

Screw Jack Series(NJ · NJV · TJ · BTV · RJ · JA · JTA)

Ball Screw Jack Series(BSJ · BXJ · BJV · BTJ · BTV · JB · JTB)

INSTRUCTION FOR

INSTRALLTION AND MAINTENANCE

Contents

General Precautions	1
Definitions and Symbols	1
Recommended conditions for Products	2
Product type to be explained in this instruction.....	2
To use our products safely	2
Inspection upon our product	4
Precautions on relocation	4
Precautions on mounting	5
Precautions on connection to a machine	6
Precautions on operation.....	7
Handling the accessories.....	9
Daily inspection maintenance	10
Recommended oil and grease and its capacity	11
Daily and periodic inspection	13
Trouble shooting Information	14
The Product warranty	16

This Instruction Document must be read thoroughly installing or operating Screw Jack series or Ball Screw Jack series so that unit would be used for long time. Get through the instructions contained herein before installing and operating the product. Keep this document available on file for future reference.

Regardless of the warranty period, contact your local distributor or service section when you want to inquire about our product



Makishinko Co., Ltd

4-206 Shin-Tanimachi Dai 3 Bld.7-chome, Tanimachi, Chuo-ku,

Osaka 542-0012 Japan

Tel. 06-6763-2101 Fax 06-6763-2100

E-mail eservice@makishinko.co.jp

■ General Precaution

- **This Instruction document should be made available for setting companies to install our products.**

In the case of installing (or operating) our products, please make clear the cautions and attentions during operating them to end users, besides giving this book.

- This Instruction Document must be read thoroughly when the end users install or operate Screw Jack series or Ball Screw Jack series.

Setting companies: User to install our products.

End users: User to operate actually the products to be installed.



Caution

- Leave the treatment of the products to qualified or well-experienced engineers in their relocation, installation, use, operation, maintenance and inspection.
- Unauthorized modification of the product will nullify Makishinko accountability for its warranty.
- Don't use the product for other purposes and manners than those designated in its nameplate, so that our products are damaged.
- When you discard the product or used lubricating oil, treat it as general industrial waste.

■ Definitions and Symbols

Negligence of those instructions contained herein may result in injury and/or damage. In this document, potentialities of injury and damage are classified into "Danger", "Caution" and "Notice", depending on the extent of their seriousness. Their definitions are as follows.



Danger

Negligence of this precaution will produce a dangerous condition, which may result in major injuries or death.



Warning

Negligence of this precaution will produce a dangerous condition, which may result in major injuries or death.



Caution

Negligence of this precaution will produce a dangerous condition, which may result in moderate or minor injuries and/or damage.

■ Recommended conditions for Products

Temperature	-15°C ~ 80°C
Humidity	80% or below(no dewdrops)
There is no erosion gas and powder dust	

■ Product type to be explained in this instruction

NJ,NJV, JA · Screw Jack (Standard Type) BSJ · Ball Screw Jack (Standard Type)
 TJ, ,NTV,JTA · Screw Jack (Traveling Nut Type) BXJ, BJV,JB · Ball Screw Jack (Standard Type)
 RJ · Screw Jack (Reverse Load Type) BTJ, BTV,JTB · Ball Screw Jack(Traveling Nut Type)

1. Comparison table between new and old model

Old model	NJ,NJV	TJ,NTV	BSJ	BXJ,BJV	BTJ,BTV	RJ
New model	JA	JTA	—	JB	JTB	JA

2. Comparison table between new and old type

Old model NJ, NJV,TJ,NTV, BSJ, BXJ,BJV, BTJ,BTV, RJ
 (The type shows the distance from center of Jack)

New model JA, JTA, JB, JTB (The type shows the load dose)

Old type	—	25	32	40	50	60	70	80	—	90
New type	002	005	010	025	050	075	100	150	200	250

Old type	100	120	135	155	175	195	200
New type	300	400	500	750	1000	—	1250

■ To use our products safely

Before installing and operation our products, the following cautions must be read thoroughly, understood and fulfilled.



Danger

- Don't use our products in an explosive atmosphere. Its use in such an atmosphere may cause an explosion, ignition, fire, electric shock, injury or damage.
- When the product is lifted up for relocation, don't step in the area below the product. Its accidental drop will result in injury and/or death.



Warning

- Check to see that the supply current does not exceed the rated one mentioned on the product's nameplate.

- During operation, keep away from the products and their elevating parts in order to prevent an accident resulting in injury and/or damage, which is caused by the product start or the sudden fall of their elevating parts.
- During operation, don't touch the rotating parts such as shafts. If you touch them, it may cause an accident resulting in injury.



Caution

- Use always lifting bolts or other lifting devices to prevent the injury and/or damage caused by the damage of lifting bolts, dropdown or turnover of the product.
- Don't touch the product's shaft key way with a bare hand to avoid the injury.
- When you relocate the product, don't hold its shaft end or don't attach the lifting belt to the shaft.
- Before starting operation of the product, exchange the attached air freezer.
If you are failed to do, neither oil nor grease leaks from the product.
- Adjust to proper centering. Improper centering work causes to the product's mechanical trouble or the expiration of its service life.
- Periodic replacement of grease is required to the prolongation of product's service life.
- Check to see that the proper capacity of lubricating oil is filled before starting the operation.
A lack of lubricating oil causes to the product damage.

■ Inspection upon our product

Upon the delivery of the product, conduct the following inspections.



Caution

Before opening the package of our product, conform the upper and lower sides of it, which may drop down or turn over.

- Check to see that the delivery conforms to your purchase order.
- Check to see that the product is intact without damage during transportation.
- When you don't operate the product at once and hold it for a time, install it in the dry and well-ventilated area,

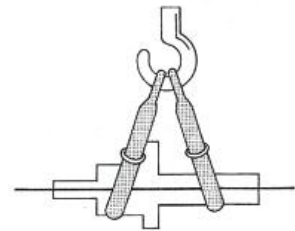
■ Precautions on relocation

Take a good care of the following matters when you relocate or transport the product.

If you lift the product with the device such as a wire, use the lifting device such as a bolt to prevent an accident resulting in injury and/or damage to be caused by the sudden fall.

Don't tie the input shaft or the screw shaft directly with a wire, and don't touch it with a bare hand.

(If you have no lifting bolt, please hang the product on the nylon sling, lifting in two points such as case and the other proper part tightly and safely.)



Danger

- When the product is lifted up for relocation, don't step in the area below the product. Its accidental dropdown will result in injury and/or death.
- When you carry the screw shaft of Ball Screw Jack series, don't forget to fix its end.



Caution

- Use always lifting bolts or other lifting devices to prevent the injury and/or damage caused by the damage of lifting bolts, dropdown or turnover of the product.
- Don't touch the product's shaft key way with a bare hand to avoid the injury.
- Take a good care of the product when you relocate or transport it, which may drop down or turn over.
- When you relocate the product, don't hold its shaft end or don't attach the lifting belt to the shaft.

■ Precautions on mounting

When you mount the product, observe the following environmental conditions in its installation area.

- **The direction to be mounted**

Check to see that the mounting surface of unit is proper.

Inadequate direction may cause the damage of the product's bearing, gear tooth and shaft.

- **The stand to be mounted**

Before mounting the product on your machine, check to see that the machine's construction and rigidity conform to the product. Inadequate construction and rigidity of the machine will generate abnormal vibration and cause an accident resulting in injury and/or damage.

- **The surface to be mounted**

Check to see that the mounting surface of unit is washed in order to keep the product adequate angles of screw shaft.

Support the mounted surface to be stained with painting and rust-proof enamel.

- Adjust to proper centering. Improper centering work causes to the product's mechanical trouble or the expiration of its service life.



Caution

- Adjust to proper centering. Improper centering work causes to the product's mechanical trouble or the expiration of its service life.

- **Bore**

There is the bore part on the mounting surface to adjust the proper place. To adjust the center of screw shaft and the center of the elevating system, process it on the mounted base.

- **Eccentric load**

When you connect the screw shaft with the elevating part, adjust the proper mounting.

The product has the screw guide. But take good care of the eccentric load or horizontal load.

For the upright model on a base plate, we recommend to use the guide roller, the guide shaft and so on.

- **Mounting of NJ, RJ, BSJ, BXJ, JA, JB model**

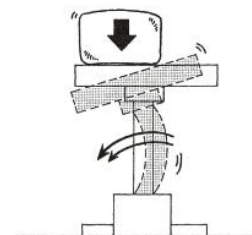
Mount the screw shaft of them to be at right angle to the surface of them.

- **Mounting of TJ, BTJ, JTA, JTB model**

Mount the screw shaft of them to be parallel to the surface of them.

- **Mounting of the long stroke model**

Take measure to avoid horizontal load. When you mount the product on a base plate or a flange, tighten its bolts at a designated torque by lifting the screw shaft (in the case of NJ, RJ, BSJ, BXJ) or the traveling nut (in the case of TJ, BTJ).



■ Precautions on connection to a machine

When you connect the product's shaft to a load or a motor, check the following matters.



Caution

- Check to see the connecting permissible accuracy when they are connected to each other directly. If such connections are destroyed during operation, they may cause the product damage and/or machine damage.
- Before connecting the product to a machine, make sure of their rotating directions. Rotation in a wrong direction may cause injury and/or damage.
- Don't touch the rotating parts. Cover them with protective guards to prevent an accident resulting in injury.
- Install the non-rotate device to the screw shaft of the ball screw jack, in order to prevent the injury caused by dropdown accident

● Adjust to the proper centering position in connecting to another machine.

● Input shaft, screw shaft's end

- Wipe off the rust inhibitor from the product's screw shaft end or input shaft with a solvent such as thinner. Notice the shaft oil seal not to be strained with its solvent to avoid the oil seal damage.
- Fit quality of the shaft with a coupling should be around H7 (JIS B 0401) and key system is introduced B 1301-1976(New JIS)(the parallel ordinary sized key model).
- When you attach a coupling, sprocket or gear to the product's shaft, treat the shaft with grease for anti-seizure and don't give the physical force unjustly to the product's bearing to avoid damage.

● The connection device to the machine

- When you connect the shaft of our product to the machine's shaft with a coupling Adjust the centering of the shaft to follow the recommended proper by the coupling maker in the above work.
- When you connect the shaft of our product to the machine's shaft with a pulley or sprocket Connect them rightly, using the recommended proper belt tension or pulley tension by the maker.

The tightening or slack of the belts or pulley may generate stress on the product.

Position sprocket or pulley as close to the product body as possible so that the shaft can carry loads at its root. If the load point is in the edge of the shaft, it causes to the product damage.

● Fixing of metal attachments on the shaft end

- C (Clevis end)
The connecting pin must be made from the tenacity materials and you should retain it.

- S (Screw end)
Tighten the screw end after screwing down it. Without fit drive in the screw shaft, please mount the fit drive device to be rigid regarding the screw torque
- F (Flange end)
Without fit drive in the screw shaft, please mount the fit drive device to be rigid regarding the screw torque.

■ Precautions on operation

Before starting the operation, check the following matters.



Caution

- **When you use the product at first time, exchange fasten plug for attached air breather.** If you forget to mount it, the leak of lubricating oil may cause injury and/or the product damage.
- **Whenever you notice something abnormal, stop operation immediately** to avoid injury, fire and/or the product damage.
- **When you want to mount the product without our recommended design,** get in touch with your local distributor or our service section.
The leak of lubricating oil or grease may cause injury and/or the product damage.

- **Check the lubricating oil or grease**

Check to see if the product is filled with the standard amount of lubricant

Oil bath lubricating type: To be the oil surface in the center (NJ, TJ, JA, JB, JTA, JTB, BSJ type)

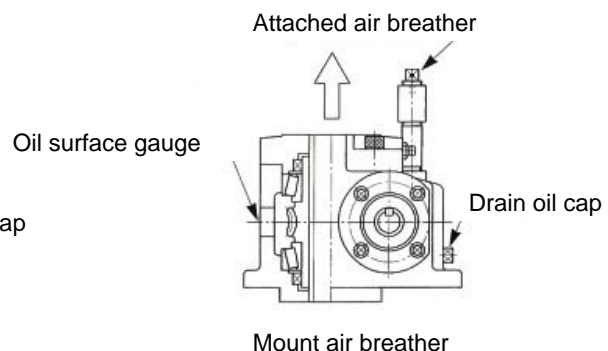
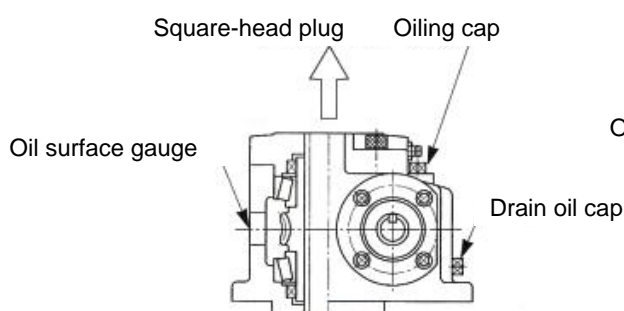
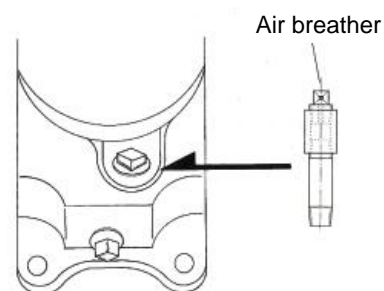
Grease lubricating type: To fill grease to the grease nipple and to drain it from the relief fitting. (RJ type)

When there is a shortage of the lubricating oil or grease, add the same recommended lubricating oil or grease as it is used.

- **Check air vent cock**

For the grease-lubricating product, grease is sealed in it in our factory before its delivery to avoid oil leakage.

When you use the product at first time, exchange fasten plug for attached air breather. In the case of Ball screw Jack with an air breather, mount the attached air freezer in exchange for the plug.



- Fitting operation

The worm wheel gives full play to its ability by fitting operation. Please operate it for two or three hours by adding between 1/3 and 1/2 load of the rated load in starting operation.



Caution

- Whenever you notice something abnormal, stop operation immediately to avoid injury, fire and/or the product damage.
- Don't operate the product at a load exceeding its rated capacity to avoid injury, fire and/or the product damage.
- Don't operate the product at a rotation exceeding its rated capacity to avoid injury, fire and/or the product damage.

- Cautions on the stroke

The stroke can overrun up and down in both direction within 5mm to 30mm.

When the stroke overrun more than above width, the screw shaft will be stopped at the place where the stopper to be mounted with the screw shaft bump the case stopper. But don't try to conduct any work when the product is energized. Always turn off the power switch supply to avoid the product damage. So that the screw shaft is locked then, you must take off the cover of the output shaft. We recommend you to use the safety device such as torque limiter and so on. But the over load for the stopper may cause the product damage

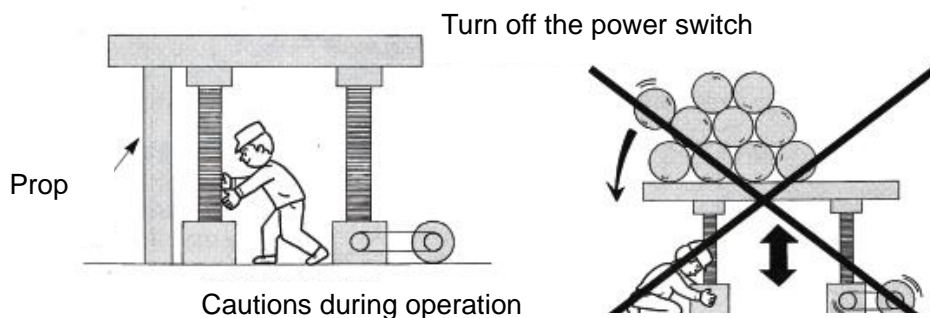


Caution

Check to see that the supply current does not exceed the rated one mentioned on the nameplate. If the stroke is over, the screw shaft is locked. Then the over load for the stopper may cause the product damage

- Caution during operating

Keep away from the products and their elevating parts. When you must approach to them, turn off the power switch and then operate after confirming the full safety by propping up the elevating part.



Caution

- During operation, keep away from the products and their elevating parts in order to prevent an accident resulting in injury and/or death, which is caused by the product start or the sudden fall of their elevating parts.

■ Handling the accessories

● One with bellows

The standard bellow is made from nylon tarpaulin. Whenever you work in such bad environment as outdoor or the area filled with dust or cutting powder.

● One with key to avoid rotating(NJ, RJ, JA)

This is the type that the screw shaft is possible to move up and down in itself. The key is fixed to cover of output screw and the key way is in the screw shaft.

After being used for a long period of time, its frictional face wore out, widening the gap between the brake disks. When the key way exceeds a certain distance, excitation of the screw shaft does no longer activate its armatures. Then replace it.

● One with the motor

This is the type the flange type motor is connected directly to the product by coupling. As it adopts the oil bath system in reduction part, it can move at high speed. (Confirm the attached instruction written by the motor maker.)

● One with the bevel gear box

This is the type the bevel gear box is connected directly to the product. As you can position input shaft at right angles to the standard input shaft direction, it is useful to connect many devices.

Don't add the over hung load on the bevel gear side.

■ Daily inspection and maintenance

Please take care of the following matters in daily inspection and maintenance.

● Replacement of lubricating oil

In the case of oil bath lubricating type, replace it at the first time after 50 hours. After then, you should replace it in every 6 months. Especially, the first replacement is required to remove the wear dust in the fitting operation.

In the case of grease lubricating type, fill grease to the grease nipple and to drain it from the relief fitting. (RJ type)



Caution

- **Periodic replacement of grease is required** to the prolongation of product's service life.

- **Replacement of lubricating grease in the part of screw shaft.**

Screw shaft employs the grease lubricating system, it is recommended to replace with new grease in about one week in the initial operation. In replacing the grease, wipe off old grease then supply new one. When you don't operate the unit for long time (over 6 months), we recommend to replace grease with new one before using it again.



Caution

- **Wipe off old grease in screw shaft periodically and supply new one.**

It will prevent undesirable accidents and prolong the product's service life.

- **When you do not operate the unit for a long time**

You must operate the unit two or three to-and-fro movement a month to keep the inner part free of rust.

- **Inspection of internal thread wear(NJ, TJ, RJ, JA, JTA)**

Check the amount of the wear. When the thread of the screw becomes about 1/3, supply new one.

- **Caution on the environmental condition**

When you mount the product on a machine like a food processor, which must be free of industrial oil, provide an oil pan or any other adequate measures against possible oil spillage caused by the product's mechanical trouble or the expiration of its service life. When you discard the used lubricant of the product in Japan, you may treat it as general industrial waste.

■ Recommended oil and grease and its capacity

(Table-1) Oil lubrication

Ambient temperature	-15°C to 40°C	40°C to 80°C
ISO Grade	VG 150	VG 320
JIS Grade	K2219 -class2 No.4	K2219 -class2 No.6
Mobil oil	Mobil Gear 629	Mobil Gear 632
Idemitsu oil	Daphne Super Gear 150	Daphne Super Gear 320
Shell oil	Omara #150	Omara #320
Esso oil	Spartan EP 150	Spartan EP 320
Nippon oil	Bonnox M 150	Bonnox M 320
Jomo oil	Reductus EP 150	Reductus EP 320

(Table-2) Grease lubrication

Ambient temperature	-20°C to 80°C
Mobil oil	Mobilux EP 2 (SHC 460)
Idemitsu oil	Daphne Eponex SR 2
Showa Shell oil	Sunlite EP 2 (Alvania EP 2)
Nippon Mitsubishi oil	Epinox AP 2

We use Showa Shell oil Omara #150 lubricating oil and Idemitsu Daphne Eponex SR 2 grease.

※Model Type 002 use Nippon oil Bonnox M 220 lubricating oil (ISO VG 220)

(Table-3) Capacity of oil and grease

Model	Oil(ℓ)Grease(g) (Reduction unit part)		Grease	Grease (Screw unit part)		
	NJ,TJ,NJV NTV,JA,JTA	BSJ,BXJ,BTJ BJV,BTV,JB,JTB	RJ	NJ,TJ,NJV NTV,JA,JTA	RJ	BSJ,BXJ,BTJ BJV,BTV,JB,JTB
(002)	0.07ℓ	-	-	5g	-	-
25 (005)	40g	40g	-	8g	-	8g
32 (010)	50g	50g	-	10g	-	10g
40 (025)	0.3ℓ	0.3ℓ	-	40g	-	30g
50 (050)	0.5ℓ	0.5ℓ	-	50g	-	40g
60 (075)	0.8ℓ	0.8ℓ	800g	60g	60g	50g
70 (100)	1.0ℓ	1.0ℓ	-	80g	-	60g
80 (150)	1.2ℓ	1.2ℓ	1200g	100g	100g	70g
(200)	1.3ℓ	1.3ℓ	-	110g	-	90g
90 (250)	1.8ℓ	1.8ℓ	1800g	120g	120g	90g
100 (300)	2.6ℓ	2.6ℓ	2600g	150g	150g	110g
120 (400)	4.0ℓ	4.0ℓ	4000g	180g	180g	130g
135 (500)	6.0ℓ	6.0ℓ	-	220g	-	160g
155 (750)	8.0ℓ	8.0ℓ	8000g	280g	280g	200g
175 (1000)	10.0ℓ	10.0ℓ	-	350g	-	250g
195	-	-	1000g	-	400g	-
200 (1250)	12.0ℓ	12.0ℓ	-	450g	450g	320g

Model RJ and Type 25(005),32(010) adopts the grease-lubricating system in the reduction part, so capacity of grease is listed.

Capacity of grease (Screw part) is listed when stroke size is 300mm.

■ Daily and periodic inspection

(Table-4) Daily and periodic inspection

Item	Daily inspection	Periodic inspection
Confirm amount of oil (grease) in the speed reduction section	Check before operation every day	
Supply grease into the screw shaft	Frequent use (Less than 10~30 times par day) In the case of Ball Screw Jack (More than 30 times par day)	Frequent use (Less than 10 times par day) In the case of Ball Screw Jack (Less than 30 times par day)
Replace grease in the speed reduction section		The beginning and Every 2 ~ 6 months
Replace grease in the screw shaft		The beginning and Every 2 ~ 3 months
Loose bolts		Every 2 ~ 12 months
External surface damage		Every 2 ~ 12 months
Wear of the internal thread (NJ, TJ, RJ, JA, JTA)		Every 2 ~ 3 months
Screw shaft damage		Every 2 ~ 12 months
Bellows damage		Every 2 ~ 12 months
Locking gap (NJ, RJ, JA)		Every 2 ~ 3 months
Clean the screw shaft		Every 2 ~ 3 months
Other items to be checked		

The stroke for the frequency in usage is showed in the case of 300 mm. The stroke correlates closely with the frequency in usage,

■ Trouble shooting Information

Whenever you notice something abnormal such as the followings, stop the operation immediately to avoid an accident.

Problem		Causes	Remedies
Overheating experienced		Overload	Check loading and adjust to adequate level
		Excess or insufficient grease	Add or remove the grease to adequate amount
		Improper grease or oil	Change to recommended grease (#005 and #010) Change to recommended oil (#025 to #1250)
		Improper adjustment of bearing	Contact Makishinko
Abnormal buzzes	Regular noise	Improper gear contact	Contact Makishinko
		Bearing damaged	Replace with new bearing
		Improper adjustment of coupling	Adjust to proper alignment
	High metallic noise	Incorrect bearing preloaded	Contact Makishinko
		Insufficient grease of gearing section	Add grease to proper amount (#005 and #010)
		Lack of grease in screw shaft	Flush and replace with new grease
	irregular noise	Foreign matter in unit	Flush old grease and change with new (#005 and #010) Flush old oil and change with new (#025 to #1250)
		Lateral load on screw shaft	Adjust to proper mounting
		Unstable continuous operation	Adjust to proper mounting
Unusual vibration		Wear of gears	Replace with new gears
		Foreign matter in unit	Flush inside and add new grease (#005 and #010)
		Bearing damaged	Replace with new bearing
		Looseness of mounting bolts	Tighten the bolts after confirmed adjustment of input and screw shaft
		Improper mounting adjustment	Adjust to proper mounting

Problem	Causes	Remedies
Oil leaking	Oil seal damage	Replace with new seal
	Packing damage	Replace with new packing
	Lack of tightening the drain plug	Tighten the drain plug by seal tape
	Oil surface gauge damage	Replace oil surface gauge
	Air vent cock failure	Take off red oiling cap or replace air vent cock
Input and screw shaft will not rotate	Worm gear distorted	Contact Makishinko
	Screw shaft distorted	Contact Makishinko
	Locking condition at excessive stroke position	Disassemble unit and replace part if needed
	Bent screw shaft	Replace screw shaft
	Bearing damaged	Replace with new bearing
	Foreign matter in unit	Contact Makishinko
Slipped input shaft and will not up screw shaft	Wear of gears	Replace gears
	Damaged key	Replace key and relative parts
	Damaged input shaft	Replace input and wheel
	Damaged internal thread	Replace parts
Falling down screw shaft	Damaged internal thread	Replace parts
Falling down screw shaft of the Ball Screw Jack	Falling down ball	Replace parts

The mentioned above matters are general troubles. When you find something abnormal as a result of your daily or periodic inspection, get in touch with your local distributor or us without delay.

■ The product warranty

The warranty period and limits

- (1) When the trouble happens in the shorter period either 18 months after installing our product or 12 months after operating the product and it is caused obviously by our responsibility on design or produce, we will repair it without charge or install the substitute for trouble product or/and part.
- (2) When you use the product in one of overseas countries, we will decide the warranty contents after other previous arrangement. Without this arrangement, we will deliver the substitute product or/and part.

Beyond the limits of the warranty

The following matters are beyond the limits of the warranty.

- (1) The damage or trouble of our product to be caused by your mistake operation
- (2) The damage or trouble to be caused by your disassembling and reassembling of our product
- (3) The damage or trouble of our product to be caused by natural calamity such as earthquake and flood, fires or other special external accidents
- (4) Replace the expendable supplies

Regardless of the warranty period, contact your local distributor or service section when you want to inquire about our product

Makishinko Co., Ltd

Head Office 4-206, 7-chome, Tanimachi, Chuo-ku, Osaka 542-0012 Japan
Tel. 06-6763-2101 Fax 06-6763-2100
E-mail eservice@makishinko.co.jp

Overseas section 4-128, 7-chome, Tanimachi, Chuo-ku, Osaka 542-0012 Japan
Tel. 06-6768-5671 Fax 06-6763-2100
E-mail kaigai01@makishinko.co.jp

Nabari Factory 2832, Natsumi, Nabari-city, Mie 518-0441 Japan
Tel. 0595-63-1031 Fax 0595-64-5435

Shijounawate Factory 12-7, 1-chome, Okayama, Shijounawate i-city,
Osaka 575-002 Japan
Tel. 072-877-1781 Fax 072-879-5117