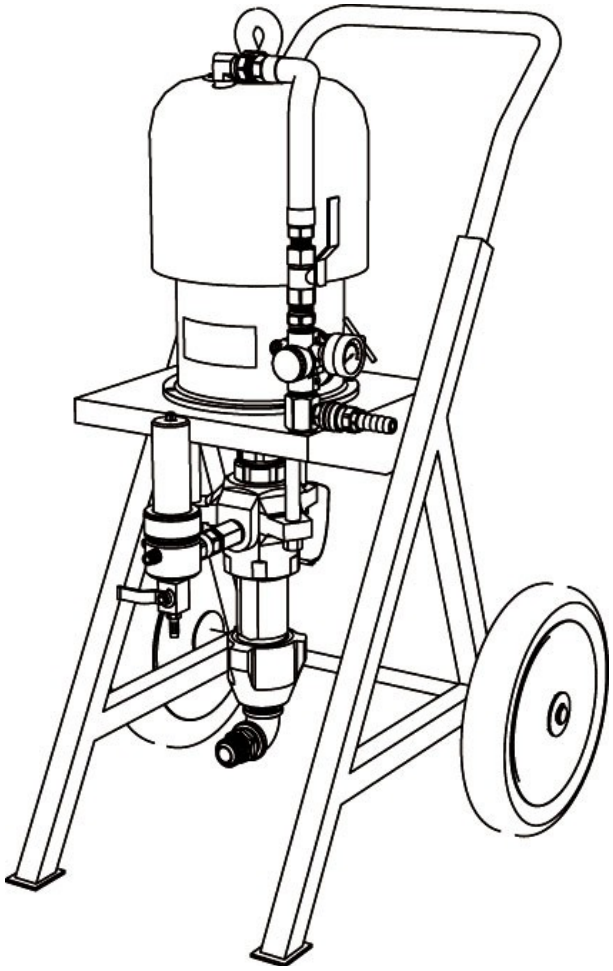
REPAIR INSTRUCTIONS

X/T 45:1 Displacement Pump



This manual contains important warning and information.
Read and keep reference.

Korean Spray Technology Co., Ltd.
#6036, Daejeo-2ong, Gangseo-Gu,
Busan, S. Korea. (618-817)
Tel: 82-70-7600-9630
Fax: 82-51-312-0991
e-mail : kst0991@naver.com
http://www.kstspray.com

! WARNING

EQUIPMENT MISUSE HAZARD

Equipment misuse can cause the equipment to rupture or malfunction and result in serious injury.

_ This equipment is for professional use only.

_ Read all instruction manuals, tags, and labels before operating the equipment.

_ Use the equipment only for its intended purpose. If you are uncertain about usage, call your KST distributor.

_ Do not alter or modify this equipment. Use only genuine KST parts and accessories.

_ Check equipment daily. Repair or replace worn or damaged parts immediately.

_ Do not exceed the maximum working pressure of the lowest rated system component.

_ Do not use hoses to pull equipment.

_ Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose KST hoses to temperatures above 82_C (180_F) or below –40_C (–40_F).

_ Wear hearing protection when operating this equipment.

_ Do not lift pressurized equipment.

_ Comply with all applicable local, state, and national fire, electrical, and safety regulations.

INJECTION HAZARD

Spray from the gun/valve, hose leaks, or ruptured components can inject fluid into your body and cause extremely serious injury, including the need for amputation. Fluid splashed in the eyes or on the skin can also cause serious injury.

_ Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate medical attention.**

_ Do not point the gun at anyone or at any part of the body.

_ Do not put your hand or fingers over the spray tip.

_ Do not stop or deflect leaks with your hand, body, glove or rag.

_ Do not “blow back” fluid; this is not an air spray system.

_ Always have the tip guard and the trigger guard on he gun when spraying.

_ Be sure the gun trigger safety operates before spraying.

_ Lock the gun trigger safety when you stop spraying.

_ Tighten all fluid connections before operating the equipment.

_ Check the hoses, tubes, and couplings daily. Replace worn, damaged, or loose parts immediately. Permanently coupled hoses cannot be repaired; replace the entire hose.

_ Use only KST approved hoses. Do not remove any spring guard that is used to help protect the hose from rupture caused by kinks or bends near the couplings.

TOXIC FLUID HAZARD

Hazardous fluid or toxic fumes can cause serious injury or death if splashed in the eyes or on the skin,inhaled, or swallowed.

_ Know the specific hazards of the fluid you are using.

_ Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.

_ Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.

MOVING PARTS HAZARD

Moving parts, such as the air motor piston, can pinch or amputate your fingers.

_ Keep clear of all moving parts when starting or operating the pump.

FIRE AND EXPLOSION HAZARD

Improper grounding, poor ventilation, open flames or sparks can cause a hazardous condition and result in a fire or explosion and serious injury.

_ If there is any static sparking or you feel an electric shock while using this equipment, **stop spraying immediately.** Do not use the equipment until you identify and correct the problem.

_ Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being sprayed.

_ Keep the spray area free of debris, including solvent, rags, and gasoline.

_ Electrically disconnect all equipment in the spray area.

_ Extinguish all open flames or pilot lights in the spray area.

_ Do not smoke in the spray area.

_ Do not turn on or off any light switch in the spray area while operating or if fumes are present.

_ Do not operate a gasoline engine in the spray area.

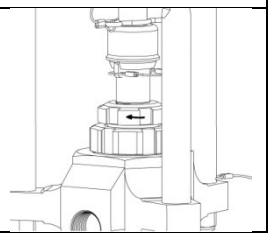
Operation

1. Lock the spray gun trigger safety.
2. Close the red-handed bleed-type master air valve
3. Unlock the gun trigger safety.
4. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
5. Lock the gun trigger safety.
6. Open the drain valve having a container ready to catch the drainage.
7. Leave the drain valve open until you are ready to spray again.

If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, very slowly loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.

Packing nut / wet-cup

Before starting, fill the packing nut 1/3 full with TSL or compatible solvent. To reduce the risk of serious injury whenever you are instructed to relieve pressure, always follow the pressure relief procedure. The packing nut is torqued at the factory and is ready for operation If is becomes loose and there is leaking form the throat packings, relieve pressure, then torque the nut to 136-149N.m using a wrench. Do this whenever necessary. Do not over tighten the packing nut.



Flush the Pump Before first Using

The pump is tested with lightweight motor oil, which is left in to protect the pump parts.
If the fluid you are using may be contaminated by the oil, flush it out with a compatible solvent before using the pump. If the pump is being used to supply a circulating system, allow the solvent to circulate until the pump is thoroughly flushed.
Flush the pump.

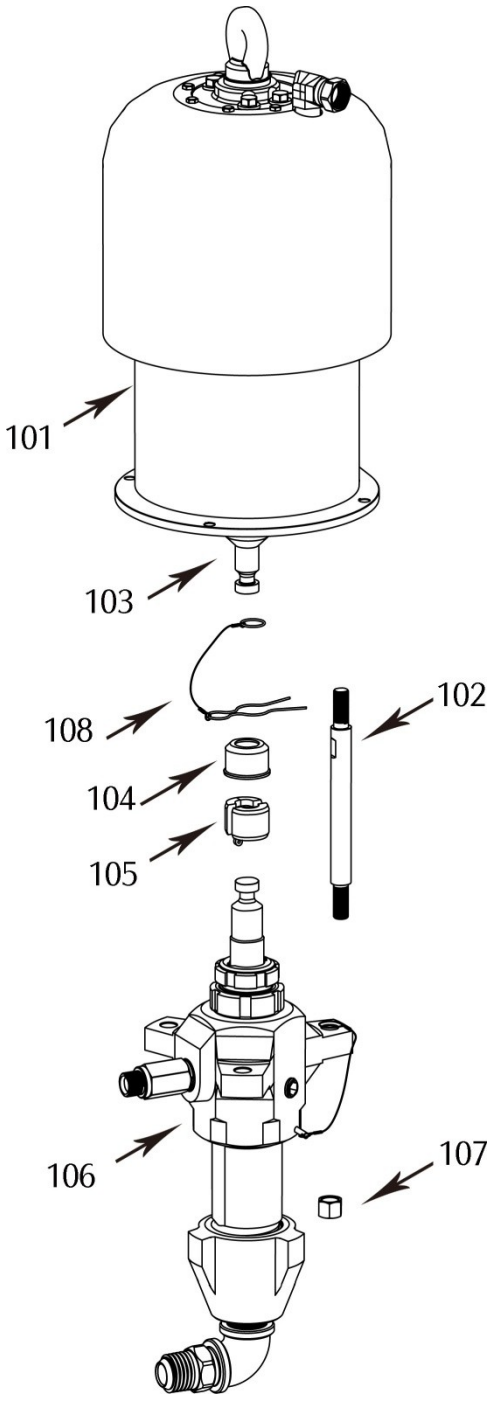
- Before the first use.
- When changing colors or fluids.
- Before fluid can dry or settle out in a dormant pump(check the pot life of catalysed fluids)
- Before storing the pump

Flush whit a fluid that is compatible whit fluid you are pumping and whit the wetted parts in your system.
Check whit a fluid manufacturer or supplier for recommended flushing fluids and flushing frequency.

Troubleshooting

PROBLEM	CAUSE	SOLUTION
Doesn't operate	Valve closed or clogged.	Clear air line: increase air supply. Check valve open.
	Fluid hose or gun obstructed.	Clear hose or gun: use hose with larger ID.
	Dried fluid on displacement rod.	Clean rod: always stop pump at bottom of stroke: Keep wet-cup filled with compatible solvent.
	Air motor parts dirty, worm, or damaged.	Clean or repair air motor: see motor manual.
Output low on both strokes.	Air line restricted or air supply inadequate. Valves closed or clogged.	Clear air line: increase air supply, Check valve open.
	Fluid hose/gun obstructed: hose ID too small.	Clear hose or gun: use hose with larger ID.
	Worn packings in displacement pump.	Replace packings.
	Air motor parts dirty, worm, or damaged.	Clean or repair air motor: see separate motor manual.
	Open or worm intake valve.	Clear or service intake valve.
Output low in down stroke	Open or worm intake valve.	Clear or service intake valve.
	High viscosity fluid.	Adjust intake spacers.
Output low on up stroke	Open or worn fluid piston valve or packings.	Clear piston valve: replace packings.
Erratic or accelerated speed	Fluid supply exhausted, clogged suction line.	Refill supply and prime pump. Clean suction tube.
	High viscosity fluid.	Reduce viscosity, Adjust intake spacers
	Open or worm piston valve or packings.	Clear piston valve: replace packings.
	Open or intake valve	Clear or service intake valve.
Runs sluggishly.	Possible icing.	Stop pump. Let ice melt
Cycles, or fails to hold pressure at stall.	Worm check valves or seals.	Service pump
Audible air leak	Check air connections.	Service pump
Air bubbles in fluid.	Loose suction line.	Tighten. Use a compatible liquid thread sealant or PTFE tape on connections.

Parts drawing and Parts List



NO.	KST-code	G-code	Description	Q'ty
101	K254-100		AIR MOTOR	1
102	KS-X002	197-329	ROD, Tie	3
103	KS-X003	197-341	ADAPTER	1
104	KS-X004	197-340	COVER	1
105	KS-X005	244-819	COUPLING	1
106	X451-200	244-416	DIS. PUMP	1
107	KS-X007	101-712	NUT	3
108	KS-X008	244-820	CLIP, HAIRPIN	1

DISCONNECTING THE DISPLACEMENT PUMP

1. Flush the pump if possible. Stop the pump at the bottom of its stroke. **Relieve the pressure.**

2. Disconnect the air and fluid hoses. Remove the pump from its mounting.

3. Unscrew the coupling nut off of the air motor piston rod . Be Carefully not to loss the two couplers as you lower the nut. Unscrew the tie rod locknuts from the tie rods. Carefully pull the displacement pump away from the air motor.

4. To service the displacement pump, refer to displacement pump service.

RECONNECTING THE DISPLACEMENT PUMP

1. Align the pump's fluid outlet to the optional fluid outlet of the air motor. Position the displacement pump on the tie rod.

2. Make sure the couplers are in place inside the coupling nut. Screw the coupling nut up onto the air motor piston rod snugly. Screw the locknut onto the tie rods loosely.

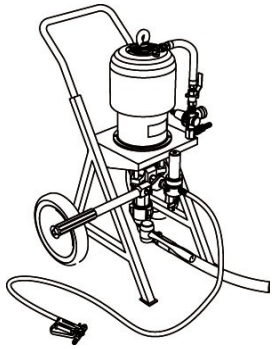
3. Mount the pump and reconnect all hoses. Reconnect the ground wire if it was disconnected during repair.

4. Tighten the tie rod locknuts evenly, and torque to 40-50ft–lb (54-68 N.m). Torque the coupling nut to 145-155 ft-lb(195-210 N. m)

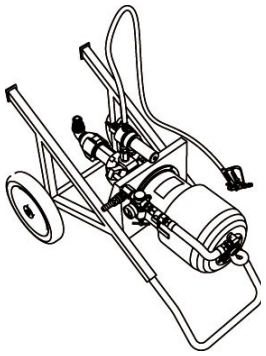
5. Start the pump and run it slowly, at about 40 psi (280 kPa,2.8 bar) air pressure, to check the tie rods for signs of binding. Adjust the tie rods as necessary to eliminate binding. Tighten the packing nut/wet-cup whit the wrench supplied. Fill the wet-cup half full whit throat seal liquid or compatible solvent.

DISASSEMBLY

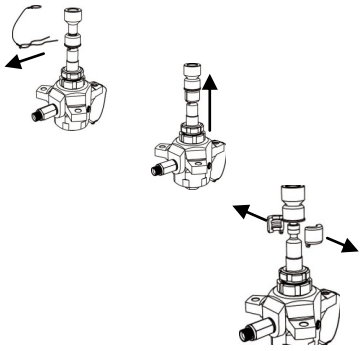
1. Use only non-sparking tools



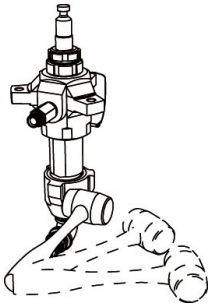
2.



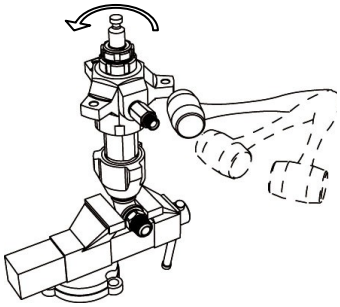
3.



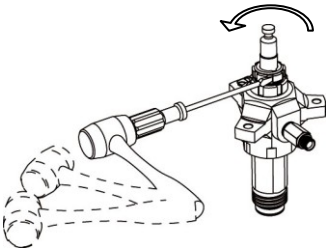
4. Service on cart



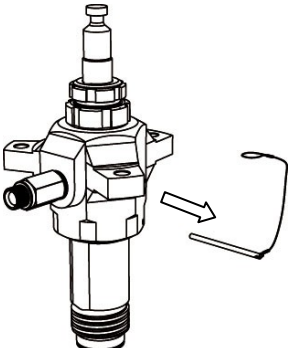
Remove for service



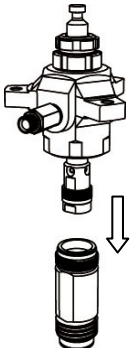
5.



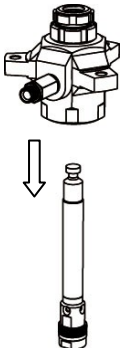
6.



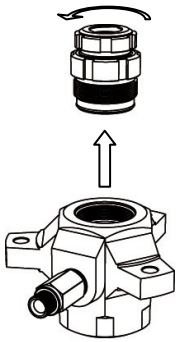
7.



8.

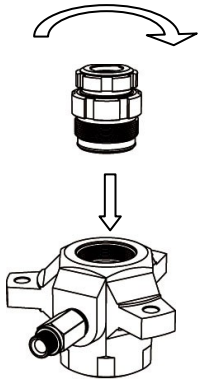


9.

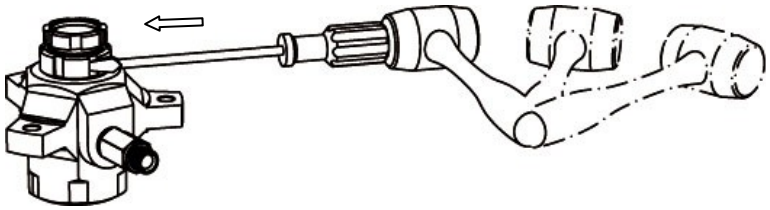


REASSEMBLY

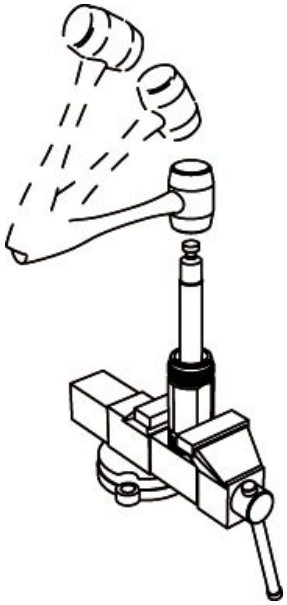
1.



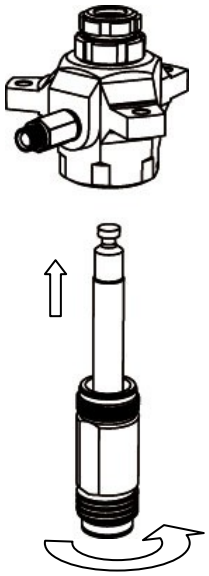
2. Use only non-sparking tools

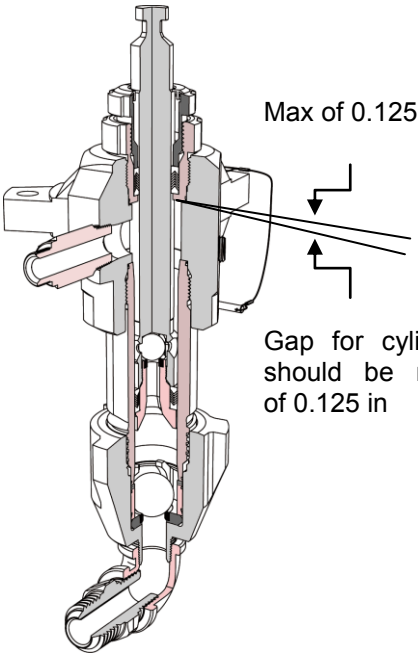


3.

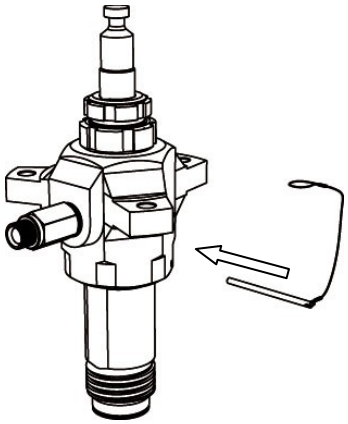


4. Assemble cylinder counter clockwise into outlet housing until cylinder bottoms out in outlet housing





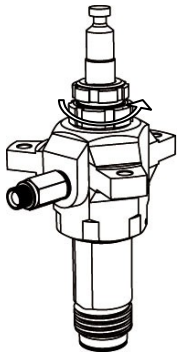
5.



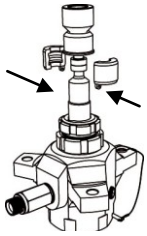
Rotate clockwise until hole in outlet housing lines up flat cylinder, and insert locking pin into cylinder

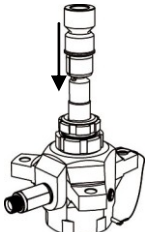
REASSEMBLY

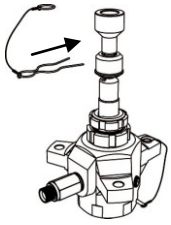
6. Torque to 25-30 ft-lb(34-41Nm)



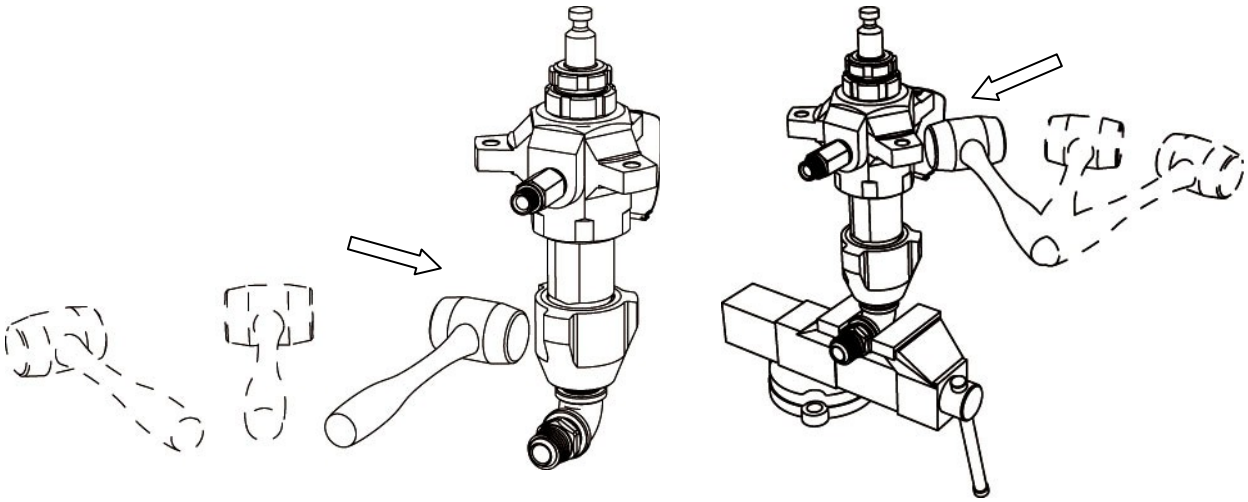
7.



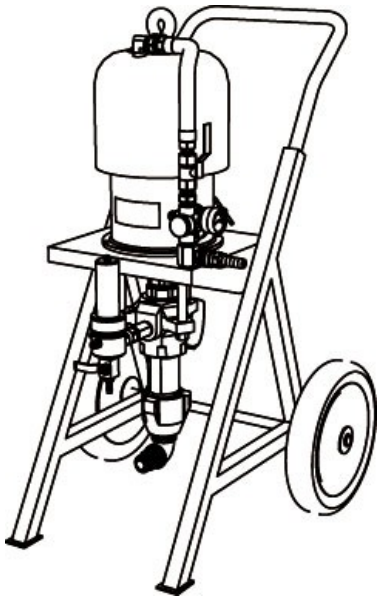




8.

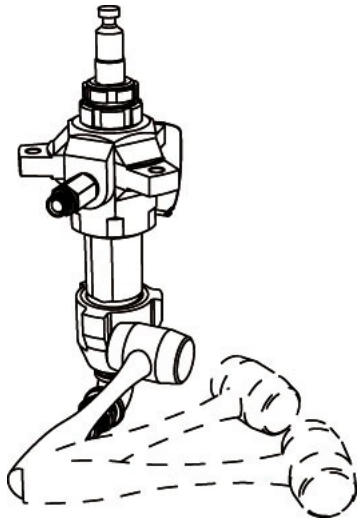


9. Reattach to air motor

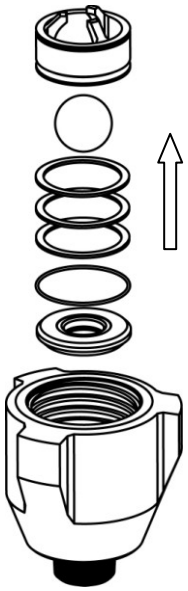


BALL ADJUSTMENT

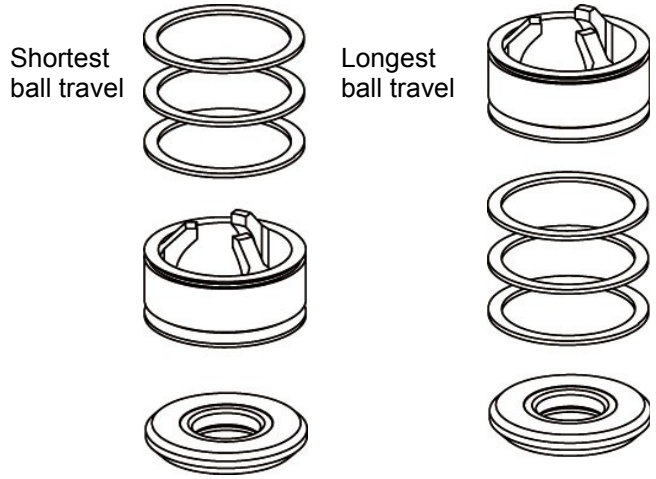
1.



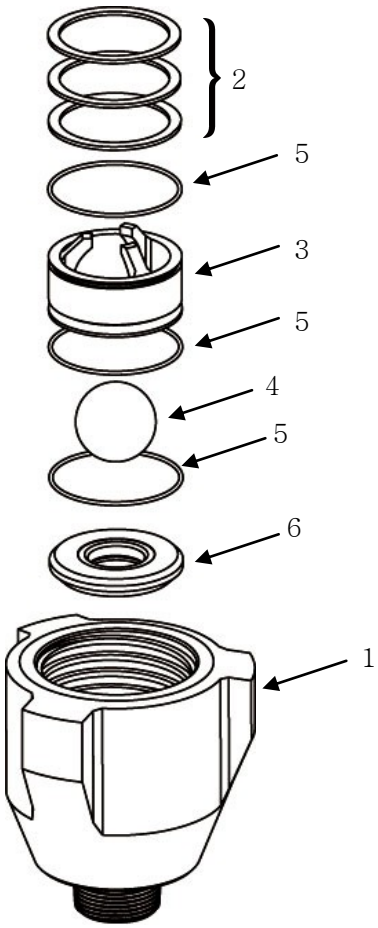
2.



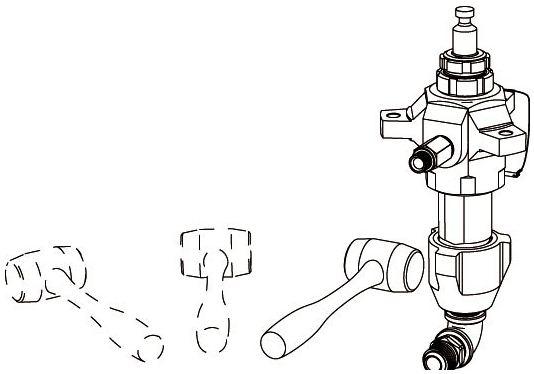
3.



4.



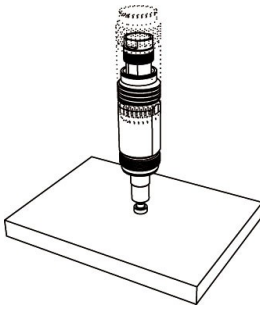
5



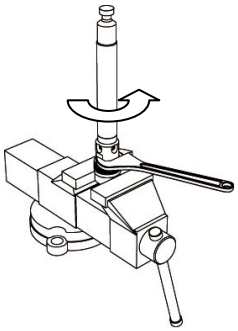
PISTON ROD DISASSEMBLY

Always use a plastic or wooden block to drive the rod out of the cylinder. *Damage to rod end will shorten pump life,*

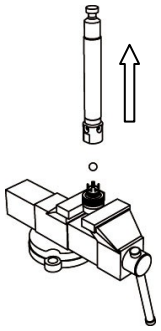
1.



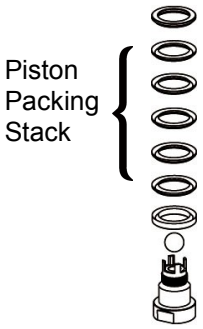
2. Torque to 190-210 Ft-lb(258-285 Nm)



3.



4.

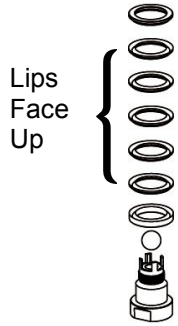


NOTE: Clean all parts with a compatible solvent and inspect them for wear or damage

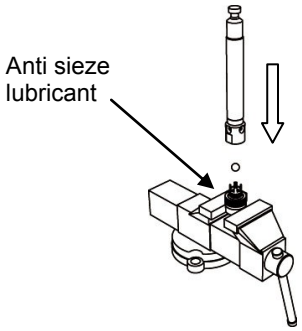
PISTON ROD DISASSEMBLY

Note: Soak packings in oil before assembly

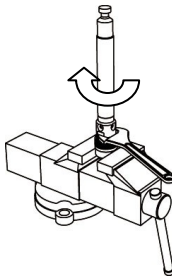
1.



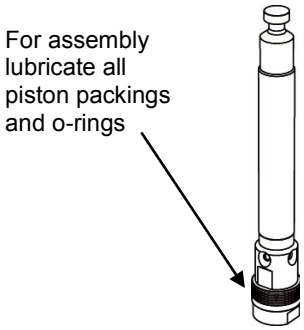
2.



3.



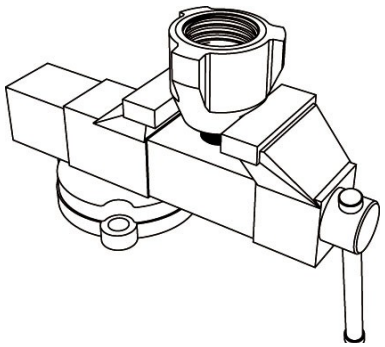
4.



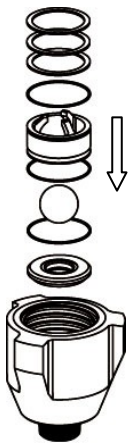
.Packing Repair Kits are available. For the best results, use all the new parts in the kit.

INLET HOUSING REASSEMBLY

1.



2.



Packing Repair Kits are available. For the best results, use all the new parts in the kit.
For assembly lubricate o-rings.

CARTRIDGE REASSEMBLY

Packing Repair Kits are available. For the best results, use all the new parts in the kit.

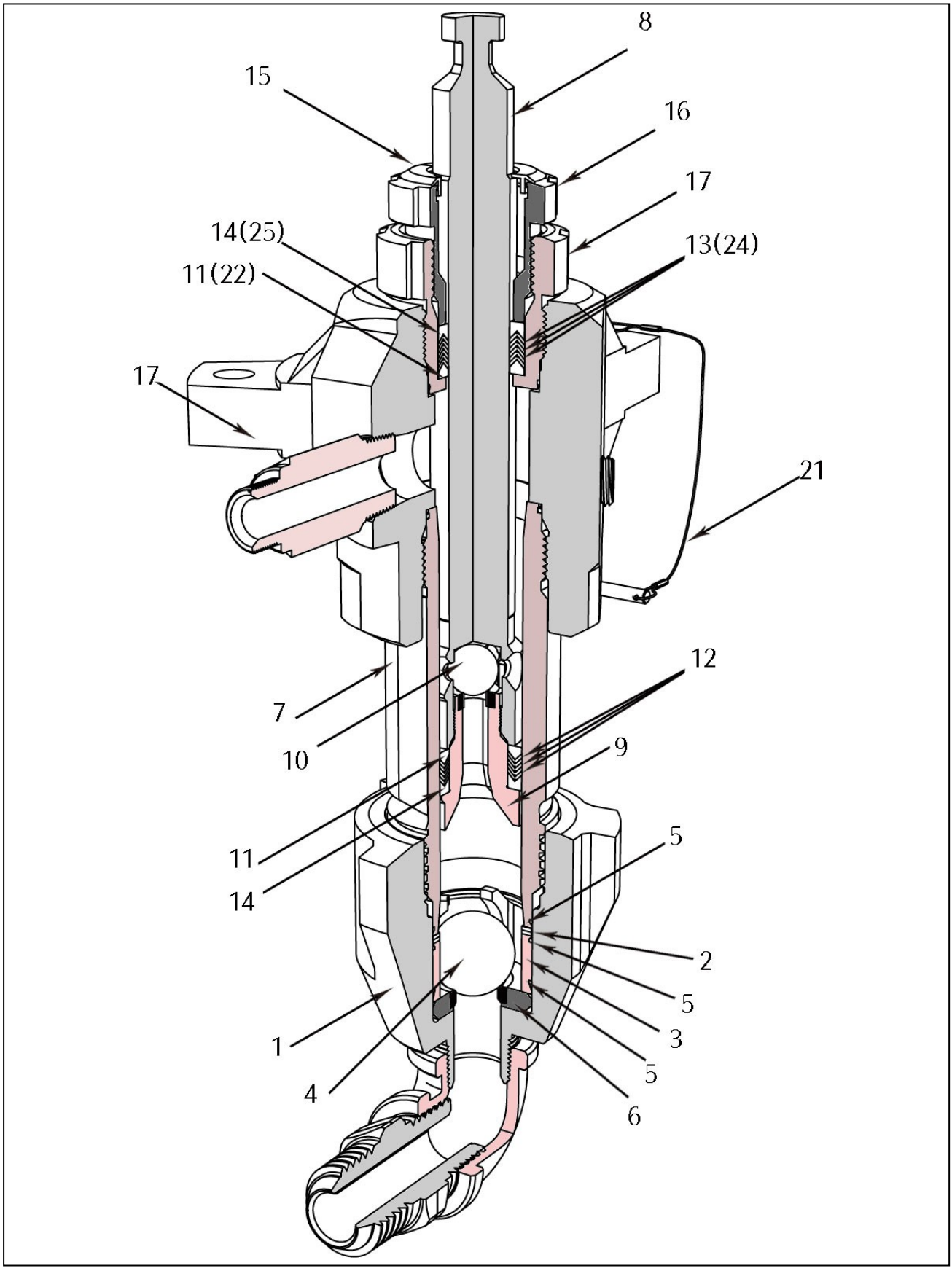
NOTE: Only the 45:1 pumps have shims placed on top of the female gland.

Throat Packing Stack

Note: Soak leather packings in oil before assembly.

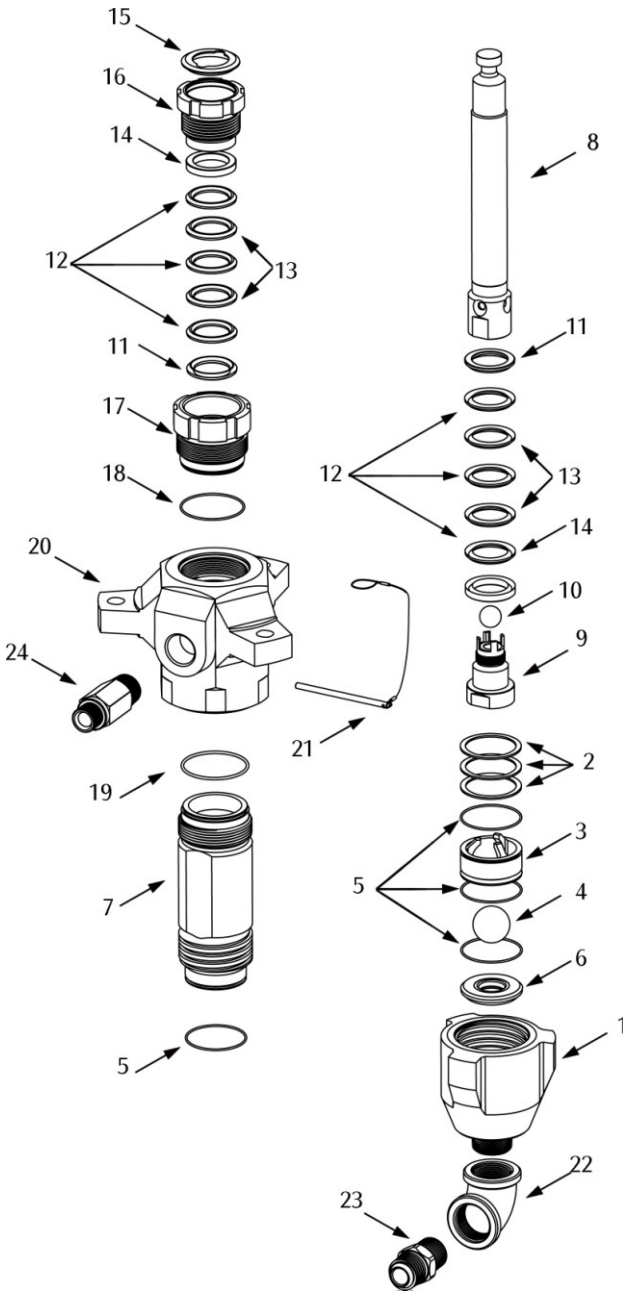
For assembly lubricate all o-rings, inside of cartridge, and outside threads of wet cup.

Service



Parts drawing and Parts List

250cc (1045)Pump
244416



Note : part marked in color are the spare parts

These parts are included in repair kit which may be purchased separately.

Always use genuine parts

No	KST-code	G-code	Description	Qty
1	X451-01	197304	HOUSING , Inlet	1
2	X451-02	244856	SHIM	3
3	X451-03	197308	BALL GUIDE	1
4	X451-04	245129	BALL	1
5	X451-05	244894	PACKING ,O-RING	4
6	X451-06	197344	SEAT	1
7	X451-07	197318	CYLINDER	1
8	X451-08	197322	DISPLACEMENT ROD	1
9	X451-09	197312	PISTON VALVE	1
10	X451-10	244898	BALL	1
11	X451-11	245232	GLAND-M	1
12	X451-12	245229	PACKING-V	6
13	X451-13	245230	PACKING-V(L)	4
14	X451-14	245233	GLAND-F	1
15	X451-15	244999	SEAL	1
16	X451-16	197331	PACKING NUT	1
17	X451-17	197327	CARTRIDGE	1
18	X451-18	244891	PACKING, O-RING	1
19	X451-19	244893	PACKING, O-RING	1
20	X451-20	197335	HOUSING	1
21	KS-X021	244826	PIN	1
22	KS-X026		TUBE	1
23	KS-X027		NIPPLE,PT1*PF1	1
24	KS-X028		NIPPLE,PT1*PF3/4	1

REPAIR KIT No : 244853
With 4,5,10,11,12,13,14,15,18,19

Technical Data

Category	Data			
	K-TYPE AIR MOTOR		B-TYPE AIR MOTOR	
	244414 245120(A)	244412 245121(A)	244414 245167(A)	244412 245117(A)
Maximum fluid working pressure	38.6 MPa 386 bar	46.9 MPa 468 bar	19.3 MPa 193 bar	22.8 MPa 228 bar
Maximum air input pressure page	0.7 MPa 7 bar			
Ratio	56:1	68:1	28:1	33:1
Air inlet size	3/4 in. npt(f)			
Fluid inlet size	1 -1/4 in npt			
Displacement per cycle	220cc	180cc	220cc	180cc
Fluid flow at 60 cycles per minute	3.4 / 13 Gal. / Ltr.	2.9 / 11 Gal. / Ltr.	3.4 / 13 Gal. / Ltr.	2.9 / 11 Gal. / Ltr.
Maximum operating temperature	82_C (180_F)			
Wetted parts	Carbon Steel; Alloy Steel; S45C, 415,440: Zinc and Nickel Plating; Ductile Iron; Tungsten Carbide; PTFE; Leather			

KST Standard Warranty

KST warrants all equipment referenced in this document which is manufactured by KST and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended,or limited warranty published by KST, KST will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by KST to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with KST written recommendations.

This warranty does not cover, and KST shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non–KST component parts. Nor shall KST be liable for malfunction, damage or wear caused by the incompatibility of KST equipment with structures, accessories, equipment or materials not supplied by KST, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by KST.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized KST distributor for verification of the claimed defect. If the claimed defect is verified, KST will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT
NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

KST sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within one (1) years of the date of sale.

KST MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, IN CONNECTION WITH ACCESSORIES, EQUIPMENT, MATERIALS OR COMPONENTS SOLD
BUT NOT MANUFACTURED BY KST. These items sold, but not manufactured by KST (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. KST will provide purchaser with reasonable assistance in making any claim for breach of these warranties.
In no event will KST be liable for indirect, incidental, special or consequential damages resulting from KST supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of KST or otherwise.

KST Information

TO PLACE AN ORDER OR FOR SERVICE, contact your KST distributor, or call these numbers to identify the nearest distributor.

Korean Spray Technology Co., Ltd.
#6036, Daejeo-2dong, Gangseo-Gu,
Busan, S. Korea. (618-812)
Tel: 82-70-7600-9630
Fax: 82-51-312-0991
e-mail : kst0991@naver.com
http://www.kstspray.com