



# Belvac Production Machinery Technical Bulletin

Information for Customers Operating & Maintaining Belvac Machines

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## REVISED 595 NECKER LUBRICATION REQUIREMENTS

This Technical Bulletin announces the revision to the lubrication requirements deemed necessary to optimize the usage of the system components, especially the Lubriquip injectors and indicators used on all 595K machines. However, this revised lube cycle will work on Lubriquip systems, Lincoln systems, 595K, 595SK, or any combination thereof.

Belvac Modular Neckers incorporate an Automatic Lube System to lubricate the push rams, the tooling rams, the cam followers, and the bearings that support the shafts for the gear train. The system uses a Lincoln Series G Model 83167 air operated reciprocating grease pump, Lubriquip grease injectors, Lincoln grease injectors, and a 3-way air solenoid valve operating the pump. Lubriquip injectors are used on 595K working turrets feeding the rams and the cam followers, while Lincoln injectors are used on 595SK working turrets. Lincoln injectors are also located inside the gear case feeding main turret rear bearings (595K only) and transfer shaft rear bearings.

Due to the length of many of our machines, the system pressure built after each lube cycle results in a residual grease pressure that remains at the end of the line for an extended period of time, which could render our original cycle sequence "2-minutes on, 2-minutes off" inadequate for the Lubriquip injectors. Based on the manufacturer's recommendation, sufficient time is mandatory to allow the injectors to reset: pressurization must be less than 160 PSI else grease will not flow. Although the manufacturer recommends 30 seconds on and 3 minutes off, Belvac found that more time was required to reset the injectors, especially in cases where the ambient grease temperature was less than 72° F (22° C) on machines considered "Cold."

Belvac recommends ExxonMobil's Mobilux EP 1 grease for the Autolube system.



Pressure gauge at Pump



Pressure gauge and Pressure Switch at End of Line

Some necking equipment is found in cold ambient conditions, and/or non-continuous production runs, hence the need to update Belvac's lubrication requirements to accommodate all such applications. As a result, the following setup must be followed to ensure proper functioning of all grease components.

### CYCLE TIME FOR GREASE

Starting in May 2006, all new Belvac Neckers will be set up as follows:

The grease autolube system is preset at Belvac to a pulse cycle setting. It is set to activate the solenoid once at the interval of every 384,000 pulses (384,000 cans for every lubrication event); the system will cycle once approximately every 2.6 hours on a machine averaging 2400 CPM (595K), or every 2.1 hours on a machine averaging 3000 CPM (595SK). For other machine speeds, the system cycle interval changes proportionally. However, in each lubrication event, the system activates as follows:

**Step 1.** The air solenoid valve opens, allowing the lube pump to flow high-pressure grease through the injectors; hence the rams, cam followers, and shaft rear bearings. While the air solenoid is ON, the high pressure switch will indicate when system pressure (1250 to 1500 PSIG / 87 to 105 BARS) has been met, at which point a 5-minute time sequence begins: the solenoid remains ON for this period of time to ensure all injectors have fully activated as evidenced by the indicator pins in the extended condition. If the desired set pressure is not met, then the system will fault, causing the machine to come to a stop, requiring the fault be cleared/corrected before restart can begin. For more information on pressure requirements, refer to Belvac Technical Bulletin Issue 01 Vol. 8 May 2005.

**Step 2.** When 5-minutes-on ends, the solenoid closes until the next cycle (lubrication event), allowing sufficient time (at least 2.1 hours) for the lube pump circuit to exhaust, the system pressure to drop below 160 psi (maximum pressure for Lubriquip injectors to reset), and all injectors to load their primary injector chambers with a full grease charge.

**CAUTION:** It is very important that this step is followed as noted. If the exhaust time is not sufficient to allow ALL the injectors to internally RESET, a fresh lube charge will not enter the injector chamber; hence no lube will be supplied to the device during the next firing sequence. Any time frame less than this cannot guarantee recharge has taken place internally of the injector.

In order to assure the pressure switch is functional, it should be electronically monitored to ensure a high-pressure signal has been met and a low-pressure signal has been met. Should the pressure switch fail in either condition (met or not), the fault system will shut the system down accordingly. Additionally, the lube pump is fitted with a low-level grease switch that alerts the control system of a low-level grease condition.

### BEST PRACTICE START-UP PROCEDURE

Most machine start-ups occur at room temperature that could be as low as 50° F (10° C), which means that normal machine operation temperature is not achieved yet. At this temperature, all machine parts are "cold" including the lubrication grease fed to the followers. Starting the machine at its highest rated speed at that time will cause the followers to skid on the cam surface, resulting in unrecoverable cam and follower damage; machine parts need to warm up to allow the grease to soften, enabling them to spin freely. As a result, Belvac recommends following a best practice start-up procedure for 595K and 595SK machinery:

1. Start the machine at 1000 CPM until the cam followers reach a stable temperature (approximately 1 hour).
2. Increase the machine speed to 1400 CPM until the cam followers reach a stable temperature (approximately 1 hour).

3. Increase the machine speed to 1800 CPM until the cam followers reach a stable temperature (approximately 1 hour).
4. Increase the machine speed to 2100 CPM until the cam followers reach a stable temperature (approximately 45 minutes).
5. Increase the machine speed to desired value within its maximum rating.

(CPM = Cans Per Minute)

The time required for the cam followers to reach a stable temperature is dependent on machine temperature and ambient temperature. The estimates supplied are only estimates -- actual times must be verified with a non-contact heat gun. Stability is determined when cam follower temperatures no longer increase with time: typically measurements are taken in 15-minute intervals.

*Contact Belvac Sales or Service Representatives for additional information.*

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