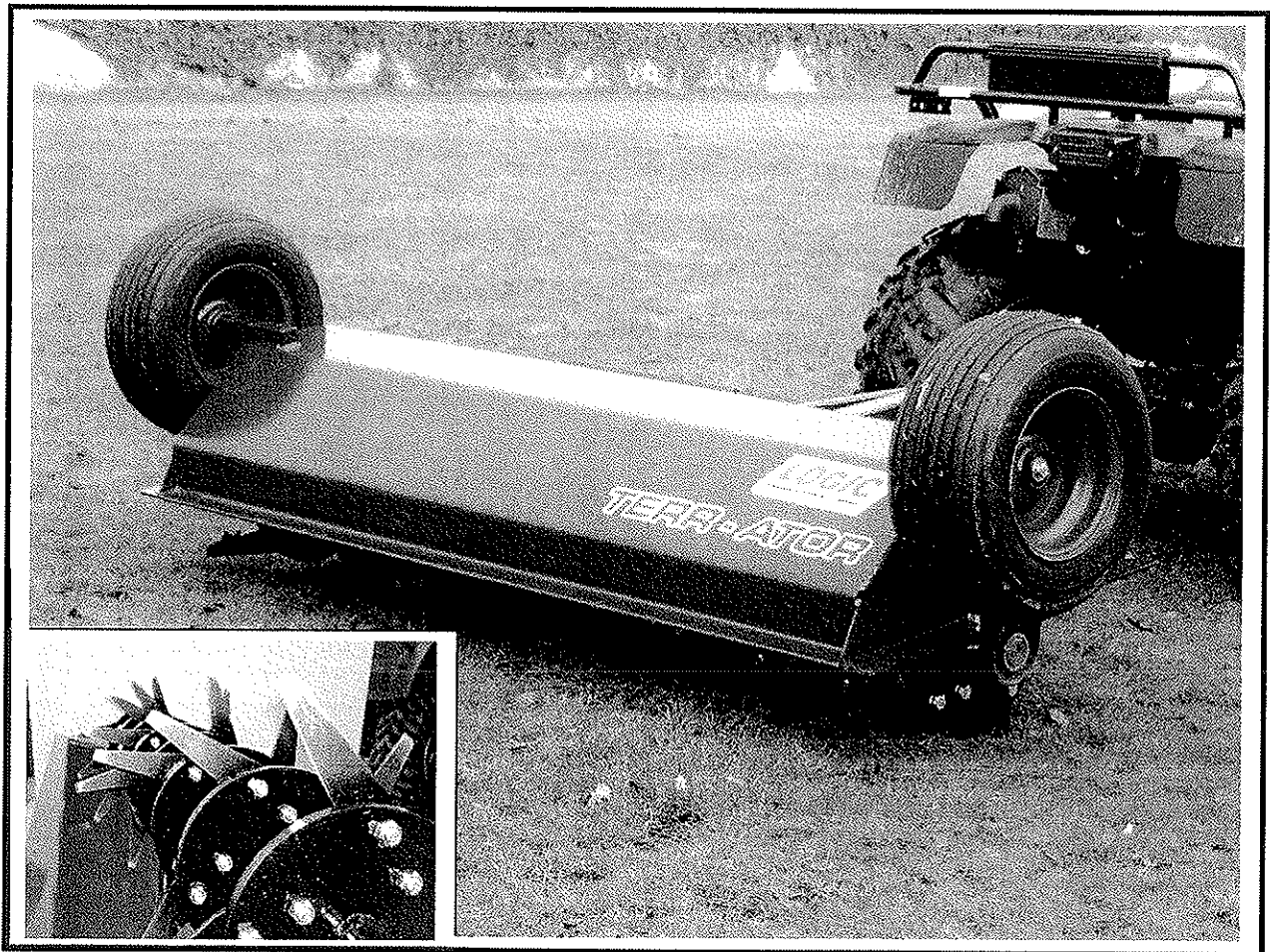


LOGIC

LTA160

TERR-ATOR



OPERATORS MANUAL

WM1-LTA160

INTRODUCTION

With the purchase of your **LOGIC TERR-ATOR**, you have made an excellent choice.

It is purpose built and designed to ensure maximum strength for its type of work.

Terr-ators are constructed from quality materials and components to ensure first class service for a long time when used correctly and maintained as described in this manual.

If after reading this manual you have any queries, please get in touch, we will be pleased to help.

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Safe use of all-terrain vehicles (ATVs) in agriculture and forestry

Agriculture Information Sheet No 33

Introduction

This information sheet gives advice on the safe use of ATVs. It covers the two main types used in off-road working in agriculture and forestry, which are:

- sit-astride ATVs: any motorised vehicle designed to travel on four low-pressure tyres on unpaved surfaces, with a seat designed to be straddled by the operator and handlebars for steering control. They are intended to be used by a single operator with no passenger. However, this type also includes ATVs intended for use by a single operator, but with a special seat for a passenger behind the operator. These vehicles are generally called ATVs in agriculture, quad bikes in leisure use and all-terrain cycles (ATCs) in forestry;
- sit-in machines: side-by-side mini-utility vehicles, usually with a steering wheel, where the driver sits in a conventional seat and there is generally seating for one or more passengers. These are often called ATVs in both agriculture and forestry.

The ATVs covered by this sheet are those designed for off-road use only. However, agricultural, horticultural and forestry users can register an ATV as a 'Light agricultural vehicle' for limited on-road use in connection with their business (see 'Road use').

Accidents

Both types of machine are designed to cope with a wide variety of terrain types, including steep slopes, but if used outside their safe operating parameters they can very rapidly become unstable. This is why most ATV accidents involve overturning.

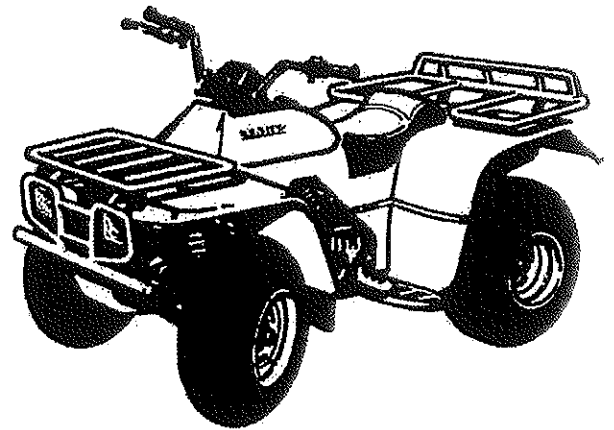
On average, two people die each year in ATV accidents. Non-fatal accidents are estimated to amount to over 1000 serious injuries per year. The underlying causes of accidents were usually one or more of the following:

- lack of structured training and/or experience;
- incorrect/lack of protective clothing;
- excessive speed;
- carrying a passenger or an unbalanced load;
- tipping on a bank, ditch, rut or bump;
- a steep slope combined with other factors, eg ground or load conditions;
- towing excessive loads with unbraked equipment.

Route planning and stability

Most accidents with these machines have occurred where they have either been driven on new routes over steep ground for the first time, or have been carrying or dragging destabilising loads. When travelling over rough terrain, get to know your own ground and stick to planned routes where possible. Walk new routes if necessary to check for hidden obstructions. Allow for changes in ground conditions and for the destabilising effect of loads or attachments.

Sit-astride ATVs (quad bikes/ATCs)



REMEMBER - GET PROPERLY TRAINED AND ALWAYS WEAR HEAD PROTECTION

Training

Under the Provision and Use of Work Equipment Regulations 1998 (PUWER), there is a legal requirement for employers to provide adequate training, and to ensure that only employees who have received appropriate training in their safe use, including the use of any towed equipment or attachments, are permitted to ride ATVs. The same requirements apply to the self-employed. HSE regards training provided by recognised training providers as being 'adequate' for the purposes of PUWER.

You can get details of suitable training courses from franchised ATV dealers, manufacturers' websites, EASI (European ATV Safety Institute), the Forestry Commission and Lantra Awards. Training is also available from agricultural trainers and colleges accredited by these bodies.

Protective clothing

More than half of all ATV riders have been thrown off at some time. As these machines are not fitted with either a cab or roll bar, your only protection is what you wear.

- **Head protection is vital.** The majority of ATV fatalities in the UK in the last ten years have been caused by head injuries. Nobody who died from head injuries was wearing a helmet. Helmets would certainly have prevented most, if not all, the deaths. **You should always wear a helmet when riding an ATV.** Helmet types suitable for ATV operations, depending on the circumstances, are motorcycle helmets to BS 6658:1985 or UN ECE regulation 22.05, equestrian helmets to BS EN 1384:1997, including specialist ATV helmets, cycle helmets to BS EN 1078:1997 and mountaineering helmets to BS EN 12492:2000. All helmets should have a chinstrap and be capable of being used with suitable eye protection. The type of helmet chosen should be based on an assessment of the circumstances in which the ATV will be used, eg the types of surface travelled over and anticipated speeds. The harder the surface and higher the speed the greater the degree of protection needed. **NB: Forestry helmets and industrial hard hats are not acceptable for any ATV operations.**
- Wear clothing that is strong and covers your arms and legs. Gloves are useful for protection and to keep hands warm in cold weather for good control of the ATV. Wear sturdy, ankle-covering footwear, eg boots or wellingtons that are strong, supportive and have good wet grip.
- Protect your eyes from insects and branches with either a visor or goggles.

Passengers

Never carry a passenger on a sit-astride ATV unless it has been designed for, and is suitable for, that purpose. The long seat is for operators to shift their body weight backwards and forwards for different slope conditions, **not** for carrying passengers. Passengers on specially adapted ATVs must wear a safety helmet. Do not carry a passenger in a trailer behind an ATV as any movement can make the machine unstable, particularly with independent rear suspension and trailers with axles wider than the ATV.

Safety checks and maintenance

Off-road use is especially harsh on equipment so it is essential to carry out safety checks and maintenance in accordance with the manufacturer's recommendations. In particular, pre-ride safety checks should **always** include:

- tyre pressures. These are low, eg around 2-7 psi, so even a 1 psi (0.07 kg/cm²) difference in pressure can cause vehicle control problems.

Use a gauge that is designed for measuring and displaying low pressures – usually supplied with the ATV;

- brakes and throttle. Check that the brakes give a safe straight stop and that the throttle operates smoothly in all steering positions. Brakes can have a relatively short life in farming or forestry environments and need frequent cleaning, regular adjustment and proper maintenance.

Safe driving methods

ATVs are rider-active machines, so rider positioning is vital to operate them correctly. The position of the rider on the machine needs to be changed depending on the terrain and motion. Riders must have the ability to move and balance the momentum of the ATV with their own body weight. Plan routes (and review the plan if the route is used regularly) to assess risks.

The following advice is no substitute for formal training.

- Most ATVs have no differential and so do not handle in the same way as other machines. This means that when you turn, the ATV tries to keep going in a straight line.
- When cornering on an ATV with no differential or with the differential lock engaged, where your body weight needs to be positioned depends on how sharp the corner is and on how fast you are going. Correct body position allows you to transfer weight to the outside of the turn through the footrests while maintaining balance with the torso. This lets the inside wheels skid slightly allowing the ATV to make the turn properly.
- You must understand how the transmission system of your machine will affect engine braking for both riding, and recovery of stalled ATVs, on slopes.
- When riding across a slope, keep your weight on the uphill side of the ATV.
- When going downhill, slide your weight backwards, select a low gear and use engine braking, reducing the need to use the brakes.
- When going uphill, it is important to review the route before starting the climb. Move your weight forwards and maintain a steady speed. It is important to shift your body weight forwards as much as possible. If necessary stand up and lean forward, keeping both feet on the footrests at all times and always maintain momentum.
- Avoid sudden increases in speed, as this is a common cause of rearward overturning accidents, even from a standing start on flat ground where there is good grip.

- Never put your foot onto the ground to stabilise an ATV when riding, but shift your weight across the ATV away from the imbalance.
- Always read the owner's manual.

Trailed equipment and loads

Ensure all riders know the manufacturer's recommended towing capacity and drawbar loading limit. Always operate within these requirements. Remember that your ability to control the ATV by your body movements will be considerably reduced when carrying a load or towing a trailer.

- When selecting trailed equipment look for:
 - over-run brakes;
 - a swivel hitch drawbar;
 - bead lock rims on wheels;
 - a low centre of gravity and a wide wheel track;
 - a long drawbar; and
 - attachment points for securing a load.
- Check the weight ratio between your ATV and its trailed load. This needs to be assessed for each operation. As a general guide, on level ground, braked trailed equipment can be a maximum of four times the unladen weight of the ATV. For unbraked trailed equipment the maximum should be twice the unladen weight. These loads should be reduced when working on slopes, uneven ground or poor surface conditions. Follow the manufacturer's advice for your particular machine.
- Weight transfer is also important. Stability and resistance to jack-knifing is improved if some load is transferred onto the ATV's drawbar. Approximately 10% of the gross weight of the loaded trailer is recommended, but this should not exceed the manufacturer's drawbar loading limit. Remember that weight transfer can change dramatically when you start going up or down hill.
- When selecting mounted equipment, make sure it is within the manufacturer's approved weight limit, with a low centre of gravity, and controls which are easy to operate but do not create a hazard. Where equipment is added to one end of the machine, add ballast at the other end to maintain stability.
- Loads carried on racks must be well secured, eg with ratchet straps, and be evenly balanced between the front and rear, except where they are deliberately altered to aid stability when going up or down a slope.
- Only tow a load from the hitch point. Loads towed from other points such as the rear rack have caused sudden rear overturning even on slight slopes or with slight acceleration. Ropes or chains should not be used to drag a load where they can become caught on a wheel. This may lead to entanglement with the brake cable, causing unexpected braking.

Using sprayers

- Pesticides should be used in accordance with the *Code of Practice for using plant protection products* published by Defra. (Available from Defra Publications, ADMAIL 6000, London SW1A 2XX Tel: 08459 556000.)
- Sprayers should meet the requirements of BS EN 907 and be fitted with an induction hopper unless the filling point is less than 1.5 m from the ground and within 0.3 m from the edge of the sprayer. A separate clean water tank for washing must be provided containing at least 15 litres of clean water and a tap that allows the water to run without being continuously pressed.
- When buying a sprayer look for a low centre of gravity and internal baffles to reduce liquid surge to improve stability when turning on slopes.
- ATVs should only be used with rear-mounted spray booms or other equipment that reduces the risk of pesticide exposure to the operator.
- Do not hold a spraying lance while riding your ATV, as two hands are needed for safe control.

Accessories

Beware of the potential dangers of accessories which are not approved by manufacturers, eg home-made gun racks and boxes. Either use accessories supplied/approved by manufacturers or seek their advice as to the suitability of those sourced elsewhere. Any weight added above the centre of gravity will decrease the ATV's stability.

Children

- Never carry a child as a passenger. It is illegal and will reduce your ability to control the ATV.
- Children under 13 are prohibited from using an ATV at work. Over 13 they should only ride ATVs of an appropriate size and power, after formal training on a low-power ATV.
- **Check and adhere to the manufacturer's minimum age recommendations for your ATV.** The ratio of a child's weight to that of the ATV is significant, as weight transfer is the key to safe handling.
- Always refer to the owner's manual and warning labels on the machine.

Roll bars, lap straps and weather cabs

- Roll bars are not recommended for sit-astride ATVs. Research has shown that they are more likely to increase injuries by obstructing the rider, either when thrown off or when jumping off during an overturn. This causes the rider to fall to the ground alongside the ATV and increases the likelihood of injury. PUEWER does not require roll bars where they would increase the overall risk.

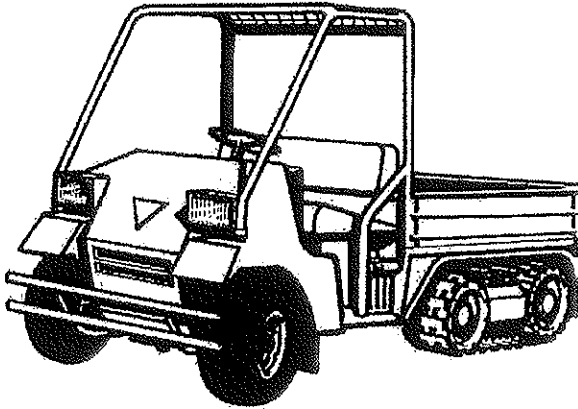
- Lap straps should not be fitted. They prevent active riding and would be potentially lethal without a full cab or roll cage.
- Weather cabs restrict a rider's ability to jump clear in an overturn. The rider is likely to be crushed within the cab unless it is strong enough to withstand the forces involved. Carefully assess the risks for your particular conditions of use before fitting any such structure and consult the manufacturer for information.

Road use

For road use, ATVs and trailers have to comply with the Road Vehicles Construction and Use Regulations 1986 (as amended) and the Road Vehicles Lighting Regulations 1989 (both enforced by the police) and be licensed in the appropriate class. They do not require an MOT and the maximum permitted speed is 20 mph. The minimum age for drivers is 17 and they need a Category B licence.

Sit-in ATVs

Sit-in ATVs include the Mule, Rhino, Argocat, Scot-Track, Gator, Ranger, Hiler, Goblin and other similar machines. They all have conventional sit-in seats and the driver does not use weight transfer to steer or control stability, although load balance is important in this respect. They range from machines designed for purely rough terrain to utility vehicles, which are also commonly used fully off-road.



Training

The legal requirements for training are the same as for the sit-astride ATVs. You should request advice on training from your suppliers, the training providers previously mentioned or, for forestry operations, from the Forestry Commission.

Rollover protection and seat belts

The requirements for these machines are quite different to those of sit-astride ATVs.

- Where there is a risk of the machine rolling over, PUWER requires an employer to fit some device to protect employees (the self-employed have the same duty to themselves). This would normally be a cab, rollover frame or roll bar. Such a structure could either be provided as part of the original machine or, if added afterwards, should be CE marked and approved by a recognised test body.
- Restraining devices such as seat belts should be fitted and worn by the driver and passengers where a roll bar or cab is fitted.
- Where a machine is amphibious and used on deep water as opposed to marshland, then the seat restraints (and possibly roll frame) could increase the overall risk rather than reduce it. In this case, do not use seat restraints while on the water. Assess the risk from the roll frame according to its design and the likelihood of trapping the occupants if the machine should sink.
- If there is a risk of overturning, employees at work who are carried in the rear of sit-in ATVs should be protected by rollover protection and seat restraints.
- Children should only be carried in these vehicles if they are in a passenger seat and wearing a properly designed and fitted seatbelt.

Parking

If you have to park on a slope, always park across it unless it is too steep. Accidents have occurred where machines have run down slopes because of poor brake maintenance or application, particularly while they are being loaded, and movement or the increase in weight sets the machine into motion.

Further information

HSE priced and free publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 2WA Tel: 01787 881165 Fax: 01787 313995 Website: www.hsebooks.co.uk (HSE priced publications are also available from bookshops and free leaflets can be downloaded from HSE's website: www.hse.gov.uk.)

For information about health and safety ring HSE's Infoline Tel: 0845 345 0055 Fax: 0845 408 9566 Textphone: 0845 408 9577 e-mail: hse.infoline@natbrit.com or write to HSE Information Services, Caerphilly Business Park, Caerphilly CF83 3GG.

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.

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SAFETY FIRST

1. Read this manual carefully, make sure only authorised personnel use this Terr-ator and have read these instructions.
2. Follow all safety advice stated in the operating instructions.
3. Be aware of the forces imposed on the towing vehicle when using a machine with no drawbar loading.
4. Never touch moving parts and be aware of flying objects.
5. Make sure spectators are at a safe distance from a moving terr-ator, and especially when travelling close to footpaths used by the public.
6. Check that all nuts, bolts and fittings are secure before using, and check at regular intervals during operation.
7. Always take care when changing from transport to operating position, avoid sloping ground.
8. Be aware of the travelling conditions - **Do Not** exceed sensible speeds.
9. NEVER carry passengers.

IT IS THE OPERATORS RESPONSIBILITY TO MAKE THEMSELVES AWARE OF ANY USER REGULATIONS IN EXISTANCE-CONSULT **H.S.E.** INFORMATION

INITIAL CHECK

Make sure that all nuts, bolts and fittings are securely fixed, and that packing materials e.g. wire bands, tape etc have been removed.

OPERATING THE TERR-ATOR

The operation of this type of machine is very simple, but care must be taken to understand the forces involved when in use. There is no weight transfer from the drawbar, so the towing vehicle must have sufficient power and weight to pull the Terr-ator on all surfaces being treated. Uphill slopes require increased power requirement, so this must be taken into account.

Ground conditions and desired penetration will control how much ballast weight may be required. This must be attached gradually and in a balanced way, see 'Ballast Weight Guide'.

Changing from transport position to working position, particularly when fitted with ballast weights must be carried out carefully: See 'Changing from transport to working position'

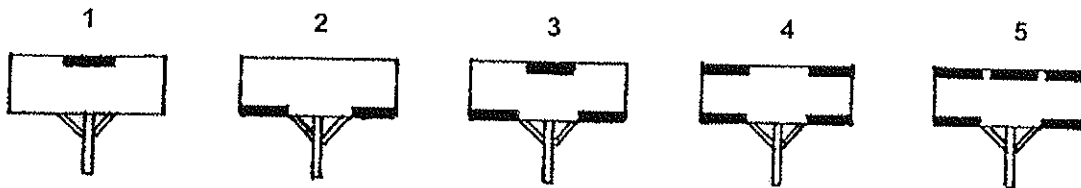
Attach the Terr-ator to the towing vehicle and move forward on the working site.

It will soon become apparent if penetration is appropriate. If more ballast weights are required, fit them to the main body in the following sequence.

BALLAST WEIGHT GUIDE

ADD WEIGHTS IN BALANCED STAGES

Each weight is approximately 22.5Kg



Normal operating speed is 8-10 kph.

Do not operate at excessive speeds when unseen objects may be struck, which could affect the stability of the towing vehicle and cause damage to the blades.

IMPROPER PRACTICES

DO NOT overload - consider ground conditions and towing vehicle.

DO NOT operate at excessive speeds particularly on hard surfaces, take extra care when moving from one operating site to another.

DO NOT operate with passengers on the towing vehicle.

MAINTENANCE

TYRE PRESSURE – Normal operating pressure is 28psi.

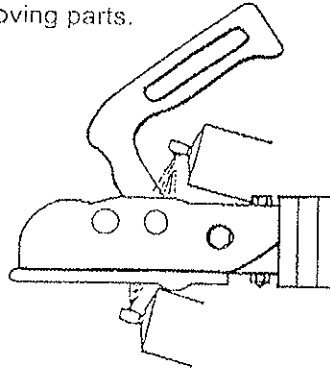
Grease rotor bearings at the beginning and end of each season.

Replace worn or damaged blades in the same position as the original.

Check for signs of damage periodically.

Check bearing condition periodically - if worn replace immediately.

Grease or oil the coupling moving parts.



WINTER STORAGE

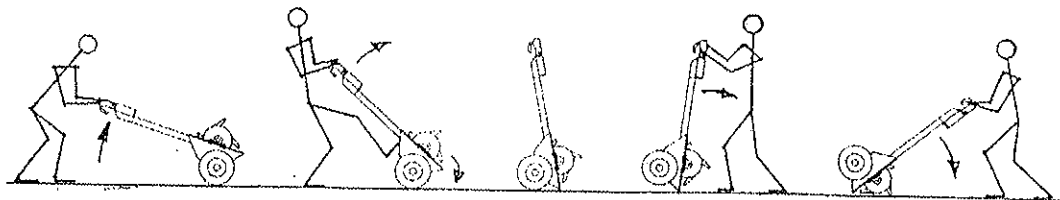
If possible store under cover in the working position. If stored outdoors, lean up against a wall or fence on end with the spikes in over. NOTE Secure the drawbar to the support with rope to prevent falling backwards.

CHANGING FROM TRANSPORT TO WORKING POSITION

CARRY OUT THIS PROCEDURE ON LEVEL GROUND

(See diagram below)

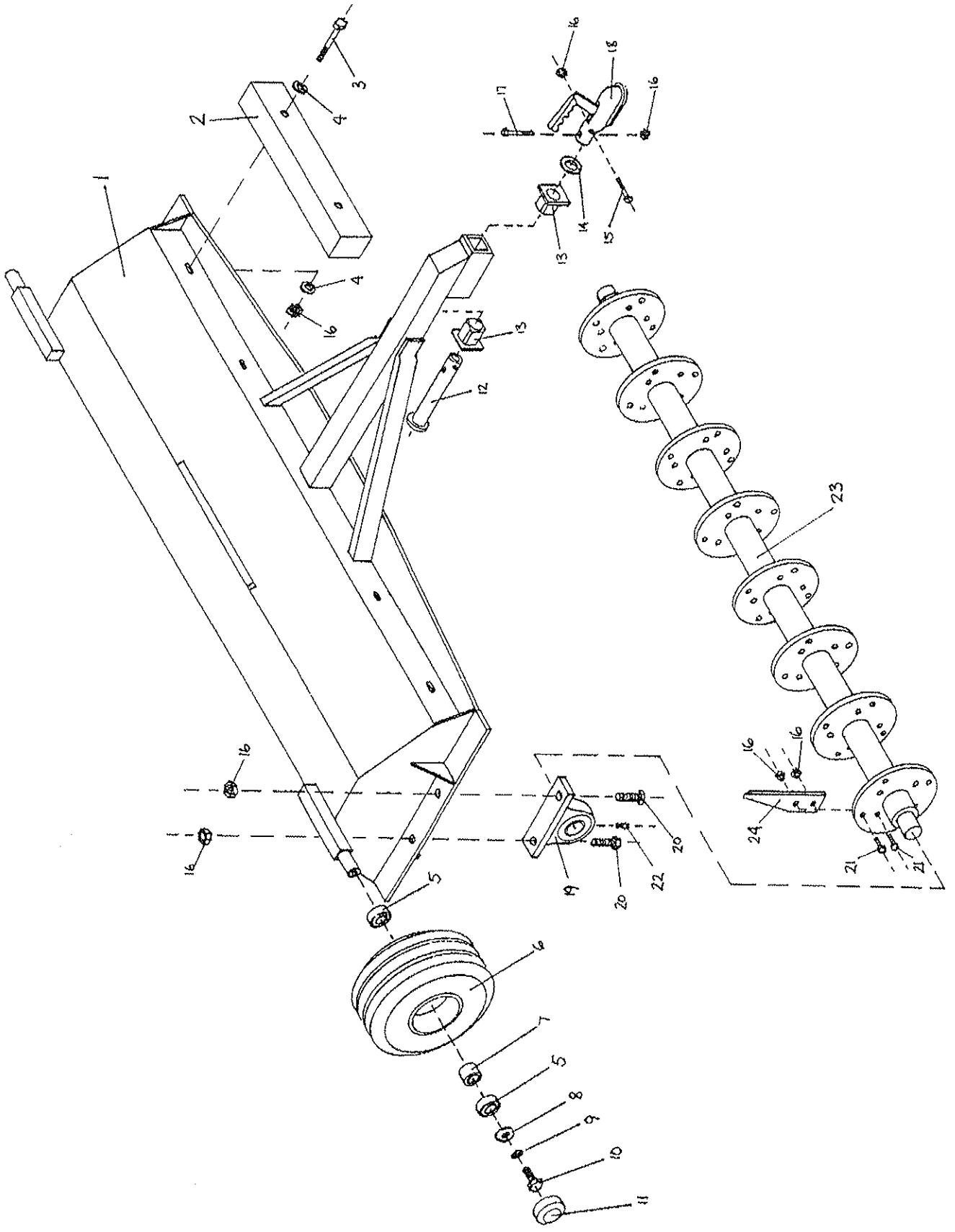
1. Take a firm grip of the coupling and lift the drawbar to approximately 45%
2. Place one foot on the body of the Terr-ator, to prevent the counter balancing weight pushing the machine forward. Continue raising the drawbar to the upright position.
3. Now stand on the other side of the Terr-ator, take a firm grip of the drawbar and carefully lower to the ground.



CHANGING FROM WORKING TO TRANSPORT POSITION.

CARRY OUT THIS PROCEDURE ON LEVEL GROUND

1. Take a firm grip of the coupling and raise the drawbar to the upright position.
2. Stand on the other side of the terr-ator, take a firm grip of the coupling and place one foot on the body of the machine.
3. Carefully pull the drawbar towards you and at the same time push on the body with your foot. This will pivot the machine onto the transport wheel.
4. Lower the drawbar to the ground.



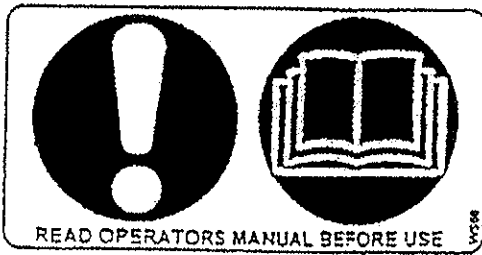
TERR-ATOR PARTS

Ref No	Description	Part No
1.	Body	LTA160-01A
2.	Ballast Weight	LTA161
3.	Bolt M12 x 90	FBH12090
4.	Washer Flat M12	FWF12
5.	Bearing	MF120-1048
6.	Wheel and Tyre	WT141
7.	Spacer	MSC120-1063
8.	Washer Repair M10	FWR10
9.	Washer Spring M10	FWS10
10.	Set Screw M10 x 30	FSH10030
11.	Dust Cap	MSC120-1054
12.	Swivel Hitch Draw Tube	CM100-04
13.	Swivel Hitch Nylon Bush	CM100-03A
14.	Swivel Hitch Thrust Washer	CM100-01A
15.	Bolt M12 x 70	FBH12070
16.	Nut Nyloc M12	FNN12
17.	Bolt M12 x 65	FBH12065
18.	Coupling	C900
19.	Rotor Bearing	LTA160-14
20.	Bolt M12 x 50	FBH12050
21.	Bolt M12 x 35	FBH12035
22.	Grease Nipple	S216-070
23.	Rotor	LTA160-04A
24.	Rotor Blade	LTA160-06

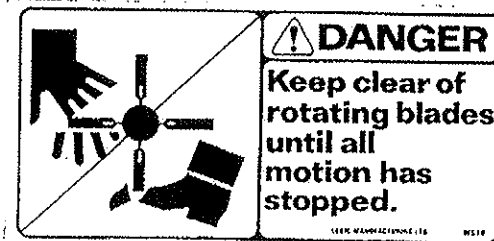
COPY OF STICKERS USED ON THIS MACHINE
(Not to scale)

TERR - ATOR

LOGIC  **atv-equip**
TEL: NORTH (0434) 506661 WS01



THIS PRODUCT IS PROTECTED BY DESIGN RIGHT



LOGIC MANUFACTURING PRODUCTS
OWNER GUARANTEE

This Logic Manufacturing product is guaranteed against faulty workmanship and materials for a period of 6 months from the date of purchase.

On engine powered equipment, the engine manufactures guarantee will apply, any claims being subject to their terms and conditions.

All claims must be made in writing within 28 days of the alleged failure.
All claims must be made through the dealer who originally supplied the machine.

Any defective parts must be kept for inspection and if requested, sent to the factory or dealer.

The customer must bring equipment for repair to the dealer.

This guarantee becomes void if unauthorised modifications have been made, or if parts not manufactured, supplied or approved by Logic Manufacturing have been fitted to the machine.

We accept no liability for normal wear and tear, misuse or abuse, or where recommended maintenance has not been carried out.

All guarantee work must be authorised by Logic Manufacturing prior to any work being done. Work carried out without our consent may not be reimbursed.

