ASAHI SUNAC

Operation and Maintenance Manual

High Performance Plunger Type Airless Pump
MINI BEAR

SP1021(S)

Ec'Coater エコーター

This manual contains important information on warnings and cautions. Read the manual thoroughly before starting to operate the equipment, and follow the instructions. Always keep the manual handy until such time as the equipment is no longer being used. If your manual is lost or worn badly, do not hesitate to contact our agency which is closest to you, or the Asahi Sunac Corporation, directly, and ask us to send you a new one.

Thank you for buying our product.

Dear Valued Customer:

Thank you for buying our High Performance Plunger Type Airless Pump, Model SP1021/S MINI BEAR.

Please read this manual carefully before starting to operate the equipment. Please pay particular attention to major specifications, warnings and precautions, including prohibited items. Use the equipment appropriately and with care, following the instructions. We hope that by doing so you derive benefit from use of the product over a long period of time.

The gun is geared to industrial painting. It is for use only by those who are familiar with its workings and have undergone proper training; persons without such knowledge should not be allowed to operate the equipment.

Should you have any questions with regard to the manual, please give us the “Model Name” and “Serial Number” of your equipment, so that we may be able to help you with your questions. You can reach us at any of the addresses, phone numbers and fax numbers shown on the back cover.

Thank you,
Asahi Sunac Corporation

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1 For Your Safety

Please carefully read this manual and get acquainted with the equipment.
Please observe the operating procedures in the manual. Failure to do so may result in **personal injury and/or damage to property**.

This manual covers only minimum safety precautions, and it does not suggest or imply that no other precautions are required. Of course, each enterprise must observe its own rules as well as the laws and regulations of the country or region in which it operates, in addition to the safety precautions in the manual.

Again, shown on the pages that follow are basic and minimum safety precautions for use of our products.

- **As shown below, safety precautions are classified into three categories based on the severity of hazards involved.**

⚠ **WARNING**	Alerts a hazardous situation which may result in personal injury, with instructions on how to avoid it.
⚠ **CAUTION**	Alerts a hazardous situation which may result in damage or breakage to equipment, with instructions on how to avoid it.
NOTICE	Indicates important methods and practical information.

※ A hazardous situation included in the CAUTION category could also cause a serious accident depending on how matters develop. All the precautions in the manual convey significant information that you should observe such precautions in order to ensure your own safety and prevent the equipment from failure.

⚠ WARNING

Equipment misuse hazard

Never use hazardous materials, such as acidic or corrosive materials, or halogenated hydrocarbon solvents with this equipment.

Should you have any questions with regard to the use of the equipment or materials to be used, please feel free to contact us.

This equipment is not of the explosion-proof type.

⚠ WARNING

Injection Hazard

<<General Safety Precautions>>

- This is a high-pressure painting equipment and an extreme care should be exercised to prevent serious personal injury.

  This pump generates very high pressure to feed paint fluid to the airless spray gun.
  High-pressure spray or ruptured component pieces from point-blank range can inject fluid or fragments into your body, causing skin injury from which no small amount of toxic substances might enter into the body.

  Should that happen, get a proper medical treatment by a specialist, immediately.
  If you don't, you may suffer from a life-long disability or you may get amputated.
  Fluid splashed in the eyes or on the skin can also cause serious injury.

<<Emergency Medical Treatment: A Must>>

If a high-pressure fluid splashes on your skin or into the eyes, go immediately to a specialist and tell him/her exactly what type of paint fluid you were using in order to obtain proper medical treatment.

- Don't point the gun at anyone or at any part of your body.
  Stay away from the trajectory of spray jet from the nozzle.
- Don't put your hand or fingers over the spray nozzle.
- Don't attempt to use the painting equipment -- until you are fully acquainted with its operation.
- Be extra vigilant when operating an air-spray painting equipment.

<<Spray Gun Safety Mechanisms>

- The spray gun is equipped with safety mechanisms. Use them properly.
- Each time you use a spray gun, ensure, in advance, if all the safety mechanisms operate properly.
- Do not alter or modify or remove any part of the gun: the gun may behave unexpectedly and personal injury may result.

☐ **Trigger Lock**

- When not spraying, always lock the trigger safety lock in order to disable trigger.
  If you forget to lock the trigger, it may be pulled accidentally.

☐ **Chip Guard**

- When spraying, always put the chip guard on the gun.
  The chip guard alerts injection hazard, reducing occurrences as a result.
  The guard, however, cannot prevent hand or part of body from getting close to the nozzle accidentally.

☐ **Trigger Guard**

- Don't spray with the trigger guard removed. This guard prevents the trigger from being pulled accidentally when the gun is dropped or hit by something.

⚠ WARNING

<<Nozzle Safety Precautions>>

- Don't put your hand or fingers or anything over the spray nozzle.
- Be extra careful when cleaning or replacing the nozzle.
  If the nozzle gets clogged while spraying, immediately lock the trigger safety lock and relieve the fluid pressure in accordance with the "Pressure Relief Procedure," and then take off the nozzle for cleaning.
  It is dangerous to wipe sticky paint off the nozzle with some residual pressure still remaining or without locking the trigger safety lock.

When relieving pressure, follow the procedure below:

<<Pressure Relief Procedure>>

To reduce the risks of injury from injection, splashing fluid on the skin or in the eyes, etc., relieve the pressure following this "Pressure Relief Procedure" whenever you: Inspect the pump or gun, Remove or mount the nozzle for cleaning or replacement, Stop spraying.

The step-by-step procedure:

① Lock the trigger.

② Shut off air supply by turning the pressure control dial counter-clockwise, bringing down the pressure all the way.

③ Relive the ball cock, bring down the system pressure to zero, unlock the trigger and pull it for double-checking.

④ Lock the trigger again.

- **When the nozzle or hose is clogged or when it is suspected that some pressure still remains after going through the "Pressure Relief Procedure," slowly loosen the chip guard mounting nut or the connector at hose end, gradually releasing the pressure until it is completely relieved. Then inspect the nozzle and hose.**

⚠ WARNING

Equipment Misuse Hazard

<<General Safety Precautions>>

- Misuse, such as use of too much pressure, unauthorized component modification, improper paints or solvents, use of worn or broken part, may result in a serious accident like pump breakage, unexpected fluid injection, fluid splashed in the eyes or on the skin that possibly causes personal injury, or even fire or explosion.
- Don't alter or modify pump parts without our authorization or approval, for such a change may result in equipment failure or malfunction.
- Inspect the whole system periodically. Repair or replace parts as required.
- When conducting spray operation, always wear eye protection, protective clothing, and breathing protection recommended by the paint/solvent manufacturer.
  Depending on the kind of pint fluid used and the ventilation performance, an additional personal protective equipment may be required. Please check it out with the paint/solvent manufacturer.

<<Equipment Interior Pressure>>

- Confirm the maximum fluid working pressure and maximum air input pressure of the pump.
  Be careful not to exceed these maximum pressures when operating the pump.
  Also, make sure that all component parts used for the equipment, such as hoses, connectors, swivels, are compatible with the maximum pressures.
  Should you find them not, set the pump at a pressure that does not exceed the lowest maximum operating pressure of all parts and accessories used with the equipment.
- Each time you use the equipment, retighten all the joints before use.

<<Paint/Solvent Compatibility>>

Check the compatibility of the paint and solvent with the "material of the pump parts they come into contact with" against the parts material specifications provided by the pump manufacturer -- before you introduce the fluid (paint/solvent) into the pump.

<<Hose Safety Precautions>>

- High-pressure fluid in the hose can be very dangerous: it could cause injury to the operator or damage to the equipment, spewing out of cracks, damage, wear in the hose, triggered by misuse or spontaneously.
- Please handle hose carefully.
  To move a hose from one place to another, don't pull, but carry.
  Don't use paint or solvent that is not compatible with the interior and exterior materials of the hose.
- Check the hose for bending or squeezing, for if there is it may cause a local
  Concentration of pressure, causing possible fluid leak.
- Don't leave hose in an environment where temperature may go up to 80°C or higher or where it may go down to - 40°C or lower.
- Securely retighten hose connectors and joints before use.
- Never use a broken hose.
  Check the hose throughout its length for cut, fluid leak, wear, blister, scratches, and loose fittings.
  Should you find anything wrong, stop using the hose right there and then, and replace.

⚠ WARNING

- When you find fluid leak, take no stopgap measures, such as covering the leak hole by hand or adhesive tape. Such measures will only increase potential hazards.
- When you find fluid leak, replace the hose with a new one or contact our authorized repair shop.
- Use a hose that is compatible with our standard specifications.
- Our fluid hose standard specifications ensure a sufficient hose durability in an normal operating environment. However, tension is applied to a hose for many hours, it deteriorates in a relatively short time. When tension is applied frequently, it may not last longer than half a year. Under normal operating conditions, replacement in a year would be recommended.

<<Moving Parts Hazard>>

- There is an air-motor piston rod in the air-motor cap. The piston rod moves up and down as air is supplied to the air-motor. When operating the pump, be sure to put the air-motor cap on so that your fingers may not be struck or caught in a pinch or shear point by the moving part, and that your eardrum may not get injured by the deafening exhaust sound.
- There is a step at the piston rod connecting nut in between the air-motor and material cylinder, which moves up and down as the pump operates. So don't touch it when the pump is operating. If you do so, you may get your fingers caught in a pinch point by the packing retainer.
- When checking or servicing the pump and component parts, bring the pressure down in advance in accordance with the "Pressure Relief Procedure" on page 3 in order to prevent the pump from behaving unexpectedly.
- With the pump running, don't leave the painting equipment unattended.
  Each time you stop spraying for a break or at the end of shift, shut off the air supply.
- Keep people away for the pump, children and adults who are not familiar with the airless painting operation.

⚠ WARNING

Fire and Explosion Hazard

<<Source of Fire>>

As liquid flows through the pump and hose, static electricity is generated.
If each component of the painting equipment is not properly grounded, sparks may occur due to static electricity. When there are vaporized solvent, sprayed paint particles, floating dust and other flammables in the atmosphere near the painting equipment, these sparks can cause fire or explosion, possibly causing serious injury to the operator and damage to the equipment.

- Provide fresh air ventilation in the spray area.
- Keep the spray area free of open flames, pilot lights, and other flammables.
- When using a pole gun, stay clear of electric wires.
- Ensure that equipment and conductive painting objects in the work area are properly grounded. Take no chances: when these things are not properly grounded, fire or explosion can occur triggered by electrostatic spark.
- If you feel any electric shock while using the painting equipment, stop spraying Immediately and check the grounding of each component of the equipment.
  Do not use the equipment until you identify and correct the problem.
- Keep a powerful fire extinguisher in the work area.

<<Grounding>>

To prevent hazards associated with static electricity, ground all the pumps, painting objects, painting equipment and components that are used in the area. If they are not properly grounded, ground properly, by all means, in accordance with the grounding procedure set forth by “Electrical Equipment Technical Standard (Class D grounding or equivalent).”
The grounding procedure for each of the painting system components is as follows:

☐ **Grounding Pump**

- Connect a ring crimp terminal (that comes with equipment) to the pump grounding terminal ⏚, the other clip to a Class D grounding object.

☐ **Grounding Compressor**

- Arrange grounding in accordance with the compressor manufacturer’s instructions.

☐ **Gruonding Hose**

- To ensure the grounding of a whole system, be sure to ground the hose. Especially when an extension hose is used, ensure that it is ground properly.
- Once every week, inspect the hose in use for electrical resistance.
  Class D grounding, our standard grounding, requires the resistance value to be 100Ω or lower.
  When the hose does not have a maximum resistance label on it, please check it out with the agency from whom you bought the hose or the hose manufacturer directly.
  Measure the electrical resistance of hose by connecting an ohmmeter to an appropriate location on the hose. If the resistance measured exceeds the maximum value allowed, replace the hose with a new one. Improper grounding of a hose puts the whole system in peril.

☐ **Grounding Spray Gun**

A spray gun that is securely connected to the properly grounded hose and pump is considered to be grounded properly.

☐ **Grounding Painting Object**

A contaminated hanger or grounding clip do not ensure proper grounding of a painting object.
Keep the hanger and clip clean to maintain proper grounding.

⚠ WARNING

☐ **Grounding Fluid Container**

When your fluid container is made of conductive metal, you can place it on the grounded floor or table. When it is made of something else, you cannot.

☐ **Grounding Cleaning Solvent Can**

When the cleaning solvet is made of conductive metal, you can place it on the grounded floor or table.
Don't place it on a non-conductive sheet, such as a sheet of paper or corrugated fiberboard.
When you clean the pump or relieve the pressure, hold a metal part of the gun firmly to the side of a grounded metal container and then pull the trigger.

<<Cleaning Safety Precautions>>

Before you get down to cleaning, ensure that the whole painting system and cleaning can are properly grounded. (see "Grounding Cleaning Solvent Can.")

- When cleaning the system, take off the nozzle in accordance with the procedure set forth in the <<Nozzle Safety Precautions>> (on page 3), and bring the pressure down to a minimum level (that is required for flushing with solvent).
- To prevent electrostatic spark, hold a metal part of the gun firmly to the side of a grounded cleaning solvent can (made of metal), and trigger the gun for flushing.

<<Solvent Safety Precautions>>

Do not use halogenated hydrocarbon solvent.
Halogenated hydrocarbon solvent may explode when it comes into contact with the aluminum or plated portion of pressure vessel (pump, heater, filter, valve, gun, etc.), possibly causing fatal or serious injury.

- Typical halogenated hydrocarbon solvents.

Carbon-fluorine	Dichlorofluoromethane, Trichlorofluoromethane
Bromine	Ethylene Dibromide; Bromine Chloride Methylene; Methyl bromide
Iodine	Butyl iodide, Methyl iodine, Ethyl iodide, Propyl iodide
Chlorine	Carbon pentachloride, Chloroform, Ethylene dichloride
Methylene Chloride, Ethylene Dichloride	Monochlorobenzene, o-dichlorobenzene, Perchloroethylene
Trichlorethane	Trichloroethylene; Monochlorotoluene

(Shown above are typical examples and there are, of course, other kinds of halogenated hydrocarbon solvents in the marketplace. Please check with your paint vendors or manufactures for further details.)

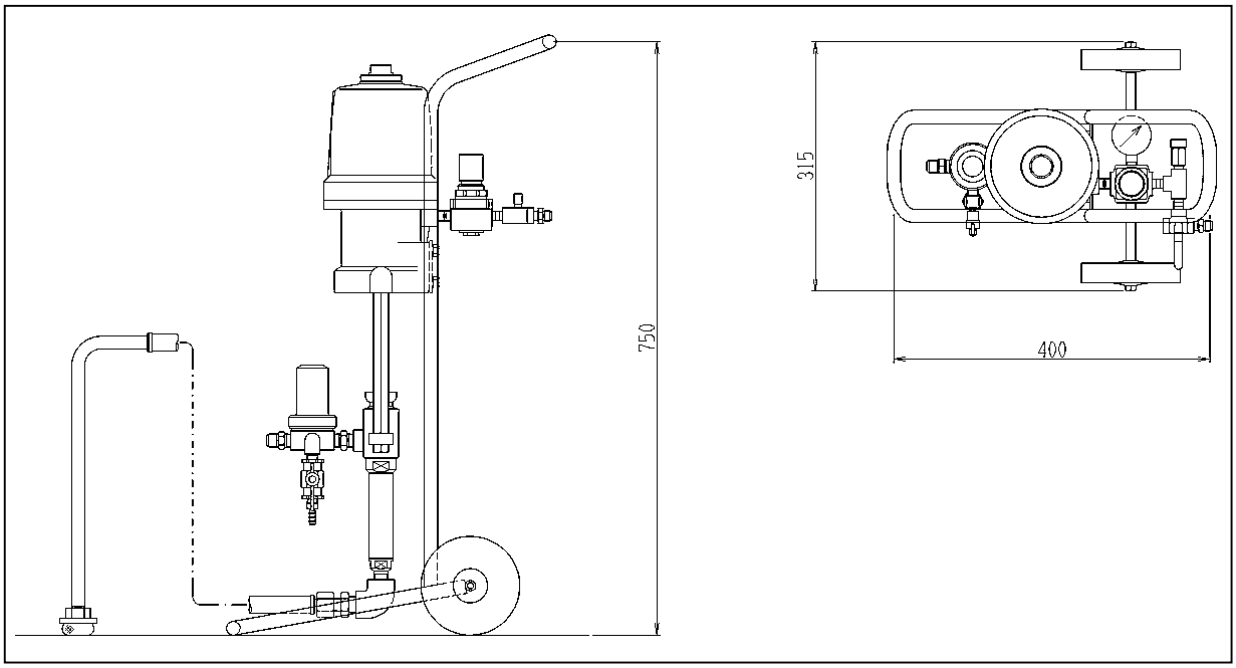
- Spray-mist-filled atmosphere may cause respiration difficulty and/or intoxication.
  Do not spray in an environment where ventilation is poor, such as indoors, in tunnel, inside the tank, etc. When you spray, exercise care so that the operator, people and livestock near by may not be affected.

NOTICE

The carbon alloy nozzle is precision-machined. To remove nozzle clogging, don't use a hard metal needle but use a soft wooden toothpick, etc. With a toothpick push the stuffed material from the tip of the nozzle, then air blow.
A hard metal needle, if used, could damage the nozzle orifice beyond repair.

2 Specifications, Dimensions and System Configurations

● Dimensions



● Specifications

Pressure ratio	1:23
Fluid flow	1.3l/min
Maximum fluid working pressure	11.5MPa [Maximum air input pressure: 0.5Mpa]
Dimensions	400^{L} x 320^{W} x 750^{H}mm
Weight	14kg
Compressor requirements	Continuous 0.75kW [1PS] Intermittent 0.4kW [0.5PS]

● System Configurations

Pump	Suction filter	○
	Suction hose	○
	Air regulator	○
	Air pressure gauge	○
	Nozzle cleaner	○
	Material filter	○
	Accumulator hose	○
	Special tool	○

Airless spray gun	※
Airless nozzle	※
Material hose	※

Items marked with ※ do not come with the equipment as standard accessories.
Please choose suitable items from our painting equipment catalog that will best suit your applications.

3 Setting Up for Operation

① General Set-up Precautions

(1) This airless spray equipment uses compressed air for the fluid displacement pump.
Use a compressor with a capacity of 0.75kW (1PS) or larger.

(2) Supply dry compressed air.

⚠ CAUTION

Wet compressed air, if supplied, may cause pump failure, such as valve shifting error, due to freezing or rusting. Watch water accumulation, etc. in the compressor tank.

(3) Pressure drop occurs when a compressor is installed in a place far removed from the pump. The maximum compressed air pressure supplied to the pump is 0.5 Mpa.
Determine the capacity of compressor taking the compressor-to-pump distance into account.

(4) Securely ground the grounding wire.
Connect a ring crimp terminal (that comes with the equipment) to the pump grounding terminal ⏚ , the other clip to a Class D grounding object.

⚠ WARNING

Improper grounding may cause electric shock, fire or explosion.

(5) When you noticed any symptom of failure, take corrective actions in accordance with the “Tear Down Inspection and Parts Replacement” (pages 15 and 16) and “Troubleshooting” (pages 17 and 18).
If your problems still exist after you did all this, don’t try to do anything further but immediately contact our agency near you or Asahi Sunac directly, giving us details about the problems. Please rest assured; we’ll take care of them.

② Unpacking and Connections

(See pages 19 through 25 for part names.)

Being 100% inspected at the factory before shipment, the airless pump is ready for operation once connections are made with a hose and gun. Upon unpacking, however, please check the contents thoroughly for any damage that may have occurred in transit and for missing parts. If you find anything wrong, please get in touch with our agency near you or us directly at Asahi Sunac.

(1) Upon unpacking you'll find that the equipment, high-pressure hose, and spray gun are not assembled yet. You'll have to put them together in the manner as described below:

(2) Connect a ring crimp terminal (that comes with the equipment) to the pump grounding terminal ⏚ , the other clip to a Class D grounding object.

⚠ WARNING

Improper grounding may cause electrical shock, fire or explosion.

(3) Connect the accumulator hose to the joint at the outlet of cylinder-shaped material filter. And connect the fluid hose to the joint further down.

⚠ WARNING

Ensure that the fluid hose is hooked up securely. A loosely connected hose may provide injection and splash hazards, possibly causing personal injury or accident.

(4) Mount the spray gun at the end of high-pressure fluid hose. At this point, do not put the nozzle on, yet.

⚠ WARNING

When you mount the spray gun, lock trigger. If you fail to lock the trigger, it may be pulled accidentally and personal injury may result.

(5) Connect the air hose to the nipple at the air regulator inlet.
With this you have made all the connections that have to be made.

4 Operation

① Operation

▲ Flushing the equipment before first use

Flush the equipment before first use. Check the fluid passage for leak at the same time. If there is any leak, retighten using two (2) special spanner, putting one on the joint, the other on the base. Remove foreign materials, as well.

NOTICE

Foreign materials, such as dust, contaminants, etc., may cause the nozzle to get clogged, resulting in inconsistent spray pattern. Flush thoroughly.

Equipment Flushing Procedure

(1) Provide 3 liters of solvent (cleaning thinner).
Fill an empty can (fluid container) with solvent (cleaning thinner). Put the suction pipe into the can and ensure that the suction filter is fully immersed in the solvent.

(2) Gradually open the air regulator (turn clockwise) and supply compressed air and then start operation. Set the compressed air at about 0.1 MPa.

(3) Put the tip of spray gun into solvent and pull the trigger. Solvent circulates through the system, purging air inside (which comes out in the form of bubbles).
This will clean the liquid passage through the system, hose and gun.

(4) Once passage cleaning is done, pull the suction pipe off the fluid can and run the pump idly to completely remove residual solvent within the pump. And then close the air regulator (turn counter-clockwise).

Now it's ready for operation.

▲ Starting and adjusting the pump

(5) Provide a paint fluid can.

(6) Repeat Step (1) through (3), with paint fluid.

(7) Adjust the air regulator to keep compressed air pressure at 0.2 to 0.5MPa.
The ratio of SP1021 is 1:23. The pump stops when the fluid pressure builds up to about 23 times of the compressed air pressure, or 4.6 to 11.5MPa or more.

⚠ WARNING

Because the operating air-to-fluid ratio is 1:23, fluid pressure gets very high: operate the pump very carefully.

(8) Put the nozzle on the spray gun.

⚠ WARNING

Ensure that spray gun's trigger is locked. If you fail to do so, trigger could be pulled accidentally, resulting in personal injury.

(9) Check to see that there is no leak from the painting equipment or the joint between the painting equipment and hose.
If you find leak:
Bring the pressure down, Drain the fluid,
Then, locate the point of leakage, Retighten to fix the leak.

② Shutdown and Equipment Care

(1) Check the equipment and hose for leak from joints.

1. Interruption or overnight shutdown with resumption due in 24 hours

① Leave the equipment filled with fluid.
In this case, because air will be purged from the fluid passage keeping the fluid in the way as if it were stored in a paint can, the fluid in the equipment will be kept free from solidification.

2. Long-term shutdown for a period beyond 24 hours

⚠ CAUTION

When you use a kind of paint that precipitates rapidly or one that is of high viscosity, flush the equipment in accordance with "Equipment Flushing Procedure" on page 11 when you shutdown the equipment.

② Completely remove fluid from the equipment and keep it empty.
Any fluid paint left inside the equipment, how little it may be, will solidify.
Flush thoroughly with solvent.

⚠ CAUTION

When you flush, keep the solvent pressure as low as possible (the minimum pressure enough for flushing).

NOTICE

For a short-term equipment shut-down with resumption due in 24 hours, leave the equipment filled with solvent until you use the equipment again.
Do so each time you shutdown the equipment. It doesn't do any harm to the equipment but keeps it in a good operating condition.

(2) Take the nozzle off the gun. Wipe the nozzle mounting surface on the gun with a solvent-soaked rag. Then clean the nozzle (you may dip it into solvent for a while for cleaning).

(3) Set the airless nozzle in the reversed direction with the rear end facing the nozzle cleaner, then loosen the nipple letting air jet out blowing out the materials that clogged the nozzle.

⚠ WARNING

Please exercise extreme care when cleaning or replacing the nozzle. Bring the pressure down following the "Pressure Relief Procedure" and then take the nozzle off. It is quite dangerous to try to remove paint stuck in the nozzle unless the pressure is completely removed, with the trigger locked.

Follow the procedure described below to relief pressure.

<<Pressure Relief Procedure>>

① Lock the trigger.

② Shut off air supply by turning the pressure control dial counter-clockwise, bringing down the pressure all the way.

③ Relive the ball cock, bring down the system pressure to zero.
Unlock the trigger and pull it for double-checking.

④ Lock the trigger again.

● **When the nozzle or hose is clogged or when it is suspected that some pressure still remains after going through the "Pressure Relief Procedure," slowly loosen the chip guard mounting nut or the connector at hose end, gradually releasing the pressure until it is completely relieved. Then inspect the nozzle and hose.**

(4) Clean the material filter when the day's work is done.

⚠ WARNING

Before you take parts apart, always drain all paint fluid from the system and relief the pump operating pressure down to zero.

(5) Operate the "three-way ball cock" when you have to bring down the pressure instantly, for safety reasons. However, to relive the paint fluid pressure down to zero, open the "ball cock."

⚠ WARNING

When you shutdown the equipment for interruption or overnight stoppage, always lock the spray gun trigger. If you fail to do so, it may be pulled accidentally, and personal injury may result.

③ Color change and additive addition precautions

(1) When you change paint fluids, thoroughly flush the can with solvent so that no paint residue may be left unremoved. (Paint residue may cause the nozzle to get clogged.)

(2) When you add additives, do so through the filter.

(3) When you change paint colors, take the suction pipe out of the paint can, pull the trigger discharging all paint from the system (this way you can save solvent), then flush it with solvent repeating suction-circulation-discharge circles as many time as it takes to completely flush the fluid passage from the inlet to outlet. After this, change paint colors.

5 Maintenance

Equipment Maintenance Guidelines

① When the pump V packing is worn, replace.
(Rule of thumb: Replace every six months under normal operation condition.)

② When paint is solidified and accumulated in the pump, take it apart and clean.

⚠ WARNING

Before you take parts apart, always drain all paint fluid in the system and completely relieve the pump operating pressure and wrap air pressure down to zero.

③ Flush the spray gun by shooting solvent. In addition, you need to clean the contacting surfaces between the seat housing and nozzle by wiping with a thinner-soaked rag. When paint is solidified in the gun, take it apart and clean.

⚠ WARNING

Please exercise extreme care when cleaning or replacing the nozzle. Bring the pressure down following the "Pressure Relief Procedure" and then take the nozzle off. It is quite dangerous to try to remove paint stuck in the nozzle unless the pressure is completely removed, with the trigger locked.

④ Always keep the high-pressure fluid hose clean, free from paint residue and other contaminants. Remove deposited paint, if any. Always keep the hose free from mechanical shock.
(e.g., don't stomp on, don't put things on, don't run over with vehicle.)

⚠ WARNING

Never use a broken hose. Check the hose throughout its length for cut, fluid leak, wear, blister, scratches, and loose fitting. Should you find anything wrong, stop using the hose right there and then, and replace.

6 Tear Down Inspection and Parts Replacement Procedure

⚠ WARNING

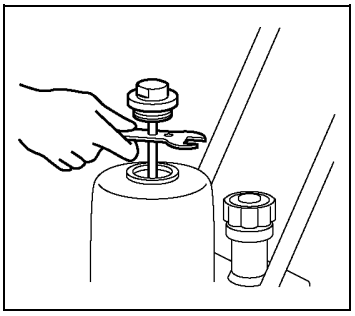
Before you take parts apart, always drain all paint fluid in the system and completely relieve the pump operating pressure and wrap air pressure down to zero.

① Air Motor

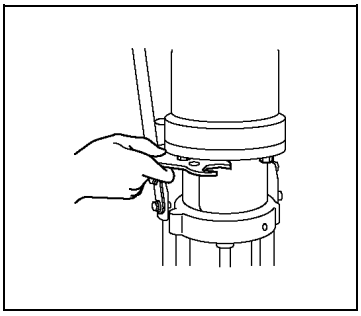
(See pages 22 and 23 for configurations and part names.)

When you apply grease to the cylinder interior or replace perishable parts, follow the procedure shown below. (See the exploded diagram for the index number referred to in the following instructions.)

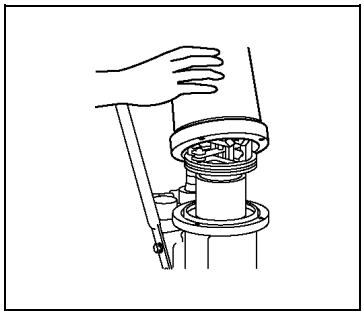
Before you take parts apart, always drain all paint fluid in the system and shutdown compressed air supply.



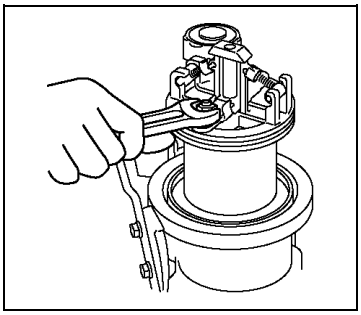
① Remove the cap (4) from the cylinder (1) using a special spanner that comes with the equipment.
At that time, the trip rod (15) comes off with the cap.
Disconnect the trip rod from the cap with a spanner.
(If the trip rod is not lifted up enough to provide a room for a spanner to be manipulated, life the cap. This will shift the valve pushing the shift rod up making access by a spanner possible.)



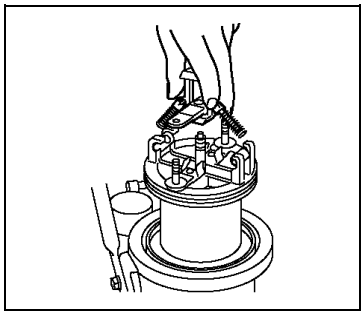
② Remove four hexagon head bolts (27).



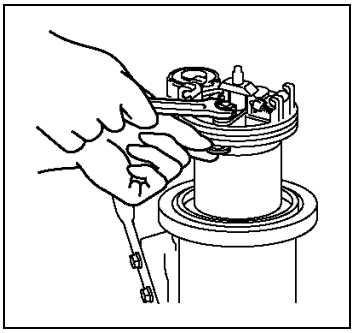
③ Carefully lift the cylinder and take it out from the top.
The entire piston (3) and air valve (12) will be exposed.



④ When you replace the air valves (12) and (16), do so with the toggle shuttle (5) lifted.
(In this case, the spring (10) will be pointing up diagonally.)



⑤ Remove the wire (11) and nut (18).
Carefully lift the toggle shuttle (5) off.



⑥ When you put them together again, do so in the reversed order.
When reassembling, carefully mount the stay so that it may move perpendicular to the hole and adjust the nut (18) so that a 3mm “clearance” may be provided between the air valve (12) and air hole.
If you find any damage to the “O”-ring, replace.

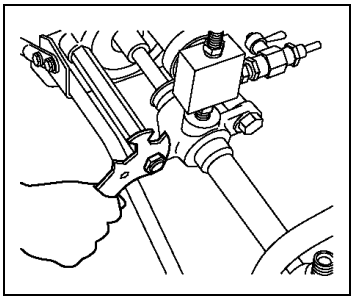
② Material Cylinder

(See page 23 for configurations and part names.)

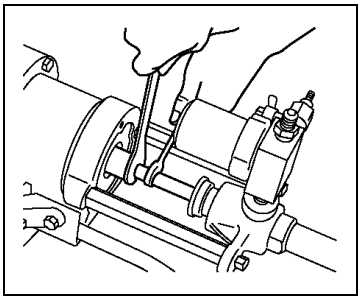
Shown below are the replacement procedures for the booster “V packing” at the upper end of the cylinder and the two suction “V packings” at the lower end of piston rod.

Packing can be adjusted by retightening the packing retainer (2).
Service the pump setting it flat horizontally.

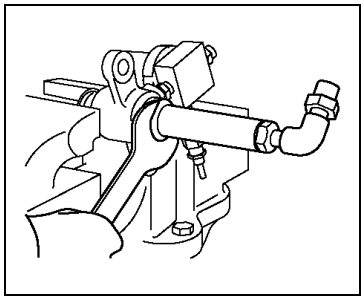
[Booster V Packing Replacement Procedure]



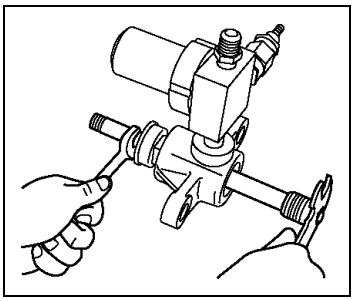
① Remove the accumulator hose.
Remove the nut for the stay that connects the pump housing (1).



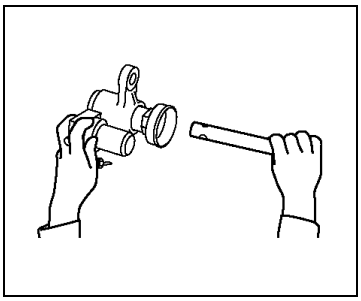
② Loosen the nut (26) disengaging the threaded portion of the rod and piston rod (6).
Disconnect the air motor from the material cylinder.



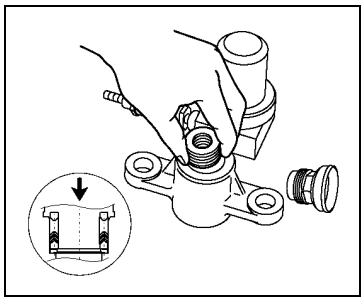
③ Remove the cylinder (14) from the pump housing (1).



④ Remove the packing from the check valve (8).
Pull the pump housing off the body.



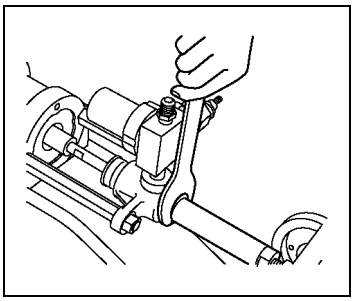
⑤ Put the packing retainer (2) back in.
Pull off the piston rod (6).
Remove the V packings.



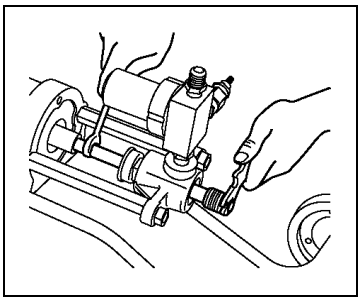
⑥ Put in new V packings, one by one.
(Install the packing gland and V packings with the convex side pointing up.)

Reassemble in the reverse order.

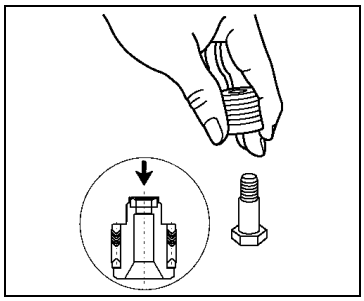
[Suction V Packing Replacement Procedure]



① Put a spanner on the two flat faces at the upper part of cylinder (14) and carefully unscrew to remove.
Then take out the piston rod (6) and V packings.



② Put a spanner on the piston rod (6) and unscrew the check valve (8) to remove it along with V packings.



③ Install new V packings, one by one.
(Install the packing gland and V packings with the convex side pointing down.)

7 Troubleshooting

※ For part index numbers, see pages 20 to 25.

Symptom	Cause	Remedy
1. No fluid pressure	① Air regulator, (22) on page 20, not opened.	① Fully open (turn clockwise).
	② Defective pressure gauge	② Replace it with a new one.
	③ Poor cleaning: Pump valve stuck due to hardened paint	③ Flush thoroughly with thinner. If hardened paint still remains after that, disassemble pump and clean.
2. Pressure does not rise to working pressure	① Air in fluid passage	① Pull spray gun trigger for air bubble purging through fluid circulation.
	② Insufficient fluid supply	② Replenish fluid.
	③ Worn V packings	③, ④ Replace V packings following V Packing Replacement Procedure.
	④ V packing installed in reversed direction	
	⑤ Clogged suction filter, (8) on page 20, not sucking enough	⑤ Clean suction filter (8).
3. Pump runs, but amortizing poorly	① Insufficient compressed air supply capacity	① Replace compressor with one with larger capacity.
	② Compressed air supply hose too small in diameter	② Use larger hose in terms of diameter.
	③ Much compressed air consumed elsewhere	③ Provide a separate compressed air source for exclusive use.
	④ Air regulator, (22) on page 20, not operating properly or setting pressure too low	④ Readjust.
	⑤ Insufficient fluid	⑤ Replenish fluid.
	⑥ Clogged material filter, (6) on page 20	⑥ Clean filter.
	⑦ Worn air motor valve or pump packing	⑦ Replace perishable parts with new ones following Parts Replacement Procedure.
	⑧ Nozzle of filter clogged with foreign materials	⑧ Flush and clean.
	⑨ Worn nozzle	⑨ Replace nozzle with a new one. (If worn too fast, suspect nozzle compatibility with fluid. Also, if pressure too high, nozzle service life gets shorter.)
4. Fluttering spray and tails	① ① through ⑨ per 3 above, apply	① Check ① through ⑨ per 3 above.
	② Fluid viscosity too high	② Adjust viscosity to proper level.
5. Pump does not stop when stop spraying	① No fluid	① Replenish fluid.
	② Leak from fluid passage	② Bring fluid pressure down to zero and retighten.
	③ Worn V packings	③ Replace V packings with new ones.

Symptom	Cause	Remedy
6. Pump fails to operate if compressed air introduced	① Seizure of rod, (20) on page 21, and oiles metal, (19) on page 22	① Disassemble and clean rod (20) and metal (19). Replace oil seal (26) with new one. If damage is found to rod (20) or metal (19), replace.
	② Packing retainer, (2) on page 22, too tight	② Loosen packing retainer (2). Then retighten it by hand until you can not turn it any further. Then turn it about another 90 ° using a spanner. That will be tight enough.
7. Air leak (Sound is heard when air leaks)	① Air valve, (12) on page 21, is stuck in middle of stroke	① Remove cap (4) and lift trip rod (15).
	② Air valve, (12) on page 21, is defective	② Replace
	③ Spring, (10) on page 21, is defective	③ Replace
8. Pump operates, but output low	① Clogged suction filter (8) on page 20	① Remove and clean. If filter gets clogged all too soon, suspect incompatibility. Contact us.
	② Worn V packings affecting suction performance	② Replace packings with new ones
	③ Foreign materials between valve seat and ball	③ Remove and clean
9. Fluid flow suddenly stops while spraying	Clogged nozzle	Dip nozzle into thinner for a while to make foreign materials softer. Then blow out with compressed air from the opposite end.

NOTICE

V Packing Replacement Precautions

(1) Install V packings in the correct direction with the convex side pointing in the right direction.

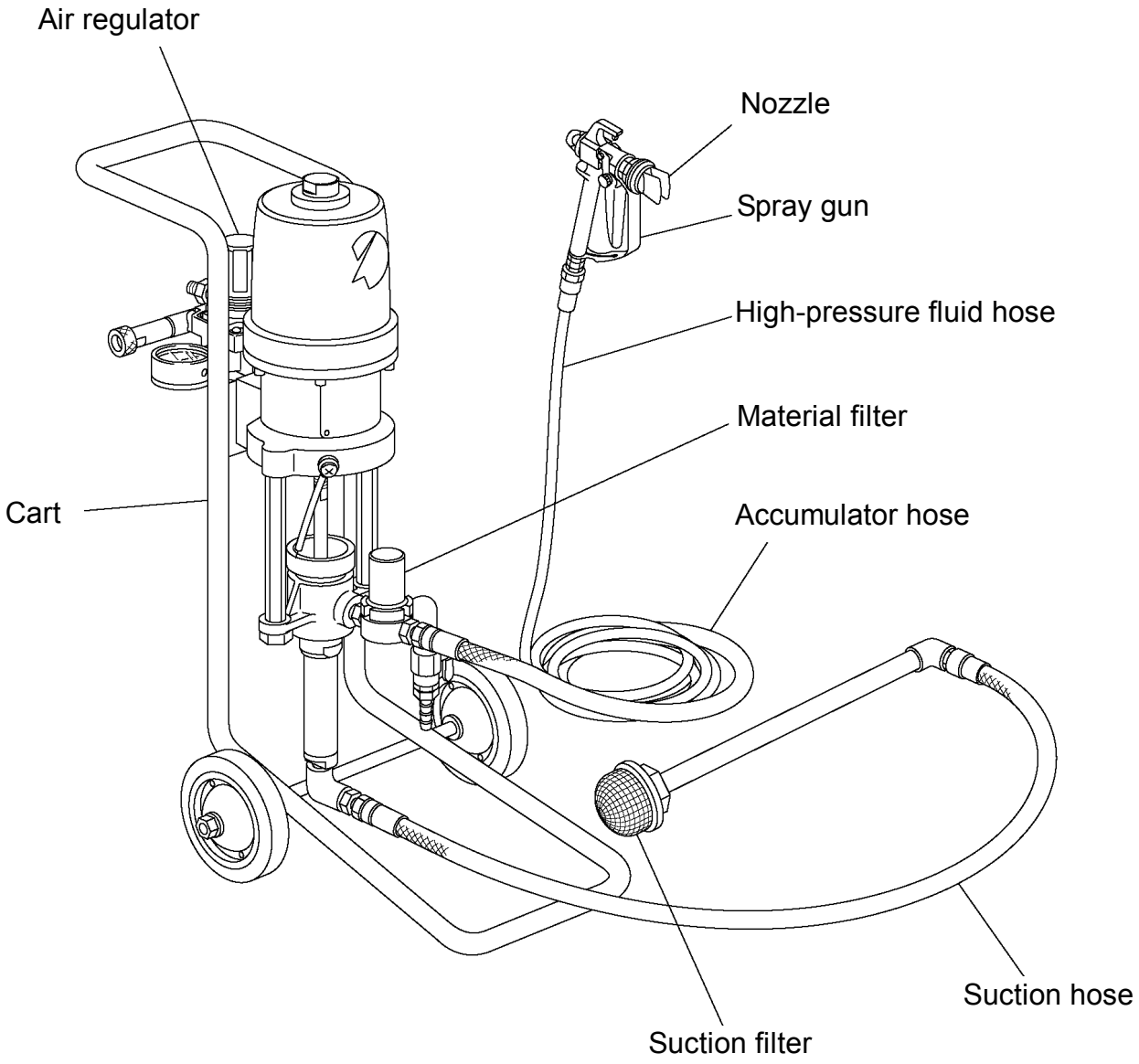
(2) Cylinder (14) clearance should be such that it can be pushed in by hand. When it's too tight, do not use plain washers (11) at all or use only one washer.
If the clearance is too tight, cylinder stroke may get sticky.
If the clearance is too loose, suction failure may occur.

(3) To mount the packing retainer (2), tighten it by hand as far as you can. Then tighten it further with a spanner for another 15° ~ 30°.
If you tighten excessively, operational failure may occur.
If you tighten insufficiently, oil leak may occur.
Proper retightening at the end of service work helps packing to last longer.

⚠ CAUTION

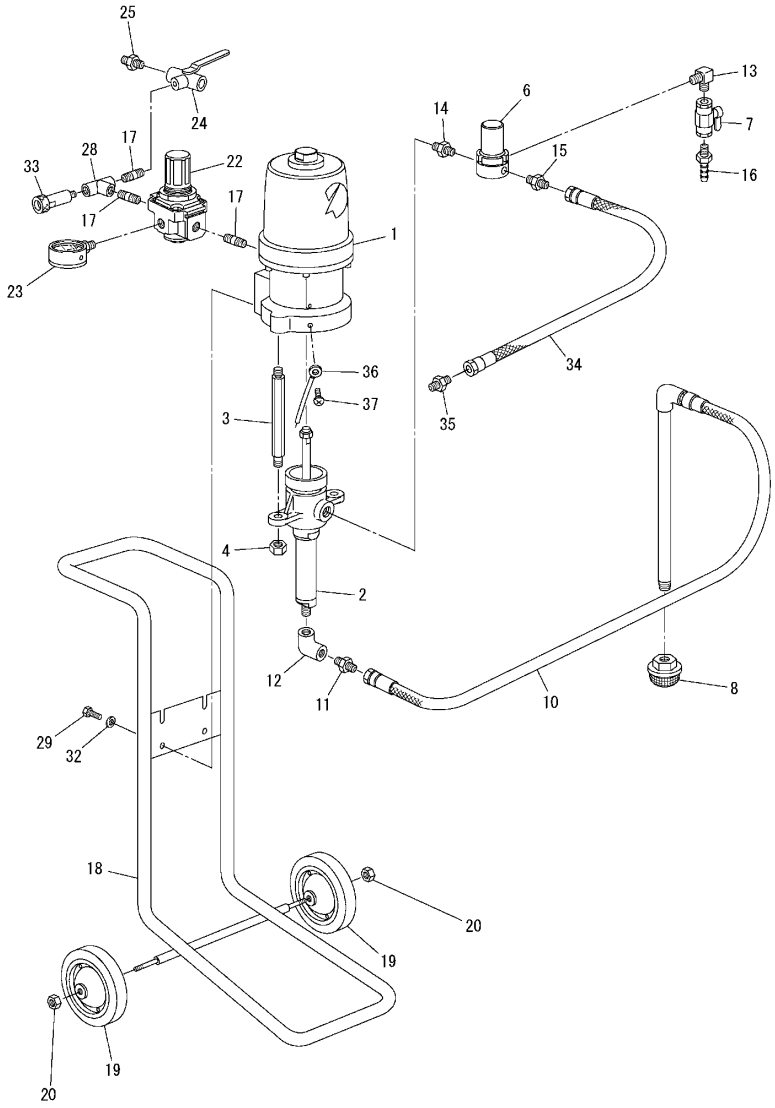
When you replace the suction filter (8) on page 20, be sure to wear safety gloves to avoid possible injury.

8 Exploded Diagram and Names of Parts



SP1021

40338-9



Airless Pump SP1021 <40338-9>

No.	Part No.	Part name	Qty	Remarks
1	0101-2	Air motor	1set	
2	0201-7	Material cylinder	1set	
3	4101-101	Stay	2	
4	4101-002	Hex. nut	2	
6	0410	Material filter	1set	
7	0902	Ball cock	1	
8	0526-043	Suction filter	1	40 mesh
10	5601-1	Suction hose	1	※
11	247-2304	Hose joint	1	
12	201-3003	Elbow	1	
13	279-2002	Elbow	1	
14	287-2003	High-pressure nipple	1	
15	3201-012	Hose joint	1	
16	3203-001	Hose fitting	1	
17	232-1002	Thick-walled nipple	3	

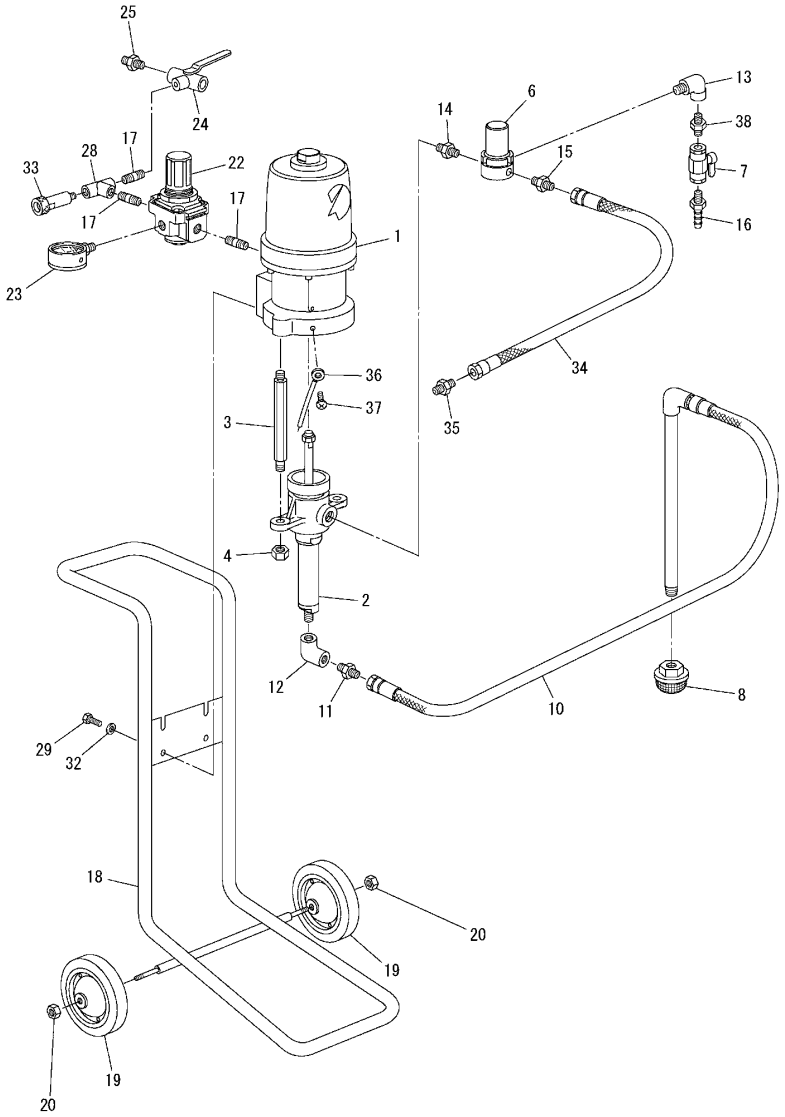
No.	Part No.	Part name	Qty	Remarks
18	2067-301	Cart frame	1set	
19	309-0004	Caster	2	
20	15-10800	Hex. nut	2	
22	301-0025	Air regulator	1	
23	305-0003	Pressure gauge	1	
24	325-0009	Three-way ball cock	1	
25	347-0001-1	Nipple	1	
28	205-3002	Tee	1	
29	01-10820	Hex. bolt	4	
32	37-10800	Plain washer	4	
33	1405	Nozzle cleaner	1	
34	563-1020	Accumulator hose	1	
35	3202-211	Interim nipple	1	
36	40338-024	Grounding wire	1set	
37	68-10406	Cross-recessed pan-head screw	1	

CAUTION: The specifications and configurations of this equipment are subject to change without prior notice in order to incorporate improvements being made continuously.

※ See 52A-0008 for hose.

SP1021S

40376-1



Airless Pump SP1021S <40376-1>

No.	Part No.	Part name	Qty	Remarks
1	0101-2	Air motor	1set	
2	0231-2	Material cylinder	1set	
3	4101-101	Stay	2	
4	4101-002	Hex. nut	2	
6	0411	Material filter	1set	
7	0913	Ball cock	1	
8	0526-043	Suction filter	1	40 mesh
10	5611-1	Suction hose	1	※
11	247-4304	Hose joint	1	
12	201-4003	Elbow	1	
13	285-4002	Elbow	1	
14	287-4003	High-pressure nipple	1	
15	3211-012	Hose joint	1	
16	3213-001	Hose fitting	1	
17	232-1002	Thick-walled nipple	3	
18	2067-301	Cart frame	1set	

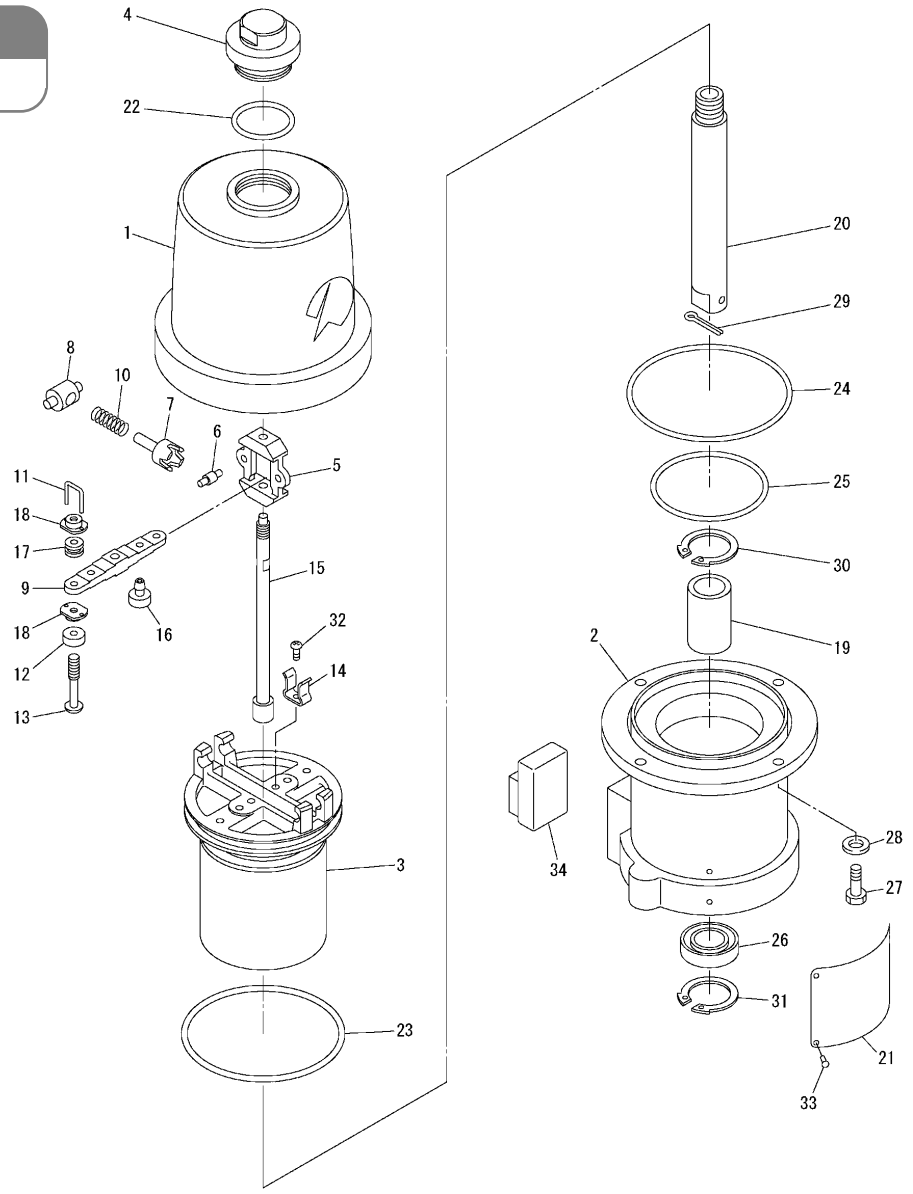
No.	Part No.	Part name	Qty	Remarks
19	309-0004	Caster	2	
20	15-10800	Hex. nut	2	
22	301-0025	Air regulator	1	
23	305-0003	Pressure gauge	1	
24	325-0009	Three-way ball cock	1	
25	347-0001-1	Nipple	1	
28	205-3002	Tee	1	
29	01-10820	Hex. bolt	4	
31	68-10406	Screw	1	
32	37-10800	Plain washer	4	
33	1405	Nozzle cleaner	1	
34	563-2020	Accumulator hose	1	
35	3212-205	Interim nipple	1	
36	40338-024	Grounding wire	1set	
37	68-10406	Screw	1	
38	287-4002	High-pressure nipple	1	

CAUTION: The specifications and configurations of this equipment are subject to change without prior notice in order to incorporate improvements being made continuously.

※ See 52A-0008 for hose.

AC1006

0101-2



Air motor AC1006 <0101-2>

No.	Part No.	Part name	Qty	Remarks
1	0101-201A	Cylinder	1	
2	0101-202A	Stand	1	
3	0101-003	Piston	1	
4	0101-304	Cap	1	
5	0101-005	Toggle shuttle	1set	
6	0101-006	Toggle pin	2	
7	0101-007	Toggle arm	2	
8	0101-008	Toggle locker	2	
9	0101-009	Valve bar	1	
10	0101-010	Spring	2	
※11	0101-011	Wire	2	
※12	0101-012	Air valve	2	
13	0101-013	Stay	2	
14	0101-014	Clip	2	
15	0101-115	Trip rod	1	
※16	0101-016	Air valve	2	
※17	0101-017	Washer	2	

No.	Part No.	Part name	Qty	Remarks
18	0101-118	Nut	4	
19	0101-019	Oilless metal	1	
20	0101-120	Rod	1	
21	0101-421	Nameplate	1	
22	103-6025	O-ring	1	
※23	103-6047	O-ring	1	
24	103-6050	O-ring	1	
※25	103-6040	O-ring	1	
26	151-0001	Oil seal	1	
27	01-10825	Hex. bolt	4	
28	0C-90800	Spring washer	4	
※29	49-10332	Split pin	1	
30	56-13200	Stop ring	1	
31	56-13800	Stop ring	1	
32	68-20406	Screw	2	
33	91-40408	Parker stud	4	
34	0101-036	Noise-canceling unit	1	

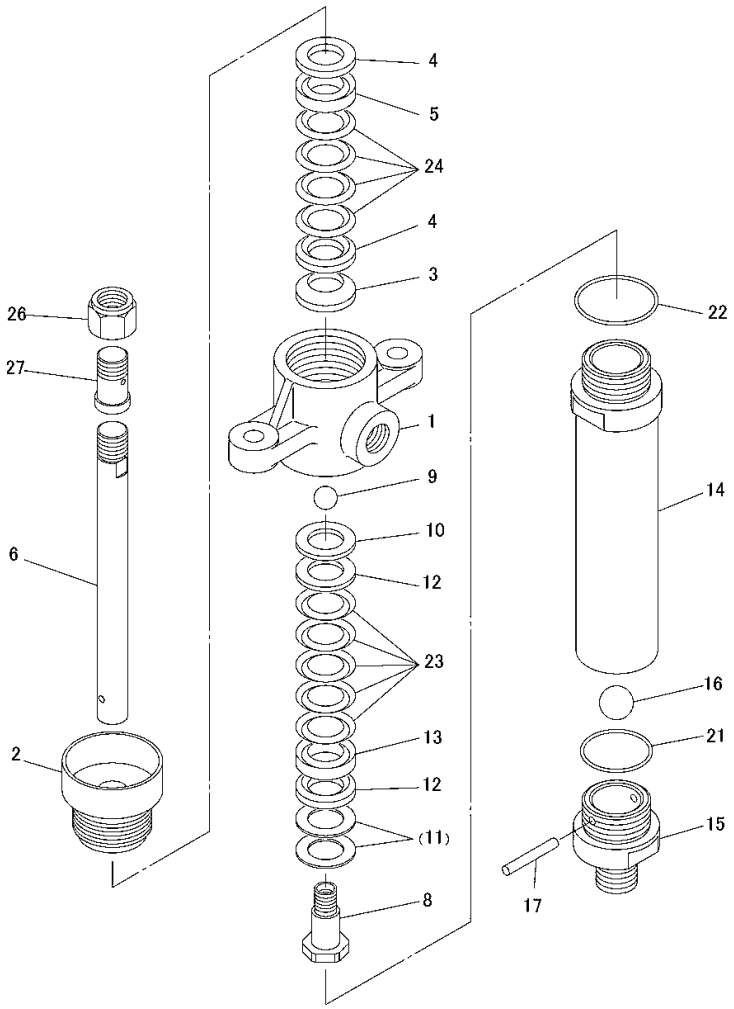
Items marked with ※ are those items that we recommend you carry in your stock.

MC2106

0201-7

MC2106S

0231-2



Material cylinder MC2106 <0201-7>

No.	Part No.	Part name	Qty	Remarks
1	0201-101	Pump housing	1	
2	0201-702	Packing retainer	1	
3	0201-725	Ring springing	1	
4	0201-005	Packing gland	2	
5	0201-007	Retainer	1	
6	0201-306	Piston rod	1	
8	0201-108	Check valve	1set	
※9	0201-009	Valve ball	1	
10	0201-010	Ring	1	
11	0201-011	Plain washer	(2)	There cases where this item is not used
12	0201-013	Packing gland	2	
13	0201-003	Retainer	1	
14	0201-014	Cylinder	1	
15	0201-115	Foot valve	1set	
※16	0201-016	Valve ball	1	
17	0201-017	Pin	1	
※21	103-6015	O-ring	1	
※22	103-6020	O-ring	1	
※23	V851180217	V packing	5	
※24	V851500280	V packing	4	
26	0201-026	Nut	1	
27	0201-027	Special joint	1	

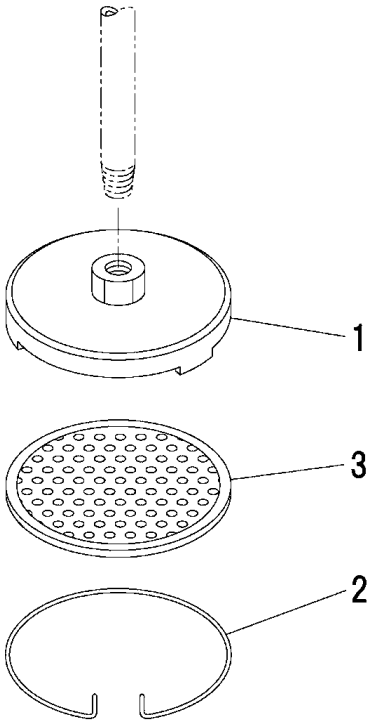
Material cylinder MC2106S <0231-2>

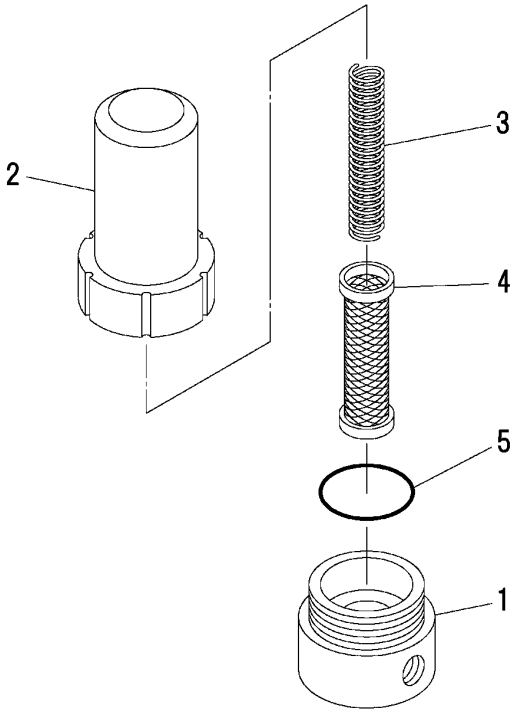
No.	Part No.	Part name	Qty	Remarks
1	0231-001	Pump housing	1	
2	0231-202	Packing retainer	1	
3	0201-725	Ring springing	1	
4	0231-005	Packing gland	2	
5	0201-007	Retainer	1	
6	0231-406	Piston rod	1	
8	0231-108	Check valve	1set	
※9	0231-009	Valve ball	1	
10	0231-010	Ring	1	
11	0231-011	Plain washer	(2)	There cases where this item is not used
12	0231-013	Packing gland	2	
13	0201-003	Retainer	1	
14	0231-014	Cylinder	1	
15	0231-115	Foot valve	1set	
※16	0231-016	Valve ball	1	
17	0231-017	Pin	1	
※21	103-6015	O-ring	1	
※22	103-6020	O-ring	1	
※23	V851180217	V packing	5	
※24	V851500280	V packing	4	
26	0201-026	Nut	1	
27	0201-027	Special joint	1	

Items marked with ※ are the parts we recommend you to carry in stock.

SF903	SF903S
0501	0511

MF50E	MF50ES
0410	0411





<Optional Items>

Suction filter SF903 <0501>, SF903S <0511>

No.	Part No.	Part name	Qty	Remarks
1	0501-001	Filter body	1	SF903
	0511-001			SF903S
2	0501-002	Snap	1	
※3	0501-003-06	Screen	1set	60 mesh

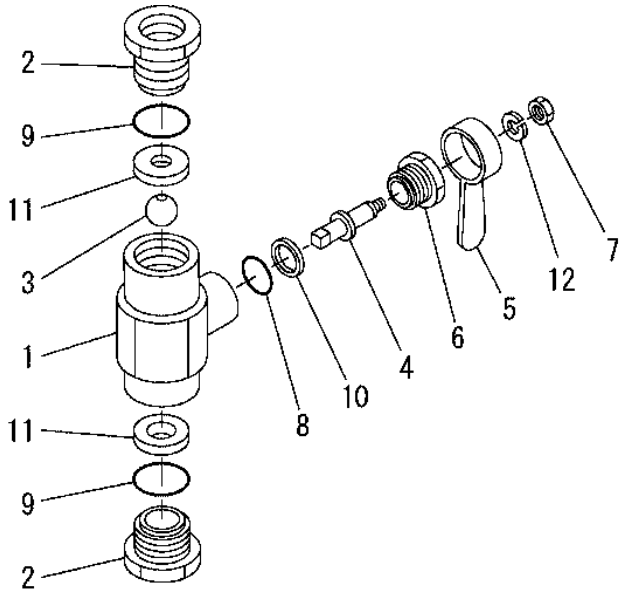
Material filter MF50E <0410>, MF50ES <4011>

No.	Part No.	Part name	Qty	Remarks	
1	0410-001	Base	1	MF50E	
	0411-001			MF50ES	
2	0410-002	Housing	1	MF50E	
	0411-002			MF50ES	
3	0402-005	Spring	1	MF50E	
	0412-005			MF50ES	
※4	0402-004-06	Screen	1	60 mesh	MF50E
	0412-004-06				MF50ES
※5	102-2040	O-ring	1		

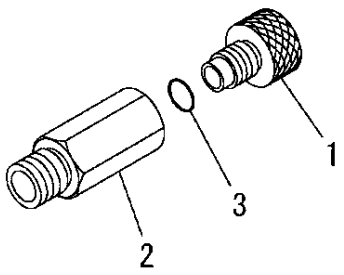
Items marked with ※ are the parts we recommend you to carry in stock.

HPC2T **0902**

HPC2TS **0913**



NC **1405**



Ball cock HPC2T <0902> , HPC2TS <0913>

No.	Part No.	Part name	Qty	Remarks
1	0902-001	Body	1	HPC2T
	0913-001			HPC2TS
2	0902-002	Nipple	2	HPC2T
	0913-002			HPC2TS
3	0902-003	Ball	1	
4	0902-004	Shaft	1	HPC2T
	0913-004			HPC2TS
5	1507-107	Handle	1	
6	0902-006	Screw	1	HPC2T
	0913-006			HPC2TS
7	0902-007	Nut	1	
※8	103-6004	O-ring	1	
※9	103-6009	O-ring	2	
※10	144-2002	Packing	1	
※11	145-2006	Packing	2	
12	41-50400	Spring washer	1	

Nozzle cleaner NC <1405>

No.	Part No.	Part name	Qty	Remarks
1	1405-001	Nipple	1	
2	1405-002	Socket	1	
3	144-4001	Packing	1	

Items marked with ※ are the parts we recommend you to carry in stock.

9 Maintenance Log

Shown below is a maintenance log format of a kind we recommend you to keep. Each time that you conduct a maintenance service, such as replacement of a part, tear-down cleaning, post-failure repair, etc., record the details. In the long run, you will find that such a log is very valuable in keeping your equipment in a consistently good operating condition.

Equipment name			MINI BEAR <SP1021>		Date of acquisition: YYYY/MM/DD	
Date of service			Portion worked on	Description	Results	Who serviced
						In-house / Agency / Asahi Sunac
						In-house / Agency / Asahi Sunac
						In-house / Agency / Asahi Sunac
						In-house / Agency / Asahi Sunac
						In-house / Agency / Asahi Sunac
						In-house / Agency / Asahi Sunac
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						In-house / Agency / Asahi Sunac

NOTE: Due to continuous improvements and modifications, the configurations and specifications of the equipment specified herein are subject to change without prior notice.

10 Warranty

ASAHI SUNAC CORPORATION (the “Company”) shall provide the original purchaser (the “Purchaser”) with warranty service against defects in material or workmanship for a period of one (1) year from the date of purchase of the product, as follows:

- Should you find defects in material or workmanship with regard to parts, ship them back to the Company, freight prepaid. The Company shall repair or replace the parts free of charge and reimburse the freight charges, provided that, as a result of an inspection and investigation of the parts conducted by the Company, the defects are deemed to be to attributable to the factors within the Company’s responsibility.

- When, on the other hand, defects are found, as a result of inspection and investigation conducted by the Company, to be attributable to natural wear, corrosion, negligence, accidents, an act of God, installation contrary to the Company’s instructions, abusive use or misuse, operation contrary to the instructions appearing in the manual, or unauthorized modification, this warranty shall not apply. Neither shall it apply to any services that are conducted outside Japan. In these circumstances, any costs that may be incurred on repair or freight shall be the responsibility of the Purchaser.

- In the event also of failure caused by use in conjunction with a hose or a gun, etc. of a maker not approved by the Company, the warranty does not apply. In these circumstances, the Company will submit a quotation for the costs of whatever corrective measures are necessary, repair or replacement, including relevant terms and conditions.

- As for items such as parts purchased by the Company from another manufacturer, the warranty of that manufacturer shall apply.

- As for any parts deemed to be defective, the Company shall not be held liable for any expenses beyond the provision of replacement parts free of charge.

- The Company shall not be held liable for any damage to the Purchaser caused by factors not attributable to the Company, such as misuse of product, etc.

- When a transfer of title of this equipment takes place, please ensure that this Operation and Maintenance Manual is handed over to the new owner.
- This equipment is manufactured in compliance with the Laws and Regulations of Japan.
  In the rare eventuality of this equipment being used outside Japan, compliance with the safety standards of the relevant countries is of course mandatory.

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ASAHI SUNAC

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