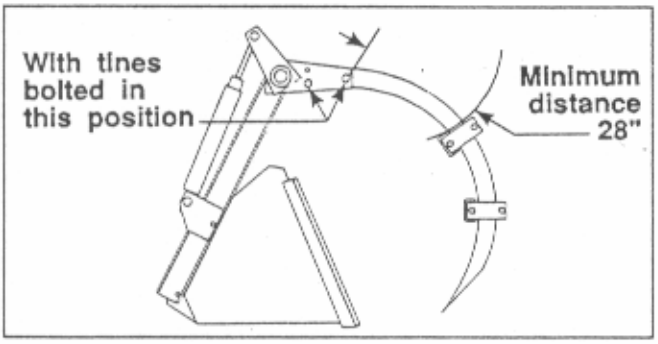
Item	Part No.	Description	Qty.
1	42136	FRAME, Grapple Fork	1
2	42124	CYLINDER, Grapple Fork (Code JS)	2
3	6075-4	FITTING, Grease, 1/4-28 Straight	6
4	35605-5	PIN, 1-1/4 x 5-1/4	2
5	35605-1	PIN, 1-1/4 X 3-3/4	2
6	31353	BOLT, Shoulder, 3/8-16 x 1	4
7	G9413534	NUT, Lock, 3/8-16	5
8	G271767	SCREW, Cap, 3/4-10 x 1-1/2	8
9	G180192	SCREW, Cap, 1/2-13 x 3-1/2	4
10	42098	BRACKET, Angle, Assembly	2
11	42101	PLATE, Tine Clamp	8
12	G120396	WASHER, Flat, 1/2	4
13	42139	PLATE, Stop	2
14	G180122	SCREW, Cap, 3/8-16 x 1	4
15	G9414074	NUT, Lock, 1/2-13	24
16	40575	TINE, Grapple Fork	4
17	G271771	SCREW, Cap, 3/4-10 x 2	8
18	G9414076	NUT, Lock, 3/4-10	16
19	42104	CLAMP, Tine, Assembly	2
20	G180181	SCREW, Cap, 1/2-13 x 2	16
21	38520	DECAL, Warning: Do not allow anyone...	2
22	32845-7	FITTING, Elbow, 3/4 SAE O-Ring - 9/16 JIC Flare x 90°	4
23	36386-5	HOSE, 3/8 x 78"	2
24	36386-12	HOSE, 3/8 x 30"	2
25	36665-1	FITTING, Tee, 9/16 JIC Flare - 9/16 JIC Flare - 9/16 JIC Flare	2
26	38163-7	HOSE, 3/8 x 108"	2
27	34853-7	SLEEVE, Nylon Hose, 84"	1
28	13722	CLAMP, Hose	1
29	G180126	SCREW, Cap, 3/8-16 x 1-1/2	1
30	G120394	WASHER, Flat, 3/8	1
31	6137-4	COUPLER, Quick, Male	2
32	36240-5	BAND, Spiral, Blue	1
	36240-6	BAND, Spiral, Red	1
33	42138	PLATE, Restrictor	2
34	G120382	WASHER, Lock, 3/8	4
35	G180177	SCREW, Cap, 1/2-13 x 1-1/2	4

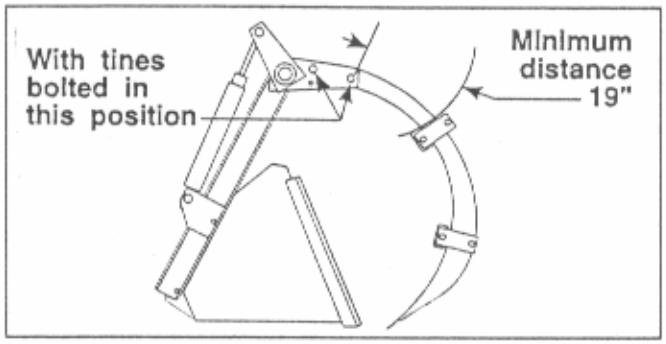
GRAPPLE FORK ASSEMBLY (Figure 1)

It is necessary to detach bucket from loader to install grapple fork. Follow procedure listed in "Loader Buckets" section of loader operators manual to detach bucket from loader.

1. Install stop plates (13) to loader boom arms using 3/8-1 cap screws (14) and 3/8 lock washers (34).
2. Attach nylon slings around torque tube of grapple fork frame(1) and use an overhead hoist to raise the grapple fork frame off pallet and lower it to back of bucket. Align holes in grapple fork frame channels with holes in bucket ears and fasten grapple fork frame to bucket ears with 3/4 x 1-1/2 cap screws (8) and lock nuts (18).
3. Position angle brackets (10) on bucket and grapple fork mounting channel. If bucket does not have 9/16 holes, use angle brackets as a guide and drill two 9/16 holes in bucket for each bracket. Fasten angle brackets (10) to bucket using 1/2 x 3-1/2 cap screws (9), flat washers (12), and lock nuts (15). Fasten angle brackets (10) to grapple fork frame channels using 1/2 x 1-1/2 cap screws (35), and lock nuts (15).
4. Attach tines (16) to outward sides of tine attachment plates on grapple fork frame (1) using 3/4 x 2 cap screws (17) and lock nuts (18).

   NOTE: *Top tine clamp must be positioned a minimum distance below attachment ears to avoid interference between grapple fork and bucket level indicator. If tines are positioned for maximum opening, minimum clamp distance is 28". If tines are positioned for closed position, maximum clamp distance is 19".*





5. Attach top tine clamp (19) to tines using 1/2 x 2 cap screws (20), 1/2 lock nuts (15) and tine clamp plates(11). Fasten remaining tine clamp (19) near tine ends using same procedure, unless fork will be used to handle loose light material.

   NOTE: *It is recommended to use both tine clamps if grapple fork is to be used for handling round or rectangular bales. Using only one clamp may work better for loose hay or silage, allowing tines to penetrate better. Additional tine clamps are optional.*

6. Install 1/4 straight grease fittings (3) into base and rod ends of cylinders (2). Install remaining grease fittings (3) into pivot tubes near ends of grapple fork frame (1). Use grease gun to apply grease into cylinder pin connections and into pivot tube/torque tube contact surfaces.

   WARNING: *Keep bucket, grapple fork and loader boom clear of overhead lines. Allowing loader boom or any attachments to contact overhead lines may electrify entire tractor and kill (electrocute) operator.*

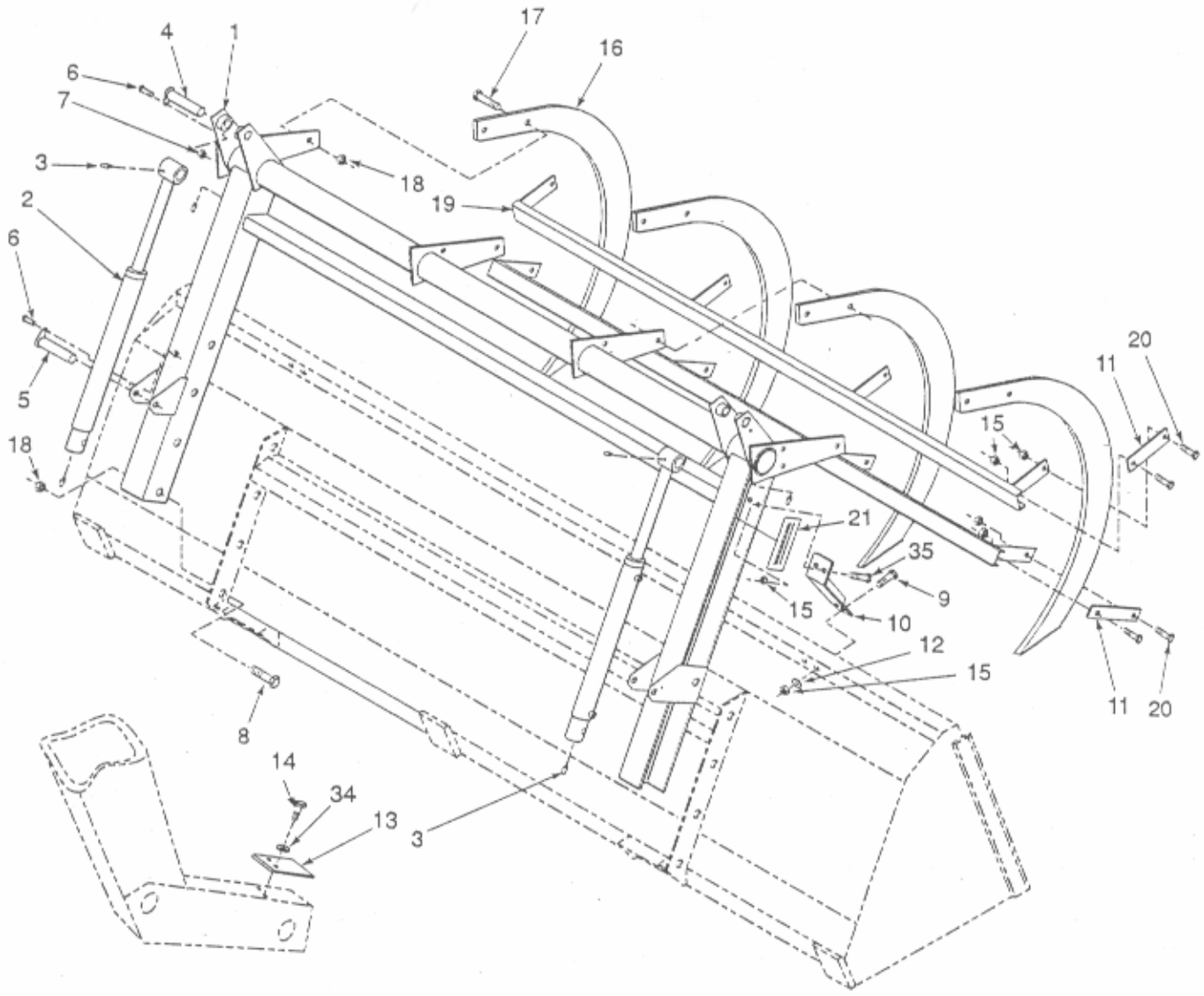


Figure 1

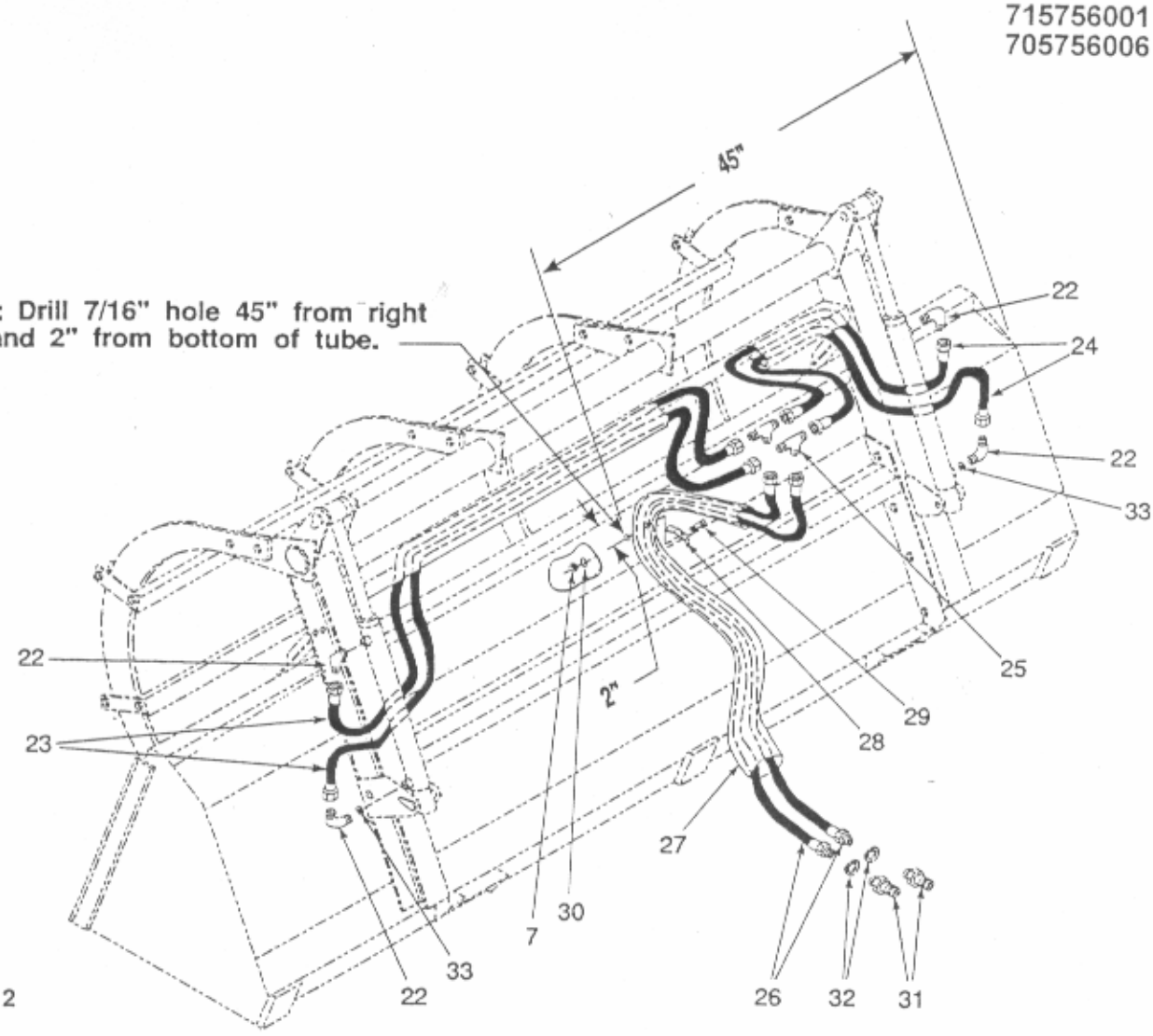


Figure 2

PLUMBING GRAPPLE FORK TO MALE QUICK COUPLERS (Figure 2)

NOTE: *Apply sealant only to all tapered threads unless coupled with swivel adapters. When using teflon tape, wrap tape clockwise (as viewed from end) and wrap tape only twice. Keep sealant away from first two threads of tapered end to prevent contamination of hydraulic fluid. Do not use sealant on o-ring or flare adapter threads.*

1. Remove plastic plugs from both ports of each cylinder. Install restrictors (33) into base ports of cylinders. Install 3/4 - 9/16 x 90° elbow fittings (22) into cylinder ports.
2. Connect 3/8 x 78 hoses (23) to fittings (22) in base and rod ends of left cylinder. Thread hoses (23) from left cylinder up to grapple fork cross-channel and across toward right side of cross-channel. Connect 3/8 x 30 hoses (24) to fittings (22) in base and rod ends of right cylinder. Route hoses (24) from right cylinder up into grapple fork cross -channel to meet hoses (23) from left cylinder.

   NOTE: *Hoses should be routed between grapple fork frame and cylinder barrel.*
3. Use one 9/16 tee fitting (25) to connect hoses (23 & 24) from rod ends of both cylinders together. Use remaining 9/16 tee fitting (25) to connect hoses (23 & 24) from base ends of both cylinders together.
4. Install 3/8 x 108 hoses (26) onto tee fittings (25) and install male quick couplers (31) and spiral identification bands (32) onto free ends. Slide hose sleeve (27) over both hoses.
5. Drill a 7/16" hole through back of bucket approximately 45" toward center from right side of bucket and approximately 2" below bucket top channel.

   NOTE: *Attach nylon sleeve to bucket after grapple fork is fully cperational.*

ATTACHING GRAPPLE FORK

1. Follow procedure listed in "Loader Buckets" section of loader operators manual to mount bucket onto loader.
2. Connect male quick couplers (31) from grapple fork cylinders to female quick couplers on quick coupler bracket or third function valve, mounted on loader boom cross tube.
3. After all plumbing has been completed, start tractor engine and slowly cycle grapple fork cylinders several times to purge any air out of hydraulic system, then retract cylinders and stop engine. Add additional tractor hydraulic fluid, as specified in tractor operators manual to bring oil level up to full.

   NOTE: *When cycling grapple fork cylinder, pulling control lever back should open grapple fork and pushing forward should close it. If direction of control lever is reversed, switch quick couplers at tractor remote hydraulic couplers.*

4. After grapple fork is completely operational, raise loader and completely dump bucket. Lower loader till it is resting on ground.

   NOTE: *Bucket is now in position for fastening nylon sleeve to bucket.*

5. Place sleeve (27) over hole with hoses (26) straddling hole to determine where hole must be. Cut through sleeve (being careful not to damage hoses). Fasten sleeve (27) and hoses (26) to bucket using oil line clamp (28), 3/8 x 1-1/2 cap screw (29), flat washer (30) and lock nut (7).

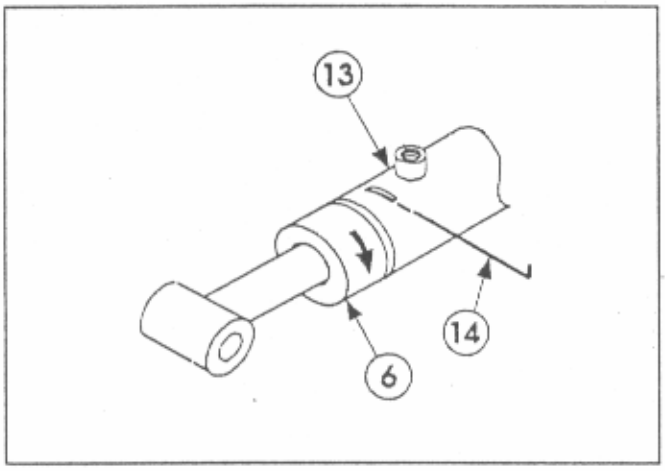
WARNING: *To avoid serious injury:*

- *Do not allow anyone within 10 feet of loader and grapple fork during operation or anytime grapple fork is in open position.*
- *ALWAYS keep grapple fork closed except when loading or unloading bucket.*

Before operating grapple fork, adjust hydraulic flow speed control on valve body to slowest speed setting. Refer to tractor operators manual for instructions.

GRAPPLE FORK CYLINDER DISASSEMBLY (Figure 3)

1. Hold cylinder tube (13) stationary and rotate cylinder head (6) so beveled end of wire ring (14) will thread out through slot.



2. Pull shaft (1) with all assembled parts out of cylinder tube (13).

NOTE: *Resistance will be felt until piston seal (11) slides over the wire retaining ring groove.*

3. Remove 3/4 flange lock nut (12) from end of shaft and slide cylinder piston (9), and cylinder head (6) off the shaft.
4. Remove piston wear ring (8), piston seal (11) and o-ring (9) from out side grooves of piston (10).
5. Remove wiper seal (2), snap ring (3), reinforcing washer (4), v-pack set (5) from inside of cylinder head and o-ring (7) from groove on outside of head.
6. Clean all parts, including cylinder tube, in a suitable cleaning solvent, then use air pressure to blow any dirt or excess solvent from all parts.
7. Examine all parts for wear or damage and replace, if necessary.

GRAPPLE FORK CYLINDER ASSEMBLY

NOTE: *Be careful not to damage seals, packings and o-rings on the edges or holes in cylinder tube. Inspect and remove burrs and sharp edges if necessary before reassembling.*

1. Place new v-pack set (5) in head (6).

NOTE: *Lips on v-pack must face toward the inside of head.*

2. Place reinforcement washer (4) on top of v-pack set (5) and force down below snap ring groove.
3. Install snap ring (3) into snap ring groove

NOTE: *Rounded outside edge of snap ring must face inward and snap ring must be firmly seated in groove.*

4. Install wiper seal (2) with lip of seal facing out and flush with top of cylinder head (6).
5. Place o-ring (7) in groove on outside of head (6).
6. Remove sharp edges on outer edge of threaded end of shaft (1). Lubricate wiper seal (2) and v-packing (5) in head and carefully slide head (6) onto shaft.
7. Place o-ring (9), piston seal (11) and piston wear ring (8) in grooves on outside of piston (10).

NOTE: *For easier installation, place piston seal (11) in 120° F water to warm seal.*

8. Slide piston (10) onto threaded end of shaft. Install 3/4 flange lock nut (12) and tighten to 100 ft. lb. of torque.
9. Lubricate piston wear ring (8) and piston seal (11) on piston (10), o-ring (7) on head (6) and inside of cylinder tube (13) then carefully slide piston and head into cylinder tube (13).
10. Insert wire retaining ring (14) into slot in cylinder tube (13) and turn cylinder head while applying pressure to wire ring to thread it into the groove.

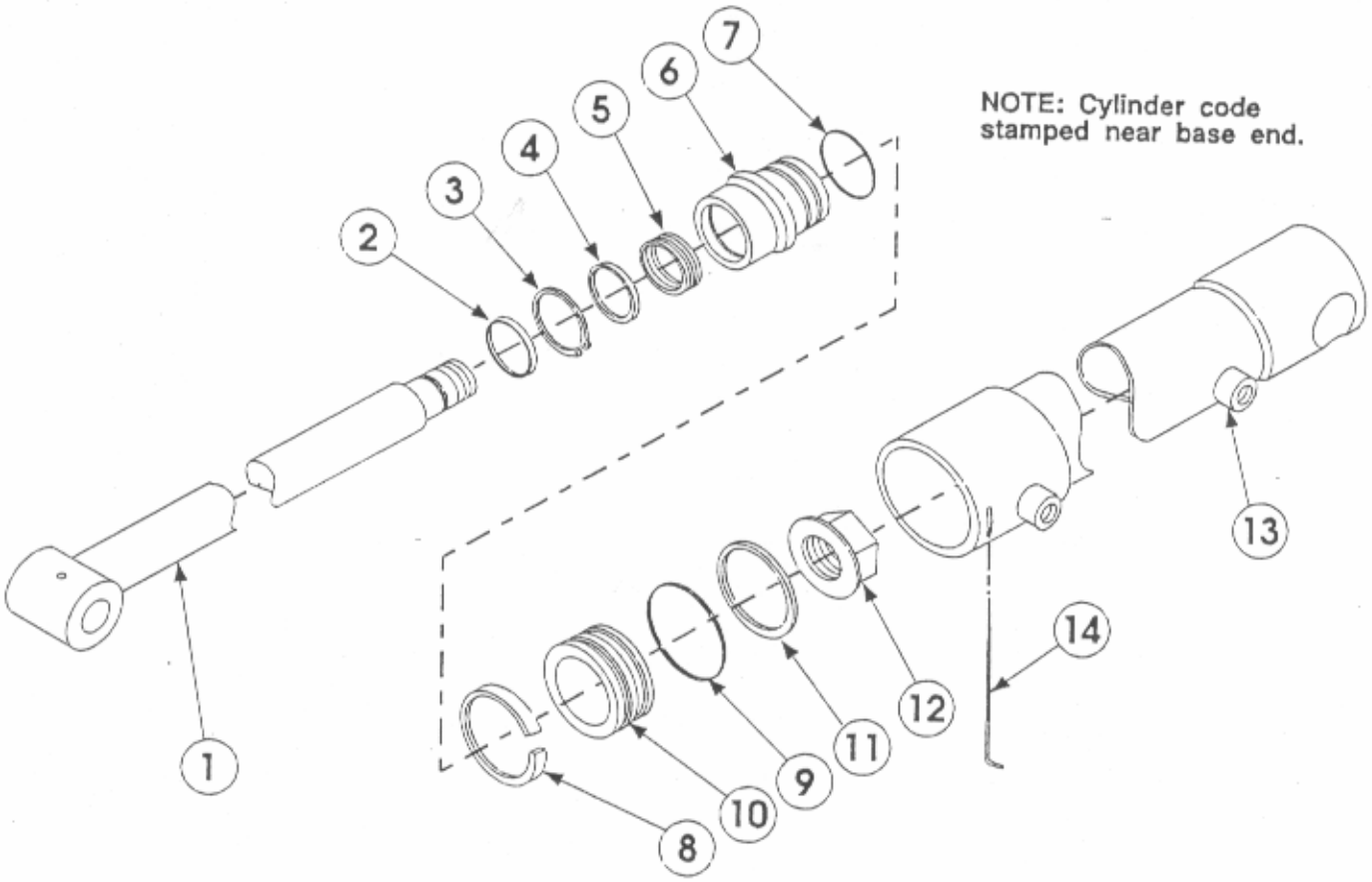


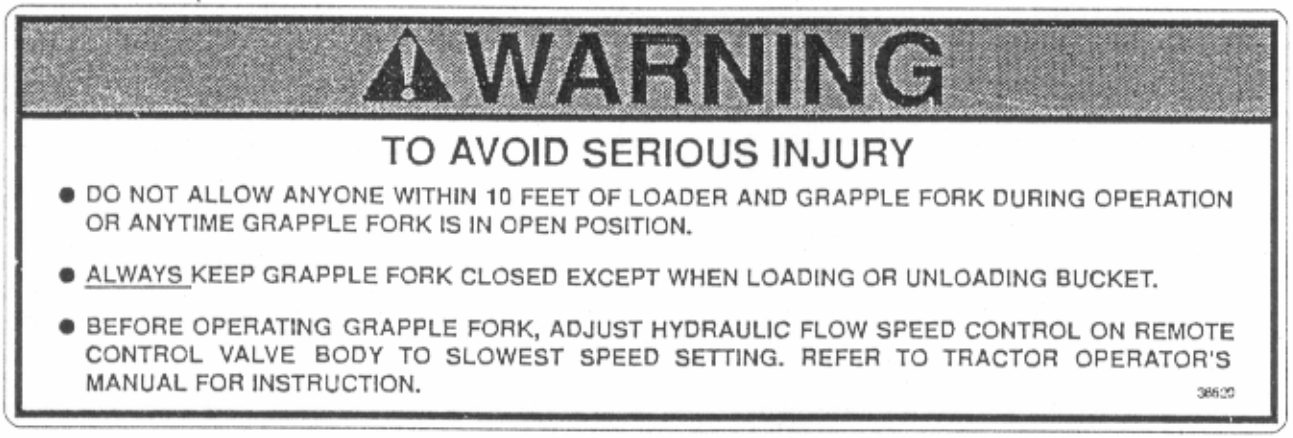
Figure 3

PARTS LIST - GRAPPLE FORK CYLINDER (42124) (Code JS)

Item	Part No.	Description	Qty.
1	42127	ROD, Weldment	1
2	*	SEAL, Wiper	1
3	*	RING, Retaining	1
4	*	WASHER, Reinforcing	1
5	*	V-PACK, Set	1
6	3525	HEAD	1
7	*	O-RING	1
8	*	RING, Wear	1
9	*	O-RING	1
10	35962	PISTON	1
11	*	SEAL, Piston	1
12	32903-1	NUT, Lock	1
13	42123	TUBE, Cylinder, Assembly	1
14	13720-2	RETAINER, Wire	1
*	36193	Repair Kit, Includes (*) Items	1

NOTE: *Loader safety decals are at locations listed below each decal part number. Replace decals if they are damaged or illegible. Replacement decals are available from your Dealer.*

DECAL P.N. 38683
Location: Loader Upper Left Boom Arm



DECAL P.N. 38520
Location: Both sides of Grapple Fork Frame

INSTALLATION INSTRUCTIONS