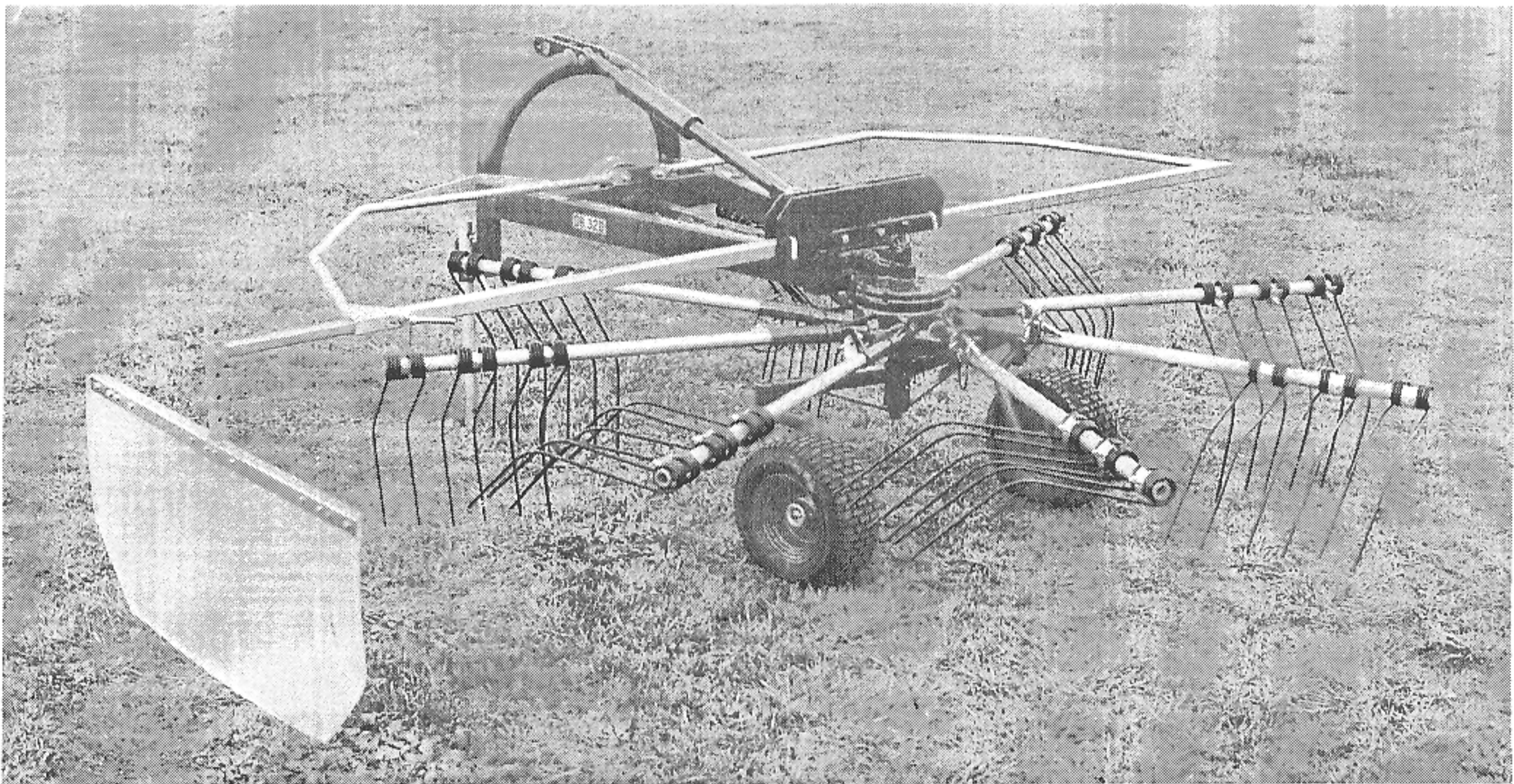


OPERATOR'S MANUAL AND SPARE PARTS

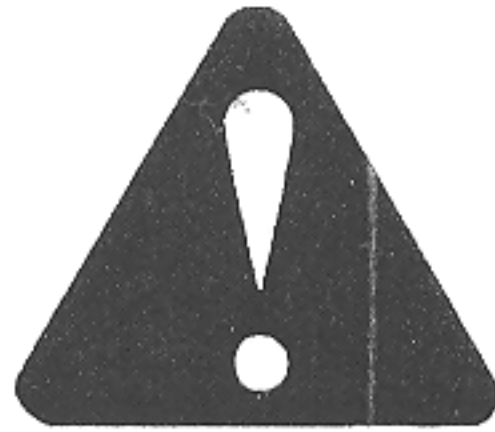
ONE WINDROW ROTARY RAKES

Mod. RR 320 ONLY ONE WINDROW



EDITION JANUARY 2006

SAFETY WARNING DECALS



DANGER

THE SYMBOL ABOVE CALLS YOUR ATTENTION TO INSTRUCTION CONCERNING YOUR PERSONAL SAFETY.

THE SAFETY AND INFORMATION DECALS ON THIS UNIT ARE INSTALLED TO ALERT OPERATORS TO DANGERS IN SPECIFIC MACHINE AREAS.

READ AND UNDERSTAND TO AVOID PERSONAL INJURY OR DEATH.



1. Read and understand the Operator's Manual.
2. Stop tractor engine and set parking brake before leaving operator's platform.
3. Keep riders off the machine.
4. Make certain everyone is clear of the machine before starting the tractor engine and operating.
5. Keep all shields in place.
6. Never lubricate, adjust, unclog, or service the machine with tractor engine running.
7. Wait for all movements to stop before servicing.
8. Keep hands, feet, and clothing away from moving parts.
9. Use flashing warning lights when operating on highways except when prohibited by law.
10. Maximum transport speed should not exceed 20 miles per hour.
11. Tractor must be equipped with Rollover Protective Structure (ROPS) and seatbelt.



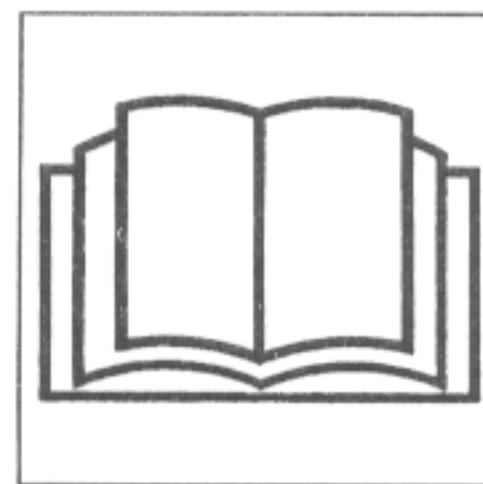
DANGER

- Crushing of torso-force applied from side.
- Stay clear of rake when opening or closing.
- Failure to heed this warning may result in personal injury or death.
- Keep clothing, yourself and others well clear.

1 SAFETY WARNING DECALS



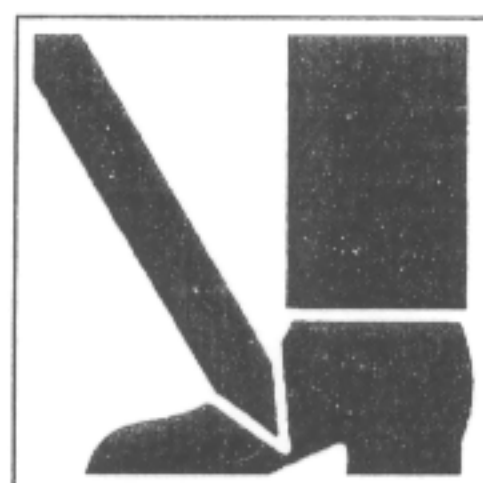
WARNING:
Heed the warning.
Be alert-Your safety is
involved.



WARNING:
Read and understand
operator's manual.



DANGER:
Stay clear to avoid
entanglement.



DANGER:
Crushing of toes or foot-
force applied from above.



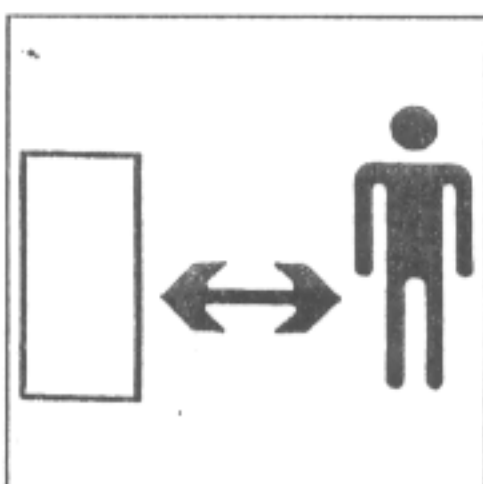
DANGER:
Crushing of fingers or
hands. Force applied from
side.



DANGER:
Crushing of whole body-
force applied from above.



DANGER:
Keep away from rotating
driveline.



DANGER:
All persons must keep
at a safety distance of
at least 5 meters.

2 TECHNICAL DATA AND SPECIFICATIONS

The Mod. RR 320 has been specially designed to make the lateral windrow.
RR 320 model can be mounted on tractors having specifications as described herebelow.

DRAWING LEGEND:

M: Counterweight weight in Kg.

N1: Weight of RR 320

G1: Weight on front axles
without counterweights but
with RR 320 mounted.

B: Distance between center
of gravity of weight and rear
tractor axle in mm.

L4: Tractor wheelbase in mm.

L3: Distance between center of
gravity of counterweight and
axles in mm.

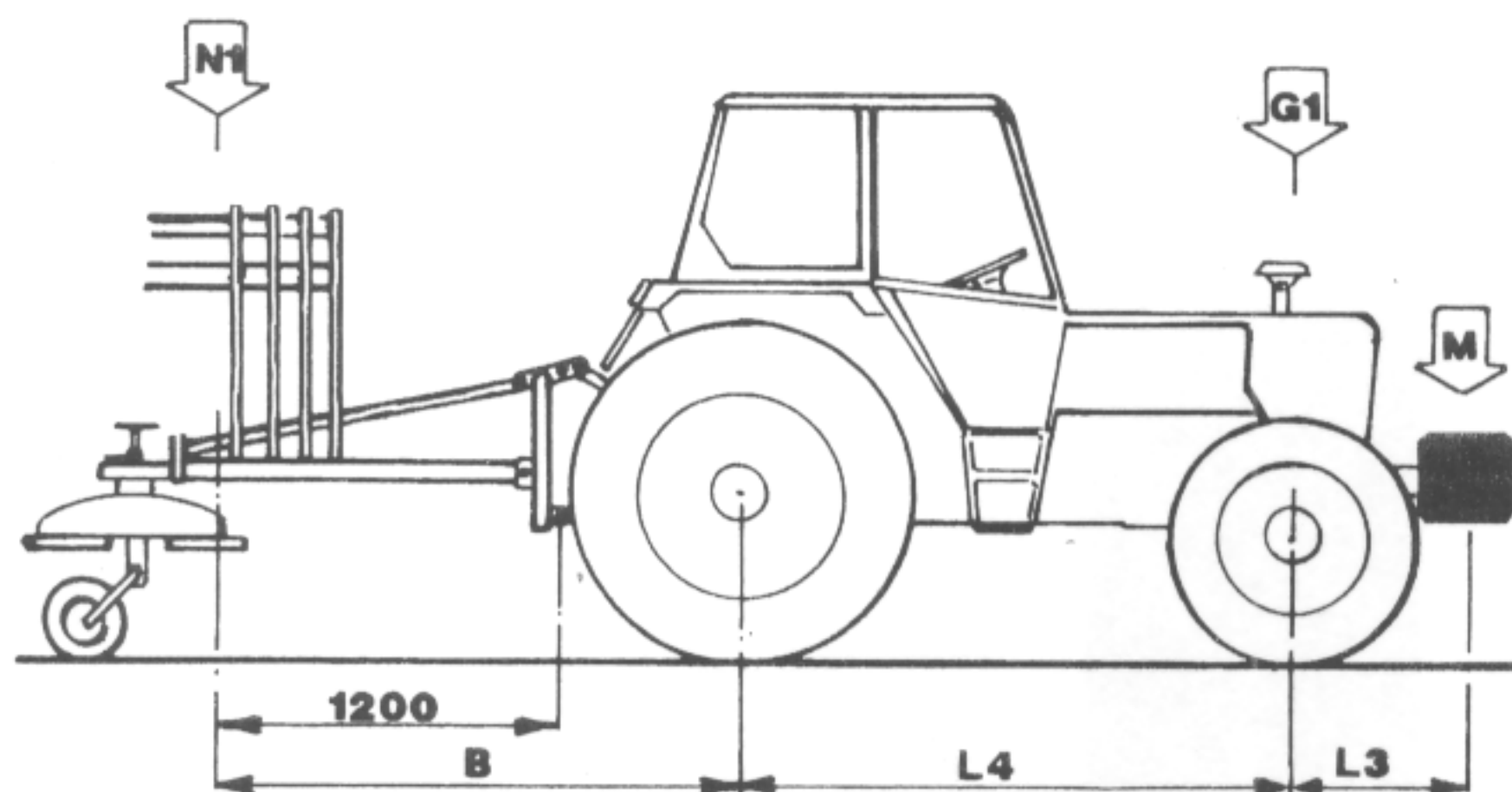


FIG. 2.1

When connecting RR 320 we have an axial load unbalance of tractor. We recommend to verify stability of tractors and eventually use counterweights to ensure maximum safety during working operations.

To verify if counterweights are necessary calculate below indicated equations: counterweights are not necessary if first equation is equal or lower to second equation.

$$N1 \times B \leq 0,66 \times (G1 \times L4)$$

If first equation is superior to second then counterweights must be put on tractor using the formula herebelow indicated to calculate counterweights necessary.

$$\text{Counterweights (in Kg.)} = (N1 \times B : 0,66 - G1 \times L4) : (L3 + L4)$$

2 TECHNICAL DATA AND SPECIFICATIONS

TABLE 1	RR 320
Weight in kilos (kg)	308
Maximum projection in working conditions (Mt.)	2,95
Maximum projection during transport in (Mt.)	1,95
Maximum width during working operations (Mt.)	2,8 ÷ 3,2
Maximum width during transport (Mt.)	1,20
N. of arms	8
N. of teeth	24
Tires (15 · 6.00 x 6)	2
P.T.O. speed max.	540
Rotor speed (rev/min)	79,4
Driveline	with torque limiter
(Nm)	450
Working speed (Km/h.)	15
HP required (Km/Cv)	14,7/20



Never use machine for other operations besides those herein specified. Above all never use unit to transport persons or objects.

3 OPERATING INSTRUCTIONS



- Assembly: if unit is shipped disassembled due to transport reasons, assembly must be carried out by specialized personell with a good knowledge of these type of machines and must refer to drawings herewith contained in operator's manual.
- Hitching to tractors: first connect unit to two lower links of tractor power lift and fasten with pin clips. Then connect third point hitch and adjust its lenght.
Bush « A » (see drawing below Fig. 3.1) must be only used with II category links.



- When connecting P.T.O. driveline follow instructions supplied by manufacturer of same (see enclosed instructions).
For your safety please follow these preliminary precautions:
 1. Mount P.T.O. shaft having the correct lenght to tractor and make sure all tollerances are respected especially when closed.
 2. Respect assembly orientation indicated on P.T.O. driveline.
 3. Hook and lock chain in place.

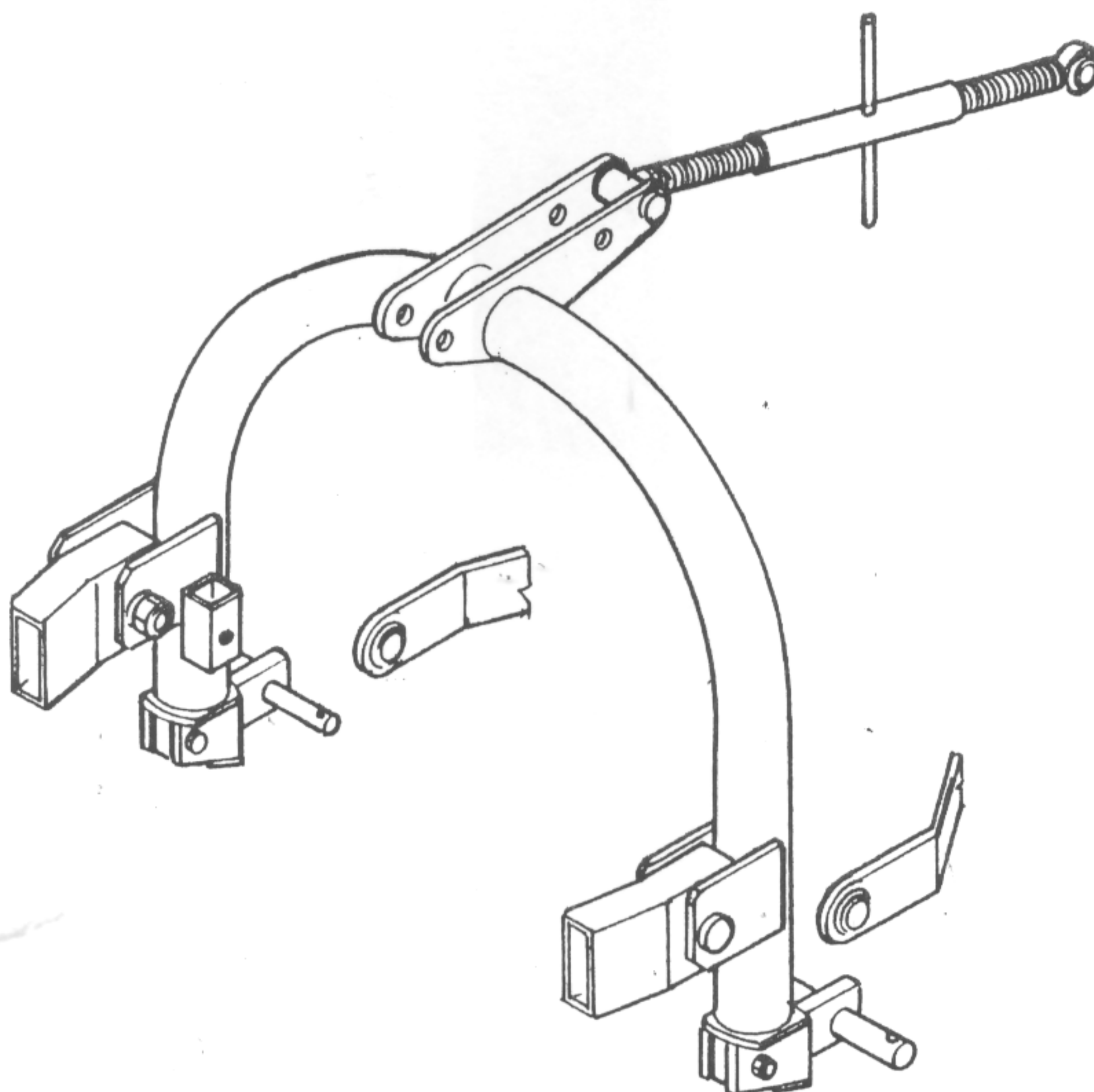


FIG. 3.1

4 SAFETY



- This chapter is important for the safety of the operator. Read and understand operator's manual.
- Machine must be used only by prepared and qualified personnel. Before carrying out any type of operation (maintenance, adjustments, hitching, unhitching) always:
 1. disengage P.T.O.
 2. set brakes.
 3. shut off tractor engine.
- During working operations, operator must make sure that bystanders are clear and faraway from unit even if machine is fitted with protection guards (see Fig. 4.1) to prevent impact of tine arms.
- Before using machine make sure all nuts and bolts are well tightened especially those of tine arms.

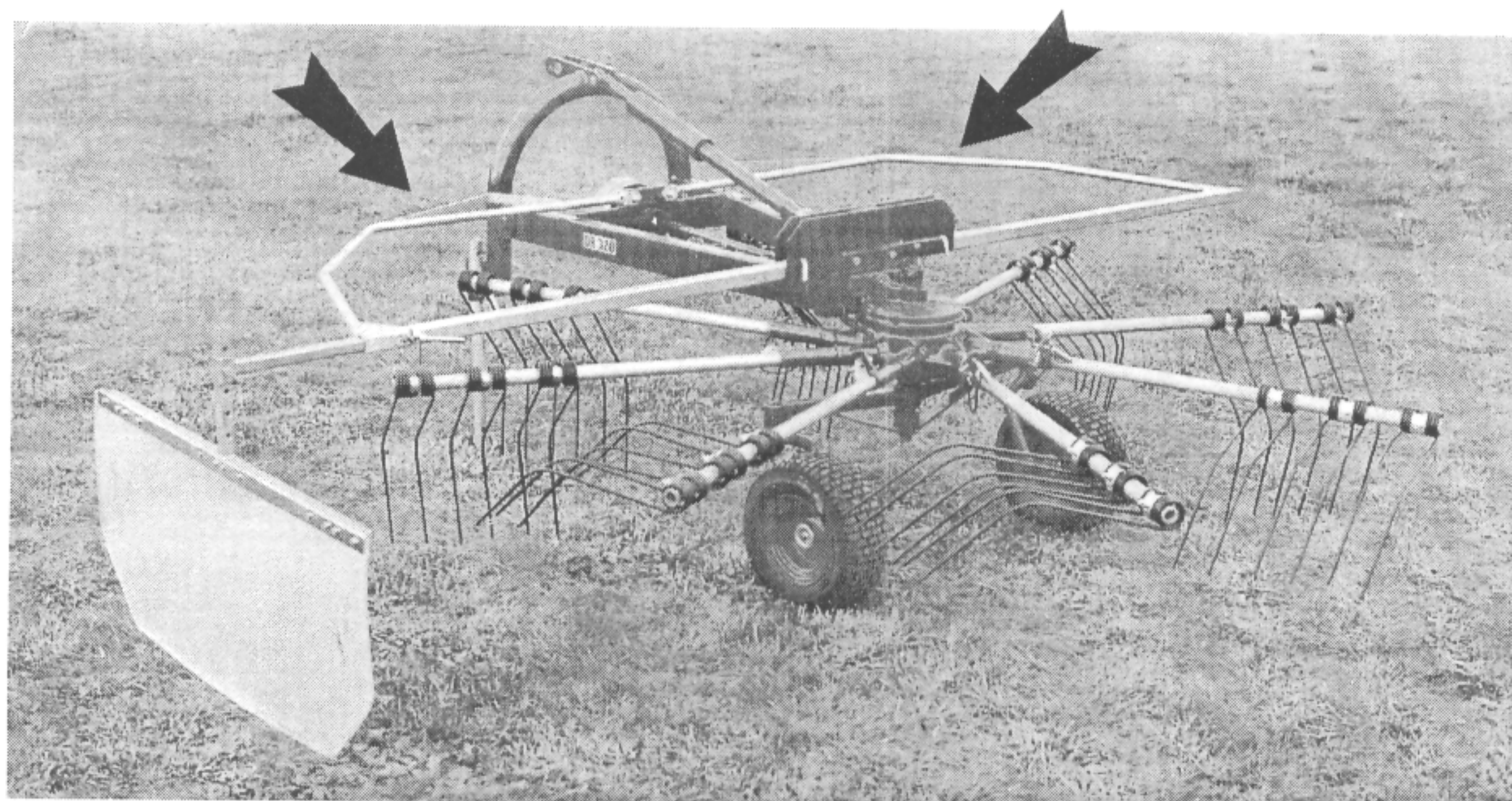


FIG. 4.1

- Make sure all protection guards are in place, if damaged replace immediately.
- Check the driveline shields to ensure free rotation and telescoping action. Restrain shields with chains provided to prevent shield rotation. Always follow P.T.O. manufacturer recommendations and read operator's manual. Be sure bystanders are clear from unit before operating tractor or machine.
- If P.T.O. begins to slip for too long disconnect immediately.
- Remove tractor start key when carrying out control or maintenance operations.
- Wear personal protective equipment. Avoid wearing loose-fitting clothing that can be caught in moving parts.
- Do not allow children to ride on, play on or operate equipment. Always keep children away from equipment operating, servicing and storage areas.
- Before transporting unit on public roads make sure same is in conformity to highway regulations of country.
- Be sure tractor is in safe operating condition, and has adequate braking capabilities. Remember that weight of machine affects stability of tractor.

5 WORKING POSITIONS ADJUSTMENTS / PREPARING UNIT FOR THE FIELD



— Warning! Before making adjustments stop tractor engine, disengage P.T.O., remove keys from dashboard, shift to park position and set brakes.

This unit can perform one function only: lateral windrow.

(1) LATERAL WINDROW (Fig. 5.8)

1° - Mount all arms and secure them using pin «A» Fig. 5.8.

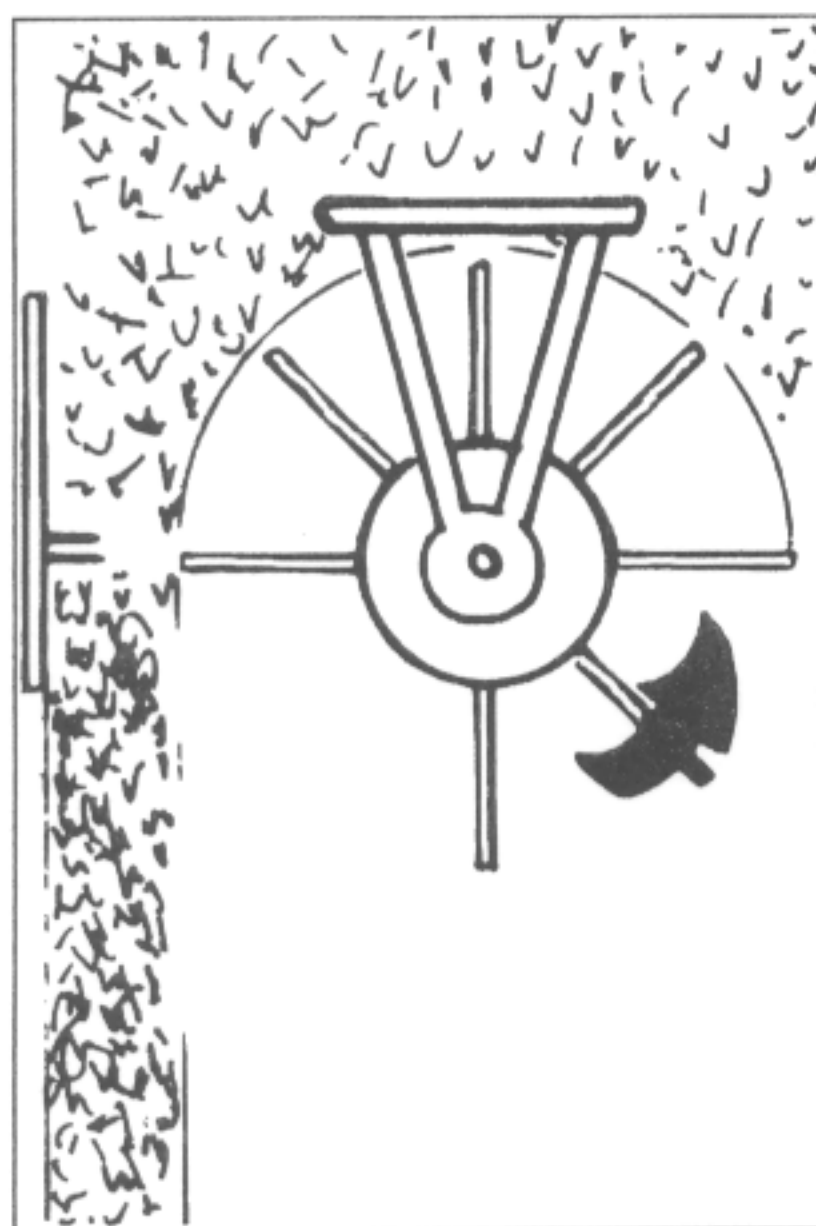


FIG. 5.2

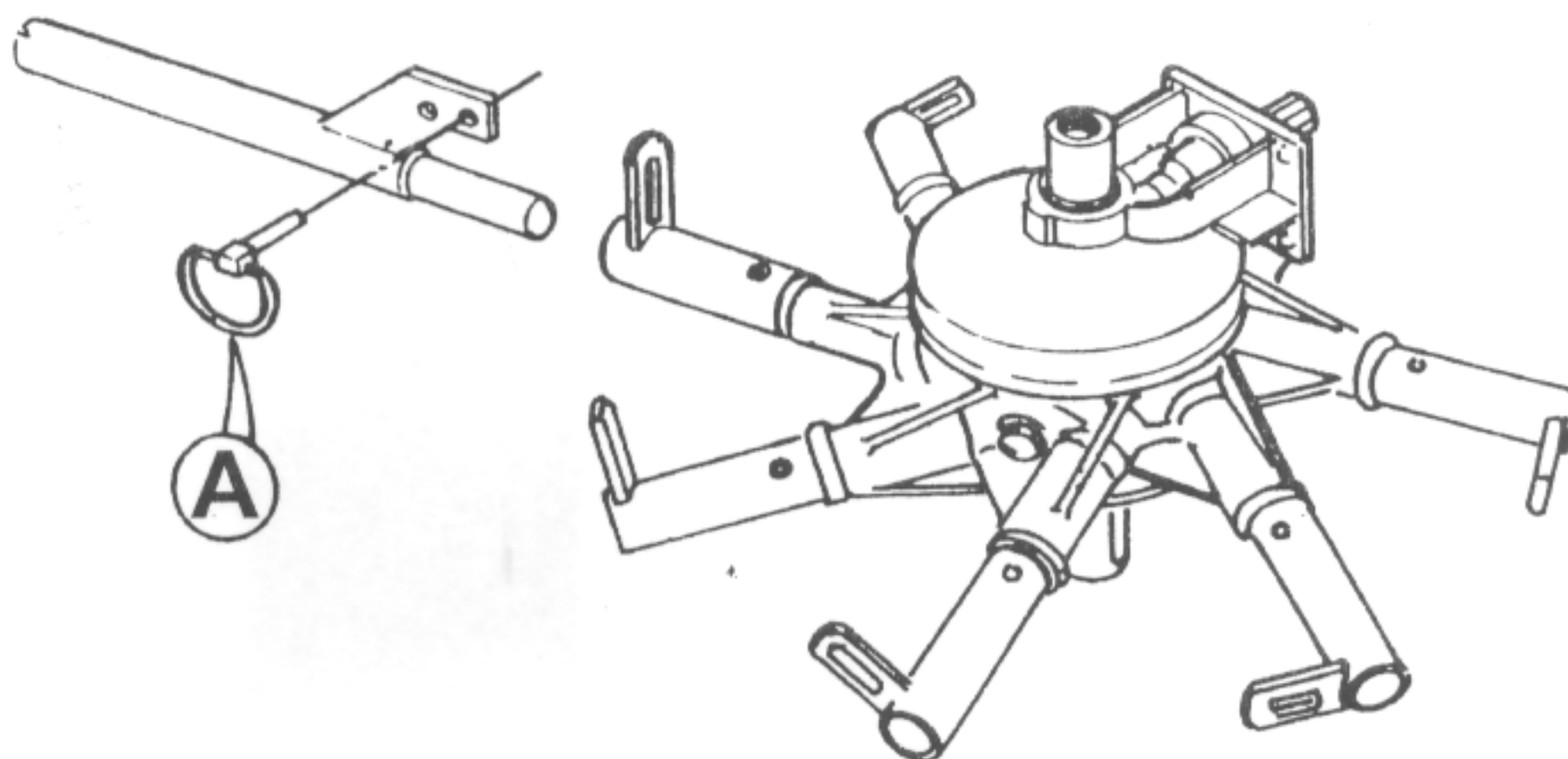


FIG. 5.8

2° - Position shield Fig. 5.4 and secure them using pins «A» Fig. 5.5 and split pins «B».

3° - Install deflector «A» Fig. 5.6 on left shield.

5 WORKING POSITIONS ADJUSTMENTS / PREPARING UNIT FOR THE FIELD

For both two functions of machine carry out the following adjustments before starting working operations.

1 - Adjust rotor arms so that they are parallel to ground (see Fig. 5.8) using adjustments bar «A» of three point hitch.

Adjust tines height using knob «B» and make sure that tines are 25/30 mm. from ground and fasten desired 2 - position using lever «C».

Important: Tines must never touch ground during working operations.

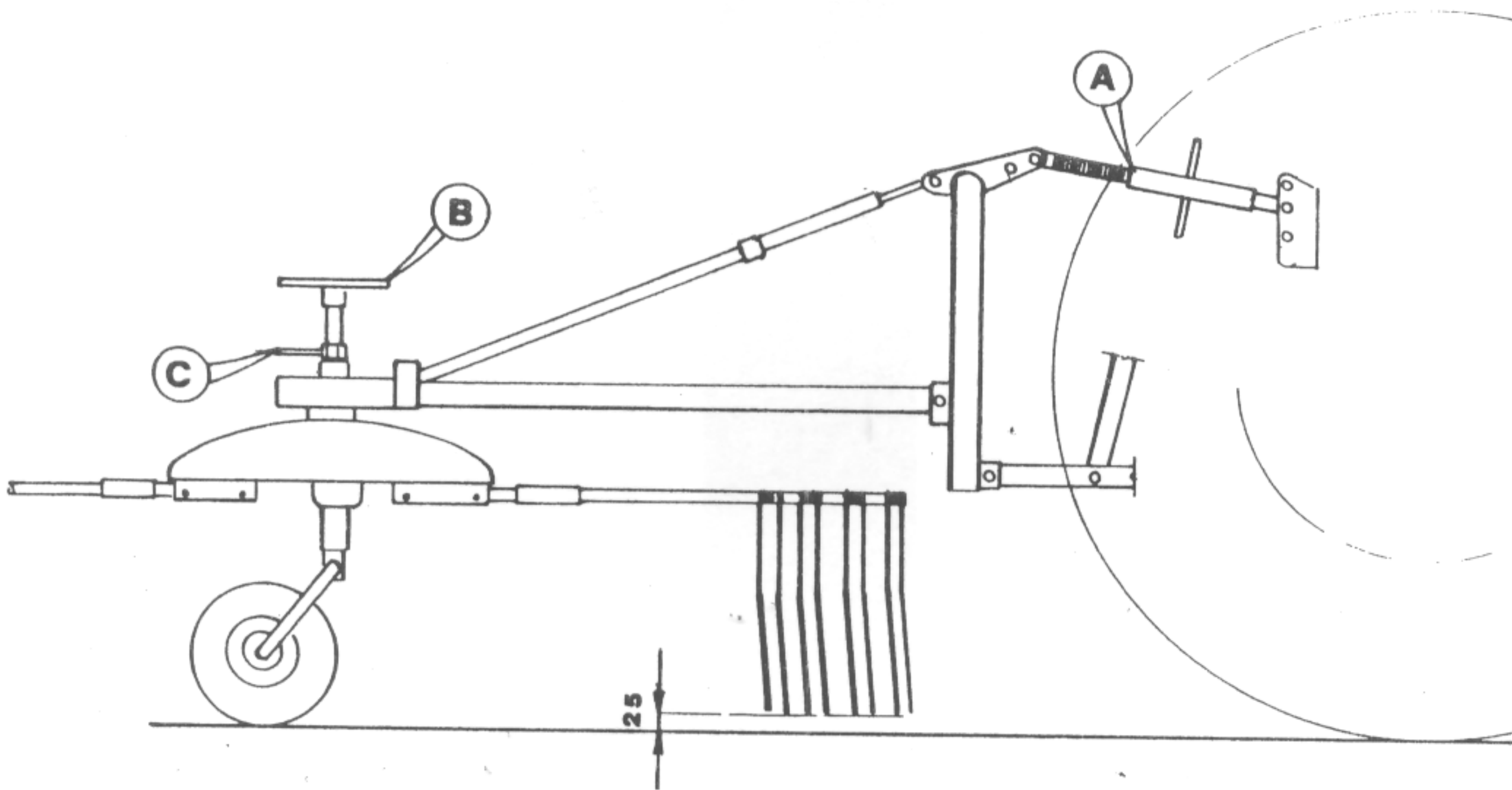


FIG. 5.8

6 MAINTENANCE



Before carrying out any maintenance operations always:

1° - disengage P.T.O. shaft.

2° - set brakes.

3° - shut off tractor engine.

Recommended weekly control and maintenance operations:

- Lubricate all lubrication points. Refer to position 43, Table 1 and position 8 on Table 2.
- Check for loose bolts.
- Check for loose or broken tines.
- Check integrity of protection guards, rotor, arm attachments, wheels and transmission.
- Control P.T.O. shaft drive line and refer to manufacture's operator's manual.
- Make sure all safety warning decals are in their place. If damaged or unreadable ask for replacements.

7 ROAD TRANSPORT



Comply with state and local laws governing highway safety and regulations when transporting

- Follow the below listed instructions for correct road transportation:

1° - Connect machine to tractor. Refer to instructions on Page 6.

2° - Store all tine arms in holders placed on frame. Make sure they are well fastened to prevent losing them during transport.

3° - Raise protection guards removing respective fastening pins (refer to Fig. 5.5) and position as illustrated in Fig. 7.1.

Before moving, raise machine to check that three point attachment is mounted correctly.

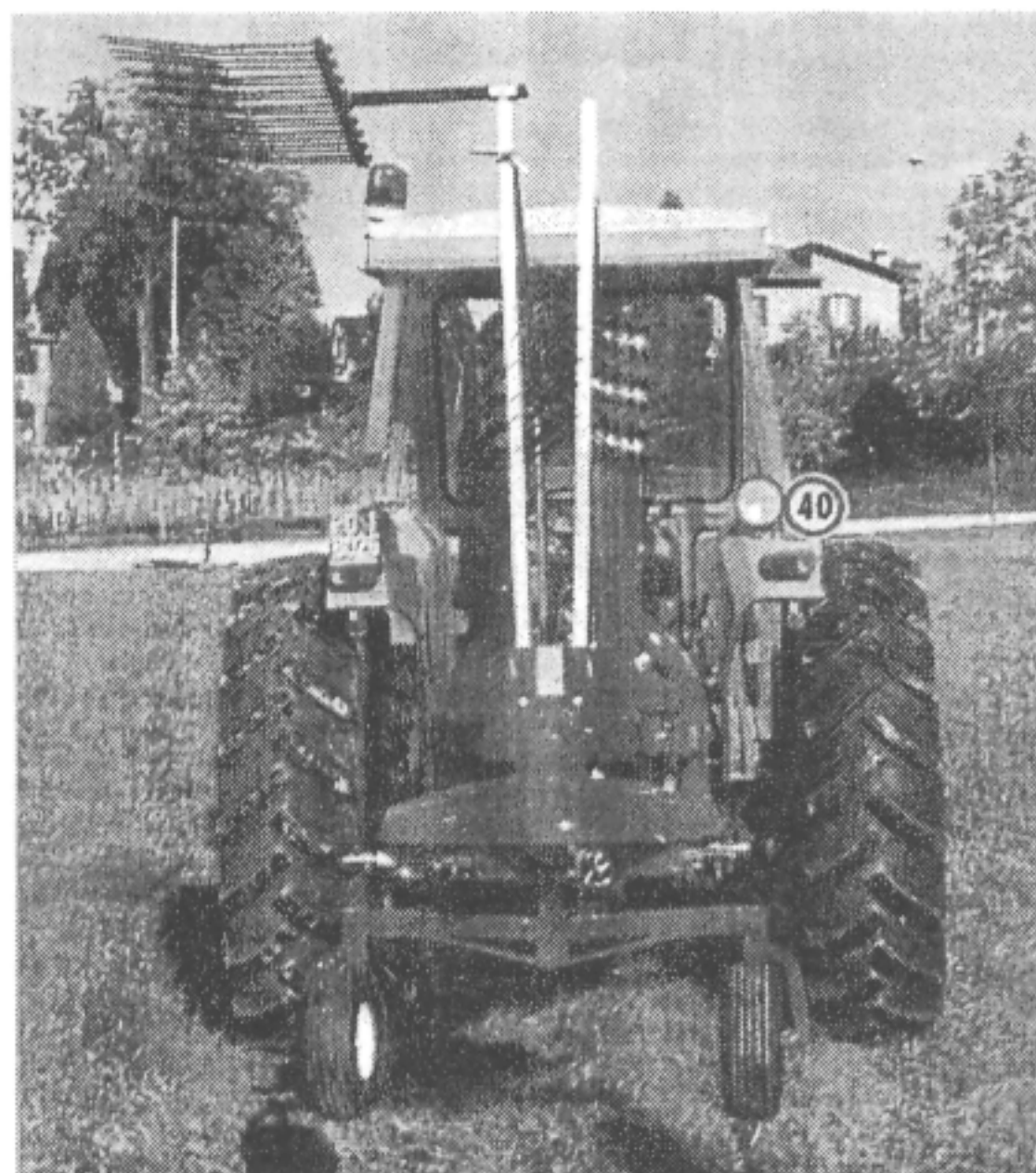


FIG. 7.1

7 ROAD TRANSPORT



- When installing or removing protection guards always hold with one hand when sliding in or out fastening pin.



- Be sure that all tine arms are removed and installed in front holders and well secured with respective pins. Control that deflector is well fastened and cannot slide out from holder during transport.

8 ASSEMBLY AND DISASSEMBLY

- These operations must be carried out by specialized personell.
- Always refer to spare part drawings for reference.

9 NOISE AND VIBRATIONS

- Acoustic pressure from only windrow turner spreader to operator tractor seat does not exceed 70 dba.
- Vibrations derived from unit to tractor operator are insignificant and howevwr below values of amendmants P.T.P. 3.6.3. as per enclosure 1 of CEE standards 89/393/CEE and 91/368/CEE.

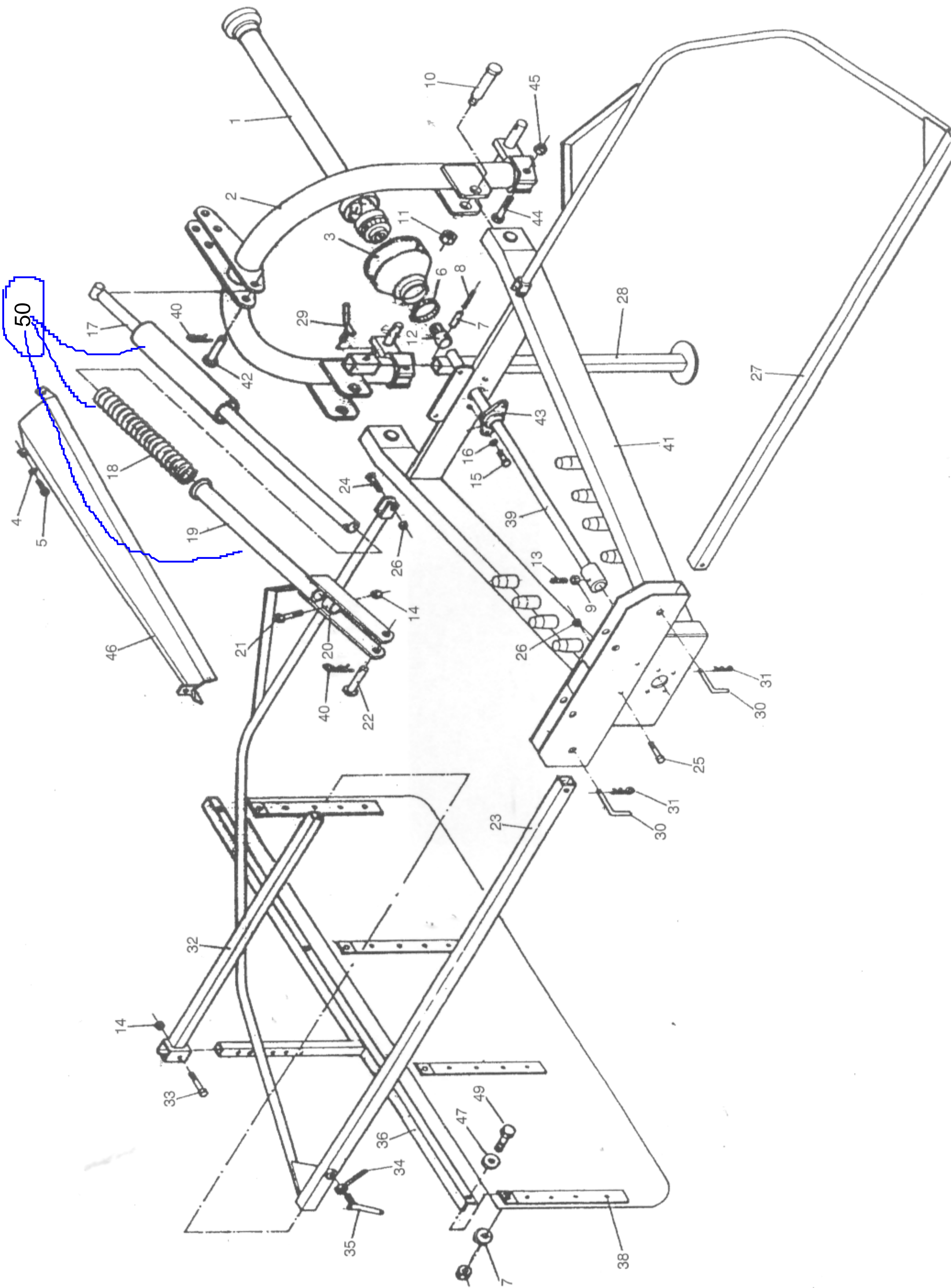


TABLE 1

POS.	CODE	DESCRIPTION	POS.	CODE	DESCRIPTION
01	8020402	Cardan shaft 101 071CE 007 117 RR/GF	26	3020202	Self-locking nut 12MA
02	18030543	Drawbar arch	27	18030550	Right protection guard
03	9070101	Master shield	28	18030548	Stand
04	3030156	Flat washer M8 UNI 6592 zinc.	29	18030585	Fastening screw 12x40
05	3011251	Screw T.E. A. 8x20 UNI 5739 zinc.	30	12120503	Pin 12 L. 125
06	4010702	Clamp 80 ÷ 100	31	3040201	Split pin R 3x60
07	3080110	Spring pin Ø 10x45	32	18030527	Deflector holder arm
08	3080120	Spring pin Ø 6x45	33	3010304	Screw T.E. 10x55 UNI 5737 zinc.
09	3020303	Nut 10MA zinc.	34	18030525	Lock nut 12MA zinc.
10	3011633	Screw T.E. 22x110 UNI 5737	35	18030526	Fastening bolt. 12x40 zinc.
11	3020202	Self-locking nut 22MA	36	18030596	Deflector frame
12	12880689	Shaft PDF 1" x 3/8 da 30,2	37	3040113	Split pin UNI 1336 6x40
13	3050107	Dowel P.C. 10x20 UNI 5929	38	12881015	Deflector
14	3020201	Self-locking nut 10MA	39	18030552	Transmission shaft
15	3011625	Screw T.E. 14x25 UNI 5739	40	3040202	Split pin R 5x100
16	3030705	Washer 14/3545	41	18030587	Frame RR 320 - GF 350
17	18030544	Internal shock absorber GF 350 / RR 320	42	18030564	Pin da 18 L. 96
18	11010616	Spring da 62 L. 385	43	12250002	Support UCFL 206
19	18030545	External shock absorber	44	3011202	Screw T.E. 14x60 UNI 5737
20	18030546	Fastening bush 48x30	45	3020203	Self-locking nut 14 MA
21	3011238	Strew T.E. 10x60 UNI 5737 zinc.	46	18030588	Shaft protection
22	18030547	Pin da 18 L. 85	47	3030169	Washer 10x30 zincata
23	18030549	Left protection guard	48	3020328	Nut T.E. 10 MA 5588 zincato
24	3010406	Screw T.E. 12x55 UNI 5737 zinc.	49	3011211	Screw T.E. 10x25 zincata
25	3011288	Screw T.E. 12x70 UNI 5737 zinc.	50	18030544	Complete Shock Absorber

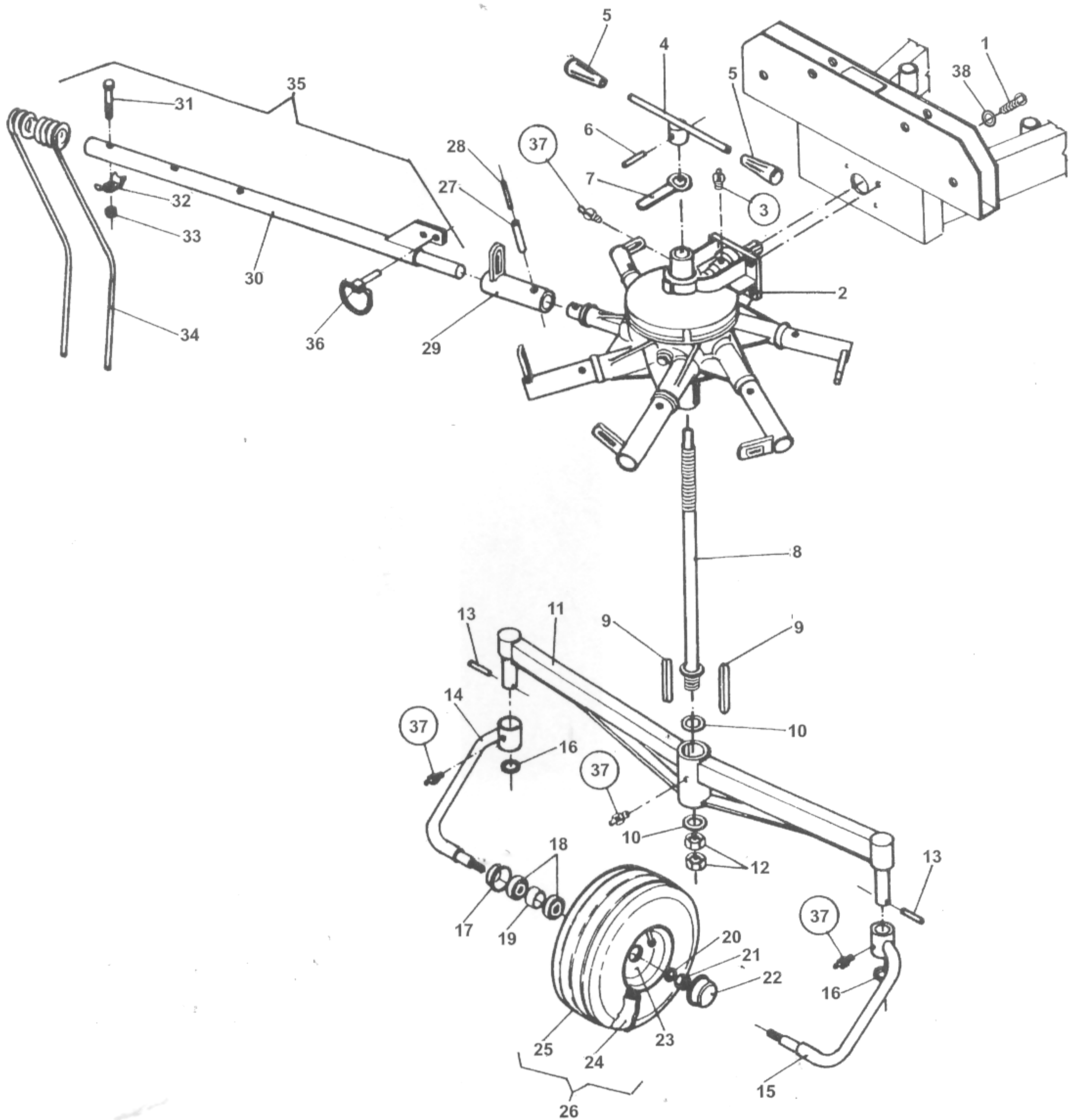
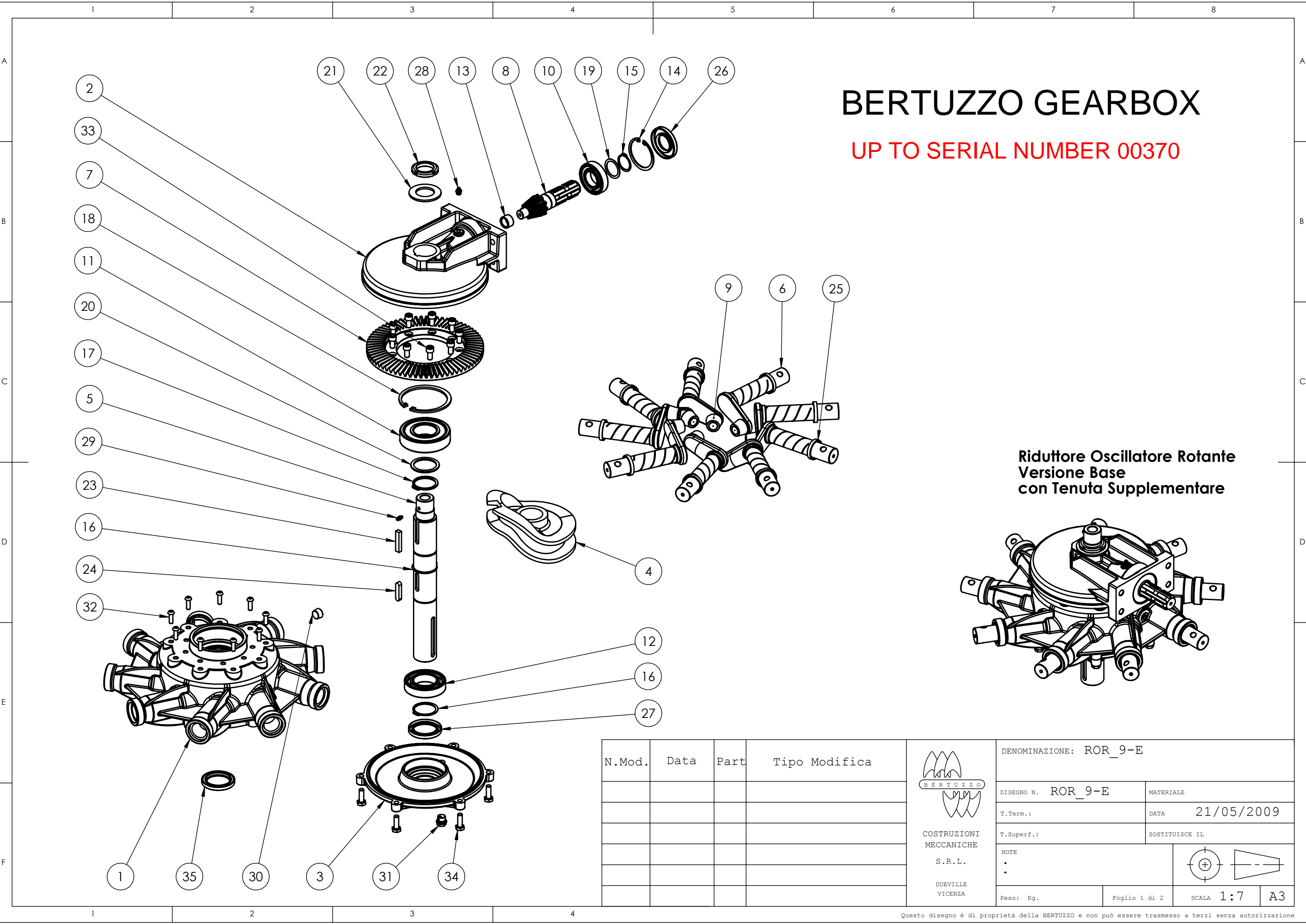


TABLE 2

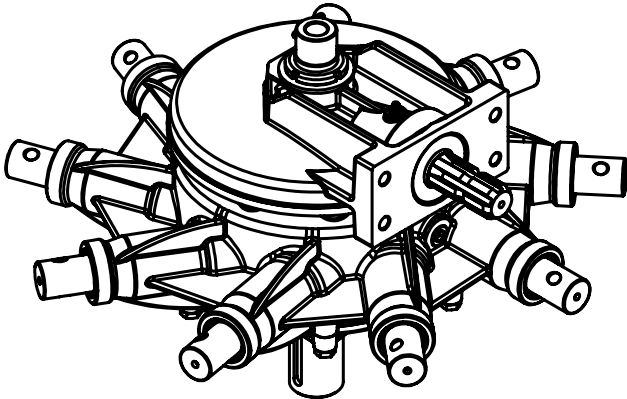
POS.	CODE	DESCRIPTION
01	3010245	Screw T.E. 14x40 UNI 5739
02	8010502	Rotor
03	3090105	Grease zerk M 10x1,5
04	18030555	Regulation handle
05	3140001	Knob Z 121.68 A 365
06	3080109	Spring pin 6x30
07	18030589	Locking lever
08	12881006	Regulation screw 22x1,5
09	3110016	Key 10x8x100
10	12280006	Shim PS 22x32x0,5
11	18030590	Axle support
12	3020343	Nut 22x1,5
13	3080105	Spring pin 8x50
14	18030561	Left axle RR 320 e GF 350
15	18030563	Right axle RR 320 e GF 350
16	3030149	Flat washer M 30
17	12070314	Internal shield da 25
18	12240113	Bearing 6205 2 RS
19	12070307	Spacer da 25
20	3030175	Flat washer M 16
21	3020204	Self-locking nut 16 MA
22	12070315	External shield da 16
23	12020201	Wheel rim 16.650 - 8
24	12380301	Wheel ait tube 16.650 - 8
25	12390301	Wheel tire 16.650 - 8
26	12170106	Complete tire 16.650 - 8
27	3080140	Spring pin Ø 12x50
28	3080139	Spring pin Ø 7x50
29	18030591	Bushing Ø 32x35 L. 145
30	18032203 18032203	Tine arm carrier RR 320
31	3011288	Screw T.E. 12x70 UNI 5737
32	12881075 12881075	Spring clamp
33	3020202	Self-locking nut 12 MA
34	11010521	Tine RR 320 - GF 350
35	18030592	Arm with tine
36	3080202	Pin Ø 10
37	3090101	Grease zerk 8x1
38	3030303	Grower washer M 14



BERTUZZO GEARBOX

UP TO SERIAL NUMBER 00370

Riduttore Oscillatore Rotante
Versione Base
con Tenuta Supplementare



N.Mod.	Data	Part	Tipo Modifica



COSTRUZIONI
MECCANICHE

S.R.L.

DUEVILLE
VICENZA

DENOMINAZIONE: ROR_9-E			
DISEGNO N. ROR_9-E		MATERIALE	
T.Term.:		DATA 21/05/2009	
T.Superf.:		SOSTITUISCE IL	
NOTE		SCALA 1:7	
Peso: Kg.		Foglio 1 di 2	A3

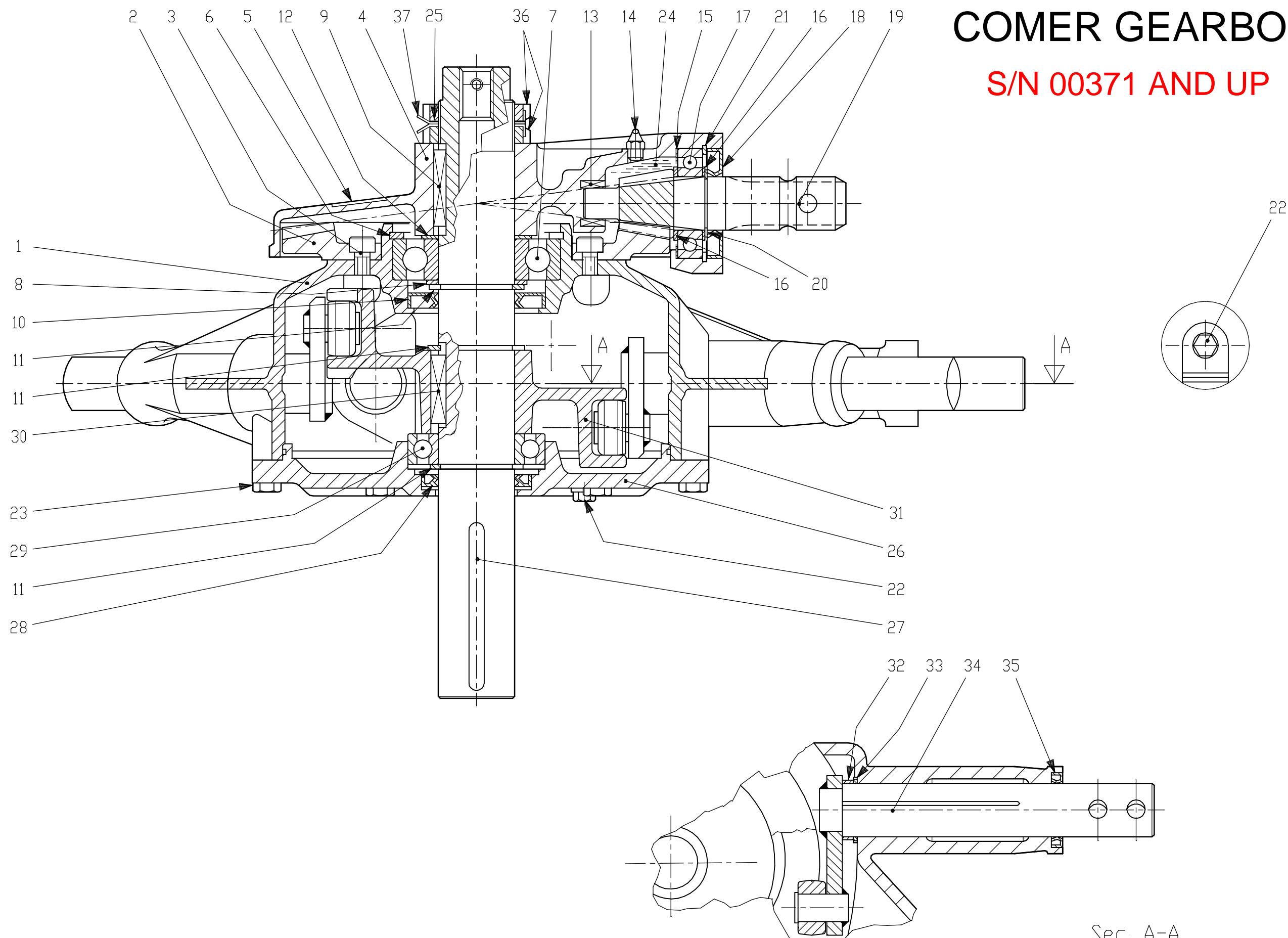
BERTUZZO GEARBOX PART NUMBERS (UP TO S/N 00370)

REFERENCE #	PART #	DESCRIPTION
1	18032210	ROTARY RAKE GEARBOX HOUSING (9-ARM)
2	18032211	TOP GEARBOX COVER
3	18032212	BOTTOM GEARBOX COVER
4	18032213	CAM
5	18032214	MAIN SHAFT
6	18032215	RAKE ARM SHAFT
7	18032208	RING GEAR
8	18032209	PINION SHAFT
9	18032216	BUSHING
10	12240145	BEARING - 6207
11	12240238	BEARING - 6310 2RS
12	12240134	BEARING - 6210
13	12240239	BUSHING
14	3120105	SNAP RING 72 X 2.5
15	3120102	SNAP RING 35 X 1.5
16	3120114	SNAP RING 50 X 2
17	3120155	SNAP RING 50 X 3
18	3120139	SNAP RING 110 X 4
19	12880625	WASHER 45 X 35 X YY
20	3030224	WASHER 62 X 50 X 3
21	11011009	WASHER 70 X 40.5 X 4
22	3180016	SEAL M40 X 1.5 CLASS 8
23	3110041	KEY 10 X 8 X 50
24	3110040	KEY 10 X 8 X 45
25	10011332	SEAL 35 X 45 X 7
26	10011333	SEAL 35 X 72 X 10
27	10011334	SEAL 50 X 72 X 8
28	3090105	GREASE ZERK M10 X 1.5 CLASS 5.8
29	3090102	GREASE ZERK M6
30	4010827	NUT 1/2"
31	4010835	NUT M8
32	3010922	BOLT M8 X 25 - 8.8
33	3010661	BOLT M10 X 25 - 8.8
34	3010780	BOLT M8 X 30 - 8.8
35	10011335	SEAL 50 X 72 X 8

COMPANY	REF.	DESIGNATION
	DATE 02-12-2003	K-791 A CODE 791.400.20

COMER GEARBOX

S/N 00371 AND UP



Sec. A-A

S.d.M.
20.9682

COMER GEARBOX PART NUMBERS, S/N 00371 AND UP

<u>REFERENCE #</u>	<u>PART #</u>	<u>DESCRIPTION</u>
1	18032217	ROTARY RAKE GEARBOX HOUSING (9-ARM)
2	18032218	RING GEAR
3	3010662	BOLT M10 X 18 - 8.8
4	18032219	TOP GEARBOX COVER
5		DECAL "COMER"
6	3120139	SNAP RING 110 X 4
7	12240238	BEARING - 6310
8	3030237	WASHER 70.3 X 50.3 X 2.5
9	3010041	KEY 10 X 8 X 50
10	10011338	SEAL 50 X 90 X 10
11	3120155	SNAP RING 50 X 3
12	3030238	WASHER 50.3 X 70.3
13	12240239	BUSHING 20 X 26 X 16
14	3090105	GREASE ZERK M10 X 1.5 CLASS 5.8
15	3030239	WASHER 49 X 71, 7 X 0, 2
16	3030240	WASHER 35.3 X 48.0
17	12240145	BEARING - 6207
18	10011333	SEAL 35 X 72 X 10
19	18032220	PINION SHAFT
20	3120102	SNAP RING 35 X 1.5
21	3120105	SNAP RING 72 X 2.5
22	4010835	NUT 3/8"
23	3011211	BOLT M10 X 25 - 8.8
24		SHELL
25	3030241	WASHER 50.2 X 57.5 X 0.5
26	18032221	BOTTOM GEARBOX COVER
27	18032222	MAIN SHAFT
28	10011334	SEAL 50 X 72 X 8
29	12240134	BEARING - 6210
30	3110010	KEY 10 X 8 X 35
31	18032223	CAM
32	18032225	BUSHING 35.3 X 43.5 X 9
33	3030242	WASHER 35.2 X 43.8 X 1
34	18032224	RAKE ARM SHAFT
35	10011332	SEAL 35 X 45 X 7
36	3180008	SEAL M50 X 1.5
37	3030195	WASHER 50 X 74 X 1.25

WARRANTY POLICY

Our Company warrants its products to be free of defects in material and workmanship for a period of 1 year from the date of purchase under normal use and service providing the equipment is purchased for individual and not commercial use.

Our Company will replace any defective part but does not allow any labor cost.

Defective parts will be sent prepaid. Retain defective parts in case they are needed for inspection by manufacturer.

No warranty is made for items made by others since such items are warranted by respective manufacturers.

No liability is assumed for expenses or damages resulting from the malfunction or interruption in operation of the equipment.

This warranty does not apply to any equipment which has been damaged in any accident, or by fire, flood, act of God or has been subjected to abuse, misuse, negligence, alterations, and/or tampering.

Purchaser's exclusive remedy for breach of warranty, other defect, or conduct giving rise to liability shall be the repair or replacement of the product sold, and the manufacturer under no circumstances shall be liable for economic loss or incidental consequential damages.

Effective upon the expiration of this limited warranty (one year from the date of purchase), the manufacturer disclaims all implied warranties, including the warranty of merchantability and fitness.

Our Company reserves the right to make improvements and changes in specifications without notice or obligation to modify previously sold units.