BHM-95

DARRELL HARP ENTERPRISES
PO BOX 140
RED BAY, AL. 35582
PHONE: 256-356-4424
FAX: 256-356-8300

SAFETY OPERATOR'S MANUAL

BACKHOE

IMPORTANT

READ THESE INSTRUCTIONS BEFORE INSTALLING AND USING THIS IMPLEMENT

INTRODUCTION

The purpose of this manual is to assist you in maintaining and operating your BHM backhoe.

Read the entire manual carefully before operating.
It provides information and instructions that will help you achieve years of reliable performance. Some information may be general in nature die 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 operator in backhoe seat position 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.

CHAPTER 1. SAFETY PRECAUTIONS

1.1 SAFETY

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

Know the position and operations of all controls before you 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 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 messages in this manual. When you see this symbol. Carefully read the message that follows 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 operations are in park, lock or neutral position.

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

Equip your tractor with a ROPS cab or frame for your protection. See your tractors 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 or backhoe. Only one person, the operator, should be on either machine when they are in operation.

Before leaving the tractor or backhoe, 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 loads. 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.

1.2 SAFETY PRECAUTIONS – CONTINUED

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 under pressure can have sufficient force to penetrate and cause infection or other injuries. If this happens seek medical attention immediately.

To prevent personal injury, relieve all pressure before disconnecting any 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 burns 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 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. 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 to always park backhoe on a hard level surface with all safety devices engaged to prevent backhoe from falling and being damaged or injuring someone. Stands may be required.

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 toed shoes, protective gloves, hard hat, safety glasses and dust 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, coordination or judgement.

ALWAYS CALL BEFORE YOU DIG!

CHAPTER 2. SAFETY DECALS

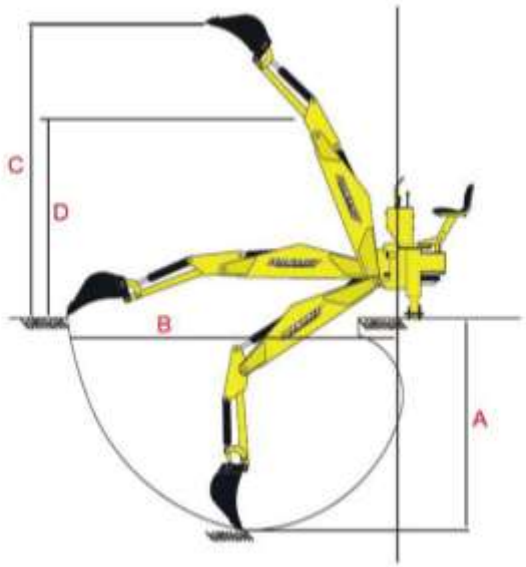
1. Keep safety decals clean and free of obstructing materials.
2. Replace damaged or missing safety decals with new decals.
3. If a component with a safety decal(s) affixed is replaced with a new part, ensure new safety decal(s) are attached in the same locations on the replacement components.

NOTE: Some decals appear on both sides of backhoe.

CHAPTER 3. BHM-95 SPECIFICATIONS

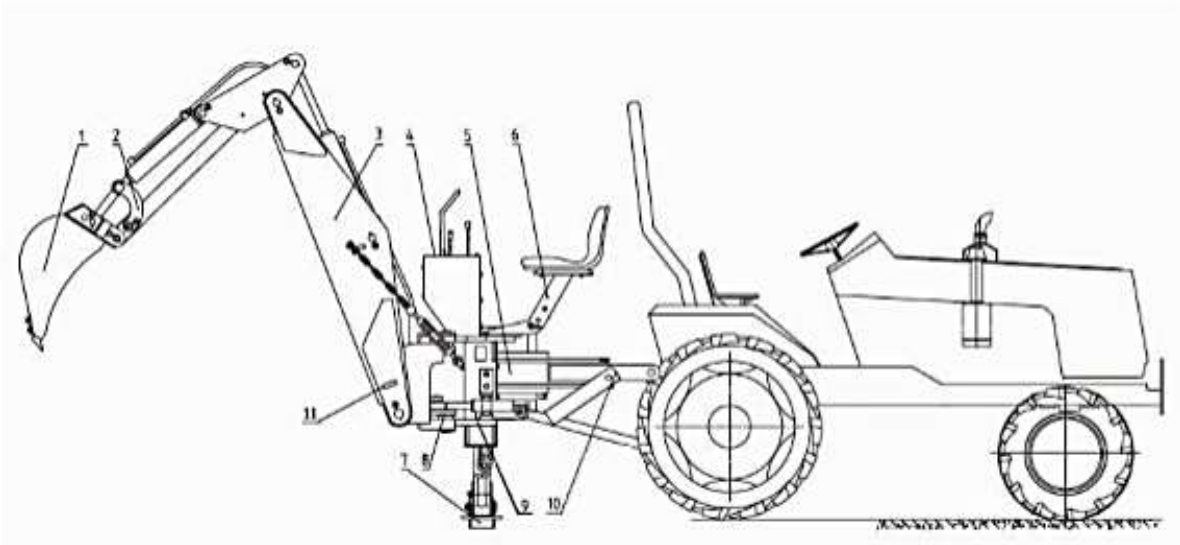
3.1 BHM-225

The BHM-95 backhoe can be attached to many brands of tractors and tracked dozers fitted with three-point linkage, increasing their versatility.



SPECIFICATION	BHM95
Recommended Tractor HP	12 – 20 HP
Boom Type	Fixed
3 Point Hitch	Cat. I
Max. Digging Depth (A)	3' 1"
Max. Digging Radius (B)	7' 6"
Max. Digging Height (C)	6' 10"
Max. Unloading Height (D)	4' 1"
Stabilizer Width	6' 2"
Swing Angle for Boom	180°
Bucket Turning Angle	180°
Bucket Capacity	.35 ft.^{3}
Bucket Width	12"
Min. Hydraulic Flow Required	4 gal/min
Max. Hydraulic Flow Allowed	6 gal/min
Min. Hydraulic Pressure Required	1885 PSI
Max. Hydraulic Pressure Allowed	2320 PSI
Bucket Digging Force	1874 lbs.
Dipper Arm Digging Force	1453 lbs.

3.2 BACKHOE COMPONENTS



Backhoe Components

1. Bucket
2. Staff
3. Boom
4. Joystick Controls
5. Hydraulic Tank
6. Seat
7. Stabilizers
8. Swing Cylinders
9. Tower
10. 3-Point Connections
11. Transport Lock

CHAPTER 4. TRACTOR PREPERATION

CAUTION: Do not exceed the manufacturer's rating for maximum gross vehicle weight. Refer to Operator's Manual, Dealer or Manufacturer.

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.

4.1 ROPS SYSTEM

The tractor must be equipped with an approved ROPS system to ensure adequate operator's protection.

4.2 HYDRAULIC SYSTEM

The BHM Series Backhoe hydraulic system is powered by the tractors Power Take Off, and are fitted with an in-built hydraulic pump, tank, and in-line filter system. Check fluid level daily, ensure PTO shaft is greased and change hydraulic filter as required (refer to Lubrication and Maintenance).

BE SURE TO FOLLOW THE DETAILED STEPS OUTLINED IN ASSEMBLY & MOUNTING BEFORE USING THE BACKHOE!

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

4.3 TIRE INFLATION

Front tires must be maintained at the maximum recommended inflation to maintain normal tire profile with the added weight of backhoe/material.
Rear tires must be maintained at equal pressure within the recommended tire inflation range. Unequal rear tire inflation can prevent backhoe attachment from controlling the ground across its full width.

4.4 WHEEL TREAD SETTINGS

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

4.5 ATTACHMENT

Ensure your tractor's 3-point linkage system is fitted with sway chains before attaching the backhoe. Failure to do this can cause the backhoe to swing when travelling potentially causing bodily injury or machine damage or 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.

4.6 COUNTER WEIGHT

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

CHAPTER 5. 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.

5.1 PRECAUTIONARY NOTES:

- 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 be prepared for operating.
- Warm 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 the fluid level in tank after doing this.
- 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 or 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: Failure to do so will result in a voided warranty, personal injury, or damage to equipment.

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.*

CAUTION: When lowering a heavy load, ease 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 void your warranty, cause unnecessary damage to the backhoe/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, void the warranty, cause damage to the tractor/backhoe or injury to personnel.

5.2 INITIAL BACKHOE OPERATION

Before operating the backhoe, fully raise and lower the boom, arm, swing and 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 to the correct oil level.

CAUTION: Before leaving the machine, stop the engine and 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 restricted 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 or being stored for an extended period of time.

5.3 COLD WEATHER OPERATION

For smooth operation in cold weather, let the tractor warm 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.

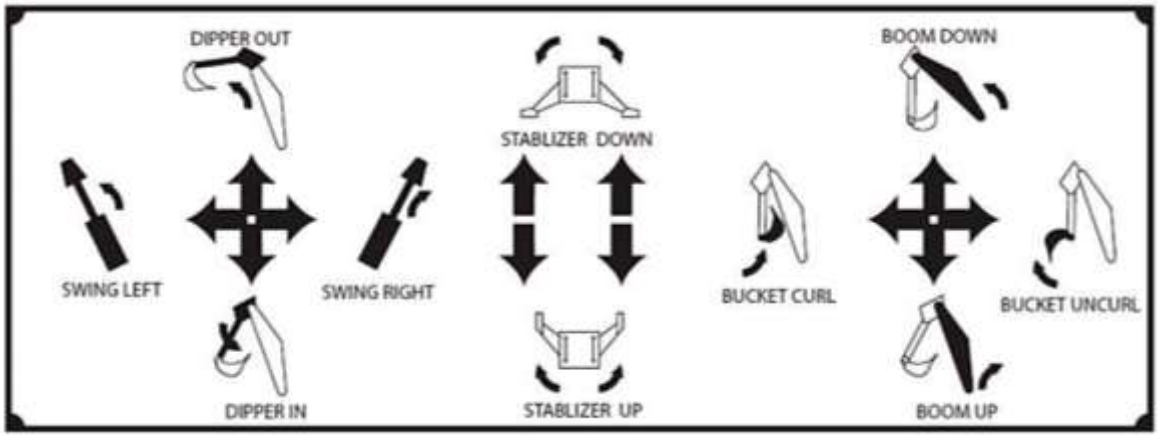
CAUTION: Operate controls only when seated in the operator's seat with seat belt on.

5.4 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. The diagram is located on the rear of the control valve bracket and is visible when operating the valve.

A. Boom & Bucket Control
B. Right Stabilizer Control
C. Left Stabilizer Control
D. Dipper Arm & Swing

5.4 BACKHOE HYDRAULIC CONTROLS-CONTINUED



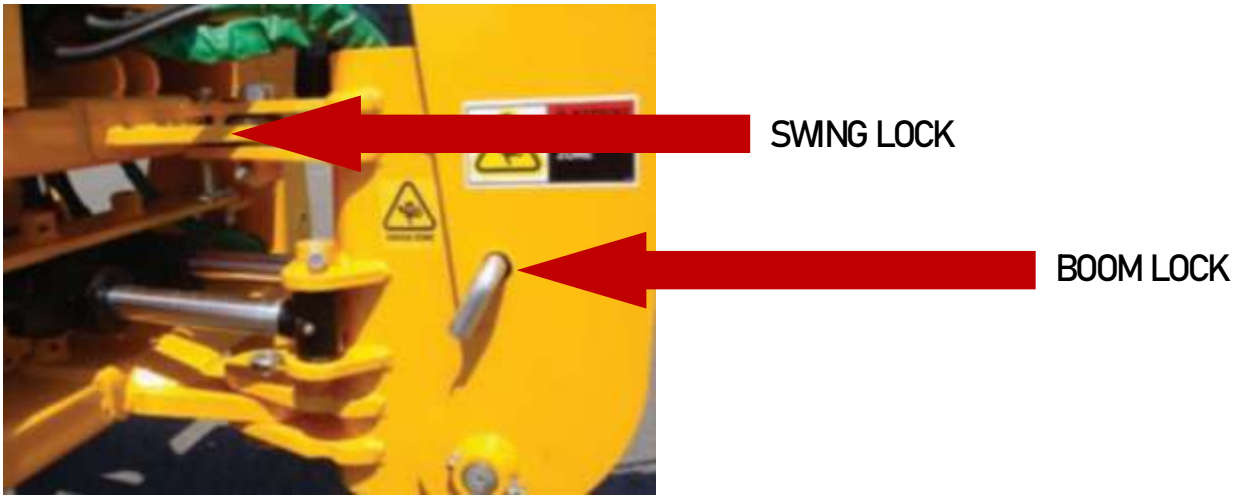
The two levers, 'Boom and Swing Control Lever' and 'Bucket and Crowd Control Lever', provide four simultaneous operations. Both experience and practice are needed to eliminate excess motion and increase operating efficiency.

Do not dig near the stabilizers to avoid possible accident.

Do not lift the tractor rear wheels by stabilizers. Also, be sure the stabilizers are seated on hard ground to support the backhoe/tractor.

5.5 SWING & BOOM LOCK

When transporting or dismounting backhoe, you must lock the backhoe's swing and boom. Position boom straight back and drop pin through holes in swing frame and boom. When not in use, store pins in the adjustable top link.



5.6 STABILIZER CLIPS

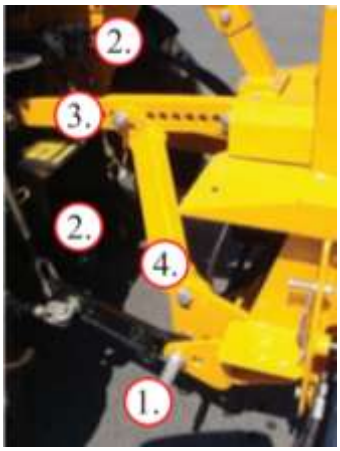
Stabilizer clips are also to be used for transporting and dismounting backhoe.

CHAPTER 6. BACKHOE MOUNTING

6.1 BACKHOE MOUNTING

The 3-pt. mounting frame is adjustable to suit all tractor models with Cat. I three-point linkage.

1. Connect tractor 3-point linkage arms to lower mounting frame pins.
2. Connect PTO and move bucket down to lift boom to move main frame into vertical position.
3. Connect and adjust top link assembly.
4. Connect left hand and right hand lock out brace to the correct hole and secure the bolt and nut tightly.
5. Lower and manually lock the tractor 3-point linkage position/draft lever (see tractor Operator's Manual).



6.2 PTO CONNECTION

Ensure PTO shaft is correct length - correct PTO shaft length must have a minimal overlap of 2" in drive position. Connect PTO shaft to tractor, PTO output shaft and backhoe hydraulic pump shaft. Check PTO shaft has suitable angle prior to operation. Angle of PTO shaft universals must be less than 25°, to prevent major damage.

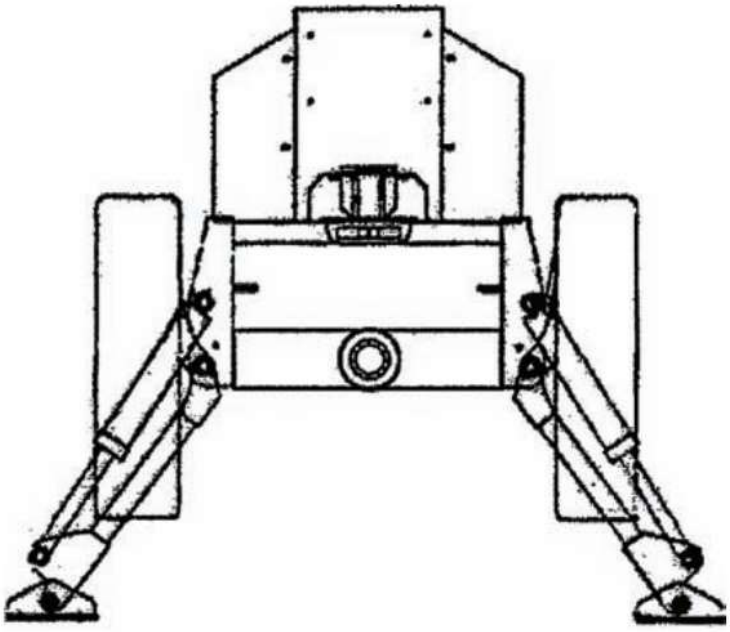
CAUTION: Backhoe should be mounted to the tractor three-point linkage.

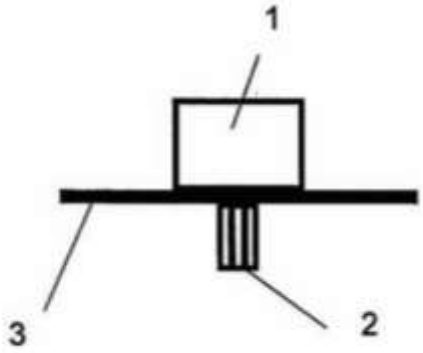
CAUTION: Never store backhoe without bucket attached to the backhoe.

CAUTION: Never raise 3-point linkage position/draft lever while backhoe is connected, damage could occur to linkage and hydraulic system. Use mechanical means to secure levers in down position.

CAUTION: It is owner/operator responsibility to ensure that the tractor 3-point linkage top link & hydraulic lift cover area is strong enough to accept 3-point linkage rigid connection and backhoe while in operation as extra forces are exerted through top link. No liability can be accepted for damage to tractor.

CHAPTER 7. HYDRAULIC PUMP ASSEMBLY





REF.	DESCRIPTION	SPECIFICATIONS	PART #	QTY.
1	Hydraulic Pump			1
2	Hydraulic Pump Shaft	1 3/8" – 6 spline		1
3	Bracket			1

CHAPTER 8. LUBRICATION AND MAINTENANCE

Total of 28 grease nipples - Grease nipples are located on every moving part

ITEM	SERVICE	SERVICE INTERVAL
Hydraulic System Oil Level	Check	Daily / 10 Hours
Hydraulic System Oil Filter	Replace	Every 50 Hours
Tire 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

CHAPTER 8. LUBRICATION AND MAINTENANCE-CONTINUED

CAUTION: Do not perform service or maintenance operations with backhoe raised off the ground. For additional access to tractor 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 connectionsa are tight and that lines, pipes and hoses are not dmaged. 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 any fittings are leaking or if the hoses are damaged. A sudden line burst could cause the boom, dipper arm or bucket to drop, causing severe injury.

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: 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 pivot points daily (10 hours).

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

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

CHAPTER 9. TROUBLSHOOTING

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

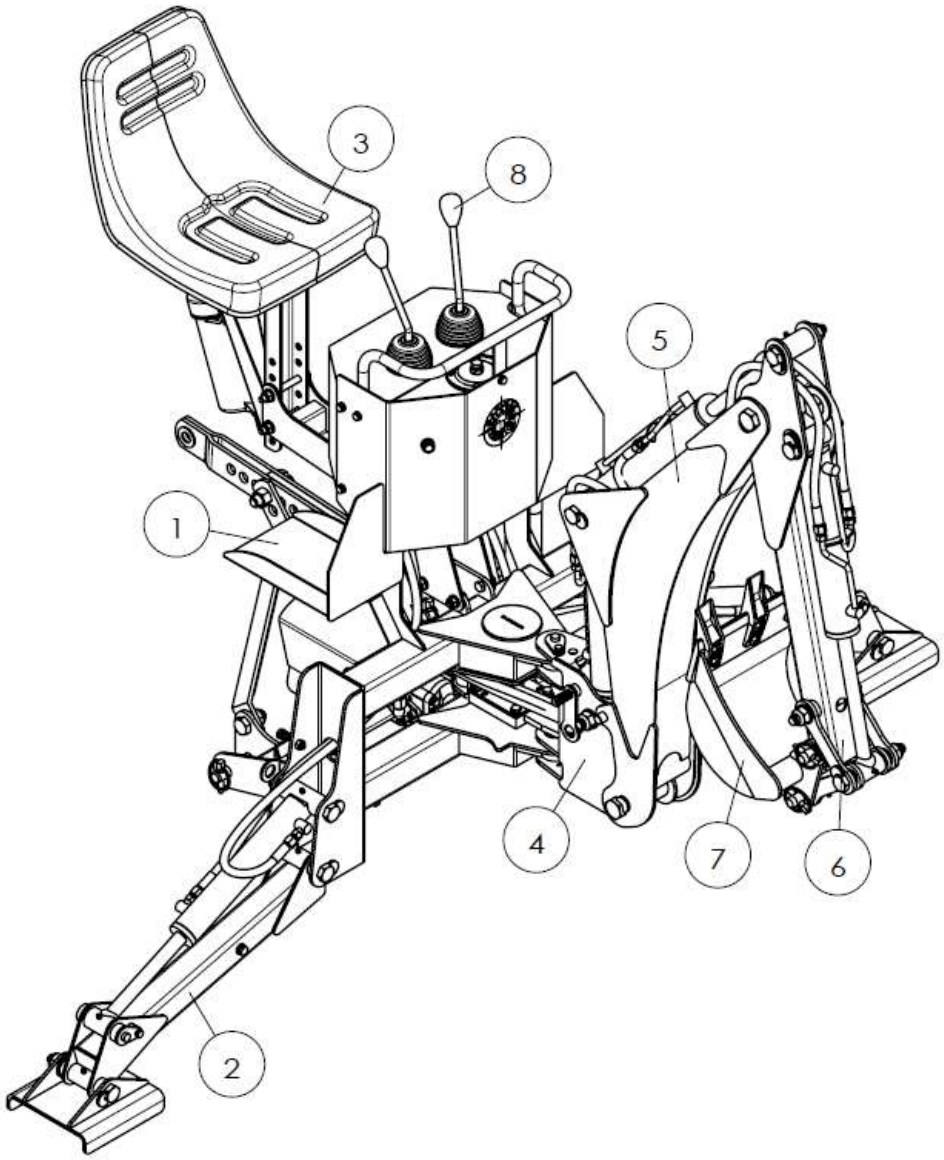
Determine the problem that best describes the operational problem being experienced and eliminate the possible causes as listed by following the correction procedures.

PROBLEM	POSSIBLE CAUSE	CORRECTION
Swing, Boom, Dipper Arm and Bucket Cylinders	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 (linked) 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 detective (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 hose connections.

PROBLEM	POSSIBLE CAUSE	CORRECTION
Slow or erratic move of cylinders (noisy operation of cylinders).	Low hydraulic fluid level.	Check and replenish hydraulic fluid.
	Cold hydraulic fluid.	Allow hydraulic system to warm up to operating temperatures.
	Hydraulic oil viscosity too heavy or incorrect oil.	Check oil number and viscosity, refill correct hydraulic oil.
	Engine RPM too slow (hydraulic pump RPM too slow).	Increase engine speed to obtain satisfactory backhoe operation.
	Excessive weight in bucket. Material weight exceeds maximum specified backhoe capacity.	Reduce material load (digging load).
	Control valve linkage binding/defective.	Check control valve linkage and repair if work/defective
	Aeration of hydraulic fluid.	Refer to "Aeration of hydraulic fluid".
	Quick disconnect coupler restriction or coupler "flow checks".	Check coupler connections. Repair or replace.
	Hydraulic hose or tube line restriction (hoses/tube line kinked or pinched).	Check hoses and tube lines 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 internally (by passing fluid within valve).	Replace control valve and recheck operation.
Inadequate lifting capacity	Engine RPM too slow.	Increase engine RPM.
Inadequate lifting capacity	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 internally.	Replace control valve and recheck operation.
	Hydraulic pump defective.	Refer to "Hydraulic Pump Capacity Inadequate".
Aeration of hydraulic fluid (generally indicated by foamy appearance of fluid)	Low hydraulic fuel level.	Check and refill hydraulic system to proper level.
	Air letting into suction side of hydraulic pump.	Check for loose or detective connections between reservoir and hydraulic pump
	Hydraulic fluid foaming due to improper hydraulic oil usage.	Refer to tractor Operator's Manual and replace hydraulic oil using recommended hydraulic oil.

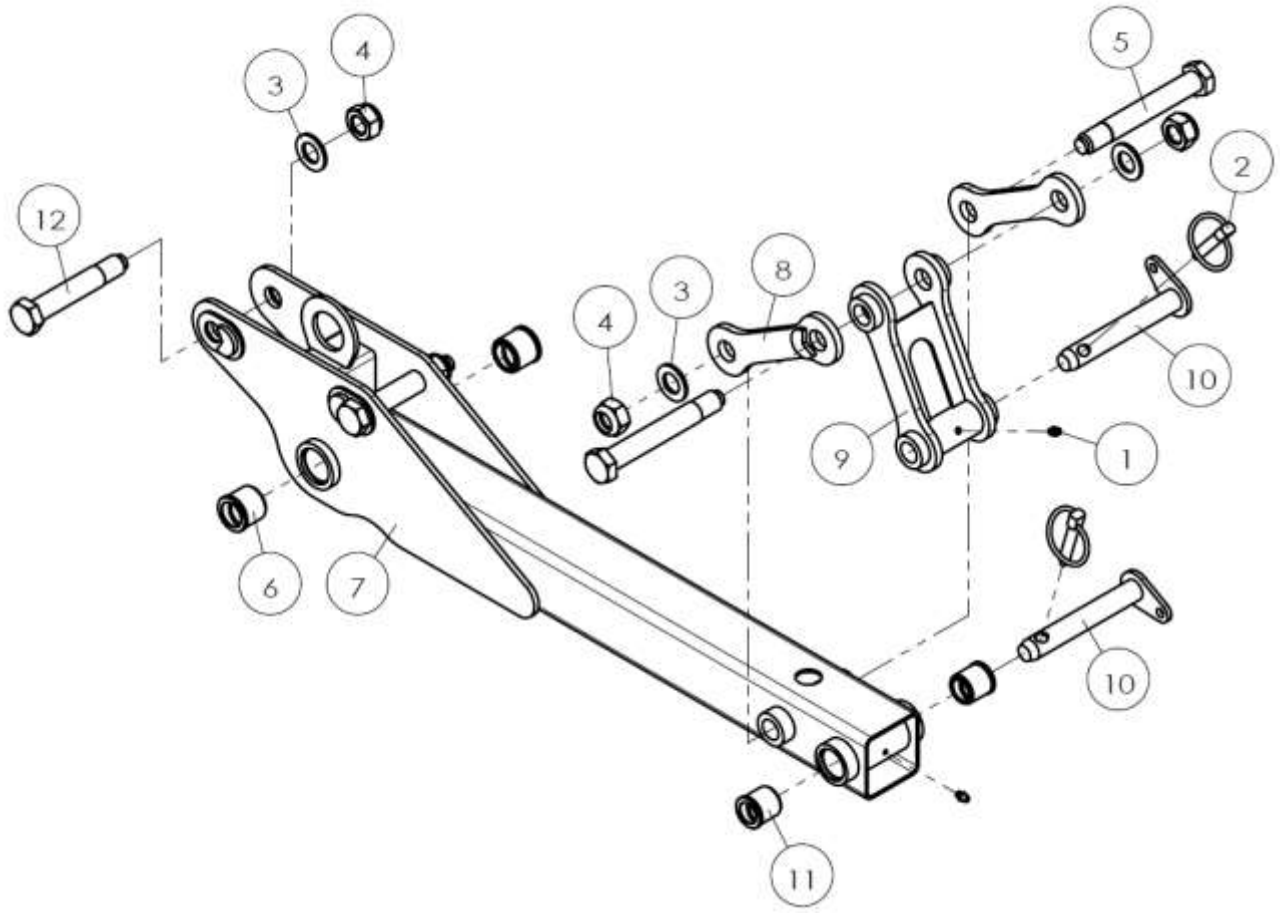
PROBLEM	POSSIBLE CAUSE	CORRECTION
System relieve valve squeals	Cold hydraulic fluid.	Allow hydraulic fluid to warm up to operating temperature.
	Hydraulic oil viscosity too heavy or incorrect oil.	Check oil number and viscosity, refill correct hydraulic oil.
	Excessive load in bucket. Loading exceeds specified backhoe capacity.	Reduce load.
	Relief valve setting below specifications.	Check and reset valve setting as needed.
	Hydraulic hose, tube line or quick disconnect coupler restriction.	Check for evidence of restriction in the hydraulic oil flow. Repair or replace detective components.
Backhoe drops with valve spool in "centered" position (no external oil leakage evident). Note: a gradual drop over an extended period of time is a normal condition.	Cylinder piston assembly leakage.	Check cylinders for leakage.
	Control valve internal leakage.	Replace control valve and recheck.
External hydraulic fluid leakage	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 inspection and repair.
Hydraulic pump capacity inadequate	Cold hydraulic fluid	Allow hydraulic fluid to warm up to operating temperature.
	Engine RPM too slow	Increase engine RPM.
	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.

CHAPTER 10. ILLUSTRATED PARTS CATALOG



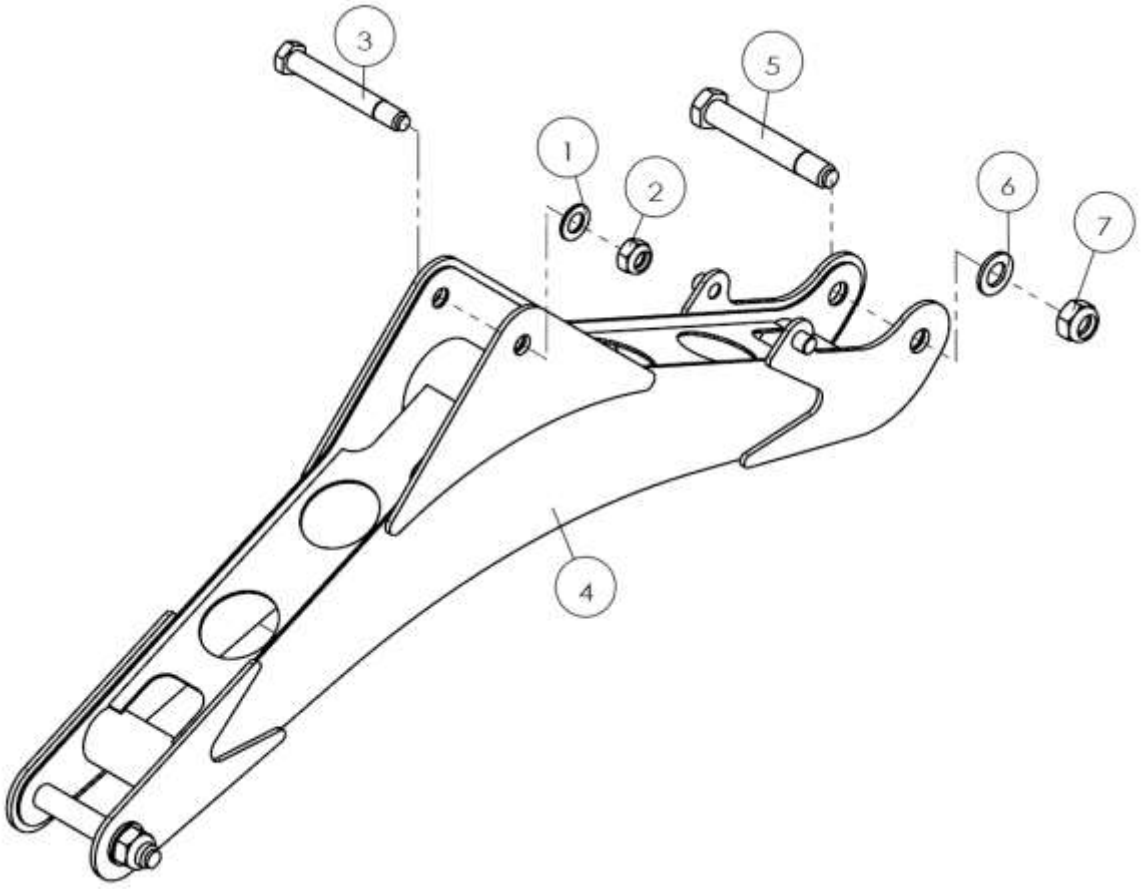
REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	BH-3.05.001	BASE ASSEMBLY	1	
2	BH-3.06.001	SUPPORTING LEG ASSEMBLY	2	
3	MBH-5.07.001	SEAT ASSEMBLY	1	
4	BH-3.04.001	SWING JOINT ASSEMBLY	1	
5	BH-3.03.001	MAIN BOOM ASSEMBLY	1	
6	BH-3.02.001	FRONT ARM ASSEMBLY	1	
7	BH-3.01.001	BUCKET ASSEMBLY	1	
8	BH-3.08.001	HYDRAULIC SYSTEM ASSEMBLY	1	

CHAPTER 10.1 FRONT ARM ASSEMBLY



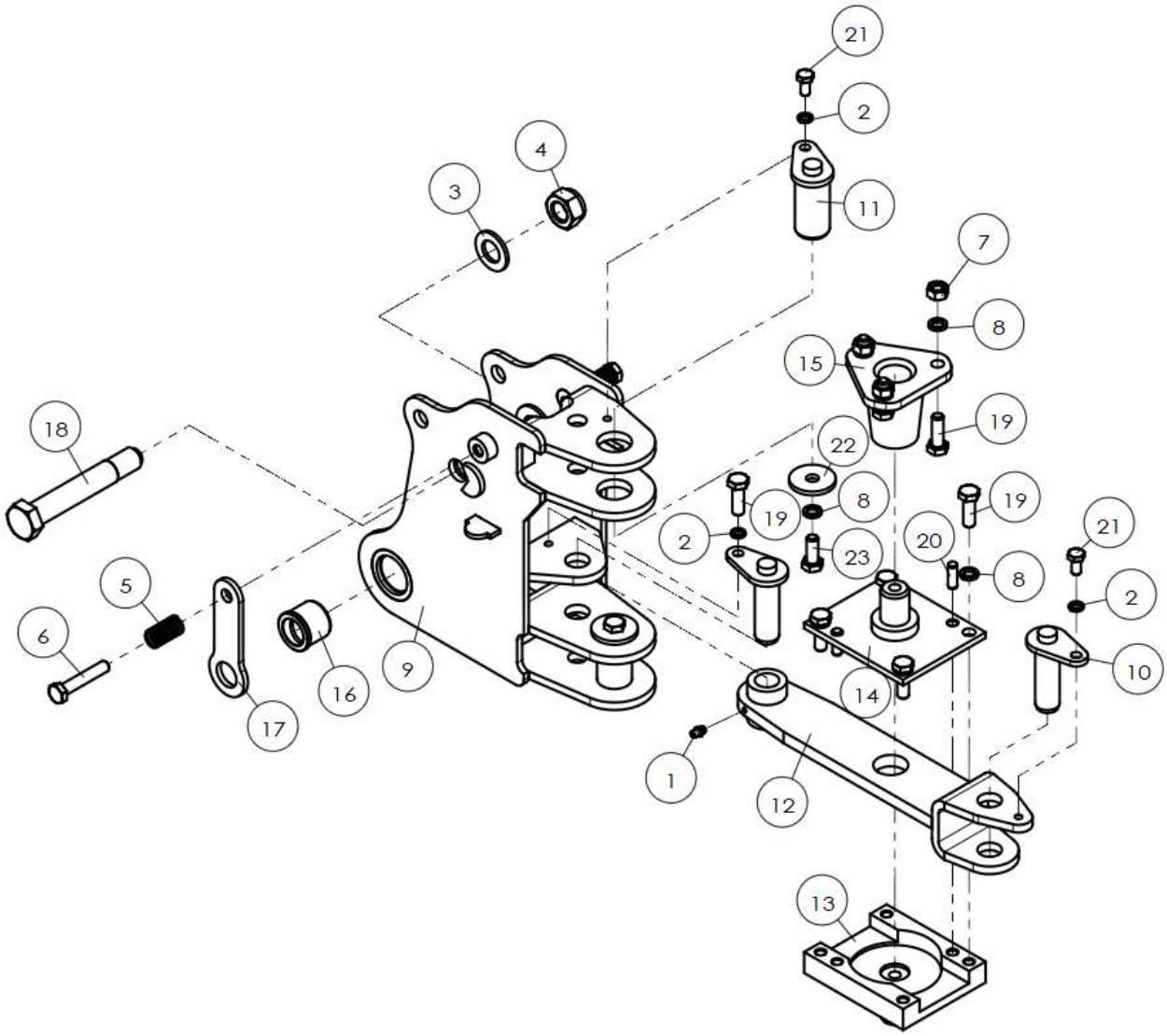
REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	GB1152-M6	GREASE NIPPLE	4	
2	200.56.011	LOCKING PIN	2	
3	GB97.1-20	PLAIN WASHER	4	
4	DIN95-M20	NUT	4	
5	GB27-M20X150	BOLT	2	
6	BH-3.02.102-1	BUSH	2	
7	BH-3.025.011-1	FRONT ARM	1	
8	BH-3.02.012	SWING ARM	2	
9	BH-3.02.014	BUCKET ADAPTOR	1	
10	BH-3.02.015	PIN	2	
11	BH-3.02.101-1	BUSH	2	
12	GB27-M20X120	BOLT	2	

CHAPTER 10.2 BOOM ASSEMBLY



REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	GB97.1-20	PLAIN WASHER	1	
2	DIN985-M20	NUT	1	
3	GB27-M20X150	BOLT	1	
4	BH-3.03.011-1	ARM	1	
5	GB27-M24X160	BOLT	2	
6	GB97.1-24	PLAIN WASHER	2	
7	DIN985-M24	NUT	2	

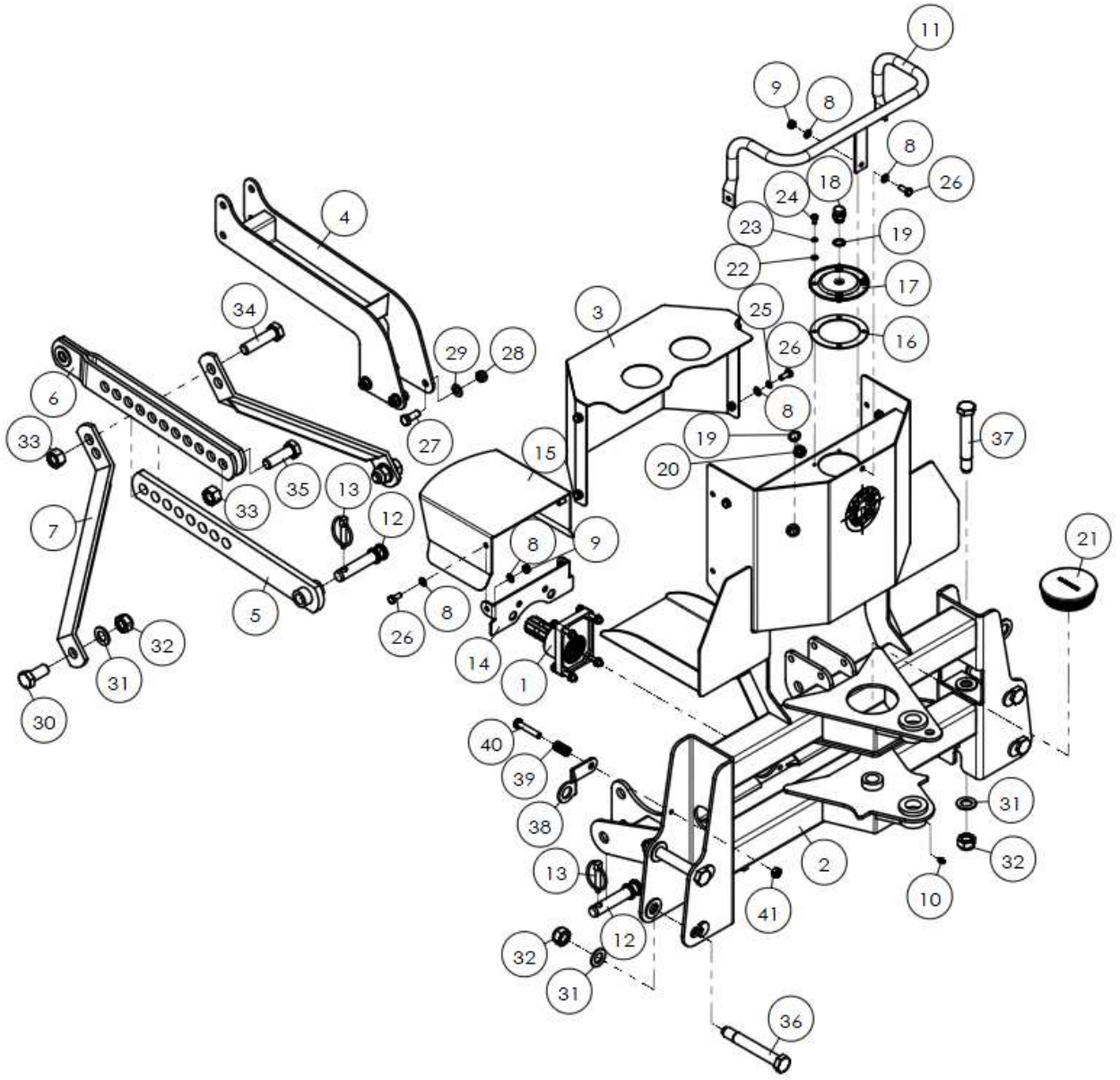
CHAPTER 10.3 SWING ASSEMBLY



REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	GB11152-M6	GREASE NIPPLE	2	
2	GB963-8	SPRING WASHER	4	
3	GB97.1-20	PLAIN WASHER	1	
4	DIN985-M20	NUT	1	
5	BH-6.05.107	SPRING	1	
6	GB5782-M10X55	BOLT	2	
7	GB6170-M10	NUT	3	
8	GB93-10	SPRING WASHER	8	
9	BH-3.04.011-1	KNUCKLE	1	
10	BH-3.04.013	PIN	2	
11	BH-3.04.014	SWING SHAFT	2	
12	BH-3.04.015	STEERING ARM	1	
13	BH-3.04.016	SLIDE BRACKET	1	
14	BH-3.04.017	SLIDE BRACKET COVER	1	

REF. #	PART #	DESCRIPTION	QTY.	REMARKS
15	BH-3.04.105	SLIDE BRACKET SEAT	1	
16	BH-3.02.102-1	BUSH	2	
17	BH-3.04.108	BOOM LOCKING PLATE	2	
18	GB27-M20X130	BOLT	1	
19	GB5783-M10X30	BOLT	8	
20	GB119.1-B-8X24	PIN	2	
21	GB5783-M8X16	BOLT	3	
22	WCR90-00012	END PLATE	2	
23	GB5783-M10X25	BOLT	2	

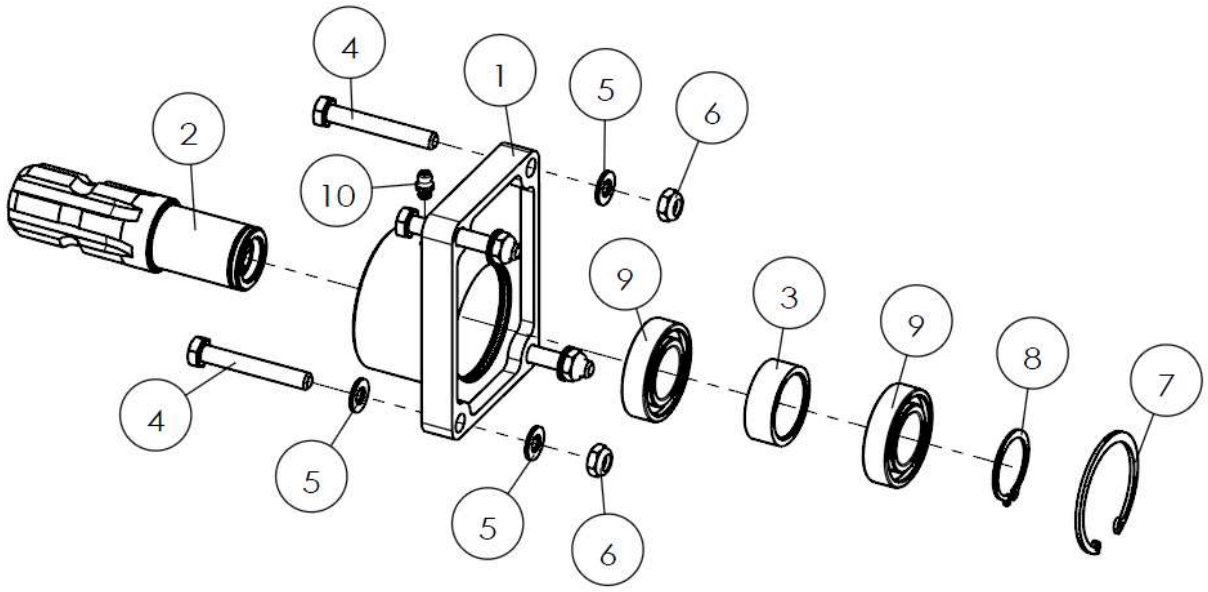
CHAPTER 10.4 BASE ASSEMBLY



REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	BH-3.05.017	PTI ASSEMBLY	1	
2	BH-3.05.011	BASE	1	
3	BH-3.05.012	REAR COVER	1	
4	BH-3.05.013	SEAT SUPPORT	1	
5	BH-3.05.014	LIFTING PLATE	1	
6	BH-3.05.015	LIFTING PLATE	1	
7	BH-3.05.016	SUPPORTING PLATE	2	
8	GB97.1-8	PLAIN WASHER	14	
9	DIN985-M8	NUT	5	
10	GB1152-M6	GREASE NIPPLE	2	
11	BH-3.05.018	PROTECTING ROD	1	
12	BH-3.05.105	PIN	3	

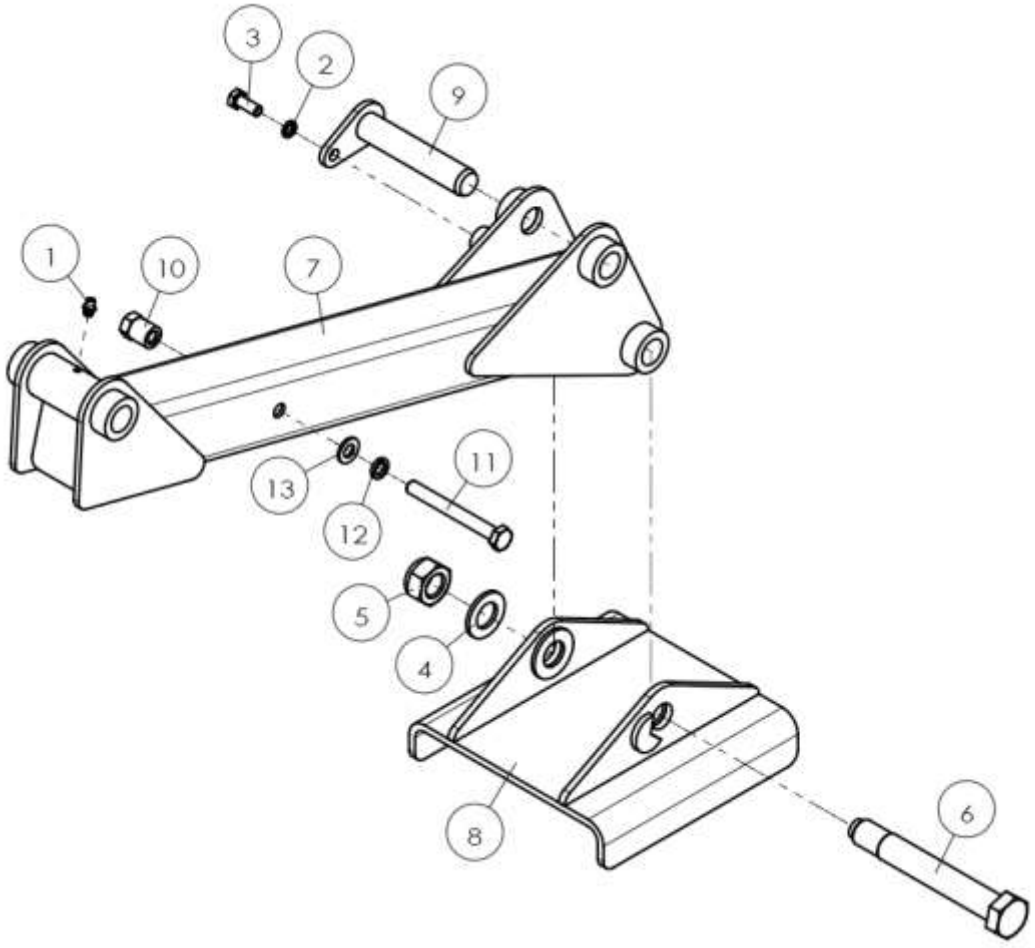
REF. #	PART #	DESCRIPTION	QTY.	REMARKS
13	200.56.011	LOCKING PIN	3	
14	WCX5-0105	SHIELD BRACKET	1	
15	WCX5-0106	DRIVE SHAFT SHIELD	1	
16	MBH-8.08.118	GASKET	1	
17	MBH-8.08.117	TANK COVER	1	
18	CBW-00-011	OIL PLUG	1	
19	JB982-16	WASHER	2	
20	JB7941.2-M16X1.5	OIL LEVEL	1	
21	ZL-DF654-170	RUBBER COVER	1	
22	GB97.1-6	PLAIN WASHER	4	
23	GB93-6	SPRING WASHER	4	
24	GB5783-M6X12	BOLT	4	
25	GB93-8	SPRING WASHER	4	
26	GB5783-M8X20	BOLT	9	
27	GB5783-M12X30	BOLT	4	
28	DIN985-M12	NUT	4	
29	GB97.1-12	PLAIN WASHER	4	
30	GB5783-M20X45	BOLT	2	
31	GB97.1-20	PLAIN WASHER	7	
32	DIN985-M20	NUT	7	
33	GB6170-M20	NUT	2	
34	GB5782-M20X80	BOLT	1	
35	GB5782-M20X65	BOLT	1	
36	GB27-M20X150	BOLT	4	
37	GB27-M20X140	BOLT	1	
38	BH-3.05.108	LOCKING PLATE	2	
39	BH-6.05.107	SPRING	2	
40	GB5782-M10X55	BOLT	2	
41	GB6170-M10	NUT	2	

CHAPTER 10.5 PTI ASSEMBLY



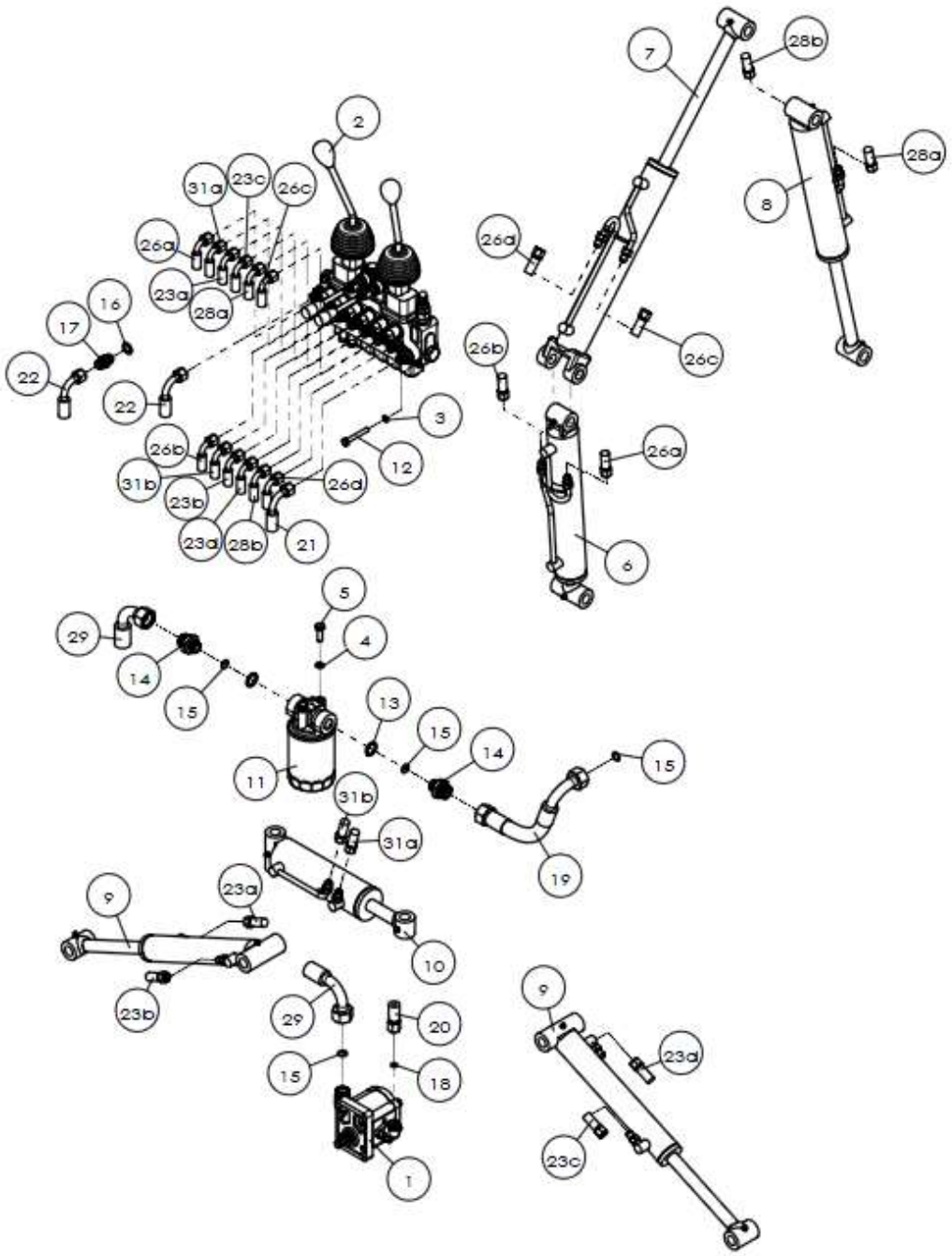
REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	BH-3.05.158	BEARING SEAT	1	
2	BH-3.05.156	INPUT SHAFT	1	
3	BH-3.05.157	SPACER	1	
4	GB5782-M8X55	BOLT	4	
5	GB97.1-8	WASHER	6	
6	DIN985-M8	NUT	4	
7	GB893.1-55	RETAINING RING	1	
8	GB894.1-30	RETAINING RING	1	
9	GB276-6005	BEARING	2	
10	GB1152-M6	GREASE NIPPLE	1	

CHAPTER 10.6 SUPPORT ASSEMBLY



REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	GB1152-M6	GREASE NIPPLE	2	
2	GB93-8	SPRING WASHER	1	
3	GB5783-M8X20	BOLT	1	
4	GB97.1-20	PLAIN WASHER	1	
5	DIN985-M20	NUT	1	
6	GB27-M20X150	BOLT	1	
7	BH-3.06.013	SUPPORTING LEG	1	
8	BH-3.06.011	BASE	1	
9	BH-3.06.012	PIN	1	
10	BH-3.06.105	PIN	1	
11	GB5782-M10X90	BOLT	1	
12	GB93-10	SPRING WASHER	1	
13	GB97.1-10	PLAIN WASHER	1	

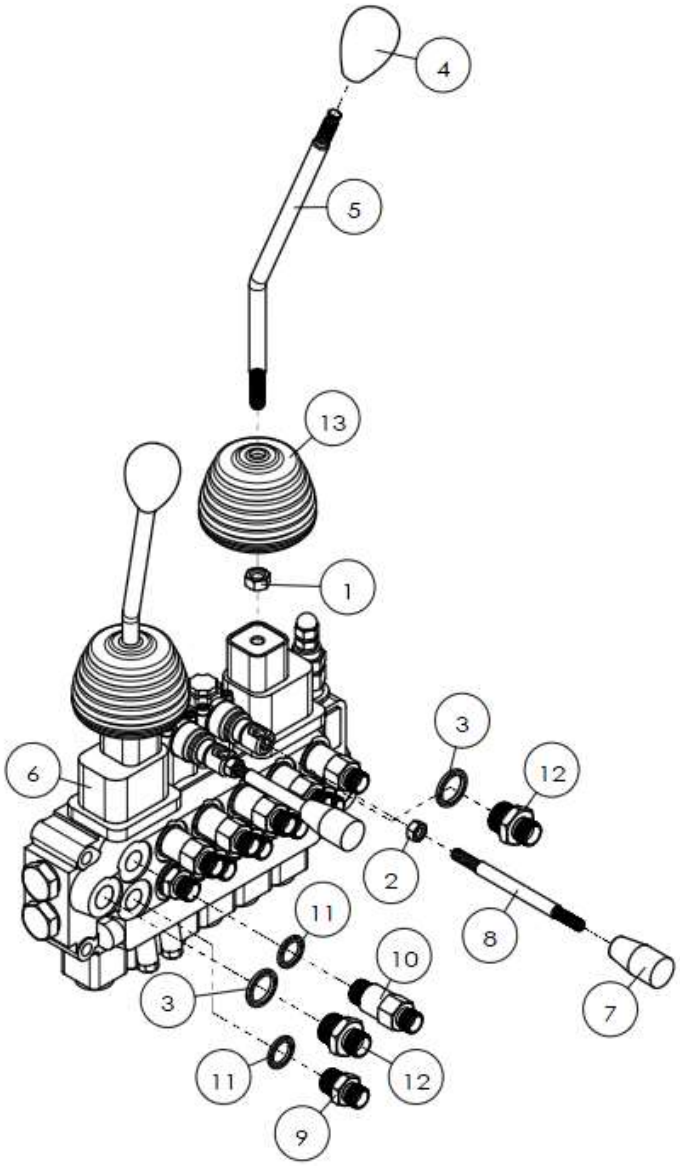
CHAPTER 10.7 HYDRAULIC SYSTEM ASSEMBLY



REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	BH-3.08.022	PUMP ASSEMBLY	1	
2	BH-3.08.014	VALVE ASSEMBLY	1	
3	GB93-8	SPRING WASHER	3	
4	GB93-10	SPRING WASHER	2	
5	GB5783-M10X30	BOLT	2	
6	BH-3.08.013	BOOM CYLINDER	1	
7	BH-3.08.012	FRONT ARM CYLINDER	1	
8	BH-3.08.011	BUCKET CYLINDER	1	
9	BH-3.08.019	SUPPORTING LEG CYLINDER	2	
10	BH-3.08.023	SWING CYLINDER	1	

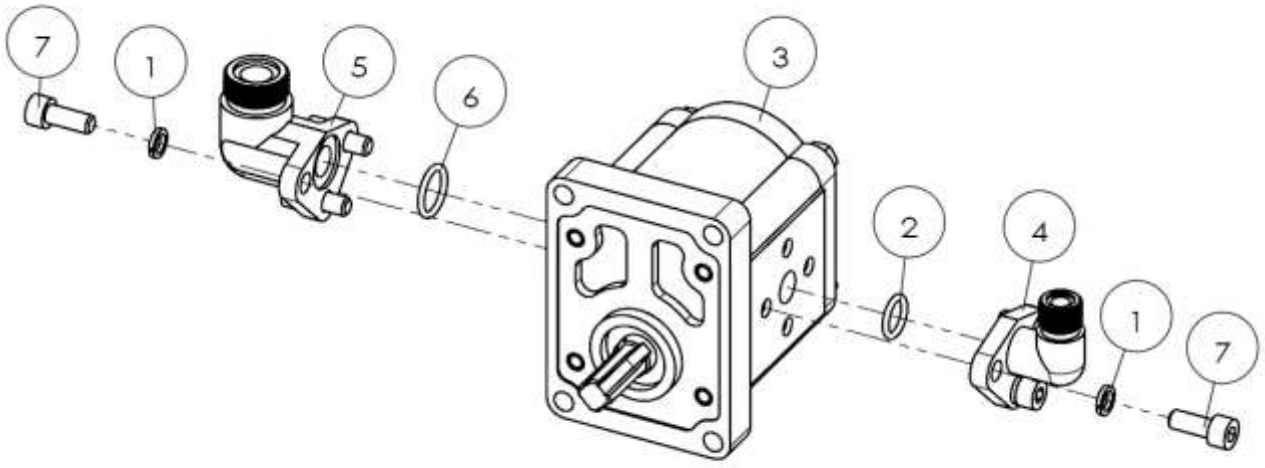
REF. #	PART #	DESCRIPTION	QTY.	REMARKS
11	YX0811A	OIL FILTER	1	
12	GB5782-M8X60	BOLT	3	
13	JB982-2	COMBINATION WASHER	2	
14	LW-7.07.101	JOINT	2	
15	GB3452.1-G-14X2.65	O-RING	4	
16	G3/8	COMBINATION WASHER	1	
17	1CB-18-06WD	CONNECTOR	1	
18	GB3452.1-G-8X2.65	O-RING	1	
19	BH-3.08.021	HOSE - OIL FILTER TO OIL TANK	1	
20	BH-3.08.015	HOSE - PUMP TO VALVE	1	
22	BH-3.08.016	HOSE - VALVE TO TANK	2	
23	BH-3.08.026	HOSE - VALVE TO SUPPORTING LEG	4	
26	BH-3.08.029	HOSE - VALVE TO FRONT ARM	4	
28	BH-3.08.030	HOSE - VALVE TO BUCKET	2	
29	BH-3.08.020	HOSE – OIL FILTER TO PUMP	2	
31	BH-3.08.027	HOSE – VALVE TO STEERING CYLINDER	2	

CHAPTER 10.8 COMBINATION MULTI-CHANNEL VALVE ASSEMBLY



REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	GB6170-M10	NUT	2	
2	GB6170-M8	NUT	2	
3	JB982-22	COMBINATION WASHER	2	
4	BH-6.07.090	KNOB	2	
5	MBH-5.08.107	CONTROL HANDLE	2	
6	ZT6-F15-T/60-5	MULTI-WAY VALVE	1	
7	BH-6.07.091	SHORT ROD HANDLE	2	
8	MBH-6.08.108	JOYSTICK (SHORT)	2	
9	MBH-6.08.302T	FITTING - VALVE INLET AND OUTLET OIL	6	
10	MBH-6.08.301T	FITTING - VALVE INLET AND OUTLET OIL	6	
11	JB982-18	COMBINATION WASHER	12	
12	MBH-6.08.304T	FITTING - VALVE INLET AND OUTLET OIL	2	
13	BH-6.08.105	RUBBER COVER	2	

CHAPTER 10.9 OIL PUMP ASSEMBLY



REF. #	PART #	DESCRIPTION	QTY.	REMARKS
1	GB93-8	SPRING WASHER	6	
2	GB3452.1-G-14X2.65	O-RING	1	
3	CBW-F314-CFHL	GEAR PUMP	1	
4	LW-7.07.116-A	GEAR PUMP INLET CONNECTOR	1	
5	LW-7.07.117A	GEAR PUMP OIL CONNECTOR	1	
6	GB3452.1-G-18X2.65	O-RING	1	
7	GB70.1-M8X20	BOLT	6	