

**YANMAR**

OPERATOR'S MANUAL

# **LOADER** **for Lx410/450/490**

**CL** Series

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**CL600**

Version 1.0

Code No.:0A052-U00601

ENGLISH

Yanmar America Corporation  
101 International Pkwy  
Adairsville, GA 30103

PRINTED IN U.S.A.

**Operator's Record**

Owner's Name	
Owner's Address	
Owner's Phone Number	
Dealer/Seller Name	
Dealer/Seller Address	
Dealer/Seller Phone Number	

# INTRODUCTION

## Welcome to the World of Yanmar Product

Thank you for purchasing Yanmar loader product that has been designed and manufactured based on the Yanmar state-of-the-art technology and rich expertise in developing and manufacturing products.

Handle the loader correctly by following the instructions in the *Operator's Manual* so that the loader will provide long years of reliable and predictable service.

The *Operator's Manual* constitutes an indispensable part of the Yanmar loader product. Always keep the *Operator's Manual* readily accessible.

Carefully study the *Operator's Manual* to get familiar with the instructions and informations contained in the *Operator's Manual*. The instructions and informations are helpful in using the loader correctly and safely, avoiding personal injury and other accidents during operation and servicing of the loader. When using any attachment together with this loader, also carefully study the *Operator's Manual* so that the operator can use the loader safely, correctly and efficiently.

The *Operator's Manual* is organized with sections arranged in a particular order so that the operator can better understand the safety messages and the controls on the tractor and the loader to help the operator operate the loader correctly and safely. The *Operator's Manual* will also help the operator answer questions about operation and servicing.

The loader shown in the *Operator's Manual* may somewhat differ from the actual loader. The *Operator's Manual* will still assist the operator in understanding the instructions associated with the tractor. Before delivery of the loader, your Yanmar tractor dealer has performed a pre-delivery check to ensure that the loader can long remain problem free.

## NOTICE

### Approved Tractor

The CL600 Loader is designed for use on Lx 410/450/490 Compact Tractor.

All information, descriptions, specifications, drawings, illustrations and pictures in this manual are based on the latest information available at the time this manual was published. Yanmar reserves the right to make changes at any time without prior notice.

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# 1. SAFETY PRECAUTIONS

## 1. Safety Alert Symbol



The safety alert symbol appears with most safety statements. The safety alert symbol means attention, become alert, the operator's safety is involved! Please read and strictly observe the message that follows the safety alert symbol.

### **DANGER**

Indicates a hazardous situation which, if not avoided, *will* result in death or serious injury.

### **WARNING**

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

### **CAUTION**

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

### **NOTICE**

Indicates a situation which can cause damage to the loader, personal property and/or the environment or cause the equipment to operate improperly.

**IMPORTANT:** Means that implement or property damage could occur if instructions are ignored.

**NOTE:** Provides useful information.



**WARNING: READ AND FOLLOW ALL INSTRUCTIONS IN THE *OPERATOR'S MANUAL* BEFORE ATTEMPTING TO OPERATE THE TRACTOR AND THE LOADER. FAILURE TO COMPLY WITH THE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.**



**WARNING:** The engine exhaust, some of its constituents, and certain tractor components contain or emit chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

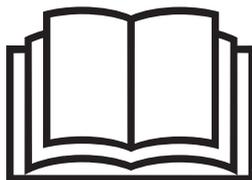


**DANGER:** The loader was built to be operated according to the rules for safe operation in the *Operator's Manual*. As with any type of power equipment, carelessness or error on the part of the operator can result in serious injury. To help prevent accidents, read and understand the following precautions before operating the tractor and the loader. Failure to observe the following safety instructions could result in serious injury or death.

# 1. SAFETY PRECAUTIONS

## 2. Precautions before Operating the Loader

1. Understand the performance and limitations of the tractor and the loader. Carefully study the *Operator's Manual* and learn the instructions in the *Operator's Manual* before operating or servicing the tractor and the loader. Keep the *Operator's Manual* in easily and accessible place.



2. Strictly follow the precautions given in the DANGER, CAUTION and WARNING safety decals attached to the loader. Keep the safety decals in good condition. Replace damaged or missing safety decals.
3. Check overhead clearance carefully before driving under power lines, wires, bridges or low hanging tree branches, before entering or leaving a building, or in any other situation where the operator and/or Roll-Over Protective Structure (ROPS) may be struck, which could result in serious injury.
4. Make sure that the usual operator and any other person who will operate the tractor and the loader studies the *Operator's Manual* before operation. Know the controls and how to stop the tractor quickly.
5. Make sure that there is no person or obstacle under or around the tractor and the loader before and during operation.
6. Do not operate the tractor and the loader while under the influence of alcohol, drugs, medicine or controlled substances or when not fully fit.
7. During operation and when performing service work:
  - Wear close-fitting clothing.
  - Do not wear loose-fitting clothes, jewelry, baggy or torn clothing.
    - when any of the preceding items is caught by a moving part of the loader, an accident can happen
  - Do not wear cut-off pants or shorts which do not provide protection against flying debris.
  - Do not under any circumstances operate the loader with bare feet.
  - Do not wear sandals or sneakers.
  - Wear additional protection including non-slip safety boots or shoes, protective goggles and

- gloves, etc., as appropriate or required by applicable local laws and regulations.
  - Wear ear protection in a noisy environment to prevent hearing damage and to reduce operator fatigue.
8. Avoid allowing passenger on any portion of the tractor and the loader.
  9. Always remain seated in the operator seat while operating the tractor and the loader.
  10. Make sure that the brakes and other mechanical and hydraulic components are properly adjusted and do not have excessive wear.
    - Immediately replace all excessively worn out or damaged components.
    - At regular intervals, check that all nuts, bolts and screws are properly tightened.
  11. Always keep the tractor clean. Dust, grease or grass clippings accumulated on the tractor can lead to fire accidents or personal injury.



12. Use the handholds and running board step when getting on and off the tractor to help prevent accidental falls. Keep the running board step clear of mud and debris.
13. Only use loader attachments that satisfy the requirements in the *Operator's Manual* or are approved by your Yanmar tractor dealer.
14. Make sure the attachment is properly installed, properly adjusted and in good operating condition.
15. Make sure both the right and the left bucket latches are in the locked position. Also ensure lock pins are installed and secured before operation.
16. When using the loader, install appropriate weight/s to the rear of the tractor to prevent the tractor from tipping over. For details, see "Rear Ballast" in "Chapter 5. PRE-OPERATION CHECK".
17. Do not under any circumstances modify the loader. Modification can deteriorate the performance and/or safety of the loader, possibly leading to personal injury or property damage.
18. The loader is only compatible with the Lx410/450/490 model tractors. Do not attempt to use the loader with any other tractor.

### 3. Safe Practices for Operating the Loader

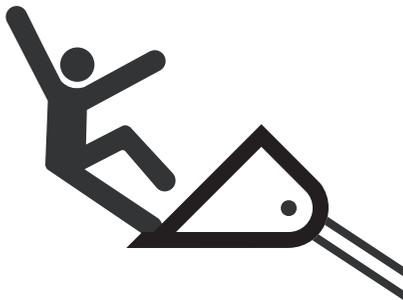
#### 1. Work with the Loader

1. Do not walk or work under a raised loader.
2. Never allow anyone to get under the loader bucket or reach through the booms when the bucket is raised.



2021723

3. Make sure there are no people, livestock or pets around the tractor during operation.
4. Do not use the loader as a work platform.



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5. Never use the loader, the bucket or any other attachment to lift or carry people.
6. Install the required rear weight on the tractor for stability, and use the appropriate rear wheel tread setting that is suitable for the application in order to maximize stability.
7. Before leaving the operator seat, always lower the loader boom to the ground, engage the parking brake securely, shut off the engine and remove the key.
8. Always handle unstable loads with extreme caution.
9. Do not use a chain, rope or cable to lift or pull loads from the loader which can make the tractor roll over or can damage the tractor. The preceding event can result in serious injury or even death.
10. During turning, ensure that there is enough space for length and width of the loader.
11. Avoid loose fill, rocks and potholes which can be dangerous to the operation of the loader.
12. Operate only in daylight or good artificial light.

13. Always comply with all state and local lighting and marking requirements.
14. Consult local utilities before beginning work. Know the location of and avoid contact with all underground cables, pipelines, overhead wires and other hazards in the working area.
15. When the loader is mounted on the tractor, enter and exit the operator seat only from the left side of the tractor.
16. Always place the leading edge of the bucket or attachment in contact with the ground before leaving the tractor.

#### 2. Avoid Roll Over Accidents

1. Move forward, backward and turn the tractor at a low speed.
2. Reduce the tractor speed before executing a turn, when travelling on rough terrain and before stopping to prevent a roll over from occurring.
3. Make sure the tractor tire tread width and rear ballast is correct before using the loader.
4. Lower and lift the load of the loader at a gradual speed.
5. Exercise extreme caution and be extra alert during operation on a slope.
6. Avoid potholes, ditches and obstructions which can make the tractor and the loader roll over.
7. Balance loads so that the overall weight is evenly distributed and the load is stable.
8. Carry loads close to the ground to aid visibility and lower center of gravity.
9. Do not overload. Know the capacity of the loader.
10. Always exercise extra caution during operation of the loader and raising the bucket or attachment.
11. When another implement is to be operated on a slope, always remove the loader to reduce the risk of a roll over.

# 1. SAFETY PRECAUTIONS

## 3. Avoid Power Lines

If the tractor or the loader gets in contact with a power line serious injury or even death could occur.

1. Make sure there is enough overhead clearance before raising the loader.



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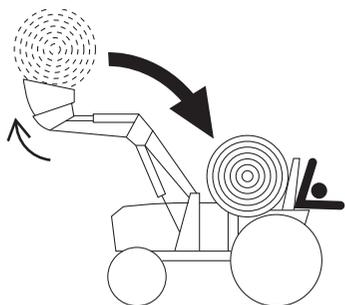
2. Before digging, ensure that there are no underground cables, gas lines and water pipes.
3. Do not leave the operator seat if any part of the tractor or the loader gets in contact with an electrical line.

## 4. Avoid Falling Objects

Be careful when handling large or heavy objects because:

- There is a danger of the tractor rolling over.
- The object falling off the loader boom to the operator.

1. Do not under any circumstances lift a large object with an attachment that can cause the object to roll backwards to the operator.



2021722

2. Do not transport and move round or square bales with the bucket attachment.
3. Do not under any circumstances lift the loader higher than necessary to clear the ground. Always carry loads low to the ground.
4. Move slowly and carefully. Avoid rough terrain.

## 5. Operate on Slopes/Inclines

On a slope, the tractor is less stable and more prone to tip over which can lead to serious injury or death. Exercise extreme caution and be extra alert when operating the tractor on any slope.



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1. Always operate the tractor directly up and down a slope or incline. Do not under any circumstances attempt to travel across a slope.
2. Place the range gear lever in the slow range when climbing or descending slopes.
3. Keep all movements on slopes slow and gradual.
  - Do not make abrupt changes in speed or direction.
  - Abrupt engagement of the brake can make the tractor to tip over which can cause serious injury.
4. Carry load low to the ground.
5. Always engage the 4-wheel drive when operating the loader.
6. Do not drive the tractor on a steep slope.
7. Balance the loads so that weight is evenly distributed and the load is stable.

## 1. SAFETY PRECAUTIONS

### 4. Travel on a Road

1. Carry the loads at the low position to maintain visibility and to stabilize the tractor.
2. During turning, ensure that there is enough space for length and width of the loader.
3. Before turning, always slow down the tractor. High speed turn may cause the tractor to tip over.
4. When traveling on a road, ensure that the Slow Moving Vehicle (SMV) emblem is on the rear of the tractor and is clearly visible. Use the hazard lights and turn signal lights as required by the currently effective local laws or regulations.
5. Strictly observe all the currently effective local traffic and safety laws and regulations.
6. Turn ON the headlights as required by the currently effective local laws or regulations.
7. Always travel at a speed that allows the operator to maintain control of the tractor.
8. Balance the loads so that the overall weight is evenly distributed and the load is stable.
9. Drive slowly while carrying a load. Driving on rough terrain can make the load to spill over.
10. Avoid carrying loads wider than the bucket/attachment or tractor.
11. Lock the implement control lever in the N (neutral) position to prevent the implement from being actuated accidentally when the implement is not in use or during transport.

### 5. Safe Practices for Servicing the Loader

Before starting any service work:

- Park the tractor on a solid and level ground.
  - Engage the parking brake securely.
  - Push down Power Take Off (PTO) switch to OFF position.
  - Lower the rear mounted ballast and the loader to the ground.
  - Move the primary gear lever to the N (neutral) position.
  - Move the range gear lever to the N (neutral) position.
  - Shut off the engine.
  - Remove the key from the starter key switch.
1. Do not walk or work under a raised loader, bucket or attachment unless the preceding component is securely supported and held in a stable position.
  2. Before disconnecting the hydraulic hoses, operate the implement control lever several times to release the hydraulic pressure.
  3. Make sure that all the parts are in good condition and properly installed. Repair or replace any damaged part.
  4. Keep any person away from operator station while performing adjustment, servicing or maintenance work.
  5. Do not allow anyone in the area when operating, attaching, removing, assembling or servicing the tractor or the loader.
  6. Check the hydraulic hoses before starting the day's operation. Failure to perform the preceding practice can cause serious injury or even death. Replace damaged hoses.
  7. Do not use the loader as a jack to support the tractor for servicing or maintenance.
    - Avoid working under any hydraulically supported device.
    - The device can settle, suddenly leak down or be accidentally lowered.
      - if working underneath the tractor is unavoidable, always support the tractor with proper and rigid lifting devices with the capacity of more than 3 tons
  8. High pressure hydraulic fluid, when released can penetrate human skin possibly leading to serious personal injury.
    - Before disconnecting any hydraulic line, fully release the internal pressure.
    - Before exerting any pressure to the hydraulic system, ensure that all connections are tight and all the lines, pipes and hoses are free from fractures/fissures, cracks or any other damage.
  9. Do not tamper with the relief valve setting. The relief valve is pre-set at the factory. Changing the setting can cause overloading of the tractor and the loader.



## 1. SAFETY PRECAUTIONS

10. Always wear protective goggles and gloves when servicing or repairing the tractor or the loader.
11. When servicing or replacing pins in cylinder ends, bucket, etc., always use a brass drift and hammer. Failure to observe the preceding practice can result in injury from flying metal fragments.
12. Do not remove the loader from the tractor without an approved bucket support.
13. Use only Yanmar genuine parts to prevent the result of severe accidents.
14. To prevent serious injury or death, assemble, remove and install the loader as explained in the *Operator's Manual*.

## 6. Safe Practices for Storing the Loader

Stored loader and attachments can fall and cause serious injury or death. Securely support the loader and attachments to prevent from falling.

1. Detach the loader or attachments on a solid and level ground.
2. Keep a child and bystanders away from stored loader and attachments.
3. Loader frame must be equipped with bucket or attachment to provide necessary balance for storage.
4. Do not loosen hydraulic fittings or hoses while storing the loader.
5. Do not climb or lean on the loader stored on stand.

## 7. Change the Rubber Products, such as Hydraulic Hose, for Every 2 Years

The rubber products have a deteriorative character. The deteriorated rubber product may cause such as fluid leakage, fire, burn injury.

## 8. Understand the Tractor and the Loader Safety Decals

### ■ Safety Alert Symbol

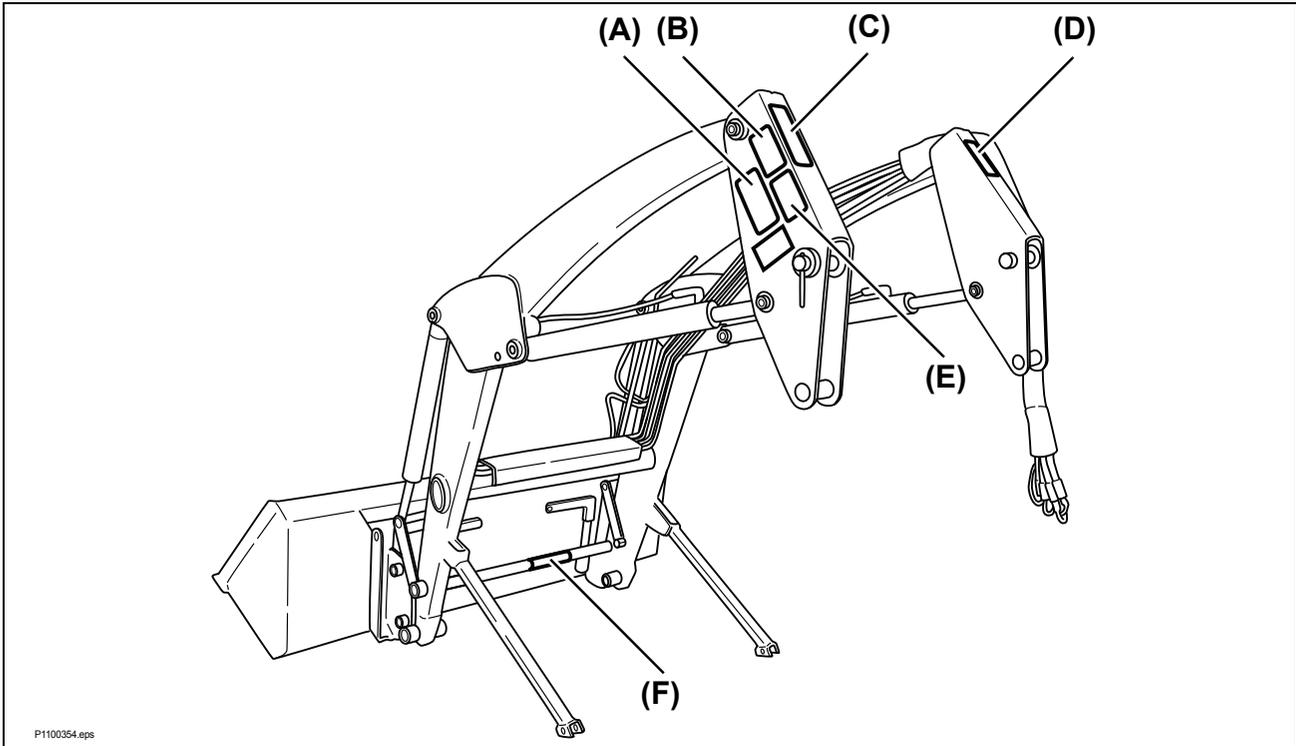
The loader safety decals illustrated in this section are provided in critical areas on the loader so that people including the operator can always remain aware of potential hazards. The loader safety decals contain the words DANGER, WARNING and CAUTION together with the safety alert symbol. DANGER and WARNING stand for the most serious hazards. The *Operator's Manual* also contains special safety messages that explain potential hazards about which the operator must remain cautious. The messages are presented together with the word CAUTION and the safety alert symbol.

### ■ Care of DANGER, WARNING and CAUTION Decals

1. Always keep all the DANGER, WARNING and CAUTION decals clean and clearly legible.
2. Clean the DANGER, WARNING and CAUTION decals with soap and water, and wipe dry with clean soft cloth.
3. Replace damaged or missing DANGER, WARNING and CAUTION decals with new decals available from YOUR LOCAL YANMAR TRACTOR DEALER.
4. If a component that has DANGER, WARNING and CAUTION decals is replaced with a new decal, ensure that the new decal is on the same location as on the replaced component.
5. Make sure the new DANGER, WARNING and CAUTION decals are smoothly affixed on a clean and dry surface. Squeeze out trapped air.

# 1. SAFETY PRECAUTIONS

## ■ Decals Location



(A) 1TN322-01411

**⚠ CAUTION**

**TO AVOID PERSONAL INJURY:**  
Manual Before operating.

- Operate loader from tractor's seat only.
- Lock pins must be installed and secured before operation.
- When parking, choose flat and hard ground. Lower the bucket to the ground, set brakes before leaving tractor.
- Before disconnecting hydraulic lines, relieve all hydraulic pressure.

**⚠ CAUTION**

**TO AVOID PERSONAL INJURY:**

Manual before operating.

- Operate loader from tractor's seat only.
- Lock pins must be installed and secured before operation.
- When parking, choose flat and hard ground. Lower the bucket to the ground, set brakes before leaving tractor.
- Before disconnecting hydraulic lines, relieve all hydraulic pressure.

1TN322-01411

(B) 1TN322-01321

**⚠ WARNING**

**TO AVOID INJURY:**

- Avoid contact with electrical power lines by loader or its attachment.

**⚠ WARNING**

**TO AVOID INJURY:**

- Avoid contact with electrical power lines by loader or its attachment.

1TN322-01321

## 1. SAFETY PRECAUTIONS

(C) 1TN322-01211

 **DANGER**

**TO AVOID SERIOUS INJURY OR DEATH CAUSED BY ROLLOVERS**

- Use ROPS and seat belt at all times. Foldable ROPS should be in upright and locked position.
- Add required rear ballast before operation.
- Move and turn tractor at slow speeds. Loader arms should be at low position during transport of tractor.
- Do not transport or move round or square bales with the bucket.

 **DANGER**



**TO AVOID SERIOUS INJURY OR DEATH CAUSED BY ROLLOVERS**

- Use ROPS and seat belt at all times. Foldable ROPS should be in upright and locked position.
- Add required rear ballast before operation.
- Move and turn tractor at slow speeds. Loader arms should be at low position during transport of tractor.
- Do not transport or move round or square bales with the bucket.

1TN322-01211

(D) 1TN322-01221

 **DANGER**

**TO AVOID SERIOUS INJURY OR DEATH CAUSED BY FALLING LOADS.**

- Load on raised bucket can fall or roll back onto operator causing serious injury or death.
- Carry loads as low as possible.
- Handle raised loads with caution.

 **DANGER**



**TO AVOID SERIOUS INJURY OR DEATH CAUSED BY FALLING LOADS.**

- Load on raised bucket can fall or roll back onto operator causing serious injury or death.
- Carry loads as low as possible.
- Handle raised loads with caution.

1TN322-01221

(E) 1TN322-01311

 **WARNING**

**TO AVOID INJURY:**

- Do not stand or work under raised loader.
- Do not use loader as jack for maintenance.
- Do not lift or carry anyone on loader, bucket or any other attachment.

 **WARNING**



**TO AVOID INJURY:**

- Do not stand or work under raised loader.
- Do not use loader as jack for maintenance.
- Do not lift or carry anyone on loader, bucket or any other attachment.

1TN322-01311

## 1. SAFETY PRECAUTIONS

(F) 1TN322-01421



### WARNING

#### TO AVOID SERIOUS INJURY OR DEATH

Before operating the loader, always verify the following on both the right and left sides of the unit.

- Both hooks must be inserted into the V-groove on the bucket side.
- Both handles must be situated in their fully locked position.
- Both stoppers must be situated in their fully locked position.



# 2. SERVICE THE LOADER

Your Yanmar tractor dealer is committed to support the loader to ensure safe operation and good performance of the loader.

After carefully studying the *Operator's Manual*, the loader operator can perform some of the regular maintenance work.

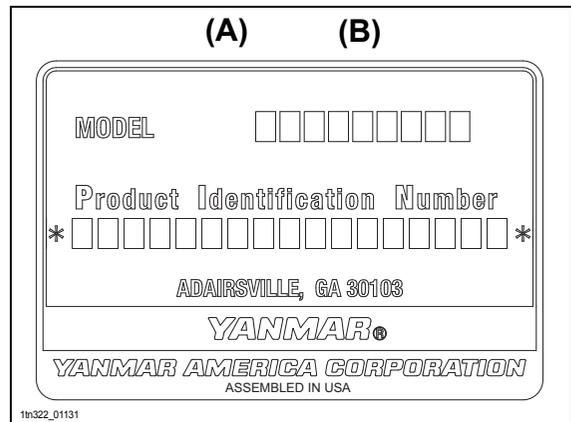
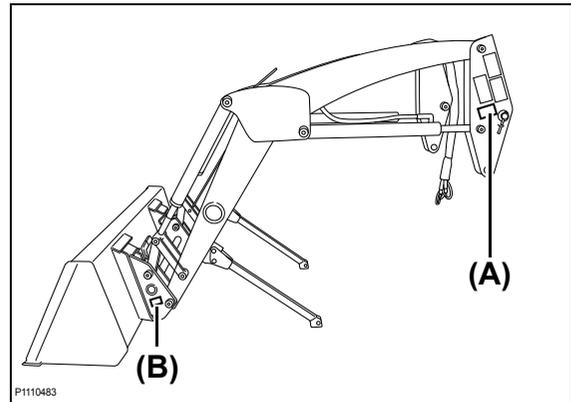
When parts/components or major service work is required, contact YOUR LOCAL YANMAR TRACTOR DEALER for technical assistance.

When ordering a part/component, let YOUR LOCAL YANMAR TRACTOR DEALER know the loader serial number.

Find the serial number and enter the serial number in the following table.

	Type	Serial No.
Loader		
Quick Hitch		
Date of Purchase		
Name of Dealer		

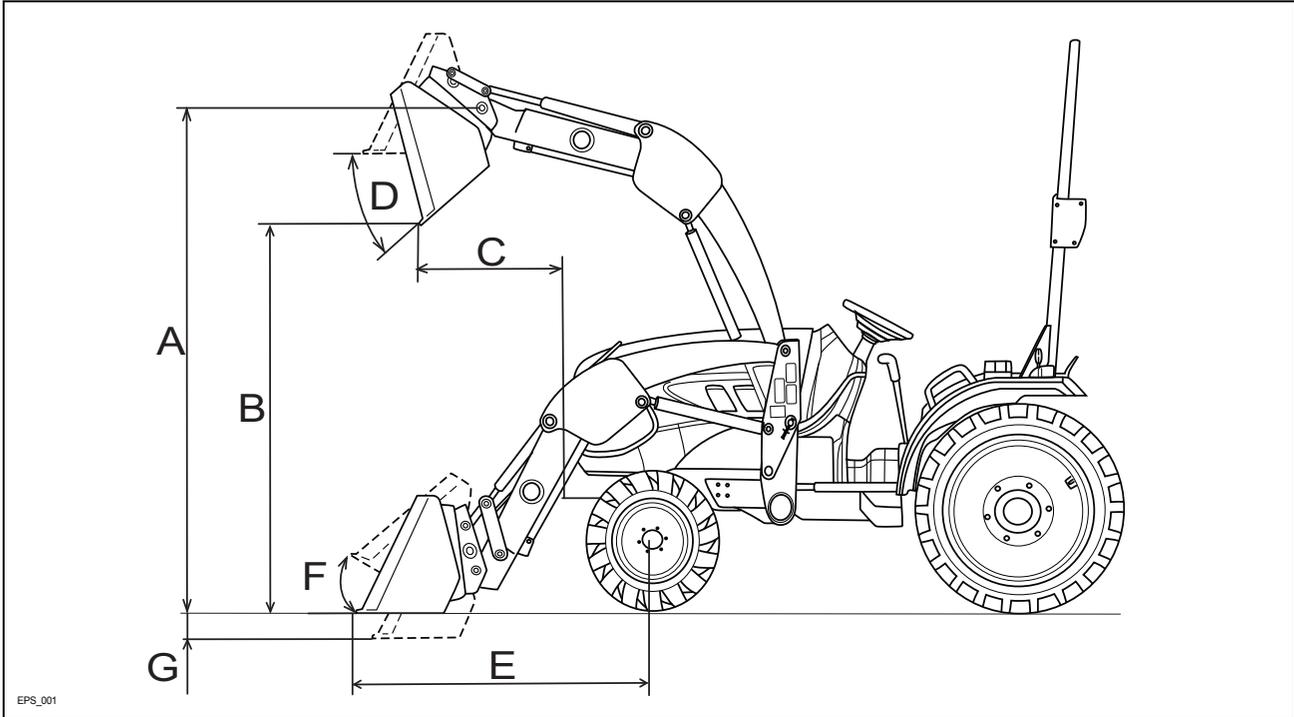
(A) Loader serial number identification plate  
(B) Quick hitch serial number identification plate



KIT CODE: 1TN322-23010		KIT CODE: 1TN323-23020	
<p>Diagram of a quick hitch assembly. Label (B) points to a component on the right side. The drawing is labeled P1100791_A in the bottom left corner.</p>		<p>Diagram of a loader assembly. Label (B) points to a component on the right side. The drawing is labeled 13 CL600 30 17.29_A in the bottom left corner.</p>	
	Serial No.		Serial No.
Quick Hitch	QAKCL 002001 - 003000	Quick Hitch	QAKCL 003001 -
Loader	000101 - 000253	Loader	000254 -

# 3. SPECIFICATIONS

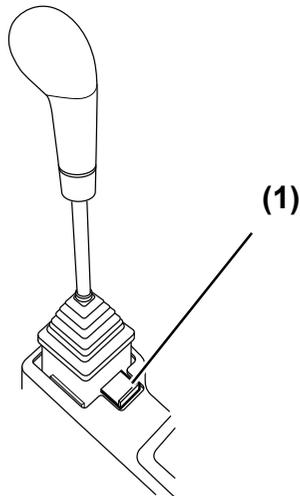
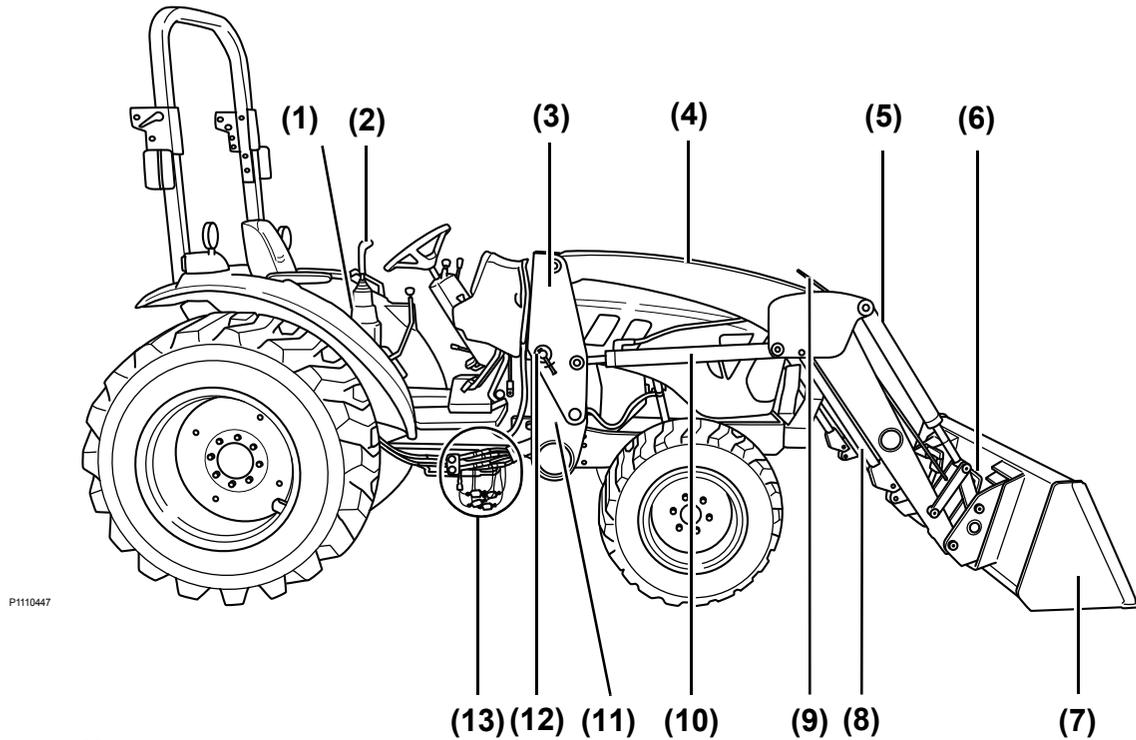
## 1. Specifications Table



Model		CL600	
A	Maximum Lift Height to Pivot Pin	in. (mm)	113 (2870)
B	Clearance with Bucket Dumped	in. (mm)	87.7 (2227)
C	Reach at Maximum Lift Height	in. (mm)	29.9 (760)
D	Maximum Dump Angle	degree	45
E	Reach with Bucket on Ground	in. (mm)	74.3 (1886)
F	Maximum Rollback Angle	degree	40
G	Digging Depth	in. (mm)	7.5 (190)
	Rising Time to Full Height w/o Load	sec.	4.9
	Lowering Time w/o Load	sec.	3.1
	Attachment Rollback Time	sec.	2.6
	Attachment Dumping Time	sec.	1.7
	Bucket Width	in. (mm)	72 (1829)
	Bucket Capacity (1 ft. = 0.3048 m)	cu. ft. (m <sup>3</sup> )	10.9 (0.31)
	Bucket Quick Coupler		SSL-OP

# 4. NAME OF COMPONENT

## 1. Overview

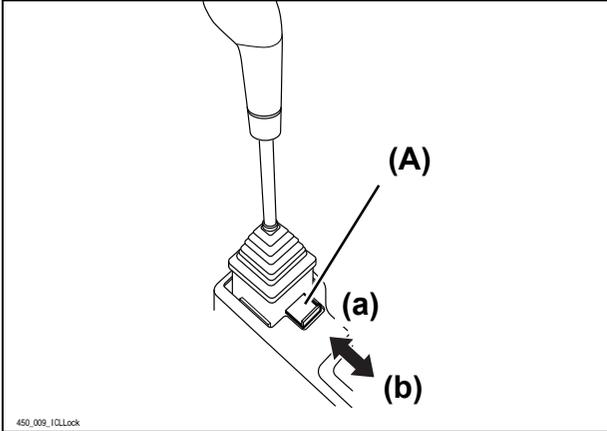


- (1) Implement control lever lock
- (2) Implement control lever
- (3) Mast assembly
- (4) Boom assembly
- (5) Bucket cylinder
- (6) Quick hitch assembly latch pin handles
- (7) Loader bucket
- (8) Loader stand
- (9) Indicator
- (10) Boom lift cylinder
- (11) Loader mount
- (12) Mast mounting pin
- (13) Hydraulic quick couplers

## 2. Function of Components

### (1) Implement control lever lock

Use the implement control lever lock to lock the implement control lever to the N (neutral) position. The preceding procedure prevents accidental operation of the loader.



**(A) Implement control lever lock**  
 (a) Locked position  
 (b) Unlocked position

#### IMPORTANT: Avoid damage!

- After the implement control lever has been locked with the implement control lever lock, move the implement control lever with a light force.
- The preceding operation ensure that the implement control lever has been securely locked.

### (2) Implement control lever

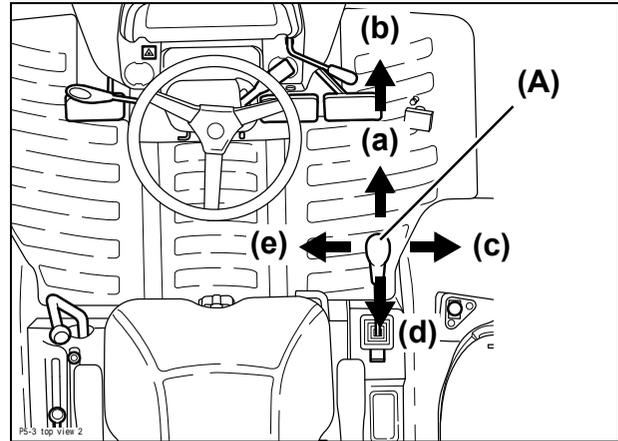
Use the implement control lever to operate the loader.

#### IMPORTANT: Avoid damage!

- Do not attempt to operate the implement control lever while the implement control lever lock is in locked position.

#### NOTE

- The implement control lever return to the N (neutral) position when released except when the implement control lever is in the float (b) position.



**(A) Implement control lever**  
 (a) Lower  
 (b) Float  
 (c) Dump  
 (d) Raise  
 (e) Curl

### (3) Mast assembly

The mast assembly connects the boom assembly to the loader mounts.

### (4) Boom assembly

The boom assembly is the frame of the loader.

### (5) Bucket cylinder

The bucket cylinder makes the bucket curl or dump, depending on the position of the implement control lever.

### (6) Quick hitch assembly latch pin handles

Use to lock and unlock the loader bucket.

### (7) Loader bucket

The loader bucket is for scooping, carrying and dumping the load.

### (8) Loader stand

Use the loader stand to support the loader when the loader is stored away or separated from the tractor.

### (9) Indicator

Use as guide for the loader bucket position.

## 4. NAME OF COMPONENT

---

### (10) Boom lift cylinder

The boom lift cylinder raises or lowers the boom assembly depending on the position of the implement control lever.

### (11) Loader mount

The loader mount is for attaching the loader to the tractor. There are two loader mounts, the left and the right loader mounts.

### (12) Mast mounting pin

Use the mast mounting pins to secure the mast assembly to the loader mounts.

### (13) Hydraulic quick couplers

Use the hydraulic quick couplers to connect the loader hydraulic hoses to the implement control valve of the tractor.

#### **IMPORTANT: Avoid damage!**

- Prevent damaged or contamination to the female hydraulic quick couplers.
- Always leave the color coded protective plug connected to the hydraulic quick couplers when the hydraulic quick couplers are not in use.

# 5. PRE-OPERATION CHECK

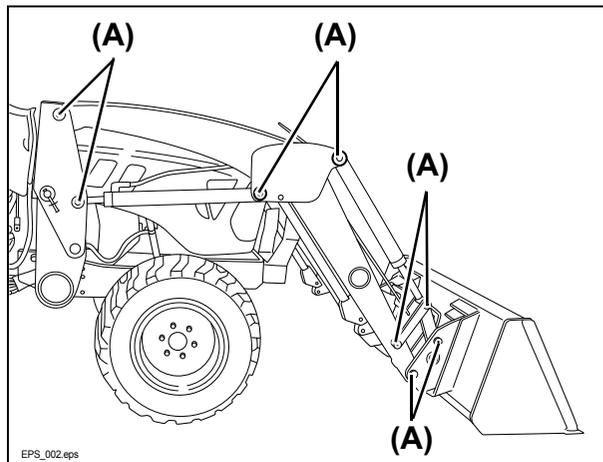
## 1. Pre-Operation Check

Perform the following checklist before operating the loader.

- Review and follow all the safety rules, including those in the safety decals described in page 1-6.
- Check that all the safety decals are installed and in good condition. Replace any damaged decals.
- Check that the loader is properly and securely attached to the tractor.
- Check that the bucket is securely attached to the loader by the supplied pins and components that hold the bucket.
- Check that all components including all screws, nuts and pins are properly installed and secured.
- Check all lubrication points and lube fittings.
- Before starting the tractor, check that all hydraulic hoses and fittings are in good condition and have no leaks.
- Check that the hoses are not twisted, sharply bent, kinked, frayed or pulled too tightly. Replace any damaged hoses immediately.
- Make sure that the tractor Roll-Over Protective Structure (ROPS) and the retractable seatbelt are in good condition.
- Do not under any circumstances operate the loader without first installing and raising the Roll-Over Protective Structure (ROPS).
- Do not under any circumstances operate the loader without first securely fastening the retractable seatbelt on the operator's waist.
- Do not allow other persons to ride on the tractor.

## 2. Lubricate

Use General all purpose grease NLGI grade No.2 to lubricate the lube fittings (A).



(A) Lube fittings

## 3. Transmission Hydraulic Oil

Regularly check the transmission hydraulic oil level in the tractor transmission.

- When the transmission hydraulic oil level is low, add more transmission hydraulic oil.
- The transmission hydraulic oil must be replenished after bleeding air from the hydraulic system.
- When doing the preceding operation, always check the transmission hydraulic oil level.
- See the tractor Lx410/450/490 *Operator's Manual* for the procedure on how to add transmission hydraulic oil and information on the appropriate transmission hydraulic oil type.

### IMPORTANT: Avoid damage!

- Always lower the 3-point hitch and the bucket all the way to the ground before checking the transmission hydraulic oil level.

## 4. Adjust the Wheel Tread

### WARNING

Avoid injury!

- To help prevent roll over accidents, use the recommended tread settings indicated below.

#### Recommended Tread Settings

Tire size	Front tread
8-16 (R1)	55.1 in. (1399 mm)
27 × 10.5-15 (R3)	51.9 in. (1297 mm)
10-16.5 (R4)	55.8 in. (1417 mm)

Tire size	Rear tread
14.9-24 (R1)	60.0 in. (1525 mm)
44 × 18.00-20 (R3)	51.7 in. (1314 mm)
17.5L-24 (R4)	51.9 in. (1319 mm)

## 5. Rear Ballast

### WARNING

To prevent serious personal injury or death:

- In order to ensure the safety of the operator and the stability of the tractor, always use Ballast Box: BB200 as follows.

#### Rear Weight Capacity

Condition	Required 3-Point Hitch approximate Weight lb. (kg)
With Rear Liquid Weight	860 (390)
Without Rear Liquid Weight	1450 (660)

For other implements used on the rear of the tractor, consult YOUR LOCAL YANMAR TRACTOR DEALER.

## 6. Remove the Front Weights

To prevent interference with the loader, remove all front weights before attaching the loader.

## 7. Tire Air Pressure

### ■ Check the Tire Air Pressure

### CAUTION

- Before loader operation, ensure to check the tire air pressure. If necessary, inflate the tire/s to the recommended tire air pressure.

R1	Tire size	Air pressure (psi (MPa))
Front	8-16	28 (0.19)
Rear	14.9-24	20 (0.14)

R3	Tire size	Air pressure (psi (MPa))
Front	27 × 10.5-15	30 (0.21)
Rear	44 × 18.00-20	20 (0.14)

R4	Tire size	Air pressure (psi (MPa))
Front	10-16.5	46 (0.32)
Rear	17.5L-24	20 (0.14)

## 8. Check the Wheel Bolt Tightening Torque

### WARNING

- Always keep the wheel bolts tightened to the specified torque.
- Never drive the tractor with loose wheel bolts.

After adjusting the wheel tread or replacing the tires, tighten the wheel bolts after the first 4 hours and 8 hours of operation. Check and tighten frequently during the first 100 hours of operation.

### ■ Tightening Torque

Bolt fixing the disk to the axle	Front wheel	123.15 to 151.91 ft•lbs (167 to 206 N•m)
	Rear wheel	101.17 to 108.34 ft•lbs (137.2 to 147 N•m)
Bolt fixing the rim to the disk (Only R1 tire)	Rear wheel	146 to 205 ft•lbs (198 to 278 N•m)

## 5. PRE-OPERATION CHECK

### 9. Liquid Weight

#### ⚠ WARNING

##### Avoid injury!

- Installation of tire liquid weight requires special equipment and training.
- An exploding tire can lead to injury.
- Contact **YOUR LOCAL YANMAR TRACTOR DEALER** for technical assistance.

##### Liquid Weight per Tire (75% filled)

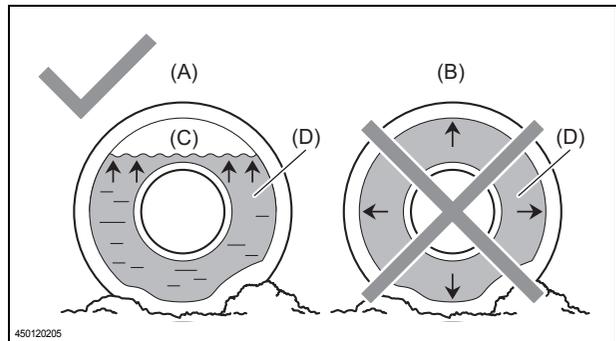
Tire Sizes	14.9-24	17.5L-24
No slush at 14°F (-10°C) Solid at -22°F (-30°C) [Add approx. 2.2 lb. (1 kg) CaCl <sub>2</sub> per 4 qt. (3.8 L) of water]	451 lb. (205 kg)	517 lb. (235 kg)
No slush at -11°F (-24°C) Solid at -22°F (-30°C) [Add approx. 3.3 lb. (1.5 kg) CaCl <sub>2</sub> per 4 qt. (3.8 L) of water]	473 lb. (215 kg)	550 lb. (250 kg)
No slush at -52°F (-47°C) Solid at -62°F (-52°C) [Add approx. 5 lb. (2.25 kg) CaCl <sub>2</sub> per 4 qt. (3.8 L) of water]	495 lb. (225 kg)	583 lb. (265 kg)

##### IMPORTANT: Avoid damage!

- Avoid exceeding the maximum load ratings indicated on the tires.
- Always fill the tire with the liquid above the rim level to prevent corrosion:
  - avoid exceeding 75% of the tire's internal space
- The preceding condition:
  - the tire is less capable of absorbing shock
  - the tire has a shorter useful lifetime

#### NOTE

- Avoid using alcohol as weight.
- Calcium chloride solution is heavier.
- A water solution of calcium chloride is a safe weight.
- The preceding solution prevents freezing and does not damage the tires, tubes or rims.
- Mix a solution of 3.5 lb. (1.6 kg) of calcium chloride and approximately 4 qt. (3.8L) of water.
- The solution mentioned in the preceding sentence does not freeze at a temperature of above -50 °F (-45 °C).
- Fill the tubeless tires at least up to the valve stem height (at least 75% filled) (A).
- A smaller amount of the solution results in partly exposed rims.
  - can lead to corrosion of the rim



(A) **Correct: 75% full - The remaining air can be compressed like a cushion.**

(B) **Incorrect: 100% full - Water cannot be compressed.**

(C) Air

(D) Water

### 10. Air Bleeding of Hydraulic System

Raise and lower the boom and bucket repeatedly until all the air is out of the hydraulic system. Check that the hydraulic system is properly operating.

##### IMPORTANT: Avoid damage!

- Do not under any circumstances place the implement control lever in the float position while the bucket is off the ground.

# 6. OPERATE THE LOADER

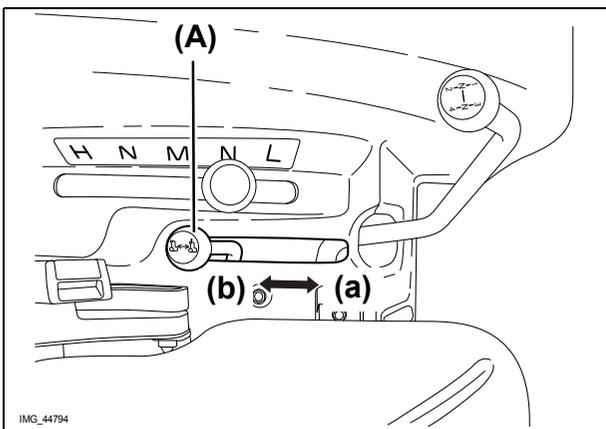
When operating the loader, ensure that the engine speed of the tractor is appropriate for the work being performed.

The operator must be experienced enough to be able to operate the tractor at the appropriate speed.

The procedures described below can prevent bucket spillage, as well as lengthen the service life of the loader.

## IMPORTANT: Avoid damage!

- Do not attempt to operate the tractor at high speeds while the loader is attached to prevent the following:
  - spilling the content of the bucket
  - placing undue strain on both the tractor and the loader
- When working in an environment below 30 °F (-1 °C), keep the engine under 1200 rpm until the oil temperature rises above 30 °F (-1 °C).
- While operating on loose soil, slippery surfaces and on a descending slope, and to prevent damage to the tractor transmission:
  - engage the 4-wheel drive only when additional traction is needed
- Deactivate the 4-wheel drive when travelling on firm and flat surfaces and when travelling at a high speed.



(A) 2WD/4WD lever  
(a) 4WD position  
(b) 2WD position

## ! WARNING

To prevent roll over accidents:

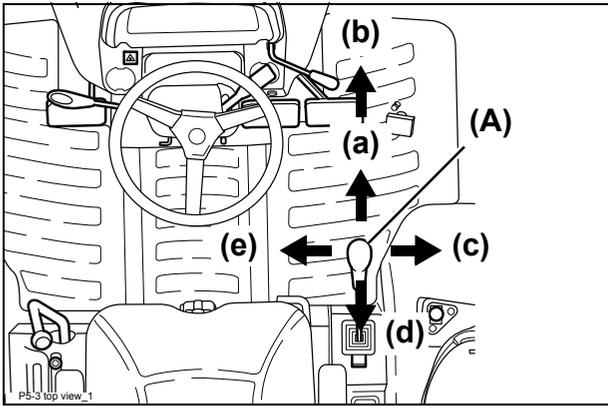
- Remove the loader from the tractor if another implement is to be operated on an inclined surface.
- Remove the rear mount mower or other rear implements from the tractor before operating the loader on rough or uneven terrain.
- The preceding procedure prevents damage to the rear mount mower and other implement.
- If a rear mounted mower or another implement is removed:
  - an appropriate loader weight box or other appropriate rear ballast should be installed in place of the implement

## 1. Use the Implement Control Lever

The tractor's implement control lever is located at the front right corner of the operator seat. The preceding lever is used to control the movements of the loader. If the loader does not operate properly:

- Shut off the engine.
- Engage the parking brake securely.
- Check that all hydraulic connections are as described in "Chapter 9. INSTALLATION" on page 9-1.
- While seated in the operator seat of the tractor, use the implement control lever to control the loader movements, as follows:
  - forward: lowers the loader boom
  - full forward past the detent: makes the boom assembly float
  - the preceding action allows the loader bucket to follow (float with) the ground contour
  - the implement control lever cannot be used to dump or curl the loader bucket at the float position
  - right: dumps the loader bucket
  - rearward: raises the loader boom
  - left: curl the loader bucket

## 6. OPERATE THE LOADER



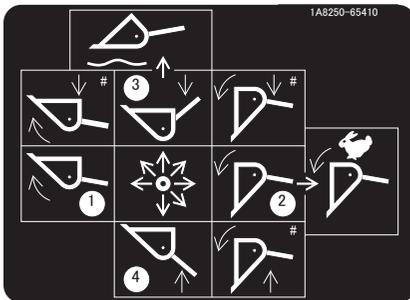
### (A) Implement control lever

- (a) Lower
- (b) Float
- (c) Dump
- (d) Raise
- (e) Curl

### ■ Use the Implement Control Valve

#### Picture Note:

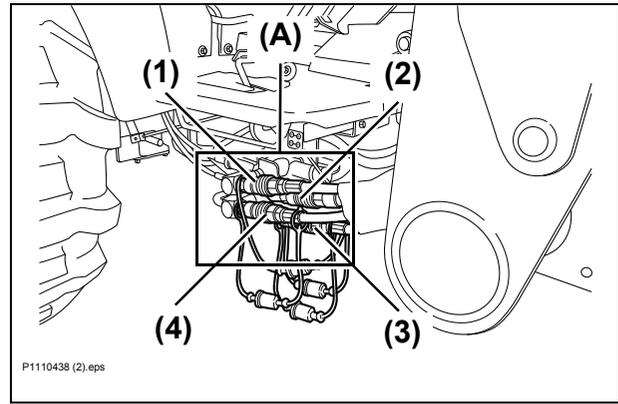
The standard label may not exactly match the label on the tractor.



The label installed on the tractor next to the implement control lever shows the different lever positions.

Lever positions numbered 1-4 on the label match the hydraulic line couplers numbered 1-4 on the label for the coupler installed on the tractor near the couplers. The table below specifies that moving the lever to position 1 supplies fluid to coupler 1 and return fluids through coupler 2 and so forth.

Lever Position	Fluid Supply to Coupler	Fluid Return to Coupler
Left to position 1	1	2
Right to position 2	2	1
Forward to position 3	3	4
Rearward to position 4	4	3



### (A) Hydraulic quick coupler

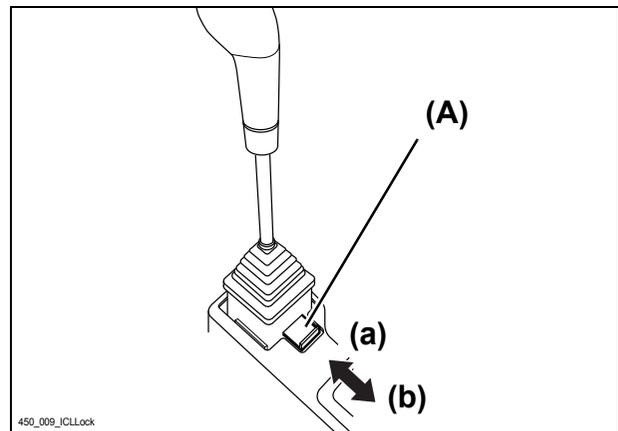
Move the implement control lever to the full forward or float position to:

- Remove the pressure in both lines 3 and 4.
- Allow the transmission hydraulic oil to flow back and forth between the lines.

The implement control lever may be left in the float position.

### ■ Use the Implement Control Lever Lock

The following procedure prevents accidental operation of the loader.



### (A) Implement control lever lock

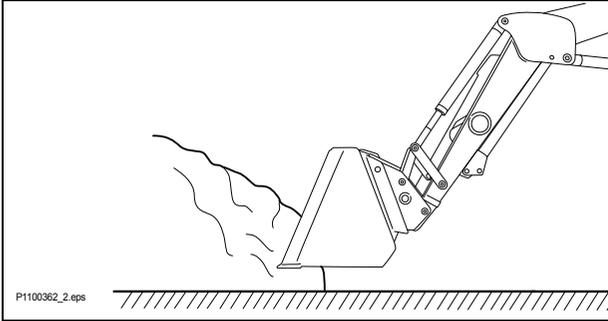
- (a) Locked position
- (b) Unlocked position

- Move the implement control lever lock to forward position (a) as shown. The preceding operation inhibits any implement control lever movement. The implement control valve cannot be operated.
- Move the implement control lever lock (A) to the backward position (b). The preceding operation allows the implement control lever to move in all directions. The implement control valve can be operated.

## 6. OPERATE THE LOADER

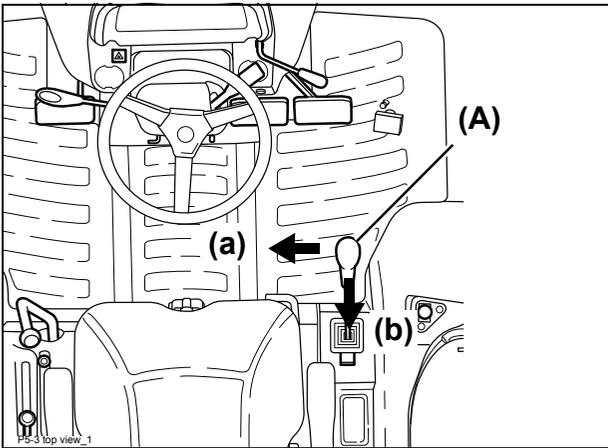
### ■ Fill the Bucket

Before approaching and entering a pile, level the bucket.



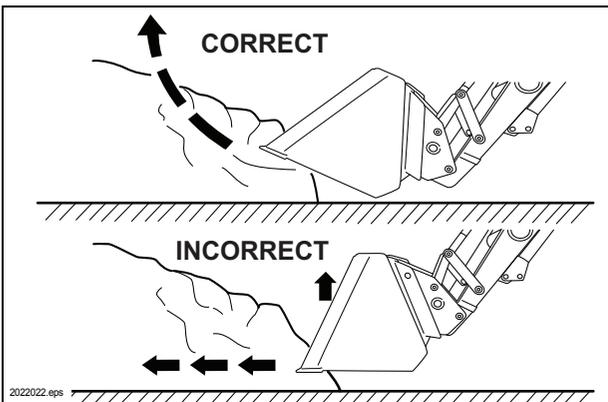
Once the bucket is in the pile, slowly move the implement control lever diagonally rearward and towards the operator.

- The preceding action simultaneously raises (b) the boom while making the bucket curl (a).



- (A) Implement control lever**  
(a) Curl  
(b) Raise

The simultaneous action of lifting the boom and curling the bucket increases efficiency because maintaining a level bucket throughout the lifting cycle prevents the bucket from lifting and from easily breaking away.

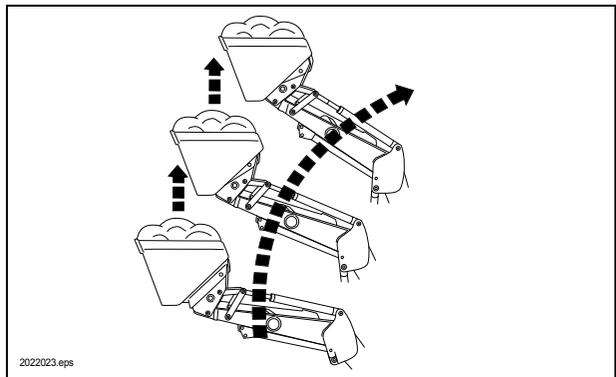


### NOTE

- Do not be concerned if the bucket is not completely filled during each pass.
- Maximum productivity is determined by the total sum of the material loaded and moved in a given period of time.
- More time is lost if two or more attempts are made to fully fill the bucket at every pass.

### ■ Lift the Load

Always keep the upward orientation (see the figure below) of the bucket during load lifting to prevent load spillage.



### ⚠ WARNING

To prevent serious personal injury or death:

- Do not attempt to lift bucket loads in excess of the loader capacity.
- Always move the tractor to level ground before attempting to raise the bucket to the highest position.

### IMPORTANT

- In case the tractor requires increased stability for a particular operation, contact YOUR LOCAL YANMAR TRACTOR DEALER about additional weights for the rear of the tractor.

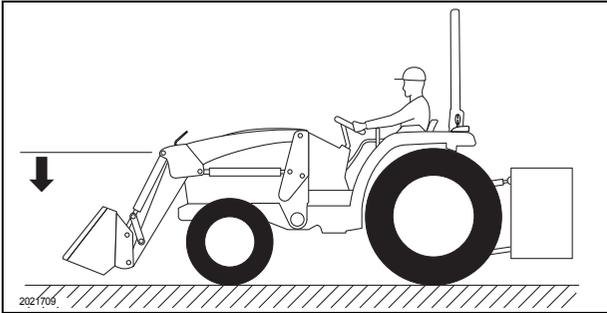
## 6. OPERATE THE LOADER

### ■ Carry the Load

Position the bucket below the level of the tractor hood for maximum stability and visibility. The preceding requirement applies whether the bucket is loaded or empty.

#### **IMPORTANT: Avoid damage!**

- When transporting a load, keep the bucket as low as possible to avoid tipping over. The preceding action is particularly relevant when a wheel drops into a rut.



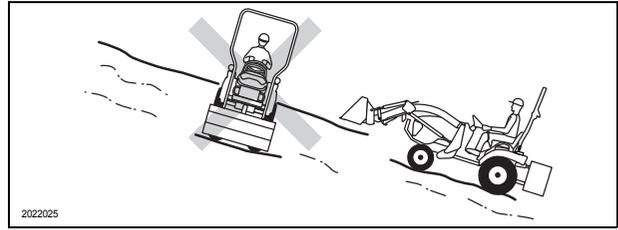
Use extreme care when operating the loader on a slope.

Keep the bucket as low as possible. The preceding practice lowers the bucket and the tractor center of gravity, and provides better tractor stability.

### **WARNING**

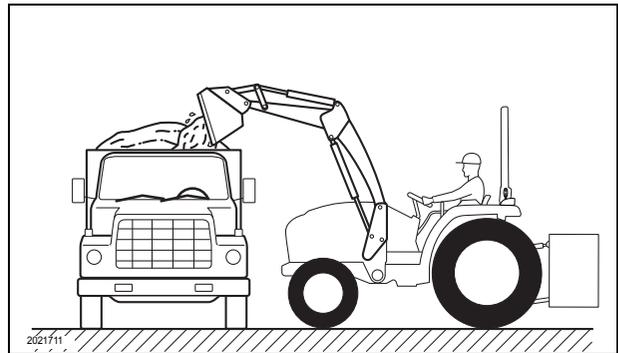
**Avoid injury or death from roll over accidents:**

- Move and turn the tractor at low speeds.
- Watch for hidden hazards such as potholes, ditches and other obstructions which can cause the tractor and the loader to tip over.
- Carry the loads close to the ground to aid visibility and to lower the center of gravity. The preceding practice improves the tractor's stability.
- Balance the loads so the overall weight is evenly distributed and the load is stable.
- Be extra careful when operating on a slope.
- Do not operate on steep slopes.
- Do not abruptly stop, start or change directions on slopes.
- The tractor must always have the retractable seatbelt and the Roll-Over Protective Structure (ROPS). Keep the retractable seat belt securely fastened. Keep the Roll-Over Protective Structure (ROPS) in the unfolded "up" position at all times.

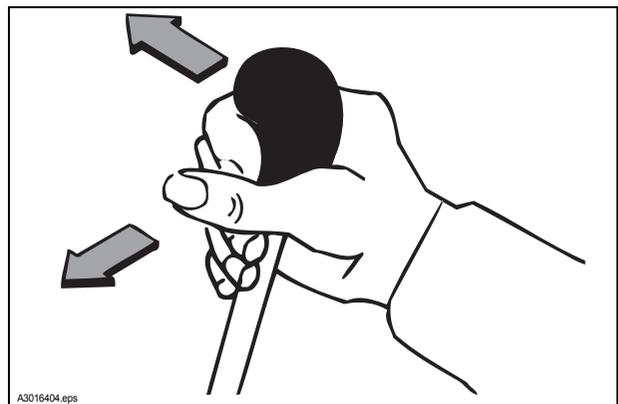


### ■ Dump the Bucket's Load

Lift the bucket high enough to clear the side of the vehicle. Move the tractor as close as possible to the vehicle. Dump the bucket's load.



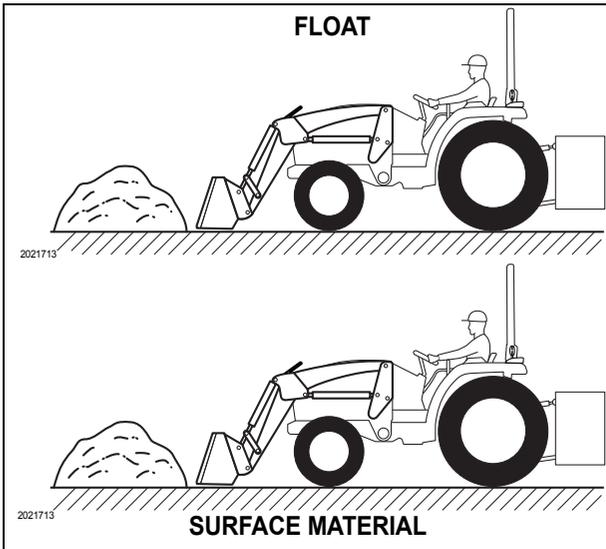
After emptying the bucket, back away from the vehicle while lowering the boom and curling the bucket.



## 6. OPERATE THE LOADER

### ■ Operate with a Float Control

When operating on a hard surface, keep the bucket level and place the implement control lever in the float position. The preceding operation makes the bucket float on the working surface.

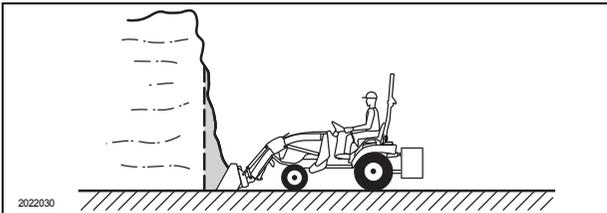


#### NOTE

- Exerting hydraulic down pressure on the bucket causes the bucket to wear out more quickly than normal.
- Allowing the bucket to float prevents the mixing of surface material with the stockpile material. The float position reduces the chance of surface gouging when removing snow or other similar materials.

### ■ Load from a Bank

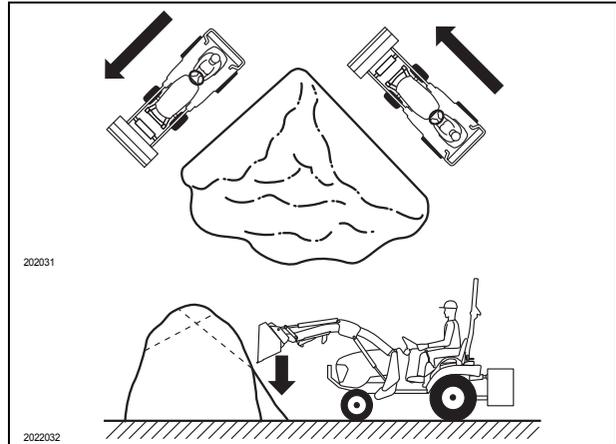
Always maintain a safe forward speed. Only apply the required level of momentum and force for the particular operation.



### ⚠ WARNING

To prevent serious personal injury or death:

- Exercise caution when undercutting high banks.
- Dirt slides can be dangerous.
- Load from as low as possible for maximum efficiency.
- The loader lift and breakaway capacity diminish as the loading height is increased.

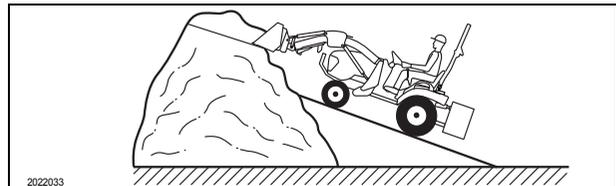


#### NOTE

Always keep the bucket as low as possible.

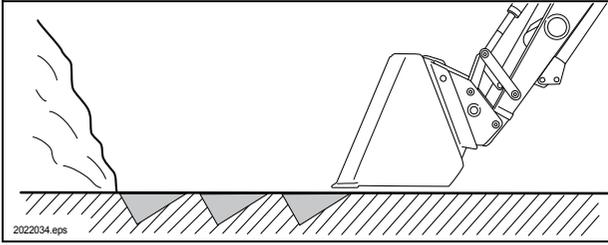
- Cut down the sides of the pile first when:
  - working on a high pile
  - danger of the dirt slides on the cave-ins is present
- Under cut the top of high pile. The preceding action requires less strength.
- When performing the preceding procedure, ensure that the width of the wheels is not greater than the width of the bucket.

Building a ramp in order to access the pile is also an option that can be used with large piles.



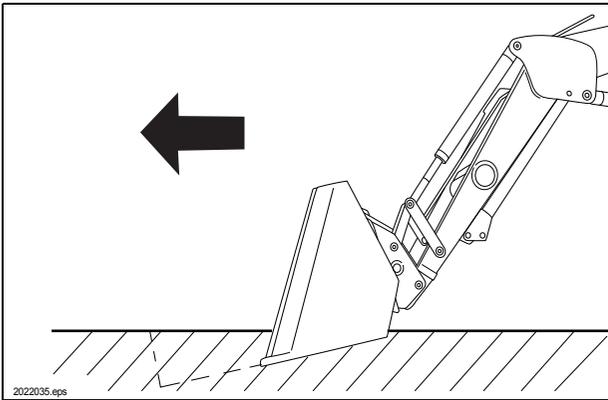
## 6. OPERATE THE LOADER

Always keep the bucket level when approaching a bank or pile. The preceding practice helps prevent gouging in the work area.



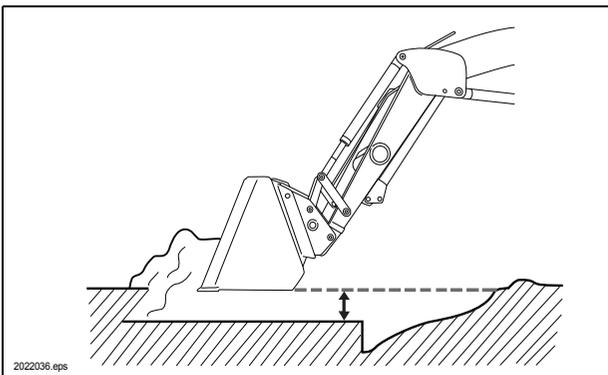
### ■ Peel and Scraping

Use a slight bucket angle, travel forward, and hold the implement control lever forward to start the cut. Make a 5 to 8 in. (127 to 203 mm) angle cut and break out cleanly.



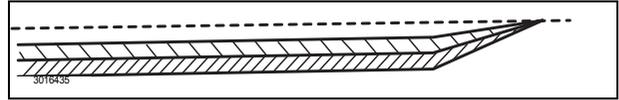
With the bucket level:

- Start a cut at the notch which is approximately 4 in. (102 mm) deep.
- Hold the depth by feathering the bucket control to adjust the cutting lip up or down.
- When the front tires enter the notch, adjust the boom lift cylinder to maintain the correct depth.



Make additional passes until the desired depth is reached:

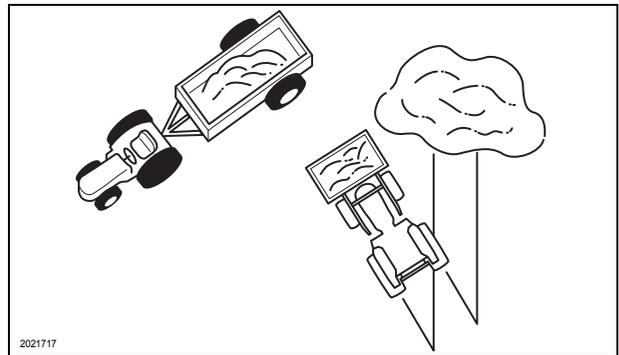
- During each pass, use the implement control lever to control the bucket position while at the working depth.
- The preceding practice allows the operator to concentrate on controlling the bucket angle to maintain a precise cut.



### ■ Load the Pile into a Low bed Truck or Spreader

The following actions results in a more efficient operation:

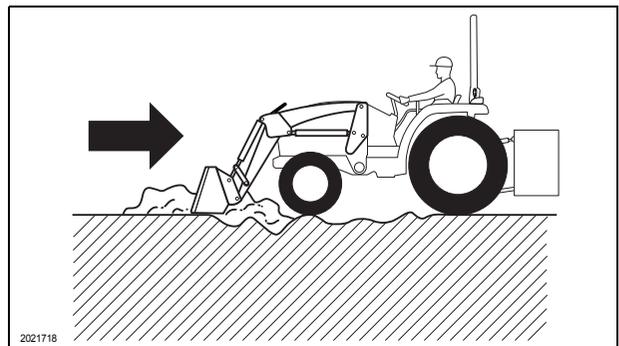
- Park the low bed truck or spreader as close as possible to the pile.
- Minimize the turning angle of the tractor to pick and dump the pile.



### ■ Backgrade

Backgrade occasionally with a loaded bucket to keep the working surface free of ruts and potholes.

- Also, holding the implement control lever forward makes the full weight of the bucket scrape the ground.
- Use the heel of the bucket.

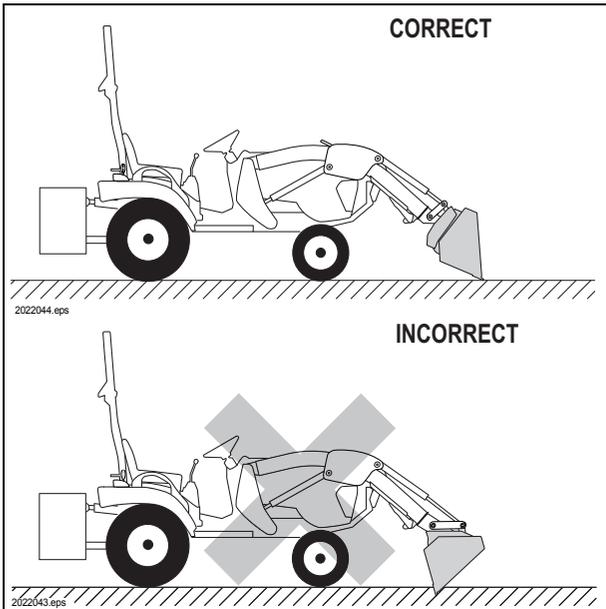


## 6. OPERATE THE LOADER

### ■ Backblade

Position the bucket at an angle of less than 45 degrees and backup slowly:

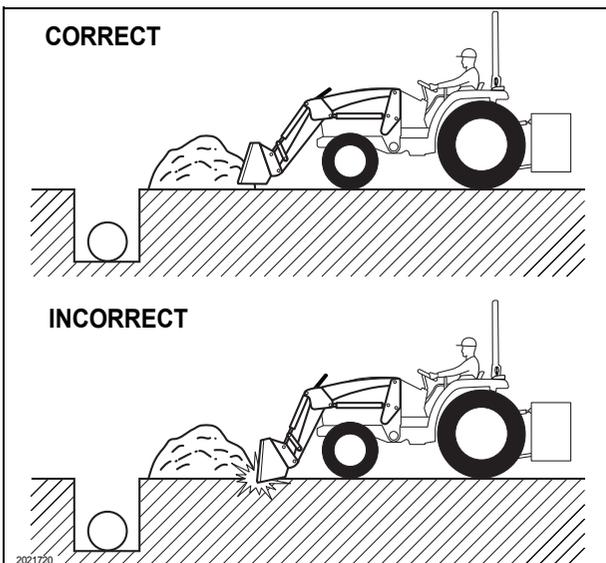
- Backgrading or backblading with the bucket tilted dumped too far damages the bucket cylinders.
- The preceding practice makes the CL600 loader warranty void.



### ■ Backfill

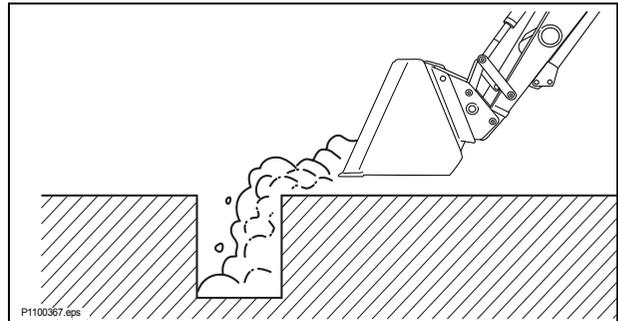
Approach the pile with a flat bucket:

- Do not use the bucket in the dump position for bulldozing.
- If the preceding practice is not observed, excessive shock is applied on the dump linkage, the bucket cylinders and the tractor.

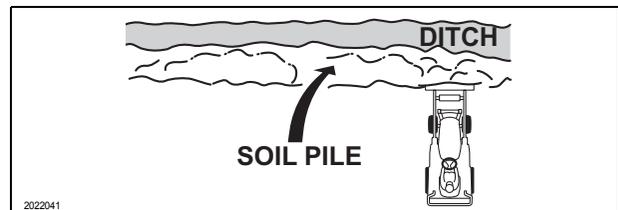


### IMPORTANT: Avoid damage!

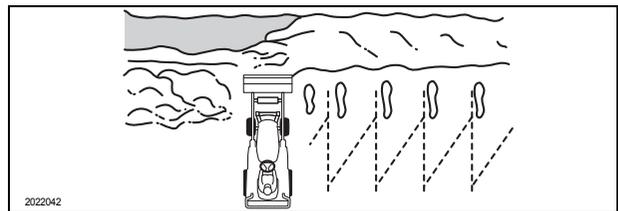
- Do not under any circumstances attempt to use the bucket for bulldozing while the bucket is in the dump position.
- If the preceding practice is not observed, severe impact damage can occur on the dump linkage, the bucket cylinders and the tractor as a whole.
- For more efficient operation, do not attempt to dump all the dirt out of the bucket after each pass.



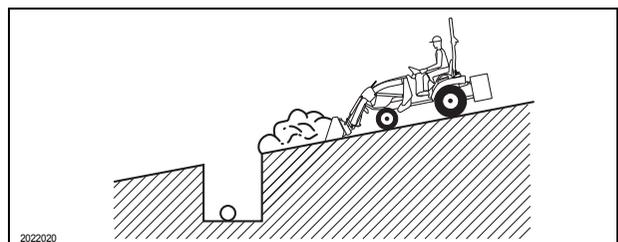
Operate at right angles to the ditch. Take a bite as big as the tractor can handle without lugging down.



Leave dirt which drifts over the side of the bucket for a final clean up.



Pile dirt on the high side for easier backfilling on a slope.



### ■ Handle Objects

#### **WARNING**

To prevent serious personal injury or death:

- The loader is not equipped with any mechanism which prevents objects such as round bales, posts, logs, etc. from curling down onto the operator.
- Do not carry large objects that can fall out of the loader bucket into the operator station.
- Do not under any circumstances lift the loader higher than necessary to clear the ground.
- Be careful when handling large or heavy objects, as there is a danger of the tractor rolling over or upending. The object can also fall off or slide down along the boom and hit the operator.
- When performing any of the operations described above:
  - always move and turn the tractor at slow speeds
  - avoid rough and uneven terrain as much as possible
  - always keep the bucket as low as possible but just high enough to clear the ground during travel
  - make the distance a load needs to be transported as short as possible
  - carry the load as low as the road or terrain permits
  - if there is no anti-rollback mechanism on the tractor, do not attempt to lift large or heavy objects
  - add an amount of rear ballast that is required to compensate for the load

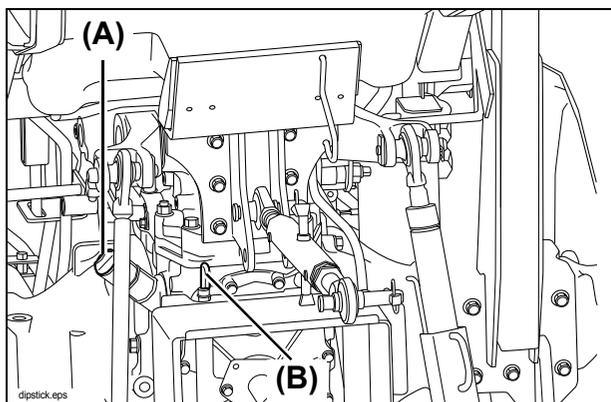
# 7. PERIODIC SERVICE

## 1. Daily Checks

### ■ Check the Transmission Hydraulic Oil Level

Read the Lx410/450/490 tractor *Operator's Manual* for the procedure on how to check the transmission hydraulic oil level. When checking the transmission hydraulic oil level, lower the loader bucket and the 3-point hitch to the ground. Add transmission hydraulic oil as necessary.

- Before any routine operation, check the tractor's transmission hydraulic oil level. If the transmission hydraulic oil level is low, add the appropriate amount of transmission hydraulic oil. Follow the procedure described in "Inspect the Transmission Hydraulic Oil Level" in the "Lx410/450/490 *Operator's Manual*".
- Regularly check and change the transmission hydraulic oil and transmission hydraulic oil filter. Follow the procedure described in "Change the Transmission Hydraulic Oil, Clean the Transmission Hydraulic Oil Filter and Replace the Transmission Hydraulic Oil Filter" in the "Lx410/450/490 *Operator's Manual*".



(A) Transmission hydraulic oil filler cap  
(B) Dipstick

### ■ Check the Wheel Bolt Tightening Torque

#### ⚠ WARNING

- Always keep the wheel bolts tightened to the specified torque.
- Do not under any circumstances drive the tractor with the loose wheel bolts.

When a tire is replaced and the tire tread width is adjusted, ensure at the following intervals that the wheel bolt tightening torque is within the specified tightening torque values:

- After the first hour of operation.
- After every 4 hours of operations until the tightening torque values are reached and maintained.

### ■ Tightening Torque

Wheel bolts	Front wheel	123.15 to 151.91 ft•lbs (167 to 206 N•m)
	Rear wheel	101.17 to 108.34 ft•lbs (137.2 to 147 N•m)

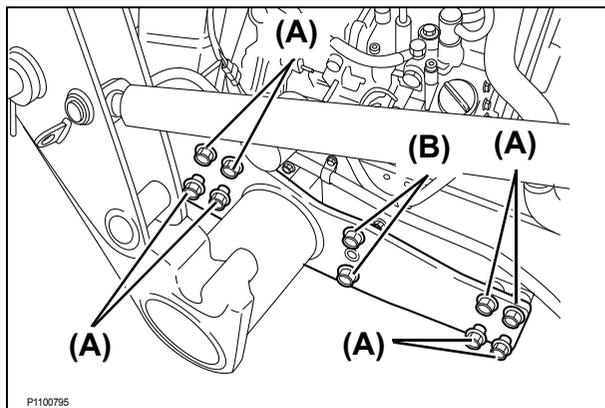
### ■ Check the Hydraulic Hoses

Check the hydraulic hoses for fractures/fissures, cracks or any other damage. If any damage or oil leaks are found, immediately replace the hydraulic hose.

## 2. First 10 Hours

### ■ Tighten the Loader Mount Bolt

At the first 10 hours of operation, tighten the ten bolts located on each side of the loader mount to the specified torque. See the table below for the specified torque.



(A) Loader mount bolts  
(B) Loader mount bolts

## 7. PERIODIC SERVICE

### Loader Mount Bolt Tightening Torque

(A) Bolt M16 × 45 mm (L: 1.7 in.)	224 to 253 ft•lbs
(B) Bolt M16 × 80 mm (L: 3.1 in.)	(304 to 343 N•m)

### 3. Every 50 Hours

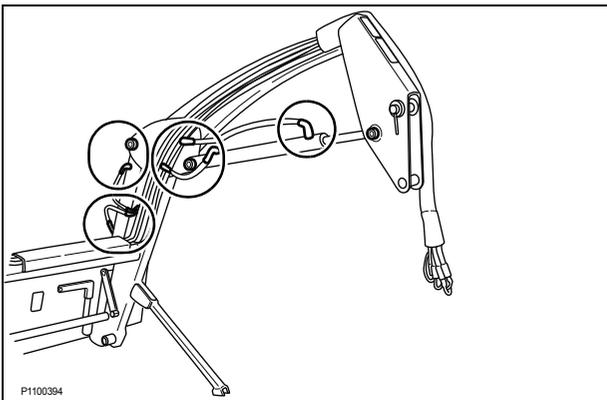
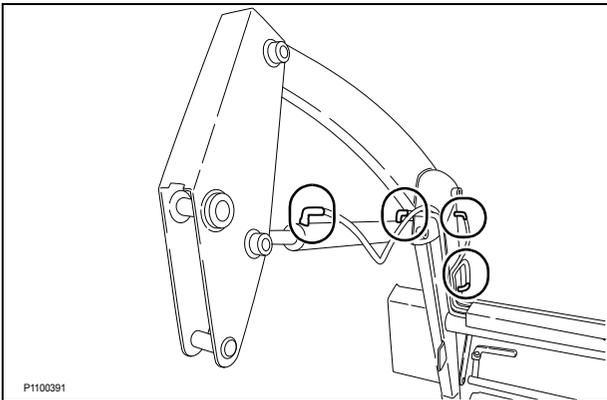
#### ■ Check the Loader Mount Bolt Tightening Torque

After every 50 hours of operations, tighten the ten bolts located on each side of the loader mounts to the specified torque. For details, see the "Loader Mount Bolt Tightening Torque" table on page 7-2 for the specified torque.

#### ■ Check the Hydraulic Fittings

After every 50 hours of operations, check the tightening torque of the hydraulic fittings. As necessary, tighten the hydraulic fittings to the specified torque. See the table below for the specified torque.

9/16 - 16	18 to 20 ft•lbs
3/4 - 16	33 to 39 ft•lbs



#### **IMPORTANT: Avoid damage!**

- Make sure not to twist the hoses when tightening the hydraulic fittings.

### 4. Every 2 Years

#### ■ Replace the Hydraulic Hoses

Replace the hydraulic hoses every 2 years.

#### **WARNING**

##### Avoid injury!

- The rubber products have a deteriorative character. The deteriorated rubber product may cause such as fluid leakage, fire, burn injury.

### 5. Daily Performance Checks

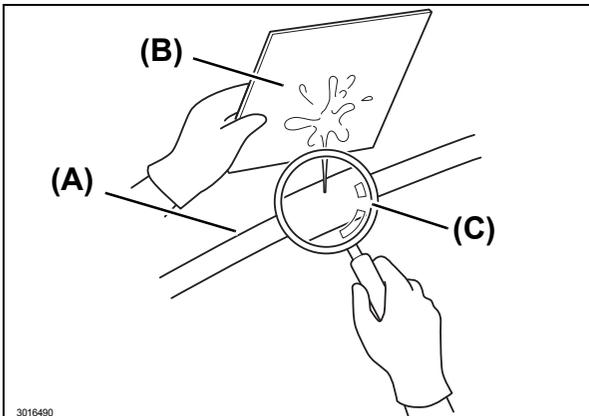
Always perform the following operations before attempting to start or operate the loader. Failure to complete the operations can result in personal injury and can shorten the service life of the tractor, the loader and the components.

1. Check all the components. Tighten all the components to the specified torque, as indicated in the "Tightening Torque" on page 7-1.
2. While the engine is off and the bucket is lowered to the ground, check all hoses for damage, wear or leakage. Make sure all fittings are tight.

## ⚠ WARNING

To prevent serious personal injury or death:

- Before applying pressure to the hydraulic system:
  - make sure that all connections are tight
  - the hoses and pipes are not damaged or worn out in any way
- Make sure to release all hydraulic pressure before disconnecting any hydraulic lines.
  - pressurized transmission hydraulic oil has enough force to penetrate the skin and can cause serious injury
- The oil escaping from pinholes is very difficult to see:
  - always use a piece of cardboard or wood to protect body parts when searching for leaks
  - do not under any circumstances use hands or any body part to detect pressurized oil leaks
  - use a magnifying glass as an aid to find leaks



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- (A) Hydraulic line
- (B) Cardboard
- (C) Magnifying glass

- If an injury does occur due to escaping oil, immediately consult a physician to receive the appropriate medical treatment to prevent serious infection or allergic reaction.
- Make sure that all surfaces have cooled off before attempting to perform maintenance work.
- Be especially careful not to touch any of the loader's hydraulic cylinders when opening or closing the hood.

# 8. DETACH AND STORE

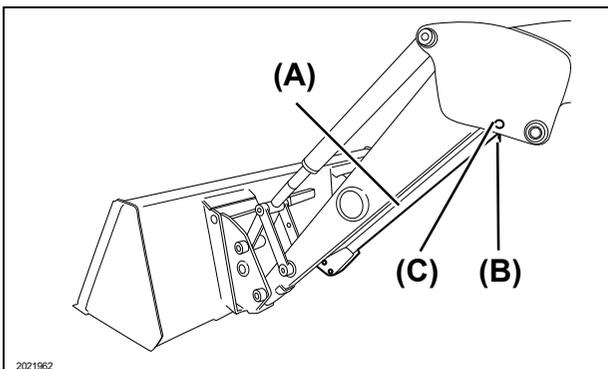
## 1. Detach the Loader

### WARNING

To prevent serious personal injury or death:

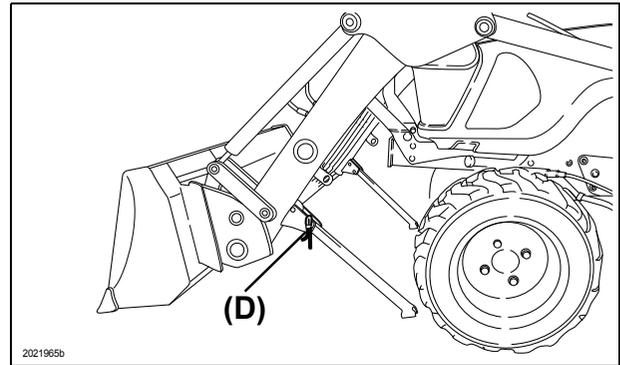
- During removal of the loader from the tractor:
  - always ensure that an approved bucket is attached
  - perform the operation with the tractor and the loader on flat and hard ground, if possible, on a concrete surface
  - if, for any reason, the work has to be performed on soft ground, always lay sufficiently strong planks or boards on the ground to support the bucket and the loader stands
- Always sit on the operator seat when starting the engine or operating the implement control lever.
- Make sure that both the bucket and the loader stands are firmly resting on the ground.

1. Make sure that all the levers are in N (neutral) position.
2. Start the engine.
3. Disengage the parking brake.
4. Raise the boom until the loader stands can be utilized.
5. Shut off the engine.
6. Remove the hairpin clips (B) from the upper clevis pins on the loader stands.
7. Remove the upper clevis pins (C).
8. Lower the loader stands (A) to the weight bearing position.



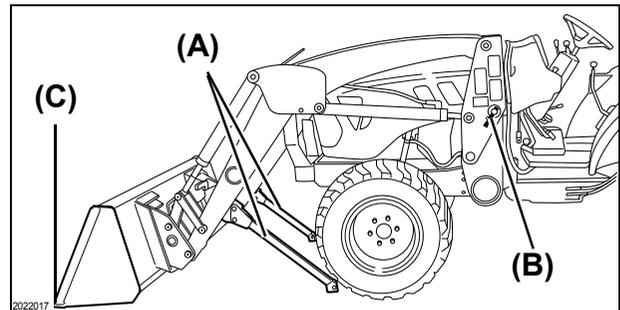
(A) Loader stand  
(B) Hairpin clip  
(C) Upper clevis pin

9. Install the upper clevis pins and hairpin clip.
10. Remove the lower hairpin clip and clevis pin and align the loader stand to the hole.
11. Install the clevis pin and hairpin clip.
12. Perform the preceding procedure to the other side loader stand.



(D) Clevis pin and hairpin clip (in the hole) in the weight bearing position

13. Start and run the engine at idle speed.
14. Use the implement control lever to lower the boom until the loader stands (A) are in contact with the ground.
  - Dump the bucket until the tip of the bucket (C) rests on the ground.
15. Continue dumping the bucket until the front wheels are slightly off the ground.
16. Shut off the engine.
17. Remove the mast mounting pins (B) from the mast assemblies.



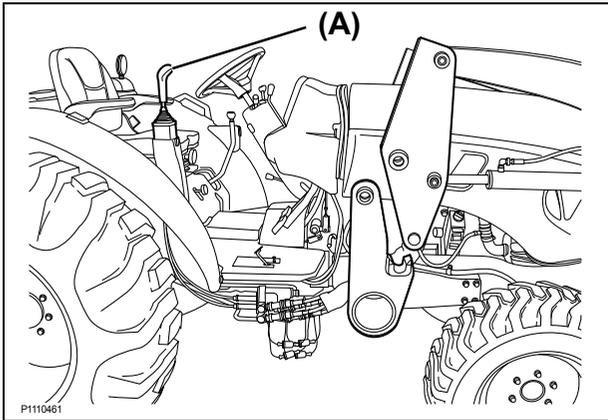
(A) Loader stands  
(B) Mast mounting pin  
(C) Tip of the bucket

### IMPORTANT: Avoid damage!

- The loader stands are not designed to support the tractor when the front wheels are lifted off the ground.

18. Start and run the engine at idle speed.

- Carefully operate the implement control lever (A) to curl the bucket until the mast assembly is separated from the loader mount. See the picture below.



**(A) Implement control lever**

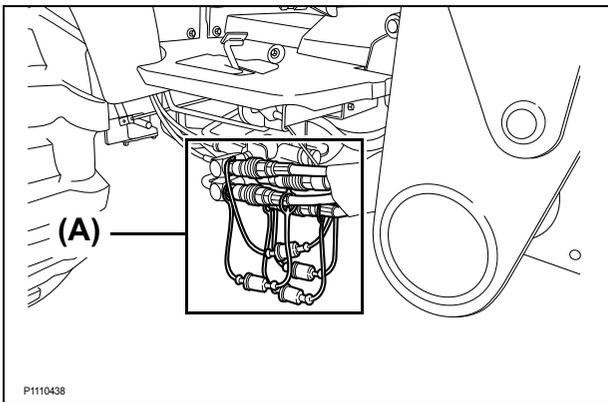
19. Continue curling the bucket until the entire lower portion of the bucket rests on the ground.

20. Shut off the engine.

21. Slowly move the implement control lever in all directions to release the hydraulic pressure.

22. Disconnect the four hoses from the implement control valves through the hydraulic quick couplers (A).

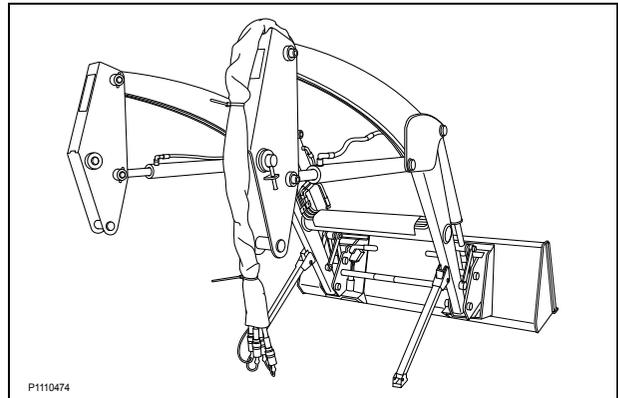
23. Place the hoses above the right section of the boom.



**(A) Hydraulic quick couplers**

## 2. Store the Loader

1. Store the loader in a clean, dry location preferably indoors. Make sure that the loader is properly and securely supported.
2. Protect the hydraulic quick couplers from dust by attaching the protective plugs and caps.
3. Inspect all hydraulic hoses, connections and other parts. As necessary, repair or replace any worn out, damaged or missing parts.
4. Follow the procedure in "Lubricate" on page 5-1. Lubricate the loader.
5. In order to prevent rust during storage, apply a coat of grease to all exposed cylinder rods and mounting pins. Repaint or replace all worn out and scratched parts.



# 9. INSTALLATION

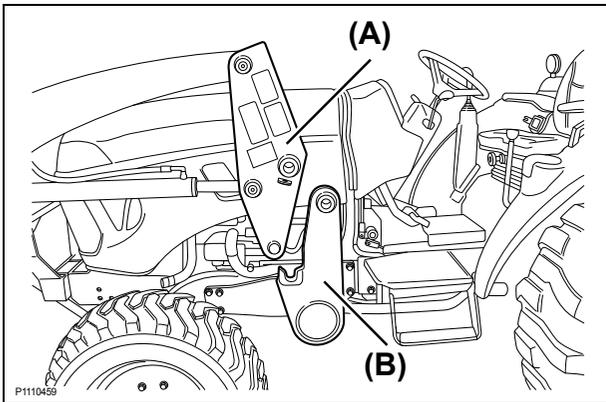
## 1. Attach the Loader

### ⚠ WARNING

To prevent serious personal injury or death:

- Always sit on the operator seat when starting the engine or operating the implement control lever.

1. Make sure that all the levers are in N (neutral) positions.
2. Start the engine.
3. Disengage the parking brake.
4. Drive the tractor forward between the mast assemblies (A).
5. Place the mast assembly in contact with the loader mount (B) by driving the tractor forward between the mast assemblies.



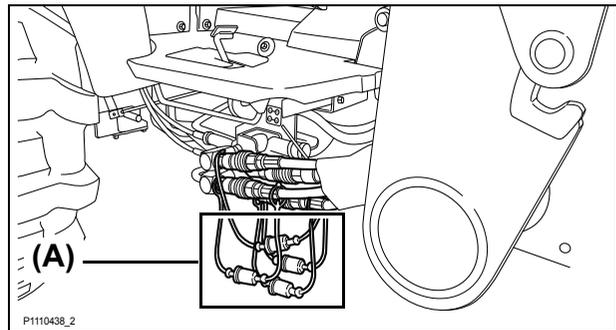
(A) Mast assembly  
(B) Loader mounts

6. Shut off the engine.
7. Slowly move the implement control lever in all directions to release the hydraulic pressure.
8. Connect the hydraulic quick couplers of the loader to the implement control valve.
  - Make sure to match the color and number of the implement control valve to the color and number of the hydraulic quick couplers of the loader.

### NOTE

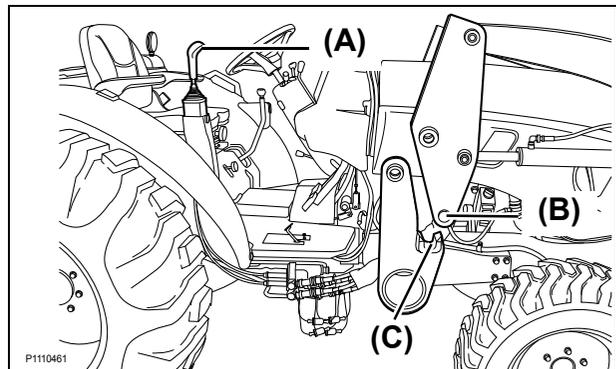
- Before connecting the hydraulic quick couplers, decrease the internal hydraulic pressure in the loader side hydraulic hoses.

9. Connect the protective plugs and caps together.



(A) Protective plugs and caps

10. Start and run the engine at idle speed.
11. Operate the implement control lever (A) to dump the bucket.
12. As necessary, lift or lower the boom until the mast fulcrum (B) of the mast assemblies engages the pivot (C) located on the loader mounts.



(A) Implement control lever  
(B) Mast fulcrum (mast assembly)  
(C) Pivot (loader mount)

13. Dump the bucket further until the front wheels are slightly off the ground.
14. Shut off the engine.
15. Install the mast mounting pins.
16. Start and run the engine at idle speed.
17. Raise the boom to the height where the loader stand is above the ground.
18. Shut off the engine.
19. Return the loader stands to the folded position.
  - Lock the loader stands in place with the clevis pins.
  - Install the hairpin clips into the clevis pins.
20. Start the engine, lower the boom and level the bucket.
21. The mounted loader is now ready for use.

# 10. MOUNT AND DISMOUNT THE BUCKET

## Mount the Bucket

### ⚠ WARNING

- Always position attachments on a solid and level ground when mounting and dismounting the attachments from the quick hitch assembly.

### NOTE

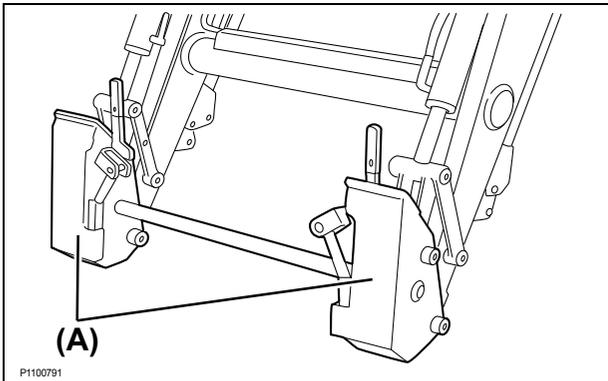
- The loader stand must be in folded position.

1. Pull the handles on the quick hitch assembly latch pins to the highest position to unlock the pins

### ⚠ WARNING

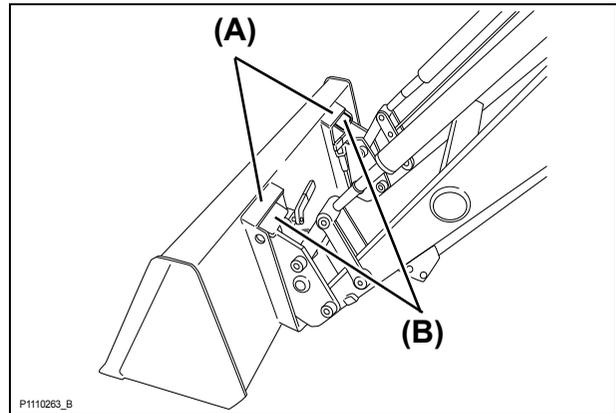
- Make sure that the latch pins are fully retracted.

2. Move the tractor squarely in front of the bucket and use the implement control lever to dump the quick hitch assembly (A) forward.



(A) Quick hitch assembly

3. Slide the quick hitch assembly (A) mounting plate slowly into the bucket saddle.
4. With the bucket still on the ground, use the implement control lever to dump the quick hitch assembly backward and slightly raise the boom.
  - Make sure that the rear of the bucket is resting flat against the front of the mounting plate of quick hitch assembly and that the loader is supporting the full weight of the bucket.



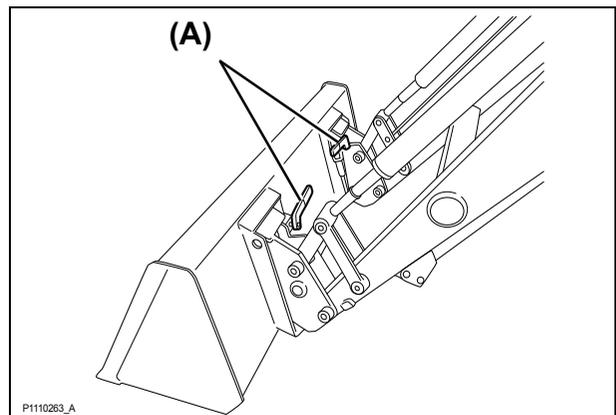
(A) Saddle of attachment  
(B) Mounting plate of quick hitch assembly

### ⚠ CAUTION

#### Avoid injury!

- Make sure that a part of the bucket remains in contact with the ground at this point so that the bucket does not swing off of the quick hitch assembly.

- Make sure that the mounting plate of quick hitch assembly is seated securely in the bucket saddle and that the bucket saddle is in contact with the front of the mounting plate.
5. Shut off the engine.
  6. Engage the parking brake securely.
  7. Push the handles of the quick hitch assembly (A) back to the fully locked position.
  8. Check that both latch pins are fully inserted into the base of the bucket.



(A) Quick hitch assembly latch pin handles

## 10. MOUNT AND DISMOUNT THE BUCKET

9. The mounted attachment is now ready for use.

### CAUTION

#### Avoid injury!

- Make sure that the bucket is mounted securely before operation or transport.
- Always replace immediately any damaged hardware.

### ■ Dismount the Bucket

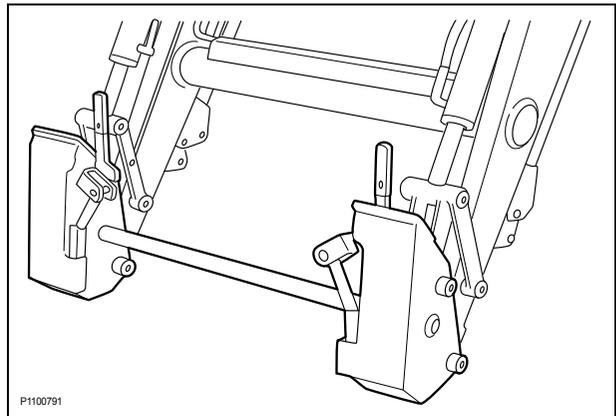
#### NOTE

- The loader stands must be in folded position.

1. Level the bucket slightly and lower the bucket to the ground.
2. Shut off the engine.
3. Engage the parking brake securely.
4. Pull up the handles of the latch pins of the quick hitch assembly to the highest position to unlock the latch pins.
5. Sit on the operator seat.
6. Start the engine and run at idle speed.
7. Slowly move the implement control lever in the dump position to slightly push the bucket away from the quick hitch assembly.
8. Lower the loader boom until the mounting plate of the quick hitch assembly is clear of the bucket saddle.
9. Slowly move back the tractor away from the dismounted bucket.

### ■ Maintenance

- An over center latch system is used to secure bucket to the quick hitch assembly. Always keep the parts of the system clean, lubricated and free from dirt and debris.
- Make sure that the latch pins and handles of the quick hitch assembly are free from dirt and debris.
- Apply grease to the latch pins on a weekly basis.
- Keep the latch pins lubricated.



- Always keep the hex nuts of the latch pin handles of the quick hitch assembly tightened.
- Always clean the bucket saddle.
- Remove any dirt and debris from latch pin holes before attempting to mount the bucket to the quick hitch assembly.

# 11. TROUBLESHOOTING

	Problem	Possible cause/s	Remedy
1	<b>Loader does not rise smoothly.</b>	1. A problem with the transmission hydraulic oil.	1. Transmission hydraulic oil <ul style="list-style-type: none"> <li>• Check whether the transmission hydraulic oil level is correct.</li> <li>• adjust the transmission hydraulic oil level</li> <li>• Check whether the ambient temperature is too low.</li> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER for the recommended remedy</li> <li>• Check whether the transmission hydraulic oil is dirty.</li> <li>• change the transmission hydraulic oil and transmission hydraulic oil filter</li> </ul>
		2. A problem other than 1 above.	2. Other problems <ul style="list-style-type: none"> <li>• Check whether the hydraulic pump is worn out or damaged.</li> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER</li> <li>• Check whether air is trapped in the hydraulic system.</li> <li>• operate the implement control lever several times to bleed air</li> <li>• Check whether there is air leak in pump inlet line.</li> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER</li> </ul>
2	<b>Loader rises too slowly.</b>	1. A problem with the implement control valve.	1. Implement control valve <ul style="list-style-type: none"> <li>• Check whether the implement control valve is worn out or damaged.</li> <li>• repair or replace the implement control valve</li> <li>• Check whether the hydraulic quick couplers are connected properly.</li> <li>• connect the hydraulic quick couplers properly</li> </ul>
		2. A problem with the transmission hydraulic oil.	2. Transmission hydraulic oil <ul style="list-style-type: none"> <li>• Check whether the transmission hydraulic oil level is correct.</li> <li>• adjust the transmission hydraulic oil level</li> <li>• Check whether the ambient temperature is too low.</li> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER for the recommended remedy</li> <li>• Check whether the transmission hydraulic oil is dirty.</li> <li>• change the transmission hydraulic oil and transmission hydraulic oil filter</li> </ul>

## 11. TROUBLESHOOTING

		<p>3. A problem other than 1 and 2 above.</p>	<p>3. Other problems</p> <ul style="list-style-type: none"> <li>• Check whether air is trapped in the hydraulic system.</li> <li>• operate the implement control lever several times to bleed air</li> <li>• Check whether there is oil leak in hydraulic cylinder seals.             <ul style="list-style-type: none"> <li>• replace hydraulic cylinder seals</li> </ul> </li> <li>• Check whether the hydraulic pump is worn out or damaged.             <ul style="list-style-type: none"> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER</li> </ul> </li> <li>• Check whether there is maladjustment or malfunctioning of implement control valve.             <ul style="list-style-type: none"> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER</li> </ul> </li> <li>• Check whether the engine speed is insufficient.             <ul style="list-style-type: none"> <li>• run the engine at a higher and appropriate speed</li> </ul> </li> </ul>
<p><b>3</b></p>	<p><b>Oil leaks.</b></p>	<p>1. A problem with the hydraulic fittings or hoses.</p>	<p>1. Hydraulic fittings or hoses.</p> <ul style="list-style-type: none"> <li>• Check whether the hydraulic fittings or hoses are worn out or damage.             <ul style="list-style-type: none"> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER</li> </ul> </li> <li>• Check whether the hydraulic fittings or hoses are connected properly.             <ul style="list-style-type: none"> <li>• connect the hydraulic fittings or hoses properly</li> </ul> </li> </ul>
		<p>2. A problem other than 1 above.</p>	<p>2. Other problems</p> <ul style="list-style-type: none"> <li>• Check whether the hydraulic cylinder seals are worn out or damaged.             <ul style="list-style-type: none"> <li>• replace hydraulic cylinder seals</li> </ul> </li> <li>• Check whether the implement control valve is worn out or damaged.             <ul style="list-style-type: none"> <li>• replace the implement control valve</li> </ul> </li> </ul>
<p><b>4</b></p>	<p><b>Loader cannot raise load.</b></p>	<p>1. A problem with the transmission hydraulic oil.</p>	<p>1. Transmission hydraulic oil</p> <ul style="list-style-type: none"> <li>• Check whether the transmission hydraulic oil level is correct.             <ul style="list-style-type: none"> <li>• adjust the transmission hydraulic oil level</li> </ul> </li> <li>• Check whether the ambient temperature is too low.             <ul style="list-style-type: none"> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER for the recommended remedy</li> </ul> </li> <li>• Check whether the transmission hydraulic oil is dirty.             <ul style="list-style-type: none"> <li>• change the transmission hydraulic oil and transmission hydraulic oil filter</li> </ul> </li> </ul>

## 11. TROUBLESHOOTING

		2. A problem other than 1 above.	<p>2. Other problems</p> <ul style="list-style-type: none"> <li>• Check whether the hydraulic cylinder seals are worn out or damaged. <ul style="list-style-type: none"> <li>• replace hydraulic cylinder seals</li> </ul> </li> <li>• Check whether the hydraulic pump is worn out or damaged. <ul style="list-style-type: none"> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER</li> </ul> </li> <li>• Check whether there is maladjustment or malfunctioning of implement control valve. <ul style="list-style-type: none"> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER</li> </ul> </li> <li>• Check whether the hydraulic quick couplers are connected properly. <ul style="list-style-type: none"> <li>• connect the hydraulic quick couplers properly</li> </ul> </li> <li>• Check whether an excessive load is being placed on the loader. <ul style="list-style-type: none"> <li>• reduce the load</li> </ul> </li> </ul>
5	<b>Loader leaks down.</b>	1. A problem with the hydraulic circuits.	<p>1. Hydraulic circuits</p> <ul style="list-style-type: none"> <li>• Check whether the hydraulic fittings or hoses are worn out or damaged. <ul style="list-style-type: none"> <li>• contact YOUR LOCAL YANMAR TRACTOR DEALER</li> </ul> </li> <li>• Check whether the hydraulic cylinder seals are worn out or damaged. <ul style="list-style-type: none"> <li>• replace hydraulic cylinder seals</li> </ul> </li> </ul>
		2. A problem other than 1 above.	<p>2. Other problems</p> <ul style="list-style-type: none"> <li>• Check whether the implement control valve is worn out or damaged. <ul style="list-style-type: none"> <li>• replace the implement control valve</li> </ul> </li> </ul>
6	<b>Loader does not lower.</b>	1. A problem with the hydraulic quick couplers.	<p>1. Hydraulic quick couplers</p> <ul style="list-style-type: none"> <li>• Check whether the hydraulic quick couplers are connected properly. <ul style="list-style-type: none"> <li>• connect the hydraulic quick couplers properly</li> </ul> </li> </ul>
7	<b>Hydraulic quick couplers are hard to hook up.</b>	1. A problem with the hydraulic circuit.	<p>1. Hydraulic circuit</p> <ul style="list-style-type: none"> <li>• Check whether there is hydraulic pressure in the hydraulic circuit. <ul style="list-style-type: none"> <li>• place the implement control lever to float position when connecting</li> <li>• have another person to perform the preceding procedure</li> </ul> </li> </ul>
8	<b>Loader does not react correctly to implement control lever movement.</b>	1. A problem with the hydraulic quick couplers.	<p>1. Hydraulic quick couplers</p> <ul style="list-style-type: none"> <li>• Check whether the hydraulic quick couplers are connected properly. <ul style="list-style-type: none"> <li>• connect the hydraulic quick couplers properly</li> </ul> </li> </ul>

# 12. ASSEMBLY INSTRUCTIONS

**NOTE**

- *The procedures described in this section are designed to be performed only by trained and experienced tractor technicians.*
- *The procedure must not be performed by untrained or inexperienced individuals.*
- *Untrained or inexperienced individuals must seek the assistance of an authorized Yanmar service technician or dealer.*

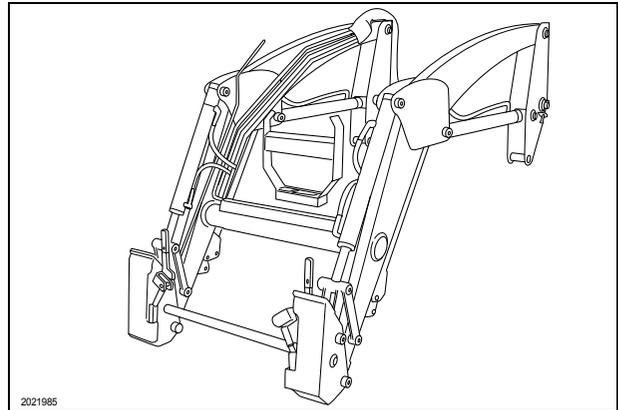
## 1. Preparation for Assembly

- Move the tractor and the loader to an assembly area.
- Make sure that the area is large enough to accommodate the tractor with an attached loader.
- Park the tractor on a solid and level ground.
- Shut off the engine.
- Engage the parking brake securely.
- Make sure to use an overhead lift with the capacity of more than 3 tons.
- Move the tractor and the shipping pallet to the location of the overhead lift.
- Carefully remove all the components from the shipping pallet.
- Make sure that all the components listed in "2. Kit Contents" below are in the assembly area and easily accessible.

## 2. Loader Kit

### 1. Kit Name

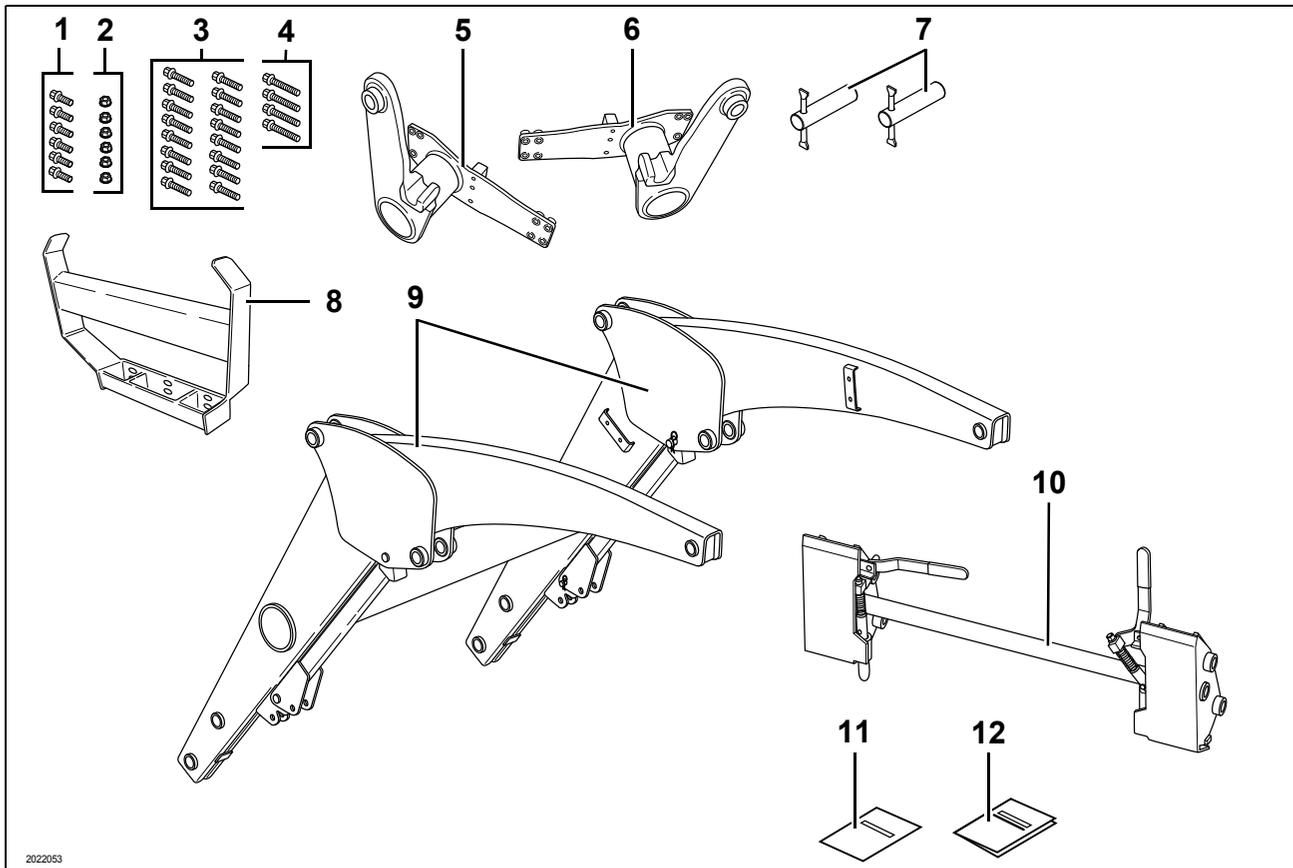
- Loader assembly
- Quick hitch (universal) kit



## 12. ASSEMBLY INSTRUCTIONS

### 2. Kit Contents

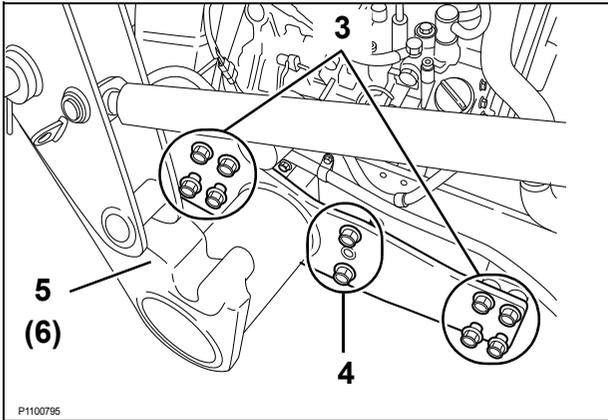
Item No.	Description	Q'ty	Remarks (General Term)	Tightening Torque (ft•lbs (N•m))
1	BOLT 12 × 35	6	Flange bolt 12 × 35 mm (L: 1.4 in.) for Front grille	
2	NUT 12	6	Flange nut for Front grille	58 to 72 (78 to 98)
3	BOLT 16 × 45	16	Flange bolt 16 × 45 mm (L: 1.7 in.)	224-253 (304-343)
4	BOLT 16 × 80	4	Flange bolt M16 × 80 mm (L: 3.1 in.)	224-253 (304-343)
5	BRACKET R CMP	1	Loader mount R	
6	BRACKET L CMP	1	Loader mount L	
7	LOCK PIN CMP	2	Mast mounting pin	
8	GRILLE GUARD CMP	1	Grille guard	
9	Boom assembly	1		
10	Quick hitch assembly	1		
11	Warranty card	1		
12	<i>Operator's Manual</i>	1		



## 12. ASSEMBLY INSTRUCTIONS

### 3. Install the Loader Kit

1. Install the left and right loader mounts (5, 6).
2. Install the left and right loader mounts to the tractor using the 16 short flange bolts (3) and 4 long flange bolts (4) on each side.

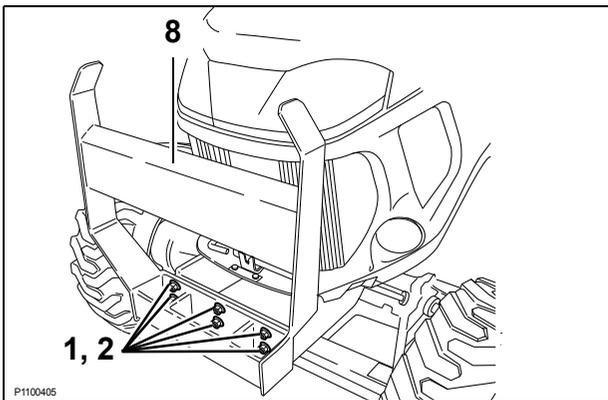


#### Tightening Torque

224-253 ft•lbs (304-343 N•m)

Kit Contents No.	Parts to be installed
3	BOLT 16 × 45..... 16 pcs.
4	BOLT 16 × 80..... 4 pcs.
5	BRACKET R CMP..... 1 pc.
6	BRACKET L CMP..... 1 pc.

3. Install the grille guard (8)
  - 3-a: Install the grille guard (8) into the tractor using the 6 flange bolts (1) and 6 flange nuts (2).



#### NOTE

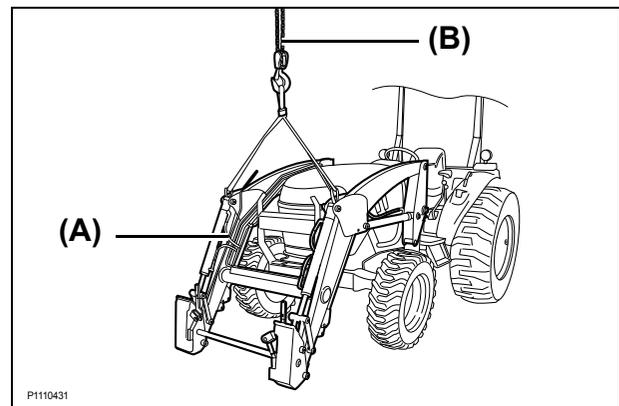
- If the front weight hitch is installed on the tractor, remove the front weight hitch before installing the grille guard.
- Install the bolts from the front side of the tractor.

#### Tightening Torque

58 to 72 ft•lbs (78 to 98 N•m)

Kit Contents No.	Parts to be installed
8	GRILLE GUARD CMP..... 1 pc.
1	BOLT 12 × 35..... 6 pcs.
2	NUT 12..... 6 pcs.

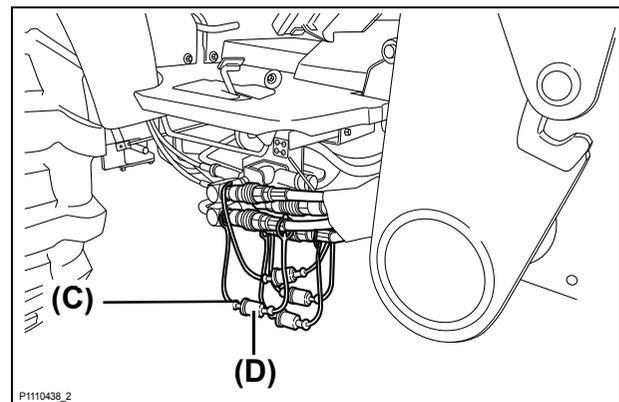
4. Mount the loader onto the tractor.
  - 4-a: Carefully raise the loader (A) with the overhead lift (B).
  - 4-b: Make sure the loader is close enough to connect the hoses to the hydraulic quick couplers on the tractor.
  - 4-c: Connect the loader hoses to the hydraulic quick couplers on the tractor.



(A) Loader  
(B) Overhead lift

#### NOTE

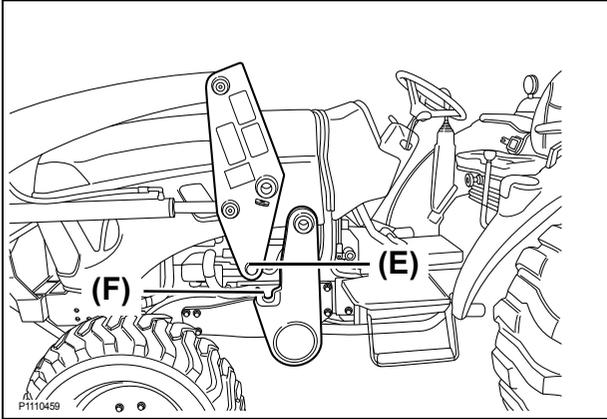
- Insert the protective plugs (C) on the tractor side to the cap (D) on the loader side matching the same color.



(C) Plug (tractor side)  
(D) Cap (loader side)

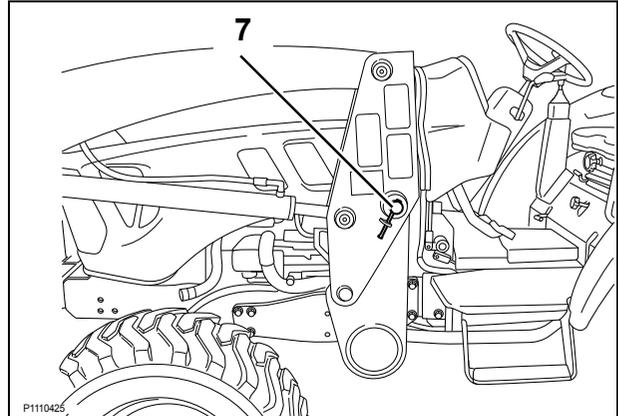
## 12. ASSEMBLY INSTRUCTIONS

- 4-d: Move the implement control lever to the "Raise" position to extend both boom lift cylinders about halfway out.
- 4-e: Carefully lower the loader until the mast fulcrum (E) of the mast is engaged to the loader mount's pivot (F).



**(E) Mast fulcrum**  
**(F) Loader mount's pivot**

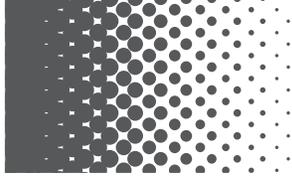
- 4-f: Make sure that the mast fulcrum does not slip out, move the implement control lever to the "Lower" position. The preceding operation:
- Retracts the boom lift cylinders.
  - Aligns the pin hole of the loader mount to the pin holes of the mast.
- 4-g: Install the mast mounting pins (7).



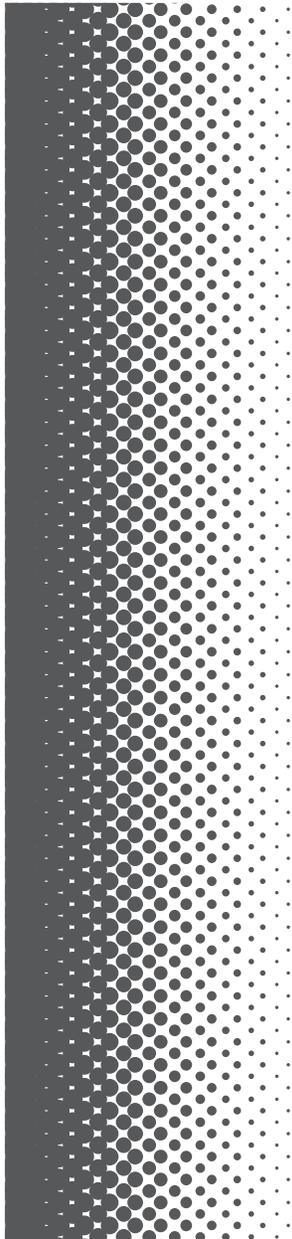
Kit Contents No.	Parts to be installed
7	LOCK PIN CMP.....2 pcs.

**NOTE**

**NOTE**



**LOADER**  
**for LX410/450/490**



**YANMAR**

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