BACKHOE MANUAL

Owner´s manual

TABLE OF CONTENTS

GENERAL INFORMATION

INTRODUCTION:

The purpose of this manual is to assist you in maintaining and operating your backhoe. Read it carefully, it provides information and instructions that will help you achieve years of reliable performance. Some information may be general in nature due to unknown and varying conditions. However, through experience and these instructions, you should be able to develop operating procedures suitable to your particular situation.

“Right” and “Left” as used throughout this manual are determined by position operator is facing when in use.

The photos, illustrations and data used in this manual are current at the time of printing, but due to possible in-line production changes, your machine may vary slightly in detail. The manufacturer reserves the right to redesign the machine as may be necessary without notification.

Important:

Illustrations used in this manual may not show all safety equipment that is recommended to ensure safe operation of tractor and backhoe. Refer to the Safety Precautions section of this manual for information concerning safety, consult your dealer for further information.

1 Safety Precautions

1.1 SAFETY

Understand that your safety and the safety of other persons is measured by how you service and operate this Backhoe.

Know the position and operations of all controls before you they operate. Make sure you check all controls in safe area before starting.

Read this manual completely and thoroughly and make sure you understand all controls. All equipment has a limit. Make sure you are aware of the stability and load characteristics of this Backhoe before you begin operation.

The Safety Information given in this manual does not replace any safety codes, insurance needs, federal, state and local laws. Make sure your machine has the correct equipment required by your local laws and regulations.

	This safety alert symbol indicates important safety message in this manual. When you see this symbol, carefully read the message that followings and be alert to the possibility of personal injury or death.

1.2 SAFETY Precautions

Before starting the engine of your tractor, make sure all operation controls are in park lock or neutral position.

Operate controls only when seated in the operator's seat.

See your tractor operator's manual for correct usage.

A frequent cause of personal injury or death is persons falling off and being run over. Do not permit others to ride on your tractor. Only one person, the operator, should be on the machine when it is in operation.

Before leaving the tractor, stop the engine, put all controls in neutral, engage the parking brake and remove the key from the ignition.

Operate the backhoe smoothly when lowering or lifting loads.

Stay off of slopes too steep for safe operation. Shift down before you start up or down a hill with heavy load. Avoid "free wheeling"

Travel speed should be such that complete control and machine stability is maintained at all times. Where possible, avoid operation near ditches, embankments and holes. Reduce speed when turning, crossing slopes, and on rough, slick or muddy surfaces.

Never use your hand to check for suspected leaks under pressure. Use a piece of cardboard or wood for this purpose. Escaping hydraulic oil or diesel fuel leaking under pressure can have sufficient force to penetrate the skin and cause infection or other injuries. If this happens seek medical attention immediately.

To prevent personal injury, relieve all pressure before disconnecting fluid lines.

Before applying hydraulic pressure, make sure all hydraulic connections are tight and components are in good condition.

Contact with overhead power lines can cause severe electrical burn or electrocution.

Make sure there is enough clearance between raised equipment and overhead power lines.

Add water to rear tires or rear wheel weights for increased stability.

A backhoe attachment should be transported in a low position at slow ground speeds. Make turns slowly and use the tractor brakes cautiously. A loaded attachment in the raised position alters the center of gravity location of the machine and increases the possibility of mishaps.

Do not stand, walk or work under a raised backhoe attachment unless it is securely blocked or mechanically in position. Accidental movement of a control lever or leak in the hydraulic system could cause the backhoe to drop, or attachment to dump, causing severe injury.

Make sure all parked backhoe on stands are on a hard level surface with all safety devices engaged to prevent backhoe from falling and being damaged or injuring someone.

When using a backhoe, be alert of bucket, boom and arm position at all times.

Only operators who have been specially trained in backhoe operation and fully understand this manual can operate the backhoe.

Keep hands, feet and clothing away from all moving parts. Wear close fitting clothing and appropriate safety equipment (Which includes, steel cap shoes, protective gloves, hard hat, safety glasses and dusk mask). Prolonged exposure to loud noise can damage hearing. Wear suitable approved hearing protection such as ear muffs or plugs. Operating equipment safely requires your full attention. Do not wear radio or music headphones. Secure hair above shoulder length.

You must be in good physical and mental health to operate the backhoe safely. Do not operate the backhoe when you are ill, fatigued or under the influence of any substance or medication that could affect your vision, co-ordination or judgment.

2 Safety Decals

Safety Decals

- Keep safety decals clean and free of obstructing material

- Replace damaged or missing safety decals with new decals from your dealer.

- If a component with a safety decal(s) affixed is replaced with a new part, ensure new safety decal(s) are attached in the same locations on the replacement components.

Refer below for summary of decals. Note decals appear on both sides of backhoe.

1.

2.

3.

4.

5.

JANSEN
BHSM-225

6.


DANGER
• Hazardous moving & rotating parts.
• Can cause severe personal injury.
• DO NOT enter working range with machine in operation.

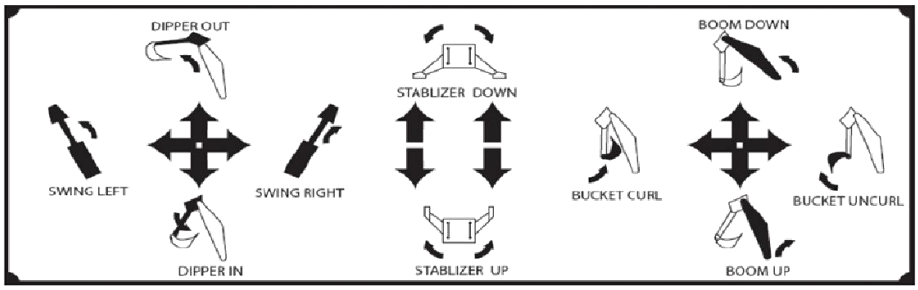
7.


DANGER
CRUSH RISK
KEEP CLEAR
Do not stand under unsupported Load Frame, Boom or Stick

8.


Warning! High Pressure Fluid
HIGH PRESSURE FLUID HAZARD
■ Relieve pressure on hydraulic system before servicing or disconnection hoses.
■ Wear proper hand & eye protection when searching for leaks. Use wood or carboard instead of hands.
■ Keep all components in good repair.

9.


DIPPER OUT
STABLIZER DOWN
BOOM DOWN
SWING LEFT
SWING RIGHT
BUCKET CURL
BUCKET UNCURL
DIPPER IN
STABLIZER UP
BOOM UP

10.


WARNING
Risk of Fall.
On Entry & Exit:

11.


DANGER
Look Up & Live!
Observe all overhead electrical hazards.

12.


DANGER
BEWARE
Overhead wires
&underground
services.

13.


WARNING
CRUSH
ZONE

14.


WARNING!
When using stabilizer arms DO NOT
lift machine off ground.
FAILURE TO COMPLY CAN BE DANGEROUS, MAY
CAUSE UNDUE DAMAGE TO MACHINE AND
VOID ALL WARRANTIES.
CONTACT YOUR DEALER FOR DETAILS FIRST.

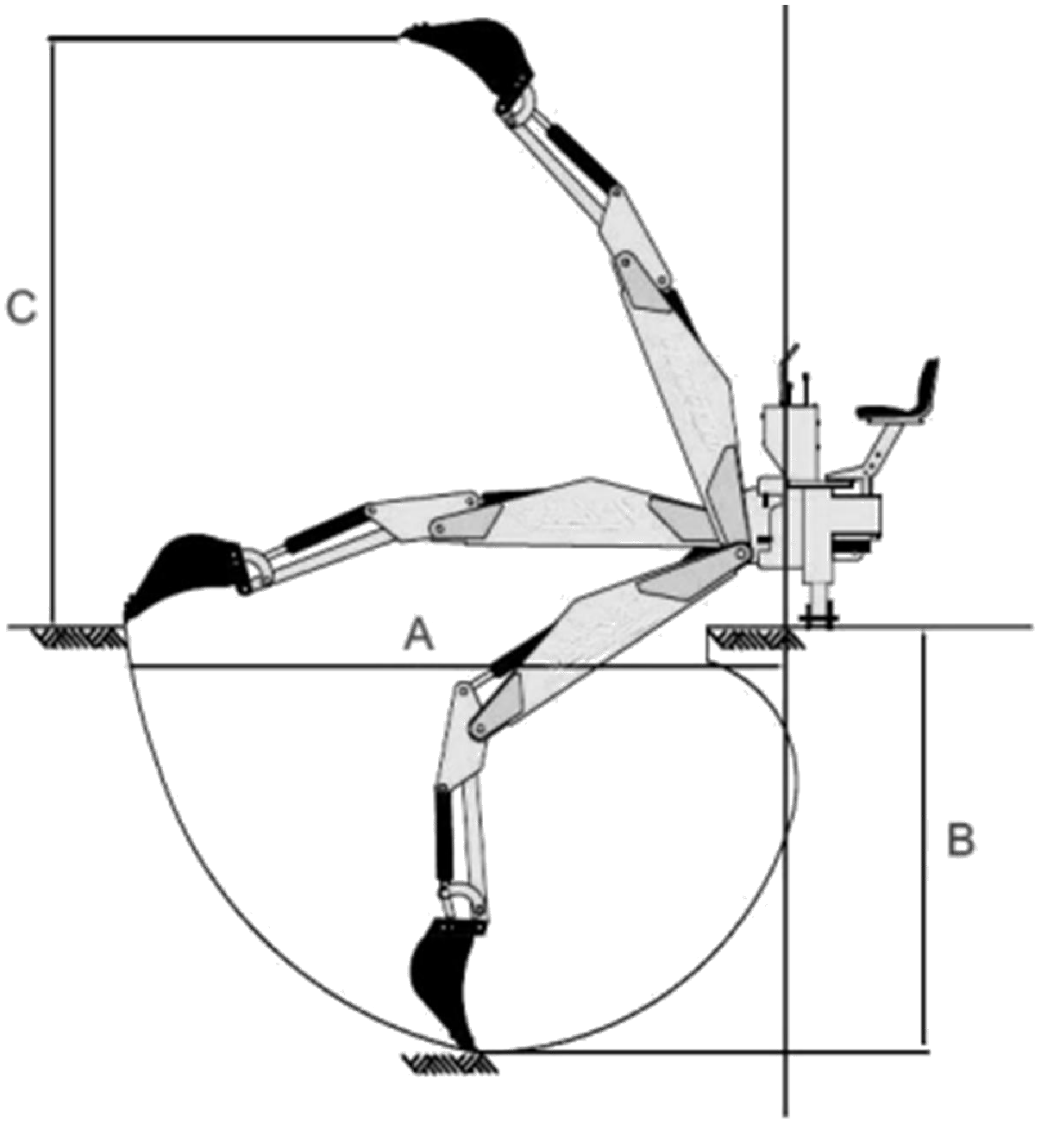
15.


WARNING
DRIVER
ONLY
Strictly NO
passengers.
safetysticker.com
WD012

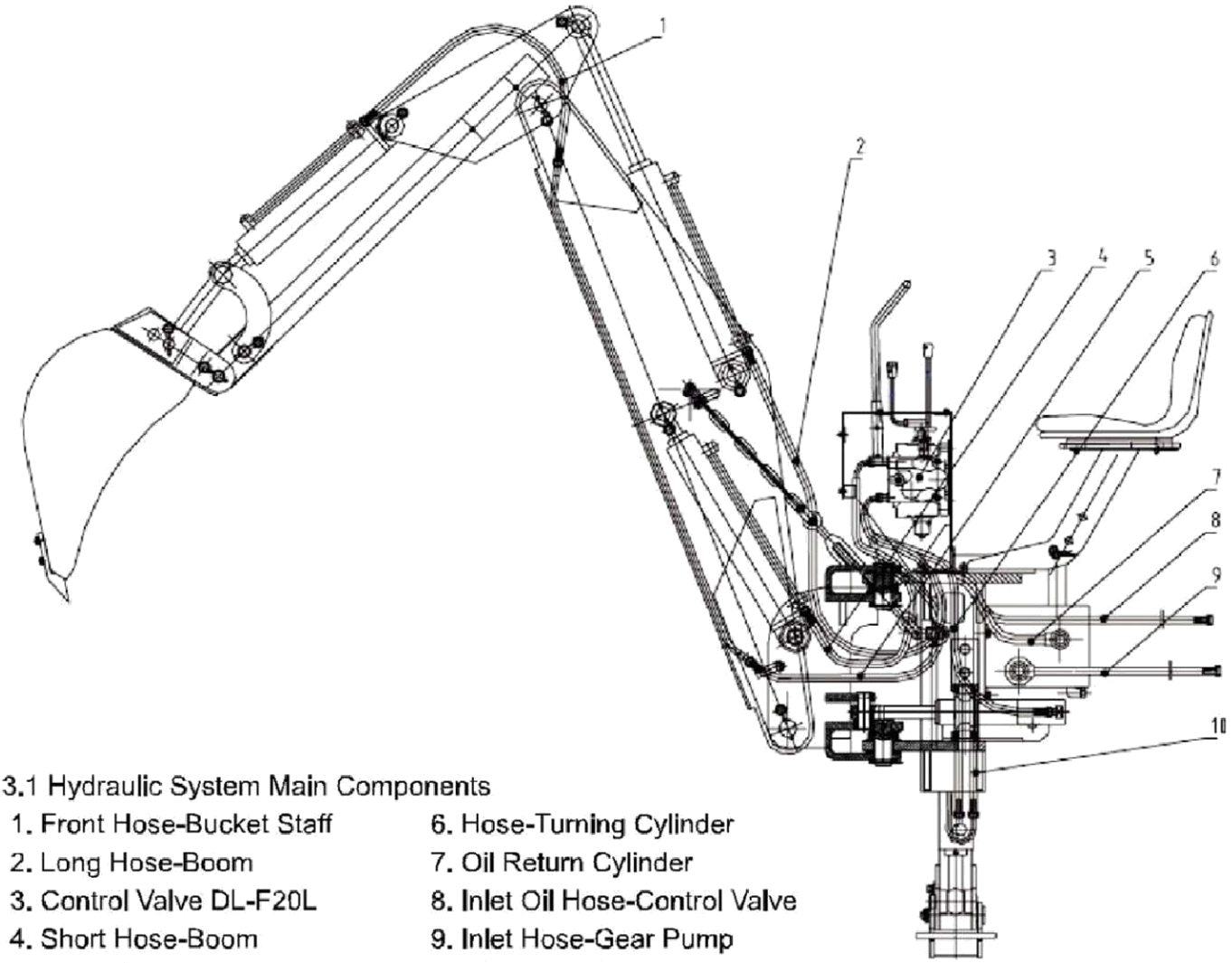
3 Backhoe Specifications

Model	**BHM-175**	**BHM-195**	**BHM-225**
Dimension (L×W×H) (mm)			
Structure weight (kg)	520	550	750
Max digging depth (m) A	2.6	2.9	3.3
Max digging radius (m) B	1.75	1.85	2.25
Max height (m) C	3.12	3.17	3.45
Max unloading height (m) D	1.8	2	2.3
Stabilizer width (m)	1.7	1.7	1.7
Swing angle for boom	180	180	180
Bucket turning angle	195	195	203
Bucket capacity of standard bucket (m^3)	0.02	0.025	0.035
Bucket width (mm)	300	400	500
Bucket Digging Force (kg)	1100	1100	1700
Dipper Arm Digging Force (kg)	850	850	1100

3.1 DIGGING DIAGRAM

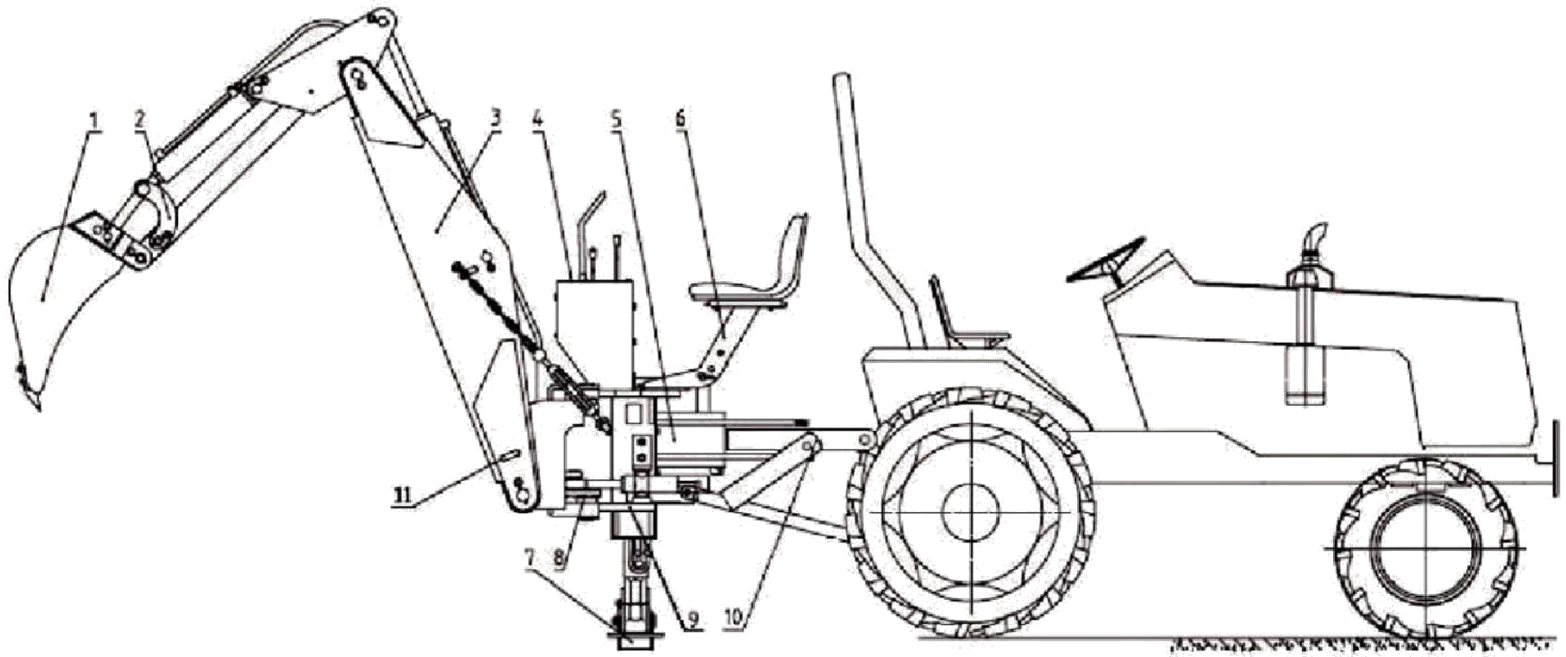


3.2 HYDRAULIC SYSTEM MAIN COMPONENT



3.1 Hydraulic System Main Components

1. Front Hose-Bucket Staff
2. Long Hose-Boom
3. Control Valve DL-F20L
4. Short Hose-Boom
5. Rear Hose-Bucket Staff
6. Hose-Turning Cylinder
7. Oil Return Cylinder
8. Inlet Oil Hose-Control Valve
9. Inlet Hose-Gear Pump
10. Hose-Stabilizer



3.2 Backhoe Main Components

1. Bucket
2. Bucket Staff
3. Boom
4. Bracket for Control
5. Tank
6. Seat
7. Stabillizer
8. Swing Post
9. Bottom Seat
10. Sub A Frame
11. Safety Lock Pin

4 Assembly instructions

Read and ensure you understand the **full** assembly instructions **before** you begin construction. Only remove the transport frame when the assembly instructions say to do so.

The machine is delivered from the factory in transport configuration. Always use suitably sized tools, appliances and lifting equipment with adequate power for assembly. Two people are always required for lifting, moving and assembling the machine. Wear suitable protective clothing such as safety shoes and protective gloves. Check that all screws and nuts are fitted correctly when assembling the machine. Take care when opening the accompanying boxes as hard additional parts are inside.

Before starting to assemble the machine, please observe the following instructions:

- Clear the area beforehand of people standing in the vicinity, particularly children.
- Use a forklift truck to move or lift the palette/machine.
- Keep the load close to the ground.
- Move the machine to the assembly site
- Ensure there is enough room to safely assemble the machine and access the machine from all sides.

Fig.1 Rear digger transport configuration

Fig.2 Rear digger transport configuration

Fig.3 Accessories and fasteners

Fig. 4 Fasteners

Important notices:

Before beginning assembly, read the **full assembly instructions** through and familiarise yourself with the individual stages of assembly **in advance**. This is **very** necessary as the assembly stages build on each other logically and failing to follow the order that the steps go in can lead to components of the rear digger being damaged.

Make sure that the rear digger is standing securely at all times during assembly. This applies especially if the rear digger has not yet been attached to the tractor's 3-point chassis.

Important: Only loosen the screws on the transport frame when the assembly instructions say to do so!

The rear digger is delivered **without hydraulic fluid**. Further information on the necessary advance filling and monitoring of the hydraulic fluid level is given later in these operating instructions. Never operate the rear digger without enough hydraulic fluid.

In rare cases you may find that the control directions on the operating unit label are **not** in compliance with the actual directions for hydraulic movements when operating the digger.

When you first operate the digger, move the lever very slowly and keep constant control of the directions of movement. This also applies to the first removal and fixing of the transport frame to manoeuvre the rear digger to a safe assembly position during initial assembly.

Always secure the rear digger with the transport frame between different places of use to avoid accidents.

Remember not to remove the lower transport frame before the instructions say to do so to categorically rule out the chance of the rear digger falling over and thereby avoid serious injuries and accidents.

Fig.5 Left side of safety frame

Fig.6 Right side of safety frame

Assembly

1. Testing

Check all of the hydraulic pipes for correct assembly, leakage and correct position. Check all screws for correct and secure positioning.

2. Filling and monitoring hydraulic fluid

Fill up the hydraulic fluid and check that it is at the correct level in the viewing glass. Figure 7 shows the unscrewed inward screws with valve. If possible, fill the hydraulic fluid up in this way. If the openings are too small, unscrew the cover as shown in Figure 8 and fill the oil up to the correct level on the viewing glass. Put the screws to one side so that they do not accidentally fall into the tank.

3. Remove the retaining strap

Remove the retaining strap, where available, from the excavator arm (Figure 10).

Fig.7 Filling hole

Fig.8 Filling hole (alternative)

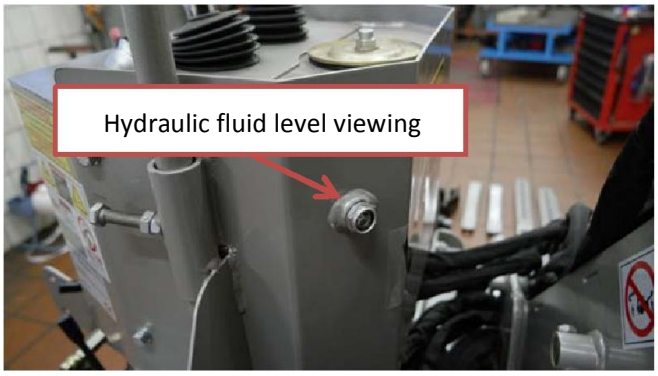


Fig.9 Hydraulic fluid level viewing glass

Fig.10 Retaining strap

4. Lubricate the universal joint

Lubricate the lubrication nipple of the universal joint on both sides (Figure 11).

5. Secure the weighing frame

Secure the protector for the universal joint to the digger. To do this, loosen the screws on the hydraulic pump as far as enables the protector to be pulled away (Figures 12 to 14). Then tighten the screws again.

Fig.11 Lubricating the universal joint

Fig. 12 Weighing frame universal joint on the digger

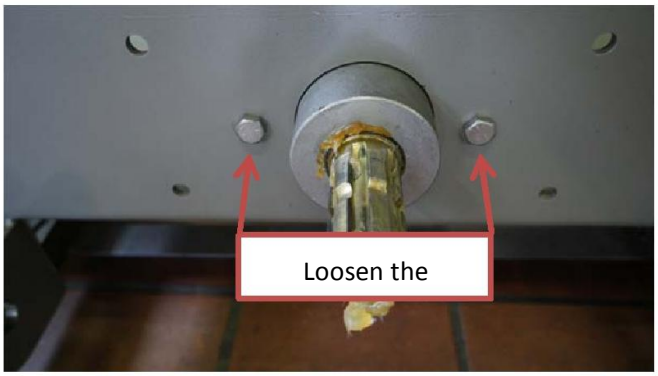


Fig. 13 Hydraulic pump shaft on the digger

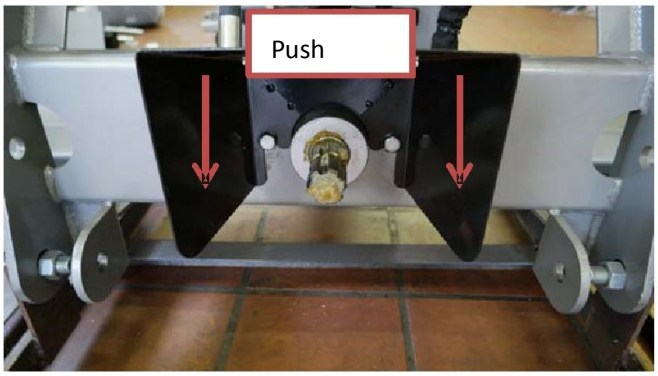


Fig. 14 PTO cover attached to the digger

6.Connecting and securing the universal joint

Fix the universal joint to the hydraulic pump shaft. Secure the universal joint protector with the chain (Figure 15). Slowly drive the tractor up to the rear digger and fix the universal joint and safety chain to the tractor. Run the universal joint carefully without using the accelerator. Take care to meet all of the tractor's relevant safety requirements and follow its operating instructions.

Fig.15 Universal joint with safety chains

7. Prepare the transport supports for digger operation.

Warning: Only adjust the transport frame on both sides of the excavator arm if you understand the functions on the label (Figure 17) and operating unit (Figure 16). The excavator arm must be raised very slightly for correct adjustment of the transport frame. **Do <u>not</u> lower the excavator arm** as otherwise the frame will be destroyed. Complete this step with 2 people to ensure that you can always keep an eye on the transport frame. You **may** also find that the excavator arm is secured with heavy loop bolts for transport. Remove these before using the operating unit.

- Lift the excavator arm very slightly to release the transport frame (Figure 18).
- Then switch the frame to operational mode as shown in Figure 19.

Important: There are 2 transport frames, one on each side of the digger. Check whether the other frame is still in a secured position. If so, carry on exactly as shown in Figures 18 and 19 for the side that is left of the digger when driving.

Fig.16 Control unit

Fig.17 Functional label (example)

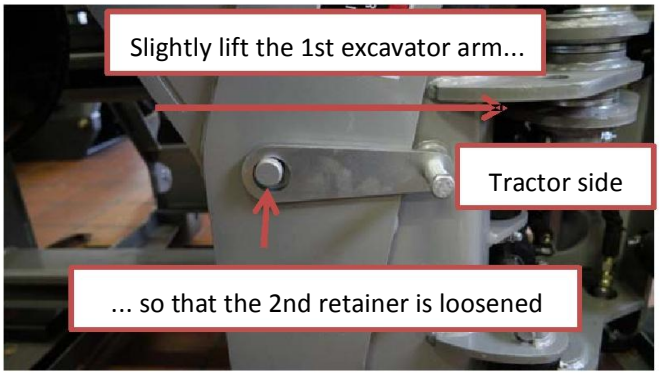


Fig.18 Frame in transport configuration

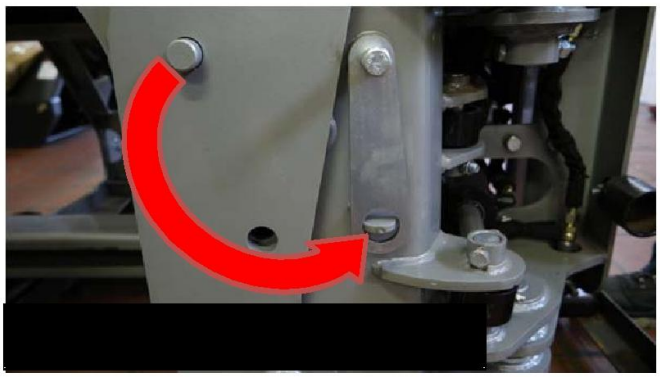


Fig.19 Frame in operational configuration

8. Aligning the excavator arm centrally and safely setting it up

- Then remove the protective sleeves for the hydraulic cylinder (Fig.20).

-Then switch on the hydraulic lateral displacement by moving the lever to the right (Figure 22).

- Align the digger centrally

- Switch the hydraulic lateral displacement off (Figure 21).

- Drive the scoop out and settle it on a safe load-bearing base so as to ensure there is a secure base for further assembly as shown in Figure 24.

Fig.20 Removing the protective sleeves

Fig.21 Hydraulic lateral displacement out

Fig.22 Hydraulic lateral displacement in

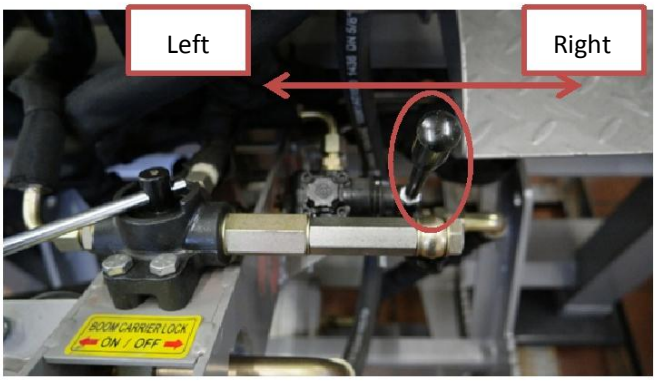
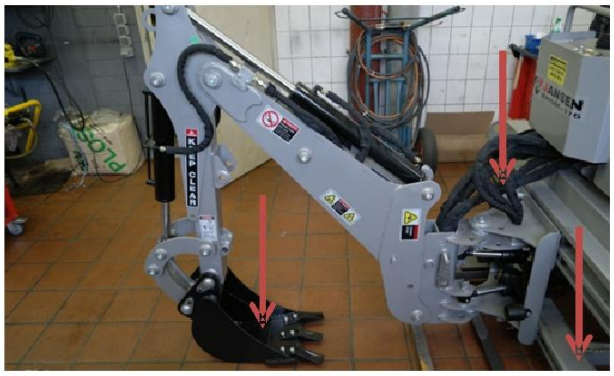


Fig. 23 Lever for lateral displacement

Fig.24 Stable base for the digger



- Then switch the tractor off and remove the universal joint to assemble the remaining parts.

9. Fixing the rubber pads

Assemble the rubber pads as shown in Figures 25 - 27.

Do this on both sides.

Fig.25 Rubber pads

Fig.26 Stop sleeve

Fig. 27 Assembled rubber pad

10. Assembling the driving seat

Put the materials to one side where you can see them as shown in Figure 28.

- Only secure the seat rods as shown in Figure 30 on the third drill hole of the perch. Put the rest of the securing materials to one side.

Arrange the materials for the seat as shown in Figure 31.

Fig.28 Seat rods with screws

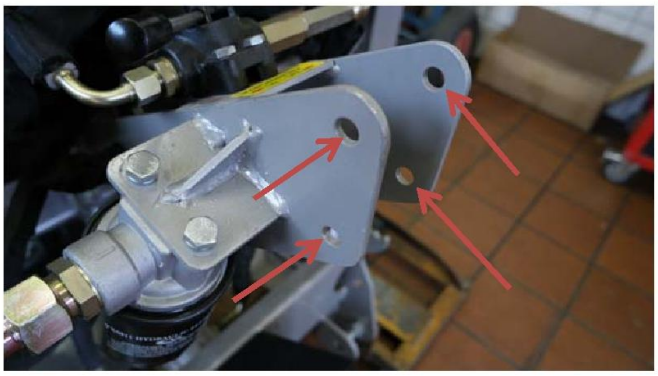


Fig. 29 Holes for seat rods

Fig.30 Partially assembled seat rods

Fig.31 Seat with rails and screws

Arrange the materials as shown in Figure 32. Be sure that the right guide rail for horizontal geared seat adjustment is present.

Assemble the guide rails on the panel with the 4 holes (Figure 34)

Place the seat on the guide rails as shown in Figure 35. Use the lever on the side of the seat to help you do this and release the locking function.

Fig. 32 Guide rails

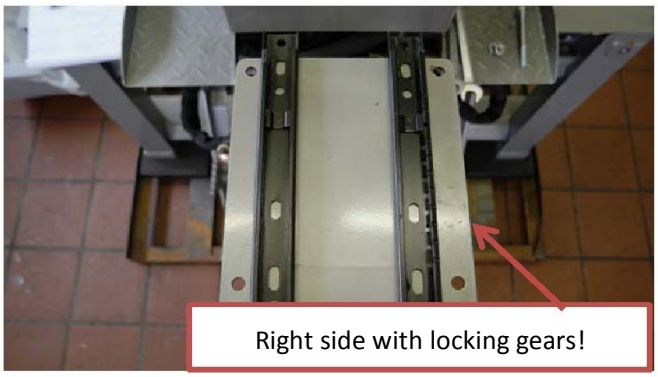


Fig. 33 Seat mounting plate with holes


Fig. 34 Bolted on guide rails

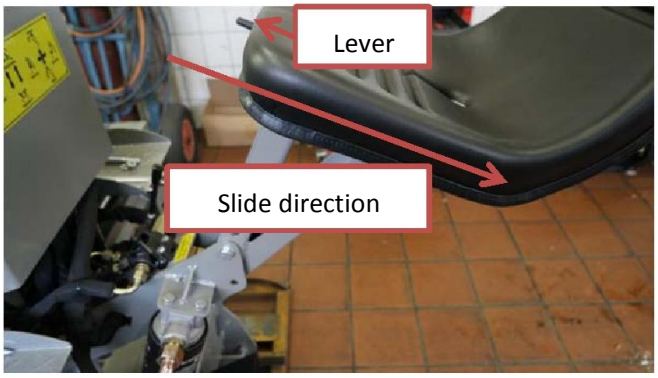


Fig.35 Suspended seat

Now place the seat vertically and screw the screws you set aside earlier in as shown in Figure 36.

The other drill holes can be used for the vertical height adjustment of the seat if this is needed.

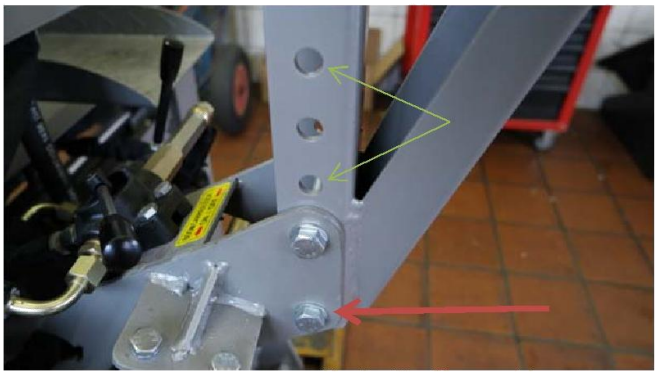


Fig.36 Seat with height adjustment

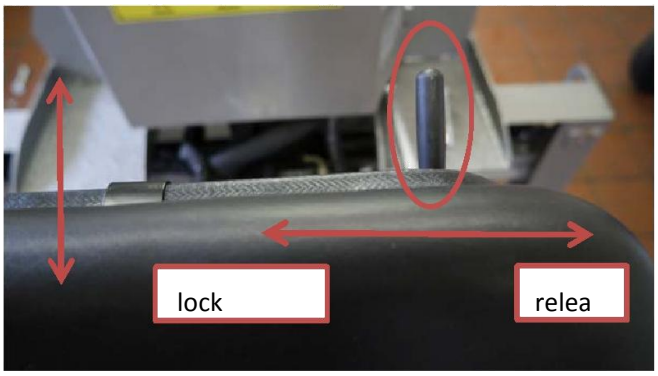


Fig.37 Lock lever for seat adjustment

Figure 37 explains the releasing and stopping of the horizontal seat adjustment process.

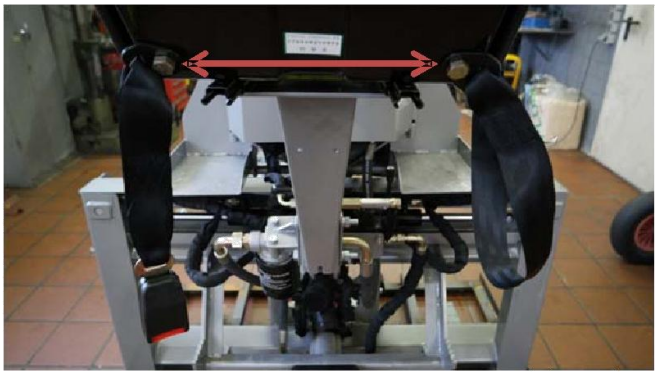


Fig.38 Securing the belt

Then clearly secure the belt as shown in Figure 38 and 39.

Fig.39 Locking the belt on the seat

11. Safety bracket

Assemble the safety bracket to the hydraulic tank as shown in Figures 40 to 42.

Use the steps for climbing onto or off of the digger seat (Figure 43).

Fig. 40 Securing left

Fig.41 Securing right

Fig.42 Safety bracket

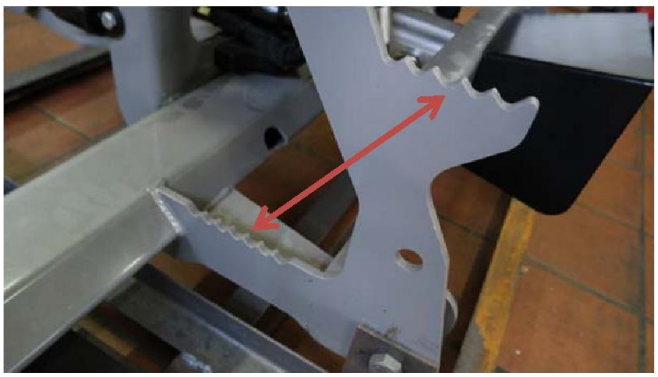


Fig.43 Steps

12. Lubricating the gear rack

Loosen both screws as shown in Figure 44 and remove the protective cover.

Lubricate the gear wheel and the gear rack with the lubrication gun (Figure 45).

Secure the protective cover with the two screws again.

Information:

Lubricating the lubrication nipple is explained later in these assembly instructions.

Fig.44 Protective cover

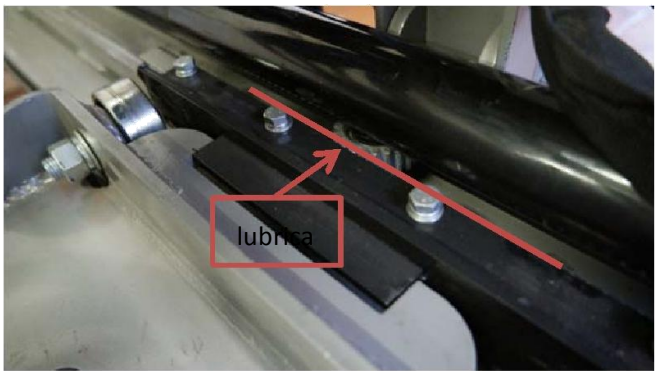


Fig.45 Gear wheel and gear rack

13. Assembling and securing the variable connecting rod / top link

Arrange the materials as shown in Figure 46.

You can vary the connecting rods to correctly connect the top link to the tractor. The digger must be aligned horizontally to lift it later with the 3 point suspension.

Assemble the upper traverse link as shown in Figures 47 and 48. Don't forget the washer and retaining nut.

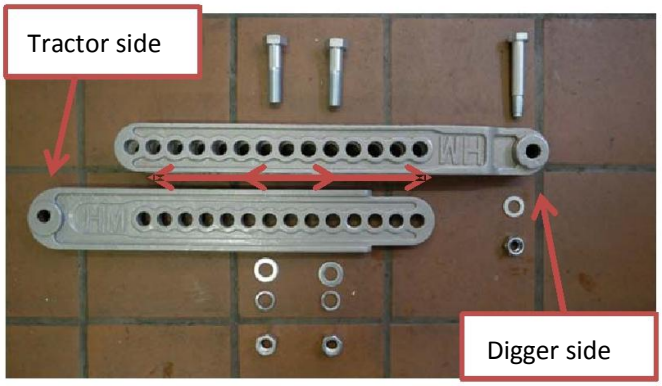


Fig.46 Connecting rods / top links

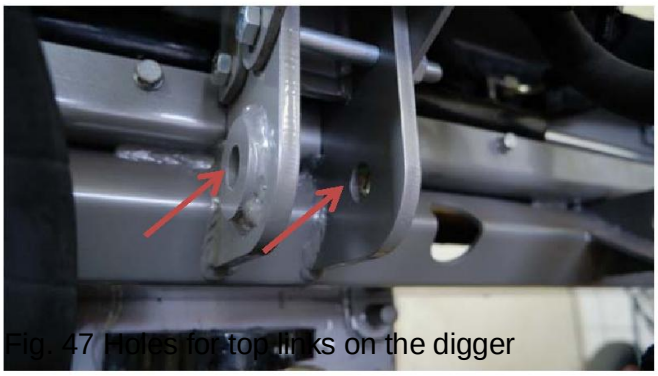


Fig. 47 Holes for top links on the digger


Fig. 48 Top link assembly on the digger

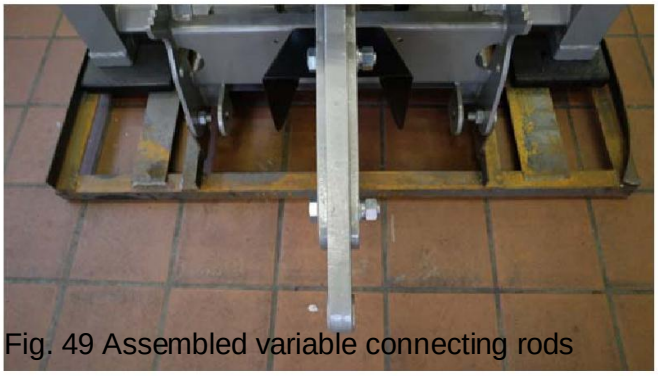


Fig. 49 Assembled variable connecting rods

14. Assembly on the tractor

Attention!!!

Observe the safety notices when securing the digger to the 3 point suspension of a tractor. A certain amount of experience is absolutely necessary for this. If you are not familiar with it, always seek help and advice. Adjust the universal joint to the correct size. Observe the corresponding intersection to guarantee error-free operation and the correct transfer of power to the universal joint. Drive the tractor up to the digger and connect the universal joint. Secure the chain of the universal joint protector. Also be aware of the connecting rod assembled in stage 13 to avoid accidents. The connecting rod may need to be secured upwards with a securing material (tensioning strap etc.) to prevent it from unintentionally falling down. Consider the fact that the connecting rod is made from cast iron and weighs over 20 kg.

Now loosen the transport supports and lift the digger carefully and **slightly** with the digger hydraulics so that you can ensure it is **stable** and you can safely insert the two lower securing bolts on the 3-point suspension.

Loosen and remove the universal joint and drive the tractor to the side.

Fig.50 Securing for transport left side

Fig.51 Securing for transport completed

Fig. 52 Bolts are replaceable

Fig. 53 Bolts and splints for lower link

Drive the tractor so that the bolts on both sides can be inserted in the lower link. Don't forget to insert the bolts' splints to avoid the bolts accidentally slipping out.

Then secure the top links to the tractor's suspension (the tractor's bolts are needed for this). When doing this be aware of the horizontal alignment of the rear digger.

Attach the universal joint to the tractor and the rear digger.

Lift the rear digger slightly with the tractor's 3-point suspension and remove the transport frame.

Be very careful not to be crushed by moving parts.

Fig. 54 Bolts and lower traverse link

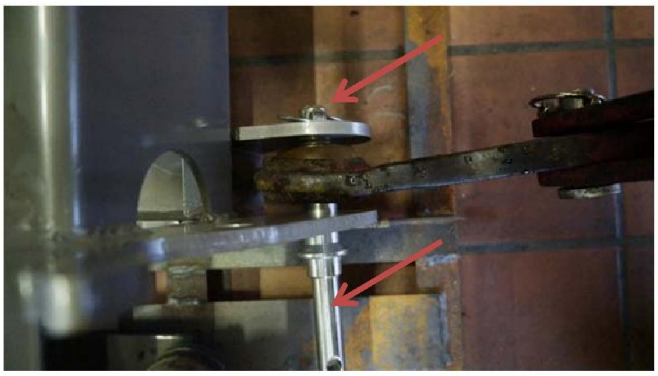


Fig.55 Left side of the lower traverse link secured with bolts and splints

Fig.56 Right side of the lower traverse link secured with bolts and splints

15. Lubricate the axels and bolts on the digger

Drive the excavator arm out and settle the scoop carefully on a secure base. Carefully drive the two supports out. Turn off the hydraulics and the tractor and secure it against rolling away. Lubricate all 20 lubrication nipples with a lubrication gun. You may find that the excavator arm needs to be moved slightly to reach and lubricate all of the lubrication nipples. You can also lubricate the two supports (Figure 57)

The order of the lubrication nipples in Figures 58 to 77 is shown continuously from the scoop to the drive shaft.

Scoop > Scoop arm > Primary excavator arm > Swivel joint > Drive shaft

Fig.57 Left supports

Lubrication nipples 1 to 20:

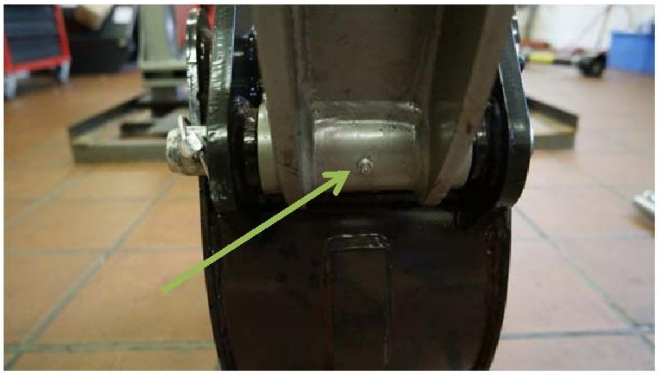


Fig.58 Scoop 1

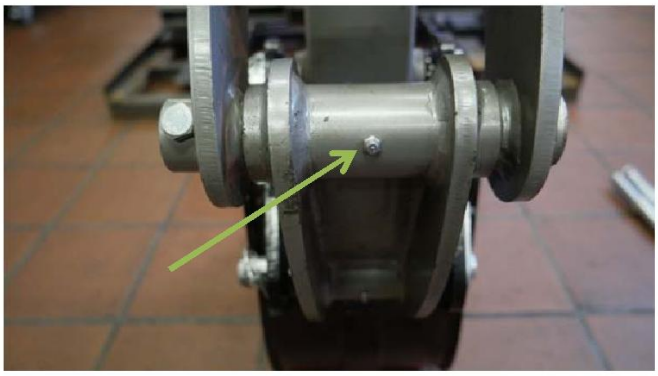


Fig.59 Scoop 2

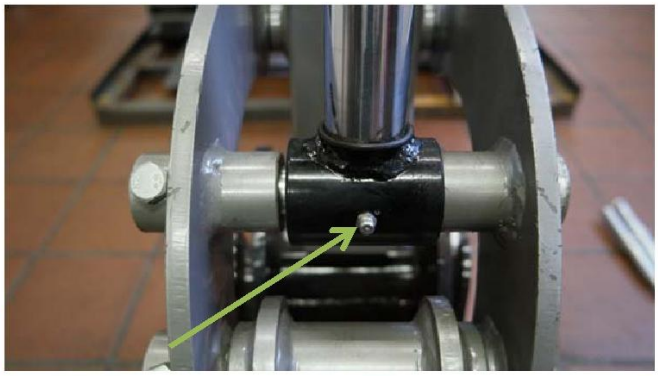


Fig.60 Scoop 3

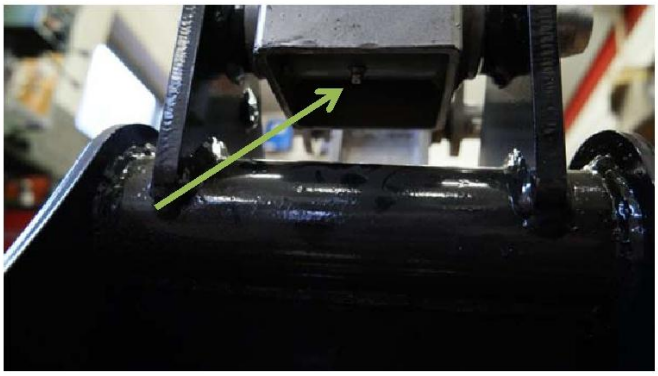


Fig.61 Scoop 4

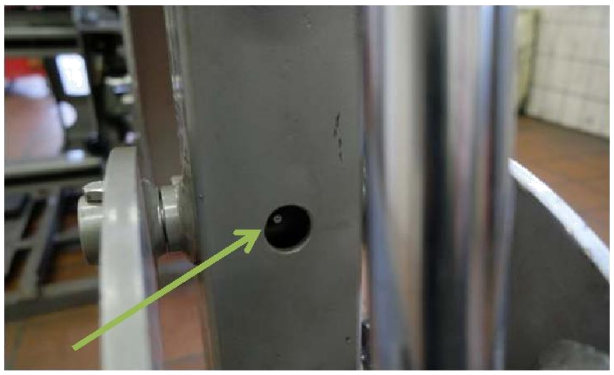


Fig.62 Scoop 5

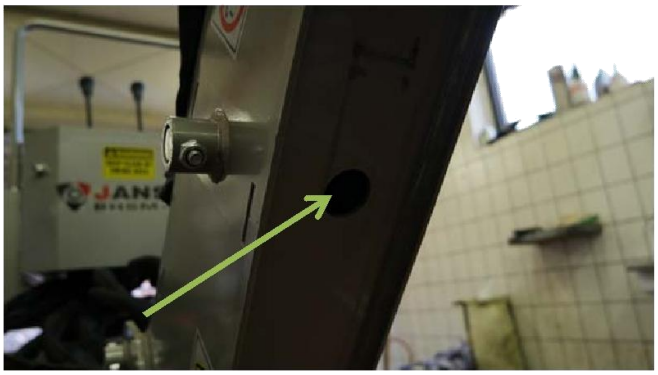


Fig.66 Excavator arm 9

Fig.63 Excavator arm 6

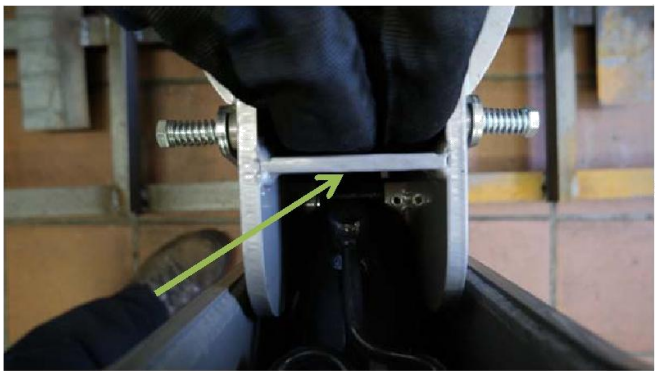


Fig.67 Excavator arm 10

Fig.64 Excavator arm 7

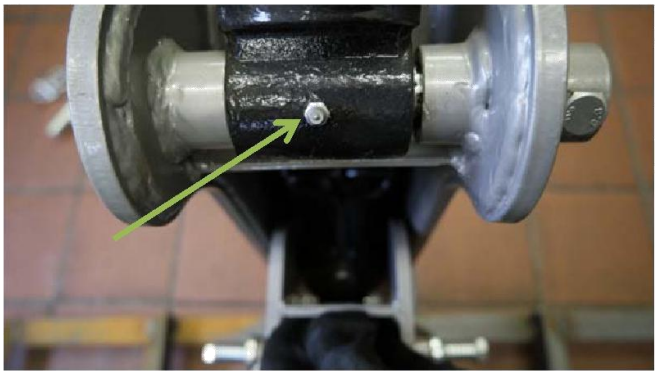


Fig.68 Excavator arm 11

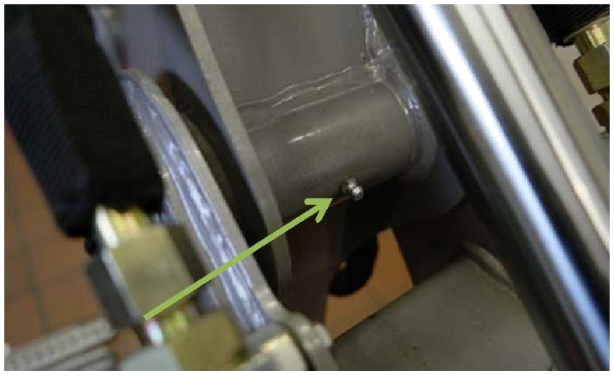


Fig.65 Excavator arm 8

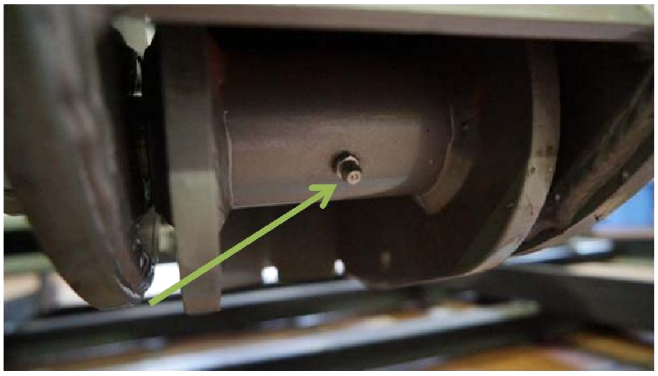


Fig.69 Excavator arm 12

Fig. 70 Cylinder from swivel joint 13

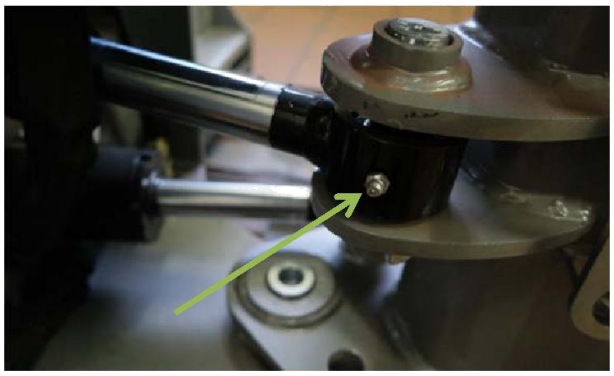


Fig. 71 Cylinder from swivel joint 14

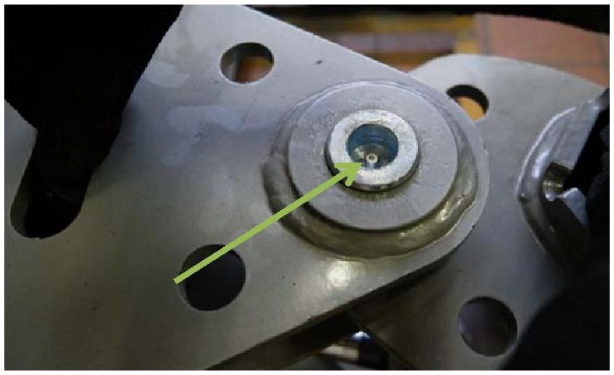


Fig. 72 Swivel joint 15

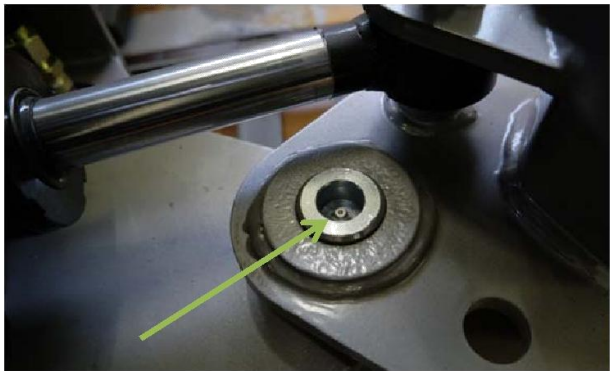


Fig. 73 Swivel joint 16

Fig. 74 Cylinder axel 17

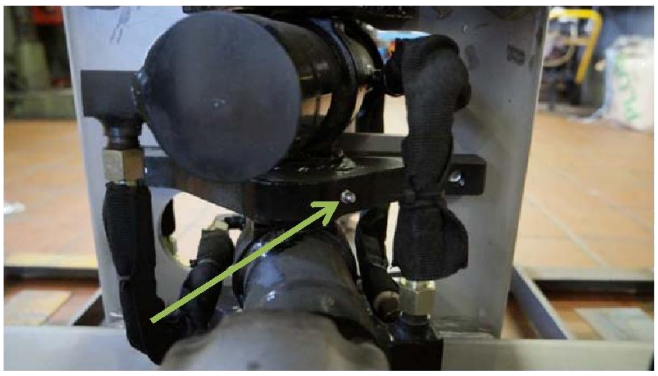


Fig. 75 Cylinder axel 18

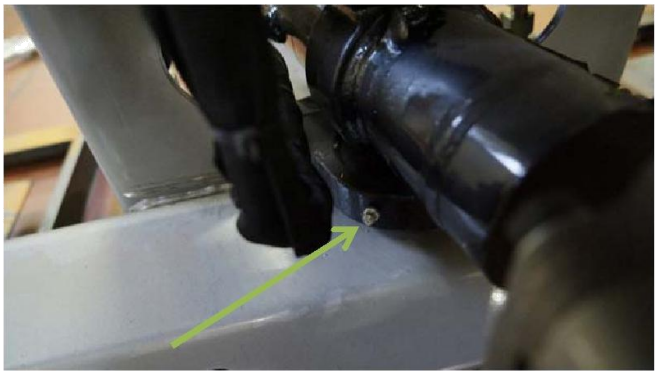


Fig. 76 Cylinder axel 19

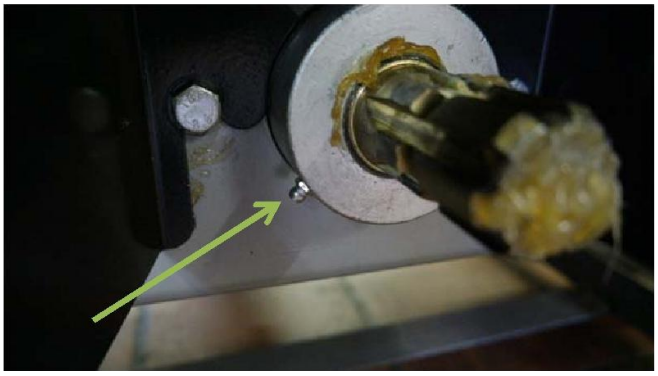


Fig. 77 Hydraulic pump shaft 20

16. Testing the hydraulic fluid and correcting the oil level

Before you use the digger, check all the hydraulic pipes for leaks and ease of movement. Be careful not to crush or damage the hydraulic pipes when operating the digger. Sit the rear digger horizontally straight to enable the oil level to be correctly filled up.

Run through all of the functions of all hydraulic components of the digger (drive it all the way in and all the way out). Do this three times for each function of the digger (scoops, excavator arms, lateral displacement, support) to completely fill the hydraulic circuit with fluid.

Then check the hydraulic fluid level of the hydraulic fluid tank and, if necessary, fill as described in step 2 of these assembly instructions.

5 Tractor Preparation

Caution: Do not exceed the manufacturer's rating for maximum gross vehicle weight. Refer to Operator's Manual provided with tractor.

Caution: Certain Specific conditions may not permit safe use of backhoe at backhoe rating or may require more careful restricted operation at the rated load.

5.1 Hydraulic System

Models BHM / BHSM Series

These Models are driven by the tractors Power Take Off, and are fitted with an in-built Hydraulic pump and tank. Check fluid level daily, ensure PTO shaft is greased and change hydraulic filter.

Caution: The tractor / backhoe must only be operated with all safety equipment properly installed

5.2 Tyre Inflation

Front Tyres must be maintained at the maximum recommended inflation to maintain normal tyre profile with the added weight of backhoe/material.

5.3 Wheel Tread Settings

Tractor front wheel tread setting must be restricted to wheel tread spacing recommended in the tractor Operator's Manual.

5.4 Attachment

Ensure your tractor's 3 point linkage system is fitted with sway chains before attaching the backhoe.

Failure to do can cause the backhoe to swing when travelling potentially causing bodily injury or machine failure.

Inspect for any worn or damaged parts that are part of the connection between the tractor and backhoe. Replace if necessary with parts of suitable strength and quality.

5.5 Counter Weight

Add recommended ballast (either front weights or front end loader) in tractor's front-end for increased stability. Refer to tractor operator' manual for specific recommendations on counter weighting tractor.

CAUTION: The tractor/backhoe should only be operated with all safety equipment properly installed. Keep assistants or bystanders a safe distance from the equipment operating area.

6 Backhoe Operation

CAUTION: The tractor/backhoe should only be operated with all safety equipment properly installed. Keep assistants or bystanders a safe distance from the equipment operating area.

6.1 Precautionary Note

- Read and understand this manual to avoid accidents.
- Check the hydraulic fitting lines to be correct and set tightly.
- Maintain and repair (if it is needed) the parts or assemblies, check bolts and pins to be sure they are positioned tightly.
- Check tractor with the tractor operator's manual that it can prepared for operating.
- Warn up and operate the tractor and backhoe carefully. Purge any air in the hydraulic lines and cylinders by fully cycling all cylinders several times.
- Check hydraulic level in the tank to the specified level.
- Do not operate the hydraulics when not seated in the backhoe operator's seat
- Keep all assistants out of area of operation.
- Do not operate rapidly.
- Do not allow riders other than the operator to be on the tractor while operating.

Important

Use tractor engine speed that your experience permits. At first set PTO RPM of the tractor to slow.

Do not use the boom, dipper arm, swing and stabilizers to lift, push or pull objects. Use only to maneuver and operate the bucket.

Important

Practice quickly turning off the engine or stopping the backhoe immediately in case of an emergency situation.

Important

Do not operate while the rear tractor wheels are off the ground by stabilizer. It is dangerous to operate the backhoe while rear wheels are off the ground.

Position vehicle so that the backhoe is as near as possible and in such a direction as to minimize the amount of backhoe turning required to dump.

Keep the unit clean and perform regular service.

We urge you to follow this advice:

1. Read and understand this manual as well as the Tractor Operator's Manual.
2. Remember and observe the safety Precautions brought to your attention in this manual, the tractor manual and on the machinery itself.
3. Use good common sense in the everyday operation of this unit. Safety recommendations can never be all-inclusive and you are responsible for watching out for and avoiding unsafe conditions.
4. Never exceed the limits of a piece of machinery. If its ability to do a job, or to do so safely, is in question, don't try it.
5. Don't hurry the learning process or take the unit for granted. Ease into it and become familiar with your new backhoe and tractor.

Caution: When lowing a heavy load, east it downward slowly. Never drop a loaded attachment and "catch it hydraulically". Stopping a load after it has gained download momentum places undue strain on the unit and may cause unnecessary damage to the backhoe or tractor or even worse, personal injury.

Caution: Before disconnecting hydraulic lines, relieve all hydraulic pressure. Escaping hydraulic oil under pressure can have sufficient force to penetrate the skin causing serious personal injury. If injured by escaping hydraulic oil, seek medical attention immediately.

Caution: Do not operate the backhoe if the fittings are leaking or if the hoses are damaged. A sudden line burst would cause the boom, or dipper arm bucket to drop suddenly, causing damage to the tractor or backhoe or injury to personnel.

6.2 Initial Backhoe Operation

Before operating the backhoe, fully raise and lower the boom, arm, swing and hydraulic stabilizers two or three times. Then raise the bucket above the ground and cycle the bucket cylinders three times. Lower the bucket to the ground. Check the tractor hydraulic oil and the correct oil level.

Caution: Before leaving the machine, stop the engine, remove the key. Place all controls in neutral, and either set the parking brake or place tractor in park as equipped.

Always keep cylinders in a retracted position when the backhoe is not in use to guard against rust and contamination which may cause damage to the cylinder rods or hydraulic system. Also, lock the swing and boom while tractor is moving and storing for an extended period of time.

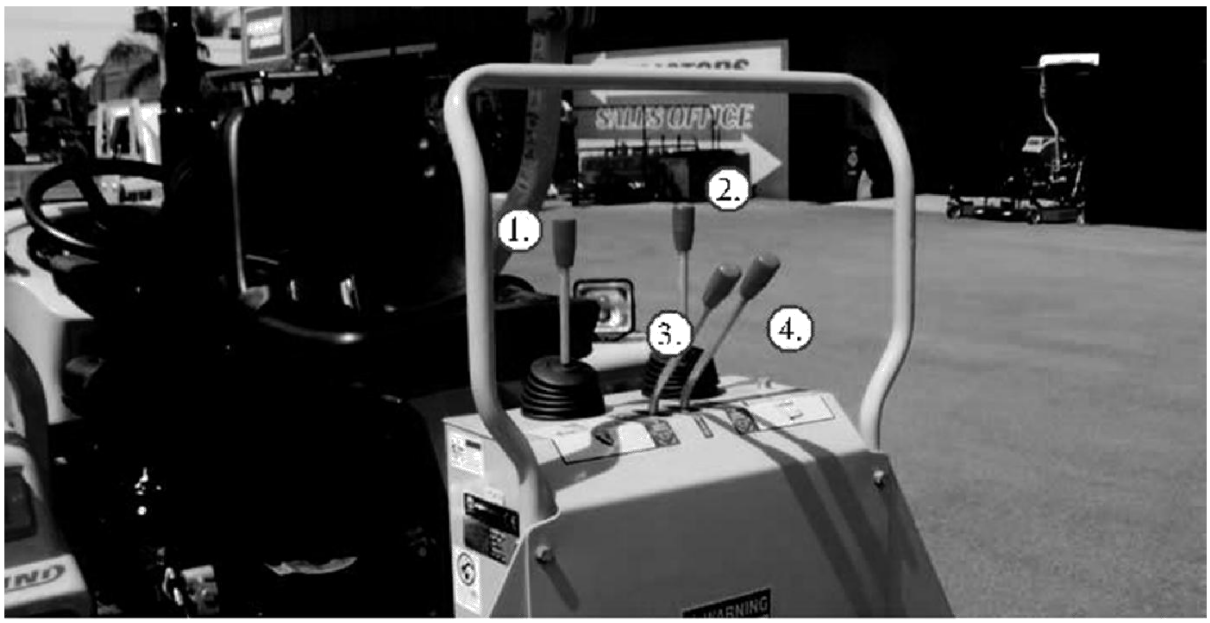
6.3 Cold Weather Operation

For smooth operation in cold weather, let the tractor warn up. Slowly cycle all of the cylinders several times to warm the oil in the hydraulic system. The backhoe may operate erratically until the hydraulic oil has warmed to operating temperatures.

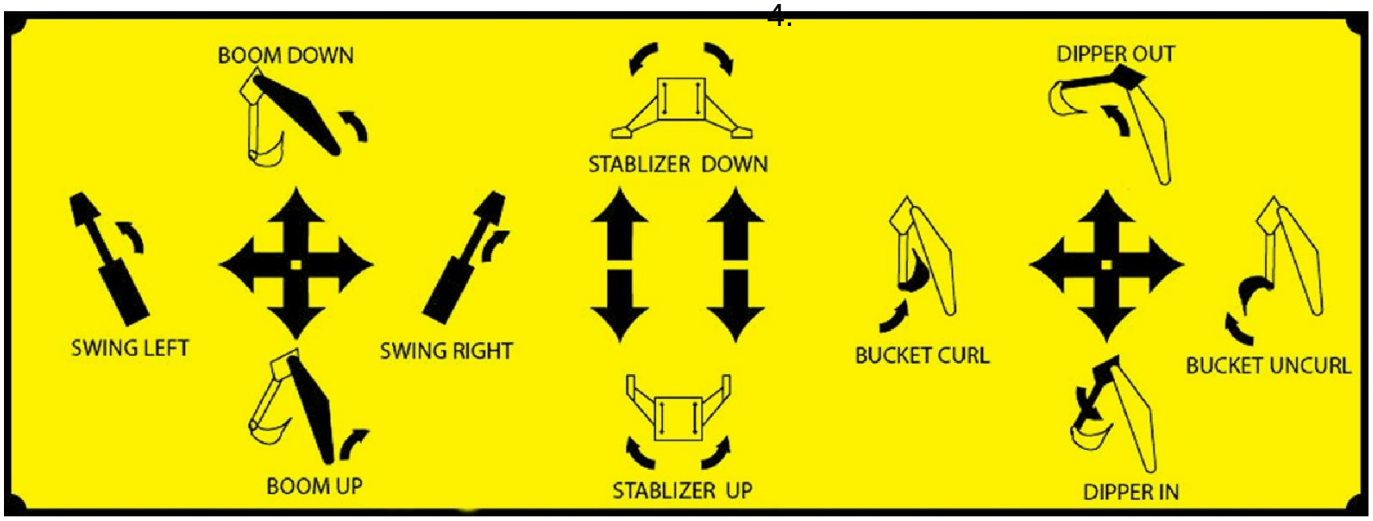
CAUTION: Operate controls only when seated in the operator's seat with seat belt on.

6.4 Backhoe Hydraulic Controls

The backhoe hydraulic valve features 4 control levers. Refer to the diagram below for backhoe control functions. “Left” and “Right” are determined by the direction the operator is facing when seated in the backhoe.



1. Dipper Arm / Bucket
2. Boom / Swing
3. Right Stabilizer
4. Left Stabilizer



The two levers provide four simultaneous operations. Both experience and practice are needed to eliminate excess motion and increase operating efficiency.

Do not dig near the stabilizers to avoid possible accident

6.5 STABILIZER CLIPS

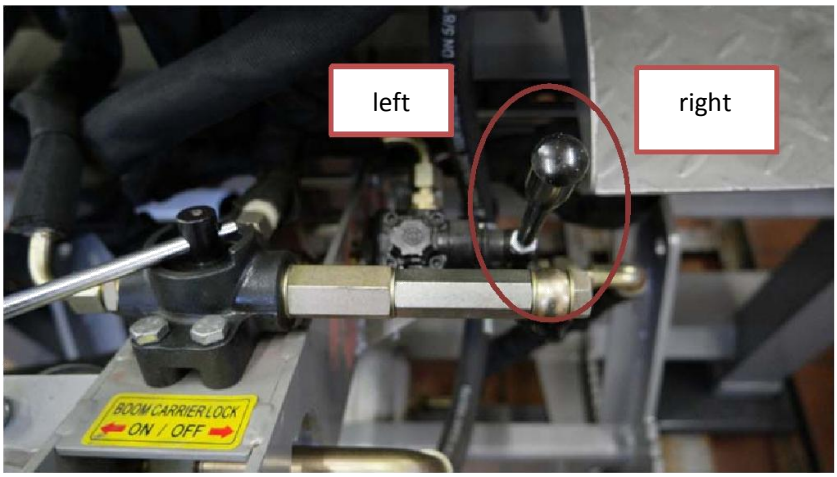
Stabilizer clips are to be used for transporting and dismounting backhoe. When locking or unlocking the clips move hydraulic very carefully in the right direction in order to prevent damage of clips.

6.6 Operating hydraulic Side shift

Prior to side shifting boom carrier, centralise and retract the boom, dipper arm and bucket.

Switch off the boom carrier lock for activating the hydraulic sideshift:

Now operate the lever for the hydraulic sideshift:



Switch on the boom carrier lock again when backhoe is in right position:

Observe the following safety warnings when working with your new backhoe / tractor.

CAUTION: Boom Carrier must be locked prior to operation.

CAUTION: When using a backhoe, be aware of bucket and boom location at all times. When raising A arm (Dipper) with bucket rolled forward, material can spill onto non target area causing injury to assistant or damage other objects.

WARNING: Do not side shift Boom Carrier unless the boom, dipper arm and bucket are centralised and retracted.

WARNING: Do not dig near stabilizers. Ground under stabilizers could collapse. Make all movements slow and gradual when practicing operation.

CAUTION: Operate from backhoe operators seat only. Pay attention, be ready to stop immediately in case of emergency.

CAUTION: To help prevent roll-over, adjust the rear wheels to their widest setting to maximize stability. Refer to your tractor Operator's Manual for recommendations.

7 Maintenance

Item	Service	Service Interval
Hydraulic System Oil Level	Check	Daily / 10 Hours
Hydraulic System Oil / Filter	Replace	Every 50 Hours
Tyre Inflation	Check	Weekly / 50 Hours
Backhoe Pivot Points	Lubricate / Grease	Daily / 10 Hours
Backhoe Hydraulic Lines, Hoses, Connections	Check for leaks, wear	Daily / 10 Hours
Boom, Arm, Swing and Bucket cylinder rod packings	Check for seepage, service as needed	Daily / 10 Hours
Pivot Pin Bolts and Dust Covers	Check, replace if missing	Daily / 10 Hours
Pin Wear	Check, replace if necessary	Daily / 10 Hours
Backhoe Mount Hardware	Check visually	Daily / 10 Hours
Bolt and Nut Release	Re-torque	Every 25 Hours
Grease nipples	Lubricate	regularly

CAUTION: Do not perform service or maintenance operations with backhoe raised off the ground. For additional access to tractor and/or backhoe components remove backhoe.

Important

Lower the backhoe to the ground and relieve pressure in backhoe hydraulic lines prior to performing any service or maintenance operations on the tractor or backhoe.

CAUTION: Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious injury, before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood rather than your hands to sear for suspected leaks. If injured by escaping fluid, seek medical attention immediately. Serious infection or reaction can develop if correct medical treatment is not administered immediately.

Refer to “lubrication and Maintenance Chart” for quick reference to Maintenance Operations.

CAUTION: Do not operate the backhoe if the fittings are leaking or if the hoses are damaged. A sudden line burst could cause the boom, dipper arm or bucket to drop suddenly, causing damage to the tractor or backhoe or injury to personnel.

CAUTION: Operate the backhoe from the operator seat only.

CAUTION: Do not stand or walk under a raised backhoe. Accidental movement of control lever or leak in hydraulic system could cause boom or dipper arm to drop, causing severe injury.

CAUTION: Operate from backhoe operators seat only. Pay attention, be ready to stop immediately in case of emergency.

CAUTION: To help prevent roll-over, adjust the rear wheels to their widest setting to maximize stability. Refer to your tractor Operator’s Manual for recommendations.

Note: when checking hydraulic system oil level, the backhoe should be on the ground and bucket fully retracted (all cylinders in retracted position).

Grease all backhoe pivot points daily (10 Hours).

Inspect hydraulic hoses, connections, control valve and cylinders for evidence of leakage.

Tractor tyres should be maintained at maximum recommended inflation to maintain normal tyre profile with added weight of backhoe/material. Unequal rear tyre inflation can result in bucket not being level to the ground.

8 Trouble Shooting

This Trouble Shooting Chart is provided for reference to possible backhoe operational problems.

Determine the problem that best describes the operational problem being experience and eliminate the possible causes as listed by following the correction procedures

PROBLEM	Possible Cause	Correction
Swing, Boom, Dipper Arm	Low hydraulic fluid level	Check and replenish hydraulic fluid.
	Hydraulic hoses connected improperly	Check and correct hydraulic hose connections.
	Hydraulic hoses to / from control valve blocked	Check for damage (kinked) hoses, etc.
	Backhoe control valve or tractor main relief valve stuck open	Check system pressure, Repair or replace relief valve. Refer to the Tractor Operator's Manual.
	Low system pressure supplied from hydraulic pump	Check system pressure. Repair or replace pump.
	Control valve linkage broken	Inspect. Repair as required.
	Quick disconnect coupler(s) are not fully connected or "Flow Check"	Check coupler connections. Replace coupler(s) if necessary.
	Hydraulic Hose or tube line blockage	Check for evidence of damage to hoses or tube lines that

		would block flow of oil between cylinders and control valve.
	Cylinder piston assembly defective (not sealing)	Check cylinders for internal leakage as described in service section under cylinder leakage tests.
	Control Valve blockage	Inspect for blockage.
	Disassemble valve if necessary.	
	Safety lock pins (2) not removed	Remove and store safety pins.
	Stabilizer legs safety clip not released	Release the clips.
Cylinders operate in wrong direction relative to control valve lever position.	Hydraulic Hoses connected incorrectly.	Correct hydraulic hoses connections.
	Low hydraulic fluid level	Check and replenish hydraulic fluid.
	Cold hydraulic fluid	Allow hydraulic system to warm up to operating temperature
	Hydraulic oil viscosity too heavy or Incorrect oil	Check oil number and viscosity, refill correct hydraulic oil.

Slow or erratic move of cylinder	Engine R.P.M too slow (hydraulic pump R.P.M too slow).	Increase engine speed to obtain satisfactory backhoe operation.
	Excessive weight in bucket. Material weight exceeds maximum specified backhoe capacity.	Reduce material load. (Dig-ging load)
	Control valve linkage binding / defective -	Check control valve linkage and repair if defective.
	Quick disconnect coupler restriction or coupler “Flow checks”	Check coupler connections. Repair or replace.
	Hydraulic hose or tube line restriction choses / Tube line) Kinked or pinched	Check hoses and tubelines for evidence of restriction.
	Boom, Dipper arm or Bucket cylinder piston assembly leakage.	Check cylinders for leakage. Repair as needed.
	Relief valve erratic or set below specifications	Check and reset relief valve. Setting as needed.
	Control valve leaking inter-nally. (bypassing fluid within valve).	Replace control valve and recheck operation.

PROBLEM	Possible Cause	Correction
Inadequate lifting capacity	Engine R.P.M too slow	Increase engine R.P.M
	Excessive load. Material loading exceeds specified backhoe capacity.	Reduce Load
	Relief valve setting below specifications	Check and reset relief valve setting as needed.
	Bucket, Boom and Dipper arm cylinder piston assembly leakage	Check Cylinders for leakage. Repair as needed.
	Control Valve leaking inter-nally	Replace control valve and recheck operation.
	Hydraulic pump defective	Refer to “Hydraulic Pump Capacity Inadequate”
Aeration of Hydraulic Fluid	Low Hydraulic fluid level	Check and refill hydraulic system to proper level.
	Air lying into suction side of hydraulic pump	Check for loose or defective connections between reservoir and hydraulic pump.
	Cold Hydraulic Fluid	Allow hydraulic fluid to warm up to operating tem-perature.
	Hydraulic Oil viscosity too heavy or Incorrect Oil	Check Oil Number and Vis-cosity, refill correct hydraulic oil

System relieve valve squeals	Excessive load in bucket. Loading exceeds specified backhoe capacity	Reduce Load
	Relief Valve setting below specifications.	Check and reset valve setting as needed.
	Hydraulic hose, tube line	Check for evidence of restrictions in the hydraulic oil flow. Repair or replace defective components.
Backhoe Drops with valve spool in “centred” position	Cylinder piston assembly leakage	Check cylinders for leakage
(no external oil leakage evident). Note: A gradual drop over an extended period of time is a normal condition.	Control valve internal leakage	Replace control valve and recheck
Control Valve spool(s) will not return to centered position	Control lever linkage binding	Determine origin of binding and repair
	Control valve spool centering is broken	Replace Centering Spring
	Control valve spool binding in valve body spool bore	Disassemble valve for in-specification and repair.
	Loose Hydraulic connection	Tighten loose connections
	Defective hydraulic hose, tube line, adapter fitting or	Check for origin of oil leak and replace defective part.

	adapter fitting o-ring.	
External Hydraulic fluid Leakage	Control valve o-ring defective	Replace defective o-rings
	Control valve spool or body damaged or worn	Replace control valve
	Cylinder rod packing set leakage	Check cylinders for leakage. Repair as needed.
Hydraulic pump capacity inadequate	Cold Hydraulic fluid	Allow hydraulic fluid to warm up to operating temperature.
	Engine R.P.M too slow	Increase engine R.P.M
	Low hydraulic fluid supply	Refer to Tractor Operator's Manual for service recommendations.
	Hydraulic hose restriction	Check for evidence of restriction in hydraulic hoses.
	Hydraulic pump defective	Refer to Tractor Operator's Manual for recommended service procedures.
	Replace hydraulic pump if determined to be defective	
Cylinder Rod bend when cylinders extended	Excessive shock load on cylinders during transport	Replace defective parts. Review and observe proper and safe operational practices.