SERVICE MANUAL

COMBINE 975

SPERRY NEW HOLLAND

Reprinted

1 INTRODUCTION

Knowing that time is of the utmost importance during the harvest season, we have in the Clayson service school prepared this manual in the firm belief that in the event of breakdowns it will be of assistance in obtaining quick and efficient repairs.

This book will also be of advantage during service courses as well as being a basis for overhauling and converting machines for the many different applications.

Arrangement of chapters.

This manual covers the whole machine except for special equipment and is divided into 28 chapters.
After this introduction the machine specification is set out,then chapters one to eleven deal directly with the self propelled portion of the machine.
From chapter twelve onwards the different cutting and threshing mechanisms are explained and dealt with in chronological order. Also included at the end of the book is an index of contents.
Every chapter is provided with illustrations that relate to the particular subject being dealt with.

Then follows a short introduction and resume of chapter contents.

Chapter eleven - Engine and supplementary NH parts.
Refers only to specific NH Clayson parts.
Details of engine are explained at depth in the engine manufacturor's handbook.

Special tools - All the special tools used in this book are numbered and catalogued in chapter twenty eight. Specific tools are given with partnumbers and of course are obtainable from the factory.
Other tools which are commonly available are described as "available on the market".

Remarks.

Whenever the terms "left and right" are used it should be understood to mean from the position facing in the direction of combine travel.

2 SPECIFICATION

Steering type : Hydro-static

Ground speed variator : controlled by a hydraulic ram, intermediate speeds can be selected from the driver's seat by means of a lever.

Drive speeds : in MPH on tyres 18.4 x 26

	Min.	Max.
1.	1.0068	2.6600 mph
2.	2.3368	6.1839 mph
3.	5.6308	14.9223 mph
R.	2.2249	5.8918 mph

Brakes : mechanical disc brakes

Parking brake : standard

Wheels and tyres :

Tyres : traction wheels 23.1x26
18.4x26
steering wheels 7.5x16

Tyre pressure : traction wheels 23.1x26 = 25 PSI
18.4x26 = 31 PSI
steering wheels 7.5x16 = 36 PSI

Engine :

Ford 6 cyl. Petrol : type 240 CID 87 HP at 2500 RPM no load
Ford 4 cyl. Diesel : type Dorset 240 CID 74 HP in accordance with DIN6270 B with 2425 RPM

Header: available widths 11ft
13ft
15ft

Cutting height : on tyres 18.4 from 8.25"to 41.30"
on tyres 23.1 from 5.10"to 44.5"

Height adjustment : hydraulically

Feed auger : with 15 round retractable fingers

Reel : type : 6 bat reel or tine pick-up reel
drive : by v-belt
speed : adjustable from steering platform by means of a mechanical variator

Threshing cylinder :

Type : with 8 rasp bars l-h and r-h ribbed
Diameter : 20"
Breadth : 39,50"
Speed : adjustable from steering platform by means of a mechanical variator
-chain driven
-with a sprocket of 21 teeth on the drum shaft. The speed range is 650-1340 RPM.

-with a sprocket of 36 teeth on the drum shaft. The speed range is 370-800 RPM.
-with a sprocket of 68 teeth (available as optional equipment) on the drum shaft the speed range is 200-430 RPM.

Concave : standard equipped encludes universal concave, adjustable from the operator's platform, fine adjusting with adjusting nuts.
-number of laths : 10
-awning plates as well as a concave for cold and warm countries are available as special equipment. A stone trap is fitted in front of the concave.

Beater : type : cylinder with four rows of staggered teeth. The teeth can be covered using cover plates
speed : from 485 to 1060 RPM adjustable from the steering platform by means of a mechanical variator

Mainshaft : Driven directly from the engine by a poly-groove V-belt.
Speed : 780 RPM at no load (petrol engine)
760 RPM at no load (Diesel engine)

Cleaning :

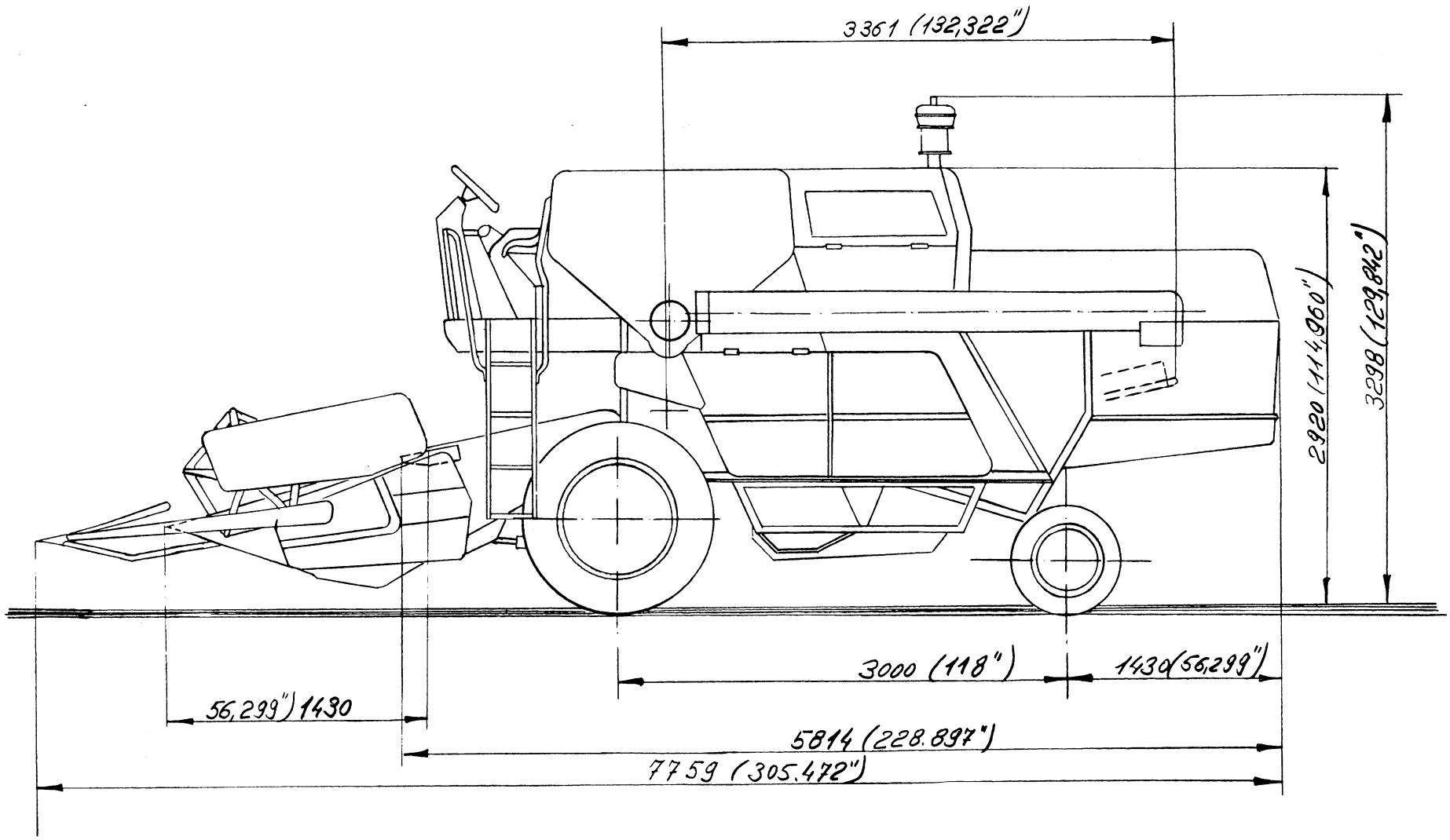
Sieves : upper sieve : length 37.4"
breadth 39.2"
area 1465.1 sq.inch
extension : length 16.8"
breadth 39.2" area : 656.97 sq.inch
total upper sieve area : 2111.07 sq.inch
lower sieve : length 37.4"
breadth 39.2"
area 1465.1 sq.inch

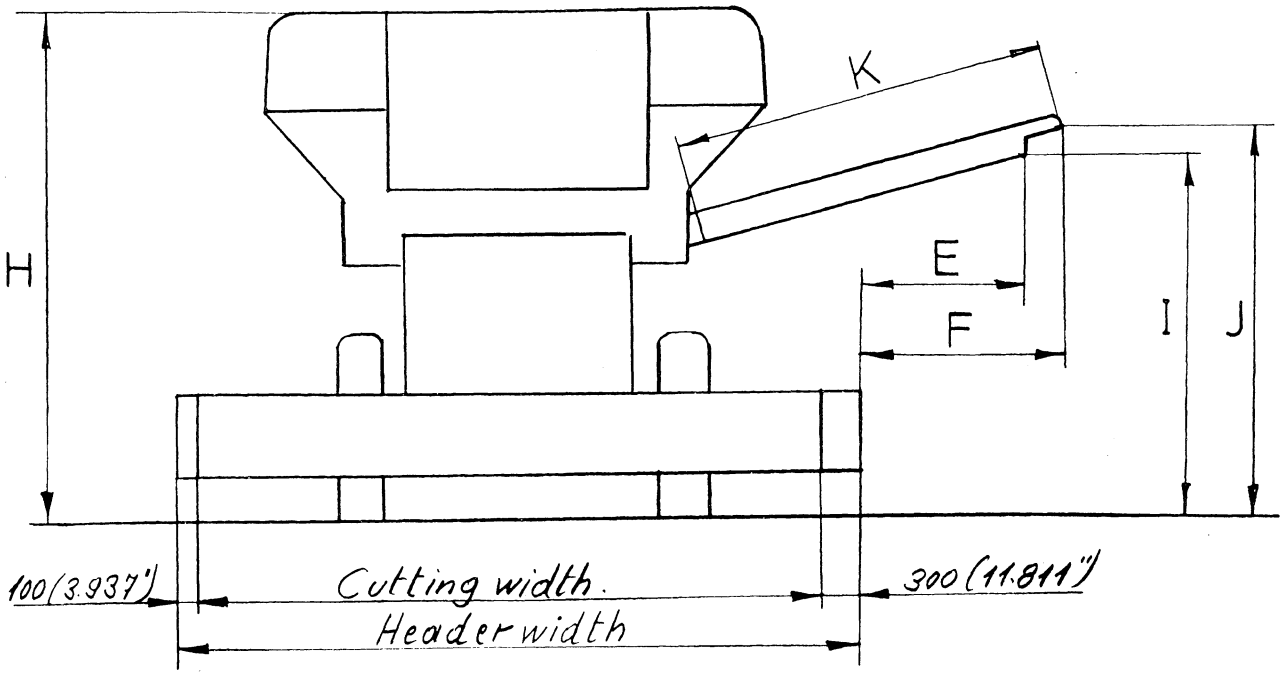
Strawwalkers :

Type : Hurdle walkers closed at the bottom with slidable extensions (3 possibilities)
Number : 4
Breadth : 9.6"
Length : 113"
Length with extensions : 120.3"
Area with extensions : 4.668.9 sq.inch
Speed : 220-225 RPM

Fan :
Type : 6 blade fan
Speed : from 560 to 1250 RPM adjustable from the rear left-hand side of the machine.

Graintank : capacity : ± 80 bushels
unloading time : approximately 80 seconds.

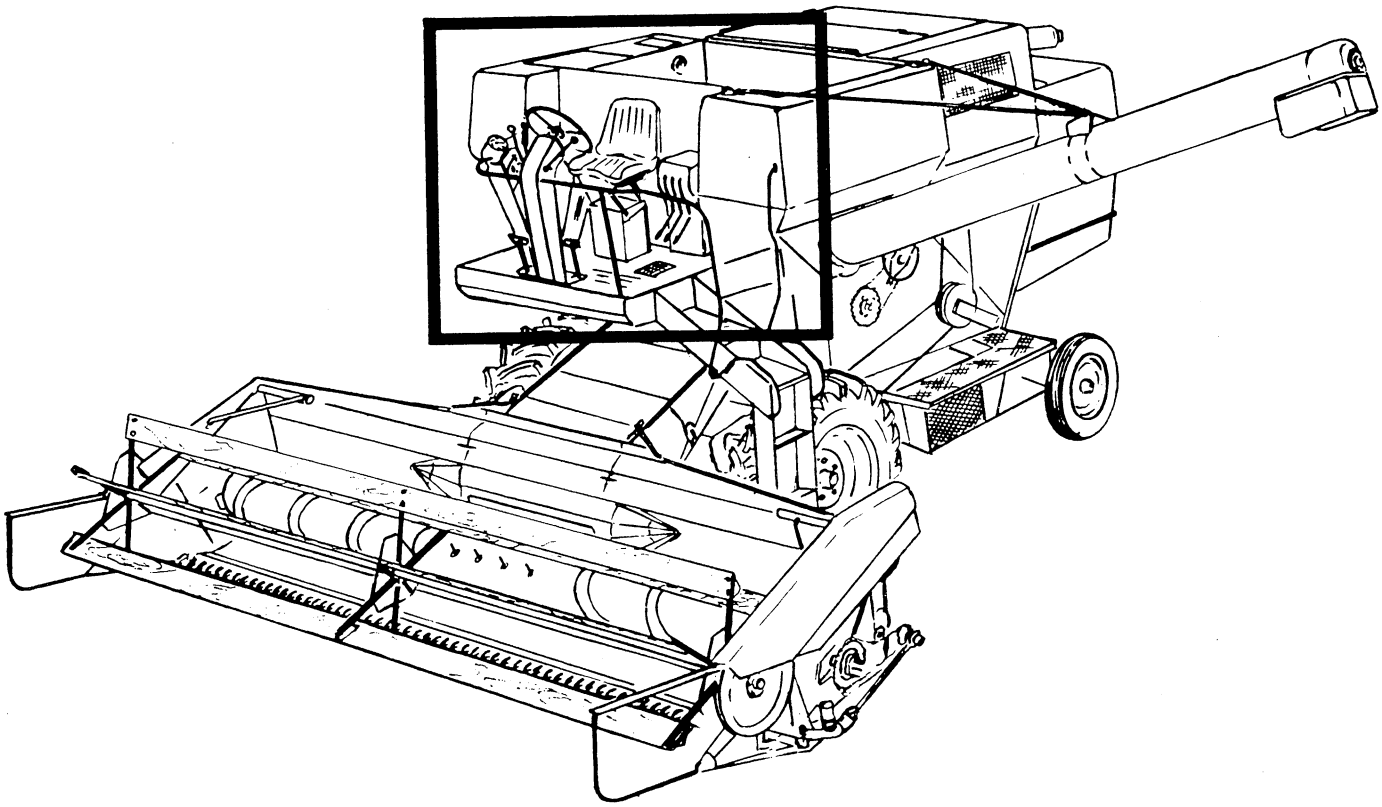

3361 (132,322")
2920 (114,960")
3298 (129,842")
3000 (118")
1430 (56,299")
56,299") 1430
5814 (228.897")
7759 (305.472")

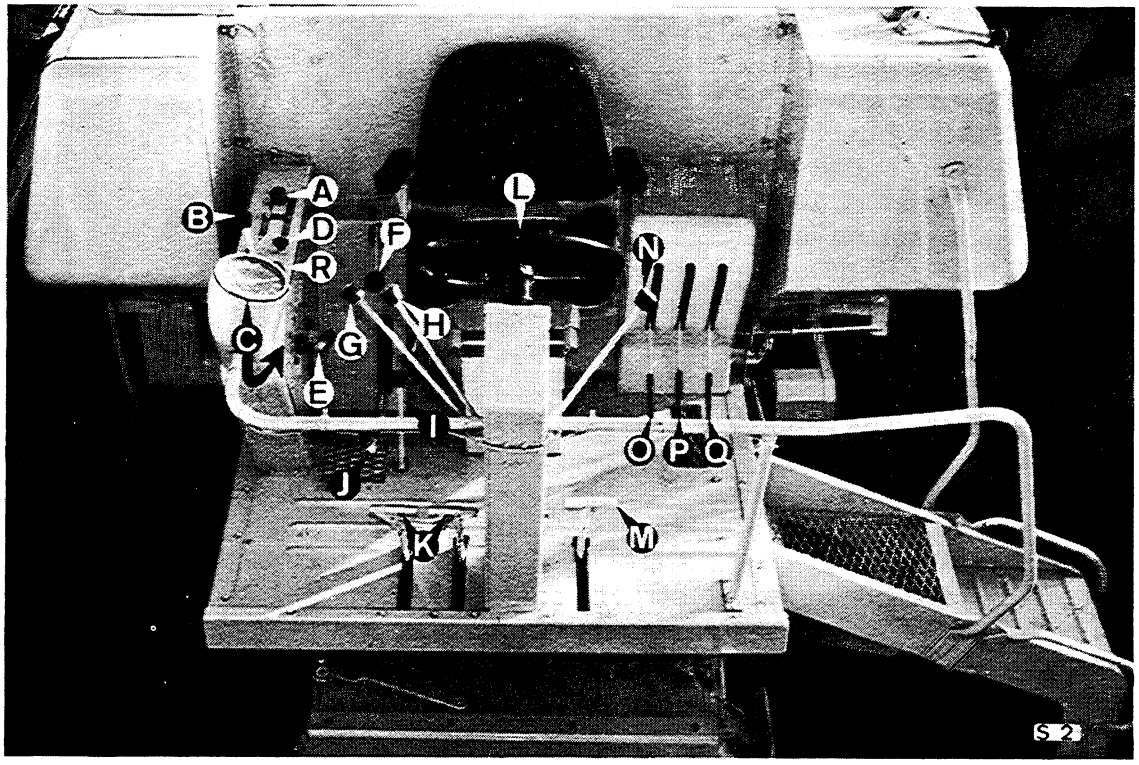


Headers	E ±50	F ±50	H +50 -0	
			18.4	23.1
8,5 ft	1292 50.866"	1570 61.811"	2965 116.732"	3045 119.881"
10 ft	1063 41.850"	1341 52.795"		
11 ft	1672 65.826"	1150 45.275"		
13 ft	1367 53.818"	1645 64.763"		
15 ft	1063 41.850"	1341 52.795"		

Headers	I ±100		J ±100		K
	18.4	23.1	18.4	23.1	
8,5 ft	2630 103.543"	2710 106.692"	2890 113.779"	2970 116.929"	2430 95.669"
10 ft	2630 103.543"	2710 106.692"	2890 113.779"	2970 116.929"	2430 95.669"
11 ft	2937 115.629"	3017 118.779"	3197 125.866"	3277 129.015"	3252 128.031"
13 ft	2937 115.629"	3017 118.779"	3197 125.866"	3277 129.015"	3252 128.031"
15 ft	2937 115.629"	3017 118.779	3197 125.866"	3277 129.015"	3252 128.031"

3 STEERING PLATFORM





INTRODUCTION

Easy access to the driver's platform is assured by a folding ladder.
The adjustable driver's seat permits a comfortable position for steering.
All control levers are situated within immediate reach of the driver and as far as possible grouped relative to the control instruments.
The driver's platform is situated in such a way that :

- -one has a perfect view of both cutting organs and unloading tube
- -the sample in the graintank is within reach for checking
- -the driver is seated in a nearly dustfree position
- -a perfect rear view is assured.

The following chapter deals with the procedure for removal of the different control levers.
To assemble always reverse the dismantling operation.
For eventual adjustments refer to the respective chapter.
Control instruments are included in the chapter "Electrical equipment".

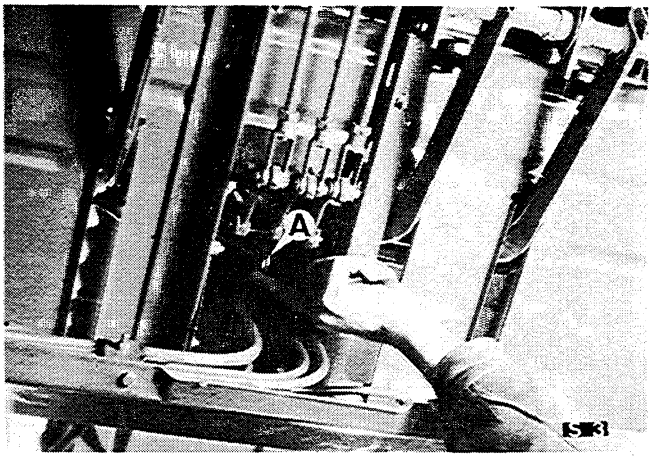
A : Gear shift
B : Throttle
C : Control instruments
D : Engine "stop knob" (only for diesel engine)
E : Concave adjustment control lever
F : Cylinder vari-drive control crank
G : Reel height control lever
H : Header height control lever
I : Parking brake lever
J : Reel speed control lever
K : Foot brake pedals
L : Steering wheel
M : Clutch pedal
N : Ground speed control lever
O : Engagement lever for header
P : Engagement lever for threshing mechanism
Q : Graintank unloading lever
R : Parking brake warning light.

CONTENTS Page

Removal of the ground speed vari-drive reel and header control levers

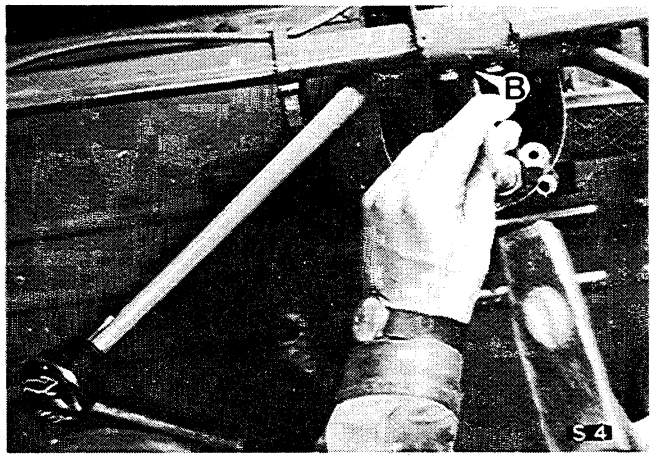
-Remove the steering wheel and the power steering control valve, see chapter 4.
Disconnect the transmission rod A, for reel height control, underneath the driver's platform.

1



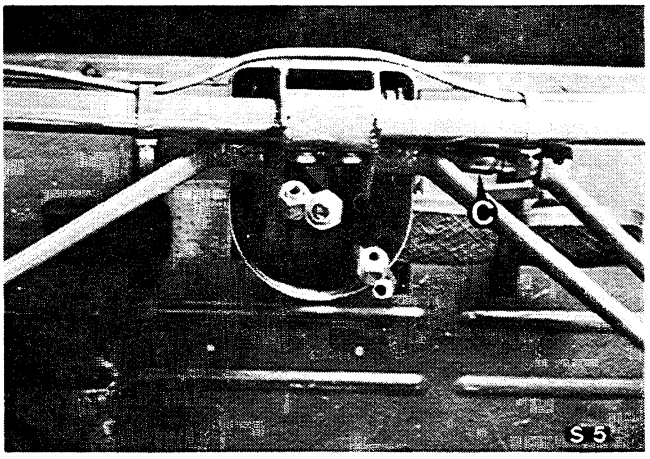
-Knock-out the roll pin B on top of the steering column using a good punch.

2



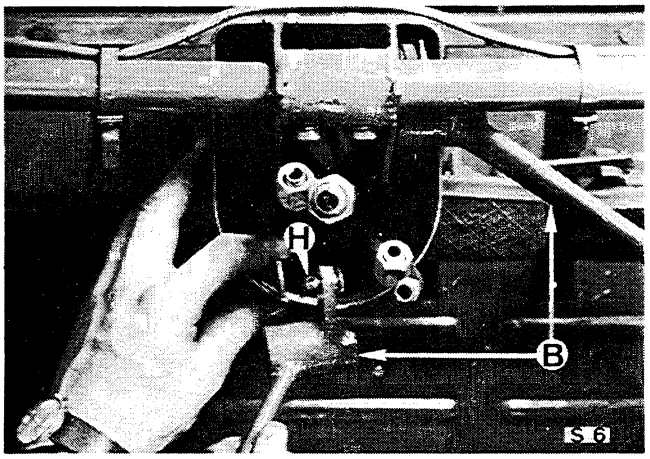
-Remove the cotterpin on the left-hand side from the shaft C and remove the shaft together with the reel height control lever.

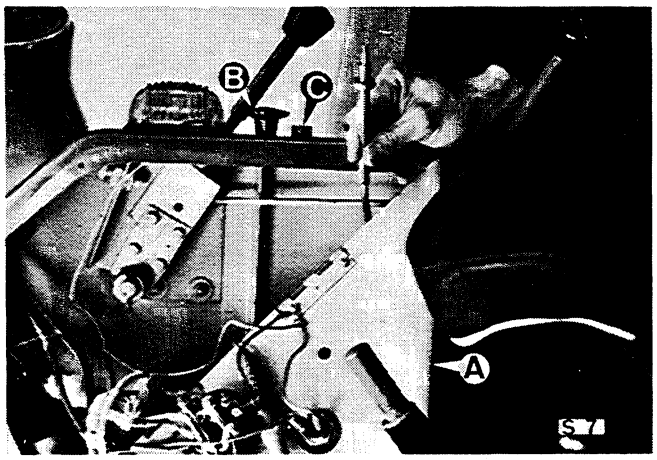
3



-Remove the control levers B after undoing first the connection H.

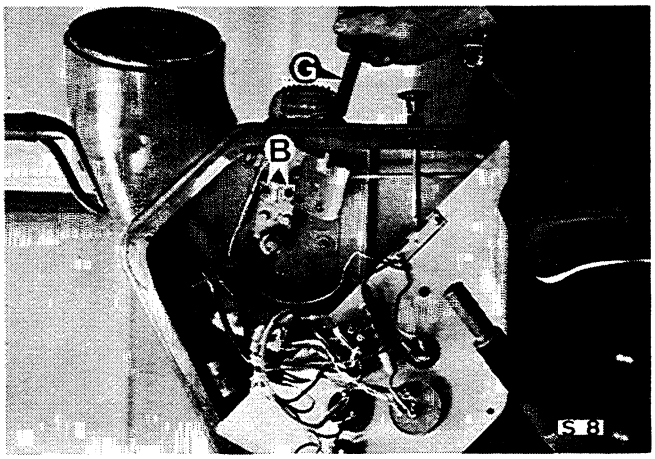
4



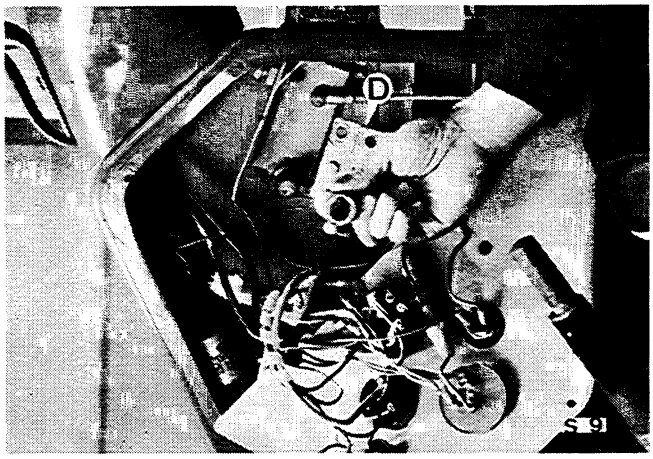


❺ Removal of the engine "stop knob", Throttle and gear shift selectors.

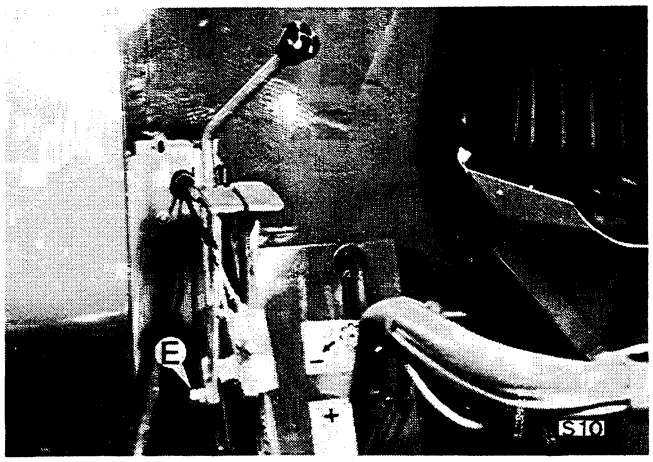
Open cover A, unscrew the fixing nut C and the knob B from the cable.



❻ Remove the fixing bolts B and remove the throttle G upwards.

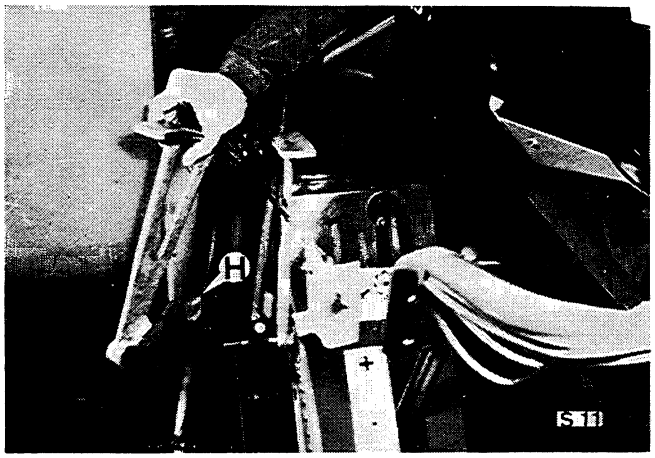


❼ The hinge piece D can now be removed from the shaft.

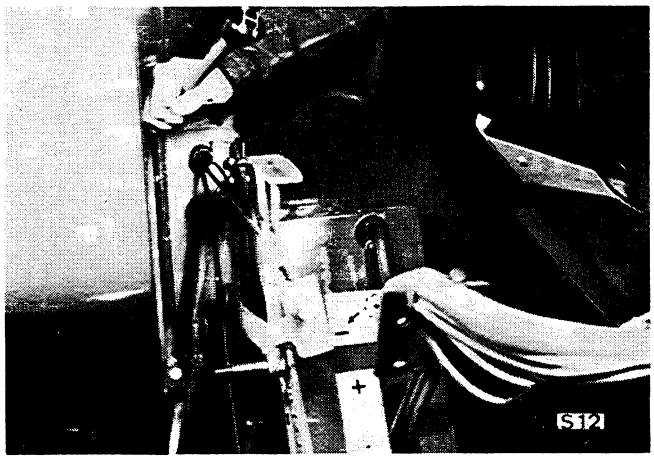


❽ In order to reach the gear shift selectors easily, it is necessary to disconnect the electrical wiring and to remove the complete instrument panel, see chapter 10.
Unscrew both nuts E.

After disconnecting the connecting rod at point H, the right-hand selector can be removed from the hinge piece.

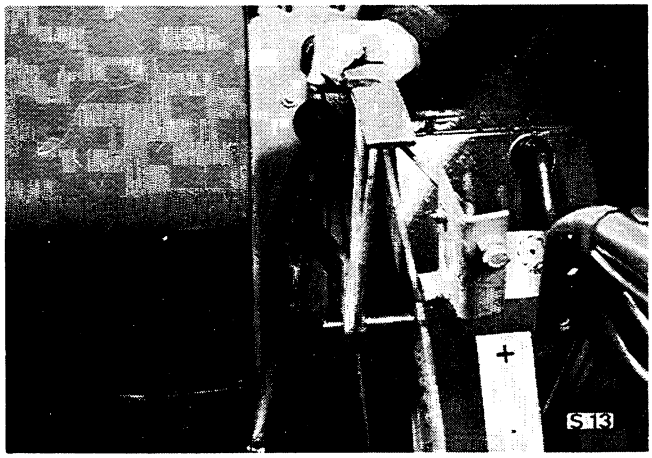


The gear shift lever which is installed between the two selectors can now be removed from the shaft.



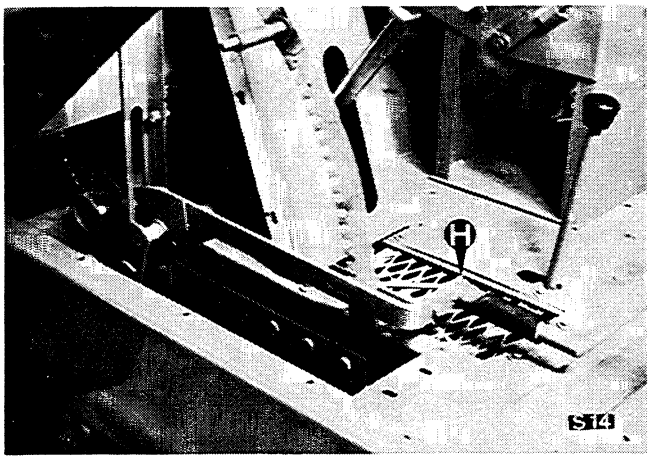
To remove the left-hand selector proceed in the same way as for the right-hand selector.

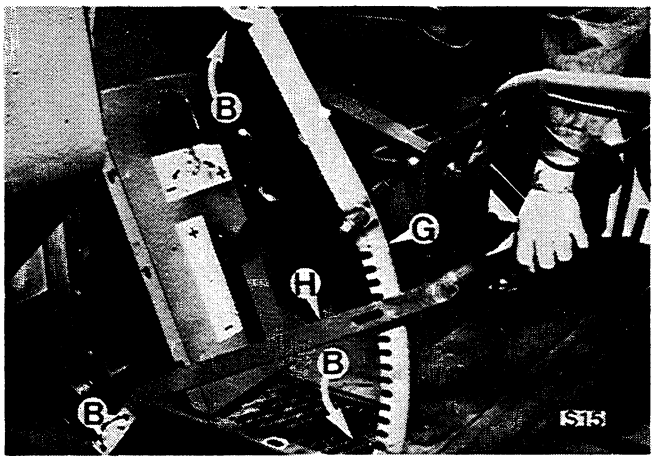
NB. : to remove the selectors it is not strictly necessary to remove the complete instrument panel.



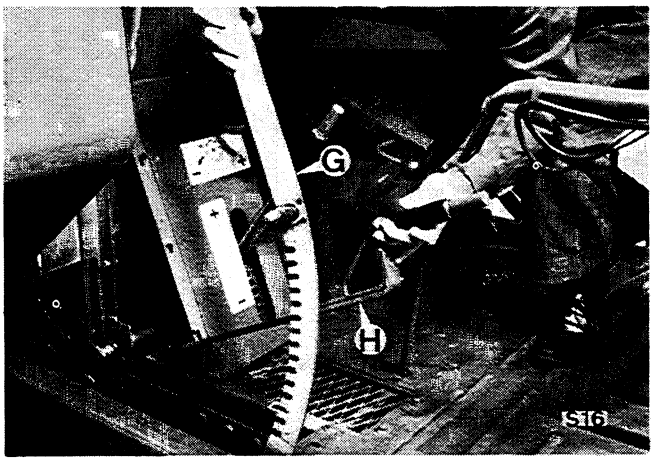
Removal of the concave adjustment control lever, reel vari-drive and drum vari-drive control levers.

Remove the complete instrument panel, see chapter 10 as well as the above mentioned gear selectors and set the concave adjustment lever H in the lowest position.

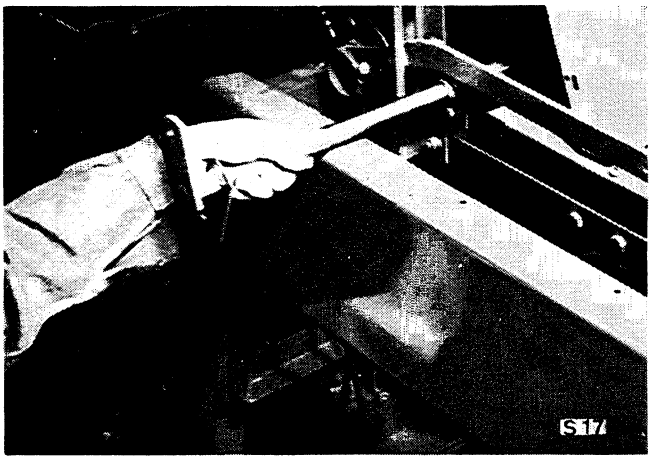




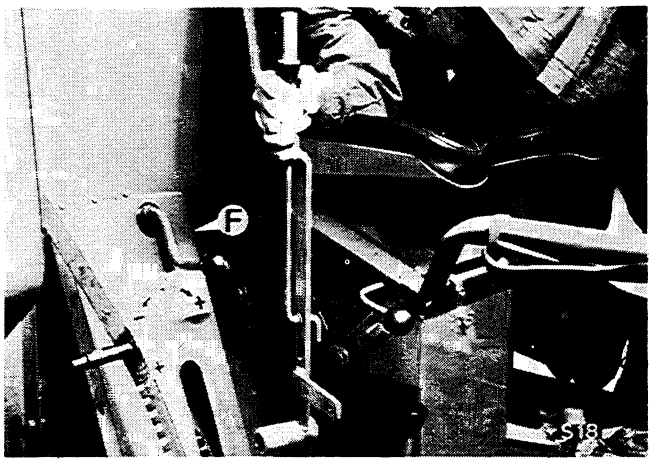
⓭ After removal of the fixing bolts B, the adjusting control lever H together with quadrant G can be removed.



⓮ Now disconnect the adjusting control lever H from quadrant G.



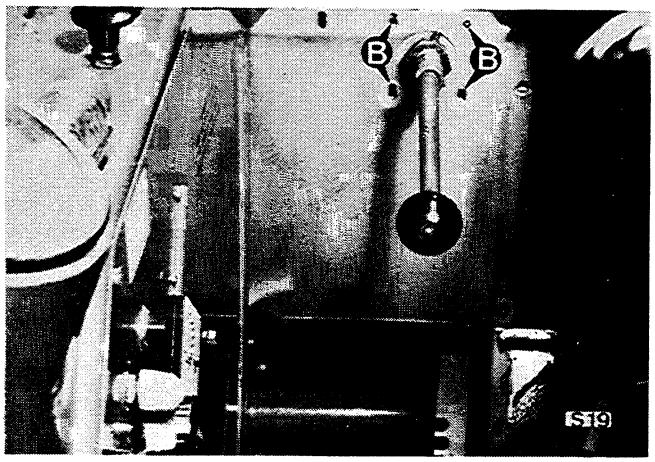
⓯ To replace the reel speed vari-drive control lever, undo and pull out the cutting platform control lever.



⓰ Now the reel speed vari-drive control lever can be removed.

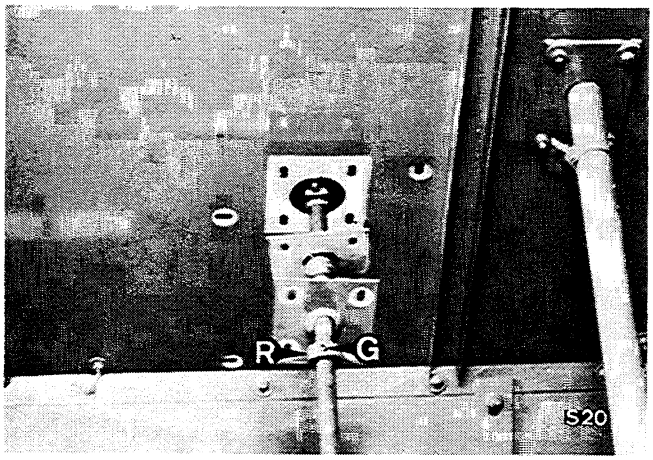
To remove the drum vari-drive operating crank, first remove the guarding F see ⑯ and the fixing bolts B.

⑰



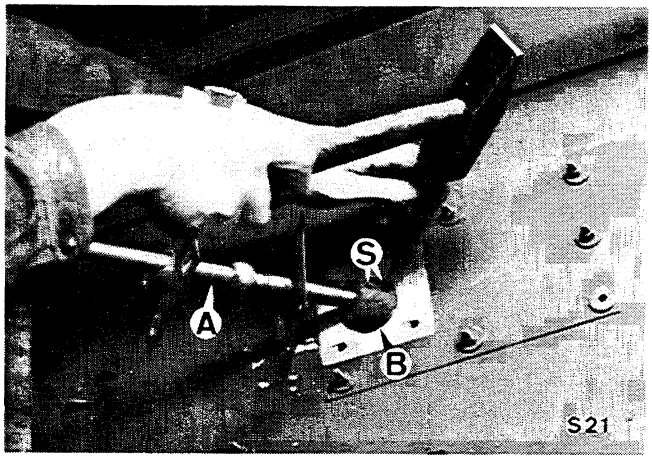
Undo the set screw G, slide the ring R forwards on the shaft with the fixing plates, then the spherical bearing can be moved further backwards.

⑱



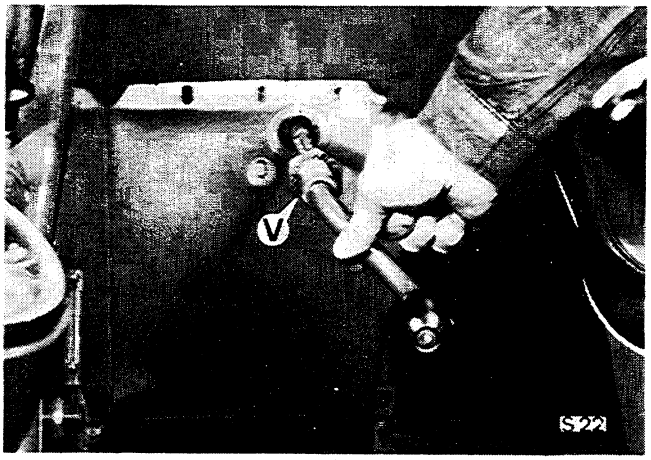
Undo the two cover plates on the inside of the graintank.
Move the drum vari-drive operating crank shaft A slightly forwards and knock out the roll pins then the connecting piece B can be removed from the shaft.
Note : Drum vari-drive position indicator only fitted until series 124

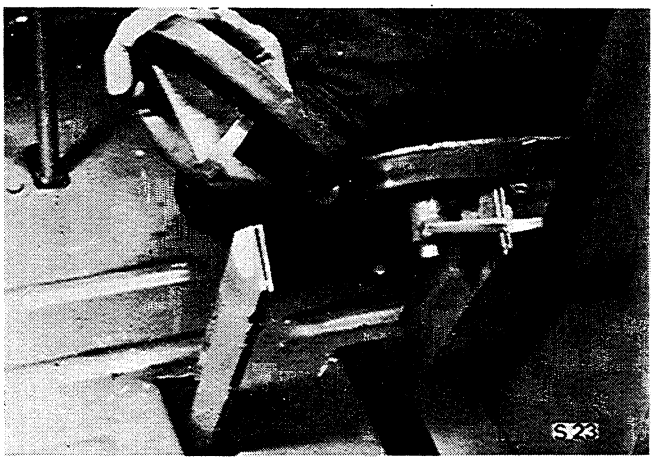
⑲



Remove the drum vari-drive operating crank from the front at the same time remove all the different pieces from the shaft inside the graintank.
The drum vari-drive position indicator V can now be removed.

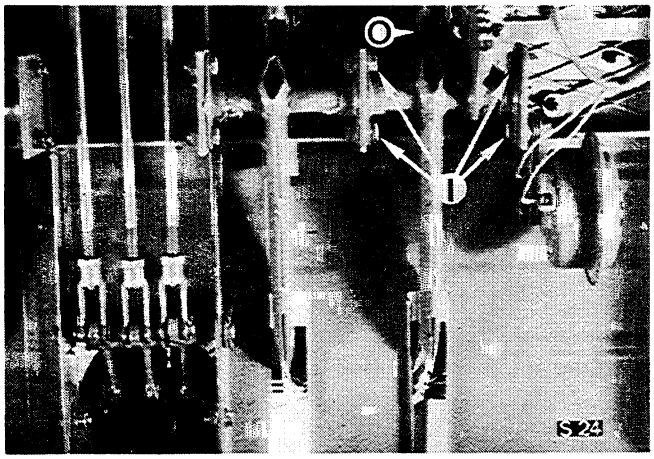
⑳



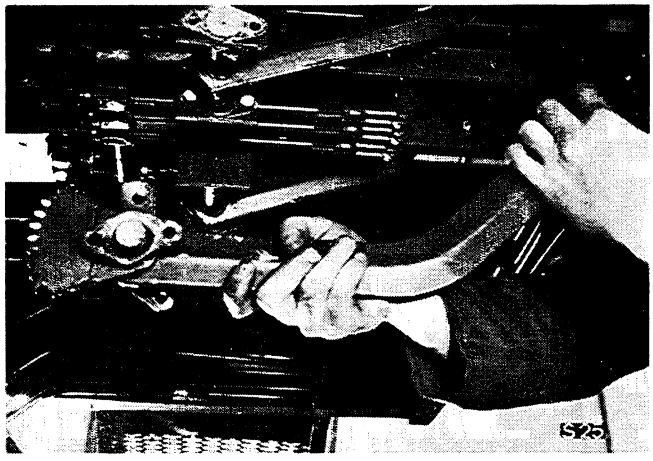


21 Removal of brake and clutch pedals, and parking brake handle.

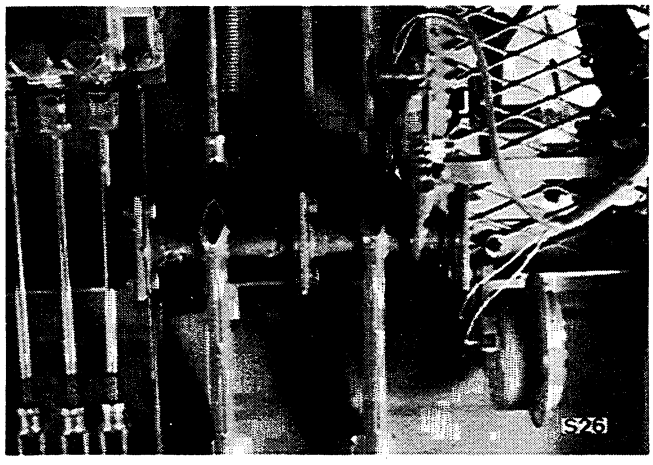
To replace a brake pedal lever first remove the pedal.



22 Undo the brake pedal lever and shaft underneath the driver's platform by removing the fixing bolts I, connecting rod O and spring.



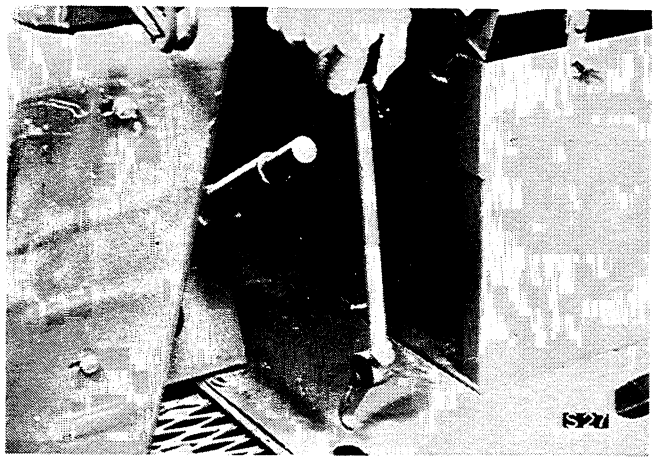
23 Now the pedal lever can be removed under the driver's platform.
To remove the clutch pedal proceed in the same way.



24 To remove the parking brake lever, remove hinge bolt J and spring.

Remove the parking brake lever from the top of the driver's platform.

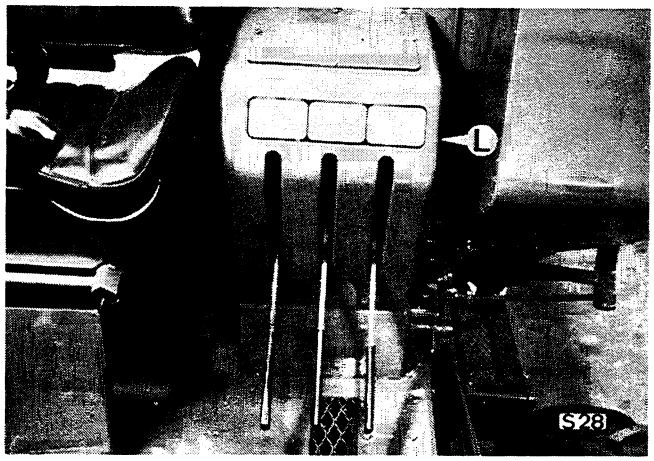
25



Disassembly of threshing mechanism, header and unloading auger - engagement levers.

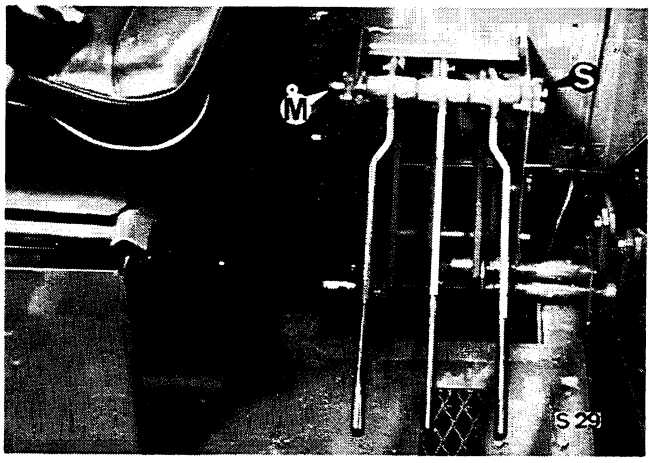
First remove cover plate L.

26



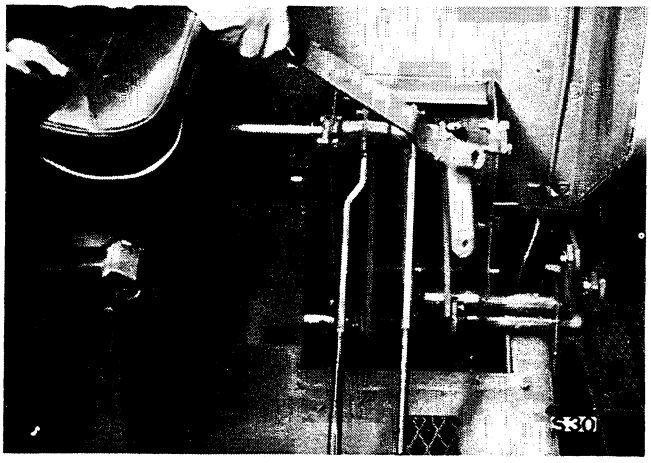
Remove cotterpin S at the left-hand side and slide the shaft M to the right-hand side.

27

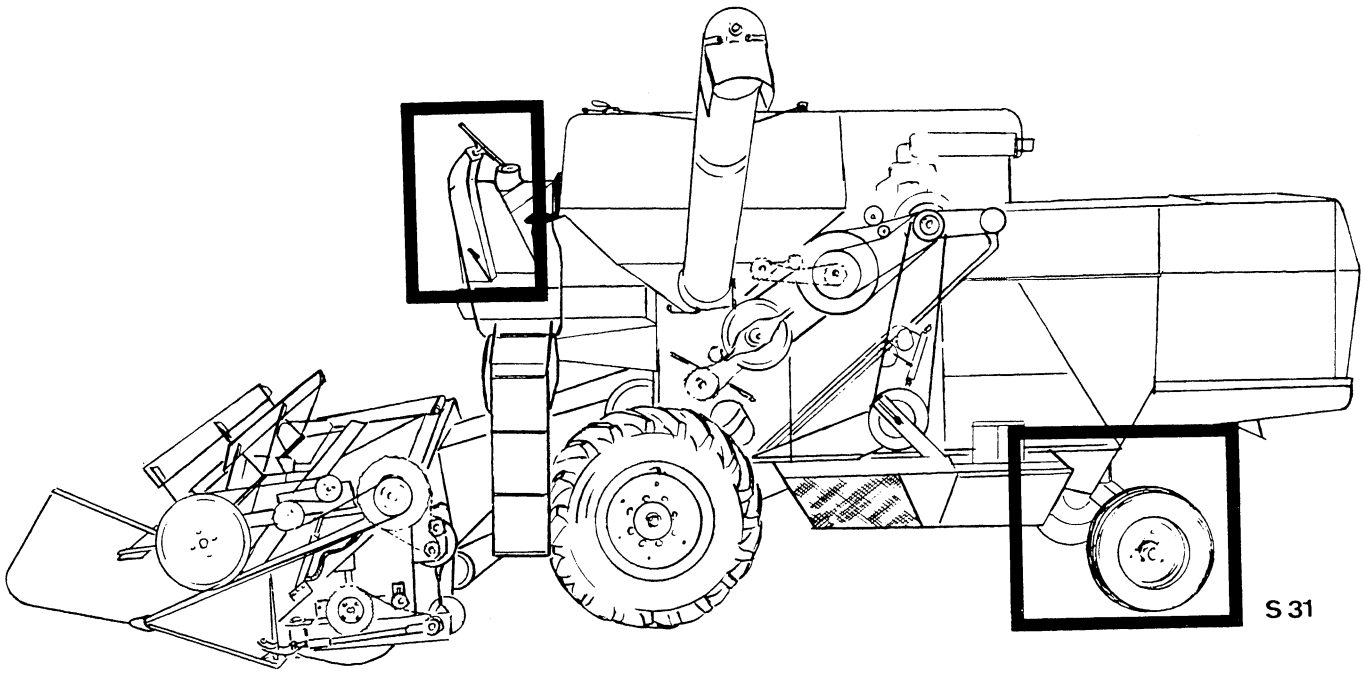


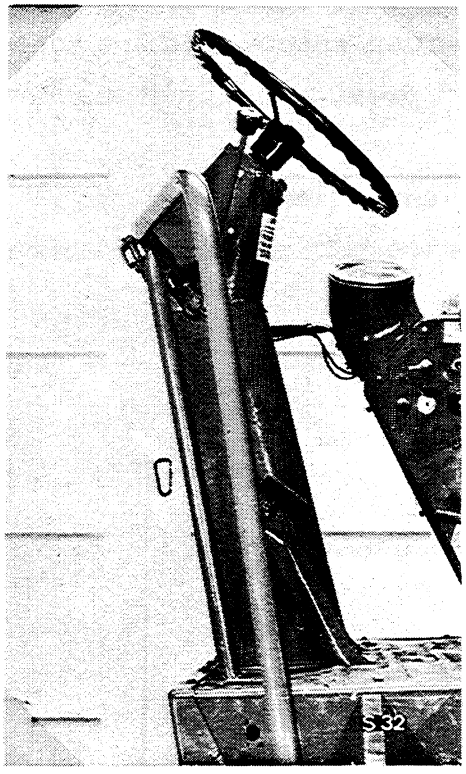
Now the different control levers can be disconnected and removed.

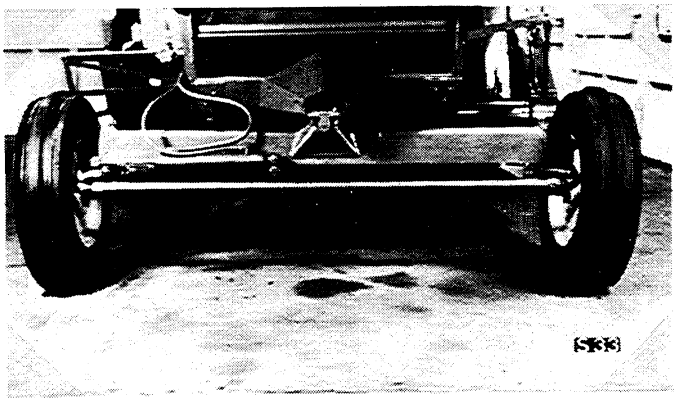
28



4 STEERING AND REAR AXLE


S 31


S 32


S 33

INTRODUCTION

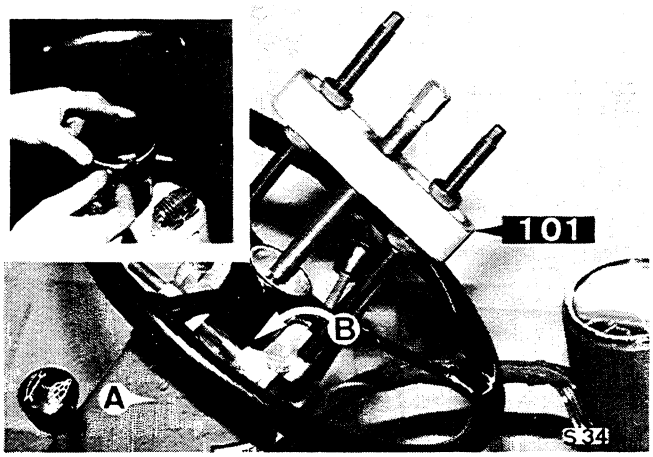
The machine is equipped with power steering.
The movement of the steering wheel is transmitted to a hydraulic valve which inturn operates the rear wheels by means of hydraulic oil passing through pipes and a double acting hydraulic cylinder.
This power steering increases the manoeuvrability in the field, as well as on the road to a maximum, on top of that it is equipped with a system that permits steering independent of engine or hydraulic pump motion.
This is called the emergency steering, and can be useful when the machine is on tow.
It is obvious that this so called emergency steering will be more difficult to use because in this case the oil which is necessary to move the steering cylinder is brought under pressure by manual force instead of the hydraulic pump.
The rear axle is connected to the frame and designed to pivot, this is to help the steerability as far as possible in difficult circumstances such as on hillsides for example.
The rear wheels run in the tracks of the traction wheels, and are connected togetr with an adjustable track rod, which makes it possible to adjust the "toe-in" if necessary.
This chapter covers only the basic steering equipment.
The hydraulic valve, rear wheels and tyres are fully detailed in their respective chapters.

CONTENTS

Removal of the steering valve.

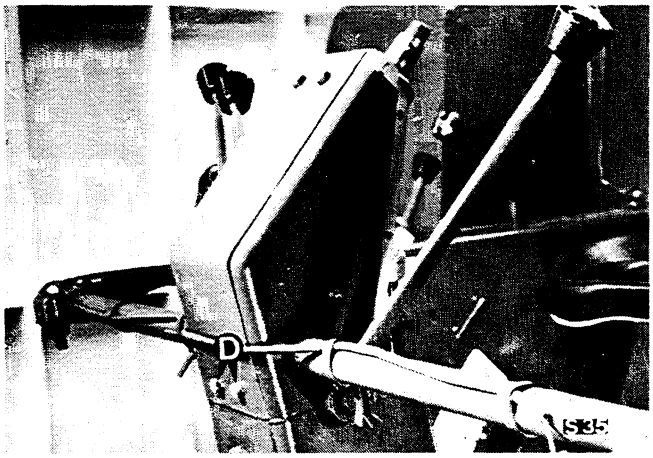
Remove steering cover and steering wheel with special tool nr.101.
Take care that the key is not lost.
Remove cover A behind the steering column and cover B on the top.

1



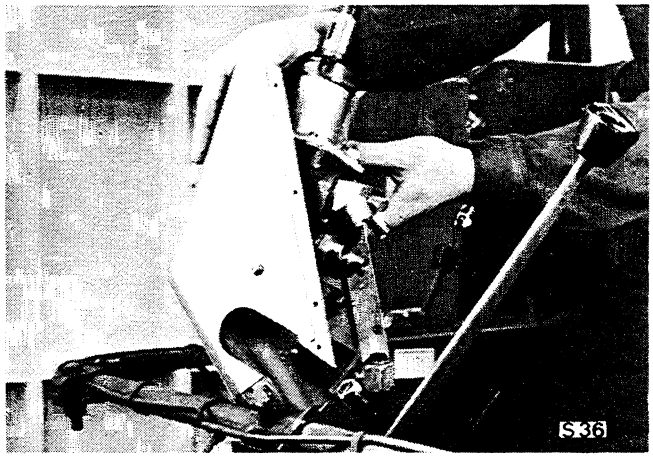
Disconnect the four hydraulic pipes and ensure that no dirt enters the openings of valve and pipes.
Remove the bolts D and the necessary self-tapping screws.

2



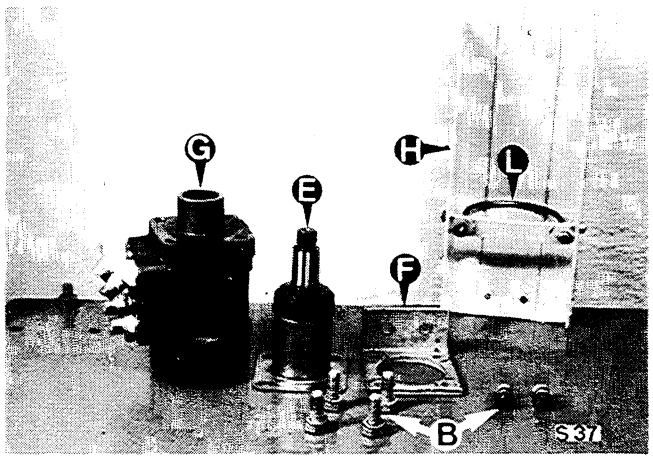
Remove the upper part of the steering column with the hydraulic steering valve.

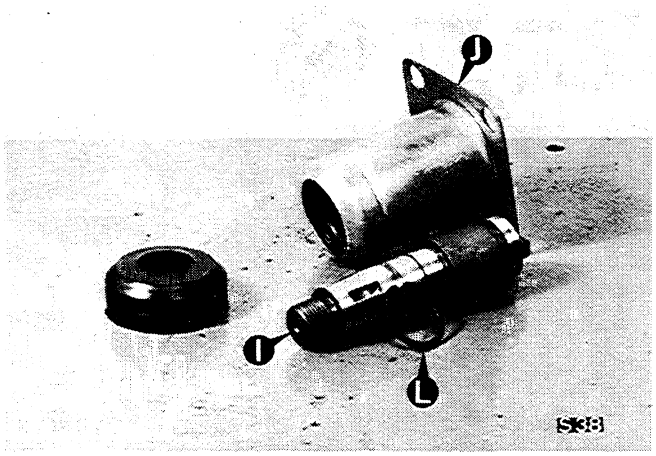
3



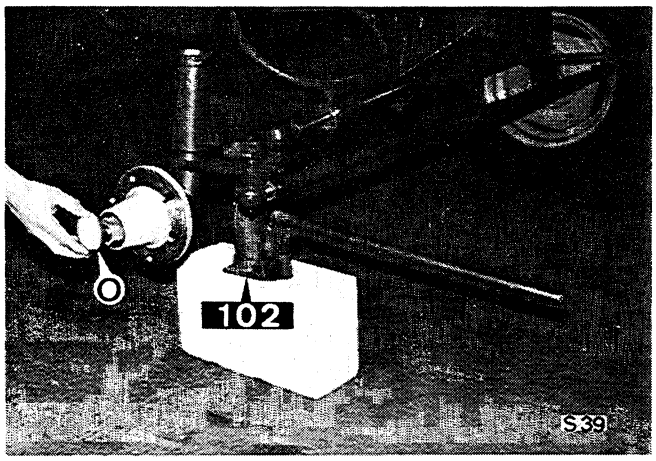
By removing the bolts B, and unscrewing the securing L, it is possible to remove the steering rod E with ball bearing and housing, fixing piece F, hydrostatic valve G of the upper part of the steering column H.

4



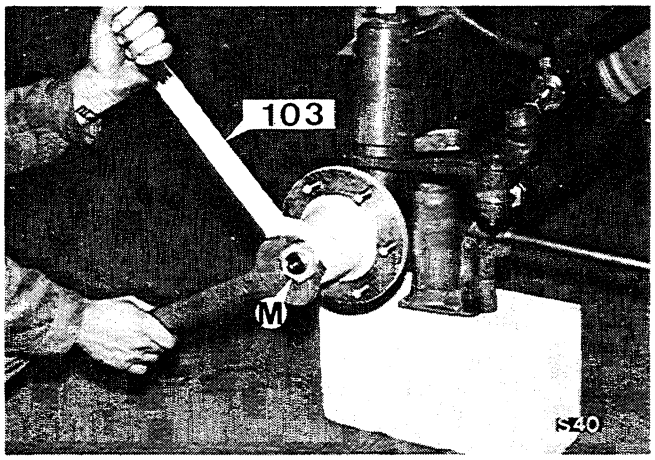


5 Remove circlips L and the steering rod I can be removed from the housing J with ball bearing.

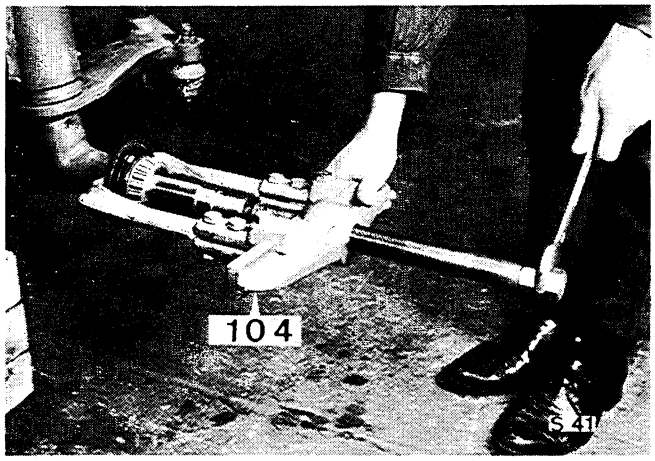


6 Replacement of a king pin and axle bushings

Place the rear axle on blocks, use special tool nr. 102 remove the wheel nuts, wheel and the hub cap O.



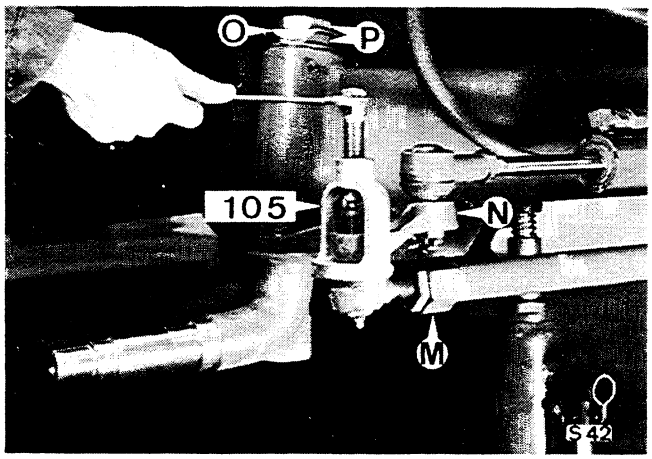
7 Remove both nuts M
Use the special tool nr. 103 together with an open end spanner
The wheel hub can now be removed.



8 Remove the tapered bearing sealing and metal guard using special tool nr 104.

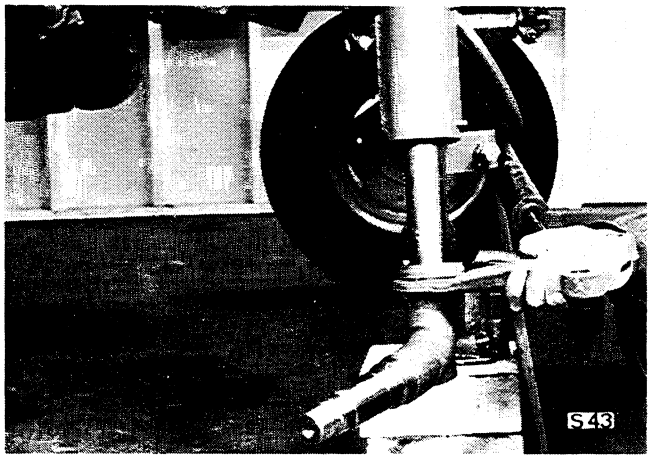
Remove the track rod M and afterwards the hydraulic ram connection N by means of special tool nr. 105 flatten the vertical side of securing plate O and remove nuts P.

9



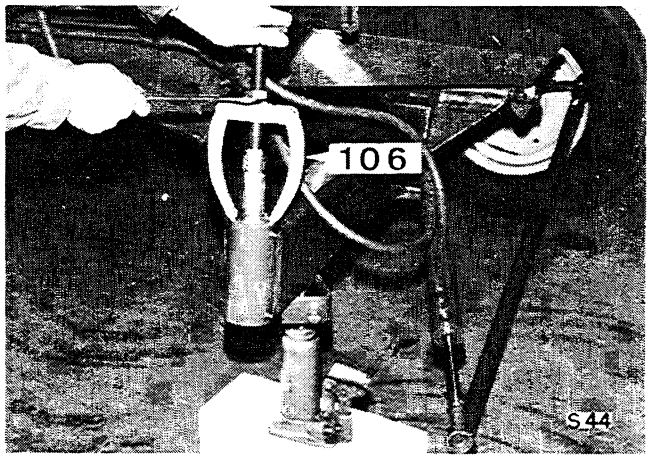
The king pin can now be pushed out downwards.

10



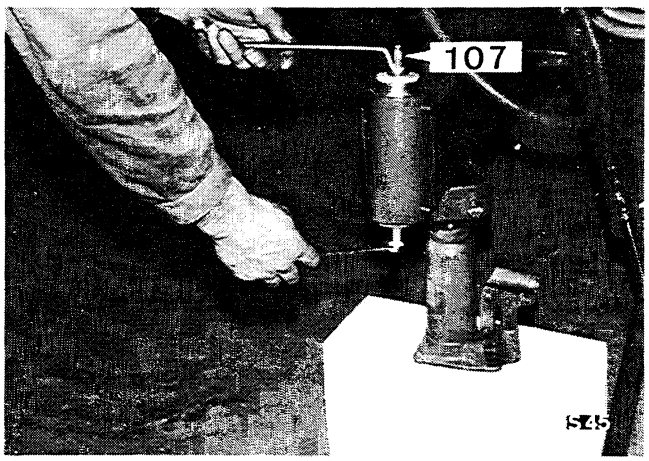
Pull the bushings out of the rear axle with special tool nr; 106.

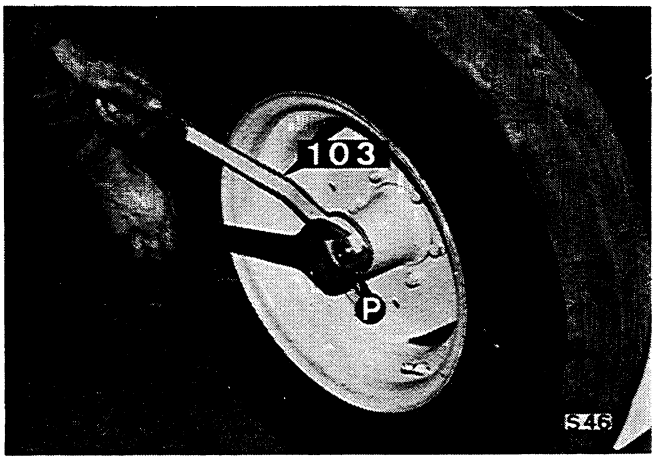
11



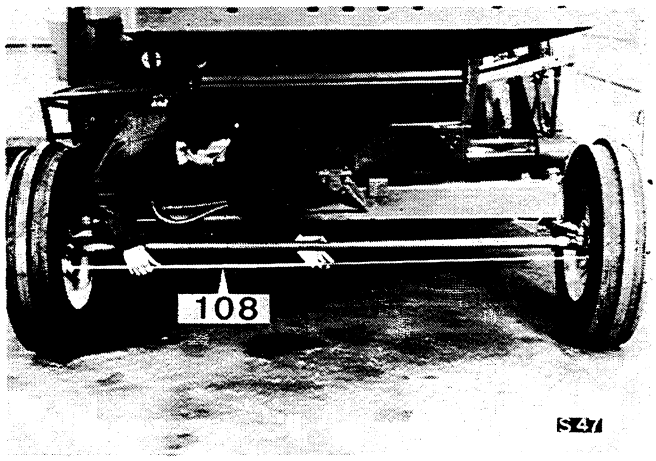
Place new bushings in the rear axle using special tool nr. 107.
Replace in reverse order king pin and wheel hub together with associate parts
The rear wheel can now be replaced.

12

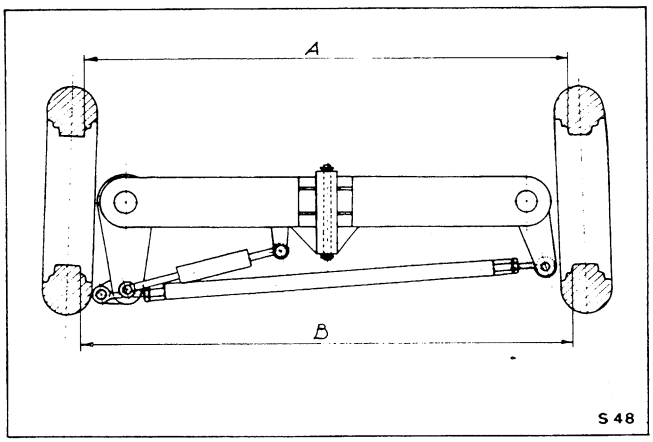




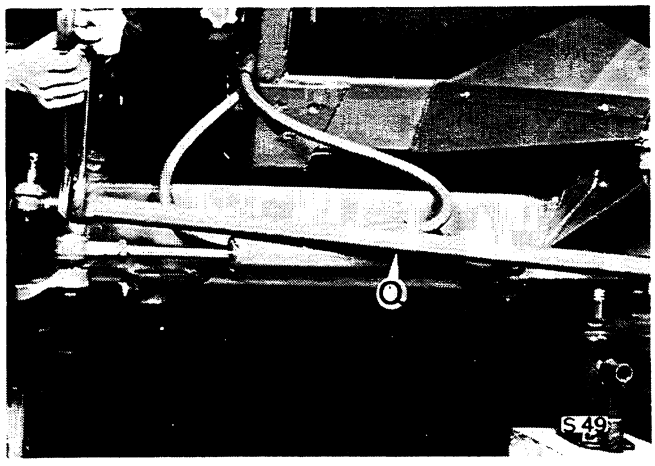
⓭ Screw both nuts P onto the king pin and tighten them until there is no free clearance on the tapered bearings, and the rear wheel turns freely. Fill up the hub cap O see ❻ with grease and replace it.



⓮ Measure rear wheel "toe-in" using special tool nr. 108.
Mark the rims at axle height and measure the horizontal distance B see ⓯



⓯ Move the combine so that the rear wheels rotate through 180°.
Measure the distance A between the marks. The difference B-A must be between 3 and 5 m/m (1/8" and 13/64")

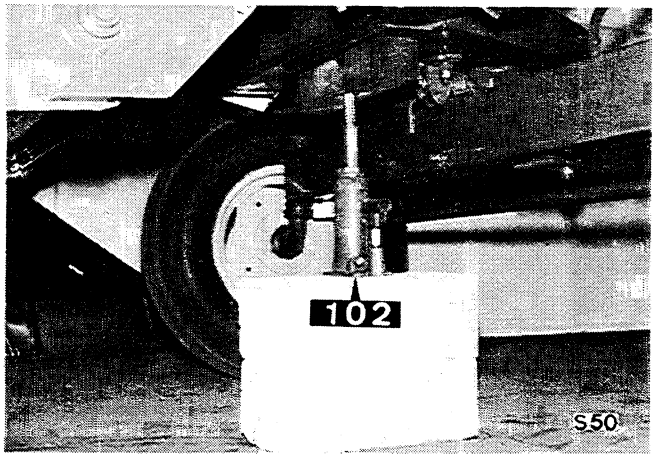


⓰ If this adjustment is not correct adjust the adjustable track rod Q until the correct setting is obtained. Utilise special tool nr. 105 see ❾ to free adjustable track rod Q.

Replacement of rear axle pivot bushings.

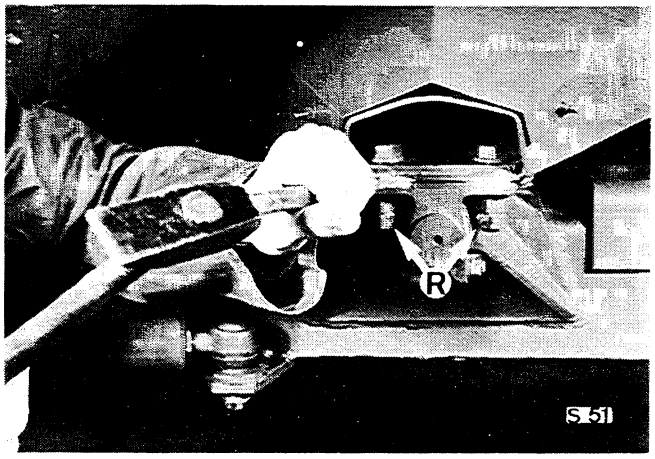
Jack the machine up centrally using special tool nr. 102.

17



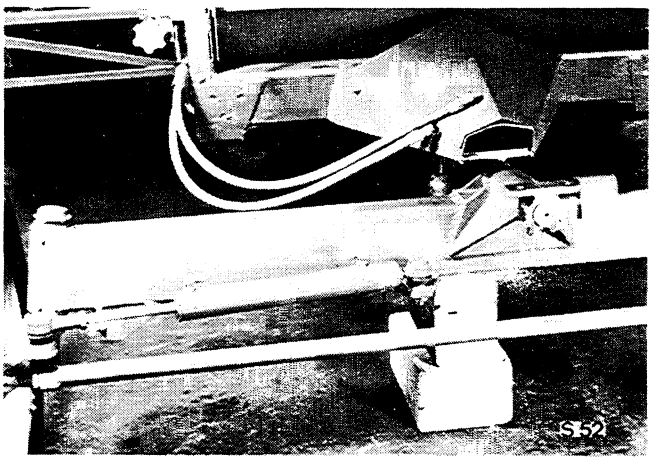
Remove the nuts R from the four securing bolts and cut the two welds at the rear of the mounting plate.

18



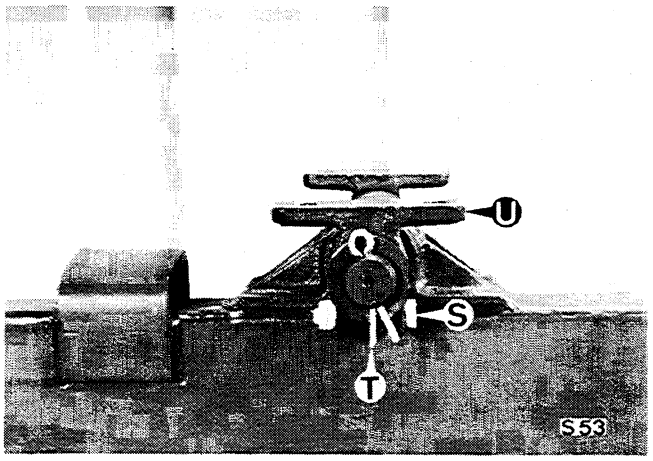
Disconnect the two hydraulic pipes at the steering ram. Lift the machine a little and remove the complete rear axle.

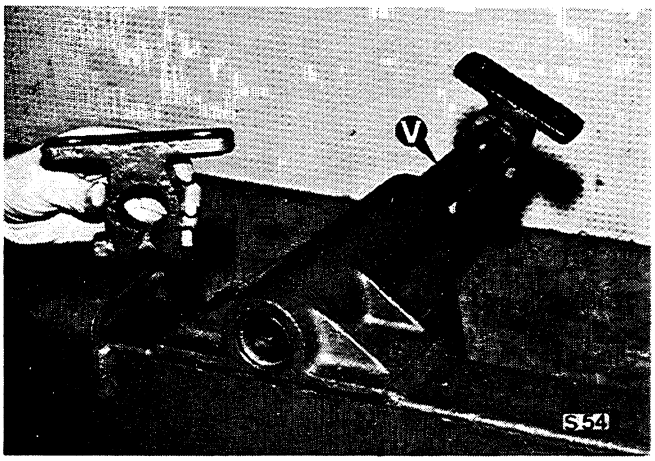
19



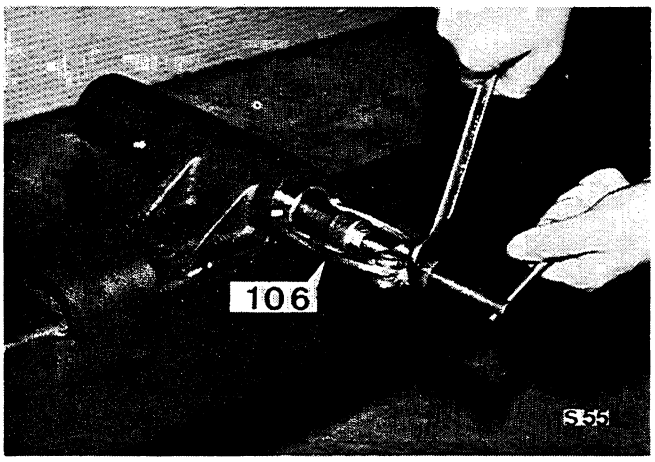
Remove bolt S cotterpin T and then remove the axle mounting plate U from the axle pivot.

20

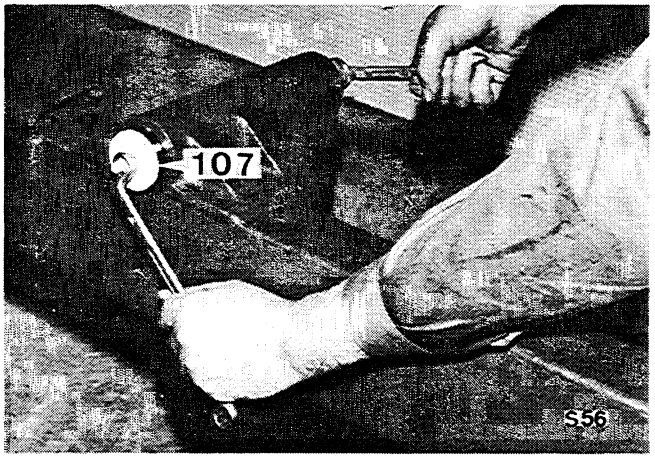




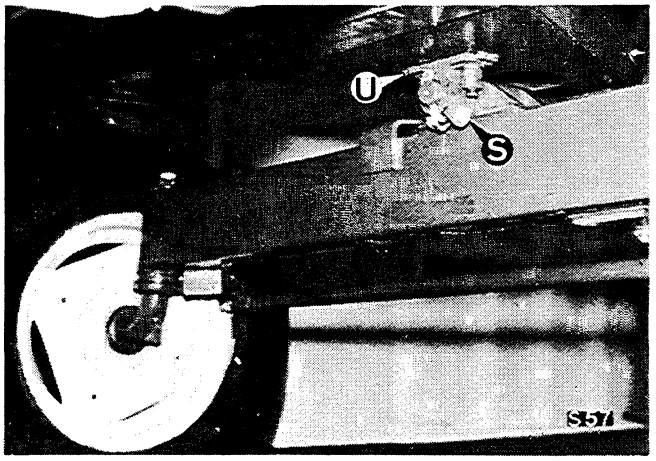
21 The axle pivot V can now be withdrawn from the rear of the axle together with the second mounting plate.



22 The axle pivot bushings may be removed from the rear axle using special tool nr. 106.



23 Utilise special tool nr. 107 to install replacement bushes.

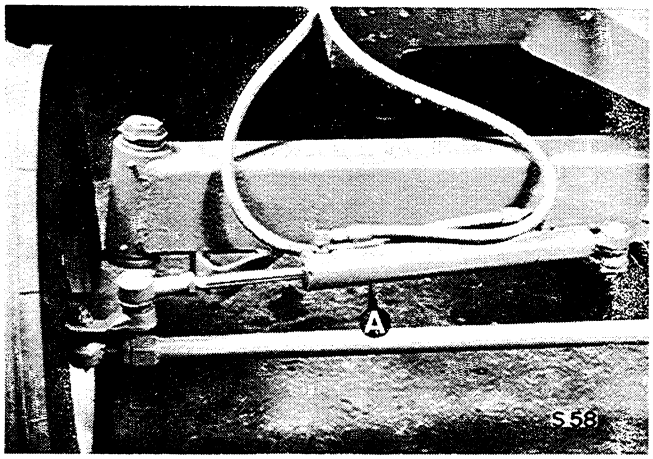


24 Installation of the rear axle is a reversal of the removal procedure. Note bolts S should be tightened finally when the weight of the machine rests fully on the rear axle.

Steering cylinder adjustment.

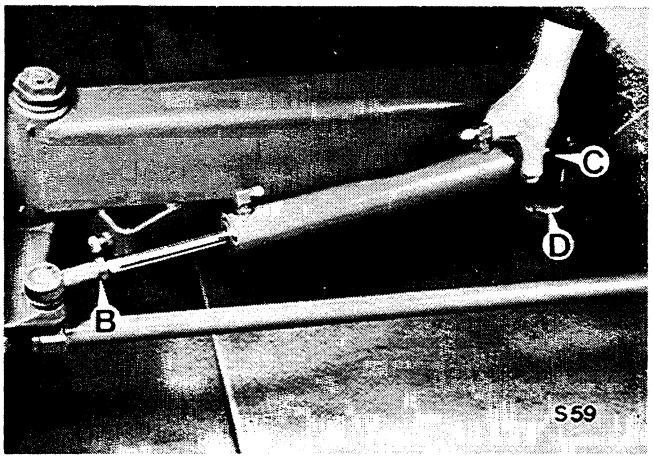
When the steering cylinder has to be either replaced or repaired the direction of the steering cylinder must be adjusted as follows :
Lift the machine a little until both rear wheels are clear of the ground.

25



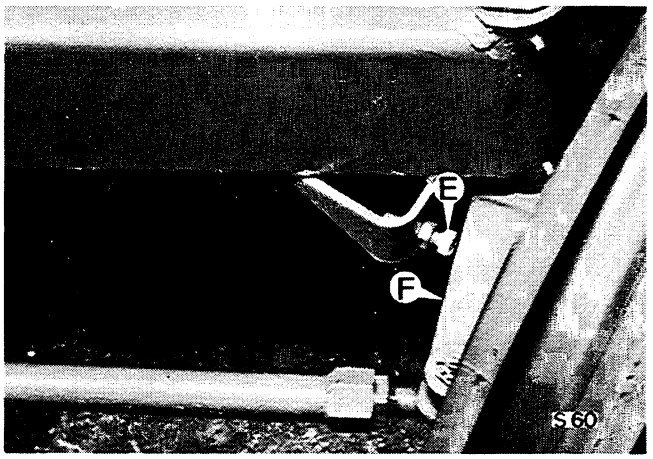
Set the rear wheels in the straight ahead position, connect the hydraulic ram to the steering arm and set it in the middle of its stroke, adjust point B or C until the steering ram will fit into point D.

26



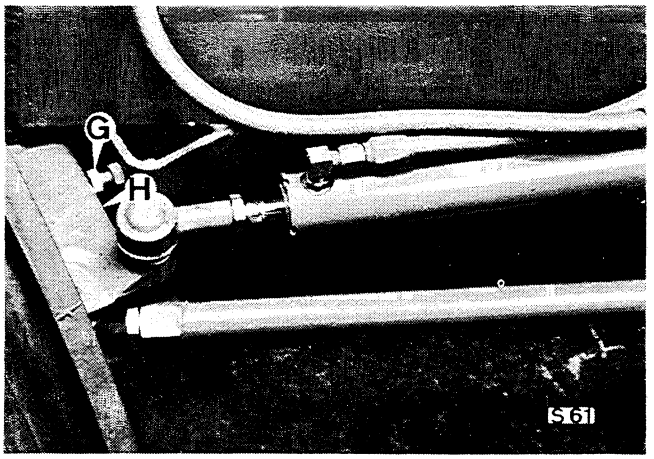
Attach the hydraulic pipes to the ram ensuring they are correctly connected at the same time.
Start the engine and turn the steering wheel towards the left-hand side until rear wheels are completely to the right and the plunger is fully out.
Adjust stop E against steering arm F

27

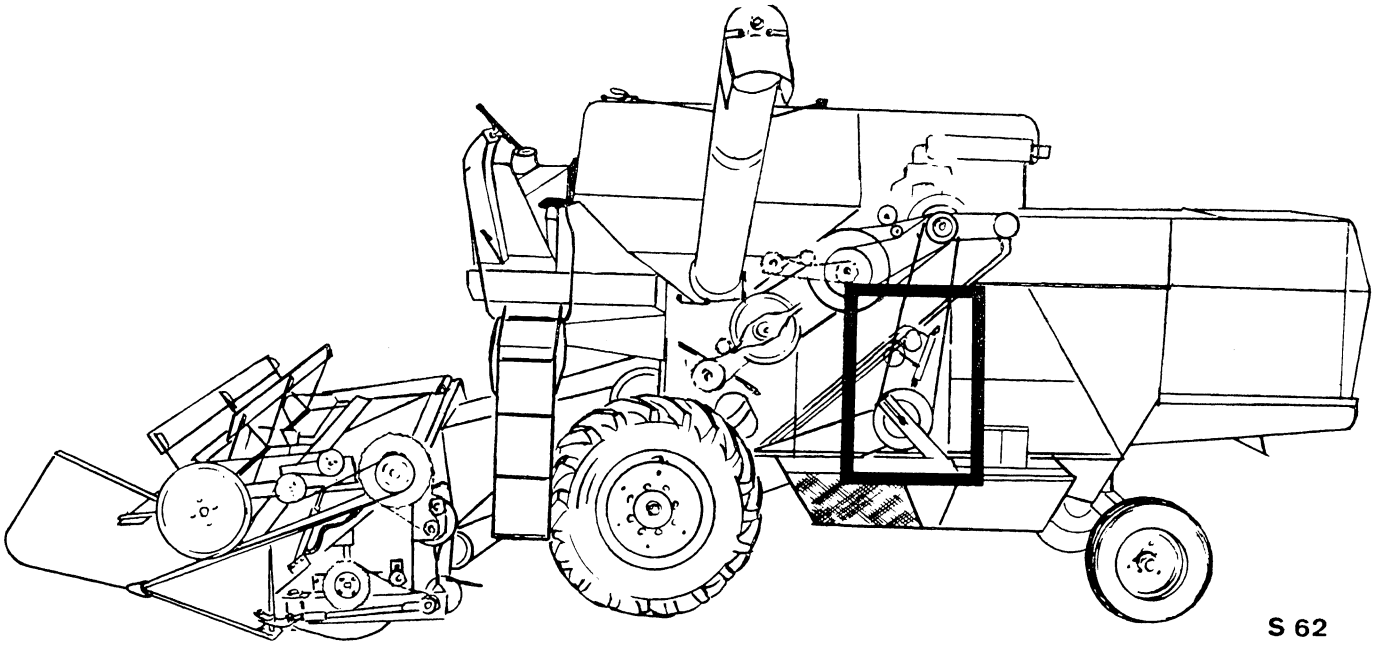


Turn the steering wheel towards the right hand side so that the rear wheels are completely to the left and the plunger is fully in.
Adjust stop G against steering arm H. It is possible that the stops E see 27 and G are to far out, so that the full stroke of the plunger cannot be reached and the turning radius is reduced.
This can be adjusted by screwing both stops in until they correspond with the piston in the hydraulic ram.

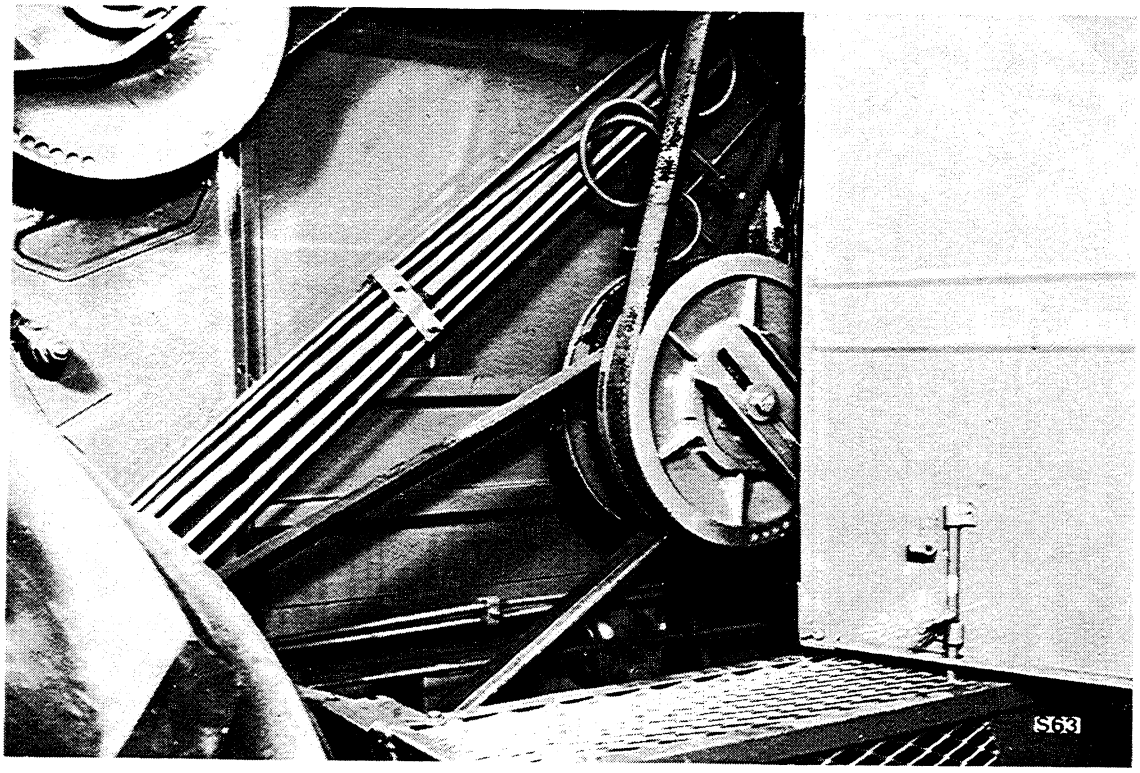
28



5 GROUND SPEED VARIATOR



S 62



S 63

INTRODUCTION

To obtain optimum performance from the threshing mechanism it is necessary to have a constant engine speed, as it is frequently necessary to alter the ground speed a ground speed vari-drive is installed between the engine and gearbox. With each gear engaged a complete variator speed range is obtainable from the maximum to the minimum position.
The variator is pivoted where it is attached to the frame and is operated by a double acting hydraulic ram which inturn is controled from the operator's platfrom.
The position of the variator is electrically indicated on the instrument panel.
When the clutch pedal is depressed the ground speed vari-drive moves automatically to its minimum speed in order to avoid the traction belt from being over-loaded when the engine is started or stopped.

CONTENTS