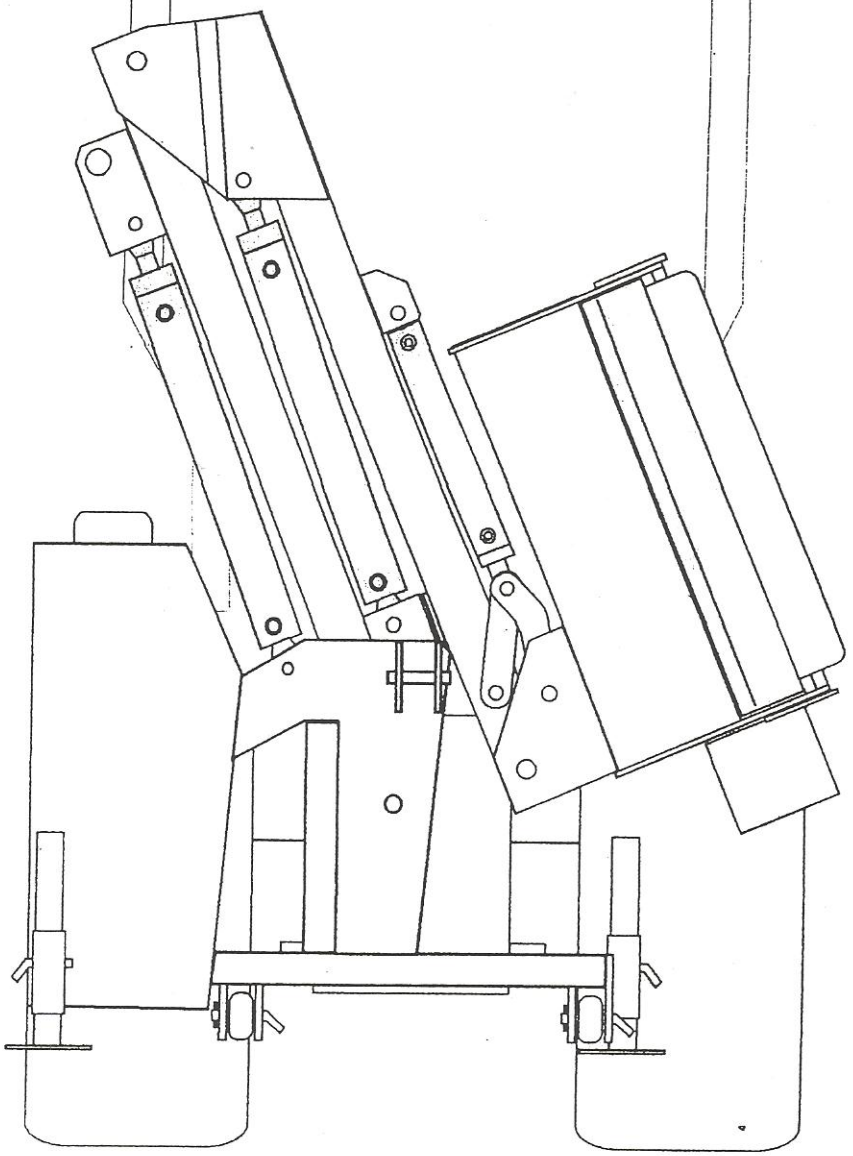
Intermac



BS – Side Arm Flail Mower

Operators Manual

Kilworth
ANNWELL LANE
SMISBY
ASHBY DE LA ZOUCH
LEICS. LE65 2TA
TEL. 01530 412690 FAX. 01530 560002

1.Introduction

This operators manual is one of the most important parts of the BS Side Arm Flail Mower. As it will enable any operator to get optimum performance from the machine with minimum risk of injury or damage to the machine.

Throughout this manual your attention will be drawn to possible hazardous situations by the use of the following symbol:

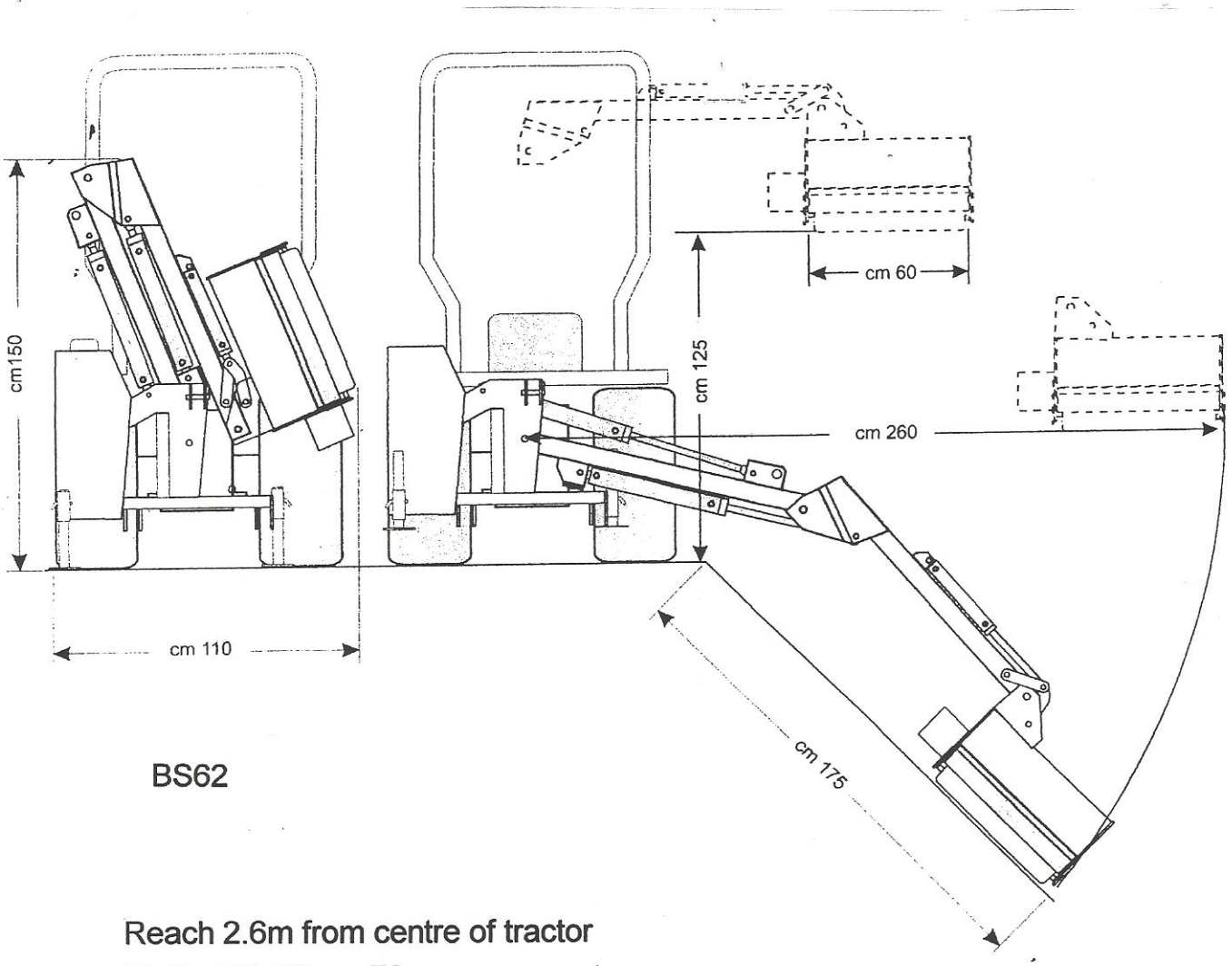
Wherever you see this symbol take careful note of the information that follows. It is for your benefit.

2. Purpose of the BS

The BS Side Arm Flail Mower is designed for mowing grass and maintaining hedges.
It can be fitted to any tractor over 530 kg in weight (650 for BS72) which has category 1 three point linkage and 540rpm 1 3/8" 6 spline Power Take Off shaft. Note that a special fitting kit is required to suit the particular tractor model. See later in this manual for further details.

The BS should not be used for anything other than the tasks mentioned above. Failure to take notice will invalidate the warranty.

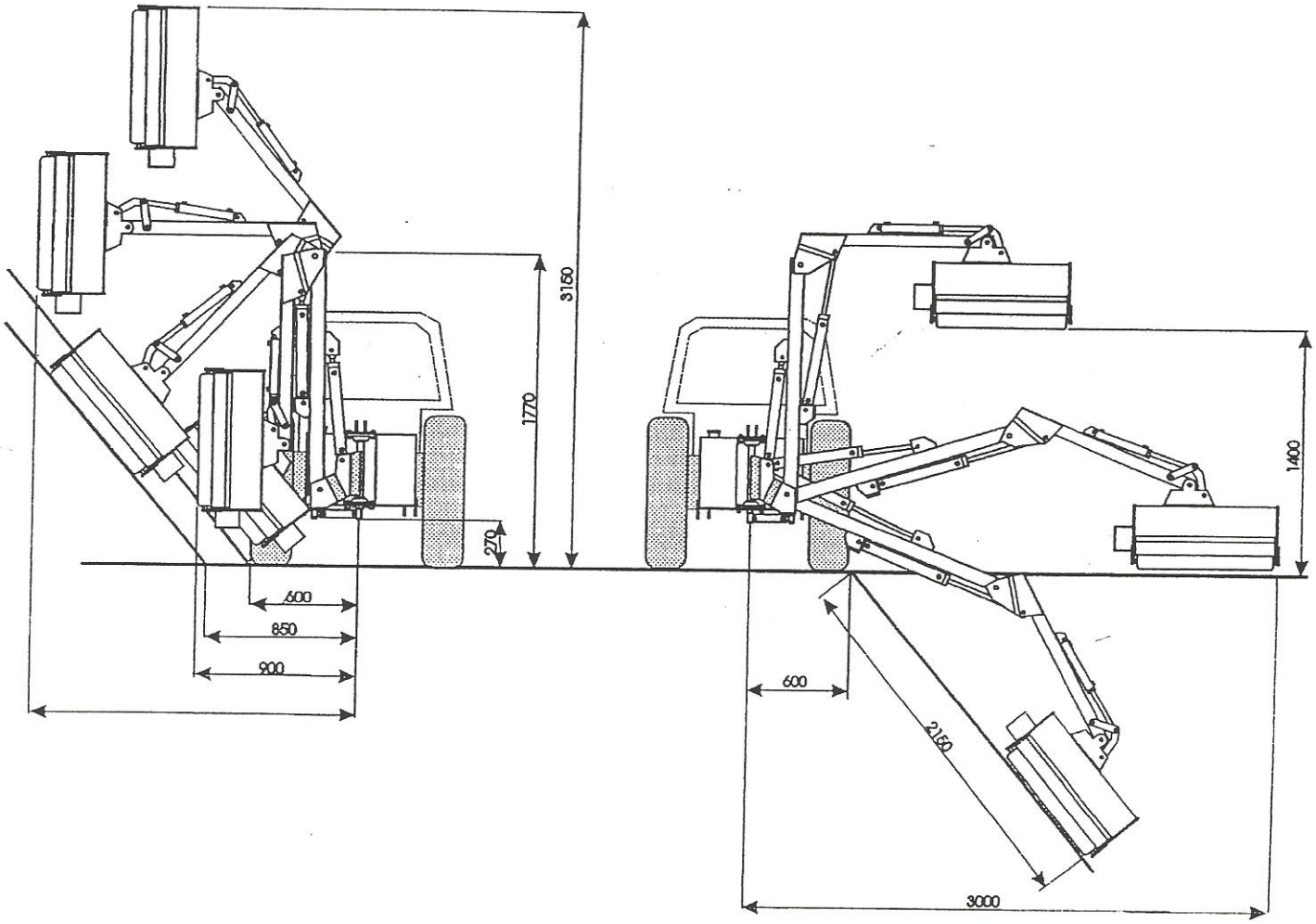
3.Technical Specification



BS62

Reach 2.6m from centre of tractor
Flail width 60cm. 70cm on request
Reversible flail rotor
2 hydraulic circuits independent of tractor hydraulics
PTO speed 540 rpm
Oil tank capacity 55 litres
Hydraulic flow rates 38 l/min for rotor, 9 l/min for cylinder control
Max hydraulic pressure 180 bar
Minimum tractor power 16HP
Total weight when full of oil 265kg
Dimensions when folded 110cmx60cmx150cm high
Number of blades 32 (60cm head)
40 (70cm head)
Rotor speed 3000 rpm

BS72

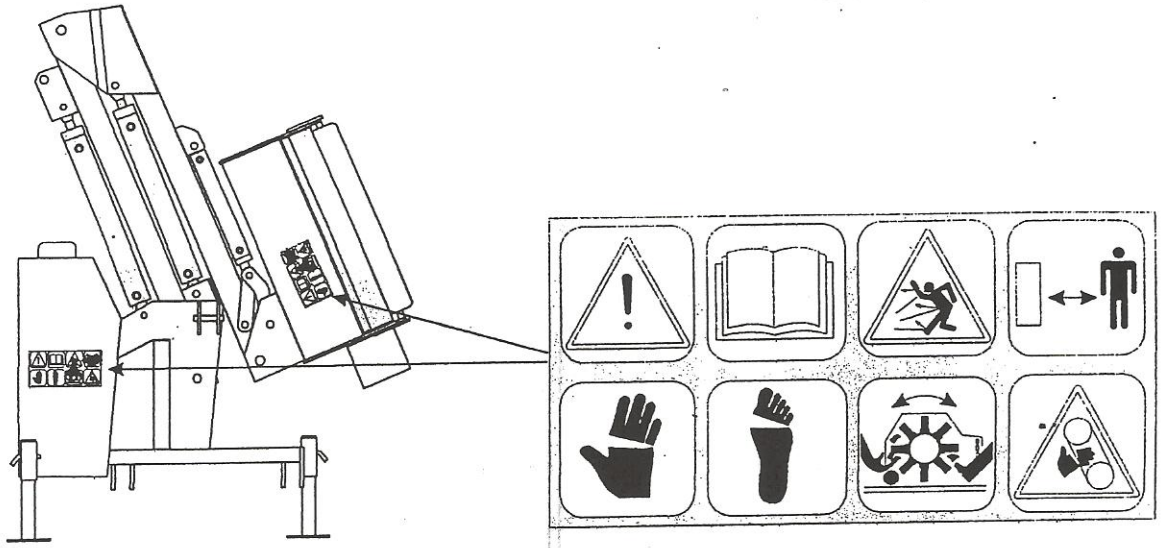


4. Safety and Hazards

General notes on Safety at work.

1. Inspect all parts of the machine any time you intend to put it into work.
2. Check all bolts, nuts and fixings. They must be tight.
3. Beware of bystanders when operating the BS. Keep all persons at least 10 metres away at all times.
4. Keep all guards fixed securely in place.
5. Never get off the tractor without:
   disconnecting the PTO/hydraulic drive
   lowering the flail head to the ground
   applying the parking brake
   switching off the engine and removing the key.
6. Always be ready to disconnect the PTO drive and switch off the engine should a hazardous situation occur.
7. Always be sure any new operator has a thorough understanding of the machine and that they follow the safety precautions. **All** operators must read this manual.
8. Ensure that the tractor can handle the weight of the machine in all positions in complete safety. Pay particular attention when working on slopes.
9. A mesh protection screen must be fitted to the tractor at all times to prevent injury to the driver due to flying debris.
10. Always fold the machine behind the tractor before travelling at road speed.
11. Wear eye protection when using the machine on tractors without a cab.

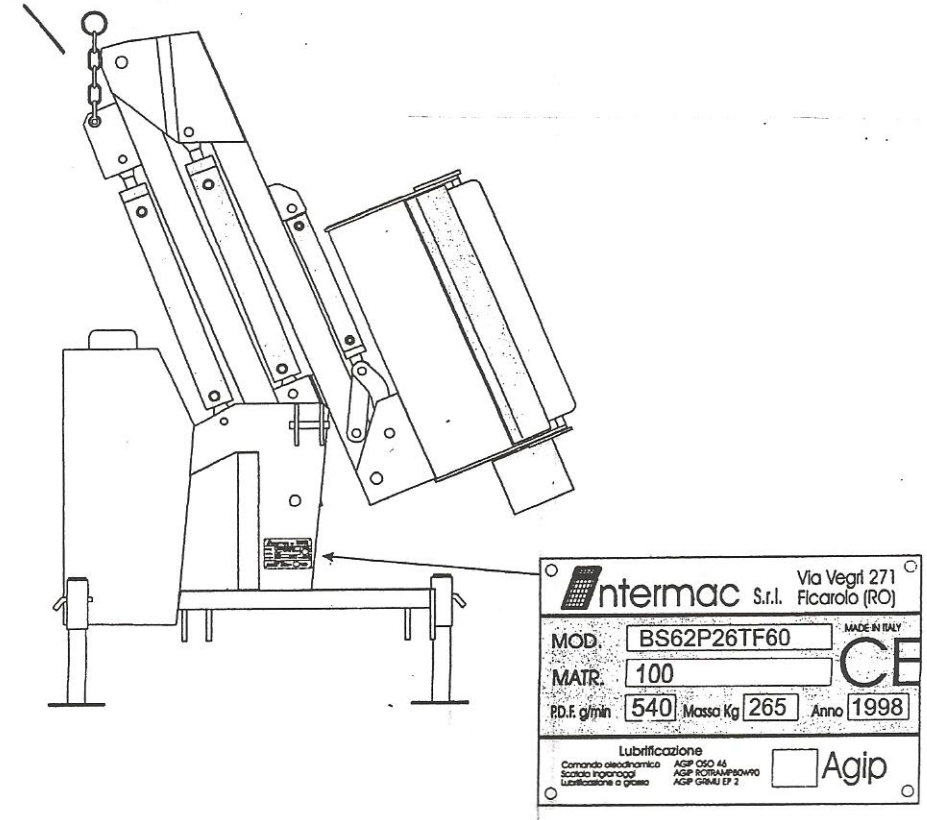
The following Warning labels are affixed to the machine and are self explanatory. Should the labels become illegible please replace them.



5. Machine Identification

The BS is fitted with a machine identification plate which bears a unique serial number. It also gives details of full model code, weight and PTO speed. When contacting your dealer please quote model and serial number.

Lifting Point



6. Fitting BS to Tractor

Fitting the machine to the tractor requires a simple fitting kit which varies depending on tractor make and model. Normally this will be specified on ordering the machine. If you do not have the correct fitting kit please contact Kilworth or your local dealer.

WARNING

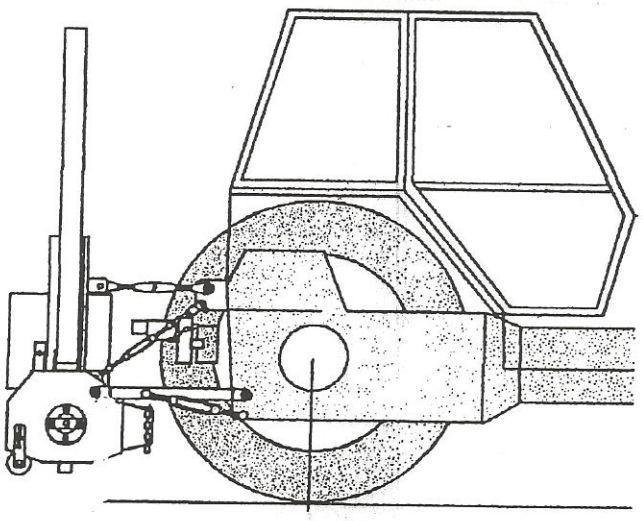
Do not attempt to use the BS without the appropriate fitting kit as this will cause damage to tractor and machine and reduces stability.

The fitting kit comprises two main components:

1] Two stays which are attached between the lower link points on the machine and the top link point on the tractor. These lock the BS rigid behind the tractor and reduce the stress on the tractor linkage.

2] A bracket to attach the hydraulic pump to the tractor.

To fit the machine to the tractor, first attach the bottom links and secure in position. Attach the top link and then raise the machine off the ground until it is at the desired working height. Try to keep it as low as is practical. Adjust the top link so the machine is square to the ground. Fit the two stays included with the fitting kit. Tighten the tractor stabilisers on the bottom links. The BS should now be rigid behind the tractor. See diagram below:



WARNING

Always stop the tractor engine and apply the hand brake before working in the area between tractor and machine.

Fit the hydraulic pump to the tractor PTO shaft and secure with the bolt or pin provided. Ensure there is no side or end load on the pump unit.

Fit the lever console to a convenient position alongside the driver seat. This must be secured rigidly in position.

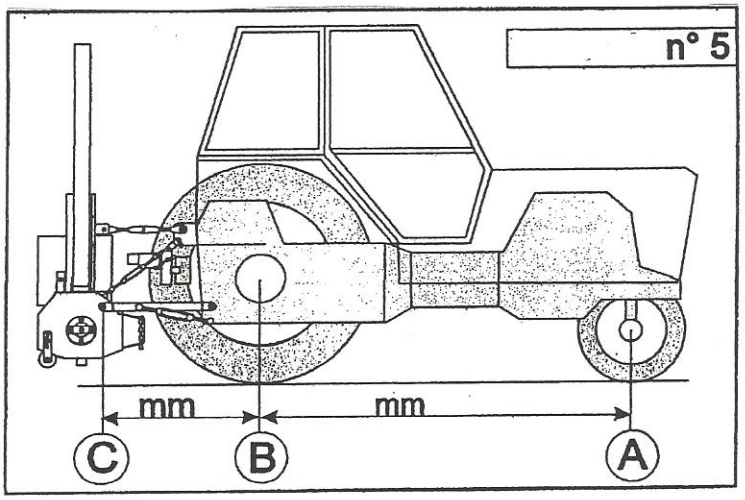
Ensure the tractor is fitted with a mesh safety guard to protect the driver.

Check the oil level in the hydraulic reservoir and the pump unit gearbox. Grease all pivot points (see Maintenance section later in this manual).

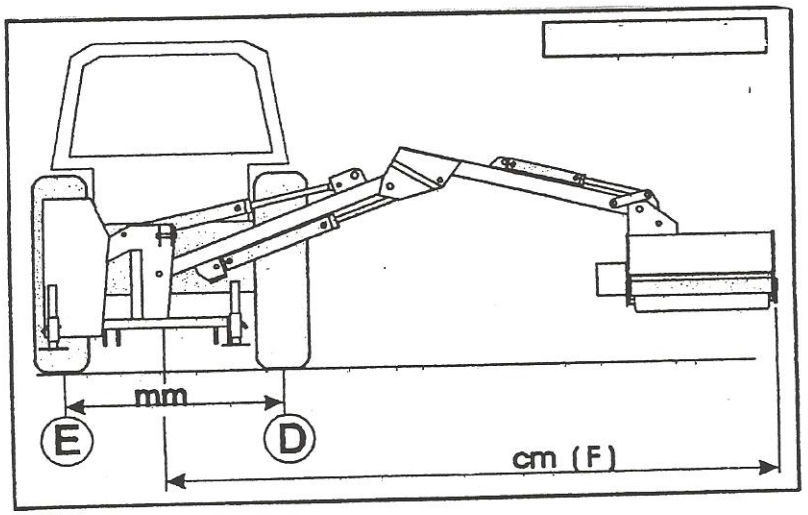
The BS is now ready for work.

7. Operation

Before using the machine first test the tractor for stability.
With the BS fitted to the tractor front ballast weights may be required to balance the tractor. As a guide the front axle of the tractor must always carry no less than 20% of the total combination weight. If the front of the tractor is light add weights at point **A** (Diagram 5).



Once front to back stability is established sideways stability must be checked. Move the flail head out from the tractor (see later in this chapter for control details) keeping it no more than 300mm off the ground until it is at full reach (Diagram 6). If the tractor becomes unstable at any point drop the flail head to the ground.



With the BS at full reach check the weight on wheel **E** (Diagram 6). It should not be less than 15% of the total combination weight. If the tractor becomes unstable consider the following measures:

1] Add water ballast to rear wheels (or wheel E only)

2] Widen the wheel base E to D.

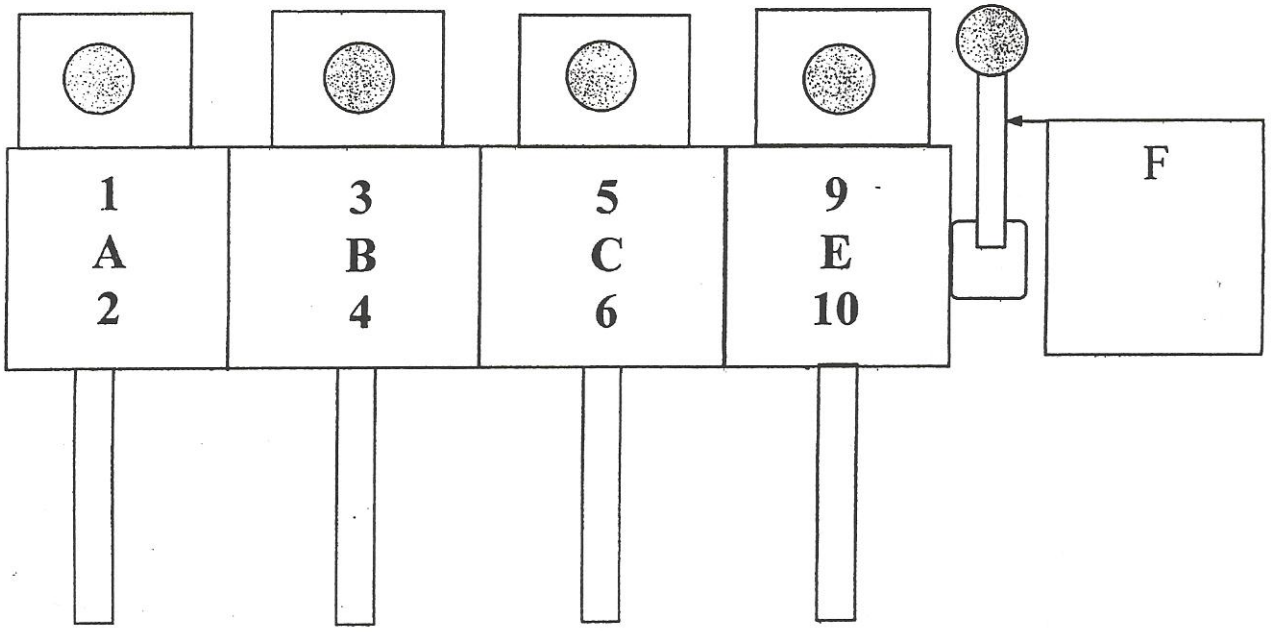
3] Add wheel or ballast weights to the opposite side of the tractor.

WARNING

Stability is of the utmost importance. If the tractor cannot be made stable then the BS must be fitted to a larger tractor. Great care must be taken on slopes as stability will be severely affected.

Controls

There are 5 levers which control the BS62. Three of the levers control the movement of the flail head, the other two the flail rotor. The BS72 has an extra lever which is used to swing the boom from left to right. **This lever must only be used with the tractor engine at low speed.**



Lever A
1] Lift primary boom
2] Lower primary boom

Lever B
1] Inclination of flail head down
2] Inclination of flail head up

Lever C
1] Closing of secondary boom
2] Opening of secondary boom

Lever E
1] Rotation of the rotor in the right direction
2] Rotation of the rotor in the left direction

Lever F
To adjust lever E this lever must also be moved in the same direction (to prevent accidental operation of lever E).

On BS72 machines the boom will swing to either side of the tractor to allow cutting on the left or right. A hydraulic cylinder under the oil tank moves the arm from side to side. This is operated by the fifth control lever in the bank of control levers. To swing the arm, operate the lever until the arm is directly behind the tractor. At the central point, push the lever fully in the opposite direction to take the arm over centre and pull it back round to the other side.

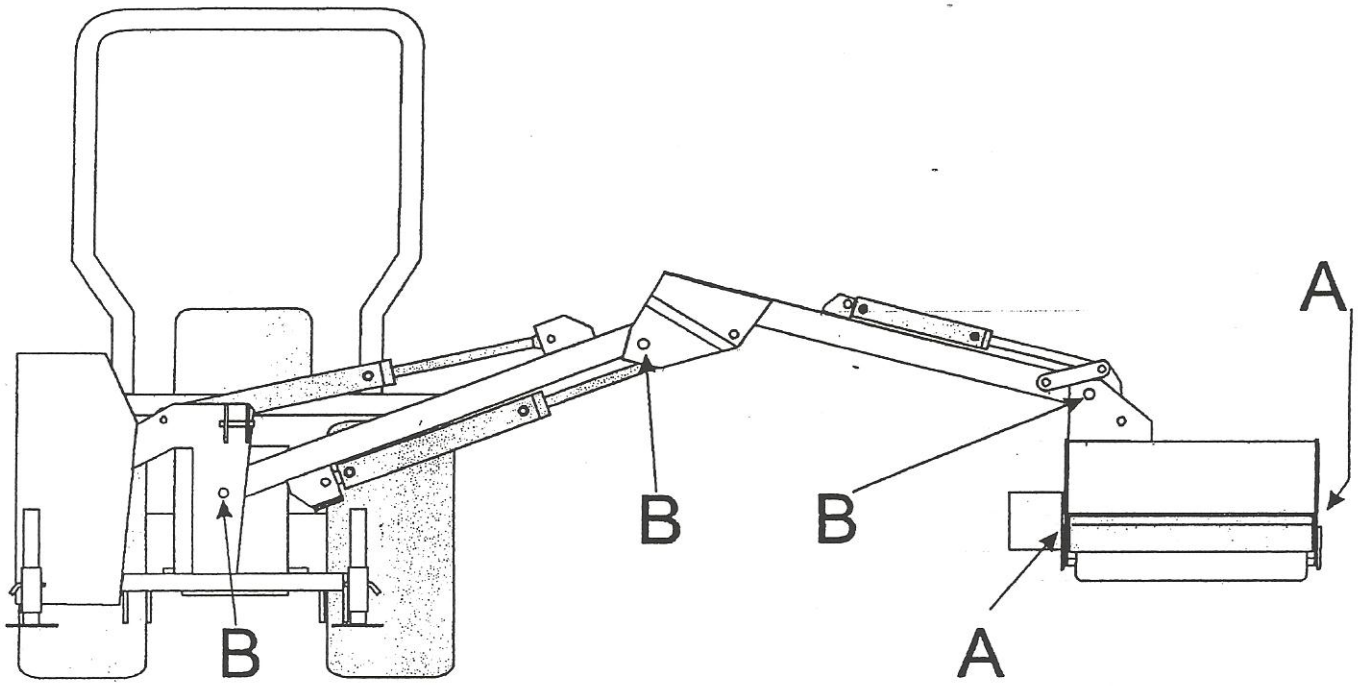
To operate the BS, unfold the boom using levers A,B and C until the head is at the required position. Operate the levers gently to prevent rapid movement of the head.
With the tractor at low engine speed, engage the rotor drive with lever E. For grass cutting it is recommended that the rotor turns anticlockwise when viewed from the right side. This allows the cut grass to be taken over the top of the rotor and discharged to the rear,
Once the rotor is turning increase tractor engine speed to give 540rpm at the PTO.
Move the tractor forward at a low speed (3km/h max).
For hedge cutting the rotor should run in the opposite direction and the rear roller should be removed.

CAUTION.

Do not reverse the direction of rotation of the flail rotor while it is running. To reverse the direction, stop the rotor completely and then restart in the opposite direction.

To adjust cutting height when cutting grass, adjust the roller stops on each side of the flail head.

7. Maintenance



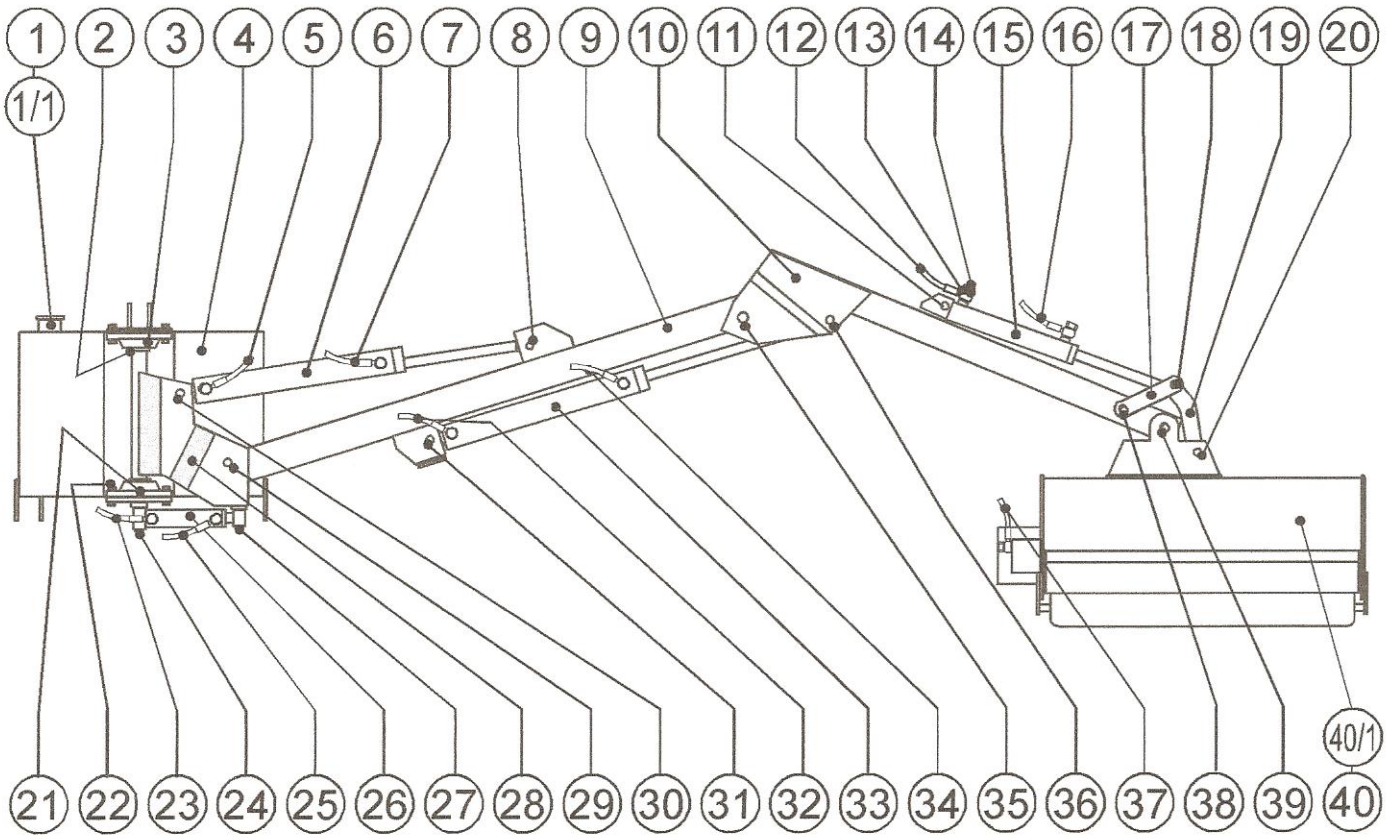
Check oil levels every 8 hours:		
Type of oil in pump gearbox	80W90 Gear oil	0.4 litres
Type of oil in main reservoir	OSO 46 Hydraulic oil	65 litres
Grease points A every 4 hours.	Multi use EP2	
Grease points B every 16 hours.	Multi use EP2	

Change the oil in pump gearbox every 300 hours.

Change the oil in the hydraulic reservoir every 1000 hours.

PROCOMAS

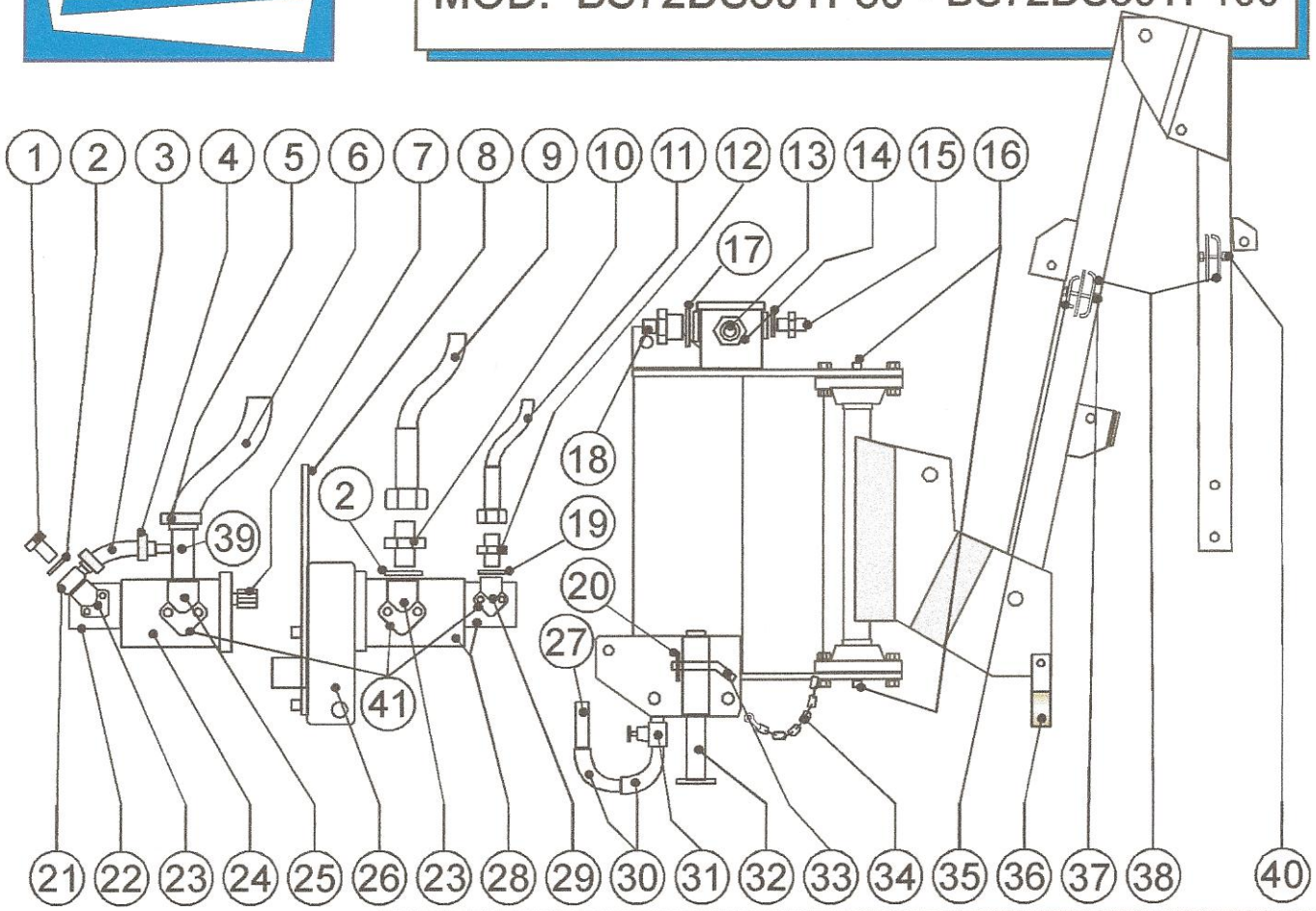
TAVOLA RICAMBI n° 1
MOD. BS72DS30TF80 - BS72DS30TF100



ARTICOLI PER BS72 TAVOLA n° 1					
1	Filtro	74 FIS100	21	Rasamento	01 BS72.03
1/1	Cartuccia	74 CR100/6	22	Bullone	41 TEM14X45/C
2	Boccola	01 U121.35.45.40	23	Tubo gomma	73 T8/16Q
3	Supporto	02 BS72.13	24	Perno	01 U114.20.90
4	Serbatoio olio	03BS72.01/2	25	Tubo gomma	73 T8/16R
5	Tubo gomma	73 T8/16N	26	Cilindro	10 U155.35/4
6	Cilindro alzata	10 U155.02	27	Perno	01 U114.20.80
7	Tubo gomma	73 T8/16N	28	Cerniera	03 BS72.02/2
8	Perno	01 U114.19.100/C	29	Perno	01 BS80.33/C
9	1° Braccio	03 BS72.04	30	Perno	01 U114.19.120/C
10	2° Braccio	03 BS72.05	31	Perno	01 U114.19.100/C
11	Perno	01 U114.20.110/C	32	Tubo gomma	73 T8/16L
12	Tubo gomma	73 T8/16I	33	Cilindro snodo	10 U155.02
13	Rondella rame	70 RR14	34	Tubo gomma	73 T8/16M
14	Vite forata	70 VPO14	35	Perno	01 BS80.33/C
15	Cilindro trincia	10 U155.35/3	36	Perno	01 U114.19.110/C
16	Tubo gomma	73 T8/16H	37	Tubo drenaggio	73 T8/16G
17	Leva diritta	01 BS72.07	38	Perno	01 U111.25.145/C
18	Perno	01 U114.20.135/C	39	Perno	01 U111.25.145/C
19	Leva curva	01 BS72.06	40	Trincia completa 80	TFH80F9
20	Perno	01 U114.20.135/C	40/1	Trincia completa 100	TFH100F9

PROCOMAS

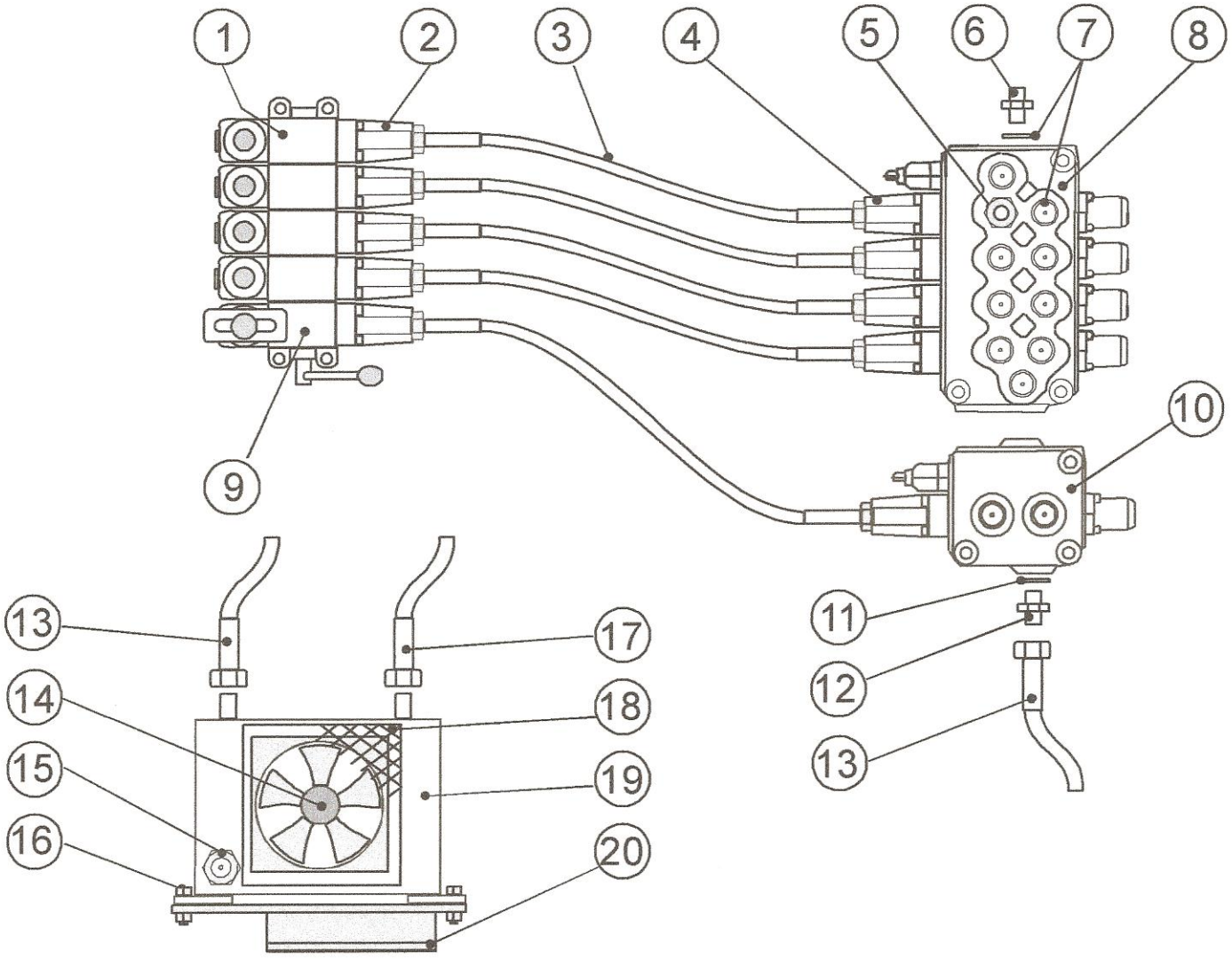
TAVOLA RICAMBI n° 2
MOD. BS72DS30TF80 - BS72DS30TF100



ARTICOLI PER BS72 TAVOLA n° 2					
1	Vite forata 1/2"	70 VPO12	21	Raccordo aspirazione	02 BS82.11
2	Rondella rame 1/2"	70 RR12	22	Pompa servizi	75 PL10.4D/2
3	Tubo aspirazione	73TA20/30X100	23	Raccordo a gomito	78 1G12
4	Fascetta	70 FASOA	24	Pompa primaria	75 PL20.20D/1/1
5	Fascetta	70 FASOA	25	Raccordo a gomito	78 2G34
6	Tubo aspirazione	73 TA25/35X1100	26	Moltiplicatore	35 MLT2FR3,8
7	Semigiunto	79 MO2/14	27	Tronchetto	72 TRF34X80
8	Piastra attacco	01 BS72.11	28	Pompa doppia	75 PL20.20+10.4D
9	Tubo mandata	73 T8/16A	28\1	Pompa doppia (*dal 2002)	75 PL20.25+10.5D
			29	Raccordo a gomito	78 1G38
10	Niplo 1/2"	70 NM12	30	Curva MF 3/4"	72 C90MFL34
11	Tubo mandata	73 T8/16E	31	Rubinetto	72 SV34
12	Niplo 3/8	70 NM38	32	Piede di appoggio	02 BS72.09
13	Niplo 3/8"-1/4"	79 NRM38M14	33	Perno per piede	01 U116.14.90
14	Rondella rame 3/8"	70 RR38	34	Kit sostegno tubi	01 BS72.10/1
15	Niplo 3/8"	70 NM38	35	Staffa per tubi	01 BS82.07/1
16	Ingrassatore M6	43 INGR6D	36	Supporto tubi	01 BS72.10
17	Rondella Rame 1"	70 RR10	37	Vite 8x70	41 TEM8X70ZN
18	Niplo 1"-1/2"	70 NRM10M12	38	Staffa tubo	01 BS82.07
19	Rondella rame 3/8"	70 RR38	39	Collettore aspirazione	02 BS82.08
20	Copiglia elastica	43 CMB3	40	Vite 8x50	41 TEM8X50ZN
			41	Kit guarnizioni	24 3.121/132

PROCOMAS

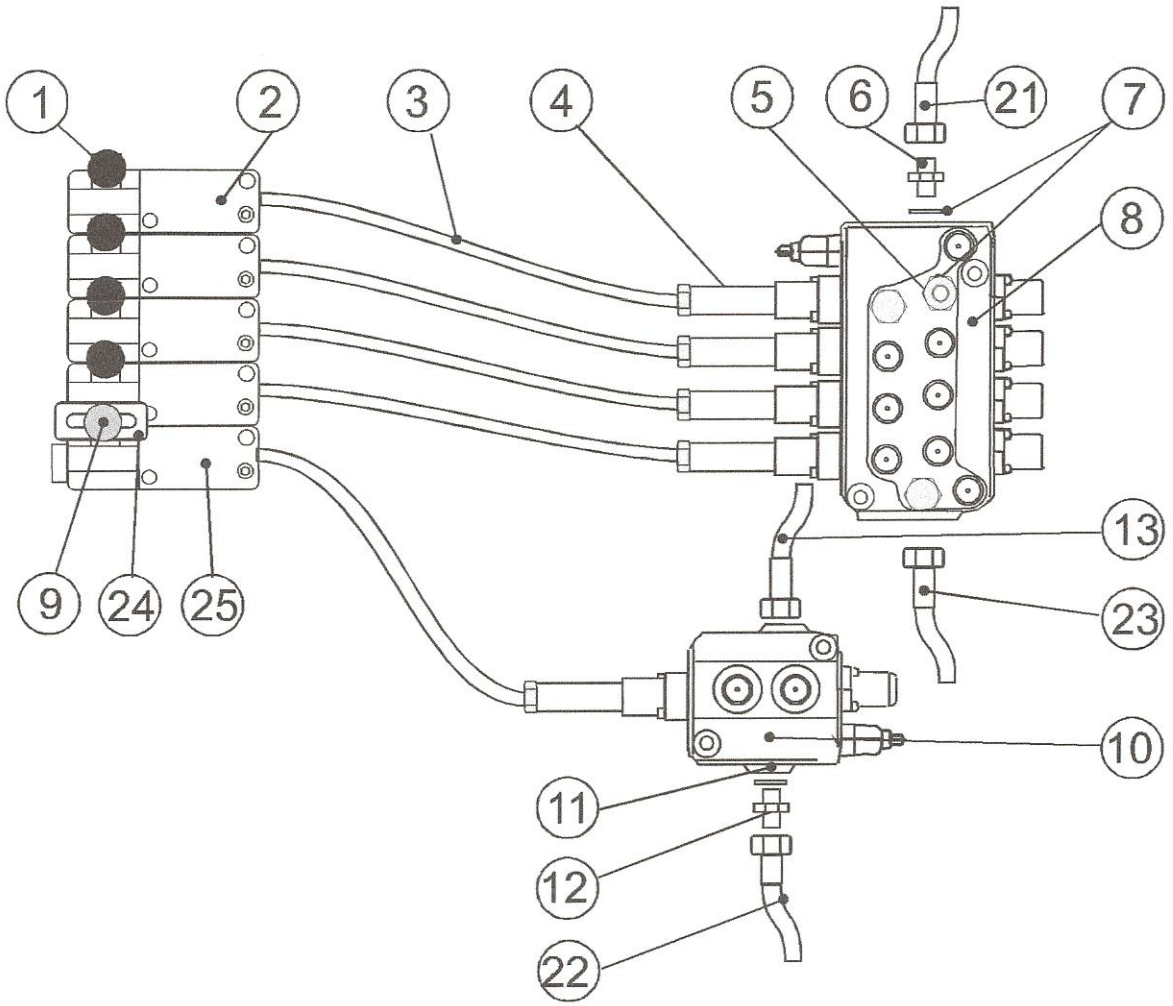
TAVOLA RICAMBI n° 3
MOD. BS72DS30TF80 - BS72DS30TF100



ARTICOLI PER BS72 TAVOLA n° 3					
1	Kit leva singola	77 TCC5	13	Tubo ritorno	73 T8/16D
2	Kit attacco cavo	77 KGR5	14	Elettroventola	74 VRO100-12V
3	Cavo flessibile	77 CF1500	15	Bulbo	74 BLR60
4	Kit attacco cavo	77 KTC5	16	Bullone	41 TEM8X25
5	Niplo	70 NRM38M14	17	Tubo ritorno	73 T8/16D
6	Niplo	70 NM38	18	Rete protezione	74 RERO100
7	Rondella rame 3/8	70 RR38	19	Radiatore completo	74 RO100MV1
8	Distributore	77 VCD20/4 18X4	20	Staffa supporto rad.	01 BS72.15
9	Kit leva anti inversione	77 TCC5/1UL			
10	Distributore	77 VCD25/1 211/12			
11	Rondella rame 1/2	70 RR12			
12	Niplo	70 NM12			

PROCOMAS

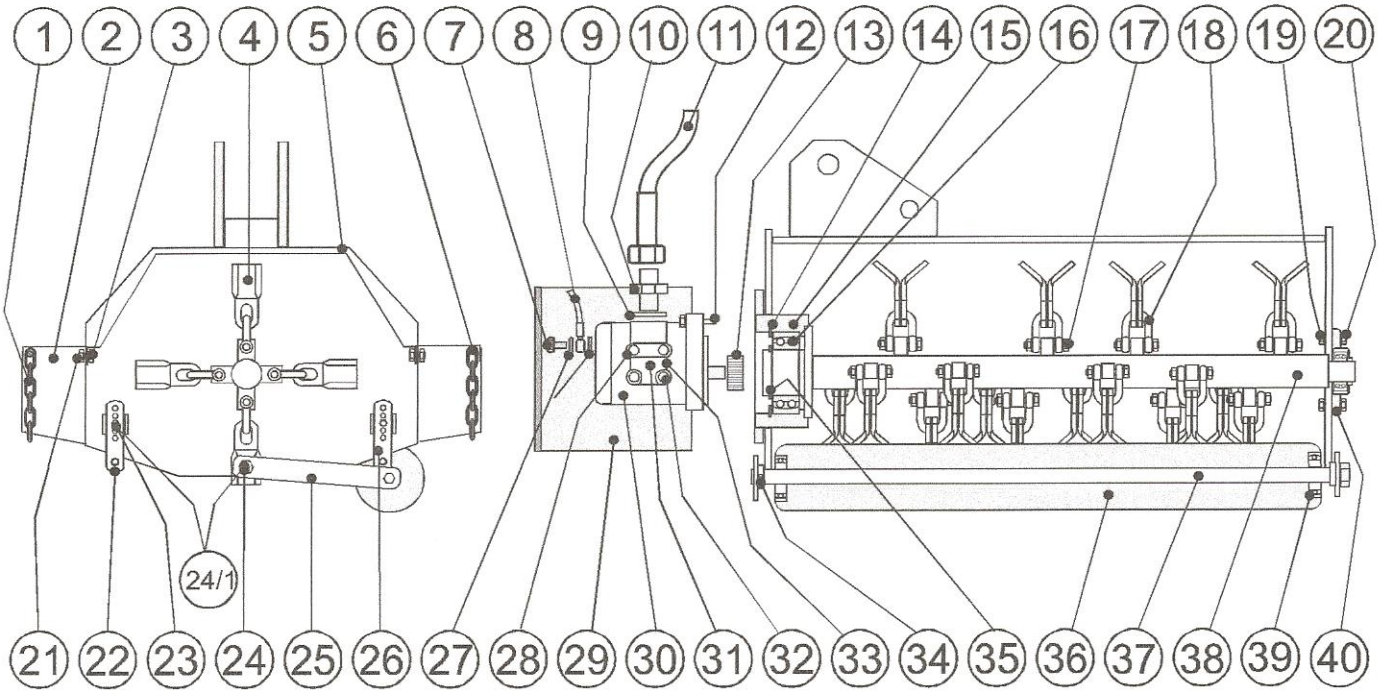
TAVOLA RICAMBI n° 3/1
MOD. BS72DS30TF80 - BS72DS30TF100



ARTICOLI PER BS72 TAVOLA n° 3/1					
1	Leva singola	77 DLLEVA	13	Tubo ritorno 1/2	73 T8/16D
2	Blocco Leva	77 DLBL	21	Tubo mandata 5/16	73 T8/16E
3	Cavo flessibile	77 DLCF1500	22	Tubo mandata 1/2	73 T8/16A
4	Kit attacco cavo	77 DLAC	23	Tubo ritorno 5/16	73 T8/16S
5	Niplo	70 NRM38M14	24	Piastra anti inversione	77 DLPAI
6	Niplo	70 NM38	25	Blocco leva anti inv.	77 DLBLAI
7	Rondella rame 3/8	70 RR38			
8	Distributore	77 MLGZA5A1X3			
9	Leva anti inversione	77 DLLAI	1÷3	Gruppo 5 elem+CF1500	77 GL5EDO
10	Distributore	77 MD1AD3	1÷10	Gruppo distributore+CF	77 ML4+MD1/tc15x5
11	Rondella rame 1/2	70 RR12			
12	Niplo	70 NM12			

PROCOMAS

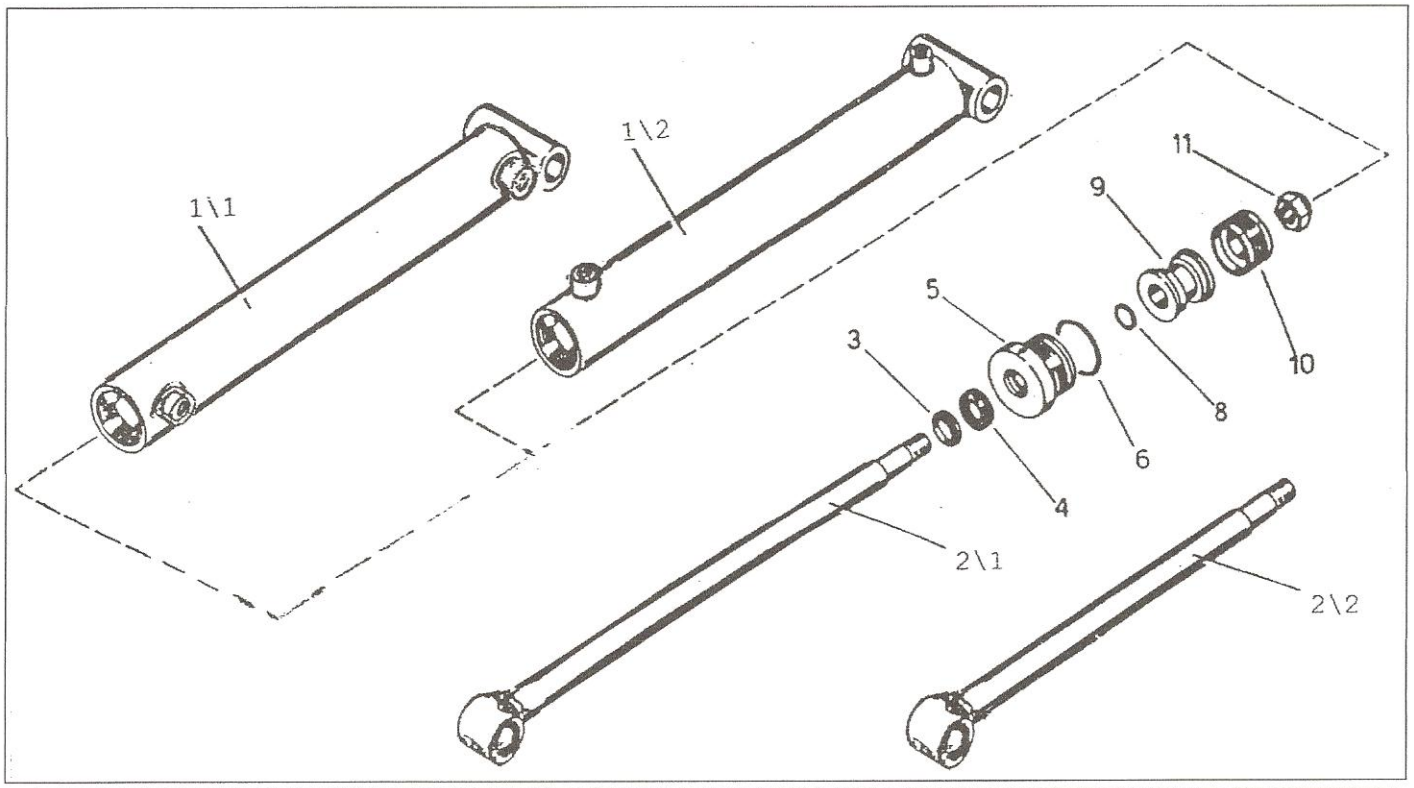
TAVOLA RICAMBI n° 4
MOD. BS72DS30TF80 - BS72DS30TF100



ARTICOLI PER BS72 TAVOLA n° 4					
1	01 TF80.29/1	Catenelle protezione	24	41 TEM12X50ZN	Vite
2	02 TFH80.31	Protezione Ant. e Post.	24/1	42 DAUTM12	Dado
2/1	02 TFH100.31	Protezione Ant. e Post.	25	02 TFH80.03/4	Staffa attacco rullo
3	41 TEM8X20ZN	Vite	26	02 TFH80.02D	Staffa DX
4	07 U150.30	Zappetta	27	70 RR14	Rondella rame
5	03 TFH80.01/2L	Cofano trincia 80	28	41 TCEIM6X55ZN	Vite
5/1	03 TFH100.01/2L	Cofano trincia 100	28/1	41 TCEIM6X45ZN	Vite
6	01 TF80.29	Perno per catena 80	29	02 TFH80.04	Carter prot. motore
6/1	01 TF100.29	Perno per catena 100	30	76 PLM14R	Motore idraulico x TFH80
			30/1	76 PLM16R	Motore idraulico x TFH100
7	70 VPO14	Vite forata 1/4	31	78 2GB34	Raccordo a gomito 3/4
8	73 T8/16G	Tubo drenaggio	31/1	78 1GB12	Raccordo a gomito 1/2
9	70 RR12	Rondella rame 1/2	32	41 TCEIM6X35ZN	Vite
9/1	70 RR34	Rondella rame 3/4	32/1	41 TCEIM6X30ZN	Vite
10	70 NM12	Niplo maschio 1/2	33	24OR3087	Guarnizioni 3/4
10/1	70 NRM34M12	Niplo maschio 3/4	33/1	24 OR3075	Guarnizioni 1/2
11	73 T8/16C	Tubo	34	41 TEM8X40ZN	Vite
12	41 TEM8X45	Vite	35	26 SDE40	Seeger
13	01 F80.16	Semigiunto	36	03 RT80.09	Rullo 80
14	26 SDI80	Seeger	36/1	03 RT100.09	Rullo 100
15	01 F80.06	Supporto lato motore	37	02 TFH80.14	Perno per rullo 80
16	20 1208	cuscinetto	37/1	02 TFH100.14	Perno per rullo 100
17	07 U151.08/C	Bullone con dado	38	04 -F9-TFH80	Albero completo 80
18	07 U150.28	Grillo temperato	38/1	04 -F9-TFH100	Albero completo 100
19	41 TEM14X35ZN	Vite	38/2	04 -F9-TFH80R	Albero completo 80 rinforzato
20	42 DAUTM14	Dado	38/3	04 -F9-TFH100R	Albero completo 100 rinforzato
21	42 DAUTM8	Dado	39	22 6204 2RS	Cuscinetto
22	02 TFH80.02S	Staffa SX	40	23 UCFL205	Supporto con cuscinetto
23	41 TEM12X30ZN	Vite			

PROCOMAS

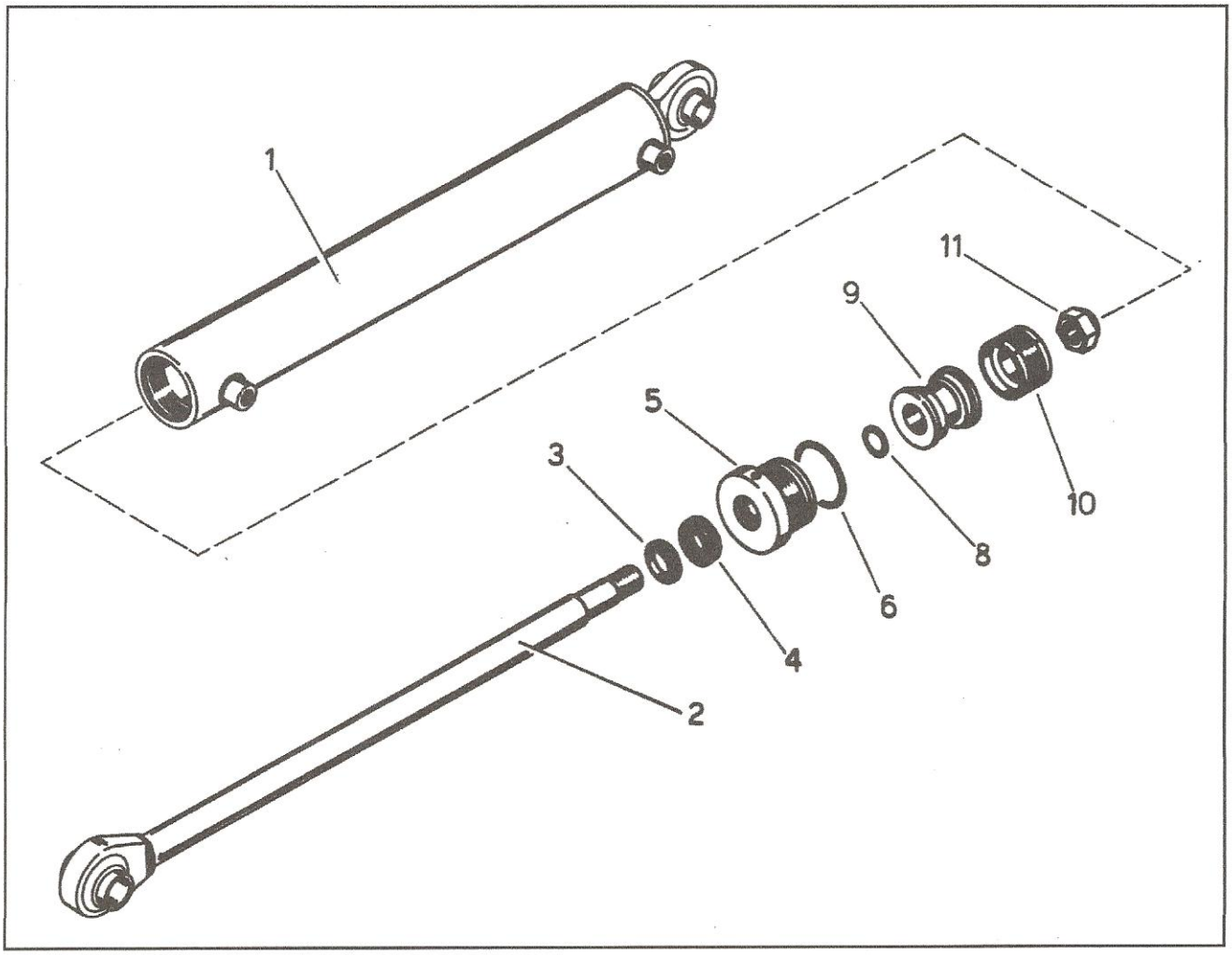
TAVOLA RICAMBI n° 5
MOD. BS72DS30TF80 - BS72DS30TF100



CILINDRO ALES.DIAM.40 STELO DIAM.25 CORSA 245 - U155.35/3				
CILINDRO ALES.DIAM.40 STELO DIAM.25 CORSA 220 - U155.35/4				
	DISTINTA TAVOLA RICAMBI N	**135/3**	**135/4**	
POS.	**DESCRIZIONE**	**PEZZI**	**PEZZI**	**CODICE ARTICOLO**
1\1	Camicia cil. ales 40 corsa 245- fori ø 20	1	-	10 U154.02/35/3
1\2	Camicia cil. ales 40 corsa 220 -foro ø 20	-	1	10 U154.02/35/4
2\1	Stelo diam.25 per corsa 245 -foro ø 20	1	-	10 U154.01/35/2
2\2	Stelo diam.25 per corsa 220 -foro ø 20	-	1	10 U154.01/35/4
3	Raschiatore per stelo d.25(rif.Polypac)	1	1	24 WRM098129
4	Guarnizione per stelo d.25 (Rif.Polypac)	1	1	24 B/NEI129098/1
5	Testina guida stelo diam.25 ales.40	1	1	10 U153/40/25
6	Guarnizione OR (Rif.Polypac)	1	1	24 OR4143 > OR4150
6*	Guarnizione OR (Rif.Polypac)	*oppure OR4150		
8	Guarnizione OR (Rif.Polypac)	1	1	24 OR2062
9	Pistone per cilindro ales. 40	1	1	10 U152/40/25
10	Guarnizione su pistone ales.40(ALTO)	1	1	24 DBM157118
10*	Guarnizione su pistone ales.40(BASSO)	oppure 24 DBM157118/1		
11	Dado autobloccante MB16 x 1,5	1	1	42 DAUTMB16X1,5
	Serie completa guarniz. cil.al.40 st.25	1	1	24 U155/40/25
	Cilindro compl.al.40 st.25 c.245-foro ø20	1	-	10 U155.35/3
	Cilindro compl.al.40 st.25 c.220-foro ø20	-	1	10 U155.35/4

PROCOMAS

TAVOLA RICAMBI n° 6
MOD. BS72DS30TF80 - BS72DS30TF100



CILINDRO ALES.DIAM.50 STELO DIAM.25 CORSA 400 - U155.02			
POS.	**DESCRIZIONE**	**PEZZI**	**CODICE ARTICOLO**
1	Camicia cil. ales 50 corsa 400	1	10 U154.02/02
2	Stelo diam.25 per corsa 400	1	10 U154.01/02
3	Raschiatore per stelo diam.25 (rif.Polypac)	1	24 WRM098129
4	Guarnizione per stelo diam.25 (Rif.Polypac)	1	24 B/NEI129098/1
5	Testina guida stelo diam.25 ales.50	1	10 U153/50/25
6	Guarnizione OR (Rif.Polypac)	1	24 OR4187 >OR152
8	Guarnizione OR (Rif.Polypac)	1	24 OR3081
9	Pistone per cilindro ales. 50	1	10 U152/50/25
10	Guarnizione su pistone ales.50	1	24 DBM196133
11	Dado autobloccante MB20 x 1,5	1*	42 DAUTMB20X1,5
	Serie completa guarnizioni cil.al.50 st.25	1	24 U155/50/25
	Cilindro completo ales.50 stelo 25 corsa 400	1	10 U155.02