

Air Grinder

NSP-601 · NA45-400 NA45-230·NA90-230

# **OPERATION MANUAL**

Thank you for purchasing Air Grinders the "NSP - 601 • NA45 - 400 • NA45 - 230 • NA90 - 230 ". These Air Grinders are designed for rotating smoothly at ultra high-speed with extremely low bur run-out and vibration. The Air Line Kit are required to drive this Air Grinders. Read this and all the associated component Operation Manuals carefully before use. Always keep this Operation Manual in a place where a user can referred to for reference at any time.

### 1. CAUTIONS FOR HANDLING AND OPERATION

- Read these warnings and cautions carefully and only use in the manner intended.
- These warnings and cautions are intended to avoid potential hazards that could result in personal injury to the operator or damage to the device. These are classified as follows in accordance with the seriousness of the risk.

Class	Degree of Risk	
	A safety hazard could result in bodily injury or damage to the	
	device if the safety instructions are not properly followed.	
	A hazard that could result in light or moderate bodily injury or	
	damage to the device if the safety instructions are not followed.	

#### – \land WARNING —

- **1** The Air Grinder is designed for hand use. Never install the Air Grinder or any hand tool on a machine such as a special purpose machine, NC lathe or mill.
- 2 Do not exceed the "Maximum Motor Rotation Speed " (Refer to "6 1 Specifications ").
- 3 When sensing that the Air Grainder is overheated during operation, reduce the working force or the motor rotation speed, or stop the operation until the Air Grinder cools down before restarting.
- ④ Do not touch the cutting tool while it is rotating. It is very dangerous. (5) Wear safety glasses, dust mask, protective cover and use a hearing protection around the Air
- Grinder whenever the Air Grinder is rotating. 6 When installing a cutting tool, tighten the collet correctly and check again the collet before use. Do
- not over-tighten the collet. This may cause damage to the spindle.  $\overline{\mathcal{O}}$  Do not use the grindstone with axis of the outside diameter other than specification when you use the grindstone with axis by the Maximum Motor Rotational Speed. Please follow the outside
- diameter of grindstone with axis detailed in Table. 1.

Table. 1 Outside diameter of grindstone with axis (at the Max. Speed).

Model	Maximum Motor Rotation Speed	Outside diameter of Grindstone with axis
NSP - 601	60,000 min <sup>-1</sup> (rpm)	Less than $\phi$ 8mm
NA45 - 400	40,000 min <sup>-1</sup> (rpm)	Less than $\phi$ 15mm
NA45 - 230 • NA90 - 230	23,000 min <sup>-1</sup> (rpm)	Less than $\phi$ 25mm

- (8) Do not exceed 13mm of overhang for mounted grindstones as shown in Fig. 1. If the overhang must exceed 13mm, reduce the motor speed in accordance with Table. 2.
- (9) Do not use bent, broken, chipped, out of round or sub-standard cutting tools as they may cause shatter or explode.

The cutting tool with cracked, bended may cause some injury to operator.

- When using a new cutting tool, rotate it in a low speed and increase speed gradually for safety. Use of a cutting tool higher than the manufacturer's recommended speed limits could cause damage to the spindle and injury to the operator.
- 1 Do not apply excessive force. This may cause cutting tool slippage, cutting tool damage, injury to the operator, loss of concentricity and precision.

Table. 2 Overhang ar	nd Speed		
Overnang (mm)	INIAX. Speed (min <sup>-+</sup> ) (rpm)		
20	N x 0.5	] [] ] [ ] [ ] [ ] [ ] [	
25	N x 0.3		
50	N x 0.1	Max.13mm	145
* N = Max. Operating Sp	beed with 13mm overhang.	-	N 18

#### Fig. 1

# 

- ① Be sure to use the NAKANISHI Air Line Kit AL H1206 of one to one Air Grinder to avoid lower speed and short service life. If there is no lubrication system in your work place, inject the NAKANISHI Lubricating Oil with approx. 2 - 3 drops in every hour into the injection inlet on the body. Poor lubricating may cause the short service life, loss of precision and damage of the internal components of the Air Grinder.
- 2 Do not drop or hit this Air Grinder, as shock can damage to the internal components. **3** Before use, carefully read " Air Line Kit Operation Manuals " regarding the correct connection,
- operation and cautions when using the Air Line Kit. ④ Be sure to drain moisture and condensation from the Air Line Kit (filter regulator) regularly to
- avoid moisture being carried to the Air Grinder. This may cause damage to the Air Grinder. (5) Be sure to clean the collet, the spindle taper and threads before replacing the cutting tool. If
- ground particles or metal chips stick to the inside of spindle or the collet, damage to the collet or spindle can occur due to the loss of precision.
- 6 When cleaning an Air Grinder, stop the Air Grinder and remove debris with a soft brush or a cloth. Do not blow air into the Air Grinder with compressed air as foreign particles or cutting debris may get into the ball bearing.
- $\overline{\mathcal{O}}$  Always clean the cutting tool shank before installing the cutting tool in the spindle.
- (8) When sizing the correct collet size to the cutting tool shank diameter, a tolerance of + 0  $\sim$  0.01mm is strongly recommended. A cutting tool shank within the +0  $\sim$  - 0.1mm range is mountable, however, this may cause poor concentricity and or insufficient cutting tool shank gripping force.

OM-K0121E 005

- (9) Select suitable products or cutting tools for each application. Do not exceed the capabilities of the Air Grinder or cutting tools.
- 10 Keep everything in order not to place the rag which could be caught near the Air Grinder. (1) Stop operating immediately when abnormal rotation or unusual vibrations are observed.
- Immediately, please check the content of section "9.TROUBLESHOOTING ". 1 Always check if the tool, collet, connection hose and supply and exhaust air / oil hose for damaged
- before and after operating. (3) If the collet show signs of wear or damage, replace it before a malfunction or additional damage occurs.
- (1) After installation, repair, initial operation, or long periods of non operation, please carry out break-in as follow. Start rotating slowly and over a short period of 5 - 10 minutes, increase speed gradually until allowable maximum speed.
- (B) Do not disassemble, modify or attempt to repair the Air Grinder. Additional damage will occur to the internal components. Service must be performed by NSK NAKANISHI or an authorized service center.
- (6) When using this Air Grinder for mass production, please consider the purchase of an additional Air Grinder to be used as a back-up in case of emergency.
- 1 Securely connect the compressor supply connection hose and the air / oil supply hose to the Air Line Kit and the Air Grinder to avoid accidental disconnection during use.

# 2. BASIC PACKAGE

When opening the package, check if it includes all items listed in "Table. 3 Packing List Contents ". In the event of any shortage, please contact either NAKANISHI (see the " 4. CONTACT US " section) or your local dealer

Table. 3 Packing List Contents



\* The collet, supply air / oil hose and exhaust air / oil hose are attached to the Air Grinder.

# 3. WARRANTY -

We provide a limited warranty for our products. We will repair or replace the products if the cause of failure is due to the following manufactures defects. Please contact us or your local distributor for details.

- 1 Defect in manufacturing.
- ② Any shortage of components in the package.
- ③ Where damaged components are found when initially opening the package. (This shall not apply if the damage was caused by the negligence of a customer)

# 4. CONTACT US -

For your safety and convenience when purchasing our products, we welcome your questions If you have any questions about operation, maintenance and repair of the product, please contact us.

#### Contact Us

- For U.S. Market Company Name
  - **Business Hours**
  - U.S. Toll Free No. Telephone No. Fax No.
  - Website
- For Other Markets Company Name **Business Hours** 
  - Telephone No. e-mail

#### Industrial Div. : 8:00 to 17:00 (CST)

: NSK America Corp.

- (closed Saturday, Sunday and Public Holidays)
- : +1 800 585 4675 : +1 847 843 7664
- : +1 847 843 7622
- : www.nskamericacorp.com

#### NAKANISHI INC. 🖬 8:00 to 17:00 (JST)

- (closed Saturday, Sunday and Public Holidays) +81 289 64 3520
- webmaster-ie@nsk-nakanishi.co.jp

- Mounted Point (42423) • 1pc. (Excluding NSP - 601  $\phi$  3.175 / NSP - 601 / NA45 - 400 • • 1pc. NA45 - 230 / NA90 - 230 · · 2pcs.
- (64836) (64837) • 1pc. Each.

### 5. FEATURES

- ① No heat is generated for long continuous use due to air driven operation.
- 2 By mounting a silencer on the back exhaust air / oil hose, the quiet operation of air turbine is remarkably improved.
- ③ Air consumption is  $165N\ell$  / min and can be used with air compressor of 2HP (1.5 kW).
- ④ Various sizes of collets are available CHS 0.8mm 3.175mm.
- NSP 601 <Max. 60,000min<sup>-1</sup> (rpm)> Straight type is designed for high speed precision grinding.



Fig. 2

- NA45 400 <Axis angle : 60 ° Max. 40,000min<sup>-1</sup> (rpm)>
- Ideal for removing sharp edges at corners and surfaces difficult to reach with straight type.



- NA45 230 <Axis angle : 60 ° Max. 23,000min<sup>-1</sup> (rpm)>
- Suitable for removing cutter marks, chamfering after end milling, and grinding wall surfaces. Collet is exchangeable. Stemmed grindstone are available.



- NA90 230 <Axis angle : 120 ° Max. 23,000min<sup>-1</sup> (rpm)>
- Suitable for removing cutter marks, chamfering after end milling, and grinding wall surfaces. Collet is exchangeable. Stemmed grindstone are available.



Fig. 5

# 6. SPECIFICATIONS AND DIMENSIONS =

# 6 - 1 Specifications

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Model	NSP - 601	NA45	- 400	NA45 - 230		NA90 - 230
Maximum Motor	60,000 min <sup>-1</sup> (rpm)	40,000	) min <sup>_1</sup> (rpm)	23,000 min <sup>-1</sup> (	rpm)	
Rotation Speed	at 0.6MPa (87psi) Air	at 0.6MPa (87psi) Air Pressure				
Appropriate Air	0.4 - 0.6MPa (58 - 87	psi)				
Pressure						
Air Consumption	165Nℓ / min (0.6MPa	(87psi)	)			
Vibration Level	2.5m / s <sup>2</sup>					
Noise Level at 1m	Less than 80dB (A)	Less t	nan 75dB (A)	Less than 90d	IB (A)	Less than 95dB (A)
distance						
	Temperature		Humidity		Atmos	pheric Pressure
Operation Environment	0 - 40°C		MAX. 75%		800 - 1	1,060hPa

(No condensation)

10 - 85%

Storage Environment <Option>

Collet (CHS -  $\Box$ )  $\phi$  0.8mm -  $\phi$  3.0mm in 0.1mm increments and  $\phi$  2.35mm,  $\phi$  3.175mm

# 7. CHANGING THE CUTTING TOOL AND REPLACING THE COLLET -

### – $\triangle$ CAUTION —

Transportation and

Do not tighten the collet without inserting a cutting tool or dummy bur, as this will damage the collet or spindle, causing difficulty in removing the collet.

- 7 1 NSP 601
- (1) Changing the Cutting tool
- ① Align the hole on the head and spindle, and insert the bur wrench.

-10 - 50°C

- 2 Place the 5mm wrench on the collet and turn counterclockwise to open the collet and remove the cutting tool.
- ③ Insert the new cutting tool and place the wrench 5mm on the collet, turn the collet clockwise and tighten (Do Not force the wrench or over tighten the collet as this can damage the collet).



500 - 1.060hPa

#### (2) Replacing the Collet

- ① Remove the cutting tool according to content of section "7 - 1 (1) Changing the Cutting Tool " procedure above.
- 2 Insert the bur wrench and turn the collet counterclockwise by hand and remove.
- ③ Insert the new collet, turn the collet clockwise and tighten by hand.

#### 7 - 2 NA45 - 400

- (1) Changing the Cutting tool
- ① Insert the bur wrench to the hole on the grindstone retainer.
- 2 Place the 5mm wrench on the collet and turn cunterclockwise to open the collet and remove the cutting tool.
- ③ Insert the new cutting tool and place the wrench 5mm on the collet, turn the collet clockwise and tighten (Do Not force the wrench or over tighten the collet as this can damage the collet).

#### (2) Replacing the Collet

- ① Remove the cutting tool according to content of section "7 - 2 (1) Changing the Cutting Tool " procedure above.
- ② Insert the bur wrench and turn the collet counterclockwise by hand and remove.
- ③ Insert the new collet into the spindle and tighten slightly by hand.

#### 7 - 3 NA90 - 230 • NA45 - 230

(1) Changing the Grindstone or Rubber Pad

- ① Align the holes on the head cover and grindstone retainer, and insert the bar wrench.
- ② Turn the grindstone or rubber pad counterclockwise to remove.
- ③ Screw in the new grindstone or rubber pad and tighten by hand.

#### (2) Replacing the Head Cover

- ① Insert the allen wrench 1.5mm to the hexagon socket screw of the head cover, and turn the allen wrench 1.5mm counterclockwise and loosen.
- ② Remove the head cover by rotating and pulling gently by hand.
- ③ When mounting the head cover, align the convex part on the inside of the head cover to the concave part of the head and turn the allen wrench clockwise and tighten the hexagon socket screw.

# (3) Replacing to the Collet from the Grindstone Axis

- ① Align the holes on the head cover and grindstone retainer, and insert the bar wrench.
- ② Insert another bar wrench into the hole on the grindstone axis and turn it counterclockwise to remove the rindstone axis.
- ③ Insert the collet into the spindle and tighten slightly by hand.

#### (4) Mounting the Cutting Tool

- ① Mount the collet according to content of section 7 - 3 (3) Replacing to the Collet from the Grindstone Axis " procedure above and insert the cutting tool into the collet.
- ② While holding the provided bar wrench, place the wrench 5 mm on the collet and turn clockwise to tighten the cutting tool (Do Not force the wrench or over tighten the collet as this can damage the collet).



















#### (5) Examples of cutting tool

#### combinations When using rubber pads, only operates the Air Grinder at low speed. Rotating adhesive felt disks or sandpaper disks at high speeds can cause the rubber pad to deform and explode. Carefully check the specifications of the cutting tools prior to operation and NEVER exceed the maximum rotating speed recommended by the cutting tool or abrasive manufacturer.



# 8. OPERATION AND CONNECTING TO THE AIR LINE KIT -

#### - $\wedge$ caution -

Make sure to turn the compressed air supply to the Air Line Kit OFF, before replacing the Lubricating Oil or draining the water in Lubricating Oil.

- 1 Connect the Filter Joint of the Air Grinder to the Secondary Joint ( $\phi$  6 One Touch Joint) on the Air Line Kit (Fig. 15 1).
- 2 Place exhaust air / oil hose with silencer into an empty container (Fig. 15 2) (Exhaust outlet air and oil from the Siliencer).



Fig. 15 Connecting to the Air Line Kit " AL - H1206 " (Option)

# – $\Lambda$ CAUTIONS IN USING AIR LINE KIT —

- · When connecting the Compressor and Air Line Kit, recommended install the air filter or air dryer to between Compressor and Air Line Kit in order to supply clean dry air to the Air Grinder. Using compressed air containing excessive moisture could result in malfunction or failure of the Air Grinder. If excessive moisture or condensation are found in Filter Regulator Bowl, it will be necessary to install a dryer and larger air filter on the Primary Joint side of the Air Line Kit to prevent and remove excessive moisture.
- Connect the input air supply connection hose and supply air / oil hose securely to avoid accidental disconnection during use. Input air pressure should never exceed 1.0MPa (145psi). Air pressure exceeding 1.0MPa (145psi) may cause the supply connection hose and or air / oil hose supply to rupture.
- Make sure operation air pressure is less than 1.0MPa (145psi) before connecting the input supply connection hose and air / oil supply hose. If operation air pressure is exceeds 1.0MPa (145psi), injury to the operator may occur by accidental disconnection before or during use. • Before use, carefully read " Air Line Kit Operation Manuals " regarding the correct connection,
- operation and cautions when using the Air Line Kit.
- ③ Remove the Oil Filter Cap. Put the Lubricating Oil\* to the Lubricator (Oil Reservoir). \* Lubricating Oil : Air Line Kit standard accessories.
- ④ Supply air from the air compressor and open the ON / OFF Valve. Turn the Regulator Knob and adjust air pressure to between 0.4 - 0.6MPa (58 - 87psi) (Clockwise direction : Air pressure is increased).
- ⑤ To adjust the rotation speed by turn the ON / OFF Ring of the Air Grinder (Fig. 16).



6 To stop rotation of the Air Grinder, turn the ON / OFF ring to the OFF position. If the Air Grinder will not be used for more than one minute, close the ON / OFF Valve on the Air Line Kit and turn the ON / OFF ring until ON position to exhaust the remaining air from the air line. \* Refer to the Air Line Kit Operation Manual.

Supply Air / Oil Hose

Exhaust Air / Oil Hose

Silencer

Air Tool Holder

## Lubricating Oil

Use ISO VG15 Liquid Paraffin (Shell Ondina Oil #15) in the Air Line Kit lubricator bowl (For U.S.A. specification, use Chevron Superla #9).

Model Lubricating Oil (K - 211) 70cc Lubricating Oil (K - 202) 1  $\ell$ 

# 9. TROUBLESHOOTING

Air flow does not reach the spindle.     Check if negut supply connection hose or air/ of supply hose is torken, bet or disconnected is supply hose.       Air flow does not reach the spindle.     Check the connection of the input supply connection and air / of supply hose.       The ball bearings have been damaged by for no Lubricating Out     Check the connection sinput supply and air / of supply hose.       The ball bearings have been damaged.     Replace the ball bearings.       (Return to NAKANISHI dealer service.)     Replace the ball bearings.       for no Lubricating OU.     Replace the ball bearings.       for connection of input supply or air / of supply one investore damaged.     Replace the ball bearings.       Poor connection of input supply or air / of supply on air / of supply one investore damaged.     Replace the ball bearings.       Low air pressure.     Check lubricator for proper lubricant level. Set the OII Drip Rate from 1 to 3 drops / min.       No Lubricating OII.     Check lubricator for proper lubricant level. Set the OII Drip Rate from 1 to 3 drops / min.       No Lubricating OII.     Check when the improvement is not seen return to NAKANISHI dealer service.)       Under graduation.     No Lubricating OII reservoir.       Water, dirt and debris are collected in the Filter Joint from Air Line Keylator.     Drain water form tubricating OII.       Over filled lubricator.     Drain water form Lubricating OII.     Drain water form the Filter	Trouble	Cause	Inspection / Corrective Action
oil supply hose is broken, bent or disconnects       oil supply hose is order, bent or disconnects       oil supply hose is order, bent or disconnects       oneck connection and air / oil supply connection and air / oil supply hoses.       Check the compressor output.       The ball bearings have been damaged.       The motor has been damaged by for no Lubricating Oil.       The motor has been damaged by for no Lubricating Oil.       Addor speed decrease.       Addor speed decrease.       Low air pressure.       Low air pressure.       Low air pressure.       Low air pressure.       Low Lubricating Oil.       Deck the compressor, Air Circuit, and Regulator.       No Lubricating Oil.       Check the compressor, Air Circuit, and Regulator.       Low Lubricating Oil.       Oil Removing the Filter Joint form Air Line Kit, supply a small amount of Lubricating Oil.       Vater, dirt and debris are collected in the Filter Joint form Air Line Kit, supply a small amount of Lubricating Oil.       Under speed decrease.       Over filted lubricator.       Water, dirt and debris are collected in the filter Joint form Arrowals, suppl air pressure and rotate the Air Grinder. Flueh in the from the supression and an other or lubricating Oil reservoir and replace the input and debris form the Filter Joint Afterwareas, suppl air pressure and rotate the Air Grinder. Fl	Air Grinder does not	Air flow does not reach the spindle.	Check if input supply connection hose or air /
Under the second state of the input supply       Check compressor output.       Check the compressor output.         The ball bearings have been       Check the Regulator and set to the correct air pressure.       Check all connections input supply and the air of supply hose.         The ball bearings have been       Replace the ball bearings.       (Return to NAKANISHI dealer service.)         The ball bearings have been       Replace the ball bearings.       (Return to NAKANISHI dealer service.)         Wolor speed decrease.       The connection of input supply on a ri / oll supply hose.       Repare the motor.         Poor connection of input supply on air / oll supply hose.       Replace the ball bearings.       (Return to NAKANISHI dealer service.)         Low air pressure.       Check the Compressor. Air Circuit, and Regulator.       Regulator.       (Return to NAKANISHI dealer service.)         No Lubricating Oil.       Check the Compressor. Air Circuit, and Regulator.       Regulator.       (Regulator.)         No Lubricating Oil.       Check the compressor. Air Circuit, and Regulator.       Regulator.       (Regulator.)         No Lubricating Oil.       Check the Compressor. Air Circuit, and Regulator.       (Regulator.)       (Return to NAKANISHI dealer service.)         Unrequal motor speed       Unrequal motor speed.       (Return to NAKANISHI dealer service.)       (Return to NAKANISHI dealer service.)	rotate or rotate smoothly.		oil supply hose is broken, bent or disconnected
Include the service of the s			Check connection of the input supply
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Image: Check the Regulator and set to the correct arrese.         Check the Regulator and set to the correct arrese.         The ball bearings have been damaged by for no Lubricating Oil.       Repart the motor.         Vector speed decrease.       The connection hose or air / oil supply hose have been damaged.         Poor connection of input supply or air / oil supply hose have been damaged.       Replace the input supply and or air / oil supply hose have been damaged.         Poor connection of input supply or air / oil supply hose have been damaged.       Check all threaded joints and re-tighten if necessary.         Low air pressure.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Check all threaded joints and re-tighten if necessary.         Low air pressure.       Check all threaded joints and re-tighten if necessary.         Low Lubricating Oil.       Check all threaded joints and re-tighten if necessary.         Low Lubricating Oil.       Check all threaded joints and re-tighten if necessary.         Low Lubricating Oil.       Clean inside of the motor use the Lubricating Oil.         Water, dirt and debris are collected in the Oil Drip Rate from 1 to 3 drops / min.         In the Filter Regulator.       Regulator bowl.         Water, dirt and debris are collected in the Filter Negulator.       Drain meat rotate the Alf Grinder. Fluat on the south the time notor and repeatedy do this work about three times. When the improvem			air compressor output.
Image: Pressure in the ball bearings in the ball bearings.         The ball bearings have been damaged by for on Lubricating Oil.       Replace the ball bearings.         Weltor speed decrease.       The connection hose or air / oil supply hose have been damaged.       Replace the input supply and or air / oil supply hose have been damaged.         Poor connection of input supply or air / oil supply hose have been damaged.       Replace the input supply and or air / oil supply hose.         Poor connection of input supply or air / oil supply hose.       Check the Compressor, Air Circuit, and Regulator.         Low air pressure.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Cleast inside of the motor use the Lubricating Oil inectivity into the Filter / oint. Ahrewards, supply are pressure and rolate the Air Grinder. Flush into mark regulator.         Water, dirt and debris are collected in the Filter / oint. Ahrewards, supply are pressure and rolate the Air Grinder. Flush dirt in the motor and repeatedly do this work about three times. When the improvement is ont seen, return to NAKANISHI dealer service.         Jnequal motor speed lacrease.       Ubricator inclined or upside down.       Inclined or upside down.         Lubricator inclined or upside down.       Inclined or upside down.       Inclined or upside down.         Inclined or upside down.       Inclined or upside down.       Inclined or upside down.         Over filled lubricator.       Drain water filte Jubricating Oil from Reservoi			Check the Regulator and set to the correct air
Unlex an confluctuon input supply and air / of supply hose.         The ball bearings have been damaged.         The motor has been damaged by for no Lubricating Oil.         Weltor speed decrease.         The connection hose or air / oil supply hose have been damaged.         Poor connection of input supply or air / oil supply hose have been damaged.         Poor connection of input supply or air / oil supply hose have been damaged.         Low air pressure.         Regulator.         Low air pressure.         Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.         Out ubricating Oil.         No Lubricating Oil.         Viet, supply and air / oil supply hose have been damaged.         No Lubricating Oil.         Check lubricator for proper lubricant level. Set the Oil pin Rate from 1 to 3 drops / min.         No Lubricating Oil.         Viet, supply and air / oil supply oil air pressure and rotate the Air Grinder. Flush dirt in the motor onal repeated yot bin work dirt in the motor and repeated yot oils work about three times. When the improvement is not seen, return to NAKANISHI dealer service.         Water, dirt and debris are collected in the Filter Aint Anterwards, supply air pressure and rotate the Air Grinder. Flush dirt in the motor load repeated yot ohis work about three times. When the improvement is not seen, return to NAKANISHI dealer service.         Unequal motor speed levels.       D			pressure.
The ball bearings have been damaged.       Replace the ball bearings. (Return to NAKANISHI dealer service.)         The motor has been damaged by for no Lubricating Oil.       Replace the ball bearings. (Return to NAKANISHI dealer service.)         Addor speed decrease.       The connection hose or air / oil supply hose have been damaged.       Replace the input supply and or air / oil supply hoses.         Addor speed decrease.       The connection of input supply or air / oil supply hose have been damaged.       Check all threaded joints and re-tighten if necessary.         Low air pressure.       Check the Compressor, Air Circuit, and Regulator.         Low Lubricating Oil.       Check Lubricator for proper lubricant level. Set the Oil Drip Rate from 1 to 3 drops / min.         No Lubricating Oil.       Clean inside of the motor use the Lubricating Oil. Removing the Filter Joint Alterwards, supply air pressure and rotate the Air Grinder. Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service in the Filter Regulator.         Water, dirt and debris are collected in the Filter Regulator.       Drain water form Lubricating Oil reservoir and replace with clean Lubricating Oil reservoir in the spindle with Lubricating Oil threawards. Supple         Janequal motor speed lecrease.       Cutting debris has ontaminated the ball bearings, and the ball bearings are damaged.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Over filled lubricator.       Cutting			Check all connections input supply and air / of
Inter bain user leven damaged.     Replace the Janka Jackanuski Jackanuski (Return to NAKANISHI dealer service.)       Woltor speed decrease.     The connection hose or air / oil supply hose have been damaged.     Replace the input supply and or air / oil supply noses.       Poor connection of input supply or air / oil supply hose.     Check all threaded joints and re-tighten if necessary.       Low air pressure.     Check all threaded joints and re-tighten if necessary.       Low Lubricating Oil.     Check all threaded joints and re-tighten if necessary.       No Lubricating Oil.     Check the Compressor, Air Circuit, and Regulator.       Low Lubricating Oil.     Check the Compressor, Air Circuit, and Regulator.       No Lubricating Oil.     Clean inside of the motor use the Lubricating Oil. Removing the Filter Joint from Air Line Kit supply a small amount of Lubricating with work about three times. When the improvement is not seen, return to NAKANISHI dealer service.       Jnequal motor speed and motor speed lecrease.     Lubricator inclined or upside down.     Inclined or upside down.       Over filled lubricator.     Drain water from Lubricating Oil.     Inclined or upside down.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.		The hell beerings have been	Supply lose.
Until of the value of the motor is been damaged by for no Lubricating Oil.       Repair the motor. (Return to NAKANISHI dealer service.)         Wotor speed decrease.       The connection hose or air / oil supply hose have been damaged.       Replace the input supply and or air / oil supply hoses.         Poor connection of input supply of air / oil supply hose.       Check all threaded joints and re-lighten if necessary.         Low air pressure.       Check the Compressor, Air Circuit, and Regulator.         Low Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         Water, dirt and debris are collected in the Filter Ageulator.       Clean inside of the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service.         Jnequal motor speed lecrease.       Lubricator inclined or upside down.       Drain water from Lubricating Oil reservoir and replace with clean Lubricating Oil.         Over filled lubricator.       Over filled lubricator.       Drain water from Lubricating Oil meservoir to meet indicated levels. Excess lubricating will food spindle.         Vertrease.       Cutting debris has ontaminated the ball bearings.       Replace the ball bearings.         Quiting dubris has ontaminated the ball bearings.       Replace the cutting tool.		damaged	(Return to NAKANISHI dealer service.)
Interminational and the service of the spinal termination is a supply and or air / all supply hose have been damaged.       (Return to NAKANISHI dealer service.)         Intermination of the service of the input supply and or air / all supply hose have been damaged.       (Return to NAKANISHI dealer service.)         Intermination of the service of the input supply and or air / all supply hose.       (Return to NAKANISHI dealer service.)         Intermination of the service of		The motor has been damaged by	Repair the motor
Addrom speed decrease.     The connection hose or air / oil     Replace the input supply and or air / oil supply       Addrom speed decrease.     The connection hose or air / oil     Replace the input supply and or air / oil supply       Addrom speed     Poor connection of input supply or air / oil supply     Check all threaded joints and re-lighten if necessary.       Low air pressure.     Check all threaded joints and re-lighten if necessary.     Check all threaded joints and re-lighten if necessary.       Low air pressure.     Check all threaded joints and re-lighten if necessary.     Check all threaded joints and re-lighten if necessary.       Low Lubricating Oil.     Check all threaded joints and re-lighten if necessary.     Check all threaded joints and re-lighten if necessary.       Low Lubricating Oil.     Check all threaded joints and re-lighten if necessary.     Check all threaded joints and re-lighten if necessary.       Low Lubricating Oil.     Check all threaded joints and re-lighten if necessary.     Check all threaded joints and re-lighten.       No Lubricating Oil.     Clean inside of the motor use the Lubricating Oil.     Check all threaded joints and re-lighten.       Water, dirt and debris are collected in the Filter Joint. Afterwards, supply are pressure and rotate the Air Grinder Flush in to not an orpested of the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service in the price of the start and thebris faso notaminated the flush contrating Oil.		for no Lubricating Oil	(Return to NAKANISHI dealer service.)
supply hose have been damaged.       hoses is there does be don't all or object in the copy of a bit of the does provide the does be does does does does does does does doe	Motor speed decrease	The connection hose or air / oil	Replace the input supply and or air / oil supply
Poor connection of input supply or air / oil supply hose.       Check all threaded joints and re-tighten if necessary.         Low air pressure.       Check the Compressor, Air Circuit, and Regulator.         Low Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         Water, dirt and debris are collected in the Filter Regulator.       Crean inside of the motor use the Lubricating Oil directly into the Filter Joint Aftermarks, supply air pressure and rotate the Air Grinder, Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service Water in Lubricating Oil reservoir.         Water in Lubricating Oil reservoir.       Drain water, dirt and debris are collected in the Filter Regulator.         Water in Lubricating Oil reservoir.       Drain water, dirt and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service in replace with clean Lubricating Oil.         Jnequal motor speed lecrease.       Cover filled lubricator.       Drain water from Lubricating Oil room Reservoir to meet indicated levels. Excess lubricant will flood spinele.         Over filled lubricator.       Drain the Lubricating Oil room Reservoir to meet indicated levels. Excess lubricant will flood spinele.         Diverheating during otation.       Cutting debris has contaminated the ball bearings. </td <td></td> <td>supply hose have been damaged.</td> <td>hoses.</td>		supply hose have been damaged.	hoses.
air / oil supply hose.       necessary.         Low air pressure.       Check the Compressor, Air Circuit, and Regulator.         Low Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Clean inside of the motor use the Lubricating Oil. Removing the Filter Joint Afterwards, suppl air pressure and rotate the Air Contracting Oil directly into the Filter Joint Afterwards, suppl air pressure and rotate the Air Contracting Oil directly into the Filter Joint Afterwards, suppl air pressure and rotate the Air Contracting Oil directly into the Filter Joint Afterwards, suppl air pressure and rotate the Air Contracting Oil directly into the Filter Joint Afterwards, suppl air pressure and rotate the Air Contracting Oil reservoir and replace with clean Lubricating Oil.         Jnequal motor speed and motor speed lecrease.       Lubricator inclined or upside down.       Inclined or upside down.         Over filled lubricator.       Drain water from Lubricating Oil.       Drain water form Lubricating Oil.         Over filled lubricator.       Drain the Lubricating Oil.       Drain water form Air Line with Clean Lubricating Oil.         Over filled lubricator.       Drain the Lubricating Oil until upper lim below by opening the Drain Valve.       Prevening Oil.         Over filled lubricator.       Cutting debris has contaminated the ball bearings.       Replace the ball bearings.       Replace the ball bearings. <td< td=""><td></td><td>Poor connection of input supply or</td><td>Check all threaded joints and re-tighten if</td></td<>		Poor connection of input supply or	Check all threaded joints and re-tighten if
Low air pressure.       Check the Compressor, Air Circuit, and Regulator.         Low Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Check the Compressor, Air Circuit, and Regulator.         No Lubricating Oil.       Chean inside of the motor use the Lubricating Oil directly into the Filter Joint Afterwards, supply air pressure and rolate the Air Crinder, Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service in the Filter Regulator.         Water, dirt and debris are collected in the Filter Regulator.       Drain water, dirt and debris from the Filter Regulator bowl.         Water in Lubricating Oil reservoir.       Drain water from Lubricating Oil reservoir and replace with clean Lubricating Oil.         Jnequal motor speed lecrease.       Lubricator inclined or upside down.       Drain water from Lubricating Oil water from Lubricating Oil.         Over filled lubricator.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Diverheating during otation.       Cutting debris has ontaminated the ball bearings.       Replace the cutting tool.         Cutting debris has contaminated the ball bearings.       Replace the cutting tool.       Return to NAKANISHI dealer service.)         The spindle ball bearings have been damaged.       Collet		air / oil supply hose.	necessary.
Regulator.     Regulator.       Low Lubricating Oil.     Check lubricator for proper lubricant level. Set the Oil Drip Rate from 1 to 3 drops 7 min.       No Lubricating Oil.     Clean inside of the motor use the Lubricating Oil Removing the Filter Joint. Afterwards, supply air pressure and rotate the Air Orinder. Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service       Water, dirt and debris are collected in the Filter Regulator.     Drain water, dirt and debris are collected in the Filter Regulator.       Unequal motor speed and motor speed lecrease.     Lubricating Oil reservoir.     Drain water, dirt and debris are collected in the Filter Regulator.       Over filled lubricator.     Drain water, dirt and debris from the Filter Regulator.     Drain water, dirt and debris from the Filter Regulator bowl.       Unrequal motor speed lecrease.     Cover filled lubricator.     Drain water, dirt and debris from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Diverheating during et damaged.     Cutting debris has ontaminated the ball bearings.     Replace the ball bearings.       Abnormal vibration or noise during rotation.     The cutting tool shank is bent.     Replace the cutting tool.       Cutting dool sippage.     Collet is not correctly installed.     Check and clean		Low air pressure.	Check the Compressor, Air Circuit, and
Low Lubricating Oil.       Check lubricator for proper lubricant level. Set the Oil Drip Rate from 1 to 3 drops / min.         No Lubricating Oil.       Clean inside of the motor use the Lubricating Oil. Removing the Filter Joint from Air Line Kit, supply a small amount of Lubricating Oil directly into the Filter Joint. Afterwards, supply air pressure and rotate the Air Grinder. Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service Drain water, dirt and debris from the Filter Regulator.         Water, dirt and debris are collected in the Filter Regulator.       Drain water, dirt and debris from the Filter Regulator bowl.         Janequal motor speed and motor speed lecrease.       Lubricator inclined or upside down.       Inclined or upside down lubricator will flood spindle.         Over filled lubricator.       Over filled lubricator.       Drain the Lubricating Oil until upper lim below by opening the Drain Valve.         Notation.       Cutting debris has ontaminated the ball bearings. are damaged.       Replace the ball bearings. (Return to NAKANISHI dealer service.) are damaged.         Vuting tool slippage.       Collet is not correctly installed.       Check and clean the collet. Replace the cutting tool.         The collet is worn.       Replace the collet.       Replace the collet.         The collet is not correctly installed.       Check and clean the collet. Reinstall the colle and re-tighten. Check the accuracy.         The collet is worn.       Replace the collet. <td< td=""><td></td><td></td><td>Regulator.</td></td<>			Regulator.
Image: Section of the construction of the consteconstruction of the construction of the construction o		Low Lubricating Oil.	Check lubricator for proper lubricant level. Set
No Lubricating Oil.       Clean inside of the motor use the Lubricating Oil. Removing the Filter Joint. Afterwards, supply air pressure and rotate the Air Grinder. Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service in the Filter Regulator.         Water, dirt and debris are collected in the Filter Regulator.       Drain water, dirt and debris from the Filter Regulator bowl.         Jnequal motor speed and motor speed tecrease.       Lubricator inclined or upside down.       Drain water, dirt and debris from the Filter Regulator bowl.         Over filled lubricator.       Drain the Lubricating Oil reservoir and replace with clean Lubricating Oil.         Over filled lubricator.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Over filled lubricator.       Drain the Lubricating Oil until upper lim below by opening the Drain Valve.         Over filled lubricator.       The cutting tool shank is bent.         Cutting debris has ontaminated the ball bearings.       Replace the ball bearings. (Return to NAKANISHI dealer service.)         The spindle ball bearings.       Collet is not correctly installed.       Check and clean the collet. Reinstall the colle and re-tighten. Check the accuracy.         The collet is worn.       Replace the collet.       Replace the collet.         Cutting tool is bent.       Replace the collet.       Cellet is not correctly installed.         C			the Oil Drip Rate from 1 to 3 drops / min.
Oil. Removing the Filter Joint from Air Line Kit, supply a small amound of Lubricating Oil directly into the Filter Joint. Afterwards, supply air pressure and rotate the Air Grinder. Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service Drain water, dirt and debris from the Filter Regulator bowl.         Water, dirt and debris are collected in the Filter Regulator.       Drain water, dirt and debris from the Filter Regulator bowl.         Jnequal motor speed tecrease.       Lubricator inclined or upside down.       Inclined or upside down.         Over filled lubricator.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Over filled lubricator.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Over filled lubricator.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Over filled lubricator.       Drain the Lubricating Oil until upper lim below by opening the Drain Valve.         Over filled ubris has ontaminated the ball bearings.       Replace the ball bearings.         The cutting tool shank is bent.       Replace the ball bearings.         The spindle ball bearings have been damaged.       Replace the cutting tool.         Cutting tool slippage.       Collet is not correctly installed.       Check and clean the collet. Reinstall the colle and re-tighten. Check the accuracy.		No Lubricating Oil.	Clean inside of the motor use the Lubricating
Kit, supply a small amound of Lubricating Oil directly into the Filter Joint. Afterwards, supply a ir pressure and rotate the Air Grinder. Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service.         Water, dirt and debris are collected in the Filter Regulator.       Drain water, dirt and debris from the Filter Regulator bowl.         Jnequal motor speed and motor speed the corease.       Lubricating Oil reservoir.       Drain water from Lubricating Oil.         Jnequal motor speed and motor speed the crease.       Lubricator inclined or upside down.       Inclined or upside down.         Over filled lubricator.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Over filled lubricator.       Drain the Lubricating Oil until upper limbelow by opening the Drain Valve.         Replace the ball bearings.       Replace the ball bearings.         Over filled blab contaminated the ball bearings.       Replace the ball bearings.         Noting rotation.       The cutting tool shank is bent.       Replace the ball bearings.         Cutting debris has contaminated the ball bearings.       Replace the cutting tool.       Review the collet. Reinstall the colle and re-tighten. Check the accuracy.         The spindle ball bearings have been damaged.       Cutting dool is bent.       Replace the collet.         Cutting tool sibpnage.       Collet is not correctly installed. <td></td> <td></td> <td>Oil. Removing the Filter Joint from Air Line</td>			Oil. Removing the Filter Joint from Air Line
directly into the Filter Joint Afterwards, supply air pressure and rotate the Air Grinder. Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service.         Water, dirt and debris are collected in the Filter Regulator.       Drain water, dirt and debris from the Filter Regulator bowl.         Jnequal motor speed and motor speed lecrease.       Lubricator inclined or upside down.       Drain water from Lubricating Oil reservoir upside down lubricator will flood spindle with Lubricating Oil.         Over filled lubricator.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Over filled lubricator.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Over filled lubricator.       Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.         Diverheating during totation.       Cutting debris has ontaminated the ball bearings.       Replace the ball bearings.         Cutting debris has contaminated the ball bearings.       Replace the cutting tool.       Replace the cutting tool.         Cutting debris has contaminated the ball bearings.       Replace the collet.       Replace the collet.         Cutting tool slippage.       Collet is not correctly installed.       Check and clean the collet. Reinstall the colle and re-tighten. Check the accuracy.         The collet is worn.       Replace the colle			Kit, supply a small amount of Lubricating Oil
air pressure and rotate the Air Grinder. Flush dirt in the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service in the Filter Regulator.       Water, dirt and debris are collected in the Filter Regulator.     Drain water, dirt and debris from the Filter Regulator.       Water in Lubricating Oil reservoir.     Drain water from Lubricating Oil reservoir and replace with clean Lubricating Oil.       Jnequal motor speed decrease.     Lubricator inclined or upside down.     Inclined or upside down lubricator will flood spindle.       Over filled lubricator.     Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.     Drain the Lubricating Oil until upper lim below by opening the Drain Valve.       Over filled lubricator.     Replace the ball bearings.       The cutting dobris has ontaminated the ball bearings.     Replace the cutting tool.       Outing debris has contaminated the ball bearings.     Replace the cutting tool.       Cutting debris has contaminated the ball bearings.     Replace the cutting tool.       Cutting debris has contaminated the ball bearings.     Replace the cutting tool.       Cutting tool slippage.     Collet is not correctly installed.     Check and clean the collet. Reinstall the colle and re-tighten. Check the accuracy.       The collet is worn.     Replace the cutting tool.     Co			directly into the Filter Joint. Afterwards, supply
In the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service in the Filter Regulator.     In the motor and repeatedly do this work about three times. When the improvement is not seen, return to NAKANISHI dealer service in the Filter Regulator.       Water in Lubricating Oil reservoir.     Water in Lubricating Oil reservoir.     Drain water from Lubricating Oil.       Jnequal motor speed and motor speed and motor speed     Lubricator inclined or upside down.     Inclined or upside down lubricator will flood spindle with Lubricating Oil.       Over filled lubricator.     Over filled lubricator.     Drain water clubricating Oil ontil upper lim below by opening the Drain Valve.       Deverheating during otation or noise during rotation.     Cutting debris has ontaminated the ball bearings. are damaged.     Replace the ball bearings. (Return to NAKANISHI dealer service.) and re-tighten. Check the accuracy.       The cutting tool shank is bent.     Replace the cutting tool.     Cutting debris has contaminated the ball bearings. (Return to NAKANISHI dealer service.)       The spindle ball bearings.     Collet is not correctly installed.     Check and clean the collet. Reinstall the colle and re-tighten. Check the accuracy.       The collet is worn.     Replace the cutting tool.     Collet is not correctly installed.     Secure the collet. Check the accuracy.       The collet is worn.     Replace the collet.     Replace the collet.     Replace the collet.       The coll			air pressure and rotate the Air Grinder. Flush
About three times, which the improvement of NAKANISHI dealer service       Water, dirt and debris are collected in the Filter Regulator.     Drain water, dirt and debris from the Filter Regulator bowl.       Jnequal motor speed and motor speed lecrease.     Lubricator inclined or upside down.     Drain water from Lubricating Oil reservoir and replace with clean Lubricating Oil.       Over filled lubricator.     Inclined or upside down.     Inclined or upside down.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Overheating during otation.     Cutting debris has ontaminated the ball bearing, and the ball bearings are damaged.     Replace the ball bearings. (Return to NAKANISHI dealer service.)       Abnormal vibration or holse during rotation.     Cutting dool shank is bent.     Replace the cutting tool.       Cutting tool slippage.     Collet is not correctly installed.     Replace the cullet. Reinstall the colle and re-tighten. Check the accuracy.       The collet is worn.     Replace the collet.     Collet is not correctly installed.       Collet is not correctly installed.     Secure the collet.     Collet is not correctly installed.       Cutting tool is bent.     Replace the collet.     Collet is not correctly installed.     Sec			dirt in the motor and repeatedly do this work
Water, dirt and debris are collected in the Filter Regulator.     Drain water, dirt and debris from the Filter Regulator bowl.       Water in Lubricating Oil reservoir.     Drain water, dirt and debris from the Filter Regulator bowl.       JInequal motor speed and motor speed tecrease.     Lubricator inclined or upside down.     Inclined or upside down.       Over filled lubricator.     Inclined or upside down.     Inclined or upside down.       Over filled lubricator.     Drain water from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over heating during otation.     Cutting debris has ontaminated the ball bearing, and the ball bearings are damaged.     Replace the cutting tool.       Nonormal vibration or noise during rotation.     The cutting tool shank is bent.     Replace the ball bearings. (Return to NAKANISHI dealer service.)       Cutting debris has contaminated the ball bearings.     Encline and re-tighten. Check the accuracy.       The spindle ball bearings have been damaged.     Collet is not correctly installed.     Check and clean the collet. Reinstall the colle and re-tighten. Check the accuracy.       The collet is worn.     Replace the collet.     Collet is not correctly installed.       Collet is not correctly installed.     Secure the collet.     Collet is not correctly installed.			about three times. when the improvement is
Water, unt and debits are considered in the Filter Regulator.     Regulator bowl.       Water, unt and debits are considered in the Filter Regulator.     Regulator bowl.       Water in Lubricating Oil reservoir.     Drain water, our and debits		Water dirt and debris are collected	Drain water, dirt and debris from the Filter
Water in Lubricating Oil reservoir.     Drain water from Lubricating Oil reservoir and replace with clean Lubricating Oil.       Jnequal motor speed tecrease.     Lubricator inclined or upside down.     Inclined or upside down.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over half debris has ontaminated the ball bearing, and the ball bearings are damaged.     Replace the ball bearings.       Outting debris has contaminated the ball bearings.     Replace the cutting tool.       Cutting tool shank is bent.     Replace the cutting tool.       Cutting tool shank is bent.     Replace the ball bearings.       Cutting tool shank is bent.     Replace the cutting tool.       Cutting tool shank is bent.     Replace the cutting tool.       Cutting tool shark is bent.     Replace the cutting tool.       Cutting tool shark is bent.     Replace the cutting tool.       Cutting tool shark is worn.     Replace the collet. Reinstall the colle and re-tighten. Check the accuracy.       The collet is worn.     Replace the collet.       Collet is not correctly installed.     Secure the collet.       Collet is not correctly installed.     Secure the collet.		in the Filter Regulator	Pequiator bowl
Water in Cubicality On reservoir.     Drain water information Cubicating Oil.       Jnequal motor speed lecrease.     Lubricator inclined or upside down.     Inclined or upside down lubricator will flood spindle with Lubricating Oil.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Over filled lubricator.     Cutting debris has ontaminated the ball bearing, and the ball bearings are damaged.       Abnormal vibration or hoise during rotation.     The cutting tool shank is bent.     Replace the ball bearings. (Return to NAKANISHI dealer service.)       Cutting tool slippage.     Collet is not correctly installed.     Check and clean the collet. Reinstall the colle and re-tighten. Check the accuracy.       The collet is worn.     Replace the collet.     Replace the collet.       Inside of the spindle is worn.     Replace the collet.     Clean the collet and the inside of the taper an applace the collet.       Igh run-out.     Contaminants inside the collet or the spindle.     Clean the collet and the inside of the taper an applace the spindle shaft. (Return to NAKANISHI dealer service.)       Contaminants inside the collet or the spin		Water in Lubricating Oil reservoir	Prain water from Lubricating Oil reservoir and
Jnequal motor speed and motor speed jecrease.     Lubricator inclined or upside down.     Inclined or upside down lubricator will flood spindle with Lubricating Oil       Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Dverheating during totation.     Cutting debris has ontaminated the ball bearing, and the ball bearings are damaged.     Drain the Lubricating Oil until upper lim below by opening the Drain Valve.       Abnormal vibration or hoise during rotation.     The cutting tool shank is bent.     Replace the ball bearings. (Return to NAKANISHI dealer service.)       Cutting tool slippage.     Collet is not correctly installed.     Replace the collet. Reinstall the colle and re-tighten. Check the accuracy.       The collet is worn.     Replace the collet.     Collet is not correctly installed.       Fighter the collet is worn.     Replace the collet.     Collet is not correctly installed.       Goulet is not correctly installed.     Secure the collet correctly.     The collet is worn.       High run-out.     Cutting tool is bent.     Replace the collet.       Collet is not correctly installed.     Secure the collet.     Replace the collet.       The collet is worn.     Replace the collet.     Replace the collet.       Collet is not correctly installed.     Secure the collet correctly.     Replace the collet.			replace with clean Lubricating Oil reservoir and
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decrease.     Over filled lubricator.     Drain the Lubricating Oil from Reservoir to meet indicated levels. Excess lubricant will flood spindle.       Deverheating during otation.     Cutting debris has ontaminated the ball bearings, are damaged.     Replace the ball bearings.       Over filled lubricator.     The cutting tool shank is bent.     Replace the ball bearings.       Outring rotation.     The cutting tool shank is bent.     Replace the ball bearings.       Outring debris has contaminated the ball bearings.     Replace the ball bearings.     Replace the cutting tool.       Cutting debris has contaminated the ball bearings.     Replace the ball bearings.     Replace the cutting tool.       Cutting debris has contaminated the ball bearings.     Replace the cutting tool.     Replace the cutting tool.       Cutting tool slippage.     Collet is not correctly installed.     Check and clean the collet. Reinstall the colle and re-tighten. Check the accuracy.       The collet is worn.     Replace the collet.     Replace the collet.       Aligh run-out.     Cutting tool is bent.     Replace the collet.       Collet is not correctly installed.     Secure the collet.     Collet is not correctly installed.       The collet is worn.     Replace the collet.     Replace the collet.       Replace the collet correctly.     The collet is worn.     Replace the collet. </td <td>and motor speed</td> <td></td> <td>spindle with Lubricating Oil.</td>	and motor speed		spindle with Lubricating Oil.
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# 10. DISPOSAL OF THE AIR GRINDER

When disposal of an Air Grinder is necessary, follow the instructions from your local government agency for proper disposal of industrial components.

700 Shimohinata, Kanuma Tochigi 322-8666 www.nakanishi-inc.com

NSK America Corp. 1800 Global Parkway Hoffman Estates L 60192, USA www.nskamericacorp.com NSK Europe GmbH ECREP Elly-Beinhorn-Strasse 8 65760 Eschborn Germany

NSK United Kingdom Ltd. UK Authorised Repre Office 4, Gateway 1000 Arlington Business Park, Whittle Way Stevenage, SG1 2FP, UK

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