Instruction Manual
Synflex® Mark IX Series Power Swaging Machines

Powering Business Worldwide

Mark IX Series
Power Swaging Machines

Instruction Manual
For
Models

4530-009S0	115/208/230 V	Single Phase/60 Hz
4530-009S1	230-246 V	Three Phase/60 Hz
4530-009S2	110/220 V	Single Phase/50 Hz

This manual contains information necessary for the proper setup and operation of the Mark IX series power swaging machines. This manual must be read and understood by the person (s) responsible for this equipment if functionality and long service life are to be assured.

WARNING

This machine is designed expressly for the purpose of swaging Synflex approved couplings and hose together using appropiate Synflex doe sets and pushers. The Eaton Corporation cannot be responsible for property damage or personal injury that may result from swaging other brands of fittings and hose together nor from the intentional misuse of this device.

0112-95004 (Rev-)

Initial Installation and Setup

First, read through this operating manual carefully before proceeding. Use the drawing and parts list to help identify the various components and their location. Uncrate the swager unit and mount it in the location where it is to used. it is recommended that the swager be bolted securely to a bench or stand so that it does not tip over or move around while sawing hose assemblies. The location should have the necessary electrical outlet required, depending on the specific swager model and the voltage desired. (See Electrical Requirements).

Remove the pipe plug from the hydraulic reservior (See figure 1) and visually verify that there is hydraulic fluid in the reservoir, then replace the pipe plug with the breather cap (See Breather Cap Installation). Use the accompanying drawing to identify and locate parts.

Now install the manual control valve handle. (See manual Control Valve Handle Installation).

The swager can now be plugged into the electrical outlet and run to see if everything operated properly.

CAUTION

Do not attempt to operate the swager until the preceeding steps have been completed. Be sure to install a die set and pusher, otherwise the cylinder may be damaged.

Electrical Requirements

The electrical requirements for each Mark IX model swager are as follows:

Model 4530-009S0
115/208/230 volt, single phase
60Hz (factory wired for 115V)

Model 4530-009S1
230/460 volt, three phase
60Hz (factory wired for 460V)

Model 4530-009S2
110/220 volt, single phase
50Hz (factory wired for 220V)

Each model is wired for the voltage as noted at the factory. The voltage in each model can be changed to the alternates indicated using the wiring diagram found on the inside of the switch cover. It is recommended that a qualified electrician perform this task if necessary. As with all electrical equipment, proper external grounding is recommended for safety. When turning on the swager for the first time, verify that the motor rotates in the proper direction according to the arrow on the motor fan housing.

Breather Cap Installation

The pipe plug found at the top and back of the reservoir must be removed and replaced with the breather cap, item 36, found in the bag attached to the swager. (See figure 1 & 2) While installing the breather cap, check to insure that the hydraulic fluid level is near the top of the reservoir, (approximately 1 to 1 ¼ inches below the breather hole). The swager is shipped from the factory filled with the proper type and amount of hydraulic fluid. However, if additional fluid is required or would ever need to be replaced, it should meet the following general requirements.

Figure 1

Figure 2

Note: The pipe plug should be reinstalled anytime shipment is contemplated or when the swager is lifted or placed on its side, to prevent loss of hydraulic fluid thourgh the breather cap.

Use Renolin AW68 or an equivalent hydraulic fluid that complies with the above requirements.

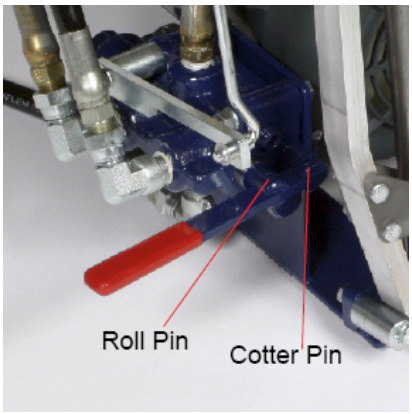
Recommended temperature	125-150° F
Maximum temperature	200° F
Flash Point	430° F
Viscosity (SSU)	325
Viscosity Index	95

CAUTION

Do not attempt to operate the swager without installing the breather cap.

Manual Control Valve Handle Installation

The Manual Control Valve Handle, Item 37, must be properly installed before the swager can be operated. The handle is shipped in the bag with the breather cap. Note that the handle has a hole in it approximately 1-½ inches from the slotted end and that the hole is offset toward one edge. The Directional Control Valve, Item 2, is found on the left side of the swager. Raise and secure the trip latch mechanism so that it is out of the way. Now position the handle in the control valve as shown in the drawing below. Proper orientation of the handle is essential. Make sure the hole in the handle is oriented toward the valve stem as shown. With the handle in the position in the valve stem and clevis pivot, line up the hole in the handle and with the roll pin that is already partially installed in the valve stem. Using a hammer, carefully tap the roll pin down through the hole in the handle until the pin is flush with the top of the stem.



Valve Handle Installation

Swager Operation

Dies and Pushers

The proper choice of die sets and pushers for the particular coupling to be swaged may be determined by referring to the current Synflex catalog. The die halves are attached to the Right and Left Hand Lifting Fingers, Items 20 and 21, by three holes found in the outer diameter of each die half and are retained by the Detent Pins, Item 22. The pusher is attached by inserting the knob end into the bottom of the swager pusher block and securing it with the thumb screw or spring plunger, Item 24.

Warning

Operating the swager without proper die sets and pushers may cause permanent damage to the cylinder.

Operating Instructions

With the die set and pusher installed and the swaging cylinder in the full up position, the hose assembly is inserted up through the die base and die set and the coupling inserted into the pusher recess until it is seated. The die cavities should previously be coated with the appropriate swage lubricant to prevent unnecessary die wear. The valve handle is then actuated by pulling it toward the operator. The cylinder then starts the downward stroke and the proper sequence of setting the dies into the the die base and the swaging operation will occur. The pusher is bottomed against the dies to insure full engagement of the coupling on the hose. After swaging operation is complete, the valve handle is pushed inward or away from the operator. The cylinder will start to retract and the latching lever will hold the valve handle in this position until the retraction portion of the cycle is completed at which time the latching lever will automatcially disengage if proper adjusted as described below. A periodic inspection of the swager should be made to ascertain that all bolts and nuts are secure.

Adjustment of the Automatic Return Stop Position

Install the proper die set and pusher, then pull the valve handle to fully bottom them in the swager. Now retract (Raise) them in short increments by jogging the valve handle rearward. When the die opening allows, insert the hose assembly into the swager, seating the coupling end in the pusher recess. Now continue to retract the swager until there is 3/4 inch between the bottom of the coupling skirt and the top face of the dies. Stop and loosen the Trip Rod Tightening Knob, Item 19, on the Trip Rod Collar, Item 14, attached to the Trip Rod, Item 13. Allow the collar and/or trip rod mechanism to drop. Retighten the tightening knob. Now run the swager a full cycle checking to see that the return stop functions properly on the return stroke. The swaged assembly should pass through the open dies without becoming caught or hung up in the die set. Re-adjust as necessary. The unit is now ready to use. Each coupling, pusher and die set combination will require this return stop procedure. This will ensure proper and efficient swaging operation.

CAUTION

Always adjust the lift rod collar so that the return stop functions before the pusher block retracts to the bottom of the cylinder. The swager may be damaged otherwise.

Maintenance and Component Adjustment Procedures

General Maintenance

The swager is designed and built to give the user long service life with minimum up keep. By performing the following maintenance procedures, the swager should function satisfactorily for years with trouble free service. After approximately one hour continuous operation, the temperature of the unit can be expected to raise approximately 100° F (38°C) above ambient. If extreme high temperatures are developed, the oil reservoir level should be checked for sufficient fluid level as indicated in the Breather Cap Installation instructions. The plumbing should be checked for possible restrictions, such as kinked hose.

Periodically check the hydraulic hoses to see that they are in good condition. There should be no evidence of damage such as cuts, tears or bagginess in the outer sheath. Again, kinked hoses should be avoided. Replace any hose assembly that appears suspect. Every four months check the oil level as previously stated with the swager turned off. The mechanical moving parts should be checked to see that they operate properly and are not excessively worn. Replace components that exhibit excessive wear or have become bent or broken.

A clean machine works and looks better. Occasionally wipe it down with a clean rag.

Die Alignment in the Swager Base

This is adjustment at the factory, but if at any time it is noted that the dies are not of equal height when seated in the swager base, adjustment is necessary. This is accomplished by loosening the four (4) mounting bolts on each side on the Die Lifting Fingers, Items 20 and 21 and then, by hand, pushing each Lifting Finger down as far as the bolt holes will allow. Now install a die set and a pusher and start the swager, the apply full down force by pulling the valve handle toward you as if swaging a coupling. The pusher should have pushed the die halves into the die bowl and the top of the doe set should be even or flat. Now retighten the four mounting bolts. Now cycle the swager so the pusher retracts upward and the die halves are lifted out of the swager base then start the swaging operation again, noting if the die halves are seated properly with equal height in the swager base before the pusher makes contact with them. If the die halves are still not seating properly, some adjustment to the Alignment Rolls may be required.

Adjustment of Alignment Rolls

The lower angled ends of the two Die Lifting Guide Arms, Item 17, are adjusted with very little clearance, but must slide freely. This is to insure that the die set halves will enter the swager base evenly and without catching the top edge of the base. Adjustment is provided by the eccentric Alignment Rolls, Item 18, located to the lower outside of the Guide Arms on the swager frame. With a die set and pusher installed, turn on the swager and apply full down force by pulling the valve handle toward you. With the swager in the full downward position, loosen the Alignment Roll mounting bolts and rotate the Rolls to reposition the Guide Arms as necessary to provide proper alignment then retighten the mounting bolts. The Guide Arms must still slide freely. Run the pusher and die set up and down to verify that the die set is seating properly and not catching on the swager base. If the problem persist, examine the Guide Arms, Lifting Fingers and the related mounting points to make sure nothing is bent or broken. Broken components must ne replaced and frame brackets straighten before further damage occurs.

Trouble Shooting

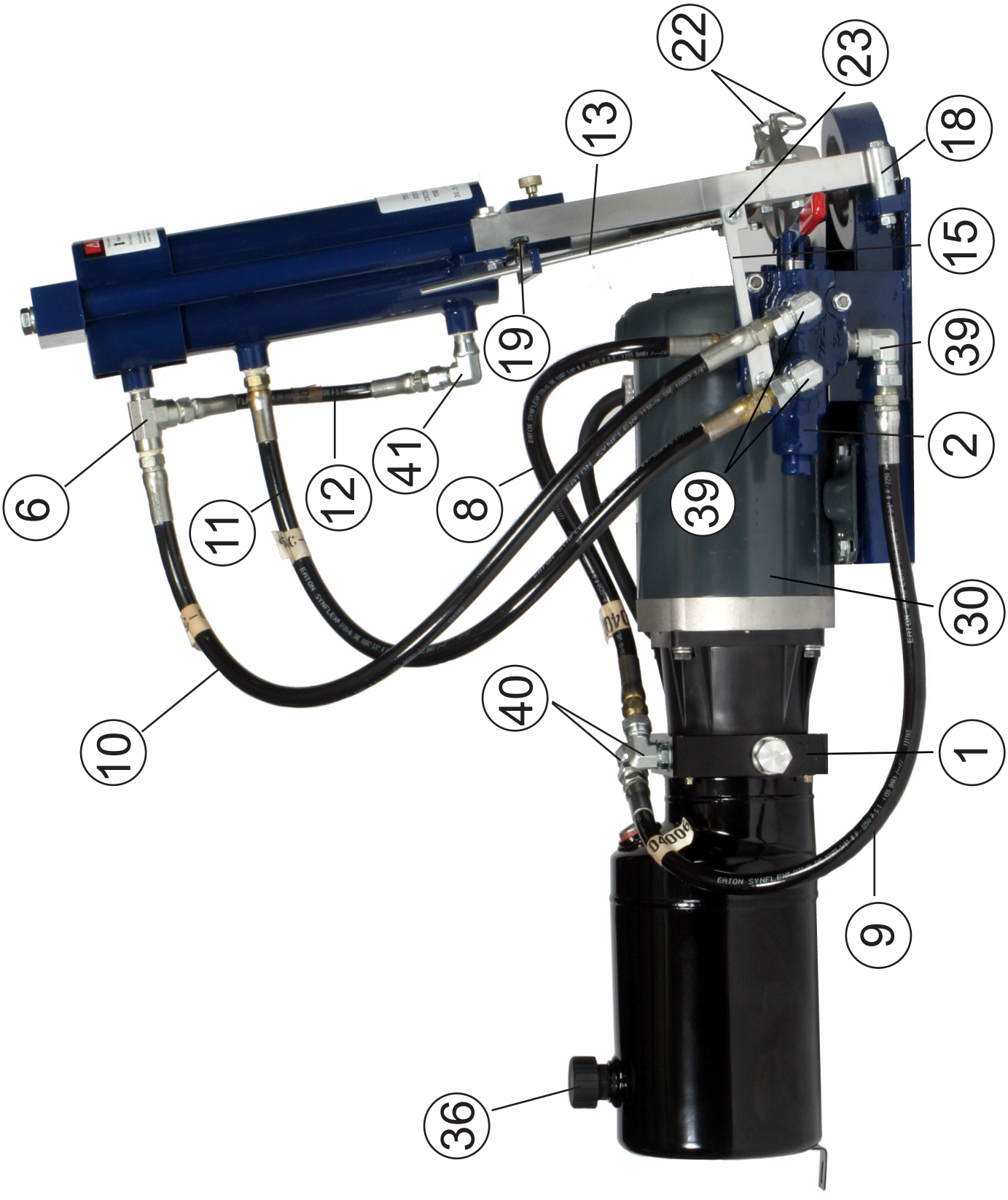
The attached trouble shooting guide should be consulted if the swager does not operate properly.

Replacement Parts

Use the accompanying drawing and parts list to identify components that may need replacement. Call the distributor the swager was purchased from or the factory to obtain pricing.

Trouble Shooting

Problem	Probable Cause	Corrective Action
Incomplete Swage	Oil by-pass through cylinder	Replace or rebuild cylinder
	Oil by-pass through control valve	Replace control valve
Excessively slow piston cycle	Low fluid level reservoir	Fill with recommended oil
	Contaminated intake screen	Remove reservoir and clean the screen on pump intakes, refill reservoir with clean oil
Dies are not aligned in die base	Die holding frames out of Adjustment	Refer to adjustment procedure
	Bent guide bar	Replace guide bar
Dies catch on die base during down cycle	Eccentric guide bushing out of adjustment	Refer to adjustment procedure
	Bent guide bar	Replace guide bar
Motor stops during swaging	Faulty wiring	Contact factory representative
	Low voltage	Insure that swager is connected directly to voltage outlet or through an extension cord of suitable size
Motor will not operate	Faulty switch	Replace toggle switch
	Faulty motor	Replace motor
	Loose wires	Check wiring on switch
Motor runs but cylinder will not cycle	Inoperative pump	Replace pump
	Contaminated screen	Remove reservoir and clean the screen on the pump intake, refill reservoir with clean oil.
	Oil by-pass through cylinder	Replace or rebuild cylinder
	Oil by-pass through control valve	Replace or rebuild control valve
	Motor runs backwards	check wiring
Swaging dies separate during swage	Worn or mis-aligned die base	Install components onto new frame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SYNFLEX
Fitting Swaging Machine
4530-009S0
LM4001
WARNING
NOTICE
THIS HYDRAULIC SYSTEM HAS BEEN INITALLY FILLED AT THE FACTORY WITH L/S AW 32
30.5-33.5 cSt @ 40C
Use Only
SYNFLEX COUPLINGS

PARTS				HARDWARE		
No.	Description	Part No.		Let.	Description	Qty.
1a.	Power Unit (4530-009S0)	453C-00004		A.	Bolt Hex 1/4-24 UNC x 1.50 Lg.	
1b.	Power Unit (4530-009S1)	453C-00005		B.	Bolt Hex 1/4-28 UNC x .50 Lg.	
1c.	Power Unit (4530-009S2)	453C-00006		C.	Nut Hex 1/4" UNC	
2.	Directional Control Valve	453C-00009		D.	Washer Star 1/4"	
3.	Hydraulic Cylinder	453C-00012		E.	Bolt Hex 5/16-18 UNC x .75 Lg.	
4.	Oil (1.5 Gallons)	See Text		F.	Bolt Hex 5/16-18 UNC x 2.00	
5.	Reservoir Plug	See Text		G.	Bolt Hex 5/16-18 UNC x 2.50 Lg.	
6.	Cylinder Service Tee	453C-03005		H.	Bolt Hex 5/16-18 UNC x 2.25 Lg.	
7.	Cylinder Safety Shield	453C-04004		J.	Nut Hex 5/16-18 UNC	
8.	Return line pump to valve	453C-04005		K.	Lock Washer 5/16"	
9.	Pressure line pump to valve	453C-04006		L.	Washer Flat 5/16"	
10.	Hose Upper Cylinder to valve	453C-04009		M.	Washer Star 5/16"	
11.	Hose Middle Cylinder to valve	453C-04010		N.	Bolt Hex 1/2-13 UNC x 2.00 Lg.	
12.	Hose Restrictor	453C-04013		P.	Screw Cap HD 5/16-18 UNC x 1.00 Lg.	
13.	Trip Rod	453C-22013		Q.	Lock Washer 1/2"	
14.	Trip Rod Collar	453C-22014				
15.	Trip Latch	453C-22015				
16.	Trip Latch Eccentric	453C22016				
17.	Die Lifting Guide Arm	453C-22036				
18.	Alignment Rolls	453C-22037				
19.	Knob Tightening, T.R. Collar	453C-23004				
20.	Die Lifting Finger R.H.	453C-23005				
21.	Die Lifting Finger L.H.	453C-23006				
22.	Die Detent Pins	453C-23007				
23.	Pal Nut	453C-23009				
24.	Spring Plunger	453C-23013				
25.	Paint, Blue Enamel	N/A				
26.	Frame (Only)	453C-24006				
27.	Cylinder Repair Kit (Not shown)	453C-40005				
28.	Hydraulic Pump (Not shown)	453C-40007				
29.	Reservoir Replacement Kit	453C-40008				
30a.	Motor & End Bell (450-009S0)	453C-41005				
30b.	Motor & End Bell (4530-009S1)	453C-41004				
30c.	Motor & End Bell (4530-009S2	453C-41003				
31a.	Switch Toggle On/Off for 4530-009S0 & 4530-009S2	453C-41015				
31b.	Switch Start for 4530-009S1	453C-11009				
32.	Decal Oil Specification	0112-49016				
33.	Decal N.F.P.A. (Not shown)	0112-49017				
34.	Decal Name (Synflex)	0112-49036				
35.	Decal Motor Directional Arrow (Not shown)	0112-49022				
36.	Breather Cap	453C-40010				
37.	Handle Replacement Kit	453C-40014				
38.	Gasket Reservoir (Not shown)	453C-40018				
39.	Adapter 90 ° 3/8"	3A03-06A06				
40.	Adapter 90 ° 3/8" ORB Male to 3/8" Female Swivel	3A06-06A06				
41.	Adapter 90 ° 3/8" Male Pipe to 1/4" NSPM Female Swivel	3A03-06A04				

NORTH AMERICA
Eaton | Synflex
115 Lena Drive
Aurora, OH 44202
Phone: (800) - 562-5151
Fax: (330-562-5717

Powering Business Worldwide

EUROPE
Eaton | Synflex
Chaussee de Tirlemont
B-5030 Gembloux, Belgium
Phone: (+32) 81-612-211
Fax: (+32) 81-615-789

www.synflexhose.com