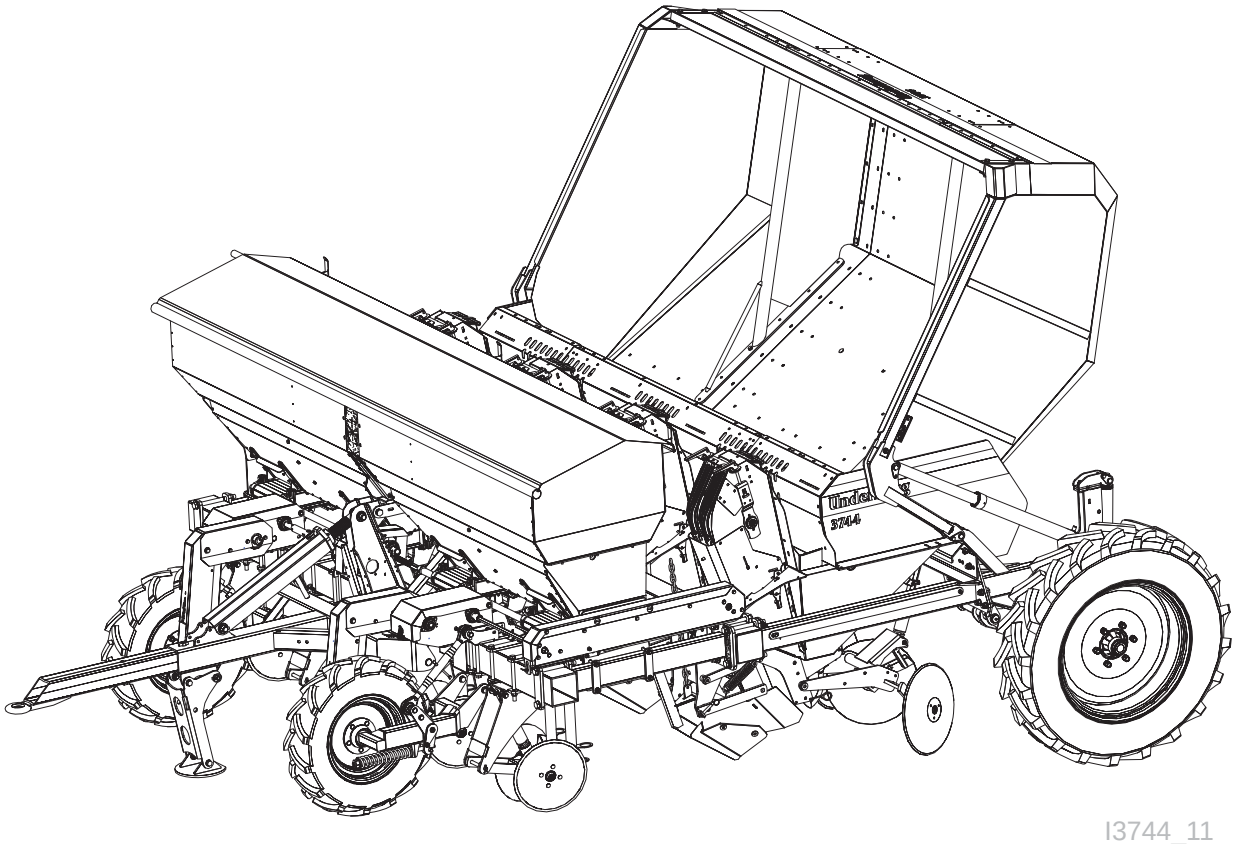
Operator's manual
3744 4-rows
Potato planter

UH124445



I3744_11

CE certificate of conformity

We,
TKS Mekaniske AS,
Torlandsvegen 3
N-4365 Nærbø
Norge
declare under our sole responsibility that the product:

Potato planter 3744

to which this declaration relates corresponds to the relevant basic safety and health requirements of the Directives 89/392/EEC, 91/368/EEC, 93/44/EEC and 93/68/EEC.

Nærbø, 10 April 2010

Henning Thunheim
Managing Director

Enter the serial number

of the machine here

_____

TKS Mekaniske AS, manufacturers of farm machinery, reserve the right to change designs and/or specifications without notice. This does not include an obligation to make changes to machines previously supplied.

Guarantee

TKS products carry warranty for a period of one year from the date of delivery, against defects in material and workmanship.
Components not manufactured by TKS. electrical and hydraulic, PTO shafts and tyres are guaranteed according to the original manufacturer's recommendation.

The components listed below have a limited warranty due to their function:
- Tyres
- Pre-stretcher rollers
- Fuses
- Hydraulic seals of motors, valves and cylinders
- Oil filter
- Chain
- Sprocket

Weakening due to wear and tear is considered to be normal for these parts. The product guarantees for these components are limited to manufacturing defects, breakage, poor workmanship, transport damage etc on new machines.
Any damage to bearings that are fitted with grease nipples is not covered under the standard product guarantee, if the damage is shown to be caused by rust or due to the ingress of liquids. Such damage is caused by insufficient lubrication or the use of low quality lubricants.
Any damage caused by the use of corrosive additives in or nearby the machine is also not covered.
If a failure is expected to be covered under the guarantee, the owner or its representative should inform the dealer when parts and/or repair work is required. Any guarantee claim should be applied for within the period of guarantee.
The dealer should fill in one guarantee claim form for each matter and forward it to the TKS representative before the 10th of the following month after the claim was raised.
The damaged parts should be marked with the number of the corresponding warranty claim and should be stored for 6 months by the dealer, available for inspection by the TKS representative if required.
Due to the operation of the TKS products being out of the manufacturer's control, the guarantee covers the product quality only. Performance or any consequential losses are not covered.

The guarantee may be invalid if:

a) spurious spare parts are used or the product is repaired or modified without the TKS authorisation.
b) operator's and service instructions given by the manufacturer are not complied with.
c) the machine is used for other purposes than those designed for.
d) The damage occurs as a result of external faces such as high voltage fluctuations due to a low supply voltage, lightening or other electrical phenomena.

The guarantee does not cover damage caused by normal wear.
Public safety regulations require from the manufacturer of this machine that all safety aspects regarding the use of the machine is thoroughly evaluated. As a result of these obligations TKS and its representative are not responsible for the function of components not shown in the spare parts catalogue covering this product.
TKS reserve the right to change the product with no obligation to previously supplied machines.
NB! It must be possible to identify all enquiries relating to this product's serial number; see page 7 Machine identification.

Content

Introduction

We congratulate you on the purchase of your new TKS product. You have chosen a product which will give you satisfaction through a network of efficient dealers where function, finish, after sales service and spare parts are always at hand.
All TKS products are designed and tested in close co-operation with farmers and contractors to ensure optimal function and reliability.

Good luck!!

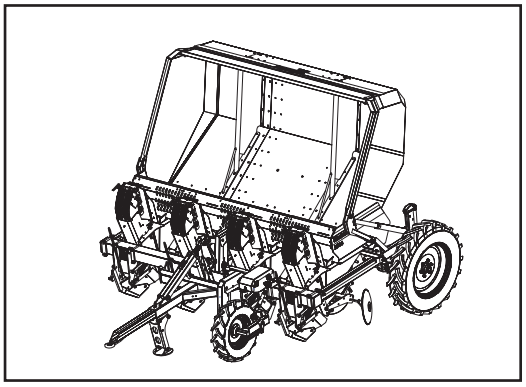
Yours faithfully
TKS Mekaniske AS

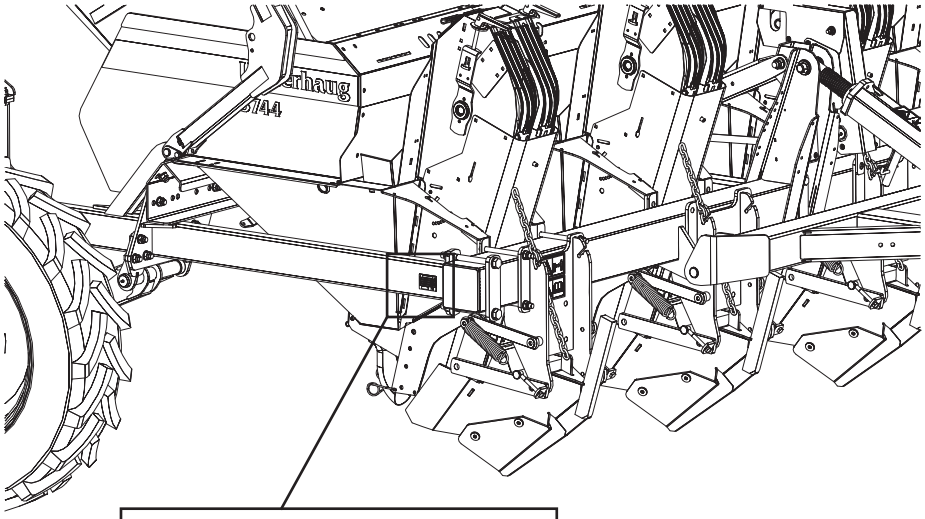
TKS Mekaniske AS,
Torlandsvegen 3
N-4365 Nærbø
Norway

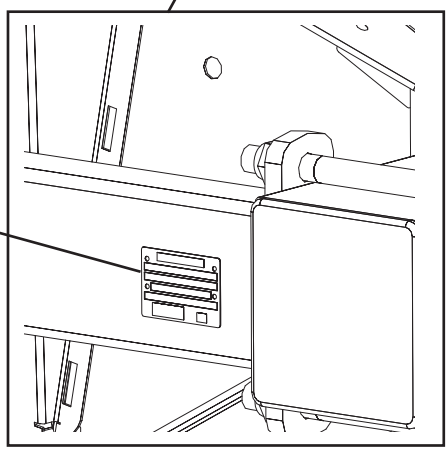
e-post : post@tksmek.no
Phone : + 47 51 43 63 00
Fax : + 47 51 43 48 62

Machine identification

The machine's serial number and the manufacturer's address are found on the number plate of the machine. See illustration below.
The serial number and year of manufacture for this machine is given below. This number is important with regard to service and the correct supply of spare parts.
The machine is marked CE. This marking with appurtenant EU statement of agreement means that the machine complies with substantial health and security demands, and that it is accordance with the directives 89/392/ECC as amended by directive 91/368/EEC, 93/44/EEC and 89/336/EEC.





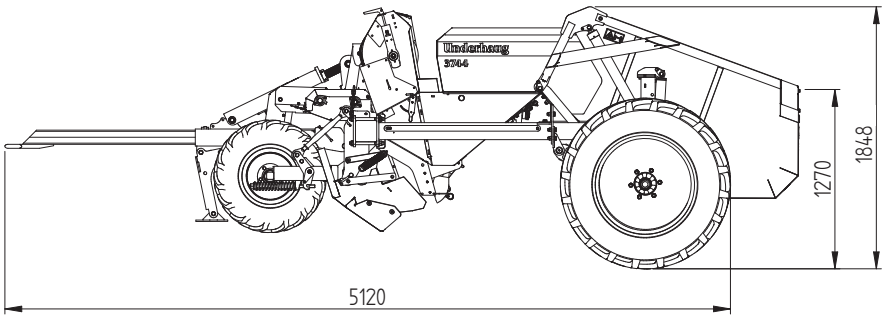


Serial number

I3744_02

Main dimensions

Potato planter basic



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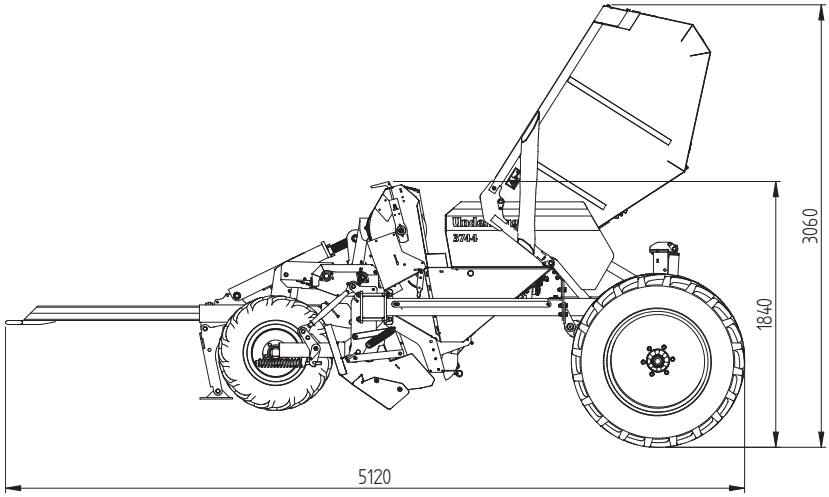

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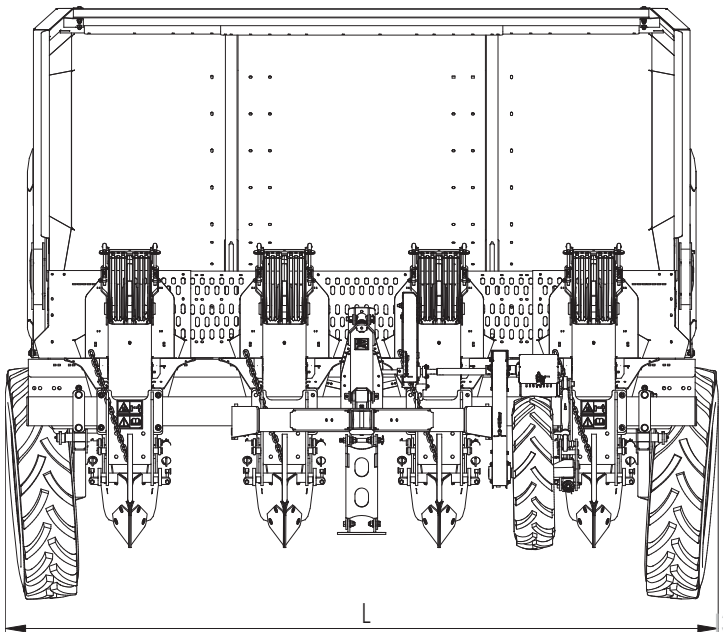
L =

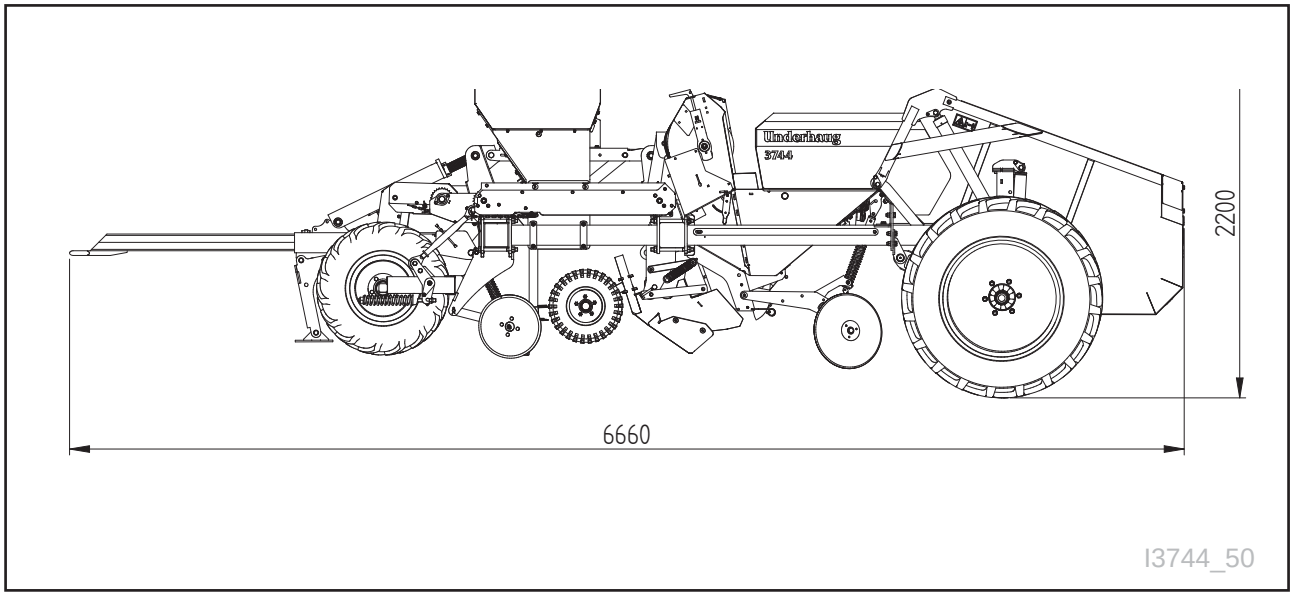
Row width	Width
915mm	4150mm
900mm	4090mm
864mm	3950mm
850mm	3890mm
800mm	3690mm
750mm	3490mm



I3744_49

Main dimensions

Potato planter with fertilizer



Technical specifications/standard

Model	
Number of rows	4
Connection to tractor	Trailed
Row width cm	75-80-85-90cm
Row width inch	34" - 36"
Seed spacing	32 Step 10-58cm 3,9-22,9 inch
Potato capasity	3500 - 4000 Kg
Fill hight hopper	0,73 m (remove the board)
Fertilizer capacity	1750 dm^3 (Approx 1700Kg)
Wheel dimensions drive wheel	11,2-28" 8 layer w/ribs
Drive wheel	Std
Mechanical drive	Std
Disc roller for covering	Std
Weight empty machine	2700 Kg
Working speed	4-10 Km/h

Model description

3744 mechanical potato planter from TKS is a trailed machine. The planting units include double cup belt with agitation, adjustable gate between hopper and planting unit with feed agitation. Different opening shoes, disc closers and manually controlled planting depth.
Mechanical drive from seperate drive wheel and 32 plant spacings.

Available equipment for 3744
Planting shoes HD w/damper
Floating opening shoes
Depth wheel for floating opening shoes 190-8
Planting shoes
Belt with planting cup Ø66. Possible insert cup steel Ø45
Belt with planting cup Ø74. Possible insert cup steel Ø54
Belt with planting cup Ø80. Possible insert cup plastic. Green Ø45 White Ø56
Electronic agitation of planting web
Electronic planting monitor
Ridging hood
Threepointed mounted offset drawbar
Marker arms
Fertilizer
Spraying equipment
Powder applicator
Electronic area meter
Light equipment
Tramline clutch

Tractor requirements

Recommended tractor size: 80 hk - 100 hk w/fertilizer.

Mechanical connection

- Hydraulic hitch or tractor drawbar
- Threepoint connection to drawbar

Hydraulic connection

- 1 double acting outlet
- 1 sigle acting outlet
- 1 double acting outlet for tramlining (option)

Electrical power supply

All connections have to be supplied with 12V DC.

- 12 V supply outlet (planting monitor)
- Planting monitor, 3 pin plug
- Agitation, 3 pin plug
- Area meter, 3 pin plug
- Powder applicator, wire
- Road light, 7 pin plug

Safety

Please pay particular attention to this symbol. It means that there is a safety risk, and describes precautions that should be taken in order to avoid accidents

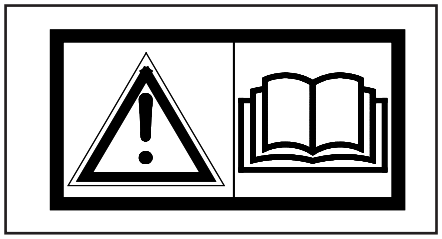


Fig. 1

Before operating, adjusting or servicing the machine it is important that the safety instructions in this manual are carefully read and understood. **See Fig. 1**
Pay attention and be careful when handling agricultural machinery. Read and take note of the safety instructions in this manual. They are here for YOUR safety – and should therefore be observed!!

NB!
Safety at work is your responsibility!

General safety instructions

Please read and understand these general safety instructions.
Pay particular attention to this symbol. It means that there could be a serious hazard. It emphasises precautions, which have to be complied with in order to prevent accidents.

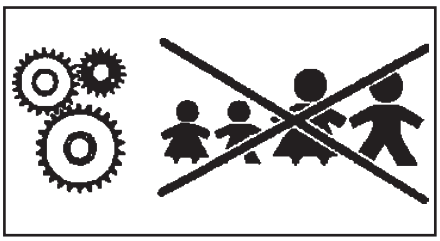


Fig. 2

Be careful when other people or animals are close by!
Never start the machine when people or animals are close by tractor or machine. Never stand between the tractor wheels and machine. **Se Fig. 2**

NB!
Bear in mind regulations regarding the lower age of operators of this kind of machines.

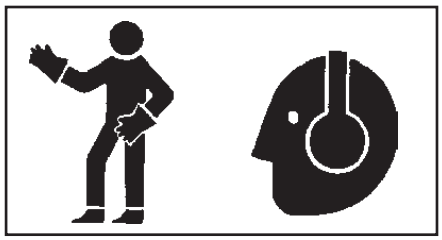


Fig. 3

Use of the machine
The machine should be used only for the purpose it has been designed for.

Use personal protection devices
Do not wear loose clothing, which might catch in any of the moving parts. In dusty conditions an approved mask must be used. **See Fig. 3**

Take care of excessive noise level. Some tractor/implement combinations, depending on conditions, may cause noise level beyond 85dB at the operator's ears, even in a "Q" cab. In these conditions ear defenders must be worn. Keep cab windows and doors closed to reduce noise level.

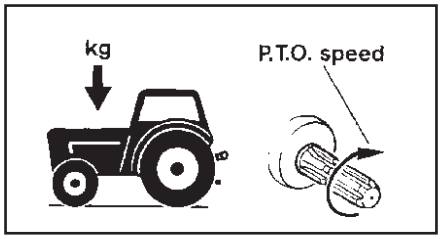


Fig.4

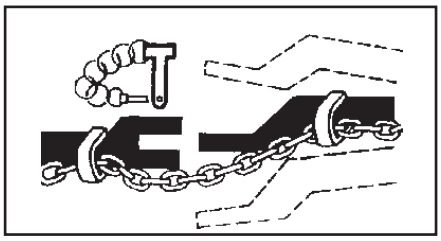


Fig. 5

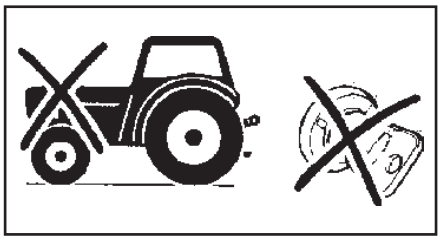


Fig. 6

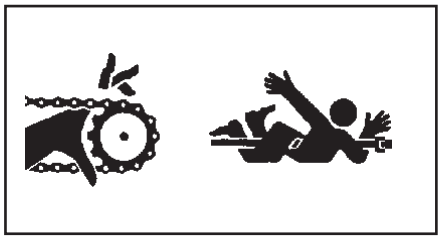


Fig. 7


Fig.8

The machine must be connected to a correctly sized tractor
The weight of the tractor must correspond to the maximum weight of the machine when operated. Follow domestic law and regulations.
See Fig. 4
Make sure that the tractor has the correct PTO gear engaged. A machine designed for an input speed of 540 rpm. should never be connected to a tractor with 1000 rpm. output speed engaged. The normal PTO speed is given on a label close to the PTO input shaft.

Connecting machine to tractor
must always be carried out as described in this manual. If connection should be carried out with drawbar, one of the parts (tractor or machine's drawbar) must have a clevis. The drawbar pin must be secured with a lock pin.
See Fig. 5
Observe national regulations regarding road transport. Some countries require the use of safety chain when a trailed machine is towed along public roads.

Think of safety while operating the machine
Stop the tractor engine and remove the ignition key prior to carrying out repairs, cleaning, lubrication or maintaining the machine.
See Fig. 6

Safety guards
Make sure all guards are in good order and fitted correctly. Do not attempt to start the machine before ensuring this. **Se Fig. 7**

Pay particular attention to the plastic guards of the PTO shaft. If damaged they must be replaced. The chain locks of the guards must always be fitted on a suitable place on the tractor and the machine to prevent the outer plastic guards turning.

Hydraulics
Be very careful when dealing with hydraulics. Use eye protection and gloves. Escaping hydraulic oil under pressure might penetrate into the skin and cause serious infection. See a doctor if you have been exposed to injury. **See Fig. 8**

Take care that nobody is close to the machine when the hydraulic functions are being operated.

Fig. 9

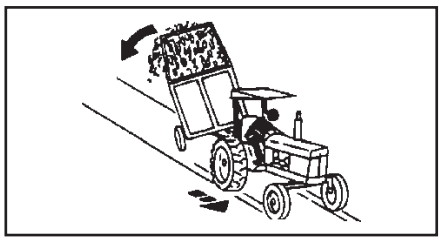


Fig. 10

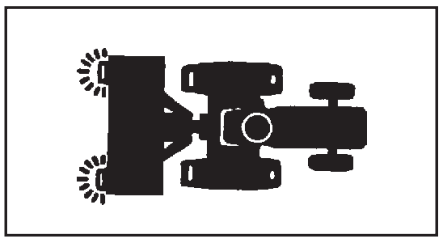


Fig. 11

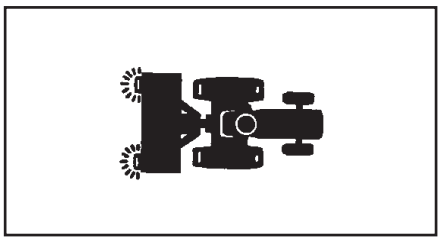


Fig. 12

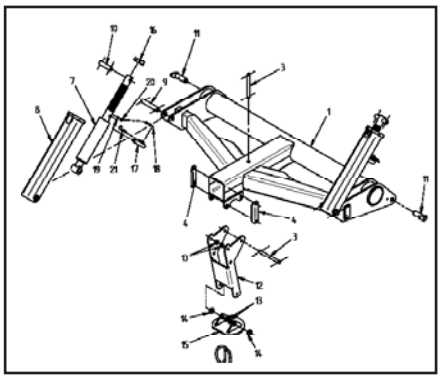


Fig. 13

When uncoupling machine and when leaving tractor/machine

When uncoupling, all hydraulic functions must be in neutral position. The machine must be lowered to the ground and be safely secured. If the machine has parking chocks they should be used at the wheels. Never allow children to play or stay near agricultural machinery. **See Fig. 9**

Drive safely
Beware of your responsibility, - carelessness or negligence may cause serious injury or even death.
See Fig. 10

Prior to transporting the machine along public roads, check wheel bolts and couplings.
Disconnect or lock the hydraulic system.
Drive carefully. Reduce speed when turning and driving on uneven ground. Take care that trailed machine does not start swinging or become unstable.
Please be aware of the danger of overturning when working on slopes and in soft ground. Reduce load.

Lights
The owner and operator is responsible of providing correct lamps and reflectors on the machine when transported on public roads. Comply with public regulations.
See Fig. 11

Safety equipment
Always carry first aid equipment on the tractor. Also observe the regulations concerning fire extinguisher. When working with burning materials like hay and straw a fire extinguisher must be available at all times.
See Fig. 12

Spare parts
For safety reasons use only original spare parts. The use of spurious spare parts will cause the Underhaug product guarantee to be invalid. **Se Fig. 13**

Maintenance
Take care that the machine is properly maintained and kept in good safe working condition. Never change the basic technical construction of the machine.

Supplementary safety instructions

The machine is equipped with ⚠ warning signs. If any of the decals are damaged, they must be replaced. Ordering numbers are shown on the illustration in the paragraph.

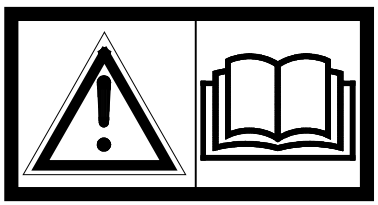


Fig. 14

Warning sign UH220532
Be careful! Read and understand the instructions in the manual before the machine is put into service and before attempting adjustment/ maintenance.
See Fig. 14

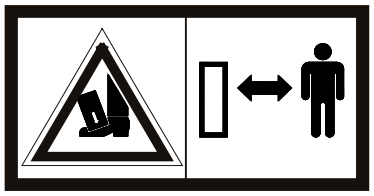


Fig. 15

Warning sign UH220525
Be careful when machine is lowered! Keep feet away from furrow openers, ridgers and wheels. When operations are to be performed underneath a raised machine, a support should be placed under the main frame.
See Fig. 15

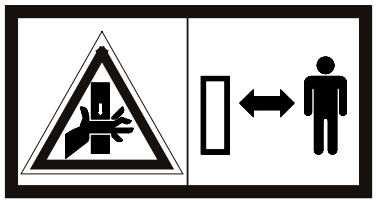


Fig. 16

Warning sign UH220536
Keep distance to the moveable parts, risk of cutting fingers.
See Fig. 16

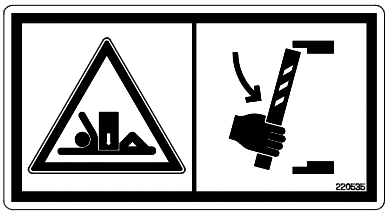


Fig. 17

Warning sign UH220535
Before the machine is being serviced a safety stay must be mounted here.
See Fig. 17

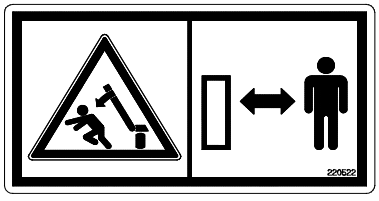


Fig. 18

Warning sign UH220522
Keep a safe distance from the hydraulically operated potato hopper.
See Fig. 18

Overwiew of safety risk

If potato planter is equiped with fertilizer, then place the decals UH220525 and UH220532 on fertilizer frame.

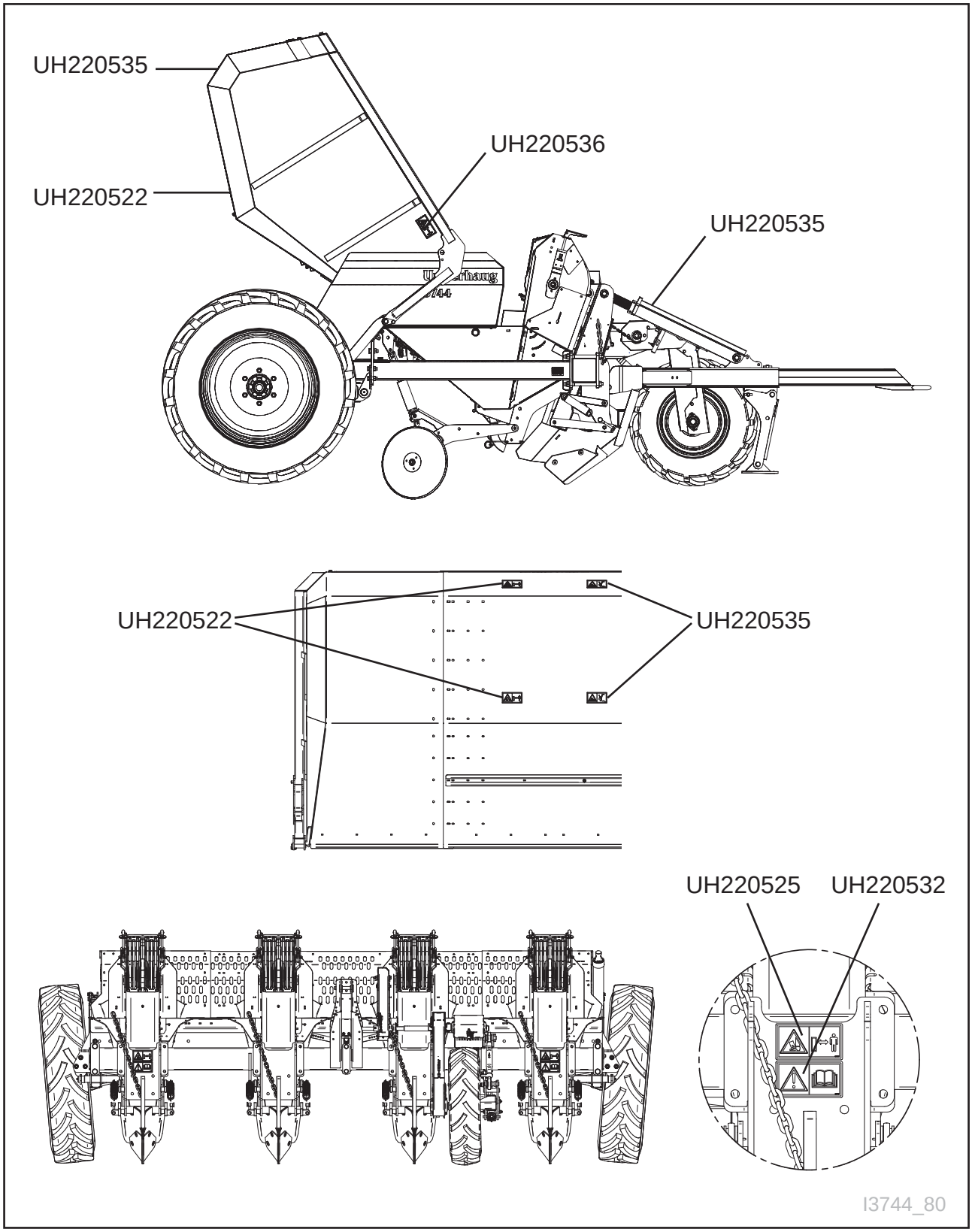


Fig. 19

Lifting the machine with crane

Only use approved lifting device.

Caution!
Be careful! Make sure that nobody stands under or near the machine when it is being lifted.

Use a guide wire to keep machine in position

Hazard at use of chemicals

The chemical manufacturer's prescriptions regarding handling of pesticides, inceticides and fertilizer should be noticed.
NB! Use approved protective equipment.

New machine – caution

Read the operator's manual
Great care must be taken when starting a brand new machine for the first time. Incorrect assembly, faulty operations etc. may cause expensive repairs and loss of profit.
The Underhaug product guarantee does not cover damage occurring when the instructions given in this book are not followed.

Pay particular attention to this symbol, - it emphasises operations where great care must be taken in order to avoid incorrect assembly, faulty operations etc.

Carefully do as described below when starting a new machine:

- Check the machine is mounted correctly and that it is not damaged.
- Assure the electric wirings and hydraulic hoses have length and position that allow machine to move without causing any damage to the wirings.

Remember that the operator is responsible for the product being properly unpacked.

Check list before starting up

- Ensure that driving chains are correctly placed on the chain wheels, and tensioned.
- Ensure the cup belt and driving rollers runs straight.
- Check the tensioning torque on wheel bolts, bolts on discs and main frame.

Safety when adjusting units

- When adjusting units under machine following safety devices have to be used.
- Drawbar cylinder at fully length have to be secured with pin **A**.
- Hopper have to be rised completely, secure with the safety stay **B**.

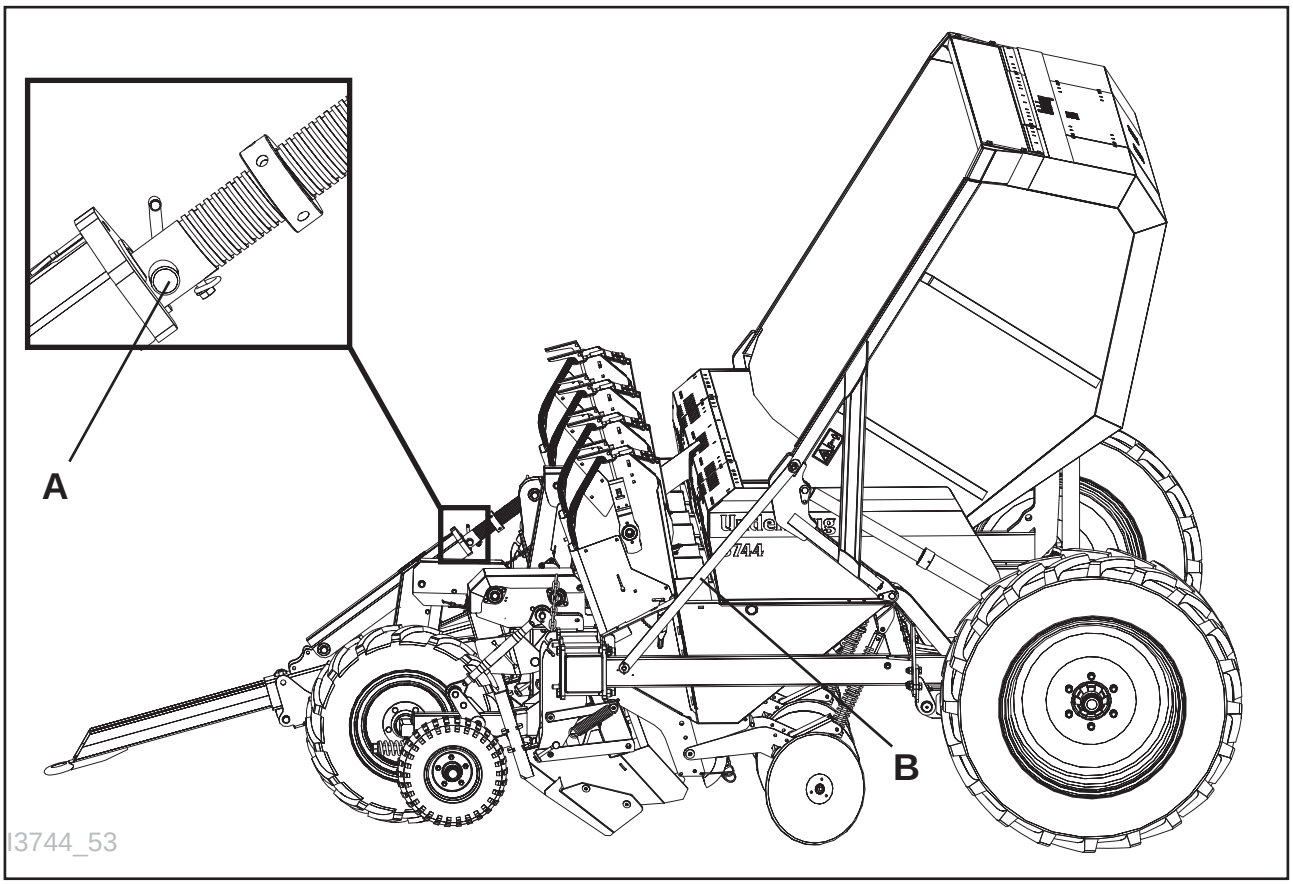


Fig. 20

1 Mounting and preparing a new machine

1.1 Packing

Remove all kind of packing.
Any equipment stored in the machine should be removed.

1.2 Row width control

Check that row width is in accordance with customer's specifications.

2 Mounting a potato planter basic

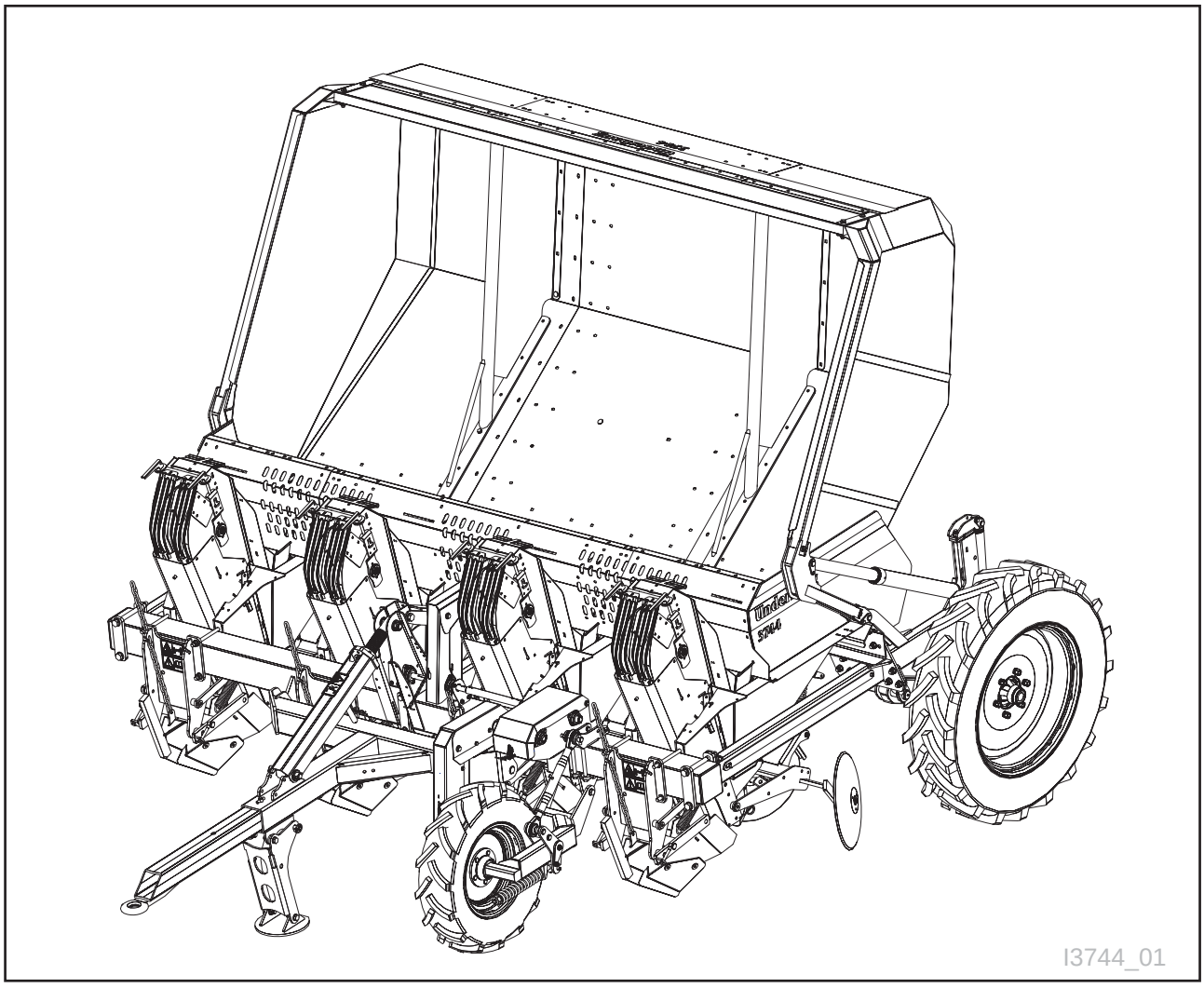


Fig. 21a

Ribbed wheels

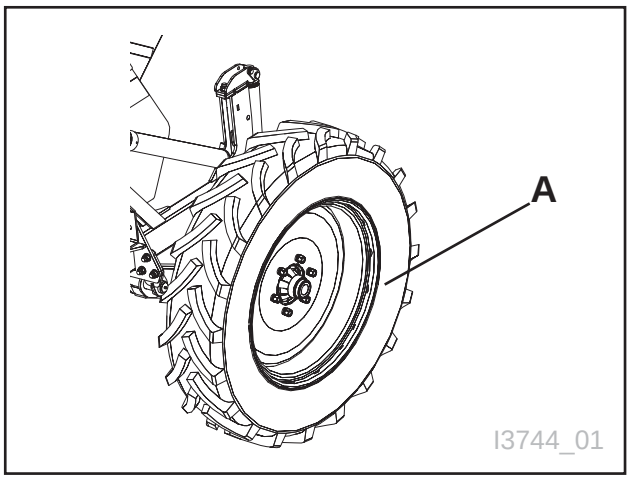


Fig. 21b

- Ribbed wheels 11.2-28" **A** on both sides are mounted on the wheel hub frame side.
- Ensure wheels with ribbed tires should be mounted on the planter in the opposite direction of tractor wheels. **See Fig. 21**

Mounting a potato planter basic

Planting shoes

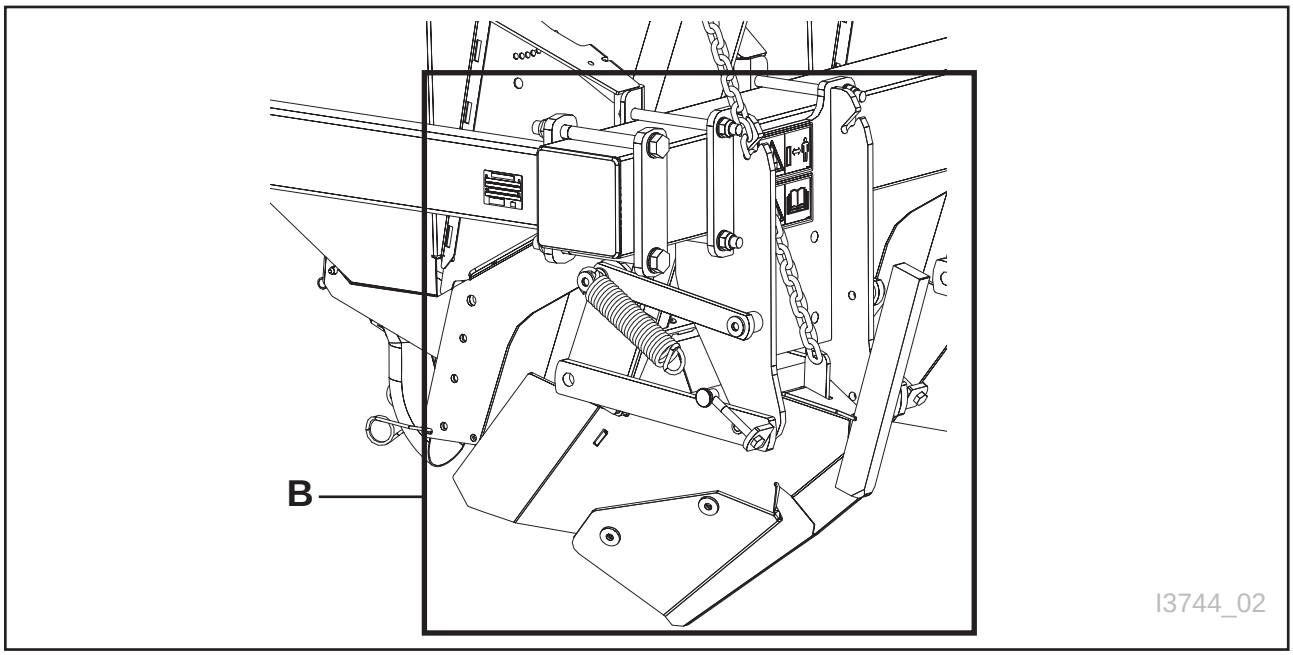


Fig. 22

Floating planting shoes
The floating planting shoe **B** should be mounted on the planting unit/beam. **See Fig. 22**

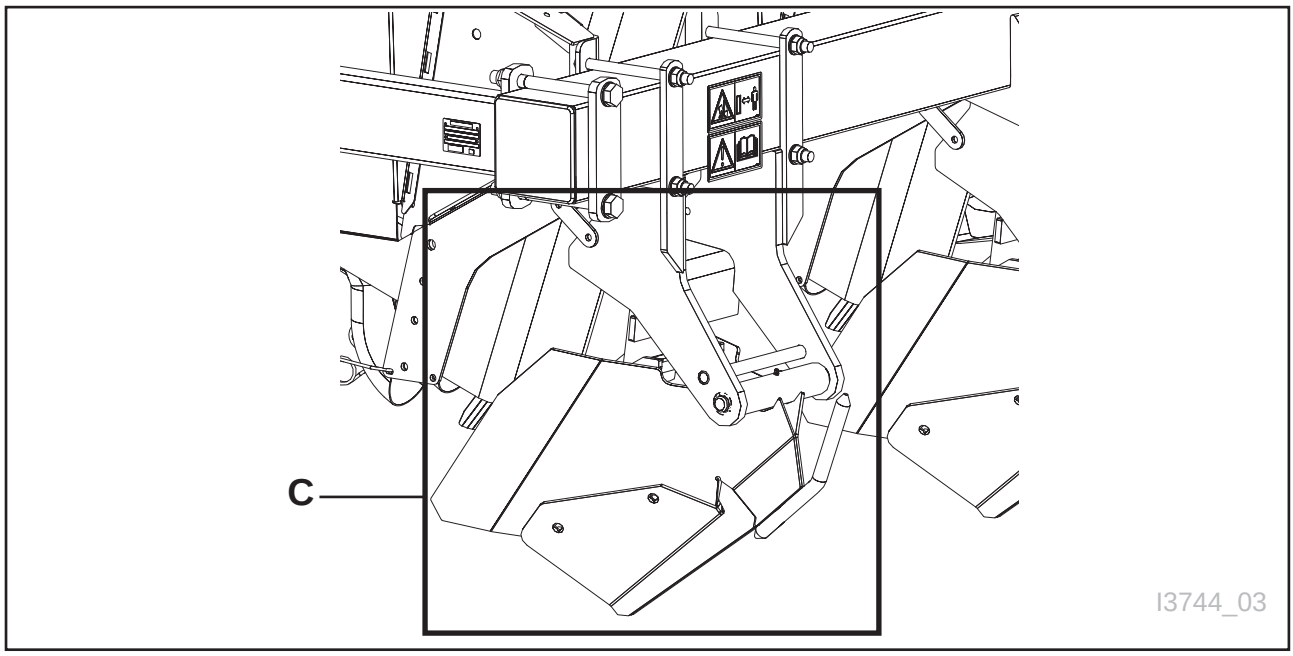


Fig. 23

Heavy duty planting shoes
HD planting shoes **C** should be mounted on the planting unit/beam. **See Fig. 23**

Mounting a potato planter basic

Drawbar

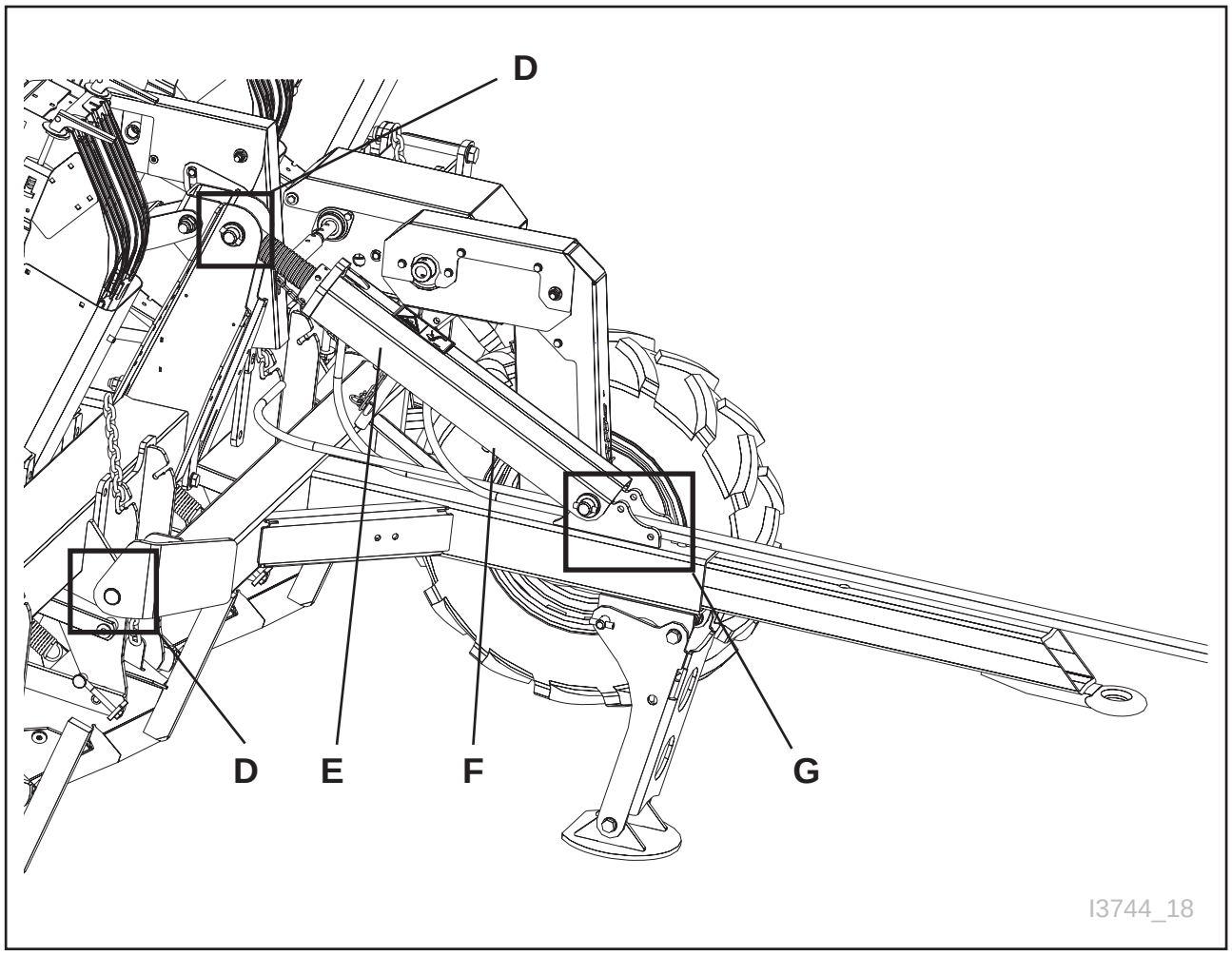


Fig. 24

- Mount the drawbar with bolts **D.**
- Connect short hose from planter to **E**
- Connect long hose from planter **F**
- Strips hose for hopper cylinder to the other hoses.
- Place hoses trough **G** and connect to tractor.

See Fig. 24

Mounting potato planter basic

Drive wheel unit

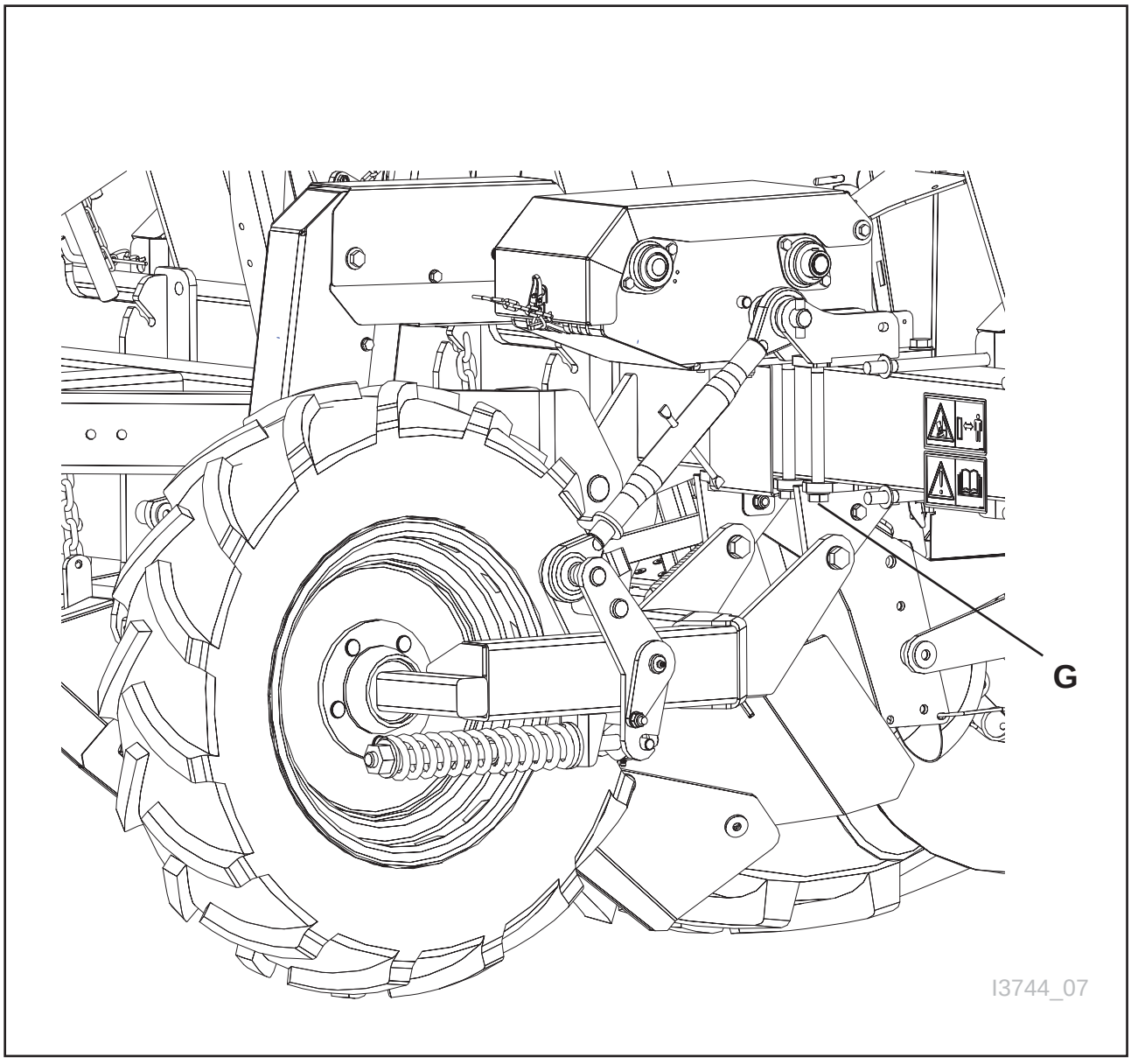


Fig. 25

- Mount the drive wheel unit on the left side of the potato planter.
- Place the drive wheel in center between 3. and 4. unit.
- Tight all 6 bolts **G.**

See Fig. 25

Mounting a potato planter basic

Hopper

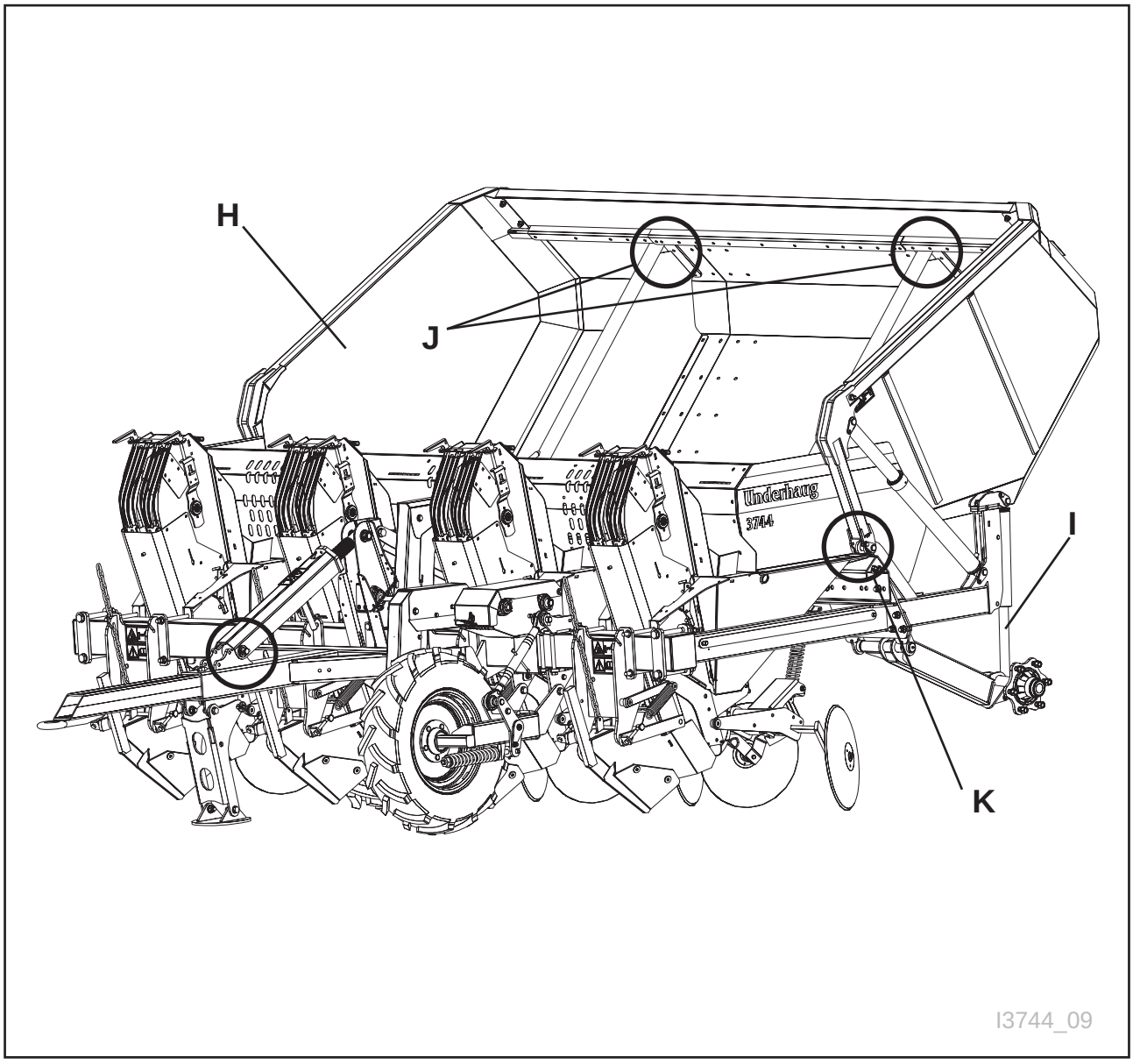


Fig. 26

- Lift with two straps in point **J** to get the right angle when connecting to frame K.
- Mount hopper **H** to frame with bolts **K.**
- Connect the cylinder **I** to the hopper on both sides.
- Lift with two straps in point J to get the right angle when connecting to frame K.

See Fig. 26

Mounting potato planter basic

Side plates

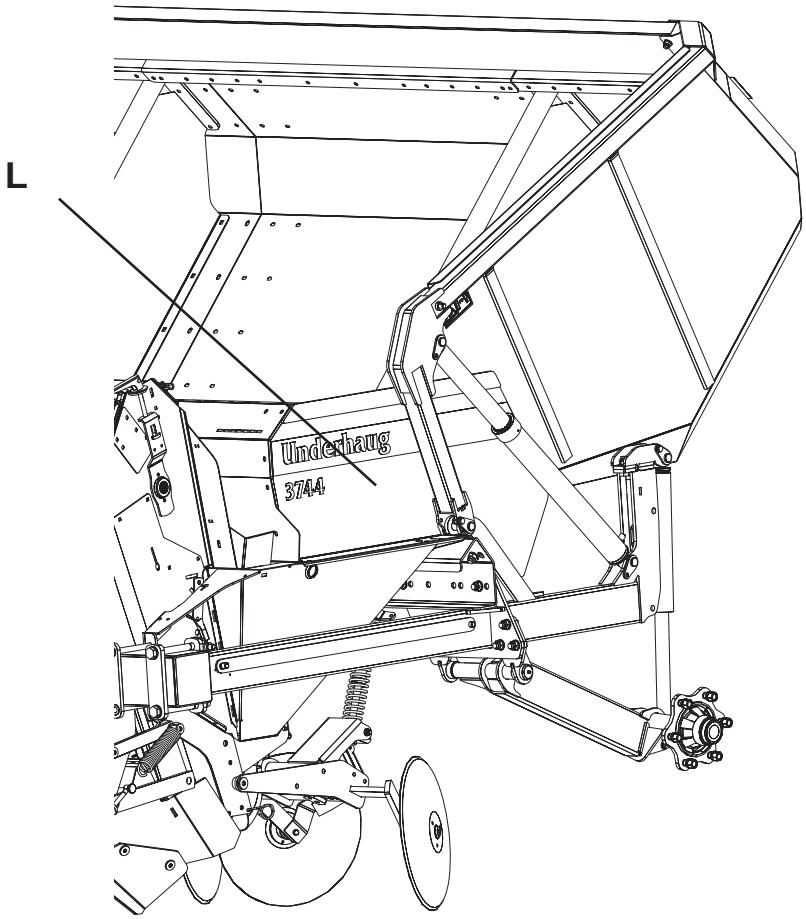


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Fig. 27

- Mount the side plate **L** between hopper and cylinder on both sides.

See Fig. 27

Mounting potato planter basic

Marker

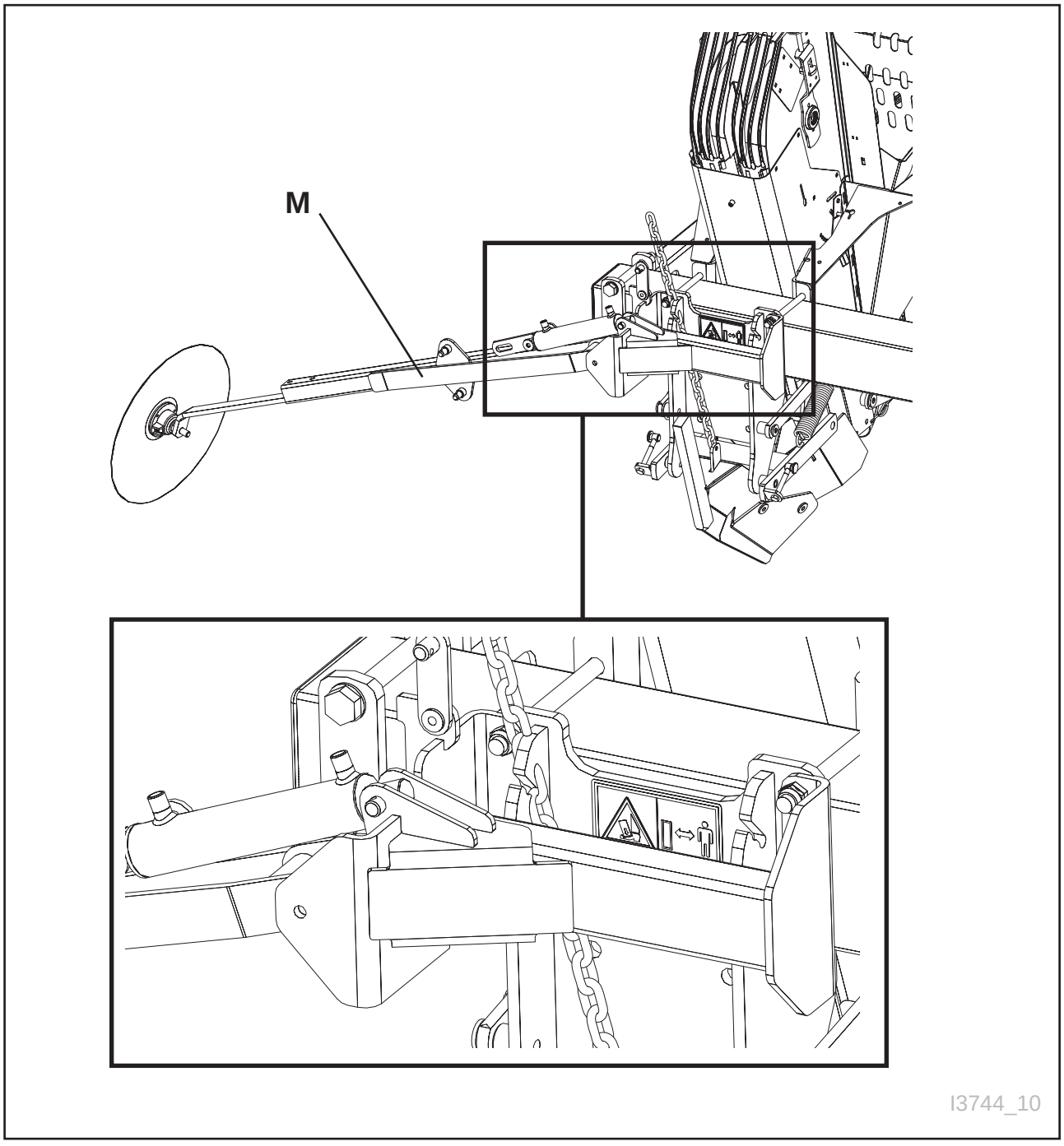

Fig. 28

- Connect the marker **M** to the potato planting unit 1 and 4.
- Mount the marker into the marker bracket on both sides.
- Connect cylinder

See Fig. 28

Hydraulic drive system - basic planter

A Drawbar cylinder
B Hopper cylinder
C Wheel cylinder
D Marker cylinder
E Ball valve
F Marker sequence valve
G Lifting sequence valve
H Flow divider
I Coupling

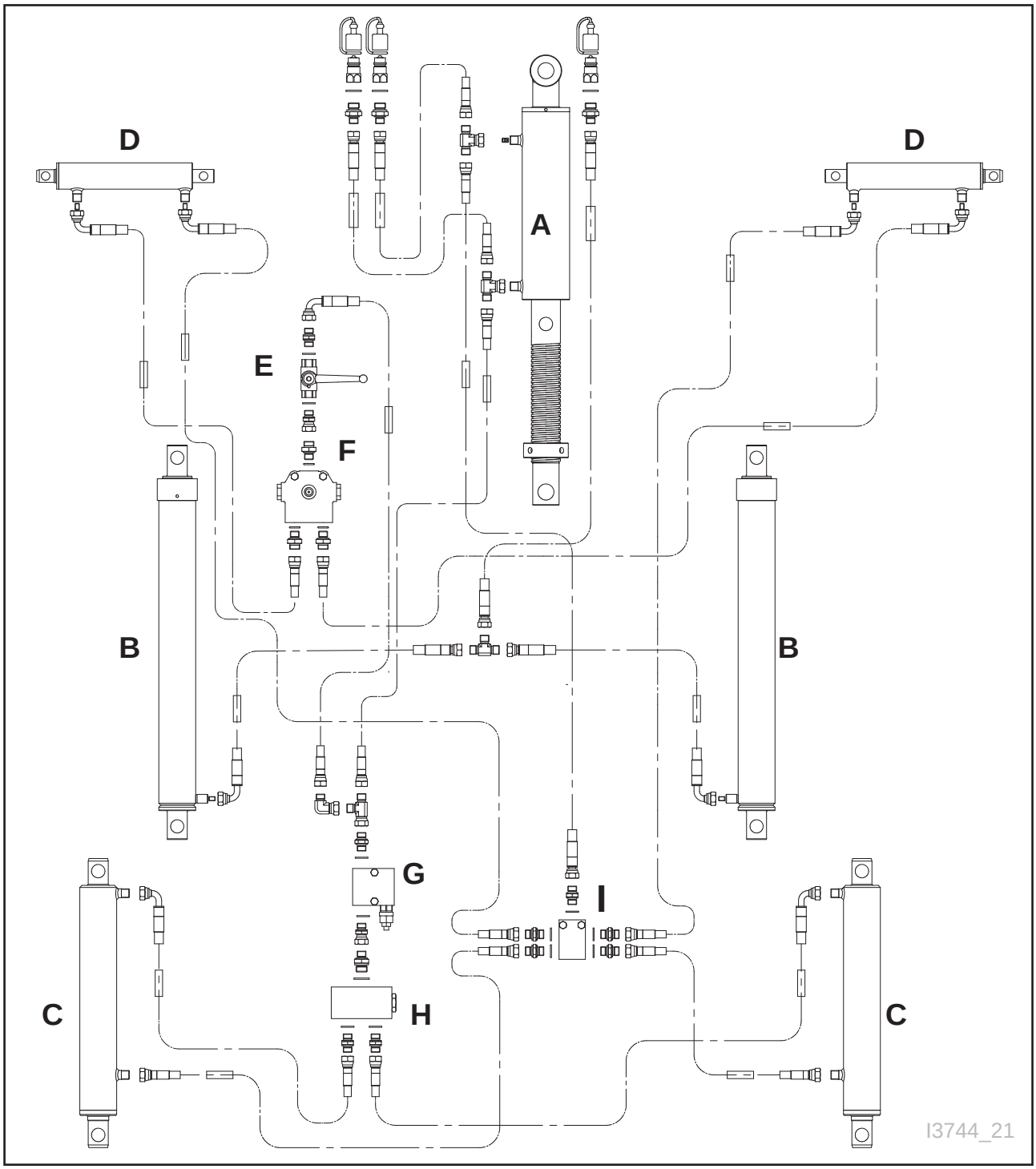

Fig. 29

Hydraulic drive system - basic planter

- Connect short hose to **J.**
- Connect long hose to **K**
- Strip hose to hopper cylinder **L**
- Place hoses trough opening **M** on drawbar

See Fig. 30

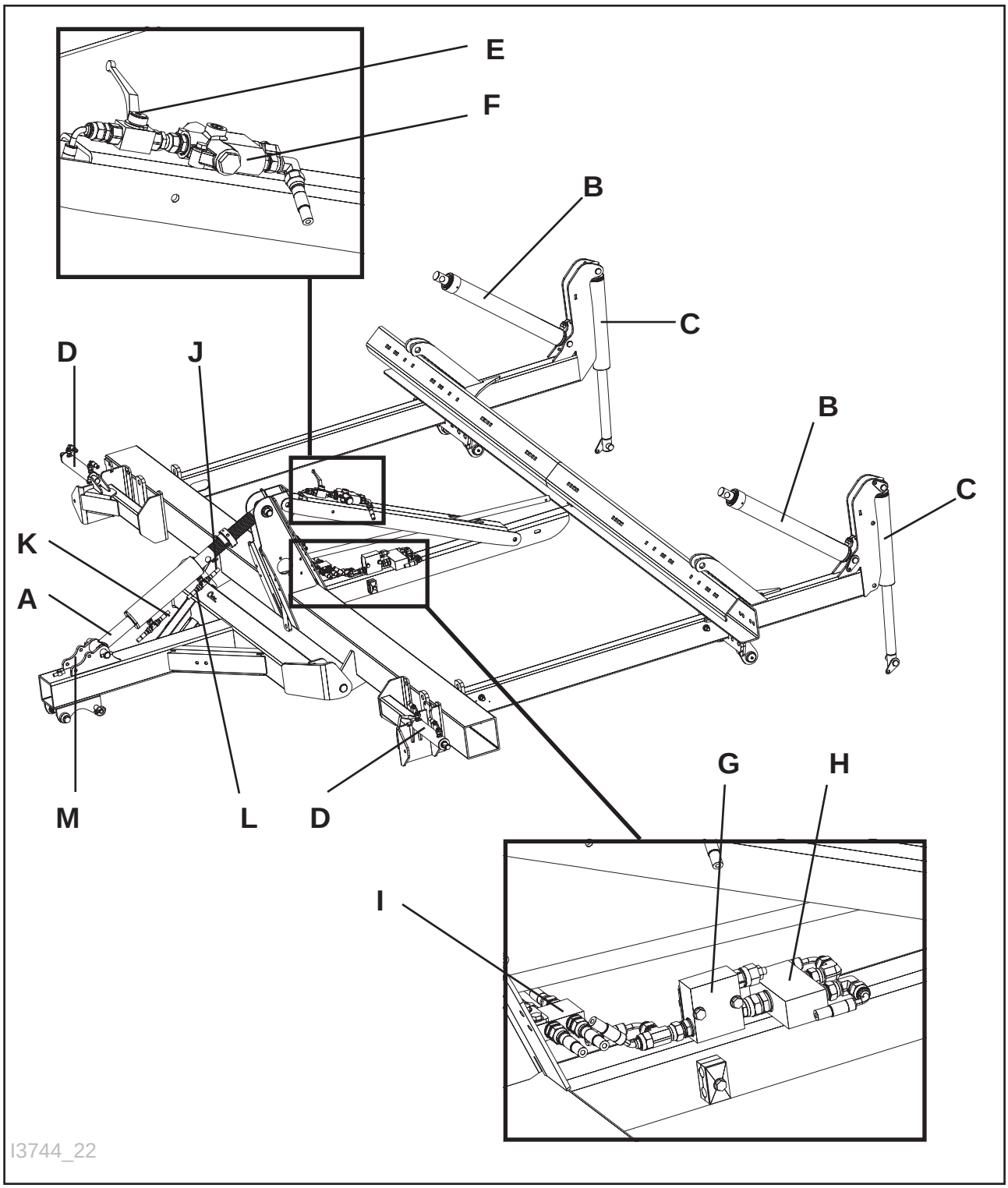

Fig. 30

3 Mounting potato planter w/fertilizer

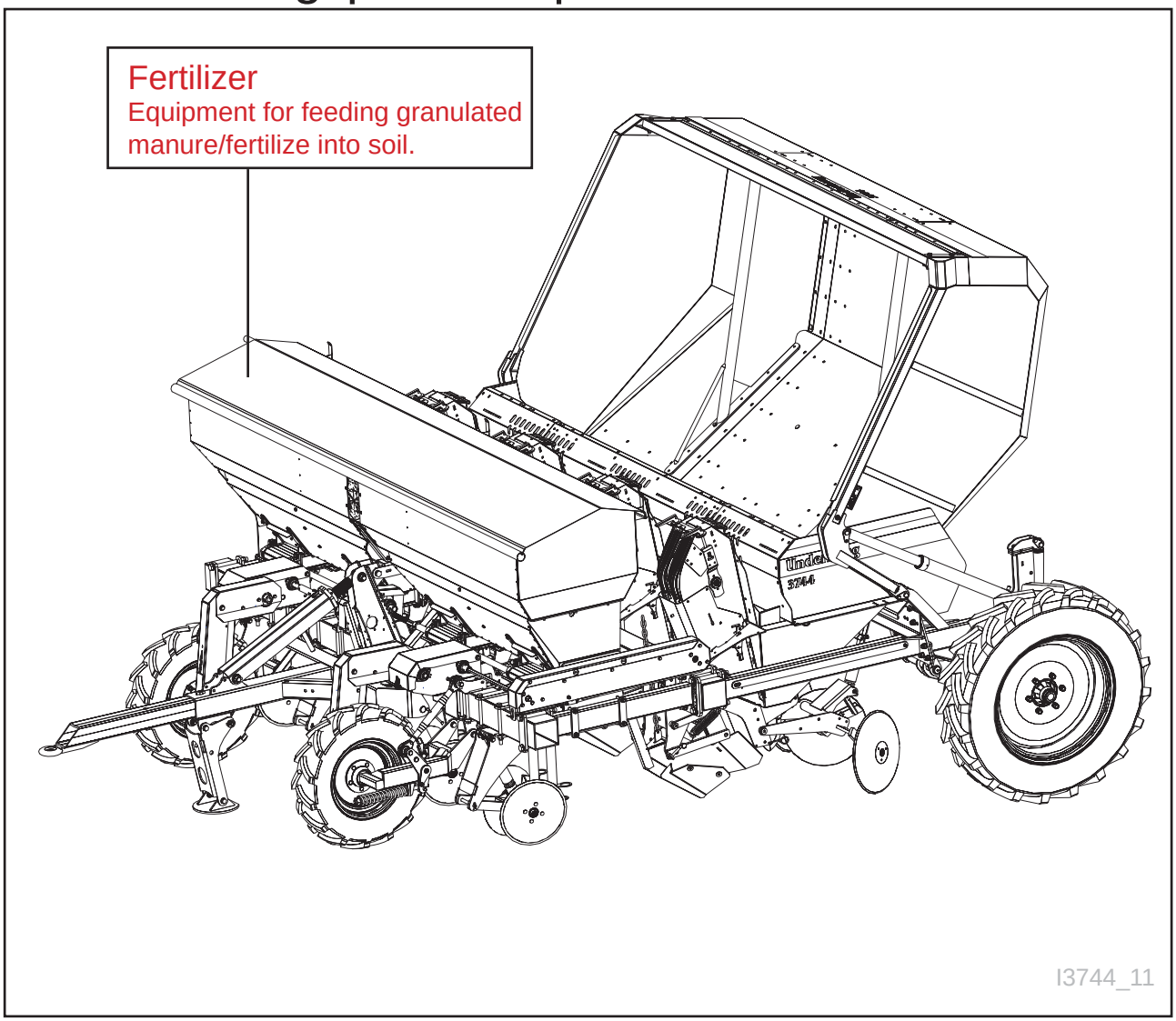

Fig. 31a

Ribbed wheels

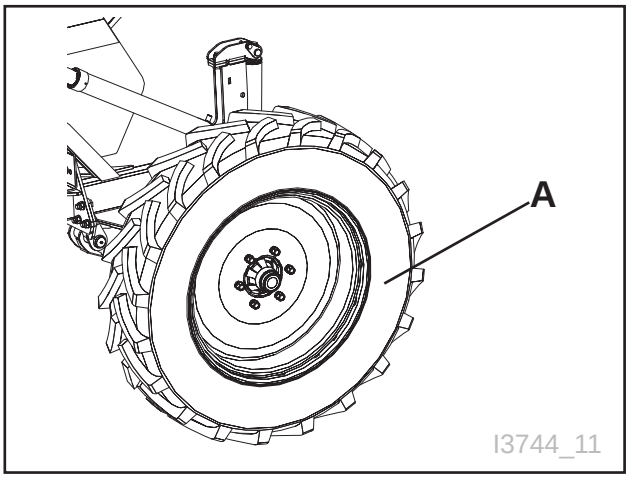

Fig. 31b

Ribbed wheels 11.2-28" **A** left and right are mounted on the wheel hub frame side.
Ensure the ribbed wheels are mounted in the right rolling direction.
(Opposite of a tractor)
See Fig. 31

Mounting potato planter w/fertilizer

Planting shoes

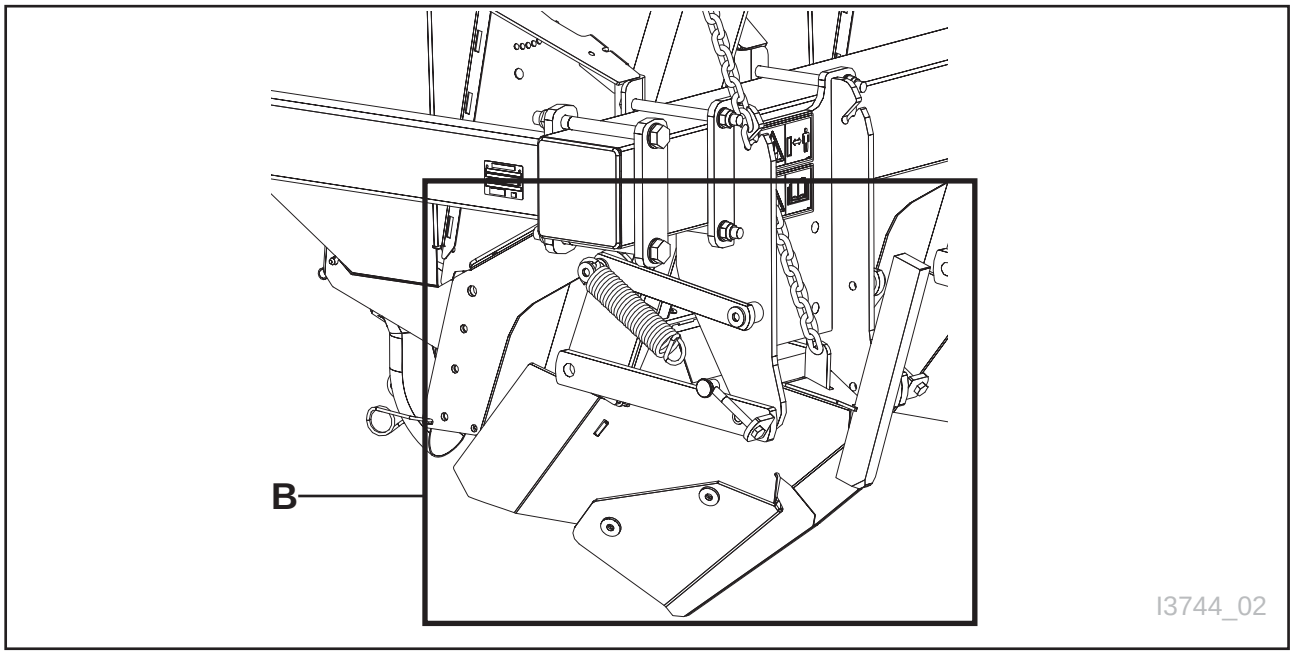

Fig. 32

Floating planting shoes
The floating planting shoe **B** should be mounted on the planting unit/beam. **See Fig. 32**

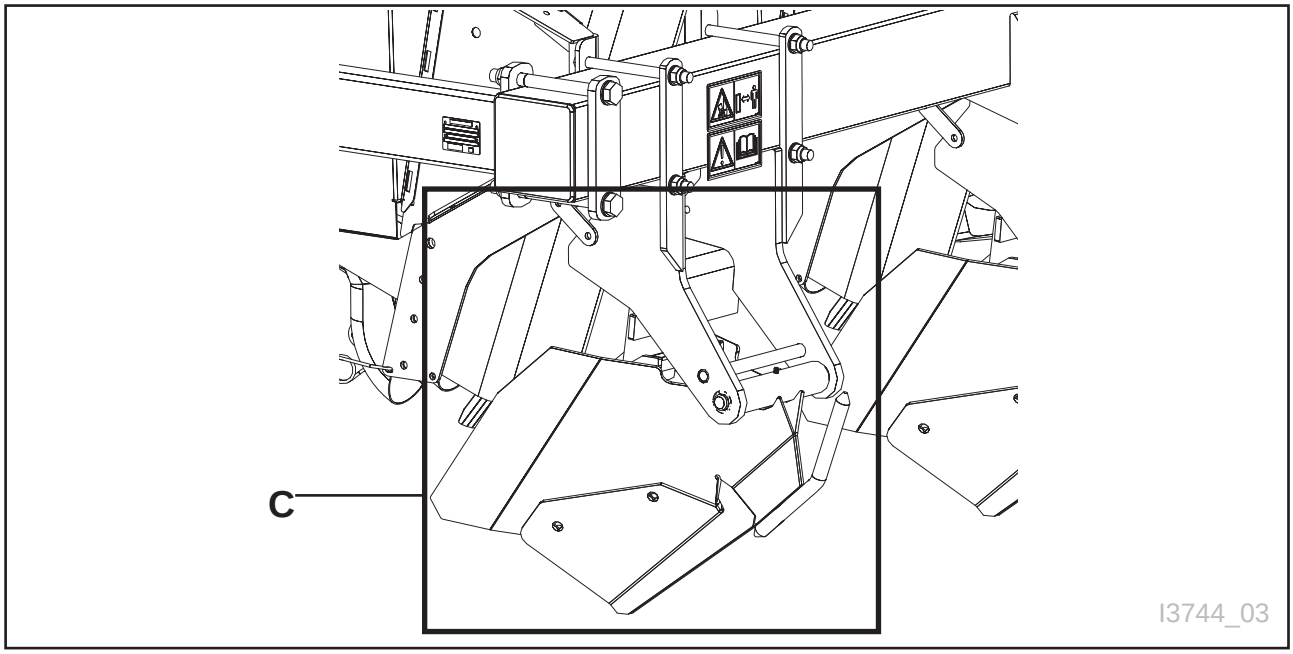

Fig. 33

Heavy duty planting shoes
HD planting shoes **C** should be mounted on the planting unit/beam. **See Fig. 33**

Mounting potato planter w/fertilizer

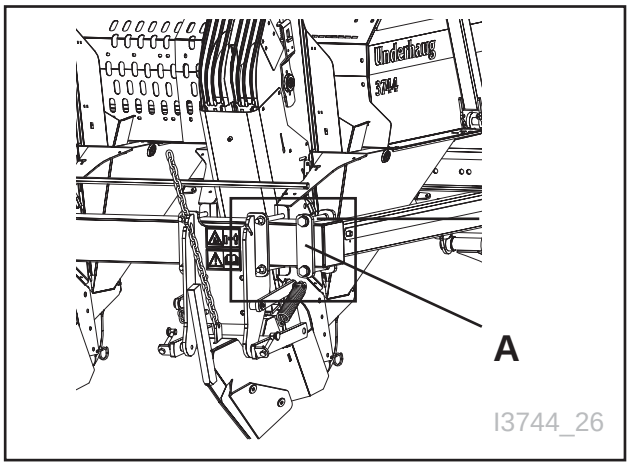

Fig. 34a

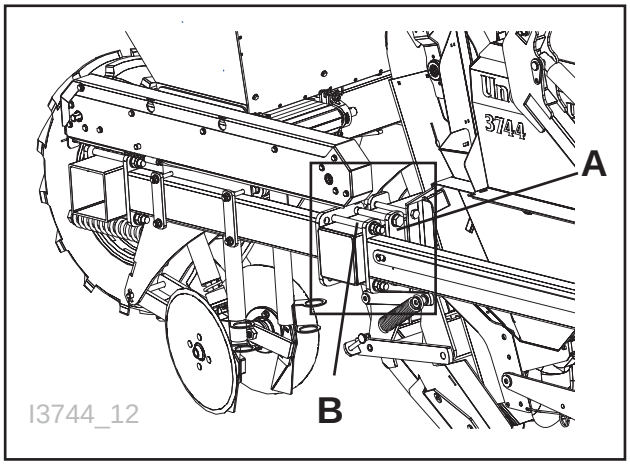

Fig. 34b

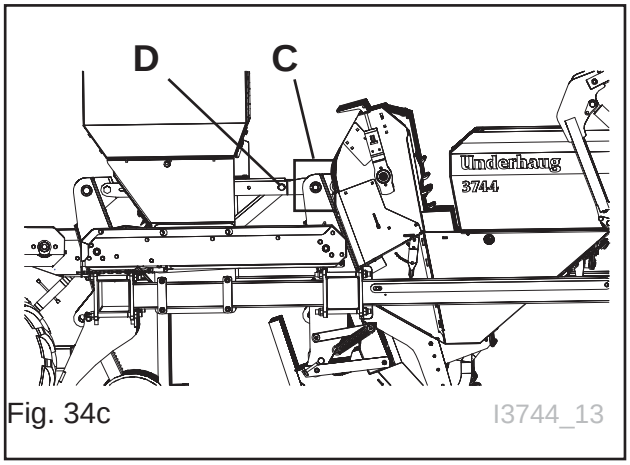

Fig. 34c

Fertilizer

- Loosen frame brackets **A**
- Place fertilizer and fit bolts **B**
- Use the bracket **A**, and tighten 4 bolts on each side.
- Install bolt **C** in center.
- Tighten all bolts for stay **D**

See Fig. 34a 34b and 34c

Mounting potato planter w/fertilizer

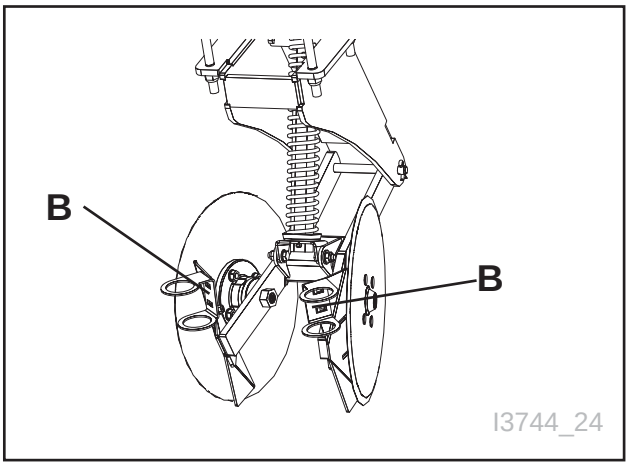

Fig. 35

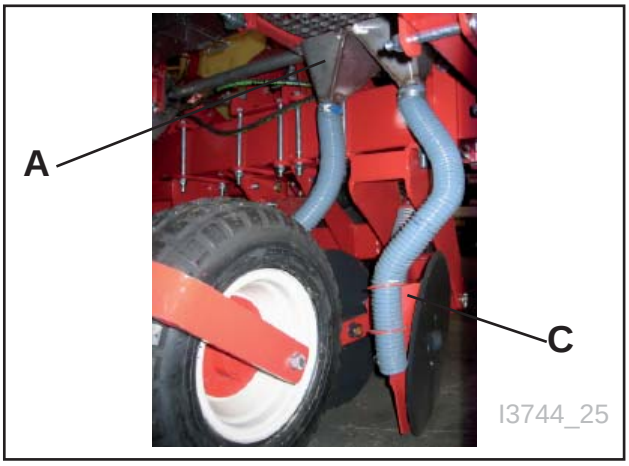

Fig. 36

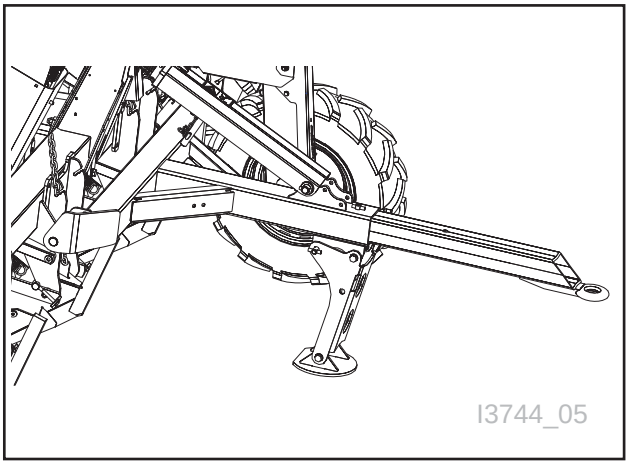

Fig. 37

Fertilizer disc

- Mount fertilizer discs to frame, according to row distance.
- Mount fertilizer hoses to funnel **A**
- Mount lower bracket to scraper **B**. Ensure left and right difference.
- Insert hose **C**.

See Fig. 35 and Fig. 36

Drawbar

Mount the drawbar with drawbar/beam.

See Fig. 37

Hydraulics - potato planter w/fertilizer

Shuttle valve and connector
Disassemble and move shuttle valve with handle **A** and connector **B** with bracket, together with cylinder **C** and hoses **D.**
See Fig. 38

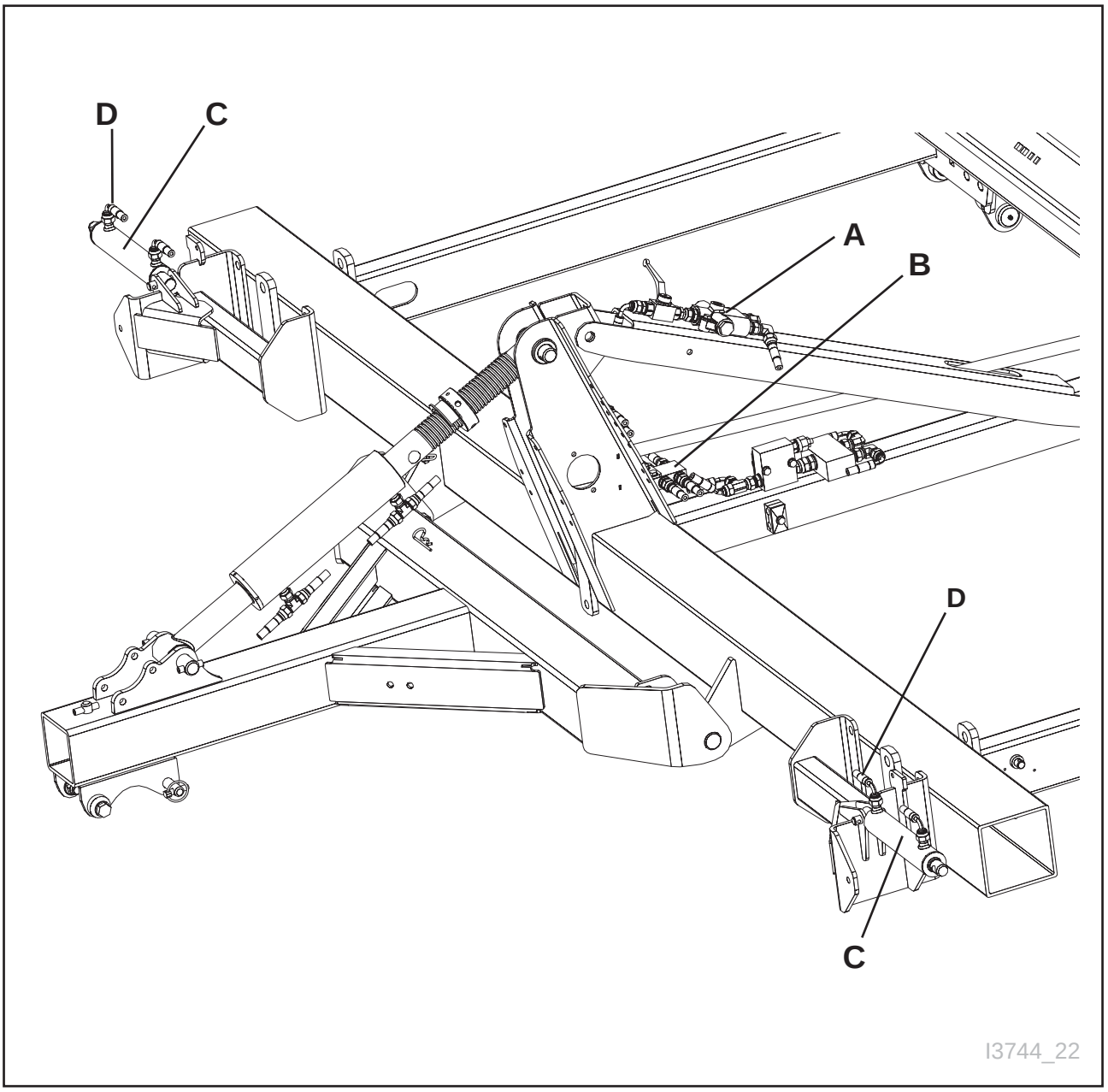

Fig. 38

Hydraulics - potato planter w/fertilizer

Hydraulic drive system for potato planter w/fertilizer

- Place T-connection **E** between return line from rear cylinders.
- Put on extension line 110cm between **K** and **L**. Use 90° albow
- Put on extension line 110cm between **M** and **N**
- Connect with short hose between **O** and **P**
- Mount the return line from connector between **Q** og **R**
- Blind the last opening on connector with cap **S**
- Connect the hose to hopper cylinder with extension line, 148cm **T** and **U**
- Place hoses trough opening **V** on drawbar

See Fig. 39

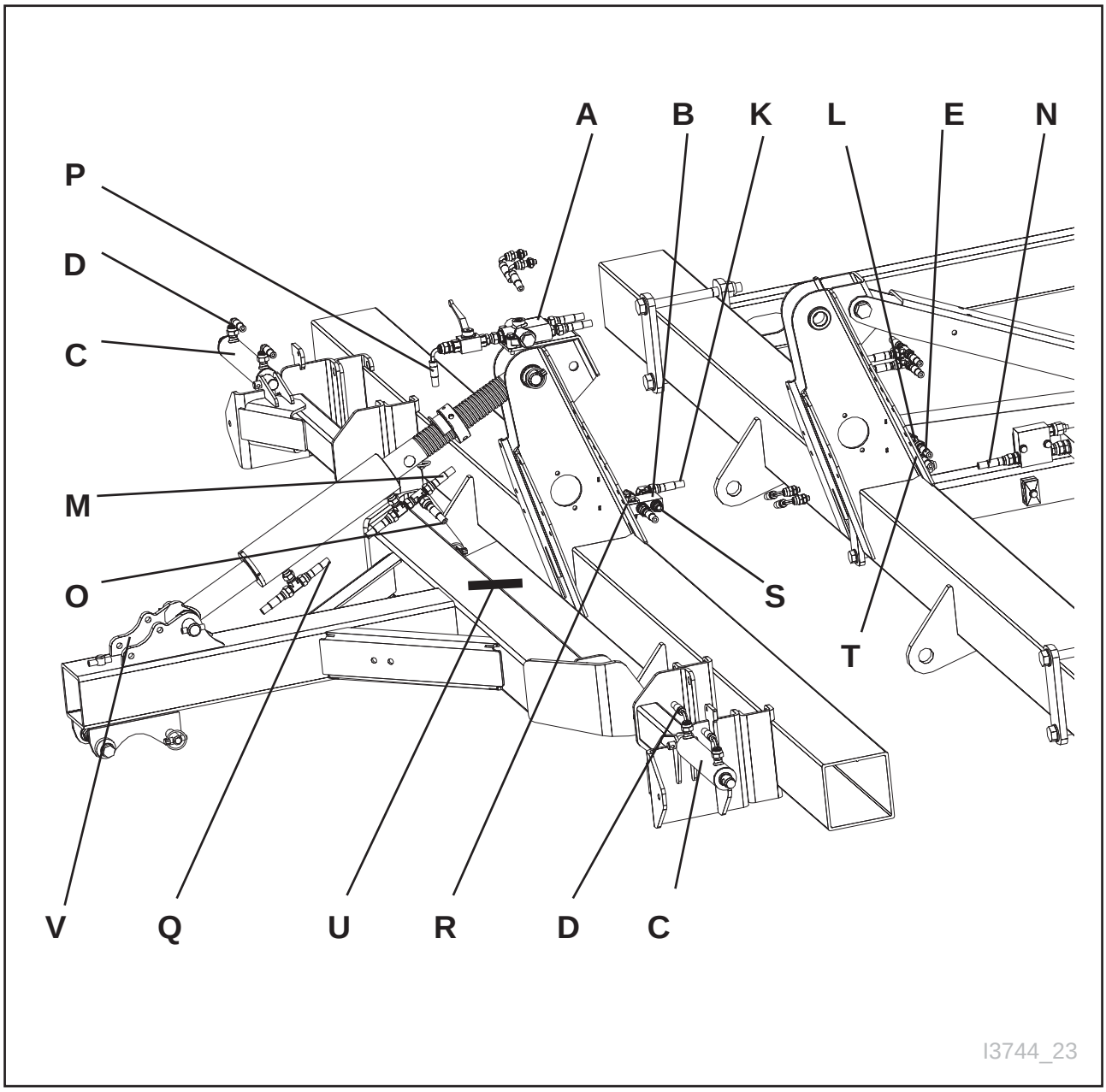

Fig. 39

Hydraulics - potato planter w/fertilizer

A Drawbar cylinder
B Hopper cylinder
C Wheel cylinder
D Marker cylinder
E Ball valve
F Marker sequence valve
G Lifting sequence valve
H Flow divider
I Coupling

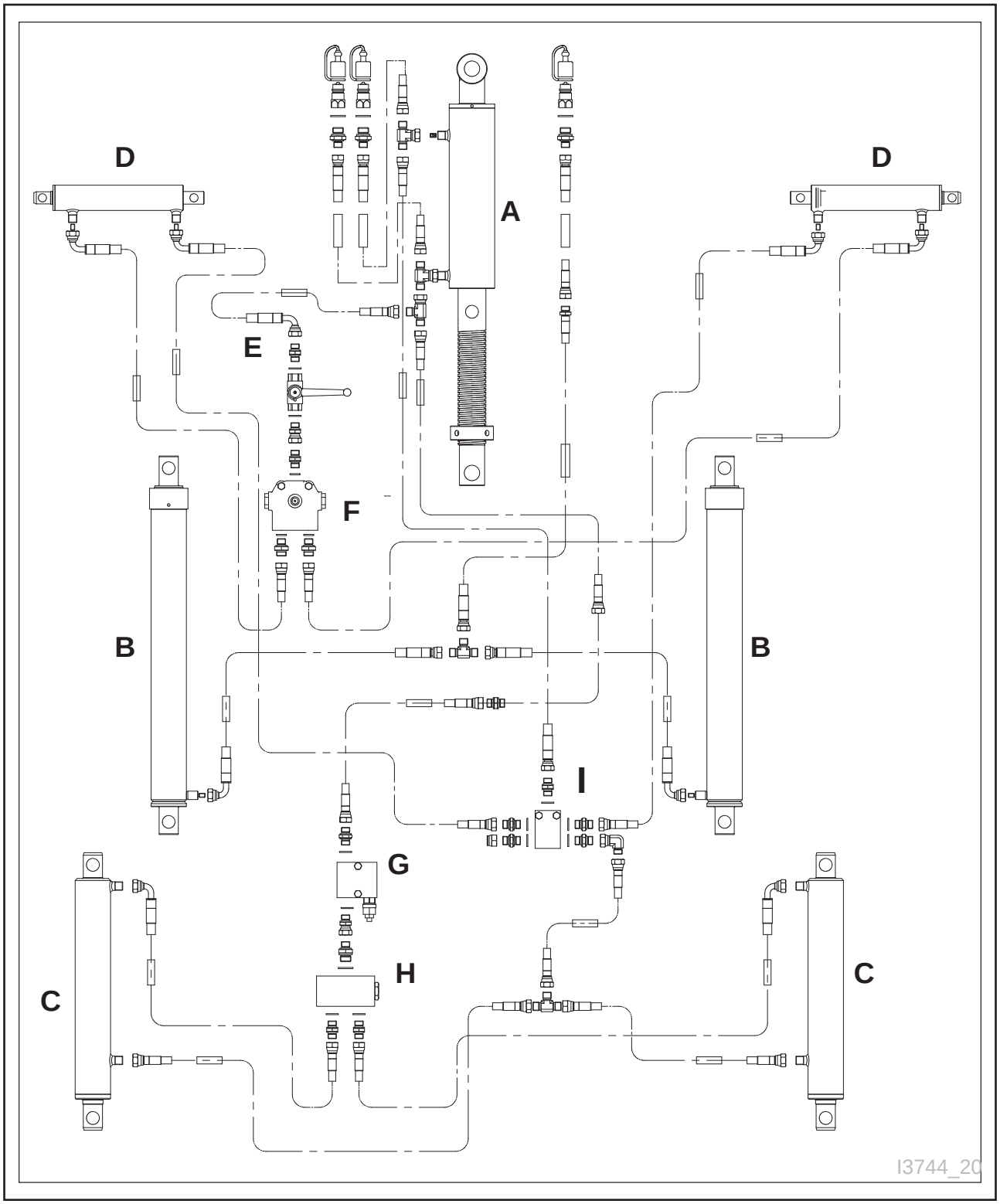

Fig. 40

Hydraulics - potato planter w/fertilizer

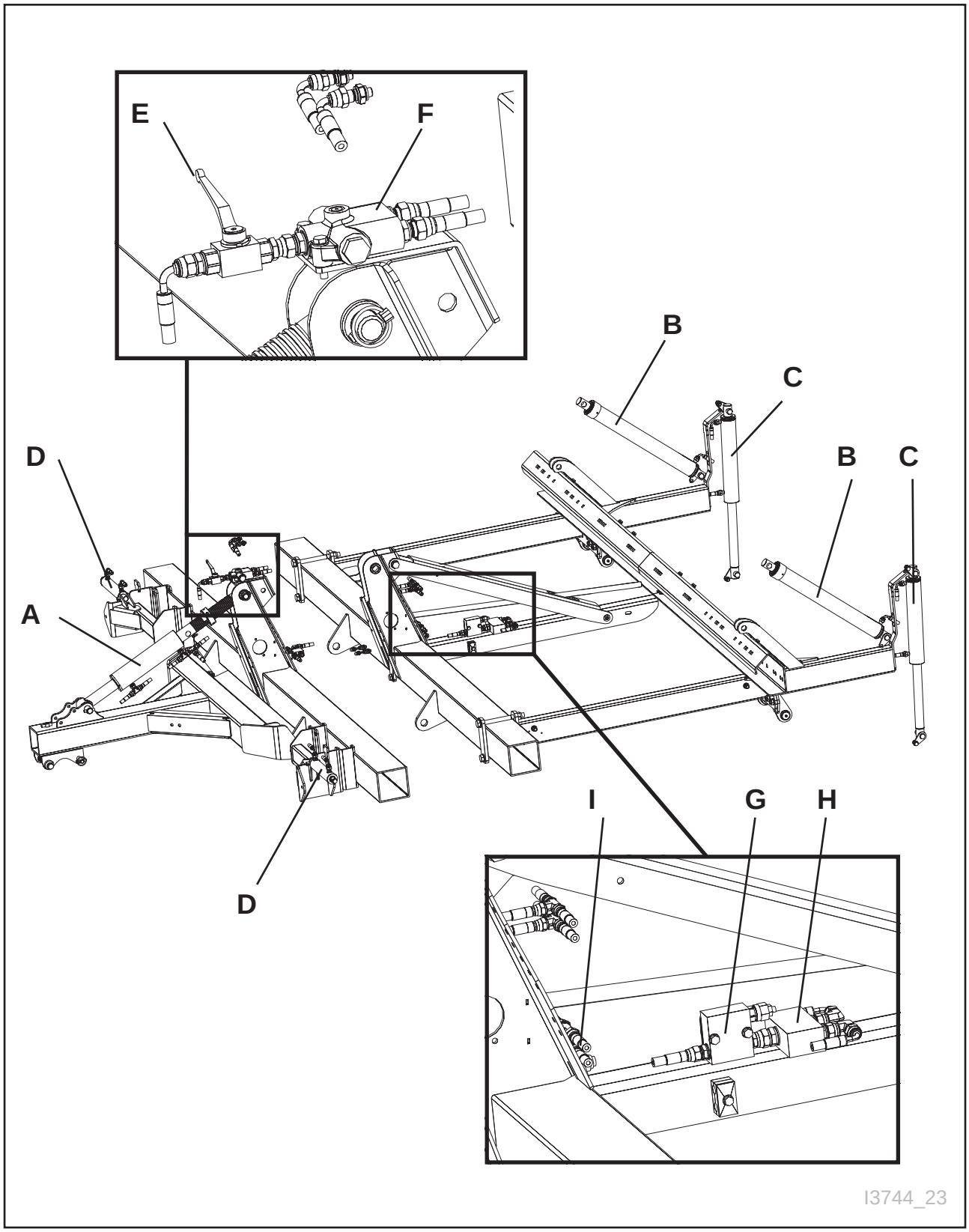

Fig. 41

Mounting potato planter w/fertilizer

Left drive wheel unit

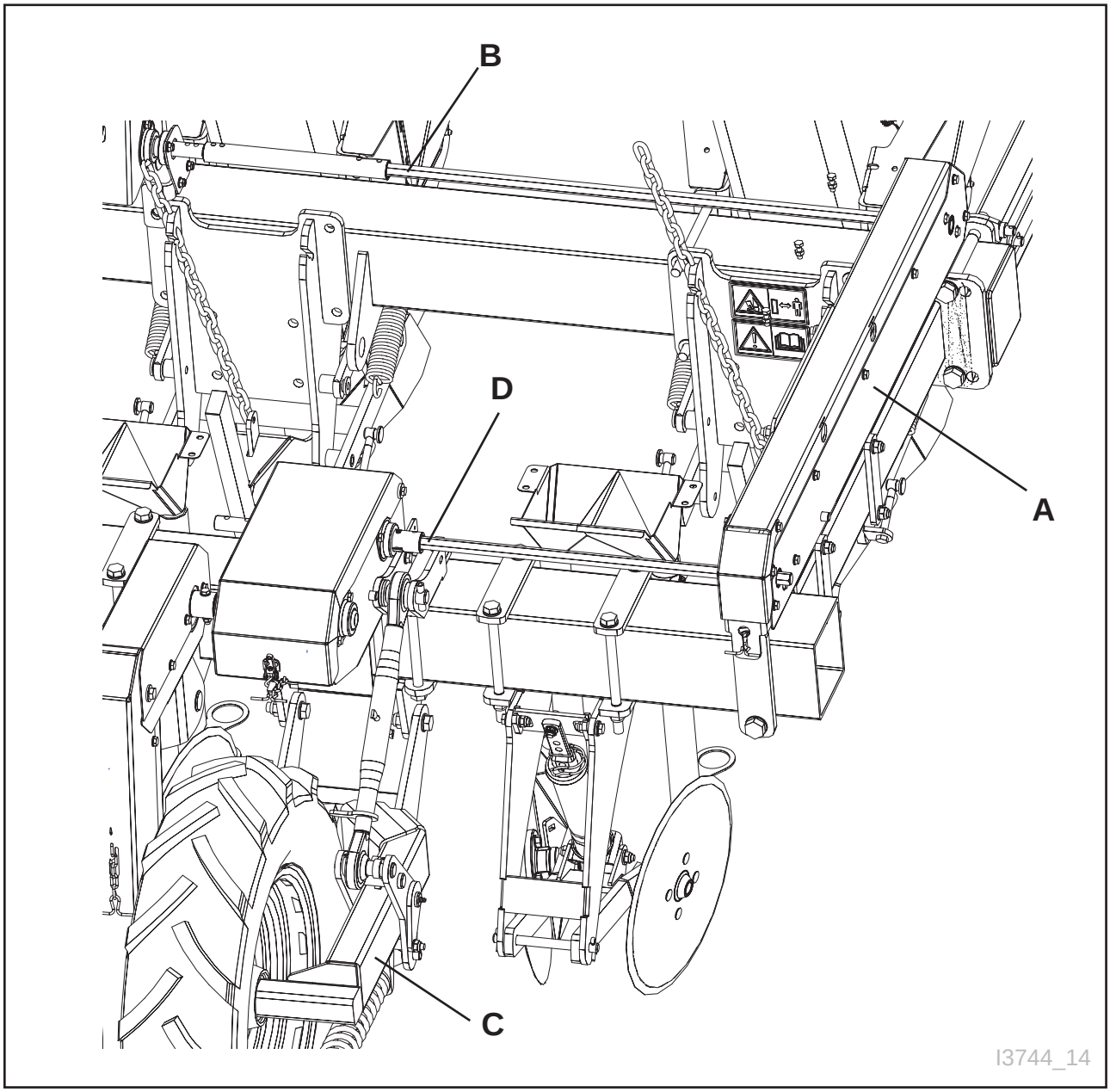

Fig. 42

- Put hexagon axles **B** and **D** in transfer box **A**, front and rear.
- Connect rear axle **B** for planting unit drive.
- Mount left drive unit **C** to fertilizer frame.
- Connect front axle **D**.
- Adjust transfer box **A** until hexagon axels are paralell with main frame.

See Fig. 42

Mounting potato planter w/fertilizer

Right drive wheel unit

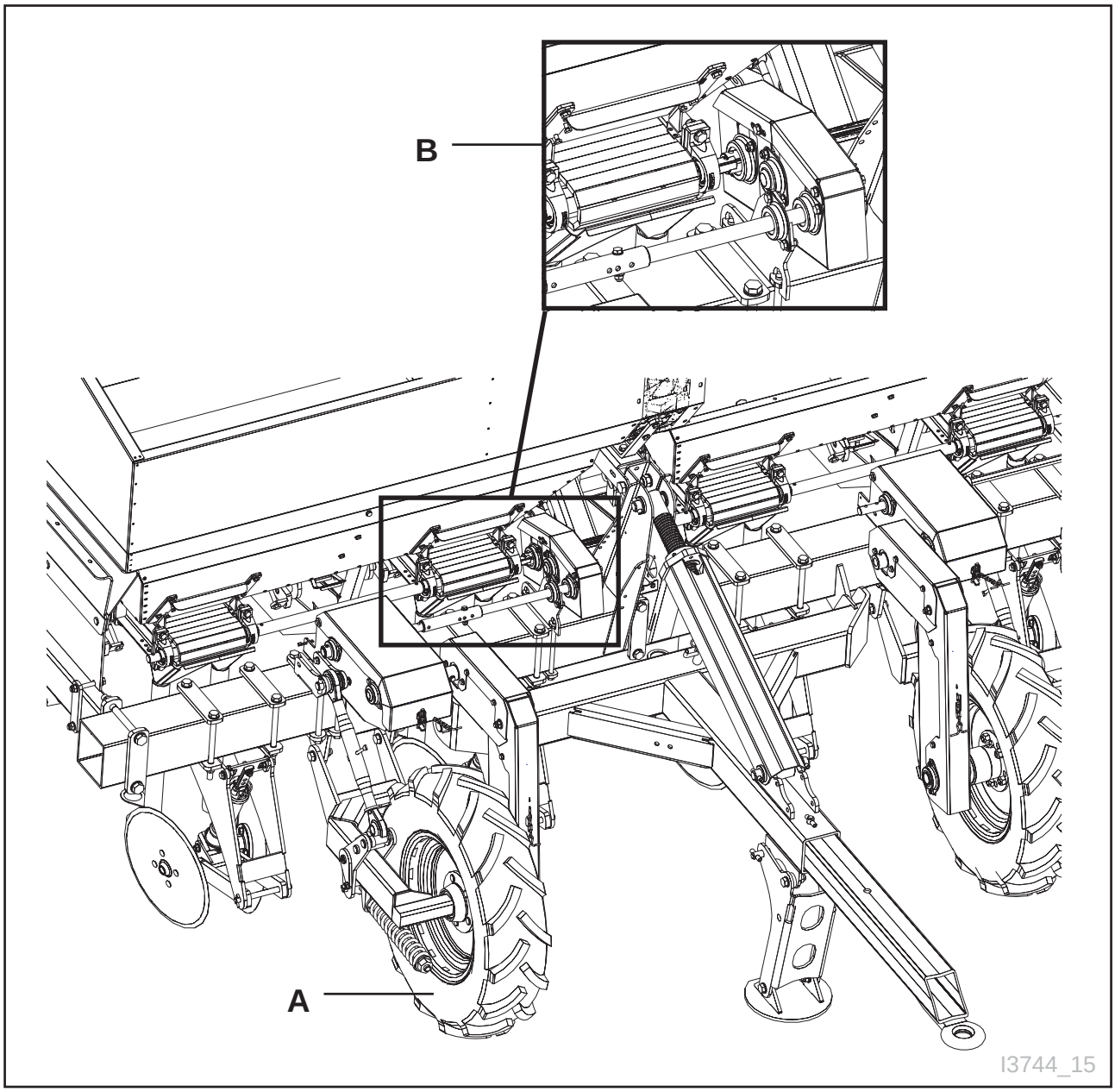

Fig. 43

- Mount right drive wheel unit **A**
- Connect to transfer box **B**

See Fig. 43

Potato planter w/fertilizer

Hopper

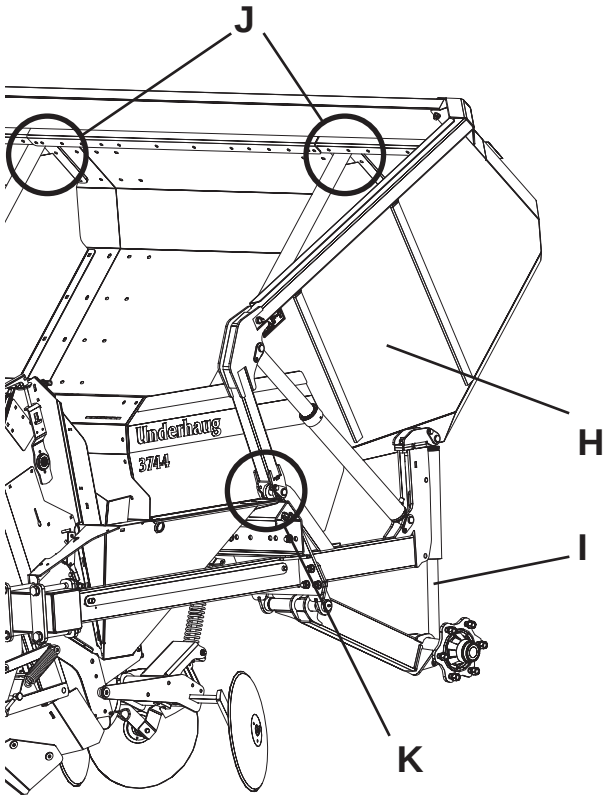

Fig. 44

- Lift with two straps in point **J** to get the right angle when connecting to frame.
- Mount hopper **H** to frame with bolts **K.**
- Connect the cylinder **I** to the hopper on both sides.

See Fig. 44

Potato planter w/fertilizer

Side plates

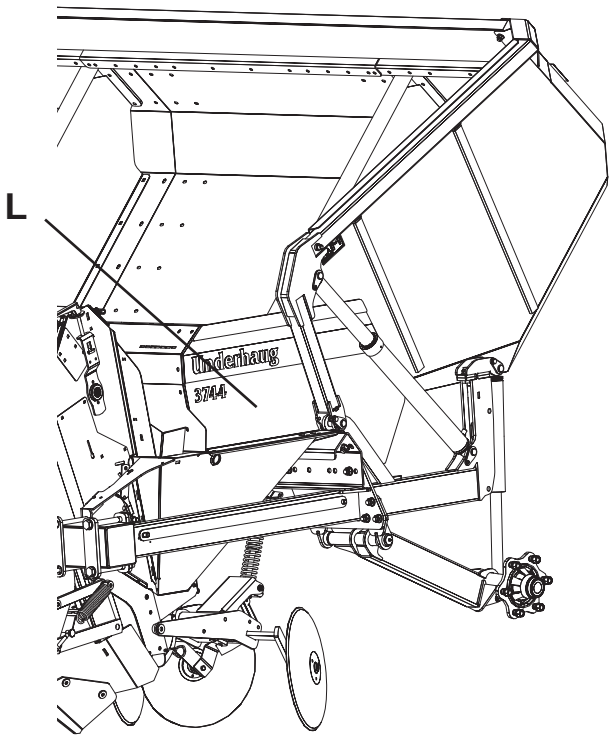

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Fig. 45

- Mount the side plate **L** between hopper and cylinder on both sides.

See Fig. 45

Potato planter w/fertilizer

Marker

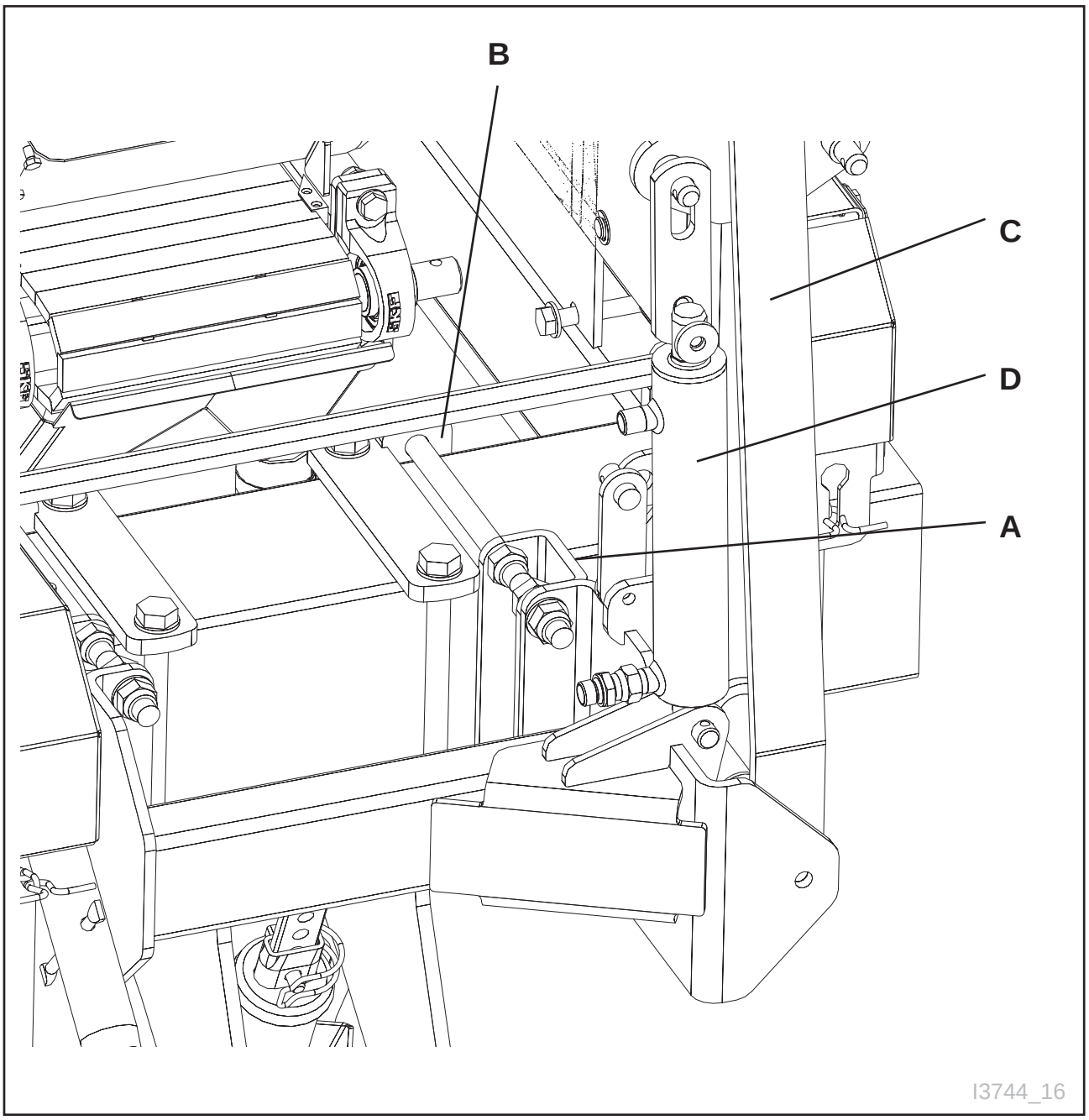


Fig. 46

- Attatch the marker with brackets **A** and **B**
- Mount the marker arm **C** and cylinder **D**

See Fig. 46

4 Tractor connections

4.1 Mechanical

Drawbar

Adjust the drawbar length to suit the tractor thus preventing the tractor wheels from touching the planter when turning.

4.2 Hydraulic

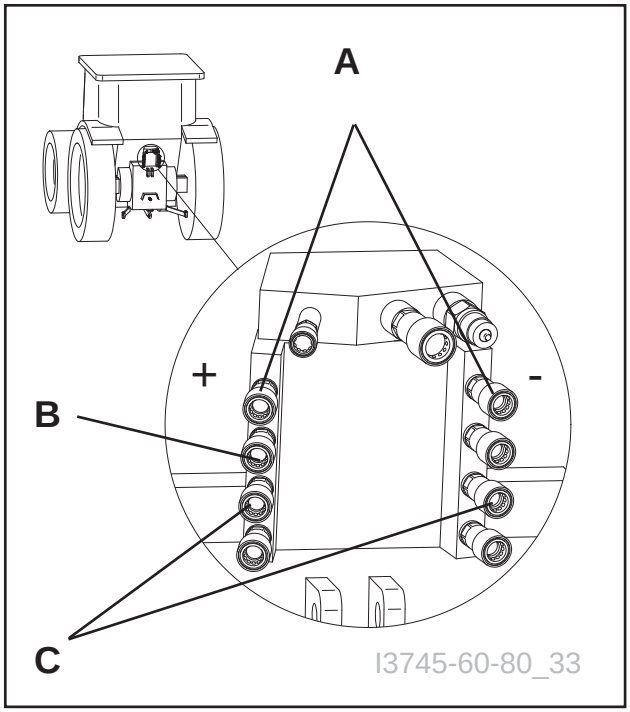


Fig. 47

- Connect hoses for lifting machine to a double acting outlet **A**. This operate drawbar, wheel lifting and markers.
- Connect hose to hopper to a single acting outlet **B.**
- Connect hoses to tramline clutch to a double acting outlet **C.**

See Fig. 47

Electrical

Connect electrical wires for planting monitors, el. agitation area meter to 12V DC power supply.

5 Adjusting planting units

5.1 Seed potatoes size

Use graded seed potatoes as equal size given an improved yield optimal planter performance.

NB! The best result is achieved when difference in the size is kept to minimum.

5.2 Planting distance

Potato planter basic

L cm	A	B	C	L inch
10	26	12	24	3,9
11	26	13	24	4,2
11,5	26	14	24	4,5
12	26	15	24	4,9
13	20	12	24	5,0
14	20	13	24	5,5
15	20	14	24	5,9
16	20	15	24	6,3
17	15	12	24	6,7
18	15	13	24	7,3
19,5	26	12	12	7,8
20	15	14	24	7,8
21,5	15	15	24	8,4
21,5	26	13	12	8,4
23	26	14	12	9,1
23,5	11	12	24	9,2
24,5	26	15	12	9,7
25	11	13	24	9,9
26	20	12	12	10,1
27	11	14	24	10,7
28	20	13	12	10,9
29	11	15	24	11,5
30	20	14	12	11,8
32	20	15	12	12,6
34	15	12	12	13,5
37	15	13	12	14,6
40	15	14	12	15,7
43	15	15	12	16,8
47	11	12	12	18,3
50	11	13	12	19,9
54	11	14	12	21,4
58	11	15	12	22,9

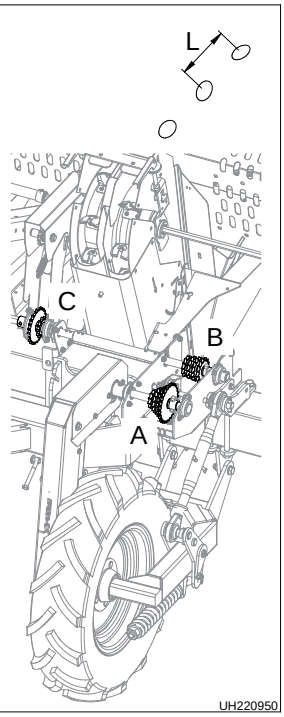


Fig. 49

Potato planter w/fertilizer

L cm	A	B	C	L inch
10	26	12	24	3,9
11	26	13	24	4,2
11,5	26	14	24	4,5
12	26	15	24	4,9
13	20	12	24	5,0
14	20	13	24	5,5
15	20	14	24	5,9
16	20	15	24	6,3
17	15	12	24	6,7
19	15	13	24	7,3
20	15	14	24	7,8
21	15	15	24	8,4
21,5	26	12	11	8,5
23	26	13	11	9,2
24	11	12	24	9,2
25	26	14	11	9,9
25	11	13	24	9,9
26	26	15	11	10,6
27	11	14	24	10,7
28	20	12	11	11,0
29	11	15	24	11,5
30	20	13	11	11,9
33	20	14	11	12,8
35	20	15	11	13,8
37	15	12	11	14,7
40	15	13	11	15,9
43	15	14	11	17,1
47	15	15	11	18,3
51	11	12	11	20,0
55	11	13	11	21,7
59	11	14	11	23,4
64	11	15	11	25,0

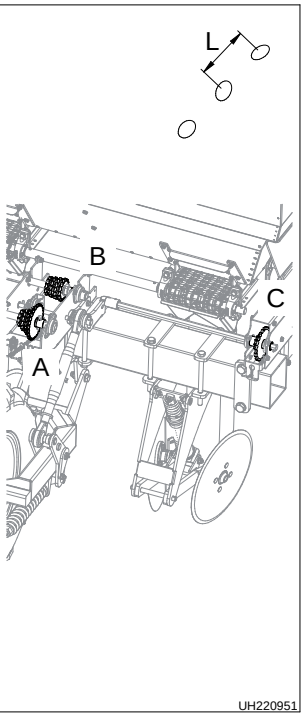
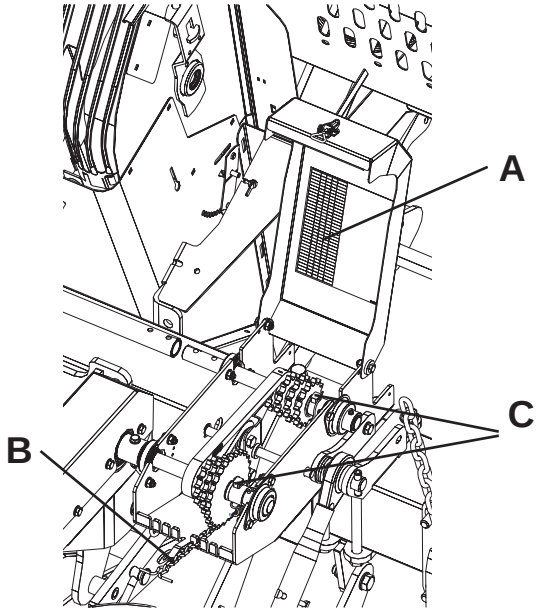


Fig. 50

Planting distance table is found under cover to gear box. **See Fig. 51 on next page.**

5.2 Planting distance



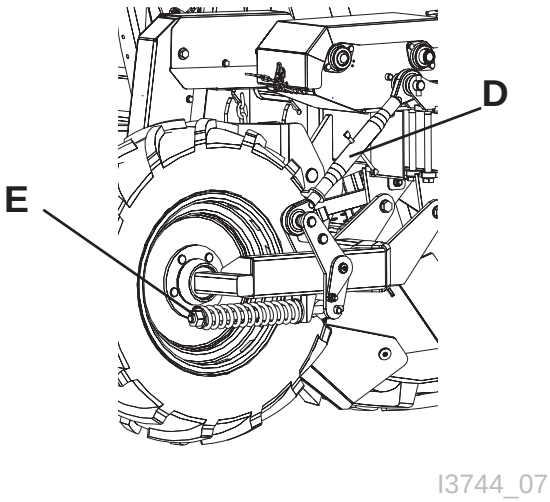


Fig. 51

- Planting distance table **A** is placed under cover of gear box.
- Release chain tensioner **B** and move chain and sprocket. Both sprocket assy can be moved on axle.
- Lock with pins **C.**
- Ensure wheel do not slip to ground.
- Tension turnbuckle **D** to have good pressure on drive wheel.
- In loose soils it can be nessecary to tighten spring pressure with bolt **E**.

See Fig. 51

Due to varying softness of soil, the spacings obtained may differ from the chart figures. Check by measuring in row (min 2m length).

5.3 Depth control

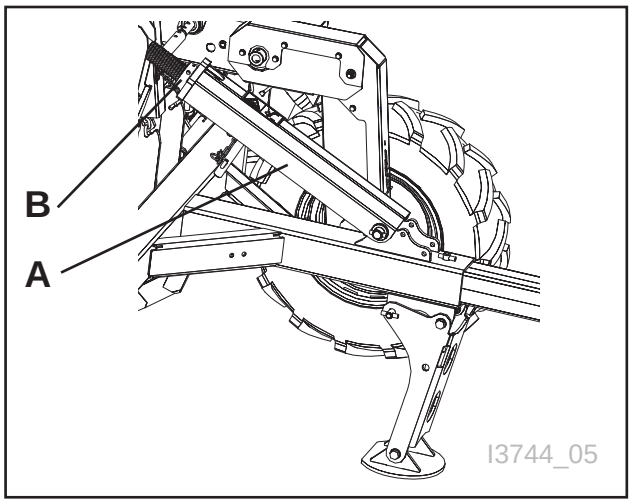


Fig. 52

- Planting depth is set by the heigth of the planter.
- This is adjusted by the nut **B** on drawbar cylinder **A**.
- Place nut **B** until heigth **H** is about 60cm from the top of ground. **See Fig. 53**
- This procedure will give the same planting depth every time the machine is lowered on the drawbar cylinder.

See Fig. 52

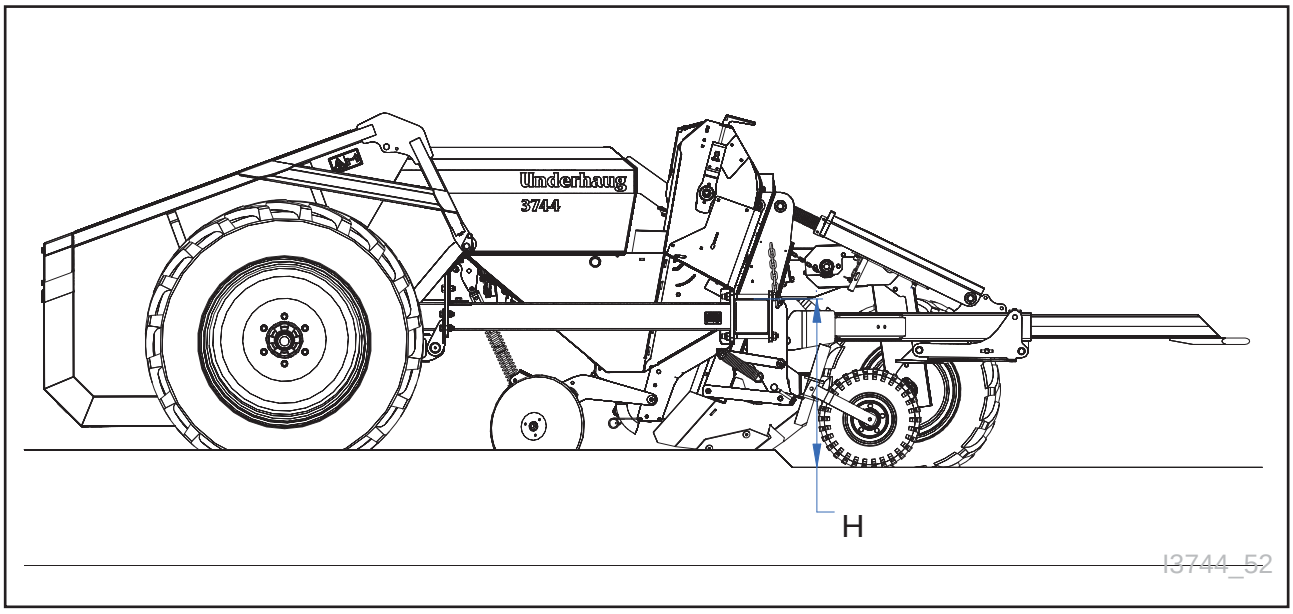


Fig. 53

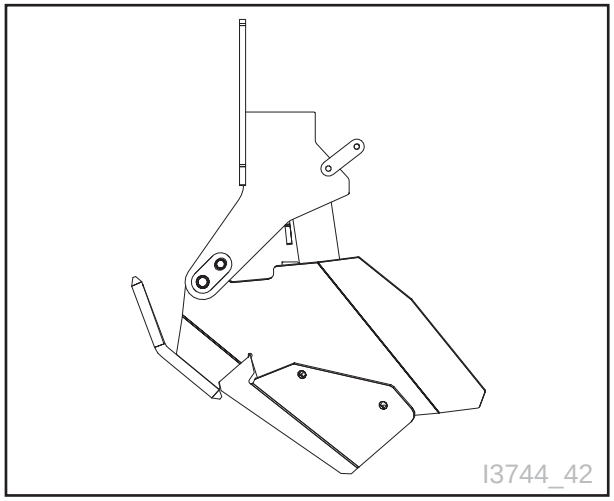


Fig. 54

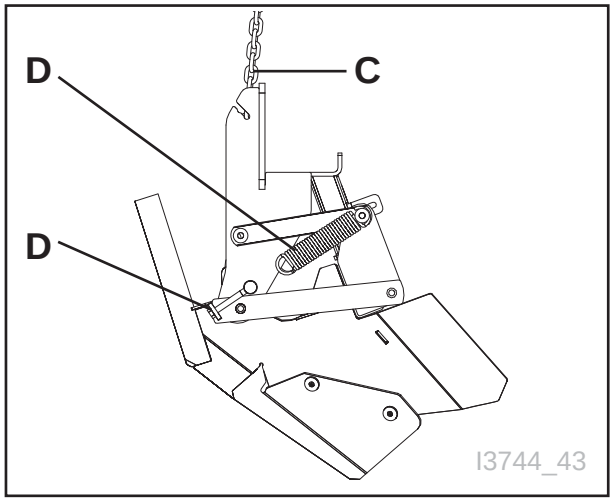


Fig. 55

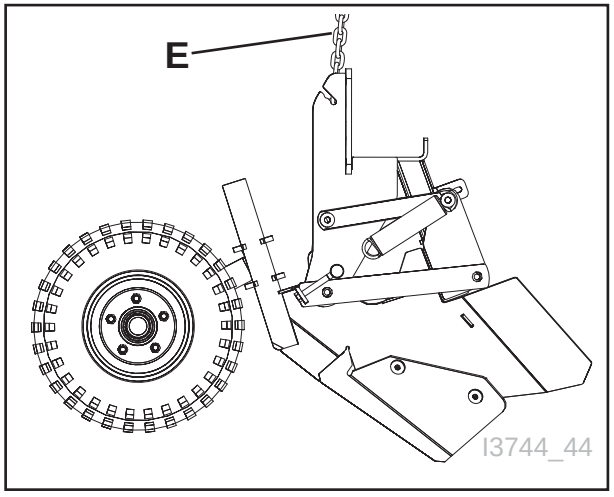


Fig. 56

Warning! Place lock on cylinder

HD planting shoes
Raise the machine and turn the adjusting nut **B**. **See Fig. 52** to required setting.
The depth will change with 12mm/14mm per turn (without or with fertilizer attachment).
Lock the nut with the chain.

Floating planting shoe (Flytende setteskjær)
Adjust the length of the suspension chain **C** so the parallelogram is horizontal when the planter is in planting position.
Adjust to required depth by the nut,
see Fig. 52 (B).
Set the spring tension **D**, to compensate for soil resistance.
See Fig. 55

Floating planting shoes with depth wheels
Same procedure as **Fig. 55** above, but after the depth wheel has been set at the required position with the set screw, the suspension chain **E** may be lengthened with a few links.
See Fig. 56

5.4 Covering up

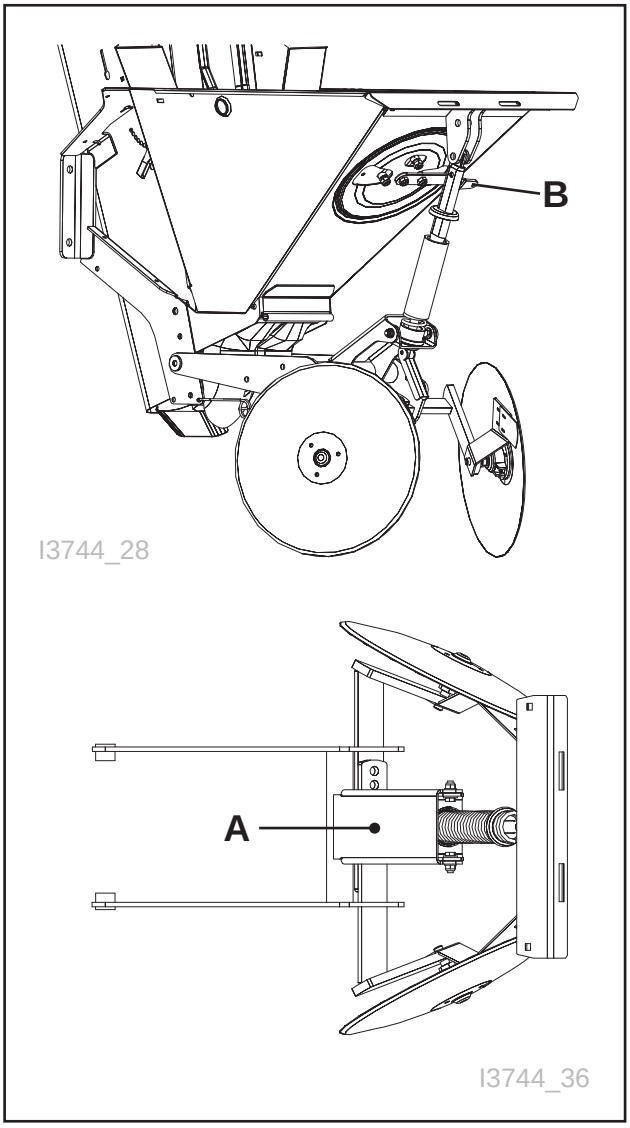


Fig. 57

NB! Use safety device before adjusting

Roller discs

A large ridge is achieved by adjusting discs to max. distance. Discs that are set to a wide angle will make sharp-topped ridges, where as a smaller angle will produce flat ridges.
Loosen bolt **A** on the frame plate for adjustment
If the discs make the ridge too small due to hard or heavy soil, increase the spring pressure by lengthening the stay **B**.
See Fig. 57

Ridge former

A customised ridging hood can be delivered upon request for each model.

- Mount ridge former with bolts on main frame and bracket.
- Connect hydraulics
- Adjust the angle of attack with turnbuckle **A**
- The former shall be horizontal or angeled a little so it presses on backside **B**.
- Adjust height of ridge former with cylinder **C**. The former shall be adjusted downwards so much that the soil doesn't come onto former plate.

See Fig. 58

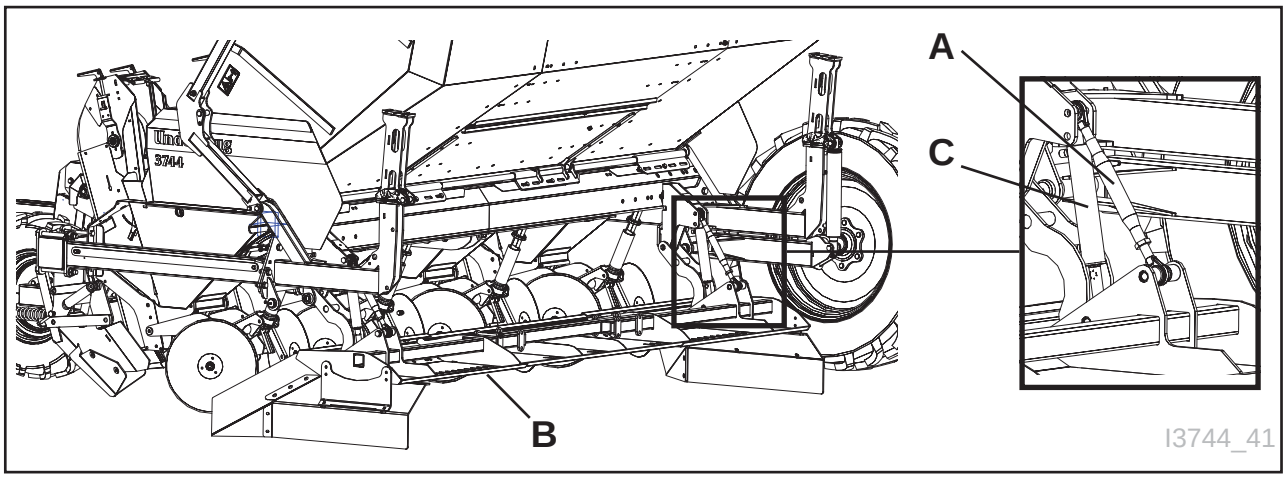


Fig. 58

5.5 Working speed

Depends on cup belt speed, i.e. the chosen spacing.

- Small spacing = low speed
- Large spacings = high speed
- Spacings (cm) x 0,25 = optimal working speed (km/h).

10 cm = 2,5km/h
20 cm = 5,0km/h
30 cm = 7,5km/h
40 cm = 10,0km/h

Observe!
Round seed can be planted at large speed oblong, and cutted seed should be set at lower speed.

5.6 Mechanical belt agitation

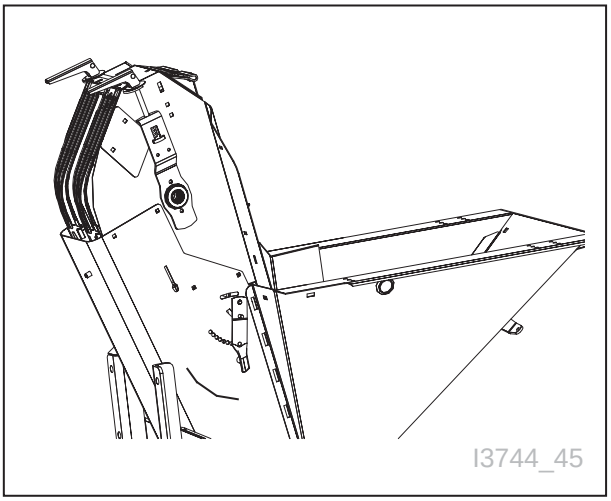


Fig. 59

Set to minimise misses and doubles.

- Minimum agitation **A** = Large potatoes, high belt speed.
- Maximum agitation **B** = Small potatoes, low belt speed.

See Fig. 59

5.7 Electrical belt agitation

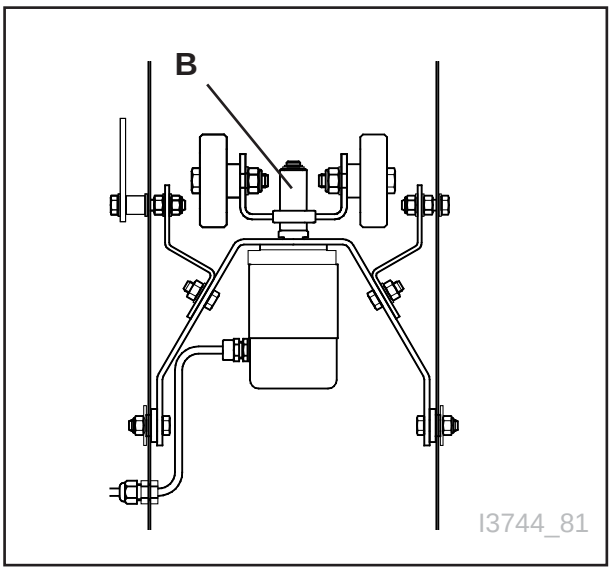


Fig. 60

The agitator motor are located inside the planting units as shown in **Fig. 60**. The control unit fitted on the main frame at the front of the planter includes fuses for every motor.
It is important to make sure that every movable component of the agitating system may move freely, otherwise the motors may overload the electric circuits causing fuses to blow.
Adjust the agitator speed by means of the control panel. The agitator system's pressure on the cup belt i adjustable.
In order to get access to the grease nipple **B** the cup belt has to be disconnected
See Fig. 60

5.8 Regulation of potato flow

Fig. 61

Set the choke plates (angle and length) **Fig. 61** to obtain balance between supply and planting.
Potato level should normally be approx. 15-20cms below the lower edge of the hoppers's front plate.
Central adjustment for 2 planting units for choke plates, by adjusting chain **A** at the headstock.

- Increase flow - pull the chain
- Reduce flow - slacken the chain

The indicator at outside of planting units shows the position of the choke plate.

5.9 Emptying the potato hopper

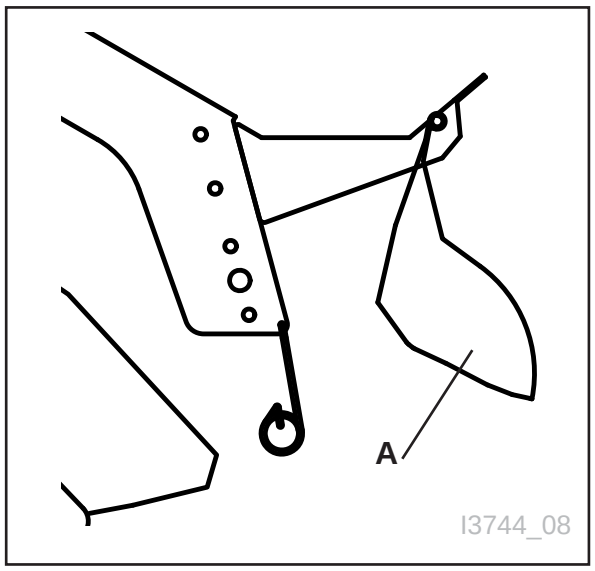


Fig. 62

Empty all accessible cup. Open the hatches **See Fig. 62/A** and empty the hopper. If the flow blocks, move the belts.
Finally turn the belts in order to empty the planting tubes.
Reposition the hatches.

It is even possible to empty the hopper by engaging the drive wheel by hand when planter is in lifted position.

5.10 Marker

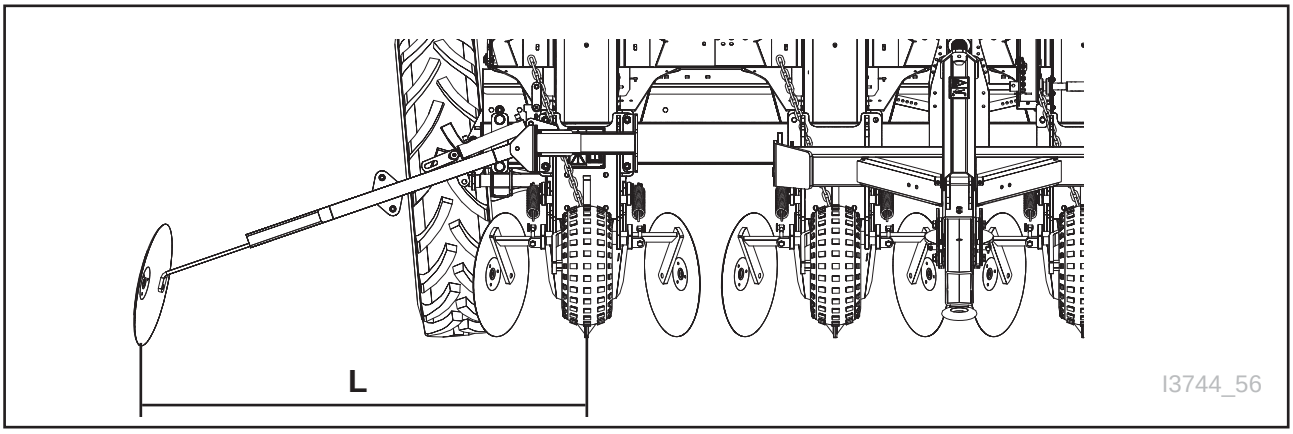


Fig. 63

The marker indicates where the middle of the tractor is to run. The distance **L** from the outer planting unit to disc is given for different row widths. The marker is fitted with changeover valve. The active marker will raise completely when machine is lifted. At the same time changeover valve is activated causing the opposite marker to lower when machine is set in working position again. **See Fig. 63**

Number of row width	Row width	Working width	L
4	75 cm	300 cm	187,5 cm
4	80 cm	320 cm	200 cm
4	85 cm	340 cm	212,5 cm
4	90 cm	360 cm	225 cm
4	34 inch	136 inch	85 inch
4	36 inch	144 inch	90 inch

6 Electronic planting monitor

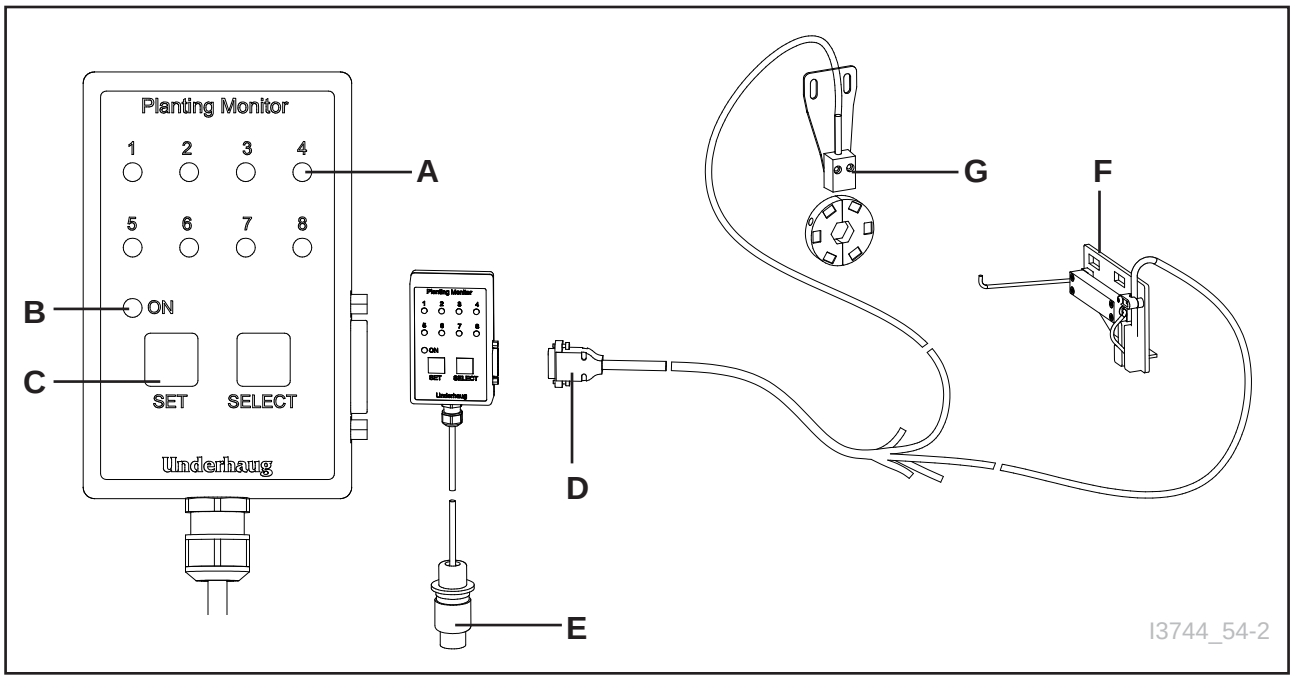


Fig. 64

6.1 Monitor description

The planting monitor gives signal to operator when potatoes are missing. At the monitor it can be read witch row it is fault with by a led lamp **(LED)** when misses are above the adjustable limit. The monitor receives signals from row sensors and 1 reference sensor.

A	**8 red LED's**, one for each actual row of planting. Only sensors for row 1-4 are used to this planter
B	**1 green LED** showing state of power supply. The green **LED** will blink if voltage is not
C	2 pushbuttons **"SET"** and **"SELECT"** for adjusting/setting the monitor.
D	Connector to planting sensors and reference sensor.
E	Power supply cable
F	Planting sensors
G	Reference sensor

6.2 Operation

When monitor is connected with a power supply all **LED's** will light up consecutively in order **"1"** to **"8"** and then **"ON"**, and the alarm transmitter will give a signal.
After this startup sequence it will go to the normal modus ready for planting.
If no reference pulses are registered all **LED's** will light up. The operation modus is entered when the first reference pulse is registered. The monitor will give a short alarm signal and then switch off the **LED's** , 1 to 4.

If a fault occurs on one of the planting row units the monitor will give an alarm signal and the **LED** for the actual row will blink.
The alarm will sound until the fault is corrected, when corrected the alarm will stop and the **LED** lights will turn off after 5 seconds.

When reference pulses stop, the monitor will give a short alarm signal and light up all **LED's.**

6.3 Adjusting

To adjust the monitor push the **"SET"** button continuously for 5 seconds. Then the 3 modes of adjustment can be selected by pushing the **"SET"** button again.
The **"SELECT"** button is used for selecting value.
In all adjustment modes the monitor will turn back to operation modus automaticly after 30 seconds.

Row setting (LED no. 5 lighting)

This adjustment is necessary for choosing number of planting rows to monitor, from 2 to 8 rows.
The 4 upper **LED's** show the number of row pairs.
Push **"SELECT"** two times to choose 4 rows.

- **LED1 = 2 rows**
- **LED2 = 4 rows**
- **LED3 = 6 rows**
- **LED4 = 8 rows**

The setting is saved by pushing **"SET"**. This will also shift to next modus of adjustment.

Alarm setting (LED no. 6 lighting)

This adjustment is used to choose number of consecutively missed potatoes or faults that will cause the monitor to give alarm.
The number on the lighting **LED** in the upper **LED-row** will also be the number of faults.
By pushing the **"SELECT"** button it is possible to choose between 2, 3 or 4 faults.
The setting is saved by pushing **"SET"**. This will also shift to next modus of adjustment.

6.4 Sensor test (LED no. 7 lighting)

This test makes it possible to check if the potato sensors function correctly. When this modus is entered the sensors should be activated as in normal operation one by one.
The monitor will give an alarm signal and the LED's will light up to indicate actual row.

LED no.	1	2	3	4
Sensor 1	●			
Sensor 2		●		
Sensor 3			●	
Sensor 4				●
Reference sensor		●	●	●

Monitor will also give an alarm signal when an activation is functioning correctly.
Exit from test modus by pushing **"SET"** button.

6.5 Wiring plan monitor

No. on connector	Monitor connector (15 pins)	Wiring color
1	- 0 V	Black and brown
2	+ 12 V	
3	- 0 V	Black and brown
4	Reference sensor	White
5	Sensor 2	Green
6	Sensor 4	Red
7	Not in use	
8	Not in use	
9	- 0 V	Black and brown
10	- 0 V	Black and brown
11	- 0 V	Black and brown
12	Sensor 1	Blue
13	Sensor 3	Yellow
14	Not in use	
15	Not in use	

7 Maintenance

Warning:
Never carry out adjustment or repair work, or service and maintenance work, on the machine when in operation. Switch off the tractor engine, remove the ignition key and wait for the machine to come to a standstill before working on moving machine parts. Support the hopper before accessing under a raised hopper.
To ensure the efficient running of the planter and to avoid premature repairs, make sure that the machine is well looked after and that repairs are carried out in time.

7.1 Maintenance of mechanic components

Welding on machine
Disconnect the command panel and the electric cabinet before any welding is done on the machine.

Re-tensioning bolts
Check thoroughly all bolts of drawbar, top section's hinge pins, wheels and wheel shafts after 1 hour of use and thereafter weekly. All other bolts and nuts should be checked after 8 hours of use and thereafter weekly.

Recommended bolt tensioning torque

Diameter	Material 8.8	Material 8.8
M5	5.7 Nm	50,5 lb.in
M6	9.9 Nm	7.3 lb.ft
M8	24 Nm	17.7 lb.ft
M10	48 Nm	35.4 lb.ft
M12	85 Nm	62.7 lb.ft
M16	210 Nm	155 lb.ft
M20	400 Nm	295 lb.ft
M24	1000 Nm	737 lb.ft

Chain tensioning
Drive chains are tightened elastically by spring-loaded chain tensioners. The chain tensioners are to be assembled in the chain row so that they can move freely with no torsion and that the wear on chains and chain wheels is reduced to a minimum.

Lubrication
Drive chains:
We recommend a special roller chain lubrication type (motor bike roller chain lubrication).
This should prevent dust and soil from sticking to the chains.

Grease nipple (grease):

Roller disc	Lubricate every 50 hour
El. agitator (niple inside cup belt)	Daily lubrication
Ridge former	Daily lubrication

Tyre pressure

Tyre dimension	Tyre pressure
11.2-28" 8 layers	2,5 bar (250 kPa)

Cup belt tensioning
Equal tension on both sides is essential to ensure that the cup belts run centrally. In order to avoid stretching the belts, reduce the tension when not in use.

Wear
- Check moving parts for wear regularly
- Check tyres for wear and damage
- Check wheel bearings, tighten wheel nuts

Cleaning
We recommend the use of pressured air when cleaning the machine. Thus there is less risk of damaging the bearings of the machine

Cylinders
Keep away from aggressive chemicals etc. in order to avoid damage to the piston surface.

Control
- Check tightness of all bolts and nuts, especially the wheel bolts, main frame bolts, bolts in hopper and any other main structure connections highly stressed, after first day of work and at regular intervals thereafter.
- Check wearing points of furrow openers, ridging bodies and tines for excessive wear.
- Check wheel pressure.

7.2 Maintenance hydraulics

Hydraulic tractor oil replacement
Keep hydraulic oil clean! Clean hydraulic oil will prevent excessive wear and premature failure of components. Replace the tractor filter and oil as per manufacturer's instructions.

7.3 Maintenance electrics/electronics

Controls
- Check wirings for damage or corrosion. (power supply and sensors)
- Check the plugs and sockets.

Cleaning
- Keep command panel and electric cabinet clean.
- Use a moist cloth, and avoid flowing water.

8 Trouble shooting

Fault type	*Procedure for rectification*
Misses	• *Remove/exchange inserts* • *Reduce belt agitation* • *Reduce working speed* • *Increase choke plates openings*
Doubles	• *Use cup inserts* • *Increase belt agitation* • *Increase working speed* • *Reduce choke plate openings*
Doubles and misses	• *Reduce variations of seed size*
Potatoes out of line in the row	• *Increase the planting depth to make a deeper vee shaped furrow*
Potatoes out of centre of ridge	• *Adjust coverers' position according ti planter's row centers*
Faulty planting depth	***a) Rigid furrow opener*** • *Lift or lower land wheels* ***b) Floating furrow openers*** • *Adjust land wheel position.* • *Adjust length of stop chain.* • *Adjust spring tension* ***c) Floating furrow openers w/depth wheel.*** • *Adjust the depth wheel position*
Varying planting depth	***a) Rigid furrow openers*** • *Reduce hopper filling* ***b) Floating furrow openers*** • *Adjust spring tension* ***c) Floating furrow openers w/depth wheel*** • *Better soil preparation (even surface)*
Covering: **Too little soil covering** **Too much soil vovering**	• *Increase depth of coverers* • *Reduce depth of coverers* • *Reduce heigth of ridge using a levelling board*
Sharp top of ridge	***a) Disc coverers:*** • *Increase distance between pair of discs* • *Use a levelling board* ***b) Ridging bodies:*** • *Reduce width of bodies* • *Use a levelling board*

Wide furrow	***a) Disc coverers:*** • *Increase distance between pair of discs* ***b) Ridging bodies:*** • *Set bodies at blunt working angle*
Narrow furrow	***a) Disc coverers*:** • *Reduce distance between pair of discs* ***b) Ridging bodies:*** • *Set bodies at sharp working angle*
Ridging equipment difficult to keep in position	• *Increase depth of track looseners (planter w/disc coverers only)*
Ridges - different sizes	***a) Roller discs*** • *Check distance, angle and length of depth adjustment stay*
Electronics	• *Check for damage cables* • *Check sensor distance* • *Check contacts, sockets and remove any* • *oxydations*

Recycling
- waste to resource -

TKS's products rely on electrical and electronic components in order to work.
These fall under the generic term of EE products. TKS's products use typical components such as cables, switches, motors, control units, etc.

When TKS products are thrown away those components containing contaminants should be treated and sorted in such a way that they do not pollute the environment. Contaminants should be taken care of safely.

Distributors are obliged to accept EE waste from products in the range of goods they sell.
This waste should be kept safe and sent on to an approved waste recipient or treatment plant.
EE waste must be sorted and transported in such a way that it is not damaged or destroyed.

If you need further information on the treatment of EE waste, please contact your distributor.

Regards
TKS AS

Notes