

Maintenance and Cleaning


Based on the inspection frequency, this chapter describes the items and methods of maintenance and check, and cleaning of the standard product to maintain it in good working condition.






The inspection task can only be taken up by those who has a good knowledge of this machine.

1. Daily maintenance, check and cleaning

Check Items	Working Contents
Gear motor	<p>Check if any abnormal sound (particularly metallic sound) occurs when operating. ※ If abnormal sound is emitting, stop operation immediately and identify the cause of the noise.</p> <p style="text-align: center;"> CAUTION</p> <p>Do not operate granulator when abnormal sound is emitting.</p> <p>※ When the abnormal sound (Cutter chafing, Metallic clank) emits from inside the granulator, please use specified gauge to check the cutter clearance based on the description on the adjusting diagram, if any problem, adjust based on the adjusting method, following the instruction by item 6-1 of the Chapter 7.</p> <p>※ It is sometimes possible to emit an abnormal sound from gear motor in the angle range that an output axis was limited to in no-load operation. It is a resonance sound made by gear motor and machine. It will not be problematic when turning the handle lightly by manual. If turn in circumference of 360 degree, you can hear the sound, or if it is hard to turn not as usual, please check bearing or gear motor. Please check if any abnormal vibration occurred during operation.</p>
	<p>Please check if there is abnormal vibration during operation.</p> <p>※ If abnormal vibration occurs, stop operation immediately and identify the cause.</p> <p style="text-align: center;"> CAUTION</p> <p>Do not operate the machine when abnormal vibration occurred.</p>
	<p>Please check if the unit body and motor have abnormal high temperatures.</p> <p style="text-align: center;"> CAUTION</p> <p>※ If abnormal high-temperatures occurs, stop operation immediately and identify the cause.</p> <p>Please don't run under the abnormal high temperature.</p>
	<p>Measure the load current value under operation, and make sure that it is under the rated value range. The rated value is noted on nameplate of motor.</p>
Curtain (For splash prevention) inside the feeding hopper	<p>Check the deterioration conditions of the curtain (For splash prevention).</p> <p>※ Replace with a new splash prevention curtain when it deteriorates drastically, or got hardened and damaged.</p>

Check Items	Working Contents
Cleaning and check the inside of feeding hopper and chamber	<p>Performing the cleaning and check task in following order.</p> <div style="text-align: center;">  WARNING </div> <p>Please make sure the four casters are well locked.</p> <ol style="list-style-type: none"> 1. Cleaning of the bearing When the grinding task is finished, and material inside get ground and discharged completely, set machine in idling operation condition, and meanwhile, clean the bearing part on both left and right holes for air cleaning with dry and clean air for one minute. 2. Operation stop Press button OFF on the operation box, and turn off your primary side power. 3. Cleaning of feed hopper Do dust removal with an Air Blow Cleaning Gun or a dust remover, starting from upper part of the feeding hopper. 4. Open feed hopper Rotate the safety lock rotary knob till its bolt goes out of the safety cover. Loosen the rotary lock, and slowly open the feed hopper with both hands firmly holding it.
Cleaning and check of the upper chamber	<ol style="list-style-type: none"> 5. Cleaning of the upper chamber Please clean the upper chamber with vacuum cleaner. After this, check the following. <ol style="list-style-type: none"> a) Check if there is any gap on cutter. b) Please check by visual if there is proper clearance between rotary cutter and fixed cutter, if there is any rub between them. (As for the standard clearance, please refer to the drawing of cutter clearance in 「Chapter 3 Name of each part」 . c) Please check if there is any looseness of tightening bolt on fixed cutter and scraper.
Cleaning and check on inside of granulator	<ol style="list-style-type: none"> 6. Open the upper chamber Loosen the rotary lock, holding the handle on the upper chamber, and slowly open the upper chamber. Please don't insert hand into the opening and closing pivot. 7. Open the drawer Loosen the fixation rotary knob on the drawer , holding the drawer handle, and slowly open it. 8. Cleaning and check inside the granulator Please use dust remover and brush to clean away powder that adheres to the inside of granulator and cutter. (Once every week, check the wear and tear of cutter edge.) <p style="text-align: center;">To be Continued...</p>

Check Items	Working Contents
Cleaning and check of inside of feed hopper	<p>9. Rotation check Insert manual rotary handle into the hole for manual rotation on side of big rotary cutter, and slowly rotate it adversely. While checking cutter edge, check if the rotation goes on smoothly. By this time, if rotation is not smooth, cutter rubs, abnormal sound appears, please adjust cutter clearance among fixed cutter, fixed crushing cutter and scraper. (About the clearance adjustment, please refer to Chapter 7-6.)</p> <p>10. Cleaning of the lower part of granulator Please use air cleaning gun to clean the lower part of granulator and collection box.</p> <p style="text-align: center;">NOTE</p> <p>Please wear dust goggles and mask when cleaning with air gun, since dust will be raised.</p> <p>11. Close the drawer Holding the handle on the drawer, slowly close it. Screw up the fixation rotary knob.</p> <p style="text-align: center;"> WARNING</p> <p>Please be sure not to insert your hand and finger into the closing part. If hand or finger get nipped, laceration or fracture will be caused.</p> <p>12. Close the upper chamber Holding the handle on the upper chamber, close the chamber slowly. Fasten up the rotary lock.</p> <p style="text-align: center;"> WARNING</p> <p>Please be sure not to insert your hand and finger into the closing part. If hand or finger get nipped, laceration or fracture will be caused.</p> <p>13. Close the feed hopper Please slowly lift the feed hopper. Fasten up the rotary lock, and then fasten up the rotary knob for safety lock.</p> <p style="text-align: center;"> WARNING</p> <p>Please be sure not to insert your hand and finger into the closing part. If hand or finger get nipped, laceration or fracture will be caused.</p>

2. Maintenance and check every 3 months

Carry out a function check for each safety limit switch.

If the machine can not function properly, stop operation, and contact our after sale dept.



- ◎ Please do not operate the machine when safety limit switch is working improperly, because that will cause breakdown and accident.
- ◎ Do not insert hands and fingers inside of the granulator. Hands and fingers will be cut off by the sharp rotating cutter.

Check Items	Working Contents
<p>Safety switch for feed hopper</p> <p>Rotary knob for safety lock on feed hopper</p> <p>Safety switch of drawer</p> <p>Safety switch for collection box</p>	<p>1. Check the state of the safety switch for feed hopper</p> <ul style="list-style-type: none"> ● When the feed hopper is closed, press the safety switch of feed hopper, and loosen fasteners ● Press button ON on the operation box, and confirm the granulator does not work. ● Restore the fastener and make sure the safety switch can work properly. Press button ON on the operation box, and make sure that the granulator could start. <p>2. Check the state of the rotary knob for safety lock on feed hopper</p> <ul style="list-style-type: none"> ● When the hopper is closed, rotate the safety lock rotary knob till its bolt goes out of the safety cover. ● Press button ON on the operation box, and confirm the granulator does not work. ● Screw up the rotary knob for safety lock. <p>3. Check the state of the safety switch of drawer</p> <ul style="list-style-type: none"> ● Loosen the fixation rotary knob on the drawer , holding the drawer handle and slowly open it. ● Press button ON on the operation box, and confirm the granulator does not work. ● Holding the handle of the drawer, and slowly close it. Please well lock the fixation rotary knob on drawer. <div data-bbox="911 1350 1070 1394" style="text-align: center;"> </div> <p style="text-align: center;">Be sure not to insert your hand and finger into the closing part. If hand or finger get nipped, laceration or fracture will be caused.</p> <p>4. Check the state of the safety switch for collection hopper</p> <ul style="list-style-type: none"> ● Loosen the lock of collection box. Pull out the collection box (KKB/ SKB/ suction box). ● Press button ON on the operation box, and confirm the granulator does not work. ● Please set collection box (KKB/SKB/suction box) back, and screw up the lock to protect collection box from falling off. <div data-bbox="915 1745 1075 1789" style="text-align: center;"> </div> <ul style="list-style-type: none"> ● If the granulator can start, then the safety switch should be with fault. Please repair or replace it at once. And please press button OFF immediately to stop the machine.

3. Maintenance and check every 6 months

Check Items	Working Contents
Bolt, nut on each part	Be sure to press button OFF on the operation box to stop machine. Please check the following items after turning off your primary side power. Check each bolt and nut to see if they are loose. If they are, please fasten them.

4. Maintenance and check before longtime halting and operation resumption

Check Items	Working Contents
Maintenance and check before longtime operation pause and operation resumption	<p>(1) Before starting a longtime operation pause such as a long holiday break.</p> <ul style="list-style-type: none"> • Please do cleaning on granulator, especially for the bearing. • When the granulating task finish, don't turn off the machine. Wait till all the materials being crushed, and then blow dry clean compressed air into the air holes for cleaning on both left and right bearing part for about 1 minute to clean the bearing, while the machine is idling. • Guard against rust. Particularly, spray antirust sprayer (AGR-oil and so on) on the cutter part, and keep the unit in dry place. • Cover the feeding skylight of feeding hopper with a plastic bag, etc. to prevent improper objects and dust from mixing into. <p>(2) Before operation resumption</p> <ul style="list-style-type: none"> • Open hopper and chamber and check if improper objects or dust mixed into. • Check if cutter clearance is properly set with feeler gauge. • Wash the inside of the granulator with mold-washing sprayer, etc.. Remove anti-rust agent. Put some runner to be sufficiently ground, and then throw them. • After that, the machine can be restarted formally.

5. Replacing grease

Check Items	Working Contents
Bearing	Use oilless type.
Gear motor	Factory uses grease to lubricate, maintenance free. Life expectancy of oil seal ring is varied with changing conditions. We suggest to replace after using for 10000 hours. For replacement, please contact our after-service department.

6. Points of replacement and clearance adjustment for cutters

This section introduces essential points of replacement and clearance adjustment for fixed cutter and scraper.

In order that you can operate this machine safely shown as in Chapter 1, while performing the replacement and assembly task, please strictly follow the matter-needs-attention item described in Chapter 2.



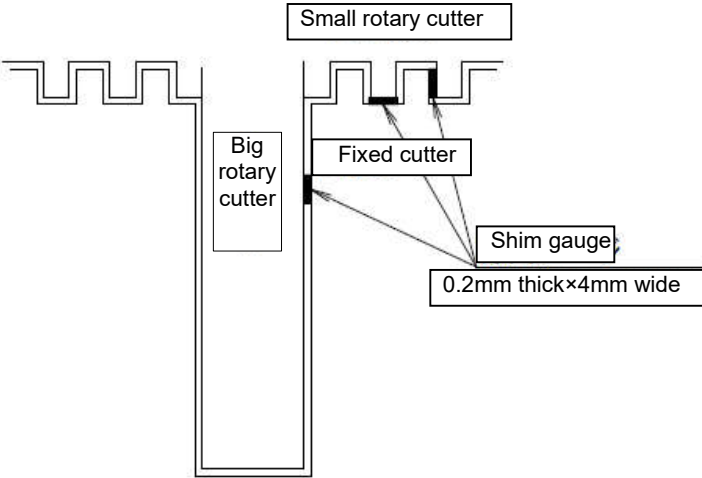
Before starting the replace tasks, make sure to turn off your primary side electric power to avoid danger resulted from malfunction.

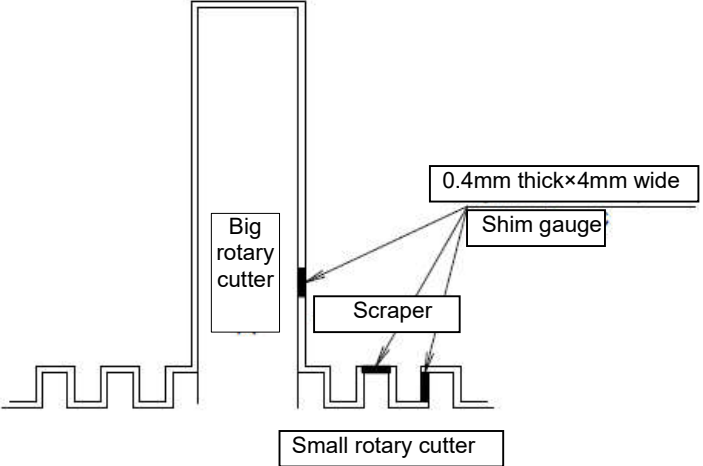
Besides, please be alert that it is very dangerous in case parts fell off on operator, while in disassembling and assembling.

6-1. Replacement and clearance adjusting method for fixed cutter, fixed crushing cutter, and scraper

Step	Working Items	Working Contents
1	Open feeding hopper	<p>Loosen the rotary knob of safety lock, till the bolt being away from the safety cover. Loosen the rotary lock, and slowly open the feed hopper with hand holding it firmly.</p> <p style="text-align: center;"> WARNING</p> <p>Do not put your hand or fingers into the hopper or into the stopper at the granulator hinge part when opening the feed hopper. Please don't put your hand or finger into gap/ If hand or fingers get pinched, laceration or fracture could be caused.</p>
2	Removal of fixed cutter, scraper and fixed crushing cutter	<p>2-1 Removal of fixed cutter and scraper Loosen and take off the inner-hexagon bolts of M12x30L fixed inside of the chamber.</p> <p>2-2 Removal of fixed coarse crushing cutter Loosen and take off the inner hexagon bolts of M10 x 25L fixed inside of the chamber.</p> <p style="text-align: center;"> WARNING</p> <p>When touching the fixed cutter and scraper, make sure to wear a glove, and operate with great care. Because cutter edge is sharp, and it will injure your hands and fingers.</p>

Step	Working Items	Working Contents
3	Assembly and adjusting method of clearance gap for fixed cutter, scraper and bed crushing cutter	<p>※ Cutter assembly and clearance Please refer to Chapter 3, drawi Cutter clearance</p> <p>3-1 Please prepare shim gauge for clearance adjustment.</p> <ol style="list-style-type: none"> 1) Shim gauge for the fixed cutter is 3 pieces in about <u>thickness: 0.2mm × width: 4mm × length: 40mm.</u> 2) Shim gauge for the scraper is 3 pieces in about <u>thickness: 0.4mm × width: 4 mm × length: 40mm.</u> <p>3-2 Clearance gap between cutters</p> <ol style="list-style-type: none"> 1) The clearance gap between rotating cutter and fixed cutter is 0.2-0.25 mm in standard. 2) The clearance gap between rotating cutter and scraper is 0.4-0.5 mm in standard. <p>3-3 Setting point for bed crushing cutter</p> <ul style="list-style-type: none"> • Imbed the bed crushing cutter. The clearance between the bed crushing cutter short side and tow side of chamber inner wall should be uniform. • Make sure that the long side of the bed crushing cutter is set in the chamber without any gap against inner wall. Then, use 3 M10 X 25L inner-hex bolts attached to fix it temporarily. Fix it temporarily while put the long side of the crush cutter against chamber inner side. At last, tighten it up absolutely with torque wrench in torque 35[Nm]. <p>※ If there's any small clearance gap between chamber wall and the long side of bed crushing cutter, the standard clearance 0.2-0.25 mm for the tip of fixed cutter won't be kept. So it is necessary to fit the bed crushing cutter perfectly into the chamber.</p>

Step	Working Items	Working Contents
3	Assembly and clearance adjustment for fixed cutter, fixed crushing cutter and scraper	<p>3-4 Fixed cutter assembly</p> <ul style="list-style-type: none"> • Inset fixed cutter • Fix hexagon round head bolt M12X30L,T12.9 temporarily Fix temporarily while set fixed cutter against fixed crush cutter with no clearance. • Manual rotation handle is on the side of the big rotary cutter. Insert it into the hole for manual rotation, and rotate it slowly in anti-clockwise direction, until it is inset into the position for clearance adjustment. • Please refer to the following picture to insert shim gauge.  <ul style="list-style-type: none"> • Put fixed cutter clinging to fixed crush cutter , while fastening it completely in torque 70[Nm] with torque wrench. • After tightened up, please re-check the clearance gap with shim gauge to see whether the gaps are uniform. If not, please re-adjust it. <p>※ When operate with manual rotary handle, please be sure to operate slowly in anti-clockwise direction. Since the clearance has not been adjusted properly, please be very careful not to make the tool nose of fixed cutter and small rotary cutter touch with each other, to avoid the breakage of tool nose.</p>

Step	Working Items	Working Contents
3	Assembly and clearance adjustment for fixed cutter, fixed crushing cutter and scraper	<p>3-5 Setting for scraper</p> <ul style="list-style-type: none"> • Fit the scraper in. • Fix attached hexagon round head bolt M12X30L,T12.9 temporarily Fix temporarily while putting scraper cling to chamber inwall. • Manual rotation handle is on the side of the big rotary cutter. Insert it into the hole for manual rotation, and rotate it slowly in anti-clockwise direction, until it is inset into the position for clearance adjustment. • Please refer to the following picture to insert shim gauge.  <ul style="list-style-type: none"> • Put scraper cling to chamber inwall, while fastening it completely in torque $70[\text{Nm}]$ with torque wrench. <p>3-6 Confirmation of the clearance gap set by each cutter</p> <p>Manual rotation handle is on the side of the big rotary cutter. Insert it into the hole for manual rotation, and rotate it slowly in anti-clockwise direction, and insert shim gauge to check the following clearance gap.</p> <ul style="list-style-type: none"> • Clearance gap between the fixed cutter and the small-rotating cutter A 0.2 mm shim gauge can be inserted. • Clearance gap between the fixed cutter and the big-rotating cutter A 0.2 mm shim gauge can be inserted. • Clearance gap between the big-rotating cutter and the bed crashing cutter A 0.2 mm shim gauge can be inserted. • Clearance gap between the scraper and the small-rotating cutter A 0.3 - 0.4 mm shim gauge can be inserted.