

Manual of Operation

Liberty Backhoe LB Series



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FOREWORD

You are now the proud owner of a LIBERTY Backhoe. This is a product of LIBERTY quality engineering and manufacturing. It is made of quality materials and superior quality control system. I will give you a long, satisfactory service. To obtain the best use of your backhoe, please read this manual carefully. It will help you become familiar with the operation of the backhoe and contains helpful hints about maintenance. It is LIBERTY's policy to utilize as quickly as possible every advance in our research. The immediate use of new techniques in the manufacture of products may cause some small parts of this manual to become outdated. Please do not hesitate to consult with LIBERTY for the most up-to-date information.



SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the mower itself to warn of the possibility of personal injury. Read these instructions carefully. It is essential that you read the instructions and safety regulations before you attempt to assemble or use this unit.



DANGER : Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING : Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION : Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

IMPORTANT : Indicates that equipment or property damage could result if instructions are not followed.

NOTE : Gives helpful information.



SAFE OPERATION

Most backhoe equipment accidents can be avoided by following simple safety precautions. These safety precautions, if followed at all times will help you operate your backhoe safely.

BEFORE OPERATING YOUR BACKHOE

1. Know your equipment and its limitations. Allow only trained personnel to operate or service this equipment. Read and understand all instructions and precautions in this manual before service or operation. Also read and understand all instructions and precautions in the tractor and loader operator's manuals before using this equipment.
2. It is the owner's responsibility to ensure that anyone who will operate the equipment reads and understands this manual first and becomes familiar with safe operation of this equipment.
3. For safe operation, check the mounting bolts for tightness and the mount levers are in the right position before operation.
4. Never operate the tractor with backhoe attached and loader removed.
5. Check for buried material such as electrical, telephone, gas and water lines. When in doubt, contact local utility companies for their buried location prior to operating the backhoe.
6. Replace any safety decal that becomes damaged, lost or illegible. Also renew all decals when repainting.

OPERATING YOUR BACKHOE

1. Do not allow anyone other than operator on the unit while in operation or transport.
2. Use care when operating on slopes to avoid tip-over. Travel at a speed compatible with safe operation, especially when operating on uneven terrain, crossing ditches or while turning.
3. Operate the backhoe from the backhoe operator's seat only.
4. When using on slopes, one stabilizer may be lower than the other. Use extreme care during excavation as risk of tip-over will increase.
5. To reduce the risk of tip-over on a slope, place the spoil to the high side of the excavation.
6. Do not dig under the stabilizer or tractor, especially in soft or sandy conditions. Take extra precaution in wet or thawing ground. Under these conditions the ground can become unstable and may collapse under the weight of the machine and may cause the unit to tip over.
7. Never operate the machine or any equipment while under the influence of alcohol or other drugs, or while fatigued.
8. When leaving the machine unattended, be sure to lower the backhoe to the ground. Set the parking brake, turn the engine off and move the key.

SAFETY FOR CHILDREN

Tragic accidents can occur if the operator is not alert to the presence of children. Children are generally attracted to machines and the work being done. Never assume children will remain where you last saw them.

1. Keep children out of the operating area and under care of another responsible adult.
2. If children enter the work area, turn machine off.
3. Before and when backing, look behind and down for small children.
4. Never carry children while operating the machine. They may fall and be injured or interfere with safe operation of the machine.
5. Never allow children to play on the machine or attachment even when turned off.
6. Never allow children to operate the machine, even with adult supervision.
7. Use extra care when approaching blind corners, shrubs, trees, or other obstructions that might hide children from sight.

DRIVING THE TRACTOR ON THE ROAD

1. Raise the center the boom, close the dipperstick, curl the buck and engage the boom and swing locks before transporting the machine.
2. Check local codes and regulations that may apply to tractor / loader / backhoe operation on public street or highways, before transporting or traveling. Use SMV emblem and warning flashers as required. (SMV: Slow Moving Vehicle)

SERVICING THE BACKHOE

1. Relieve all hydraulic pressure by moving the controls before disconnecting hydraulic lines.
2. Always use personal protection devices such as safety goggles and gloves when servicing or repairing the machine.
3. Lower the backhoe to the ground and shut the engine off before servicing.
4. When servicing or repairing pins in cylinder ends, bucket, etc., always use a brass drift and hammer. Failure to do so could result in injury from flying metal fragments.
5. To avoid serious personal injury, keep clear of working are of the backhoe.
6. When servicing or checking underneath, do not get under the machine while it is help only with the bucket, backhoe or stabilizers. Securely support with adequate jackstands. Do not work under any hydraulically support machine elements, as they can settle, suddenly leak down, or be accidentally lowered.
7. Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before apply pressure to the system, be sure the tall connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Do not use hands to search for suspected leaks, use a piece of cardboard. If injured by escaping fluid, see a doctor at once. Serious infection or allergic reaction can develop if proper medical treatment is not administered immediately.
8. Do not taper with any backhoe control valve relief pressure setting. The relief valve pressure is present at factory. Changing the setting can cause overloading of the backhoe and and cause serious injury or death.
9. Do not modify the backhoe for any reason. Modifying the backhoe can cause unstable condition for the tractor / loader / backhoe combination and serious personal injury or death may result.

CARE OF DANGER, WARNING AND CAUTION LABELS

1. Keep danger, warning and caution labels clean and free from obstructing material.
2. Replace damaged or missing safety labels and make sure the labels are attached a the same location as the replaced component.

BEFORE YOU BEGIN:

LIBERTY ships the backhoe the hydraulic oil tank drained after testing. You can put regular utility grade hydraulic oil in the tank.

WHEN YOU RECEIVE YOUR MACHINE

1. Fill hydraulic fluid to middle of side viewer on tank.
(Utility grade hydraulic oil is fine)
2. Check oil on the PTO pump through the sight gauge. (80-90 weight gear oil).
3. Check all bolts, and make sure they are snug.
4. Check for all parts, bolts, etc for your model
5. Attach legs of backhoe with two pins on either side and connect leg hydraulic hose (Hose with [X] goes towards the feet.
6. Check hydraulic hoses for tightness.



Yellow box is fill for gear oil.
Red circle is glass viewer.

INSTALLING BACKHOE FRAME FOR KUBOTA SUBFRAME

LIBERTY ships the backhoe with the adapter for Kubota backhoe subframe ready to install.

It has the following parts:

- 2 - Two side plates
- 2 - Top pins with linch pin
- 1 - short cross member
- 1- one longer cross member
- 1 - bolt package

STEP 1: Remove any wire tires that hold any parts to the backhoe and prepare to assemble.

STEP 2: Using bolts, washers, lock washers and nuts on each side mount the side brackets. The U Collar on top goes towards the centerline of the machine.
TIP: Keep nuts loose until fully assembled . Three larger bolts go in upper 3 holes. 4 slightly smaller in bottom for to form a square

STEP 3: Install lower crossmember (the longer of the two cross members) then place hydraulic pump between front pins before attaching top crossmember.



STEP 4: Install the top crossmember. This is the shorter of the two cross members and goes inside of the support bracket using the two bolts you fastened the tractor side of the support bracket.

Step 5: Install the bottom crossmember using bolts, washers, lock washers, nut.

Step 6: Securely tighten all bolts with lock washers and nuts.

OPTIONAL ASSEMBLY PARTS:



INSTALLING SUBFRAME

If you purchased the subframe for the L series, please see parts above for L series. It has the following parts:

- 2 - Two long side plates
- 2 - Small angled axle support plates
- 4 - bolts for front of subframe
- 4- bolts for axle support
- 3 - bolts with spacers for ROPS attachment

Prior to installing subframe on your L series tractor, you should assemble the subframe main adapter, and set it aside, not yet mounting on the main frame of the backhoe. We will use this to make sure our subframe is mounted correctly on the ROPS.

Also, it may be advantageous to remove one rear wheel to access each point. If you do so, make sure you properly support your rear axle, and always be safe and secure in your blocking and support. Not everyone removes their rear wheel.

Step 1: Attach one of the bolts for the rear subframe on ROPS. Remember that the short tube spacer goes on the inside of ROPS and outside of the Subframe. Do not tighten at this point .

Step 2: Attach the axle bracket to the subframe with two short bolts and leave the bolts loose. See picture for orientation. Make sure to use the lock washers.

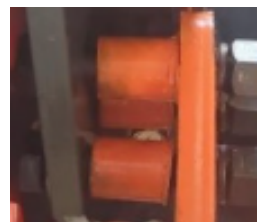
Step 3: Lift or jack up the front of the subframe and align the four holes of the front of the subframe to the 4 holes on the Front End Loader frame. Some need bolts, washers, lock washers and nuts and some are threaded holes. Put in 4 bolts and leave loose.

Step 4: At ROPS put the remaining two bolts with standoff tubes on the ROPS bracket.

Step 5: Under the axle put in two bolts on the axle bracket. Do not tighten yet.

Step 6: REPEAT Steps 1-5 for opposite side.

Step 7: Take the subframe main adapter and set it in the 4 point attachment. You will be able to see if it lines up, or if your ROPS needs some adjustment. ROPS can be adjusted by loosening 4 bolts that attach it to the rear axle. Loosen and tap in our out to make sure you align well. (OPTION: If you do not want to adjust ROPS, you can often use 5/8" washers to adjust the distance of the subframe to exactly match the distance of the subframe adapter.



Step 8: When adjusted. Tighten all bolts of the subframe.

Step 9: Bolt the subframe adapter to the main frame of the backhoe.

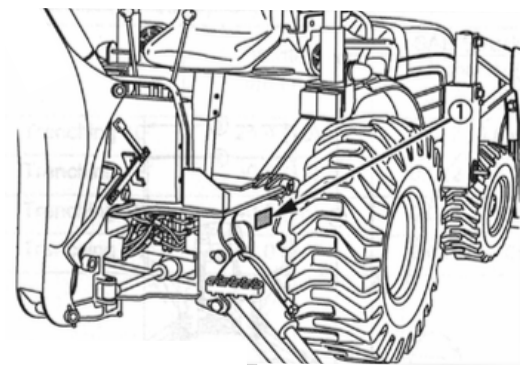
SERVICING OF BACKHOE

LIBERTY is very interested in helping you get the most value out of your backhoe. After reading this manual thoroughly, you will find that you can do some regular maintenance yourself. However, when in need of parts or major service, please give LIBERTY a call with the backhoe model and serial number.

Locate the serial number now and record it in the space provided.

The reference to left hand and right hand in this manual refers to the p position when seated in the operators seat at backhoe position and facing rearward of the tractor.

LIBERTY BACKHOE	
Model	
Serial Number	
Date of Purchase	



1 - Serial number locator

SPECIFICATIONS

Specifications:

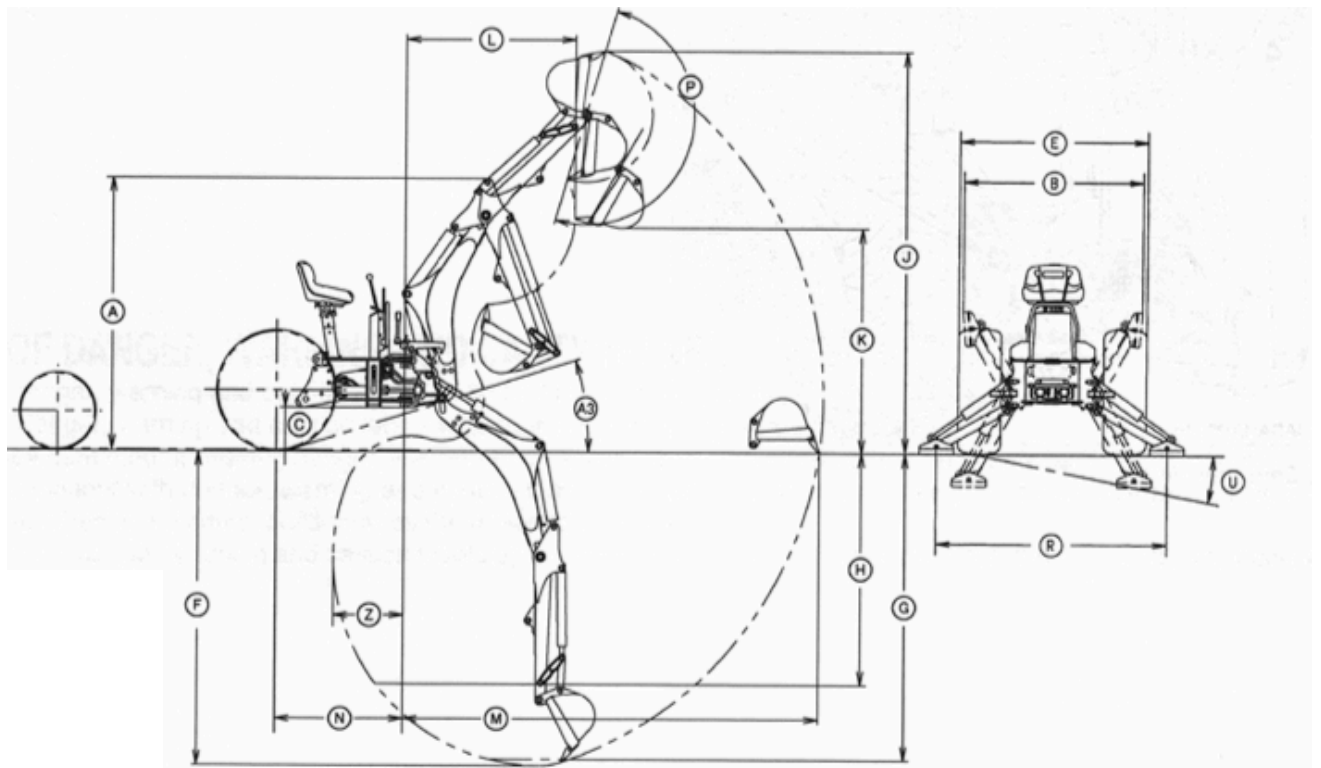
Model		LBS	LB7	LB9
Tractor Range (Recomended HP)		15-20	25 - 60	35 - 85
Maximum Digging Depth	F	5'	7'	8'7"
Digging Depth - Two foot flat bottom	G	4'5"	6'5"	8'5"
Ground clearance*	C	19"	12"	14"
Swing Arc		170 °	170 °	170 °
Max Digging Radius		8'3"	11'	12'10"
Loading Height - Bucket @ 60 degrees		5'	6'2"	6'5"
Reach from centre line of Swing Pivot		7'6"	9.6"	10.6"
Maximum Transport Height	A	4.2"	5.9"	6.8"
Bucket rotation		180°	180°	180°
Standard Bucket size		12"	16"	18"
Bucket capacity (ft3)		1.06	1.27	1.70
Stabiliser spread - Down position	R	6'	6'9"	8'5"
Stabiliser spread - Up position	B	3'2"	4'3"	6'
Leveling Angle	U	10.2°	10.2°	10.2°
Bucket cylinder digging force		2140lbs	2860lbs	3520lbs
Dipper stick digging force		1437lbs	2090lbs	2200lbs
Hydraulic Pressure requirements		2250psi	2250psi	2250psi
Weight		760 lb	1100 lb	1340 lb

* depending on tractor and tire size

DIMENSIONS:

Cycle Time	Seconds
------------	---------

Boom Cylinder, retract	3.5
Boom Cylinder, retract	3.1
Swing Cylinder, Right to Left	4.2
Dipperstick extend	4.9
Dipperstick retract	3.4
Bucket extend	3.2
Bucket retract	2.5
Stabilizer max height to ground	2.4
Stabilizer, ground to max. height	2.0



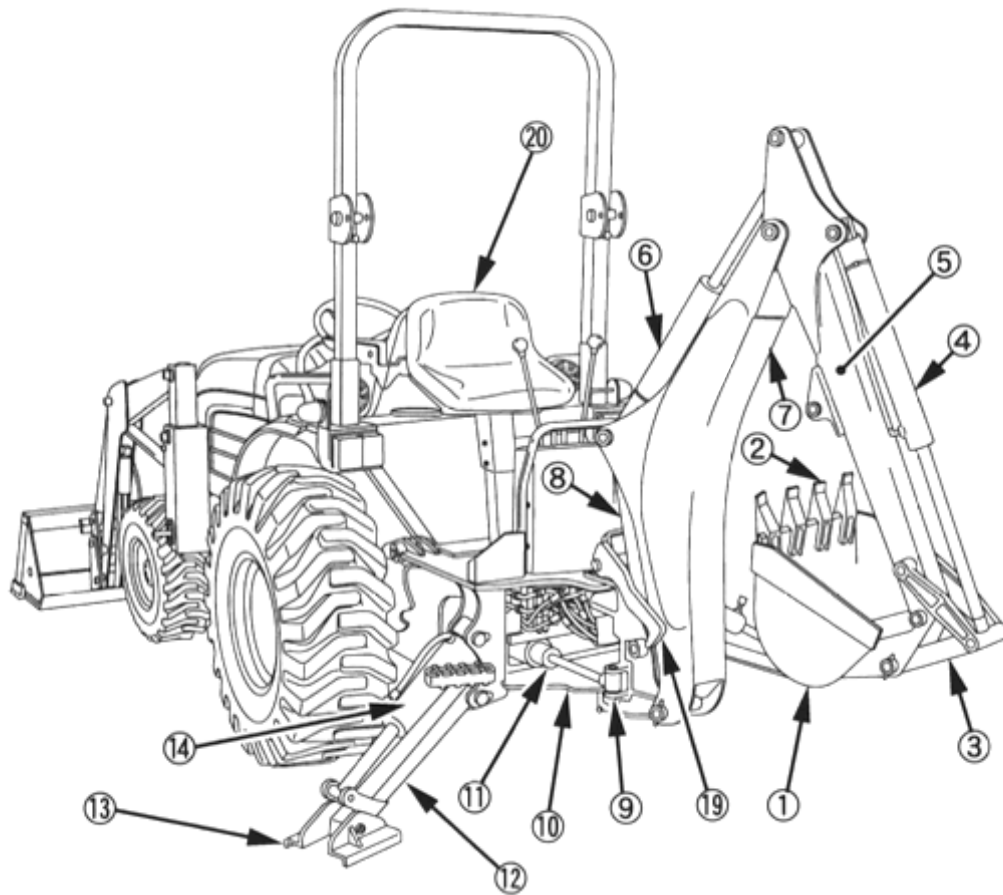
Hydraulic Cylinders

	LB6	LB7	BL8
Boom	75 mm	75 mm	75 mm
Dipperstick	60 mm	60 mm	60 mm
Bucket	60 mm	60 mm	60 mm
Stabilizer	60mm	60mm	60mm
Swing	60 mm	60 mm	60 mm

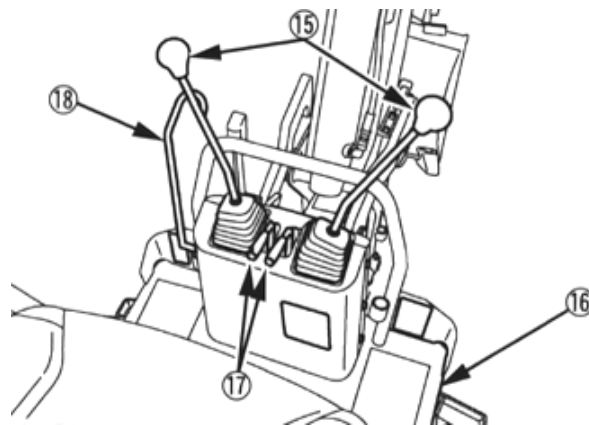
Bucket Alternatives:

	Width cm (in.)	Capacity m3 (cu-ft)	Heaped capacity	No of teeth
Trenching 9"	200 mm	0.167 (0.58)	0.20 (0.71)	2
Trenching 12"	300 mm	.0222 (0.77)	0.027 (0.95)	3
Trenching 16"	400mm	0.031 (1.09)	0.039 (1.38)	3
Trenching 18"	450mm	0.034 (1.22)	0.044 (1.55)	4
Trenching 24"	600mm	0.048 (1.70)	0.064)2.26)	5

BACKHOE TERMINOLOGY



- (1) Backhoe bucket
- (2) Bucket teeth
- (3) Link, bucket
- (4) Cylinder, bucket
- (5) Dipperstick
- (6) Cylinder, dipperstick
- (7) Boom
- (8) Cylinder, boom
- (9) Swing frame
- (10) Main frame
- (11) Cylinder, swing
- (12) Stabilizer
- (13) Stabilizer pad
- (14) Cylinder, stabilizer
- (15) Joystick control
- (16) Step
- (17) Stabilizer control
- (18) Swing lock pin
- (19) Boom lock
- (20) Seat



PRE-OPERATION CHECK LIST

(OWNER'S RESPONSIBILITY)

The operator should perform the following check list before operating backhoe.

___ Check that backhoe is properly and securely attached to tractor.

___ Make sure all hydraulic connections are tight and all hydraulic lines and hoses are in good condition before engaging tractor PTO.

___ Check that there are no leaks in the hydraulic system. Before operating, all hydraulic hoses must be routed properly and not be twisted, bent sharply, kinked, pulled tight or frayed.

___ During inspection, check that all nuts and bolts are secure and clevis pins are properly cotter pinned.

___ Be sure special heavy-duty top link, provided with backhoe, is installed.


___ Make sure only original equipment high- strength top link pin, provided with tractor, is used to attach top link to tractor.

___ Use a 3/4" x 3-1/2" grade 5 bolt to mount top link to backhoe.

___ Make sure tractor lower lift arm stabilizers (blocks or chains) are positioned to prevent lift arms and backhoe from swaying.

___ Place all backhoe controls in neutral position before starting tractor engine.

___ Check hydraulic reservoir level. **IMPORTANT!** Check fluid level daily and if using all day, check every few hours. LOW hydraulic fluid can cause the oil to get hot, to mix with air, and can damage the pump or seals. Damage due to low fluid WILL NOT covered in our 1 year parts warranty.

 **IMPORTANT:** Do not add liquid ballast or any other weights to the front tires. While your backhoe is installed on tractor, liquid ballast in the rear tires should not be used.

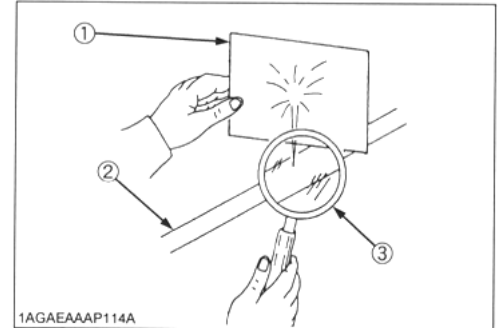
MAINTENANCE

DAILY CHECKS



CAUTION: TO AVOID PERSONAL INJURY.

1. Never make repairs, service or adjustments when the hydraulic system is under pressure, when the engine is running or when any backhoe cylinder is under load.
2. Escaping hydraulic fluid under pressure can have sufficient force to penetrate skin, causing personal injury.
3. Before disconnecting lines, be sure to relieve all pressure. Before apply pressure to system, be sure all connections are tight and that lines, pipes and hoses are not damaged.
4. Fluid escaping from a very small hole can be almost invisible. Do not use hands to search for suspected leak. Use a piece of cardboard. If injured by escaping fluid see a doctor at once.



1AGAEAAAP114A

- (1) Cardboard
- (2) Hydraulic line
- (3) Magnifying glass

MAINTENANCE

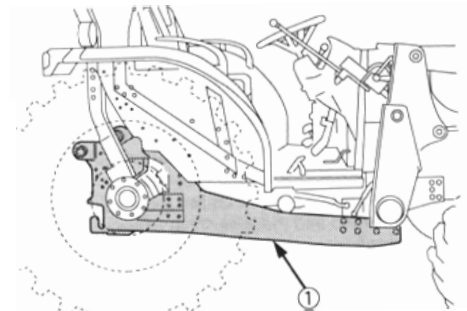
1. The backhoe is run by its independent hydraulic system. Before operation, check the hydraulic tank for hydraulic fluid level by simply removing the hydraulic tank cap and visually inspecting tank level. You can use a clean rod to check level. Tank should be 1/2 - 3/4 full. If low, replenish the oil with high quality hydraulic fluid.
2. CHECK all hardware daily before operation. Tighten hardware snugly.
3. Inspect all hoses for cuts or wear. Check for signs of leaks and make sure all fittings are tight.
4. For safe operation, check that the upper mounting pins are secure and fastened on the Kubota upper 4 point secure system.

EVERY 50 HOURS : Check sub frame bolt torque



CAUTION: TO AVOID PERSONAL INJURY.

1. Never operate backhoe and front loader with a loose subframe.
2. Anytime bolts and/or nuts are loose, retighten to specified torque.
 - M16 bolt and nut : 145 - 166 ft-lbs
 - M14 bolt and nut: 91.5 - 108.4 ft-lbs
 - M12 bolt and nut: 46.3 - 53.5 ft-lbs
 - Other: 57.2 - 66.5 ft-lbs
3. Check all bolts and nuts frequently and keep them tight.
Please check standard chart of torque specifications (pg 12)



LUBRICATION

Lubricate all grease fittings every 10 hours operation. High quality grease designated ‘extreme pressure’ and containing Molybdenum disulfide is recommended. This grease may specify “Moly Ep” on it’s label.

TIRE INFLATION

Ensure tractor tires are properly inflated. Refer to the tractor operator’s manual for optional tires and correct pressure.

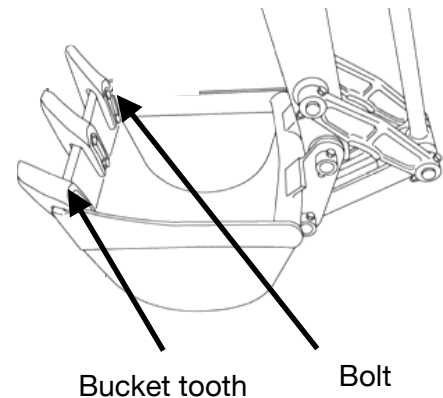
BUCKET SERVICE

⚠ CAUTION: TO AVOID PERSONAL INJURY.
When servicing or repairing pins in cylinder ends, bucket, etc., always use a brass drift and hammer. Failure to do so could result in injury from flying fragments.

Changing the Backhoe Bucket

Changing the backhoe bucket becomes necessary as the top of job to be accomplished changes. In most backhoe operations this is a common occurrence. By using the following instructions, this job can be quick and easy. Always select a smooth level area to change buckets.

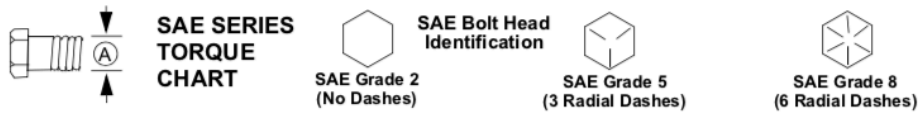
Place the bucket to be installed on its bottom, near the backhoe dipper stick and bucket to be removed. Position the bucket to be removed hydraulically, into this natural position, just touching the ground. **(See illustration to right side)**



Changing the Backhoe Teeth

The bucket teeth are locked on with bolts to the bucket. Even though the teeth are heat-treated and hard, they will eventually need replacement. As the teeth become worn, the resistance of digging will increase. When the teeth are worn, install new teeth using new bolts. Bucket teeth may be removed and stored when drainage work is required. This type of work may not require trenching teeth.

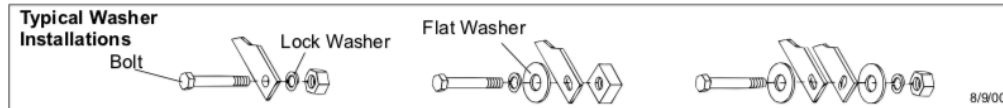
General Torque Specifications:



Ⓐ Diameter (Inches)	Wrench Size	MARKING ON HEAD					
		SAE 2		SAE 5		SAE 8	
		lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m
1/4"	7/16"	6	8	10	13	14	18
5/16"	1/2"	12	17	19	26	27	37
3/8"	9/16"	23	31	35	47	49	67
7/16"	5/8"	36	48	55	75	78	106
1/2"	3/4"	55	75	85	115	120	163
9/16"	13/16"	78	106	121	164	171	232
5/8"	15/16"	110	149	170	230	240	325
3/4"	1-1/8"	192	261	297	403	420	569
7/8"	1-5/16"	306	416	474	642	669	907
1"	1-1/2"	467	634	722	979	1020	1383



Ⓐ Diameter & Thread Pitch (Millimeters)	Wrench Size	Coarse Thread				Fine Thread				Ⓐ Diameter & Thread Pitch (Millimeters)
		Marking on Head				Marking on Head				
		Metric 8.8		Metric 10.9		Metric 8.8		Metric 10.9		
		N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	N-m	lbs-ft	
6 x 1.0	10 mm	8	6	11	8	8	6	11	8	6 x 1.0
8 x 1.25	13 mm	20	15	27	20	21	16	29	22	8 x 1.0
10 x 1.5	16 mm	39	29	54	40	41	30	57	42	10 x 1.25
12 x 1.75	18 mm	68	50	94	70	75	55	103	76	12 x 1.25
14 x 2.0	21 mm	109	80	151	111	118	87	163	120	14 x 1.5
16 x 2.0	24 mm	169	125	234	173	181	133	250	184	16 x 1.5
18 x 2.5	27 mm	234	172	323	239	263	194	363	268	18 x 1.5
20 x 2.5	30 mm	330	244	457	337	367	270	507	374	20 x 1.5
22 x 2.5	34 mm	451	332	623	460	495	365	684	505	22 x 1.5
24 x 3.0	36 mm	571	421	790	583	623	459	861	635	24 x 2.0
30 x 3.0	46 mm	1175	867	1626	1199	1258	928	1740	1283	30 x 2.0



*If the torque levels are specified in the text, follow that specification.

Item	Shape	Thread size	Tightening torque		
			N-m	kgf-m	ft-lbs
Adjustable elbow, Adaptor (O-ring port) (UNF)	 [A] Nut Type [B] No Nut Type a: O-ring	9/16	37 to 44	3.8 to 4.5	27 to 33
		3/4	48 to 54	4.9 to 5.5	35 to 40
		7/8	77 to 85	7.9 to 8.8	57 to 62
Hose fitting, Flare nut (UNF)		9/16	22 to 25	2.3 to 2.8	16 to 19
		3/4	36 to 40	3.6 to 4.1	26 to 30
		7/8	43 to 50	4.4 to 5.0	32 to 36
Adaptor (NPT)		1/4	30 to 50	3.1 to 5.0	23 to 36
		3/8	39 to 60	4.0 to 6.1	29 to 44
		1/2	49 to 58	5.0 to 5.9	36 to 43

OPERATING INSTRUCTIONS

OPERATING SPEED

⚠ CAUTION: Use care when operating tractor on slopes to avoid tip-over. Travel at speed compatible with safe operation, especially when operating in uneven terrain, crossing ditches, and while turning, or upset may occur.

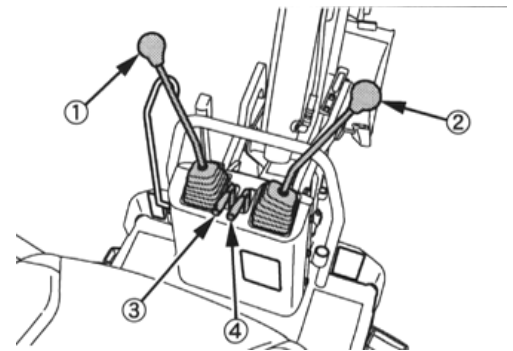
1. This backhoe can be operated at any engine speed from about 75% of rated rpm to factory rated rpm. The backhoe is most efficient at rated engine speed. However, when learning controls, or in special digging conditions, for optimal fuel economy, or where noise may be a consideration, the engine speed can be lowered to about 75% of rated rpm. Normal rpm will be about 2500 rpm engine speed.
2. **IMPORTANT:** A continuous operating in high engine speed might cause temperature rise. Please keep an eye on your tractor oil temperature.
3. In cold temperatures below 0° C (32° F), run the tractor engine below 50% of rated rpm until oil exceeds 0°C (32° F).

BACKHOE CONTROLS

⚠ CAUTION: For all excavation work, operate the backhoe from the backhoe's operator's seat only. Do not tamper with any backhoe control valve relief setting. This is preset at factory and changing the setting can cause failure and lead to serious personal injury.

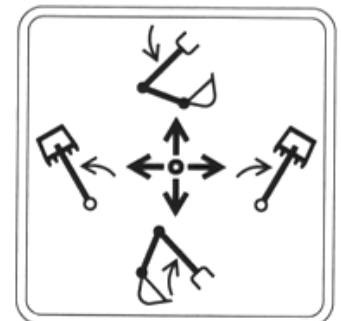
The backhoe is controlled by using the two lever 'joystick' system. The left lever controls the boom and swing circuits, and the right lever controls the dipper stick and bucket circuits. The further the levers are moved from neutral, the faster the component will move. Learn the feature of the controls for smooth and precise component movement.

1. *Boom and swing lever*
2. *Dipperstick and bucket lever*
3. *Stabilizer control lever, left*
4. *Stabilizer control lever, right*



Boom and Swing Lever (1)

Pushing the lever forward will lower the boom, and pulling it back will raise it. Movement of the lever to the left will swing the bucket to the left, and moving it to the right will swing the bucket to the right. It is possible to raise or lower and swing at the same time by moving the lever out of the plus "+" position; into an "X" relationship.

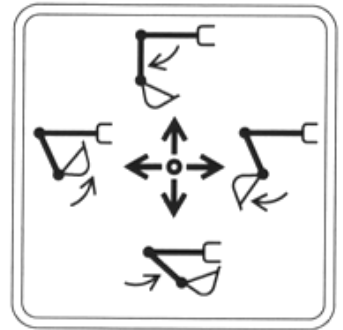


Dipperstick and Bucket Lever (2)

Pushing the lever forward will crowd out the dipper stick and the bucket and pulling it back will crowd them in. Lever movement to the left will curl the bucket to fill it, and right lever movement will dump the bucket.

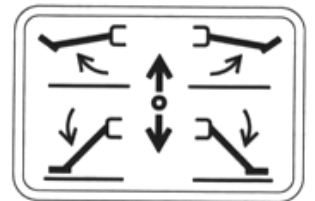
Again movement into an “X” relationship will crowd in and fill the bucket, or crowd out and dump the bucket. With experience you can combine both joystick levers and lift, swing, crowd out and dump all in one smooth movement OR lowering, swing, crowd in and fill bucket with reverse movement.

NOTE: if you want this switched, then change hoses on the dipper arm.



Stabilizer Control Levers (3) and (4)

Moving the levers downward will lower the stabilizers and upward lever movement will raise them.



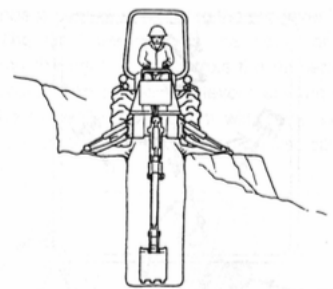
PLACING THE STABILIZERS

⚠ CAUTION: When working on slopes, one stabilizer may be lower than the other. Use extreme care during excavation as risk of overturn increases. When digging on a sidehill always dump the bucket on the uphill side of excavation. To reduce risk of overturn on a slope, place the spoil on the high side of excavation.

1. Lower the stabilizers and remove the weight of the backhoe from the rear wheels. However, one or both rear tires should remain in light contact with the ground. This will give the backhoe the widest possible stance and the lowest center of gravity. If the rear wheels are raised too high, digging depth will be reduced and undue stress will be exerted on the backhoe frame components.

If the slope is unusually steep, cut a level surface with the loader and pile the soil on the downhill side. Back drag and back the spoil so it will support the stabilizer on the low side. This procedure is recommended when a wall, tree-like or other obstruction prevents placing backhoe spoil on the high side of the excavation. (See picture on right).

2. The loader bucket should be lowered to give the backhoe unit a ‘tripod’ stance. With the loader bucket on the ground, front tire bounce should be a factor in overall control.



GENERAL BACKHOE OPERATION

⚠ CAUTION: Do not dig under the stabilizer or tractor, especially in soft or sandy conditions. Take extra precaution in wet or thawing ground. these conditions can cause

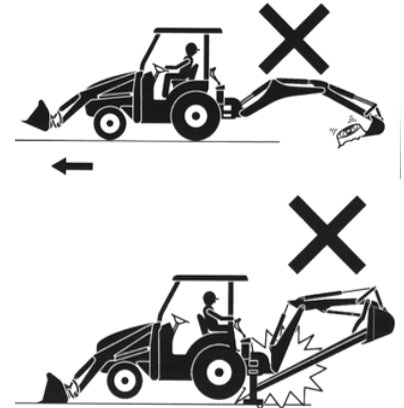
the ground to become unstable quickly and collapse under the weight of the machine and the unit may tip over.

- ⚠ **Use care for buried material such as electrical, telephone, gas and utility lines. When in doubt contact the local utility companies for their buried location.**

IMPORTANT:

DO NOT use tractor to pull out tree stumps with the boom dipper extended and the bucket in its crowded position.

In work using the mechanical or hydraulic thumb do not handle long objects (wider than machine). Such long objects help by the thumb can hit the machine and other objects, which damage the machine and others.



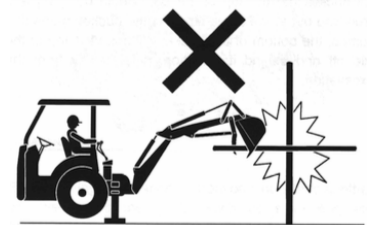
DIPPERSTICK DIGGING

Lower the bucket to the ground, the same as with bucket digging, then curl until bucket teeth are flat on the ground. Using only the crowd cylinder, retract the dipper stick, dragging the bucket through the trench until it is approximately half full. Begin to curl the bucket in while continuing to crowd in, until the bucket is completely full. Raise and swing the boom and dump the bucket in the spoil area on the high side of the trench or excavation.

SPOIL PILE LOCATION

- ⚠ **CAUTION: Do not place spoil close to the edge of the excavation where its height could cause a cave in.**

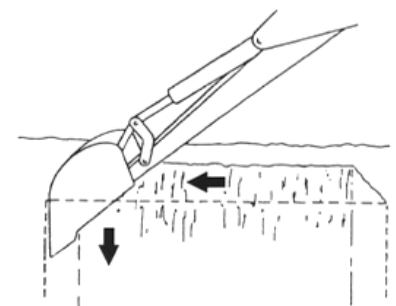
Carefully preplan the location for the spoil that will be removed from the excavation. The location will vary depending on the excavation being dug. The height of the spoil pile can be controlled without moving the tractor. Approach the pile with the bucket full and ready to empty. Instead of dumping on top, lower the full bucket into the top of the pile. begin dumping and crowding out at the same time. As the bucket opens and dumps, the bottom of the bucket will push the top of the pile off and behind its location, safely away from the excavation.



STRAIGHT WALL or Cemetery Digging

Strip the top soil off of the ground, within the confines of the straight hold or grave to be dug. Clean out as much of the material, within the same confines as possible with normal digging methods. Finish the fall wall by crowding out while forcing the bucket down with the boom.

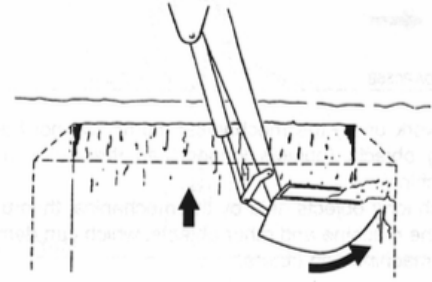
Curl the bucket tout to keep the bottom fo the bucket vertical



while making the down cut.

To finish the near wall, raise the boom while crowding in. The bucket will have to be curled in to keep the cutting edge horizontal with the wall during the uncut.

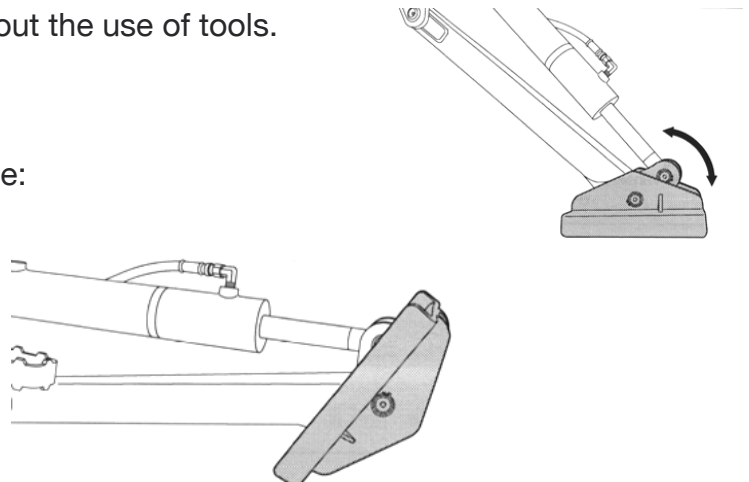
When finishing straight wall, or digging graves, in sandy soil, use a platform under the rear tires and stabilizers. The platform distributes the backhoe load over a large area and lessens the possibility of a cave-in.



STABILIZER PADS

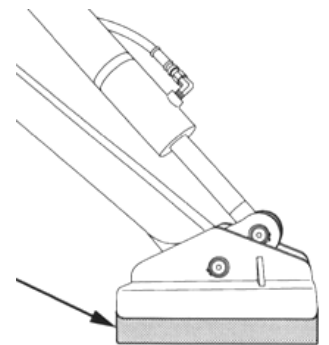
The stabilizer pads can be reversed without the use of tools. Change the pads depending on the job.

When operating in dirt to prevent slippage:



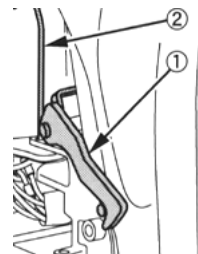
When operating on Street to prevent damage to work area use rubber shoes (optional)

IMPORTANT: Always lower stabilizers slightly when changing from one position to another to avoid soil splash.



TRANSPORTING: DRIVING TO JOB SITE

- ⚠ CAUTION:** Before transporting the machine, raise and center the boom, close the dipper stick, curl the bucket and engage the boom and swing locks.
- ⚠** Power unit must be equipped with Roll Over Protection System (ROPS) or ROPS cab and seat belt. Keep seat belt securely fastened. Falling off power unit can result in death from being run over or crushed. Keep foldable ROPS system in “locked up” position at all times.



Before driving or transporting from one job site to another, or when using the loader such as stockpiling and backfilling, always engage the boom and swing locks.

3-Point Hitch Model

TRAILER TRANSPORTING

CAUTION: Always securely fasten the tractor / loader / backhoe, with chains and binders, to transport the vehicle. Determine and note the load height of the backhoe, for underpass clearance, before transporting.

When loading or off-loading the machine on or from trailer / truck , use strong secure raps long enough to provide a low angle to the transport vehicle.

After loading the machine, release the boom lock, lower the backhoe bucket to the bed of the transport vehicle, lower the loader bucket, set the parking brake of the tractor, shut off the engine and remove the key.

Check the hood for proper securement, and remove SMV sign from holder driving transport to avoid damage, reinstall after transport.

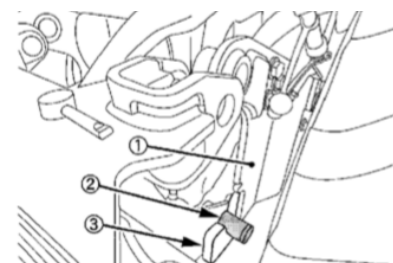
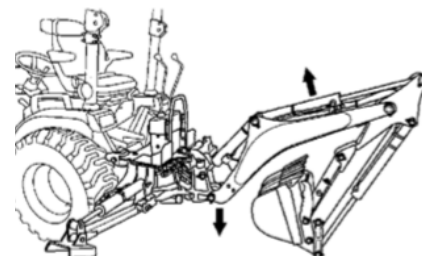
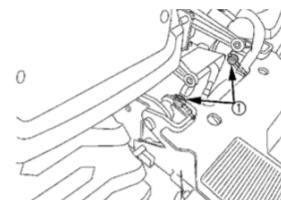
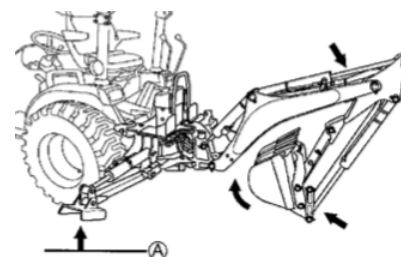
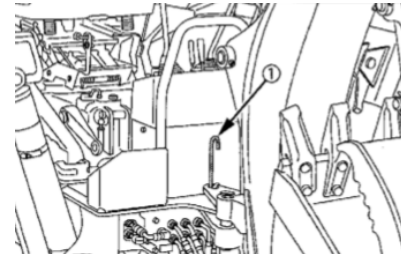
Check the local codes and regulations that may apply to tractor / loader / backhoe operation on public streets or highways, before transporting or traveling. Use SMV emblem and warning flashers as required (SMV: Slow Moving Vehicle)

BACKHOE REMOVAL

Subframe 4-Point Mount Removal

NOTE: See the sub- frame mounting kit manual that fits your tractor for specific instructions.

1. Position tractor on a hard level surface and set the engine speed to low idle.
2. Set the swing lock pin (1) and to secure the boom in it's center position.
3. Stand behind the rear tire, fully close the dipperstick, curl the bucket and lower the boom until the back of the bucket contacts the ground.
4. Keep the stabilizer pads at approximately 15" high
5. Raise the rear wheels slightly with the boom and remove the mounting pins (two top pins on the 4-point mount)
6. Store the mountain pins you just removed in the holes on the step of the backhoe.
7. Raise the boom to disengage backhoe from the tractor subframe.
8. Raise the backhoe by operating the stabilizers to the lowering direction until the mount bars (2) hit the guide stops (1) on the support hooks (3) .
9. Move the tractor forward about 6 inches to clear with the subframe bracket and provide some room for removing the PTO pump. You may want to place 6 inch blocks under the backhoe mainframe.ATTENTION: Do not pull ahead too far as to damage or break the hoses connecting the PTO pump with the backhoe!
10. Place 6 inch blocks under backhoe mainframe and raise stabilizers to lower backhoe to the storage position on blocks. Boom and dipper should be at 90- degree angle.



11. Stop tractor engine and remove key. Disconnect the PTO pump from the tractor by pressing the spring pin on the female PTO shaft collar and pulling towards you. If needed with backhoe free from the subframe, move the tractor forward about 6 inches for extra room to remove the PTO pump.
12. Secure backhoe pump on back- hoe. Move tractor carefully away from backhoe.

STORAGE OF THE BACKHOE

1. Store the backhoe in a dry place.
2. Apply a coat of grease to all exposed cylinder rods to prevent rusting.
3. If the backhoe is being stored outside, cover the backhoe with a suitable weather cover. This will keep moisture, dirt and other airborne debris from getting into the system.
4. Repair or replace any worn, damaged or missing parts.

MECHANICAL THUMB (OPTIONAL)

The mechanical thumb is used for grabbing objects and securing them between the thumb and the bucket.

Become familiar with the geometry and extra weight the thumb adds to the backhoe before operating. Large heavy objects such as rocks and logs can increase momentum when pivoting backhoe to the side. DO NOT make sudden stops and starts. Be extremely careful lifting and moving long items such as poles or tree limbs which may extend beyond the normal back- hoe operating area.

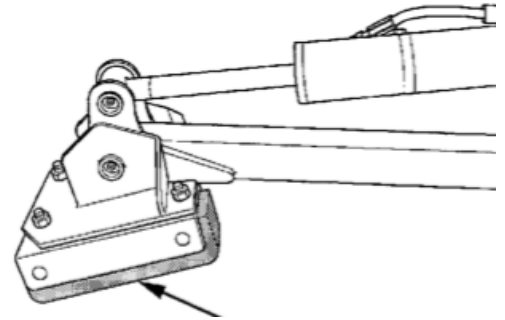
Improper usage can also damage the thumb or back- hoe. DO NOT use the thumb to rake material, push or pull material, use the side of the thumb to move mate- rial, use as a lifting devise with chain or rope, or as a pry bar to dislodge objects.

Place thumb in operating position by selecting an appropriate pin location on the telescoping channel. Rotate the bucket to hold material against the thumb.





When normal backhoe operation is required, place thumb in storage position. Remove pin, rotate thumb up against dipper, and insert pin to lock thumb into position.

RUBBER STABILIZER PADS (OPTIONAL)

Rubber Stabilizer pads can be mounted to prevent damage to work area when on concrete or a street.

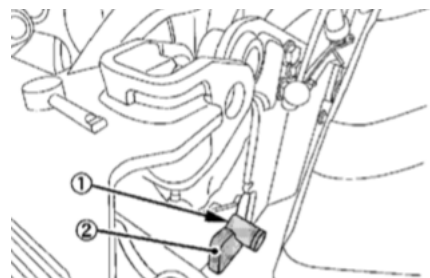


(RE)INSTALLING THE BACKHOE

-  **WARNING:** When starting the engine, always sit in the operator's seat.
-  When getting off the tractor, make sure the PTO lever is "OFF" and range gear shift lever is in "NEUTRAL". Set the parking brake
-  Keep hands, feet and body from between tractor and backhoe. Never allow any part of the body under the machine.
-  Before mounting backhoe, use caution and do not use any controls as handholds.

IMPORTANT: Before reinstalling the backhoe, set the engine speed to low idle.

1. Remove the 3-point hitch and/or drawbar (if equipped)
2. Make sure swing lock pin is installed on backhoe.
3. Slowly back the tractor, centering to the backhoe main frame, stopping 10 - 12 inches away from the backhoe.
4. Shut the engine off and set the parking brake.
5. Connect the PTO pump to the tractor's PTO. Turn on tractor and engage the PTO to run the PTO pump.
6. Stand beside the rear tire and raise the backhoe by operation of the stabilizers until the mount bars on the backhoe main frame are slightly higher than the tractor subframe support hooks .
7. Move the tractor backward until the support hooks

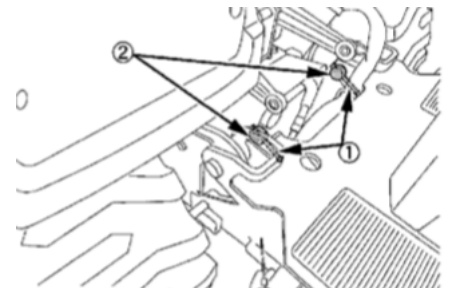
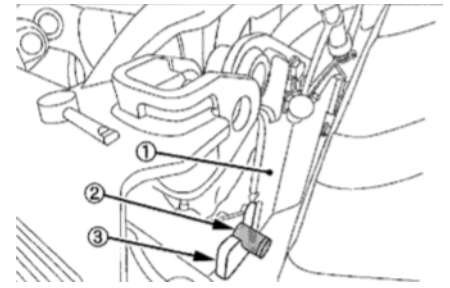


on the tractor main frame are just beneath the mount bars on the main frame.

8. Lower the mount bars onto the support hooks by operating the stabilizer and boom control levers.
9. Move the boom slowly to the lowering position, and engage the guide plates of the main frame to the sub frame. Then raise rear rears slightly by operating the boom to the lowering direction.
10. Shut off the engine and reinstall the mounting pins, and insert the slide bars (2) of the mounting pins (1) to the lower hole of the main frame.

IMPORTANT: If the slide bar of the mounting pins is inserted to the upper hole, the mounting pin comes off and the backhoe might come off. Therefore, please make sure to insert the slide bar to the lower hole.

NOTE: Move the tractor / backhoe to an open area and cycle all backhoe functions. This will check their operation and oil flow, and filter it through each circuit. Check the hydraulic oil level before putting the backhoe into full operation. See “MAINTENANCE” section of the tractor operator’s manual for oil type and correct level.



TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Noisy pump caused by cavitation	Oil too heavy Oil filter plugged Suction line plugged or too small Suction line kinked	Change to proper viscosity Replace filter Clean line and check for size Replace line
Oil heating	Oil supply low Contaminated oil Setting of relief valve too high or too low Pump operating too fast	Fill reservoir Drain reservoir, change filter, and refill with clean oil Set to correct pressure Do not exceed 540 rpm PTO speed
Shaft seal leakage	Worn shaft seal	Replace shaft seal
Foaming oil	Low oil level Air leaking into suction line Wrong kind of oil Moisture in oil	Fill reservoir Tighten fittings Drain and refill reservoir with non-foaming oil Keep oil temperature below 180° and continue to operate as oil dries out, or replace oil and purge system if foaming is excessive
Boom drops as dipper or bucket cylinder lever is activated while boom control is in raised position	Load check valve leaking	Clean or replace check valve assembly
Jerky operation	Hydraulic hoses plumbed incorrectly	Check hydraulic plumbing schematic and correct hose routing as required

LIMITED 1 YEAR PARTS WARRANTY

The manufacturer will replace or repair any part or parts of the machine that are defective in workmanship or material for a period of 12 months from the date of purchase under normal use during this warranty period. . All components including but not limited to motor, relays, switches and buttons for a period of 12 months from the date of purchase. Hydraulic hoses and connections are not included in this warranty. Claims under this warranty, are the sole option of the Liberty Seamless Enterprises, Inc. [Liberty] .

The obligation under this warranty is limited to the replacement or repair of such parts defective in material or workmanship. This warranty does not cover failures found to have been caused by wear, damage, improper customer assembly, abuse, misuse, accident or any procedures contrary to instructions set forth in the instruction manual. This warranty does not obligate the manufacturer to bear the cost of material used for adjustment, transportation charges, or down time in connection with the replacement or repair of defective parts nor shall it apply to machine upon which repairs or alterations have been made unless authorized by Manufacturer.

Shipping charges are not covered under this warranty. Liberty will not assume risk of loss or damage to the Physical Good while in transit to the customer. If damaged is detected customer should refuse shipment and notify Liberty Seamless Enterprises, Inc.

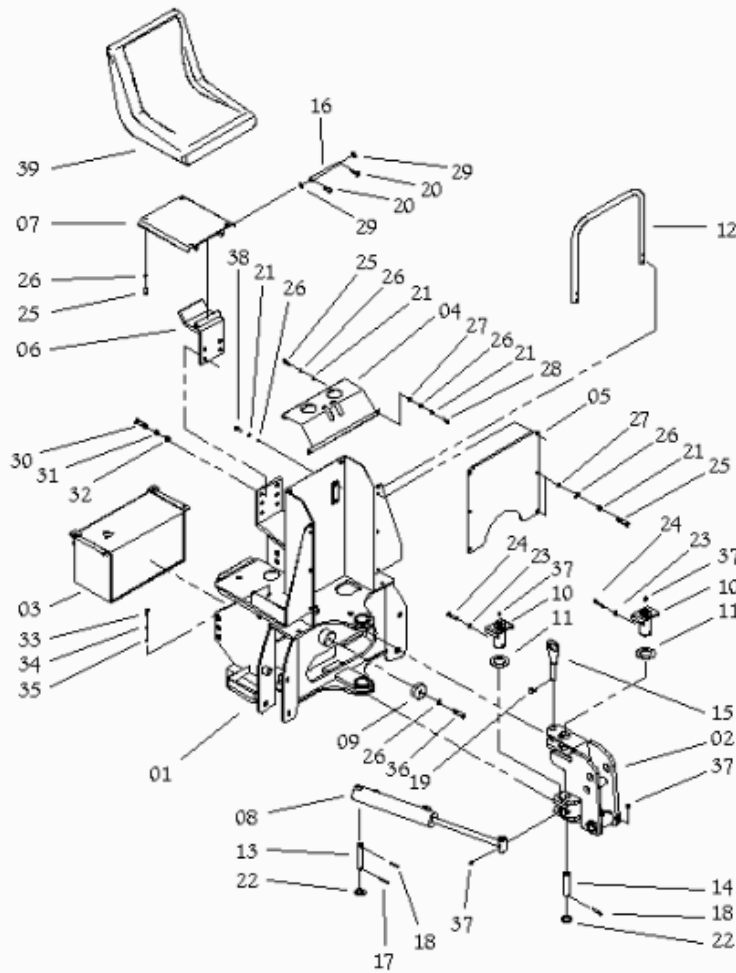
Liberty shall in no event be liable for consequential damage or contingent liabilities arising out of the failure of any machine or parts to operate properly.

Liberty shall in no event be liable to bear costs of lost work, material, travel, or freight, caused by any part or parts of the machine that are defective in workmanship or material. All warranty work must be returned to 102 E. Railroad Ave., Knoxville PA, 16928 at purchasers expense. Prior authorization must be obtained from Liberty Seamless Enterprises, Inc before any warranty work will be performed.

THE WARRANTIES SET FORTH HEREIN ARE IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED. THE BUYER ACKNOWLEDGES THAT NO OTHER REPRESENTATIONS WERE MADE TO HIM OR RELIED UPON BY HIM WITH RESPECT TO THE QUALITY AND FUNCTIONS OF THE MACHINE.

PARTS DIAGRAMS

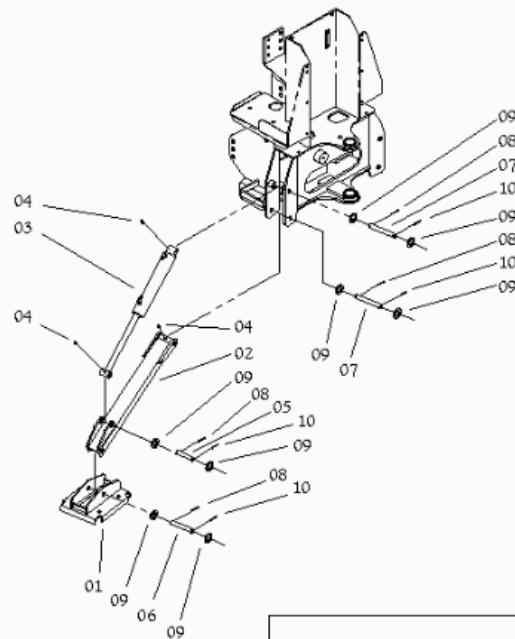
1. SUB FRAME PARTS



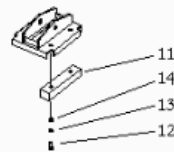
1. SUB FRAME PART

Index No.	Parts Number	Description
1-01	BH111-11001	Sub Frame/BH7600
	BH121-11001	Sub Frame/BH6600
1-02	BH111-12001	Swing Frame/BH7600
	BH121-12001	Swing Frame/BH6600
1-03	BH600-11001	Oil-Tank
1-04	BH111-00191	Valve Cover/Upper/BH7600
	BH121-00191	Valve Cover/Upper/BH6600
1-05	BH111-00201	Valve Cover/Side/BH7600
	BH121-00201	Valve Cover/Side/BH6600
1-06	BH110-20000	Seat Support Bracket
1-07	BH111-21000	Seat
1-08	BH111-00260	Swing cylinder
1-09	BH111-00130	Cushion Rubber
1-10	BH110-15000	Hinge Pin
1-11	BH111-00151	Spacer Plate
1-12	BH111-00290	Handle
	BH121-00290	Handle
1-13	BH111-00121	Cylinder Pin/Swing
1-14	BH111-00310	Swing cylinder Pin
1-15	BH111-26000	Swing Fixed Pin
1-16	BH111-00140	Seat Support Hinge Pin
1-17	S515000535	Spring Pin/φ5×35
1-18	S513110545	Split Pin/φ5×45
1-19	S514210025	Snap Pin/φ3×φ20
1-20	S514210020	Snap Pin/φ3×φ10
1-21	S400410008	Flat Washer/φ8
1-22	S400410020	Flat Washer/φ20
1-23	S211531008	U-Nut/M8×1.25p
1-24	S111110855	Bolt/M8×1.25p×55
1-25	S111110820	Bolt/M8×1.25p×20
1-26	S431010008	Lock Washer/φ8
1-27	S211211008	Nut/M8×1.25p
1-28	S111110845	Bolt/M8×1.25p×45
1-29	S400410012	Flat Washer/φ12
1-30	S113511240	Bolt/M12×1.25p×40
1-31	S431010012	Lock Washer/φ12
1-32	S212231012	Nut/M12×1.25p
1-33	S111111035	Bolt/M10×1.5p×35
1-34	S431010010	Lock Washer/φ10
1-35	S400410010	Flat Washer/φ10
1-36	S111110835	Bolt/M8×1.25p×35
1-37	S561130208	Grease Nipple/PT1/8
1-38	SS100-00011	Bolt/ 5/16-18×1"
1-39	BH-STSS	Seat

2. STABILIZER PART



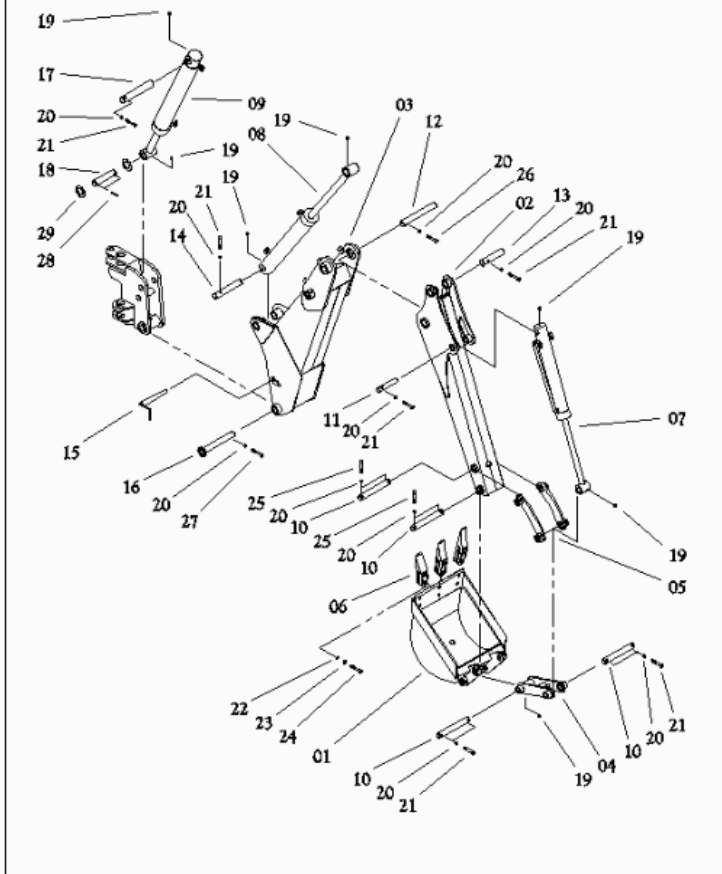
OPTION



2. STABILIZER PARTS

Index No.	Parts Number	Description
2-01	BH111-19001	Leg Support
2-02	BH111-18000	Stabilizer Leg/BH7600
	BH121-18000	Stabilizer Leg/BH6600
2-03	BH111-00270	Stabilizer Cylinder/BH7600
	BH121-00270	Stabilizer Cylinder/BH6600
2-04	S561130208	Greese Nipple/PT1/8
2-05	BH111-00110	Cylinder Pin/Stabilizer
2-06	BH111-00050	Leg Support Fixed Pin
2-07	BH111-00040	Leg Fixed Pin
2-08	S513110545	Split Pin/ $\phi 5 \times 45$
2-09	S400410020	Flat Washer/ $\phi 20$
2-10	S515000535	Spring Pin/ $\phi 5 \times 35$
2-11	BH111-00320	Pad
2-12	S113511240	Bolt/M12 \times 1.25p \times 40
2-13	S431010012	Lock Washer/ $\phi 12$
2-14	S212231012	Nut/M12 \times 1.25p

3. BUCKET/DIPPER/BOOM PARTS

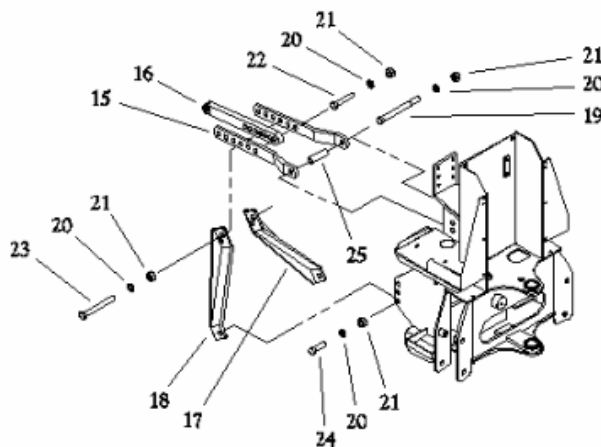


3. BUCKET/DIPPER/BOOM PART

Index No.	Parts Number	Description
3-01	BH220-12001	Bucket/16"
	BH210-12001	Bucket/14"
3-02	BH111-14001	DIPPER/BH7600
	BH121-14001	DIPPER/BH6600
3-03	BH111-13001	BOOM/BH7600
	BH121-13001	BOOM/BH6600
3-04	BH111-16000	Link Support Bracket/BH7600
	BH121-16000	Link Support Bracket/BH6600
3-05	BH111-17000	Link Guide/BH7600
	BH121-17000	Link Guide/BH6600
3-06	BH200-00010	Tooth
3-07	BH111-00250	Bucket Cylinder/BH7600
	BH121-00250	Bucket Cylinder/BH6600
3-08	BH111-00240	Dipper Cylinder/BH7600
	BH121-00240	Dipper Cylinder/BH6600
3-09	BH111-00230	Boom Cylinder/BH7600
	BH121-00230	Boom Cylinder/BH6600
3-10	BH111-00030	Bucket Fixed Pin
3-11	BH111-00100	Cylinder Pin/Bucket
3-12	BH111-00020	Dipper Fixed Pin
3-13	BH111-00090	Cylinder Pin/Dipper 2
3-14	BH111-00080	Cylinder Pin/Dipper1
3-15	BH111-27000	Boom Fixed Pin 1
3-16	BH111-25000	Boom Fixed Pin 2
3-17	BH111-00070	Cylinder Pin/Boom 2
3-18	BH111-00060	Cylinder Pin/Boom 1
3-19	S561130208	Greese Nipple/PT1/8
3-20	S211531008	U-Nut/M8*1.25p
3-21	S111110855	Bolt/M8*1.25p*55
3-22	S212231012	NUT/M12*1.25p
3-23	S431010012	Lock Washer/Φ12
3-24	S113511245	Bolt/M12*1.25p*45
3-25	S111110850	Bolt/M8*1.25p*50
3-26	S111110870	Bolt/M8*1.25p*70
3-27	S111110865	Bolt/M8*1.25p*65
3-28	S515000845	Spring pin/Φ8*45
3-29	BH111-00300	Cylinder Pin Washer

4. MOUNTING 3 POINT HITCH:

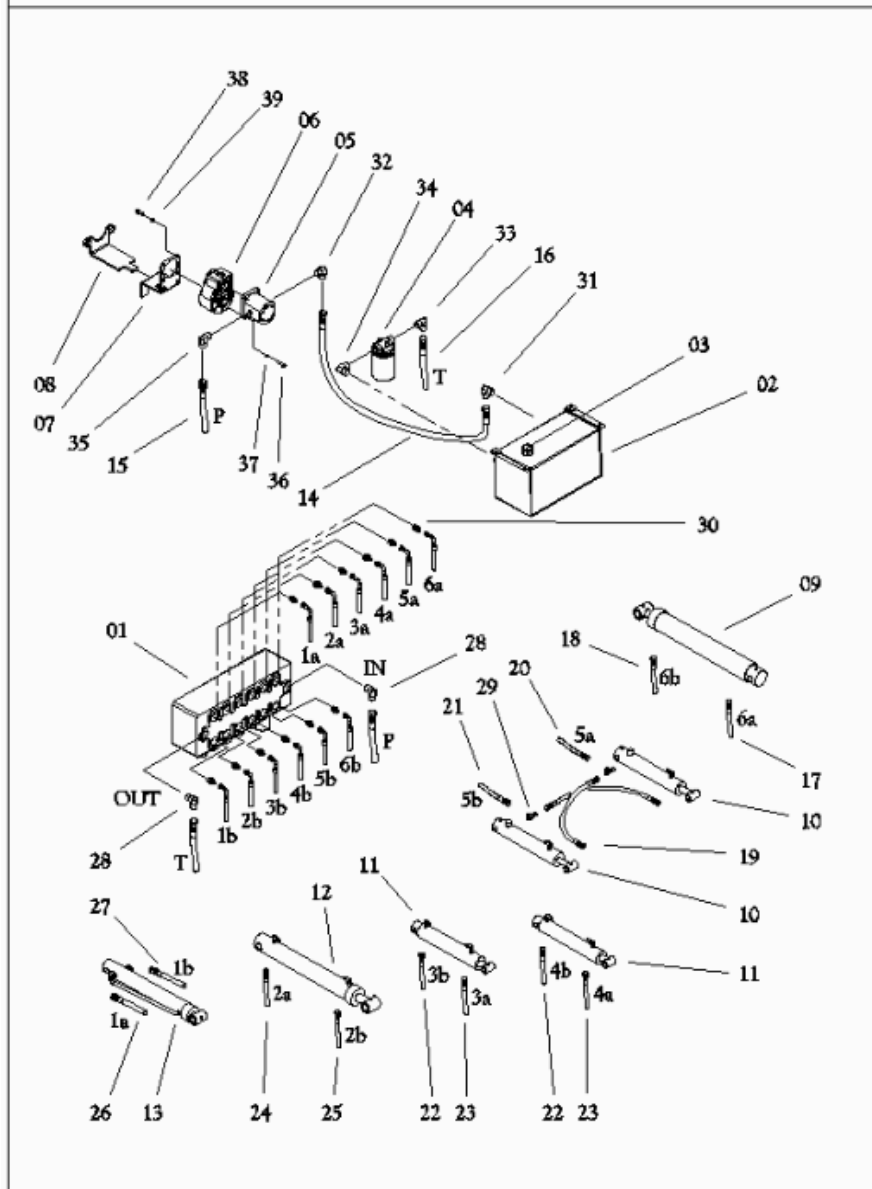
3 POINT TYPE



B. 3 POINT TYPE

Index No.	Parts Number	Description
4-15	BH510-00020	Link Fixed Bar/BH7600
	BH500-00021	Link Fixed Bar/BH6600
4-16	BH510-11000	Upper Link Bar/BH7600
	BH500-11000	Upper Link Bar/BH6600
4-17	BH510-12001	Link Fixed Bar/Left/BH7600
	BH500-12002	Link Fixed Bar/Left/BH6600
4-18	BH510-13001	Link Fixed Bar/Right/BH7600
	BH500-13002	Link Fixed Bar/Right/BH6600
4-19	SS100-00010	Bolt/M20*2.5P*180
4-20	S431010020	Lock Washer/Φ20
4-21	S211231020	Nut/M20*2.5P
4-22	S111112090	Bolt/M20*2.5P*90
4-23	S111112002	Bolt/M20*2.5P*110
4-24	S111512050	Bolt/M20*2.5P*50
4-25	BH500-00030	Upper Link Bushing

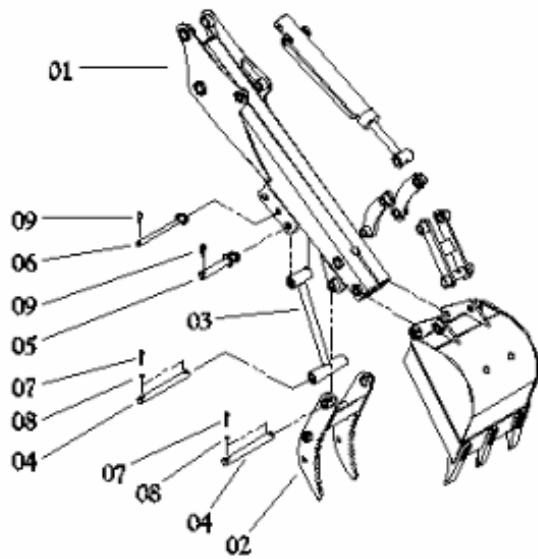
5. HYDRAULIC PARTS



5. HYDRAULIC PARTS

Index No.	Parts Number	Description
5-01	BH-CV556	Valve/556
	BH-CV126	Valve/126
5-02	BH600-11001	OILTANK
5-03	BH-AB138040	Filter/0T
5-04	BH-MX2406	Filter/0TP
5-05	BH-P20140	Pump/14/7600
	BH-P20112	Pump/11.2/6600
5-06	BH-GMP2	Gear Box 8
	BH-CA2522	Coupling(25-22-14)
5-07	BH600-00010	Pump fixed flate
5-08	BH600-12000	Pump support Plate
5-09	BH111-00230	Boom Cylinder/7600
	BH121-00230	Boom Cylinder/6600
5-10	BH111-00260	Swing Cylinder
5-11	BH111-00270	Stabilizer Cylinder/7600
	BH121-00270	Stabilizer Cylinder/6600
5-12	BH111-00240	Dipper Cylinder/7600
	BH121-00240	Dipper Cylinder/6600
5-13	BH111-00250	Bucket Cylinder/7600
	BH121-00250	Bucket Cylinder/6600
5-14	SS500-00025	Hydraulic Hose/3/4*750
	SS500-00024	Hydraulic Hose/3/4*700
5-15	SS500-00046	Hydraulic Hose/1/2*1700
	SS500-00045	Hydraulic Hose/1/2*1600
5-16	SS500-00044	Hydraulic Hose/1/2*1130
5-17	SS501-00011	Hydraulic Hose/H 1/4*1950
	SS501-00010	Hydraulic Hose/H 1/4*1850
5-18	SS501-00004	Hydraulic Hose/L 1/4*1950
	SS501-00003	Hydraulic Hose/L 1/4*1850
5-19	SS500-00017	Hydraulic Hose/1/4*400
5-20	SS501-00008	Hydraulic Hose/H 1/4*1000
5-21	SS501-00001	Hydraulic Hose/L 1/4*1000
5-22	SS501-00009	Hydraulic Hose/H 1/4*1150
5-23	SS501-00002	Hydraulic Hose/L 1/4*1150
5-24	SS501-00012	Hydraulic Hose/H 1/4*2100
	SS501-00011	Hydraulic Hose/H 1/4*1950
5-25	SS501-00005	Hydraulic Hose/L 1/4*2100
	SS501-00004	Hydraulic Hose/L 1/4*1950
5-26	SS501-00014	Hydraulic Hose/H 1/4*2900
	SS501-00013	Hydraulic Hose/H 1/4*2700
5-27	SS501-00007	Hydraulic Hose/L 1/4*2900
	SS501-00006	Hydraulic Hose/L 1/4*2700
5-28	S59SOLA04	Nipple/Elbow/UNF3/4 [SAE]+UNF3/4
	S59SOLA09	Nipple/Elbow/UNF1/4 [SAE]+UNF3/4
5-29	SS310-00002	Nipple/Tee/PT1/4+UNF1/2+UNF1/2
5-30	S59S0SAA11	Nipple/UNF3/4 [SAE]+UNF1/2
5-31	S59SBLAA06	Nipple/Elbow/PT1/4+UNF1 1/16
	S59SBLA004	Nipple/Elbow/PT1/4+UNF1 1/16
5-32	S59SBLAE04	Nipple/Elbow/PT1/4+UNF3/4
5-33	S59SBLCA05	Nipple/Elbow/PT1/4
5-34	S59SBLAA05	Nipple/Elbow/PT1/2+UNF3/4
5-35	S141008030	Bolt/Wrench/M8*1.25P*30
5-36	S431010008	Lock Washer/φ8
5-37	S111111025	Bolt/M10*1.5P*25
5-38	S431010010	Lock Washer/φ10

6. THUMB PARTS



7. THUMB PARTS

Index No.	Parts Number	Description
7-01	TH110-11000	Dipper/thumb
	TH120-11000	Dipper/thumb
7-02	TH110-12000	Thumb
7-03	TH110-13000	Thumb Link
7-04	TH110-00010	Fixed Pin
7-05	TH110-14000	Arm Fixed Pin
7-06	TH110-15000	Lock pin
7-07	S111110850	Bolt/M8*1.25p*50
7-08	S211531008	U-Nut/M8*1.25p
7-09	S514210040	Snap Pin/φ5

