IM & PM 681

PRO-SAW
1600, 2000, 2400

INSTRUCTION & PARTS BOOK

ISSUE 1

IMPORTANT

NOTE HERE THE SERIAL NUMBER OF YOUR MACHINE AND ALWAYS QUOTE IT IN ANY COMMUNICATION WITH US OR YOUR DEALER. THIS IS PARTICULARLY IMPORTANT WHEN ORDERING SPARES. REMEMBER TO INCLUDE ALL NUMBERS AND LETTERS.

MACHINE SERIAL NUMBERS _____

THE INFORMATION GIVEN THROUGHOUT THIS MANUAL IS CORRECT AT THE TIME OF PUBLICATION. HOWEVER, IN THE COURSE OF CONSTANT DEVELOPMENT OF BOMFORD TURNER MACHINES, CHANGES IN SPECIFICATION ARE INEVITABLE. SHOULD YOU FIND THE INFORMATION GIVEN IN THIS BOOK TO BE AT VARIANCE WITH THE MACHINE IN YOUR POSSESSION, YOU ARE ADVISED TO CONTACT THE BOMFORD TURNER SERVICE DEPARTMENT WHERE UP-TO-DATE INFORMATION WILL BE PROVIDED.
THE MANUAL CAN CONTAIN STANDARD AND OPTIONAL FEATURES AND IS NOT TO BE USED AS A MACHINE SPECIFICATION.
THE MACHINE HAS BEEN TESTED AND IS CONSIDERED SAFE IF CAREFULLY USED. ENSURE YOUR OPERATOR IS PROPERLY TRAINED IN ITS USE AND MAINTENANCE.

IMPORTANT

NOTEZ ICI LES NUMEROS DE SERIE DE VOTRE MACHINE ET MENTIONNEZ LES DANS TOUTE COMMUNICATION AVEC NOS SERVICES OU VOTRE REVENDEUR. CECI EST IMPORTANT POUR LA COMMANDE DE PIECES DETACHEES. PENSEZ A NOTER TOUS LES NUMEROS ET TOUTES LES LETTERS.
NUMEROS DE SERIE DE LA MACHINE_____.

LES INFORMATIONS DONNEES DANS CE MANUEL SONT CORRECTES CEPENDANT, DU FAIT DE DEVELOPPEMENT CONSTANT DES MACHINES BOMFORD TURNER.
CHANGEMENTS DANS LES CARACTERISTIQUES SONT INEVITABLES.
SI VOUS TROUVEZ QUE LES INFORMATIONS DONNEES NE CORRESPONDENT PAS A VOTRE MACHINE VEUILLEZ CONTACTER LE SERVICE DES REPARATIONS OU DES INFORMATIONS PLUS RECENTES VOUS SERONT DONNEES.
CE MANUEL PEUT MONTRER DES CARACTERISTIQUES OPTIONNELLES ET NE PEUT PAS ETRE CONSIDERE COMME SPECIFICATION DE LA MACHINE.
CETTE MACHINE A ETE TESTEE, ET ELLE EST CONSIDEREE COMME FIABLE A CONDITION D'UNE BONNE UTILISATION. ASSUREZ-VOUS QUE VOTRE OPERATEUR EST QUALIFIE EN CE QUI CONCERNE L'UTILISATION DE LA MACHINE AINSI QUE SON ENTRETIEN.

WICHTIG

TRAGEN SIE HIER DIE SERIENNUMMERN IHRER MASCHINE EIN UND GEBEN SIE DIESE IMMER AN, WENN SIE SICH AN UNS ODER IHREN HÄNDLER WENDEN. DAS IST BESONDERS BEI ERSATZTEILBESTELLUNGEN WICHTIG. VERGESSEN SIE NICHT, ALLE ZAHLEN UND BUCHSTABEN ZU NOTIEREN.
SERIENNUMMERN DER MASCHINE_____
DIE ANGABEN INDIESEM HANDBUCH SIND BEI VERÖFFENTLICHING KORREKT. AUFGRUND DER KONSTANTEN WEITERENTWICKLUNG VON BOMFORD TURNER MASCHINEN SIND JEDOCHÄNDERUGDEN IN DER SPEZIFIKATION UNVERMEIDLICH. WENN DIE INFORMATION IN DIESEM HANDBUCH NICHT MIT IHRER MASCHINE ÜBEREINSTIMMEN, NEHMEN SIE BITTE KONTAKT MIT DER BOMFORD TURNER KUNDENDIENSTABTEILUNG AUF, DIE IHNEN GERNE DIE AKTUELLEN INFORMATION ZUKOMMEN LÄSST.
DAS HANDBUCH KANN SOWOHL BESCHREIBUNGEN FÜR DIE STANDARD AUSFÜHRUNG ALS AUCH FÜR ZUBEHÖR ENTHALTEN UND IST NICHT ALS MASCHINENSPEZIFIKATION ZU VERWENDED.
DIE MASCHINE IST GETESTET UND BEI SACHGEMÄSSEM BETRIEB ALS SICHER BEFUNDEN WORDEN. SORGEN SIE DAFÜR, DASS IHR BEDIENPERSONAL IN ANWENDUNG UND WARTUNG RICHTIG GESCHULT WIRD.

EC DECLARATION OF CONFORMITY
Conforming to EU Directive 2006/42/EC

We,

Of BOMFORD TURNER LIMITED, Station Road, Salford Priors, Evesham, Worcestershire, WR11 8SW

Declare that we are the authorised representative, responsible for the product (type);

Base unit	Product code
Pro-Saw 1600	**PSAW**
Pro-Saw 2000	**PSAW**
Pro-Saw 2400	**PSAW**

A vegetation control arm mower cutting attachment

Serial No(s). &
Date:……

Manufactured by:

Designed by:

This product complies with the required provisions of;

- Directive 2006/42/EC
- Directive 2004/108/EC
- EN ISO 12100-1:2010

And other national standards associated with its design and construction as listed in its technical file.

BOMFORD TURNER LIMITED operates an ISO 9001:2008 quality management system. This system is accredited by;

BSI, Beech House, Linford Wood, Milton Keynes, UK, MK14 6ES
BSI identification number: UKAS 003
Bomford Turner certificate number: FM 34659

Signed…….

On behalf of BOMFORD TURNER LIMITED Responsible person

Status Managing Director Date: 03/01/2012

CONTENTS

GENERAL INFORMATION

Always read this manual before fitting or operating the machine – whenever doubt exists contact your dealer or the Bomford Service Department for advice and assistance.

Use only Bomford Genuine Service Parts on Bomford Equipment and Machines

DEFINITIONS – *The following definitions apply throughout this manual:*

WARNING
An operating procedure, technique etc. which can result in personal injury or loss of life if not observed carefully.

CAUTION
An operating procedure, technique etc. which can result in damage to either machine or equipment if not observed carefully.

NOTE
An operating procedure, technique etc. which is considered essential to emphasis.

LEFT AND RIGHT HAND
This term is applicable to the machine when attached to the tractor and is viewed from the rear – this also applies to tractor references.

MACHINE & DEALER INFORMATION

Record the Serial Number of your machine on this page and always quote this number when ordering parts. Whenever information concerning the machine is requested remember also to state the make and model of tractor to which the machine is fitted.	
Machine Serial Number:	**Installation Date:**
Machine Model details:	
Dealer Name:	
Dealer Address:	
Dealer Telephone No:	
Dealer Email Address:	

SERIAL PLATE

The machine is fitted with a Serial Number Plate stating the manufacturers name, machine, serial number and weight – when ordering parts or requesting advice please quote the machine name and serial number as stated on the plate.

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

When the machine is not in use it should be lowered to rest on the ground. In the event of any fault being detected with the machine's operation it must be stopped immediately and not used again until the fault has been corrected by a qualified technician.

POTENTIAL 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 sides 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 blades 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's 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 use a machine until you have read and understood the operator handbook, are familiar with it, 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 or more 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.*

ADDITIONAL SAFETY ADVICE

Training
Operators need to be competent and fully capable of operating this machine in a safe and efficient way prior to attempting to use it in any public place. We advise therefore that the prospective operator make use of relevant training courses available such as those run by the Agricultural Training Board, Agricultural Colleges, Dealers and Bomford.

Working in Public Places
When working in public places such as roadsides, consideration should be paid to others in the vicinity. Stop the machine immediately when pedestrians, cyclists and horse riders etc. pass. Restart only when they are at a distance that causes no risk to their safety.

Warning Signs
It is advisable that any working area be covered by suitable warning signs and statutory in public places. Signs should be highly visible and well placed in order to give clear advanced warning of the hazard. Contact the Department of Transport or your Local Highways Authority to obtain detailed information on this subject. The latter should be contacted prior to working on the public highway advising them of the time and location of the intended work asking what is required by way of signs and procedure. – '*Non-authorised placement of road signs may create offences under the Highways Act'.*

Suggested Warning Signs Required

'Road works ahead' *warning sign with a supplementary* ***'Hedge cutting'*** *plate.* ***'For 1 mile'*** *or appropriate shorter distance may be added to the plate.*

'Road narrows' *warning signs with supplementary* ***'Single file traffic'*** *plate.*

White on blue ***'Keep right'*** *(*) arrow sign on rear of machine.*
**** Note – this applies to UK Market machines where traffic passes to the right of a machine working in the same direction as the traffic flow. The direction, use and colour of the arrow sign will depend on the country of use and the Local Highway Authorities regulations in the locality.***

Use of Warning Signs

- ▲ *On two-way roads one set of signs is needed facing traffic in each direction.*
- ▲ *Work should be within 1 mile of the signs.*
- ▲ *Work only when visibility is good and at times of low risk e.g.: NOT during 'rush-hour'.*
- ▲ *Vehicles should have an amber-flashing beacon.*
- ▲ *Ideally, vehicles should be conspicuously coloured.*
- ▲ *Debris should be removed from the road and path as soon as practicable, and at regular intervals, wearing high visibility clothing and before removing the hazard warning signs.*
- ▲ *Collect all road signs promptly when the job is completed.*

Although the information stated here covers a wide range of safety subjects it is impossible to predict every eventuality that can occur under differing circumstances whilst operating this machine. No advice given here can replace 'good common sense' and 'total awareness' at all times, but will go a long way towards the safe use of your Bomford machine.

SAFETY DECALS

WARNING
Pressurised oil, beware of leaks. Consult technical manual for service procedures.

WARNING
Stop engine and remove key before performing maintenance or repair work.

WARNING
Danger – flying objects. Keep a safe distance from the machine when the engine is running.

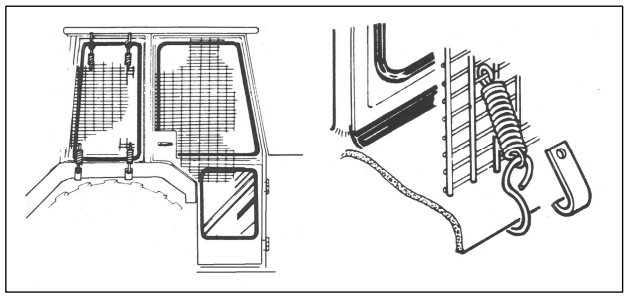
WARNING
Check tightness of bolts every 8 hours – retighten if required.

WARNING
Danger - keep clear of rotating blades.

WARNING
Read the operator's manual before handling or using the machine. Observe the safety rules when operating.

WARNING
Keep clear of the machines swing area.

WARNING
Danger - keep clear of overhead power lines.
Where doubt exists, contact your local power company for advice.



We recommend vehicles are fitted with cabs using 'safety glass' windows and protective guarding when used with our machines.
Fit Operator Guard (Part No. 7313324) using the hooks provided. Shape the mesh to cover all vulnerable areas. The driver must be looking through mesh and/or polycarbonate glazing when viewing the flail head in any working position - unless the vehicle/ cab manufacturer can demonstrate that the penetration resistance is equivalent to, or higher than, that provided by mesh/polycarbonate glazing. If the tractor has a roll bar only, a frame must be made to carry both mesh and polycarbonate glazing. The operator should also use personal protective equipment to reduce the risk of serious injury such as; eye protection (mesh visor to EN1731 or safety glasses to EN166), hearing protection to EN352, safety helmet to EN297, gloves, filter mask and high visibility clothing.

Vehicle Ballast: It is imperative when attaching 'third-party' equipment to a vehicle that the maximum possible stability of the machine and vehicle combination is achieved – this can be accomplished by the utilisation of 'ballast' in order to counter-balance the additional equipment added.

Front weights may be required for rear mounted machines to place 15% of total outfit weight on the front axle for stable transport on the road and to reduce 'crabbing' due to the drag of the cutting unit when working on the ground.

Rear weights may be required to maintain a reasonable amount of rear axle load on the opposite wheel from the arms when in work; for normal off-ground work i.e. hedge cutting this should be 20% of rear axle weight or more for adequate control, and for ground work i.e. verge mowing with experienced operators, this can be reduced to 10%.
All factors must be addressed in order to match the type and nature of the equipment added to the circumstances under which it will be used – in the instance of Power Arm hedgecutters it must be remembered that the machines centre of gravity during work will be constantly moving and will differ from that during transport mode, therefore balance becomes critical.

Factors that effect stability:

- Centre of gravity of the tractor/machine combination.
- Geometric conditions, e.g. position of the cutting head and ballast.
- Weight, track width and wheelbase of the tractor.
- Acceleration, braking, turning and the relative position of the cutting head during these operations.
- Ground conditions, e.g. slope, grip, load capability of the soil/surface.
- Rigidity of implement mounting.

Suggestions to increase stability:

- Increasing rear wheel track; a vehicle with a wider wheel track is more stable.
- Ballasting the wheel; it is preferable to use external weights but liquid can be added to around 75% of the tyre volume – water with anti-freeze or the heavier Calcium Chloride alternative can be used.
- Addition of weights – care should be taken in selecting the location of the weights to ensure they are added to a position that offers the greatest advantage.
- Front axle locking (check with tractor manufacturer).

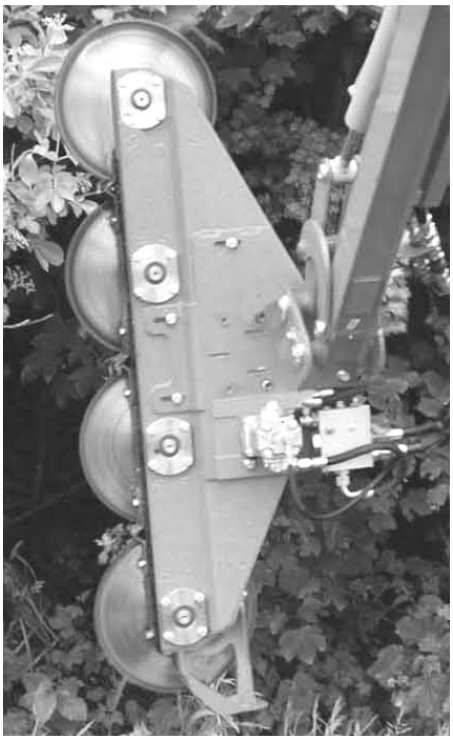
NOTE: The advice above is offered as a guide for stability only and is not a guide to vehicle strength. It is recommended that you consult your vehicle manufacturer or local dealer to obtain specific advice on this subject, additionally advice should be sought from a tyre specialist with regard to tyre pressures and ratings suitable for the type and nature of the machine you intend to fit.

OVERVIEW

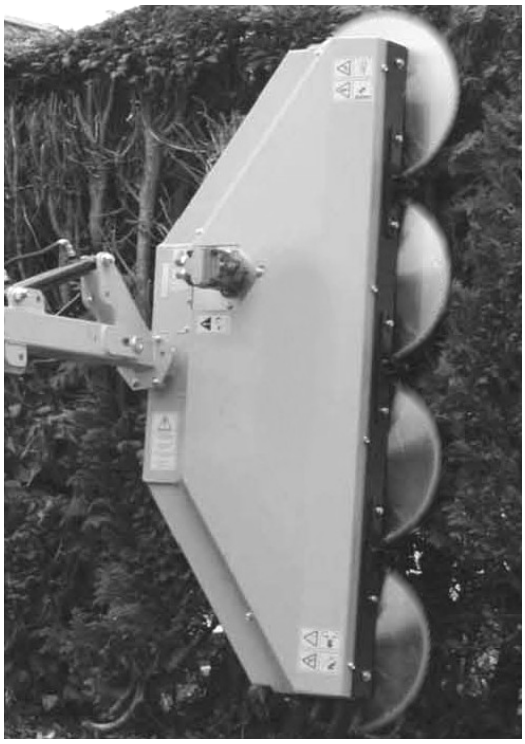
Bomford Pro-Saws 1600, 2000 & 2400 are a range of hydraulic arm mounted 4 blade saw units used for the cutting of trees and branches. Available in widths of 1.6, 2.1 & 2.4m the machines are equipped with 400mm, 500mm & 600mm 'belt-driven' blades respectively.
The machines have the following cutting capabilities;
Pro-Saw 1600 up to 70mm diameter material (up to 100mm when cutting single branches)
Pro-Saw 2000 up to 80mm diameter material (up to 120mm when cutting single branches)
Pro-Saw 2400 up to 120mm diameter material (up to 160mm when cutting single branches)
Best performance is achieved if the unit is angled at no more than 45° from the upright when vertical cutting.
When working horizontally on hedges, best performance will be achieved on hedge widths of less than 1000mm for the 1600 model and less than 1200mm for the 2000 and 2400 models with branch diameters of up to 40mm; thicker diameter materials may cause the blades to stall or get stuck.

SPECIFICATIONS

Specification / Model	**Pro-Saw 1600**	**Pro-Saw 2000**	**Pro-Saw 2400**
Working Width	1.6m	2.1m	2.4m
Blade Diameter	400mm	500mm	600mm
Teeth per Blade	60	72	78
Blade Material	Hardened Steel	Hardened Steel	Hardened Steel
Blade Speed	2600-2700RPM	3000-3200RPM	2700-2800RPM
Oil Flow Rate	40 l/min	50 l/min	45 l/min
Cutting Performance *(single branch)*	Up to 100mm	Up to 120mm	Up to 160mm
Main Application	Vertical Cutting	Vertical Cutting	Vertical Cutting
Weight	98kg	220kg	280kg

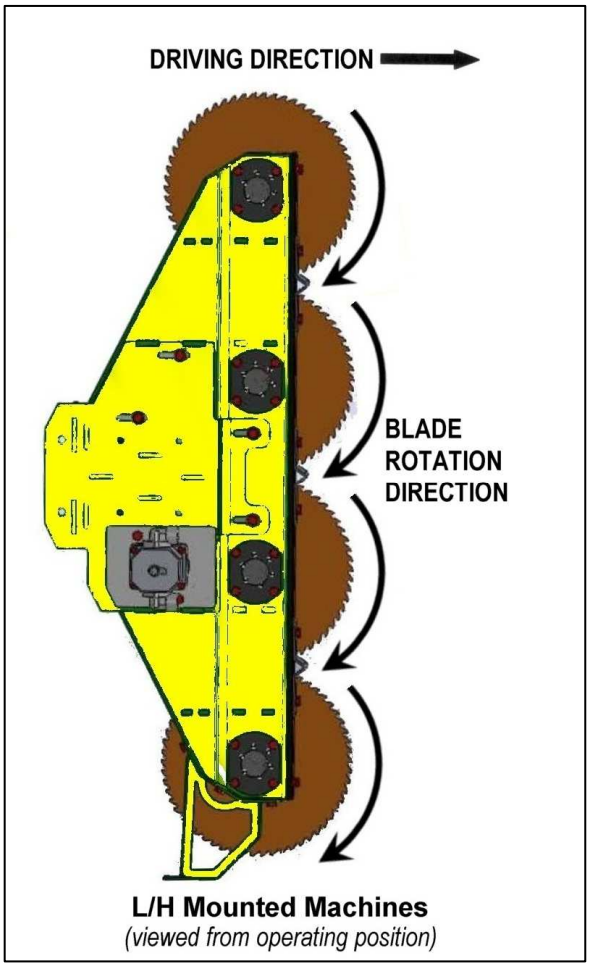


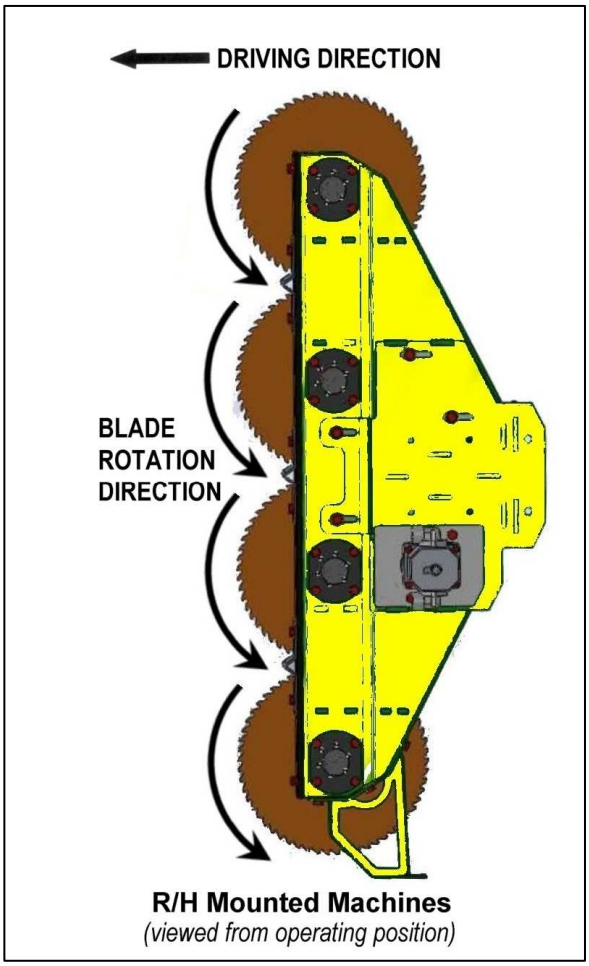
Pro-Saw 1600 Model



Pro-Saw 2000 & 2400 Models

- Blades MUST be mounted in a downward cut rotation in relation to the tractors driving direction.





- Install and connect the hydraulic hoses ensuring the correct cutting direction is achieved. The separate drainage hose (max. 1.5 bar) must be led directly back to the oil reservoir.

- Check system for leaks.

- On initial installation the blade speed should be measured and the flow control valve adjusted to achieve the optimum working speeds of;

  2600-2700RPM for 1.6m models (Pro-Saw 1600)

  3000-3200RPM for 2.1m models (Pro-Saw 2000)

  2700-2800RPM for 2.4m models (Pro-Saw 2400)

PRO-SAW OPERATION

It is recommended that forward speed is kept to a minimum when starting work in order to retain the correct working speed of the blades. Set the angle of the Pro-Saw so it is positioned at right angles to the work and adjust the machine position so the branches meet the saw blades ‘straight on’.
Should small branches or unwanted material get stuck in the blades the machine and tractor must be switched off and the debris cleared.
Wherever possible try to keep the blades running vertical in relation to the direction of travel, this will help prevent them from ‘distorting’ during operations.
A skid is available as an option which can be mounted on the base of the machine to prevent the blades from hitting the ground.

When in charge of the machine always obey the following rules;

- Always inspect the work area prior to operation and remove any dangerous materials.
- Never operate the machine with persons or animals in close proximity.
- Ensure all cab guarding is in place and the tractor windows are kept shut.
- Only operate the machine at the correct blade speed.
- Never use the machine in excess of the maximum oil pressure in the hoses (250 bar).
- Never stop the engine with the PTO engaged.
- Never transport the machine with the PTO engaged.
- Never transport the machine without the blade protection guards fitted.
- Never approach the machine when it is running, always switch it off and stop the tractor.
- Always remove the tractor ignition key before leaving the cab.
- Never use the machine to perform tasks it was not designed for.

Initial Maintenance

- After an initial 2 hours work, re-tighten taper-lock bushes to 31 Nm.
- After the first day's work, all bolts, screws and taper-lock bushes must be re-tightened - if the bushes loosen at a future time they should be secured with 'Loctite' or similar.

Regular Maintenance

- Check all bolts and screws on a regular basis and re-tighten as and when required.
  Torque settings for blade bolts; Allen Bolts (6 per blade) = 25 Nm.
  Taperlock Bolts (1 per blade) = 40 Nm.
- The plastic strips should be adjusted down to a 1mm clearance from the blades – these strips must be replaced when no further adjustment is available and the clearance distance exceeds 5mm.
- Branch deflectors must be adjusted as close as possible to the blades without touching.
- Remove belt guard and clean the housing.
- Inspect belts and check their tension, adjust if required.
- Check condition of protection guards – always replace guards before using the machine.

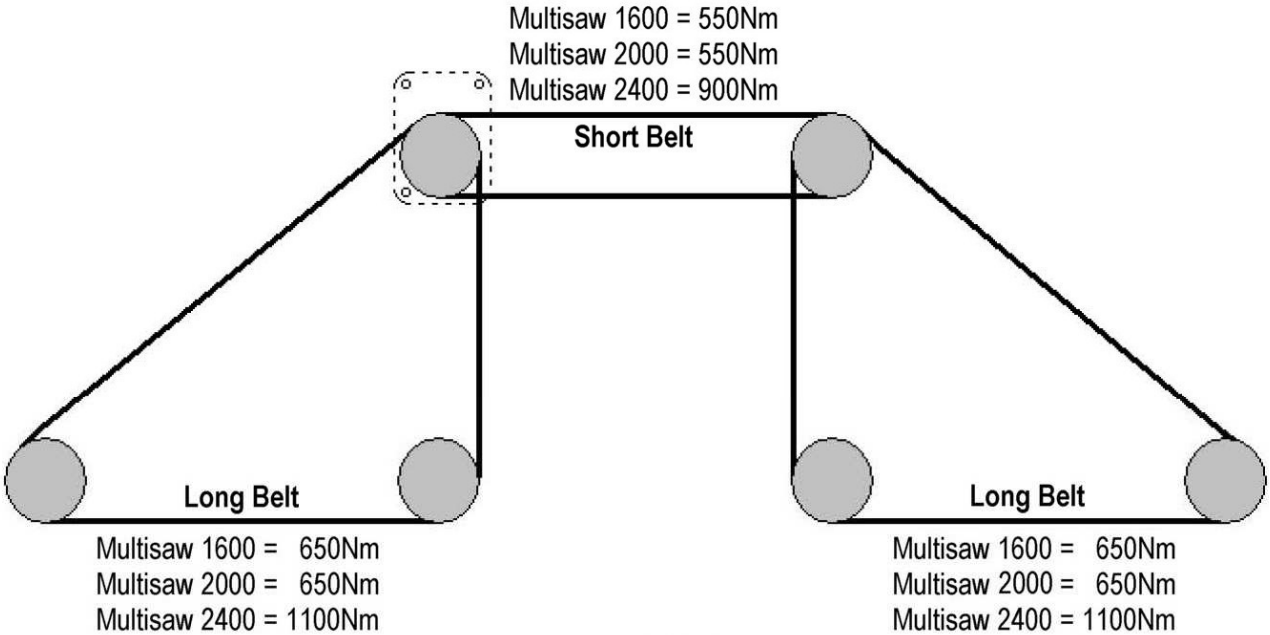
Belts

It is important that belts are kept in good condition and are correctly tensioned at all times. The correct tensions are as follows;

Pro-Saw 1600: Short Belt 550Nm and Long Belts 650Nm

Pro-Saw 2000: Short Belt 550Nm and Long Belts 650Nm

Pro-Saw 2400: Short Belt 900Nm and Long Belts 1100Nm

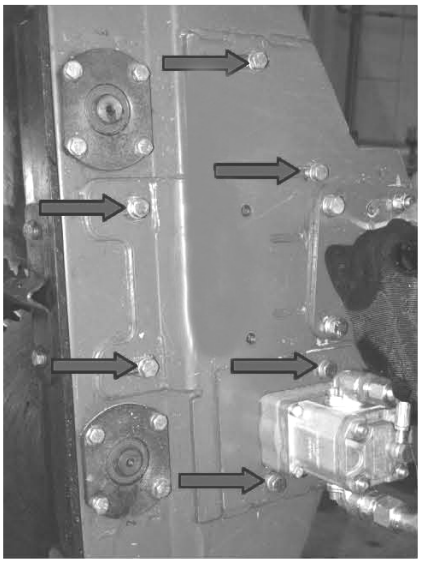


Belt Tension Measuring Tool

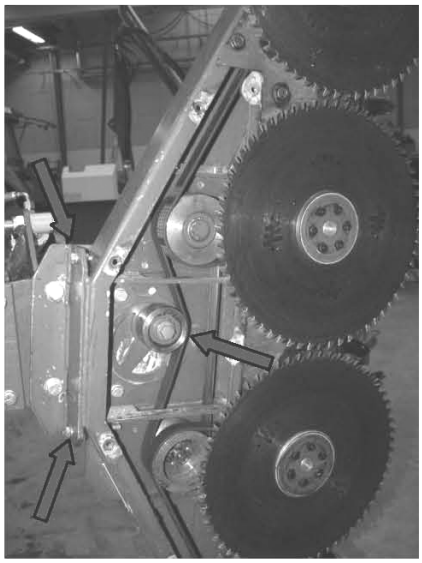
Tensioning the Belts

CAUTION! Care must be adopted when servicing this part of the machine as there is risk of trapping hands or fingers in the belts, pulleys and blades.

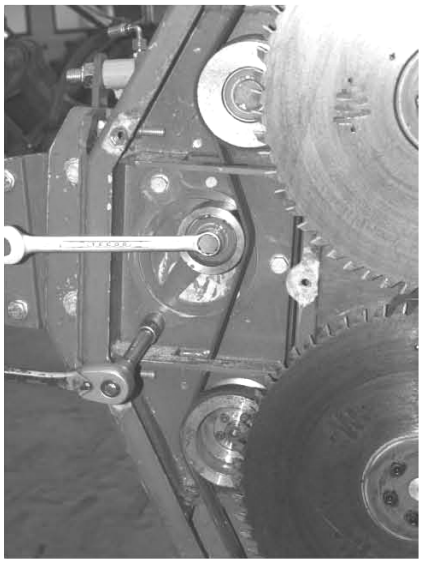
Loosen bolts indicated



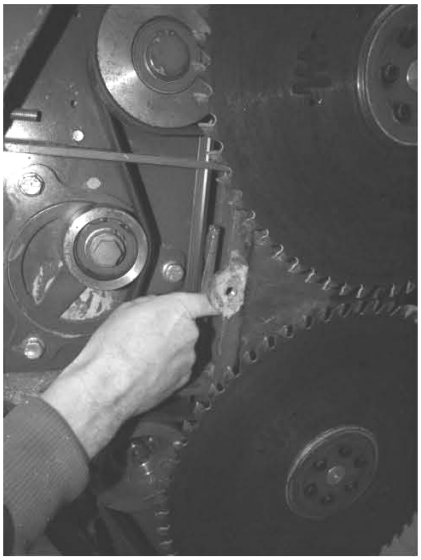
Remove cover



Loosen bolt and turn idler roller

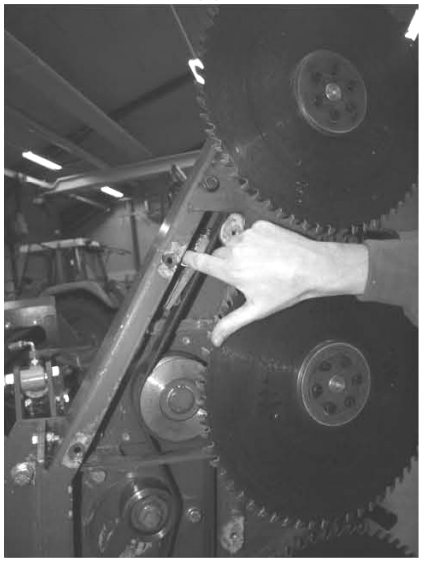


Set tension of the centre belt



Set tension of lower belt

Set tension of upper belt



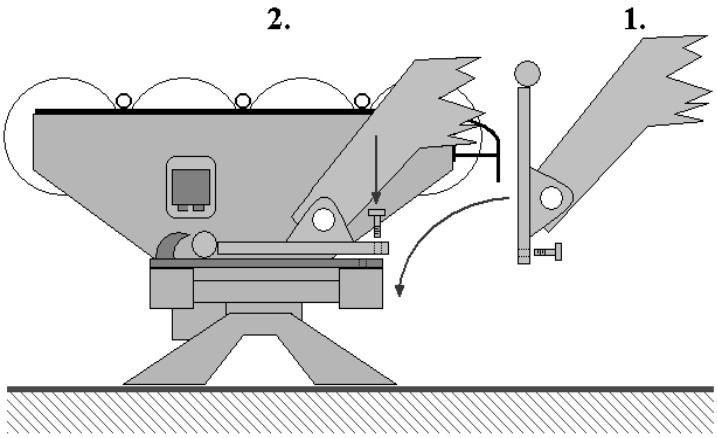
Set the tensions at centre point of the belts between the pulleys, turn blades a few times and re-check.

WARNING: Ensure cover is replaced and all bolts are re-tightened before using the machine.

HXF3300 MOUNTING CARRIAGE

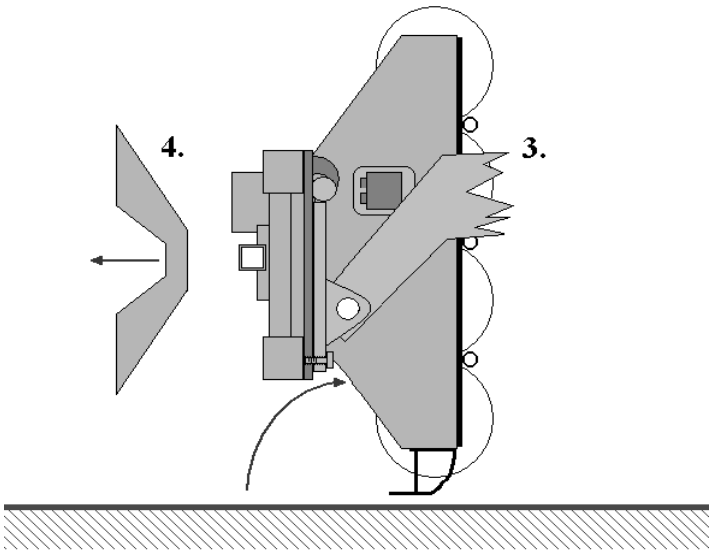
The HXF3300 is a mounting carriage specifically designed for attaching Pro-Saw 2000 and 2400 models to Telehandlers. The HXF3300 features a reach of approximately 2.5 metres, 180° manual folding system, and hydraulic collision safety. The overall weight of the unit, without tools, is 225kg.

ATTACHING THE CARRIAGE



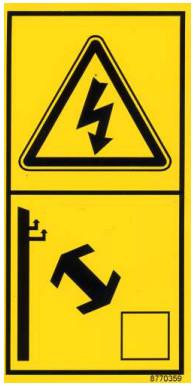
1) **Drive up to the machine, tilt attachment bracket into the horizontal position.**

2) **Locate attachment bar into hooks and secure latches.**



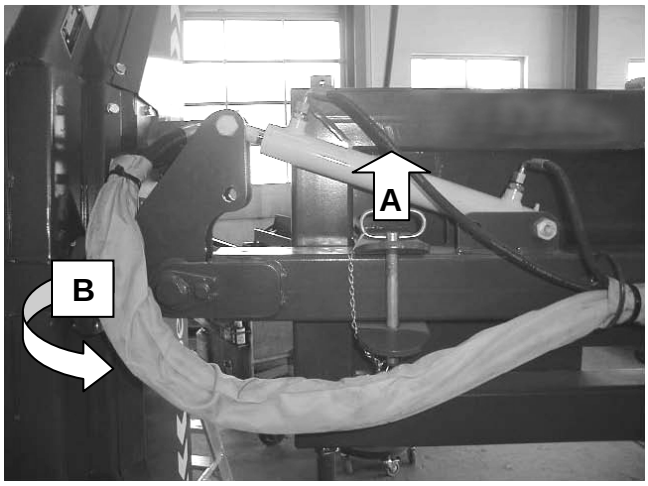
3) **Tilt bracket backwards 90°.**

4) **Detach supporting legs.**

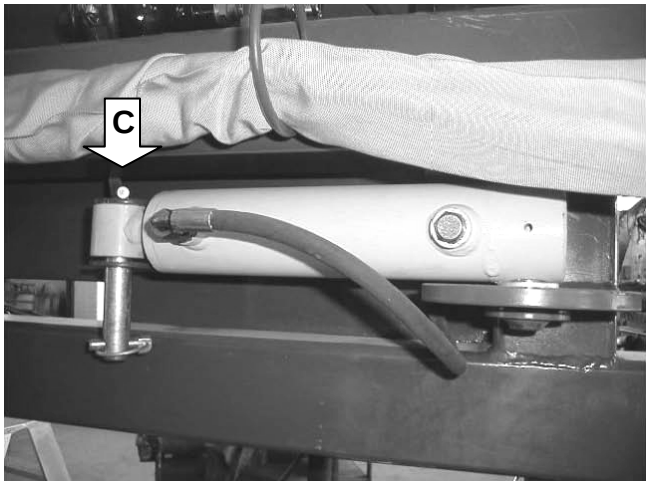


DANGER
Keep well clear of all overhead power lines when manoeuvring or operating this machine.

Transport Position 



Work Position 



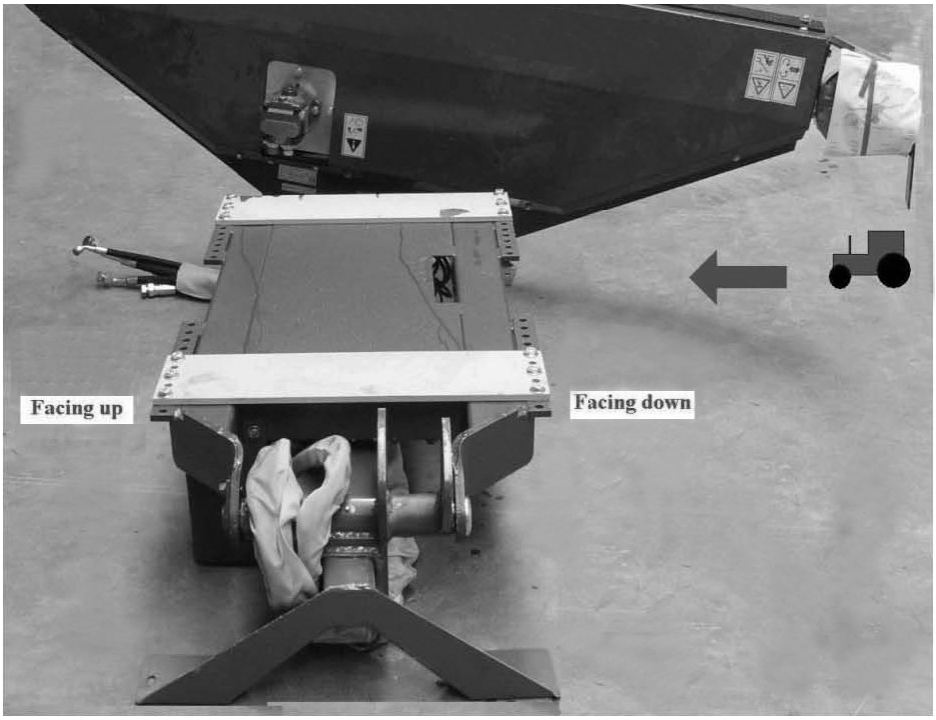
The procedure for moving the machine from transport position to work position is as follows;

A) Remove transport pin.

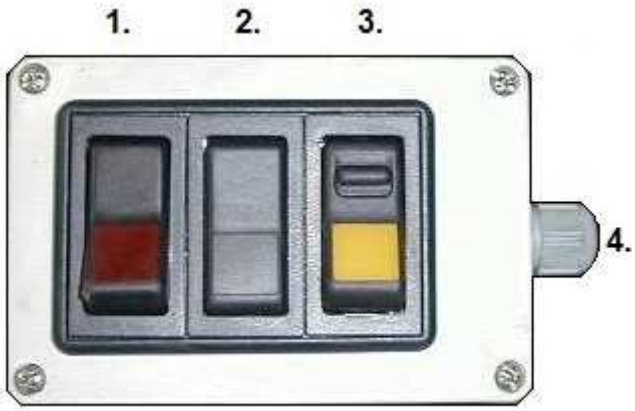
B) Manually fold the arm out by 180° into the work position.

C) Fit and secure the ram pin.

Storage Position



Operator Controls



1) On/Off Switch.

2) Cutting Angle Switch.

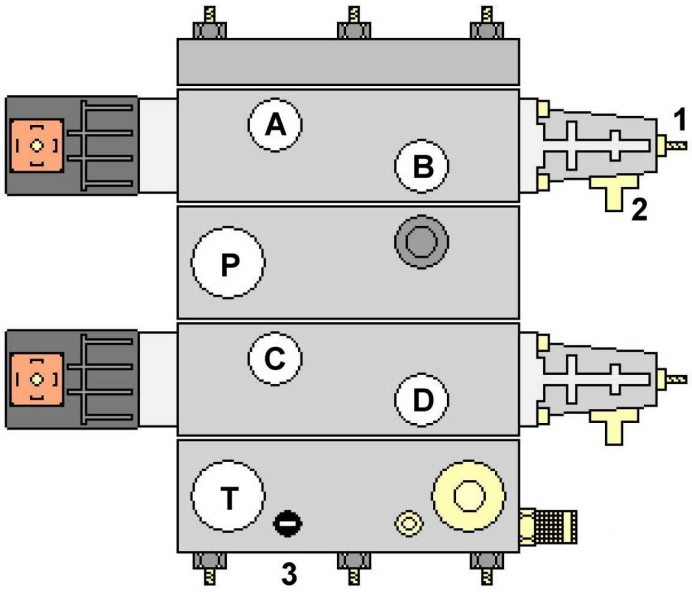
3) Tool On/Off Switch.

4) Control Unit Fuse (8 Amp).

Cutting Angle Adjustment

The cutting angle is adjusted hydraulically by operation of the rocker switch (2); operate the switch in the required direction to set the desired cutting angle before starting work.
The angle switch may be operated during work to make minor angling adjustments, but it is recommended to halt work before making major adjustments to the cutting angle.

Valve Unit



1) Flow Adjustment.

2) Manual Override.

3) Pressure Relief Valve (200 bar).

A) Flow for Tool (regulated).

B) N/A

C) Cutting Angle

D) Cutting Angle

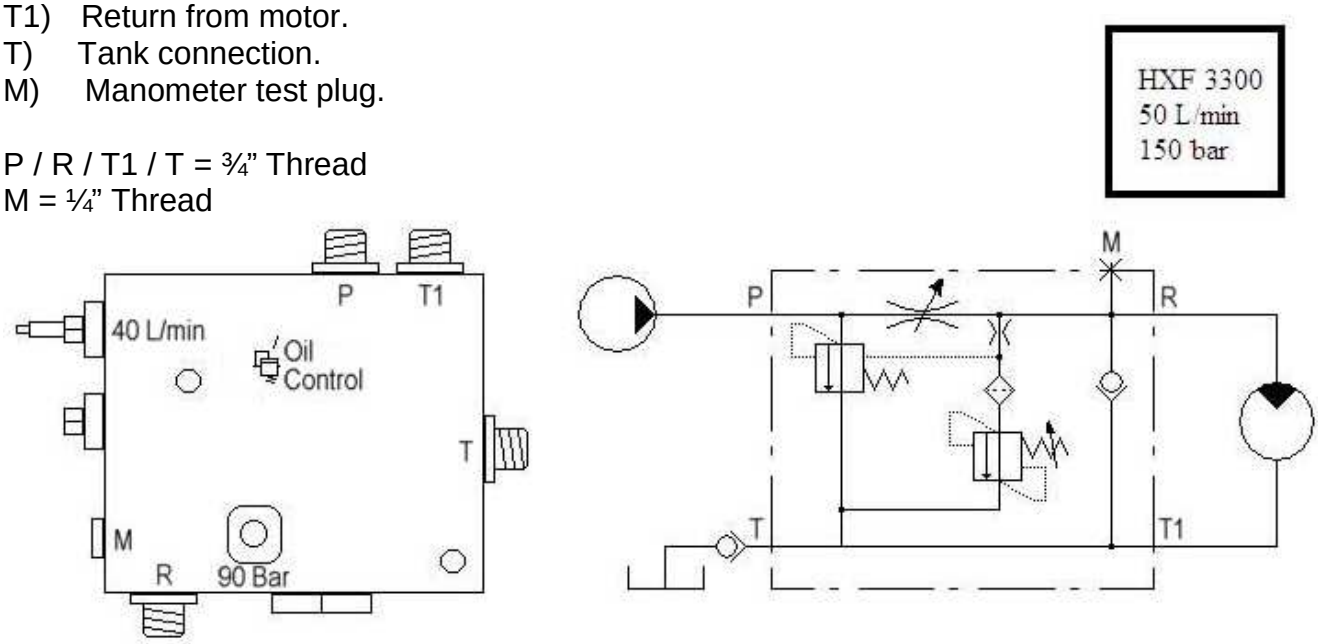
P) Pressure (flow from pump).

T) Tank Connection
(pressureless + T from motor).

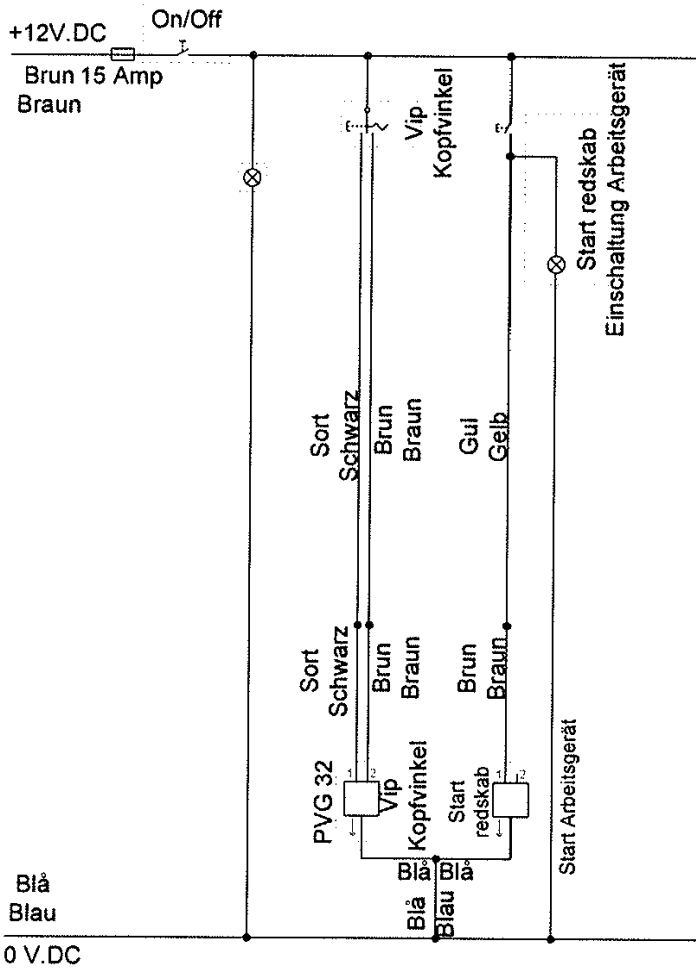
Splitter Valve

P) Pressure from pump (Max. 150L/min).
R) Regulated oil flow (Max. 90L/min).
T1) Return from motor.
T) Tank connection.
M) Manometer test plug.

P / R / T1 / T = ¾" Thread
M = ¼" Thread

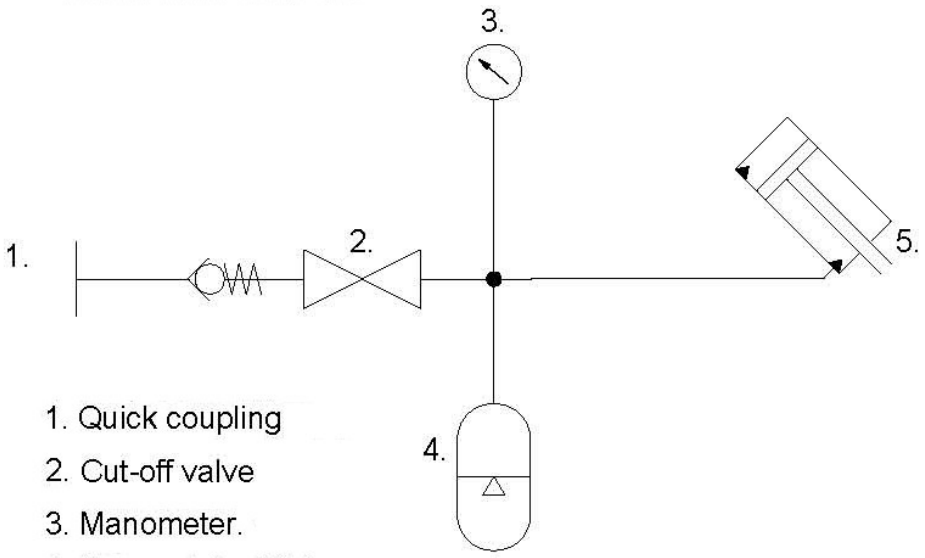


Electrical Diagram

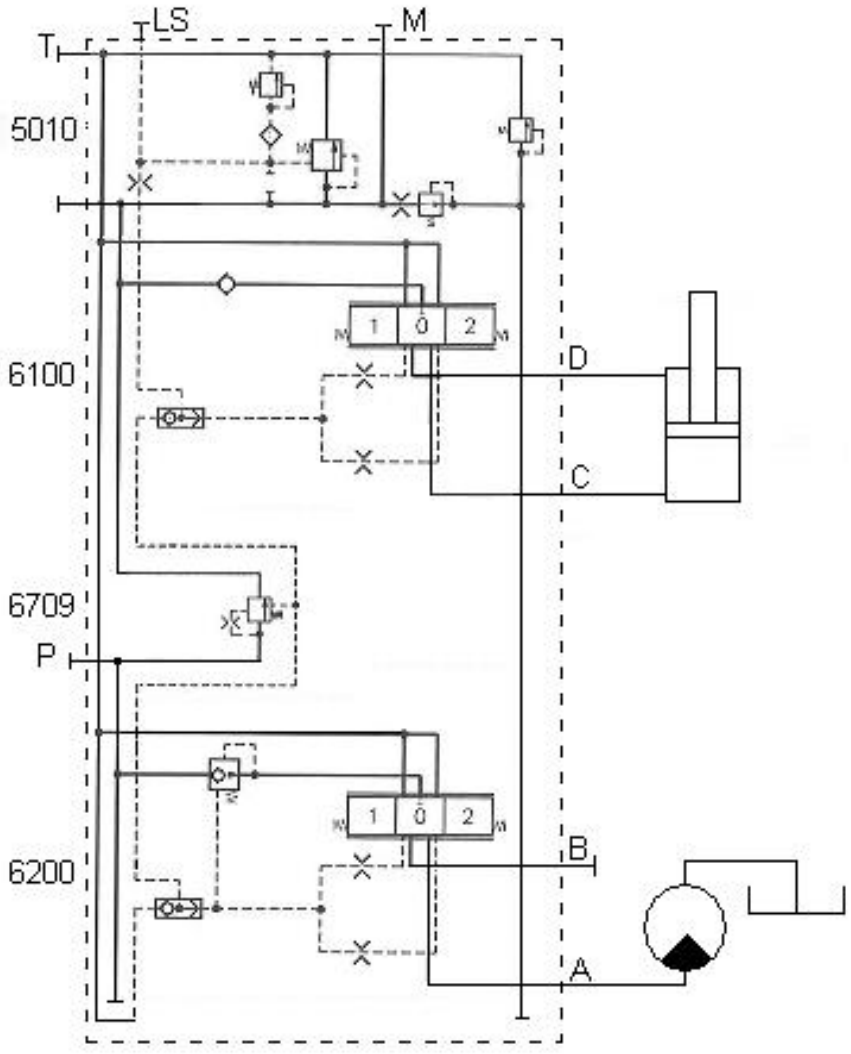


Hydraulic Diagrams

Break-back 40-50 bar



1. Quick coupling
2. Cut-off valve
3. Manometer.
4. Accumulator 32 bar
5. Break back ram



Lubrication
Grease the lubrication points on machine on the following basis;

- Daily prior to use.
- Always prior to storage.
- Always after it has been washed.

NOTE: Never use grease that contains Molybdenum Disulfide on nylon bushes.

Hydraulic Hoses
Inspect hydraulic hoses and fittings on a daily basis prior to using the machine; ensure they are free from damage or leaks and that the hoses are not rubbing on machine components.
Any damaged hoses or fittings should be repaired or replaced immediately.
Run new hoses alongside the old ones prior to removal to ensure the correct routing is retained. When replacing a hose avoid twisting it, use 2 spanners to tighten it.
Ensure hoses bend with machine movements and that they do not twist or strain.

All hose connections are of a 'soft seal' type and should only be turned a further 1/2 turn more than hand tight in order to be leak-proof *(see table below).*

BSP (size)	**Nm**	
¼"	24 Nm	18 lbs/ft
⅜"	33 Nm	24 lbs/ft
½"	44 Nm	35 lbs/ft
¾"	84 Nm	62 lbs/ft
1"	115 Nm	85 lbs/ft

Oil Supply
Check oil level in the tank each day prior to starting work - it is good practice to constantly keep an eye on the sight glass level as a ruptured pipeline can empty a system within minutes; a pump or motor that runs out of oil will be damaged beyond repair very quickly.
The oil must be changed if there are signs that it is contaminated (discolored).

Ensure cleanliness when replacing or topping up the oil by;

- Carefully cleaning around the filler neck prior to opening.
- Always using clean containers for refilling the system.
- Regular inspection of the filtration system.
- Never letting the oil level fall below the level in the sight glass.

Check daily for all hydraulic connections and fittings are in good condition. Any defect or leak must be immediately repaired, it is part of the daily maintenance that will reduce costs and prolong machine life.
If fittings require retightening always use 2 spanners and avoid over tightening. If the fitting continues to leak, replace it.

Regular Maintenance Tasks
After every 4 hours of use the following maintenance task should be observed;

- Check bolts for tightness and – *retighten if required.*
- Check valve block, hoses and fittings for signs of leaks – *retighten or replace seals if required.*
- Bolts and bushes should be greased and retightened.

Bolts and Bushes
All major pivot points are equipped with replaceable bushings, if they show signs of wear, replace them. **NOTE: Never use grease that contains Molybdenum Disulfide on nylon bushes.**

Machine Storage
Before the machine is placed into storage, it should be thoroughly washed. Remove all traces of grass, leaves and dirt.
Take care if using high pressure jet hoses or steam cleaners as these can quickly damage paintwork and decals. Remove all cleaning products thoroughly to avoid them from staining or damaging the paint.
Grease lubrication points until fresh grease comes out.
Where applicable, rotor drive belts should be loosened to remove tension and ‘relax’ the belts.
Ideally, the machine should be stored in a clean dry environment where it is protected from the elements; it the machine has to be stored outside it is advisable to keep it covered over to protect it from rain and sunlight. Control units should be stored clear of the ground and protected from the damp. It is recommended that canvas tarpaulin or similar coverings are used to cover the machine rather than plastic sheeting which would harbor condensation and promote rapid corrosion.

TROUBLESHOOTING GUIDE

Problem	Possible Cause	Solution
Valve or motor leak.	Oil pressure too high. Hose incorrectly fitted or loose.	Check pressure. Replace gasket. Refit and tighten correctly.
Overheating.	Tool speed incorrect. Incorrect oil level. Wrong oil type. Blades clogged. Air temperature too high.	Check PTO speed. Check oil level. Empty tank and fill with correct oil. Stop machine and clear blades. Reduce operating speed/install fan.
Electrical failure.	Wrong supply from tractor. Contacts exposed to water.	Check fuse and supply from tractor. Always store protected from water.
Hydraulic failure.	Oil level too low. Pressure hose kinked. Oil leak in pressure hose. Oil pump suction filter blocked.	Top up oil to correct level. Check pump rotates / check hoses. Check machine for leaks. Replace filter element.
Irregular arm movements.	Broken spring in the PVG valve. Defective ram seals.	Check spring – *replace if required.* Check seals – *replace if required.*
Electric valve not responding.	Faulty wiring. Dirt in valve. Valve stuck. Insufficient voltage.	Check wiring and switches. Check and clean valve. Replace valve. Check for bad connection.

For best performance …

USE ONLY GENUINE Bomford SERVICE PARTS

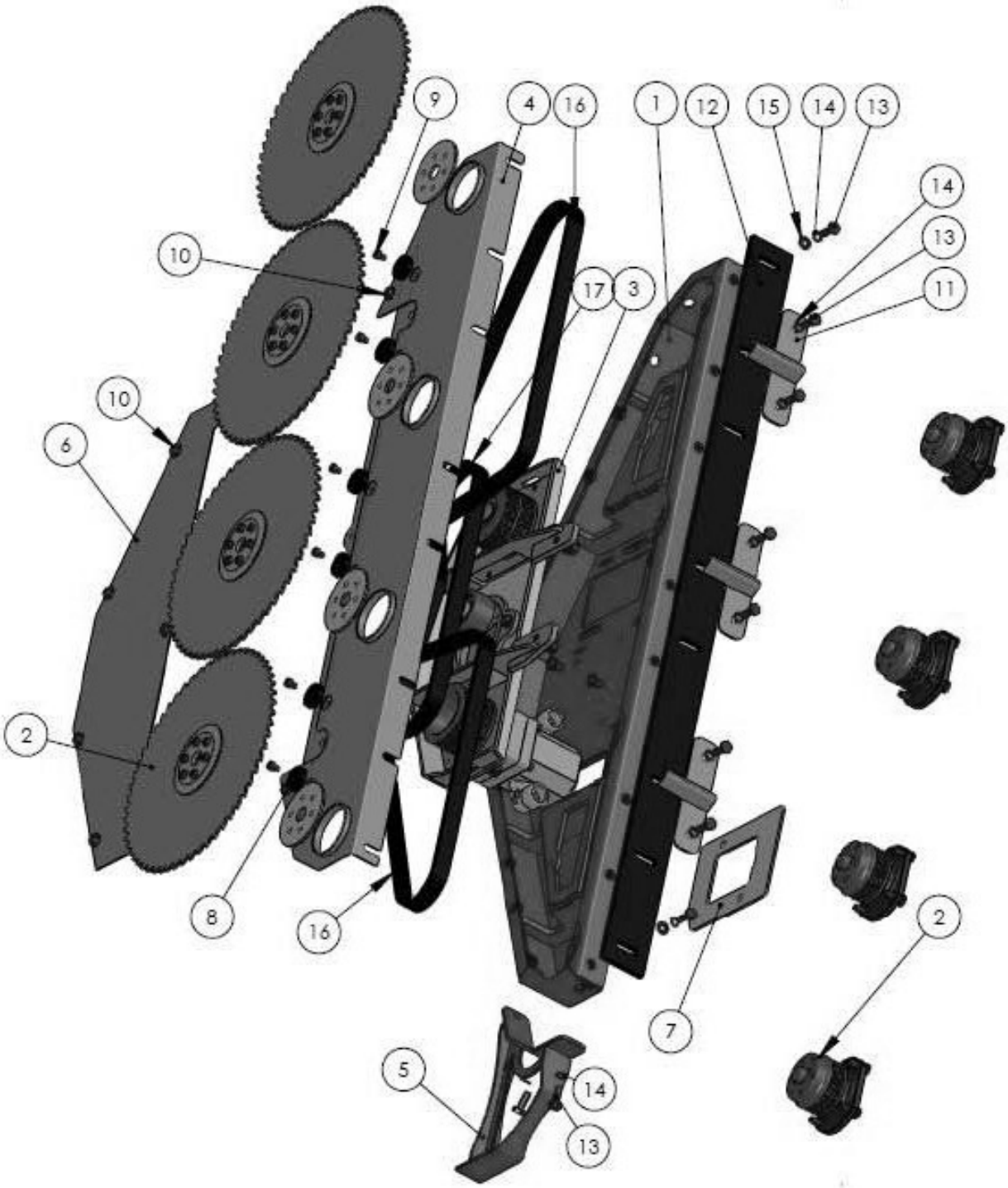
To be assured of the latest design improvements purchase your 'Genuine Replacements' from the 'Original Equipment Manufacturer'

Through your local Dealer or Stockist

Always quote:

- ***Machine Type***
- ***Serial Number***
- ***Part Number***

Design improvements may alter some of the parts listed in this manual – the latest part will always be supplied when it is interchangeable with an earlier one.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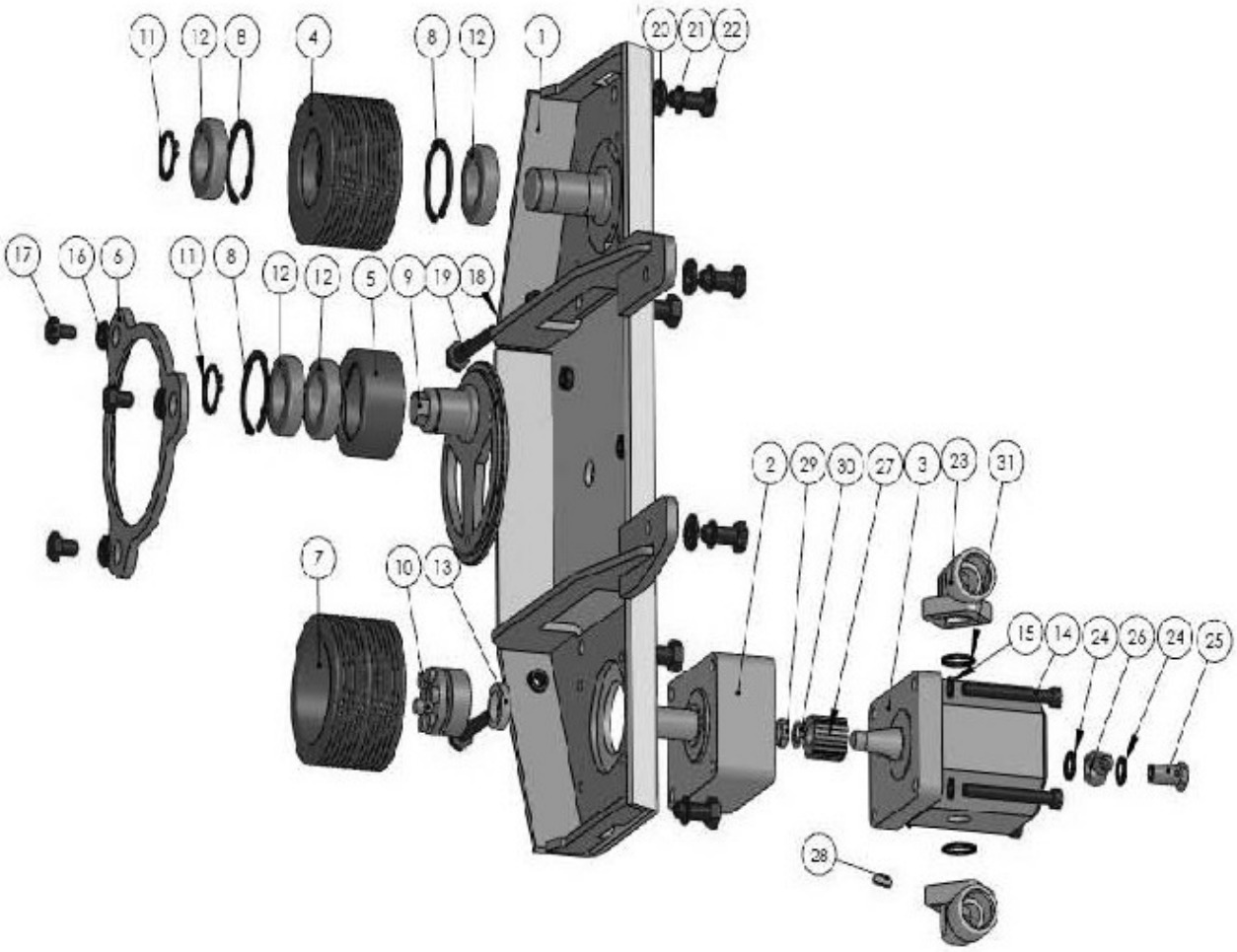
REF.	QTY.	PART No.		DESCRIPTION
				MULTISAW 1600 - MAIN ASSEMBLY
1	1	1070072		FRAME
2	*See blade unit page*			DRIVE PULLEY ASSEMBLY
3	1	1070088		DRIVE BOX
4	1	1070073		DECK
5	1	1070074		SKID
6	1	1070075		BELT COVER
7	1	1070076		PLATE
8	6	1070077		RUBBER BLOCK
9	6	1070078		BOLT
10	9	1070079		BOLT
11	3	1070080		BRANCH DEFLECTOR
12	1	1070081		PLASTIC STRIP
13	11	1070082		BOLT
14	11	1070083		WASHER
15	2	1070084		WASHER
16	2	1070085		BELT (LONG)
17	1	1070086		BELT (SHORT)
18	1	1070087	*	PROTECTION

* *not illustrated*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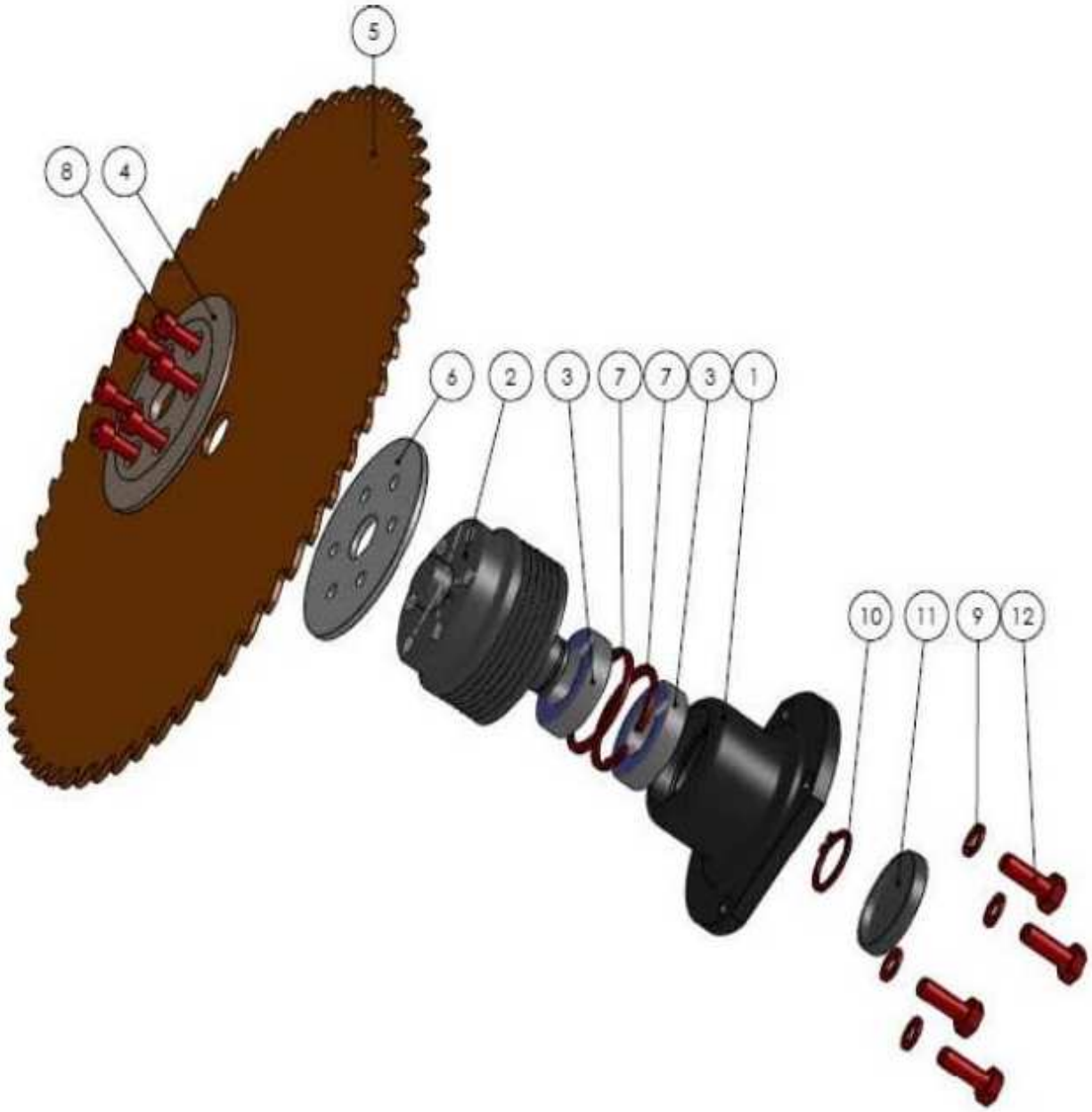
REF.	QTY.	PART No.	DESCRIPTION
			PRO-SAW 1600 - DRIVE ASSEMBLY
1	1	1070088	DRIVE BOX
2	1	1070089	DRIVE SUPPORT
3	1	1070090	MOTOR (17cc)
4	1	1070091	BELT PULLEY
5	1	1070092	IDLER PULLEY
6	1	1070093	ADJUSTER RING
7	1	1070094	DRIVE PULLEY
8	3	1070095	CIRCLIP
9	1	1070096	ADJUSTMENT WHEEL
10	1	1070097	EASY LOCK BUSH
11	2	1070098	CIRCLIP
12	4	1070099	BEARING
13	1	1070100	ADJUSTER
14	4	1070101	BOLT
15	4	1070064	WASHER
16	3	1070084	WASHER
17	3	1070102	BOLT
18	2	1070103	NUT
19	2	1070104	BOLT
20	4	1070105	WASHER
21	6	1070106	WASHER
22	6	1070107	BOLT
23	2	1070108	FLANGE CONNECTOR
24	2	1070109	WASHER
25	1	1070110	BANJO BOLT
26	1	1070111	BANJO
27	1	1070112	SPLINED COUPLING
28	1	1070113	SOCKET
29	1	1070114	NUT
30	1	1070115	WASHER
31	2	1070116	O RING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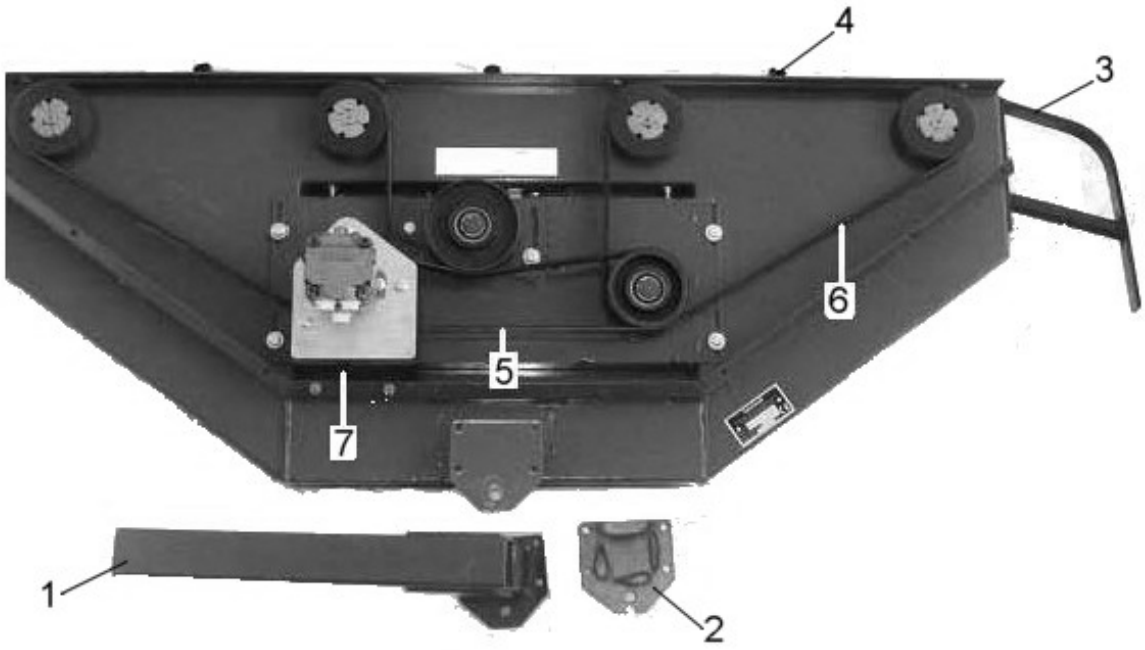
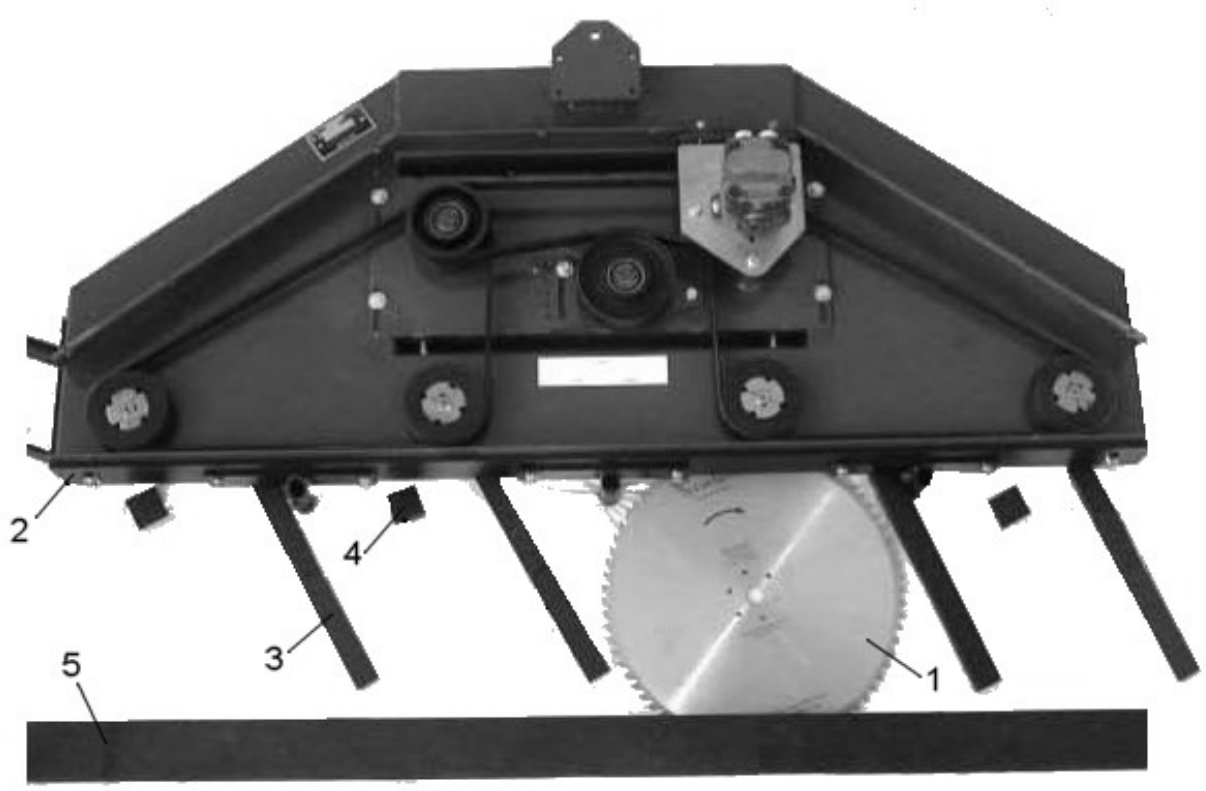
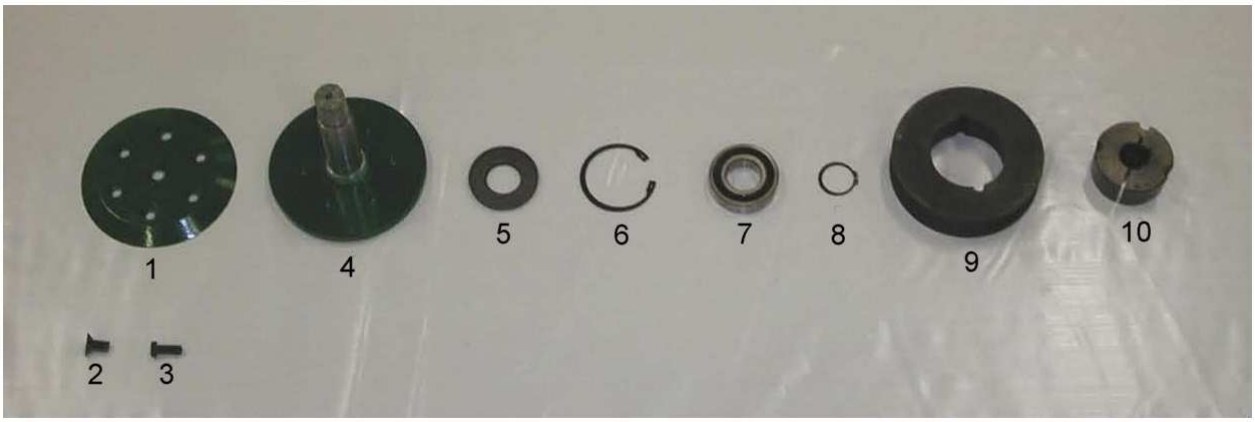
REF.	QTY.	PART No.	DESCRIPTION
			PRO-SAW 1600 - BLADE ASSEMBLY
1	1	1070117	BEARING HOUSING
2	1	1070118	DRIVE PULLEY
3	2	1070099	BEARING
4	1	1070119	OUTER BLADE PLATE
5	1	1070001	BLADE
6	1	1070120	INNER BLADE PLATE
7	2	1070095	CIRCLIP
8	6	1070121	SETSCREW
9	4	1070083	WASHER
10	1	1070098	CIRCLIP
11	1	1070122	COVER PLATE
12	4	1070082	BOLT



REF.	QTY.	PART No.	DESCRIPTION
			PRO-SAW 2000/2400 - MAINFRAME (1)
1	1	1070005	MOUNTING ARM - Pro-Saw*2000*
	1	1070006	MOUNTING ARM - Pro-Saw *2400*
2	1	1070007	MOUNTING PLATE
3	1	1070010	SKID (LH USE) - Pro-Saw*2000*
	1	1070011	SKID (LH USE) - Pro-Saw*2400*
	1	1070008	SKID (RH USE) - *Pro-Saw2000*
	1	1070009	SKID (RH USE) - Pro-Saw*2400*
4	3	1070012	BRANCH CARRIER - *Pro-Saw2000*
	3	1070013	BRANCH CARRIER - *Pro-Saw2400*
5	1	1070014	BELT (SHORT) - *Pro-Saw2000*
	1	1070015	BELT (SHORT) - *Pro-Saw2400*
6	2	1070016	BELT (LONG) - *Pro-Saw2000*
	2	1070017	BELT (LONG) - *Pro-Saw2400*
7	1	1070018	RUBBER PROTECTION



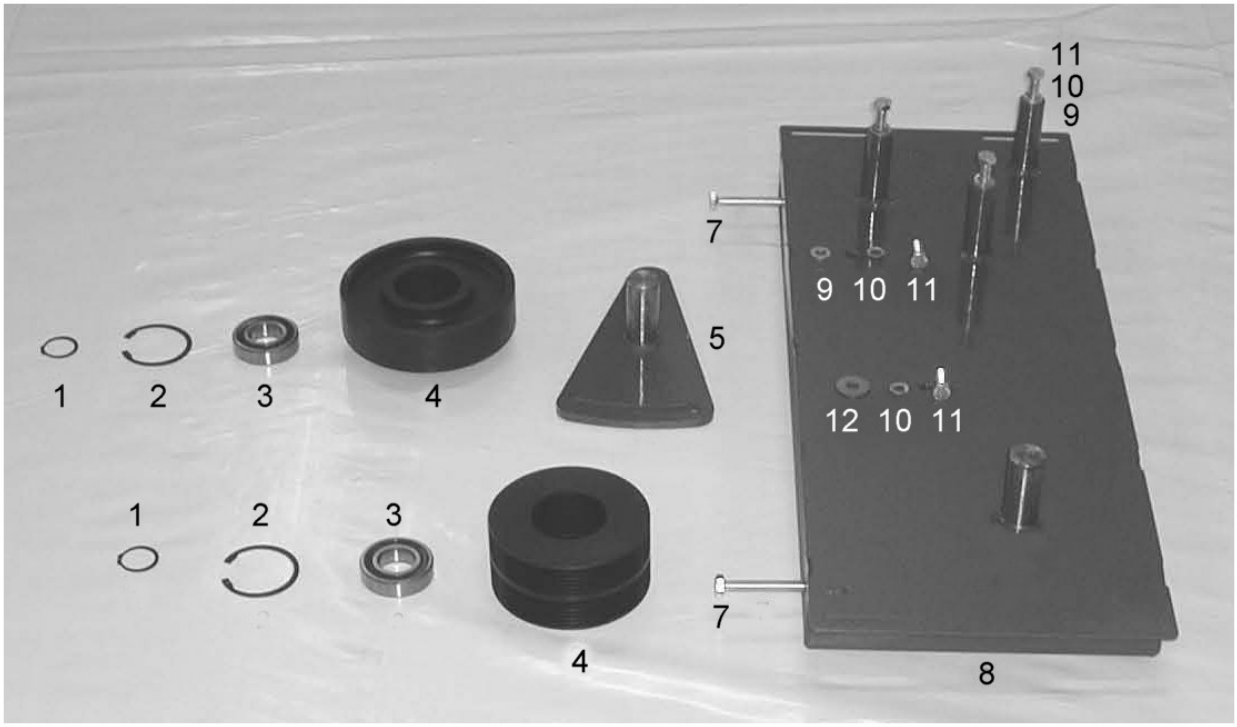
REF.	QTY.	PART No.	DESCRIPTION
			PRO-SAW 2000/2400 - MAINFRAME (2)
1	4	1070002	BLADE - *Pro-Saw2000*
	4	1070003	BLADE - *Pro-Saw2400*
2	1	1070019	PLASTIC STRIP - *Pro-Saw2000*
	1	1070020	PLASTIC STRIP - *Pro-Saw2400*
3	4	1070021	WEAR PLATE (LONG) - *Pro-Saw2400*
4	4	1070022	WEAR PLATE (SHORT)
5	1	1070023	TRANSPORT PROTECTOR



Torque settings: Item 2 = 40 Nm., Item 3 = 25 Nm.

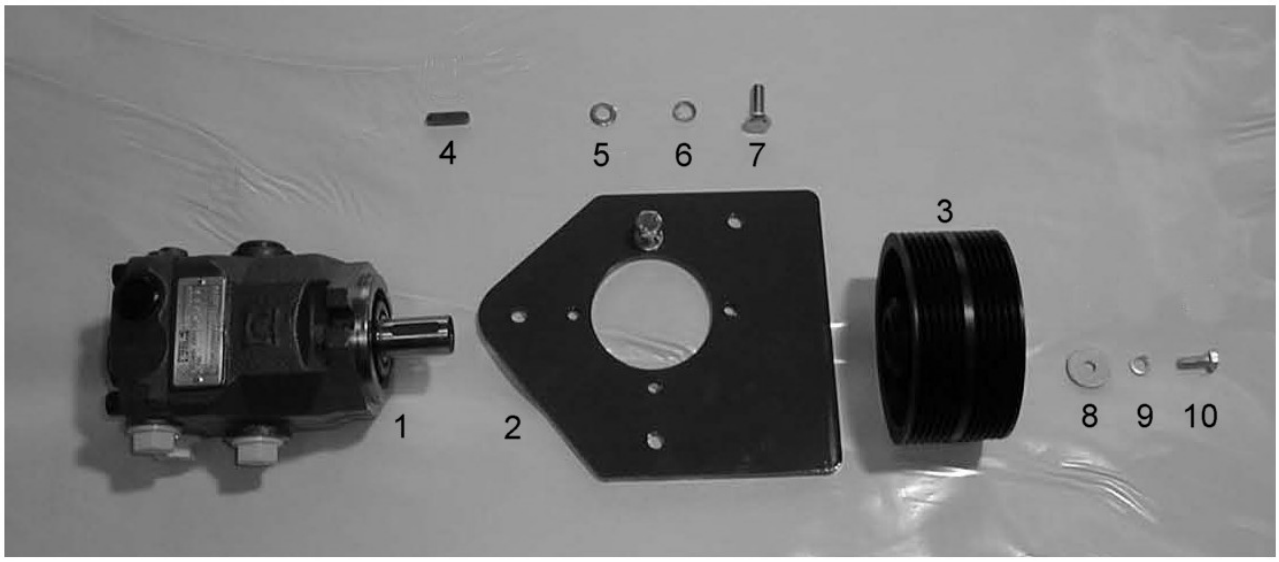
REF.	QTY.	PART No.	DESCRIPTION
			PRO-SAW 2000/2400 - BLADE SHAFT
1	4	1070024	MOUNTING PLATE
2	4	1070025	CENTRE BOLT (CONICAL) - *Pro-Saw2000*
	4	1070026	CENTRE BOLT (ALLEN) - Pro-Saw*2000/2400*
3	24	1070027	BOLT
4	4	1070028	BLADE SHAFT - *Pro-Saw2000*
	4	1070029	BLADE SHAFT - *Pro-Saw2400*
5	4	1070030	SEAL - *Pro-Saw* 2400
	4	1070031	SEAL - *Pro-Saw2400*
6	8	1070032	CIRCLIP - *Pro-Saw2000*
	8	1070033	CIRCLIP - *Pro-Saw2400*
7	8	1070034	BEARING - *Pro-Saw2000*
	8	1070035	BEARING - *Pro-Saw2400*
8	4	1070036	CIRCLIP - *Pro-Saw2000*
	4	1070037	CIRCLIP - *Pro-Saw2400*
9	4	1070038	PULLEY - *Pro-Saw2000*
	4	1070039	PULLEY - *Pro-Saw2400*
10	4	1070040	TAPERLOCK - *Pro-Saw2000*
	4	1070041	TAPERLOCK - *Pro-Saw2400*

NOTE: Quantities stated are per machine



REF.	QTY.	PART No.	DESCRIPTION
			MULTISAW 2000/2400 - ADJUSTER SYSTEM
1	2	1070036	CIRCLIP
2	4	1070032	CIRCLIP
3	4	1070034	BEARING
4	1	1070042	TENSION PULLEY - *Pro-Saw2000*
	1	1070043	TENSION PULLEY - *Pro-Saw2400*
5	1	1070044	ADJUSTER PLATE - *Pro-Saw2000*
	1	1070045	ADJUSTER PLATE - *Pro-Saw2400*
6	1	1070046	DOUBLE PULLEY - *Pro-Saw2000*
	1	1070047	DOUBLE PULLEY - *Pro-Saw2400*
7	2	1070048	ADJUSTMENT BOLT
8	1	1070051	ADJUSTMENT BOX - *Pro-Saw2000 LH*
	1	1070049	ADJUSTMENT BOX - *Pro-Saw2000 RH*
	1	1070052	ADJUSTMENT BOX - *Pro-Saw2400 LH*
	1	1070050	ADJUSTMENT BOX - *Pro-Saw2400 RH*
9	4	1070053	WASHER
10	5	1070054	SPRING WASHER
11	5	1070055	BOLT
12	1	1070056	WASHER

NOTE: Quantities stated are per machine



REF.	QTY.	PART No.	DESCRIPTION
			PRO-SAW 2000/2400 - PISTON MOTOR
1	1	1070057	PISTON MOTOR (15cc)
	1	1070058	PISTON MOTOR (28cc)
2	1	1070061	MOUNTING PLATE - *Pro-Saw2000*
	1	1070062	MOUNTING PLATE - *Pro-Saw2400*
3	1	1070063	PULLEY - *Pro-Saw2000*
	1	1070064	PULLEY - *Pro-Saw2400*
4	1	1070065	KEY
5	2	1070053	WASHER
6	2	1070054	SPRING WASHER
7	2	1070055	BOLT
8	1	1070066	WASHER
9	1	1070067	SPRING WASHER
10	1	1070068	BOLT
11	2	1070069	3/4" HYDRAULIC HOSE
12	1	1070070	3/8" HYDRAULIC HOSE
13	1	1070071	HOSE PROTECTION (1600mm)
		1070059	**SEAL & O RING (Output Shaft)**
		1070060	**SEAL KIT COMPLETE**

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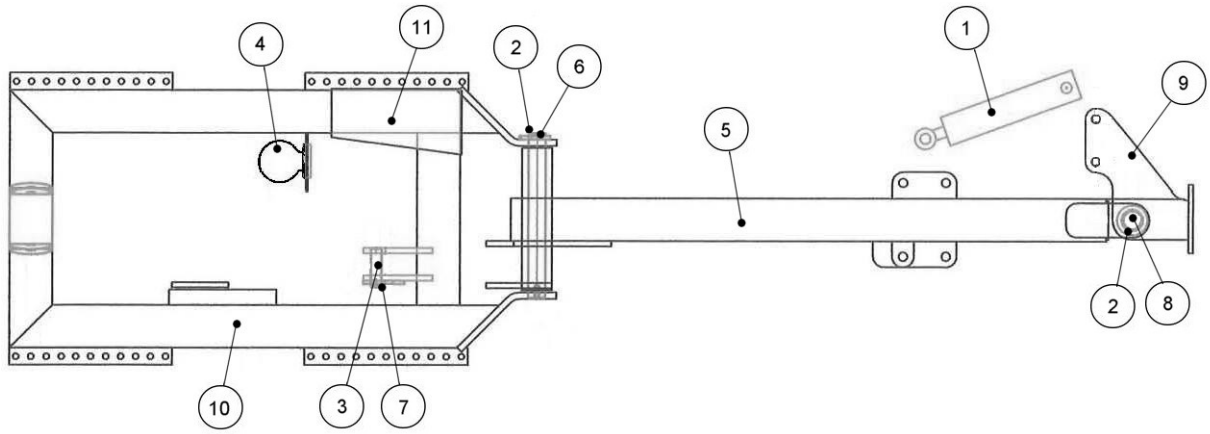
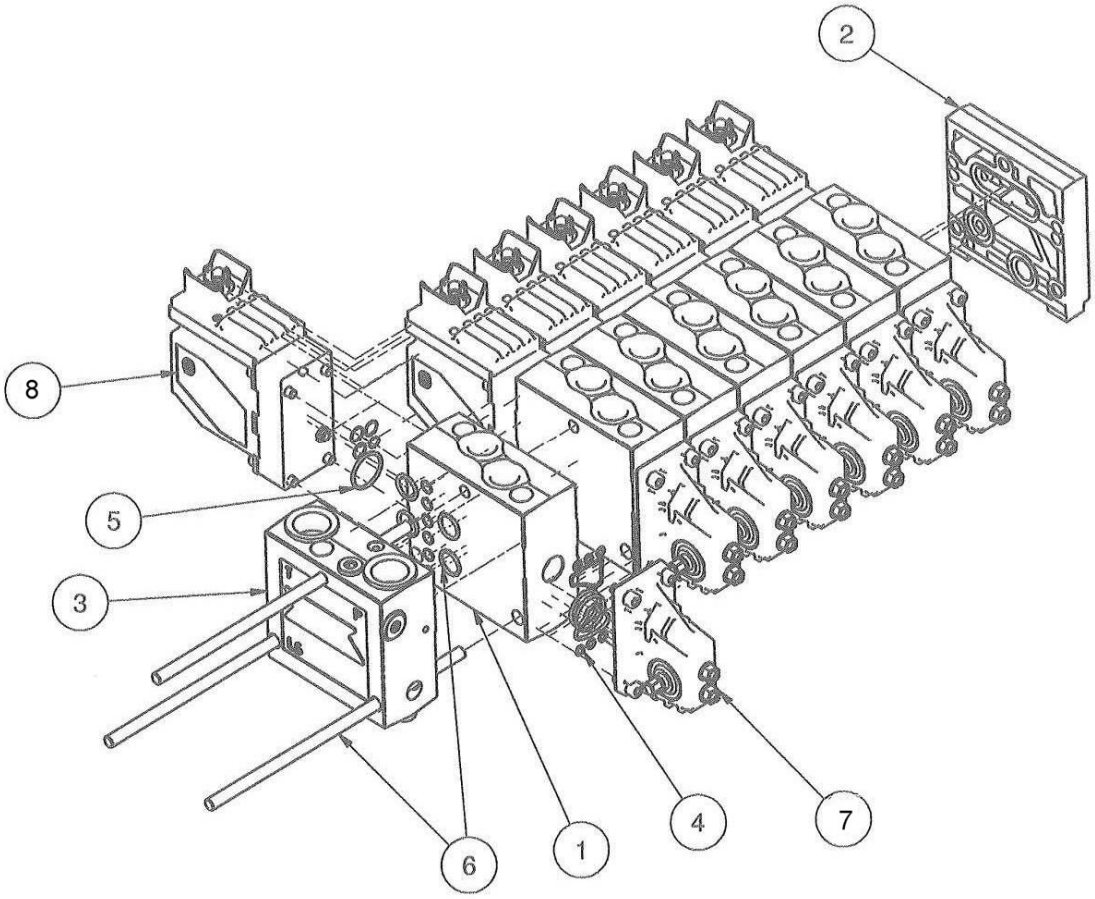
REF.	QTY.	PART No.	DESCRIPTION
			PRO-SAW - DECALS
1	1	1070123	DANGER ROTATING PARTS
2	1	1070124	KEEP DISTANCE FROM ELECTRIC
3	1	1070125	KEEP SAFE DISTANCE FROM MACHINE
4	1	1070126	CHECK BOLT TIGHTNESS (8 HOURS)
5	1	1070127	READ THE BOOK
6	1	48486.03	DECAL - PRO-SAW 1600
6	1	48486.04	DECAL - PRO-SAW 2000
6	1	48486.05	DECAL - PRO-SAW 2400



REF.	QTY.	PART No.	DESCRIPTION
			TELEHANDLER CARRIAGE
1	1	1070128	RAM
2	4	1070130	BUSH
3	1	1070131	RAM
4	1	1070132	ACCUMULATOR
5	1	1070133	ARM
6	1	1070134	PIN
7	1	1070135	PIN
8	1	1070136	PIN
9	1	1070137	BRACKET - L/H
	1	1070138	BRACKET - R/H
10	1	1070139	MAINFRAME
11	1	1070140	GUARD
12	1	1070129	TOP LINK - *Not shown*



REF.	QTY.	PART No.	DESCRIPTION
			TELEHANDLER CARRIAGE VALVE
1	1	1070141	PRIORITY VALVE
2	1	1070142	MOTOR VALVE
3	1	1070143	TOOL VALVE
4	1	1070144	END COVER
5	1	1070145	END COVER
6	1	1070146	LEVER SEAL KIT
7	1	1070147	O RING KIT
8	1	1070148	SEAL KIT
9	1	1070149	LEVER HOUSING c/w SEAL KIT 1070146
10	1	1070150	ELECTRIC VALVE c/w O RING KIT 1070147
11	1	1070151	SPOOL
12	1	1070152	SPOOL