



OPERATORS MANUAL FOR HYMARI FRONT END LOADER KITS

SAFETY WARNING: Do not use or operate this equipment until this manual and assembly instructions (where applicable) has been read and understood



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FRONT END LOADER

Operator's Manual

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CHAPTER □ SAFETY INFORMATION

PLEASE NOTE


Make sure all potential operators of this equipment review this manual and all safety messages contained within.

1.1 Safety First

Read this manual completely and carefully and make sure you understand all the functionality of the controls on the machine. Make sure you are aware of the stability and load characteristics of this loader before you begin operation. Contact your dealer if you are unsure of any item concerning operation, maintenance or service of this loader.

Understand that your safety and the safety of other persons is measured by how you service and operate this loader. Know the position and operations of all controls before you try to operate. **Make sure you check all controls are in a safe state before starting.**

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 messages in this manual. When you see this symbol, carefully read this message that follows and be alert to the possibility of personal injury or death.
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1.2 Safety Precautions



Improper use of a loader can cause serious injury or death. The following safety precautions, and those given on the tractor mount installation instruction, should be thoroughly understood before attempting to operate this machine.

Before Operating

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

Equip your tractor with a ROPS cab or frame for your protection. See your tractor operator's manual for correct seat belt usage.

Carefully study and scrutinise this manual together with the specific tractor mount instructions in order to gain a full understanding of the performance, operation and maintenance of the loader.

Prior to operation, inspect the loader and hydraulic hoses / connectors for system leaks, damaged, missing, or malfunctioning components in an effort to avoid the possibility of a dangerous failure involving structural members or hydraulic system components.

Be certain any repairs necessary are completed prior to loader operation.

The driver/operator should have the specific driving license and strictly follow the public traffic regulations. Other people who have no driving license are not allowed to drive the loader set, especially drive on public road.

Do not permit others to ride on your tractor. Only one person, the operator or driver, should be on the machine when it is in operation.

Be certain all bystanders are clear of the machine and operation area prior to operation.

Add recommended wheel ballast or rear wheel weights for increased stability.

Set both front and rear wheel treads to the widest recommended width to assure best stability.

Remember that your machine is designed and produced exclusively for agricultural use, such as snow removal, barn and feedlot cleaning or light grading and digging. Its design is **NOT** intended for industrial use.

During Operating

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

Be sure the operating area is clear of bystanders during machine operations.

Never lift, hoist, or carry humans in the bucket or on any portion of the loader or loader attachments.

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

Avoid sudden stops when lowering or lifting the loader boom to prevent loss of control over the machine and / or loader.

Never adjust or perform maintenance on the loader or tractor with the unit in motion, or without power source locked out.

A loader 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 loader or attachment unless it is securely blocked or held in position. Accidental movement of a control lever or leak in the hydraulic system could cause the loader to drop, or attachment to dump, causing severe injury.

Contact with overhead power lines can cause severe electrical burns or death from electrocution. Make sure there is enough clearance between raised equipment and overhead power lines.

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

When using a loader, be alert of bucket position at all times. A loader in the raised position with the bucket rolled back can dump material onto the tractor causing damage or injury to the tractor and / or operator.

When using remote hydraulic tractor valves on some tractors, the loader lifting and dumping cylinders will continue moving unless the control levers are manually returned to neutral, or until relief pressure is reached at the ends of piston strokes. Observe the bucket movement and maintain control with the control levers.

Following Operation

When the machine is not in operation, lower the loader boom. Apply the tractors parking brakes. Disengage the power take off (PTO). Put all controls in neutral. Shut the engine off, and remove the ignition key before leaving the tractor.

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

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

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

Stop the loader arms gradually when lowering or lifting loads.

Always park loader with bucket attached to loader in the lowest position.

Performing Maintenance

Carefully review, understand, and follow the “maintenance” section in this manual before attempting to service the loader.

Lower the bucket or attachment to the ground, stop the engine, and relieve pressure in the hydraulic system before adjusting, lubrication, or servicing the loader.

To prevent personal injury, before disconnecting fluid lines, lower the loader and attachments. Lock out the hydraulic supply and relieve all hydraulic pressure.

Never use your hand to check for suspected leaks under pressures. 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 injury. If injured by leaking fluid, seek medical attention immediately.

General

The use of good judgment and common sense is required by the operator whilst using this loader. Use extra caution when rear wheel weights and tyre ballast are added to a loader-equipped tractor. **Do not** ram into frozen dirt piles, frozen manure piles, ice, etc. with great momentum where sudden shock loads are encountered. Serious and costly damage may result to both the loader and the tractor.

Do not use a bucket to scrape or as a dozer blade, unless the bucket is tilted so that the bucket stops are in contact with the boom. A limited amount of leveling may be done, when the loader valve is arranged with a float control. This will prevent damage to the cylinder rods.

Always keep unused PTO shaft clutch levers disengaged.

Keep hands, feet and clothing away from all moving parts.

Care must be taken with your loader cylinders. Always keep cylinders in a retracted position when the loader is not in use to guard against rust and contamination which may cause damage to the cylinder rods or hydraulic system.



Remember

Move slowly!

Always use care and common sense!

Be careful for your own sake and for that of others.

1.3 Safety Decals

Care of 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, make sure new safety decal(s) are attached in the same locations as the replaced components.

Safety Decal locations

Safety decals No. 1, No. 2 located on the left and right upright, which can be visible when getting on tractor. Safety decals No. 3, No. 4 located on the front part of left and right main frame. Safety decals No. 5 located on the hydraulic cylinders.

CHAPTER □ LOADER SPECIFICATIONS

2.1 Brief introduction

The **HYMARI** series of front end loaders can be attached to several brands of wheeled tractors in order to make it possible for the tractor to perform more tasks.

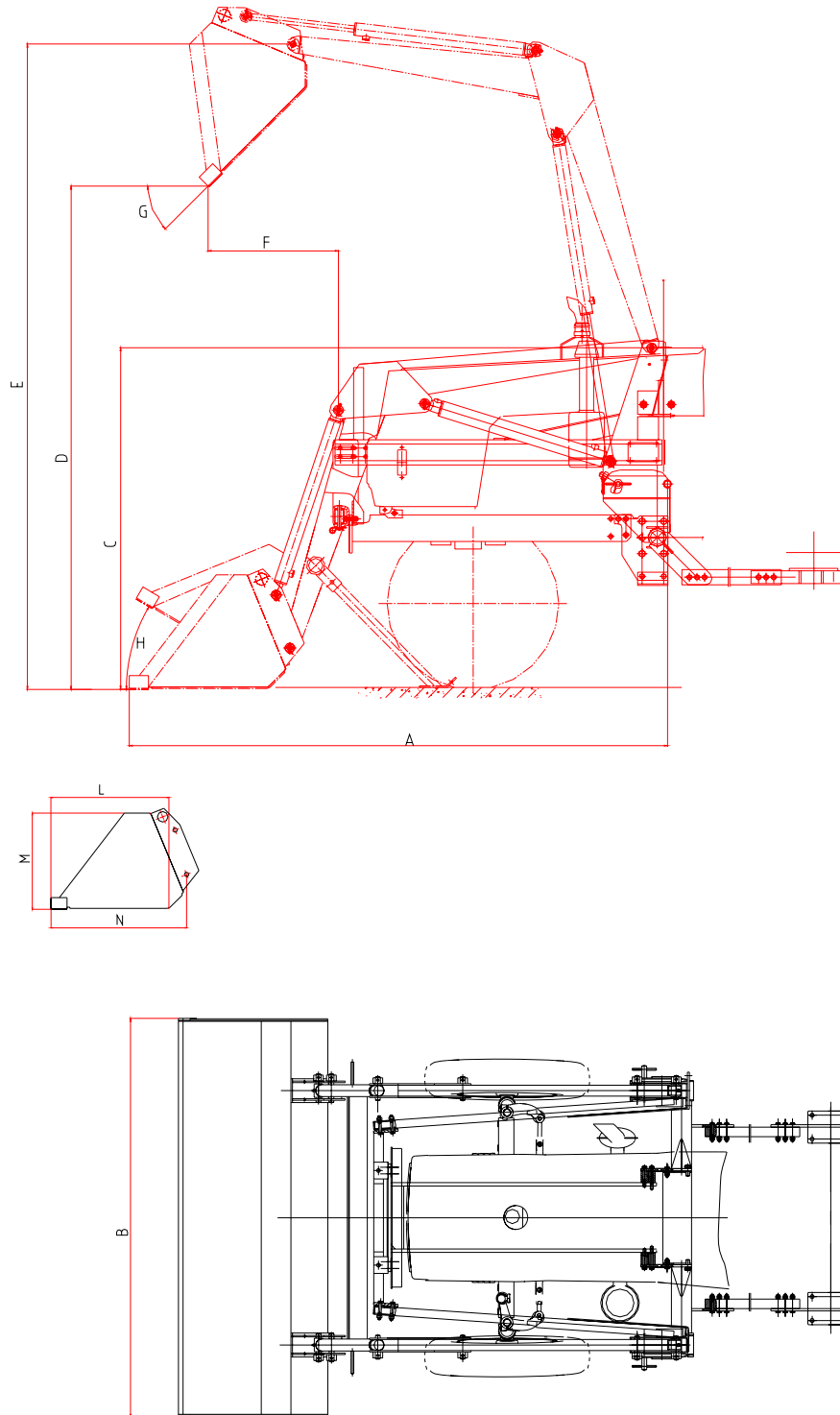


Fig 2.1 Overall dimensions of the Loader

2.2 Specifications and parameters for front end loader

	Model of loader attachment	FRKU-3	FRIS-2	FRIS-1	FRYN-1	FRKU-1
		KUBOTA -L1802DT	ISEKI -TU2100	ISEKI -TX1510	YANMAR -YM1510D	KUBOTA -B7001
A	Overall length (mm) (With bucket on the ground)	1,825	1,825	1,720	1,720	1,720
B	Bucket width (mm)	1,400	1,400	1,100	1,100	1,100
C	Overall height (mm) (With bucket on the ground)	1,168	1,168	1,060	1,060	1,060
D	Clearance with bucket dumped	1,440	1,440	1,330	1,330	1,330
E	Maximum lifting height (mm) (From ground to bucket pivot)	1,955	1,955	1,845	1,845	1,845
F	Reach the bucket (mm) (Bucket fully lifted and at 45° dumping angle)	425	425	375	375	375
G	Bucket dumping angle	49°	49°	49°	49°	49°
H	Bucket rollback angle	15°	15°	15°	15°	15°
L	Depth of bucket (to back of inner shell) (mm)	500	500	500	500	500
M	Height of bucket (mm)	460	460	460	460	460
N	Depth of bucket (to pivot pin) (mm)	535	535	535	535	535
	Bucket cubage (m ³)	0.16	0.16	0.12	0.12	0.12
	Carrying capacity (kg)	150	150	100	100	100
	Mass of loader attachment (kg)	200	200	200	200	200
	Working pressure of the hydraulic system (MPa)	16	16	16	16	16
	Lifting cylinder Bore × stroke – Number	25×365–2	25×365–2	25×365–2	25×365–2	25×365–2
	Bucket cylinder Bore × stroke – Number	25×330–2	25×330–2	25×335–2	25×335–2	25×335–2
	Control valve (single joystick)	ZD-15-T/0Q				

REMARK: 1. A-2 Specifications shown are based on tractor 1802DT (A-1).

B-1 B-3 B-4 Specifications shown are based on tractor YM1510D (B-2).

Specifications may vary with tractor model, front axle configurations, tyre size options and type of attachment.

2.3 Specifications and parameters for clamping type loader

	Model of loader attachment	B-4	FRIS-2	FRKU-2	FRYN-2
		MITSUBISHI -MT1401D	ISEKI -TU1500	KUBOTA -B1400	YANMAR -F15D
A	Overall length (mm) (With bucket on the ground)	1,720	1,720	1,720	1,720
B	Bucket width (mm)	1,100	1,150	1,250	1,200
C	Overall height (mm) (With bucket on the ground)	1,060	1,060	1,060	1,060
D	Clearance with bucket dumped	1,330	1,330	1,330	1,330
E	Maximum lifting height (mm) (From ground to bucket pivot)	1,845	1,845	1,845	1,845
F	Reach the bucket (mm) (Bucket fully lifted and at 45° dumping angle)	375	375	375	375
G	Bucket dumping angle	49°	49°	49°	49°
H	Bucket rollback angle	15°	15°	15°	15°
L	Depth of bucket (to back of inner shell) (mm)	500	500	500	500
M	Height of bucket (mm)	460	460	460	460
N	Depth of bucket (to pivot pin) (mm)	535	535	535	535
	Bucket cubage (m ³)	0.12	0.13	0.14	0.13
	Carrying capacity (kg)	100	100	100	100
	Mass of loader attachment (kg)	200	200	200	200
	Working pressure of the hydraulic system (MPa)	16	16	16	16
	Lifting cylinder Bore × stroke – Number	25×365–2	25×365–2	25×365–2	25×365–2
	Bucket cylinder Bore × stroke – Number	25×335–2	25×335–2	25×335–2	25×335–2
	Control valve (single joystick)	ZD-15-T/0Q			

CHAPTER □ OPERATION

3.1 Tractor Preparation

Rear Counterweight

Add recommended rear ballast for increased stability.

Refer to tractor operator's manual for specific recommendations on counterweighing tractor.

ROPs System.

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

Tractor Hydraulic System

Tractor operation in a loader application significantly increases demands on the tractor hydraulic system. Check the tractor hydraulic system fluid level daily. Refer to your tractor operator's manual maintenance section for instructions regarding tractor hydraulic system maintenance.

Adhere to recommendations in your tractor operator's manual concerning hydraulic fluid and filter specifications, and change intervals.

Tractor Tyres

Front tyres must be maintained at the maximum recommended inflation to maintain normal tyre profile with the added weight of the loader.

Rear tyres must be maintained at equal pressure within the recommended tyre inflation range. Unequal rear tyre inflation can prevent loader bucket from contacting the ground across its full width.

Wheel Tread Setting

Tractor front wheel tread settings must be restricted to wheel tread spacing recommended in the tractor operator's manual.

3.2 Loader Mounting

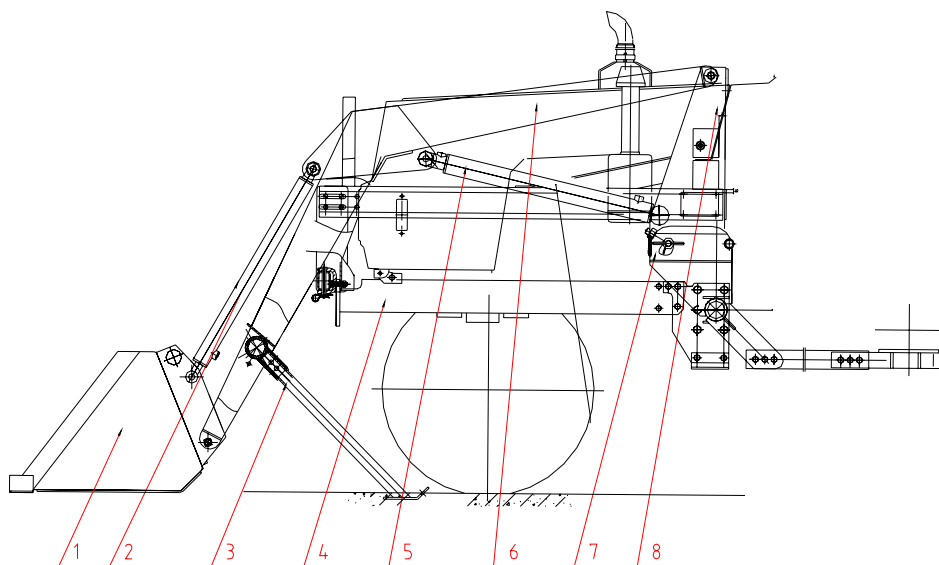


Fig 3.1 Main components of the loader

1. Upright assembly
2. Sub frame assembly
3. Boom assembly
4. Lifting cylinder
5. Front bracket assembly
6. Parking leg
7. Bucket cylinder
8. Bucket

Step 1. Fit front and rear sub-frames to the half shaft housing at the rear of the tractor and the engine. Join the front and rear sub-frames together using the strengthening bar.

Step 2. Carefully drive the tractor into the loader between the loader booms to a position where the hydraulic hoses can be connected to the control.

Note: The mounting brackets should be aligned with the upright

Step 3. Shut the tractor **OFF**, apply the brake, remove the ignition key and connect the hydraulic couplings taking to matching them correctly.

Step 4. Start the tractor and drive ahead slowly to position the upright into the mounting brackets.

Note: Activate the bucket cylinders and lifting cylinders as required to align the upright / mounting brackets.

Shift the control valve (lifting cylinder spool) into the “float” position.


Step 5. With the uprights secure in the mounting brackets, extend the bucket cylinders to ensure the uprights are fully seated in the mounting brackets.

Step 6. Shut the tractor **OFF**, apply the brake, remove the ignition key and secure the uprights to the mounting brackets using the existing lock pin and R pin. Tighten the bolt on the front of the upright to draw the uprights to the rear of the shoe.


Step 7. Start the tractor, raise the loader off the ground and put bucket in dumped position.

Lower loader to position bucket cutting edge on ground and shut the tractor **OFF**.

Remove the parking legs and return to storage position.


	Caution: Never allow the weight of the tractor to be put on the loader stand when mounting loader.
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3.3 Loader operating

	Caution: The tractor / loader should only be operated with all safety equipment properly installed.
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Initial Loader Operation

Before operating the loader, fully raise and lower the boom two or three times. Then raise the bucket approximately four feet 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 disconnecting hydraulic lines, relieve all hydraulic pressure. Escaping hydraulic oil under pressure can have sufficient force to penetrate the skin causing serious personal injury.
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	Caution: Do not operate the loader if the fittings are leaking or if the hoses are damaged. A sudden line burst would cause the mainframe to drop suddenly, causing damage to the tractor, the loader and injury to personnel.
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Cold Weather Operation

For smooth operation in cold weather, let the tractor warm up. SLOWLY cycle the lift and bucket cylinders several times to warm the oil in the hydraulic system. The loader may operate erratically until the hydraulic oil has warmed to operating temperatures.

Loading Bucket

For the most efficient loading, slowly drive the tractor straight into the material to be loaded and increase speed only after contact has been made. Roll the bucket back a small amount and slowly lift to break away the material. As the load increases, continue rolling the bucket back so as to get the maximum load. Remove the top levels first when loading from large piles of material. When bucket is full, raise loader so the bucket is clear of material and slowly back out or the pile.

Dumping Bucket

When in the dump area slowly drive the tractor forward and raised the loader at the same time. Raise the loader to the height needed to dump the bucket. Make sure to keep a level bucket position to prevent spilling from the bucket. Dump the bucket, and keep all movements smooth.

Transporting a Loader Bucket

Transport material with the bucket as low as possible to prevent spilling and keep maximum stability. The loader must be in a position that will not block the operators' vision. A loaded bucket must not be transported in the upright position or at excessive speed.



Caution: When using a loader, be aware of bucket location at all times. When raising a loader with bucket rolled back, material can sump onto tractor causing damage to tractor or injury to operator.

Scraping

When scraping, the float position must be used to keep the bucket on the ground and at the same time let the bucket follow ground contours. The bucket must be kept level to the ground during scraping operations.

Backfilling / Backgrading

When "Backfilling" or "Backgrading", position the bucket so it is level on the ground. Do not dump material from bucket following each pass, as additional weight of material in bucket will assist in "Backgrading" and increases loader efficiency during "Backfilling".

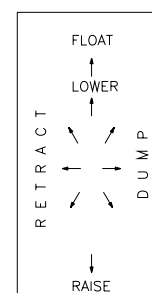
Control Rate of Loader Functions

By "feathering" the control lever, reduced operational speeds can be controlled. This action controls the position of the valve spool in the valve body and regulates flow of oil to / from cylinders. It is important to utilize this operational practice when lowering loader boom when the bucket is loaded with material.

Loader Hydraulic Controls

The loader hydraulic valve features single lever control. Refer to the diagram for reference to loader control functions.

The diagram located on the right of the control valve is visible when operating the valve.



The loader hydraulic valve lift cylinder circuit incorporates a “float” position, which allows the loader bucket to follow ground contours. The “float” position is engaged by shifting the control lever forward into the float position. It will remain in “float” mode until the operator pulls the control lever out of the float position.

The control valve has a neutral position that prevents movement of loader or bucket. When the control valve is released from the work position, the spool will return to neutral.

3.4 Loader Dismounting

Step 1. Position loader on hard level surface. Raise boom. Put bucket in dump position. Lower the loader until front edge of bucket is on the ground and shut tractor off. Apply the parking brake and remove the ignition key.

Step 2. Remove pins and put the parking legs down.

Step 3. Raise loader and fully retract bucket. Lower the loader until the parking legs make contact on the ground. Tip the bucket until bucket cutting edge and the parking legs touch the ground.

Step 4. Loosen the bolts on the front of the uprights and remove the pins from the mounting brackets securing the loader upright. Repeat procedure on both sides. Reinstall pins in the uprights after removing loader to prevent loss.

Step 5. Start the tractor and shift the control valve (lifting cylinder spool) into the “float” position. Slowly retract the bucket cylinders until the bottom of the bucket rests firmly on the ground.

Back the tractor up slowly until the uprights are clear of the mounting brackets observe the four hoses (valve / tubelines) to ensure they are not caught or stretched when backing away from loader.

Shift the control valve (lifting cylinder spool) into the neutral position.

Step 6. Check to ensure the uprights will clear the front tyres. If additional clearance is required, extend the lift cylinders.

Turn the tractor **OFF** remove ignition key, disconnect the four hydraulic hoses to ensure they will be clear of the tractor.

Start the tractor and carefully back out of the loader.

CHAPTER □ LUBRICATION AND MAINTENANCE



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

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

Refer to “Lubrication and Maintenance Chart” for quick reference to maintenance operations.

Check the tractor hydraulic system as outlined in the tractor operator’s manual.

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

Grease all loader pivot points daily (10 hours). Refer to tractor operator’s manual for lubricant recommendations.

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 loader / material. Unequal rear tyre inflation can result in the bucket not being level to the ground.

Lubrication and Maintenance Chart

Item	Service	Service Interval
Hydraulic system oil level	Check	Daily / 10 hours
Hydraulic system oil / filter	Replace	As specified in tractor operator’s manual
Tyre inflation	Check	Weekly / 50 hours
Loader pivot points	Lubricate	Daily / 10 hours
Loader hydraulic lines, hoses, connections	Check for leaks, wear	Daily / 10 hours
Lift and bucket cylinder rod packing	Check for seepage, service as needed	Daily / 10 hours
Pivot pin bolts and dust covers	Check, replace if missing	Daily / 10 hours
mid-mount lock pin and R pin	Check, replace if necessary	Daily / 10 hours
Loader mount hardware	Check visually	Weekly / 50 hours
Loader mount hardware	Re-torque	Every 200 hours

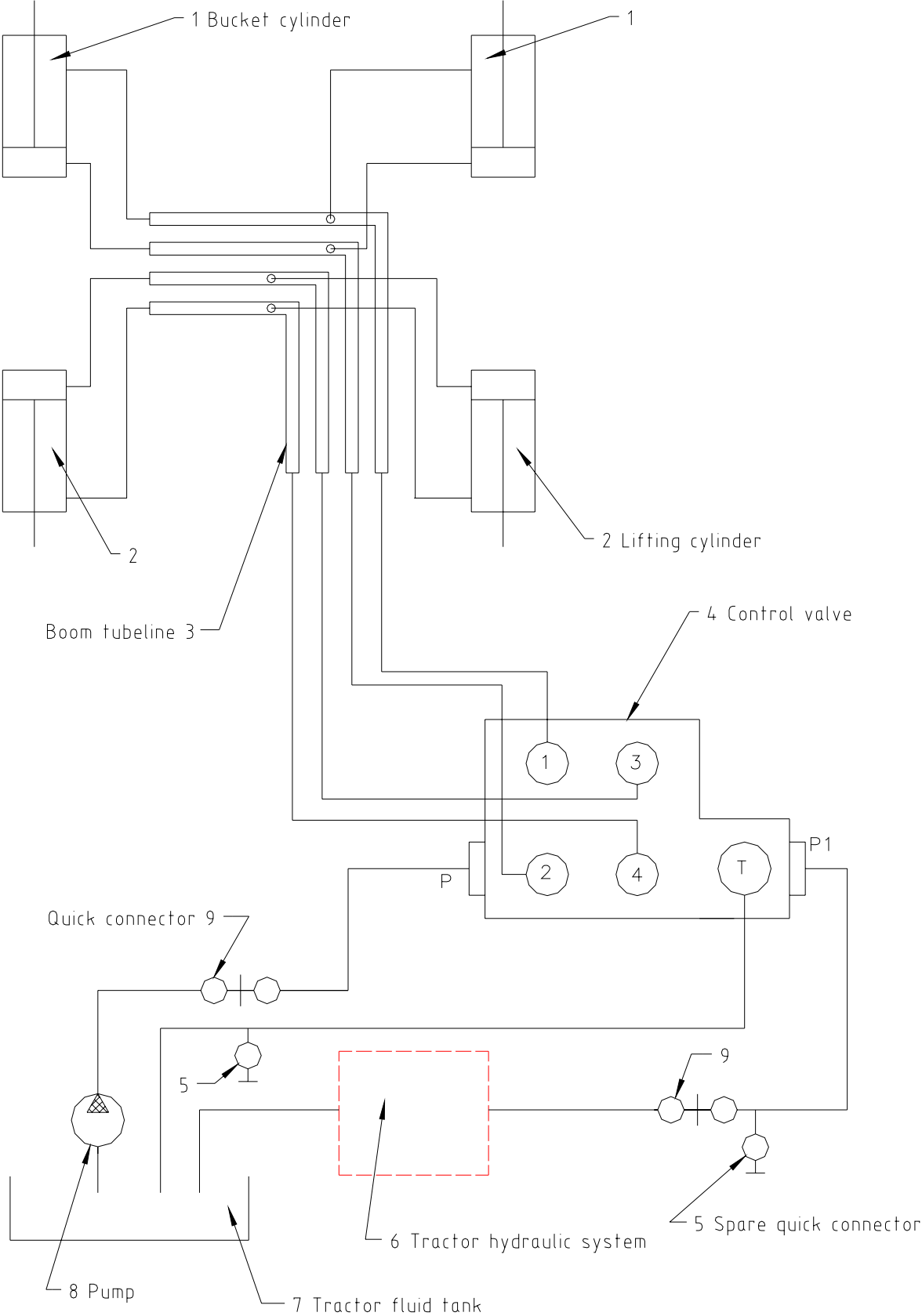
Lubricate with pressure gun using grease as recommended in tractor operator’s manual.

CHAPTER □ TROUBLE SHOOTING

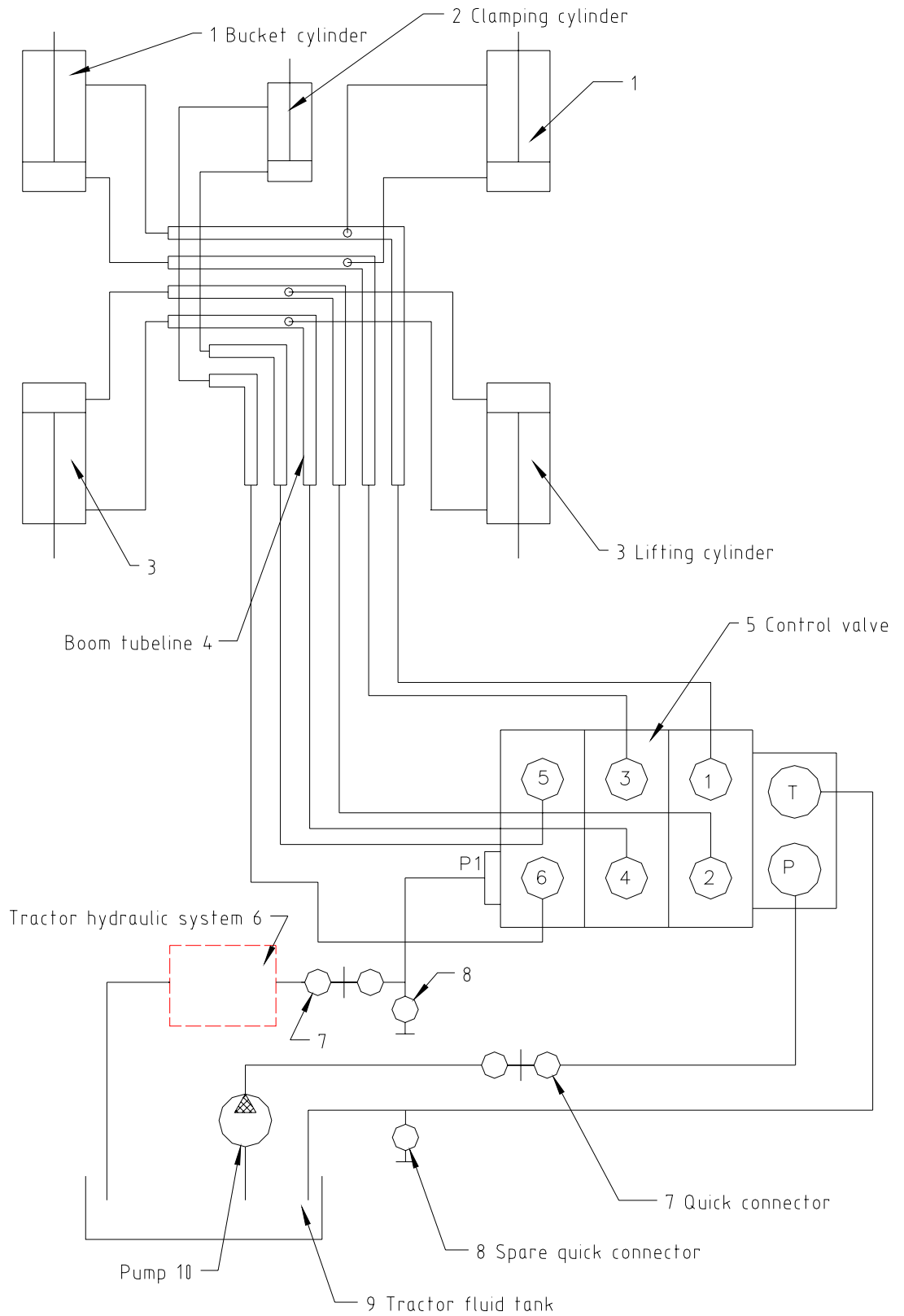
Trouble	Possible causes	Shootings
Lifting and bucket cylinders not working	1. Transmission short of lube oil (oil level below the lower scale line on dipstick).	Replenish oil.
	2. Hydraulic hoses connected improperly.	Check and correct hydraulic hose connections.
	3. Low system pressure supplied from hydraulic pump.	Check system pressure. Replace or repair pump.
	4. Control valve linkage broken.	Inspect. Repair as required.
	5. Quick disconnect couplers are not fully connected.	Check couple connections. Replace coupler(s) if necessary.
	6. Hydraulic hose or tubeline blockage.	Check for evidence of damage to hoses or tubelines that would block flow of oil between cylinders and control valve.
	7. Cylinder piston assembly defective (not sealing).	Check cylinders for internal leakage as described in service section under cylinder leakage tests.
	8. Control valve blockage	Inspect for blockage. Disassemble valve if necessary.
Insufficient lifting capacity	1. Insufficient engine power output	Inspect and fix up the engine as per its operating manual.
	2. Oil level in transmission case is too low	Replenish oil.
	3. Excessive load-material weight exceeds specified loader capacity	Reduce load.
	4. Lifting cylinder piston assembly leakage.	Check cylinders for leakage. Repair as needed.
	5. Control valve leaking internally.	Replace control valve and recheck operation.
	6. Hydraulic pump defective.	Check and repair or replace.
Slow or uneven lift	1. Low hydraulic fluid level.	Check and replenish.
	2. Cold hydraulic fluid.	Allow hydraulic system to warm up operating temperature.
	3. Engine R.P.M. too slow (hydraulic pump R.P.M. too slow).	Increase engine speed to obtain satisfactory loader operation.
	4. Excessive weight in bucket. Material weight exceeds maximum specified loader capacity.	Reduce material load.
	5. Quick disconnect coupler restriction or coupler "Flow Checks"	Check coupler connections for evidence of restriction.
	6. Hydraulic hose or tubeline restriction	Check hoses and tubelines for evidence of restriction.
	7. Lifting cylinder piston assembly leakage.	Check cylinders for leakage. Repair as needed.
	8. Control valve leaking internally.	Replace control valve.

Lifting and/or bucket cylinders operate in wrong direction relative to control valve lever position	Hydraulic hoses connected incorrectly.	Correct hydraulic hose connections.
Loader drops with control valve spool in "centered" position Note: A gradual drop over an extended period of time is a normal condition.	1. Cylinder piston assembly leakage.	Check cylinders for leakage.
	2. Control valve internal leakage.	Replace control valve.
Control valve spool(s) will not return to centered position.	1. Control lever linkage binding.	Determine origin of binding and repair.
	2. Control valve spool centering is broken.	Replace centering spring.
	3. Control valve spool binding in valve body spool bore.	Disassemble valve for inspection and repair.
Bucket cutting edge wear is uneven side to side	Bucket is not level to ground.	Check rear tire inflation and adjust to level bucket to ground.
Abnormal sound	1. Nuts and bolts got loose or lost.	Tighten the loose ones and make up the missing ones.
	2. Insufficient lube oil causing dry friction.	Add oil when necessary.
	3. Incorrect lube oil in use or impurity in oil.	Replace with the oil of correct specification.
Excessive foam in oil tank	1. Improper hydraulic oil usage.	Refer to Tractor operator's manual and replace hydraulic oil using recommended hydraulic oil.
	2. Oil below specific level	Refill oil to the specific level
	3. Air leaking into suction side of hydraulic pump.	Check for loose or defective connections between reservoir and hydraulic pump.
Abnormal noise of the oil pump	1. Excess foam in oil tank.	Replenish oil and bleed air
	2. Oil intake pipe or oil filter clogged.	Clean oil filter and intake pipe.
Acting speed of the bucket is slow and insufficient	1. Large interior leakage in gear pump or control valve.	Replace or repair it.
	2. Oil filter is clogged.	Clean the filter.
	3. Oil level is low, oil brand is incorrect.	Fill the specified brand oil to specified level.
	4. Interior leakage in cylinder.	Inspect hydraulic system; replace seals according to specified setting of cylinder.
Oil leakage	1. O-ring damaged.	Replace rubber oil seal.
	2. Gasket damaged.	Replace with a new one.
	3. Loose hydraulic connection.	Tighten loose connections.
	4. Control valve spool or body damaged or worn.	Replace control valve.
	5. Cylinder rod packing set leakage.	Check cylinders for leakage. Repair as needed.

APPENDIX I HYDRAULIC SYSTEM SCHEMATIC



APPENDIX Π HYDRAULIC SYSTEM SCHEMATIC □ with clamping type loader□



The information contained in this operations manual is a general introduction only. The information contained herein may be modified at any time, for any reason. Modification may affect the details or specifications of the product described in this manual. Therefore, users – dealers must include the manufacturing date and serial number when placing an order for spare parts and components.