WOODWARD

Application Note 51269
(Revision B, 2/2018)
Original Instructions

Re-greasing Procedure for LELA Actuator

General Precautions

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment.

Practice all plant and safety instructions and precautions.

Failure to follow instructions can cause personal injury and/or property damage.

Revisions

This publication may have been revised or updated since this copy was produced. To verify that you have the latest revision, check manual *26455*, *Customer Publication Cross Reference and Revision Status & Distribution Restrictions*, on the *publications page* of the Woodward website:

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The latest version of most publications is available on the *publications page*. If your publication is not there, please contact your customer service representative to get the latest copy.

Proper Use

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (i) constitute "misuse" and/or "negligence" within the meaning of the product warranty thereby excluding warranty coverage for any resulting damage, and (ii) invalidate product certifications or listings.

Translated Publications

If the cover of this publication states "Translation of the Original Instructions" please note:

The original source of this publication may have been updated since this translation was made. Be sure to check manual *26455*, *Customer Publication Cross Reference and Revision Status & Distribution Restrictions*, to verify whether this translation is up to date. Out-of-date translations are marked with ⚠. Always compare with the original for technical specifications and for proper and safe installation and operation procedures.

Revisions— A bold, black line alongside the text identifies changes in this publication since the last revision.

Application Note 51269

Warnings and Notices

Important Definitions

This is the safety alert symbol used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

- **DANGER** - Indicates a hazardous situation, which if not avoided, will result in death or serious injury.
- **WARNING** - Indicates a hazardous situation, which if not avoided, could result in death or serious injury.
- **CAUTION** - Indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.
- **NOTICE** - Indicates a hazard that could result in property damage only (including damage to the control).
- **IMPORTANT** - Designates an operating tip or maintenance suggestion.

⚠WARNING

Overspeed / Overtemperature / Overpressure

The engine, turbine, or other type of prime mover should be equipped with an overspeed shutdown device to protect against runaway or damage to the prime mover with possible personal injury, loss of life, or property damage.

The overspeed shutdown device must be totally independent of the prime mover control system. An overtemperature or overpressure shutdown device may also be needed for safety, as appropriate.

⚠WARNING

Personal Protective Equipment

The products described in this publication may present risks that could lead to personal injury, loss of life, or property damage. Always wear the appropriate personal protective equipment (PPE) for the job at hand. Equipment that should be considered includes but is not limited to:

- **Eye Protection**
- **Hearing Protection**
- **Hard Hat**
- **Gloves**
- **Safety Boots**
- **Respirator**

Always read the proper Material Safety Data Sheet (MSDS) for any working fluid(s) and comply with recommended safety equipment.

⚠WARNING

Start-up

Be prepared to make an emergency shutdown when starting the engine, turbine, or other type of prime mover, to protect against runaway or overspeed with possible personal injury, loss of life, or property damage.

Electrostatic Discharge Awareness

NOTICE

Electrostatic Precautions

Electronic controls contain static-sensitive parts. Observe the following precautions to prevent damage to these parts:

- **Discharge body static before handling the control (with power to the control turned off, contact a grounded surface and maintain contact while handling the control).**
- **Avoid all plastic, vinyl, and Styrofoam (except antistatic versions) around printed circuit boards.**
- **Do not touch the components or conductors on a printed circuit board with your hands or with conductive devices.**

To prevent damage to electronic components caused by improper handling, read and observe the precautions in Woodward manual *82715*, *Guide for Handling and Protection of Electronic Controls, Printed Circuit Boards, and Modules*.

Follow these precautions when working with or near the control.

1. Avoid the build-up of static electricity on your body by not wearing clothing made of synthetic materials. Wear cotton or cotton-blend materials as much as possible because these do not store static electric charges as much as synthetics.
2. Do not remove the printed circuit board (PCB) from the control cabinet unless absolutely necessary. If you must remove the PCB from the control cabinet, follow these precautions:
   - Do not touch any part of the PCB except the edges.
   - Do not touch the electrical conductors, the connectors, or the components with conductive devices or with your hands.
   - When replacing a PCB, keep the new PCB in the plastic antistatic protective bag it comes in until you are ready to install it. Immediately after removing the old PCB from the control cabinet, place it in the antistatic protective bag.

IMPORTANT

External wiring connections for reverse-acting controls are identical to those for direct-acting controls.

Re-greasing Procedure for LELA Actuator

Ball Screw Lubrication Procedure

1. Clean the outside of the actuator to ensure that no debris gets inside the actuator during the lubrication process. Any debris on the ball screw will reduce its life.
2. Remove the ball screw access plug located on the top of the gear cover with a 5/16 inch hex wrench (Figure 1).
3. Remove the ball screw port plug with a 3/16 inch hex wrench (Figure 2).
4. Set the ball screw access and port plugs aside and keep clean, ensuring that they are not scratched or marred.
5. Attach the thread connector of the grease syringe to the threaded grease port of the ball screw. The fitting should be fully seated (Figure 3).
6. Inject 2 cm^3 of Woodward approved grease into the ball screw grease port.
7. Remove the grease syringe from the ball screw grease port and install the ball screw port plug. Do not torque the port plug (Figure 4).
8. Remove the plug that is adjacent to the ball screw port, set aside, and keep clean, ensuring that the plug is not scratched or marred (Figure 5).
9. Using a permanent marker or tape, mark a 5/32 inch Allen wrench at 2.75 inches from the bottom. Make sure the top of the marking is at 2.75 inches (Figure 6).
10. Insert the Allen wrench into the port located adjacent to the ball screw port. The Allen wrench is seated if the marking is below the top surface of the gear cover (Figure 7).
11. If the Allen wrench is not seated, rotate the gears using a 3/16 inch hex wrench on the ball screw port plug and rotate clockwise until the 5/32 inch Allen wrench is seated.
12. Once the 5/32 inch Allen wrench is seated, torque the ball screw port plug to 38–42 lb-in (4.3–4.7 N·m) (Figure 8).
13. Remove the 5/32 inch Allen wrench from the port, install the plug into the port located adjacent to the ball screw port, and torque to 38–42 lb-in (4.3–4.7 N·m) (Figure 9).
14. Install the ball screw access plug and torque to 145–155 lb-in (16.4–17.5 N·m) (Figure 10).

Figure 1

Figure 2

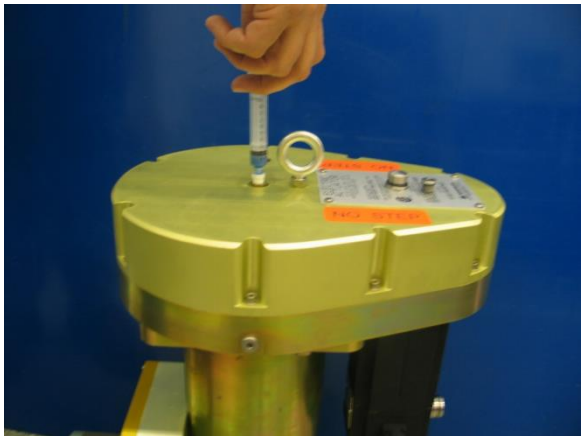

Figure 3

Figure 4

Figure 5

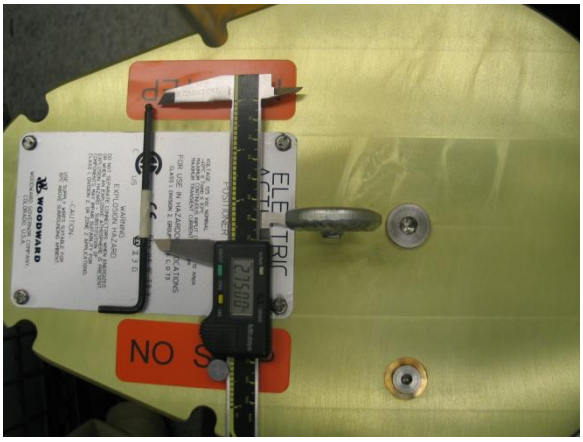

Figure 6

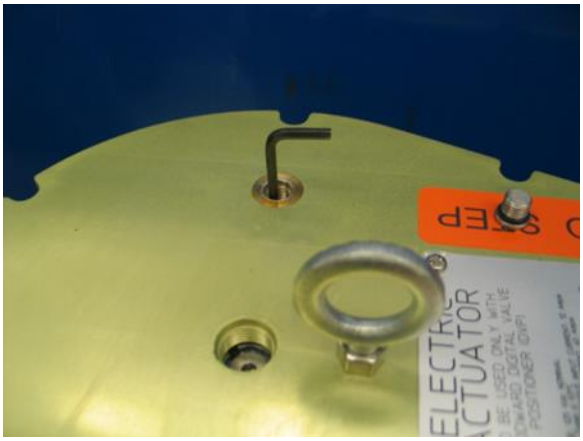

Figure 7

Figure 8

Figure 9

Figure 10

Bearing Lubrication Procedure

1. Clean the outside of the actuator to ensure that no debris gets inside the actuator during the lubrication process. Any debris in the bearing will reduce its life.
2. Remove the bearing port plug with a 3/16 inch hex wrench (Figure 11).
   Note: Some actuator models have bearing port plugs on both sides of the gearbox housing to allow for access from either side. For these models, the following greasing procedure only needs to be performed on one grease port. Leave the plug installed in the other port that is not being greased.
3. Set the plug aside and keep clean, ensuring that the inside plug surface is not scratched or marred.
4. Attach the thread connector of the grease syringe to the threaded bearing grease port. The fitting should be fully seated (Figure 12).
5. Inject 2 cm^3 of Woodward approved grease into the bearing grease port.
6. Remove the grease syringe from the bearing port and install the bearing port plug. Torque to 38–42 lb-in (4.3–4.7 N·m) (Figure 13).

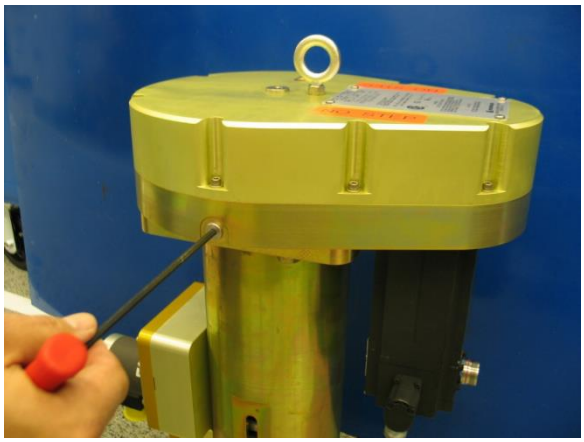

Figure 11

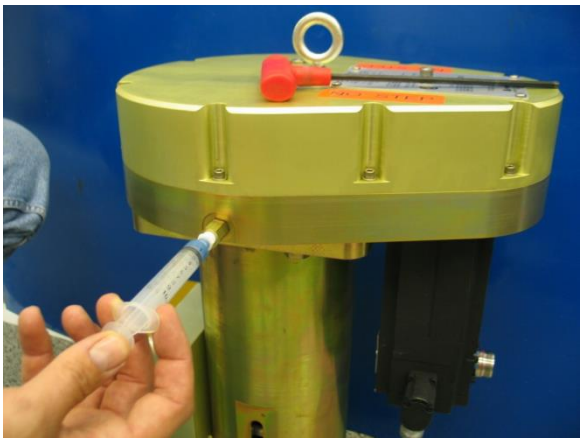

Figure 12

Figure 13

MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**UNIFLOR 8951**
Version #	08
Revision date	January-29-2013
CAS #	Mixture
Product Code	UNIFLOR 8951
Product use	Lubricating Grease
Manufacturer information	Nye Lubricants, Inc. 12 Howland Road Fairhaven, MA 02719 US 508-996-6721 CHEMTREC 1-800-424-9300

2. Hazards Identification

Emergency overview	Thermal decomposition will generate hydrogen fluoride, which is corrosive and can cause burns on contact with skin and other tissue. Inhalation of fumes generated during thermal decomposition may cause polymer fume fever. Prolonged and/or repeated skin contact may result in mild irritation or redness. Contact with eyes may cause irritation. Health injuries are not known or expected under normal use.
OSHA regulatory status	This product is considered not hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Skin contact. Eye contact.
Eyes	Contact with eyes may cause irritation.
Skin	Prolonged and/or repeated skin contact may result in mild irritation or redness.
Inhalation	Health injuries are not known or expected under normal use.
Ingestion	Health injuries are not known or expected under normal use.
Target organs	Eyes. Skin.

3. Composition / Information on Ingredients

The manufacturer lists no ingredients as hazardous according to OSHA 29 CFR 1910.1200.

4. First Aid Measures

First aid procedures	
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Get immediate medical attention.
Skin contact	Wash off with soap and water. Get medical attention if symptoms occur. Wash clothing separately before reuse.
Inhalation	If symptoms develop, remove affected person from source of exposure into fresh air. Get immediate medical attention.
Ingestion	If ingestion of a large amount does occur, seek medical attention. Do not induce vomiting without medical advice. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Never give anything by mouth to a victim who is unconscious or is having convulsions.
General advice	If you feel unwell, seek medical advice (show the label where possible).

5. Fire Fighting Measures

Flammable properties	Not flammable by OSHA criteria. Not combustible by OSHA criteria.
Extinguishing media	
Suitable extinguishing media	Water Fog. Use methods for the surrounding fire. Product does not burn.
Unsuitable extinguishing media	Water. Do not use water jet as an extinguisher, as this will spread the fire.

Protection of firefighters	
Protective equipment and precautions for firefighters	Wear suitable protective equipment.
Fire fighting equipment/instructions	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Move containers from fire area if you can do it without risk. Move containers from fire area if you can do so without risk.
Hazardous combustion products	Hydrogen fluoride. Carbonyl fluoride.

6. Accidental Release Measures

Personal precautions	Keep unnecessary personnel away. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Keep people away from and upwind of spill/leak. Observe precautions from other sections.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Prevent entry into waterways, sewers, basements or confined areas.
Methods for containment	ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible.
Methods for cleaning up	Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Cover with plastic sheet to prevent spreading. Soak up with inert absorbent material. Absorb in vermiculite, dry sand or earth and place into containers. Clean contaminated surface thoroughly. Following product recovery, flush area with water. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Never return spills in original containers for re-use. For waste disposal, see section 13 of the MSDS. Clean up spills immediately, observing precautions in Protective Equipment section. Sweep up and shovel into suitable containers for disposal.

7. Handling and Storage

Handling	Do NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. Avoid prolonged or repeated skin contact with this material. Avoid breathing gas/vapors/mist/fumes. DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Do not handle or store near an open flame, heat or other sources of ignition. Do not take internally. Do not taste or swallow. Avoid contact with eyes. Wash thoroughly after handling. Handle and open container with care.
Storage	Keep away from heat and sources of ignition. Store in cool place. Store in a closed container away from incompatible materials. Use care in handling/storage.

8. Exposure Controls / Personal Protection

Engineering controls	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
Personal protective equipment	
Eye / face protection	Wear safety glasses; chemical goggles (if splashing is possible).
Skin protection	Wear suitable protective clothing. Wear nitrile, neoprene, PVC or viton gloves.
Respiratory protection	No personal respiratory protective equipment normally required. An air purifying respirator with an organic vapor cartridge may be used under certain circumstances where airborne concentrations are expected to exceed exposure limits, or if irritation or symptoms are experienced. Respiratory protection must be provided in accordance with 29 CFR 1910.134.
General hygiene considerations	When using, do not eat, drink or smoke. Handle in accordance with good industrial hygiene and safety practice. Wash hands thoroughly after handling. Launder contaminated clothing before reuse.

9. Physical & Chemical Properties

Appearance	Not available.
Form	Liquid. Liquid
Color	White
Odor	Slight
Flash point	Not available.

Other data

Kinematic viscosity	18 cSt
Shelf life	4 years

10. Chemical Stability & Reactivity Information

Chemical stability	Material is stable under normal conditions. Stable.
Conditions to avoid	Heat, flames and sparks. Avoid temperatures exceeding the flash point.
Incompatible materials	Strong acids, alkalies and oxidizing agents. Alkaline metals. Alkaline earth metals. Powdered metals. Halogenated compounds.
Hazardous decomposition products	Hydrogen fluoride. Carbonyl fluoride.

11. Toxicological Information

Local effects	Inhalation of decomposition products may cause polymer fume fever, a temporary flu-like illness accompanied by fever, chills, and sometimes cough. Refer to Hazards Identification Section for additional information.
Carcinogenicity	This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA. This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC and NTP.
Further information	This product has no known adverse effect on human health.

12. Ecological Information

Ecotoxicity	This material is not expected to be harmful to aquatic life.
Persistence and degradability	Not available.

13. Disposal Considerations

Disposal instructions	Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Collect and reclaim or dispose in sealed containers at licensed waste disposal site. This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Dispose in accordance with all applicable regulations.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport Information

DOT

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations

This product is not known to be a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2)

Not regulated

DEA Essential Chemical Code Number

Not regulated

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated

DEA Exempt Chemical Mixtures Code Number

Not regulated

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance	No
Section 311 hazardous chemical	No

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	No
Canada	Non-Domestic Substances List (NDSL)	Yes
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	No
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other Information

Further information	HMIS® is a registered trade and service mark of the NPCA.
HMIS® ratings	Health: 0 Flammability: 0 Physical hazard: 0
NFPA ratings	Health: 3 Flammability: 0 Instability: 0
Disclaimer	The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication . The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release. Nye Lubricants, Inc. makes no warranty with respect thereto and disclaims all liability with respect thereon. The information in the sheet was written based on the best knowledge and experience currently available.
Issue date	January-29-2013
This data sheet contains changes from the previous version in section(s):	Product and Company Identification: Product and Company Identification

Revision History

Changes in Revision B—

- Changed content in step 1 of Ball Screw Lubrication Procedure
- Changed content in step 1 of Bearing Lubrication Procedure
- Added note to step 2 of Bearing Lubrication Procedure

Released

We appreciate your comments about the content of our publications.

Send comments to: icinfo@woodward.com

Please reference publication 51269.

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