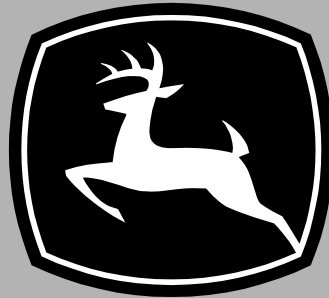


JOHN DEERE
WORLDWIDE COMMERCIAL & CONSUMER
EQUIPMENT DIVISION

Backhoe for Compact Utility Tractor
46, 47, 48

OMLVU13145 E3

OPERATOR'S MANUAL



JOHN DEERE

All information, illustrations and specifications in this manual are based on the latest information at the time of publication. The right is reserved to make changes at any time without notice.

COPYRIGHT© 2003

Deere & Co.

John Deere Worldwide Commercial and Consumer Equipment Division

All rights reserved

Previous Editions

COPYRIGHT©

North American Version

Litho in U.S.A.

INTRODUCTION

Introduction

Using Your Operator's Manual

This manual is an important part of your machine and should remain with the machine when you sell it.

Use the safety and operating information in the attachment operator's manual along with the machine operator's manual to operate and service the attachment safely and correctly.

Specifications and design are subject to change without notice.

Product Identification

Product Compatibility

The backhoe is designed for use with compact utility tractors. The backhoe is recommended for installation on these machine models only:

Backhoe Model	Machine Model
46	4100, 4110, 4115
47	4200-4400, 4210-4410
48	4300-4400, 4310-4410, 4500-4600, 4510-4710

Contact your John Deere dealer before installation on any other machines.

Before operating the backhoe, the following equipment must be installed on the tractor. See your John Deere dealer.

- Front Loader
- Tall Folding Roll Over Protection System (ROPS)
- Power Beyond hydraulic kit

Record Identification Numbers

Model 46 Serial No. (010001 -)

Model 47 Serial No. (010001 -)

Model 48 Serial No. (010001 -)

If you need to contact an Authorized Service Center for information on servicing, always provide the product model and serial number.

You will need to locate the model and serial numbers for the backhoe and record the information in the spaces provided below.

DATE OF PURCHASE:

DEALER NAME:

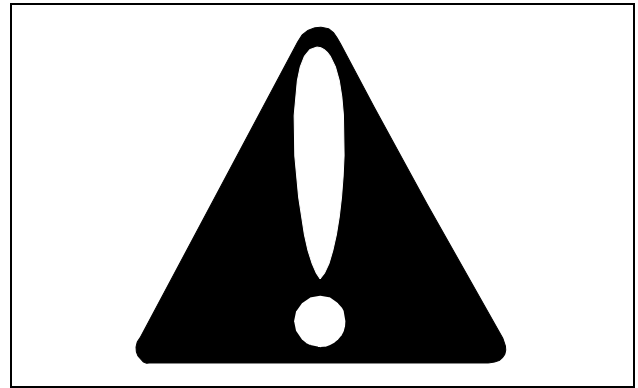
DEALER PHONE:

PRODUCT SERIAL NUMBER (A):

Safety

Read the general safety operating precautions in your machine operator's manual for additional safety information.

Understanding The Machine Safety Labels



Safety-Alert Symbol

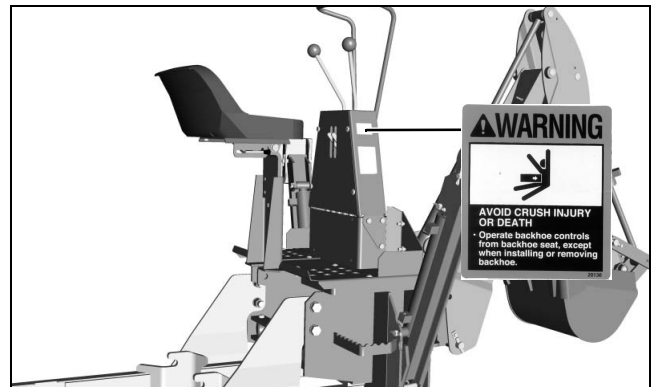
The machine safety labels shown in this section are placed in important areas on your machine to draw attention to potential safety hazards.

On your machine safety labels, the words DANGER, WARNING, and CAUTION are used with this safety-alert symbol. DANGER identifies the most serious hazards.

The operator's manual also explains any potential safety hazards whenever necessary in special safety messages that are identified with the word, CAUTION, and the safety-alert symbol.

Machine Safety Labels (Model 46)

WARNING: AVOID CRUSH INJURY OR DEATH

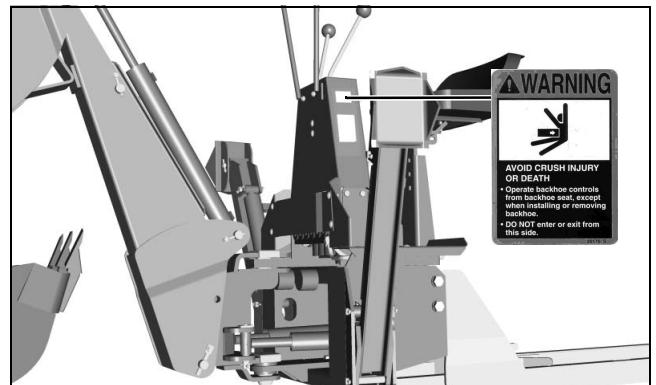


LVU12267, MX15457

Picture Note: RH side.

- Operate backhoe controls from backhoe seat, except when installing or removing backhoe.

WARNING: AVOID CRUSH INJURY OR DEATH



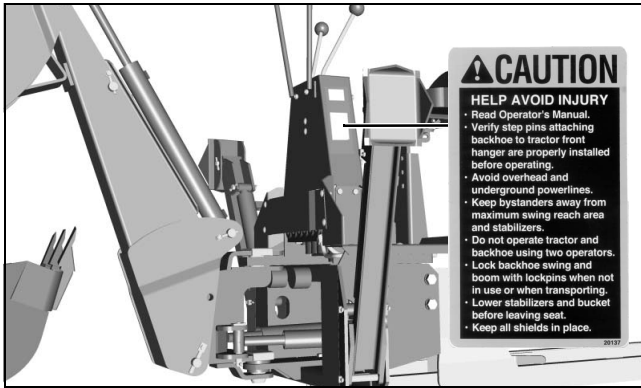
LVU15750, MX15458

SAFETY

Picture Note: LH side.

- Operate backhoe controls from backhoe seat, except when installing or removing backhoe.
- DO NOT enter or exit from this side.

CAUTION: HELP AVOID INJURY



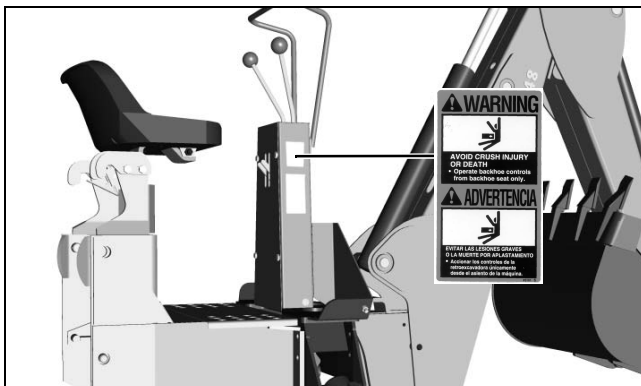
LVU12266, MX15458

Picture Note: Both sides.

- Read Operator's Manual.
- Verify step pins attaching backhoe to tractor front hanger are properly installed before operating.
- Avoid overhead and underground powerlines.
- Keep bystanders away from maximum swing reach area and stabilizers.
- Do not operate tractor and backhoe using two operators.
- Lock backhoe swing and boom with lockpins when not in use or when transporting.
- Lower stabilizers and bucket before leaving seat.
- Keep all shields in place.

Machine Safety Labels (Models 47, 48)

WARNING: AVOID CRUSH INJURY OR DEATH

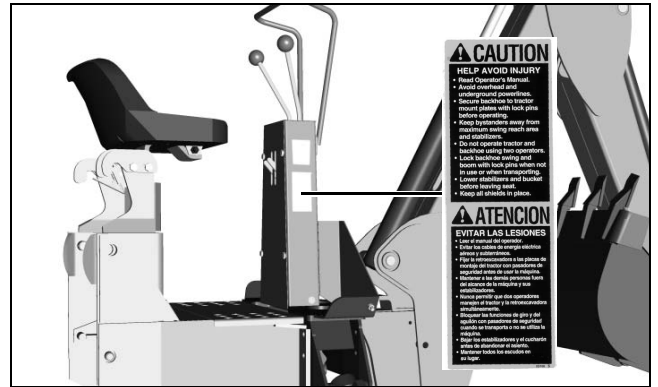


M139061, MX17600

Picture Note: Both sides.

- Operate backhoe controls from backhoe seat only.

CAUTION: HELP AVOID INJURY



M139060, MX17600

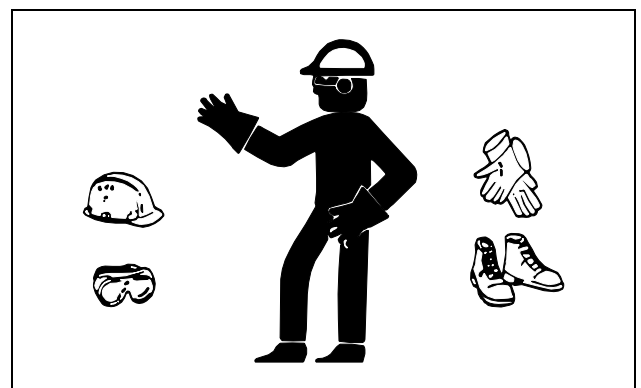
Picture Note: Both sides.

- Read Operator's Manual.
- Avoid overhead and underground powerlines.
- Secure backhoe to tractor mount plates with lock pins before operating.
- Keep bystanders away from maximum swing reach area and stabilizers.
- Do not operate tractor and backhoe using two operators.
- Lock backhoe swing and boom with lockpins when not in use or when transporting.
- Lower stabilizers and bucket before leaving seat.
- Keep all shields in place.

Parking Safely

1. Stop machine on a level surface, not on a slope.
2. Disengage PTO and stop attachments.
3. Lower attachments to the ground.
4. Lock park brake.
5. Stop engine.
6. Remove key.
7. Wait for engine and all moving parts to stop before you leave the operator's station.
8. Close fuel shut-off valve, if your machine is equipped.

Wear Appropriate Clothing



MIF

- Always wear safety goggles, or safety glasses with side shields, and a hard hat when operating the machine.

SAFETY

- Wear close fitting clothing and safety equipment appropriate for the job.
- While mowing, always wear substantial footwear and long trousers. Do not operate the equipment when barefoot or wearing open sandals.
- Wear a suitable protective device such as earplugs. Loud noise can cause impairment or loss of hearing.

Practice Safe Maintenance



MIF

- Only qualified, trained adults should service this machine.
- Understand service procedure before doing work. Keep area clean and dry.
- Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
- Never lubricate, service or adjust the machine or attachment while it is moving. Keep safety devices in place and in working condition. Keep hardware tight.
- Keep hands, feet, clothing, jewelry, and long hair away from any moving parts, to prevent them from getting caught.
- Lower any attachment completely to the ground or to an existing attachment mechanical stop before servicing the attachment. Disengage all power and stop the engine. Lock park brake and remove the key. Let machine cool.
- Disconnect battery or remove spark plug wire (for gasoline engines) before making any repairs.
- Before servicing attachment, carefully release pressure from any components with stored energy, such as hydraulic components.
- Securely support any machine or attachment elements that must be raised for service work. Use jack stands or lock service latches to support components when needed.
- Never run engine unless park brake is locked.
- Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Replace all worn or damaged safety and instruction decals.
- Check all hardware, including shear bolts, at frequent intervals to be sure the equipment is in safe working condition.
- Do not modify machine or safety devices. Unauthorized modifications to the machine or attachment may impair its function and safety.

Avoid High Pressure Fluids



MIF

- Hydraulic hoses and lines can fail due to physical damage, kinks, age, and exposure. Check hoses and lines regularly. Replace damaged hoses and lines.
- Hydraulic fluid connections can loosen due to physical damage and vibration. Check connections regularly. Tighten loose connections.
- Escaping fluid under pressure can penetrate the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure.
- Search for leaks with a piece of cardboard. Protect hands and body from high pressure fluids.
- If an accident occurs, see a doctor immediately. Any fluid injected into the skin must be surgically removed within a few hours or gangrene may result. Doctors unfamiliar with this type of injury should reference a knowledgeable medical source. Such information is available from Deere & Company Medical Department in Moline, Illinois, U.S.A. Information may be obtained in the United States and Canada only by calling 1-800-822-8262.

Drive Machine Safely

- Set backhoe boom lock and swing lock pins to center the backhoe before driving. If you must drive on hillsides, move the backhoe to uphill side for added stability.
- Drive carefully:
 - On slopes.
 - Where room is limited.
 - Over rough ground, curbs, or tracks.
 - Near a ditch or excavation.
- For traveling:
 - Be sure brake pedals are connected.
 - Lower the loader bucket.
 - Keep machine in gear at all times.
- Use accessory lights and safety devices to warn operators of other vehicles.
- Where flashing lights are prohibited, disconnect warning light flasher.

Avoid Tipping

- Always wear seat belt with ROPS in upper position.
- Avoid holes, ditches and obstructions which cause the machine to tip, especially on hillsides. Avoid sharp, uphill turns.

ASSEMBLY

- Never drive near the edge of a gully or steep embankment - it might cave in.
- Stay alert for holes, rocks, and roots in the terrain; and other hidden hazards. Keep away from drop-offs.
- Reduce speed and exercise extreme caution on slopes and in sharp turns to prevent tipping or loss of control. Be especially cautious when changing direction on slopes.
- Driving forward out of a ditch or mired condition or up a steep slope could cause tractor to tip over rearward. Back out of these situations if possible.
- While mechanical front wheel drive greatly increases traction, it does not increase stability of the tractor. With mechanical front wheel drive engaged, the tractor can climb steeper slopes but it does not become more stable. When this option is used, extra caution is needed on slopes. Compared to a 2-wheel drive, a front-wheel drive tractor maintains traction on steeper slopes, increasing the possibility of a tip-over.
- Danger of overturn increases greatly with narrow tread setting, at high speed.

Backhoe Safety Tips

- Learn backhoe controls before you operate.
- Do not let anyone work under raised bucket.
- Do not use boom and bucket as a battering ram.
- Use hand rail to help you mount or dismount. Be careful not to bump levers.
- Avoid rocks, roots, etc. when digging.
- Do not dig under stabilizers.
- Do not contact stabilizers with bucket.
- Do not let backhoe contact electrical cables, overhead or underground, or overhead obstacles.
- Keep bystanders away from maximum swing reach area and stabilizers.
- Carry loads low and travel slowly over rough or uneven ground.
- Before you leave the seat: Lower stabilizers and bucket to the ground. Stop the engine. Remove the key.

Assembly

NOTE: Some parts are used during backhoe assembly, others are used during installation on tractor.

Parts (Model 46)

Qty.	Description
4	Bolt, 1/4 x 3/4 in.
6	Cap Screw, 3/4 x 2-1/2 in.
8	Cap Screw, M12x1.75
4	Locknut, 1/4 in.
8	Locknut, 3/8 in.
6	Locknut, 3/4 in.

Qty.	Description
8	Lockwasher, 1/2 in.
8	Washer, .344 x .688 in. (zinc plate)
8	Washer, 3/8 x 7/8 in. (steel)
12	Washer, 3/4 x 1-3/8 in.
2	Pin, Locking
4	U-bolt
2	Pin, Step
2	Hanger
1	Rear Mounting Support
4	Bolt, 5/16 x 7/8 in.
4	Washer, 5/16 in.
4	Locknut, 5/16 in.
4	Retainer
4	Bushing
2	Pin, Pivot

Parts (Model 47)

Qty.	Description
2	Pin, Pivot
4	Washer, 1-1/32 x 1-1/2 in.
2	L-Pin
2	Retainer Ring
4	Washer, 1/2 in.
4	Lockwasher, 1/2 in.
4	Cap Screw, 1/2 x 1-1/4 in.
1	Spring Clamp with Screw, Washer, Lockwasher and Nut
2	Cable
2	Latch Plate
2	Pin, Hitch
4	Bolt, 5/16 x 7/8 in.
4	Washer, 11/32 x 11/16 in.
4	Locknut, 5/16 in.
4	Retainer

ASSEMBLY

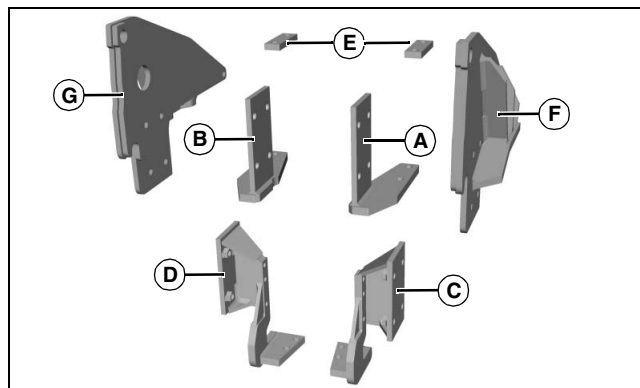
Parts (Model 48)

Qty.	Description
2	Pin, Pivot
4	Washer, 1-1/32 x 1-1/2 in.
2	L-Pin
2	Retainer Ring
4	Washer, 1/2 in.
4	Lockwasher, 1/2 in.
4	Cap Screw, 1/2 x 1-1/4 in.
1	Spring Clamp with Screw, Washer, Lockwasher and Nut
2	Cable
2	Latch Plate
2	Pin, Hitch
4	Bolt, 3/8 x 1-1/4 in.
4	Washer, 11/32 x 11/16 in.
4	Locknut, 5/16 in.
4	Retainer
2	Cap Screw, 1/2 x 8 in.
12	Cap Screw, 1/2 x 7-1/2 in.
15	Nut, 1/2 in.
14	Washer, 1/2 in.
4	Cap Screw, 5/16 x 3/4 in.
4	Lockwasher, 5/16 in.
1	Cap Screw, 1/2 x 6-1/2 in.
2	Lockwasher, M12
2	Nut, M12

Parts (4200-4410 Tractor Mounting)

Qty.	Description
1	RSA Mounting Plate, LH
1	RSA Mounting Plate, RH
4	Bolt, M16x130
4	Bolt, M16x140
10	Washer, 5/8 in.

Parts (4500-4710 Tractor Mounting)



MX15456

Qty.	Description
1	Mount Weldment, RH (A)
1	Mount Weldment, LH (B)
1	Hook Weldment, RH (C)
1	Hook Weldment, LH (D)
2	Spacer (E)
1	RSA Mounting Plate, RH (F)
1	RSA Mounting Plate, LH (G)
18	Washer, 5/8 in.
6	Cap Screw, M16x45
6	Washer, 1/2 in.
4	Washer, 9/16 in.
4	Cap Screw, M14x45
2	Nut, M12
12	Cap Screw, M16x60
4	Cap Screw, M12x55
2	Spacer, Hex
1	Fitting, 90° Elbow

Remove Backhoe From Pallet

1. Position pallet on level ground where tractor can be backed up for installation.
2. Remove plastic wrap from seat. Remove seat if not installed.
3. Remove stabilizers or stabilizer legs from pallet.
4. Remove bags covering ends of hydraulic hoses.
5. Remove any bolts and plates securing other parts to pallet.
6. Use a proper lifting device to remove model 46 backhoe from pallet. Model 47 and 48 backhoe may remain on pallet for stability until tractor installation.

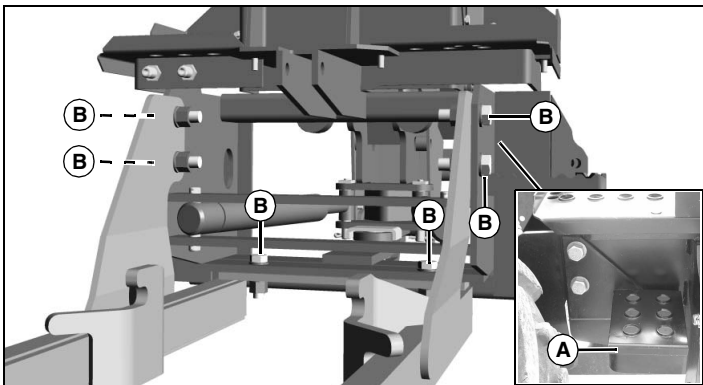
ASSEMBLY

Assemble Backhoe

Model 46

NOTE: Follow *Preparing Tractor for Model 46* instructions to remove 3-point hitch, install front hangers, install rear mounting support, and align backhoe subframe before you assemble model 46 backhoe.

1. Use proper lifting device to raise and support backhoe mainframe.



MX17605, MX17781

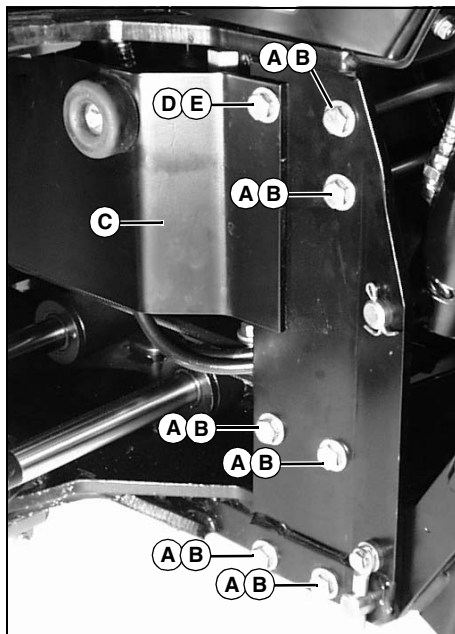
Picture Note: On early models, install step (A) on mainframe LH side as you install subframe on mainframe.

2. Align subframe with holes in mainframe, and install six 3/4 x 2-1/2 in. cap screws (B), twelve washers, and locknuts. Tighten to 379 N•m (280 lb-ft).

Model 47, 48

NOTE: Large frame adapter (tractor models 4500-4710) or medium frame adapter (tractor models 4300-4410) is required for model 48 backhoe.

1. Install adapter (48 only):

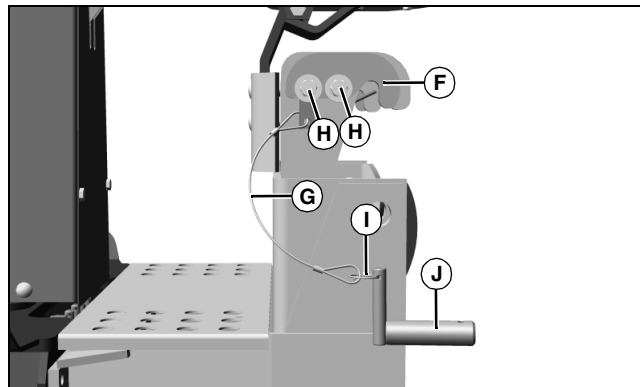


M64095

a. Install adapter on backhoe frame with twelve 1/2 x 7-1/2 in. cap screws (A), washers (B), and nuts.

b. Install valve cover (C) with two 1/2 x 8 in. cap screws (D), washers (E), and nuts.

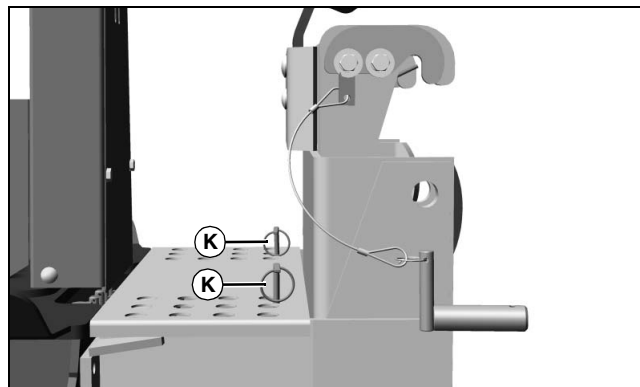
c. Tighten all cap screws to 142 N•m (105 lb-ft).



MX17603

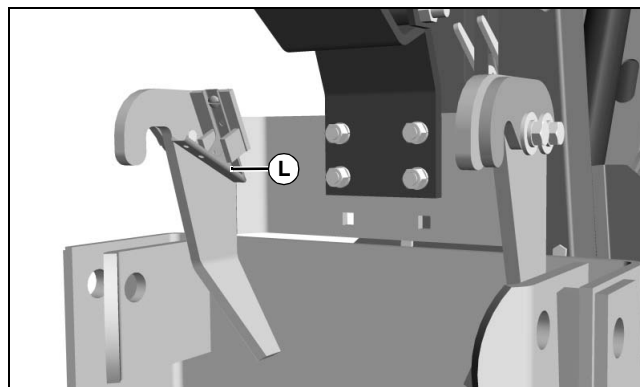
2. Loosely install latch plates (F) and cables (G) on outside of backhoe hooks with four 1/2 x 1-1/4 in. cap screws (H), lockwashers, and washers. Center the slots in the latch plates on the cap screws before tightening.

3. Install retainer rings (I) in L-pins (J) and cables as shown.



MX17604

4. Store hitch pins (K) for L-pins in storage holes on floor of operator's station as shown.

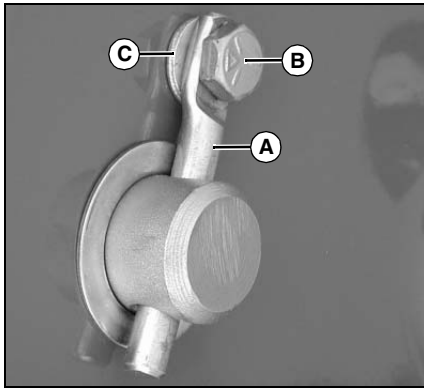


MX17601

5. Install spring clamp (L) next to LH latch plate with screw, washer, lockwasher and nut.

ASSEMBLY

Install Stabilizers

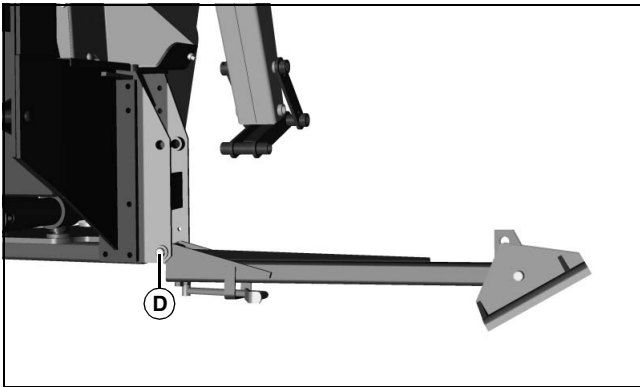


MX15434

NOTE: Pivot pins on backhoe are installed with either cotter pins or retainers (A). Retainer is installed in pivot pin with bolt (B), 11/32-in. washer (C), and 5/16-in. locknut.

1. Remove pivot pins stored in stabilizers.
2. Model 48 only: Remove retainers securing pivot pins to backhoe.
3. Remove pivot pins securing cylinders to backhoe, and remove cylinders.

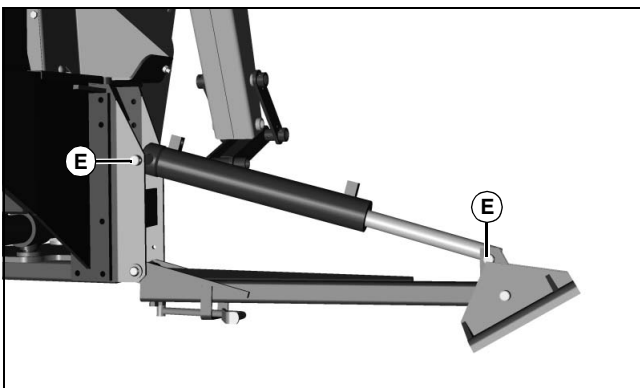
NOTE: Lubricate all pivot pins before installation.



MX17606

Picture Note: Model 48 shown.

4. Install both stabilizers on backhoe with pivot pin (D) as shown. Install cotter pins or retainers in pivot pins.



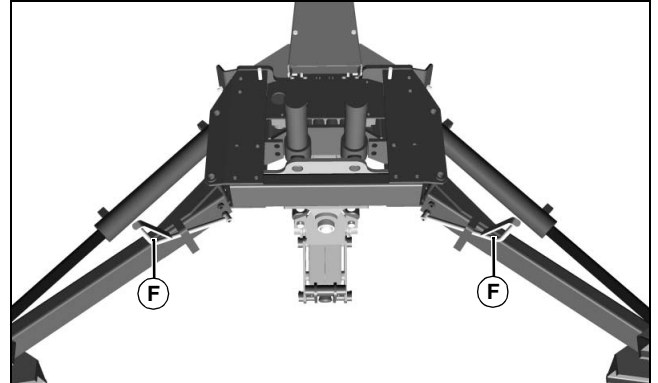
MX17607

Picture Note: Model 48 shown.

5. Install both cylinders on backhoe and stabilizers with pivot pins (E) as shown.
6. Install cotter pins or retainers in pivot pins.

7. Route hydraulic hoses:

- Model 46: Route cylinder rod end hoses above the pivot pins, and route cylinder base end hoses below the pivot pins.
- Model 47, 48: Route all hoses above the pivot pins.

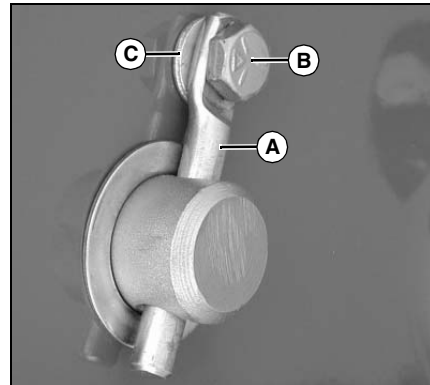


MX17608

8. Model 48 only: Stabilizer steps (F) must be installed on welded nuts closest to backhoe bucket.
9. Lubricate all grease fittings and pivot points before operating backhoe.

Install Bucket

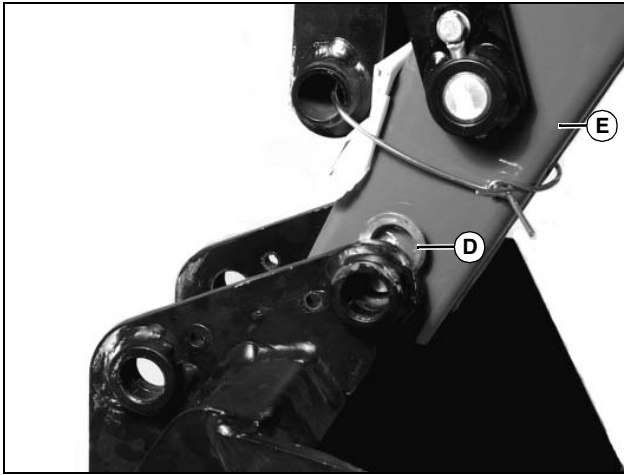
NOTE: Lubricate all pivot pins before installation.



MX15434

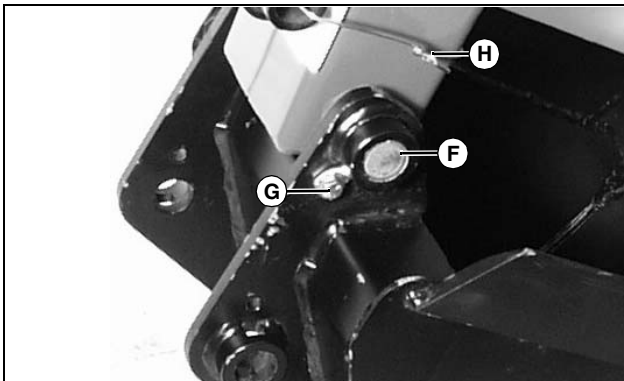
NOTE: Pivot pins on backhoe are installed with either cotter pins or retainers (A). Retainer is installed in pivot pin with bolt (B), 11/32 in. washer (C), and 5/16 in. locknut.

ASSEMBLY



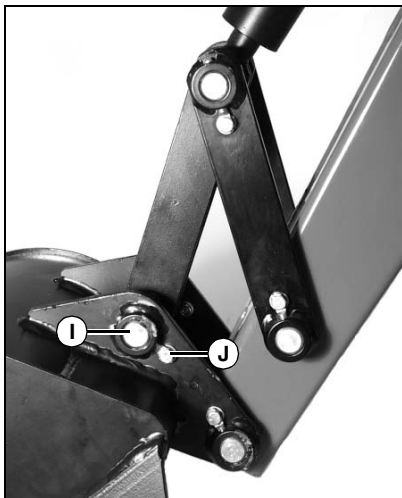
M64103

1. Grease both sides of two 1-1/32 x 1-1/2 in. washers (D) and install between bucket and dipperstick (E) on both sides of dipperstick.



M64104

2. Install pivot pin (F) through bucket, washers, and dipperstick.
3. Install two retainers (G) in pivot pin with hardware.
4. Remove shipping wire holding link (H) to dipperstick.

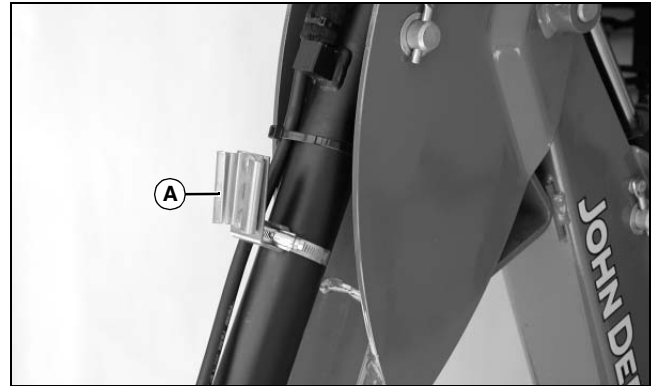


M64105

5. Pivot the bucket back and install pivot pin (I) through bucket and link. Install two 1-1/32 x 1-1/2 in. washers between bucket and link if needed.
6. Install two retainers (J) in pivot pin with hardware.
7. Lubricate all grease fittings and pivot points before operating backhoe.

Installing Slow Moving Vehicle (SMV) Sign

NOTE: Use the SMV sign when transporting the backhoe on roads.



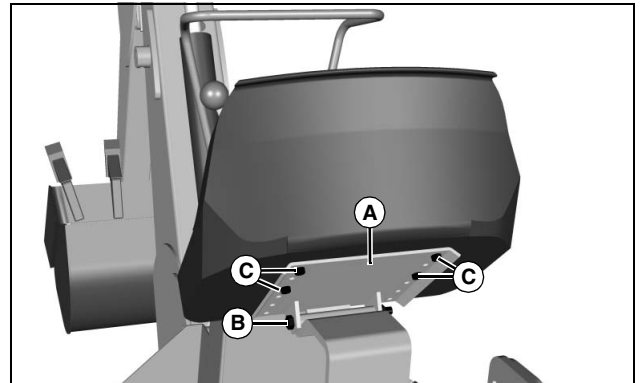
MX15437

Picture Note: Model 46 shown.

1. Install SMV sign:

- Model 46: Remove SMV sign shipped with backhoe, and install into bracket (A) on the backhoe bucket cylinder.
- Model 47, 48: Remove SMV sign from tractor, and install into bracket (A) on the backhoe bucket cylinder.

Install Operator's Seat (Model 48)

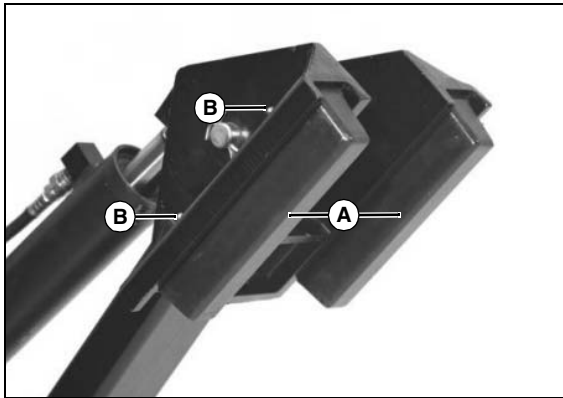


MX17784

1. Install plate (A) on bracket with 1/2 x 6-1/2 in. cap screw (B) and nut. Tighten until slight drag is felt when pivoting plate.
2. Position where desired and install seat on plate with four 5/16 x 3/4 in. cap screws (C) and lockwashers.

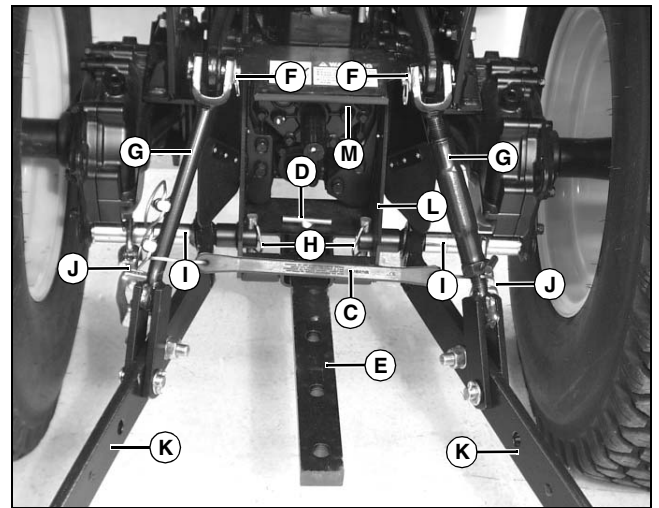
PREPARING TRACTOR FOR MODEL 46

Install Optional Street Pads (Models 47, 48)



M64102

1. Install street pads (A) on stabilizers with nuts (B).



MX12179

Preparing Tractor For Model 46

All Tractor Models



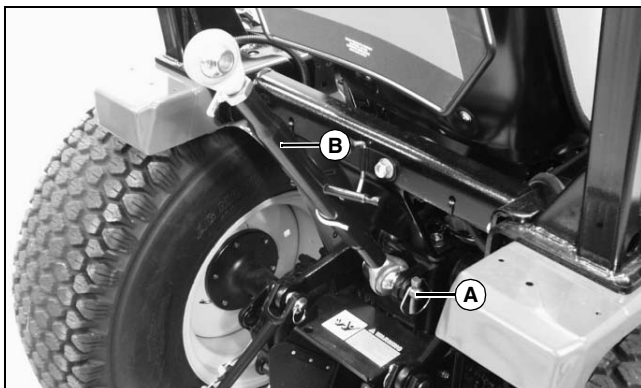
CAUTION: Avoid injury! DO NOT operate backhoe without front loader and tall folding Roll Over Protection System (ROPS) mounted on tractor.

Loader provides front ballast for better steering control and makes tractor/backhoe more stable during backhoe operation.

Tall folding ROPS provides necessary headroom while sitting on backhoe seat.

Mount rear wheels in the widest position for maximum stability.

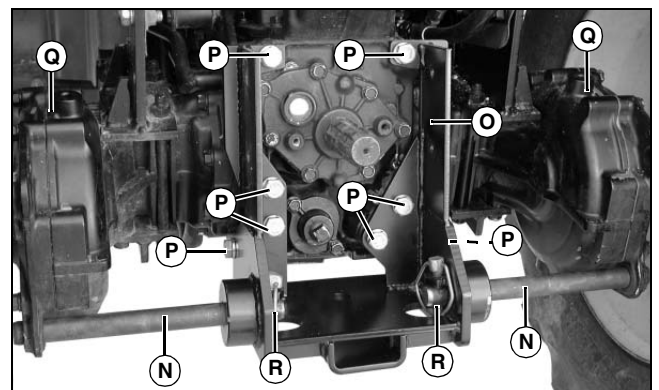
1. Install Front Loader.
2. Park tractor safely.
3. If installed, remove mid-mount mower deck.



MX12109

4. Remove 3-point hitch and drawbar hitch:
 - a. Remove locking pins (A) and center link (B).

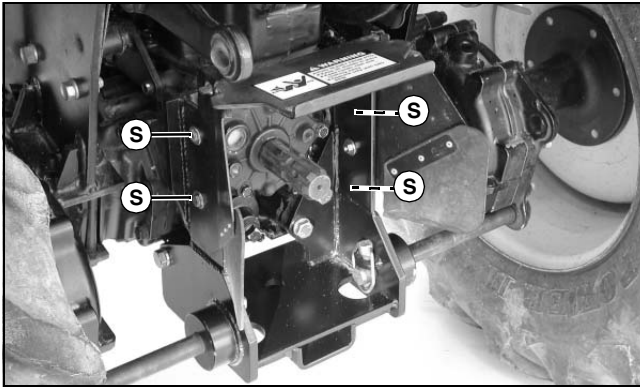
- b. Remove strap (C).
 - c. Remove locking pin (D) and remove drawbar (E).
 - d. Remove locking pins (F) from lift links (G) and lower the lift links.
 - e. Remove locking pins (H) from draft link pins (I).
 - f. Slide draft link pins in. Remove sway links (J), draft links (K), and lift links (G).
 - g. Disassemble links as needed and install locking pins in links for storage.
 - h. Remove eight bolts from drawbar hitch (L) and remove drawbar hitch.
 - i. Remove and retain draft links pins with locking pins from drawbar hitch.
 - j. Remove four bolts from three piece PTO shield (M) and remove shield from drawbar hitch.
5. Install rear mounting support:



MX15439

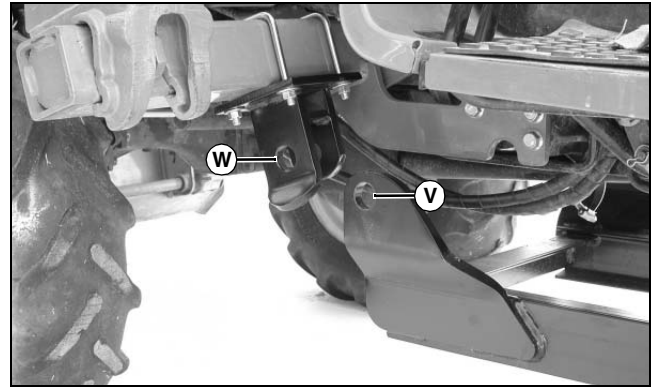
- a. Install draft link pins (N) in rear mounting support (O), and install rear mounting support with eight M12x1.75 cap screws (P) and 1/2 in. lockwashers. Tighten to 113 N•m (83 lb-ft).
- b. Install draft link pins in drive housings (Q) and install locking pins (R) in draft link pins.

PREPARING TRACTOR FOR MODELS 47, 48



MX15440

c. Install three piece PTO shield on rear mounting support with four new 1/4 x 3/4 in. bolts (S), eight .344 x .688 zinc plate washers, and four 1/4 in. locknuts. Tighten to 12 N•m (106 lb-in.)



MX15442

b. Push down to pivot subframe rear end and align holes (V) on subframe front end with holes (W) in hangers.

c. Position hangers as needed for subframe alignment.

d. Tighten locknuts on hanger U-bolts to 47 N•m (35 lb-ft).

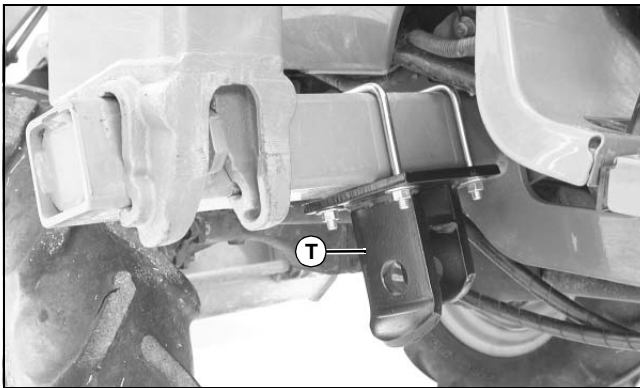
e. Use proper lifting device to remove subframe from draft link pins.

8. Inflate tires to maximum pressure recommended by tire manufacturer.

9. Install Tall Folding Roll Over Protection System (ROPS).

10. Install Power Beyond kit.

11. Follow tractor operator's manual instructions to check hydraulic fluid level.

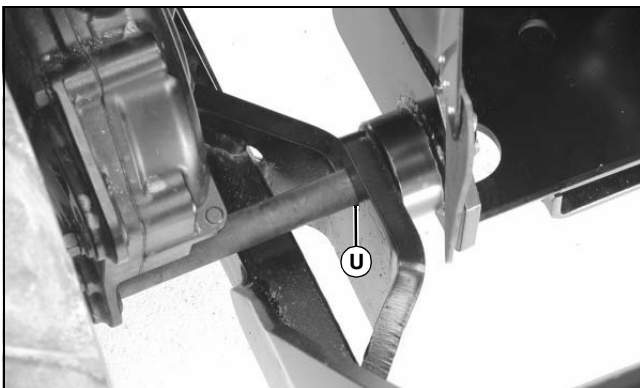


MX15438

6. Install hangers (T):

a. Loosely install hangers on loader mounts on both sides of tractor with four U-bolts, eight 3/8 x 7/8 in. washers and locknuts.

b. Position hangers centered on tractor with 22 in. space between inside surfaces of outer lugs.



MX15441

7. Align backhoe subframe:

a. Use proper lifting device to position and install subframe hooks (U) onto draft link pins.

Preparing Tractor For Models 47, 48

All Tractor Models



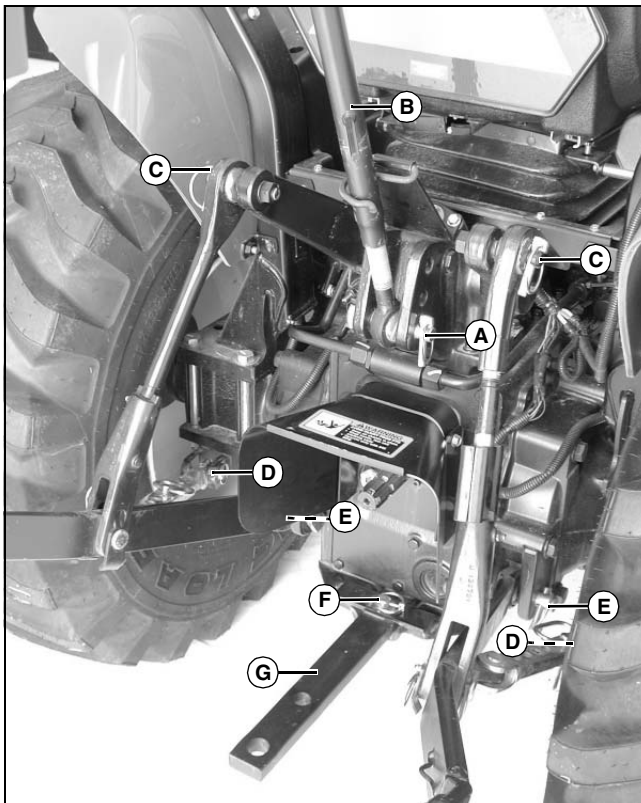
CAUTION: Avoid injury! DO NOT operate backhoe without front loader and tall folding Roll Over Protection System (ROPS) mounted on tractor. Loader provides front ballast for better steering control and makes tractor/backhoe more stable during backhoe operation. Tall folding ROPS provides necessary headroom while sitting on backhoe seat. Mount rear wheels in the widest position for maximum stability.

1. Park tractor safely.

2. If mid-mount mower deck is installed:

- 4200-4400, 4210-4410 Models: Raise mower and lock SCV valve into centered neutral position.
- 4500-4600, 4510-4710 Models: Raise mower deck and install transport lock. Remove mower lift links from rockshaft.

PREPARING TRACTOR FOR MODELS 47, 48



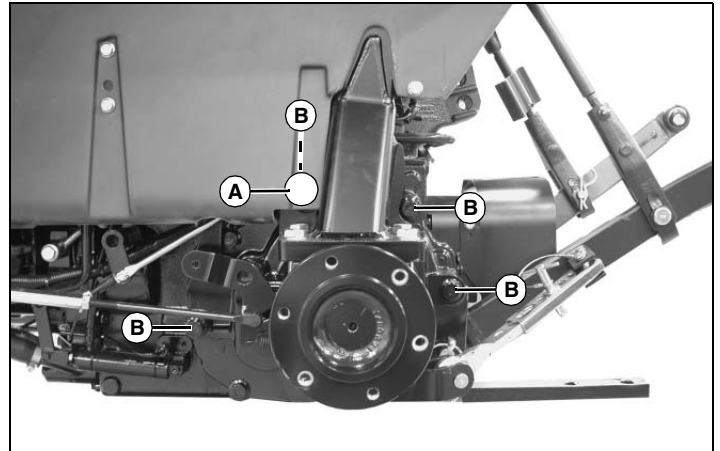
Install Rockshaft Assist (RSA) Mounting Plates (Tractor Models 4200-4400, 4210-4410)



CAUTION: Avoid injury! Support machine securely on stands before removing a wheel.

1. Raise rear of tractor and support rear axles with jack stands.
2. Remove rear wheels.

NOTE: Rear fenders can be removed to access the top axle flange bolt rather than drilling holes in fenders.



3. Remove 3-point hitch and drawbar:

- a. Remove locking pins (A) and center link (B).
- b. Remove locking pins (C), (D), and (E), and remove links on both sides.
- c. Disassemble links as needed and install locking pins in links for storage.

IMPORTANT: Avoid damage! Failure to remove drawbar from tractor will result in damage to tractor, backhoe, or both.

- d. Remove locking pin (F) and drawbar (G). Install pin in drawbar to store.



CAUTION: Avoid injury! Support machine securely on stands before removing a wheel.

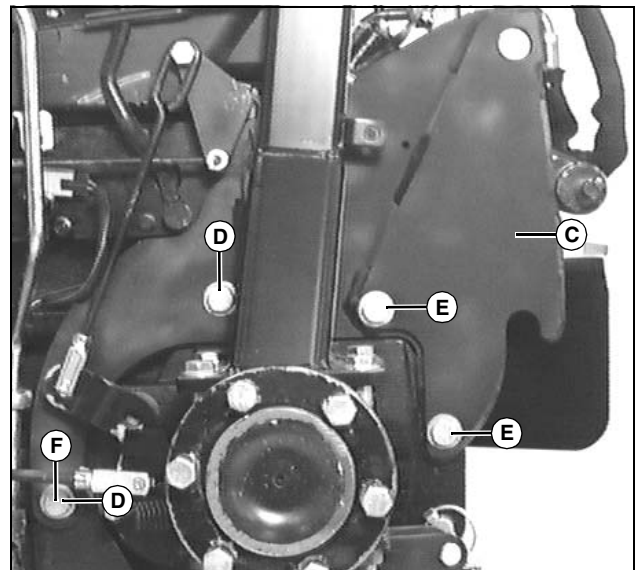
4. Mount rear wheels in widest tread width position.

NOTE: If removing rear wheels to change tread width, leave wheels off tractor until RSA mounting plates are installed.

5. Install rockshaft assist (RSA) mounting plates.
6. Inflate tires to maximum pressure recommended by tire manufacturer.
7. Install Tall Folding Roll Over Protection System (ROPS).
8. Install Front Loader.
9. Install Power Beyond kit.
10. Follow machine operator's manual instructions to check hydraulic fluid level.

3. Remove axle flange bolts:

- a. Using a 35mm (1-3/8 in.) or larger hole saw, cut a hole (A) through rear fenders in front of ROPS to reach bolt.
- b. Remove four bolts (B) from axle flanges on both sides.



Picture Note: Fender removed in photo.

4. Install RSA mounting plates (C) from rear of tractor. Avoid pinching electrical wires.

PREPARING TRACTOR FOR MODELS 47, 48

IMPORTANT: Avoid damage! Always use hardened washers included with the kit. If standard washers are substituted, the cap screw heads will dig into the washer faces and loosen as backhoe is used.

Do not overtighten cap screws. Damage to the transaxle case will result.

NOTE: For tractors with hydrostatic transmission, install two additional 5/8 in. hardened washers behind the RSA mounting plates on the forward M16x130 bolt (F).

5. Install two M16x130 bolts (D) and washers, and two M16x140 bolts (E) and washers on both plates. Tighten to 258 N•m (190 lb-ft).

6. Install fender if removed.

7. Mount rear wheels in widest tread width position. See your machine operator's manual or technical manual for wheel bolt torque.

Install Rockshaft Assist (RSA) Mounting Plates (Tractor Models 4500-4600, 4510-4710)

All Tractors

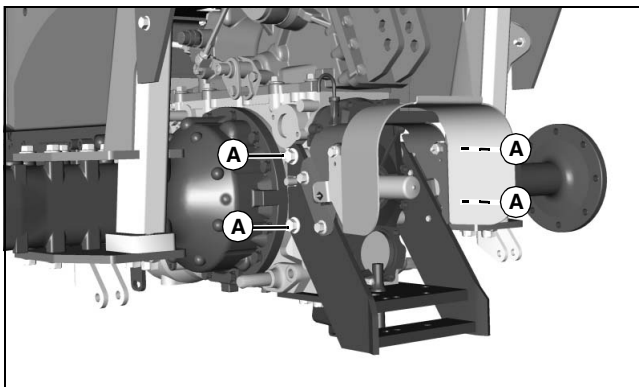
NOTE: Removing rear wheels and fenders is not required but makes installation easier.



CAUTION: Avoid injury! Support machine securely on stands before removing a wheel.

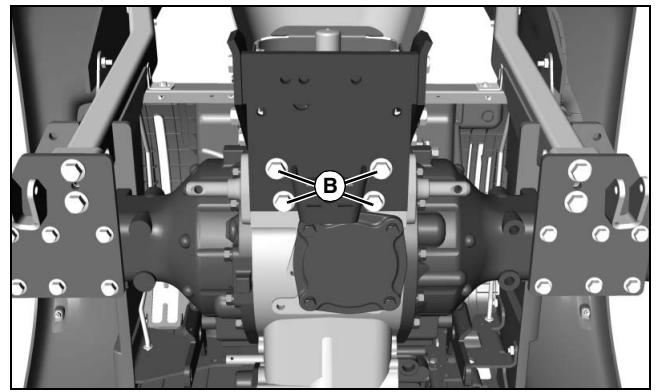
1. Raise rear of tractor and support rear axles with jack stands.

2. Remove rear wheels.



MX17612

3. Remove four cap screws (A) and washers in sides of drawbar hitch support.

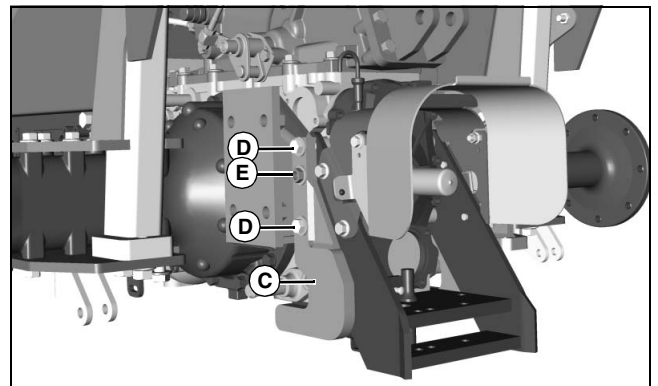


MX17613

4. Remove four cap screws (B) and lock washers from bottom of drawbar hitch support.

IMPORTANT: Avoid damage! Always use hardened washers included with the kit. If standard washers are substituted, the cap screw heads will dig into the washer faces and loosen as backhoe is used.

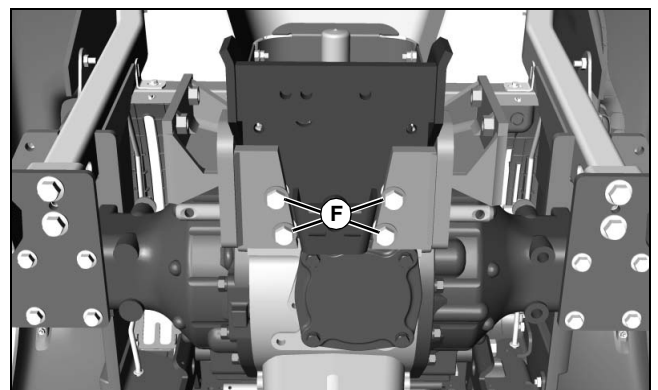
Do not overtighten cap screws. Damage to the transaxle case will result.



MX17614

5. Loosely install both hook weldments (C) on drawbar hitch support with four M12x55 cap screws (D), and four 1/2 in. washers.

6. Loosely install two M12 nuts (E), and two 1/2 in. washers on tractor studs.

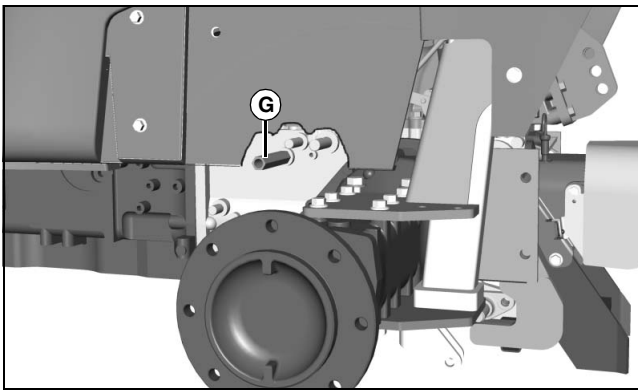


MX17615

7. Install four new M14x45 cap screws (F) and 9/16 in. washers in hook weldments. Tighten to 40 N•m (30 lb-ft).

8. Tighten M12x55 cap screws (D) and M12 nuts (E) to 40 N•m (30 lb-ft).

PREPARING TRACTOR FOR MODELS 47, 48

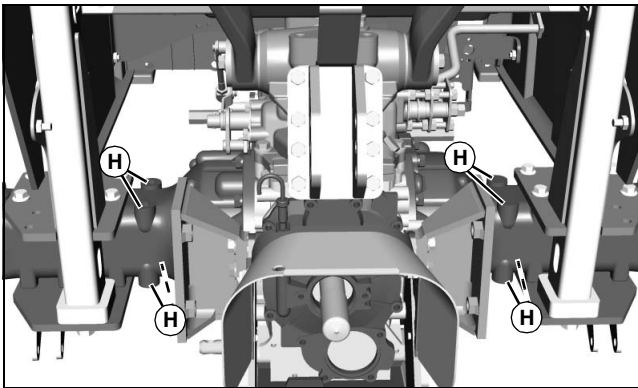


MX17616

9. Install hex spacer (G) on 16mm stud on both sides of transaxle. Tighten to 163 N•m (120 lb-ft).



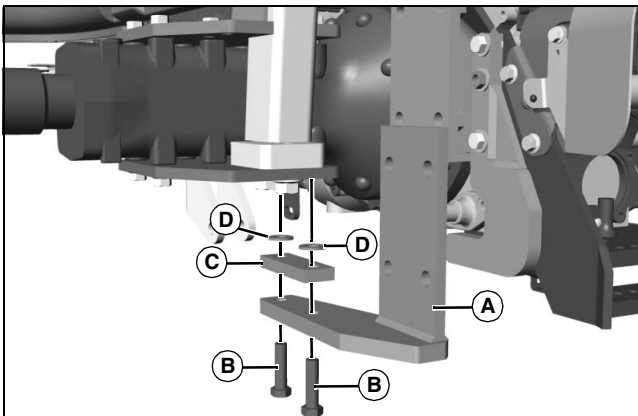
CAUTION: Avoid injury! To obtain proper hardware clamping forces, the 16mm tapered threads in the tractor rear axle must be cleaned to remove paint and debris. The cap screws must turn in freely by hand.



MX17617

10. Use a M16x2 tap to clean the M16 tapped holes (H) in both top and bottom of the rear axles on both sides of tractor.

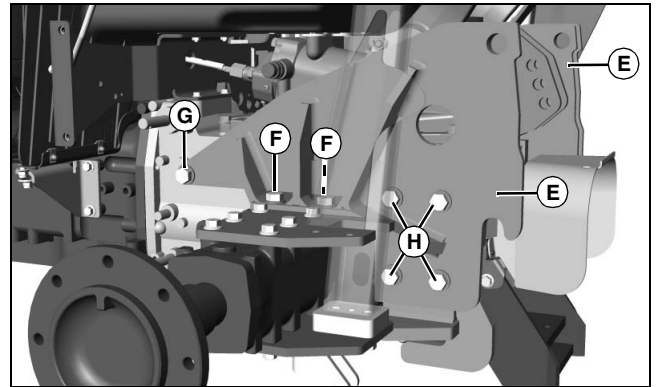
Tractors Without Mid-Mount Lift Assemblies Installed



MX17618

1. Install both mount weldments (A) in bottom of rear axle with two M16x60 cap screws (B), spacers (C), and 5/8 in. washers (D). Tighten to 40 N•m (30 lb-ft).

NOTE: LH side RSA mounting plate has a large hole to permit access to the transaxle oil filter tube.

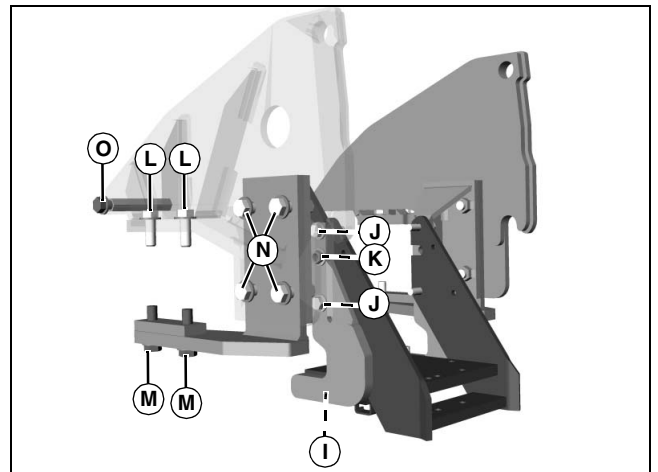


MX17760

Picture Note: Rear fenders removed in picture.

2. Install RSA mounting plates (E) onto mount weldments from rear of tractor. Avoid pinching electrical wires. Loosely install two M16x45 cap screws (F) and 5/8 in. washers in both mount weldments.
3. Loosely install one M16x45 cap screw (G) and 5/8 in. washer in both RSA mounting plates and hex spacers.
4. Loosely install four M16x60 cap screws (H) and washers in both RSA mounting plates.

IMPORTANT: Avoid damage! Proper tightening sequence is critical in achieving maximum clamping forces. Do not overtighten the cap screws. Damage to the transaxle case will result.



MX17763

5. Tighten hardware on both sides in the following order:

- a. Tighten the four M14x45 cap screws (I) in bottoms of hook weldments to 215 N•m (158 lb-ft).
- b. Tighten the four M12x55 cap screws (J) and two M12 hex nuts (K) to 95 N•m (70 lb-ft).
- c. Tighten the four M16x45 cap screws (L) installed on the top of the rear axle to 258 N•m (190 lb-ft).
- d. Tighten the four M16x60 cap screws (M) installed on the bottom of the rear axle to 258 N•m (190 lb-ft).
- e. Tighten the eight M16x60 cap screws (N) installed in the RSA mounting plates to 217 N•m (160 lb-ft).

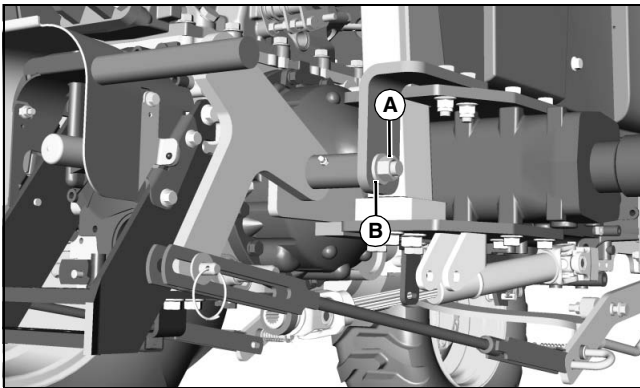
PREPARING TRACTOR FOR MODELS 47, 48

f. Tighten the two M16x45 cap screws (O) installed in the threaded hex spacers to 163 N•m (120 lb-ft).

6. Install fenders if removed.
7. Mount rear wheels in widest tread width position. See your machine operator's manual or technical manual for wheel bolt torque.
8. Inflate tires to maximum pressure recommended by tire manufacturer.
9. Install Tall Folding Roll Over Protection System (ROPS).
10. Install Front Loader.
11. Install Power Beyond kit.
12. Follow machine operator's manual instructions to check hydraulic fluid level.

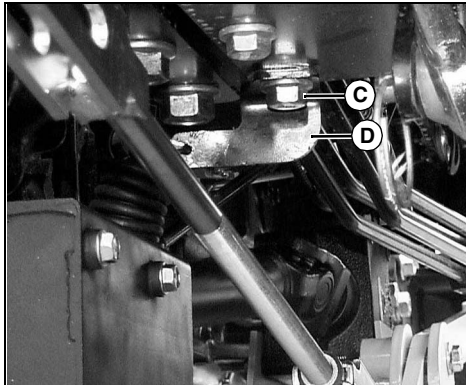
Tractors With Mid-Mount Lift Assemblies Installed

1. Support the mower deck if installed.
2. Remove the mower deck pivot plates:



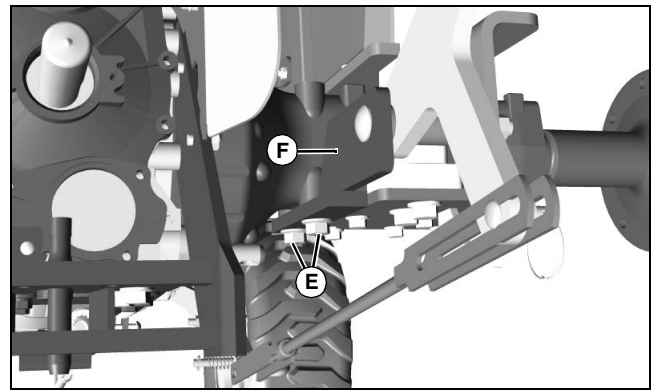
MX17764

a. Remove and retain nut (A) and washer (B) from carriage bolt securing pivot plate to lift arm on both sides of tractor.



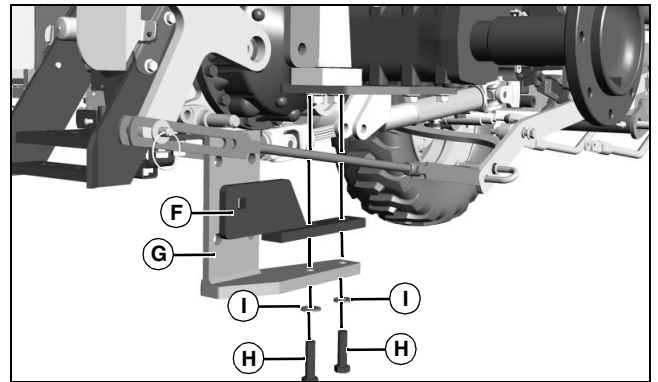
M93905

b. Tractor RH side only: Loosen ROPS bolt (C) and move spring bracket (D) out of the way.



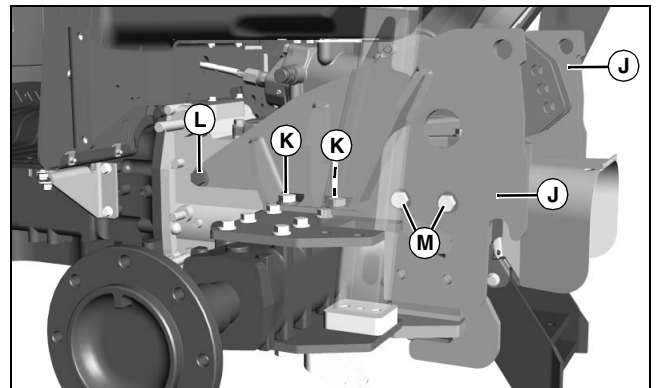
MX17766

c. Remove M16x40 cap screws (E) and pivot plate (F) [including carriage bolt, washer, and spacer] from both sides of tractor. Retain cap screws for use with mower deck if RSA mounting plates are removed.



MX17767

3. Install both mount weldments (G) and pivot plates (F) in bottom of rear axle with two M16x60 cap screws (H), and 5/8 in. washers (I). Tighten to 40 N•m (30 lb-ft).



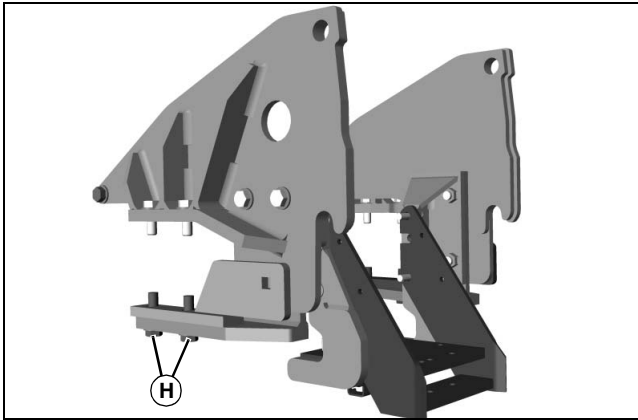
MX17768

4. Install RSA mounting plates (J) onto mount weldments from rear of tractor. Avoid pinching electrical wires. Loosely install two M16x45 cap screws (K) and 5/8 in. washers in both RSA mounting plates.

5. Loosely install M16x45 cap screw (L) and 5/8 in. washer in RSA mounting plate and hex spacer on both sides of tractor.

6. Loosely install two M16x60 cap screws (M) and washers in top two holes in both RSA mounting plates.

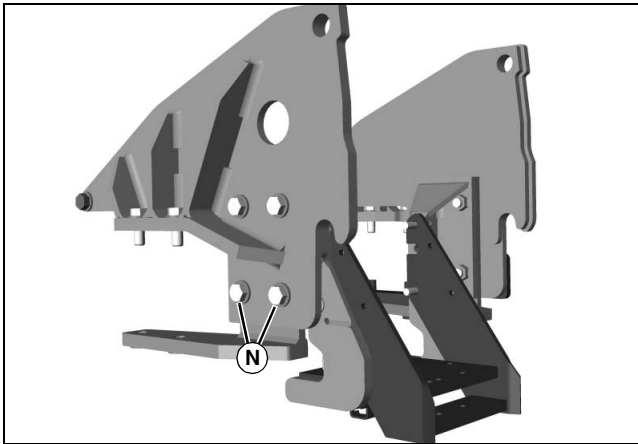
PREPARING TRACTOR FOR MODELS 47, 48



MX17761

7. Remove two M16x60 cap screws (H) and washers securing mount weldments and pivot plates to bottom of left and right rear axle. Retain hardware for installation later.

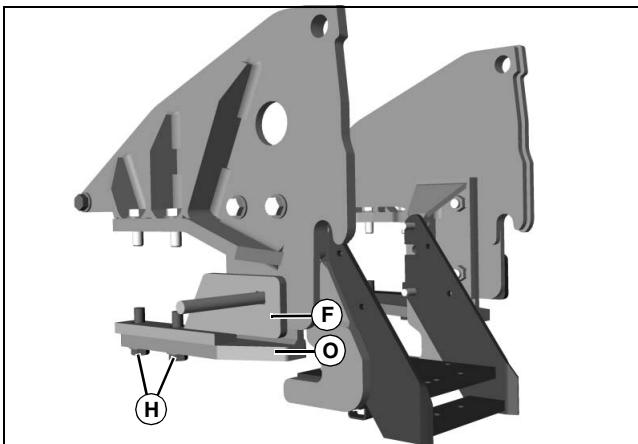
8. Remove and retain each pivot plate using a hammer and a punch.



MX17771

9. Install two M16x60 cap screws (N) and 5/8 in. washers in bottom two holes in both RSA mounting plates. Tighten to 217 N•m (160 lb-ft).

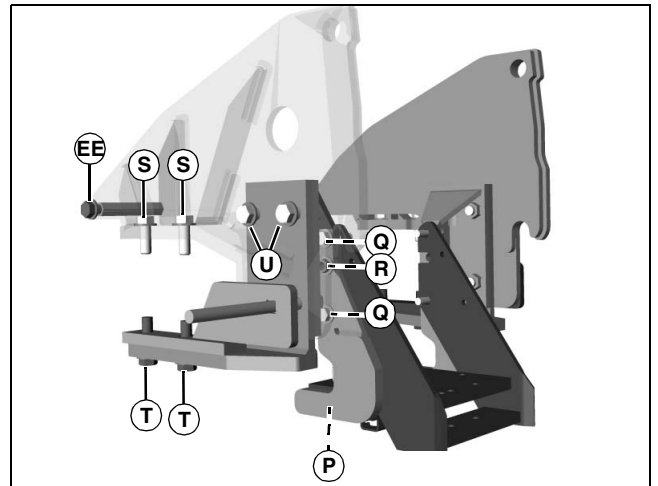
10. Install original M16x155 carriage bolt in square hole of pivot plate.



MX15459

11. Install pivot plate (F) between mount weldment (O) and bottom of tractor rear axle. Loosely install two M16x60 cap screws (H) and 5/8 in. washers removed earlier.

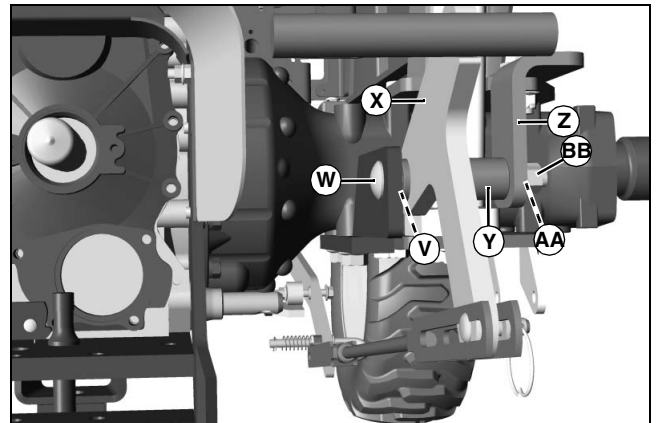
IMPORTANT: Avoid damage! Proper tightening sequence is critical in achieving maximum clamping forces. Do not overtighten the cap screws. Damage to the transaxle case will result.



MX17772

12. Tighten hardware:

- Tighten the four M14x45 cap screws (P) in bottoms of hook weldments to 215 N•m (158 lb-ft).
- Tighten the four M12x55 cap screws (Q) and two M12 hex nuts (R) to 95 N•m (70 lb-ft).
- Tighten the four M16x45 cap screws (S) installed on the top of the rear axle to 258 N•m (190 lb-ft).
- Tighten the four M16x60 cap screws (T) installed on the bottom of the rear axle to 258 N•m (190 lb-ft).
- Tighten the top four M16x60 cap screws (U) installed in the RSA mounting plates to 217 N•m (160 lb-ft).

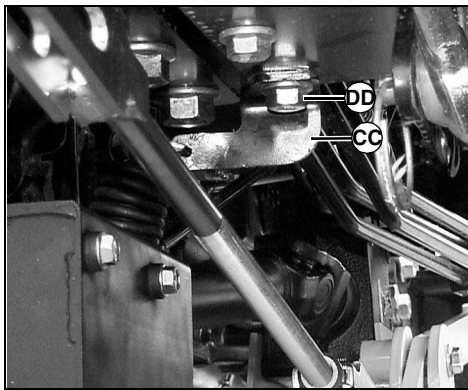


MX17774

13. Install mower deck pivot plates on lift arms with original hardware:

- Install one washer (V) on the M16x155 carriage bolt (W).
- Insert carriage bolt through lift arm (X) and add bushing (Y).
- Insert carriage bolt through plate (Z) and secure with washer (AA) and M16 nut (BB).

INSTALLING BACKHOE (MODEL 46)



M93905

14. Tractor RH side only: Move spring bracket (CC) back to its original position and tighten ROPS bolt (DD) to 138 N•m (102 lb-ft).
15. Tighten the two M16x45 cap screws (EE) installed into the threaded hex spacers to 163 N•m (120 lb-ft).
16. Install fenders if removed.
17. Mount rear wheels in widest tread width position. See your machine operator's manual or technical manual for wheel bolt torque.
18. Inflate tires to maximum pressure recommended by tire manufacturer.
19. Install Tall Folding Roll Over Protection System (ROPS).
20. Install Front Loader.
21. Install Power Beyond kit.
22. Follow machine operator's manual instructions to check hydraulic fluid level.

Installing Backhoe (Model 46)

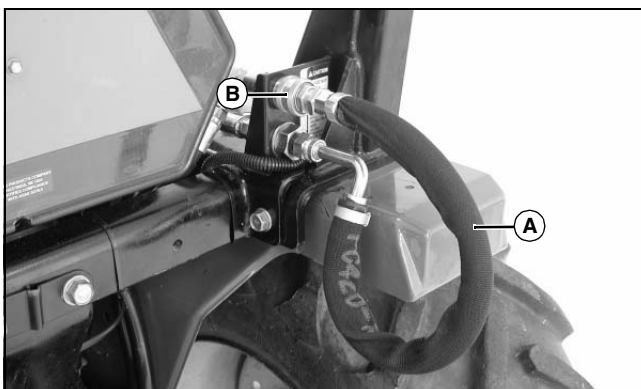
Attaching Backhoe To Tractor



CAUTION: Avoid injury! Operator must be seated in tractor seat when positioning tractor for backhoe installation.

NOTE: Front hanger end of subframe must be below level of front hanger on tractor before tractor is positioned.

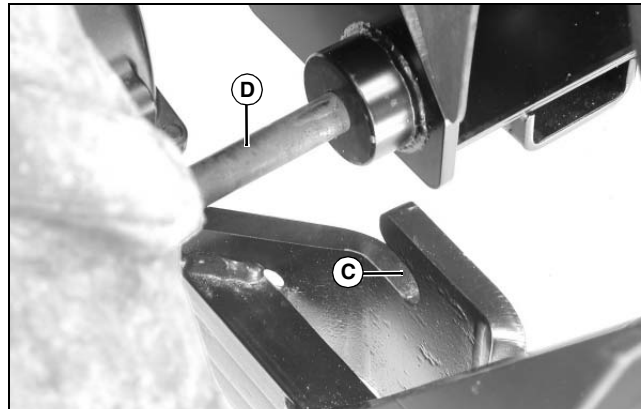
1. Back tractor into position over backhoe subframe.
2. Park tractor safely.



MX15444

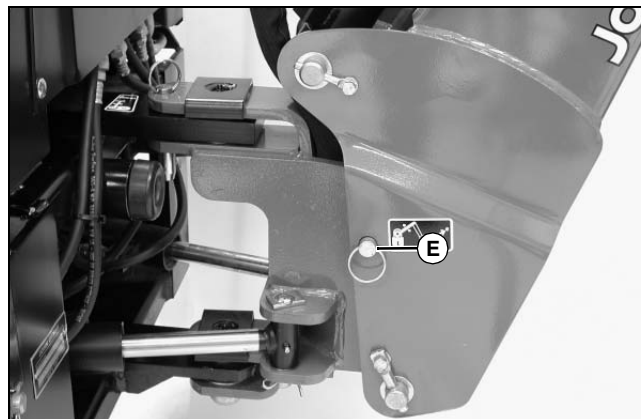
3. Connect backhoe hydraulic hoses:

- a. Disconnect Power Beyond hose (A) from female coupler (B) and connect to backhoe hose.
 - b. Connect backhoe hose with male coupler to female coupler (B).
4. Start engine and run at slow idle.



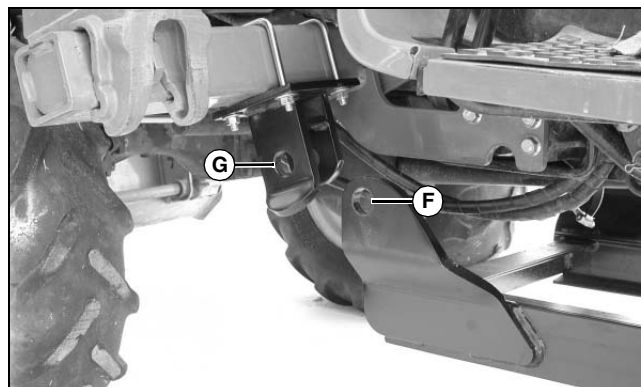
MX15445

5. Use stabilizer control levers to raise or lower stabilizers as needed to position hooks (C) on backhoe subframe in line with draft link pins (D) on tractor rear mounting support.
6. Back tractor until subframe hooks seat firmly into draft link pins.
7. Lock tractor park brake.



MX15447

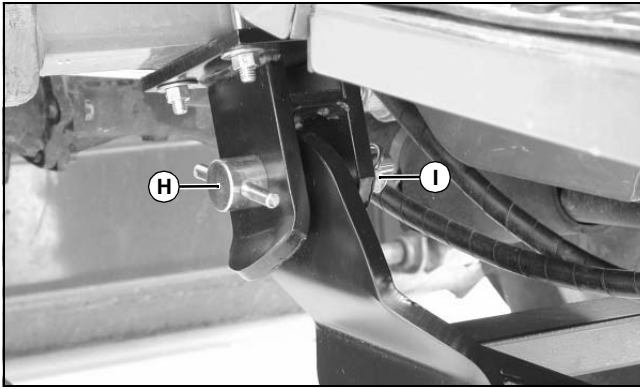
8. Remove backhoe boom lock pin (E).



MX15442

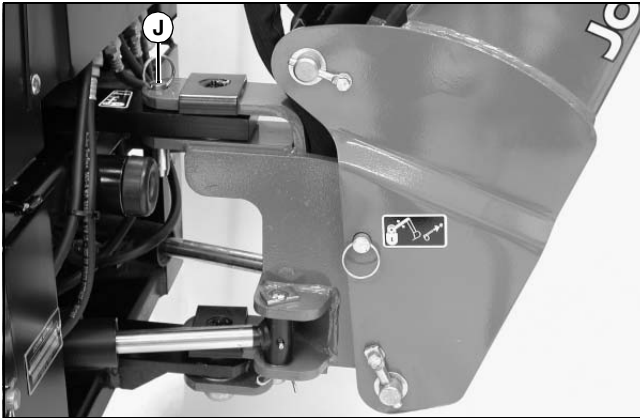
9. Use boom and stabilizer control levers to alternately raise the boom and stabilizers, pivoting the subframe on the draft link pins until the holes in the subframe front end (F) align with holes in front hanger (G).

INSTALLING BACKHOE (MODEL 47, 48)



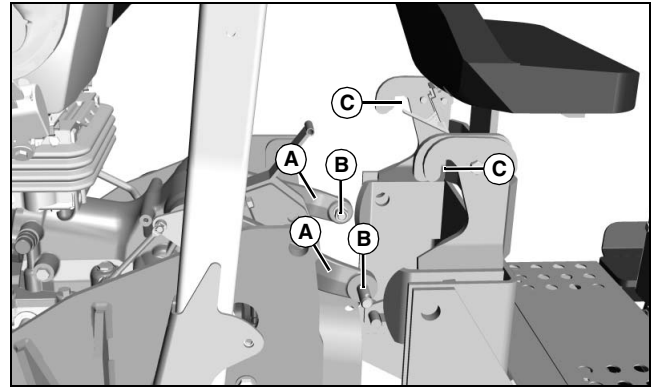
MX15446

10. Install step pins (H) in front hanger and secure with locking pins (I).
11. Check to be sure hydraulic hoses are routed away from pinch points.



MX15447

12. Remove backhoe swing lock pin (J).
13. From the operator's seat, bleed the system by doing the following:
 - a. Raise and lower stabilizers.
 - b. Raise and lower boom.
 - c. Extend and retract dipperstick.
 - d. Curl and dump bucket.
 - e. Swing boom from side to side.
14. Install swing lock pin and boom lock pin.
15. Park tractor safely.

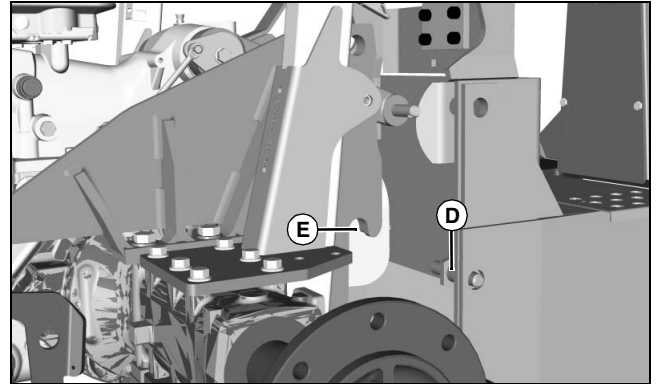


MX17776

Picture Note: Tires and fenders removed.

2. Fully lower tractor rockshaft arms (A). Align rockshaft pins (B) with hooks (C) on backhoe, and back tractor into position.
3. Check to be sure backhoe hydraulic hoses are clear of backhoe hooks and hardware.

IMPORTANT: Avoid damage! During this setup procedure the operator may note the hydraulic system is going over relief when the backhoe is lifted all the way up. To prevent excessive heat buildup in the hydraulic system and/or hydraulic pump damage, the operator should not allow the hydraulic system to go over relief for more than 10 seconds at a time. When checking for proper L-pin clearance, the operator can lift the backhoe until the hydraulics hit relief pressure, then stop the tractor engine. This will prevent damage to the tractor hydraulics and allow more time for checking for proper backhoe mounting.



MX17782

Picture Note: Tires and fenders removed.

4. Slowly lift rockshaft arms, making sure pins engage into hooks on backhoe. Check to be sure both lower pins (D) on backhoe engage both hooks (E) on tractor RSA mounting plates.

Installing Backhoe (Model 47, 48)

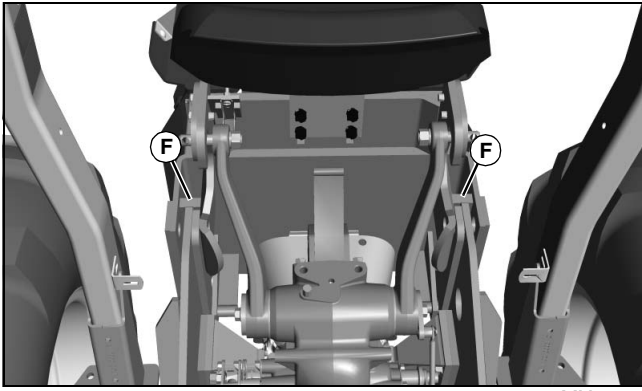
Attaching Backhoe To Tractor



CAUTION: Avoid injury! Operator must be seated in tractor seat when positioning tractor for backhoe installation.

1. Review instructions on using rockshaft control lever included in your tractor operator's manual.

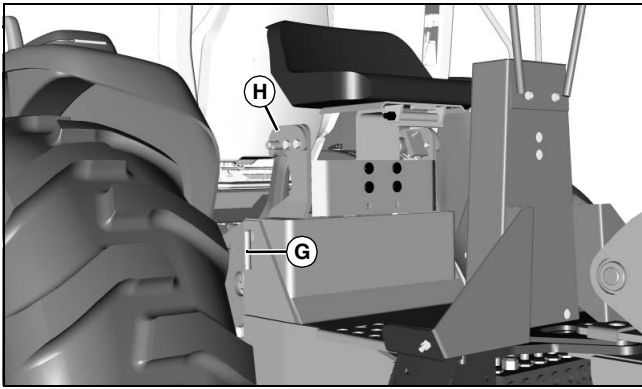
INSTALLING BACKHOE (MODEL 47, 48)



MX17777

Picture Note: Tractor seat removed.

5. Fully raise rockshaft arms so stop (F) is against edge of RSA mounting plates.



MX17783

6. Install L-pins (G) in backhoe and RSA mounting plates. If backhoe and RSA mounting plates do not align, and L-pins do not slide in and out easily, lower backhoe to ground and adjust movable latch plates (H).

IMPORTANT: Avoid damage! In some cases the rockshaft may not lift the backhoe high enough to install the L-pins. If this occurs, the linkage which connects the rockshaft to the rockshaft control valve needs to be adjusted. See your John Deere dealer for rockshaft position adjustment.

7. Install hitch pins in L-pins.

8. Park tractor safely.

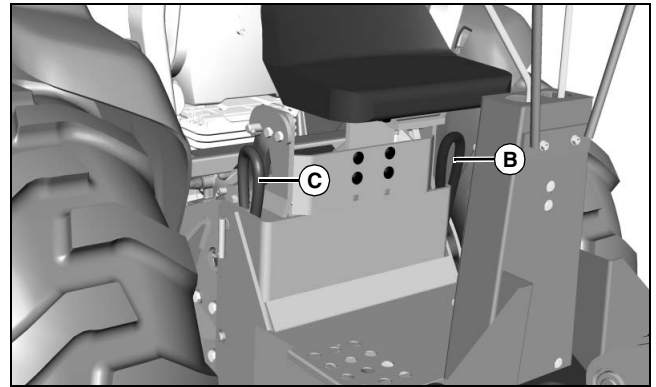
9. Lower the rockshaft to transfer weight of backhoe from rockshaft arms to L-pins.

Routing Hydraulic Hoses (Model 48)



M64118

1. Position drain pan and remove male coupler (A) from 90° elbow on backhoe pressure hose.

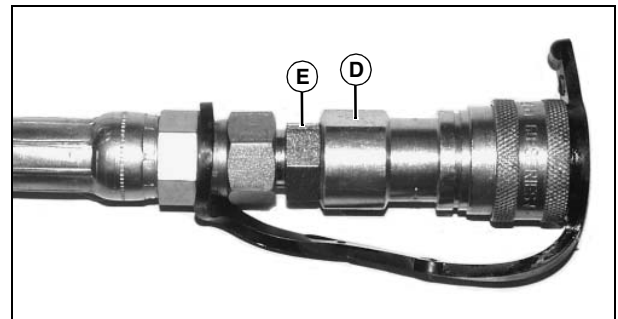


MX17778

2. Route backhoe pressure hose (B) up through backhoe left side.

3. Install male coupler back on 90° elbow.

4. Route backhoe return hose (C) up through backhoe right side. It may be necessary to remove the female coupler to allow the hose to fit.



M64119

5. Install 90° elbow (tractor models 4500-4710 only):

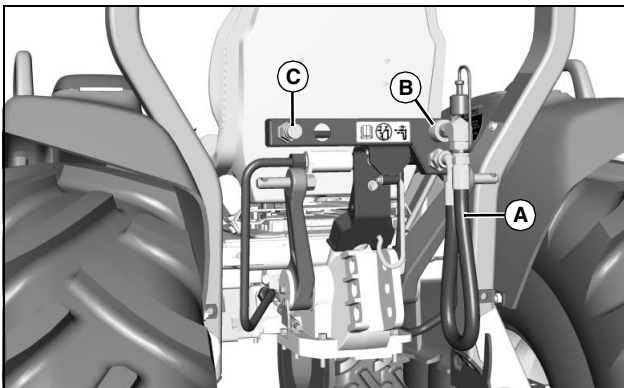
- a. Remove female coupler (D) from straight fitting (E) on backhoe return hose.
- b. Remove straight fitting (E) from hose.
- c. Install 90° elbow included in kit on return hose in place of straight fitting.
- d. Install female quick coupler onto 90° elbow.

REMOVING AND STORING BACKHOE

Connecting Hydraulic Hoses

1. Park tractor safely with L-pins installed in backhoe.
2. Cycle the rockshaft control lever to relieve all pressure on rockshaft.

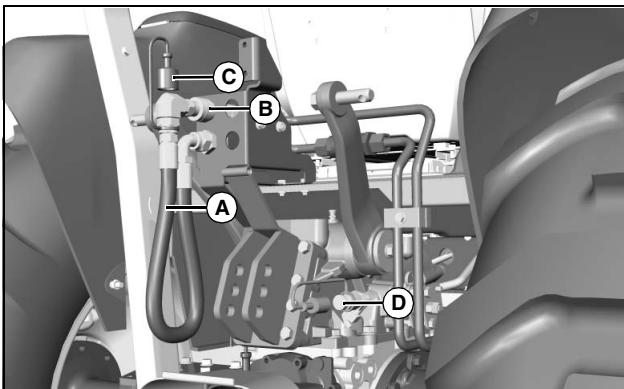
Model 47 and 48 on 4200-4410 Tractor



MX17786

1. Disconnect Power Beyond hose (A) from female coupler (B). Install dust cap on hose, and lay hose aside on backhoe frame.
2. Connect backhoe pressure hose with male coupler to female coupler (B).
3. Connect backhoe return hose with female coupler to fitting (C).

Model 48 on 4500-4710 Tractor



MX17785

1. Disconnect Power Beyond hose (A) from female coupler (B). Install dust cap (C) on hose, and lay hose aside on backhoe frame.
2. Connect backhoe pressure hose with male coupler to female coupler (B).
3. Connect backhoe return hose with female coupler to fitting (D).

Removing and Storing Backhoe

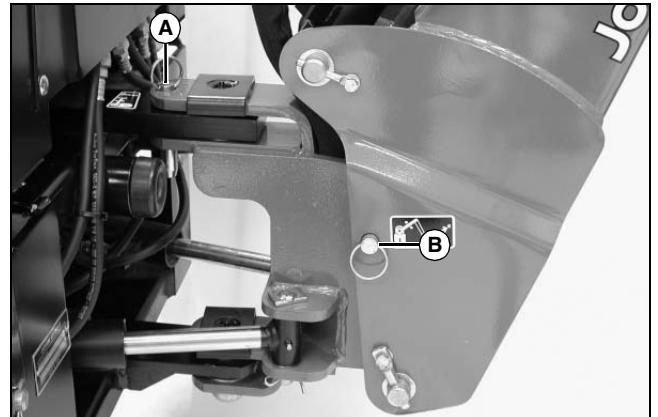
Removing Backhoe (Model 46)



CAUTION: Avoid injury! Keep people away from tractor while removing backhoe. Run engine just above slow idle to keep tractor movements slow and controllable.

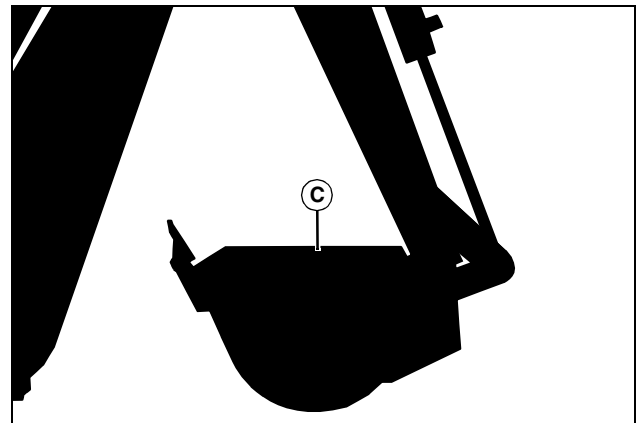
1. Park tractor safely.
2. Start engine and run at slow idle.

3. Lower stabilizers to the ground.

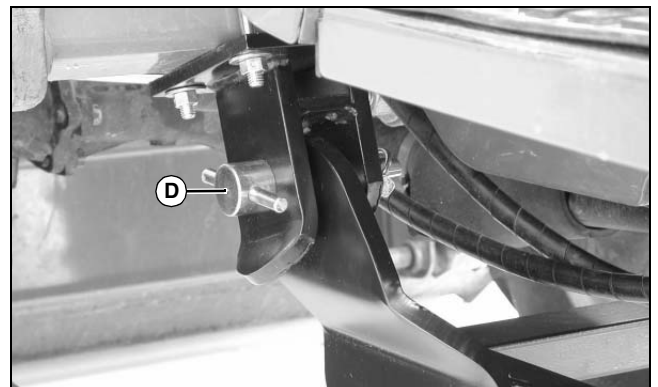


MX15447

4. Center boom and install swing lock pin (A) if not installed.
5. Remove boom locking pin (B) if installed.
6. Extend dipperstick and lower boom.



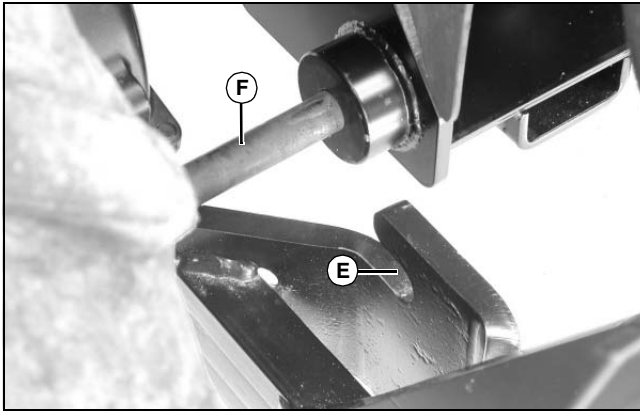
7. Rotate bucket until top edge (C) is parallel with ground.
8. Stop engine.



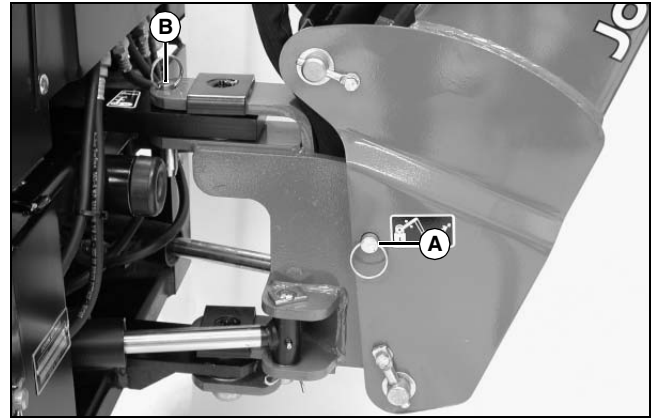
MX15446

9. Remove step pins (D) from both front hangers.
10. Start engine and run at slow idle.
11. Lower boom and stabilizers alternately, pivoting subframe on rear hanger, to lower front hanger end of subframe to ground.
12. Lower boom or stabilizers slightly to free rear mounting support of subframe weight.

REMOVING AND STORING BACKHOE



MX15445



MX15447

Picture Note: Model 46 shown.

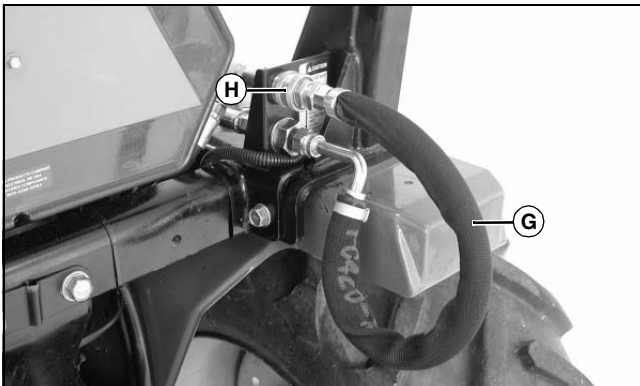
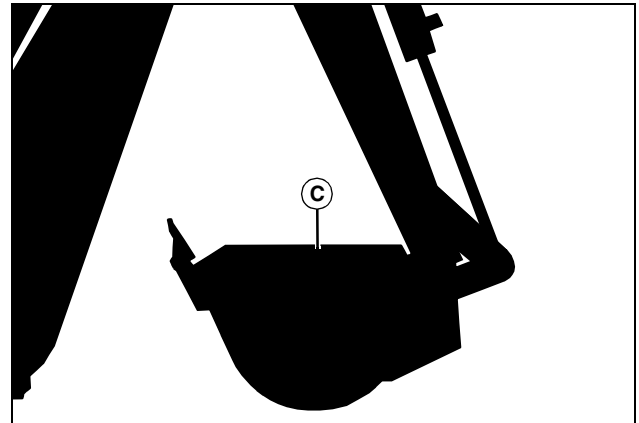
13. Drive tractor ahead slowly until both subframe hooks (E) clear mounting support draft link pins (F).
14. Lower backhoe until main frame is resting on ground.
15. Park tractor safely.
16. Cycle boom control lever to relieve backhoe system pressure.
17. Disconnect hydraulic hoses:

2. Raise boom to highest position and install boom locking pin (A).
3. Center boom and install swing lock pin (B).
4. Retract dipperstick to full back position.



CAUTION: Avoid injury! Before removing hydraulic hoses, be sure swing lock pin has been installed. Cycle boom control lever to relieve backhoe system pressure before attempting to remove quick disconnect couplers.

- a. Disconnect backhoe hoses from tractor Power Beyond.
- b. Connect hoses together and store hoses out of way on backhoe.



MX15444

- c. Connect Power Beyond hose (G) to female coupler (H).

5. Rotate bucket until top edge (C) is parallel with ground.
6. Fully raise both stabilizers.
7. Stop engine.
8. Cycle boom control lever to relieve backhoe system pressure and allow boom to come to rest on boom lock pin.
9. Remove hitch pins from L-pins. Do not remove L-pins.
10. Flip up backhoe seat.

Preparing Backhoe for Removal (Models 47,48)



CAUTION: Avoid injury! Keep people away from tractor while removing backhoe. Run engine just above slow idle to keep tractor movements slow and controllable.

1. Park tractor safely.

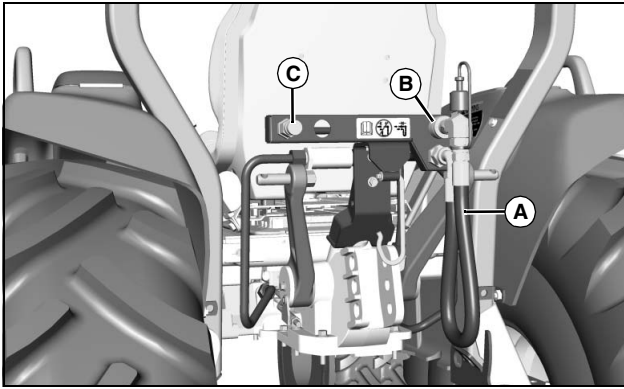


CAUTION: Avoid injury! Before removing hydraulic hoses, be sure boom lock pin and swing lock pin have been installed. Cycle boom control lever to relieve backhoe system pressure before attempting to remove quick disconnect couplers.

4200-4410 Tractors

1. Disconnect backhoe hoses from tractor Power Beyond.
2. Install dust caps on hoses and store hoses out of way on backhoe.

REMOVING AND STORING BACKHOE

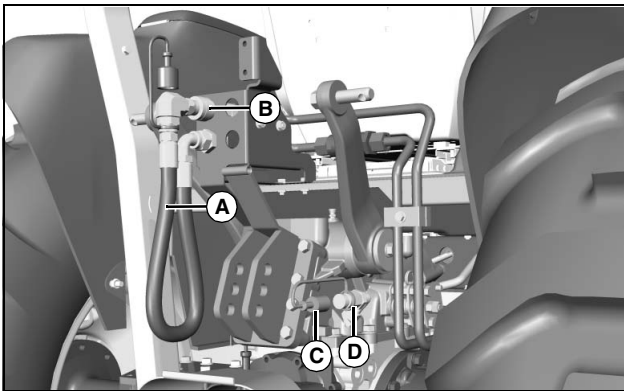


MX17786

3. Connect Power Beyond hose (A) to female coupler (B). Install dust cap on fitting (C).

4500-4710 Tractor

1. Disconnect backhoe hoses from tractor Power Beyond.
2. Install dust caps on hoses and store hoses out of way on backhoe.

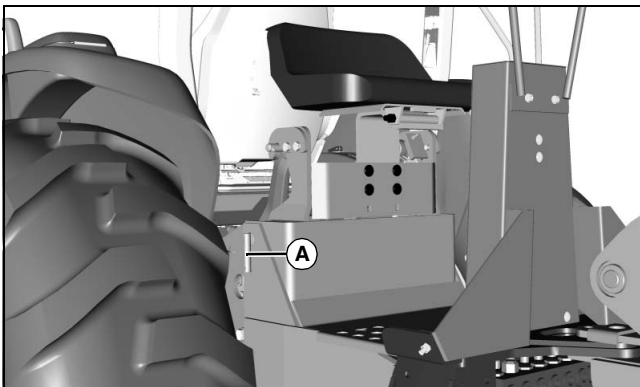


MX17785

3. Connect Power Beyond hose (A) to female coupler (B). Install dust cap (C) on fitting (D).

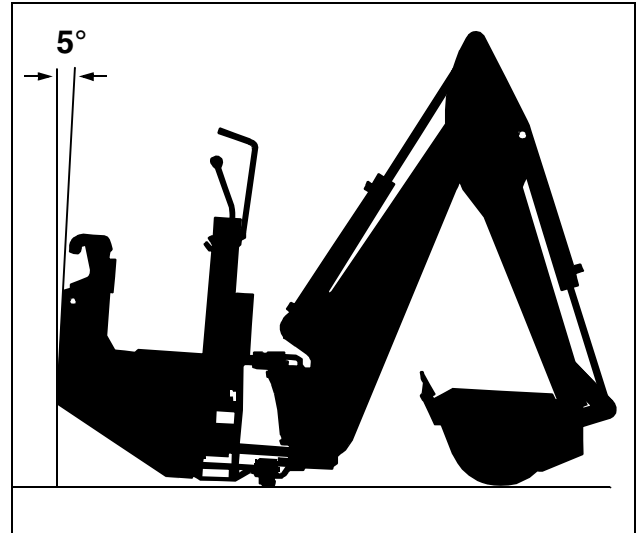
Removing Backhoe (Models 47, 48)

1. Start engine and run at slow idle.
2. Pull rockshaft position control lever rearward to lift rockshaft arms.



MX17783

3. Pull L-pins (A) from backhoe.
4. Push rockshaft position control lever forward to lower backhoe to ground.

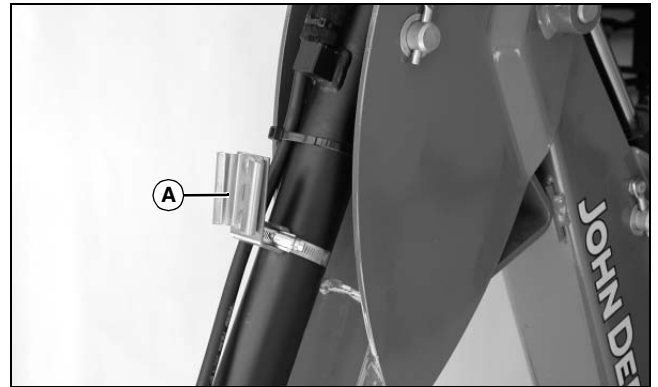


5. To aid installation, position backhoe on ground as shown, leaning away from tractor about 5°, and resting on bucket and boom pivot pin.

6. Be sure hoses are clear of pinch points.

7. Slowly move tractor forward and back until rock shaft pins clear hooks on backhoe.

Removing Slow Moving Vehicle (SMV) Sign



MX15437

Picture Note: Model 46 shown.

1. Remove SMV sign from the backhoe bucket cylinder bracket (A).
 - Model 46: Retain sign for later installation on backhoe.
 - Model 47, 48: Install sign on tractor.

Storing

1. Position boards under bucket and backhoe frame to prevent corrosion.
2. Keep drain holes in bucket clear and positioned at bottom.
3. Store backhoe in clean, dry place.
4. Raise seat to vertical position.
5. Keep hydraulic hoses off ground and not kinked.
6. Connect hydraulic hoses together (46). Install dust covers on ends of hydraulic hoses (47, 48).
7. Clean backhoe with water pressure.
8. Paint worn or scratched areas.

OPERATING BACKHOE

- Lubricate all grease points.
- Keep boom lock pin and swing lock pin in locked position.
- Coat exposed cylinder rods and hooks on backhoe with thin film of grease.
- Put waterproof cover over backhoe if stored outside.

Operating Backhoe

Adjusting Operator's Seat

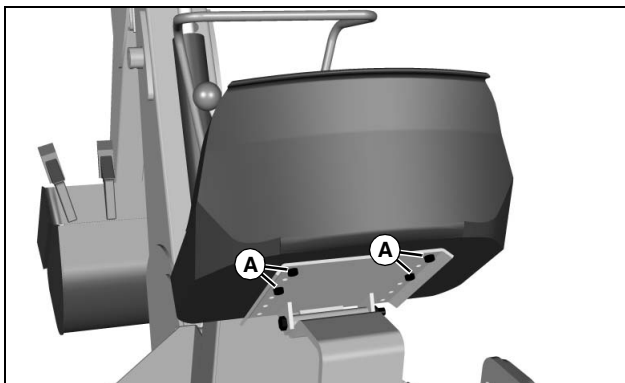
Move From Transport to Operating Position (Model 46)



MX15448

- Tilt seat forward so handle (A) clears cutout area (B).
- Tilt handle toward tractor and slide handle along groove as you tilt the seat back and down.

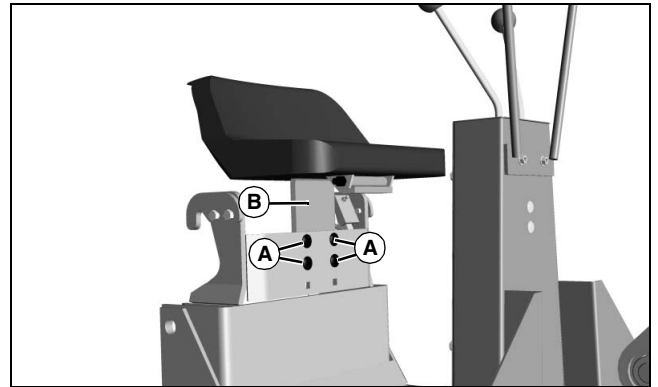
Front-to-Back Adjustment



MX17784

- Remove four cap screws (A) and lockwashers holding seat to plate.
- Install seat in one of four positions. Be sure operator can reach controls.
- Install lockwashers and cap screws.

Height Adjustment

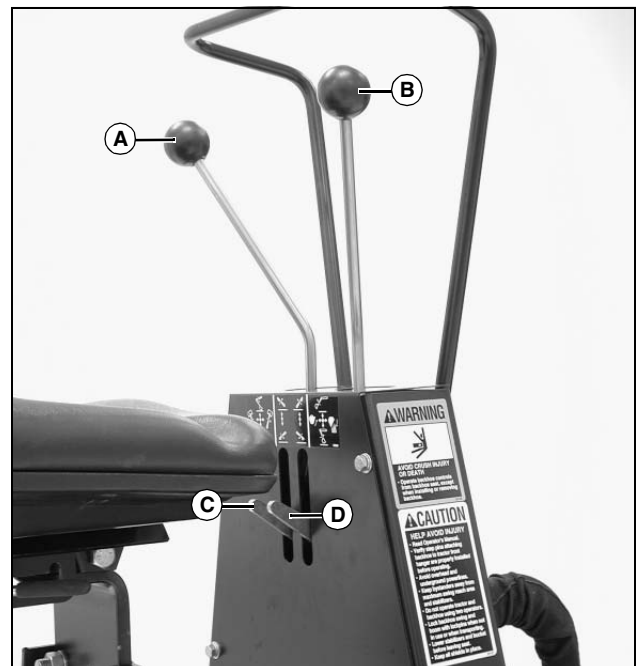


MX17780

- Remove four bolts (A).
- Raise or lower seat bracket (B).
- Install bolts, lockwashers and nuts.

Using Controls

CAUTION: Avoid injury! Do not use control levers to help you mount or dismount the backhoe. Always use hand rail. Do not operate controls while standing on the ground. Backhoe movements could strike and/or crush you against frame.



MX15449

Boom And Swing Control Lever (A):

- To raise boom: pull lever to rear.
- To lower boom: push lever forward.
- To swing boom to left: push lever to left.
- To swing boom to right: push lever to right.

OPERATING BACKHOE

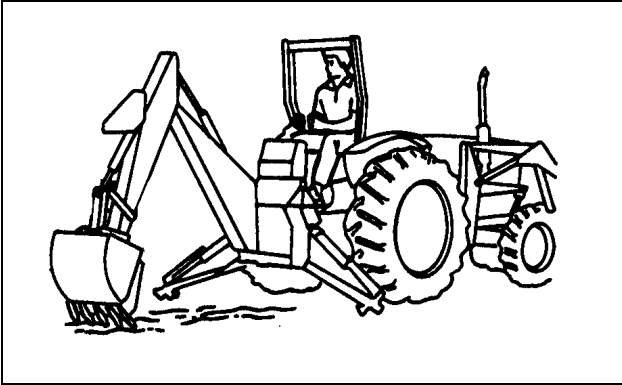
Dipperstick And Bucket Control Lever (B):

- To retract dipperstick: pull control lever to rear.
- To extend dipperstick: push control lever forward.
- To curl bucket in: push lever to left.
- To roll bucket out: push lever to right.

Stabilizers Control Levers; Left (C), and Right (D):

- To raise stabilizer: pull control lever up.
- To lower stabilizer: push control lever down.

Digging Safely



CAUTION: Avoid injury! To dig safely:

- Sit in backhoe seat.
- Lower stabilizers to ground.
- Keep loader bucket low or on ground.

Operating Tractor

IMPORTANT: Avoid damage! Always check tractor hydraulic fluid level before operating backhoe.

Operate tractor engine at the proper speed to reduce hydraulic system heat buildup in hot conditions.

- Operate engine at the following maximum speeds when using backhoe in hot conditions:

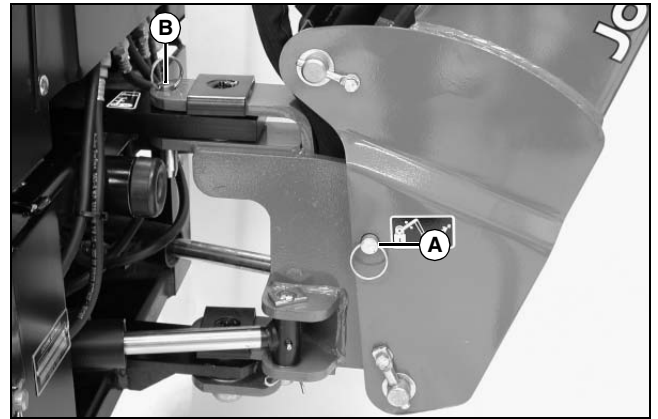
Gear Drive Tractor.....2400 rpm

Hydrostatic Drive Tractor.....2700 rpm

Faster engine speeds result in faster backhoe movement. When operating where precise movements of the backhoe are required, slow the engine to slow backhoe movement.

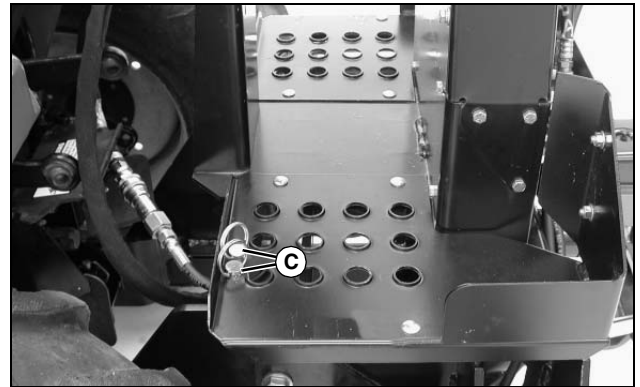
Digging forces and breakout forces are functions of hydraulic pressure only, and are the same at any digging rpm.

Removing Boom And Swing Lock Pins



Picture Note: Model 46 shown.

1. Remove boom lock pin (A).
2. Remove swing lock pin (B).



Picture Note: Model 46 shown.

3. Store pins in storage holes (C) on floor of operator's station while operating backhoe.

OPERATING BACKHOE

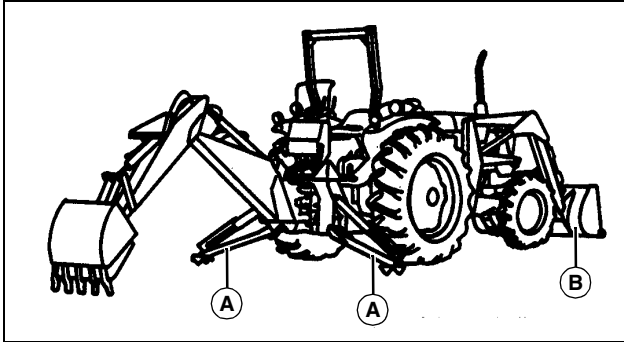
Digging Position



CAUTION: Avoid injury! Avoid serious injury or death: Check for buried electric cables or gas pipes before you dig.

IMPORTANT: Avoid damage! To help prevent damage to backhoe:

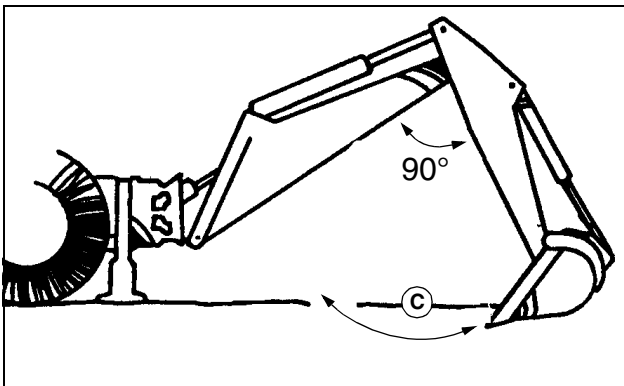
- Raise tractor only with stabilizers.
- Do not let backhoe bucket contact stabilizers.



TY1226a

1. Lower backhoe stabilizers (A), and loader bucket (B) to ground.
2. Set throttle to 1400–2400 rpm on gear tractor, 1400-2700 rpm hydrostatic tractor.

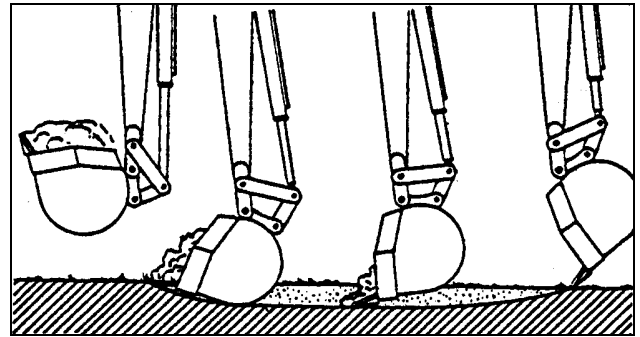
Digging Angle



TY10107

1. Put dipperstick at correct angle to boom for digging, approximately 90 degrees.
2. Put bucket teeth in-line with crowd angle (C).

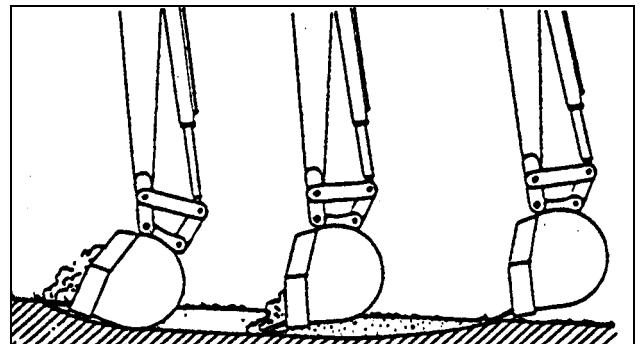
Bucket Digging



M61256

1. Lower bucket to ground.
2. Retract dipperstick and curl bucket until full.
3. Raise bucket, swing, and dump onto spoil pile.

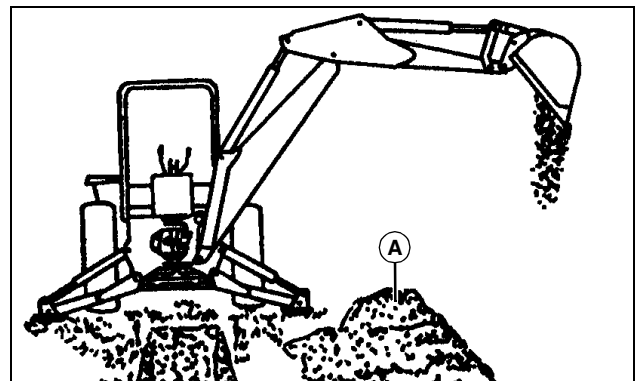
Dipperstick Digging



M61257

1. Lower bucket until teeth lie flat on ground.
2. Retract dipperstick until bucket is half full.
3. Retract dipperstick as you roll bucket back.
4. When bucket is full, raise, swing, and dump onto spoil pile.

Spoil Pile Location



TY10108

- Put spoil pile (A) where minimum effort is needed to back fill. Spoil pile should be a minimum of 0,6m (2 ft) from hole.

OPERATING BACKHOE

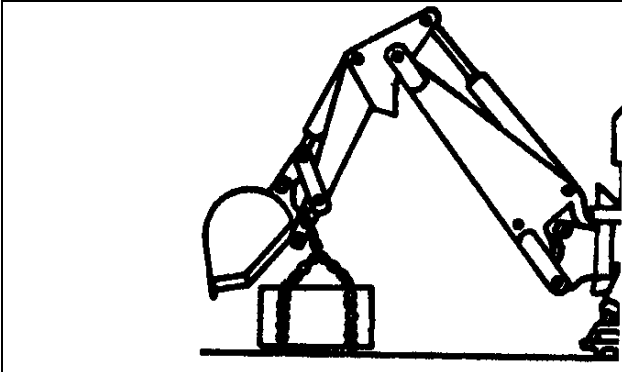
Lifting With Backhoe

IMPORTANT: Avoid damage! Do not use backhoe as towing vehicle. Damage to backhoe and tractor could occur.

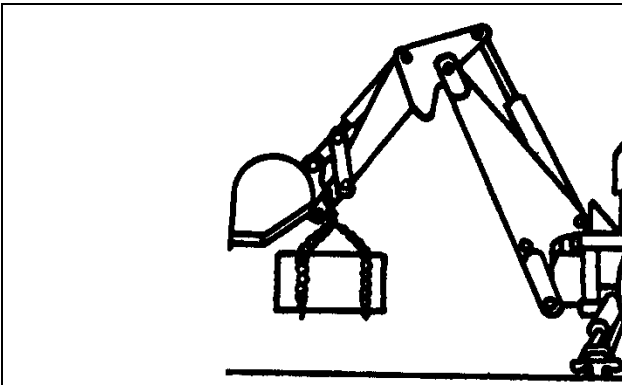
CAUTION: Avoid injury! Improper lifting may cause crushing, injury or death. To lift safely:

- Fasten chains to object and backhoe.
- Avoid jerking or swinging boom.
- Keep people away:
- Do not let anyone under object.

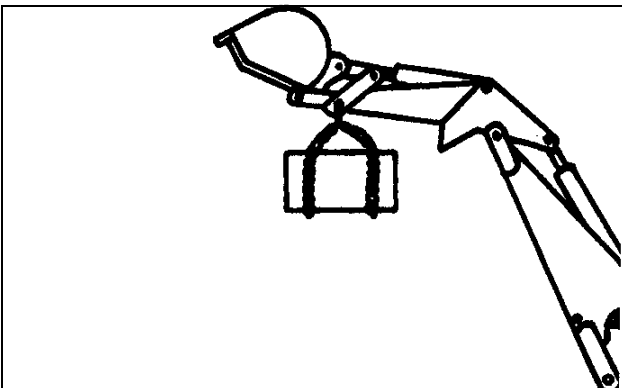
1. Extend boom and dipperstick until you can fasten chain to object.



TY10142



TY10143



TY10144

2. Fasten chain to dipperstick approximately 50 mm (2 in.) above bucket pin.

3. Fasten chain to object.

4. Raise boom to full height. Extend dipperstick cylinder if needed.

5. Retract dipperstick cylinder to lift load.

Transporting Backhoe

CAUTION: Avoid injury! To help prevent injury while transporting backhoe:

- Look for people or obstacles **BEFORE** you change directions.
- LOCK** backhoe in **TRANSPORT** position. See steps below.
- Keep as far to right as possible on roads.
- Go slow: Use safe travel speed.

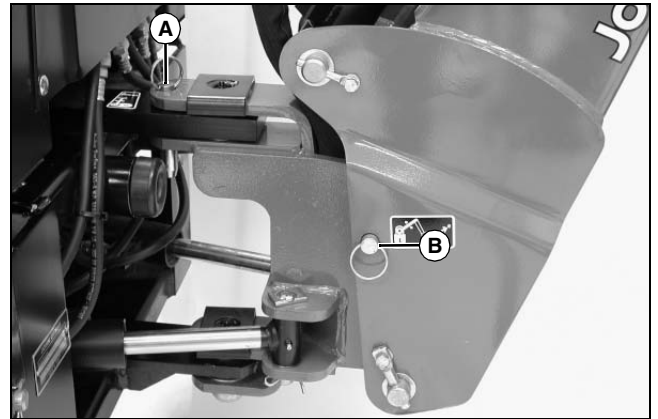
1. Fully raise and center the boom.

2. Fully retract the dipperstick.

3. Curl the bucket back into dipperstick.

4. Fully raise the stabilizers.

5. Park tractor safely.

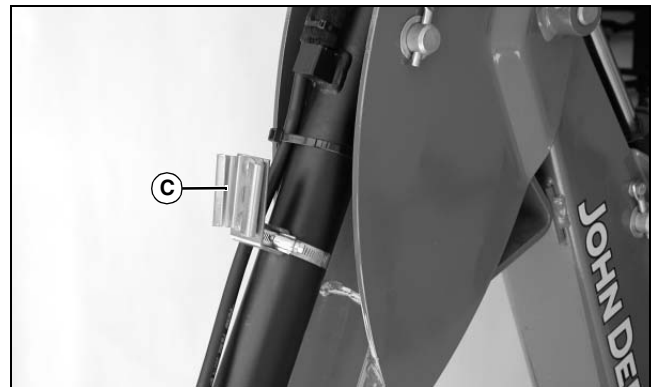


MX15447

Picture Note: Model 46 shown.

6. Install swing lock pin (A).

7. Install boom lock pin (B).



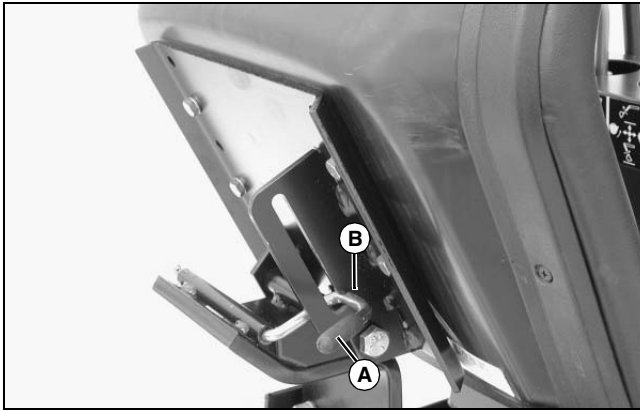
MX15437

Picture Note: Model 46 shown.

8. Install Slow Moving Vehicle (SMV) sign in bracket (C) on bucket cylinder.

9. Position backhoe seat:

SERVICE BACKHOE



MX15448

- Model 46: Pivot seat forward until handle (A) locks into cutout area (B).
- Model 47, 48: Pivot seat forward to vertical position.

Transporting Tractor With Backhoe

CAUTION: Avoid injury! Do not chain backhoe down in order to secure tractor to trailer.

NOTE: Backhoe bucket should be lowered to trailer bed if possible.

1. Put wheel chocks against tractor wheels. Chain tractor securely to trailer bed.
2. Do not attach hold-down chains to any part of the backhoe assembly. Lower the backhoe bucket to the trailer bed, if possible.

Service Backhoe

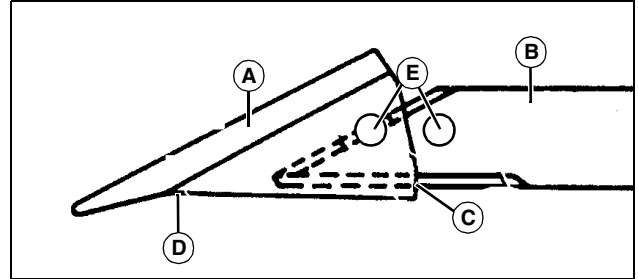
Service Intervals

After Assembly	Lubricate all pivot points and grease fittings.
After Each Use	Clean backhoe of all oil and debris.
As Needed	Replace bucket teeth.
Every 10 Hours	Lubricate all cylinders.
	Lubricate swing frame.
	Lubricate boom pivot and dipperstick pivot.
	Lubricate bucket pivot and linkage.
Every 50 Hours	Lubricate stabilizer pivots.
	Check hardware torque.
Every 100 Hours	Clean inside valve covers.

NOTE: If you use backhoe for more than 10 hours daily, lubricate all points listed above twice a day.

Replacing Bucket Teeth

CAUTION: Avoid injury! Bucket teeth are heavy. When you remove them, they may pinch fingers. Wear gloves and safety glasses when you remove teeth.



M41227

1. Remove tooth (A) from shank (B):
 - Drive chisel in at (C).
 - When tooth is loose, hit area (D) with hammer.
2. Clean the shank.
3. Install new tooth.
4. Peen area (E) on each side.

Cleaning Inside Valve Covers



MX15449

Picture Note: Model 46 shown.

1. Remove four bolts (A). Remove cover.
2. Clean with water pressure.
3. Install cover and bolts.

Lubrication

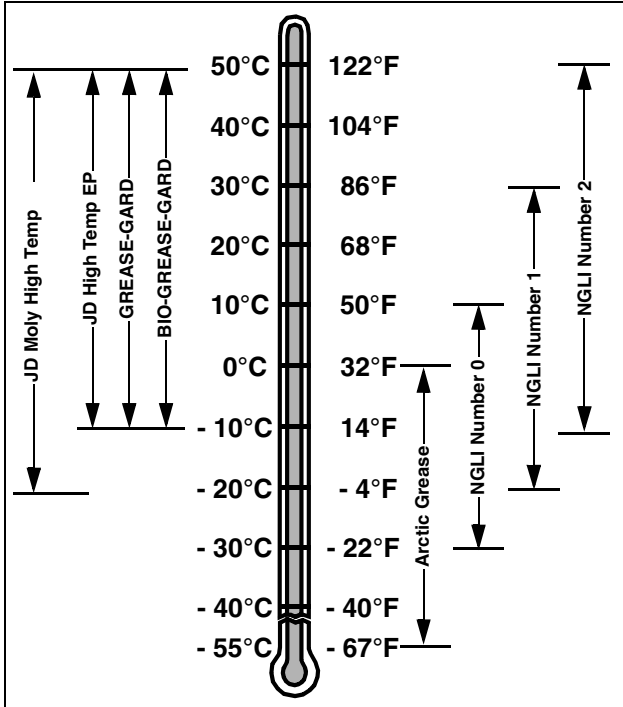
Grease

Use grease based on the expected air temperature range during the

SERVICE BACKHOE

service interval.

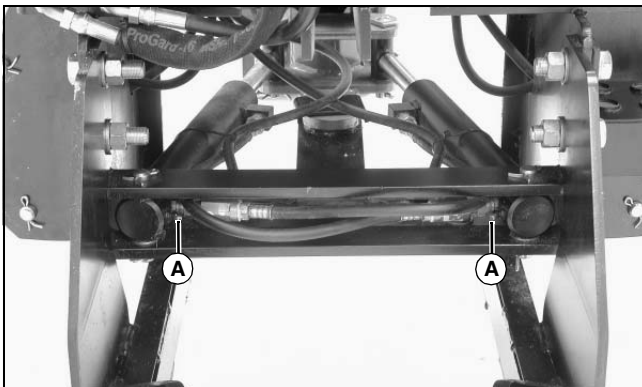
The following greases are preferred:



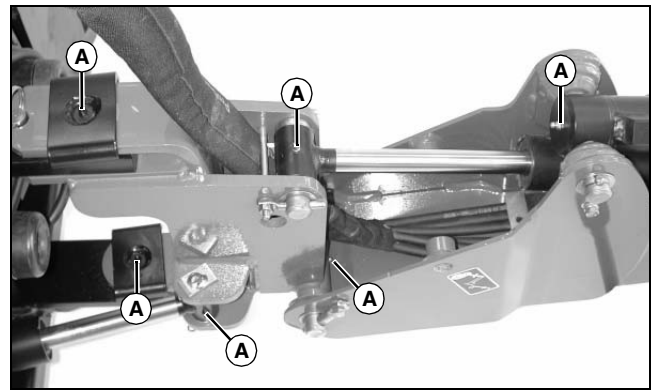
- John Deere Moly High Temperature EP Grease.
 - John Deere High Temperature EP Grease.
 - John Deere GREASE-GARD™.
- Other greases may be used are:
- SAE Multipurpose EP Grease with 3 to 5 percent molybdenum disulfide.
 - SAE Multipurpose EP Grease.
 - Greases meeting Military Specification MIL-G-10924C may be used as arctic grease.

NOTE: Lubricate grease fittings as shown. Lubricate all other pivot points with SAE-10 oil.

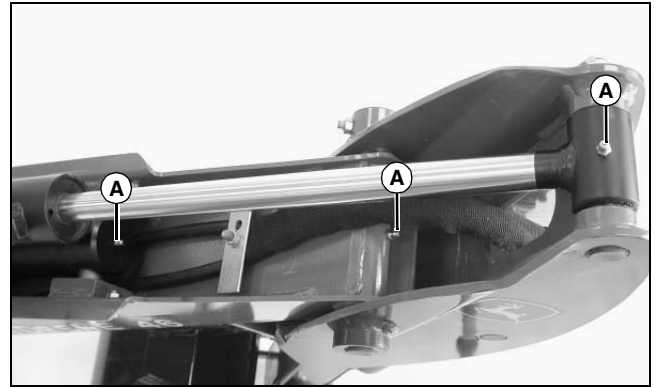
Model 46



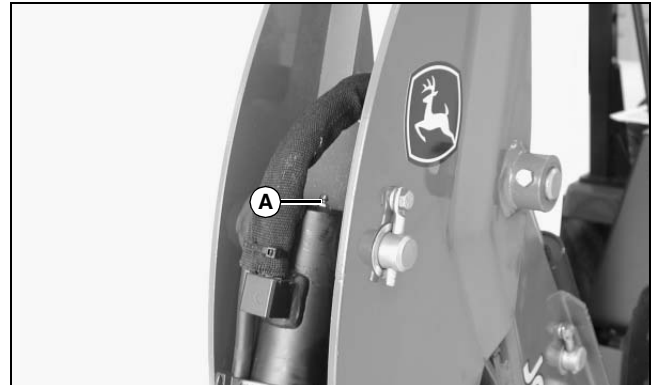
MX15455



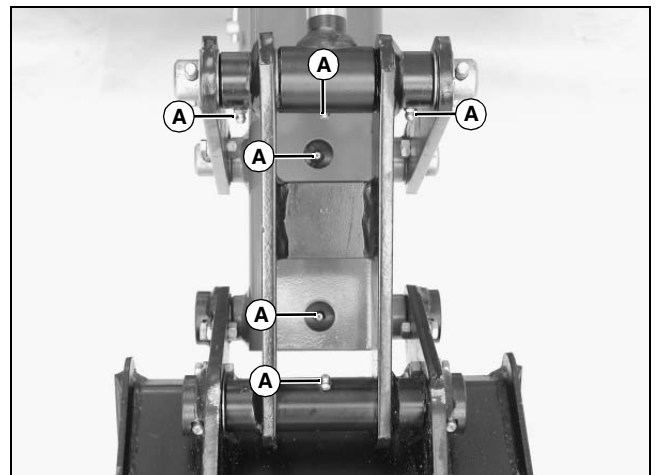
MX15451



MX15453



MX15454

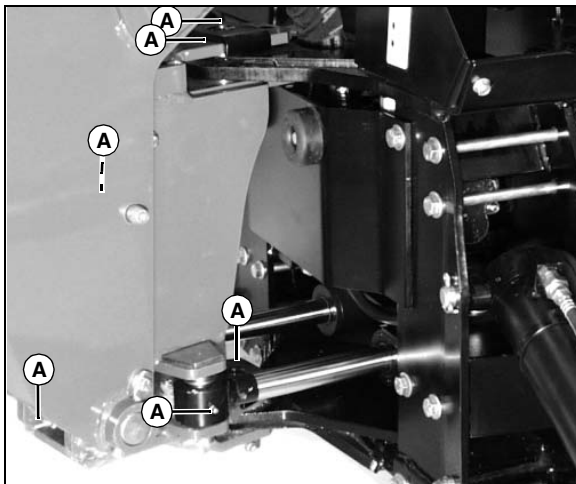


MX15452

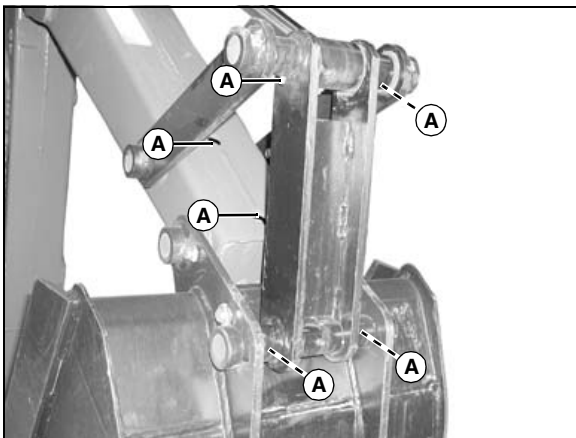
TROUBLESHOOTING

1. Lubricate grease fittings (A) with John Deere multipurpose grease or an equivalent.

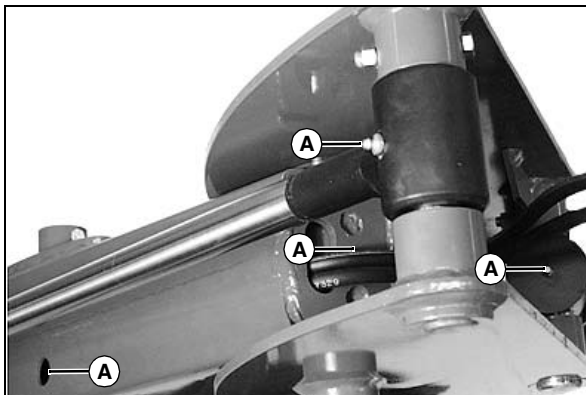
Model 47, 48



M64106



LV5614



LV5615

1. Lubricate grease fittings (A) with John Deere multipurpose grease or an equivalent.

John Deere dealer for service.

When you have checked all the possible causes listed and you are still experiencing the problem, see your John Deere dealer.

Troubleshooting

If	Check
Backhoe does not run smoothly.	Tractor hydraulic oil level low. Air in hydraulic oil lines. Bleed air from lines. Hydraulic lines not connected properly. Check hydraulic quick-disconnect couplers for full engagement. Backhoe needs lubrication.
Backhoe will not swing.	Swing lock pin is installed. Remove boom lock pin. Tractor hydraulic oil level low.
Backhoe will not operate.	Debris inside valve cover.
Backhoe will not hold position.	Hydraulics are leaking. Check lines and tighten any leaking connections. Tractor hydraulic oil level low. Tractor hydraulic oil is dirty. Change oil if needed.
Tractor will not lift backhoe high enough to install L-pins.	Rockshaft position needs adjustment. Contact your John Deere dealer.

Troubleshooting

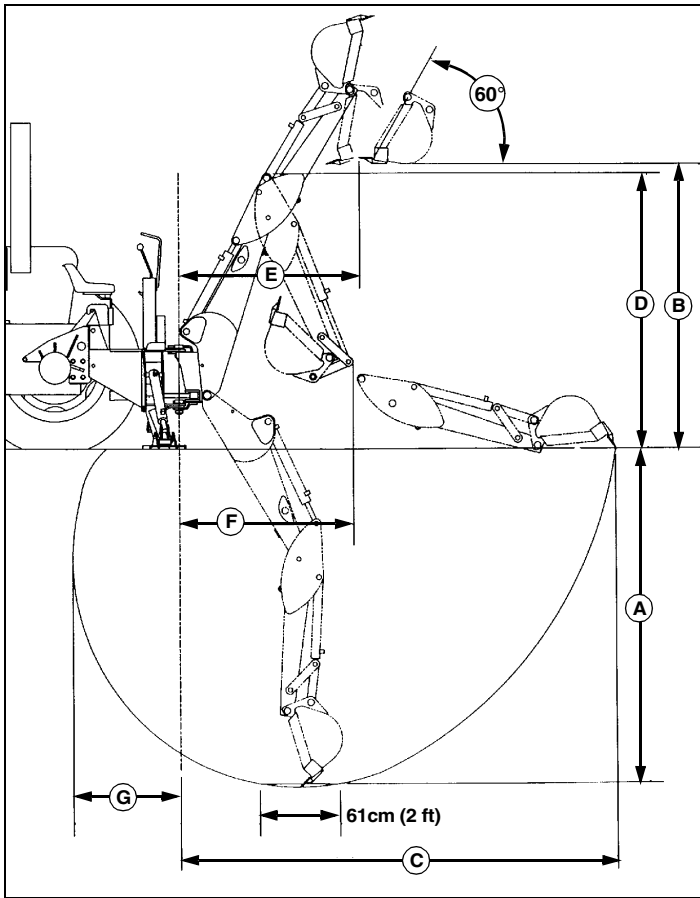
Using Troubleshooting Chart

If you are experiencing a problem that is not listed in this chart, see your

SPECIFICATIONS

Specifications

Backhoes



M64109

Model 46

NOTE: Dimensions are given for backhoe with boom pivot pin 30cm (12 in.) above ground.

Digging Depth (A) (see note below)	1,98m (78 in.)
Swing Arc	180 degrees
Weight	407kg (896 lb)
Loading Height (bucket at 60°) (B)	1,5m (60 in.)
Reach From Center Line of Swing Pivot (C)	2,57m (101 in.)
Transport Height (D)	1,5m (60 in.)
Bucket Rotation	180 degrees
Loading Reach (bucket at 60°) (E)	97cm (38 in.)
Transport Overhang (F)	1,04m (41 in.)
Undercut (G)	71cm (28 in.)
Stabilizers Spread Width (Raised)	1,19m (47 in.)
Stabilizers Spread Width (Lowered)	1,98m (78 in.)
Boom Lift Capacity (see note below)	158kg (348 lb)
SAE Dipperstick Digging Force	5,56kN (1250 lb)
SAE Bucket Digging Force	10,90kN (2450 lb)
Bucket Control Main Relief Valve Pressure	15,51mPa (2250 psi)

Digging Depth: 61cm (24 in.) flat bottom.

Boom Lift Capacity: Dipper arm and boom extended, lifting with boom

cylinder only, weight attached at bucket pivot, bucket pivot 91cm (36 in.) above ground.

Model 47

NOTE: Dimensions are given for backhoe with boom pivot pin 36cm (14 in.) above ground.

Digging Depth (A) (see note below)	2,29m (90 in.)
Weight	460kg (1013 lb)
Swing Arc	180 degrees
Loading Height (bucket at 60°) (B)	1,8m (70 in.)
Reach From Center Line of Swing Pivot (C)	2,9m (114 in.)
Transport Height (D)	1,8m (69 in.)
Bucket Rotation	180 degrees
Loading Reach (bucket at 60°) (E)	1,09m (43 in.)
Transport Overhang (F)	1,07m (42 in.)
Undercut (G)	76cm (30 in.)
Stabilizers Spread Width (Raised)	1,55m (61 in.)
Stabilizers Spread Width (Lowered)	2,26m (89 in.)
Boom Lift Capacity (see note below)	245kg (540 lb)
SAE Dipperstick Digging Force	8,92kN (2005 lb)
SAE Bucket Digging Force	12,63kN (2840 lb)
Bucket Control Main Relief Valve Pressure	15,51mPa (2250 psi)

Digging Depth: 61cm (24 in.) flat bottom.

Boom Lift Capacity: Dipper arm and boom extended, lifting with boom cylinder only, weight attached at bucket pivot, bucket pivot 91cm (36 in.) above ground.

Model 48

NOTE: Dimensions are given for backhoe with boom pivot pin 41cm (16 in.) above ground.

Digging Depth (A) (see note below)	2,59m (102 in.)
Weight With Large Frame Adapter	1517kg (690 lb)
Weight With Medium Frame Adapter	1477kg (671 lb)
Swing Arc	180 degrees
Loading Height (bucket at 60°) (B)	2,08m (82 in.)
Reach From Center Line of Swing Pivot (C)	3,38m (133 in.)
Transport Height (D)	2,1m (81 in.)
Bucket Rotation	180 degrees
Loading Reach (bucket at 60°) (E)	1,09cm (43 in.)
Transport Overhang (F)	1,22m (48 in.)
Undercut (G)	86cm (34 in.)
Stabilizers Spread Width (Raised)	1,37m (54 in.)
Stabilizers Spread Width (Lowered)	2,51m (99 in.)
Boom Lift Capacity (see note below)	345kg (760 lb)
SAE Dipperstick Digging Force	10,83kN (2435 lb)
SAE Bucket Digging Force	16,59kN (3730 lb)
Bucket Control Main Relief Valve Pressure	17,58mPa (2550 psi)

Digging Depth: 61cm (24 in.) flat bottom.

Boom Lift Capacity: Dipper arm and boom extended, lifting with boom cylinder only, weight attached at bucket pivot, bucket pivot 91cm (36 in.) above ground.

GETTING QUALITY SERVICE

Buckets

Model 46, 47

NOTE: 91cm (36 in.) bucket not for use on backhoe model 46.

Bucket Width	23cm (9 in.)	33cm (13 in.)	41cm (16 in.)	51cm (20 in.)	61cm (24 in.)	91cm (36 in.)
SAE Struck Capacity	0.014 m ³ (0.49 ft ³)	0.022 m ³ (0.77 ft ³)	0.028 m ³ (0.98 ft ³)	0.036 m ³ (1.26 ft ³)	0.044 m ³ (1.54 ft ³)	0.067 m ³ (2.38 ft ³)
Heaped Capacity	0.018 m ³ (0.64 ft ³)	0.029 m ³ (1.04 ft ³)	0.038 m ³ (1.33 ft ³)	0.049 m ³ (1.74 ft ³)	0.061 m ³ (2.14 ft ³)	0.095 m ³ (3.34 ft ³)

Model 48

Bucket Width	31cm (12 in.)	46cm (18 in.)	61cm (24 in.)	91cm (36 in.)
SAE Struck Capacity	0.034 m ³ (1.20 ft ³)	0.052 m ³ (1.84 ft ³)	0.072 m ³ (2.53 ft ³)	0.111 m ³ (3.92 ft ³)
Heaped Capacity	0.043 m ³ (1.53 ft ³)	0.070 m ³ (2.47 ft ³)	0.099 m ³ (3.48 ft ³)	0.156 m ³ (5.50 ft ³)

Getting Quality Service

Service Literature

If you would like a copy of Parts Catalog or Technical Manual for this machine call:

- **U.S. & Canada:** 1-800-522-7448.
- **All Other Regions:** Your John Deere dealer.

Parts

We recommend John Deere quality parts and lubricants, available at your John Deere dealer.

When you order parts, your John Deere dealer needs the serial number or product identification number (PIN) for your machine or attachment.

Order Service Parts Online

- Visit <http://JDParts.deere.com> for your Internet connection to parts ordering and information.

John Deere Quality Continues with Quality Service

John Deere provides a process to handle your questions or problems, should they arise, to ensure that product quality continues with your John Deere dealer's parts and service support.

Follow the three steps below to get answers to any questions you may have about your product.

1. Refer to your attachment and machine operator manuals.
2. Contact your John Deere dealer with unanswered questions.
3. Call the John Deere Customer Communications Center.
 - Call 1-800-537-8233 and provide product serial number and model number.

