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<b>Chuck Serial Number</b>	
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<b>Revision Number</b>	1	<del>2</del>	<del>3</del>	<del>4</del>	<del>5</del>	6	7	8	9
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## ENVIRONMENTAL ASPECTS

**This chuck to be lubricated as per recommendation in the Instruction Manual. The used Grease to be disposed as per EMS Norms without affecting the environment.**

# 1. MOUNTING THE CHUCK

- 1.1) Check the location dia. and face of the machine spindle for Radial and Axial Runout using a Dial gauge. Maximum permissible Radial Runout and Axial Runout of the spindle shall not exceed by 0.005 mm.
- 1.2) Mount the chuck flange on the machine using the necessary clamping screws or the special provisions made by the manufacturers.
- 1.3) Check the flange for true running for Radial and Axial Runout and ensure that these do not exceed 0.005 mm.
- 1.4) Connect the drawtube/draw bar to the cylinder. If the drawtube/draw bar is to be fitted into the cylinder piston rod, ensure that the piston rod is retracted. If fitted at the intermediate position, the anti-rotation stop pin of the piston may be damaged.
- 1.5) Mount the Cylinder Flange on to the spindle rear side and check the flange for true running for Radial and Axial Runout and ensure that these do not exceed 0.005mm.
- 1.6) Mount the cylinder on to the cylinder flange.
- 1.7) Connect the pressure ports of the cylinder by hose.
- 1.8) Actuate the cylinder at low pressure (4-5kgf / cm<sup>2</sup>) two or three times and set the piston towards the cover end and switch off the hydraulic power.
- 1.9) Remove the cover from the chuck by removing cover clamping screws.
- 1.10) Keep the Wedge in fully declamped condition (At this position, the jaws will be fully opened).
- 1.11) Clean the chuck location diameter and hold the chuck in such a way that the collar just touches the drawtube end. Tighten the collar on to the drawtube using the special spanner provided, until the chuck sits properly on the flange face. Align the chuck clamping holes with the tapped holes provided on the chuck flange.
- 1.12) Tighten the collar with drawtube(in case of draw bar,tighten the wedge screw into the drawbar) and chuck clamping screws simultaneously till the chuck location face butts against the flange butting face.
- 1.13) True up the periphery of the chuck with the help of plastic mallet. The maximum permissible peripheral runout on chuck should be as per the chart (Table No.1 & 2).
- 1.14) Ensure there is a gap (approximately 0.5 mm) between the wedge face and body inner face by adjusting wedge screw or wedge collar.
- 1.15) Reassemble the cover.

## NOTE :

1. Ensure that the mounting of the chuck is as per schematic diagram shown (Fig. No.1).
2. Before tightening the chuck flange (Adaptor plate for mounting the chuck) with the Taper nose of the machine spindle, ensure that the clearance between the spindle face and chuck flange butting face is not more than 0.03mm.
3. Ensure that jaw clamping torque as per Table No.3 on page No.4.

4. The flatness of the face of the chuck flange after machining on the machine can have only concavity maximum 0.01mm. Convexity is not permitted. Check with the help of straight edge for blue bearing.
5. Actuate the actuator and check the jaws are moving freely.
6. Check for the jaw stroke. (Ref Table 1 & 2).

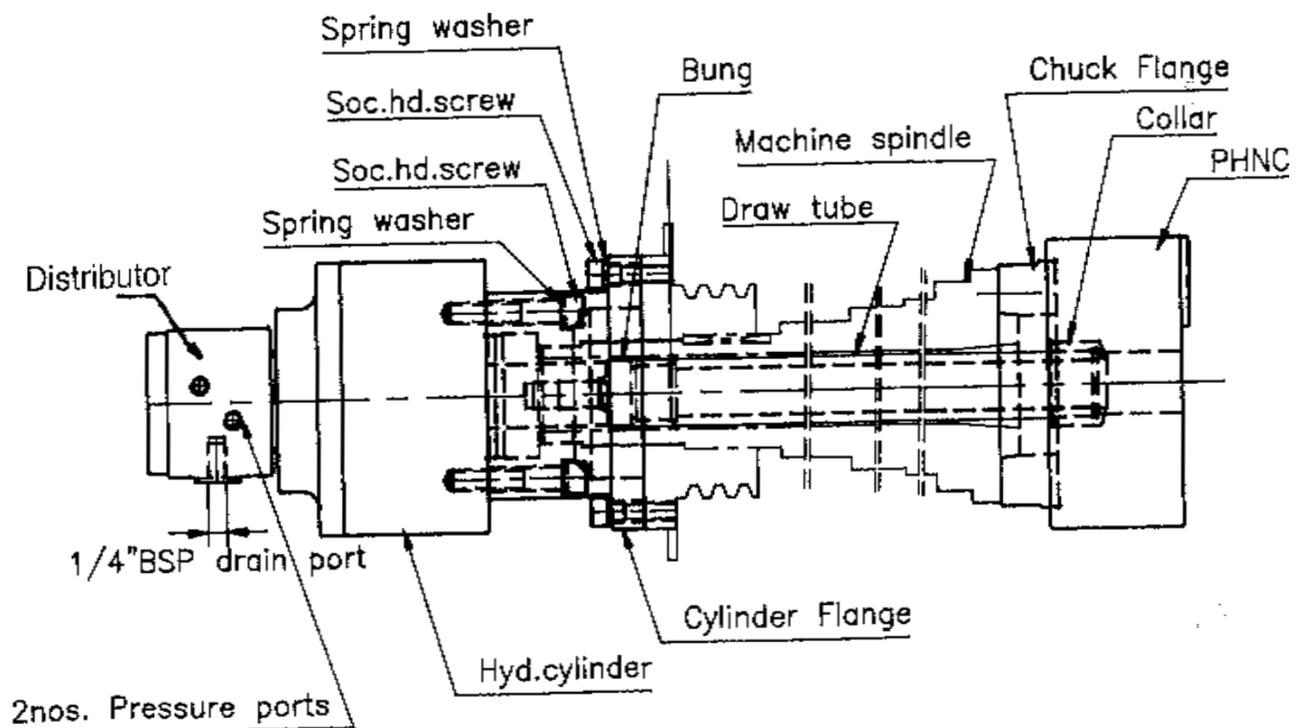
**TABLE No. 1**

Chuck size (PHNC) Ø	135	165	200	250	315	400	500
Jaw stroke in MM	2.7	3.15	5.4	5.4	5.4	8	8
Permissible Run out on Chuck OD in MM (TIR)	0.02	0.02	0.02	0.02	0.03	0.03	0.03
Maximum draw bar pull (Kgf)	1700	2000	4000	6000	6000	9000	9000

**TABLE No. 2**

Chuck size (PHNC-K) Ø	165	210	254	305			
Jaw stroke in MM	2.75	3.7	4.4	5.3			
Permissible Run out on Chuck OD in MM (TIR)	0.02	0.02	0.02	0.03			
Maximum draw bar pull (Kgf)	2200	3400	4300	5500			

**Mounting arrangement for Solid cylinder with draw bar.**



**Fig. 1**

*Note : Suitable bracket to be provided to restrict the distributor rotation.*

## 2. CHECK POINTS BEFORE RUNNING THE SPINDLE

- 2.1) The chuck should run true as stated in column 1.13. otherwise all further steps in checking would be useless and unworthy.
- 2.2) The top jaw to be tightened on the base jaw (master jaw) through the T' nut.
- 2.3) Recommended torque for Jaws screws (Ref. Table No.3) should be applied to the screws while tightening the top jaws with master jaws.
- 2.4) Check whether the hard jaws (number) are tightened to corresponding base jaw number.
- 2.5) Ensure that the clamping radius on the jaws run true if it is hard jaw.
- 2.6) The job clamping length should be in such a way that the over hanging of the job should not exceed  $1\frac{1}{2}$  times of the clamping length. (Ref. Point 4.7)
- 2.7) For checking concentricity the Test Mandrels and Test Rings should be clamped in position as shown in Fig.No.2, Recommended drawbarpull. (Refer Table 1 & 2) should be given to the chuck by setting the pressure in the power pack.

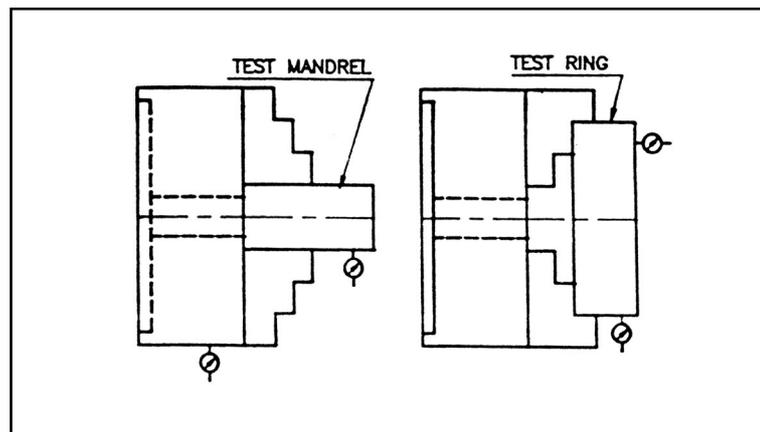


Fig No. 2

## 3. TIGHTENING TORQUE FOR CHUCK MOUNTING & TOP JAW SCREWS

TABLE : 3

SCREW SIZE	TIGHTENING TORQUE
<b>M8</b>	<b>39 NM</b>
<b>M10</b>	<b>77 NM</b>
<b>M12</b>	<b>110 NM</b>
<b>M16</b>	<b>220 NM</b>
<b>M20</b>	<b>400 NM</b>

## 4. USERS' CARE

**To achieve optimum clamping force (chucking force), better chucking accuracy and a long service life of the chuck the following care should be taken by the user.**

- 4.1) Refer Selection Chart (Page No.24 & 25) for achieving Max. draw bar pull.
- 4.2) For thin walled components the drawbar pull should be set (by varying the pressure in the power pack) only by trial and error method.
- 4.3) While chucking internal diameter of thin walled component, reduce the hydraulic pressure by less than half.
- 4.4) The maximum speed should not exceed the rated rpm mentioned in the Catalogue.
- 4.5) High speed machining with heavy cutting can cause slipping of the work piece. Therefore RPM of the CHUCK SHOULD NOT EXCEED PRESCRIBED SPEED SPECIFIED IN THE CATALOGUE.
- 4.6) The actuating Switch of the Chuck should not be actuated during Component machining.
- 4.7) Maintain the height of the jaw always less than the length of the jaw.
- 4.8) Lengthy jobs requires tailstock support as well as steady rest.
- 4.9) Lubricate the chuck once in every shift. Regarding lubrication refer the **“LUBRICATION OF THE CHUCK”**.
- 4.10) The drastic reduction of the clamping force may be due to the ingress of dust and dirt between the sliding parts and entry of coolant washes the contaminated grease from the chuck.
- 4.11) If the clamping force reduces drastically, the chuck needs service by proper cleaning and lubrication.
- 4.12) For proper cleaning and lubrication, the chuck is to be dismantled, every part is to be cleaned thoroughly with liquid paraffin or washing petrol. All inner parts are to be lubricated and the chuck should be reassembled. Refer procedure for dismantling and cleaning.. (Refer page No.13).
- 4.13) Cleaning and greasing of the inner parts, which can be done without dismantling the chuck (e.g.basejaw), is recommended when there is no sign of a film of lubrication between the moving parts (i.e. if they are dry).
- 4.14) The chuck is used to machine the material like cast iron, which are not broken into chips but as powder, needs cleaning and greasing frequently.
- 4.15) When lifting chuck (size 250mm Ø & above) use eyebolt.

To attain the full life time of the chuck (2,50,000 cycles of operation) user is advised to strictly adhere the above instructions. After that chuck may require for reconditioning.

Chuck wear is a function of lubrication and usage.

## 5. IMPORTANT NOTES & CAUTIONS

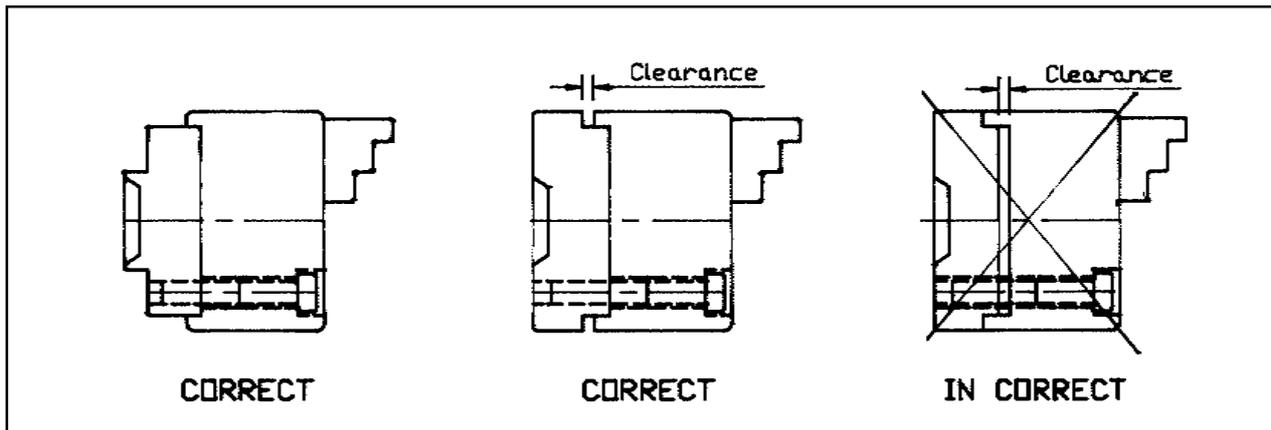


Fig No.3.

- 5.1) The chuck is not to be checked on mandrel between centres.
- 5.2) The chuck is not to be tested before it has been properly tightened with Chuck Flange.
- 5.3) The chuck should not be mounted against the outer edge (see fig No.3) of the chuck flange. Ensure face butting of the flange with the chuck location face.
- 5.4) Pipe should not be used with the allen key for tightening jaw screws.
- 5.5) Use lint - free cloth or a jet of air for cleaning wiping and drying **DO NOT USE COTTON WASTE.**
- 5.6) Clamping diameter of Spare Hard jaws or Soft jaws subsequently supplied are to be ground in the chuck for accurate concentricity.
- 5.7) Please specify chuck size, serial number and spare parts number from Fig.No.4 & 5 (as applicable) while placing order for spare parts.

## 6. LUBRICATION OF THE CHUCK

**The most common cause of chuck problem is the lack of lubrication. Not only poorly lubricated chuck wear out faster, but also it may easily become UNSAFE. Chucks can easily loose 50% of their normal gripping force, and accuracy if not properly lubricated.**

Because of the widely differing job conditions, it is difficult to recommend a standard frequency schedule for lubrication. Lubrication once a shift with grease gun can be taken as a minimum standard norm. The actual jaw force that a chuck delivers can be taken as a sure guide, when to lubricate. If the jaw force is not upto the specified level, even after lubrication, it means the chuck needs to be dismantled, cleaned and lubricated.

All GMT chucks are factory lubricated with GMT recommended grease and are ready to use. Under clean operating conditions. GMT chucks can be operated upto 10,000 cycles without dismantling & re-lubrication. However, to ensure extended service life and maximum performance, every chuck should be dismantled, cleaned and re - lubricated periodically.

The frequency of dismantling, cleaning and re-lubrication is entirely dependent upon operating conditions and can be determined by inspecting the chuck on a periodic basis during the first few weeks of operation.

Some means must be established for determining whether lubrication is required. Typically the following or combinations of the following are used for this purpose.

- a) Visual inspection for contamination, damage, or wear.
- b) Operator decide to increase the hydraulic pressure (to increase draw bar pull) to develop the required gripping force.
- c) Jaw force measurement.

However from our practical study and research regarding the above subject, we have derived the re-lubrication period and some of the few important points regarding lubrication as mentioned below which guides the maintenance engineer to get more service life of the chuck.

## **I. FREQUENCY OF LUBRICATION**

A chuck should be greased after completion of every 500 - 1000 cycles or after completion of every 8 to 16 hours of operation, whichever is earlier.

## **II. HOW AND WHERE TO LUBRICATE THE CHUCK**

By the help of GMT supplied grease gun through the grease nipples provided in all the Base jaws (Master jaws) and periphery of the chuck.

While applying grease by grease gun, make movement of master jaw for full stroke (clamping and de-clamping) to ensure uniform distribution of grease on sliding surfaces.

## **III. DISMOUNTING FREQUENCY**

A new chuck must be dismantled after completion of 5,000 to 8,000 cycles

Then periodically after completion of every 20,000 to 25,000 cycles.

If C.I. Castings are machined continuously, dismantle once in a month regardless of No. of cycles.

## **IV. WHAT TO DO FOR PERIODIC MAINTENANCE**

Dismount the chuck from the machine by adopting the procedure explained in Page No.13 in the instruction manual.

## **V. RECOMMENDED LUBRICATING PASTE**

Altemp QNB - 50 Klubber grease

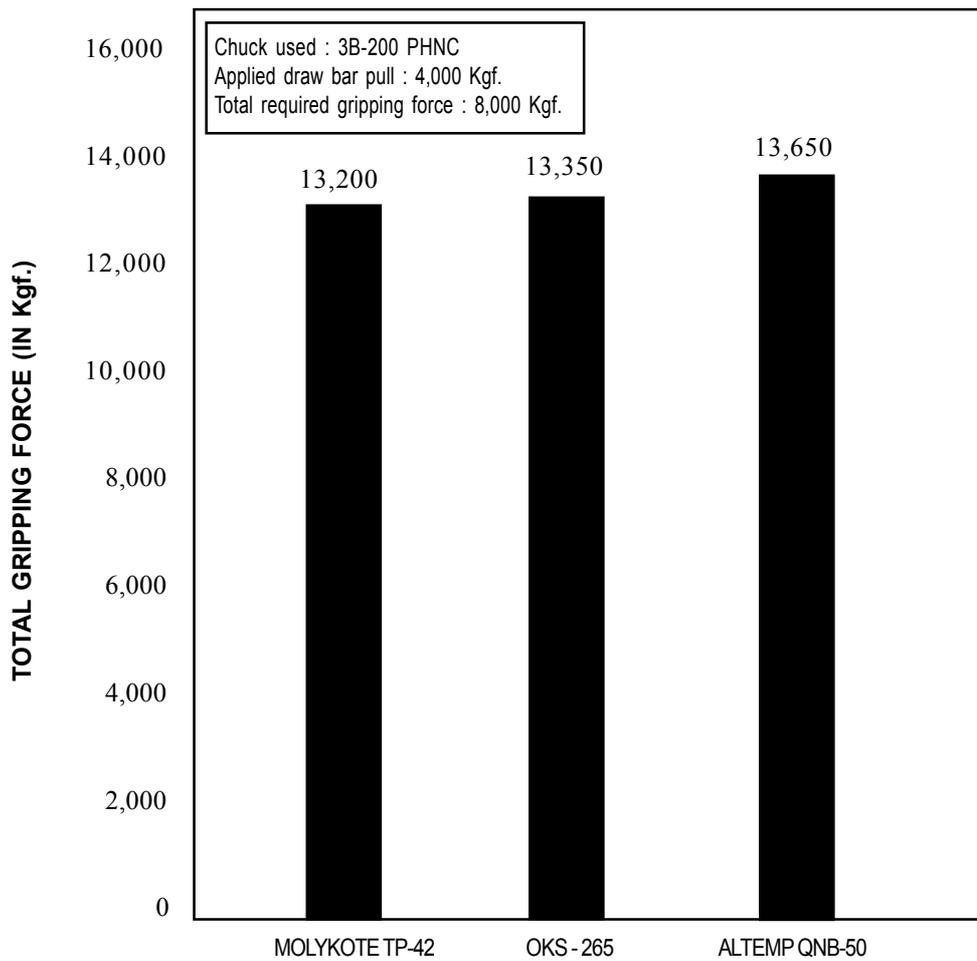
OKS - 265 White assembly grease

Moly kote TP - 42 grease

## VI MEASUREMENT OF GRIPPING FORCE

Static gripping force measured for the above mentioned lubricating grease to a specified draw bar pull of a particular chuck and obtained values are shown by means of Graphical representation as shown below.

### STATIC GRIPPING FORCE FOR DIFFERENT GREASES AT STANDARD TEST CONDITIONS



## VII . Manufacturers' / Dealers' Addresses of the lubricating Grease

### Altemp QNB - 50 Klubber Grease Distributors' Addresses

**M/S. Klubber Lubricants (Pvt.) Ltd.**, 504, Novbharat Estates, Zakaria Bunder Road, Sewri (West) Mumbai - 400 015  
Phone: 022-4166109, Fax 022-4147319.

**M/s. Bharat Enterprises**, 9/192, Pushpkunj, Station Road, Wadala, Mumbai - 400 031  
Phone: 022-24160295 / 24124614, Fax: 022-24145475

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### OKS - 265 Grease Manufacturers' and Distributors Addresses

- TAMILNADU**  
**M/s. Siva Technical Services Pvt. Ltd.** No.645, I Floor, MTH Road, Mannurpet, Chennai - 600 050.  
Contact Person: Mr. Sivaraj, Phone Off. 044-42077910, Mobile: 9840351997, Fax: 044-42039026.  
**M/s. Bey Marketing Enterprise**, AK,-26/3, 7th Street, XI Main Road, Anna Nagar, Chennai - 600 040.  
Contact Person: Mr. Sivakumar, Phone Off. 044 26221273 / 42171853, Mobile: 9940150581, Fax: 044-26221273  
**M/s. Bharath Polymers & Machines**, 44-A, Senguptha Street, Ramnagar, Coimbatore -641 009.  
Contact Person: Mr. Sudhakar, Phone: Off. 0422-2231798 / 4380803, Mobile: 9443331076. Fax :0422 - 2230407  
**M/s. VRP Marketing**, No. 185, Nehru Street, Ramnagar, Coimbatore - 641 009.  
Contact Person: Mr. Venkatesh, Phone: Off. 0422-4379131, Mobile: 9364161131, Fax: 2233131.  
**M/s. Balaji Enterprises**, KG Towers, 37, Kovai Road, Karur - 639 002.  
Contact Person: Mr. Palaniappan, Phone: Off. 0432-4231528, Mobile: 09443364129, Fax: 0432-231528.
- PONDICHERY**  
**M/s. Venus Engineering**, No.3, Vinayagar Koil Street, Kamaraj Nagar, Pondicherry - 605 011.  
Contact Person: Mr. Elangovan, Phone: Off. 0413-2214385, Mobile: 9443268529.
- ANDHRA PRADESH**  
**M/s. Deraz Engineers**, 6-3-1177/90, BS Maktha, Begumpet, Hyderabad - 500 016.  
Contact Person: Mr. Abdul Razak, Phone: Off. 040-23402442 / 23406843, Mobile: 09848025361, Fax: 040-23412165.  
**M/s. Deraz Engineers**, P-2, Navrang Apartments, Khanna Nagar, Vijayawada 520 010.  
Contact Person: Mr. Abdul Razak, Telefax: 0866-2488330, Mobile: 09848025361.
- KARNATAKA**  
**M/s. Advance Engineering**, 75, Ranoji Rao Road, Mohammeden Block, Basavanagudi, Bangalore - 560 004.  
Contact Person: Mr. Murtaza, Phone: Off. 080-41325090, Mobile: 9845178016, Fax: 080-41325090.
- MAHARASHTRA**  
**M/s. Siddharth Trading Company**, 106, Ashok Ind. Estate, L B S Marg, Next to Navnit Motors, Gokul Nagar, Thane - 400 601.  
Contact Person: Mr. Ghosh, Phone: Off: 022 21723544 / 21721160, Mobile: 9821415402, Fax: 022 21720069.  
**M/s. Techno Trade**, 691/2A-B, Satara Road, Near D'Mello Petrol Pump, Pune - 411 037.  
Contact Person: Mr. Kishore H Mungale, Phone: Off: 020 24212171 / 72 / 73, Mobile: 9822790821, Fax: 020 24212174.  
**M/s. Datta Enterprise**, Gurukripa, Behind Rahul Apartment, Maniknagar, Station Road, Ahmednagar - 414 001.  
Contact Person: Mr. Anil Malve, Phone: Off: 0241 2429685 / 2429686, Mobile: 9325100476, Fax: 0241 2429687.  
**M/s. Mayuresh Enterprises**, Plot No: X-125, Hotel Vrindavan Garden Complex, Bajaj Nagar, MIDC, Waluj, Aurangabad - 431136.  
Contact Person: Mr. Sridhar Gaikwad, Phone: Off: 0240 3296309 / 2554892, Mobile: 9326611989.  
**M/s. SS Sales Corporation**, 334, SICOF Ltd, Plot No: 69, MIDC, Satpur, Nasik - 422 007.  
Contact Person: Mr. Sachin Jadhav, Phone: Off: 0253 3042323, 6609073, Mobile: 9371179007.  
**M/s. Rathe Enterprises**, 12, Avtar Meherbaba Society, RTO Square, Nagpur - 440 010.  
Contact Person: Mr. Aalok Rathi, Phone: Off: 0712 253582.  
**M/s. Gayatri Plastics**, Opp to Deccan Coop Spinning Mills Road, Jawaharnagar, Lchalkaranji, Kolhapur - 416 115.  
Contact Person: Mr. Dayama, Phone: Off: 0230 2440765 / 2440838, Mobile: 9422045638.
- DELHI**  
**M/s. ECS Corporation**, B-31, Ansal Chambers - 1, 3, Bhikaji Cama Place, New Delhi - 110 066.  
Contact Person: Mr. Prem Nath, Phone: Off: 011 26179188 / 26179308, Fax: 011 26179188.
- HARYANA**  
**M/s. Multi Weld**, 313-314, Apna Bazar, Gurgaon - 122 001.  
Contact Person: Mr. Dilip Kumar, Phone: Off: 0124 2300543 / 2325969, Mobile: 9810304758, Fax: 0124 2300543.
- GUJARAT**  
**M/s. Endeavour**, 25/34, New Jagnath Plot, Rajkot - 360 001.  
Contact Person: Mr. Anish Chandarana, Phone: Off: 0281 2460162 / 2467521, Mobile: 09898227078, Fax: 0281 2465430.  
**M/s. Electrolube Solutions Private Ltd**, GF/41, RC Dutt Road, Windsor Plaza, Alkapuri, Baroda - 390 005.  
Contact Person: Mr. Tejas Shah, Phone: Off: 0265 2333211 / 2325733, Mobile: 09824516476.  
**M/s. Diagonal Engineering Company**, 2, F/F, Devshruti Complex, Near Medisurge Hospital, Mithakhali, Ahmedabad - 380 006.  
Contact Person: Mr. Pareesh Soni, Phone: Off: 079 26464087, Mobile: 09366667487, Fax: 079 26464087.
- UTTAR PRADESH**  
**M/s. Guptha Trade Links**, A 26, Sector 35, Gautambuth Nagar, Noida - 201 303.  
Contact Person: Mr. Alok Guptha, Phone: Off: 0120 2505814 / 2505815, Mobile: 9810009641.  
**M/s. Nitin Agencies**, 1, Novelty Commercial Complex, 77/151 A, Latouche Road, Kanpur - 208 001.  
Contact Person: Mr. Nitin Agarwal, Phone: Off: 0512 2353895, Mobile: 9839031166, 9935931166.
- WEST BENGAL**  
**M/s. Hydrochem Product India Pvt Ltd**, 20 B, British India Street, III Floor, Suite No: 3 B, Kolkatta - 700 069.  
Contact Person: Mr. R.K. Choudry, Phone: Off: 033 22483174 / 22484738, Mobile: 09830237336.  
**M/s. Kalinga Enterprises**, Plant Site Road, Rourkela - 769 001.  
Contact Person: Mr. Sohanlal Jain, Phone: Mobile: 943704906.
- JHARKAND**  
**M/s. Apex Marketing**, 3/5, H.S. Tower, 3rd Floor, L Road, Bistupur, Jamshedpur - 831 001.  
Contact Person: Mr. S. Das, Phone: Off: 0657 2423653 / 2422814, Mobile: 09234600624, Fax: 0657 2422814.

<b>UTTRANCHAL</b>	<b>M/s. Multi Weld</b> , Sidcul Road, Transit Camp, Rudrapur - Uttarkhand. Contact Person: Mr. Dilip Kumar, Phone: Mobile: 9810304758.
<b>RAJASTHAN</b>	<b>M/s. Aditya Enterprises</b> , Plot No: 242, The Paradise, Opp Agarwal Dharmshala, Hiranmagri, Sec - 11, Udaipur - 313 001. Contact Person: Mr. Kandarov Soni, Phone: Off: 0294 2486418 / 3290935, Mobile: 9351300913. <b>M/s. Vishal Enterprises</b> , 6, Jain Gurukul, Station Road, Chittorgarh - 312 001. Contact Person: Mr. Prabhjot Singh, Phone: Mobile: 9413315681 - 2, Telefax: 0132 240672.
<b>PUNJAB</b>	<b>M/s. Compaq Technologies India Ltd</b> , I Floor, Roshan Market, Millerganj GT Road, Ludhiana - 141 003. Contact Person: Mr. Sunil Bansal, Phone: Off: 0161 2532767 / 2539493, Mobile: 09815510062.

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### Molykote TP 42 Grease Distributors' Addresses

<b>TAMIL NADU</b>	<b>M/s. 4P International Pvt Ltd</b> , Indian Chamber Building, III Floor, 6, Esplanade, Chennai - 600 108. Contact Person: Mr. P. Nagarajan - 98410 20682, Mr. B. Siva Prasad - 98410 20683, Mr. Narasimhulu - 98410 20684. - Phone: Off: 044 25331110 / 25331112, Fax: 044 25332176. <b>M/s. 4P International Pvt Ltd.</b> , Coimbatore. Contact Person: Mr. A.P. Tulasiram, Phone: Mobile: 98414 20688. <b>M/s. 4P International Pvt Ltd.</b> , Trichy. Contact Person: Mr. Balasubramaniam, Phone: Mobile: 98410 20864. <b>M/s. 4P International Pvt Ltd.</b> , Madurai. Contact Person: Mr. Manoharan, Phone: Mobile: 98414 20683. <b>M/s. Caretex Engineering</b> , 1, Nehru Street, Opp Tirupur Textiles Ltd, Peelamedu, Coimbatore - 641 004. Contact Person: Mr. Subramaniam, Phone: Off: 0422 592971.
<b>ANDHRA PRADESH</b>	<b>M/s. 4P International Pvt Ltd</b> , Hyderabad. Contact Person: Mr. M.S. Murthy, Phone: Off: 040 27748077, Mobile: 98490 66674. <b>M/s. Prabha Trade Impex Pvt Ltd.</b> , 8-2/469/11 Road 5, Banjara Hills, Hyderabad - 500 034. Contact Person: Mr. B. Ramesh, Phone: Off: 040 23353464 / 23356890. <b>M/s. Project Sales Corporation</b> , 28, Founta Plaza, I Floor, Suryabagh, Visakhapatnam - 530 020. Contact Person: Mr. Satish Agarwal, Phone: Off: 0891 596482.
<b>KARNATAKA</b>	<b>M/s. Caravan Oil Suppliers</b> , 13, H. Siddiah Road, (Opp to Lions Eye Hospital), Bangalore - 560 002. Contact Person: Mr. Sanjah Asher, Phone: Off: 080 22224332, Fax: 080 22229411.
<b>MAHARASHTRA</b>	<b>M/s. Jineshwar Traders</b> , 84, V.V. Chandan Street, 1st Floor, Mumbai - 400 003. Contact Person: Mr. Naresh Sanghvi, Phone: Off: 022 23438154. <b>M/s. RMM &amp; Associates</b> , Suraju Kunj, D-32, Magha Sector, CIDCO, Nasik - 422 009. Contact Person: Mr. Ramesh Malu, Phone: Off: 0253 392759. <b>M/s. Sanjay Enterprises</b> , 8/2/2, Near Sapkale Vasti, Tathwade, Tal - Mulshi Dist., Pune - 411 033. Contact Person: Mr. Prasad Jakhotia, Phone: Off: 020 4104084.
<b>MADHYA PRADESH</b>	<b>M/s. S.P. Enterprises</b> , Unit No.1 & 2, Plot No. G/6/D, Pologound Industrial Area, Indore - 452 015. Contact Person: Mr. S.N. Patwardhan, Phone: Off: 0731 2423670 / 2422473.
<b>DELHI</b>	<b>M/s. Emem Enterprises</b> , BFH 108, Shalimar Bagh (West), New Delhi - 110 052. Contact Person: Mr. Mulchandani, Phone: Off: 011 7484603. <b>M/s. Jivika Enterprises</b> , 10A/UA, Jawahar Nagar, Delhi - 110 007. Contact Person: Mr. Jitendra Kalra, Phone: Off: 011 3914073. <b>M/s. Vishwas Enterprises</b> , C-40, Manak Vihar Extn, Subash Nagar, Delhi - 110 018. Contact Person: Mr. Chandan Kohli, Phone: Off: 011 25122839.
<b>HARYANA</b>	<b>M/s. Vats Associates</b> , 498, Sector 9, Faridabad - 121 006. Contact Person: Mr. Shekhar Vats, Phone: Mobile: 9811319418.
<b>GUJARAT</b>	<b>M/s. Ekon Abrasives</b> , A-147, Patel Super Market, Bharuch - 392 001. Contact Person: Mr. Ketan Patel / Mr. Ketul Parikh, Phone: Off: 02642 240843 / 260532 / 251556. <b>M/s. Janki Industrial Marketing</b> , 1, Harisiddh Chambers, 1st Floor, Ashram Road, Ahmedabad - 380 014. Contact Person: Mr. Girish Patel, Phone: Off: 079 7542523. <b>M/s. Mehta Enterprises</b> , Chandralaya, Chandi Bazar, Jamnagar - 361 001. Contact Person: Mr. Mukesh Mehta, Phone: Off: 0288 2678023. <b>M/s. Noble Agencies</b> , Prestige, Opp. Bank Of India, Race Course, Vadodara - 390 007. Contact Person: Mr. Rajan Shah, Phone: Off: 0256 2340310.
<b>U.P.</b>	<b>M/s. Ajay Industrial Corporation</b> , 78/46, Capital Chamber, La Touche Road, Kanpur - 208 001. Contact Person: Mr. Vinit Jain, Phone: Off: 0512 365130.
<b>W.B.</b>	<b>M/s. East &amp; West Agencies Pvt Ltd</b> , 7/A, Lala Lajapatrai Sarani, 1st Floor, Kolkata - 700 020. Contact Person: Mr. Arun J.Shethia, Phone: Off: 033 22832011.
<b>J.</b>	<b>M/s. Srisarada Technical Services</b> , Globe Centre Complex, Mango Chowk, Jamshedpur - 831 012. Contact Person: Mr. Pandey / Mr. C.R. Jana, Phone: Off: 0657 2362007.

## **7. THE FACTORS CONTRIBUTE TO THE FASTER WEAR OF THE BASE JAWS AND ITS GUIDE WAYS (BODY SLOTS)**

- 7.1) Lubricate the chuck daily (every 8 - 16 hours). Use only recommended grease to achieve the desired gripping force.
- 7.2) Dismount the chuck periodically, clean carefully, check the condition of the contact surfaces also grease passages. If the passages are clogged clean the same by using high pressure air. Reassemble the chuck with fresh grease.
- 7.3) Clamping force loss may be due to the following:
  - 3.1 Ingress of dust and dirt between the sliding parts.
  - 3.2 Entry of coolant washes the contaminated grease from the chuck.
- 7.4) Generally the chuck is used for machining cast iron components, which are not broken to chips but as powder. Therefore the chuck needs cleaning and greasing frequently. If cast iron components and components made of forgings are machined frequently. Clean the chuck once a month regardless of number of cycles of operation.
- 7.5) While machining long shaft ensure that, the same is supported on tail stock centre as well as a steady rest.
- 7.6) Maintain height of the top jaws viz. hard / soft always less than the length of the master jaw.
- 7.7) While using special jaws if the weight of the jaw is more, due to centrifugal action the wear pattern between master jaw and body slot will also increase. Therefore, avoid using jaws with excess weight.
- 7.8) Ensure that the component is always clamped in the middle of jaw stroke.
- 7.9) Recommended torque for jaw screws (Ref. Table No.3) should be applied while tightening the top jaws with master jaws. Use screws of reputed make only. Length of screw should be as per GMT standard.. If long screws are used top jaw will not be clamped with master jaw, as the clamping screw will rest at the bottom face of master jaw T-slot. This will result in master jaw breakage.
- 7.10) Do not use chuck without the front cover, dust and chips will enter chuck mechanism & the movement of master jaw will be tight.

### **SPECIAL INSTRUCTION:**

THE CHUCK RPM SHOULD NOT EXCEED MORE THAN PRESCRIBED SPEED SPECIFIED.  
(max. RPM engraved on the chuck body face)

## 8. SPARE PARTS LIST - PHNC

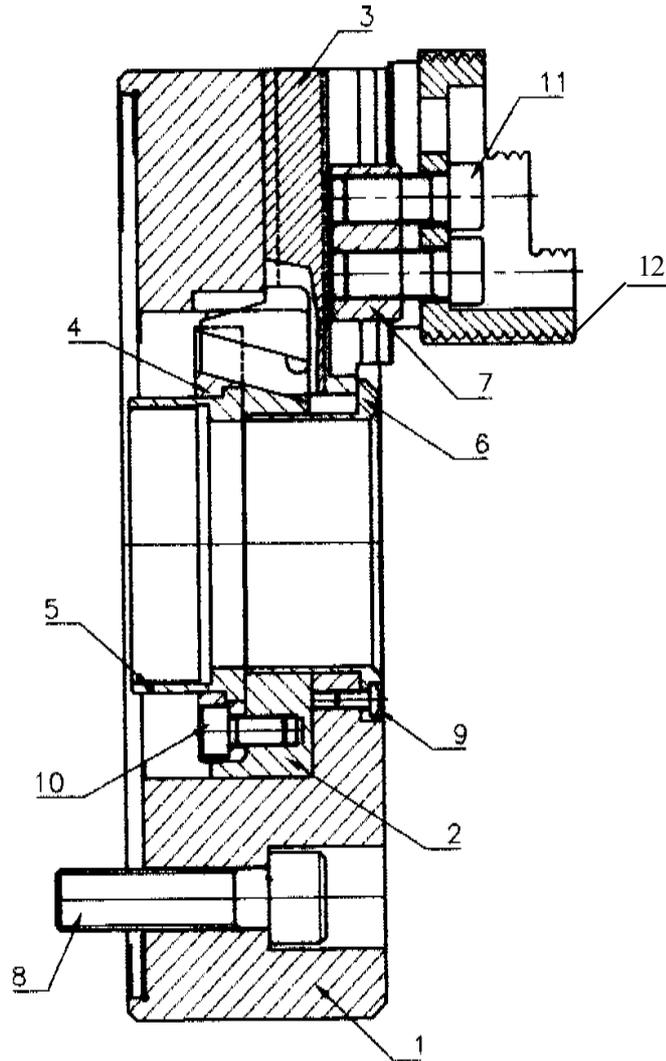


Fig. 4

- |  |                          |
|--|--------------------------|
| 1. BODY<br>(Will not be supplied as spare) | 6. COVER                 |
| 2. WEDGE                                   | 7. T'NUT                 |
| 3. BASE JAW                                | 8. CHUCK CLAMPING SCREW  |
| 4. WEDGE ADAPTOR                           | 9. COVER CLAMPING SCREW  |
| 5. COLLAR                                  | 10. WEDGE ADAPTOR SCREW  |
|  | 11. JAW CLAMPING SCREW   |
|  | 12. HARD JAW             |
|  | 13. SOFT JAW (NOT SHOWN) |

## 9. DISMANTLING AND CLEANING PROCEDURE - PHNC

### Ref. Fig No.4

9.1) Remove the hard jaws / soft jaws from the base jaws (3) by loosening the socket head screws (11) along with the T' Nuts (7)

9.2) Remove the cover (6) with cover adaptor (if available) from the chuck.

9.3) Loosen the chuck clamping screws (8)

Which are used for mounting the chuck on the flange. Do not loosen the screw fully. 2 or 3 threads must be engaged with flange.

9.4) Ensure that a wooden plank is placed below the chuck on the guide ways of the lathe.

9.5) Using the special spanner (Provided along with chuck), rotate the collar (5) till the drawtube is completely disengaged. If it is special execution chuck, then using the allenkey (provided with the chuck) loosen the wedge screw till it disengages from the draw bar.

9.6) Then loosen the chuck clamping screws fully from the flange, so that the chuck comes out from the flange.

**NOTE : DO NOT LOOSEN THE COLLAR OR WEDGE SCREW WITHOUT LOOSENING THE CHUCK CLAMPING SCREWS.**

9.7) After removing the chuck from the machine spindle, keep it in a table and pull out the wedge (2) along with wedge adaptor (4) and collar (5)

9.8) Push the base jaw towards the wedge bore of the chuck and remove them.

**NOTE : DO NOT HAMMER THE BASE JAWS WITH STEEL. ALWAYS USE ALUMINIUM OR PLASTIC MALLETT.**

9.9) Remove the screwed grease nipple from the base jaws, and then clean the lubrication hole with a jet of air.

9.10) Clean all the components in kerosene to remove all the metal dusts, grease and rust.

9.11) Dry all the parts with compressed air or wipe with lint - free cloth.

9.12) Remove any dent marks on the location diameter and sliding surfaces in the chuck body with oilstone only.

9.13) Apply fresh grease on all sliding surface.

9.14) Insert all the base jaws in the respective slots in the body.

9.15) Slide the wedge along with wedge adaptor and collar in by tapping slightly.

9.16) Ensure that the base jaw slots are in line with the slides of the wedge.

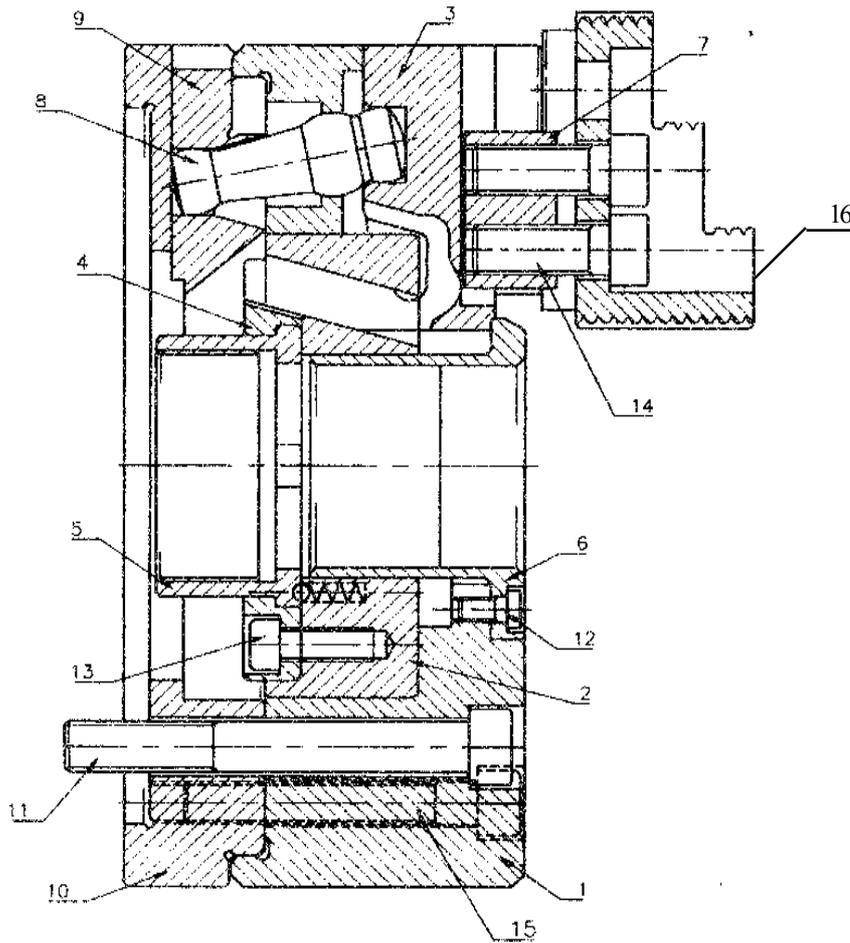
9.17) Mount the chuck again on the machine spindle as per the instruction given in Mounting of the chuck.

9.18) Slide the T' Nuts in the base jaws along with Hard Jaw / Soft jaw.

9.19) Ensure that the hard jaw is mounted on the corresponding number of base jaw, which is mounted on the corresponding number of slot in the body. **THESE SHOULD NOT BE INTERCHANGED.**

9.20) Ensure the hard jaw clamping screws are tightened to the tightening torque given in the Table 3.

## 10. SPARE PARTS LIST - PHCNC



**Fig. No. 5**

- |   |  |
|---|--|
| 1. <b>BODY</b><br>(Will not be supplied as spare) | 9. <b>COUNTER WEIGHT</b>               |
| 2. <b>WEDGE</b>                                   | 10. <b>BACK PLATE</b>                  |
| 3. <b>BASE JAW</b>                                | 11. <b>CHUCK CLAMPING SCREW</b>        |
| 4. <b>WEDGE ADAPTOR</b>                           | 12. <b>COVER CLAMPING SCREW</b>        |
| 5. <b>COLLAR</b>                                  | 13. <b>WEDGE ADAPTOR SCREW</b>         |
| 6. <b>COVER</b>                                   | 14. <b>JAW CLAMPING SCREW</b>          |
| 7. <b>T'NUT</b>                                   | 15. <b>BACK PLATE TIGHTENING SCREW</b> |
| 8. <b>LEVER</b>                                   | 16. <b>HARD JAW</b>                    |
|   | 17. <b>SOFT JAW (NOT SHOWN)</b>        |

# 11. DISMANTLING AND CLEANING PROCEDURE - PHCNC

## Ref Fig No.5

- 11.1) Remove the hard jaws / soft jaws from the base jaws (3) by loosening the socket head screws (14) along with the T' Nuts (7)
- 11.2) Remove the cover (6) with cover adaptor ( if available) from the chuck.
- 11.3) Loosen the chuck clamping screws (11) which are used for mounting the chuck on the flange. Do not loosen the screw fully 2 or 3 threads must be engaged with flange.
- 11.4) Ensure that a wooden plank is placed below the chuck on the guide ways of the lathe.
- 11.5) Using the special spanner (provided along with chuck), rotate the collar (5) till the draw tube is completely disengaged. If it is special execution chuck, then using the allenkey (provided with the chuck) loosen the wedge screw till it disengages from the draw bar.
- 11.6) Then loosen the chuck clamping screws fully from the flange, so that the chuck comes out from the flange.

**NOTE : DO NOT LOOSEN THE COLLAR OR WEDGE SCREW WITH OUT LOOSENING THE CHUCK CLAMPING SCREWS.**

- 11.7) After removing the chuck from the machine spindle, keep it on a table and remove the socket head screws (15) connecting the body and back plate.
- 11.8) Now remove the back plate from the chuck body.
- 11.9) Pull out the wedge (2) along with wedge adaptor (4) and collar (5).
- 11.10) Remove the counter weight (9) and lever (8) by pulling them from the body.
- 11.11) Push the base jaw towards the wedge bore of the chuck and remove them.

**NOTE : DO NOT HAMMER THE BASE JAWS WITH STEEL. ALWAYS USE ALUMINIUM OR PLASTIC MALLETT.**

- 11.12) Remove the screwed grease nipple from the base jaws, and then clean the lubrication hole with a jet of air.
- 11.13) Clean all the components in kerosene to remove all the metal dusts, grease and rust.
- 11.14) Dry all the parts with compressed air or wipe with lint - free cloth.
- 11.15) Remove any dent marks on the location diameter and sliding surfaces in the chuck body and back plate with oilstone only.
- 11.16) Apply fresh grease on all sliding surfaces.
- 11.17) Insert all the base jaws in the respective slots in the body.
- 11.18) Slide the wedge along with wedge adaptor and collar in by tapping slightly.
- 11.19) Ensure that the base jaw slots are in line with the slides of the wedge.

- 11.20) Put back the lever in the hole provided in the body and engage the lever with base jaw.
- 11.21) Put back the counter weight in the lever.
- 11.22) Put back the back plate in the body and ensure the counter weights are properly guided in the slot provided in the back plate. Tighten the back plate with body.
- 11.23) Mount the chuck again on the machine spindle as per the instruction given in Mounting of the chuck. (Refer page No.3)
- 11.24) Slide the T’Nuts in the base jaws along with Hard jaw / Soft jaw.
- 11.25) Ensure that the hard jaw is mounted on the corresponding number of base jaw, which is mounted on the corresponding number of slot in the body. **THESE SHOULD NOT BE INTERCHANGED.**
- 11.26) Ensure the hard jaw clamping screws are tightened to the tightening torque given in the Table-3.

## 12. TROUBLE SHOOTING GUIDE

S.No.	Problem	Cause	Remedy
1.	The chuck does not work	Alarm signal in the operation system of the machine that could stop the operation of the controls.	Check the operation system for electrical circuit for proper functioning.
		Improper functioning of Hydraulic system which does not deliver the required pressure.	<ol style="list-style-type: none"> <li>1. Check the oil level.</li> <li>2. Check the Hydraulic pump for Proper functioning.</li> <li>3. Check the filters for any dirt and clog.</li> <li>4. Check the function of solenoid valves for smooth operation without any jamming.</li> <li>5. Check the pressure hoses for proper connection.</li> </ol>
		Loosening of Drawbar/Draw Tube	Do the correct adjustments using appropriate special spanners / Allen key supplied along with the chuck.
		Excess length of Drawbar / Draw Tube.	Calculate the correct length, assemble and remount the chuck.
2.	Master jaw does not move.	Chuck is dirty and lot of burrs and chips are gone inside the guide ways and clogged.	Remove the chuck from the machine. Dismantle, clean and do the periodic maintenance.
		Internal part of the chuck are broken or got jammed.	Replace the broken parts and carry out maintenance task.
3.	Excessive vibration during running	Rotation of the chuck is not true. There is a peripheral runout on chuck body beyond the permissible value.	True up the body of the chuck within permissible value as specified.
		The top jaws (Soft jaws) used for holding the work piece or component are not symmetric with the rotation axis and therefore cause imbalance.	Balance the chuck with the holding jaws and the work piece in clamped condition.
		Draw tube / draw bar should be out of centre or out of alignment.	Check and do the necessary to avoid misalignment of draw bar / Draw tube.
4.	Vibration observed when the work piece is in clamped condition.	Bending of the Draw bar / Draw tube which undergoes and axial stop.	Guide the draw bar / Draw tube radially on to Bronze bush bearings.
5.	Vibration observed even after addressing the problem No.(3) & (4)	Improper Adaptor plates (Chuck flange) cylinder flange & other adaptation if provided for mounting of chuck.	Check for geometrical accuracies and balance it.
6.	The Base jaws do not complete their full stroke or insufficient Base jaws stroke.	<p>Too much swarf in the chuck. Draw tube / Draw bar is slack.</p> <p>Internal parts of the chuck broken or jammed.</p>	<p>Dismantle and clean the chuck.</p> <p>Remove and tighten the Draw tube / Draw bar.</p> <p>Replace the broken parts and carry out maintenance.</p>

7.	There is an excessive clearance in the Base jaws which results play in Radial and axial directions (Radial float & Axial float)	Feature of the chuck happened due to wear & tear of the sliding parts subject to heavy load under stringent cutting condition of various materials.	The rate of wear & tear of the Base jaws can be reduced or minimized by adopting regular maintenance in the way of cleaning and lubricating the chuck with recommended Grease. Any how a radial clearance of 0.15mm to 0.25mm is normal and is a feature of the chuck with inclined surfaces. Chuck with Base Jaw play beyond the limit to be sent to reconditioning.
8.	Movement of Base jaws too much slow and noisy.	Insufficient hydraulic pressure. Lower tank capacity. Clogged filter.	Correct the Hydraulic system.
		Improper functioning of Hydraulic cylinder.	Carry out Maintenance work by adhering the instruction manual of the Hydraulic cylinder.
		Excessive tightening of top jaw mounting screws.	Tighten the screws to specified tightening torque.
		Serration of the top jaws not matching with Base Jaws.	Match the right top jaws to the Base jaw serrations.
		Serration of the top jaws not square with respect to its 'T - Nut' guiding slot which in turn deform the base jaws.	Use correct Top jaws.
		Damaged or worn out "T" nuts will deform the Base jaws.	Use correct "T" nuts of G.M.T. make.
		Top jaw mounting screws are too long and push against the bottom of the "T" slot, will deform the Base jaw.	Use correct length screws for tightening.
		Improper mounting of chuck by using incorrect chuck flange (Adaptor) and axial reference of the chuck is made on the external outer edge instead of on the internal surface of the chuck.	Modify the chuck flange with permitted geometric accuracy (Flatness, concentricity, radial runout & Face runout) and make the axial reference of the chuck correctly.
Inadequate lubrication, chuck is very dirty and too much swarf inside the chuck.	Lubricate regularly and follow maintenance instruction.		
9.	Workpiece slippage	Insufficient master jaw stroke.	Realign Top jaw so that it is in area of stroke center.
		Insufficient chucking force.	Check is hydraulic pressure setting has been reached.
		Formed dia of the top jaws does not match workpiece dia.	Reform top jaw using correct Jaw boring techniques.
		Cutting forces too high.	Calculate cutting force & check against chuck specifications.
		Lack of lubrication on master jaw and moving parts.	lubricate from grease nipple and perform chucking operations of jaws several times without workpiece in chuck.
		Speed is excessively high.	Reduce Speed levels to obtain necessary chucking force.

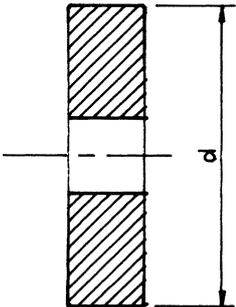
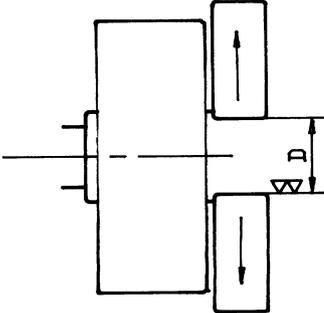
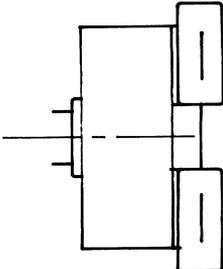
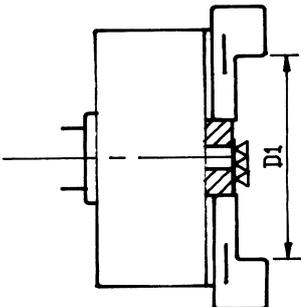
10	Poor accuracy (Concentricity, Repeatability Errors)	The guide ways of the internal parts of the chuck could be worn out because of excessive deformation during gripping of various components.	Dismount the chuck, clean all the parts and check the clearance if necessary, Recondition the same or replace the chuck with a new one.
		Form of top jaw wrong shape for component / workpiece.	Check whether the forming ring or plug is parallel and opposite to each other. Check the forming ring for parallelity with respect to chuck surface.
			Check whether the forming plug is deformed due to clamping force.
			Check Hydraulic pressure during clamping.
			Check the surface roughness (Finish) of forming plug and Bored top jaws during forming.
		Excessive top jaw deformation caused because of excess length of top jaw tightening screws as well as over tightening.	Use corect size screws and tighten the screws to the specified torque.
		Excessive height of top jaws beyond the standard top jaws recommended by the chuck manufacturer.	Reduce the height of top jaws. Use always standard top jaws.
		Too much chucking force deformed the component.	Reduce the chucking force to the optimum level. So that it never deforms the work piece after machining.
Chuck has runout on periphery and face.	Correct the Radial and Axial runout of the chuck to the specified value.		
Dust deposits in between the Base jaws and top jaw serration and tightening Bolts are not tightened properly.	Clean the serrations thoroughly and tighten the Bolts to the specified torque.		
11	Parallelity errors	<p>To achieve parallelism on the Component, take the axial reference of the work piece from the fixed supports on the three slots which are provided on the Chuck body face @120°. Each slot has two drilled and tapped holes equispaced for clamping the fixed support.</p> <p>Component to be clamped on the bored gripping dia. of the jaws and resting of the Component on the fixed supoort (not on jaw face). This procedure will ensure parallelism on the Component after machining.</p>	

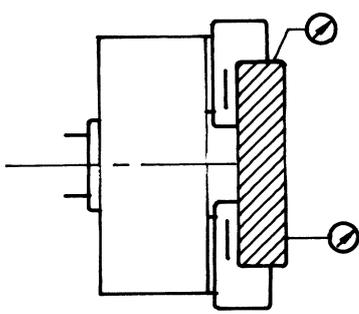
### 13. FORMING OF SOFT JAWS (SOFT JAW BOARING TECHNIC)

- To hold components of different diameters, the soft jaws are moved radially either towards the center or away from the center and bored in position to achieve proper holding of the work piece.
- The profile of the soft jaw should be matched suitably according to the shape, size, material, surface roughness and cutting conditions of the work piece. To perform correct jaw boring operation the techniques were explained as below with a help of schematic diagram.
- It is very important that the component should always to be clamped in the middle stroke of jaws.

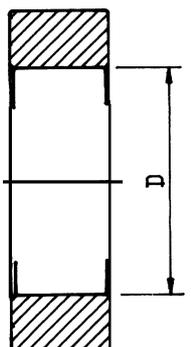
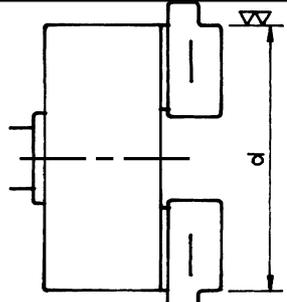
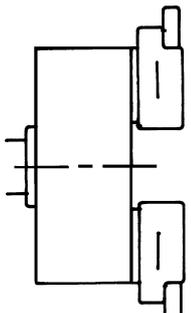
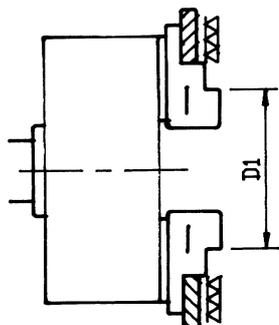
#### Procedure for forming of soft jaw

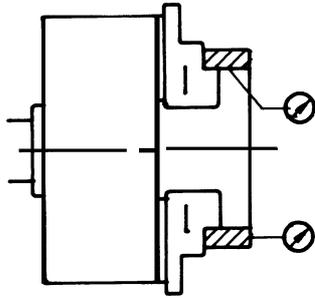
#### EXTERNAL DIAMETER CHUCKING

	<ul style="list-style-type: none"> <li>• Prepare a suitable ring with sufficient wall thickness.</li> <li>• Since the clamping diameters are varying it is necessary to produce different rings and ensure that the ring should be strong enough and not to deform under clamping pressure.</li> </ul>
	<ul style="list-style-type: none"> <li>• Open the jaws fully (de-clamp) by actuating the cylinder / Actuator.</li> <li>• Then turn the soft jaw with diameter (D) equal to ring outside diameter + 1/2 jaw stroke.  <math>D = (d + \frac{1}{2} \text{ Jaw stroke})</math></li> </ul>
	<ul style="list-style-type: none"> <li>• The ring to be gripped in the soft jaw turned diameter and in the same time ensures the ring should butt against the chuck face.</li> </ul>
	<ul style="list-style-type: none"> <li>• In the above condition the component gripping diameter to be turned in the soft jaw with a good surface finish.</li> <li>• The turning diameter (D1) should be as large as the component diameter after jaw boring. The entry of component should be (H7/H6) in sliding fit.</li> <li>• While turning the soft jaw, the clamping pressure setting should be as same as required for clamping the component.</li> </ul>

	<ul style="list-style-type: none"> <li>• After turning the soft jaw, clamp the component and check the jaw stroke and gripping accuracy in the component.</li> <li>• Perform a trial cutting run and check the machining accuracy</li> <li>• For checking the jaw seating face for the component, de-clamp the component and rotate to 90 degrees, clamp once again and check end face for true running.</li> </ul>
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INTERNAL DIAMETER CHUCKING

	<ul style="list-style-type: none"> <li>• Prepare suitable ring with sufficient wall thickness.</li> <li>• Since the clamping diameters are varying, it is necessary to produce different ring with suitable wall thickness and ensure that the ring should be strong enough and not to deform under clamping pressure.</li> </ul>
	<ul style="list-style-type: none"> <li>• Close the jaws fully (de-clamp) condition by actuating the cylinder / Actuator.</li> <li>• Then turn the soft jaw with diameter (d) equal to ring bore diameter - 1/2 jaw stroke.  <math>d = (D - \frac{1}{2} \text{ jaw stroke})</math></li> </ul>
	<ul style="list-style-type: none"> <li>• The ring to be gripped in the soft jaw turned diameter ensures that the ring should not be inclined and should butts against the jaw face fully.</li> </ul>
	<ul style="list-style-type: none"> <li>• In the above condition the component gripping diameter to be turned in the soft jaw.</li> <li>• The turning diameter (D1) should be as small as the component diameter. The entry of component into the turned dia should be (H6/H7) sliding fit.</li> <li>• While turning the soft jaw, the clamping pressure should be as same as required for clamping the component.</li> </ul>



- After turning the soft jaw, clamp the component and check the jaw stroke and gripping accuracy in the component.
- Perform a trial cutting run and check the machining accuracy.
- For checking the jaw seating face for the component, de-clamp the component and rotate to 90 degree clamp. Once again and check end face for true runing.

## 14. DO'S

- 14.1) Lubricate the chuck daily (Every 8 - 16 hours).
  - 14.2) Use only recommended Grease for efficient functioning of the Chuck.
  - 14.3) Few times a day, operate the chuck to its full stroke, without component.
  - 14.4) Dismount the chuck periodically, clean carefully, check the condition of the contact surfaces and ensure that the grease has penetrated uniformly.
  - 14.5) Use torque wrench to tighten the clamping screws.
  - 14.6) Use tailstock or work steady, when machining a long work piece.
  - 14.7) Ensure hand is out of clamping area while clamping.
  - 14.8) Before running the chuck at higher R.P.M. apply maximum Drawbar pull and Check static gripping force.
  - 14.9) Always clamp the component in the middle stroke of the Base jaw / Master jaw.
  - 14.10) Always clamp the component on the greatest diameter possible.
  - 14.11) Do soft jaw boring by adhering jaw boring techniques.
  - 14.12) When good axial tolerance is necessary, refer fixed supports on the chuck body or on the front cover.
  - 14.13) For external clamping, the T - Nuts with clamping screws must be as close as possible to the center.
  - 14.14) For internal clamping, the T-Nuts with clamping screws must be in the most external position possible.
  - 14.15) Replace the worn out or damaged T - nut by new one immediately.
  - 14.16) Ensure top jaw height is as low as possible.
  - 14.17) Ensure height of top jaws should be less than its length.
  - 14.18) The maximum length of the component to be clamped must be lesser than 3 times the height of the clamping jaws.
  - 14.19) When using special jaws, which are heavier than standard jaws, reduce the speed accordingly.
- Note : If the special jaws weight increase, due to centrifugal action, the wear pattern also increases accordingly.
- 14.20) Follow the cutting speed, depth of cut and feed rate as recommended.
  - 14.21) When attaching the top jaws to the base jaws / master jaws. there must be at least 2 mounting screws.

- 14.22) When chucking internal components, reduce the hydraulic pressure by less than ½.
- 14.23) Maximum rated speed will always be the lower RPM of either the cylinder or chuck.
- 14.24) Use double solenoid valves with detend positions in the power pack.
- 14.25) Check the hydraulic circuit and avoid water contamination.
- 14.26) Ensure the required hydraulic pressure is set.
- 14.27) Ensure a gap of 0.5 mm between the wedge and the chuck body inner face, when jaws are at radially outer most condition.

## **15. DON'TS**

- 15.1) Don't forget to lubricate the chuck daily.
- 15.2) Don't operate Machine with door open
- 15.3) Don't operate the solenoid valve during rotation of the spindle.
- 15.4) Don't exceed the recommended R.P.M. of the Chuck.
- 15.5) Don't apply excess draw bar pull beyond the specified limit.
- 15.6) Don't tighten the mounting screws beyond the specified torque level.
- 15.7) Don't attempt to redesign the chuck
- 15.8) Don't machine long work pieces without supporting tail stock or work steady
- 15.9) Don't use jaws higher than twice the height of standard jaws.
- 15.10) Don't use a hammer on the chuck jaws or clamped work pieces.
- 15.11) Don't rotate the spindle if the work piece is not clamped properly.
- 15.12) Don't use too long clamping screws. (Screws should not hit the base jaw/master jaw T slot bottom)
- 15.13) Don't allow the T nuts to protrude from the base jaws/Master jaws.
- 15.14) Don't remove the front cover of the chuck.
- 15.15) Don't hit the wedge against the chuck body face.
- 15.16) Don't attempt to braze or weld if any internal parts found in broken condition.
- 15.17) Don't use hard water in coolant.

## 16. CYLINDER (CH & CH-S) SELECTION CHART FOR PHNC / PHCNC CHUCKS

Cylinder - CH/CH-S Size & Piston area	3B-PHNC			3B-PHCNC		
	Chuck Size (Pressure to be set)	Max. Draw bar pull in kgf	Max. Gripping force in kgf	Chuck Size (Pressure)	Max.Draw bar pull in kgf	Max.Gripping force in kgf
105Ø Piston Area = 76.5 cm <sup>2</sup>	135Ø (23 bar)	1780	3670	165Ø (39 bar)	3000	8000
	165Ø (26 bar)	2000	5400			
	165Ø-K (29 bar)	2200	5400			
120Ø Piston Area = 103 cm <sup>2</sup>	135Ø (17 bar)	1780	3670	200Ø (38 bar)	4000	8000
	165Ø (19 bar)	2000	5400			
	200Ø (38 bar)	4000	8000			
	210Ø-K (33 bar)	3400	8400			
160Ø Piston Area = 191 cm <sup>2</sup>	200Ø (21 bar)	4000	8000	200Ø (21 bar) 250Ø (31bar)	4000 6000	8000 12000
	250Ø (31 bar)	6000	12000			
	254Ø-K (22.5 bar)	4300	11100			
200Ø Piston Area = 304 cm <sup>2</sup>	250Ø (20 bar)	6000	12000	250Ø (18 bar) 315Ø (18bar) 400Ø (30bar) 500Ø (30bar)	6000 6000 9000 9000	12000 13000 20000 21000
	315Ø (20 bar)	6000	13000			
	305Ø-K (18 bar)	5500	14400			
	400Ø (30 bar)	9000	20000			
	500Ø (30 bar)	9000	21000			
250Ø Piston Area = 478 cm <sup>2</sup>	400Ø (19 bar)	9000	20000	400Ø (19 bar) 500Ø (19 bar)	9000 9000	20000 21000
	500Ø (19 bar)	9000	21000			

➤ Power pack pressure setting for Four Jaw Power Chuck (4B) = 4/3 x Pressure in bar given in bracket

➤ Power pack pressure setting for Two Jaw Power Chuck (2B) = 2/3 x Pressure in bar given in bracket

➤ Power pack pressure setting for Two Jaw Power Chuck (2B) with one Jaw movable & one Jaw fixed = 1/3 x Pressure in bar given in bracket

➤ Draw bar Pull calculation for Chuck while using other make cylinder = Cylinder Piston area x Pressure

## 17. CYLINDER (OCHNC & OCHNC-S) SELECTION CHART FOR PHNC / PHCNC CHUCKS

Cylinder - OCHNC/ OCHNC-S Size & Piston area	3B-PHNC			3B-PHCNC		
	Chuck Size (Pressure to be set)	Max. Draw bar pull in kgf	Max. Gripping Force in kgf	Chuck Size (Pressure)	Max. Draw bar pull in kgf	Max. Gripping force in kgf
100Ø Piston Area = 66 cm <sup>2</sup>	135Ø (27 bar)	1780	3670	165Ø (45 bar)	3000	8000
	165Ø (30 bar)	2000	5400			
	165Ø-K (33 bar)	2200	5400			
130Ø Piston Area = 103 cm <sup>2</sup>	165Ø (19 bar)	2000	5400	165Ø (29 bar)	3000	8000
	165Ø-K (21 bar)	2200	5400			
	200Ø (39 bar)	4000	8000	200Ø (39 bar)	4000	8000
	210Ø-K (33 bar)	3400	8400			
150Ø Piston Area = 132.5 cm <sup>2</sup>	200Ø (30 bar)	4000	8000	200Ø (30 bar)	4000	8000
	250Ø (45 bar)	6000	12000			
	254Ø-K (32.5 bar)	4300	11100	250Ø (45 bar)	6000	12000
170Ø Piston Area = 170 cm <sup>2</sup>	200Ø (24 bar)	4000	8000	250Ø (35 bar)	6000	12000
	250Ø (35 bar)	6000	12000			
	254Ø-K (25 bar)	4300	11100	315Ø (35bar)	6000	13000
	315Ø (35 bar)	6000	13000			
	305Ø-K (33 bar)	5500	14400			
200Ø Piston Area = 229 cm <sup>2</sup>	250Ø (26 bar)	6000	12000	250Ø (26 bar)	6000	12000
	315Ø (26 bar)	6000	13000			
	305Ø-K (24 bar)	5500	14400	315Ø (26 bar)	6000	13000
	400Ø (39 bar)	9000	20000			
	500Ø (26 bar)	9000	21000			
				500Ø (39 bar)	9000	21000

- Power pack pressure setting for Four Jaw Power Chuck (4B) =  $4/3 \times$  Pressure in bar given in bracket
- Power pack pressure setting for Two Jaw Power Chuck (2B) =  $2/3 \times$  Pressure in bar given in bracket
- Power pack pressure setting for Two Jaw Power Chuck (2B) with one Jaw movable & one Jaw fixed =  $1/3 \times$  Pressure in bar given in bracket
- Draw bar Pull calculation for Chuck while using other make cylinder = Cylinder Piston area x Pressure