BARMAC

ROCK-ON-ROCK VSI CRUSHER

Manufacture and design of the Barmac crusher is carried out under quality control systems certified to ISO 9001 by Svedala Barmac Product Group. Distributed worldwide under the following granted and pending patents and design applications:

New Zealand 198107, 201180, 215510, 217752, 217751, 250027, 22926, 22927, 22929, 25569, 25473, 25474, 233457, 245954, 245955, 248552, 245955, 250154, 227492, 258349
Australia 557168, 562251, 594367, 625636, 640710
U.S.A. 4662571, 4586663, 4921173, 4940188
Canada 1189045, 1229835, 1265772, 130135
Japan 1554366, 1620260, 217863/64, 32286/88
South Africa 82/6374, 83/5817, 86/6902, 86/5063, 85/8062, 89/9325, 89/9495

United Kingdom 0074771, 0101277, 216592, 2214107, 2246410
France 0074771, 0101277, 216592, 88-17021
Italy 0074771, 0101277, 216592
Sweden 8203465-9, 0101277, 216592
Austria 216592
Federal Republic of Germany 3275505.8, 0101277, 216592
Europe 0074771, 0101277, 90112563.5
Mexico 164123

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AFTER SALES CONTACTS
(PLEASE QUOTE MACHINE REF. NO.)

Spare Parts		Service	
Technical		Crusher Sales	
Telephone		Fax	

SVEDALA

Svedala Chile

Av. Los Conquistadores 2758, Providencia, Santiago, Chile.
Tel. +56 2 360 5500, Fax: 56 2 360 5555.

Dealer:

PRINTED IN NEW ZEALAND

BARMAC PRODUCT STANDARD LIMITED WARRANTY

SVEDALA NEW ZEALAND LIMITED (hereinafter Svedala NZ) warrants its products to its authorized Distributors and Dealers, and Distributors and Dealers agree to extend the same warranty and no other to each purchaser of the Barmac products at the time of sale, and to notify each purchaser of the terms and conditions of this warranty. Distributors and Dealers are not authorized by Svedala NZ to make any other, different, or additional warranty on behalf of Svedala NZ, and any such warranty given by Distributor and Dealer is not binding on Svedala NZ. Distributors and Dealers shall hold Svedala NZ harmless from any loss and/or costs (including attorney's fees) arising from failure to observe these conditions. Svedala NZ extends this same warranty to those, in addition to its authorized Distributors and Dealers, who buy the Barmac products directly from it rather than purchasing them from an authorized Distributor or Dealer.

Svedala NZ warrants, commencing with the date of shipment of goods by Svedala NZ to Distributor or Dealer or end user and for a period of one hundred and eighty (180) days thereafter or the date of signing of the Owner Registration Form (MD433) (which must be signed by Owner Representative and Dealer/Distributor Representative at completion of machine commissioning) and for a period of one hundred and eighty (180) days thereafter, whichever period has a later expiry date, all machinery and parts manufactured by Svedala NZ to be free from defects in workmanship and material. If, within such warranty period, any machinery or parts shall be proved to the satisfaction of Svedala NZ to be defective, they shall be replaced or, at the option of Svedala NZ, repaired at its nearest Distributorship or Dealership at no charge providing the defective machinery or parts are returned to Svedala NZ or its Distributor or Dealer, freight prepaid. At its option, Svedala NZ may repair, or arrange to have repaired, any defective machinery or parts, at the location of the Distributor and/or Dealer, or at the location of the operating site of the first end-user, or any other suitable location at no charge to first end-user and at no charge to Distributor and Dealer other than those agreed to by its Distributor and Dealer Agreement. The right to have defective machinery or parts replaced shall constitute Distributors, Dealers and first end-user's sole and exclusive remedy.

Svedala NZ may, at its sole discretion, refund the purchase price of defective machinery or parts in lieu of repairing or replacing them providing the defective machinery or parts are returned to Svedala NZ or its nominee, freight prepaid and providing such return is authorized by it.

Svedala NZ may, at its sole discretion, waive the requirement that defective machinery or parts be returned to its factory in connection with a warranty claim.

The obligation of Svedala NZ under the terms of this warranty, is limited to the described repair of or replacement of defective machinery and parts and does not include charges, direct or indirect, by Distributor and Dealer, or end-user for field labor, field expenses or equipment used in removing or replacing defective machinery or parts.

With regard to machinery, parts or accessories which are furnished by Svedala NZ, but not manufactured by it, the warranty obligation of Svedala NZ shall be limited to that of its supplier. No warranty shall apply to any used machinery or parts. No warranty shall apply to the Barmac products which, in its opinion, have been adversely affected by the use, on or with its products, of parts, attachments, equipment or lubricants not either manufactured, sold or authorized by it.

No warranty shall apply to machinery, parts or accessories which have been furnished, repaired or altered by others so as, in the opinion of Svedala NZ, to have affected the same adversely. No warranty shall apply to machinery, parts or accessories which, in the opinion of Svedala NZ, have been subject to accident or negligence; or improper operation, installation, maintenance, storage, care, or other than normal use during and after shipment.

Svedala NZ warrants that field services conducted by Svedala NZ itself in connection with any warranty repairs of machinery and parts will be performed in a good and workmanlike manner. The obligation and liability of Svedala NZ connected with field services performed by others on its behalf shall be limited to a refund of the amount charged for such services, if any.

Inasmuch as the work to be performed by the buyer or end-user with the machinery or parts furnished by Svedala NZ will vary according to the materials used, local conditions and the results required and that such variation will continue throughout the use of such machinery or parts, it is not possible to and Svedala NZ does not warrant or represent that machinery and parts furnished by it will handle specific materials nor will they produce specific results from such materials.

Svedala NZ is to be wholly discharged of liability under the foregoing warranties in cases where the purchaser of the machinery or parts fails to settle and pay for the goods promptly and in accordance with the terms of the purchase agreement.

Svedala NZ's liability hereunder is conditional upon Distributor and Dealer (or in the event of a direct sale to a first end-user, then first end-user) giving notice in writing to Svedala NZ of any alleged defect, and such notice must be given immediately upon the discovery of such alleged defect; but, in any event, such notice must be received by Svedala NZ not later than thirty (30) days after the expiration of the warranty period.

Svedala NZ does not warrant or represent that any machinery, parts, or accessories furnished by it meet any Federal, State, or local statutes, codes, ordinances, rules, standards or other regulations covering safety, pollution, electrical wiring and so forth.

The foregoing warranties are in lieu of all other warranties express or implied except of title including but not limited to any warranty of merchantability and Svedala NZ and its Distributors and Dealers shall not be subject to any other obligations or liabilities whatsoever with respect to machinery, parts, accessories or services manufactured or furnished by it or any undertakings, acts or omissions relating thereto. Under no circumstances shall Svedala NZ and its Distributors and Dealers be liable for any consequential damages, expenses, losses or delays howsoever caused. There are no warranties which extend beyond the description of the face hereto.

SVEDALA NEW ZEALAND LIMITED, Mangawhero Road, Private Bag 4074, Matamata, NEW ZEALAND.

MD377 – 80S

MACHINE DATA FORM

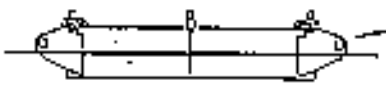
Machine Ref. No.: TM241 Date: 5/93

Model: VS 7000 QUADRACTOR

Please record Cycle and Serial numbers for all components as listed below.

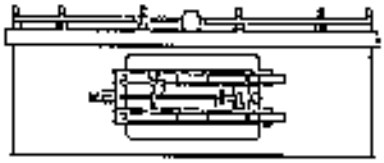
Hopper: 100699

Cascade: 100280



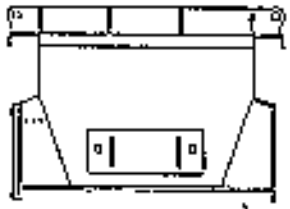
Roof: 100720

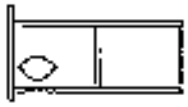
Cavity Ring: 100264



Crushing Chamber: _____ (9000 & 8000 models only)

Motor Mount: 1 100926 2

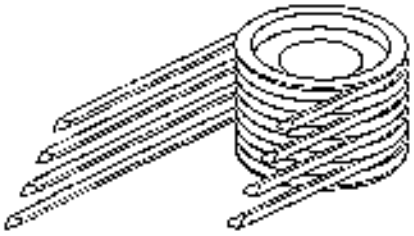




Transmission: 1 100296 2

Base Serial No.: 100340

Dual Drive Only



BELT DRIVE:

Belt Length: 4250

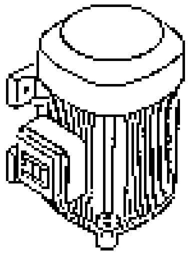
Belt Section: SPCX

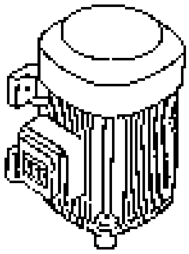
Number of Belts: 6

Barmac Sheave ø: 355 No. Grooves: 6C

Motor Sheave ø: 375 No. Grooves: 6C

MOTOR:





Motor 1: Brand: ______________________

Serial No.: ______________________

Rated Power: ______________________

Volts: __________ Amps: __________

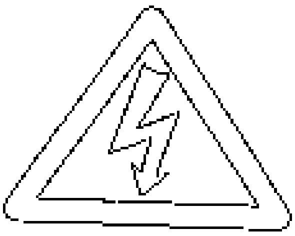
Hz: __________ RPM: __________

Motor 2: (Dual Drive Only)

Serial No.: ______________________

Rated Power: ______________________

(For motor details see manufacturer's information included in this manual).



MOTOR STARTER:

Start Method: ______________________

Manufacturer: ______________________

Serial No.: ______________________

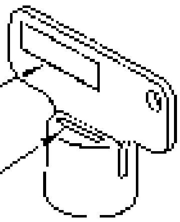
(For motor starter details see manufacturer's information included in this manual).

SAFETY INTERLOCK:

Shutout Key (at Starter Panel)

Key Code: TIL 327

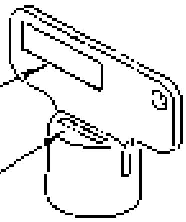
Key Serial No.: 361082



Access Key (at Timer Box)

Key Code: TIL 327A

Key Serial No.: 361182



VIBRATION SWITCH:

Switch Brand: Ewart Inerma

Model: 3171, Dual Solenoid Reset

Serial No.: 625290.

CASCADE CONTROL:

Method: Hydraulic Choke Adjuster

Details: Hydraulic Handpump Sign

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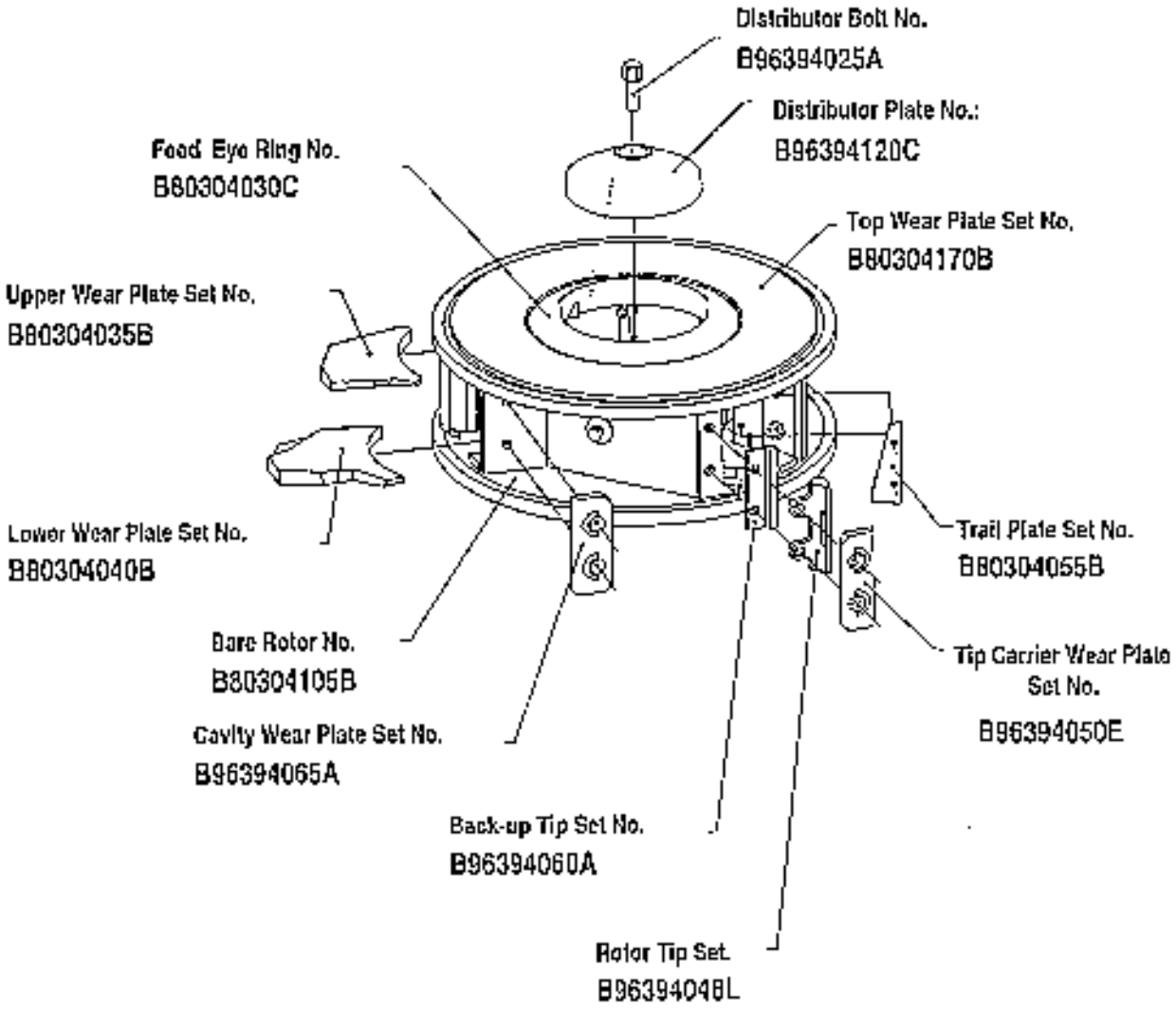
ROTOR PARTS LIST

Name:

Machine Ref No.: **TM241**

Date: 5/98

Rotor 1:	Size: Ø760	
	Type: Open Sided	
	Serial No.: 100328-19	
	Taper Lock No.: 101204-41	
Rotor 2:	Size: Ø760	
	Type: Open Sided	
	Serial No.: 100328-18	
	Taper Lock No.: 101204-45	



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ROTOR PARTS LIST

Name:

Machine Ref No.: TM241

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Serial No.: 100328-19

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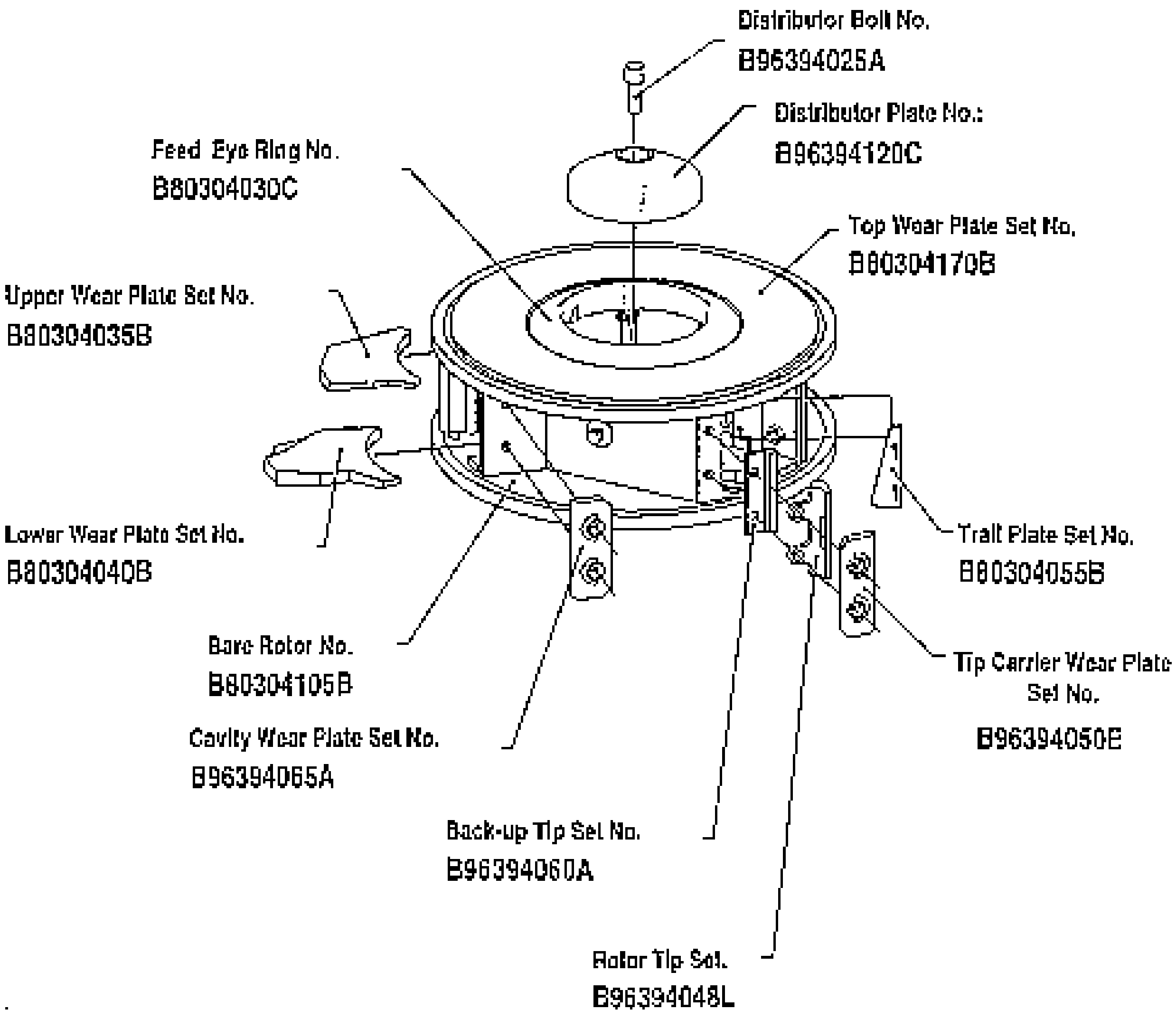
Type: Open Sided

Serial No.: 100328-18

Taper Lock No.: 101204-45



SVEDALA

Svedala de Argentina S.A.
Suipacha 1067, 3° Piso, (1008) Buenos Aires, Argentina.
Tel.: 312-5211 / 3896 - Telefax: 314-0112

Check list BARMAC

Número Equipo

NOTA : El check list debe ser realizado (o supervisado) por un Técnico de Servicio Barmac autorizado. En cada etapa, la casilla de verificación debe ser llenada, a fin de evitar saltear alguna etapa.

Instalación

1. Verificar si el equipo ha sido instalado de acuerdo con las dimensiones y accesos recomendados en la Sección Instalación. ☐
2. Verificar la correcta operación de la traba de seguridad de la puerta y del procedimiento de cierre por parte del Cliente. ☐

Montaje

1. Verificar si el número de ciclos ha sido registrado en el formulario de Datos del equipo ☐
2. Verificar si el equipo ha sido montado de acuerdo a las instrucciones que se indican en la Sección Instalación ☐
3. Verificar el ajuste de todos los tornillos de acuerdo a lo especificado en el Manual de Operación y Mantenimiento ☐
4. Verificar el montaje del centrado de cascada como se indica en el Manual de Operación y Mantenimiento ☐
5. Verificar el montaje del rotor ☐

Correas de accionamiento

1. Confirmar que las especificaciones de las correas y poleas son correctas ☐
2. Verificar alineamiento (Ver Manual de Operación y Mantenimiento) ☐
3. Verificar la tensión de las correas (Ver Manual de Operación y Mantenimiento) ☐
4. Verificar si las protecciones de las correas fueron fijadas correctamente ☐
5. Verificar la instalación del motor ☐

Sistema eléctrico

1. Verificar si el switch de vibración esta instalado y conectado ☐

2. Verificar que el cableado ha sido realizado en forma correcta ☐

3. Verificar la dirección de rotación del rotor (debe ser antihoraria mirando desde arriba) ☐

4. Calibrar y chequear el funcionamiento del switch de vibración (Ver detalles en el Manual de Servicio del Sistema de Control de Vibración) ☐

5. Verificar el funcionamiento del corte térmico, si esta instalado ☐

Encendido del equipo

1. Encendido del equipo siguiendo las instrucciones de encendido del Manual de Operación Y Mantenimiento ☐

Tiempo de parada del rotor

_____ minutos

Entrenamiento del operador

1. El Técnico de Servicio de Barmac explicó adecuadamente la operación del equipo, incluso los efectos de alterar el volumen de alimentación, el tamaño de alimentación, velocidad del rotor y el flujo de cascada ☐

2. Explicó adecuadamente las caracteristicas del rotor y como ajustarlo para un rendimiento Óptimo ☐

3. Entrenó al personal de operación y mantenimiento en procedimientos para solucionar Problemas específicos ☐

4. Verificó si el personal de operación y mantenimiento esta compenetrado con el Manual de Operación y Mantenimiento y si tienen una copia del mismo ☐

5. Verificar si el Formulario de Registro del propietario ha sido firmado. ☐

OWNER REGISTRATION

Machine Ref. No.: TM 241 Date: 5/93

OWNER DETAIL:

Company: _____ Tel: _____

Address: _____ Fax: _____

_____ Telex: _____

_____

Contact Person: _____ Tel. A/H: _____

DEALER DETAIL:

Company: _____ Tel: _____

Address: _____ Fax: _____

_____ Telex: _____

_____

Contact Person: _____ Tel. A/H: _____

MACHINE DETAIL:

Model: _____ Serial No.: _____

INSTALLATION TYPE: Mobile ☐ Skid Mounted ☐ Fixed ☐

APPLICATION DETAIL:

Rock Type: _____ Duty: _____

1. This machine has been commissioned in accordance with commissioning procedures contained in this manual.
2. Warranty commences from: _____

Owner Representative:

Name: _____

Signature: _____

Date: _____

Dealer/Distributor Representative:

Name: _____

Signature: _____

Date: _____

OWNER COPY

MD433 - 2/95

safety

BARMAC™

SAFETY

GENERAL

During the design and manufacture of the equipment, a lot of effort is put into the avoidance of health and safety risks.

In a crushing and screening plant there are many potential risks and to avoid these it is important that:

- The recommendations in instruction manuals are studied and followed.
- Personnel are regularly given training on maintenance and safety.
- General and official safety regulations are followed.
- Dangerous areas are marked with warning signs.
- The appropriate equipment and tools are available.
- The owner and management live up to their responsibility to make sure that effective safety programmes and regulations are worked out and are followed by all personnel.

EXTRA SAFETY PRECAUTIONS

Our instruction manuals and other documentation contain important information which must be read and understood by all users before they operate the equipment. To make it easier to notice information in our instruction manuals directly concerning user safety and the avoidance of problems with the equipment, we use the terms shown below:

CAUTION: Important information which describes how you avoid damage to a machine and its systems or how you avoid a situation which could cause personal injury.

NOTE: Advice about operation, inspection and maintenance of a machine and its systems.

GENERAL SAFETY PRECAUTIONS

The following list of general safety precautions should be considered as a guide only. There may be other conditions and variations in the operation of this equipment that are not covered in these general safety precautions. The purpose of the general safety precautions is to make all personnel aware of the general hazards and dangerous situations that exists around the equipment and the work area.

Personnel Safety

1. Read and understand each of the warnings, cautions and instructions in the instruction manual and on all signs and information plates on and around the equipment.
2. Report all accidents immediately to your supervisor. Consult a doctor or medical personnel as soon as possible if personnel injury is involved.
3. Keep a list of emergency telephone numbers close to the telephone and inform all work area personnel about the location of the list.
4. Do not operate or work equipment while under the influence of alcohol, medicines, tranquillisers or other drugs that can make you less alert or affect your judgement.
5. Use hand grips, ladders, guard rails and other safety devices when getting on or off equipment and when moving around while on the equipment. Use a safety harness when necessary.
6. Take precautions to keep hair and loose fitting clothing from being caught on moving parts or controls.
7. Wear safety glasses whenever there is danger of flying debris, chips, objects or dust that could enter the eyes, and when required by operating regulations. Be extra safe — always wear eye protection. Look after your eyes!
8. Wear gloves whenever possible to protect hands and fingers from cuts, scrapes, burns and solvents.
9. Always wear a hard hat and safety shoes when appropriate for the work being done and always when required by local or national regulations.
10. Remove rings, watches, necklaces and bracelets before working in the plant.
11. In areas where noise levels are high, wear hearing protection devices.
12. Wear a breathing apparatus mask or whenever appropriate, i.e. when painting or working with chemicals, solvents and other substances that may be hazardous to your health. Remember that there is a risk of silicosis when there is siliceous dust in the air.
13. Do not take chances with your back. Use lifting and moving devices to help you with your work. Always life with your legs, not with your back.

WORK AREA SAFETY

1. Keep the general work area clean and free of debris. Avoid stone or other material build-ups on walkways, platforms, ladders and under conveyors.
2. Do not allow unauthorised personnel in or around the work area. Keep a check on who is in your work area at all the times. If necessary, keep a list.
3. Keep equipment surfaces that will be touched by hands and feet clean, dry and free of oil or grease.
4. Keep hand grips, guard rails, ladders and platforms clean, dry and free of oil or grease. Store parts and tools in the designated places when not in use.
5. Keep safety equipment in a designated place and ensure that work area personnel know the location and the proper use of the safety equipment.
6. Make a daily check of starting alarms and warning devices in the work area, and ensure that each device is working properly before starting or operating the equipment.
7. Do not stand under or allow anyone else to stand under equipment that is being hoisted or suspended. Use a safety hook or hook with a safety latch when hoisting equipment and use spreader bars when necessary.
8. Learn the weight limitations and clearances in and around your work area and for the equipment in use.
9. Do not overload walkways. They are intended for personnel, not for storing parts or tools!
10. Be alert to conditions that may obscure vision in and around your work area.

EQUIPMENT SAFETY

1. Do not alter, deface or remove warning and information signs.
2. Before setting up portable equipment, be sure that the ground surface is firm and level. Make sure that all supporting and locking devices are securely in place. Follow manufacturers' recommended procedures for supporting and locking the equipment when applicable.
3. Before moving portable equipment, check that the brakes and running lights operate properly. Ensure that supporting legs are raised high enough off the ground to provide sufficient clearance for safe transport. Check that there are no loose items that could fall off during transport.
4. Never climb aboard equipment while it is in transit or being hoisted, or allow anyone else to do so.
5. Inspect all equipment components before each operating shift to ensure that no parts are damaged or suspected of being damaged. Repair or replace damaged parts before starting or operating the equipment. Use only original parts.
6. Before starting or operating equipment, walk around the work area and the equipment to check that no personnel, animals, tools, parts or foreign objects are in, on, under or around equipment. Make sure that all guards and safety devices are properly installed and in good working condition.
7. Before starting equipment, make sure that all work area personnel and visitors know the equipment is going to be started. Use appropriate devices such as sirens or flashing lights to warn personnel and visitors.
8. When starting equipment, follow the manufacturer's recommended starting sequence. Do not allow unskilled persons to start or operate any equipment without the proper supervision of a skilled operator.
9. Never leave equipment controls unattended. Always have a qualified operator relieve you if you must leave.
10. During start-up and while equipment is operating be alert for improper readings, visual defects, odours or unusual sounds that could be a warning of a potential hazard. Shut down equipment immediately, following established shutdown procedures, if any unsafe condition should arise.
11. Use extreme caution whenever any equipment is required to be operating during an inspection, maintenance, lubrication or adjustment procedure. This may only be permitted if it is absolutely essential. Under normal circumstances the machine must be stopped and safety switches locked out before any work is carried out.
12. Perform all inspections, maintenance, lubrication and adjustment procedures with caution and in accordance with the manufacturer's recommended procedures.

ELECTRICAL SAFETY

1. Permit only trained and competent personnel to work on electrical components in the plant or on any equipment.
2. Always assume that an electrical circuit is live until it is proven dead by proper testing procedures.

3. Lock out and tag electrical controls before performing any inspection, maintenance, lubrication or adjustment procedure.
4. Repair or replace electrical wires, cables and connectors that are broken or damaged in any way.
5. Check the electrical ground wires, motor plugs and power cable connections are properly and securely connected before starting any equipment.
6. Know the location of all power lines and underground cables. Use extreme caution when working around these areas. Know the location of all main electrical isolating switches.
7. Never work on electrical equipment while it is raining or while standing in water or on wet surfaces unless you know the power is disconnected.
8. Be alert when working around or with electricity. Report any electrical hazard immediately to your supervisor.

FLAMMABLE & HAZARDOUS MATERIALS SAFETY

1. Store flammable, combustible or hazardous materials in a safe place and in containers specifically designed for the purpose and clearly marked in accordance with relevant the regulations.
2. Store used and oily cleaning rags in a properly designed container as required by national or local rules and regulations, and away from flammable and combustible materials.
3. Do not store flammable or combustible materials in, or around the equipment, electrical installations or personnel facilities.
4. Do not permit smoking or an open flame around fuel tanks or other storage facilities for combustible materials.
5. Keep several fully charged fire extinguishers located throughout the work area. Make sure that all personnel know their location and how to operate them. Have them readily available during fuelling operations or when other fire hazards are present. Check the charge on each fire extinguisher at least one a month or when otherwise specified.
6. Shut down all engines and motors when fueling or transferring flammable, combustible or hazardous materials. Follow the recommended fueling and transfer procedures for the substance or material being worked with.
7. Fill fuel storage tanks and other combustible materials storage facilities in a well ventilated area, well away from equipment which can cause sparks and thus ignite flammable materials.
8. When refueling or transferring flammable or combustible materials, ground the nozzle or spout to prevent sparks caused by static electricity.
9. Never start a diesel or gasoline engine in an enclosed area unless there is adequate ventilation.
10. Do not use flammable or combustible substances such as gasoline, kerosene or diesel fuel for cleaning parts. Always use a nonflammable solvent for cleaning.
11. When using epoxy-resin based materials, follow the manufacturer's recommended procedures and precautions. Mix and pour epoxy materials in an open or well ventilated area. Do not burn cured resin without adequate ventilation. Avoid skin contact with uncured epoxy-resin materials.
12. Always inspect and charge batteries in an open or well ventilated area. Do not permit smoking or open flames near batteries. Remember that batteries can contain explosive gas.
13. Properly dispose of waste, drain fluids and hazardous materials with due regard to and in full accordance with all national and local environmental, safety, transportation, and other regulations and ordinances. Make sure that all personnel are familiar with these regulations.
14. Wear the appropriate clothing and protection devices, and follow the recommended procedures when working with hazardous, flammable and combustible materials.

PRESSURISED SYSTEMS SAFETY (AIR & HYDRAULIC)

1. Do not perform maintenance on pressurised system components without first relieving all pressure in the system.
2. Do not make internal checks on pressurised oil or fluid systems reservoir or levels until all pressure in the system has been relieved. Pressurised oil and air are dangerous if released incorrectly. Oil and air pressure can get very hot; use extreme caution and allow the system to cool before working on it.
3. Do not attempt to remove an air line or hydraulic line from a cylinder or other component unless all pressure to the system has been relieved.

4. Do not attempt to remove an air or hydraulic cylinder clevis from its attachment unless all pressure in the system has been relieved.
5. Do not operate pressurised systems with worn or damaged hoses, valves or fittings. Replace defective components before pressurising the system.
6. Do not attempt to disassemble air or hydraulic cylinders unless you have been trained and authorised for such maintenance.
7. Never adjust pressure relief valves beyond the recommended values.
8. Follow the manufacturer's recommended inspection and maintenance procedures for pressurised systems to ensure the safe operating conditions exist at all times.
9. Take extreme care when working with hydraulic accumulators. They must never be heated or subjected to welding or mechanical damage.

WELDING SAFETY

1. All welding or cutting operations should only be performed by experienced welders who are familiar with the welding equipment and the material to be welded.
2. Take all necessary precautions to avoid dropping sparks or welding splatter on belts, hoses, tanks or other parts of equipment, or on personnel in the work area. Always keep the risk of fire in mind.
3. Attach the welding ground cable as close as possible to the piece being welded to avoid damage to the equipment and potential injury to personnel.
4. Always consult with the manufacturer's of the equipment to be welded before any welding operation.
5. Never weld vessels or pipework which is pressurised.

TEN COMMANDMENTS OF SAFETY

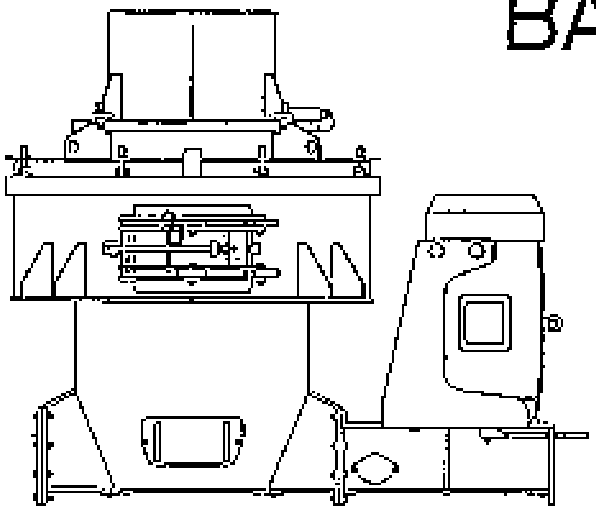
1. **Support all efforts to make your workplace safe and healthful.**
2. **Act responsibly and with concern for the safety of others, as well as yourself.**
3. **Check all tools and protective equipment frequently, to make sure they are in safe working order.**
4. **Educate yourself and others in the hazards associated with your job so that they can be avoided in a safe manner.**
5. **To avoid injury and damage, familarise yourself in advance with the risk and safety aspects of procedures which are new to you.**
6. **Think over accident and injury possibilities before starting on any project. Take appropriate precautions to protect yourself and others. Revise and improve working procedures regularly.**
7. **Warn others of the possibility of accidents and injuries if you see them working unsafely or creating potential hazards.**
8. **Stay alert for changes in work conditions and the work process.**
9. **Report unsafe acts and conditions immediately to your supervisor. Don't assume that someone else will do it.**
10. **Keep your work area and your tools clean. Pick up tools and materials after use and return to the appropriate storage place.**

installation

BARMAC™

BARMAC B7000 DUOPACTOR INSTALLATION

Single Feed (Hydracascade)



Congratulations...

...on your purchase of a Svedala Barmac Rock-on-Rock VSI crusher. The Svedala Barmac VSI is the leader in Rock-on-Rock technology and will if installed correctly, be the easiest crusher in your plant to operate and service.

READ THIS BOOK PRIOR TO PREPARATION OF THE SITE and installation of the unit.

This book contains specific information on installation dimensions, SERVICE CONSIDERATIONS and technical specifications. THIS BOOK HAS BEEN PRODUCED TO SUPPLY THE NEW OWNER OF THE BARMAC WITH ALL OF THE INFORMATION required to install a Barmac to ensure that it will operate correctly and will be accessible to service.

If you consider the information is unclear or insufficient please contact your Barmac Representative.

CONTENTS :

PAGE 2 – GENERAL ARRANGEMENT
A general arrangement of the crusher giving overall reference dimensions. Feed and discharge details are also detailed here.

PAGE 3 – CRUSHER SUPPORT OPTIONS
Details of acceptable support arrangements in various configurations. Dynamic force data also included for your reference.

PAGE 4 – CRUSHER COMPONENT WEIGHTS
Total operating weight and individual weights of main crusher components. Also included are internal component lift out heights for service reference.

PAGE 5 – CRUSHER SERVICE CONSIDERATIONS
It is important that when installed there is adequate access for service. This page contains details of all aspects of the installation that affect the ability to service the crusher.

PAGE 6 – CRUSHER ON-SITE ASSEMBLY
Final assembly of the crusher is carried out on site. This page gives assembly instructions and bolt torques.

PAGE 7 – CRUSHER DRIVE DETAILS
Fitting dimensions for pulleys (sheaves) and maximum power and speed ratings.

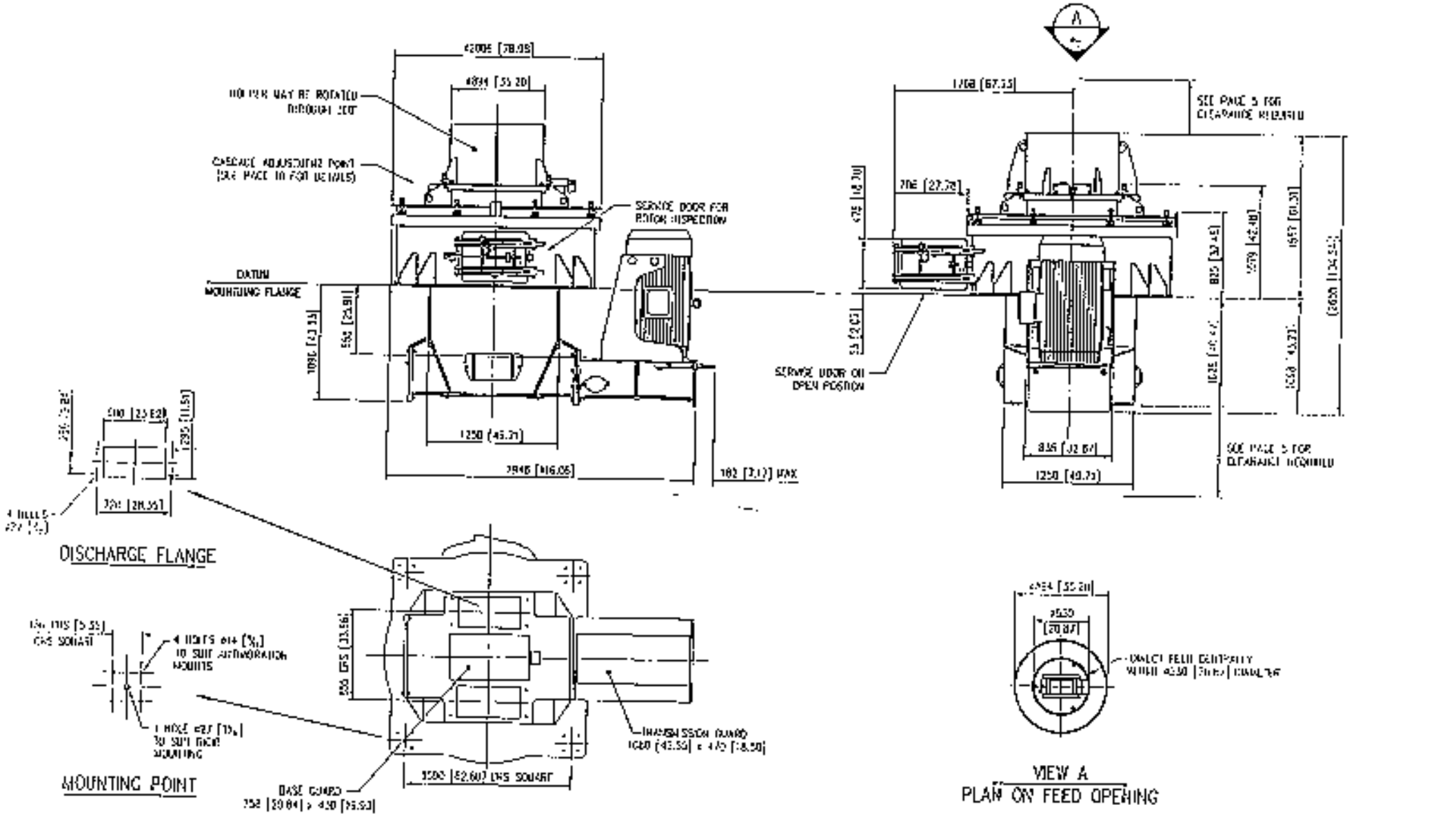
PAGE 8 – SAFETY INTERLOCK AND STARTER
The safety interlock system must be incorporated into the electrical starter of the crusher. Included are basic starter requirements, an explanation of the interlock system and fitting instructions for the interlock.

PAGE 9 – VIBRATION CONTROL
The Barmac warranty is contingent on this cutout switch being installed and operating correctly.

PAGE 10 – HYDRACASCADE CONTROL
A variety of options are given for controlling the cascade ratio. These range from a manual handpump or in smaller models threaded rod adjustment to remote control or interfacing with external control devices.

NOTE: NOT ALL COMPONENTS DEPICTED IN THIS BOOKLET ARE SUPPLIED WITH THE STANDARD BARMAC – CHECK WITH YOUR BARMAC REPRESENTATIVE FOR DETAILS

SVEDALA Svedala Barmac Limited	CONFIDENTIAL © COPYRIGHT 1997 Copyright in this drawing resides in Svedala Barmac Limited	BARMAC B7000 DUOPACTOR SINGLE FEED / SINGLE DRIVE INSTALLATION INTRODUCTION AND CONTENTS	DRAWN Jarrod Mulford CHECKED DIMENSIONS mm [INCH] — PAGE 1 of 10	BARMAC DRAWING DATE 8 / 5 / 97 DRAWING NUMBER INS 705FSD1



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Svedala Barmac Limited

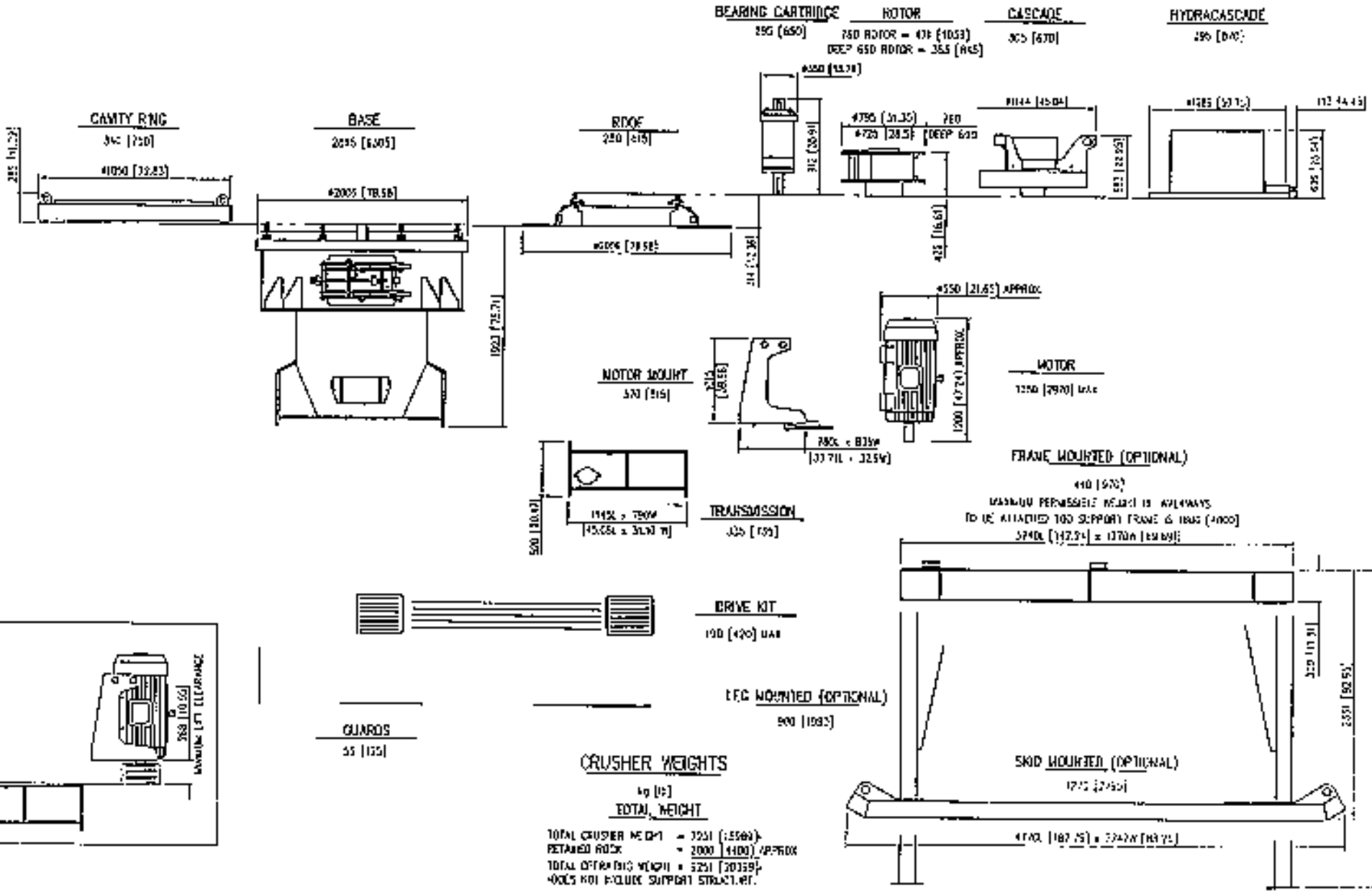
BARMAC B7000 DUOPACTOR
SINGLE FEED / SINGLE DRIVE INSTALLATION
GENERAL ARRANGEMENT

DRAWN Jarrod Mumford
CHECKED
DIMENSIONS mm [INCH]
PAGE 2 OF 10

BARMAC

DRAWING DATE 8 / 5 / 97

DRAWING NUMBER INS 70SFSD2



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BARMAC B7000 DUOPACTOR
SINGLE FEED / SINGLE DRIVE INSTALLATION
CRUSHER COMPONENT WEIGHTS

DRAWN GARTH TAYLOR
CHECKED T. Cole
DIMENSIONS mm [INCH]
PAGE 4 OF 10
DRAWING DATE 10 / 5 / 95
DRAWING NUMBER INS 70SFSD4

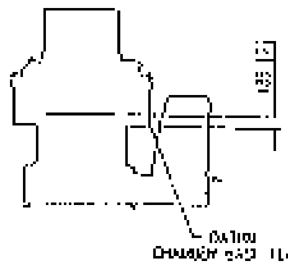
BARMAC

DYNAMIC FORCES

ANY OUT OF BALANCE LOAD ON THE SUPPORT STRUCTURE CAUSED BY ROTOR IMBALANCE WILL BE IN A HORIZONTAL PLANE APPROXIMATELY 185 [7.28] ABOVE THE CRUSHER MOUNTING FLANGE.

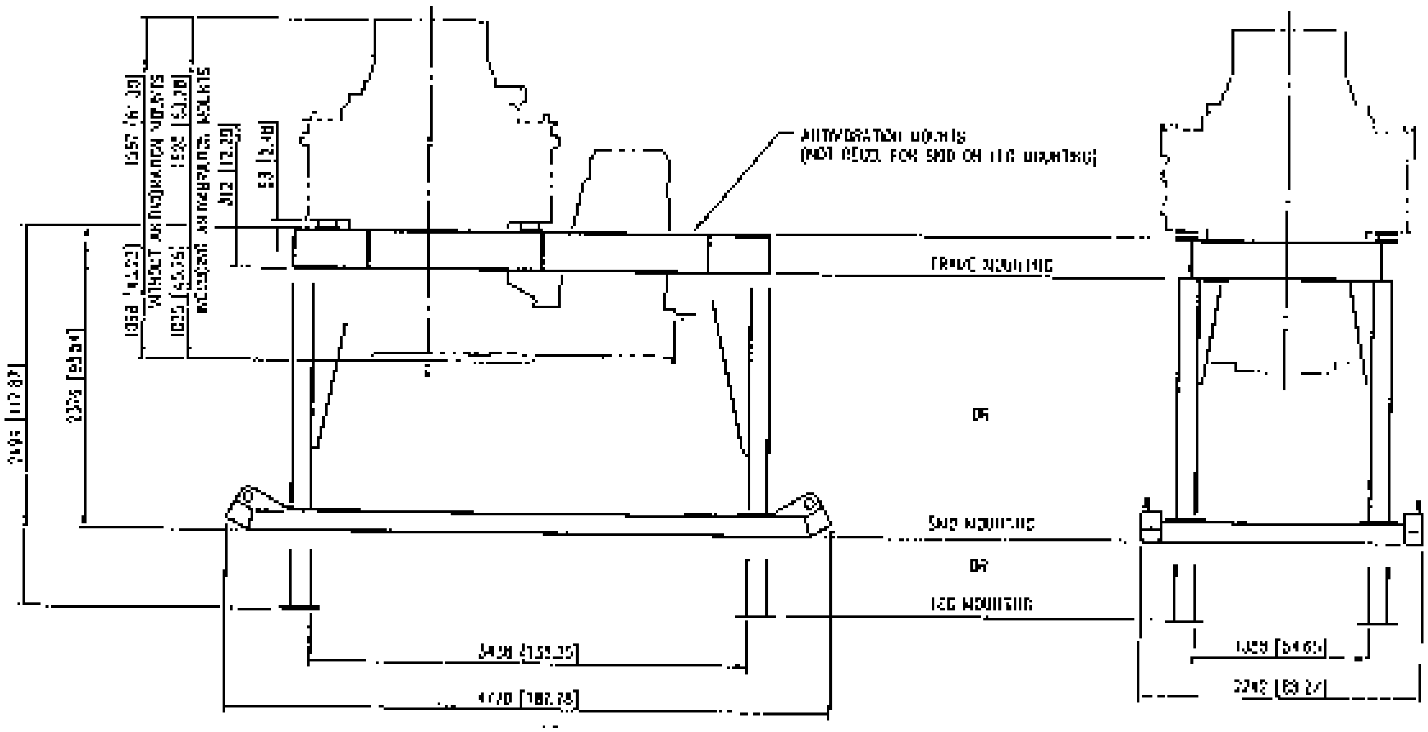
THE MAGNITUDE AND FREQUENCY OF SUCH A LOAD FOR A BARMAC DUOPACTOR FITTED WITH A [illegible] ROTOR AND A TCG ROTOR WILL BE AS FOLLOWS:

	ROTOR SPEED (MAXIMUM)	ROTOR SPEED (MINIMUM)
SPEED	2200 RPM	1300 RPM
FREQUENCY	37 Hz	22 Hz
IMBALANCE LOAD AT NORMAL RUNNING	16.8 kN 3777 lbf	6.1 kN 1371 lbf
IMBALANCE LOAD IF ROTOR BREAKS UP ASSEMBLY (SINGLE BOLT FAILURE)	167.5 kN 37657 lbf	60.5 kN 13597 lbf
TORQUE AT FULL LOAD	561 Nm 414 lbft	1.3 kNm 987 lbft



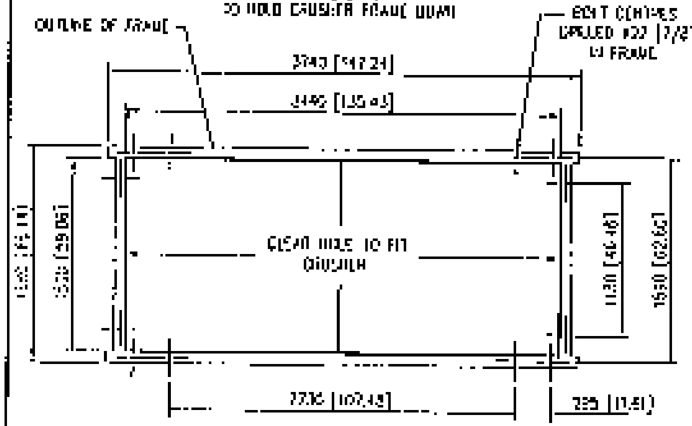
LEGS MANUFACTURED BY SVEDALA ARE RECOMMENDED AS THEY ARE THE CORRECT STIFFNESS FOR OPERATION WITH THE SVEDALA VIBRATION SWITCH

THE BARMAC MUST BE ALLOWED TO MOVE IN A HORIZONTAL PLANE 15mm [5/8"] OR FATIGUE DAMAGE TO THE BARMAC OR SUPPORT FRAME MAY RESULT



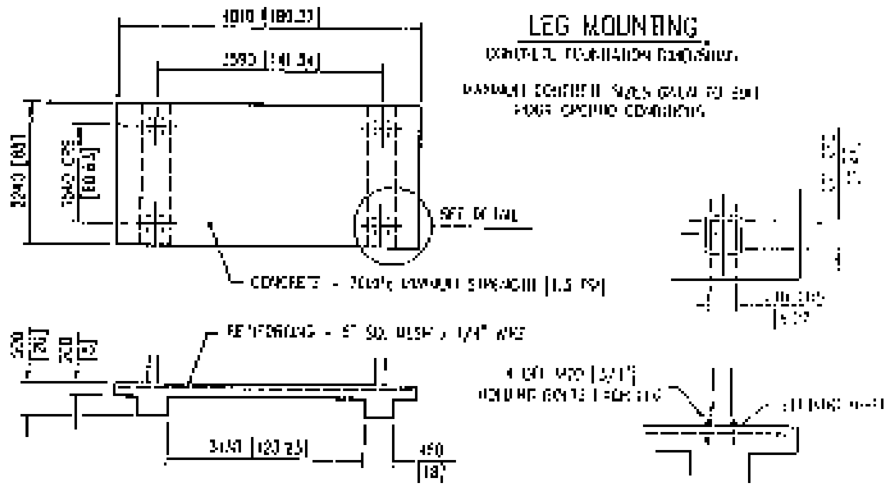
FRAME MOUNTING

FRAME BOLT DIMENSIONS
12 BOLTS M20 [3/4"] REQUIRED TO HOLD CRUSHER FRAME DOWN

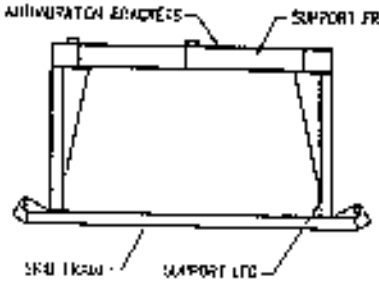


LEG MOUNTING

CONCRETE FOUNDATION DIMENSIONS
MINIMUM CONCRETE SIZES SHOWN TO SUIT POOR GROUND CONDITIONS



SVEDALA	CONFIDENTIAL © COPYRIGHT 1997	BARMAC B7000 DUOPACTOR SINGLE FEED / SINGLE DRIVE INSTALLATION CRUSHER SUPPORT OPTIONS	DRAWN Jarred Mudford	BARMAC
Svedala Barmac Limited	Copyright in this drawing belongs to Svedala Barmac Limited		CHECKED	DRAWING DATE 8 / 5 / 97
			DIMENSIONS mm [INCH]	PAGE 3 of 10	INS 70SFSD3



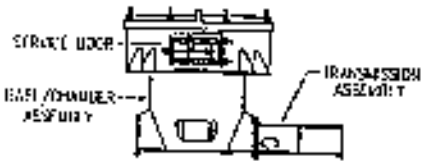
1. SUPPORT FRAMEWORK ASSEMBLY

A. IF ANEMISRATION MOUNTS ARE REQUIRED, FIT THESE TO THE TOP OF THE SUPPORT FRAME USING THE M12 x 55 BOLTS AND NUTS OF THE FLAT AND SPRING WASHERS PROVIDED IN BOLT SET B80AP10. TORQUE TO 60Nm (50 ft lb).

B. IF SUPPORT LEGS ARE REQUIRED FIT THESE TO THE THE SUPPORT FRAME USING THE M20 x 80 BOLTS, FLAT AND SPRING WASHERS PROVIDED IN BOLT SET B80AP10. TORQUE TO 325 Nm (220 ft lb).

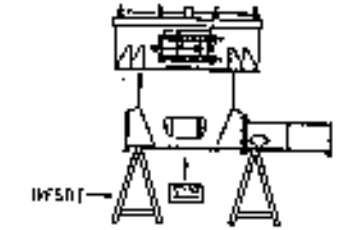
C. IF SKID FRAME IS REQUIRED, BOLT THE FRAME ASSEMBLY TO THIS WITH THE M20 x 55 BOLTS AND WASHERS PROVIDED IN BOLT SET B56AP22. TORQUE TO 285Nm (220 ft lb)

NOTE. IF THE LEGS AND SKID ARE NOT FITTED BOLT THE SUPPORT FRAME INTO YOUR OWN SUPPORT STRUCTURE NOW.



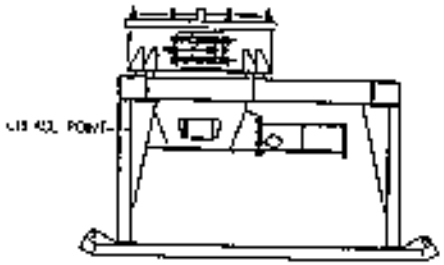
2. TRANSMISSION FITTING

ENSURE THE MATING SURFACES OF THE FLANGES ARE CLEAN, FLAT AND FREE FROM RUST. BOLT THE TRANSMISSION ASSEMBLY INTO THE BASE ASSEMBLY USING THE M20 x 80 BOLTS, FLAT AND SPRING WASHERS PROVIDED IN BOLT SET 970TS10V2A TORQUE TO 285 Nm (210 ft lb).
NOTE: THE TRANSMISSION ASSEMBLY MAYBE FITTED TO THE RIGHT OR LEFT HAND SIDE RELATIVE TO THE SERVICE DOOR AS REQUIRED.



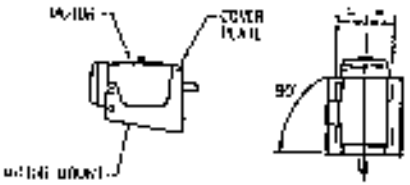
3. BARMAC PULLEY

SUPPORT THE BASE ASSEMBLY ON TRESTLES AND FIT THE BARMAC PULLEY TO THE BOTTOM OF THE SHAFT.
REFER TO PAGE 7 FOR APPROXIMATE FITTED HEIGHT OF PULLEY.
FOLLOW PULLEY MANUFACTURERS FITTING PROCEDURE FOR FITTING OF THE TAPERLOCKS



4. BASE FITTING

LOWER THE BASE ASSEMBLY INTO THE SUPPORT FRAME.
IF ANEMISRATION MOUNTS ARE FITTED, USE THE M12 x 35 BOLTS, FLAT AND SPRING WASHERS FROM THE BOLT SET PROVIDED TO AFFIX THE BASE. TORQUE TO 60Nm (50 ft lb) OTHERWISE USE THE 4 M24 x 80 BOLTS, FLAT AND SPRING WASHERS PROVIDED IN BOLT SET B80AP10 TO HOLD THE BASE TO THE SUPPORT FRAME. TORQUE TO 450 Nm (345 ft lb)



5. MOTOR FITTING

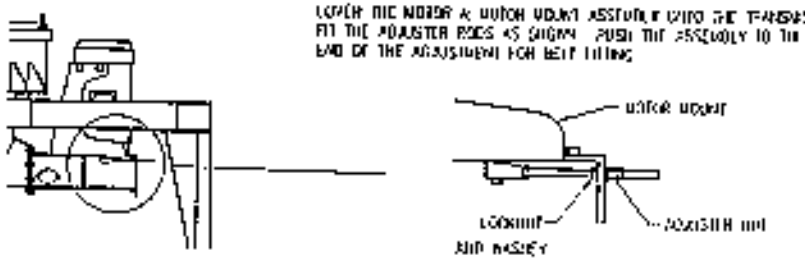
BOLT THE MOTOR TO THE MOTOR MOUNT USING THE APPROPRIATE BOLT SIZES FOR THE MOTOR BEING USED.
IF THE MOTOR MOUNT HAS NOT BEEN PREDRILLED REFER MOTOR AS SHOWN ON PAGE 7 OF THIS BOOKLET AND DRILL THE HOLES REQUIRED.
NOTE: HARDENED WASHERS SHOULD BE USED IN SECURING THE MOTOR TO THE MOTOR MOUNT.

6. MOTOR PULLEYS

FIT THE MOTOR SHEAVES TO THE MOTOR SHAFT.
REFER TO PAGE 7 FOR APPROXIMATE FITTED HEIGHT OF PULLEY.
FOLLOW PULLEY MANUFACTURERS FITTING PROCEDURE FOR FITTING OF TAPERLOCKS.

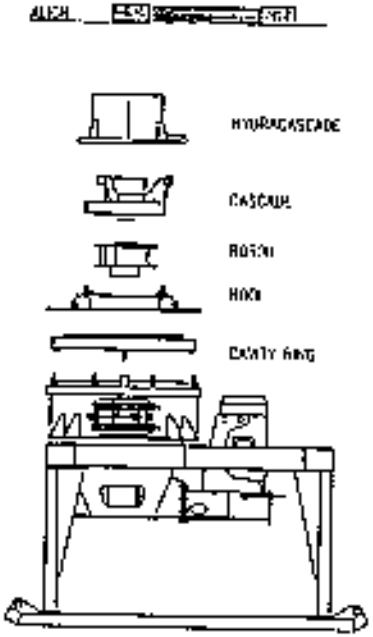
7. MOTOR MOUNT FITTING

LOWER THE MOTOR & MOTOR MOUNT ASSEMBLY INTO THE TRANSMISSION FIT THE ADJUSTER RODS AS SHOWN. PUSH THE ASSEMBLY TO THE CRUSHER END OF THE ADJUSTMENT FOR BELT FITTING



8. BELT FITTING

FIT THE BELTS BETWEEN THE TRANSMISSION AND MOTOR PULLEY.
REFER TO OPERATORS MANUAL FOR DETAILS OF FITTING AND TENSIONING.
ADJUST HEIGHT OF PULLEYS OR SHAFT IF REQUIRED SO THAT BOTH ARE WITHIN MAXIMUM ALLOWABLE MISSALIGNMENT - 3.6 (0.15) AT PULLEY CENTRES



9. CRUSHER TOP FITTING

DISASSEMBLE THE CRUSHER TOP HALF IF REQUIRED TO THE MAIN ASSEMBLY AS SHOWN

10. FINAL ASSEMBLY

REFER TO OPERATORS MANUAL FOR ASSEMBLY INSTRUCTIONS RELATING TO THE REMAINDER OF THE CRUSHER COMPONENTS

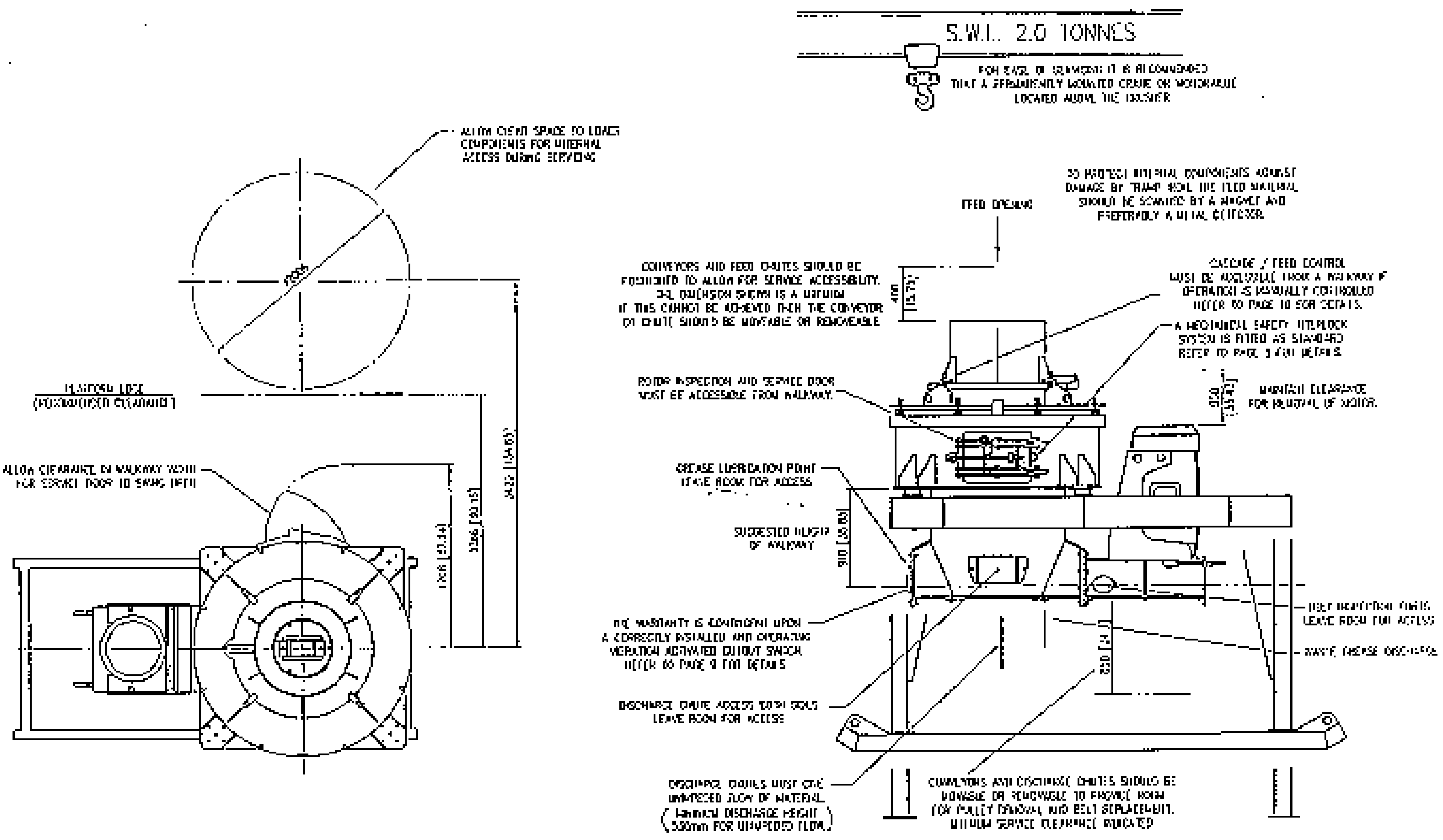
NOTE. IF IS POSSIBLE TO ASSEMBLE THE CRUSHER COMPONENTS IN ANY ORDER. THESE INSTRUCTIONS ASSUME ONLY ONE CRANE IS AVAILABLE AND WILL MAKE THE ASSEMBLY SEQUENCE AS EFFICIENT AND ECONOMICAL AS POSSIBLE

SVEDALA
Svedala Barmac Limited
Head Office: Private Bag 1671, Hamilton, New Zealand
Telephone +64 7 8486693 Facsimile +64 7 8486244

BARMAC B7000 DUOPACTOR
SINGLE FEED / SINGLE DRIVE INSTALLATION
CRUSHER ON-SITE ASSEMBLY

DRAWN	Jarrod Muggeridge
CHECKED	
DIMENSIONS mm (INCH)	PAGE 6 OF 10
DRAWING DATE	8 / 5 / 97
DRAWING NUMBER	INS 70SFSD6

BARMAC



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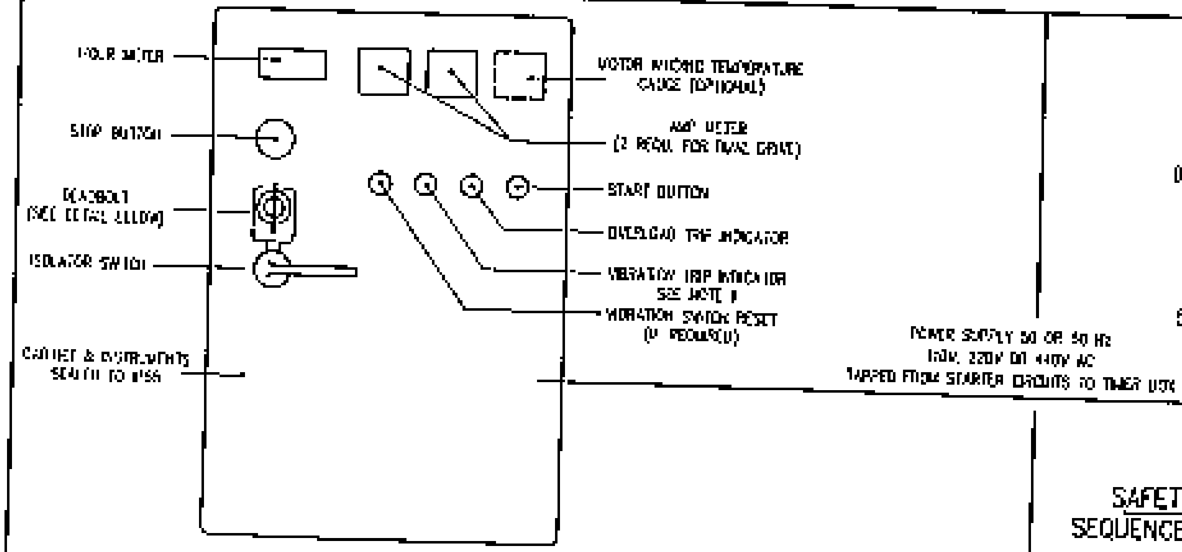
Svedala Barmac Limited

BARMAC B7000 DUOPACTOR
SINGLE FEED / SINGLE DRIVE INSTALLATION
CRUSHER SERVICE CONSIDERATIONS

DRAWN	Jaaaco Mudford	DRAWING DATE	DRAWING NUMBER
CHECKED		8 / 5 / 97	INS 70SFSD5
DIMENSIONS mm [INCH]	PAGE 5 OF 10		

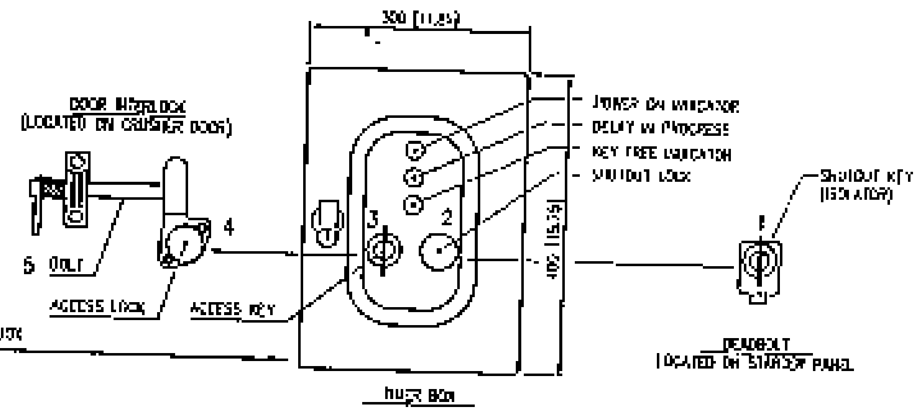
BARMAC

MOTOR STARTER



RECOMMENDED MINIMUM REQUIREMENTS SHOWN
ALSO : - SEMICONDUCTOR FUSES
- CAPABLE OF 2 STARTS PER HOUR
- RAMP UP TIME OF MAXIMUM 15 SEC

SEE PAGE 9 FOR INFORMATION ON INTEGRATION OF THE VIBRATION SWITCH TO THE CONTROL SYSTEM



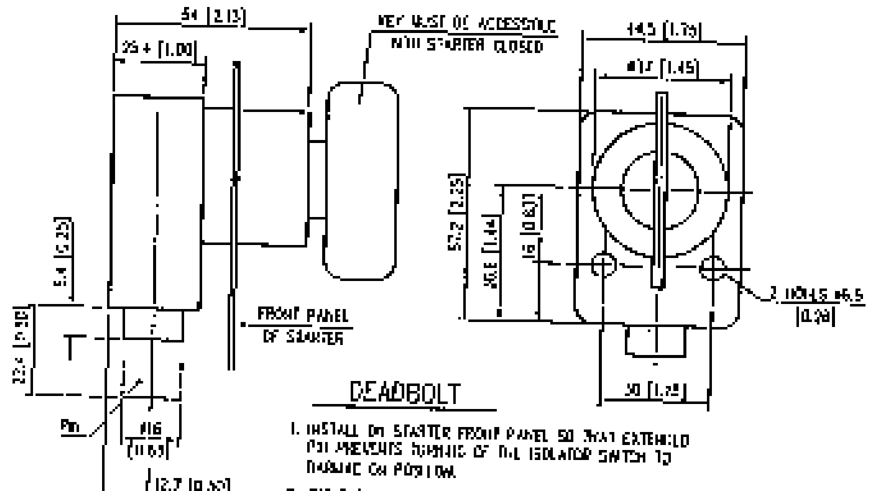
SAFETY INTERLOCK SEQUENCE OF OPERATION

FOR WIRING AND TESTING DETAILS, REFER TO THE MANUAL SUPPLIED WITH THE INTERLOCK KIT

1. TURN SHUTOUT KEY IN DEADBOLT AND REMOVE KEY
2. PUT SHUTOUT KEY IN SHUTOUT LOCK AND TURN
3. AFTER TIME DELAY HAS ELAPSED, TURN AND REMOVE ACCESS KEY
4. PUT ACCESS KEY IN ACCESS LOCK AND TURN.
5. RELEASE BOLT AND OPEN DOOR

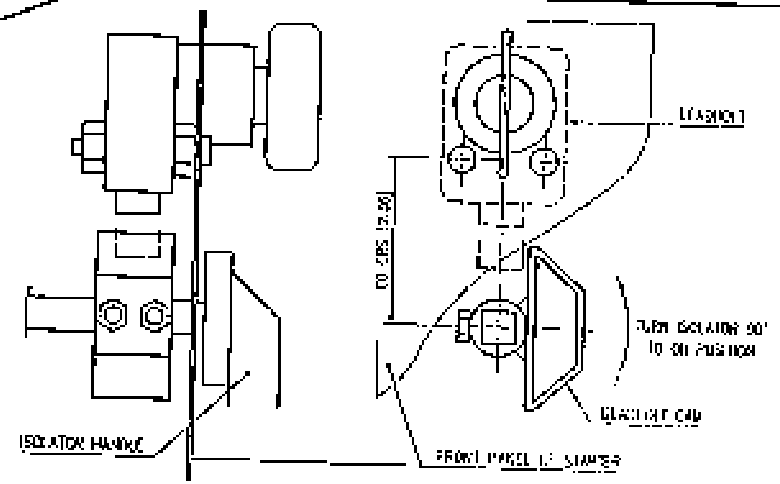
TO CLOSE DOOR, ENGAGE BOLT AND TRANSFER KEYS THROUGH REVERSE SEQUENCE. (TIME DELAY WILL NOT ACTIVATE IN REVERSE SEQUENCE)

DEADBOLT



1. INSTALL ON STARTER FRONT PANEL SO THAT EXTENDED PIN PREVENTS TURNING OF THE ISOLATOR SWITCH TO THE ON POSITION
2. THE BARMAC POWER SUPPLY MUST BE ISOLATED BEFORE THE PIN IS ABLE TO BE EXTENDED

DEADBOLT CAM



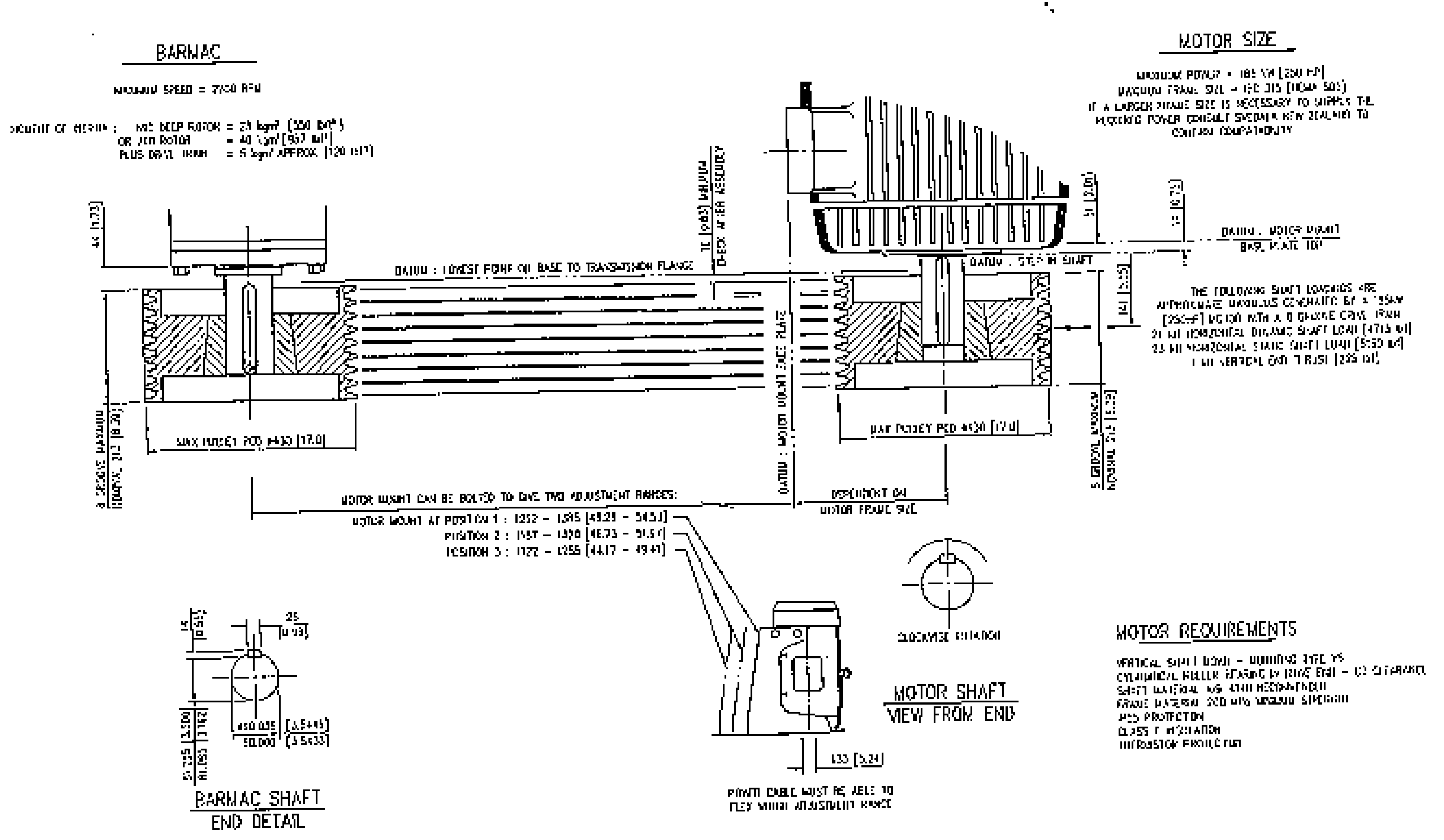
THIS DEADBOLT CAM IS SUPPLIED WITH THE INTERLOCK OR AND CAN BE USED IN CONJUNCTION WITH THE DEADBOLT TO PREVENT THE ISOLATOR WITHOUT PROTECTION. THE CAM WILL SUIT ANY ROTATING ISOLATOR SWITCH WITH 90° TURN OPERATION AND 6, 8 OR 12 mm SHAFTS. [1/4", 5/16" OR 15/32"]

IF THIS IS UNSUITABLE, YOUR BARMAC DEALER WILL BE ABLE TO ADVISE ON A SUITABLE ALTERNATIVE.

SVEDALA
Svedala New Zealand Limited

BARMAC B7000 DUOPACTOR
SINGLE FEED / SINGLE DRIVE INSTALLATION
SAFETY INTERLOCK AND STARTER

DRAWN	GARTH TAYLOR
CHECKED	
DIMENSIONS mm [INCH]	PAGE 8 OF 10
DRAWING DATE	14 / 5 / 96
DRAWING NUMBER	INS 70SFSD8



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Svedala New Zealand Limited

BARMAC B7000 DUOPACTOR
SINGLE FEED / SINGLE DRIVE INSTALLATION
CRUSHER DRIVE DETAILS

DRAWN CARTH TAYLOR
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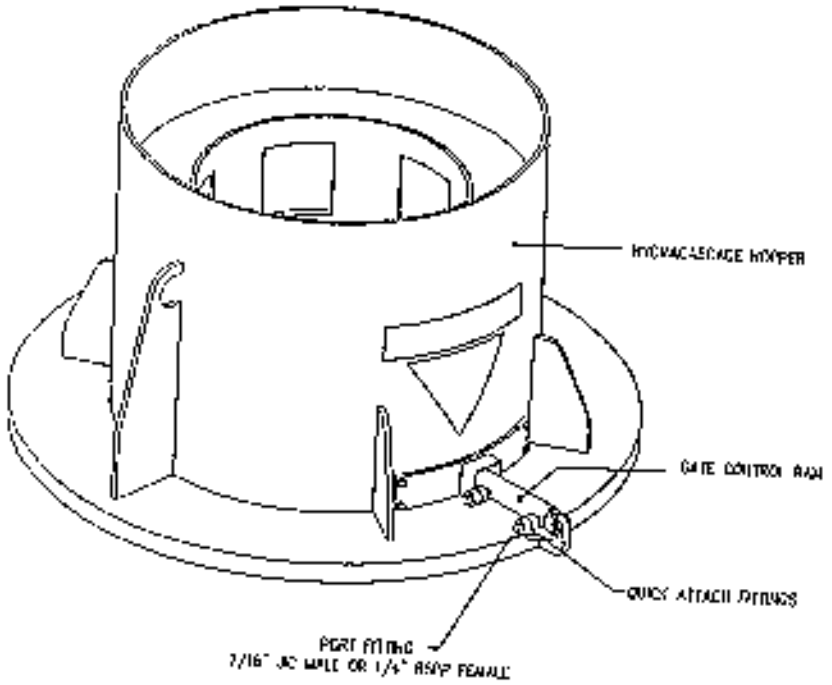
PAGE 7 OF 10
DIMENSIONS mm [INCH]

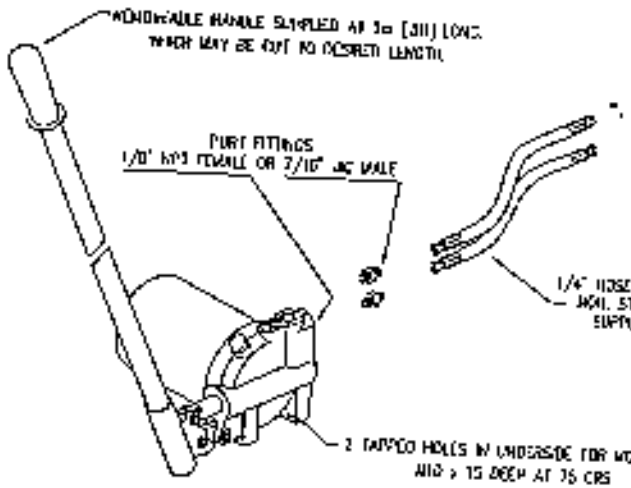
BARMAC

DRAWING DATE 11 / 6 / 96
DRAWING NUMBER INS 70SFSD7



OPTION 1
CUSTOMER SUPPLIED HYDRAULIC CONTROL

PROVIDE ANY TYPE OF HYDRAULIC PUMP TO ACTIVATE A DOUBLE ACTING RAM OF
2" BORE x 1" SPEAR x 4" STROKE
PUMP MUST HAVE PRESSURE RELIEF SET TO 2500PSI
MOTION OF SPEAR SHOULD BE NO MORE THAN 0.25" / SEC IN FASTEST DIRECTION

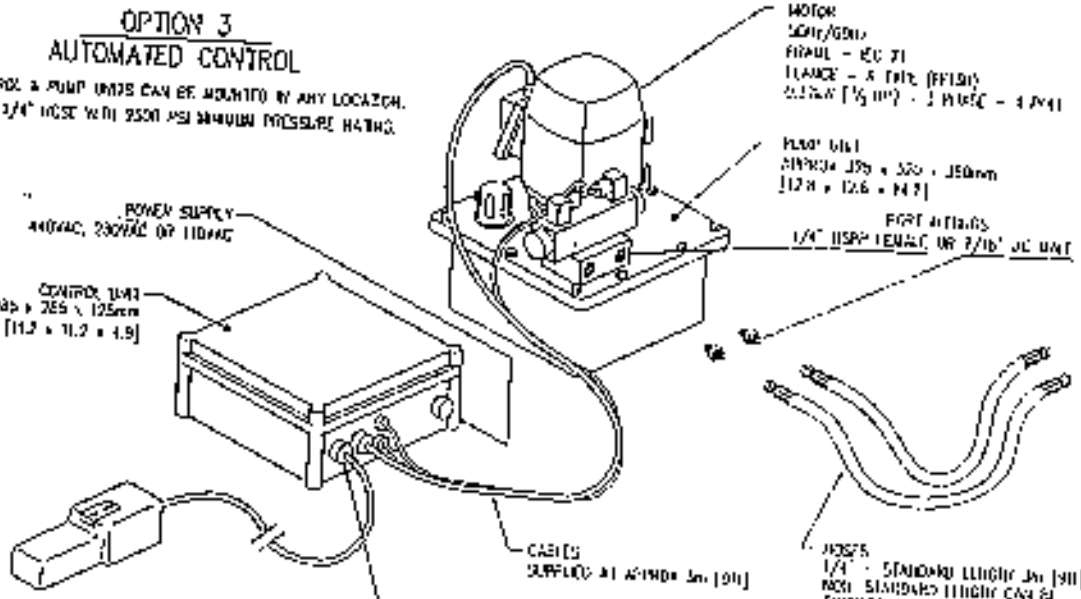


OPTION 2
HANDPUMP CONTROL

HANDPUMP CAN BE MOUNTED IN ANY LOCATION.
USE 1/4" HOSE WITH 2500 PSI MINIMUM PRESSURE RATING.

OPTION 3
AUTOMATED CONTROL

CONTROL & PUMP UNITS CAN BE MOUNTED IN ANY LOCATION.
USE 1/4" HOSE WITH 2500 PSI MINIMUM PRESSURE RATING.



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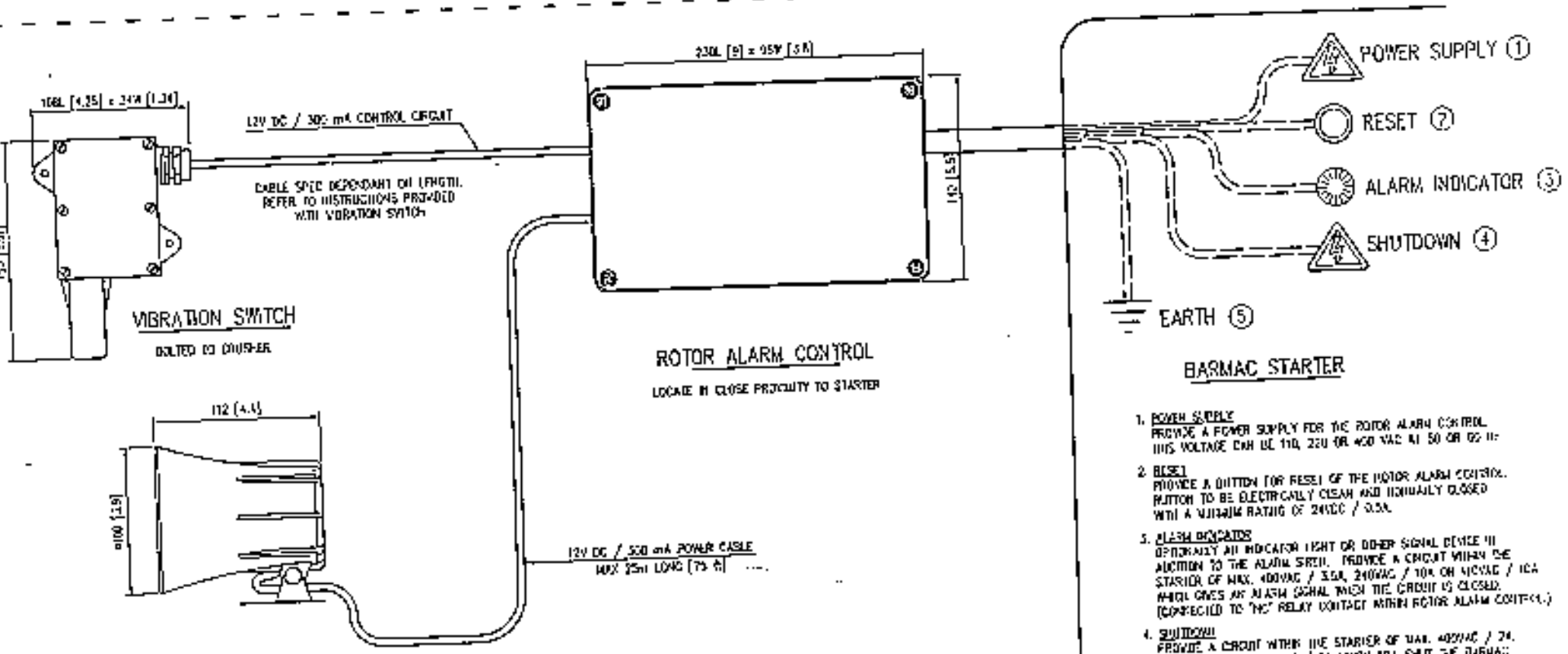
BARMAC B7000 DUOPACTOR
SINGLE FEED / SINGLE DRIVE INSTALLATION
HYDRACASCADE CONTROL

DRAWN JARROD MUDFORD		BARMAC	
CHECKED			
DIMENSIONS mm [INCH]	PAGE 10 of 10	DRAWING DATE 8 / 5 / 97	DRAWING NUMBER INS 70SFSD10



1. POWER SUPPLY
PROVIDE A POWER SUPPLY FOR THE ROTOR ALARM CONTROL. THIS VOLTAGE CAN BE 110, 230 OR 400 VAC AT 50 OR 60 Hz

2. RESET
PROVIDE A BUTTON FOR RESET OF THE ROTOR ALARM CONTROL. BUTTON TO BE ELECTRICALLY CLEAN AND NORMALLY CLOSED WITH A MINIMUM RATING OF 240VAC / 0.5A.

3. ALARM INDICATOR
OPTIONALLY AN INDICATOR LIGHT OR OTHER SIGNAL DEVICE TO ADDITION TO THE ALARM SIREN. PROVIDE A CIRCUIT WITHIN THE STARTER OF MAX. 400VAC / 3.5A, 240VAC / 10A OR 110VAC / 16A WHICH GIVES AN ALARM SIGNAL WHEN THE CIRCUIT IS CLOSED. (CONNECTED TO 'NO' RELAY CONTACT WITHIN ROTOR ALARM CONTROL)

4. SHUTDOWN
PROVIDE A CIRCUIT WITHIN THE STARTER OF MAX. 400VAC / 2A, 240VAC / 3A OR 110VAC / 3A WHICH WILL SHUT THE BARMAC DOWN WHEN THE CIRCUIT IS OPENED. (CONNECTED TO 'NO' RELAY CONTACT WITHIN THE ROTOR ALARM CONTROL.

5. EARTH
EARTH THE ROTOR ALARM CONTROL TO THE STARTER EARTH.

OPERATION

WHEN A VIBRATION CONDITION EXISTS, THE ALARM SIREN WILL SOUND IMMEDIATELY.

IF THE VIBRATION CEASES WITHIN THE TIMER SETTING (0 – 2 MINUTES), THE ALARM STOPS.

IF THE VIBRATION CONTINUES FOR LONGER THAN THIS SETTING, THE ROTOR ALARM CONTROL SHUTS DOWN THE CRUSHER AND THE ALARM SIREN CONTINUES TO SOUND.

WHEN CRUSHER SHUTS DOWN, PRESS THE "RESET" BUTTON TO RESET THE ROTOR ALARM CONTROL AND SILENCE THE ALARM SIREN. INVESTIGATE AND REMEDY THE CAUSE OF THE VIBRATION CONDITION BEFORE RESTARTING THE BARMAC IN THE NORMAL MANNER.

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Svedala New Zealand Limited

BARMAC B7000 DUOPACTOR
SINGLE FEED / SINGLE DRIVE INSTALLATION
VIBRATION CONTROL

DRAWN JUSTIN READ
CHECKED T.L.W
DIMENSIONS mm [INCH]
PAGE 9 OF 10

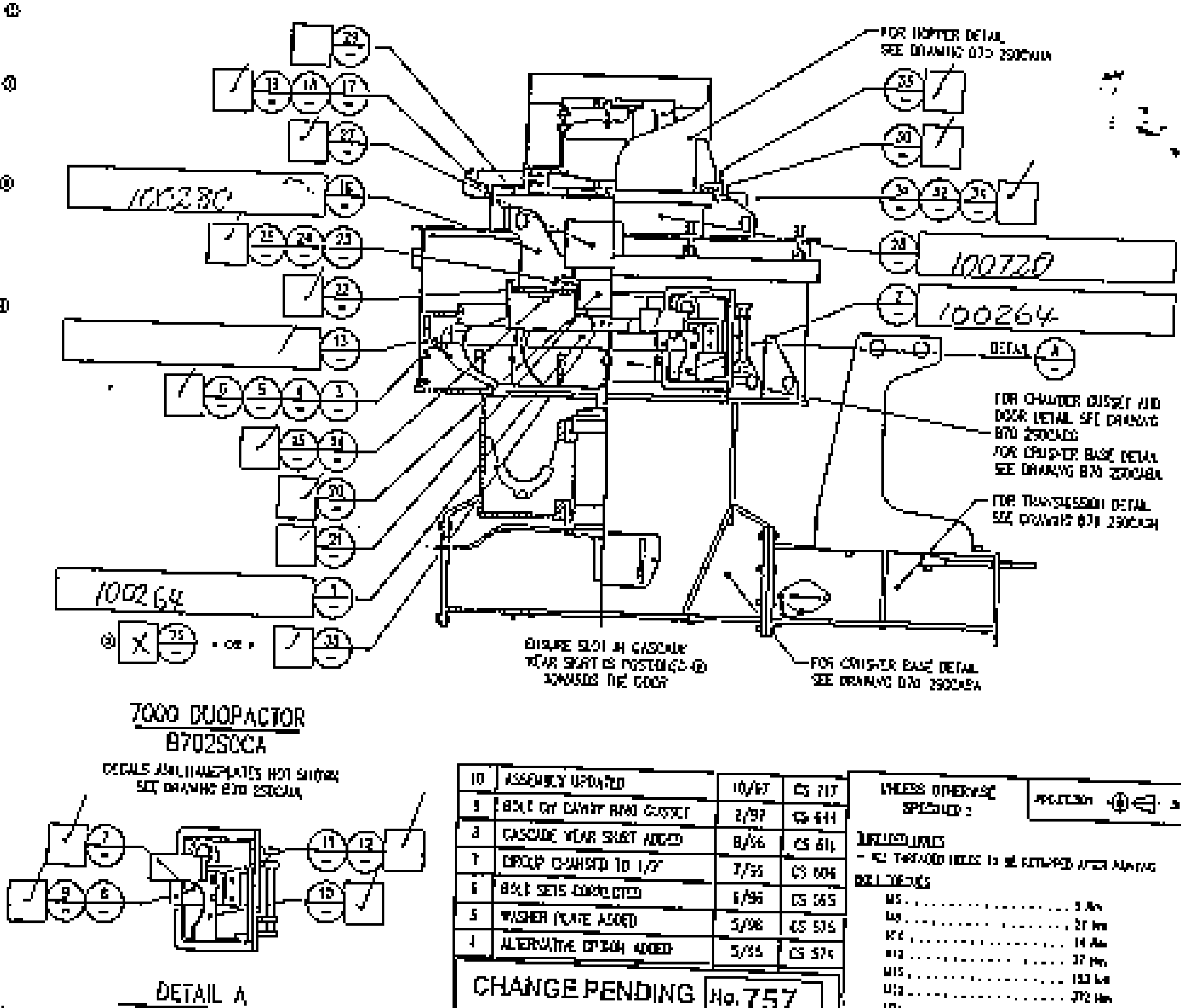
BARMAC

DRAWING DATE 28 / 6 / 96

DRAWING NUMBER INS 705FSD9

COMPONENT	DESCRIPTION	QTY.	ITEM
B702SOCA	7000 DUOPACTOR	1 ASSY	
B702S...	CAVITY RING ASSEMBLY	1 ASSY	
[illegible]	MAIN SECTION	1	8
[illegible]	DOOR SECTION	1	7
[illegible]	CAVITY RING BOLT SET	1 SET	
BOLT 20-80	BOLT/NUT M20 x 80 GRADE 8.8	2	3
WASHER F20	WASHER M20 FLAT	2	4
WASHER S20	WASHER M20 SPRING	2	5
[illegible]	WASHER PLATE	2	6
BOLT 24-80	BOLT M24 x 80 GRADE 8.8	2	7
WASHER F24	WASHER M24 FLAT	2	8
WASHER S24	WASHER M24 SPRING	2	9
[illegible]	CAVITY RING GUSSET	1	10
[illegible]	CAVITY RING GUSSET BOLT SET	1 SET	
BOLT 16-50	BOLT/NUT M16 x 50 GRADE 8.8	2	11
WASHER F16	WASHER M16 FLAT	2	12
[illegible]	CASCADE ASSEMBLY	1 ASSY	
[illegible]	CASCADE WEAR SKIRT KIT	1 KIT	
[illegible]	CASCADE WEAR SKIRT	1	35
[illegible]	WEAR SKIRT BOLT SET	1 SET	
BOLT 20-65	BOLT/NUT M20 x 65 GRADE 8.8	4	14
WASHER F20	WASHER M20 FLAT	4	15
[illegible]	CASCADE	1	36
[illegible]	CASCADE HANGER BOLT SET	1 SET	
SS 20-80	SETSCREW M20 x 80 GRADE 8.8	3	17
NUT 20	NUT M20 GRADE 8.8	6	18
WASHER F20	WASHER M20 FLAT	5	19
[illegible]	FEED TUBE HOLDER KIT	1 KIT	
[illegible]	FEED TUBE CLAMP SLEEVE	1	20
[illegible]	FEED TUBE HOLDER	1	21
[illegible]	CASCADE WEDGE	1	22
[illegible]	CASCADE WEDGE BOLT SET	1 SET	
BOLT 10-50	BOLT/NUT M10 x 50 GRADE 8.8	1	23
WASHER F10	WASHER M10 FLAT	8	24
WASHER S10	WASHER M10 SPRING	1	25
[illegible]	FEED TUBE	1	26
[illegible]	FLOW CONTROL RING	1	27
[illegible]	CRUSHER ROOF ASSEMBLY	1 ASSY	
[illegible]	ROOF	1	28
[illegible]	RUBBER STRIP	1 LN	
NEW 100	RUBBER STRIP 10mm	3140	29
[illegible]	ROOF CLAMP KIT	4 KITS	
[illegible]	CLAMP BRACKET	1	30
[illegible]	CLAMP SWING BOLT	1	31
[illegible]	CLAMP SWING BOLT PIN	1	32
[illegible]	SWING BOLT NUT	1	33
C/CLIP EX 1/2	CIRCLIP EXTERNAL 1/2"	1	34

COMPONENT	DESCRIPTION	QTY.	ITEM
* ALTERNATIVE CONFIGURATION *	ONLY IF SPECIFICALLY REQUESTED		
[illegible]	FEED TUBE	1	35
* REPLACES COMPONENT *			
[illegible]	FEED TUBE	1	26



ID			
10	ASSEMBLY UPDATED	10/97	CS 717
9	BOLT ON CAVITY RING GUSSET	2/97	CS 641
8	CASCADE WEAR SKIRT ADDED	8/96	CS 611
7	CIRCLIP CHANGED TO 1/2"	7/96	CS 606
6	BOLT SETS CORRECTED	6/96	CS 565
5	WASHER PLATE ADDED	5/96	CS 575
4	ALTERNATIVE OPTION ADDED	5/96	CS 574

CHANGE PENDING No. 757

Hold ☐ Refer ☐ Ignore ☑

UNLESS OTHERWISE SPECIFIED:

PROJECTION 3rd ANGLE

THREADED HOLES
- ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

BOLT TORQUES

M6 . . . . 9 Nm
M8 . . . . 21 Nm
M10 . . . . 44 Nm
M12 . . . . 77 Nm
M16 . . . . 183 Nm
M20 . . . . 372 Nm
M24 . . . . 640 Nm
M16 SWINGBOLT NUTS . . . . 34 Nm
M20 SWINGBOLT NUTS . . . . 141 Nm
- ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

SVEDALA

Svedala Barmac Limited
[illegible]

BARMAC 7000 DUOPACTOR
ASSEMBLY
TOP HALF DETAIL

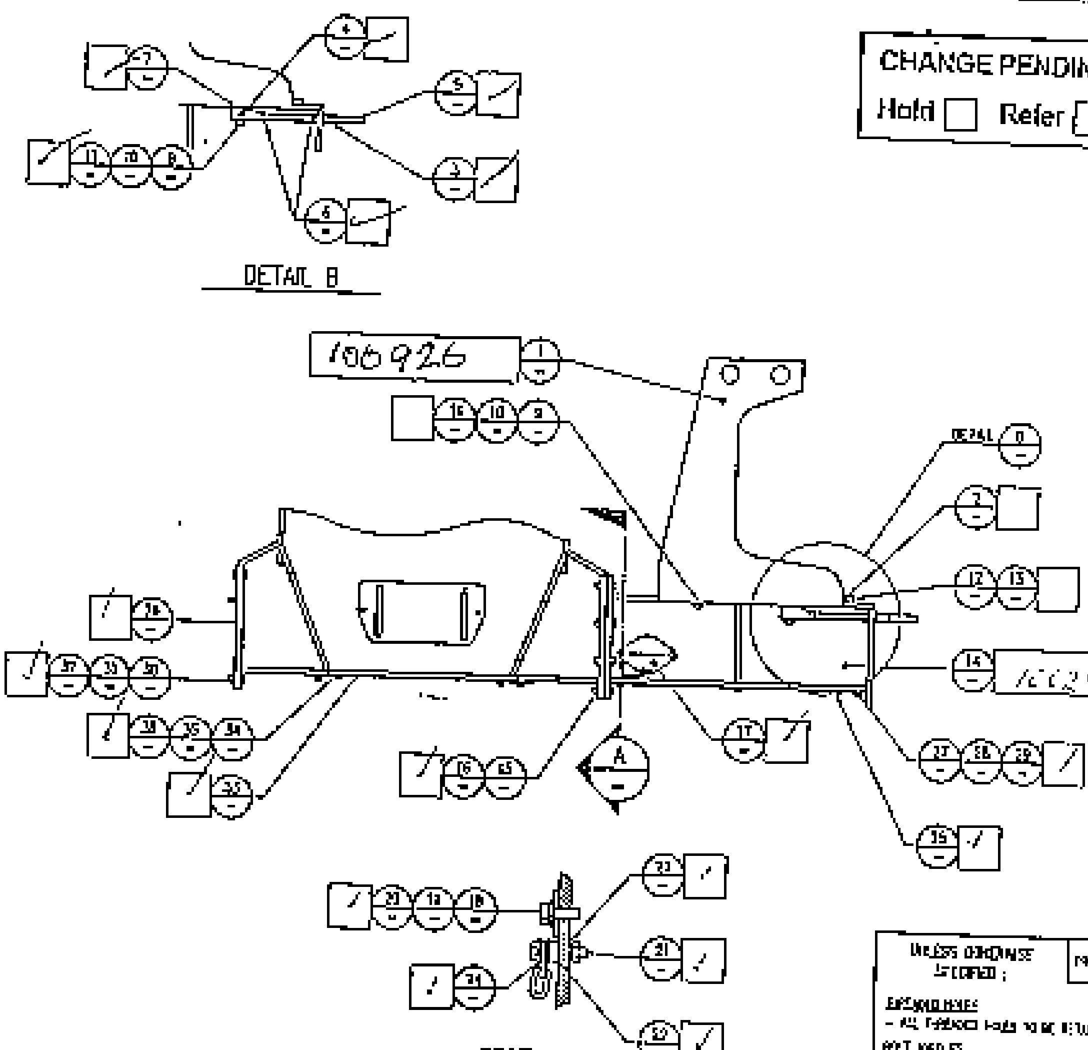
DRAWN Jarrod Mudford
CHECKED [signature]
DIMENSIONS mm
PART PAGE 1 OF 6
ISSUE PAGE OF

ISSUE REFERENCE 10157
SEDALES ORDER NUMBER 100161 - 1
DRAWING DATE 31 / 10 / 97
DRAWING NUMBER B70 2S0CA

[M24]

COMPONENT	DESCRIPTION	QTY	ITEM	
B702SOCA	7000 DUOPACTOR (CONTINUED)	1 ASSY		
[illegible]	HOIST MOUNT ASSEMBLY	1 ASSY		
[illegible]	HOIST MOUNT	1	1	
[illegible]	COVER PLATE	1	2	
[illegible]	ADJUSTER ROD KIT	2 KITS		
[illegible]	ADJUSTER NUT	1	3	
[illegible]	ADJUSTER BOSS	1	4	
[illegible]	ADJUSTER ROD	1	5	
[illegible]	LOCK NUT SET	1 SET		
NUT 24	NUT M24 GRADE 8.8	2	6	
[illegible]	ADJUSTER ROD WASHER	2	7	
[illegible]	HOIST MOUNT BOLT SET	1 SET		①
BOLT 24x150	BOLT / NUT M24 x 150 GRADE 8.8	2	8	
BOLT 24x80	BOLT / NUT M24 x 80 GRADE 8.8	1	9	
WASHER H24	WASHER M24 HARDENED	8	10	
WASHER S24	WASHER M24 SPRING	4	11	
CS 12x25	CAPSCREW M12 x 25 GRADE 8.8	2	12	
WASHER 1012	WASHER M12 FAN DISC	2	13	
[illegible]	TRANSMISSION ASSEMBLY	1 ASSY		
[illegible]	TRANSMISSION CASE	1	14	
[illegible]	TRANSMISSION CASE BOLT SET	1 SET		
BOLT 20x80	BOLT / NUT M20 x 80 GRADE 8.8	12	15	
WASHER H20	WASHER M20 HARDENED	24	16	
[illegible]	INSPECTION HOLE COVER PLATE	2	17	
[illegible]	INSPECTION HOLE COVER BOLT SET	2 SETS		①③
BOLT 12x30	BOLT M12 x 30 GRADE 8.8	2	18	
WASHER S12	WASHER M12 SPRING	2	19	
WASHER F12	WASHER M12 FLAT	2	20	
BOLT 16x55	BOLT / NUT M16 x 55 GRADE 8.8	4	21	
COLLAR 12	WASHER M12 COLLAR	1	22	
WASHER S10	WASHER M10 SPRING	1	23	
WASHER F10	WASHER M10 FLAT	2	24	
[illegible]	BELT GUARD ASSEMBLY	1 ASSY		
[illegible]	TRANSMISSION BELT GUARD	1	25	
[illegible]	TRANSMISSION PANEL	1	26	
[illegible]	TRANSMISSION GUARD BOLT SET	1 SET		②
BOLT 16x35	BOLT M16 x 35 GRADE 8.8	6	27	
WASHER S16	WASHER M16 SPRING	6	28	
WASHER F16	WASHER M16 FLAT	6	29	
[illegible]	TRANSMISSION PANEL BOLT SET	1 SET		①
BOLT 20x60	BOLT / NUT M20 x 60 GRADE 8.8	4	30	
WASHER S20	WASHER M20 SPRING	4	31	
WASHER F20	WASHER M20 FLAT	8	32	
[illegible]	CASE BELT GUARD	1	33	
[illegible]	BASE GUARD BOLT SET	1 SET		①
BOLT 16x35	BOLT M16 x 35 GRADE 8.8	4	34	
WASHER S16	WASHER M16 SPRING	4	35	
WASHER F16	WASHER M16 FLAT	4	36	

CHANGE PENDING No. 742
Hold ☐ Refer ☐ Ignore ☑



① SECTION A–A

7000 DUOPACTOR
B702SOCA

REV.	DETAIL OF CHANGE	DATE	REF.
4	ASSEMBLY UPDATED	10/97	CS 737
3	VARIOUS BOLT SET CHANGES	3/97	CS 657
2	BOLT SETS CORRECTED	6/96	CS 595
1	INSPECTION HOLE BOLTS CHANGED	5/96	CS 587

UNLESS OTHERWISE SPECIFIED : PROJECTION 3rd ANGLE

EXPANDING HOLES
– ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

BOLT TORQUES
M8 .... 9 Nm
M10 .... 72 Nm
M16 .... [illegible]
M12 .... [illegible]
M16 .... 186 Nm
M20 .... 357 Nm
M24 .... [illegible]
M16 SPRINGBOLT NUTS .... [illegible]
M20 SPRINGBOLT NUTS .... 141 Nm
– ALL THREADS TO BE [illegible] [illegible] PRIOR TO ASSEMBLY

SVEDALA

Svedala Barmac Limited
[illegible]

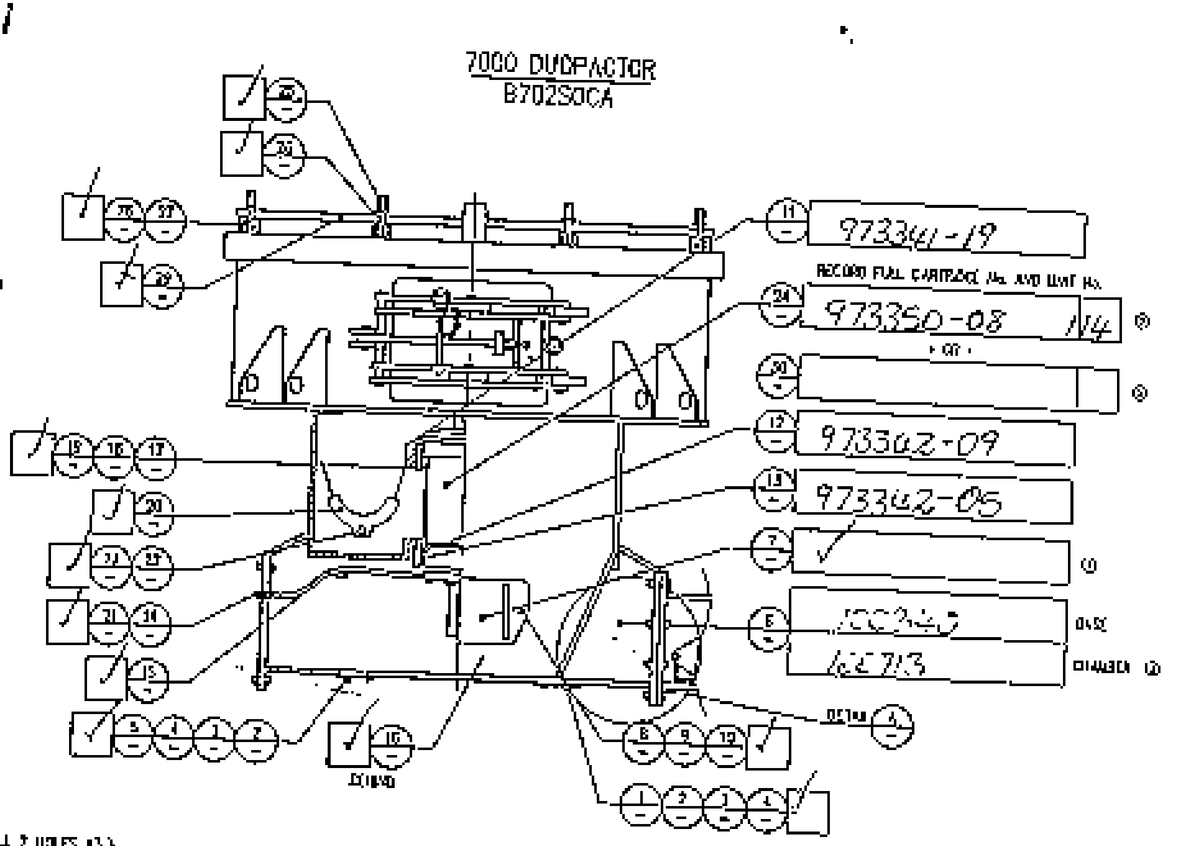
BARMAC 7000 DUOPACTOR
ASSEMBLY
TRANSMISSION DETAIL

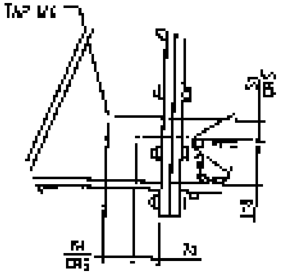
DRAWN Jarrod Mudford
CHECKED [signature]
DIMENSIONS mm
PART PAGE 2 OF 6
ISSUE PAGE OF

ISSUE REFERENCE 101157
REQUISITION NUMBER 100861-1
DRAWING DATE 31 / 10 / 97
DRAWING NUMBER B70 2SOCATR

TA 241

COMPONENT	DESCRIPTION	QTY	ITEM
B70250CA	7000 DUOPACTOR (CONTINUED)	1 ASSY	
- 07025?00?	CRUSHER BASE ASSEMBLY	1 ASSY	
- B7025?05A	GREASE DUCT		
- B7025?0??	GREASE DUCT BOLT SET	1 SET	
- BOLT 16x35	BOLT M16 x 35 GRADE 8.8	4	2
- WASHER S16	WASHER M16 SPRING	4	3
- WASHER F16	WASHER M16 FLAT	4	4
- B7025?0?A	GREASE HOLE BLANK PANEL	1	5
- B7025?00B	CRUSHER BASE	1	6
- B7025?02A	CRUSHER BASE INSPECTION DOOR KIT	2 KITS	
- B7025?0?A	CRUSHER BASE INSPECTION DOOR	1	7
- B7025?0?A	BASE INSPECTION DOOR BOLT SET	1 SET	
- BOLT 12x35	BOLT M12 x 35 GRADE 8.8	4	8
- WASHER S12	WASHER M12 SPRING	4	9
- WASHER F12	WASHER M12 FLAT	4	10
- B7025?00A	TOP TAPER RING	1	11
- B7025?04A	BOTTOM TAPER RING OUTER	1	12
- B7025?05A	BOTTOM TAPER RING INNER	1	13
- B7025?05A	GREASE NIPPLE	3 EA	
- ?? 1/8	GREASE NIPPLE 1/8" BSP	1	14
- B7025?00A	GREASE HOSE	3	15
- B7025?10A	GREASE CHUTE	1	16
- B7025?01A	TAPER RING BOLT SET	1 SET	
- BOLT 20x??	BOLT M20 x 90 GRADE 8.8	16	17
- ?? 20x??	?? M20 x 50 GRADE 8.8	4	18
- WASHER ?20	WASHER M20 ??? DISC	15	19
- B7025?0?0	GUSSET WEAR CASTING	4	20
- B7025?0?A	BULKHEAD FITTING	3	21
- B7025?0?A	GUSSET CASTING BOLT SET	1 SET	
- BOLT 16x100	BOLT / NUT M16 x 100 GRADE 8.8	4	22
- WASHER F16	WASHER M16 FLAT	4	23
- B7025?0?A	BEARING CARTRIDGE ASSEMBLY	1	24
- B7025?00?	SWING BOLT KIT	8 KITS	
- B7025?0??	SWING BOLT NUT	1	25
- B7025?0?A	FOOT SWING BOLT	1	26
- B7025?0?A	SWING BOLT PIN	1	27
- C/CLIP E.C 16	CIRCLIP EXTERNAL 16mm	1	28
- B7025?0?A	RUBBER STRIP	1 EA	
- KEY ??	RUBBER STRIP 12mm	EDGE	29
COMPONENT	DESCRIPTION	QTY	ITEM
* ALTERNATIVE CONFIGURATION *	ONLY IF SPECIFICALLY REQUESTED		
B8025?000	BEARING CARTRIDGE HIGH TEMPERATURE SERVICE	1	30
* REPLACES COMPONENT *			
B8025?0CA	BEARING CARTRIDGE ASSEMBLY	1	24





DETAIL A

REV.	DETAIL OF CHANGE	DATE	REF.
11	BOLLING DIMENSIONS GIVEN	2/00	CS 728
10	ASSEMBLY UPDATED	10/97	CS 717
9	VARIOUS BOLT SET CHANGES	1/97	CS 652
8	CRUSHER BASE WAS AH A	3/97	CS 664
7	BOLLING REPLACED BY GROUP	10/96	CS 618
6	BOLT SETS CORRECTED	5/96	CS 595
5	ALTERNATIVE OPTION ADDED	5/96	CS 574
4	PART NUMBER CORRECTED	2/96	CS 559
3	NUMBER CYCLE No. RECORDED	10/95	CS 525
2	CARTRIDGE UNIT No. ADDED	8/95	CS 505
1	NEW DOOR AND BOLT SET	7/95	CS 493

UNLESS OTHERWISE SPECIFIED :

THREADED HOLES
- ALL THREADED HOLES TO BE DEBURRED AFTER MACHINING

BOLT TORQUES
M6 ... 9 Nm
M8 ... 22 Nm
M10 ... 44 Nm
M12 ... 77 Nm
M16 ... 190 Nm
M20 ... 372 Nm
M24 ... 642 Nm
M16 SWING BOLT NUTS ... 14 Nm
M20 SWING BOLT NUTS ... 14 Nm

- ALL THREADS TO BE LIGHTLY GREASED PRIOR TO ASSEMBLY

SVEDALA

Svedala Barmac Limited

Ranquahua Road, Private Bag ????, Matangi, New Zealand
Telephone +64 7 ???????? Facsimile +64 7 ????????

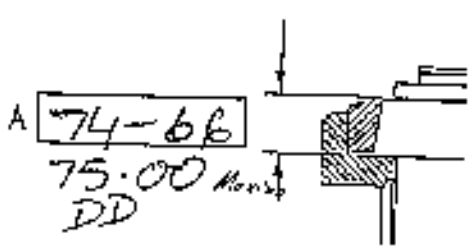
BARMAC 7000 DUOPACTOR
ASSEMBLY
CRUSHER BASE DETAIL

DRAWN	Jarrod Murcia	ISSUE REFERENCE	REQUISITION NUMBER
CHECKED	[signature]	101157	1001161-1
DIMENSIONS mm	PART 3 of 6	DRAWING DATE	DRAWING NUMBER
	ISSUE	4 / 2 / 99	B70 2S0CABA

TA241

BEARING CARTRIDGE FITTING

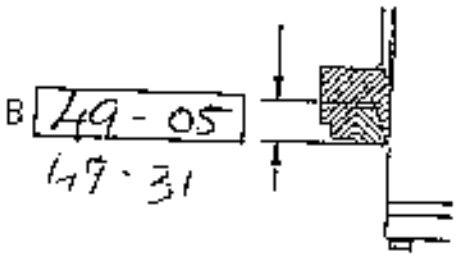
This form to stay with the base until stage 12 of Bearing Cartridge Fitting ED513



A 74-66
75.00 mm
DD

Minimum Dimension "A"

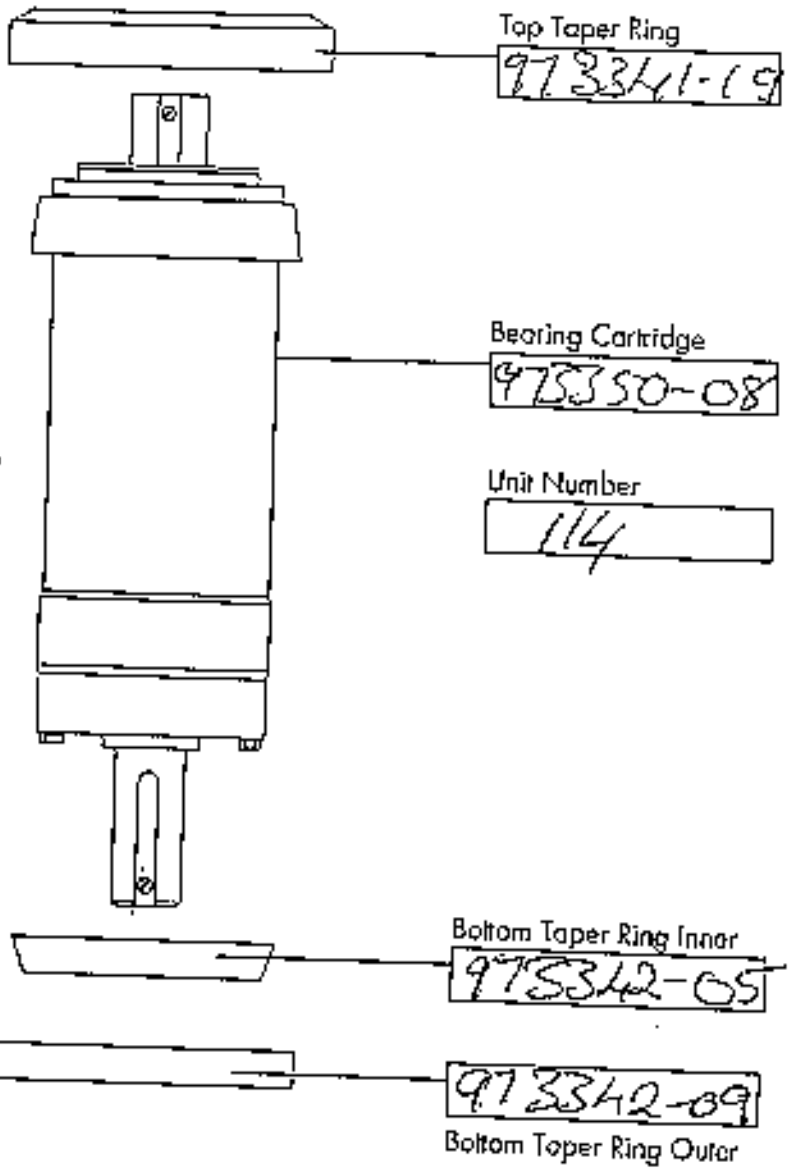
2400/3000	38
4800/5000	48
MkI/6000/7000/8000/MkII	72 mm
MkIII/9000	102



B 49-05
49.31

Minimum Dimension "B"

2400/3000	24
4800/5000	24
MkI/6000/7000/8000/MkII	47 mm
MkIII/9000	47



Top Taper Ring: 973341-19

Bearing Cartridge: 975350-08

Unit Number: 114

Bottom Taper Ring Inner: 975342-05

973342-09
Bottom Taper Ring Outer

Base Type: 7000

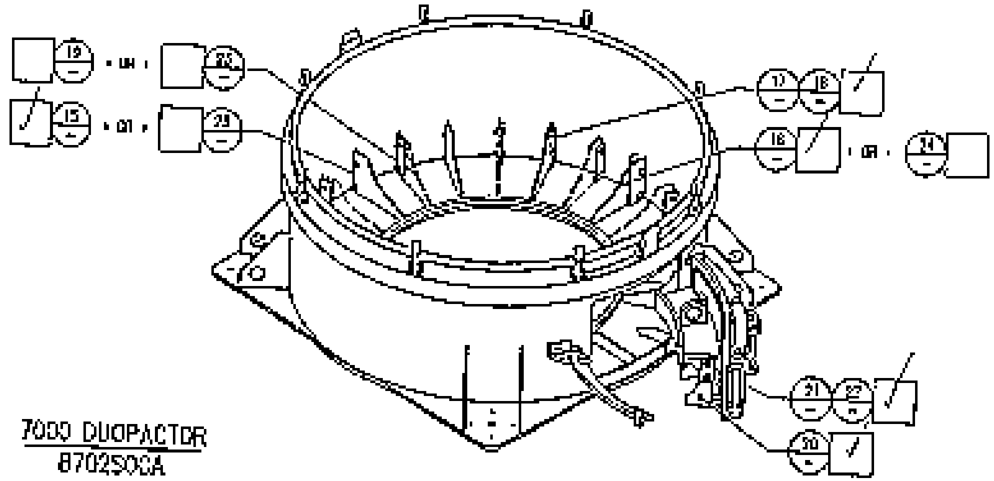
Base Number: 100340

TM 241

Assembled By: _____ Signed

Date: 27-3-96

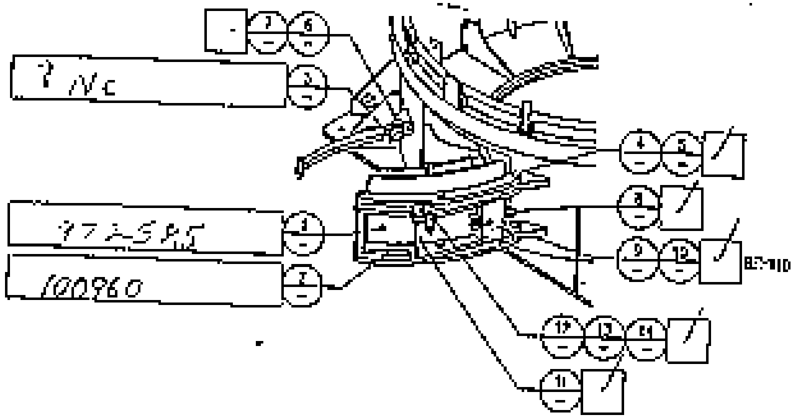
COMPONENT	DESCRIPTION	QTY.	ITEM
[illegible]	7000 DUOPACTOR (CONTINUED)	1 ASSY	
- [illegible]	DUOPACTOR DOOR ASSEMBLY (COMBINED)	1 ASSY	
- [illegible]	DOOR	1	
- [illegible]	DOOR HINGE FRAME	1	2
- [illegible]	DOOR HANDLE	1	3
- [illegible]	DOOR FRAME HINGE PIN KIT	1 KIT	
- [illegible]	HINGE PIN LONG	1	1
- C/CLIP [illegible]	CIRCLIP EXTERNAL 30mm	1	5
- [illegible]	DOOR HANDLE HINGE PIN KIT	1 KIT	
- [illegible]	HINGE PIN SHORT	1	6
- C/CLIP [illegible]	CIRCLIP EXTERNAL 30mm	1	7
- [illegible]	LOCK PIN	1	8
- [illegible]	SPRING	1	9
- [illegible]	ROLLPIN 6 x 45	1	10
- [illegible]	SAFETY PIN	1	11
- [illegible]	SAFETY PIN CHAIN BOLT SET	1 SET	
- BOLT 10-40	BOLT M10 x 40 GRADE 8.8	1	12
- WASHER S10	WASHER M10 SPRING	1	13
- WASHER F10	WASHER M10 FLAT	1	14
- [illegible]	STANDARD BOLT ON GUSSET SET	1 SET	
- [illegible]	GUSSET - LONG	9	15
- [illegible]	GUSSET - SHORT	3	16
- [illegible]	GUSSET BOLT SET	1 SET	
- BOLT 16-45	BOLT/NUT M16 x 45 GRADE 8.8	32	17
- WASHER F16	WASHER M16 FLAT	32	18
COMPONENT	DESCRIPTION	QTY.	ITEM
* ALSO AVAILABLE *	WHEN ORDERED SEPARATELY		
- [illegible]	INTERMEDIATE BOLT ON GUSSET SET - SHANGHAI	1 SET	
- [illegible]	GUSSET - LONG	10	19
- [illegible]	GUSSET BOLT SET	1 SET	
- BOLT 16-45	BOLT/NUT M16 x 45 GRADE 8.8	20	17
- WASHER F16	WASHER M16 FLAT	32	18
- [illegible]	CAVITY RING GUSSET	2	20
- [illegible]	CAVITY RING GUSSET BOLT SET	2 SETS	
- BOLT 16-50	BOLT/NUT M16 x 50 GRADE 8.8	2	21
- WASHER F16	WASHER M16 FLAT	2	22
COMPONENT	DESCRIPTION	QTY.	ITEM
* ALTERNATIVE CONFIGURATION *	ONLY IF SPECIFICALLY REQUESTED		
- [illegible]	WELDED BOLT ON GUSSET SET	1 SET	
- [illegible]	GUSSET - LONG	12	23
- [illegible]	GUSSET - SHORT	2	24
- [illegible]	GUSSET BOLT SET	2 SETS	
- BOLT 16-45	BOLT/NUT M16 x 45 GRADE 8.8	21	17
- WASHER F16	WASHER M16 FLAT	32	18
- [illegible]	CAVITY RING GUSSET	2	20
- [illegible]	CAVITY RING GUSSET BOLT SET	3 SETS	
- BOLT 16-50	BOLT/NUT M16 x 50 GRADE 8.8	3	21
- WASHER F16	WASHER M16 FLAT	2	22
* OBVIOUS COMPONENT *			
- [illegible]	STANDARD BOLT ON GUSSET SET	1 SET	



7000 DUOPACTOR
870250CA

ENSURE GUSSETS ARE BOLTED IN POSITION SHOWN

FIT EXTRA CAVITY RING GUSSETS TO EACH END OF THE DOOR SECTION



1	ASSEMBLY UPDATED	11/97	GS 717
REV.	DETAIL OF CHANGE	DATE	REF.

UNLESS OTHERWISE SPECIFIED :

PROJECTION — 3rd ANGLE

THREADED HOLES
- ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

BOLT TORQUES
- M8 . . . . 9 Nm
- M10 . . . . 32 Nm
- M12 . . . . 41 Nm
- M16 . . . . 77 Nm
- M20 . . . . 193 Nm
- M24 . . . . 378 Nm
- M30 . . . . 643 Nm
- M16 SPECIFIED NUTS . . . . . . 74 Nm
- M20 SPECIFIED NUTS . . . . . . 141 Nm
- ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

SVEDALA

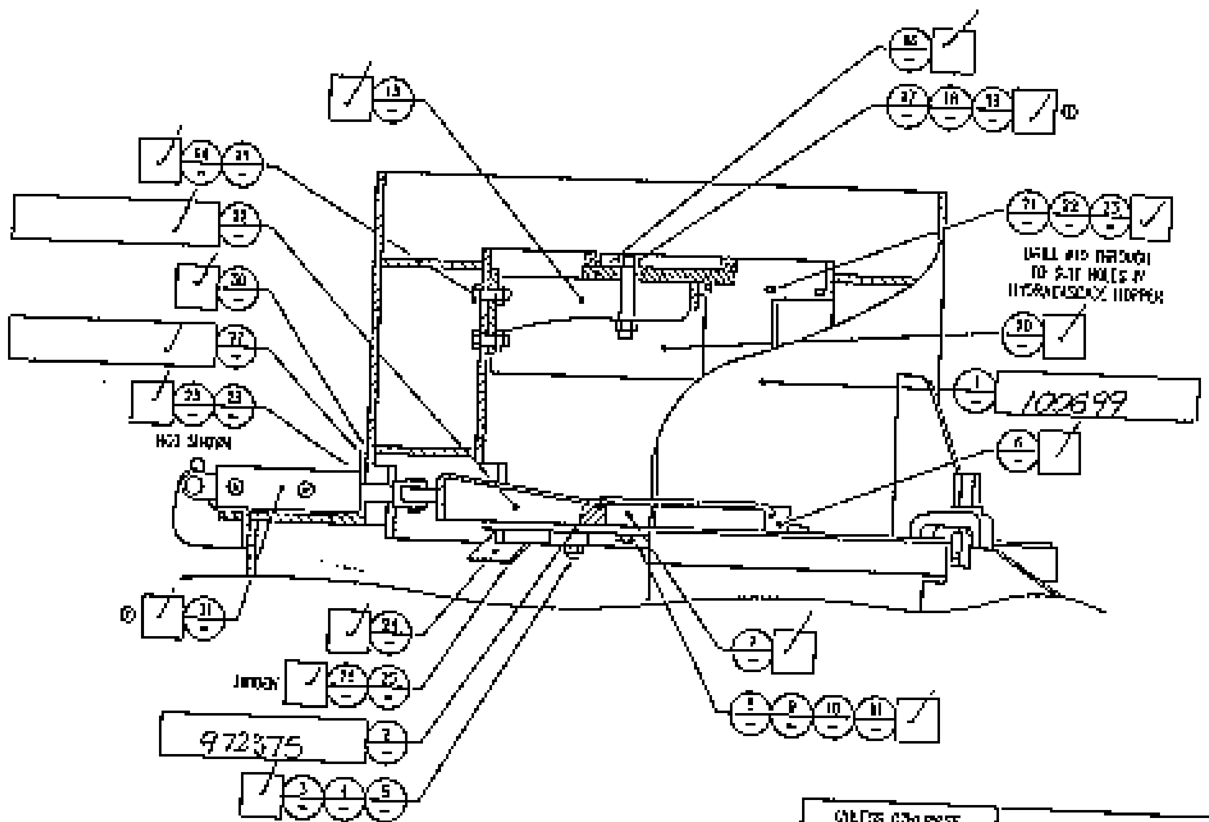
Svedala Barmac Limited
[illegible] Road, Private Bag 4001, Hamilton, New Zealand
Telephone +64 7 [illegible] Facsimile +64 7 [illegible]

BARMAC 7000 DUOPACTOR
ASSEMBLY
DOOR AND GUSSET DETAIL

DRAWN	Jarrod Mudford	ISSUE REFERENCE	REQUISITION NUMBER
CHECKED	[signature]	101157	1061161-1
DIMENSIONS mm	PART Page 4 of 5	DRAWING DATE	DRAWING NUMBER
	ISSUE Page of	3 / 11 / 97	870 250CACG

TM241

COMPONENT	DESCRIPTION	QTY.	ITEM	
B702SOCA	7000 DUOPACTOR (CONTINUED)	1 ASSY		
– B70259300A	HOPPER ASSEMBLY	1 ASSY		
– B70259311A	INTERCASCADE HOPPER	1	1	
– B70253520A	CONTROL PLATE KIT	1 KIT		
– B70259121A	CONTROL PLATE	1	2	
– B90259172A	CONTROL PLATE BOLT SET	1 SET		④
– BOLT 16-55	BOLT / NUT M16 x 55 GRADE 8.8	3	3	
– WASHER S16	WASHER M16 SPRING	3	4	
– WASHER F16	WASHER M16 FLAT	3	5	
– B70259123A	CONTROL PLATE FIN LINER	1	5	
– B70259127A	CONTROL PLATE SIDE LINER	2	7	
– B90259125A	CONTROL PLATE LINER BOLT SET	1 SET		
– BOLT 16-40	BOLT M16 x 40 GRADE 8.8	4	8	
– WASHER F16	WASHER M16 FLAT	4	5	
– BOLT 12-30	BOLT M12 x 30 GRADE 8.8	2	10	
– WASHER F12	WASHER M12 FLAT	4	11	
– [illegible]	CHUTE	1	13	
– B70259354A	SPREADER BRACKET KIT	1 KIT		
– B70259331A	SPREADER BRACKET	1	15	
– B90159337A	SPREADER BRACKET BOLT SET	1 SET		②
– BOLT 16-45	BOLT / NUT M16 x 45 GRADE 8.8	2	14	
– WASHER FD16	WASHER M16 [illegible] DISC	2	15	
– B70259340A	SPREADER PLATE KIT	1 KIT		①
– B70259351A	SPREADER PLATE	1	16	
– B70259342A	SPREADER BOLT SET	1 SET		①
– NUT 24	NUT M24 GRADE 8.8	1	17	
– WASHER [illegible]	WASHER M24 HARDENED	1	18	
– WASHER S24	WASHER M24 SPRING	1	19	
– B70259354A	RUBBER SKIRT KIT	1 KIT		
– B70259351A	RUBBER SKIRT	1	35	
– B90059352A	SKIRT BOLT SET	1 SET		
– BOLT 8-35	BOLT / NUT M8 x 35 GRADE 8.8	12	31	
– WASHER F8	WASHER M8 FLAT	12	32	
– WASHER S8	WASHER M8 SPRING	12	33	
– B70259360A	AIR TRANSFER BLADE KIT	1 KIT		
– B70259361A	AIR TRANSFER BLADE	9	24	
– B90259362A	AIR TRANSFER BLADE BOLT SET	1 SET		
– BOLT 12-30	BOLT / NUT M12 x 30 GRADE 8.8	10	25	
– WASHER S12	WASHER M12 SPRING	33	26	
– B70259370A	RAM COVER KIT	1 KIT		
– B70259371A	RAM COVER	1	27	
– B90259372A	RAM COVER BOLT SET	1 SET		
– BOLT 12-10	BOLT M12 x 40 GRADE 8.8	4	28	
– WASHER F12	WASHER M12 FLAT	4	29	
– B70259173A	RAM COVER GASKET	1	30	
– B70259150A	HYDRAULIC RAM ASSEMBLY	1	31	②



7000 DUOPACTOR
B702SOCA

REV.	DETAIL OF CHANGE	DATE	AUT.
4	ASSEMBLY UPDATED	12/97	CS 717
3	VARIOUS BOLT SET CHANGES	5/97	CS 657
2	HYDRAULIC RAM ASSEMBLY ADDED	5/96	CS 571
1	BOLT SET CHANGE	10/95	CS 536

UNLESS OTHERWISE SPECIFIED:

PROJECTION: 3rd ANGLE

DIMENSIONS
- ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

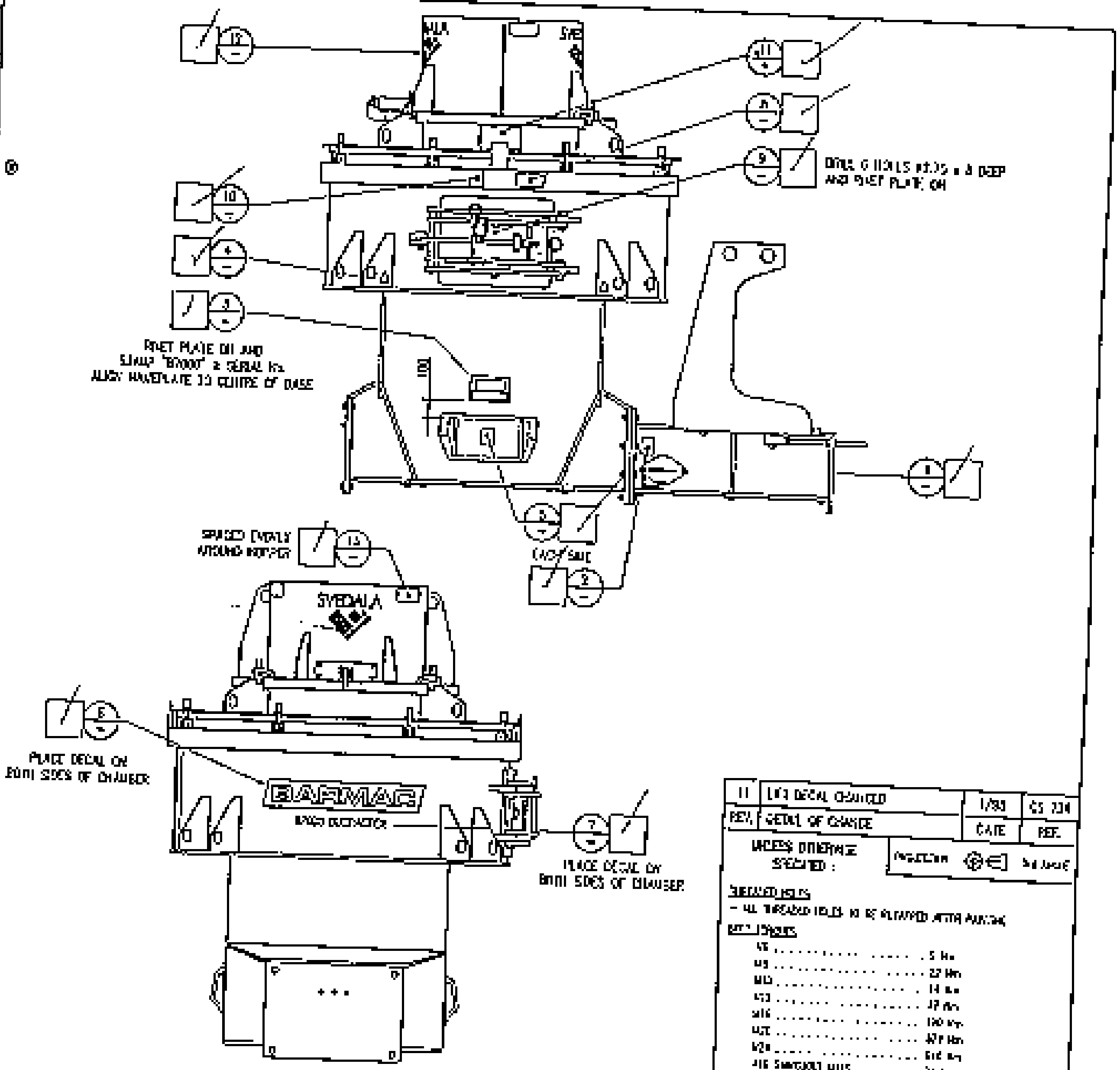
BOLT TORQUES
- ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

BARMAC 7000 DUOPACTOR
ASSEMBLY
HOPPER DETAIL

DRAWN: GARTH TAYLOR
CHECKED: [signature]
PART: 5 of 6
ISSUE REFERENCE: 101157
REQUISITION NUMBER: 100161-1
DRAWING DATE: 11 / 11 / 97
DRAWING NUMBER: B70 2SOCARA

TM241

COMPONENT	DESCRIPTION	QTY.	ITEM
B702SOCA	7000 DUOPACTOR (CONTINUED)	1 ASSY	
- B702570204	TRANSMISSION ASSEMBLY (CONTINUED)	1 ASSY	
- 0902550231	DECAL "BELT TENSION"	1	1
- 850255C19A	DECAL "WARNING - DO NOT OPEN"	2	2
- B702520000	CRUSHER BASE ASSEMBLY (CONTINUED)	1 ASSY	
- 0962520070	BASE NAMEPLATE	1	3
- E55355C17C	LIFT DECAL	4	4
- 0902720194	DECAL "WARNING - DO NOT OPEN"	2	5
- B702550C4A	DECAL "BARMAC"	2	6
- B70255005A	DECAL "B7000 DUOPACTOR"	2	7
- E5595560C3	DECAL "DANGER - DO NOT OPEN"	1	8
- 0962560068	NAMEPLATE PATENT	1	9
- E562550311	DECAL "REFIT SAFETY PIN"	1	10
- B70258000A	CRUSHER ROOF ASSEMBLY (CONTINUED)	1 ASSY	
- B962560134	DECAL "DIRECTION OF ROTOR"	1	11
- B712590000A	HIGHCASCADE HOPPER ASSEMBLY (CONTINUED)	1 ASSY	
- 070293011A	DECAL "SVEDALA"	2	12
- B602565014	DECAL "DO NOT CLEAR"	2	13
COMPONENT	DESCRIPTION	QTY.	ITEM
ALSO AVAILABLE-	WHEN ORDERED SEPARATELY		
- 570ADTA	DECAL SET	1 SET	
- 4552510250	DECAL "BELT TENSION"	1	1
- 0902570194	DECAL "WARNING - DO NOT OPEN"	2	2
- B062520070	LIFT DECAL	4	4
- 2702552044	DECAL "BARMAC"	2	6
- B707550C5A	DECAL "B7000 DUOPACTOR"	2	7
- E572550069	DECAL "DANGER - DO NOT OPEN"	1	8
- 5552550310	DECAL "REFIT SAFETY PIN"	1	10
- 0357560134	DECAL "DIRECTION OF ROTOR"	3	11
- 090255012A	DECAL "SVEDALA"	2	12
- 552253011A	DECAL "DO NOT CLEAR"	3	13



7000 DUOPACTOR
B702SOCA

11	LIFT DECAL CHANGED	1/99	CS 734
REV.	DETAIL OF CHANGE	DATE	REF.

UNLESS OTHERWISE SPECIFIED :

THREADED HOLES
- ALL THREADED HOLES TO BE FLATTENED AFTER PAINTING

BOLT TORQUES
M6 . . . . 5 Nm
M8 . . . . 22 Nm
M10 . . . . 14 Nm
M12 . . . . 37 Nm
M16 . . . . 190 Nm
M20 . . . . 479 Nm
M24 . . . . 610 Nm
M16 SHAKEPROOF NUTS . . . . 71 Nm
M20 SHAKEPROOF NUTS . . . . 314 Nm
- ALL FASTENERS TO BE CORRECTLY LUBRICATED PRIOR TO ASSEMBLY

PROJECTION

SVEDALA

Svedala Barmac Limited
Mangakotukutuku Road, Frankton, Box 4011, Hamilton, New Zealand
Telephone (64 7) 8476999 Facsimile (64 7) 8476344

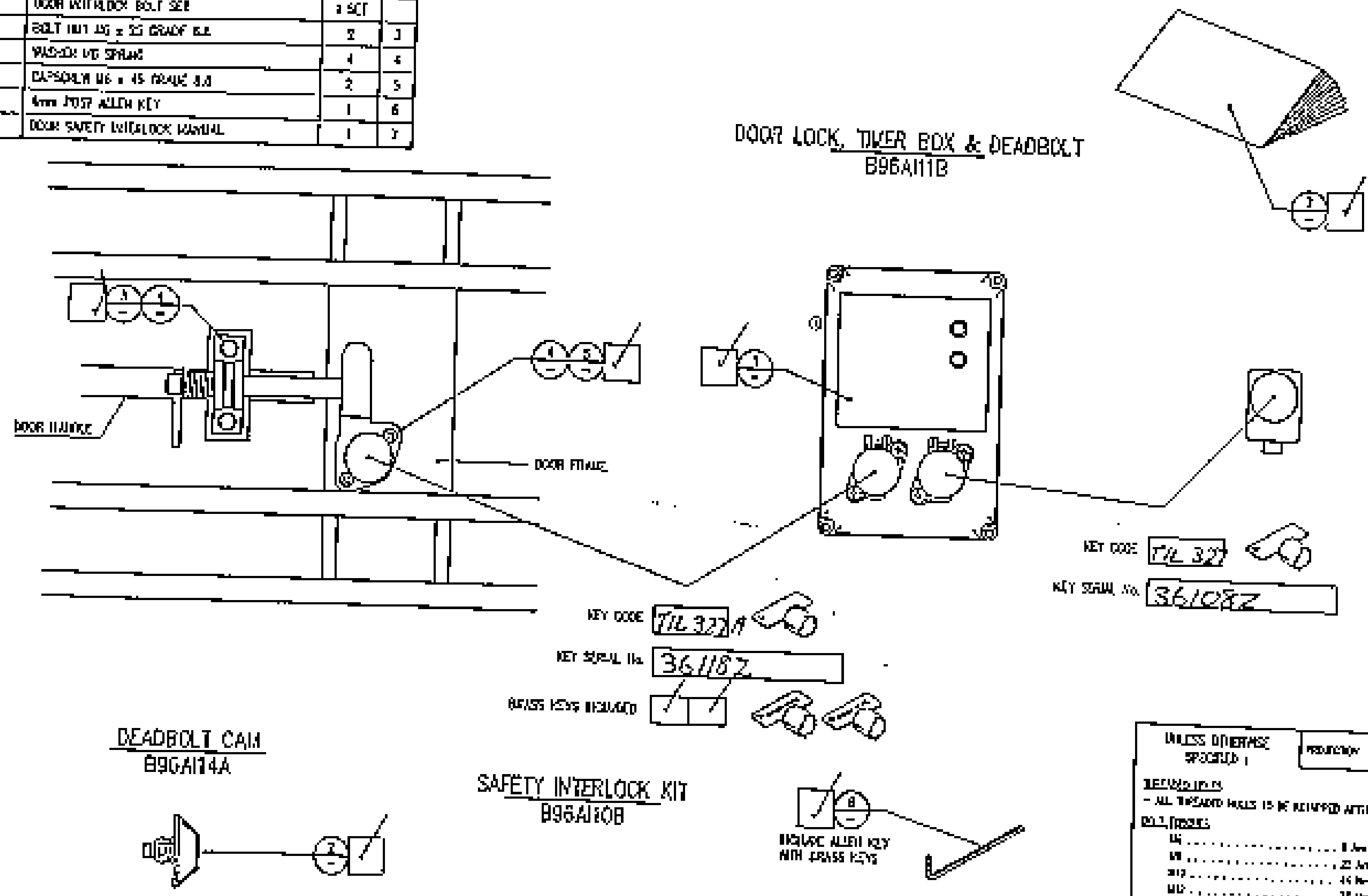
BARMAC 7000 DUOPACTOR
ASSEMBLY
DECAL / NAMEPLATE POSITIONS

DRAWN	GARTH TAYLOR
CHECKED	[signature]
MACHINES	PART Page 6 of 6
REV	ISSUE

ISSUE REFERENCE	REQUISITION NUMBER
10157	001161-1
DRAWING DATE	DRAWING NUMBER
15 / 1 / 99	B70 250CADL

TAZA 1

COMPONENT	DESCRIPTION	QTY.	ITEM
B96A110B	SAFETY INTERLOCK KIT	1 ASSY	
– B96A111B	DOOR LOCK, TIMER BOX & DEADBOLT	1 ASSY	1
– B96A114A	DEADBOLT CAM KETL – ZP 15	1 EA	
– B96A115A	DOOR INTERLOCK BOLT SET	1 SET	
– BOLT 6-25	BOLT NUT M6 x 25 GRADE 8.8	2	3
– WASHER 6G	WASHER M6 SPRING	4	4
– CAPSCREW 6-45	CAPSCREW M6 x 45 GRADE 8.8	2	5
– B96A176A	4mm POST ALLEN KEY	1	6
– P202	DOOR SAFETY INTERLOCK MANUAL	1	7



UNLESS OTHERWISE SPECIFIED:

PROJECTION 3rd ANGLE

THREADED HOLES
– ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

BOLT TORQUES

M6	8 Nm
M8	22 Nm
M10	45 Nm
M12	77 Nm
M16	190 Nm
M20	372 Nm
M24	640 Nm
M8 SHACKLE NUTS	21 Nm
M20 SHACKLE NUTS	114 Nm

* ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

REV.	DETAIL OF CHANGE	DATE	INIT.
2	ASSEMBLY UPDATED	10/97	CS JL
1	INTERLOCK UNIT CHANGED	4/97	CS DM

SVEDALA

Svedala Barmac Limited
Manganese Road, Private Bag 4011, Hamilton, New Zealand
Telephone +64 7 8496321 Facsimile +64 7 8496195

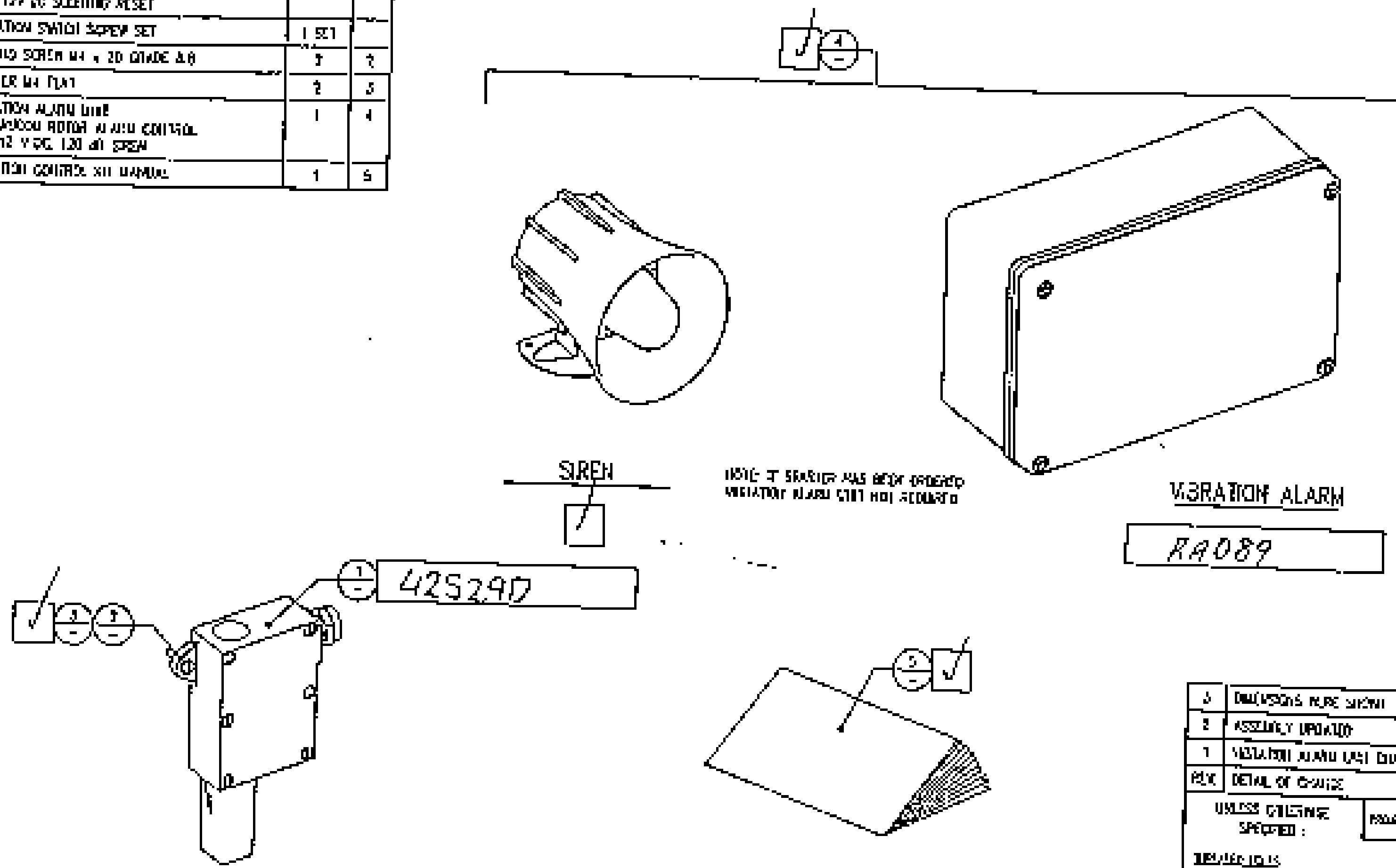
BARMAC 9600 DUOPACTOR
SAFETY INTERLOCK KIT

DRAWN Jhardo Muirhead
CHECKED [signature]
DIMENSIONS: MM
PART PAGE 1 OF 1
ISSUE PART OF

ISSUE REFERENCE 101165
REQUISITION NUMBER 100461-1
DRAWING DATE 22 / 10 / 97
DRAWING NUMBER B96 A110B

TM291

COMPONENT	DESCRIPTION	QTY.	ITEM
B96AV10A	VIBRATION CONTROL KIT	1 KIT	
B96AV11A	[illegible] KIT	[illegible]	[illegible]
B96AV12A	VIBRATION SWITCH TYPE - 3171 12V DC SOLENOID RESET	1	1
B96AV13A	VIBRATION SWITCH SCREW SET	1 SET	
CHS HD SCREW M4×20	CHS HD SCREW M4 × 20 GRADE 8.8	2	2
WASHER M4	WASHER M4 FLAT	2	3
B96AV14A	VIBRATION ALARM UNIT AVCON ROTOR ALARM CONTROL 12 V DC 120 dB SIREN	1	4
P364	VIBRATION CONTROL KIT MANUAL	1	5



VIBRATION CONTROL KIT
B96AV10A

REV	DETAIL OF CHANGE	DATE	REF.
3	DIMENSIONS WERE SHOWN	1/98	CS 728
2	ASSEMBLY UPDATED	10/97	CS 717
1	VIBRATION ALARM UNIT CHANGED	7/95	CS 609

UNLESS OTHERWISE SPECIFIED :

PROJECTION: 3rd ANGLE

THREADED HOLES
- ALL THREADED HOLES TO BE ASSEMBLED AFTER PAINTING

BOLT TORQUES
- ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

SVEDALA

Svedala Barmac Limited

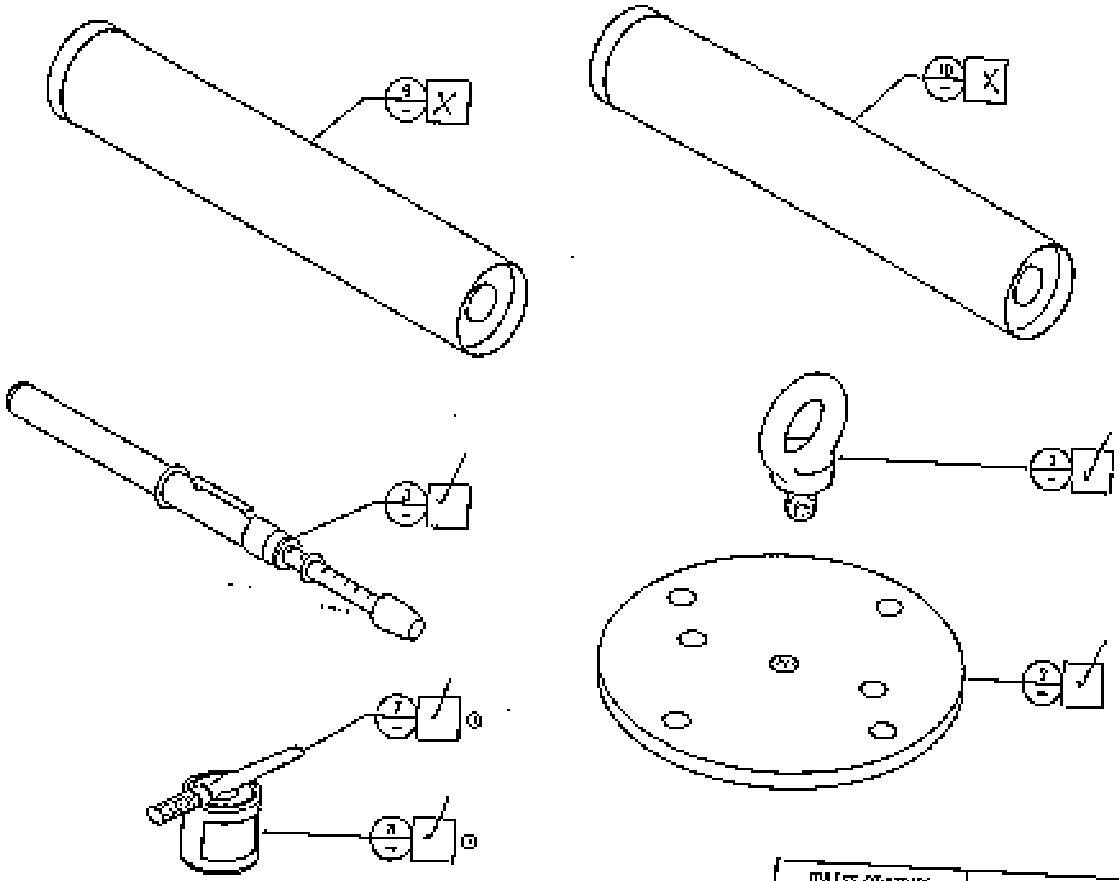
BARMAC 0600 DUOPACTOR
VIBRATION CONTROL KIT

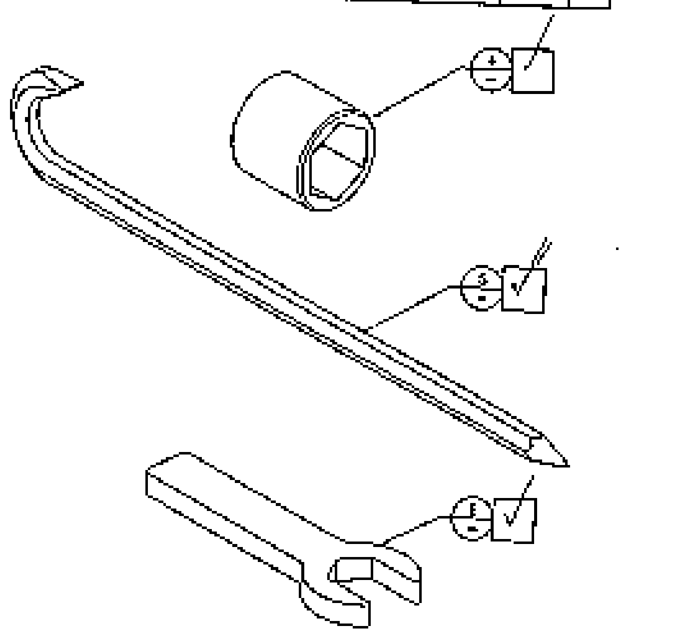
DRAWN	JARROD MURDOCH
CHECKED	[signature]
PART	1 of 1
ISSUE	
CODE REFERENCE	10467
PRODUCTION NUMBER	100461-1
DRAWING DATE	3 / 2 / 98
DRAWING NUMBER	B96 AV10A

TM241

COMPONENT	DESCRIPTION	QTY.	ITEM
B69AS00A	SERVICE TOOL KIT	1	
- B55AS13	LIFTING KIT	1 KIT	
- D90AS108	LIFTING EYE BOLT M24	1	1
- D93AS139	ROTOR LIFTING PLATE	1	2
- D95AS14	BOLT T[illegible]	1	3
- B35AS15	DISTRIBUTOR BOLT SOCKET 36 A/F x 1/2" SQUARE DRIVE	1	4
- B55AS16	PODGER BAR 600 Long x 16 Section	1	5
- D90AS17	STAND BOLT SPANNER	1	6
- B39AS19	TOUCH-UP PAINT KIT	1 KIT	(1)
- D30AS19/A	BRUSH	1	7
- D30AS19/B	PAINT LEVERES CATALYTIC 250ml	1	8

COMPONENT	DESCRIPTION	QTY.	ITEM
* ALSO AVAILABLE *	WHEN ORDERED SEPARATELY		
- B30AS80A	GREASE CARTRIDGE - NORMAL TEMPERATURE CASTROL OPTIMOL LONGTIME PD2	1	9 (2)
- B33AS80	GREASE CARTRIDGE - HIGH TEMPERATURE MOBIL MOBILITH SHC220	1	10 (2)





SERVICE TOOL KIT
B69AS00A

UNLESS OTHERWISE SPECIFIED :

PROJECTION: 3rd ANGLE

THREADED HOLES
- ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

BOLT TORQUES

M6	9 Nm
M8	22 Nm
M10	44 Nm
M12	77 Nm
M16	190 Nm
M20	370 Nm
M24	640 Nm
M16 STANDPOST NUTS	74 Nm
M12 STANDPOST NUTS	114 Nm

- ALL THREADS TO BE LIGHTLY GREASED PRIOR TO ASSEMBLY

REV.	DETAIL OF CHANGE	DATE	REF.
1	TOUCH-UP PAINT KIT	4/98	CS 464
2	GREASE CART. ADDED	1/99	CS 635

SVEDALA

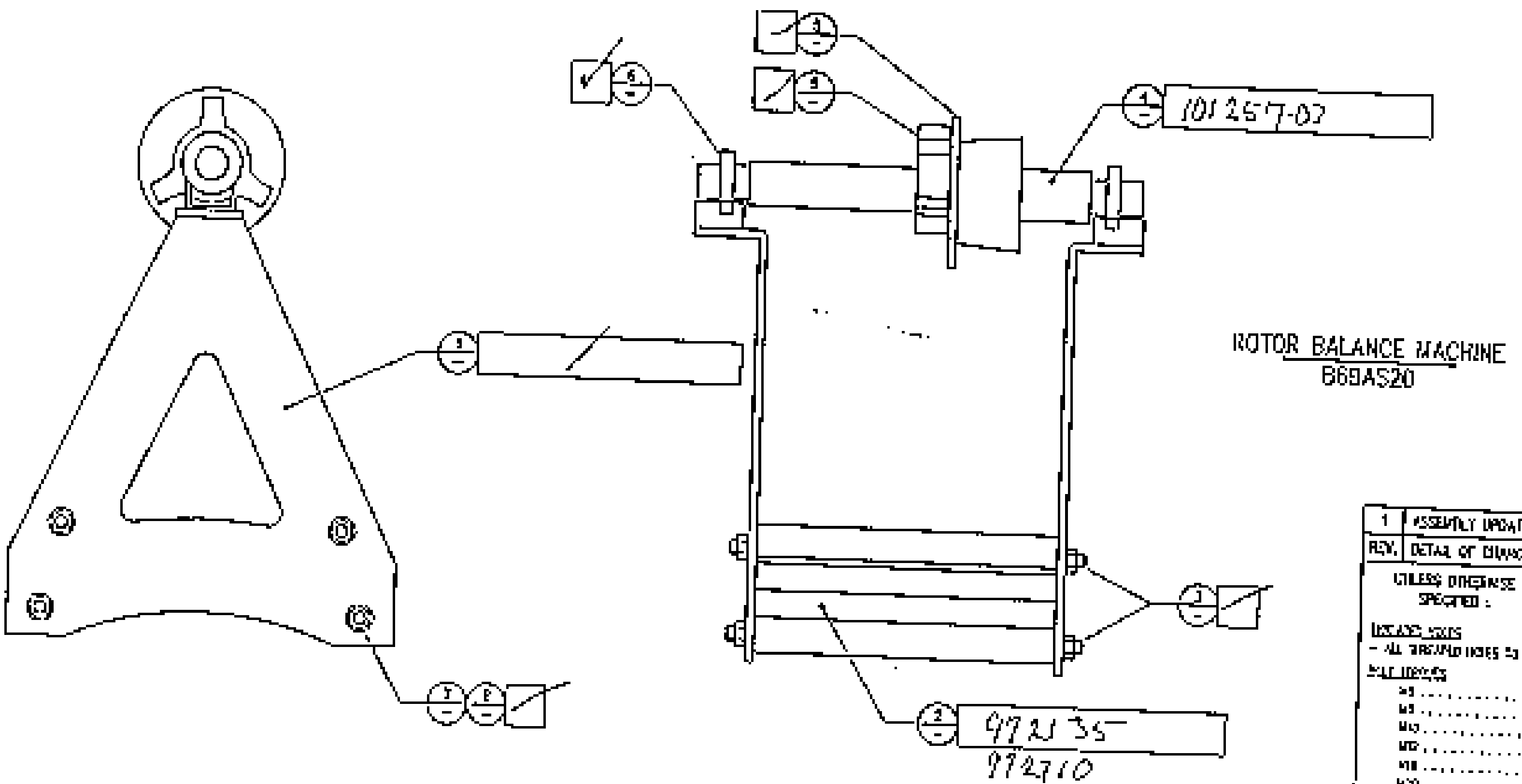
Svedala Barmac Limited
Hargreaves Road, Private Bag 4011, Mt Maunganui, New Zealand
Telephone +64 7 5755088 Facsimile +64 7 5758914

BARMAC 6900 DUOPACTOR
SERVICE TOOL KIT

DRAWN	JUSTIN READ
CHECKED	G.H. Taylor
DIMENSIONS	mm
PART	PAGE 1 of 1
ISSUE	PAGE 2
ISSUE REFERENCE	101169
ACQUISITION NUMBER	100461-1
DRAWING DATE	15 / 1 / 99
DRAWING NUMBER	B69 AS00A

TM 241

COMPONENT	DESCRIPTION	QTY.	ITEM
B69AS20 1	ROTOR BALANCE MACHINE	1 ASSY.	-
B69AS21	ROTOR BALANCE SIDE FRAME	2	1
B69AS22	ROTOR BALANCE DIS BRACKET	2	2
B69AS23	ROTOR BALANCE TIE ARM	4	3
B69AS24	ROTOR BALANCE SHAFT	1	4
B69AS25	ROTOR BALANCE SHAFT WASHER	1	5
B35AS26	ROTOR BALANCE BEARING RADIAL BEARING UC510	2	6
B56AS27	ROTOR BALANCE BOLT SET	1 SET	
NUT 20	NUT M20 GRADE 8.8	8	7
WASHER F20	WASHER F20 FLAT	8	8
B69AS23	ROTOR BALANCE LOCKNUT	1	6



ROTOR BALANCE MACHINE
B69AS20

1	ASSEMBLY UPDATED	11/97	GS 717
REV.	DETAIL OF CHANGE	DATE	REF.

UNLESS OTHERWISE SPECIFIED :

PROJECTION 3rd ANGLE

TORQUE VALUES
- ALL THREADED HOLES TO BE RELIEVED AFTER PLATING
BOLT TORQUES

- all threads to be suitably lubricated prior to assembly

SVEDALA

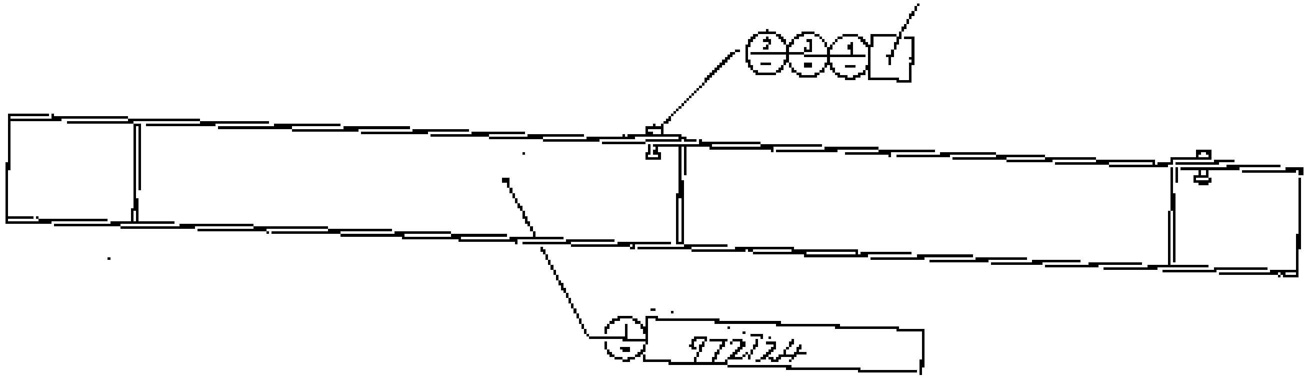
Svedala Barmac Limited

BARMAC 690 ROTOR
ROTOR BALANCE MACHINE

DRAWN	GARTH TAYLOR	ISSUE REFERENCE	REQUISITION NUMBER
CHECKED	[signature]	101171 ✓	100161-1
DIMENSIONS mm	PART PAGE 1 OF 1	DRAWING DATE	DRAWING NUMBER
	ISSUE PAGE OF	12 / 11 / 97	B69 AS20

TM24)

COMPONENT	DESCRIPTION	QTY.	ITEM
890AP01B	SINGLE DRIVE SUPPORT FRAME KIT	1 SET	
890AP01?0	SINGLE DRIVE SUPPORT FRAME	1	1
890AP01	SINGLE DRIVE SUPPORT FRAME BOLT SET	1 SET	
BOLT 24x75	BOLT / NUT M24 x 75 GRADE 8.8	4	2
WASHER F24	WASHER M24 FLAT	4	3
WASHER H24	WASHER M24 HARDENED	4	4



SINGLE DRIVE SUPPORT FRAME KIT
890AP01B

UNLESS OTHERWISE SPECIFIED :

PROJECTION 3rd ANGLE

EXPANDED NOTES
- ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

BOLT TORQUES
M6 . . . . 8 Nm
M8 . . . . 27 Nm
M10 . . . . 54 Nm
M12 . . . . 77 Nm
M16 . . . . 193 Nm
M20 . . . . 378 Nm
M24 . . . . 640 Nm
M16 STANDBOLT NUTS . . . . 7? Nm
M20 STANDBOLT NUTS . . . . 1?1 Nm
- ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

REV.	DETAIL OF CHANGE	DATE	REF.
1	ASSEMBLY UPDATED	11/97	CS 717

SVEDALA

Svedala Barmac Limited
[illegible]
Telephone +64 7 [illegible] Facsimile +64 7 [illegible]

BARMAC 9000 DUOPACTOR
SINGLE DRIVE SUPPORT FRAME KIT

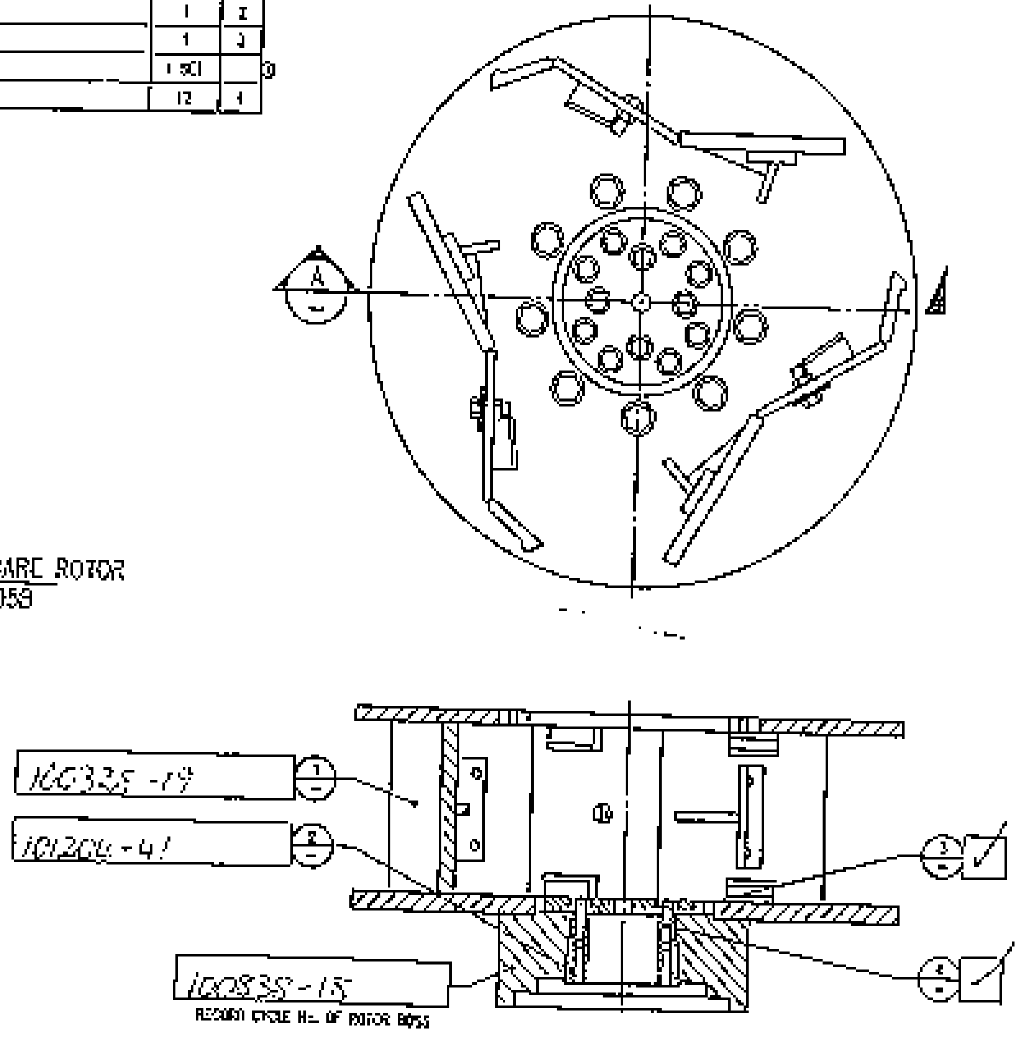
DRAWN: GARTH TAYLOR
CHECKED: [signature]
PART PAGE 1 OF 1
ISSUE PAGE OF

ISSUE REFERENCE: 10473
ACQUISITION NUMBER: 100116-1
DRAWING DATE: 12 / 11 / 97
DRAWING NUMBER: 890 AP01B

TM 241

COMPONENT	DESCRIPTION	QTY.	ITEM
B803041058	760 OPEN SIDED BARE ROTOR	1	
B803041059	760 OPEN SIDED ROTOR BODY	1	1
D692740074	ROTOR TAPER LOCK – 1/L 1	1	2
B502740064	TOP PLATE	1	3
B502740059	TOP PLATE BOLT SET	1 SET	
BOLT 16-40	BOLT M16 x 40 GRADE 8.8	12	4

760 OPEN SIDED BARE ROTOR
B803041058



SECTION A–A

REV.	DETAIL OF CHANGE	DATE	REF.
1	BOLT SET CHANGED	11/97	CS 727

UNLESS OTHERWISE SPECIFIED :
[illegible]
– ALL TAPPED HOLES TO BE RETAPPED AFTER PAINTING
BOLT TORQUES
M6 . . . . 9 Nm
M8 . . . . 22 Nm
M10 . . . . 45 Nm
M12 . . . . 75 Nm
M16 . . . . 180 Nm
M20 . . . . 355 Nm
M24 . . . . 610 Nm
[illegible] . . . . 21 Nm
[illegible] . . . . 141 Nm
– ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

PROJECTION 3rd ANGLE

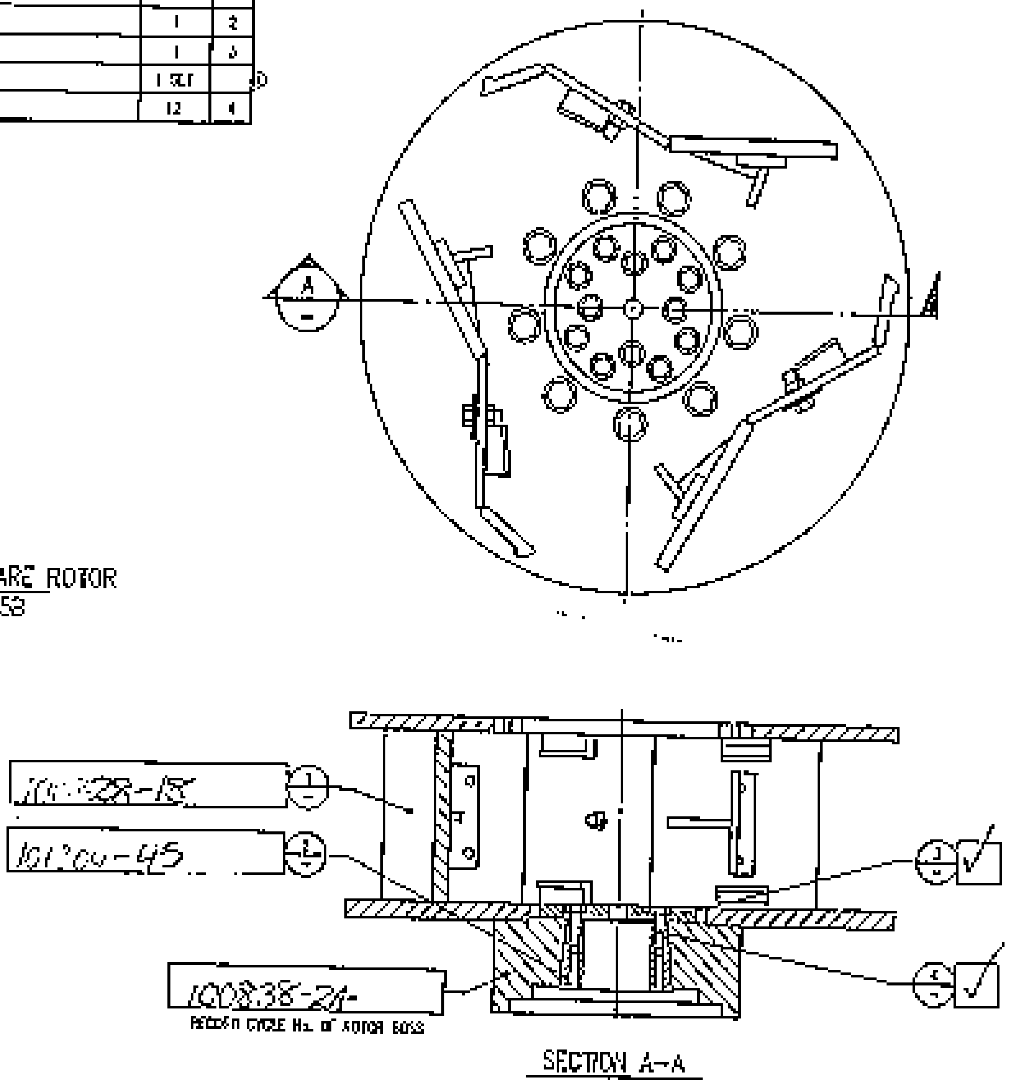
SVEDALA
Svedala Barmac Limited
[illegible]

BARMAC 760 ROTOR
760 OPEN SIDED BARE ROTOR

DRAWN Jarrod Murrone
CHECKED [signature]
DIMENSIONS mm
PARTS Page 1 of 1
ISSUE Page of
ISSUE REFERENCE 10463/
REQUISITION NUMBER 1001161 – 1
DRAWING DATE 20 / 11 / 97
DRAWING NUMBER B80 3041058

COMPONENT	DESCRIPTION	QTY.	ITEM
B803041058	760 OPEN SIDED BARE ROTOR	1 ASSY	
– B803011060	760 OPEN SIDED ROTOR BODY	1	1
– B5327-507A	ROTOR TAPER LOCK – Mk I	1	2
– B6027-4056A	TOP PLATE	1	3
– C0327-10090	TOP PLATE USE SET	1 SET	
– BOLT 16-40	BOLT M16 x 40 GRADE 8.8	12	4

760 OPEN SIDED BARE ROTOR
B803041058



1	BOLT SET CHANGED	11/97	GS 727
ADV.	DETAIL OF CHANGE	DATE	R.P.

UNLESS OTHERWISE SPECIFIED :

THREADED HOLES
– ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

BOLT TORQUES

PROJECTION: 3rd ANGLE

SVEDALA

Svedala Barmac Limited

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BARMAC 760 ROTOR
760 OPEN SIDED BARE ROTOR

DRAWN: Jarrod Mulford
CHECKED

PART PAGE 1 of 1

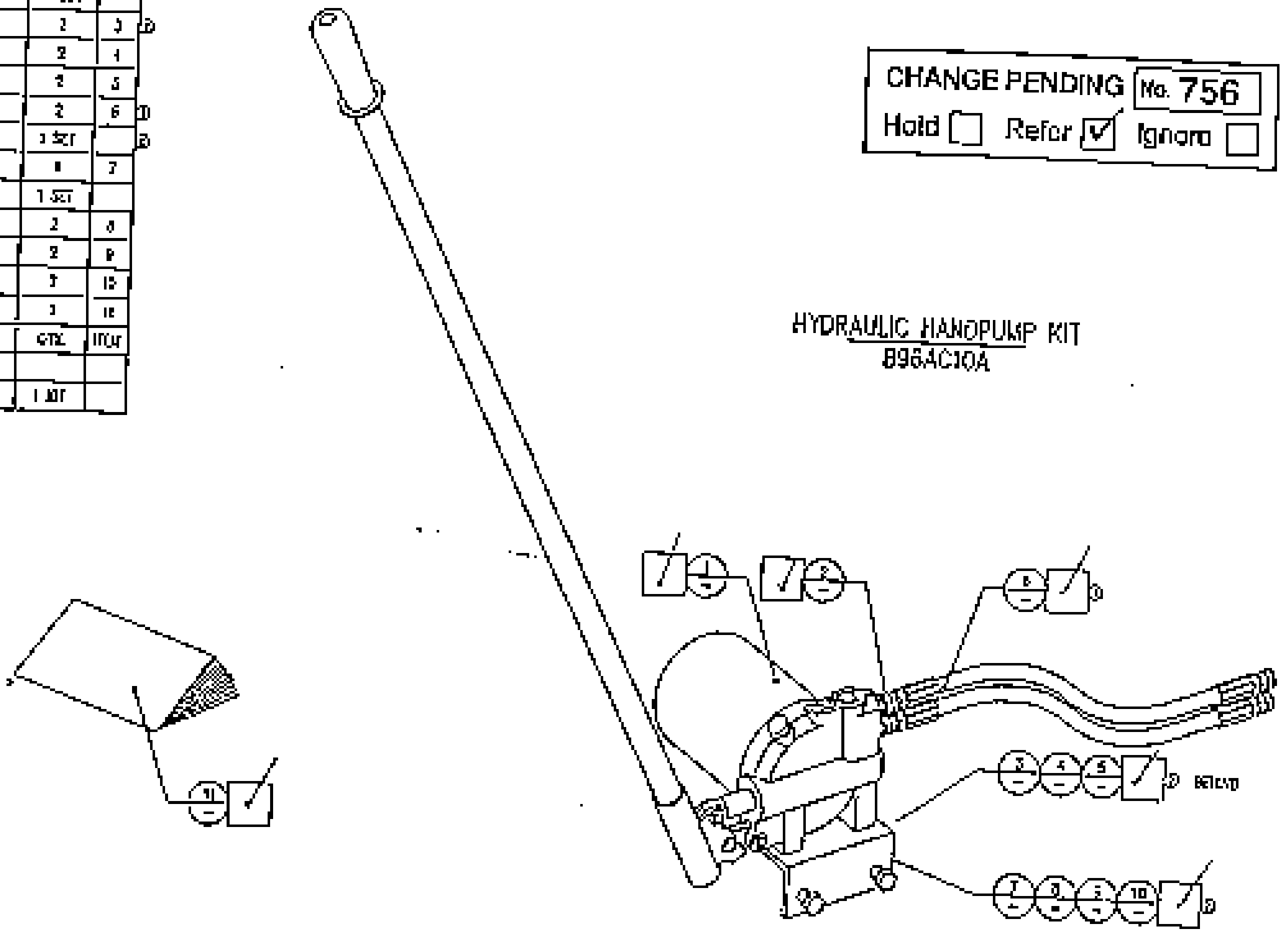
ISSUE REFERENCE: 10062
REQUISITION NUMBER: 1001161-1
DRAWING DATE: 20 / 11 / 97
DRAWING NUMBER: B80 304105B

COMPONENT	DESCRIPTION	QTY.	ITEM
B96AC10A	HYDRAULIC HANDPUMP KIT	[illegible]	[illegible]
- B96AC11A	HYDRAULIC HANDPUMP DOUBLE D/A 27506 PUMP	1	1
- B96AC11A	PORT FITTING 1/4" BPS MALE x 7/16" JIC MALE (C-6202)	2	2
- B96AC14A	HANDPUMP BOLT SET	1 SET	
- BOLT 10125	BOLT M10 x 25 GRADE 8.8	2	3
- WASHER F10	WASHER M10 FLAT	2	4
- WASHER S10	WASHER M10 SPRING	2	5
- B96AC15A	HANDPUMP HOSE	2	6
- B96AC16A	HANDPUMP MOUNT SET	1 SET	
- B96AC17A	HANDPUMP MOUNT	1	7
- B96AC18A	HANDPUMP MOUNT BOLT SET	1 SET	
- BOLT 10-30	BOLT/NUT M10 x 30 GRADE 8.8	2	8
- WASHER F10	WASHER M10 FLAT	2	9
- WASHER S10	WASHER M10 SPRING	2	10
- P547	HYDRAULIC HANDPUMP MANUAL	1	11
COMPONENT	DESCRIPTION	QTY.	ITEM
* ALSO AVAILABLE *	ITEM ORDERED SEPARATELY		
B96AC12A	SEAL KIT	1 OFF	

CHANGE PENDING No. 756

Hold ☐ Refer ☑ Ignore ☐

HYDRAULIC HANDPUMP KIT
B96AC10A



REV.	DETAIL OF CHANGE	DATE	REF.
3	ASSEMBLY UPDATED	12/97	CS 717
2	HOUSE AMDS. BOLT CHANGED	8/97	CS 537
1	HOSES ADDED	11/94	CS 435

UNLESS OTHERWISE SPECIFIED :

PROJECTION: 3rd ANGLE

THREADED HOLES
- ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

BOLT TORQUES
M6 . . . . 8 Nm
M8 . . . . 27 Nm
M10 . . . . 54 Nm
M12 . . . . 77 Nm
M16 . . . . 193 Nm
M20 . . . . 312 Nm
M24 . . . . 640 Nm
M16 STANDARD NUTS . . . . 74 Nm
M20 STANDARD NUTS . . . . 146 Nm
- ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

SVEDALA

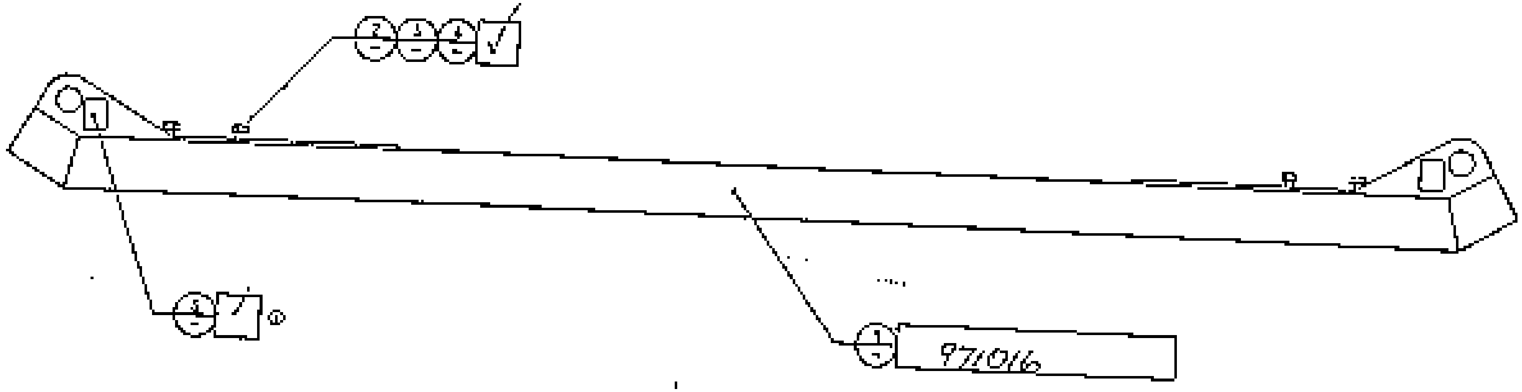
Svedala Barmac Limited
Waterworks Road, P.O. Box 4241, Hamilton, New Zealand
Telephone +64 7 [illegible] Facsimile +64 7 [illegible]

BARMAC 9500 DUOPACTOR
HYDRAULIC HANDPUMP KIT

DRAWN	Jarrod Mudford	ISSUE REFERENCE	REVISION NUMBER
CHECKED	[signature]	10459	100461-1
	PART PAGE 1 of 1	DRAWING DATE	DRAWING NUMBER
	ISSUE PART of	22 / 10 / 97	B96 AC10A

TM241

COMPONENT	DESCRIPTION	QTY.	ITEM
B90AP208	SKID FRAME KIT	[illegible]	
- B90AP218	SKID FRAME	1	1
- B90AP22	SKID FRAME BOLT SET	1 SET	
- BOLT 24x55	BOLT / NUT M24 x 55 GRADE 8.8	16	2
- WASHER F24	WASHER M24 FLAT	15	3
- WASHER H24	WASHER M24 HARDENED	16	4
- B90AP234	DECAL "BRAS CRUSHER ONLY"	4	5



SKID FRAME KIT
B90AP208

UNLESS OTHERWISE SPECIFIED:
THREADED HOLES
- ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING
BOLT TORQUES
M8 . . . . 8 Nm
M10 . . . . 27 Nm
M12 . . . . 44 Nm
M16 . . . . [illegible]
M20 . . . . [illegible]
M24 . . . . [illegible]
M30 . . . . [illegible]
M16 HARDENED NUTS . . . . . . [illegible]
M20 HARDENED NUTS . . . . . . [illegible]
- ALL THREADS TO BE [illegible] PRIOR TO ASSEMBLY
PROJECTION: 3rd ANGLE

REV.	DETAIL OF CHANGE	DATE	REF.
1	ASSEMBLY UPDATED	11/97	CS 737
2	DECAL ADDED	5/97	CS 630

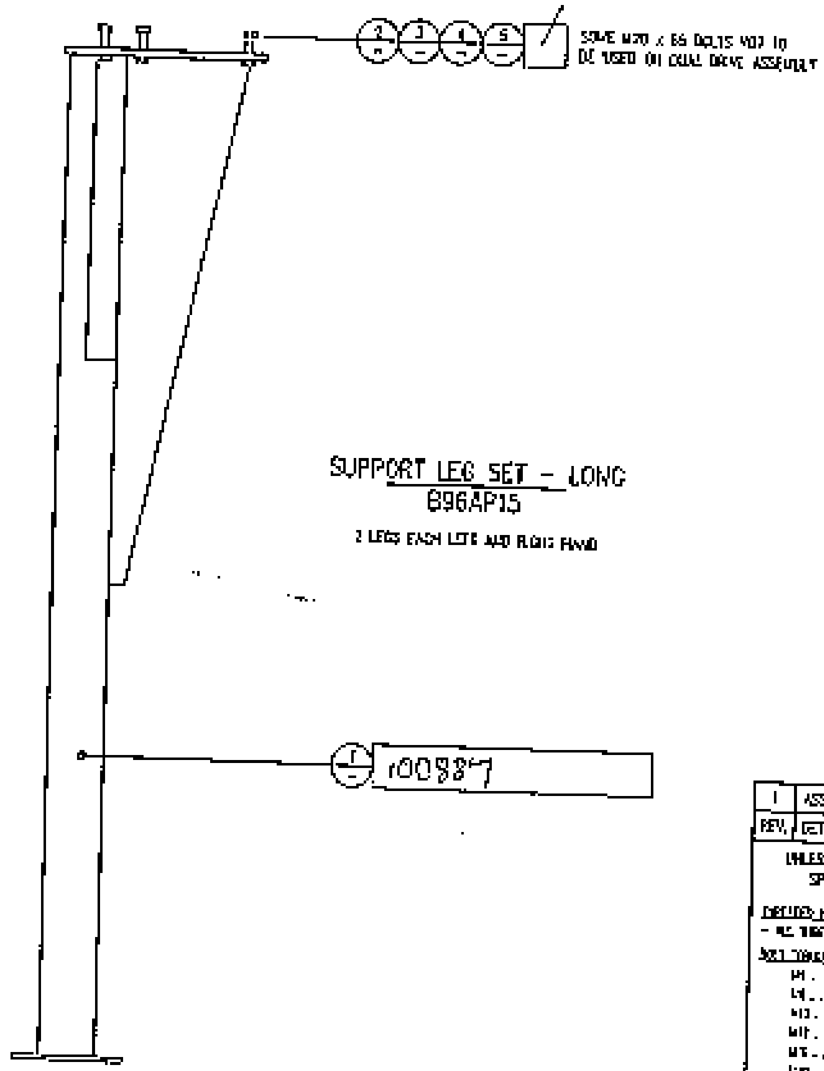
DRAWN: GARTH TAYLOR
CHECKED: [signature]
PART: PAGE 1 OF 1
ISSUE: PAGE OF
ISSUE REFERENCE: 16177
REQUISITION NUMBER: 1061161-1
DRAWING DATE: 12 / 11 / 97
DRAWING NUMBER: B90 AP20B

BARMAC 9000 DUOPACTOR
SKID FRAME KIT

SVEDALA
Svedala Barmac Limited
[illegible] Road, Private Bag 4011, Hamilton, New Zealand
Telephone +64 7 [illegible] Facsimile +64 7 [illegible]

TM241

COMPONENT	DESCRIPTION	QTY.	ITEM
B96AP15	SUPPORT LEG SET - LONG	ASSY	1/10
B96AP15	SUPPORT LEG - LONG	4	
B96AP12	LEG BOLT SET	1 SET	
BOLT 20160	BOLT / NUT M20 x 80 GRADE 8.8	8	2
BOLT 20155	BOLT / NUT M20 x 65 GRADE 8.8	12	3
WASHER F20	WASHER M20 FLAT	12	4
WASHER H20	WASHER M20 HARDENED	12	5



SUPPORT LEG SET - LONG
B96AP15
2 LEGS EACH LEFT AND RIGHT HAND

REV.	DETAIL OF CHANGE	DATE	APP.
1	ASSEMBLY UPDATED	11/97	GS 717

UNLESS OTHERWISE SPECIFIED: PROJECTION 3rd ANGLE

THREADED HOLES
- ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING
BOLT TORQUES
M6 .... 8 Nm
M8 .... 20 Nm
M10 .... 44 Nm
M12 .... 77 Nm
M16 .... 190 Nm
M20 .... 372 Nm
M24 .... 646 Nm
M16 SWAGEBOLT NUTS .... 74 Nm
M20 SWAGEBOLT NUTS .... 114 Nm
- ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

SVEDALA
Svedala Barmac Limited
Mangaolea Road, Private Bag 1971, Tauranga, New Zealand
Telephone +64 7 5755539 Facsimile +64 7 5755344

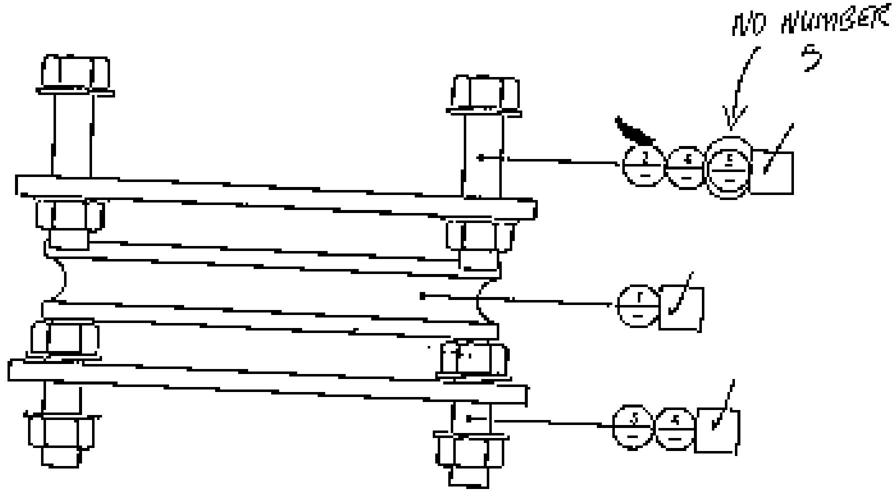
BARMAC 9600 DUOPACTOR
SUPPORT LEG SET - LONG

DRAWN	GARTH TAYLOR
CHECKED	[signature]
DRG. SIZE A4	PART: PAGE 1 OF 1
	ISSUE: PAGE OF

ISSUE REFERENCE: 101175
RECORDATION NUMBER: 100116 (-)
DRAWING DATE: 12 / 11 / 97
DRAWING NUMBER: B96 AP15

TM241

COMPONENTS	DESCRIPTION	QTY.	ITEM
B90AP90	VIBRATION MOUNT KIT	1 KIT	
B90AP91	ANTIVIBRATION MOUNT NUMBER SAW 150 HARDNESS D	4	1
B90AP92	ANTIVIBRATION MOUNT BOLT SET	1 SET	
BOLT 12x50	BOLT / NUT M12 x 50 GRADE 8.8	16	2
BOLT 12x35	BOLT / NUT M12 x 35 GRADE 8.8	16	3
WASHER F12	WASHER M12 FLAT	64	4



VIBRATION MOUNT KIT
B90AP90

REV.	DETAIL OF CHANGE	DATE	REF.
1	ASSEMBLY UPDATED	11/97	CS 717

UNLESS OTHERWISE SPECIFIED :

PROJECTION: 3rd ANGLE

THREADED HOLES
- ALL THREADED HOLES TO BE RETAPPED AFTER PAINTING

BOLT TORQUES
- M6 . . . . 8 Nm
- M8 . . . . 22 Nm
- M10 . . . . 41 Nm
- M12 . . . . 72 Nm
- M16 . . . . 180 Nm
- M20 . . . . 372 Nm
- M24 . . . . 640 Nm
- M16 DISTORTED NUTS . . . . . . 74 Nm
- M20 STAINLESS NUTS . . . . . . 141 Nm
- ALL THREADS TO BE LIGHTLY LUBRICATED PRIOR TO ASSEMBLY

SVEDALA

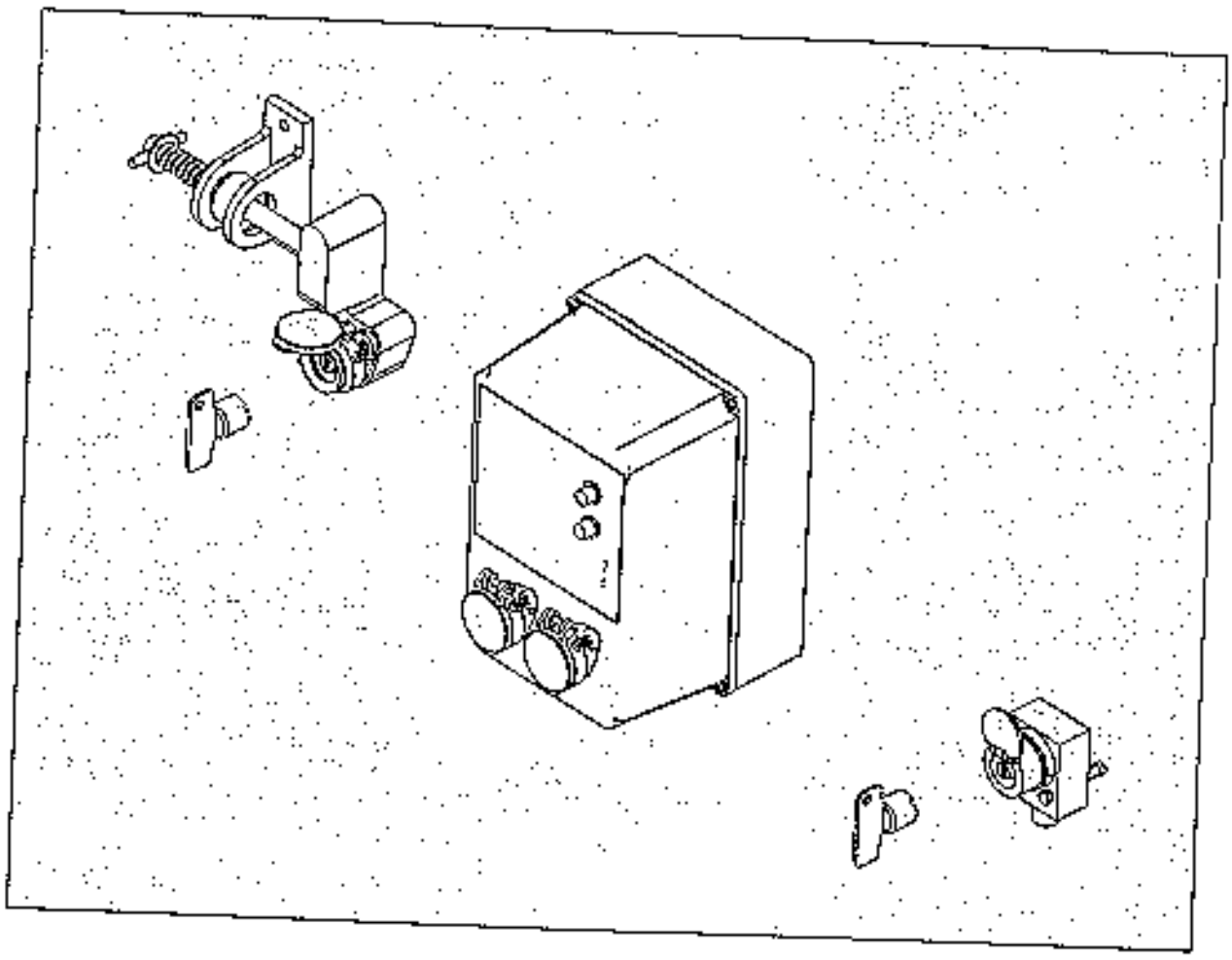
Svedala Barmac Limited
Hamilton Road, Private Bag ..., Auckland, New Zealand
Telephone (64) 9 ... Facsimile (64) 9 ...

BARMAC 9000 DUPACTOR
VIBRATION MOUNT KIT

DRAWN	GARTH TAYLOR
CHECKED	[signature]
PART	PAGE 1 OF 1
ISSUE	PAGE OF
ISSUE REFERENCE	100179/
REQUISITION NUMBER	100116 1-1
DRAWING DATE	12 / 11 / 97
DRAWING NUMBER	B90 AP90

TM741

BARMAC™ VSI CRUSHER
DOOR SAFETY INTERLOCK



Installation, Operation and Service Manual

SVEDALA

CONTENTS

INTRODUCTION	Section 1
INSTALLATION	Section 2
OPERATION	Section 3
PARTS REPLACEMENT	Section 4

Introduction

The safety interlock device fitted to your Barmac Duopactor crusher is designed to restrict access to the crushing chamber while the rotor is in motion.

This system has been incorporated in the Barmac crusher in the interests of operator safety, and once installed and set, should not be tampered with or any attempt to bypass it be made.

This manual contains instructions on the installation and operation, which when followed should provide trouble-free operation.

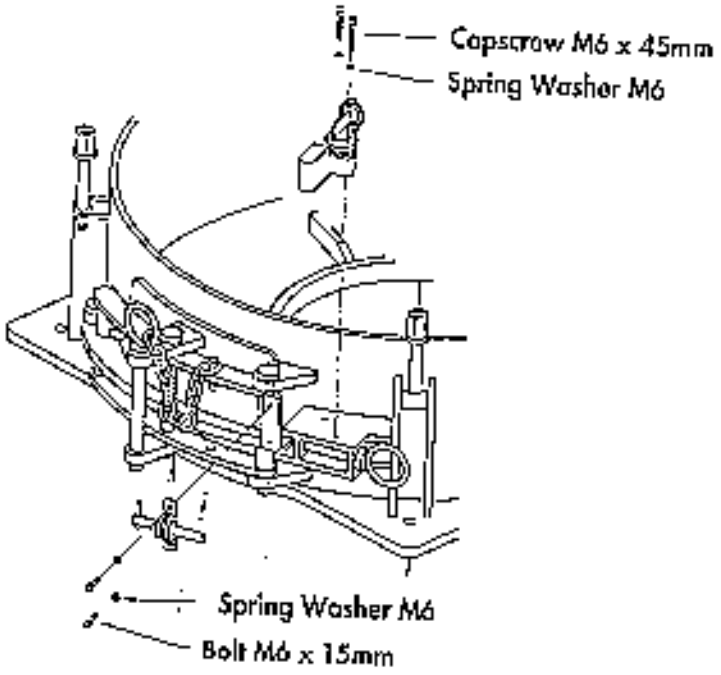
In the event of breakage there is a list of replacement parts available from your local Barmac crusher dealer.

Installation

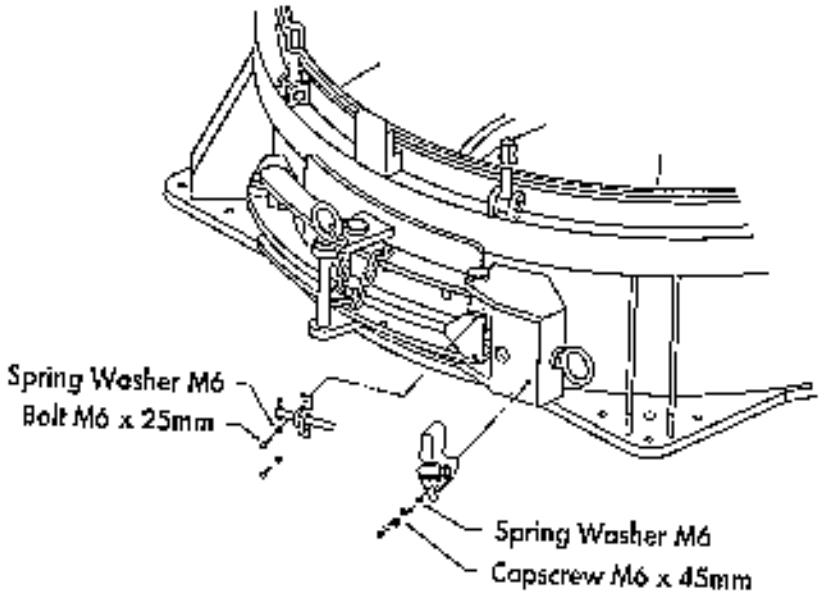
DOOR LOCK

Bolt the door lock components to the Barmac as shown.

1. For 2400/B3000



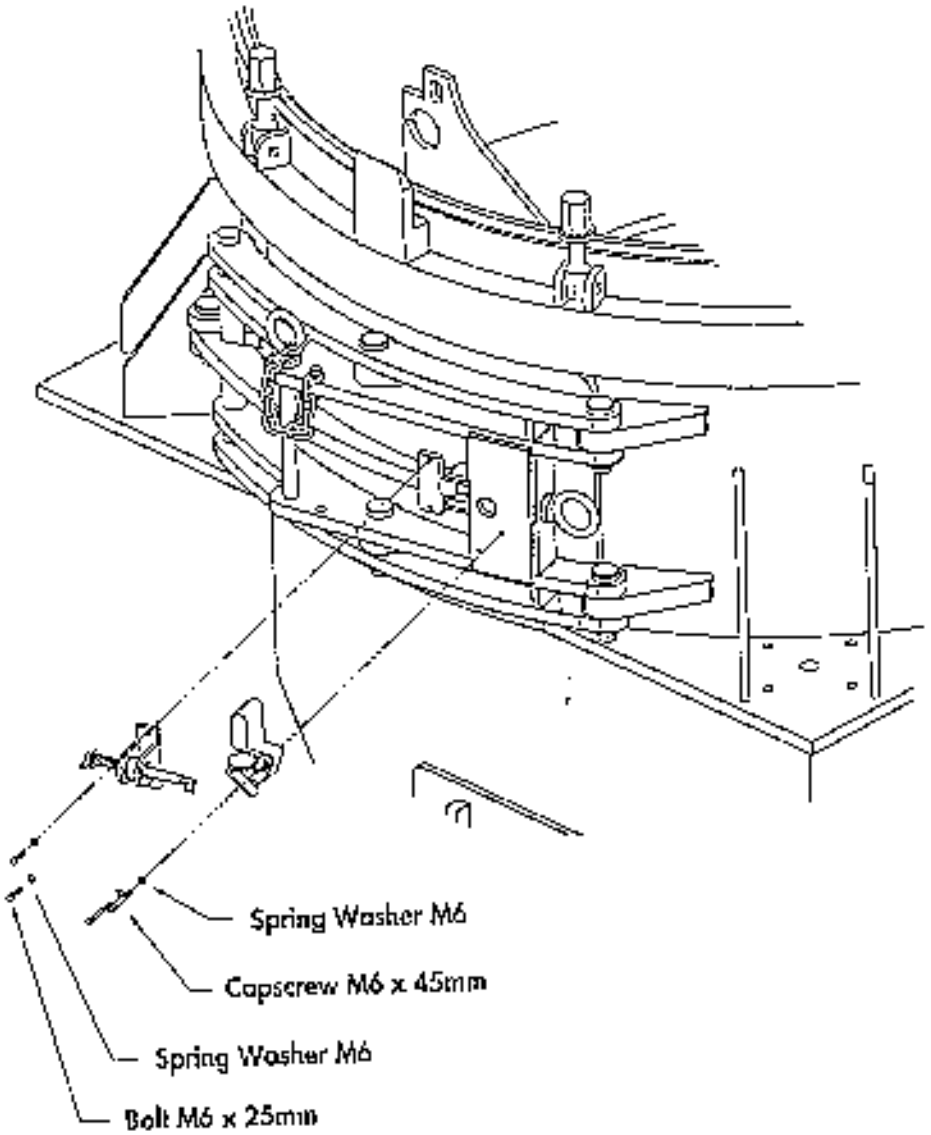
2. For 4800/B5000



Continued ▶

INSTALLATION

3. For B6000 and larger machines



Continued ▶

INSTALLATION

TIMER BOX (Serial Nos. TIL 001 - TIL 182)

1. INSTALLATION — See schematic section 2-5.

   (a) Mount the unit to a convenient vertical surface, using the four fixing holes provided. The unit should be mounted in a position where it will not be subjected to vibration, water splash or excessive dust.

   (b) Open hinged doors to expose internals of timer box. Unscrew plastic grommet and drill to suit cable entry. Ensure cable fits snugly in plastic grommet. After all connections have been made seal around cable entry with sealant.

2. CONTROL SUPPLY CONNECTIONS (TERMINALS 7 & 8)

   Before connecting the incoming cables it must be ascertained what the control supply voltage is, i.e. 440/240/110V 50/60 Hz.

   All H31ET units are supplied for use with 440V control supply.

   For use on a 240V or 110V control supply, the flying lead voltage tapping on the printed circuit board assembly must be re-connected to the appropriate voltage connection (Faston tags marked with voltage).

   (a) 440V/380V (2 PHASE & EARTH)

   Connect the incoming 440/380V supply through a two pole isolator and two 2 amp fuse links to terminals 7 and 8, also connect the earth (terminal 13/Yellow) to the factory earth.

   (b) 240V (SINGLE PHASE L, N & EARTH)

   Connect the line and neutral supply via a single pole and neutral isolator, with a 2A fuse link in the circuit, to terminals 7 and 8 (live to terminal 8, neutral to terminal 7 and earth to terminal 13 Green/Yellow).

   Note 1

   Reconnect the control supply flying lead on the printed circuit board assembly from the 440V terminal lug to the 240V terminal lug (as advised 1b).

   Note 2

   Ensure that the earthed (neutral) side of the supply is connected to terminal 7.

   (c) 110V (SINGLE PHASE L, N & EARTH

   Connect the live and neutral supply via a single pole and neutral isolator, with a 2A fuse link in the circuit, to terminals 7 and 8 (live to terminal 8, neutral to terminal 7 and earth to terminal 13 Green/Yellow.

Continued ▶

INSTALLATION

Note 1

Reconnect the control supply flying lead on the printed circuit board assembly, for the 440V terminal lug to the 110V terminal lug (as advised 1b).

Note 2

Ensure that at the earthed (Neutral) side of the supply is connected to terminal 7.

(d) It should be noted that a 110V supply derived from a centre tapped islolating transformer is not recommended (see BS5304 [1975] Fig. 85).

3. EARTH CONNECTION

Earth the H31E'I' using the earth terminal and replace the side cover plate.

4. SETTING UP AND 'TESTING

(a) With the shutout key (isolator key) removed from the unit, switch on all supplies.

Check that the access key (guard key) cannot be removed at this stage.

(b) Switch off all supplies. Carefully open the front cover and set the internal timer to approximately 10 seconds delay. Reclose the front cover and switch the incoming supplies on.

Do not start the machine.

Insert the shutout key (isolator key) and turn to the trapped position. Check that the access key (guard key) can be removed after about 10 seconds and that the 'Key Free' lamp illuminates.

Note

The access key (guard key) will not release and the 'Key Free' lamp will not illuminate if any of the following conditions exist:

1. The timer is incorrectly set.
2. The internal 500 mA fuse has blown.

(c) Check that when the access key (guard key) is removed, the shutout key (isolator key) is trapped.

(d) Finally set the internal timer to give a safe run-down time of the rotor such that the access key (guard key) will never be released until the rotor is safely at rest.

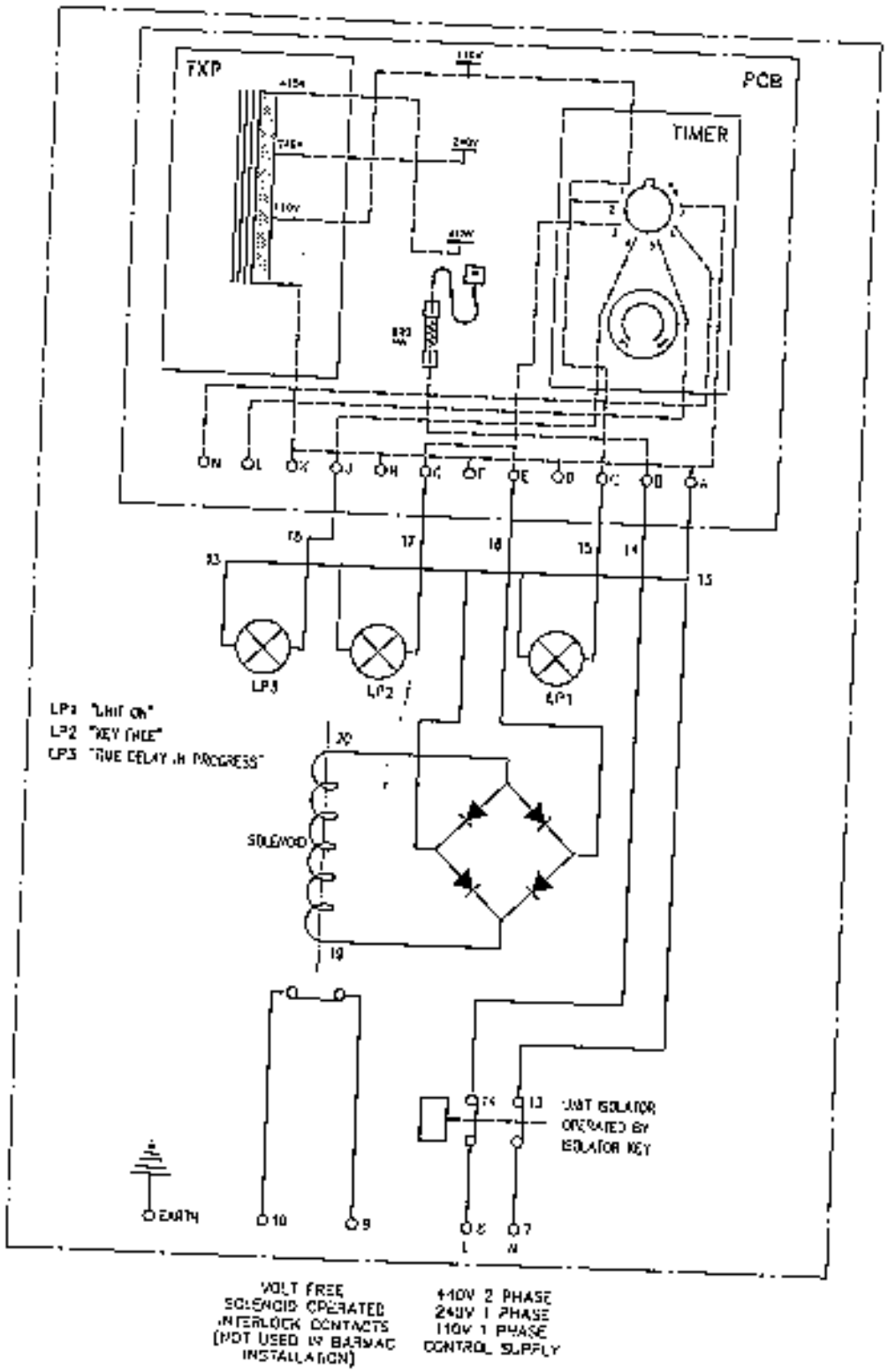
5. MAINTENANCE

(a) Periodically check that the unit functions correctly and that the time delay is still correct.

(b) If internal fuse blows, replace with a 20mm quick blow, 500mA type, e.g. R.S. Components 412-122.

Continued ▶

INSTALLATION



TIME DELAY INTERLOCK H31ET CIRCUIT DIAGRAM

Continued ▶

INSTALLATION

TIMER BOX – 24V to 415V (Serial Nos. TIL 183 - TIL 279)

1. INSTALLATION — See schematic section 2-8.

   (a) Mount the unit to a convenient vertical surface, using the four fixing holes provided. The unit should be mounted in a position where it will not be subjected to vibration, water splash or excessive dust.

   (b) Open hinged doors to expose internals of timer box. Unscrew plastic grommet and drill to suit cable entry. Ensure cable fits snugly in plastic grommet. After all connections have been made seal around cable entry with sealant.

2. CONTROL SUPPLY CONNECTIONS (TERMINALS 7 & 8)

   Before connecting the incoming cables it must be ascertained what the control supply voltage is, i.e. 440/240/110/24V 50/60 Hz.

   All H31ET units are supplied for use with 440V control supply.

   For use on a 240V, 110V or 24V control supply, the flying lead voltage tapping on the printed circuit board assembly must be re-connected to the appropriate voltage connection (Faston tags marked with voltage).

   (a) 440V/380V (2 PHASE & EARTH)

   Connect the incoming 440/380V supply through a two pole isolator and two 2 amp fuse links to terminals 7 and 8, also connect the earth (terminal 13/Yellow) to the factory earth.

   (b) 240V (SINGLE PHASE L, N & EARTH)

   Connect the line and neutral supply via a single pole and neutral isolator, with a 2A fuse link in the circuit, to terminals 7 and 8 (live to terminal 8, neutral to terminal 7 and earth to terminal 13 Green/Yellow).

   Note 1

   Reconnect the control supply flying lead on the printed circuit board assembly from the 440V terminal lug to the 240V terminal lug (as advised. 1b).

   Note 2

   Ensure that the earthed (neutral) side of the supply is connected to terminal 7.

   (c) 110v (SINGLE PHASE L, N & EARTH

   Connect the live and neutral supply via a single pole and neutral isolator, with a 2A fuse link in the circuit, to terminals 7 and 8 (live to terminal 8, neutral to terminal 7 and earth to terminal 13 Green/Yellow.

   Note 1

   Reconnect the control supply flying lead on the printed circuit board assembly, for the 440V terminal lug to the 110V terminal lug (as advised 1b).

Continued ▶

INSTALLATION

Note 2

Ensure that the earthed (Neutral) side of the supply is connected to terminal 7.

Note 3

It should be noted that a 110V supply derived from a centre tapped isolating transformer is not recommended (see BS5304 [1975] Fig. 85).

(d) 24V (DIRECT CURRENT L, N)

Connect the positive and negative supply to terminals 7 (live, positive) and 8 (neutral, negative) and the earth to terminal 13 (earth, green/yellow).

3. EARTH CONNECTION

Earth the H31ET using the earth terminal and replace the side cover plate.

4. SETTING UP AND TESTING

(a) With the shutout key (isolator key) removed from the unit, switch on all supplies.

Check that the access key (guard key) cannot be removed at this stage.

(b) Switch off all supplies. Carefully open the front cover and set the internal timer to approximately 10 seconds delay. Reclose the front cover and switch the incoming supplies on.

Do not start the machine.

Insert the shutout key (isolator key) and turn to the trapped position. Check that the access key (guard key) can be removed after about 10 seconds and that the 'Key Free' lamp illuminates.

Note

The access key (guard key) will not release and the 'Key Free' lamp will not illuminate if any of the following conditions exist:

1. The timer is incorrectly set.
2. The internal 500 mA fuse has blown.

(c) Check that when the access key (guard key) is removed, the shutout key (isolator key) is trapped.

(d) Finally set the internal timer to give a safe run-down time of the rotor such that the access key (guard key) will never be released until the rotor is safely at rest.

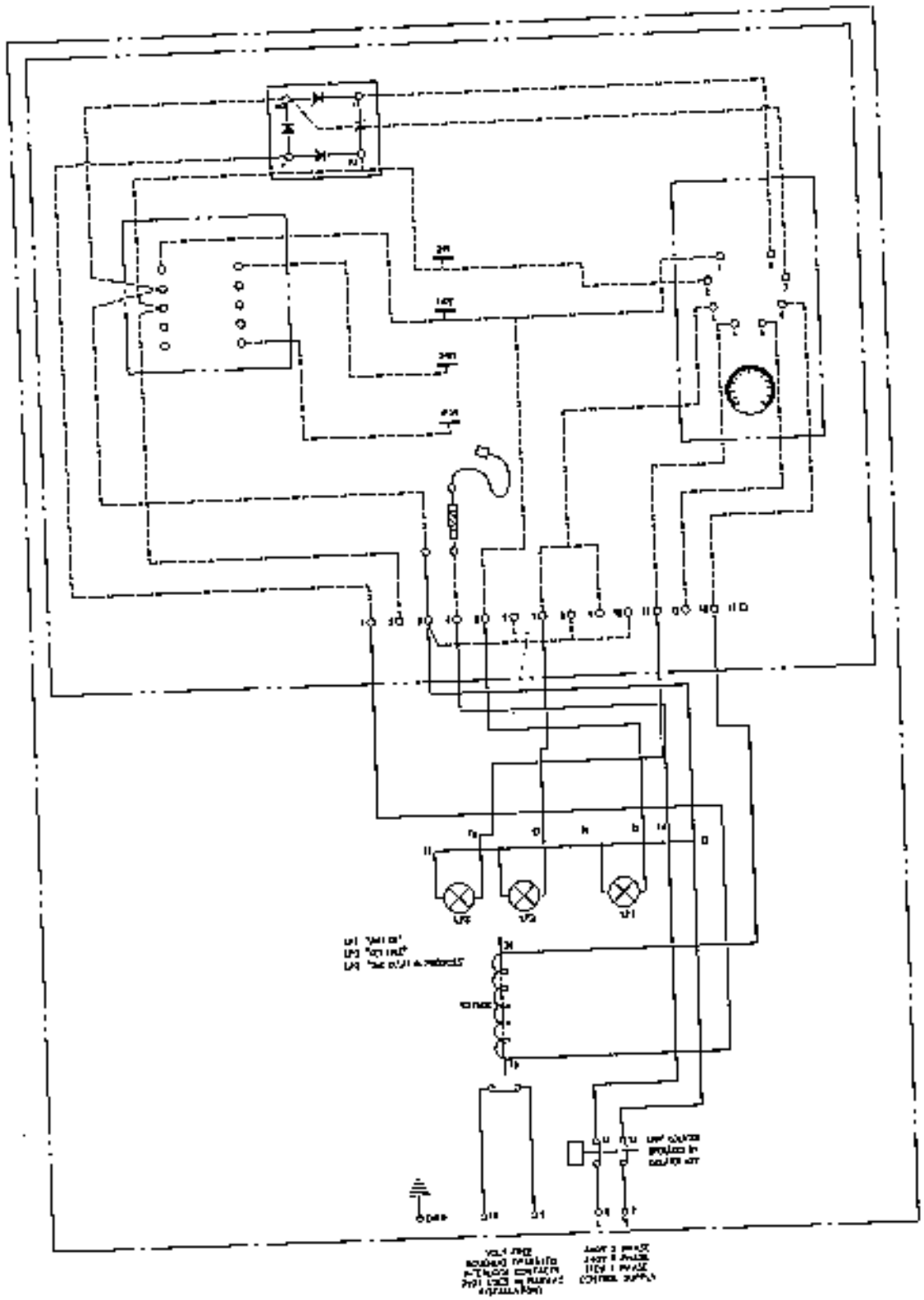
5. MAINTENANCE

(a) Periodically check that the unit functions correctly and that the time delay is still correct.

(b) If internal fuse blows, replace with a 20mm quick blow, 500mA type, e.g. R.S. Components 412-122.

Continued ▶

INSTALLATION



TIME DELAY INTERLOCK H31ET CIRCUIT DIAGRAM

Continued ▶

INSTALLATION

TIMER BOX – 24V to 415V (Serial Nos. TIL 280 -)

1. INSTALLATION — See schematic diagram section 2-11.

   (a) Mount the unit to a convenient vertical surface, using the four fixing holes provided. The unit should be mounted in a position where it will not be subjected to vibration, water splash or excessive dust.

   (b) Remove screws from the corners of the unit and remove lid slowly from base. Drill hole to suit cable entry and fit grommet. After all connections have been made seal around cable entry with sealant.

2. CONTROL SUPPLY CONNECTIONS (TERMINALS L, N & E)

   Before connecting the incoming cables it must be ascertained what the control supply voltage is, i.e. 440/240/110/24V 50/60 Hz.

   All H31ET units are supplied for use with 440V control supply.

   For use on a 240V, 110V or 24V control supply, the flying lead voltage tapping on the printed circuit board assembly must be re-connected to the appropriate voltage connection (Faston tags marked with voltage).

   (a) 440V/380V (2 PHASE & EARTH)

   Connect the incoming 440/380V supply through a two pole isolator and two 2 amp fuse links to terminals L and N, also connect the earth (terminal E) to the factory earth.

   (b) 240V (SINGLE PHASE L, N & EARTH)

   Connect the line and neutral supply via a single pole and neutral isolator, with a 2A fuse link in the circuit, to terminals L (live) and N (neutral). Connect earth to terminal E (earth).

   Note 1

   Reconnect the control supply flying lead on the printed circuit board assembly from the 440V terminal lug to the 240V terminal lug (as advised. 1b).

   Note 2

   Ensure that the earthed (neutral) side of the supply is connected to terminal N.

   (c) 110V (SINGLE PHASE L, N & EARTH

   Connect the live and neutral supply via a single pole and neutral isolator, with a 2A fuse link in the circuit, to terminals L (live) and N (neutral). Connect earth to terminal E (earth).

   Note 1

   Reconnect the control supply flying lead on the printed circuit board assembly from the 440V terminal lug to the 220V terminal lug (as advised 1b).

Continued ▶

INSTALLATION

Note 2

Ensure that the earthed (neutral) side of the supply is connected to terminal N.

Note 3

It should be noted that a 110V supply derived from a centre tapped islolating transformer is not recommended (see BS5304 [1975] Fig. 85).

(d) 24V (DIRECT CURRENT L, N)

Connect the positive and negative supply to terminals L (live, positive) and N (neutral, negative). Connect earth to terminal E (earth).

Note 1

Reconnect the control supply flying lead on the printed circuit board assembly from the 440V terminal lug to the 24V terminal lug (as advised 1b).

3. EARTH CONNECTION

Earth the H31ET using the earth terminal and replace lid.

4. SETTING UP AND TESTING

(a) With the shutout key (isolator key) removed from the unit, switch on all supplies.

Check that the access key (guard key) cannot be removed at this stage.

(b) Switch off all supplies. Carefully open the front cover and set the internal timer to five minutes (minimum delay time). Reclose the front cover and switch the incoming supplies on.

Do not start the machine.

Insert the shutout key (isolator key) and turn to the trapped position. Check that the access key (guard key) can be removed after five minutes (minimum delay time) and that the 'Key Free' lamp illuminates.

Note

The access key (guard key) will not release and the 'Key Free' lamp will not illuminate if any of the following conditions exist:

1. The timer is incorrectly set.
2. The internal 500 mA fuse has blown.

(c) Check that when the access key (guard key) is removed, the shutout key (isolator key) is trapped.

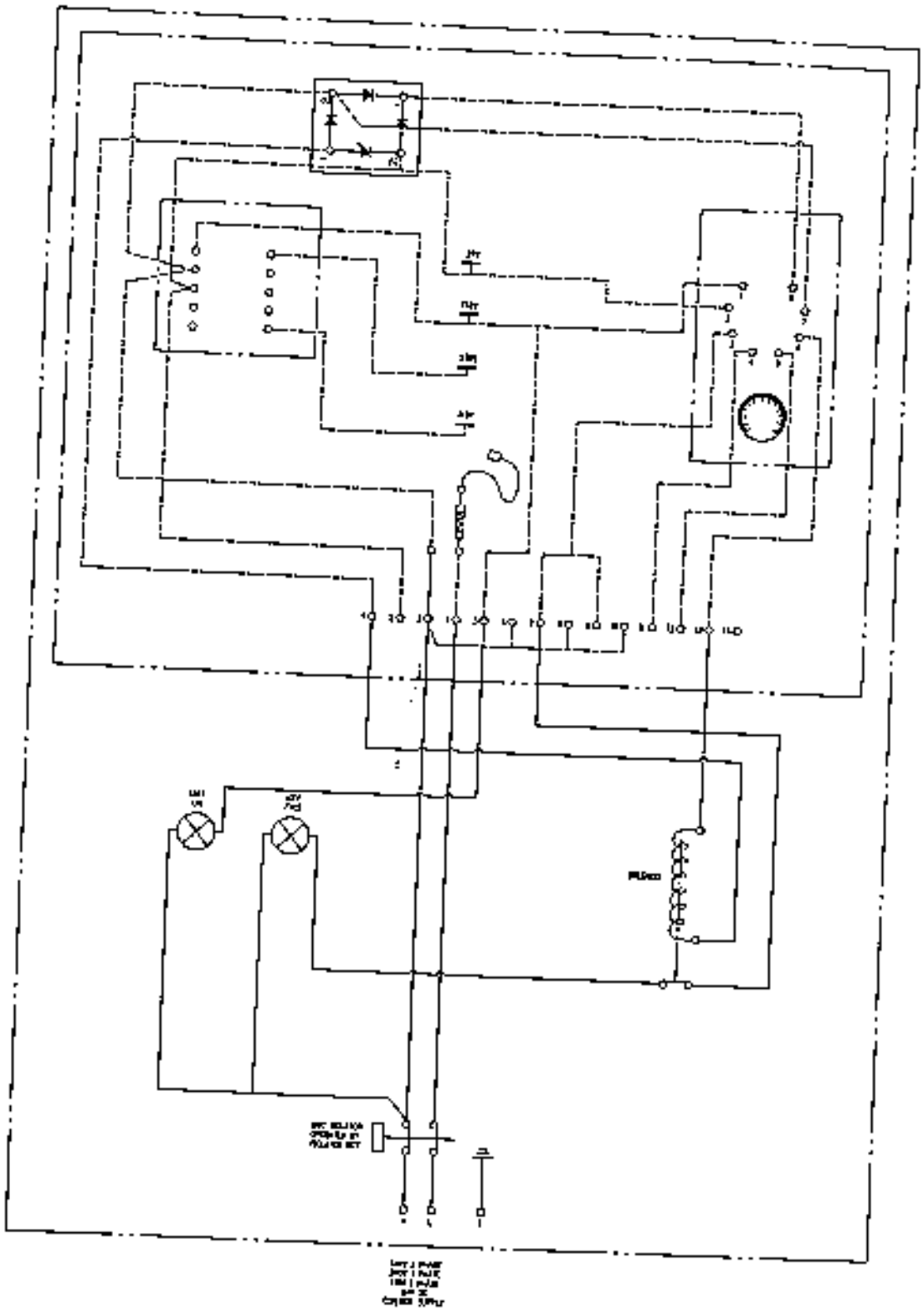
(d) Finally set the internal timer to give a safe run-down time of the rotor such that the access key (guard key) will never be released until the rotor is safely at rest. The timer can be set from a minimum of 5 minutes to a maximum of 15 minutes.

5. MAINTENANCE

(a) Periodically check that the unit functions correctly and that the time delay is still correct.

(b) If internal fuse blows, replace with a 20mm quick blow, 500mA type, e.g. R.S. Components 412-122.

Continued ▶



TIME DELAY INTERLOCK H31ET CIRCUIT DIAGRAM

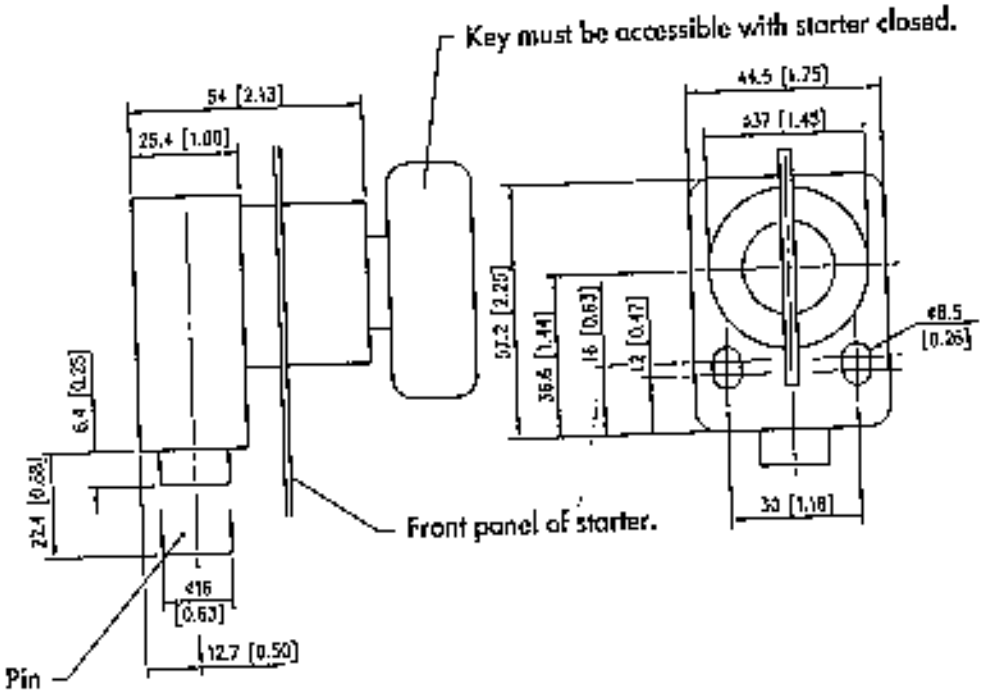
Continued ▶

INSTALLATION

DEAD LOCK AND CAM

The dead lock and cam are installed behind the front panel of the starter and work in conjunction to provide the isolating switch with lockout protection.

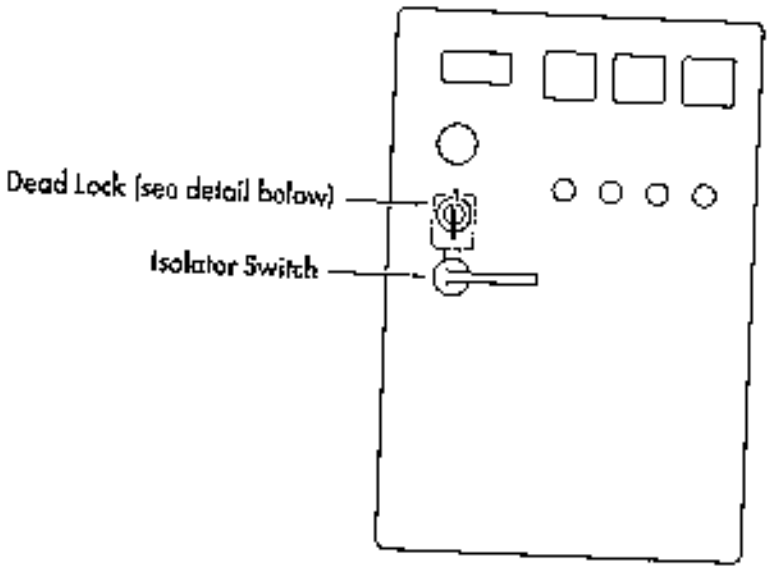
Install the dead lock and cam as pictured below.



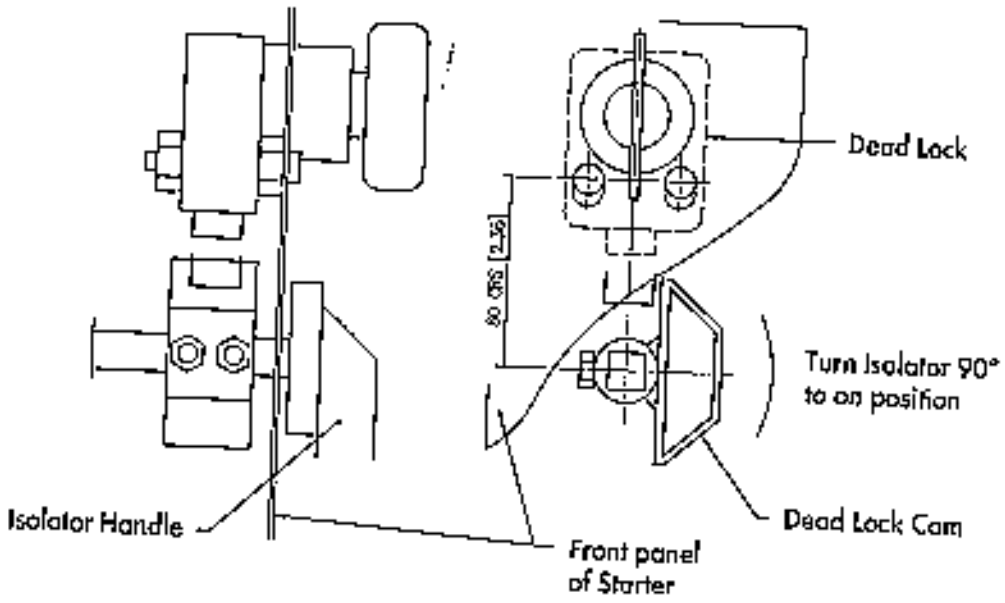
1. Install on starter front panel so that extended pin prevents starting of the Barmac crusher.
2. The Barmac crusher power supply must be isolated before the pin is able to be extended.

Continued ▶

INSTALLATION



BARMAC CRUSHER STARTER PANEL



This dead lock cam is supplied with the interlock kit and can be used in conjunction with the dead lock to provide the isolator with lockout protection. The cam will suit any rotating isolator switch with 90° turn operation and 6, 8 or 12mm shank (1/4", 5/16" or 15/32").

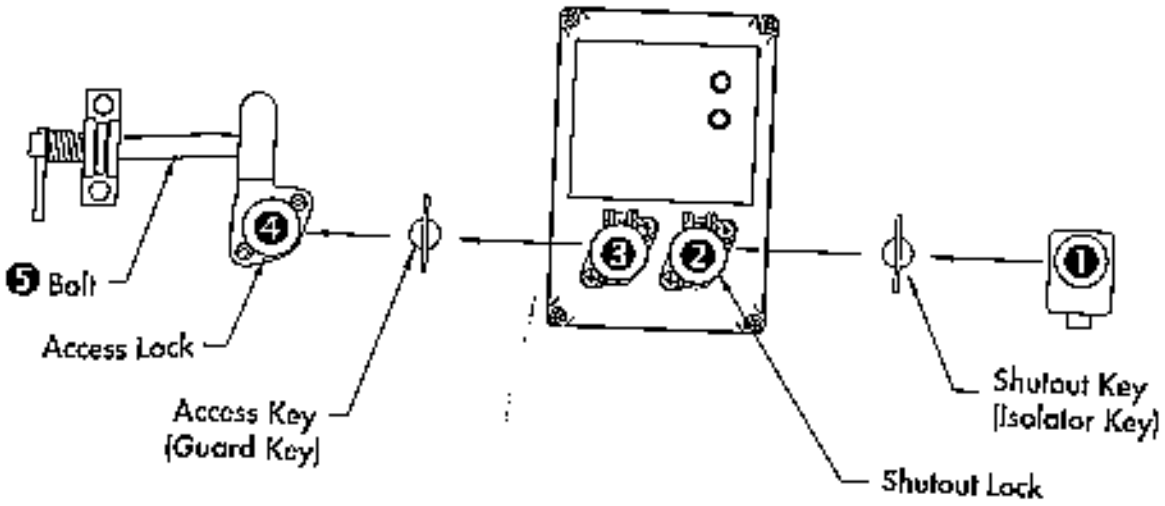
If this is unsuitable, your Barmac crusher dealer will be able to advise on a suitable alternative.

Operation

This Safety Interlock System is designed to prevent the crushing chamber service door from being opened while the machine is in operation or on shut-down before sufficient time has elapsed to allow the rotor to stop rotating.

The interlock also prevents accidental start-up while the crusher is being serviced, or when the door is left open.

SEQUENCE OF OPERATION



Isolate Barmac crusher power supply then:

❶ Turn Shutout Key in Deadlock and remove key.

❷ Put Shutout Key in Shutout Lock and turn.

❸ After time delay has elapsed, turn and remove Access Key.

❹ Put Access Key in Access Lock and turn.

❺ Release Bolt and open door.

To close door, engage bolt and transfer keys through reverse sequence. (Time delay will not activate in reverse sequence).

Parts Replacement

Replacement parts can be obtained from either your local Barmac crusher representative or direct from a Fortress Security distributor.

If ordering from a Barmac crusher dealer, please quote description and Barmac crusher part number.

If ordering from a Fortress Security dealer, quote only the description.

FORTRESS OUTLETS:

Australia:	Fortress Security Pty Ltd No. 4 Jarrah Street, Braeside, Victoria, Australia. Tel: 3-9587 4099. Fax: 3-9587 4130.
United Kingdom:	Fortress UK 148 Birmingham New Road, Wolverhampton. WV4 6NT. Tel: (0902) 403546. Fax: (0902) 353003.
United States:	Castell Safety Incorporated Erlager, Kent. Tel: 606 3413075.

When repairs have been completed, it is important to test the total operation of the safety interlock system. (Refer to installation section, instruction number 4).

IT IS NOT SAFE TO RESTART THE CRUSHER UNTIL THE SAFETY INTERLOCK SYSTEM IS FUNCTIONING CORRECTLY.

IMPORTANT NOTE

WARRANTY CLAIMS

Fortress Security Pty Ltd (manufacturer) and Svedala Barmac Ltd (supplier) will not be held liable for any injury or warranty claims resulting from substandard repair work.

If you do not feel competent to carry out the repair work yourself, refer to your local Barmac crusher dealer or Fortress agent for further instruction.

Continued ▶

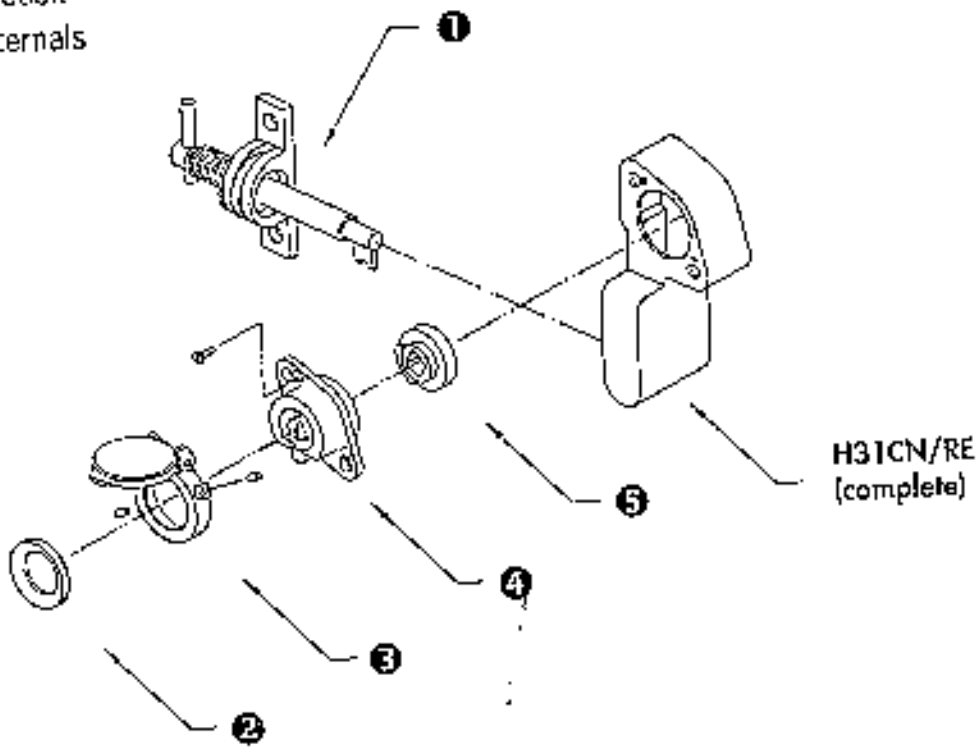
PARTS REPLACEMENT

BARMAC PART NUMBER
B24AI11A/100

DOOR LOCK H31CN/RE

(Barmac 2400/3000 Duopactors Only)

Standard Construction
Stainless Steel Internals



When ordering individual replacement components, quote the description below. If ordering from your Barmac crusher dealer, quote the Barmac part number also.

BARMAC PART NUMBER
B24AI11A/101
B96AI11B/102
B96AI11B/103
B24AI11A/104
B24AI11A/105

❶ Stainless Steel Self Aligning Bolt Assembly to suit H31CN/RE (Type H31C-19)

❷ Rubber Seal to suit Stainless Steel Cap

❸ Stainless Steel Cap (including spring and grubscrews)

❹ Basic Lock with Stainless Steel internals. Type H31LH to suit H31CN/RE

❺ Internal Cam to suit H31CN/RE

NOTE: When ordering a replacement lock (item 4), or complete unit, also quote the code and differ numbers, as these are unique to your installation. These code and differ numbers can be found on the key or the face of the lock and lock cover.

Continued ▶

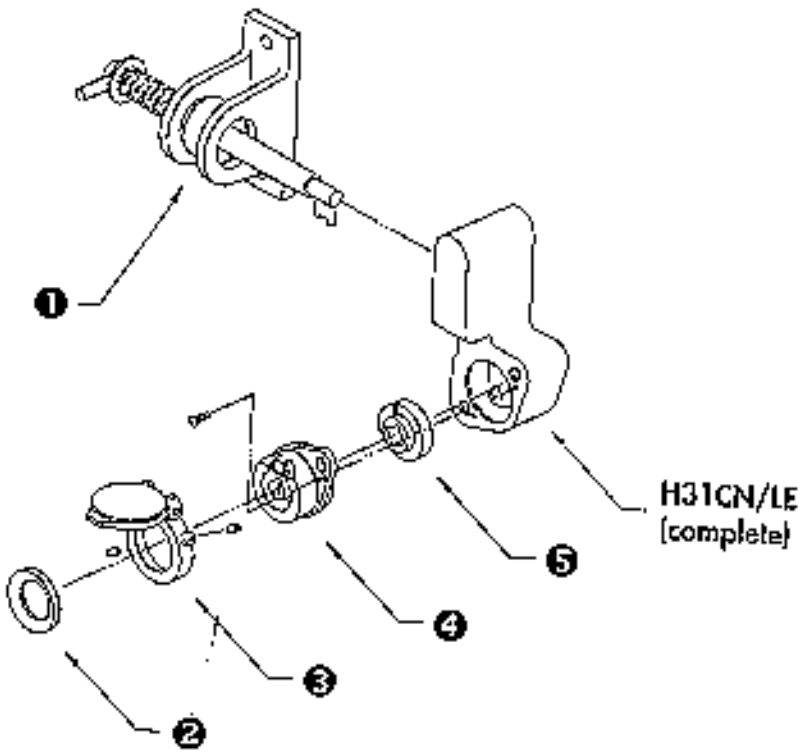
PARTS REPLACEMENT

DOOR LOCK H31CN/LE

(All models except Barmac 2400/3000 Duopactors)

Standard Construction
Stainless Steel Internals

BARMAC PART NUMBER
B96AI11B/100



When ordering individual replacement components, quote the description below. If ordering from your Barmac crusher dealer, quote the Barmac part number also.

	BARMAC PART NUMBER
❶ Stainless Steel Self Aligning Bolt Assembly to suit H31CN/LE (Type H31C-29)	B96AI11B/101
❷ Rubber Seal to suit Stainless Steel Cap	B96AI11B/102
❸ Stainless Steel Cap (including spring and grub screws)	B96AI11B/103
❹ Basic Lock with Stainless Steel internals. Type H31RH to suit H31CN/LE.	B96AI11B/104
❺ Internal Cam to suit H31CN/LE	B96AI11B/105

NOTE: When ordering a replacement lock (item 4), or complete unit, also quote the code and differ numbers, as these are unique to your installation. These code and differ numbers can be found on the key or the face of the lock and lock cover.

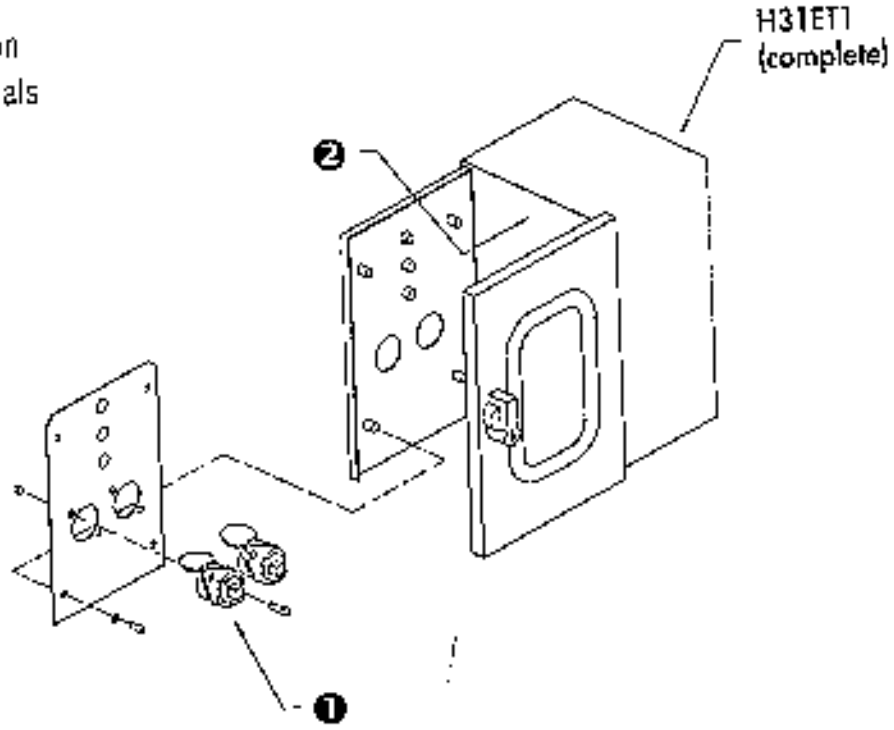
Continued ▶

PARTS REPLACEMENT

BARMAC PART NUMBER
B96AI11B/200

TIMER BOX H31ET1
(Serial Nos. TIL 001 - TIL 279)

Standard Construction
Stainless Steel Internals
Rating IP55



When ordering individual replacement components, quote the description below. If ordering from your Barmac crusher dealer, quote the Barmac part number also.

BARMAC PART NUMBER
B96AI11B/201
B96AI11B/202

❶ Basic Lock to suit H31ET1

❷ Fuse 500 mA

NOTE: When ordering a replacement lock (item 1), or complete unit, also quote the code and differ numbers, as these are unique to your installation. These code and differ numbers can be found on the keys or the faces of the locks and lock covers.

NOTE: Early models of the timer box were rated to IP42. These units utilise the same replacement components as the IP55 rated box described above.

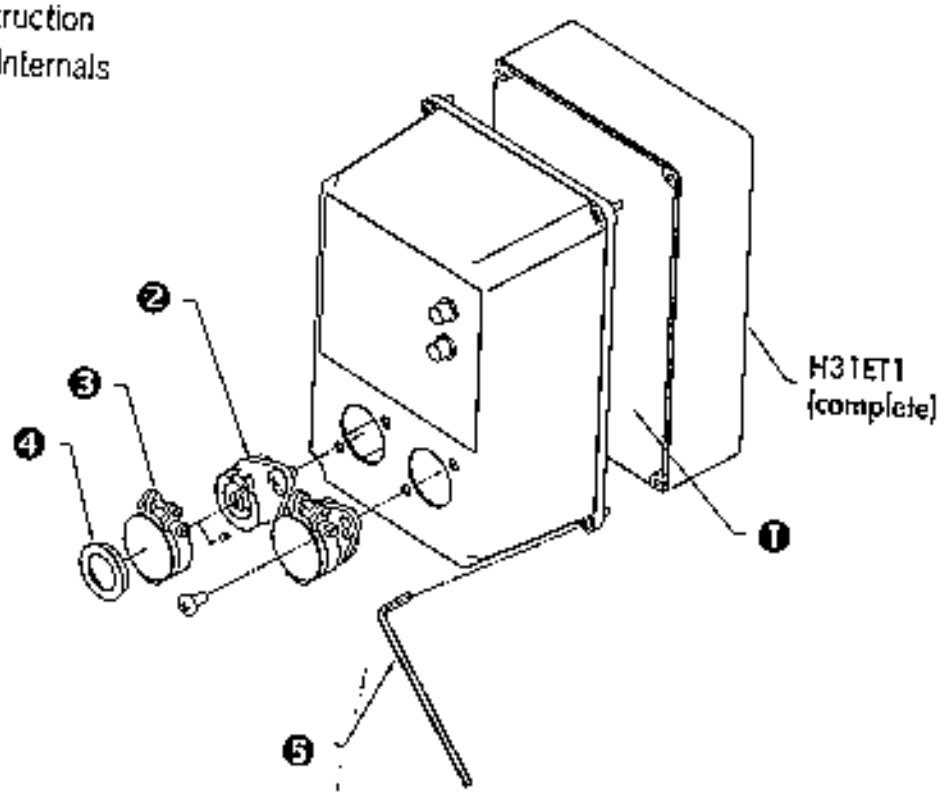
Continued ▶

PARTS REPLACEMENT

TIMER BOX H31ET1
(Serial Nos. TIL 280 -)

BARMAC PART NUMBER
B96AI11B/200

Standard Construction
Stainless Steel Internals
Rating IP55



When ordering individual replacement components, quote the description below. If ordering from your Barmac crusher dealer, quote the Barmac part number also.

		BARMAC PART NUMBER
1	Fuse 500mA	B96AI11B/202
2	Basic Lock with Stainless Steel internals. Type H31RH to suit IP55 Timer Unit	B96AI11B/104
3	Stainless Steel Cap (including spring and grubscrews)	B96AI11B/103
4	Rubber Seal to suit Stainless Steel Cap	B96AI11B/102
5	4mm Post Allen Key	B96AI164A

NOTE: When ordering a replacement lock (item 2), or complete unit, also quote the code and differ numbers, as these are unique to your installation. These code and differ numbers can be found on the keys or the faces of the locks and lock covers.

Continued ▶

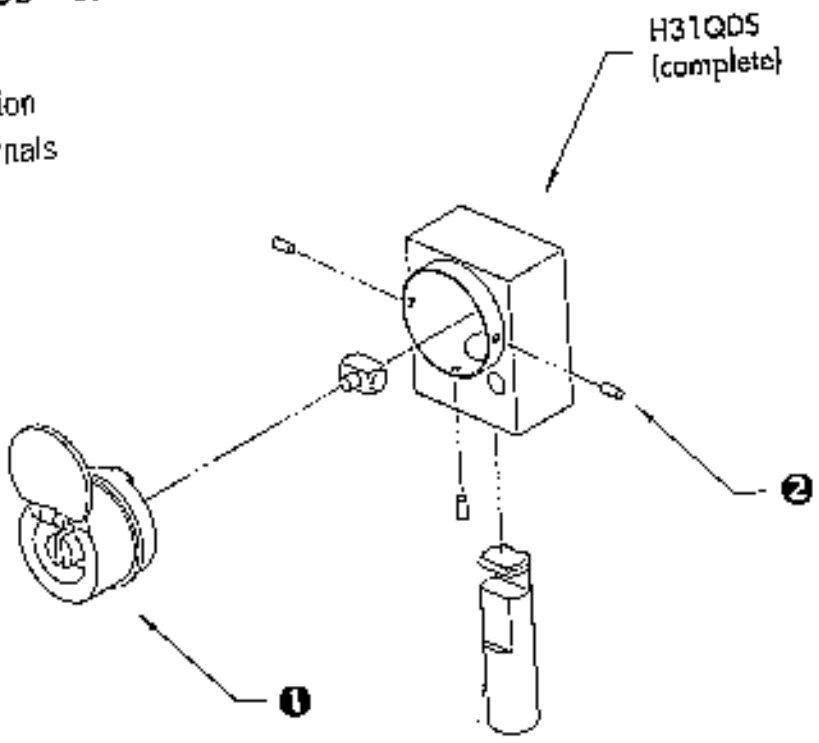
PARTS REPLACEMENT

BARMAC PART NUMBER
B96AI11B/300

DEADLOCK H31QDS – SHOT

(All Models)

Standard Construction
Stainless Steel Internals



When ordering individual replacement components, quote the description below. If ordering from your Barmac crusher dealer, quote the Barmac part number also.

BARMAC PART NUMBER
B96AI11B/301
B96AI11B/302

❶ Earless Basic Lock with Stainless Steel internals to suit H31QDS

❷ 3mm Roll Pin (3 off) and 4mm Roll Pin (3 off)

To remove earless basic lock, drill out 3 roll pins (carefully) with 3mm (⅛") drill.

To replace, position bolt in housing and place drive block in slot in bolt.

Ensure orientation of drive block is such that pin is closest to right hand side of drive block when viewed with the bolt down.

Insert new lock (lid hinge up) and drill holes for roll pins.

Check function of lock and then fit replacement roll pins.

If the holes in the housing were damaged whilst drilling out the original roll pins, it may be necessary to drill the new lock with a 4mm (5/32") drill and fit 4mm roll pins.

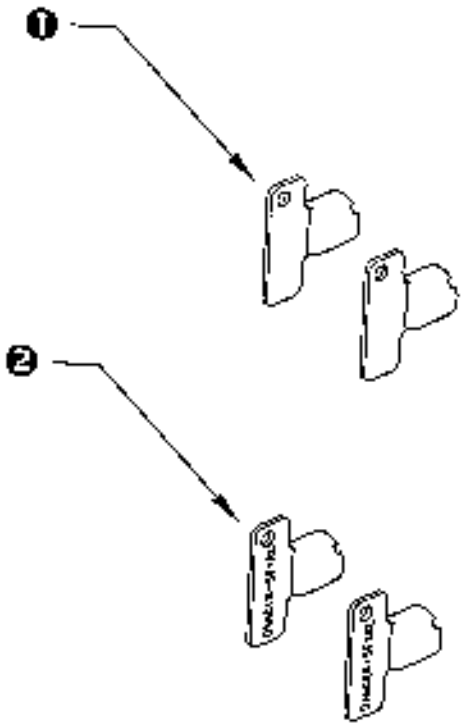
NOTE: When ordering a replacement lock (item 1), or complete unit, quote the code and differ numbers also as these are unique to your installation. These code and differ numbers can be found on the key or the face of the lock and lock cover.

Continued ▶

PARTS REPLACEMENT

KEYS

(All Models)

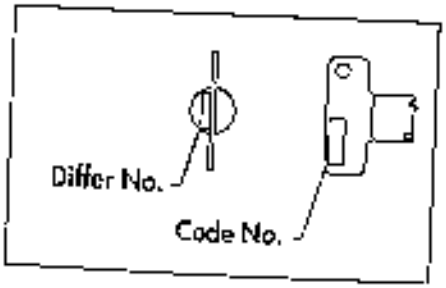


When ordering replacement keys, quote the following:

(a) Description as listed below;
(b) Code and differ number found on the existing key (as these are unique to your installation); and
(c) Barmac crusher part number (if ordering from your Barmac crusher dealer).

❶ Key (Stainless Steel) – H31
❷ Danger – Spare Key (Brass) – H31

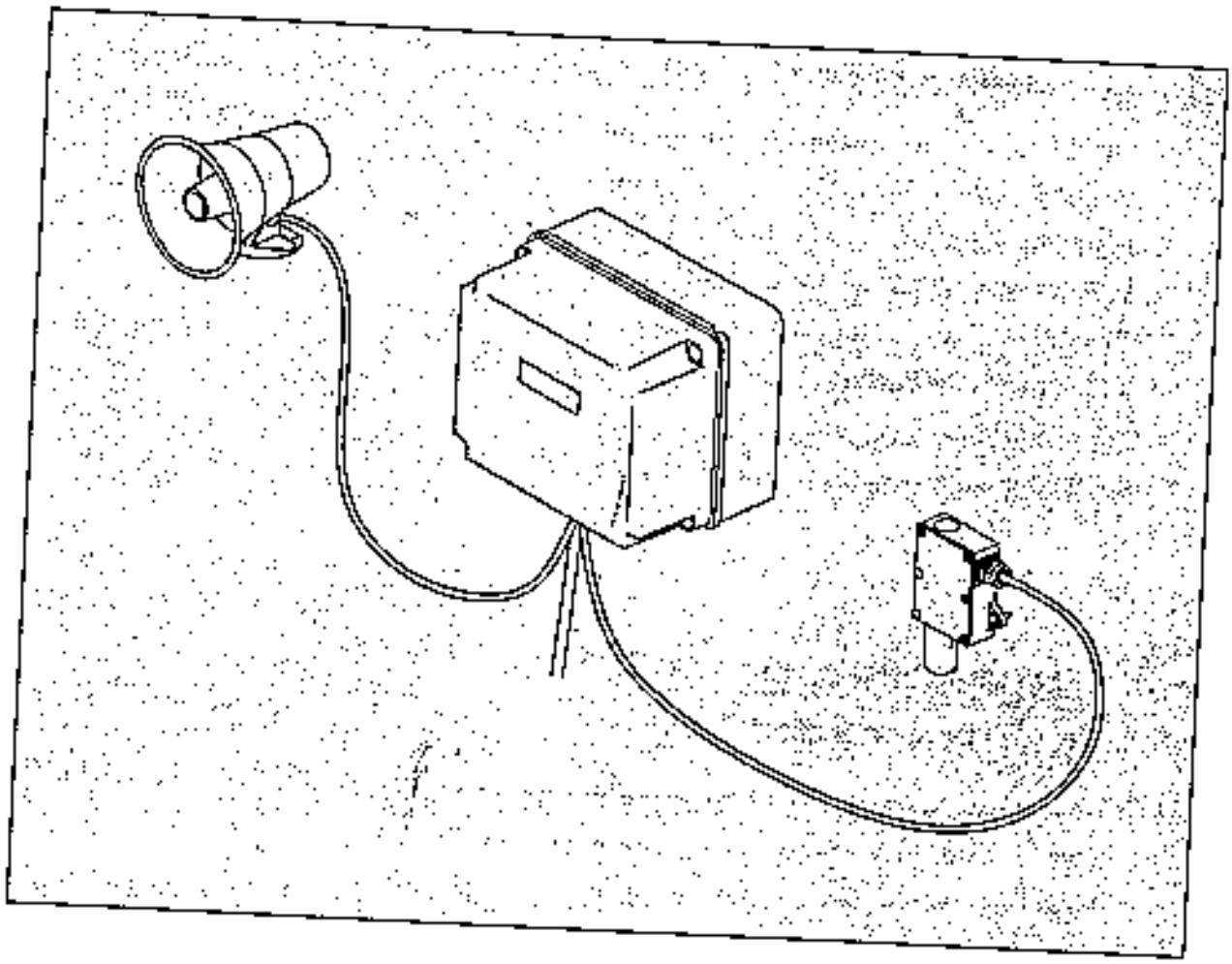
BARMAC PART NUMBER
B96AI11B/401
B96AI11B/402



IMPORTANT: The spare key has been supplied for use in an emergency. If circumstances arise that this key needs to be used, a replacement for the original must be ordered immediately. The brass key has a shorter life expectancy than the original stainless steel key.

When the replacement key arrives, return the spare key to its original package and store in a secure place.

BARMAC™ VSI CRUSHER
VIBRATION CONTROL KIT



Installation, Operation and Service Manual

SVEDALA

CONTENTS

1 INTRODUCTION

2 INTEGRATED ELECTRONIC VIBRATION CONTROL KIT

(Solenoid Reset Vibration Switch)

Layout 1
Circuit Diagram .... 2 – 3
Mounting Details .... 4 – 7
Wiring Instructions .... 8 – 10
Operation .... 11 – 12
Adjustment/Calibration 13
Servicing 14
Parts Replacement .... 15 – 16

3 BASIC VIBRATION CONTROL KIT

(Manual Reset Vibration Switch)

Layout 1
Circuit Diagram 2
Mounting Details .... 3 – 4
Wiring Instructions .... 5 – 6
Operation 7
Adjustment/Calibration 8
Servicing 9
Parts Replacement 10

Introduction

The vibration control device fitted to your Barmac Duopactor crusher is designed to protect your machine from the effects of severe vibration.

This manual contains instructions on the installation, operation and service of the vibration control device, which when followed, should provide trouble-free operation.

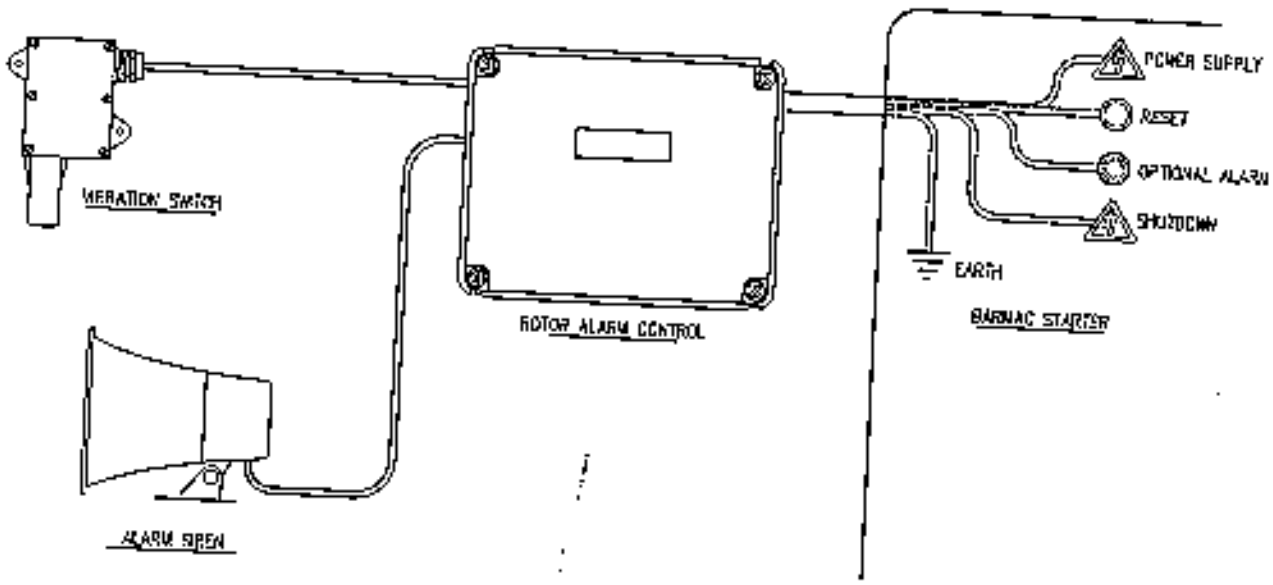
The Barmac crusher warranty is contingent on this cut-out switch being installed and operating correctly.

Integrated Electronic Vibration Control Kit

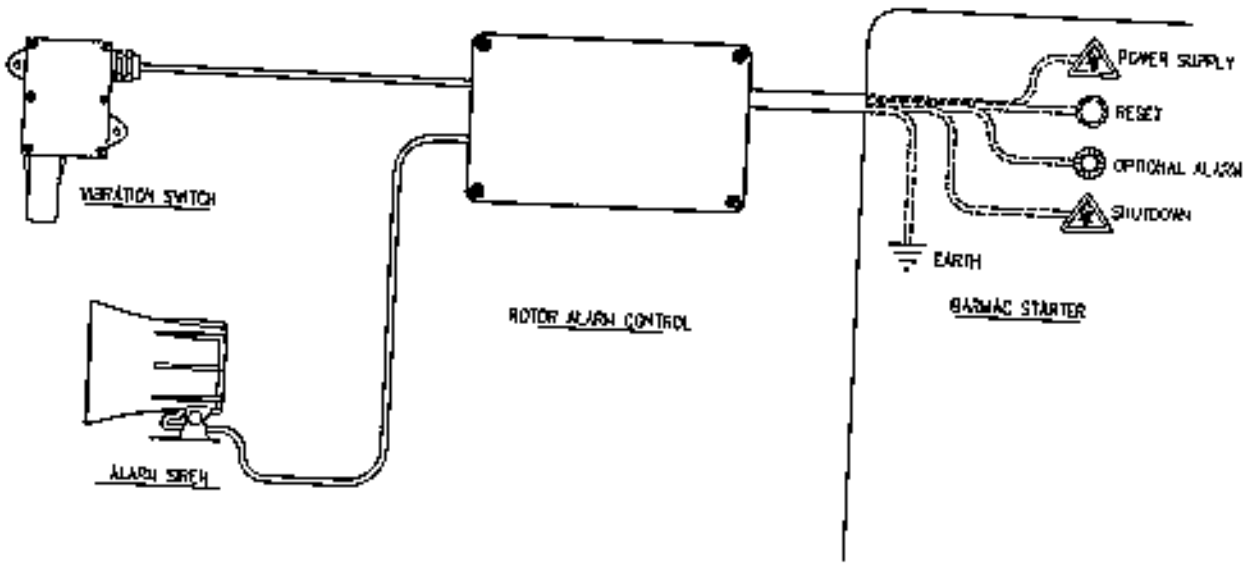
(SOLENOID RESET VIBRATION SWITCH)

LAYOUT

Serial Number C001 to C197

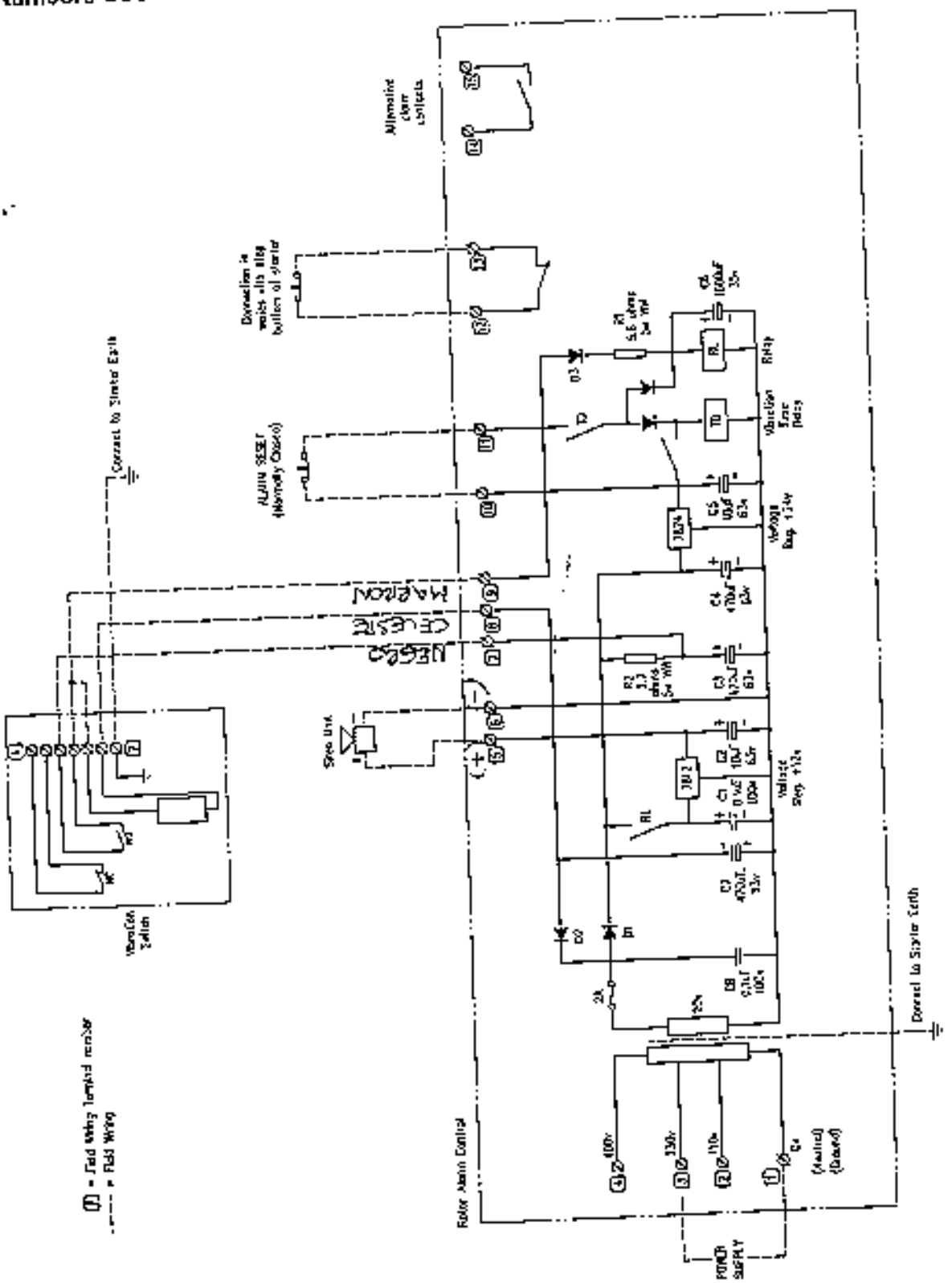


Serial Number from RA001



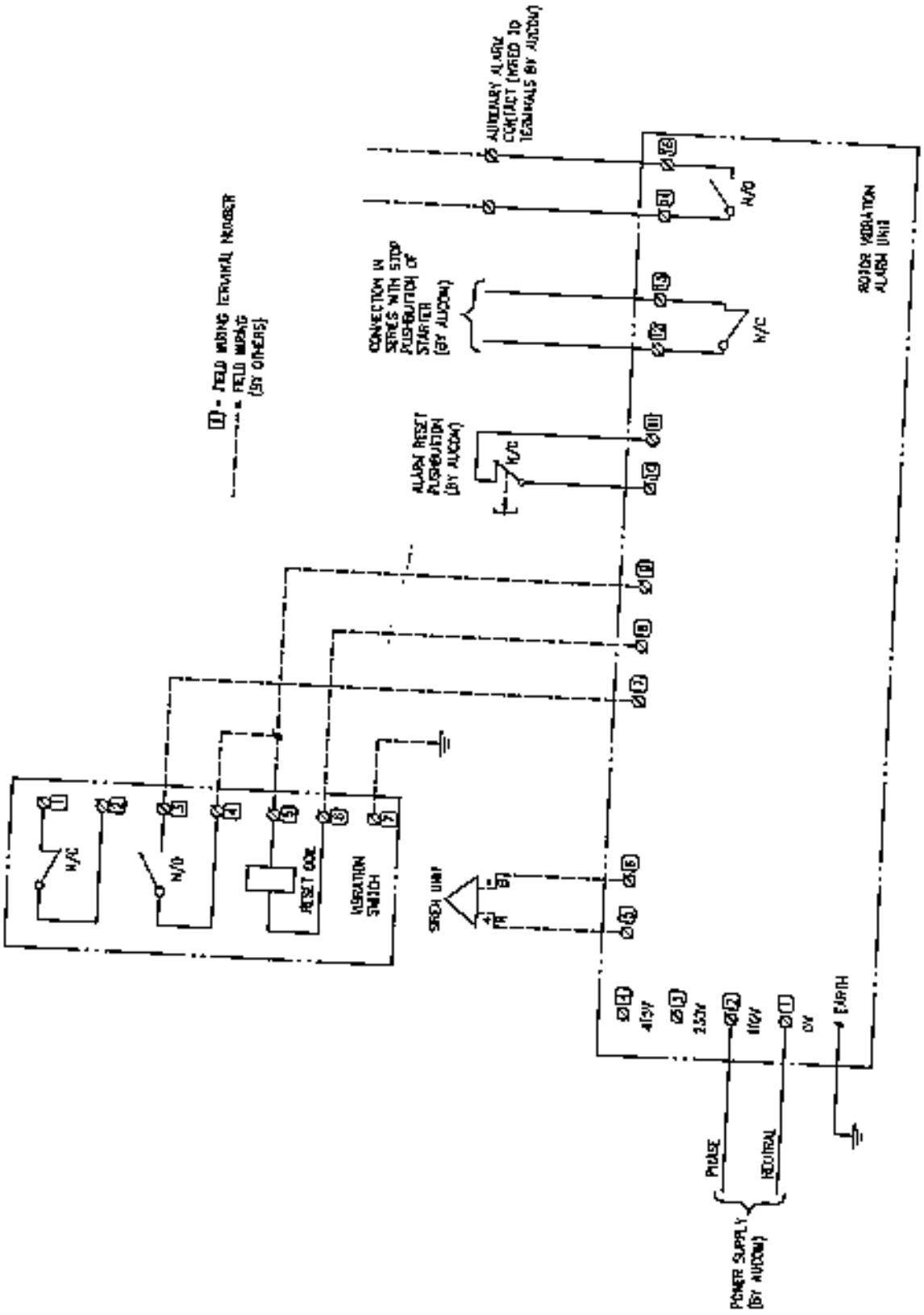
COMPLETE SYSTEM CIRCUIT DIAGRAM

Serial Numbers C001 to C197



COMPLETE SYSTEM CIRCUIT DIAGRAM

For Serial Numbers RA001 and above

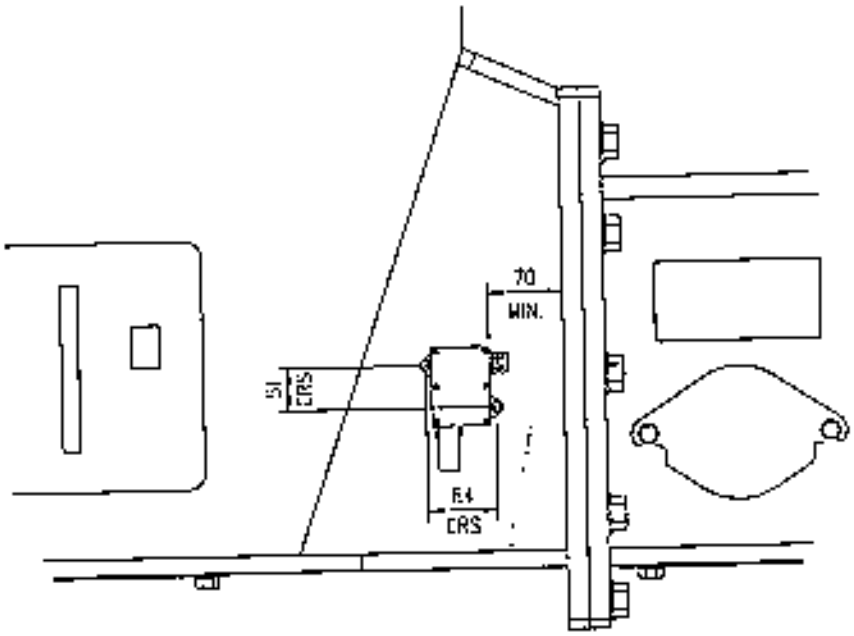


MOUNTING DETAILS

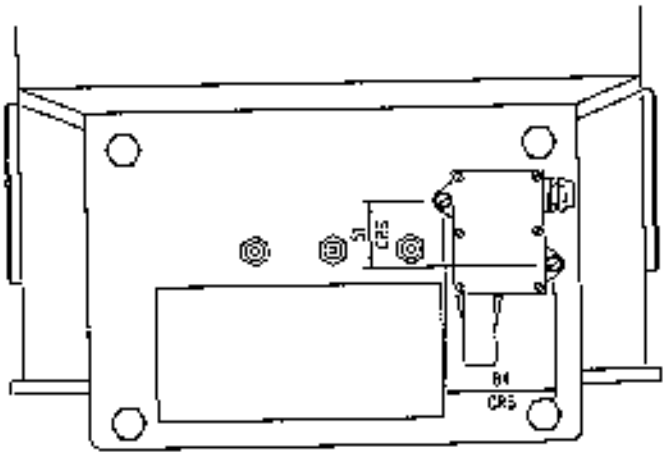
VIBRATION SWITCH

The unit should be mounted on a vertical face with the reset mechanism at the bottom using the two fixing holes on the outside of the unit. (See below for fixing detail).

The switch will respond to vibrations in any axis and should be fitted on the structure so that good transmission is ensured from the source of excess vibrations.



Recommended mounting position B9000, B8000, B7000 and B6000 machines.

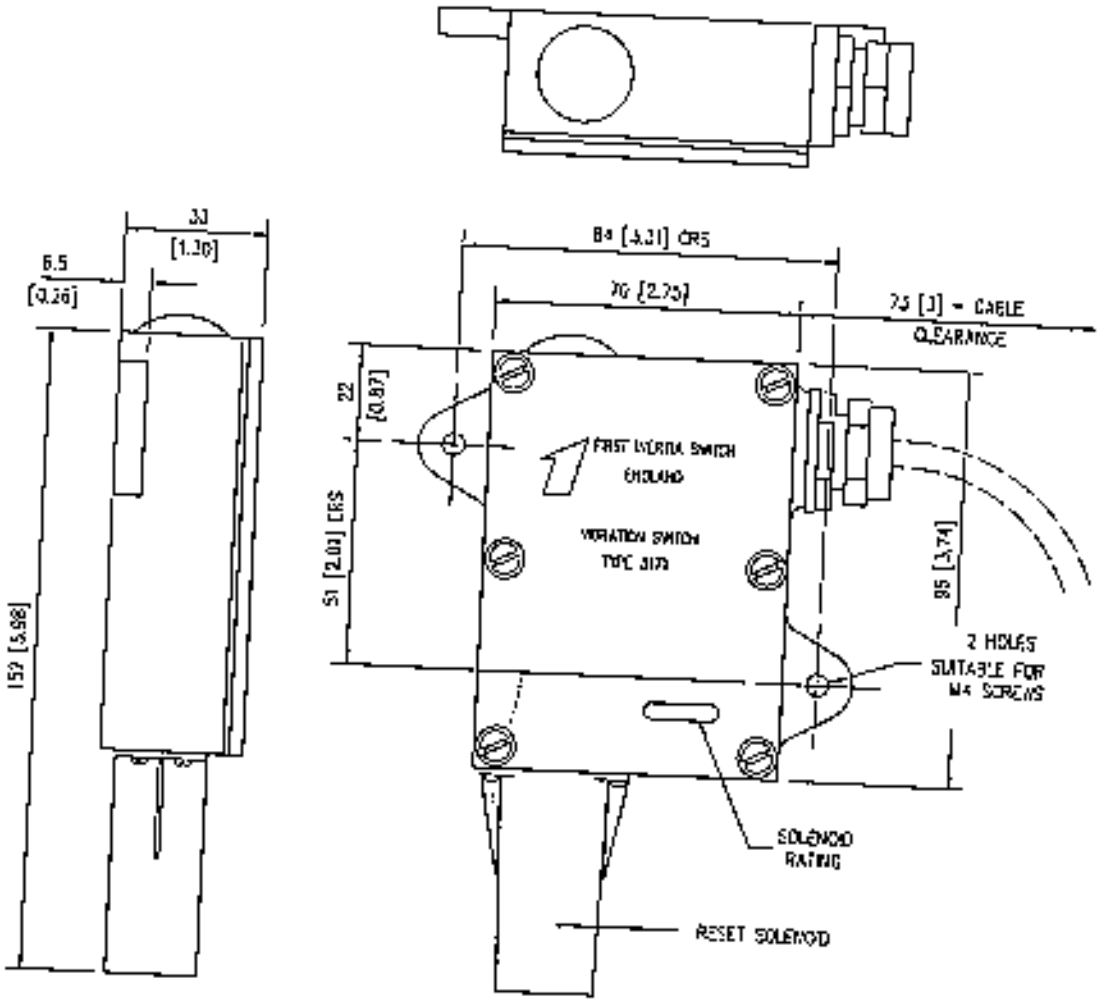


Recommended mounting position B5000 and B3000 machines.

Continued ▶

MOUNTING DETAILS

VIBRATION SWITCH



ELECTRICAL CONNECTIONS

Standard cable entry tapped to M20 x 1.5, I.S.O.

Maximum connector core size – 2.5mm²

Internal earth connection – 2.5mm² maximum core diameter

Ensure cables are correctly fitted into terminal block and earth terminals comply to relevant code of practice.

STORAGE

If switches are fitted to machinery without electrical connections being made, ensure that the cable entry is sealed to prevent moisture entering the switch.

Continued ▶

MOUNTING DETAILS

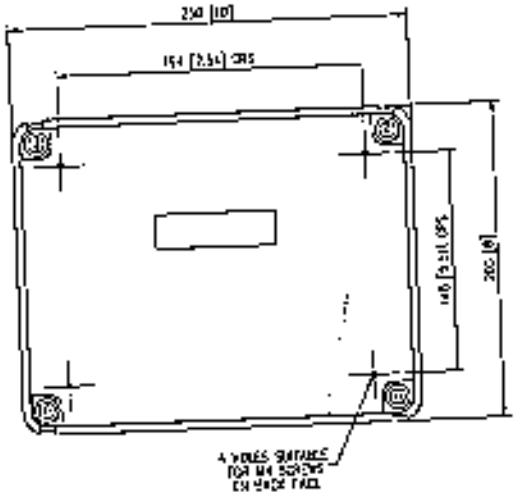
ROTOR ALARM CONTROL

The rotor alarm control unit is suitable for mounting adjacent to, or as part of the main motor starter. See distance between Vibration Switch and Rotor Alarm Control 2–10.

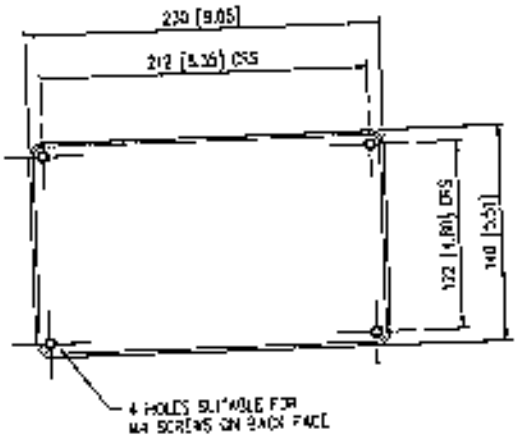
Remove cover and mount unit using the four fixing holes in each corner of the enclosure.

For mounting as part of the starter, the gear plate may be removed from the enclosure if this is more convenient.

Serial Numbers C001 to C197



From Serial Number RA001



Cable entry into unit to be made to suit cable size.

Ensure cables are correctly fitted into terminal block and sealed at entry into unit.

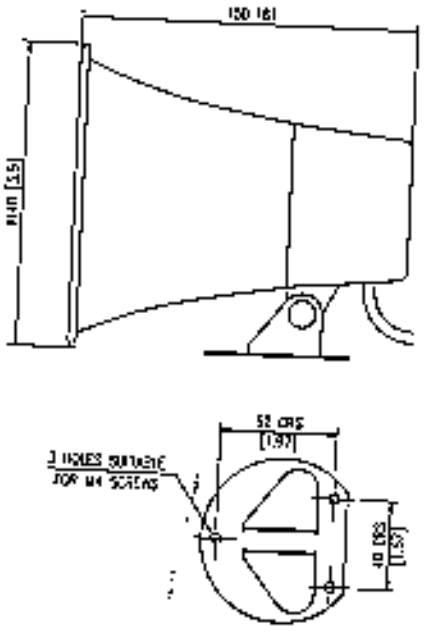
Continued ▶

MOUNTING DETAILS

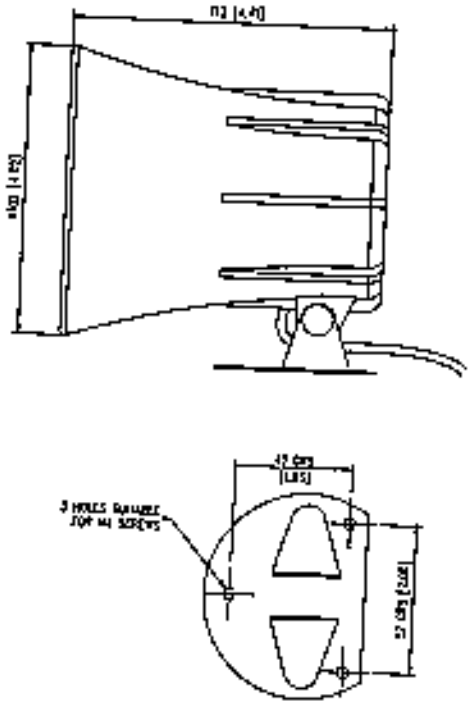
SIREN ALARM

Mount the siren in a suitable position within audible range of the Barmac operator and within 25m of the rotor alarm control.

Serial Numbers C001 to C197

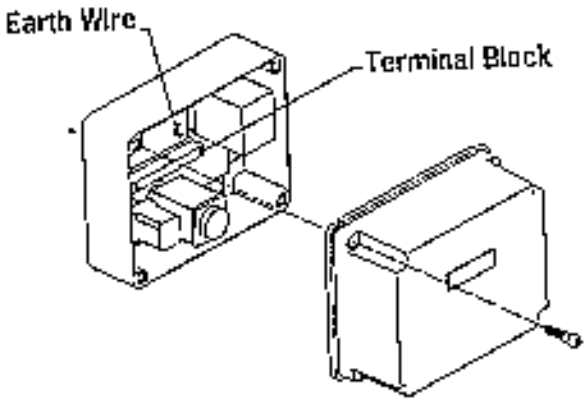


From Serial Number RA001

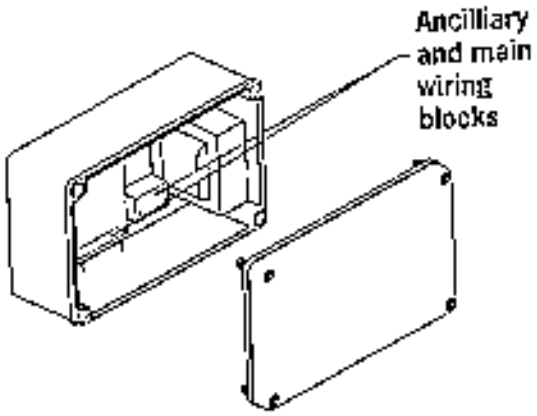


WIRING INSTRUCTIONS

Serial Numbers C001 to C197



From Serial Number RA001



ROTOR ALARM CONTROL

ROTOR ALARM SUPPLY CONNECTIONS (TERMINALS 1 – 4)

The Rotor Alarm Control is suitable for use with the following supply voltage:

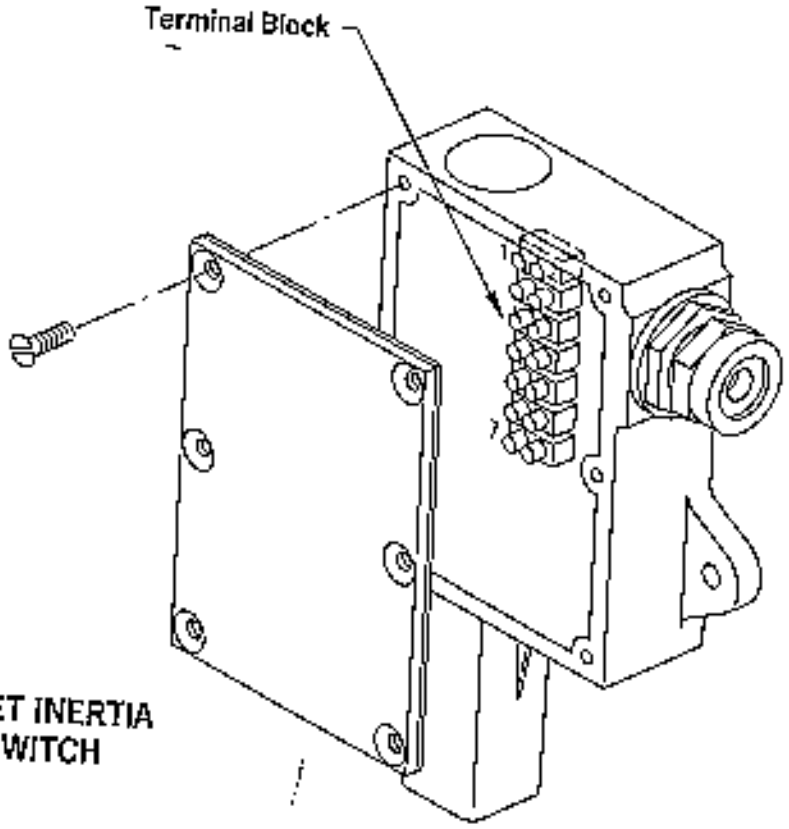
110 – 125v	50/60 Hz	Connect between terminals 1 (neutral wire) and 2 (live wire)
220 – 240v	50/60 Hz	Connect between terminals 1 (neutral wire) and 3 (live wire)
400 – 440v	50/60 Hz	Connect between terminals 1 (neutral wire) and 4 (live wire)

SIREN CONNECTIONS (TERMINALS 5 – 6 IN ROTOR ALARM CONTROL)

These terminals are connected to the siren speaker and supply 12 VDC at 300mA when an alarm condition exists. Terminal 5 is positive (+) and should be connected to the speaker red wire, and terminal 6 is negative (–) and should be connected to the speaker black or black/red striped wire. Neither terminal should be earthed.

Continued ▶

WIRING INSTRUCTIONS



VIBRATION SWITCH CONNECTIONS (TERMINALS 7 – 9 IN ROTOR ALARM CONTROL)

Terminals 7 and 9 of the rotor alarm control are connected to the "normally open" contact in the Inertia Vibration Switch (which are terminals 3 and 4 of the terminal strip within the switch, counting from the top). The voltage present at these terminals is 12 VDC. Use a short length of wire to link terminals 4 and 5 together in the vibration switch. Terminal 8 of the rotor alarm control is connected to terminal 6 in the vibration switch.

ALARM RESET (TERMINALS 10 – 11 IN ROTOR ALARM CONTROL)

These terminals should be connected to a separate push button with a clean set of normally-closed contacts. The push button should be labelled "Alarm Reset". The voltage present at these terminals is 12 VDC.

SHUTDOWN (TERMINALS 12 – 13 IN ROTOR ALARM CONTROL)

These terminals are electrically clean and should be connected to the Barmac starter or starting system in such a way that when no continuity exists between terminals, the starter will stop.

OPTIONAL ALARM (TERMINALS 14 – 15 IN ROTOR ALARM CONTROL)

These terminals may be connected to an alternative alarm if so desired. They are electrically clean.

Continued ▶

WIRING INSTRUCTIONS

EARTH

Earth the Rotor Alarm Control (green wire) to the starter earth.

DISTANCE BETWEEN VIBRATION SWITCH AND ROTOR ALARM CONTROL

Care should be exercised in the selection of cable size when connecting the Vibration Switch to the Alarm Unit.

Following are the recommended minimum cable sizes for a given length of cable run.

METRIC

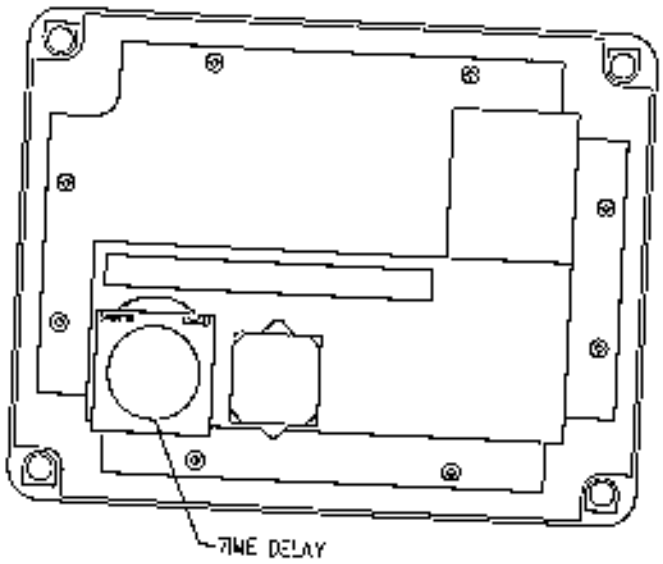
Vibration Switch/Rotor Alarm Control Distance (m)	Minimum Wire Size (mm^2)
50	0.75
65	1.0
120	2.0
150	2.5
250	4.0

U.S.

Vibration Switch/Rotor Alarm Control Distance (ft)	Minimum Wire Size (AWG)
150	18
250	16
400	14
600	12
800	10

OPERATION

Serial Numbers C001 to C196



The Timing Setting in the Rotor Alarm Control can be adjusted from 0 - 3 minutes to suit plant operation.

When a vibration condition exists, the alarm siren will sound immediately.

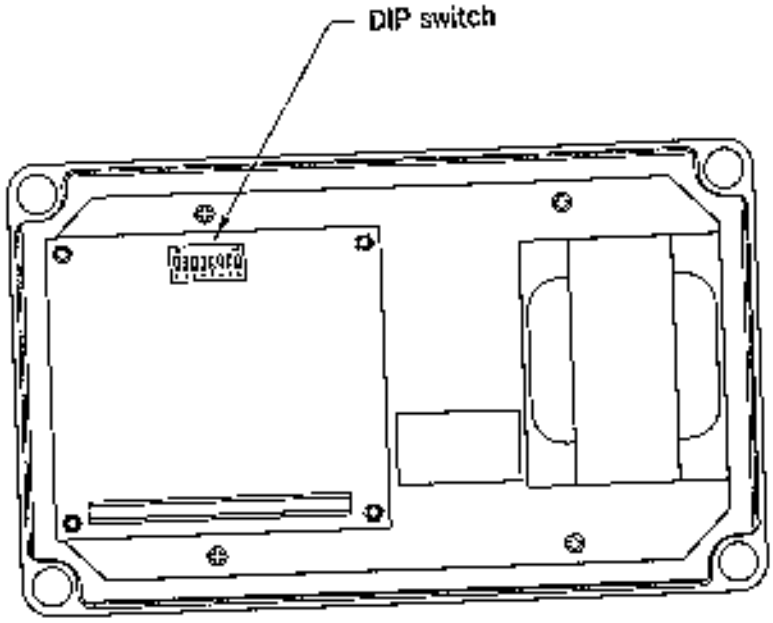
If the vibration ceases within the vibration switch setting (0 – 3 minutes for serial numbers C001 to C197) or (0 – 2 minutes for serial numbers RA001 and above), the alarm stops.

If the vibration continues for longer than this setting, the vibration alarm unit shuts down the crusher and the alarm siren continues to sound.

When the crusher shuts down, press the "Reset" button to reset the vibration alarm unit and silence the alarm siren. Investigate and remedy the cause of the vibration condition before restarting the crusher in the normal manner.

OPERATION

From Serial Number RA001



The Barmac rotor alarm unit has two adjustment settings controlled by way of a bank of of eight DIP switches; the sensitvity adjustment and the delay adjustment.

SENSITIVITY ADJUSTMENT: Switches #1, #2 and #3 control the sensitivity. This is set at 2 Hz (switch 2 on, 1 and 3 off) and should never need to be changed.

DELAY ADJUSTMENT: The delay adjustment is controlled by switches #4 – #8. This determines the time delay before the Barmac is shut down in an excessive vibration condition. The delay is adjustable from 2 seconds (all switches OFF) to 124 seconds (all switches ON), by combination of the eight switches.

The individual settings are as follows:

#4	#5	#6	#7	#8
4 sec	8 sec	16 sec	32 sec	64 sec

e.g. 44 second delay = #7 (32 sec) + #5 (8 sec) + #4 (4 sec) = 44 seconds

ADJUSTMENT AND CALIBRATION OF VIBRATION SWITCH

1. Remove cover of switch and grommit from adjuster.
2. With small screwdriver rotate set level screw (see Fig. 1) until magnet can be seen to be in contact with metal ball (metal ball will start to rotate with set level screw when in contact).
3. Remove one cavity wear plate (open sided rotor) or tip carrier wear plate (enclosed rotor) from rotor and close door.
4. Start Barmac. **WARNING:** The removal of the cavity wear plate/tip carrier wear plate will create the "maximum allowable vibration level" that will allow adjustment of the switch.
5. With the machine running at the "maximum allowable vibration level", readjust the vibration switch set level screw anti-clockwise (slowly) until the ball drops onto the micro-switch. Then, continue to screw anti-clockwise one half turn beyond this point. See notes (a) and (b) below.
6. Replace the cavity wear plate/tip carrier wear plate and run machine to test that, under no vibration conditions, the vibration switch will not activate.
7. Repeat 3 above, to test vibration switch, and then repeat 6 once again.
   (a) With Manual Reset Switch the crusher will shut down immediately.
   (b) With Vibration Control Unit the solenoid will continually reset the Vibration Switch for the pre-set time. The alarm should sound throughout this period. **Note:** If the above does not occur, check wiring. (See wiring diagram section 2 p. 2-3).

TYPICAL CALIBRATION CURVE

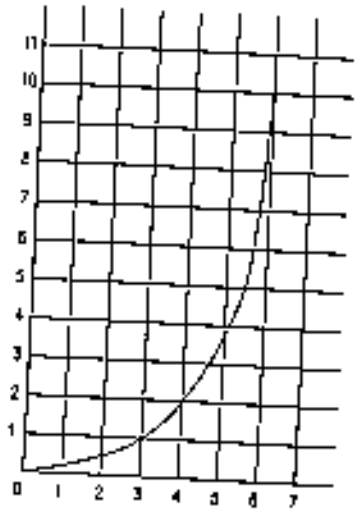
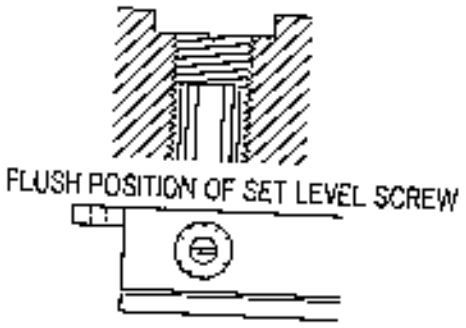


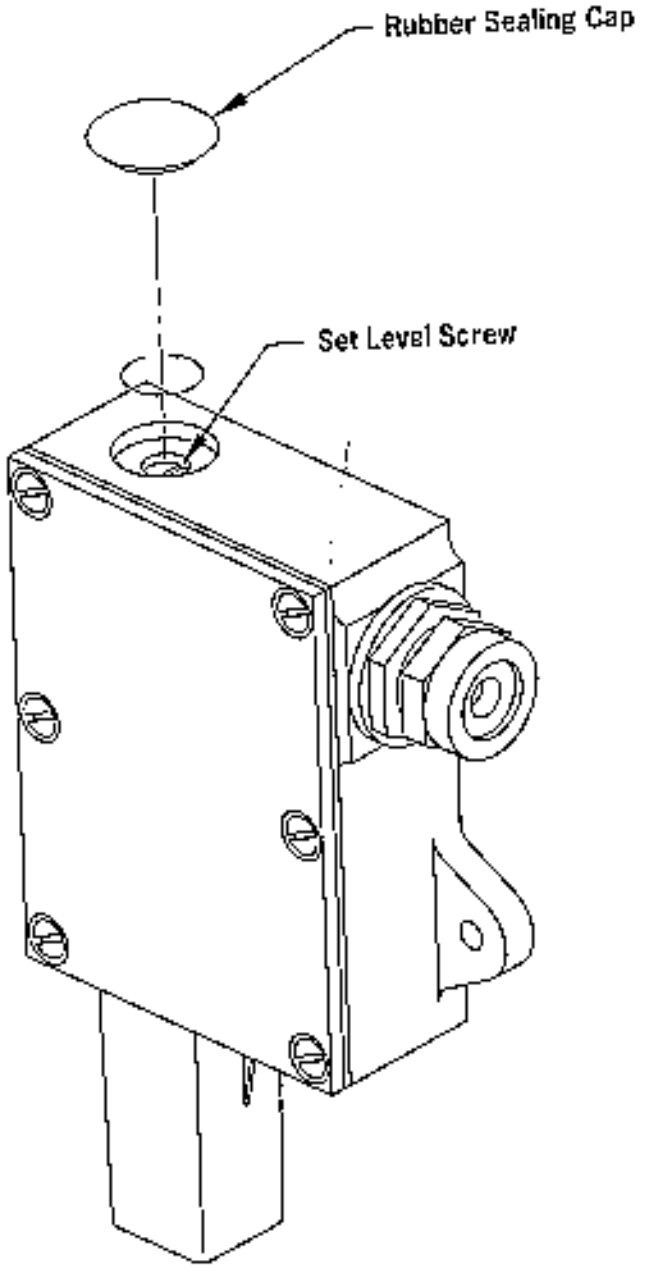
FIG. 1



SERVICING

A periodic service functional check is recommended by reducing the vibration switch setting (screw set level screw towards flush) until switch is activated. This should cause the alarm siren to sound and after the pre-set time delay, the crusher should shut down.

VIBRATION SWITCH



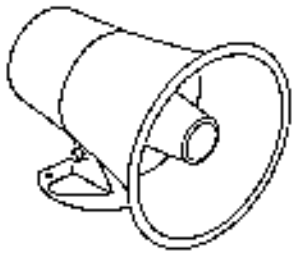
PARTS REPLACEMENT

ROTOR ALARM CONTROL B96AV14A

(Includes both Siren and Vibration Alarm Unit)

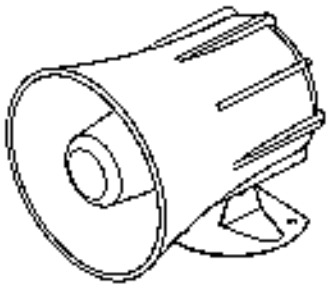
A. SIREN B96AV14A/100

TYPE: 12 vdc, 8 ohms, 10 watts
Serial Number C001 - C197



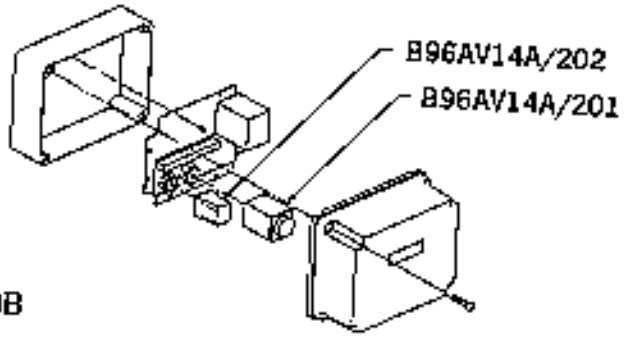
SIREN B96AV14A/100B

TYPE: 12 vdc, 120 dB
Serial Numbers from RA001



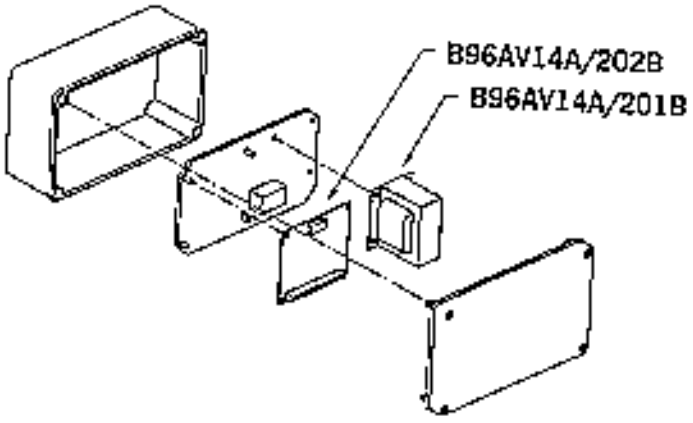
B. VIBRATION ALARM UNIT B96AV14A/200

TYPE: Dawson Control
TIDCO MK IV
Serial Numbers C001 to C197



VIBRATION ALARM UNIT B96AV14A/200B

TYPE: Aucom Rotor Alarm Control
Serial Numbers from RA001



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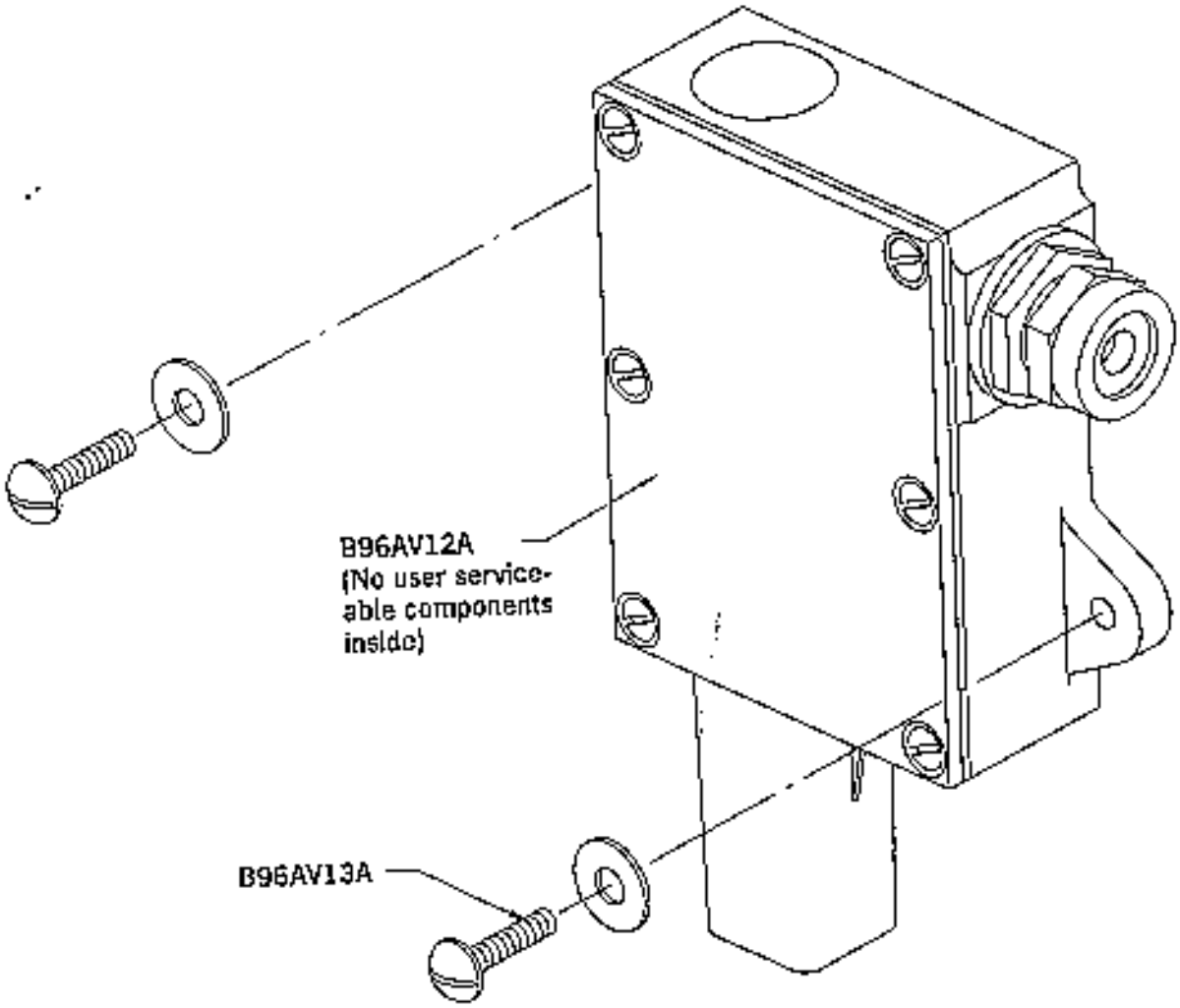
PARTS REPLACEMENT

VIBRATION SWITCH KIT B96AV11A



When ordering individual components quote part number and descriptions below:

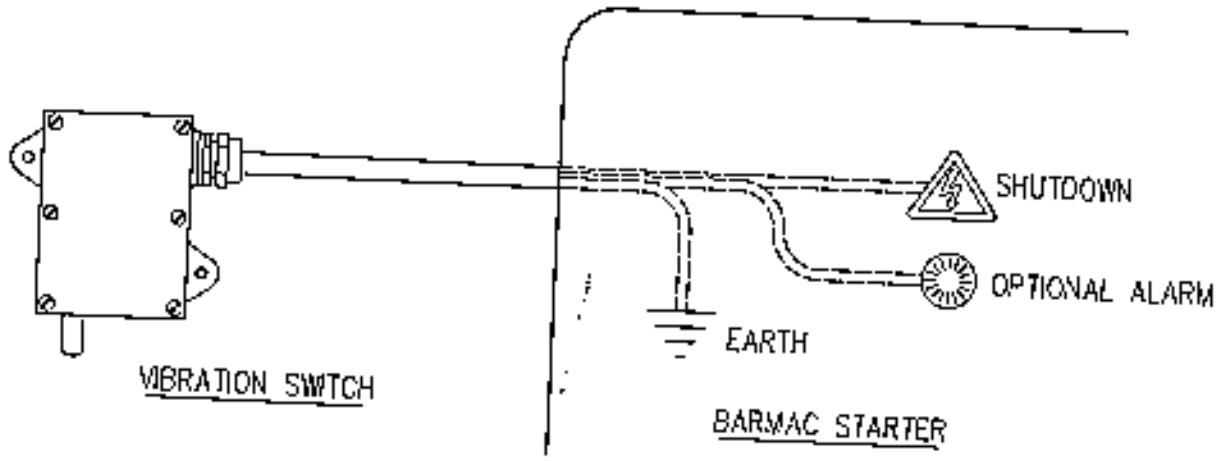
B96AV12A Vibration Switch, type 3171, 12 vdc Solenoid.

B96AV13A Vibration Switch Screw Set.

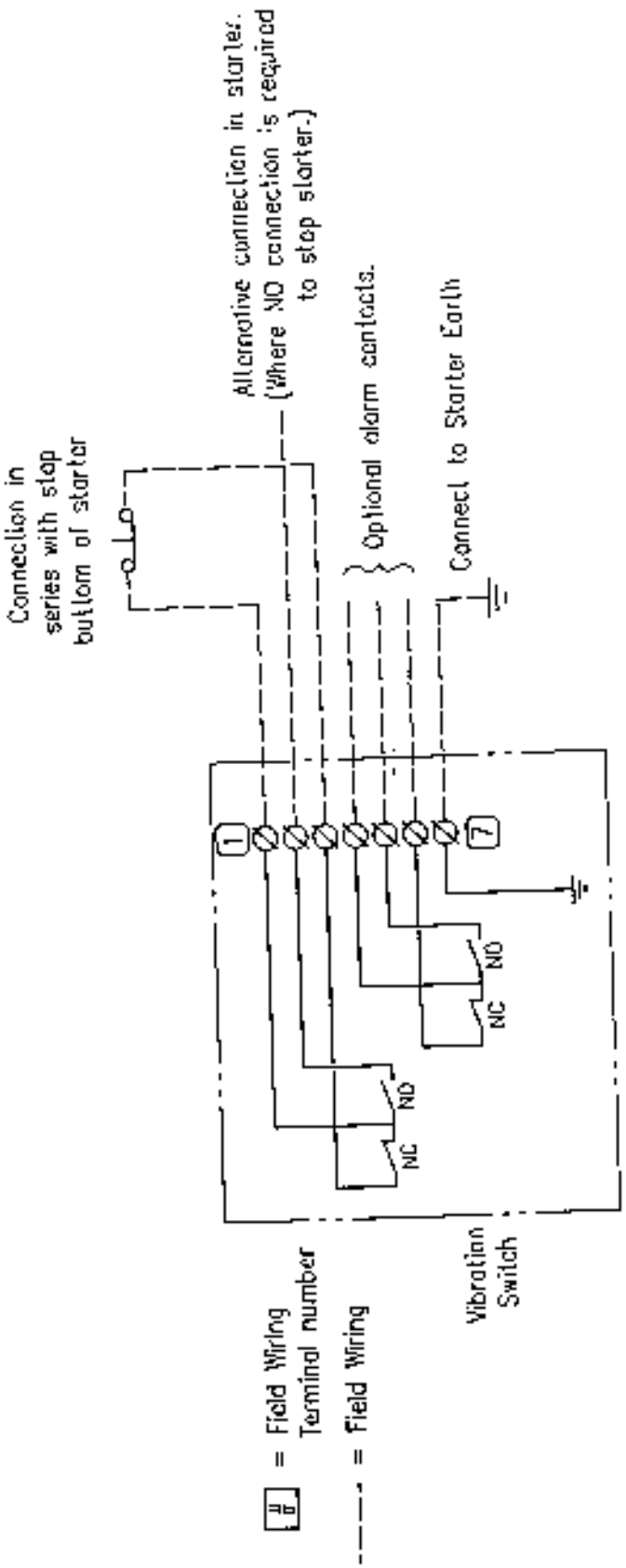
Basic Vibration Control Kit

(MANUAL RESET VIBRATION SWITCH)

LAYOUT



COMPLETE SYSTEM CIRCUIT DIAGRAM

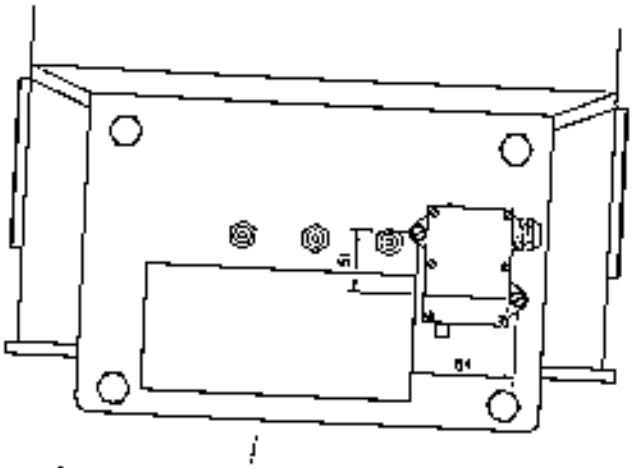


MOUNTING DETAILS

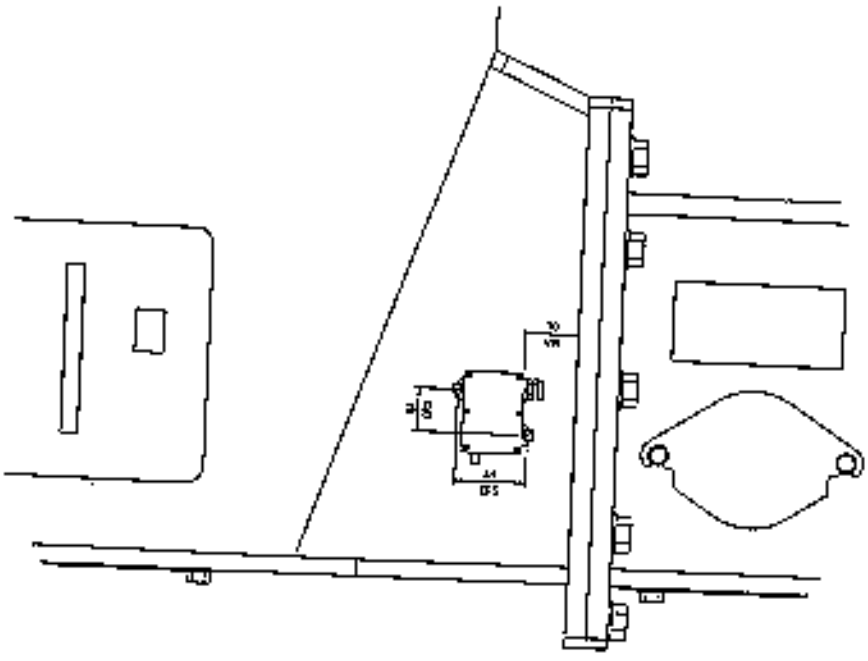
VIBRATION SWITCH

The unit should be mounted on a vertical face with the reset mechanism at the bottom using the two fixing holes on the outside of the unit). See distance between Vibration Switch and Barmac Starter 3–6.

The switch will respond to vibrations in any axis and should be fitted on the structure so that good transmission is ensured from the source of excess vibrations.



Recommended mounting position 5000 and 3000 machines.

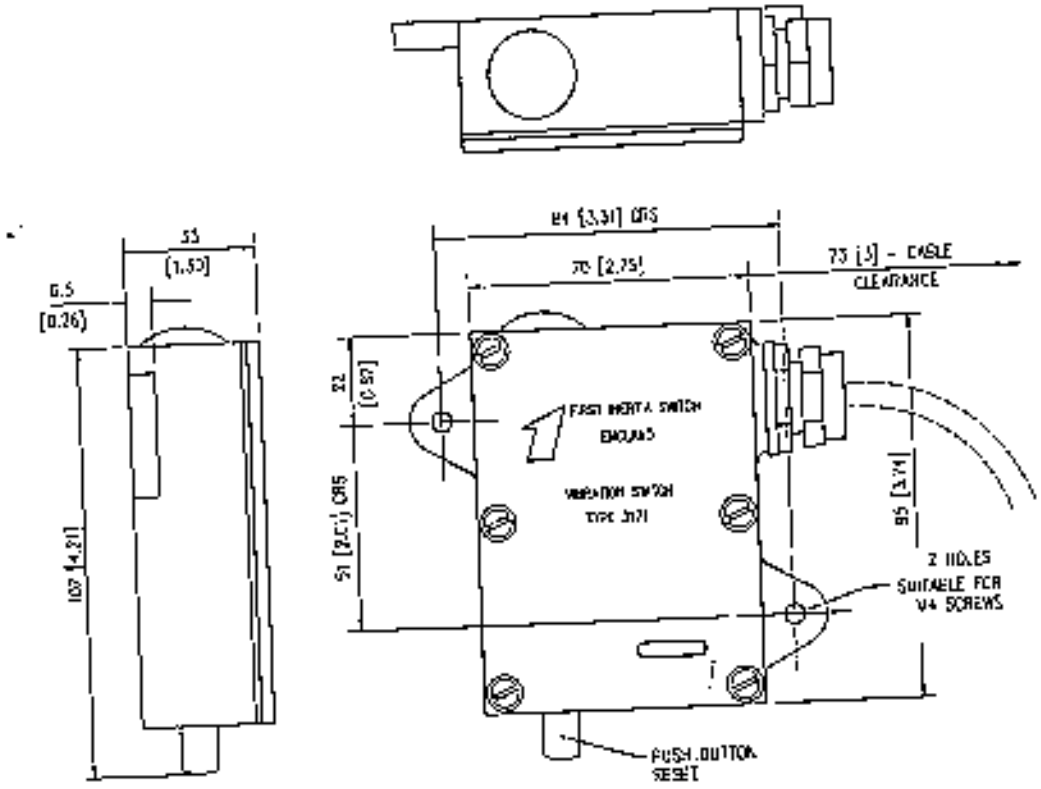


Recommended mounting position 9000, 8000, 7000 and 6000 machines.

Continued ▶

MOUNTING DETAILS

VIBRATION SWITCH



ELECTRICAL CONNECTIONS

Standard cable entry tapped to M20 x 1.5, I.S.O.

Max connector core size – 2.5mm²

Internal earth connection – 2.5mm² max. core diameter

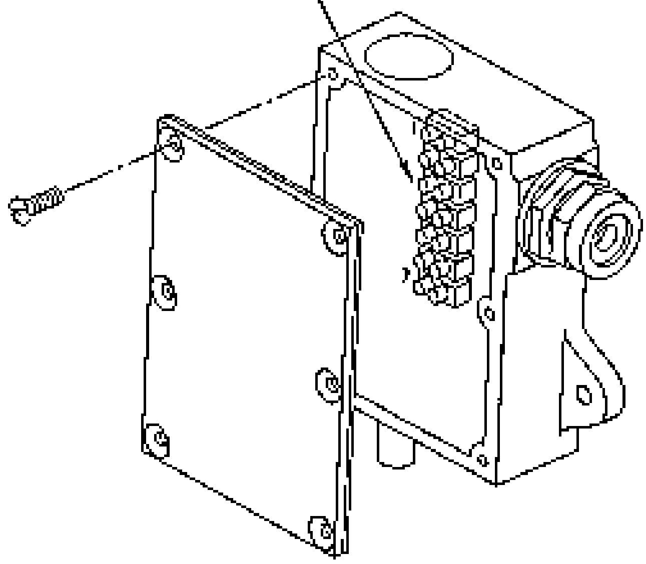
Ensure cables are correctly fitted into terminal block and earth terminals comply to relevant code of practice.

Refer to page 3–6 for maximum distance between Vibration Switch and Barmac Starter.

STORAGE

If switches are fitted to machinery without electrical connections being made, ensure that the cable entry is sealed to prevent moisture entering the switch.

WIRING INSTRUCTIONS



Terminals 1, 2, and 3 (Motor Starter Connections)

For a "normally open" circuit where the starter will stop when the circuit is closed, connect the motor starter to terminals 1 and 2 of the terminal strip, counting from the top.

For a "normally closed" circuit where the starter will stop when the circuit is opened, connect the motor starter to terminals 1 and 3 of the terminal strip.

Note: Operating voltage of the Vibration Switch is 12 vdc.

Terminals 4, 5 and 6 (Optional Alarm)

These terminals may be connected to an alternative alarm if so desired. A connection between terminals 4 and 5 will give a "normally open" circuit and between terminals 4 and 6 will give a "normally closed" circuit. The voltage present at these terminals is 12 vdc.

Continued ▶

WIRING INSTRUCTIONS

DISTANCE BETWEEN VIBRATION SWITCH AND BARMAC STARTER

Care should be exercised in the selection of cable size when connecting the Vibration Switch to the Barmac crusher starter.

Following are the recommended minimum cable sizes for a given length of cable run.

METRIC

Vibration Switch/Barmac Starter	Minimum Wire Size (mm^2)
50	0.75
65	1.0
120	2.0
150	2.5
250	4.0

U.S.

Vibration Switch/Barmac Starter	Minimum Wire Size (AWG)
150	18
250	16
400	14
600	12
800	10

OPERATION

When a vibration condition exists, the Barmac crusher will shut down. Investigate and remedy the cause of the vibration condition before restarting the crusher in the normal manner.

ADJUSTMENT AND CALIBRATION OF VIBRATION SWITCH

1. Remove cover of switch and grommit from adjuster.
2. With small screwdriver rotate set level screw (see Fig. 1) until magnet can be seen to be in contact with metal ball (metal ball will start to rotate with set level screw when in contact).
3. Remove one cavity wear plate (open sided rotor) or tip carrier wear plate (enclosed rotor) from rotor and close door.
4. Start Barmac. **WARNING:** The removal of the cavity wear plate/tip carrier wear plate will create the "maximum allowable vibration level" that will allow adjustment of the switch.
5. With the machine running at the "maximum allowable vibration level", readjust the vibration switch set level screw anti-clockwise (slowly) until the ball drops onto the micro-switch. Then, continue to screw anti-clockwise one half turn beyond this point. See notes (a) and (b) below.
6. Replace the cavity wear plate/tip carrier wear plate and run machine to test that, under no vibration conditions, the vibration switch will not activate.
7. Repeat 3 above, to test vibration switch and then repeat 6 once again.
   (a) With Manual Reset Switch the crusher will shut down immediately.
   (b) With Vibration Control Unit the solenoid will continually reset the Vibration Switch for the pre-set time. The alarm should sound throughout this period. **Note:** If the above does not occur, check wiring. (See wiring diagram section 3 p. 2).

TYPICAL CALIBRATION CURVE

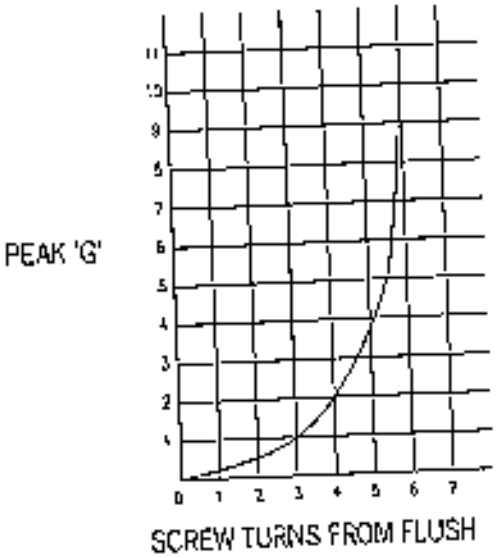
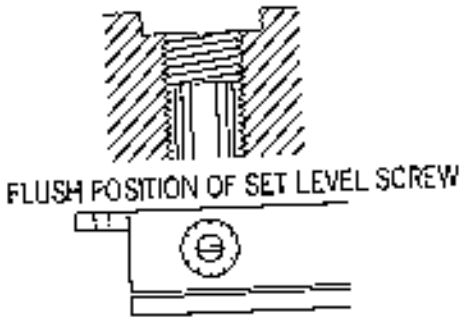


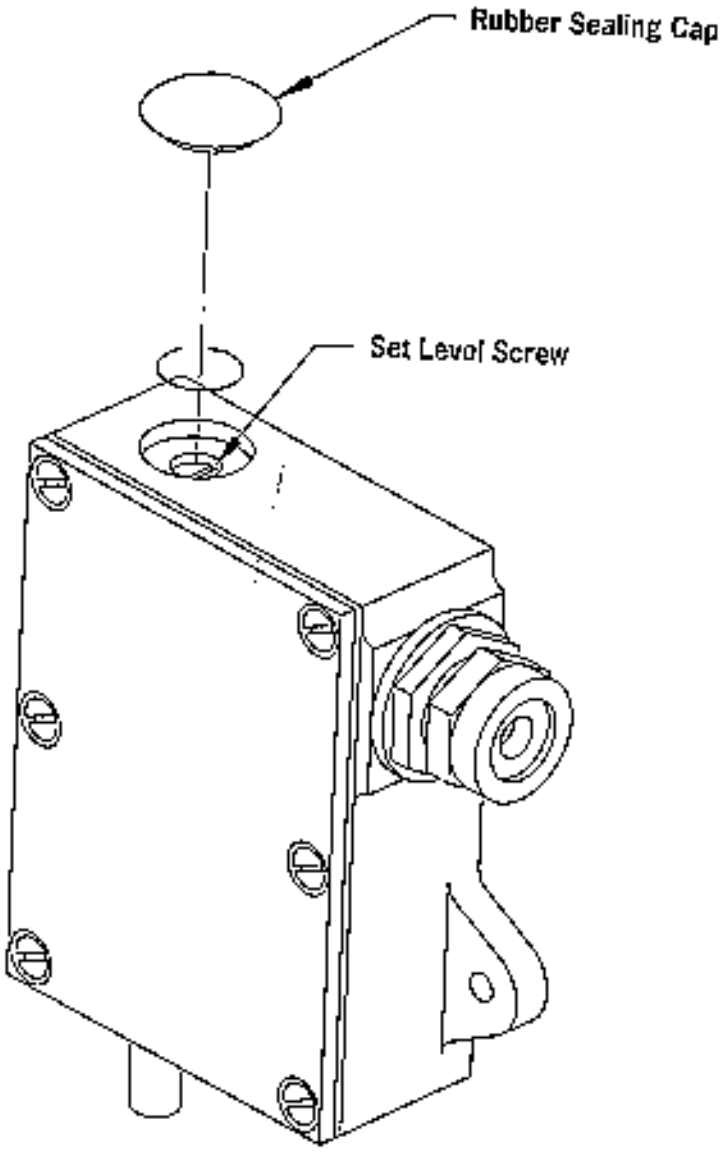
FIG. 1



SERVICING

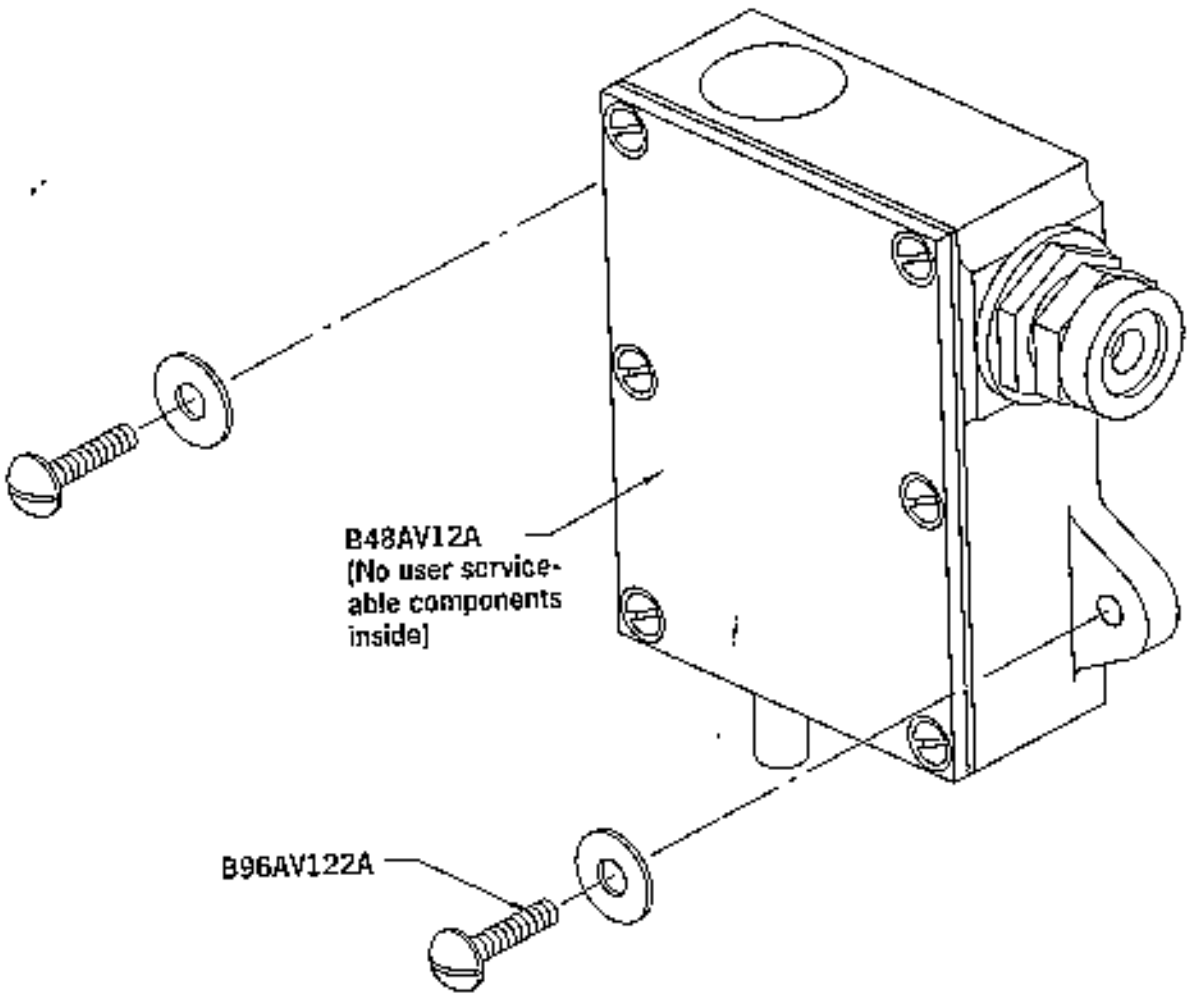
A periodic service functional check is recommended by reducing the vibration switch setting (screw set level screw towards flush) until switch is activated. This should cause the crusher to shut down.

VIBRATION SWITCH



PARTS REPLACEMENT

BASIC VIBRATION SWITCH KIT B48AV11A



When ordering individual components quote part number and descriptions below:

B48AV12A Vibration Switch, type 3171, Manual Reset.

B96AV13A Vibration Switch Screw Set.

spare parts & accessories

BARMAC™

operation & maintenance

BARMAC™

BARMAC ROCK-ON-ROCK VSI CRUSHER

Manufacture and design of the Barmac crusher is carried out under quality control systems certified to ISO 9001 by Svedala Barmac Product Group. Distributed worldwide under the following granted and pending patents and design applications:

New Zealand 195307, 202193, 213510, 217752, 217753, 250027, 25928, 25927, 25928, 25569, 25473, 25474, 234457, 248954, 248956, 248952, 248955, 250154, 227492, 238349
Australia 557168, 562251, 594367, 623616, 640710
U.S.A. 4662571, 4586663, 4921173, 4940185
Canada 1195045, 1229833, 1265772, 1301135
Japan 2564366, 1620260, 2078631/86, 32236/88
South Africa 87/6374, 87/5817, 86/6908, 86/8061, 96/8062, 90/9935, 88/9485
United Kingdom 0074771, 0101277, 216592, 2214107, 2218410
France 0074771, 0101277, 216592, 88-17023
Italy 0074771, 0101277, 216592
Sweden 8250465-2.9, 0101277, 216592
Austria 216592
Federal Republic of Germany 3275506.8, 0101277, 216592
Europe 0074771, 0101277, 90312660.9
Mexico 164323

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AFTER SALES CONTACTS
(PLEASE QUOTE MACHINE REF. NO.)

Spare Parts		Service	
Technical		Crusher Sales	
Telephone		Fax	

Dealer:

PRINTED IN NEW ZEALAND

P400 – 1 – 9/97

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Safety

GENERAL

During the design and manufacture of the equipment, a lot of effort is put into the avoidance of health and safety risks.

In a crushing and screening plant there are many potential risks and to avoid these it is important that:

- The recommendations in instruction manuals are studied and followed.
- Personnel are regularly given training on maintenance and safety.
- General and official safety regulations are followed.
- Dangerous areas are marked with warning signs.
- The appropriate equipment and tools are available.
- The owner and management live up to their responsibility to make sure that effective safety programmes and regulations are worked out and are followed by all personnel.

EXTRA SAFETY PRECAUTIONS

Our instruction manuals and other documentation contain important information which must be read and understood by all users before they operate the equipment. To make it easier to notice information in our instruction manuals directly concerning user safety and the avoidance of problems with the equipment, we use the terms shown below:

⚠ **WARNING:** Important information which describes how you avoid damage to a machine and its systems or how you avoid a situation which could cause personal injury.

NOTE: Advice about operation, inspection and maintenance of a machine and its systems.

GENERAL SAFETY PRECAUTIONS

The following list of general safety precautions should be considered as a guide only. There may be other conditions and variations in the operation of this equipment that are not covered in these general safety precautions. The purpose of the general safety precautions is to make all personnel aware of the general hazards and dangerous situations that exists around the equipment and the work area.

Personnel Safety

1. Read and understand each of the warnings, cautions and instructions in the instruction manual and on all signs and information places on and around the equipment.
2. Report all accidents immediately to your supervisor. Consult a doctor or medical personnel as soon as possible if personal injury is involved.
3. Keep a list of emergency telephone numbers close to the telephone and inform all work area personnel about the location of the list.
4. Do not operate or work equipment while under the influence of alcohol, medicines, tranquillisers or other drugs that can make you less alert or affect your judgement.
5. Use hand grips, ladders, guard rails and other safety devices when getting on or off equipment and when moving around while on the equipment. Use a safety harness when necessary.
6. Take precautions to keep hair and loose fitting clothing from being caught on moving parts or controls.
7. Wear safety glasses whenever there is danger of flying debris, chips, objects or dust that could enter the eyes, and when required by operating regulations. Be extra safe — always wear eye protection. Look after your eyes!
8. Wear gloves whenever possible to protect hands and fingers from cuts, scrapes, burns and solvents.
9. Always wear a hard hat and safety shoes when appropriate for the work being done and always when required by local or national regulations.
10. Remove rings, watches, necklaces and bracelets before working in the plant.
11. In areas where noise levels are high, wear hearing protection devices.

Continued ▶

SAFETY

GENERAL SAFETY PRECAUTIONS

12. Wear breathing apparatus or a mask whenever appropriate, i.e. when painting or working with chemicals, solvents and other substances that may be hazardous to your health. Remember that there is a risk of silicosis when there is siliceous dust in the air.
13. Do not take chances with your back. Use lifting and moving devices to help you with your work. Always lift with your legs, not with your back.

WORK AREA SAFETY

1. Keep the general work area clean and free of debris. Avoid stone or other material build-ups on walkways, platforms, ladders and under conveyors.
2. Do not allow unauthorised personnel in or around the work area. Keep a check on who is in your work area at all the times. If necessary, keep a list.
3. Keep equipment surfaces that will be touched by hands and feet clean, dry and free of oil or grease.
4. Keep hand grips, guard rails, ladders and platforms clean, dry and free of oil or grease. Store parts and tools in the designated places when not in use.
5. Keep safety equipment in a designated place and ensure that work area personnel know the location and the proper use of the safety equipment.
6. Make a daily check of starting alarms and warning devices in the work area, and ensure that each device is working properly before starting or operating the equipment.
7. Do not stand under or allow anyone else to stand under equipment that is being hoisted or suspended. Use a safety hook or hook with a safety latch when hoisting equipment and use spreader bars when necessary.
8. Learn the weight limitations and clearances in and around your work area and for the equipment in use.
9. Do not overload walkways. They are intended for personnel, not for storing parts or tools!
10. Be alert to conditions that may obscure vision in and around your work area.

EQUIPMENT SAFETY

1. Do not alter, deface or remove warning and information signs.
2. Before setting up portable equipment, be sure that the ground surface is firm and level. Make sure that all supporting and locking devices are securely in place. Follow manufacturers' recommended procedures for supporting and locking the equipment when applicable.
3. Before moving portable equipment, check that the brakes and running lights operate properly. Ensure that supporting legs are raised high enough off the ground to provide sufficient clearance for safe transport. Check that there are no loose items that could fall off during transport.
4. Never climb aboard equipment while it is in transit or being hoisted, or allow anyone else to do so.
5. Inspect all equipment components before each operating shift to ensure that no parts are damaged or suspected of being damaged. Repair or replace damaged parts before starting or operating the equipment. Use only original parts.
6. Before starting or operating equipment, walk around the work area and the equipment to check that no personnel, animals, tools, parts or foreign objects are in, on, under or around equipment. Make sure that all guards and safety devices are properly installed and in good working condition.
7. Before starting equipment, make sure that all work area personnel and visitors know the equipment is going to be started. Use appropriate devices such as sirens or flashing lights to warn personnel and visitors.
8. When starting equipment, follow the manufacturer's recommended starting sequence. Do not allow unskilled persons to start or operate any equipment without the proper supervision of a skilled operator.
9. Never leave equipment controls unattended. Always have a qualified operator relieve you if you must leave.

Continued ▶

SAFETY

GENERAL SAFETY PRECAUTIONS

10. During start-up and while equipment is operating be alert for improper readings, visual defects, odours or unusual sounds that could be a warning of a potential hazard. Shut down equipment immediately, following established shutdown procedures, if any unsafe condition should arise.
11. Use extreme caution whenever any equipment is required to be operating during an inspection, maintenance, lubrication or adjustment procedure. This may only be permitted if it is absolutely essential. Under normal circumstances the machine must be stopped and safety switches locked out before any work is carried out.
12. Perform all inspections, maintenance, lubrication and adjustment procedures with caution and in accordance with the manufacturer's recommended procedures.

ELECTRICAL SAFETY

1. Permit only trained and competent personnel to work on electrical components in the plant or on any equipment.
2. Always assume that an electrical circuit is live until it is proven dead by proper testing procedures.
3. Lock out and tag electrical controls before performing any inspection and maintenance. See details of the door safety interlock system recommended by Svedala, section 1 - 5.
4. Repair or replace electrical wires, cables and connectors that are broken or damaged in any way.
5. Check the electrical ground wires, motor plugs and power cable connections are properly and securely connected before starting any equipment.
6. Know the location of all power lines and underground cables. Use extreme caution when working around these areas. Know the location of all main electrical isolating switches.
7. Never work on electrical equipment while it is raining or while standing in water or on wet surfaces unless you know the power is disconnected.
8. Be alert when working around or with electricity. Report any electrical hazard immediately to your supervisor.

FLAMMABLE & HAZARDOUS MATERIALS SAFETY

1. Store flammable, combustible or hazardous materials in a safe place and in containers specifically designed for the purpose and clearly marked in accordance with the relevant regulations.
2. Store used and oily cleaning rags in a properly designed container as required by national or local rules and regulations, and away from flammable and combustible materials.
3. Do not store flammable or combustible materials in, or around the equipment, electrical installations or personnel facilities.
4. Do not permit smoking or an open flame around fuel tanks or other storage facilities for combustible materials.
5. Keep several fully charged fire extinguishers located throughout the work area. Make sure that all personnel know their location and how to operate them. Have them readily available during fuelling operations or when other fire hazards are present. Check the charge on each fire extinguisher at least once a month or when otherwise specified.
6. Shut down all engines and motors when fuelling or transferring flammable, combustible or hazardous materials. Follow the recommended fuelling and transfer procedures for the substance or material being worked with.
7. Fill fuel storage tanks and other combustible materials storage facilities in a well ventilated area, well away from equipment which can cause sparks and thus ignite flammable materials.
8. When refuelling or transferring flammable or combustible materials, ground the nozzle or spout to prevent sparks caused by static electricity.
9. Never start a diesel or gasoline engine in an enclosed area unless there is adequate ventilation.
10. Do not use flammable or combustible substances such as gasoline, kerosene or diesel fuel for cleaning parts. Always use a non-flammable solvent for cleaning.

Continued ▶

SAFETY

GENERAL SAFETY PRECAUTIONS

11. When using epoxy-resin based materials, follow the manufacturer's recommended procedures and precautions. Mix and pour epoxy materials in an open or well ventilated area. Do not burn cured resin without adequate ventilation. Avoid skin contact with uncured epoxy-resin materials.
12. Always inspect and charge batteries in an open or well ventilated area. Do not permit smoking or open flames near batteries. Remember that batteries can contain explosive gas.
13. Properly dispose of waste, drain fluids and hazardous materials with due regard to and in full accordance with all national and local environmental, safety, transportation, and other regulations and ordinances. Make sure that all personnel are familiar with these regulations.
14. Wear the appropriate clothing and protection devices, and follow the recommended procedures when working with hazardous, flammable and combustible materials.

PRESSURISED SYSTEMS SAFETY (AIR & HYDRAULIC)

1. Do not perform maintenance on pressurised system components without first relieving all pressure in the system.
2. Do not make internal checks on pressurised oil or fluid systems reservoir or levels until all pressure in the system has been relieved. Pressurised oil and air are dangerous if released incorrectly. Oil and air pressure equipment can get very hot; use extreme caution and allow the system to cool before working on it.
3. Do not attempt to remove an air line or hydraulic line from a cylinder or other component unless all pressure to the system has been relieved.
4. Do not attempt to remove an air or hydraulic cylinder clevis from its attachment unless all pressure in the system has been relieved.
5. Do not operate pressurised systems with worn or damaged hoses, valves or fittings. Replace defective components before pressurising the system.
6. Do not attempt to disassemble air or hydraulic cylinders unless you have been trained and authorised for such maintenance.
7. Never adjust pressure relief valves beyond the recommended values.
8. Follow the manufacturer's recommended inspection and maintenance procedures for pressurised systems to ensure that safe operating conditions exist at all times.
9. Take extreme care when working with hydraulic accumulators. They must never be heated or subjected to welding or mechanical damage.

WELDING SAFETY

1. All welding or cutting operations should only be performed by experienced welders who are familiar with the welding equipment and the material to be welded.
2. Take all necessary precautions to avoid dropping sparks or welding splatter on belts, hoses, tanks or other parts of equipment, or on personnel in the work area. Always keep the risk of fire in mind.
3. Attach the welding ground cable as close as possible to the piece being welded to avoid damage to the equipment and potential injury to personnel.
4. Always consult with the manufacturers of the equipment to be welded before any welding operation.
5. Never weld vessels or pipework which is pressurised.

Caution: Do not attempt to weld on rotor while it is in the machine or arcing damage will cause premature failure of the bearings.

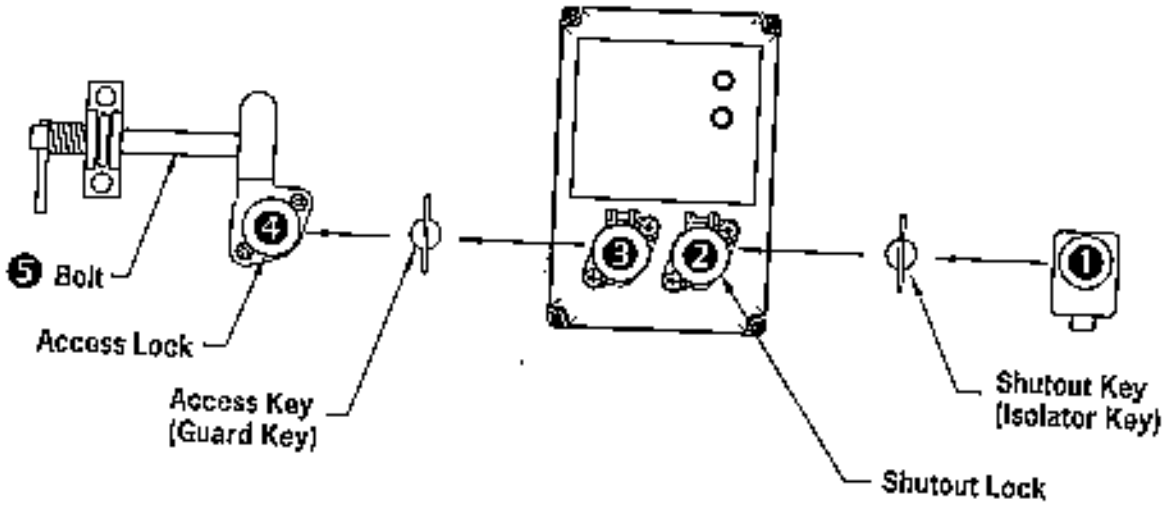
SAFETY

DOOR SAFETY INTERLOCK SYSTEM OPERATION

Svedala recommend and provide for the fitting of a Door Safety Interlock System which is designed to prevent the crushing chamber service door from being opened while the machine is in operation or on shut-down before sufficient time has elapsed to allow the rotor to stop rotating.

The interlock also prevents accidental start-up while the crusher is being serviced, or when the door is left open.

SEQUENCE OF OPERATION



❶ Turn Shutout Key in Deadlock and remove key.

❷ Put Shutout Key in Shutout Lock and turn.

❸ After time delay has elapsed, turn and remove Access Key.

❹ Put Access Key in Access Lock and turn.

❺ Release Bolt and open door.

To close door, engage bolt and transfer keys through reverse sequence. (Time delay will not activate in reverse sequence).

▪ For further information See Door Safety Interlock Installation, Operation and Service Manual.

SAFETY

VIBRATION PROTECTION

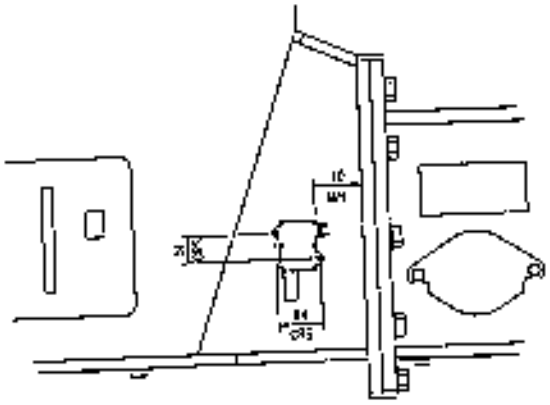
A vibration protection system protects the machine from the effects of severe vibration. With this installed the machine will be shut down and\or an alarm sounded if vibration becomes excessive.

In normal operation, the Barmac has a slight vibration which varies from time to time, due to the wear and replacement of material within the rotor. As material wears away it is continually replaced.

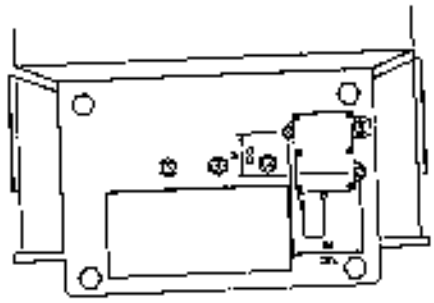
Consistent or excessive vibration should always be investigated. A likely cause is breakage of a rotor tip or uneven build-up within the rotor. High pitched vibration may be caused by poor rotor taper lock seating or a bent shaft.

Your Barmac dealer will set the vibration switch when commissioning the machine.

RECOMMENDED VIBRATION SWITCH POSITION



B9000, B8000, B7000 and B6000 machines.



B5000 and B3000 machines.

ALL MACHINES MUST HAVE A VIBRATION PROTECTION SYSTEM PROPERLY FITTED AND CONNECTED.

Full wiring instructions are supplied with the vibration protection system.

Machines without a vibration protection system will not be covered by warranty.

- For further information see Vibration Control Kit Installation, Operation and Service Manual.

SAFETY

TEN COMMANDMENTS OF SAFETY

1. Support all efforts to make your workplace safe and healthful.
2. Act responsibly and with concern for the safety of others, as well as yourself.
3. Check all tools and protective equipment frequently, to make sure they are in safe working order.
4. Educate yourself and others in the hazards associated with your job so that they can be avoided in a safe manner.
5. To avoid injury and damage, familiarise yourself in advance with the risk and safety aspects of procedures which are new to you.
6. Think over accident and injury possibilities before starting on any project. Take appropriate precautions to protect yourself and others. Revise and improve working procedures regularly.
7. Warn others of the possibility of accidents and injuries if you see them working unsafely or creating potential hazards.
8. Stay alert for changes in work conditions and the work process.
9. Report unsafe acts and conditions immediately to your supervisor.

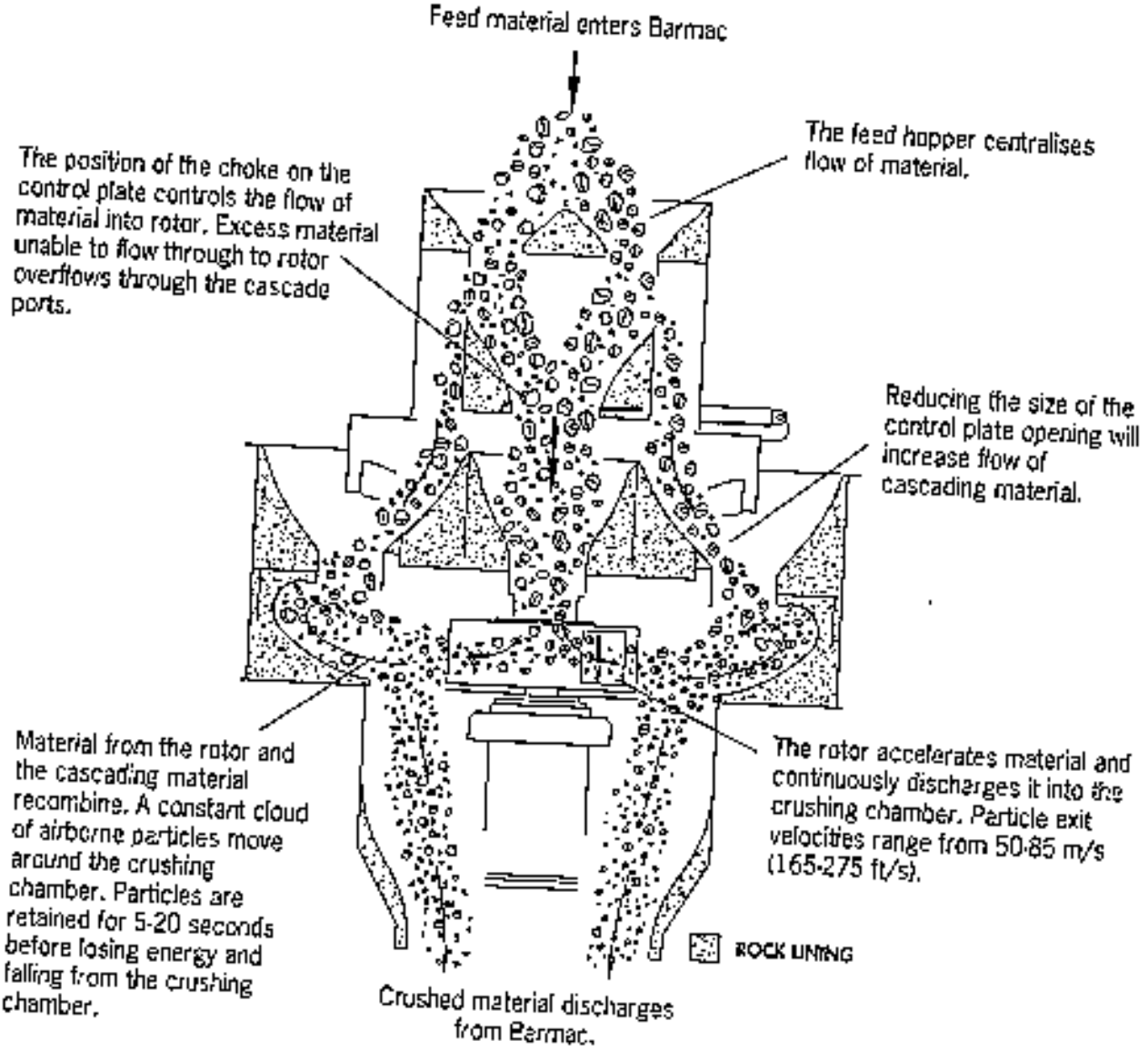
   Don't assume that someone else will do it.
10. Keep your work area and your tools clean. Pick up tools and materials after use and return to the appropriate storage place.

Principles of Operation

The Barmac rock-on-rock crusher uses a field proven rock lined rotor that acts as a high velocity dry stone pump hurling a continuous rock stream into a stone lined crushing chamber.

Material fed into the top of the machine is accelerated in the Barmac patented rock lined rotor, achieving exit velocities of up to 85 metres (275 feet) per second. The rotor continuously discharges into the crushing chamber. This process replenishes the rock lining, while at the same time maintains a rock-on-rock chain reaction of crushing and grinding.

A second stream of material in a controlled quantity can be cascaded into the crushing chamber turbulence causing a supercharging of the particle population within the chamber, improving the energy transfer. This, in combination with other variables of rotor diameter and speed and crushing chamber profile, enhances power efficiency, reduces wear, plus provides an efficient means of controlling the grinding and crushing action, to either maximise or minimise fines.



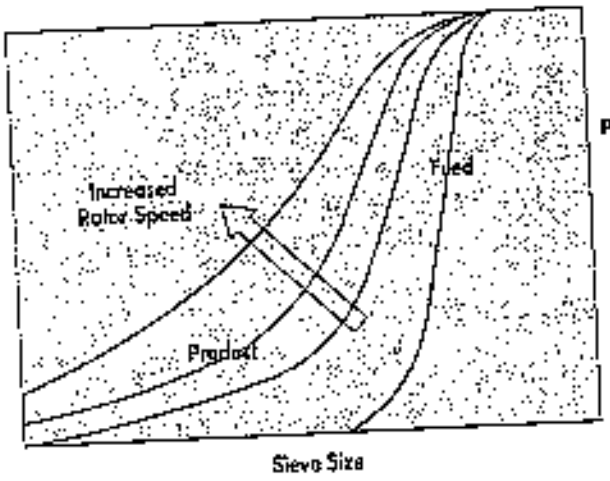
PRINCIPLES OF OPERATION

CONTROL OF CRUSHED PRODUCT SIZES

The Barmac offers a number of controllable variables which affect the final product grading.

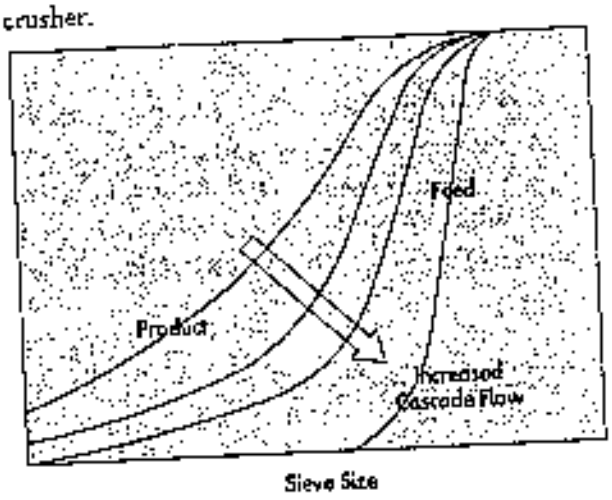
ROTOR SPEED

Increasing rotor speed increases the particles kinetic energy and increases the reduction achieved.



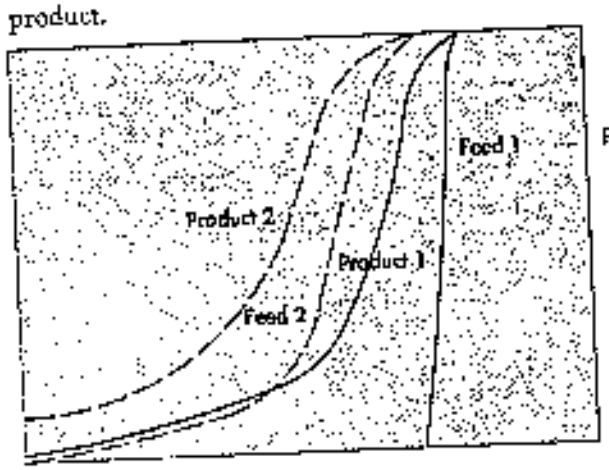
CASCADE

Increasing the cascade flow decreases the reduction ratio achieved whilst increasing the capacity of the crusher.



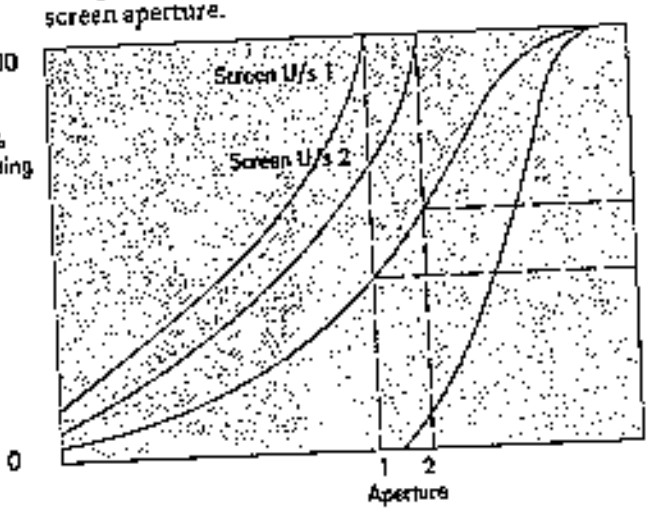
FEED GRADATION

Changing the size distribution of the feed to the Barmac will affect the size distribution of the crushed product.



SCREEN APERTURE

When operating in closed circuit the final product size produced by the Barmac is controlled by the screen aperture.



Crushing Chamber Profile: In some models, coarse and fine cavity rings are offered. The fine cavity ring increases particle retention time with the crushing chamber increasing the reduction achieved.

Rotor Diameter: Different rotor diameters are available for some models. Changing to a larger diameter rotor effectively increases the tip speed and the effect is similar to increasing the rotor speed with the addition that the longer grinding arm in the rotor produces more fines than a smaller diameter rotor with the same tip speed.

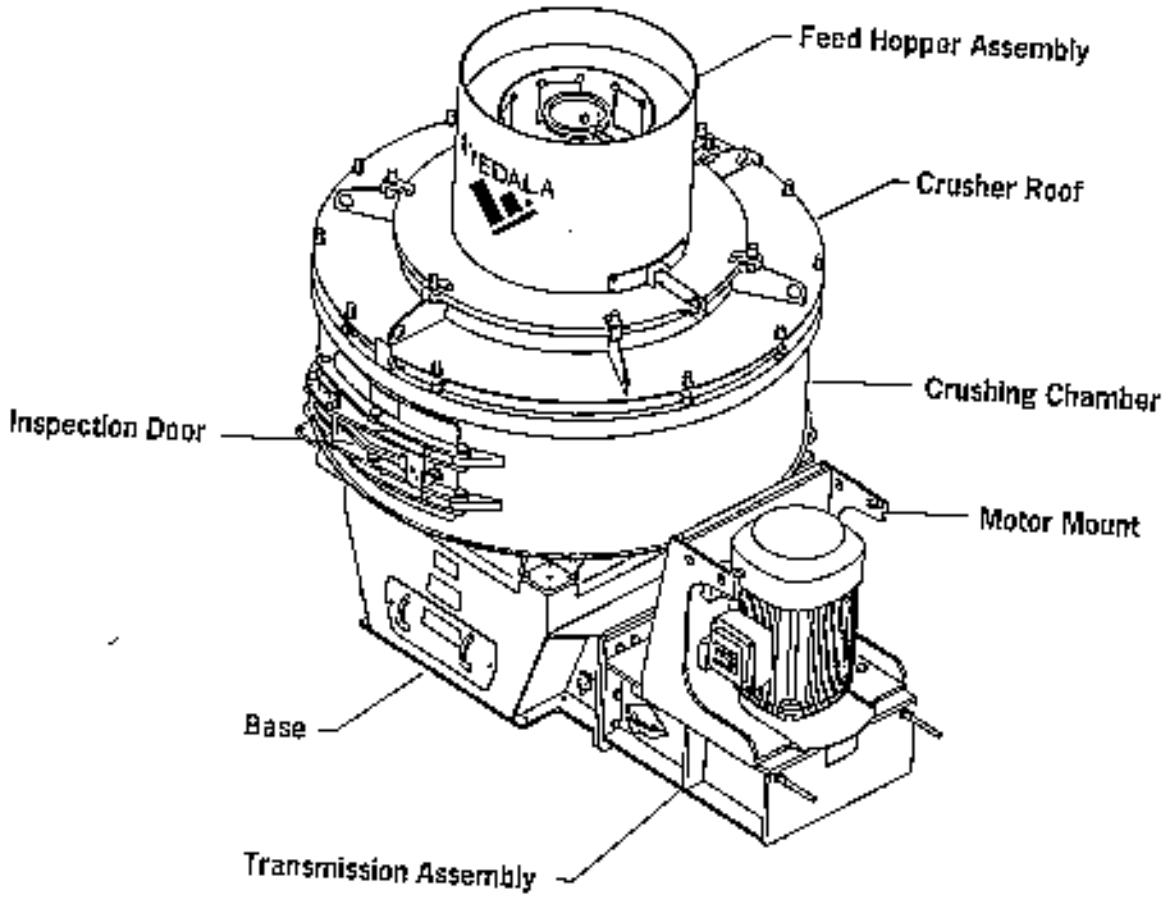
Know Your Barmac

This section has been included to introduce you to your Barmac. It will also serve to introduce you to the terms used to describe the various components and parts of your Barmac. These terms will be constantly used throughout the manual and parts listings that are provided.

VISUAL INDEX

The numbers that appear in brackets refer to the section of the manual that details the inspection and service instructions for each part or component.

General Description



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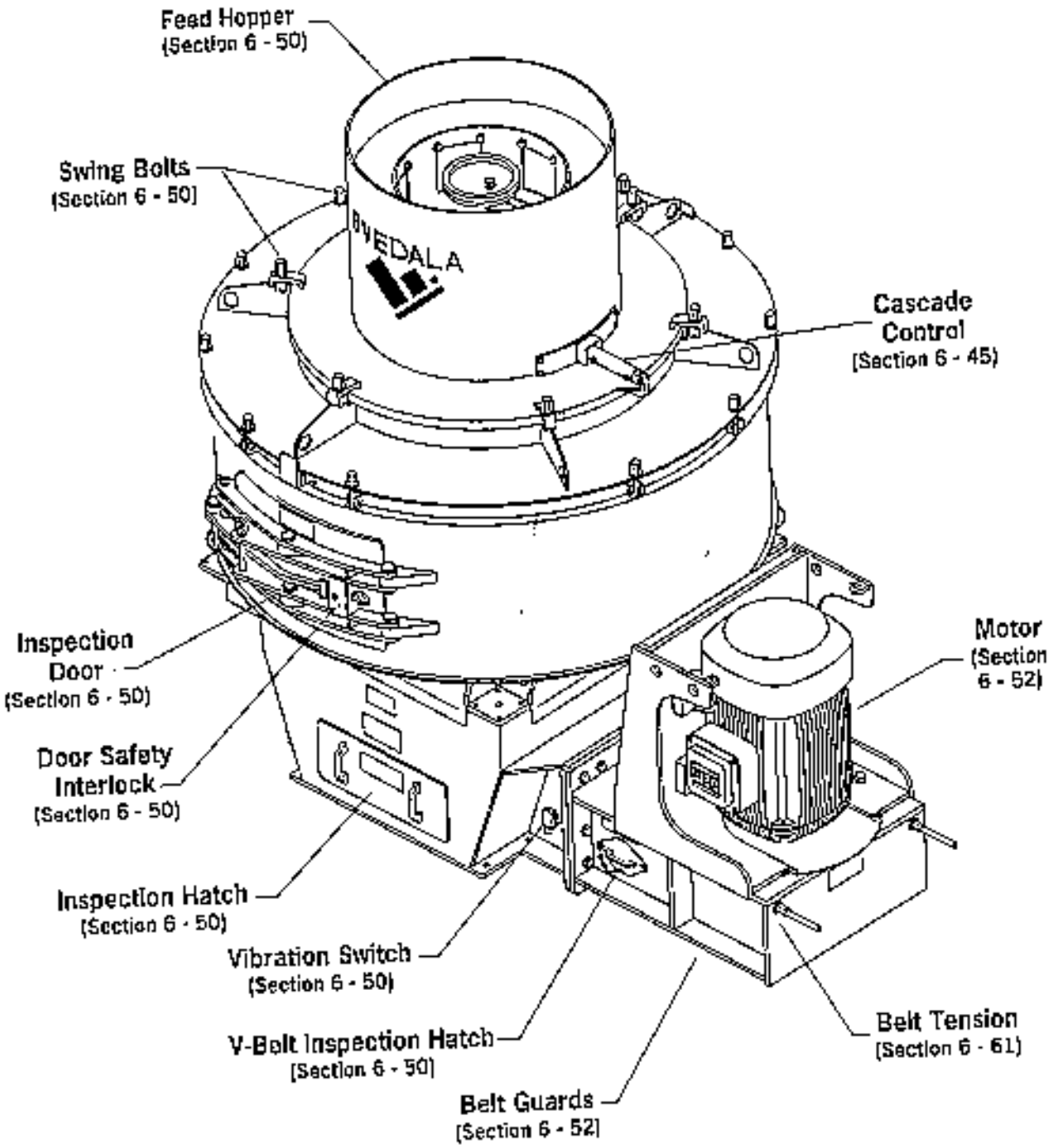
KNOW YOUR BARMAC

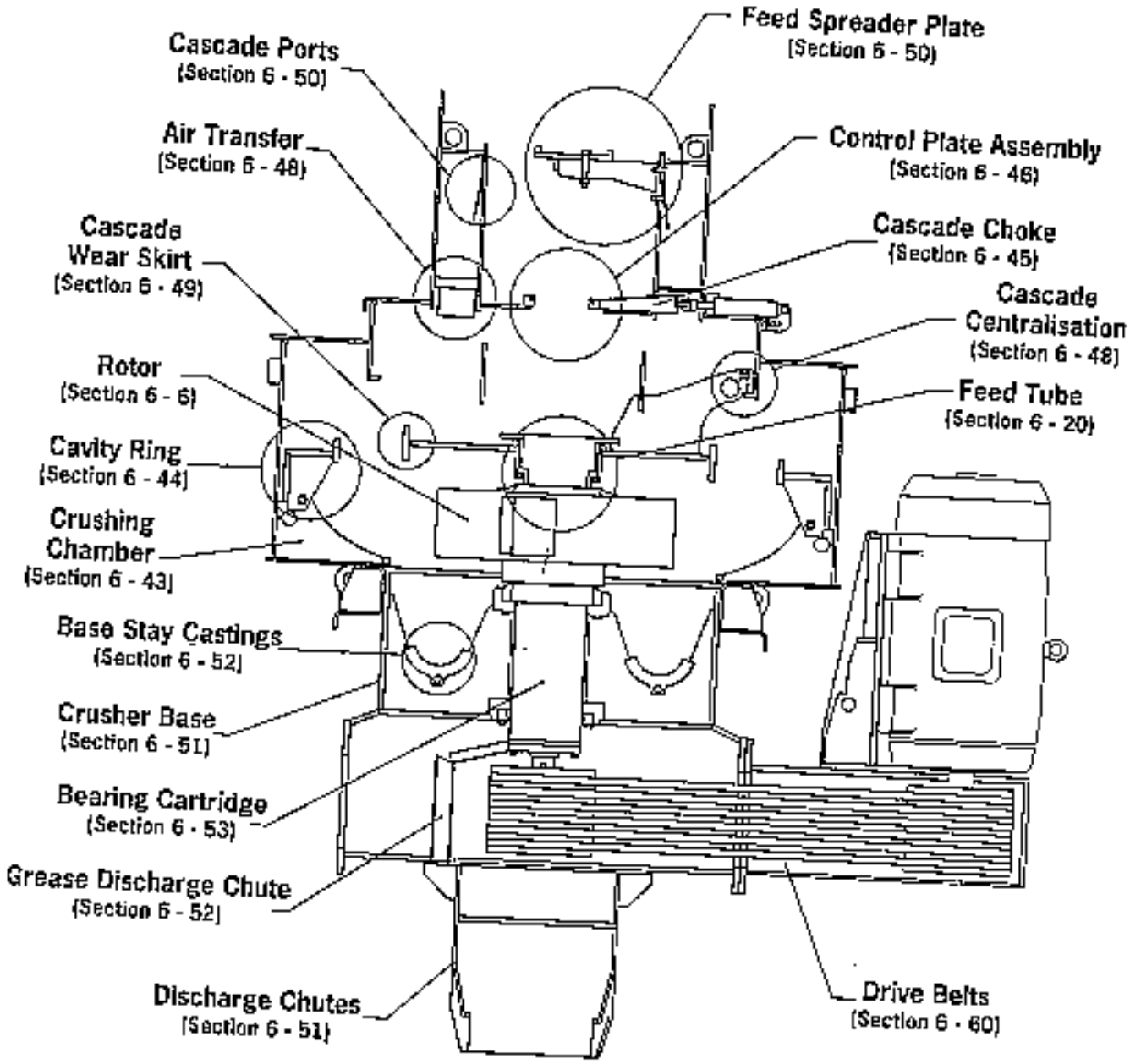
EXTERIOR OF THE CRUSHER



Continued ▶

KNOW YOUR BARMAC

INTERIOR OF THE CRUSHER



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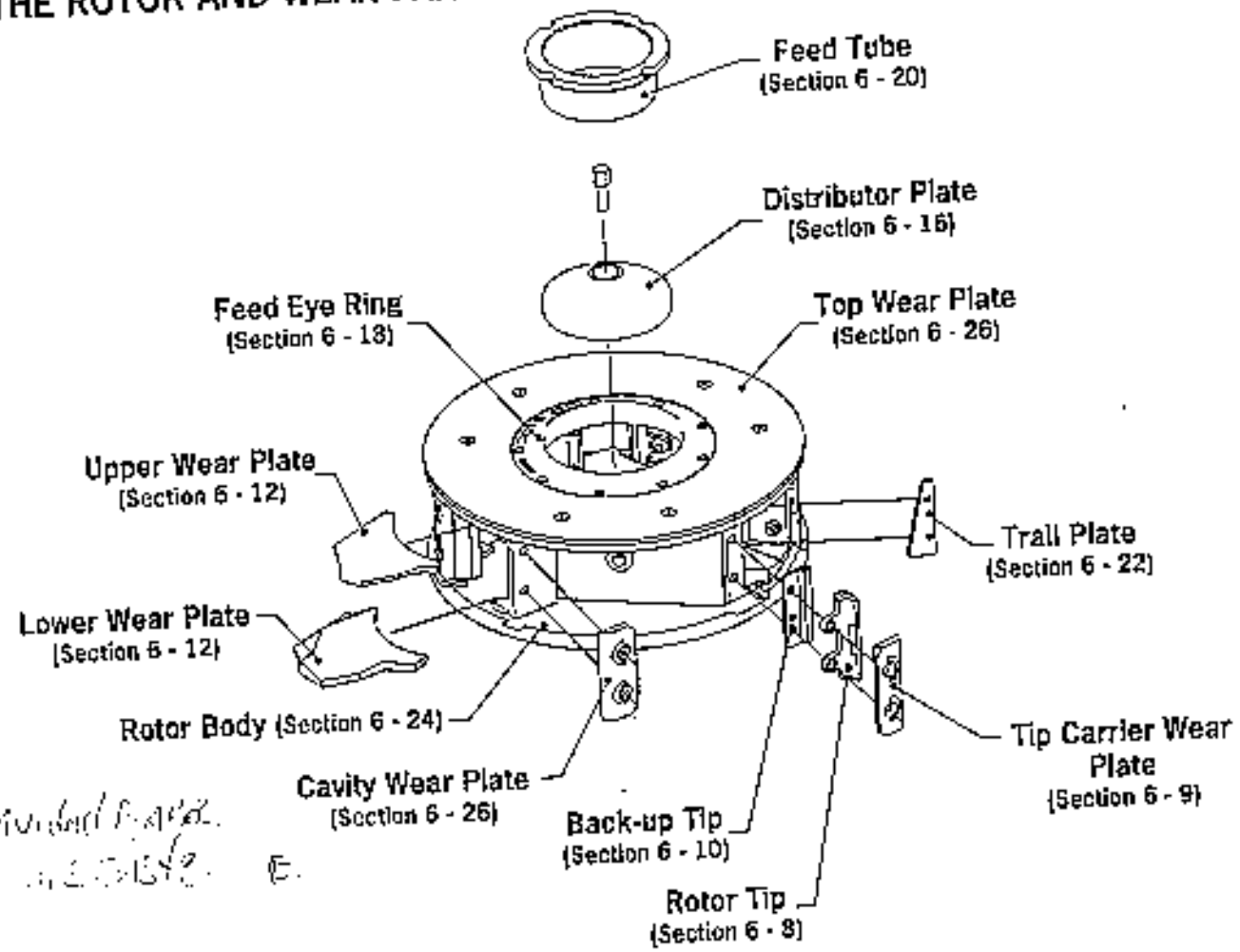
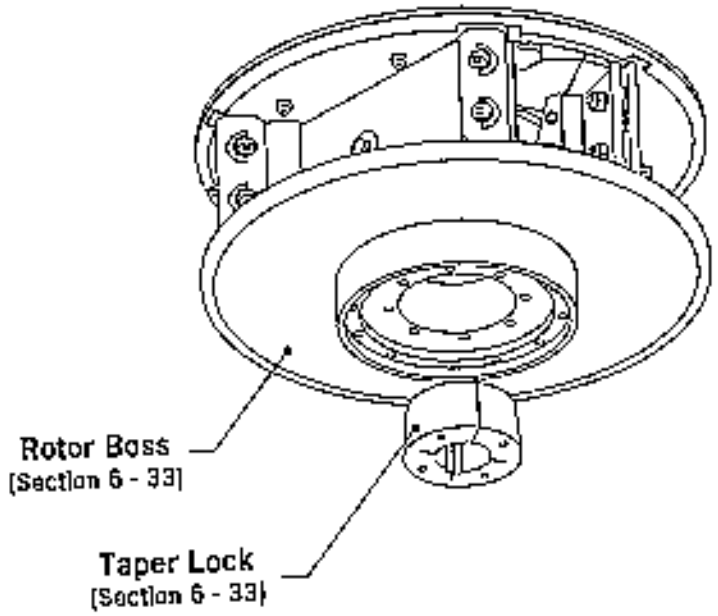
KNOW YOUR BARMAC

THE ROTOR AND WEAR PARTS





Start-up Procedure

This section describes the full start-up procedure, including the initial commissioning start-up. The start-up procedure should be used after a major repair such as bearing cartridge replacement or crushing chamber refurbishment has taken place.

BEFORE START-UP

1. Be completely familiar with the Barmac, take the time to read this manual.
2. Have all electrical connections checked, including the operation of the vibration switch.
3. Check pulley alignment and V-belt tensions. (See Belt Tensioning 6-60).
4. **Check rotor rotation – it must be counter-clockwise when viewed from above.** Severe damage to the rotor will result if the rotation is incorrect.
5. Check that a safety interlock device is connected and functioning.
6. Make sure all bolts in the rotor, crusher and main support frame are tightened to the correct torque. See installation book for correct torque details.
7. Ensure that the cascade assembly is centralised. (See section 6-48).
8. Check that all wear parts are correctly fitted in the rotor. (See section 6-6).
9. Remove all tools from on or within the crusher.
10. Ensure that all guards, doors, hatches and safety pins are in place.

INITIAL START-UP

1. Confirm ammeter is operating.
2. Run without load for 30 minutes. Grease bearing cartridge until grease flows from the grease discharge chute while the machine is running. (See greasing procedure section 6-2).
3. After 30 minutes running, stop the Barmac, remove belt guards and check bearing cartridge temperature. (Use a magnetic thermometer). The temperature should not exceed 70°C (160°F). If temperature exceeds this, continue to run Barmac with no load for a further 30 minutes and check again. If high temperatures continue contact your Barmac service centre for advice. If temperature is within normal range (see section 4-3), replace guards.
4. Inspect rotor and cascade assembly. Ensure that all rotor parts are in place. Ensure that the feed tube is still centralised in the feed eye ring. (See section 6-48).
5. Test vibration switch. (See Vibration Control System instruction manual).

Continued ▶

START-UP PROCEDURE

INITIAL FEEDING OF CRUSHER

1. The machine can now be run with a load. Feed material should be no larger than the maximum allowable feed size for the Barmac model being commissioned.
2. Feed a small sized chip or all-in product, preferably 5mm (¼ in.) for the first half minute or so. A few cubic metres/yards of material is enough. This allows an even build-up of stone in the rotor and promotes good balance.
3. If coarse feed must be used at the start, some vibration can be expected for several hours until fines are able to work their way through the voids in the initial rotor build-up and bring the density of each rotor build-up into equilibrium.
4. When first feeding the rotor there will usually be an 'out of balance' stage for about 30-60 seconds. Do not stop the feed to the rotor at this point but feed it as much as possible until the vibration settles down.

   In normal operation there is intermittent detectable vibration about 30% of the time. This can be felt when standing on the machine and is most noticeable with largest feed sizes. This is due to stone lodging by one rotor tip, causing a build-up and then being worn away. The condition is normal and no cause for concern provided the machine returns to normal running after a few seconds.

AFTER 10 MINUTES

1. Centre the spreader plate under conveyor discharge so feed falls in an even curtain around the spreader. The feed should fall squarely through the control plate feed opening (i.e. not at an angle). This stabilises rotor feed. Watch for involuntary cascading through material being directed towards the cascade ports in the feed hopper.
2. Check motor power draw. If motor(s) are overloaded, reduce feed volume or adjust cascade control until ammeter reading is corrected. If dual drive motors are running at different amps see belt tensioning (section 6-60).

AFTER 30 MINUTES

1. Stop machine and check build-up in rotor. For ideal build-up see rotor tuning (section 6-28).
2. Check crushing chamber build-up. (See section 6-43 for ideal build-up).
3. Make sure feed tube is in correct position in rotor, i.e. central in rotor feed hole and extending into rotor. (See section 6-20).
4. Check that rotor tip assemblies are intact and tight.
5. Check feed eye ring has not turned or lifted.
6. Check belt tensions. (See section 6-60).

Continued ▶

START-UP PROCEDURE

AFTER 4 HOURS

1. Check build-up in rotor, crushing chamber and base.
2. Check bearing temperatures. (See below).
3. Check belt tensions.
4. Grease at the end of the shift, and perform daily inspections as listed.
5. Once the machine has settled down to normal running, adjustment of the cascade can be undertaken. (See section 5-2).

BEARING OPERATING TEMPERATURE

Normal bearing temperature is 30° to 40°C (54° to 72°F) above feed material or ambient temperature. A short duration temperature rise of approximately 10°C (18°F) can be experienced when bearings are lubricated.

The maximum permissible bearing temperature for continuous running is:

70°C (160°F) – Normal temperature service.

150°C (300°F) – High temperature service.

Operation

During operation it is important that the operator pays attention to the following:

1. AMMETER READING – watch for major fluctuations.

   High amps could indicate high feed rates, extreme build-up in the chamber or the base, blocked discharge chutes, incorrect cascade adjustment, mechanical or electrical problems.

   Low amps could indicate low feed rates, incorrect cascade adjustment, V-belt slippage, electrical problems.

   Unbalanced amps in a dual drive unit could indicate incorrectly tensioned V-belts, electrical or mechanical problems.

2. NOISE LEVELS

   An increase in noise level could indicate bearing failure, V-belt slippage, scouring of build-up in crushing chamber, feed tube rubbing on feed eye ring.

3. VIBRATION

   An increase in vibration could indicate uneven wear on wear parts or rotor, unbalanced rotor due to uneven build-up in rotor, failure of anti-vibration pads, loose rotor or pulley taper lock.

   THE VIBRATION SWITCH FITTED TO THE BARMAC WILL, IF CORRECTLY ADJUSTED, SENSE OUT-OF-BALANCE VIBRATION AND SHUT DOWN THE CRUSHER BEFORE ANY DAMAGE OR DANGER TO PERSONNEL OCCURS.

4. FLOW OF MATERIAL

   Changes in feed conditions could require adjustment of the feed plate and control choke in the feed hopper. Increases in moisture content may increase build-up in the rotor, crushing chamber and base. Observing the discharge of the Barmac will often warn an operator of build-up problems.

5. DUST EMISSION

   The Barmac should not emit dust while being fed material. If the crusher is emitting dust the following points should be checked:

   Feed rate – Very low feed rates may cause the Barmac to discharge dust from the discharge chures.

   Blocked air transfer – Moist feeds may promote the blocking off of the air transfer.

OPERATION

FEED CONTROL

The aim of feed control is to govern the rotor feed volume so that the motor(s) run at full load current. This is done by restricting the rotor feed with the cascade control unit. Any excess feed which does not go through the rotor will cascade.

Product grading can also be controlled by varying the percentage of cascade feed to rotor feed. As the volume of cascading material increases, the product grading will become coarser.

The cascade volume is varied by adjustment of the control plate feed opening choke, to increase or decrease the feed opening size.

The basic principles of cascade control are:

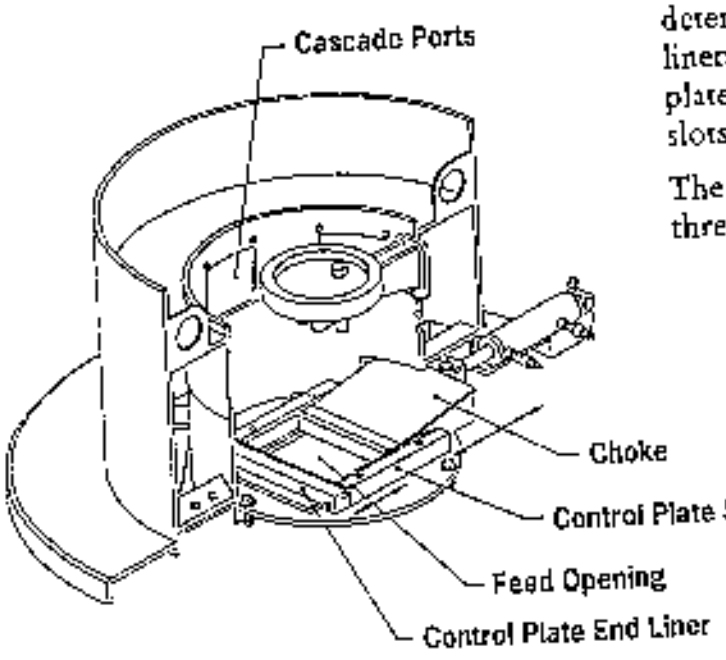
1. Increasing the opening size decreases or eliminates material flow to the cascade and results in more reduction.
2. Decreasing the opening size commences or increases material flow to the cascade and results in less reduction.

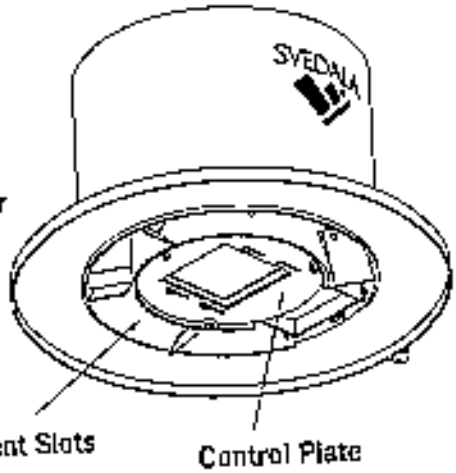
NOTE: The feed opening should not be reduced to a point where bridging of the feed opening may occur.

Use the feed spreader plate in the feed hopper by positioning it under the conveyor discharge so that feed material drops directly down the feed opening. If feed enters the hopper at an angle it may enter the cascade involuntarily.

The maximum feed opening size is determined by two adjustable feed opening liners. The control plate end liner and control plate side liner have an adjustment using the slots in the control plate, shown below.

The choke is adjusted by a two-way ram or thread adjuster in the small models.





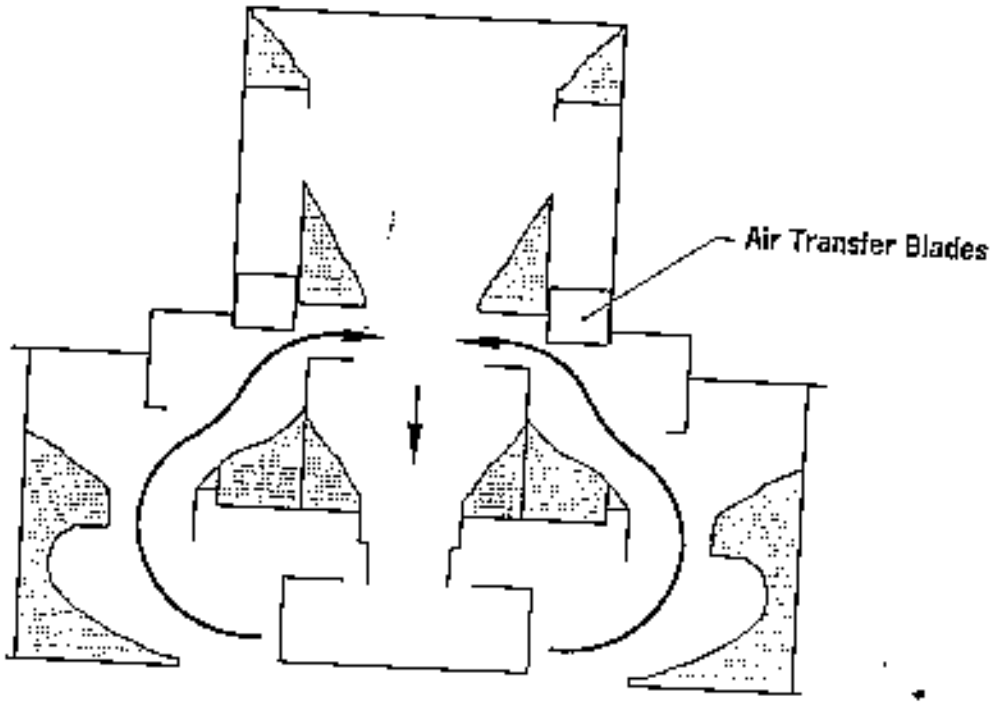
OPERATION

DUST CONTROL

When in operation, the rotor acts as a powerful fan. To control dust emissions from the crusher, the air transfer, which is incorporated in the hopper assembly, recycles air within the machine, minimising air being sucked in and discharged with the material.

The basic rule is that any air sucked in with the feed will be blown out with the product, so to minimise dust, the air transfer system has been developed to strike a balance, so that no air is sucked in and therefore little dust is blown out.

Under some conditions it may be necessary to tune the dust control system. For example, at high rpm and with very fine-grained materials the system may suck air in from the product discharge chutes and blow it out of the cascade ports to the atmosphere. By removing some of the air transfer blades, it is possible to achieve a satisfactory balance. (See section 6-48).



If dust is blowing out from the bottom of the machine, this indicates that the unit is being under-fed. If the feed rate cannot be increased, close off the control plate feed opening to minimise the rush of air.

While it is not generally necessary to suppress dust within a Barmac (either by dry dust collection or mist spray suppression), the turbulent activity within the Barmac crushing chamber makes it an ideal environment for the addition of small quantities of water by means of mist sprays to effectively control dust in other parts of the process plant downstream of the Barmac.

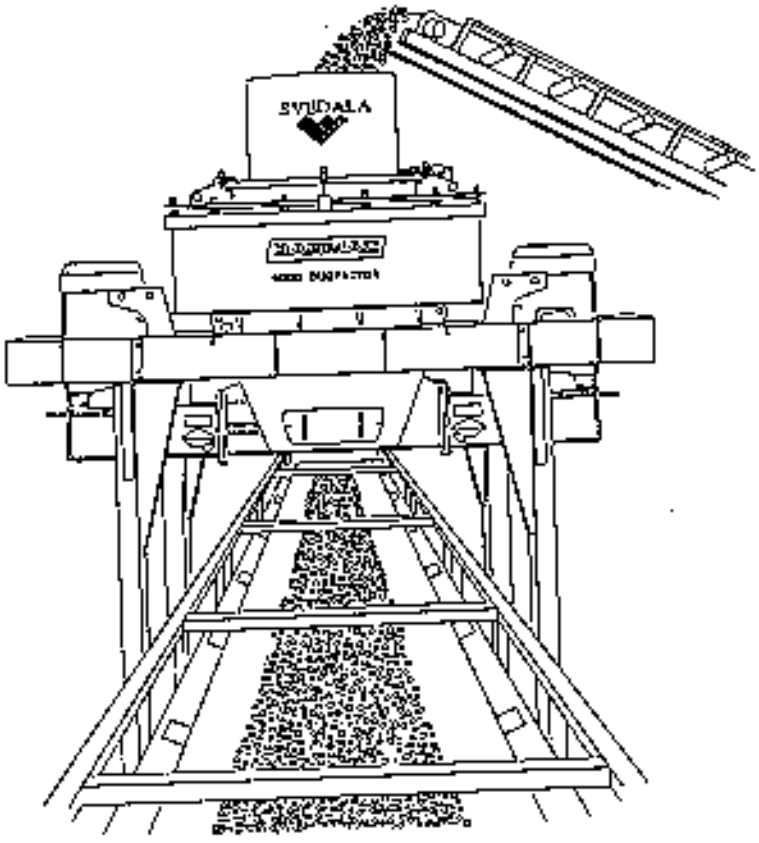
OPERATION

SHUT DOWN PROCEDURE

Extended periods of running out the circuit with low feed rates to the Barmac can result in undue wear to the crushing chamber and rotor body. If the crushing circuit and weather conditions permit, stop all conveyors before the Barmac fully loaded. At the very least be aware of the excessive wear that takes place and minimise the run-out time.

SHUT-DOWN

1. Shut down feed device (conveyor or feeder) before the Barmac.
2. Observe ammeter unload prior to disconnecting power from the Barmac.
3. Time run-down time of rotor and record in Daily Log Book. Measuring the run-down time of the rotor will provide a good guide to the condition of the bearing cartridge. The commissioning records for your unit will have the rotor run-down time recorded. This will be located in the owners manual. If you cannot locate this contact your Barmac Service Engineer.
4. Prior to any servicing or maintenance ensure that a safety interlock system provides you with control over the power supply to the crusher.



Inspection and Servicing

The Barmac is a rugged machine which is mechanically simple and extremely easy to maintain. The machine does however require ROUTINE and REGULAR inspections and attention.

The machine should not be ignored for lengthy periods, during which potentially serious damage to wear parts may remain undetected.

Long service and consistent trouble-free operation are the rewards of regular inspection.

IMPORTANT NOTE: Barmac rotor wear parts are designed to protect the rotor body from wear. They are not involved in the crushing action of the machine. Consequently it is not possible to determine the state of wear of these parts from the product discharging from the crusher.

To ensure trouble-free operation of the Barmac it is necessary to inspect the condition of the rotor wear parts and the rock build-up within the machine on a regular basis.

Any wear parts that are unable to complete another shift should be replaced.

Svedala recommend that you should carry out the following every 8 to 10 hours of operation:

1. GREASE BEARING CARTRIDGE.
2. INSPECT EXTERIOR OF CRUSHER.
3. INSPECT INTERIOR OF CRUSHER.
4. INSPECT ROTOR

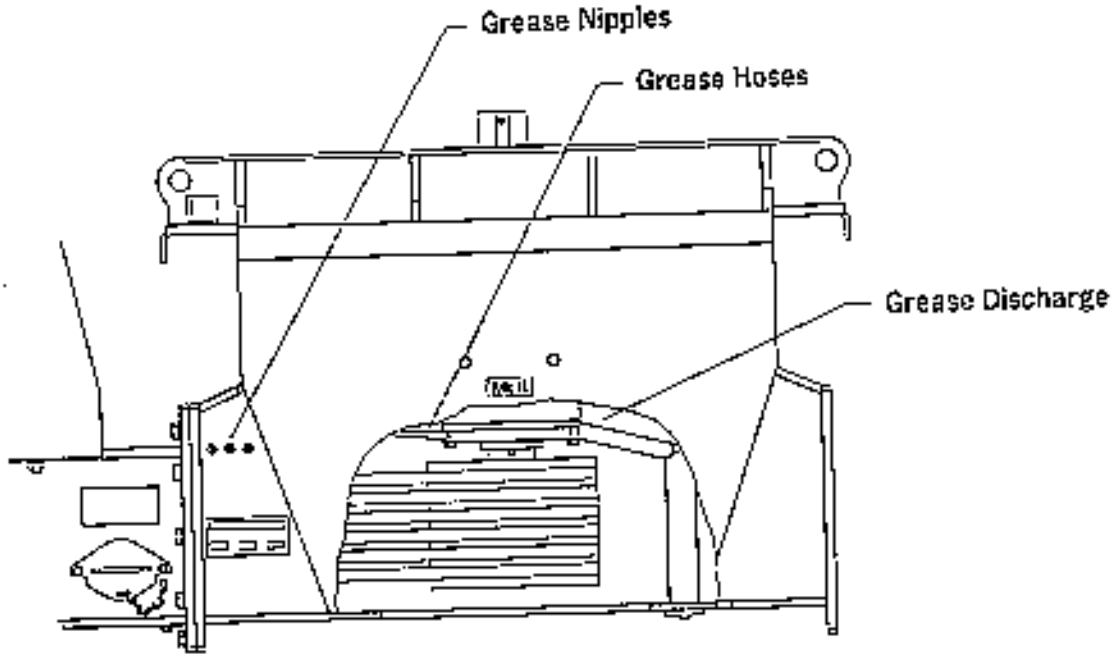
Svedala recommends the use of a Barmac Daily Log Book to record inspection and replacement of parts. Service personnel will find the log book extremely helpful in assisting you to maximise the life of the wear components in your Barmac.

LUBRICATION

BEARING CARTRIDGE

THE BEARING CARTRIDGE MUST BE GREASED EVERY 8 TO 10 HOURS OF OPERATION

The best practice is to grease the bearings when the bearing cartridge is at operating temperature while the machine is running at the end of each production shift.



GREASE REQUIREMENT

The following amounts are recommended for every 8-10 hours of operation:

Barmac Duopactor Model	Each Nipple
B3000	5g (0.18 oz)
B5000	8g (0.28 oz)
B6000	10g (0.35 oz)
B7000	15g (0.53 oz) 3 Bombs
B8000	15g (0.53 oz)
B9000	15g (0.53 oz)

Continued ▶

LUBRICATION

BEARING CARTRIDGE

RECOMMENDED GREASES

Feed Material Temperature °C (°F)	Barmac Model	Rotor Speed (RPM)	Grease Brand and Type
-20 to 65 (-4 to 149) Normal Service Bearing Cartridge (Low Speed)	3000	3000 to 4200	Shell Alvania EP2 Mobil Mobilux EP2 BP Energrease LS-EP2 Mobil Mobilith SHC100 Arcanol LI35V Castrol Optimol Longtime PD2
	5000	2100 to 2800	
	6000	1400 to 2000	
	7000	1300 to 1700	
	8000	1100 to 1700	
	9000	1100 to 1400	
-20 to 65 (-4 to 149) Normal Service Bearing Cartridge (High Speed)	3000	4200 to 5300	Mobil Mobilith SHC46 Castrol Optimol Longtime PD2 ✔ Arcanol LI35V Kluber Isoflex Topas NB152 ✖
	5000	2800 to 3600	
	6000	2000 to 2500	
	7000	1700 to 2200	
	8000	1700 to 2000	
	9000	1400 to 1800	
60 to 100 (140 to 212) High Temp. Bearing Cartridge (All Speeds)	3000	3000 to 5300	Mobil Mobilith SHC220 ✔ Shell Stamina U2 ✖ BP Synthetic HT-XP ✖
	5000	2100 to 3600	
	6000	1400 to 2500	
	7000	1300 to 2200	
	8000	1100 to 2000	
	9000	1100 to 1800	

✔ Indicates preferred grease. Bearing cartridges are pre-lubricated with this grease type.

✖ Indicates that this type of grease is not compatible with any of the others. If this grease is used, the cartridge must first be completely stripped, cleaned and reassembled to ensure maximum bearing service life.

Continued ▶

LUBRICATION

BEARING CARTRIDGE

Please note that the bearing cartridge in the Barmac presents a very unique set of operating conditions for the bearings and for this reason, selection of alternative grease types is not a straight forward task. Grease properties to consider include thickener type, base oil viscosity and the inclusion of tackiness additives. Consideration must also be given to mixability of any new grease with the grease already in the bearing cartridge. Mixing (especially of different thickener types) causes unpredictable lubrication conditions and possibly premature failure of the bearing cartridge.

If you wish to use a grease that is not on the list, please consult your Barmac dealer to confirm its suitability for the specific application in question. This will be determined based on your particular application It is <u>not</u> recommended that you use an equivalent grease as promoted by various oil companies and organisations without first consulting Svedala Barmac, New Zealand.

OPERATING TEMPERATURE

Normal bearing temperature is 30° to 40°C (54° to 72°F) above feed material or ambient temperature. A short duration temperature rise of approximately 10°C (18°F) can be experienced when bearings are lubricated.

The maximum permissible bearing temperature for continuous running is:

70°C (160°F) – **Normal temperature service.**

150°C (300°F) – **High temperature service.**

GREASE DISCHARGE

Ensure that the grease discharge is away from the V-belts and grease hoses are undamaged.

It is also a good practice to perform a weekly inspection of the grease discharge to ensure that it is not blocked, which may lead to pressure build-up inside the cartridge; breakdown of grease inside, etc.

Continued ▶

LUBRICATION

BEARING CARTRIDGE

AUTOMATIC LUBRICATION

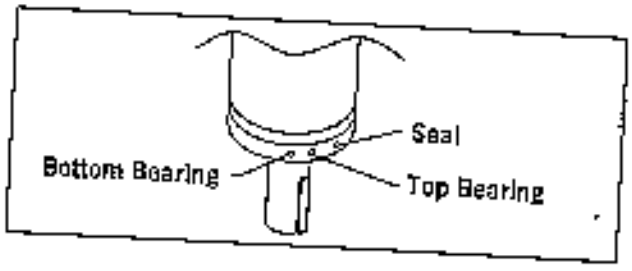
Whilst Svedala make no particular recommendations for automatic lubrication, these systems can be used on the Barmac.

The total quantity of lubrication applied over an 8-10 hour operating period should not exceed the total quantity as for manual lubrication (page 6-2) over this same period.

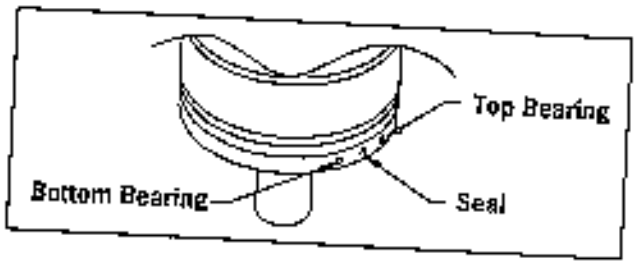
The top seal plate may benefit from a more frequent/higher quantity grease application. If contamination of the top seal is known to be a problem, an increase in quantity over the above that listed in the table can safely be applied.

NOTE: It is essential that the grease points are properly identified so that grease directed at the top seal is not mistakenly applied to the bearings.

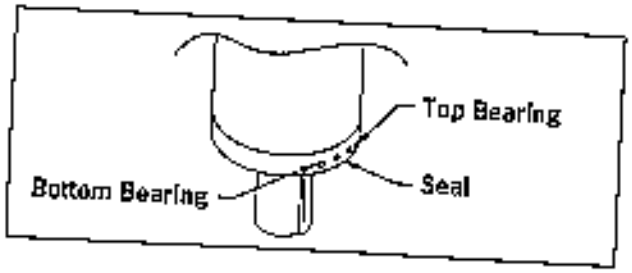
The grease points can be identified on the bearing housing as follows:



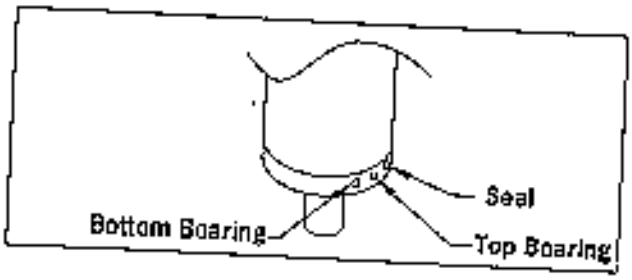
B9000



B8000, B7000, B6000



B5000



B3000

ROTOR SERVICING

Please observe the correct shut-down procedures. (See section 5-4 of this manual). Prior to any internal inspection/service ensure that a safety interlock system provides you with control over the power supply to the crusher.

The rotor assembly is the main wearing component of the Barmac, and regular and timely inspection of wear parts will extend the life of the rotor. If wear parts are not replaced when required, severe damage or even total destruction of the rotor body may result.

ACCESS

While wear patterns and wear rates can be observed with the rotor in place, it may be necessary or desirable to remove the rotor from the crusher to replace any worn wear parts.

In this manual we have assumed that the parts are being replaced with the rotor in the machine. The major problem with this can be the removal of the build-up of material in the rotor around the wear parts.

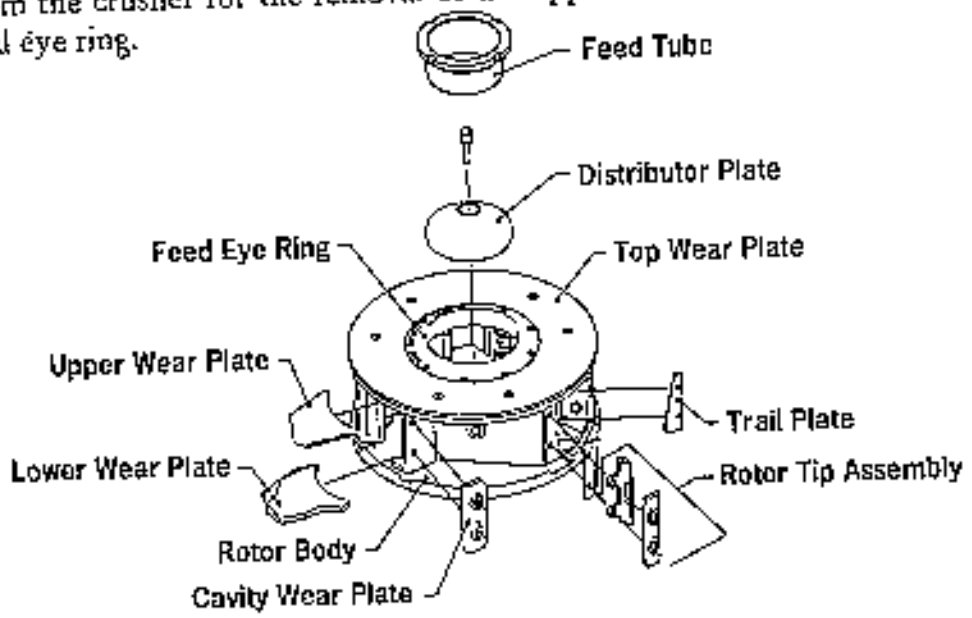
CLEANING OUT ROTOR

The most successful method of removing the build-up is by using water. If a hose pipe is available at the crusher it is quite in order to "wash out" the build-up by inserting the hose pipe into the hopper, directing the water into the rotor while the crusher is running.

⚠ **WARNING:** Do not insert the hose pipe into the rotor, direct the water flow only into the rotor.

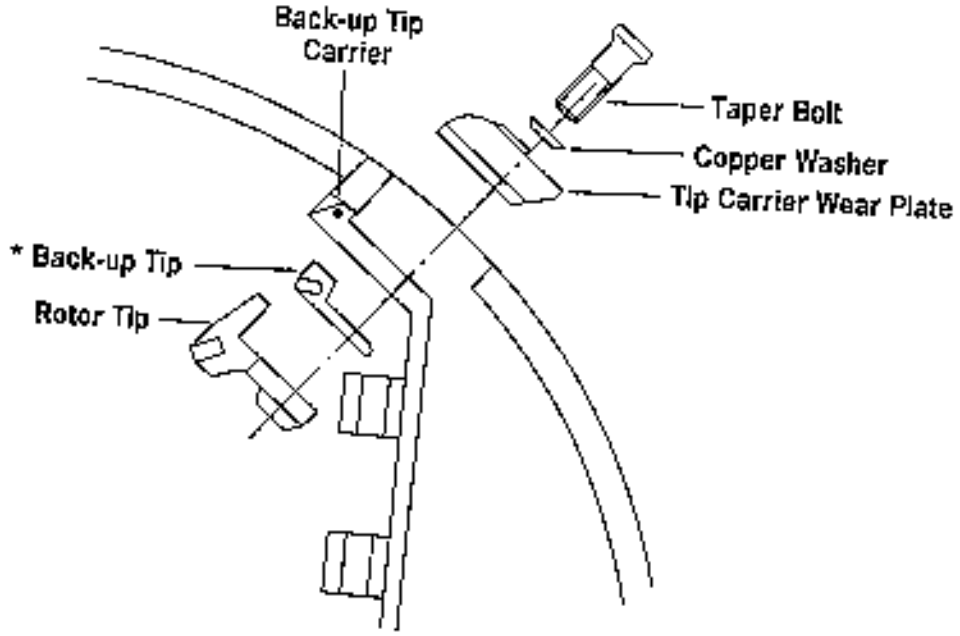
The use of water into the rotor may scour out the build-up in the crushing chamber. This in itself is not a problem but if the feed size is at the maximum, chamber gusset wear will result until the build-up in the crushing chamber is replaced on start-up.

If a hose pipe is not available near the crusher it may be possible to remove build-up with a podger bar. If this is not possible or too time consuming, then it will be necessary to remove the rotor from the crusher for the removal of the upper and lower wear plates, distributor plate and feed eye ring.



ROTOR SERVICING

ROTOR TIP ASSEMBLY

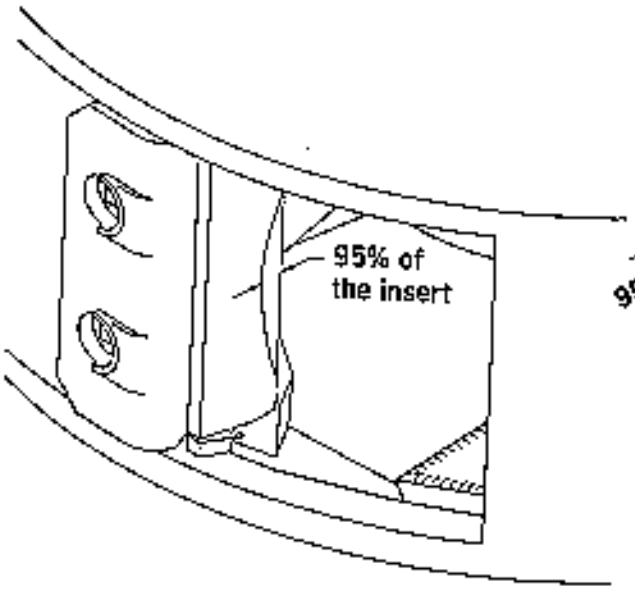


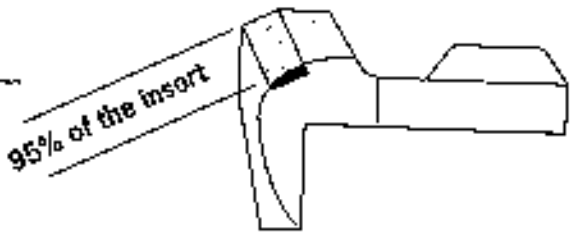
* The smaller rotors do not have a back-up tip and the bolting arrangement is different but the assembly is similar.

ROTOR TIPS

Rotor tips must be checked to determine the amount of wear on the inserts. Tips need to be replaced once 95% of the insert has been removed at the centre of the wear. The back-up tip assembly will protect the rotor body from damage, therefore a tip in this condition could be run for another shift. Experience will help the operator understand the wear performance of the tip.

Ensure that the rotor tips are tightly held and not broken, cracked or badly chipped.





This rotor tip profile has been used as an example only. Different models with different rotor designs will vary but the principles are the same.

Continued ▶

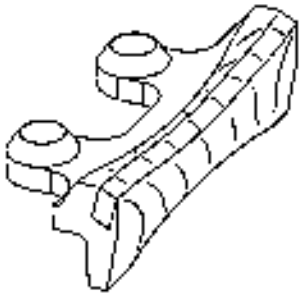
ROTOR SERVICING

ROTOR TIP ASSEMBLY

ROTOR TIPS

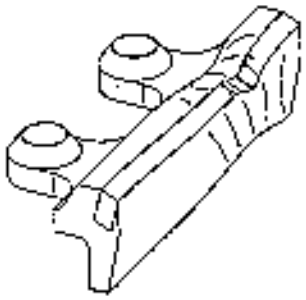
Normal Wear

The rotor tips are wearing normally. Replace when less than 3mm (⅛ in.) of insert remains at the centre of the wear, or if tip will not last another shift.



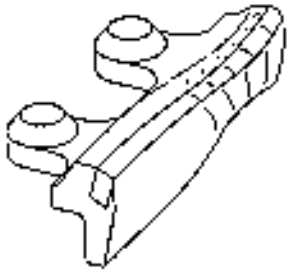
Cracked or Chipped Inserts

Tramp iron in feed. Remove tramp iron. Oversize feed material. Investigate cause of oversize. Reduce maximum feed size.



Off Centre Wear

The rotor tips are wearing at the top or bottom not in the centre. Trail plate angle may require altering (refer to rotor tuning section 6-28).



SELECTION OF ROTOR TIPS

A range of rotor tips is available to suit differing feed material characteristics and operating conditions. The rotor tips supplied with your machine have been carefully chosen to suit your requirements. However, changing feed material can require the re-selection of the rotor tips.

For information regarding rotor tip options, contact your Barmac representative.

Continued ▶

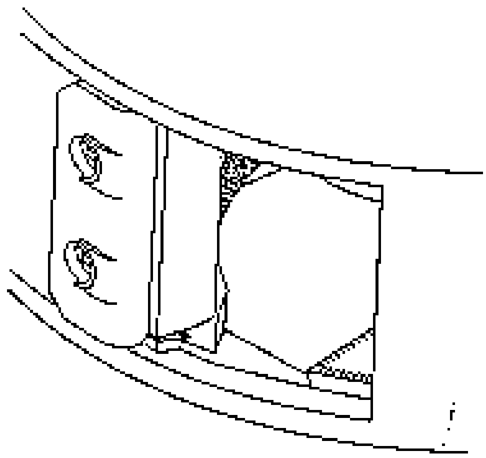
ROTOR SERVICING

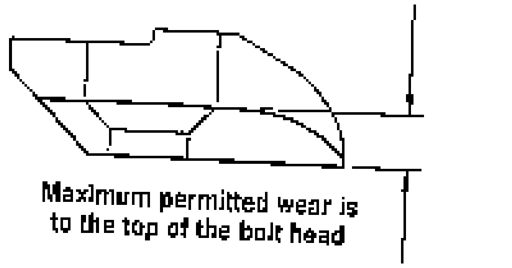
ROTOR TIP ASSEMBLY

TIP CARRIER WEAR PLATES

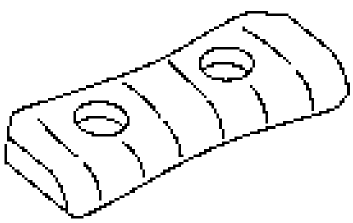
Initially, the tip carrier wear plates may wear quickly until they reach a certain profile governed by the application. This is quite normal and should not cause concern.

Tip carrier wear plates must be inspected for wear and be replaced when there is doubt they will last another shift, or as soon as wear appears on the top of the bolt head. Replace tip carrier wear plates which have cracked. Check that tip carrier wear plates are not loose.



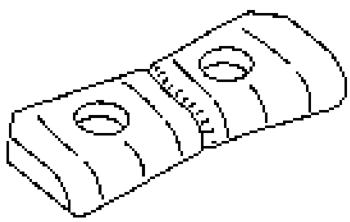


This tip carrier wear profile has been used as an example only. Different rotor designs have different tip carrier wear plates but the principles are the same.



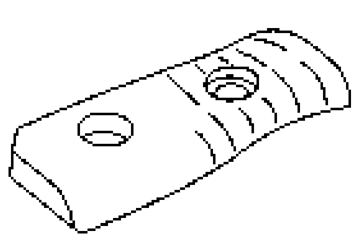
Normal Wear

The tip carrier wear plates are wearing normally. Replace when wear just starts to show on bolt head.



Cracked Tip Carrier Wear Plates

Caused by tramp iron, oversize feed, excess build-up with damp/sticky material or uneven mating surface. Remove tramp iron. Reduce feed size. Ensure that mating surfaces are flat, i.e. there is no spatter or grit between tip carrier wear plate and back-up tip. (See Rotor Tip Assembly Removal/Installation section 6-11).



Uneven Wear

Tip carrier wear plates are wearing at the top or bottom not in the centre. Adjust trail plate angle. (See rotor tuning, section 6-28).

Uneven wear can also be caused by excessive crushing chamber build-up.

Premature top wear can be indicative of a worn cavity ring and/or cascade wear skirt.

Premature bottom wear can be indicative of excessive build-up in the base.

Continued ▶

ROTOR SERVICING

ROTOR TIP ASSEMBLY

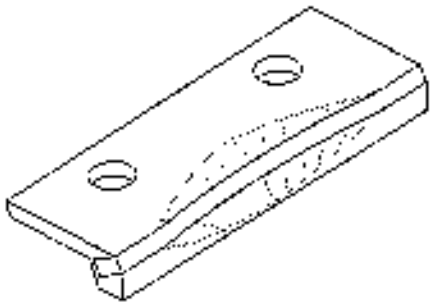
BACK-UP TIPS

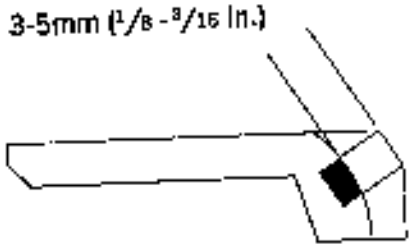
In normal operation the back-up tip should be unused and in many cases is not visible (depending on rotor tip and tip carrier wear plate style used).

Normal Wear

The back-up tip is only exposed to wear when the rotor tip has failed or worn out. In the event of emergency use of the back-up tips, they should be replaced once there is only 3-5 mm (⅛ - 3/16 in.) of insert remaining at the centre of the wear path.

Back-up tips should also be replaced if the insert is cracked or badly chipped.





Irregular Wear

Rotor tips being left in place too long and wearing out.

Back-up Tips Breaking

Rotor tip failed, exposing back-up tip, usually caused by tramp iron or oversize feed or having been worn too thin.

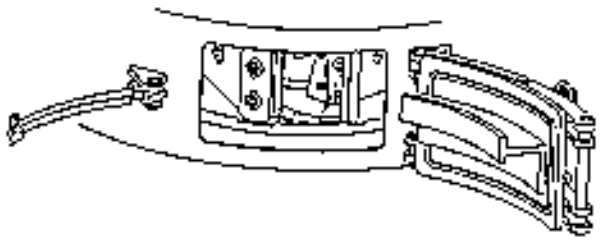
⚠ WARNING: If the back-up tip fails or is worn out the flow of material will severely damage or even destroy the rotor body.

Continued ▶

ROTOR SERVICING

ROTOR TIP ASSEMBLY

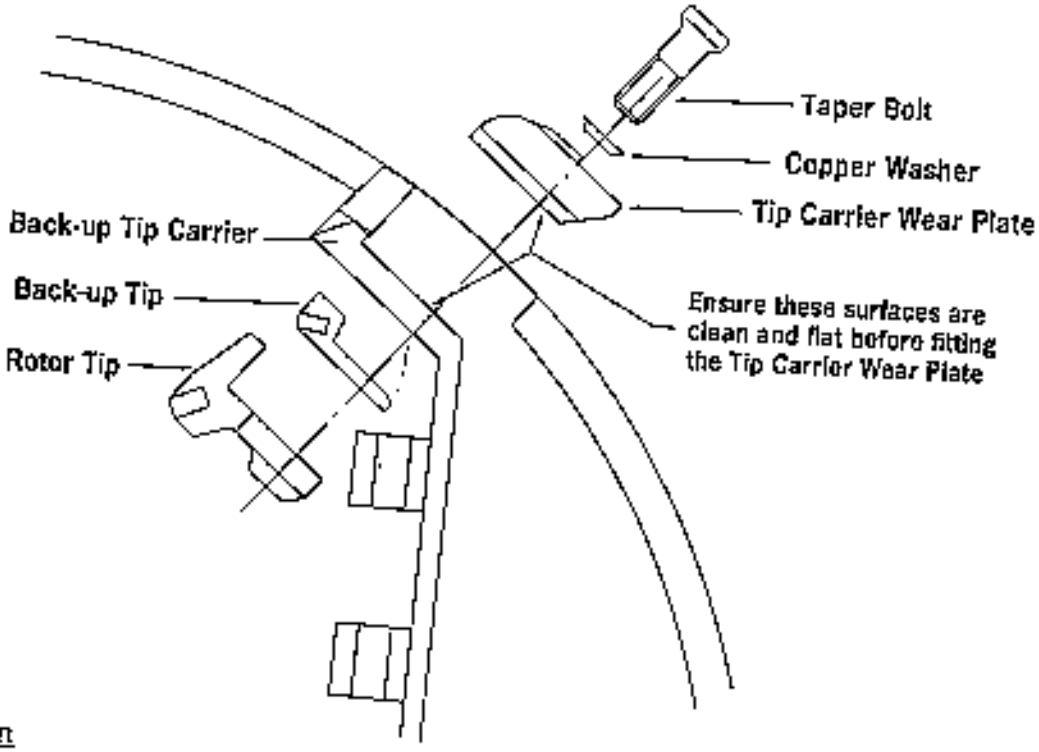
ACCESS: Through inspection door.



REMOVAL/INSTALLATION

Removal

Remove taper bolts. Tap rotor tip inward to break away build-up that will hold tip and back-up tip in place. It may be necessary to use a bar to chisel away very tightly compacted build-up. If this condition persists it is advisable to wash out build-up with water. (See 6-6).



Installation

Ensure that all mating surfaces on rotor tip, tip carrier wear plates and back up tips are free of any high spots (dirt, weld spatter, burrs).

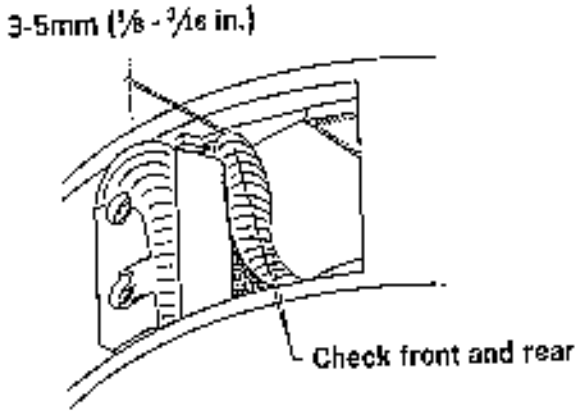
Position back up tip, rotor tip and tip carrier wear plate in rotor port. Insert taper bolts, ensure that copper washer is in place, and tighten. (Applying anti-lock compound to thread will make removal easier). Ensure that tip assembly is pulled up tight and that there is no movement in the parts. (See torque settings 6-64).

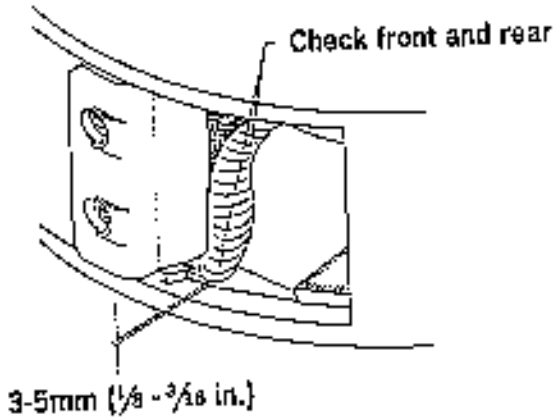
NOTE: ROTOR TIPS, TIP CARRIER WEAR PLATES AND BACK-UP TIPS MUST BE CHANGED AS SETS. DO NOT REPLACE SINGLE PARTS OR A ROTOR OUT-OF-BALANCE CONDITION MAY RESULT.

ROTOR SERVICING

UPPER AND LOWER WEAR PLATES

Replace upper and lower wear plates when it is obvious that they will not last another shift. Replace once there is less than 3-5 mm. (⅛ - 3/16 in.) of plate remaining at the centre of the wearpath at the discharge edge or inside edge.





Upper Wear Plate

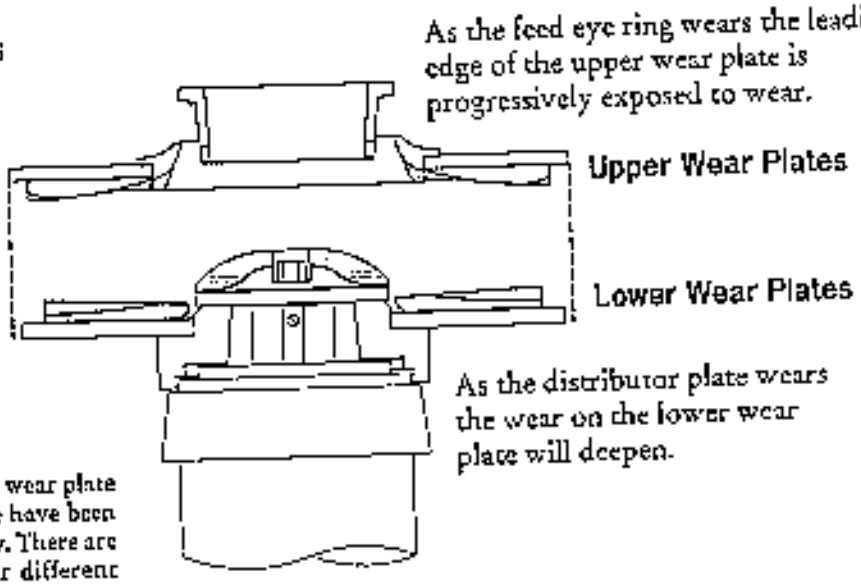
Rapid upper wear plate wear is an indication that the feed tube and feed eye ring are worn. Replace worn parts.

Upper wear plate wear accompanied by rotor tip top end wear is an indication that the trail plates are incorrectly shaped. Adjust trail plates as described in rotor tuning, section 6-28.

Lower Wear Plate

Lower wear plate wear accompanied by rotor tip bottom end wear is an indication that the trail plates are incorrectly shaped. Adjust trail plates as described in rotor tuning, section 6-28.

Other Influences



The upper and lower wear plate profiles shown above have been used as examples only. There are different profiles for different rotors, but the principle is the same.

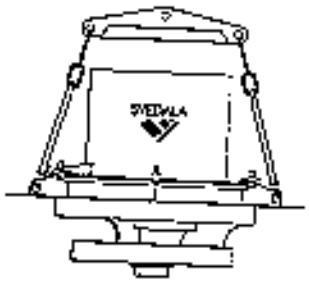
Continued ▶

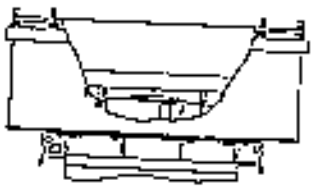
ROTOR SERVICING

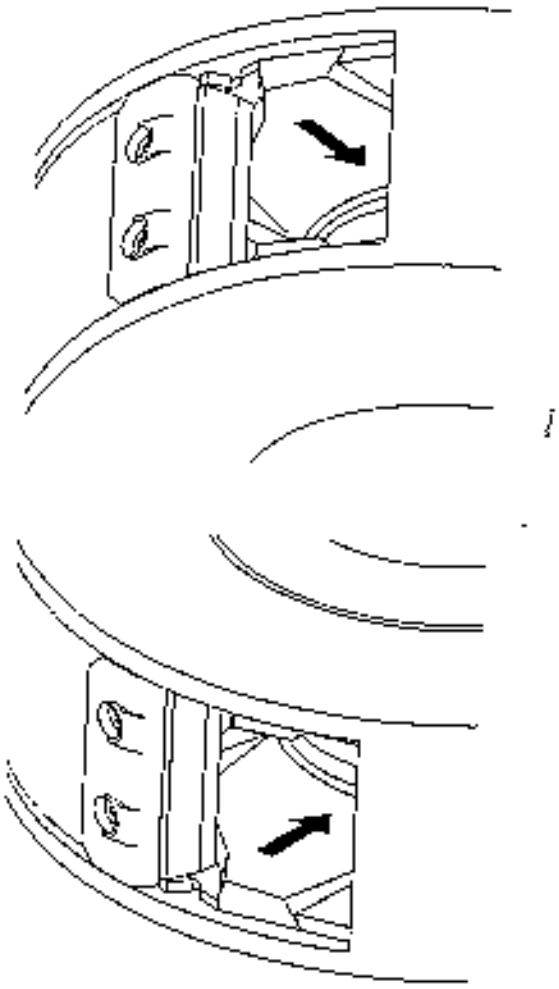
UPPER AND LOWER WEAR PLATES

REMOVAL/INSTALLATION

It is possible to remove and install the upper and lower wear plates while the rotor is in place, however it is necessary to clean out the build-up thoroughly. This can be done by using water as described in rotor servicing 6-6.







<u>Removal</u>

Upper Wear Plates

1. Remove hopper, crusher top and cascade assembly in one lift.
2. Remove rotor tips and tip carrier wear plates.
3. Remove feed eye ring.
4. Tap the wear plate towards the centre of the rotor to release it from the keepers.
5. Withdraw the plate through the feed hole.
6. Thoroughly scrub out the remaining build-up with a wire brush or hose pipe.

Lower Wear Plates

1. Remove rotor tips and tip carrier wear plates.
2. Remove the distributor plate.
3. Tap the wear plate towards the centre of the rotor to release it from the keepers.
4. Withdraw the plate through the feed hole.
5. Thoroughly scrub out the remaining build-up with a wire brush or hose pipe.

<u>Installation</u>

1. Ensure mating surfaces are clean and free of snags.
2. Insert new wear plate through the feed opening and slide into place.
3. Ensure the new plates are wedged under the keepers.

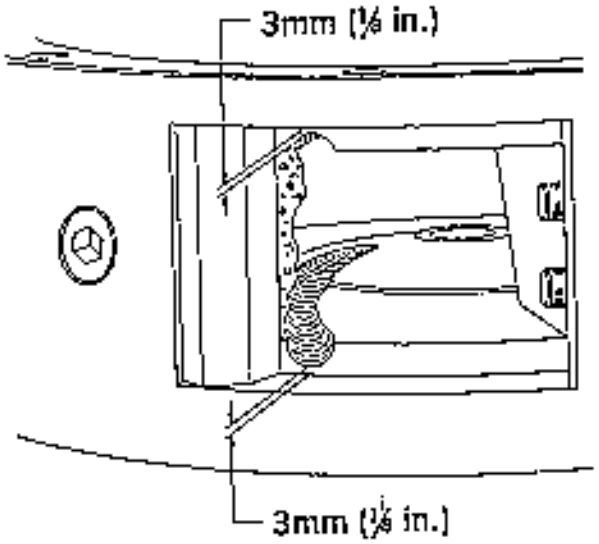
• See over for 300mm rotor instructions.

ROTOR SERVICING

300mm ROTOR UPPER AND LOWER WEAR PLATES

ADJUSTING / REPLACING UPPER WEAR PLATE

The 300mm rotor upper wear plate can be re-positioned three times for three lives before it is worn out. When worn as shown below:



1. Remove rotor from crusher.
2. Thoroughly clean wear plate and build-up in rotor, especially the bolting face of the wear plate.
3. Check the wear paths on the underside of the wear plate (fig. 1), they should be of even width, depth and position. If so, plate can be re-fitted. Uneven wear paths are caused by uneven trail plates. These should be checked. See rotor tuning 6-28.
4. Balance rotor with plates positioned so a new unworn area is next to the rotor tip.
5. Mark position of plate to rotor when balanced and remove plate.
6. When rotor body is refitted to shaft, position wear plate in correct balanced position as marked earlier, lubricate screw threads, fit aluminium taper washers and screws and torque to 30 Nm (15 lb ft).
7. If after re-starting and feeding a small amount of material, the rotor runs heavily out of balance, the wear plate is probably unbalanced and will have to be checked.

ROTOR SERVICING

300mm ROTOR UPPER AND LOWER WEAR PLATES

ADJUSTING / REPLACING LOWER WEAR PLATE

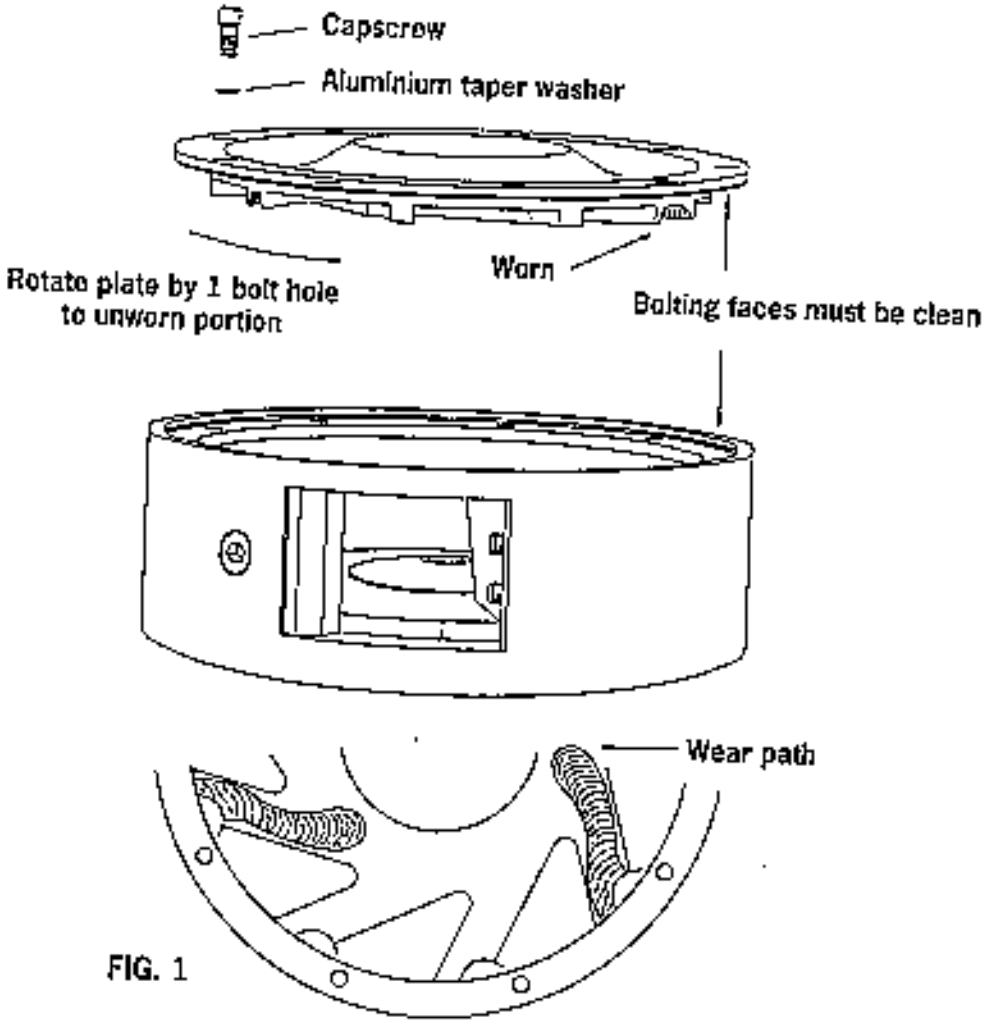


FIG. 1

As with the upper wear plate, the 300mm rotor lower wear plate can be re-positioned three times for three lives before it is worn out. To rotate or replace:

1. Remove rotor from crusher.
2. Remove upper wear plate, rotor tips and trail plates and clean out rotor (see changing upper wear plate).
3. Lift out lower wear plate and clean thoroughly. Check that wear paths on the wear plate are of even width, depth and position. If so, plate can be re-fitted. Uneven wear paths are caused by uneven trail plates. These should be checked.
4. Re-fit plate, positioned so a new unworn area is next to the rotor tip. Make sure the wear plate is sitting down flat and not resting on any grit, etc.
5. Rebalance rotor. (See section 6-36).

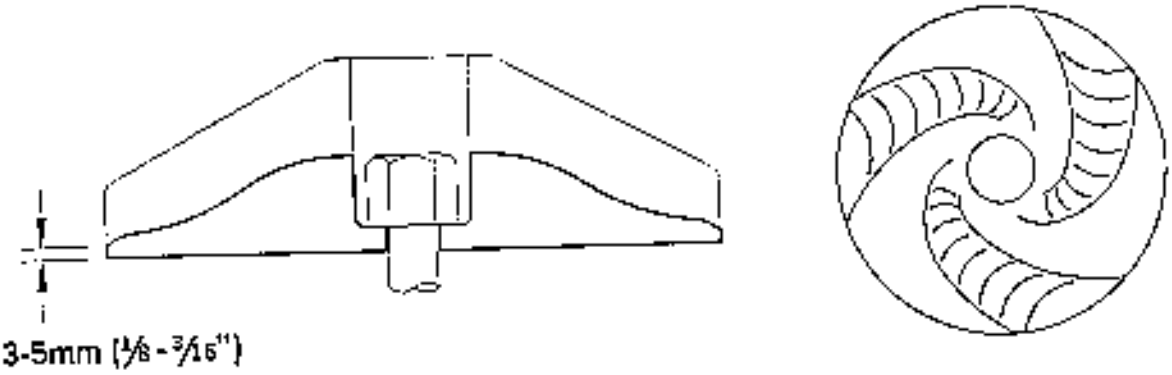
ROTOR SERVICING

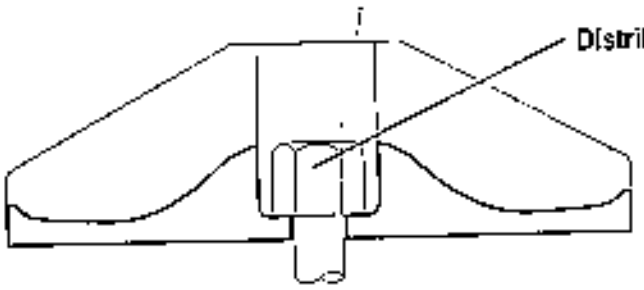
DISTRIBUTOR PLATE

The distributor plate wears in three places, opposite each rotor port.

Turn the distributor plate 1/6th of a turn when partly worn to ensure maximum usage.

Replace distributor plate once the bolt head starts to wear or once there is only 3-5mm (⅛ - 3/16") of casting left at the thinnest point.





Premature Wear

Generally caused by oversize feed or material dropping from a conveyor or screen chute directly onto the distributor plate.

Reduce feed size. Install or centralise spreader plate in feed hopper. Change distributor plate type.

SELECTION OF DISTRIBUTOR PLATE

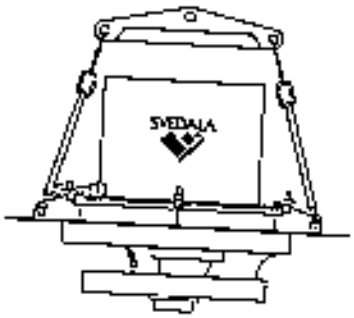
Different types and shapes of distributor plate are available. Please contact your dealer for more information.

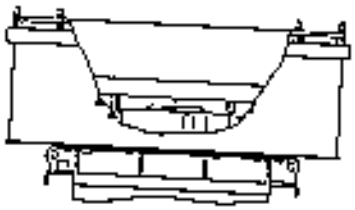
Continued ▶

ROTOR SERVICING

DISTRIBUTOR PLATE

REMOVAL/INSTALLATION





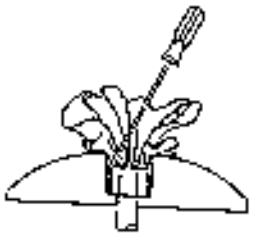
Removal

1. Remove hopper, crusher top and cascade assembly in one lift.
2. Remove feed eye ring. (See 6-19).
3. Remove stones and protective rag from distributor bolt hole.
4. Remove distributor plate bolt.
5. Distributor plate lifts out.

Refitting

1. Ensure the top plate surface is clear of obstructions before fitting the distributor plate to protect the distributor plate from breakage.
2. Place distributor plate in centre of rotor. Insert distributor plate bolt and tighten. (Refer to bolt torque table section 6-60 for correct torque).
   - The use of large impact wrenches should be avoided when tightening bolt.

Reassembly is a straight reversal of removal.



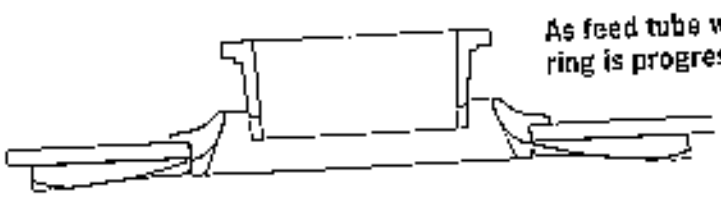
Insert a piece of rag into the distributor plate bolt hole and tamp firmly around bolt head. This will keep dirt from getting around the bolt head and will make removal much easier.

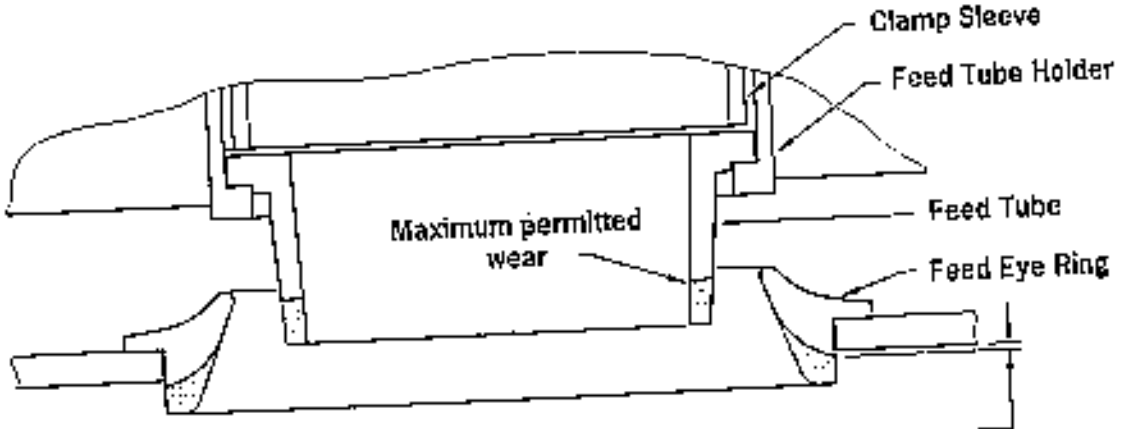
ROTOR SERVICING

FEED EYE RING

Wear on the feed eye ring is largely determined by the material flow from the feed tube. Thus as the feed tube wears the feed eye ring will be exposed to more wear.

To minimise the wear of the feed eye ring it is essential to maintain the feed tube in the correct position. (Refer to feed tube section 6-20).





The feed eye ring wears in three places opposite the rotor ports.

Replace the feed eye ring when the upper wear plate is worn to a thickness of 3-5mm (⅛-³⁄₁₆ in.) at the inside edge.

The standard feed eye ring cannot be rotated. A two-life turnable feed eye ring is available for some models.

Premature Wear
Check feed tube is correctly positioned.

Feed Eye Ring Breakage
Material lodging between the feed tube and the feed eye ring. Check rotor build-up.

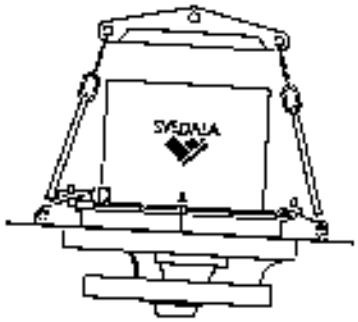
Feed Eye Ring Coming Loose
Check feed eye ring is correctly installed.

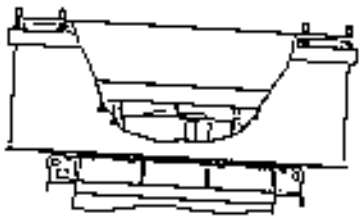
Continued ▶

ROTOR SERVICING

FEED EYE RING

REMOVAL/INSTALLATION





Removal

1. Remove hopper, crusher top and cascade assembly in one lift.
2. With a hammer hit the top of the rotor (not the feed eye ring) above the wear plates to loosen the build-up.
3. Turn the feed eye ring counter-clockwise until the locking tabs line up with the slots in the rotor top. If material build-up stops the worn feed eye ring from turning use a soft blow hammer to tap the feed eye ring counter-clockwise.
4. Lift the feed eye ring out.

Installation

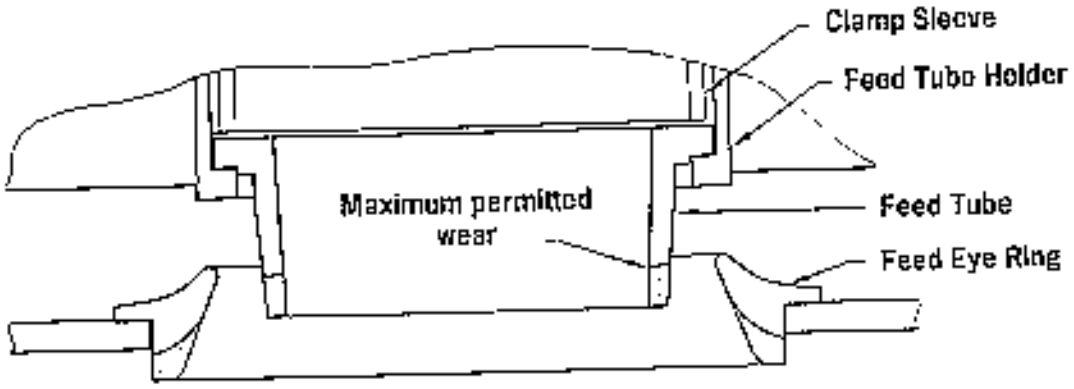
1. Ensure mating surfaces are clean and free of snags. If refitting upper and lower wear plates ensure these are in position.
2. Position feed eye ring so locking tabs and slots line up.
3. Lower feed eye ring and turn clockwise to lock in place.

ROTOR SERVICING

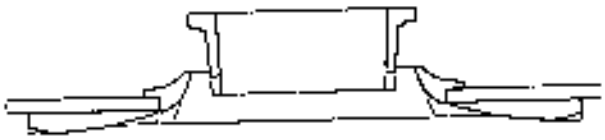
FEED TUBE

Replace feed tube just before the bottom lip is exposed above the feed eye ring.

The feed tube should wear evenly up the casting.



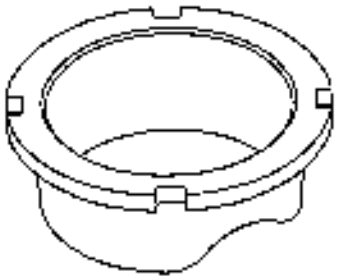
Maintaining the correct position of the feed tube in the rotor will result in increased life for the feed eye ring and upper wear plates.



Uneven Wear

Feed tube wearing on one side – feed tube not centralised.

Check feed tube and cascade assembly. (To centralise cascade assembly see section 6-48).

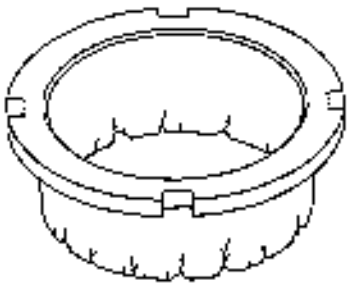


Cracking and Breakage

Feed tube cracking on bottom edge – excessive rotor build-up is rubbing on feed tube and causing overheating.

Adjust trail plates to reduce build-up.

Feed tube breaks – can be caused by excessive build-up in rotor, stones wedging between feed tube and feed eye ring, feed eye ring coming loose or the feed tube coming loose (check clamp sleeve).



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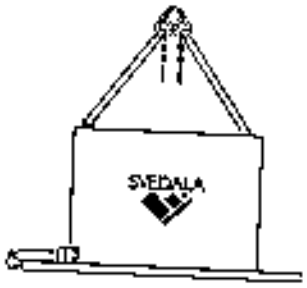
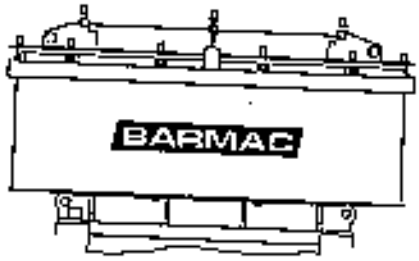
ROTOR SERVICING

FEED TUBE

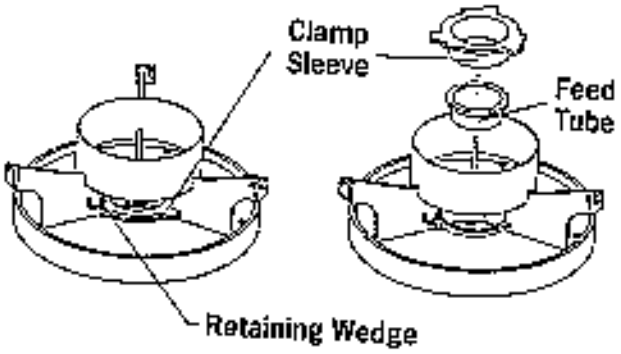
REMOVAL/INSTALLATION



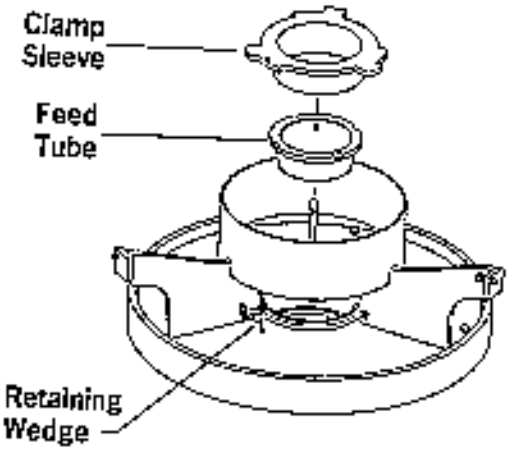


Removal

1. Remove the hopper from the crushing chamber assembly.



2. Clear stones from around feed tube, clamp sleeve and retaining wedge.
3. Remove retaining wedge and knock the clamp sleeve clockwise to release.
4. Lift clamp sleeve out.
5. Lift feed tube out.



Installation

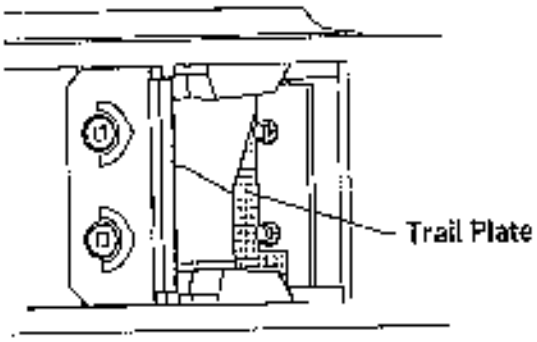
1. Ensure feed tube holder is free from stones, etc.
2. Lower feed tube into place.
3. Ensure it is centralised and level.
4. Refit clamp sleeve.
5. Turn clamp sleeve into locked position and insert retaining wedge.

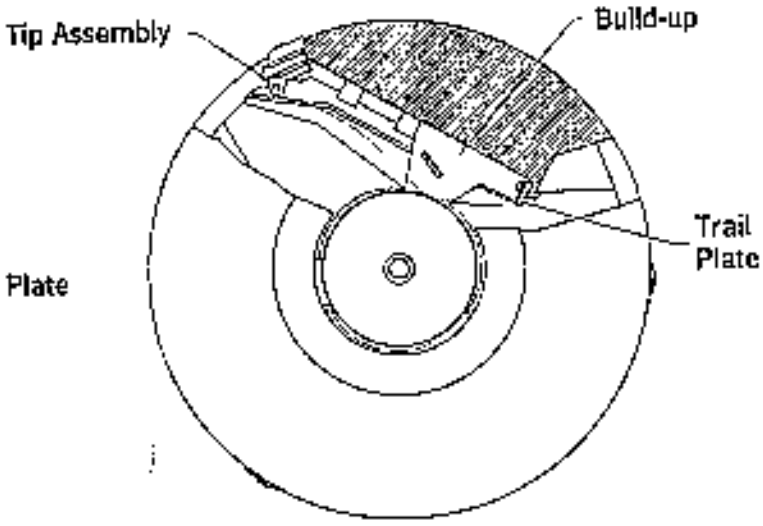
ROTOR SERVICING

TRAIL PLATES

Check trail plates for wear. Replace if badly worn or rotor build-up needs adjusting.

In some applications, trail plates are changed at the same time as the rotor tips – just to keep the stone bed profile constant. Regular change of trail plates maximises rotor tip life and is often very cost effective.





SELECTION OF TRAIL PLATES

The trail plates are the heart of the rotor. The size, position and angle of the trail plate controls the size of the rotor build-up and the flow of material through the rotor.

Incorrectly sized or shaped trail plates can result in premature wear on every rotor wear part. (See rotor tuning 6-28).

A number of trail plate profiles are available. For information regarding trail plate options, contact your Barmac representative.

CAUTION: The use of different sized trail plates can create uneven build-up which may cause severe vibration. Ensure that trail plates are matched in size and shape. Differently positioned trail plates in each port may create uneven build-up which may cause vibration.

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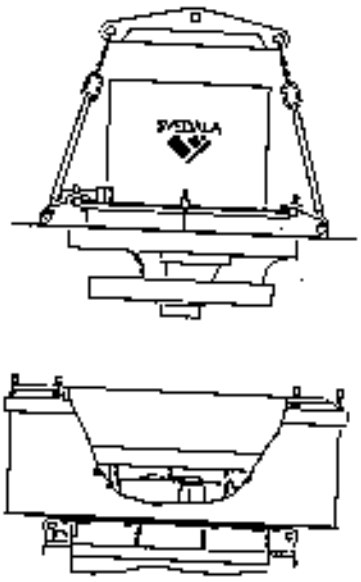
ROTOR SERVICING

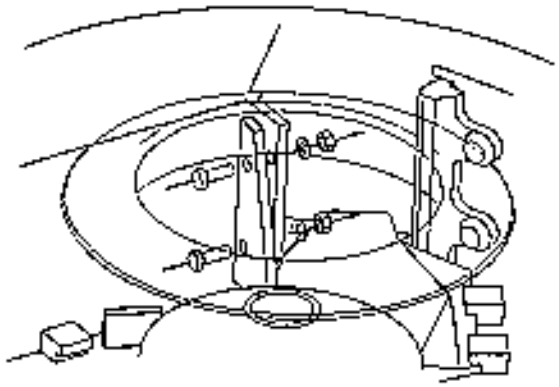
TRAIL PLATE

REMOVAL/INSTALLATION



Removal

1. Remove hopper, crusher top and cascade assembly in one lift.
2. Remove trail plate retaining bolts. Bolts will be covered with build-up and will have to be knocked out with a hammer and punch. Care should be taken not to damage threads.
3. If trail plate is held in by the build-up, a sharp blow with a hammer will break away the build-up and allow the trail plate to fall free.



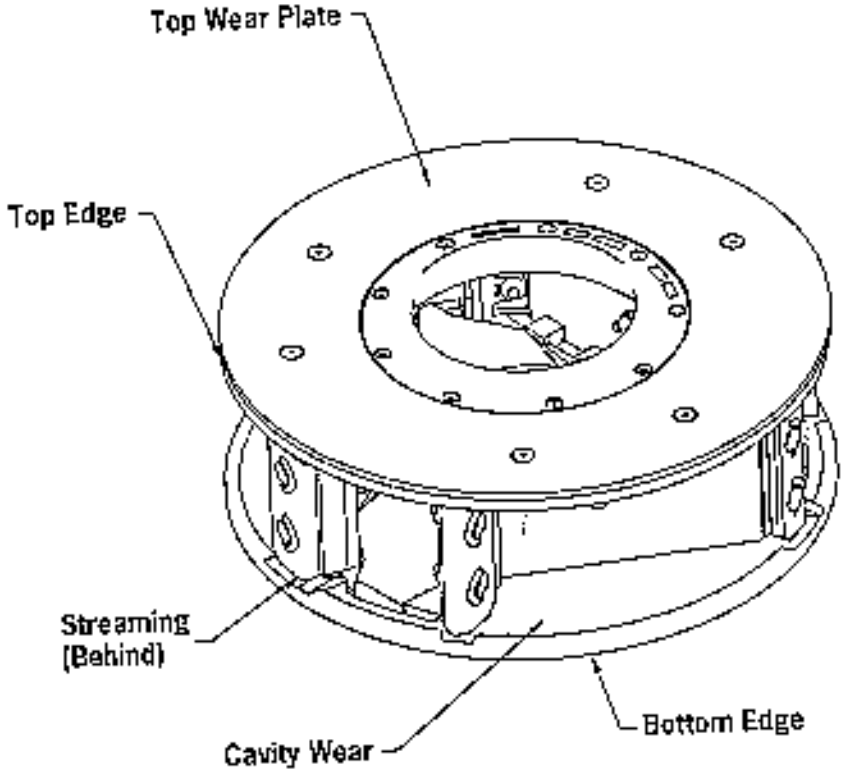
Installation

1. Clean out any remaining build-up.
2. Position trail plate and insert bolts.
3. Insert bolt from the inside of the rotor.
4. Tighten bolt to hand tight.

ROTOR SERVICING

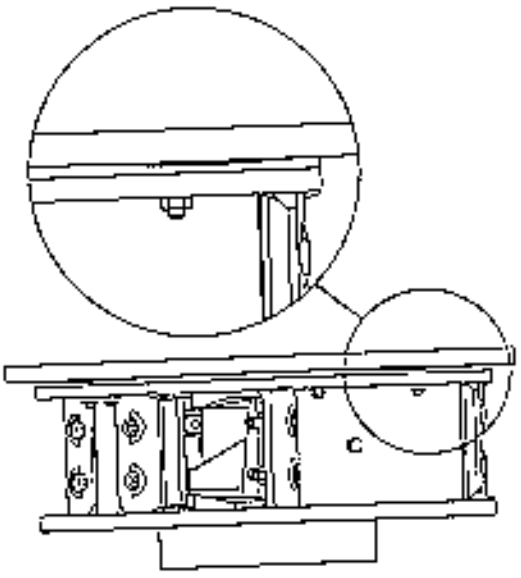
ROTOR BODY

The following areas are subject to normal wear – the comments provide a guide to causes of unusual rapid wear.



Top Wear Plate

Feed tube too short and material is discharging over the top of the rotor or dust has accumulated on the air transfer blades and is rubbing on the rotor. Replace feed tube or remove dust build-up. If the top wear plate continues to wear it may be necessary to replace the mild steel top wear plate with a more wear resistant material. Please contact your Barmac representative.



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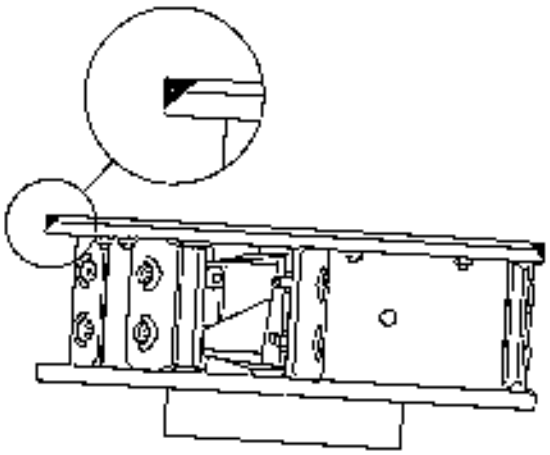
ROTOR SERVICING

ROTOR BODY

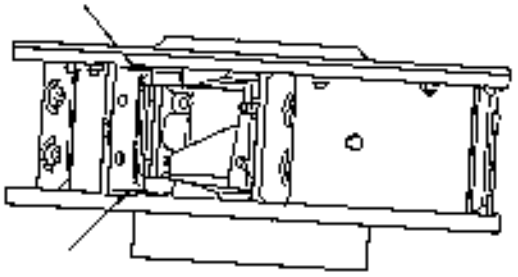
Top Edge Worn

Cascade wear skirt and/or cavity ring is worn. Replace worn parts. See section 6-49.



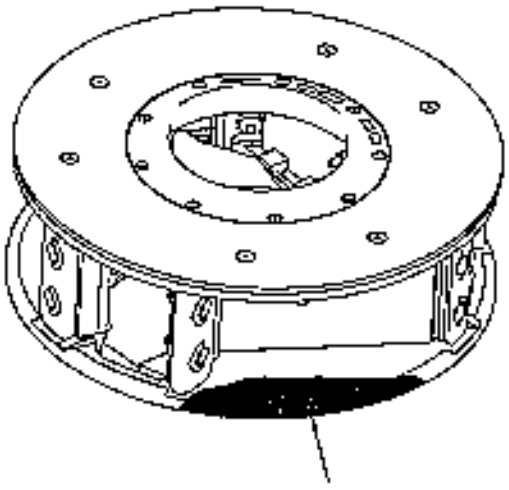
Streaming Wear

This is more prevalent in very abrasive fine applications, and is caused by dust streamlining around the tip carrier wear plate. Effects can be reduced by sealing the gap between the top and bottom edges of the tip carrier wear plate and the rotor with a silicone rubber or urethane sealant.



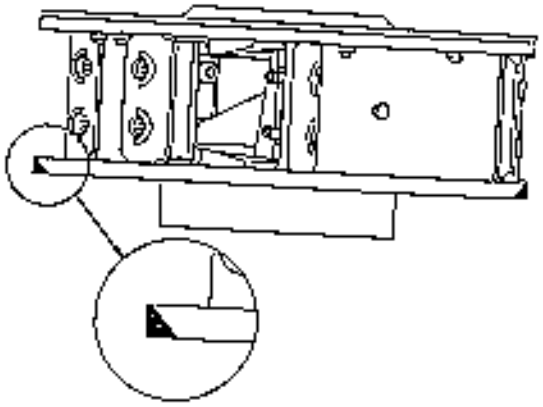
Cavity Wear

In very abrasive fine applications, this area can be subject to light wear. If it becomes a problem, wear resistant plates can be fitted to the base plate of the cavity. Please contact your Barmac representative.



Bottom Edge Worn

Can be a feature of high tonnage operation or indicative of excessive buildup in the base that is rubbing on the rotor. Reduce build-up by reducing moisture content of feed or introducing water spray system. See section 6-51.

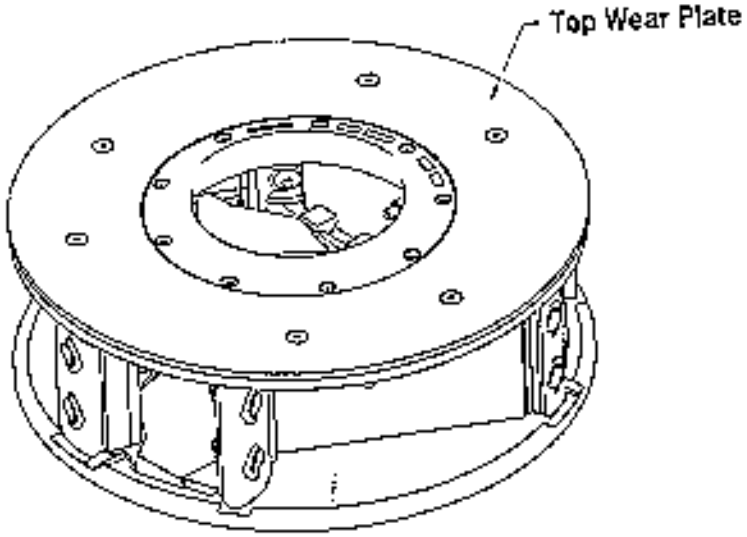


ROTOR SERVICING

ROTOR WEAR PROTECTION PLATES

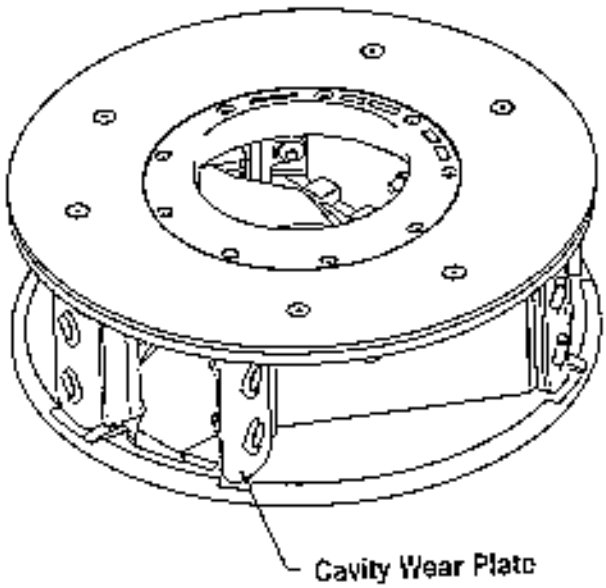
TOP WEAR PLATE

The top wear plate , although only mild steel, should not wear rapidly, but it should be inspected and replaced before the rotor body is damaged. If rapid wear occurs, wear resistant plates may be required. Contact your Barmac representative for details.



CAVITY WEAR PLATES

The cavity wear plates should be replaced before wear progresses to the body of the rotor. Remove the bolts and nuts holding the wear plate to the rotor body and replace. Always replace all three cavity wear plates with a matched set to maintain balance.

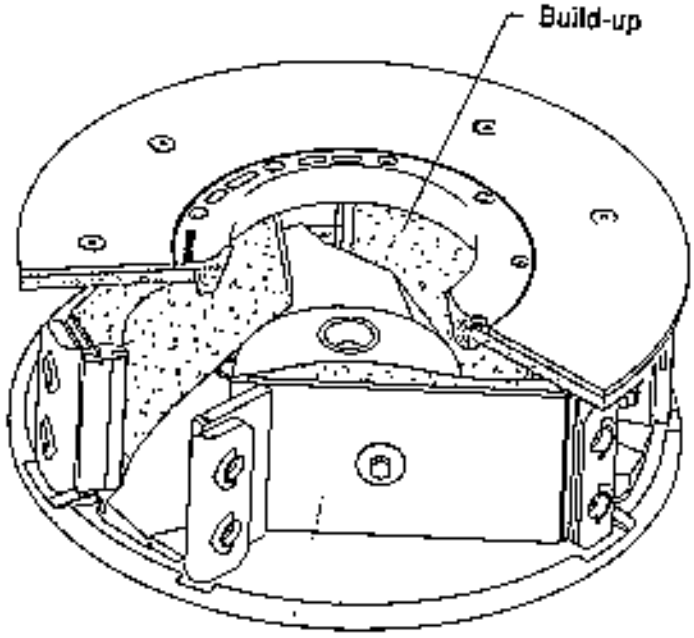


ROTOR SERVICING

ROTOR BUILD-UP

PRIMARY FUNCTION

The build-up in the rotor needs to protect the internal walls of the rotor and most importantly protect the rotor tip from direct wear and impact.



SECONDARY FUNCTION

The build-up in the rotor can influence the wear patterns of the wear parts in order of importance:

ROTOR TIPS

TIP CARRIER WEAR PLATES

UPPER AND LOWER WEAR PLATES

DISTRIBUTOR PLATE

FEED EYE RING

While large build-ups tend to assist in the protection of the above wear parts – particularly the rotor tips – they can greatly increase feed tube wear.

• See rotor tuning section 6-28.

ROTOR SERVICING

ROTOR TUNING

The success of the Barmac is centred around its rotor. If the rock build-up within the rotor is ideal, then wear on the upper and lower wear plates will be even, the rotor tips fully utilised, and the lowest consumables cost per tonne of product will be achieved.

DIFFERENT MATERIAL CHARACTERISTICS

Unfortunately, the build-up characteristics are never the same for any two materials, indeed the nature of the build-up will vary with rotor speeds, rotor sizes, feed rates, feed sizes, and feed moisture.

TUNING ON SITE

A factory delivered rotor will rarely work at optimum efficiency without some degree of tuning. It is normal that some tuning will be required as each rotor is placed into service. Tuning relates to controlling the build-up of material within the rotor. This is done by altering the size, position, shape, or style of the trail plates.

PRIMARY FUNCTION

The main purpose of tuning is to ensure that the build-up within the rotor extends from the trail plate to the inserts in the rotor tip, and that the wear is centralised across the rotor tips.

Insufficient build-up will result in tip exposure. This will lead to early failure of the rotor tips through the chipping of the inserts by direct contact with the larger stones in the feed. Insufficient build-up of material will expose the supporting metal of the rotor tips. This will also lead to premature failure of the inserts by direct abrasion from the stone flow through the rotor. This can also result in the rotor tips wearing in front of the inserts which will eventually lead to their falling out of the carrier plate.

BASIC PRINCIPLES

In tuning the rotor one should try to maximise the build-up within the rotor to achieve:

- A build-up of rock within the rotor to protect the wear parts and not restrict the feedpath through the crusher.
- A build-up that clears the side and bottom of the feed tube, preventing premature feed tube wear.
- An equal flow through each rotor port, equalising the wear on the rotor tips.

Continued ▶

ROTOR SERVICING

ROTOR TUNING

ADJUSTMENT OF ROTOR BUILD-UP

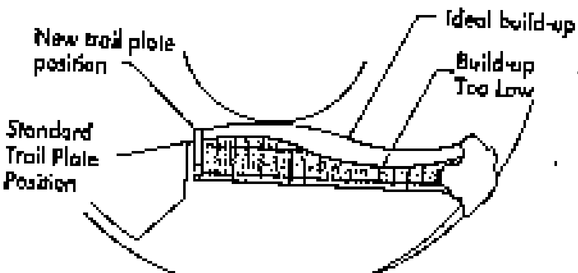
The width and position of the trail plates will control the amount and characteristics of the build-up in the rotor.

The following is meant only as a guide, as rotor build-up is dependent on many factors: material type, moisture content, rotor speed, etc., and trial and error will have to be employed to determine the correct trail plate position for each application.

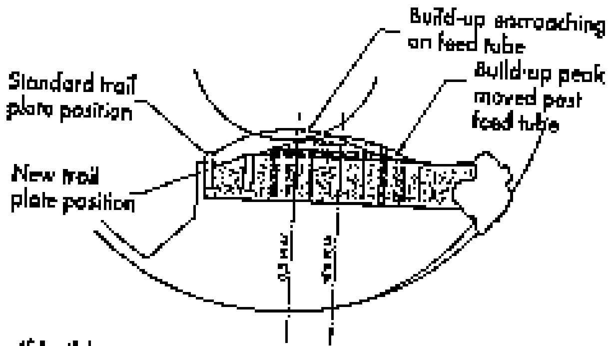
Generally –

- Wide trail plates make the material build-up deeper.
- Narrow trail plates make the material build-up shallower.
- Moving the trail plate away from the rotor tip makes the build-up shallower and moves the peak away from the tip.
- Moving the trail plate toward the rotor tip makes the build-up deeper and moves the peak toward the tip.

Lack Of Build-up

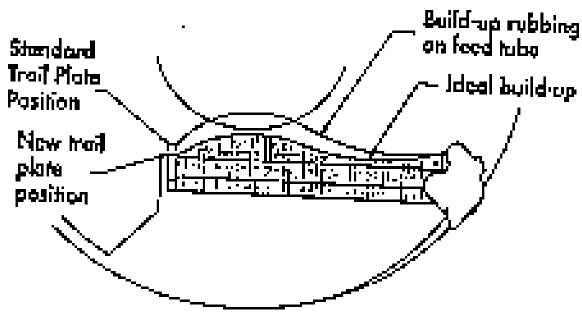


If build-up is not up to rotor tip — Increase trail plate width until build-up approaches rotor tip.

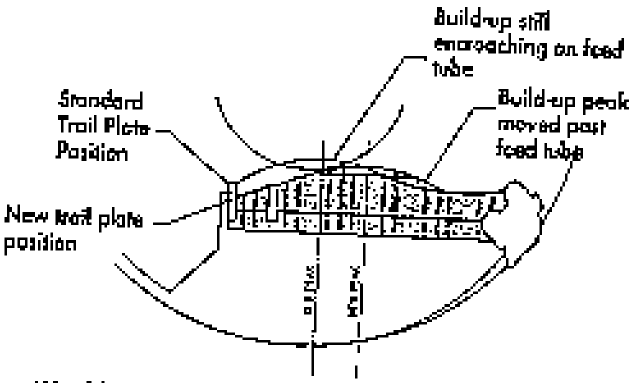


If build-up starts to encroach on feed tube — Pack trail plate toward tip. This will move the peak of the build-up past the feed tube without reducing rotor tip build-up.

Too Much Build-up



If build-up is rubbing on feed tube — Reduce trail plate width until build-up starts to pull back from rotor tip.



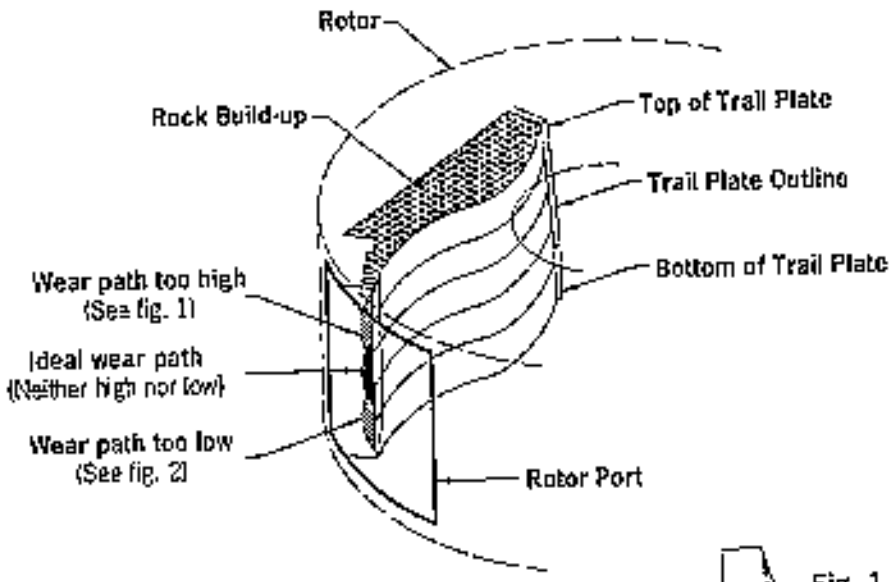
If build-up is still encroaching on feed tube, packing the trail plate forward will again move the build-up peak past feed tube without reducing tip build-up.

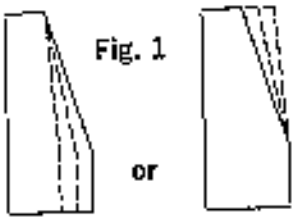
Continued ▶

ROTOR SERVICING

ROTOR TUNING

ADJUSTMENT OF ROTOR BUILD-UP

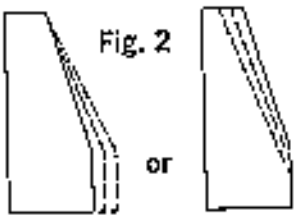




If wear path is too high—

1. Shorten bottom of trail plate by gradual increments.
   OR
2. Extend top of trail plate by gradual increments.

Ensure that rock build-up depth is maintained.



If wear path is too low—

1. Extend bottom of trail plate by gradual increments.
   OR
2. Shorten top of trail plate by gradual increments.

Increasing the width of the trail plate increases the depth of the rotor build-up. Decreasing the width of the trail plate decreases the depth of the rotor build-up. Increasing the trail plate thickness at the top increases the rotor build-up at the top and encourages material to move lower when leaving the rotor.

Increasing the trail plate thickness at the bottom increases the rotor build-up at the bottom and encourages material to move higher when leaving the rotor. The rotor build-up cross section will reflect the trail plate shape.

Adjustment of the trail plates should be made by cutting thin (6mm [¼"]) slices off. Large adjustments should not be made as the problem may simply move to the opposite extreme, i.e. top end tip wear may become bottom end tip wear.

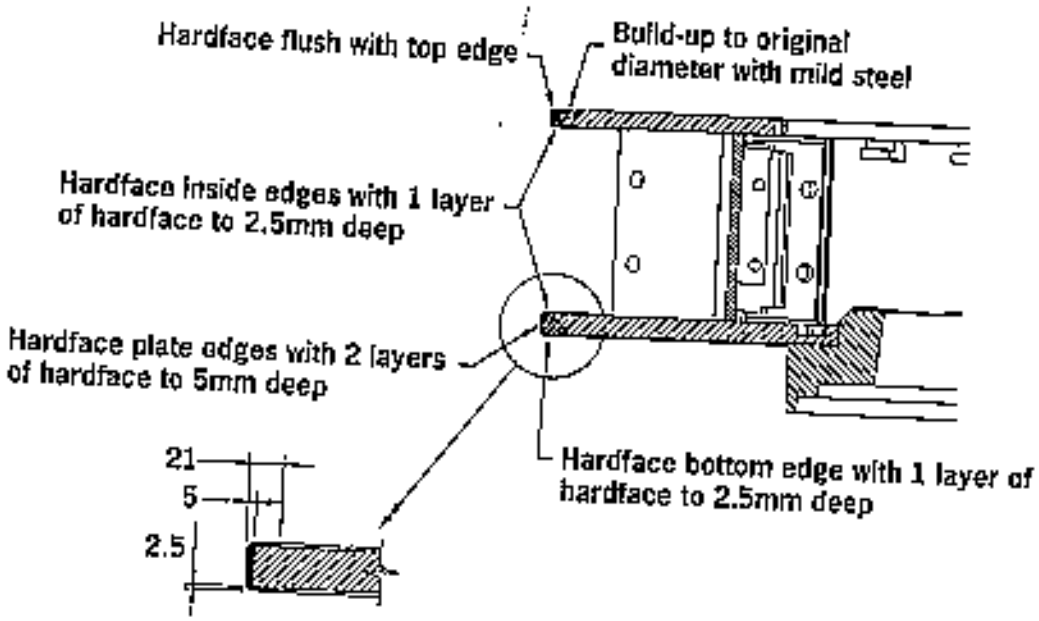
NOTE: ALL TRAIL PLATES SHOULD BE THE SAME SIZE AND SHAPE OR AN OUT-OF-BALANCE SITUATION MAY RESULT.

ROTOR SERVICING

ROTOR REBUILDING

WARNING: Do not attempt to weld on rotor while it is in the machine or arcing damage will cause premature failure of the bearings.

1. Remove rotor (see 6-32).
2. Clean out all wear parts and build-up.
3. Do not weld on balance machine.
4. Spin rotor on balance machine to check for low spots on periphery. Mark them.
5. Build-up top edge to original diameter and roundness.
6. Build-up bottom edge to original diameter and roundness.
7. Replace top plate as required.
8. Effect any internal repairs.
9. Balance rotor.

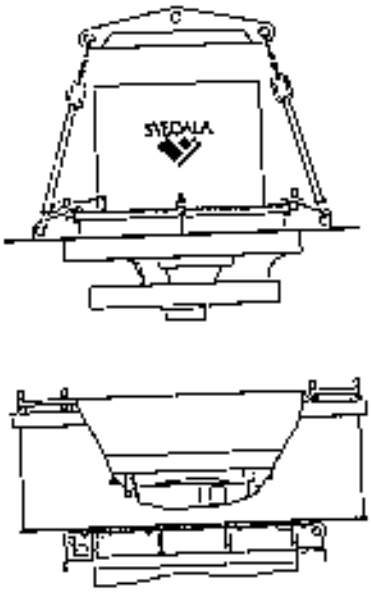


NOTE:

- Use electrodes with a hardness of 400-500 Brinell such as Vidalloy-30. For submerged arc machine welding use Lincoln 550 flux with L60 wire or equivalent. Use Low Hydrogen rods for structural repairs.
- Frequent minor rebuilding is cheaper than infrequent major rebuilding work.

ROTOR SERVICING

ROTOR REMOVAL



❶ Remove hopper, crusher top and cascade assembly in one lift.

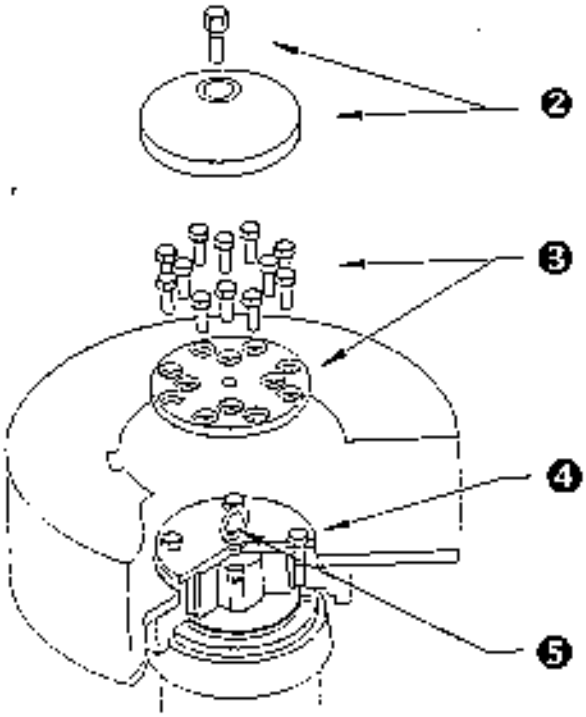
❷ Pick out material from the centre of the distributor plate and remove the rag or paper from around the distributor bolt. Remove the distributor bolt and take out the distributor plate.

NOTE: Prevent any material falling down the threaded distributor bolt hole. Use a rag or put the distributor bolt back in.

❸ Remove the top plate bolts and the top plate.

❹ Attach the rotor lifting plate. Bolt down with four bolts and tighten bolts in series until fully screwed in to force rotor off taper lock.

❺ Lift out rotor using eyebolt in rotor lifting plate.



ROTOR SERVICING

ROTOR INSTALLATION

The life of a Barmac bearing cartridge is greatly reduced when the rotor is running with excessive vibration for long periods. When this vibration is extreme, there is potential for catastrophic failure, i.e. shaft breakage.

One factor which has a direct influence on the smooth running of a Barmac is the fit between bearing cartridge and rotor. The correct procedure for securing a rotor to a bearing cartridge is as follows:-

1. PREPARATION

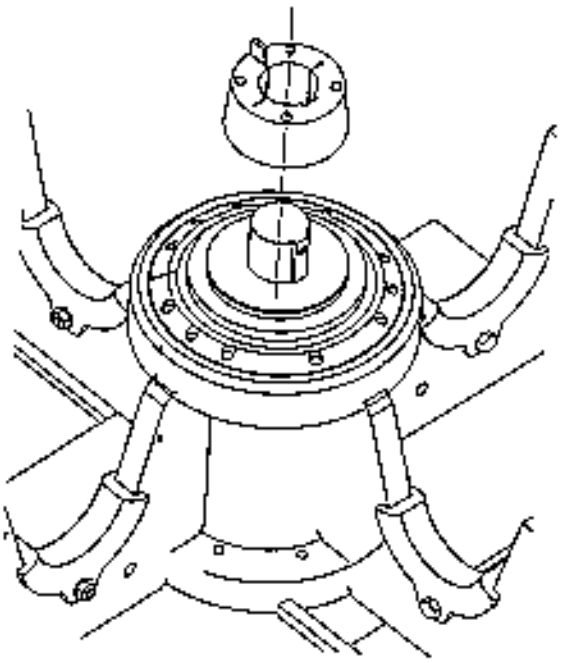
   Thoroughly clean the shaft, key, taper lock and rotor boss. Coat these surfaces with light oil or dewatering fluid and wipe down prior to assembly. Ensure the key screw is not proud of the outer face of the key.

2. TAPER LOCK FITTING

   Place a small wedge or screwdriver in the split on the TOP of the taper lock to expand it slightly. Place the taper lock, large end downward, on the shaft so that it sits hard down on the top seal plate.

   Remove the wedge or screwdriver and remove any burrs on the taper lock left behind.

   NOTE: Do not expand the taper lock any more than necessary to achieve a snug sliding fit onto the shaft. Excessive expansion of the taper lock can break it.



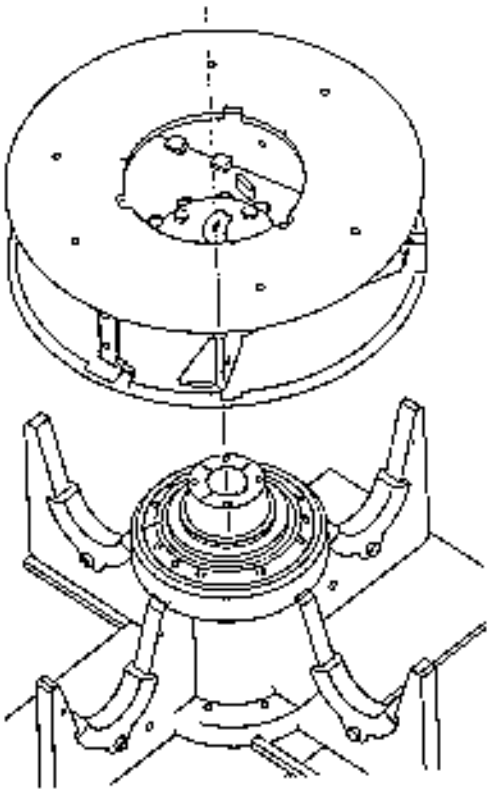
ROTOR SERVICING

ROTOR INSTALLATION

3. ROTOR TAPER CHECK

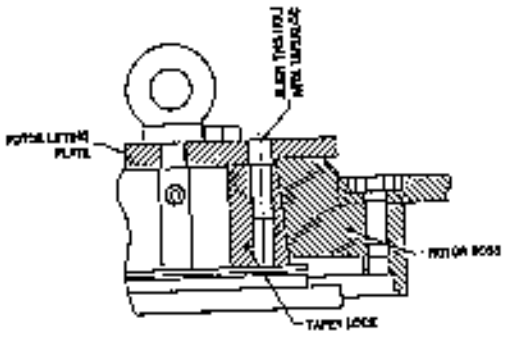
If the rotor being fitted has just been repaired and/or reconditioned around the taper area (i.e. has undergone extensive welding that may cause distortion), it is recommended that the fit between rotor and taper lock be checked prior to final fitting.

To do this, blue the bore of the rotor boss and lower onto the taper lock on the shaft. (Use the rotor lifting plate or, for the 300 rotor, the lifting sling supplied with the crusher). Ensure the taper is properly seated under the weight of the rotor and then remove. You should see a blue mark on the taper lock indicating contact with the rotor boss. This mark should cover at least 80% of the circumference and 80% of the length of the taper. Any less contact than this will require replacement of the rotor boss. If this is not practical (e.g. the boss is welded in), consult your Barmac representative for further advice.

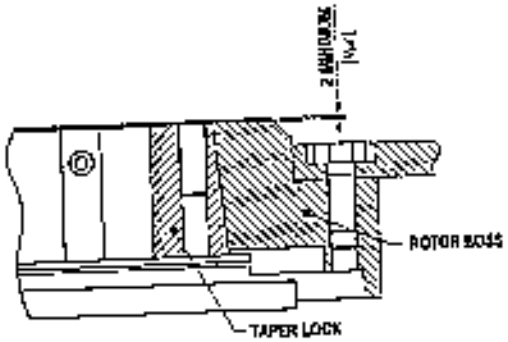


4. ROTOR FITTING

Fit the rotor lifting plate to the rotor boss and lower the rotor onto the taper lock. Before removing lifting plate, line up two spare holes in lifting plate with any holes in the taper lock.



Remove the lifting plate bolts evenly, allowing the rotor to slide onto the taper lock under its own weight. With the rotor firm on the taper lock there must be at least 2mm (1/16 in.) between the top of the taper lock and the top of the rotor boss.



NOTE: The rotor must be lowered square to the shaft onto the taper lock. Failure to do so may result in a poor mating of the tapered surfaces and hence vibration problems.

ROTOR SERVICING

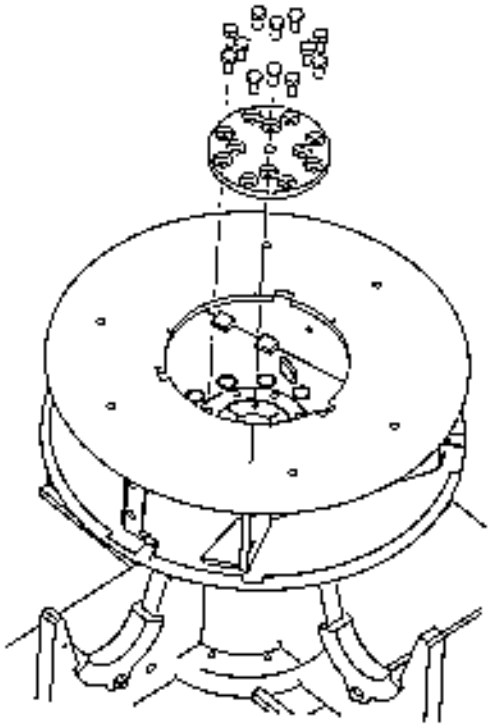
ROTOR INSTALLATION

5. SECURING BOLTS

Insert the bolts through the top plate into the taper lock and tighten evenly. This pulls the taper lock up tight on the shaft and rotor boss.

Model	Torque Nm (ft lbs)
B3000	34 (26)
B5000	60 (45)
B6000, B7000, B8000, B9000	250 (190)

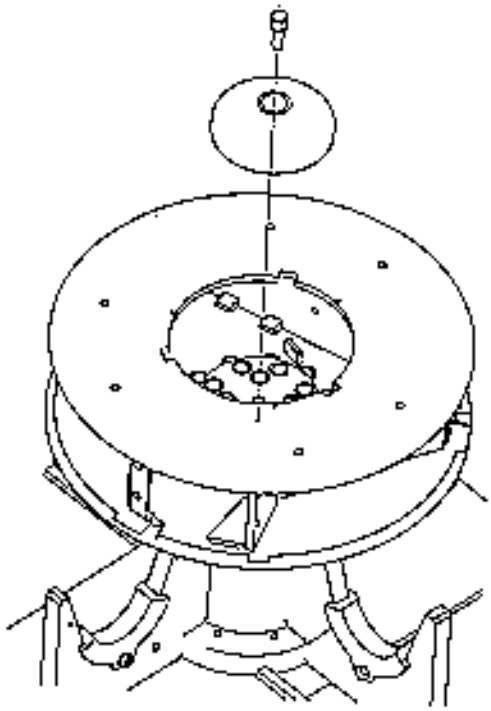
For the larger rotors, fit the additional 8 outer bolts through the top plate into the rotor boss and tighten. This fills the holes that are necessary for removal and provides positive drive between taper lock and rotor boss in addition to the friction fit of the taper. Torque to 250 Nm (190 ft lbs).



6. FINAL CHECK

Stand on top of the rotor (if possible) and try to rock it from side to side. If there is excessive movement or if you feel the rotor "settle" at all, recheck the torque on all bolts.

Note that there will be a small movement of the shaft within the bearings. This is normal. This check simply confirms that the rotor is properly seated on the taper lock.



7. DISTRIBUTOR PLATE FITTING

The distributor plate must now be fitted to protect the taper assembly. Note that the centre bolt of the distributor plate cannot be relied upon alone to secure the rotor to the shaft. (See 6-17).

ROTOR SERVICING

ROTOR BALANCING

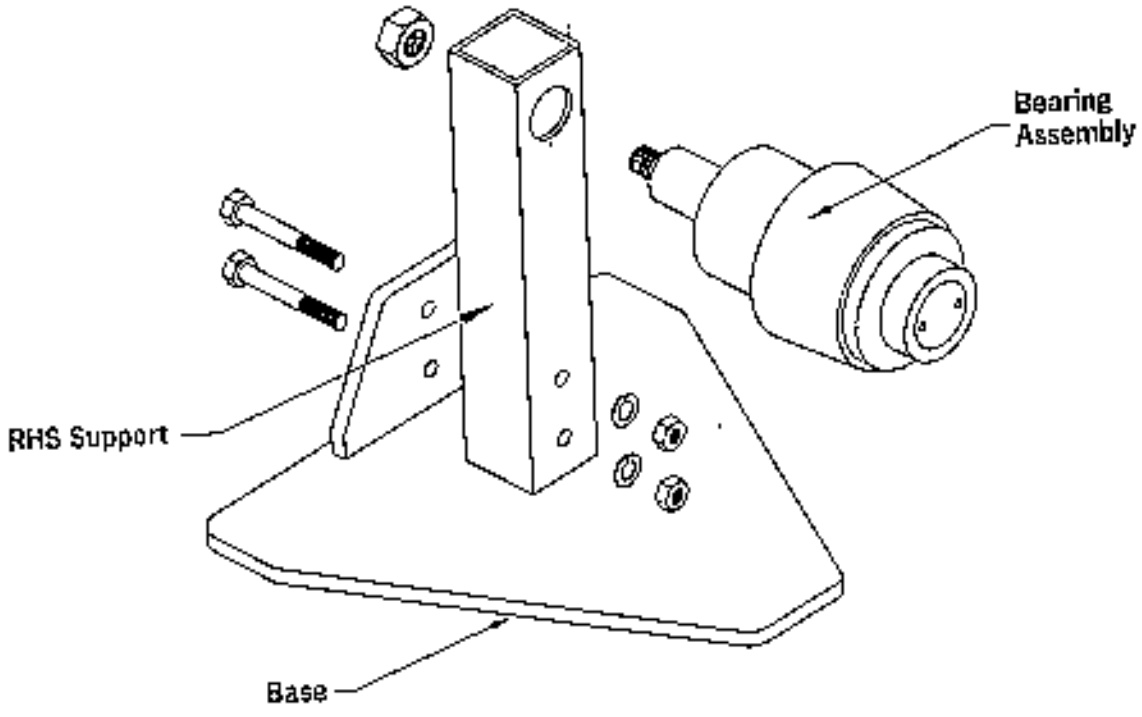
It is important that the Barmac rotor is properly balanced in order to provide the maximum trouble-free life of the bearing assembly in the crusher. Svedala manufactured rotor balance machines are designed specifically, and only, for this job.

To get the best results from the balance machine, it must be properly set up and in good mechanical order.

ASSEMBLY – SMALL ROTOR BALANCE MACHINES (300 and 500 rotors only)

The bearing assembly of these machines is supplied fully assembled. All that remains is to:

1. Assemble the RHS support to the base with the bolts provided.
2. Assemble the bearing assembly to the RHS support with the nyloc nut provided.



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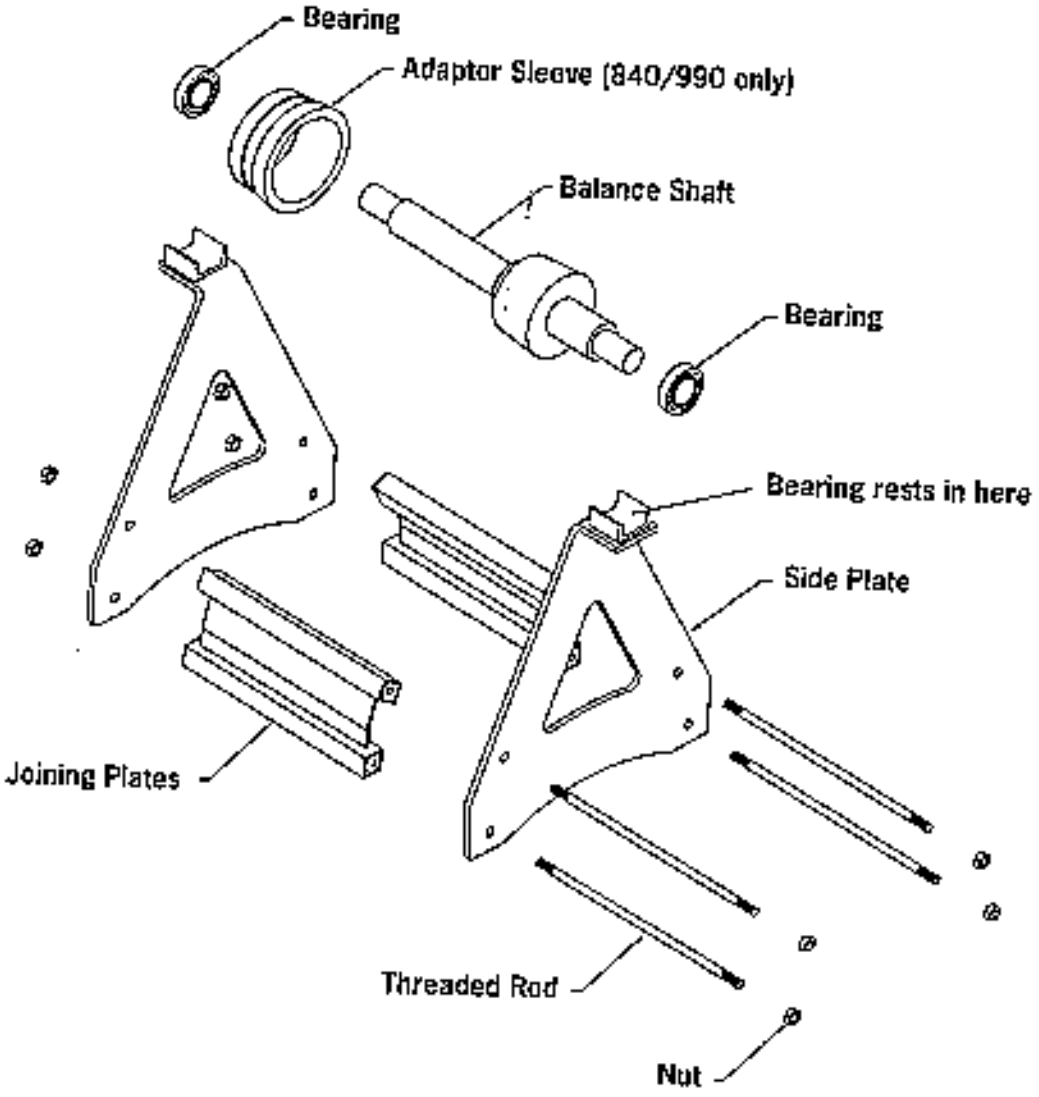
ROTOR SERVICING

ROTOR BALANCING

ASSEMBLY – LARGE ROTOR BALANCE MACHINES (690mm, 760mm, 840mm and 990mm rotors only)

These machines require full assembly as follows:

1. Assemble the two side plates of the frame with the joining plates, threaded rod and nuts supplied.
2. For 840mm and 990mm rotors only, fit the adapter sleeve to the balance shaft.
3. Clean the bearings in solvent to remove all traces of dirt, grease, oil, etc. Fit the bearings to the balance shaft and tighten the grubscrews.
4. Rest the shaft assembly on the frame. The shaft should rotate freely.



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ROTOR SERVICING

ROTOR BALANCING

WHEN TO BALANCE

- The rotor must be balanced after any repair work has been carried out, e.g. hardfacing.
- In the case of 300mm rotors, the rotor must be balanced after turning or changing the upper or lower wear plates.
- It is advisable to check the balance if the vibration switch trips out repeatedly and the wear plates appear to be in good condition.

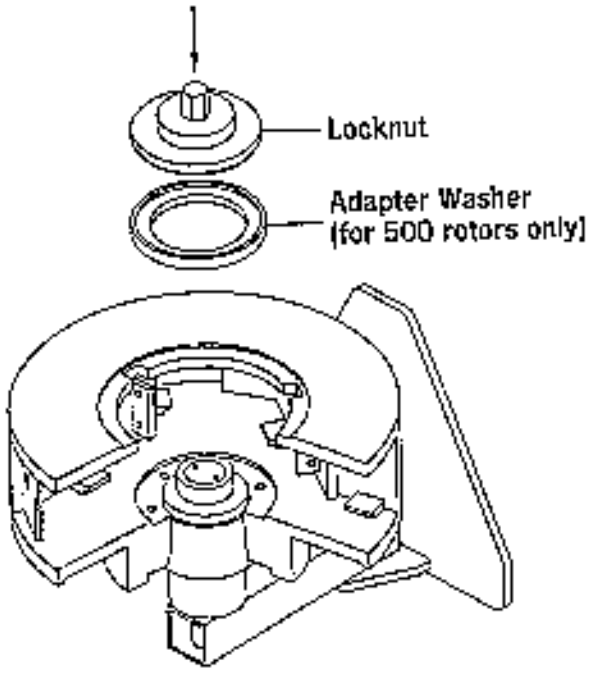
OPERATION

In all cases, remove rock build-up, dirt, old wear parts, etc. before attempting to rebalance the rotor.

- For 300mm rotors, re-fit clean wear parts in the new position ready for next period of operation.
- Make sure the taper in the rotor and on the rotor balancer are clean and free from damage.

SMALL ROTOR BALANCE MACHINES

1. Lay the rotor balance machine on its back and lower the rotor onto the taper.
2. In the case of 500mm rotors, assemble the adapter washer onto the the balancer housing.
3. Lock the rotor on with the locknut.
4. Tilt the rotor upright.
5. Make sure the balancer is level.



Proceed to BALANCING PROCEDURE.

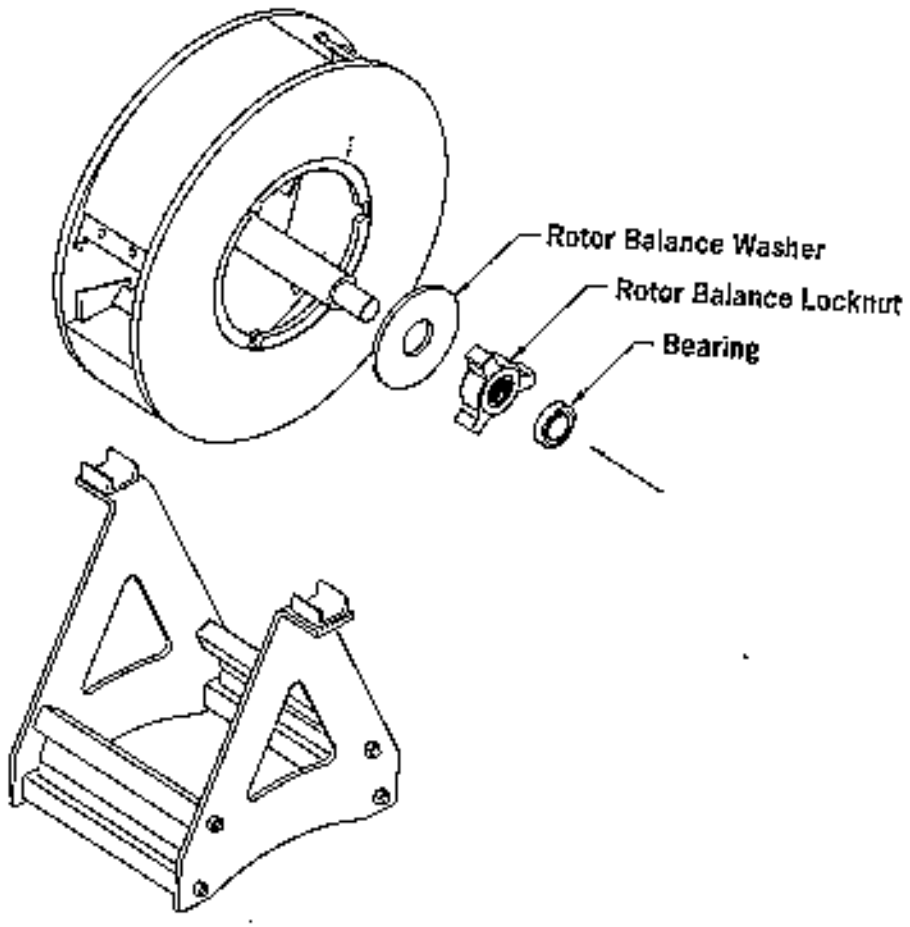
Continued ▶

ROTOR SERVICING

ROTOR BALANCING

LARGE ROTOR BALANCE MACHINES

1. Ensure the balance frame is level.
2. Remove bearing from the end of shaft that passes through the rotor.
3. Insert the balance shaft through the rotor.
4. Locate rotor on taper, ensure that the two tapers fit evenly, fit rotor balance washer and rotor balance locknut and tighten with hammer.
5. Fit bearing back onto shaft and tighten grubscrew.
6. Using suitable lifting apparatus, position the rotor and balance shaft on the support frame.



Proceed to BALANCING PROCEDURE.

Continued ▶

ROTOR SERVICING

ROTOR BALANCING

BALANCING PROCEDURE

1. Thoroughly clean out rotor of all rock, dirt, old wear parts and any old welded on weights from a previous balance (see fig. 3). Check for perforations in the inner and outer walls.
2. Check taper in rotor boss is clean and free from damage.
3. Remove weights from previous balance and set rotor up level in rotor balancing frame.
4. Gently rotate the rotor and allow it to wind down to a stop. The heaviest point on the rotor is now at the bottom.
5. With chalk mark the blades A, B, and C (see fig. 1).
6. Add weights to the blade A (fig. 1) until blade B is at top dead centre. Each time a weight is added give the rotor a gentle push in the direction you are working and allow the rotor to settle to the new balance point. This helps overcome bearing friction.
7. When blade B has settled at Top Dead Centre, pull it around 90° and hold it steady there by hand (fig. 2).
8. Add weights to the blade you are holding down (B) until it doesn't try to go up or down.
9. Sometimes the blade B won't take enough weights to balance the rotor. If this is the case cut a piece of 50mm x 12mm (2 in. x ½ in.) flat bar 200mm (8 in.) long and weld it onto the B section where indicated (fig. 3). Use a small tack weld so the weight is easy to remove for the next balance. Repeat the whole balancing exercise.
10. When you think the rotor is balanced, rotate the rotor in 90° steps four times. If the rotor does not move from each stop, it is balanced.
11. Tighten the balance bolts.
12. Keep spare weights in a safe place.

NOTE: To check that the rotor is now properly balanced, remove one balance weight and confirm that the rotor is out-of-balance.

IF SO: Replace the weight. The rotor is now balanced.

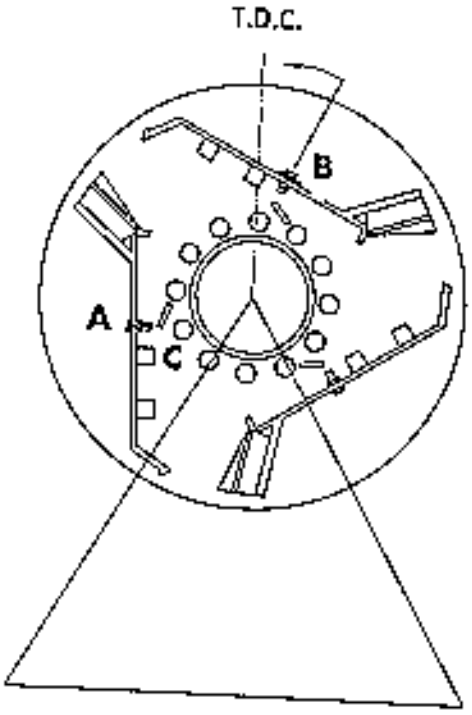
IF NOT: There may be a fault with the balance machine. The balance machine should be sensitive enough to detect an out-of-balance condition less than the effect of one balance weight.

- Refer to Troubleshooting 6-40.

Continued ▶

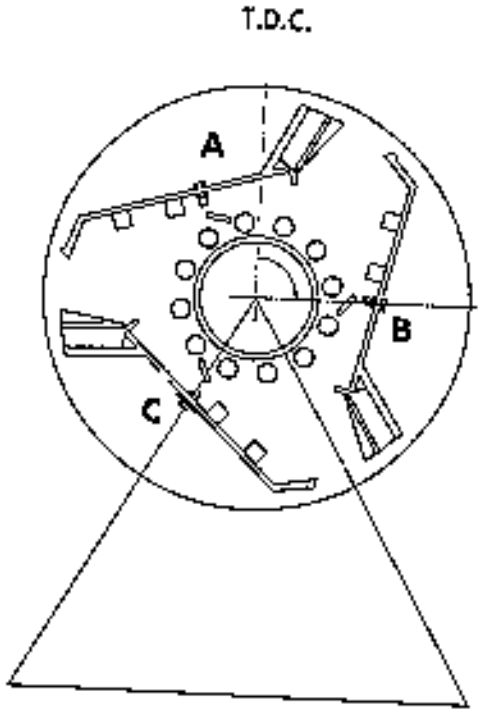
ROTOR SERVICING

ROTOR BALANCING



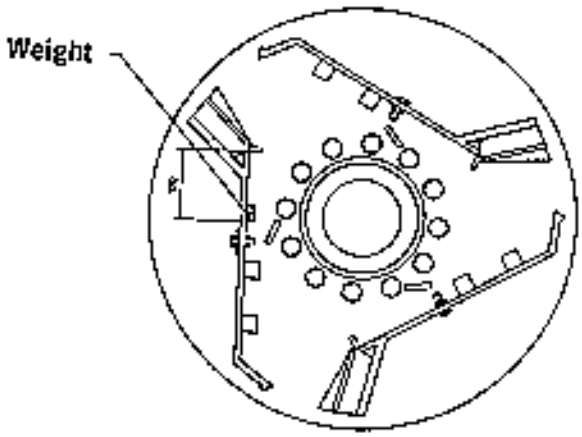
Typical rotor position after step 4. Add weights to 'A' until 'B' moves to T.D.C.

FIG. 1



Step 6: 'B' is pulled around 90° from T.D.C. Add weights to 'B' until rotor does not try to turn.

FIG. 2



Step 8: If you can't get enough weights into position B, weld flat weight inside rotor as shown and start again.

FIG. 3

Continued ▶

ROTOR SERVICING

ROTOR BALANCING

TROUBLESHOOTING

If the rotor fails to balance properly, check the following:

- Make sure there is no loose material in the rotor that could be moving as the rotor is turned.
- Make sure the rotor balance machine is level and the bearings are totally clean.
- Make sure the tapers are in good condition.
- Make sure the bearings are not damaged or worn.

After all checks have been made, attempt to balance the rotor again from stage 1.

MAINTENANCE

The rotor balance machine is designed to give many years of trouble-free operation. However, as with any precision machinery, proper care must be taken to ensure this is the case.

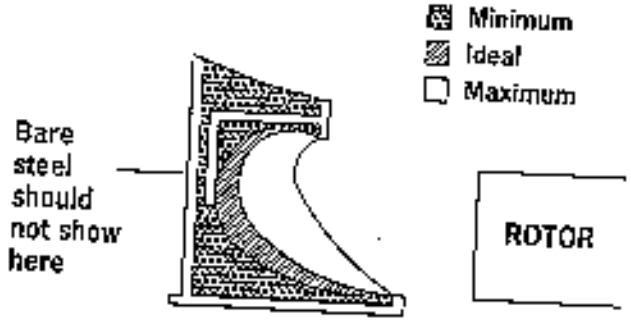
- Wrap a cloth around the taper on the balance machine when not in use.
- For the large balance machine, remove the bearings from the shaft and store in a container of light machine oil.
- Store all components in a clean environment.

CRUSHER SERVICING

CRUSHING CHAMBER

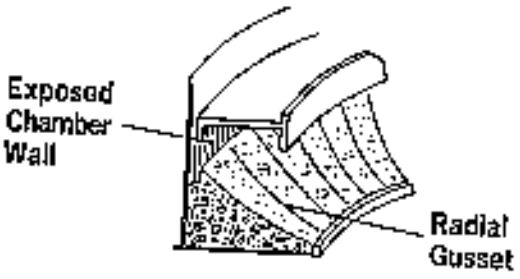
BUILD-UP

- The chamber should have a full rock lining covering all items of the structure except for the faces of the radial gussets (see below).
- The outer wall must not be exposed.
- The feed areas must be free of fines build-up and debris.
- Build-up should not be excessive, i.e. blocking material flow routes or encroaching on moving parts.



Initially, the bottom crushing chamber gussets may protrude through the build-up. These will soon wear to their ideal level. This is quite normal.

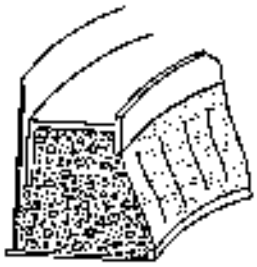
On stopping the crusher, if the time between shutting off the feed and the rotor stopping is more than 5 minutes, air movement in the crusher may blow away much of the lighter material from the stone bed, giving the impression of insufficient build-up. In these cases, stone beds will be re-instated shortly after starting to feed material again. This can be confirmed by 'crash-stopping' the plant, to minimise the chance of air blowing material away.



Chamber Wall Exposed

Caused by bony feed, very dry feed, or rounded feed. The addition of fines to a rounded or bony feed and or adding some water will enable the build-up to form.

Normally a good build-up is held but occasionally it erodes – caused by running with intermittent feed or by running empty for a period of time and blowing the build-up out.



Excessive Buildup

Feed moisture content too high and/or high fines content. Remove moisture and/or reduce fines content. Where this is not practicable a water spray system may be required.

In some instances, removal of some of the radial gussets is recommended. Please contact your Barmac dealer for advice.

Continued ▶

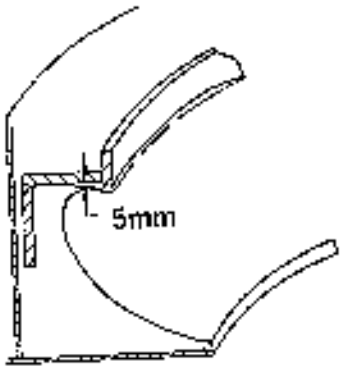
Frequent operation of the crusher running light/empty may reduce stability of the build-up and increase the likelihood of gusset and/or casing wear.

CRUSHER SERVICING

CRUSHING CHAMBER

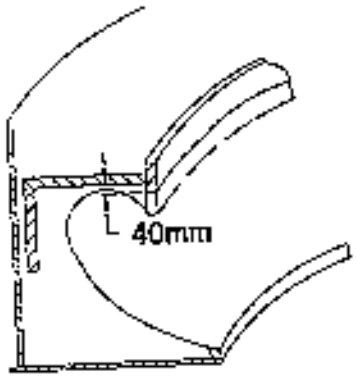
CAVITY RING

When the cavity ring becomes worn it must be replaced.



COARSE

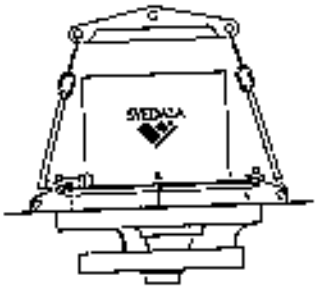
Replace when 5mm (¼ in.) left as shown.

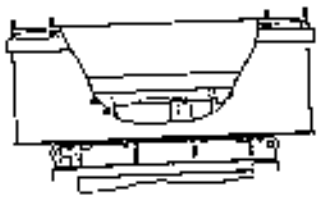


FINE (B9000 model only)

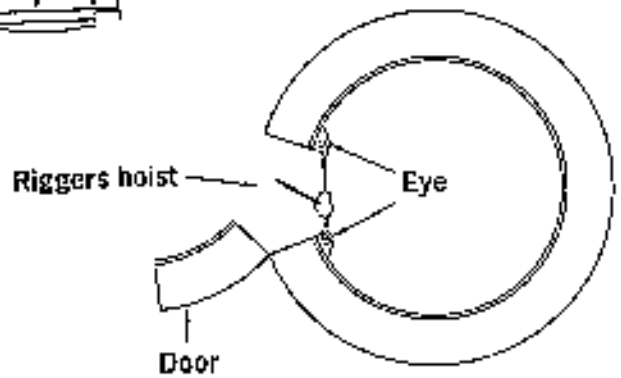
Replace when 40mm (1½ in.) left as shown.

Removal





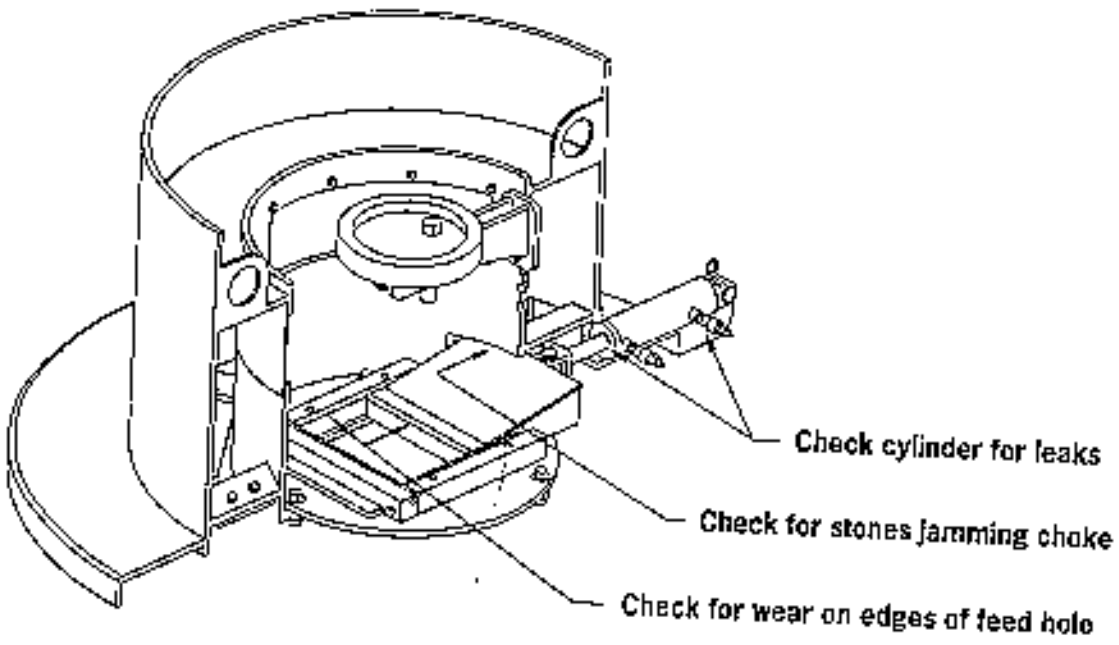
1. Remove hopper, crusher top and cascade assembly in one lift.
2. Open the door.
3. Weld an eye to the cavity ring on each side of the door opening.
4. Using a riggers hoist, pull the ring in until there is about 12mm (½ in.) gap all the way around.
5. Lift the ring off with a crane, or
6. Cut the old cavity ring up with a gas torch and remove it in sections.



CRUSHER SERVICING

CASCADE CHOKE

If the edges of the feed hole are excessively worn, it is necessary to replace these edges.



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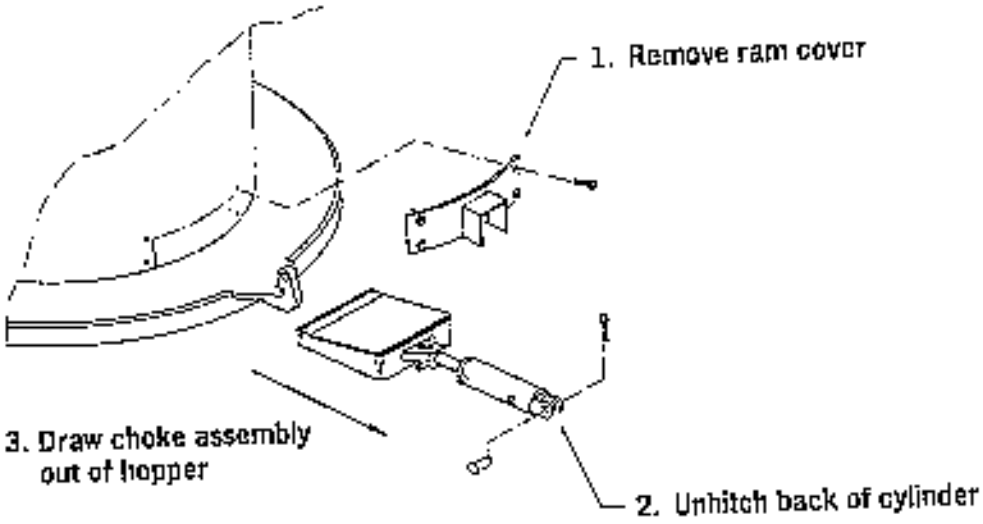
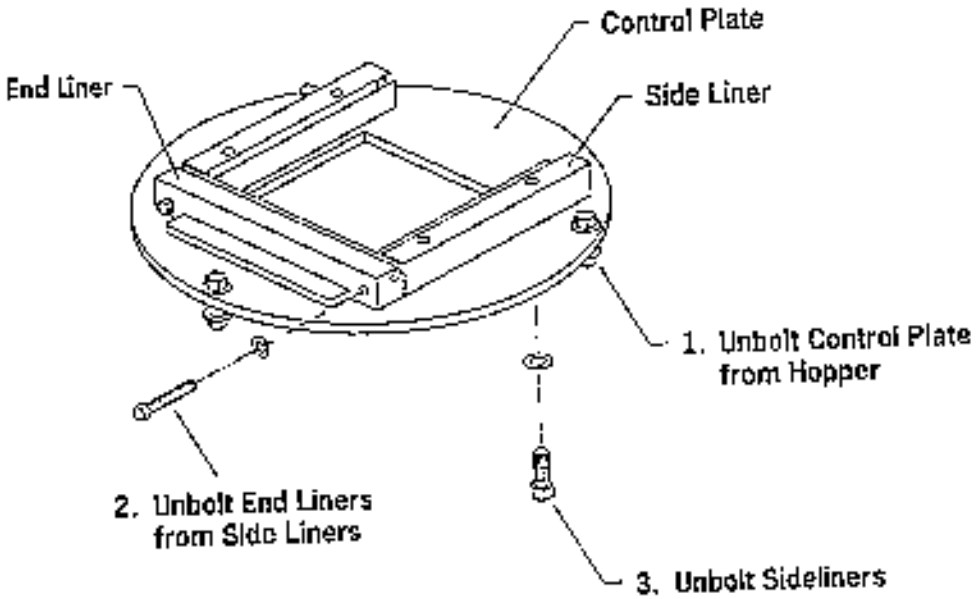
CRUSHER SERVICING

CASCADE CHOKE

REMOVAL/INSTALLATION



If cylinder requires service, unhitch from the back of the choke and refer to Cylinder Servicing on the following page.



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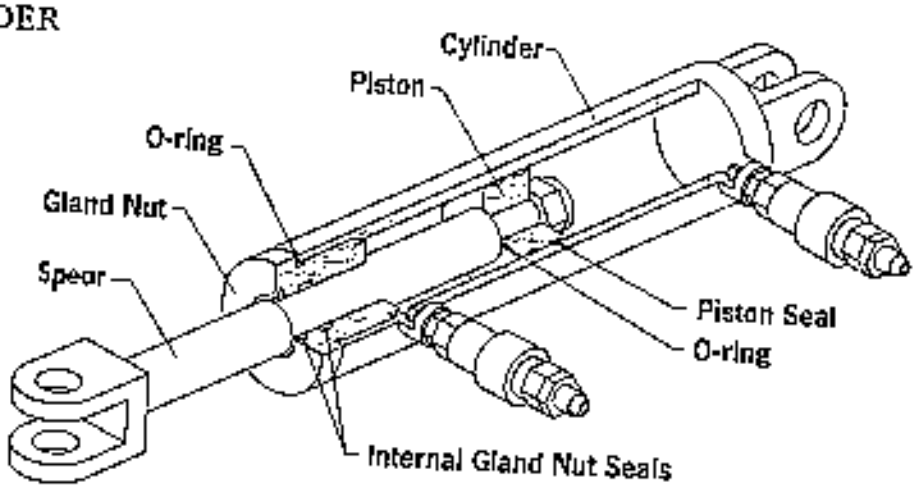
CRUSHER SERVICING

CASCADE CHOKE

CYLINDER



Disassembly

(Refer to drawing above).

All repair work should be carried out in a clean, dust free environment.

1. Fully clean outside of cylinder prior to disassembly.
2. Remove the gland nut and slide the spear and piston assembly from the cylinder.
3. Unscrew the piston and slide the gland nut off the spear.
4. Remove all the old seals.

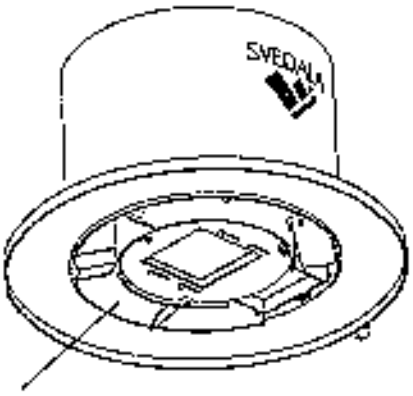
Assembly

(Refer to drawing above).

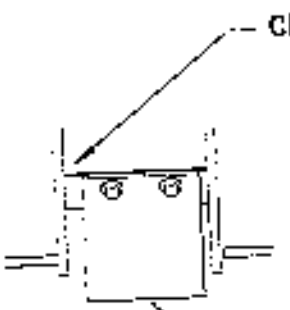
1. Clean all cylinder components.
2. Refit the internal seals into the gland nut.
3. Slide the gland nut over the spear.
4. Fit the o-ring onto the end of the spear and refit the piston.
5. Fit the piston seal and slide the piston into the cylinder.
6. Fit the external gland nut o-ring and refit into the cylinder.

CRUSHER SERVICING

AIR TRANSFER



This area should be cleaned to avoid build-up causing dust emission.



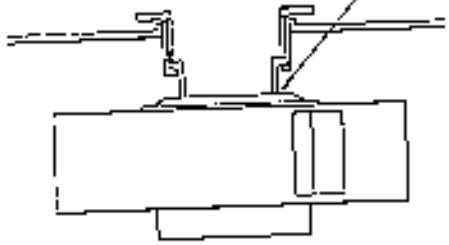
Check for blockage

Check tip of blades for wear

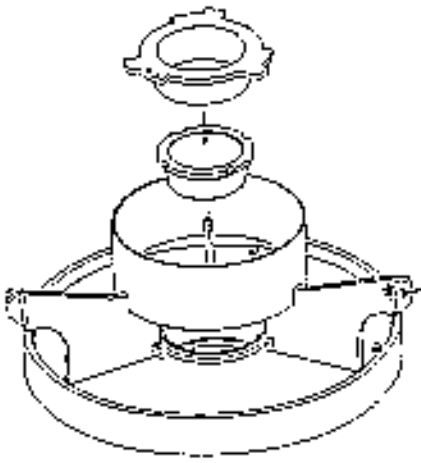
CASCADE CENTRALISATION

Every time the cascade assembly is removed from the crusher it is important to check that the feed tube is centrally located in the feed eye ring.

The position of the cascade assembly can be adjusted by the adjustment screws located on the arms of the cascade assembly.



Ensure feed tube is centralised in feed eye ring



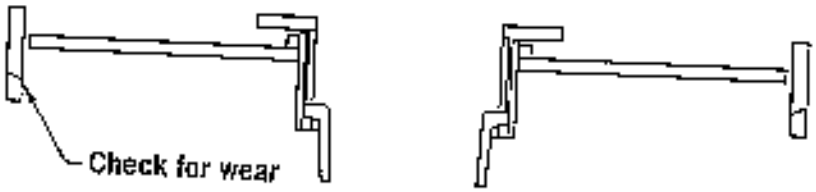
Adjustment screw to centralise cascade assembly.

CRUSHER SERVICING

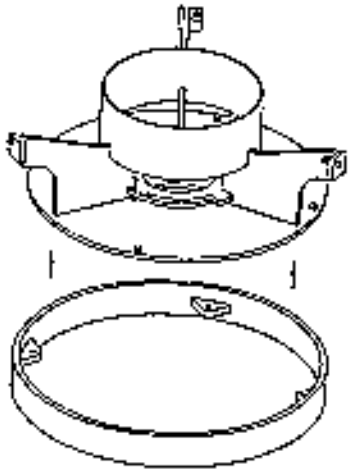
CASCADE WEAR SKIRT

Like the cavity ring, this is a secondary wear part and under normal conditions wears little, but needs checking. High cascade wear skirt wear rates could indicate low feed rates or a worn cavity ring.

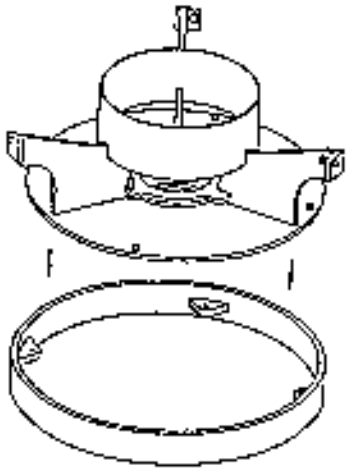
The cascade wear skirt should be replaced when wear on rotor top edge increases.



Removal



Installation



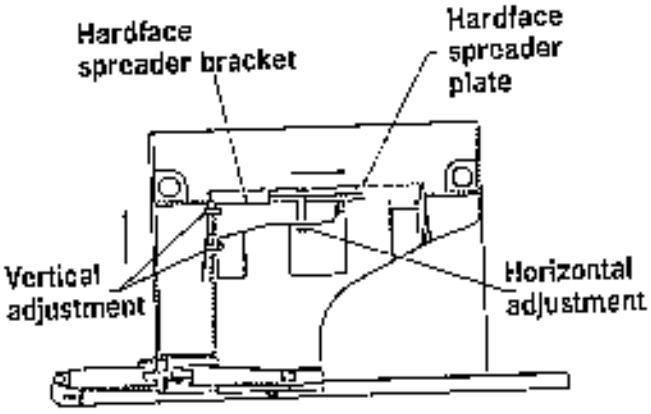
CRUSHER SERVICING

FEED HOPPER

It is important to check the general condition of the hopper. Material flow from the conveyor, feeder and/or chute work may create wear in the hopper structure. Adjust flow of material to correct.

FEED SPREADER PLATE

Changes in material flow may necessitate changing the position of the feed spreader plate. It is important that the material flow is centralised but not allowed to flow involuntarily through the cascade ports. The feed spreader plate will be subject to secondary wear. Replace or build-up with hardface welding in areas indicated.



CASCADE PORTS

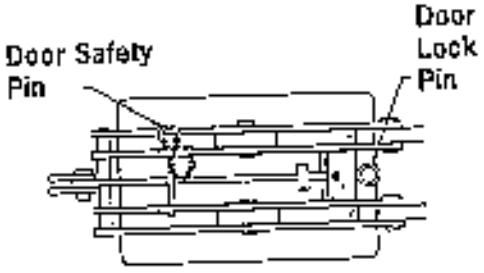
Check rubber skirt for damage or wear. Replace as required. Check edges of cascade ports for wear. Build-up with hardface weld as required.

SWING BOLTS

Check swing bolt threads and hinge action. Replace damaged swing bolts and/or swing bolt roll pins as required.

INSPECTION DOORS AND HATCHES

Ensure all inspection hatches, doors, guards and locks are secure. Ensure safety pin is in inspection door.



DOOR SAFETY INTERLOCK

Regularly check that the safety interlock device is offering the operator or maintenance staff adequate protection. If your Barmac has been fitted with a Door Safety Interlock, refer to the separate manual supplied with the machine for additional service information.

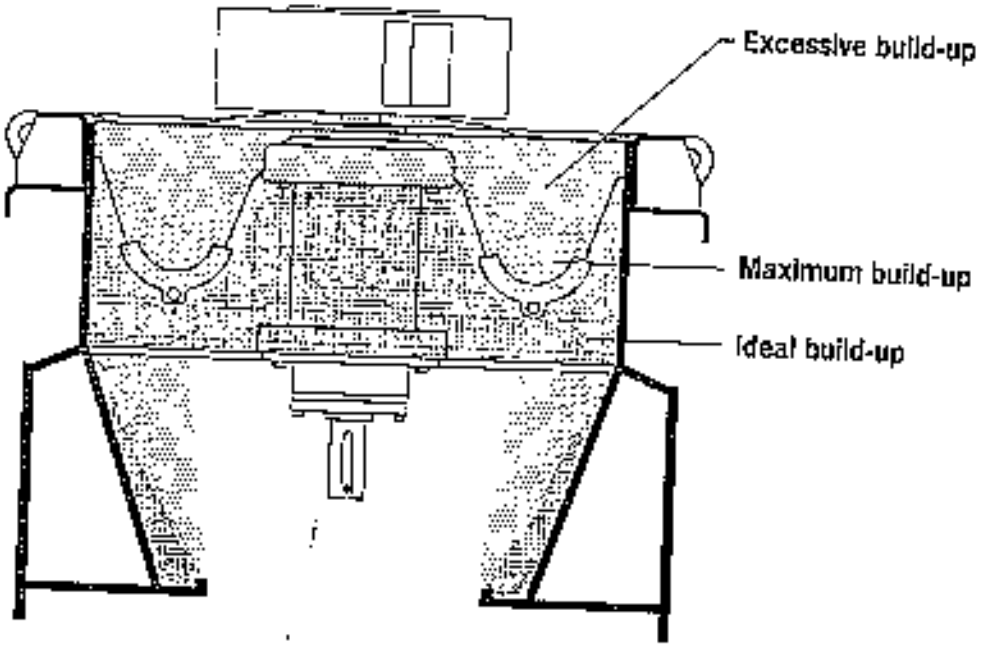
VIBRATION SWITCH

It is very important to check regularly that the vibration switch is operating. For detailed information refer to the Vibration Switch Manual provided with the machine for full testing and service instructions.

CRUSHER SERVICING

CRUSHER BASE

It is very important that material does not build-up under the rotor. This can cause severe wear and possibly damage bearings and/or the main shaft. Build-up should not impede flow of material to the discharge chutes.



Excessive Build-up

Excessive build-up can be caused by:
(1) Moisture content of feed too high
(2) High percentage of fine material in feed
(3) A combination of 1 and 2

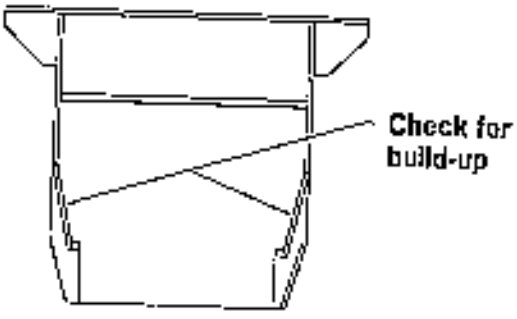
If the moisture or fines content cannot be lowered, please contact your Barmac dealer for advice. This problem can be overcome by fitting a water spray system and/or low friction liners in the base of the crusher. In extreme cases air cannons are recommended. Your Barmac dealer has access to recommended systems.

DISCHARGE CHUTES

Discharge chutes must be clear. In moist feed applications the discharge chutes need to be checked for possible build-up.

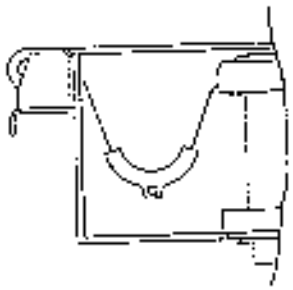
Check if the discharge chutes design restricts the flow, i.e. size or angle.

If moist material is creating a problem, consider lining with low friction material.



CRUSHER SERVICING

BASE STAY CASTINGS



Check wear castings on bearing cartridge gusset. Replace as required.

GREASE DISCHARGE CHUTE

Check regularly that the grease discharge chute is not building up with grease. Clean out as required. See 6-2.

⚠ **WARNING:** Excessive build-up of grease may cause an overflow of grease onto the V-belts, causing premature failure of the V-belts.

BELT GUARDS

Ensure that all guards are in place and secure.

MOTORS

Check for missing bolts, bearing noise, excessive shaft float or damage and obstruction to fan cover. Grease according to manufacturer's instructions.

CRUSHER SERVICING

BEARING CARTRIDGE

BEARING CARTRIDGE SEALS

Many premature bearing cartridge failures can be attributed to failure of the upper seals within the cartridge. It is recommended these upper seals be inspected at least annually and replaced if found to be worn or broken. This inspection/replacement can be done with the bearing cartridge installed in the base of the crusher and with the rotor removed.

The lower seals cannot be inspected or replaced while the cartridge is installed in the base but are very unlikely to cause a premature failure of the cartridge. These seals are always replaced during the repair/reconditioning process.

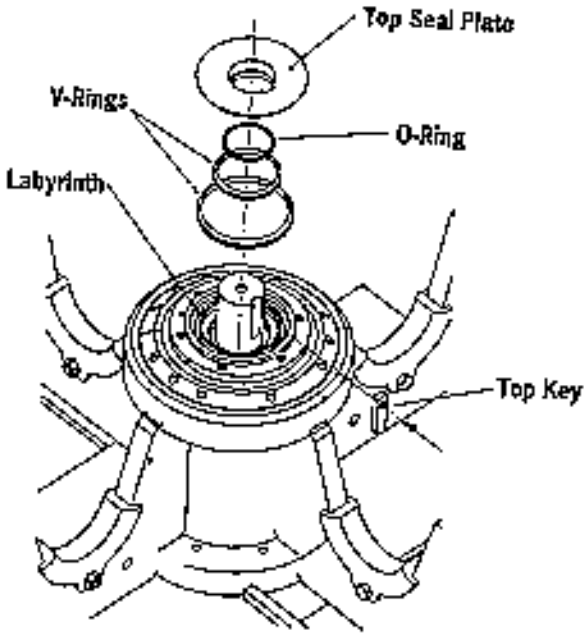
To inspect/replace upper seals:

1. Remove the top key and slide top seal plate off shaft.

2. Remove the o-ring from within the top seal plate. This is a static seal and may have a flat surface from contact against the shaft. If the seal is not broken or obviously damaged in any other way, it can be re-used.

3. Inspect the labyrinth between the bearing and the outermost seal. This should always be fully packed with clean grease. If the grease is not clean, the v-ring seals are not effective and must be replaced.

   If the labyrinth is not completely packed with grease, there could be a problem with the grease supply to the Barmac (check hoses, etc) or with the lubrication schedule. (See 6-2).



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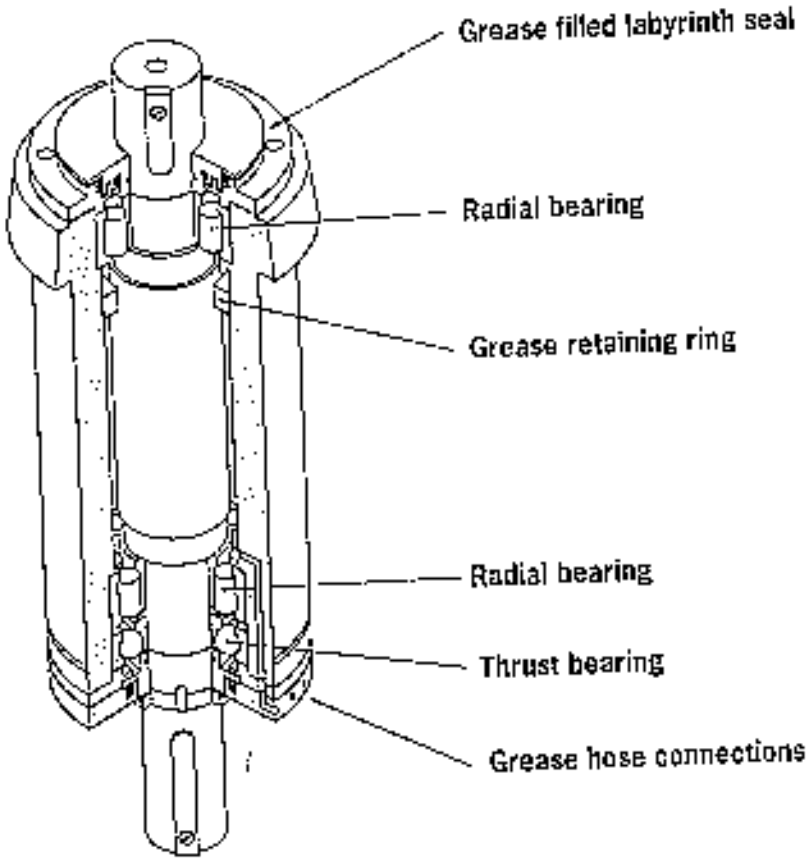
CRUSHER SERVICING

BEARING CARTRIDGE



The bearing cartridge is a grease filled, sealed bearing assembly which can be removed in one piece (shaft, bearings, seals and housing) for overhaul and inspection.

When the new bearing cartridge has run between 100 and 150 hours, begin a series of routine checks on the run down time of the rotor (time from power being cut to rotor stops turning).

A significant decrease in the run down time over a period will indicate that the bearings (crusher or motor) are deteriorating. Once the time falls below two minutes the bearings should be checked at the next routine service time.

Operators should become familiar with the sound of the bearings running. If this noise changes, especially if it begins rumbling, this will also indicate that the bearings are deteriorating.

If, when standing on top of the rotor during servicing, the shaft can be rocked from side to side with excessive float, then the radial bearings are worn.

If no-load current begins to increase slowly over a period of time, this is an indication that the crusher bearings are worn.

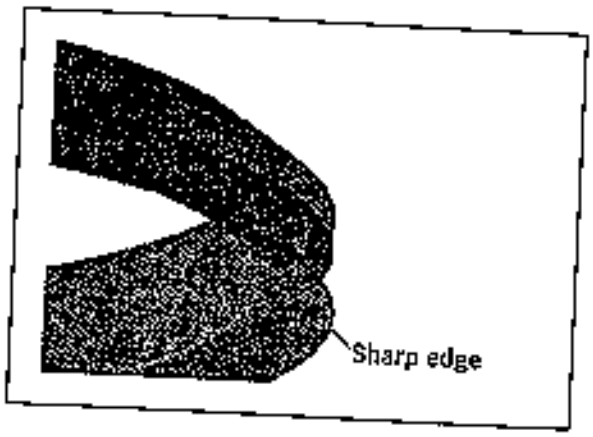
Upper seals should be replaced and labyrinth repacked with grease at yearly intervals.

Continued ▶

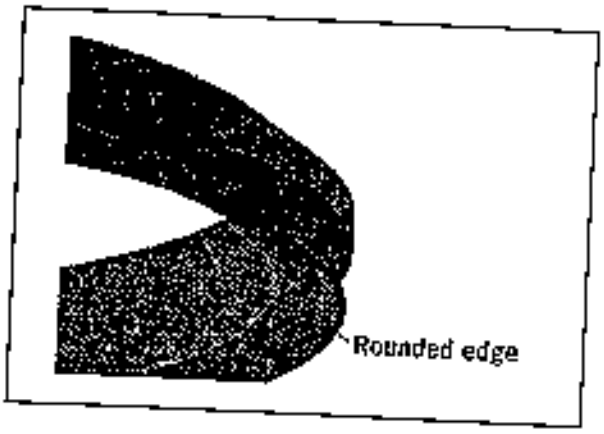
CRUSHER SERVICING

BEARING CARTRIDGE

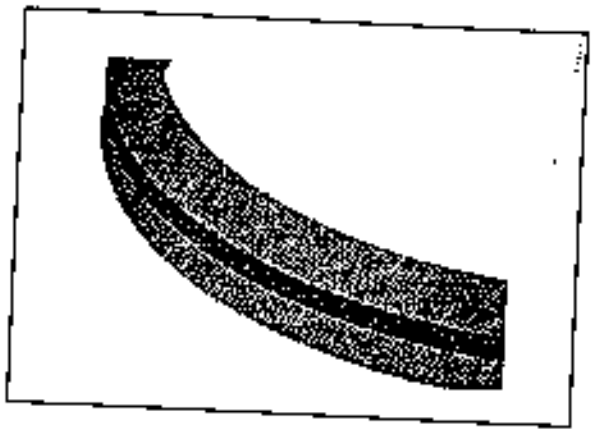
4. Remove the one or two v-ring seals (depending on the Barmac model) from the upper bearing retaining ring. These should not be worn, cracked or broken.



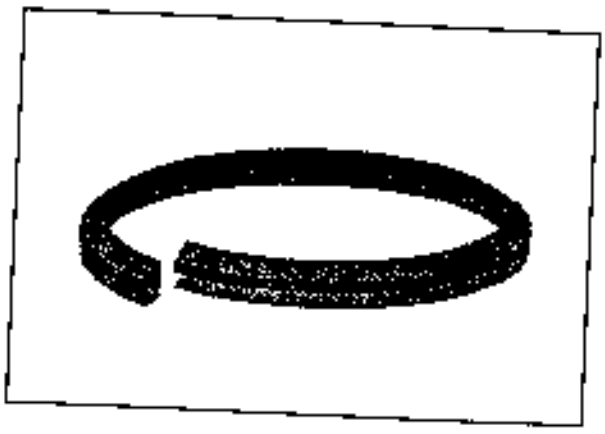
Normal Condition



Worn



Cracked



Broken

5. Refit/replace seals as necessary, pack the labyrinth with grease, refit top seal plate and key.

6. Refit the rotor and start the Barmac. Apply twice the normal amount of grease to each nipple and continue with normal operation.

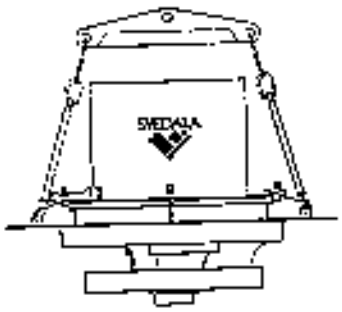
DO NOT RUN THE BARMAC WITHOUT ROTOR FITTED.

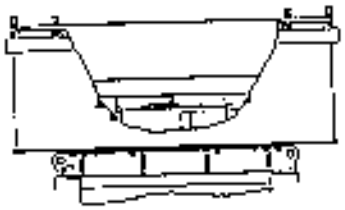
CRUSHER SERVICING

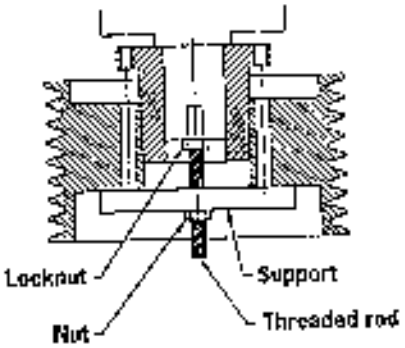
BEARING CARTRIDGE

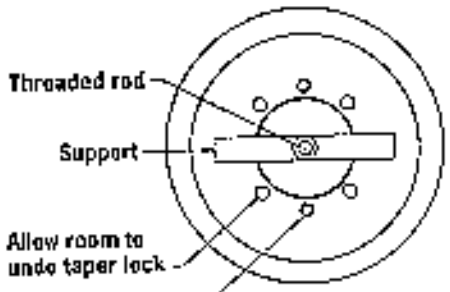
REMOVAL FROM BASE

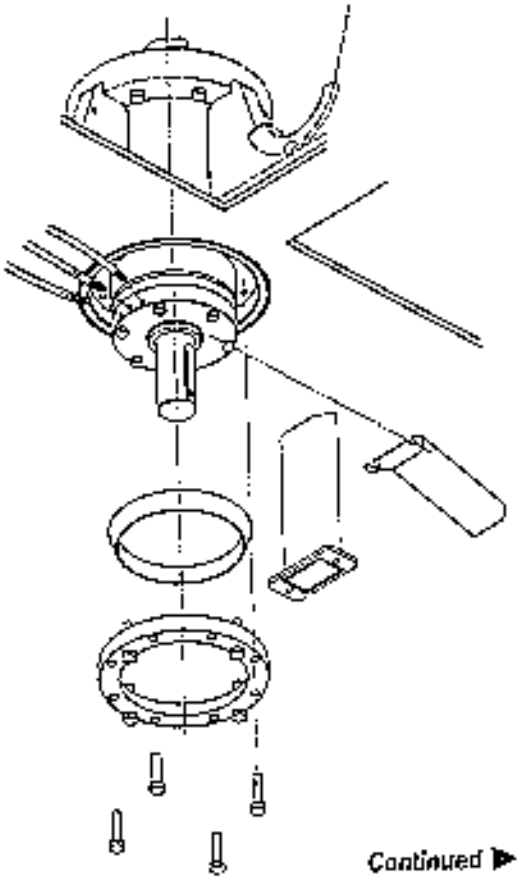
1. Remove hopper, crusher top and cascade assembly in one lift.
2. Remove the rotor. (See 6-56).
3. Loosen off belt tension and remove V-belts.
4. Remove Barmac pulley. In larger models, use a threaded rod (in the threaded hole in shaft) and support to assist in lowering pulley.











5. Remove grease hoses and grease chute.
6. Release the bottom taper ring by removing the taper ring bolts.
7. Screw half of these back into the top of the tapped extractor holes to force the outer taper ring off.
8. Remove the bottom inner taper ring.

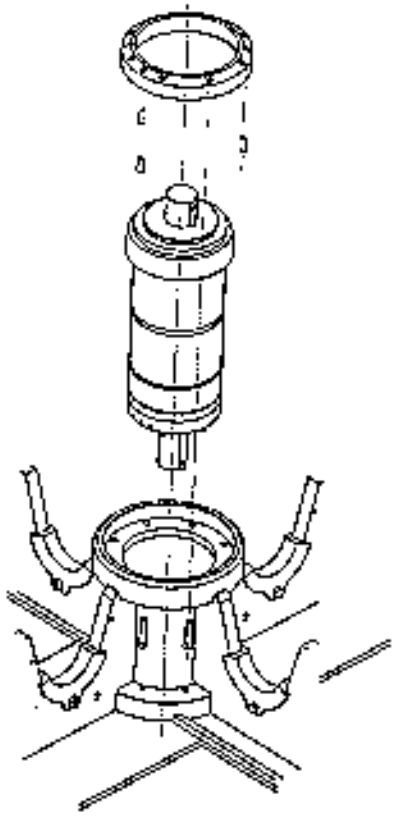
Continued ▶

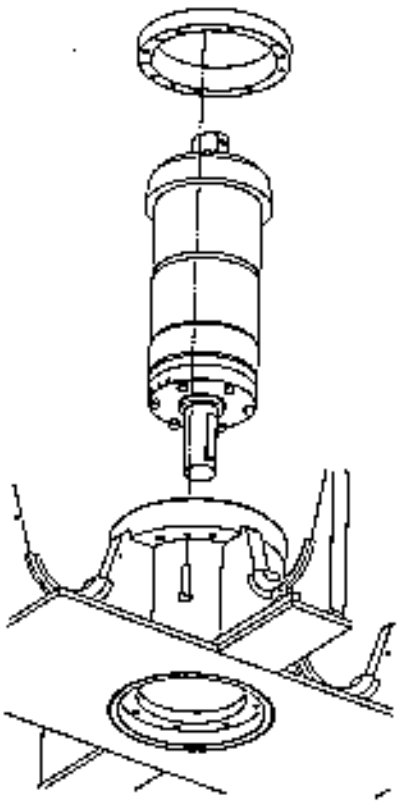
CRUSHER SERVICING

BEARING CARTRIDGE

REMOVAL FROM BASE

9. Remove the top taper ring bolts.
10. Use extractor grub screws to remove top taper ring.
11. Insert lifting eye bolt into the top of the shaft.
12. Lift out bearing cartridge.



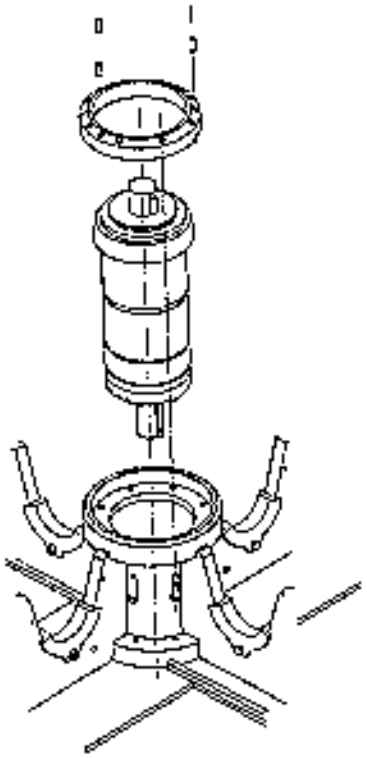


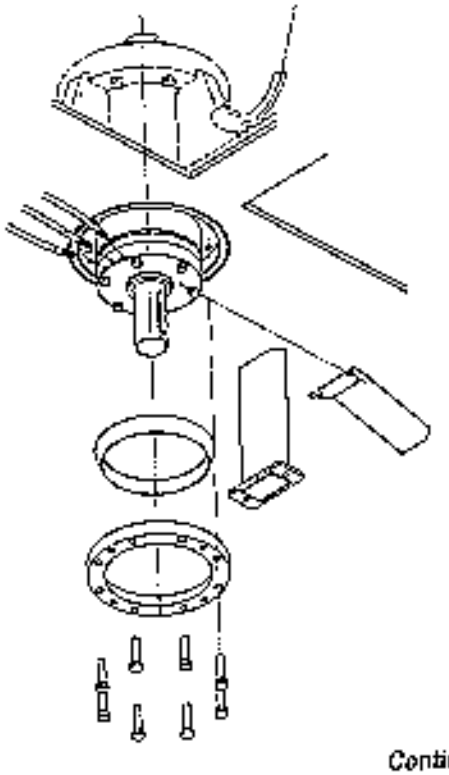
CRUSHER SERVICING

BEARING CARTRIDGE

REFITTING CARTRIDGE IN BASE

1. Remove all traces of grease, protectant, dust, etc, from machined surfaces using thinners or similar solvent.
2. Ensure all mating surfaces are free from rust, dents, scratches, etc.
4. Apply a thin layer of heavy machine oil to the mating surfaces of the bearing housing, cartridge housing and taper rings.
5. Lower bearing cartridge into top of cartridge housing and check to see that the three plastic grommets are still in place. This will ensure the grommets are not lodged in the cartridge housing.
6. Check orientation of cartridge. The grease discharge slot must align with the grease discharge chute.
7. Locate bearing cartridge centrally with top taper ring.
8. Fit bottom taper rings (inner and outer) and lightly screw in bottom taper ring bolts.
9. Fit grubscrews in until just below flush with top of taper rings and secure in place with silicone.
10. Refer to Bearing Cartridge Bolt Torque Settings (6-59).





Continued ▶

CRUSHER SERVICING

BEARING CARTRIDGE

REFITTING CARTRIDGE IN BASE

11. Starting on top taper ring, torque down bolts top and bottom in a "star" sequence (Fig.1) in two stages. Torque bolts in order from 1 to 8. Repeat for bottom taper ring.

Torque settings are as follows:

B3000, B5000			B6000, B7000, B8000, B9000		
Stage 1	–	15Nm (11 ft lb)	Stage 1	–	70Nm (55 ft lb)
Stage 2	–	30Nm (22 ft lb)	Stage 2	–	130Nm (100 ft lb)

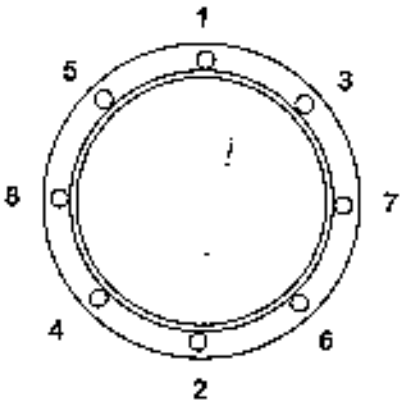


Fig.1

12. Refit grease hoses, making sure they are not twisted or blocked. See 6-5 for identification of grease points on bearing housing. Ensure that grease hoses are not able to fall onto V-belts during operation. Note: Some models have a bar to rest the grease hoses on.

13. Refit pulley and drive belts.

15. Refit rotor.

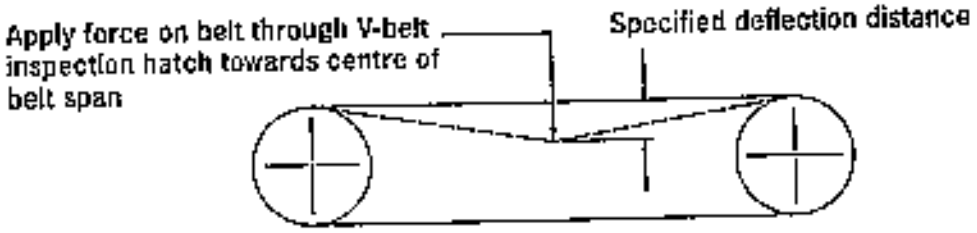
BELT TENSIONING

Correct belt tensioning is the most important factor necessary for long, satisfactory V-belt operation. Too little tension will result in slippage, causing rapid belt and sheave wear, and poor efficiency. Too much tension results in excessive strain on belts, bearings (especially motor bearings), and shafts.

PROCEDURE

Measuring

1. Select the second V-belt from the bottom.
2. Measure the force required to deflect the V-belt the distance as set out below:



Force and deflection for each model and V-belt type can be found on the *Belt Tension/Deflection Chart*, overleaf.

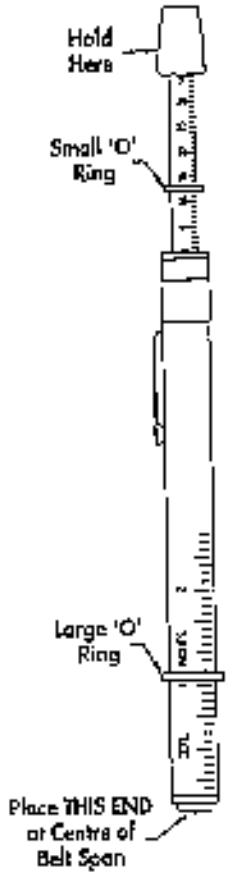
3. For measuring the force and deflection, Svedala recommend the use of a tension gauge similar to the one represented.

   Using the belt tension gauge at the centre of the belt span, follow these instructions:

   (a) Set the large 'O' ring on the designated deflection as per the *Belt Tension/Deflection Chart*.

   (b) Push the belt tension gauge against the second to bottom belt until the large 'O' ring is even with the top of the next belt. Ensure that the gauge is in the centre of the belt section, and always test the belts on the tight (or driven) side of the belts.

   (c) Remove the gauge and observe that the small 'O' ring has moved from its original setting at zero to the number of kg (lb) required to deflect the belt.



Adjustment

1. Slightly loosen off motor mount bolts.
2. Tighten (or loosen) tension by adjusting belt tension adjuster nuts.
3. Adjust belt tension as per the *Belt Tension/Deflection Chart*. (For dual drive, adjust both exactly the same).

Continued ▶

BELT TENSIONING

BELT TENSION/DEFELECTION CHART

Machine	Initial Installation Tension kg (lb)	Normal Running Tension kg (lb)	Deflection Distance mm (in.)
B3000	4 (8.75)	2.5 - 3 (5.50 - 6.50)	10 (3/8)
B5000	10 (22.00)	8 - 9 (17.50 - 19.75)	16 (5/8)
B6000	11 (24.25)	8 - 9 (17.50 - 19.75)	19 (3/4)
B7000	16 (35.25)	12 - 14 (26.50 - 30.75)	27 (1)
B8000	16 (35.25)	12 - 14 (26.50 - 30.75)	27 (1)
B9000	16 (35.25)	12 - 14 (26.50 - 30.75)	27 (1)

NOTE: The above belt tension/defelection values relate to SP, SPX, V and VX belt sections, and have been formulated to accommodate the various centre distances that motor frame sizes or sheave diameters will provide on each model. If V-belt life, tensioned to the above values, is not satisfactory, please contact your Barmac representative.

NEW BELTS (This includes the initial commissioning of the crusher).

New belts will take a little time to settle into the grooves, and will naturally stretch in the first days of operation. To accommodate this settling in process, it is recommended that the V-belts are tensioned some 20% above the optimum. Refer to the *Belt Tension/Deflection Chart* under **Initial Installation Tension** column for the recommended tension for the standard deflection for new belts.

Tension Range

Belt tension should be monitored regularly (at least weekly), but does not need adjustment unless it falls outside the range indicated in the **Normal Running Tension** column

RUNNING IN NEW BELTS (This includes the initial commissioning of the crusher).

After 30 Minutes

After thirty minutes running it is recommended that the tension should be checked and retensioned to the **Initial Installation Tension** values.

After 4 Hours

Re-tension to the **Initial Installation Tension** values.

Next 5 Days

Check tension at least once daily and you should observe a "settling", requiring minimum adjustment to maintain the tension as per the **Normal Running Tension.**

Continued ▶

BELT TENSIONING

LOOSE BELTS

In the event of there being one or two belts being looser than the others, tension the belts normally, and measure the deflection force required on the loose belt. If this is 10% or more below the low range tension, then there is a danger that the loose belt could turn, or even jump off, taking the rest of the set with it. If the belt is one of a new set, then initially add an extra 1kg (2 lb) of pressure relative to tension to that particular side of the drive, to see if the belt will "settle in" on its own. If this has not happened within 5 days or if the loose belt does not tension up to the minimum, then the loose belt must be replaced.

DUAL DRIVE

Belt Tension/Balanced Motor Amps

On dual drive Barmacs, one motor may draw less current than the other, i.e. it appears lazy. For the motors to do equal work the V-belt drives must be set up with equal tension.

On dual drive Barmacs, a small difference in belt tension between drives can make a big difference in motor amps. For example, a dual drive 185 kW (250 hp) Duopactor under full load with 0.5% slip in one drive and 1.0% in the other will show a current draw of 170 amps in one motor and 120 in the other – a 50 amp difference.

Adjustment

Static

Follow normal static adjustment procedure as explained above, but make special effort to adjust the two drives to exactly the same values.

Dynamic

1. With the Barmac operating under load, prepare the low current motor for adjustment, ensuring that when the four motor mount bolts are loosened, the motor mount is held in place by the belt tension adjuster nuts. This is done by loosening off the two motor mount bolts that pass through the adjuster rods. (See Important Note below). Apply tension to these adjuster rods by turning the adjuster nuts approximately half a turn from hand tight.
2. Then loosen off the other two motor mount bolts. Important Note: Loosen only enough to permit the motor mount to be adjusted by means of the adjuster nuts.
3. Turn the adjuster nuts clockwise by one turn to tighten the belts. Retighten the four motor mount bolts and observe the current drawn by both motors for ten minutes.
4. Repeat until the currents drawn by the motors are within approximately 10 amps of each other.
5. After balancing amps in this way, belt tensions should be checked as soon as possible to ensure correct balanced belt tensions. If balanced amps are achieved with unbalanced tension, the cause should be investigated.

Continued ▶

BELT TENSIONING

Other Causes Of Unbalanced Motor Amps

If the motors will not draw similar amps by altering belt tension, check–

1. The motor or starter electric terminals. Have a qualified electrician check motor or starter terminals. If dirty they will need cleaning and re-fitting.
2. The starter has a fault. To confirm starter fault exists, have a qualified electrician check the following:

   With the machine under load:

   (a) Read both ammeters and record amps on ammeter 1 and ammeter 2.

   (b) Stop the machine.

   (c) Swap motor wiring over at starter contactors.

   (d) Restart the machine. The ammeter readings should have swapped, i.e. No. 1 should read what No. 2 used to, and vice versa. If this doesn't happen, the electrician must check the function of the starter componentry.
3. Belt alignment – Make sure sheaves are in line using a straight edge or string line.
4. Motors – They should be of the same brand and type and preferably be manufactured in the same batch (check with motor manufacturer or agent). Different manufacturers and sometimes different batches of motors have different winding specifications.
5. Belts – The belts should be matched, i.e. all the same brand at least, and a matched set if possible.
6. Sheaves –

(a) Check sheave axes are parallel and grooves are properly aligned with one another – any dust build-up entering under the motor mount will cause the sheaves to be out of parallel, with higher tension on belts at one end of the sheave.

(b) Check sheave diameters. For equal power transmission, the pitch diameters of the driving sheaves must be within 0.5mm (0.02") of each other. This can be checked by measurement as shown. Check grooves at each end of the sheave – any taper in sheave length will cause problems.

(c) If after a period of satisfactory running the motors become difficult to match, check the sheaves for wear.

BOLT TORQUE SETTINGS

BARMAC BOLT TORQUE SETTINGS Nm (ft lbs)

Model	Rotor Size	Tip Assembly	Top Plate Bolts	Dist. Plate Bolt	Top Taper Ring Bolts	Bottom Taper Ring Bolts
B3000	300	100 (75)	34 (26)	40 (30)	30 (22)	30 (22)
B5000	500	100 (75)	60 (45)	40 (30)	30 (22)	30 (22)
B6000	690	130 (100)	250 (190)	200 (150)	130 (100)	130 (100)
B7000	760	130 (100)	250 (190)	200 (150)	130 (100)	130 (100)
B8000	840	130 (100)	250 (190)	200 (150)	130 (100)	130 (100)
B9000	990	130 (100)	250 (190)	200 (150)	130 (100)	130 (100)

NOTE: All threads must be lightly lubricated before assembly.