EN

SUMMARY

ANALYTICAL INDEX

Aim of the manual

This instruction manual is produced by the manufacturer to provide all those who have dealings with the work vehicle stated on the cover with all the necessary information and criteria to apply for its use.
Apart from adopting good use practices, operators (in compliance with their job responsibilities) are also required to read and understand the information contained in this use manual and put it into practice exactly as stated.
The original instructions are supplied by the manufacturer in English language.
To fulfil legal or commercial requirements, the original instructions may be supplied by the manufacturer in other languages.
This manual is an integral part of the work vehicle; it must be kept for future reference, in an easily accessible place known to all those concerned, for the entire working life of the work vehicle.
If the work vehicle is sold on, the seller is required to pass on the manual to the new owner.
The illustrations may differ from the actual configuration of the work unit however this does not affect in any way the instructions provided.
For any doubts contact the manufacturer or authorised service centres.
To highlight certain parts of the manual's contents deemed important for safety or information reasons the following symbols have been used, whose meanings are outlined below.

Danger - Warning

This indicates seriously hazardous situations which, if ignored, could put the health and safety of those involved at risk.

Caution

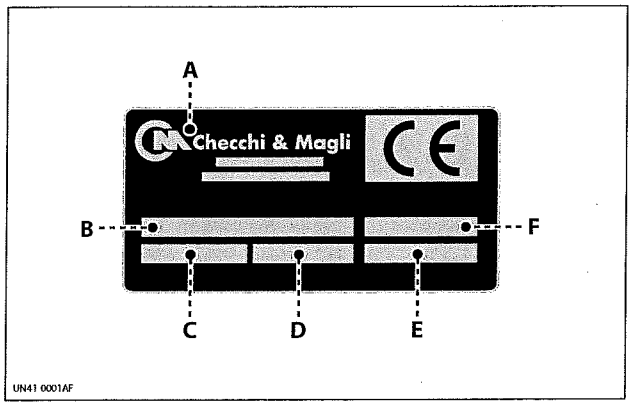
This shows that appropriate behaviour must be adopted in order to prevent the health and safety of those involved being at risk.

Information

This highlights vital technical information which must not be overlooked.

Manufacturer and machine identification details

The plate shown, which is applied directly to the work vehicle, contains all the essential information for identifying the machine and the manufacturer.



A - Manufacturer's identification details
B - Work vehicle type
C - Work vehicle model
D - Work vehicle gross weight
E - Serial number
F - Year of manufacture

Annexed documentation

Along with this handbook, the Customer is given the documentation specified.
The instructions for use and maintenance of any optional units that may be provided with the work vehicle which are not considered in this manual.
- "EC" Declaration of conformity for the work vehicle.

Assistance request procedure

All requests for technical assistance must be made to the manufacturer's Technical Assistance Service or the authorised service centres.
Whenever making requests for technical assistance concerning the work vehicle, remember to quote the data shown on the data plate and the fault encountered.

Disclaimer notice

The work vehicle is delivered to the user under the conditions applicable at the time of purchase and specified in the sale agreement.

- Any modification which is not authorised by the manufacturer
- work vehicle misuse
- use of the work vehicle by the untrained or unauthorised personnel
- lack of maintenance
- the partial or total failure to comply with the instructions in this manual
- use of non-original spare parts or parts not designed specifically for the model concerned

shall result in forfeiture of the warranty and shall relieve the manufacturer of all and any liability for damage caused to persons, animals and property.

Glossary of terms

Rearing/overturning: when the tractor/work vehicle suddenly upsets.

Plant spacing: this is the distance between one seedling and the next in the same row.

Row spacing: the distance between each row.

Cup: this is the container which holds the plant inside the dispensing unit.

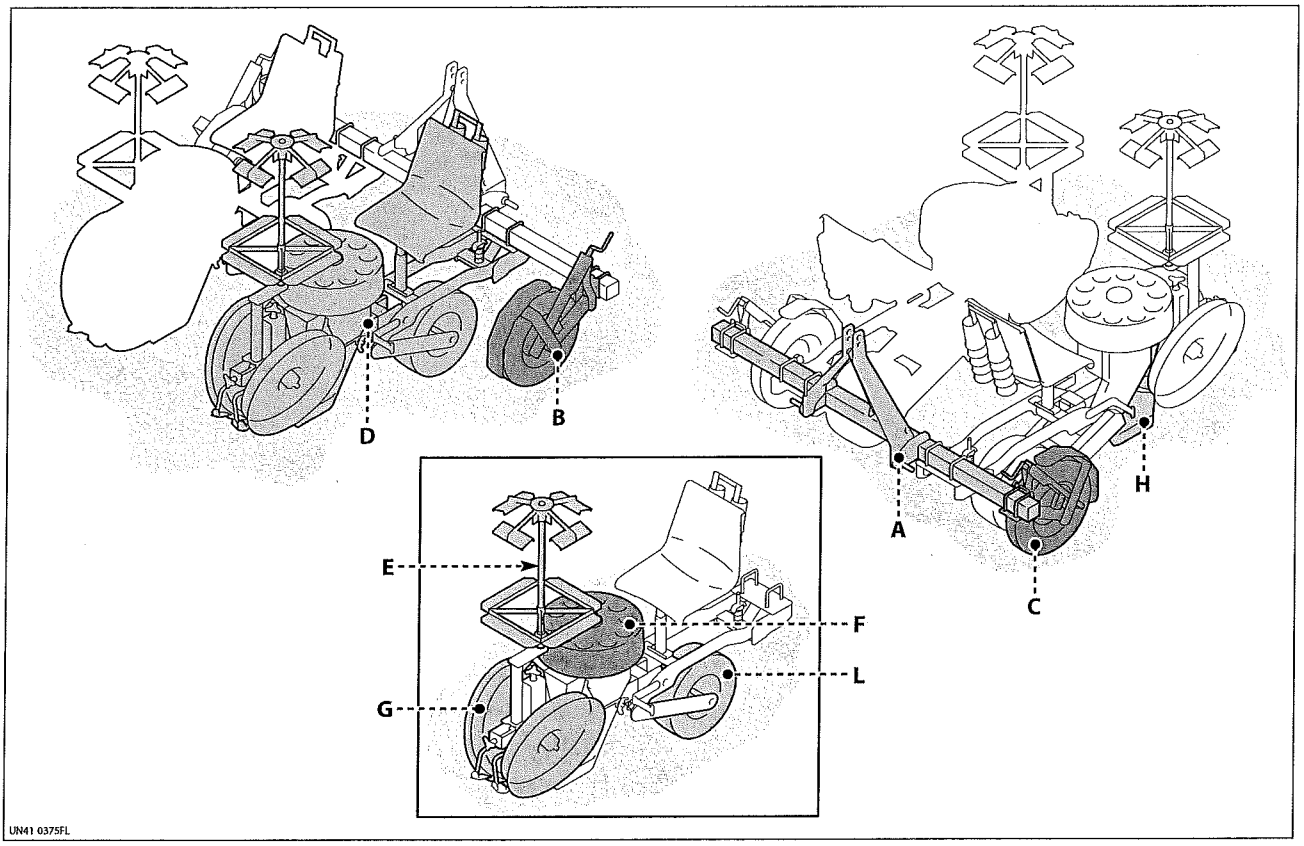
The number of cups depends on the type of dispenser.

General description

This work vehicle is designed and built for planting seedlings of various kinds (e.g. horticultural, floral, tobacco, nursery-grown, etc.), rooted in conical or pyramid-shaped root balls, including small plants with hardly developed leaf apparatus (see "Seedling size" schedule).
The work vehicle is a semi-carried device, equipped with a frame for attaching to the three-point hitch on a tractor and it is suitable for planting in fields and greenhouses.
The moving parts of each planting unit (dispensing unit, ejector, etc.) are driven by the planting unit's driving wheel (when it is touching the ground) and the movement of the tractor.
The seedling falls from the dispenser into the furrow created by the ploughshare and the packing wheels fill back up and compact the soil around the seedling root ball.
The work vehicle is manufactured in several models which differ mainly in terms of number of planting units featured and number of cups in the dispensing unit.

Main parts (UNITRIUM)

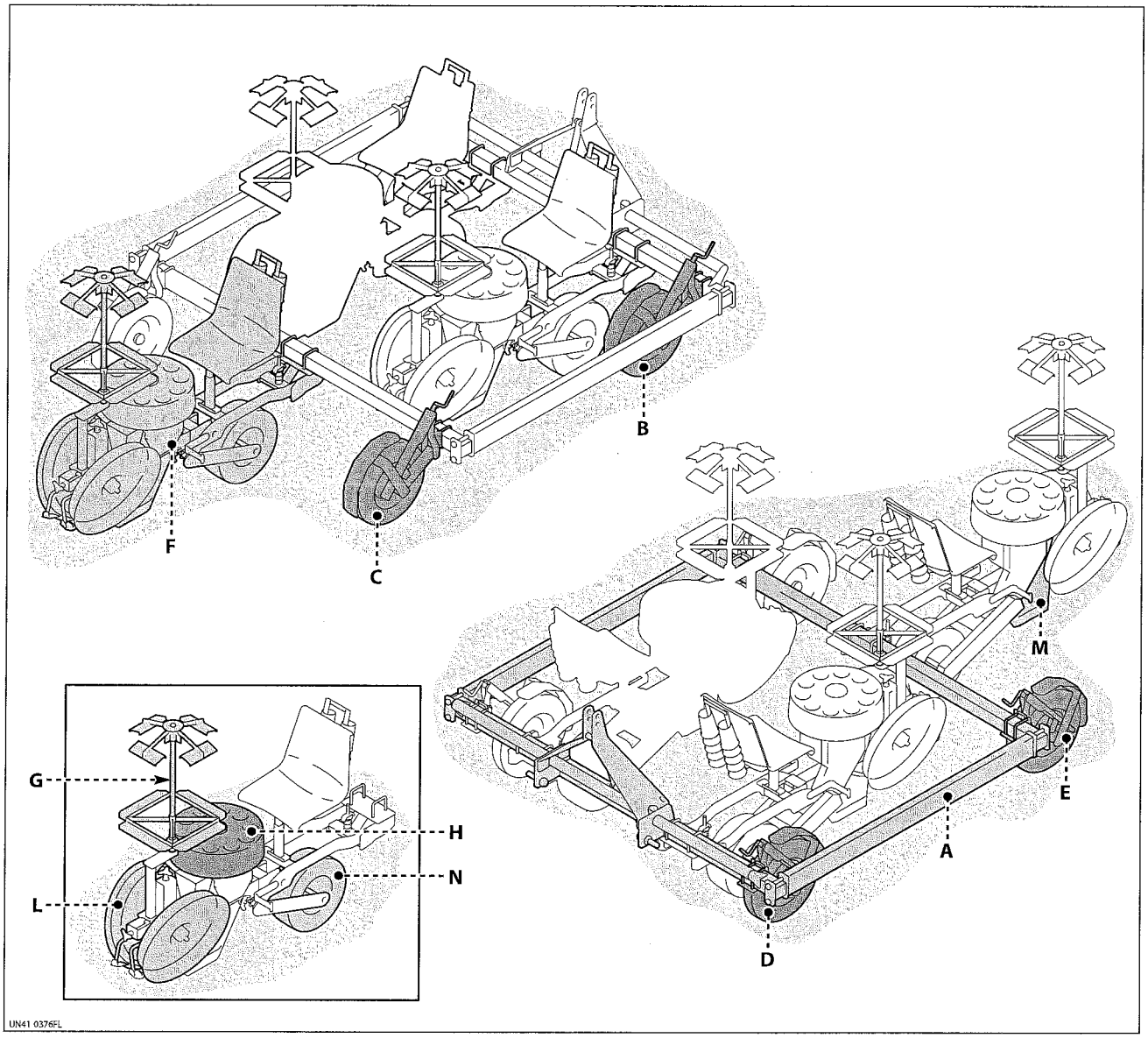
The illustration shows the work vehicle with three planting units.



A) Structure for attaching to the three-point hitch on a tractor (frame)
B) RH support wheel
C) LH support wheel
D) Planting unit
E) Tray holder
F) Dispenser
G) Packing wheels
H) Ploughshare
L) Driving wheel

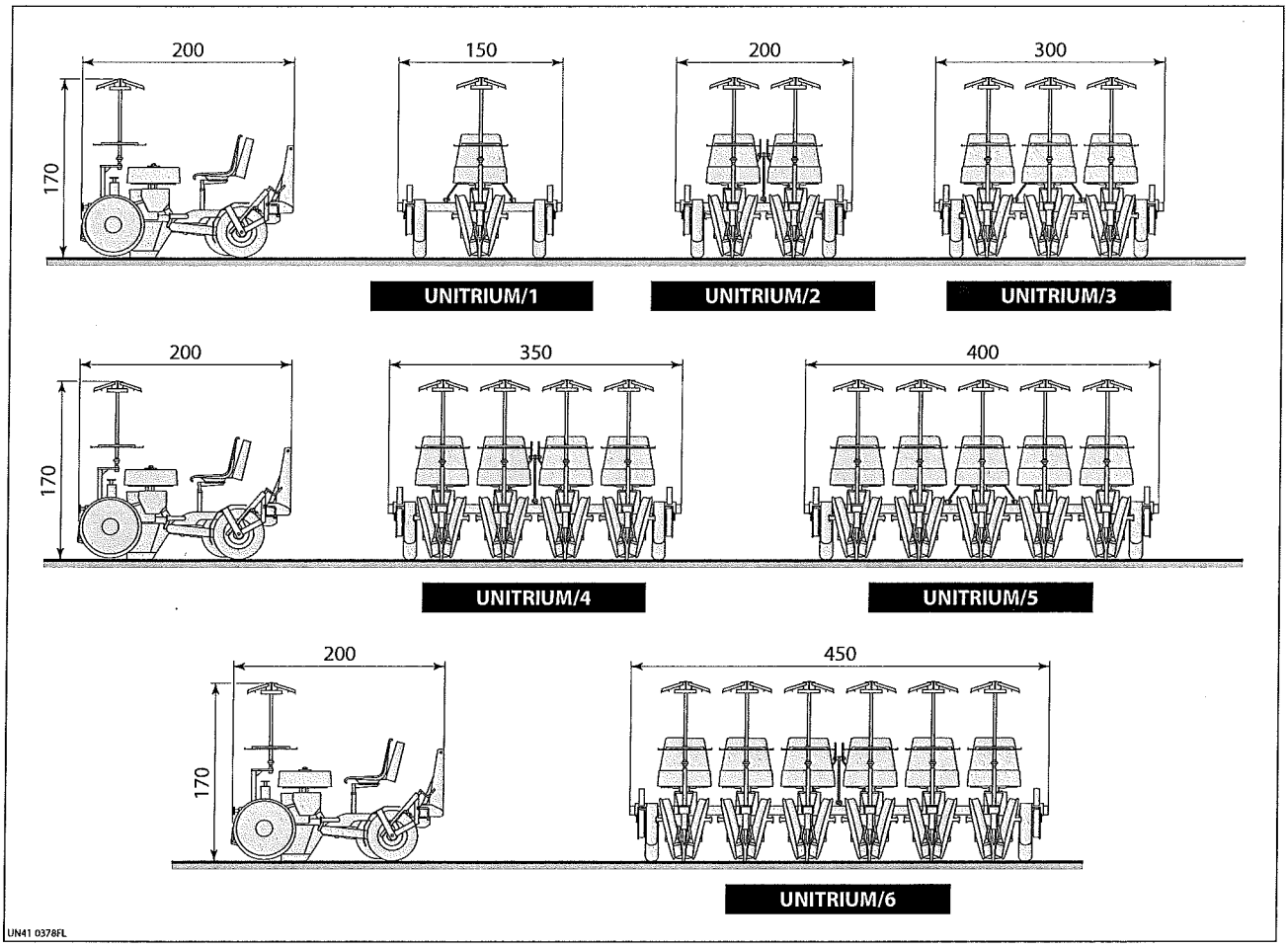
Main parts (UNITRIUM DT)

The illustration shows the work vehicle with three planting units.



A) Structure for attaching to the three-point hitch on a tractor (double frame)
B) Front right hand support wheel
C) Rear right hand support wheel
D) Front left hand support wheel
E) Rear left hand support wheel
F) Planting unit
G) Tray holder
H) Dispenser
L) Packing wheels
M) Ploughshare
N) Driving wheel

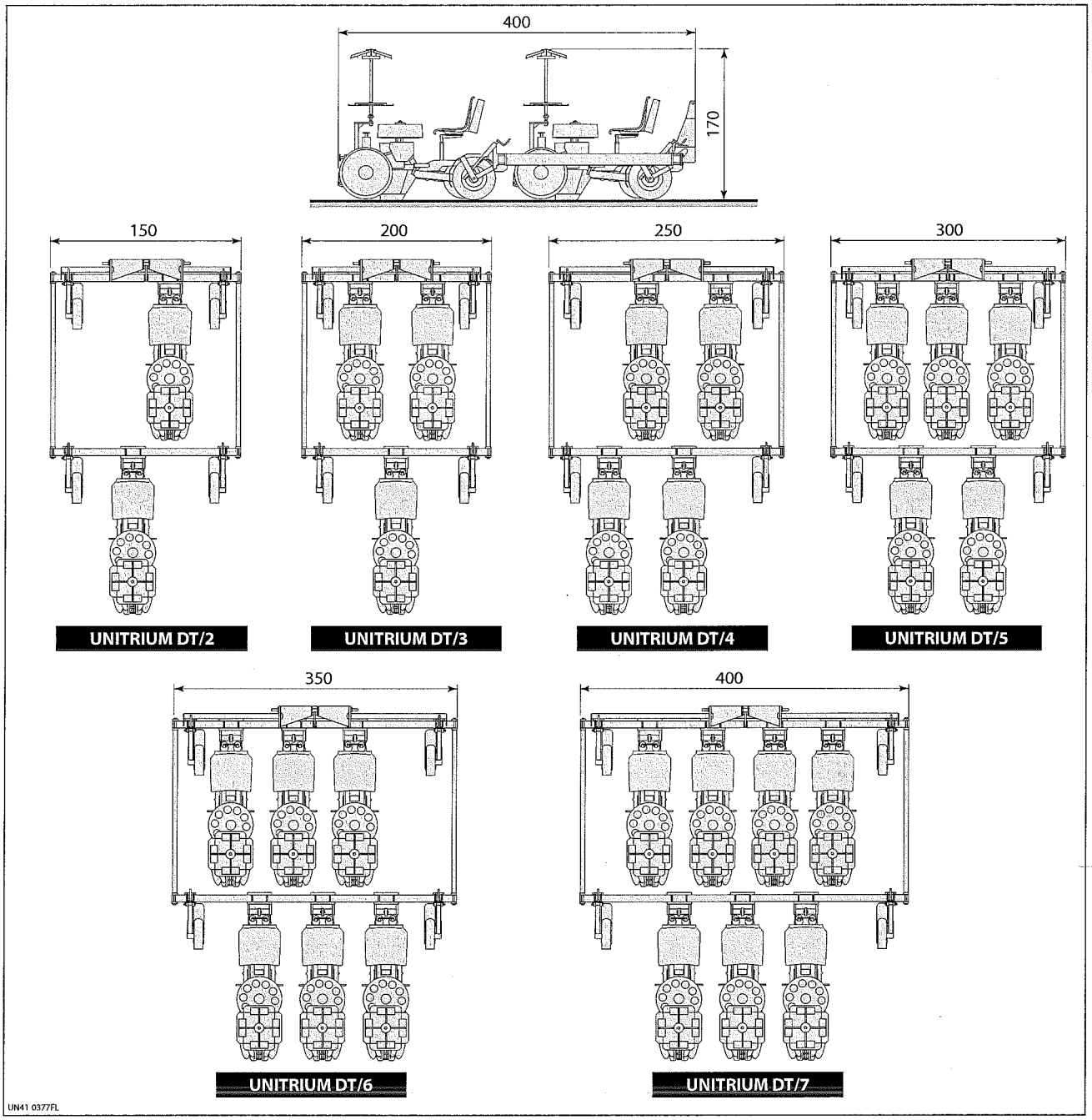
Overall dimensions (UNITRIUM)



Technical characteristics UNITRIUM							
		UNITRIUM/1	UNITRIUM/2	UNITRIUM/3	UNITRIUM/4	UNITRIUM/5	UNITRIUM/6
Required tractor power	HP	20	25	30	40	50	60
Minimum row spacing (dispensing unit with 6 - 10 cups)	cm	50					
Minimum row spacing (dispensing unit with 12 cups)	cm	62					
Plant spacing distance	cm	10 - 100					
Planting unit	n°	1	2	3	4	5	6
Driving wheel (*)	n°	1	2	3	4	5	6
Idle wheels (right and left)	n°	2					
Idle wheel tyre pressure	bar	2,5					
Driving wheel tyre pressure	bar	1					
Weight	kg	215	375	555	710	850	1020

(*) The driving wheels are fitted on every planting unit.

Overall dimensions (UNITRIUM DT)

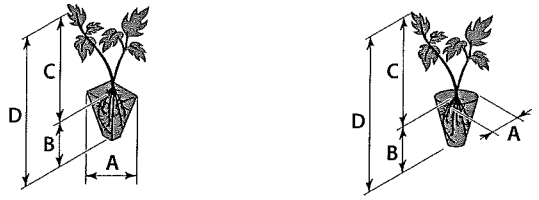


Technical characteristics UNITRIUM DT							
		UNITRIUM DT/2	UNITRIUM DT/3	UNITRIUM DT/4	UNITRIUM DT/5	UNITRIUM DT/6	UNITRIUM DT/7
Required tractor power	HP	25	30	40	50	60	70
Minimum row spacing (dispensing unit with 6 - 10 cups)	cm	25					
Minimum row spacing (dispensing unit with 12 cups)		31					
Plant spacing distance	cm	10 - 100					
Planting unit	n°	2	3	4	5	6	7
Driving wheel (*)	n°	2	3	4	5	6	7
Idle wheels (right and left)	n°	4					
Idle wheel tyre pressure	bar	2,5					
Driving wheel tyre pressure	bar	1					
Weight	kg	500	640	800	970	1155	1380

(*) The driving wheels are fitted on every planting unit.

Seedling size

The table shows the type and size of seedlings that the work vehicle can plant.

Seedling size			
 UN41 0133NI	A (cm)	min.	1,5
		max.	6
	B (cm)	min.	4
		max.	7
	C (cm)	min.	8
		max.	23
	D (cm)	min.	12
		max	30

Plant spacing distance

The work vehicle plants seedlings with variable spacing options.

For the range of possible spacing options, see "Adjusting the plant spacing".

Permitted gradients

The ground conditions (slippery, sloping, etc.) and the type of tractor used can reduced the stability of the tractor/work vehicle assembly and cause sudden, dangerous movements, especially when the work vehicle is lifted off the ground.

It is up to the tractor driver to assess the environmental conditions of the work area and not to exceed the weights allowed on the axles and the permitted gradients established for the tractor (see tractor user manual).

Declaration of conformity

CHECCHI & MAGLI s.r.l.
Via Guizzardi n° 38
40054 – BUDRIO (BOLOGNA) - ITALIA
hereby declares, under its own responsibility that the planting machine in question, i.e. models
UNITRIUM/1, UNITRIUM/2, UNITRIUM DT/2, UNITRIUM/3, UNITRIUM DT/3, UNITRIUM/4, UNITRIUM DT/4, UNITRIUM/5, UNITRIUM DT/5, UNITRIUM/6, UNITRIUM DT/6, UNITRIUM DT/7,
comply with the Essential and Health Safety Requirements provided for by Directive 2006/42/CE.
The following regulations in particular have been applied: UNI EN ISO 12100-1, UNI EN ISO 12100-2 and UNI EN 13857, on machine safety.

Budrio

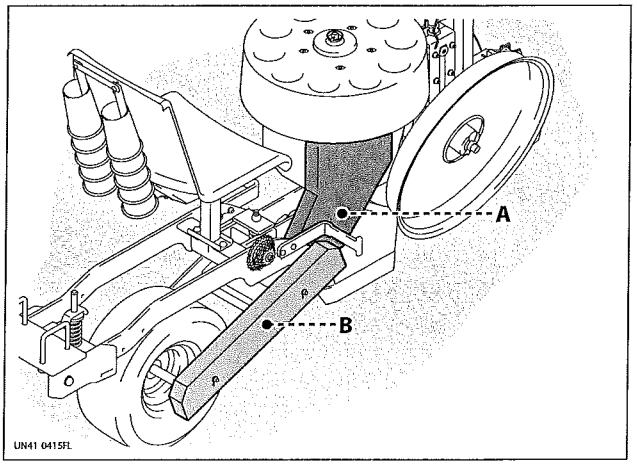
CHECCHI & MAGLI s.r.l
Legal representative
Nerio Checchi

Guards

Danger - Warning

Never use the machine without the safety guards.

The work vehicle is fitted with guards covering the transmission components to prevent accidental contact with the moving parts.
The illustration shows the protective casings (**A** - **B**) installed on a planting unit.
The protective casings are fitted on all the planting units of the work vehicle.



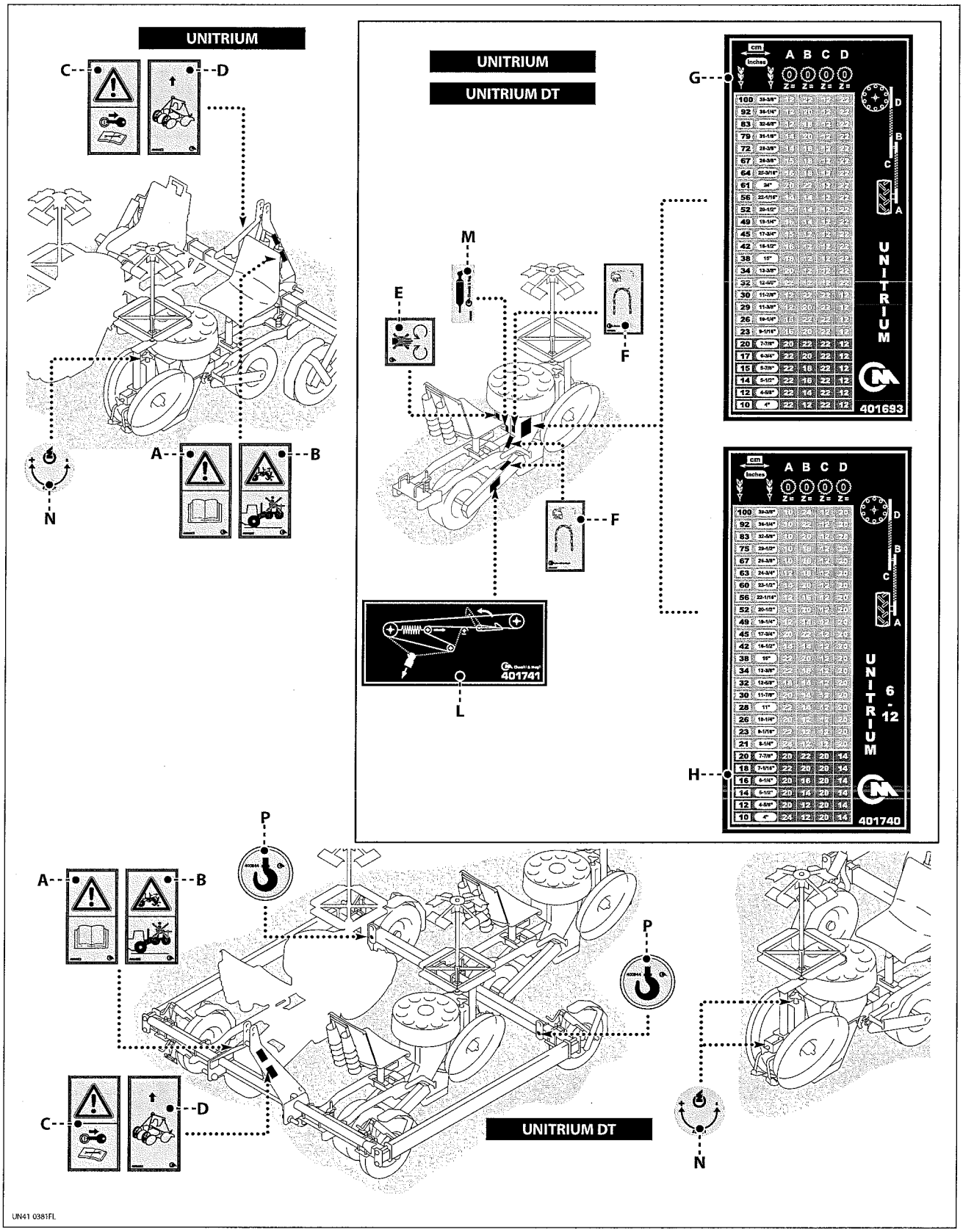
UN41 0415FL

Information and safety signs

Danger - Warning

Check that all the plates are legible; if they are not, clean them or - if they are damaged - replace them, applying the new ones in the same place as the old ones.

The illustration shows the locations and meanings of the signs affixed.



A) **Hazard plate:** read the use and maintenance manual before using the work vehicle.
B) **Hazard plate:** do not remain on the seat with the work vehicle lifted off the ground.
C) **Hazard plate:** switch off the tractor; remove the ignition key and store in a safe place before carrying out any type of work on the work vehicle.
D) **Information plate:** strap up at the anchor points shown to lift the work vehicle.
E) **Hazard plate:** this highlights a risk of hands being crushed between the dispenser and the dispenser disc.
F) **Information plate:** lubricate the chain inside the casing to which the plate is affixed.
G) **Plant spacing plate (dispensing unit with 10 cups):** this shows the type of pinion to fit according to the plant spacing required.
H) **Plant spacing plate (dispensing unit with 6 - 12 cups):** this shows the type of pinion to fit according to the plant spacing required.
L) **Information plate:** this graphically shoes how to release the chain.
M) **Information plate:** this shows the greasing points.
N) **Information plate:** this indicates rotation of the part to which the plate is applied, showing the direction required to achieve the desired effect.
P) **Information plate:** hook up the work vehicle at the points shown to lift it.

The plates (**E - F - G - H - L - M - N**) are fitted on every planting unit.

Optional accessories

Manual lift row tracers (max. row spacing: 110 cm)
Manual lift row tracers (max. row spacing: 150 cm)
Hydraulic lift row tracers
Localised, synchronised inter-ploughshare watering device TRIUM
300 l tank for one row (for models without manure spreader only)
300 l tank for two rows (for models without manure spreader only)
300 l tank for three rows (for models without manure spreader only)
300 l tank for four rows (for models without manure spreader only)
Special cushioned seat
Flex rubber tamping wheels Ø 580x80 for damp and clayey soils (as an alternative to steel wheels)
Extra side-mounted rotary tray holder (minimum row spacing 120 cm)
Extra top-mounted rotary tray holder
Transversal 2-shelf tray holder (shelf size: 200 cm)
Transversal 2-shelf tray holder (shelf size: 250 cm)
Transversal 2-shelf tray holder (shelf size: 300 cm)
Transversal 2-shelf tray holder (shelf size: 350 cm), complete with rear frame and support wheels
Transversal 2-shelf tray holder (shelf size: 400 cm), complete with rear frame and support wheels
Additional 6-shelf tray holder
Additional shelf for 6-shelf tray holder
UNITRIUM sincromicro, microgranular fertiliser spreader featuring localised, synchronised spreading per line or per plant (not available for machines already in use)
Root ball separator plate with adjustable depth
UNITRIUM narrow ploughshare kit
UNITRIUM standard ploughshare kit
UNITRIUM intermediate ploughshare kit
UNITRIUM medium ploughshare kit
UNITRIUM wide ploughshare kit
Inserts for UNITRIUM cup adapter (for very small plants)
Irrigation hosepipe laying device
Hydraulically removable frame (3 rows, width: 240 cm - 250 cm)
Kit containing disks to be located in front of the ploughshare
Highly productive 12-cup dispensing unit (minimum row spacing: 62 cm)

Noise

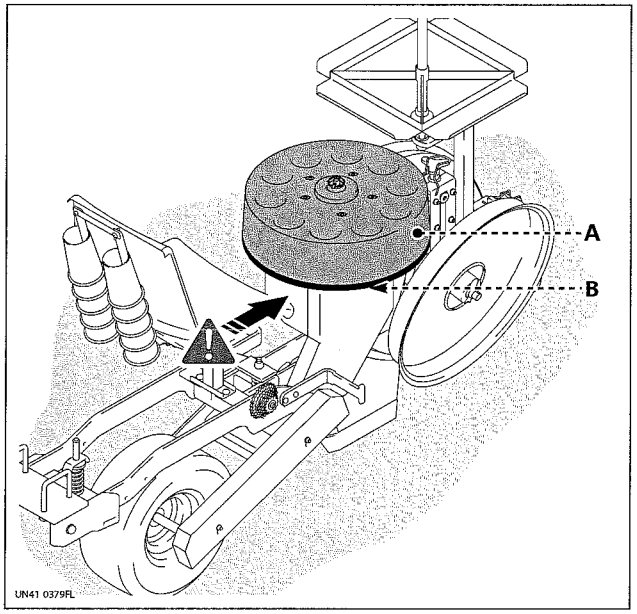
The use of the planting machine does not mean a significant increase in the noise levels of the tractor to which the planting machine is hitched.

Check the tractor manufacturer's manual to decide which PPE to adopt for hearing protection.

Residual risks

During the design and construction stages, the manufacturer has focused particular attention on safety aspects; nevertheless the risks described below remain.

- Risk of cuts and shearing between the dispenser (**A**) and the dispenser disc (**B**) on each planting unit.
- Risk of getting caught/dragged/trapped by the moving parts.
- Danger of getting crushed or trapped when hitching and unhitching the work unit to and from the tractor.



Read this manual carefully before proceeding with any operations concerning use, maintenance or other work on the work vehicle.

Heed and comply with the symbols on the work vehicle, especially those concerning safety.

To reduce risks of accidents as much as possible, the tractor must be driven by a trained operators who is able to coordinate the work of all the other staff involved in the work.

The machine must only be put to the uses specified by the manufacturer; misuse may cause safety and health risks and could result in damage of a financial nature.

Before using the work vehicle check that the guards are all fitted correctly.

Before hitching the work vehicle up to the tractor, make sure the tractor is in good condition.

Check that the work vehicle coupling to the tractor at the third point of the hitch is securely locked so that it cannot work loose.

During use, wear the personal protective equipment and clothing envisaged by the laws in force on safety in the workplace.

In the event of a failure, do not carry out any repairs on site unless you are certain that the area you are in is appropriate and the equipment required is available; it is more advisable to take the time needed to return the business premises rather than carry out repair work in poor safety conditions.

When driving on the roads, the driver must comply with the highway code, ensuring the tractor is roadworthy and the relative signs to signal jutting objects are affixed.

Do not carry people on the work vehicle when moving from one area to another or on the roads.

Maintenance and adjustment work must be carried out with the work vehicle on flat, compact ground, with the tractor engine off, parking brake engaged, ignition key removed.

Never leave the driver's seat when the tractor engine is running.

Before leaving the tractor, lower the work vehicle to the ground, stop the engine, engage the parking brake, and remove the ignition key from the control panel and store in a safe place.

Safety advice for handling and transportation

Perform handling and transportation manoeuvres in compliance with the information provided by the manufacturer and stated directly on the machine, on the packing and in the instructions for use.

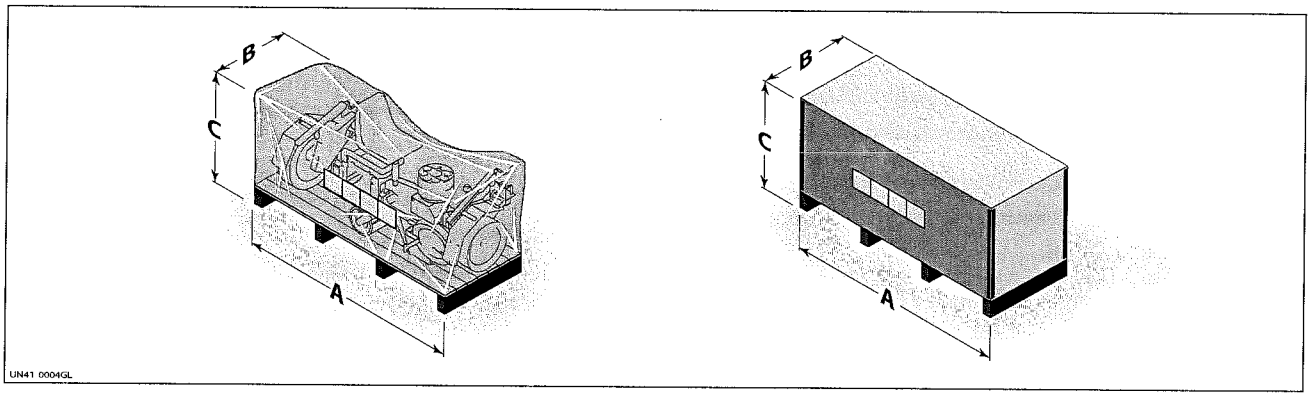
The staff assigned to handling the load must have the required ability and experience and must be skilled in the use of the lifting means adopted.

Packing

The type of packing is chosen according to the selected means of transport and the destination.
The work unit can be delivered fully assembled, or to facilitate carriage, disassembled and packed in several packages.

The illustration shows the types of packing most commonly used.

All the information for safe loading/unloading procedures is printed on the packing.



Approximate packing dimensions - UNITRIUM (dispensing unit with 6 - 10 cups)							
		UNITRIUM/1	UNITRIUM/2	UNITRIUM/3	UNITRIUM/4	UNITRIUM/5	UNITRIUM/6
Parcels	n°	1	1	2	2	3	3
A	cm	220	220	220	220	220	220
B		80	80	80	80	80	80
C		110	110	110	110	110	110

Approximate packing dimensions - UNITRIUM DT (dispensing unit with 6 - 10 cups)							
		UNITRIUM DT/2	UNITRIUM DT/3	UNITRIUM DT/4	UNITRIUM DT/5	UNITRIUM DT/6	UNITRIUM DT/7
Parcels	n°	2	2	2	3	3	4
A	cm	220	220	220	220	220	220
B		80	80	80	80	80	80
C		110	110	110	110	110	110

Approximate packing dimensions - UNITRIUM (dispensing unit with 12 cups)							
		UNITRIUM/1	UNITRIUM/2	UNITRIUM/3	UNITRIUM/4	UNITRIUM/5	UNITRIUM/6
Parcels	n°	1	1	2	2	3	3
A	cm	220	220	220	220	220	220
B		115	115	115	115	115	115
C		110	110	110	110	110	110

Approximate packing dimensions - UNITRIUM DT (dispensing unit with 12 cups)							
		UNITRIUM DT/2	UNITRIUM DT/3	UNITRIUM DT/4	UNITRIUM DT/5	UNITRIUM DT/6	UNITRIUM DT/7
Parcels	n°	2	2	2	3	3	4
A	cm	220	220	220	220	220	220
B		115	115	115	115	115	115
C		110	110	110	110	110	110

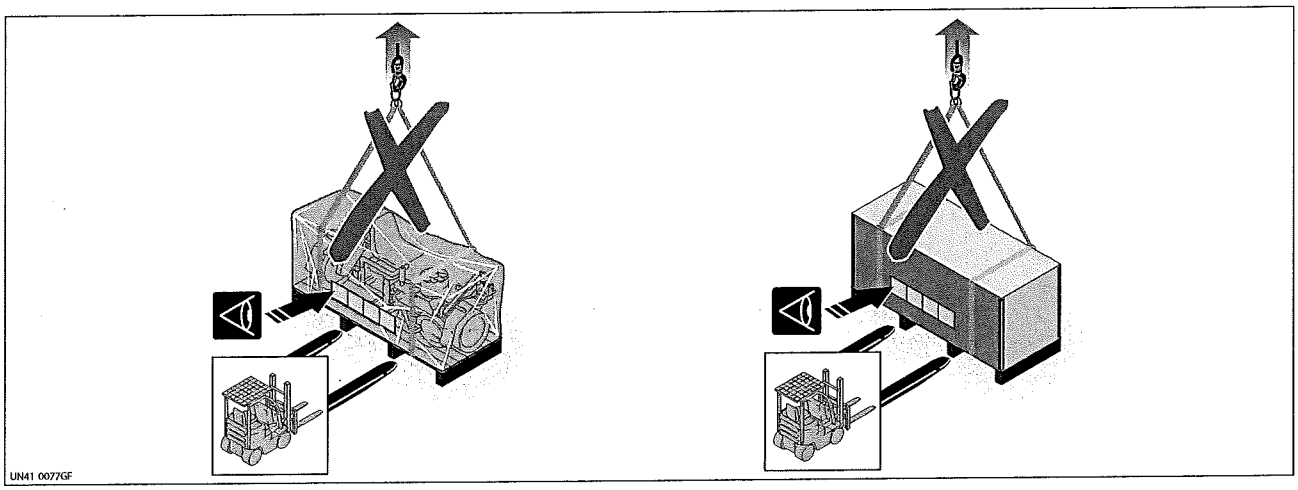
Handling and lifting the packed unit

Danger - Warning

Lift the packed machine using appropriate hoisting means for the load to lift.
Check the parcel weight stated on the packing itself.

Authorised personnel must comply with the instructions contained on the packing, in particular those concerning security.
Handle the packed equipment slowly, with care and caution, to prevent it swinging dangerously.

The illustration shows the harnessing points and lifting procedure.

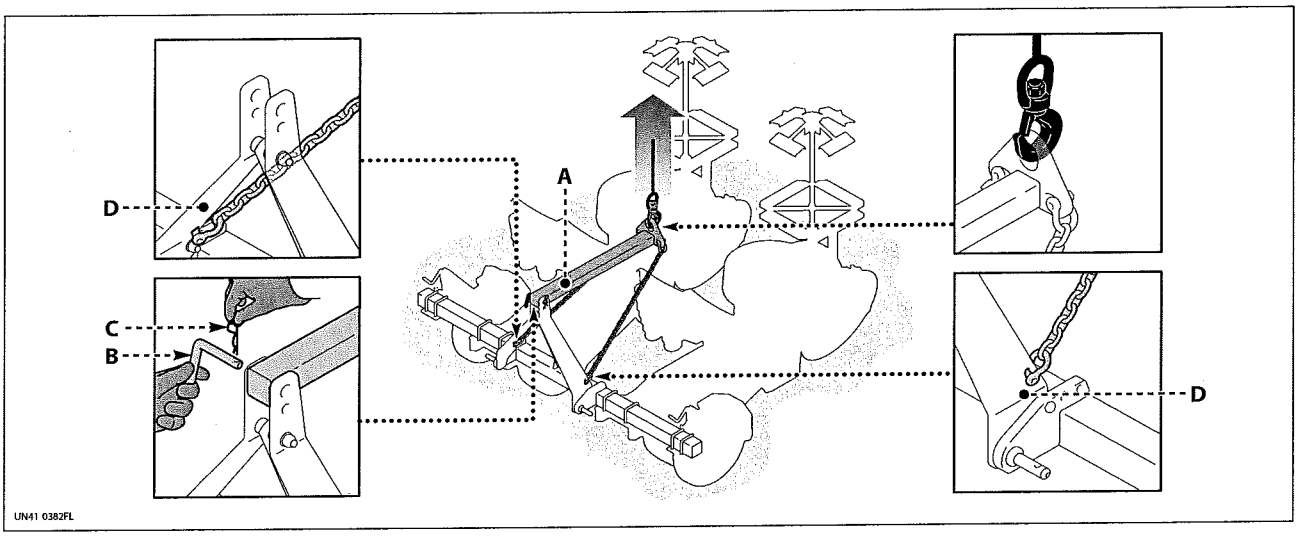


Lifting the UNITRIUM

Danger - Warning

During lifting watch out for the load swinging, as the hook-up point is never perfectly at the centre of gravity.

Lifting operations must be carried out using suitable means for the load to be lifted, by qualified and authorised personnel in order to safeguard their own safety and that of the other people involved in the operations.
The illustration shows the hook-up points for lifting the work unit with two planting units fitted.
The hook-up points for lifting apply for all the UNITRIUM models.



Proceed as outlined below.

1) Use the specific tool (**A**) provided with the work vehicle for lifting.
2) Strap up the work vehicle as shown in the figure.
3) Check that the pin (**B**) is secured by the lock pin (**C**) and that the chains are fastened stably to the frame (**D**).

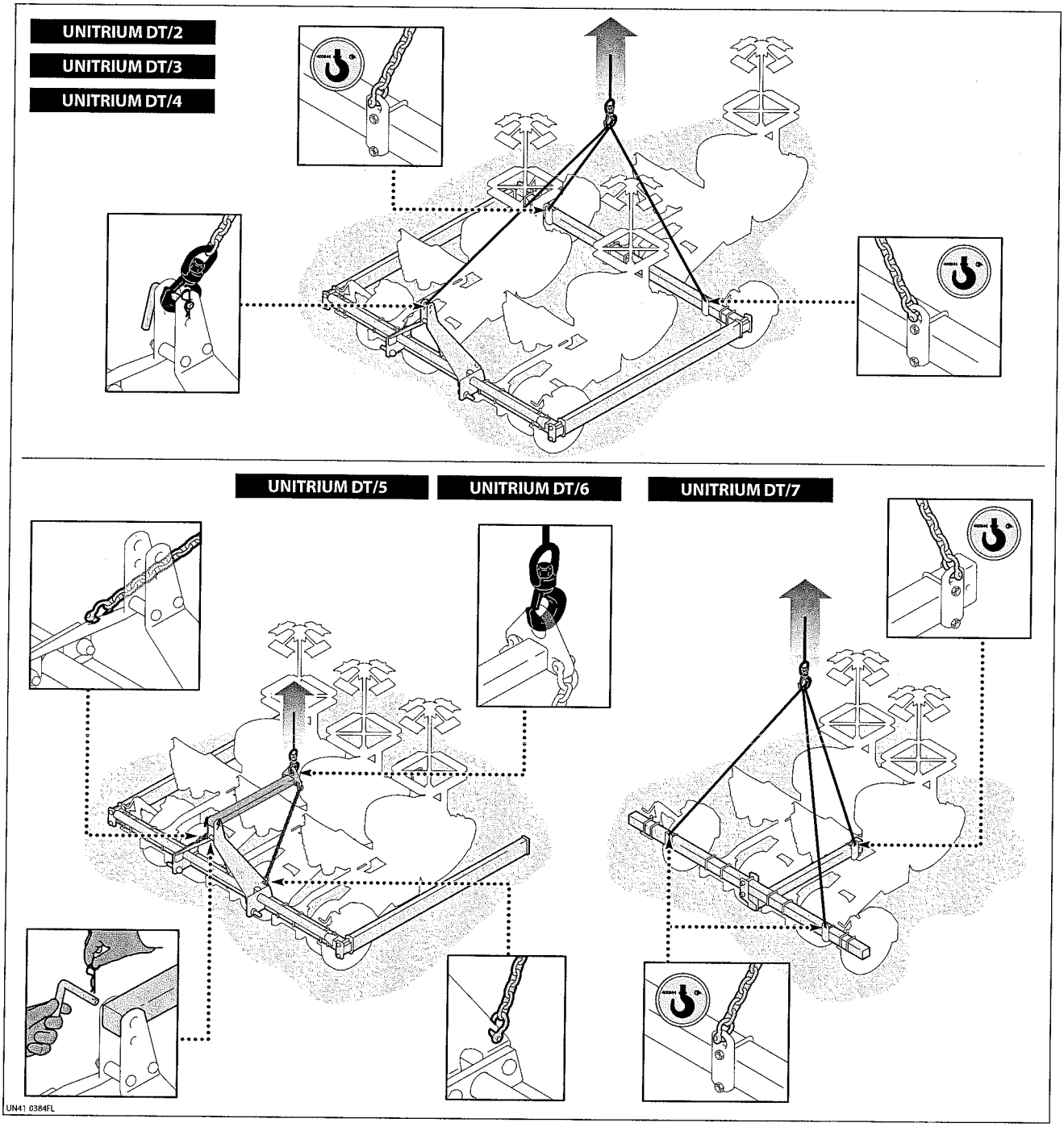
Lifting the UNITRIUM DT

Danger - Warning

During lifting watch out for the load swinging, as the hook-up point is never perfectly at the centre of gravity.

Lifting operations must be carried out using suitable means for the load to be lifted, by qualified and authorised personnel in order to safeguard their own safety and that of the other people involved in the operations.

The machine is equipped with lifting plates marked with appropriate signs.
The illustration shows the points for lifting the work vehicle.
The lifting procedure shown applies for all the work vehicle models specified in the manual.
The **UNITRIUM DT/5 - UNITRIUM DT/6 - UNITRIUM DT/7** models must always be hoisted separately to avoid damage to the frame and possible injury to persons involved in the operations.



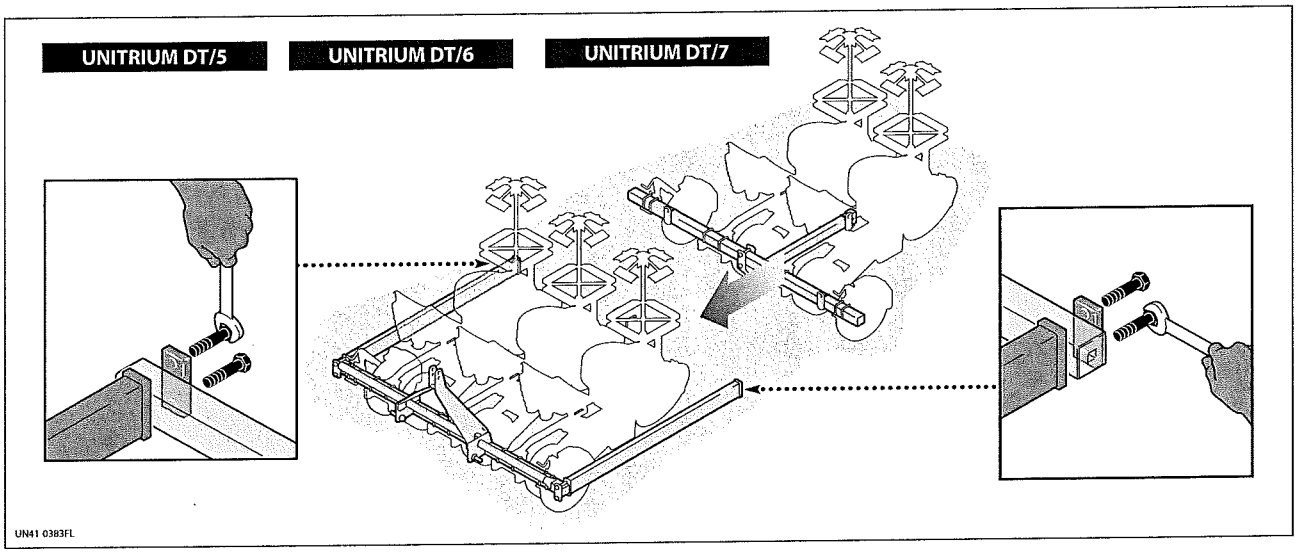
To lift the work vehicle, proceed as follows.

1) Before lifting check the stability of the harness.
2) Strap up the work vehicle or separate units as shown in the figure.

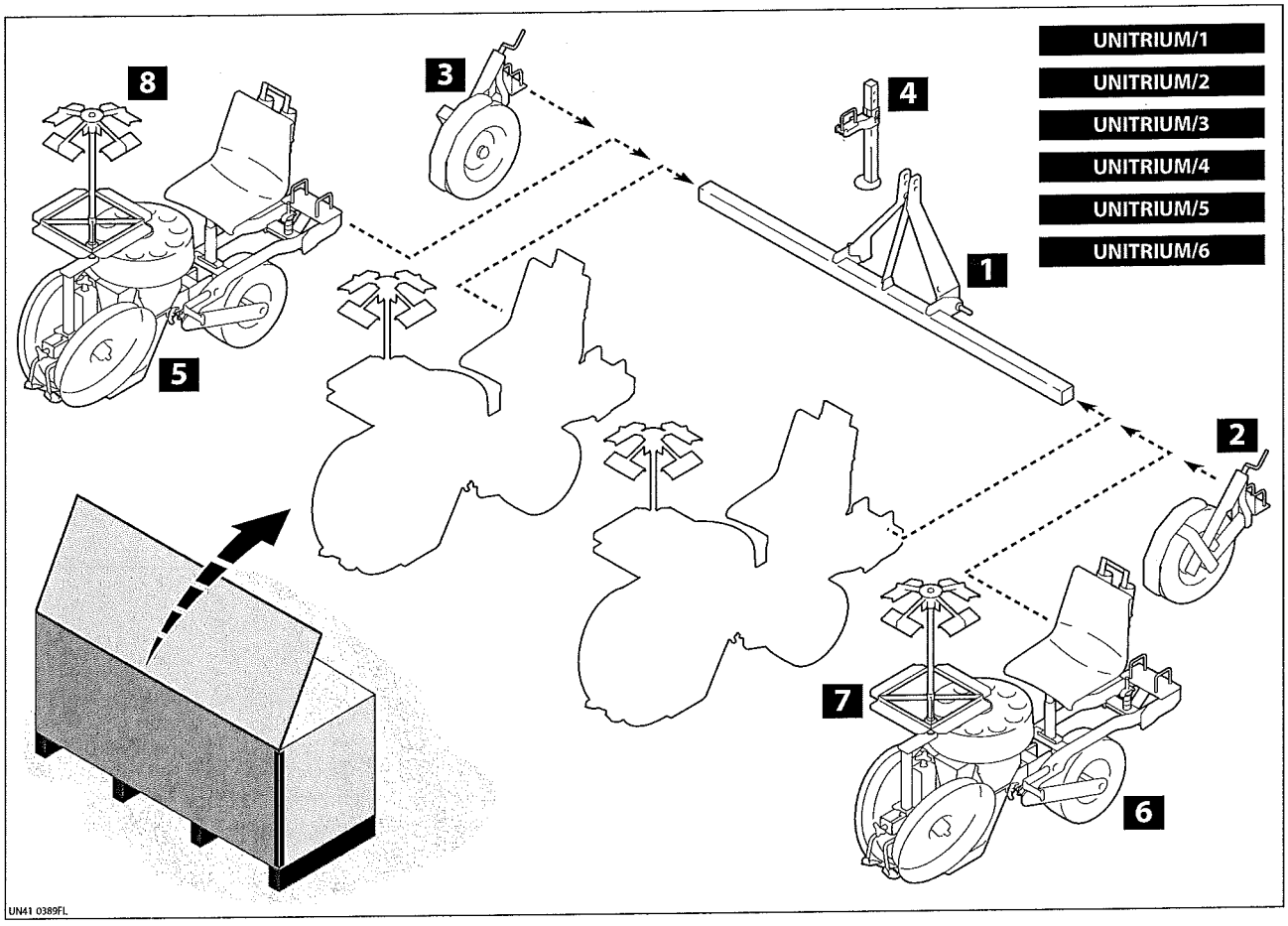
Unpacking and assembly

During unpacking, check that the components are in good condition and tally with the number stated; in the event of damage, report the damage to the retailer or directly to the manufacturer within 8 days of receiving the machine.
The packing materials must be appropriately disposed of or recycled in accordance with the laws in force.

The illustration provides a rough outline of the work vehicle assembly divided into two units.



The illustration provides a rough outline of the work vehicle assembly.



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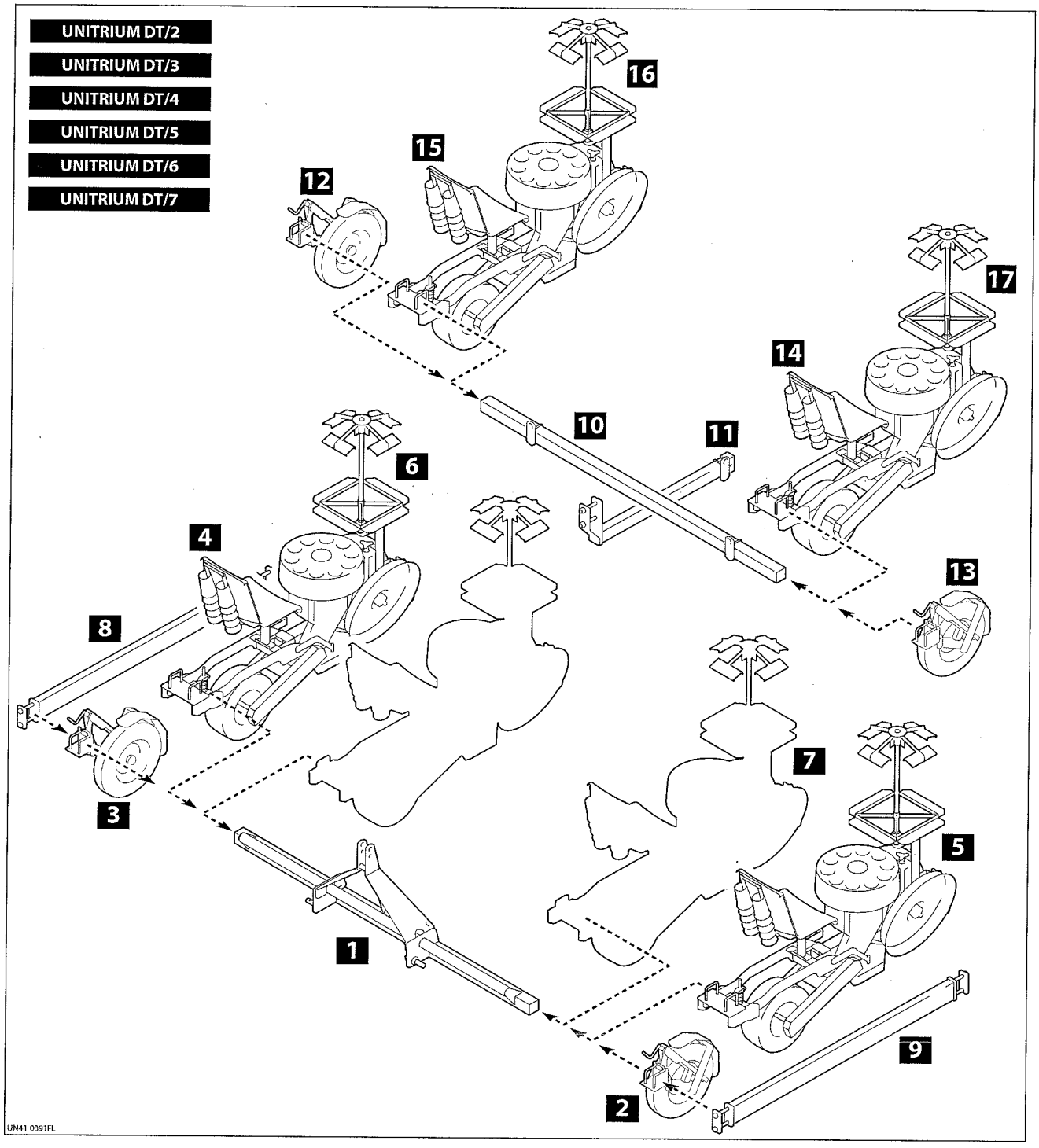


Safety advice for the adjustments

Maintenance and adjustment work must be carried out with the work vehicle on flat and compact ground, with the tractor engine off, parking brake engaged, ignition key removed, and adopting all the necessary safety measures required to work safely.

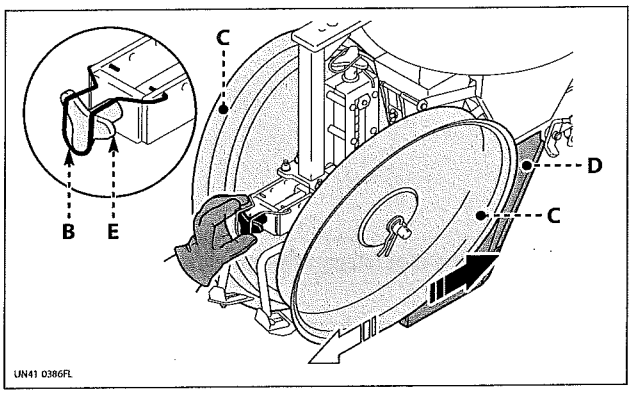
Adjusting the spacing between the packing wheels and the ploughshare

The packing wheels (**C**) are used to ridge and compact the soil around the planted seedlings.

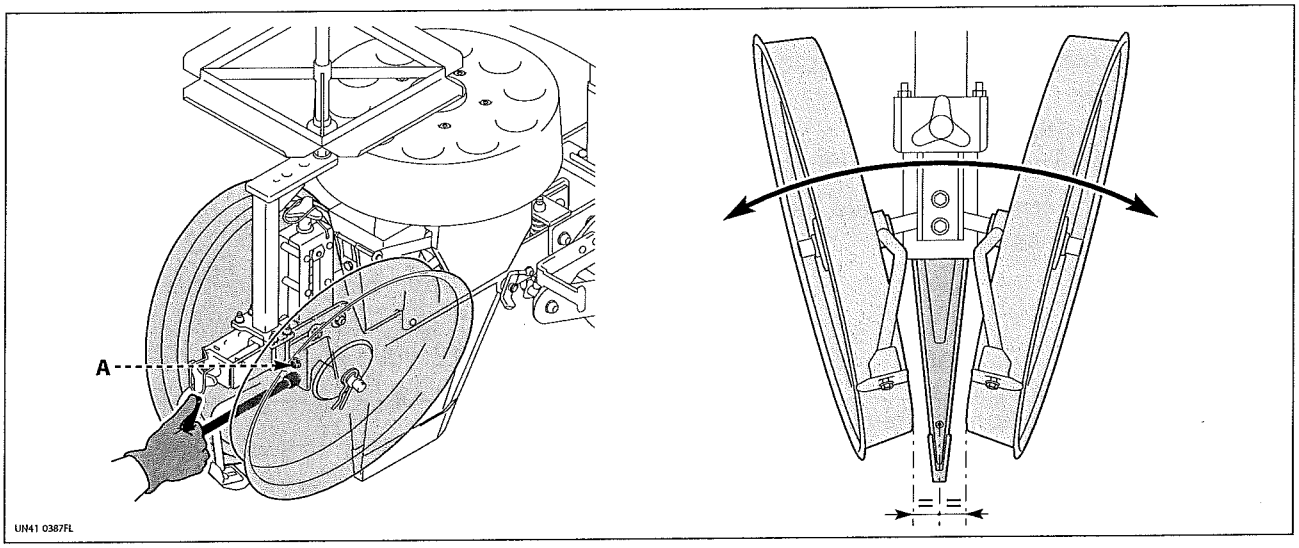
To adjust the packing wheels, proceed as outlined below.

1) Use the lock (**B**) to release the knob (**E**).
2) Turn the knob (**E**) to move the packing wheels (**C**) closer to or away from the ploughshare (**D**).
3) After adjustment secure the knob (**E**) with the lock (**B**).

The distance between the packing wheels and the ploughshare must be adjusted according to the type of ground.



Adjusting the symmetry between the packing wheels and the ploughshare



Because of their incorrect position, the packing wheels may rub against the share.

For adjustments, proceed as outlined below.

1) Loosen the screws (**A**).
2) Centre the packing wheels with the ploughshare.
3) Tighten the screws (**A**).

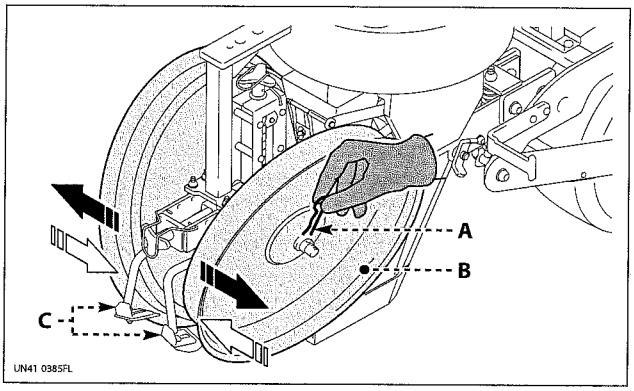
Adjusting the packing efficiency

Adjust the spacing between the packing wheels (**B**) as required.

The farther apart the wheels are, the less efficient the packing is.

For adjustments, proceed as outlined below.

1) Remove the pin (**A**) from both packing wheels.
2) Open out the packing wheels (**B**) as required and then lock them in position with the pins (**A**).
3) Adjust the scrapers (**C**) accordingly (see "Adjusting the packing wheel scraper").



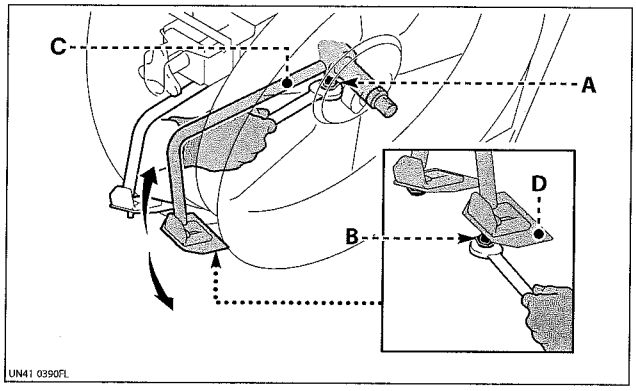
Adjusting the packing wheel scraper

The scraper is used to clean the packing wheels, removing any soil and debris that has built up.

For this operation, proceed as outlined below.

1) Loosen the screw (**A**).
2) Turn the scraper (**C**) until it reaches the desired position.
3) Tighten the screw (**A**).
4) Loosen the nut (**B**).
5) Position the blade (**D**) so that it is just touching the packing wheel.
6) Tighten the nut (**B**).
7) Repeat the same procedure for the other scraper.

Carry out the same operations to adjust the scrapers of the other planting units installed.



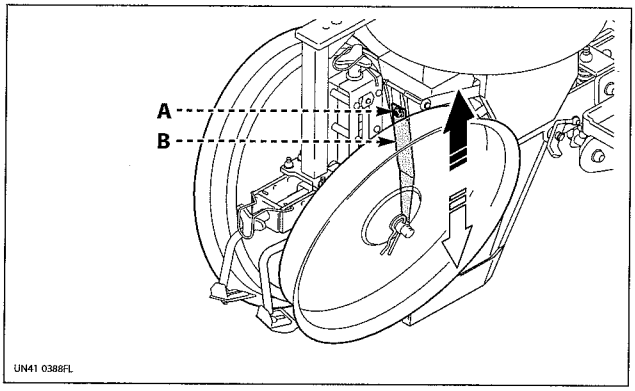
Adjusting the Plant Control device

The Plant Control device stops the seedling in vertical position before they are ejected.

Move the device down for smaller seedlings and up for taller seedlings.

For adjustments, proceed as outlined below.

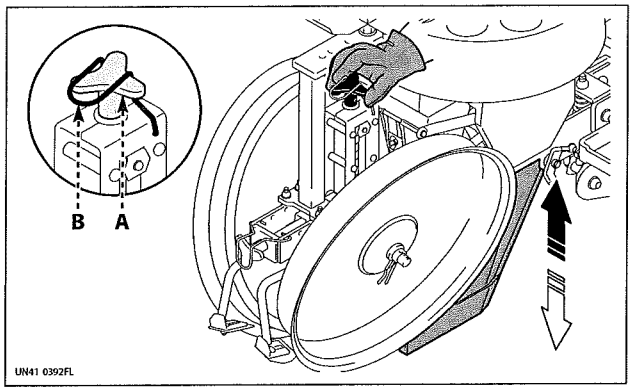
1) Loosen the nut (**A**).
2) Adjust the device (**B**) as required.
3) After adjustment, tighten the nut (**A**).



Planting depth adjustment

For adjustments, proceed as outlined below.

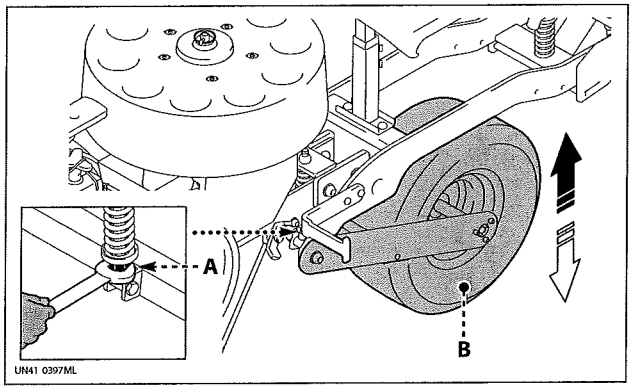
1) Use the lock (**B**) to release the knob (**A**).
2) Turn the knob (**A**) to increase or decrease the depth of the furrow.
3) After adjustment, secure the knob with the lock (**B**).



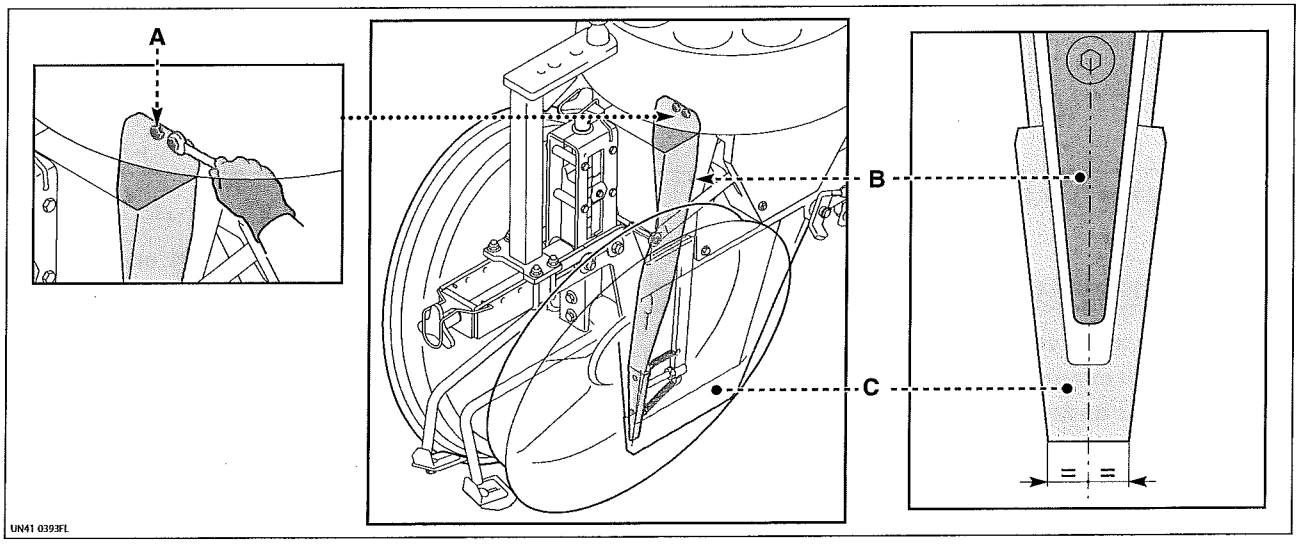
Adjusting the driving wheel load

For adjustments, proceed as outlined below.

- Tighten the nut (**A**) to increase the load of the driving wheel (**B**) on the ground.
- Unscrew the nut to reduce the load of the driving wheel on the ground.



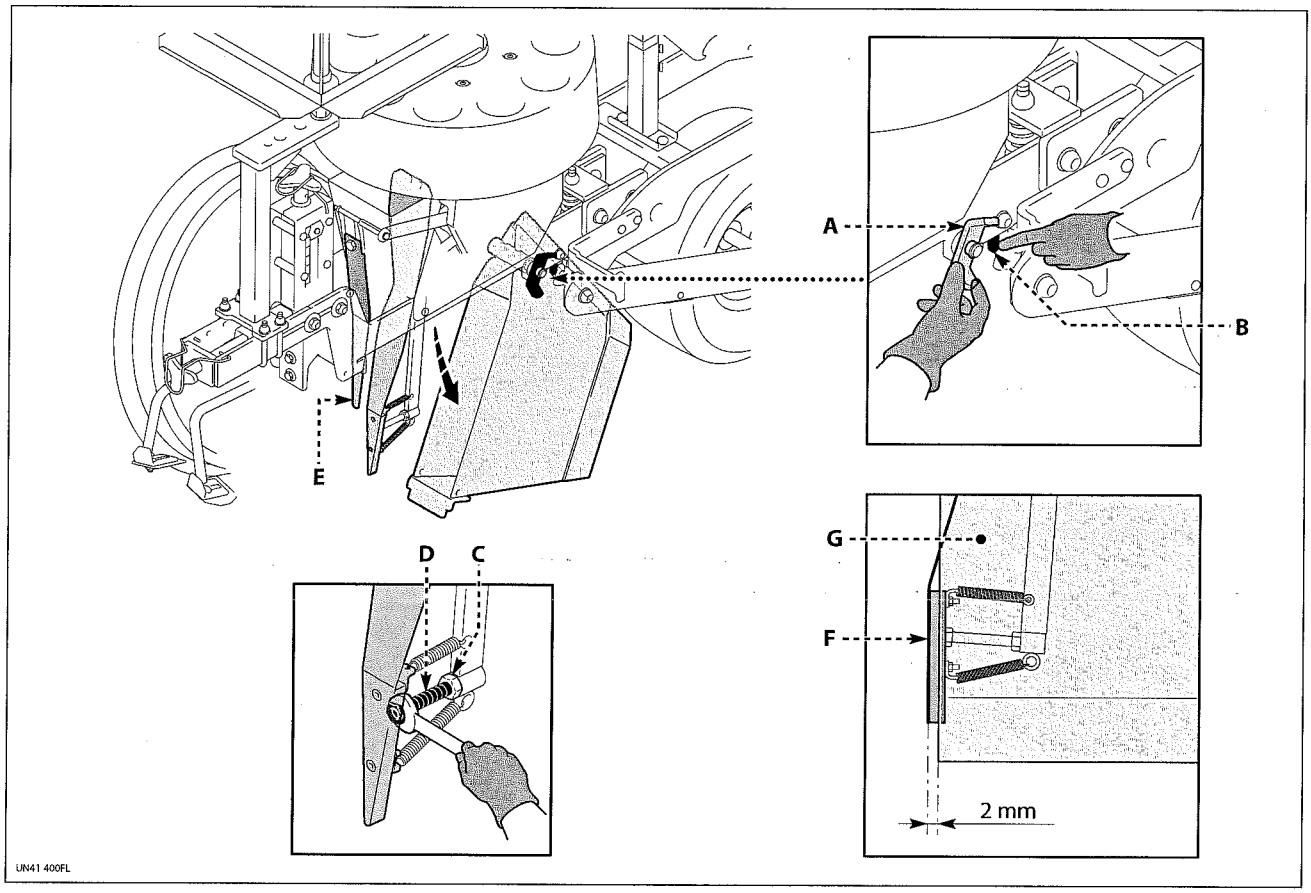
Adjusting the flexible plate centring



For adjustments, proceed as outlined below.

1) Loosen the screws (**A**).
2) Centre the flexible plate (**B**) in relation to the share (**C**).
3) Tighten the screws (**A**).

Adjusting the flexible plate position



For adjustments, proceed as outlined below.

1) Loosen the wing nut (**A**).
2) Turn the lock lever (**B**).
3) Push the share forwards and turn it so it is facing downwards.
4) Loosen the nut (**C**).
5) Turn the screw (**D**) as required to position the flexible plate (**F**) with respect to the ploughshare (**G**) as shown in the figure.
6) Tighten the nut (**C**).
7) Refit the share in the work position.
8) Check that the Plant Control device (**E**) is inside the ploughshare.
9) Make sure that the share is secured in place with the lock lever (**B**).
10) Tighten the wing nut (**A**).

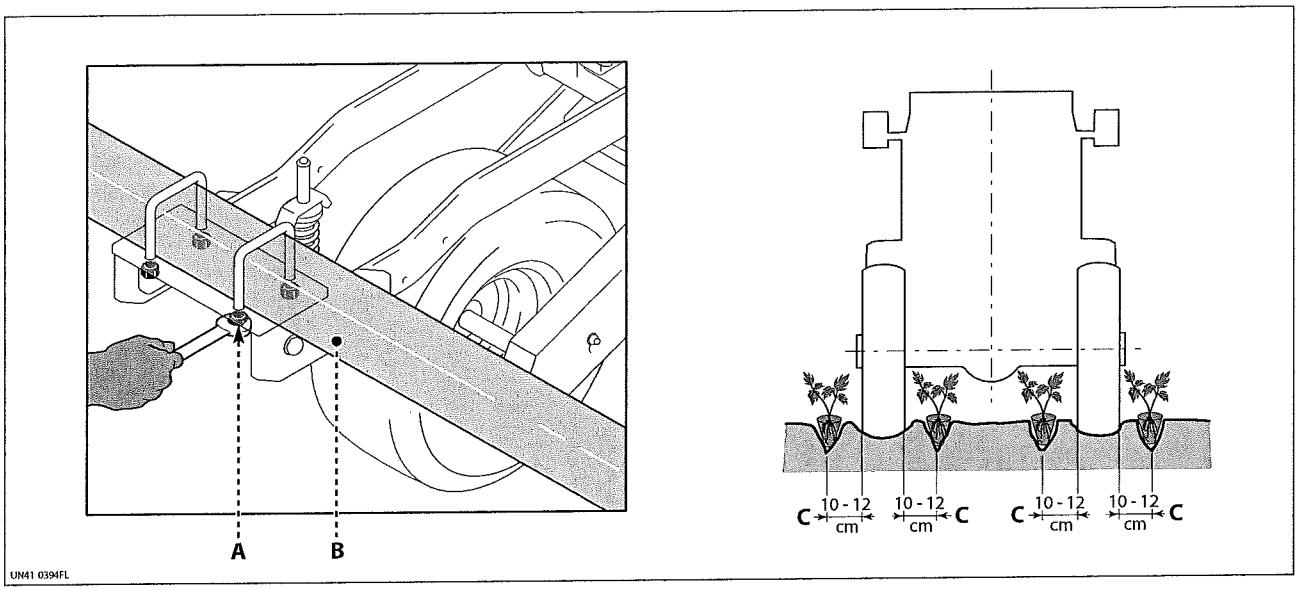
Adjusting the row spacing

Danger - Warning

Secure the work vehicle in position (lifted off the ground) with external means (trestles, etc.).
Do not stand under the hoisted machine unless it is suitably secured in position.

Adjust the gap between the planting units to obtain the row spacing required (for distances envisaged, see "Technical characteristics" for model concerned).

Keep the minimum distance stated on the illustration between the seedlings and the tractor wheels.



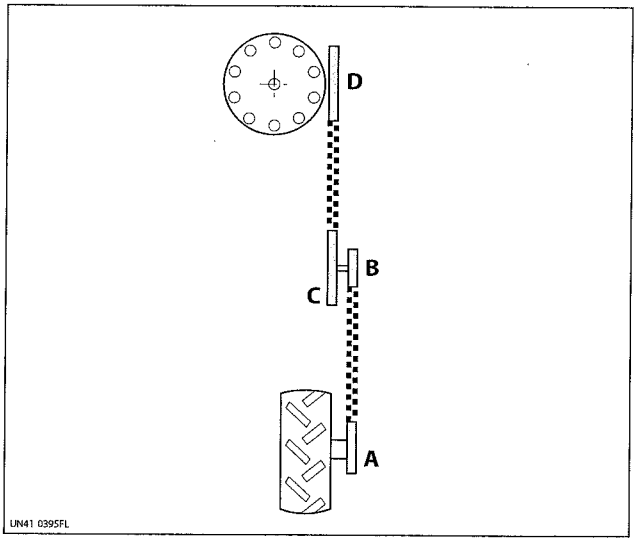
For adjustments, proceed as outlined below.

1) Lift the work vehicle slightly off the ground.
2) Loosen the nuts (**A**).
3) Slide the planting unit along the frame (**B**) until the required plating spacing is obtained.
4) Tighten the nuts (**A**).

To plant the seedlings in bare ground, adjust the planting units so that the seedlings are kept (**C**) 10 - 12 cm away from tractor wheel.

Adjusting the plant spacing

The space between one plant and the next depends on the number of teeth on the pinions installed and on the number of cups of the dispensing unit.
A series of pinions may be fitted to ensure the required plant spacing is obtained.
The pinions must be replaced on all the planting units fitted.
The tables show, in relation to the number of cups of the dispensing unit, the possible distances between one seedling and the next with the range of pinions available.
To mount the pinions, see the section on "Replace the driving wheel pinions" on page 34.



Dispensing unit equipment package featuring 10 cups

Plants spacing		A	B	C	D
cm	inches	(z)	(z)	(z)	(z)
100	39-3/8"	12	22	12	22
92	36-1/4"	12	20	12	22
83	32-5/8"	12	18	12	22
79	31-1/8"	14	20	12	22
72	28-3/8"	14	18	12	22
67	26-3/8"	15	18	12	22
64	25-3/16"	16	18	12	22
61	24"	20	22	12	22
56	22-1/16"	14	14	12	22
52	20-1/2"	15	14	12	22
49	19-1/4"	16	14	12	22
45	17-3/4"	15	12	12	22
42	16-1/2"	16	12	12	22
38	15"	18	12	12	22
34	13-3/8"	20	12	12	22
32	12-5/8"	22	12	12	22
30	11-7/8"	12	22	22	12
29	11-3/8"	12	20	22	12
26	10-1/4"	15	22	22	12
23	9-1/16"	16	20	22	12
20	7-7/8"	20	22	22	12
17	6-3/4"	22	20	22	12
15	5-7/8"	22	18	22	12
14	5-1/2"	22	16	22	12
12	4-5/8"	22	14	22	12
10	4"	22	12	22	12

(z) = N. teeth on the pinions

Dispensing unit equipment package featuring 6 -12 cups

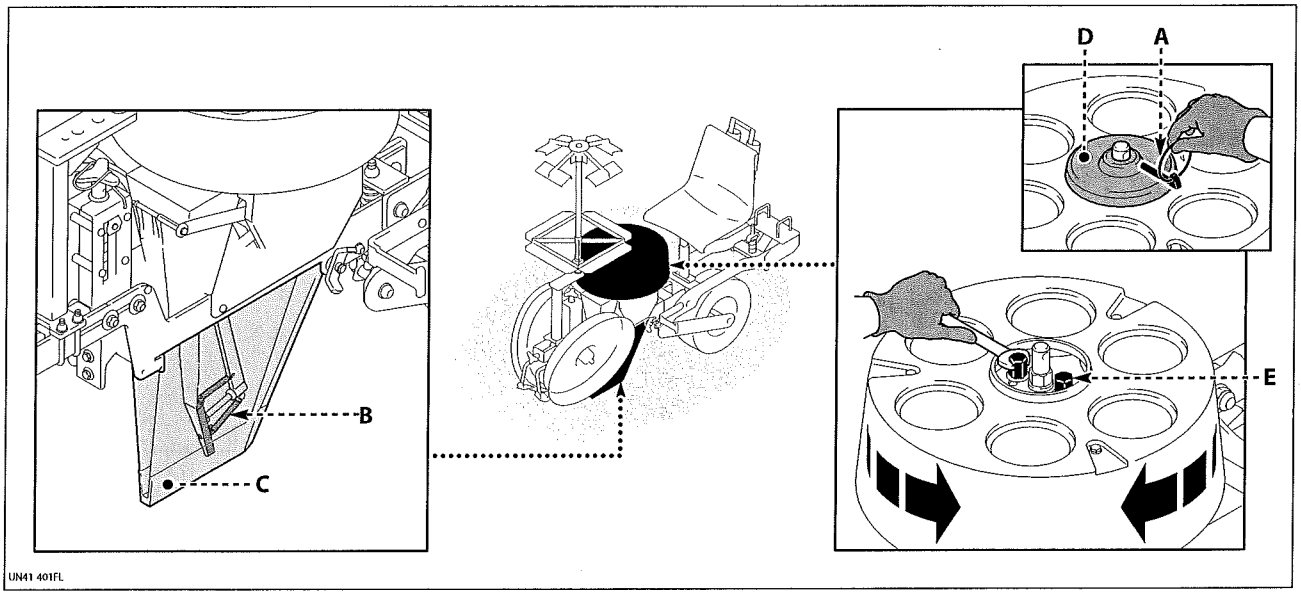
Plants spacing		A	B	C	D
cm	inches	(z)	(z)	(z)	(z)
100	39-3/8"	10	24	12	20
92	36-1/4"	10	22	12	20
83	32-5/8"	10	20	12	20
75	29-1/2"	10	18	12	20
67	26-3/8"	10	16	12	20
63	24-3/4"	12	18	12	20
60	23-1/2"	14	20	12	20
56	22-1/16"	12	16	12	20
52	20-1/2"	16	20	12	20
49	19-1/4"	12	14	12	20
45	17-3/4"	20	22	12	20
42	16-1/2"	14	14	12	20
38	15"	22	20	12	20
34	13-3/8"	22	18	12	20
32	12-5/8"	18	14	12	20
30	11-7/8"	20	14	12	20
28	11"	22	14	12	20
26	10-1/4"	20	12	12	20
23	9-1/16"	22	12	12	20
21	8-1/4"	24	12	12	20
20	7-7/8"	20	22	20	14
18	7-1/16"	22	20	20	14
16	6-1/4"	20	16	20	14
14	5-1/2"	20	14	20	14
12	4-5/8"	20	12	20	14
10	4"	24	12	20	14

(z) = N. teeth on the pinions

Adjusting the dispensing/ejection timing

When the plant falls into the ploughshare (**C**), the ejector (**B**) should be in the rear position and should then start pushing the plant to eject it.

If the conditions allow high- or low-speed planting, correct timing between the dispenser and the ejector can be maintained by adjusting the dispenser.



For adjustments, proceed as outlined below.

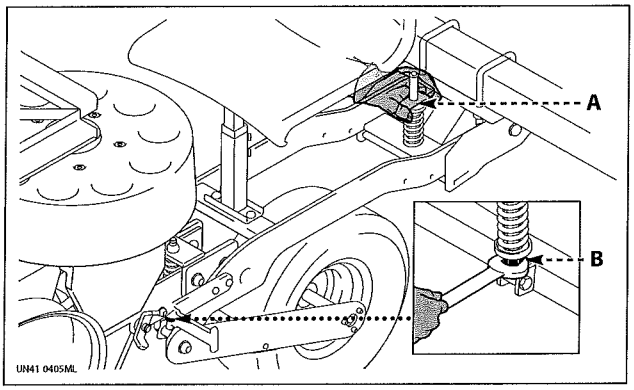
1) Remove the pin (**A**).
2) Remove the lid (**D**).
3) Loosen the screws (**E**).
4) Turn the dispenser clockwise to speed up the ejector's pushing action or rotate the dispenser anticlockwise to delay the pushing action.
   The notches on the dispenser allow accurate timing adjustment.
5) Tighten the screws (**E**).
6) Place the lid (**D**) on the dispensing unit.
7) Insert the pin (**A**).

Adjusting the planting unit load

The weight (load) to be applied to the packing wheels is obtained by the combined action of the handwheel (**A**) and nut (**B**).

For adjustments, proceed as outlined below.

Alternatively turn the handwheel (**A**) clockwise or anticlockwise and tighten or loosen the nut (**B**) to exercise the ideal weight on the packing wheels.



Safety advice concerning use

To prevent the risk of injury, read the safety instructions given in section "3" carefully.

The machine must only be used by fit and healthy personnel, who are suitably trained and authorised, and hold the appropriate category driving licence for a tractor.

The tractor driver is responsible for assessing the hazards associated with envisaged environmental conditions, e.g., specific ground conditions (loose soil, slippery, sloping ground, etc..) which require special precautions, and it is up to the driver to take the necessary measures to eliminate or reduce these hazards.

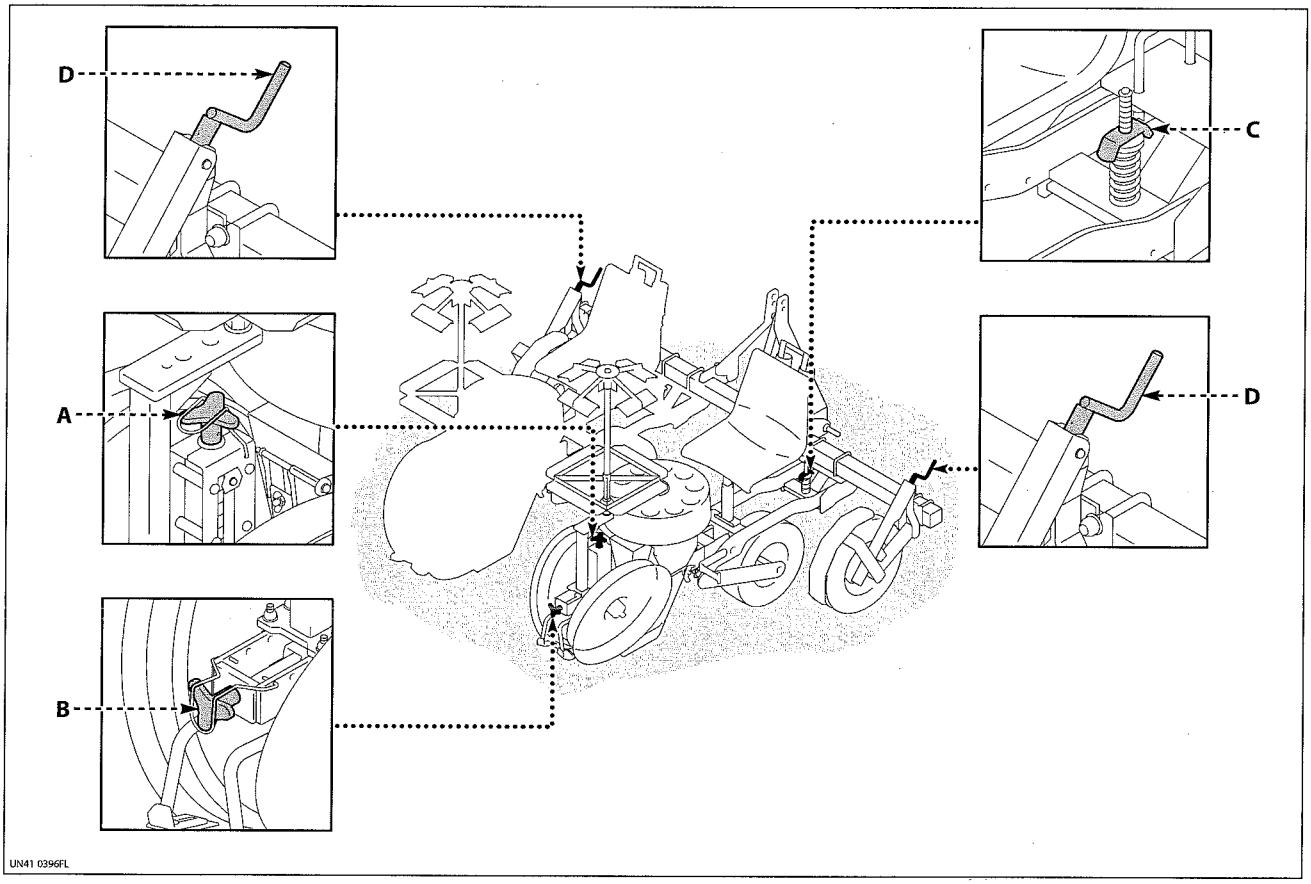
Make sure nobody and no animals are in the machine work and manoeuvring area.

Before transiting on public roads, check that the tractor/work vehicle assembly complies with highway code regulations.

Check that the tractor exhaust gas is not emitted in the direction of the work vehicle's operators.

To prevent serious personal injury, particularly to children, never leave the tractor with the key in the ignition and the machine off the ground.

Description of the controls



A) Knob: this is used to adjust the planting depth (see page 19).

B) Knob: this adjusts the spacing between the packing wheels and the ploughshare (see pag 17).

C) Handwheel: this adjusts the weight on the packing wheels (see page 23).

D) Lever: this is used to adjust the set up of the dispenser(s) so that the seedlings are planted in the ground upright.

The knobs (**A - B**) and the handwheel (**C**) are fitted on every planting unit.

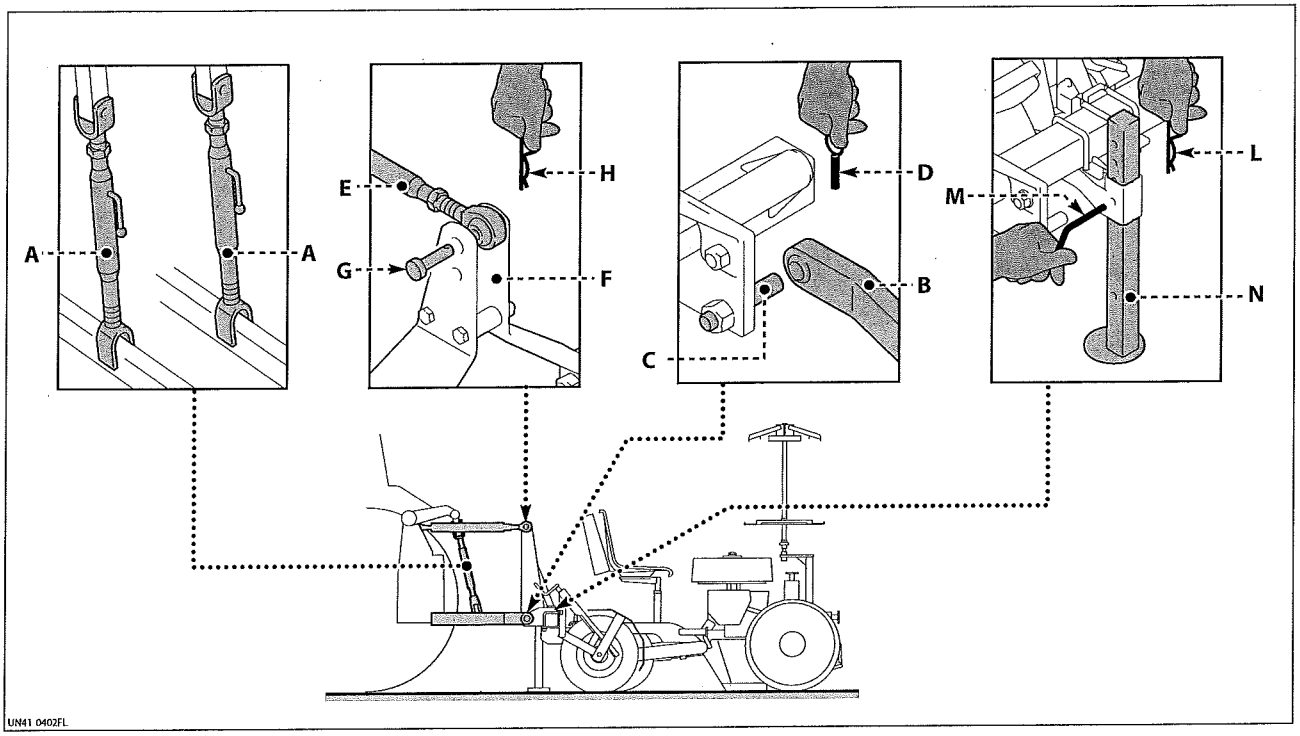
Hitching and unhitching the work vehicle to and from the tractor

Danger - Warning

Hitching the work vehicle up to the tractor is one of the riskiest moments as it could required the involvement of several people at once, carrying out synchronised manoeuvres between the tractor driver and the operators on the ground, which - if badly organised - could result in accidents.

Danger - Warning

The work vehicle must only ever be coupled to a tractor with an appropriate power rating which is equipped with a lift that complies with the regulations in force, observing the maximum weight limit on the rear axle and the gross vehicle weight (see tractor user manual).
Assess whether ballast is required at the front of the tractor to prevent it rearing up and losing stability during driving.
Check that the work vehicle coupling to the tractor at the third point of the hitch is securely locked so that it cannot work loose.



- For hitching, proceed as outlined below.

1) Position the work vehicle on flat, solid ground in a risk-free area.
2) Start moving the tractor to move the three-point hitch up to the lift frame.
3) Align the arms of the lifting unit with the coupling points on the work vehicle.
4) Switch off the tractor engine, remove the ignition key, and store in a safe place.
5) Turn the tie rods (**A**) to adjust the height of the lift arms (**B**) (see tractor instruction manual).
6) Insert the pins (**C**) into the lift arms and fit in the lock pins (**D**).
7) Turn the tie-rod (**E**) to adjust the space between the tie-rod and the upper coupling (**F**) on the support frame.
8) Insert the pin (**G**) and the lock pin (**H**).
9) Remove the lock pin (**L**), slide out pin (**M**) and lift the resting foot (**N**) off the ground.
10) Adjust the tie-rod (**E**) so that the work vehicle is parallel with the ground.

- For unhitching, proceed as outlined below.

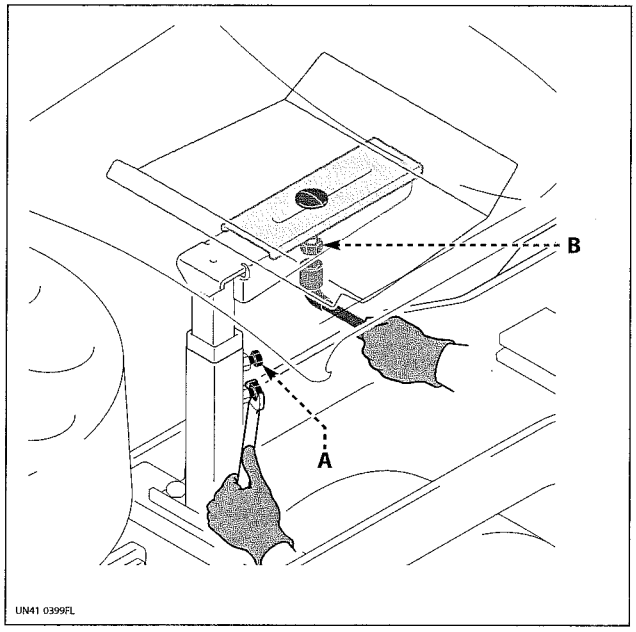
1) Select an area with flat, solid ground to park the work vehicle.
2) Using the tractor's controls, lower the work vehicle to the ground.
3) Lower the resting foot (**N**), insert pin (**M**) and lock pin (**L**).
4) Switch off the tractor engine, remove the ignition key, and store in a safe place.
5) Take out the lock pin (**H**) and remove the pin (**G**).
6) Slide out the lock pins (**D**) and remove the lift arms (**B**) from the work vehicle's coupling points.

Seat positioning

Poor work posture will tire the operator and could lead to mistakes being made; therefore, before starting work, adjust the seat and secure it in the position that offers maximum comfort.

Proceed as outlined below.

1) Loosen the screws (**A**) and adjust the seat height.
2) Tighten the screws (**A**) to secure the seat in the right position.
3) Loosen the nut (**B**) to move the seat lengthways in relation to the vehicle.
4) Tighten the nut (**B**) to secure the seat in the right position.



Using the inserts and extensions

- The inserts (**A**) are used to keep small seedlings vertical in the dispenser unit and to ensure that they fall vertically into the ploughshare.

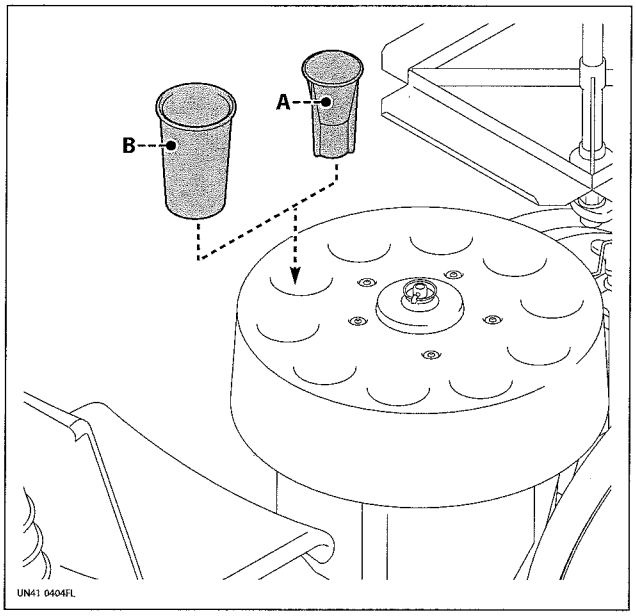
Proceed as outlined below.

1) Fit the inserts (**A**) inside the cups of the dispenser.

- The extensions (**B**) are used to keep seedlings with developed leaf apparatus in vertical position.

Proceed as outlined below.

1) Fit the extensions (**B**) inside the cups of the dispensing unit.



Information

The inserts must be fitted inside the cups of the dispensing unit instead of the extensions or vice versa.

Planting procedure

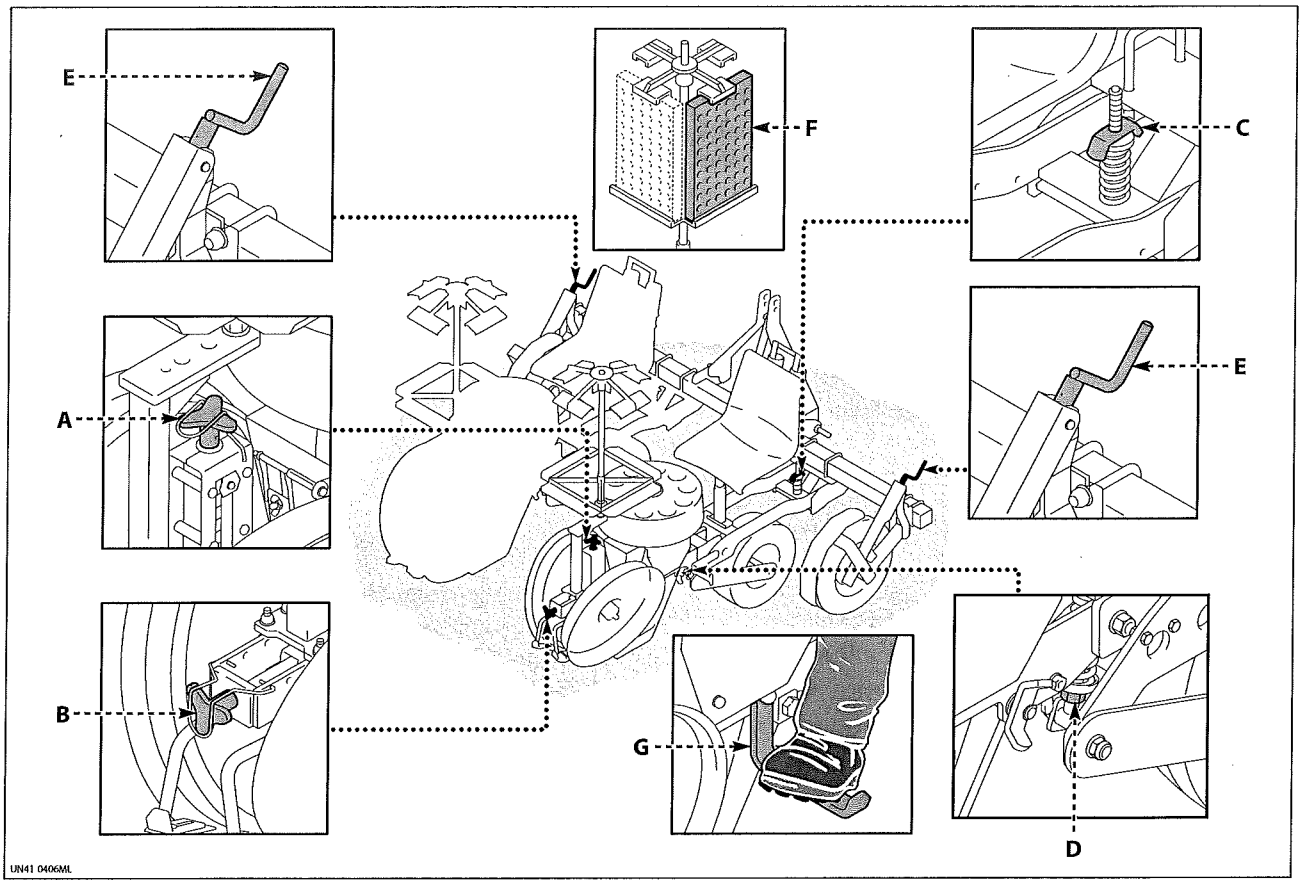
The seedlings must be planted in soil which has been finely tilled with a harrow or hoeing machine and lightly compacted on the surface.

We recommend you dampen the root ball well (but without causing dripping) to help the seedling fall from the dispenser better and also take root.

We recommend you dampen the root ball well (but without causing dripping) to help the seedling fall from the dispenser better and also take root.

Do not work on extremely spongy spoil, or extremely compact soil, nor on very wet ground, as these conditions would all affect planting quality negatively.

During planting, the driving wheels of every planting unit must grip the ground at all times and the tractor lift must be fully lowered.



- Preliminary operations

Before starting planting, position the machine on flat ground and carry out the following operations.

1) Check that the plant spacing is correct (see "Adjusting the plant spacing" - page 22).
2) Check that the row spacing is correct (see "Adjusting the row spacing" - page 20).
3) Assess the soil consistency in order to adjust the distance between the packing wheels and the ploughshare using the knob (**B**) (see "Adjusting the spacing between the packing wheels and the ploughshare" - page 17).
4) Decide whether the gap between the packing wheels is large enough to ensure the correct pressure is applied to the root ball (see "Adjusting the packing efficiency" - page 18).
5) Turn the levers (**E**) by the same amount to set (depending on the model) the dispensing unit(s) parallel to the ground.
6) Use the knob (**A**) to adjust the furrow depth (see "Planting depth adjustment" - page 19).
7) Use, alternatively, the handwheel (**C**) and the nut (**D**) to adjust the load of the packing wheels (see "Adjusting the planting unit load" - page 23).
8) Use the nut (**D**) to apply the load of the driving wheel to the ground (see "Adjusting the driving wheel load" - page 19).
9) Position the trays (**F**) safely in the tray holder.

- Planting operations

1) To prevent overloads on the ploughshare, the tractor driver must lower the work vehicle with the tractor moving forwards at low speed. Do not reverse the tractor with the work vehicle on the ground as this could damage the ploughshare.
2) Stop the tractor and let the operators get on the work vehicle.
   In the planting stage, the operators on the work vehicle must adopt a correct posture with their feet resting on the footboard (**G**) and must agree - together with the tractor driver - on the most effective speed of travel.
3) Load the seedlings into the dispenser and keep it loaded during the planting stage.
   Do not load the seedlings into the front cups as they are continually opening and closing.
4) The operators on the work vehicle must decide on the tractor's speed of travel together with the tractor driver so that a least 60 seedlings can be placed in the dispenser per minute and correct ejector/seedling timing is obtained.
5) Move forwards with the tractor before starting the planting.
6) The operators on the work vehicle must check the planting quality constantly. In the event of anomalies, stop the tractor moving forwards and adopt corrective measures (see "Information on adjustments" and "Troubleshooting" - pages 17 and 31).

Night-time work or poor visibility conditions

Working at night or in poor visibility conditions increases the risks arising from machine use; in these conditions, proper lighting must be provided to ensure safe work.

Transporting the work vehicle

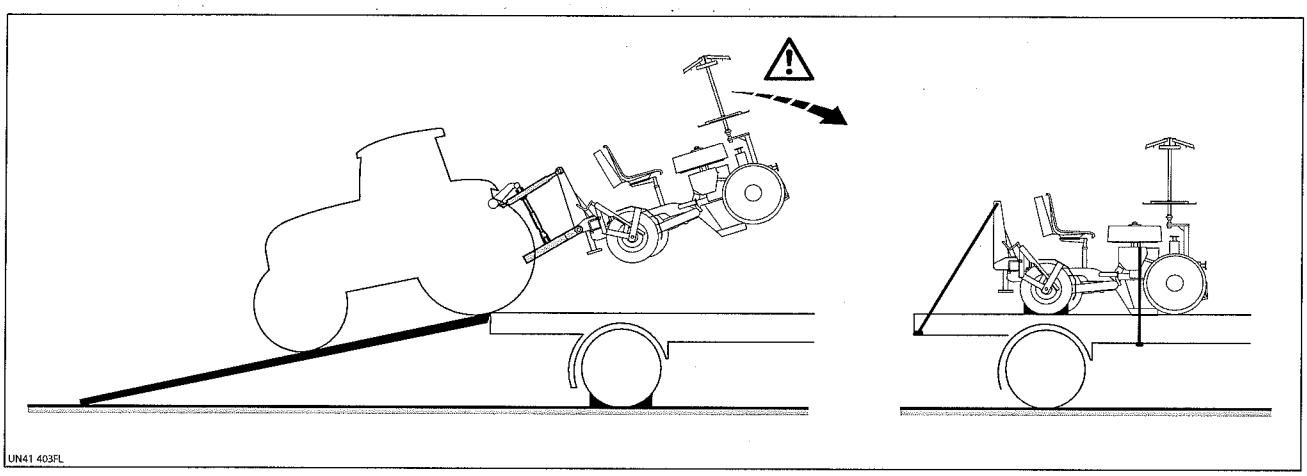
Danger - Warning

For work vehicle loading/unloading, use lifting equipment with a suitable capacity for the load to be lifted.
Use all possible caution when lifting to avoid damaging the work vehicle and causing injuries to persons involved in operations.

Strap up the unit at the lifting points envisaged by the manufacturer.
See the strap-up points and lifting procedures in the sections titled "Lifting the UNITRIUM" on page 13 or "Lifting the UNITRIUM DT" on page 14.
Anchor the work unit to the means of transport with ropes and secure the wheels with wedges.
Units which are narrower than the maximum width allowed by the Highway Code can be loaded, coupled to the tractor, onto suitable means of transport using loading ramps.

Danger - Warning

Thoroughly clean the ramps and loading platform before boarding the vehicle.
Position the ramps on the transport means and fix them in a stable way to the truck bed using the fastening devices (pins, screws, chain etc.).
Where the ramps meet the truck bed there is a dangerous bump so move the machine very carefully over this point.



Proceed as outlined below.

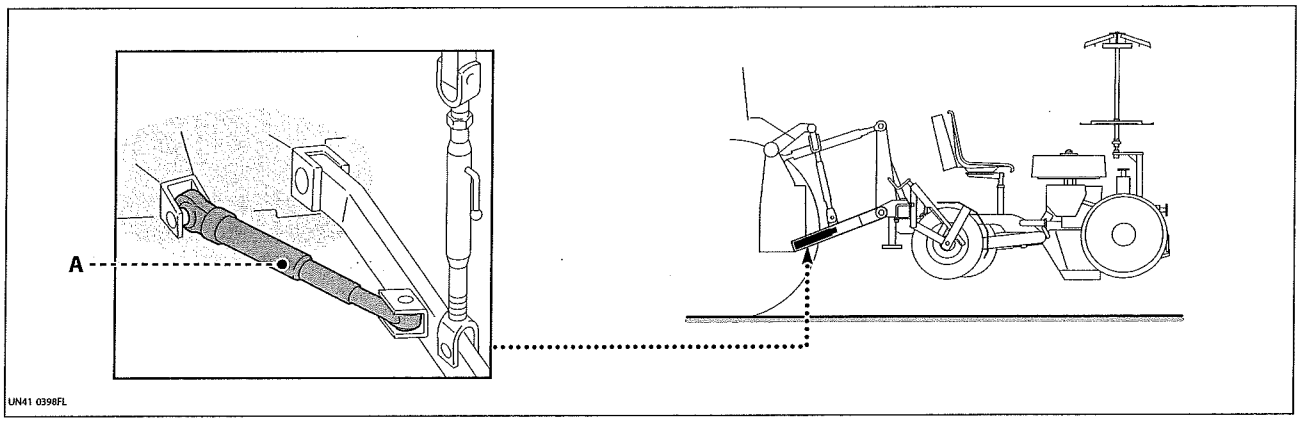
1) Start the tractor and lift the work vehicle as far off the ground as is permitted.
2) Get into the means of transport from the tractor's driving seat.
3) Lower the work vehicle onto the truck bed.
4) Off the tractor engine and engage the parking brake.
5) Anchor the work unit -tractor assembly to the means of transport with ropes and secure the wheels with wedges.
6) Affix the relative signalling signs to any parts jutting out from the means of transport.

Transit on public roads

Danger - Warning

It is prohibited to carry people and/or things on the work vehicle.
Before any on-the-road driving remove all the trays from the tray holder and clean the working parts and the tires to remove any soil residues.

When transporting the work vehicle/tractor assembly, the regulations of the highway code must always be complied with.
Obligatorily, the three-point hitch must be secured with the relative bars (**A**) to prevent the work vehicle swinging against the tractor and the speed of travel must be adjusted to prevent loss of control of the tractor.



Prolonged disuse of the work vehicle

If the work vehicle is not due to be used for long periods, proceed as follows.

1) Clean the machine thoroughly, taking care to remove any chemical or fertiliser residues (see "Cleaning the work vehicle").
2) Check the condition of the all the machine's parts and replace any that are worn or damaged.
3) Check that the screws are correctly tightened.
4) Grease to all the unpainted parts.
5) Grease the parts that require lubrication (see "Lubrication points diagram").
6) Park the machine carefully on flat ground in a dry area protected from the weather.

Leave enough room around the work vehicle for the hitching up and unhitching manoeuvres.
Lower the foot to the ground (if featured) to guarantee work vehicle stability.

Safety advice for maintenance

Maintenance work must be carried out with the work vehicle on flat, compact ground, with the tractor engine off, parking brake engaged, and ignition key removed, and adopting all the necessary safety measures required to work safely.
Any maintenance operations that can be carried out on the business premises come under the ordinary maintenance envisaged in the instruction manual.

Special maintenance operations (non included in this handbook) require a specialised workshop on the premises which meets the requirements specified by the relative laws in force (appropriate equipment suitably trained staff etc.); if you do not have a compliant workshop, contact an authorised one.

Maintenance interval schedule

To guarantee constant, efficient and safe machine operation, ensure all the maintenance envisaged by the manufacturer is carried out.

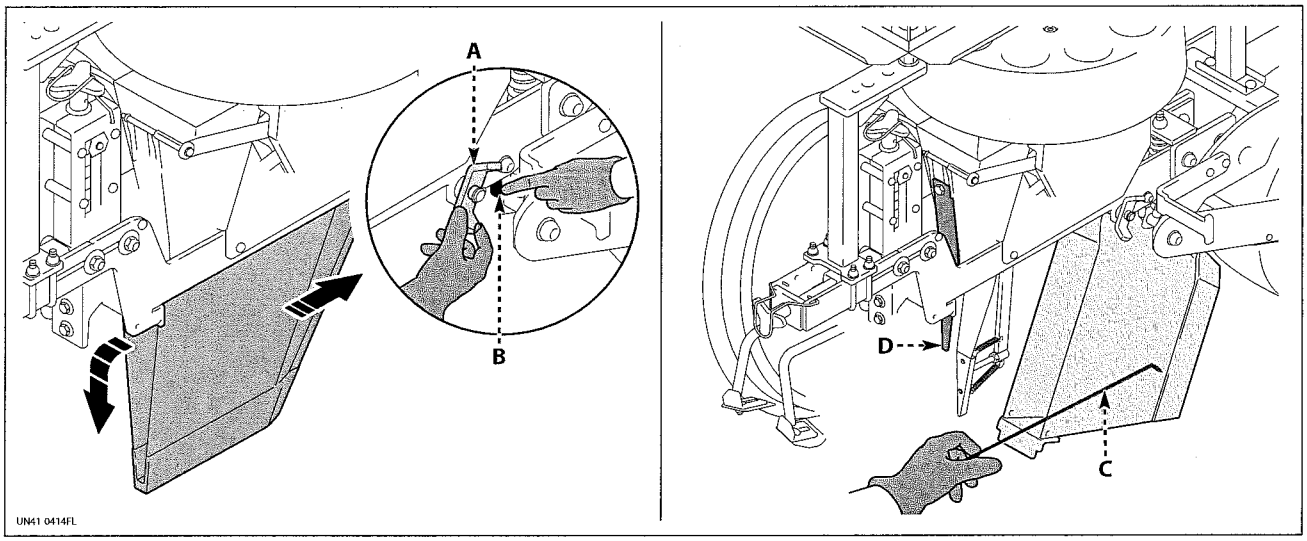
Maintenance schedule

Maintenance intervals			
Frequency	**Component**	**Type of work**	**Manual reference**
Every hour	Dispenser	Cleaning	
	Ploughshare	Cleaning	Cleaning the ploughshare
Every day	Lift frame	Inspection	
	Safety devices	Inspection	Guards
	Warning and hazard plates	Inspection	Information and safety signs
Every 50 hours	Machine components	Greasing	Lubrication points diagram
	Nuts and bolts	Tightening	
Every 150 hours	Tyres	Pressure check	Tyres check

Cleaning the ploughshare

Clean the ploughshare to remove any debris, mud, peat, plant residues etc that may have built up during use.

Lack of cleaning will limit the ejector range, therefore, as well as affecting the machine's operation, it also causes serious mechanical damage.



Proceed as outlined below.

1) Lift the work vehicle off the ground.
2) Loosen the wing nut (**A**).
3) Turn the lock lever (**B**).
4) Push the share forwards and turn it so it is facing downwards.
5) Clean the ploughshare with the tool provided (**C**).
6) After cleaning, refit the ploughshare in the work position.
7) Check that the Plant Control device (**D**) is inside the ploughshare.
8) Make sure that the share is secured in place with the lock lever (**B**).
9) Tighten the wing nut (**A**).

Tyre check

Check the tyres for wear and if they feature tears or signs of ageing, they must be replaced.

Check and if necessary restore the tyre pressure (see the "Technical characteristics" table).

Cleaning the work vehicle

Clean the work vehicle with a high-pressure water jet and, if necessary, with approved detergents.
The liquid used for washing could be hazardous for the environment due to the presence of pollutants such as detergents, oils, etc., therefore do not simply dump the wastewater; dispose of it in suitable areas equipped with separation devices for the pollutants.
Dry with compressed air and lubricate the components shown (see "Lubrication points diagram").

Troubleshooting

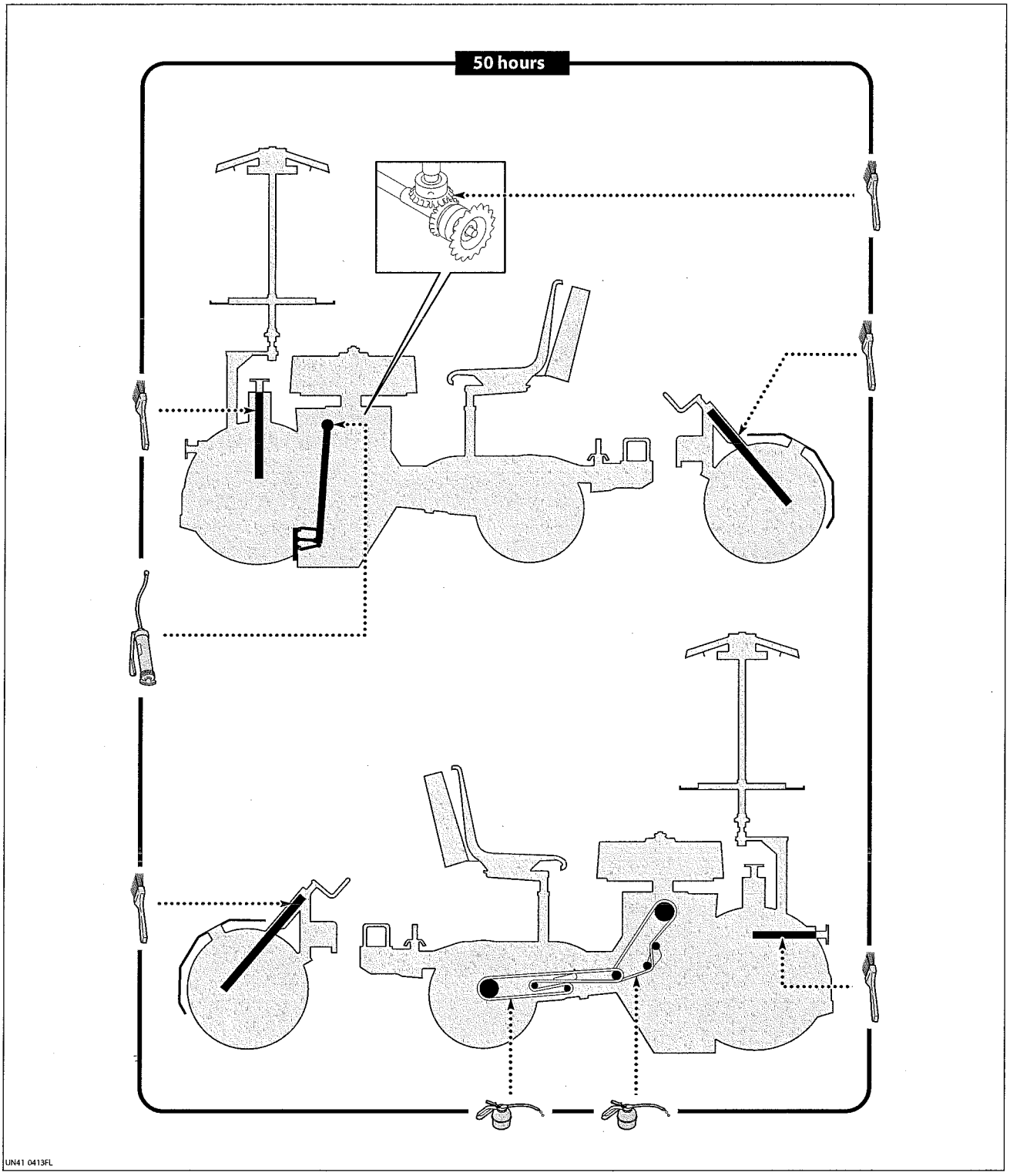
The following list contains a number of common problems that may arise during work, together with the ways to solve them.

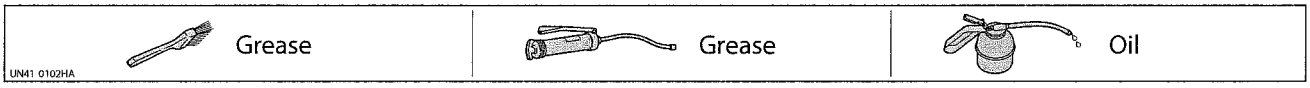
Problem	Likely cause	Solution
The seedling planted is too close to the surface or too deep	Incorrect planting depth	Make the relative adjustment (see "Adjusting the planting depth")
	The dispenser is not synchronised with the ejector	Adjust the timing (see "Adjusting the dispensing / ejection timing")
The soil has not been properly compacted on top of the seedlings	The packing wheels are not properly adjusted	Adjust the packing wheels (see "Adjusting the spacing between the packing wheels and the ploughshare")
The seedling is planted at an angle	The dispenser is not synchronised with the ejector	Adjust the timing (see "Adjusting the dispensing / ejection timing")
	The Plant Control device is not in the correct position	Adjust the plant control plate (see "Adjusting the Plant Control device")
The seedling is lying overturned on the ground	The Plant Control device is not in the correct position	Place the Plant Control device inside the ploughshare

Lubrication points diagram

Lubricate the parts shown at the times and in the ways specified.
Before lubricating, clean the components concerned and the greasing nipples to prevent contamination of the lubricant.

Use universal grease for traction in farming and industrial machinery, which is water-repellent with a 180° drop point.

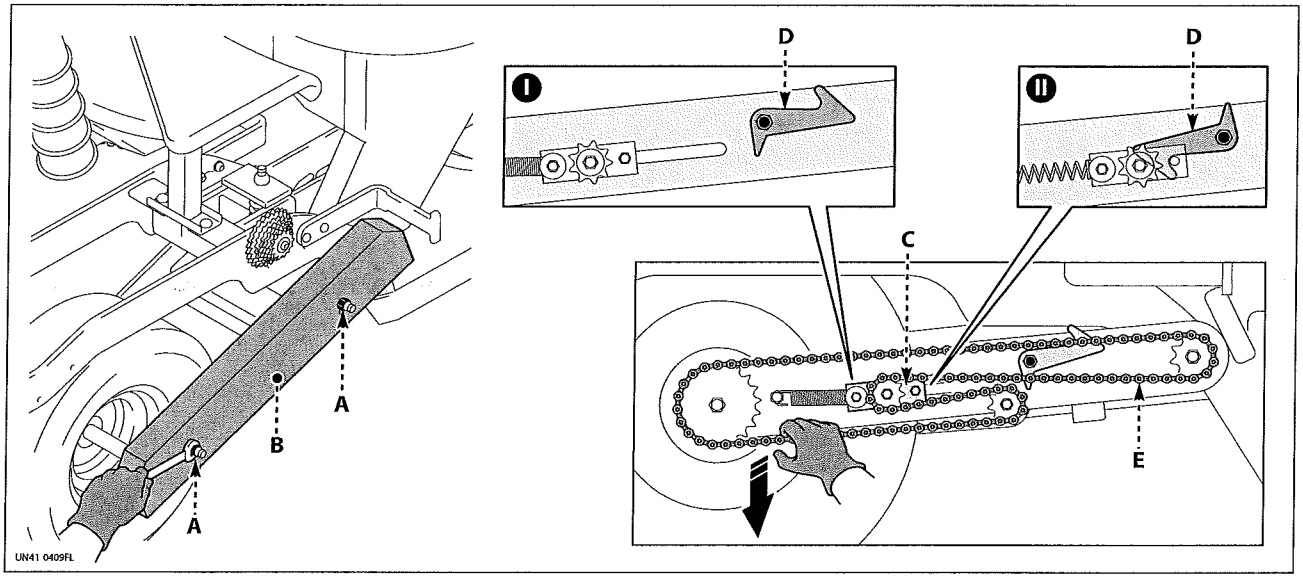




Safety advice in case of replacements

When replacing worn or damaged parts, original spares must always be used.
Special maintenance operations (non included in this handbook) require a specialised workshop on the premises which meets the requirements specified by the relative laws in force (appropriate equipment suitably trained staff etc.); if you do not have a compliant workshop, contact an authorised one.

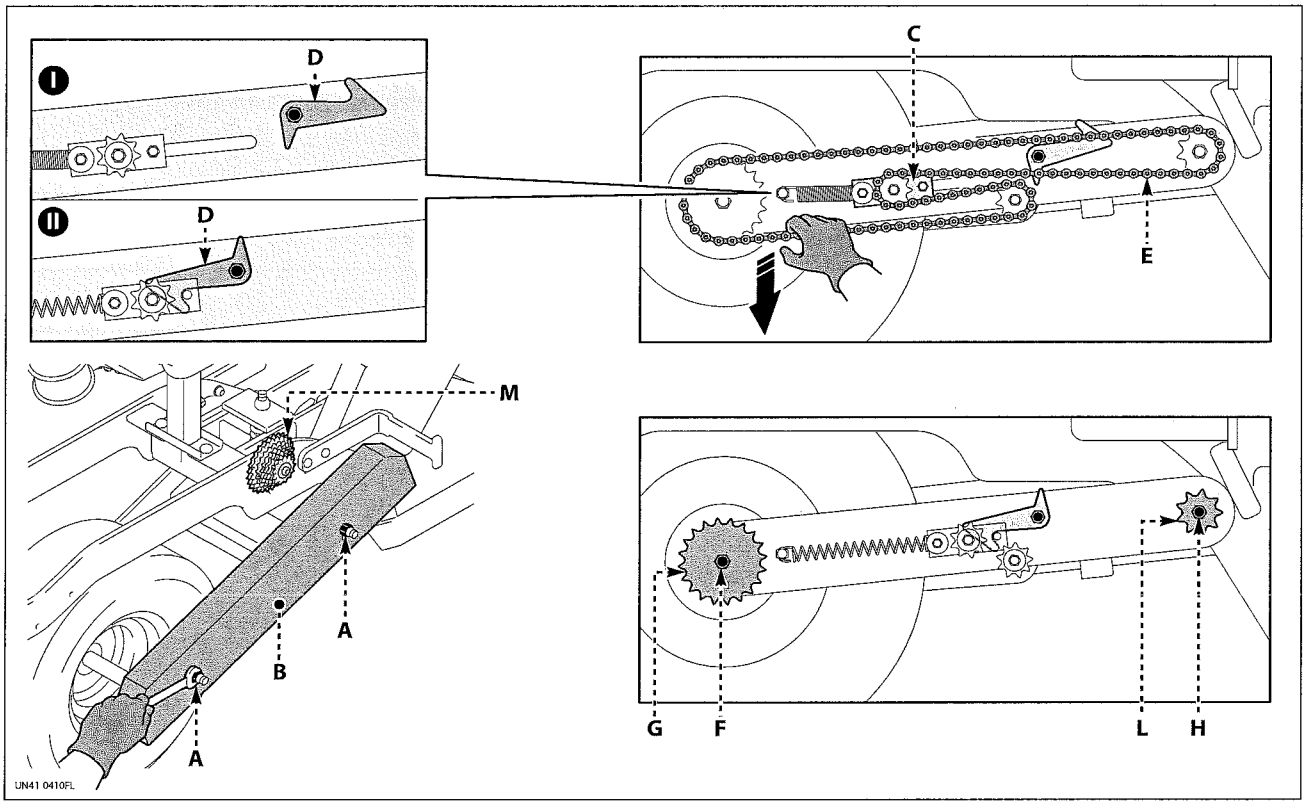
Replacing the driving wheel chain



For this operation, proceed as outlined below.

1) Unscrew the nuts (**A**) and remove the casing (**B**).
2) Turn the engagement device (**D**) to position (**II**) to lock the chain tensioner (**C**).
3) Pull the chain downwards.
4) Remove the chain (**E**).
5) Fit a new chain.
6) Pull the chain downwards.
7) Turn the engagement device (**D**) to position (**I**) to release the chain tensioner (**C**).
8) Slowly release the chain to tension it.
9) Fit the casing (**B**) and tighten the nuts (**A**).

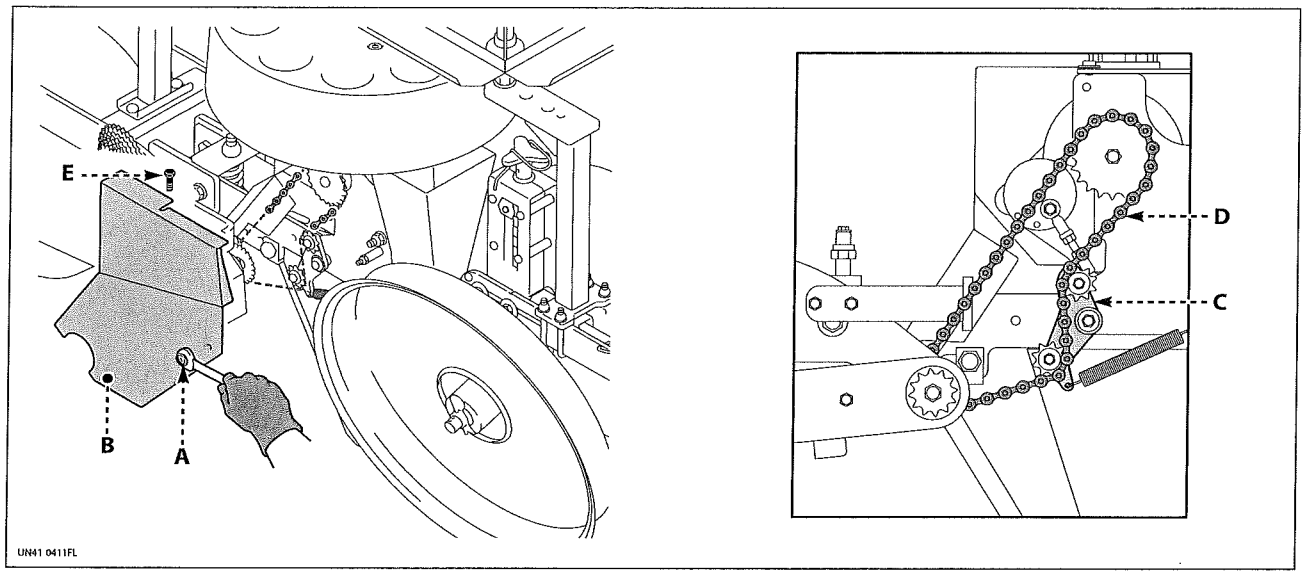
Replace the driving wheel pinions



For this operation, proceed as outlined below.

1) Unscrew the nuts (**A**) and remove the casing (**B**).
2) Turn the engagement device (**D**) to position (**II**) to lock the chain tensioner (**C**).
3) Pull the chain downwards.
4) Remove the chain (**E**).
5) Unscrew the screw (**F**) and remove the pinion (**G**).
6) Unscrew the screw (**H**) and remove the pinion (**L**).
7) From the range of pinions (**M**), select the most suitable pinion to obtain the required plant spacing (see page 22).
8) Fit the new pinions and tighten the screws (**F** - **H**) respectively.
9) Fit the chain on the pinions and the tensioner.
10) Pull the chain downwards.
11) Turn the engagement device (**D**) to position (**I**) to release the chain tensioner (**C**).
12) Slowly release the chain to tension it.
13) Fit the casing (**B**) and tighten the nuts (**A**).

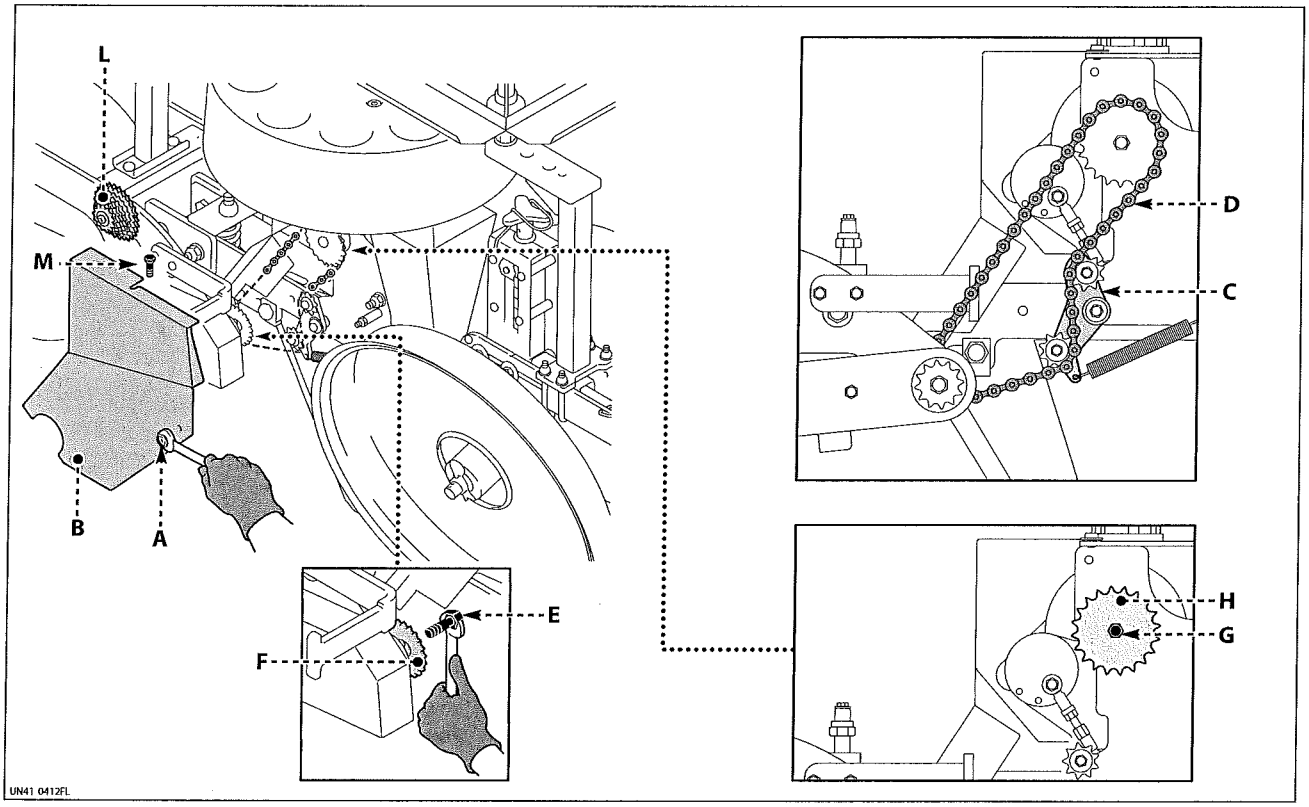
Replacing the dispensing unit chain



For this operation, proceed as outlined below.

1) Unscrew the nut (**A**), loosen the screw (**E**) and remove the casing (**B**).
2) Move the tensioner (**C**) and remove the chain (**D**).
3) Fit the chain on the pinions and the tensioner.
4) Fit the casing (**B**), tighten the nut (**A**) and the screw (**E**).

Replacing the pinions of the dispensing unit



For this operation, proceed as outlined below.

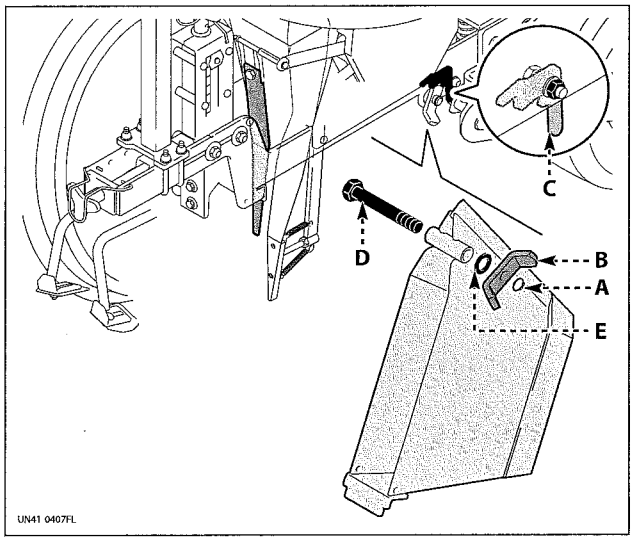
1) Unscrew the nut (**A**), loosen the screw (**M**) and remove the casing (**B**).
2) Move the tensioner (**C**) to slacken the chain (**D**).
3) Unscrew the screw (**E**) and remove the pinion (**F**).
4) Unscrew the screw (**G**) and remove the pinion (**H**).
5) From the range of pinions (**L**), select the most suitable pinion to obtain the required plant spacing (see page 22).
6) Fit the new pinions and tighten the screws (**E** - **G**) respectively.
7) Fit the chain on the pinions and the tensioner.
8) Fit the casing (**B**), tighten the nut (**A**) and the screw (**M**).

Replacing the ploughshare

For this operation, proceed as outlined below.

1) Remove the circlip (**A**).
2) Unscrew the wing nut (**B**).
3) Lift and hold the clamping device (**C**).
4) Push the share forwards and turn it so it is facing downwards.
5) Hold the ploughshare and remove the screw (**D**) and washer (**E**).
6) Position the new ploughshare.

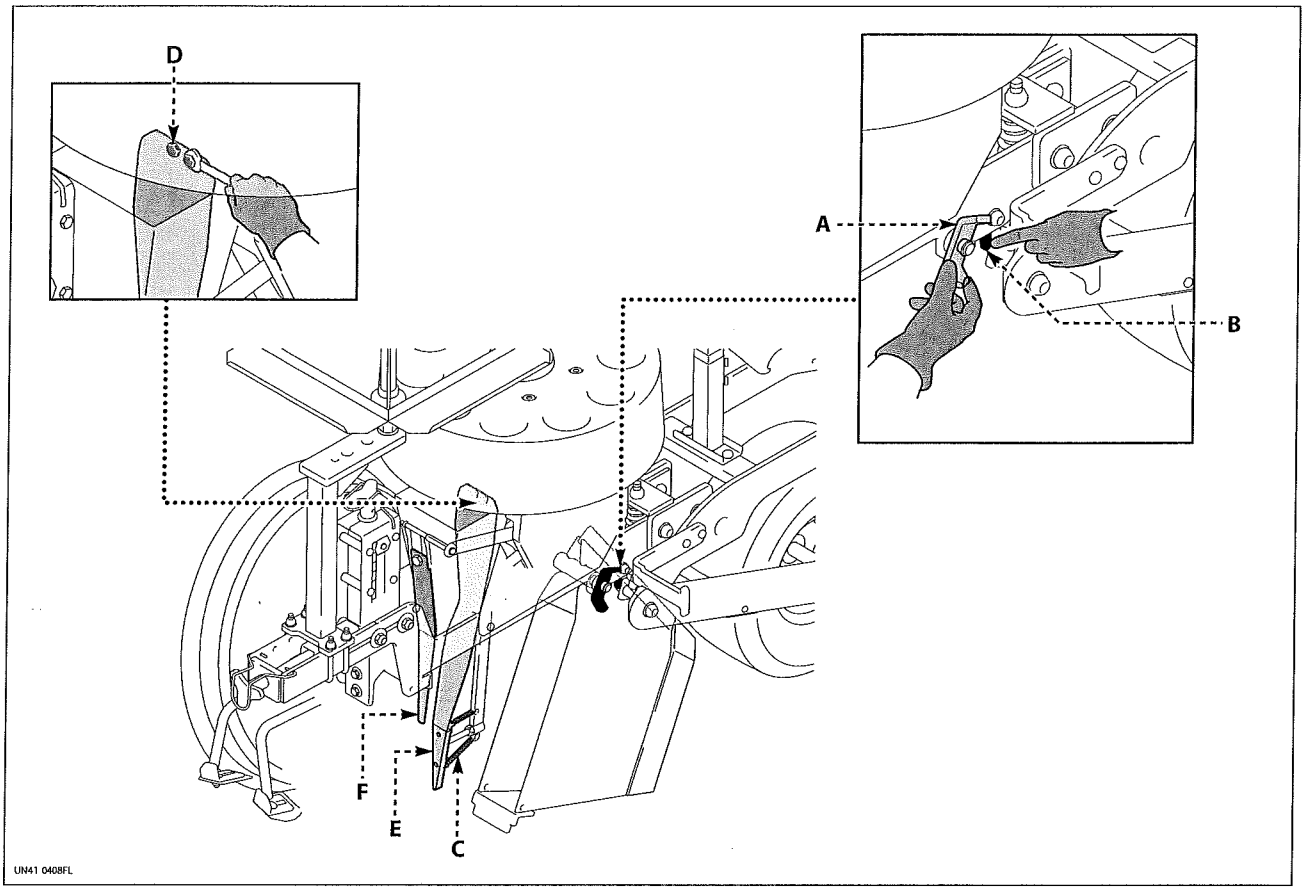
For the assembly, carry out the same operations as for disassembly but proceeding in reverse order.



Information

During assembly, fit the Plant Control device inside the ploughshare.
Make sure the flexible plate is centred with respect to the share (see "Adjusting the flexible plate centring").

Replacing the flexible plate



For this operation, proceed as outlined below.

1) Loosen the wing nut (**A**).
2) Turn the lock lever (**B**).
3) Push the share forwards and turn it so it is facing downwards.
4) Release the springs (**C**).
5) Unscrew the screws (**D**).
6) Remove the flexible plate (**E**).
7) Fit the new flexible plate in position.
8) Tighten the screws (**D**).
9) Hook up the springs (**C**).
10) Make sure the flexible plate is centred (see "Adjusting the flexible plate centring").
11) Check the position of the flexible plate with respect to the share (see "Adjusting the flexible plate position").
12) Tighten the screws (**D**).
13) Refit the share in the work position.
15) Tighten the wing nut (**A**).

Information

Check that the Plant Control device (F) is inside the ploughshare.

Scrapping the work vehicle

Scrapping operations must be handled by specialised personnel with suitable skills for the job.
The components removed must be sorted according to the type of materials they contain and in compliance with the laws in force concerning "waste collection, sorting and disposal".