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Description: Smart Extruder Gear Pump Seal Replacement Procedure			
Written By: Ken Collier			
Approved By:			
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A) Original release	ER03426	Ken Collier	7/27/04

1. Purpose

This procedure provides instruction for the proper replacement of gear pump seals on the GED Smart and Smart Co-Extruders. Serious damage may occur to the gear pump if re-alignment is not done properly.

2. Scope

This procedure applies the GED Smart and Smart Co-Extruders. As a preventive maintenance measure the seals should be replaced once a year based on a single shift operation or whenever a leak forms a ball around ½" in diameter.

3. Applicable Documents

GED Drawing

5-15889 Smart Extruder Main Assembly

5-15653 Smart Co-Extruder Main Assembly

1-15720 Smart Co-Extruder Gear Pump Stand Assembly

3-15638 Gear Pump Assembly

5-15268 Smart Extruder Desiccant Stand Assembly

Kawasaki Heavy Industries, LTD Technical Bulletin No. 124M

CAUTION:

This procedure contains important information necessary for the proper service and operation of the equipment. Please pay extra attention to the warnings and danger notices. Ignoring these notices could damage the equipment or injure the personnel.

If you have any questions or concerns about your equipment, contact GED Service Department at 330-963-5401 for additional information.

4. Procedure

4.1 Tools and Materials

GED Tool T00034

Hex Key Wrench Set

1/2" Box Wrench or Socket

O-Ring pick

Solvent (such as Mineral Spirits)

Never-seez NSBT-8N nickel speed grade lubricant

4.2 Disassembly Procedures

4.2.1 Getting the Machine Ready

1. Energize and allow the GED Smart Extruder and pump stations to warmup to operating temperatures.
2. Turn off and lock out air supplies on the applicable pumps.
3. Bleed off material pressures in the applicable pump, hose and heads by running a couple test spacers through the extruder. Verify pressures have been releaved in the *Remake Screen* of WinExtrude.
4. Turn off and lock out the main electrical supply.

CAUTION:

Before performing any maintenance, always turn OFF the Main Power Disconnect and the pneumatic supply valve. Lock them out to prevent accidental re-connection and injury.

NOTE:

It is NOT recommended to remove the gear pump to replace the gear pump seals. Removal of the gear pump will cause misalignment of the gear pump and motor arbors which will result in component failure.

***** Failure due to misalignment is not covered under warranty. *****

5. If gear pump must be removed or replaced be sure to check alignment. It is strongly recommended that GED fixture T00034 is used to align gear pump and transfer case arbors. This fixture is availble for purchase or for loan from GED.

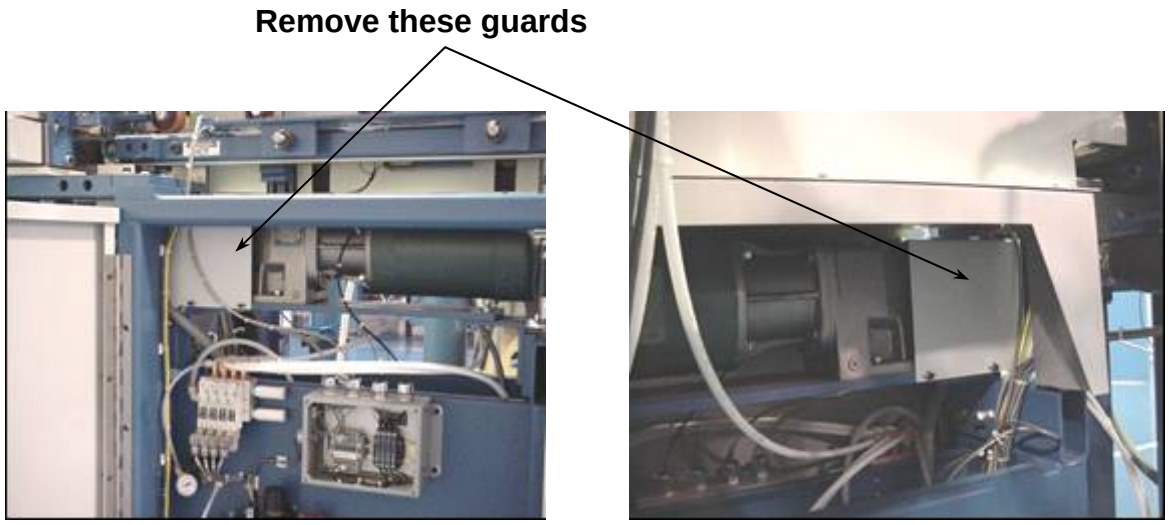
CAUTION:

During re-assembly, the mounting bolts should be coated with Never-seez NSBT-8N and tightened to 430-480 lbs-in of torque.

*****Excessive torque can cause binding of the gear pump.*****

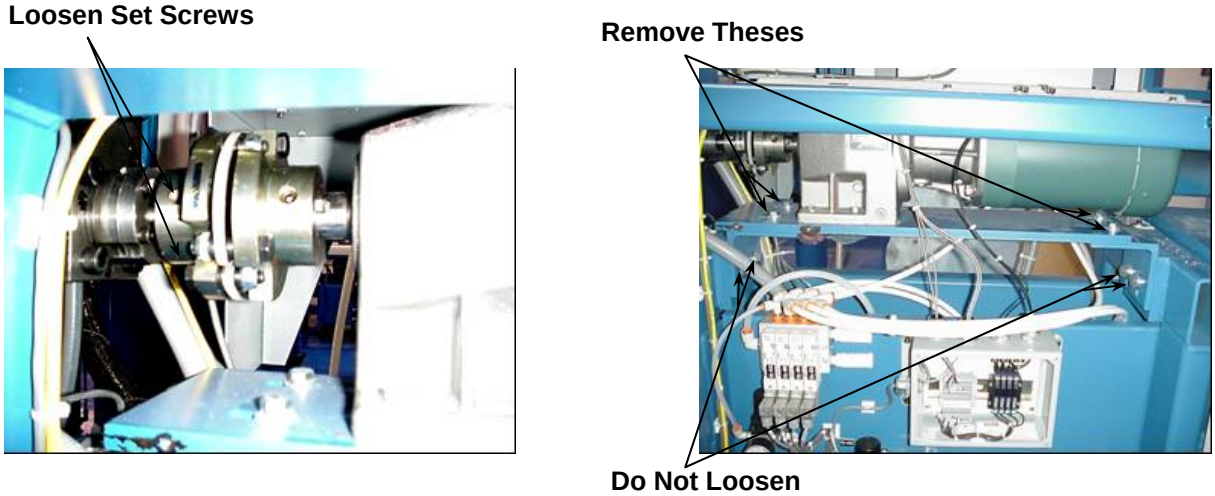
4.2.2 Removing Sealant Motor Assembly (Co-Extruder Bottom Sealant Motor)

1. Remove the two guards that cover the sealant gear pump and coupling. Remove the non-operators side first. The operator's side guard will pass over the top of the coupling and gearbox assembly, and will be removed from the non-operators side.



Operator's Side **Non-Operator's Side**

2. Loosen the two attachment set screws from the pump side of the flexible coupling. One set screw is located at the arbor key; the second is at 90 degrees from the key.

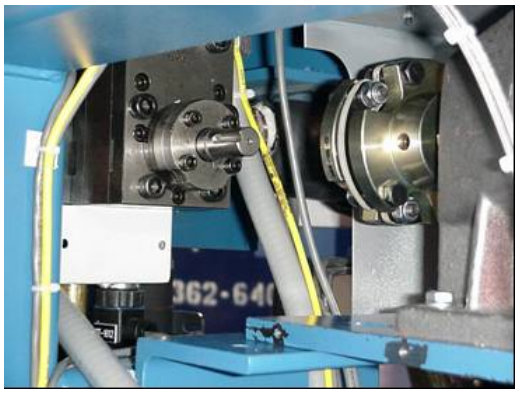


3. Remove the four attachment bolts from the motor assemble mounting plate.

NOTE:

DO NOT loosen the four bolts holding the Motor Support Mounting Bracket to the weldment. This will cause a misalignment of the gear pump and gearbox arbors resulting in damage to the gear pump arbor.

4. Slide mounting plate back until the coupling is clear of the gear pump arbor. The coupling, motor assembly and mounting plate assembly will move as a unit. A small pry bar maybe required. Carefully place the pry bar between the coupling and the gear pump seal holder assembly and ease the coupling off the arbor.
5. Continue with section 4.3.

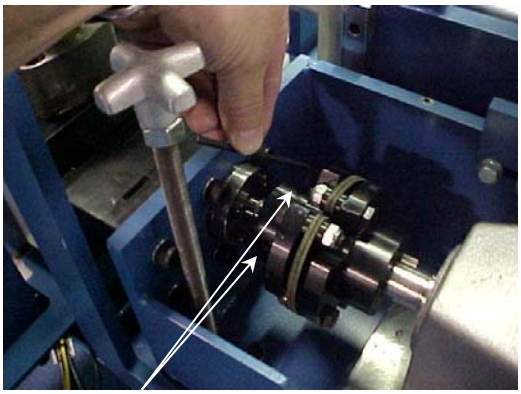


4.2.3 Removing Matrix Motor Assembly

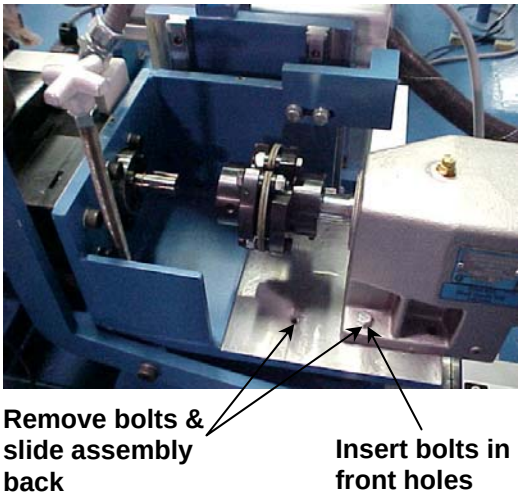
CAUTION:

Removal of the Matrix Motor Assembly is a two person task. One person must hold the motor assembly while the other removes the mounting bolts.

1. Remove the guard covering the matrix gear pump.



2. Loosen the coupling set screws from the gear pump arbor.
3. With an assistant holding the motor assembly, remove the four bolts securing the transfer case to the mounting plate.
4. Slide the motor assembly back and insert two bolts though the front holes of the transfer case and thread them into the back two holes of the mounting plate until they are finger tight. This should provide sufficient clearance to access the seals. If not, carefully place the motor assembly on the floor
5. Continue with section 4.3.



4.2.4 Removing Co-Extruder Side Sealant Motor Assembly

Removal of the co-extruder side sealant motor assembly is basically the same as outlined for the matrix station in the previous section.

4.3 Gear Pump Seal Replacement

NOTE:

It is NOT recommended to remove the gear pump to complete this step. Removal of the gear pump will cause misalignment of the gear pump and motor arbors which will result in component failure.

***** Failure due to misalignment is not covered under warranty. *****

1. Remove the four hex key bolts that secure the seal retainers, seal plate and shaft hub.
2. Remove the two seal retainers, seal plate and shaft hub from the pump arbor.

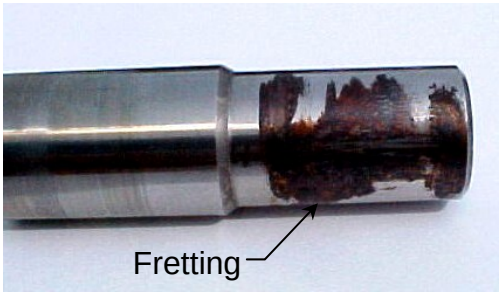
3. Remove the old seals and clean all parts.

4. Inspect gear pump arbor for wear and damage. Make sure the drive arbor on the gear pump is not grooved. If a groove can be felt with fingernail then the arbor should be replaced to achieve optimal seal life. A penny may also be rubbed along the arbor to detect grooves or abraded surfaces. If the surface finish of the arbor is abraded the penny may leave copper deposits on the surface.

NOTE:

Wear or damage to the sealing area of an arbor will greatly reduce the seal life. Adding a .030" shim between the shaft hub and seal plate may extend the life of a worn arbor without greatly reducing seal life.

5. Also, look for signs of fretting which is an indication that the arbors had not been properly aligned. Fretted surfaces will appear worn and discolored.



6. Install new seals assuring that the seal cup faces inward toward the gear pump.

NOTE:

It is recommended that when replacing the seals that a hygroscopic grease such as petroleum jelly is packed into the cup of the new seals and applied to the gear pump arbor. This prevents the sealants or desiccants from immediately packing into the cup of the seals and curing around the arbor. Cured material around the arbor abrades the polished surface of the arbor which will cause premature wear of the seals.

7. Install the shaft hub, seal plate and seal retainers on the gear pump arbor.
8. Apply Never-seez NSBT-8N nickel speed grade lubricant to the cap screws and tighten to 85-105 lbf-in of torque.
9. Verify that the gear pump arbor turns freely.

4.4 Reassembly Procedures

4.4.1 Precautions

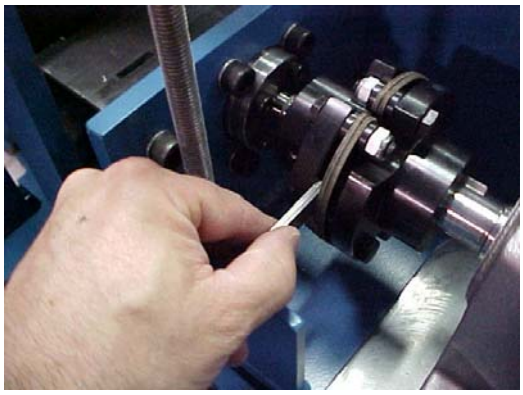
CAUTION:

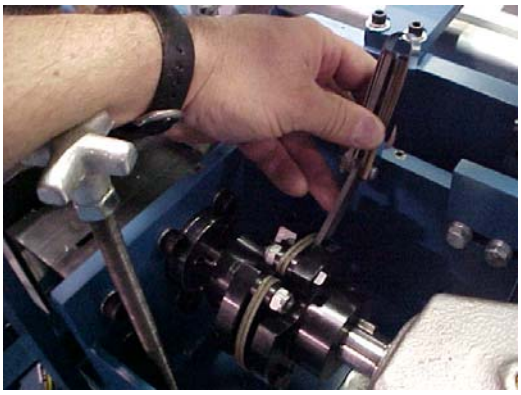
If the gear pump or motor mounting brackets has been moved, it will be necessary to realign the gear pump and motor arbors so that they are inline within .002". It is recommended that GED fixture T00034 be used to accomplish this task. Misalignment of the gear pump and motor arbors will result in component failure.

***** Failure due to misalignment is not covered under warranty. *****

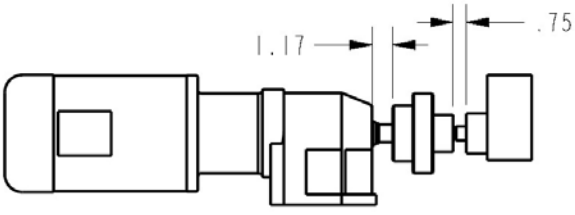
1. Arbors must be inline within .002" and angular misalignment should not exceed .004".
2. If the arbors are not inline within .002" it will be necessary to align the motor mounting plate (sealant gear pump #1) or the gear pump itself (desiccant gear pump and co-extruder sealant gear pump #2). To accomplish this it is recommended that GED fixture T00034 be used.

3. Angularity can be checked with feeler gauges around the circumference of the coupling. Measure the gap between the two halves of the coupling and the resin connector and assure that the gap is the same all the way around and on both sides.

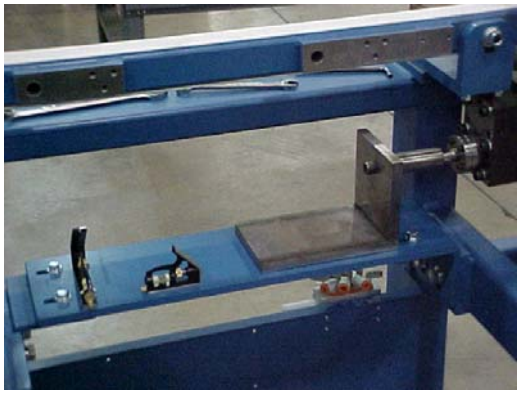


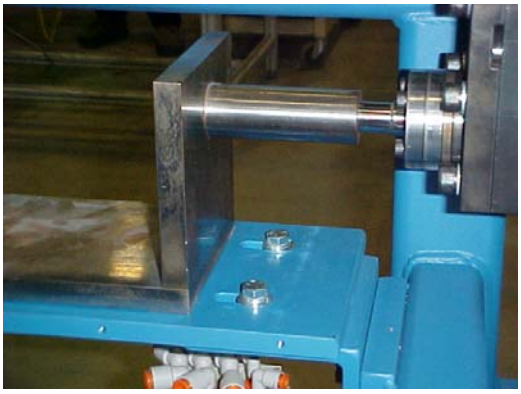


4. Slide the coupling, gearbox and motor into position. The spacing between the face of the coupling and the outer seal retainer should be .75" ± .010" as shown below. This is a rough dimension from the face of the case and is only to ensure that there is enough play in the slotted holes of the mounting plate for adjusting the position of the motor assembly. *Reference GED Drawing 5-15889.*
5. Verify the distance between the coupling and the gearbox is 1.17" ± .010" as shown to the right.



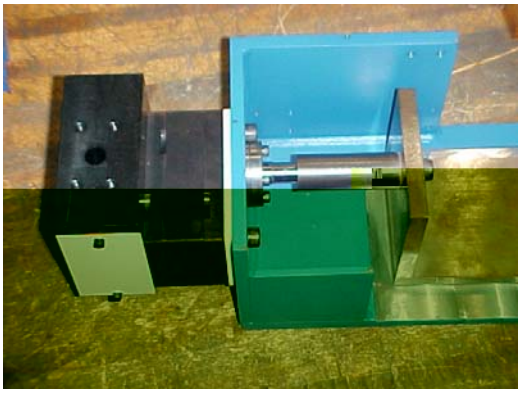
4.4.2 Sealant Motor Assembly Installation (Co-Extruder Bottom Sealant Motor)





1. If necessary, level the mounting plate both side to side and front to back while simultaneously raising or lowering the mounting plate to the correct height with GED fixture T00034. The arbors must be inline within .002”
2. Slide the mounting plate and motor assembly into place and align it initially with the conveyor tube by sight. The transfer case arbor must be straight in line with the gear pump arbor to prevent damage to the gear pump arbor. The angular misalignment should not exceed .004”. Check this as described in section 4.4 with feeler gauges.
3. Align the spacing between the, transfer case, coupling and gear pump as outlined in section 4.4.
4. Tighten the mounting bolts.
5. Tighten the coupling set screws to the gear pump arbor.

4.4.3 Matrix Motor Assembly Installation



1. If the desiccant head and gear pump mounting bolts were loosened, it will be necessary to reposition the gear pump arbor relative to the transfer case arbor. To do this it is recommended that GED fixture T00034 is used.
2. Once the gear pump and desiccant head are positioned tighten the mounting bolts to 430-480 lbf-in of torque. Never-seez NSBT-8N nickel speed grade lubricant should be used on the mounting bolts.

CAUTION:

Excessive torque can cause binding of the gear pump.

3. With an assistant, position the motor assembly on the mounting bracket and fasten in place leaving bolts loose for the moment.
4. Assure correct spacing between the transfer case, coupling and gear pump.

5. Assure that the angularity of the motor assembly relative to the gear pump is within specification per section 4.4 with use of feeler gauges.
6. Tighten mounting bolts.
7. Tighten the coupling set screws to the gear pump arbor.

4.4.4 Co-Extruder Side Sealant Motor Assembly Installation

Install the co-extruder side sealant motor assembly in the same manor as the matrix station reference section 4.4.2.

4.4.5 Checking for Proper Seal

1. Unlock electric and warm machine to operating temperature.

CAUTION:

Warm material at least 25 minutes prior to running the Extruder. Material in the heater blocks heats faster than the material around the seals. Cold material may abrade the gear pump arbor resulting in premature seal failure.

2. Assure that there are no leaks around the seals by running several test spacers through the machine.
3. Material should be purged though the gear pump for approximately 10 minutes to assure that all packing oils and contaminates are flushed out of the system. This may be accomplished by opening the ball valve on the bottom of the sealant manifold, using the matrix purge button or (for side sealant gear pumps on co-extruders) by running test spacers through the extruder
4. Press Emergency Stop and replace the applicable gear pump guards.