MDL POWERUP LIMITED

Dalston Carlisle

MDL POWERUP
01228 712121

OPERATERS MANUAL

COMPACT HEDGE TRIMMER

Please read through manual thoroughly before operation

CE

For any technical issues please call the workshop on 01228 712121

Or email info@mdlpowerup.com

GENERAL INFORMATION

Read this manual before fitting or operating the machine. Whenever any doubt exists contact your dealer or the MDL Service Department for assistance.

Record the serial number of your machine on this page and always quote this number when ordering spares. Whenever information concerning the machine Is requested remember to also state the type of tractor to which it is fitted.

Model	A80 / A100
Serial Number (This Will Be Your Invoice Number)	
Date Purchased / Year	Manufactured 2019
Dealer	MDL Power Up LTD
Dealers Telephone	01228 712121 / 07834258433
Dealers Email	info@mdlpowerup.com

NOISE

The equivalent daily personal noise exposure from this machine, measured at the operators' ear, is within the range 78 – 85 DB. These figures apply to a normal distribution of use where the noise fluctuates between zero and maximum. The figures assume that the machine is fitted to a tractor with a quiet cab with the windows closed in a generally open environment. We recommend that the windows are kept closed. With the cab rear window open the equivalent daily personal noise exposure will increase to a figure within the range 82 – 88 DB. At equivalent daily noise exposure levels of between 85 and 90 DB, ear protection is recommended, it should be used if any window is left open.

SAFETY INSTRUCTIONS

Before operating your flail mower, please read the following safety instructions. Failure to comply with these warnings may result in serious injury or death.

Please review these safety instructions with all users annually.

SIGNAL WORDS: The signal words DANGER, WARNING and CAUTION are used with the safety messages in this manual and with each safety sign. They are defined as follows:

DANGER: Indicates an immediate hazardous situation that, if not avoided, could result in serious injury or death. This signal word is to be limited to the most extreme situations typically for machine components that, for functional purposes, cannot be guarded.

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in serious injury or death, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practice.

SAFETY INFORMATION

This machine has the potential to be extremely dangerous, in the wrong hands it can kill or maim. It is therefore imperative that the owner, and the operator of this machine, read the following section to ensure that they are both fully aware of the dangers that do, or may exist, and their responsibilities surrounding its use.

The operator of this machine is responsible not only for their own safety but equally for the safety of others who may come into the close proximity of the machine, as the owner you are responsible for both.

POTENTIAL SIGNIFICANT DANGERS ASSOCIATED WITH THE USE OF THIS MACHINE:

- Being hit by debris thrown by rotating components.
- Being hit by machine parts ejected through damage during use.
- Being caught on a rotating power take-off (PTO) shaft.
- Being caught in other moving parts i.e.: belts, pulleys and cutting heads.
- Electrocution from Overhead Power Lines (by contact with or ‘flashover’ from).
- Being hit by cutting heads or machine arms as they move.
- Becoming trapped between tractor and machine when hitching or unhitching.
- Tractor overbalancing when machine arm is extended.
- Injection of high-pressure oil from hydraulic hoses or couplings.
- Machine overbalancing when freestanding (out of use).
- Road traffic accidents due to collision or debris on the road.

BEFORE USING THIS MACHINE, YOU MUST:

- Ensure you read all sections of the operator handbook.
- Ensure the operator is, or has been, properly trained to use the machine.
- Ensure the operator has been issued with and reads the operator handbook.

- Ensure the operator understands and follows the instructions in operator handbook.

- Ensure the tractor front, rear and side(s) are fitted with metal mesh or polycarbonate guards of suitable size and strength to protect the operator against thrown debris or parts.

- Ensure tractor guards are fitted correctly, are undamaged and kept properly maintained.

- Ensure that all machine guards are in position, are undamaged, and are kept maintained in accordance with the manufacturer's recommendations.

- Ensure flails and their fixings are of a type recommended by the manufacturer, are securely attached and that none are missing or damaged.

- Ensure hydraulic pipes are carefully and correctly routed to avoid damage by chaffing, stretching or pinching and that they are held in place with the correct fittings.

- Always follow the manufacturer's instructions for attachment and removal of the machine from the tractor.

- Check that the machine fittings and couplings are in good condition.

- Ensure the tractor meets the minimum weight recommendations of the machine manufacturer and that ballast is used as necessary.

- Always inspect the work area thoroughly before starting to note obstacles and remove wire, bottles, cans and other debris.

- Use clear suitably sized warning signs to alert others to the nature of the machine working within that area. Signs should be placed at both ends of the work site. (It is recommended that signs used are of a size and type specified by the Department of Transport and positioned in accordance with their and the Local Highways Authority guidelines).

- Ensure the operator is protected from noise. Ear defenders should be worn and tractor cab doors and windows must be kept closed. Machine controls should be routed through proprietary openings in the cab to enable all windows to be shut fully.

- Always work at a safe speed taking account of the conditions i.e.: terrain, highway proximity and obstacles around and above the machine.

- Extra special attention should be applied to Overhead Power Lines. Some of our machines are capable of reach in excess of 8 metres (26 feet) this means they have the potential to well exceed, by possibly 3 metres (9' 9"), the lowest legal minimum height of 5.2 metres from the ground for 11,000- and 33,000-volt power lines. It cannot be stressed enough the dangers that surround this capability, it is therefore vital that the operator is fully aware of the maximum height and reach of the machine, and that they are fully conversant with all aspects regarding the safe minimum distances that apply when working with machines in close proximity to Power Lines. (Further information on this subject can be obtained from the Health & Safety Executive or your Local Power Company).

- Always disengage the machine, kill the tractor engine, remove and pocket the key before dismounting for any reason.

- Always clear up all debris left at the work area; it may cause hazard to others.

- Always ensure when you remove your machine from the tractor that it is left in a safe and stable position using the stands and props provided and secured if necessary.

WHEN NOT TO USE THIS MACHINE:

- Never attempt to use this machine if you have not been trained to do so.

- Never uses a machine until you have read and understood the operator handbook, are

familiar with, and practiced the controls.

- Never use a machine that is poorly maintained.

- Never use a machine if guards are missing or damaged.

- Never use a machine on which the hydraulic system shows signs of wear or damage.

- Never fit, or use, a machine on a tractor that does not meet the manufacturer's minimum specification level.

- Never use a machine fitted to a tractor that does not have suitable front, rear and side(s) cab guarding made of metal mesh or polycarbonate.

- Never use the machine if the tractor cab guarding is damaged, deteriorating or badly fitted.

- Never turn a machine cutting head to an angle that causes debris to be ejected towards the cab.

- Never start or continue to work a machine if people are nearby or approaching - Stop and wait until they are at a safe distance before continuing. WARNING: Some Cutting Heads may continue to ‘freewheel’ for up to 40 seconds after being stopped.

- Never attempt to use a machine on materials in excess of its capability.

- Never use a machine to perform a task it has not been designed to do.

- Never operate the tractor or machine controls from any position other than from the driving seat, especially whilst hitching or unhitching the machine.

- Never carry out maintenance of a machine or a tractor whilst the engine is running – the engine should be switched off, the key removed and pocketed.

- Never leave a machine unattended in a raised position – it should be lowered to the ground in a safe position on a level firm site.

- Never leave a tractor with the key in or the engine running.

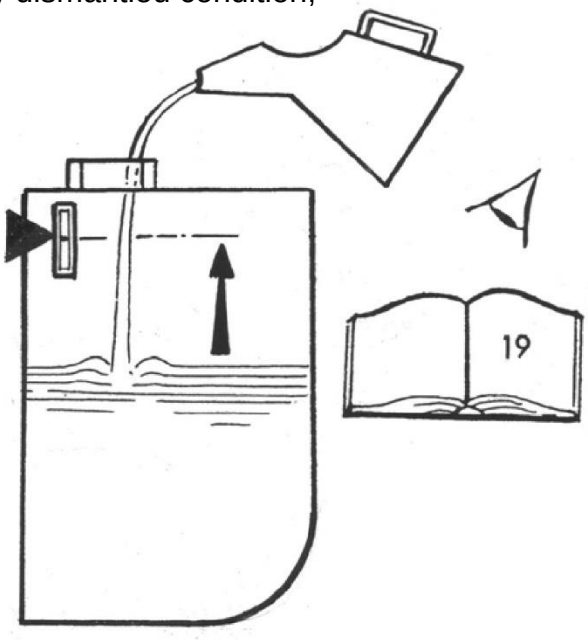
- Never carry out maintenance on any part or component of a machine that is raised unless that part or component has been properly substantially braced or supported.

- Never attempt to detect a hydraulic leak with your hand – use a piece of cardboard.

- Never allow children near to, or play on, a tractor or machine under any circumstances.

INITIAL ATTACHMENT TO TRACTOR

The machine will be delivered in a partially dismantled condition, secured with transport strap and banding.

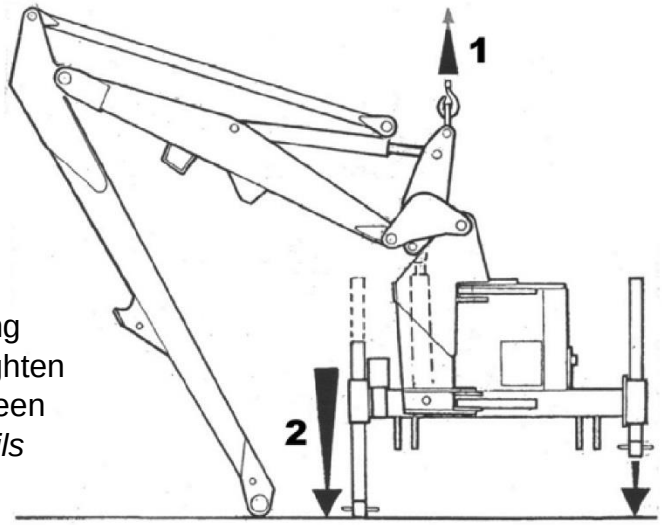


- Choose a firm level site.
- Remove the transport strap, banding straps and loose items.
- Raise the machine using overhead lifting equipment with a minimum capacity of 1500kg SWL.

LEAVE IN POSITION AT THIS STAGE.

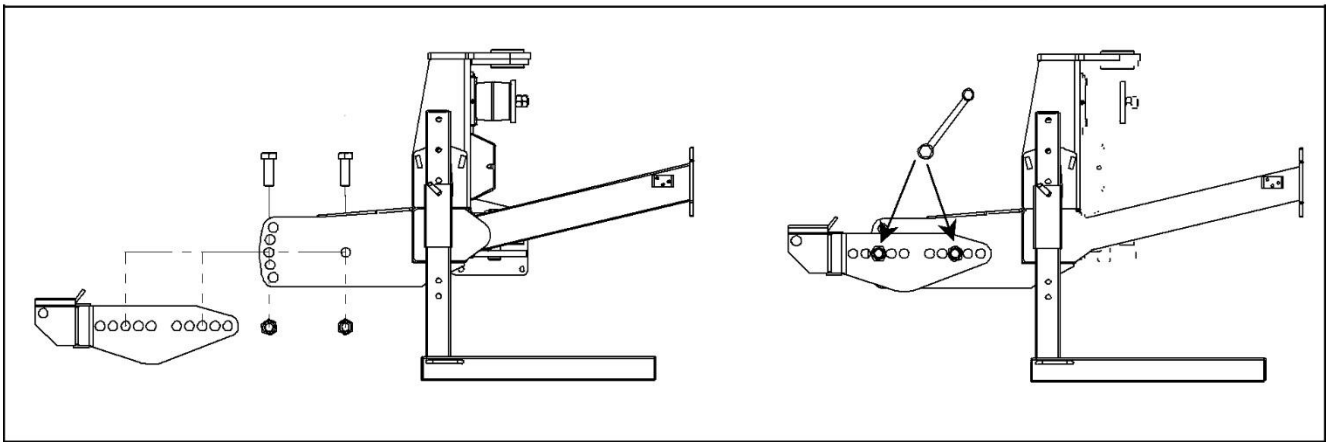
Lower the legs and pin in position selecting the holes that position the machines gearbox stub shaft approx. 75 mm below the tractors P.T.O. shaft.

Note: Leg pin position used.

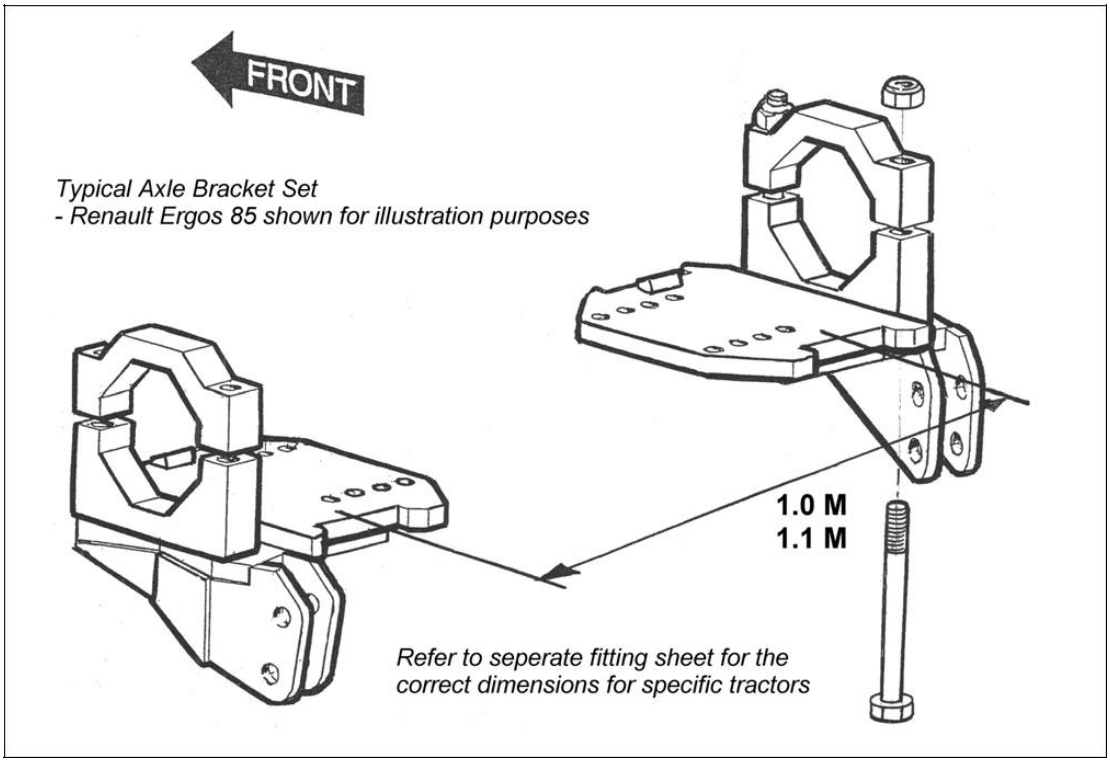


- Unbolt stabiliser from machine and remove the stabiliser nose quadrant pin.

Locate axle-mounting arms onto the mainframe and secure in position using the correct nuts and bolts supplied, tighten nuts when correct hole location has been selected - *see following page for details on mounting hole selection.*



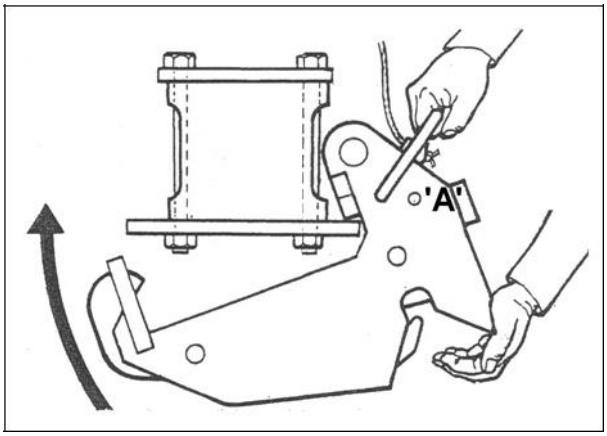
AXLE BRACKET/CATCH ASSEMBLY - FITTING BY DEALER



Bolt axle plates to the tractor axle at either 1.0 M or 1.1 M apart - this may necessitate the two removal of the tractor's check chains and/or assister ram brackets, if this is the case, the axle plate will include replacement brackets for these functions.

The axle brackets supplied will be accompanied by a fitting sheet with instruction for their attachment to your tractor, follow the instructions exactly as they are specific to your particular make and model of tractor. Replace assister ram(s) if fitted.

Hook the catch assemblies onto the rear of the axle plates, push firmly against the plate and vigorously pivot the catch in a forward and up direction until the spring-loaded hook 'snaps' into position. Pass the release cords up into the cab.

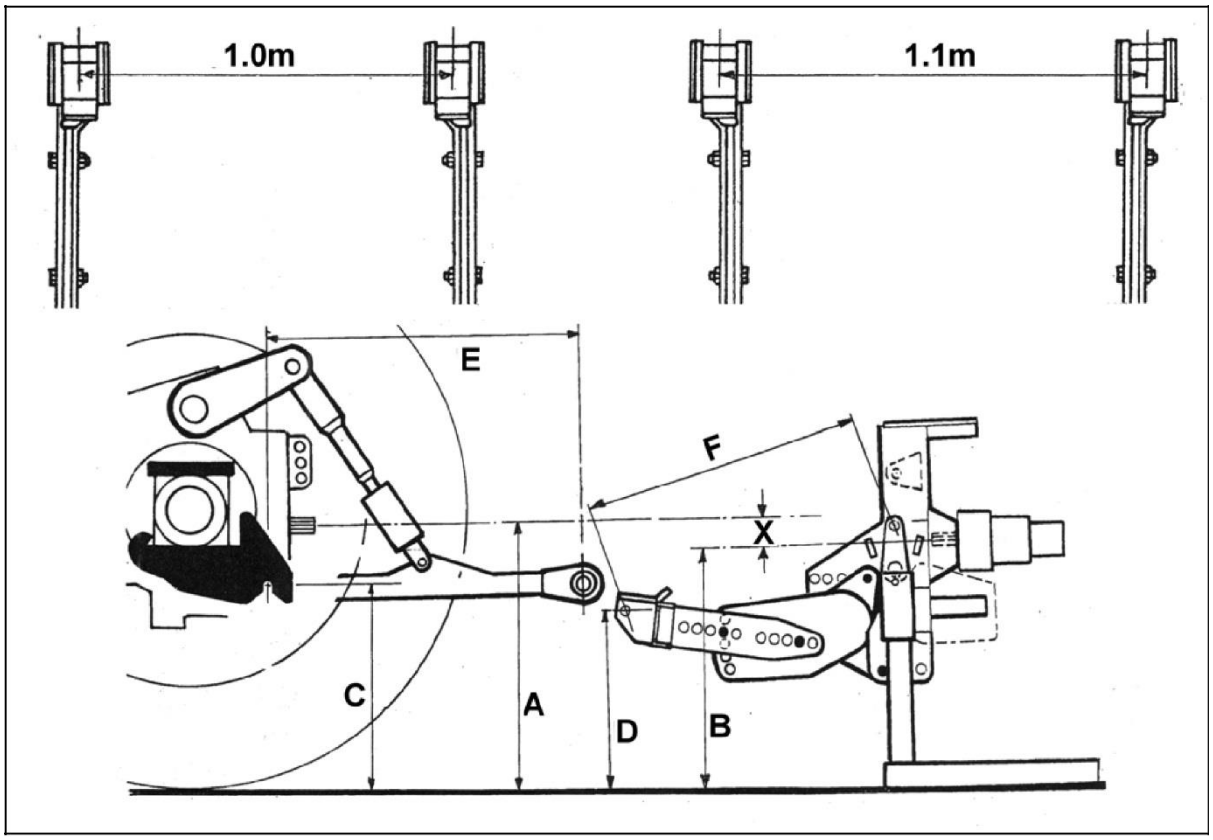


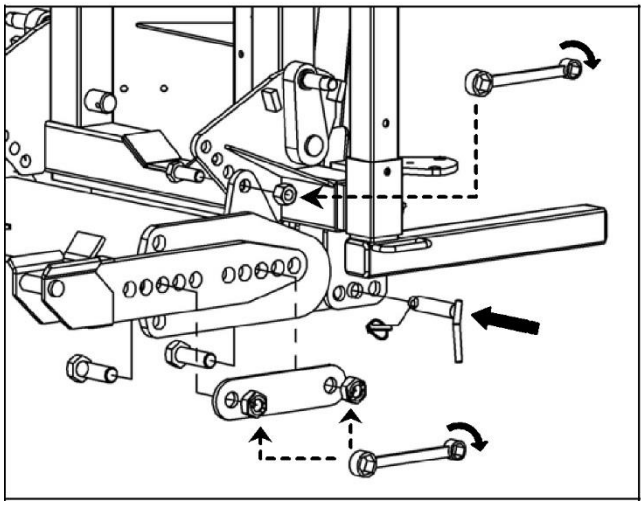
NOTE:

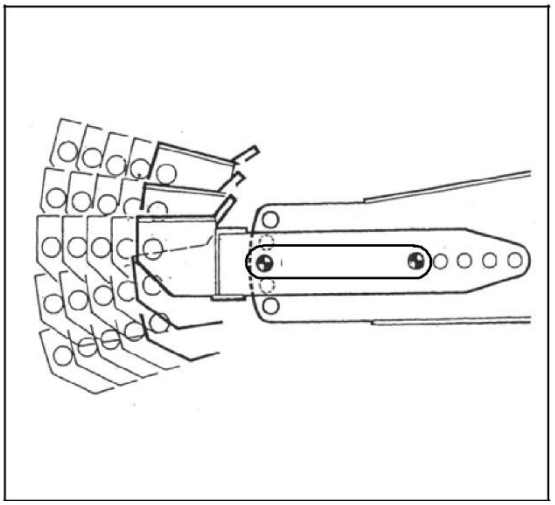
On some tractors fitted with auxiliary fuel tanks, there is insufficient space for the spring catches to be fitted, in these instances special axle brackets and catches with a 'pin on' facility are available on request.

Ensure catch-locking pin 'A' is removed.

STANDARD TYPE BRACKETS



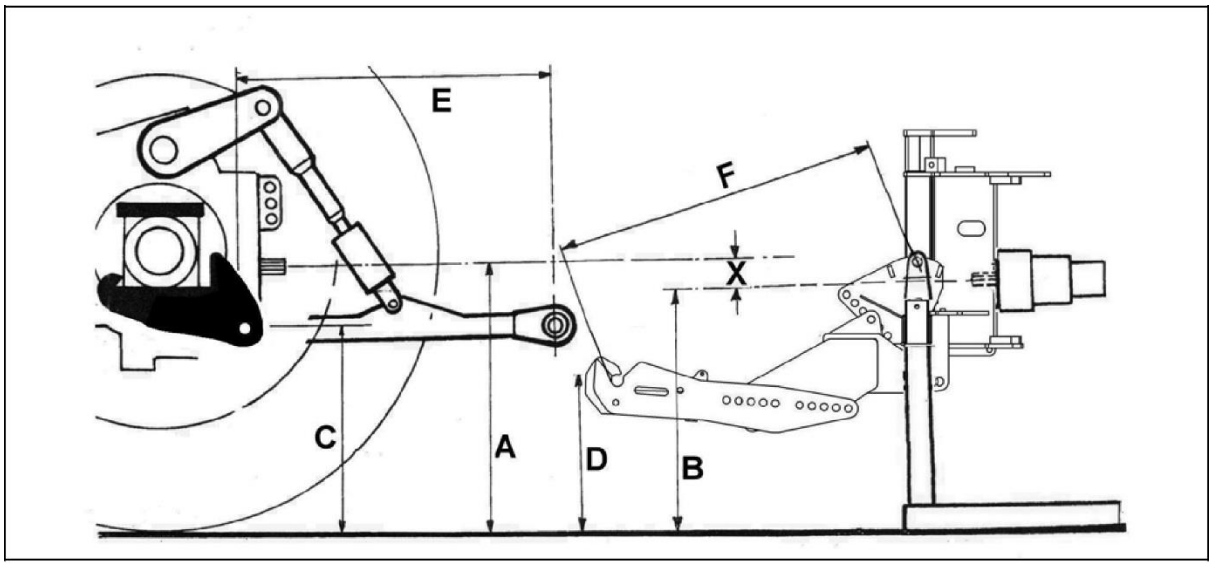


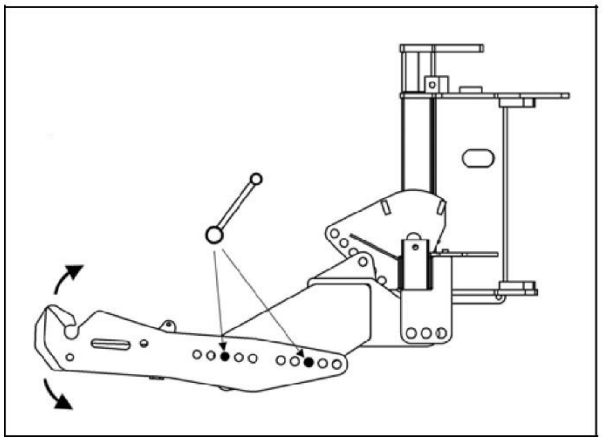


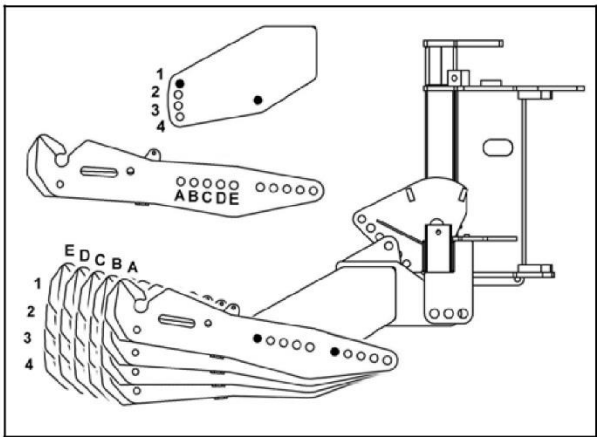
With the frame in the vertical position, measure dimensions 'A' and 'B', subtract 'B' from 'A' to obtain measurement 'X'. Measure dimension 'C'.
Select mounting holes which position the mounting bars in the end of the latch arms so that dimension 'D' equals dimension 'C' minus measurement 'X' and also when

the draft link is horizontal and the rocking draft pin is in the upright position dimensions 'E' and 'F' are equal.

ALTERNATIVE TYPE BRACKETS



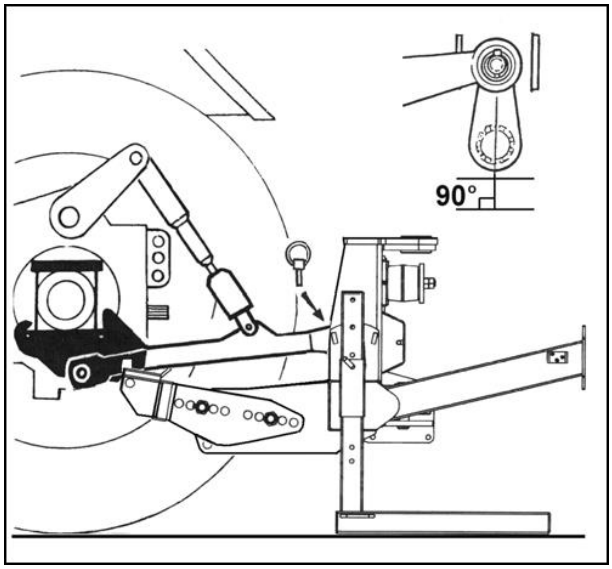




With the frame in the vertical position, measure dimensions 'A' and 'B', subtract 'B' from 'A' to obtain measurement 'X'. Measure dimension 'C'.
Select mounting holes which position the mounting bars in the end of the latch arms so that dimension 'D' equals dimension 'C' minus measurement 'X' and also when the draft link is horizontal and the rocking draft pin is in the upright position dimensions 'E' and 'F' are equal.

TRACTOR ATTACHMENT - BY CUSTOMER OR DEALER

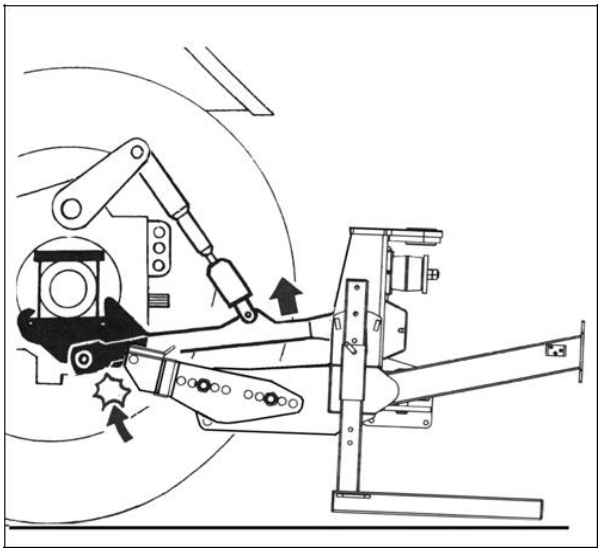
Reverse tractor squarely into position adjacent to the machine and connect the draft links to the machine - *maneuver tractor until both draft pin rockers are vertical.*



Raise the machine on the tractor's linkage sufficient only for the latch bar to fully engage in the axle catch.

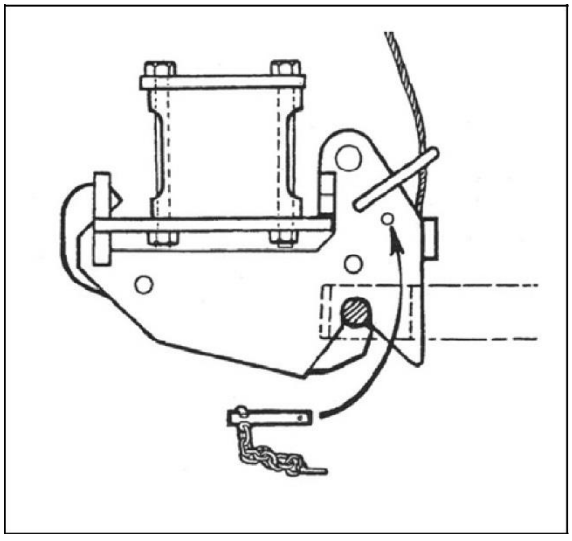
WARNING!

The quadrant lever or machine controls must only be operated from the tractor seat. Ensure no one is standing close to or within the linkage arms or bars.

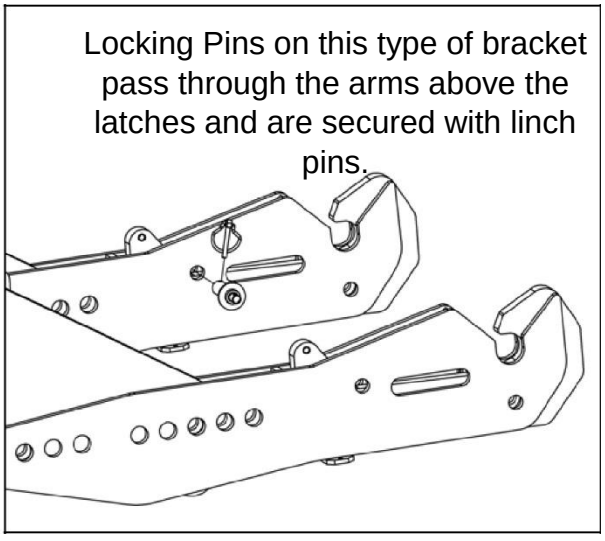


NOTE:
Be aware - as lift occurs the machinery may tilt slightly.

Insert catch lock pins – *refer to diagrams below for specific type*



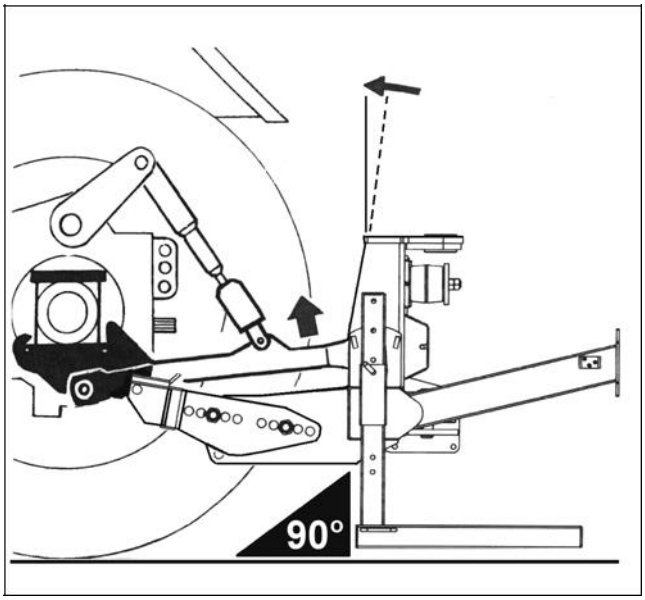
Locking Pins on this type of bracket pass through the arms above the latches and are secured with linch pins.



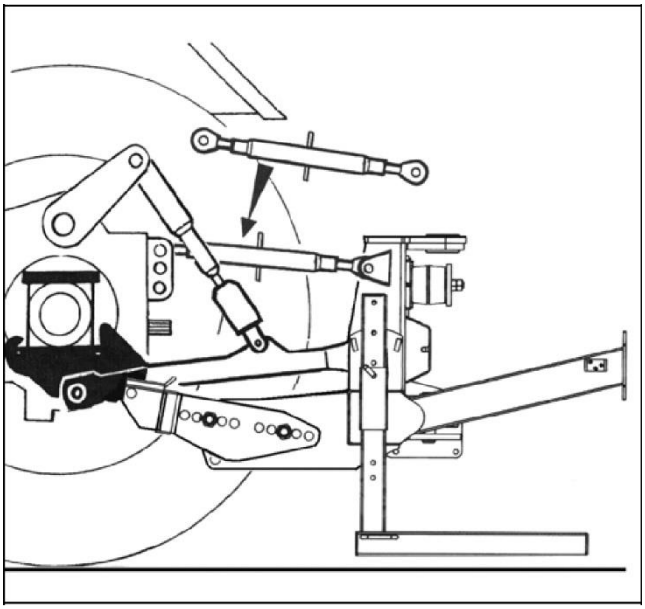
Standard Type Bracket

Alternative Type Bracket

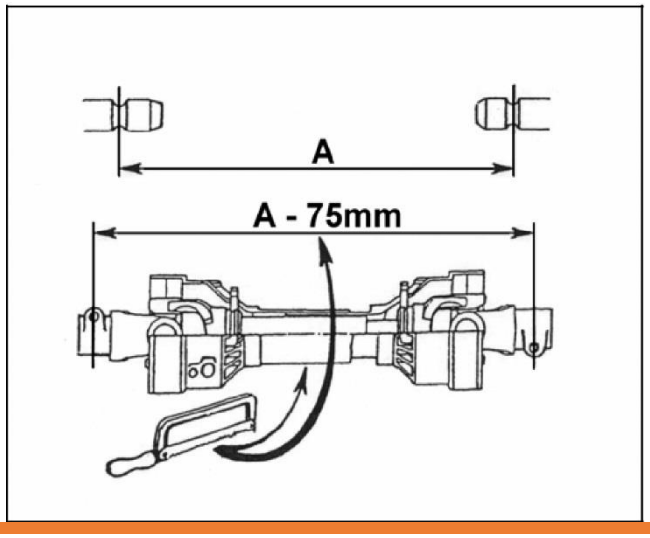
Raise the machine on the tractors linkage until the frame is vertical.



Fit top link.



Measure PTO shaft and cut to dimension shown (distance ‘A’ minus 75mm) – *see diagram opposite and refer to maintenance section for further details.*

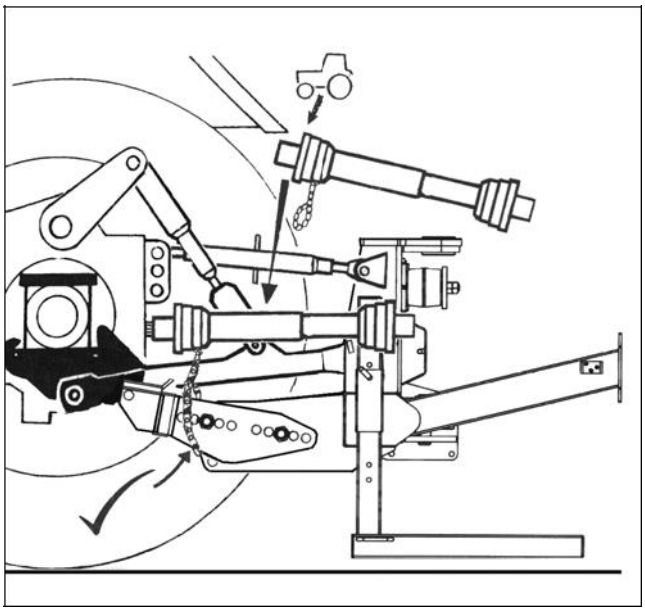


NOTE:

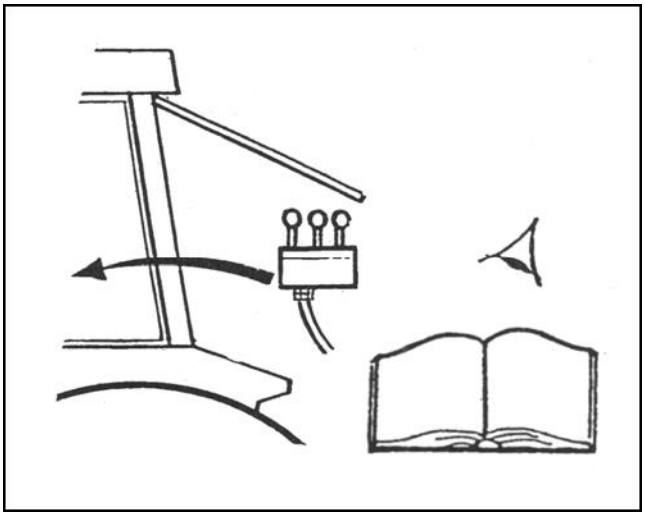
For subsequent use on a different tractor measure again - there must be a minimum of 6" (150mm) of shaft overlap

Fit PTO shaft into position.

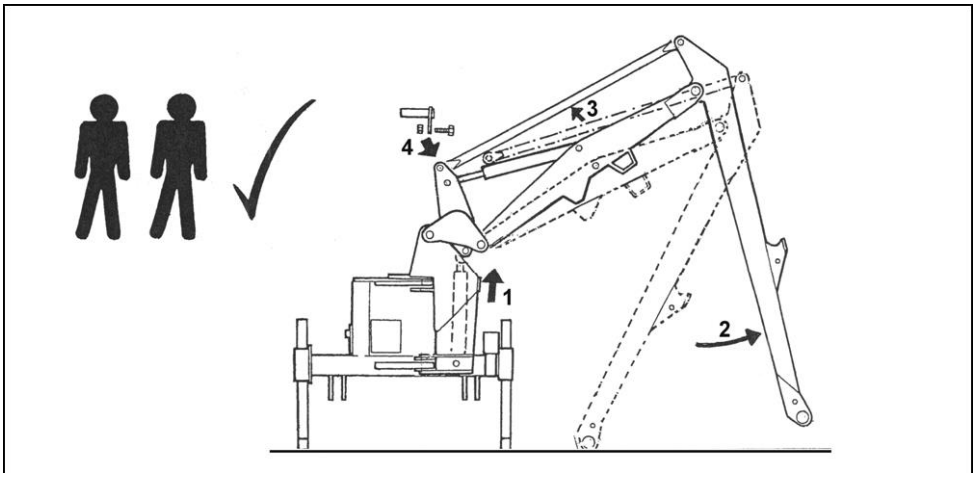
Attach the torque chains to a convenient location to prevent rotation of the shaft guards.



Fit machine controls into the cab - *refer to the specific page on this subject for further details.*

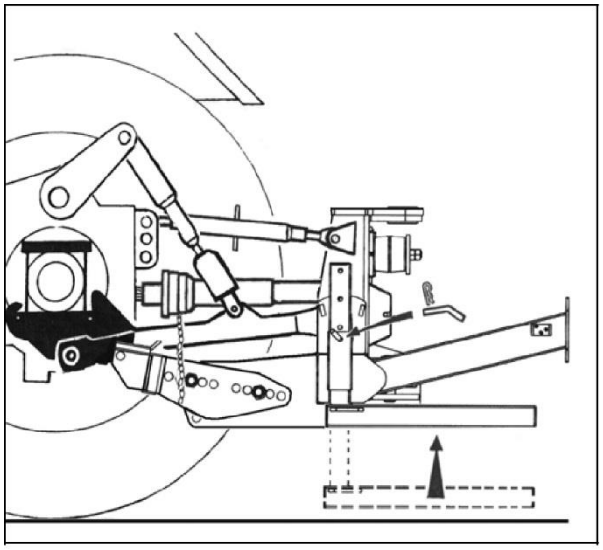


FIRST FITTING ONLY - *for Dealer reference*



Request assistance. Operate 'Lift up' on machine controls sufficient only for the dipper arm to clear the ground. Pivot out the dipper until the tension link can be reconnected.

Raise the stand legs into the work position and secure with their pins - *see diagram opposite.*



Tighten check chains and/or stabilizer bars.

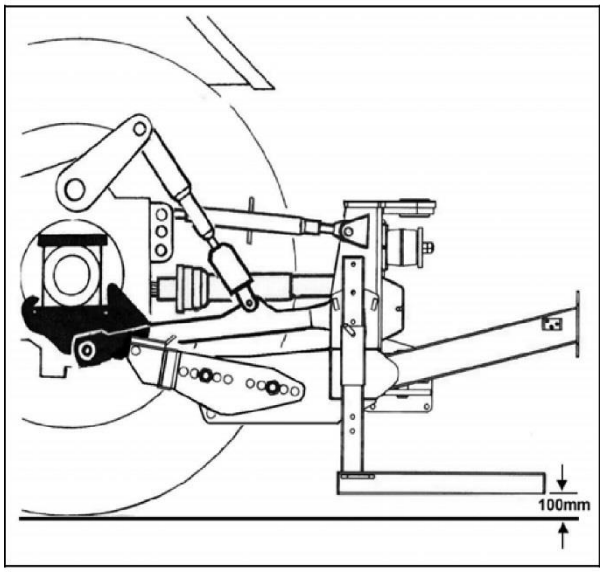
The machine should now be carefully operated throughout its full range of movements to check hoses are not being strained, pinched, chafed or kinked, and that all movements are functioning correctly.

The machine can now be folded into the transport position ready to proceed to the work site - *Refer to the section on Transport Position for details on this subject.*

REMOVAL FROM TRACTOR

Select a firm safe site to remove the machine

Locate parking legs into their housings.



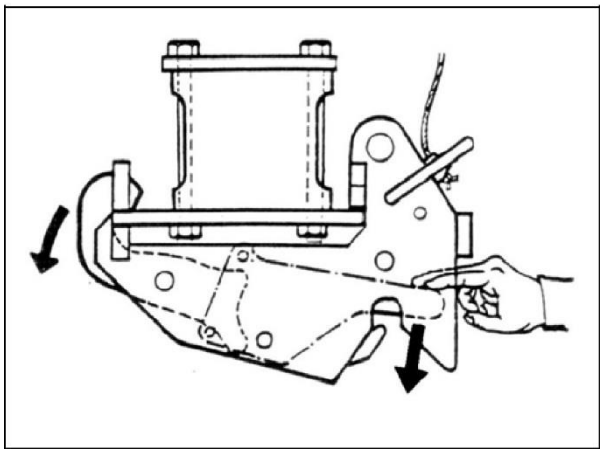
NOTE: The correct, and most stable, position for removing the machine from the tractor is with the arm positioned to the rear of the machine.

Position the flail head on the ground directly to the rear of the machine at approximately half reach.

Disengage PTO.

Remove latch security pins.

Locate parking legs into their housings.



Take machine weight on draft links sufficient only to allow the top link to be disconnected.

Open axle catches using the release cord and lower the machine.

Disconnect draft links and remove the PTO shaft.

Remove the axle catches from the tractor.

Remove control units from the tractor cab and stow clear of the ground in a location where they are protected from the weather or risk of accidental damage.

Drive tractor away from machine.
Replace check chains / stabiliser bars
– The axle plates can remain permanently in position
STORAGE

If the machine is to be left standing for extended periods of time, lightly coat the exposed portions of the ram rods with grease. Subsequently this grease should be wiped off before the rams are next moved. If the machine is to be stored outside tie a piece of tarpaulin or canvas over the control assembly –
do not use a plastic bag as this can lead to corrosion in the unit.

HYDRAULIC SYSTEM

OIL SUPPLY

Check the oil level in the reservoir daily.

No fixed time period can be quoted for oil changes as operating conditions and maintenance standards vary so widely. Burnt and scorched oil odours and the oil darkening and thickening are all signs of oxidation and indicate the oil should be changed.

Moisture that results from condensation can become entrapped in the oil and cannot be removed by filtration so that water contamination is progressive.

Contamination can be reduced by:

- Cleaning around the reservoir cap before removal, and keeping that area clean.
- Using clean containers when replenishing the system.
- Regular servicing of the filtration system.

FILTRATION MAINTENANCE

The machine is protected by a 125-micron suction strainer and a low pressure 10-micron full flow return line filter.

- Suction strainer

The strainer is permanently fixed within the reservoir.
Should symptoms of pump cavitation or spongy intermittent operation occur the tank must be drained and flushed out with a suitable cleaning agent e.g. clean diesel oil

- Return Line Filter

The elements should be changed after the first 50 hours and thereafter at 500-hour intervals. It is important to note hours worked as if the filter becomes blocked an

internal by-pass within the canister will operate and no symptoms of filter malfunction will occur to jog your memory.

HYDRAULIC HOSES

The condition of all hoses should be carefully checked during routine service of the machine. Hoses that have been chaffed or damaged on their outer casing should be securely wrapped with waterproof adhesive tape to stop the metal braid from rusting. Hoses that have suffered damage to the metal braid should be changed at the earliest opportunity.

HOSE REPLACEMENT

- Replace one hose at a time to avoid the risk of wrong connections.
- When the hose is screwed to an additional fitting or union, use a second spanner on the union to avoid breaking both seals.
- Do not use jointing compound on the threads.
- Avoid twisting the hose. Adjust the hose line to ensure freedom from rubbing or trapping before tightening hose end connections.

Before changing hoses study the installation these are carefully calculated to prevent hose
damage during operation. Always replace hoses in exactly the same manner. This is especially important for the flail hoses where they must be crossed, upper to lower, at the dipper and head pivots.

SAFETY NOTE

Soft Seal hose connections are capable of holding pressure when the nut is only ‘finger tight’. It is therefore recommended that when dismantling, the hose be manually flexed, to relieve any residual pressure, with the retaining nut slackened prior to complete disassembly.

TRACTOR ATTACHMENT – Linkage Mounted Machines

- With the machine positioned on a firm level site and securely supported, maneuver the tractor squarely up to the machine with the tractor's draft links set to a height level with the machines lower link brackets. *Fig.1*

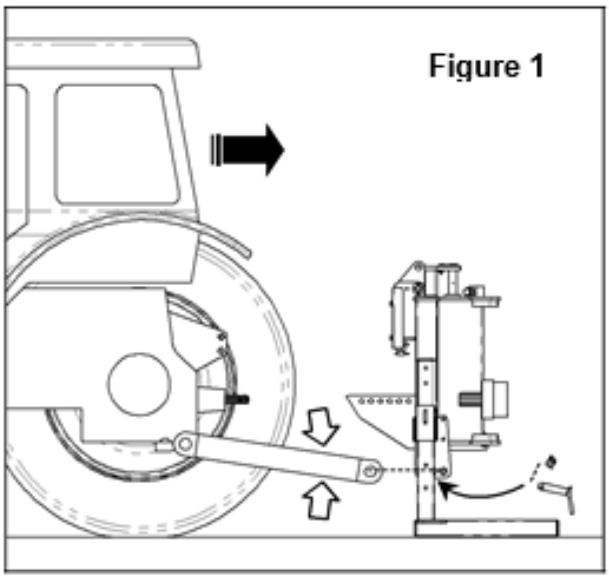


Figure 1

- Connect the tractor's draft links to the machine's lower link brackets, retain in position with the linkage and lynch pins supplied. Ensure that the same 'hole position' is selected on each side of the machine.
NOTE: *The hole selected on the lower link bracket should be the rear most that permits the machine to be mounted without fouling the tractor.*

LIFTING EQUIPMENT MAY NOW BE REMOVED.

- Fit and secure stabiliser nose into the tractors top link selecting the highest position available avoiding any load sensing properties. *Fig.2*
NOTE: *The bolt on nose of the stabiliser is reversible in order to accommodate variations of tractor linkage designs.*

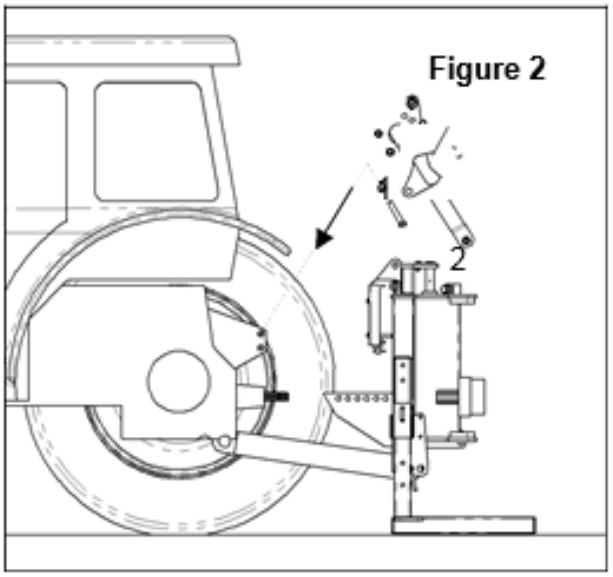


Figure 2

- Remove the 'R' clip and quadrant pin from stabiliser and swing it rearwards to locate with one of the holes on the mainframe - select the hole that is furthest away from the tractor and secure loosely with the bolt provided. DO NOT TIGHTEN AT THIS STAGE and DO NOT REPLACE QUADRANT PIN AT THIS STAGE. *Fig.3*

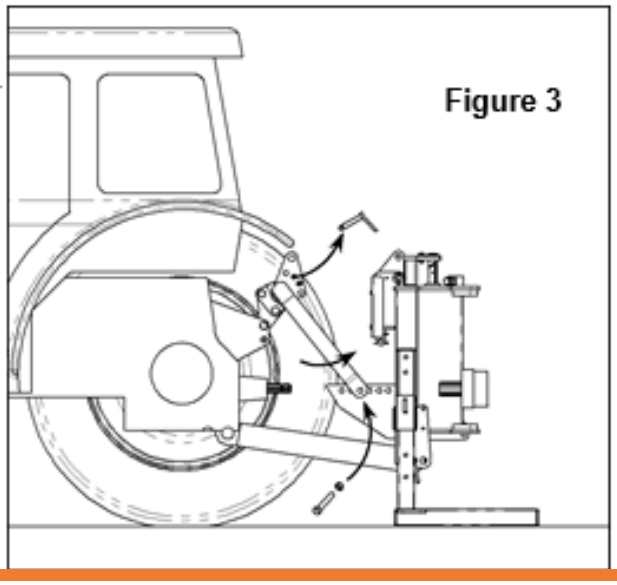
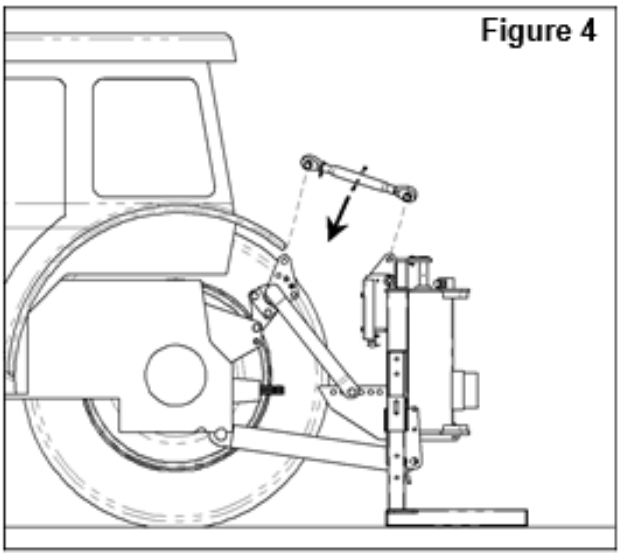


Figure 3

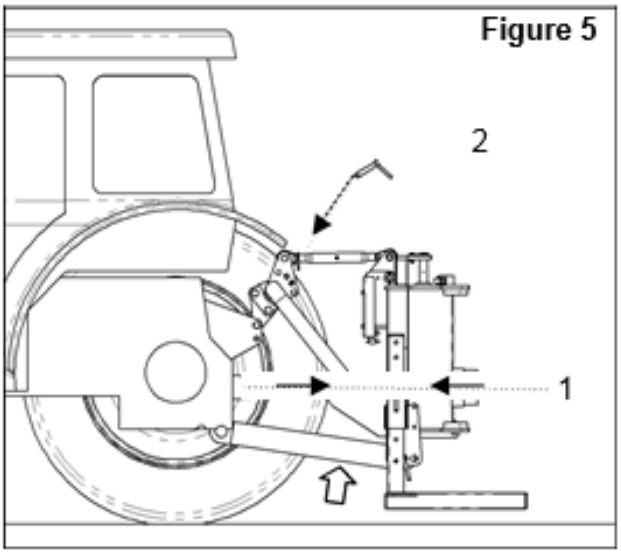
- Fit the machines top link.
Fig.4



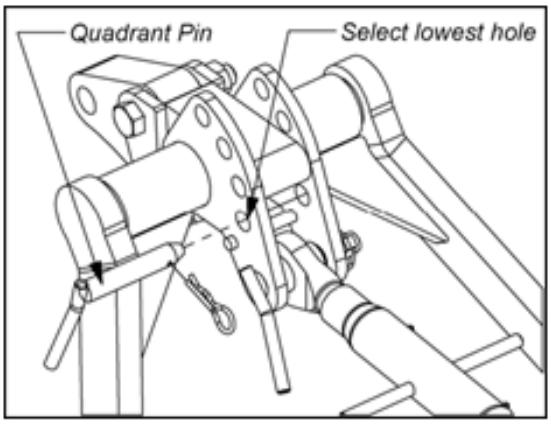
- Raise the machine on the tractor's linkage to a position where the tractor PTO and the machines gearbox stub shaft are approximately in line with each other. Note: *As lift occurs be aware the machine may tilt slightly.*

WARNING
The quadrant lever or machine controls must be operated from the tractor seat. Ensure no one is standing on or between the linkage arms or bars.

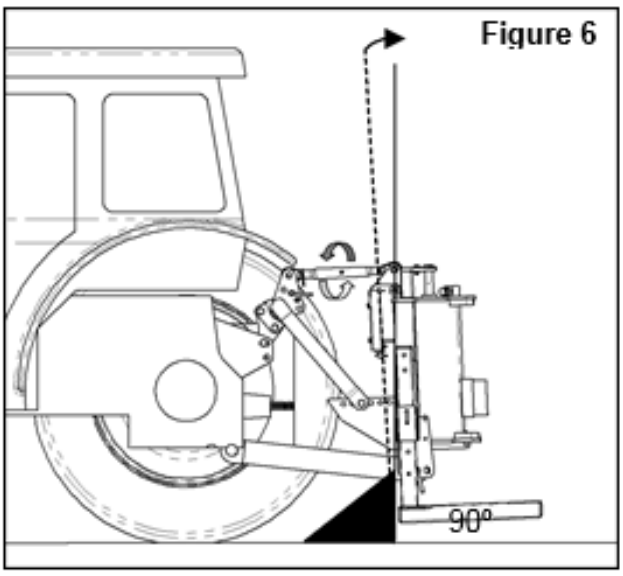
- Replace the stabiliser quadrant pin and secure with the 'R' clip.
Fig.5



NOTE: The quadrant pin <u>must</u> be fitted in the lowest hole on the stabiliser in order that it acts as a 'bottom stop' - *this will prevent the machine from dropping when stopped and permit the tractor's inbuilt transport protection system to function correctly during operation and transportation.*
Ensure the tractor's linkage is in 'position control' and the linkage raised sufficiently to hold the hedge cutter at the correct height and remove the load from the quadrant pin.
<u>Never</u> fit the quadrant pin in a location hole that locks the stabiliser as this can cause damage to the machine and/or tractor.



- Adjust the top link to bring the machine frame into the vertical position.
Fig.6



- Fully tighten the stabiliser lower bolts
Fig.7

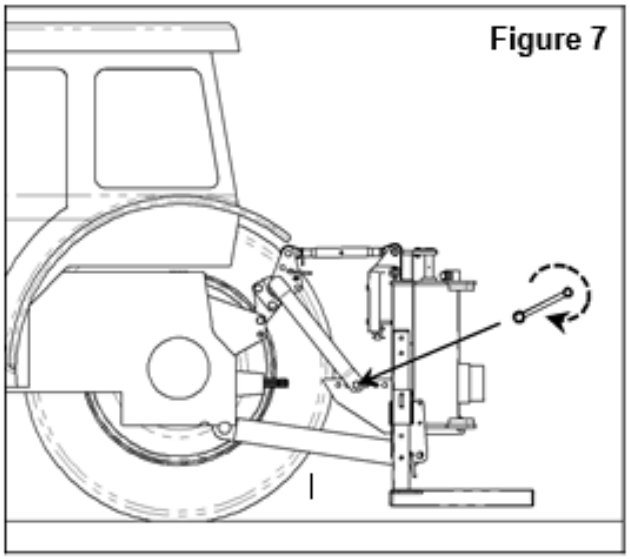


Figure 7

- Measure the PTO shaft and cut to the dimension shown – the finished length of the PTO shaft should be 75mm (3") less than the measured distance '**A**' - between tractor shaft and gearbox stub shaft - to enable fitting.
Fig.8
NOTE:
For subsequent use with different tractors measure again, there must be a minimum shaft overlap of 150mm (6").

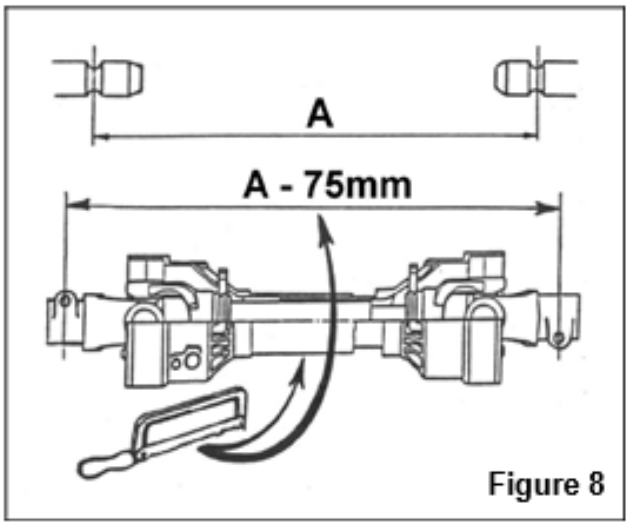


Figure 8

- Fit PTO in position and attach the torque chains to a convenient location to prevent the shaft guards from rotating.
Fig.9

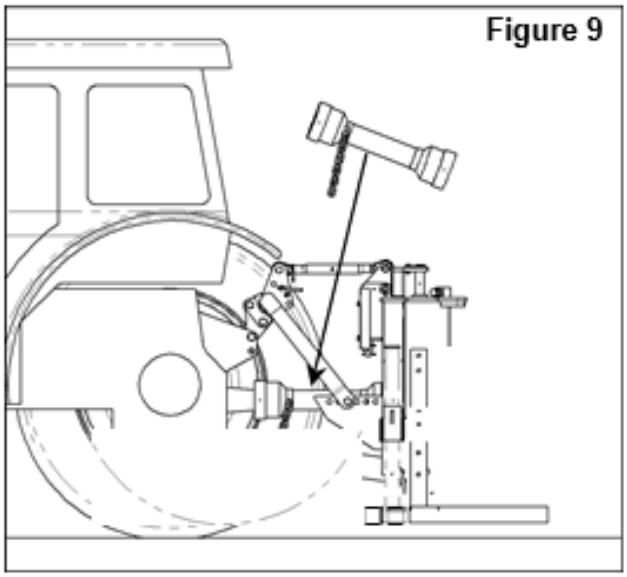


Figure 9

- **On semi independent machines only** connect up the supply and return hoses.
  Supply – *from tractors auxiliary service.*
  Return – *to tractors transmission casing (refer to Tractors Handbook).*

- Fit the machine control unit into the tractor cab – *see page 28*

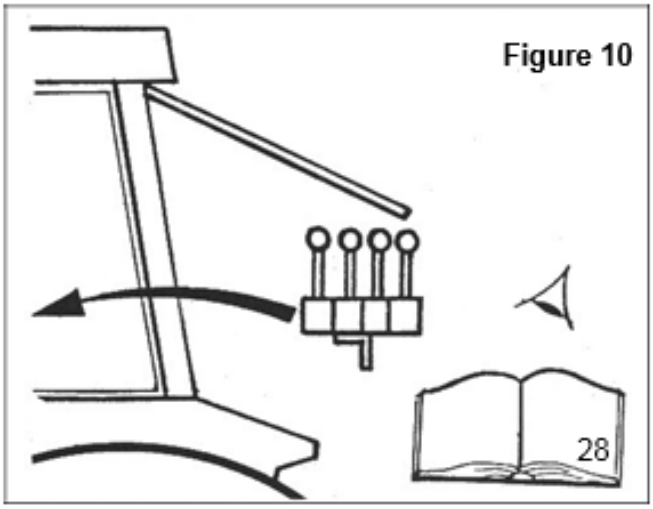
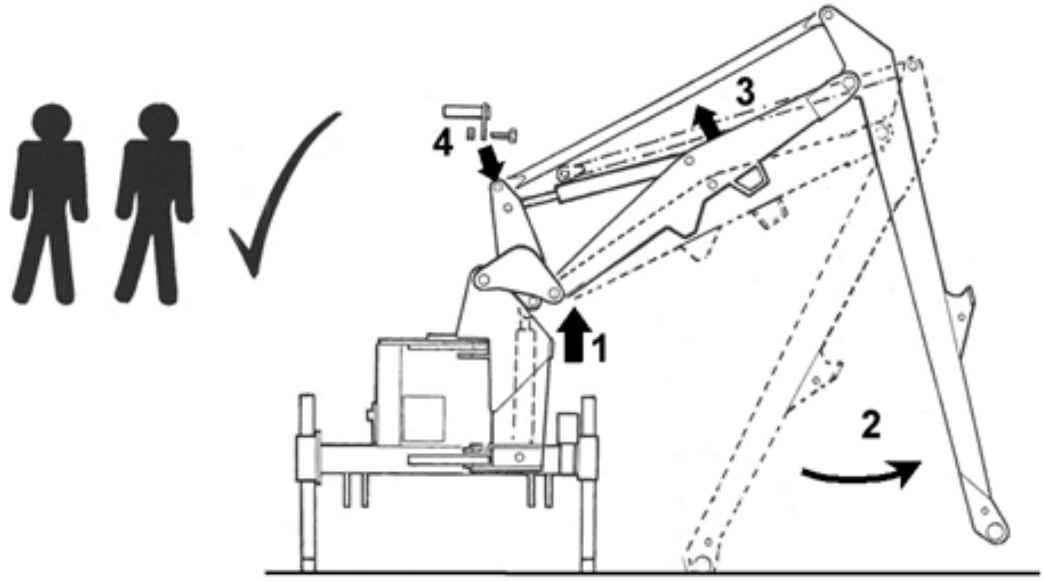


Figure 10

Note: On semi independent machines only select tractors external services.

- Ensure the Lift Ram tap and Slew Ram taps are open.

Figure 11

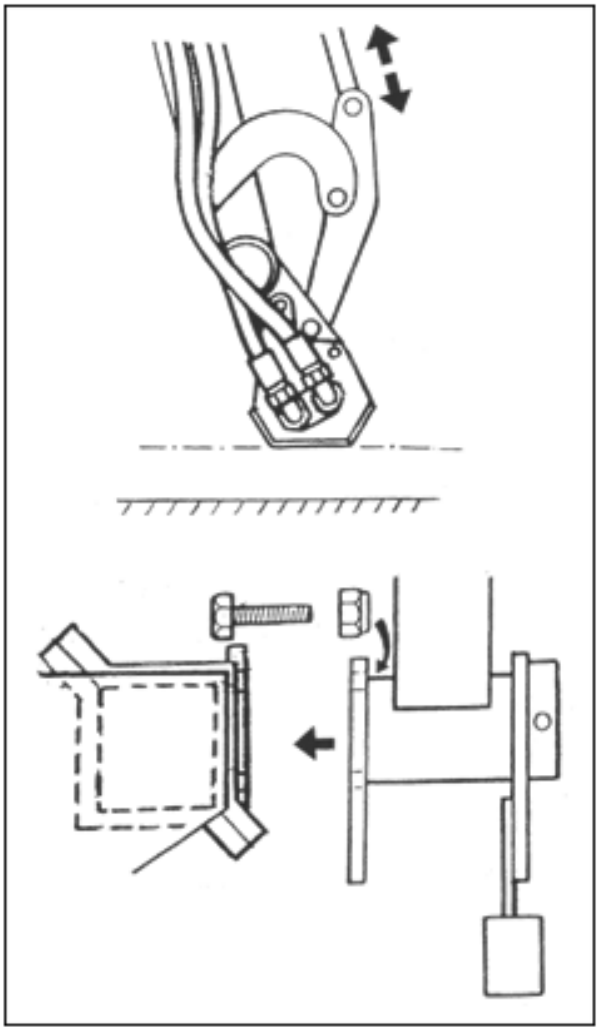


- Request assistance.
- Operate 'lift up' on machine controls sufficient only for the end of the dipper arm to clear the ground.
- Pivot out the dipper arm until the tension link can be connected.
- Operate the controls to 'slew' the arms towards the rear only until the frame is horizontal.
- Carefully operate the machine through its full range of movements whilst checking that hoses are not strained, pinched, chaffed or kinked, and that all machine movements are functioning correctly.
- On initial installation, the machine is now ready for attachment of the flail head *(see following page for fitting details).*
- Fold the machine into the transport position *(see pages 40-43 for details).* The machine is now ready to proceed to the work site.

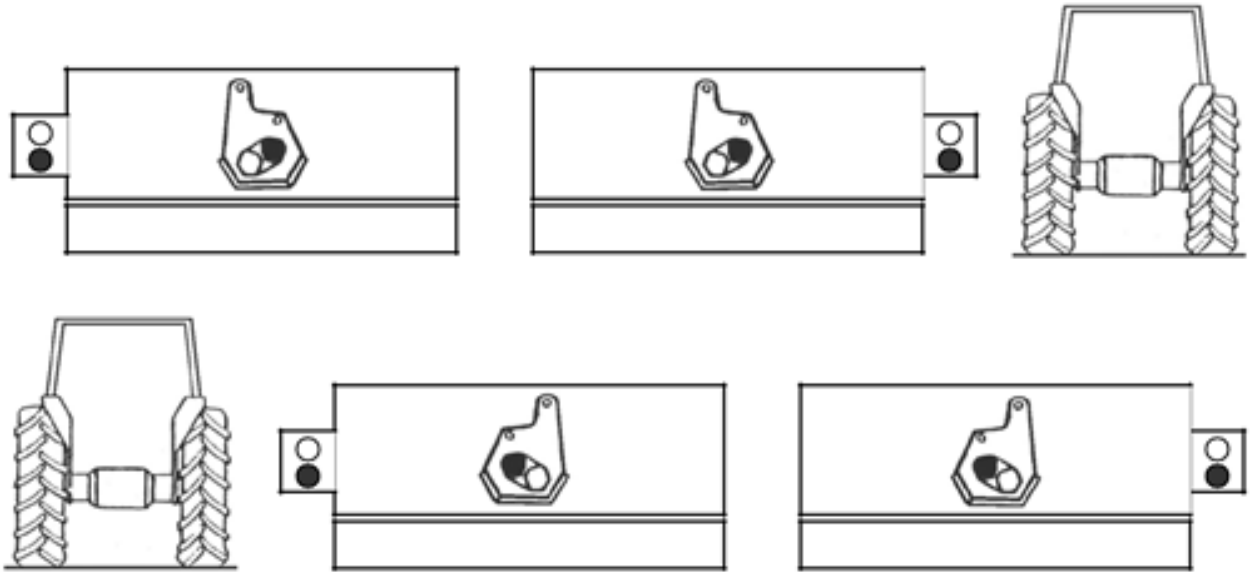
FLAILHEAD ATTACHMENT

Operate machine controls to maneuver into a position to enable attachment of the flail head – the bottom of the hose junction bracket must be parallel with the ground.

Refer to 'Pre operational checks' for correct bolt torque settings.



Connect up flail hoses as indicated below.



With the arms at half reach and the flail head clear of the ground carry out final adjustment of the lift arm levelling box to bring the main frame horizontal.

REMOVAL FROM TRACTOR

DANGER

READ CAREFULLY BEFORE COMMENCING TO REMOVE THE MACHINE FROM THE TRACTOR.

THE ORDER OF THE FOLLOWING STEPS **MUST** BE FOLLOWED **EXACTLY** DISCONNECTING THE TOP LINK **MUST** BE THE **LAST** OPERATION PRIOR TO DRIVING THE TRACTOR AWAY FROM THE MACHINE.

WARNING

Do not operate quadrant lever or machine controls through the rear cab window whilst standing on or amongst linkage components. **Always seek assistance.**

- Select a firm level site for parking the machine.
- Replace parking legs in their sockets and secure in their lowest position.
- Raise the machine on the tractor linkage until the weight is taken off the stabiliser.
- Remove the lower stabiliser pins.
- Unscrew the lift ram tap.
- Lower the machine to be ground.
- Extend the arms and place the flail head on the ground at half reach.
- Disengage tractor P.T.O. and remove.
- Disconnect stabiliser bars or loosen check chains as applicable.
- Unbolt the control unit from the mounting pillar, remove from tractor cab and stow the levers or switchbox clear of the ground.
- Disconnect the stabiliser from the tractors top hitch position. Allow the stabiliser to slide along the rail until it contacts the eccentric stops.
- Remove draft link pins and drive tractor away from machine.

STORAGE

If machine is to be left standing for an extended period of time, lightly coat the exposed portions of the ram rods with grease. Subsequently this grease should be wiped off before the rams are next moved.

If the machine has to be stored outside tie a piece of tarpaulin or canvas over the control assembly, do not use a plastic fertilizer bag which could lead to rapid corrosion.

SUBSEQUENT ATTACHMENT TO IDENTICAL TRACTOR

Refer to and follow steps on ***'initial attachment to tractor'*** *(page 13)*

- Connect Stabiliser into tractors top hitch position used previously.
- Raise the machine on the tractor linkage until the Stabiliser contacts the eccentric stops.
- Fit Stabiliser lower pins.
- Mount controls in the tractor cab.
- Fit PTO Shaft and attach torque chain to a convenient point to prevent the shaft guard rotating.
- Place arms in work position at half reach and adjust lift arm leveling box to bring frame horizontal.
- Tighten Check Chains if fitted.
- Stow parking legs.
- Fold machine into transport position *(see page 36)*.
- Proceed to the work site.

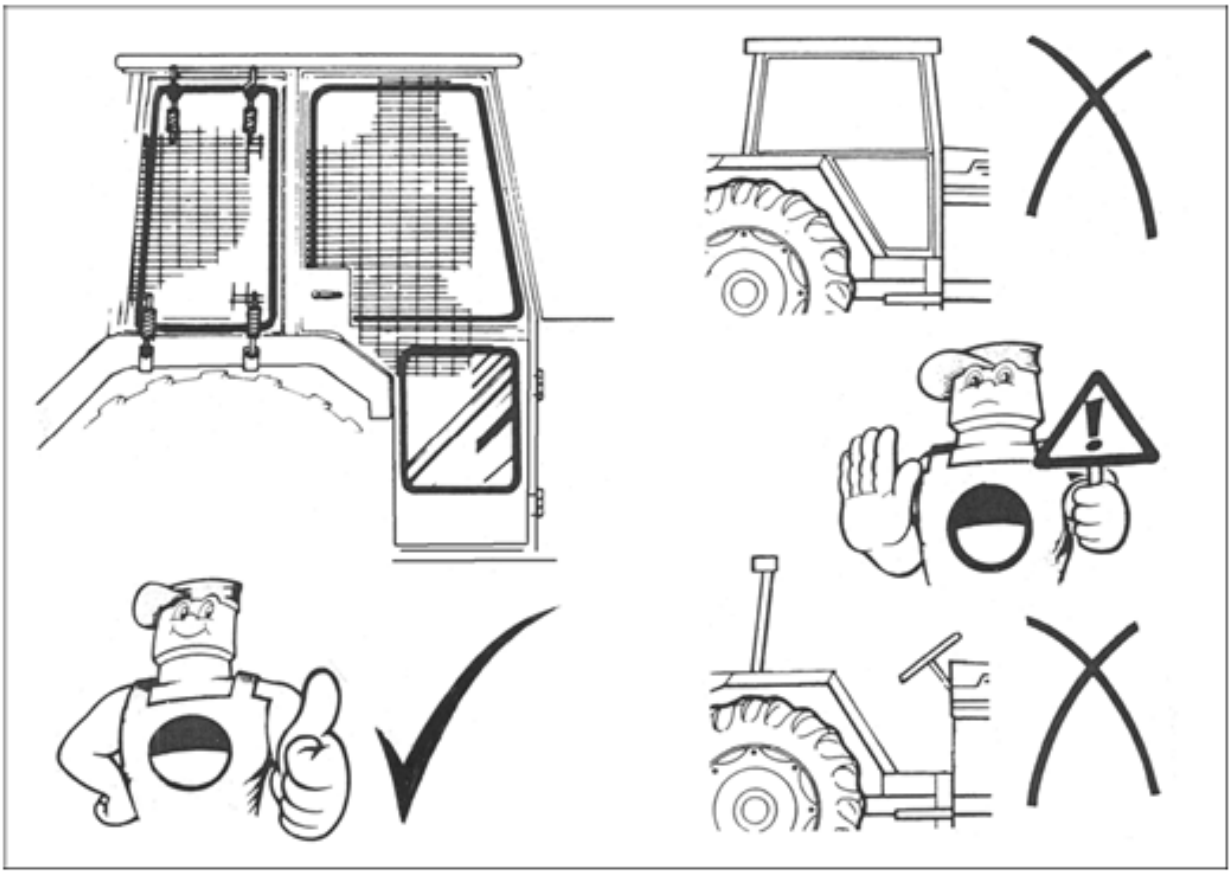
SUBSEQUENT ATTACHMENT TO DIFFERENT TRACTOR

- Remove Stabiliser and Top Link from machine and separate.

Refer to and follow steps ***'initial attachment to tractor'*** *(page 13)*

OPERATION

OPERATOR GUARD



PREPARATION

READ THE BOOK FIRST

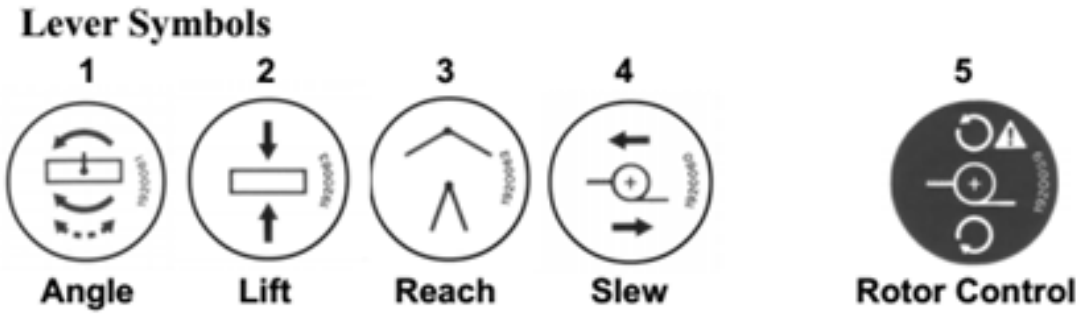
Practice operating the machine in an open space without the rotor running until you are fully familiar with the controls and operation of the machine.

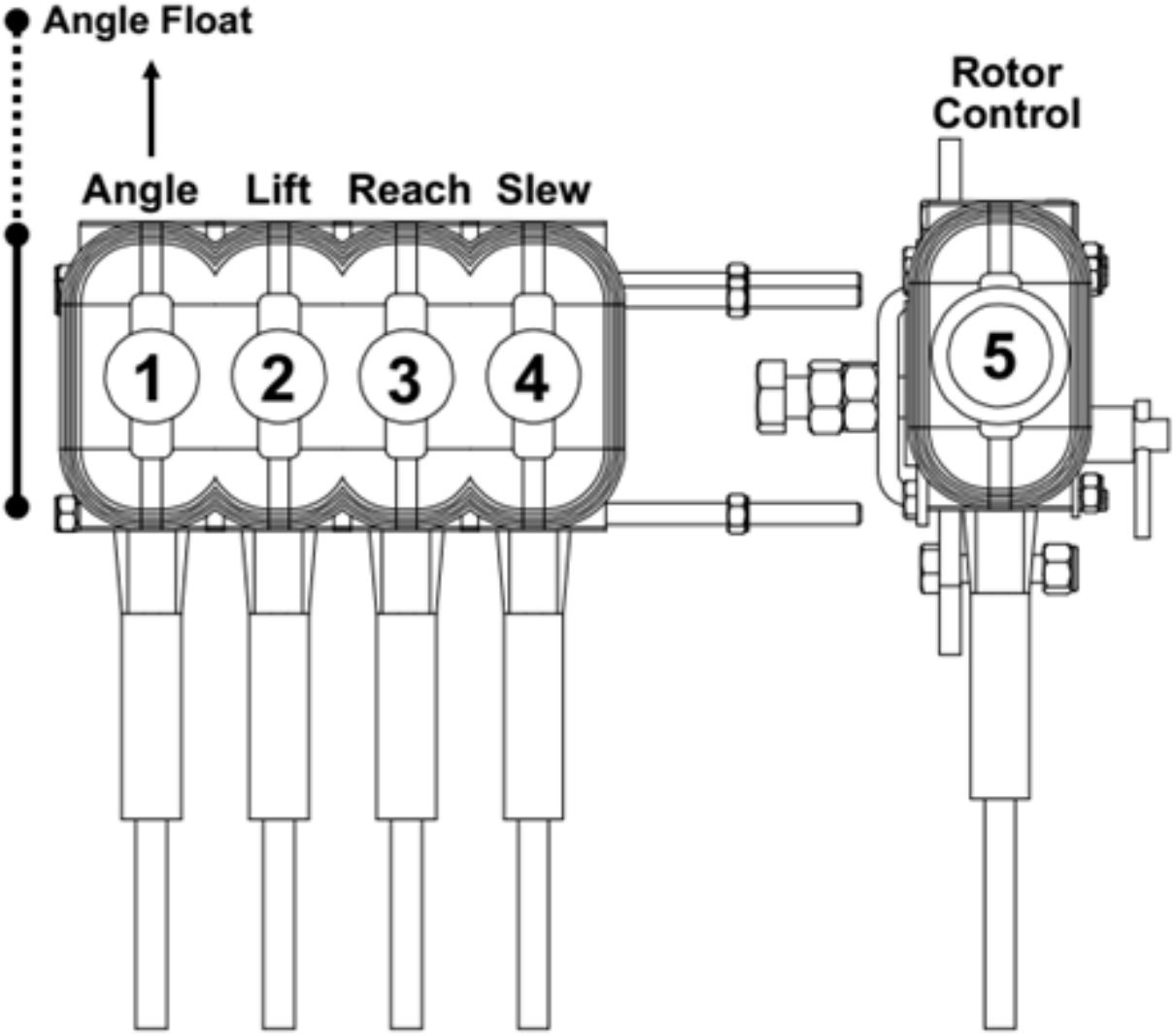
CAUTION

Care must be taken when working with the flail head close in as it can come into contact with the tractor.

MACHINE CONTROLS

Cable controlled machines only





The breakaway function does not relieve the operator of his responsibility to drive carefully, be alert and AVOID OBVIOUS HAZARDS BEFORE CONTACT OCCURS.

Breakaway may occur momentarily during normal work should an extra thick or dense patch of vegetation be encountered. In these instances, tractor forward motion may be maintained with care. Where breakaway has occurred as a result of contacting a post or tree etc. the tractor must be halted and the controls of the machine utilised to maneuver the head away from the obstacle. **NEVER CONTINUE FORWARD MOTION TO DRAG THE HEAD AROUND THE OBSTACLE IN BREAKBACK POSITION.**

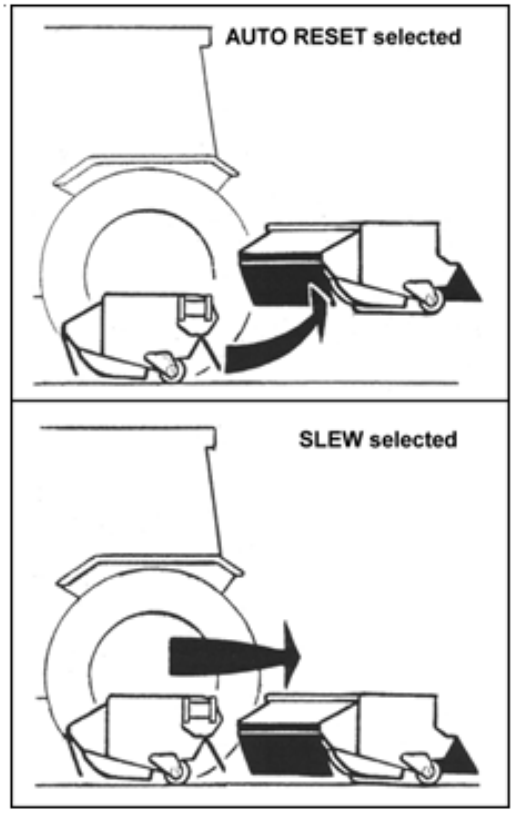
NOTE:
The force required to activate the breakaway system will vary dependent upon the gradient of work. It will require less force when working uphill and vice versa.

On mid-cut machines the geometry of the breakaway will cause the head to initially move outwards in addition to rearwards. Therefore, be aware that the breakaway action will be impeded if the outer end of the head is working against a steep bank. In this circumstance extra care must be taken during operation to avoid this occurrence.
Breakaway occurs at the slew column pivot. When an obstacle is encountered continued forward motion causes the pressure in the slew ram base to rise until the relief valve setting is exceeded.

With 'AUTO RESET' selected:

When the slew relief valve setting is exceeded oil is displaced from the slew ram into the base of the lift ram which causes the head to rise as the arm pivots backwards to clear the obstruction.

Resetting of the head into the work position occurs automatically.



With 'SLEW' selected:

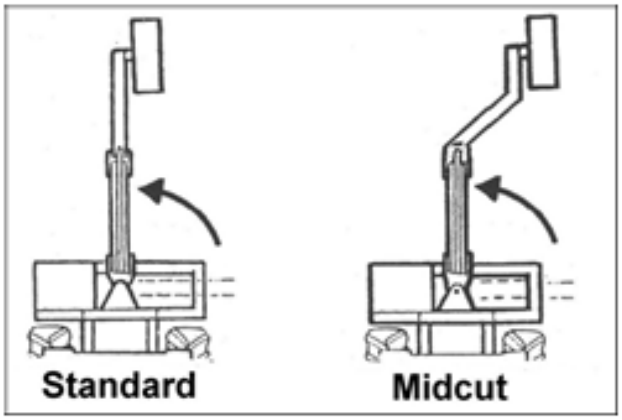
When the slew relief valve setting is exceeded oil is displaced from the slew ram allowing the arm to pivot backwards horizontally and the obstacle to be cleared.

Re-setting the head into the work position is carried out manually by selecting 'SLEW OUT' on the control assembly

MOVING INTO THE TRANSPORT POSITION

- Select 'ROTOR OFF' and wait until the **rotor has stopped turning.**

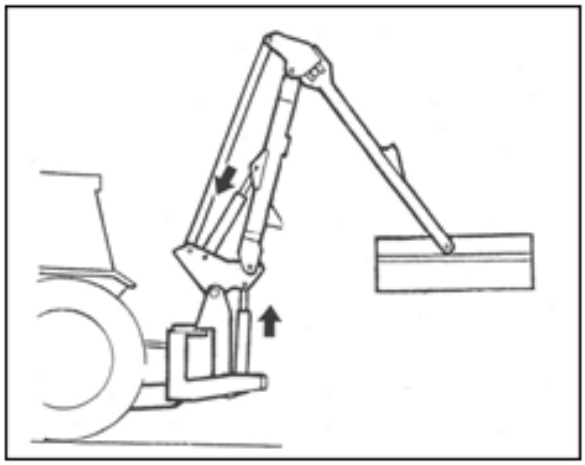
- Ensure that the **'lift'** and **'angle float'** are switched **off.**



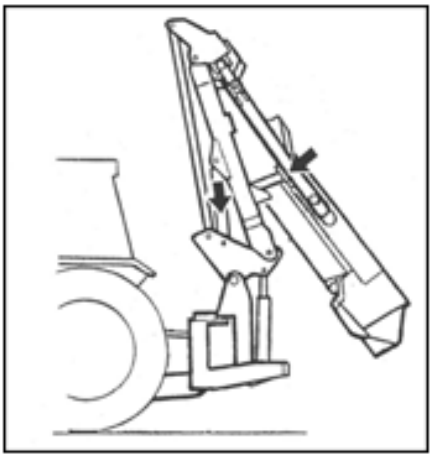
- Select 'SLEW' mode on the control assembly.

- Operate 'SLEW IN'.

- Operate 'LIFT' and 'REACH' to position the machine *(see diagram)*.

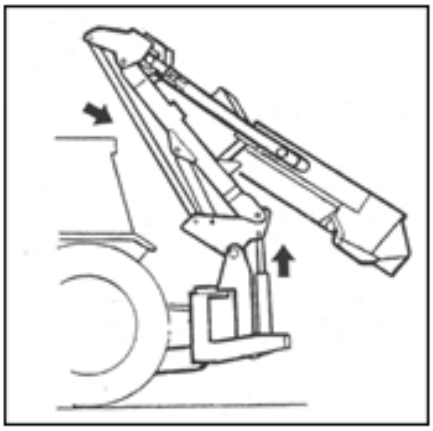


- Operate 'REACH IN' until the dipper arm contacts the transport cradle.



- Select 'LIFT UP' and raise the arms until the tension link is 300mm from the tractor cab.

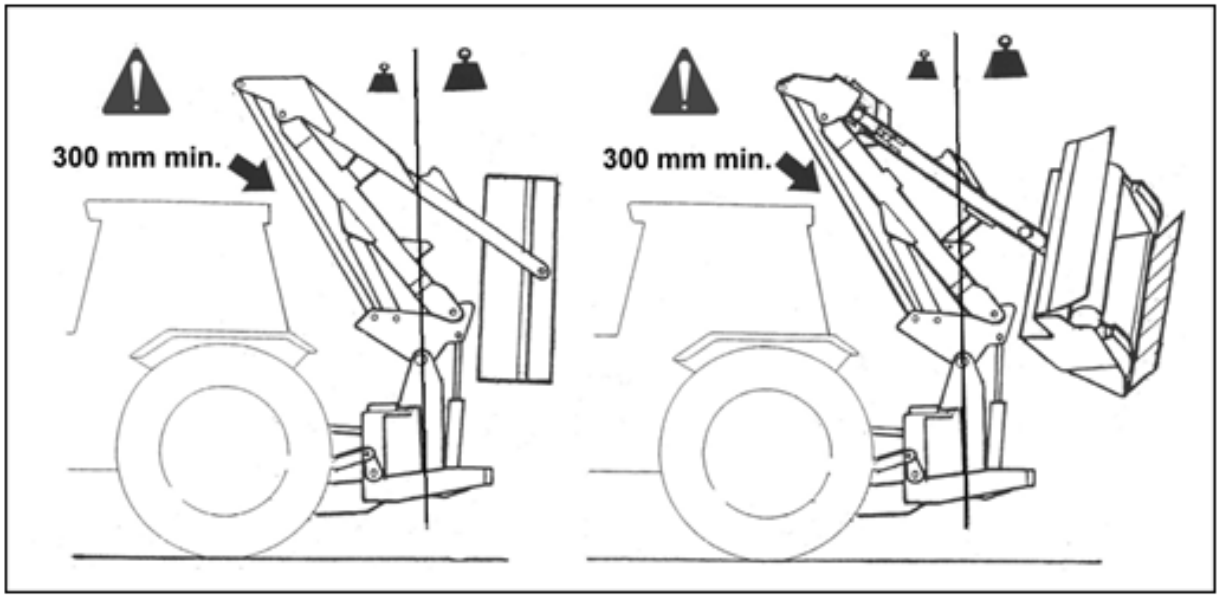
- Operate 'ANGLE' and position the flail head in as compact position as possible. *(see transport position)*



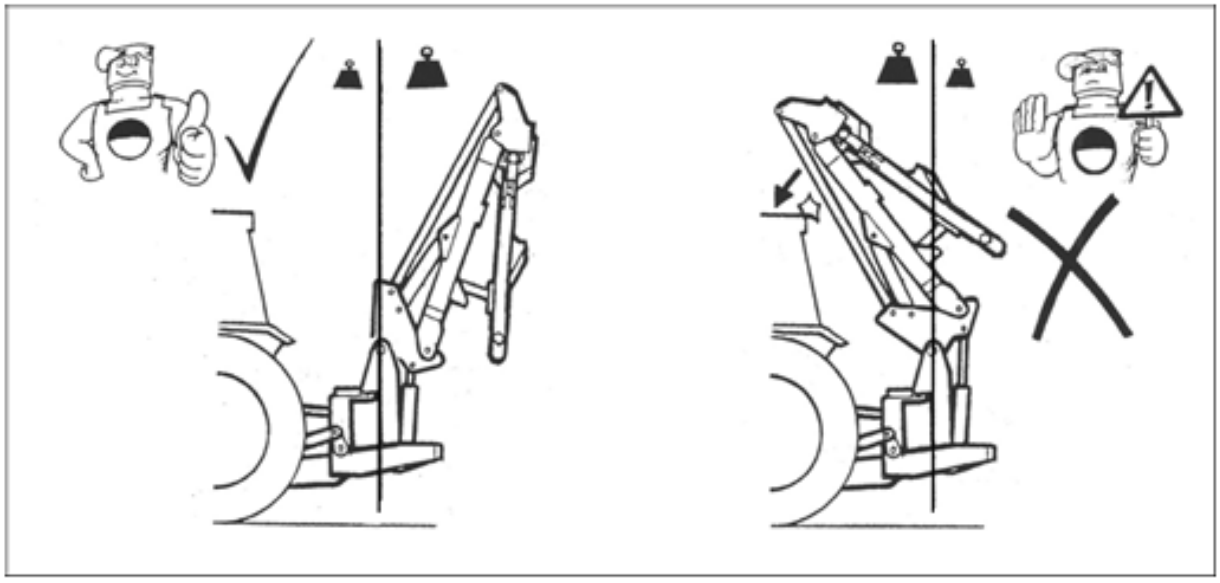
Fully screw in the lift ram and slew ram taps.

TRANSPORT POSITION – Rear Mounted Machines

The machine is transported in line to the rear of the tractor with a minimum of 3OOmm clearance between the tension link and the rear cross member of the tractor cab.



TRANSPORT POSITION WITH FLAILHEAD REMOVED



With the flail head removed the arms are fully folded but with the lift ram fully retracted. If the lift ram is extended the weight of the arms will result in the balance of the machine to go 'over centre' causing the tension link to crash into the rear cross member of the tractor's cab.

WARNING
During transport:
The 'SLEW' mode must ALWAYS be selected on the control assembly.

TRANSPORT

When in transport the P.T.O. must be disengaged and the power to the control box switched off.

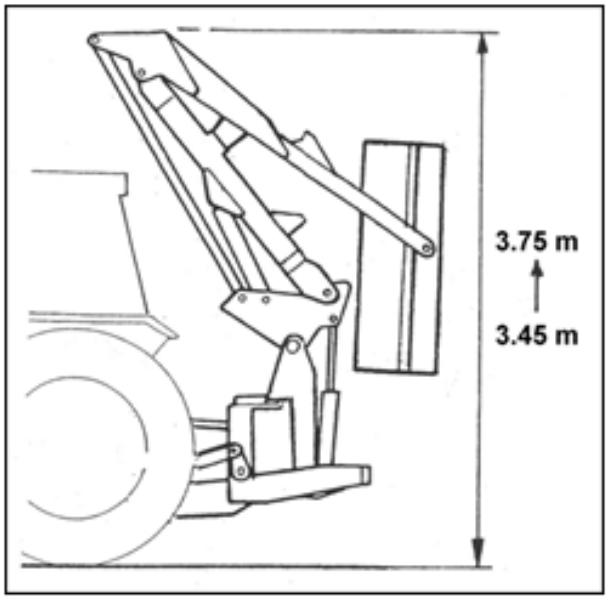
The acceptable speed of transport will vary greatly depending upon the ground conditions.

In any conditions avoid driving at a speed which causes exaggerated bouncing as this will put unnecessary strain on the tractors top hitch position and increase the likelihood of the tension link contacting the cab rear cross member.

TRANSPORT HEIGHT

There is no fixed dimension for transport height. It will vary depending on the height that the machine is carried and the degree of arm fold that the rear of the cab will allow.

For the majority of installations, the transport height will generally fall between a minimum of 3.45m and a maximum of 3.65m when the machine is correctly folded



MOVING FROM TRANSPORT TO WORK POSITION *(all models)*

To revert to the work position' the previous procedures for the relevant models are largely reversed.

NOTE: Remember to unscrew the lift ram tap.

ENGAGING DRIVE

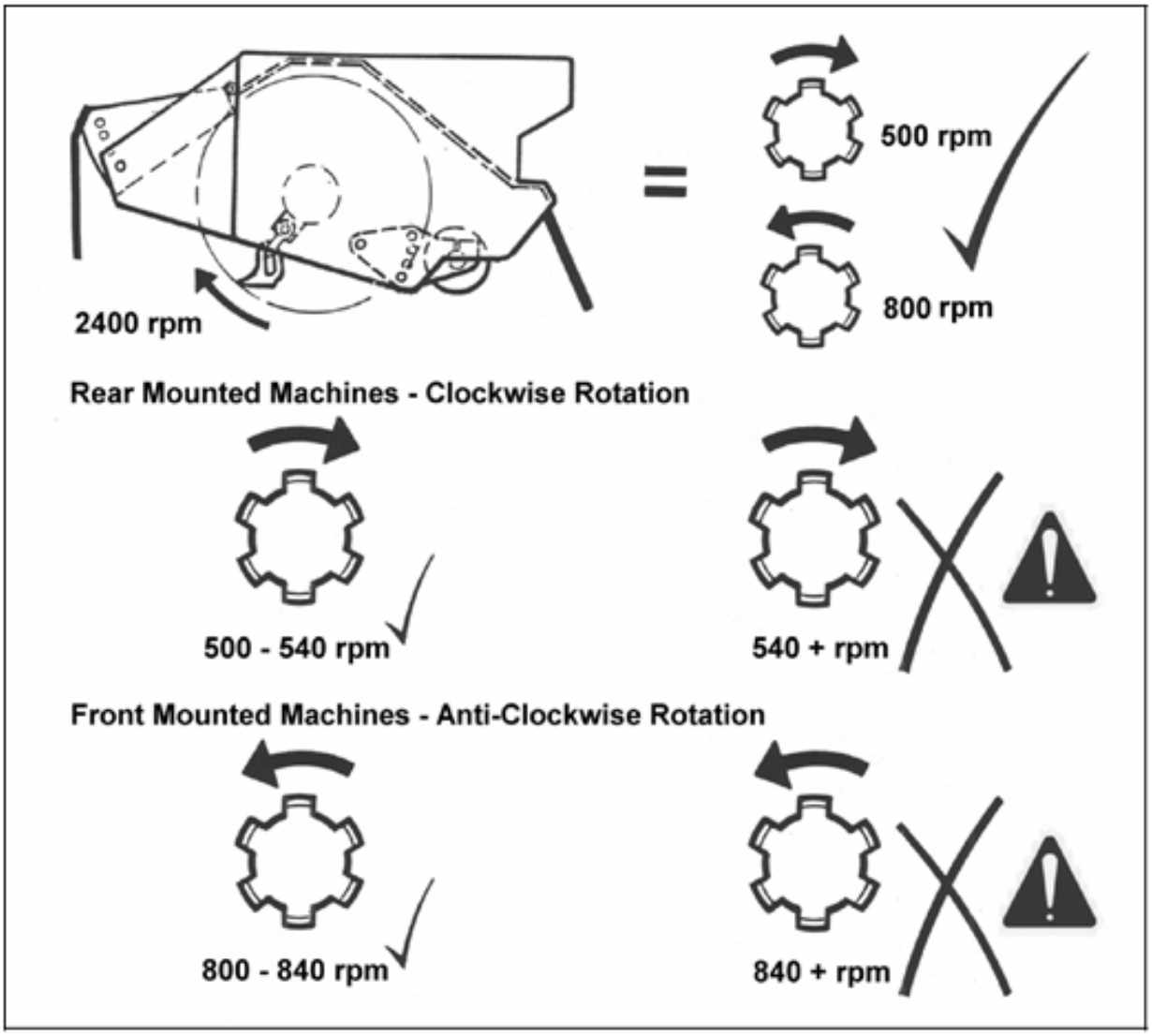
T.i. models only

Ensure that the rotor control lever is in the 'Stop' position before engaging the P.T.O. shaft. Allow the oil to circulate for a minute or so before operating the arm head levers. Position the flail head in a safe position, increase the engine speed to a high idle and move rotor control lever to 'START'. After initial surging the rotor will run at an even speed.

S.i. models only

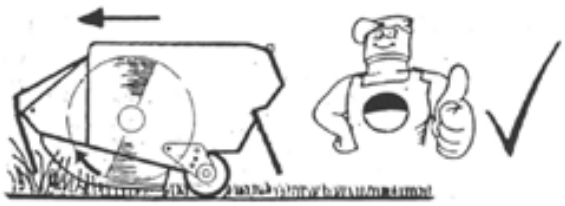
Place the flail head at a safe attitude and bring the tractor engine revolutions to 1000 r.p.m. Engage the P.T.O. and slowly increase revs. until operating speeds are attained.

ROTOR OPERATING SPEED

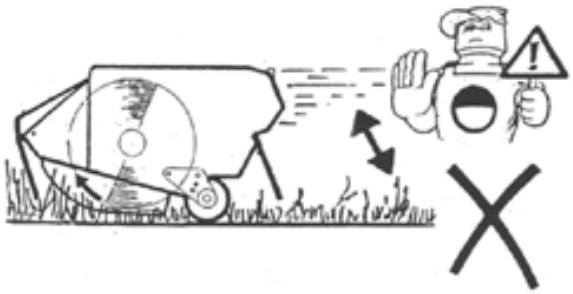


TRACTOR FORWARD SPEED

The material being cut determines tractor forward speed. Forward speed can be as fast as that which allows the flail head sufficient time to cut the vegetation properly.



Too fast a speed will be indicated by over frequent operation of the breakaway system, a fall off in tractor engine revs and a poor finish to the work leaving ragged uncut tufts and poorly mulched cuttings.

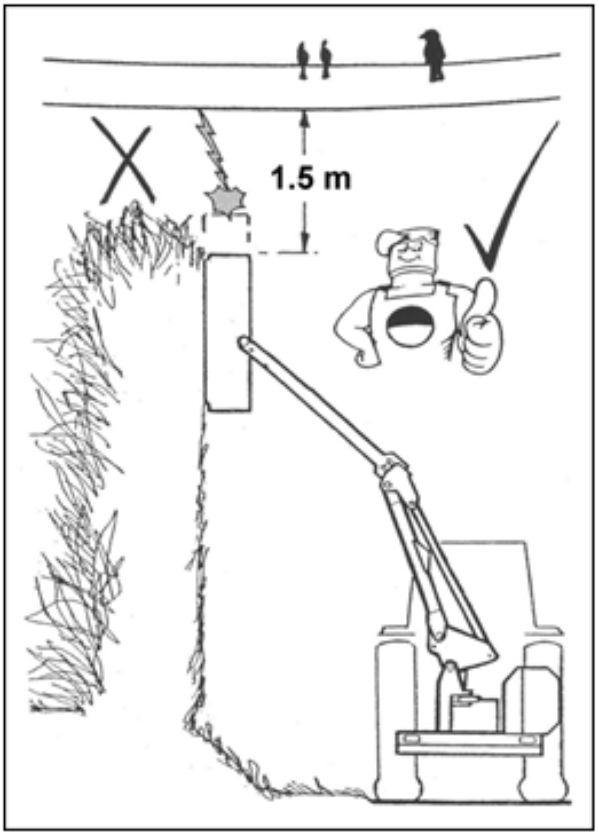


HIGH VOLTAGE CABLES

It cannot be stressed enough the dangers involved when working near high voltage electricity cables. Before attempting to work in these areas ensure you have read and fully understood the safety section at the beginning of this manual which includes information on this subject.

ALWAYS MAINTAIN A MINIMUM CLEARANCE DISTANCE OF 1.5 M WHEN OPERATING NEAR HIGH VOLTAGE CABLES

It is advisable that you consult your Local Power Company to obtain information regarding a safe procedure for working.

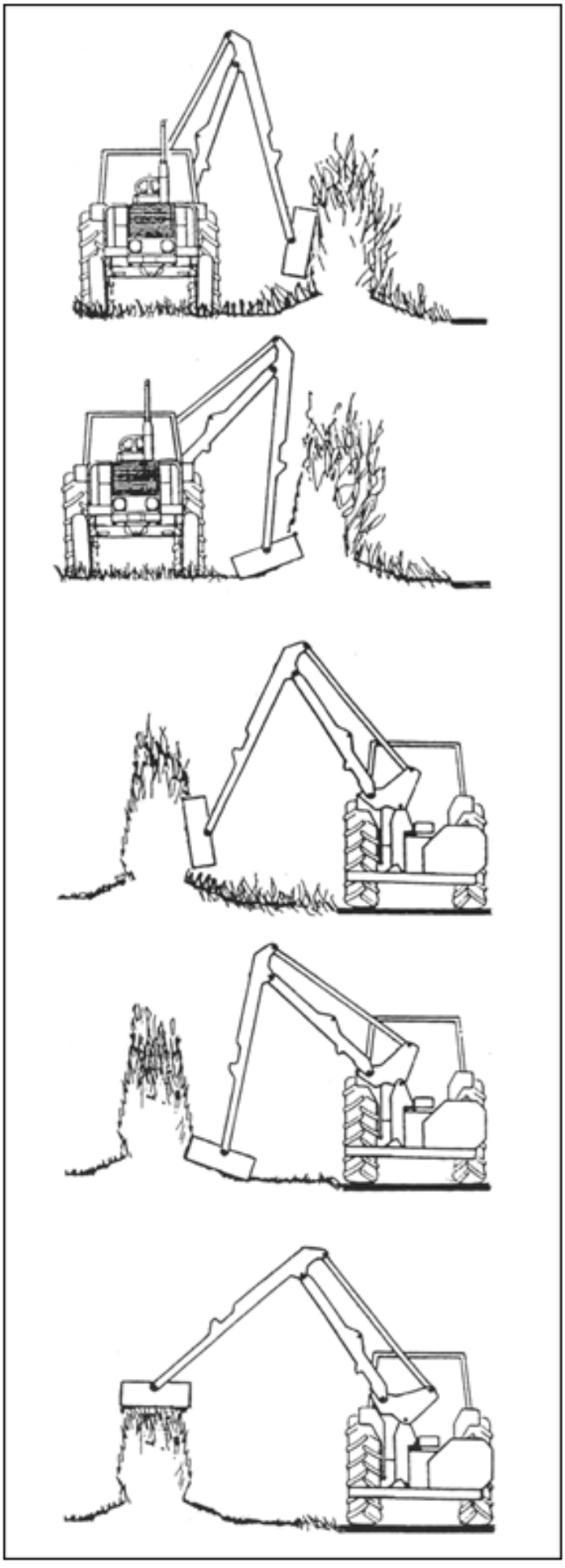


OVERHEAD OBSTRUCTIONS

Always be aware of the height of the machine when working or folded and take care especially when maneuvering near or under bridges, buildings, power cables or any other obstacles you may encounter when moving your machine.

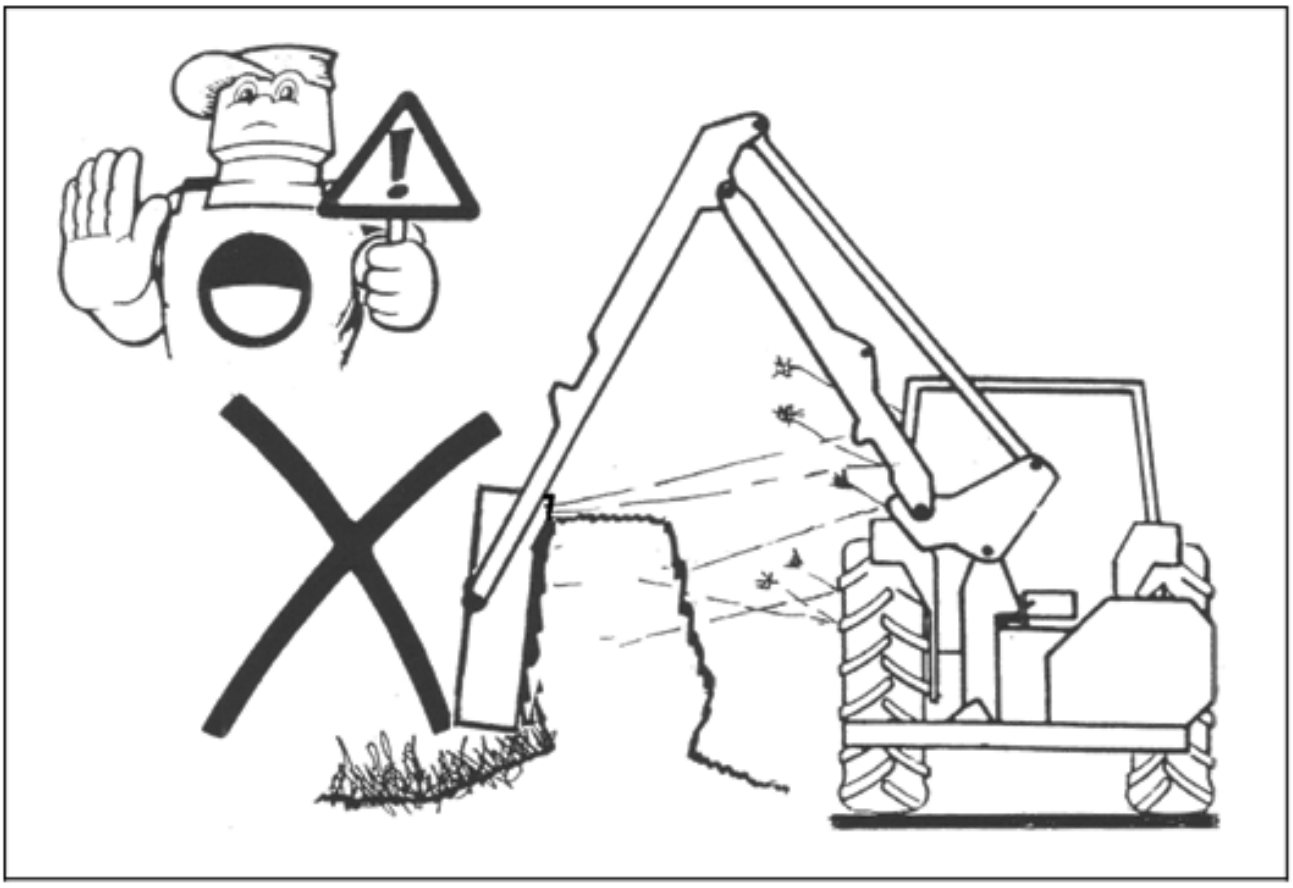
HEDGE CUTTING PROCEDURE

1. Cut the side and bottom of the field side first. This leaves the maximum thickness of hedge on the road side to prevent the possibility of any debris being thrown through the hedge into the path of oncoming vehicles.



2. Cut the side and bottom of the road side.

3. Top cut the hedge to the height required.



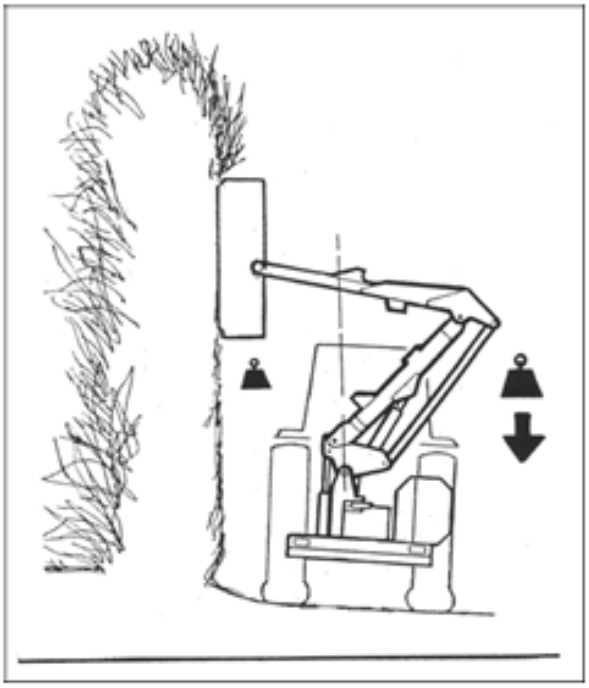
WARNING
NEVER CUT ON THE BLIND SIDE OF THE HEDGE.
It is impossible to see potential hazards or dangers and the position of the flail head would possibly allow debris to be propelled through the hedge towards the tractor and the operator.

WORKING ON ADVERSE SLOPES

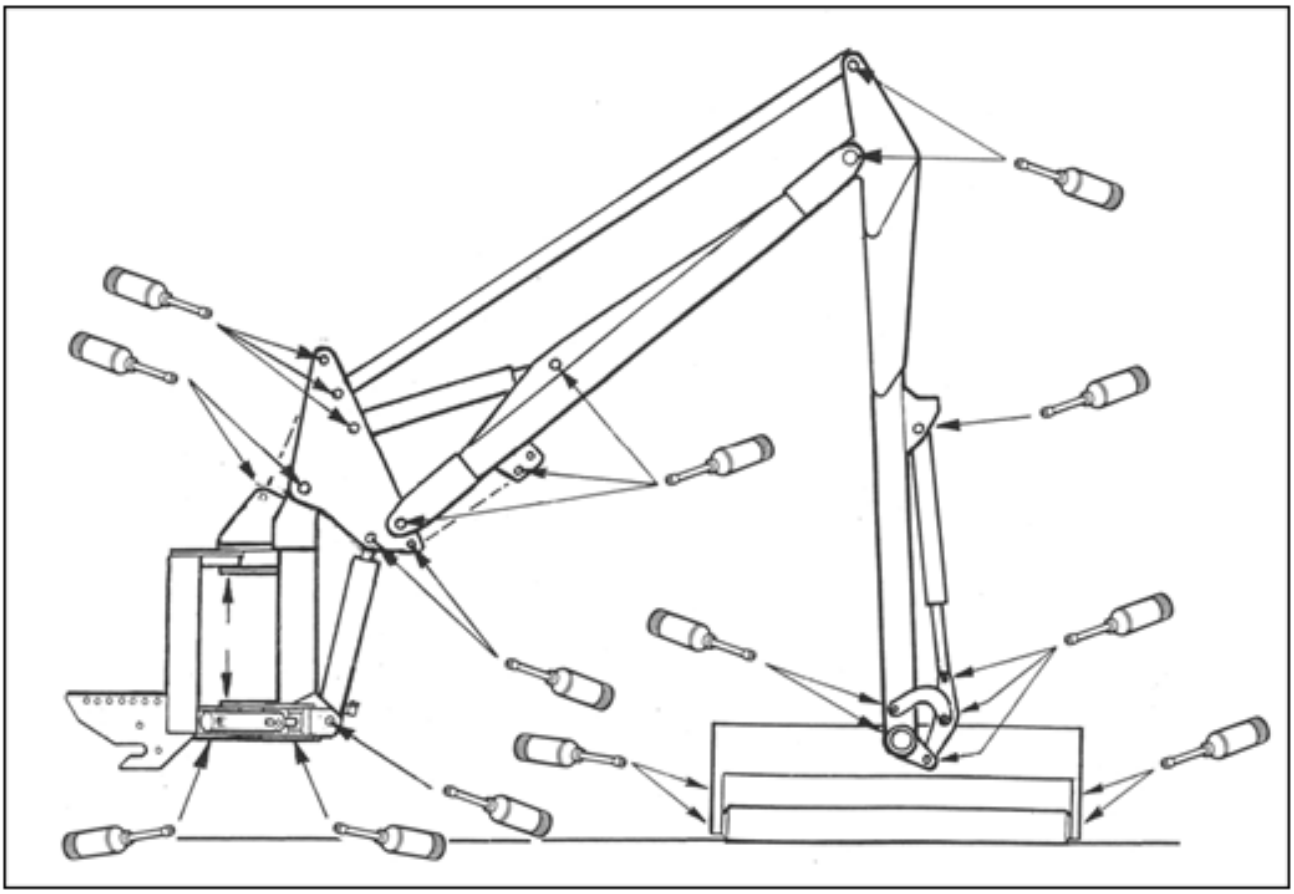
When working high with the reach fully in it is possible for the main arm balance to go over centre and take the weight off the lift ram. A restrictor in the gland connection of the lift ram prevents sudden unpredictable movements should this occur.

WARNING
Do not remove this restrictor from the lift ram gland connection.

The machine is fitted with a cam valve which stops unpredictable movements when working with the machine in a high position.

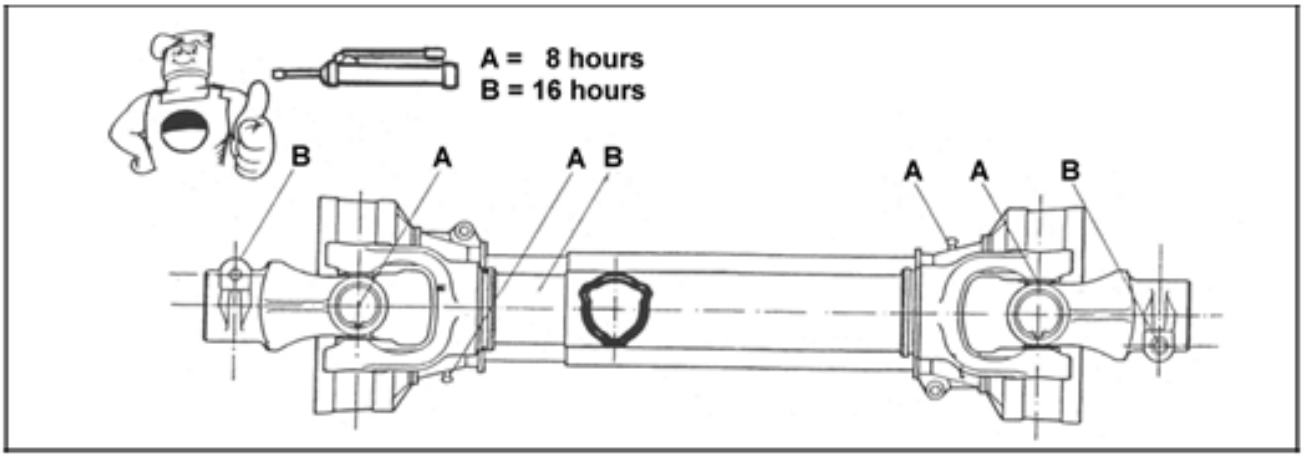


MAINTENANCE



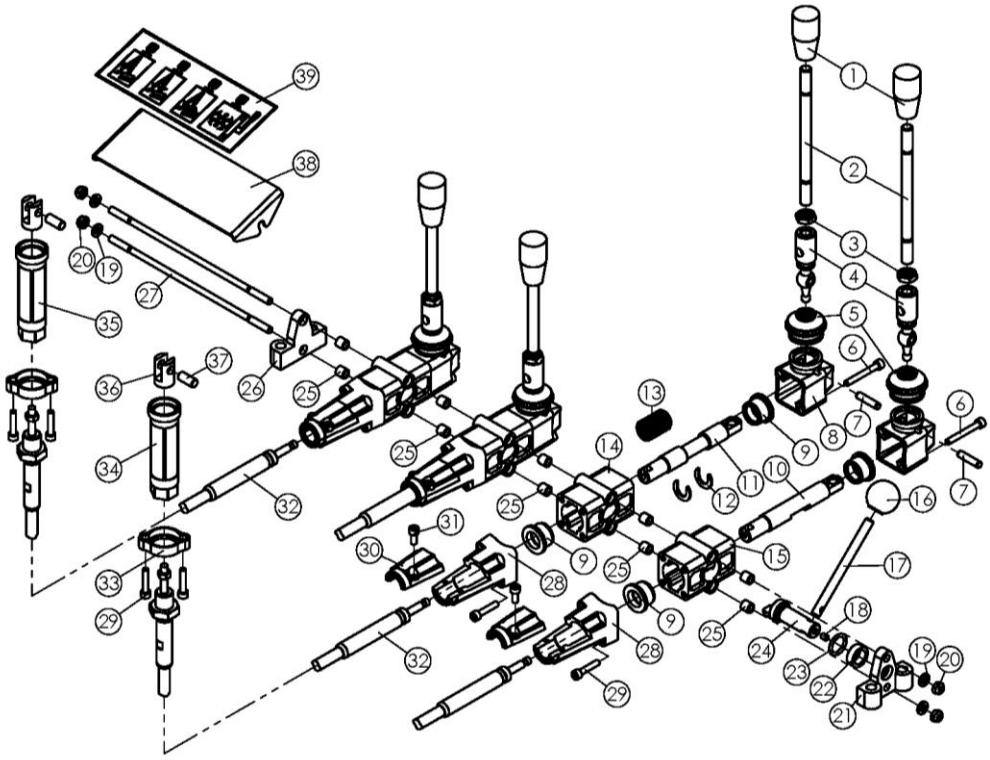
LUBRICATION
GENERAL
Grease daily all the points shown in the diagram above.

P.T.O. SHAFT
Regularly check the P.T.O. guards for damage and ensure the anti rotation chains are in place and that their anchor points are in good condition.
Lubricate the points shown on the diagram below at the intervals indicated using general purpose lithium-based grease.

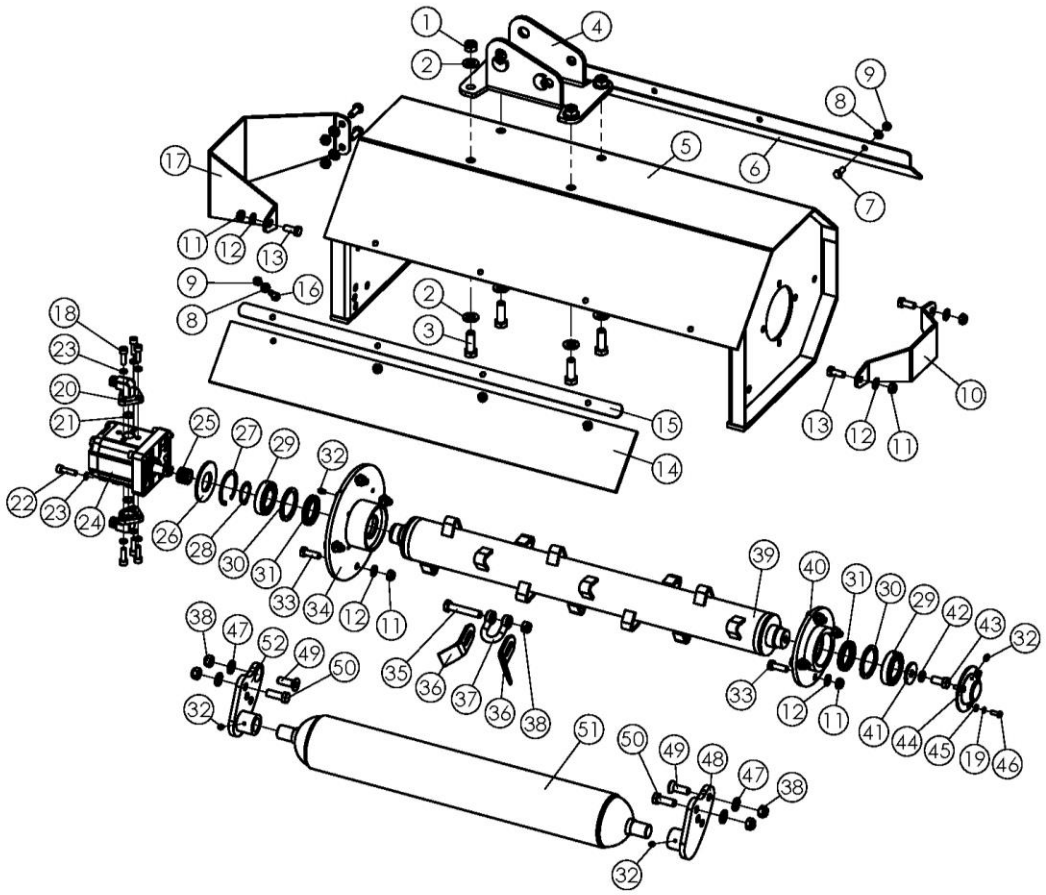


WARNING
DO NOT OPERATE THE MACHINE WITH ANY DAMAGED GUARDS
REPLACE SUSPECT ITEMS IMMEDIATELY

Control assembly



No.	Article no.	Part no.	Name&spec	QTY
1	702830121	BH-6.07.091	short hand shank	4
2	702910335	MBH-6.08.108	Joystick(short)	4
3	503010099	GB6172.1-M10	Thin nut	4
4	702770020	AM60.01.120	Shifting block	4
5	702770019	AM60.01.119	Protecting bush	4
6	505011396	GB70.1-M5X40	hexagon socket cap screw	8
7	508010099	GB119.1-B-6X26	B cylindrical pin	4
8	702770015	AM60.01.114	Upper cover	4
9	702770010	AM60.01.109	Flange bush	8
10	702770216	AM60.01.118A	Pull rod 2	1
11	702770213	AM60.01.111A	Pull rod 1	3
12	702770022	AM60.01.122	Check ring	6
13	702770011	AM60.01.110	Release spring	3
14	702770014	AM60.01.113	shell	3
15	702770017	AM60.01.117	Lock hole shell	1
16	702770171	AM60.04.092	Bulb hand shank	1
17	702770008	AM60.01.107	Lock joystick	1
18	505020541	GB78-M5X8	inner hexagon set screw	1
19	506010054	GB97.1-6	Plain washer	4
20	503010759	DIN985-M6	hexagon locking thin nut	4
21	702770006	AM60.01.105	fixed seat 2	1



22	702770005	AM60.01.104	bush	1
23	510013130	GB3452.1-G-16X2.65	O sealing	1
24	702770007	AM60.01.106	Lock shaft	1
25	702770004	AM60.01.103	Locating sleeve	10
26	702770003	AM60.01.102	Fixed seat 1	1
27	702770002	AM60.01.101	Screw rod	2
28	702770214	AM60.01.112A	Lower cover	4
29	505011393	GB70.1-M5X25	hexagon socket cap screw	16
30	702770215	AM60.01.123A	Lower cover	4
31	505011389	GB70.1-M5X12	hexagon socket cap screw	8
32	802770212	AM60.01.011A	dragline	4
33	702770191	AM60.01.201	flange	4
34	702770192	AM60.01.202	Pressure casting	3
35	702770193	AM60.01.203	flaring pressure casting pipe	1
36	702770194	AM60.01.204	Aluminum connector	4
37	702770195	AM60.01.205	pin	4
38	702770224	AM60.01.115	Label plate	1
39			label	1

No.	Article no.	Part no.	Name&spec	QTY
1	503010764	DIN985-M14	hexagon locking thin nut	4
2	506010058	GB97.1-14	Plain washer	8
3	501011142	GB5783-M14X40	Screw bolt	4
4	802770061	AM60.02.017	hitch frame weldment	1
5-1	802770037	AM60.02.010	Hood weldment	1
5-2	802780005	AM80.02.010	Hood weldment	1
5-3	806830004	AM100.02.010	Hood weldment	1
6-1	702770033	AM60.02.110	Head board	1
6-2	702780002	AM80.02.110	Head board	1
6-3	706830001	AM100.02.110	Head board	1
7	501011099	GB5783-M8X20	Screw bolt	4
8	506010055	GB97.1-8	Plain washer	8
9	503010760	DIN985-M8	hexagon locking thin nut	8
10	702770031	AM60.02.108	shaft end cover plate	1
11	503010762	DIN985-M10	hexagon locking thin nut	13
12	506010056	GB97.1-10	Plain washer	13
13	501011112	GB5783-M10X25	Screw bolt	5
14-1	702770035	AM60.02.112	rubber board	1
14-2	702780004	AM80.02.112	rubber board	1
14-3	706830003	AM100.02.112	rubber board (L=1050)	1
15-1	702770034	AM60.02.111	Pressing bar	1
15-2	702780003	AM80.02.111	Pressing bar	1
15-3	706830002	AM100.02.111	Pressing bar	1
16	501011100	GB5783-M8X25	Screw bolt	4
17	702770026	AM60.02.103	motor guard board	1
18	505011416	GB70.1-M8X25	hexagon socket cap screw	6
19	506030034	GB93-6	Spring washer	3
20	702780010	AM60.02.104-2	motor oil in and out connector	2
21	510013139	GB3452.1-G-23.6X2.65	O sealing	2
22	505011417	GB70.1-M8X30	hexagon socket cap screw	4
23	506030035	GB93-8	Spring washer	10
24	702770169	HPLMA220BMLE5E5B00	Hydraulic motor	1
25	702770025	AM60.02.102	splined hub	1
26	702770036	AM60.02.141	motor positioning plate	1
27	506060183	GB893.1-62	A checking ring	1

28	506060317	GB894.1-35	A shaft checking ring	1
29	511022556	GB276-6007	Deep groove ball bearing	2
30	702770028	AM60.02.105	Oil sealing check ring	2
31	510020044	GB13871-FB-40X55X8	FB oil seal	2
32	509010007	GB1152-M6	Oil cup	4
33	501011113	GB5783-M10X30	Screw bolt	8
34	802770042	AM60.02.011	Main bearing seat	1
35	501010758	GB5782-M12X60	half thread bolt	16
36	702770029	AM60.02.106	blade	32
37	702770030	AM60.02.107	blade buckle	16
38	503010763	DIN985-M12	hexagon locking thin nut	20
39-1	802770046	AM60.02.012	Blade shaft	1
39-2	802780008	AM80.02.012	Blade shaft	1
39-3	806830006	AM100.02.012	Blade shaft	1
40	802770052	AM60.02.013	second bearing seat	1
41	703140005	MZ105.115	Locking gasket	1
42	506030037	GB93-12	Spring washer	1
43	501011125	GB5783-M12X25	Screw bolt	1
44	702770032	AM60.02.109	End cap	1
45	506010054	GB97.1-6	Plain washer	3
46	501011088	GB5783-M6X16	Screw bolt	3
47	506010057	GB97.1-12	Plain washer	4
48	802770055	AM60.02.014	roller shaft seat 1	1
49	505011750	GB70.3-M12X30	inner hexagon sunk screw	2
50	501011127	GB5783-M12X35	Screw bolt	2
51-1	802770207	EFG120.012-AM60	Roller weldment (AM60)	1
51-2	802780018	EFG120.012-AM80	Roller weldment (AM80)	1
51-3	806830008	EFG120.012-AM100	Pulley weldment（AM100）	1
52	802770058	AM60.02.016	Roller shaft 2	1

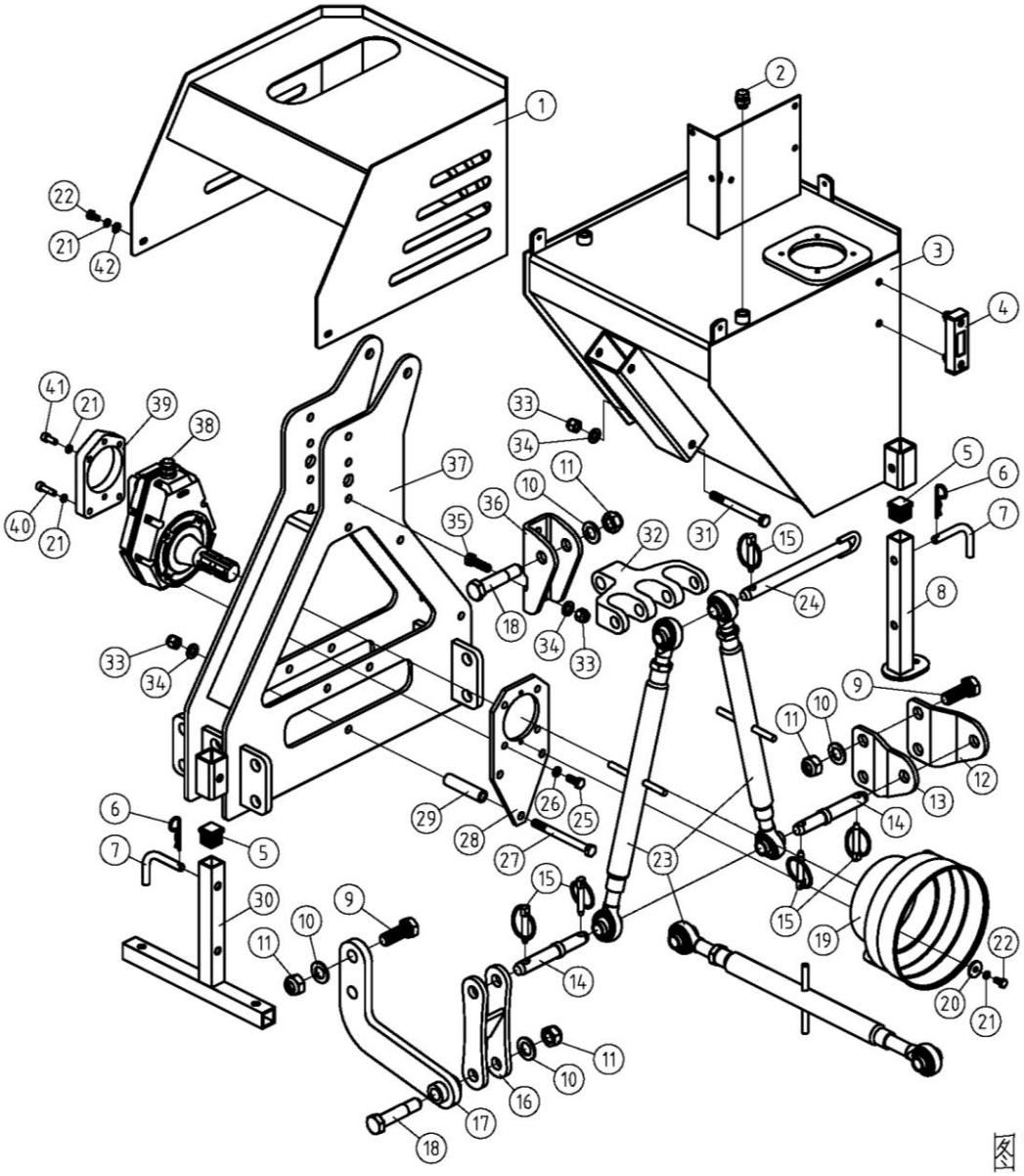


图1

No.	Article no.	Part no.	Name spec	QTY
1	802770115	AM60.03.016	fuel tank cover	1
2	703070084	CBW-00-011	Air plug M16X1.5	2
3	802770118	AM60.03.017Y-1	Fuel tank	1
4	509010012	JB7941.2-B80	Liquid level meter	1
5	700920105	EF100.00.117	End cover	3
6	703190209	1G-150-01-142	Middle R pin	4
7	800920101	EF100.00.111A	D square cotter	3

8	802770128	AM60.03.018	Support leg 2	2
9	501011198	GB5783-M20X55	Screw bolt	4
10	506010061	GB97.1-20	Plain washer	9
11	503010767	DIN985-M20	hexagon locking thin nut	9
12	702770078	AM60.03.114	Down hook plate 1	1
13	702770079	AM60.03.115	Down hook plate 1	1
14	702770077	AM60.03.113	Down pull rod pin shaft	2
15	700080010	200.56.011	Lock pin assembly	5
16	802770135	AM60.03.021	Lifting eye weldment	1
17	802770138	AM60.03.022	connecting lever weldment	1
18	501014279	GB27-M20X95	articulation bolt	2
19	703400008	FM120.00.199	PTO shaft cover	1
20	506010035	GB96.1-8	Extra-large plain washer	10
21	506030035	GB93-8	Spring washer	5
22	501011098	GB5783-M8X16	Screw bolt	5
23	802770134	AM60.03.020	Adjusting pull rod	3
24	802770131	AM60.03.019	upper pull rod pin shaft weldment	1
25	501011843	GB5786-M10X1.25X25	fin thread screw bolt	4
26	506030036	GB93-10	Spring washer	4
27	501014700	GB5782-M12X130	Half screwed bolt	3
28	702770066	AM60.03.102	gear box fixed plate	1
29	702770065	AM60.03.101	Spacer bush	3
30	802770080	AM60.03.010	Support leg 1	1

31	501010765	GB5782-M12X120	half thread bolt	2
32	702770076	AM60.03.112	Three joint forks	1
33	503010763	DIN985-M12	hexagon locking thin nut	3
34	506010057	GB97.1-12	Plain washer	8
35	501011128	GB5783-M12X40	Screw bolt	3
36	702770075	AM60.03.111	Upper hook frame	1
37	802770083	AM60.03.011	bed frame weldment	1
38	802770211	AM60.03.012	oil pump transmission box	1
39	702770146	AM60.04.102	transition connecting plate	1
40	505011417	GB70.1-M8X30	Hexagon socket cap screw	2
41	505011415	GB70.1-M8X20	Hexagon socket cap screw	2
42	506010054	GB97.1-6	Plain washer	4

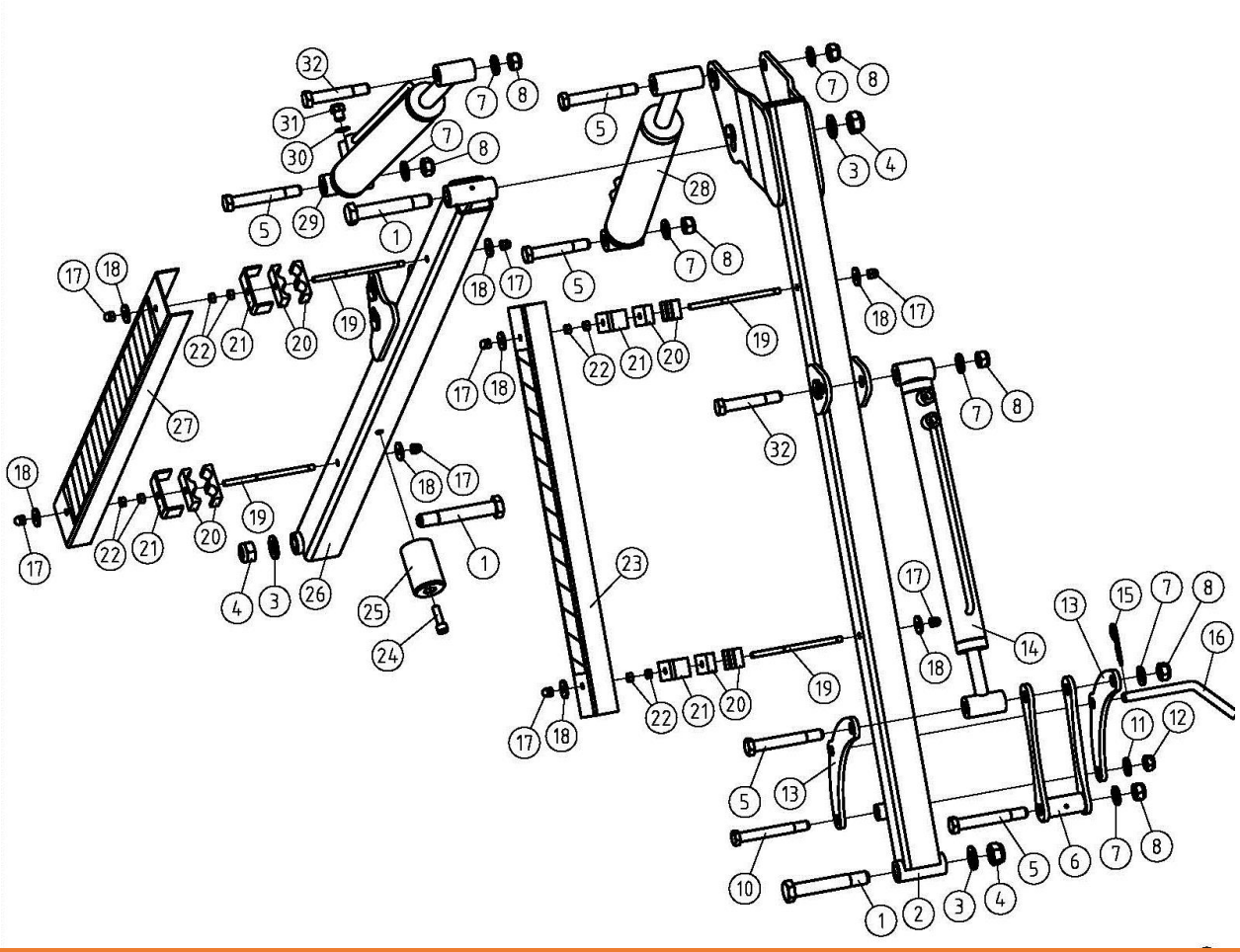
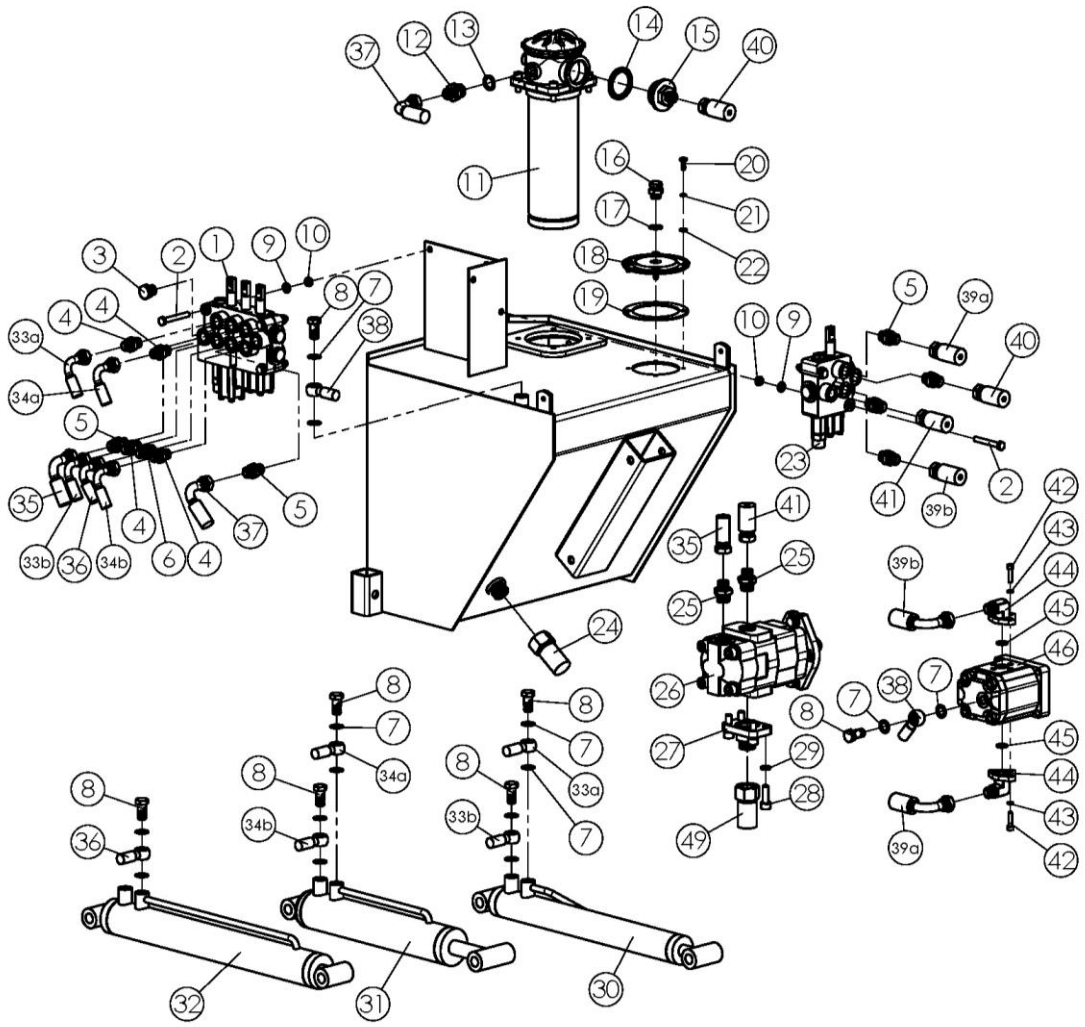


图 2

No.	Article no.	Part no.	Name spec	QTY
1	501014283	GB27-M20X130	Articulation bolt	3
2	802770096	AM60.03.014	Small support arm	1
3	506010061	GB97.1-20	Plain washer	9
4	503010767	DIN985-M20	hexagon locking thin nut	9
5	501014240	GB27-M16X120	Articulation bolt	4
6	802770093	AM60.03.013	pushing pull plate	1
7	506010059	GB97.1-16	Plain washer	7
8	503010765	DIN985-M16	hexagon locking thin nut	7
10	501014220	GB27-M14X120	Articulation bolt	1
11	506010058	GB97.1-14	Plain washer	1
12	503010764	DIN985-M14	hexagon locking thin nut	1
13	702770067	AM60.03.103	Swing arm	2
14	702770153	AM60.04.016-1	Swing arm cylinder	1
15	703190209	1G-150-01-142	Middle R pin	4
16	702770074	AM60.03.110	Lock pin	1
17	503020124	GB923-M8	nut with cap	8
18	506010035	GB96.1-8	Extra-large plain washer	10
19	702770073	AM60.03.109	Screw rod	4
20	702770069	AM60-03-105	Oil tub clip	8
21	702770070	AM60.03.106	Pressing plate	4
22	503010045	GB6170-M8	Hexagon nut	8
23	702770071	AM60.03.107	oil tube short cover	1
24	505011431	GB70.1-M10X35	Hexagon socket cap screw	1

25	702770068	AM60.03.104	buffering limited block	1
26	802770108	AM60.03.015	big support arm	1
27	702770072	AM60.03.108	oil tube long cover	1
28	702770160	AM60.04.023	Smaller arm cylinder	1
29	702770152	AM60.04.015	big arm cylinder	1
30	510015239	JB982-14（进）	Bonded washer 14.7X22X1.5	1
31	702770174	AM60.04.090	Breathe filter	1
32	501014238	GB27-M16X100	Articulation bolt	3



No.	Article no.	Part no.	Name spec	QTY
1	702770159	AM60.04.022Y	Three-way valve	1
2	501010741	GB5782-M8X60	half thread bolt	5
3	516010003	ZBT32001.3-ZG3/8-19"	inner hexagon tapered plug	1
4	702930544	MBH-8.08.302Y	oil in and out connector	3
5	700250036	1CB-18-06WD	connector M18X1.5-G3/8	6
6	702930546	MBH-8.08.305Y	valve throttle connector	2
7	510015239	JB982-14（进）	Bonded washer14.7X22X1.5	14
8	501014707	GB3541-M14X1.5	Hinge joint bolt	6
9	506010055	GB97.1-8	Plain washer	5
10	503010761	DIN985-M8	hexagon locking thin nut	5
11	702770173	RFA-100X30L	Return oil filter	1
12	706530042	1CM-18WD	M18X1.5(both end) adapter	1
13	510013132	GB3452.1-G-18X2.65	O sealing ring	1
14	510015250	JB982-42	Bonded washer M42	1
15	702770147	AM60.04.104-1	Oil filter adapter	1
16	703070084	CBW-00-011	Air plug M16X1.5	1
17	510015240	JB982-16	Bonded washer M16	1
18	702930505	MBH-8.08.117	Fuel tank cap	1
19	702930506	MBH-8.08.118	fuel tank sealing gasket	1
20	501011087	GB5783-M6X12	Screw bolt	4
21	506030034	GB93-6	Spring washer	4
22	506010054	GB97.1-6	Plain washer	4
23	702770154	AM60.04.017Y	Single valve	1
24	702770148	AM60.04.011-1	oil pump inlet tube	1
25	705190067	1CB-18-08WD	Transition connector M18X1.5-G1/2X14	2
26	702770172	CBHY-G25/F4.5-ATP	Duplex gear pump	1
27	702770145	AM60.04.101-1	oil pump oil inlet adapter	1
28	505011430	GB70.1-M10X30	hexagon socket cap screw	4
29	506030036	GB93-10	Spring washer	4
30	702770153	AM60.04.016-1	Swing arm cylinder	1
31	702770160	AM60.04.023	Small arm cylinder	1
32	702770152	AM60.04.015	Big arm cylinder	1
33	702770157	AM60.04.020	Swing arm cylinder tube	2
34	702770155	AM60.04.018	small arm cylinder tube	2
35	702770198	AM60.04.025Y	oil pump to triple valve tube	1
36	702770156	AM60.04.019	big arm cylinder tube	1
37	702770158	AM60.04.021Y	triple valve outlet tube	1
38	702770150	AM60.04.013	motor oil return tube	1
39	702770151	AM60.04.014	motor oil filling tube	2

40	702770197	AM60.04.024Y	single valve to oil filter tube	1
41	702770149	AM60.04.012Y	oil pump outlet tube	1
42	505011416	GB70.1-M8X25	hexagon socket cap screw	6
43	506030035	GB93-8	Spring washer	6
44	702780010	AM60.02.104-2	motor oil in and out connector	2
45	510013139	GB3452.1-G-23.6X2.65	O sealing ring	2
46	702770169	液压马达	Hydraulic motor	1

Warranty

MDL warrants to the original purchaser that this MDL product will be free from defects in material and workmanship beginning on the date of purchase by the end user according to the following schedule when used as intended and under normal service and conditions for personal use.

Overall Unit and Driveline: One-year Parts and Labour
Gearbox: One year on all components.
Blades and Belts: Considered wear items.

This Warranty is limited to the replacement of any defective part by MDL and the installation by the dealer of any such replacement part, and does not cover common wear items. MDL reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

This Warranty does not apply to any part or product which in MDL's judgment shall have been misused or damaged by accident or lack of normal maintenance or care, or which has been repaired or altered in a way which adversely affects its performance or reliability, or which has been used for a purpose for which the product is not designed. Misuse also specifically includes failure to properly maintain oil levels, grease points, and driveline shafts.

Claims under this Warranty should be made to the dealer which originally sold the product and all warranty adjustments must be made through an authorized MDL dealer. MDL reserves the right to make changes in materials or design of the product at any time without notice.

This Warranty shall not be interpreted to render MDL liable for damages of any kind, direct, consequential, or contingent to property. Furthermore, MDL shall not be liable for damages resulting from any cause beyond its reasonable control. This Warranty does not extend to loss of crops, any expense or loss for labour, supplies, rental machinery or for any other reason.

No other warranty of any kind whatsoever, express or implied, is made with respect to this sale; and all implied warranties of merchantability and fitness for a particular purpose which exceed the obligations set forth in this written warranty are hereby disclaimed and excluded from this sale.

Your Warranty starts from the date the machine was delivered / collected.

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