RANSOMES®
A Textron Company

23910G-GB (rev.2)

Safety & Operation Manual

RANSOMES Mounted Hydraulic 5

Series: LF, LG, RM.
Product Code: LKDA104, LKDA103, LKDA110, LKDA204

WARNING: If incorrectly used this machine can cause severe injury. Those who use and maintain this machine should be trained in its proper use, warned of its dangers and should read the entire manual before attempting to set up, operate, adjust or service the machine.

GB
English

RJL 100 May 2005

IAlways refer to the tractor manufactures Operators Manual, in conjuction with the mower's Safety & Operators manual, before operating this machine.

IMPORTANT: This is a precision machine and the service obtained from it depends on the way it is operated and maintained.

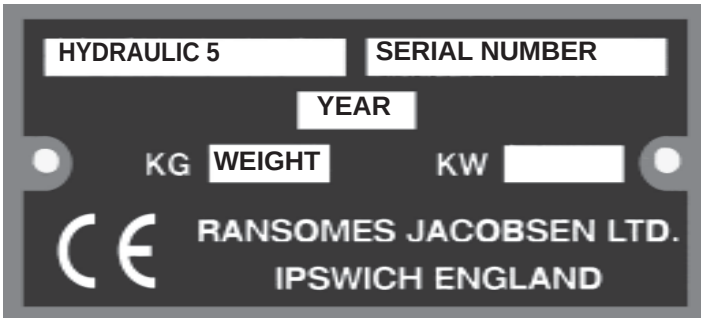
This SAFETY AND OPERATORS MANUAL should be regarded as part of the machine. Suppliers of both new and second-hand machines are advised to retain documentary evidence that this manual was provided with the machine.

This machine is designed solely for use in customary grass cutting operations. Use in any other way is considered as contrary to the intended use. Compliance with and strict adherence to the conditions of operation, service and repair as specified by the manufacturer, also constitute essential elements of the intended use.

Before attempting to operate this machine, **ALL** operators **MUST** read through this manual and make themselves thoroughly conversant with Safety Instructions, controls, lubrication and maintenance.

Accident prevention regulations, all other generally recognized regulations on safety and occupational medicine, and all road traffic regulations shall be observed at all times.

Any arbitrary modifications carried out on this machine may relieve the manufacturer of liability for any resulting damage or injury.


HYDRAULIC 5
SERIAL NUMBER
YEAR
KG
WEIGHT
KW
CE
RANSOMES JACOBSEN LTD.
IPSWICH ENGLAND

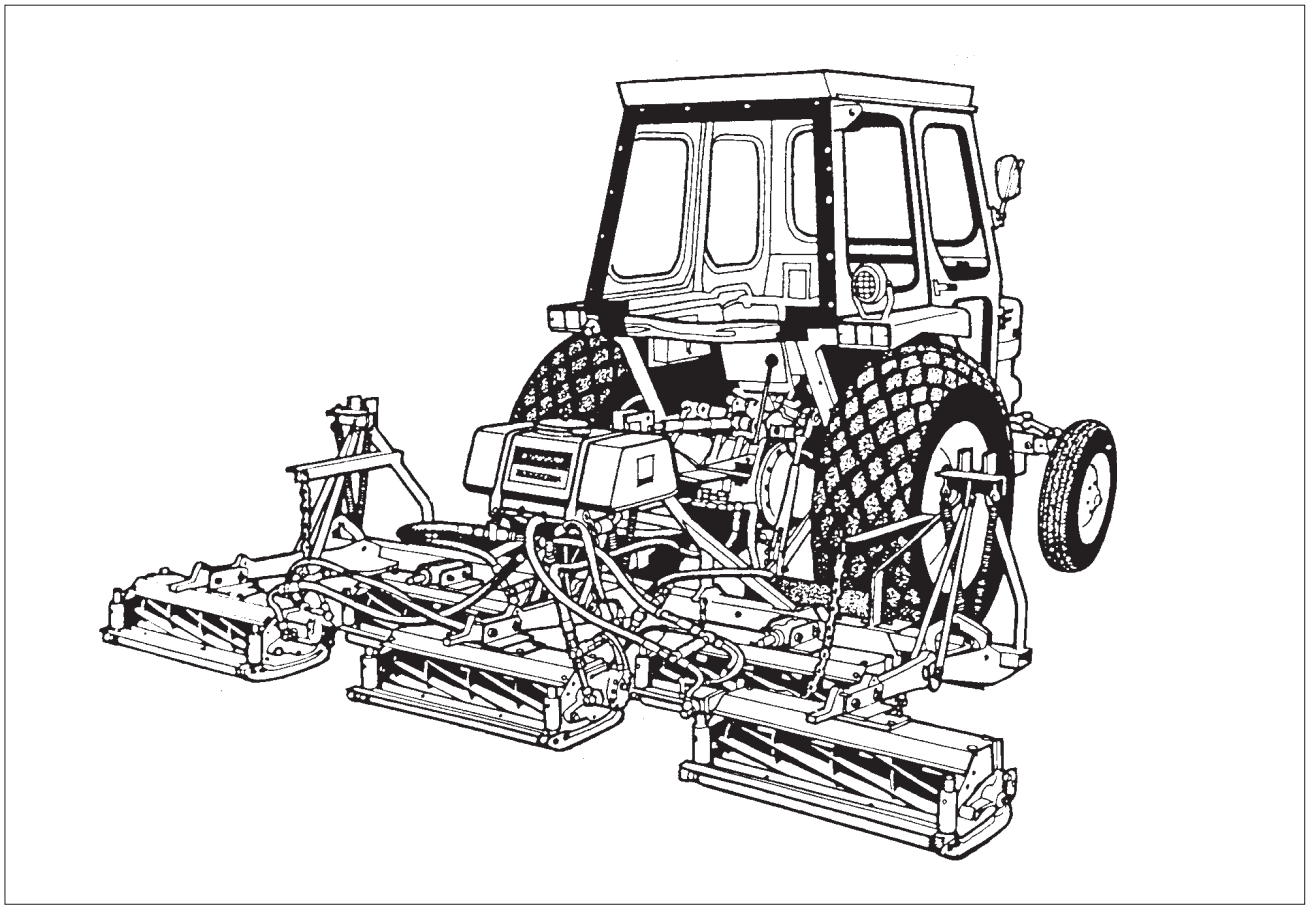


Fig.1

CONTENTS

This safety symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury, carefully read the message that follows, and inform other operators.

WARNING:
Hydraulic Fluid escaping under pressure can penetrate skin and do serious damage. Immediate medical assistance must be sought.

WARNING:
Batteries produce explosive gases and contain corrosive acid and supply levels of electrical current high enough to cause burns.

SAFETY INSTRUCTIONS

OPERATING INSTRUCTIONS

- Ensure that the instructions in this book are read and fully understood.
- No person should be allowed to operate this machine unless they are fully acquainted with all the controls and the safety procedures. Never allow children or people unfamiliar with these instructions to use this machine. Local regulations may restrict the age of the operator.

SAFETY SIGNS

- It is essential all safety labels are kept legible, if they are missing or illegible they must be replaced. If any part of the machine is replaced and it originally carried a safety label, a new label must be affixed to the replacement part. New safety labels are obtainable from Ransomes dealers.

STARTING THE ENGINE

- Before starting the engine check that the brakes are applied, drives are in neutral, guards are in position and intact, and bystanders are clear of the machine. Do not run the engine in a building without adequate ventilation.

DRIVING THE MACHINE

- Before moving the machine, check to ensure that all parts are in good working order, paying particular attention to brakes, tyres, steering and the security of cutting blades. Replace faulty silencers, mow only in daylight or good artificial light.
- Always observe the Highway Code both on and off the roads. Keep alert and aware at all times. Watch out for traffic when crossing or near roadways. Stop the blades rotating before crossing surfaces other than grass.
- Remember that some people are deaf or blind and that children and animals can be unpredictable.
- Keep travelling speeds low enough for an emergency stop to be effective and safe at all times, in any conditions.
- Remove or avoid obstructions in the area to be cut, thus reducing the possibility of injury to yourself and/or bystanders.
- When reversing, take special care to ensure that the area behind is clear of obstructions and/or bystanders. DO NOT carry passengers.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.

- When the machine is to be parked, stored or left unattended, lower the cutting means unless the transport locks are being used.
- While mowing, always wear substantial footwear and long trousers. Do not operate the equipment when barefoot or wearing open sandals.
- Check the grass catcher frequently for wear or deterioration. After striking a foreign object. Inspect. the lawnmower for damage and make repairs before restarting and operating the equipment.
- If the machine starts to vibrate abnormally, check immediately.

TRANSPORTING

- Ensure that the cutting units are securely fastened in the transport position. Do not transport with cutting mechanism rotating.
- Drive the machine with due consideration of road and surface conditions, inclines and local undulations.
- Sudden decelerating or braking can cause the rear wheels to lift.
- Remember that the stability of the rear of the machine is reduced as the fuel is used.

LEAVING THE DRIVING POSITION

- Park the machine on level ground. Before leaving the driving position, stop the engine and make sure all moving parts are stationary. Apply brakes and disengage all drives. Remove the starter key.

SLOPES

TAKE EXTRA CARE WHEN WORKING ON SLOPES

- Local undulations and sinkage will change the general slope. Avoid ground conditions which can cause the machine to slide. Keep machine speeds low on slopes and during tight turns.
- Sudden decelerating or braking can cause the rear wheels to lift. Remember there is no such thing as a “safe” slope. Travel on grass slopes requires particular care.

BLOCKED CUTTING CYLINDERS

- Stop the engine and make sure all moving parts are stationary. Apply brakes and disengage all drives.
- Release blockages with care. Keep all parts of the body away from the cutting edge. Beware of energy in the drive which can cause rotation when the blockage is released.
- Keep other people away from the cutting units as rotation of one cylinder can cause the others to rotate.

ADJUSTMENTS, LUBRICATION AND MAINTENANCE

- Stop the engine and make sure all moving parts are stationary. Apply brakes and disengage all drives.
- Read all the appropriate servicing instructions. Use only the replacement parts supplied by the original manufacturer.
- When adjusting the cutting cylinders take care not to get hands and feet trapped when rotating cylinders. Make sure that other people are not touching any cutting units, as rotation of one cylinder can cause the others to rotate.
- To reduce the fire hazard, keep the engine, silencer and battery compartments free of grass, leaves or excessive grease.
- Replace worn or damaged parts for safety.
- When working underneath lifted parts or machines, make sure adequate support Is provided.
- Do not dismantle the machine without releasing or restraining forces which can cause parts to move suddenly.
- Do not alter engine speed above maximum quoted in Engine Specification. Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- When refuelling, STOP THE ENGINE, DO NOT SMOKE. Add fuel before starting the engine, never add fuel while the engine is running. Use a funnel when pouring fuel from a can into the tank. Do not fill the fuel tank beyond the bottom of the filler neck. Replace all fuel tank and container caps securely. Store fuel in containers specifically designed for this purpose. Refuel outdoors only and do not smoke while refuelling.
- If petrol is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until petrol vapours have dissipated. Allow the engine to cool before storing in any enclosure. Never store the equipment with petrol in the tank inside a building where fumes may reach an open flame or spark. If the fuel tank has to be drained, this should be done outdoors. Do not spill fuel onto hot components.
- When servicing batteries, DO NOT SMOKE, and keep naked lights away. Do not place any metal objects across the terminals.

SPECIFICATIONS

MACHINE SPECIFICATION

Frame:	Welded and bolted construction
Hydraulic controls:	Forward, neutral and reverse drive to cutting units by 3 stack hydraulic valve and independent hydraulic lift by tractor hydraulics.
Transmission:	PTO drive from tractor to gearbox mounted on frame, through hydraulic pump, via hydraulic valve to cutting unit hydraulic motors.
Capacities:	
hydraulic tank:	40 litre (9 Imp.gals) (43.3 US quarts)
Gearbox:	0.28 litre (0.5Imp.pint) (0.3 US quart)

DIMENSIONS

Width of cut:	3.43 m (11' 3")
Overall width (cutting):	3.61 m (11' 10")
Overall width: (transport)	2.50 m (8' 2")
Overall length (free standing:	1.11 m (3' 8")
Overall height (free standing):	0.98 m (3' 3")
Overall weight of machine:	
with Sportcutter 8-knife	
Floating head units:	600kg (1323lb)

CUTTING UNITS SPECIFICATION
SPORTCUTTER

Construction	Heavy-duty pressed steel bolted construction
Cylinder	Diameter 197mm (7 3/4in) Width of cut 762mm (30in) Number of knives 8
Height of cut	
Fixed	13mm - 65mm (1/2in - 2 9/16in)
Floating	9.5mm - 47mm (3/8in - 1 7/8in)
Height of cut adjustment	
Fixed head	Adjustable screw system on rear roller.
Floating head	Front and rear rollers adjust in parallel by screw system to rear roller.
Rear roll:	Full width plain roll 60mm (2 3/8in) diameter running on ball bearings with shaft seals and lubricators.
Front roll:	Full width plain or Grooved roll 60mm (2 3/8in) diameter running on ball bearings with shaft seals and lubricators.
Bottom block and blade:	Replaceable blade, mounted onto steel constructed bottom block.
Transmission:	By hydraulic motor through gear and pinion to cutting cylinder.

Recommended lubricants

General:	Multipurpose Lithium based automotive grease with good water resisting properties. Shell Retinax 'A' or equivalent.
Gearbox:	
Cutting units:	Shell Simnia 'O' grease or Shell Retinax 'G' grease
Pump drive:	SAE30
Hydraulic Oil:	To ISO.VG.46. Shell Tellus 46 or equivalent.

TRACTOR SPECIFICATION

Designed to fit Ford 3000, 3600, 333 and Massy Ferguson 20 & 135 tractors with factory fitted 'Q' cabs. It is also suitable for other makes depending on the tractor linkage and PTO mounting

Recommended tractor tyres:	14.9/ 13 x 24 (all weather)
Pressure:	0.84Kg/cm^2 (12psi).
Recommeneded wheel weights and front weights:	Total 155Kg (344lb)

EC Declaration of Conformity • Déclaration de Conformité CE • EG Conformiteits-Declaratie • EG-Konformitatsbescheinigung • Certificato di Conformità CE • EF Konformitetserklæring • EU Uppfyllandecertifikat • Ilmoitus yhdenmukaisuudesta ey:n sääntöjen kanss • Declaración de Conformidad de la CE • Declaração de Conformidade da CE

We the undersigned • Nous, soussignés • Wij, ondergetekenden • Wir, die Unterzeichnenden • Noi sottoscritti Undertegnede • Undertecknarna • Me allekirjoittaneet • Los abajo firmantes • Nós, abaixo assinados

Ransomes Jacobsen Limited
West Road, Ransomes Europark,
Ipswich, England, IP3 9TT

Declare that the machine Described Below • Certifions que la machine suivante • verklaren dat onderstaand beschreven machine • erklären, dass die nachfolgend beschriebene Maschine • Dichiariamo che la macchina descritta di seguito • Erklærer, at følgende maskine • Deklarerar att den maskin som beskrivs nedan • vahvistamme, että alla kuvattu kone • Certificamos que la máquina descrita abajo • declaramos que a máquina a seguir descrita

Make & Type • Nom & Type • Merk & Type • Marke und Typ • Marca e tipo • Fabrikat og type • Fabrikat & typ • Malli ja tyyppi • Marca y Tipo • Marca & Tipo ..... **Ransomes Hydraulic 5**

Category • Modèle •Categorie • Kategorie • Categoria • Kategori • Luokka • Categoría • Categoria ..... **Mounted Hydraulic Cylinder Mower**

Series • Série • Serie • Sarja ..... **LF, LG & RM**

Cutting Width • Largeur de coupe • Maaibreedte • Schnittbreite • Larghezza di taglio • Klippebredde • Klippbredd • Leikkuuleveys • Anchura de corte • Potência real instalada **343cm**

Approved for use with: ..... **Tractor 25.4KW Minimum Power 3.7 to 5.2KW per Cutting Unit Output at PTO on Tractor**

Complies with the provisions of the following European directives and amendments and the regulations transposing it into national law • Est conforme aux prescriptions des normes, modifications et règles européennes suivantes • voldoet aan de bepalingen van de volgende Europese Richtlijnen en Amendementen, alsmede aan de verordeningen die deze omzetten in nationale wetgeving • den Bestimmungen der folgenden Europa-Richtlinien einschließlich aller Änderungen und Ergänzungen sowie den Vorschriften, die diese in das nationale Recht umsetzen, entspricht • soddisfa quanto previsto dalle seguenti direttive ed emendamenti europei e dalle normative che li riportano in legge nazionale • Overholder bestemmelserne i følgende EF-direktiver med ændringer og i de forordninger, hvorved de omsættes til national lov • Uppfyller kraven i följande europeiska direktiv med tillägg och regler transponerade till nationell lagstiftning • täyttää seuraavana mainittujen Euroopan direktiivien ja muutosten ja säännösten asettamat edellyt

Machinery Safety Directive • Directive de sécurité des machines • Richtlijn Machineveiligheid • Richtlinie zur Maschinensicherheit • Direttiva sulla sicurezza del macchinario • Maskinsikkerhedsdirektivet • Maskinsäkerhetsdirektiv • Koneen turvallisuutta koskeva direktiivi • Directiva de seguridad de maquinaria • Directiva de segurança de máquinas **98/37/EC**

Complies with the following harmonised standard or technical provisions • est conforme aux normes harmonisées • Voldoet aan de volgende geharmoniseerde norm of technische bepalingen • Diese Maschine entspricht den folgenden harmonisierten Normen oder technischen Bestimmungen • Rispetta il seguente standard armonizzato o requisiti tecnici • Overholder følgende harmoniserede standardbestemmelser eller tekniske bestemmelser • Uppfyller följande harmoniserade standard eller tekniska definitione • täyttää seuraavat harmonisoidut standardit tai tekniset edellytykset • Cumple con los siguientes estándares de hramonización o provisiones técnicas • Está em conformidade com a norma harmonizada ou com as provisões técnicas seguintes

Machinery Safety • Sécurité des machines • Machineveiligheid • Maschinensicherhei • Sicurezza del macchinario • Maskinsikkerhed • Maskinsäkerhet • Koneen turvallisuus • Seguridad de maquinaria • Segurança de máquinas **EN836**

Keeper of Technical File, Place & Date of Declaration • Lieu & Date de déclaration • Plaats & datum verklaringsaflegging • Ort und Datum dieser Erklärung • Luogo e data della dichiarazione • Sted og dato for erklæringen • Plats & datum för deklaration • Lausunnon paikka ja päivämäärä • Lugar y fecha de la declaración • Local e data da declaração

Technical Director
Ransomes Jacobsen Limited
Central Avenue, Ransomes Europark,
Ipswich, England, IP3 9QG

01.09.2004

T Lansdell
Technical Director

Certificate Number • Numéro du certificat • Certificaatnummer • Zertifikat Nummer • Numero certificato • Certifikatnummer • Certifikat nummer • Sertifikaattinumero • Número de certificado • Número do Certificado

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GB English | FR French | NL Dutch | DE German | IT Italian | DK Danish | SE Swedish | FI Finnish | ES Spanish | PT Portuguese

ATTACHING THE MACHINE TO THE TRACTOR

READ THE SAFETY INSTRUCTIONS

The instructions in this book apply to Ford and Massey Ferguson tractors. For fitting to other makes of tractor, consult your authorised dealer for guidance.

A standard P.T.O. shaft is provided and this will have to be shortened in length to suit the tractor being used. It is essential that no more than necessary is cut off as maximum engagement of the sliding portion is needed to prevent excessive wear.

Adequate deburring and radiusing of the cut ends must be carried out.

NOTE: On certain tractors it will be impossible to lift the machine to the maximum height on the 3-point linkage without the sliding part of the P.T.O. shaft disengaging. Stops must be set correctly on the tractor lift quadrant lever to limit the lift height to prevent the disengagement of the P.T.O. shaft.

CHECK CHAINS

On Ford tractors a special external check chain (A Fig. 2) is supplied with the machine. On Massey Ferguson tractors the standard check chain is used.

HYDRAULIC CONNECTIONS

The tractor should be fitted with a trailer tipping pipe and single acting hydraulic valve. These are required to operate the hydraulic lift rams to fold the wing units on the mower.

Connect the hydraulic hose quick release coupling to the tractor hydraulics.

FITTING THE MACHINE TO THE TRACTOR

Lower Links (Fig. 3)

1. Reverse the tractor up to the machine.

2. Stop the tractor engine.

3. Connect up the tractor lower lift arms to the two articulating links (A) on the main crossbeam and secure in position with the hitch pins (B) and spring clips (C).

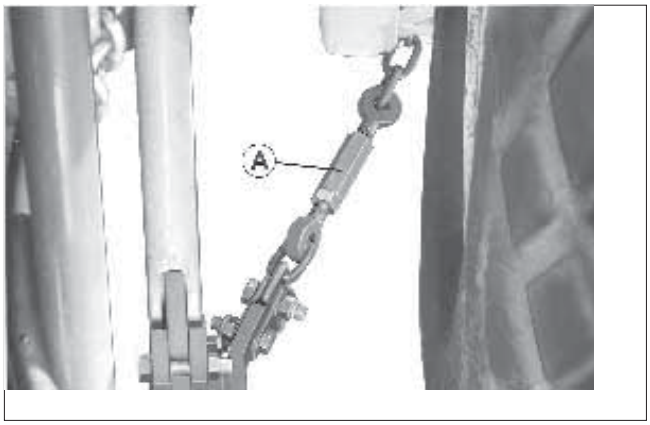

Fig.2

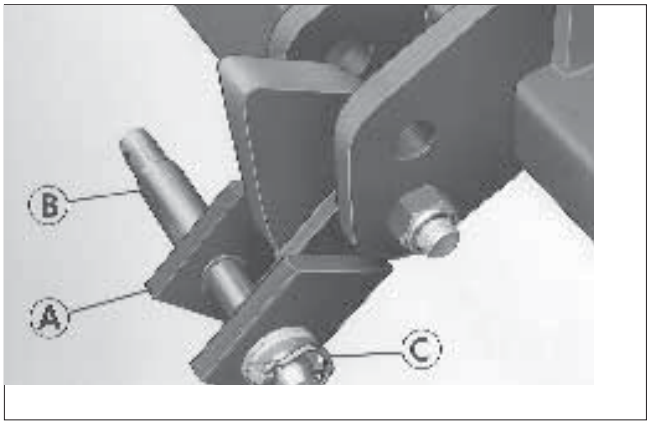

Fig.3

Top Link (Fig. 4)

1. Connect the tractor top link to the machine.

IMPORTANT: Select the pair of holes in the 'A' frame which allows the top link to take up as near an horizontal position as possible.

2. Fir pin (A) and secure with pin and spring ring (B).

3. Extend the top link and remove the stabiliser pins from the rear pivot support plates. Stow these pins in the holes in the lugs at the front of the main crossbeam and secure with spring pins.

4. Shorten the top link until the 'A' frame becomes vertical. Attach the jubilee clip (supplied) to the top link up against the end of the turnbuckle and tighten securely in this position.

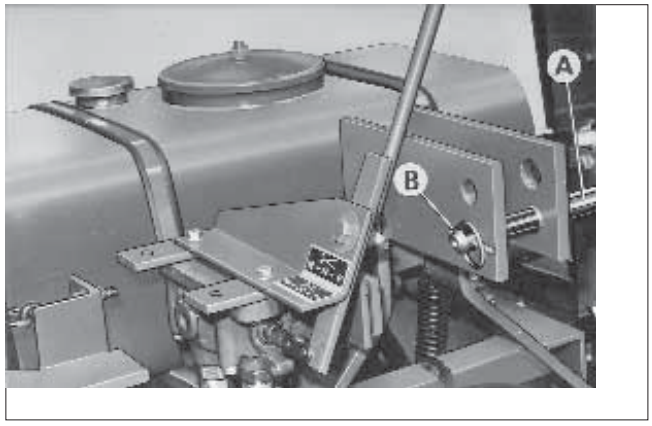

Fig.4

VALVE MOUNTING POSITION (fIG. 5)

The valve assembly (A) can be fitted in two positions (B) to suit various types of tractor.

The position for the valve (A) must always be chosen to ensure that there is no strain on the hydraulic hoses and that the hoses do not chafe.
With the machine in both the lifted and lowered positions, check the hose routing to ensure that no chafing occurs.

Any small adjustments should be carried out by resetting the hoses at the motors, either at the elbows or the hose end fittings.

For some tractors, adjustment at the control valve elbow fittings may also be necessary to prevent chafing.

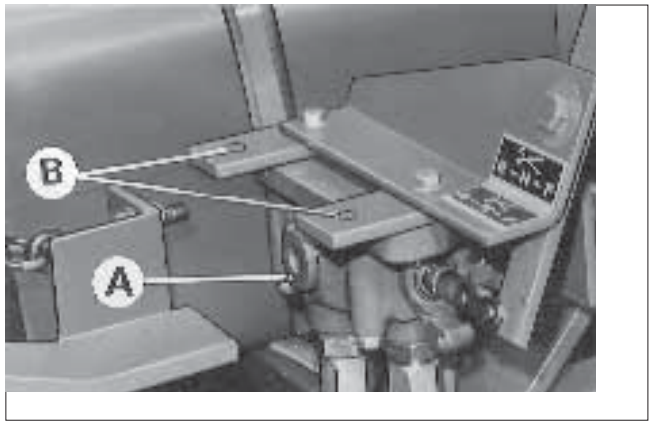

Fig.5

CHECK CHAIN ADJUSTMENT

1. Start the tractor engine and lift the machine fully by means of the tractor lifting quandrant lever.

2. Switch of the engine.

3. Adjust the tractor RH lift rod length to level the main crossbeam of the machine.

4. Measure the height of the crossbeam from the ground at each end to ensure the machine is level.

5. Adjust the length of the check chains so that there is a minimum of slack when the tractor arms are fully raised. This will prevent excessive side swing of the machine when transporting.

FINAL TOP LINK ADJUSTMENT

This adjustment may be made when the "floating head" cutting units are used in any of the locked positions.

Before this adjustment can be made, the height of cut of all 5 units should be accurately set on a level, hard surface. See pages 21-22. The 'A' frame must be vertical.

1. On the area to be mown, make an initial cut of approximately 20 metres in length.

2. Carefully examine the finish of cut across the width of the swathe. It is likely that the 2 front units will be cutting lower than the rear units.

3. If necessary, extend the top link by 1½ to 2 turns to obtain an even finish.

IMPORTANT: Do not lengthen the top link by more than 3 turns. The need for adjustment in excess of this indicates that the height of cut settings on the units were not equal initially.

Any subsequent changes in height of cut will not effect the length of the top link but it is IMPORTANT that if the units are set up by using spacers between the ground and bottom blade, the top link should be shortened to its original length, ie. until the turnbuckle contacts the jubilee clip. After re-setting the height of cut by this method, the top link should again be lengthened by the same amount.

NOTE: Alternatively the height of cut setting on the individual units can of course be adjusted slightly to obtain an even finish without altering the length of the top link.

When the cutting units are used in the "Floating Head" position, it is not necessary to make the above top link adjustment. The top link length must however be set so that the mower 'A' frame is vertical with the machine in the working position.

REMOVING THE MACHINE FROM THE TRACTOR

To remove the machine from the tractor, reverse the attachment instructions.

IMPORTANT
(Fig. 6)

1. The three stabilising pins (A) must be replaced over the rear unit trailing arms (B) before the machine is removed from the tractor 3-point linkage; this ensures that the machine is stable when removed from the tractor.

2. The stabilising pins MUST always be removed from over the rear unit trailing arms for all mowing and transporting operations.

It is recommended that the machine should be removed from the tractor and stored in the working (cutting) position. If the machine is removed when the wing units (4th and 5th) are in the folded position the floating head pivot brackets of units 1, 2 and 3 must be locked in a fixed position after lowering the machine to the ground.

REMEMBER: It is not necessary at anytime when assembling or removing the mower from the tractor to dismantle, or disturb, any hydraulic pipe joints or components. Should servicing be necessary during use, it must be carried out by a trained service person.

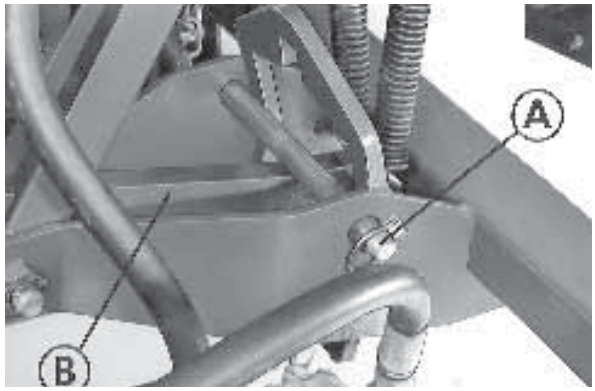

Fig.6

OPERATING THE MOWER

Read the Safety Instructions.

CONTROLS

Two controls are provided for operating the machine:

1. Cutting cylinder drive (Fig. 7)
   This lever (A) positioned at the rear of the operator, on the right hand side above the pump gearbox, controls forward and reverse drive to the cylinders.

To operate:

(a) Pull the lever forward (F) for forward drive for grass cutting.

(b) Push the lever rearward (R) for reverse drive for backlapping or clearing of cylinders.

(c) When drive is not required the lever should be in the neutral (N) position.

2. Lift valve lever
   This lever is used to operate the hydraulic lift rams to fold the wing units on the mower.

TRACTOR CONTROLS

Tractor implement lift
Lifting and lowering of the complete machine is carried out by operation of the lift and lower lever on the tractor which must be pushed fully down for grass cutting.

1. Before cutting, set the following:

(a) Tractor hydraulic control system

Ford tractor

1. Set the position/draft selector in the upper-most position.

2. Set the flow control valve to slow.

3. Set the auxiliary services three position control knob tot he fully IN position to give hydraulic power to the lifting arms only.

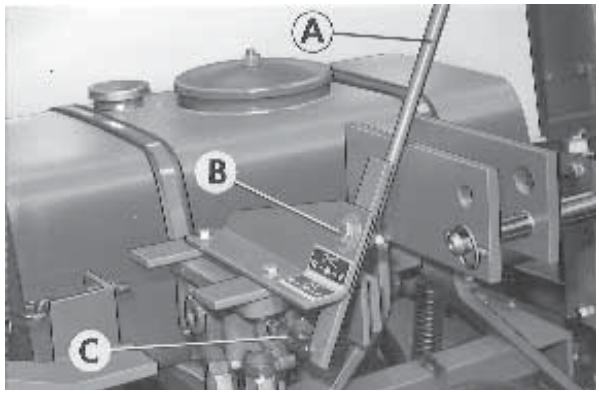

Fig.7

Massey Ferguson Tractor

Set the draft lever at the top of its quandrant in the UP position and lock it with its adjustable stop. Adjust the response lever to slow.

(b) P.T.O.

Ford Tractor

To engage the P.T.O. the selector knob should be pulled fully out. To disengage the P.T.O. drive the selector knob should be pushed in.

Massey Ferguson Tractor

To engage live P.T.O. depress clutch pedal fully, lift handle and pull lever back (engine speed P.T.O.). To disengage the P.T.O. drive, depress clutch pedal fully, move the lever to the central (neutral) position and release the handle.

Tractors with Dual Range P.T.O.
The “low” range must be used , ie. 540 P.T.O. r.p.m at approximately 1800 engine r.p.m.
IMPORTANT: Do not use “Ground Speed P.T.O.”

2. Start the tractor, and lower the lift arms by means of the quandrant lever to the fully lowered position.

3. Engage the tractor P.T.O.

4. Engage the selected tractor gear in readiness for moving off. Massey Ferguson Tractors with “Multi-power” options can be operated with MULTI-POWER either IN or OUT on level ground. Where long banks or slopes are to be cut, and it is necessary to cut downhill, MULTI-POWER “IN” should be used to maintain the selected ground speed.

5. Move the mower control valve forward to engage the forward drive to the cutting cylinders.

CAUTION: Always put the drive controls in the neutral position and switch off the engine before dismounting from the tractor.

IMPORTANT: Do not reverse the tractor with the machine lowered. Always lift the machine on the tractor 3-point linkage before moving in reverse, and when obstructions are met during cutting.

IMPORTANT NOTE: The machine must not be used for cutting with the wing units in the folded position.

TRANSPORTING

1. Move the cutter cylinder control lever to neutral.

2. Raise the machine fully by operating the tractor lift qaudrant lever.

3. Put the tractor P.T.O. drive in neutral to avoid unnecessary circulation of oil in the hydraulic system.

It is imperative that the P.T.O. drive is disengaged and the valve control lever is in neutral before the machine is lifted and the wing units folded.

No automatic cut out of the hydraulic drive is provided and damage will occur to the machine components if the P.T.O. is not disengaged.

IMPORTANT: The tractor P.T.O. drive MUST NOT be re-engaged until both wing units and the machine are returned to the cutting position.

When folding the wing units (4th and 5th) for transporting, the stabiliser pins will have to be fitted to locate the swinging arms. This will reduce the transport width of the machine to within 2.5m (8ft 2in).

IMPORTANT: Do not transport the machine with the stabiliser pin fitted over the rear centre unit arm.

The frame locking pin must be in position to hold the wing frames both when working and during transport. Failure to do this will cause damage to the machine. The machine must be in the raised position when the wing units are being lifted or lowered, this will prevent damage to the turf by the inner skids of the cutting units.

LUBRICATION AND MAINTENANCE CHART

	Daily or every 8 hours	Weekly or every 40 working hours	End of season
Maintenance			
Check level of hydraulic oil in tank *	●		
Drain and refill tank *			●
Check all nuts and bolts and Hydraulic connections for tightness		●	
Lubricate with SAE30 oil or shell Retinax ‘A’ grease			
Cutting cylinder bearing housing pivots		●	
Height adjustment sleeves		●	
Cutting cylinder pivot brackets		●	
Lubricate with SAE30 oil			
Valve lever pivot and connecting link			
PTO gearbox		●	
Lubricate with Rocol Anti-seize			
Cutting cylinder clamp pivot		●	
Cutting cylinder adjusting screws		●	
Lubricate with Shell Simnia ‘O’ or Retinax ‘G’ grease			
Cutting cylinder gearboxes			●
Lubricate with Shell Retinax ‘A’ grease			
Cutting cylinder rolls		●	
Lubricate with Rocol ‘GP 1’ grease			
PTO shaft (sliding portion)		●	
PTO shaft (universal joint bearings)		●	
Trailing arm spherical bearings	●		
* Top up or refill with Shell Tellus 46 hydraulic oil.			

CUTTING PERFORMANCE
FORD 3910H TRACTORS ON 11 X 28 TYRES

NOTE: 1. Figures include allowance for overlap and turning.
NOTE: 2. The gears and engine speeds are general purpose cutting, use other gears to suit cutting conditions.

METRIC	Tractor Engine Speed (rpm)								
	Cuts per meter	1400		1600		1800		2000	
Tractor Gear	6 knife	km/hr	ha/hr	km/hr	ha/hr	km/hr	ha/hr	km/hr	ha/hr
2nd	123	2.73	0.7	3.12	0.79	3.51	0.89	3.9	1
3rd	82	4	1.04	4.56	1.18	5.13	1.33	5.7	1.48
4th	57	5.81	1.5	6.64	1.71	7.47	1.93	8.3	2.14
5th	50	6.65	1.7	7.6	1.94	8.55	2.19	9.5	2.43
6th	34	9.66	2.48	11.04	2.83	12.42	3.19	13.8	3.56
7th	24	14.14	3.6	16.16	4.13	18.18	4.64	20.2	5.16

IMPERIAL	Tractor Engine Speed (rpm)								
	Cuts Per Yard	1400		1600		1800		2000	
Tractor Gear	6 knife	mph	acre / hr	mph	acre / hr	mph	acre / hr	mph	acre / hr
2nd	113	1.68	1.71	1.92	1.95	2.16	2.2	2.4	2.45
3rd	75	2.52	2.57	2.88	2.93	3.24	3.3	3.6	3.67
4th	52	3.64	3.71	4.16	4.24	4.68	4.77	5.2	5.3
5th	46	4.13	4.21	4.72	4.81	5.31	5.41	5.9	6.02
6th	31	6.02	6.14	6.88	7.01	7.74	7.89	8.6	8.8
7th	22	8.75	8.9	10	10.2	11.25	11.47	12.5	12.75

CUTTING PERFORMANCE MASSEY FERGUSON MF 20F TRACTORS ON 11 X 28 TYRES

Note: 1. Figures include allowance for overlap and turning.
Note: 2. The gears and engine speeds are for general purpose cutting, use other gears to suit cutting conditions.

METRIC	Tractor Engine Speed (rpm)								
	Cuts per metre	1400		1600		1800		2000	
Tractor Gear	6 knife	km/hr	ha/hr	km/hr	ha/hr	km/hr	ha/hr	km/hr	ha/hr
2nd	150	2.21	0.57	2.53	0.65	2.85	0.73	3.16	0.81
3rd	110	3.03	0.77	3.46	0.89	3.9	1	4.33	1.1
4th	82	4.06	1.04	4.64	1.19	5.22	1.33	5.8	1.5
5th	56	6.05	1.55	6.91	1.77	7.78	1.99	8.64	2.21
6th	38	8.87	2.27	10.14	2.6	11.41	2.93	12.67	3.25
7th	27	12.12	3.11	13.85	3.55	15.6	4	17.31	4.45

IMPERIAL	Tractor Engine Speed (rpm)								
	Cuts per yard	1400		1600		1800		2000	
Tractor Gear	6 knife	mph	acre / hr	mph	acre / hr	mph	acre / hr	mph	acre / hr
2nd	138	1.38	1.4	1.57	1.6	1.77	1.8	1.96	2
3rd	101	1.88	1.91	2.15	2.2	2.41	2.46	2.68	2.73
4th	75	2.52	2.57	2.89	2.95	3.25	3.3	3.61	3.68
5th	51	3.76	3.83	4.3	4.38	4.83	4.92	5.36	5.47
6th	35	5.51	5.62	6.3	6.43	7.1	7.24	7.87	8.03
7th	25	7.53	7.68	8.6	8.77	9.68	9.87	10.75	11

LUBRICATION

Read the safety instructions

For recommended lubricants see page 5.

Should the number of working hours that the machine is in use during the indicated period exceed the number quoted in brackets, then use the recommended 'working hour' guide as the lubrication schedule.

Before using the machine for the first time:

1. Lubricate all points.

2. Check and if necessary fill the pump gearbox to the correct level.

3. Check and if necessary fill the hydraulic tank with Shell Tellus 46 oil (ISO viscosity grade VG46) until the level of oil is midway up the filler filter (A Fig. 8). Run the machine to circulate the oil in the hydraulic system and re-check the oil level. Top up if necessary.

4. Lubicate both ends of the Power Take Off shaft where it connects to the tractor PTO and the pump drive gearbox with Rocol Anti-sieze (dry Molybdenum) paste.

Daily (Every 8 working hours)

Lubricate the trailing arm spherical bearing (for unit numbers 1, 4, and 5) using Rocol G.P.1 grease (A Fig 9).

Weekly (Every 40 working hours)

1. Lubricate the rear rolls (A Fig. 10) with shell Retinax 'A' grease or equivalent. Rotate the roll oll continuously during lubrication.

NOTE: Lubricate more often in dusty or wet conditions.

2. Lubricate the following points using Shell Retinax 'A' grease or SAE 30 oil.

(a) Cutting cylinder bearing housing pivots (A Fig. 11).

(b) Height adjustment sleeves (B Fig. 11).

(c) Cutting cylinder clamp pivot (D Fig. 11).

Fig.8

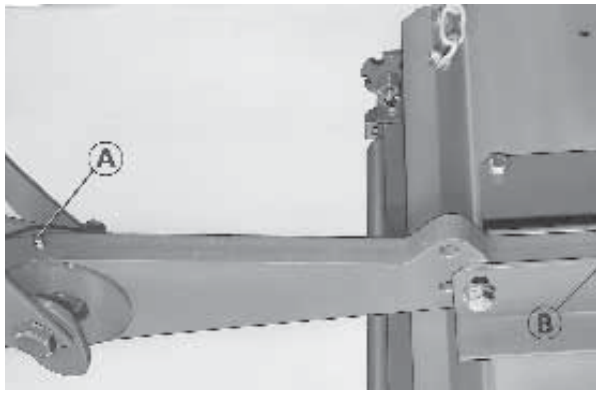

Fig.9

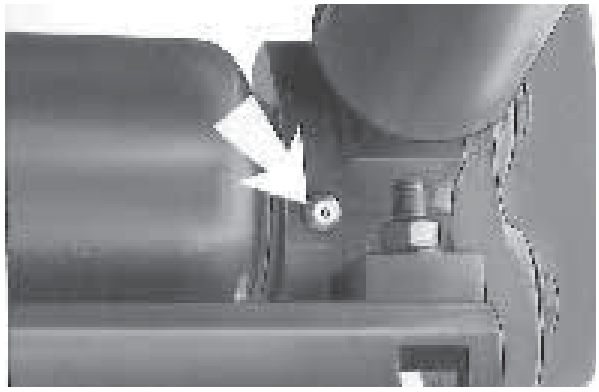

Fig.10

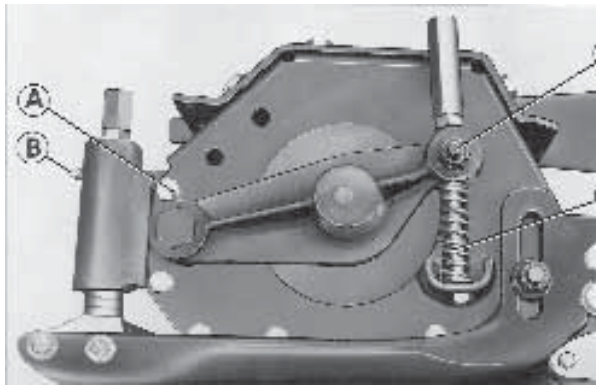

Fig.11

(d) Cutting cylinder adjusting screws (C Fig.11).

4. Using oil SAE 30 lightly oil the valve lever pivot bolt (B Fig. 13) and connecting link (C Fig. 13).

5. Remove the filler plug (A Fig. 14) and level plug (A Fig. 15) from the pump gearbox and check the oil level. If necessary top up to correct level the gearbox must be on position on the machine and the machine on a level surface.

6. Lubricate the PTO shaft using Rocol G.P.1 grease.

(a) Sliding portion (adequate lubrication should be provided on this part of the shaft).

(b) Universal joint bearings.

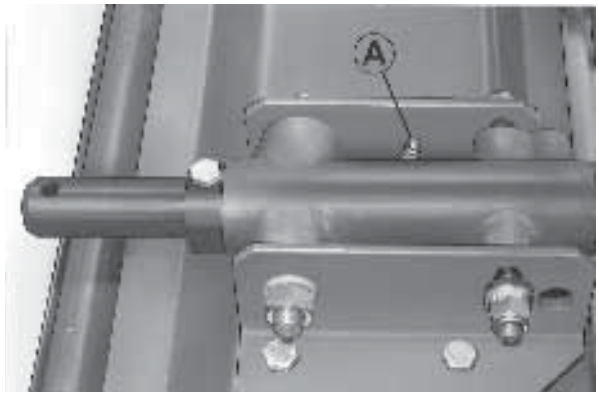

Fig.12

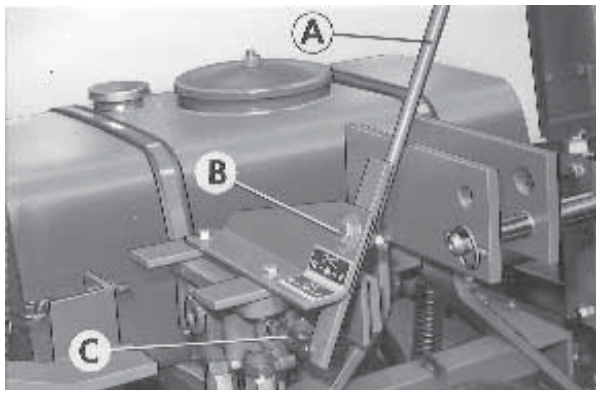

Fig.13

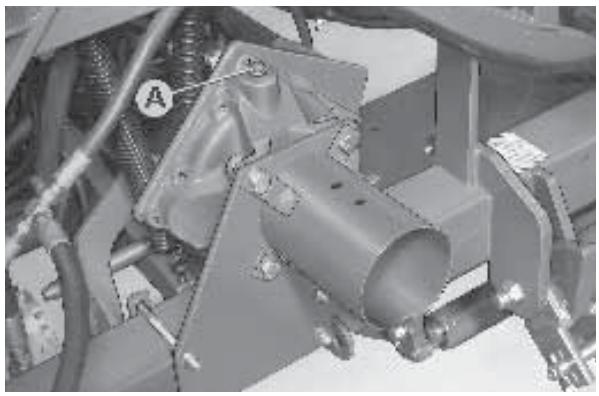

Fig.14

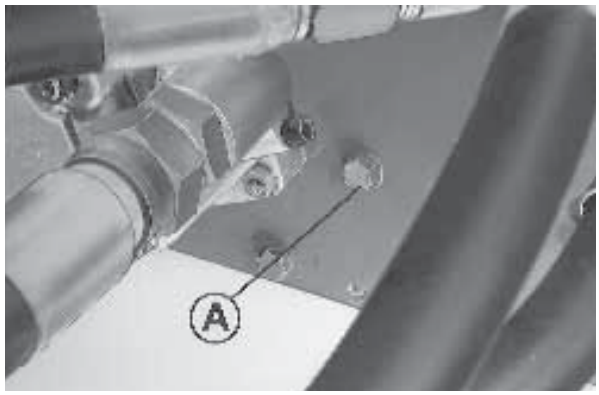

Fig.15

MAINTENANCE

Read the safety instructions

Weekly (Every 40 working hours)

Make general check on all nuts, bolts and screws to ensure that these are tight.

END OF SEASON SERVICING

1. MACHINE

(a) After grasscutting the machine should be thoroughly cleaned down to remove all accumulations of grass clippings and debris.
(b) Turn the cutting cylinders to clean the cutting edges.
(c) Brush a little oil onto the cutters to prevent rusting. A few turns of the cylinders will soon spread the oil onto the bottom blade.

NOTE: DO NOT turn the cylinders by hand.

2. Cutting unit gearboxes

(a) During the end of season overhaul the hydraulic motors should be removed and the gearboxes cleaned out.
(b) Repack the gearboxes with Shell Simnia 'O' or Shell Retinax 'G' grease (non tracking) to half fill the box approximate quantity - 0.10kg (0.22lbs) per gearbox).

3. Hydraulic tank and filter

(Fig. 16 and Fig. 17)

(a) Remove the return hose at the valve elbow (A Fig. 17) to completely drain the tank of oil. Fit a new filter in the tank and refill with new Shell Tellus 46 oil (capacity 40 litres (9 imp. gallons) 42.3 US quarts.
(b) To change the filter (Fig. 16): Unscrew the nut (A) and remove washer (B) sealing washer (C) cover plate (D) and sealing ring (E). Unscrew the filter bolt (F) and withdraw the element (G) from the tank. After taking out the split pin (H) the filter and bottom plate (J) can be removed from the filter bolt. Refit a new element and re-assemble in the reverse order.

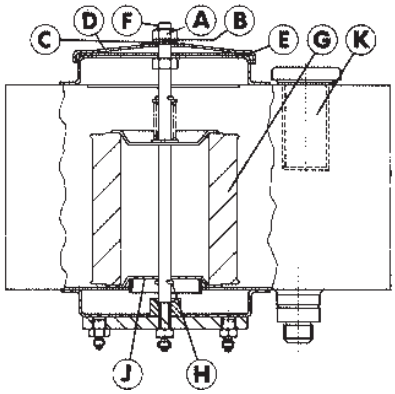

Fig.16

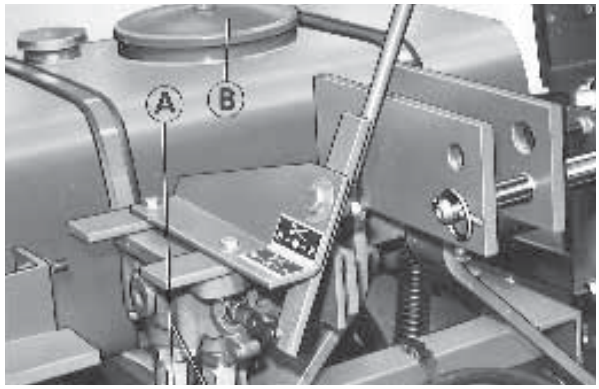

Fig.17

(c) The oil strainer (K Fig 16) should be withdrawn and thoroughly cleaned.

4. Drain the PTO gearbox and refill to the correct level.

ADJUSTMENTS

Read the safety instructions

HEIGHT OF CUT ADJUSTMENT

The cutting height is determined by the position of the side skids and rolls in relation to the bottom blade. This height is adjustable between 13 and 65mm (½ and 2 9/16in) in the floating head position and between 13 and 85mm (½ and 3 5/16in) in the fixed head position.

1. Floating head configuration (Fig. 19)

(a) Release the two nuts (A) which secure the skids to the side frame.

(b) Turn adjusters (B) clockwise (-) to reduce the height of cut or anti-clockwise (+) to increase the height of cut.

(c) After adjusting, retighten the nuts (A) securely.

2. Fixed head configuration

The floating head can be locked up into three different positions which are used when the grass is too high to allow efficient cutting in the free floating condition.

First position (Fig. 20)

(a) Locate the spring pin in the hole in the pivot and mounting brackets. Ensure that the hole in the mounting bracket is resting against the top of the pin.

(b) Securely tighten the front locknut.

(c) Raise or remove the front roll.

NOTE: This setting can also be used with the front roll down. The setting places the front roll approximately 12mm (½in) above the rear roll and is particularly situated to prevent scalping on very low heights of cut. The height of cut should be adjusted as in floating head configuration.

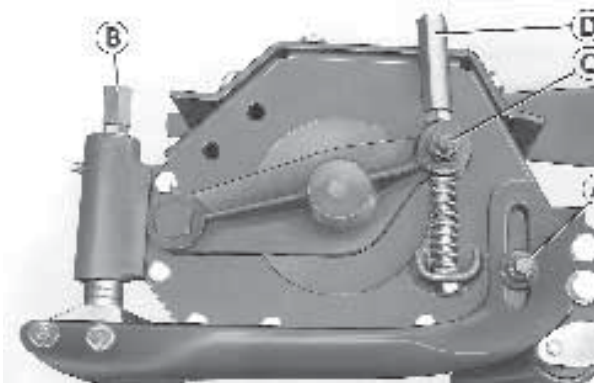

Fig.19

Fig.20

Second position (Fig. 21)

To give a quick height of cut increase of 10mm (3/8 in).

(a) Release the forward locknut.

(b) Pull the cutting unit up so that the hole in the mounting bracket locates up against the bottom of the spring pin.

(c) Retighten the locknut.

(d) Raise or remove the front roll.

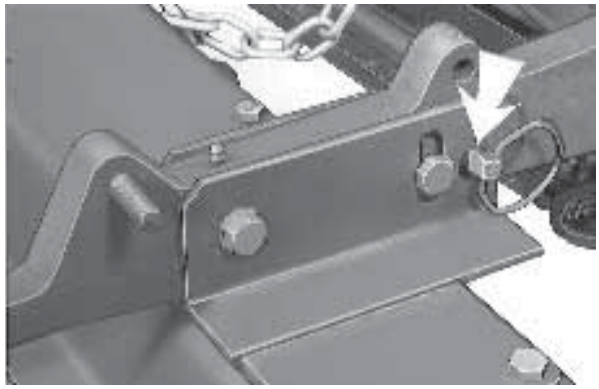

Fig.21

Third position (Fig. 22)

A further 10mm (3/8in) increase height of cut can be made as follows:

(a) Release forward locknut.

(b) Pull the unit up so that the bottom of the long slot locates up against the locking stud. (DO NOT use spring pin).

(c) Retighten the locknut.

(d) Raise or remove the front roll.

Fig.22

NOTE: If the machine is used with the floating head units in the "fixed" position the front rolls on units No. 2 and 3 will have to be removed as they cannot be used in the stowed (raised) position.

CUTTING CYLINDER ADJUSTMENT (Fig. 23)

To check that the cutting cylinder is set correctly to the bottom blade:

(a) Hold a thin piece of paper between the edge of the bottom blade and the spiral cutter and revolve the cylinder manually.

(b) The paper should be cut cleanly along the ength of the bottom blade. If it is not, some adjustment is necessary. DO NOT OVER-TIGHTEN.

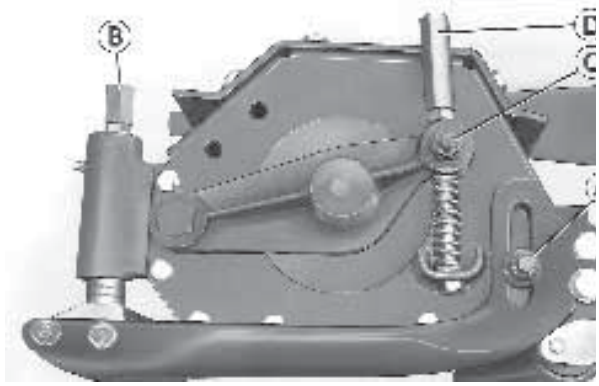

Fig.23

To adjust:
(Fig.24)

(a) Slacken the clamp pin locknuts (C).

(b) Turn the adjusters (D) anti-clockwise (+) to move the cylinder closer to the bottom blade.

(c) Make 1/8 of a turn alternately to each adjuster until the adjustment is correct.

(d) Re-tighten the clamp pin locknuts (C) securely and recheck the setting with paper.

NOTE: The cutting cylinder setting should be checked every four working hours.

If after adjusting correctly the paper is still not cut cleanly then the cylinder and bottom blade should be backlapped.

BACKLAPPING
The keen cutting edges of the spiral cutters can be maintained by backlapping. With the units in the lowered position proceed as follows.

1. Ensure that the cutting cylinder is set correctly to the bottom blade (refer to adjustments).

2. Smear the cutting edges of the spiral cutters with a medium grade of carborundum paste (obtainable from most motor accessory shops or garages).

3. Seated on the tractor, start the engine and select reverse drive on the hydraulic control lever.

4. Set engine speed to give a cylinder speed of approximately 200 rpm.

5. Continue backlapping until a thin piece of paper can be cut cleanly along the length of the bottom blade.

6. After backlapping ensure that all traces of grinding paste are removed from the cutting edges of the spiral cutters and the bottom blade. Failure to do this will cause the cutting edges to be lost when the cylinders rotate normally for grasscutting.

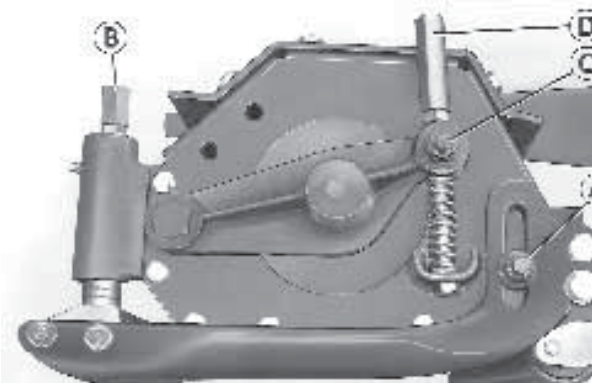

Fig.24

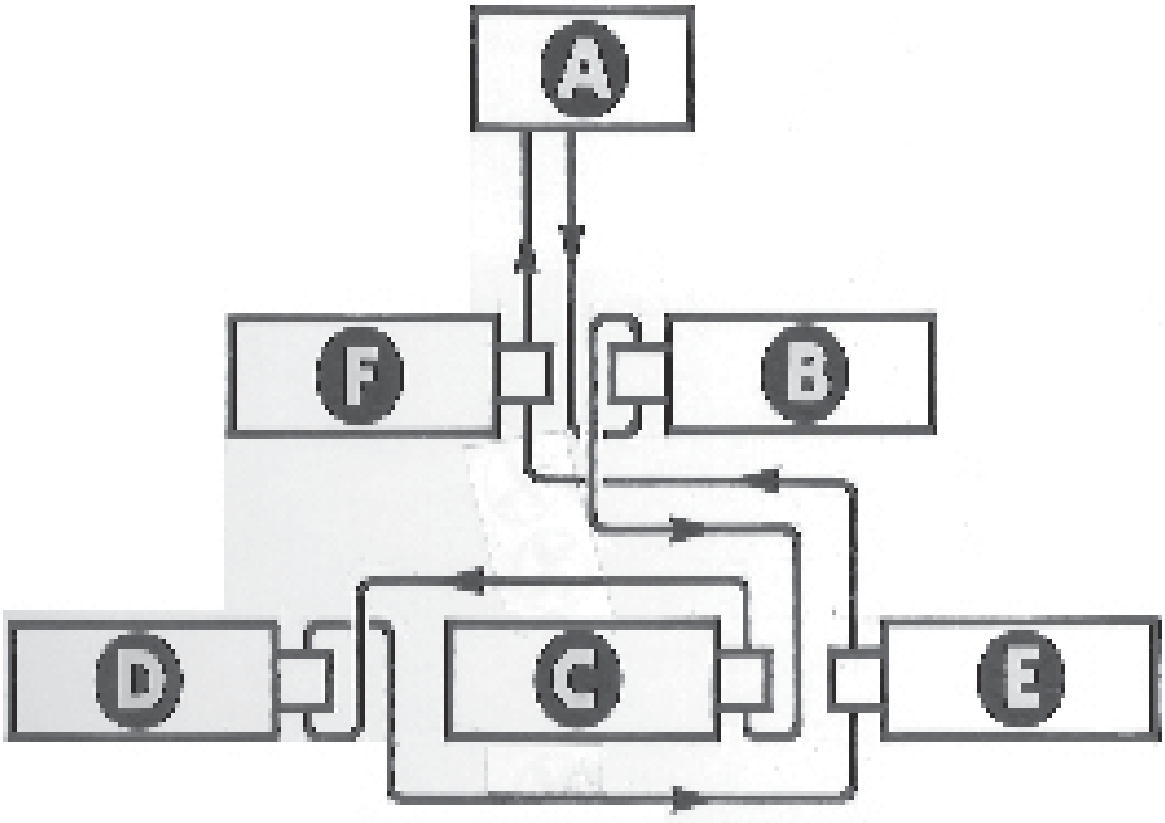

Fig.25

HYDRAULIC CIRCUIT

(Fig. 25)

A = Hydraulic Control Valve.
B = Front Cutting Unit, R.H.
C = Centre Cutting Unit.
D = Wing Cutting Unit, L.H.
E = Wing Cutting Unit, R.H.
F = Front Cutting Unit, L.H.

GUARANTEE

We GUARANTEE that should any defect in workmanship or material occur in the goods within TWO YEARS or two thousand hours (on models equipped with hour meters), or whichever occurs first.
Exception to this warranty will be Aeration products, which are covered for a period of TWO-YEARS or five hundred hours (on models equipped with hour meters) or whichever occurs first.
We will repair, or at our option, replace the defective part without making any charge for labour or for materials, provided that the claim under this guarantee is made through an authorised dealer and that the defective part shall, if we so request, be returned to us or to the dealer.
This guarantee is in addition to, and does not exclude, any condition or warranty implied by law, except that we accept no liability in respect of used/second-hand goods, or in respect of defects which in our opinion are in any way or to any extent attributable to misuse, lack of reasonable care or ordinary wear and tear, or to the fitting of spares, replacements, or extra components which are not supplied or approved by us for the purpose. The use of non-recommended oil or lubricant nullifies the guarantee.
Damage through transport or normal wear does not come under the guarantee.
The warranty is extended to the original purchaser only and is not transferable to subsequent owners. The warranty period begins on the date the product is delivered to the end user (customer), unless otherwise agreed with the manufacturer. At the end of the first year the owner must have the product serviced by an authorised dealer to be eligible for the second year of warranty coverage.

SALES & SERVICE

A network of authorised Sales and Service dealers has been established and these details are available from your supplier.
When service attention, or spares, are required for the machine, within or after the guarantee period your supplier or any authorised dealer should be contacted. Always quote the registered number of the machine.
If any damage is apparent when delivery is made, report the details at once to the supplier of the machine.
It is recommended that the machine number is recorded.
The machine serial number is located on the registration plate .

Machine Number :- .....

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A Textron Company

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