1. Foreword
Installation work, setting up, operation and maintenance of injectors and the Central Lubrication System shall be executed by qualified, trained personnel.
This User Manual is primarily intended to familiarize the user of Centro-Matic central lubricating equipment with the supplied product 'injector' and its specifications. It shall also aid to identify parts by part number and parts for service part inventory.

2. Safety Instructions

Warnings for exposure to hazards that may result in serious personal injury if ignored, are marked in the manual by the general safety symbol.
Safety Symbol according to DIN 4844-W9

CAUTION
Safety instructions that might result in equipment damage and machine malfunction if ignored, are marked by the word 'CAUTION'.
Also heed safety instructions of the manufacturer of the machine!

3. Specifications of the Product
Manufacturer: LINCOLN
Sales & Service: Lincoln GmbH & Co. KG
St. Louis, Mo 63120-1578
Heinrich-Hertz-Str. 2-8
USA: D-69190 Waldorf
Contact customer service if requiring additional information or service:
⇒ See bottom line for telephone- and telefax numbers

Designated Use
• Single-line metering device for oil, for use in Centro-Matic single-line lubrication systems.
• Metering device for petroleum based lubricants; if using synthetic oils, the subject lubricant must be compatible with the construction parts of the injector.
• Designed for pressure range of 51-68 bar for operating during lubrication cycle and residual pressure < 10 bar.

Note: The recommended operating pressure is 58 bar for the lubrication cycle.
Injectors SL-41 can be used in a single-line circuit of Lincoln injectors type SL-42, SL-43 and SL-44 in Centro-Matic central lubrication systems for oil.

Subject to change
LINCOLN GmbH & Co. KG • Postfach 1263 • D-69193 Waldorf • Fax + (49) 6227 33259 • Tel + (49) 6227 330
Principal operation (continued)

The working pressure (fluid pressure) of the pump must be at least 51 bar for lubricating and shall not exceed 68 bar. The recommended pressure for standard application of Centro-Matic single-line oil systems is 59 bar.

Fig. III Completion of the lubricating phase. As piston (3) completes its stroke, it pushes the slide valve piston (5) past the passage, cutting off further admission of lubricant to the passage. The discharge from chamber (a) of the preset amount of lubricant to the outlet is completed; piston and slide valve remain in this position until lubricant pressure in the supply line is vented (relieved) at the pump.

Fig. IV Pressure relief. After completion of the lubricating phase, the supply line (lubricant line between pump and injector) must be relieved from pressure. The pressure at injector inlet (P1) must drop below 10 bar. The re-charge with lubricant will be initiated at a pressure of ~10 bar, permitting the compressed spring (4) to release. The spring moves the slide valve to closed position. This opens the port from the measuring chamber and permits the lubricant to be transferred from the top of the piston (3) to the discharge chamber (a). After the preset amount of lubricant is shifted from chamber (b) to chamber (a) and the pressure is vented, the injector returns to its normal (rest) position (Fig. I).

Note: Injector SL-41 is a so-called ‘direct’ single-line metering device. The injector lubricates under pressure applied by the pump to the injector piston (3). The spring of the injector is only for re-charging purposes. Injector output adjustment:

⇒ See Section 5 ‘Operation’.

Technical Data

<table>
<thead>
<tr>
<th>Injector type</th>
<th>Series SL-41</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part number</td>
<td>82294 - -</td>
</tr>
<tr>
<td></td>
<td>82295 Replacement injector</td>
</tr>
<tr>
<td>Output range</td>
<td>0.131-1.31 cm³</td>
</tr>
<tr>
<td>Output adjustment</td>
<td>Setting by set screw, min. to max. = 12 turns j²</td>
</tr>
<tr>
<td>Operating pressure</td>
<td>minimum normal maximum</td>
</tr>
<tr>
<td></td>
<td>51 bar 58 bar 68 bar</td>
</tr>
<tr>
<td>Vent pressure</td>
<td>&lt; 10 bar</td>
</tr>
<tr>
<td>Constr. materials</td>
<td>Steel NBR O-rings (static seals)</td>
</tr>
<tr>
<td>Amb. temperature (const materials)</td>
<td>TMIN: 26°C TMAX: +176°C</td>
</tr>
<tr>
<td>Connections: manifold</td>
<td>2 x 3/8&quot; NPTF, female thread</td>
</tr>
<tr>
<td>Injector</td>
<td>Outlet 1/8&quot; NPTF female</td>
</tr>
</tbody>
</table>

Note:

j¹ Character - - of part number stands for substitution by number of injectors mounted on manifold:
-1, -2, -3, -4, -5.

j² Attention: Check output if Set Screw is adjusted to less than 1½ turn from minimum.

j³ "normal" = recommended operating pressure.

During pause time, after completion of the lubrication cycle, a pressure relief below 10 bar must follow.

Dimensions

<table>
<thead>
<tr>
<th>Assy. Unit</th>
<th>Manifold</th>
<th>Dim. A</th>
<th>Dim. B</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1</td>
<td>No. 12656</td>
<td>-</td>
<td>64 mm</td>
</tr>
<tr>
<td>-2</td>
<td>No. 11962</td>
<td>-</td>
<td>76 mm</td>
</tr>
<tr>
<td>-3</td>
<td>No. 11963</td>
<td>32 mm</td>
<td>108 mm</td>
</tr>
<tr>
<td>-4</td>
<td>No. 11964</td>
<td>64 mm</td>
<td>140 mm</td>
</tr>
<tr>
<td>-5</td>
<td>No. 11965</td>
<td>95 mm</td>
<td>171 mm</td>
</tr>
</tbody>
</table>

* Manifold with 1 mgd. hole

4. Erection & Installation

Warning
Never exceed the maximum working pressure of the Centro-Matic system.
Do not carry out any assembly or disassembly works when the system is pressurized or pump/machine are in operation.
Before using synthetic lubricants, check compatibility with the construction materials of injectors and other system components.

CAUTION

Required tools:
Ring & Open end wrenches of inch-size series (max. 11/16") are required for the installation of injectors; 1/8" hex. key for output setting.

Mounting of injectors:
The injectors have two outlets; one outlet must be closed by the fitting supplied with. The outlet for connecting the feed line has a female thread of 1/8" NPTF. If the ‘tube’ point (bearing) to be connected requires more than 1,31 cm² of lubricant per ‘tube’ cycle, the outlets of two or more injectors can be externally linked by a connector tube for combined discharge of lubricant; one connector tube is required for each injector connection.
The injector manifolds have a female thread of 3/8" NPTF at both ends.

Order connectors separately if required.
The manifolds have mounting holes; see figure above.
- Injectors can be mounted in any position.
- Mount injector in a position which permits access for output adjustment and function control of the injector.
- Location of injectors:
   ⇒ See drawing & instructions of the machine manufacturer.
- Allocation of injector/lubricating point:
   ⇒ See drawing & instructions of the machine manufacturer.
5. Operation

Warning

Do not exceed the maximum working pressure of the Centro-Matic system.

Setting-up for operation

For setting-up of Centro-Matic Central Lubrication Pump and Controller:

⇒ See User Manual of supplied components.

See specific instructions and safety instructions of the manufacturer/supplier of the machine.
Note: Before operating the machine, for example after installation works or repairs:
- Main supply line / branch lines and injectors must be filled with lubricant and vented.
- Feed lines must be filled with lubricant and connected with 'lube' points.
- The function of all injectors must have been checked.
- All injectors and the system control for the lubricating intervals must have been adjusted in compliance with the specifications.
⇒ See specific instructions of the machine manufacturer.

Functional check of injectors:
The recommended system operating pressure is 58 bar; adjust pump and control system accordingly.
⇒ See User Manual of the relevant central lubrication pump / control system and injectors.
- Initiate manual starting of the lubricating cycle.
After the rising of the pressure to ~ 51 bar the injector dispenses the lubricant through the outlet; after pressure relief < 10 bar the piston moves back to rest position, refilling the discharge chamber with lubricant. Insufficient venting of the supply line system may impair the function of injectors.
When all injectors of the system have been checked and function properly:
- Fill feed lines with lubricant.
Before connecting the feed lines to the lubricating points:
- Fill feed lines with lubricant.
Use only lubricant specified by the machine manufacturer for pre-filling.
- Fill lines with lubricant by means of an oil gun.
The feed line can be filled via the alternate outlet port in the injector body.
- Check feed line outlet for evidence of lubricant flow.
- Collect emerging lubricant at the end of the line.
When all lines have been filled:
Connect feed lines.

Operation:
During operation of the central lubrication system:
- All injectors must have been set to the lubricant output specified by the machine manufacturer.
- The lubrication system controller must have been set to pause time as specified by the machine manufacturer.
- The required operating pressure (fluid pressure) for operating the injectors (lubricant discharge) as well as the subsequent pressure relief of the lubricant supply line for re-charge of the injectors have to be observed.
When the machine is put out of operation:
- The central lubrication system must be switched off.

Excess lubrication or insufficient lubrication may result in machine damages.
Do not use contaminated lubricants.

Warning
Never exceed the admissible working pressure of the central lubrication system.

Switch off pump immediately in case of defects or abnormal operating performance.
When putting machine and central lubrication system in operation after a longer shut-off period:
- Check function of the central lubrication system.

Inspection and maintenance:

Warning
Never attempt to disassemble the equipment while pump is in operation or system is pressurized.
Do not perform adjustment of injectors while the system is pressurized.
- Check all lubricant lines and injectors regularly for leakproof and proper condition.
- Check function of the central lubrication equipment (pump/controller/injectors) regularly.
- Eliminate defects immediately.

Maintenance:

Warning
Never attempt to disassemble the equipment while pump is in operation or system is pressurized.

Before performing any works the machine must be out of operation.
Head safety instructions of the machine manufacturer.
If machine components being also part of the central lubrication system were removed for service, they shall be properly reassembled before the machine is operated again.
Then check the function of the centralized lubrication system as specified. The same applies to maintenance work performed on parts of the Centro-Matic central lubrication system.

Trouble shooting:
⇒ See User Manual of the relevant central lubrication pump.
⇒ See User Manual of the relevant system control & monitoring equipment and instructions of the manufacturer of the machine.

Operation of the machine with inactive or defective central lubrication system will cause damages to the machine.
⇒ See instructions of the machine manufacturer.
Malfuction of individual lubricant metering devices or damaged lubricant feed lines will cause damage of parts connected to because of lack of lubrication.

6. Repair
Repar must be carried out by qualified, trained personnel only.

Warning
Do not disassemble injectors when pump / central lubrication system are pressurized.
Before performing any works the machine must be out of operation.
Before servicing shut off pump / central lubrication system and perform pressure relief procedure. Depressurize pump and supply line system.
Always collect lubricant in a can.
After repair of injectors:
- Check function of injectors.
Replacement Injector no. 82295 recommended for service parts inventory. Permits change of injector without remove of the injector manifold.
Note when performing disassembly and overhaul of injectors:
Discharge piston as well as slide valve piston of injector SL-41 are fitted type pistons.
After repair, before restart of normal operation of the machine / central lubrication system:
- Adjust output of the relevant injectors as described.
- Vent lubrication line system and check function of the central lubrication system.
Service parts drawing  Injector SL-41,  Ser. A

Attention: Adhere to torque specifications on re-assembly
Item 11  Piston stop  torque  34-40,5 Nm
Item 2  Adapter bolt  torque  61-67.8 Nm

Note:
Replacement injector no. 82295 for manifold consist of item 1 thru 14

Item 15  Manifold  ref. to chart

<table>
<thead>
<tr>
<th>MANIFOLDS Item 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 12658  1 Unit</td>
</tr>
<tr>
<td>No. 11962  2 Unit</td>
</tr>
<tr>
<td>No 11963  3 Unit</td>
</tr>
</tbody>
</table>

Service Parts List  Injector SL-41,  Ser. A,  No. 82295 and 82294 - **

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>@</th>
<th>Qty.</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>INJECTOR BODY ASSY. with fitted piston</td>
<td>*</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>ADAPTER BOLT SW 7/8&quot; hex.</td>
<td>1</td>
<td>11961</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>GASKET</td>
<td>x</td>
<td>2</td>
<td>31057</td>
</tr>
<tr>
<td>4</td>
<td>GASKET</td>
<td>x</td>
<td>1</td>
<td>31064</td>
</tr>
<tr>
<td>5</td>
<td>O-RING (NBR)</td>
<td>1</td>
<td>34185</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>BUSHING ASSY. with fitted slide valve piston</td>
<td>1</td>
<td>91157</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>GASKET</td>
<td>1</td>
<td>31014</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SPRING SEAT</td>
<td>1</td>
<td>12661</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>COMPRESSION SPRING</td>
<td>1</td>
<td>55227</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>@</th>
<th>Qty.</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>PLUG</td>
<td>1</td>
<td>12511</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>PISTON STOP SW 7/8&quot; hex.</td>
<td>1</td>
<td>12980</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>O-RING (NBR)</td>
<td>x</td>
<td>34179</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>LOCK NUT SW 7/16&quot; hex.</td>
<td>1</td>
<td>51009</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>SET SCREW 1/8&quot; hex. socket</td>
<td>1</td>
<td>50527</td>
<td></td>
</tr>
</tbody>
</table>
| 15   | MANIFOLD see chart |  |  |  | Column @: *  Use replacement injector no. 82295
|      | with 2 inlet connections of 3/8" NPTF female |  |  |  | Column @: X Item recommended f. service parts inventory