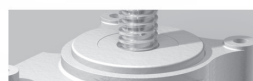


Q&A, Caution and Other Information

16



Small Screw Jack /01



Screw Jack /02



Ball Small Jack /03



Ball Screw Jack /04



High-Lead Screw Jack /05



High-Lead Ball Screw Jack /06



Smoothy Screw Jack /07



Rack Jack /08



Bevel Gear Type Jack /09



Hi-Speed Jack /10



Geared Motor Jack /11



Option /12



Bevel Gear Box /13



Coupling /14



Technical Data /15

**Q&A, Caution and
Other Information /16**

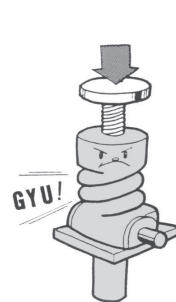
Q What are the differences in use between screw jacks and ball screw jacks?

A The main differences are the torque (efficiency) necessary for driving jacks, and the self-locking mechanism. In addition, the brake also matters.

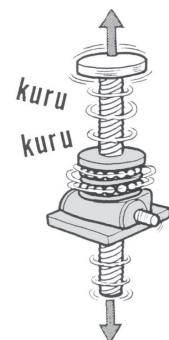
In case of using screw jacks, wherever you stop the jacks, they do not rotate in reverse, but they require more power.

In case of using ball screw jacks, the jacks require less power to lift the same load compared to screw jacks. However, when you stop the jacks, there may be cases of reverse rotation.

If you cannot use a large motor, or if you would like to save power cost while using a jack frequently, it would be better to use a ball screw jack. If you do not use a jack frequently, and would like to ensure the safety and save facility cost, it would be better to use a screw jack. From the perspective of energy saving, in case of hydraulic cylinders for example, unless the pumps continue to generate the hydraulic pressure, loads are lowered; however, screw jacks can maintain the lifting position owing to the self-locking mechanism by simply turning off power, thus significantly saving energy. Since ball screw jacks do not have any self-locking mechanism, it is necessary to install magnet brakes suitable for the jacks, but their high efficiency contributes to further saving energy in the frequent use for lifting and lowering loads.



Screw jack



Ball screw jack

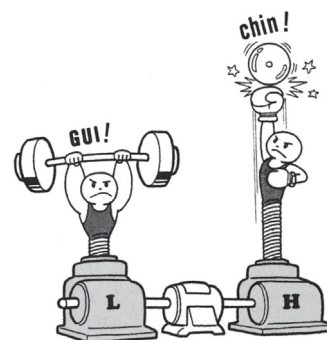
Q How are low speed jacks and high speed jacks used differently?

A Either low speed (L) or high speed (H) jacks could be used in many occasions, but it is recommended to select whichever one is suitable for your intended purpose, taking into account the maintenance in the future.

Grease lubricant is applied to screw jacks to ensure the versatility. Accordingly, while the input shaft rotates at high speed, it may run out of lubricant over time.

When the rotation speed of the lifting screw is high, select "H" type, and drive the jack at a low speed reverse-calculated from the input shaft rotation. Conversely, when lower speed of the lifting screw is acceptable, but you need minor adjustments, it is better to select "L" type and ensure low input speed.

Almost all series have 2 types of worm gear ratios: jacks for low speed operations (high gear ratio) are called "L", and those for high speed operation (low gear ratio) are called "H".



Q

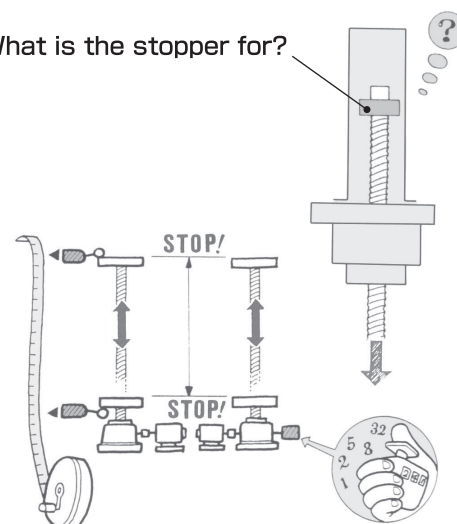
Are the upper and lower limits of the motion determined by the stopper?

A

In case of manual operation, a mechanical stopper would be fine. However, in case of a motor-driven jack, a limit switch must be used for determining the limits.

Some lifting screws are designed to allow for mounting a stopper, but such a stopper is intended to prevent the screw from coming off during manual rotation for adjustment at the time of installation. Therefore, it cannot prevent overtravel during motor-driven operation. In case the jack is usually powered by an electric motor, install a limit switch available in the marketplace, which is suitable for the relevant travel length, in order to prevent such overtravel. In such a situation, if you select a geared limit switch to be mounted on a jack, the wiring will be easy, and adjustments will be flexible.

What is the stopper for?



Lever limit switch:
measures the length

Geared limit switch:
counts the revolutions

Q

The bigger the motor, the better?

A

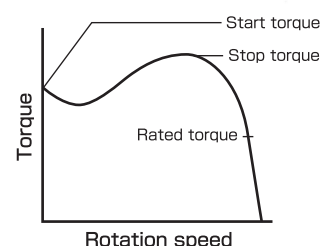
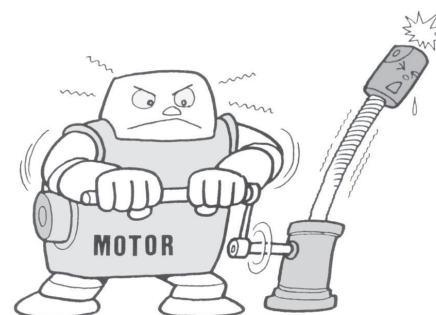
No. Rather, in order to ensure the safety, be careful that the jack is not driven by unnecessarily large power.

Usually, a jack system does not continue to be operated so frequently. So people do not care about a loss in electricity expenses by selecting a large motor, and tend to select a motor with a larger capacity than calculated value, considering that it would be better than an insufficient one.

However, motors have the rotor inertia (J), and this value increases along with an increase in the motor capacity.

Screw jacks are intended for performing a linear movement within a limited distance, so if the inertia is smaller, the overrun will be less.

Furthermore, if an obstacle gets stuck, the maximum torque of the motor will be imposed on the system, and it may damage the device. In contrast as the motor's torque characteristics, it is designed in a way that the start torque is 1.5 times larger than the rated torque, so it will sufficiently endure for a short time. Therefore, it is recommended to select a minimal motor



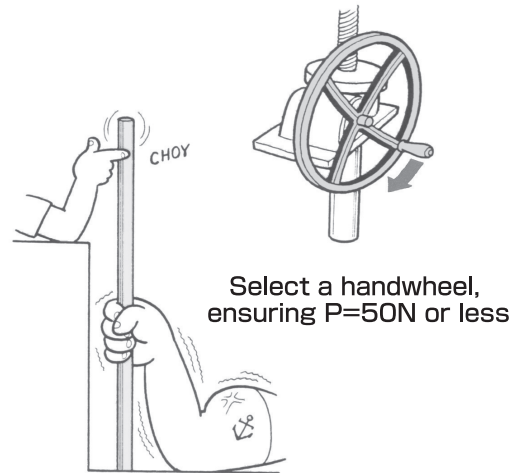
Q What is an appropriate size for a handwheel?

A Some people select any handwheel that rotates without careful consideration, but whether the design is right or wrong makes a significant difference in practical use.

While the output of an ordinary person, which can be generated for 10 minutes or more, is said to be 1/4 horsepower, the operation cannot be maintained unless the handwheel operating force is no more than 50 N. The handwheel (handle) operating force (P) is calculated as follows:

$$P = \frac{\text{Input shaft torque}}{\text{Handwheel radius}}$$

Even if you have hard times at the planning stage, it will be nicer to be appreciated by actual users.

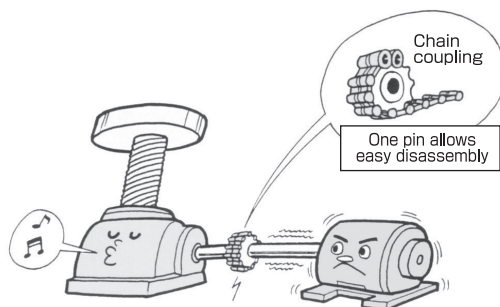


Q How can I connect the power source and the jack?

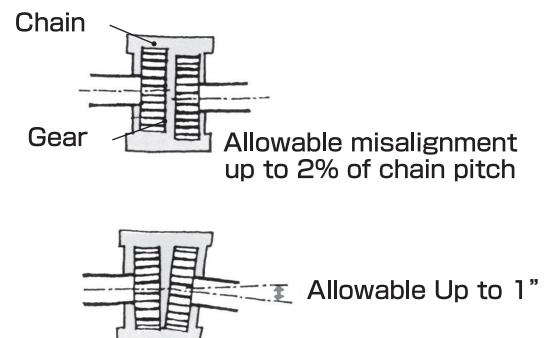
A In case of the handwheel type, you can mount the handwheel directly on the jack. However, in case of the motor-driven type, you must use a flexible coupling in order to protect the jack from vibration, wobble due to misalignment, etc.

Chain couplings are economical, and cost-effective.

When you operate jacks – especially when you interlock multiple jacks or align their heights, you can make fine adjustments by changing the position of sprocket teeth one by one. It is very convenient.



Does not transmit motor vibration to jack

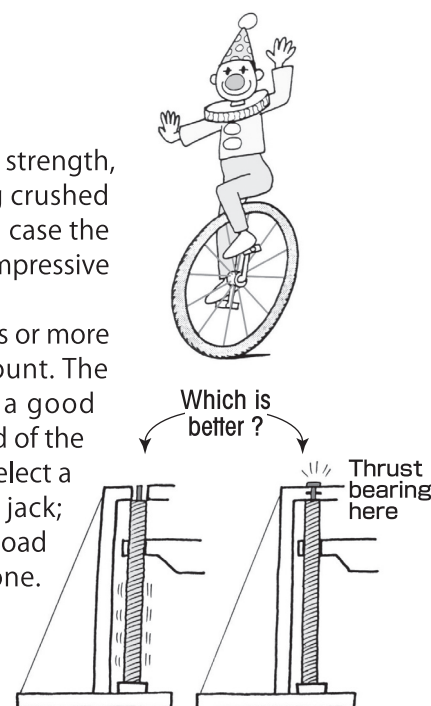


Q To lift loads for a long distance, is it necessary to select that large jack?

A In principle, that's right. Yet it is also possible to take advantage of the maximum capacity of a jack by a well-considered design.

The strength of steel is usually expressed by the tensile (or tension) strength, yet the compressive strength, which is the strength to resist being crushed under load, is 1.3 times more than the tensile strength. However, in case the steel is in the shape of a long bar, it is subject to buckling, and its compressive strength reduces.

Generally, in case of round steel bars, when the bar length is 20 times or more larger than the diameter, you need to take the buckling into account. The bicycle spoke, which is preferred to be as light as possible, is a good example of creatively using wires to support the tension load instead of the compressive load. In case of moving a load for a long stroke, if you select a jack based on the buckling load, you need to select a large screw jack; however, if you show creativity in design in a way that the tension load is imposed on a jack, you can select a smaller and less expensive one.



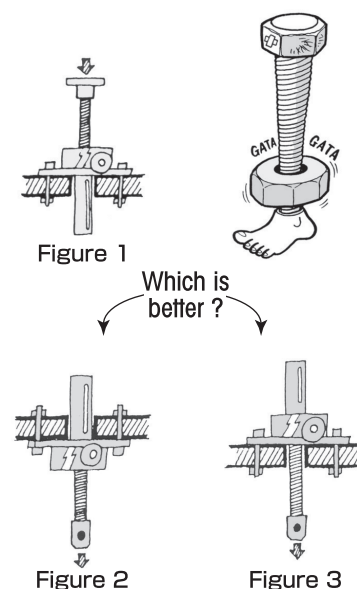
Q What do I need to take care of, when using a jack for lifting loads?

A If you use a jack of the prescribed size, there should be no particular problem with the main body. Even the stroke is long, you do not have to worry about the buckling load. However, you should not forget about the strength of mounting.

In case a load is imposed in a way to press the mounting legs (Figure 1), there is nothing to worry about. However, in case the tension load is imposed, you need to use bolts with high tensile strength. In case a load is imposed in a way to pull the mounting legs (Figure 2), use 10.9 bolts, where "10" indicates the tensile strength, and "9" represents the yield point. Please consult with a leading bolt manufacturer/seller.

Nippon Gear's screw jacks are designed in the internationally common shape, so dimensions of mounting holes also conform to the international standards.

In case of inverted jacks, it is safer to mount it as specified in Figure 3.



Q

Does the screw shaft end of a jack always need to be fixed to a moving object?

A

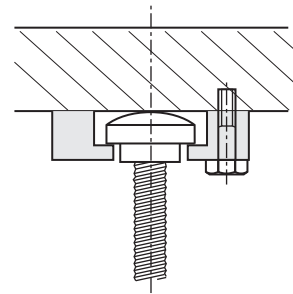
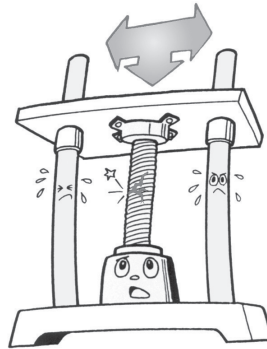
Not necessarily. There are even cases where the fixation damages jacks.

In principle, screw jacks are designed in consideration of only loads and motion in the axial direction of the screw shaft.

In case side force acts on the screw shaft, it is required to install a guide which can bear such force.

In this case, it is necessary to align the jack's shaft precisely with the guide.

Contrive how to mount the jack, and count on the guide to secure the direction of motion, while the jack plays a role of merely pushing and pulling. Then it will not cause any failure.



Example of not over-fixing the end fitting

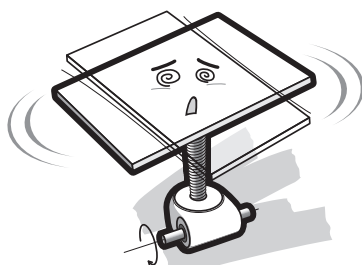
Q

What is the anti-rotation mechanism?
If I select a jack with anti-rotation key, can I use it worry-free?

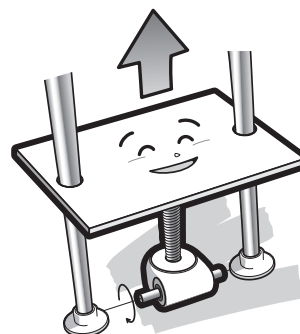
A

The anti-rotation mechanism is intended to prevent the screw shaft or travelling nut from drag turning along with the rotation of the worm wheel.

When operating a jack, unless its screw shaft or traveling nut is held not to rotate, the screw shaft or traveling nut will not ascend and descend. By preventing the rotation of the elevating object by means of a guide, etc., you can prevent the drag turning.



It does not elevate as it is



It will be OK if a guide is installed on the elevating object!

Appropriate tip for service : What is "key torque"?

Q

How can I ensure the anti-rotation key torque?

A

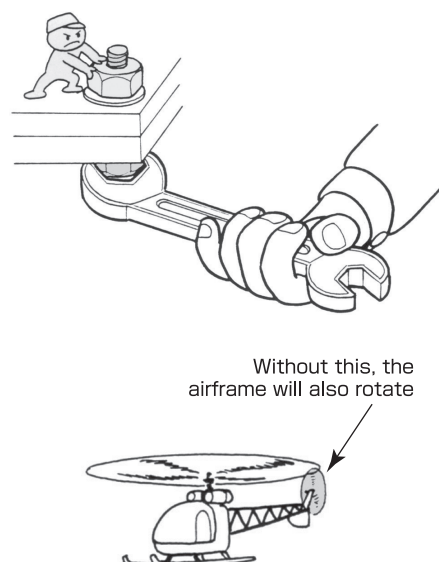
In case of a screw jack, its screw shaft elevates, because the worm wheel rotates while the screw shaft is held not to rotate. In case a guide cannot be installed, please order a jack "with anti-rotation key" which has a structure to negate the key torque internally.

When we tighten something with a bolt and nut, we hold the nut not to rotate, while turning the bolt. In this case, the rotary force on the nut is called key torque.

The key torque significantly changes depending on the roughness of the screw surface and whether it is lubricated or not. The screw surface is fine-finished, and supplied with grease. So the key torque is as minor as a tip for service staff.

Some jacks using a trapezoidal screw have an anti-rotation structure designed by cutting a groove on the screw shaft and attaching a key interlocking with the groove.

The propeller in the rear of the helicopter performs a similar function to the key torque.



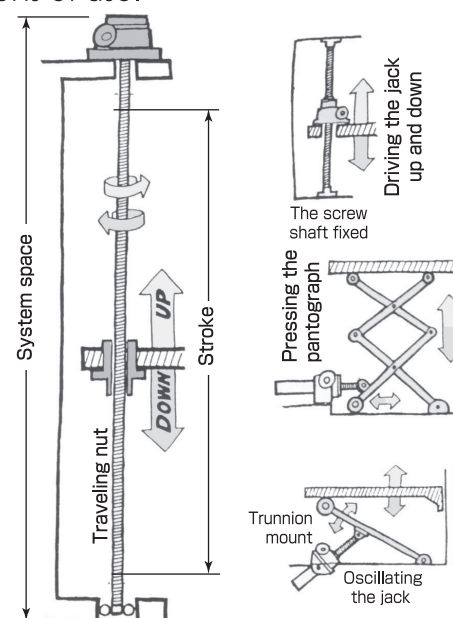
Q

What should I do in order to minimize the space required for a jack, while securing the desired stroke length?

A

The main body of a screw jack is designed extremely compact in proportion to its best possible performance. The length of the screw shaft must correspond to the desired stroke length, but various layouts can be considered, depending on your intended use and conditions of use.

When operating the traveling nut type jack, its screw shaft rotates and drives the nut up and down, instead of the screw shaft going up and down. For ordinary screw jacks, you need an extra space equivalent to the stroke length for the motion of the screw shaft. So, if there is a space limitation vis-à-vis the ceiling or floor, you will not be able to secure the full stroke. In such a case, the traveling nut type jack offers an easy solution. Mounting orientations of jacks can be either upright or inverted. We have a wealth of experience in both orientations, so please consult with us. You could also consider other mounting methods, including: the method by fixing both ends of the screw shaft and driving the jack's main body up and down; the method of oscillating the jack by the clevis-mount or trunnion-mount style; and the use of the pantograph mechanism.



Dustproof bellows are like a dustcoat : a tailor-made raincoat : is also available

Q For what purposes are bellows used?

A When jacks are used at locations with dust, etc., use dustproof bellows to protect the screw shaft.

The standard bellows are intended to prevent the acceleration of wear caused by sand or dust which gets attached to the screw shaft and mixed with grease.

The bellows are made of chloroprene rubber cloth, and the equally-spaced wiring arranges the shape. Depending on use conditions, you can specify various materials.

● **For dust prevention (standard specification)**

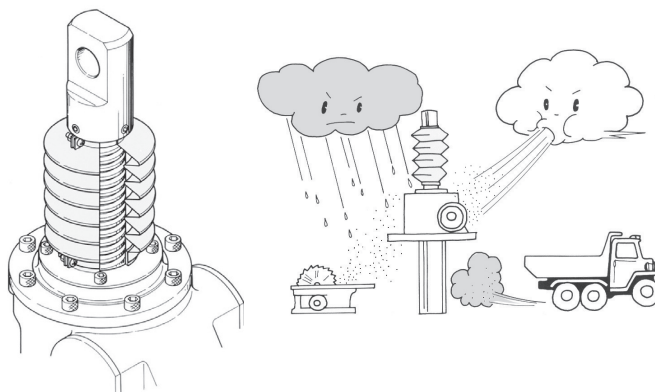
Chloroprene rubber cloth (CR)
Durable temperature: -15 to 100°C

● **For cold-resistance**

Silicon seat
Durable temperature: -40 to 150°C
* Cannot be used near sparks

● **For heat-resistance**

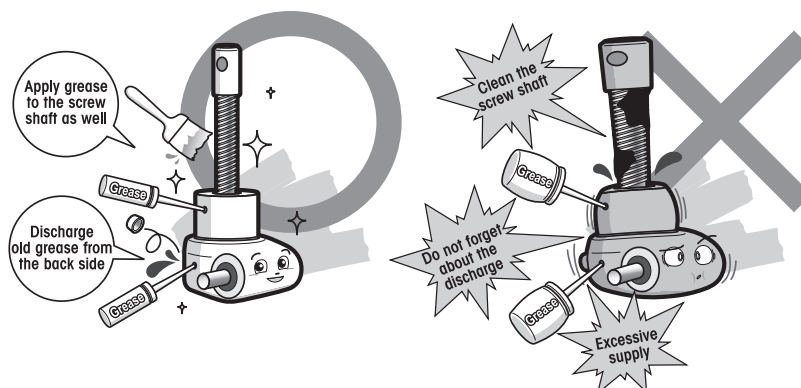
Glass cloth sheet
Durable temperature: -20 to 250°C
* OK to be exposed to sparks



Q In supplying/changing grease, is that OK to merely supply grease from the grease nipple?

A It is necessary to apply grease directly to the screw shaft.

While grease can be supplied to the inside of the jack's main body from the grease nipple, it is necessary to apply grease directly to the screw shaft. If the grease becomes dirty and discolored, loses its luster, shows a change in viscosity, or develops an oxidized odor, the deterioration of the grease has been accelerated, so you need to change the grease immediately. Excessive grease supply not only goes to waste, but also causes an overflow of grease from the jack's main body.



Supply grease evenly : an appropriate amount of grease to every necessary part

JACK Series

INSTRUCTION MANUAL



Caution on Safety

These CAUTION notes describe important matters on safety in using a gear device. Please read the CAUTION notes prior to the use, and handle the device properly. The gear device must be handled by (a) trained professional(s).

At the Time of Receipt, Transportation, and Storage



CAUTION Prevention of overhead hazard

- Hoisting and crane operations for the gear device must be done upon checking its mass (weight), and careful attention must be paid to the safety, including the avoidance of walking underneath the hoisted load.
- When the product is packed in a cardboard box, the strength of the packaging may deteriorate when it gets wet. Pay careful attention to the handling and storage.

Failure to observe these notes for CAUTION may result in an injury accident.

At the time of Installation, Test Operation, and Maintenance Checkup



WARNING Prevention of electric shock hazard (electric-powered products)

- When performing wiring, ensure that there is no defective insulation due to humidity or moisture.
- Make sure to connect ground wire.

Failure to observe these notes for WARNING may result in an electric shock accident.



CAUTION Prevention of overhead and fall hazard

- Hoisting and crane operations for the gear device must be done upon checking its mass (weight), and careful attention must be paid to the safety, including the avoidance of walking underneath the hoisted load.
- When performing the operation, ensure the safety of the scaffold, and avoid unstable behaviors.

Failure to observe these notes for CAUTION may result in an injury accident.



CAUTION Prevention of entanglement hazard

- Ensure the rotation is completely stopped before servicing.
- When servicing, properly communicate with a power operator.
- Do not approach or contact a rotary object during operation.

Failure to observe these notes for CAUTION may result in an injury accident.

Operation and Maintenance



WARNING Prevention of electric shock hazard (electric-powered products)

- When performing wiring, ensure that there is no defective insulation due to humidity or moisture.
- Make sure that the ground wire is properly connected.

Failure to observe these notes for WARNING may result in an electric shock accident.



To use gear devices properly and safely, it is important to conduct maintenance checkups, and keep them in good condition.

[CONTENT]

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Remarks

Thank you for adopting a screw jack(s) manufactured by Nippon Gear.
This Instruction Manual is prepared to explain and familiarize users (those who in charge of operation/maintenance of the jack series) with proper handling of the equipment. Please read through the Manual before starting the operation or maintenance service.

To device manufacturers: Please make an arrangement for ensuring that this Instruction Manual definitely reaches the end-user, specifically their maintenance administrator

1. Product Check at the Time of Receipt

Upon receipt of the jack, check the following items:

- (1) The series/size code, gear ratio, stroke, etc. indicated on the plate correspond to your order.
- (2) Accessories or parts you ordered are delivered as specified.
- (3) Whether there is any rust or damage during transportation or storage.

If any of the above items is not conformed, contact our company or transportation company within a week from your receipt of the product.

2. Installation



- Never use the product for specifications different from those specified in the approved drawing.
- The screw shaft (lifting screw) does not have a stopper.
- Depending on the structure on which the jack is mounted, abnormal noise may be generated during operation.
- In case a load acts on the jack's mounting bolts, use bolts categorized into the strength class 10.9.


- (1) Fix the jack on a highly rigid, flat and level base plate.
- (2) Install the jack ensuring that any side force or unbalanced load will not be applied to the entire stroke of the screw shaft.
- (3) In case a jack is attached to a vibrating machine or device, careful attention must be paid to ensure that the vibration is not transmitted directly to the jack.
- (4) To connect the input shaft with the power generator or in order for another shaft to be interlocked, use a flexible coupling.

- (5) If you intend to use the jack under different conditions from those predetermined, be sure to consult with us. If you use the jack under different mounting conditions or specifications from those in the approved drawing or catalogue, it may damage the jack or transmitting device.
- (6) There is no stopper at the screw shaft end of the jack, so careful attention must be paid to the position setting. If you need a stopper, specify so at the time of placing the order.
- (7) In case of using the jack at the screw shaft rotation speed of 1500mm/min or more, make an air vent port ($\phi 5 \sim \phi 10$, in one location).
- (8) In case the structure, on which the jack is mounted, has a pipe, etc., or a guide, note that abnormal noise may be generated due to resonance, sympathetic vibration, or chattering vibration accompanied by the jack operation.
- (9) In case a load is applied to mounting bolts, use bolts categorized into the strength class 10.9.
- (10) The screw shaft does not have seal structure.
 - ① There may be cases where grease or oil separated from grease may leak from the plated through hole of the housing, which the screw shaft moves in and out. In addition, grease or oil separated from grease, which is applied to the screw shaft, may leak. In case your device needs to avoid grease/oil dropping or dispersal, install an oil catcher as the countermeasure.

②We can also manufacture seal structure-type jacks. In case of seal structure-type jacks, although the leakage of grease or oil separated from grease applied to the screw shaft cannot be prevented, the leakage from the plated through hole can be prevented. Specify that you need the seal structure-type when placing an order. Since some dimensions of this type are different from those of the standard type, check dimensions before placing the order.

- (11) In case you selected a jack without anti-rotation key, or traveling nut-type jack, install an anti-rotation device for the traveling nut.
- (12) Shaft end fittings cannot be removed. If you add an end fitting, install an appropriate loose stopper.
- (13) As for rack jacks, ensure that the rack shaft does not rotate.
- (14) When using the jack for the device for elevating materials, and when people enter the venue for maintenance, etc., install an anti-drop mechanism on the device.
- (15) Be careful that when a load is applied on the screw shaft cover, the cover may be damaged.
- (16) Be careful that the screw shaft may descend due to its own weight.

3. Operation

 **Caution** • Never use the jack outside of the specified stroke range.

- (1) Prior to starting the load operation, perform running-in for several hours with no load or light load.
- (2) Never use the jack outside of the specified stroke range.
- (3) Make sure to install a limit switch to control the stroke. Prior to the operation, confirm that the limit switch properly works.
- (4) The jack is designed for intermittent operation. It cannot be used for continuous operation. Taking 60 minutes as a unit time, the jack must be operated by ensuring that

the duty cycle does not exceed the allowable range.

$$\begin{aligned} \%ED(\text{duty cycle}) = & \\ & \frac{\text{Operating time per cycle}}{\text{Operating time per cycle} + \text{Resting time per cycle}} \times 100(\%) \end{aligned}$$

Allowable percentage duty cycle

- J*H: no more than 70%ED, AND the start frequency of 20 or less per minute
- R*G, B, Y, and F: no more than 25%ED
- Other series/size codes: no more than 12.5%ED

- (5) Use the jack, ensuring that the surface temperature around the input shaft of the housing conforms to the following conditions. In case of the traveling nut type, check the surface temperature around the traveling nut as well.
 - Series/size codes other than below:
 - Ambient temperature plus 50°C or less, AND the maximum temperature 80°C or less
 - J4A,B~J7A,B
 - Ambient temperature plus 50°C or less, AND the maximum temperature 100°C or less
 - RMS, RSS
 - Ambient temperature plus 50°C or less, AND the maximum temperature 60°C or less
 - J*H
 - Ambient temperature plus 50°C or less, AND the maximum temperature 93°C or less
- (6) In case abnormal noise, abnormal heat, or abnormal vibration, etc. is generated while operating the jack, stop the jack and check it.
- (7) In case the value displayed on the ammeter (driven by electric motor) or the manometer (driven by hydraulic motor or air motor) on the control panel significantly changed, the following events are considered likely to have occurred: malfunction within the jack, load increase, increase/decrease in power voltage or pressure, malfunction of driving source. Stop the jack immediately and investigate the cause.
- (8) In case non-operation of the jack continues for a long time due to it being out-of-service, in storage, transportation, etc., consider rust-proof treatment.

4. Maintenance

(except for Hi-Speed Jack J*H series)

- (1) The jacks are lubricated by grease. Nippeco S No. 2, manufactured by Nippeco Ltd., is applied to the screw shaft and filled in the jack's main body. For the refill/replacement, use the above-mentioned grease.
- (2) Table 1 shows the grease supply cycle for the normal use of the jack.

Table 1. Grease Supply Cycle

Target part	Trapezoidal screw shaft	Ball screw shaft, rack shaft	Main body of jack
Grease supply cycle	1 month	3 months	3 months (or 12 months for BA type)

- (3) If such foreign materials as dust, grit, and fluid are included, or if the deterioration of grease is accelerated by severe use conditions, shorten the grease supply cycle. Even during the out-of-service period, grease deteriorates, so check and supply grease before resuming the operation.
- (4) When supplying grease to the screw shaft, wipe off old grease, and then apply new grease. As for RMS and RSS series, there is no need to supply grease to the screw shaft.
- (5) In order to change grease for the main body of the jack, you need to disassemble the jack. If it is difficult to disassemble, you can change grease according to the following method:
Remove the plug or inspection cover of the jack; supply grease from the grease nipple until old grease is pushed out, and new grease comes out of the plug hole.
- (6) As for RM* and RS* series, there is no need to supply grease to the main body of the jack, and the main body cannot be disassembled.
- (7) In case of a change to grease of a different brand, remove the existing grease before the change. Table 2 summarized recommended grease, and Table 3 shows the initial amount of grease filled in the jack's main body.

Table 2. Recommended Grease

Manufacturer	Product name	Soap group
Nippeco Ltd. ※	Nippeco S No. 2	Li
Idemitsu Kosan	Daphne Eponex EP No.2	Li
Cosmo Oil	Cosmo Grease Dynamax EP No.2	Li
Exxon Mobile	Mobilux EP2	Li
Showa Shell Sekiyu	Shell Albania EP Grease 2	Li
JXTG Nippon Oil & Energy Corporation	Epnoc Grease AP (N) 2	Li
	Lisonix Grease EP No.2	Li

※Standard grease for our jacks

Table 3. Initial Amount of Filled Grease

(specific gravity of grease: approx.0.9)

Series/ size code	Filled amount	Series/ size code	Filled amount	
			Lower side of main body	Upper side of main body
J0G, Y	0.07kg	J0B, F	0.1kg	0.05kg
J1G	0.25	J1B, F	0.25	0.1
J2G	0.6	J2B, F	0.6	0.2
J3G	0.8	J3B, F	0.8	0.7
J4A	1.0			
J4A	1.2	J4B, F	1.2	1.1
J5A	2.5	J5B	2.5	2.0
J6A	4.0	J6B	4.0	2.0
JFA	7.5	JFB	7.5	4.5
J7A	11.0	J7B	11.0	4.0
JMR	0.05			
JSR	0.06			
BAD*	0.25kg			
BA0*	0.5			
BA1*	1.0			
BA2*	3.0			

As for the traveling nut type ball screw jacks, grease is supplied only to the lower side of the main body.

- (8) In case non-operation of the jack continues for a long time due to it being out-of-service, in storage, transportation, etc., consider rust-proof treatment.
- (9) Even if the jack is used under adequate conditions, wear and deterioration of parts are inevitable. The following are the guidelines of when the jack should be replaced:
 - Trapezoidal screw: when the axial backlash exceeds 1/3 of the pitch of the screw
 - Ball screw: when the screw surface is peeled off; or when metallic powder is mixed in grease

- Smoothy: when the axial backlash exceeds 1/6 of the pitch of the screw
- Gear: relative to the rotation angle of the input shaft, when the backlash exceeds 20 degrees for H type, and 60 degrees for L type; or when large pieces of metallic powder are included in the grease for the main body of the BA type jacks

For other consumable parts, check and replace them in accordance with Table 4

Table 4. Inspection of Consumable Parts

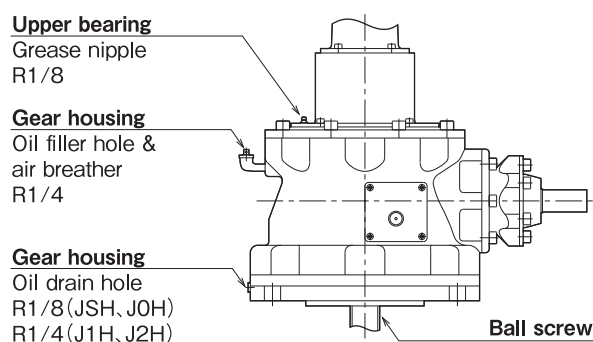
Item to be inspected	Frequency of inspection	Inspection details
Bearing	In every 6 months	If there is any abnormal noise or vibration, release the bearing.
Oil seal, O-ring	In every 6 months	In every 2 years, or if there is any grease-bleeding, replace the oil seal.
Dustproof bellows	In every 6 months	If any part is torn or ragged, replace the bellows.

In order to prevent defects due to wear and/or deterioration of the jack, be sure to conduct the inspection and replacement.

5. Maintenance of Hi-Speed Jack J*H series

- (1) For lubricating the jack, grease is used for the ball screw, and the upper bearing of the main body, and oil is used for the gear housing. The details of the oil filler hole and drain hole are as shown in Figure 1.

Figure 1. Oil Filler/Drain Hole of Hi-Speed Jack



- (2) As for grease, unless otherwise specified, Nippeco S No. 2 (lithium-based grease) manufactured by Nippeco Ltd. is filled. For the refill/replacement, use the above-mentioned grease.

- (3) At the time of delivery, no lubricant oil is filled in the gear housing. Purchase recommended lubricating oil and fill the specified amount. Remove the air breather in the rear of the main body, fill the oil, and then put the air breather back in the way it originally was. Different lubricating oil must be used depending on ambient temperatures. The amount of grease/oil by series/size, and recommended lubricant by manufacturer are shown in Table 5 and Table 6, respectively.

Table 5. Amount of Filled Grease for Hi-Speed Jack

Jack series /size code	Amount of filled grease	Amount of oil
JSH	20g	0.1L
JOH	25g	0.3L
J1H	45g	0.5L
J2H	80g	1.8L

Table 6. Recommended Oil

Ambient Temperature	-10°C to 30°C	10°C to 50°C
Idemitsu Kosan	Daphne Super Gear Oil 150	Daphne Super Gear Oil 220
Cosmo Oil	Cosmo Gear SE 150	Cosmo Gear SE 220
Showa Shell Sekiyu	Shell Omala Oil 150	Shell Omala Oil 220
Exxon Mobile	Spartan EP 150	Spartan EP 220
	Mobile Gear 629	Mobile Gear 630
JXTG Nippon Oil & Energy Corporation	BONNOC M 150	BONNOC M 220
	JOMO Reductas 150	JOMO Reductas 220

- (4) Table 7 shows the grease/oil supply cycle for the normal use of the jack.

Table 7. Cycle of Supplying Oil/Grease to Hi-Speed Jacks

Target part	Ball screw shaft	Gear housing
Cycle of supplying grease/changing oil	One month (grease supply)	Six months (oil change)

- (5) If such foreign materials as dust, grit, and fluid are included, or if the deterioration of grease is accelerated by severe use conditions, shorten the grease supply cycle.

Even during the out-of-service period, grease deteriorates, so check and supply grease before resuming the operation.


- (6) When supplying grease to the screw shaft, wipe off old grease, and then apply new grease.
- (7) In order to change grease for the main body of the jack, you need to disassemble the jack.
- (8) With respect to the change of lubricating oil, change the oil 2 weeks after the first oil filling. Thereafter, change the oil once in every 6 months. After starting load operations of the jack, the lubricating oil becomes very dirty at first due to the initial wear. Therefore, the first oil change should take place in 2 weeks, and changes thereafter should be in every 6 months. If the lubricating oil is insufficient or deteriorated, refill or replace the oil even before the expected time of replacement.
- (9) In case non-operation of the jack continues for a long time due to it being out-of-service, in storage, transportation, etc., consider rust-proof treatment.
- (10) Even if the jack is used under adequate conditions, wear and deterioration of parts are inevitable. The following are the guidelines of when the jack should be replaced:
 - Ball screw: when the screw surface is peeled off; or when metallic powder is mixed in grease

For other consumable parts, check and replace them in accordance with Table 8.

Table 8. Inspection of Consumable Parts

Item to be inspected	Frequency of inspection	Inspection details
Bearing	In every 6 months	If there is any abnormal noise or vibration, release the bearing.
Oil seal	In every 6 months	In every 2 years, or if there is any grease-bleeding, replace the oil seal.
Dustproof bellows	In every 6 months	If any part is torn or ragged, replace the bellows.

6. Oil Lubrication-Type Jack

-  **Caution** • At the time of delivery of the oil lubrication-type jack, lubricating oil is not filled in the gear housing.

For the oil lubrication-type jack, oil lubricant is used for the inside of its gear housing. (For its screw shaft, grease is to be applied. There is no oil lubrication-type jack for JM*, JS*, JO*, RM*, and RS* series.) The basic structure is similar to Figure 1 and Figure 4 for the grease lubrication-type, except for the oil seals attached to both upper and lower sides of the worm wheel. At the time of delivery, no lubricating oil is filled in the gear housing, so purchase recommended lubricating oil and fill the specified amount. The lubricant oil to be used should be AGMA7EP (ISO No. VG460 gear oil). The relevant oil by manufacturer, and the amount of oil by series/size code are shown in Table 9 and Table 10, respectively.

With respect to the change of lubricating oil, change the oil 2 weeks after the first oil filling. Thereafter, change the oil once in every 6 months. After starting load operations of the jack, the lubricating oil becomes very dirty at first due to the initial wear. Therefore, the first oil change should take place in 2 weeks, and changes thereafter should be in every 6 months.

As for the oil filled for the first time, if it is sufficiently filtrated by using a 25 μm to 100 μm filter, it can be reused. Otherwise, use new oil.

Table 9

Manufacturer	Product name
Idemitsu Kosan	Daphne Super Gear Oil 460
Cosmo Oil	Cosmo Gear SE460
Showa Shell Sekiyu	Shell Omala S2G460
Esso	Spartan EP460
Exxon Mobile	Mobile SHC634
JXTG Nippon Oil & Energy Corporation	BONNOC M460
	JOMO Reductase 460

Table 10

Jack series/size code	Oil amount
J1G, J1B, J1F	0.2ℓ
J2G, J2B, J2F	0.3
J3G, J3B, J3F	0.6
JGA	0.8
J4A, J4B, J4F	1.5
J5A, J5B	2
J6A, J6B	3
JFA, JFB	5
J7A, J7B	8

7. Disassembly & Assembly

The disassembly, assembly or part replacement should be performed by professionals in our company or service provider we designate.

8. When Making Inquiries

For replacement parts supply and other inquiries, please contact salespersons of our company.

9. Disposal

In disposing of a screw jack, ball screw jack or lubricant, they should be treated as general industrial waste.

10. Figures 2 to 6 show the construction of screw jacks and ball screw jacks.

No.	Part name
1	Lifting screw
2	Dustproof bellows
3	Flange
4	Key
5	Housing cover
6	Bearing
7	Worm wheel
8	Housing
9	Lifting screw cover
10	
11	
12	
13	Plug
14	Grease nipple
15	Key
16	Worm shaft
17	Oil seal
18	Side cover
19	Bearing
20	Snap ring
21	Bolt
22	Bolt
23	Shim
24	Bolt
25	Shim
26	Bolt
27	Bolt

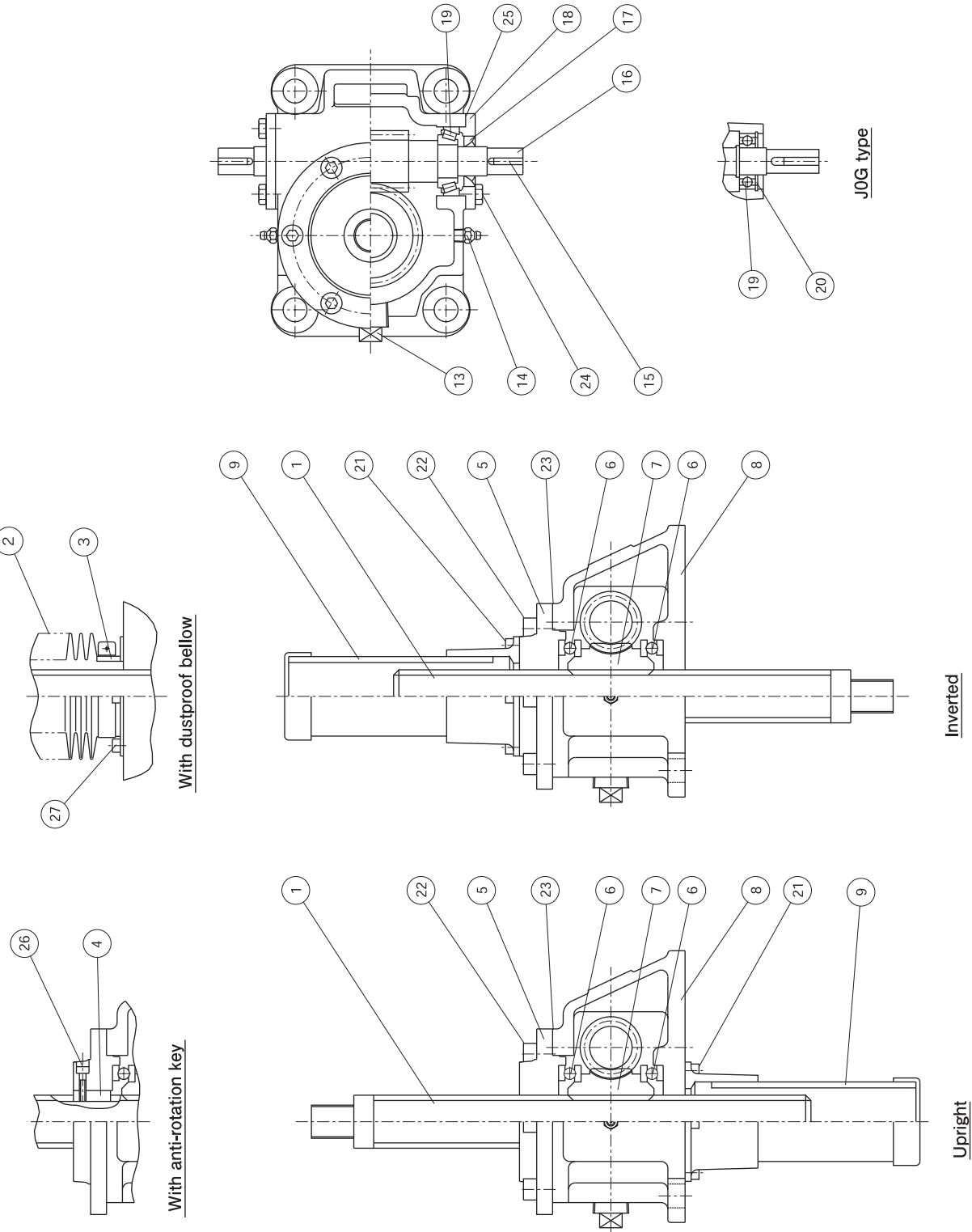
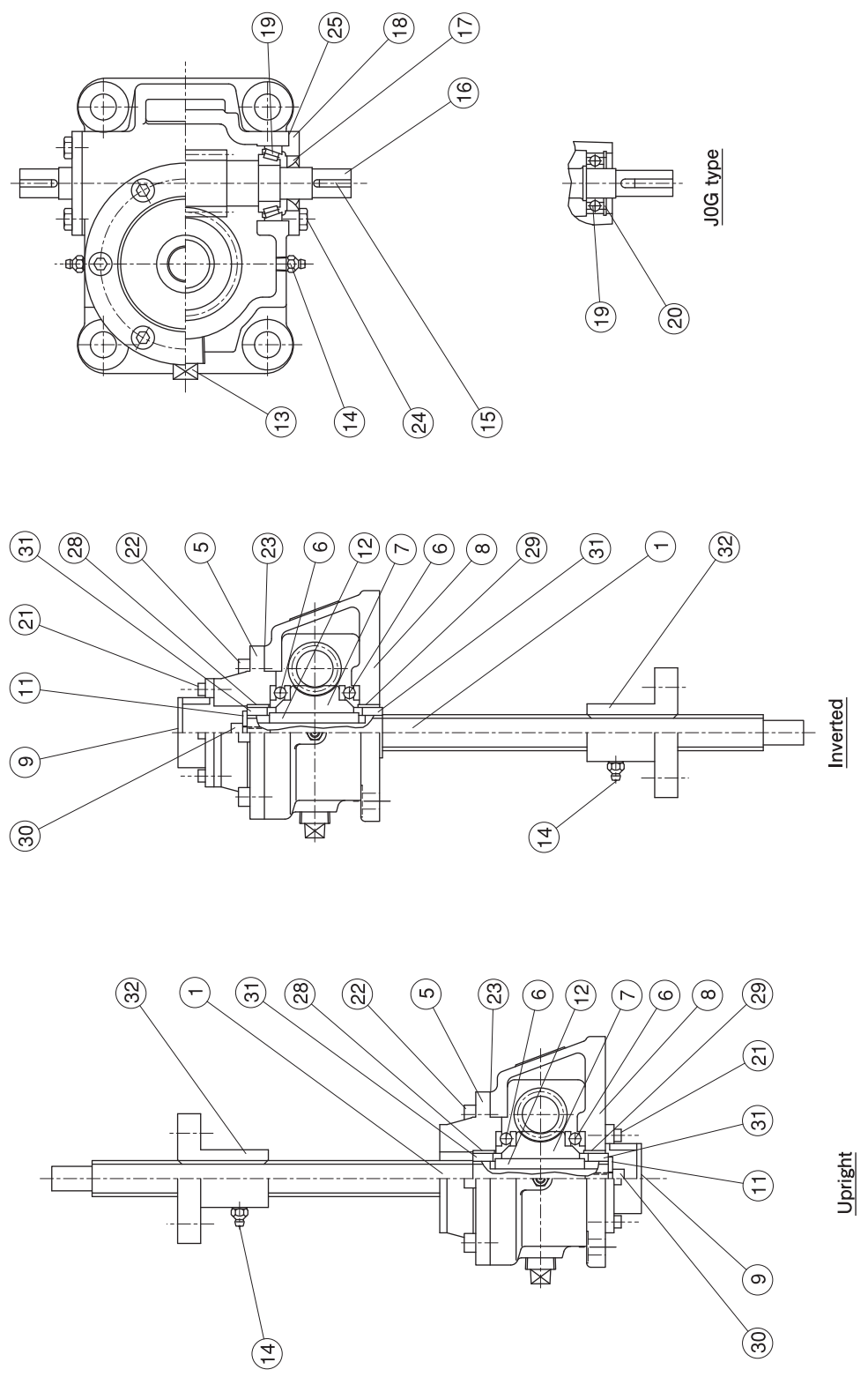
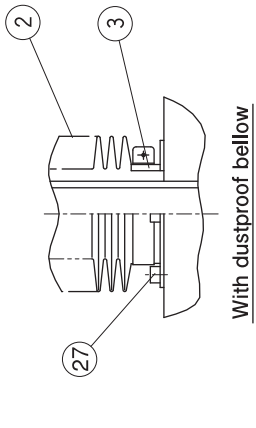


Figure 2. Translating Screw Jack



No.	Part name
1	Lifting screw
2	Dustproof bellows
3	Flange
4	
5	Housing cover
6	Bearing
7	Worm wheel
8	Housing
9	Lifting screw cover
10	
11	Fastening plate
12	Key
13	Plug
14	Grease nipple
15	Key
16	Worm shaft
17	Oil seal
18	Side cover
19	Bearing
20	Snap ring
21	Bolt
22	Bolt
23	Shim
24	Bolt
25	Shim
26	
27	Bolt
28	Bush
29	Bush
30	Bolt
31	Spacer
32	Traveling nut

Figure 3. Traveling Nut Type Screw Jack (J0G~J3G)

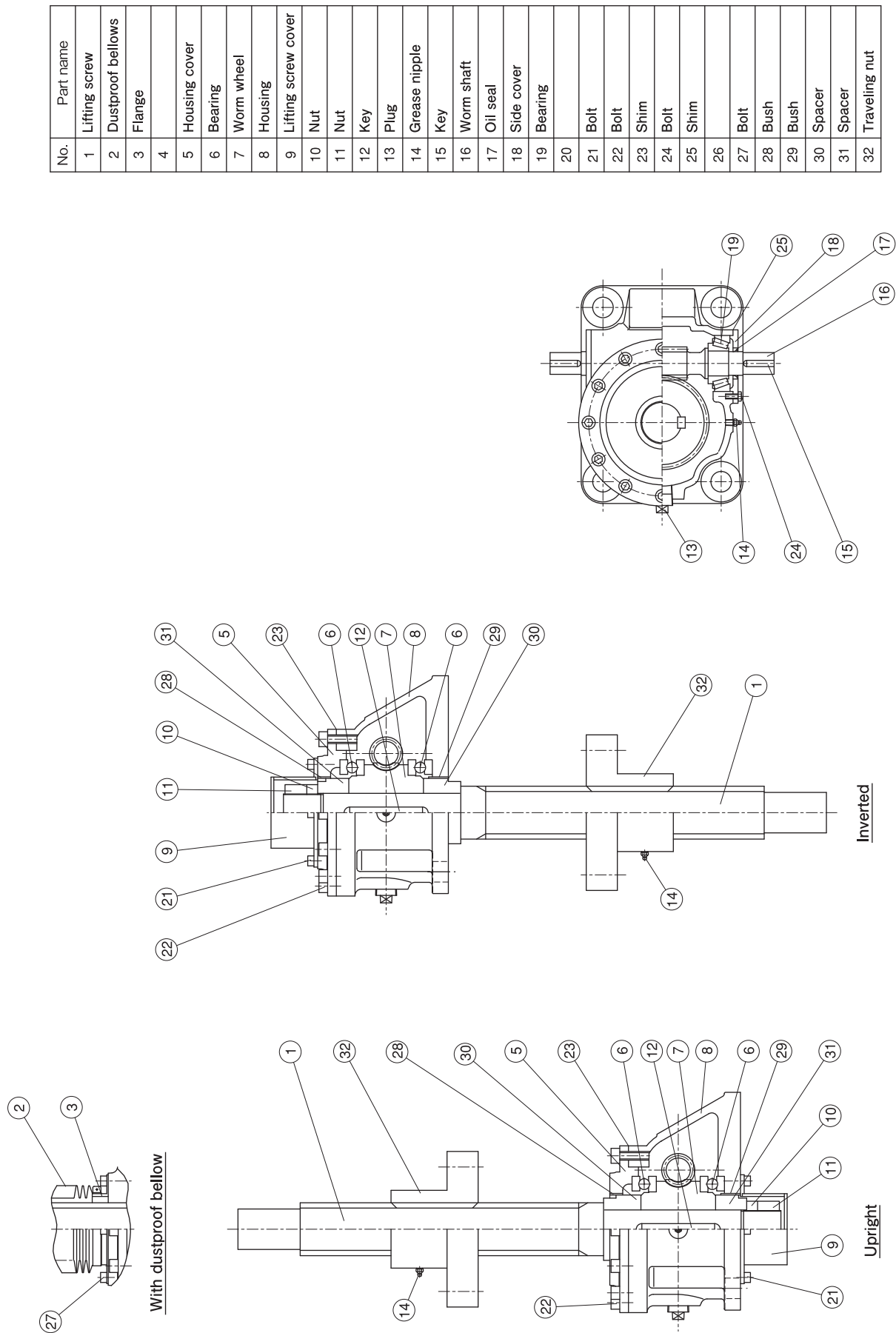
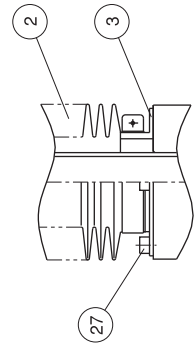
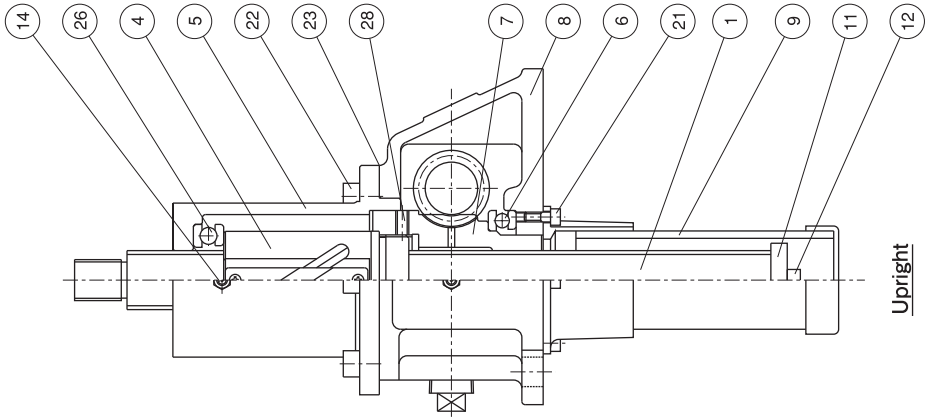


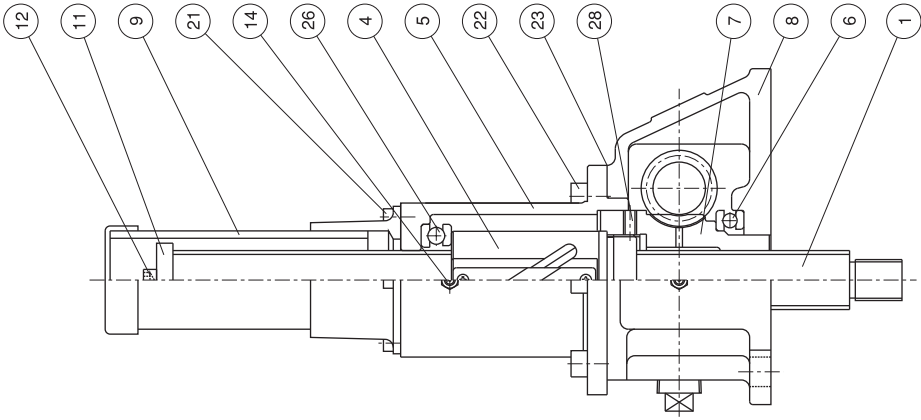
Figure 4. Traveling Nut Type Screw Jack (JGA, J4A~J7A)



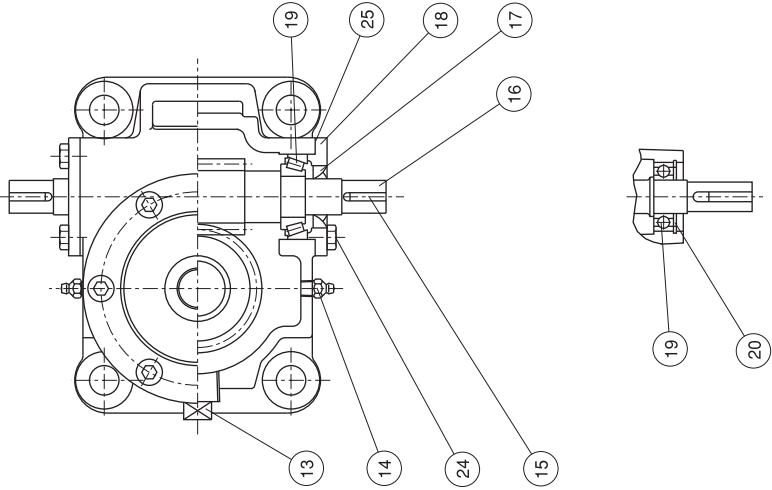
Upright



Inverted



JOB and F types



No.	Part name
1	Lifting screw
2	Dustproof bellows
3	Flange
4	Ball screw nut
5	Housing cover
6	Bearing
7	Worm wheel
8	Housing
9	Lifting screw cover
10	
11	Fastening plate
12	Bolt
13	Plug
14	Grease nipple
15	Key
16	Worm shaft
17	Oil seal
18	Side cover
19	Bearing
20	Snap ring
21	Bolt
22	Bolt
23	Shim
24	Bolt
25	Shim
26	Bearing
27	Bolt
28	Locking screw

Figure 5. Translating Ball Screw Jack

No.	Part name
1	Lifting screw
2	Dustproof bellows
3	Flange
4	
5	Housing cover
6	Bearing
7	Worm wheel
8	Housing
9	Lifting screw cover
10	Nut
11	Nut
12	Key
13	Plug
14	Grease nipple
15	Key
16	Worm shaft
17	Oil seal
18	Side cover
19	Bearing
20	Snap ring
21	Bolt
22	Bolt
23	Shim
24	Bolt
25	Shim
26	
27	Bolt
28	Bush
29	Bush
30	
31	Spacer
32	Traveling nut

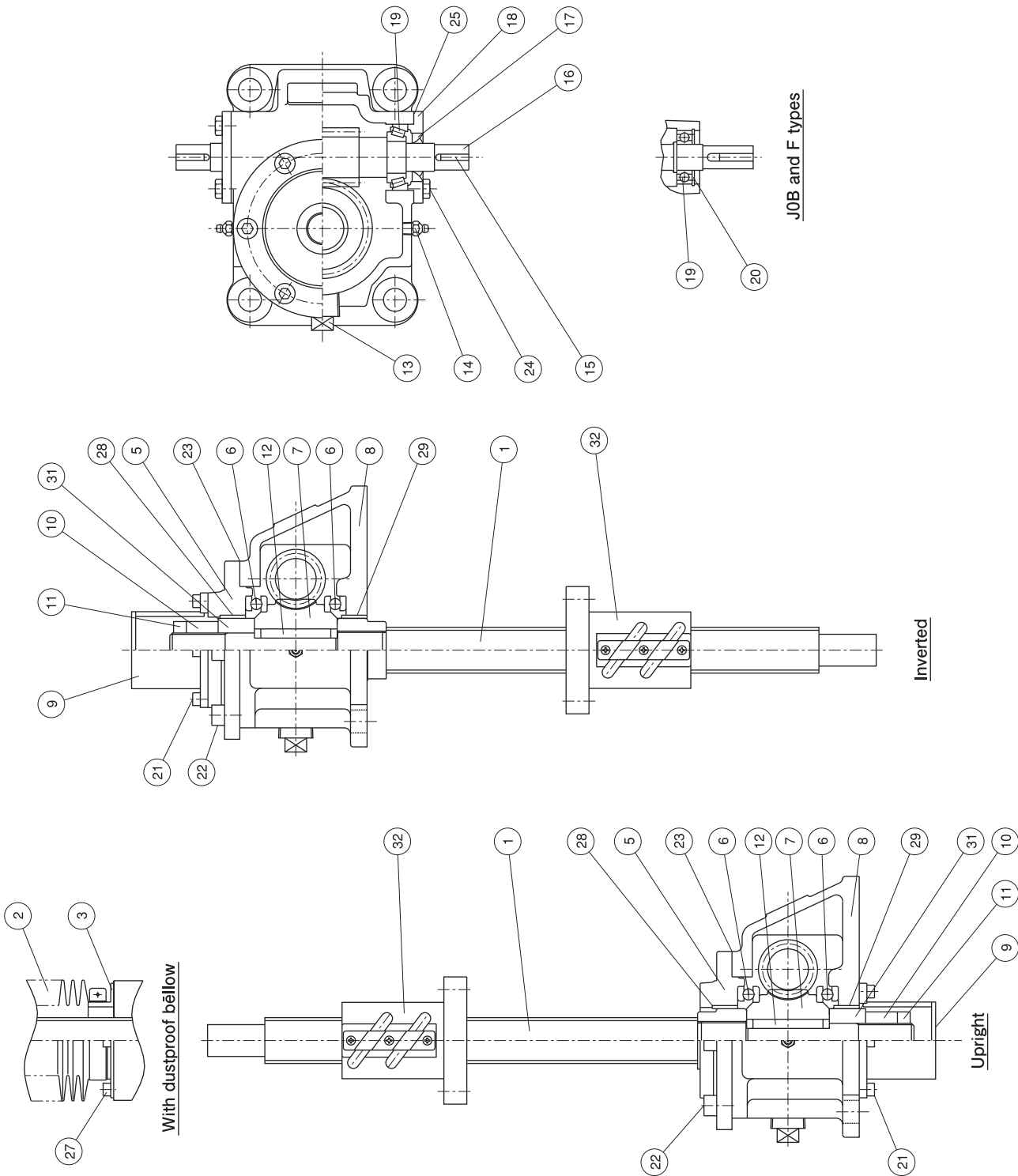


Figure 6. Traveling Nut Type Ball Screw Jack



Caution for Using Jacks

1. In selecting a jack, ensure that the motor capacity, lifting load, lifting screw speed, allowable buckling load, allowable side force (excluding ball screw jacks), etc., which you need, are within the range specified in the specification table. If your selection is not adequate, it may cause damage not only to the jack itself, but also to your device, or may lead to a serious accident.
2. When installing a jack, fix it on a highly rigid, flat and level base plate. When attaching a motor, speed reducer, etc., perform the centering.
3. Take care to ensure that the load on a jack is applied concentrically with its screw shaft. If eccentric load is applied to the jack, it may induce an excessive bending moment, and damage the jack. Furthermore, if there are excessive restraints, unbalanced load may be induced on the jack. Therefore, when connecting the jack to your device, please secure a certain degree of freedom.
4. In case a jack is attached to a vibrating machine or device, take care to ensure that the vibration is not transmitted directly to the jack. In case there is any shock or vibration, or due to running-in as a result of operating the jack, the self-locking mechanism may not work, even if it is a screw jack. To ensure the safety, install a brake. If excessive vibration works on the jack, it may lead to the loosening/breakage of locking bolts, or breakage of the lifting screw cover.
5. During the use, the stroke should never exceed the specified stroke range. Prepare a reliable limit detector and stopping device to avoid possible damage to the lifting screw and drive gear. Please select a jack with sufficient allowance against the stroke you need for your operation.
6. The lifting screw does not have a stopper.
7. To ensure the normal operating state of a jack, it is necessary to supply grease/oil to the lifting screw and jack's main body. For details of supplying grease/oil, refer to the section "Maintenance" of the Instruction Manual.
8. The jack's lifting screw does not have seal structure, so grease or oil separated from grease may leak. (In case of the oil lubrication method, the same shall apply to its lifting screw). In case your device needs to avoid grease/oil dropping or dispersal, install an oil catcher as the countermeasure.
9. Even if use conditions are adequate, jack parts cannot avoid wear and deterioration. If the lifting screw and/or gear become worn or deteriorated, it is required to replace the jack. Conduct inspections in accordance with the section "Maintenance" of the Instruction Manual.
10. Regularly check whether a shaft end fitting attached to the lifting screw, bolts for mounting the housing, and bolts for fixing the housing cover are not loose. If they are loose, tighten them up.
11. Momentary overload capacity is up to 10% for dynamic load, and up to 30% for static load.
12. The jack is designed for intermittent operation. It cannot be used for continuous operation. Taking 60 minutes as a unit time, the jack must be operated by ensuring that the duty cycle does not exceed the allowable range. As for the surface temperature around the input shaft of the housing, please ensure that the temperature does not exceed the ambient temperature range, while using the jack. In case of traveling nut type, please also check the surface temperature of the traveling nut. As for the allowable duty cycle, and surface temperature, please refer to the section "Operation" of the Instruction Manual.
13. The mounting surface of the jack housing (Except J*H) is painted. If the painting is not acceptable, please instruct salespersons of Nippon Gear about that.
14. When dimensions are described without tolerance, general tolerance/casting tolerance applies. Actual dimensions may be larger than the described dimensions by 2 to 5 mm. Design the machinery with enough tolerance.

 *As we manufacture various kinds of tailor-made products to satisfy your needs, please consult with us.
 The contents of this catalog are subject to change for product improvements. Please contact us for your detailed design.

Warranty for Jacks

Nippon Gear Co., Ltd. (hereinafter “the Company”) can promise excellent performance and durability of its Jack series, based on its strict internal testing and proven track record over the years. Furthermore, the Company set the following warranty standards.

1. Warranty Period

The warranty shall expire in 1 (one) year after the date of shipment from the Company's factory.

2. Scope of Warranty

When the Company's product is used in accordance with specified rating and operating conditions, the product is warranted during the period specified at the time of concluding the contract. Accordingly, even within the warranty period, in case of any failure attributable to the following reasons, it shall be outside the scope of warranty:

- 1) Failure due to the use beyond the Company's product specifications or selection criteria;
- 2) Failure due to events not attributable to our Company's product, including fire, flood, typhoon, earthquake, or other acts of nature;
- 3) Failure attributable to modification or repair by a person(s) other than service agents designated by our Company;
- 4) Non-conformance due to changes over time (including but not limited to, natural discoloration of coating, plating, etc., rust, deterioration of grease, and oil separation);
- 5) Failure attributable to non-implementation of maintenance, checkup, care, etc. specified in the operation manual or other technical documents;
- 6) Failure attributable to inadequate operation or treatment; or
- 7) Sensuous phenomenon (sound, vibration, etc.) to the extent that is generally considered to have no impact on quality and/or performance.
- 8) Parts specified in the list of consumable supplies, etc., which deteriorate/wear over time.

3. Warranty expense

In the event any failure attributable to our Company is found during the warranty period, our Company shall replace the defective product with a comparable product, or repair the product, at our cost. The warranted area is limited to within the country. Furthermore, the warranty expense refers to the warranty for the single product which our Company delivered, and does not include the following expenses induced by any failure of the products in question:

- 1) Man-hour cost for removing/installing the product from/on your equipment, transportation expense and taxes required for re-delivery, and such extra cost as storage cost; and
- 2) Expenses for loss from suspending operation of your equipment and/or opportunity loss caused by the defect of the product in question.