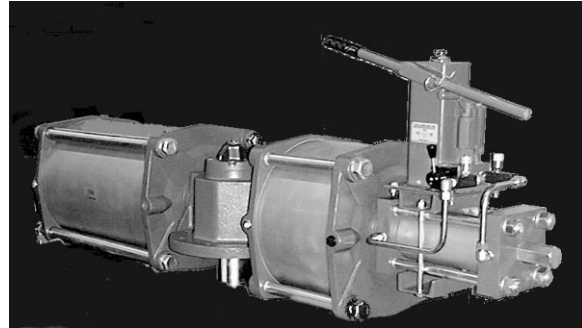
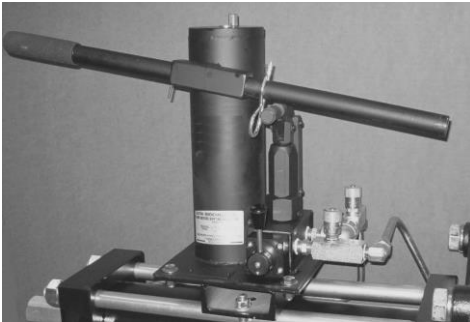


OPERATION AND MAINTENANCE MANUAL FOR MANUAL HAND PUMP- ALL MORIN ACTUATORS



Description:

The optional hydraulic manual hand pump (MHP) option provides an emergency override capability for an actuated valve. The MHP unit consists of a hydraulic cylinder and a handpump connected by a self-contained hydraulic system. Standard features include speed control valves, removable 24-inch handle, and internal pressure relief valve.

Specifications:

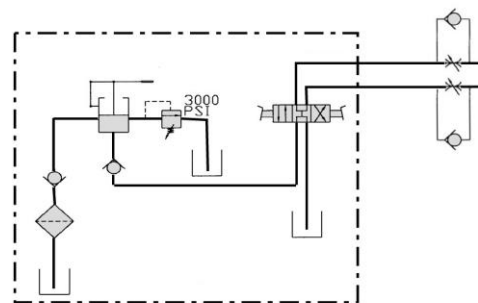
Reservoir volume:	75 cu.in.
Stroke Displacement:	0.60 cu.in./stroke.
Hydraulic Fluid:	ISO-22 (Chevron hydraulic oil AW or Equal petroleum base only.)

Maintenance Requirements:

No routine maintenance is required except to maintain fluid in reservoir. Do not exceed the maximum fluid level. Seal repair kit is available if servicing is required. The hydraulic cylinder seal kit is included with the standard repair kit for the entire actuator. A pump repair kit is available separately.



Figure 1



Hydraulic Schematic

OPERATION AND MAINTENANCE MANUAL FOR MANUAL HAND PUMP

Operation Instructions:

A. Remote Operation

When the actuator is operated by air, the selector valve must be in the remote (center) position. (Figure 1)

B. Local Operation

1. Release the air supply to the actuator.
2. Shift the selector valve to the desired open or close position (figure 1).
3. Install the pump lever and operate the pump until the actuator position indicator reaches the desired position. The actuator is hydraulically locked in this position until the selector valve is moved.
4. Return the pump handle to the storage holder and lock in place with the pump plunger down (figure 2).
5. To return the actuator to remote control, restore the air supply and return the selector valve to the remote (center) position. **Caution: a spring return actuator will shuttle to its fail position when the selector is moved.**

Important:

1. For **safety** reasons, never operate the selector valve unless the pump handle has been removed and placed in its storage holder.
2. Spring return actuators will not require pumping in the failure mode direction.

Hydraulic fluid level:

The fluid level in the handpump reservoir changes when the actuator is operated. The fluid level is higher when the hydraulic cylinder piston rod is retracted into the hydraulic cylinder. The fluid level is lower when the hydraulic cylinder piston rod is extended out of the hydraulic cylinder. Measure the fluid level in the **lower** position, using a dip stick, and maintain this fill level as shown on the sticker (1 inch above the pump base). Operate the actuator open and closed with its fill plug securely in place and view the fluid level to verify where the low position is. Be sure to tighten the fill port plug securely to avoid hydraulic fluid overflow. **Caution: Do not exceed this fluid level or fluid may squirt out of the relief valve.**

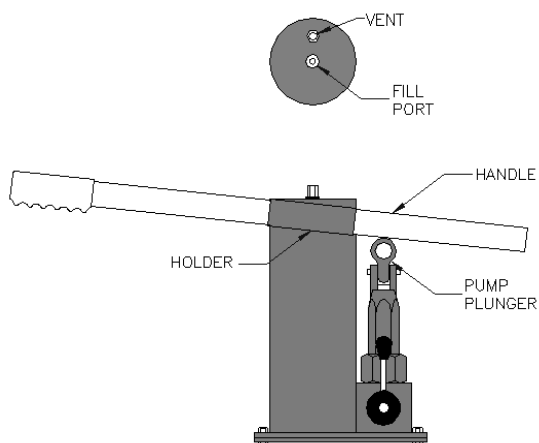


Figure 2

OPERATION AND MAINTENANCE MANUAL FOR MANUAL HAND PUMP

Replacement Parts – Hand pump only

Repair parts for hand pumps are limited to the following components. Items 1, 2 and 3 are available only as a kit. Item 4 is available separately.

ITEM	DESCRIPTION
1*	RELIEF VALVE
2*	FILL PLUG* & O-RING
3	SELECTOR VALVE & O-RINGS
4	HANDLE

REPAIR KIT {

Locate the pump part number stamped on the pump as shown in Figure 1 and order the corresponding repair kit or handle.

PUMP MODEL NO.	REPAIR KIT	HANDLE
100619 100719 100816	B-RKMHP1	15-1399
100879* 100915* 100925* 100950*	B-RKMHP2	
	B-RKMHP3	
200879* 200915*	B-RKMHP4	

* Relief valve and fill plug is only furnished for these pump models.

Repair / seal kits for the hydraulic cylinder portion of the MHP are available as part of the complete actuator seal repair kit. Contact the factory for the part number for the actuator kit.

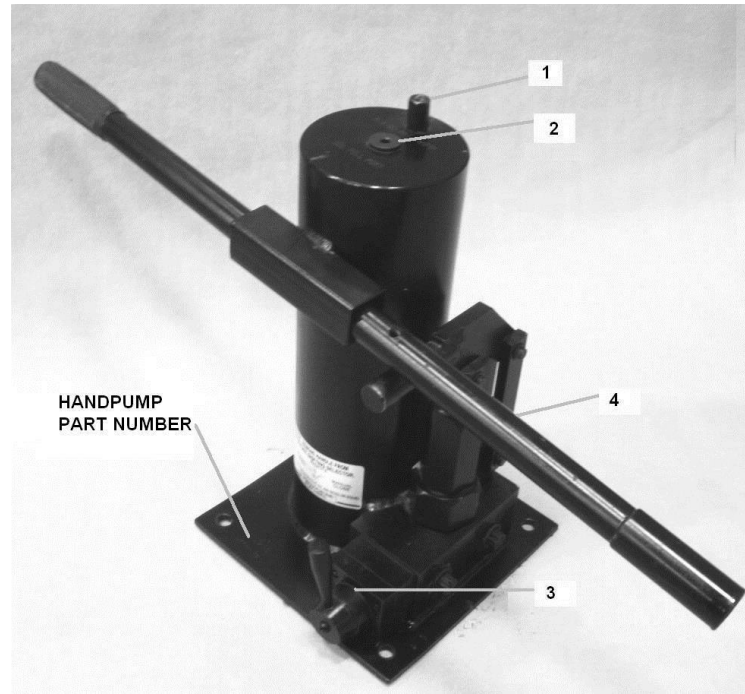


Figure 3



Disassembly Procedure:

The manual hydraulic override is composed of parts from the Morin standard hydraulic actuator and standard pneumatic actuator. Please refer to the maintenance manuals for those products for diagrams and parts lists and fastener torque specifications. Read the Morin standard hydraulic actuator and standard pneumatic actuator manuals and follow all the safety warnings. **Disengage the power supply** and remove the actuator from the valve before proceeding with actuator disassembly. **Caution:** Be aware that spring return actuators must be disassembled per the actuator maintenance instructions because of the danger of stored spring energy.

For the Manual Hydraulic Override assembly:

1. Remove the manual hand pump assembly by loosening the tubing connectors at the hydraulic cylinder and unbolting the hand pump mounting bracket. Plug the ends of the tubing to retain the hydraulic oil and keep dirt out of the hydraulic system.
2. Remove hydraulic cylinder endcap; tie rods and cylinder piston bolt and piston.

For a single cylinder actuator:

3. Remove the remaining hydraulic endcap by withdrawing the four mounting bolts from inside the actuator housing.
4. Remove the piston rod seal and bushing.

For a two cylinder actuator:

5. Remove the pneumatic tie rods and slide the endcap back with the piston rod assembly to gain access to the inside.
6. Remove the four bolts and seal washers from inside the pneumatic endcap to release the remaining hydraulic cylinder endcap. Then slide the seals, bushing, and endcaps off the piston rod.
7. Remove the hydraulic cylinder piston rod from the pneumatic piston.

Assembly Procedure:

Assembly is in reverse order of the disassembly procedure. Lube all seals with Dow Corning 55 seal lube. Use loctite 262 on the piston rod stud. Fill the hydraulic cylinder with hydraulic oil prior to installing the handpump tubing to minimize air in the hydraulic system. Operate the actuator pneumatically several times to bleed any trapped air. Add oil to the handpump reservoir up to the fill level line. This level will vary as the actuator strokes. Check to be sure that the oil level never exceeds the maximum fill line in both open and closed positions. (Approximately 1 inch from the base of the reservoir).

Pneumatic Actuators - Installing a Manual Hand Pump Supplied As a Kit:

Normally for a single cylinder double acting or spring return actuator, the manual hand pump kit is installed in place of the rod cover assembly. However, installing the manual hand pump in place of the rod cover is not possible in the field without replacing the actuator housing. *Therefore all manual hand pump kits supplied for field installation must be installed on the endcap of the actuator.*

If the actuator is a two-cylinder spring return actuator, install the kit on the shorter cylinder end. For two cylinder double acting actuators, the kit can be installed on either endcap but the left endcap is preferred. (When facing the Morin nameplate).

Installation Procedure:

Replace the existing pneumatic endcap with the one included assembled with the kit. Remove and discard the piston bolt but retain the lock washer. Screw the piston rod of the hydraulic cylinder in place of the

piston bolt using the piston bolt lock washer. Bolt the hydraulic cylinder and pneumatic endcap assembly on to the pneumatic actuator. Install the handpump and bleed per instructions above.

Assembly view showing hydraulic cylinder, hand pump, and pneumatic cylinder (Figure 1)

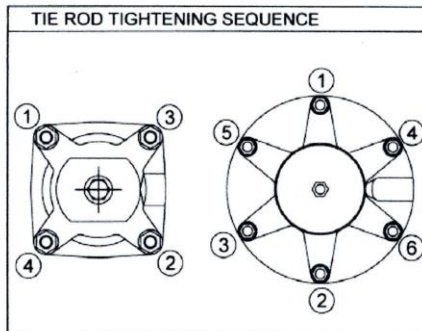
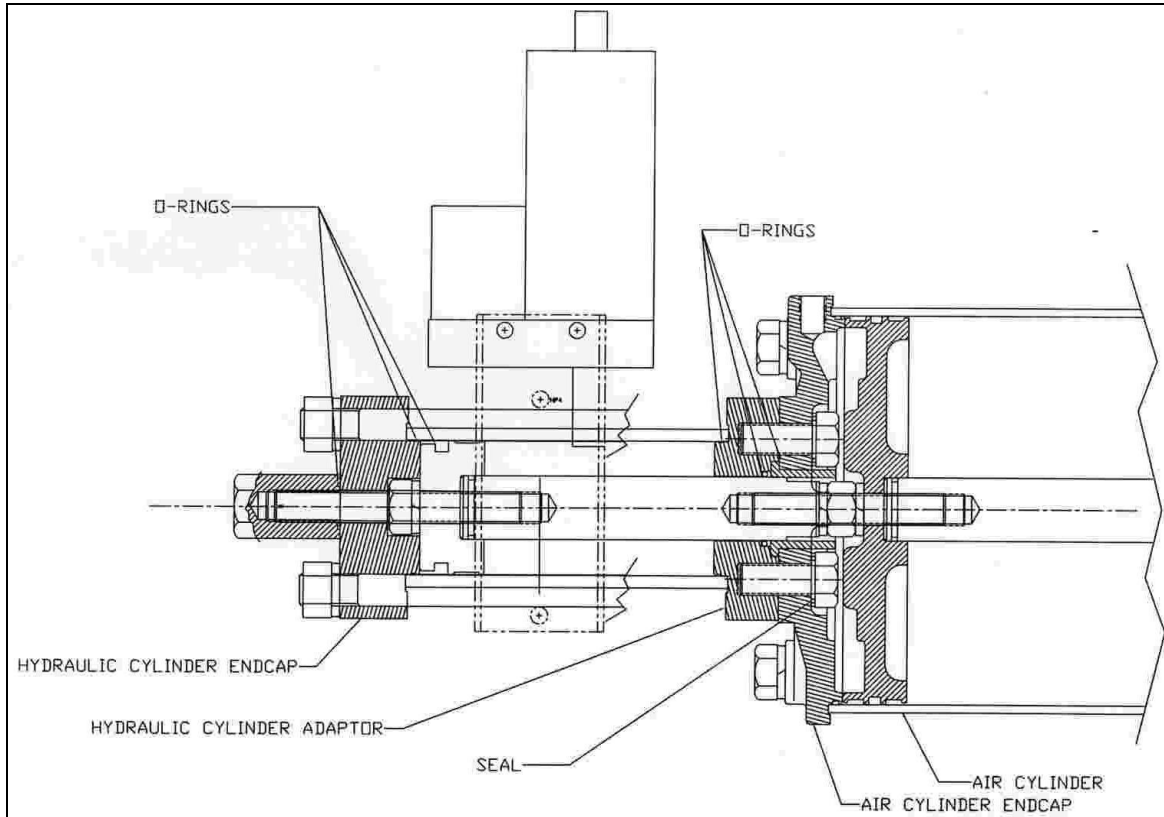


FIGURE 8

ASSEMBLY TORQUE REQUIREMENTS (FT./LBS.)				
Model No.	Adaptor Bolt (44)	Piston Bolt (33)	Tie Rod (33)	Tie Rod Bolt Spring side (51)
003	N/A	15	10	N/A
B-006	N/A	15	15	N/A
015	N/A	15	30	25
S-006, 012	15	15	15	10
023 thru 100	30	40	30	25
135, 270	150	150	150	100
344	150	150	250	100
345	150	150	150	250
210, 420	150	150	250	250
370, 575 thru 7114	250	250	250	250

FIGURE 9



Bill of Material for Manual Handpump Components

MANUAL HANDPUMP FOR A ONE CYLINDER ACTUATOR				MANUAL HANDPUMP FOR A TWO CYLINDER ACTUATOR			
PART	MATERIAL	QTY		PART	MATERIAL	QTY	
1	CYLINDER	S. S.	1	1	CYLINDER	S. S.	1
2	PISTON	STEEL	1	2	PISTON	STEEL	1
3	ADAPTOR	STEEL	1	3	ADAPTOR	STEEL	1
4	ENDCAP	STEEL	1	4	ENDCAP	STEEL	1
5				5			
6				6			
7	SEAL PISTON ROD	BUNA-N	1	7	SEAL PISTON ROD	BUNA-N	1
8	SEAL PISTON BOLT	BUNA-N	1	8	SEAL PISTON BOLT	BUNA-N	1
9	SEAL PISTON	BUNA/TEFL	1	9	SEAL PISTON	BUNA/TEFL	1
10				10	SEAL ENDCAP/ADAPTOR	BUNA-N	1
11	BEARING PISTON	TEFLON	1	11	BEARING PISTON	TEFLON	1
12	SEAL CAP NUT	BUNA-N	1	12	SEAL CAP NUT	BUNA-N	1
13	ADJUSTING SCREW	STEEL	1	13	ADJUSTING SCREW	STEEL	1
14	CAP NUT	STEEL	1	14	CAP NUT	STEEL	1
15	TIEROD	STEEL	4	15	TIEROD	STEEL	4
16	HEX NUT	STEEL	4	16	HEX NUT	STEEL	4
17	LOCKWASHER	STEEL	4	17	LOCKWASHER	STEEL	4
18	SOCKET HD CAP SCREW	STEEL	4	18	SOCKET HD CAP SCREW	STEEL	4
19	CYLINDER O-RING	BUNA-N	2	19	CYLINDER O-RING	BUNA-N	2
20				20	STATO SEALS	BUNA	4
21				21	JAM NUT	STEEL	1
22				22	LOCKWASHER	STEEL	2
23				23	PISTON ROD STUD	STEEL	1
24				24			
25	MHP LABEL	MYLAR	1	25	MHP LABEL	MYLAR	1
26	HANDPUMP	STEEL	1	26	HANDPUMP	STEEL	1
27	DELTRON SPEED CONTROL	STEEL	2	27	DELTRON SPEED CONTROL	STEEL	2
28	ISO-22 HYDRAULIC FLUID		1	28	ISO-22 HYDRAULIC FLUID		1
29	PIPING KIT	S. S.	1	29	PIPING KIT	S. S.	1
30	BRACKET - PUMP	STEEL	1	30	BRACKET - PUMP	STEEL	1
31	BRACKET - COMPANION	STEEL	1	31	BRACKET - COMPANION	STEEL	1
32	HEX BOLT - 1/2UNC X 8 1/2	STEEL	4	32	HEX BOLT - 1/2UNC X 8 1/2	STEEL	4
33	LOCKWASHER - 1/2	STEEL	4	33	LOCKWASHER - 1/2	STEEL	4
34	HEX NUT - 1/2	STEEL	4	34	HEX NUT - 1/2	STEEL	4

Hydraulic Actuators - Installing a Manual Hand Pump Supplied As a Kit:

Single cylinder hydraulic double acting actuators:

Field mounted kits are not offered because the main powerhead housing would need to be disassembled and machined to accept the handpump cylinder assembly.

Two-cylinder hydraulic double acting actuators:

1. Install the handpump bracket on one of two cylinders (see figure 1).
2. Install the handpump with the reservoir fill port up.
3. Locate and remove steel vent plug fittings on the two inboard endcaps. Fill the two ports as full as possible with Chevron type AW hydraulic oil (or equal mineral oil based oil).
4. Install stainless steel hydraulic tubing and tube fittings (3000 psi minimum rating) between the port on each inboard endcap and the hydraulic control valves on the pump.
5. Fill the pump to the fluid level noted on the pump. Cycle the actuator using remote power several times to work the air out of the handpump and refill as required to the max fill line.

Spring return hydraulic actuators:

The manual handpump hydraulic cylinder must be installed on the spring cylinder. See instructions above for installing a manual handpump on a pneumatic actuator.