

10:1 Ratio Stainless Steel

DynaMite™ 190 Extruders

308302Y

EN

Used for precision dispense of single component viscous materials for 1 quart (.95 liter) and 1 gallon (3.79 liter) containers. For professional use only.

Not approved for use in European explosive atmosphere locations.

Part No. 25D097, Series B

Part No. 235871, Series D

Includes Pump and Ram

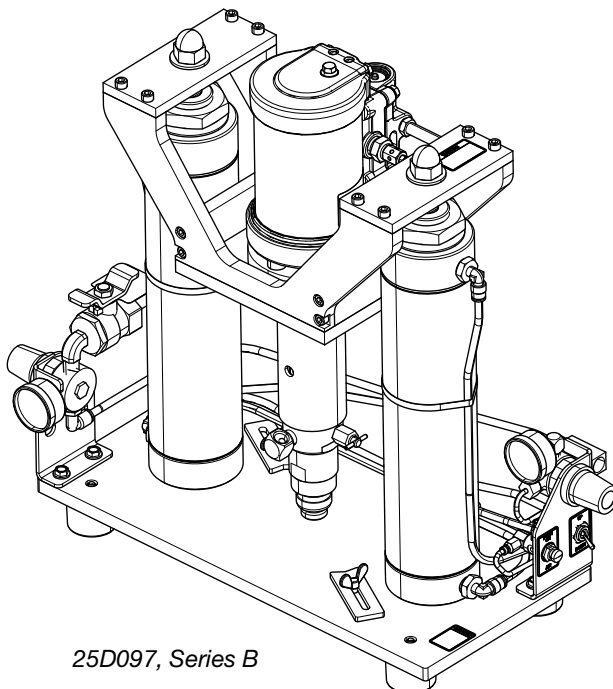
1000 psi (6.9 MPa, 69 bar) Maximum Fluid Working Pressure

100 psi (0.7 MPa, 7 bar) Maximum Air Inlet Pressure

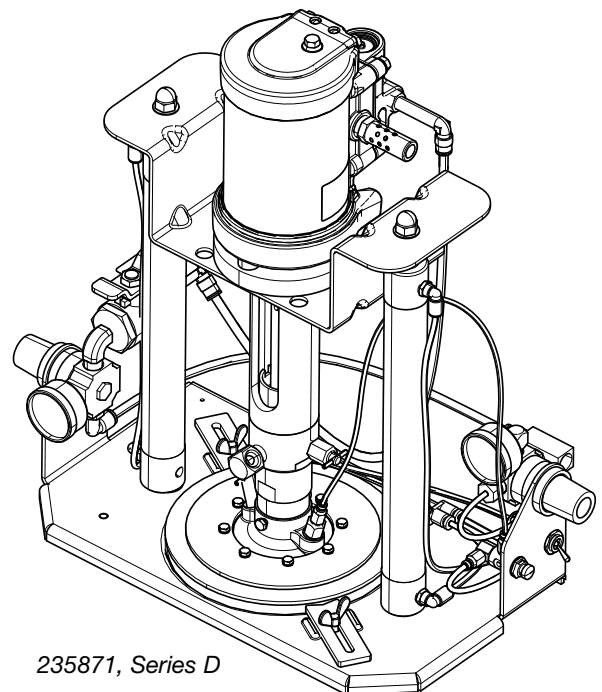


Important Safety Instructions

Read all warnings and instructions in this manual and in all related manuals. Save all instructions.



25D097, Series B



235871, Series D



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Related Manuals

Manuals	
Part	Description
3A3442	NXT Air Motor Repair and Parts Manual
3A5311	Tandem Heavy Duty DynaMite™ Supply System Instructions - Parts Manual

Part Numbers

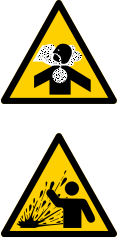
Part No.	Maximum Fluid Working Pressure	Description
235871	1000 psi (6.9 MPa, 69 bar)	DynaMite 190 Extruder Assembly, Series D -  Approved
25D097	1000 psi (6.9 MPa, 69 bar)	Heavy Duty DynaMite 190 Extruder Assembly, Series B -  Approved
235870	1000 psi (6.9 MPa, 69 bar)	DynaMite Pump Assembly, Series D
25C829	1000 psi (6.9 MPa, 69 bar)	Heavy Duty Pump Assembly - Series A and B
224908*		Wiper Plate, Series A, 1 gallon (3.79 liter) size
224923*		Wiper Plate, Series B, 1 quart (.95 liter) size
25C843*		Heavy Duty Wiper Plate, Series A, 1 gallon (3.79 liter) size

* Wiper plates must be ordered separately.

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

 WARNING	
	SKIN INJECTION HAZARD High-pressure fluid from spray gun, dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. Get immediate surgical treatment. • Do not point the dispensing device at anyone or at any part of the body. • Do not put your hand over the fluid outlet. • Do not stop or deflect leaks with your hand, body, glove, or rag. • Follow the Pressure Relief Procedure when you stop dispensing and before cleaning, checking, or servicing equipment. • Tighten all fluid connections before operating the equipment. • Check hoses and couplings daily. Replace worn or damaged parts immediately.
	MOVING PARTS HAZARD Moving parts can pinch, cut or amputate fingers and other body parts. • Keep clear of moving parts. • Do not operate equipment with protective guards or covers removed. • Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the Pressure Relief Procedure and disconnect all power sources.

 WARNING	
	FIRE AND EXPLOSION HAZARD Flammable fumes, such as solvent and paint fumes, in work area can ignite or explode. Paint or solvent flowing through the equipment can cause static sparking. To help prevent fire and explosion: • Use equipment only in well ventilated area. • Eliminate all ignition sources; such as pilot lights, cigarettes, portable electric lamps, and plastic drop cloths (potential static sparking). • Ground all equipment in the work area. See Grounding instructions. • Never spray or flush solvent at high pressure. • Keep work area free of debris, including solvent, rags and gasoline. • Do not plug or unplug power cords, or turn power or light switches on or off when flammable fumes are present. • Use only grounded hoses. • Hold dispensing device/gun firmly to side of grounded pail when triggering into pail. Do not use pail liners unless they are anti-static or conductive. • Stop operation immediately if static sparking occurs or you feel a shock. Do not use equipment until you identify and correct the problem. • Keep a working fire extinguisher in the work area.
	TOXIC FLUID OR FUMES HAZARD Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed. • Read Safety Data Sheet (SDS) to know the specific hazards of the fluids you are using. • Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.
	EQUIPMENT MISUSE HAZARD Misuse can cause death or serious injury. • Do not operate the unit when fatigued or under the influence of drugs or alcohol. • Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See Technical Data in all equipment manuals. • Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request Safety Data Sheet (SDS) from distributor or retailer. • Do not leave the work area while equipment is energized or under pressure. • Turn off all equipment and follow the Pressure Relief Procedure when equipment is not in use. • Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only. • Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards. • Make sure all equipment is rated and approved for the environment in which you are using it. • Use equipment only for its intended purpose. Call your distributor for information. • Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces. • Do not kink or over bend hoses or use hoses to pull equipment. • Keep children and animals away from work area. • Comply with all applicable safety regulations.
	PERSONAL PROTECTIVE EQUIPMENT Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. Protective equipment includes but is not limited to: • Protective eyewear, and hearing protection. • Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer

Component Identification

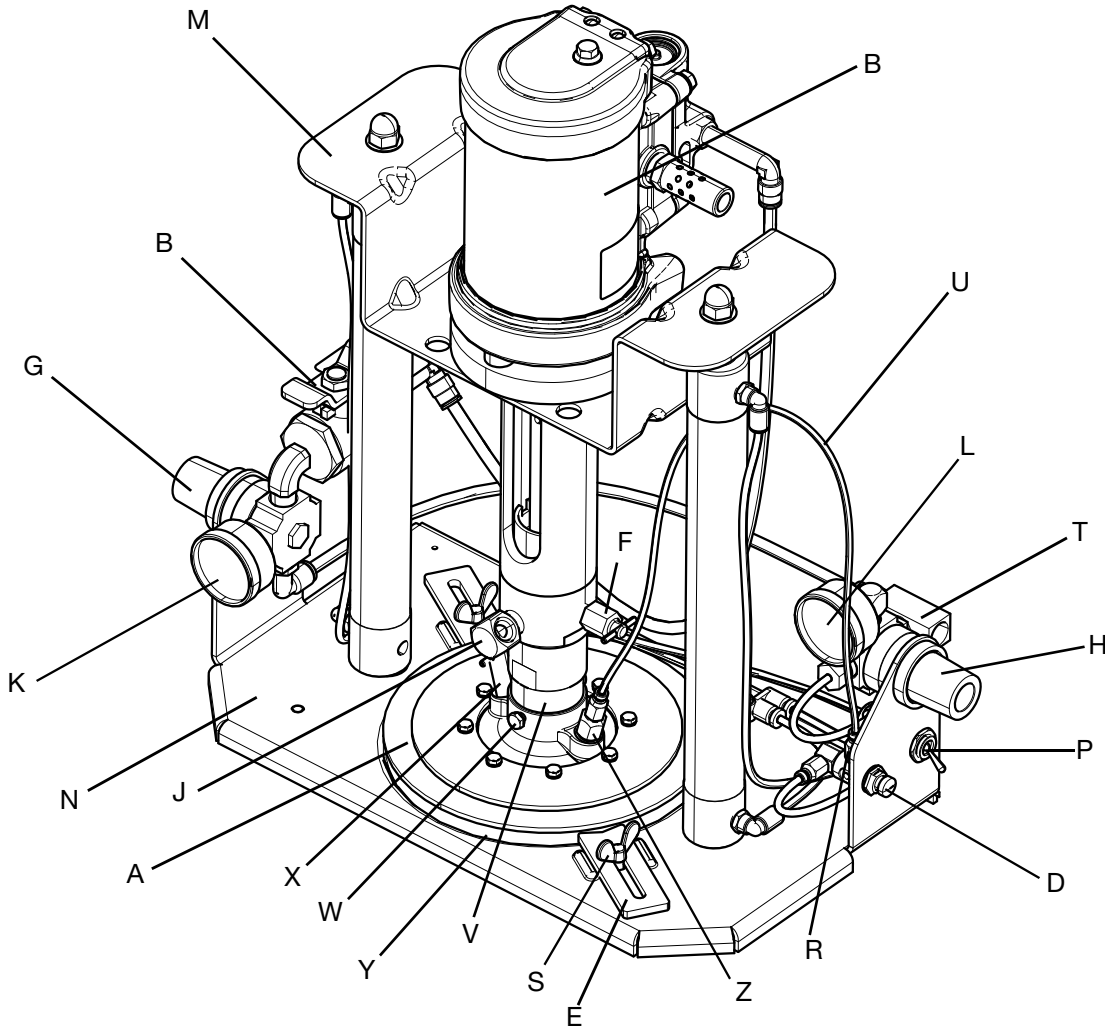


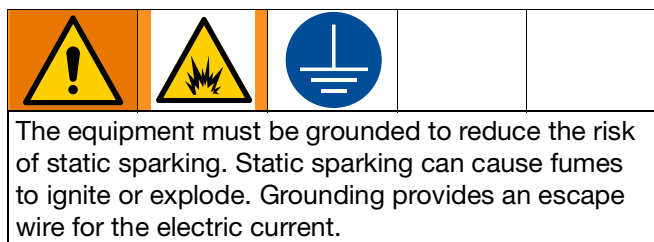
FIG. 1: System Components

Key:

A	Wiper Plate Assembly	N	Base
B	Pump	P	Ram Director Valve
C	Bleed-Type Mater Air Valve	R	Air Assist Valve Connector
D	Air Assist Valve (Push Button)	S	Clamp Wing Screws
E	Clamps	T	Main Air Line Inlet Fitting
F	Pump Bleeder Valve	U	Air Tube to Wiper Plate
G	(A) Pump Air Regulator	V	Pump Fluid Intake Housing
H	(B) Ram Air Regulator	W	Wiper Plate Cap Screws
J	Fluid Outlet Fitting	X	Wiper Plate Bleed Valve
K	(A) Pump Air Pressure Gauge	Y	Wiper Plate Ring
L	(B) Ram Air Pressure Gauge	Z	Wiper Plate Connector
M	Mounting Bracket		

Installation

Grounding



Pump: unscrew the green grounding screw (AA) and washer (AB) located on the ram base (AC). Install a 1.5 mm² (12 awg) minimum ground wire (AD) and secure with the screw and washer. Connect the other end of the ground wire to a true earth ground.

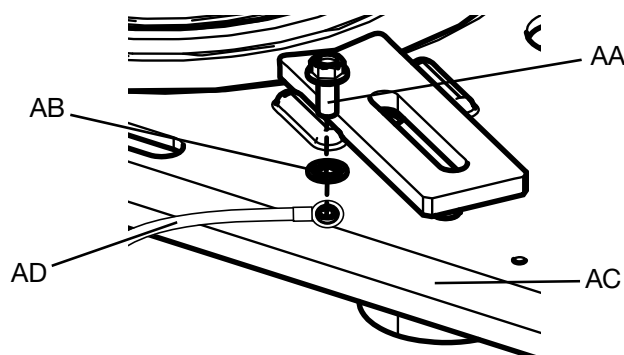


FIG. 2: Grounding Connection on Pump

Air and fluid hoses: use only electrically conductive hoses with a maximum of 500 ft. (150 m) combined hose length to ensure grounding continuity. Check electrical resistance of hoses. If total resistance to ground exceeds 29 megohms, replace hose immediately.

Air compressor: follow manufacturer's recommendations.

Spray gun / Dispense valve: ground through connection to a properly grounded fluid hose and pump.

Fluid supply container: follow local code.

To maintain grounding continuity when flushing or relieving pressure: hold metal part of the spray gun/dispense valve firmly to the side of a grounded metal pail, then trigger the gun/valve.

Pump Location and Set Up

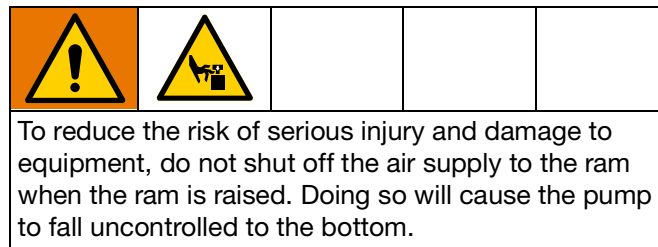


NOTE: Reference numbers and letters in parentheses in the text refer to the callouts in FIG. 1 on page 6 and the parts drawings. Refer to those for installation.

If you supply your own accessories, be sure they are adequately sized and pressure-rated to meet the system's requirements. Contact your Graco distributor for assistance in designing a system to suit your needs.

1. Place the unit on a hard, level surface. Check that the unit is level in all directions. Refer to **Dimensions** on page 31 to ensure that there is sufficient overhead clearance for the pump when the ram is fully raised. Leave room on both sides so the air regulators will be easily accessible.
2. See **Pump Components and Accessories** on page 8. Connect an air supply hose to the 1/4 npt(f) main air line inlet fitting (T). See FIG. 1 on page 6. See **Connect and Disconnect Tubes** on page 8.

Wiper Plate Setup



1. Unpack the wiper plate (A). Back out the wiper plate cap screws (W) so they clear the pump fluid intake housing (V).
2. Raise the ram by setting the ram director valve (P) to the up position and increasing the setting of the ram air regulator (H).
3. Place the wiper plate (A) on a 2 in. thick x 4 in. wide block of wood. Center the wiper plate and the wood block on the base, under the pump fluid intake housing (V).

- Set the ram air regulator (H) to zero. Set the ram director valve (P) to the down position. As the ram unit slowly falls, guide the pump fluid intake housing (V) into the wiper plate (A).
- Set the ram air regulator (H) to 10 psi (0.07 MPa, 0.7 bar). Push down on the pump to install the wiper plate (A) onto the pump fluid intake housing (V). Secure the wiper plate to the pump with the two wiper plate cap screws (W).
- Connect the 660 mm (26 in.) air line tube (U) from the air assist valve connector (R) at the air assist valve (D) to the wiper plate connector (Z) at the wiper plate (A). See **Connect and Disconnect Tubes** on this page.

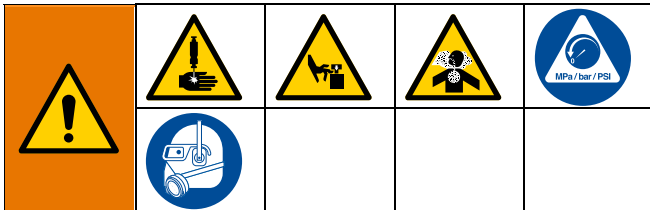
Connect and Disconnect Tubes

Follow these steps when connecting and disconnecting any air tubes on the DynaMite 190 Extruder assembly.

Connection

- Grasp the tube, then slowly push it straight into the fitting until it stops.
- Be sure that the tube is securely connected, and will not pull out when air pressure is applied. To check, pull gently on the tube.

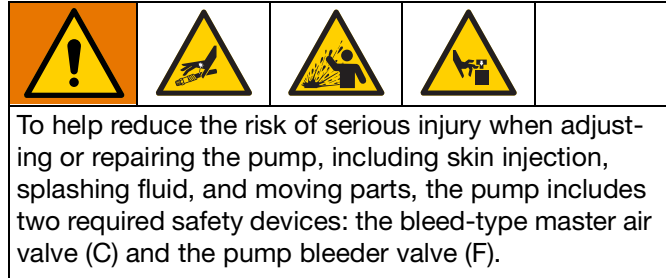
Disconnection



- Follow the **Pressure Relief Procedure** on page 9.
- Push evenly on the red release button on the fitting.
- While holding the release button in, pull the tube out of the fitting.
- To reuse the tubing, cut off the previous connection portion at 90°, being careful not to damage the outer diameter of the tube.

NOTE: Use of a tube cutter is recommended. The fitting will leak if the tubing is not cut at 90°.

Pump Components and Accessories



The following components are supplied with the pump (see FIG. 1 on page 6).

- The bleed-type master air valve (C)** is supplied with your system to relieve air trapped between this valve and the pump after the air is shut off. Trapped air can cause the pump to cycle unexpectedly. The valve is located close to the pump, downstream from the pump air regulator.
- The pump air regulator (G)** controls pump speed and outlet pressure by adjusting the air pressure to the pump. The regulator is located upstream from the bleed-type master air valve.
- The ram air regulator (H)** controls ram speed by adjusting the air pressure to the ram, and also controls the pressure exerted by the wiper plate on the fluid.
- The pump bleeder valve (F)** is supplied in your system to relieve fluid pressure in the displacement pump, hose, and dispensing valve. Triggering the dispensing valve to relieve pressure may not be sufficient. Be sure the drain hole in the valve is pointing down. This valve is also used to bleed air from the pump when priming.

Air Line

Connect an air supply line to the 1/4 npt(f) main air line inlet fitting (T). Install an air line filter and lubricator in the main air line. In the main air line, upstream from all other air line accessories, install a second bleed-type master air valve to shut off all air to the system and to isolate the accessories for servicing.

Fluid Line

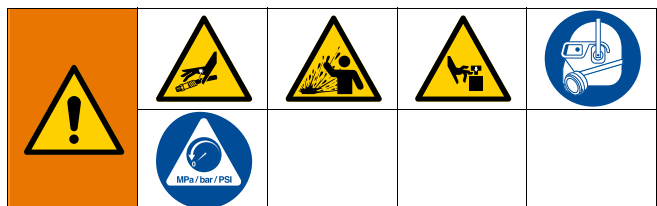
Connect a fluid line to the fluid outlet fitting (J). Connect a suitable dispensing valve to the free end of the line.

Operation

Pressure Relief Procedure



Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid, and moving parts, follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing the equipment.

1. Lock the sprayer, dispenser, or gun/valve trigger of the equipment that is being used with this extruder.
2. Disconnect the main air line from the machine.
3. Set the ram director valve to the down position. The ram slowly drops.
4. Quickly move the ram director valve up and down to bleed air from the ram cylinder.

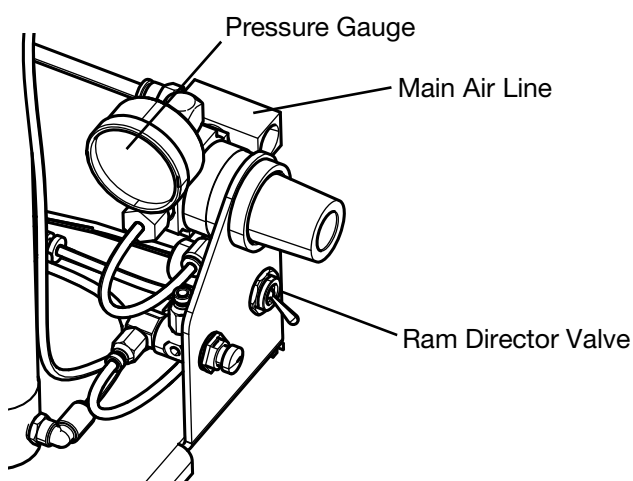


FIG. 3: Pressure Relief Components

5. Unlock the dispensing device trigger.
6. Hold a metal part of the gun/valve firmly to the side of a grounded pail and trigger the dispensing device to relieve pressure.
7. Lock the dispensing device trigger.
8. Open the pump bleeder valve.
9. Leave the pump bleeder valve open until you are ready to dispense again.

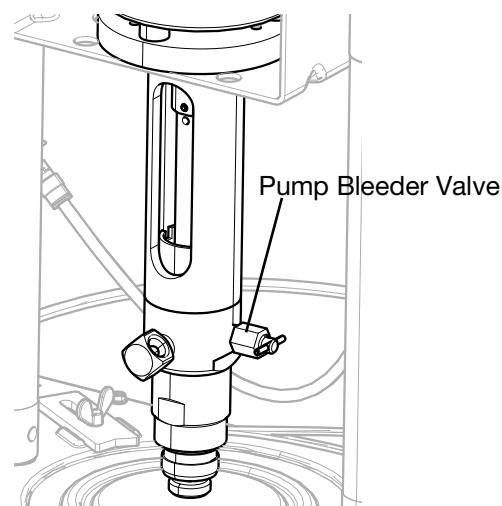
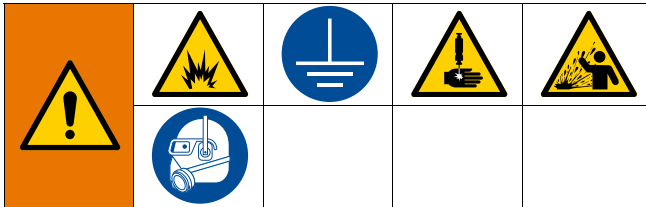


FIG. 4: Open Valves

If you suspect that the spray tip/nozzle or hose is completely clogged, or that pressure has not been fully relieved, proceed as follows:

10. Very slowly open the pump bleeder valve, having a container ready to catch the drainage.
11. Very slowly loosen the hose end coupling to relieve pressure gradually; then loosen it completely.
12. Clear the tip/nozzle or hose.

Flush the System



To avoid fire and explosion, always ground equipment and waste container. To avoid static sparking and injury from splashing, always flush at the lowest possible pressure.

NOTE: The pump is tested with lightweight oil, which is left in to protect the pump parts. If the fluid you are using might be contaminated by the oil, flush it out with a compatible solvent before using the pump.

Flush with a fluid that is compatible with the fluid you are pumping and with the wetted parts in your system. Check with your fluid manufacturer or supplier for recommended fluids and flushing frequency. Always flush the pump before fluid dries on the displacement rod.

NOTICE

Never leave water or water-based fluid in a carbon steel pump overnight. If you are pumping water-based fluid, flush with water first, then with a rust inhibitor, such as mineral spirits. Relieve pressure, but leave rust inhibitor in the pump to protect parts from corrosion.

1. Follow the **Pressure Relief Procedure** on page 9.
2. Remove the tip/nozzle from the dispensing device you are using with the pump.
3. Hold a metal part of the dispensing device firmly to the side of a grounded metal pail.
4. Start the pump. See **Start and Adjust the Pump** on page 11. Always use the lowest possible fluid pressure when flushing.
5. Trigger the dispensing device.
6. Flush the system until clear solvent flows from the dispenser.
7. Relieve the pressure. See page 9.

Start and Adjust the Ram



To reduce the risk of serious injury and damage to equipment, do not shut off the air supply to the ram when the ram is raised. Doing so will cause the pump to fall uncontrolled to the bottom. Also, as the ram is raised and lowered, the wiper plate, ram tubes, and pump mounting bracket move. To reduce the risk of pinching or amputation of fingers, keep your hands away from the wiper plate, lip of the fluid can, pump bracket, ram tubes, and air motor coupling cavity while the pump is operating.

NOTE: Reference numbers and letters in parentheses in the text refer to the callouts in FIG. 1 on page 6 and the parts drawings. Refer to those for operation.

1. Close all air regulators and bleed-type air valves.
2. Open the air valve in the main air line and set the ram air regulator (H) to 28 psi (200 kPa, 2 bar). Set the ram director valve (P) to the up position and let the ram rise to its full height. To change the speed at which the ram raises and lowers, adjust the air regulator to increase or decrease the air volume.
3. Check that the fluid can is not dented or out of shape, which will damage the wiper plate and cause leakage around the wiper. Cut off the top of the fluid can with the can opener, or remove the bottom of the can. Be sure that the edge is free of burrs, which will damage the wiper plate. If necessary, bend the edge back with pliers so the wiper plate will enter the can easily. Lubricate the wiper plate ring (Y) to help the plate enter the can easily.
4. Set a can of fluid on the ram base, centering it under the wiper plate (A).



If the can has a welded seam, position it with the seam facing the rear of the pump to avoid injury due to splattering fluid if the can leaks at the seam.

- Loosen the wiper plate bleed valve (X) enough to allow air trapped under the wiper plate to escape. With your hands away from the lip of the can and the wiper plate, set the ram director valve (P) to the down position and lower the ram until the wiper plate enters the can. Reduce the air pressure when the plate enters the can.

NOTE: If the wiper plate does not enter the can easily, increase the ram pressure; once it enters the can, immediately reduce the pressure.

- Continue to lower the ram until fluid appears at the wiper plate vent hole. Tighten the wiper plate bleed valve (X) securely. See FIG. 1 on page 6.
- Clamp the can in place with the clamps (E) and wing screws (S), being sure the clamp catches the lip of the can.

Start and Adjust the Pump



The air motor piston and fluid piston (located inside the air motor cylinder and coupling) move when air is supplied to the motor. Do not place your hand or fingers into the air motor coupling cavity while the pump is operating.

Also, keep hands and fingers away from the priming piston (see FIG. 9 on page 20) during operation and whenever the pump is charged with air. During operation, the priming piston extends beyond the intake housing to pull material into the pump and can amputate a hand or finger caught between it and the intake housing. Follow the **Pressure Relief Procedure** on page 9 before checking, clearing, or cleaning the priming piston.

- Supply fluid to the pump per the requirements of your system. See **Prime the Pump and Pump Fluid** on page 12.
- Close the pump air regulator (G).
- Set the ram air regulator (H) to 50 psi (3.5 bar).
- Set the ram director valve (P) to the down position.
- Reduce the air motor regulator pressure to zero and open the air motor valve.

- Adjust the air motor regulator until the pump starts.

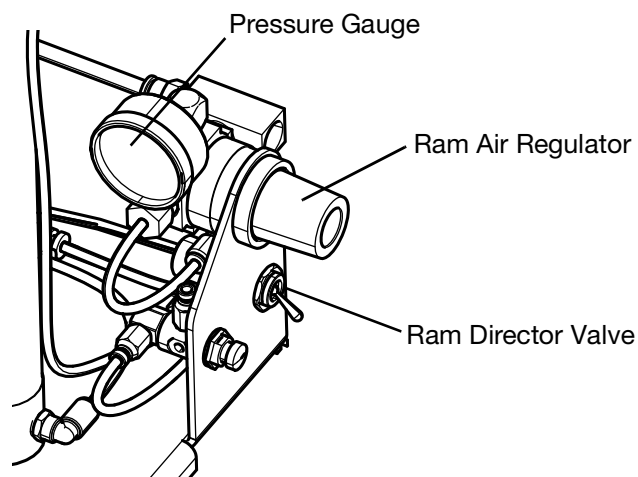


FIG. 5: Set Ram Director Valve for Startup

- Cycle the pump slowly until all air is pushed out and the pump and hoses are fully primed.
- Release the dispensing device trigger and lock the safety. The pump should stall against the pressure.



To reduce the risk of skin injection, do not use your hand or fingers to cover the bleed hole on the underside of the bleeder valve when priming the pump. Use the handle or a crescent wrench to open and close the bleeder plug. Keep your hands away from the bleed hole.

- If the pump fails to prime properly, open the pump bleeder valve slightly. Use the bleed hole on the underside of the valve as a priming valve until the fluid appears at the hole. Then close the plug.

NOTE: Always use the lowest possible fluid pressure to bleed air out of the pump.

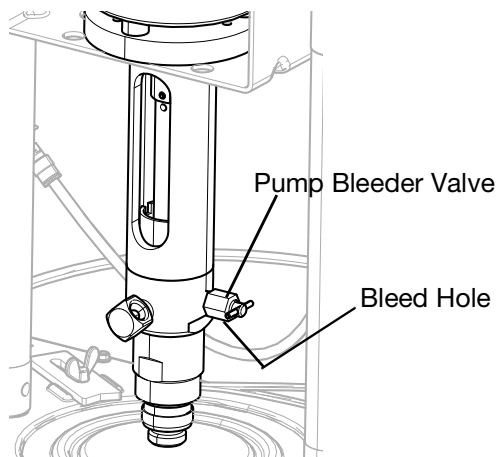


FIG. 6: Pump Bleeder Valve

NOTE: When changing fluid containers with the hose and dispensing device already primed, open the pump bleeder valve to help prime the pump and vent air before it enters the hose. Close the valve when all air is eliminated.

NOTICE

Do not allow the pump to run dry. It will quickly accelerate to a high speed, causing damage. If your pump is running too fast, stop it immediately and check the fluid supply. If the container is empty and air has been pumped into the lines, refill the container and prime the pump and the lines, or flush and leave it filled with a compatible solvent. Eliminate all air from the fluid system.

10. With the pump and lines primed, and with adequate air pressure and volume supplied, the pump starts and stops as you open and close the dispensing device. In a circulating system, the pump speeds up or slows down on demand until the air supply is shut off.

11. Use the air motor regulator to control the pump speed and the fluid pressure.

NOTICE

Always use the lowest air pressure necessary to get the desired results. Higher pressures cause premature tip/nozzle and pump wear.

Prime the Pump and Pump Fluid

1. Be sure the pump air regulator (G) is closed. Then set the ram air regulator (H) to be about 22 psi (150 kPa, 1.5 bar). Set the ram director valve (P) to the down position.
2. Open the bleed-type master air valve (C). Set the pump air regulator (G) to 28 psi (200 kPa, 2 bar).
3. Open the pump bleeder valve (F) to allow air to bleed from the pump. When the pump is fully primed, close the valve.
4. Keep the director valve switch (P) in the down position while the pump is operating.

NOTE: Adjust the air pressure to the ram as needed, but do not increase it to a level where fluid is forced past the wiper plate.

Change the Fluid Can

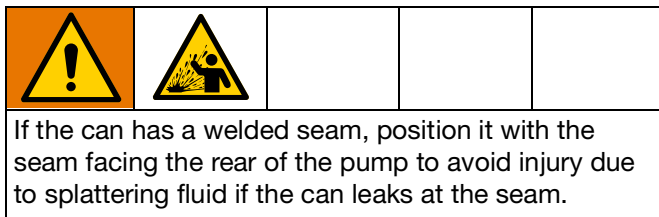


1. Stop the pump.
2. Close the bleed-type master air valve (C), but leave air pressure on to the ram.
3. Set the ram air regulator (H) to below 30 psi (210 kPa, 2.1 bar).
4. Open the dispensing valve and relieve all fluid pressure in the system. See the **Pressure Relief Procedure** on page 9.
5. Set the ram director valve (P) to up.
6. Push in the air assist valve (D) and hold it in until the wiper plate clears the top of the can.

NOTICE

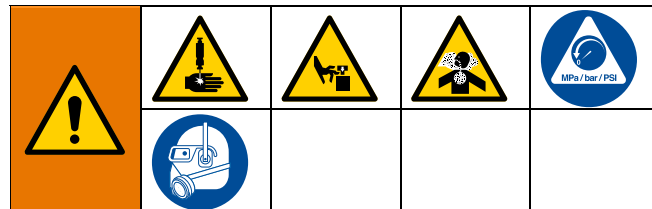
If the fluid has set up and the wiper plate (A) is stuck in the can, do not increase the setting of the ram air regulator (H) to remove the plate. Excessive pressure in the can may cause the can to rupture. If you cannot pull the can off the plate by hand, loosen the two wiper plate cap screws (W) holding the plate to the pump (B), disconnect the air tube (U) from the plate, and remove the can and plate. It may be necessary to cut the can to remove the plate.

7. Loosen the clamps (E) and remove the empty can. Set the full can on the ram base and position it under the wiper plate.



8. Lower the ram and adjust the position of the can relative to the wiper plate. See **Start and Adjust the Ram** on page 10.
9. Clamp the can in place.

Shutdown and Care of the Pump



NOTICE

Never leave water or water-based fluid in a carbon steel pump overnight. If you are pumping water-based fluid, flush with water first, then with a rust inhibitor, such as mineral spirits. Relieve pressure, but leave rust inhibitor in the pump to protect parts from corrosion.

1. Stop the pump at the bottom of the stroke to prevent fluid from drying on the exposed displacement rod and damaging the throat packings.
2. Set the ram director valve to the down position.

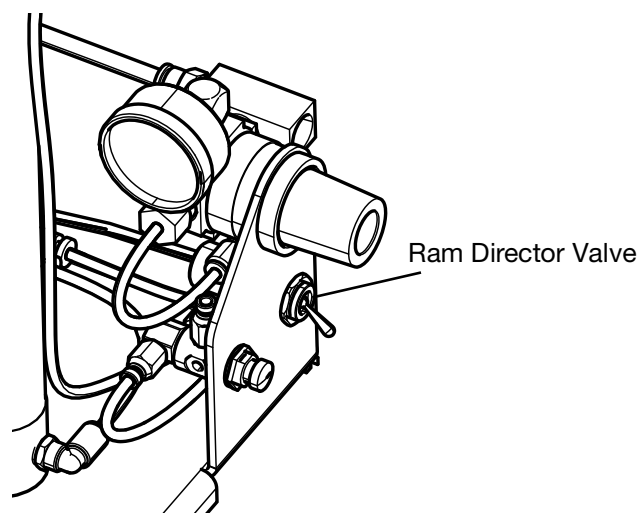
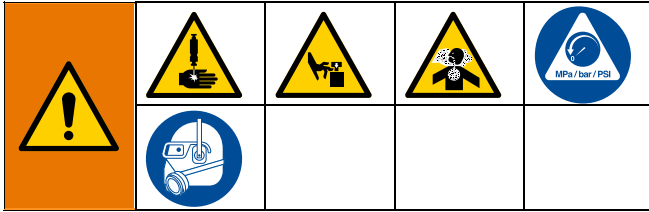


FIG. 7: Ram Director Valve Position for Shutdown.

3. Follow the **Pressure Relief Procedure** on page 9.
4. Always flush the pump before the fluid dries on the displacement rod.

Troubleshooting



Before servicing this equipment always make sure to follow the **Pressure Relief Procedure** on page 9.

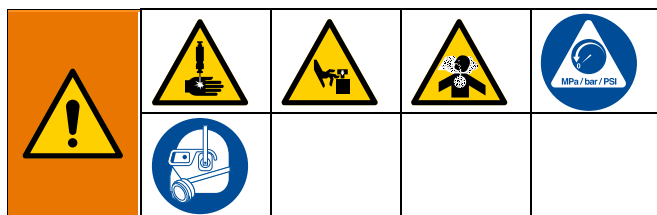
Check all possible problems and solutions before disassembling the pump.

Problem	Cause	Solution
Pump fails to operate.	Restricted line or inadequate air supply; closed or clogged valves.	Clear; increase air supply. Ensure that all valves are open.
	Obstructed fluid hose or gun/valve; fluid hose ID is too small.	Open, clear*; use a hose with a larger ID.
	Fluid dried on displacement rod.	Clean. Always stop pump at the bottom of the stroke. Keep enclosed wet cup 1/3 filled with a compatible solvent.
	Dirty, worn, or damaged motor parts.	Clean or repair; see separate motor manual.
Pump operates, but output is low.	Fluid is too heavy for pump priming	Use drain/purge valve. use a ram.
	Held open or worn intake valve or seals.	Clear valve. Replace seals.
Erratic or accelerated pump.	Exhausted fluid supply.	Refill and prime.
	Fluid is too heavy for pump priming.	Use drain/purge valve.
	Held open or worn intake valve of seals.	Clear valve. Replace seals.
	Held open or worn priming piston.	Clear; service.
	Worn packings in displacement pump.	Replace packings.

* To determine if the fluid hose or gun is obstructed, **relieve the pressure**. Disconnect the fluid hose and place a container at the pump fluid outlet to catch any fluid. Turn on the air just enough to start the pump (about 20-40 psi [140–280 kPa, 1.4–2.8 bar]). If the pump starts when the air is turned on, the obstruction is in the fluid hose or dispensing device.

Service

Disassembly



NOTE: Reference numbers and letters in parentheses in the text refer to the callouts in FIG. 8 and FIG. 10 on pages 18 and 21, and the parts drawings. Refer to those for service.

NOTE: Repair Kit 223894 is available to repair 235871, Repair Kit 25C844 is available to repair 25D097 Series A, and Repair Kit 26A972 is available to repair 25D097 Series B. Parts included in these kits are marked with a † symbol in the parts list on pages 24, 26, and 28. For the best results, use all the new parts in the kit.

235871 and 25D097 Series A

1. Follow the **Pressure Relief Procedure** on page 9.
2. Disconnect all hoses. Remove the wiper plate. Remove the fluid outlet fitting (28, 57), noting its position relative to the air inlet. Remove only the three screws (38, 55) and lock washers (41, 56) holding the pump to the mounting bracket (33, 37).
3. Rotate the pump so the bleeder valve (25, 58) is aligned with the slot in the mounting bracket (33, 37), and lift the pump straight up through the bracket.
4. Remove the pin (144) from the fluid piston (106). Unscrew the air motor shaft from the fluid piston by turning the screw (145).
5. Unscrew the adapter (214) from the cylinder coupling (196). Pull the air motor coupling straight up until it clears the fluid piston (106).
6. Hold the fluid piston (106) steady by inserting a small screwdriver or punch into the 4 mm diameter hole (BA). Remove the screw (145) and lock washer (135) holding the priming piston (115) to the priming piston rod (110).
7. Pull the priming piston rod (110) and fluid piston (106) straight up out of the fluid housing (109).

Remove the pin (123), and unscrew the priming piston rod from the fluid piston.

8. Unscrew the pump fluid intake housing (111) from the fluid housing (109). Remove the o-ring (161) from the intake valve housing.
9. Remove the intake valve (114) and valve stop (112) from the pump fluid intake housing (111).
10. Unscrew the wet-cup/packing nut (107). Remove the u-cup packing (163) from the throat. Remove the o-ring (162) from the wet-cup/packing nut.
11. Clean all parts with a solvent compatible with the fluid you are pumping, and inspect for wear or damage.

25D097 Series B

1. Follow the **Pressure Relief Procedure** on page 9.
2. Disconnect all hoses. Remove the wiper plate. Remove the fluid outlet fitting (28, 57), noting its position relative to the air inlet. Remove only the three screws (38, 55) and lock washers (41, 56) holding the pump to the mounting bracket (33, 37).
3. Rotate the pump so the bleeder valve (25, 58) is aligned with the slot in the mounting bracket (33, 37), and lift the pump straight up through the bracket.
4. Remove the pin (212) from the fluid piston (201). Unscrew the air motor shaft from the fluid piston by turning the screw (213).
5. Unscrew the adapter (224) from the cylinder coupling (223). Pull the air motor coupling straight up until it clears the fluid piston (201).
6. Hold the fluid piston (201) steady by inserting a small screwdriver or punch into the 4 mm diameter hole (BA). Remove the screw (213) and lock washer (211) holding the priming piston (208) to the priming piston rod (204).
7. Pull the priming piston rod (204) and fluid piston (201) straight up out of the fluid housing (203). Remove the pin (210), and unscrew the priming piston rod from the fluid piston.

8. Unscrew the pump fluid intake housing (205) from the fluid housing (203). Remove the o-ring (214) from the intake valve housing.
9. Remove the intake valve (207) and valve stop (206) from the pump fluid intake housing (205).
10. Unscrew the wet-cup/packing nut (202). Remove the u-cup packing (215) from the throat. Remove the washer (216) from the wet-cup/packing nut.
11. Unscrew the piston rod housing (232). Remove the u-cup packing (215) from the fluid housing (203).
12. Clean all parts with a solvent compatible with the fluid you are pumping, and inspect for wear or damage.

Reassembly

235871 and 25D097 Series A

NOTE: Lubricate all packings and o-rings with a compatible grease before reassembling.

1. Install the u-cup packing (163) in the throat of the fluid housing (109), with the lips facing down. Install the o-ring (162) into the groove above the bearing of the wet-cup/packing nut (107). Apply thread lubricant and install the wet-cup/packing nut in the fluid housing (109). Torque to 298-314 in-lb (35–37 N•m).
2. Screw the priming piston rod (110) into the fluid piston (106) until the holes align. Install the pin (123) in the holes. Carefully slide the assembled piston and rod down through the wet-cup and fluid housing.
3. Place the intake valve (114) onto the seat of the pump fluid intake housing (111). Insert the valve stop (112) into the intake valve housing, with the flat side facing up. Be sure the valve stop (112) seats on the lip of the intake housing. Lubricate the o-ring (161). Bend it into a kidney shape, then carefully push it into the inner groove of the pump fluid intake housing (111), to avoid damaging it.
4. Apply thread lubricant to the lower threads of the fluid housing (109). Bring the fluid housing and the pump fluid intake housing (111) together. Make sure the priming piston rod (110) passes straight through the valve stop (112) and intake valve (114) already installed in the pump fluid intake housing (111). Screw together the fluid housing (109) and the fluid intake housing (111), then torque to 298-314 in-lb (35–37 N•m).
5. Apply lubricant to the threads of the screw (145). Hold the fluid piston (106) steady by inserting a small screwdriver or punch into the 4mm diameter hole (BA). Install the priming piston (115) onto the end of the priming piston rod (110), using the screw (145) and lockwasher (135). Torque to 14-20 in-lb (1.7–2.3 N•m).
6. Apply lubricant to the top threads of the fluid housing (109). Screw the cylinder coupling (196) onto the fluid housing, and torque to 298-314 in-lb (35–37 N•m).
7. Thread the fluid piston (106) into the shaft of the air motor (216) until the holes line up. Use the screw (145) to turn the fluid piston, if necessary. Once the holes in the air motor shaft and fluid piston are aligned, insert the pin (144).
8. Lower the pump through the mounting bracket (33, 37). Orient it in the correct direction and secure to the bracket using the three screws (38, 55) and washers (41, 56). Torque the screws to 17-33 in-lb (2–4 N•m). Reinstall the fluid outlet fitting (28, 57).
9. Reinstall the wiper plate assembly on the pump fluid intake housing (111). Secure with the two wiper plate cap screws (302). Reconnect all hoses and return the pump to service.

25D097 Series B

NOTE: Lubricate all packings and o-rings with a compatible grease before reassembling.

1. Install one u-cup packing (215) in the throat of the fluid housing (203), with the lips facing down. Apply thread lubricant and install the piston rod housing (232) with the rod guide (231) into the fluid housing (203). Torque to 298-314 in-lb (35–37 N•m).
2. Install the second u-cup packing (215) in the throat of the piston seal retainer (202) with lips facing the threads. Place the washer (216) over the seal. Apply thread lubricant and install the seal retainer (202) onto the fluid housing (203). Torque to 298-314 in-lb (35–37 N•m).
3. Screw the priming piston rod (204) into the fluid piston (201) until the holes align. Install the pin (210) in the holes. Carefully slide the assembled piston and rod down through the wet-cup and fluid housing.

4. Place the intake valve (207) onto the seat of the intake valve housing (205) with the snap-ring facing up. Insert the valve stop (206) into the intake valve housing. Be sure the valve stop (206) seats on the lip of the intake housing. Lubricate the o-ring (214). Bend it into a kidney shape, then carefully push it into the inner groove of the intake valve housing (205), to avoid damaging it.
5. Apply thread lubricant to the lower threads of the fluid housing (203). Bring the fluid housing and intake valve housing (205) together. Make sure the priming piston rod (204) passes straight through the valve stop (206) and intake valve (207) already installed in the housing (205). Screw together the fluid housing (203) and the fluid intake housing (205), then torque to 298-314 in-lb (35-37 N•m).
6. Apply lubricant to the threads of the screw (213). Hold the fluid piston (201) steady by inserting a small screwdriver or punch into the 4mm diameter hole (BA). Install the priming piston (208) onto the end of the priming piston rod (204), using the screw (213) and lockwasher (211). Torque to 14-20 in-lb (1.7-2.3 N•m).
7. Apply lubricant to the top threads of the fluid housing (203). Screw the cylinder coupling (223) onto the fluid housing, and torque to 298-314 in-lb (35-37 N•m).
8. Thread the fluid piston (201) into the shaft of the air motor (226) until the holes line up. Use the screw (213) to turn the fluid piston, if necessary. Once the holes in the air motor shaft and fluid piston are aligned, insert the pin (212).
9. Lower the pump through the mounting bracket (33, 37). Orient it in the correct direction and secure to the bracket using the three screws (38, 35) and washers (41, 56). Torque the screws to 17-33 in-lb (2-4 N•m). Reinstall the fluid outlet fitting (28, 57).
10. Reinstall the wiper plate assembly on the fluid intake housing (205). Secure with the two wiper plate cap screws (302). Reconnect all hoses and return the pump to service.

235871, Series D Parts - Standard Duty

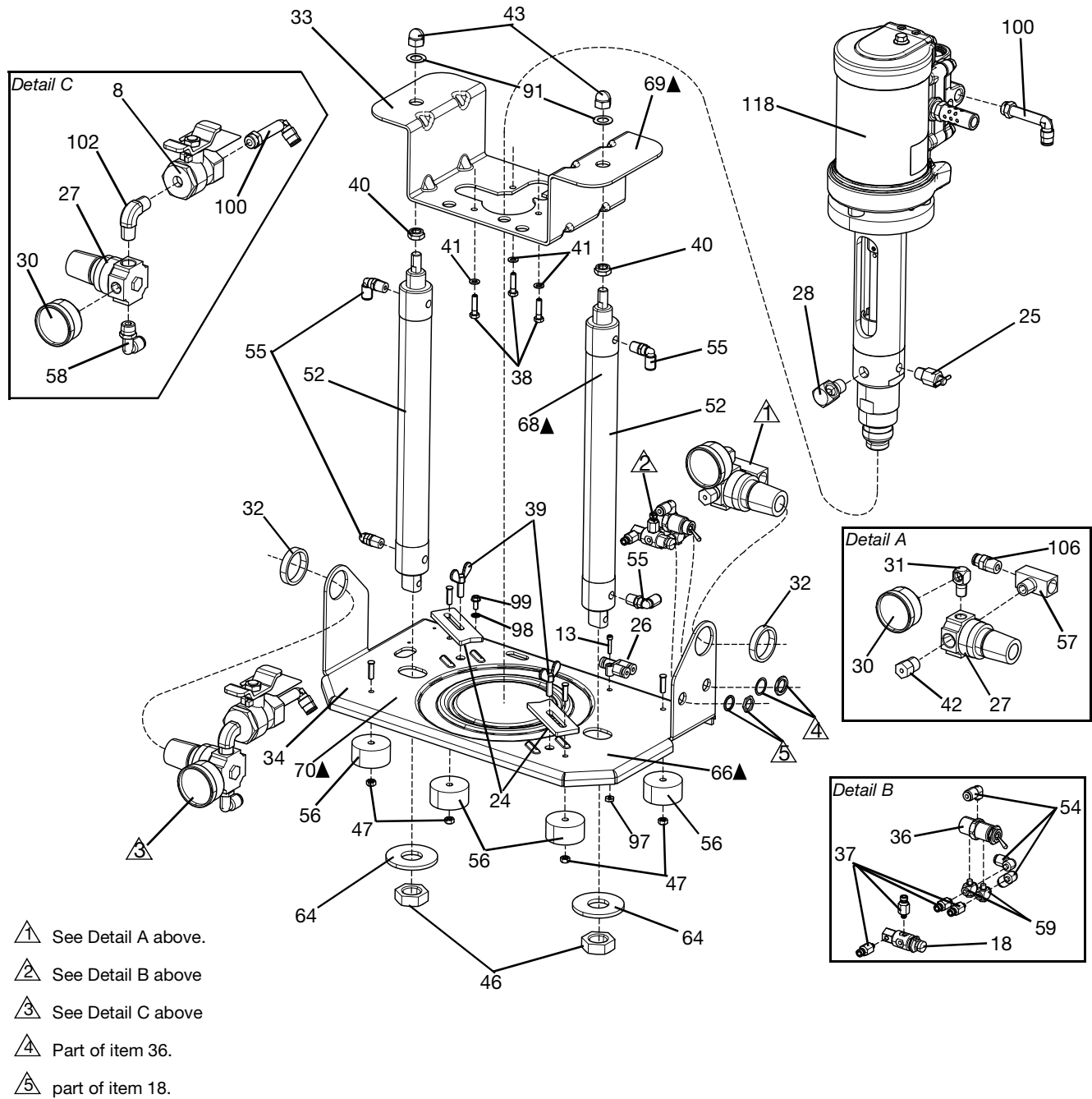


FIG. 8: DynaMite 190 Extruder Assembly Parts without Air Tubing

Ref	Part	Description	Qty	Ref	Part	Description	Qty
8	110223	VALVE, vented 2 way	1	52	110910	CYLINDER, mount, universal	2
13	112338	SCREW, cap, button hd	1	54	109193	FITTING, tube, male, elbow	3
18	110914	VALVE, button, push	1	55	198171	FITTING, elbow	4
24	186291	CLAMP, pail	2	56	110930	BUMPER,	4
25	223730	VALVE, assy	1	57	110936	FITTING, tee, pipe	1
26	112189	FITTING, y	1	58	110937	ELBOW, male	1
27	110318	REGULATOR, air, 1/4 in. npt	2	59	110940	FITTING, adjustable, tee	2
28	166866	FITTING, elbow, street	1	64	110947	WASHER, plain	2
30	108190	GAUGE, pressure, air	2	66	186503▲	LABEL, caution	1
31	100839	FITTING, elbow, street	1	68	186502▲	LABEL, caution	2
32	110209	NUT, regulator	2	69	186505▲	LABEL, warning	1
33	188852	BRACKET	1	70	186531▲	LABEL, warning	1
34	236062	BASE, elevator	1	91	158019	SHIM, washer	2
36	110859	VALVE, air, manual	1	97	100975	NUT	1
37	110932	CONNECTOR, male	4	98	157021	WASHER, lock, int	1
38	110873	SCREW, cap, hex hd	3	99	111593	SCREW, grounding	1
39	110888	SCREW, wing	2	100	112188	FITTING, elbow	2
40	186361	RETAINER, nut	2	102	110249	ADAPTER, male elbow 90 degr	1
41	110874	WASHER, flat	3	106	112186	CONNECTOR, male	1
42	110933	CONNECTOR, male	1	118	235870❖	PUMP, extruder, sst, 190, series D	1
43	110889	NUT, hex, crown	2	* Not shown.			
46	100071	NUT, hex	2	▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.			
47	110911	NUT, hex	4	❖ See page 23.			

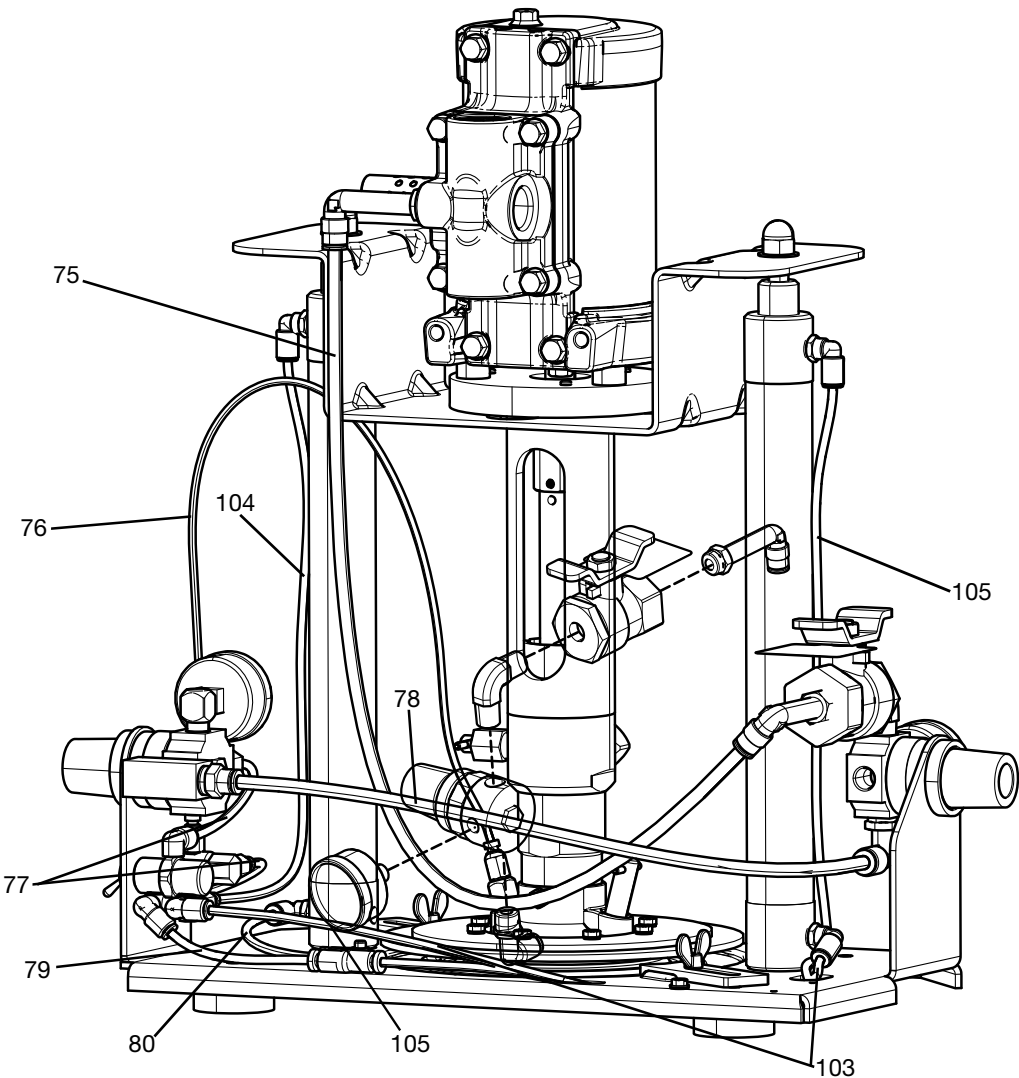


FIG. 9: DynaMite 190 Extruder Assembly Air Tubing Parts

Ref	Part	Description	Qty
75	186532	TUBE, air	1
76	186533	TUBE, air	1
77	186534	TUBE, air	2
78	188963	TUBE, air	1
79	188964	TUBE, air	1
80	188965	TUBE, air	1
103	188966	TUBE, air	1
104	188967	TUBE, air	1
105	188968	TUBE, air	1

25D097, Heavy Duty

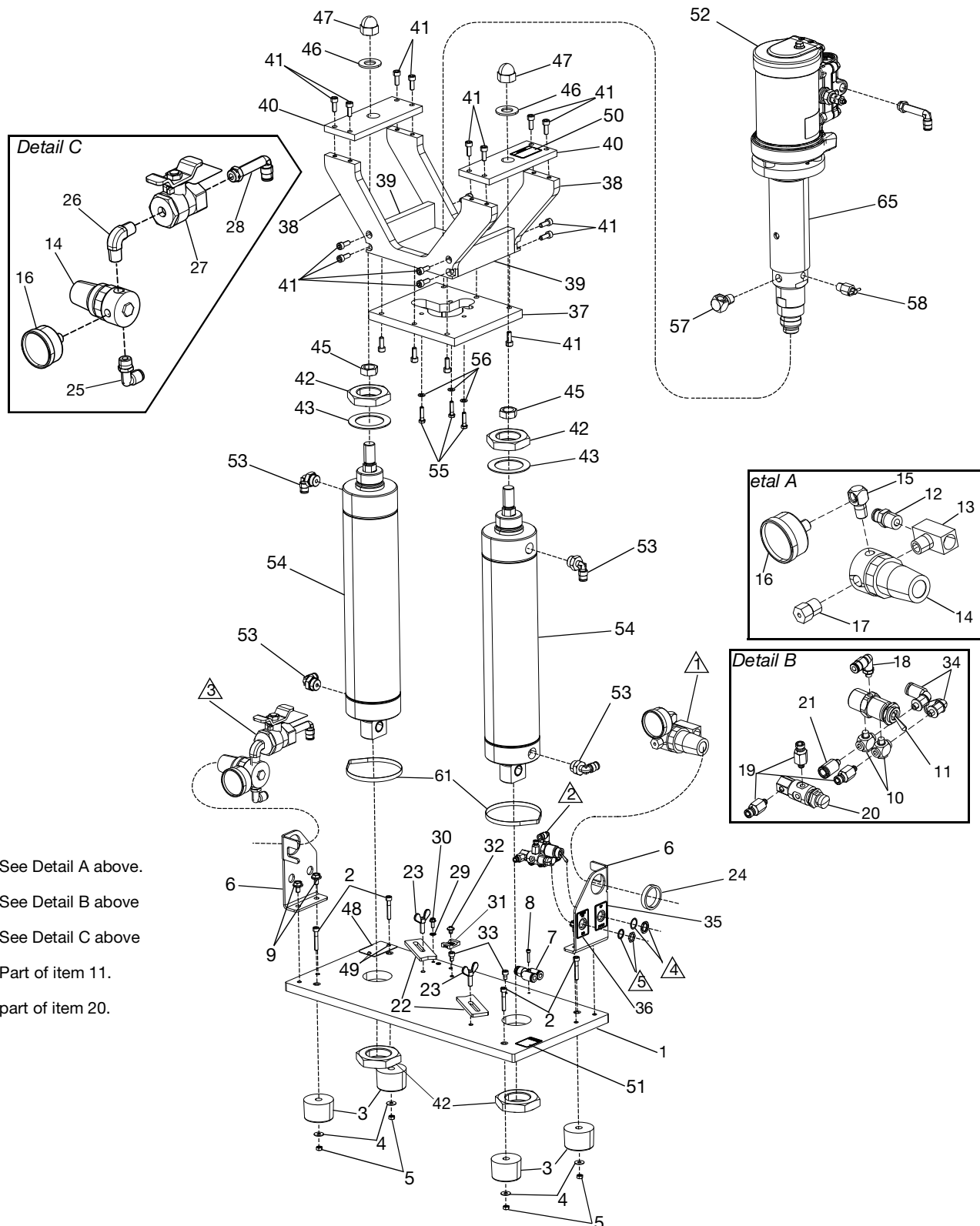
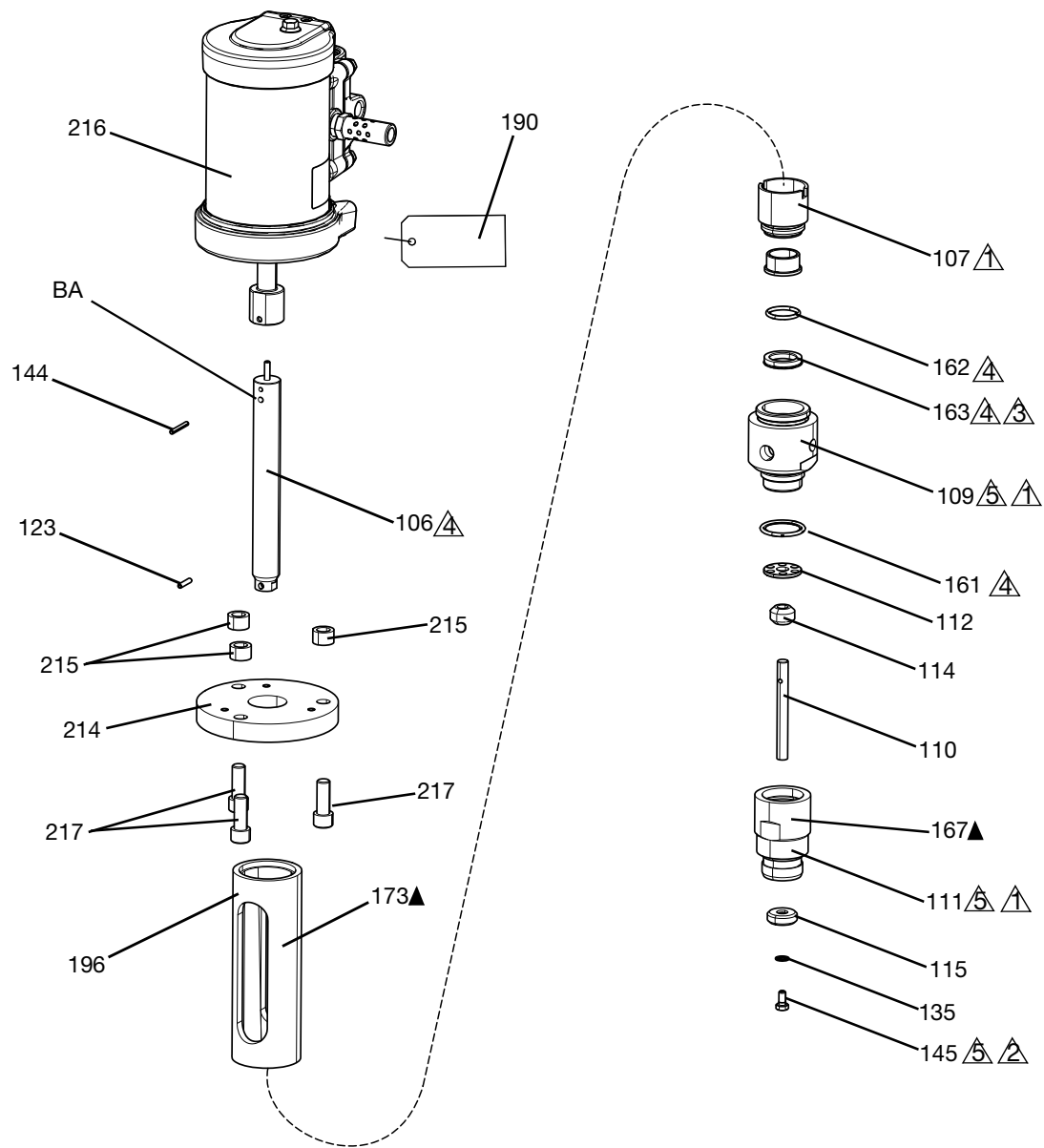


FIG. 10: DynaMite 190 Extruder Assembly Parts without Air Tubing

Ref.	Part	Description	Qty.	Ref.	Part	Description	Qty.
1	17T074	PLATE, base, elevator	1	58	223730	VALVE, assy	1
2	130286	SCREW, shcs	4	59	054172*	TUBE, nylon, rd	9.5
3	130199	BUMPER	4				ft
4	112776	WASHER, plain	4	60	054753*	TUBE, nylon rd, black	3.1
5	110911	NUT, hex	4				ft
6	17T082	BRACKET, mtg, regulator	2	61	114958	STRAP, tie	3
7	129574	FITTING, ptc	1	62	070408*	SEALANT, pipe, sst	1
8	124186	SCREW, shcs, sst	1	63	070268*	LUBRICANT, grease	1
9	127047	SCREW, mach, hex, flange	4	64	217374*	LUBRICANT, iso pump	1
10	110940	FITTING, adjustable, tee	2	65	17T317	GUARD, pinch	1
11	110859	VALVE, air, manual	1				
12	112186	CONNECTOR, male	1		* Not shown.		
13	110936	FITTING, tee, pipe	1				
14	110318	REGULATOR, air	2		▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.		
15	100839	FITTING, elbow, street	1		❖ See page 25.		
16	108190	GAUGE, pressure, air	2		★ Verify the pump serial number before ordering parts.		
17	110933	CONNECTOR, male	1				
18	125414	FITTING, tube, elbow, swivel	1				
19	110932	CONNECTOR, male	3				
20	110914	VALVE, button, push	1				
21	124746	FITTING, straight	1				
22	186291	CLAMP, pail	2				
23	110888	SCREW, wing	2				
24	110209	NUT, regulator	2				
25	110937	ELBOW, male	1				
26	110249	ADAPTER, male elbow 90 degr	1				
27	110223	VALVE, vented 2 way	1				
28	112188	FITTING, elbow	2				
29	157021	WASHER, lock, int	1				
30	111593	SCREW, grounding	1				
31	123452	HOLDER, anchor	1				
32	105901	SCREW, mach, pnh	1				
33	121224	SCREW, shcs	2				
34	124892	FITTING, elbow	2				
35	186360	LABEL	1				
36	186359	LABEL	1				
37	17T075	PLATE, mounting, air motor	1				
38	17T076	PLATE, riser, air motor	2				
39	17T077	PLATE, spacer, air motor	2				
40	17T078	PLATE, mtg, cyl, air motor	2				
41	108288	SCREW, cap, sch	22				
42	130198	NUT, hex	4				
43	114671	WASHER, thrust	2				
45	100155	NUT	2				
46	111841	WASHER, plain	2				
47	104143	NUT, crown	2				
48	186499	PLATE, identification	1				
49	100508	SCREW, drive	2				
50	186505▲	LABEL, warning	1				
51	186502▲	LABEL, caution	3				
52	25C829❖★	PUMP, extruder, ss, 190, heavy-duty	1				
53	114153	FITTING, elbow, male, swivel	4				
54	130197	CYLINDER, air	2				
55	110873	SCREW, cap	3				
56	110874	WASHER, flat	3				
57	166866	FITTING, elbow, street	1				

235870, Series D Parts - Standard Duty



△1 Torque to 298-314 in-lb (35-37 N•m).

△2 Torque to 14-20 in-lb (1.7-2.3 N•m).

△3 Lips must face down.

△4 Lubricate

△5 Apply thread lubricant.

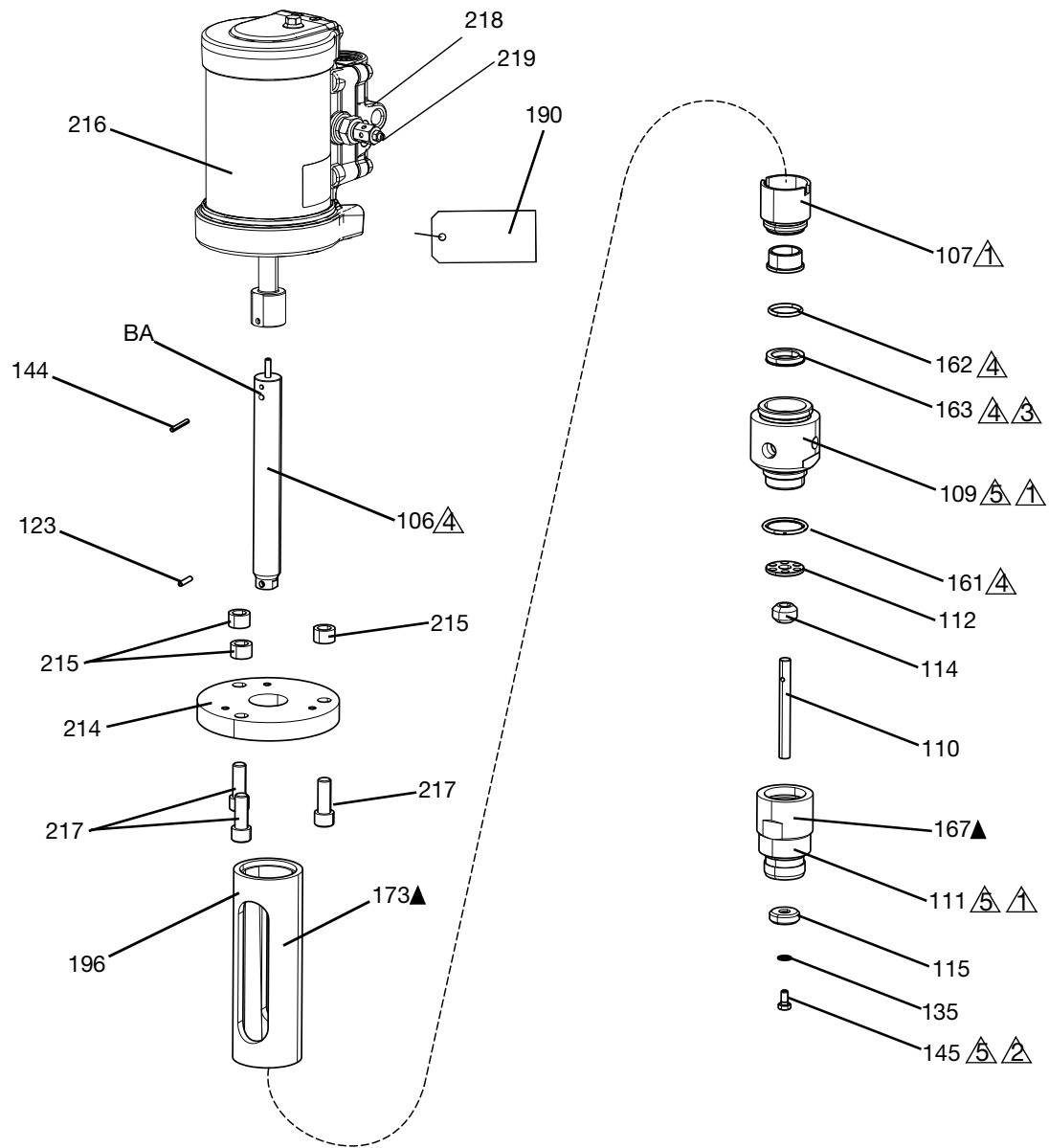
FIG. 11: Pump Assembly Parts

Ref	Part	Description	Qty
106	187579	PISTON, fluid	1
107	235838	CUP, wet	1
109	187578	HOUSING, fluid	1
110	187586	ROD, plunger	1
111	186283	VALVE, intake	1
112	186285	STOP	1
114	186296†	VALVE, fluid	1
115	187759	PLUNGER, priming piston	1
123	110893	PIN, spring	1
135	111640	WASHER, lock, internal	1
144	112120	PIN, spring	1
145	111639	SCREW, cap, hex hd	1
161	110966†	PACKING, o-ring	1
162	110955†	PACKING, o-ring	1
163	110946†	PACKING, u-cup	1
167	186501▲	LABEL, warning	1
173	186500▲	LABEL, caution	1
190	172479▲	TAG, warning	1
196	187582	COUPLING, cylinder	1
214	17J516	ADAPTER	1
215	17J517	SPACER	3
216	25A641	MOTOR, air, 2.5 in., .75 in. stroke	1
217	128762	SCREW, shcs, 3/8-24 x 1.00, zc	3

† These parts are included in Pump Repair Kit 223894, which may be purchased separately. This kit also includes two Part No. 110954 PTFE O-rings for use with the wiper plate.

▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

25C829, Series A Parts - Heavy Duty



① Torque to 298-314 in-lb (35-37 N•m).

② Torque to 14-20 in-lb (1.7-2.3 N•m).

③ Lips must face down.

④ Lubricate

⑤ Apply thread lubricant.

NOTE: Series A and Series B are not interchangeable.

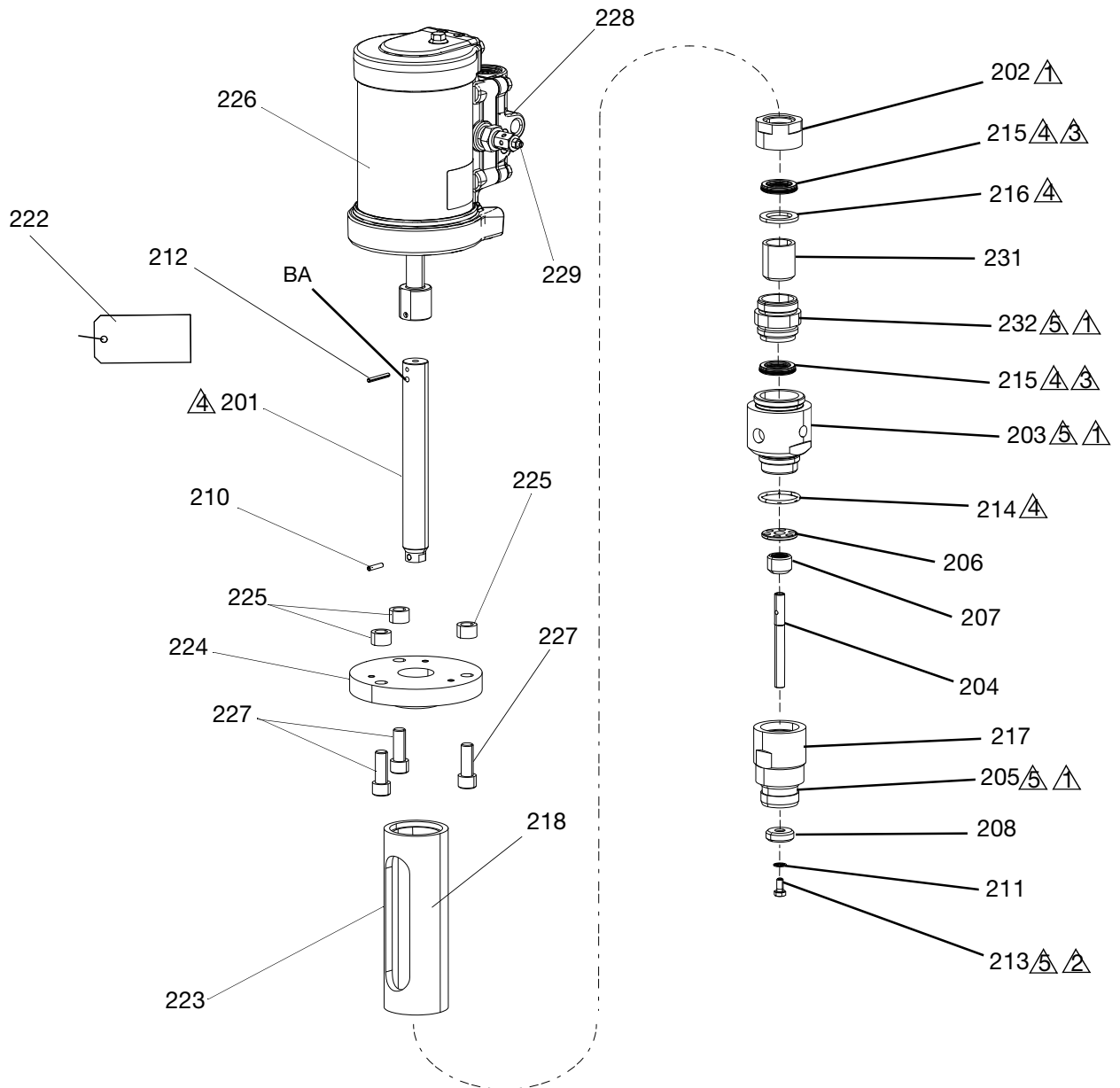
FIG. 12: Pump Service Components

Ref	Part	Description	Qty
106	17T149	KIT, piston, fluid	1
107	235838	CUP, wet	1
109	187578	HOUSING, fluid	1
110	17T150	KIT, rod, plunger	1
111	186283	VALVE, intake	1
112	17T151	KIT, stop	1
114	186296†	VALVE, fluid	1
115	17T152	KIT, plunger, priming piston	1
123	110893	PIN, spring	1
135	111640	WASHER, lock, internal	1
144	112120	PIN, spring	1
145	111639	SCREW, cap, hex hd	1
161	110966†	PACKING, o-ring	1
162	110946†	PACKING, u-cup	1
163	17S426†	PACKING, u-cup	1
167	186501▲	LABEL, warning	1
173	186500▲	LABEL, caution	1
190	172479▲	TAG, warning	1
196	187582	COUPLING, cylinder	1
214	17J516	ADAPTER	1
215	17J517	SPACER	3
216	25A641	MOTOR, air, 2.5 in., .75 in. stroke	1
217	128762	SCREW, shcs, 3/8-24 x 1.00, zc	3
218	118758	FITTING, adapter	1
219	120922	MUFFLER, w/ integral flow control	1

† These parts are included in Pump Repair Kit 25C844, which may be purchased separately. This kit also includes two Part No. 110954 PTFE O-rings for use with the wiper plate.

▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

25C829, Series B Parts - Heavy Duty



① Torque to 298-314 in-lb (35-37 N•m).

② Torque to 14-20 in-lb (1.7-2.3 N•m).

③ Lips must face down.

④ Lubricate

⑤ Apply thread lubricant.

NOTE: Series A and Series B are not interchangeable.

FIG. 13: Pump Service Components

Ref	Part	Description	Qty
201	26A962	ROD, piston, fluid	1
202	18C131	RETAINER, seal, piston	1
203	187578	HOUSING, fluid	1
204	26A963	ROD, plunger	1
205	186283	VALVE, intake	1
206	26A964	STOP, fluid	1
207	26A965	CARTRIDGE, valve, fluid, in Kit 26A972	1
208	17T152	PLUNGER, fluid	1
210	110893	PIN, spring	1
211	111640	WASHER, lock, internal	1
212	112120	PIN, spring	1
213	111639	SCREW, cap, hex hd	1
214	110966†	PACKING, o-ring, included in Kit 26A972	1
215	18B719†	SEAL, triple, lip	2
216	18C133	WASHER, spacer, seal	1
217	186501▲	LABEL, safety, warning	1
218	186500▲	LABEL, safety, warning	1
219	070270	LUBRICANT, grease	1
220	070268	LUBRICANT, grease	1
222	172479▲	TAG, warning	1
223	187582	COUPLING, cylinder	1
224	17J516	ADAPTER	1
225	17J517	SPACER	3
226	25A641	MOTOR, air, 2.5", .75" stroke	1
227	128762	SCREW, shcs, 3/8 - 24 x 1.00	3
228	118758	FITTING, adapter	1
229	120922	MUFFLER, w/ integral flow control	1
230	070408	SEALANT, pipe, sst	1
231	18C132	GUIDE, rod, piston	1
232	18C130	HOUSING, rod, piston	1

† These parts are included in Pump Repair Kit 26A972, which may be purchased separately. This kit also includes two Part No. 110954 PTFE O-rings for use with the wiper plate.

▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

Accessory Can Opener

(not supplied with unit)

For use with containers that have a lip at the top that needs to be removed.
Graco Kit 111002 is available and can be purchased separately.

Wiper Plate Parts

NOTE: The wiper plate is not supplied with the pump and must be ordered separately.

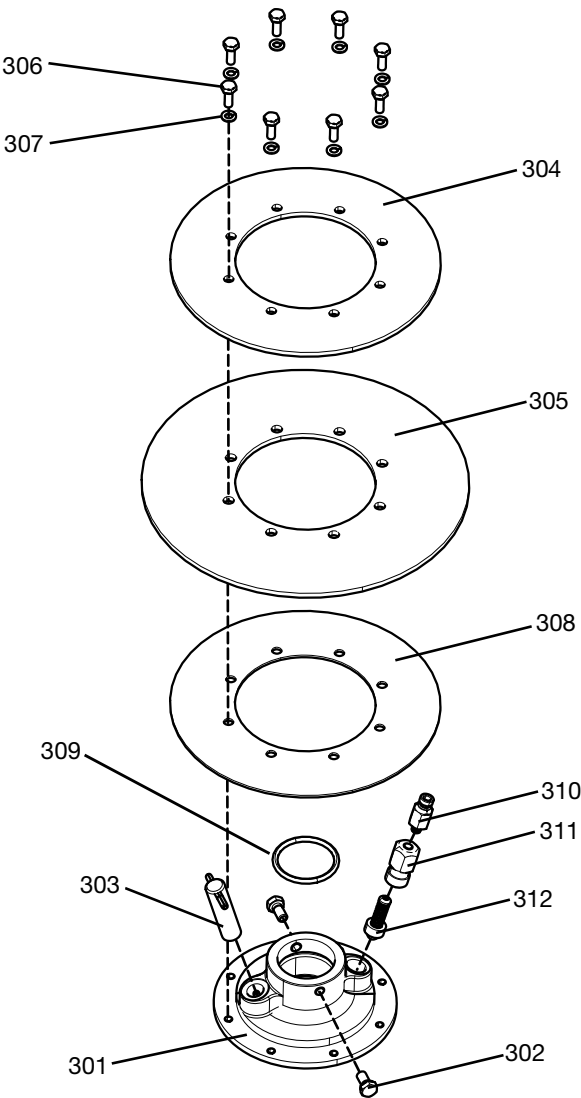


FIG. 14: Wiper Plate Parts

Part No. 25C843 Heavy Duty 1 Gallon (3.79 liter) Size

Includes items 301-312

Ref	Part	Description	Qty
301	187596	PLATE, inductor	1
302	111639	SCREW, cap, hex hd	2
303	223746	VALVE, bleed	1
304	17W949	PLATE, follower, 1 gal	1
305	17W950	WIPER, 1 gal, hd	1
306	130362	SCREW, cap, hex hd	8
307	111637	WASHER, lock	8
308	187600	RING, backup	1
309	110954†	PACKING, o-ring	1
310	110932	CONNECTOR, male	1
311	187683	HOUSING, valve	1
312	224918	VALVE, check	1

Part No. 224908 Standard Duty 1 Gallon (3.79 liter) Size

Includes items 301-312

Ref	Part	Description	Qty
301	187596	PLATE, inductor	1
302	111639	SCREW, cap, hex hd	2
303	223746	VALVE, bleed	1
304	187597	RING, sst.	1
305	187599	WIPER,	1
306	111638	SCREW, cap, hex hd	8
307	111637	WASHER, lock	8
308	187600	RING, backup	1
309	110954†	PACKING, o-ring	1
310	110932	CONNECTOR, male	1
311	187683	HOUSING, valve	1
312	224918	VALVE, check	1

Part No. 224923 1 Quart (.95 liter) Size

Includes items 301-312

Ref	Part	Description	Qty
301	187596	PLATE, inductor	1
302	111639	SCREW, cap, hex hd	2
303	223746	VALVE, bleed	1
304	187738	RING, sst.	1
305	187740	WIPER,	1
306	111638	SCREW, cap, hex hd	8
307	111637	WASHER, lock	8
308	187741	RING, backup	1
309	110954†	PACKING, o-ring	1
310	110932	CONNECTOR, male	1
311	187683	HOUSING, valve	1
312	224918	VALVE, check	1

† For all models. These parts are included in Pump Repair Kits 223894, 25C844, and 26A972, which may be purchased separately. This kit also includes two Part No. 110954 PTFE O-rings for use with the wiper plate.

Dimensions

235871 - Standard Duty

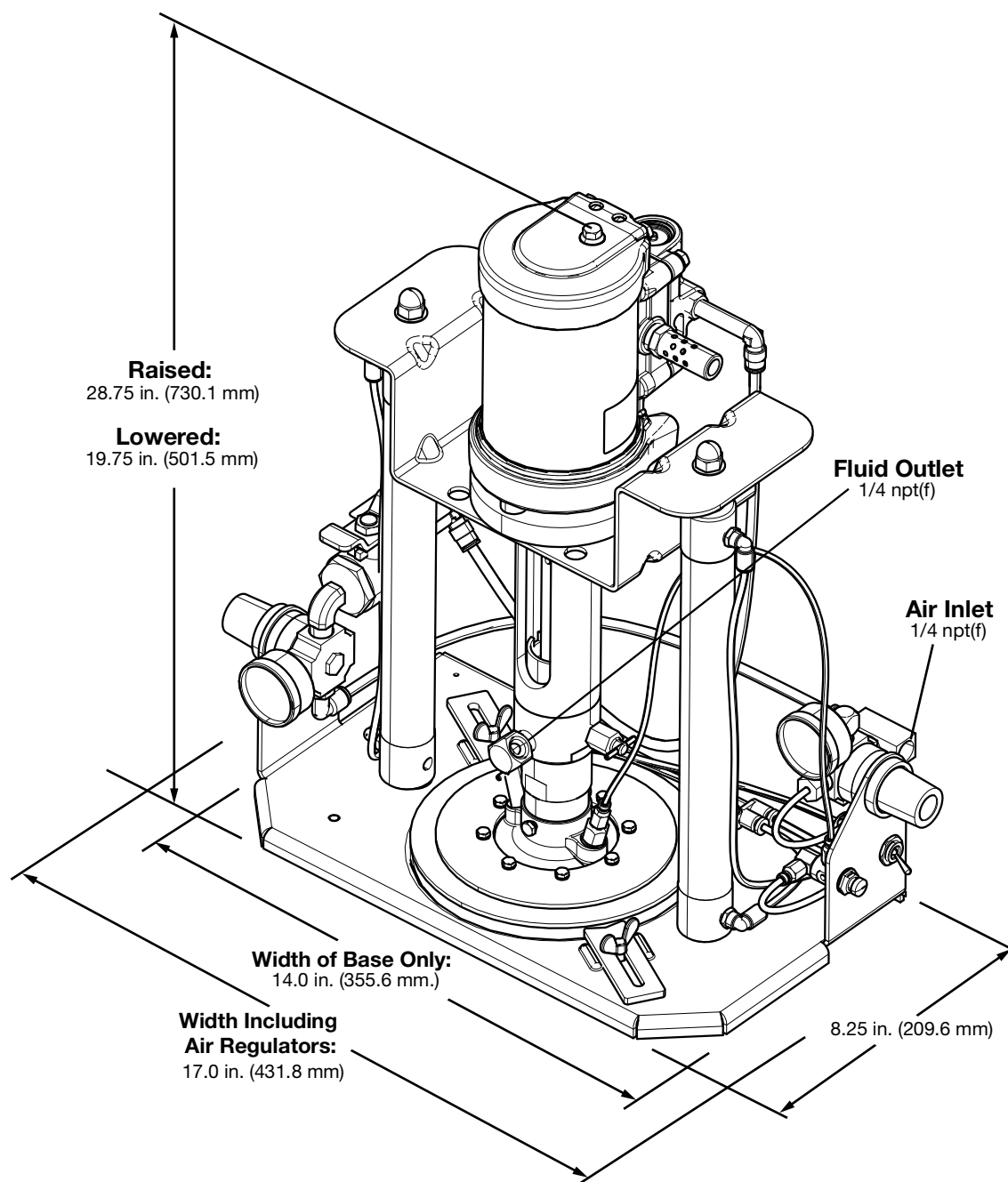


FIG. 15: DynaMite 190 Extruder Assembly Dimensions

25D097 - Heavy Duty

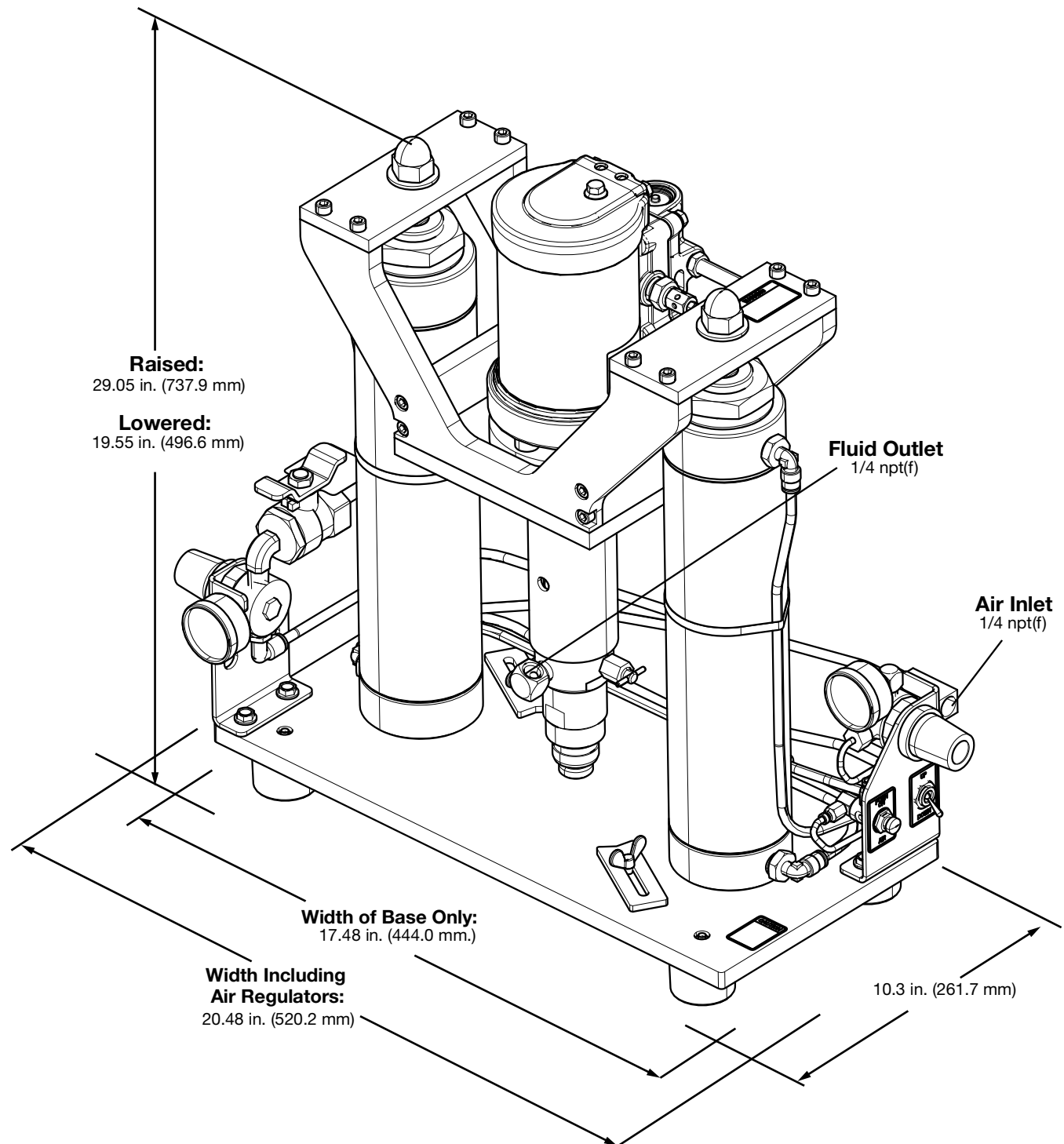


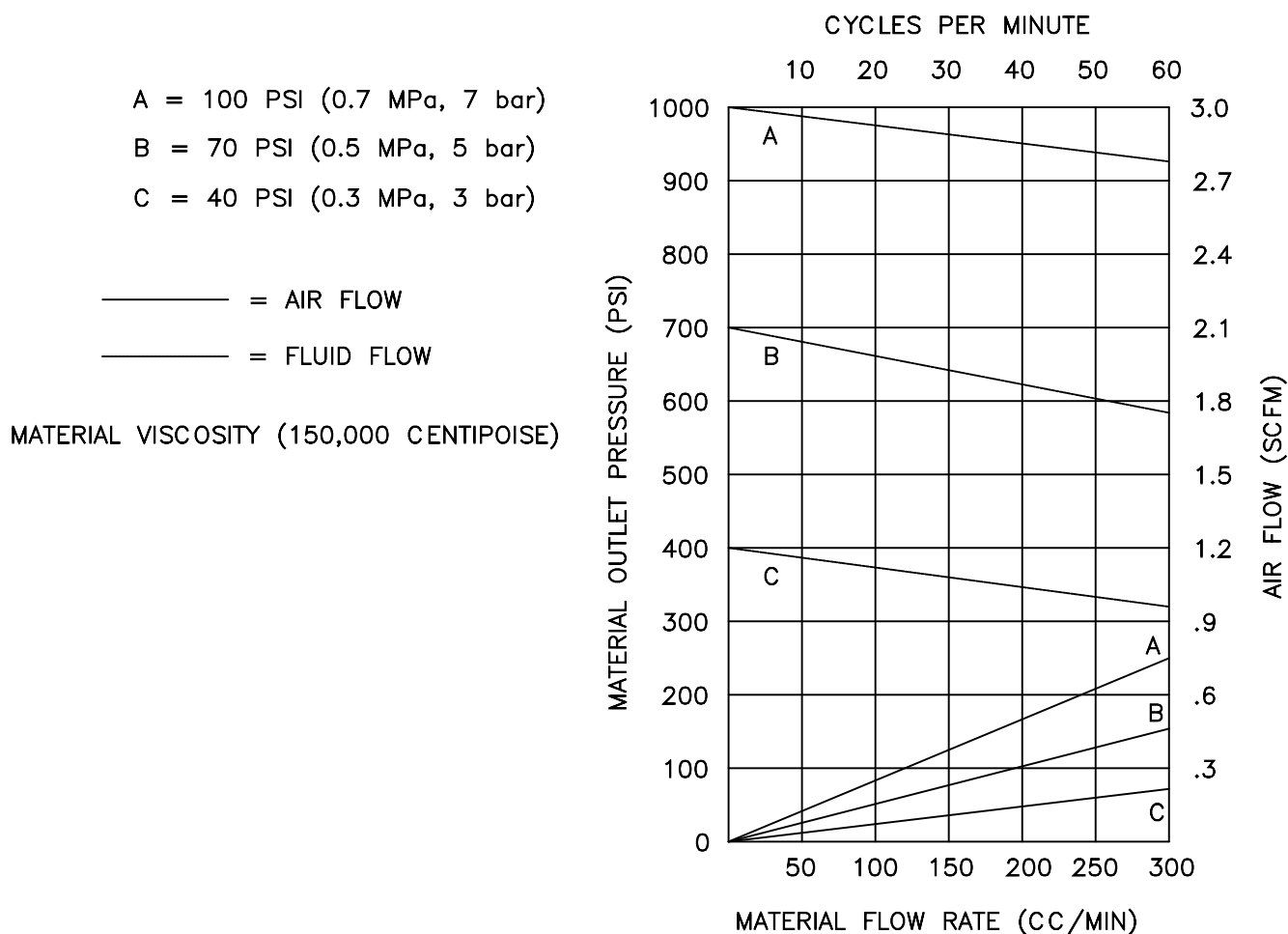
FIG. 16: DynaMite 190 Extruder Assembly Dimensions

[illegible]

Technical Data

DynaMite 190 Extruder		
	US	Metric
Maximum fluid output pressure	1000 psi	6.9 MPa, 69 bar
Air input pressure	35-100 psi	243-700 KPa, 2.4-7.0 bar
Maximum fluid viscosity	600,000 cps	
Volume per stroke	0.17 oz	5.0 cc
Recommended pump speed for continuous operation	40 cycles per minutes (cpm)	
Maximum recommended pump speed	60 cpm	
Stroke length	3/4 in.	19 mm
Maximum pump operating temperature	140° F	60° C
Weight		
235871	18.5 lb	8.4 kg
25D097	56.5 lb	25.6 kg
Sound pressure level*		
At 70 psi (0.48 MPa, 4.8 bar), 80 cpm	76.5 dB(A)	
Sounds power level*		
At 70 psi (0.48 MPa, 4.8 bar), 80 cpm	83.2 dB(A)	
Inlet/Outlet Sizes		
Air inlet size	1/4 in. npt(f)	
Pump fluid outlet size	1/4 in. npt(f)	
Materials of Construction		
Wetted parts	304 and 17-4 pH stainless steel; carbon steel, PTFE, fluoro-elastomer, PEEK	
Notes		
*Sound pressure measured 1 meter (3.28 ft) from the pump resting on the floor. Sounds power level measured per ISO standard 9614-2.		

Technical Data - Fluid Flow Chart (235871)



California Proposition 65

CALIFORNIA RESIDENTS

 **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

Graco Standard Warranty

Graco warrants all equipment referenced in this document which is manufactured by Graco 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 Graco, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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Original instructions. This manual contains English. MM 308302

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