



PROGRAM TITLE: SMB/L120 ACTUATORS

PROGRAM LENGTH: 24 HOURS

This program presents the fundamental maintenance and operation of L120 and SMB actuators. Mechanical and electrical operation is presented in guided lecture periods. Aspects of field level maintenance are presented in both lecture and guided hands-on activities. Electrical control theory covers the basics of L120 and SMB actuator operation while locating and interpreting operation of each component. The program should encourage rapid turn around of L120 and SMB actuators at a facility or plant through the application and troubleshooting exercises.

At the end of this program each trainee will be able to:

- 1. Perform maintenance tasks associated with L120 and SMB actuators:**
 - a. Mechanical Assemblies**
 - b. Electrical Assemblies**
- 2. Perform adjustments for:**
 - a. Limit Switches**
 - b. Torque Switches**
- 3. Evaluate L120 and SMB actuators for correct operation.**
- 4. Troubleshoot defective L120 and SMB actuators.**

METHOD OF INSTRUCTION

The program is presented in a combination of 30 percent lecture supported by 70 percent guided hands-on exercises. Student performance is evaluated at the end of the program by troubleshooting instructor generated faults inserted into L120 and SMB actuators.

PROGRAM PERQUISITES

The program is intended for personnel involved with the operation and maintenance of L120 and SMB actuators. A basic understanding of electrical control is recommended but not required.

WHO SHOULD ATTEND

Personnel who are involved with the installation, troubleshooting and repair of L120 and SMB actuators. Company personnel other than maintenance oriented can attend selected modules from the course. Personnel who might attend include but are not limited to:

- 1. Maintenance mechanics or millwrights**
- 2. Maintenance electricians**
- 3. Instrument technicians**
- 4. Maintenance supervisors**
- 5. Operations supervisors**
- 6. Operations personnel**

DRESS CODE

This class takes place in an industrial environment. Attending students should wear long pants, steel toed shoes, and safety glasses.

L120/SMB PROGRAM OUTLINE

I. HOW VALVE ACTUATORS DRIVE VALVES

- A. PURPOSE**
- B. FUNCTION**
- C. GENERAL VALVE OPERATION**

- 1. MULTI-TURN VALVES**
- 2. OPERATIONAL RELATIONSHIPS**
- 3. QUARTER TURN VALVES**

D. ACTUATORS AND VALVE OPERATION

- 1. TOP MOUNTING**
- 2. SIDE MOUNTING**
- 3. BASIC L120 10/20/40 OPERATION**
 - a. ELECTRO-MECHANICAL**
 - b. MANUAL**
- 4. L120 ACTUATOR MOTORS**
- 5. GEARED LIMIT SWITCH**
- 6. TORQUE SWITCH**

II. MECHANICAL DESCRIPTION

- A. PRINCIPLES OF OPERATION**
- B. L120 MECHANICAL ASSEMBLIES**

- 1. HOUSING ASSEMBLY**
- 2. DRIVE SLEEVE ASSEMBLY**
- 3. WORM SHAFT ASSEMBLY**
- 4. LIMIT SWITCH COMPARTMENT COVER**
- 5. LIMIT SWITCH**
- 6. TORQUE SWITCH**
- 7. MOTOR GEARING**
- 8. HANDWHEEL ASSEMBLY**

- a. TOP MOUNTED**
- b. SIDE MOUNTED**

**9. MOTOR OPERATION AND ADAPTION
10. THRUST BASE ASSEMBLY**

III. RECOMMENDED MECHANICAL MAINTENANCE

- A. GENERAL**
- B. SAFETY**
- C. RECOMMENDED TOOLING FOR MAINTENANCE**
- D. RECOMMENDED DISASSEMBLY PROCEDURES**
- E. ASSEMBLY INSPECTION AND ADJUSTMENT(S)**
- F. RECOMMENDED REASSEMBLY PROCEDURES**

IV. GENERAL MAINTENANCE FOR ACTUATORS

- A. GASKET AND SEAL MATERIALS**
 - 1. GASKETS**
 - 2. SEALS**
- B. LUBRICATION**
 - 1. GENERAL**
 - 2. RECOMMENDATIONS**
 - 3. INSPECTION OF LIMIT SWITCH COMPARTMENT**
- C. NAMEPLATE INTERPRETATION**
 - 1. GENERAL INFORMATION**
 - 2. TYPES OF NAMEPLATES**

V. ELECTRICAL DESCRIPTION

- A. GENERAL**
 - 1. RECOMMENDED TOOLS AND MATERIAL**
 - 2. ELECTRICAL SAFETY**
- B. L-120 ELECTRICAL ASSEMBLIES**
 - 1. INTEGRAL STARTER**
 - 2. NON-INTEGRAL STARTER PUSHBUTTON STATION**
 - 3. LIMIT SWITCH**
 - 4. TORQUE SWITCH**
 - 5. MOTOR**
 - 6. BASIC INTEGRAL UNIT**
 - 7. UNIVERSAL ELECTRICAL CONTROL**
- C. ELECTRICAL OPERATION**
 - 1. ACTUATOR POWER**

2. CONTROL CIRCUIT OPERATION
 - a. LIMIT SWITCH CONTROL
 - b. TORQUE SWITCH CONTROL
3. TROUBLESHOOTING

V. RECOMMENDED TROUBLESHOOTING AND MAINTENANCE PROCEDURES

- A. ROUTINE MAINTENANCE
- B. MAJOR MAINTENANCE
- C. TROUBLESHOOTING

L120 MAINTENANCE PROGRAM LAB EXERCISES

LAB #	TITLE
01	L120 – DISASSEMBLY, INSPECTION, ADJUSTMENT & REASSEMBLY
02	L120 – ELECTRICAL OPERATION OF BASIC INTEGRAL CONTROL PACKAGE
03	LIMIT SWITCH ADJUSTMENT PROCEDURES
04	L120 – ELECTRICAL OPERATION – “BIC” CONTROL PACKAGE
05	L120 – ELECTRICAL OPERATION – “UEC” CONTROL PACKAGE
06	TROUBLESHOOTING

SMB MAINTENANCE PROGRAM LAB EXERCISES

LAB #	TITLE
07	SMB – DISASSEMBLY, INSPECTION, ADJUSTMENT & REASSEMBLY
08	SMB – ELECTRICAL OPERATION OF BASIC INTEGRAL CONTROL PACKAGE
09	LIMIT SWITCH ADJUSTMENT PROCEDURES
10	SMB – ELECTRICAL OPERATION – “BIC” CONTROL PACKAGE
11	SMB – ELECTRICAL OPERATION – “UEC” CONTROL PACKAGE

