

MS50/CMS100

CHIPPER/MULCHER/SHREDDER

Operation, Safety & Maintenance Instructions





INTRODUCTION

Dear Valued Customer,

Congratulations! You have just purchased one of the most superbly crafted Chipper/Mulcher/Shredders in the world. Properly maintained, it will give you years of reliable service. When the instructions in this manual are adhered to, operation is safe and simple.

Red Roo Chipper/Mulcher/Shredders are built to withstand the most difficult conditions. The twin feed system allows most organic material to be turned into mulch with a minimum of effort. This machine will chip branches up to 100mm and will process a variety of organic material through the mulcher shredder hopper.

The Red Roo Chipper/Mulcher/Shredder utilizes leading edge design technology and incorporates precision engineered componentry. This ensures ease of operation, maintenance and most importantly, your safety.

Thank you for purchasing this Red Roo product. Please remember to operate the machine responsibly and safely.

For your future reference

Serial No. **Date of purchase**



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ABOUT THIS MANUAL

The information contained in this manual has been prepared to assist you in the safe operation, the routine maintenance and general care of your Red Roo product. By following these guidelines, you may look forward to years of reliable service from your Red Roo. Information is categorised and denoted by the following symbols and phrases:



SAFETY FIRST Identifies general safety practices.



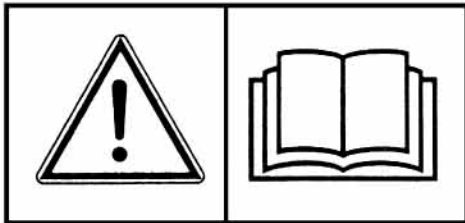
DANGER! An instruction which, if not followed, could result in serious or fatal injury.



WARNING! An instruction which, if not followed, could result in personal injury.



CAUTION! An instruction which, if not followed, could damage machine components.



Before operating this Machine read and observe all Warnings, Cautions and Instructions on the Machine and in the Operators Manual. Although the reading of information contained in this manual does not eliminate the risk involved in operating this machine, your understanding of this information will promote the correct and safe use of your machine. Failure to follow Instructions and Safety Information could result in serious injury or death.

HAZARD WARNINGS



Read



Hearing Protection



Eye Protection



Wear Gloves



Cut Hand



Electrical Shock



Moving Parts



Hot Surfaces



Remove Spark Plug Leads



Toxic Fumes



Explosion



Don't Refuel Hot Engine

SAFETY FIRST – Stay Alert, Do Not get Hurt



Read this section before use!

The MS50/CMS100 is designed to chip/mulch/shred and therefore is potentially dangerous. Careless or improper use may cause serious or even fatal injury.

It is important that you read and understand the contents of this manual and that you allow only mature, adult individuals to operate your Chipper Mulcher Shredder. It is your responsibility to ensure that any individual who operates your MS50/CMS100 Chipper, Mulcher, Shredder have read and understood this manual.

Never use the Chipper Mulcher Shredder for any other purpose than chipping branches and mulching organic garden waste. The machine is designed for this purpose only. Any other use may cause serious or even fatal injury and/or damage to the machine.

SAFETY PRECAUTIONS FOR MS50/CMS100 USERS

Outdoor Power Equipment Institute Recommendations



WARNING TO PURCHASERS OF INTERNAL COMBUSTION ENGINE EQUIPPED MACHINERY OR DEVICES:

The equipment which you have purchased does not have a spark arrester muffler. If this equipment is to be used on any forest and brush covered land or grass covered unimproved land, the law may require that a spark arrester muffler be installed and be in effective working order. The spark arrester must be attached to the exhaust system and comply with local authorities by-laws.



USE COMMON SENSE AND PLENTY OF IT

- 1)  **DO NOT** allow any person to operate the Chipper/Mulcher/Shredder without first reading and understanding the safety precautions and operating instructions manual. Also read and understand the engine manual. **KNOW THE CONTROLS AND HOW TO STOP THE CHIPPER/MULCHER/SHREDDER QUICKLY IN AN EMERGENCY.**
- 2) **NEVER** allow children to operate the Chipper/Mulcher/Shredder.
- 3) **ALWAYS** wear protective clothing when operating the Chipper/Mulcher/Shredder. This includes, but is not limited to: safety glasses, loose fitting gloves, steel capped boots and hearing protection. **NEVER** wear loose fitting clothing or jewellery when operating the Chipper/Mulcher/Shredder. Keep all clothing away from moving parts. Items could become caught in the machine, resulting in injury. 
- 4) **ALWAYS** operate the Chipper/Mulcher/Shredder in a well lit area.
- 5) **ALWAYS** operate Chipper/Mulcher/Shredder on level ground only. Keep your work area clear and free of debris. Never attempt to move the Chipper/Mulcher/Shredder over uneven or hilly ground without a tow vehicle or adequate help. This machine should be operated only upon a level surface.
- 6) **NEVER** operate the Chipper/Mulcher/Shredder when fatigued. **ALWAYS BE ALERT!** If you get tired while operating the Chipper/Mulcher/Shredder, take a break. If you have any type of physical or mental condition that may be aggravated by strenuous work, check with your physician before you operate this equipment. **NEVER** operate the Chipper/Mulcher/Shredder under the influence of medication, alcohol or drugs.
- 7)  **DO NOT** allow other persons near the Chipper/Mulcher/Shredder. It is up to the operator to keep bystanders and animals a minimum of 6 metres away from the machine while in operation.
- 8)   **NEVER PUT YOUR HANDS, FEET, FACE OR ANY OTHER PART OF YOUR BODY INTO EITHER OF THE FEED HOPPERS. Use a stick, not hands, to push limbs into the shredding and chipper hopper.**
- 9)  **NEVER** remove the guarding attached to the shredding hopper. This protective device minimises material flyback and must be in place at all times during operation. **NEVER** use the chipper with the chipper hopper removed.
- 10) **DO NOT** leave the machine unattended while the engine is running.
- 11) **DO NOT** overspeed the engine or alter the governor settings. Excessive engine speed is dangerous and will shorten engine life.
- 12)  **NEVER** operate the Chipper/Mulcher/Shredder in an enclosed area. Engine exhaust contains carbon monoxide, an odourless and tasteless poison.
- 13)  **STOP** the engine and disconnect the spark plug lead(s) and allow engine to cool before inspecting or performing maintenance.
- 14)  **REFUELLING**
 - * **SHUT OFF ENGINE. DO NOT REFUEL AN ENGINE WHILE OPERATING!**
 - * Allow engine to cool. Minimum 5 minutes.
 - * **USE UNLEADED FUEL ONLY. Use clean, fresh unleaded fuel.**
 - * **Do not mix oil with unleaded fuel.**
 - * Do not over-fill fuel tank. Allow space for fuel expansion.
 - * Do not smoke near equipment.
 - * Allow no naked flame or hot material in refuelling area.
 - * Use only approved fuel containers and funnels. Remember, fuel is a potential hazard.
 - * Refer to engine owners manual for full details.




OPERATING INSTRUCTIONS

TRANSPORT

- 1) **WARNING:** Do not exceed 80 kms per hour when towing.




BEFORE USE

- 1)  **WARNING:** Before starting engine, inspect the chipper intake hopper and mulching shredding chamber and remove any foreign debris or branches, stones, cans, nails sweepings, wire, etc.

OPERATION



- 1) Familiarize yourself with the Chipper/Mulcher/Shredder and its controls.
- 2) Wear safety glasses or helmet and visor combination, loose fitting gloves, and hearing protection.
- 3) No foreign objects such as stones, steel, cans, glass, wire, rope or nails should be fed into the machine, as damage will occur.
- 4)  Open fuel shut-off valve, if engine is equipped. Move choke control to CHOKE or START position. Note: Choke must fully close. Move throttle control to RUN or FAST position. Turn key to "ON" position. Operate engine in FAST position.



- 5) **SHREDDER HOPPER** (See Figure 1) Four rows of hammers shred material until it reaches such size to allow it to pass through the discharge screen. The discharge screen retains the material within the mulcher shredder chamber for several seconds until the free-swinging hammers have rotated several times. The number of cuts by the hammers and retention time within the chamber varies with different types of organic material.

- 6) **CHIPPER CHUTE** (See Figure 1) Branches are fed into the side hopper for chipping. One at a time if they are thicker than 50mm, several together if of small diameter. The throat opening is approximately 135 mm square. Some side shoots or side branches may have to be trimmed from the main stalk before chipping. Short stubs of branches may be pushed through the chipper section with the next branch. **NEVER ASSUME YOU KNOW WHERE THE BLADE IS. DO NOT PUSH BRANCHES IN BY HAND. BE SAFE – ALWAYS KEEP YOUR HANDS AWAY FROM THE CHIPPING BLADE.**

- 7)  **CAUTION: IF SHREDDER CHUTE OR MULCHER CHUTE CLOGS WITH MATERIAL, STOP THE ENGINE IMMEDIATELY TO PREVENT CLUTCH DAMAGE.**

- 8) Do not allow an accumulation of processed material to build up under the discharge area of the shredder as this will prevent discharge and will result in clogging.

- 9)  **NEVER ALLOW YOUR HANDS OR ANY PART OF YOUR BODY OR CLOTHING INSIDE THE FEED HOPPER OR DISCHARGE AREA OF THE MULCHER/SHREDDER.**



- 10) **ALWAYS STAND CLEAR OF THE DISCHARGE AREA WHEN THE MACHINE IS IN USE.** (See Figure 1)

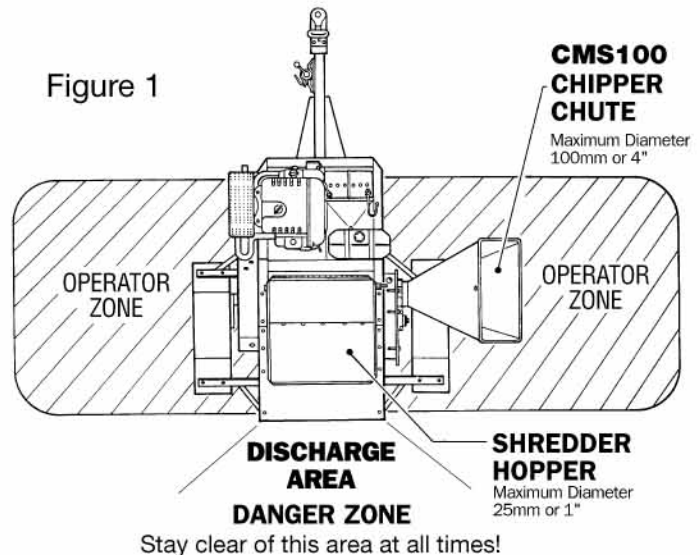
- 11) Keep your face and body away from the intake hoppers to avoid being struck by any material that may bounce back. Do not over-reach. Keep proper balance and footing.

- 12) **Stop Engine:** Do not move choke control to CHOKE position to stop engine. Backfire or engine damage may occur. Move throttle control to SLOW position, and turn key to OFF.



AFTER USE

- 1)  Turn fuel tap to "OFF" position.
- 2)  Allow machine to cool down.
- 3) Clean with warm soapy water. Ensure no water enters the carburettor.





BASIC DESIGN PRINCIPLE

Before operating the Chipper/Mulcher/Shredder, you should first understand the basic principle of design.



Whenever you operate your MS50/CMS100, the wearing of gloves, hearing protection and safety glasses is required. If necessary to push material into the shredding chamber, use a wooden stick. Do not use hands or non-organic implements.

MULCHER/SHREDDER

Adjust the discharge flap (0601-0006) to direct the discharge down and away from the shredder. The discharge end of the shredder body has three drilled holes in each side through which passes a flap rod. The loose end of the plate rests over this rod providing three angles of discharge. **Keep clear of discharge area at all times.**

As engine ignition begins, the engine shaft operates freely until approximately 1400-1600 rpm. The centrifugal clutch engages at this time and begins driving the rotor. The rotor consists of four pins with 60 hammers – four rows of hammers cutting or beating material until it reaches a size to allow it to pass through the discharge screen. The discharge screen retains the material within the mulcher/shredder chamber for several seconds until the free-swinging hammers have rotated several times. The number of cuts by the hammers and retention time within the chamber varies with each organic material.


When viewed from the pulley side of the shredder body, the rotor runs counterclockwise. This action pulls materials into the mulching/shredding chamber. Short stalks (bean plants) and long stalks (sweet corn) sod and similar materials should be fed into the hopper **slowly**. This will prevent the hammermill pulling the complete stalk into the chamber, wrapping the material around the rotor shaft and stalling the mulcher/shredder. When feeding stalks or trimmings by hand, be certain to keep your hands away from the rotor and hammers.

Remember – technique and understanding is required to successfully shred or grind the variety of materials available to you for compost.

CHIPPER

Branches are fed into the side hopper for chipping. One at a time if they are thicker than 50mm, several together if of small diameter. The throat opening is approximately 135 mm square. Side shoots or side branches may have to be trimmed from the main stalk before the chipping process. Short stubs of branches may be pushed through the chipper section with the next branch. **Never assume you know where the blade is! Do not push short branches in by hand. Be safe and always keep your hands away from the chipping blade.**

GENERAL

1. When feeding material into the chipper/mulcher/shredder be careful that pieces of metal, glass, wire, rope, rocks, cans or other non-organic or foreign objects are not included.
2. Do not allow an accumulation of processed material to build up under the discharge of the mulcher/shredder as this can prevent material from discharging and will result in clogging.
3.  Never allow your hands or any part of your body or clothing inside the feed hopper or discharge area of the mulcher/shredder.
4. Keep all protective guards on the machine and deflectors in place and in good working condition.
5. Always stand clear of the discharge area when the machine is in use.
6. Keep your face and body away from the feed hopper to avoid being struck by any material that may bounce back. Do not over-reach, keep proper balance and footing.
7. Do not transport the machine with the engine running.
8. Do not refuel the engine while it is hot, warm or running.

NEVER USE THE CHIPPER/MULCHER/SHREDDER FOR ANY OTHER PURPOSE THAN CHIPPING AND SHREDDING ORGANIC YARD DEBRIS OR PAPER. IT IS DESIGNED FOR THIS USE ONLY AND ANY OTHER USE MAY CAUSE SERIOUS PERSONAL INJURY OR DAMAGE TO THE MACHINE.

SAFE ENVIRONMENT

Use the Chipper/Mulcher/Shredder in a well lit area only. Never use the Chipper/Mulcher/Shredder on slippery, wet, muddy or icy surfaces. **Safe footing** is essential to prevent accidents.

Only operate the Chipper/Mulcher/Shredder on **level ground**. Never on a hillside or incline. Keep your work area clear and free of debris so that you don't stumble over it. Never move the Chipper/Mulcher/Shredder over uneven or hilly ground without a tow vehicle or adequate help.

SAFE OPERATOR

USE ONLY on a level earthen surface. Make sure the unit is level and not tilted up or down by the jockey wheel.

NEVER put your hands, feet, face or any other part of your body into either of the feed hoppers (Shredder or Chipper). When chipping, never allow your hands to enter the chipper hopper. **Use a stick**, never a hand to push limbs into the chipper hopper.

NEVER remove the guarding attached to the shredding hopper. These protective devices prevent flyback and must be in place at all times during operation.

NEVER operate the Chipper/Mulcher/Shredder while under the influence of medications, drugs or alcohol. A clear mind is essential for safety.

NEVER allow anyone who is tired or otherwise not alert to operate the Chipper/Mulcher/Shredder.

SAFE APPAREL

NEVER wear loose clothing or jewelry that can be caught in moving parts of the Chipper/Mulcher/Shredder and pull you into it. Keep all clothing away from moving parts. Wear proper head gear to keep hair away from moving parts.



Always wear safety glasses, loose fitting gloves and hearing protection while operating the Chipper/Mulcher/Shredder. A chip could fly out and hit you in the eye. Be sure your glasses fit properly and your gloves do not have loose cuffs or drawstrings.

DAMAGE TO THE UNIT RESULTING FROM ANY USE OTHER THAN SHREDDING AND CHIPPING ORGANIC MATERIAL IS YOUR RESPONSIBILITY.

No sticks or branches larger than 1½" or 40 mm diameter into the Large Mulcher/Shredder Hopper

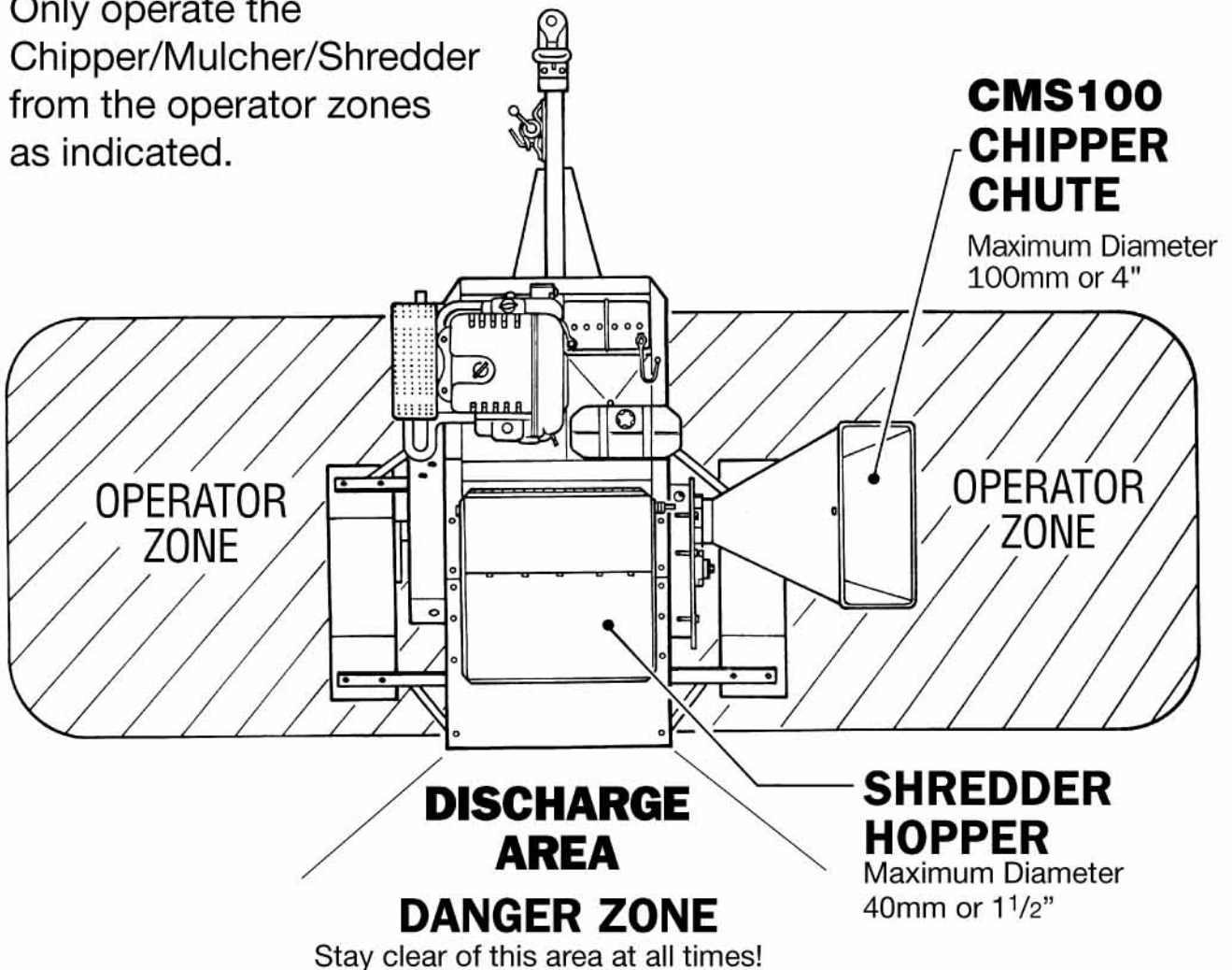


THIS MACHINE IS CAPABLE OF INFLECTING SERIOUS INJURY IF OPERATED IMPROPERLY. READ WARNINGS AND CAUTION.

1. The operator of this machine must wear safety glasses, hearing protection and loose fitting gardening or work gloves at all times while operating this chipper/mulcher/shredder.
2. Wear proper work apparel: avoid loose clothing such as skirts or loose sleeves.
3. Children must never be allowed to operate this machine.
4. This machine should never be operated in the vicinity of children, pets, or bystanders.
5. This machine should be operated only upon a level, earthen surface.
6. Never run this machine in an enclosed area. Engine exhaust contains carbon monoxide which is an odourless, tasteless and poisonous gas.
7. Keep hands and face away from feed hopper and discharge area. Read operating section carefully.
8. Do not remove the plastic shield or curtain inside the shredding or the chipping hopper. These guards prevent material from coming back out of the hopper and are installed for operator safety. These are protective guards and should be intact at all times when mulching or chipping.



Only operate the
Chipper/Mulcher/Shredder
from the operator zones
as indicated.



Know the controls and how to shut the chipper/mulcher/shredder down in an emergency.
Never clear the discharge area with hands, feet, or any other part of your body.
Never clear the discharge area while the Chipper/Mulcher/Shredder is running.
After unit is shut off, use a long handle tool to clear the area.



SERVICE INFORMATION

GENERAL MAINTENANCE

WHEN EVER DOING ANY TYPE OF MAINTENANCE ON THIS MACHINE, ALWAYS FOLLOW THE SAFETY STEPS DESCRIBED IN EACH SECTION, AND ALWAYS DO THESE THREE STEPS:

1. TURN THE MACHINE OFF
2. ALLOW ENGINE TO BECOME COOL
3. REMOVE SPARK PLUG LEADS.

1. Read the information referring to the operation and maintenance of the CMS 100 engine. Read it carefully. Be certain to lubricate the engine before you start it. Refer to engine manual.
2. Tools Required (Excluding Engine)

Ring & Open End Spanners & Sockets – 7/16, 1/2, 9/16, 5/8, 11/16, 3/4, 15/16	Hex Keys 5/16, 5mm, 6mm
5/16 Hex Key Socket Drive	Sharpening Stone
1.2 to 3 mm Feeler Gauges	25mm Cold Chisel or Wedge
Socket Accessory – Sliding Tee Handle	
2 Multi Grips	
3. Lubricate the two rotor bearings before operating and after every 10 hours of operation with multi-purpose bearing lubricant (grease). **DO NOT OVER GREASE. Check the bearing collar set screws frequently to be sure they are tight.**
4. When the mulcher shredder hammers become dull or round on the cutting or leading edge, they may be reversed. First remove the rotor pin access cover and open chipper disc access panel then the hammer rod (1604-0030) access holes are revealed. One hammer rod at a time can be removed through this side hole and the hammers reversed as the rotor is reassembled. Each rod is held in place by 5mm x 40mm hardened roll pin. **Extreme care must be taken to reinstall the spacers in exactly the same order as shown on the drawing. The spacers and hammers must be re-installed in exactly their original order** (see DRG No. 1 Page 14). **NOTE:** A cold chisel is a handy wedge to hold the rotor still. Refit all guards before starting.

5. When the chipping knife (0206-0003) **Item C/ Figure #1/ Drawing 2/ Page 16** needs turning, sharpening or replacing, proceed as follows:

- a. Ensure engine is cool and remove spark plug leads.
- b. Observe drawing Number 2/ Page 16
- c. Open access flap on front plate by removing the bolt.
- d. Rotate the chipper disc until blade is in full view and engage lock pin.
- e. Clean hexagonal cap head screw (1901-0013) **Item B** thoroughly using a pressure washer, or sharp pointed object.
- f. Using a 5/16" hex bit 1/2" drive (2004-0003) loosen them, beginning at the middle of the wheel outward.

NOTE: Ensure to hold key square to the face of blade.

HINT: Using socket style key and sliding tee wrench, fit key into countersunk socket screw (**Item B**), with tee handle in a horizontal plane, apply a light, counter clockwise pressure onto the handle until key rests on edge of access hole. Hit the back of drive section of sliding tee wrench lightly until you find the centre line of the screw, gradually increase pressure on sliding tee wrench handle as you increase intensity of impact with hammer until screw loosens.

- g. Remove blade and rotate or resharpen retaining the same angle of bevel (32°).

NOTE: BE VERY CAREFUL NOT TO DROP BLADE SCREWS INTO CHIPPING CHAMBER WHEN REMOVING.

NOTE: When sharpening, maintain equal centre distances on paired edges. i.e. Bolt hole centre to sharp edge.

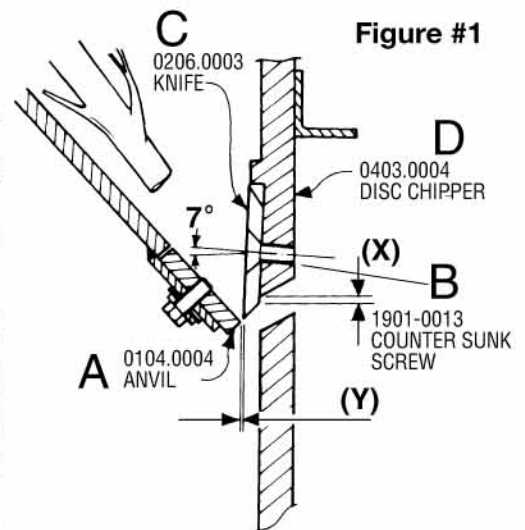
NOTE: The blade life is determined by the point where the bevel face meets the slot in the chipper disc. See Figure 1. Dim. (X) not to become less than zero.

WARNING: Do not exceed this point as the blade may fail.

- h. Clean the mating surfaces between the chipper disc and the blades.
- i. Replace the chipper knives using a metal base grease (eg. anti seize) on threads and under head of counter sunk knife screws. Do not allow the grease to get between the knife and disc.
- j. Finger tighten all screws. Then tighten, starting at outside, then inside on each blade. Take care not to damage the countersunk screws when tightening.
- k. Close access flap and cover with bolts and disengage lock pin.

6. After the blade is sharpened, the gap Dim. (y) (Fig. 1) between the blade and anvil (0104-0004) **Item A/ Figure #1** must be checked. This gap should be 2.5 mm to 3 mm at outside circumference of blade and 1.2 mm to 2 mm at inside circumference of blade.

HINT: For stringy, fibrous or pulpy materials keep the gap as close as possible to the smallest size of the tolerance. For hard wood, use the upper size of the tolerance.



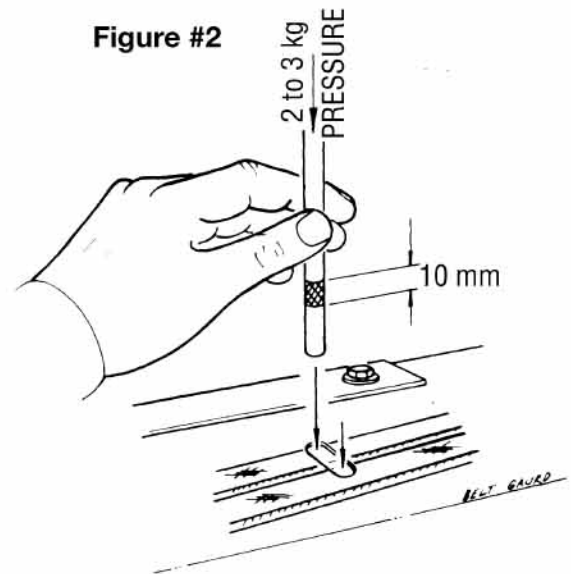
- a. Ensure engine is cool and remove spark plug leads.
- b. Secure chipping hopper in transport position. (Drawing No. 5, page 22 and Figure #1)
- c. Insert rotor locking pin (Drawing No. 2, page 16)
- d. While looking into the chipper throat, reach under machine and turn rotor until the knife is in view.
- e. Using feeler gauge, check the gap (Dim "Y"). It will be necessary to slightly rotate the disc to individually line the inside and outside edges.
- f. To adjust the gap, loosen the three anvil bolts. Leave a light pressure on the spring washers of the two bolts on either end and take all pressure off the middle one.
- g. Tap the heads of the end bolts in or out to attain feeler gauge setting required. Repeat step **f** as many times as necessary.
- h. Tighten all anvil bolts from right to left and recheck gap.
- i. Reassemble all components before starting engine.

NOTE: If the gap between anvil and knife is excessive, there will be excessive vibration when chipping and the blade will seem to be dull. Metal fatigue may occur. If the gap is too small, the blade may strike the anvil.

7. If at any time it becomes necessary to disassemble the chipper for repairs, the chipping disc (0403-0004) **must be installed exactly in its correct position on the shaft.** Fit spacer (1913-0032) between chipper disc taper lock bush and bearing. Refer Drawing 2/Page 16.
8. The belt tension will need to be checked regularly. Refer Fig. 2.
 - a. Remove spark plug leads and ensure engine is cool.
 - b. Put pencil or similar object through access slot at top of belt guard, onto either of the belts and mark a line flush with the top of guard onto pencil.
 - c. Then mark another line 10mm above.
 - d. If tension is correct the top line will be flush with the guard when 2 to 3 kg force is applied to the end of the pencil.

HINT: To familiarise yourself with the required pressure, have kitchen scales nearby and press the centre of scales then the pencil and repeat until satisfied.

 - e. Repeat process on the other belt.



If the belts have become slack continue with the following steps.

- f. Observe Drawing Nos. 1, 3 & 5.
 - g. Loosen nuts – Item 44 (11/16"AF), bolts – Item 48 (5/8"AF), nuts – Item 46 and bolts – Item 49 (9/16"AF)
 - h. Back off Item 52 underneath (Lock Nut) to allow front Item 52 to be tightened further (11/16"AF)
 - i. Adjust item 52 and repeat steps (a) to (e) until satisfied.
 - j. **IMPORTANT:** Tighten engine mounting bolts as follows to ensure pulleys remain parallel. Tighten rear bolt Item 48 first. Then front bolt Item 48. Then both bolts Item 49.
 - k. Tighten underneath lock nut Item 52.
- NOTE: The Belts will need to be visually inspected periodically. Remove excess grease from around rotor pulley and check that the mounting of both pulleys is secure. When the belts require replacing, always change both and preferably with matching Production Code Numbers.
9. Periodically check that the chipping disc is firmly secured to the rotor shaft by trying to wobble the disc. The best opportunity is during blade sharpening. Some fasteners have a tendency to loosen under vibration, so periodically check they remain tight. This is the responsibility of the owner.
 10. Frequently check for fibrous material wrapped around rotor shaft ends and remove if present. If material is not removed machine performance will be reduced and may cause clutch damage.
 11. If the cutting mechanism strikes any foreign object or if your machine should start making an unusual noise or vibration stop the engine.
 - (a) Allow the engine to cool.
 - (b) Remove spark plug leads.
 - (c) Inspect for obvious damage
 - (d) Check for loose parts, bolts, or rods. Examine rotor visually for any obvious defects.

STORAGE

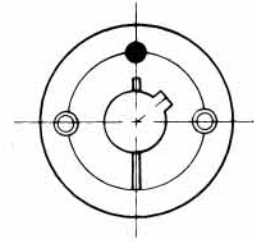
When not in use, your Chipper/Mulcher/Shredder should be stored out of the reach of children. Be sure there are no petrol fumes in the storage area. For long periods of storage (over winter), petrol should be drained from the tank and either stored or disposed of safely. Always allow the engine to cool before storing. Engine should be stored with valves closed (on compression stroke).

CLAMPING COLLAR

How does the Clamping Collar work, which holds the Rotor Pulley and Chipper Disc onto the Rotor Shaft?

The Collar is a taper lock bush. It and the pulley (or disc) have a matching taper with the big end of the taper on the outside where there is a special threaded hole pattern designed to pull the two tapers together and clamp onto the shaft, or to push them apart for removal. If you were to find either the pulley or disc to have come loose, follow these steps:

- (i) Remove Spark Plug Leads.
- (ii) Observe Figure 1. and Figure 4.
- (iii) Clean out all 3 holes on front of Taper Bush
- (iv) In the case of the Rotor Pulley, check its alignment to the Motor Pulley and adjust if required.
- (v) Use a 6mm Hex Key to tighten both Grub Screws (Socket Set Screws)



For REMOVAL of either Pulley or Disc continue as follows:

- (vi) Slacken both Screws, then remove one. After oiling point and thread of Grub Screw insert into the third hole (Jacking Off Hole).
- (vii) Tighten this screw until the two components push apart. It may be required to tap the Pulley with a punch and hammer just outside the join line of the two parts, directly opposite the Jacking Screw.
- (viii) For ease of removal gently tap a flat screw driver into the slot to spread bush.

ASSEMBLY

- (ix) Clean all components thoroughly. Insert the Bush and Line up the holes (half thread holes must line up with the half straight holes).
- (x) Lightly oil the Grub Screws and screw them into the two opposing holes. Do not tighten yet!
- (xi) Fit this assembly onto the shaft over key and locate in correct position along shaft. See Figure 1 for Pulley, or assemble hard up against shoulder for Chipper Disc. See Drawing No. 2.
- (xii) Using a 6mm Hex Key gradually tighten the Grub Screws alternately to (50 Newton Metres)
- (xiii) When the drive has been operating under load for about an hour, check to ensure that the screws remain at the appropriate tightening torque.
- (xiv) Fill the empty hole and Hex sockets with grease to simplify cleaning next time.

TROUBLE SHOOTING QUESTIONS AND ANSWERS

1. My MS50/CMS100 stalls as soon as I put anything in it.

This could be a problem of a slow engine or loose belt. By “stalling”, do you mean the engine, the rotor or both? If the rotor stops but the engine keeps running, you may have a loose belt, slipping clutch pulley, or both (Refer to No. 5). If the engine stalls, it can be a carburetor problem, dirty air filter or it is running too slow. These engines should run at top speed. (See your Engine Manual).

2. My Chipper/Mulcher/Shredder vibrates too much.

Vibration can come from poor engine ignition or unbalanced rotor. Visually check the rotor to be certain all hammers are still intact and swinging independently.

3. My Chipper/Mulcher/Shredder worked fine last year but now I can't chop anything.

This is probably due to excessive wear on the hammers. If you have processed sand, soil, phosphate rock, your hammer tips will round off and wear away. Page #10 Section 4 discusses service and replacement.

4. My centrifugal clutch (0310-0007) smokes and burns the belt.

In all probability you are working the machine too hard and not allowing the engine to regain maximum rpm. This will cause the clutch to slip excessively and heat up then burning the belts or the interior brake shoes of the clutch are worn or the retaining spring is broken. You may also have a loose drive belt. If you attempt starting your machine with heavy material in the mulcher/shredder chamber, the rotor may refuse to turn when the engine comes up to rpm, thus burning the clutch pulley. Check the machine interior for cleanliness. Excessive grease on rotor bearing may come in contact with belts.

5. My chipping knife is dull after only an hour.

Unless you accidentally put metal or dirt in the chipping hopper, the clearance between the knife and anvil has changed. This causes the knife to either not shear wood cleanly if the gap is too big or comes in contact with anvil when the disc flexes forward on heavy cuts if the gap is too small. This gives the impression of dullness or creates excessive wear and vibration on your hands when using the chipper. Early in the manual we discuss knife to anvil clearance (Dim 'Y'). Adjust this by moving the anvil in or out. Page 10 Section 5 Figure 1.

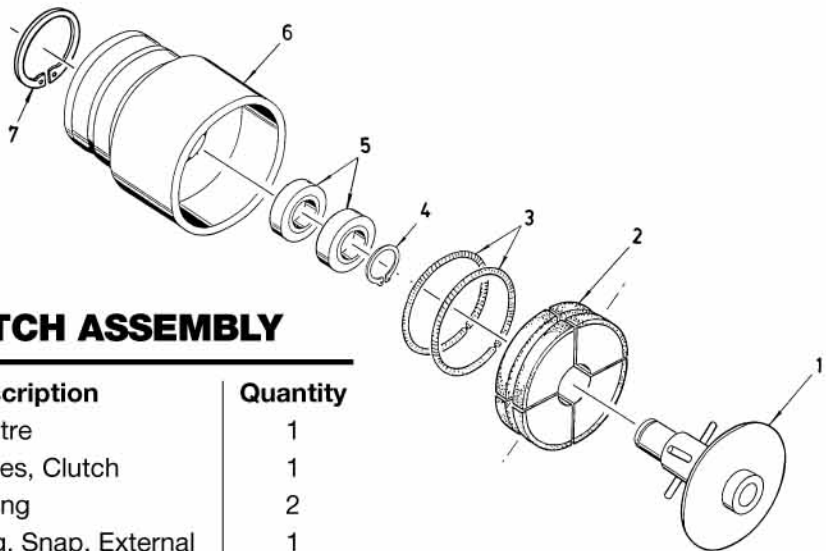


SHREDDING TIPS (TECHNIQUE)

1. When shredding green or damp material (sweet corn stalks, potato vines, tomato plants, green or fresh pulled plants) – **TAKE YOUR TIME**. Direct the shredder to discharge into a compost pile or wall, large board or other obstruction. Feed sweet corn stalks by hand, slowly, several at a time until the last 50cm remain in your hand - then let go. This will give you a coarsely shredded product several centimetres long and stripped. With a garden spade or pitchfork, re-process this material into the shredder again or until it reaches the condition you want. A sweetcorn stalk that has been processed this way will chemically break down within a day or two in your compost heap. For green materials such as tomato or potato vines, you may first have to snap off extending side shoots. Place vine in the hopper and prod further with a rugged stick (never your hands).
2. For grinding dry leaves, dump leaves into the top feed hopper by basket, bag or pitchfork. If bridging occurs inside hopper, use a stick to stir leaves into the shredding chamber. Freshly fallen leaves do present a problem, and it is best to pile these and allow to sit until they become quite soggy. All by themselves, for the most part, wet leaves will simply blow through the shredder. Soggy, partially decomposed leaves process very well. Dump in pitchfork loads and prod through with a stick.
3. For green hedge prunings, small diameter wood prunings (with leaves), rose or flower trimmings, process bunches at a time through the top feed hopper. Experience will tell you how much your machine will handle at one time.
4. Always use chipper for branches over 25mm as it is quicker and easier on your machine. Never put large branches into the shredder as you will stall the engine and eventually damage the scroll, and the screen. Enter one at a time if there is any thickness (50mm or more) to the branch. Green branches process more quickly and easier than dry branches and soft wood easier than hardwood. Push the branch in at the angle of the hopper and throat. Always use the hopper extension. **Never allow your hands to enter the hopper. As the branch being chipped shortens, finish chipping it by shoving in with the next branch to be chipped.** Only your operator experience will tell how to process difficult materials, and overall length of material. There is such a magnitude of possible materials that we cannot discuss each individually. Some naturally are easier to work with than others, but most all common organic products available to a gardener can be processed by using your machine and common sense.
5. **REMEMBER!** Work with the chipper/mulcher/shredder. Do not overload. Allow the chamber to clear and engine rpm to pick up before processing additional material. Always work with engine at maximum rpm. Otherwise, you **WILL CAUSE PREMATURE WEAR TO THE CLUTCH AND DRIVE BELTS**.
6. Optional discharge screens are available for special applications. Sizes include 6mm, 12mm, 20mm, 30mm, 45mm, 62mm. Uses include potting soil, shells, paper, cardboard, woodchips, pinebark, pinestraw, hay, seaweed.

CLUTCH ASSEMBLY

Part No. 0310-0007



PARTS LIST FOR CLUTCH ASSEMBLY

Item No.	Part No.	Description	Quantity
1	0304-0002	Centre	1
2	1909-0003	Shoes, Clutch	1
3	1916-0014	Spring	2
4	1806-0006	Ring, Snap, External	1
5	0204-0017	Bearing	2
6	0406-0005	Drum	1
7	1806-0007	Ring, Snap, Internal	1

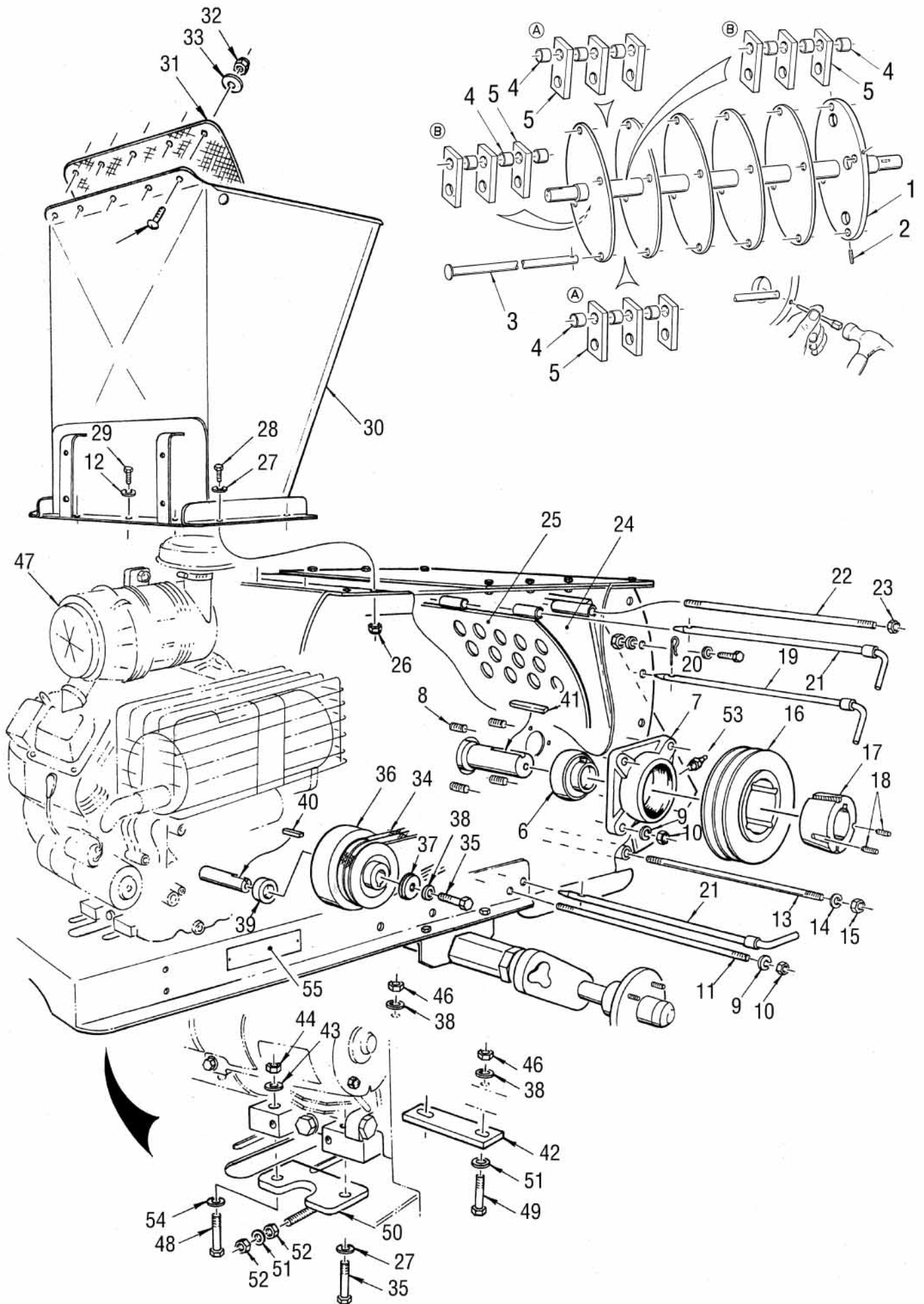
USE ONLY GENUINE RED ROO PARTS



STOP ENGINE IMMEDIATELY IF CHIPPER DISCHARGE CLOGS WITH MATERIAL OR THE CHIPPER DISC JAMS. FAILURE TO DO SO WILL RESULT IN CLUTCH DAMAGE.

CLUTCH DOES NOT REQUIRE LUBRICATION

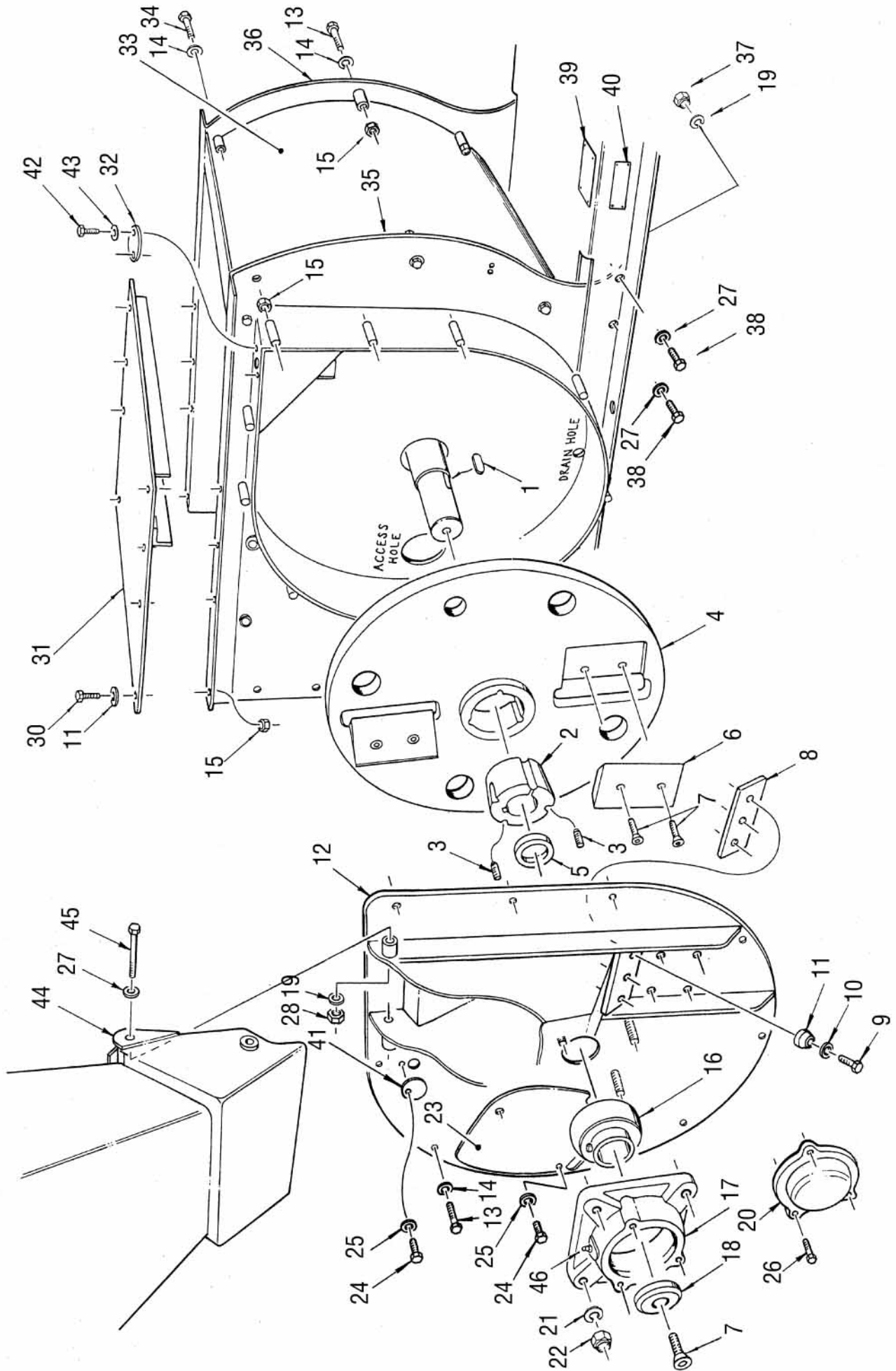
MS50/CMS100 DRAWING 1



PARTS LIST FOR MS50/CMS100 – DRAWING 1

Item No.	Part No.	Description	Quantity
1	1807-0006	Rotor Only	1
*	1807-0004	Rotor Assembly Complete	1
2	1604-0032	Spring Pin, High Tensile	4
3	1604-0030	Pin, Rotor	4
4	1913-0058	Spacer	60
5	0206-0007	Hammer	60
6	0204-0016	Bearing	2
7	0806-0015	Housing, Bearing	2
8	0209-0619	Bolt	8
9	2301-0010	Washer, Lock	10
10	1401-0071	Nut	14
11	1808-0022	Rod, Tie	2
12	2301-0021	Nut, Nylock	2
13	1808-0023	Rod, Tie	1
14	2301-0008	Washer, Lock	14
15	1401-0050	Nut	10
16	1608-0023	Pulley, Rotor	1
17	0215-0027	Bushing	2
18	1901-0008	Screw, Socket Set	4
19	1808-0024	Rod, Discharge Flap	1
20	1604-0018	Pin, R	3
21	1808-0025	Rod, Screen	1
22	1808-0026	Rod, Tie	1
23	1401-0053	Nut, Nylock	4
24	0601-0006	Flap, Rear Discharge	1
25	1905-0003	Screen, 45mm	1
*	1905-0064	Screen, 62mm	Optional
*	1905-0032	Screen, 30mm	Optional
*	1905-0020	Screen, 20mm	Optional
*	1905-0014	Screen, 12mm	Optional
*	1905-0008	Screen, 6mm	Optional
26	1401-0034	Nut, Cone	31
27	2301-0024	Washer	31
28	0209-0318	Bolt	12
29	0209-0115	Bolt	6
30	0805-0003	Hopper, Mulcher/Shredder	1
31	0601-0007	Flat, Hopper Guard	1
32	1401-0022	Nut	5
33	2301-0033	Washer	7
34	0205-0066	Belt	2
35	0209-0322	Bolt	13
36	0310-0007	Clutch Assembly	1
37	2301-0037	Washer, Retaining (Clutch Cap)	1
38	2301-0006	Washer, Lock	3
39	1913 0059	Spacer, Clutch	1
40	1102-0002	Key, Engine Shaft	1
41	1102-0017	Key, Rotor Shaft	2
42	1918-0008	Strap, Engine Clamp	2/3
43	2301-0007	Washer, Lock	2
44	1401-0042	Nut	2
45	2301-0038	Washer	2
46	1401-0032	Nut	2
47	0503-0001	Engine (Type as Required)	1
48	0209-0429	Bolt	6
49	0209-0326	Bolt	2
50	0202-0002	Bar Tensioner, Engine Belt	1
51	2301-0039	Washer	1
52	1401-0040	Nut	2
53	0603-0004	Zerk, Grease Fitting	2
54	2301-0026	Washer	2
55	0401-0086	Plate, Vin	1

MS50/CMS100 DRAWING 2



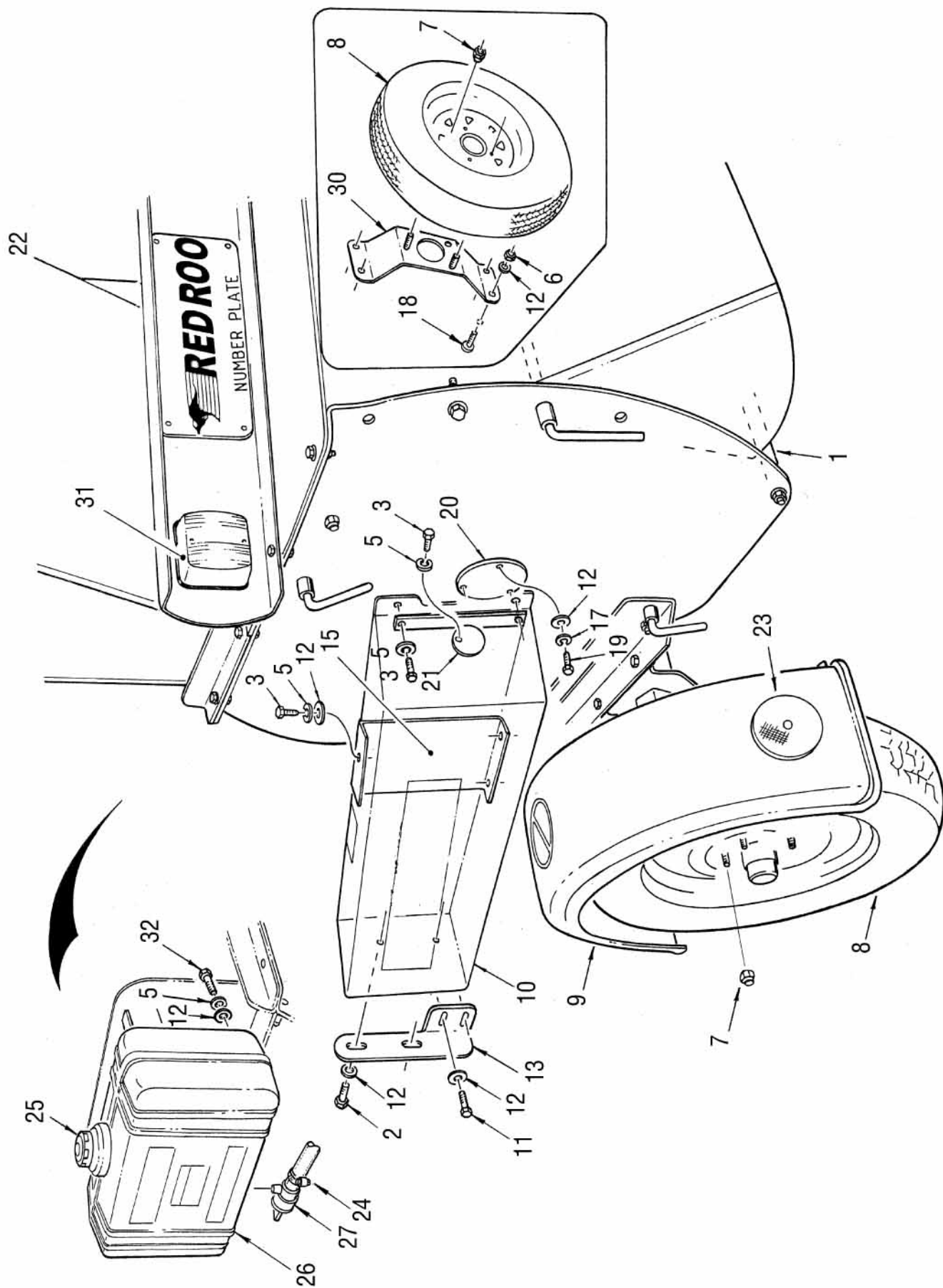
PARTS LIST FOR MS50/CMS100 – DRAWING 2

Item No.	Part No.	Description	Quantity
1	1102-0018	Key	As Noted
2	0215-0017	Bushing	As Noted
3	1901-0008	Screw, Socket Set	As Noted
4	0403-0004	Disc, Chipper	1
5	1913-0032	Spacer	1
6	0206-0003	Knife, Double Bevel	2
7	1901-0013	Screw	5
8	0104-0004	Anvil	1
9	0209-0320	Bolt	4
10	2301-0004	Washer, Lock	18
11	2301-0024	Washer	3
12	1605-0014	Plate – Front, Chipper W/Throat	1
13	0209-0326	Bolt	14
14	2301-0024	Washer	As Noted
15	1401-0034	Nut, Cone	As Noted
16	0204-0016	Bearing	As Noted
17	0806-0015HD	Housing, Bearing	1
18	0303-0008	Cap, Retainer	1
19	2301-0008	Washer, Lock	As Noted
20	0314-0023	Cover	1
21	2301-0010	Washer, Lock	As Noted
22	1401-0075	Nut	As Noted
23	1613-0002	Panel, Access Cover	1
24	0209-0106	Bolt	10
25	2301-0004	Washer, Lock	21
26	0209-0622	Bolt	3
27	2301-0025	Washer	4
28	1401-0059	Nut	2
29	0805-0003	Hopper, Chipper	1
30	0209-0318	Bolt	As Noted
31	0314-0006	Cover, Top	1
32	0704-0026	Disc, Access Cover (2 Hole)	2
33	1908-0003	Scroll	1
34	0209-0329	Bolt	As Noted
35	1605-0016	Plate, Middle Tear. W/Scroll	1
36	1605-0017	Plate, Back	1
37	1401-0050	Nut	As Noted
38	0209-0515	Bolt	4
39	0401-0050	Decal, Warning	1
40	0401-0049	Decal, S.N.	1
41	0704-0016	Guard/Disc Access	1
42	0209-0019	Bolt	5
43	2301-0003	Washer, Spring	13
44	0805-0006	Hopper	1
45	0209-0539	Bolt	1
46	0603-0004	Zerk	As Noted

safety
IS EVERYBODY'S BUSINESS
...now

You alone know the operational demands and special conditions affecting the equipment in your situation and therefore assume the responsibility for developing, carrying out, and enforcing the safety concepts which apply to your own operation to effect the greatest safety for yourself and the people around you.

MS50/CMS100 DRAWING 3



PARTS LIST FOR MS50/CMS100 – DRAWING 3

Item No.	Part No.	Description	Quantity
1	1913-0033	Spacer	1
2	0209-0115	Bolt	As Noted
3	0209-0108	Bolt	8
4	2301-0033	Washer, Mudguard	10
5	2301-0004	Washer, Spring	As Noted
6	1401-0022	Nut	4
7	1401-0055	Nut, Wheel Stud	8
8	2305-0012	Wheel Assembly	2
9	0606-0005	Mudguard	2
10	0704-0024	Guard, Belt	1
11	0209-0115	Bolt	1
12	2301-0021	Washer	16
13	0214-0081	Bracket, Belt Guard	1
14	1401-0034	Nut, Cone	As Noted
15	0704-0011	Guard, Inner Fill in Belt	1
16	0209-0020	Bolt	5
17	2301-0003	Washer, Lock	As Noted
18	0209-0044	Washer	4
19	0209-0019	Bolt	As Noted
20	0704-0027	Disc, Access Cover (3 Hole)	1
21	0704-0016	Disc, Access Cover (1 Hole)	As Noted
22	1105-0004	Light Kit, Complete	1
23	1802-0001	Reflector	2
24	0307-0003	Clamp, Fuel Hose	2
25	0303-0005	Cap, Fuel Tank	1
26	2001-0006	Fuel Tank	1
27	2201-0002	Fuel Tap	1
28*	0812-0040	Hose, Fuel	1.65mts
29*	0307-0021	Clamp	1
30	0214-0067	Bracket, Spare Tyre	1
31	1202-0002	Light	2
32	0209-0820	Bolt	4

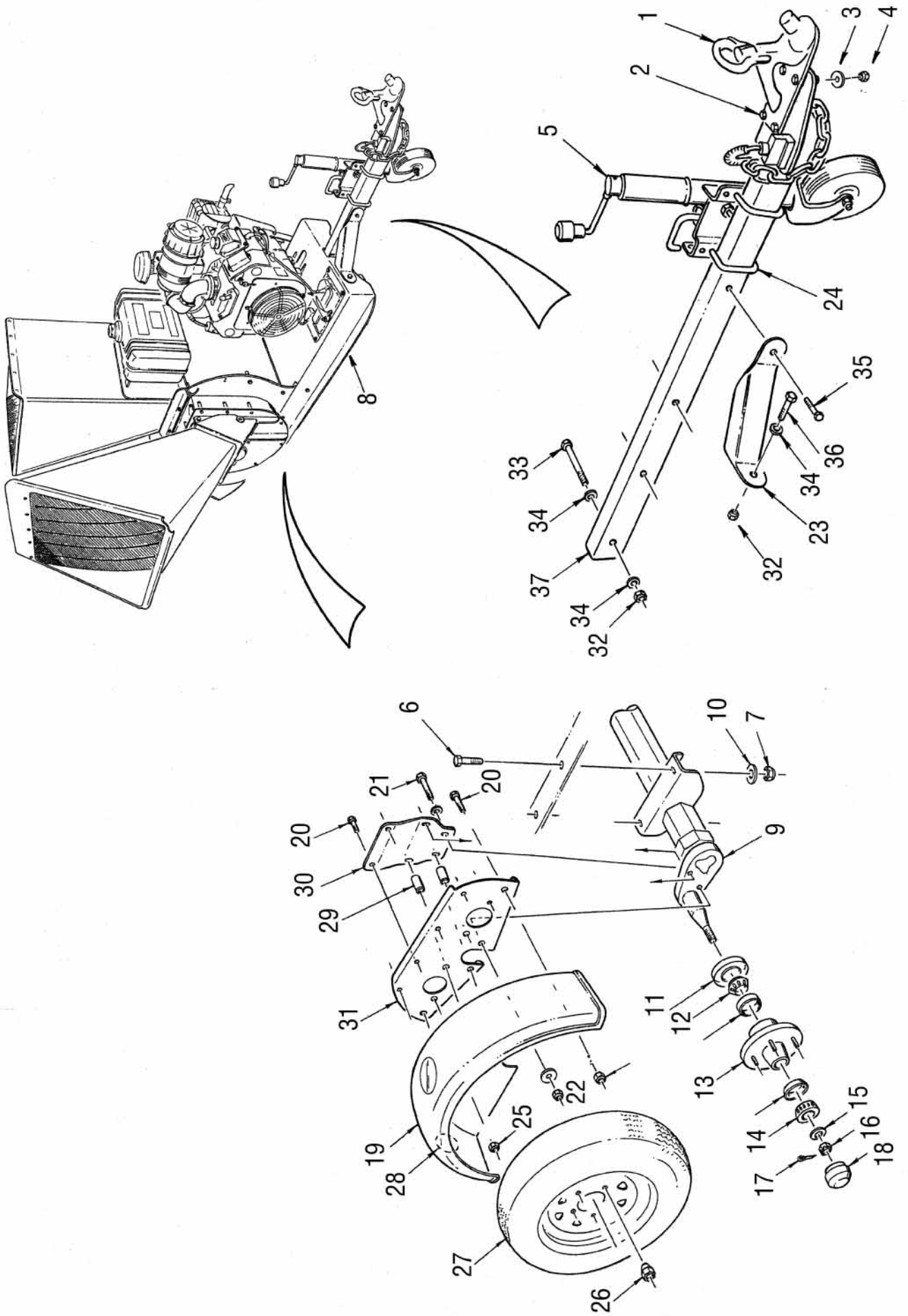
*Part not shown



You alone know the operational demands and special conditions affecting the equipment in your situation and therefore assume the responsibility for developing, carrying out, and enforcing the safety concepts which apply to your own operation to effect the greatest safety for yourself and the people around you.



MS50/CMS100 DRAWING 4

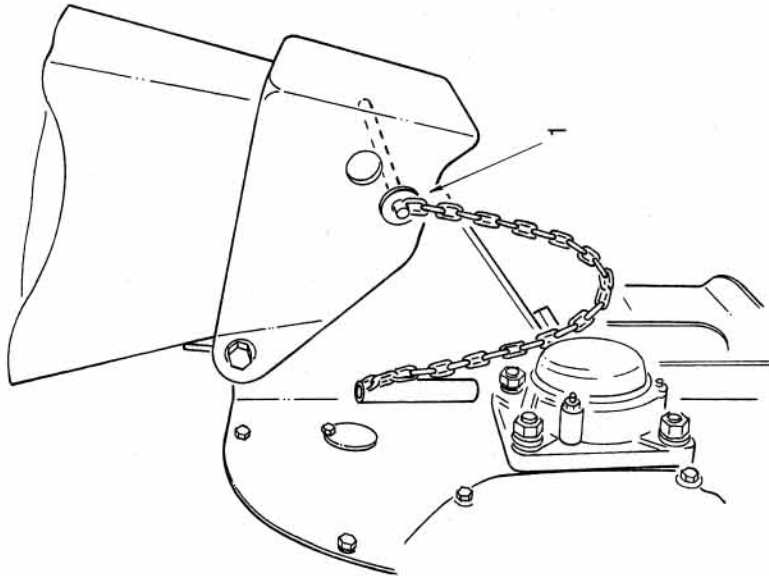


PARTS LIST FOR MS50/CMS100 – DRAWING 4

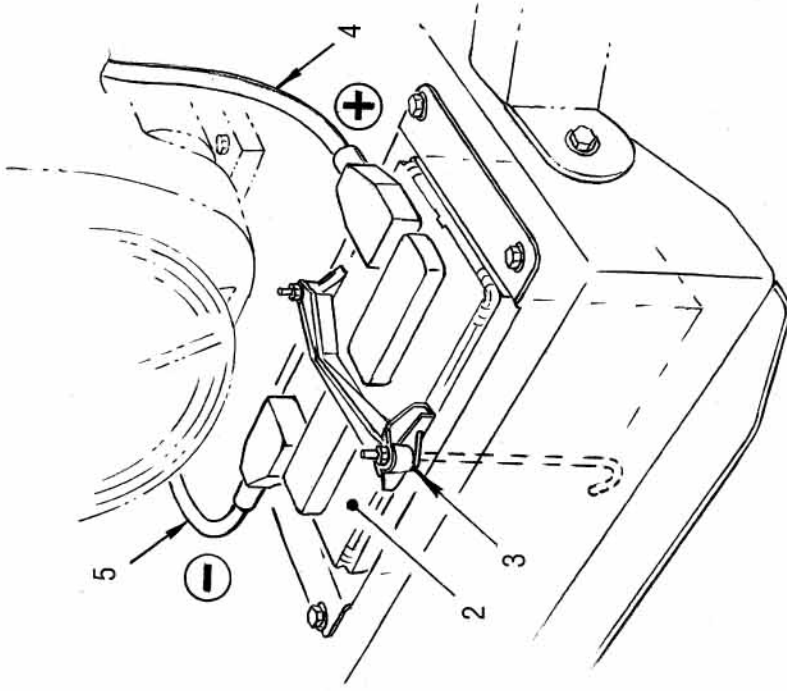
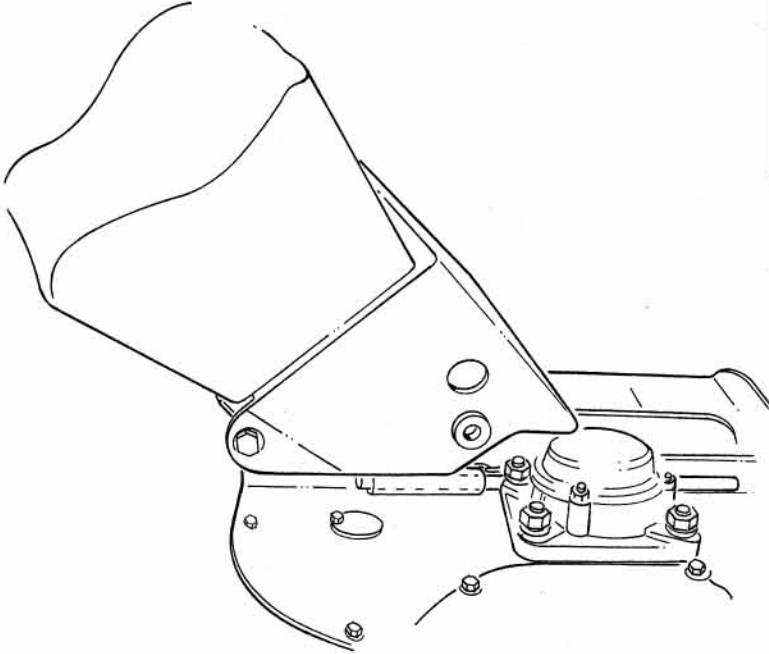
Item No.	Part No.	Description	Quantity
1	0316-0003	Coupling, Tow 50mm	1
2	0209-0520	Bolt	As Noted
3	2301-0008	Washer, Lock	As Noted
4	1401-0052	Nut	As Noted
5	2305-0006	Jockey Wheel Assembly	1
6	0209-0515	Bolt	As Noted
7	1401-0053	Nut	8
8	0605-0033	Frame, Trailer	1
9	0103-0003	Axle Assembly	1
10	2301-0040	Washer	As Noted
11	1902-0007	Seal, Hub	2
12	0204-0014	Bearing Assembly, Rear	2
13	0806-0016	Hub, Wheel	2
14	0204-0034	Bearing Assembly, Front	2
15	2301-0028	Washer	2
16	1401-0010	Nut, Castle Axle	2
17	1604-0026	Pin, Cotter	2
18	1906-0001	Shield, Dust	2
19	0606-0005	Fender	2
20	0209-0624	Bolt	16
21	0209-0127	Bolt	8
22	1401-0023	Nut	8
23	0214 0104	Bracket, Draw Bar	1
24	0209-0030	U Bolt	2
25	1401-0504	Nut	16
26	1401-0055	Nut, Wheel	As Noted
27	2305-0012	Wheel, Assembly	As Noted
28	1802-0001	Reflector	As Noted
29	1913-0078	Spacer	4
30	0214-0102	Bracket	2
31	0214-0101	Bracket	2
32	1401-0034	Nut	5
33	0209-0348	Bolt	3
34	2301-0022	Washer	9
35	0209-0339	Bolt	1
36	0209-0318	Bolt	1
37	0605-0034	Draw Bar	1



**UP/TRAVEL (TOW)
POSITION**



**DOWN/OPERATING
POSITION**



PARTS LIST FOR DRAWING 5

Item No.	Part No.	Description	Quantity
1	1604-0044	Pin Assembly	1
2	0203-0004	Battery	1
3	0214-0063	Battery Bracket Clamp Kit	1
4	0301-0011	Cable, Battery Positive	1
5	0301-0012	Cable, Battery Negative	1

Chipping Hopper shown in the Operational Position

Item #1 shows the Pin used to secure Chipping Hopper in Travel (Tow) Position. Chipping Hopper shown in the Travel (Tow) Position.

CAUTION

IF MACHINE STALLS OR DISC JAMS
STOP ENGINE IMMEDIATELY TO
PREVENT CLUTCH DAMAGE

0401-0052

0401-0052

RED ROO GROUP OF COMPANIES
MELBOURNE AUSTRALIA
www.redroo.com

MODEL SERIAL NUMBER

0401-0049

WARNING

READ AND UNDERSTAND ALL SAFETY AND OPERATING INSTRUCTIONS BEFORE USING MACHINE

DO NOT REACH INTO HOPPER WHEN OPERATING MACHINE

EAR, EYE, HAND AND FOOT PROTECTION MUST BE WORN WHEN OPERATING MACHINE

KEEP BYSTANDERS 6 METRES (20 FEET) AWAY FROM MACHINE

0401-0055

4 x 0401-0055

IMPORTANT

EXCESS BLADE TO ANVIL CLEARANCE AND BLUNT BLADES CAN LEAD TO METAL FATIGUE AROUND THE THROAT AREA OF HOPPER, FRONT PLATE AND ANVIL SUPPORT.

1 x 0401-0053

WARNING

THIS MACHINE IS CAPABLE OF INFLECTING SERIOUS INJURY IF OPERATED IMPROPERLY. - READ AND UNDERSTAND WARNINGS AND CAUTIONS ON THE MACHINE. READ AND UNDERSTAND ALL SAFETY AND OPERATING INSTRUCTIONS BEFORE OPERATING EQUIPMENT. 0401-0050

1 x 0401-0050



Large 1 x 0401-0034 Small 2 x 0401-0036



1 x 0401-0058



3 x 0401-0001

DANGER

KEEP BYSTANDERS
6m (20ft) AWAY
FROM THE
MACHINE

0401-0077

0401-0077

DANGER

BLADES CUT 4mm
(5/32in) FROM
DISCHARGE SCREEN
KEEP HANDS AWAY!

0401-0066

1 x 0401-0066

WARNING

NEVER OPERATE WITHOUT
BELTGUARD IN PLACE

0401-0070

1 x 0401-0070

CAUTION

TO AVOID INJURY

- Read and understand all safety and operating instructions before using this machine.
- Know the location and functions of all the controls.
- Keep all safety devices in good working order and never remove protective guarding.
- Turn off engine, allow the engine to become cool, remove spark plug leads before attempting any type of maintenance on this machine.
- Keep all bystanders away from this machine while in operation.

0401-0033

1 x 0401-0038



1 x 0401-0065

DANGER

Do Not Open Cover
Wait until all moving parts have come to a complete stop.

0401-0062

1 x 0401-0062

CUSTOMER SUPPORT SERVICE AND SPARE PARTS

Australia 1300 133 767 USA 1800 579 7352
www.redroo.com

0401-0095

1 x 0401-0095

CAUTION

- Read instructions and operators manual before operating machine. Know the controls and how to stop in an emergency.
- NEVER allow children to operate the chipper mulcher shredder.
- ALWAYS wear protective clothing when operating the chipper mulcher shredder. e.g safety glasses, loose fitting gloves, steel capped boots and hearing protection. NEVER wear loose fitting clothing or jewellery when operating the chipper mulcher shredder. Keep all clothing away from moving parts.
- ALWAYS operate chipper, mulcher shredder on level ground only.
- Keep stones, nails and all objects other than branched larger than 25mm out of shredder hopper.
- NEVER operate when fatigued. Always be alert! NEVER operate under the influence of medication, alcohol or drugs.
- DO NOT allow other persons near the chipper mulcher shredder. It is up to the operator to keep bystanders and animals a minimum of 3 metres away from the machine while in operation.
- Always stand clear of the discharge area when the shredder is running. Keep your face and body away from the feed hopper to avoid being struck by any material that may bounce back. DO NOT use hands to clear away material from hopper.
- NEVER put your hands, feet, face or any other part of your body into either of the feed hoppers. Use a stick, not hands, to assist branches into the shredding and chipper hopper. DO NOT use hands to clear away material from the discharge area.
- NEVER remove the guarding attached to the shredding hopper. This protective device minimises material flyback and must be in place at all times during operation. NEVER use the chipper with the chipper hopper removed.
- DO NOT leave the machine unattended while the engine is running.
- If shredder and mulching chamber cloggs with material, stop the engine immediately to prevent clutch damage. Use extreme care before removing screen pin and eliminating blockage or obstruction.
- NEVER operate the chipper mulcher shredder in an enclosed area.

1 x 0401-0061

Superseding Warranty
Red Roo Group of Companies
Warranty Policy
effective August 5, 2002

Replaces all undated previous Warranties and all Warranties dated prior to August 5, 2002.

"For a time period shown below from date of purchase, pending owner registration, Red Roo Sales & Service Company, P/L, herein referred to as "MANUFACTURER", will, at its option, repair or replace for the original purchasers of new Red Roo equipment, free of charge, any part, or parts of the unit (excluding Power Unit, warranty coverage provided by respective engine manufacturer), found upon inspection and testing by a Factory Authorised Agent, or by the Factory at Keysborough, Victoria, to be defective in material or workmanship or both under normal operating conditions; this is the exclusive remedy. All transportation charges on parts submitted to the MANUFACTURER for replacement under this Warranty are the responsibility of the purchaser.

This Warranty shall not apply to any product that has been altered, modified, or operated in a manner not approved or recommended by the MANUFACTURER. Warranty will be null and void in the following circumstances: (1) repairs or attempted repairs have been performed by persons other than agents authorised by the MANUFACTURER; (2) repairs are required because of normal wear; (3) the unit has been subject to abuse or involved in an accident; (4) misuse is evident, such as that caused by an application that unit is not intended to perform.

The MANUFACTURER reserves the right to modify, alter, or otherwise improve any product or part.

The purchaser is responsible for the performance of regular maintenance services as specified in the operator manual applicable to the unit. Untimely and/or improper care and replacement of normal maintenance items (eg.: filters, belts, drive chains, blades, knives, lubricants) may void Warranty. Use of non genuine Red Roo parts may void Warranty.

THERE IS NO OTHER EXPRESS WARRANTY. IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO 14 DAYS FROM PURCHASE, AND TO THE EXTENT PERMITTED BY LAW ANY AND ALL IMPLIED WARRANTIES ARE EXCLUDED. LIABILITY FOR CONSEQUENTIAL DAMAGES UNDER ANY AND ALL WARRANTIES ARE EXCLUDED TO THE EXTENT EXCLUSION IS PERMITTED BY LAW. RED ROO GROUP OF COMPANIES DOES NOT AUTHORISE ANY PERSON OR ENTITY TO CREATE FOR IT ANY OTHER OBLIGATION OR LIABILITY IN CONNECTION WITH ITS PRODUCTS OR SERVICES. Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion of limitation of incidental or consequential damages, so the above limitation exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state."

Red Roo Sales & Service Company, P/L
James A. Kerr III
Managing Director

Warranty Period

All Equipment	Consumer Use* 365 Days	Commercial Use* 90 Days
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* For the purposes of this warranty policy, "consumer use" shall mean personal residential household use by the original retail consumer. "Commercial use" shall mean all other uses, including use for commercial, income producing or hire purposes. Once a unit has experienced commercial use, it shall thereafter be considered as a commercial use unit for purposes of this warranty policy.

Proper registration of your Red Roo equipment is required to obtain warranty service. It is the responsibility of the original purchaser to register equipment within 10 days of purchase.