carco Marking Systems

ES-612-A Automated Spring Contact Marker

ES-712-A Automated Spring Marker

ES-1518-Automated Mini-Spring Marker

ES-1752 Automated Mini-Spring Contact Marker

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Manufacturers of Industrial Inks and Ink Marking Systems

BASIC FUNCTION

The marking devices discussed in this publication are the Carco ES-612-A and ES-712-A Automated Spring Contact Markers, and the ES-1518-A and ES-1752 Automated Mini-Spring Markers. These devices are simple in their design and are meant to mark parts with a specialty marking fluid (ink) or dye.

> Carco produces several hundred different series of marking fluids.
> Contact Carco for assistance in determining the correct marking fluid for a particular application.

A basic feature of the Spring Contact Markers is the neatness in which parts are marked. The ink dot places on a part uses a small amount of material, allowing only 2 ounces of marking fluid to mark between 20,000 and 40,000 parts, depending on the application. This is an important point to understand because the material use in this system is minimal. To prevent settling or solidifying of the marking fluid in the reservoir, an automatic back-surge feature continually mixes the marking fluid whenever the pump is cycled.

There are two basic components to the marking systems, the spring marker and the pump unit. Although the two components work together to mark parts, their operation is separate. The spring marker is responsible for marking parts.

The pump is responsible for ensuring sufficient marking fluid is available to the spring marker.

During operation, the spring marker air cylinder is actuated by a solenoid valve assembly whenever an electrical signal is sent to the valve.
Every part going past the spring marker will be marked on command of the solenoid. The movement of marking fluid to the spring marker is actuated by a counter (available from Carco) or the manufacturing center's programmable logic control (PLC). The pump will activate on command after a predetermined number of marks.

> The Carco counter does not perform any function besides counting the air cylinder / spring marker strokes.
> It is not responsible for performing any functions normally associated with a PLC.

It is very important to understand that the number of cycles between pump activations varies according to the application and will have to be determined by the end user. Carco can provide recommendations based upon the experience of other manufacturers. Typical numbers of cycles between pump applications range from 10 to 20.

Cycling of the pump with each actuation of the spring marker will result in excessive material usage and sloppy operation.

DIFFERENCES BETWEEN MARKING DEVICES

Currently, there are over two thousand Carco ES-612-A spring markers *(Fig. 1)* in use.

The ES-1518-A *(Fig. 3)* and ES-1752 *(Fig. 4)* are mini-spring markers. These devices are physically smaller.

The ES-1518-A and ES-1752 work exactly as the ES-612-A. The ES-1752 does not have the same mounting capabilities as the ES-1518-A.
The mini-spring markers were introduces to allow a marking device to be placed in more confined areas that would not accommodate the ES-612-A

The following are specific features and benefits of the two markers:

ES-1518-A

- Bracket assembly allows for adjustment once the marker is mounted
- Excellent for small/confined space constraints. Besides size, the biggest difference is that the flow controls* are located on the solenoid valve.

ES-1752

- Bullet design allows marker to reach part in small / confined areas.
- Uses a spring return air cylinder
- Besides size, the biggest difference is one flow control* mounted to the solenoid valve is used to adjust return stroke speed: the low pressure regulator is used to adjust forward stroke speed and pressure.

* See “restarting the System after Idle Time”, step 11, regarding operation of flow controls

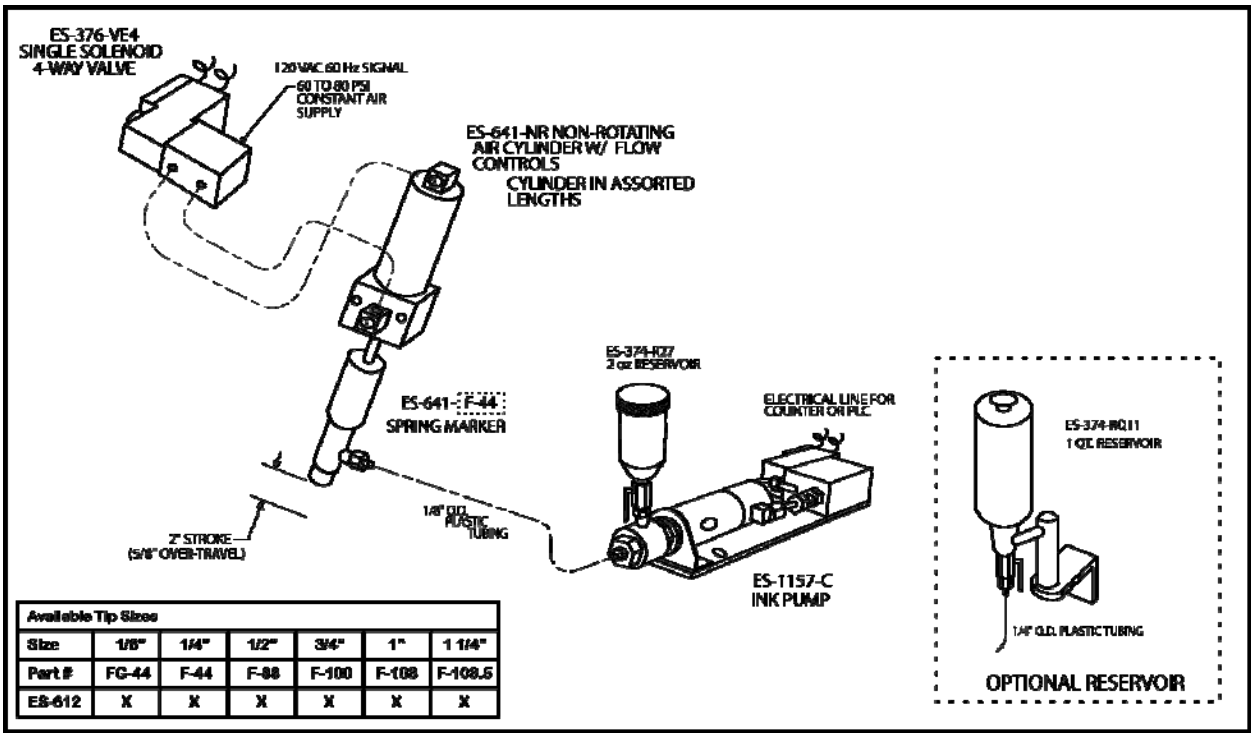

Figure 1 — Carco ES-612-A Automated Spring Contact Marker

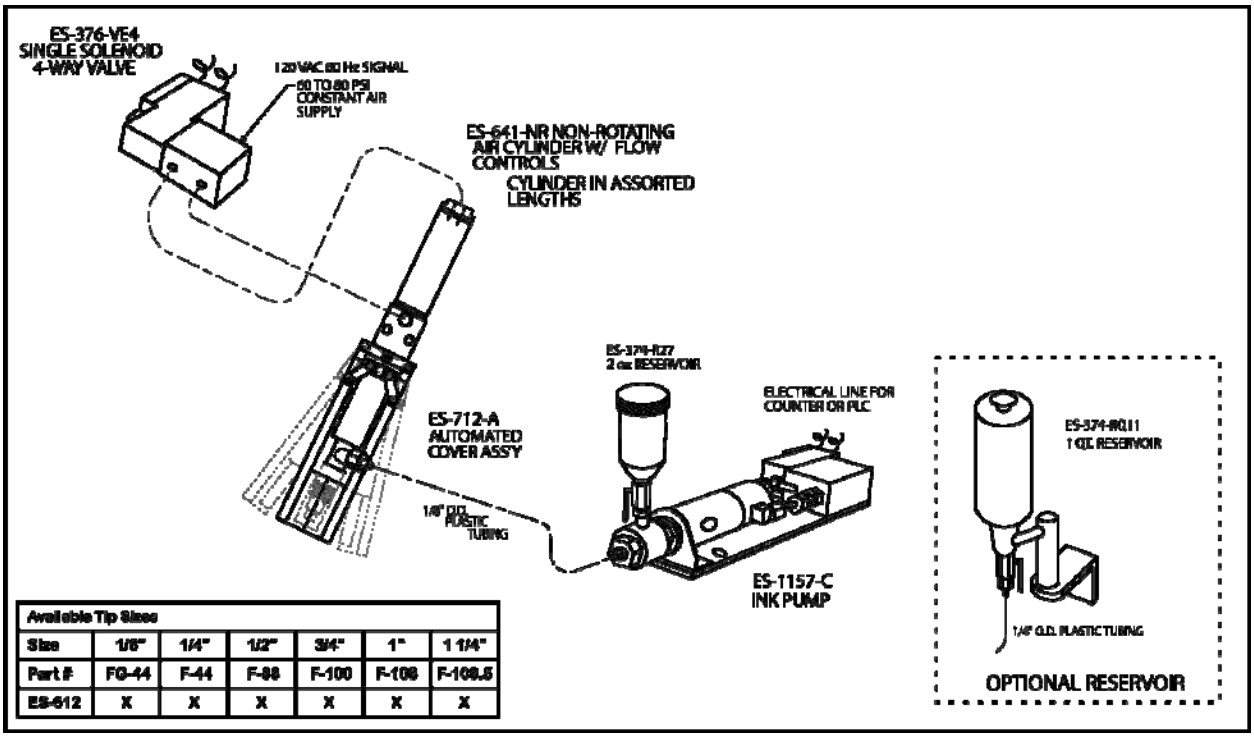

Figure 2 — Carco ES-712-A Automated Spring Contact Marker

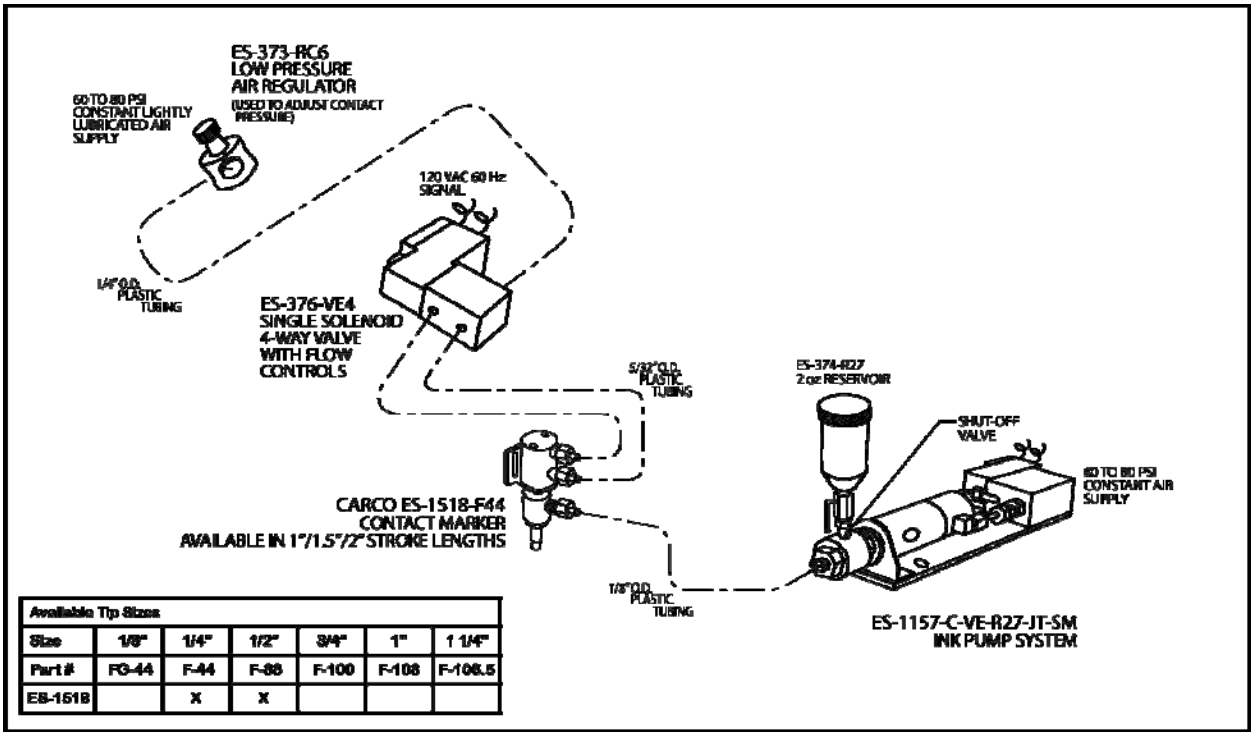

Figure 4 — Carco ES-1518-A Mini-Spring Contact Marker

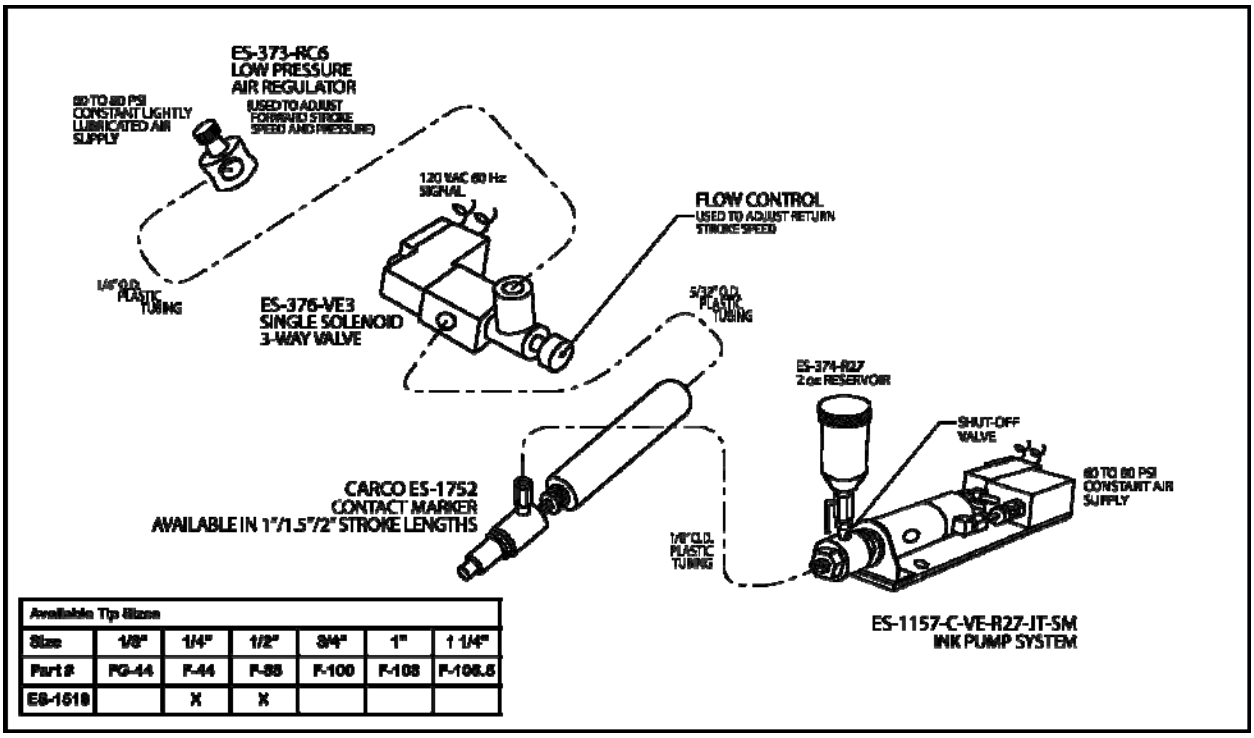

Figure 4 — Carco ES-1752 Mini-Spring Contact Marker

FIRST TIME STARTUP

Bleeding the System

The first time startup requires that the system be bled of all air so that a smooth flow of marking fluid occurs. To do this:

1. Shut off the marking fluid by closing the shutoff valve on the reservoir, and then remove the tube adapter. Leave the tube adapter intact and pull it from the pump body.
2. Open the shutoff valve and allow the marking fluid to flow into the poppet valve. The marking fluid will flush out the poppet.

Be sure to have a rag below the poppet valve to catch the excess marking fluid.

3. If the poppet valve is plugged (which should not occur on a new unit on first time startup) it can usually be cleaned by soaking it in solvent.
4. Reattach the tube adapter to the pump body.
5. Go to the procedure for restarting the system.

RESTARTING THE SYSTEM AFTER IDLE TIME

The steps for restarting the system are quite simple. These steps apply for both initially starting the system (after the preceding bleeding procedure has been performed), and when the system is restarted after having been idle (such as sitting over the weekend).

1. Inspect the marking nib. If the nib is hard, it must be replaces. Nibs are threaded out of the cavity that holds them. There are no fasteners or clamps.

Nibs are considered consumable items and are not typically reused. If desired, soaking a nib in an appropriate solvent will usually soften it sufficiently for reuse. Typical soaking time required is 24 hours.

2. Ensure there is a sufficient fluid supply in the reservoir.
3. Open the shutoff valve on the reservoir that allows marking fluid to flow into the pump.
4. Inspect air and ink lines to be sure there are no kinks or damaged areas.
5. Place a rag beneath the nib.

This step is critical as the rag will absorb excess marking fluid ejected from the nib during the purge process. Failure to place a rag beneath the nib will result in a mess.

6. Turn the system on.
7. Cycle the solenoid valve on the pump to fill the line with marking fluid. Depending on the length of the line, this process may require cycling the valve 40 to 60 times.

If your shop does not use the Carco ink counter control box, there should be a push button that functions as the manual override to energize the pump.

8. Continue cycling the valve until ink is flowing from the nib. Once the ink is flowing, stop cycling the valve.
9. Wipe off excess marking fluid from the nib and remove the rag used to catch the excess marking fluid.
10. As the system cycles for the first few times ensure that the mechanical operation is normal (i.e., cylinder, strokes, ink mark is placed on the part, and pump cycles at the specified interval). Check for marking fluid leakage.
11. Adjust Flow controls for a consistent marking without wasting marking fluid.

The purpose of the flow controls is to allow for a smooth light touch of the inked nib to the part, as well as a smooth return to the ready position. This, along with the spring override in the marker, will extend the life of the felt and prevent crushing and mark distortion.

If the pump does not purge …

Generally if the pump does not purge there is a restriction, usually in the poppet valve. *(Fig. 5).* To correct this concern, follow the first time startup procedures for bleeding the system.

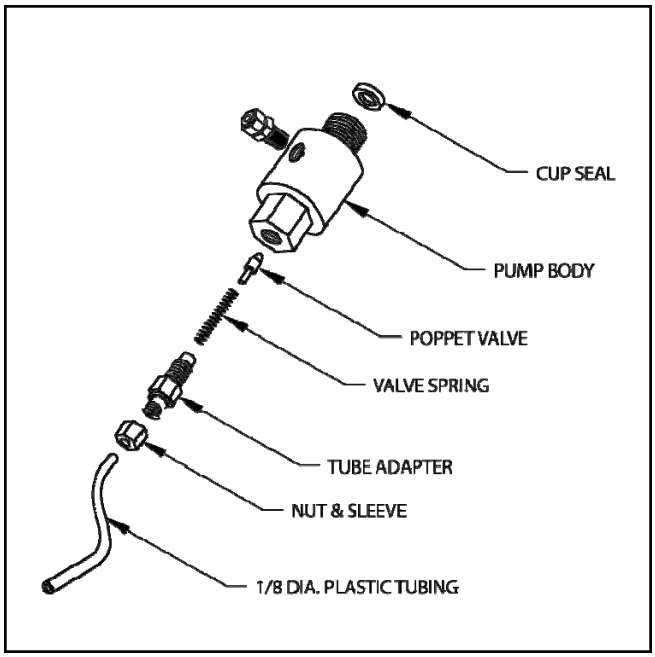

Figure 5 — Poppet Valve

Troubleshooting

Pump Concerns

The typical concern on the pump is leakage of ink, which can occur at two different points**:**

- Pump Body
- Front of Pump Assembly

<u>Leakage from the Pump Body</u>

Leakage from the pump body is caused by a worn or damaged cup seal *(Fig. 6)*. The cup seal is located in the pump body with the spring side of the cup seal facing the ink inlet fitting. In the case of a cup seal leak, order the parts from the parts list. To replace the cup seal, it is necessary to disassemble the pump to the point where the pump body can be disconnected from the housing assembly. The cup seal is between these two components. Use the same procedure outlined for leakage from the front of the pump to gain access to the pump body.

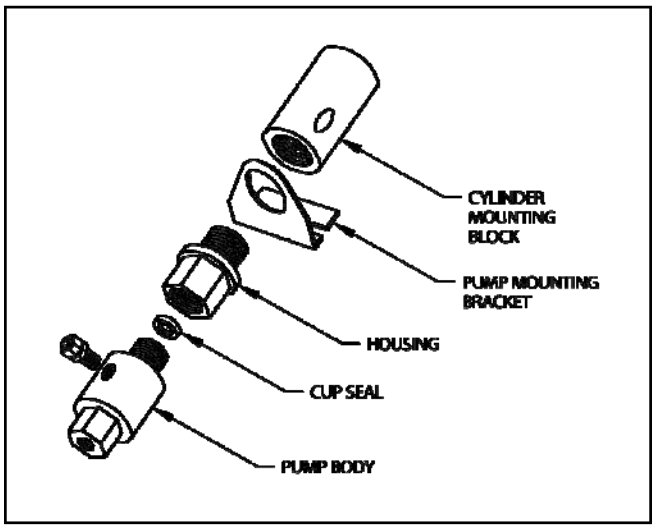

Figure 6 — Cup Seal Location

Leakage from the front of the Pump

Leakage from the from to the pump is often caused by dirt getting into the ink reservoir and then making its way down to the poppet valve (shown in Figure 5). To prevent this from occurring, it is important to maintain cleanliness of marking fluid containers and the reservoir fill area t ensure that contamination does not occur, Dirt or grit in the poppet valve prevents the valve from seating, causing uncontrolled flow of marking fluid.

When dirt or grit in the poppet is causing a leak, it can often be corrected by cleaning the poppet valve, especially if there is no evidence of wear to the valve itself. If it is necessary to replace a poppet valve to correct a leak, replace both the valve and spring at the same time. The parts are ordered from the parts list. To disassemble the pump to gain access to the poppet valve and spring, follow this procedure:

1. Shut off the marking fluid and remove the tube adapter, leaving the tube adapter intact Pull the tube adapter straight away from the pump body.
2. Wash the tube adapter, spring, and poppet valve in solvent.
3. Inspect the poppet valve for signs of wear. The poppet valve will need to be replaced when there is the appearance of grooves, rings, or roughness on the conical nose of the poppet valve.
4. Reassemble the components, starting with the poppet valve, valve spring, and tube adapter.
5. To avoid, or remove an airlock in the poppet valve during reassembly, open the shutoff valve and let the marking fluid flush the poppet valve.

Be sure to place a rag beneath the tube adapter to absorb the marking fluid that drips out.

Loss of Efficiency and Reliability

After extended use over months or years, wear is inevitable. Replace the pump piston and body whenever severe wear occurs on one side of the piston, which indicates a bent condition. The pump body and piston are sold together, as a matched set.

Spring Marker and Air Leak Concerns

There are very few things that can go wrong with the spring marker or air cylinder assembly. One possible concern is bending the air cylinder rod. If this occurs, contact Carco and provide specifications for the air cylinder so that a new one can be provided.

The only general maintenance on the spring marker is to replace the nib. The timing for nib replacement varies on the number of cycles. In general, when the nib starts to wear down, when the marking becomes sloppy, or the nib gets hard, replace it. This is accomplished by unscrewing the old nib, and then threading a new nib in its place. Prime the new nib before commencing operation.

The final point on the spring marker and air cylinder are ensuring that there are no kinks in the air supply ling going to the air cylinder. Any kinking or leakage will affect operation of the air cylinder. Air leaks are most common at the connectors, and can be found by applying a soap and water solution to the area and watch for bubbles to form.

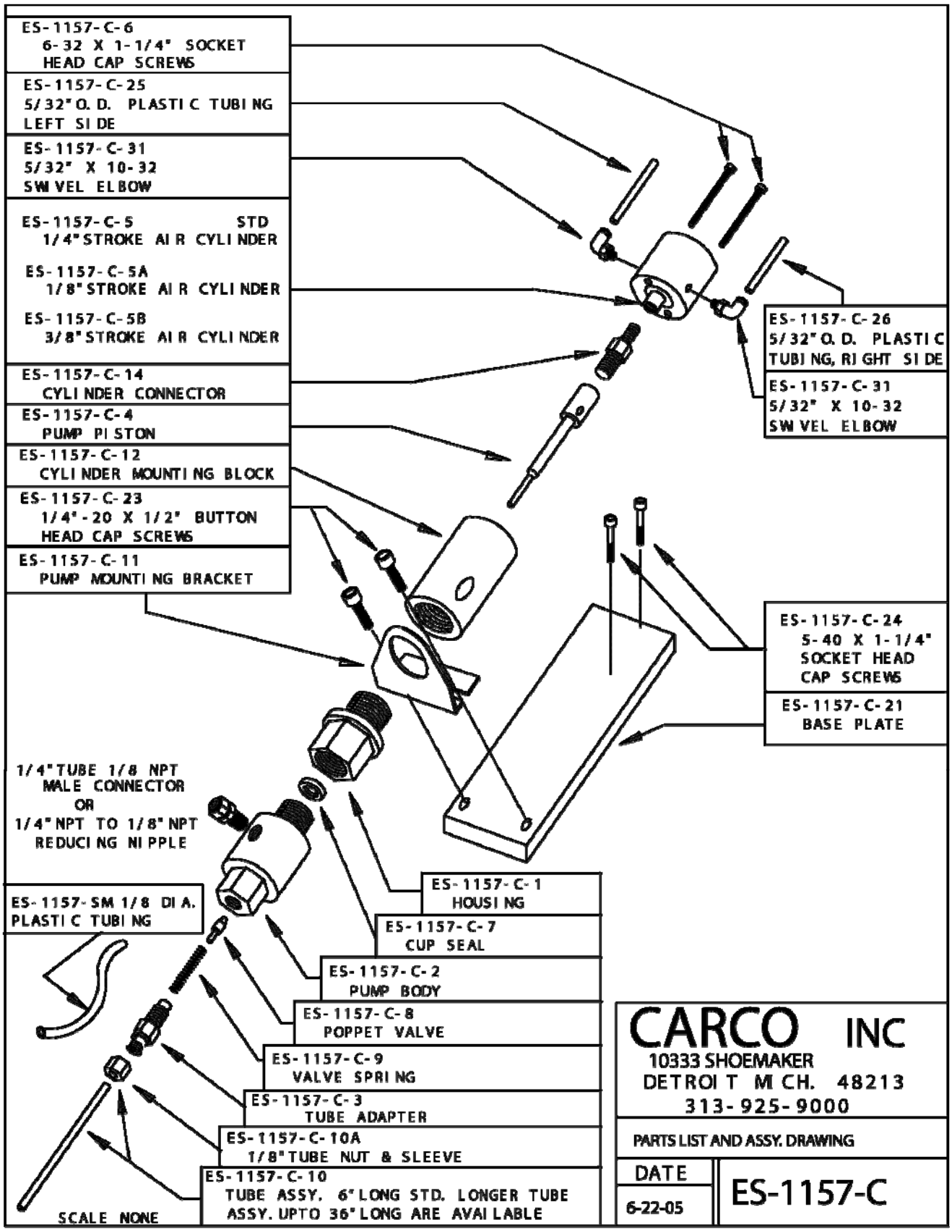

Figure 5 — Parts List for ES-1157-C Pump Assembly

PIPING INSTRUCTIONS FOR:

ES-612-A & ES-712-A

PIPING AIR

1: SUPPLY MAIN AIR (60 TO 80 PSI) TO INK PUMP INLET PORT ON VALVE (ES-1157-C-VE-R27-SM) AND INLET PORT ON MARKER VALVE (ES-376-VE-4).

2: RUN ¼" O.D PLASTIC TUBING FROM OUTLET PORTS OF MARKER VALVE (ES-376-VE-4) TO INLET PORTS OF FLOW CONTROLS ON MARKER AIR CYLINDER (ES-641-NR)

3: ADJUST FLOW CONTROLS ON AIR CYLINDER TO CONTROL EXTEND & RETRACT SPEED.

PIPING INK LINE

1: USING 1/8" O.D. (WHITE) PLASTIC TUBING FROM OUTLET OF INK PUMP TO INLET OF MARKER HEAD. USE POLYPROPYLENE TUBING ONLY.

ES-1518-A

PIPING AIR

1: SUPPLY MAIN AIR (60 TO 80 PSI) TO INK PUMP INLET PORT ON VALVE (ES-1157-C-VE-R27-SM) AND INLET PORT OF LOW PRESSURE REGULATOR (ES-375-RC-6) USING ¼" O.D TUBING

NOTE: ***LOW PRESSURE REGULATOR IS USED ONLY FOR ES-1518-A MARKER (NOT TO BE USED FOR INK PUMP)***

2: RUN ¼" O.D PLASTIC TUBING FROM OUTLET SIDE OF LOW PRESSURE REGULATOR (ES-375-RC-6) TO INLET SIDE OF MARKER VALVE (ES-376-VE-4)

3: USE 5/32" O.D. (BLACK) PLASTIC TUBING FROM OUTLET SIDE OF LOW CONTROLS ON MARKER VALVE TO ES-1518-A AIR CYLINDER INLET PORTS.

4: ADJUST LOW PRESSURE REGULATOR BETWEEN 15 & 30 PSI. (ENOUGH PRESSURE TO GET FULL MARK BUT NOT ENOUGH TO CRUSH FELT)

5: ADJUST FLOW CONTROLS ON MARKER VALVE (ES-376-VE-4) TO CONTROL EXTEND AND RETRACT SPEED.

PIPING INK LINE

1: USING 1/8" O.D. (WHITE) PLASTIC TUBING FROM OUTLET OF INK PUMP TO INLET OF MARKER HEAD. USE POLYPROPYLENE TUBING ONLY.

ES-1752

PIPING AIR

1: SUPPLY MAIN AIR (60 TO 80 PSI) TO INK PUMP INLET PORT ON VALVE (ES-1157-C-VE-R27-SM) AND INLET PORT OF LOW PRESSURE REGULATOR (ES-375-RC-6) USING ¼" O.D TUBING

NOTE: ***LOW PRESSURE REGULATOR IS USED ONLY FOR ES-1752 MARKER (NOT TO BE USED FOR INK PUMP)***

2: RUN ¼" O.D PLASTIC TUBING FROM OUTLET SIDE OF LOW PRESSURE REGULATOR (ES-375-RC-6) TO INLET SIDE OF MARKER VALVE (ES-376-VE-4)

3: USE 5/32" O.D. (BLACK) PLASTIC TUBING FROM OUTLET SIDE OF LOW CONTROLS ON MARKER VALVE TO ES-1752 AIR CYLINDER INLET PORTS.

4: ADJUST LOW PRESSURE REGULATOR BETWEEN 15 & 30 PSI. (ENOUGH PRESSURE TO GET FULL MARK BUT NOT ENOUGH TO CRUSH FELT)

5: ADJUST FLOW CONTROLS ON EXHAUST PORT (ES-376-VE-3) VALVE TO CONTROL RETURN SPEED OF MARKER

PIPING INK LINE

1: USING 1/8" O.D. (WHITE) PLASTIC TUBING FROM OUTLET OF INK PUMP TO INLET OF MARKER HEAD. USE POLYPROPYLENE TUBING ONLY.