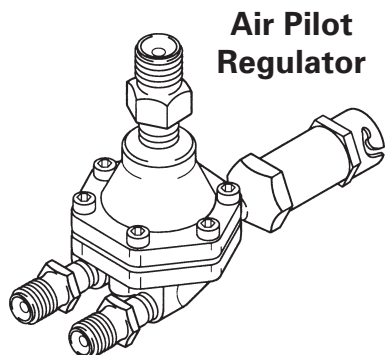


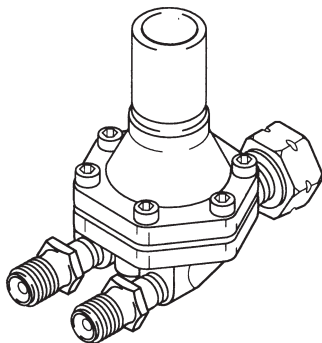
DEVILBISS® HGS STAINLESS STEEL FLUID REGULATORS

IMPORTANT: Read and follow all instructions and safety precautions before using this equipment. Retain for future reference.

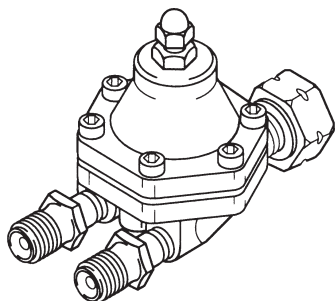


Air Pilot Regulator

Tamper Resistant Regulator



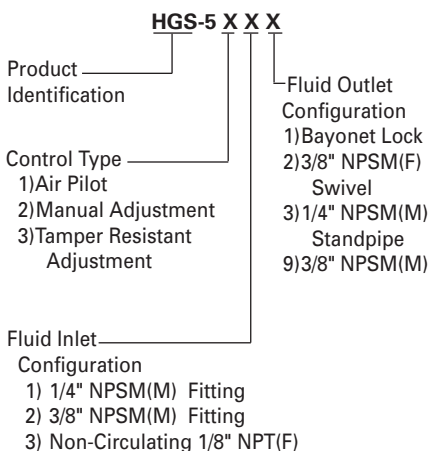
Manual Regulator



GENERAL

This service bulletin covers installation, operation, preventive maintenance, parts replacement, and accessory items for HGS Fluid Regulators.

MODEL IDENTIFICATION



DESCRIPTION

HGS Fluid Regulators provide regulation of fluid to the spray gun without stopping the flow of material which can cause setting of pigmented materials.

NOTE

These regulators may be used with materials containing chlorinated solvents.



PROP 65 WARNING

WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

MODEL CHART

- MODELS**
- HGS-5112
 - HGS-5113
 - HGS-5122
 - HGS-5132
 - HGS-5133
 - HGS-5211
 - HGS-5212
 - HGS-5221
 - HGS-5222
 - HGS-5231
 - HGS-5232
 - HGS-5233
 - * HGS-5239
 - ** HGS-5242
 - HGS-5312
 - HGS-5313
 - HGS-5321

	CONTROL			FLUID INLET				FLUID OUTLET			
	Air Pilot	Manual Adjust.	Tamper Res.	1/4" NPSM(M)	3/8" NPSM(M)	1/8" NPT(F)	3/8" NPSM(F)	Bayonet	3/8" Swivel	Stand-Pipe	3/8" NPSM(M)
HGS-5112	●										
HGS-5113	●									●	
HGS-5122	●				●				●		
HGS-5132	●					●			●		
HGS-5133	●					●				●	
HGS-5211	●	●						●			
HGS-5212	●	●							●		
HGS-5221	●	●			●			●			
HGS-5222	●	●			●			●			
HGS-5231	●	●				●		●			
HGS-5232	●	●				●		●			
HGS-5233	●	●				●			●		
* HGS-5239	●	●					●				●
** HGS-5242	●	●						●			
HGS-5312		●	●						●		
HGS-5313		●	●							●	
HGS-5321		●	●			●		●			

* Manual, non-circulating, single gun fluid regulator, primarily used in conjunction with fluid pumps or dead end systems.

** Manual, non-circulating, can be attached to gun inlet or in line. **Note:** If used in color change applications or with catalyzed materials, plug (24) must be removed and the threads cleaned periodically.

SAFETY PRECAUTIONS

This manual contains information that is important for you to know and understand. This information relates to **USER SAFETY** and **PREVENTING EQUIPMENT PROBLEMS**. To help you recognize this information, we use the following symbols. Please pay particular attention to these sections.

WARNING

Important safety information -- a hazard that may cause serious injury or loss of life.

CAUTION

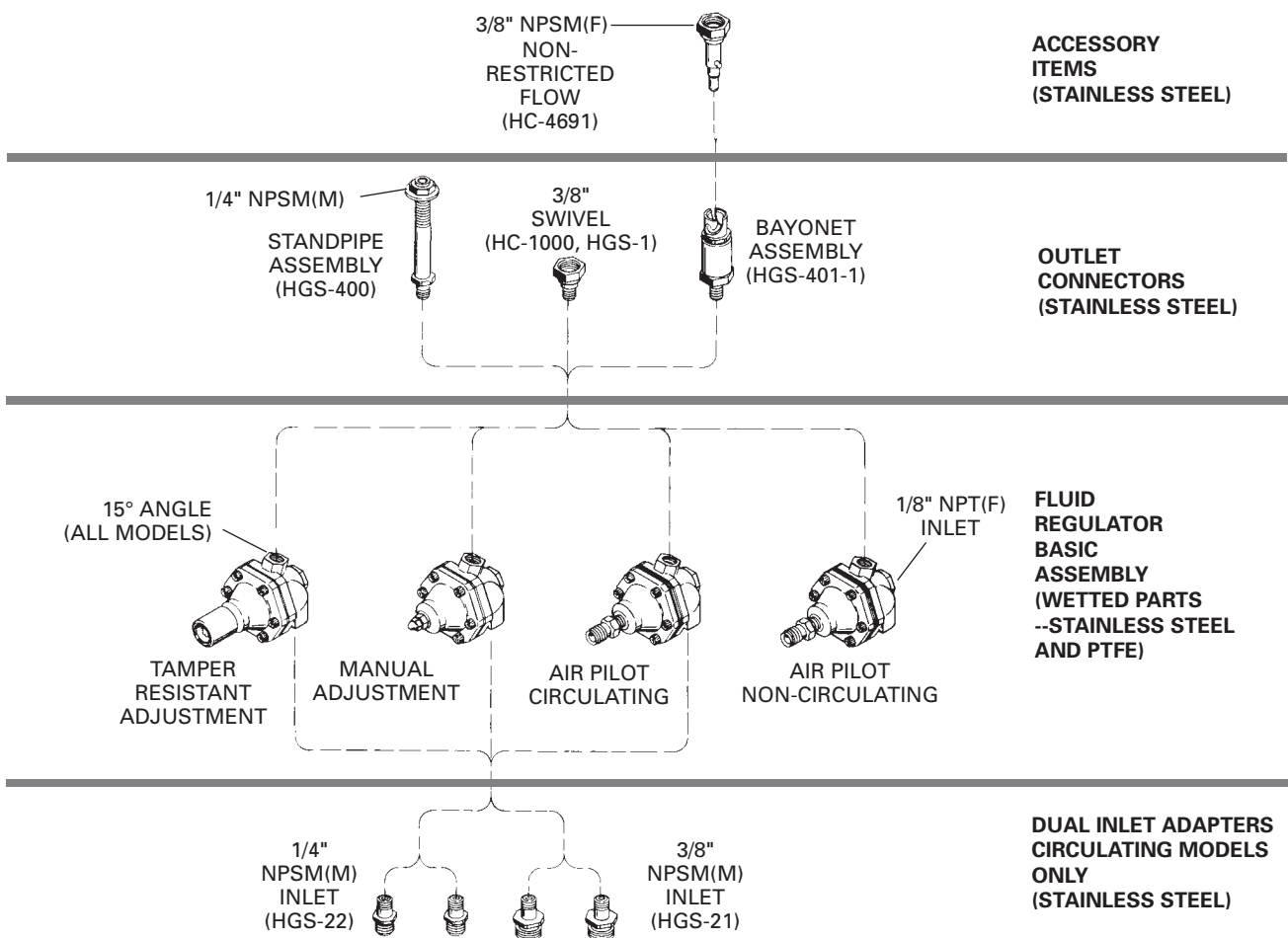
Important information that tells how to prevent damage to equipment, or how to avoid a situation that may cause minor injury.

NOTE

Information that you should pay special attention to.

MODEL NUMBER TO REGULATOR BODY CROSS REFERENCE CHART

Model Number	Body Number (Less Fittings)
HGS-5112, HGS-5113, HGS-5122	HGS-452
HGS-5132, HGS-5133	HGS-453
HGS-5211, HGS-5212, HGS-5221, HGS-5222	HGS-451
HGS-5231, HGS-5232, HGS-5233, HGS-5239	HGS-455
HGS-5312, HGS-5313, HGS-5321	HGS-450
HGS-5242	HGS-461



TECHNICAL DATA

	PSI	(bar)
Fluid Inlet Pressure Min. Max.	50 300	(3.5) (20.7)
Regulated Fluid Pressure Range Min. Max.	2 100	(0.14) (6.9)
*Typical Flow Rates 150 to 2500 cc's/minute		
	oz's	(grams)
Average Unit Weight Models - Swivel	7.3	(210)
- Tamper Resist	7.9	(225)
- Standpipe	9.3	(265)
- Bayonet	9.7	(275)
Fluid	oz's	(ml)
Static Content Models - Circulating	0.25	(7)
- Non-circulating	0.20	(5)
Wetted Parts	303 and 416 Stainless Steel, PTFE	
Models	17 models offered as standard	

*Dependent upon viscosity and specific gravity of material. Above information based upon testing with mineral oil with viscosity of 24 seconds #4 Ford, and specific gravity of 0.84.

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INSTALLATION

WARNING

Risk of hazardous bursting or equipment damage. Do not exceed 300 PSI (21 bar) maximum fluid inlet pressure to regulator.

CAUTION

These regulators may be used with most common coating and finishing materials. However, they are not designed for use with highly abrasive materials. If used with abrasive materials, frequent and thorough cleaning will be required, and replacement of parts will be increased.

- Where possible, mount the HGS regulator as shown below with the fluid outlet facing up. This will prevent trapped air from causing erratic operation. Trapped air can result from an "air push" during a color change cycle, or entrapped air in the paint.



Fluid outlet should face upward.

- Connect fluid inlet supply hose.

Circulating Models

Connect the fluid supply hose to either fluid inlet adapter (53 or 54). Connect the return line to the other adapter (53 or 54).

Non-Circulating Models

Connect the fluid supply hose to inlet of plug (23 or 40).

- Connect fluid outlet.

Bayonet Regulators

Attach the bayonet lock body (41) to the bayonet quick disconnect stem at the spray gun fluid inlet.

3/8" Swivel Regulators

Thread swivel nut (49) onto fluid inlet of spray gun body.

Standpipe Regulators

Attach fluid supply hose from spray gun to bulkhead fitting (52).

- Connect air inlet.

Air Pilot Regulators

Attach regulated air supply to connector (25).

OPERATION

WARNING

Risk of hazardous bursting or equipment damage. Do not exceed 300 PSI (21 bar) maximum fluid inlet pressure to regulator.

Fluid pressure adjustment range is from 2 psi to 100 psi (0.1 bar to 6.9 bar). Fluid pressure to regulator inlet is 300 psi (20.7 bar) maximum and 50 psi (3.5 bar) minimum.

To Regulate Fluid Pressure on Manual Adjust Models

- Remove cap nut (1) and loosen lock nut (2).
- With a 3/32 inch hex key allen wrench, adjust hex key allen set screw (3) for desired pressure setting. Turn set screw (3) clockwise to increase and counterclockwise to decrease pressure.
- Retighten lock nut (2) after desired pressure setting has been established. Replace and tighten cap nut (1).

To Regulate Fluid Pressure on Tamper Resistant Models

- Using T-handle (4B), loosen lock (6).
- Engage adjusting screw (5) with torx key (4A) and turn adjusting screw until desired pressure setting is reached. Turn torx key clockwise to increase pressure and counterclockwise to decrease pressure.
- Using the torx key, hold adjusting screw (5) from turning and tighten lock (6) with the T-handle (4B).

To Regulate Fluid Pressure on Air Pilot Models

Fluid pressure is controlled by means of air pressure. **To actuate fluid flow, a minimum of 12-14 psi air pressure must be applied to the bonnet.** Attach one end of regulated air line to connector (25) and the other end of the air line to a remote regulator. Increase air pressure to increase fluid pressure, and decrease air pressure to decrease fluid pressure.

Fluid pressure remains constant unless air pilot regulator setting is altered.

PREVENTIVE MAINTENANCE

Cleaning

CAUTION

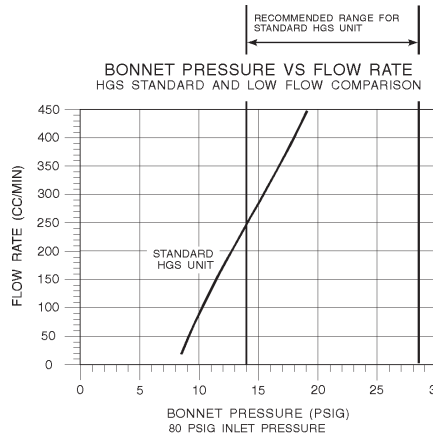
Total submersion of the fluid regulator in solvent for cleaning purposes will shorten the life expectancy of the diaphragm.

The frequency with which the fluid regulator should be cleaned will be the same as the rest of the system in which it is being used.

Bayonet Models

When spray gun is removed from service and fluid regulator is not going to be used for a period of time, the bayonet end should immediately be soaked in solvent. **Do not submerge the entire regulator.**

This will avoid hardening of material around the ball and seat which may cause leakage when regulator is put back in service. The soaking container should be an approved closed container if hazardous solvents are used.



TEST MATERIAL
MINERAL OIL
SPECIFIC GRAVITY = 0.855
VISCOSITY = 24 SEC.
FORD #4

MANUAL FLUID REGULATOR BODY ASSEMBLIES HGS-450, HGS-451, HGS-455, HGS-461

Ref. No.	Replacement Part No.	Description	Ind. Parts Req.
1	---	Cap Nut #10-32	1
2	---	Nut #10-32	1
3	---	Hex Key Allen Set Screw, #10-32 x 3/4"	1
#4	KK-5047	T-Handle Kit (Order Separately)	
4A	---	Torx Key	1
4B	---	T-Handle	1
5	---	Torx Screw 10-32 Thd.	1
6	HGS-36	Lock	1
7	HGS-34	Guard	1
8	SSF-3169-K6	Socket Head Cap Screw, S.S. #8-32 x 3/8" (Kit of 6)	6
9	HGS-5	Bonnet	1
10	HGS-28	Adjustment Seat	1
11	HGS-30	Regulator Spring	1
*12	---	Hex Nut #6-32	1
*13	---	Upper Plate	1
*14	HGS-12-K5	Gasket (Kit of 5)	1
*15	HGS-20-1	Diaphragm, PTFE	1
*16	SSN-57	Washer, PTFE	1
17	SSN-54	Flat Washer	1
18	HGS-8	Regulator Body, Non-Circulating	1
	HGS-59	Regulator Body, Non-circulating, for Model HGS-5242	1
19	HGS-7	Regulator Body, Circulating	1
*20	HGS-43-K5	Valve Seat, PTFE, Std. Flow (Kit of 5)	1
21	HGS-44	Valve Stem, Std Flow	1
*22	SSG-8144	O-ring, PTFE	1
23	HGS-27	Plug, Non-Circulating	1
+24	HGS-26	Plug, Circulating	1
*	QH-130	Loctite	1

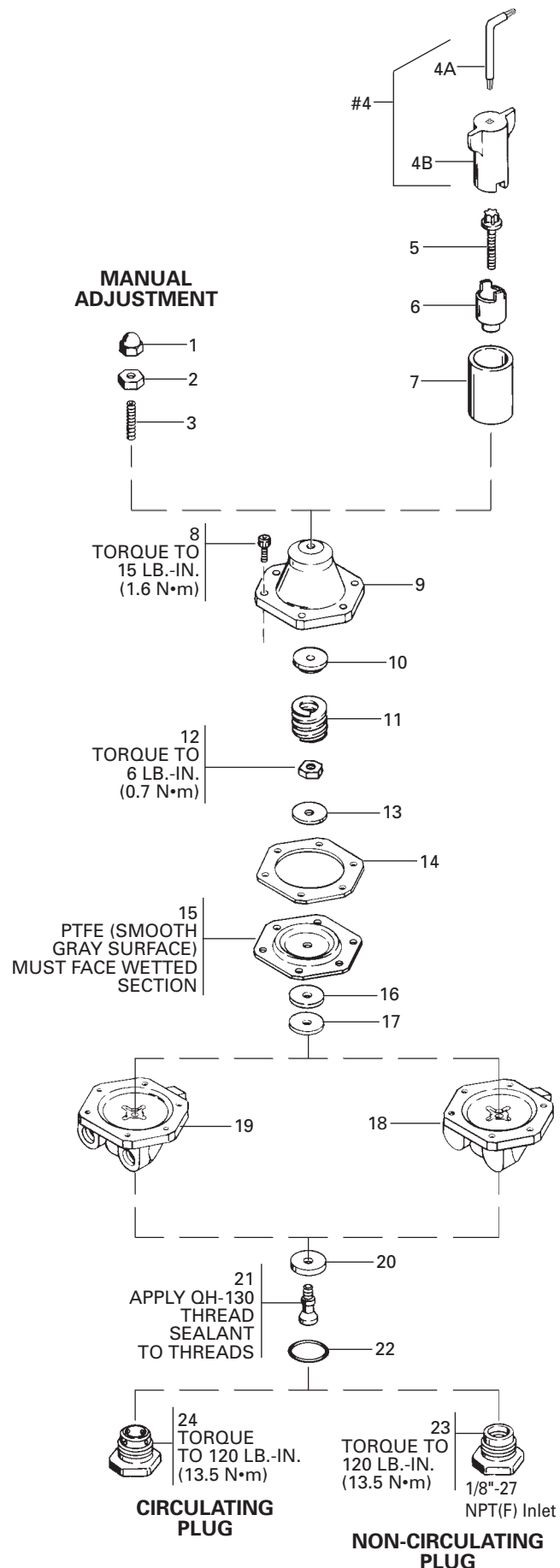
Dual Inlet Fittings supplied with regulator (see page 8).
 Manual Adjustment Fluid Regulator includes items 1 through 3 and 8 through 24.
 Tamper Resistant Fluid Regulator includes items 5 through 24.

To maintain the "tamper-proof" security feature, the KK-5047 T-Handle is not included with each regulator, as one T-Handle will service multiple regulators.

NOTE: KK-5047 T-Handle must be purchased separately.

Suffix -K5 designates kits of multiple parts.
 * Parts included in Regulator Repair Kit KK-4456 (Std Flow).
 + HGS-5242 Model uses the circulating plug.

TAMPER RESISTANT



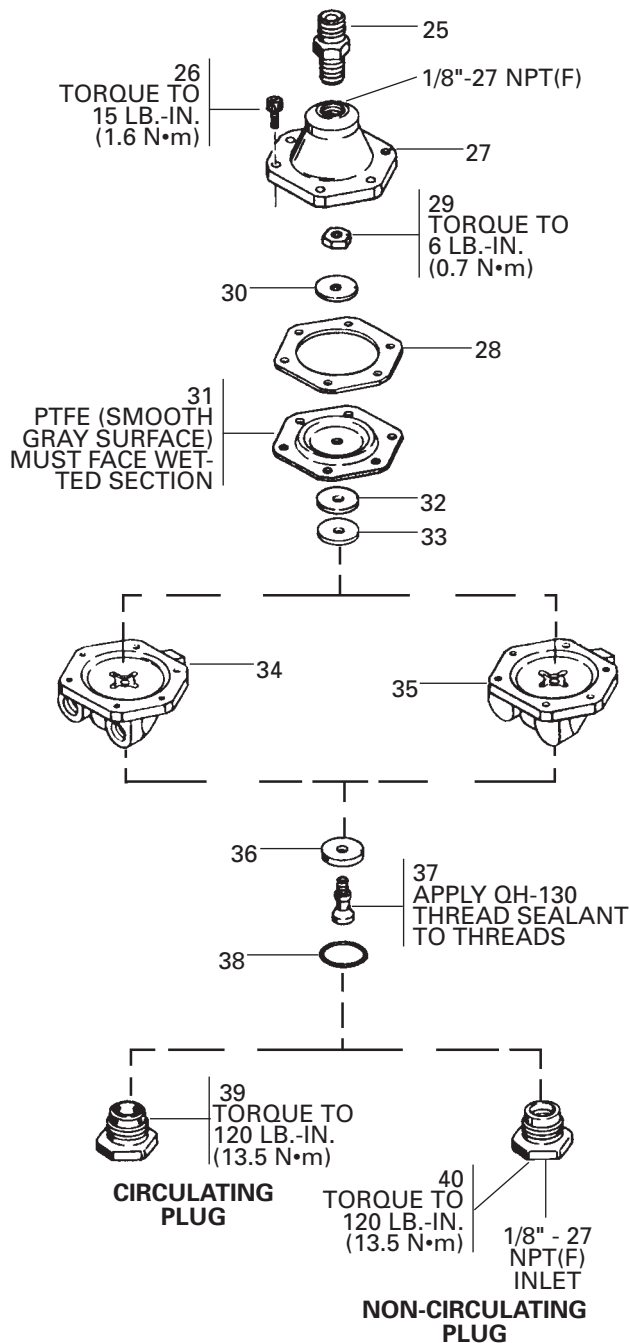
AIR PILOT FLUID REGULATOR BODY ASSEMBLIES HGS-452 AND HGS-453

Ref. No.	Replacement Part No.	Description	Ind. Parts Req.
25	H-1766	Connector 1/8" NPT(M) x 1/4" NPSM(M)	1
26	SSF-3169-K6	Socket Head Cap Screw, S.S. #8-32 x 3/8" (Kit of 6)	6
27	HGS-4	Bonnet	1
*28	HGS-12-K5	Gasket (Kit of 5)	1
*29		Hex Nut #6-32	1
*30		Upper Plate	1
*31	HGS-20-1	Diaphragm, PTFE	1
*32	SSN-57	Washer, PTFE	1
33	SSN-54	Flat Washer	1
34	HGS-7	Regulator Body, Circulating	1
35	HGS-8	Regulator Body, Non-Circulating	1
*36	HGS-43-K5	Valve Seat, PTFE (Kit of 5)	1
37	HGS-44	Valve Stem	1
*38	SSG-8144	O-ring, PTFE	1
39	HGS-26	Plug, Circulating	1
40	HGS-27	Plug, Non-Circulating	1
*	QH-130	Loctite	1

Dual Inlet Fittings supplied with regulator (see page 8).
 Air Pilot Fluid Regulator, Circulating, includes items 25 through 34 and 36 through 39.

Air Pilot Fluid Regulator, Non-Circulating, includes items 25 through 33, 35 through 38 and 40.

Suffix -K5 designates kits of multiple parts.
 *Parts included in Regulator Repair Kit KK-4456.

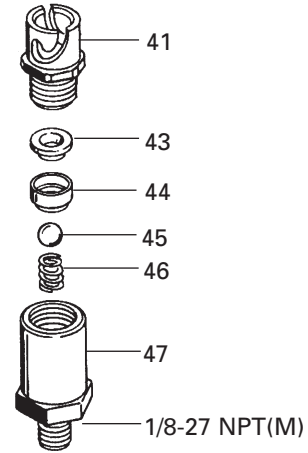


FLUID OUTLET CONNECTORS

Ref. No.	Replacement Part No.	Description	Ind. Parts Req.
41	HC-370-1	Bayonet Lock Body	1
42	---	Not Used	
*43	---	Stem Seal	1
*44	---	Ball Seat	1
*45	---	Stainless Steel Ball 7/16" Diameter	1
*46	---	Spring	1
47	HGS-25	Bayonet Body	1

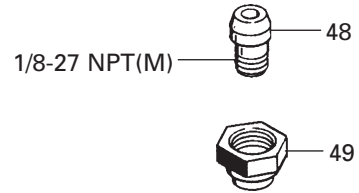
*KK-5061 Repair Kit

**HGS-401-1
Bayonet
Assembly**



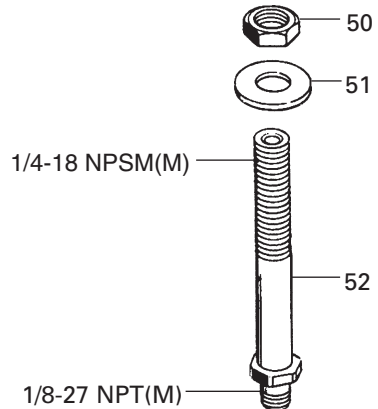
Ref. No.	Replacement Part No.	Description	Ind. Parts Req.
48	HGS-1	Tail Piece	1
49	HC-1000-K5	Swivel Nut 3/8" NPS(F) (Kit of 5)	1

Swivel Adapter



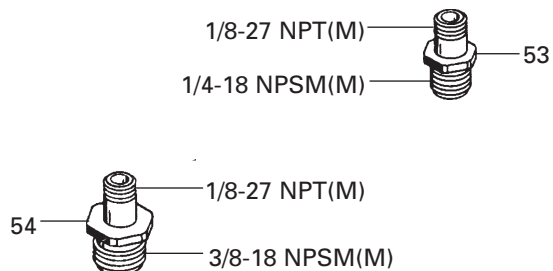
Ref. No.	Replacement Part No.	Description	Ind. Parts Req.
50	MBD-11-K5	Lock Nut (Kit of 5)	1
51	---	Lock Washer, Shake- Proof, 9/16)	1
52	---	Bulkhead Fitting	1

**HGS-400
Stand Pipe**



FLUID INLET ADAPTERS

Ref. No.	Replacement Part No.	Description	Ind. Parts Req.
53	HGS-22	1/4" Stainless Steel Inlet Adapter	2
54	HGS-21	3/8" Stainless Steel Inlet Adapter	2



NOTE

Use a PTFE based thread sealant on the threads of inlet adapters (53 and 54), and threads of fittings on outlet connectors (47, 48 and 52).

SERVICE

WARNING

Pressurized parts cause a risk of injury if disassembled. Shut off and relieve pressure before disconnecting hoses from the fluid regulator.

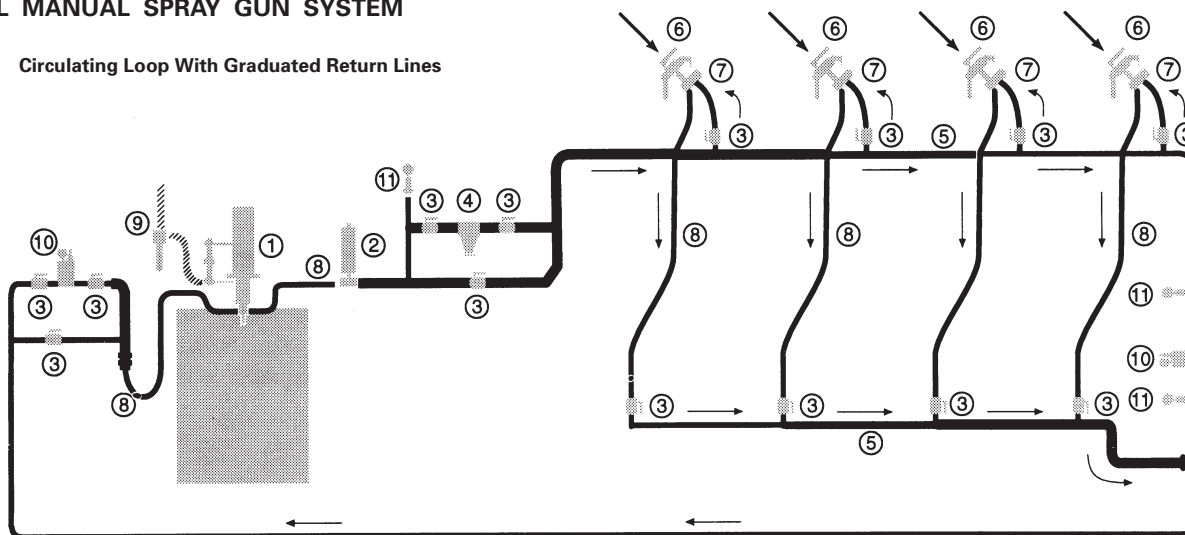
Cleaning or servicing is required if the regulator does not: regulate fluid, maintain its pressure setting, or leaks fluid. To service regulator, relieve pressures, disconnect regulator from spray gun and hoses from regulator. Disassemble regulator; refer to exploded views. Clean and inspect parts carefully. Replace worn or damaged parts and reassemble regulator.

TROUBLESHOOTING CHART

PROBLEM	CAUSE	REMEDY
No flow or insufficient pressure regulation	Plugged fluid path Defective diaphragm	Disassemble and clean fluid passages. Replace diaphragm (Ref. 15 or 31).
Excessive fluid flow	Worn seat Worn stem Material viscosity low	Replace seat (Ref. 20 or 36). Replace stem (Ref. 21 or 37). Check material viscosity.
Material leaking under bonnet	Bonnet screws (SSF-3169) have come loose	Check screw torque. specifications.
Pressure creep	Foreign material or dirt on seat or stem Worn seat Worn stem	Clean seat and stem. Replace seat (Ref. 20 or 36). Replace stem (Ref. 21 or 37).
Erratic fluid pressure	Air trapped in regulator body	Mount regulator in a vertical position; input port at bottom, output port at top.

TYPICAL MANUAL SPRAY GUN SYSTEM

Circulating Loop With Graduated Return Lines

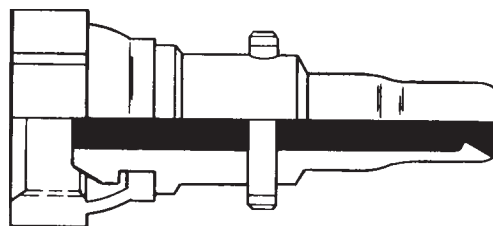


- | | |
|--|--|
| ① Pump Assembly/Low Ratio | ⑦ Gun Mounted, HGS Fluid Regulator |
| ② Pulsation Chamber | ⑧ Fluid Hose Assembly |
| ③ Fluid Shut-Off Valve | ⑨ Oil and Moisture Separator/Extractor Dryer |
| ④ Filter/Fluid Outlet | ⑩ Back Pressure Regulator/Low Pressure |
| ⑤ Graduated Supply and Returns Lines | ⑪ Pulsation Proof Gauge |
| ⑥ Air Atomized Spray Gun/Manual or Automatic | |

ACCESSORY ITEMS

HC-4691 — 3/8" NPSM(F) STEM, STAINLESS STEEL

Unrestricted fluid passage, for use with standard spray gun.



WARRANTY POLICY

This product is covered by Carlisle Fluid Technologies' materials and workmanship limited warranty. The use of any parts or accessories, from a source other than Carlisle Fluid Technologies, will void all warranties. Failure to reasonably follow any maintenance guidance provided may invalidate any warranty.

For specific warranty information please contact Carlisle Fluid Technologies.

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China	Tel: +8621-3373 0108 Fax: +8621-3373 0308	
Japan	Tel: +81 45 785 6421 Fax: +81 45 785 6517	
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