OPERATION MANUAL

FLOATING SEAT®

P A T E N T

Thank you sincerely for adopting our **FLOATING SEAT®**.

Read this operation manual without fail before using **FLOATING SEAT®**.

CONTENTS

N. B.

Among the abobe-mentioned contents, please direct particular attention to the items (B-1, 2, 3), (C-2), (D-1, 2), (E-5, 7, 8, 13, 15), (F-1, 2, 3, 4), (G-1, 2).

Matters to be Attended

(regarding use of **FLOATING SEAT®**)

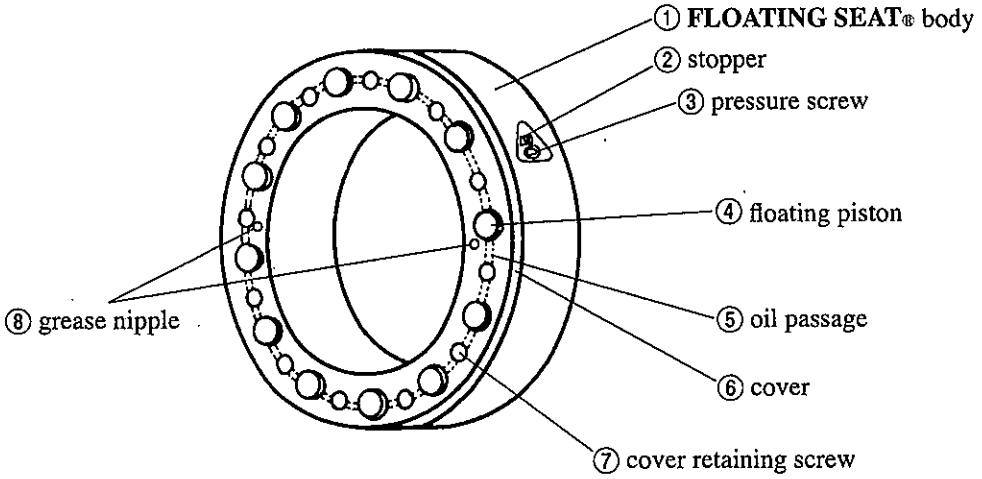
1. Although all items in the operation manual are important, please direct particular attention to following items.

B. Basic Conditions (items 1, 2, 3)
C. Preparation items (item 2)
D. Confirmation before Using (items 1, 2)
E. The Method of Using (items 5, 7, 8, 13, 15)
F. Matters to be Attended in Operation (items 1, 2, 3, 4)
G. Maintenance (items 1, 2)

In addition, in order to protect a pressure screw, after finishing the tightening work, apply an adhesive tape to an inlet port of a pressure chamber and close the inlet port of the pressure chamber tightly (to prevebent the mixing-in of scale and foreign substance).

2. Take particular care not to give impact (letting fall, striking against substance) to the body. (If the impact is applied thereto, oil leakage may be produced and pressure does not rise.)

A. Name of Each Part



B. Basic conditions

1. It is controlled that there is no damage or no adhesion of dust on the arbor reference surface and side surfaces of knives and spacers.
2. The precision of the arbor reference surface, knives and spacers is controlled properly.
3. A right angle of the arbor reference surface to the arbor is checked properly.

Since all effects of **FLOATING SEAT®** can not be gained when all conditions 1, 2, 3 are not filled, pay sufficient attention to the above-mentioned control.

C. Preparation items

1. Prepare a spacer for exclusive use.
   a. When floating pistons of **FLOATING SEAT®** Rtouch a spacer, the spacer may be flawed.
   b. If this flaw becomes big, remove it by grinding.
   c. The hardness of the spacer is the most suitable in HRC 40 ~ 45.
   d. The thickness of the spacer may be 10mm ~ 20mm.
   e. The outer diameter of the spacer may be larger than the PCD of the floating piston by 10mm or more (refer to the approval drawing).
2. Is the surface of a lock nut (arbor nut) touching **FLOATING SEAT®** smooth enough ?
   a. If there are flaws and dusts on the surface touching **FLOATING SEAT®**, it may cause the damage of **FLOATING SEAT®**. Also the flatness of the surface is important.

D. Confirmation before using.

1. Has the pressure screw been returned ?
   a. After returning the pressure screw weakly until it touches its stopper, turn the pressure screw to the right by nearly 1/4 revolution.
2. Are floating pistons of **FLOATING SEAT®** set up at nearly the same amount ? (refer to the approval drawing)
   a. It is to facilitate the work of E-5 described afterward.
3. The method of reading a chart. Keep the chart near at hand.
   a. A numerical value on an indicator of a torque wrench is indicaled in unit of kg · f · cm.
   b. A tightening force is indicated in unit of kg · f.
   c. The point where a value on the indicator (kg · f · cm) and curve kg · f intersect, indicates the tightening force then.

E. The Method of Using (Operation Procedure) (common method to upper arbor and lower arbor)

1. After finishing the installalion of knives and spacers to an arbor, install exclusive spacers.
2. After finishing the installation of the exclusive spacers, the arbor shall be projected outward by about 50 mm.
3. **FLOATING SEAT®** shall be entered into the arbor by about 50 mm and the back side of the **FLOATING SEAT®** shall be projected out of the screw side of the arbor by ahout 25 mm.
4. Install a lock nut (arbor nut).
5. Tighten the lock nut by hand as securely as possible, and further tighten it strongly several times by hand using a familiar spanner.
   a. This work eliminates a slight clearance between knives and spacers and also gets both parts stick to each other.
   b. Under condition that the spacers and knives do not stick to each other, even if the tightening force of **FLOATING SEAT®** is increased, it sometimes can not be tightened strongly.
   c. Because the stroke of the floating pistons (the length of the floating pistons pushed out by the increasing pressure) is limited (refer to the approval drawing).
6. When **FLOATING SEAT®** is installed, set the hole for inserting a pressure multiplying torque wrench to the side of the worker. So next pressure multiplying work can be done earlier.
7. Attach an adapter to the torque wrench, and insert the haxagon of the adapter into the hexagonal hole of the pressure screw correctly.
   a. If it is not installed correctly, it may cause crack of the hexagonal hole and deformation of the hexagonal part.
8. Turn the handle of the torque wrench to the right with both hands. With this work, the inner pressure of **FLOATING SEAT®** is muiltiplied and the tightening is beginned.
   a. When the handle of the torque wrench is rotated, the tightening should be performed by the same force in both hands so that the power is applied to the axial center of the torque wrench.
   b. Turn the handle while seeing the chart showing the use pressure range without fail.
   c. Do not exceed the limit pressure of use in any case.
   d. The limit pressure of use is the normal load being 80% of the maximum pressure shown in the approval drawing (refer to the approval drawing).
9. Seize the conventional tightening force using a hammer. (It becomes criterion of the minimum tightening force when **FLOATING SEAT®** is used.) A measuring method of the tightening force by a hammer is as follows.
   a. Do the work in E-1, E-2, E-3, E-4 as previously described.
   b. Next, tighten **FLOATING SEAT®** by striking a spanner by a hammer in conventional manner.
   c. Insert a torque wrench into **FLOATING SEAT®**, and apply force slowly and carefully to the torque wrench rightward.
   d. The force at the moment that the pressure screw begins to rotate shall be made the tightening force by the hammer.
   e. Compare a numerical value of the indicator then with the chart.
   f. Regard the force indicated on the chart as the tightening force by the hammer.
10. The first tightening force shall be made 2 ~ 3 tons higher than the tightening force by the hammer.
    a. The first tightening force must be maintained over that by the hammer in conventional manner.
11. After finishing the tightening of an upper arbor, tighten a lower arbor next with the same method.
    a. The first tightening force (numerical value on the indicator) must be made the same in the upper arbor and the lower arbor.
12. Check clearance in the axial direction between the upper arbor and the lower arbor. If the result of the

check is satisfactory, the tightening work is finished.

13. After finishing the tightening work, apply an adhesive tape to a pressure chamber and close the pressure chamber tightly.
    a . This is to prevent the mixing-in of scale or the like and to protect the pressure screw.
    b . If the work of the pressure chamber is performed while the scale or the like remains mixed in, the pressure screw may be damaged and this can not be repaired.
14. Adjust the clearance in the axial direction if necessary.
    a . The adjustment shall be fine adjustment.
    b . The adjustment is performed in a method of brinding the knives to the reference surface of the arbor by the pressure multiplying.
    c . Multiply the pressure gradually at **FLOATING SEAT®** on the side of the knife to be brought to the arbor.
    d . Stop the pressure multiplying if the clearance could be satisfied.
    e . The pressure multiplying shall be done in the range within 80% of the maximum pressure (Normal load approx) in any case (refer to the approval drawing).
    f . When the satisfactory clearance can not be obtained even if items 14. a ~ f are performed, something of the basic condition of B-1, B-2, B-3 seems not to be satisfied. Check the basic condition.
    g . The tightening force of **FLOATING SEAT®** is within the adjustment range (refer to the chart for the range of maximum normal use pressure).
    h . Since **FLOATING SEAT®** is a tightening jig and not a clearane adjustment jig, the adjustment at assembling state of all cutters can not be done.
15. As for the tilt of knives, the items B-1, B-2, B-3 become a standard. It is because the floating pistons push down the side surface of the spacer uniformly.
    a . When the tilt of knives is not satisfactory, there may be a cause in something of the basic conditions B-1, B-2, B-3.
    b . There is the contingency of the installation condition of knives and spacers because a tolerance of dimension is included in each case of B-1, B-2, B-3.
    (When the knives and the spacers are tilted, the tilt may be repaired by performing the installation again.)

F. Matters to be Attended in Operation

1 . Since **FLOATING SEAT®** is a precise instrument, do not apply impact (letting fall or touching other substance) to **FLOATING SEAT®** in any case.
    a . Impact applied from the outside may cause strain within **FLOATING SEAT®** and therefore the floating seat can not be used.
2 . When **FLOATING SEAT®** is removed, put it on a rubber mat (about 10mm in thickness) without fail.
3 . When **FLOATING SEAT®** is to be held, put it to parallel with the side of the floating pistons being at lower side.
    a . When **FLOATING SEAT®** is not put to parallel, since the floating pistons are entered or projected, the work of the item E-5 can not be done easily.
4 . Do not stack **FLOATING SEAT®** in any case.

G. Maintenance

1 . Fill up greace every month or after use of 200 to 300 times.
    a . If grease becomes insufficient in quantity, correct measurement can not be performed.
    b . If a pressure screw suffers damage, correct measurement can not be performed.
    c . If grease is not supplied regularly, a pressure screw is subjected to seizure and can not be used.

2. Check each screw for being loosened during the grease supply. If the screw is loosened, tighten it further.
   a. Particularly a stopper retaining screw may be loosened.
3. Check a torque wrench tor getting warped.
4. Take special care for careless overtightening.
5. Do not leave a screw being tightened for a long time.
   a. Let a screw be loosened, if it is not used for several weeks.

H. Remarks

All **FLOATING SEAT®** are subjected to pressure test and dimension check at the shipment (check sheets are stored and controlled in our company), but while they are used for a long time, following problems may be produced.

1. Leak of Inner Pressure Oil

① Natural leak
   (1) Aging of inner pressure oil and seal materialor the like
   (2) Wear of parts
② Leak due to outside factors
   (1) Deformation of airtight portion and parts due to impact or the like
   (2) Damage of airtight portion and parts due to mixing-in of foreign substance
   (3) Abnormal temperature

Measures When Inner Oil Leak Is Suspected

Measure height of all floating pistons.

<Please act in accordance with following instructions!>

Return both two portions of a pressure screw completely, and set the pressure screw to an arbor until it abuts on a stopper as seen in the blade assembling state, and strike an anbor nut strongly by a hammer and tighten it completely, and then push down a floating piston completely.

Ⅰ. Measure projecting height of all floating pistons (measurement in the order of some tents mm may be done by vernier calipers), and then calculate the average height.

Ⅱ. Since the floating pistons are forwarded in the average height beging 2.0 ~ 2.5mm at the shipment, if the height is 2mm or less, leak seems to occur (except a special article).

Ⅲ. However, in the state that the floating pistons are pushed down completely in the work of ①, ever if the average height is in the projecting height as small as 0.1 to 0.2mm for example, scince the floating piston is further projected from this state by amount corresponding to the pressure stroke (refer to the approval drawing) by the pressing work, this article still can not be used.

Ⅳ. However, in the state that the leak amounts is large and the floating piston is pushed down completely to the cover surface (surface of the main body) at the measurement state of ①, even if the pressing work is performed, since the pressing can not be made in some case, overhaul or repair is necessary.

2. Malfunction of Pressure Screw Part

(1) Wear and seizure of a screw due to insufficient supply of lubrication oil such as grease
(2) Damage of a screw due to mixing-in of foreign substance (such as scale) in a threaded portion
(3) Deformation of threaded portion due to impact or the like

Measures When Malfunction of Pressure Screw Part is Suspected

Ⅰ. When a pressure screw (male screw) is worn and damaged, exchange parts.
Ⅱ. When a pressure screw (female screw) at the main body side is worn and damnged, this can not be repaired normally. (Helisert screw may be adopted as measures, but this is not good in the durability.)
Ⅲ. When a threaded part is deformed due to impact or the like, this can be repaired or otherwise can not be repaired.

3. Malfunction of the hexagonal portion (handle inlet port) is suspected

(1) Due to crack of a port base portion of a hexagonal portion
(2) Wear and deformation of hexagon due to use for a long time

Measures When Malfunction of the hexagonal portion is suspected

Ⅰ. When a hexagonal portion is cracked, worn and deformed, exchange parts.
N.B. Do not use a pressure screw when a hexagonal portion remains cracked. This may cause damage of the female screw.

FLOATING SEAT® is a jig of inner pressure closed type. Since inner pressure oil and seal material may be deteriorated, we recommend overhaul in criterion of three years.

Ⅰ. When the inner oil leaks or when malfunction is produced in the pressing part of others, please send **FLOATING SEAT®** to our company. We will repair it after the estimation.
Ⅱ. We recommend use of spare parts for rotation during the overhaul (repair).

We hope anyone can handle the practical setting up more safely and easily than before.

YOSHIDA & CO., LTD.

www.meishoujapan.com

TEL03-5604-5170 FAX03-5604-5171
有限会社 明照ジャパン

YOSHIDA & CO., LTD

2-44 NISHINO-CHO ATSUTA-KU NAGOYA 456-0063 JAPAN
TEL 81-52-682-8221 FAX 81-52-671-1559