Dear JCB Customer

Even if you have operated this type of equipment before, it is very important that your new machines operations and functions are explained to you by a JCB Dealer Representative following delivery of your new machine.

Following the installation you will know how to gain maximum productivity and performance from your new product.

Please contact your local JCB dealer if the Installation Form has not yet been completed with you.

Your Local JCB Dealer is:

OPERATOR MANUAL

THIS MANUAL SHOULD ALWAYS STAY WITH THE MACHINE

446, 456

ENGLISH - 9811/0320 - ISSUE 3 - SEP 08

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Safety Notices

Introduction

⚠ WARNING

Study the Operator Manual before starting the machine. You must understand and follow the instructions in the Operator Manual. You must observe all relevant laws and regulations. If you are unsure about anything, ask your JCB dealer or employer. Do not guess, you or others could be killed or seriously injured.

INT-1-1-1_2

In this publication and on the machine, there are safety notices. Each notice starts with a signal word. The signal word meanings are given below.

⚠ DANGER

Denotes an extreme hazard exists. If proper precautions are not taken, it is highly probable that the operator (or others) could be killed or seriously injured.

INT-1-2-1

⚠ WARNING

Denotes a hazard exists. If proper precautions are not taken, the operator (or others) could be killed or seriously injured.

INT-1-2-2

⚠ CAUTION

Denotes a reminder of safety practices. Failure to follow these safety practices could result in injury to the operator (or others) and possible damage to the machine.

INT-1-2-3

⚠ WARNING

Use only the JCB approved attachments that are specified for your machine. Operating with non-specified attachments can overload the machine, causing possible damage and machine instability which could result in injury to yourself or others.

The use of non-approved attachments could invalidate your warranty.

2-4-5-2_1

Introduction

T1-019

Vandalism and theft of unattended machines is an ever increasing problem and JCB is doing everything possible to help combat this.

Your JCB Distributor or Dealer will be pleased to provide information on any of these sensible precautions. ACT NOW!

JCB Plantguard

JCB PLANTGUARD is a comprehensive package available to help you safeguard your machine. It includes such devices as vandal proof covers, window etching, immobiliser, concealed serial number, battery isolator, Tracker security system and much more.

Remember that the fitting of any one of these security devices will help to minimise not only the damage or loss of your machine but also subsequent lost productivity. It could also result in reduced insurance premiums.

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Operation

Introduction

The aim of this part of the handbook is to guide the operator step-by-step through the task of learning how to operate the machine efficiently and safely. Read the OPERATION section through from beginning to end.

Before starting the machine, sit in the drivers seat and familiarise yourself with the layout of the cab. Use your handbook to identify each control lever, switch, gauge, button and pedal. **Do not guess**. If there is anything you do not understand, ask your JCB Dealer.

The operator must always be aware of events happening outside the cab as well as inside the cab. **Safety** must always be the most important feature when operating the JCB Wheeled Loader.

When you have familiarised yourself with the operating controls, gauges and switches, practice using them. Drive the machine in an open space, clear of people. Get to know the 'feel' of the machine and its driving controls.

Finally, do not rush the job of learning, make sure you fully understand everything in the OPERATION section. Take your time and work efficiently and safely.

Remember

BE CAREFUL

BE ALERT

BE SAFE

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Cab Layout

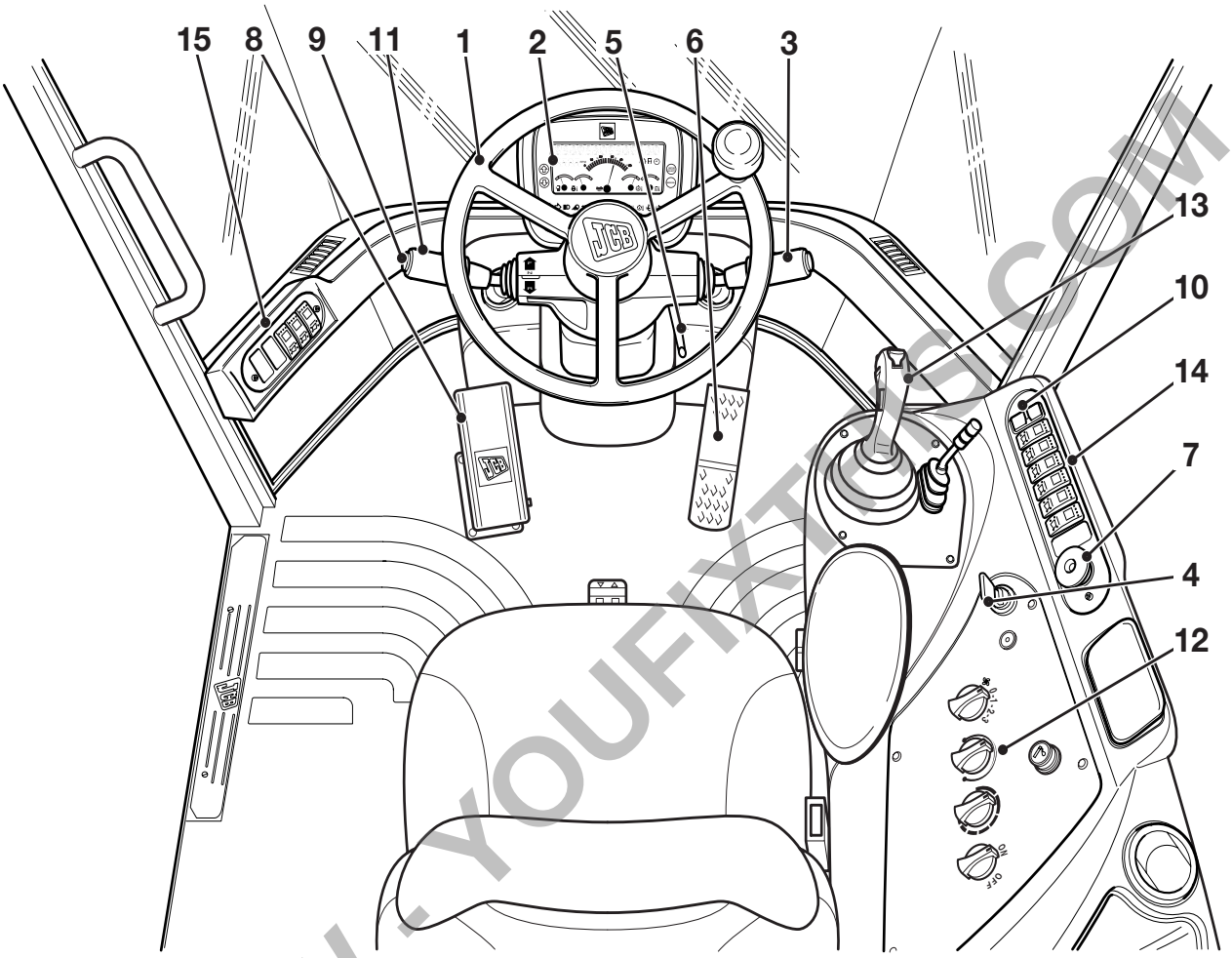


Fig 8.

1 ⇨ *Steering Wheel (22)*.

2 ⇨ *Display Panel (35)*.

3 ⇨ *Steering Column Switch (26)*.

4 ⇨ *Starter Switch (30)*.

5 ⇨ *Steering Wheel - Tilt and Height Adjustment (25)*.

6 ⇨ *Accelerator Pedal (22)*.

7 ⇨ *Parking Brake Switch (22)*.

8 ⇨ *Brake Pedal (22)*.

9 ⇨ *Forward/Reverse Lever (23)*.

10 ⇨ *Forward/Reverse Switch (31)*.

11 ⇨ *Gear Change Switch (24)*

12 ⇨ *Heater/Air Conditioning Controls (34)*

13 ⇨ *Loader Controls (45)*

14 ⇨ *Right Panel Switches (29)*

15 ⇨ *Left Panel Switches (28)*

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Optional Attachments

Introduction

A wide range of optional attachments is available to increase the versatility of your machine. Only JCB approved attachments are recommended for use with your machine. Consult your JCB Dealer for the full list of approved attachments available.

JCB attachments are designed and manufactured specially to suite the machine's hydraulic system, mounting arrangements and safe load requirements. Attachments which are not designed for use with this machine may cause damage and create safety hazards for which JCB cannot be held responsible. In addition the machine's warranty may be affected by the use of non JCB approved attachments.

For other JCB attachments, this information is provided in the form of a specific handbook supplied with each attachment. General installation and removal procedures for these attachments are, however, included here.

Before installing, using or removing any optional attachment, make sure you read and understand the information provided. If there is anything you do not understand, Ask your JCB Dealer.

The 456 Wheeled Loaders are fitted with direct mount attachments as listed below:

3.0 m^3	General Purpose Shovel
3.3 m^3	General Purpose Shovel
3.5 m^3	General Purpose Shovel
3.1 m^3	Penetration Shovel

⚠ CAUTION

If you have an attachment which is not covered in the Operator Manual do not install it, use it or remove it until you have obtained, read and understood the pertinent information. Install attachments only on the machines for which they were designed.

5-5-1-1_2

Should you consider fitting an attachment from an alternative manufacturer, we strongly recommend that you first seek the expert advice of your JCB Dealer to ascertain the compatibility of the attachment with the machine.

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Transporting The Machine

⚠ WARNING

The safe transit of the load is the responsibility of the transport contractor and driver. Any machine, attachments or parts that may move during transit must be adequately secured.

5-2-5-9

Note: *Before transporting the machine make sure you will be obeying the rules and laws of all the areas that the machine will be carried through.*

Make sure that the transporting vehicle is suitable. K Static Dimensions 456 HT (T 134) or K Static Dimensions 456 ZX (T 133) for the dimensions of your machine.

⚠ WARNING

Before moving the machine onto the trailer, make sure that the trailer and ramp are free from oil, grease and ice. Remove oil, grease and ice from the machine tyres. Make sure the machine will not foul on the ramp angle. See Static Dimensions in SPECIFICATION section for the minimum ground clearance of your machine.

2-2-7-5_1

1 Position the trailer.

- **a** For an operational machine, any convenient position will be suitable.
- **b** If the machine is disabled, it will be necessary to align the trailer with the rear of the machine.

2 Place blocks at the front and rear of the trailer wheels.

3 Move the machine onto the trailer.

- **a** Make sure the ramps are correctly in place and secure.
- **b** Set the loader arms, see ⇨ *Moving A Disabled Machine (64)*.
- **c** Carefully drive the machine onto the trailer.
- **d** Engage the parking brake and set the drive to neutral.
- **e** When the machine is safely in position, lower the attachment onto the trailer.
- **f** Check that the overall height of the load is within regulations. Adjust if necessary.
- **g** Switch off the engine.
- **h** Secure the cab.
- **i** Cover the exhaust stack.

4 Put blocks at the front and rear of all four tyres. Anchor the machine to the trailer with chains. The anchor points are shown on ⇨ *Fig 54. (65)*.

5 Measure the maximum height of the machine from the ground. Make sure the truck driver knows the clearance height before he drives away.

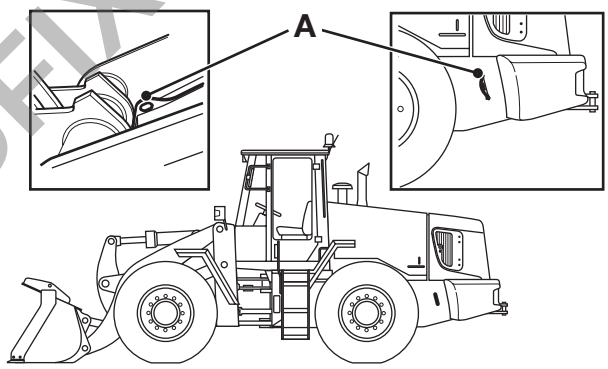


Fig 54.

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Routine Maintenance

Service Requirements

Introduction

T3-002

Your machine has been designed and built to give maximum performance, economy and ease of use under a wide variety of operating conditions. Prior to delivery, your machine was inspected both at the Factory and by your Distributor to ensure that it reaches you in optimum condition. To maintain this condition and ensure trouble free operation it is important that the routine services, as specified in this Manual, are carried out by an approved JCB Distributor at the recommended intervals.

This section of the Manual gives full details of the service requirements necessary to maintain your JCB machine at peak efficiency.

It can be seen from the Service Schedules on the following pages that many essential service checks should only be carried out by a JCB trained specialist. Only JCB Distributor Service Engineers have been trained by JCB to carry out such specialist tasks, and only JCB Distributor Service Engineers are equipped with the necessary special tools and test equipment to perform such tasks, thoroughly, safely, accurately and efficiently.

JCB regularly updates its Distributors advising them of any product developments, changes in specifications and procedures. Therefore only a JCB Distributor is fully able to maintain and service your machine.

A Service Record Sheet or Book is provided which will enable you to plan your service requirements and keep a service history record. It should be dated, signed and stamped by your Distributor each time your machine is serviced.

Remember, if your machine has been correctly maintained, not only will it give you improved reliability but its resale value will be greatly enhanced.

Owner/Operator Support

JCB together with your Distributor wants you to be completely satisfied with your new JCB machine. If you do encounter a problem however, you should contact your Distributor's Service Department who are there to help you!

You will have been given the names of the relevant service contacts at your Distributor when the machine was installed.

To get the most from your Distributor please help them to satisfy you by:

1 Giving your name, address and telephone number.

2 Quoting your machine model and serial number.

3 Date of purchase and hours of work.

4 Nature of the problem.

Remember, only your JCB Distributor has access to the vast resources available at JCB to help support you. In addition, your Distributor is able to offer a variety of programmes covering Warranty, Fixed Price Servicing, Safety Inspections, including weight tests, covering both legal and insurance requirements.

Service/Maintenance Agreements

To help plan and spread the costs of maintaining your machine, we strongly recommend you take advantage of the many Service and Maintenance Agreements your Distributor can offer. These can be tailor made to meet your operating conditions, work schedule etc.

Please consult your JCB Distributor for details.

Initial Service and Inspection (100 Hours)

T3-005

To further protect your machine's performance it is essential your JCB Distributor carries out an initial service and inspection when the machine is one month old or when it has completed 100 hours of operation (whichever occurs first). You should notify your Distributor in advance to allow the necessary arrangements to be made.

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Lubricants and Capacities

Note: *New engines DO NOT require a running-in period. The engine/machine should be used in a normal work cycle immediately; glazing of the piston cylinder bores, resulting in excessive oil consumption, could occur if the engine is gently run-in. Under no circumstances should the engine be allowed to idle for extended periods; (e.g. warming up without load).*

Table 2.

ITEM	CAPACITY	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Engine Oil			
-10 to 50° C (1)	18.9 litres (4.2 UK gal)	JCB Extreme Performance Engine Oil 15W/40	ACEA E3/B3/A3 API CH-4A3
Gearbox	34 litres (7.5 UK gal)(2)	JCB HP Universal ATF	ZF TE-ML 06, 11, 12, 14
Axles- -446 Front/ 456ZX front and Rear/456HT Rear	51 litres (11.2 UK gal)	JCB LS Gear Oil	API GL4, MIL-L-2105B(3)
Axles- -446 Rear	41 litres (9.0 UK gal)	JCB LS Gear Oil	API GL4, MIL-L-2105B(3)
Axles- -456HT Front	69 litres (15.2 UK gal)	JCB LS Gear Oil	API GL4, MIL-L-2105B(3)
Hydraulic System	215 litres (47.3 UK gal)(4)	JCB HP32 Hydraulic Fluid	ISO VG32
Cooling System	40 litres (8.8 UK gal)	Water/Anti-freeze (⇨ ***Coolant Mixtures (🗋 105)***)	ASTM D3306-74
Fuel System	320 litres (71.5 UK gal)	Diesel Oil (⇨ ***Types of Fuel (🗋 112)***)	ASTM D975-66T Nos. 1D, 2D.
Grease Points		JCB HP Grease(5)	Lithium based
Autolube System (if fitted)		JCB MPL EP Grease	Lithium based

(1) If API CH-4 or ACEA E3/B3/A3 engine oil is not available, then the engine oil must be changed every 250 hours.
(2) The figure quoted is TOTAL system capacity. Use the 'MAX' and 'MIN' marks on the dipstick when refilling the system.
(3) Must be suitable for use with oil immersed brakes and limited slip differentials (LSD).
(4) The total hydraulic system capacity depends on the equipment being used. Fill the system with all rams closed and watch the level indicator.
(5) If JCB Special MPL Grease is used, all 100 hour greasing operations must be carried out at TEN (10) HOUR intervals.

Note: *Biodegradable Hydraulic Fluid is a factory option ONLY. Replenish with JCB Biodegradable Multigrade Hydraulic fluid. For further information, contact Wheeled Loader Technical Service.*

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Service Schedules

A badly maintained machine is a danger to the operator and the people working around him. Make sure that the regular maintenance and lubrication jobs listed in the service schedules are done to keep the machine in a safe and efficient working condition.

⚠ WARNING

Maintenance

Maintenance must be done by suitably qualified personnel. Before attempting any maintenance work, make sure the machine is safe. Park on level ground. If it is necessary to work with the loader arms raised, then the loader arm safety strut must be fitted as shown in Loader Arm Safety Strut in MAINTENANCE section.

2-3-1-1

Apart from the daily jobs, the schedules are based on machine running hours. Keep a regular check on the hourmeter readings to correctly gauge service intervals. Do not use a machine which is due for a service. Make sure any defects found during the regular maintenance checks are rectified immediately.

Calendar equivalents:

Every 10 Hours	=	Daily
Every 50 Hours	=	Weekly
Every 500 Hours	=	Six Months
Every 1000 Hours	=	Yearly
Every 2000 Hours	=	2 Years
Every 6000 Hours	=	6 Years

Table 1. Key

☐ Regular Maintenance Check

○ Initial 100 Hour Check Only

Pre-start Cold Checks, Service Points and Fluid Levels	Operation	10 Hr(1)	100 Hr(2)	500 Hr	1000 Hr	2000 Hr
ENGINE						
Oil Level	- Check	☐	☐			
Oil and Filter	- Change		○	☐	☐	☐
Air Cleaner Outer Element	- Change			☐		
Air Cleaner Inner Element (Every 3rd Outer Element)	- Change			☐		
Fuel Filter	- Drain			☐		
Fuel Filter	- Change			☐	☐	☐
Coolant Level	- Check	☐	☐	☐	☐	
Coolant Filter	- Change			☐		
Antifreeze Strength	- Check			☐		
Coolant	- Change					☐
Fuel Sedimenter	- Drain			☐		
Drive Belt Tension/Condition	- Check			☐	☐	☐
Valve Clearances	- Check and Adjust					☐
Engine Mount Security	- Check			☐	☐	☐
Air Compressor Belt Tension/Condition (if fitted)	- Check			☐	☐	☐

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Starting The Engine

⚠ WARNING

Seat Belt

Operating the machine without a seat belt can be dangerous. Before starting the engine, make sure your seat belt is fastened. Check the tightness and condition of the seat belt securing bolts regularly (see maintenance schedules).

INT-2-1-8_1

1 Read and comply with ⇨ ***Before Starting The Engine (51)***.

2 Start the engine

a Fully depress accelerator pedal **B**.

b Turn starter key **A** Fully clockwise to **HS** to start the engine.

c Release the starter key as soon as the engine starts. The switch will return to IGN.

d Ease off on the accelerator pedal to reduce engine speed.

Note: *If the outside temperature is low, 0°C (32°F) or below, turn the starter switch key to the `heat' position for 20 seconds to warm the engine induction manifold.*

⚠ WARNING

Do not use ether or other starting fluids to assist cold starting. Using these fluids may result in an explosion causing possible injury and/or damage to the engine.

3-2-1-9

Note: *If the engine has not started after 20 seconds, release the starter switch. Wait two minutes before attempting another start. This will allow the starter motor to cool down.*

3 **Check the Warning Lights**

Once the engine has started, check that all the warning lights have gone off. Do not race the engine until the **oil pressure low** light has gone out. Check that the audible alarm is silent.

Note: *If any warning lights fail to go off, or come on while the engine is running, stop the engine as soon as it is safe to do so.*

Note: *New engines DO NOT require a running-in period. The engine/machine should be used in a normal work cycle immediately; glazing of the piston cylinder bores resulting in excessive oil consumption, could occur if the engine is gently run-in. Under no circumstances should the engine be allowed to idle for extended periods; (e.g. warming up without load).*

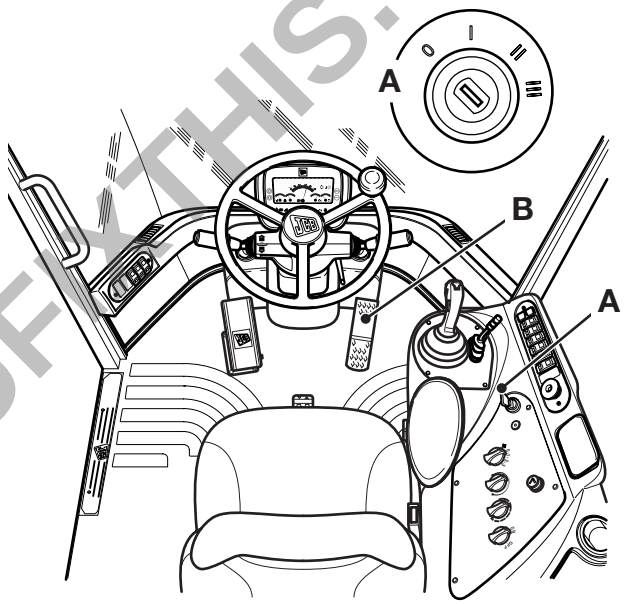


Fig 48.

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Greasing

⚠ WARNING

Make the machine safe before working underneath it. Park the machine on level ground, lower the attachments to the ground. Apply the park brake, put the transmission in neutral and stop the engine. Block both sides of all four wheels.

Disconnect the battery, to prevent the engine being started while you are beneath the machine.

GEN-4-1_1

For interval ⇨ *Service Schedules (🗋 75)*

The machine must be greased regularly to keep it working efficiently. Regular greasing will also increase the machine's working life.

Grease should be applied with a grease gun, normally two strokes of the gun should be sufficient. Stop the greasing procedure when fresh grease appears at the joint. Use the recommended grease, ⇨ *Lubricants and Capacities (🗋 78)*.

In the following illustrations, the grease points are numbered. Count off the grease points as you apply grease to each one. Refit the dust caps after greasing.

Note: *In arduous conditions the shovel pivot pins should be greased at least every ten (10) hours.*

Shovel Pivot Pins (HT)

Total of 6 grease points. (**1** to **6**)

Loader Arm Pivot Points (HT)

Total of 18 grease points (**7** to **24**)

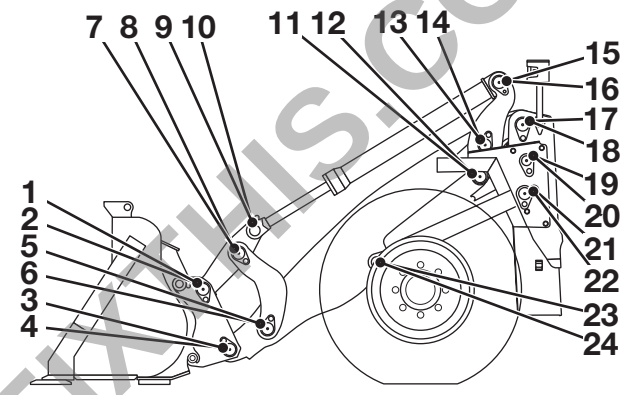


Fig 1.

Shovel Pivot Pins (ZX)

Total of 4 grease points. (**1** to **4**)

Loader Arm Pivot Points (ZX)

Total of 8 grease points (**5** to **12**)

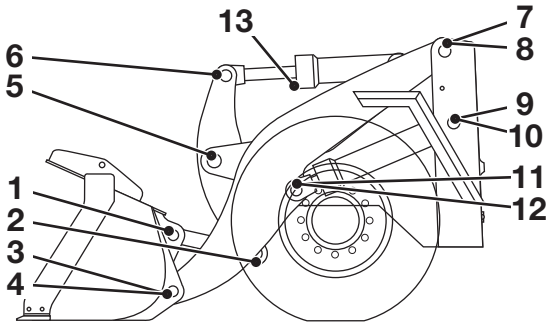


Fig 2.

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