Teagle

TOMAHAWK

404M & 505M Straw Mills

Instruction Book & Parts List

Issue 11/05

⚠SAFETY FIRST!

1. **READ THE INSTRUCTION BOOK THOROUGHLY** before attempting to operate or carry out any maintenance on the machine. If you do not understand any part of this manual, ask your dealer for assistance.
2. ⚠**ALWAYS CARRY OUT SAFE MAINTENANCE.** Never clean, adjust or maintain the machine until the engine has been stopped, the machine come to rest, the PTO disengaged and the key removed.
3. ⚠**NEVER WORK UNDER A MACHINE RAISED ON THE 3-POINT LINKAGE** unless it is securely supported.
4. **NEVER OPERATE THE MACHINE WITH <u>ANY</u> PARTS OR GUARDS MISSING.** Check that all guards including the PTO shaft guards are in good condition and in place before operating the machine.
5. **OPERATE SAFELY.** Before starting work, check that there are no persons or animals in the immediate vicinity of the machine or tractor. Always maintain full control of the tractor and machine. Ensure that you know how to stop the tractor and machine quickly in case of emergency.
6. **SECURE THE PTO GUARD BY MEANS OF CHECK CHAINS** to suitable points on the tractor and machine to prevent the outer plastic shield from rotating.
7. **NEVER STAND BETWEEN THE MACHINE AND THE TRACTOR WHEELS.**
8. **DO NOT WEAR LOOSE OR RAGGED CLOTHING**
9. **BEWARE OF DUST.** Under dusty conditions, keep the cab windows and doors closed. The use of a dust mask conforming to EN149 is strongly recommended.
10.  **BEWARE OF HIGH NOISE LEVELS**. Some tractor/implement combinations give noise levels in excess of 90dB at the operator's ear. Under such circumstances, ear defenders should be worn. Keep cab windows and doors closed to reduce noise level.

Throughout this handbook, the term `tractor' is used to refer to the power source used to drive the machine. It does not necessarily refer to a conventional agricultural tractor.

HEALTH AND SAFETY AT WORK

Our equipment is designed so as to conform with current Health & Safety Regulations and therefore poses no significant hazard to health when properly used. Nevertheless, in the interests of all concerned, it is essential that equipment of our manufacture is used in accordance with the instructions that are supplied or are available from our Technical Staff.

Legislation requires that all operators are instructed in the safe operation, cleaning and maintenance of equipment and machines. This handbook forms part of that instruction and it must be read and understood before fitting the machine onto the tractor or attempting to use it.

Your supplier is responsible for carrying out any necessary pre-delivery inspection, fitting the machine onto the tractor and test running. The supplier must also give instruction in the safe use, maintenance and adjustment of the machine.

In the interests of safety, please ensure that the instructions referred to above are brought to the attention of all your employees who are to use the equipment. We recommend that the use of this equipment is restricted to capable trained operatives. Persons under the age of sixteen should not operate the machine and should be kept away from where it is being

WARRANTY

The standard warranty is for 12 calendar months against faulty materials and workmanship. Components supplied as part of the original machine, but manufactured by another company, e.g. PTO shafts, wheels etc., are subject to the original manufacturer's conditions and warranty.

Where repairs are carried out under warranty:-

a) Claims for the fitting of non original parts will not be considered unless prior agreement has been obtained.

b) The repairer must be advised that the work is to be the subject of a warranty claim beforehand.

c) Any claim must be submitted within four weeks of the repair.

d) The damaged parts must be retained for inspection and returned carriage paid if required.

The right to withdraw warranty is reserved if:-

a) Non-original parts are fitted.

b) The machine has been abused, badly maintained or used for purposes other than that for which it was

INDEX

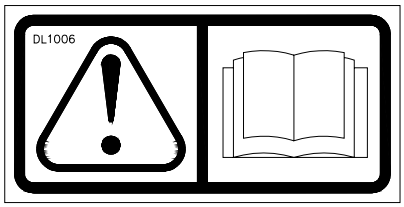
INSTRUCTIONS

SPECIFICATIONS

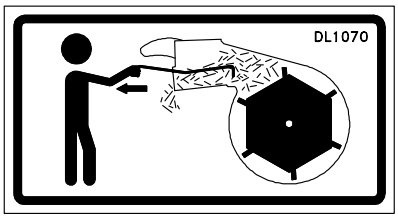
	404	505
Width - chutes closed	1.98m	1.98m
Width - operating	2.06m	2.13m
Operating width with Giraffe Chute	2.28m	2.28m
Length	2.10m	2.10m
Height lowered *	2.10m	2.38m
Drum diameter	1.57m	1.83m
Upper chute discharge height *	1.09m	1.09m
Lower chute discharge height *	0.4m	0.4m
Straw Giraffe chute height *	1.84m	1.84m
Unladen weight	647kg	737kg
Tractor power required	37kw	37kw
Sound Power Level	93dbA	93dbA

***** Heights listed are with the machine on the ground. When operating these heights can be increased by up to 1m depending on the tractor to which the machine is attached.

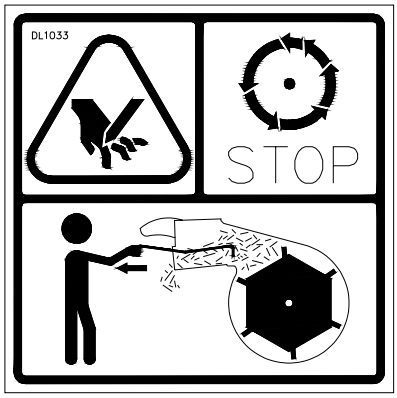
EXPLANTAION OF PICTOGRAMS



Please read instruction book before using the machine.



Blockage removal tool



Allow rotor to stop before removing blockage with tool provided

SAFETY

⚠ In addition to the standard safety guide lines listed at the beginning of this hand book, the following special safety items apply to the Tomahawk.

1 ⚠ **NEVER** put your hands inside the delivery chutes. In the event of a blockage, clear it using the tool provided (stored across the top of the rotor bearing housing). First, stop the engine, remove the key, disengage the PTO and wait for the rotor to come to rest.

2 ⚠ **NEVER** enter the drum unless the machine is resting on the ground, the engine stopped, the key removed, the PTO disengaged and the rotor come to rest.

3. Never insert anything inside the flaps or drum while the machine is running.
4. Do not allow anyone to ride on the machine or tractor linkage.
5. Do not allow persons or animals to stand in front of the outlet chutes whilst the machine is running.
6. Never put your hand over a hydraulic leak. Oil under pressure may enter the blood stream.
7. The shredding of dusty or mouldy material can cause dust having adverse health effects. Operator exposure to such conditions should be avoided where possible. When circumstances prevent this, either use a tractor with a suitable forced air cab filtration system or use an adequate respirator. Respirators must comply with the relevant Standard and be approved by the Safety Inspectorate. Disposable filtering face piece respirators to EN149 or half mask respirators to EN140 fitted with filters to EN 143 are likely to be adequate.
8. If a hydraulic top link is used, ensure that the top of the Tomahawk is clear of the cab with the machine fully raised and the top link in the fully contracted position.
9. When lifting the machine on the three point linkage, always check the clearance between the upper front of the Tomahawk and the rear of the cab, particularly the window if it is open, as the machine is lifted.

LEFT AND RIGHT HAND

In this Handbook and Parts List, the terms Right and Left Hand apply to the machine when viewed looking towards the rear of the tractor.

USE OF THE TOMAHAWK

The Tomahawk is designed for shredding either round or rectangular bales of dry hay or dry straw. It's use for shredding other materials is not recommended without first seeking further advice from the manufacturers.

Material can be delivered from both chutes simultaneously or from one chute at a time. By fitting the optional high level Giraffe Chute, material can be discharged over gates or barriers etc. The extra discharge height is also useful when it is necessary to spread over a greater distance.

Unapproved chute modifications should not be carried out, otherwise Safety Regulations may be infringed.

PREPARATION OF THE TRACTOR

The PTO power required to drive the Tomahawk is typically about 45KW (60 HP). However, the suitability of any particular tractor will depend upon, a) the strength/capacity of the 3-point linkage, b) its stability and c) operating conditions. Front end weights may be considered necessary depending upon circumstances. Castor wheels are available as an optional extra where stability is a particular problem.

A Quick Hitch A-Frame is built into the machine, so this can be used as an option to the normal 3-point linkage. In either case, stabilisers or adjustable check chains must be fitted.

⚠ **Do not use the A-Frame quick-hitch system if the optional castor wheels are fitted.** The normal 3-point linkage system must be used if castor wheels are attached to the machine.

The machine is designed to use either the standard 540 or 1000 R.P.M. PTO shaft speeds. The higher speed may cause an increase in power consumption.

The Tomahawk uses the tractor hydraulic system to power the drum rotation motor. A rotational speed of approximately 15 - 20 R.P.M. is required typically to achieve a good rate of shredding. Where the flow rate of the hydraulic oil cannot be controlled from the tractor, it may be necessary to fit a separate flow divider to reduce the drum speed under some circumstances.

To drive the motor, a double acting spool valve or a single acting valve with an unrestricted return line will be necessary. Whichever is used, the hydraulic supply must be independent of the 3-point linkage. Some tractors may require the fitting of a linkage isolating valve to achieve this. If a hydraulic top link is used then an additional valve will be required to operate it.

FITTING THE MACHINE ONTO THE TRACTOR

Unbolt the round metal guard from the front of the main shaft bearing housing and fit the slip-clutch end of the PTO shaft onto the machine. Ensure the clamp bolts are tightened fully, check that there is no free play on the splines of the shaft otherwise damage will occur. Refit the metal guard.

The Tomahawk is designed for use either on the normal category 2 3-point linkage or on a 'Quick Hitch A-Frame'. If the 3-point linkage is to be used, the implement lifting frame and the adjustable upper link should both be in the lower positions. The upper

position should be used where the machine is to be mounted on an A-Frame. These two positions take into account the height of the A-Frame.

Fit the machine onto the tractor in the usual manner and fit the stabilisers or tighten the check chains. Using the multi-hole tie bar at the top of the lifting frame, angle the frame such that it is vertical, or leaning away from the tractor. The top link pin should be in the lower of the two holes at this stage. The angle of the machine may be adjusted in use to give the required feed rate. A steeply sloping drum will generally produce a faster feed and vice versa. This adjustment is greatly facilitated by the use of a hydraulic top link.

Fit the PTO shaft and with 'Position Control' selected, lift the machine fully on the linkage, continuously checking that the PTO shaft does not come to within 25 mm. (1 inch) of bottoming. With the shaft in its most extended position, there should not be less than half of the original overlap between the sliding members. If necessary, cut the PTO shaft to the correct length. If a hydraulic top link is used, check the PTO for bottoming throughout the full range of adjustment of the top link.

Connect the hydraulic hoses into the spool valve connections of the tractor. The connections and valve operation must be such that the drum rotates in an anti-clockwise direction when viewed from the rear. This ensures that a) the belt drive operates safely and effectively and that b) the bale is fed into the rotor in the correct manner.

In use, the drum rotates, feeding the bale into the rotating blades. The output (and power requirement) can be increased by tilting the machine forwards slightly, thereby increasing the pressure of the bale against the blades.

It is essential to get the relationship between the tractor PTO shaft and Tomahawk splined shaft correct to give a satisfactory PTO shaft life. The correct geometry exists when the angle between the tractor shaft and the PTO shaft is the same as the angle between the Tomahawk splined shaft and the PTO shaft (ref Fig.4). Any significant deviation from this situation will adversely affect the life of the drive line.

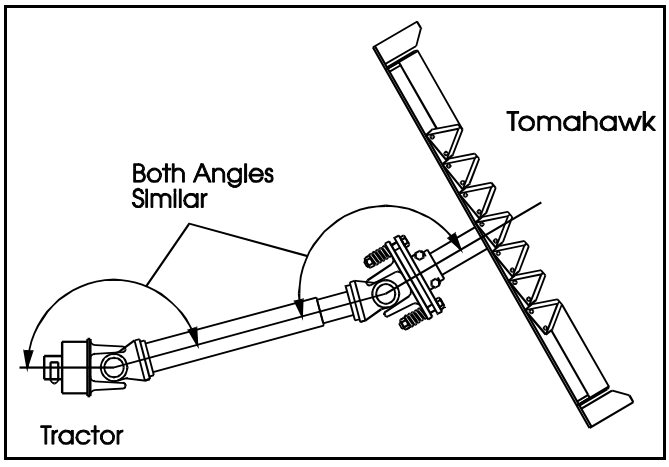


Fig.4 Correct PTO Geometry

The geometry will vary from one tractor to another but the basic layout is obtained by adjusting the angle of tilt using linkage geometry and height of lift. Once the correct top link lengths/ positions/working heights have been established for a particular tractor, these should always be used when the machine is shredding.

OPERATION

String and netwrap should not be put through the machine as it will wrap around hammers jamming them causing the machine to perform poorly and vibrate. Putting twine or netwrap through the machine is not recommended as it will eventually be spread on the land and pollute the next crop of silage or hay. The strings or net should be removed from the bale as it is being loaded into the machine.

Bales can be loaded into the machine in two ways, using a loader or by hand. If a loader is used, simply load the bale into the drum such that it is fully inserted, but without ramming it against the end plate. It may also be possible to load straw bales by hand with the machine lowered onto the ground.

Raise the machine on the linkage until the working geometry described under 'Fitting the Machine onto the Tractor' is obtained. Open the flap on the side(s) to which the shredded straw is to be delivered and adjust the deflector(s) to give the desired spread width. Never run the machine with no flaps open, as a severe blockage and possible damage is liable to occur.

Engage the PTO with the tractor engine on low idle and increase the speed rapidly when the clutch has engaged fully. Once the rotor is turning at the normal PTO speed, operate the spool valve so that the drum starts rotating and shredding is commenced. When it is necessary to stop shredding part-way through a bale, always stop the drum rotation a few seconds before the rotor, so that the shredded material in the area around the outside of the rotor has time to be blown clear of the machine. Failure to do this may result in a blockage occurring when the machine is re-started.

The length of chop will vary with the condition of the bale. Fresh clean straw will tend to result in a longer chop length than that which is old, slightly damp, weathered or caked together in the bales. The power consumption will also vary with the material being shredded.

The chop length may be altered by selecting a different screen with different hole sizes. After swapping a screen and before starting the tractor engine, turn the rotor by hand to check that it rotates freely.

⚠ **IMPORTANT:** The machine is fitted with a slip clutch on the rotor shaft. If this slips repeatedly, it should not be tightened until the machine has been examined to check that there is no fault or blockage. Refer to 'Maintenance' for the correct clutch setting.

USE ON THE PUBLIC HIGHWAY

⚠ If the machine is to be transported along the public highway (any road where the public have access) behind the tractor it will be necessary to comply with local road traffic legislation as the machine is likely to obscure the rear light units of the tractor.

Failure to comply with road traffic legislation may lead to prosecution by local law enforcement agencies and could also result in a road traffic accident.

MAINTENANCE

BLADES AND HAMMERS

⚠ When carrying out maintenance work on the blades, wedge the rotor to prevent it from turning and make sure all hammers hang down. Always keep your hands away from the edges of blades - particularly new ones, as they are extremely sharp. A leather glove will give some protection against minor cuts.

Hammers will wear with use and are designed to give four different cutting surfaces before needing replacing. Before removing the hammers note the size and position of the spacers. Remove the bolt retaining the hammers and either turn them or reposition them using the unused pivot hole. Refit the bolt making sure the spacers and blade bushes are replaced in the correct order.

DRUM REMOVAL
This operation requires two persons.

To remove the drum, dismantle the belt guards then slacken and remove the belts. Swing the motor assembly around so that it is well clear of the drum and restrain it in that position. Turn the drum so that the large hole in its periphery is at the top. Suspend the drum from the spiral bar inside the hole using a strong rope or chain attached to a fore end loader.

Remove the two lower rear drum retainers and roller guards so that is it possible to slide the drum rearwards. Slacken the two bolts holding the top bearing channel in place and carefully remove it, ensuring that the loader is just taking the weight of the drum as the bolts are loosened. Raise the drum slightly and slide it rearwards, away from the machine.

Reassembly is a reverse of the above procedure.

DRUM MOUNTINGS
The lower rollers which support the drum are mounted on eccentric hexagonal bosses - see Fig.7. By rotating these bosses, it is possible to centralise the drum and adjust the clearance between the drum and back plate at the bottom. The roller at the top of the drum can be adjusted by moving the channel in its slots. No adjustment is normally required as the rollers are correctly positioned during factory assembly. The clearance between the drum and back plate should be 10 - 15mm.

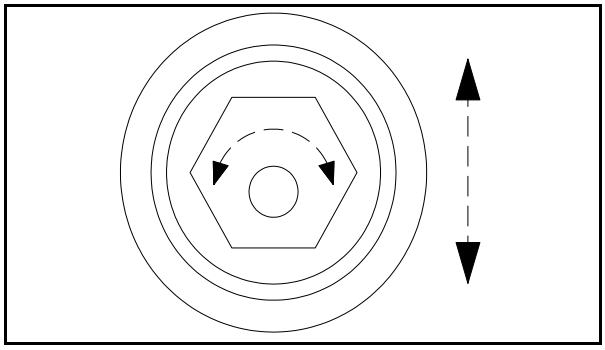


Fig.7 Eccentric Drum Mountings

SCREEN REPLACEMENT
Undo the six bolts retaining the screen to the back plate. Rotate and slide the screen towards the rear of the machine until it clears the rotor. Select the screen to give the desired chop length and fit in the reverse order of the above.

ROTOR REMOVAL
First, remove the drum and as described above. Undo the eight bolts securing the screen and the lower segment to the housing assembly. Remove the ring to give access to the rotor. Suspend the rotor from a lifting device so that it can be removed safely. Wedge the rotor to prevent rotation and unscrew the bolt in the centre of the rotor.

The rotor is located on a taper and will usually require a sharp blow to be administered to the end of the shaft to dislodge it. Care should be taken not to damage the tapped hole in the rear of the shaft.

Refitting is a reverse of the above.

BEARING HOUSING
To remove the rotor bearing housing support the rotor using a block of wood placed underneath the rotor through the lower outlet chute. Release the four nuts securing the bearing housing to the mainframe and drive out the two roll pins. The rotor must then be released as described in the previous section. Refitting is the reverse of the above. Make sure the roll pins are replaced securing the position of the bearing housing. Failure to replace the roll pins may result in the rotor moving and causing serious damage.

PTO SHAFT
Check once a week that the clamp bolts on the rotor shaft are tight and that there is no free play on the splines.

SLIP CLUTCH
If the clutch slips repeatedly for no apparent reason, it should be adjusted as follows.

1. Remove the large metal guard fitted over the clutch.
2. Insert a piece of wood through the top discharge chute and position it such that it prevents the rotor from turning.
3. Insert a steel bar through the rear PTO yoke and use a spring balance to obtain the correct torque setting. The clutch should just slip at a torque of 800

Nm.(600 lb.ft.) - equal to a force of 800N. at 1 metre (200 lb. at 3 feet) from the centre of the yoke. Adjust the clutch as necessary using the eight spring loaded clamp bolts. If the clutch linings show signs of damage or excessive wear, they should be replaced. When new they are 3mm. (1/8") thick.

BELT ADJUSTMENT

The belt tension should be sufficient for slip not to occur, but over-tightening should be avoided. Tensioning is carried out by means of an adjuster attached to the motor bracket.

If the belt slips persistently, check that the drum is not fouling on the back plate.

If the belt turns over in its grooves or appears to run out of alignment, the position of the motor pulleys should be adjusted by means of the large nuts on the threaded pivot shaft.

LUBRICATION

A good quality semi-solid grease should be applied to the following grease points:

Every week:

Main rotor shaft

Every 2 weeks:

PTO shaft joints - 2 nipples
PTO guard bearings (where fitted)
PTO shaft sliding members

Every 4 weeks:

Motor housing pivot shaft
Oil PTO shaft spring plungers

The above frequencies are based on typical daily use for bedding purposes. Continuous use for special applications may necessitate more frequent lubrication.

STATIONARY USE

When used as a stationary machine it should always be attached to the power source to prevent separation of the drive shaft. If it is necessary for the operator to be anywhere other than on the tractor seat, then means must be provided to stop the tractor from the operating position.

If the Tomahawk is to be installed as a permanent stationary machine it is subject to the regulations which apply to stationary machinery. The person installing the machine along with its power source is responsible for ensuring the installation complies with all relevant legislation.

OPTIONAL EXTRAS

CASTOR WHEELS

The castor wheels fit onto the rear of the mainframe and socket into brackets permanently bolted onto the machine. For parking purposes, the machine is raised just clear of the ground and the wheel assemblies removed. The Tomahawk is then lowered onto the ground and parked in a similar manner to a standard machine.

⚠ Never park the Tomahawk on a raised s u p p o r t with the castor wheels still attached.

⚠ **Never use a quick-hitch A-Frame in conjunction with a castor wheel kit.** The loading on the tractor linkage is such that the latch may become detached with a serious risk of personal injury.

The castor pivot shafts should be greased once a week with a good quality semi-solid grease. The tyres should be inflated to a pressure not exceeding 89 psi (6.25 bar).

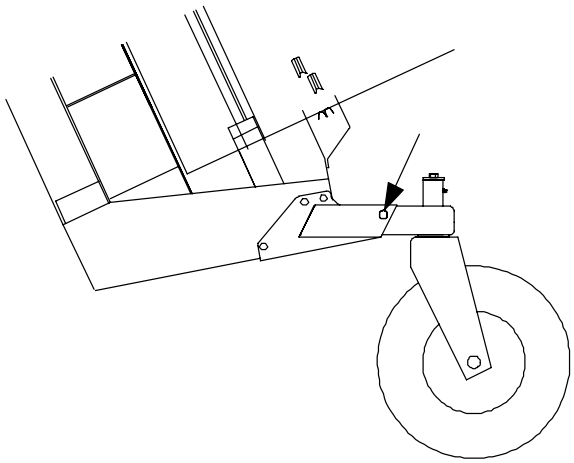


Fig. 8 Optional Castor Wheels

GIRAFFE CHUTE

A high level 'Giraffe Chute' kit is available for instances where a greater discharge height/distance is required.

Included in the kit is a deflector, on/off flap and operating linkage.

In the event of the Giraffe Chute being removed, the ⚠ machine must not be operated without the blanking plate being bolted securely in place.

⚠ The flap pivot bar and operating linkage should not be removed until the engine has been switched off, the PTO disengaged and the rotor come to rest.

DRUM EXTENSION

This is a factory fitted option and it is intended only for holding large rectangular bales of straw.

END OF SEASON STORAGE

At the end of the shredding season it is advisable that the machine is thoroughly cleaned and the belt tension should be released.

DISPOSAL

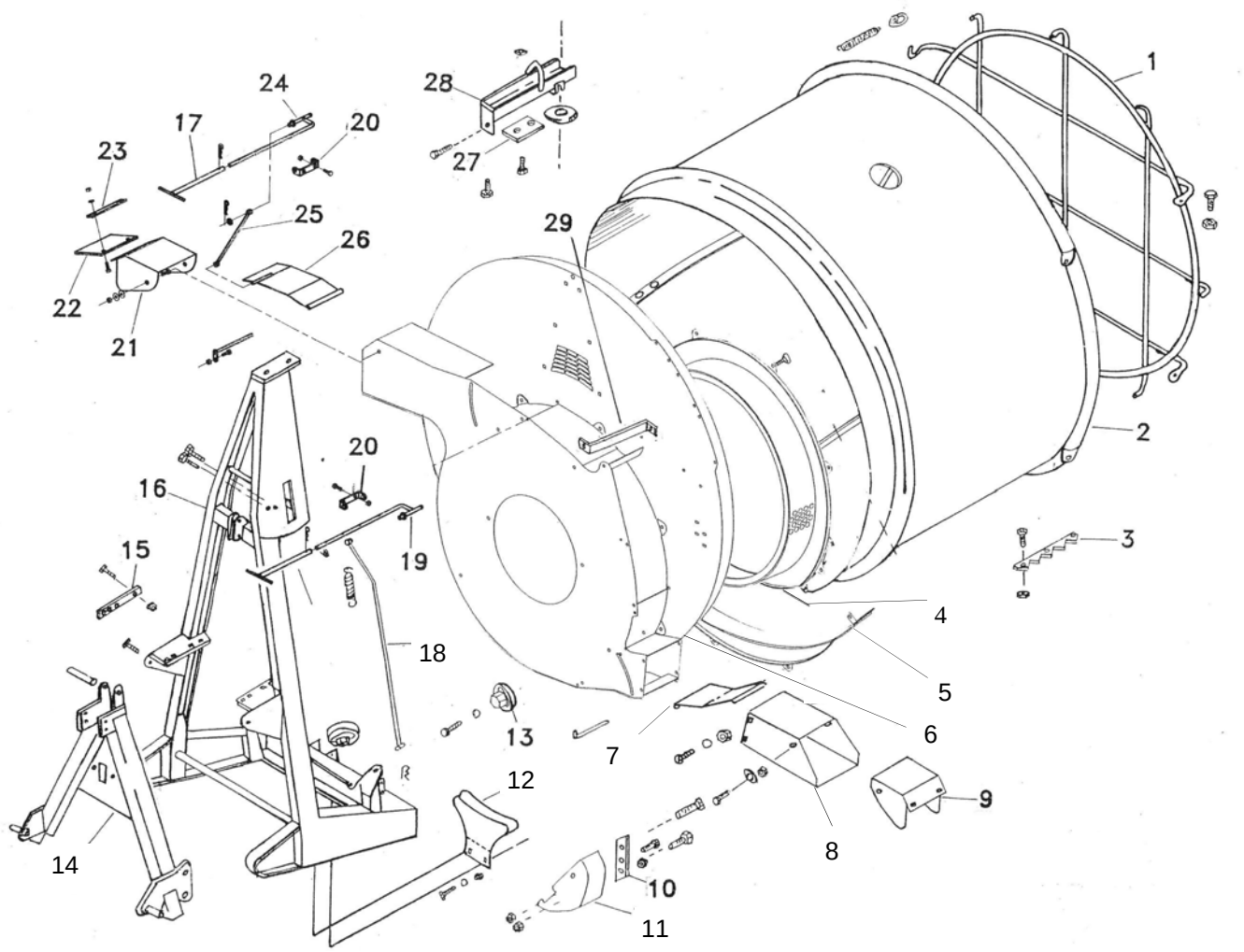
At the end of the machine's working life, the method of disposal must be within the legislation laid down by the local authority or the National Environment Agency.

The machine is composed of ferrous materials, synthetic paints and rubber compounds.

TOMAHAWK FAULT FINDING CHART

Symptom	Fault	Possible Solutions
Drum does not turn	Hydraulic connections to tractor faulty or not connected	Rectify
	Belt slack	Tighten belt
	Drum fouling back plate	Adjust drum away from back plate using eccentric adjusters.
	Motor not turning	Check connections and tractor hydraulics. Check that motor turns by hand with belt slack and hoses disconnected. If motor is seized, reverse flow to release. Consult your dealer if this fails.
	Rollers seized	Replace bearings or complete rollers
	Material jammed between drum and back plate/shield	Clear material and adjust drum further from back plate if problem continues.
	Bale out of shape.	Check belt tension.
Slow discharge	Blades blunt or worn	Sharpen or replace blades. Blade condition is critical for performance.
	Hammers worn	Turn or replace worn hammers.
	Insufficient pressure between bale and rotor	Tilt drum at steeper angle - shorten top link
	Drum speed too slow	Consult dealer for advice if hydraulic flow cannot be controlled using tractor valve See handbook for recommended speeds.
	Drum rotating in wrong direction	Reverse hose connections or reverse spool.
	Bale not turning in drum.	Fit bale grippers in drum.
	Rotor speed low.	Check that slip clutch is not slipping - indicated by hot clutch assembly. Check tractor tachometer or simply increase engine speed (try 1000rpm. PTO if necessary).
	Bale jammed in drum or not feeding into rotor.	Remove bale grippers if fitted, peel layer off outside of bale before loading.
	Baled material wet	Use only dry material with the 21mm sieve
Poor delivery from Giraffe Chute	Rotor speed low	See above - Rotor Speed Low
High power consumption	Excess pressure of bale upon rotor.	Lengthen top link.
Rotor won't start	Bale jammed hard against rotor	Lower machine, lengthen top link and rotate drum one or two turns.
	Clutch setting too low	Check setting and adjust
Insufficient delivery from bottom chute when both	Drum speed too low.	Increase hydraulic flow rate. Check belt tension etc. Consult dealer regarding motor size. It may be

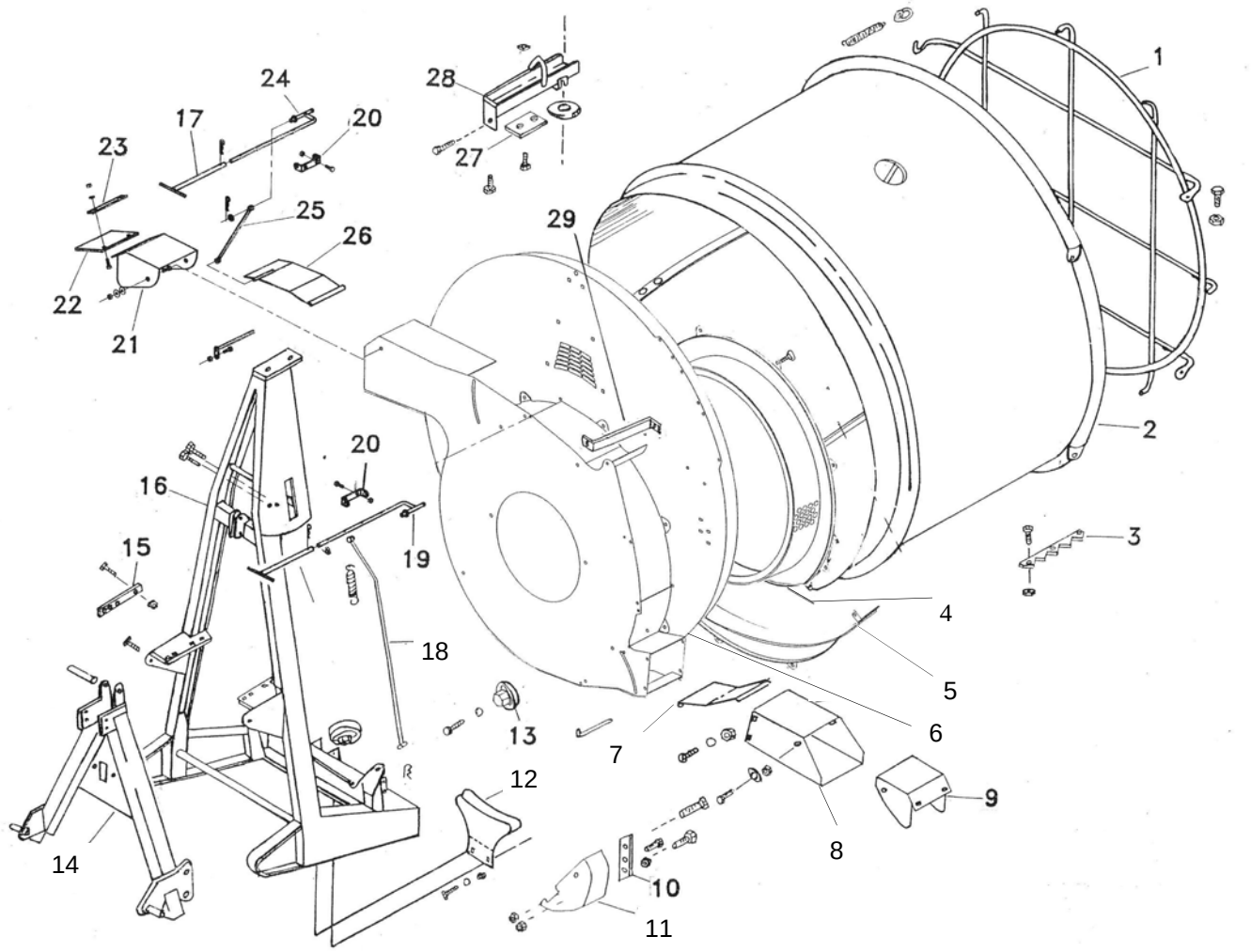
MAINFRAME, DRUM & ASSOCIATED PARTS



Ref	Description	404M	505M	Qty	Associated Components	Part No.	Qty
1	Guard - 450mm sq.mesh	SC1518	SC1102	1	Bolt M12 x 30	FAS2278P	2
	Guard - 220mm sq.mesh	SC1244	SC1306	1	Locknut M12	FAS2334	2
					Spring	SPR4416	2
					Guard spring handle	SC1040	2
2	Drum	SC1607	SC1702	1			
3	Serrated bale grip	SC1146	SC1146	4	Setscrew M10 x 30	FAS2255P	12
	(where fitted)				Locknut M10	FAS2333	12
4	Screen - 21mm holes	SC1660	SC1660	1	Bolt M10 x 25 cup square	FAS9261P	6
	Screen - 36mm holes	SC1661	SC1661	opt	Locknut M10	FAS2333	6
	Screen - 120 x 40 slots	SC1662	SC1662	opt			
	Raised Ring	SC1823	SC1908	opt			
5	Lower sealing segment	SC1651	SC1751	1	Bolt M10 x 25 cup square	FAS9261P	2
					Locknut M10	FAS2333	2
6	Rotor housing	SC1600	SC1700	1	Setscrew 1/2" x 1" BSF	FAS1780P	4
					Locknut 1/2" BSF	FAS1804	4
					Bolt M12 x 25 cup square	FAS9282P	8
					Locknut M12	FAS2334	8

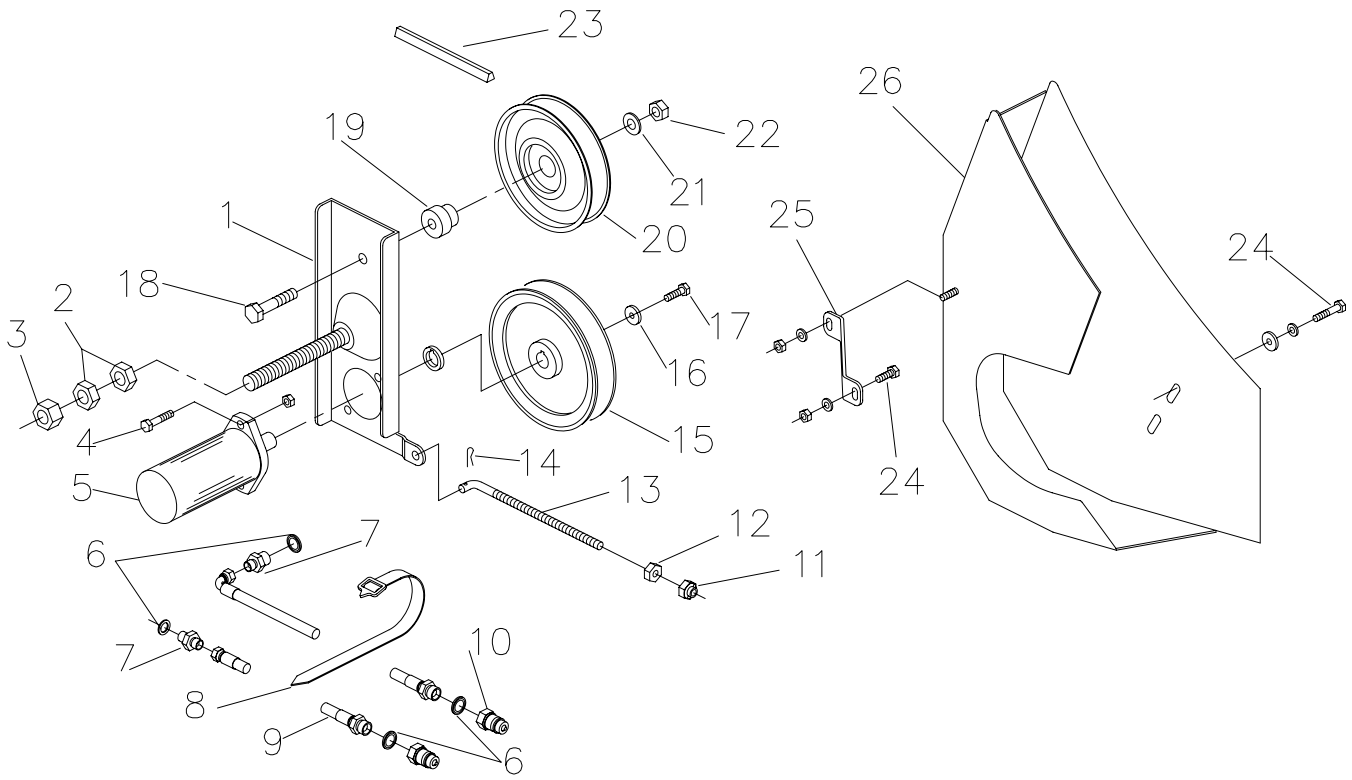
Ref	Description	404M	505M	Qty	Associated Components	Part No.	Qty
7	Lower flap	SC1210	SC1210	1	Flap pivot bar	SC1216	1
					Setscrew M8 x 20	FAS2227P	1
					Locknut M8	FAS2332	1
					R clip 3mm	FAS6003	1
8	Lower chute	SC1603	SC1701	1	Bolt M8 x 20 cup square	FAS9241P	4
					Locknut M8	FAS2332	4
					Plain washer M8	FAS2343P	4
9	Straw deflector	SC1219	SC1219	1	Setscrew M12 x 25	FAS2277P	1
					Disc spring	SPR7012	2
					Locknut M12	FAS2334	1
10	Drum retainer	SC1201	SC1301	2	Setscrew M16 x 60 (8.8)	FAS2707P	2
					Plain nut M16	FAS2305P	2
					Bolt M12 x 35 cup square	FAS9284P	4
					Locknut M12	FAS2334	4
11	Roller guard - L.H.	SC1202	SC1302	1			
	Roller guard - R.H.	SC1203	SC1303	1			
12	Lower belt guard	SC1204	SC1204	1	Setscrew M10 x 20	FAS2252P	2
					Spring washer M10	FAS2354P	2
					Plain washer M10	FAS2344P	2
13	Wheel assembly	SC1051	SC1051	4	Bearing and tire assembly	SC1014	4
					Bearing 6307 2RS	BRG1038	4
					Setscrew M16 x 35 (8.8)	FAS2702P	4
					Spring washer M16	FAS2356P	4
14	A Frame	SC1214	SC1214	1	Lower link pin	TRM0731	2
					Plain nut 1" BSF	FAS1808P	2
					Spring washer 1"	FAS2378P	2
					Adjustable link pin	SC1293	1
					Lynch pin 6mm	FAS6102	1
					Bolt M20 x 60 (8.8)	FAS9732P	2
					Locknut M20	FAS2336	2
15	Adjustable link	SC1215	SC1215	1	Bolt M20 x 50 (8.8)	FAS9730P	1
					Locknut M20	FAS2336	1
16	Main frame	SC1200	SC1300	1	Grease nipple " BSF	BRG5004	1
17	Flap operating handle	SC1017	SC1017	2	R Pin 2mm	FAS6001	2
18	Lower flap link	SC1604	SC1604	1			
19	Flap operating rod L.H.	SC1605	SC1605	1	R Pin 3mm	FAS6003	1
					Spring	SPR4419	1
					R Pin 3mm	FAS6003	1
20	Operating rod mount	SC1606	SC1606	2	Setscrew M12 x 25	FAS2277P	2
					Locknut M12	FAS2334	2
21	Straw Deflector	SC1219	SC1704	1	Setscrew M12 x 25	FAS2277P	1
					Disc spring	SPR7012	2
					Locknut M12	FAS2334	1
22	Deflector strip	SC1041	SC1041	1			
23	Deflector backing strip	SC1045	SC1045	1	Bolt M8 x 25 cup square	FAS9242P	2
					Locknut M8	FAS2332	2
24	Flap operating rod R.H.	SC1612	SC1612	1	Split pin 1/8" x 1"	FAS5002P	1
					Spring	SPR4419	1
					R Pin 3mm	FAS6003	1

MAINFRAME, DRUM & ASSOCIATED PARTS



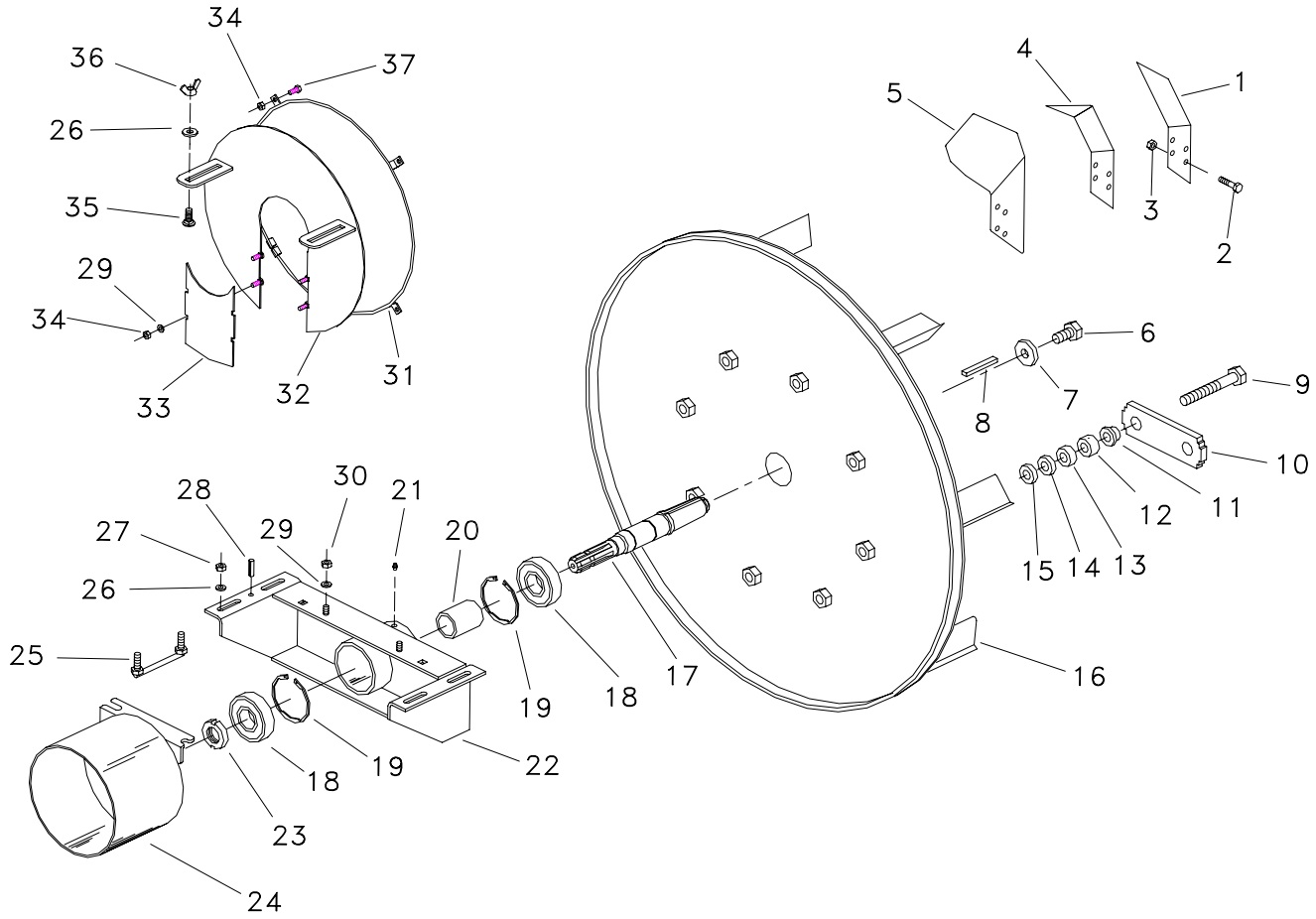
Ref	Description	404M	505M	Qty	Associated Components	Part No.	Qty
25	Upper flap link	SC1602	SC1602	1			
26	Upper Flap	SC1611	SC1611	1	Flap pivot bar	SC1216	1
					Setscrew M8 x 20	FAS2227P	1
					Locknut M8	FAS2332	1
27	Spacer (where fitted)	SC1222	SC1222	1			
28	Top drum mount incl. tyre	SC1221	SC1221	1	Setscrew M12 x 80 (8.8)	FAS2688P	1
	Top drum mounting bare	SC1212	SC1212	1	Plain nut M12	FAS2304P	1
	Bearing and tyre assembly	SC1014	SC1014	1	Strengthener	SC1031	2
	Bearing 6307 2RS	BRG1038	BRG1038		1 Bolt M16 x 60 (8.8)	FAS9706P	2
					Locknut M16	FAS2335	2
29	Back plate stay	SC1229	SC1307	1	Setscrew M10 x 25	FAS2254P	2
					Locknut M10	FAS2333	2

MOTOR & DRIVE



Ref.	Description	404M	505M	Qty
1	Motor mounting plate	SC1213	SC1213	1
2	1" BSF half nut	FAS1818P	FAS1818P	2
3	1" BSF full nut	FAS1808P	FAS1808P	1
4	Setscrew M12 x 35 (8.8)	FAS2679P	FAS2679P	2
	Locknut M12	FAS2334	FAS2334	2
5	Hydraulic motor AVMB200	HYD5202	HYD5202	1
6	Bonded seal 1/2" BSP	HYD4204	HYD4204	4
7	1/2" BSP x 3/8" BSP union	HYD1115	HYD1115	2
8	Strap re-useable	FAS9001	FAS9001	2
	Strap non re-useable	FAS9050	FAS9050	1
9	Hose 3/8" x 2743mm	HYD2152	HYD2152	2
10	Quick release coupling-male	HYD1901	HYD1901	2
11	Nut - tensioner 1/2" BSW	TRM0284	TRM0284	1
12	Plain nut 1/2" BSW	FAS1304P	FAS1304P	1
13	Belt tension rod	SC1217	SC1217	1
14	'R' Pin 3mm.	FAS6003	FAS6003	1
15	Drive pulley - Single belt	SC1043	SC1043	1
16	Plain washer	BU1027	BU1027	1
17	Bolt M8 x 45 HT (8.8).	FAS9633P	FAS9633P	1
18	Bolt M16 x 70	FAS2106P	FAS2106P	1
19	Idler pulley spacer	SC1145	SC1145	1
20	Idler pulley	SC1126	SC1126	1
21	Plain washer M16	FAS2346P	FAS2346P	1
22	Locknut M16	FAS2335	FAS2335	1
23	Belt C6360(C248)	- - - - - - -	BEC0248	1
	Belt C5630(C220)	BEC0220	- - - - - - -	1
24	Setscrew M10 x 20	FAS2252P	FAS2252P	3
	Plain washer M10	FAS2344P	FAS2344P	4
	Spring washer M10	FAS2354P	FAS2354P	2
	Locknut M10	FAS2333	FAS2333	2
25	Guard link	SC1206	SC1206	1
26	Drum and Pulley guard	SC1205	SC1304	1

ROTOR & BEARING HOUSING



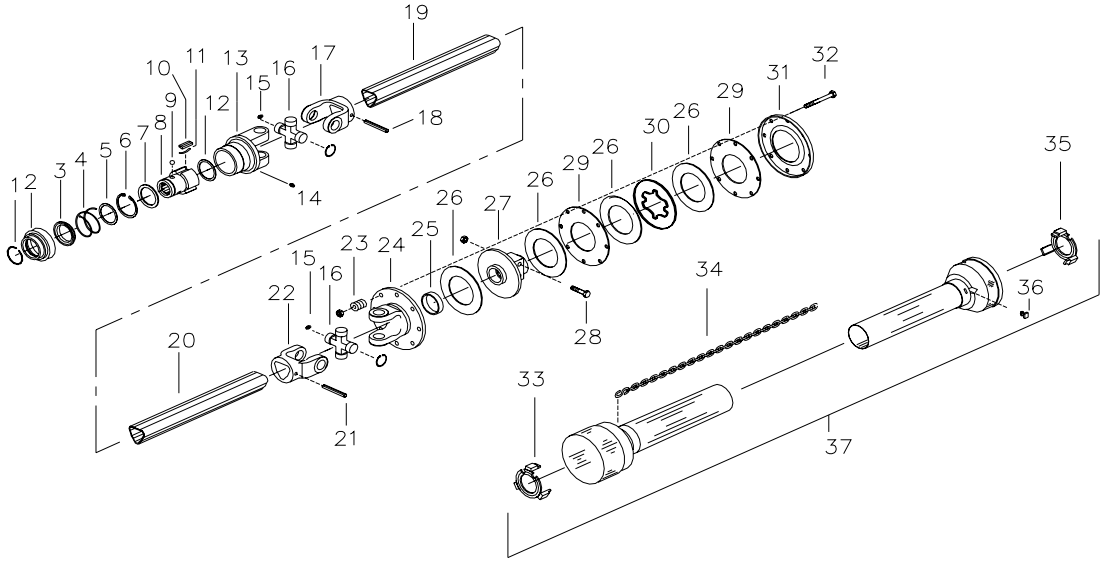
Ref.	Description	404M	505M	Qty
	Rotor complete (items 1 to 16)	SC1658	SC1658	1
	Shaft & housing assembly (items 16 to 22)	SC1079	SC1079	1
1	Blade - single bend	SC1012	SC1012	2
2	Bolt M10 x 45 (12.9)	SC1194	SC1194	16
3	Locknut M10	FAS2333	FAS2333	16
4	Blade - double bend	SC1013	SC1013	2
5	Wind paddle	SC1659	SC1659	4
6	Bolt M20 x 40 (8.8)	FAS2728P	FAS2728P	1
7	Washer 55 x 20 x 10	FAS2409P	FAS2409P	1
8	Key 1/2" x 5/16" x 85mm long	FAS8115	FAS8115	1
9	Bolt M20 x 140 (8.8)	FAS9742P	FAS9742P	8
	Shakeproof washer M20	FAS9206	FAS9206	8
	Spring Washer M20	FAS2357	FAS2357	8
10	Hammer: Hole centres 142mm	SC1653	SC1653	16
	Hammer: Hole centres 116mm	SC1672	SC1672	16
11	Hammer pivot bush	SC1654	SC1654	16
12	Spacer 10	SC1666	SC1666	4
13	Spacer 12	SC1665	SC1665	8
14	Spacer 17	SC1656	SC1656	4
15	Spacer 27	SC1667	SC1667	4
16	Rotor bare: To take hammer SC1653	SC1652	SC1652	1
	Rotor bare: To take hammer SC1672	SC1671	SC1671	1
17	Shaft	SC1065	SC1065	1
18	Bearing 6309RS	BRG1048	BRG1048	2
19	Circlip internal 1300-100 (where used)	FAS7111	FAS7111	2
20	Bearing spacer	RS1039	RS1039	1
21	Grease nipple 1/8" BSP	BRG5001	BRG5001	1
22	Bearing housing	SC1001	SC1001	2

Ref.	Description	404M	505M	Qty
24	PTO Cover shield	SC1139	SC1139	1
25	Bearing bolt assembly	SC1260	SC1260	2
26	Plain washer M12	FAS2345P	FAS2345P	6
27	Locknut M12	FAS2334	FAS2334	4
28	Roll pin 10 x 30	FAS4141	FAS4141	2
29	Plain washer M10	FAS2344P	FAS2344P	6
30	Locknut M10	FAS2333	FAS2333	2
31	Guard ring	SC1813	SC1813	1
32	Upper rotor guard	SC1808	SC1808	1
33	Lower rotor guard	SC1809	SC1809	1
34	Locknut M8	FAS2332	FAS2332	9
35	Cup square bolt M12 x 25	FAS9282P	FAS9282P	2
36	Wing nut M12	FAS1392	FAS1392	2
37	Setscrew M8 x 16	FAS2225P	FAS2225P	5

DECALS

Descripton	404M	505M	Qty
"Read Instruction Book.."	DL1006	DL1006	1
Fingers being severed	DL1033	DL1033	3
"Tomahawk"	DL1051	DL1051	2
Arrow	DL1052	DL1052	3
"Teagle"	DL1015	DL1015	1
"Tomahawk 404M"	DL1068	- - - - - -	1
"Tomahawk 505M"	- - - - - -	DL1069	1
Serial No. plate	DL2032	DL2039	1
Rivets	FAS9077	FAS9077	2

COMER (EG TRANSMISSIONS) PTO SHAFT

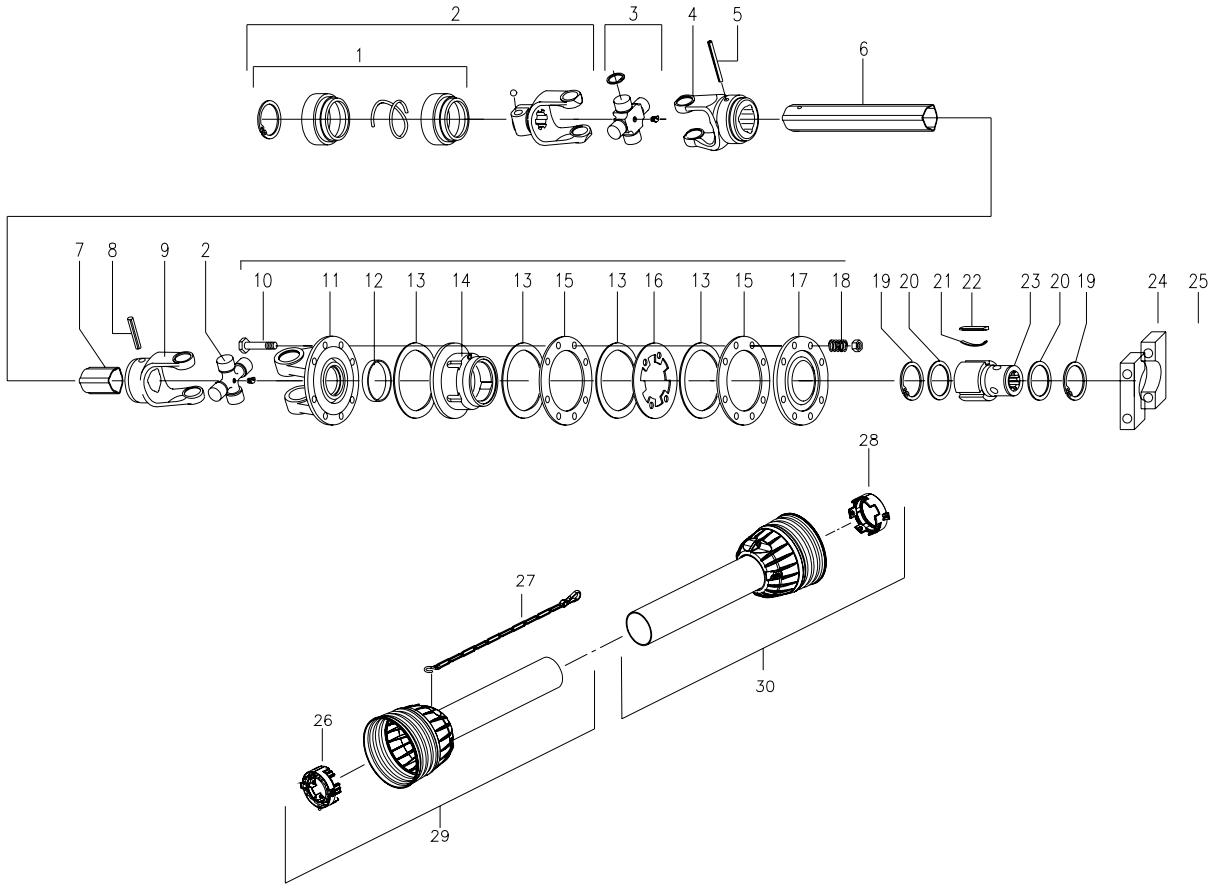


**Parts for shafts with either a black plastic sliding sleeve collar or the metal sliding sleeve collar

Ref	Description	**Steel Part No.	**Plastic Part No.	Qty.	Ref.	Description	Common Parts Part No.	Qty.
PTO Shaft comp. 540rpm		PTO1410	PTO1410	1	18	Spring tension pin 10 x 80	FAS4147	1
Tractor end half shaft complete with guard.		PTO1928	PTO1928	1	19	Outer Tube	PTO1916	1
Machine end half shaft complete with guard.		PTO1994	PTO1994	1	20	Inner tube	PTO1917	1
					21	Spring tension pin 10 x 70	FAS4145	1
1	Outer circlip	PTO2711	PTO1902	1	22	Inner tube yoke	PTO1918	1
2	Sliding sleeve collar	PTO2712	PTO1903	1	23	Spring	PTO1921	8
3	Ball hold up ring	- - - - - -	PTO1904	1	24	Flanged yoke	PTO1920	1
4	Spring	PTO2713	PTO1905	1	25	Bush	PTO1922	1
5	Spring push ring	PTO1906	PTO1906	1	26	Friction lining 153 x 91.5 x 3	PTO2029	4
6	Inner circlip 130072	FAS7112	FAS7112	1	27	Splined hub	PT01992	1
7	Retaining washer	PTO1907	PTO1907	1	28	Bolt M12 x 65 Locknut M121	FAS4720 FAS4714	2 2
8	Hub 6 spline Hub 21 spline	PTO2714 PTO2715	PTO1908 PTO1909	1	29	Inner plate	PTO1962	2
9	Ball	PTO1910	PTO1910	3	30	Small Inner Plate	PTO1993	1
10	Ratchet tooth	PTO1911	PTO1911	3	31	Pressure plate	PTO1963	1
11	Ratchet spring	PTO1912	PTO1912	3	32	Bolt M10 x 100 Locknut M10	FAS2065P FAS2333	8 8
12	Retaining washer	PTO1913	PTO1913	1				
13	Outer casing /yoke	PTO1914	PTO1914	1	33	Outer guard retaining ring	PTO1925	1
14	Grease nipple M8 x 1 straight	BRG5033	BRG5033	1	34	Chain	PTO2336	1
15	Cross journal kit	PTO2321	PTO2321	1	35	Inner guard retaining ring	PTO1926	1
16	Grease nipple M8 x 1 x 45º	BRG5049	BRG5049	2	36	Guard bolt	PTO1930	6
17	Outer tube yoke	PTO1915	PTO1915	1	37	PTO Guard complete	PTO1927	1

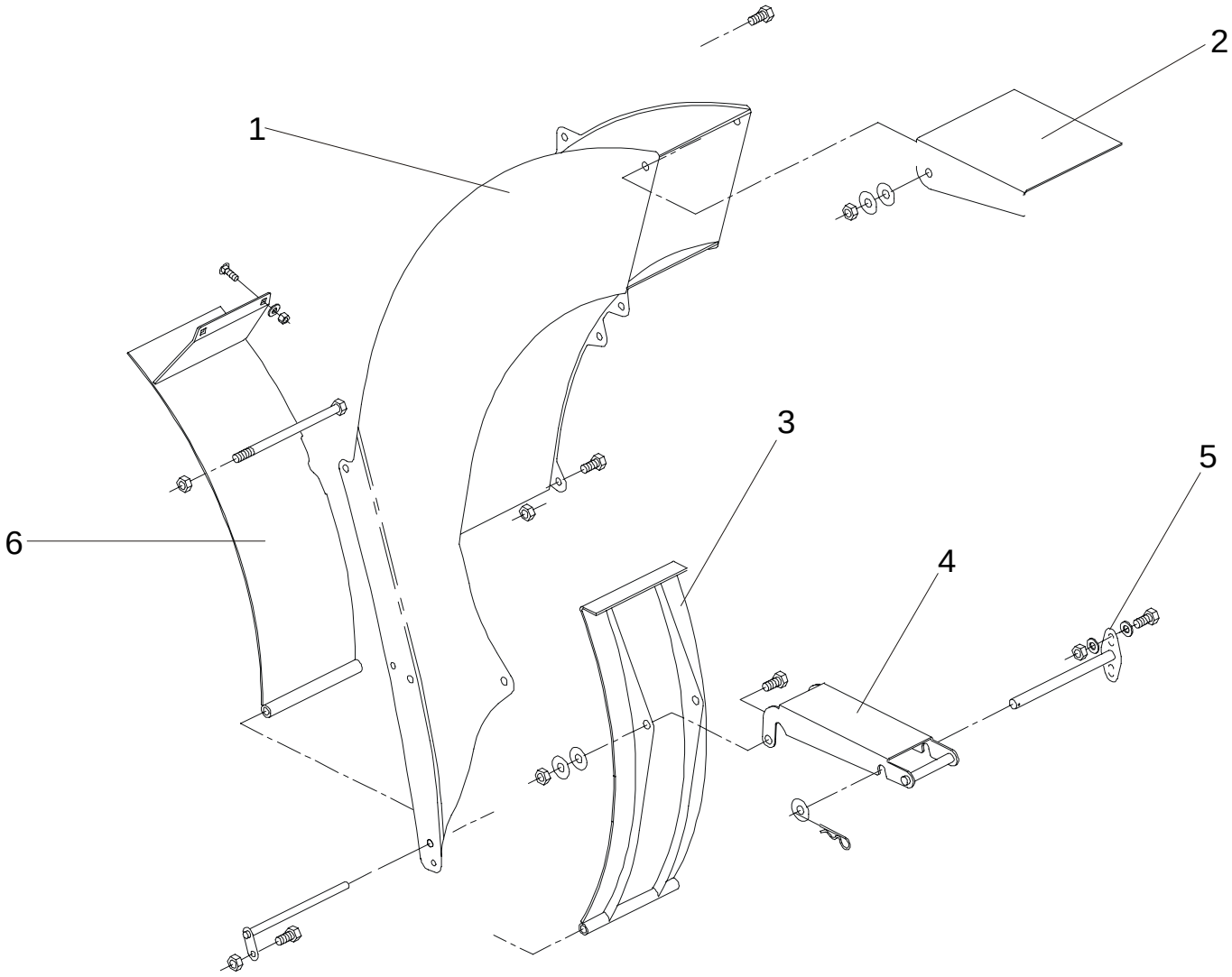
* Spring length to give correct slip clutch torque setting is 33.5mm.

COMER PTO SHAFT - COMBINED SLIP AND OVERRUN CLUTCH



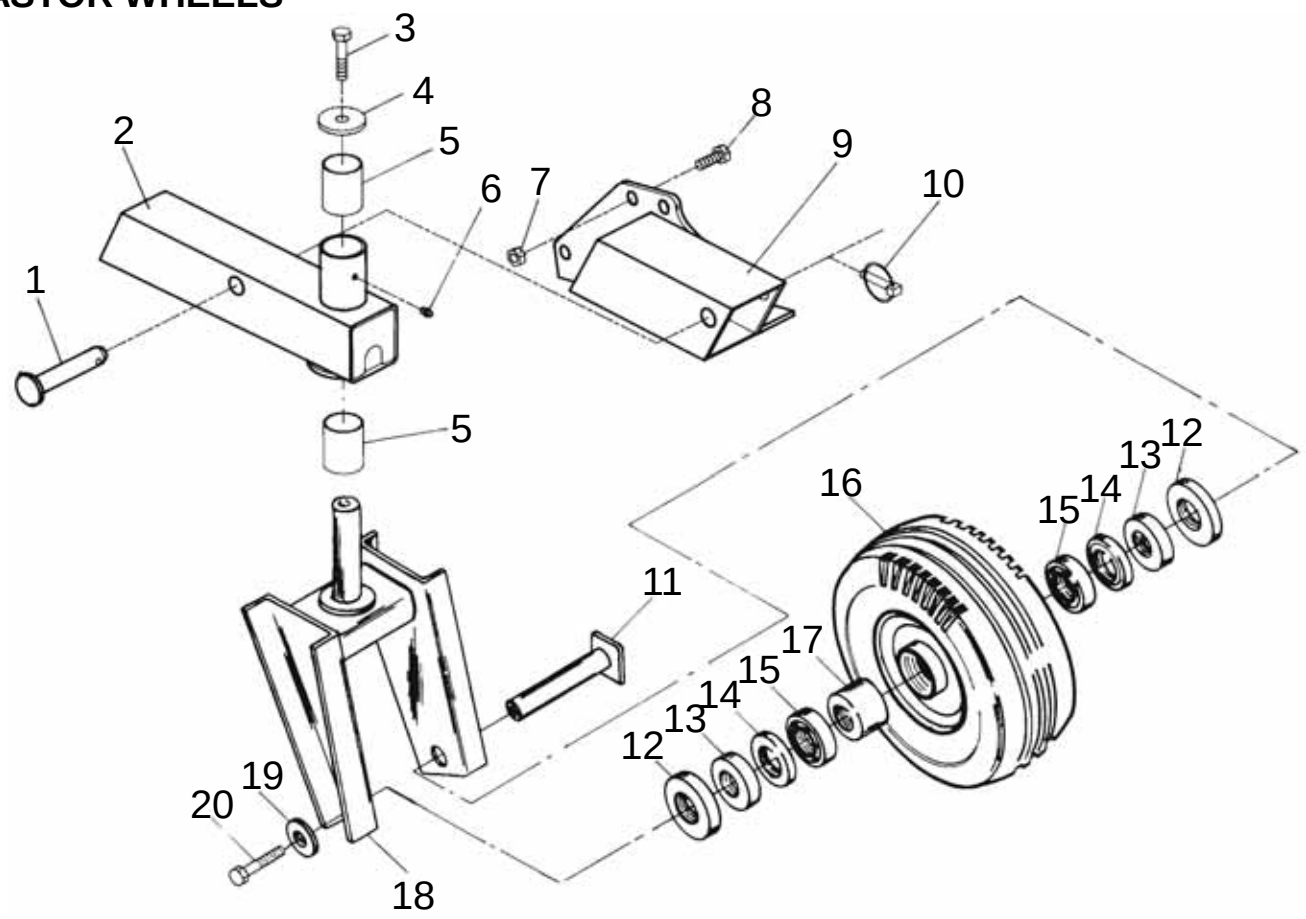
Ref	Description	Part No.	Q'ty
	PTO Shaft complete 540rpm	PTO8084	
	PTO Shaft complete 1000rpm	PTO8072	
	Tractor end half shaft complete with guard 540rpm	PTO2785	
	Tractor end half shaft complete with guard 1000rpm	PTO2786	
	Machine end half shaft complete with guard.	PTO2787	
1	Pull back collar set	PTO2771	1
2	6 Spline yoke	PTO2775	1
	21 Spline yoke	PTO2784	1
3	Cross journal kit - c.v. joint	PTO2321	2
4	Outer yoke	PTO1915	1
5	10 x 80mm Spring tension pin	FAS4147	1
6	Outer tube	PTO1916	1
7	Inner tube	PTO1917	1
8	10 x 70mm Spring tension pin	FAS4145	1
9	Inner yoke	PTO1918	1
10	M10 x 100mm Bolt	FAS2065	8
	M10 Locknut	FAS2333	8
11	Flanged yoke	PTO2070	1
12	Bush	PTO2071	1
13	Clutch plate 152.5 x 102	PTO2058	4
14	Overrun clutch body	PTO2072	1
15	Inner plate	PTO2073	2
16	Intermediate plate	PTO2074	1
17	Pressure plate	PTO2075	1
18	Spring	PTO2076	8
19	Inner circlip	FAS7112	2
20	Retaining washer	PTO2077	2
21	Spring	PTO1912	3
22	Ratchet tooth	PTO1911	3
23	Hub - 6 spline	PTO2788	1
24	Clamp plate	PTO2789	2
25	Bolt M12 Fine x 95	FAS4725	2
	Locknut M12 Fine	FAS4714	2
26	Outer guard retaining ring	PTO2768	1
27	Chain	MB0952	2
28	Inner guard retaining ring	PTO2769	1
29	Outer half guard	PTO2778	1
30	Inner half guard	PTO2777	1
*	Spring length to give correct slip clutch torque setting is 35.2mm		

STRAW GIRAFFE



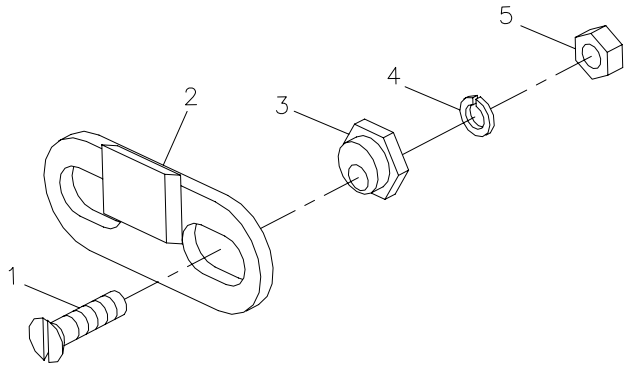
Ref	Description	404M	505M	Qty	Associated Parts	Part No.	Qty
Giraffe Chute Kit Comprising all except item 6		SC1227	SC1227				
1	Giraffe chute	SC1608	SC1608	1	Setscrew M10 x2 0 Locknut M10 Setscrew M8 x 20 Locknut M8	FAS2252P FAS2333 FAS2227P FAS2332	5 5 1 1
2	Deflector	SC1283	SC1283	1	Setscrew M12 x 25 Disc spring Locknut M12	FAS2277P SPR7012 FAS2334	1 2 1
3	On/off flap	SC1803	SC1803	1	Flap pivot bar Setscrew M8 x 20 Locknut M8	SC1216 FAS2227P FAS2332	1 1 1
4	Flap operating link	SC1609	SC1609	1	Setscrew M12 x 25 Disc spring Locknut M12	FAS2277P SPR7012 FAS2334	2 2 2
5	Latch bar	SC1610	SC1610	1	Setscrew M8 x 20 (8.8) Locknut M8 Plain Washer M8	FAS2627P FAS2332 FAS2343P	2 2 4
6	Blanking plate - giraffe	SC1812	SC1812		Bolt M8 x 20 cup sq. Locknut M8 Plain washer M8 Bolt M10 x 200 Locknut M10	FAS9241P FAS2332 FAS2343P FAS2073P FAS2333	2 2 2 1 1

CASTOR WHEELS



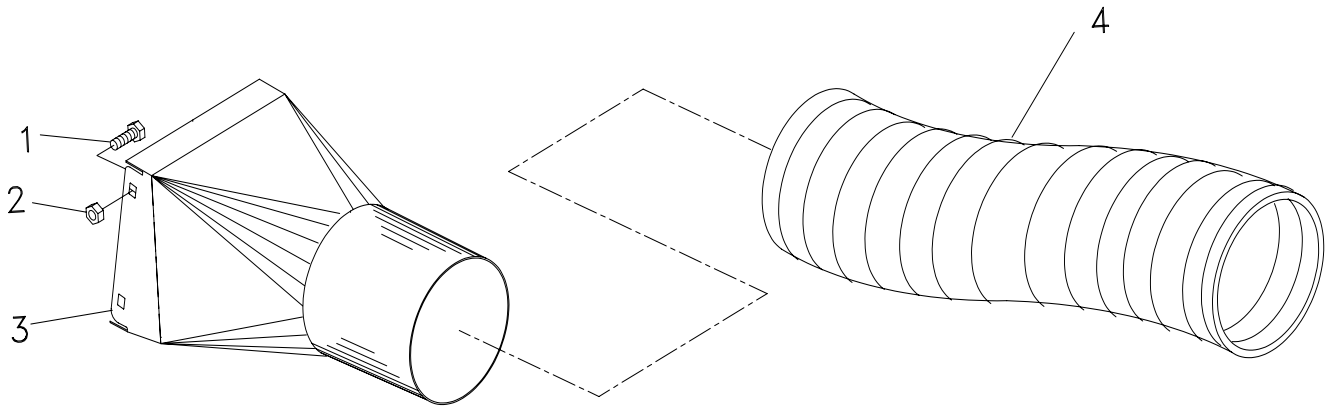
Ref	Description	404M	505M	Qty
	Castor wheel kit complete	SC1234	SC1234	1
1	Retaining pin	SC1293	SC1293	2
2	Castor wheel beam	SC1242	SC1242	2
3	Setscrew M12 x 30 (8.8)	FAS2678P	FAS2678P	2
4	Plain washer 50 x 13 x 5	FAS2383P	FAS2383P	2
5	Wrapped bush	BRG2027	BRG2027	4
6	Grease nipple ¼" BSF	BRG5004	BRG5004	4
7	Locknut M12	FAS2334	FAS2334	10
8	Setscrew M12 x 25 (8.8)	FAS2677P	FAS2677P	10
9	Castor wheel mount (left hand) Castor wheel mount (right hand)	SC1240 SC1241	SC1240 SC1241	1 1
10	Lynch pin 8mm	FAS6102	FAS6102	2
11	Axle	SC1130	SC1130	2
12	Wheel spacer	SC1131	SC1131	4
13	Spacing collar	SC1137	SC1137	4
14	Grease seal	BRG3044	BRG3044	4
15	Ball bearing 6206	BRG1054	BRG1054	4
16	Wheel assembly 500 x 8 (items 13-17)	SC1128	SC1128	2
17	Bearing spacer	SC1136	SC1136	2
18	Castor wheel fork	SC1243	SC1243	2
19	Plain washer M20	FAS2347P	FAS2347P	2
20	Setscrew M20 x 40 (8.8)	FAS2728P	FAS2728P	2

‘A’ FRAME LATCH KIT



Ref.	Description	404M	505M	Qty
1	Countersunk screw ½" BSW	FAS1455	FAS1455	2
2	Locking plate	AF0112	AF0112	1
3	Locking plate adjuster	AF0113	AF0113	2
4	Spring washer ½"	FAS2374P	FAS2374P	2
5	Locknut ½" BSW	FAS1324	FAS1324	2
	Latch kit comprising items 1 - 5	AF0117	AF0117	1

HOSE KIT



Ref.	Description	404M	505M	Qty
	Hose kit complete	SC1231	SC1231	1
1	Bolt M8 x 25 cup square	FAS9242P	FAS9242P	4
2	M8 Thin Nyloc Nut	FAS2332	FAS2332	5
3	Hose adaptor 180mm.	SC1262	SC1262	1
4	Hose - 7" Dia. x 2m long	SC1272	SC1272	1