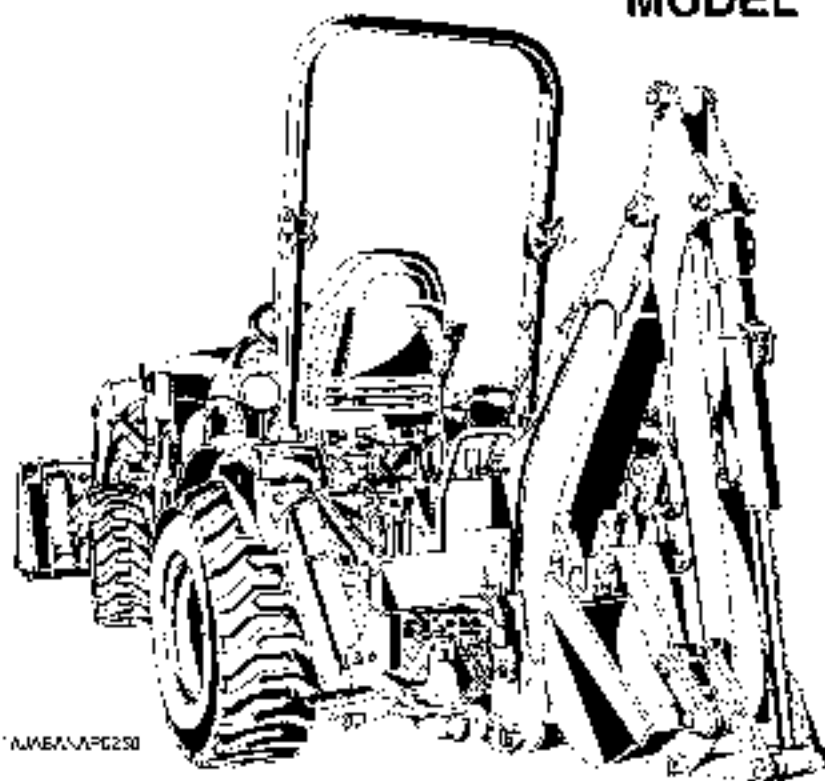


OPERATOR'S MANUAL

KUBOTA BACKHOE

MODEL BH70



1A467A-AP0230

READ AND SAVE THIS MANUAL

Kubota

ABBREVIATION LIST

Abbreviations	Definitions
2WD	Two Wheel Drive
4WD	Four Wheel Drive
API	American Petroleum Institute
ASABE	American Society of Agricultural and Biological Engineers, USA
ASTM	American Society of Testing and Materials, USA
DIN	Deutsches Institut für Normung, GERMANY
DT	Dual Traction (4WD)
fpm	Feet Per Minute
GST	Glide Shift Transmission
Hi-Lo	High Speed-Low Speed
HST	Hydrostatic Transmission
m/s	Meters Per Second
PTO	Power Take Off
RH/LH	Right-hand and left-hand sides are determined by facing in the direction of forward travel
ROPS	Roll-Over Protective Structures
rpm	Revolutions Per Minute
r/s	Revolutions Per Second
SAE	Society of Automotive Engineers, USA
SMV	Slow Moving Vehicle

FOREWORD

You are now the proud owner of a KUBOTA Backhoe. This backhoe is a product of KUBOTA quality engineering and manufacturing. It is made of excellent materials and under a rigid quality control system. It will give you 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 many helpful hints about backhoe maintenance. It is KUBOTA'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The immediate use of new techniques in the manufacture of products may cause some small parts of this manual to become outdated. KUBOTA distributors and dealers will have the most up-to-date information. Please do not hesitate to consult with them.



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.

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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 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 found 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 the safe operation of the equipment.
3. For safe operation, check the mounting bolts for tightness and that the mount levers are in the right position before operation.
4. Never operate 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 THE BACKHOE

1. Do not allow anyone other than the 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, then shut the engine off and remove 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 the watchful eye of another responsible adult.
2. Be alert and turn the machine off if children enter the work area.
3. Before and when backing, look behind and down for small children.
4. Never carry children while operating the machine. They may fall off and be seriously 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 under 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 and center the boom, close the dipperstick, curl the bucket and engage the boom and swing locks before transporting the machine.
2. Check the local codes or 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)

SERVICING THE BACKHOE

1. Before disconnecting hydraulic lines, relieve all hydraulic pressure by moving the controls.
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 area of the backhoe.
6. When servicing or checking underneath, do not get under the machine while it is being held with only the bucket, backhoe or stabilizers. Securely support with jackstands.
7. For your safety, do not work under any hydraulically supported machine elements. They can settle, suddenly leak down, or be accidentally lowered.
8. Escaping hydraulic fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before applying pressure to the system, be sure that all 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 or wood. If injured by escaping fluid, see a doctor at once. Serious infection or allergic reaction will develop if proper medical treatment is not administered immediately.



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9. Do not tamper with any backhoe control valve relief pressure setting. The relief valve pressure is preset at the factory. Changing the setting can cause overloading of the backhoe and the tractor, and serious personal injury or death may result.
10. Do not modify the backhoe for any reason. Modifying the backhoe can cause an unstable condition of the tractor / loader / backhoe combination and serious personal injury or death may result.

DANGER, WARNING AND CAUTION LABELS

(1) Part No. 75597-7528-0



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(2) Part No. 7K501-7529-0

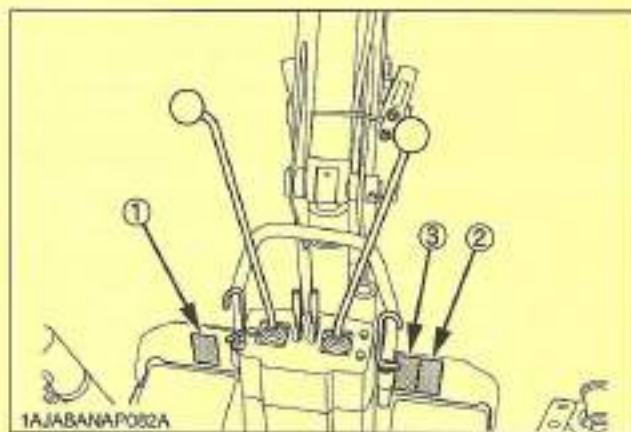


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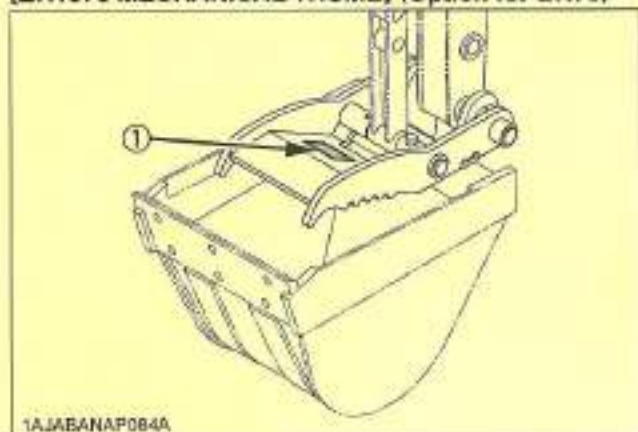
(3) Part No. 75595-7524-2



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[BH1976 MECHANICAL THUMB] (Option for BH70)



(1) Part No. 7K523-8452-1

▲ WARNING

TO AVOID INJURY FROM CRUSHING:

Keep all body parts (Head, Arms, Hands, Legs, and Feet) out of the operating area of the Thumb and Backhoe Bucket.

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(1) Part No. 75595-7517-2 (Both sides)

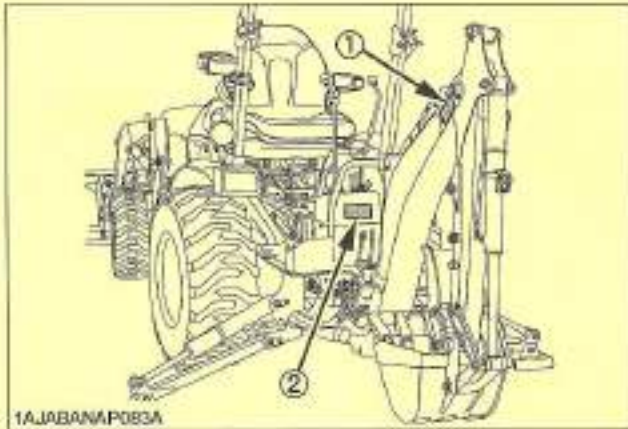


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(2) Part No. 75597-7517-3



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CARE OF DANGER, WARNING AND CAUTION LABELS

1. Keep danger, warning and caution labels clean and free from obstructing material.
2. Clean danger, warning and caution labels with soap and water, dry with a soft cloth.
3. Replace damaged or missing danger, warning and caution labels with new labels from your local KUBOTA Dealer.
4. If a component with danger, warning and caution label(s) affixed is replaced with new part, make sure new label(s) is (are) attached in the same location(s) as the replaced component.
5. Mount new danger, warning and caution labels by applying on a clean dry surface and pressing any bubbles to outside edge.

SERVICING OF BACKHOE

Your dealer is interested in your new backhoe and has the desire to help you get the most value from it. After reading this manual thoroughly, you will find that you can do some of the regular maintenance yourself.

However, when in need of parts or major service, be sure to see the KUBOTA dealership which you purchased your equipment from or a local KUBOTA dealer.

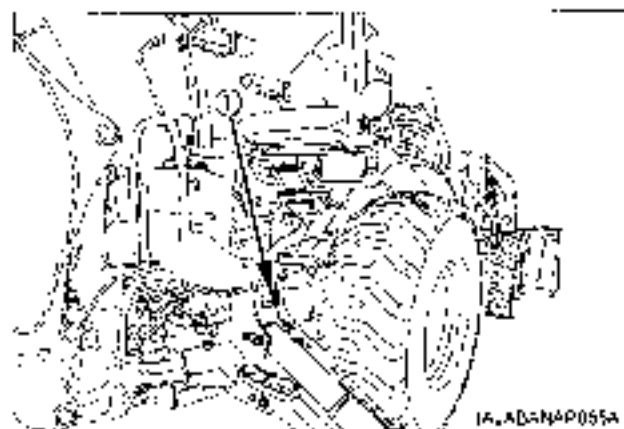
When in need of parts, be prepared to give your dealer the backhoe model and serial number.

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

The reference to left hand and right hand used in this manual refers to the position when seated in the operator's seat at backhoe position and facing rearward of the tractor.

KUBOTA BACKHOE

Model	BH70
Serial Number	
Date of Purchase	
Name of Dealer (To be filled in by purchaser)	



1A,ADAN4P055A

(1) Serial number

SPECIFICATIONS

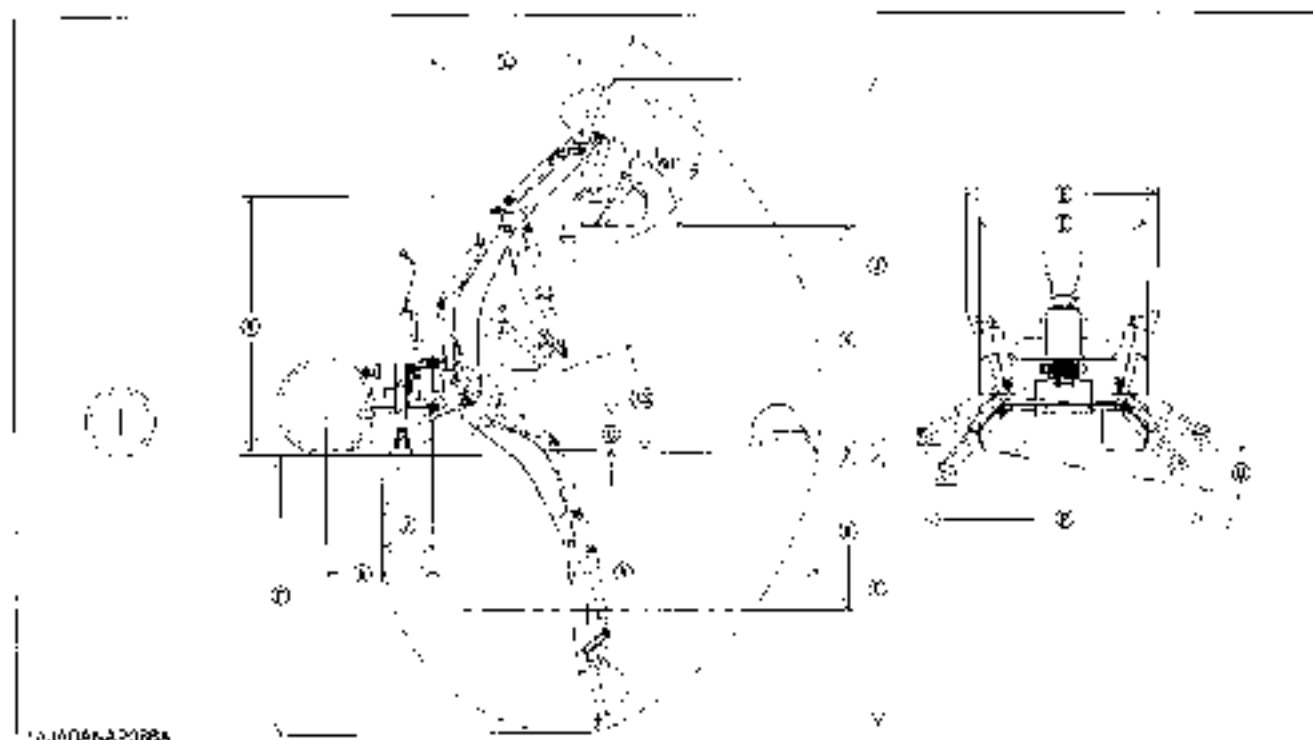
BACKHOE SPECIFICATIONS

NOTE:

- ◆ The specifications are taken with KUBOTA D3030 tractor. (Tire size: Front 23 x 8.5-12, Rear 12 x 16.5)

■ Dimensions

Item		D170
Transport height	(A)	1856 mm (73.1 in.)
Stabilizer spread-transport	(B)	1280 mm (50.4 in.)
Ground clearance	(C)	262 mm (10.3 in.)
Overall width	(E)	1260 mm (49.6 in.)
Maximum digging depth	(F)	2197 mm (86.5 in.)
Digging depth, 2 ft. flat bottom	(G)	2165 mm (85.2 in.)
Digging depth, 8 ft. flat bottom	(H)	1554 mm (61.2 in.)
Operating height, fully raised	(J)	2863 mm (113.0 in.)
Loading height	(K)	1474 mm (58.1 in.)
Loading reach	(L)	1157 mm (45.6 in.)
Reach from swing pivot	(M)	2983 mm (116.8 in.)
Swing pivot to rear axle center line	(N)	797 mm (31.4 in.)
Bucket rotation	(P)	180 deg.
Stabilizer spread-operating	(R)	1854 mm (73.0 in.)
Angle of departure per SAE J1204	(A3)	18.2 deg.
Leveling angle	(U)	11.8 deg.
Undercut	(Z)	510 mm (20.1 in.)
Swing arc		140 deg.



■ Specifications

Digging force (Per SAE J49)

With bucket cylinder	2900 lbs (12900 N)
With dozer/slick cylinder	1500 lbs (7117 N)

Cycle Time (seconds)

Boom cylinder, extend	3.4
Boom cylinder, retract	2.7
Swing cylinder, RH, LH	2.8 / 2.5
Dipperstick cylinder, extend	4.5
Dipperstick cylinder, retract	3.5
Bucket cylinder, extend	3.6
Bucket cylinder, retract	2.8
Stabilizer cylinder, max. height to ground	2.4
Stabilizer cylinder, ground to max. height	2.1

Hydraulic cylinders

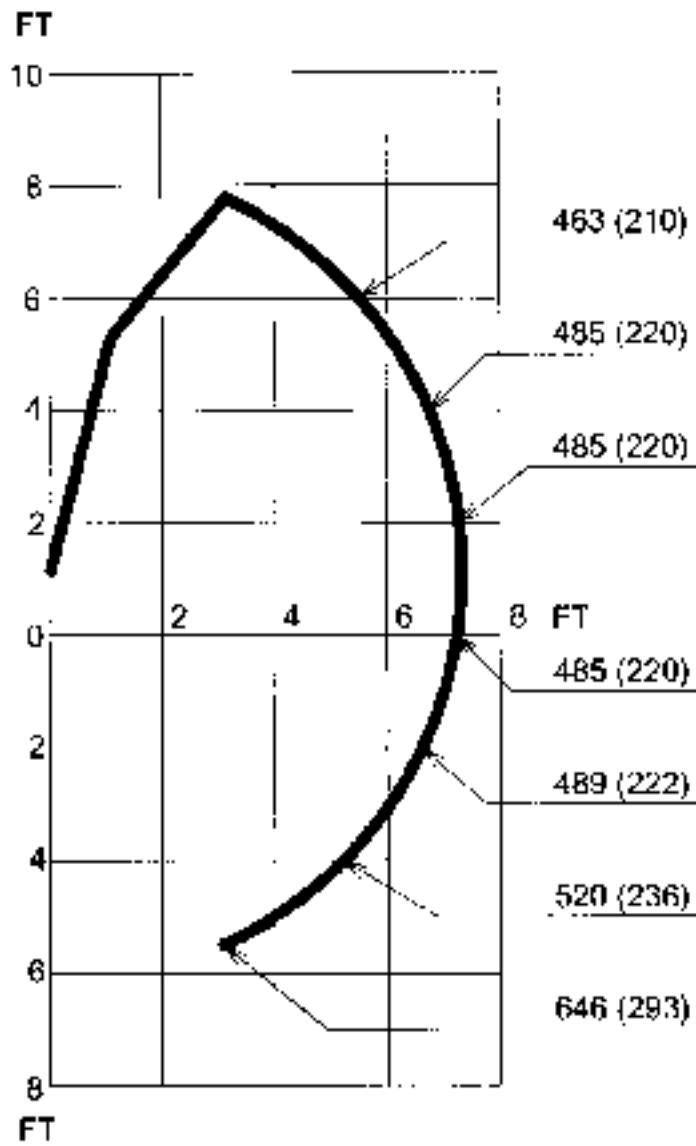
	Boom cm (in.)	Dipperstick cm (in.)	Bucket cm (in.)	Stabilizer cm (in.)	Swing cm (in.)
Rod diameter	3.0 (1.18)	3.0 (1.18)	3.0 (1.18)	2.5 (0.98)	3.0 (1.18)
Cylinder bore	5.5 (2.16)	6.5 (2.56)	5.5 (2.17)	6.0 (2.36)	6.0 (2.36)

Bucket Alternatives (Option)

	Width cm (in.)	SAE Struck Capacity m ³ (cu-ft)	SAE Heaped Capacity m ³ (cu-ft)	Number of Teeth	Weight kg (lbs.)
Trenching 10'	25.4 (10)	0.017 (0.60)	0.021 (0.74)	3	29 (64)
Trenching 12'	30.5 (12)	0.022 (0.77)	0.027 (0.95)	3	32 (71)
Trenching 15'	40.6 (16)	0.031 (1.09)	0.039 (1.38)	4	38 (84)

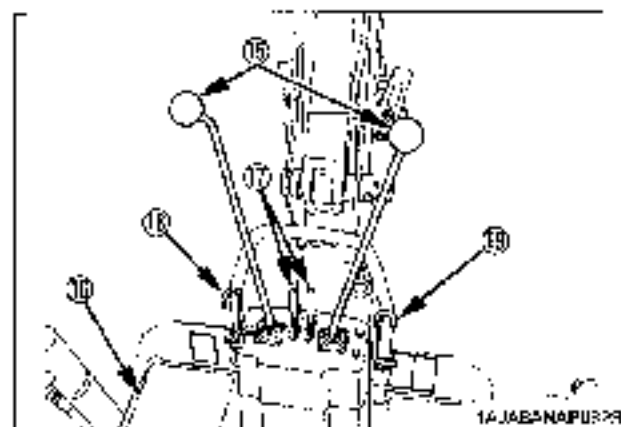
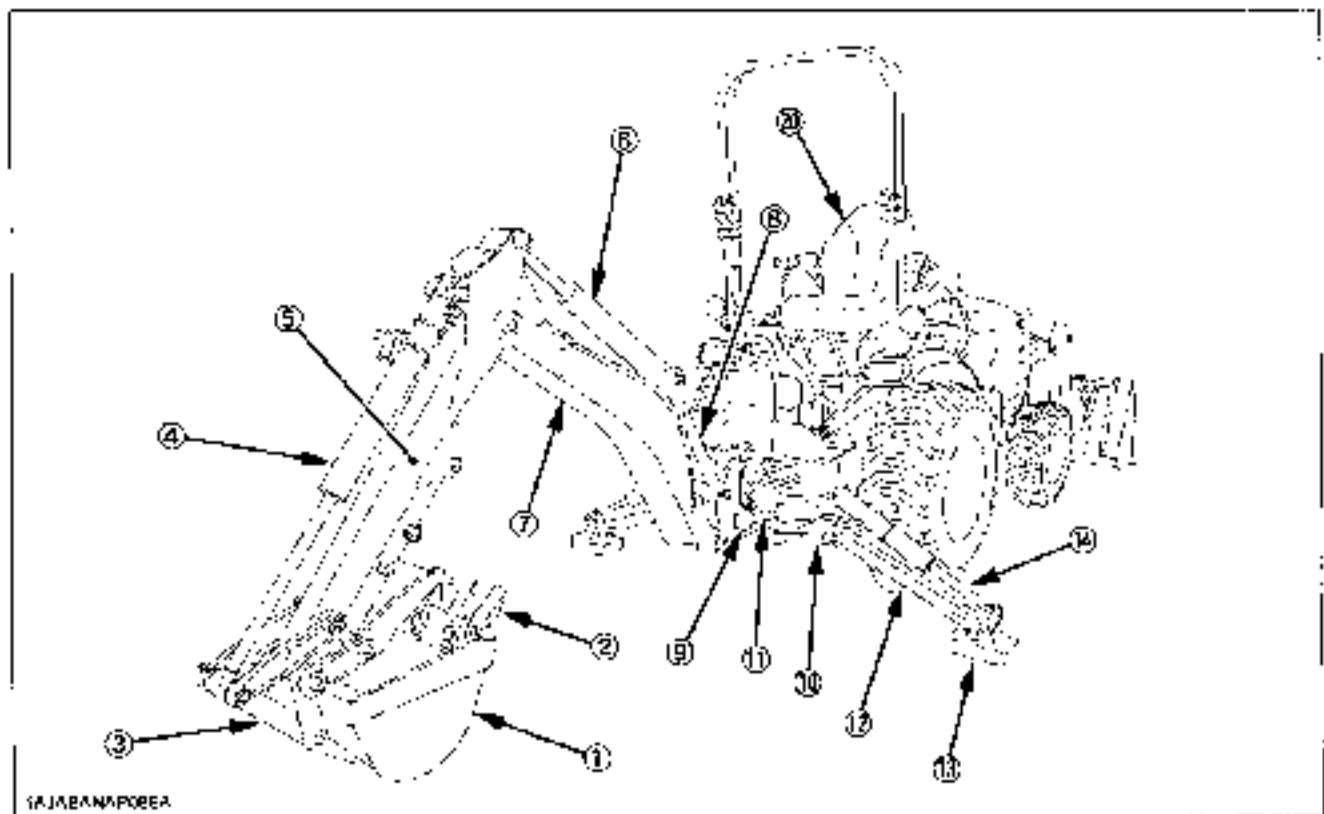
■ Lift Capacity (Per SAE J31)

Lift capacities shown are 87% of maximum lift force, according to SAE definition.



RATED LIFT CAPACITY (OVER END)-lbs (kg)

BACKHOE TERMINOLOGY



- (1) Backhoe bucket
- (2) Bucket tooth
- (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 pin
- (20) Seat

PRE-OPERATING INSTRUCTIONS

PRE-OPERATION CHECKS

Prior to starting the engine, make pre-operation checks according to " MAINTENANCE "



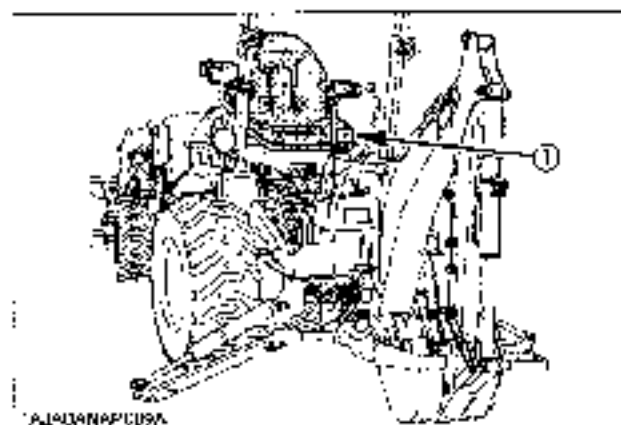
CAUTION

To avoid personal injury:

- Read " SAFE OPERATION " section in the front of this manual.
- Read the safety labels located on the backhoe.
- Make sure the swing lock pin is set before entering or exiting the backhoe operator area.
- Do not grab controls when entering or exiting.

OPERATOR'S SEAT

Operator's seat for the B2301 and B2601 tractor(s) can be used to operate loader and backhoe. See "REVERSING THE SEAT" section for the detail to turn the seat around for backhoe operation.



(1) Operator's seat (backhoe position)

BALLAST



WARNING

To avoid serious personal injury or death:

- Never remove loader when backhoe is attached to ensure tractor stability at all times.

IMPORTANT :

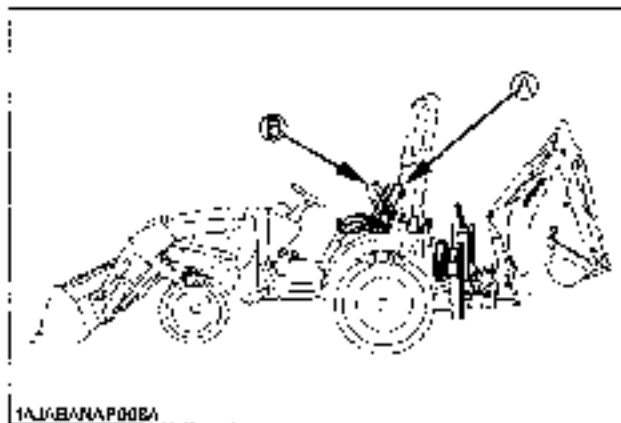
- ◆ Do not add liquid ballast or any other weights to the front tires.
- While BH70 backhoe is installed on the tractor, liquid ballast in the rear tires should not be used.

OPERATION

1. BH70 backhoe is approved for use on
 - ◆ B2301 and B2601 tractors with foldable ROPS, LA434 Loader and BH1627 mount kit.
2. The BH70 backhoe sub frame can be mounted on a tractor together with mid mount mower on B2301 and B2601.
3. When using other implements with backhoe removed, mount the 3-point hitch linkage to the tractor.
4. Removal and reinstallation of backhoe sub frame should be performed by your KUBOTA dealer.
5. Store the 3-point hitch linkage components which are removed.

REVERSING THE SEAT

[B2301] [B2601]

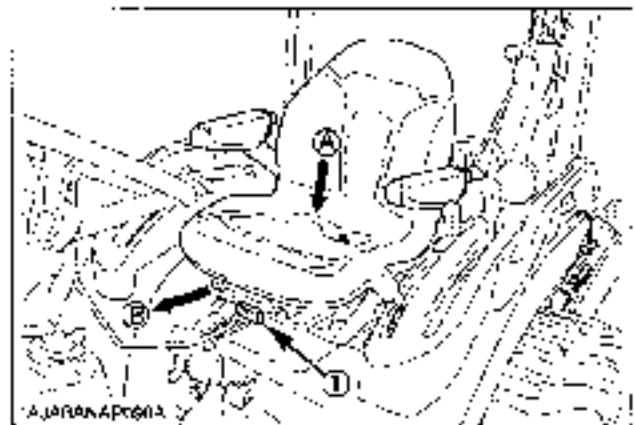


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(A) "TRACTOR DRIVING POSITION"
 (B) "BACKHOE POSITION"

The seat is reversible for backhoe operator. Follow the procedure below to turn the seat around.

1. Slide the seat to the foremost position
2. Pull the lever forward as shown in the illustration to release the seat lock while pushing the seat.



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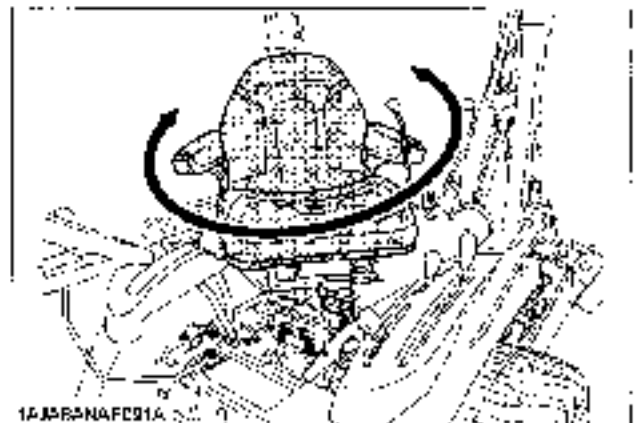
(C) Seat lock lever

(A) "CUSHION"

(E) "BASE"

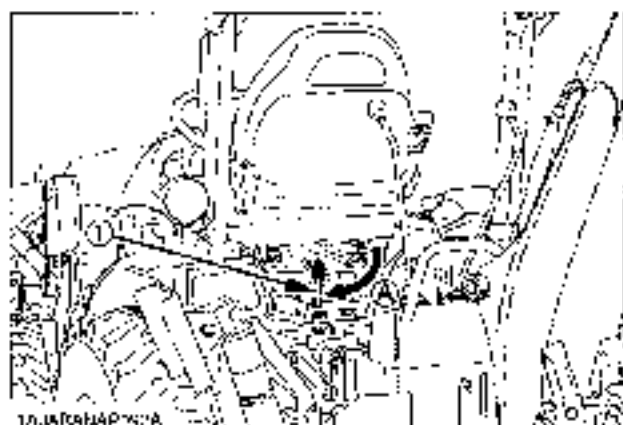
3. Raise the seat on top
4. Turn the seat around rearward and push it down for backhoe operation

The seat is automatically locked at the backhoe position.



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5. After reversing the operator's seat, be sure to check to see that the seat is properly locked.

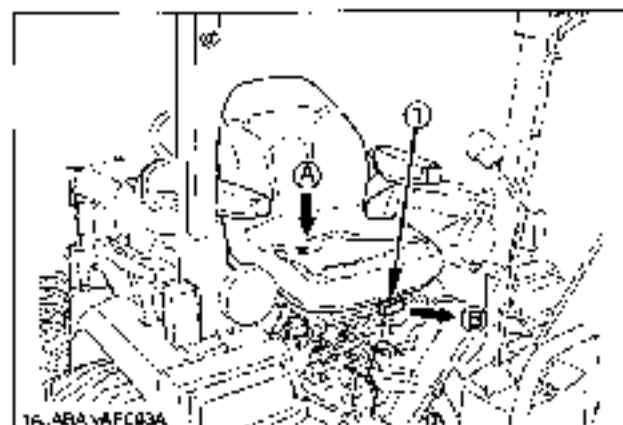


(1) Seat lock

(A) "LOCK"

IMPORTANT :

- Turn the seat at the top position to avoid damaging the seat locking mechanism.
6. For tractor driving position, pull the lever backward while pushing the seat, and follow the reverse procedure mentioned above.



(1) Seat lock lever

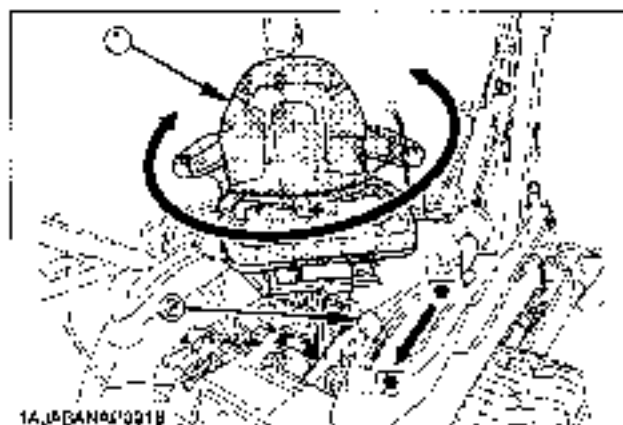
(A) "PUSH"

(B) "RELEASE"

◆ **Stationary PTO**

To park the tractor and use the PTO system (for chipper or pump, for example), start the PTO system in the following steps.

1. Apply the parking brakes and place blocks at the tires.
2. Make sure the shift levers are at NEUTRAL and start the engine. Position throttle speed to idle.
3. Set the Rear PTO gear shift lever to engage "ON" position.
4. Set the engine speed to provide recommended rear PTO speed.
5. Unlock the seat lock lever, stand up and raise the seat.



1A, JABANA02021B

(1) Seat

☑ "ON" (Engaged)

(2) Rear-PTO gear shift lever

☒ "OFF" (Disengaged)

6. Turn the seat around rearward and lock the seat at backhoe position.

NOTE -

- If the PTO system is engaged and you stand up from the seat or the seat is not at backhoe position, the engine stops automatically after standing up.

OPERATING INSTRUCTIONS

OPERATING SPEED



CAUTION

To avoid personal injury:

- ◆ 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, in special digging conditions, for optimal fuel economy, or in residential neighborhood where noise may be a consideration, the engine speed can be lowered to about 75% of rated rpm.
 - 2 When operating in temperature below 0°C (32°F), run the tractor engine below about 50% of rated rpm until the oil temperature exceeds 0°C (32°F).

BACKHOE CONTROLS

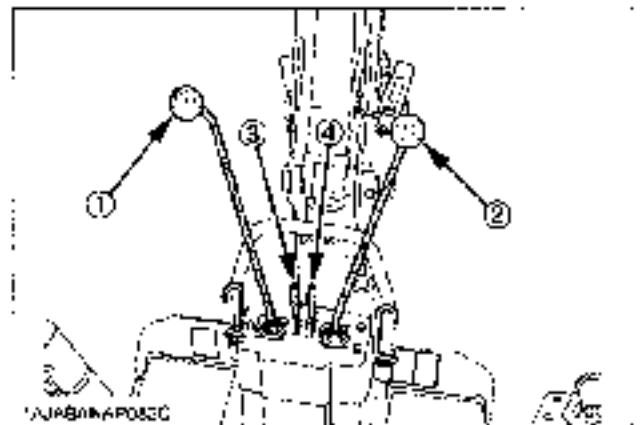


CAUTION

To avoid personal injury:

- ◆ For all excavation work, operate the backhoe from the backhoe operator's seat only.
- ◆ Do not tamper with any backhoe control valve relief pressure setting. The relief valve is preset at the factory. Changing the setting can cause overloading of the backhoe and the tractor and serious personal injury may result.

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 dipperstick 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.



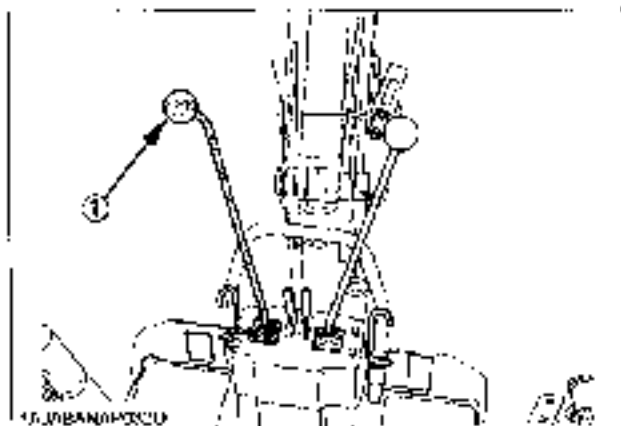
- (1) Boom and swing lever
- (2) Dipperstick and bucket lever
- (3) Stabilizer control lever, left
- (4) Stabilizer control lever, right

■ Boom & Swing Lever

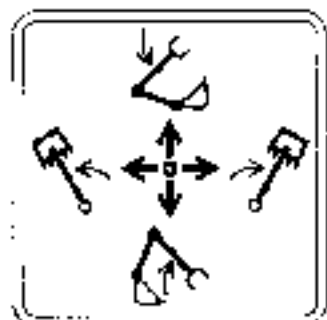
Pushing the lever forward will lower the boom, and pulling it back will raise it.

Movement of the lever to the left will swing the bucket to the left, and right lever movement will swing to the right.

By moving the lever out of the plus "+" position, into an "X" relationship, it is possible to raise or lower and swing at the same time.



(1) Boom and swing lever



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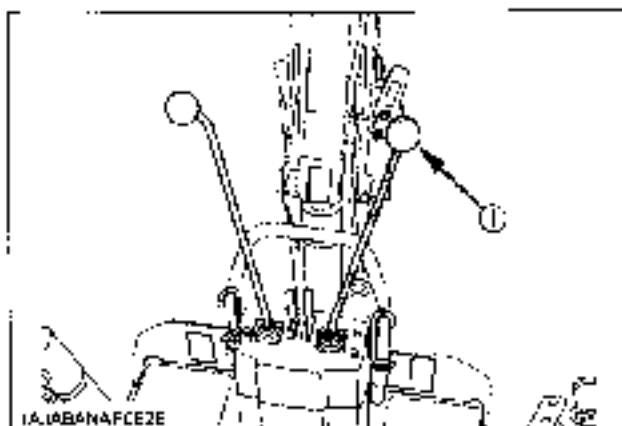
■ Dipperstick & Bucket Lever

Pushing the lever forward will crowd out the dipperstick and the bucket and pulling it back will crowd them in.

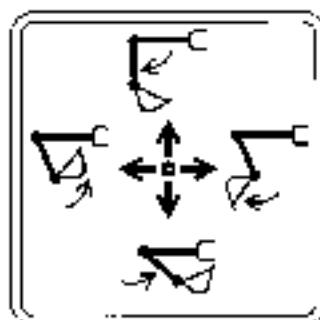
Lever movement to the left will curl the bucket to fill it, and right lever movement will dump the bucket.

Again, movement into an "X" relationship will crowd in and fill the bucket, or crowd out and dump the bucket.

With experience, the combination of both "joystick" levers will allow lift, swing, crowd out and spoil dumping all in one smooth movement or lowering, swing, crowd in and bucket filling with reverse movement.



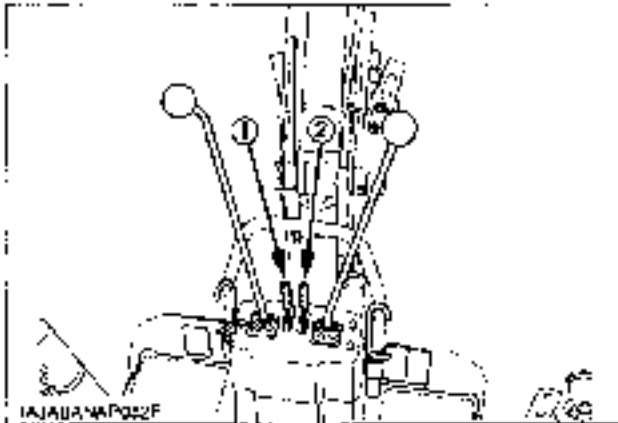
(1) Dipperstick and bucket lever



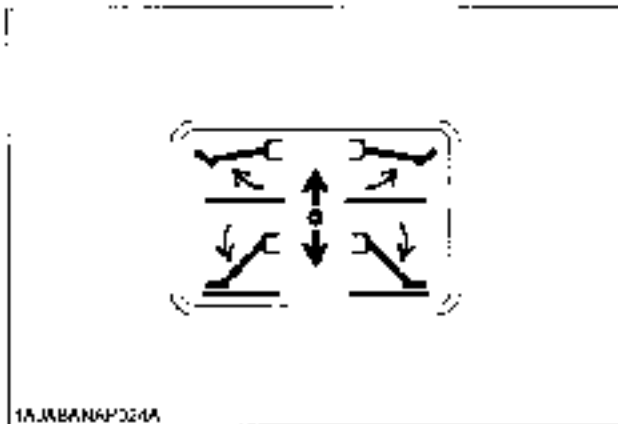
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■ Stabilizer Control Levers

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



(1) Stabilizer control lever, left
(2) Stabilizer control lever, right



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PLACING THE STABILIZERS



CAUTION

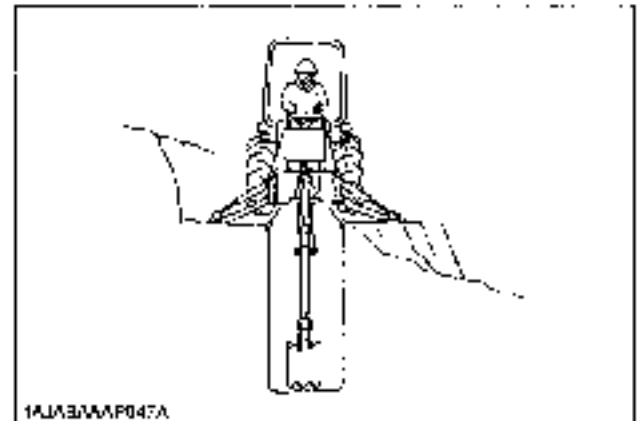
To avoid personal injury:

- When working on slopes, one stabilizer may be lower than the other. Use extreme care during excavation as risk of overturn will increase.
- When digging on a hillside, always dump the bucket on the uphill side of excavation.
- To reduce the risk of overturn on a slope, place the spoil to the high side of the 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 spoil on the downhill side. Backdrag and pack the spoil so it will support the stabilizer on the low side. This procedure is recommended when a wall free line or other obstruction prevents placing backhoe spoil on the high side of the excavation.



1AJJABNAP047A

- 2 The loader bucket should be lowered to give the backhoe unit a "tri-pod" stance. With the loader bucket in ground contact, front tire bounce will not be a factor in overall control. When possible, the loader bucket cutting edge should be lowered vertically into the ground surface. This will assist the stabilizers, not allowing the unit to shift, while excavating. However, on a slope, the bottom of the bucket should be used, and only the side that contacts the uneven terrain. Too much loader down pressure, on a slope, will restrict the unit from being correctly leveled and will place an undue twist through the loader bucket and lift arms.

GENERAL BACKHOE OPERATION



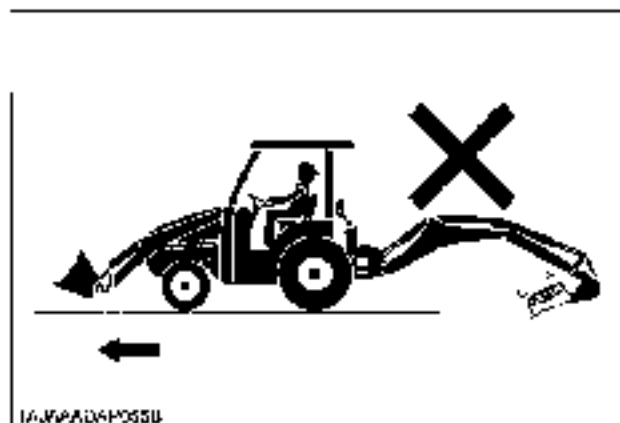
CAUTION

To avoid personal injury:

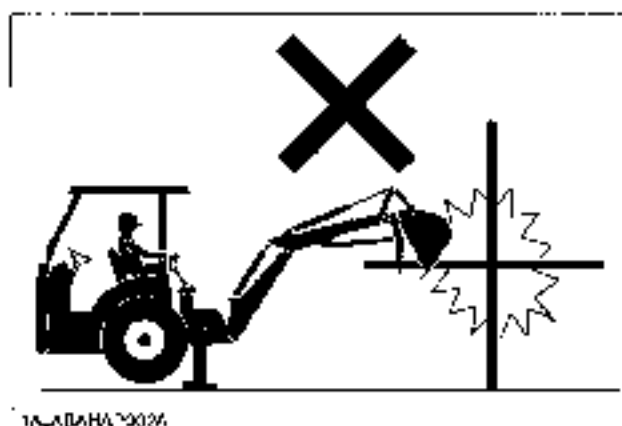
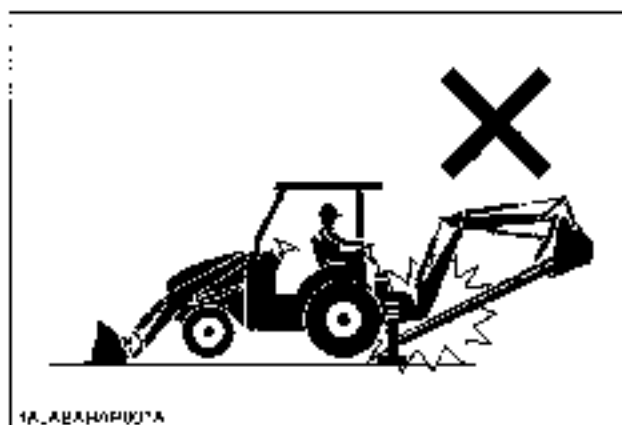
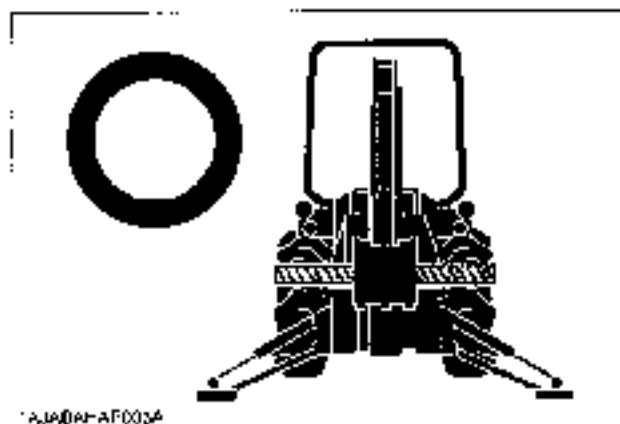
- Do not dig under the stabilizer or tractor, especially in soft or sandy conditions. Take extra precaution in wet or thawing ground. These conditions can cause the ground to become unstable very quickly and may collapse under the weight of the machine and the unit may tip over.
- Use care for buried material such as electrical, telephones, gas and water lines. When in doubt, contact local utility companies for their buried location.

IMPORTANT :

- Do not use the tractor to pull out tree stumps with the boom dipper extended and the bucket in its crowded position.



- In work using the mechanical thumb, do not handle long objects (objects longer than the width of the machine). Such long objects held by the mechanical thumb can hit the machine and other objects, which can damage the machine and others.



■ Dipperstick Digging

Lower the bucket to the ground, the same as with bucket digging, then curl until the bucket teeth are flat on the ground.

Using only the crowd cylinder, retract the dipperstick, 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 or the high side of the trench or excavation.

■ Spoil Pile Location



CAUTION

To avoid personal injury:

- Do not place spoil close to the edge of the excavation where its weight 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.

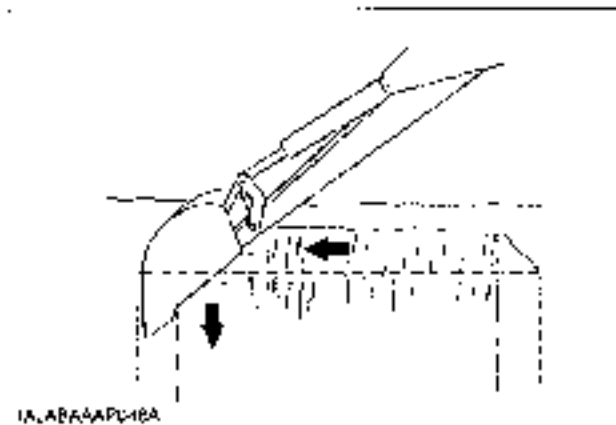
The height of spoil pile can be controlled without moving the tractor. Approach the pile with the backhoe bucket full and ready to empty. Instead of dumping on top, lower the full bucket into the top of the pile. Begin dumping and crowding out at the same time. As the bucket opens and dumps, the bottom 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

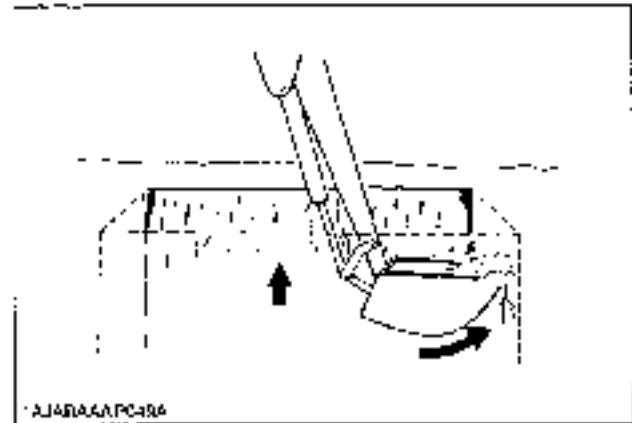
Strip the top soil off the ground, within the confines of the straight hole or grave to be dug. Clean out as much material, within the same confines, as possible with normal digging methods.

Finish the far wall by crowding out while forcing the bucket down with the boom.

Curl the bucket out to keep the bottom of the bucket vertical while making the down cut.

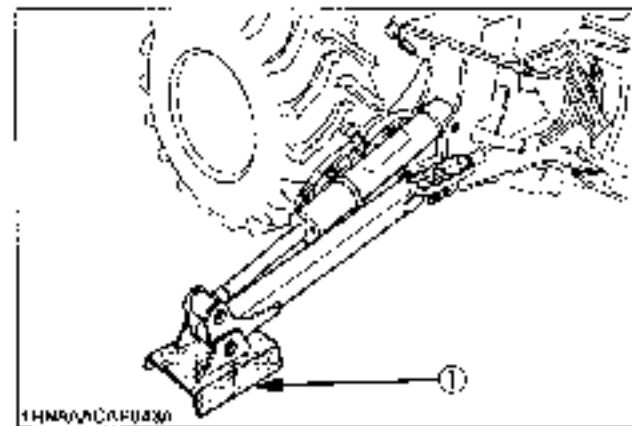


To finish the rear wall, raise the boom while crowding in. The bucket will have to be curled in to keep the cutting edge horizontal with the wall during the up cut.



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.

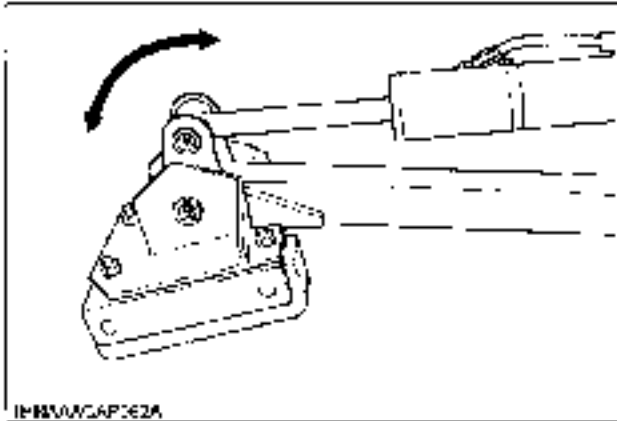
■ Stabilizer pads (Standard)



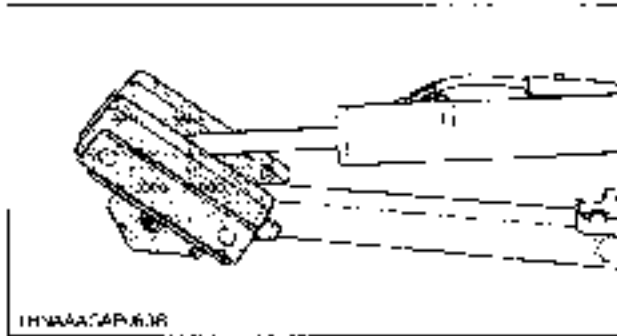
(1) Stabilizer pads

■ Stabilizer pads (Option)

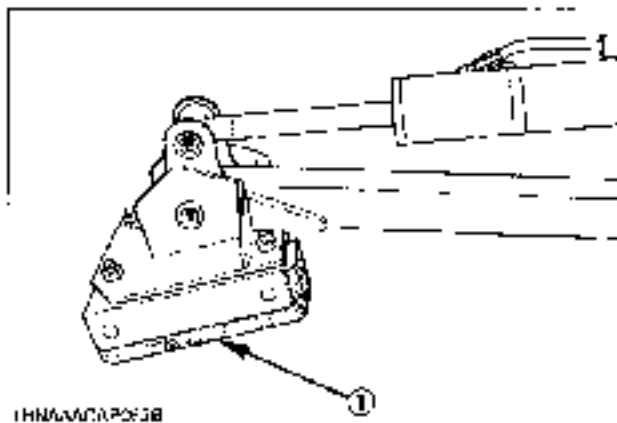
The stabilizer pads can be reversed without the use of tools. Change the pads depending on the job



◆ When operating in dirt to prevent slippage.



◆ When operating on steel to prevent damage to work area.



(1) Rubber shoes

IMPORTANT :

- ◆ Always lower stabilizers slightly when changing from one position to another to avoid soil splash.

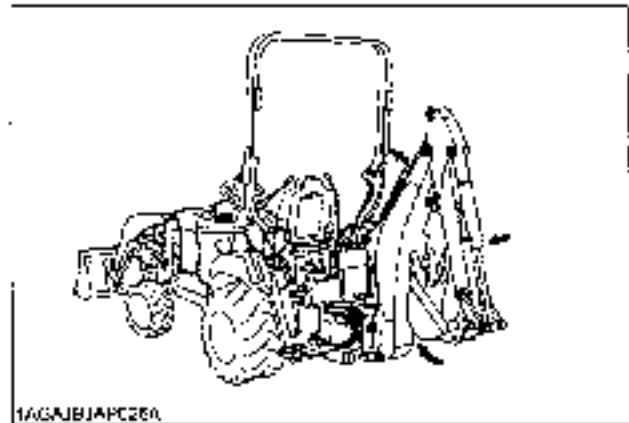
TRANSPORTING



CAUTION

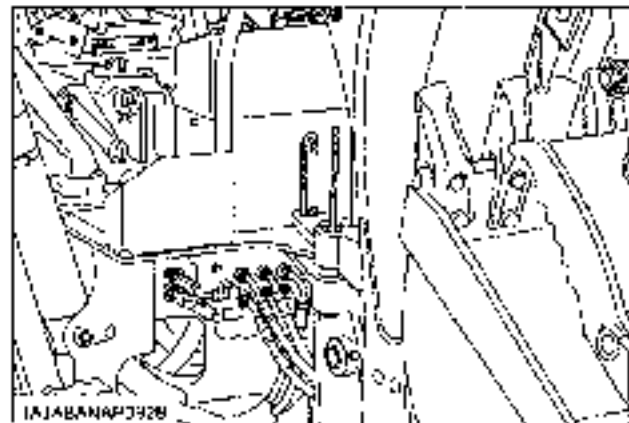
To avoid personal injury:

- ◆ Before transporting the machine, raise and center the boom, close the dipperstick, curl the bucket and engage the boom and swing locks.
- ◆ Always securely fasten the tractor / loader / backhoe, with chains and chain binders, to transport vehicle. Determine and note the load height of the backhoe, for underpass clearance, before transporting.



■ Driving to the Job-site

When 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



(1) Boom lock pin
(2) Swing lock pin

■ Trailer Transporting

When loading or off-loading the machine on or from trailer / truck. Use strong, secure ramps 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 the engine off and then remove the key.

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

Check the local codes or 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)

MAINTENANCE

DAILY CHECKS



CAUTION

To avoid personal injury:

- Never make any repairs, service or adjustments when the hydraulic system is under pressure, when the engine is running or when any backhoe cylinder is under load.
- Escaping hydraulic fluid under pressure can have sufficient force to penetrate skin, causing serious personal injury.

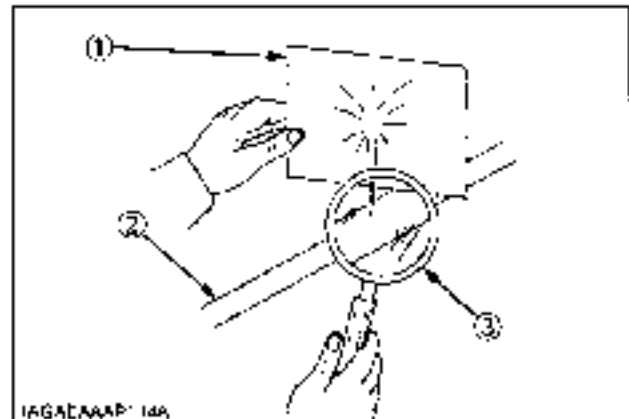


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- Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to system, be sure all connections are tight and that lines, pipes and hoses are not damaged.

- Fluid escaping from a very small hole can be almost invisible. Do not use hands to search for suspected leak, use a piece of cardboard or wood. If injured by escaping fluid, see a doctor at once.

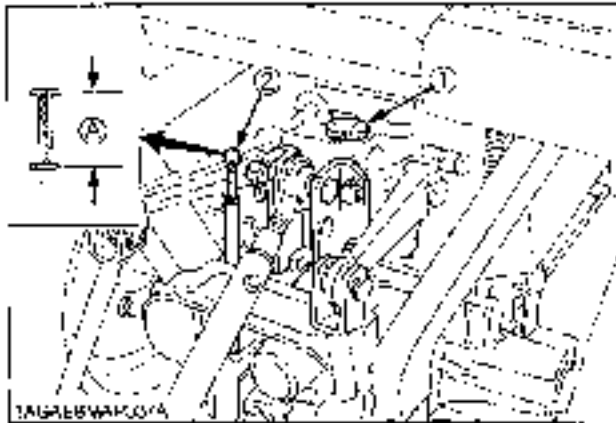
Serious infection or allergic reaction will develop if proper medical treatment is not administered immediately.



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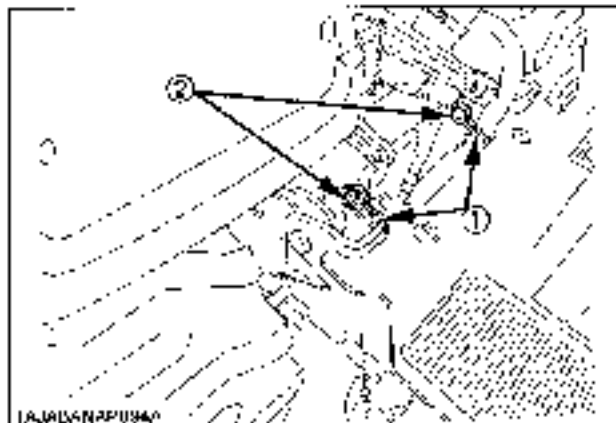
- (1) Cardboard
- (2) Hydraulic line
- (3) Magnifying glass

1. The backhoe is run by the tractor hydraulic system. Daily before operation, check the tractor hydraulic level. If low, replenish the oil as described in the tractor operator's manual. Also check the filter screen and change the hydraulic fluid as recommended in the tractor operator's manual.



(1) Oil level (A) Oil level is acceptable within this range.
(2) Dipstick

2. Check all hardware before daily operation. Tighten hardware to torque values as specified in the "General torque specification"
3. With the engine off and the bucket on the ground, 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 mounting pin slide bars are inserted into the lower hole of the main frame before operation



(1) Mounting pin
(2) Slide bar

EVERY 50 HOURS

■Checking Sub Frame Bolt Torque

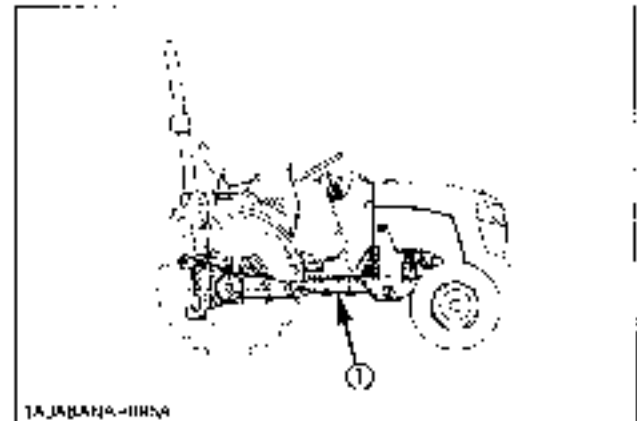


CAUTION

To avoid personal injury:

- Never operate backhoe and front loader with a loose sub frame.
- Any time bolts and nuts are loosened, retighten to specified torques.
- Check all bolts and nuts frequently and keep them tight.

Check sub frame bolts and nuts regularly especially when new. If they are loose, tighten them as follows.



(1) Sub frame

M16 bolt and nut

Tightening torque: 176-203 N-m
(13.0-20.7 kgf-m, 130-150 ft-lbs)

M12 stud and nut

[At rear axle case]

Stud Tightening torque: 26.5-44.1 N-m

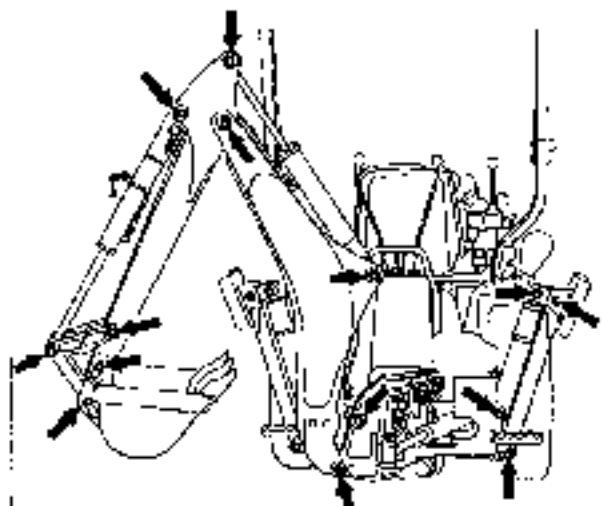
(2.1-4.5 kgf-m, 19.5-32.5 ft-lbs)

Nut Tightening torque: 80 N-m

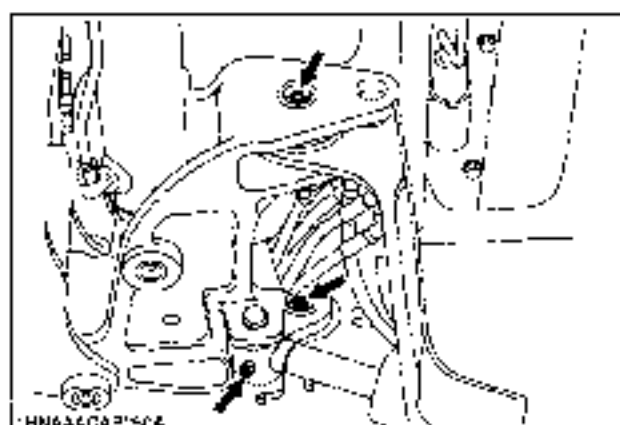
(6.2 kgf-m, 56.4 ft-lbs)

LUBRICATION

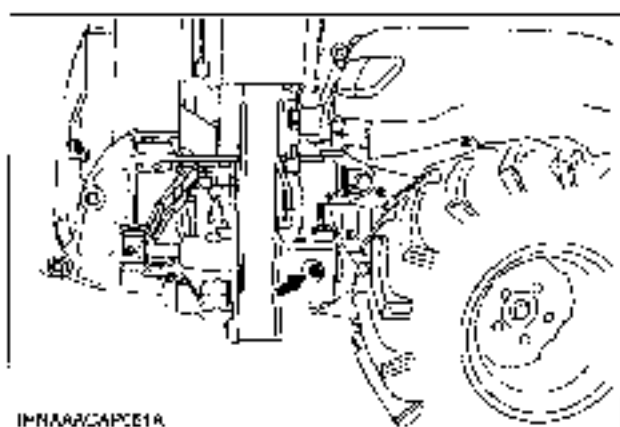
Lubricate all grease fittings every 10 hours of operation. High quality grease designated "extreme pressure" and containing Molybdenum disulfide is recommended. This grease may specify "Moly Ep" on its label.



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TIRE INFLATION

Ensure the tractor tires are properly inflated. Refer to the tractor operator's manual for optional tires.

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 metal fragments.

■ Changing the Backhoe Bucket

Changing the backhoe bucket becomes necessary as the type of job to be accomplished changes. In most backhoe operations, this is a common occurrence.

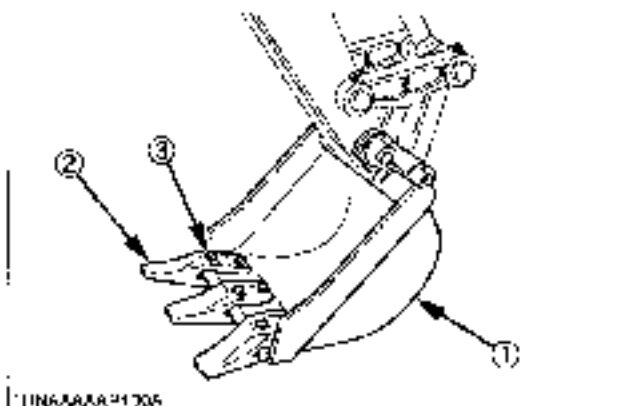
By using the following instructions, this job will be quick and easy. Always select a smooth level area to change buckets.

Place the bucket to be installed on its bottom, near the backhoe dipperstick and the bucket to be removed. Position the bucket to be removed, hydraulically, into this "NATURAL" position, just touching the ground.

■ Changing the Bucket Teeth

The bucket teeth are locked with bolts on 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.






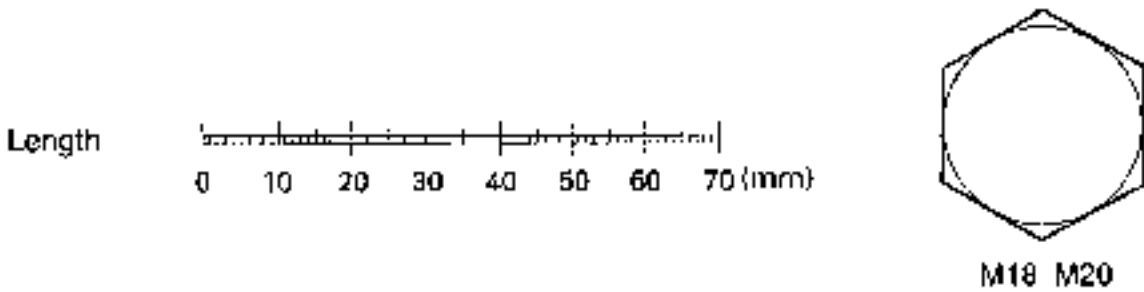
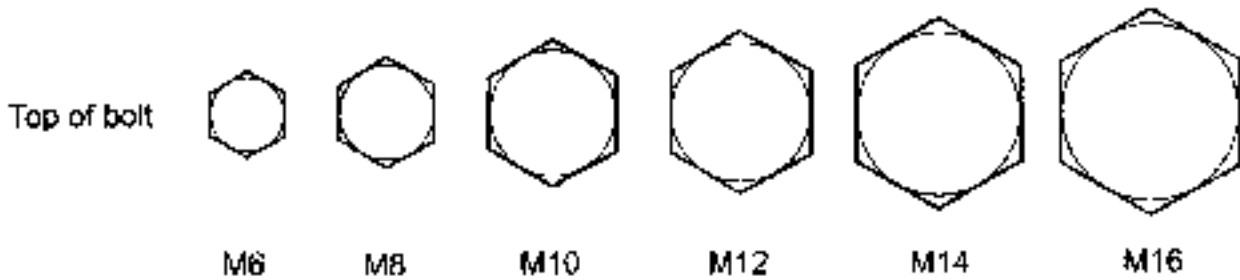
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- (1) Bucket
- (2) Bucket teeth
- (3) Bolt

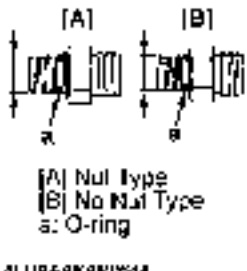


General torque specification

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

American standard screws, bolts and nuts with JNC or UNF threads			Metric cap screws 		
SAE grade No.	SAE GR 5 	SAE GR 5 	property class		8.8 Approx. SAE GR 5
1/4 (N·m) (kgf·m) (ft·lbs)	11.7 to 15.8 1.19 to 1.61 8.6 to 11.6	16.3 to 19.8 1.66 to 2.02 12.0 to 14.6	M6	(N·m) (kgf·m) (ft·lbs)	9.8 to 11.7 1.0 to 1.1 7.2 to 8.3
5/16 (N·m) (kgf·m) (ft·lbs)	23.1 to 27.6 2.35 to 2.83 17.0 to 20.5	32.5 to 39.3 3.31 to 4.01 24.0 to 29.0	M8	(N·m) (kgf·m) (ft·lbs)	23.6 to 27.4 2.4 to 2.8 17.4 to 20.2
3/8 (N·m) (kgf·m) (ft·lbs)	47.5 to 57.0 4.84 to 5.81 35.0 to 42.0	61.0 to 75.2 6.22 to 7.46 45.0 to 54.0	M10	(N·m) (kgf·m) (ft·lbs)	48.1 to 55.8 4.9 to 5.7 35.5 to 41.2
1/2 (N·m) (kgf·m) (ft·lbs)	108.5 to 130.2 11.06 to 13.28 80.0 to 96.0	149.2 to 179.0 15.21 to 18.25 110.0 to 132.0	M12	(N·m) (kgf·m) (ft·lbs)	77.5 to 90.1 7.9 to 9.2 57.2 to 66.5
9/16 (N·m) (kgf·m) (ft·lbs)	149.2 to 179.0 15.21 to 18.25 110.0 to 132.0	217.0 to 260.4 22.13 to 26.55 160.0 to 192.0	M14	(N·m) (kgf·m) (ft·lbs)	124 to 147 12.8 to 15.0 91.5 to 108.4
5/8 (N·m) (kgf·m) (ft·lbs)	203.4 to 244.1 20.74 to 24.89 150.0 to 180.0	298.3 to 358.0 30.42 to 36.51 220.0 to 264.0	M16	(N·m) (kgf·m) (ft·lbs)	198 to 225 20.0 to 23.0 145 to 166
			M18	(N·m) (kgf·m) (ft·lbs)	275 to 318 28.0 to 32.5 203 to 235
			M20	(N·m) (kgf·m) (ft·lbs)	368 to 431 37.6 to 44.0 272 to 318



*If the torque levels are specific 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)	 <p>(A) Nut Type (B) No Nut Type a: O-ring 4111PAAAKAP11YHA</p>	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 8.6	57 to 62
Hose fitting. Flare nut (UNF)	 <p>4F5AAAKAP005A</p>	9/16	22 to 25	2.3 to 2.6	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)	 <p>4F5AAAKAP05BA</p>	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

REMOVING THE BACKHOE

REMOVAL OF THE BACKHOE



CAUTION

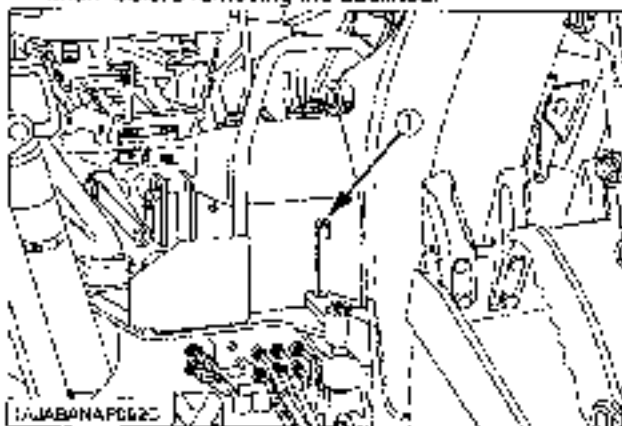
To avoid personal injury:

- Before starting the engine, always sit in the tractor operator's seat.
- Before getting off the tractor, make sure that PTO lever is off and range gear shift lever is in neutral. Then set the parking brake.
- Keep hands, feet and body from between tractor and backhoe. Never allow any part of body under the machine.
- Before leaving the backhoe operator's seat, fully lower the boom to the ground.
- Before removing the backhoe, set the swing lock pin.

IMPORTANT:

- Before removing the backhoe, set the engine speed low idle.
- For removing the backhoe, locate the tractor / loader / backhoe on a flat level and hard surface, preferably concrete. If the surface is soft, place a board on the ground for the bucket and stabilizers.

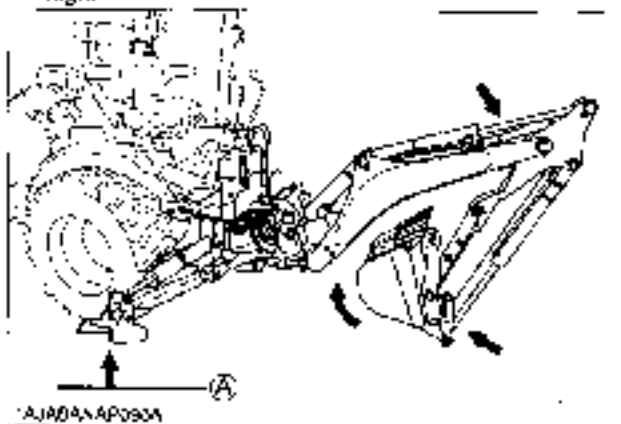
- 1 Set the swing lock pin to prevent the pivoting of the boom before removing the backhoe.



(1) Swing lock pin

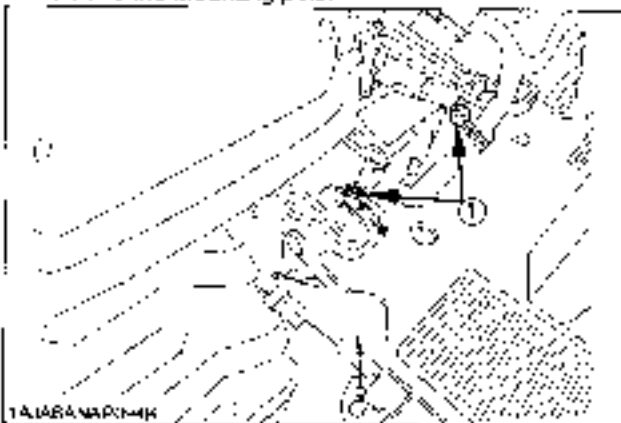
- 2 Stand beside the rear tire, fully close the dipperstick, curl the bucket and lower the boom until the back of bucket contacts the ground.

- 3 Keep the stabilizer pads at about 381 mm (15 0 in.) high.



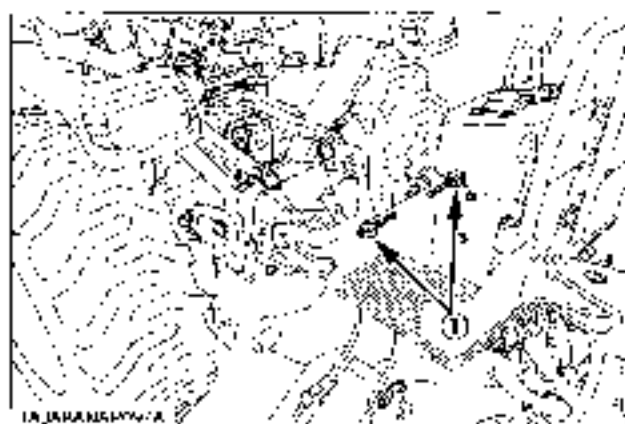
(A) 381 mm (15 0 in.)

- 4 Raise the rear wheels slightly with the boom and remove the mounting pins.



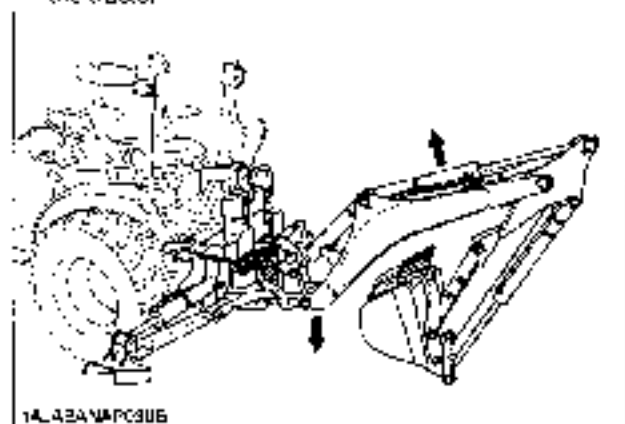
(2) Mounting pin

- 5 Put the mounting pins in the holes on the step of the backhoe.

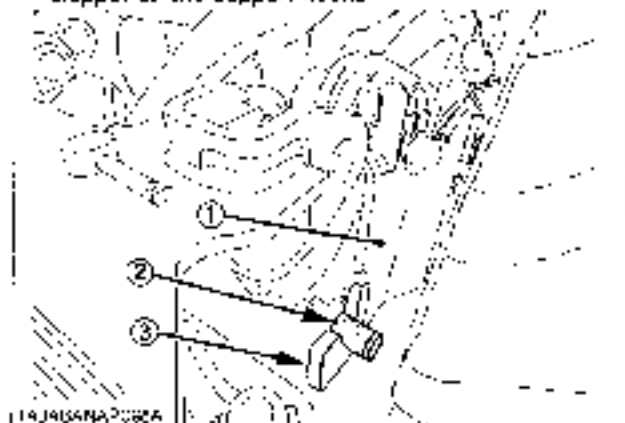


(1) Mounting pins

- 6 Slowly raise the boom to disengage the backhoe from the tractor.



- 7 Raise the backhoe by operating the stabilizers to the lowering direction until the mount bars hit the guide stopper or the support hooks.



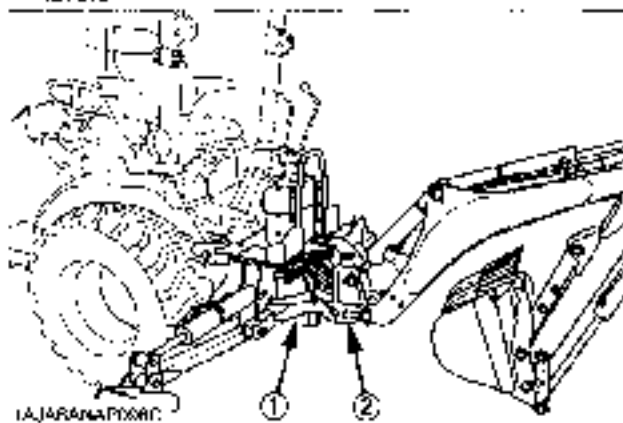
(1) Guide stop
(2) Mount bar
(3) Support hook

- 8 Move the tractor forward from the backhoe about 203 mm (8.0 in.)

IMPORTANT:

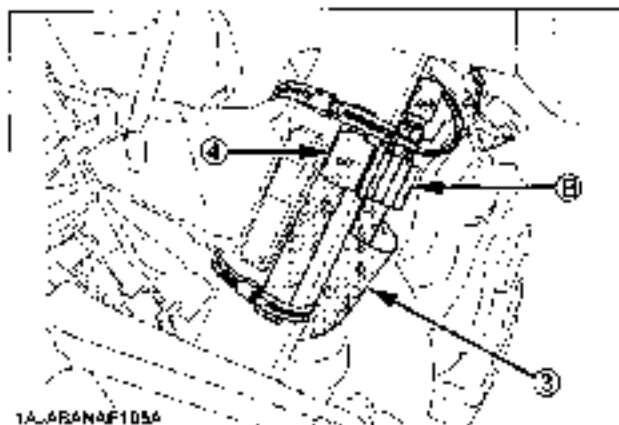
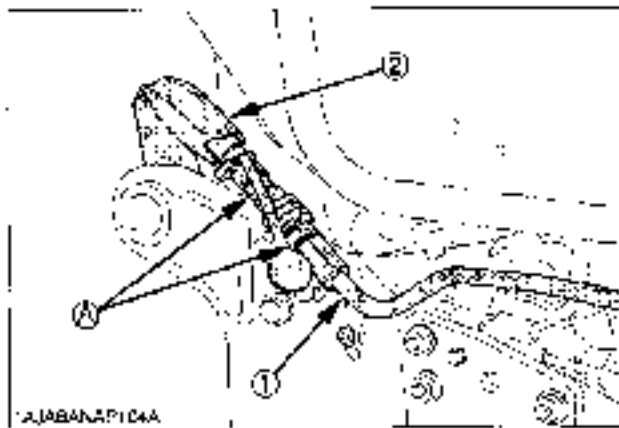
- Be careful not to damage or break the hoses when moving the tractor.

- 9 Lower the main frame and swing frame onto the ground by operating the boom and stabilizer control levers.



(1) Main frame
(2) Swing frame

- 10 Shut off the engine and set the parking brake
- 11 Slowly release all hydraulic pressure by moving the backhoe hydraulic control levers in all directions.
12. Disconnect hydraulic hoses in the following manner:
 - (1) Disconnect the inlet, outlet and power beyond hoses from the tractor.
 - (2) Connect tractor's power beyond hose to the coupler of outlet pipes.
 - (3) Set the tractor's tank hose to the hose holder.



- (1) Outlet pipe (tractor, red) (A) To be connected
 (2) Power beyond hose (tractor, yellow) (B) Set the hose
 (3) Tank hose (tractor, blue)
 (4) Hose holder

* 3. Restart the engine.

Then drive the tractor / loader slowly away from the backhoe.

- * 4 Shut off the engine and remove the key from the tractor. Set the parking brake

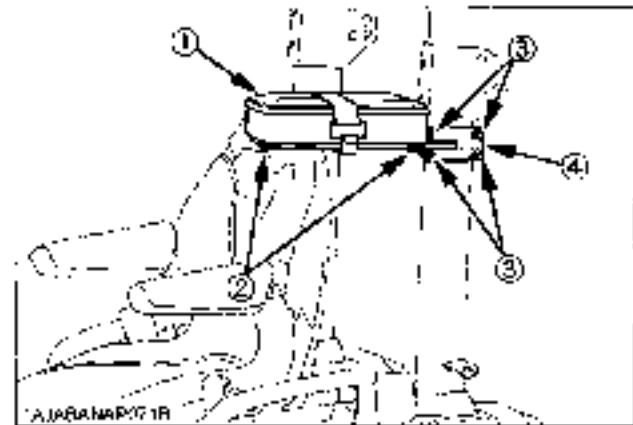
NOTE:

- Failure to reconnect the hose can result in severe damage to Hydraulic Pump and seals
 Do not start tractor with hose disconnected.
- The entire 3 point hitch can now be reinstalled on the tractor for use with other rear mount implements.
- Be sure that there is sufficient ballast in the rear tires and an implement is attached to the 3 point hitch before using the loader with backhoe removed

IMPORTANT:

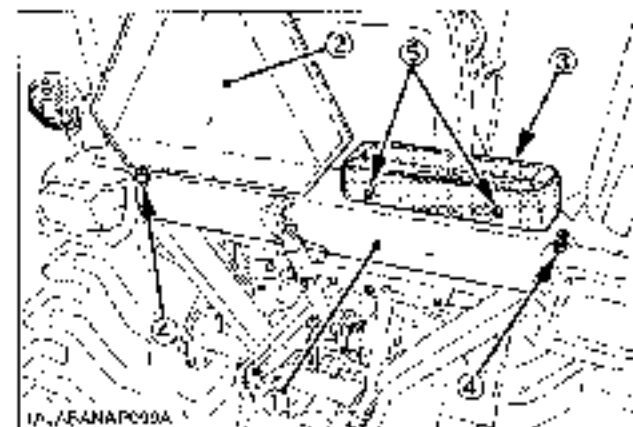
- ◆ Move the tool box and SMV emblem.

- 1 Detach the SMV emblem from the SMV socket of the backhoe.
- 2 Detach the tool box from the left side of the ROPS with the tool box stay.



- (1) Tool box
 (2) 2 M6 x 25 bolts, 2-M6 flange nuts
 (3) 2-11 bolts, 4-M10 flange nuts
 (4) Tool box stay

- 3 Attach the tool box and SMV emblem to the fender stay.
- 4 Attach the fender stay to the tractor fender.



- (1) Fender stay
 (2) SMV emblem
 (3) Tool box
 (4) 2 M8 nuts with washer

Tightening torque: See "General torque specification" section

- (5) 2-M5 x 15 flange bolts

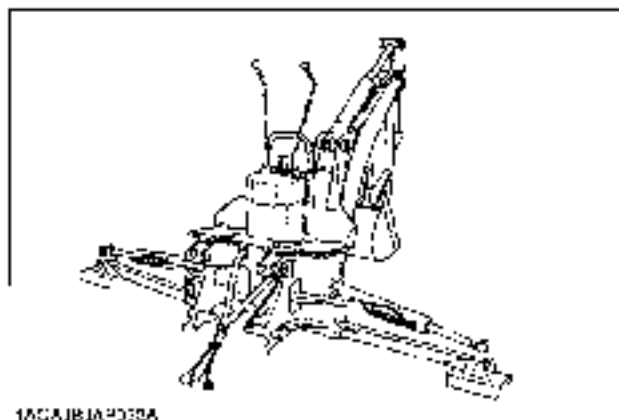
Tightening torque: See "General torque specification" section

IMPORTANT:

- When traveling on the road, be sure to attach the SMV emblem

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 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.



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IMPORTANT :

- When storing the backhoe, install the dust caps onto the backhoe's hydraulic nipples to prevent contamination.

REINSTALLING THE BACKHOE



WARNING

To avoid personal injury or death:

- When starting the engine, always sit in the operator's seat
- When getting off the tractor, make sure that 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 body under the machine.
- Before mounting backhoe, use caution and do not use any controls as handholds.



CAUTION

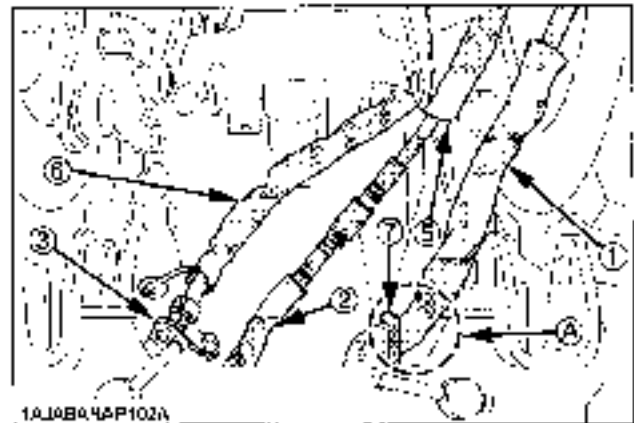
To avoid personal injury:

- Make sure the tractor PTO is disengaged.

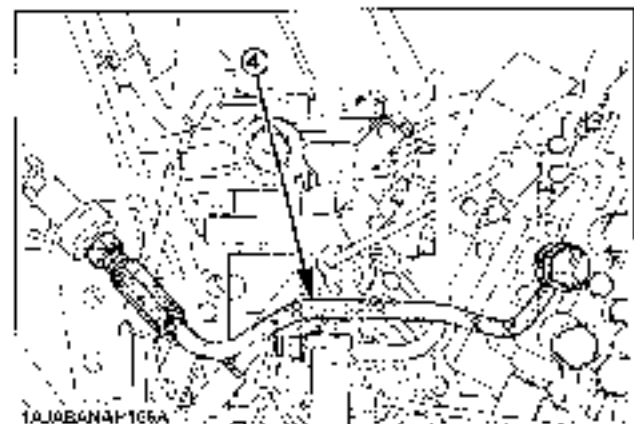
IMPORTANT :

- Before reinstalling the backhoe, set the engine speed to low idle
- 1 Remove the 3-point hitch and / or drawbar, (if equipped)
 - 2 Detach the mower, if attached in position.
 - 3 Make sure the swing lock pin is installed.
 - 4 Slowly back the tractor / loader, centering to the backhoe main frame.
Stop the tractor 254 to 304 mm (10.0 to 12.0 in.) away from the backhoe.
 - 5 Shut the engine off and set the parking brake

6. Connect the backhoe inlet hose (red) to the tractor outlet pipe (red), the backhoe outlet hose (blue) to the tractor tank hose (blue) and the backhoe power beyond hose (yellow) to the tractor power beyond hose (yellow).



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1A1AB04AP105A

- | | |
|---|---------------|
| (1) Inlet hose (Backhoe, red) | (A) Pass here |
| (2) Outlet hose (Backhoe, blue) | |
| (3) Power beyond hose (Backhoe, yellow) | |
| (4) Outlet pipe (Tractor, red) | |
| (5) Tank hose (Tractor, blue) | |
| (6) Power beyond hose (Tractor, yellow) | |
| (7) Hose guide | |

IMPORTANT :

- Connect pipes and hoses to their respective same color cap pipes and hoses
- Make sure both hoses are firmly connected before starting the engine
- Pass the backhoe inlet hose (red) from outside the hose guide (A) as illustrated

7. Restart the engine.



WARNING

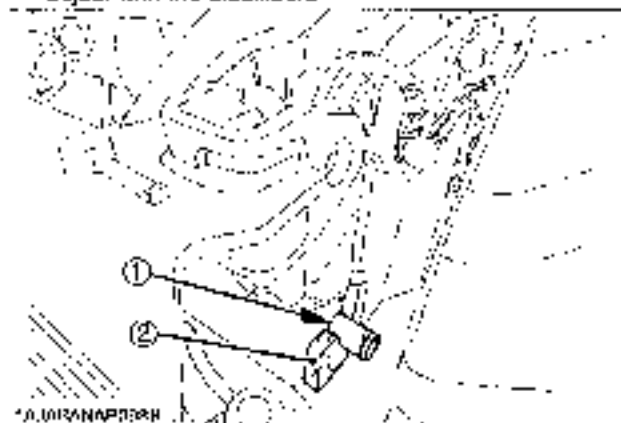
To avoid personal injury or death:

- Do not move the joystick control lever to the swing position.

8. Stand beside the rear tire. Move the boom to fully raising position and raise the backhoe by operating the stabilizers until the mount bars on the backhoe main frame are slightly higher than the tractor main frame support hooks.

NOTE:

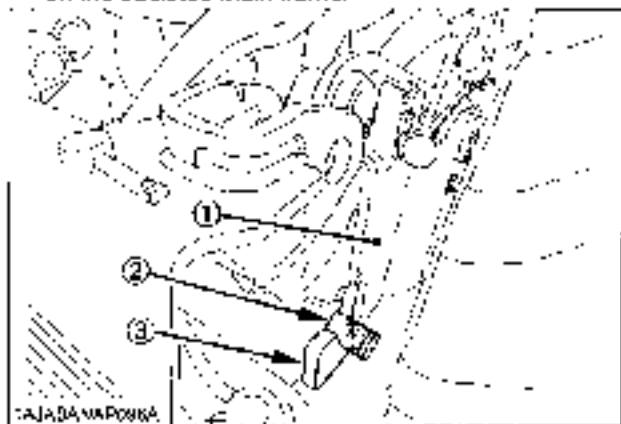
- If the support hooks are not parallel to the mount bars, adjust with the stabilizers.



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- (1) Mount bar
(2) Support hook

9. Move the tractor backward until the support hooks on the tractor main frame are just beneath the mount bars on the backhoe main frame.



1AJABANAF0344

- (1) Guide stop
(2) Mount bar
(3) Support hook

10. Lower the mount bars onto the support hooks by operating the stabilizer and boom control levers.
11. Move the boom slowly to the lowering position, and engage the guide plates of the main frame to the bosses of sub frame. Then raise the rear wheels slightly by operating the boom to the lowering direction.

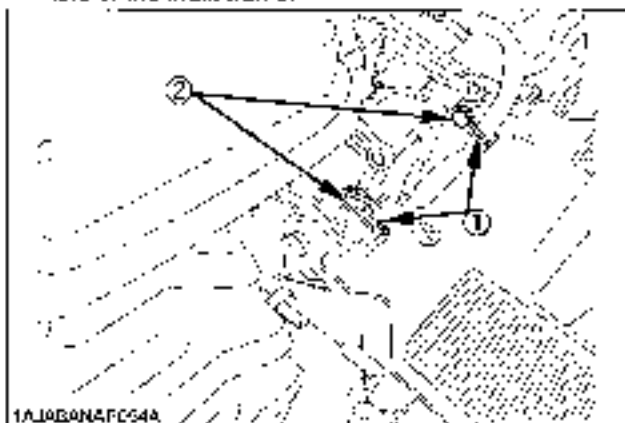


WARNING

To avoid serious injury or death:

- Make sure pins are in all the way, slide bar secured, and backhoe securely attached.

12. Shut off the engine. Reinstall the mounting pins, and insert the slide bars of the mounting pins to the lower hole of the main frame.



1AJABANAF0344

- (1) Mounting pin
(2) Slide bar

IMPORTANT:

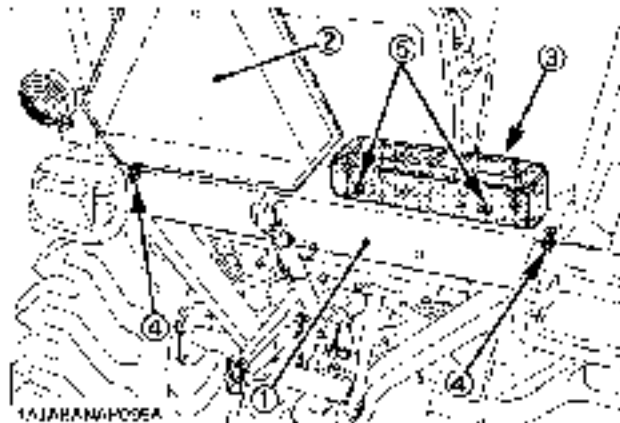
- If the slide bar of the mounting pins is inserted to the upper hole, the mounting pin comes off and the backhoe might come off. Therefore please make sure to insert the slide bar to the lower hole.

NOTE:

- Move the tractor / loader / backhoe to an open area and cycle all backhoe functions. This will check the operation and flow oil back through the system, filtering it and refilling 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.

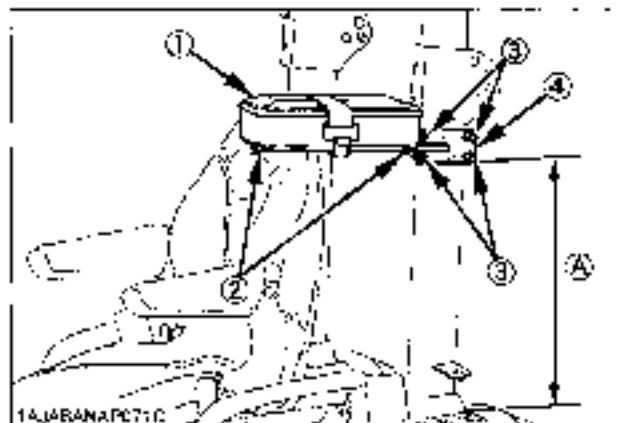
INSTALLING THE TOOL BOX AND SMV EMBLEM

- 1 Detach the fender stay from the tractor fender.



- (1) Fender stay
 (2) SMV emblem
 (3) Tool box
 (4) 2-M6 nuts with washer
 (5) 2-M6 x 16 flange bolts

- 2 Attach the tool box to the left side of the ROPS with the tool box stay.



- (1) Tool box
 (2) 2-M6 x 25 bolts, 2-M6 flange nuts
 (3) 2-1/2 bolts, 4-M10 flange nuts
 (4) Tool box stay
 (A) 400 to 450 mm
 (15.7 to 17.7 in.)
 Tightening torque 45.3 to 50.3 N-m
 (4.4 to 5.1 kg-m, 21.9 to 37.1 lb-ft)

NOTE :

- Secure the tool box where your hand does not hit against it when moving the levers.

- 3 Attach the SMV emblem to the SMV socket of the backhoe.

IMPORTANT :

- When traveling on the road, be sure to attach the SMV emblem.

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