GEM GRAVURE COMPANY, INC

Gem
Type U2 High Speed
Marker
Parts and Assembly Manual

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Gem Type U2 High Speed Marker
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Safety Information

It is the responsibility of the user of this equipment to provide his employees with a safe place to work, including proper tools, devices, and safety equipment.

It is essential that all personnel operating this equipment be instructed by their supervisors in safety precautions as outline on the following pages as well as proper operating procedures.

Introduction

The high speed one side printer for long production runs on extruder lines has filled a particular need in the industry which is the capability of printing at top extruder speeds.

Its benefit lies in the ability to print at these speeds for full shift runs with little operator attention. For top marking speeds, oversized 15” circumference flat print wheels are specified to provide a high rate of Linear marking at moderate rotational speeds.

However, the machine can be modified to accommodate 10.6”, 12” and 15” circumference flat wheels. It should be noted that potential top printing speeds are decreased with smaller sized print wheels.

The unit incorporates such features as a forced ink feed system with pressure gauge check on viscosity, a one gallon ink supply, pneumatic action top guide wheel raising and lowering movement with fine pressure adjustment, shielded ink well to prevent ink splash and many other desirable features.

Please specify line direction and furnish complete print wheel legend and wire diameter when ordering the Gem Type U Ultra High Speed Marker.

The recommended marking ink for this printer is the Gem Ultra High Speed ink prepared in the proper viscosity for high speed extrusion marking and is ready for use as received. After many hours of use, check the ink pressure gauge shows signs of the ink viscosity becoming heavier, adding a small amount of thinner to the 1 gallon ink reservoir will restore the ink to its original furnished viscosity.

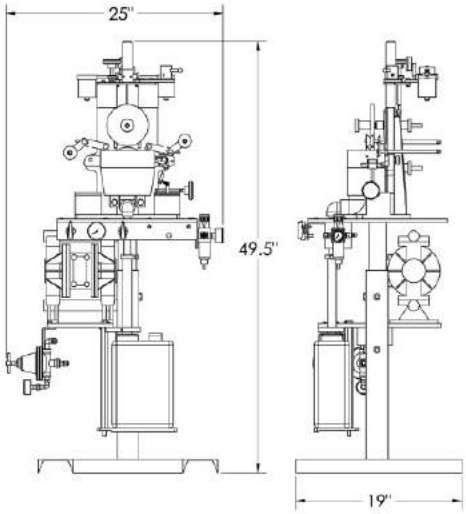
GEM Type U2 High Speed Marker

SPECIFICATIONS

GEM GRAVURE GEM GRAVURE

GEM GRAVURE GEM

Machine Specifications	MINIMUM INCH/MM	MAXIMUM INCH/MM
Wire Speed	0 FPM / 0MPM	1,000 FPM / 303 MPM
Wire Diameter	.030" / .77MM	3" / 77MM
Wire Line Height	35" / 889MM	48.5" / 1232MM
Ink Supply	1 GAL.	
Code	LONGITUDINAL OR VERTICAL	
Water Cooler	OPTIONAL	
Ink Filter	YES	
Stand	HEAVY DUTY ADJUSTABLE STAND	
Strobe Light	OPTIONAL	
Air	40 PSI	
Power Requirements	N/A	



GEM®

GEM GRAVURE COMPANY, INC. WORLD LEADER IN WIRE IDENTIFICATION

Marking Machinery & Equipment • Gravure Printing Wheels • Inks, Dyes and Coatings • Non-contact Ink Jet Printing Systems • 112 School Street, P.O. Box 1158, West Hanover, MA 02339 USA • E-mail: sales@gemgravure.com • Fax (781) 871-2753 • Tel (781) 878-0456

Initial Setup Instructions

Top air cylinder requires minimum 40 psi. Gem marking ink is furnished in a “Use as Received” viscosity.

After unpacking, roughly center the machine in your wire line so the wire passes directly over print wheel position.

Setup and Operating Procedure

Select a can of ink and place in paint shaker. Upon clamping the ink can into the shaker turn on paint shaker and set it for a minimum of 10 minutes duration.

Raise the top concave guide wheel up by actuating the air cylinder valve. The air cylinder valve is located at the upper right hand side on top of the printer. Air pressure gauge should be set at 40 PSI.

Select the proper concave guide wheel based on the F.O.D. of the cable being run. A range of cable sizes is printed on the concave guide wheel.

Place the concave guide wheel onto the top shaft and secure into place with wheel nut. Select a print wheel based on wire gauge and F.O.D. of cable being run.

Place the print wheel onto the bottom shaft and secure into place with wheel nut.

Proper alignment of the two wheels is necessary. First align the print wheel on the bottom shaft by loosening the thumb screw at the back of the printer that locks the bottom shaft assembly. Slide the bottom shaft assembly until it is in the line with the ink spray nozzle and then lock into place with thumb screw.

Operating Procedures for GEM U2 Printers

Align Concave guide wheel on top shaft by centering it in line with the print wheels. Lock shaft assembly into place with thumb screw at back of printer at top shaft.

Insert a fresh flat poly wipe (1.5 x .5 x .125) into the slot of the brass wiper holder. Mount wiper holder on the holder pin and position slide plate so that wiper fingers fit around the print wheel, and the bottom sharp edge of the poly wipe contacts the wheel face on an angle. To achieve this proper angle slide the wiper assembly up as high of an angle on the wheel as it will go, then slide it back just slightly and lock into place. Angle should be 10 to 15 degrees.

NOTE: The wiper assembly must be mounted on the wire entrance side of printer.

Engage the coil tension spring onto the split ring fastened to the bottom of the wiper holder. Crank and adjust the wiper tension assembly to provide a small amount of drag on the print wheel face when it is rotated by hand. With a cable stretched thru the printer adjust the entrance side adjust the small guide sheave so the sheave is on the underside of the cable and align sheave to center of cable.

Place a gallon of ink into position and turn on ink pump. Adjust ink pressure to 5-6 PSI. Rotate the print wheel by hand and check wipe. With the exception of the lettering the face of the print wheel should be wiped clean.

Replace ink well top cover. Rotate the print wheel by turning the wheel shaft at the rear of the machine and check if the print wheel rotates freely and does not scrape on slot side of the ink well cover. If it rubs against the slot side, make a small adjustment of the wheel position by moving the wheel shaft in or out.

Start up the cable line, after the knots have gone thru the printer, check to see that the cable is properly traveling thru the sheave and printer.

Lower the concave guide wheel down into position on top of the cable by actuating the air cylinder valve. Adjust the concave guide wheel with the top air lever forcing the cable to slightly contact the print wheel.

Check print quality. Re-adjust guide wheel pressure as required.

As the ink begins to thicken use the same series extended to thin the ink.

Clean Up Procedures

With diaphragm air pump off, lower the ink can so that the can catches the ink as the pump drains the ink well. Quickly remove the ink can and replace it with a can of flushing solvent #4555. Place the can of flushing solvent up into position and allow it to pump thru the system.

Pour some cleaner into a bucket and place the print wheel, wiper holder, concave guide wheel, shaft spacers, and wheel nuts into bucket.

Using a rag, dip it into the flushing solvent as it comes out of the ink nozzle and cleanup ink splatters and excessive ink with it. All areas to be cleaned include the frame, shafts, wiper tension assemblies, etc. It is best to wipe with a flushing solvent soaked rag followed by wiping it clean with a dry clean rag.

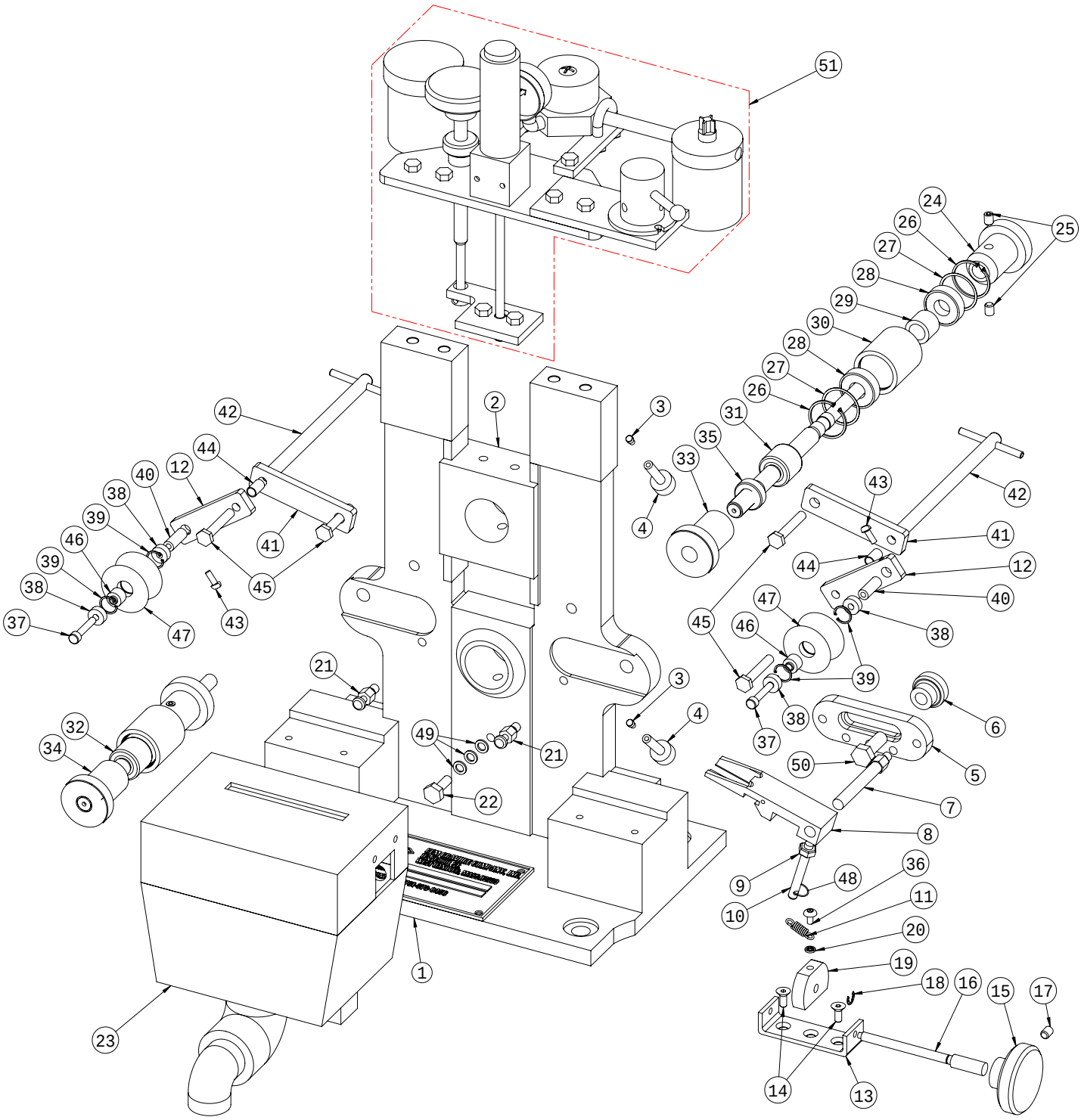
Lower the can of flushing solvent allowing the can to catch the solvent as the pump drains the ink well then turn off pump. Replace the can of flushing solvent with an empty can.

Use a rag to wipe the inside of the ink well clean.

Remove each item soaking in the cleaner and wipe them clean with a rag one at a time.

Take the dirty cleaner in bucket and dispose of by placing it into a drum properly labeled with a yellow hazardous waste label.

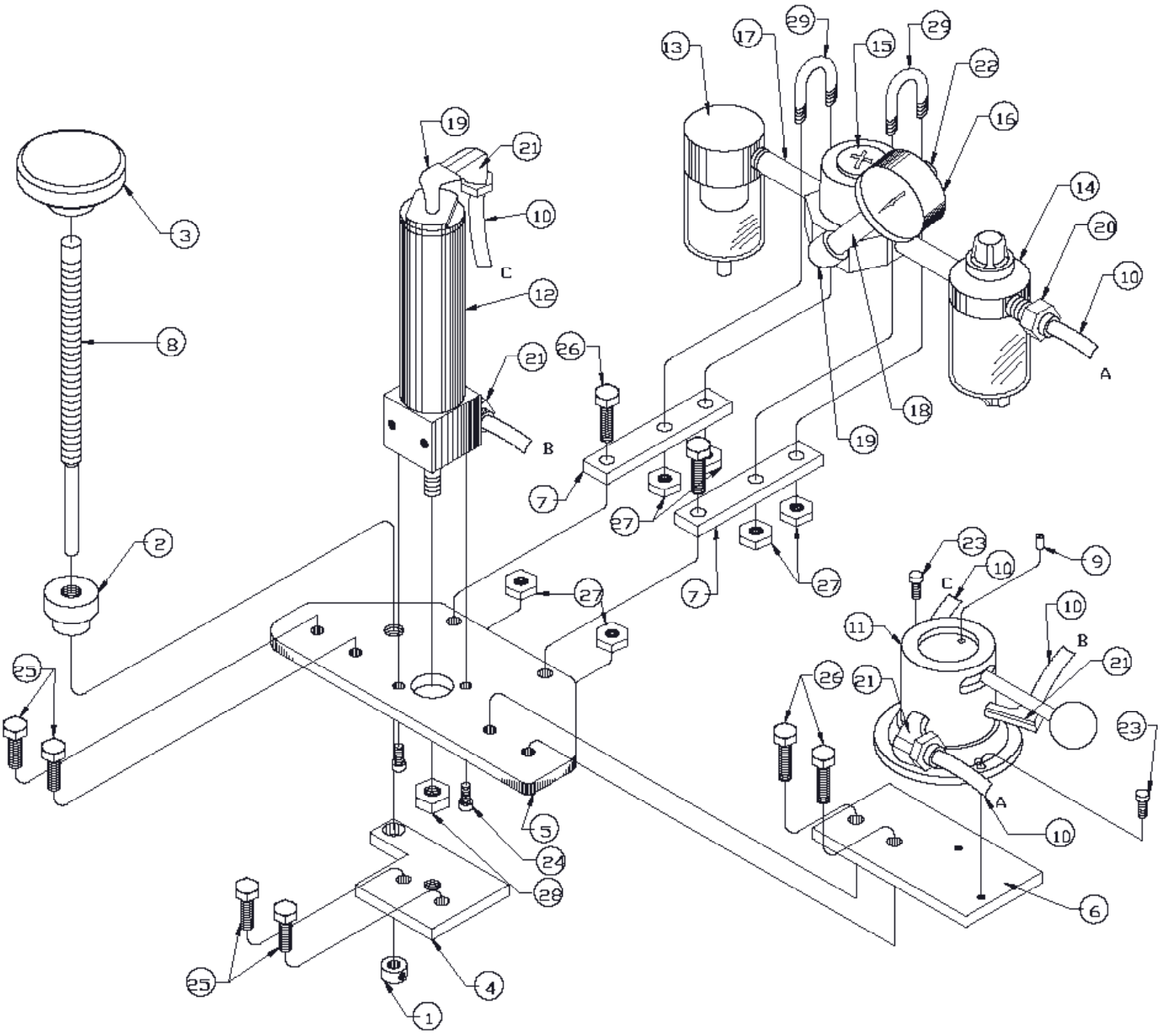
U2 Exploded View (Top)



Overall Mechanical Parts list for High speed Marker

REF. #	GEM #	PART #	NAME
1	40-1543	61-146	High casting base
2	40-1002	61-7	Adjusting wheel carrier
3	40-1010	61-10	Brass Plug For lock Screw
4	40-1011	61-9	Bearing Housing Locking Screw With Brass Plug
5	40-1012	61-19	Slide Plate
6	40-1268	61-34	Adjusting Knob
7	40-1014	61-20	Wiper Support Arm
8			Flat Wiper Holder
			See Pages 18 For Various Sizes Of Flat Wipers
9			1/4-20 Jam Nut
10	40-1015	61-28	Wheel Wiper Stud
11	40-1016	61-27	Wiper Spring (Tension)
12	40-1285	61-46	Support Arm (Short)
13	40-1017	61-110	Tension Adjusting Bracket
14	96-073		10-32 x 3/8” Flat Hd. Soc. Cap Screw
15	40-1018	61-68	Knob For Wiper Blade Tension Screw
16	40-1019	61-69	Wiper Blade Tension Screw
17	96-0028		1/4-20 x 1/4” Cup Point. Soc.Set Screw
18	98-0237		E - Clip
19	40-1020	61-26	Tension Follow Nut
20	40-1021		# 10 Internal Lock Washer
21	40-1022	61-22	Ink Reservoir Pins
22	96-0014		1/4-20 X 1/2” Hex Hd. Cap Screw
23			See Page 12 For Ink Pot Parts
24	40-1024	61-38	Rear Rol Nut
25	96-0027		1/4 - 20 X 5/16” Cup Pt. Soc. Set Screw
26	40-1025	5000-112	TruArc Retaining Ring
27	40-1273	R-8	Wavy Spring Washer
28	40-1266		Bearing
29	40-1028	61-12	Bearing Spacer
30	40-1029	60-13	Bearing Housing
31	40-1030	61-16R	Top Wheel Shaft
32	40-1031	61-16L	Bottom Wheel Shaft
33	40-1032	61-17R	Top Roll Nut (Front)
34	40-1033	61-17L	Bottom Roll Nut (Front)
35	40-1034	61-42	Wheel Spacer
36	96-0702		10-32 x 3/8” Button Hd. Soc. Cap Screw
37		61-245	Screw For Guide Wheel
38	40-4311	33KDD5	Bearing
39		5000-50	Internal Tru-Arc Retaining Ring
40	40-1269	61-48	Post (For Wire Guide Assembly)
41	40-1286	61-47	Support Arm For Wire Guide Assembly (Long)
42	40-2146	61-132	Adjusting Nut (Spec.)
43			8-32 Thumb Screw
44	40-1295	61-49	Spacer (For Wire Guide Asm.)
45		61-50	Stud (For Wire Guide Asm.)
46	40-4309	61-155	Bearing Spacer
47	40-1116	61-153	Wire Guide Wheel
48			1400-0083-00482 Key Ring
49			1/4” Washer
50	96-0216		3/8-24 x 1-1/4” Hex Hd.Cap Screw
51	40-1534	61-21A	High Speed A.M. Air Asm. See Page 16 & 17 For Parts
			*Right Hand Shaft For Wire Direction R. to L, Left Hand Shaft For Wire Direction L. to R.

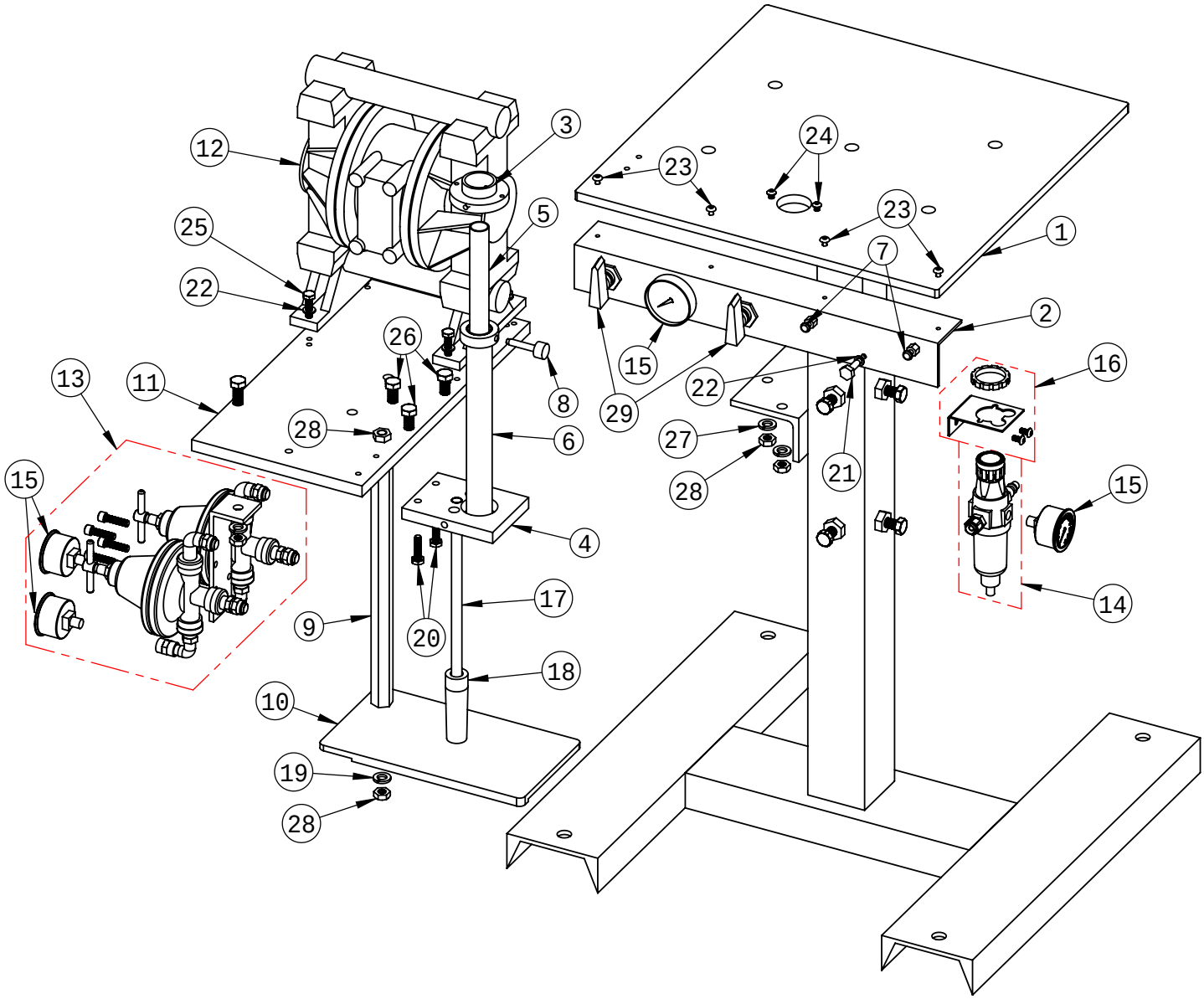
Air Assembly Exploded View For U2 High Speed Marker - 61-21A



Air Assembly Exploded Parts View For U2 High Speed Marker -61-21A

REF. #	GEM #	PART #	NAME
1	40-1009	61-4	Top Roll Adjusting Screw Collar
2	40-1268	61-34	Adjusting Knob
3	40-1018	61-68	Knob
4	40-1105	61-141	Carrier Plate
5	40-1289	61-142	Top Plate
6	40-1115	61-143	Air Valve Support Plate
7	40-1114	61-144	Air Gage Support
8	40-1120	61-145	Stop Adjustinbg Screw
9	40-1516	61-152	Choke
10		4P	Ensaco Green tubing
11	40-1518	4MV8	Bimba 4 way Valve
12	40-1519	BF094-D	Bimba Air Cylinder
13		504-2	Watts Filter
14		508-2	Watts Lubricater
15		364-2	Watts Regulator 0-60
16		274Z-60	Watts Gage
17	97-0010	113-B	1/4”x1-1/2” Nipple
18	97-0005		!/8”x3” nipple
19	97-0029	116-B	1/8 Pt. Street Elbow
20		268-P	1/8x1/4 Tube Male Connector
21		269-P	1/8x1/4 Tube Male Elbow
22		270-P	1/8x1/4 Tube Female Elbow
23	96-0802		8-32x1/4” Soc. Hd. Cap Screw
24	96-0705		10-32x1/2” Soc. Hd. Cap Screw
25	96-0014		1/4-20x1/2” Hex Hd. Cap Screw
26	96-0013		1/4-20x3/4” Hex Hd. Cap Screw
27	96-0040		1/4-20 Hex Nut
28			5/16-24 Hex Nut
29			1/4” U-Bolts

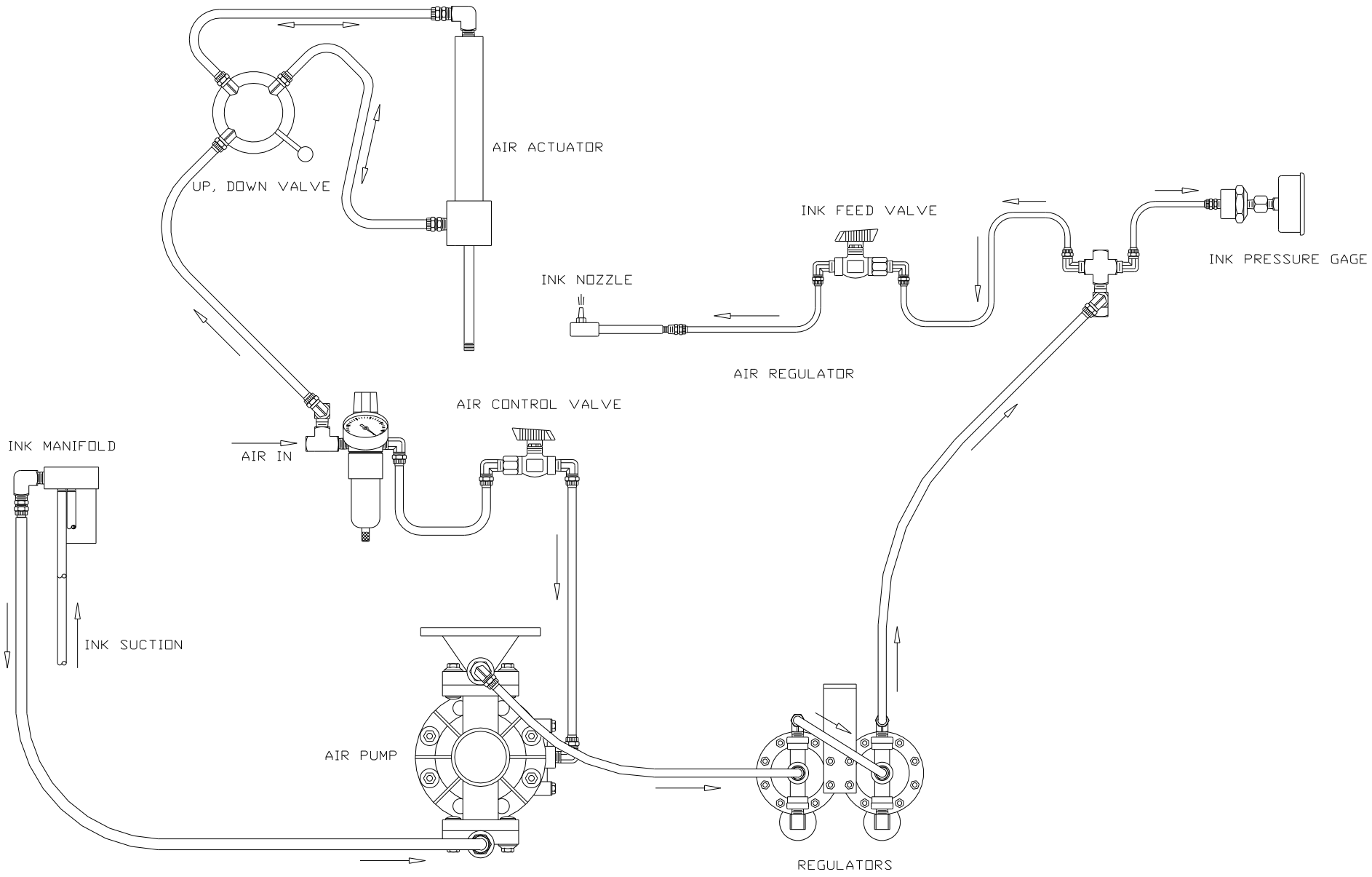
U2 Stand Assembly



U-2 Stand Assembly & Parts

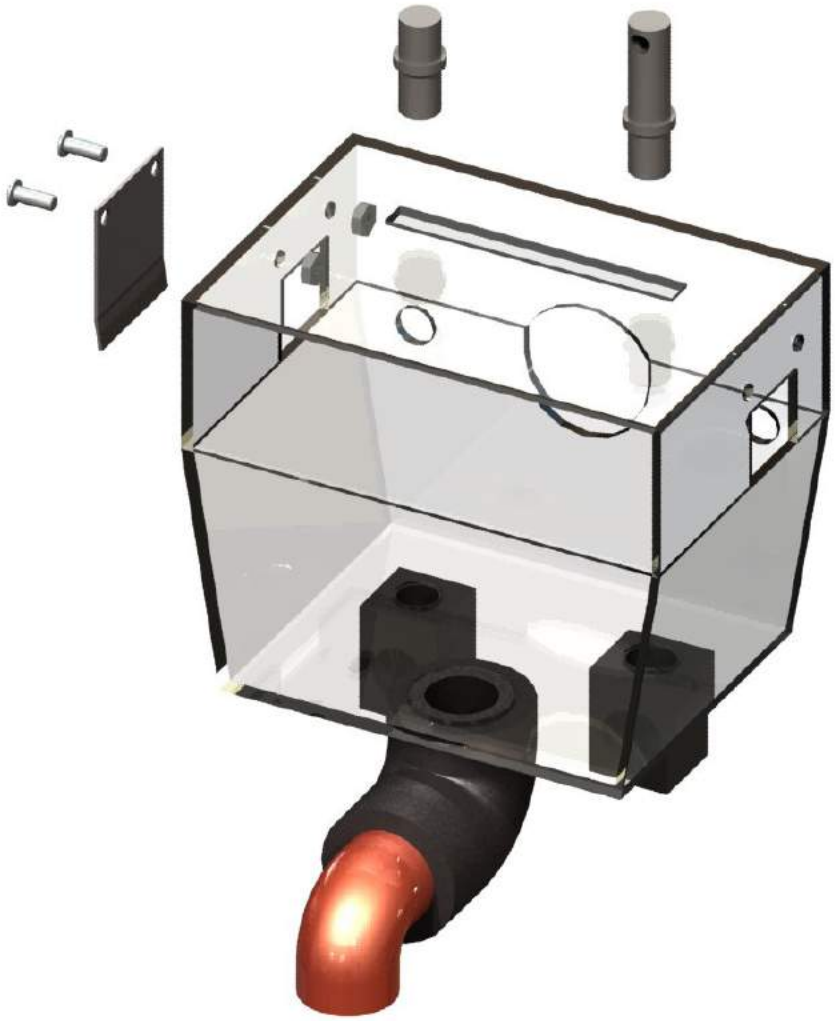
REF #	GEM #	PART #	NAME
1	99-0224	61-54A	STAND ASSEMBLY
2	40-1293	61-233	CONTROL BRACKET FOR INK FEED
3	40-1104	61-168	FLANGE FOR INK DRAIN TUBE
4	40-1068	61-171	TUBE HOLDER
5		61-409	DRAIN TUBE(STATIONARY)
6		61-410	DRAIN TUBE (ADJUSTABLE)
7	40-1022	61-22	INK RESERVOIR PIN
8	40-1011	61-9	BEARING HOUSING LOCKING SCREW
9	40-5297	80-32	SUPPORT POST FOR INK CAN
10	40-2106	80-31	SUPPORT FOR INK CAN
11	40-3519	60-217	PLATE FOR INK PUMP
12	98-0022		PUMP
13	40-2021	80-25A	REGULATOR ASSEMBLY FOR PUMP
14	40-1520		REGULATOR AND FILTER
15	40-2166		GAGE 60 P.S.I.
16	40-2004		BRACKET FOR REGULATOR
17		80-27	INK INTAKE PIPE
18	98-0011		INK FILTER
19			3/8-FLAT WASHER
20			1/4-20 X 1” HEX BOLT
21			1/4-20 X 1/4” SOCKET HD. CAP SCREW
22			1/4” FLAT WASHER
23			10-32 X 5/8” BUTTON HD. SOC. CAP SCREW
24			10-32 X 3/4” BUTTON HD. SOC. CAP SCREW
25			1/4-20 X 1” HEX BOLT
26			3/8-16 X 1-1/4” HEX HD. BOLT
27			3/8” SPLIT LOCK WASHER
28			3/8-16 HEX NUT
29	40-2161		HOKE VALVE

U2 INK FLOW


AIR ACTUATOR
UP, DOWN VALVE
INK FEED VALVE
INK NOZZLE
INK PRESSURE GAGE
AIR REGULATOR
AIR CONTROL VALVE
INK MANIFOLD
AIR IN
INK SUCTION
AIR PUMP
REGULATORS

Parts Information

Cover and Parts for High-Speed Ink Pot Assembly



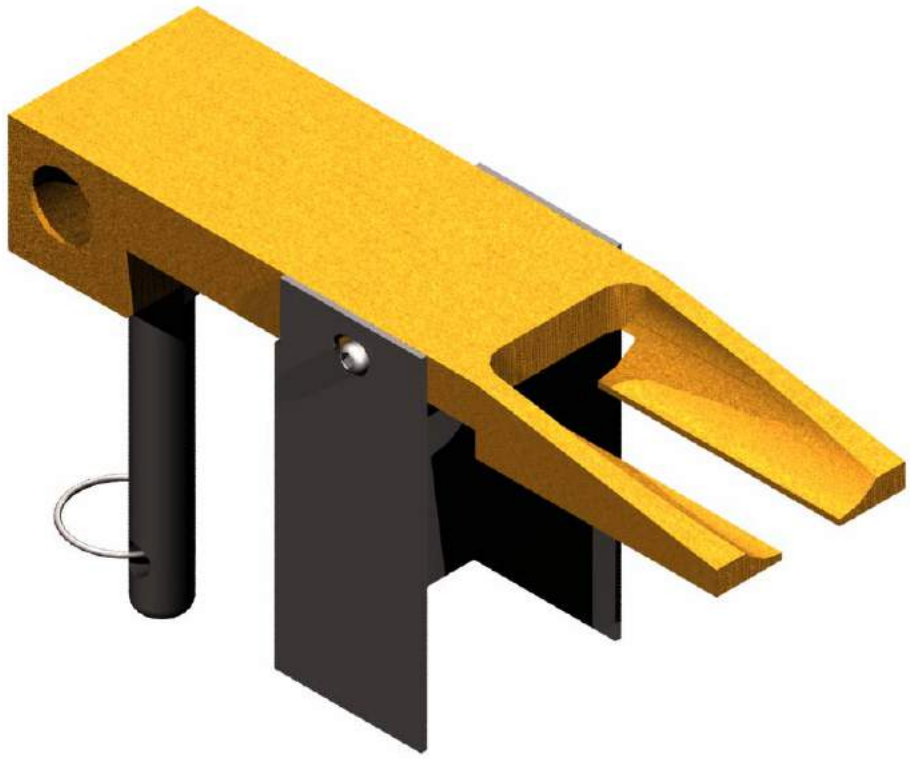
Gem #	Generic #	Name
40-1505	61-115	Ink Pot Plug
40-1541	61-134-.300	Ink Pot Cover (10.6” Cir. Wheels)
40-1545	61-134-.437	Ink Pot Cover (10.6” Cir. Wheels)
40-1505	61-135	Ink Pot ink feed Nozzle (10.6” Cir. Wheels)
40-1113	61-136	Ink Pot Cover Skirt (10.6” Cir. Wheels)
40-1542	61-137-.300	Ink Pot Cover (12” Cir. Wheels)
40-1546	61-137-.437	Ink Pot Cover (12” Cir. Wheels)
40-1508	61-138	Ink Pot Ink Feed Nozzle (12” Cir. Wheels)
40-1106	61-139	Ink Pot Cover Skirt (12” Cir. Wheels)
40-1510	61-170	Ink Pot (With Front Drain)
		10-32 x 3/8” Button Head Screw
		10-32 Hex Nut

Parts Ordering Information

Flat Wiper Holder

Flat Wiper Holder				Poly Or Nylon Wiper Materials	
GEM Part No.	Generic Part No.	Wheel Width	Wheel Type	Corresponding Wiper Material	Wiper Materials
40-1037	61-10A.300	.300”	Flat-HS	1½” x ½” x 1/8” Poly or Nylon	Poly Wipe- 40-9033
40-1038	61-10A.437	.437”	Flat-HS	1½” x ½” x 1/8” Poly or Nylon	

*Note: Poly or Nylon Flat Wipes purchased in packs of 100.
Note: Ink Skirt Optional



Wiper Tension Assembly

Gem # Generic #

40-1072 - #61 – 14A Wiper Tension Assembly, complete

Complete Assembly includes:

Qty	GEM Part Number	Generic Part Number	Description
1	40-1018	#61-68	Knob
1	40-1017	#61-110	Tension Adjusting Bracket
1	40-1019	#61-69	Tension Screw
1	40-1020	#61-26	Tension Follow Nut
1	40-1016	#61-27	Tension Spring
1	96-9706		#10-32 x 3/8” Button Head Cap Screw
1	40-1021	-	#10 Internal Lock Washer
1	96-0028	-	¼ - 20 x ¼” Cup Pt. Soc. Set Screw
1	98-0237	98407A120	E-Clip
2	96-0703	-	#10-32 x 3/8” Flat Head Screws

Wheel Shaft Assembly

Qty	Gem Part No.	Generic Part No.	Description
1	40-1073	#61-6A	Shaft Assembly, complete (R.H.)*
1	40-1074	#61-4A	Shaft Assembly, complete (L.H.)*

*Left to right machine operation
Note: When machine is operating right to left, top shaft will be L. H. and bottom R. H.

Complete Assembly includes:

Qty	Gem Part No.	Generic Part No.	Description
1	40-1031	#61-16L	Wheel Shaft (L. H.)
1	40-1030	#61-16R	Wheel Shaft (R.H.)
1	40-1033	#61-17L	Roll Nut (L. H.)
1	40-1032	#61-17R	Roll Nut (R. H.)
2	98-0298		Bearings
2	40-1025	5000-112	1-1/8” Snap Rings
1	40-1028	#61-12	Bearing Spacer
1	40-1273	R-8	Wavy Spring Washer
1	40-1024	#61-38	Rear Roll Nut
1	40-1029	#61-13	Bearing Housing

Solvent- or Ink-Dripper Assembly

Qty	Gem Part No.	Generic Part No.	Description
1	40-1075	#61-39A	Dripper Assembly, complete
Complete Assembly includes bracket 40-1288			

PN# 40-1081 Wire Guide Assembly

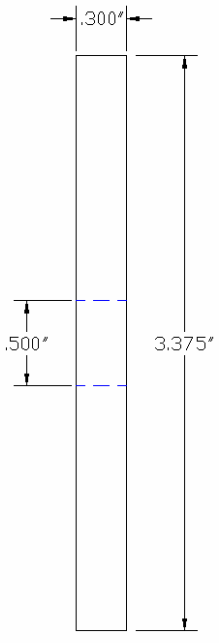
Qty	Gem Part No.	Generic Part No.	Description
1	40-1081	#61-5A	In-Out Adjusting Wire Guide (L.H. & R.H)
1	40-1082	#61-27	Small V-Groove Roll

PN# 40-1080 Slide Plate Assemble Generic PN# 61-26A			
Qty	**Gem Part No.**	**Generic Part No.**	**Description**
1	40-1012	#61-19	Slide Plate
1	40-1268	#61-34	Adjusting Knob
1	96-0216		3/8 – 24 x 1 ¼” Hex Cap Screw
1	40-1014	#61-20	Wiper Support Arm

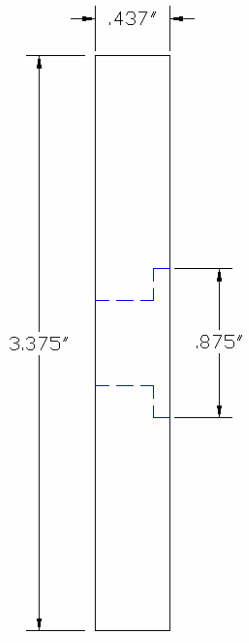
Flat Print Wheels

For printing on wire covering with Min.-Max. O.D. Range of:	Wheel Model-Width	Type Size	Wiper Required	Wiper Material Poly or Nylon
.040 – 0.080”	G - .300”	1/32”	.300” Flat Hi-Speed	½” x ½” x 1/8”
.080 – 0.100”	G - .300”	1/32”	(same)	(same)
.100 – 0.125”	G - .300”	3/64”	(same)	(same)
.125 – 0.200”	G - .300”	1/16”	(same)	(same)
.200 – 0.300”	GL - .437”	5/64”	.437” Flat Hi Speed	(same)
.300 – 0.400”	GL - .437”	3/32”	(same)	(same)
.400 – 0.500”	GL - .437”	7/64”	(same)	(same)

NOTE: Models GM, GP and GR have same profile as Model GL, differing only in dimensions



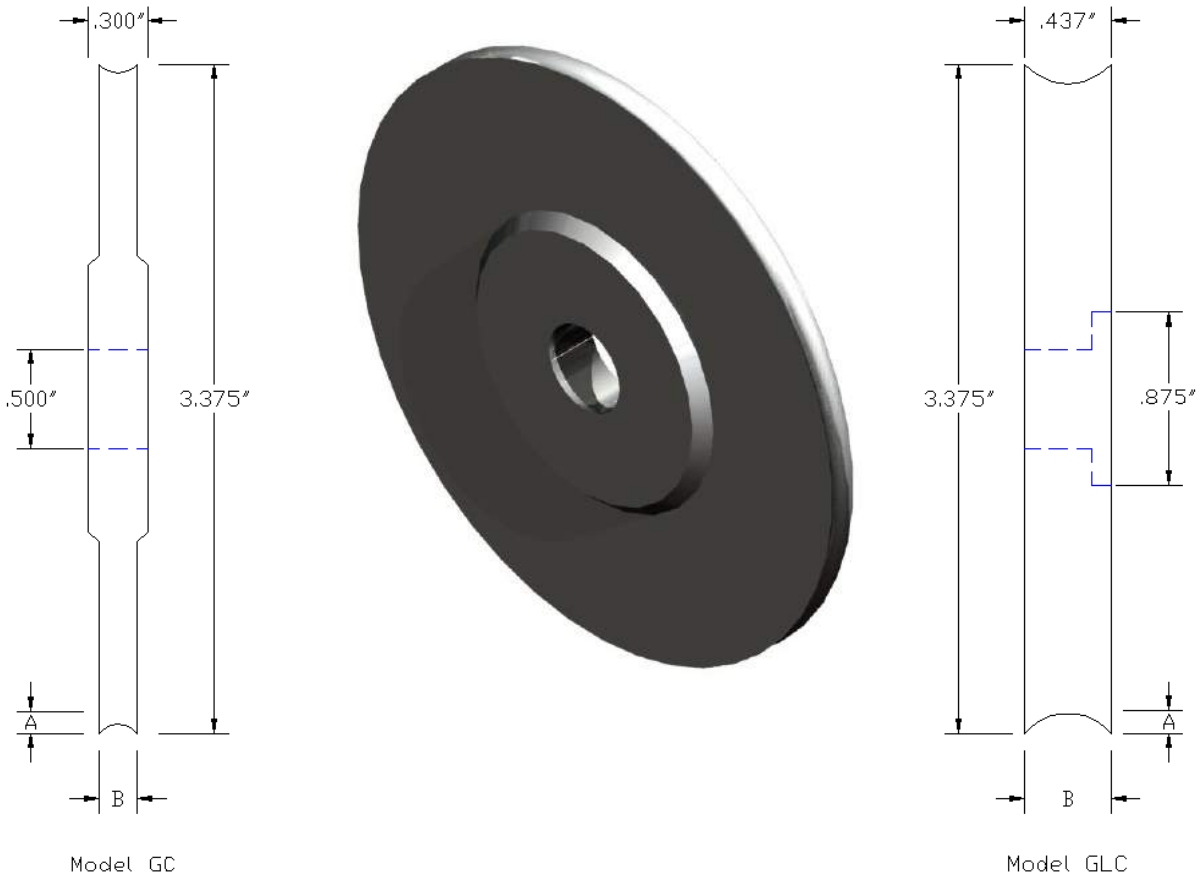
Model G



Model GL

Concave Guide Wheels

For printing on wire covering with Min-Max O.D. Range of:	Wheel Radius
.045-.070”	3/64”
.070-.095”	1/16”
.095-.115”	5/64”
.115-.135”	3/32”
.135-.190”	1/8”
.190-.235”	5/32”
.235-.280”	3/16”
.280-.330”	7/32”
.330-.400”	1/4”
.400-.430”	9/32”
.430-.500”	13/32”



Model GC

Model GLC

- **BLACK**
- **WHITE**
- **YELLOW – 2na**
- **RED – 7na**
- **GREEN – 23pc**
- **BLUE – 14na**
- **ORANGE – 5na**
- **BROWN – 4pi**
- **VIOLET – 12ia**
- **GREY – F**
- **PINK -6 ½"ea**
- **SLATE – 13ih**
- **AQUA – 19ga**
- **SILVER**
- **GOLD**

Wire Marking Inks and Thinner

Different covering materials require differently compounded inks, as indicated in the accompanying chart:

For printing on:	**Specify ink:**
Polyvinyl chloride…….……	Type G
Rubber, natural or synthetic……..	Type CV
Nylon…….	Type NA
Polyethylene or cross-link poly…….	Type HCP

- For hot or cold applications
- Passes all standard abrasion and solvent-resistant tests
- Dated for shelf life and inventory control

Available in Quarts

Gallons

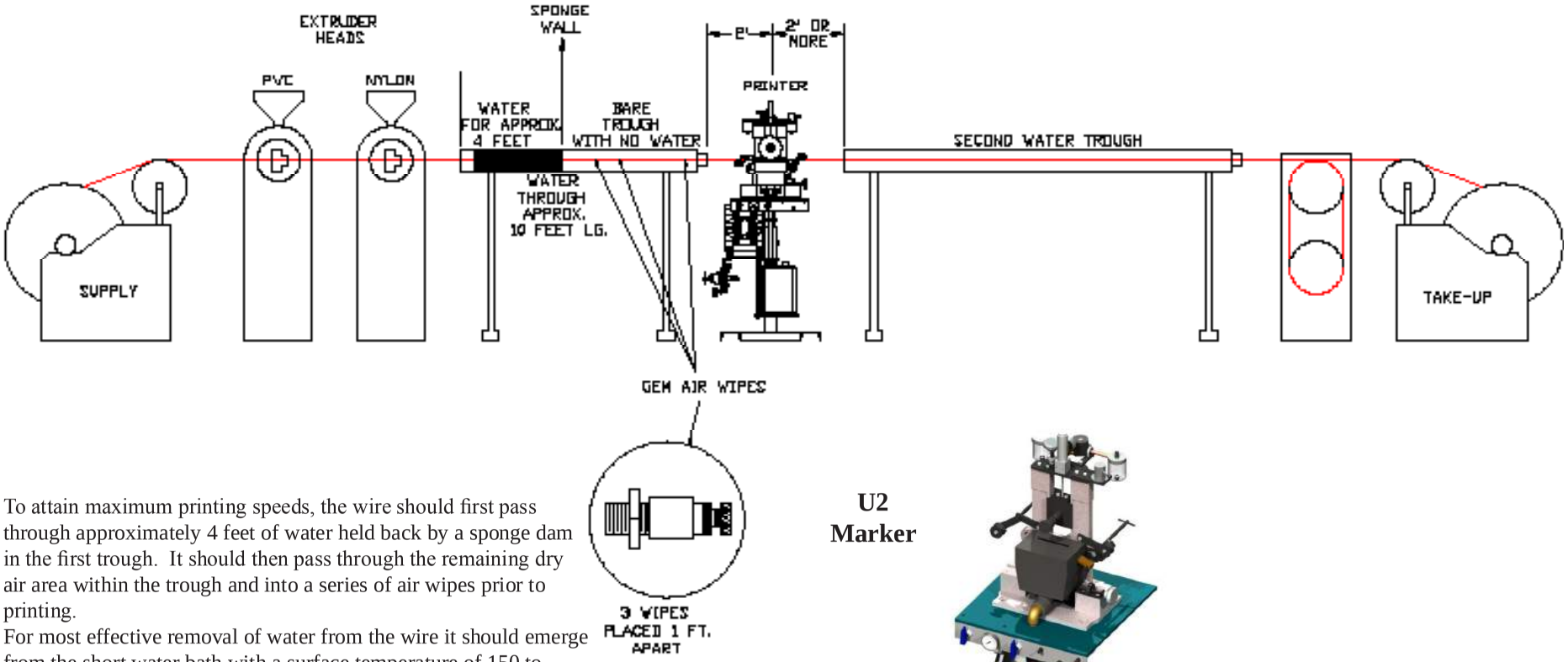
5-Gallon Pails

30-Gallon Drums

55-Gallon Drums

Order shipped on day it is received

Recommended GEM Type U-2 Ultra Hi-Speed Marker Printing Set-Up for Tandem THHN-THWN Insulated Wire Line.



To attain maximum printing speeds, the wire should first pass through approximately 4 feet of water held back by a sponge dam in the first trough. It should then pass through the remaining dry air area within the trough and into a series of air wipes prior to printing.

For most effective removal of water from the wire it should emerge from the short water bath with a surface temperature of 150 to 170 degree Fahrenheit indicated by a beading effect of the water remaining on the wire. The clean, dry wire can be then printed at high speed and re-entered in the remaining water trough. Gem engraved marking wheels and Gem type NA Ultra High Speed Marking Ink for nylon are recommended for best printing results. If when occasionally checking ink pressure readings on the Gem Ultra High Speed Markers, the pressure increases, you can correct this by adding a small amount of type NA High Speed Thinner to the ink to reduce the pressure to that indication the original recommended viscosity.

U2 Marker