

SURFACE GRINDER

MODEL: G3104/G3155

OPERATOR MANUAL

**PLEASE READ THIS MANUAL CAREFULLY
BEFORE OPERATION**

It is essential to give the serial number of your machine in any order of repair parts to assure prompt and accurate service

GRIZZLY INDUSTRIAL, INC.

WARNING

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

- Lead from lead-based paints.
- Crystalline silica from bricks, cement, and other masonry products.
- Arsenic and chromium from chemically treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

METALWORKING EQUIPMENT SAFETY INSTRUCTIONS

WARNING

For Your Own Safety Read Instruction Manual Before Operating This Equipment

Metalworking can be fun and rewarding, however it can also be a dangerous activity if safe and proper operating procedures are not followed. Please take the time to review the manual which was supplied with your machine, as well as these general safety instructions. Make sure you have properly assembled and adjusted the machine before operating it the first time. Metalworking requires a certain degree of specialized knowledge. The manual is provided to familiarize you with the features of this machine, but is not intended to be a complete training manual. If you are not familiar with the proper use of this type of machine, consult a trained machinist, refer to books/reference materials, or enroll in training classes in your community.

If you have assembly, adjustment or operation questions, or you cannot find adequate assistance regarding metalworking procedures, please contact Grizzly Industrial's Customer Service:

Grizzly Industrial, Inc.
1203 Lycoming Mall Circle
Muncy, PA 17756
Phone: (570) 546-9663
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Web Site: <http://www.grizzly.com>

WARNING

Safety Instructions For Metalworking Machines

- 1. KEEP GUARDS IN PLACE** and in working order.
- 2. REMOVE ADJUSTING KEYS AND WRENCHES.** Form a habit of checking to see that keys and adjusting wrenches are removed from tool before turning on.
- 3. KEEP WORK AREA CLEAN.** Cluttered areas and benches invite accidents.
- 4. DON'T USE IN DANGEROUS ENVIRONMENT.** DO NOT use power tools in damp or wet locations, or where any flammable or noxious fumes may exist. Keep work area well lighted.
- 5. KEEP CHILDREN AND VISITORS AWAY.** All children and visitors should be kept a safe distance from work area.
- 6. MAKE WORK SHOP CHILD PROOF** with padlocks, master switches, or by removing starter keys.
- 7. DO NOT FORCE TOOL.** It will do the job better and safer at the rate for which it was designed.
- 8. USE RIGHT TOOL.** DO NOT force tool or attachment to do a job for which it was not designed.

WARNING

Safety Instructions For Metalworking Tools

9. **USE PROPER EXTENSION CORD.** Make sure your extension cord is in good condition. Conductor size should be in accordance with the chart below. The amperage rating should be listed on the motor or tool nameplate. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. Your extension cord must also contain a ground wire and plug pin. Always repair or replace extension cords if they become damaged.

Minimum Gauge for Extension Cords

AMP RATING	LENGTH		
	25ft	50ft	100ft
0-6	16	16	16
7-10	16	16	14
11-12	16	16	14
13-16	14	12	12
17-20	12	12	10
21-30	10	10	No

10. **WEAR PROPER APPAREL.** DO NOT wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
11. **ALWAYS USE SAFETY GLASSES.** Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.
12. **SECURE WORK.** Use properly secured clamps or vises to hold work while performing the machining operation
13. **DO NOT OVERREACH.** Keep proper footing and balance at all times.
14. **MAINTAIN TOOLS AND MACHINERY WITH CARE.** Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.
15. **USE RECOMMENDED ACCESSORIES.** Consult the owner's manual for recommended accessories. The use of improper accessories may cause risk of injury.

16. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** On machines with magnetic contact starting switches there is a risk of starting if the machine is bumped or jarred. Always disconnect from power source before adjusting or servicing. Make sure switch is in OFF position before reconnecting.

17. **CHECK DAMAGED PARTS.** Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

18. **NEVER LEAVE MACHINE RUNNING UNATTENDED. TURN POWER OFF. DO NOT** leave machine until it comes to a complete stop.

19. **SOME COOLANTS USED FOR MACHINING MAY CONTAIN HAZARDOUS CHEMICALS.** Read and understand all user information on the coolant container and protect yourself accordingly.

20. **NEVER OPERATE A MACHINE WHEN TIRED, OR UNDER THE INFLUENCE OF DRUGS OR ALCOHOL.** Full mental alertness is required at all times when running a machine.

CAUTION

No list of safety guidelines can be complete. Every shop environment is different. Always consider safety first, as it applies to your individual working conditions. Use this and other machinery with caution and respect. Failure to do so could result in serious personal injury, damage to equipment or poor work results.

Thank you for purchasing the G3104/G3155 surface grinder. This machine can provide you with years of accurate service if properly cared for and operated. Please read this manual carefully before using your machine.

Warning: Failure to follow these warnings will result in serious personal injury:

1. Read and understand manual before starting machine.
2. Always wear eye protection.
3. Plug power cord into grounded outlet only.
4. Never place hands directly under cutter.
5. Keep all guards in place at all times.
6. Do not wear loose clothing, gloves or jewelry. Secure long hair and button all long sleeve shirts.
7. Disconnect power prior to servicing, setting up, adjusting, or changing speeds.
8. Do not expose to rain or dampness.
9. Do not operate under the influence of drugs or alcohol.
10. Make sure machine is properly adjusted and set up correctly before starting motor.
11. Before starting machine, make certain it rests securely on flat, level ground.
12. Never allow untrained people to use this machine.
13. Never use hands to hold work-piece during operation.
14. Be sure that bit is securely locked in the chuck before use.
15. Shut off power before leaving machine.
16. Keep Children and visitors away. All children and visitors should be kept a safe distance from work area.
17. Check damage parts. Before further use of the tool, a guard or other part that is damaged should be carefully checked to ensure that it will operate properly and perform its intended function check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
18. Never leave tool running unattended. Turn power off. Don't leave tool until it come to a complete stop

This machine was designed for certain application only. We strongly recommends that this machine NOT be modified and /or used for any application other than for which it was designed. If you have any questions relative to its application DO NOT use the machine until you have had detail instruction from your dealer.

CLEANING:

1. Your machine has been coated with a heavy grease to protect it during shipment. This coating should be completely removed before operating the machine. Commercial degreaser, kerosene or similar solvent may be used to remove the grease from the machine, but avoid getting solvent on belts or other rubber parts.
2. After cleaning, coat all bright work with a light lubrication, Lubricate all points with medium consistency machine oil.

Main Specification:

Model	G3104	G3155
Max. width to be ground	6-1/2"	8-1/2"
Max. length to be ground	18-1/2"	21"
Max. height to be ground	12-1/2"	13"
Table size	6"x18"	8"x20"
Max. longitudinal travel of table	19"	22"
Max. cross travel of table	7"	9"
Max. distance, spindle to table	15-3/4"	17"
Down-feed dial per revolution, Graduation	0.05" 0.0002"	0.05" 0.0002"
Spindle diameter	1-1/4"	1-1/4"
Grinding wheel size (O.D x W x I.D)	7"x1/2"x1-1/4"	8"x3/4"x1-1/4"
Wheel spindle speed	3450rpm(60hz)	3450rpm(60hz)
Power of wheel head motor	2HP/2p	2HP/2p
Electric wiring	110v/220v pre-wired 110v 60Hz / single Phase	110v/220v pre-wired 220v 60Hz/3Ph
Coolant Tank (L x W x H)	19-1/2"x11"x9-7/8"	19-1/2"x11"x9-7/8"
Footprint	22"x22"	26-1/4"x26-1/4"
Machine weight	1518LBS	1838LBS
Gross weight	1738LBS	2058LBS
Machine dimension (L x W x H)	61"x39"x65"	66"x43"x67"
Package dimension (L x W x H)	45"x40"x73-1/2"	56"x45"x75"

All specification and designs are subject to change without notice.

INSTRUCTION MANUAL

INSTALLATION

1. Lifting

- 1.1 The machine should be lifted by using "fork lifter" or "hoist".
- 1.2 There are transit clamps at the saddle/base guide and table/base guide, these clamps must not be removed until the machine is completely installed.

2. Installation

2.1 Place

It is very important to install the grinding machine in good condition to obtain high accuracy. Installation should be accomplished considering the following notices.

- 2.1.1 To install where the temperature varying is small.
- 2.1.2 To avoid the place near the machines which may splash cutting chips.
- 2.1.3 To install at vibration-free place, away from compressors, presses, planers and other machines which generate vibration.
- 2.1.4 Concrete foundation is required when the place is not rigid or the vibrating sources are near.

2.2 Foundation and Installation

If the machine is badly installed, chatter marks and stripes marks will be generated. Install the machine, therefore, as follows:

Such a foundation is desirable, please see Fig. 1.

Move the machine to the place, then install it by using jack bolts.

3. Mounting the table

- 3.1 This is just for the machine which provided with ball rolling slideways. (Fig. 2a)
- 3.2 For protecting the hardened and ground ball rolling slideways, the table is dismantled from steel balls when machine in transportation.
- 3.3 When the machine is placed in position, mounting the table as shown Fig2.
 - 3.3.1 Loosening the nuts for pulley screw (See fig 2b) Release the pulley from saddle.
 - 3.3.2 Tightening the bolts for fixing the fix block with working table. (See fig.2c)
 - 3.3.3 Adjusting the pulleys and belt-support in the middle of table, keep the transmission in one line, and then fasten the bolts of fix block. Adjust the screw to fox synchronism belt to achieve table move smoothly.

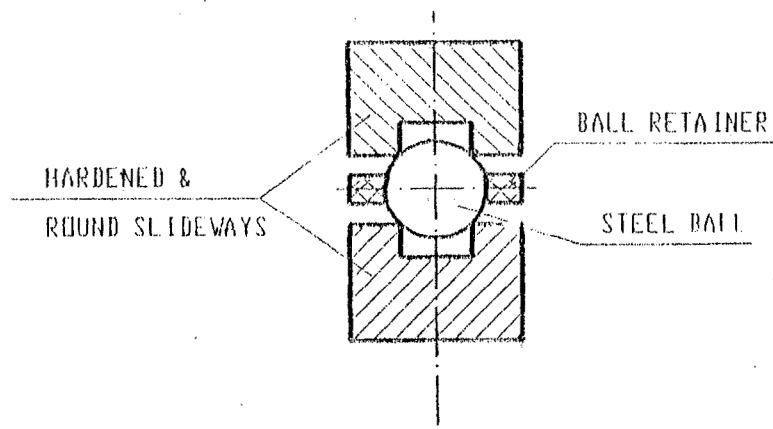


Fig. 2a

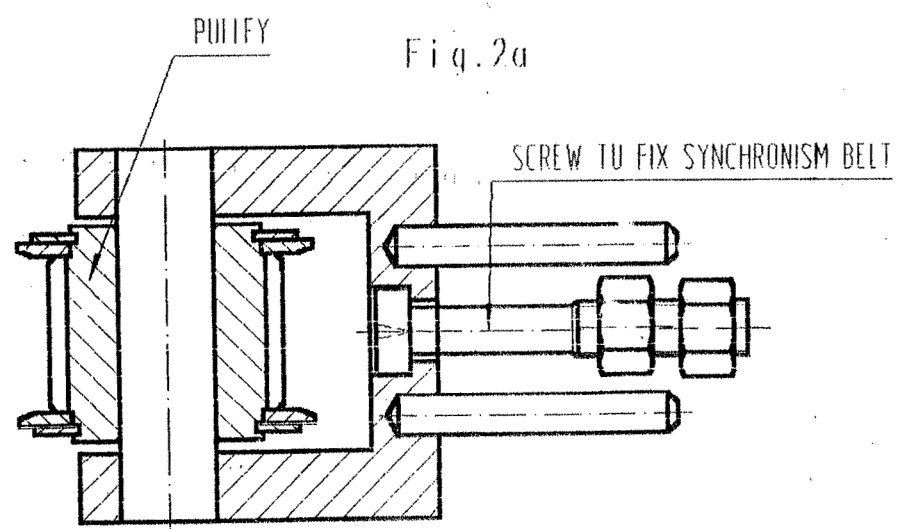


Fig. 2b

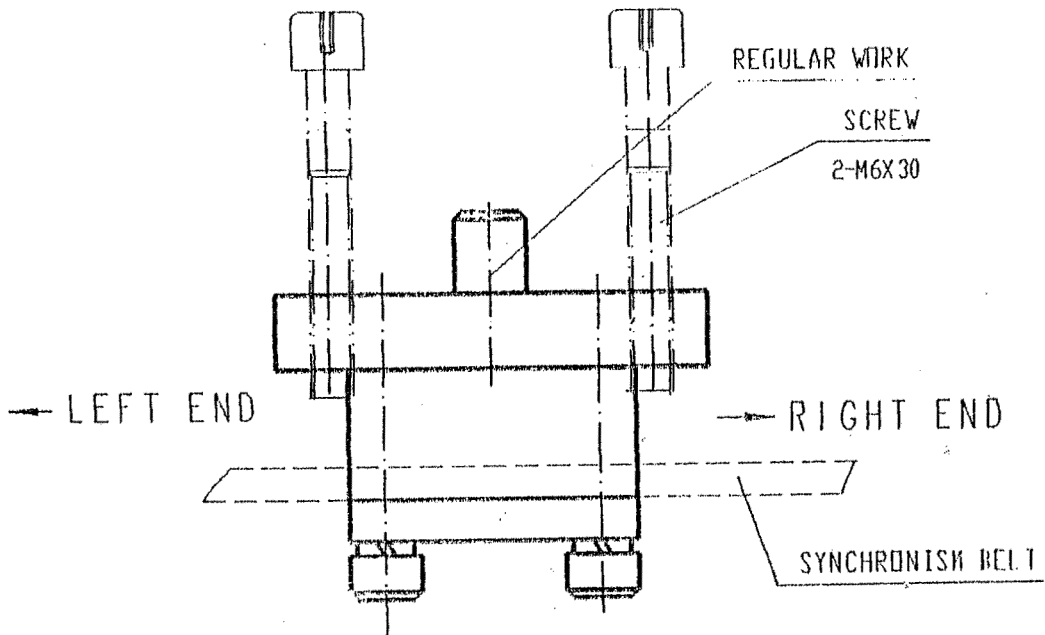


Fig. 2c

4. Levelling

Machines should be carefully levelled, especially surface grinders, it must be levelled by a 0/02/m precision spirit level, and machine must be equally loaded on the jack bolt, the adjusting procedure as follows:

- 4.1 Set spirit level on the middle of the table (or chuck if any), both on longitudinal and transverse direction and adjust jack bolts until level accuracy shows within 0.02/m.
- 4.2 For getting good precision it is recommended to recheck level again:
 - 4.2.1 After 24 hours when machine installed on its final position for making the machine temperature same as those of the ambient circumstances.
 - 4.2.2 After levelling the machine, grinding the table (or chuck) surface make it flat.
 - 4.2.3 When machine level is checked every time, table (or chuck) surface grinding is necessary.
 - 4.2.4 Usually the levelled machine will lose its level due to machine vibration so that its level should be always checked.
 - 4.2.5 Levelling machine is troublesome but essential for getting good operation results, it is recommended to check level every month.

Lubrication Instruction Chart

Lubrication points	Table guideways	Column guideways and Leadscrew	Saddle guideways and Leadscrew	
Interval	Automatically	Twice daily	Twice daily	
Instruction		Pull one shot lubrication pump 5 times	Pull one shot lubrication pump 3 times	
MOBIL	Vacouline oil 1409			
SHELL	Tonna 33 or 27			
BP	BP Energol HP 20-C			

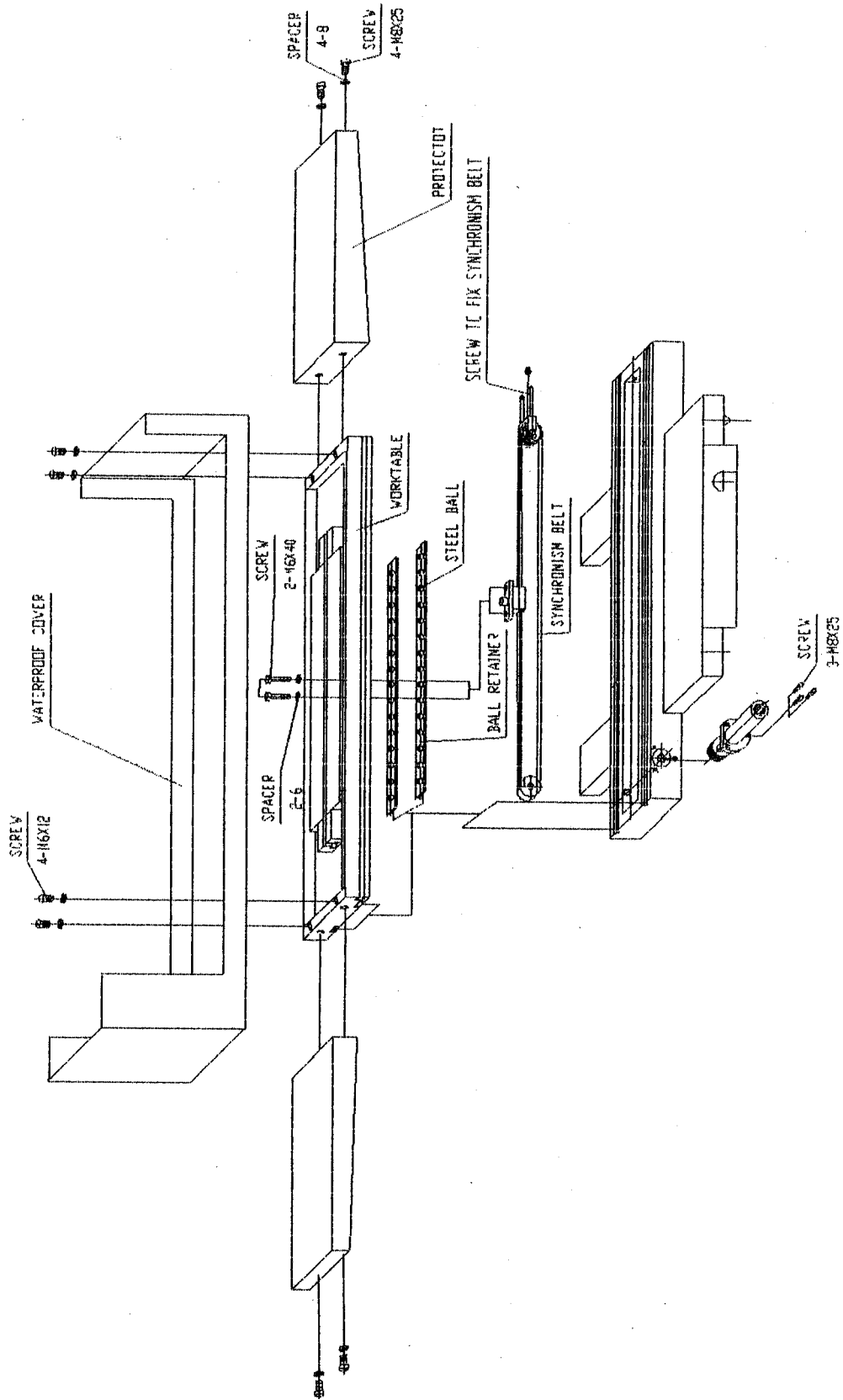
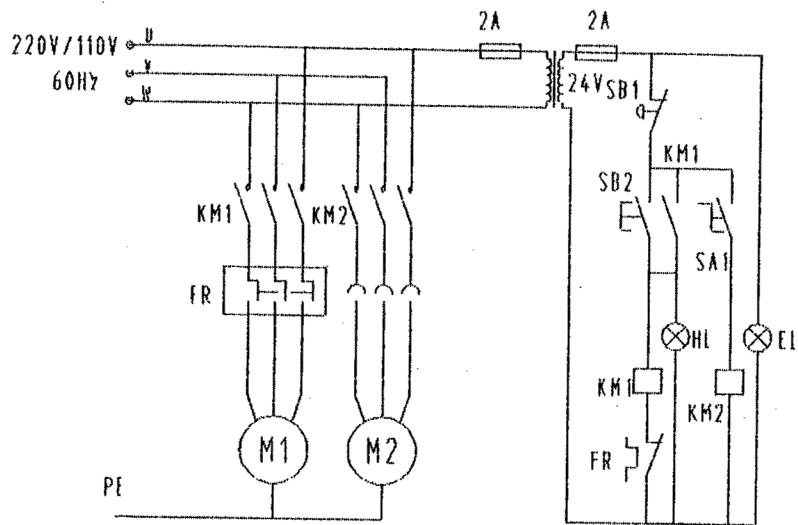
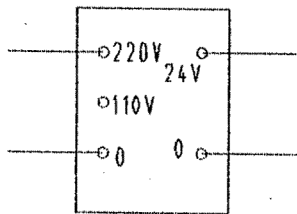


Fig2



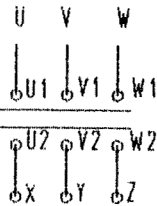
Dual voltage 220V/110V/60Hz
Prewired 220V

Transformer

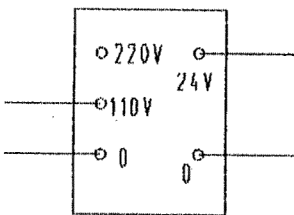


220V

Motor

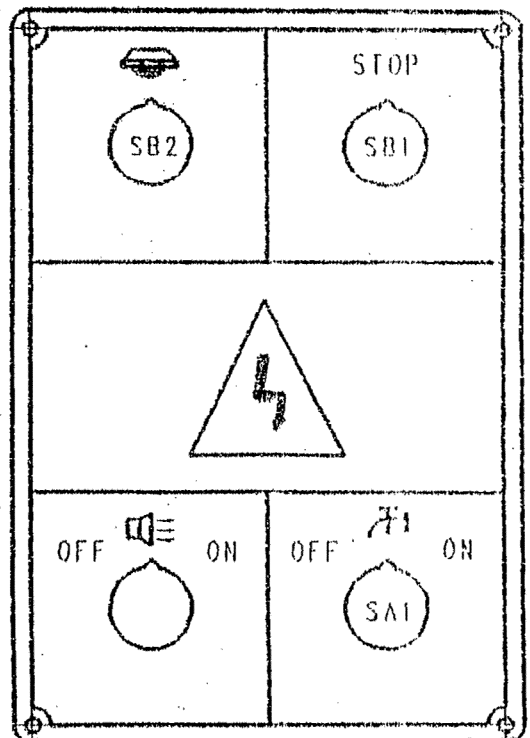
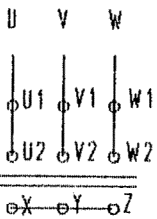


Transformer



110V

Motor



- SB1: Power Source "off" button
- SB2: Grinding Wheel "on" switch
- SA1: Switch of cool ant system
- M1: Spindle motor 1.5Kw
- M2: Cool ant motor 40w

WHEEL

1. Wheel Fitting

- 1.1 Check the wheel surface carefully and tap it with a woodhammer to ensure a clear sound. A crack inside of the wheel results a sonant sound. Be sure to check for cracks carefully.
- 1.2 There are two pieces of paper washers on both sides of wheel and serve as elastic packings between wheel and flange. The packing washers must not be removed.
- 1.3 The flange fixing screws should be tightened gradually and diagonally, the wrench should be applied at least 4 to 6 times to each screw in turn.
- 1.4 When the wheel runs under coolant for some time the paper packing washers will be damped, so it must retighten the fixing screws again diagonally.

2. Wheel Complete

Check the following points before grinding.

- 2.1 Wheel guard is in its right position.
- 2.2 Turn the wheel without loading for a few minutes.

3. Wheel Balancing

- 3.1 How to balance the wheel:

EFFICIENT BALANCING IS ESSENTIAL to eliminate unnecessary and additional stress in the wheel. It is also unavoidable to obtain high-quality results. Grinding accuracy and surface finish as well as life of grinding wheel, wheel spindle and bearings depend to some considerable extent on careful balancing. static balancing will frequently sufficiency for this purpose. The grinding wheel together with the wheel flange must be fitted to balancing arbor and then place it on the wheel balancer, and balance the wheel as following method:

- 3.1.1 The wheel balancer must be levelled (Fig. 4), check it by spirit.
- 3.1.2 Let the wheel to oscillate, and find the center of gravity then marked with chalk. (Fig. 9)
- 3.1.3 Fix the first balance weight "G" opposite to point "S" and set it. (Fig. 10)
- 3.1.4 Place two correction weight "K" anywhere round the periphery, but at equal distance "a" from weight "G". (Fig. 11).
- 3.1.5 Turn the wheel through 90 degree and see if it is in balance, if not, the correction weight "K" must be change a place until the wheel is in balance, no oscillation occur in every position. (Fig. 12)
- 3.1.6 After balancing, the wheel must be given a test run of at least five minutes at full working speed before being used.
- 3.2 Fitting the wheel flange:
prior to placing the flange-mounted gringing wheel to the grinding spindle,

flange cone bore and spindle taper must be absolutely clean, and the wheel is pushed by hand onto the spindle taper. Subsequently, tighten wheel flange securely with fixed bolt (Fig. 7) release wheel flange from spindle taper with jacket bolt (Fig. 8).

3.3 How to check the wheel vibration;

If the spindle vibrates please take off the wheel then switch on the spindle and check the following items;

- 3.3.1 If no vibration occur it means the wheel balance is no good. please rebalance it.
- 3.3.2 If the spindle still vibrate please take down motor and spindle and check the rubber and coupling, if rubber broken change new one, if couplings loosen set it well.
- 3.3.3 The spindle can be used more than 10 years under normal operation, please don't disassemble it without our advise.
- 3.3.4 Because of the spindle running at very high speed the wheel must be balanced well otherwise it will cause spindle vibration and can't get good surface finish.

Since the balabced wheel will lose its balance during grinding operation owing to its wear, it is advisable to rebalance wheels occasionally.

Grinding wheel absorb humidity and coolant, it is therefore advisable not to start coolant supply when the wheel is not running, otherwise the wheel will absorb liquid on bottom side only and make it out of balance. If the wheel is allowed to stand for any length of time, coolant will collect at the lowest point, unblance will also be generated if the wheel is not allowed to idle after completing the grinding operation. So that idle running is essential to throw-off coolant by centrifugal force.

- 3.4.1 The wheel can be dressed eigher by diamond dresser on th chuck (Fig. 13b) or on the parallel dressing attachment (Fig. 13a) which mounted beside spindle carrier. The dianiond tool is arranged at an angle to the center line of the wheel as shown on Fig. 13a, 13b so that when the diamond loses its keenness as (Fig. 13c) it can be turned an angle, and another sharp edge is obtained as (Fig. 13d). When dressing the wheel, it begin from the middle of the width, as shown on (Fig. 13e), due to two edges are usually worn out. If dressing begin at the edges, there is danger of the highter pressure in the middle, then over-stressing the diamond and shattering it. Light dressing with more times is bet-ter for the life of the grinding wheeland diamond than a heavy dressing. Vari-ous degrees of roughnes can be produced in the ground workpiece by varying the feeds and speed of the diamond. If there is ^(0.008") 0.2mm or ^(0.012") 0.3mm stock re-moval, it is advisable to roughen the wheel, this is done by feeding the dia-

(0.0012")

mond in about 0.03mm and let the diamond moves quickly over the wheel, this will makes the wheel bite well and the stock removal is good. If the work-piece is to be finish ground to size with the same wheel, the wheel must be dressed again, this time slowly, in two or three passes, with the diamond feed only about 0.01mm. Experience has shown that, with highly accurate grinding, or better surface finish dressing with the diamond dresser which mounted on the magnetic chuck is better than which on the spindle housing (the former is more stable than latter) as the latter condition will causes light undulation in the surface of the wheel.

- 3.4.2 sufficient coolant to contact point of wheel and diamond is necessary.
- 3.4.3 Wheel speed to pass through diamond is between 250nm/min to 1000mu/min.
(9.5") (39")
For rough grinding high speed is better.

GRINDING OPERATION

1. The grinding results obtained depend to very great degree on the choice of the correct grinding wheel and suitable operation.

1.1 Stock removal efficiency

For intensive stock removal a coarse grain (about 30-36) should be used. The wheel is dressed by passing the diamond over it quickly. So that the surface of the wheel is roughened and bites well.

1.2 Surface finish required

If fine finish is to be produced, a finer grain is require (40-80).

The diamond in this case is passed slowly over the wheel, so as to break up the grain.

1.3 Distortion of the workpiece

If the workpiece shows too much distortion when being ground, this means that the stock removal was too great and the longitudinal and cross movements of the table too slow, or the grinding wheel is blunt or "clogged".

1.4 Undesirable burns and grinding cracks appear, this means that the wheel is too hard, or wheel blunt or "clogged".

2. Selection of suitable grinding wheels.

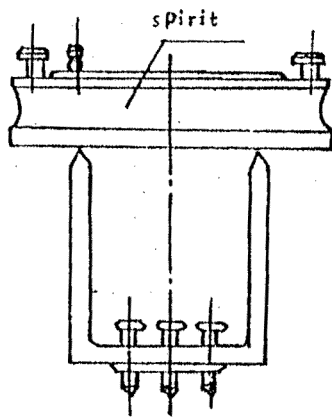


Fig. 4

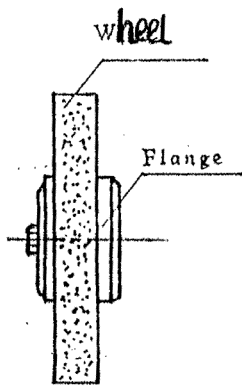


Fig. 5

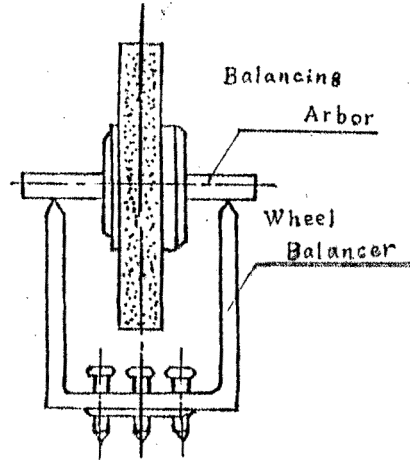
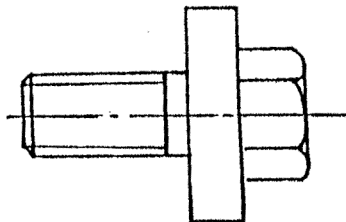
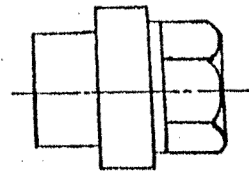


Fig. 6



Fixed Bolt

Fig. 7



Jacket Bolt

Fig. 8

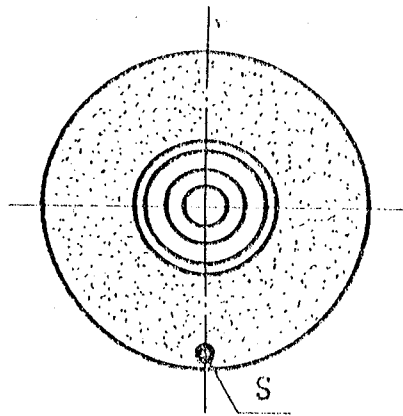


Fig. 9

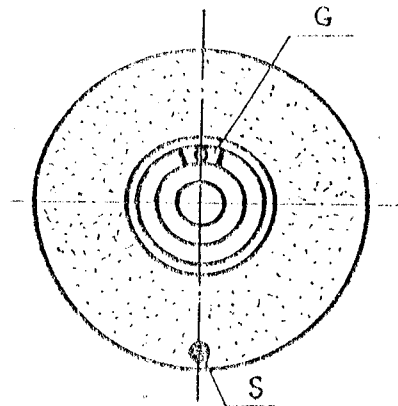


Fig. 10

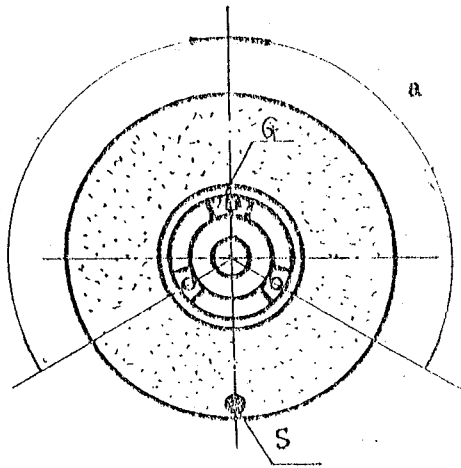


Fig. 11

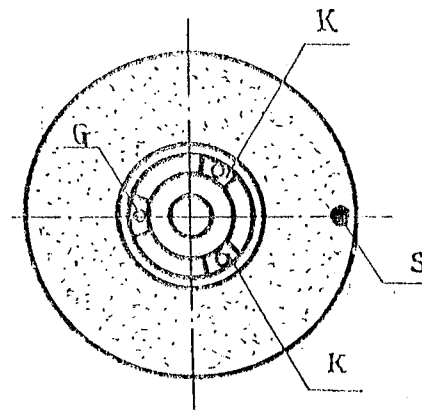


Fig. 12

2.1 Kinds of abrasive

A: For common steel grinding

WA: For higher hardness materials grinding, such as heat-treated carbon steel, alloy steel etc.

H: Suitable for higher hardness material, particularly high-speed steel.

C: For cast iron and non-ferrous grinding.

GC: For super-hard grinding such as tungsten carbide steel.

2.2 Grain size:

Coarse: 10, 12, 14, 16, 20, 24 μm

Medium: 30, 36, 46, 54, 60 μm

Fine: 70, 80, 90, 100, 120, 150, 180 μm

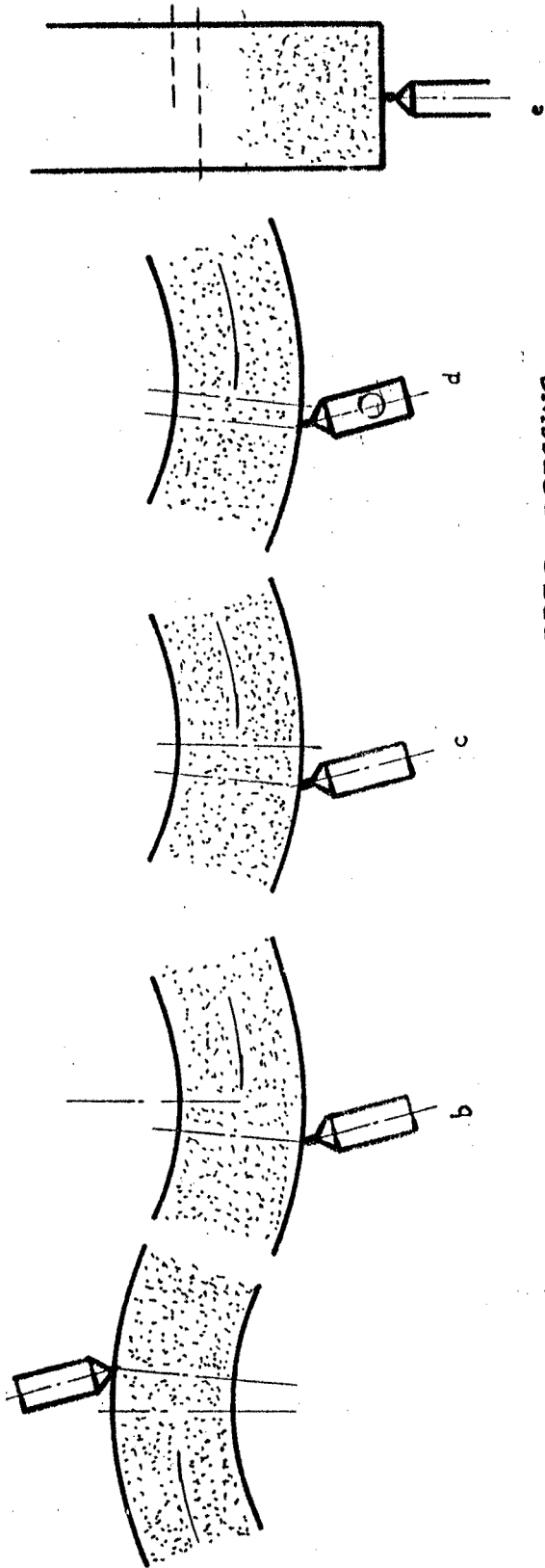


Fig. 13 CORRECT DRESSING



Fig. 14 INCORRECT DRESSING

Grinding condition	Grain Size	Coarse	Fine
	Stock removal		much
Surface roughness		coarse	fine
Workpiece hardness		soft	hard
Surface contacted		wide	narrow
Dia of the wheel		big	small

- 2.3 Grade: It indicates the strength of the bond which holds abrasive.
- Soft: A-H
 - Medium: I-P
 - Hard: Q-z

Grinding condition	Grain	Soft	Hard
	Workpiece hardness		hard
Surface contacted		wide	narrow
Movement of workpiece		slow	quick
Wheel speed		quick	slow

- 2.4 Structure; The structure number of a wheel refers to the relative spacing of the grains of abrasive, the larger the number, the wider the grain spacing.
- Close: 0, 1, 2, 3, 4, 5 μm
- Medium: 6, 7, 8, 9 μm
- Wide: 10, 11, 12 μm

Grinding Condition	Structure	
	Wide	Close
Surface roughness	coarse	fine
Surface contacted	wide	narrow
Workpiece hardness	soft	hard

3. Wheel be recommended

Material be ground		Wheel Diameter	Under 205 mm
		Under 205 mm	
Carbon	Under HRC 25	WA 46K or A 46K	
Steel	Above HRC 25	WA 46J	
Alloy	Under HRC 55	WA 46J	
Steel	Above HRC 55	WA 46I	
Tool	Under HRC 60	WA 46I	
Steel	Above HRC 60	WA 46H	
Stainless Steel		WA 46J	
Cast Iron		C 46J	
Brass		C 30J	
Aluminum Alloy		C 30J	
Tungsten Carbide		GC 60-100H, I	
Glass		C 60K	
Marble		C 36M or GC 36M	

4. Choice of the Grinding Conditions

4.1 Down feed of grinding wheel

Down Feed	Great	Small
Grinding resistance	great	small
Heat produced	much	less
Surface finish	rough	fine
Wheel worn-out	much	little

4.2. Cross Feed

Cross Feed	Great	Small
Grinding Resistance	great	small
Heat produced	less	much
Surface finish	rough	fine
Wheel worn-out	much	little

Rough grinding: $(4-19.5 \text{ in})$ 100-500mm/min. or under 1/2 of the wheel width
 Fine grinding: under (2 in) 50mm/min. or under 1/4 of the wheel width.

4.3 Table Longitudinal traverse:

Table traverse	Quick	Slow
Grinding resistance	quick	Small
Heat produced	less	much
Surface finish	rough	fine
Wheel worn-out	much	little

Suitable speeds of the table traverse: m/min (in/min)

Workpiece Material	Soft steel	Heat-treated steel	Toolsteel	Cast Iron
Speed	6-15(0.2-0.6)	30-50(1.2-2)	6-30(0.2-1.2)	16-20(0.6-0.8)

4.4 Suitable peripheral speeds of wheel, 20-30m/sec.

(0.8-1.2 in/sec)

Wheel Condition	Quick	Slow
Grinding resistance	small	great
Heat produced	much	less
Surface finish	fine	rough
Wheel worn-out	small	great
Safety	bad	better

Material	Peripheral Speed
Steel	20-30m/sec (0.8 - 1.2 in/sec)
Cast Iron	20-18m/sec (0.8 - 0.7 in/sec)
Tungsten Carbide	8-18m/sec (0.3 - 0.7 in/sec)
Zinc alloy & Light Metal	25-30m/sec (0.9 - 1.2 in/sec)

. The symbol of bonda listed below;

V; Vittrified

S; Silicate

B; Resinoid

R; Rubber

E; Shellac

COOLING THE WORKPIECE DURING GRINDING

Advantages of wet grinding for most of the workpiece.

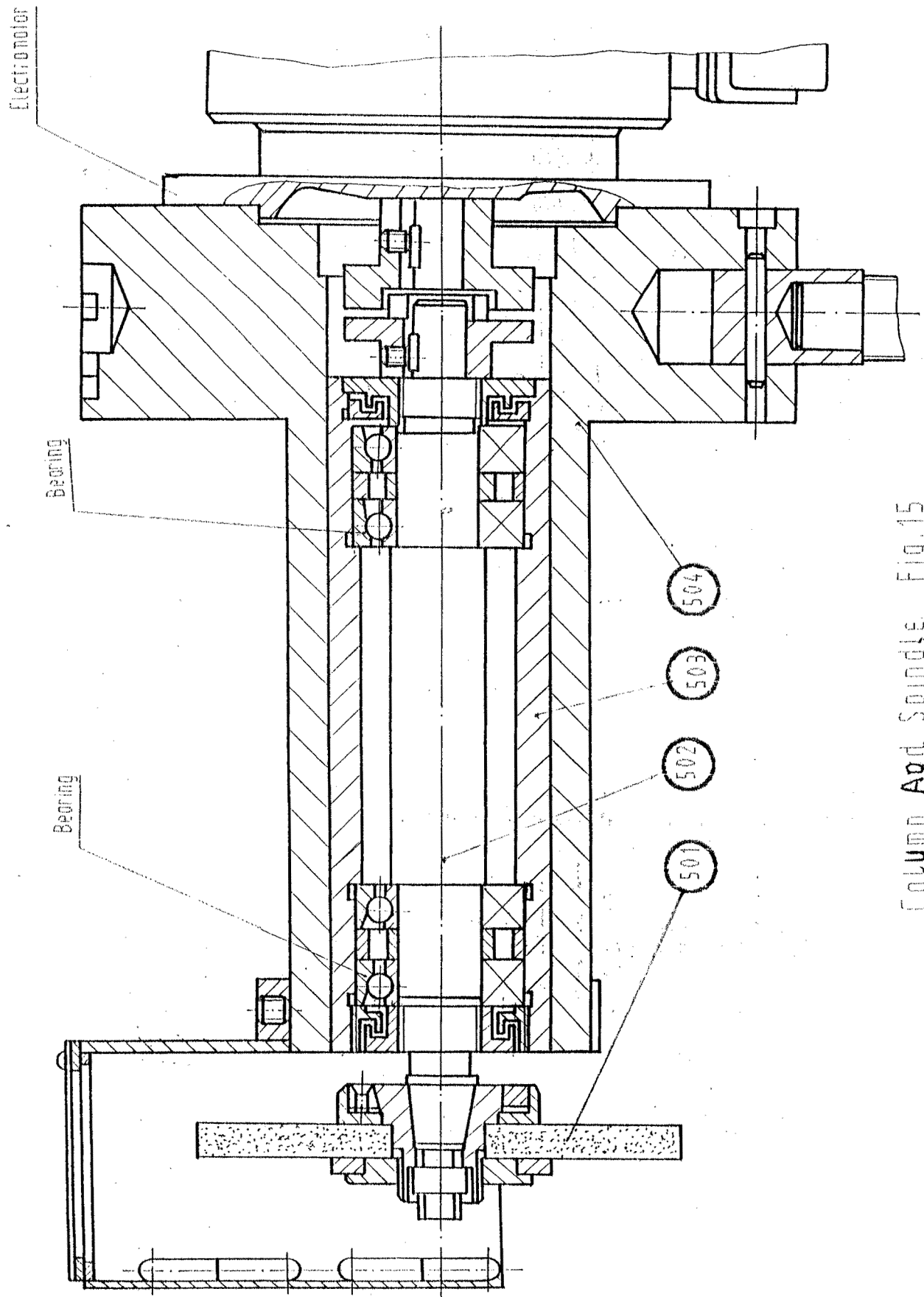
1. Reduce the possibility of distortion of the workpiece caused by heating.
2. Reduce the danger of burning.
3. prevent wheel from clogging.

4. Shorter grinding times.
5. Longer the wheel life.
6. Protect operator, machine and circumstances from grinding dust.
7. Clear transparent coolant is recommended to replace milky one, because:
 - 7.1 The workpiece surface can easily be watched during it is being ground.
 - 7.2 The grinding wheel can keep more bite and sharp than the milky one.
8. The coolant should have an oil base, the mixing ratio preferably be about oil:water = 1:60-80 if less than 1:50 the excessive heat will make workpiece distorted.
9. The coolant will gradually loses its effectiveness, some lost as spray, some evaporates during grinding, and, become thin, so that it must be renew or correct the mixing ratio by adding new oil.
10. The coolant delivered by a water pump to the wheel through a nozzle, to prevent the wheel from clogging.
11. If beautiful surface finish is preferred, the automatic paper strip filter is recommended to be used to instead of the simple coolant system.

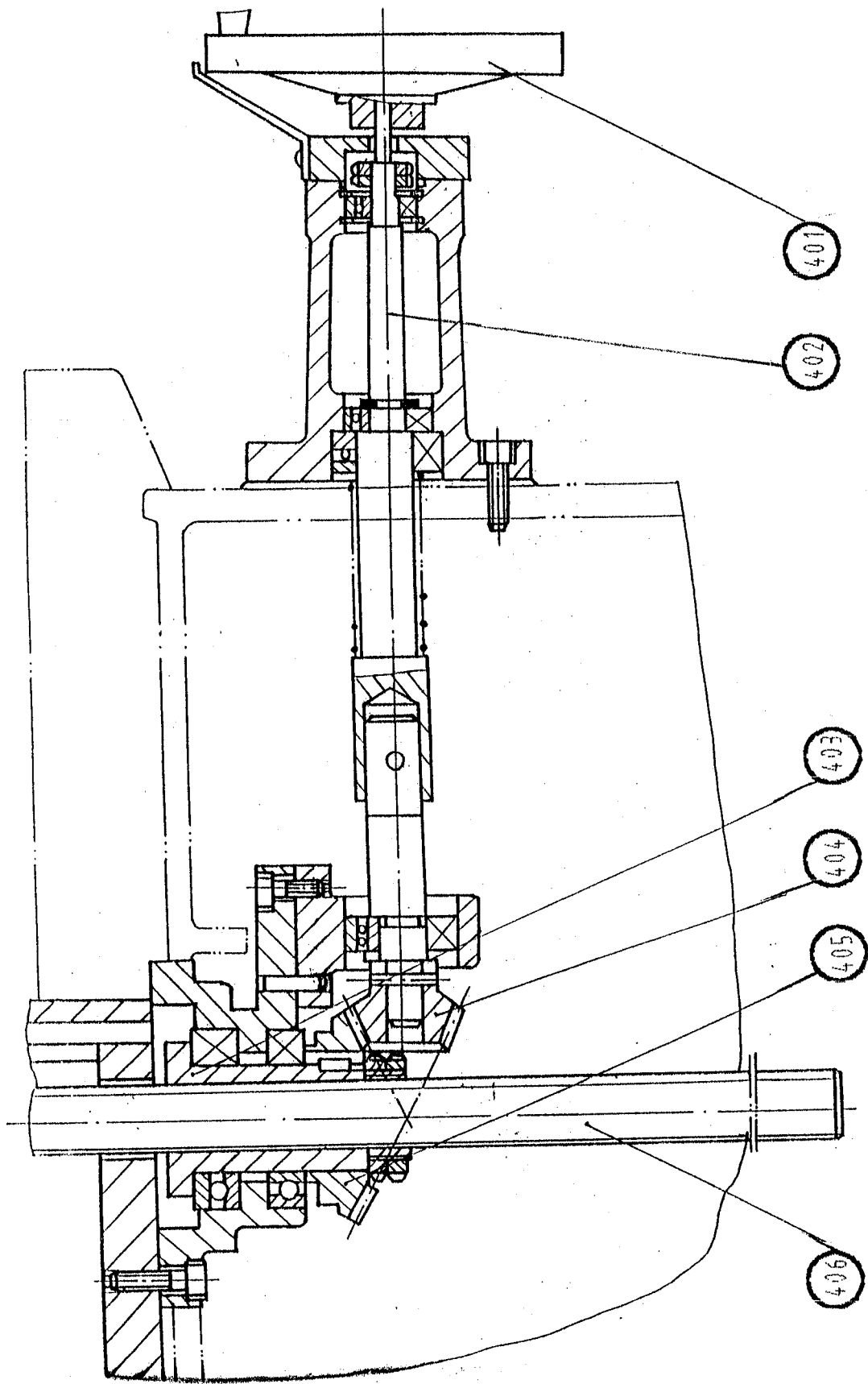
PERFECT SURFACE FINISH

If there is exist any one of the following items, the perfect surface finish can not be obtained.

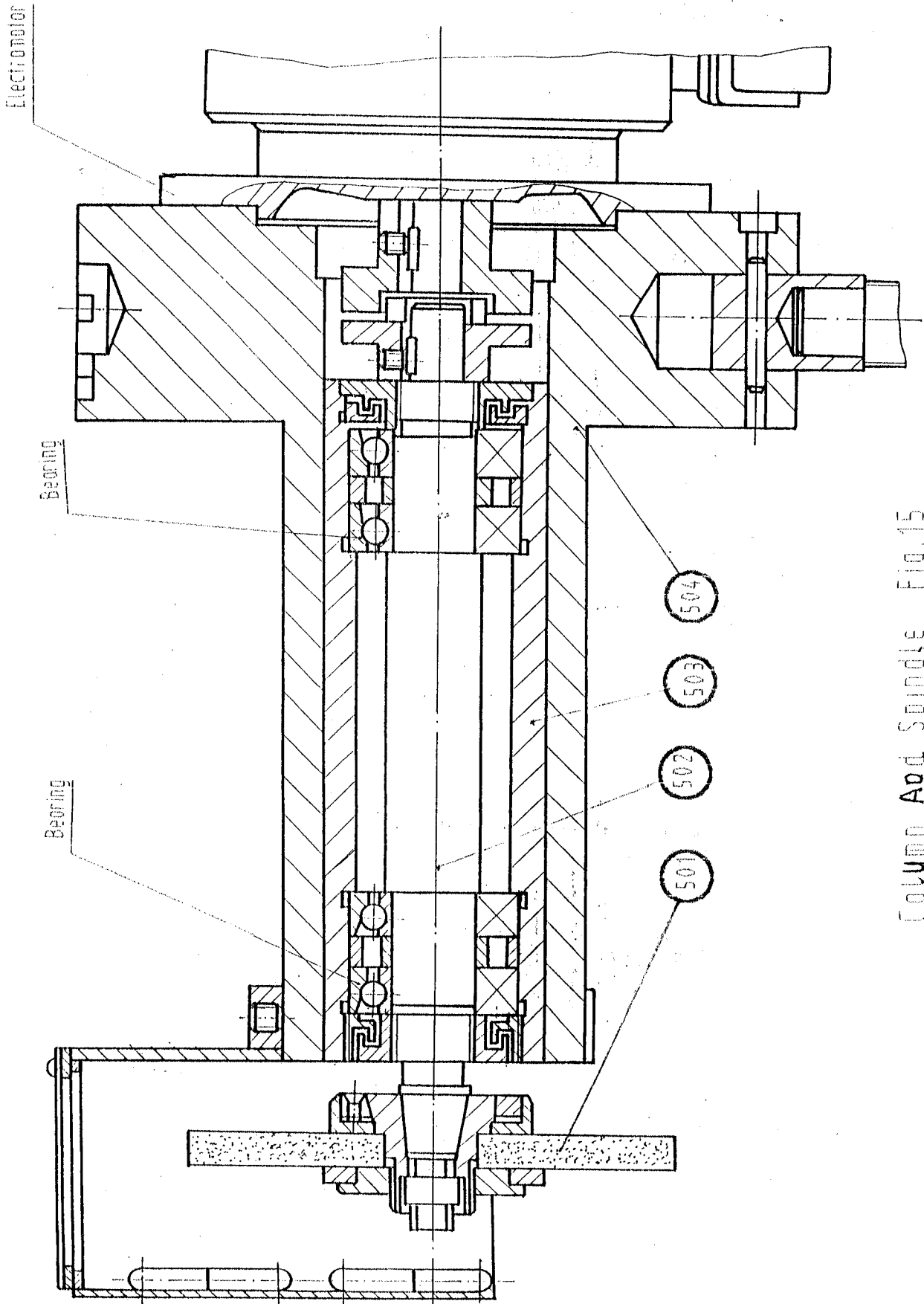
1. Wheel is too hard, or wheel is not correctly choiced.
2. Workpiece is not fixed well.
3. There is dirty between spindle taper and flange (adaptor) bore, and make the wheel vibrate.
4. Use unqualified flange, such as poor concentricity and poor squareness.
5. Wheel and flange not fixed well and have somewhat slip.
6. Use unbalanced wheel or wheel not be balance well.
7. Wheel not be well dressed.
8. The coupling between motor and spindle become loosen or broken.
9. There is defect bearing in spindle or motor.
10. Coolant mixing is unproper, the oil too much. The correct ratio is oil:water = 1:60-80.
11. The coolant is dirty. For getting good surface finish the automatic paper strip filter attachment is recommended.



Column Add Spindle Fig. 15



Elevating Mechanism Fig. 16



Column And Spindle Fig. 15

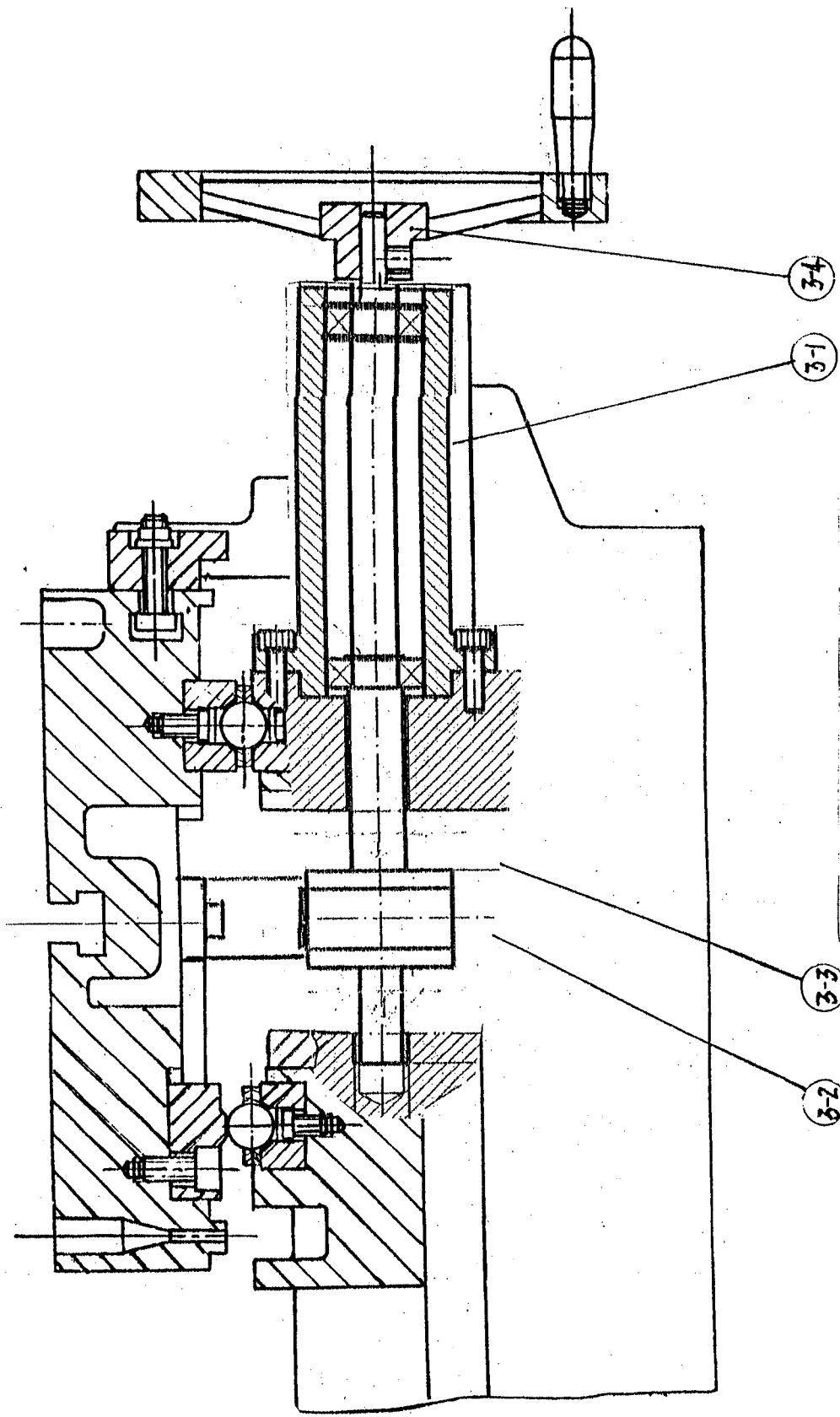
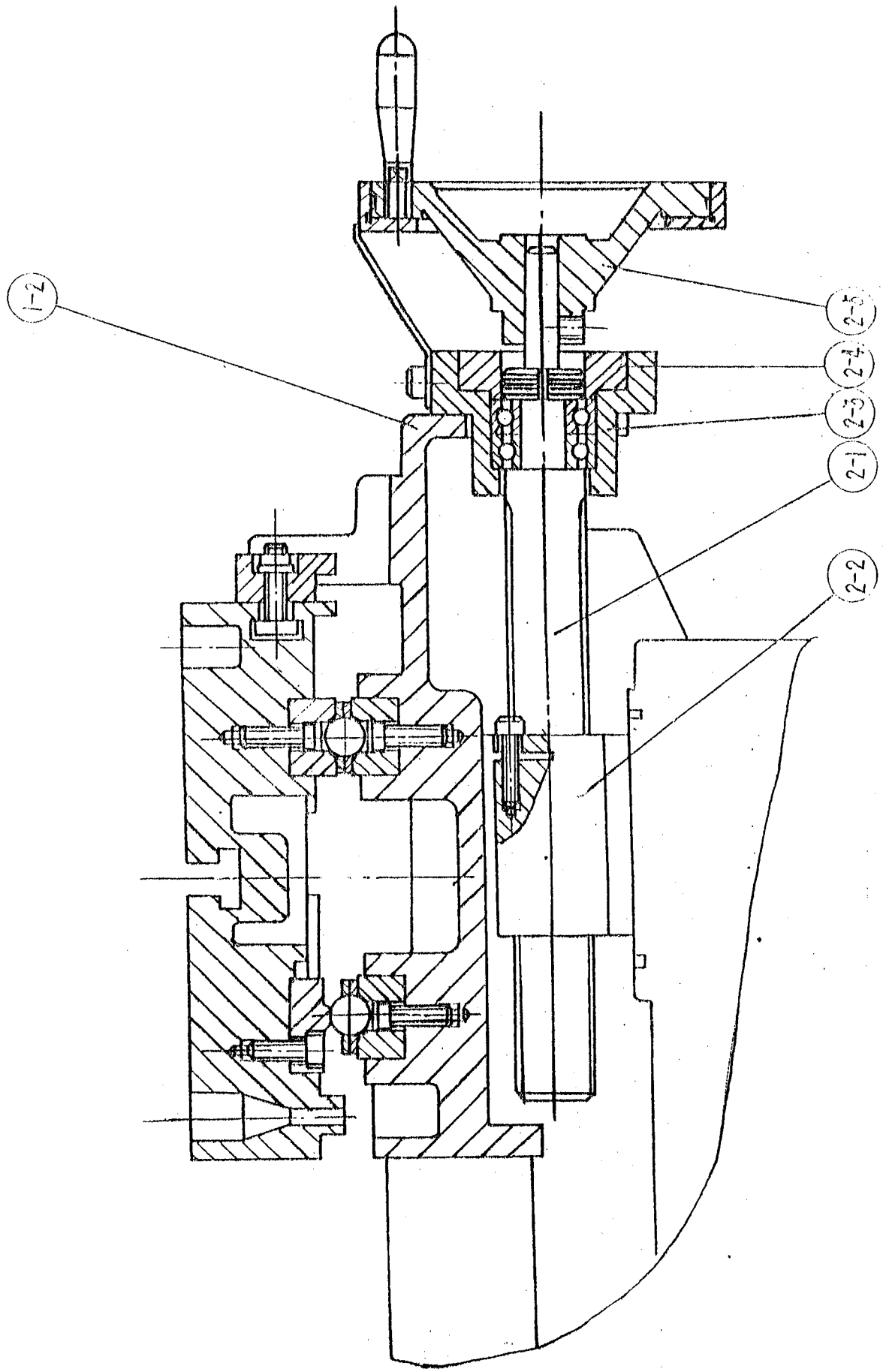


Table Traverse Mechanism

Fig. 17



Cross feed mechanism Fig. 18

MAGNETIC CHUCK

To ensure maximum precision when grinding with a magnetic chuck, the following process must be taken care for grinding the magnetic chuck, otherwise the machine table will be distorted if the magnetic chuck clamped to the table in case the contact surface of the chuck is not flat.

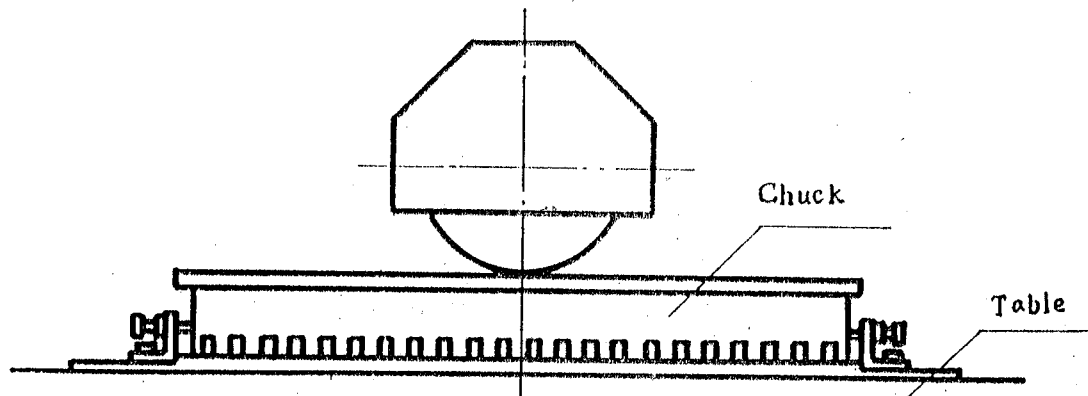


Fig. 19

1. The underside of the magnetic chuck must first be ground with great care to ensure this is flat. Chuck is laid upside down on the table, must not be clamped, stoppers are used at both right and left sides, they are used to prevent chuck from moving only, in this way chuck must not be switched on. wet grinding with max. Coolant volume and minimum wheel infeed is recommended to avoid excessive heating and the consequent surface inaccuracy.
2. Lightly grease the ground surface area of the machine table and underside of the magnetic chuck to prevent them from getting dust after the latter clamped to the former. The grease coating must be very thin for keeping the accuracy.
3. Clamp the magnetic chuck on the machine table

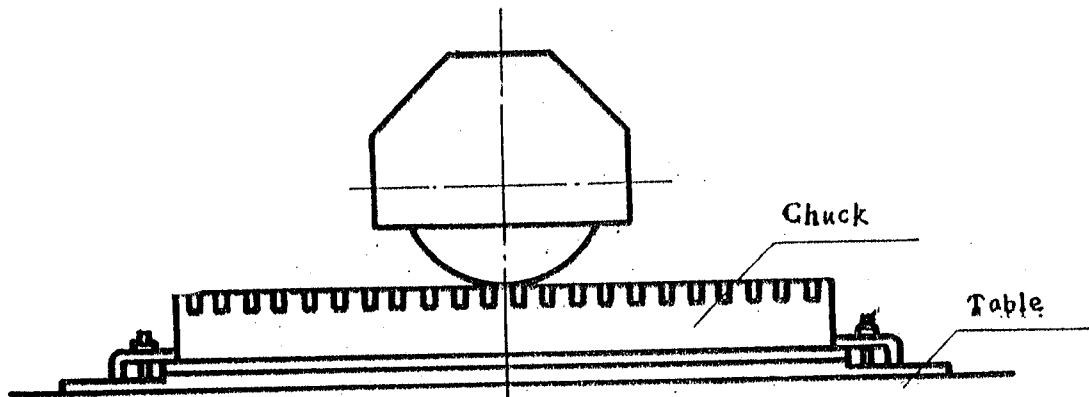


Fig. 20

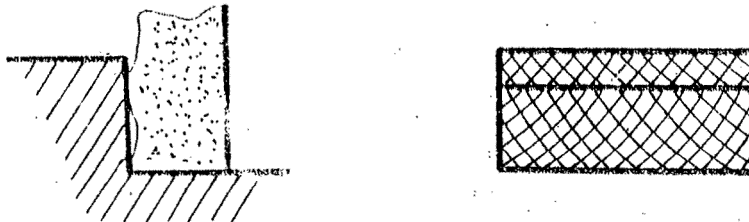
- 3.1 Rough grinding the chuck surface such as grinding the underside of the chuck.
- 3.2 Switch on the magnetic chuck and fine grinding the surface with 0.005mm wheel infeed.
- 3.3 Spark out grinding the surface with no infeed, 2 to 3 times passes the wheel over the chuck surface.

COMMON CASES IN SIDE GRINDING

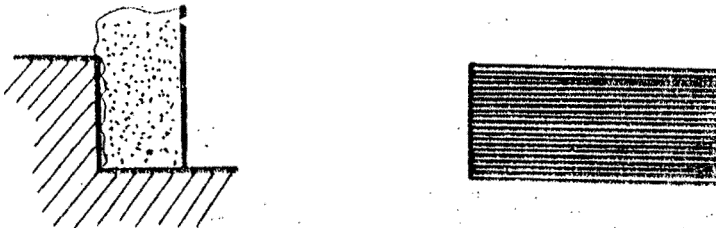
1. Wheel and the workpiece have a smaller contact surface, in which case the efficiency is higher, and the surface roughness is better.



2. The wheel and the workpiece have two contact sections, and the surface of grinding is bad.

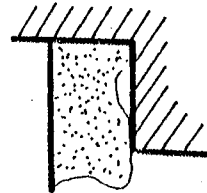


3. The wheel do not have the "Relief Angle", thus it contacts the whole face to the workpiece, cause the workpiece surface rough and rugged. Further-more, it will cause workpiece burned and cracked.

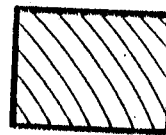
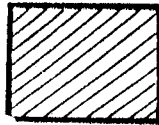


4. The "Relife Angle" of the wheel is lower than the surface of the workpiece, so that the

workpiece face becomes two sections, the upper part like those in (3) and the lower in (1).



5. If the spindle does not right angle with the work table, the side faces will be as shown on bellow.



TROUBLE SHOOTING

Grinding defects, Causes and Remedy			
NO.	Defects	Causes	Remedy
1	Chatter Marks Usually caused by vibration in the machine itself. The machine does not run free from vibration.	<p>machine foundation is not firm enough.</p> <p>The levelling screws(jack bolts) in machine base are loosen</p> <p>work table does not run smoothly.</p> <p>Table not fully supported.</p> <p>Grinding wheel does not sit firmly on the wheel flange.</p> <p>Flange(with wheel)does not fit firmly on the grinding spindle taper nose.</p> <p>Wheel and flang are not well balanced.</p>	<p>improve the foundation</p> <p>Tight and lock them.</p> <p>See item NO. 8.</p> <p>Re - scrap the contact surfaces of table and bed slideways.</p> <p>Replace the intermediate washer between wheel and flange, tighten them well</p> <p>Clean both taper contact surfaces, make sure they are well contacted and fitted firmly.</p> <p>Balance them well again, (collant in the w.eel must be thrown out prior to balance</p>

TROUBLE SHOOTING

Grinding defects, Causes and Remedy			
NO.	Defects	Causes	Remedy
1		Wheel is unhomogeneous.	If wheel and flange can not be well balance, dress wheel on periphery and both sides and rebalance again, if can't make it balanced, replace a new wheel.
		Use unproper wheel.	Select the proper one to suit the workpiece material.
		Wheel is not dressed correctly.	The dressing diamond must be turn an angle or replace new one if it is not contacted wheel with an edge.
			Diamond tool not firmly fixed.
		Too much play on the grinding spindle.	Re-adjust the spindle play by qualified technician.
		Too much play on wheel head guideways	Clean and adjust the gibs

TROUBLE SHOOTING

Grinding defects, Causes and Remedy			
NO.	Defects	Causes	Remedy
1		<p>Vibrations transferred to machine from outside, such as rough - running machines, travelling cranes of the building and street vehicles.</p> <p>Couplings of motor and spindle loosen or rubber broken.</p> <p>Unsteady running of grinding wheel</p> <p>Stock removal too great.</p> <p>Grinding wheel too hard or dull and clogged</p>	<p>Improve the foundation, make it vibration free, place machine to another vibration free position.</p> <p>Fix couplings well, or replace new ones.</p> <p>3 phases voltage of power source are unbalance, please check and balance it or replace new spindle.</p> <p>Reduce infeed</p> <p>Reduce cross feed</p> <p>Use softer or coarser wheel</p> <p>Increase table speed.</p> <p>Reduce infeed</p> <p>Roughen the wheel</p> <p>Check diamond of the dresser.</p>

TROUBLE SHOOTING

Grinding defects, Causes and Remedy			
NO.	Defects	Causes	Remedy
2	Flutter Marks Appear in the form of small flat surface distributed over the surface of the workpiece unevenly.	Travelling cranes or hoist of the building	Improve the foundation.
		Travelling vehicles in the building or street.	Change the position.
3	Ray pattern parallel lines, hardly perceptible to the naked eye.	Grinding spindle bearings defective.	Use anti-vibration plates.
		Too much play on wheelhead guideways	
		Wheel badly dressed.	
4	Commas It appear the form of comma-shaped lines when grinding to get a high finish	Collant too dirty.	Clean Collant, or use automatic paper strip filter.
		Grinding wheel chips off	Clean inside of the wheel cover.
			Choose proper wheel.

TROUBLE SHOOTING

Grinding defects, Causes and Remedy			
NO.	Defects	Causes	Remedy
5	Burn marks and grinding cracks, caused by intense local heating of the workpiece.	Grinding wheel too hard or too fine.	Use softer or coarser wheel Increase table speed. Reduce peripheral speed of wheel.
		Grinding wheel dull or clogged.	Dress the wheel make it roughen and bit better.
		Stockremoval too great.	Reduce infeed. Reduce cross feed.
		Table speed too low.	Increase table speed. Increase coolant
		Inefficient cooling.	Use stronger mixture coolant (fill up with fresh oil)
6	Grinding spark abnormally	It can not be "spark out"	Re-align the machine by adjusting the jack bolt and checked it with spirit level.