CHASSIS SERIAL NUMBER……

SECTION & CONTENTS

1. OPERATING INSTRUCTIONS

The intended purpose of the vehicle is to tow and spread manure and other materials.

1.1 Hitching to tractor.

Attach spreader to pick-up hook or static hitch stub. Do not attach to swinging drawbar or pick-up hook in extended position.

Remove screwjack from drawbar (if fitted) and locate in transport position provided at the front of spreader.

Slide the tractor end of the PTO shaft out and fit to the tractor PTO. Lay the two halves of the PTO shaft alongside one another and mark the required lengths, allowing for turning. Minimum of 150mm (6 inches) engagement of the two halves. Cut to size and clean burrs at each end of shaft **KEEP SHAFT SLIDING SURFACES GREASED.** Attach chains fitted to PTO guard (to prevent rotation of guard) to suitable point on the tractor and hole provided on metal cover over PTO shaft on spreader. Ensure that the spring loaded pins in splined yokes are fully locked in position. Always disengage the PTO when turning sharply to avoid damage to shafts universal joints. Where a wide angle PTO is fitted attach this end to the tractor.

1.2 Coupling of hydraulic hoses.

Fit the two hoses for the floor drive hydraulic motor (one to feed and one for return) to double spool valve on tractor. Choose position of spool lever for ease of control to obtain floor movement to rear. Reversing of floor is done by selecting the opposite port of rearward floor movement in tractor cab. Universal quick release probes are fitted as standard to hose ends. Mark hose as required to assist in the future coupling for correct position of feed and return. When a slurry door is fitted connect the hydraulic hoses to a double spool valve and select the hose positions to suit the operator to open and close the door.

Fit hydrualic brake hose to trailer brake valve on tractor (male fitting).
A universal female brake coupling is fitted as standard to the hose ends.

N.B CHECK DIRECTION OF FLOOR BEFORE LOADING.
Do not run floor in reverse with full load. Speed of floor in reverse is at **MAXIMUM**.
Only reverse floor for a few seconds.

1.3 Hand brake.

The handbrake is a multi-stroke ratchet type. To apply the handbrake give the handle short pumps (a clicking of the ratchet will be heard) until resistance occurs and subsequent tightening of the cable. To release the handbrake give the handle one sharp movement to the left. This releases the ratchet mechanism.

1.4 Brake adjustment.

Brake adjustment is carried out at the hydraulic brake ram unit fitted to each wheel axle giving independent adjustment to each wheel. To adjust, jack up the spreader, slacken the locknut in the set screw and turn the set screw clockwise. (See pages 89 & 90)
BEWARE NOT TO OVER ADJUST. Make sure the wheel can rotate freely.

1.5 Floor adjustment.

When adjusting floor chains ensure that the adjustment is carried out equally to both sides. (See page 19)

DO NOT ALLOW THE CHAINS TO BECOME TOO SLACK.
ADJUST CHAINS AFTER A FEW LOADS.
KEEP CHAINS ADJUSTED CORRECTLY AT ALL TIMES, A GUIDE IS TO BE ABLE TO SEE A WHOLE LINK BELOW FRONT BOTTOM EDGE OF SPREADER i.e. FROM CENTRE TO FRONT.

Reverse floor
The floor should only be reversed for very short periods, to clear the augers.
Do not reverse if the floor chain is slack, tighten floor chain first. (See page 19)

1.6 Method of operation.

1) Select speed of floor required on control valve.
2) Engage PTO to power the rear augers – tractor engine revs low.
3) Engage spool valve to power floor to rear.

1.7 Slurry Door

As the load height reduces lower the slurry door to cover the augers. This will help prevent foreign objects being thrown forward.

2. MAINTENANCE

2.1 Lubrication of spreader.

DAILY GREASE Front and rear floor shaft
Overrun clutch to front of main 'T' gearbox

WEEKLY GREASE All sealed bearing – 2 pumps of grease gun maximum.

TAKE CARE NOT TO DAMAGE GREASE SEAL BY OVERGREASING
Sliding tube of PTO shaft.
PTO universal joints – **Follow instructions as for sealed bearings.**
Screwjack top (when fitted)
Shearbolt bush

MONTHLY	Check gearbox oil levels
ANNUALLY	Change oil to all gearbox
TYPE OF LUBRICATION GREASE	Multi purpose
GEARBOXES	EP90

2.2 Shearbolt Protection.

Only one shearbolt is fitted to the spreader. This is located on the spreader end of the PTO shaft. The bolt is M10 x 60 grade 6.8 mild steel.
ON NO ACCOUNT MUST A BOLT OF HIGHER GRADE THAN 6.8 TENSILE STRENGTH BE FITTED.

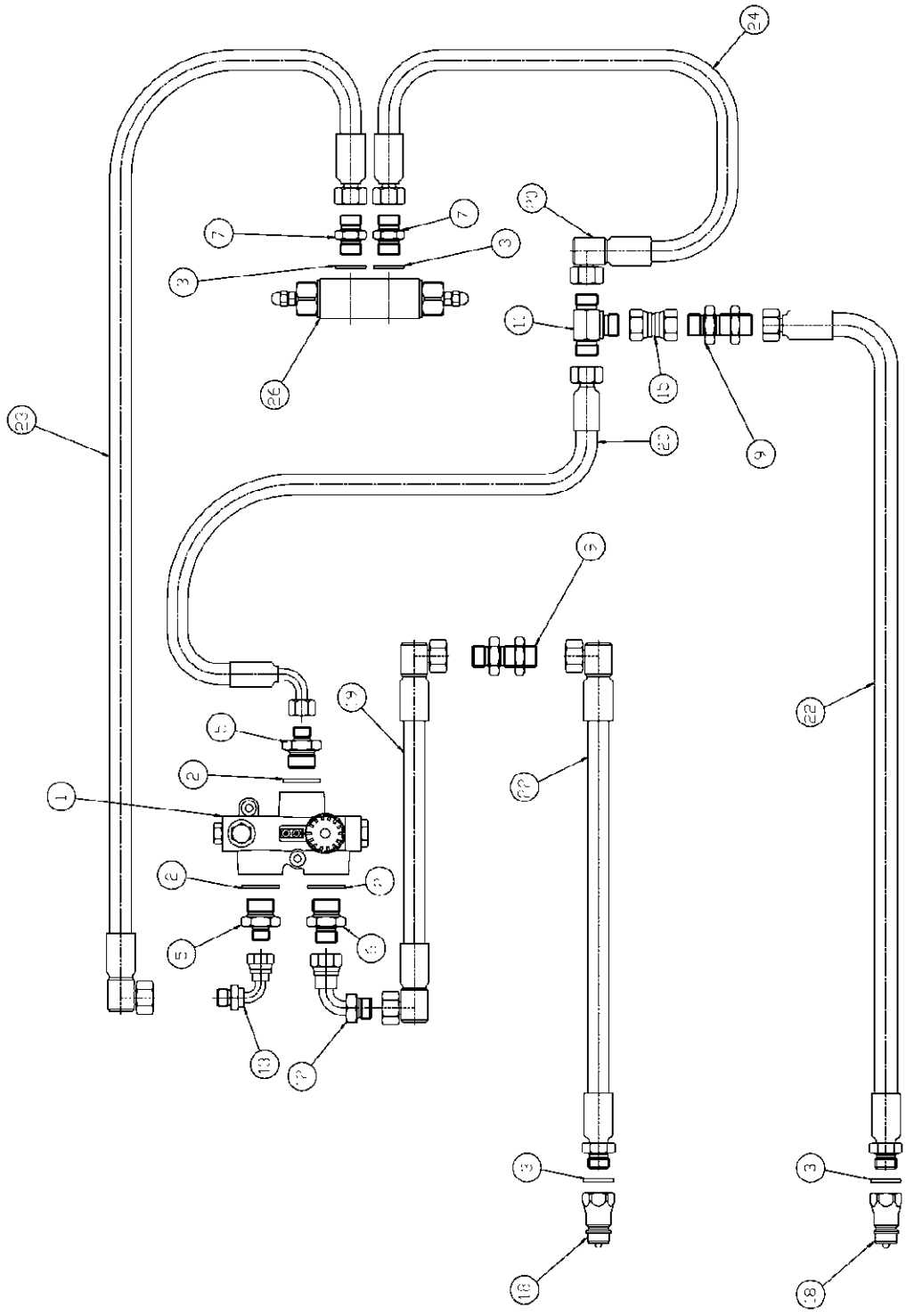
2.3 Pressure relief valve to floor drive.

This valve is cross line type and fitted to the hydraulic motor on the floor drive gearbox. The pressure can be varied to suit the material being spread. To adjust, engage the oil flow via the spool valve on the tractor, slacken the locknut and insert an allen key and turn clockwise to increase pressure until the floor starts to move. Tighten the locknut. To decrease the pressure, reverse procedure. When making this adjustment, the spreader pressure will be set lower than the tractor PRV. A diagram in the floor drive section of this manual shows which screw relieves forward motion and which screw for reverse motion of the floor.

It is recommended to apply waste oil to the floor chains periodically when spreading dry material and particularly at the end of the spreading season. This assists in the smooth running of the machine and prolongs the working life of the components.

3. FLOOR DRIVE

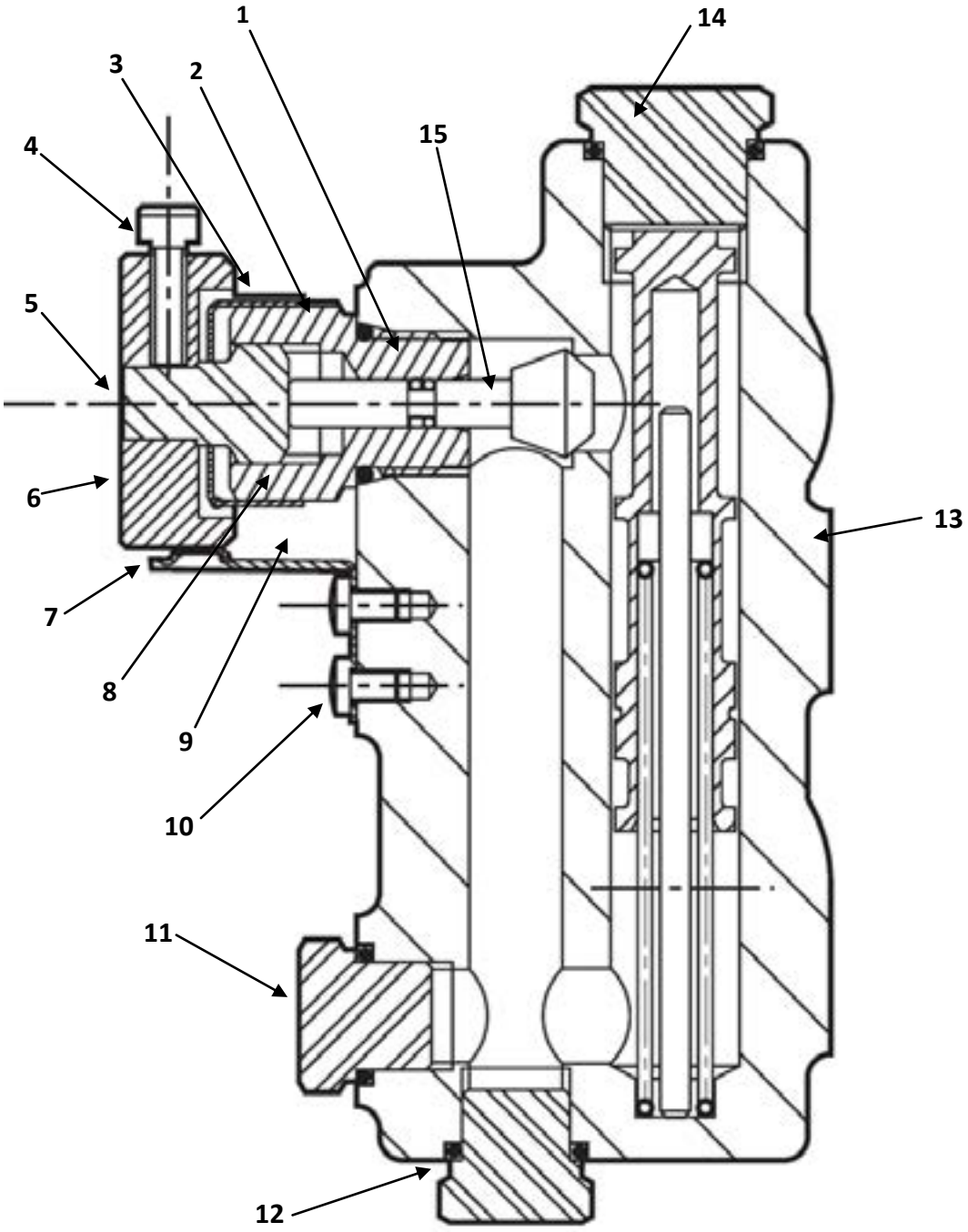
3.1 HYDRAULIC CIRCUIT FOR FLOOR DRIVE



3.1 HYDRAULIC CIRCUIT FOR FLOOR DRIVE PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3000	FLOW CONTROL
2	3	51593	3/4" BONDED SEAL
3	4	51591	1/2" BONDED SEAL
4	1	51590	3/8" BONDED SEAL
5	2	51337	3/4" TO 3/8"ADAPTOR
6	1	51340	3/4" / 1/2" ADAPTOR
7	2	51336	1/2" TO 3/8" ADAPTOR
8			
9	2	51464	1/2" BULKHEAD
10			
11	1	51447	3/8" MALE TEE
12	1	51412	1/2" MALE/FEMALE 90 DEG
13	1	51414	3/8" MALE/FEMALE 90 DEG
14			
15	1	51393	1/2" TO 3/8" FEMALE/FEMALE
16			
17			
18	1	51576	1/2" MALE PROBE
19	2	B4400	HYD HOSE 230mm
20	1	B4401	HYD HOSE 610mm
21			
22	2	B4414	HYD HOSE 2500mm
		B4415	EXPORT 2440mm
23		B4416	HYD HOSE FLOW 75
		B4418	HYD HOSE FLOW 90
		B4420	HYD HOSE FLOW 105
		B4422	HYD HOSE FLOW 120
		B4424	HYD HOSE FLOW 150
		B4426	HYD HOSE FLOW WB
24		B4417	HYD HOSE RETURN 75
		B4419	HYD HOSE RETURN 90
		B4421	HYD HOSE RETURN 105
		B4423	HYD HOSE RETURN 120
		B4425	HYD HOSE RETURN 150
		B4427	HYD HOSE RETURN WB / 230
26	1	B3068	DOUBLE CROSS LINE RELIEF VALVE

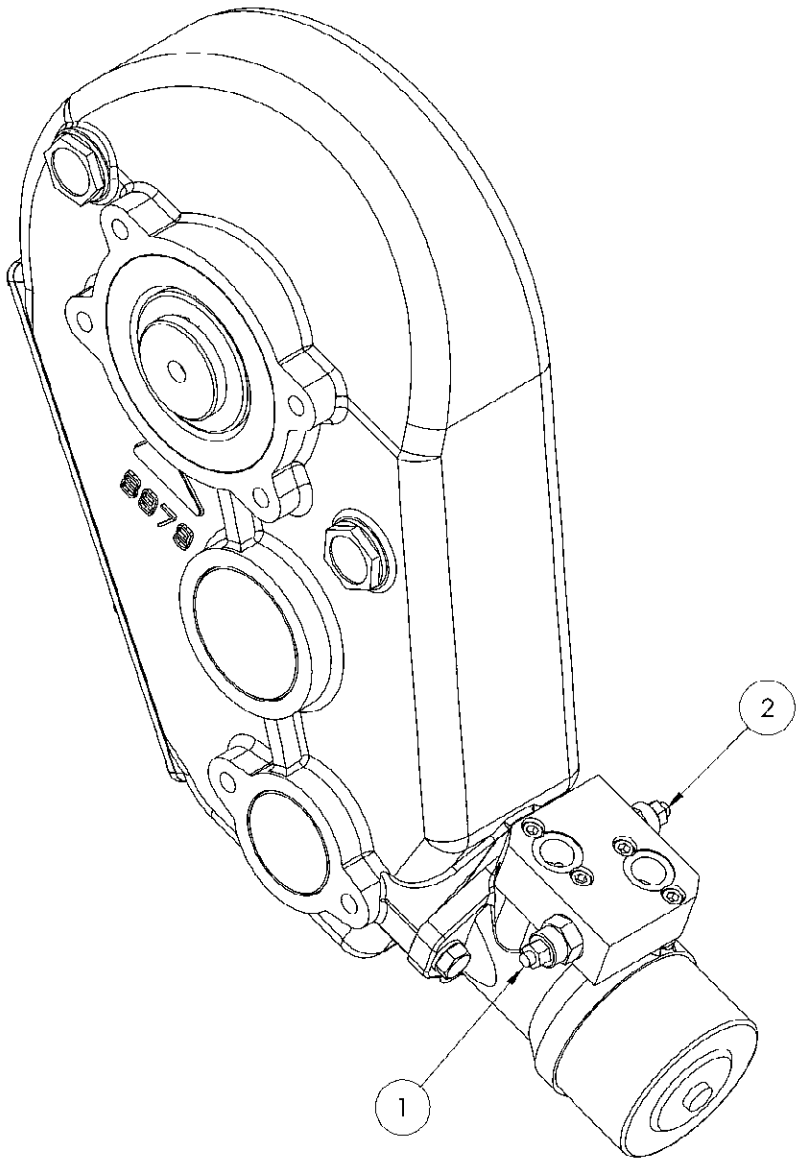
3.2 FLOOR SPEED CONTROL UNIT – PART No. B3000



3.2 FLOOR SPEED CONTROL UNIT – PART No. B3000 PARTS LIST

KEY	QTY	DESCRIPTION
1	1	O RING
2	1	BACK-UP RING
3	1	O RING
4	1	SET SCREW
5	1	ADJUSTER SCREW
6	1	ADJUSTING KNOB
7	1	INDEX SPRING
8	1	PLUG
9	1	CONTROL SLEEVE
10	1	SCREW
11	1	PLUG
12	1	O RING
13	1	BODY
14	1	PLUG
15	1	NEEDLE VALVE

3.3 FLOOR DRIVE RELIEF VALVES



3.3 FLOOR DRIVE RELIEF VALVES

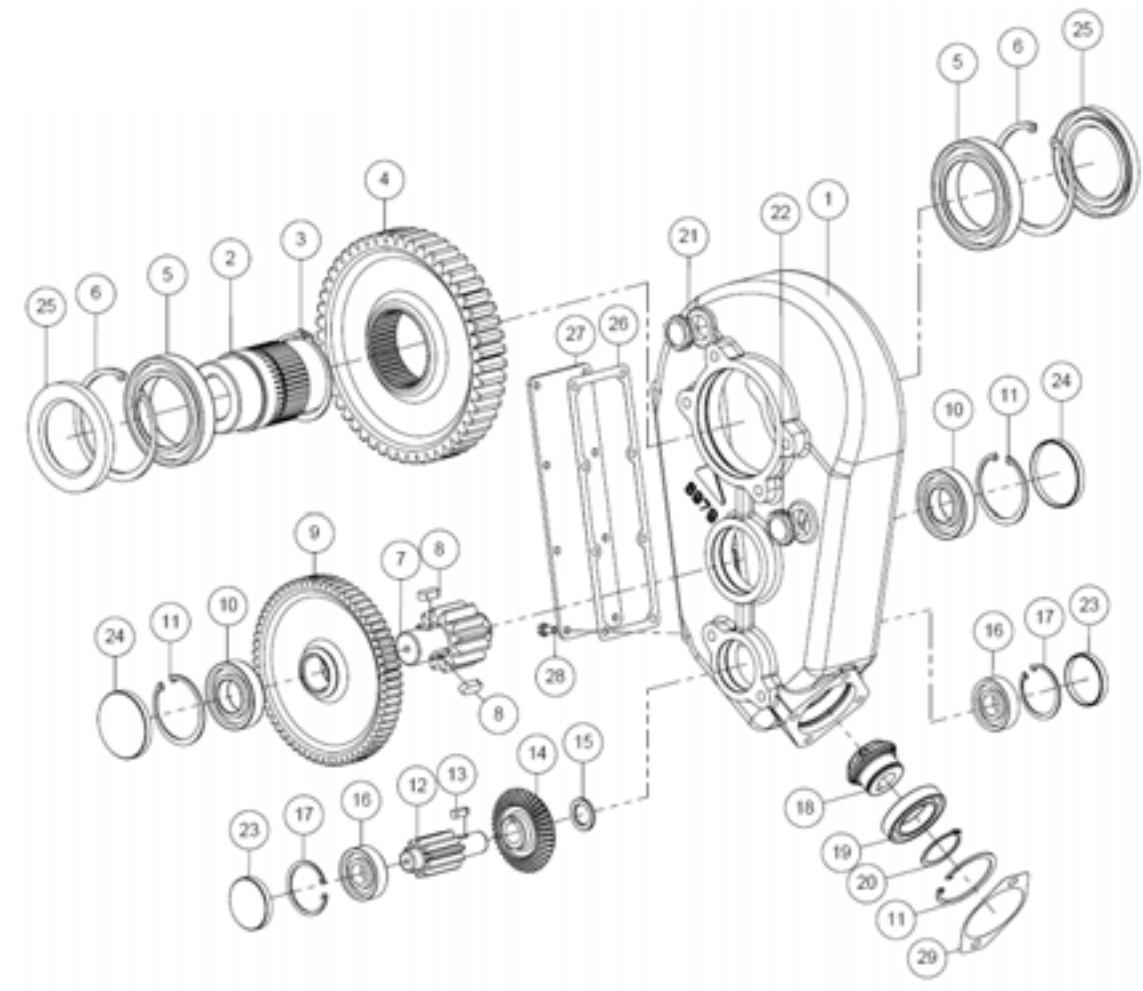
To adjust relief valve pressure

No.1
Cartridge contols movement of floor to rear. To increase pressure release locknut turn screw clockwise and retighten locknut.
To decrease pressure turn screw anticlockwise.

No.2
Cartridge controls movement of floor to front. To increase pressure release locknut turn screw clockwise and retighen locknut.
To decrease pressure turn screw anticlockwise.

NOTE
Maximum protection can be given to moving parts by keeping relief valve pressure set to a minimum.

3.4 FLOOR DRIVE GEARBOX MK4 75/90/105/120 – B3105

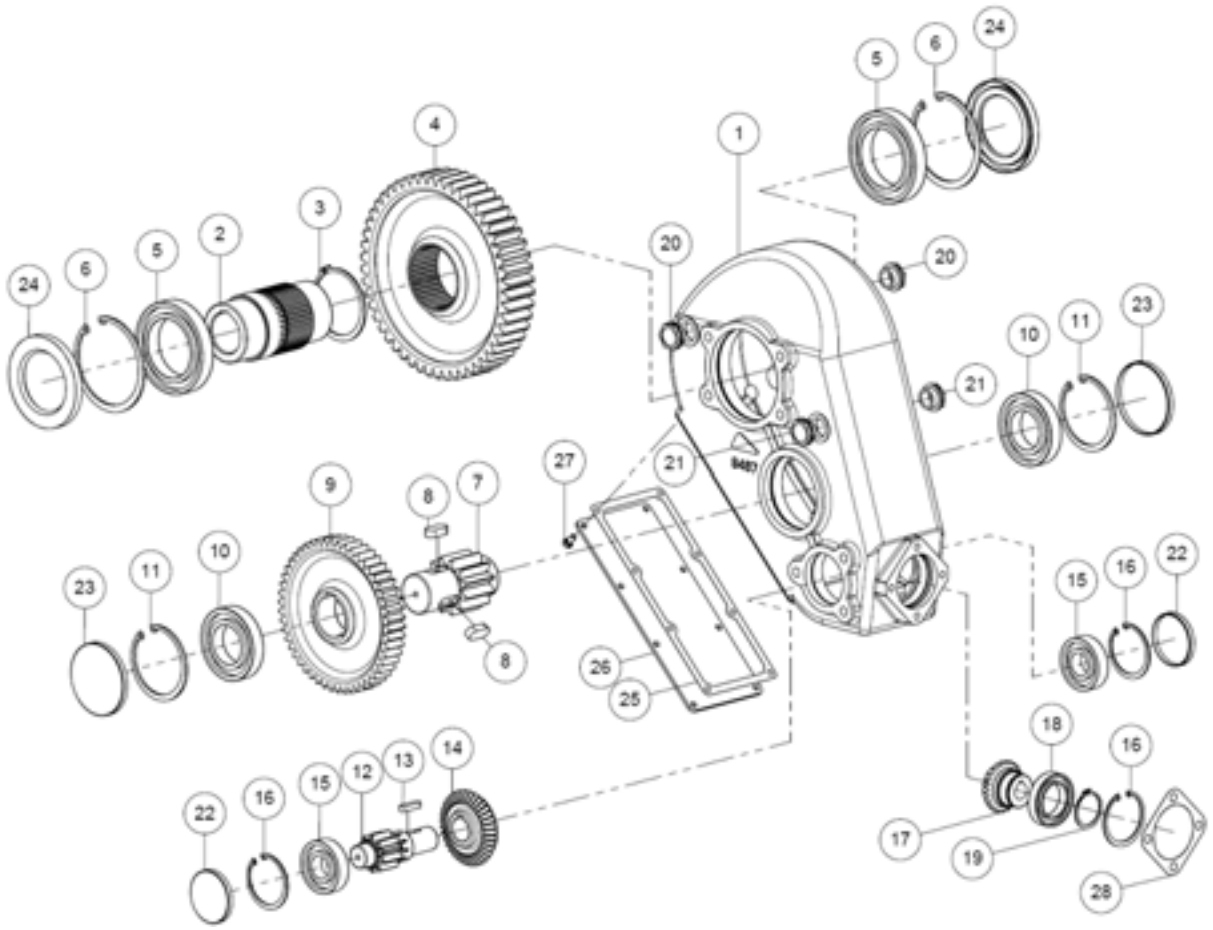


Note:
Motor not shown Part No. **B3060**

3.4 FLOOR DRIVE GEARBOX MK4 75/90/105/120 – B3105 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3203	CASING
2	1	B3228	SLEEVE M50
2	1	B3229	SLEEVE M60 (W.B BEATERS)
3	1	B4099	CIRCLIP
4	1	B3231	GEAR
5	2	B3869	BEARING
6	2	B9069	CIRCLIP
7	1	B3237	PINION SHAFT
8	2	B2271	KEY
9	1	B3234	GEAR
10	2	B3863	BEARING
11	3	B4006	CIRCLIP
12	1	B3232	PINION SHAFT
13	1	B2270K	KEY
14	1	B3238	CROWN BEVEL
15	1	B3478	SPACER
16	2	B3865	BEARING
17	2	B4002	CIRCLIP
18	1	B3233	PINION SHAFT
19	1	B3862	BEARING
20	1	B4019	CIRCLIP
21	2	B3997	BREATHER PLUG
22	2	B3995	SIGHT GUAGE
23	2	B3921	CAP SEAL
24	2	B3922	CAP SEAL
25	2	B3946	SEAL
26	1	B3222	GASKET
27	1	B3218	COVER PLATE
28	8	73030/1	BOLT
29	1	B3226	GASKET

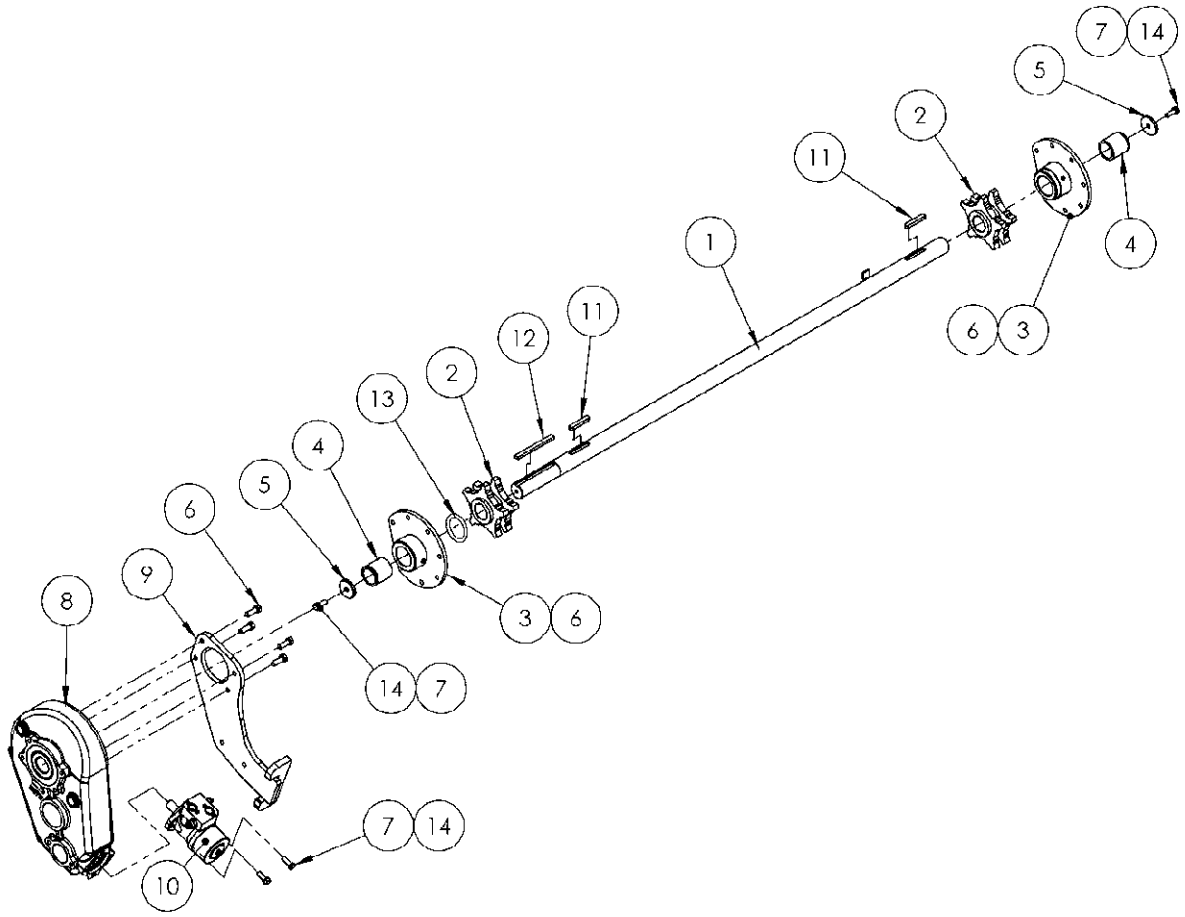
3.5 FLOOR DRIVE GEARBOX MK4 150 – B3120



3.5 FLOOR DRIVE GEARBOX MK4 150 – B3120 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3204	CASING
2	1	B3230	SLEEVE
3	1	B4030	CIRCLIP
4	1	B3236	GEAR
5	2	B3868	BEARING
6	2	B4016	CIRCLIP
7	1	B3240	PINION
8	2	509560	KEY
9	1	B3244	GEAR
10	2	B3867	BEARING
11	2	B4012	CIRCLIP
12	1	B3242	PINION
13	1	509554	KEY
14	1	B3248	CROWN GEAR
15	2	B3864	BEARING
16	3	B4006	CIRCLIP
17	1	B3252	PINION
18	1	B3862	BEARING
19	1	B4019	CIRCLIP
20	2	B3997	BREATHER BUNG
21	2	B3995	SIGHT GLASS
22	2	B3922	CAP SEAL
23	2	B3926	CAP SEAL
24	2	B3948	SEAL
25	1	B3224	GASKET
26	1	B3220	COVER PLATE
27	8	73030/1	BOLT
28	1	B3226	GASKET

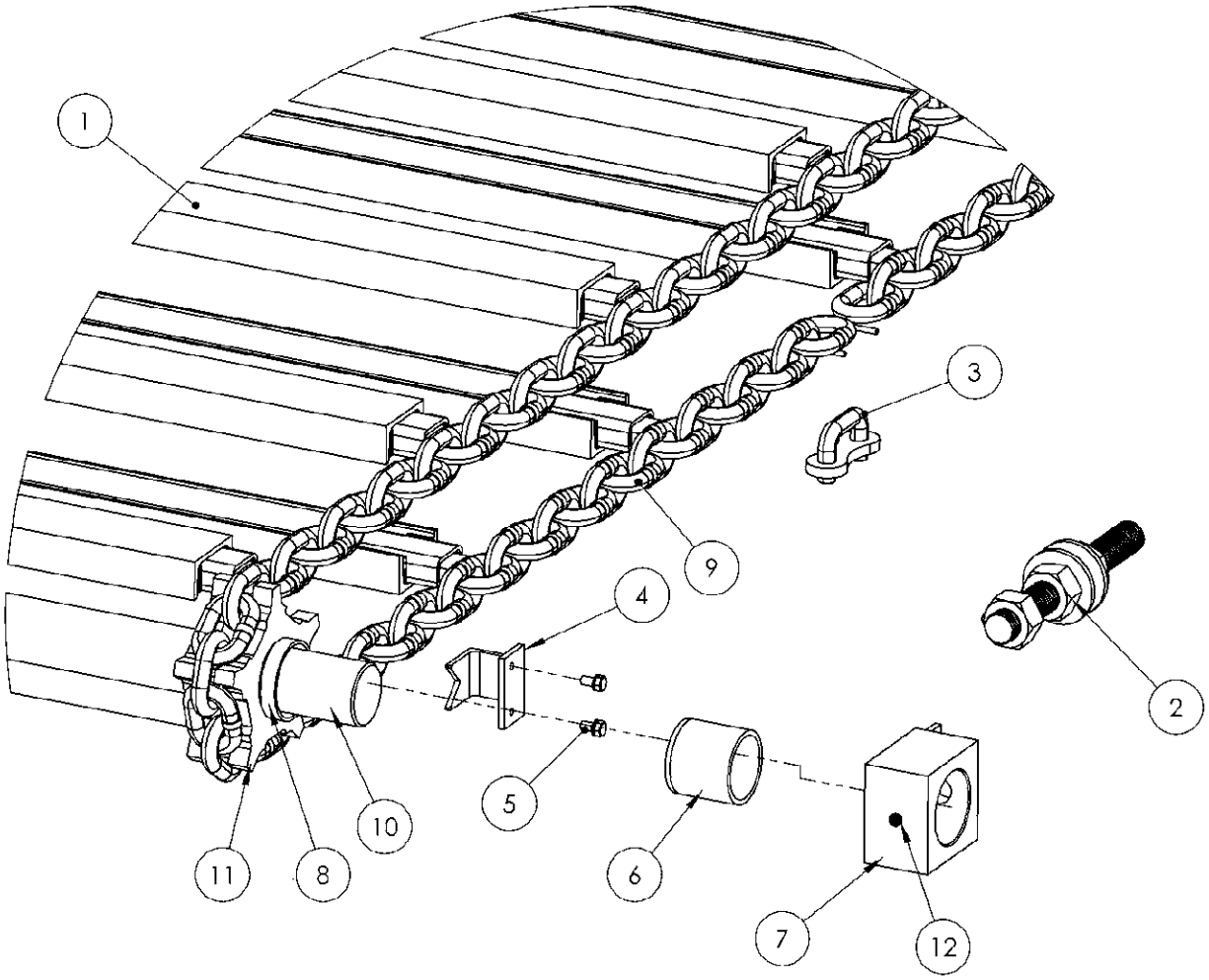
3.6 REAR FLOOR SHAFT ASSEMBLY



3.6 REAR FLOOR SHAFT ASSEMBLY PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B2250	REAR SHAFT M50
	1	B2254	REAR SHAFT M60 MK4 150 ONLY
	1	B2256	REAR SHAFT M60 MK4 WITH W.B BEATERS
2	2	B2100	GYPSY WHEEL M50 MK4 75-120
	2	B2301	GYPSY WHEEL M60 MK4 WITH W.B BEATERS
3	2	B2300	BEARING FLANGE M50
	2	B2302	BEARING FLANGE M60
4	2	B2320	ACM BUSH M50
	2	B2322	ACM BUSH M60
5	2	B2280	END PLATE M60
6	14	73556	NUT & BOLT M14
7	4	BOLT	M12 x 35
8	1	B3105	GEARBOX 75/90/105/120
	1	B3106	GEARBOX WITH W.B BEATERS
	1	B3120	GEARBOX 150 ONLY
9	1	B3212	TORQUE PLATE 75/90/105/120
	1	B3214	TORQUE PLATE 150 ONLY
10	1	B3060	HYDRUALIC MOTOR
	1	B3070	HYDRUALIC MOTOR MK4 150 ONLY
11	2	B2274	KEY FOR M50 SHAFT
	2	B2275	KEY FOR M60 SHAFT
12	1	B2277	KEY FOR M50 SHAFT
	1	B2278	KEY FOR M60 SHAFT
13	1	B2348	SPACER 150 ONLY
14	4	WASHER	SPRING WASHER M12

3.7 FRONT SHAFT AND CHAIN ASSEMBLY

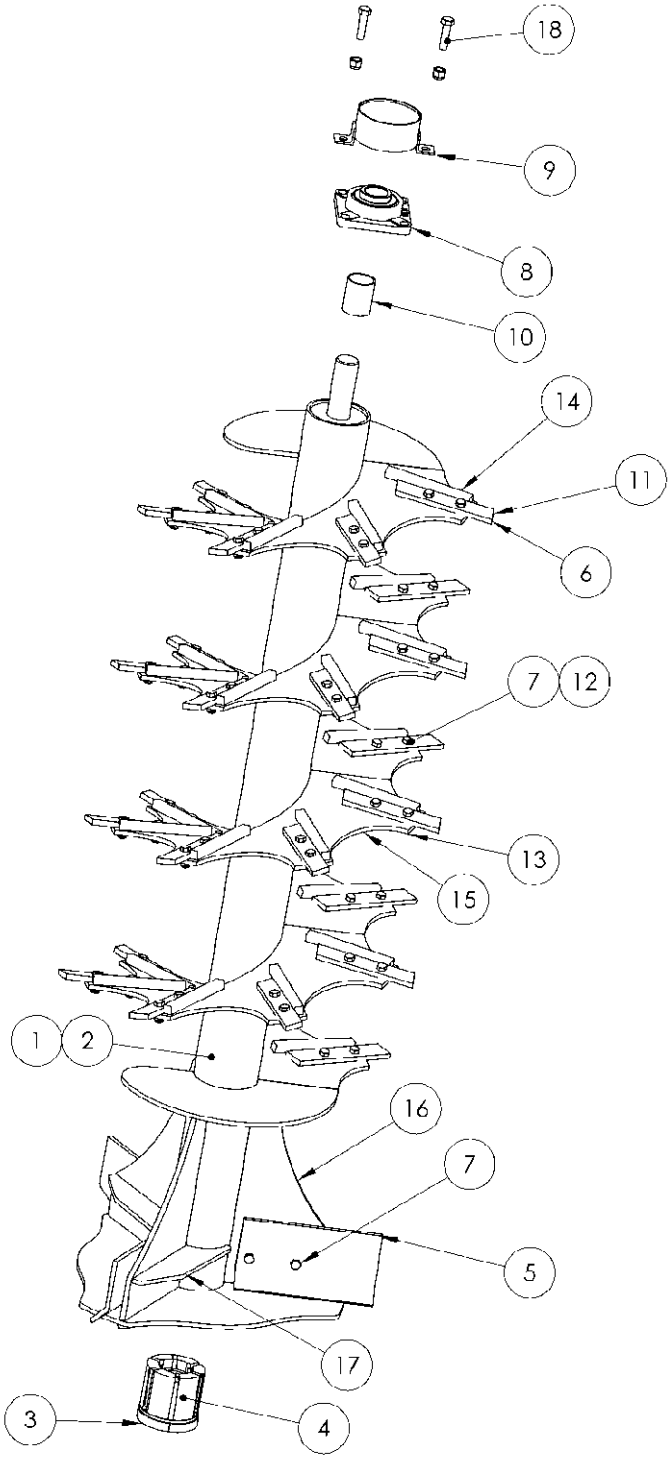


3.7 FRONT SHAFT AND CHAIN ASSEMBLY PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	22	B2010	CHANNEL FLOOR SLAT MK4 75
	28	B2010	CHANNEL FLOOR SLAT MK4 90/105
	30	B2010	CHANNEL FLOOR SLAT MK4 120
	33	B2010	CHANNEL FLOOR SLAT MK4 150
	43	B2015	BOX FLOOR SLAT MK4 75
	55	B2015	BOX FLOOR SLAT MK4 90/105
	59	B2015	BOX FLOOR SLAT MK4 120
	65	B2015	BOX FLOOR SLAT MK4 150
2	2	B2286	ADJUSTERS M24 MK4
	2	B2288	ADJUSTERS M30 MK4 150 ONLY
3	2	B2202	JOINER LINK
4	2	B2126	FRONT CLEANER
5	4	73031	BOLT
6	2	B2320	BUSH M50
	2	B2322	BUSH M60 MK4 150 ONLY
7	2	B2290	BEARING HOUSING M50
	2	B2294	BEARING HOUSING M60 MK4 150 ONLY
8	2	B2345	SPACER M50
	2	B2346	SPACER M60 MK4 150 ONLY
9	1PR	B2152	FLOOR CHAIN 28FT FOR CHANNEL SLATS MK4 75
	1PR	B2162	FLOOR CHAIN 35FT FOR CHANNEL SLATS MK4 90/105
	1PR	B2172	FLOOR CHAIN 37FT FOR CHANNEL SLATS MK4 120
	1PR	B2182	FLOOR CHAIN 40FT FOR CHANNEL SLATS MK4 150
	1PR	B2154	FLOOR CHAIN 28FT FOR BOX SLATS MK4 75
	1PR	B2164	FLOOR CHAIN 35FT FOR BOX SLATS MK4 90/105
	1PR	B2174	FLOOR CHAIN 37FT FOR BOX SLATS MK4 120
	1PR	B2184	FLOOR CHAIN 40FT FOR BOX SLATS MK4 150
10	1	B2220	SHAFT M50
	1	B2222	SHAFT M60 FOR MK4 150 ONLY
11	1	B2214	PLATE WHEEL SET OF 4
	1	B2218	PLATE WHEEL SET OF 4 MK4 150 ONLY
12	2	50726	GREASE NIPPLE

4 AUGERS AND DRIVES

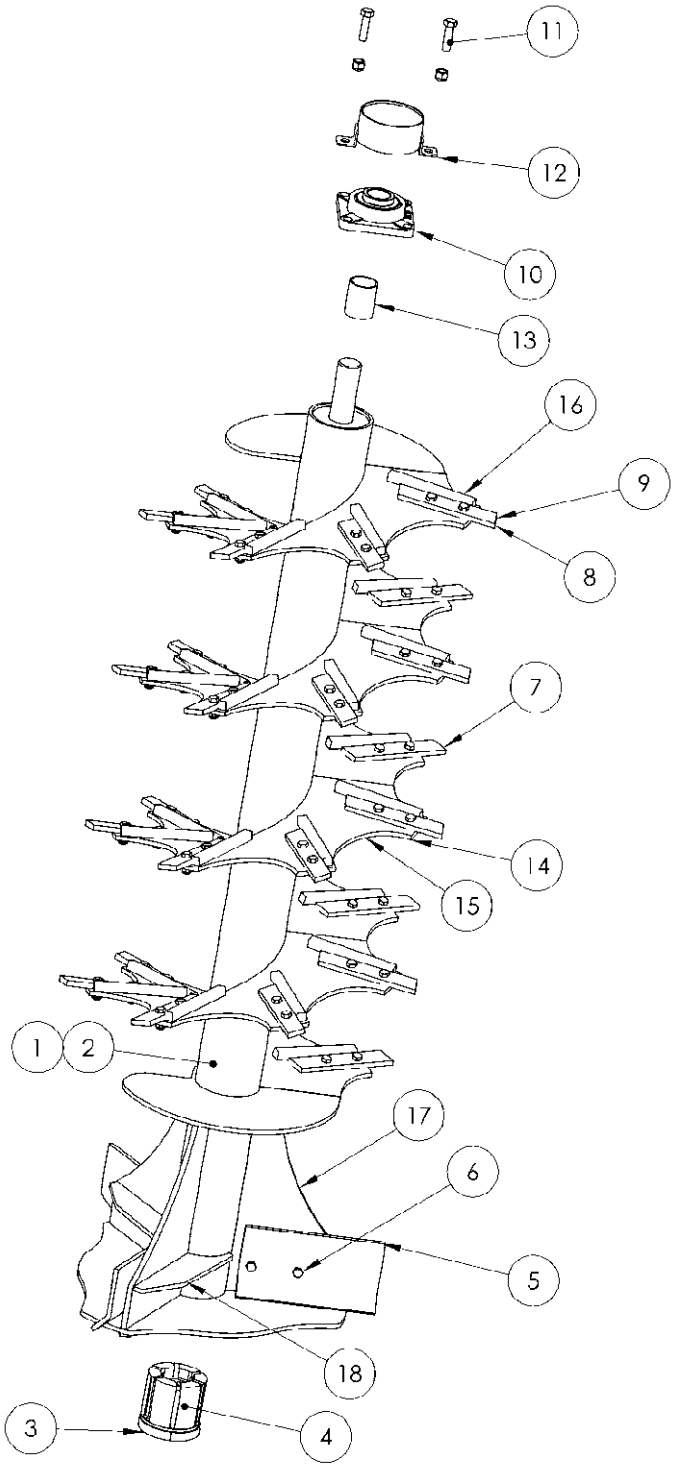
4.1 SHREDDING AUGER MK4



4.1 SHREDDING AUGERS MK4 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B1021	AUGER R.H 75/90
	1	B1031	AUGER R.H 120/150
2	1	B1020	AUGER L.H 75/90
	1	B1030	AUGER L.H 120/150
3	2	B1152	DRIVE FLANGE
4	12	B1142	RUBBER DRIVE BLOCK
5	3	B1121	BLADE R.H 12"x6"
	3	B1120	BLADE L.H 12"x6"
6	44	B1100	CUTTER 75/90
	56		CUTTER 120/150
7	100	73556	BOLT & NUT 75/90
	124		BOLT & NUT 120/150
8	2	B1178	BEARING
9	2	B1160	BEARING COVER
10	2	B2350	SPACER
11		B1106	ANGLE THROWER
12		73558	BOLT & NUT
13		B1096	REPLACEMENT LUG
14	44	B1098	REINFORCING BAR
15		B1066	AUGER SECTION
16	6	B1080	BLADE MOUNTING
17	6	B1088	BUTTRUSS
18	6	73155	BOLT & NUT

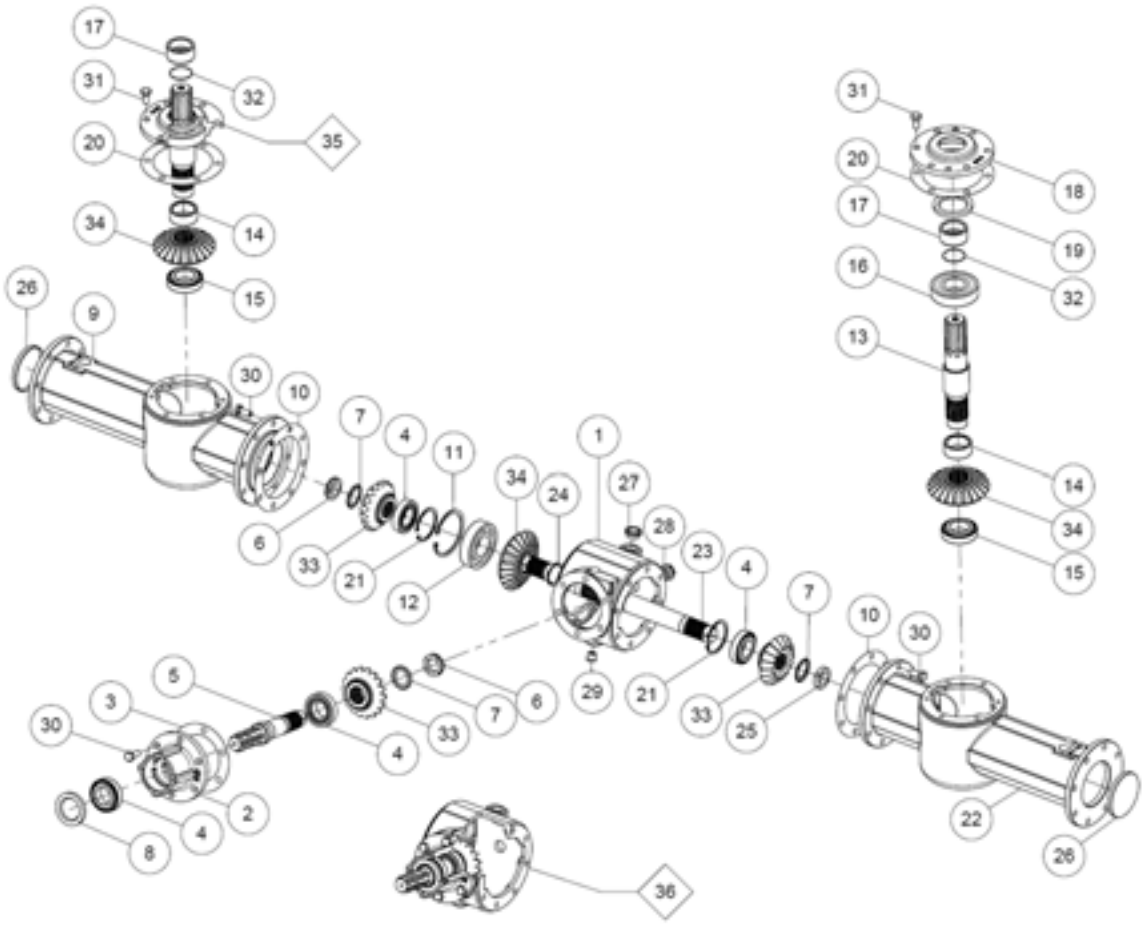
4.2 SHREDDING AUGER MK2 & WIDE BODY



4.2 SHREDDING AUGER MK2 & WIDE BODY PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B1044	AUGER L.H
2	1	B1045	AUGER R.H
3	2	B1156	DRIVE FLANGE
4	12	B1146	RUBBER DRIVE BLOCK W.B MK2
5	4	B1124	AUGER BLADE LH
5	4	B1125	AUGER BLADE RH
6		B1103	BOLT & LOCKNUT
7		B1100	CUTTER POINT STD
		B1101	CUTTER POINT H.D
8		B1106	ANGLE THROWER OPTIONAL
9		B1105	BOLT & LOCKNUT FOR STD CUTTER & ANGLE THROWER
9A		B1101/1	BOLT & NYLOC FOR H.D CUTTERS
10	2	B1180	BEARING M60
11	8	73155	BOLT & LOCKNUT
12	2	B1162	BEARING COVER
13	2	B2352	SPACER
14	8	B1070	AUGER SECTION HANDED
15		B1097	CUTTER MOUNT WELD ON
16	64	B1098	REINFORCING BAR

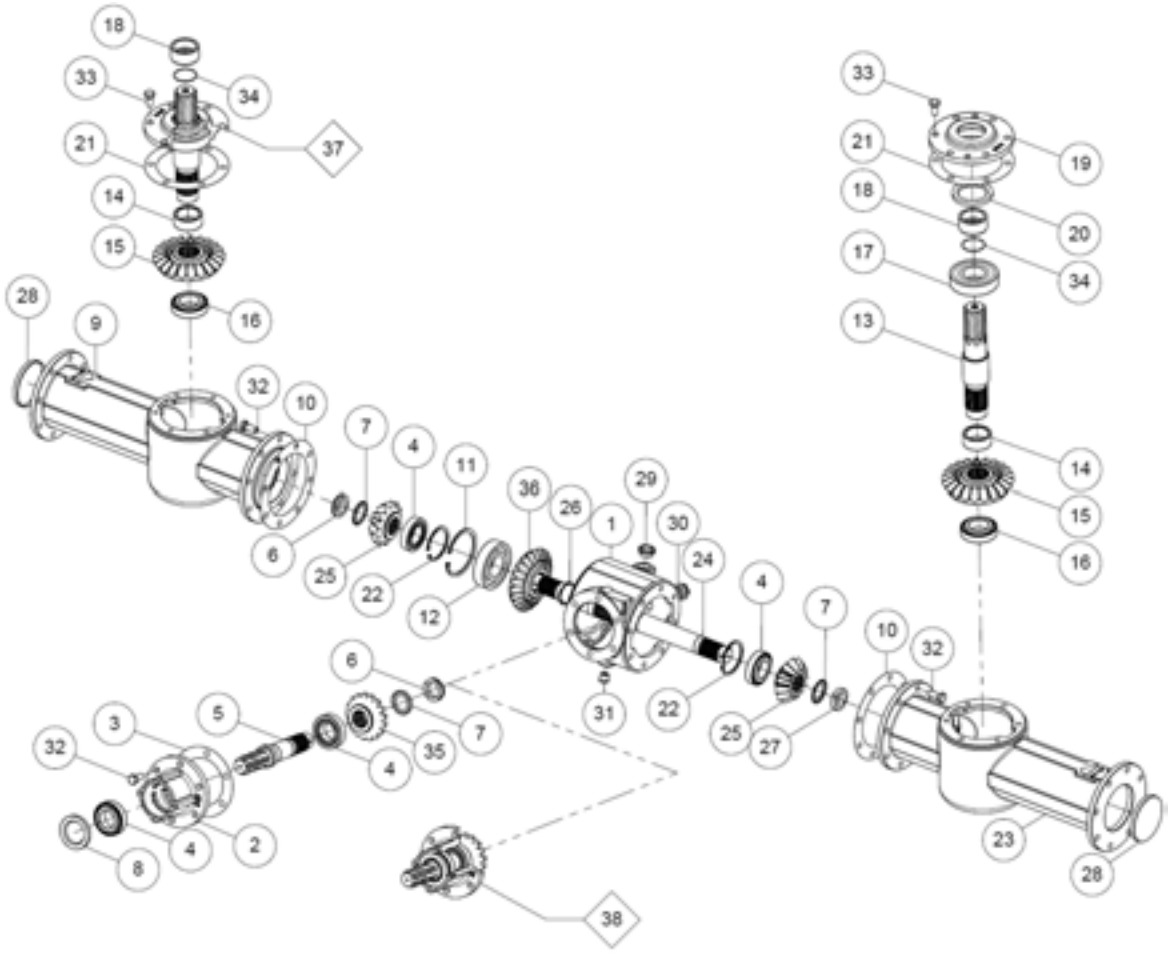
4.3 GEARBOX 540/360 STANDARD PART No. B3172



4.3 GEARBOX 540/360 STANDARD PART No. B3172 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3404	CASING
2	1	B3410	EXTENSION
3	1	B3494	GASKET
4	4	B3822	BEARING
5	1	B3440	SHAFT
6	2	B3510	NUT LH THREAD
7	3	B3520	WASHER
8	1	B3940	SEAL
9	1	B3400	CASING R.H
10	2	B492	GASKET
11	1	B4014	CIRCLIP
12	1	B3866	BEARING
13	2	B3442	SHAFT
14	2	B3480	SPACER
15	2	B3824	BEARING
16	2	B3870	BEARING
17	2	B3482	SLEEVE
18	2	B3420	TOP PLATE
19	2	B3942	SEAL
20	2	B3490	GASKET
21	2	B4007	CIRCLIP
22	1	B3402	CASING
23	1	B3446	SHAFT
24	1	B4020	CIRCLIP
25	1	B3512	NUT R.H THREAD
26	2	B3928	CAP SEAL
27	1	B3998	PLUG
28	1	B3996	SIGHT GLASS
29	1	B3990	DRAIN BUNG
30	22	73125	BOLT
31	12	73124	BOLT
32	2	B3939	O -RING
33	3	B3456	PINION
34	3	B3464	GEAR

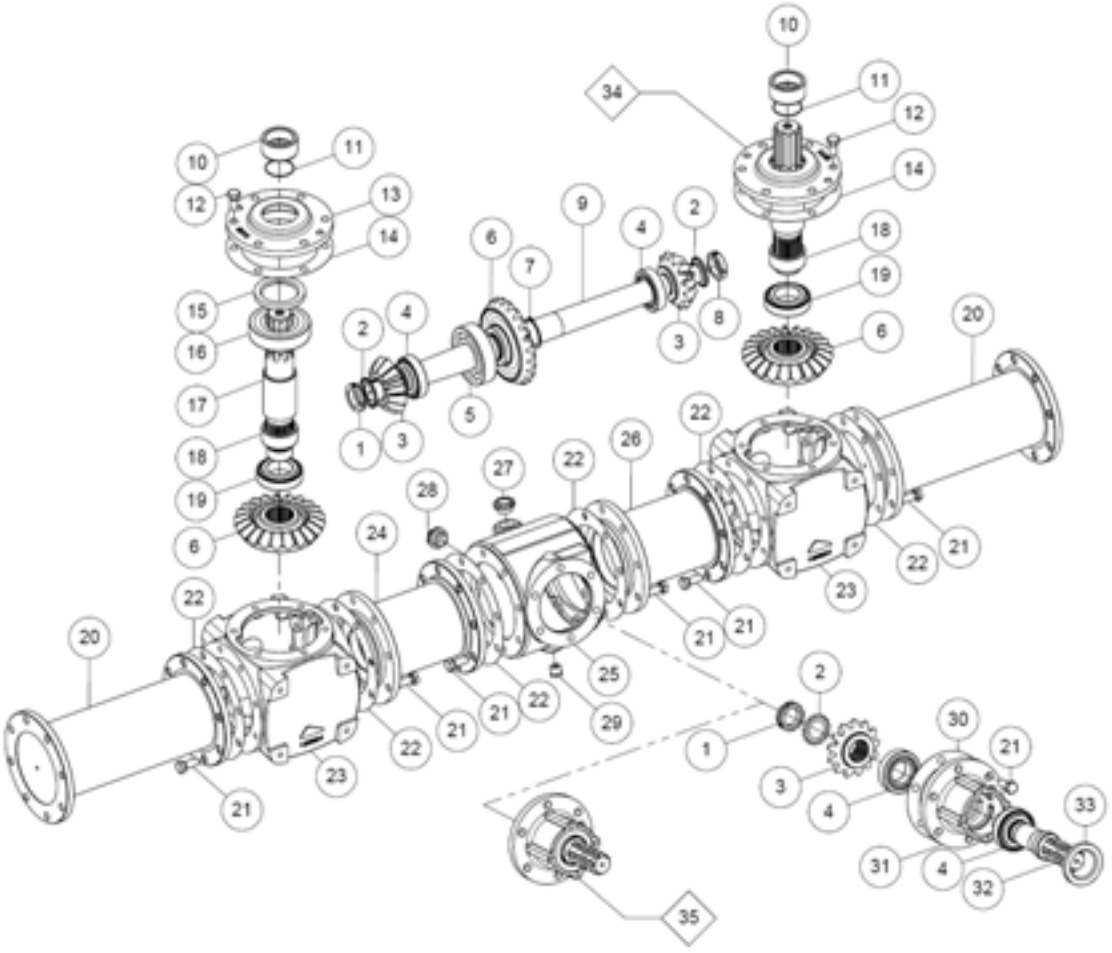
4.4 GEARBOX 1000/420 STANDARD PART No. B3170



4.4 GEARBOX 1000/420 STANDARD PART No. B3170 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3404	CASING
2	1	B3410	EXTENSION
3	1	B3494	GASKET
4	4	B3822	BEARING
5	1	B3440	SHAFT
6	2	B3510	NUT LH THREAD
7	3	B3520	WASHER
8	1	B3940	SEAL
9	1	B3400	CASING
10	2	B492	GASKET
11	1	B4014	CIRCLIP
12	1	B3866	BEARING
13	2	B3442	SHAFT
14	2	B3480	SPACER
15	2	B3466	CROWN GEAR
16	2	B3824	BEARING
17	2	B3870	BEARING
18	2	B3482	SLEEVE
19	2	B3420	TOP PLATE
20	2	B3942	O RING
21	2	B3490	GASKET
22	2	B4007	CIRCLIP
23	1	B3402	CASING
24	1	B3446	SHAFT
25	2	B3456	PINION GEAR
26	1	B4020	CIRCLIP
27	1	B3512	NUT RH THREAD
28	2	B3928	CAP SEAL
29	1	B3998	PLUG
30	1	B3996	SIGHT GLASS
31	1	B3990	DRAIN BUNG
32	22	73125	BOLT
33	12	73124	BOLT
34	2	B3939	O RING
35	1	B3458	PINION GEAR
36	1	B3468	PINION GEAR

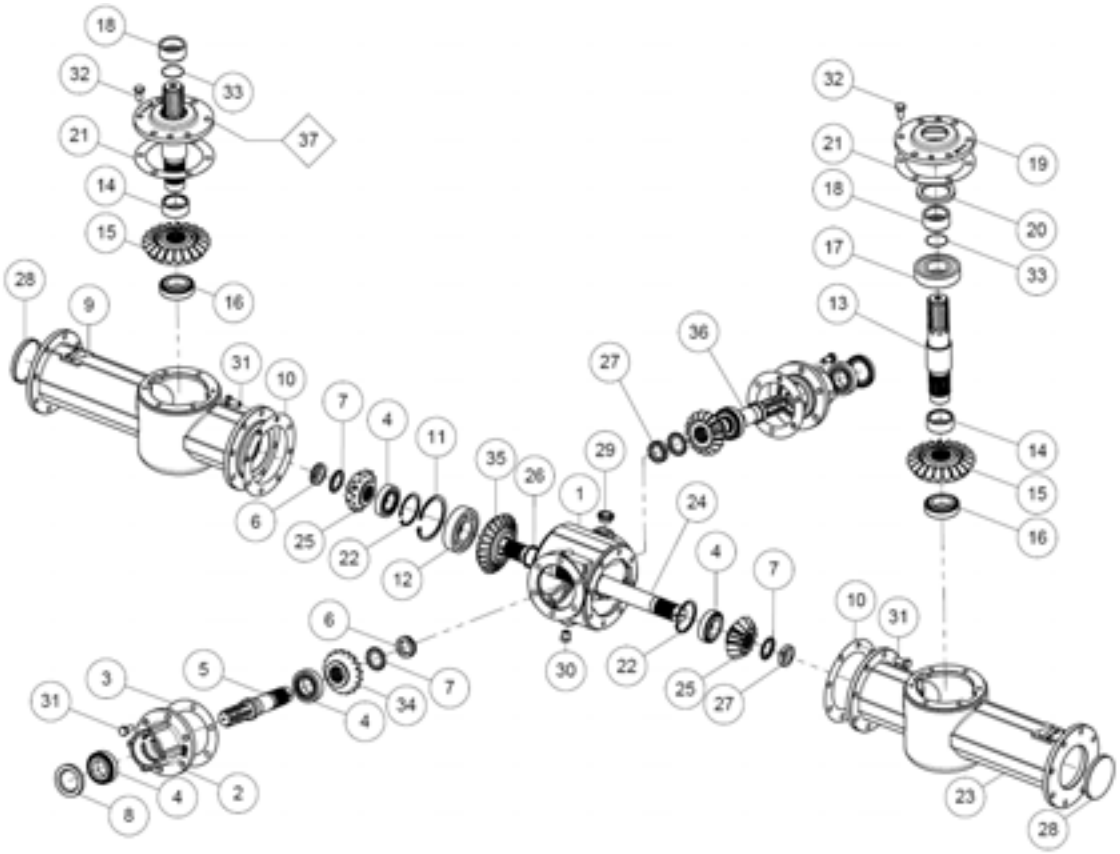
4.5 GEARBOX 1000/350 WIDEBODY PART No. B3180



4.5 GEARBOX 1000/350 WIDEBODY PART No. B3180 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3510	NUT
2	3	B3520	LOCKING WASHER
3	3	B3460	PINION GEAR
4	4	B3822	BEARING
5	1	B3866	BEARING
6	3	B3470	CROWN GEAR
7	1	B4020	CIRCLIP
8	2	B3510	NUT
9	1	B3448	CROSS SHAFT
10	2	B3482	SPACER SLEEVE
11	2		CIRCLIP
12	12	73124	BOLT
13	2	B3420	TOP PLATE
14	2	B3490	GASKET
15	2	B3942	SEAL
16	2	B3870	BEARING
17	2	B3444	OUTPUT SHAFT
18	2	B3480	GEAR SPACER
19	2	B3824	BEARING
20	2	B3412	OUTER CASE SECTION
21	54	73125	BOLT
22	6	B3492	GASKET
23	2	B3418	AUGER GEAR CASE
24	1	B3414	INNER CASE SECTION
25	1	B3404	CENTRE CASE
26	1	B3417	INNER CASE SECTION
27	1	B3998	BREATHER PLUG
28	1	B3996	SIGHT GLASS
29	1	B3990	DRAIN PLUG
30	1	B3494	GASKET EXT
31	1	B3410	EXTENSION
32	1	B3440	INPUT SHAFT
33	1	B3940	SEAL

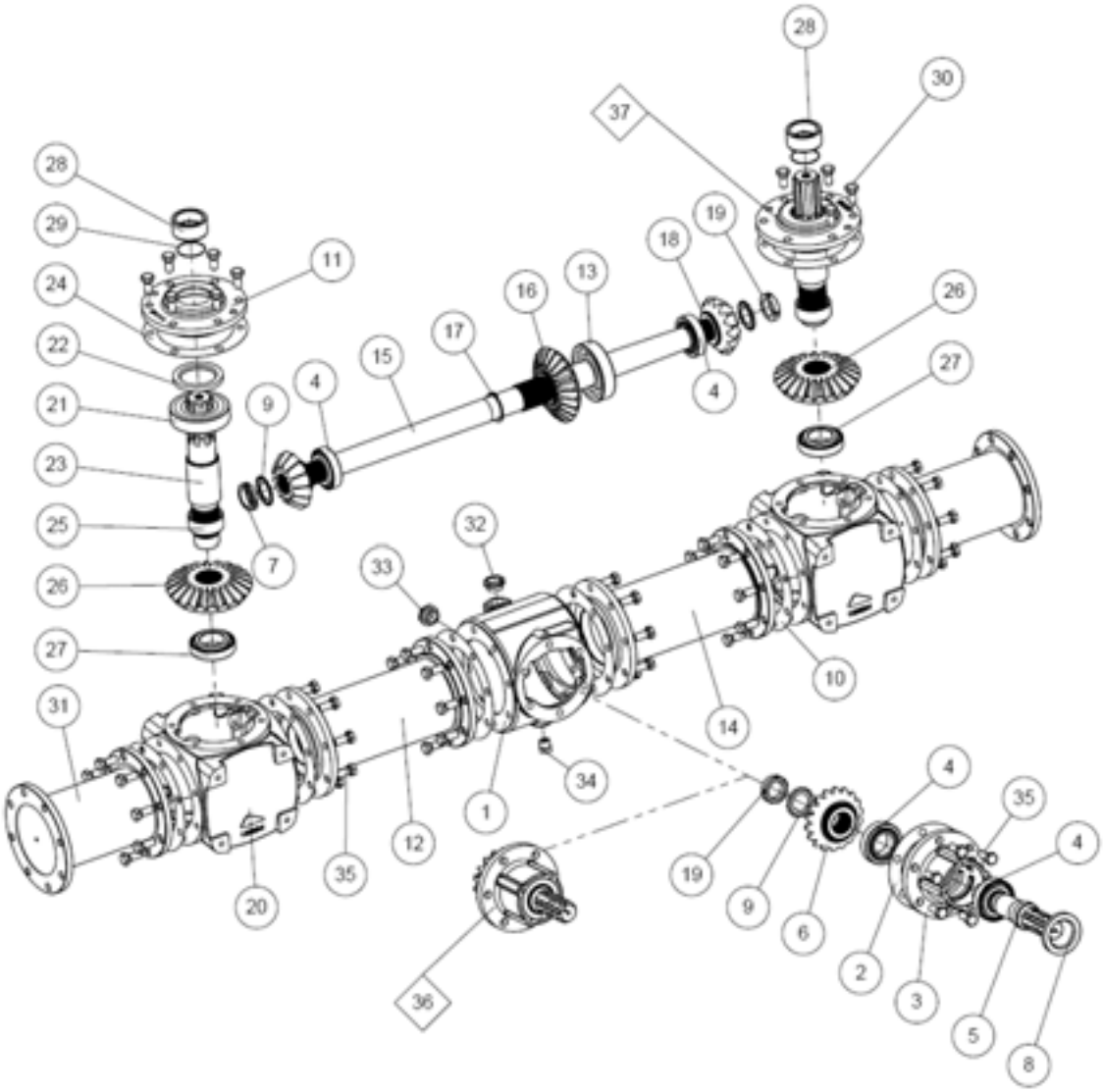
4.6 GEARBOX 1000/420 SPINNER DECK PART No. B3175.



4.6 GEARBOX SPINNER DECK 1000/420 PART No. B3175.

KEY	QTY	PART No.	DESCRIPTION
1	1		CASING
2	1	B3410	EXTENSION
3	1	B3494	GASKET
4	4	B3822	BEARING
5	1	B3440	SHAFT
6	2	B3510	NUT LH THREAD
7	3	B3520	WASHER
8	1	B3940	SEAL
9	1	B3400	CASING
10	2	B492	GASKET
11	1	B4014	CIRCLIP
12	1	B3866	BEARING
13	2	B3442	SHAFT
14	2	B3480	SPACER
15	2	B3466	CROWN GEAR
16	2	B3824	BEARING
17	2	B3870	BEARING
18	2	B3482	SLEEVE
19	2	B3420	TOP PLATE
20	2	B3942	O RING
21	2	B3490	GASKET
22	2	B4007	CIRCLIP
23	1	B3402	CASING
24	1	B3446	SHAFT
25	2	B3456	PINION GEAR
26	1	B4020	CIRCLIP
27	1	B3512	NUT RH THREAD
28	2	B3928	CAP SEAL
29	1	B3998	PLUG
30	1	B3996	SIGHT GLASS
31	1	B3990	DRAIN BUNG
32	22	73125	BOLT
33	12	B3939	O RING
34	2	B3458	PINION GEAR
35	1	B3468	PINION GEAR
36	1		SHAFT

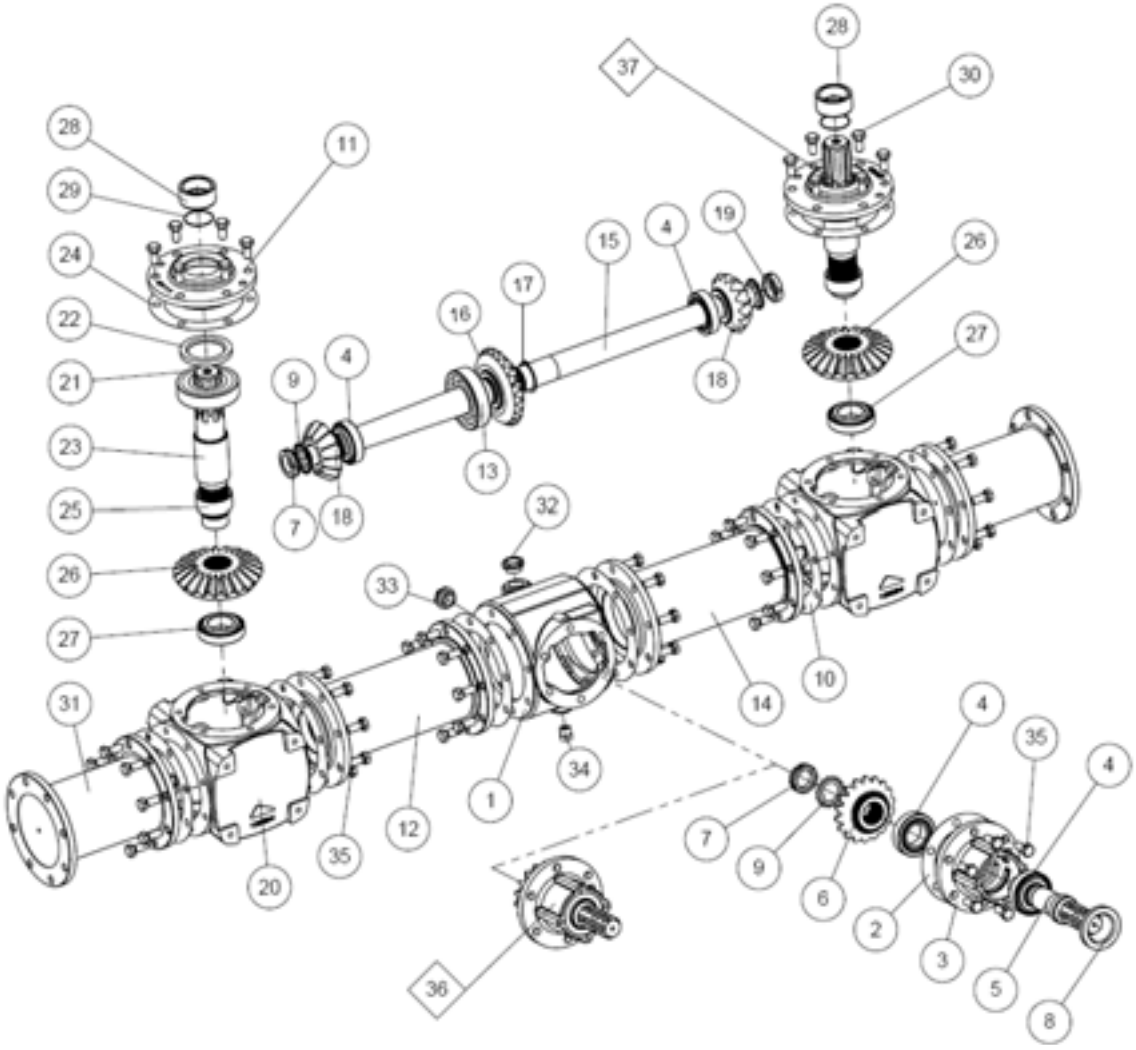
4.7 GEARBOX SPINNER DECK 1000/520 PART No. B3190



4.7 GEARBOX SPINNER DECK 1000/520 PART No. B3190 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3405	CASING
2	1	B3494	GASKET
3	1	B3410	EXTENSION
4	4	B3822	BEARING
5	1	B3458	SHAFT
6	1	B3454	PINION GEAR
7	1	B3510	NUT LH THREAD
8	1	B3940	SEAL
9	3	B3520	WASHER
10	6	B3492	GASKET
11	2	B3420	TOP PLATE
12	1	B3415R	INNER CASE SECTION
13	1	B3866	BEARING
14	1	B3416R	INNER CASE SECTION
15	1	B3449R	CROSS SHAFT
16	1	B3464	PINION GEAR
17	1	B3430	CIRCLIP
18	2	B3459	PINION GEAR
19	2	B3512	NUT
20	2	B3418	AUGER GEAR CASE
21	2	B3870	BEARING
22	2	B3942	SEAL
23	2	B3444	OUTPUT SHATF
24	2	B3490	GASKET
25	2	B3480	SPACER
26	2	B3469	CROWN GEAR
27	2	B3824	BEARING
28	2	B3482	SLEEVE
29	2	B3939	O RING
30	12	73124	NUTS
31	2	B3413	OUTER CASE SECTION
32	1	B3998	PLUG
33	1	B3996	SIGHT GLASS
34	1	B3990	DRAIN BUNG
35	54	73125	BOLT

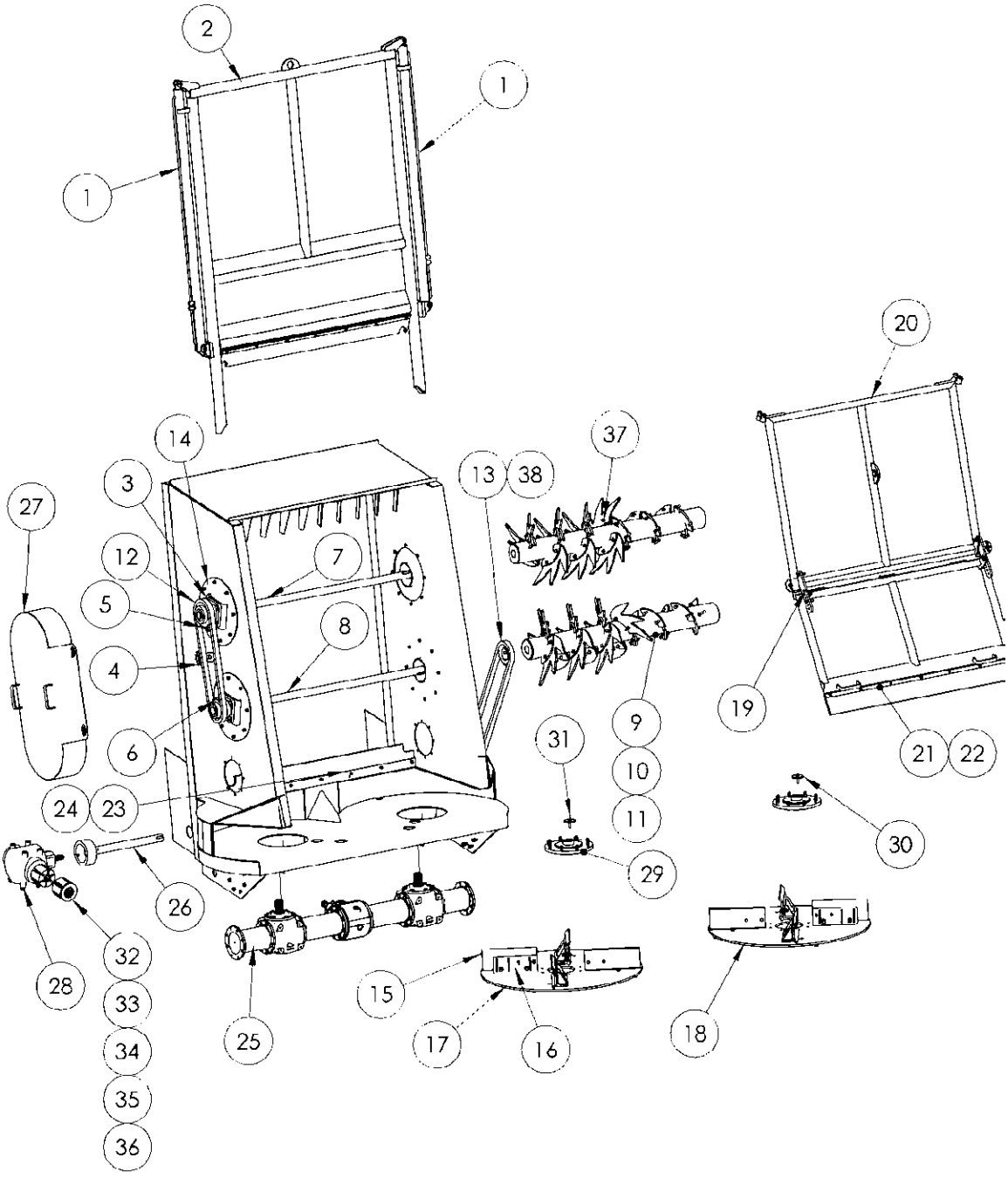
4.8 Gearbox HORIZONTAL BEATER 1000/520 PART No. B3192



4.8 Gearbox HORIZONTAL BEATER 1000/520 PART No. B3192 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3405	CASING
2	1	B3494	GASKET
3	1	B3410	EXTENSION
4	4	B3822	BEARING
5	1	B3440	SHAFT
6	1	B3454	PINION GEAR
7	2	B3510	NUT
8	1	B3940	SEAL
9	3	B3520	WASHER
10	6	B492	GASKET
11	2	B3420	TOP PLATE
12	1	B3415	INNER CASE SECTION
13	1	B3866	BEARING
14	1	B3416	INNER CASE SECTION
15	1	B3450	SHAFT
16	1	B3464	PINION GEAR
17	1	B4020	CIRCLIP
18	2	B3459	PINION GEAR
19	1	B3512	NUT RH THREAD
20	2	B3418	AUGER GEAR CASING
21	2	B3866	BEARING
22	2	B3942	SEAL
23	2	B3444	OUTPUT SHAFT
24	2	B3490	GASKET
25	2	B3480	GASKET
26	2	3469	CROWN GEAR
27	2	B3824	BEARING
28	2	B3482	SPACER SLEEVE
29	2	B3939	SEAL
30	12	73124	BOLT
31	2	B3413	OUTER CASE SECTION
32	1	B3990	DRAIN PLUG
33	1	B3996	SIGHT GLASS
34	1	B3998	BREATHER PLUG
35	54	73128	BOLT

4.8 2 x HORIZONTAL BEATER

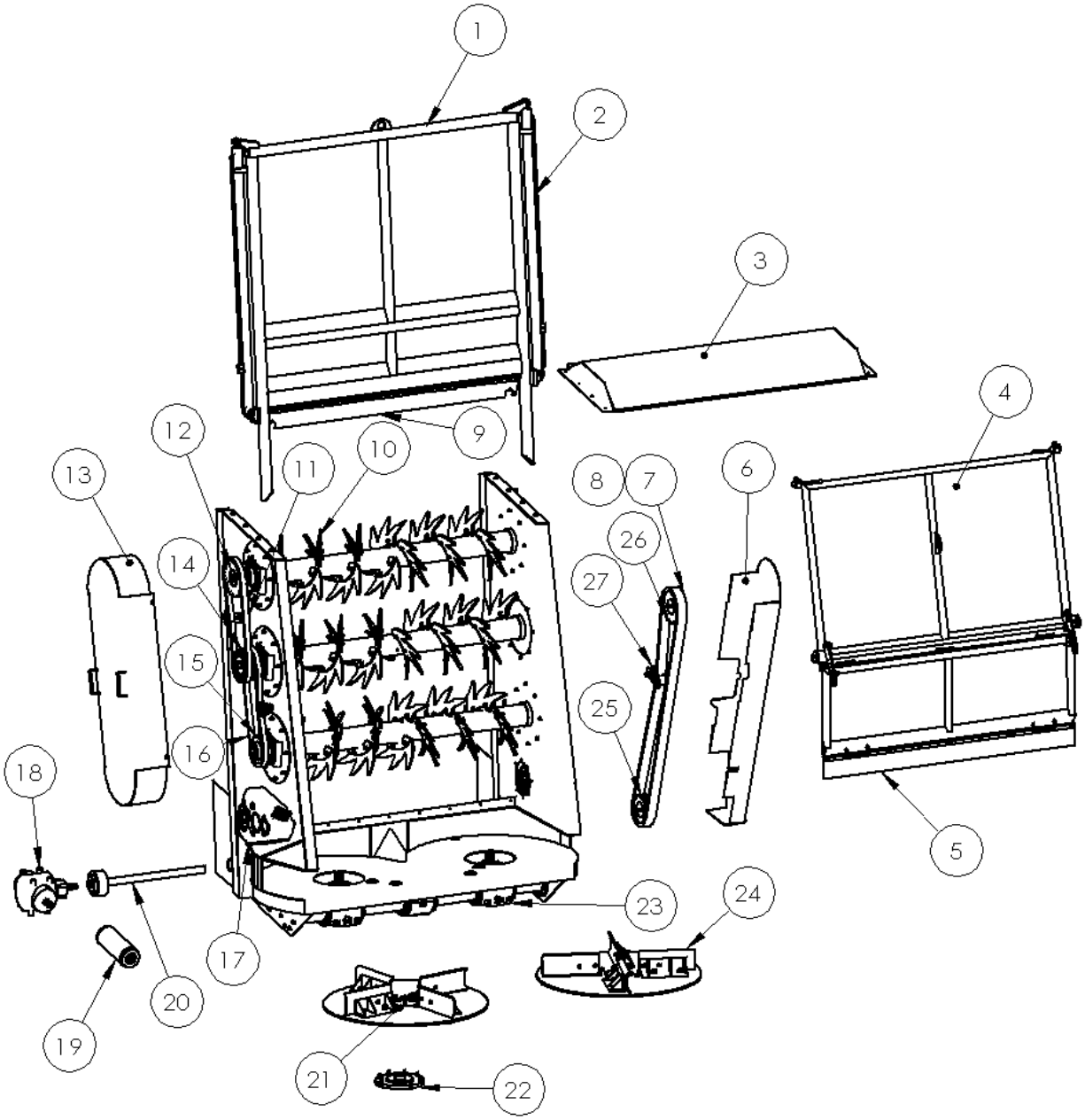


IMPORTANT: OIL OR GREASE THE CHAINS DAILY.

4.8 2 x HORIZONTAL BEATER PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	2	B4138	RAM 2" BORE 64" STROKE
2	1	B4113	SLURRY DOOR ASSEMBLY
3	5	B1178	FLANGE BEARING 50mm SHAFT
4	2	BC214	SPROCKET 11T C/W BEARING
5	1	BC250	SPROCKET 23T TAPER BORE
6	3	BC246	SPROCKET 19T TAPER BORE
7	1	B8220	BEATER SHAFT
8	1	B8226	BEATER SHAFT
9	2	B8200	BEATER BARREL TRIPLE TOOTH (TT)
10	36	B1101/4	BEATER KNIFE H.L. 2000
11	36	B8244	BEATER HALF MOON MOUNT PLATE
12	1	BC124	CHAIN 647mm LG
13	1	BC124	CHAIN 1105mm LG
14	4	B8260	BEATER DISC REMOVABLE
15	8	B1124/B1125	PADDLE LH & RH
16	8	B8350/B8352	BLADE HOLDER ASSEMBLY LH & RH
17	1	B8234	SPINNER DISC LH ASSEMBLY
18	1	B8235	SPINNER DISC RH ASSEMBLY
19	2	DMS0889	LINK CANAOPY
20	1	AMS0133	REAR CANOPY ASSEMBLY
21	1	B4148	CLAMP PLATE
22	1	B4161	RUBBER SKIRT
23	1	B4160	RUBBER SKIRT DECK
24	1	B4148	CLAMP PLATE
25	1	B3190	SPINNER GEARBOX
26	1	AMS0386	SHAFT & CHAIN ASSEMBLY
27	1	AMS0199	CHAIN COVER ASSEMBLY
28	1	B308C	GEARBOX DRIVE CHAIN
29	2	B8338	DISC DRIVE FLANGE
30	2	B8339	FLANGE CAP
31	2	73699	CAP SCREW
32	2	B8484	FLEXIDRIVE BODY
33	1	B8486	FLEXIDRIVE FLANGE 1 3/4
34	1	B8488	FLEXIDRIVE 1 3/8
35	6	B1140	RUBBER DRIVE BLOCK
36	6	B1142	RUBBER DRIVE BLOCK
37	72	B1104	BOLT & NYLOC (FINE THREAD)
38	2		SPROCKET 25T DUPLEX

4.9 3 x HORIZONTAL BEATER

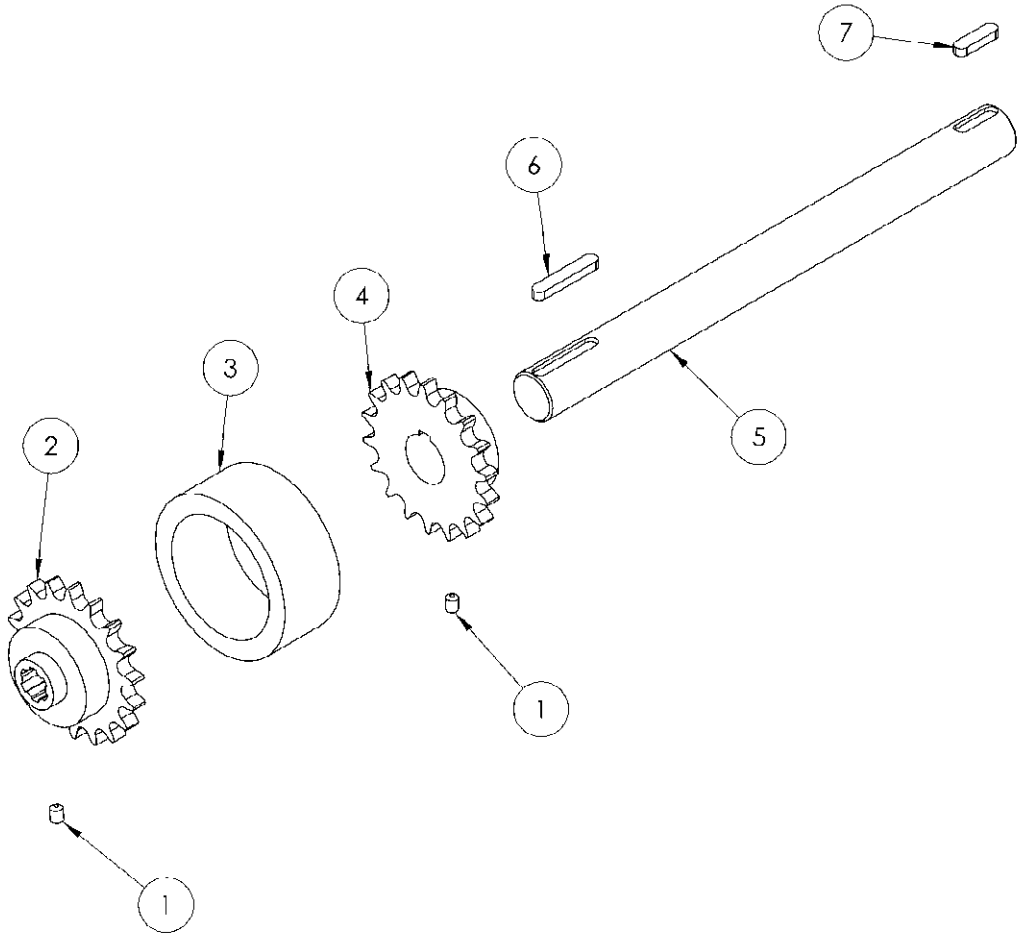


IMPORTANT: OIL OR GREASE THE CHAINS DAILY.

4.9 3 x HORIZONTAL BEATER PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B4113	SLURRY DOOR ASSEMBLY
2	2	B4138	RAM 2" BORE 64" STROKE
3	1	AMS0134	TURRET TOP COVER ASSEMBLY
4	1	AMS0133	REAR CANOPY ASSEMBLY
5	1	B4161	RUBBER SKIRT
6	1	DMS1091	CHAIN GUARD O/S
7	1	BC124	CHAIN DUPLEX 1" PITCH 23T - 25T
8	1		SPROCKET 27 TOOTH DUPLEX
9	1	DMS0396	RUBBER SKIRT
10	36	B1101/4	BEATER KNIFE
11	1	BC124	CHAIN 1" CTRS 25T - 30T
12	1		SPROCKET 30 SINGLE REVERSE TAPER
13	1	AMS0521	CHAIN GUARD N/S
14	1		SPROCKET 25T TRIPLEX
15	1	MS121108	SPROCKET 23T TAPER BORE
16	1	BC124	CHAIN 1" 23T - 25T
17	1 OR 2	B3120	MOVING FLOOR GEARBOX
18	1	B308C	GEARBOX DRIVE CHAIN
19	1	AMS0064	CONNECTING DRIVE ASSEMBLY
20	1	AMS0386	TRANSVERSE DRIVE SHAFT ASSEMBLY
21	2	73698	CAP SCREW
22	2	B8338	DISC DRIVE FLANGE
23	1	B3190	AUGER GEARBOX
24	8	B1124/B1125	PADDLE LH & RH
25	1	BC286	SPROCKET
26	1	BC290	SPROCKET
27	2	BC214	SPROCKET 11T C/W BEARING

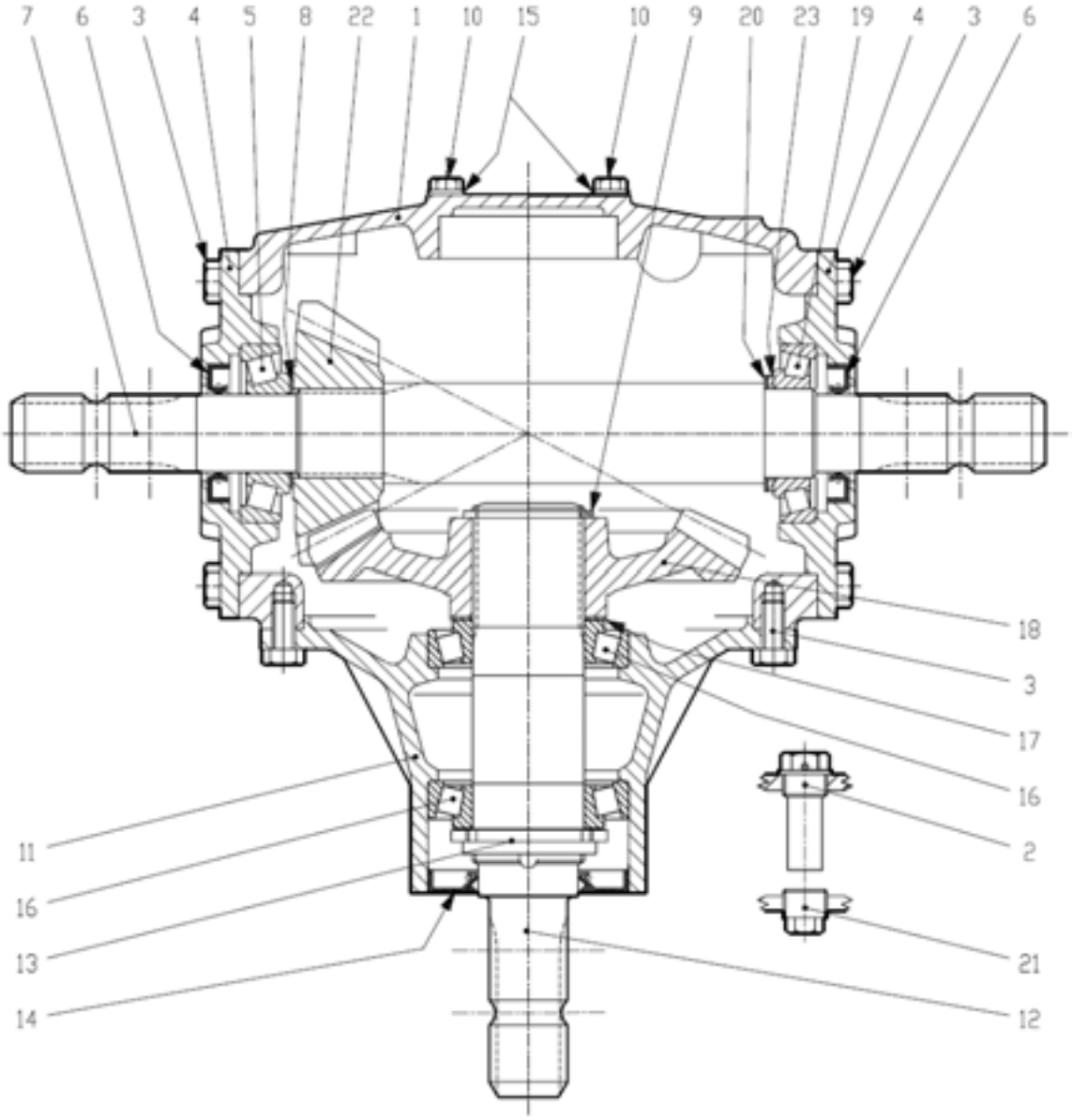
4.10 TRANSVERSE DRIVE ASSEMBLY HORIZONTAL BEATERS - AMS0386



4.10 TRANSVERSE DRIVE ASSEMBLY HORIZONTAL BEATERS - AMS0386 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	2	73898	M12 x 16 LG GRUB SCREW
2	1	BC262	SPROCKET
3	1	BC150	DUPLEX CHAIN
4	1	BC264	SPROCKET
5	1	B1260	DRIVE SHAFT
6	1	B2274	KEY WAY 14x9x80
7	1	B2276	KEY WAY 14x9x51

4.11 TRANSVERSE GEARBOX HORIZONTAL BEATERS

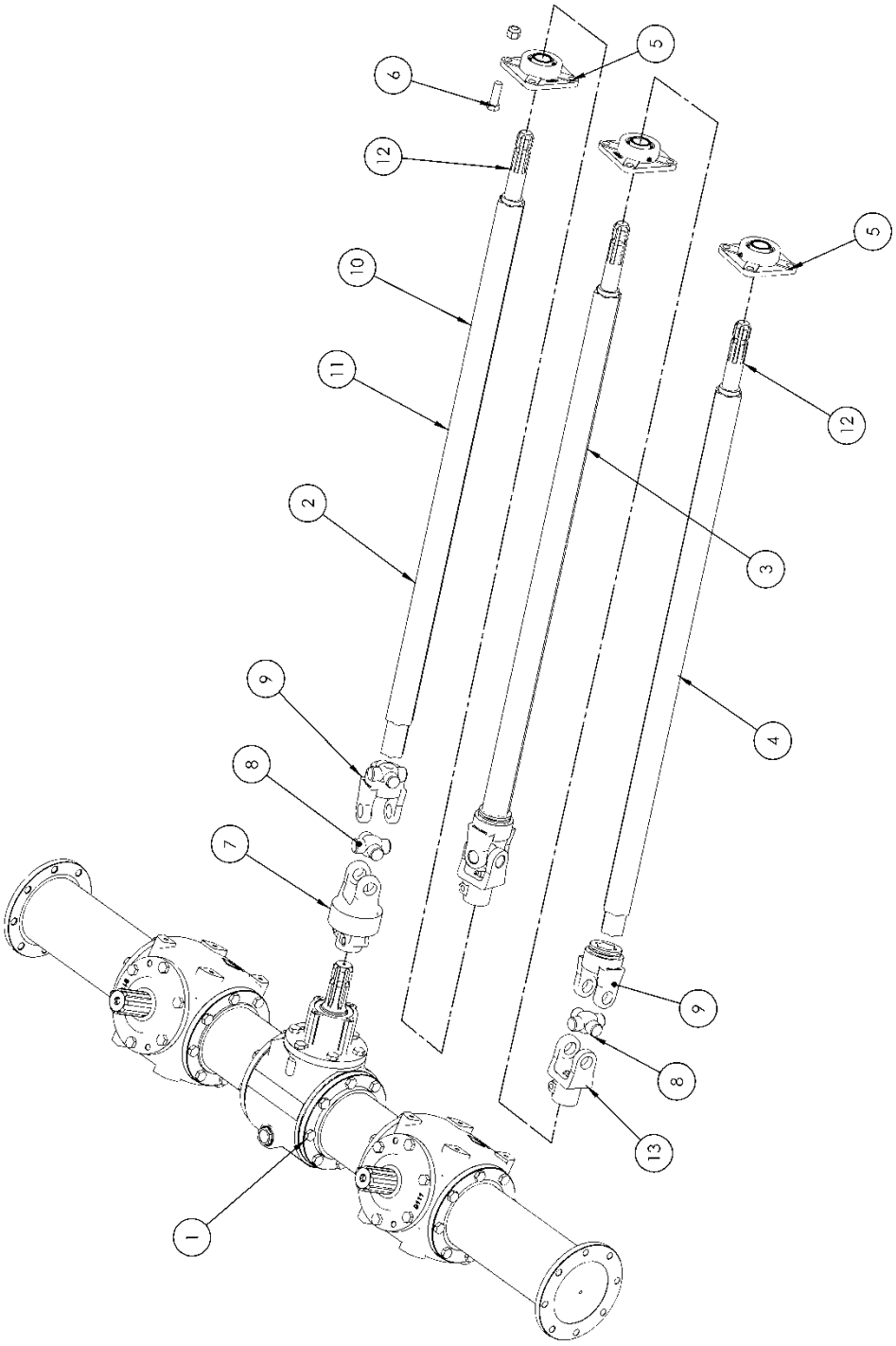


4.11 TRANSVERSE GEARBOX HORIZONTAL BEATERS PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1		CASING
2	1		OIL FILLER PLUG 1/2" GAS
3	24		BOLT M10X22 8,8
4	2		COVER
5	1	MS 150018/1	BEARING
6	2	MS 150018/3	OIL SEAL
7	1		SHAFT
8	1		SHIM
9	1		SNAP RING
10	2		BOLT M10X22 8,8
11	1		EXTENSION
12	1		SHAFT
13	1		NUT
14	1	MS 150018/4	OIL SEAL
15	2		COPPER WASHER
16	2	MS 150018/2	BEARING
17	1		SHIM
18	1		CROWN WHEEL
19	1	MS 121148	BEARING
20	1		SHIM KIT
21	1		PLUG
22	1		PINION SHIM
23	1		SHIM

5. P.T.O AND TRANSMISSION

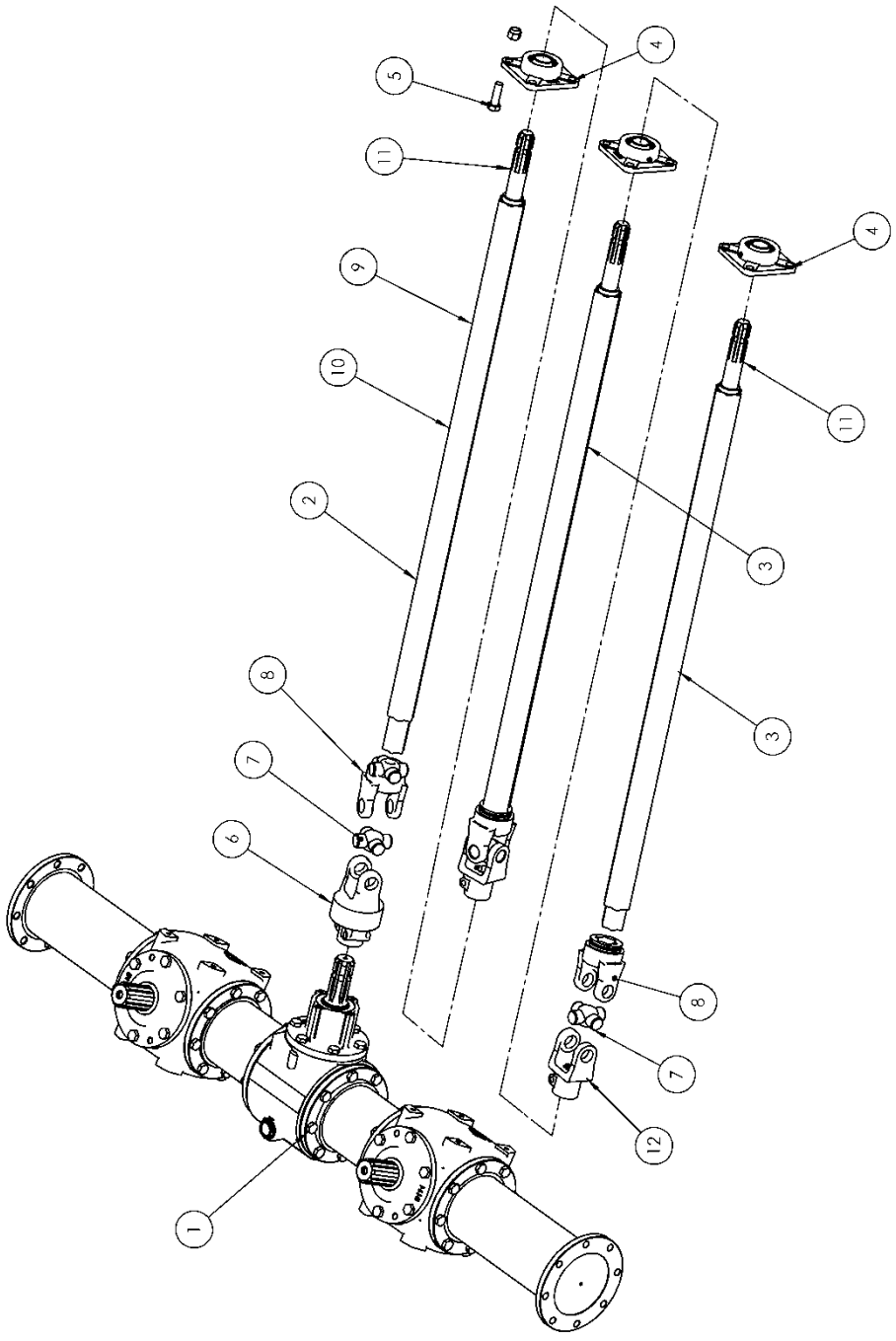
5.1 MK4 TRANSMISSION MODEL 75



5.1 MK4 TRANSMISSION MODEL 75 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3170	GEARBOX 1000-420
	1	B3172	GEARBOX 540-360
2	1	43109	DRIVESHAFT
3	1	43108	DRIVESHAFT
4	1	431071	DRIVESHAFT
5	3	B1170	BEARING
6	12	73093	NUT & BOLT
7	1	43318	YOKE TO 1 3/4" & OVERRUN
8	3	43325	JOURNAL
9	3	43314	YOKE TO S4
10		43301	S4 STAR PROFILE INNER TUBE
11		43302	S5 STAR PROFILE OUTER TUBE
12	3	43305	SPLINED STUB
13	2	43310	YOKE TO 1 3/8"

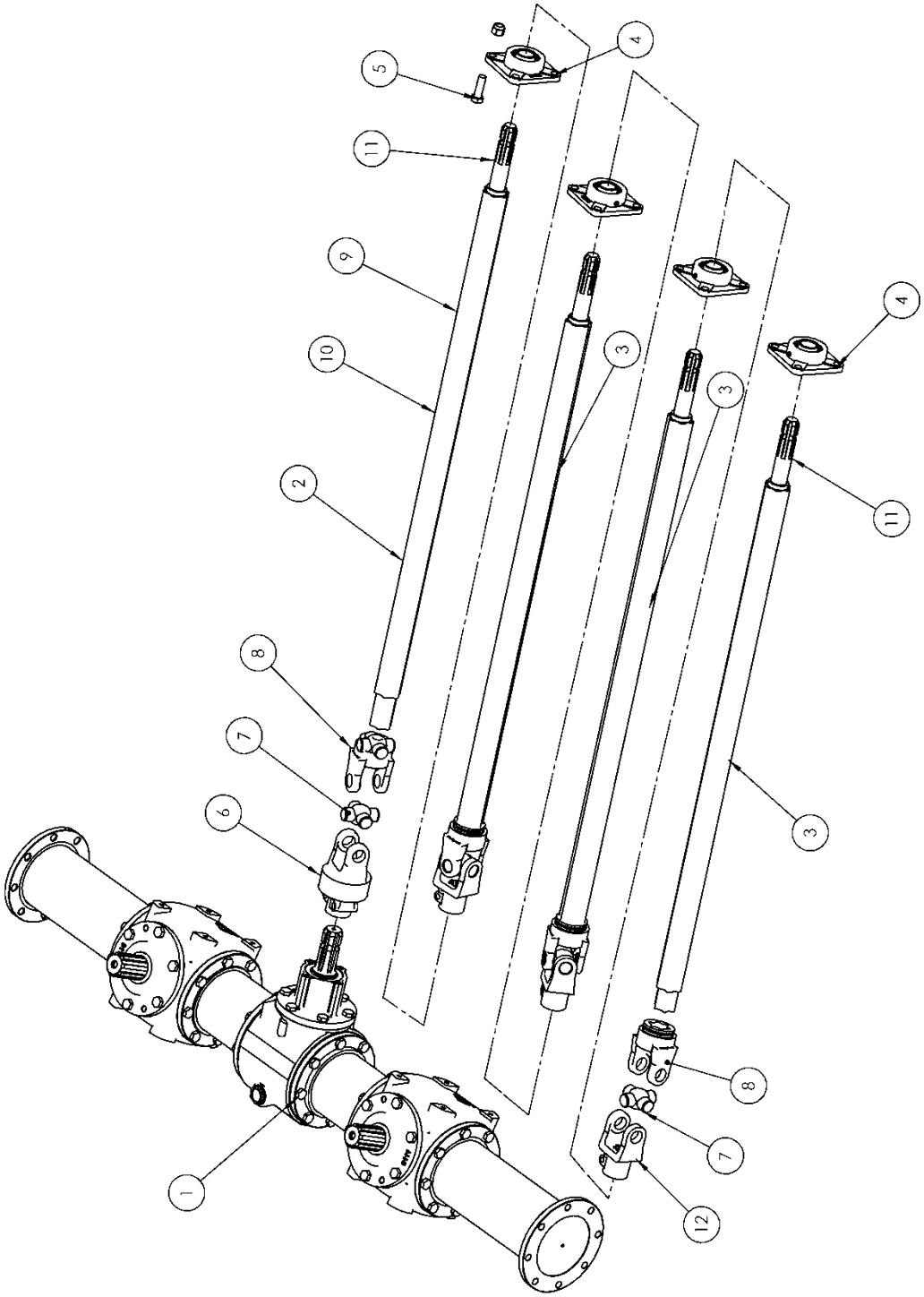
5.2 MK4 TRANSMISSION MODEL 90/105



5.2 MK4 TRANSMISSION MODEL 90/105 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3170	GEARBOX 1000-420
	1	B3172	GEARBOX 540-360
2	1	43109	DRIVESHAFT
3	2	431081	DRIVESHAFT
4	3	B1170	BEARING
5	12	73093	NUT & BOLT
6	1	43318	YOKE TO 1 3/4" & OVERRUN
7	3	43325	JOURNAL
8	3	43314	YOKE TO S4
9		43301	S4 STAR PROFILE INNER TUBE
10		43302	S5 STAR PROFILE OUTER TUBE
11	3	43305	SPLINED STUB
12	2	43310	YOKE TO 1 3/8"

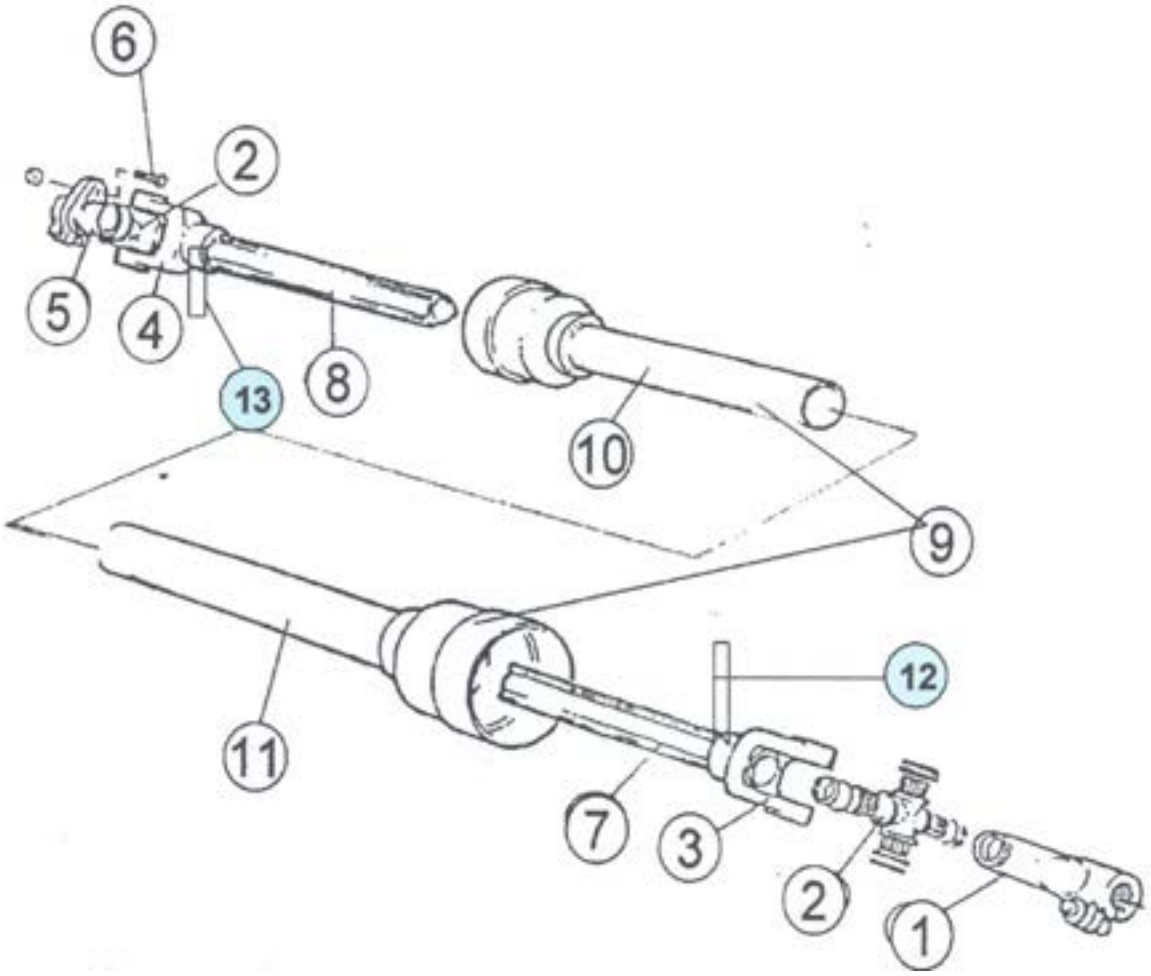
5.3 MK4 TRANSMISSION 120/150



5.3 MK4 TRANSMISSION MODEL 120/150 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B3170	GEARBOX 1000-420
	1	B3172	GEARBOX 540-360
2	1	43109	DRIVESHAFT (150)
2	1	431071	DRIVESHAFT (120)
3	3	43108	DRIVESHAFT (150)
3	2	431071	DRIVESHAFT (120) (FRONT SHAFT 43108)
4	4	B1170	BEARING
5	16	73093	NUT & BOLT
6	1	43318	YOKE TO 1 3/4" & OVERRUN
7	4	43325	JOURNAL
8	4	43314	YOKE TO S4
9		43301	S4 STAR PROFILE INNER TUBE
10		43302	S5 STAR PROFILE OUTER TUBE

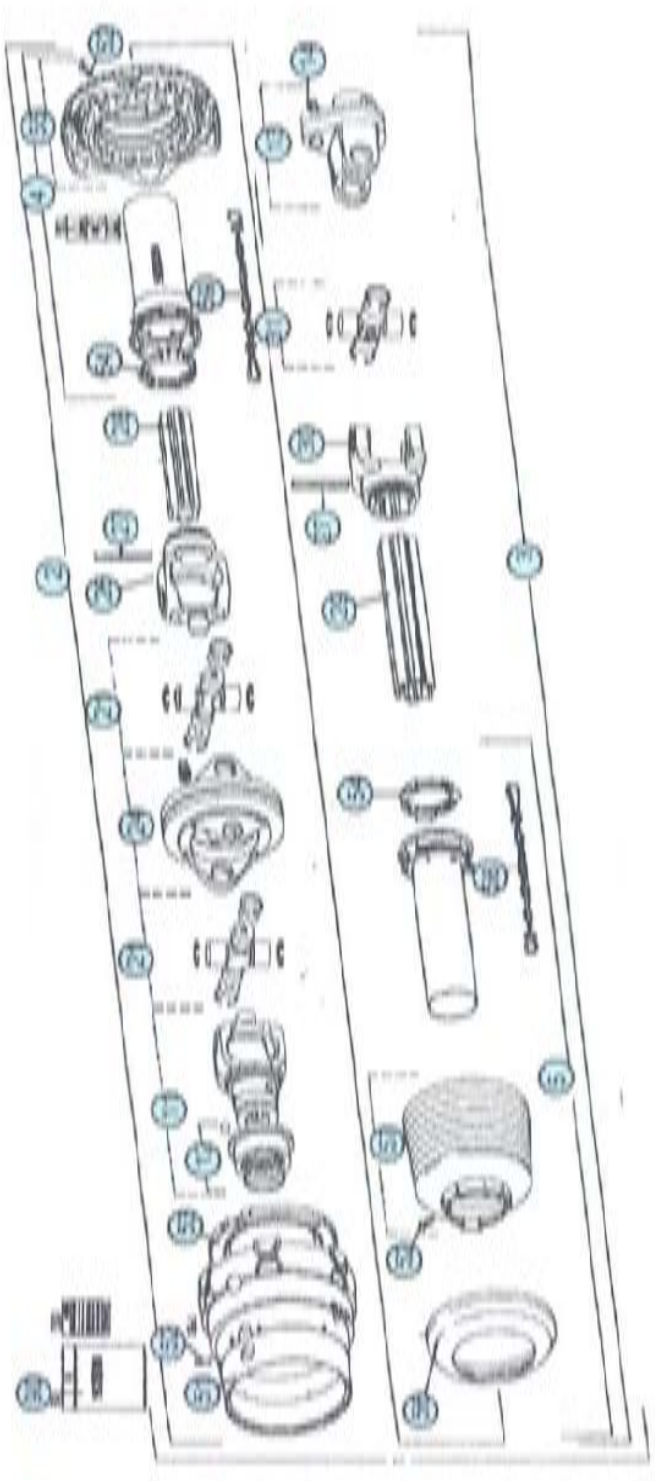
5.4 WALTERSCHEID P.T.O SHAFT



5.4 WALTERSCHEID P.T.O SHAFT PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	43312	YOKE TO 6 SPLINE
	1	43313	YOKE TO 21 SPLINE
2	2	43325	JOURNAL
3	1	43314	YOKE TO S4 TUBE
4	1	43315	YOKE TO S5 TUBE
5	1	43317	YOKE TO SHEAR BOLT CLUTCH
6	1	B1310	SHEAR BOLT 6.8 HARDNESS
7		43301	S4 TUBE INNER
8		43302	S5 TUBE OUTER
9	1	43441	GUARD COMPLETE
10	1	43443	GAURD INNER
11	1	43444	GUARD OUTER
12	1	42030	ROLL PIN
13	1	42030	ROLL PIN

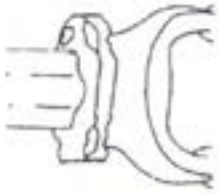
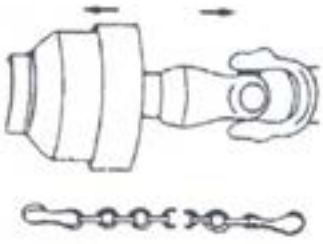
5.5 WALTERSCHEID WIDE ANGLE P.T.O SHAFT



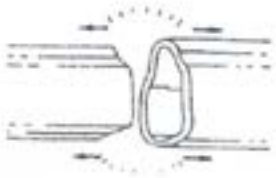
5.5 WALTERSCHEID WIDE ANGLE P.T.O SHAFT

KEY	QTY	PART No.	DESCRIPTION
1	1	43005	W/A P.T.O SHAFT COMPLETE 21 SPLINE
	1	43006	W/A P.T.O SHAFT COMPLETE 6 SPLINE
	1	43007	W/A P.T.O SHAFT COMPLETE 20 SPLINE
2	1	43390	21 SPLINE INNER W/A HALF SHAFT WITH OUTER GUARD
	1	43391	6 SPLINE INNER W/A HALF SHAFT WITH OUTER GUARD
	2	43389	20 SPLINE INNER W/A HALF SHAFT WITH OUTER GUARD
3	1	43392	6 SPLINE INNER W/A HALF SHAFT WITH OUTER GUARD
4	1	43472	W/A HALF GUARD OUTER
5	1	43470	W/A HALF GUARD INNER
11	1	43360	W/A YOKE TO 21 SPLINE
	1	43361	W/A YOKE TO 6 SPLINE
	11	43362	W/A YOKE TO 20 SPLINE
12	1	43322	AS - LOCK SIZE C (AG118)
13	1	43374	SHEAR BOLTS CLUTCH TO YOKE
14	1	B1310	SHEAR BOLT 6.8 HARDNESS
21	2	43367	W/A JOURNAL KIT COMPLETE
24	1	43365	W/A CENTRE BODY
26	1	43366	W/A YOKE TO S4 INNER TUBE
27	2	42030	ROLL PIN
28		43301/1	INNER TUBE STAR PROFILE COATED S4GA
29		43302	OUTER TUBE STAR PROFILE
30	1	43315	YOKE OUTER TUBE
31	1	43340	JOURNAL KIT
51	1	43474	W/A GUARD CONE
52	10	43490	SCREW
53	1	43475	W/A BEARING RING
54	1	43450	INNER TUBE BEARING RING
55	1	43476	W/A FLEXIBLE GUARD
56	1	43452	REINFORCING COLLAR
57	1	43451	CONE FOR INNER TUBE
58	1	43448	SAFETY CHAIN 400
59	1	43449	SAFETY CHAIN 600
90	1	43002	W/S INSTRUCTION MANUAL

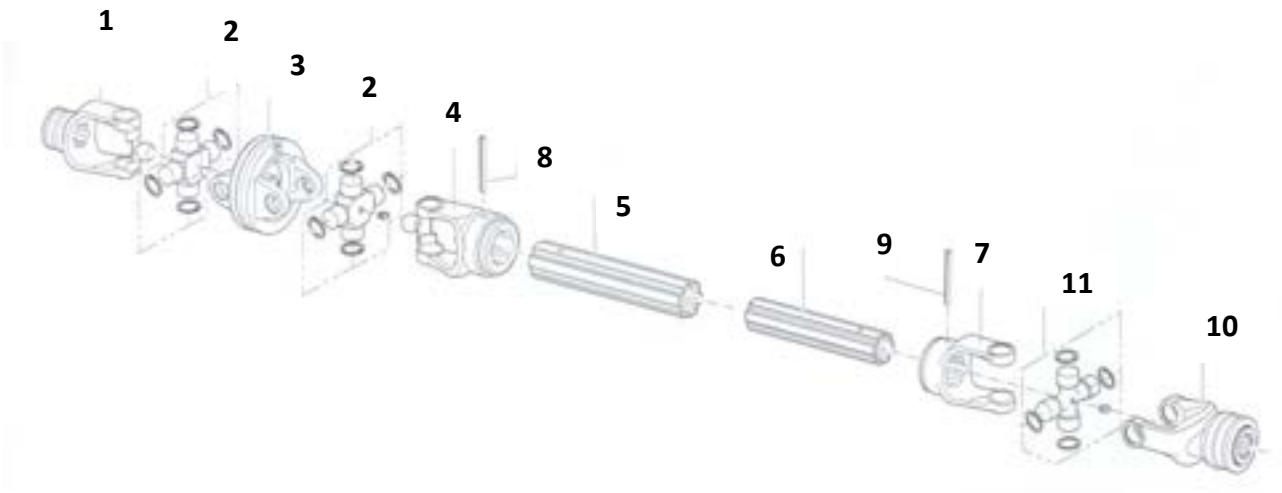
5.6 PROBLEMS AND POSSIBLE SOLUTIONS

PROBLEM	PROBABLE CAUSE	POSSIBLE SOLUTION
 Torsion of telescopic tubes	Excessive twisting of shafts	Fit an appropriate safety device onto the drive
		Upgrade the drive
 Rapid wear on tubes	Excessive slipping under load of drive	Use drive polyamide coated tubes. (Rilsan coated)
	Drive too short so tubes are not coupled well	Replace drive with one of an adequate length
	Poor lubrication	Lubricate as prescribed
 Rapid wear on shielding ring nuts	Poor lubrication	Lubricate as prescribed
 Shielding coming out of its seat and chain giving way	Bad chain connection	Position chain properly so that even at the maximum drive angle the chain is not under tension

5.6 PROBLEMS AND POSSIBLE SOLUTIONS

PROBLEM	PROBABLE CAUSE	POSSIBLE SOLUTION
 Yoke eyes opening / deforming	Excessive twisting of shafts	Fit an appropriate safety device onto the drive
	Drive too long	Upgrade the drive
 Wear on yoke arms	Excessive working angle of worn joint	Use a constant velocity joint or disengage the P.T.O. on tight bends
 Cross pins break	Excessive twisting movement	Fit an appropriate safety device onto the drive
		Upgrade the drive
 Rapid wear on cross pins	Excessive continuous load or excessive working angle	Check that the choice of working conditions and type are appropriate
	Lubrication intervals not respected	Respect the prescribed lubrication intervals
 Telescopic tubes disengaging during work or manoeuvring	Drive too short	Replace drive with a longer one

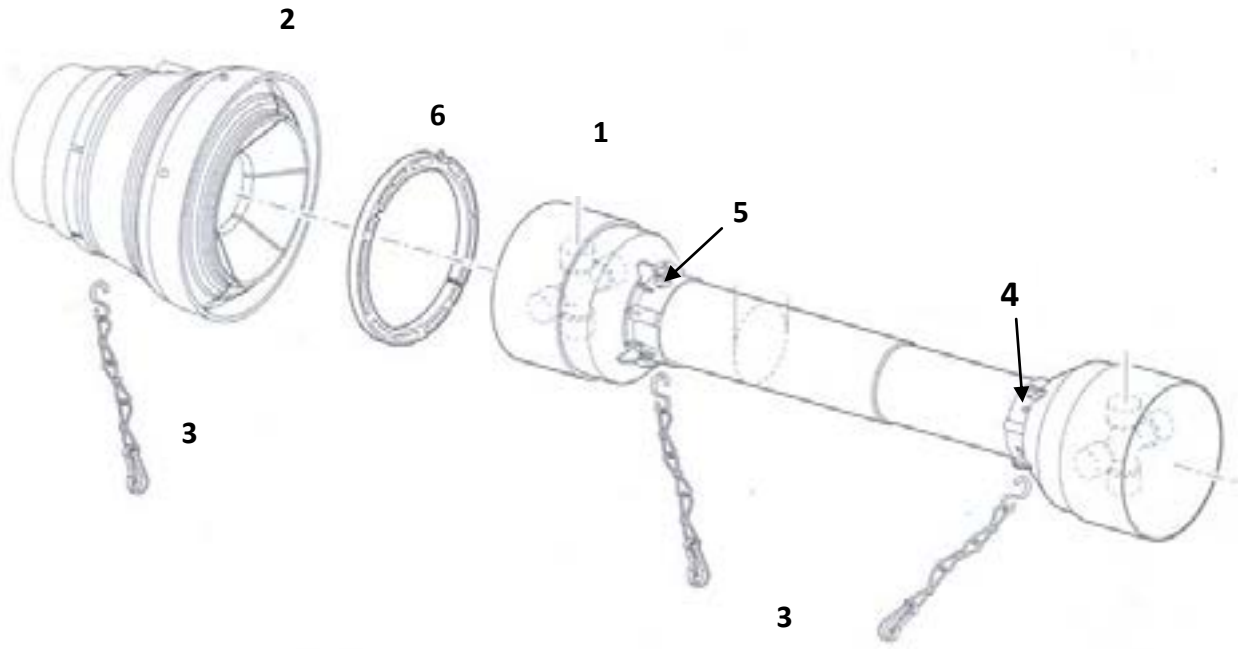
5.7 COMER SERIES V PTO SHAFT ASSEMBLY.



5.7 COMER SERIES V PTO SHAFT ASSEMBLY PARTS LIST.

KEY	QTY	DESCRIPTION	PART No.
1	1	W/A YOKE 6 SPLINE 1⅜	42810
1	1	W/A YOKE 21 SPLINE 1⅜	42815
1	1	W/A YOKE 20 SPLINE 1¾	42825
2	2	W/A JOURNAL	42848
3	1	W/A CENTRAL BODY	42845
4	1	W/A YOKE TO OUTER	42830
5	1	MULTI LOBE OUTER TUBE	42780
6	1	MULTI LOBE INNER TUBE	42785
7	1	YOKE TO INNER MULTI LOBE	42835
8	1	ROLL PIN	42792
9	1	ROLL PIN	42790
10	1	T60 YOKE TO SHEARBOLT	42760
11	1	T60 JOURNAL	42701
12	1	SHEARBOLT 4.6	B1310
12	1	SHEARBOLT 6.8	B1311
12	1	SHEARBOLT 8.8	B1312
12	1	SHEARBOLT 10.9	B1313

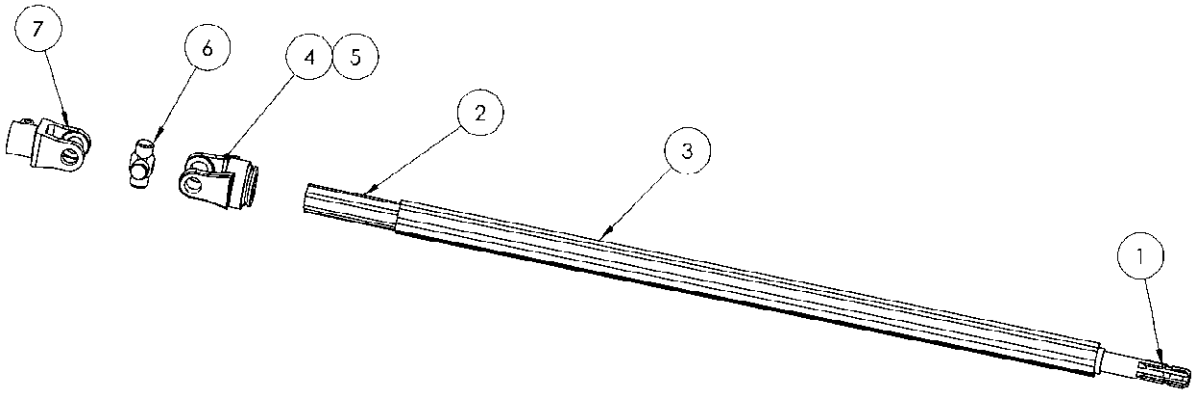
5.8 COMER WIDE ANGLE GUARD COMPLETE PART No. 42088.



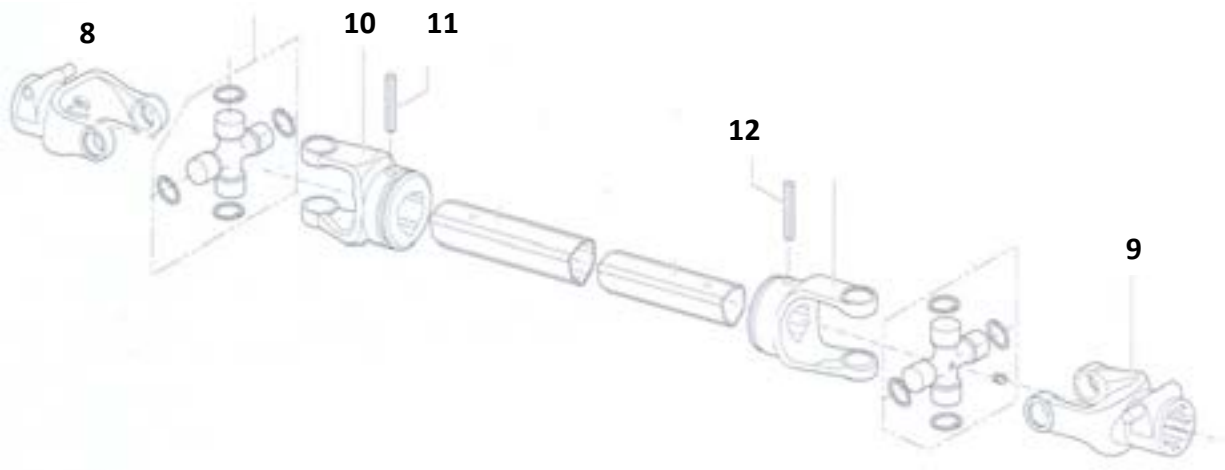
5.8 COMER WIDE ANGLE GUARD COMPLETE PART No. 42088 PARTS LIST.

KEY	QTY	DESCRIPTION	PART No.
1	1	PLASTIC GUARD COMPLETE	42910
2	1	W/A CONE	42920
3	1	SAFETY CHAINS	42945
4	1	BEARING RING INNER	42935
5	1	BEARING RING OUTER	42930
6	1	GUARD RETAINING COLLAR	42940

5.9 COMER T60 UNDERBODY DRIVESHAFT.



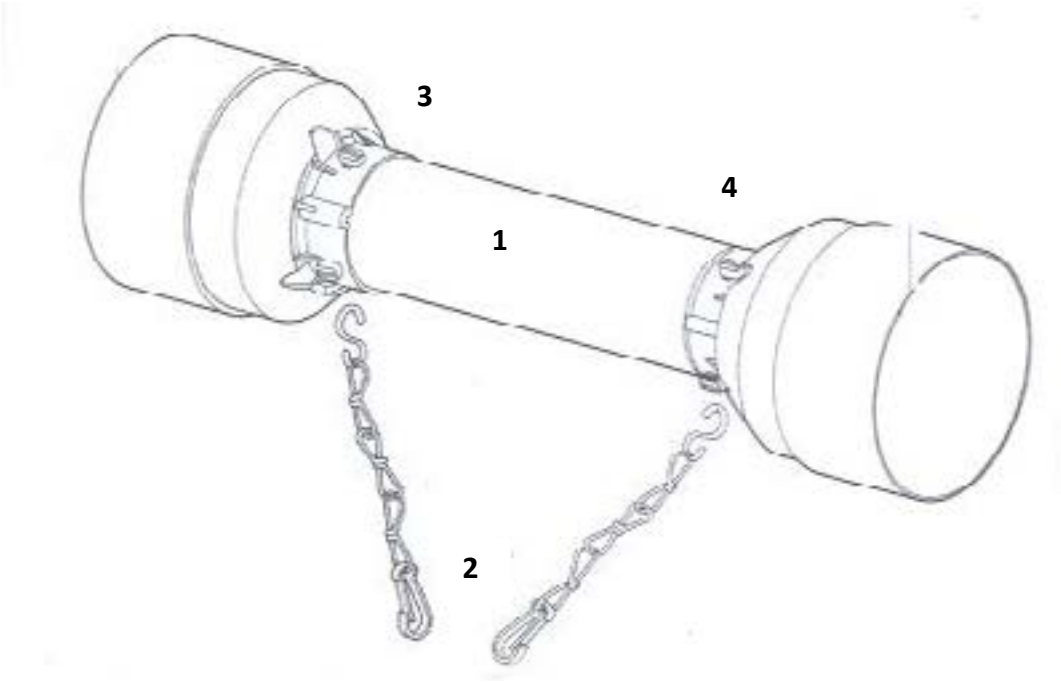
INTERCONNECTING PTO SHAFT



5.9 COMER T60 UNDERBODY DRIVESHAFT PARTS LIST.

KEY	QTY	DESCRIPTION	PART No.
1	1	SPLINED BAR	42041
2	1	T60 INNER TUBE (PER METER)	42775
3	1	T60 OUTER TUBE(PER METER)	42770
4	1	YOKE TO OUTER	42745
5	1	ROLL PIN	42030
6	1	JOURNAL	42701
7	1	YOKE 6 SPLINE CLAMP BOLT	42715
7	1	1¾ YOKE 6 SPLINE OVERRUN CLAMPBOLT	42766
8	1	1⅜ 6 SPLINE YOKE QUICK RELEASE SHEARBOLT	42760
9	1	1⅜ 6 SPLINE YOKE QUICK RELEASE SHEARBOLT	42705
9	1	1 ⅜ 21 SPLINE YOKE QUICK RELEASE SHEARBOLT	42725
9	1	1 ¾ 21 SPLINE YOKE QUICK RELEASE SHEARBOLT	42740
10	1	YOKE TO INNER	42750
11	1	ROLL PIN	42790
12	1	ROLL PIN	42792

5.10 COMER PLASTIC GUARD ASSEMBLY.



5.10 COMER PLASTIC GUARD ASSEMBLY PARTS LIST.

KEY	QTY	DESCRIPTION	PART No.
1	1	PLASTIC GUARD COMPLETE	
2	1	SAFETY CHAIN	42058
3	1	BEARING RING INNER	42056
4	1	BEARING RING OUTER	42057

5.11 COMER PTO GUARD SAFETY CHAIN FIXING

Care should be taken when fixing the PTO safety chains, by following the guidelines below you can help avoid unnecessary and possibly expensive damage to the PTO guard and its component parts.

The purpose of the safety chain is to stop the guarding from rotating during its normal operation thus preventing foreign objects becoming entangled in it including you!, the safety chains must be fixed in a position that limits the risk of damage to both operator and shaft guarding.

Because each application varies there is no one perfect way of fitting, as we are all aware tractors vary as do machines, some come with ideal fixing points others don't. The chains are supplied at a set length, this is not the length they have to be used at, more so the length exists to ensure attachment can be achieved should a suitable anchor point be some distance from the guard.

In the case where a chain can be shortened it should be, not so much as to then cause damage by pulling on the guard but enough to stop the whole chain wrapping around the guard cuffs as the shaft starts to work. This is especially true when fixing wide angle constant velocity joints, by its nature the shaft will be moving to the left and right as the tractor turns, in this case we have to leave enough slack on the chain to allow this movement but at the same time ensuring that the chain does not wrap around the wide angle cover or pull across its surface causing damage, in an ideal world the chain would be fixed at 90 degrees to the guard, in effect the only point of contact between guard and chain would be where the chain is fixed to the guard, getting the anchor point as close to 90 degrees to the shaft will certainly help prevent damage.

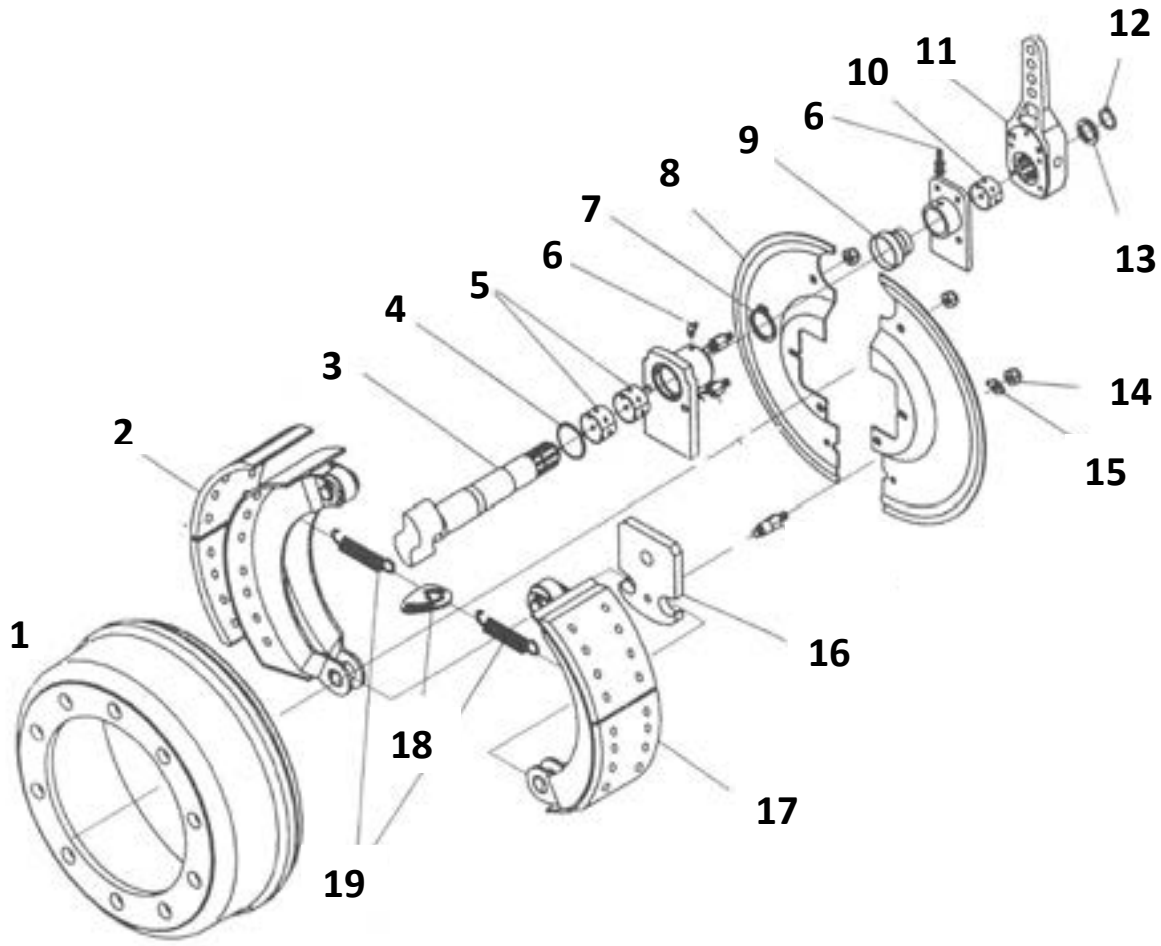
Sometimes with the wide angle shafts it is possible to fix one chain to the other, at the same time shortening the length of chain as it is done, this can be achieved by taking the main tube guard chain that is at the wide angle end of the drive shaft and clipping it to the chain running from the wide angle guard which in turn is anchored as close to 90 degrees from the shaft as is possible, again providing there is some slack left in the chain, the length of chain can be reduced thus avoiding damage casued by excess chain wrap around and crossover.

The following pointers should help keep your guard serviceable for many hours.

1. Don't leave the chains too long allowing them to wrap around the guard it will damage the guard.
2. Don't leave the chains so short they pull on the guard.
3. Always try and avoid contact between chain and guard, keep contact to a minimum.
4. Anchor the chains as close to 90 degrees from the shaft as possible.
5. If needed attach one chain to the other, to avoid cross over and chain wrap around.
6. Always ensure there is enough slack to allow for exaggerated movement especially when using a wide angle shaft.
7. Always maintain then shaft as instructed by the manual supplied with it.
8. Grease your shaft and guard bearings regularly.
9. Always replace worn chains and guarding, damaged guards ae potentially lethal.
10. Always stop the tractor engine, wait for the machine to stop turning and remove the ignition key before attempting to work on or around your driveshaft.

6. BRAKE & AXLE ARRANGEMENTS

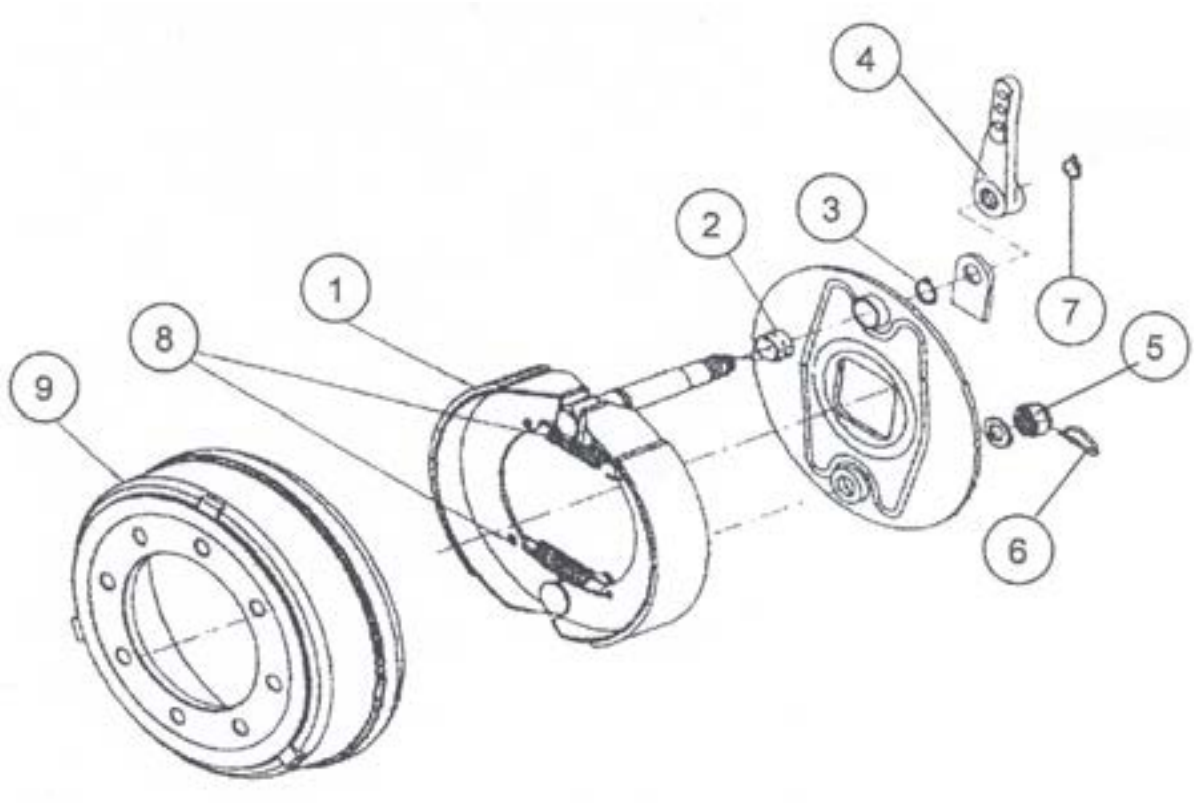
6.1 MK4 BRAKE ARRANGMENT 120/150 & WB



6.1 MK4 BRAKE ARRANGMENT 120/150 & WB PARTS LIST

		MODEL	120	150/180
		AXLE SIZE	140mm SQ	150mm SQ
		BRAKE TYPE	412S	414S
KEY	**QTY**	**DESCRIPTION**	**PART No.**	**PART No.**
1	2	DRUM	F10017/6	F10017/7
2	4	LINING	97726D08	97726013
3	2	S' CAM ROD	97831	97831
4	2	WASHER	97770008	97770008
5	4	BUSH	97610568	97610568
6	4	GREASER	50731/3	50731/3
7	2	CIRCLIP 42E	98900042	98900042
8	2	BACK COVER PER PAIR	F10123/4	F10123/5
9	2	RUBBER BOOT	97610575	97610575
10	2	BUSH	771382601	771382601
11	2	BRAKE LEVER	F1030	F1030
12	2	CIRCLIP	98900025	98900025
13	2	WASHER	92630030	92630030
14	10	NUT	92411008	92411008
15	2	TAB WASHER	97610579	97610579
16	2	STUD	97620583	97620583
17	2 PR	BRAKE SHOE	F10108/2	F10108/3
18	2	SPRING TENSIONER	97610576	97610576
19	4	RETURN SPRING	738119	738119

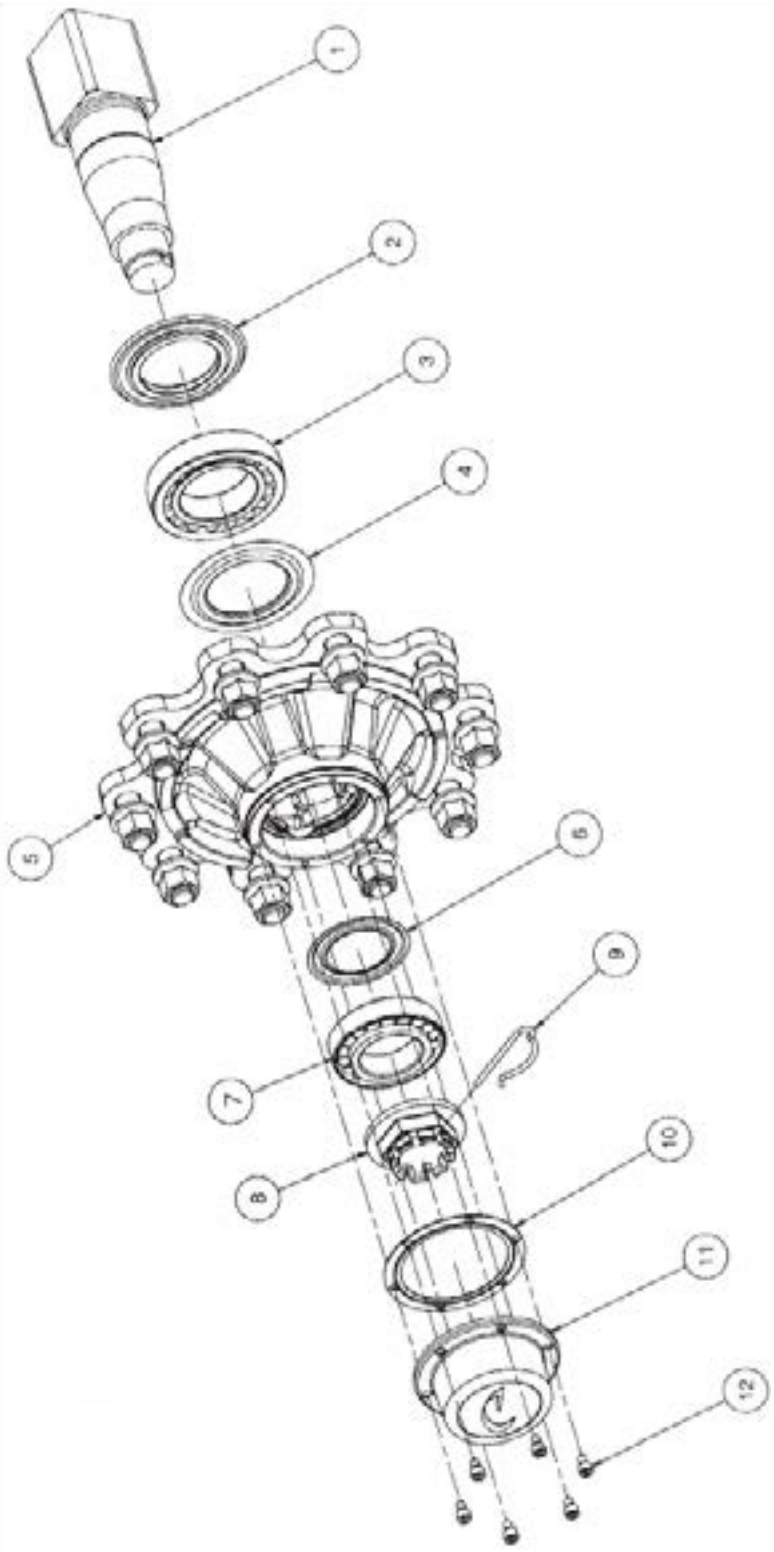
6.2 MK4 BRAKE PARTS MK4 75/90/105



6.2 MK4 BRAKE PARTS MK4 75/90/105 PARTS LIST

	MODEL	75	90/105
	AXLE SIZE	EF938	EUR 1010/1110
	BRAKE TYPE	A 410	A 610
	BRAKE SIZE	355 x 80	400 x 80
KEY	**DESCRIPTION**	**PART No.**	**PART No.**
1	BRAKE SHOES	F10107	F10108/1
2	BRAKE ROD BUSH	97610514	97610514
3	CIRCLIP 38E	98900038	98900038
4	BRAKE LEVER	F00620	F00620
5	NUT	57524B2	57524B2
6	PIN 4 x 32	98850432	98850432
7	CIRCLIP	98900025	98900025
8	RETURN SPRING	738123	738117
9	DRUM	F0017/4	F0017/5

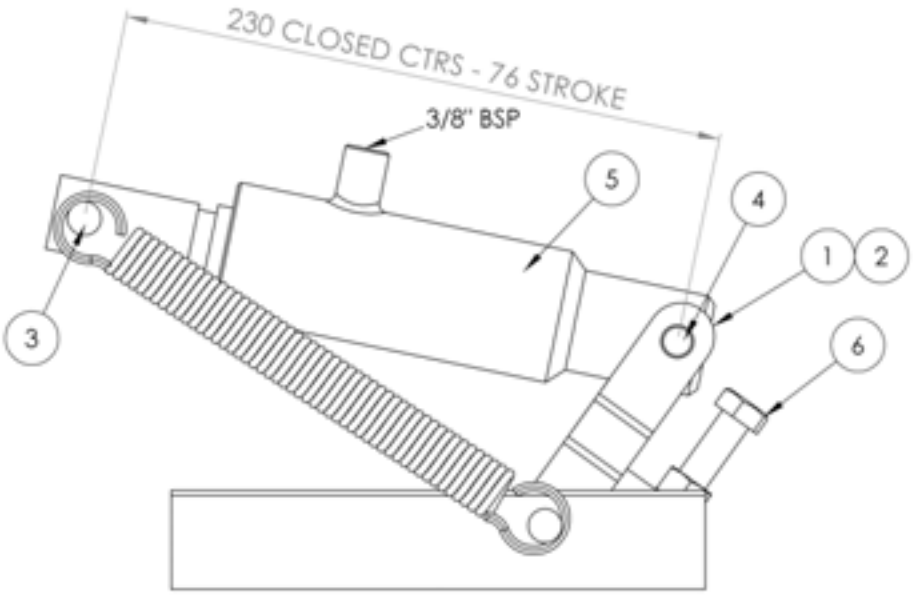
6.3 AXLE HUB AND BEARING PARTS MK4

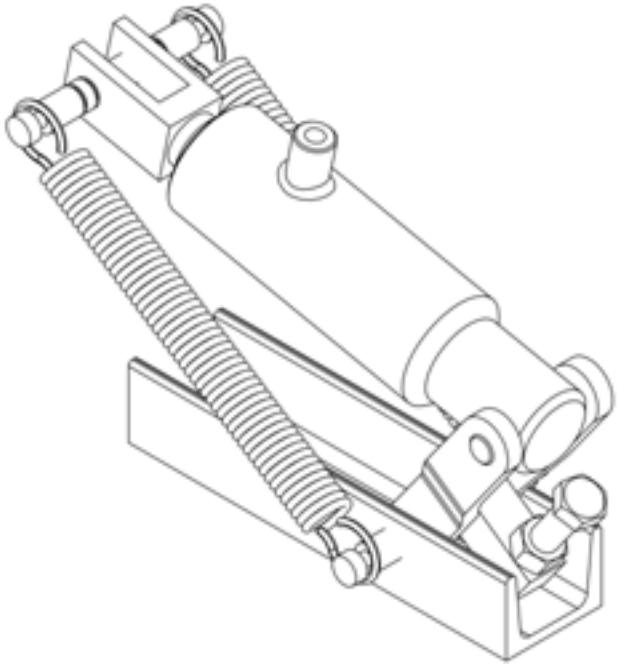


6.3 AXLE HUB AND BEARING PARTS MK4 PARTS LIST

	MODEL	75	90 & 105	120	150
	AXLE TYPE	EF 938	EUR 1010/1110	EUR 1410	EUR 1510
	AXLE SIZE	90mm	100/110mm	140mm	150mm
KEY	**DESCRIPTION**	**PART No.**	**PART No.**	**PART No.**	**PART No.**
1	AXLE	J1020	J1030/40	J1050	J1060
2 4 6	SEAL KIT	F10061/3	F10061/4	F10061/5	F10061/6
3	BEARING	F10044	F10049/1	F10047	F10049
5	HUB	F10016/1	F10016/2	F10016/2	F10016/3
7	BEARING OUTER	F10036	F10045/1	F10045/1	F10049/1
8	CASTLE NUT	F10066/1	F10066/2	F10066/2	F10066/2
9	PIN	J1060F1	J1060F1	J1060F1	J1060F1
10	HUB CAP GASKET				
11	HUB CAP	F10073	F10073/1	F10073/1	F10073/2
12	HUB CAP SCREW				
	WHEEL NUT	F00550	F00547	F00547	F00547
	WHEEL STUD	F00545/1	F00546	F00546	F00546

6.4 HYDRAULIC BRAKE RAM ASSEMBLY – MK4 75 30mm BORE – 70830.2

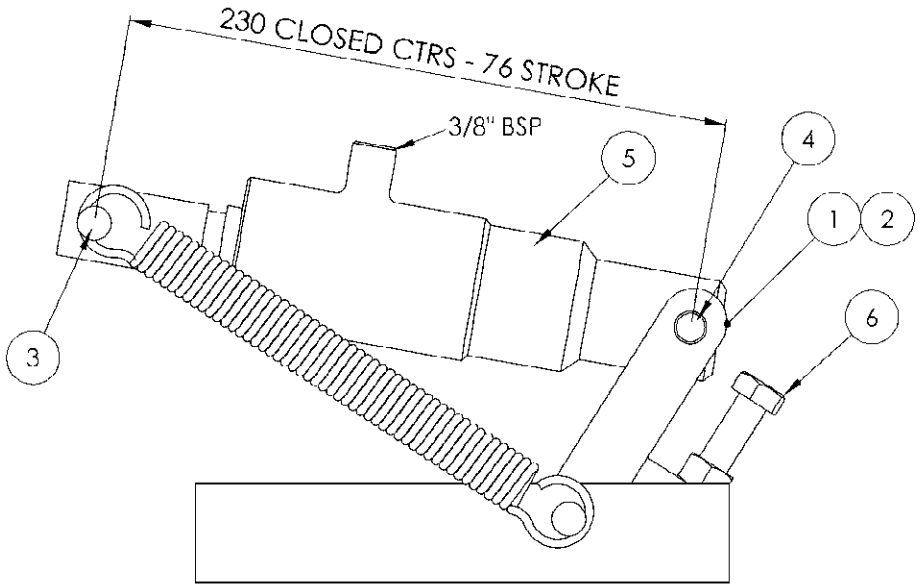


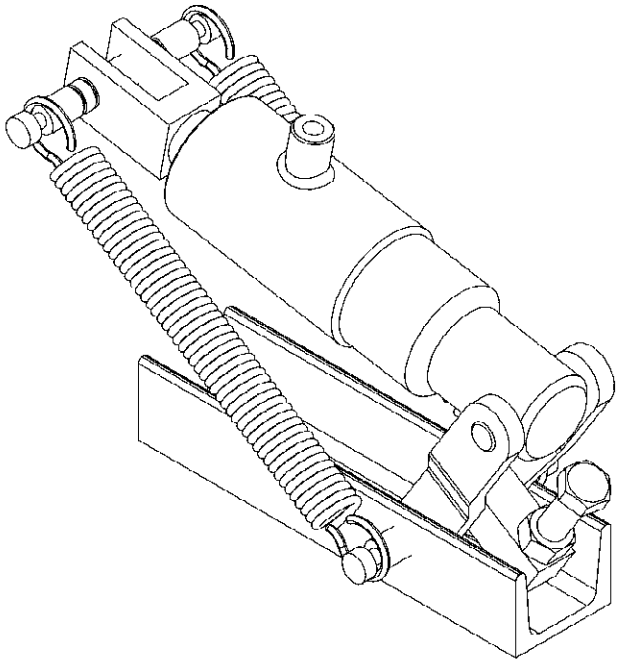


6.4 HYDRAULIC BRAKE RAM ASSEMBLY – MK4 75 30mm BORE – 70830.2 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	2	70830/2	RAM ASSEMBLY
2	2	70831/2	SEAL KIT
3	2	70830/4	SPRING & PIN KIT
4	2	70836	SELLOCK PIN
5	2	70835/3	CYLINDER
6	2	70834	ADJUSTER

6.5 HYDRAULIC BRAKE RAM ASSEMBLY - MK4 90/105/120/150 & WB 35mm BORE – 70830.3

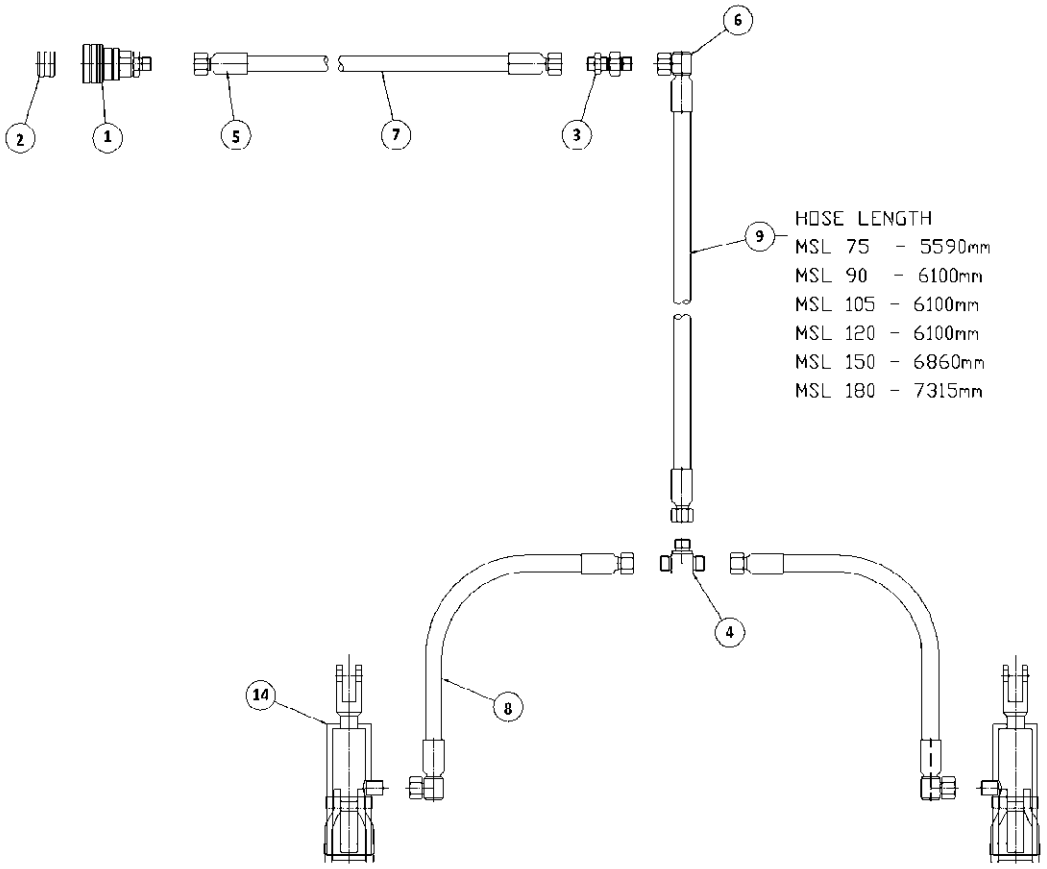




6.5 HYDRAULIC BRAKE RAM ASSEMBLY - MK4 90/105/120/150 & WB 35mm BORE – 70830.3 PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	2	70830/3	RAM ASSEMBLY
2	2	70831/3	SEAL KIT
3	2	70830/4	SPRING & PIN KIT
4	2	70836	SELLOCK PIN
5	2	70835/3	CYLINDER
6	2	70834	ADJUSTER

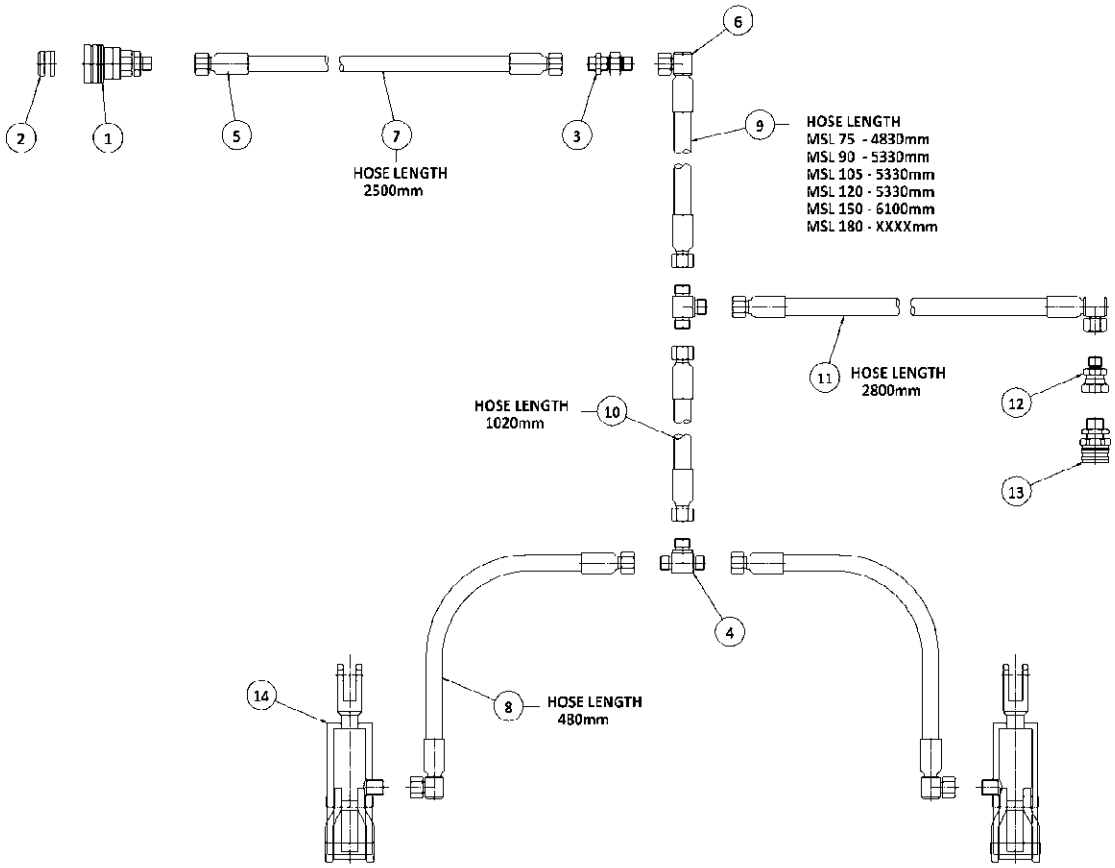
6.6 HYDRAULIC BRAKE CIRCUIT SINGLE AXLE



6.6 HYDRAULIC BRAKE CIRCUIT SINGLE AXLE – PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	51568	COUPLING 3/8 FEMALE SELF SEAL
2	1	51583-1	DUMMY 3/8 MALE
3	1	51463	3/8"-3/8" NPT BULKHEAD
4	2	51447	3/8"-3/8"-3/8" NPT MALE TEE
5	8	52311	HOSE END DIA3/8"-3/8" BSP FEMALE
6	4	52313	HOSE END DIA3/8"-3/8" BSP 90 DEG FEM
7	1	51828 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x 2500
8	2	51828 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x 480
9	1	52760 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x LENGTH
10			
11			
12			
13			
14	REF		BRAKE ACTUATOR HYDRAULIC

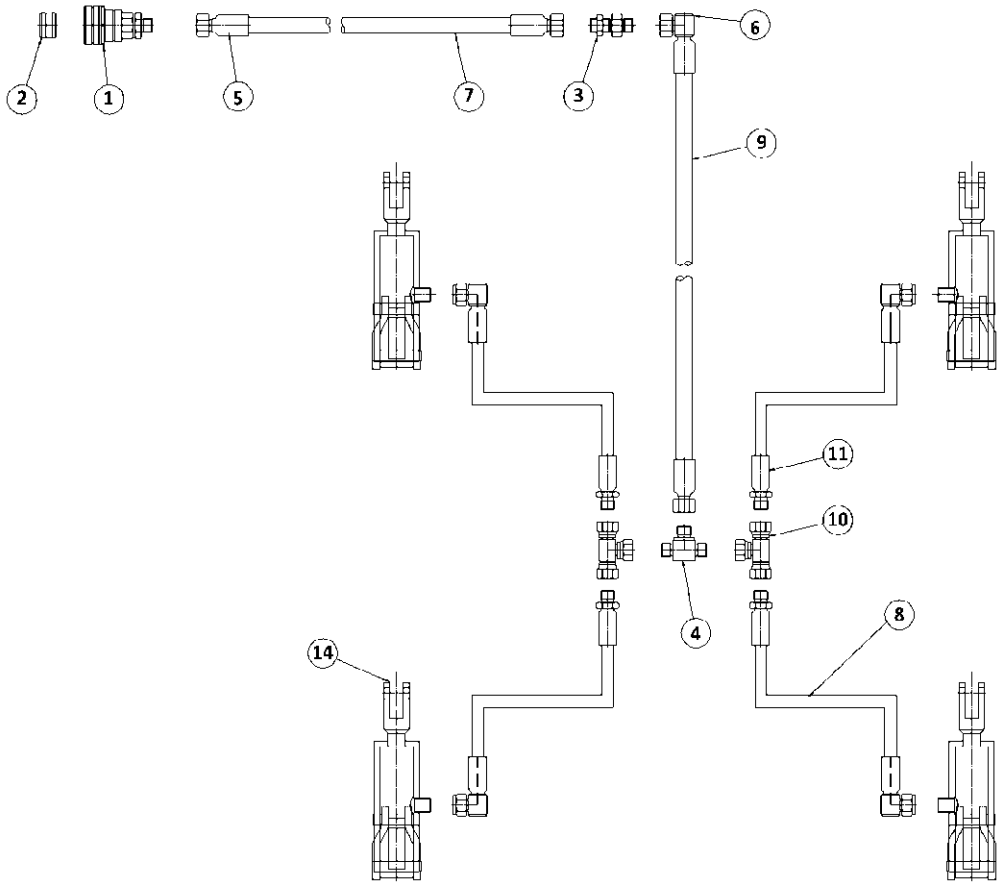
6.7 HYDRAULIC BRAKE CIRCUIT & CLEVIS DRAWBAR



6.7 HYDRAULIC BRAKE CIRCUIT & CLEVIS DRAWBAR PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	51568	COUPLING 3/8 FEMALE SELF SEAL
2	1	51583-1	DUMMY 3/8 MALE
3	1	51463	3/8"-3/8" NPT BULHKHEAD
4	2	51447	3/8"-3/8"-3/8" NPT MALE TEE
5	8	51037	HOSE END DIA3/8"-3/8" BSP FEMALE
6	4	51111	HOSE END DIA3/8"-3/8" NPT 90 DEG FEM
7	1	51828 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x 2500
8	2	51828 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x 480
9	1	51828 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x LENGTH
10	1	51828 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x 1020
11	1	51828 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x 2800
12	1	51644	ADAPTOR 3/8" MALE-M20x1.5 FEM
13	1	51569	COUPLING 3/8 MALE SELF SEAL
14	REF		BRAKE ACTUATOR HYDRAULIC

6.8 HYDRAULIC BRAKE CIRCUIT TANDEM AXLE



6.8 HYDRAULIC BRAKE CIRCUIT TANDEM AXLE – PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	51568	COUPLING 3/8 FEMALE SELF SEAL
2	1	51583-1	DUMMY 3/8 MALE
3	1	51463	3/8"-3/8" NPT BULHKHEAD
4	2	51447	3/8"-3/8"-3/8" NPT MALE TEE
5	7	52311	HOSE END DIA3/8"-3/8" BSP FEMALE
6	5	52313	HOSE END DIA3/8"-3/8" BSP 90 DEG FEM
7	1	51828 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x 2500
8	4	51828 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x 1000
9	1	52760 HIFLEX	HOSE DIA3/8" BORE 2 WIRE x LENGTH
10	2	51457	TEE 3/8 NPT FEMALE
11	4	52310	HOSE END DIA3/8-3/8 NTP MALE
12			
13			
14	REF		BRAKE ACTUATOR HYDRAULIC

7.

AXLES

1. SAFETY NOTICE

The authors and publisher are not liable for any physical damage or personal injury resulting from errors or omissions in this manual.

This manual does not replace the manual provided by the vehicle manufacturer.

Maintenance must be carried out by suitably qualified personnel using appropriate tools.

This manual describes everyday maintenance operations and does not cover major repairs.

We recommend that maintenance should be carried out by a specialised workshop.

Carrying out repairs and maintenance work may be dangerous. This safety notice describes only some of the potential hazards and is intended to make users aware of the risks and encourage them to take care.

Personal protection :
Wear appropriate personal protection equipment: goggles, mask, gloves, helmet, safety shoes, overalls, etc.
Work in the presence of another person.

Unstable vehicles :
Never work underneath or near a vehicle that has been raised using only a jack.
When working underneath or near a vehicle that has been jacked up, always make sure that the jack is used in conjunction with stands or other effective supports and that the jack and stands used can bear the weight.
Check that the vehicle is perfectly stable and that the forces applied to the vehicle while carrying out maintenance will not cause it to shift. Also check that the ground is firm.

Hot parts :
Some parts, such as brake drums, for example, may become extremely hot in use.

Pressurised hydraulic or pneumatic systems :
NB: Before carrying out maintenance on hydraulic or pneumatic systems, which may be pressurised, take all necessary precautions to avoid accidental pressure release.

Risk of fire, risks from fumes, toxic gases and irritant substances :
All fuel is highly flammable and petroleum vapour is explosive.
For cleaning and degreasing parts, use only appropriate, recognised cleaning fluids and follow the instructions on the packaging.
Avoid contact with the skin and avoid inhaling vapour, fumes or toxic gases.
Do not smoke, use a naked flame or create sparks, etc if there is a risk of explosion or fire owing to the presence of flammable vapours, fuel, oil, paint, solvents, dust, straw, etc.
A fire extinguisher appropriate for the type of risk should always be to hand.

Asbestos :
The brake linings of our axles no longer contain asbestos. We used asbestos-free linings well before EU regulations prohibited its use.
If there is any doubt about the presence of asbestos (for example, when carrying out maintenance on old axles), the brakes and linings should be handled as if they contained asbestos, as asbestos dust is a major health hazard.

General information.

2. AXLES

2.1 General

The specifications of our axles and suspensions can be found in the general COLAERT ESSIEUX catalogue.
The catalogue provides the following information.

Axles
- The axle cross-section.
- The axle type.
- The axle loads and maximum admissible offset at speeds of 25, 40 and 60 km/h with zero offset wheels, with single, tandem or tridem axles.
- The number and size of studs and the bolt circle.
- The centre hole diameter.
- The brake dimensions (drum internal diameter and lining width).
- The braking characteristics certified by CEMAGREF and TUV.

The general catalogue also gives the admissible load on the axle assembly for different load offsets.
Exceeding these values may cause excessive bending of the axle and possibly permanent damage.

Stabiliser jacks bearing on the axles, weight transfer devices or lifting axles do not increase the maximum load on the axles or suspensions.

Suspension
- The maximum load for the suspension.
- The wheel-base.
- The type of spring, the number of leaves and the number of fixed leaves.
- The height of the axle assembly unladen and laden, for different axle cross-sections.

Axle, maintenance and adjustment.

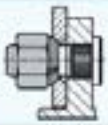
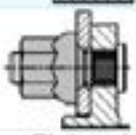
2. AXLES

2.2 Axle, maintenance and adjustment

2.2.1 Assembly and fixing of the wheels

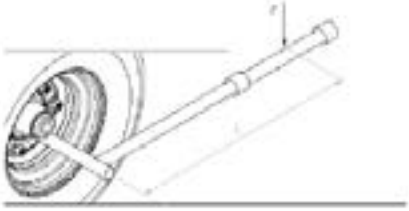
Above all to check that the type of wheel used is compatible with the nut of the wheel stud, for all the cases of fixing of the wheel with centering on the wheel stud, i.e. all those of table below except the nuts of the type M, to check that the holes of the rim have a conical part in order to receive the spherical part as of nuts DIN, the spherical washer of the plain nuts or the conical part of the nuts with "Bec ".

In the case of twim tyres, in order to ensure a good centering, it is necessary to insert a spherical washer between the flask of the hub and the rim except assembly nuts M .

NUT TYP	Spanner	Wheel stud	Tightening torque	Leverage (*L)	Force (*F)
	mm	mm	Nm	mm	Kg
DIN 	17	M12x1,5	90	300	30
	19	M14x1,5	130	300	40
	24	M18x1,5	270	450	60
Plain nut + washer 	24	M18x1,5	270	450	60
	27	M20x1,5	380	600	60
	30	M22x1,5	510	800	60
"Twin" 	24	M18x1,5	270	450	60
	27	M20x1,5	380	600	60
	30	M22x1,5	510	800	60
"M" 	-	-	-	-	-
	27	M20x1,5	450	800	55
	32	M22x1,5	650	1000	65
"Bec" 	28	M18x1,5	270	450	60
	30	M20x1,5	380	600	60
	32	M22x1,5	510	800	60

Tightening of the nuts of wheel

On lately assembled wheels, the nuts can, at the beginning, to loosen itself in consequence of a compressing. It is thus necessary to check the tightening of the nuts after the first course in load. One will proceed in the same way later on after each disassembling of wheels. To tighten the nuts, to use the adapted special spanner. If one uses the machines bolt ones for the nuts of wheel, to regulate the tightening torque well, if not the threading and the metal of the stud and nuts of wheel undergo an overload.



(*) The 2 last columns of the table are useful as reference for those which do not have a torque spanner or of pneumatic screw driver (see the figure at side).

It is allowed to use an impact spanner for disassembling, but it is absolutely necessary to avoid the tightening of the nuts with this type of spanner, because the exerted couple is unverifiable.

2. AXLES

2.2.2 Tightening and retightening wheel nuts (Summary) :

Never use impact wrenches to tighten the wheel nuts as the impact torque may be excessive.

Wheel nuts should be tightened diagonally using a torque wrench.

If power tools are used (for example, pneumatic torque wrench) they must be carefully set to the required torque for tightening.

Otherwise, the studs and wheel nuts may be overtightened which may damage or break them.

Retighten the wheel nuts after:
- The first time of use.
- The first laden journey.
- The first 1,000 km.
- Every 6 months or 25,000 km.

Repeat every time the wheels are changed or removed.

2.2.3 Checking the hubcaps

Missing or damaged hubcaps must be replaced immediately to avoid dirt penetrating into the hub which might result in damage to the bearings.

Check that the hub caps are in place and in perfect condition.

For press fit hubcaps, check visually that they are fully home.

For hubcaps attached using screws, fit a new gasket if necessary when the hubcap is removed and retighten the screws regularly (every 6 months).

2.2.4 Checking the wheel bearing play

- After the first 1,000 km.
- Before intensive use, every 6 months or 25,000 km.

Wheel bearings are subject to wear: their lifetime depends on the operating conditions, the load, the speed, the adjustment and lubrication, etc.

To check the wheel bearings
- Lift the wheel off the ground.
- Turn in both directions slowly to check for any rough points or friction.
- Turn it at high speed to check for unusual noises, such as grating or knocking.

If the bearing is damaged or worn, the bearing and seals should all be replaced (see paragraph 2.2.7 Replacing the wheel bearings)

2. AXLES

- Always err on the side of too free rather than too tight.
- When the hub has been adjusted, fit a new split cotter pin or re-fit the hair-pin clip.
- Refit the hubcap.
- Refit the wheel following the instructions in paragraphs 2.2.1 (Fitting wheels) and 2.2.2 (Tightening and retightening wheel nuts).

When the wheel has been refitted, turn it slightly. It should come to rest with a slow rocking movement due to the imbalance.

2.2.6 Lubricating the wheel bearings

In normal operating conditions, lubricate the bearings every 2 years or every 50,000 km and when the brake shoes are replaced.
In harsh conditions the bearings should be lubricated more frequently.

Use a general purpose EP grease formulated for lubricating plain, ball and roller bearings, subject to heavy loads and impacts typical of HGV, agricultural vehicle hubs, etc.

All parts (hub, spindle, bearings, seals, castle nuts, hubcap, cotter pin) should be degreased and perfectly clean before reassembly.

The work should be carried out in a clean environment with appropriate tools as the slightest bit of dirt can damage the bearings or even the spindle.

When carrying out maintenance on the bearings, check the brake linings, drum and return springs, clean the brakes, clean and lubricate the brake cam shaft.

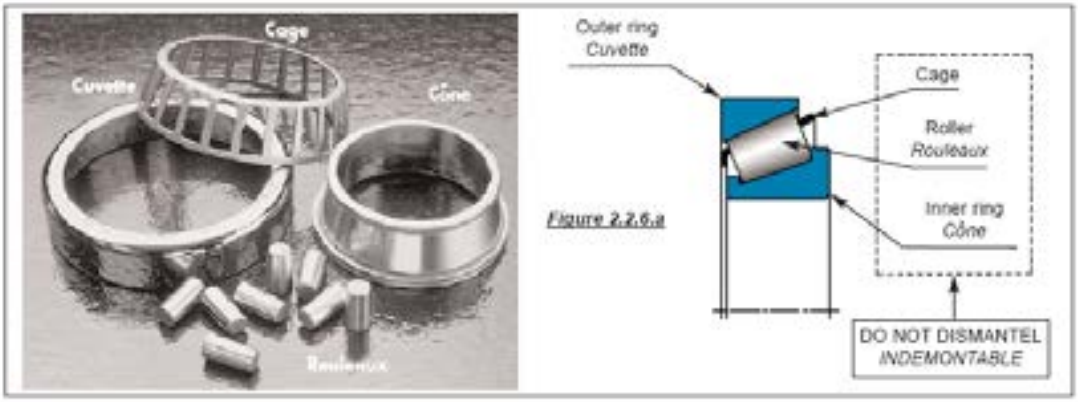


Figure 2.2.6.a

Disassembly : (See figures **2.2.5** and **2.2.6.a**)

- Slacken the wheel nuts.
- Lift the axle until the wheel is off the ground.
- Remove the wheel.
- Release the brakes (make sure that the vehicle cannot move).
- Remove the hubcap.
- Remove the split pin or pin from the spindle.
- Remove the castle nut.

2. AXLES

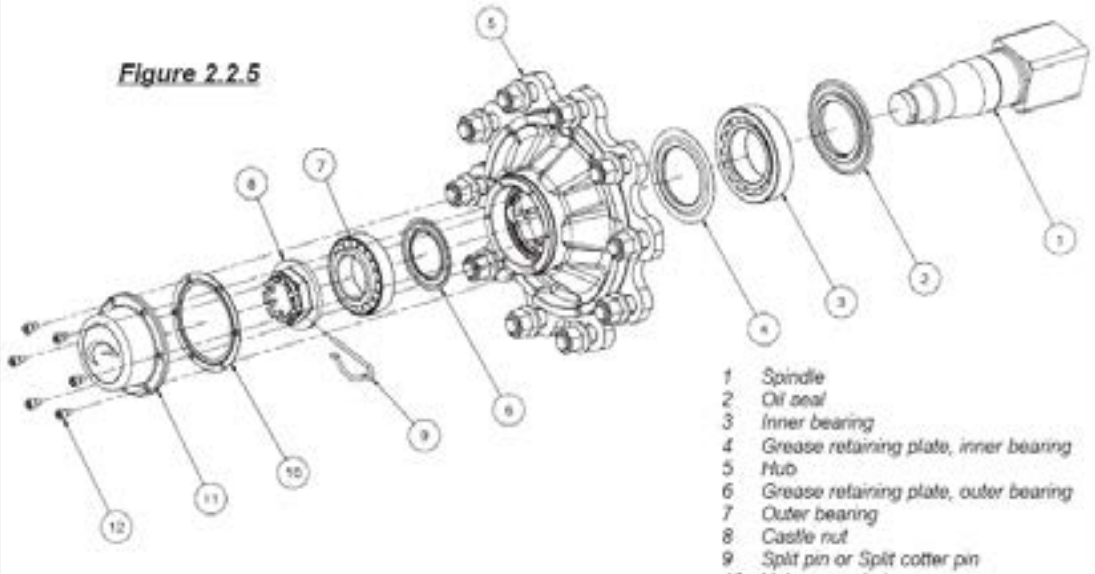
To check the wheel bearing play, raise the axle until the wheel is no longer resting on the ground ***(ensure that the vehicle cannot move)***
Release the brake, grip the wheel at the top and the bottom and check the play by trying to tilt it. The play can also be detected by using a lever between the wheel and the ground.
If you can feel any play, adjust the wheel bearing (see paragraph 2.2.5 Adjusting the wheel bearings).

Make sure that the play does not come from the suspension or a steering axle kingpin.

2.2.5 Adjusting the wheel bearings

Lift the axle until the wheel is no longer resting on the ground.
Large wheels should be removed so that the play is easier to feel and to make it easier to adjust the bearings.

Figure 2.2.5



1 *Spindle*
2 *Oil seal*
3 *Inner bearing*
4 *Grease retaining plate, inner bearing*
5 *Hub*
6 *Grease retaining plate, outer bearing*
7 *Outer bearing*
8 *Castle nut*
9 *Split pin or Split cotter pin*
10 *Hubcap gasket*
11 *Hubcap*
12 *Hubcap screw*

- Remove the hubcap.
- Remove the cotter pin or hair-pin clip from the spindle.
- Tighten the castle nut (right-hand thread) to take up the internal play (the conical roller bearings should then be firmly held between the hub seatings, the pressure ring, spindle and castle nut).
The rotation of the hub or wheel feels to be slightly stiff.
- Slacken the castle nut until there is no longer any friction between the castle nut and the outer bearing and the hole for the pin is aligned with a notch in the castle nut.
- Tap the hub gently using a mallet to shake down the assembly.
- Check that the hub rotates more freely.

2. AXLES

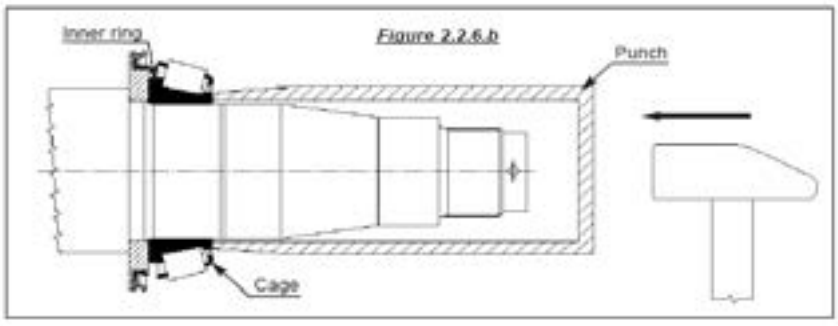
- Remove the drum/hub assembly. using a hub puller if necessary: the outer ring, the grease retaining plates inside the hub (depending on the model), the small bearing cone and cage come with the hub. Check these parts.
  The bearing cups and grease retaining plates can be left inside the hub for cleaning.
- Remove the large bearing cage and cone from the spindle using a bearing puller if necessary.
- Check the oil seal between the spindle and the large bearing (or the wheel bearing seal depending on the model), and replace these parts if necessary. A puller may be required to remove the wheel bearing seal. Note the orientation of the oil seal for reassembly.
- Check the contact surfaces on the spindle for the bearing and seal and the threaded end of the spindle and remove any bumps or asperities.
- Check the hub surfaces in the same way.
- Check the bearing face of the castle nut.

Clean and degrease all parts with a suitable cleaning fluid.

Reassembly :

- Grease the spindle lightly.
- Refit the oil seal or wheel bearing seal (ensure that the seal is the right way round), a punch makes it easier to fit the wheel bearing seal and avoids damaging the seal.
- Apply a generous coating of grease to the large bearing cage and rollers, making sure that the grease penetrates all round the rollers and under the cage.
- Fit at bottom the interior ring (cone) of the large bearing on the rocket, it is important to take care not to damage the cage of the bearing, to go up the cone unit, rollers and cage (figure **2.2.6.a**) on fized to use if necessary tools as shown in the figure **2.2.6.b**, the effort to push must apply only to the cone, in no case on the cage or the rollers what involves a deterioration of the bearing.
- Apply a 15 mm (small axles) or 20 mm (large axles) layer of grease all around and right across the large and small bearing cups that are still in the hub.
- If the hub does not have grease retaining plates, put a large amount of grease in the centre of the hub to act as a reservoir.
- Slide the hub/drum assembly over the spindle and the brake shoes keeping the hub perfectly straight and aligned until it is in contact with the oil seal at the back of the spindle.
- Apply a generous layer of grease to the small bearing cage and rollers and fit the assembly to the spindle.
- Fit the castle nut and adjust it as described above (See paragraph 2.2.5 Adjusting the wheel bearings).
- Lock the castle nut with a hair-pin clip or new split cotter pin as appropriate.
- For hubs without grease retaining plates, fill the hubcap with grease.
- Refit the hubcap.

Figure 2.2.6.b



2. AXLES

2.2.7 Replacing the wheel bearing

New grease retaining plates should be fitted to hubs with grease retaining plates (See figure 2.2.5), as the plates will be damaged while removing the bearing cups.

Unpack the bearings at the last moment and never mix them up.

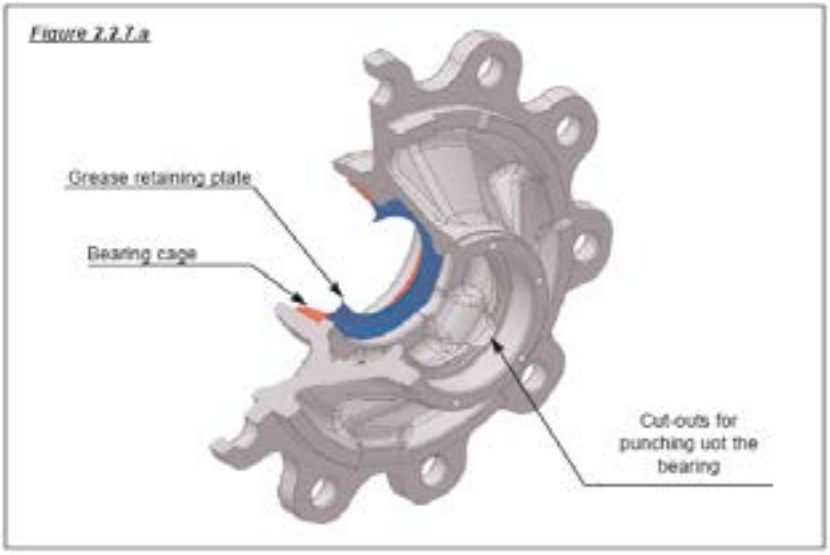
To replace the wheel bearings, follow the instructions for removing the hub (see paragraph 2.2.6 Lubricating the wheel bearings) and remove the bearing cups from the hub as follows.

Removing the bearing cups from the hub

Note the orientation of the bearing cups and grease retaining plates for reassembly.

- The bearing cups are an interference fit and must be punched out using a hammer and a mild steel punch (See figure **2.2.7.a**).
- If the hub has grease retaining plates, these will be punched out at the same time as the bearing cups and will, therefore, be damaged.

Figure 2.2.7.a



Fitting new bearing cups into the hub :

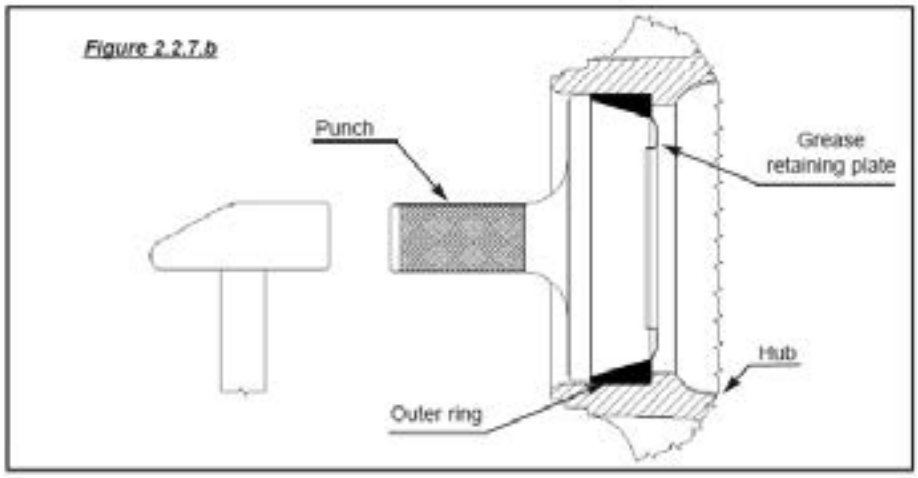
Make sure that the bearing cups and grease retaining plates are the right way round.

NB: Never fit the bearing cup with the bearing cone and rollers in place

- If the hub has grease retaining plates, first put the grease retaining plate in its seating (the right way round) and ensure that it remains well centred and in place while the bearing cup is being fitted. Re-check when the operation is complete.
- Fit the bearing cups and punch into place using a mild steel punch as shown in figure 2.2.7.b.

Take care that the bearing cups are straight and that they are firmly against the seating in the hub.

2. AXLES



2.3 Brake maintenance and adjustment

2.3.1 Initial checks

The brakes should be tested before using for the first time and after the first laden journey:

- Check the actuator and return spring mountings, check the actuator stroke and return travel and check that the road and parking brakes operate and release correctly.
- Tighten the screws and nuts (covers, fulcrum, etc), check the cotter pins, pins, circlips, etc.
- Check for hydraulic fluid and air leaks.

2.3.2 Checking brake clearance and wear

Check and test the brakes before intensive use and every 3 months:

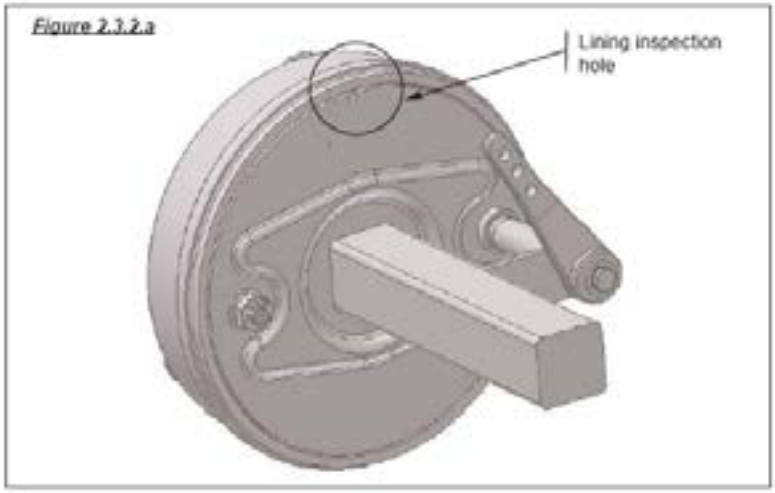
- Check the brake wear and the clearance between the brake linings and the drum visually (See figure **2.3.2.a**). It is probable that the linings are worn when the actuator travel has increased significantly.
- Check the thickness of the brake linings (See table paragraph 2.3.5 Replacing the brake shoes for the minimum thickness).

The brake shoes should be replaced as soon as the minimum lining thickness is reached.

- Check that the brakes are clean and clean them if necessary.
- Lubricate brake cam shaft bearings with grease nipples lightly to avoid grease deposits on the brake linings and drums.
- Carry out the initial checks described above (See paragraph 2.3.1 Initial checks).

2. AXLES

Figure 2.3.2.a



2.3.3 Adjusting brakes with fixed levers

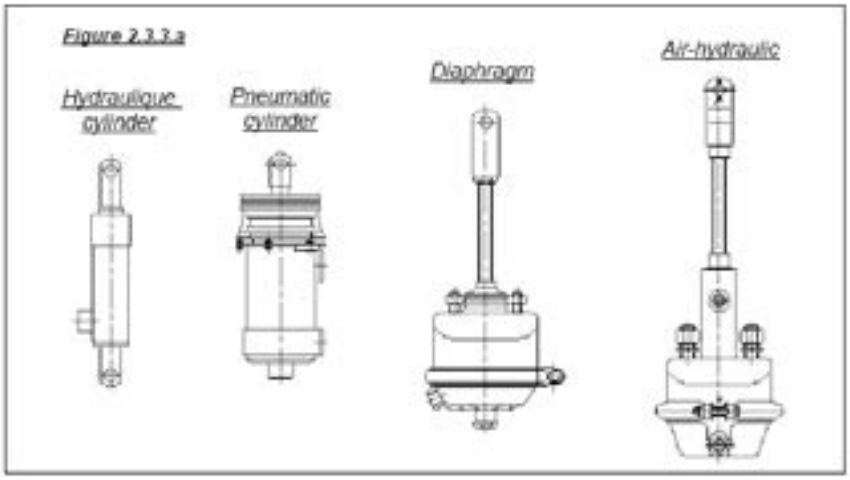
Take up the slack when the actuator stroke reaches about two thirds of the maximum travel (See figure **2.3.3.a**).

To take up the slack, turn the lever by one or more splines, ensuring that the brakes are not touching when released (to prevent overheating the brakes).

Never change the linkage position for the actuator on the lever without authorisation from the vehicle manufacturer as the vehicle will have been tested with the actuator at this position (the brake operating levers have several holes, always use the original hole).

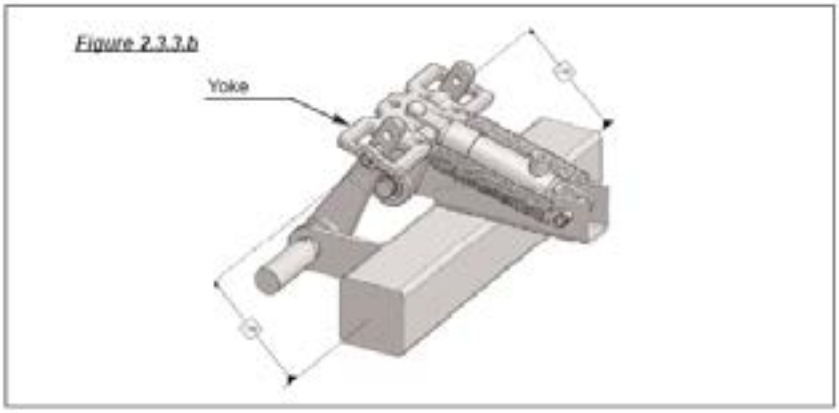
For braking systems with a yoke, the yoke must remain parallel with the axle especially when the brakes are fully applied (See figure 2.3.3.b). This means that the stroke of the levers on the brakes at each side must be identical. Otherwise, the brake slack must be adjusted.

Figure 2.3.3.a



2. AXLES

Figure 2.3.3.b



2.3.4 Adjusting brakes with adjustable levers

Take up the slack when the actuator stroke reaches about two thirds of the maximum stroke (See also paragraph 2.3.3 Adjusting brakes with fixed levers).

To take up the slack, turn the adjustment screw on the lever to adjust the relative position of the cam and the lever (See figure **2.3.4**).

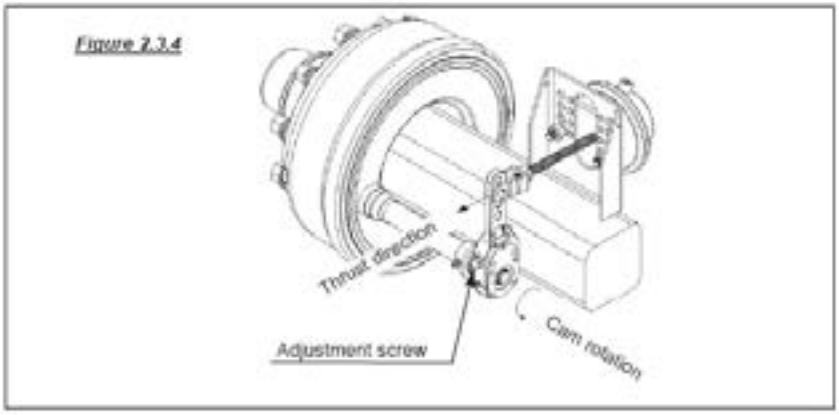
NB. The actuator brakes by pushing the lever to turn it in a particular direction. The screw must be adjusted so that the cam moves in this direction to take up the slack. The direction in which the screw must be turned depends on the configuration.

Ensure that the brakes are not touching when released (to prevent overheating the brakes).

Never change the linkage position for the actuator on the lever without authorisation from the vehicle manufacturer as the vehicle will have been tested with the actuator at this position (the brake operating levers have several holes, always use the original hole)

For braking systems with a tandem yoke, the yoke must remain parallel with the axle especially when the brakes are fully applied (See figure **2.3.3.b**). This means that the stroke of the levers on the brakes at each side must be identical. Otherwise, the brake slack must be adjusted.

Figure 2.3.4



2. AXLES

2.3.5 Replacing the brake shoes

The brake shoes should be replaced as soon as the minimum lining thickness is reached.
When replacing the brake shoes, repack the wheel bearings with grease (See paragraph 2.2.6 Lubricating the wheel bearings).

MINIMUM LINING THICKNESS		
BRAKE TYPE	DIMENSIONS (Drum internal diameter and lining width)	Minimum lining THICKNESS
A25	250 x 60	2
A30	300 x 60	2
309E	300 x 90	2
310E	300 x 100	5
314E	300 x 135	5
316	300 x 160	5
A320	350 x 60	2
A410	355 x 80	2
A61	400 x 80	2
408E	400 x 80	2
314S	300 x 135	5
A910	406 x 120	5
A940	406 x 140	5
412S	406 x 120	5
414S	406 x 140	5

See paragraphs 2.2.5 Adjusting the wheel bearings and 2.2.6 Lubricating the wheel bearings for hub disassembly and reassembly and wheel bearing lubrication and adjustment.

When replacing the brake linings, check all the brake components.
- Condition of the drums.
- Condition of the cam shafts and levers, in particular check the play in the splines.
- Wear on the bushings.
- Condition of the bellows (depending on the model).
- Condition of the shoe return springs.
- Condition the fulcrums and their mountings (depending on the model).
- Check the rotation of the brake shoe rollers (if fitted) and lightly lubricate before reassembly.

2. AXLES

Always replace any worn or damaged parts.

When reassembling, apply a thin coat of grease to all contact surfaces (cams, fulcrums, bushings, etc) being careful to avoid getting any grease on the drums and shoe linings.

For brakes with an adjustable fulcrum, centre the brake shoes before clamping the fulcrum:
When the hub/brake assembly has been reassembled, slacken the fulcrum nut slightly, operate the brake lever in the correct direction (direction of the actuator thrust) by pulling on the lever by hand. (it is easier if a pipe is placed over the lever as shown in figure 2.3.5) to press the shoes against the drum.
Clamp the fulcrum while pressing on the lever.
If the nut is locked using a split cotter pin, always use a new cotter pin.

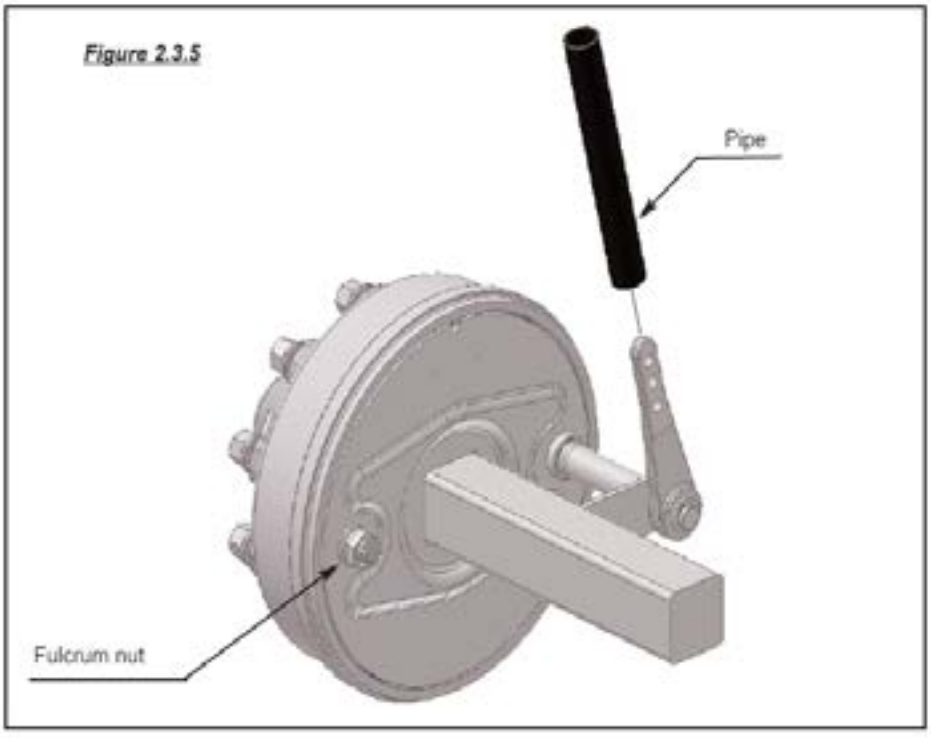


Figure 2.3.5

9. SPRING DRAWBAR

After the first laden journey, before intensive use or every 6 months ***(See figure 8)***

- Retighten all the mounting U-bolt nuts to the recommended torque *Item 2.*
- Lubricate the attachment shaft *Item 3.*

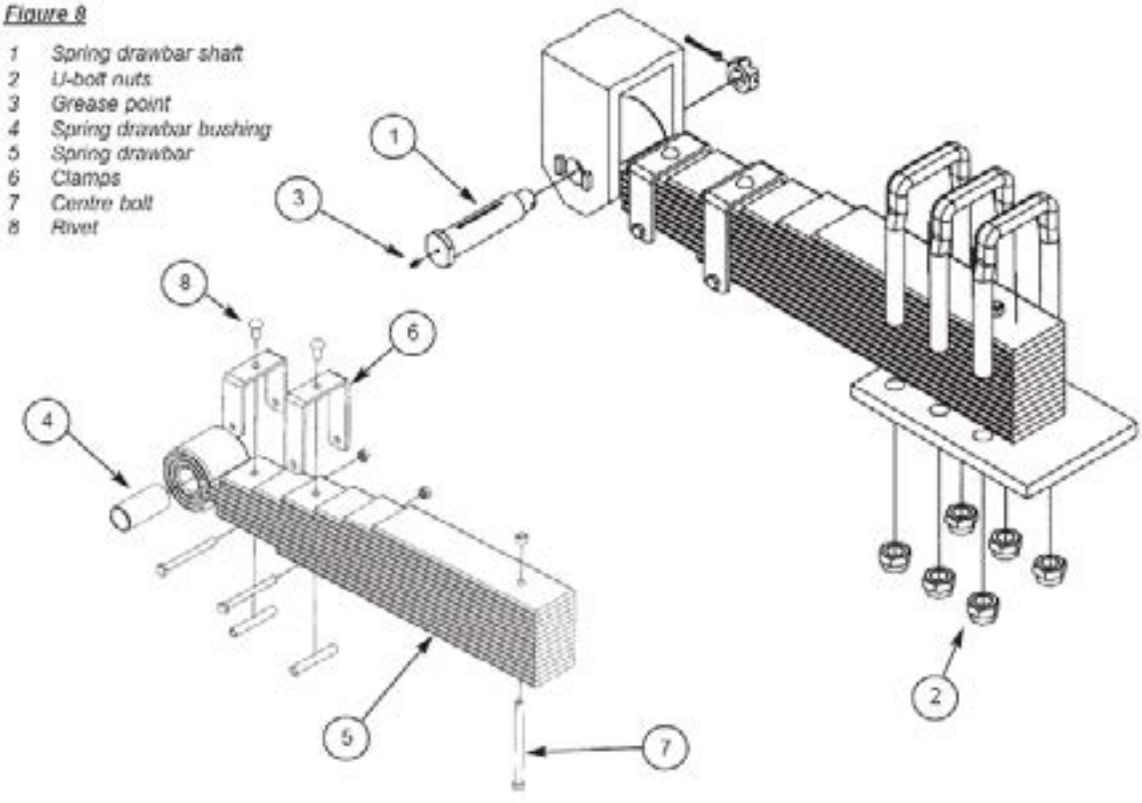
Under harsh or intensive operating conditions, maintenance should be carried out more frequently.

Every year:

- Check the play between the bushing *Item 4* and the spring drawbar shaft *Item 1*, and, if there is excessive play, replace the worn parts.
- Check the general condition of the spring *Item 5*, clean it thoroughly and brush the sides of the springs to check for cracks. Check the condition of the clamps *Item 6.*

Figure 8

1 *Spring drawbar shaft*
2 *U-bolt nuts*
3 *Grease point*
4 *Spring drawbar bushing*
5 *Spring drawbar*
6 *Clamps*
7 *Centre bolt*
8 *Rivet*



11. MINIMUM PROGRAM OF MAINTENANCE

This maintenance plan is intended for normal operating conditions. More frequent maintenance may de required for harsh operating conditions (construction sites, mountains, intensive use, etc).

See the following paragraphs for detailed maintenance instructions.

	on commissioning	after the firt laden journey	after the first 1,000 km	every 3 months	every 6 months or 25,000 km	before intensive service	every 2 years or 50,000 km
2.2 Axle maintenance and adjustment							
2.2.2 Tightening and retightening wheel nuts	X	X	X		X		
2.2.3 Checking the hubcaps	X				X		
2.2.4 Checking the wheel bearing play			X		X	X	
2.2.6 Lubricating the wheel bearings							X
2.3 Brake maintenance and adjustment							
2.3.1 Initial checks	X	X		X		X	
2.3.2 Checking brake clearance and wear				X		X	
2.3.3 Adjusting brakes with fixed levers				X		X	
2.3.4 Adjusting brakes with adjustable levers				X		X	
3. Steering axles							
3.2.1 Normal maintenance				X		X	
3.2.2 Checking and adjusting the wheel alignment					X		
3.2.3 Locking cylinder maintenance and adjustment					X		
3.2.4 Adjusting the clearance, steering axles with tapered pins only						X	
3.2.5 Adjusting the steering angle						X	
4. Bogies suspension		X			X	X	
5. Basic tandem suspension and basic half-tandem suspension		X			X	X	
6. Rod half-tandem suspension, tandem and tridem		X			X	X	
7. Pneumatic suspension		X			X	X	
8. Springs drawbar		X			X	X	

8 TYRES AND WHEELS

8.1 Tyre and wheel maintenance.

Maintenance of correct inflation pressure is the basic essential factor in obtaining the best performance and life from a pneumatic tyre. The air inside the tyre enables it to carry a load. It is only when the inflation pressure is correctly matched that the tyre adopts its optimum cross-sectional shape and the tread rests correctly on the road surface with the correct pressure distribution across its whole width, thus allowing the sidewalls to provide the required degree of flexibility. Both performance and life of the tyres will suffer if pressures are unsuitable so both over or under inflation (or overload which has the same effect) are similary undesirable.

Underinflation results in excessive deflection which increases the heat generated by the tyre, this in turn leads to its eventual disintigration. In addition the distortion of the casing will result in the lifting of the centre of the tread, thus overloading the outer edges of the tread, producing rapid wear at those points.

Overinflation distorts the tyre's casing, but in this case it tends to lift the outer edges of the tread off the road surface and imposes extra load and more rapid wear on the centre of the tread. Owing to reduced flexibilty the tyre will be more vulnerable to impact damage, ride quality will be impaired and the wheels will be more liable to bounce which can result in skidding due to brakes locking.

Unlike cars on which tyre loads do not vary greatly it is not practicable to provide standard recommendations. This is because tyre loading and operating conditions vary widely.

Remember that spreaders travel laden one way and unladen in the opposite direction, it is therefore desirable to estabish a suitable mean pressure that mimimises both under inflation when loaded and excessive over inflation when running light.

8.2 TYRE PRESSURE SETTINGS

TYRE TYPE	6 MPH/10 KPH - Bar/PSI						20 MPH/30 KPH - Bar/PSI			
	10000 kg	13000 kg	15000 kg	17000 kg	18000 kg	20000 kg	10000 kg	10170 kg	15000 kg	20000 kg
16.9-14 x 34 P14	3.0/44						2.5/36			
18.4 x 34 PR14		3.0/44					3.0/44			
18.4 x 38 T-347		2.9/43						3.0/44		
580/70 R38			2.0/29	2.5/36	2.8/41	3.0/44		2.0/29		
710/70 R38			2.0/29	2.0/29	2.3/33	2.5/36		1.7/25		

8.3 WHEEL TYPE & TORQUE SETTINGS

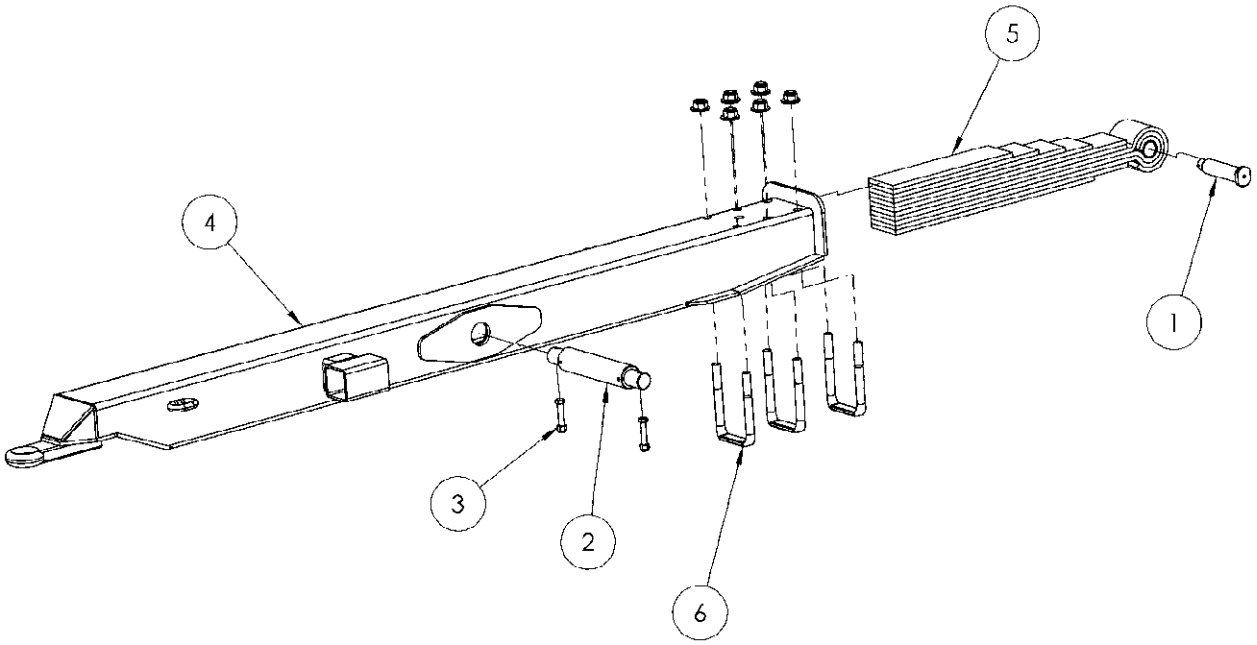
TYRE TYPE	WHEEL TYPE	WHEEL STUD TYPE & SIZE	TORQUE SETTINGS
16.9-14 x 34 P14	DW 16x34 centre nave 220 bore	8 x M18 - 1.5 275 PCD	270 Nm/200 lb/ft
18.4 x 34 PR14	16 x 34 centre nave 280 bore	10 x M22 - 1.5 335 PCD	510 Nm/375 lb/ft
18.4 x 38 PR14	DW 16x38 centre nave 281 bore	10 x M22 - 1.5 335 PCD	450 Nm/330 lb/ft
580/70 R38	W18A x 38 - 45 offset 280 bore	10 x M22 - 1.5 335 PCD	510 Nm/375 lb/ft
710/70 R38	DW 23a x 38 - 50 offset 280 bore	10 x M22 - 1.5 335 PCD	510 Nm/375 lb/ft

IMPORTANT

CHECK WHEEL NUT TORQUE DAILY.

9. OPTIONS

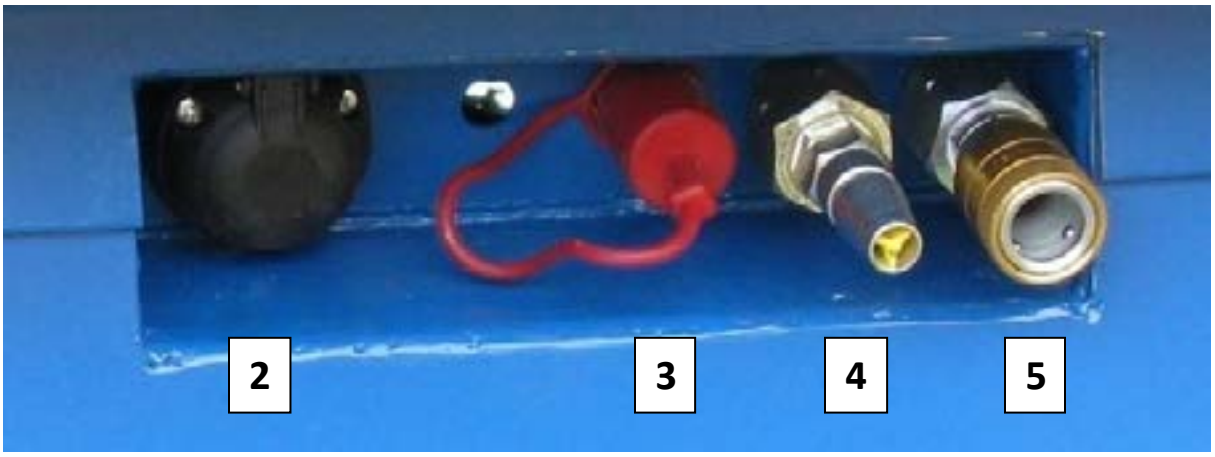
9.1 SPRUNG DRAWBAR – OPTIONAL

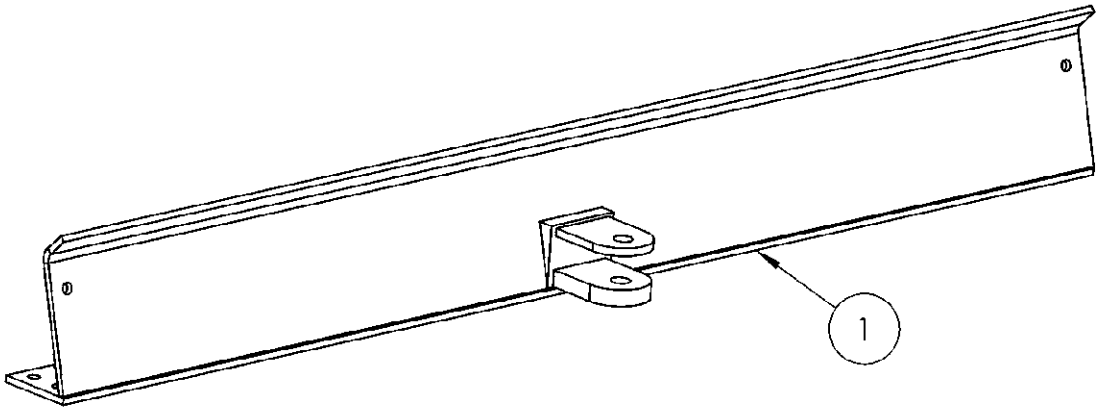


9.1 SPRUNG DRAWBAR PART LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	70440	GUDGEON PIN & NUT
2	2	70442/2	PIVOT PIN
3	1	73102	NUT & BOLT M16
4	1	N/A	DRAWBAR TO SUIT MODEL
5	2	70438	SPRING 11 LEAF UP TO 15 TONNE
	2	70438/1	SPRING 13 LEAF UP TO 18 TONNE & OVER
6	3	70439	U-BOLT 24mm FOR 11 LEAF SPRING
		70439/2	U-BOLT 30mm FOR 13 LEAF SPRING

9.2 REAR CLEVIS DRAWBAR - OPTIONAL





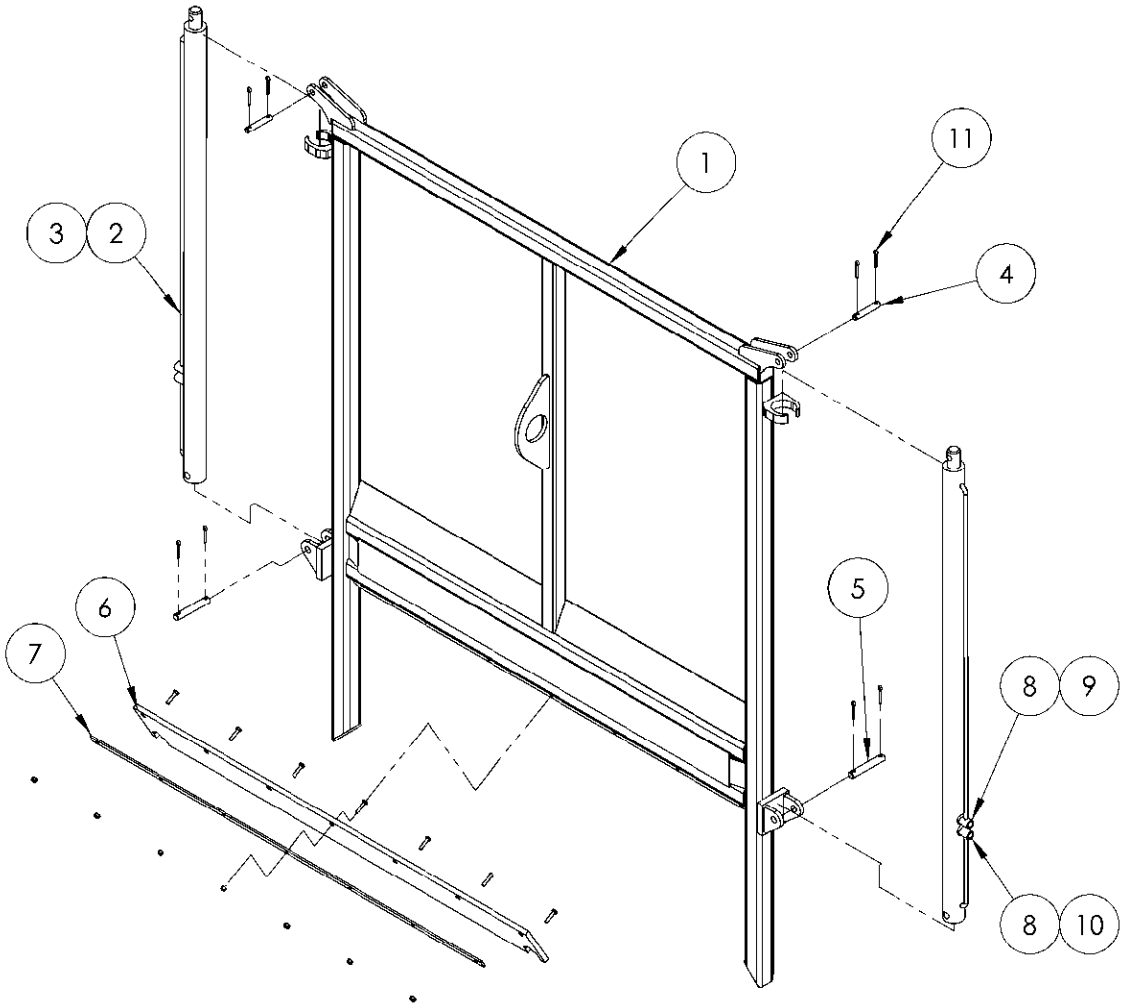
9.2 REAR CLEVIS DRAWBAR – OPTIONAL PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B5310	REAR CLEVIS DRAWBAR CROSS MEMBER
2	1	70107	7 PIN LIGHT SOCKET
3	1	51569	HYDRAULIC BREAK CONNECTION
4	1	CF350932	AIR COUPLING MALE
5	1	CF351543	AIR COUPLING FEMALE

NOTE:

The drawbar is designed for highway use **only** towing an unladen spreader.

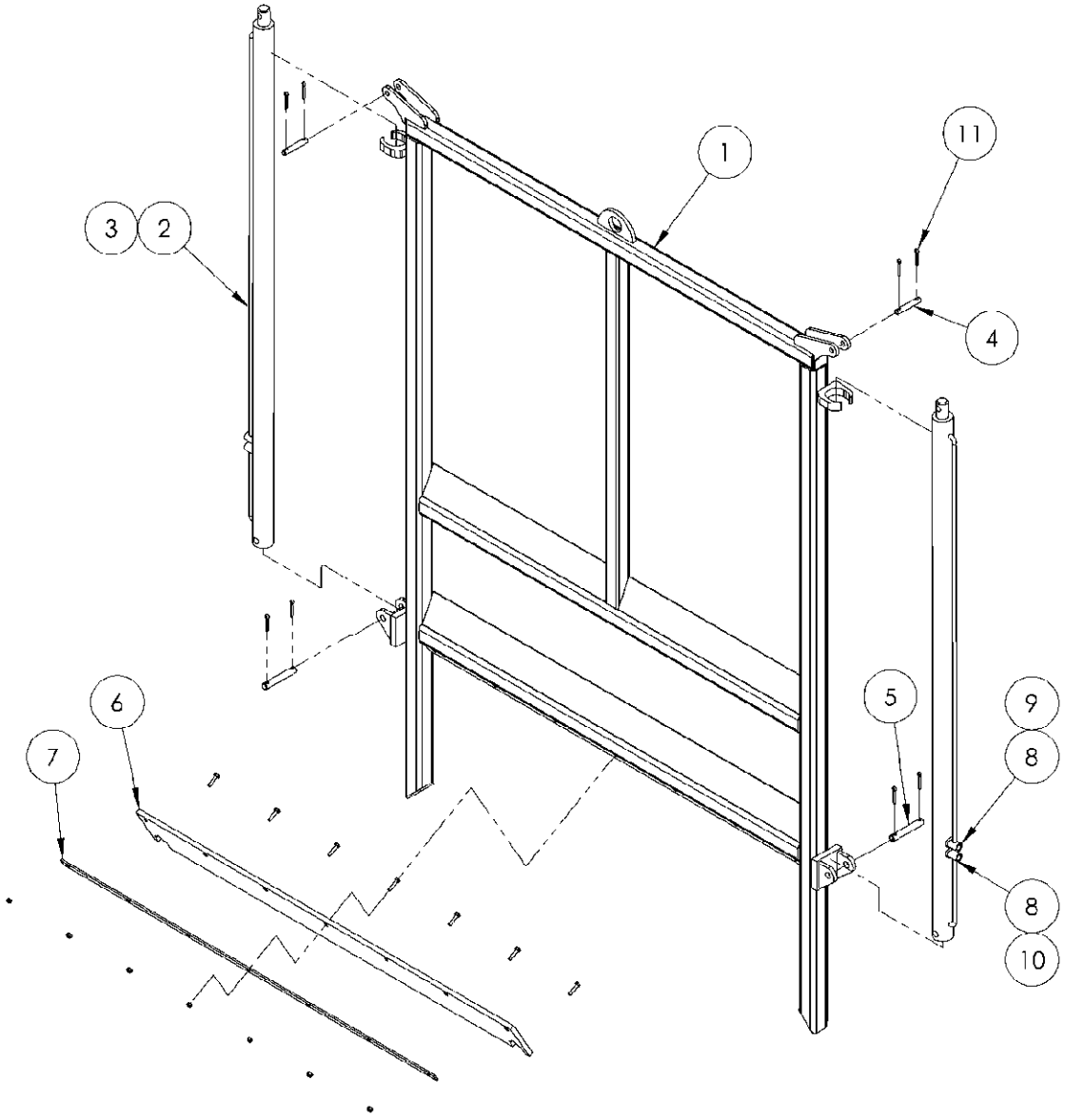
9.3 GUILLOTINE SLURRY DOOR



9.3 GUILLOTINE SLURRY DOOR PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B4110	DOOR - 75/90
	1	B4112	DOOR - 105/120/150
	1	B4115	DOOR WITH WB AUGERS
2	2	70879	2" BORE x 52" STROKE RAM - 75/90
	2	70880	2" BORE x 64" STROKE RAM - 105/120/150
3		70931	SEAL KIT 2" BORE
4	2	B4130	TOP RAM PIN DIA 5/8"
5	2	B4132	BOTTOM RAM PIN DIA 3/4"
6	1	B4158	RUBBER SEAL
	1	B4184	CLAMPING STRIP & M8 x 35 BOLT C/W S.L NUTS
7	1	B4188	CLAMPING STRIP WITH W.B AUGERS
8	4	51590	3/8" BONDED SEAL
9	2	51335	3/8" M/M ADAPTOR
10	2	10522	3/8" x 1/8" RESTRICTOR
11	8	50988	SPLIT PIN

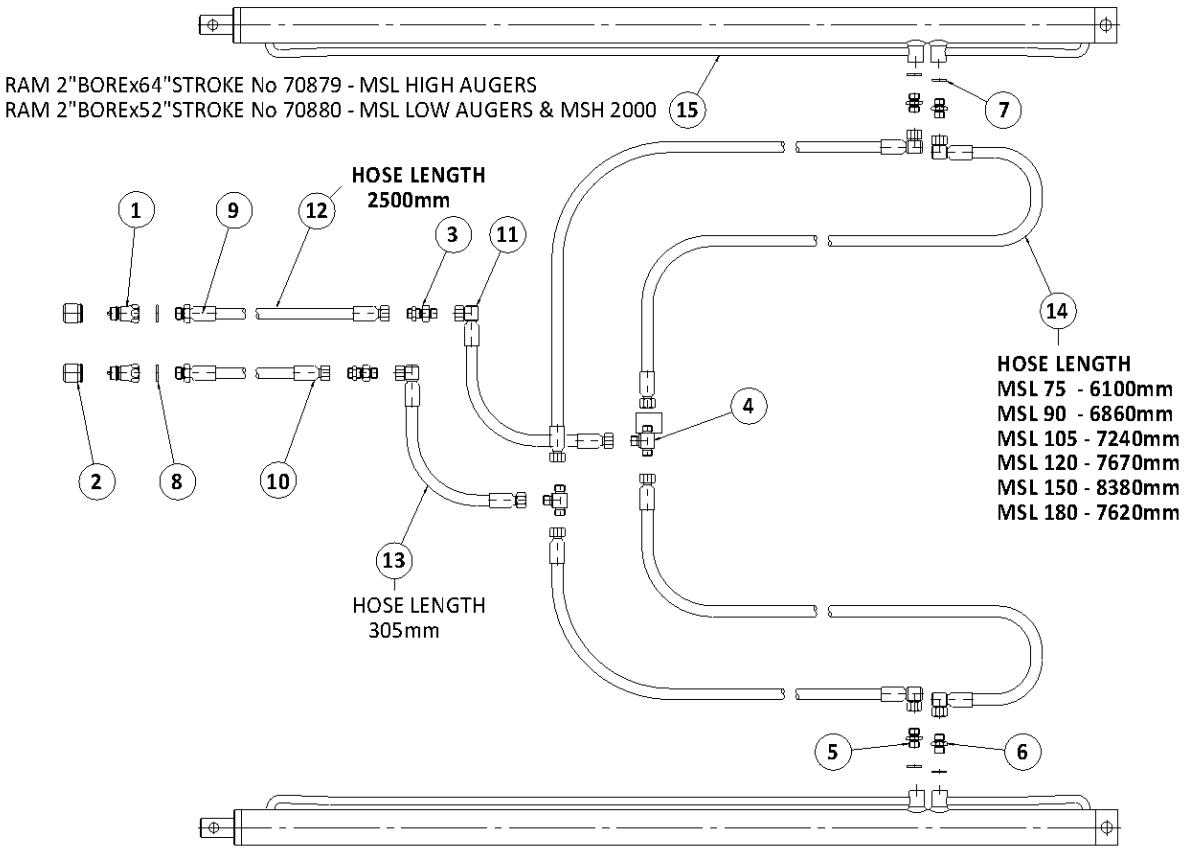
9.4 GUILLOTINE SLURRY DOOR HORIZONTAL BEATERS



9.4 GUILLOTINE SLURRY DOOR HORIZONTAL BEATERS PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	1	B4113	DOOR - 105/120/150 HB
	2	70880	2" BORE x 64" STROKE RAM - 105/120/150
3		70931	SEAL KIT 2" BORE
4	2	B4130	TOP RAM PIN DIA 5/8"
5	2	B4132	BOTTOM RAM PIN DIA 3/4"
6	1	B4158	RUBBER SEAL
	1	B4166	RUBBER SEAL WITH WB AUGERS
7	1	B4184	CLAMPING STRIP & M8 x 35 BOLT C/W S.L NUTS
8	4	51590	3/8" BONDED SEAL
9	2	51335	3/8" M/M ADAPTOR
10	2	10522	3/8" x 1/8" RESTRICTOR
11	8	50988	SPLIT PIN

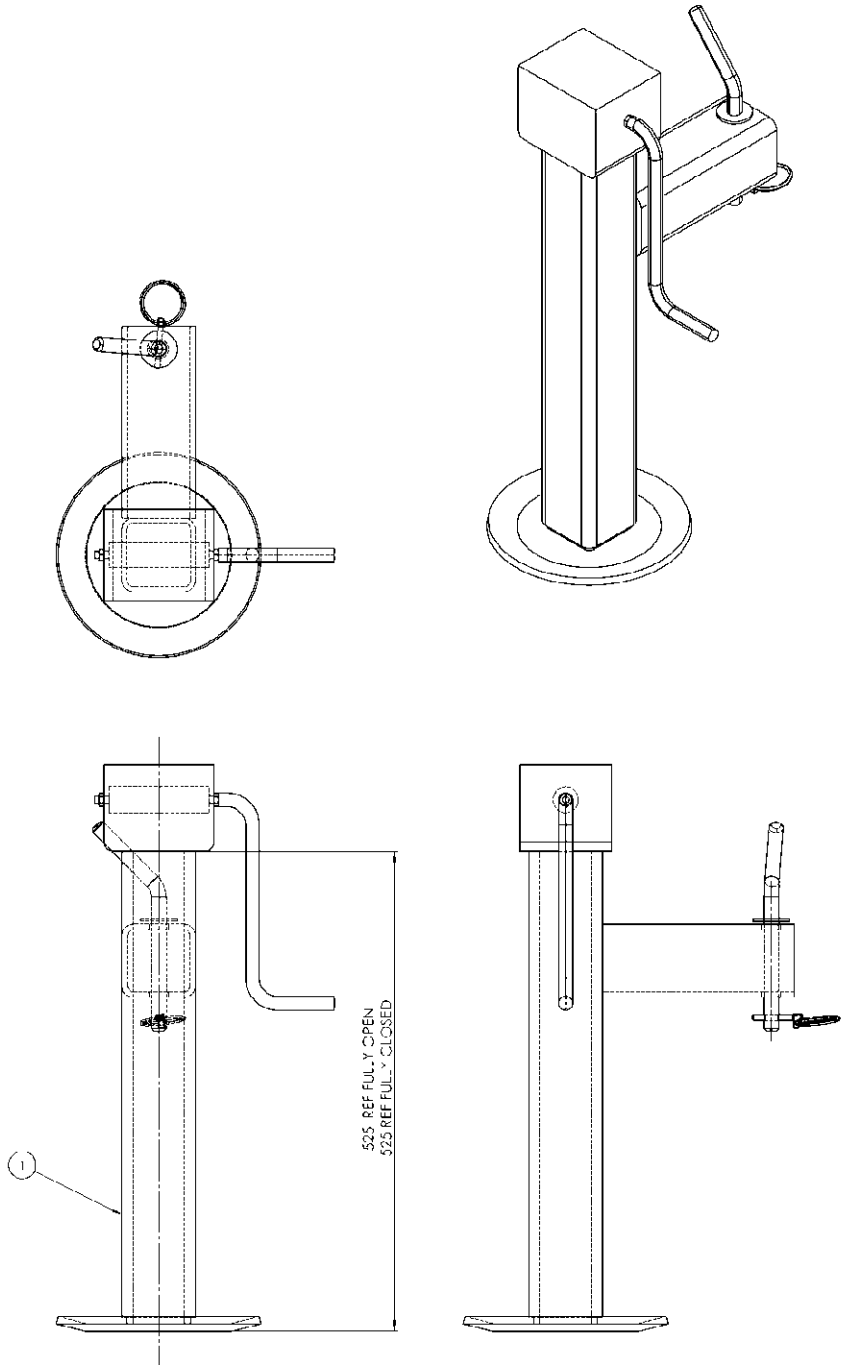
9.5 GUILLOTINE SLURRY DOOR HYDRAULIC CIRCUIT.



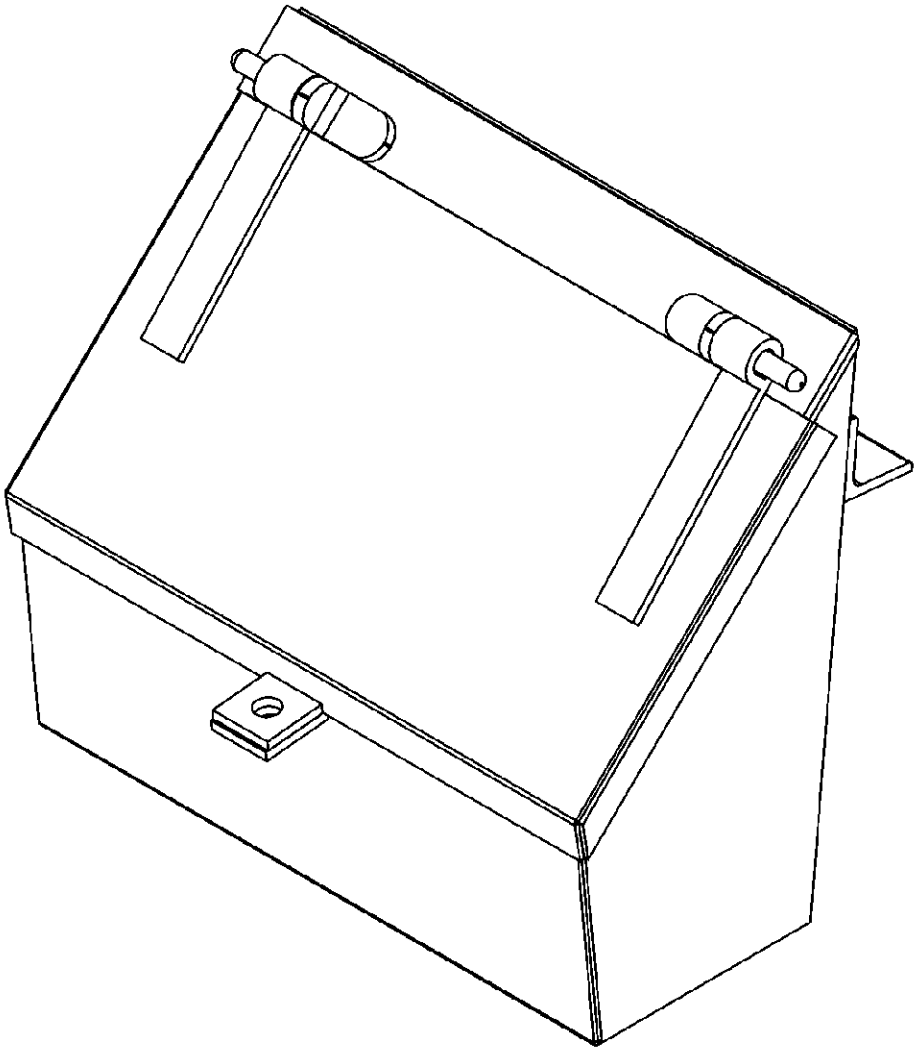
9.5 GUILLOTINE SLURRY DOOR HYDRAULIC CIRCUIT PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	2	51576	1/2" PROBE MALE SELF SEALER
2	2	51583	DUMMY 1/2" FEMALE
3	2	51463	3/8"-3/8"- BPT BULKHEAD
4	2	51447	3/8"-3/8"-3/8" MALE TEE
5	2	51335	3/8"-3/8" BPT NIPPLE
6	2	10522	3/8"-3/8" BPT NIPPLE 1/8" REDUCED
7	4	51590	DIA 3/8" DOWTY WASHER
8	2	51591	DIA 1/2" DOWTY WASHER
9	2	52316	HOSE END DIA 3/8-1/2" BPT MALE
10	8	52311	HOSE END DIA 3/8"-3/8" BPT FEMALE
11	6	52313	HOSE END DIA 3/8"-3/8" BPT 90 DEG FEM
12	2	52760	HOSE 3/8" BORE 2 WIRE x 2500
13	2	52760	HOSE 3/8" BORE 2 WIRE x 305
14	4	52760	HOSE 3/8" BORE 2 WIRE x LENGTH
16	REF	SEE NOTE	HYD RAM 2" BORE DOUBLE ACTING

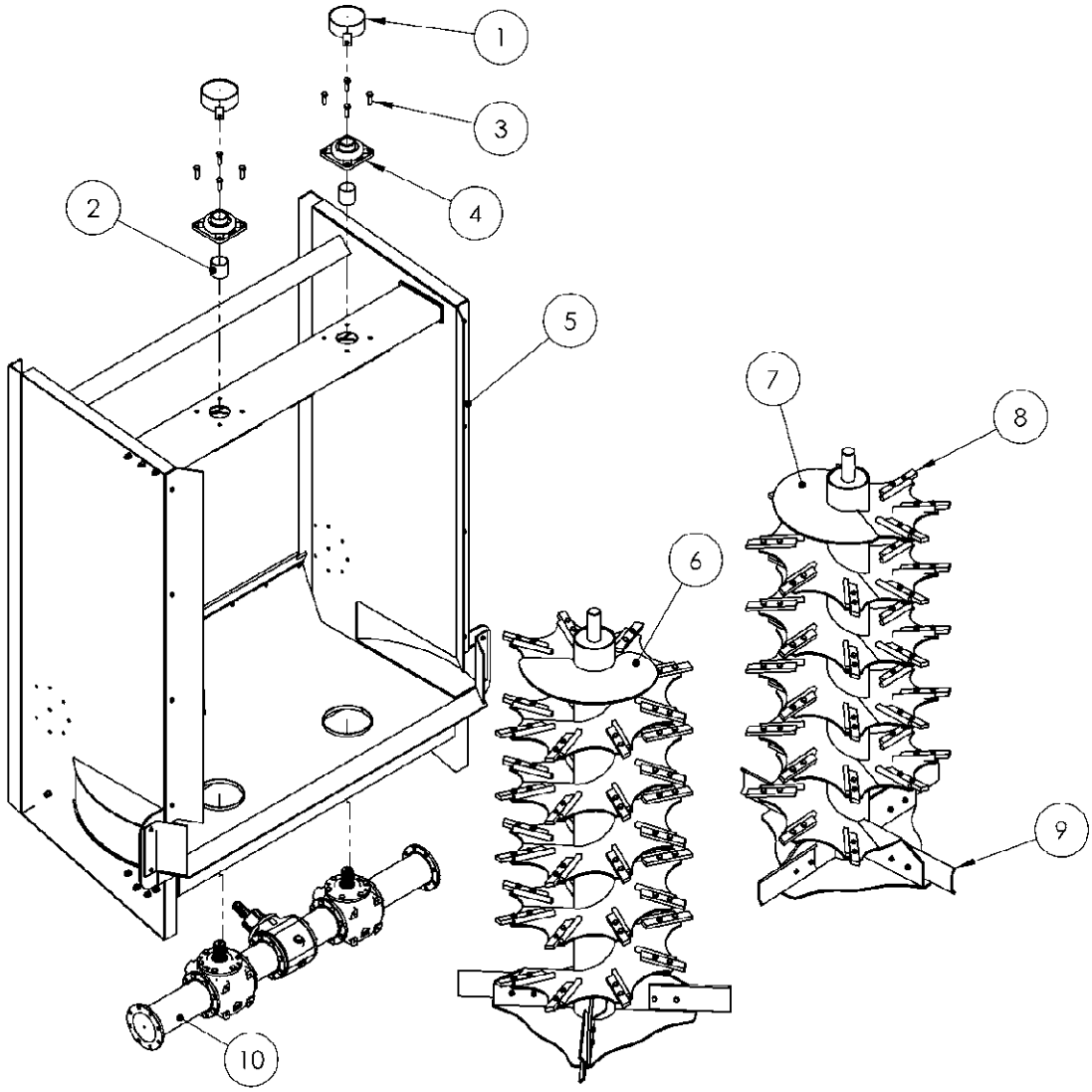
9.6 SUPPORT LEG PART No. 70307



9.7 TOOLBOX PART No. 80136



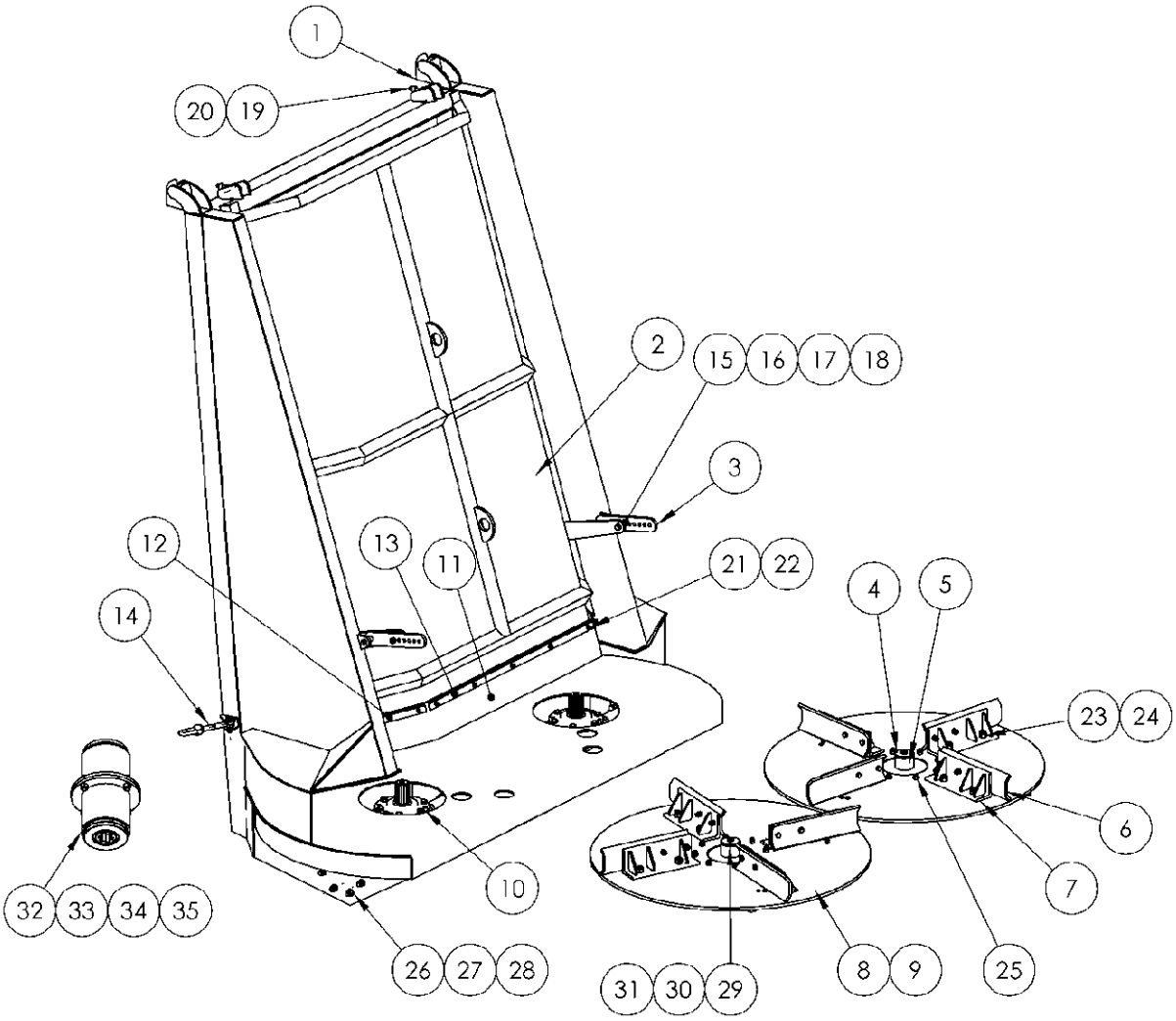
9.8 SLUDGE CAKE OPTION WIDEBODY



9.8 SLUDGE CAKE OPTION WIDEBODY PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	2	B1162	BEARING CAP
2	2	B2352	SPACER
3	16	B1103	BOLT AND LOCKNUT (BOLTS FOR BLADES)
4	2	B1180	BEARING M60
5	1		SLUDGE CAKE BODY
6	1	B1048	AUGER ASSEMBLY LH
7	1	B1049	AUGER ASSEMBLY RH
8	80	B1101	CUTTER POINT H.D
9	4	B1124	AUGER BLADE L.H
9	4	B1125	AUGER BLADE R.H
10	1	B3180	AUGER GEARBOX
	160	B1101/1	BOLT AND LOCKNUT (BOLTS FOR CUTTER)

9.9 DETACHABLE SPINNER DECK – ADD ON OPTION



9.9 DETACHABLE SPINNER DECK – ADD ON OPTION PARTS LIST

KEY	QTY	PART No.	DESCRIPTION
1	2	DMS0233	BUCKET HOOK
2	1	AMS0142	REAR CANOPY ASSEMBLY
3	3	DMS0889	LINK CANOPY
4	2	DMS0322	END CAP
5	2	AMS0141	MOUNTING FLANGE ASSEMBLY
6	8	B1116	AUGER/SPINNER BLADE 15"
7	6	AMS0119	BLADE HOLDER ASSEMBLY
8	1	B8340	SPINNER DISC LH
9	1	B8342	SPINNER DISC RH
10	1	B3190	BERMA SRT 18/1830 1000/520 3IN1
11	1	DMS0513	RUBBER SKIRT
12	2	DMS0512	CLAMPING STRIP
13	1	DMS0511	CLAMPING STRIP
14	2	A2134	HOOK BOLT
15	4	DMS0072	HINGE TUBE
16	20		M12 LOCK NUT
17	4		M12 WASHER
18	4		M12 BOLT x 70mm
19	2		M10 BOLT x 70mm
20	2		M10 LOCK NUT
21	8		M8 LOCK NUT
22	8		M8 LOCK NUT
23	8		M16 LOCK NUT
24	8		M16 BOLT x 45mm
25	16		M12 BOLTx 50mm
26	16		M14 LOCK NUT
27	16		M14 BOLT x 50
28	16		M14 WASHER
29	2	B8336	DISC DRIVE FLANGE
30	2	B8339	FLANGE CAP
31	2	73698	CAP SCREW
32	1	B8484	FLEXIDRIVE BODY
33	1	B8486	FLEXIDRIVE
34	12	B1140	RUBBER DRIVE BLOCK
35	12	B1142	RUBBER DRIVE BLOCK

9.10 INSTALLATION AND GENERAL USE OF DETACHABLE SPINNER DECK

GENERAL USE

The detachable spinner deck is designed purely for wider spread patterns and low application rates of between 1 and 3 tonnes per acre (2 ½ to 7 ½ tonnes per hectare). It must **NEVER** be used to spread long straw based material or heavy applications beyond 5 tonnes per acre.

INSTALLATION

When fitting or removing the spinner deck assembly great care must be taken not to endanger an assistant in any way, especially when raising or lowering the unit. Persons must not be put at risk.
Before making any adjustments, fitting or removing attachments, the tractor that the spreader is attached to must be switched off and the key removed.

FITTING THE SPINNER DECK

1 Remove guard from output spigots of the auger gearbox.
2 Slide one half of 'flexi coupling' onto the shaft, through shaft of spinner gearbox.
3 Slide other half of the 'flexi coupling' on the input spigot of the spinner gearbox.
4 Using approved lifting apparatus lift the complete spinner deck assembly using lower lifting eye on canopy (ensure bolt & nuts No. 20/20 and 16/18 are securely in place).
5 Offer the assembly to rear of the machine and lower into position. Firstly locate the 'bucket hooks' of deck into clevises at the top rear corners of the spreader.
6 Hinge hook bolt No. 14 into anchors and tighten.
7 Fit and tighten 4 bolts to join the two halves of the flexi coupling.
8 The machine is now ready for use with the spinner deck.

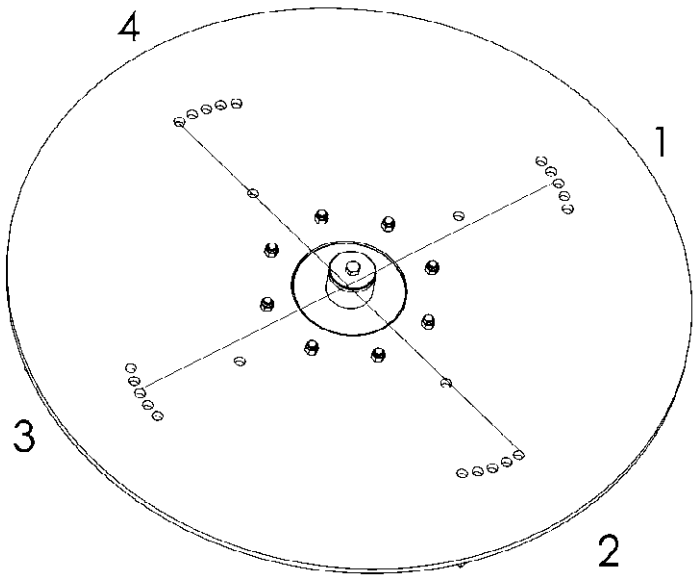
REMOVING THE SPINNER DECK

1 Clean all material from spinners and decks.
2 Remove 4 bolts from the flexi coupling.
3 Loosen hook bolts No. 14 and hinge back to clear anchors.
4 Using approved lifting apparatus lift from lower lifting eye on the canopy firstly pulling the bottom of the deck assembly away from rear of spreader to the clear auger blades.
5 Lift the assembly clear of the spreader and stand on level ground with the front of the assembly close to, or against a wall or stable object.
6 Fit the shaft cover to the output spigot of the spreader auger gearbox.
7 The machine is now ready for use without spinner deck.

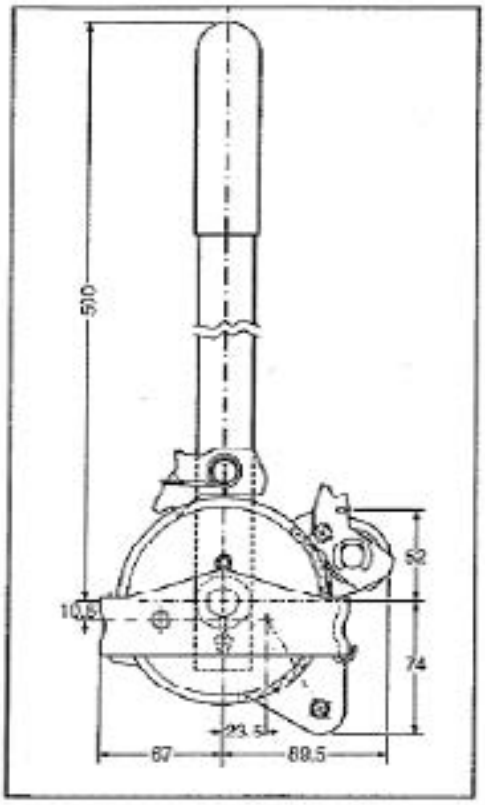
ADJUSTMENT OF CANOPY & BLADES

<u>For the best results</u>

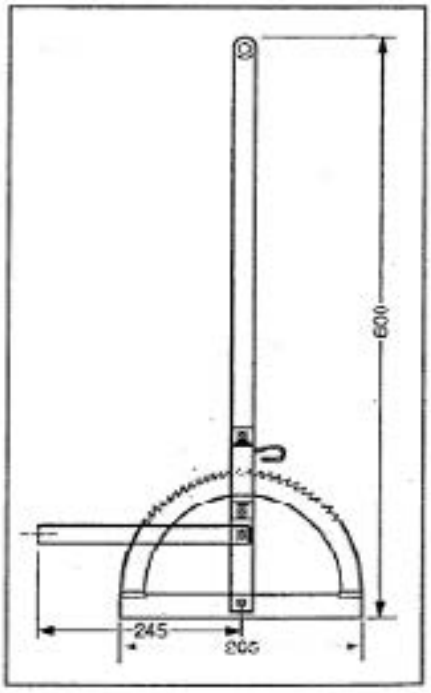
1 Fix the canopy on the inner positions for light materials i.e. Poultry manure.
2 For heavy material i.e. slurry or sludge adjust canopy out as far as possible so as not to deposit material beyond the deck into gaps between the discs.
3 To increase the width of the spread pattern adjust the angle of blades forward on the disc.
4 If the spread pattern is light immediately behind the machine adjust the angle of the blades back.
5 It is possible to achieve an even spread by adjusting the blades, as opposing pairs. i.e. Blade 1 and 3 position 3 and blade 2 and 4 in position 1.



9.11 HANDBRAKE CONTROL MULTI-STROKE MS45

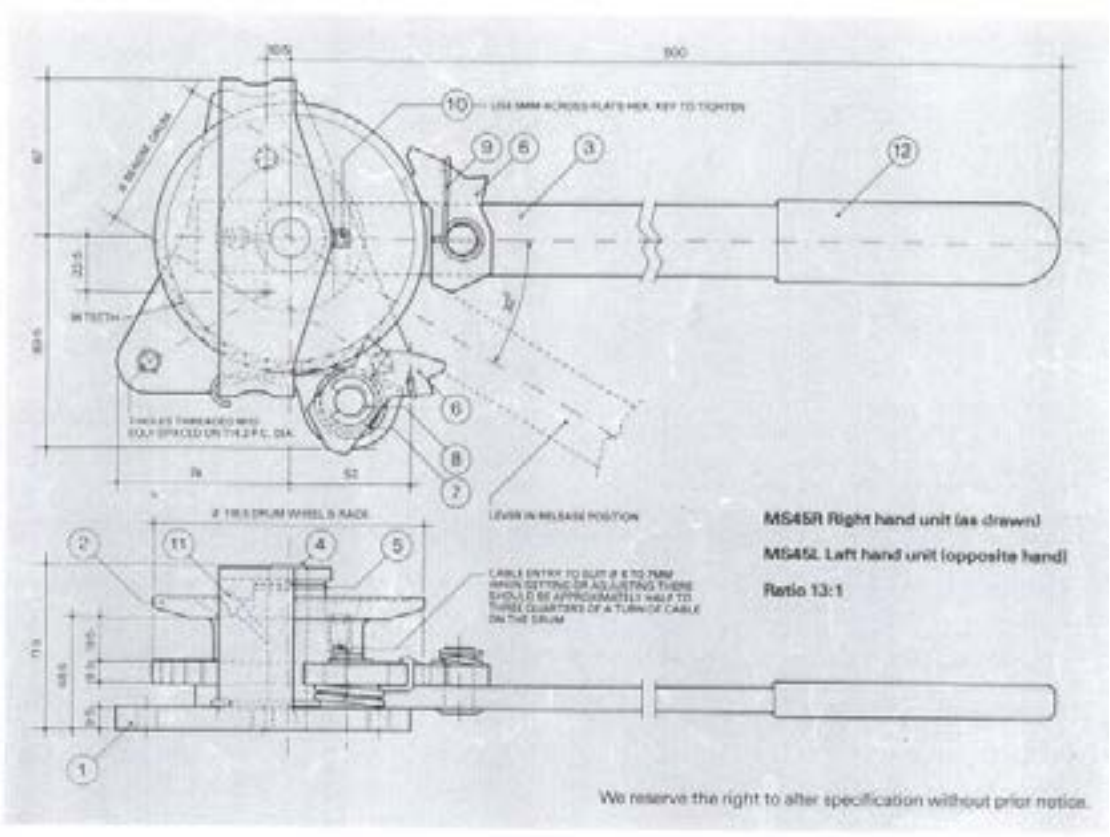


RATCHET HANDBRAKE



PULL ON/OFF HANDBRAKE

9.11 HANDBRAKE CONTROL MULTI-STROKE MS45

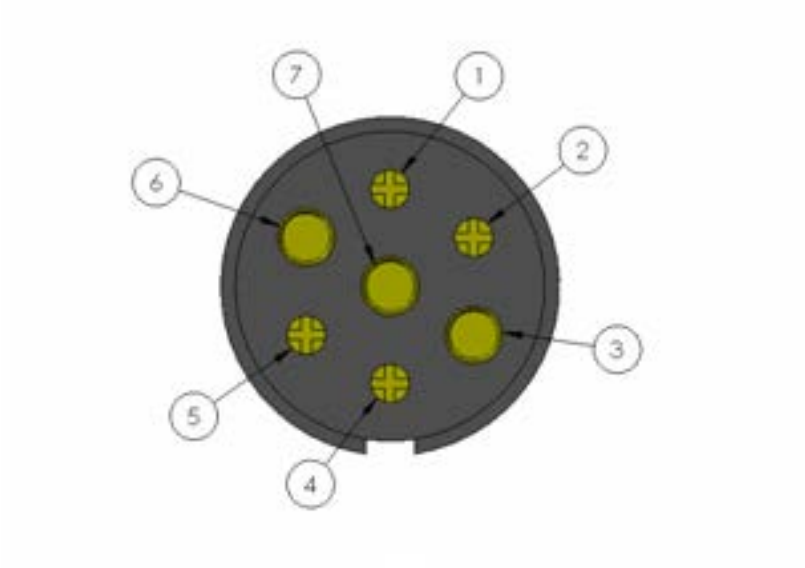


9.11 HANDBRAKE CONTROL MULTI-STROKE MS45

KEY	QTY	PART No. RH UNIT	PART No. LH UNIT	DESCRIPTION
1	1	MS45-325	MS45-328	BACKPLATE ASSY. C/W PAWL, SPRING & CIRCLIP
2	1	MS45-326	MS45-329	DRUM RACK ASSY. C/W GREASE NIPPLE & SOCKET SCREW
3	1	MS45-327	MS45-330	LEVER ASSEMBLY. C/W PAWL, SPRING & GRIP
4	1	MS45-318	MS45-318	AXLE PIN
5	2	MS45-222	MS45-222	DOUBLE COIL SPRING
PARTS OF ASSEMBLIES WHICH MAY BE ORDERED SEPARATELY				
6	1	MS45-211	MS45-211	PAWL
7	1	MS45-319	MS45-321	SPRING - HOLDING PAWL
8	1	MS45-317	MS45-317	CIRCLIP - HOLDING PAWL
9	1	MS45-316	MS45-320	SPRING - APPLICATION PAWL
10	1	MS45-125	MS45-125	SOCKET SET SCREW - FULL DOG
11	1	MS45-105	MS45-105	GREASE NIPPLE
12	1	MS45-159	MS45-159	GRIP FOR LEVER

10. ELECTRICS

10.1 WIRING FOR 12v 7 PIN PLUG



1) YELLOW –Y– L.H INDICATOR
2) BLUE –B– FOG
3) WHITE -W– EARTH
4) GREEN – G- R.H. INDICATOR
5) BROWN –BR- TAIL
6) RED –R- STOP
7) BLACK –BL- SIDE MARKERS

Pins 5 & 7 may be linked.

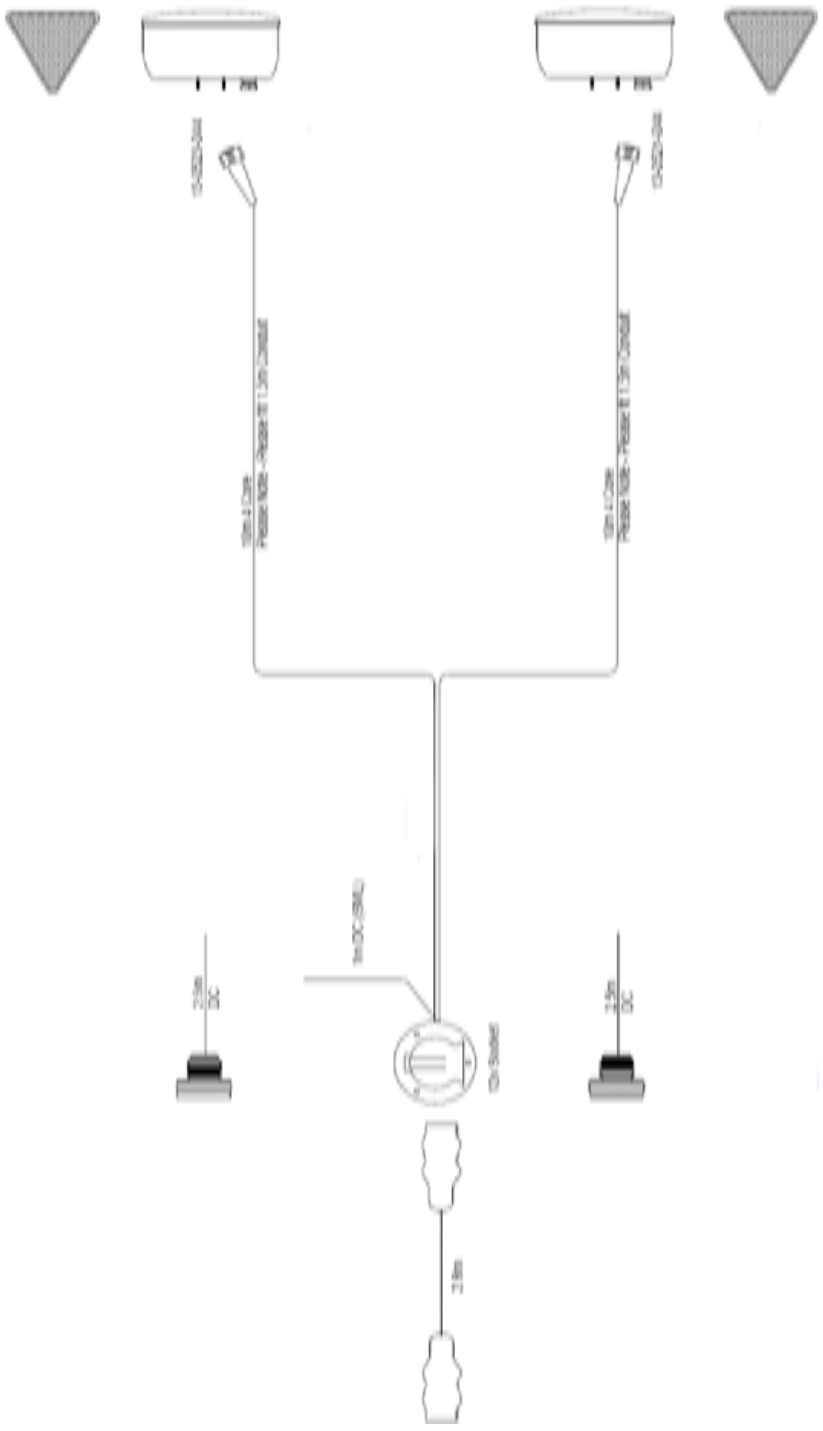
10.2 REAR LAMPS - 70152

10.3 FRONT MARKER LAMP - 70154

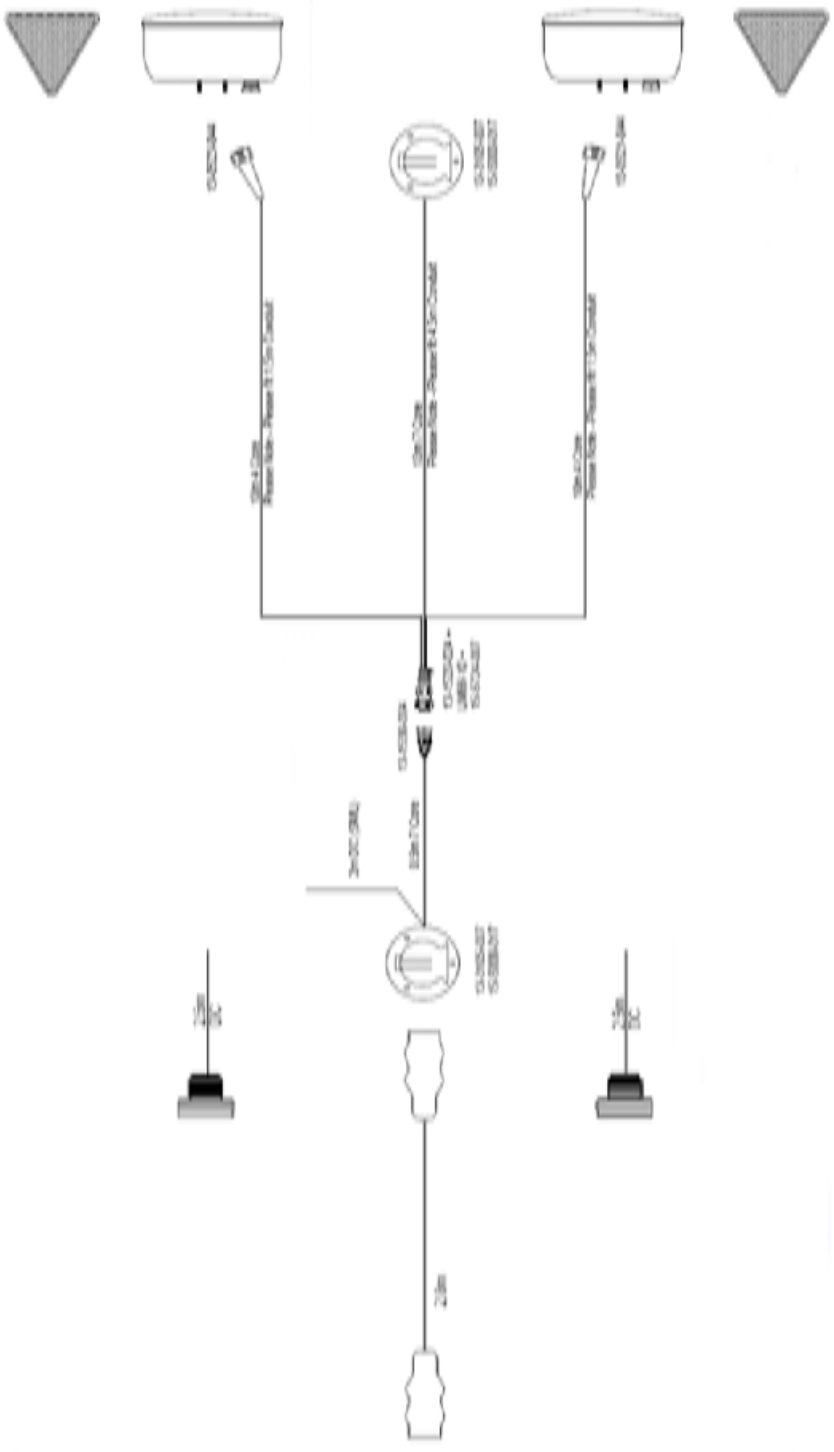
10.4 7 PIN CONNECTOR - 70156

10.5 7 PIN LIGHT LOOM - 70160

10.6 7 PIN LIGHT CIRCUIT



10.7 7 PIN LIGHTING CIRCUIT FOR REAR DRAWBAR



11. HEALTH AND SAFETY

11.1 Hazardous machinery warning

This machine is hazardous if improperly used and may cause serious injury or death if not used in accordance with these operating instructions and safety warnings. Employers are required to train and supervise all operators and assistants to observe safety precautions described by this handbook, the installation process and by warning decals.

11.2 Loss of control

Overloading, excessive speed or use on excessive slopes may result in loss of control. The towing tractor must be suitable for the trailer weight and other operating conditions. Trailer brakes must be used at all times.

11.3 Operation around bystanders

Do not operate this machine in proximity to bystanders who may be injured by projectiles or other functions including being run over or entangled in the auger.

11.4 Hydraulic fluid penetration or burning

Operators must be trained to avoid risks relating to the possibility of hydraulic fluid penetration resulting from high pressure fluid sprays directly contacting an operators skin. Hydraulic components may also be hot and may cause burning if touched.

11.5 Electrocution

An operator or a bystander could be electrocuted if the guillotine door was raised where there is a possibility of contact with overhead electrical wires.

11.6 Body entry

A person must not enter the body while the machine is running. Care must be taken to avoid slip/fall injuries while entering the body**.**

11.7 Coupling / Decoupling

Care must be taken to avoid crushing an assistant when coupling or decoupling the machine to a tractor.

11.8 Machinery start up

Sound the horn before starting this machine.

11.9 Machinery shut down

This machine must be operated from a tractor driver's seat. The tractor and machine must be shut down, the key removed and hydraulics lowered, if the driver leaves the seat or before any adjustments or repairs are made.

11.10 Additional driver protection

Extra protection can be achieved by lowing the slurry door as the load decreases in height.

11.11 PTO Connection and gaurding

Improper PTO connection and operation may cause machine failure and injury to an operator. PTO shaft guards must be used at all time.

WARNINGS
Keep all limbs clear of the spreading augers when in motion. Do not attempt to remove obstacles or carry out adjustments without stopping spreader operation first. Taking short cuts can result in permanent injury or loss of life.

Before attempting to carry out any check or adjustments disengage the PTO and stop the tractor engine and remove key.

Guards are provided for your safety. **Never** operate the spreader with any removed or open.

Before engaging the PTO make sure that there is no person standing to the rear or side of the spreader. Please observe at all times during spreading operation that no person or persons present within the working proximity. Remember any foreign objects hidden in the material i.e. stones, bricks, wood etc can be thrown further than the actual material, which could result in serious injury or loss of life.

12. WARRANTY

During the 12 month warranty period any failures which occur due to faulty components or workmanship must be reported to G.T. Bunning & Sons Ltd before any repairs or replacements of components is carried out. The warranty period commences on the despatch date from the factory. All parts not guaranteed by G.T. Bunning & Sons Ltd are covered by the component manufacturer and are subject to their own warranty. The warranty terms only apply to machines that have been subject to fair wear and tear operation and where routine maintenance has been carried out.

13. IMPORTANT INFORMATION

When using the speader in conjunction with a tractor which has a fast and slow response control on the spool valves, check that the control on the spool valve is not in the slow position in respect of the floor drives, as this will over ride the variable floor speed.
The spreader always runs very quietly when working, if loud banging noises are heard this will mean that foreign objects are in the material. Obviously the shearbolt may well break. If the shearbolts on the PTO has not sheared and the noises persists **STOP THE SPREADER SWITCH OFF TRACTOR ENGINE** and check the spreader.

From new, it is strongly recommended that you do not use a high pressure cold washer and definatley not a hot pressure washer to the outside of the spreader for **12 weeks**.
This will damage the paintwork whilst normal curing of the paint takes place.
Careful low pressure washing is acceptable.

Do not let manure dry and set on fresh paint for the first 3-4 weeks. During this period it is advisable to clean the machine after use as instructed.

14. NOTES

15. TECHNICAL DATA & SPECIFICATIONS

	MODEL					
	75	**90**	**105**	**105C**	**120**	**150**
GROSS DESIGN Kg	12500	16000	17500	17500	18750	20750
GROSS GB Kg	12500	13170	13670	13670	13920	13920
AXLE DESIGN Kg	10000	13000	14000	14000	15000	17000
AXLE GB Kg	10000	10170	10170	10170	10170	10170
EYE Kg	2500	3000	3500	3500	3750	3750
TARE WEIGHT Kg	--	--	5050	5050	5530	--
PAYLOAD Kg	7500	9000	10500	10500	12000	15000
PAYLOAD + TARE Kg	--	--	15550	15550	17530	--

	MODEL					
	75	**90**	**105**	**105C**	**120**	**150**
Axle	Single	Single	Single	Single	Single	Single
Axle beam size	90mm	100mm	110mm	110mm	140mm	150mm
Carrying capcacity	7500 Kg	9000 Kg	10500 Kg	10500 Kg	12000 Kg	15000 Kg
Cubic meters level	6.8m	8.6m	10.4m	9.6m	11.6	12.6
Cubic meter heaped	9.1m	11.4m	13.2m	12.9	14.6m	15.9m
Extended capacity	15.3m	18.6m	20.4m	N/A	22.2m	24.3m
Body size (int.mm)	4150x1500x1010	5150x1500x1010x	5150x1500x1240	4200x1500x1270	5450x1500x1315	5950x1500x1315
Floor drive	Hydraulic	Hydraulic	Hydraulic	Hydraulic	Hydraulic	Hydraulic
Floor chain size	16mm	16mm	16mm	16mm	16mm	16mm
Brake size mm	355x80	400x80	400x80	400x80	406x140	406
Tyre size	16.9x34 PR14	18.4x34 PR14	580/70 R38	580/70 R38	580/70 R38	580/70 R38
Spread Mech	Twin vertical augers	Twin vertical augers	Twin vertical augers	Twin vertical augers	Twin vertical augers	Twin vertical augers
Spread width	Up to 16m	Up to 16m	Up to 16m	Up to 16m	Up to 16m	Up to 16m
PTO speed	1000 RPM	1000 RPM	1000 RPM	1000 RPM	1000 RPM	1000 RPM
Floor plate	5mm	5mm	5mm	5mm	5mm	5mm
Side plate	4mm	4mm	4mm	4mm	4mm	4mm

FOR PROMPT IDENTIFICATION AND SUPPLY OF SPARES, ALWAYS QUOTE CHASSIS SERIAL NUMBER (found on the chassis identification plate).

Manual Author Robert Spurgeon. 2008