

DRUM MOWERS

DR165 / DR185 / DR220

INSTRUCTION & PARTS MANUAL

Publication 505

Part No.41571.05



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Revisions

<i>July 2006</i>	<i>First Issue</i>

IMPORTANT VERIFICATION OF WARRANTY REGISTRATION



DEALER WARRANTY INFORMATION & REGISTRATION VERIFICATION

It is imperative that the selling dealer registers this machine with Twose of Tiverton Limited before delivery to the end user – failure to do so may affect the validity of the machine warranty.

To register machines go to the Twose web site at www.twose.com, log onto 'Dealer Inside' and select the 'Machine Registration button' which can be found in the Service Section of the site. Confirm to the customer that the machine has been registered in the section below.

Should you experience any problems registering a machine in this manner please contact the Twose Office on 01884 253691.

Registration Verification

Dealer Name:
Dealer Address:
Customer Name:
Date of Warranty Registration:/...../..... Dealer Signature:

NOTE TO CUSTOMER / OWNER

Please ensure that the above section above has been completed and signed by the selling dealer to verify that your machine has been registered with Twose of Tiverton Limited.

IMPORTANT: During the initial 'bedding in' period of a new machine it is the customer's responsibility to regularly inspect all nuts, bolts and hose connections for tightness and re-tighten if required. New hydraulic connections occasionally weep small amounts of oil as the seals and joints settle in – where this occurs it can be cured by re-tightening the connection – *refer to torque settings chart below*. The tasks stated above should be performed on an hourly basis during the first day of work and at least daily thereafter as part of the machines general maintenance procedure.

TORQUE SETTINGS FOR HYDRAULIC FITTINGS

HYDRAULIC HOSE ENDS		
BSP	Setting	Metric
1/4"	18 Nm	19 mm
3/8"	31 Nm	22 mm
1/2"	49 Nm	27 mm
5/8"	60 Nm	30 mm
3/4"	80 Nm	32 mm
1"	125 Nm	41 mm
1.1/4"	190 Nm	50 mm
1.1/2"	250 Nm	55 mm
2"	420 Nm	70 mm

PORT ADAPTORS WITH BONDED SEALS		
BSP	Setting	Metric
1/4"	34 Nm	19 mm
3/8"	47 Nm	22 mm
1/2"	102 Nm	27 mm
5/8"	122 Nm	30 mm
3/4"	149 Nm	32 mm
1"	203 Nm	41 mm
1.1/4"	305 Nm	50 mm
1.1/2"	305 Nm	55 mm
2"	400 Nm	70 mm

WARRANTY POLICY

WARRANTY REGISTRATION

All machines must be registered, by the selling dealer with Twose of Tiverton Ltd, before delivery to the end user. On receipt of the goods it is the buyer's responsibility to check that the Verification of Warranty Registration in the Operator's Manual has been completed by the selling dealer.

1. LIMITED WARRANTIES

- 1.01. *All machines supplied by Twose of Tiverton Ltd are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 12 months, unless a different period is specified.*
- 1.02. *All spare parts supplied by Twose of Tiverton Ltd and purchased by the end user are warranted to be free from defects in material and workmanship from the date of sale to the original purchaser for a period of 6 months. All parts warranty claims must be supported by a copy of the failed part invoice to the end user. We cannot consider claims for which sales invoices are not available.*
- 1.03. *The warranty offered by Twose of Tiverton Ltd is limited to the making good by repair or replacement for the purchaser any part or parts found, upon examination at its factory, to be defective under normal use and service due to defects in material or workmanship. Returned parts must be complete and unexamined. Pack the component(s) carefully so that any transit damage is avoided. All ports on hydraulic items should be drained of oil and securely plugged to prevent seepage and foreign body ingress. Certain other components, electrical items for example, may require particular care when packing to avoid damage in transit.*
- 1.04. *This warranty does not extend to any product from which Twose of Tiverton Ltd's serial number plate has been removed or altered.*
- 1.05. *This warranty does not apply to any part of the goods, which has been subjected to improper or abnormal use, negligence, alteration, modification, fitment of non-genuine parts, accident damage, or damage resulting from contact with overhead power lines, damage caused by foreign objects (e.g. stones, iron, material other than vegetation), failure due to lack of maintenance, use of incorrect oil or lubricants, contamination of the oil, or which has served its normal life. This warranty does not apply to any expendable items such as blades, belts, clutch linings, filter elements, flails, flap kits, skids, soil engaging parts, shields, guards, wear pads, pneumatic tyres or tracks.*
- 1.06. *Temporary repairs and consequential loss - i.e. oil, downtime and associated parts are specifically excluded from the warranty.*
- 1.07. *Warranty on hoses is limited to 12 months and does not include hoses which have suffered external damage. Only complete hoses may be returned under warranty, any which have been cut or repaired will be rejected.*
- 1.08. *Machines must be repaired immediately a problem arises. Continued use of the machine after a problem has occurred can result in further component failures, for which Twose of Tiverton Ltd cannot be held liable, and may have safety implications.*
- 1.09. *If in exceptional circumstances a non Twose of Tiverton Ltd part is used to effect a repair, warranty reimbursement will be at no more than Twose of Tiverton Ltd's standard dealer cost for the genuine part.*
- 1.10. *Except as provided herein, no employee, agent, dealer or other person is authorised to give any warranties of any nature on behalf of Twose of Tiverton Ltd.*
- 1.11. *For machine warranty periods in excess of 12 months the following additional exclusions shall apply:*
 - 1.11.1. *Hoses, exposed pipes and hydraulic tank breathers.*
 - 1.11.2. *Filters.*
 - 1.11.3. *Rubber mountings.*
 - 1.11.4. *External electric wiring.*
 - 1.11.5. *Bearings and seals.*

- 1.12. All service work, particularly filter changes, must be carried out in accordance with the manufacturer's service schedule. Failure to comply will invalidate the warranty. In the event of a claim, proof of the service work being carried out may be required.
- 1.13. Repeat or additional repairs resulting from incorrect diagnosis or poor quality previous repair work are excluded from warranty.

NB Warranty cover will be invalid if any non-genuine parts have been fitted or used. Use of non-genuine parts may seriously affect the machine's performance and safety. Twose of Tiverton Ltd cannot be held responsible for any failures or safety implications that arise due to the use of non-genuine parts.

2. REMEDIES AND PROCEDURES

- 2.01. The warranty is not effective unless the Selling Dealer registers the machine, via the Twose of Tiverton Ltd web site and confirms the registration to the purchaser by completing the confirmation form in the operator's manual.
- 2.02. Any fault must be reported to an authorised Twose of Tiverton Ltd dealer as soon as it occurs. Continued use of a machine, after a fault has occurred, can result in further component failure for which Twose of Tiverton Ltd cannot be held liable.
- 2.03. Repairs should be undertaken within two days of the failure. Claims submitted for repairs undertaken more than 2 weeks after a failure has occurred, or 2 days after the parts were supplied will be rejected, unless the delay has been authorised by Twose of Tiverton Ltd. Please note that failure by the customer to release the machine for repair will not be accepted as a reason for delay in repair or submitting warranty claims.
- 2.04. All claims must be submitted, by an authorised Twose of Tiverton Ltd Service Dealer, within 30 days of the date of repair.
- 2.05. Following examination of the claim and parts, Twose of Tiverton Ltd will pay, at their discretion, for any valid claim the invoiced cost of any parts supplied by Twose of Tiverton Ltd and appropriate labour and mileage allowances if applicable.
- 2.06. The submission of a claim is not a guarantee of payment.
- 2.07. Any decision reached by Twose of Tiverton Ltd is final.

3. LIMITATION OF LIABILITY

- 3.01. Twose of Tiverton Ltd disclaims any express (except as set forth herein) and implied warranties with respect to the goods including, but not limited to, merchantability and fitness for a particular purpose.
- 3.02. Twose of Tiverton Ltd makes no warranty as to the design, capability, capacity or suitability for use of the goods.
- 3.03. Except as provided herein, Twose of Tiverton Ltd shall have no liability or responsibility to the purchaser or any other person or entity with respect to any liability, loss, or damage caused or alleged to be caused directly or indirectly by the goods including, but not limited to, any indirect, special, consequential, or incidental damages resulting from the use or operation of the goods or any breach of this warranty. Notwithstanding the above limitations and warranties, the manufacturer's liability hereunder for damages incurred by the purchaser or others shall not exceed the price of the goods.
- 3.04. No action arising out of any claimed breach of this warranty or transactions under this warranty may be brought more than one (1) year after the cause of the action has occurred.

4. MISCELLANEOUS

- 4.01. Twose of Tiverton Ltd may waive compliance with any of the terms of this limited warranty, but no waiver of any terms shall be deemed to be a waiver of any other term.
- 4.02. If any provision of this limited warranty shall violate any applicable law and is held to be unenforceable, then the invalidity of such provision shall not invalidate any other provisions herein.
- 4.03. Applicable law may provide rights and benefits to the purchaser in addition to those provided herein.



DECLARATION OF CONFORMITY

Conforming to EU Machinery Directive 2006/42/EC

We,

TWOSE of TIVERTON LIMITED,
6 Chinon Court, Lower Moor Way,
Tiverton Business Park, Tiverton, Devon, EX16 6SS, UK

Hereby declare that:

The Product; Tractor Mounted Drum Mower

Product Code; TSIP

Serial No. & Date Type

Manufactured in; Slovenija

Complies with the required provisions of the Machinery Directive 2006/42/EC
The machinery directive is supported by the following harmonized standards;

- BS EN ISO 14121-1 (2007) Safety of machinery - Risk assessment, Part 1: Principles Part 2: practical guide and examples of methods.
- BS EN ISO 12100-1 (2010) Safety of machinery - Part 1: Basic terminology and methodology Part 2: Technical principles.
- BS EN 349(1993)+ A1 (2008) Safety of machinery - Minimum distances to avoid the entrapment with human body parts.
- BS EN 953 (1998) Safety of machinery - Guards General requirements for the design and construction of fixed and movable guards.
- BS EN 982(1996)+ A1 (2008) Safety requirements for fluid power systems and their components. Hydraulics

Signed *Responsible Person*
CHRISTIAN DAVIES on behalf of **TWOSE of TIVERTON LIMITED**

Status: General Manager

Date: May 2011

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TECHNICAL DATA

SPECIFICATION	DR165 Model	DR185 Model	DR220 Model
Attachment (3-point hitch)	<i>Cat. I & II</i>	<i>Cat. I & II</i>	<i>Cat. I & II</i>
Working width	<i>1650 mm</i>	<i>1850 mm</i>	<i>2200 mm</i>
Weight	<i>392 kg</i>	<i>425 kg</i>	<i>490 kg</i>
Transport width	<i>1340 mm</i>	<i>1460 mm</i>	<i>1965 mm</i>
Transport length	<i>2850 mm</i>	<i>3300 mm</i>	<i>3980mm</i>
Maximum height	<i>1110 mm</i>	<i>1110 mm</i>	<i>1110 mm</i>
Maximum PTO speed	<i>540 rpm</i>	<i>540 rpm</i>	<i>540 rpm</i>
Drum rotation speed	<i>1950 rpm</i>	<i>1725 rpm</i>	<i>1530 rpm</i>
No. drums	<i>2</i>	<i>2</i>	<i>2</i>
No. of knives	<i>6</i>	<i>6</i>	<i>8</i>
Basic drive type	<i>Belt (x3)</i>	<i>Belt (x3)</i>	<i>Belt (x4)</i>
Drum drive type	<i>Gear</i>	<i>Gear</i>	<i>Gear</i>
Minimum power requirement	<i>22kW / 30HP</i>	<i>26kW / 35HP</i>	<i>32kW / 43HP</i>
Conditioner	<i>Optional</i>	<i>Optional</i>	<i>Optional</i>
Minimum power requirement (mower+conditioner)	<i>32kW / 44HP</i>	<i>36kW / 49HP</i>	<i>50kW / 67HP</i>
Weight (mower+conditioner)	<i>507 kg</i>	<i>540 kg</i>	<i>582 kg</i>

MACHINE SERIAL NUMBER PLATE

All machines will have a serial number plate fitted to them stating; the machine model, serial number of the machine, and the machine's weight. When ordering replacement parts or requesting service information always quote the machine model and serial number as stated on its serial number plate.

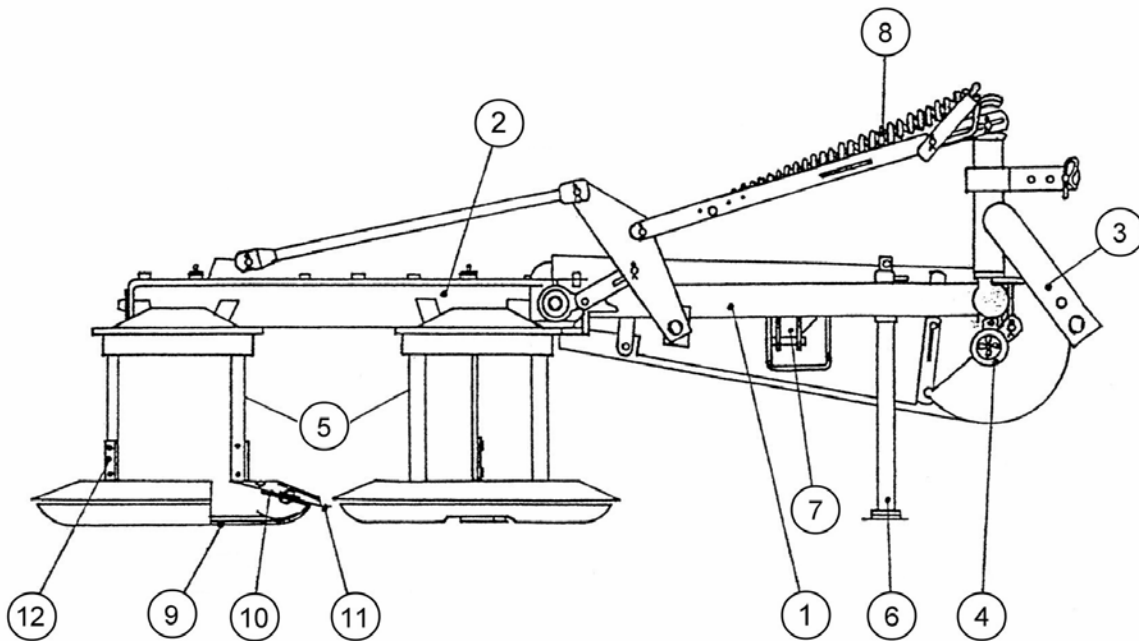
DESCRIPTION

Twose DR Series Drum Mowers are three-point linkage tractor mounted agricultural implements specifically designed for the mowing of grass and clover on even terrain. The machines have 2, cutterbar mounted, height adjustable, belt-driven rotating drums each equipped with 3 cutting knives.

These machines must only be used to perform the designated task for which they were designed. Use of these machines for any other function may cause damage to the machine and possible injury to the operator or other persons.

GENERAL ARRANGEMENT















The diagram below shows the location of the machines main components.












1. Linkage Frame
2. Cutter Bar
3. Hitch
4. Belt Drive
5. Drums
6. Support Leg
7. Safety Release
8. Discharge Spring
9. Lower Disc
10. Knife Holder
11. Knife
12. Protection Rib

SAFETY INFORMATION

In the interest of safety it is important that great care is adopted at all times during the attachment, transportation, operation and maintenance of this machine. Both the owner and the operator of the machine should read and understand the following section to ensure the safety of themselves and all other persons who enter into the close proximity of these machines.

-  In addition to the instructions stated here always abide by general safety and accident regulations.
-  Safety and warning decals placed on the machine give important instructions for safe work - take them into consideration for your safety and the safety of others.
-  While driving on public roads always abide by traffic signs and road regulations.
-  Familiarise yourself with the controls and functions of the machine and practice them in a safe location before attempting to start work.
-  Never approach this machine whilst it is working or running – switch off the machine and wait until it has stopped fully before approaching.
-  Do not wear loose fitting clothes in the vicinity of this machine - clothes should fit tight to the user's body.
-  Check no one is near to, or on, the machine before attempting to start or transport it. Ensure your visibility is kept clear at all times.
-  Never permit anyone to ride on this machine.
-  Implements should always be attached according to the manufacturer's instructions and fastened correctly to the prescribed devices using the correct components.
-  When disconnecting the machine from the tractor select a firm level site and use the support leg.
-  Take care when connecting or disconnecting the implement to the tractor – keep onlookers at a safe distance.
-  Ensure controls for the machine are positioned such that the machine cannot accidentally be started during transport.
-  For transportation on the road, prepare and secure the machine according to the manufacturer's instructions.
-  Never leave the driver seat whilst the tractor or the machine is running.

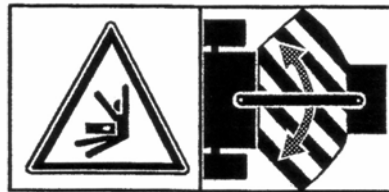
-  Always adjust the driving speed to suit the driving conditions. Avoid fast turning when driving uphill, downhill or across a slope. Braking performance and turning ability will be affected when implements are connected or mounted to the tractor - allow extra time for turning and braking.
-  Never attempt to operate a machine without its safety devices fitted or incorrectly secured.
-  Ensure all bystanders are kept at a safe distance from a moving or working machine.
-  Even when the machine is unattached some hydraulic or mechanical components on the machine are able to be rotated or moved by hand and are therefore capable of causing injury to fingers or hands due to trapping. Wherever possible secure these components during storage to prevent accidental injuries.
-  Always place the machine in a safe position before leaving the tractor - lower the implement completely, switch off the engine and remove the ignition key.
-  Never permit anyone between the machine and the tractor whilst either is working or when the machine is in a raised position.
-  Only use machines on a tractor that is capable of taking its weight - use weights or ballast as required ensuring stability of the unit.
-  Be aware at all times of the width, height and length of any machinery you are operating – especially when transporting on the public highway or near obstructions.
-  Ensure the work area is clear of obstructions before starting work – clear stones, wire, glass or any other dangerous objects from the work site before attempting to start work.

Although the information given 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 Twose machine.

SAFETY DECALS



1.



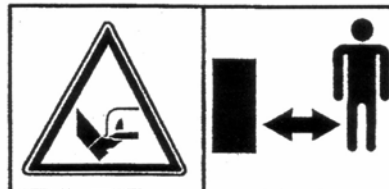
2.



3.



4.



5.



6.



7.



8.



9.



10.

1. **WARNING!** Always 'Read the Operator Manual'.
2. **DANGER!** Articulation Zone – Keep Clear.
3. **DANGER!** Pinch & Crush Zone – Keep hands and limbs clear whilst machine is working.
4. **DANGER!** Wait until machine has stopped completely before approaching.
5. **DANGER!** Keep clear of mower knife area whilst tractor or machine is running.
6. **DANGER!** Keep clear of machine whilst tractor or machine is running.
7. **WARNING!** Switch off tractor engine & remove key before performing maintenance or repair.
8. **DANGER!** Keep clear of danger area between tractor and machine.
9. **DANGER!** Keep clear of raised machine.
10. **WARNING!** Maximum RPM & direction of rotation warning

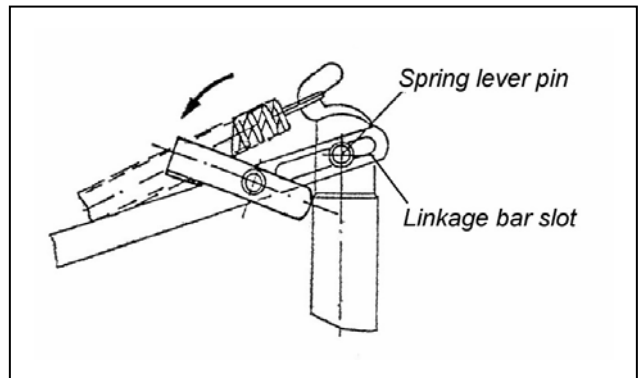
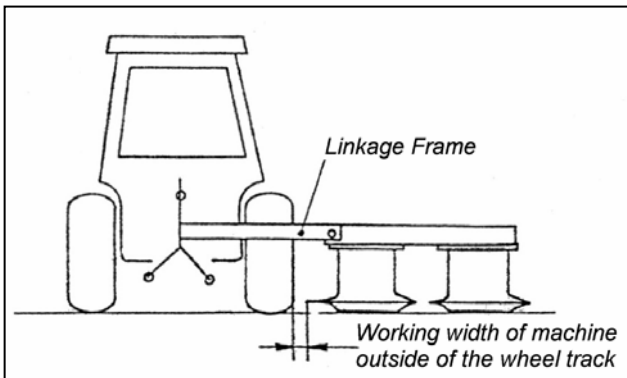
TRACTOR REQUIREMENTS

The tractor to which this machine is to be fitted must meet the following criteria:

- 3-point linkage connection – Cat. I or Cat. II.
- Minimum power requirement of:
 - 22kW (30HP) for DR165 models
 - 26kW (35HP) for DR185 models
- Maximum PTO shaft speed of 540 RPM.
- Hydraulic service connection.

ADJUSTMENT OF THE MACHINE TO THE TRACTOR WHEEL TRACK

The 3-point linkage pins should be set in a position that permits the machine to be attached to the tractor as close as possible whilst still allowing the full working width of the machine to remain outside of the tractors wheel track – refer to diagram below left.



CONNECTION TO THE TRACTOR

The machine must be connected to the 3-point connection bars with the pin of the discharge spring lever located at the mid-point position of the slot in the linkage bar when the main linkage frame is in the horizontal position – refer to diagram above.

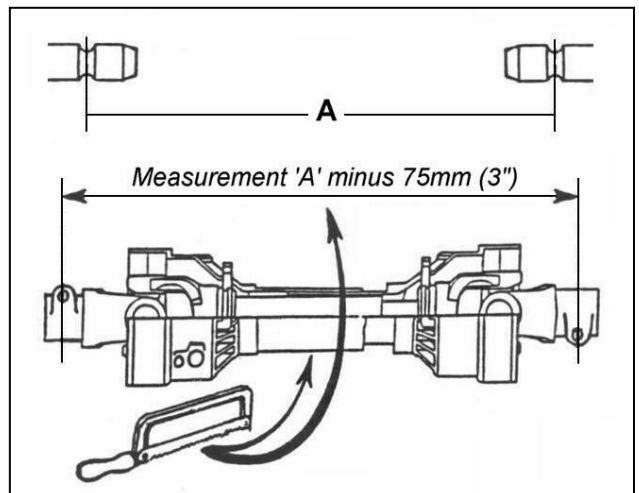
Fit the PTO shaft

– On initial attachment this will need to be measured and adjusted to suit the tractor used.

Measure the PTO shaft and cut to the dimension shown - see diagram opposite.

The finished length of the PTO shaft should be 75mm (3") less than the measured distance 'A' - between the tractor shaft and gearbox stub shaft - to enable correct fitting.

Note: For subsequent use with different tractors measure again – there must be a minimum shaft overlap of 150mm (6").



Connect hoses to the tractors hydraulic system.

Add front end weights to the tractor if required.

TRANSPORTATION

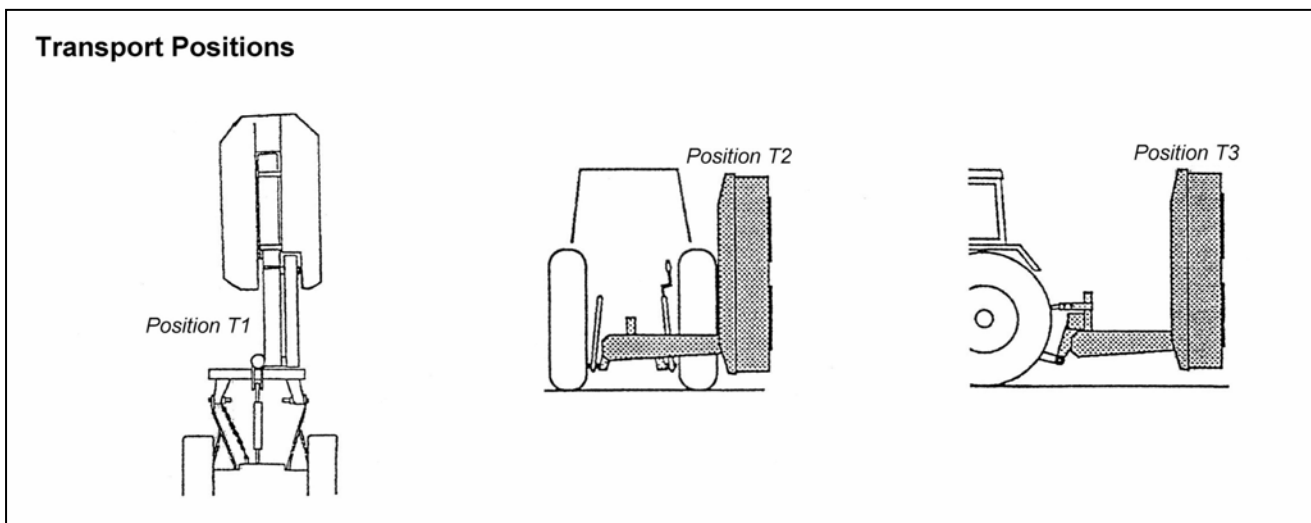
When moving the machine into transport position:

- Never enter the 'swivelling' area of the mower bar.
- Never permit anyone to stand between the tractor and the implement.
- Always wait until the mower drums have stopped completely before changing the position of the mower.

Transport positions

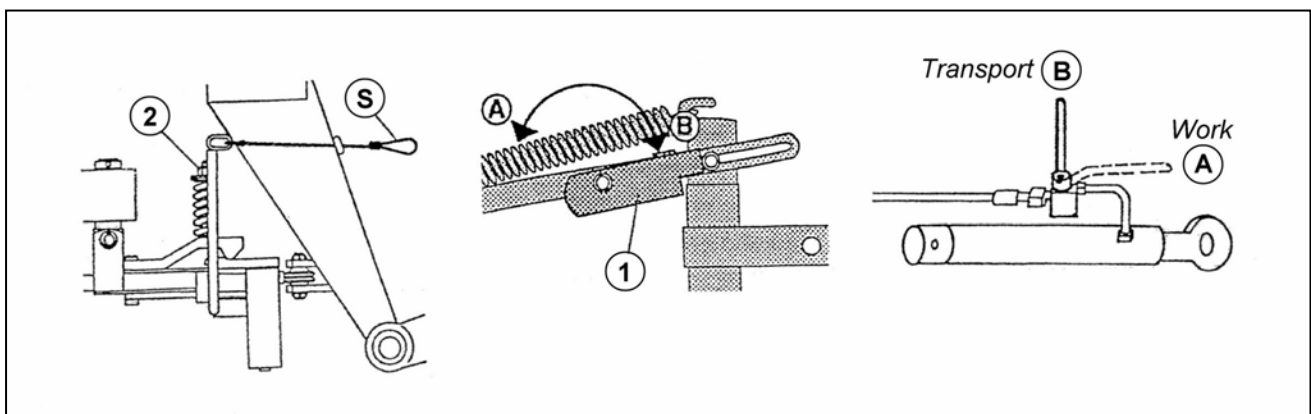
There are 3 positions in which the mower may be transported – positions T1, T2 or T3.

Note: Lifting of the machine into positions T2 & T3 is only possible on models fitted with additional hydraulic equipment (optional).



Transport positions T1 & T3

To move the machine from work position to transport positions T1 & T3 lower the machine almost to the ground on level terrain and whilst the tractor is moving slowly in a forwards direction pull rope 'S' (see diagrams below) to releasing the locking pin allowing the machine to 'swing' round to transport position T1 directly behind the tractor - the machine will automatically lock itself in this position. Check that the machine is correctly locked in the transport position and swing the safety catch (1) from position 'A' to position 'B'. For machines fitted with hydraulic lifting rams only, the cutterbar may now be raised into transport position T3 by operation of the valve on the hydraulic ram from work position 'A' to transport position 'B' and lifted using the tractor hydraulics.



Transport positions T2 – for models fitted with additional hydraulic equipment only.

Transport position T2 is with the cutterbar raised into the vertical position using the hydraulic ram but with the machine left to the side of the tractor rather than swung back behind it.

NOTE: Ensure the machine is clear of the ground by approximately 200mm before lifting the cutterbar with the hydraulic ram.

MOVING FROM TRANSPORT TO WORK POSITION

When moving the machine into work position:

- Ensure a level even site is chosen.
- Never enter the ‘swivelling’ area of the mower bar.
- Never permit anyone to stand between the tractor and the implement.

Procedure

Hydraulic models only

Put hydraulic ram valve tap into work position ‘A’

Lower cutterbar to the ground using hydraulic ram – put tractor hydraulics lever into ‘float’ position.

All models

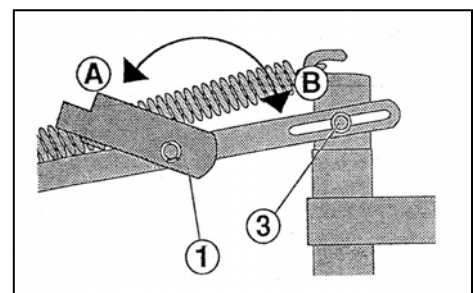
Lower the machine to the ground.

Pull rope ‘S’ whilst slowly moving tractor in a backwards direction to release the locking pin and allow the machine to ‘swing’ into the work position - when working position is reached the machine will automatically lock in place. Check lock has engaged correctly and swing safety catch into position ‘A’.

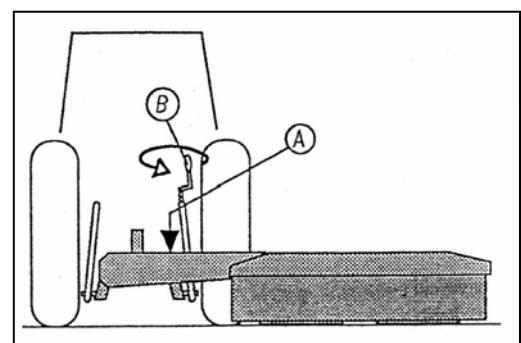
Always ensure the safety catch is in position ‘A’ for work.

Setting the tractor hydraulics

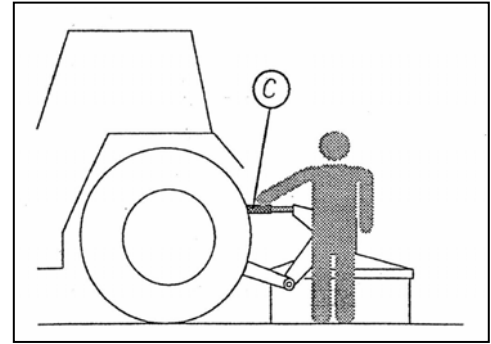
Set the tractor’s lifting system so that the spring lever pin (3) is located approximately in the centre of the linkage bar slot to enable the mower to follow the contours of the ground – see diagram opposite.



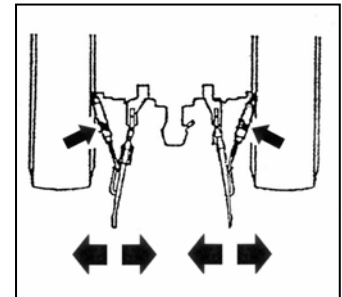
Ensure that the attachment frame (A) is in the horizontal position.



Set cutting height by adjustment of upper link spindle (C).



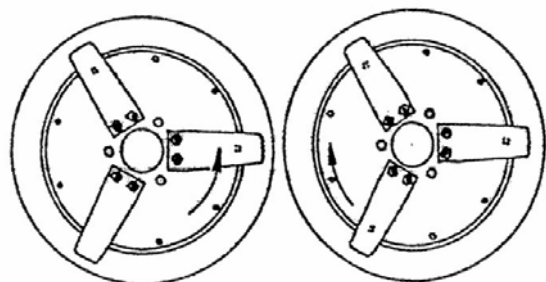
Fasten lower hydraulic links to prevent sideways movement of the mower.



PRECAUTIONS FOR SAFE MOWING

- Ensure each drum is fitted with 3 new or 3 equally outworn knives.
- Two protection ribs must always be fastened to each drum using 'genuine' screws (see diagram on page 7- item 12).
- Always replace damaged or worn drums and knife holders immediately.
- Always stop the machine immediately if increased vibration or increased noise is experienced – continue only when the cause of the problem has been investigated and rectified.
- Never exceed the maximum permitted PTO speed of 540 RPM.

- With prolonged use the knife fixing points on the edge of the upper disc may begin to show signs of wear – the life of these discs can be extended by removing the lower gliding disc, remove the nuts that fasten the upper disc and knives, and turn the upper disc through 40° (1 hole place) - replace nuts and lower gliding disc.

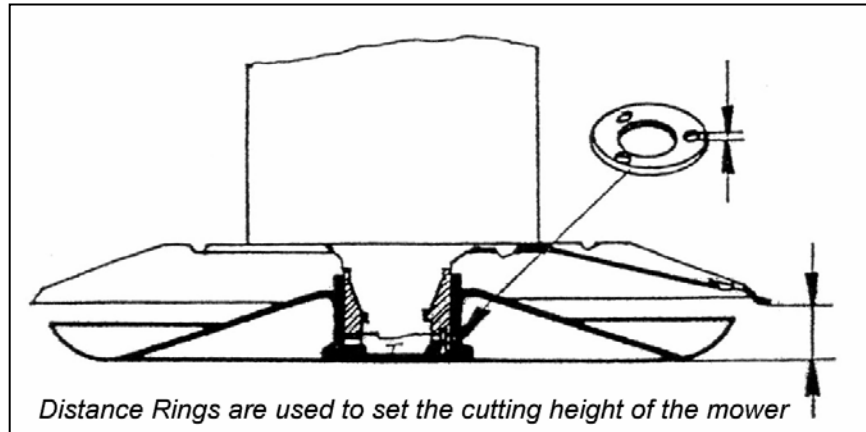


Upper Discs: rotate position for longer wear life

- Check tightness of all nuts and bolts prior to starting work and on a regular basis during work – this is especially important for the nuts on the gearbox cover which is under heavy load during working of the machine.

SETTING THE CUTTING HEIGHT

The cutting height is regulated with the use of 'distance' rings. Each mower is supplied with 4 rings, two of which will be already mounted. Each drum on the mower will take a maximum of 6 rings – where more than 2 rings are to be fitted on a drum the attachment screws need to be changed from 30 mm long to 45 mm long.



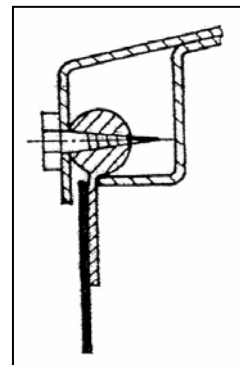
MOWING INSTRUCTIONS

- Allow the machine to reach its maximum PTO speed of 540 RPM before starting to mow and keep the machine at this speed for the duration of the mowing to ensure a clean cut.
- Select the gear that allows best mowing according to the ground conditions.
- Replace blunt or worn knives – sharp knives will give a cleaner and more efficient cut.
- Keep cutterbar parallel to the ground during mowing to allow the machine maximum adjustment to ground undulations.

PROTECTION CURTAIN REPLACEMENT

Removal and replacement of the protection curtain is as follows:

- Undo attachment screws.
- Remove curtain out of the notch.
- Install new curtain and re-fasten with attachment screws.

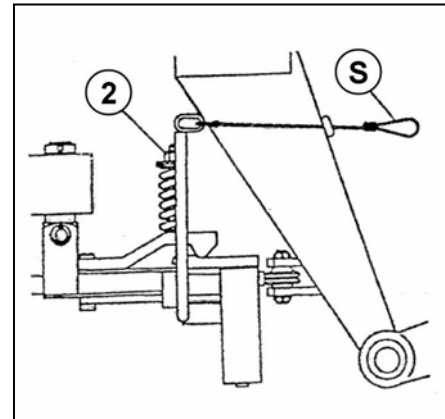


SAFETY 'BREAKBACK'

The mower has a safety system which allows the machine to automatically breakback to a position behind the tractor if contact with a heavy or fixed obstacle is made, thus preventing, or reducing, damage to the machine. When the mower 'breaks back' the tractor should be stopped immediately and reversed backwards to return the mower to the work position - the obstacle should then be removed or avoided to allow continuation of mowing.

NOTE: The 'breakback' system only operates when the machine is moving in a forwards direction.

If it is found that the 'breakback' operates during normal working without any contact with obstructions the sensitivity of the system is incorrectly set – this setting can be altered by adjustment of the spring tensioning nut (2) – see diagram opposite.

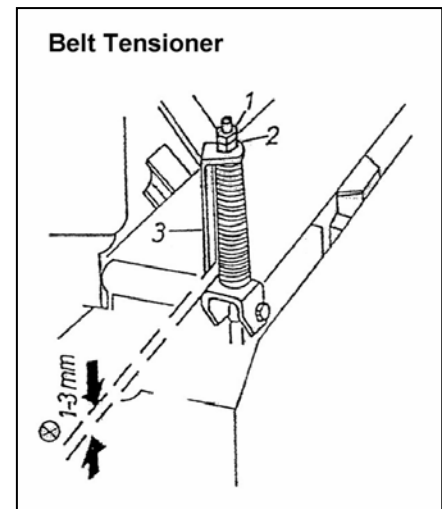


BELTS

The mowing unit is driven by 3 'spring tensioned' vee-belts. If a belt is damaged or worn out all 3 belts should be replaced at the same time.

BELT TENSION

New belts will experience a certain amount of stretching on initial use and will therefore occur during the first working hours of the new machine. The belt tensioner will keep the belts taut but it is advisable that the belt tension is checked regularly and adjusted if necessary during this initial 'running in' period and at regular intervals thereafter.

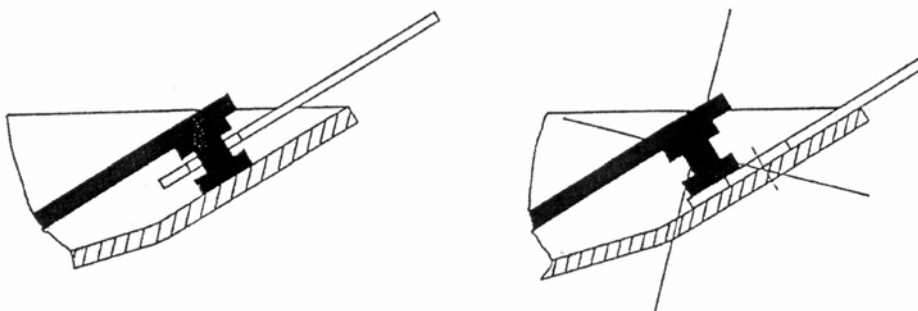


NOTE:

Do not tighten belts more than necessary as this may damage bearings and shafts.

KNIFE REPLACEMENT

When replacing damaged or worn knife blades always replace all the knives on the drum at the same time to retain the equilibrium of the cutting unit. Ensure when replacing the knives that they are correctly positioned on the bolt of the knife holder – see below



MAINTENANCE AND LUBRICATION

Main Frame

Lubricate main frame grease points (5 off) after every 5 hours of work.

PTO Shaft

Lubricate PTO shaft in accordance with the enclosed manufacturer's instructions.

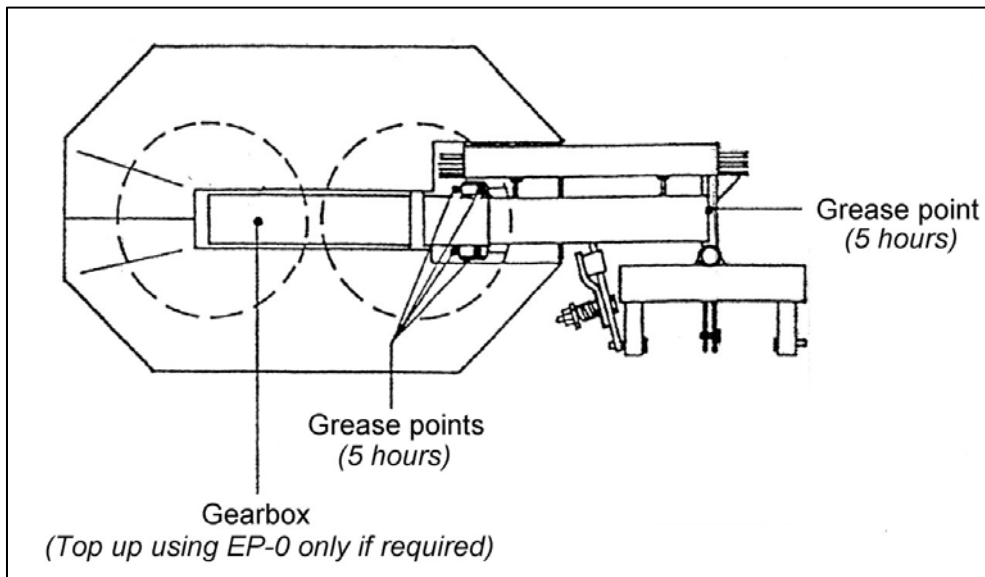
Safety 'Breakback'

Test 'breakback' function occasionally to ensure it works correctly.

Gearbox

The main gearbox is filled with semi-liquid grease EP-0. The grease level must always reach the lower point of the driving shaft. Top up the gearbox using EP-0 only if required.

Checking the level of the semi-liquid grease is via the breather located on the top cover of the gearbox; remove the breather and dip a clean screwdriver or similar suitable tool into the breather hole to determine the depth of grease. The correct level should be 40 – 45mm.



Maintenance Checks

A thorough inspection of the machine should be carried out on a regular basis to check components for excessive wear or damage and, if required, suspect parts replaced.

The specific areas to check are:

Gearbox – check tightness of fasteners & lubrication level

Upper & Lower Discs (Drums) – check for wear and replace worn components if required.

Knife Holders – check for wear and replace worn components if required.

Knives – check for wear and replace over worn knives (replace drum set not single knives)

Protection Covers & Curtains – check for damage or wear, replace if required.

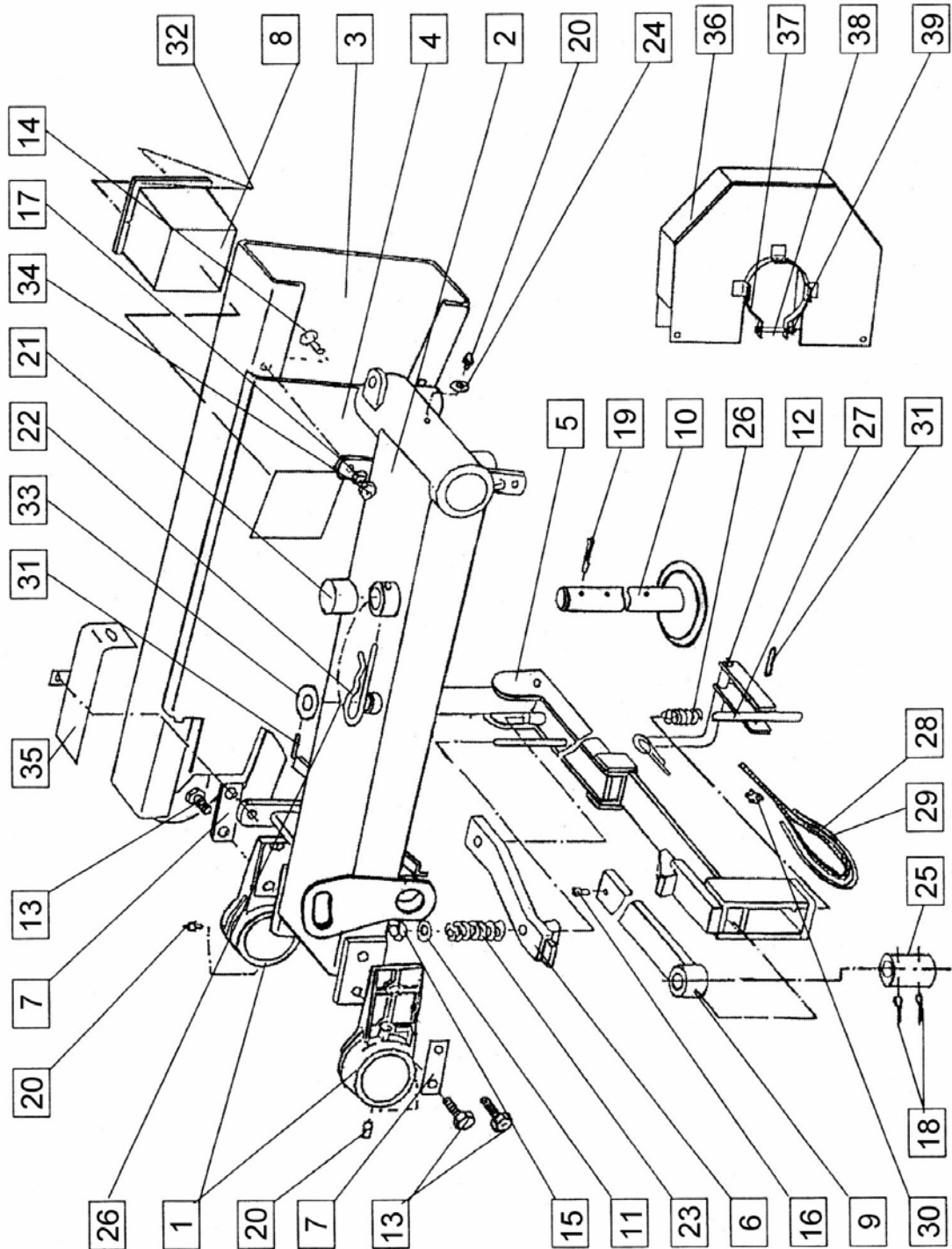
PTO Shaft Guarding – check for damaged/missing components, repair/replace if required.

Lubrication – lubricate machine at the points indicated in the diagram above.

Always clean and check the machine prior to storage to ensure the machine is fully prepared and ready for the next seasons work.

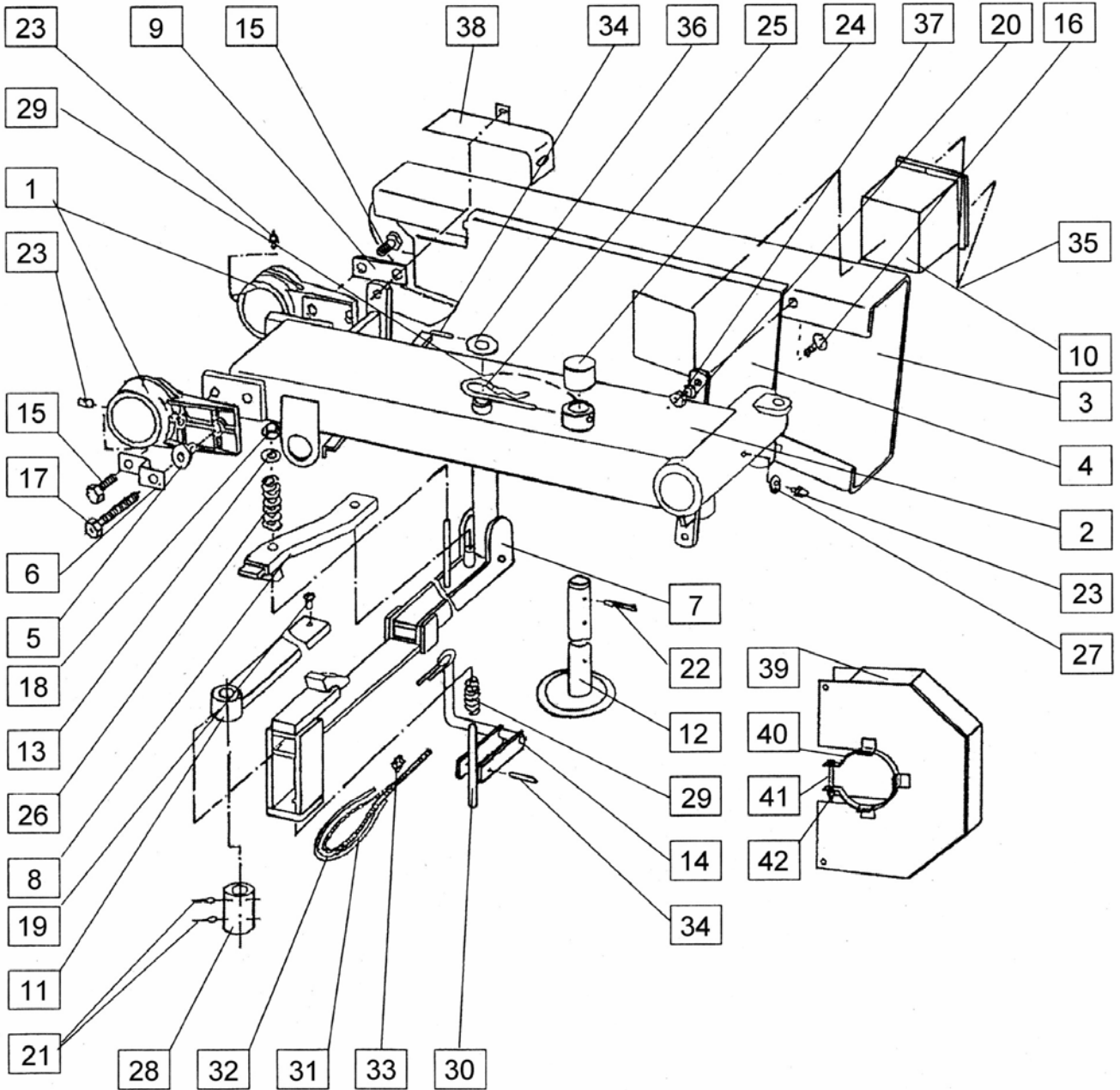
PARTS SECTION
DR165 & DR185
Drum Mowers

MAIN FRAME ASSEMBLY – DR165 Models



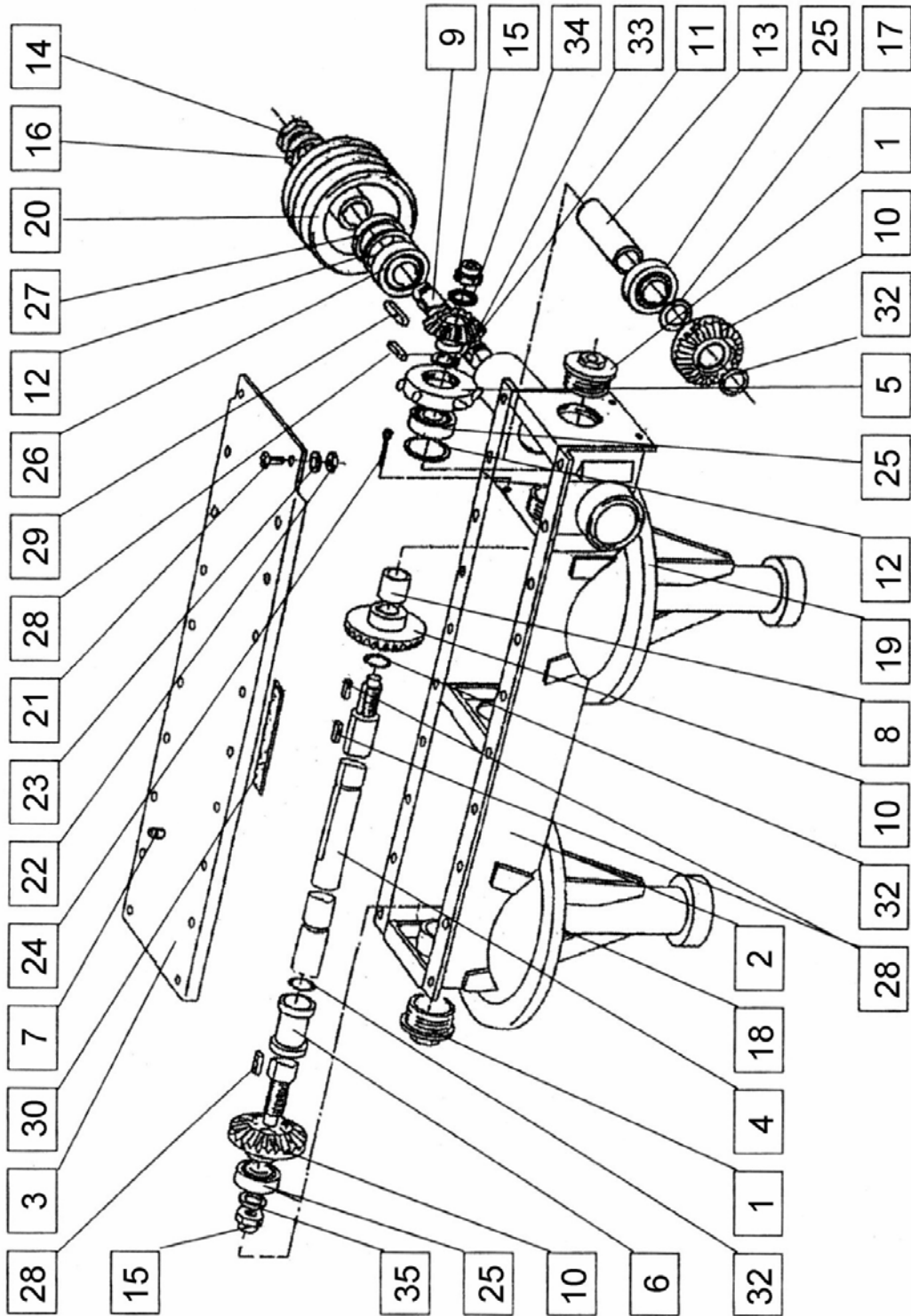
REF.	QTY.	PART No.	DESCRIPTION
			DR165 - MAIN FRAME ASSEMBLY
1	2	1021631	NECK
2	1	1021632	HOLDER
3	1	1021633	PROTECTION CPL.
4	1	1021634	PROTECTION INNER
5	1	1021568	PROTECTION
6	1	1021635	PROTECTION
7	2	1021636	STRIPE 2
8	1	1021637	FRAME
9	1	1021569	LINK
10	1	1021638	SUPPORT LEG
11	1	1021639	WASHER
12	1	1021640	LEVER
13	4	1021641	SCREW
14	4	1021642	SCREW
15	1	1021643	NUT
16	1	1021644	SCREW
17	4	1021226	WASHER
18	1	1021261	COTTER
19	1	1021645	COTTER
20	6	1021063	GREASE NIPPLE
21	1	1021646	COVER
22	1	1021060	SPRING CLIP
23	1	1021647	SPRING
24	1	1021648	WASHER
25	1	1021649	BOLT
26	1	1021650	SPRING
27	1	1021651	BOLT
28	1	1021652	STRING
29	1	1021653	TUBE
30	2	1021654	CLIP
31	2	1021655	TENSION PIN
32	4	1021656	SCREW
33	1	1021657	WASHER SET
34	4	1021179	NUT
35	1	1021658	PROTECTION
36	1	1021659	PROTECTION PLATE
37	1	1021660	CLIP
38	1	1021225	SCREW
39	1	1021628	NUT

MAIN FRAME ASSEMBLY – DR185 Models



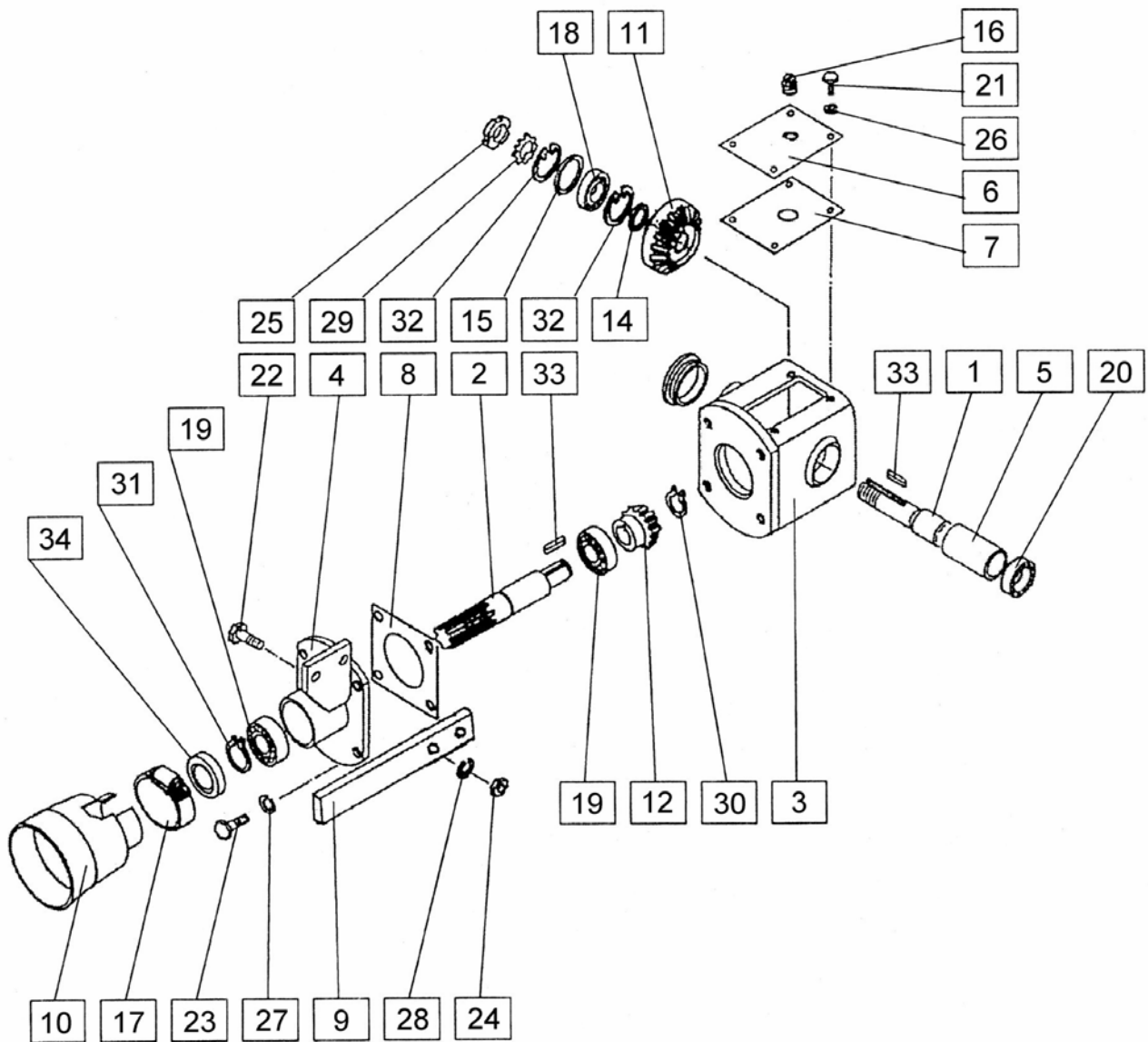
REF.	QTY.	PART No.	DESCRIPTION
			DR185 - MAIN FRAME ASSEMBLY
1	2	1021631	NECK
2	1	1021661	HOLDER
3	1	1021662	PROTECTION CPL.
4	1	1021663	PROTECTION INNER
5	1	1021664	SLEEVE
6	1	1021665	BAND
7	1	1021568	PROTECTION
8	1	1021635	PROTECTION
9	1	1021636	BAND 2
10	1	1021637	FRAME
11	1	1021569	LINK
12	1	1021638	SUPPORT LEG
13	1	1021639	WASHER
14	1	1021640	LEVER
15	1	1021666	SCREW
16	4	1021642	SCREW
17	1	1021667	SCREW
18	1	1021643	NUT
19	1	1021644	SCREW
20	4	1021226	WASHER
21	1	1021261	COTTER
22	1	1021645	COTTER
23	6	1021063	GREASE NIPPLE
24	1	1021646	COVER
25	1	1021060	SPRING CLIP
26	1	1021647	SPRING
27	1	1021648	WASHER
28	1	1021649	BOLT
29	1	1021650	SPRING
30	1	1021651	BOLT
31	1	1021652	STRING
32	1	1021653	TUBE
33	2	1021654	CLIP
34	2	1021655	TENSION PIN
35	4	1021656	SCREW
36	1	1021657	WASHER SET
37	4	1021179	NUT
38	1	1021668	PLATE
39	1	1021659	PROTECTION
40	1	1021660	CLIP
41	1	1021225	SCREW
42	1	1021628	NUT

GEARBOX ASSEMBLY



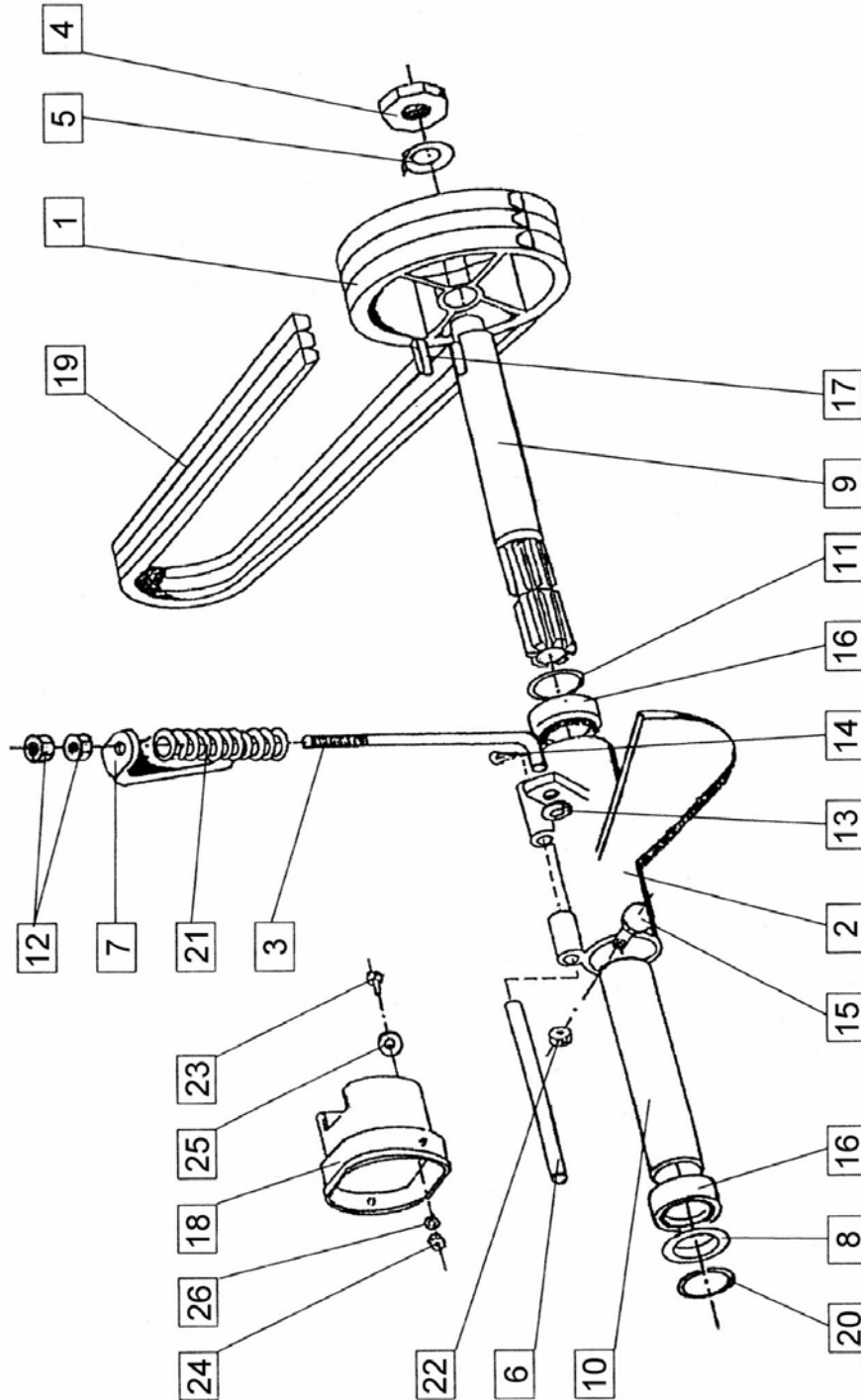
REF.	QTY.	PART No.	DESCRIPTION
DR165 & DR185 - GEARBOX ASSEMBLY			
1	2	1021669	PLASTIC COVER
2	1	1021670	GEARBOX HOUSING - <i>DR165 Models</i>
	1	1021671	GEARBOX HOUSING - <i>DR185 Models</i>
3	1	1021672	GEARBOX COVER - <i>DR165 Models</i>
	1	1021673	GEARBOX COVER - <i>DR185 Models</i>
4	1	1021519	SHAFT - <i>DR165 Models</i>
	1	1021563	SHAFT - <i>DR185 Models</i>
5	1	1021674	NUT
6	1	1021522	SLEEVE
7	1	1021675	BLEED SCREW
8	1	1021676	SLEEVE
9	1	1021520	SHAFT
10	3	1021523	PINION
11	1	1021524	WASHER
12	1	1021512	WASHER
13	1	1021677	DISTANCE TUBE
14	1	1021678	NUT
15	2	1021553	NUT
16	1	1021613	WASHER
17	1	1021511	WASHER
18	1	1021679	COVER
19	1	1021680	COVER
20	1	1021557	PULLEY
21	15	9313045	SCREW - <i>DR165 Models</i>
	18	9313045	SCREW - <i>DR185 Models</i>
22	16	1021179	NUT - <i>DR165 Models</i>
	13	1021179	NUT - <i>DR185 Models</i>
23	16	1021226	WASHER - <i>DR165 Models</i>
	18	1021226	WASHER - <i>DR185 Models</i>
24	1	1021681	COTTER
25	3	1021540	BEARING
26	1	1021537	BEARING
27	1	1021504	OIL SEAL
28	4	1021507	KEY
29	1	1021535	KEY
30	1	1021682	SEAL PASTE
31	2	1021683	O SEAL
32	3	1021684	ELASTIC RING
33	1	1021521	GEAR
34	1	1021685	WASHER - <i>DR165 Models</i>
	1	1021686	WASHER - <i>DR185 Models</i>
35	1	1021687	WASHER

DRIVE ASSEMBLY



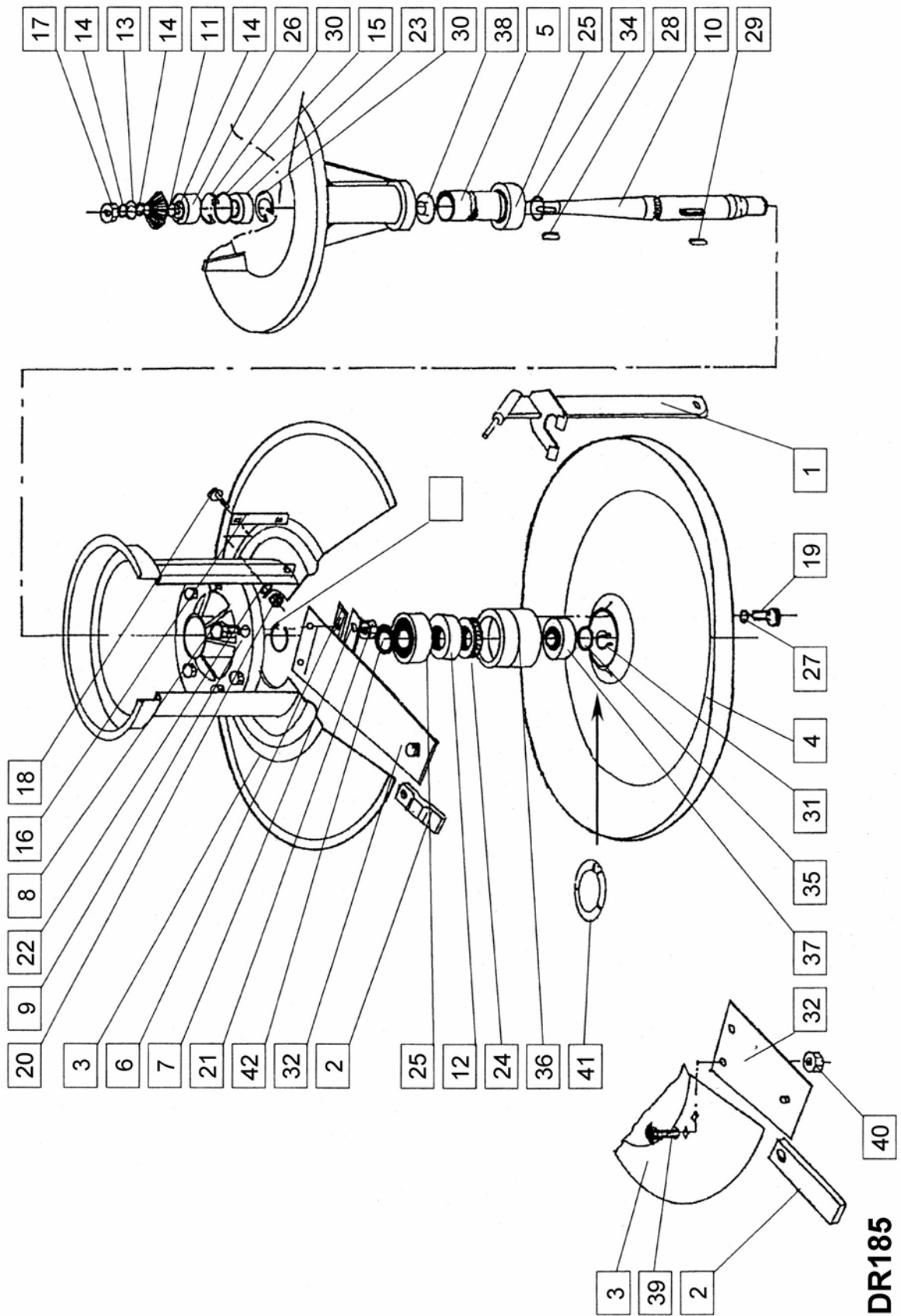
REF.	QTY.	PART No.	DESCRIPTION
			DR165 & DR185 - DRIVE ASSEMBLY
1	1	1021788	SHAFT
2	1	1021789	SHAFT
3	1	1021790	GEARBOX
4	1	1021791	TUBE
5	1	1021792	SLEEVE
6	1	1021793	PLATE
7	1	1021794	SEAL
8	1	1021795	PLATE
9	1	1021796	BAND
10	1	1021797	PTO SHAFT PROTECTION
11	1	1021510	PINION
12	1	1021518	PINION
13	1	1021669	PLASTIC COVER <i>(not illustrated)</i>
14	1	1021798	WASHER
15	1	1021512	WASHER
16	1	1021799	SCREW
17	1	1021800	CLAMP
18	1	1021250	BEARING
19	2	1021801	BEARING
20	1	1021802	BEARING
21	4	1021803	SCREW
22	2	9313066	SCREW
23	4	9313056	SCREW
24	2	1021169	NUT
25	1	1021804	NUT
26	4	1021698	WASHER
27	4	1021805	WASHER
28	2	1021806	WASHER
29	1	1021807	WASHER
30	1	1021808	CIRCLIP
31	1	1021080	CIRCLIP
32	2	1021701	CIRCLIP
33	2	1021809	KEY
34	1	1021810	OIL SEAL

BELT DRIVE ASSEMBLY



REF.	QTY.	PART No.	DESCRIPTION
			DR165 & DR185 - BELT DRIVE ASSEMBLY
1	1	1021556	PULLEY
2	1	1021610	BEARING HOUSING
3	1	1021611	TENSIONER
4	1	1021612	NUT
5	1	1021613	WASHER
6	1	1021614	BOLT
7	1	1021615	SUPPORT
8	1	1021616	COVER
9	1	1021528	SHAFT
10	1	1021617	DISTANCE TUBE
11	1	1021618	WASHER
12	2	1021619	NUT
13	1	1021620	WASHER
14	1	1021621	COTTER
15	1	1021622	SCREW
16	2	1021623	BEARING
17	1	1021624	COTTER
18	1	1021625	PTO SHAFT PROTECTION
19	3	1021508	VEE BELT - <i>DR165 Models</i>
	3	1021539	VEE BELT - <i>DR185 Models</i>
20	1	1021626	ELASTIC RING
21	1	1021627	SPRING
22	1	1021628	NUT
23	2	9313045	SCREW
24	2	1021179	NUT
25	2	1021629	WASHER
26	2	1021630	WASHER

DRUM ASSEMBLY

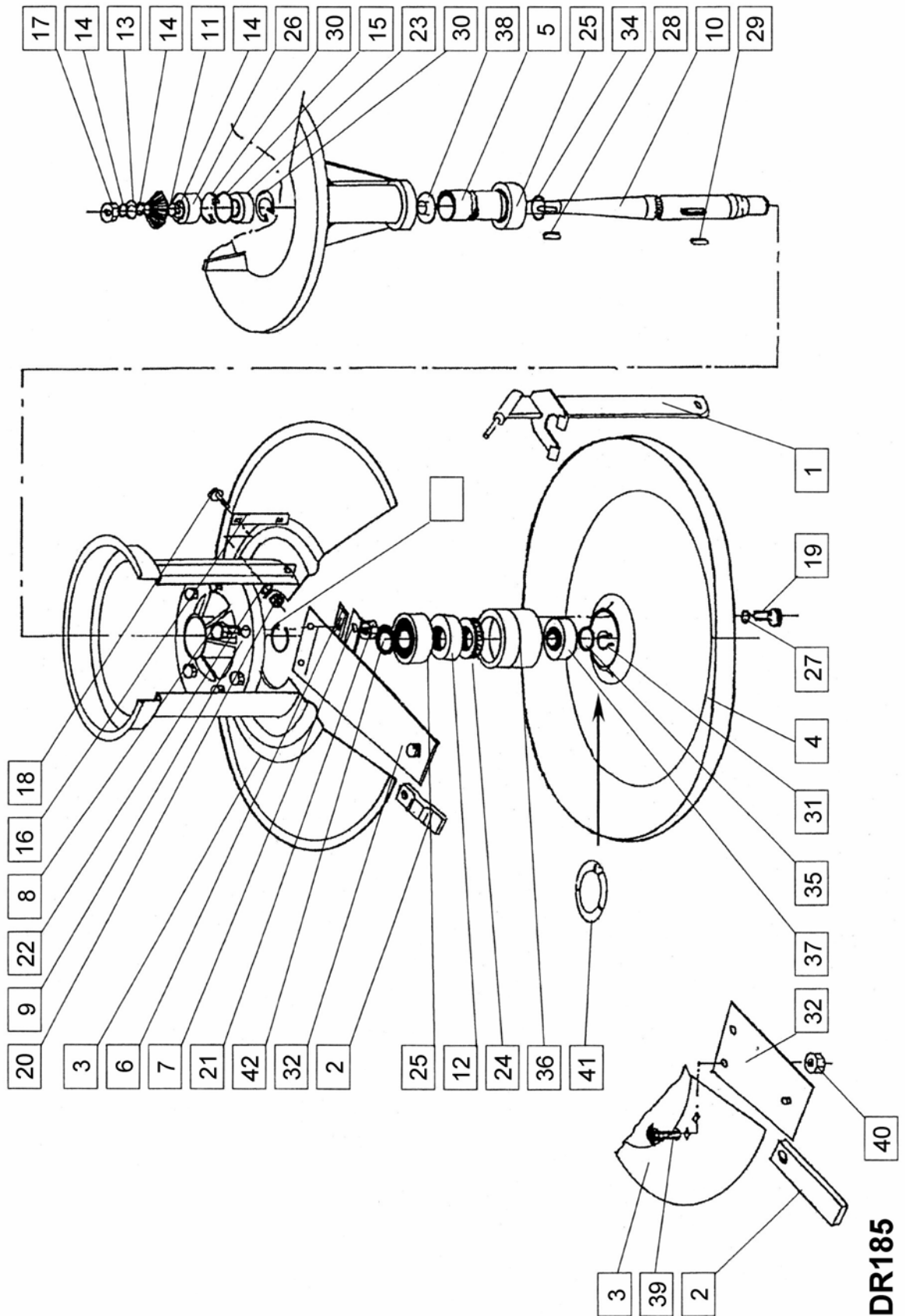


DR185

REF.	QTY.	PART No.	DESCRIPTION
			DR165 & DR185 - DRUM ASSEMBLY
1		1021688	KEY
2		1021689	KNIFE - <i>DR165 Models</i>
		1021554	KNIFE - <i>DR185 Models</i>
3		1021513	UPPER DISC - <i>DR165 Models</i>
		1021560	UPPER DISC - <i>DR185 Models</i>
4		1021514	LOWER DISC - <i>DR165 Models</i>
		1021562	LOWER DISC - <i>DR185 Models</i>
5		1021690	DISTANCE TUBE
6		1021096	DISTANCE PLATE
7		1021098	PROTECTION PLATE
8		1021691	SCREW - <i>DR165 Models</i>
		1021692	SCREW - <i>DR185 Models</i>
9		1021693	FLANGE
10		1021525	SHAFT - <i>DR165 Models</i>
		1021561	SHAFT - <i>DR185 Models</i>
11		1021516	PINION
12		1021694	DISTANCE RING
13		1021543	WASHER
14		1021684	WASHER
15		1021512	WASHER
16		1021708	PROTECTION FLANGE
17		1021546	NUT
18		1021695	SCREW
19		1021696	SCREW
20		1021697	NUT
21		1021619	NUT
22		1021698	WASHER
23		1021500	BEARING
24		1021502	BEARING
25		1021501	BEARING
26		1021251	OIL SEAL
27		1021699	O RING
28		1021700	KEY
29		1021535	KEY
30		1021701	CIRCLIP
31		1021080	CIRCLIP
32		1021515	KNIFE HOLDER - <i>DR165 Models</i>
		1021558	KNIFE HOLDER - <i>DR185 Models</i>
33		1021702	ELASTIC RING
34		1021703	WASHER
35		1021124	WASHER

Cont'd ...

DRUM ASSEMBLY - Continued

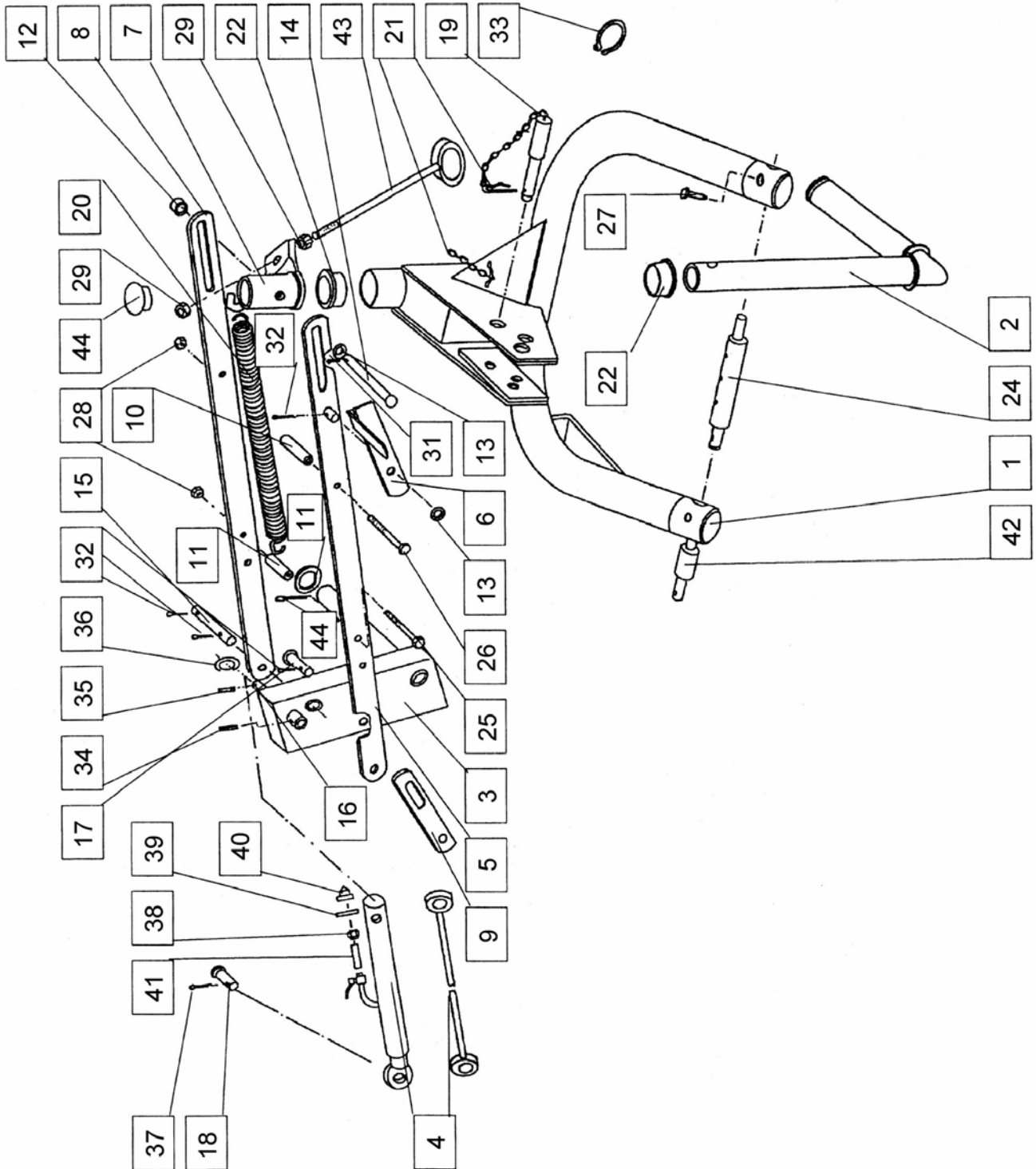


DR185



REF.	QTY.	PART No.	DESCRIPTION
			DR165 & DR185 - DRUM ASSEMBLY (Cont'd)
36		1021544	BEARING HOUSING
37		1021023	BEARING
38		1021704	TENSION RING
39		1021559	SCREW - <i>DR185 Models</i>
40		1021532	NUT - <i>DR185 Models</i>
41		1021705	DISTANCE WASHER
42		1021706	WASHER - <i>DR165 Models</i>
		1021707	SLEEVE - <i>DR185 Models</i>

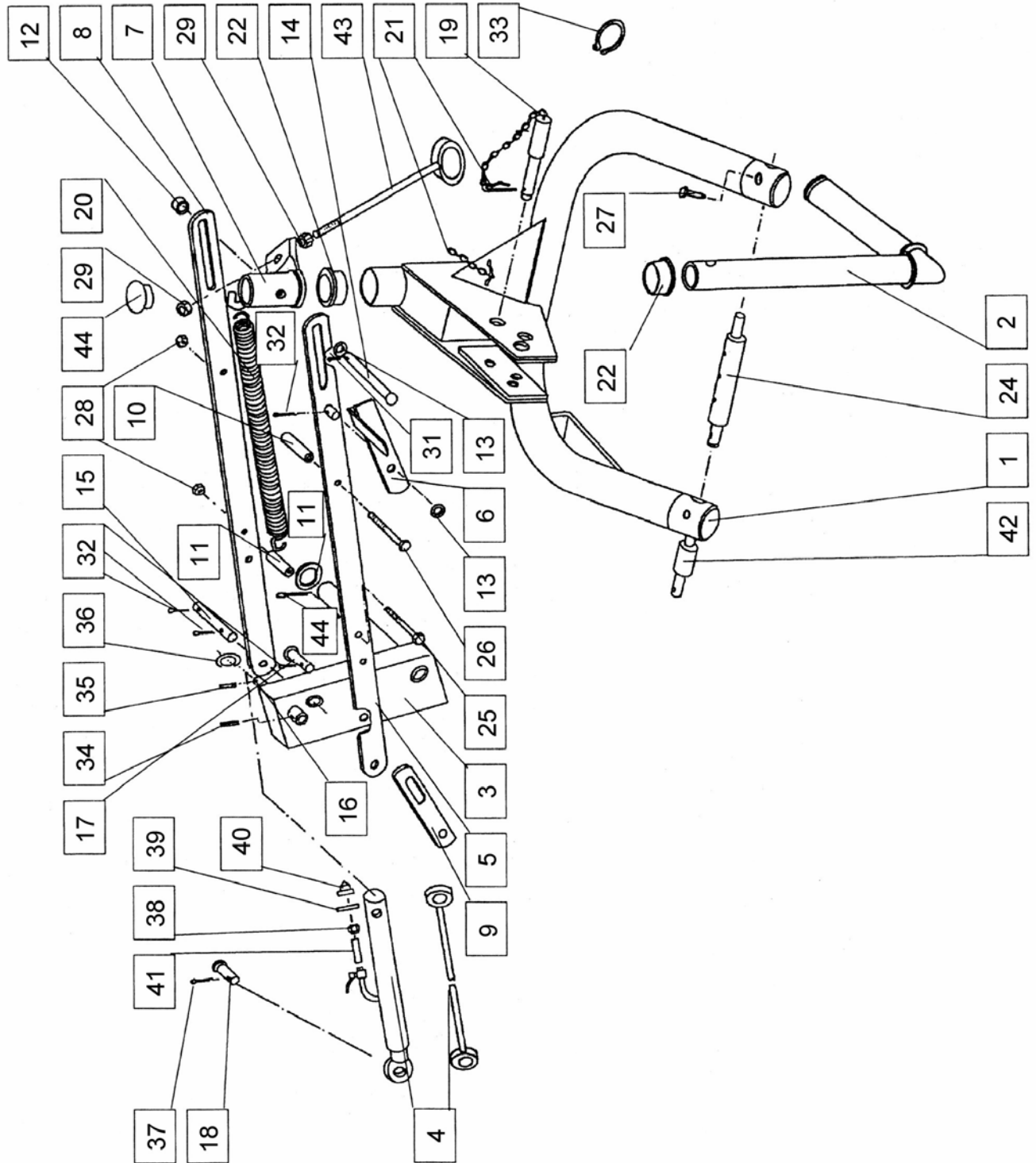
HITCH FRAME



REF.	QTY.	PART No.	DESCRIPTION
DR165 & DR185 - HITCH FRAME ASSEMBLY			
1	1	1021709	HITCH
2	1	1021567	LEVER
3	1	1021710	LEVER - <i>DR165 Models</i>
	1	1021711	LEVER - <i>DR185 Models</i>
4	1	1021712	LINKING BAR
	1	1021713	HYDRAULIC CYLINDER
5	1	1021714	LINKING BAR - <i>DR165 Models</i>
	1	1021715	LINK - <i>DR185 Models</i>
6	1	1021716	LINK
7	1	1021717	SAFETY DEVICE - <i>DR165 Models</i>
8	1	1021718	LINK 2 - <i>DR165 Models</i>
	1	1021719	LINK 2 - <i>DR185 Models</i>
9	1	1021720	LIMITER - <i>DR185 Models</i>
10	1	1021721	DISTANCE SLEEVE
11	1	1021722	DISTANCE SLEEVE
12	1	1021723	SLEEVE
13	4	1021153	WASHER
14	1	1021724	BOLT
15	1	1021725	BOLT
16	1	1021726	BOLT
17	1	1021727	BOLT - <i>DR165 Models</i>
	1	1021649	BOLT - <i>DR185 Models</i>
18	1	1021728	BOLT
19	1	1021729	BOLT
20	1	1021517	SPRING
21	1	1021730	SAFETY WIRE
22	2	1021608	PLASTIC SLEEVE
23	1	1021731	WASHER
24	1	1021732	BOLT
25	1	1021733	SCREW - <i>DR165 Models</i>
26	1	1021734	SCREW
27	2	1021735	SCREW
28	2	9113005	NUT
29	2	1021619	NUT
30	1	1021736	COTTER
31	1	1021737	COTTER
32	7	1021621	COTTER
33	1	1021102	CIRCLIP
34	1	1021738	TENSION PIN
35	1	1021591	TENSION PIN
36	1	1021739	WASHER

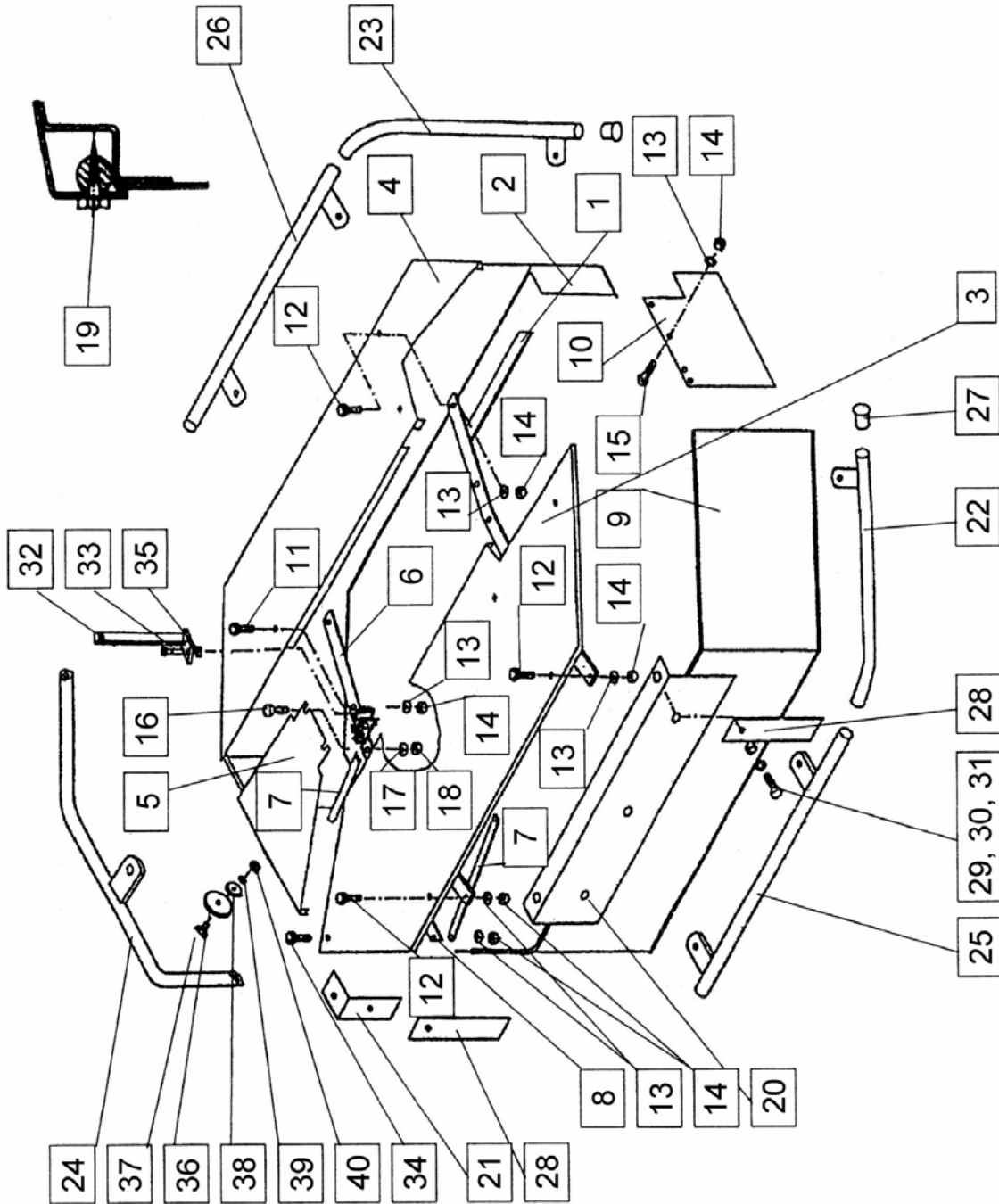
Cont'd....

HITCH FRAME (Continued)



REF.	QTY.	PART No.	DESCRIPTION
			DR165 & DR185 - HITCH FRAME ASSEMBLY
37	1	1021079	COTTER PIN
38	1	1021740	GEARBOX
39	1	1021741	GASKET
40	1	1021742	PIN
41	1	1021743	TUBE
42	1	1021744	BOLT
43	1	1021745	BUSH
44	1	1021811	PLASTIC STOPPER

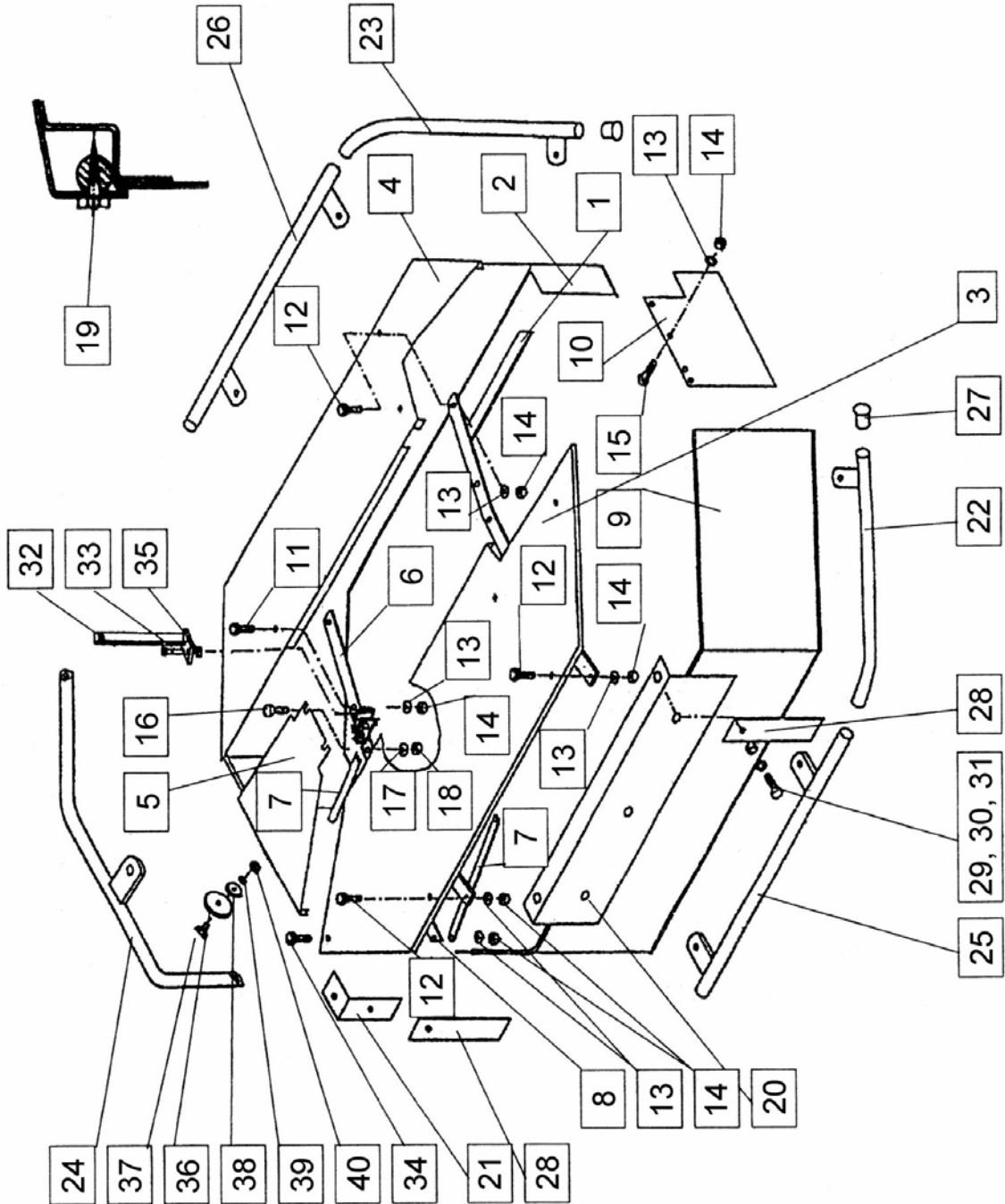
PROTECTION



REF.	QTY.	PART No.	DESCRIPTION
DR165 & DR185 - PROTECTION			
1	1	1021747	LINK - <i>DR165 Models</i>
	1	1021748	LINK - <i>DR185 Models</i>
2	1	1021527	REAR CURTAIN - <i>DR165 Models</i>
	1	1021564	REAR CURTAIN - <i>DR185 Models</i>
3	1	1021749	FRONT COVER PLATE - <i>DR165 Models</i>
	1	1021750	FRONT COVER PLATE - <i>DR185 Models</i>
4	1	1021751	REAR COVER PLATE - <i>DR165 Models</i>
	1	1021752	REAR COVER PLATE - <i>DR185 Models</i>
5	1	1021753	SIDE COVER PLATE - <i>DR165 Models</i>
	1	1021754	SIDE COVER PLATE - <i>DR185 Models</i>
6	1	1021755	TIE - <i>DR165 Models</i>
	1	1021756	LINK - <i>DR185 Models</i>
7	2	1021757	REINFORCEMENT - <i>DR165 Models</i>
	2	1021758	REINFORCEMENT - <i>DR185 Models</i>
8	1	1021759	LINK - <i>DR165 Models</i>
	1	1021760	LINK - <i>DR185 Models</i>
9	1	1021526	FRONT CURTAIN - <i>DR165 Models</i>
	1	1021565	FRONT CURTAIN - <i>DR185 Models</i>
10	1	1021761	PLATE
11	4	1021762	SCREW
12	7	1021763	SCREW
13	13	1021764	WASHER
14	16	1021173	NUT
15	3	1021765	SCREW
16	4	1021766	SCREW
17	4	1021226	WASHER
18	4	1021179	NUT
19	8	1021767	SCREW
20	1	1021768	PROTECTION - <i>DR165 Models</i>
	1	1021769	PROTECTION - <i>DR185 Models</i>
21	1	1021770	SPRING HOLDER
22	1	1021771	FRONT LINK - <i>DR165 Models</i>
	1	1021772	FRONT LINK - <i>DR185 Models</i>
23	1	1021773	REAR LINK - <i>DR165 Models</i>
	1	1021774	REAR LINK - <i>DR185 Models</i>
24	1	1021775	SIDE PROTECTION - <i>DR165 Models</i>
	1	1021776	SIDE PROTECTION - <i>DR185 Models</i>
25	1	1021777	FRONT PROTECTION - <i>DR165 Models</i>
	1	1021778	FRONT PROTECTION - <i>DR185 Models</i>
26	1	1021779	REAR PROTECTION - <i>DR165 Models</i>
	1	1021780	REAR PROTECTION - <i>DR185 Models</i>

Cont'd ...

PROTECTION - Continued



REF.	QTY.	PART No.	DESCRIPTION
			DR165 & DR185 - PROTECTION (Cont'd)
27	2	1021781	COVER
28	4	1021782	STEEL REINFORCEMENT
29	5	1021783	SCREW
30	5	1021148	WASHER
31	5	9113003	NUT
32	1	1021784	HOLDER
33	1	1021785	SCREW
34	2	1021786	SCREW
35	1	9113005	NUT
36	1	1021197	REFLECTING PLATE - RED
37	1	1021189	SCREW
38	1	1021191	WASHER
39	1	1021196	SPRING WASHER
40	1	1021194	NUT