



This manual contains important warnings and information.
READ AND KEEP FOR REFERENCE.

INSTRUCTIONS

First choice when quality counts.™

For Automatic Lubrication Systems Only

Provides lubricant flow and pressure to operate a single line, parallel, automatic lubrication system and vents the system to reset the injectors.

5:1 Dynastar® Pump Module

Part No. 243159, Series C

Part No. 243502 (35# Custom Tank Installation)

Part No. 243503 (120# Custom Tank Installation)

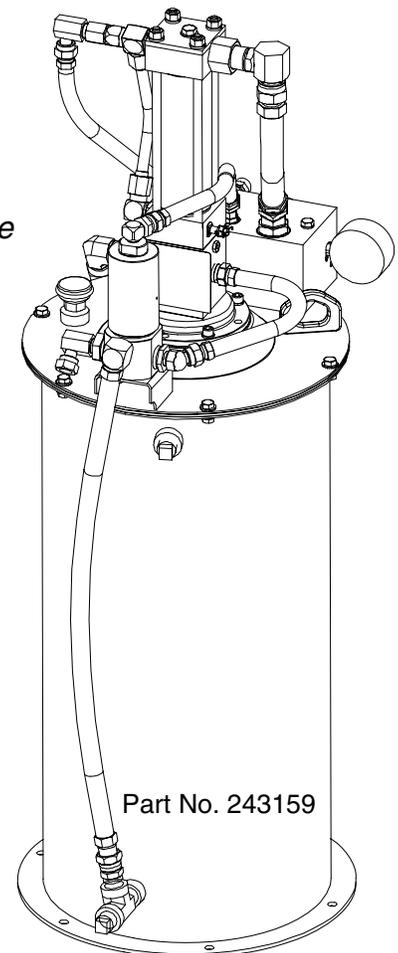
Part No. 243504 (400# Custom Tank Installation)

3500 psi (24 MPa, 240 bar) Maximum Lubricant Outlet Pressure

3500 psi (24 MPa, 240 bar) Maximum Hydraulic Fluid Input Pressure

Hydraulic Vent Valve Kit Part No. 243170

Hydraulic Control Module Kit Part No. 243501



WARNING

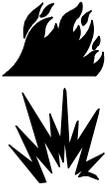


INSTRUCTIONS

EQUIPMENT MISUSE HAZARD

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

- This equipment is for professional use only.
- Read all instruction manuals, tags, and labels before you operate this equipment.
- Use the equipment only for its intended purpose. If you are not sure, call your Graco distributor.
- Do not alter or modify this equipment. Use only Graco approved repair parts.
- Check equipment daily. Repair or replace worn or damaged parts immediately.
- Do not exceed the maximum working pressure of the lowest rated component in your system.
- Use fluids and solvents that are compatible with the equipment wetted parts. Refer to the **Technical Data** section of all equipment manuals. Read the fluid and solvent manufacturer's warnings.
- Handle hoses carefully. Do not pull on hoses to move equipment.
- Route hoses away from traffic areas, sharp edges, moving parts, and hot surfaces. Do not expose Graco hoses to temperatures above 82°C (180°F) or below -40°C (-40°F).
- Do not lift pressurized equipment.
- Comply with all applicable local, state, and national fire, electrical, and safety regulations.
- Be sure breather is not plugged before filling reservoir.
- Be sure unit is securely mounted before operation.



FIRE AND EXPLOSION HAZARD

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

- Ground the equipment and the object being dispensed to. See **Grounding** on page 5.
- If there is any static sparking or you feel an electric shock while using this equipment, **stop dispensing immediately**. Do not use the equipment until you identify and correct the problem.
- Provide fresh air ventilation to avoid the buildup of flammable fumes from solvents or the fluid being dispensed.
- Keep the dispensing area free of debris, including solvent, rags, and gasoline.
- Do not smoke in the dispensing area.

! WARNING



INJECTION HAZARD

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

- Fluid injected into the skin might look like just a cut, but it is a serious injury. **Get immediate surgical attention.**
- Do not put your hand or fingers over the end of grease outlet.
- Do not stop or deflect leaks with your hand, body, glove or rag.
- Follow the **Pressure Relief Procedure** on page 9 if the injector clogs and before you clean or service this equipment.
- Tighten all fluid connections before you operate this equipment.
- Check the hoses, tubes, and couplings daily. Replace worn or damaged parts immediately. Do not repair high pressure couplings; you must replace the entire hose.
- Fluid hoses must have spring guards on both ends to protect them from rupture caused by kinks or bends near the couplings.



TOXIC FLUID HAZARD

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

- Know the specific hazards of the fluid you are using.
- Store hazardous fluid in an approved container. Dispose of hazardous fluid according to all local, state and national guidelines.
- Always wear protective eyewear, gloves, clothing and respirator as recommended by the fluid and solvent manufacturer.



MOVING PARTS HAZARD

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

- Do not insert fingers in overflow port when filling reservoir.
- Keep clear of all moving parts when you start or operate the pump.
- Before you service this equipment, follow the **Pressure Relief Procedure** on page 9 to prevent the equipment from starting unexpectedly.

Unpacking

Unpacking the Product

The Dynastar® pump module was carefully packaged for shipment by Graco. When the package arrives, perform the following procedure to unpack the units:

1. Inspect the shipping box carefully for shipping damage. Contact the carrier promptly if damage is discovered.
2. Unseal the box and inspect the contents carefully. There should not be any damaged parts.
3. Compare the packing slip against all items included in the box. Any shortages or other inspection problems should be reported immediately.
4. Store the box and packing materials in a safe place for future use. Graco recommends that all packing materials be saved in case the unit needs to be shipped again.

Pump Module Overview

Pump Module Capabilities

The Pump Module provides lubricant flow and pressure to operate a single line parallel automatic lubrication system. The module requires a hydraulic power Supply and a timed signal from a lubrication controller. Based on these signals, the pump module provides lubricant flow and pressure to operate the injectors and vents the injector system to reset the injectors.

Pump Module Operation

Pump Module Operation performs these cycles:

1. Upon receiving a signal from a 24 volt lubrication controller, the 3-way solenoid valve (Fig. 3, item F) opens, starting the pump (D) and closing the vent valve (U).
2. The pumps builds pressure until the pressure switch in the system sends a signal to the timer, ending the cycle, or the pump stalls.
3. The timer terminates the 24 volt signal to the 3-way solenoid valve (F).
4. The 3-way solenoid valve (F) closes, stopping the pump and opening the vent valve (U).
5. The system lubricant pressure bleeds back through the vent valve (U) into the reservoir (P).
6. The pressure reducing valve (PRV) (item S) and flow control valve (FCV) (item N) control the pump output pressure and cycle rate.

Installation

Reservoir

Mount reservoir [Fig. 2, item (P)] on sturdy flat surface with 6, 3/8 in. diameter bolts. Note location of fill port (K), hydraulic lines, and lubricant outlet port (G) for easy access once installed.

! WARNING

Hydraulic system must be depressurized before connecting high pressure hydraulic supply line.

! CAUTION

Hydraulic supply must be 10 μ filtered or better and supply 0.5 – 3.0 gpm (1.9 – 11.4 lpm) at 800 psi – 3500 psi (55 bar – 241 bar, 5.5 MPa – 24 MPa).

1. Read instruction manual 308156 (included) before installing this product.
2. Install ball valve (Fig. 2, item AA) (user provided) in the 3/8" hydraulic supply line (X).
3. Connect the 3/8" hydraulic supply line (X) to the swivel (Y).
4. Connect the 3/4" hydraulic tank line (T) to the swivel (Z).
5. Connect the 24 VDC timer controlled signal to the 3-way solenoid valve (F).
6. Connect supply line (G) to the lubricant swivel (C).
7. Ground system (see **Grounding** below). Mount reservoir to grounded chassis member.

Grounding (for non-mobile installation)

Loosen grounding lug locknut [Fig. 1 item (A)] and washer (B). Insert one end of a 12 ga (1.5 mm²) minimum ground wire (C) into slot in lug (D) and tighten locknut securely. Connect other end of wire to true earth ground. To order a ground wire and clamp, order part number 222011.

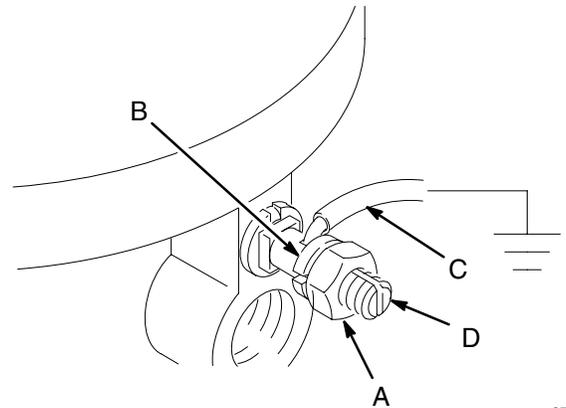


Fig. 1

0720

Vent Valve Kit for Custom Tank (Part Number 243170) Installation (See Figure 3)

1. Weld the bracket (see Fig.5) in place per recommended configuration for mounting the vent valve . Paint the bracket if desired.
2. Connect the hydraulic control line (Fig. 3, item A) to the control module vent valve hydraulic control line (Fig. 4, item J).
3. Connect the high pressure lubricant line (Fig. 3, item C) feeding the injector system to the lubricant output (E).
4. Connect the vent line (F) to the lubricant reservoir.

Control Module Kit for Custom Tank (Part Number 243501) Installation (See Figure 4)

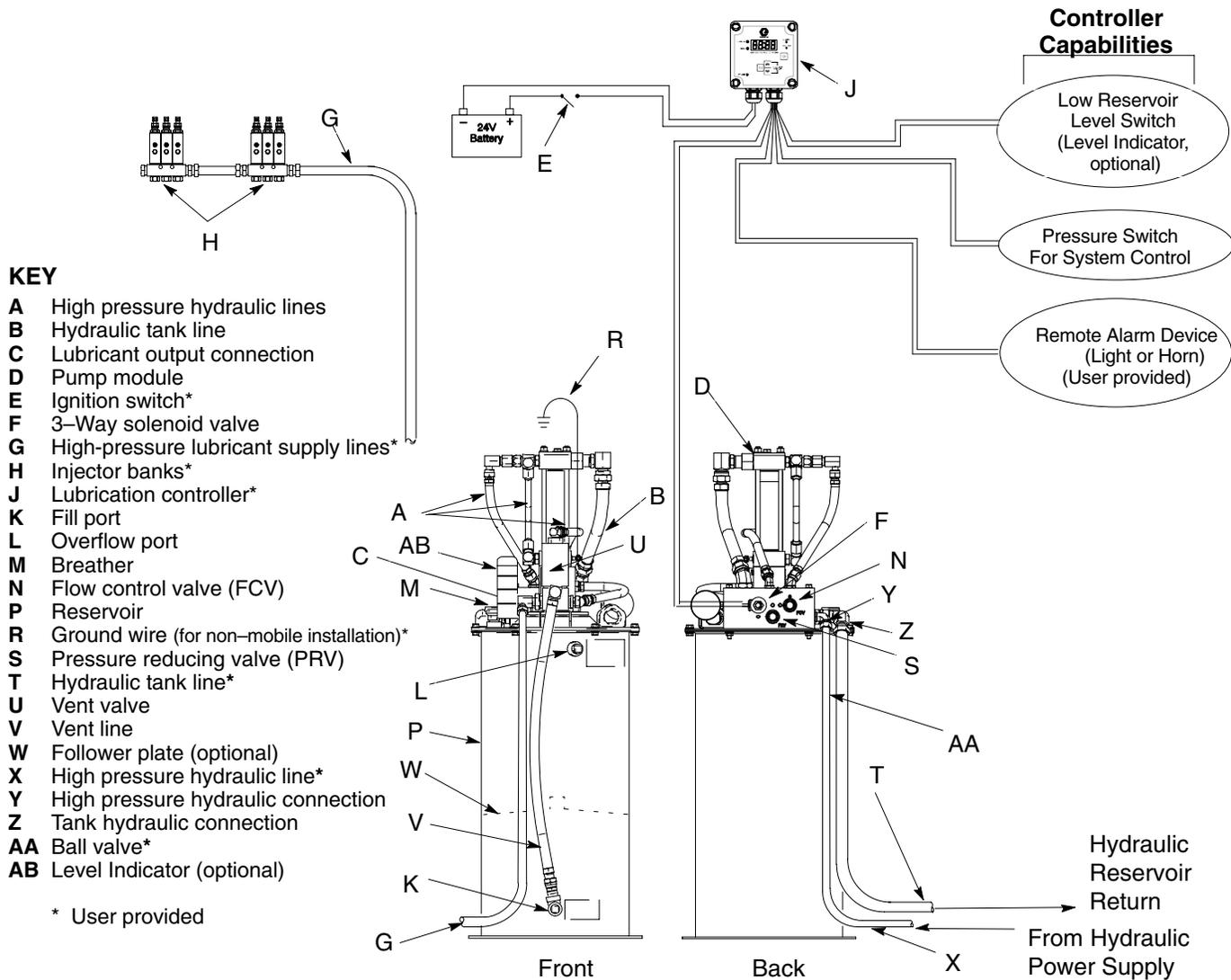
1. Mount the control module on a flat, sturdy surface per the recommended configuration (see Fig.2)
2. Connect the hydraulic tank line (Fig. 4, item G) to the pump hydraulic outlet port.
3. Connect the vent valve hydraulic control (J) connection to the hydraulic control line (Fig. 3, item A).
4. Connect the pump high pressure hydraulic line (Fig. 4, item H) to the pump hydraulic input port.
5. Connect the high pressure hydraulic supply to the high pressure hydraulic supply connection (L) and the tank lines to the hydraulic tank connection (K).
6. Connect the 3-way solenoid valve (P) to the timer.

Note: Coil should always be installed with lettering facing out.

Installation

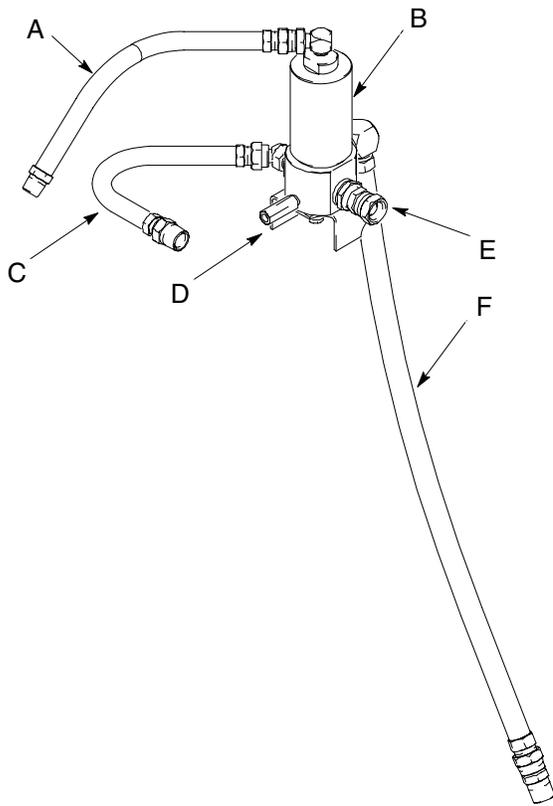
Typical Installation

The installation shown in Figs. 2, 4, and 5 are only a guide for selecting and installing system components. Contact your Graco distributor for assistance in planning a system to suit your needs.



9649B

Fig. 2



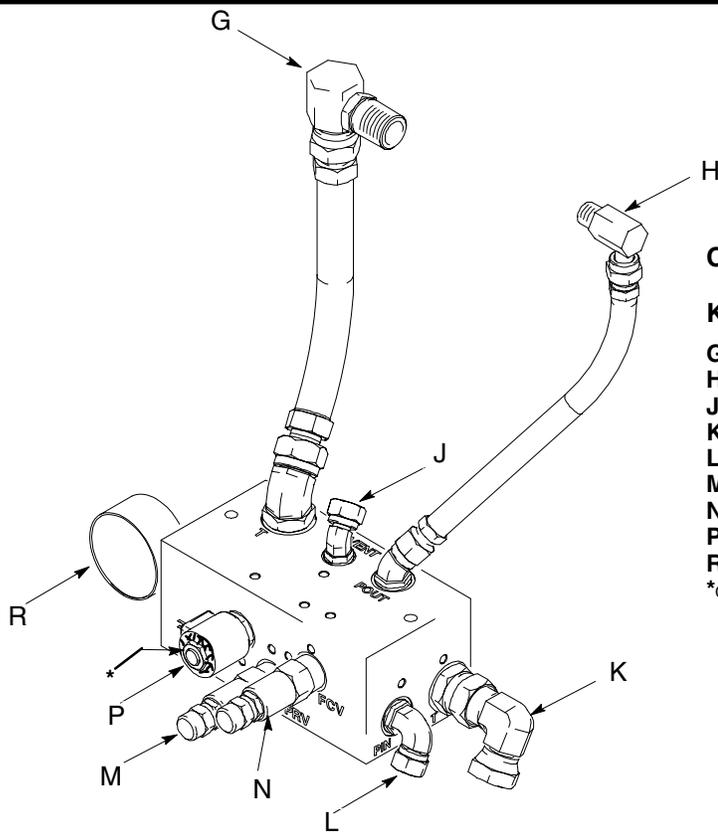
Vent Valve Installation Kit (243170)

KEY

- A Hydraulic control line
- B Vent valve
- C Pump output connection line
- D Pressure relief valve
- E Lubricant output
- F Vent line

Fig. 3

9647A



Control Module Installation Kit (243501)

KEY

- G Pump tank line
- H Pump high pressure hydraulic line
- J Vent valve hydraulic control
- K Hydraulic tank connection
- L High pressure hydraulic connection
- M Pressure reducing valve
- N Flow control valve
- P 3-Way solenoid valve
- R Regulated hydraulic pressure gauge

*Coil should always be installed with lettering facing out

Fig. 4

9648A

Installation

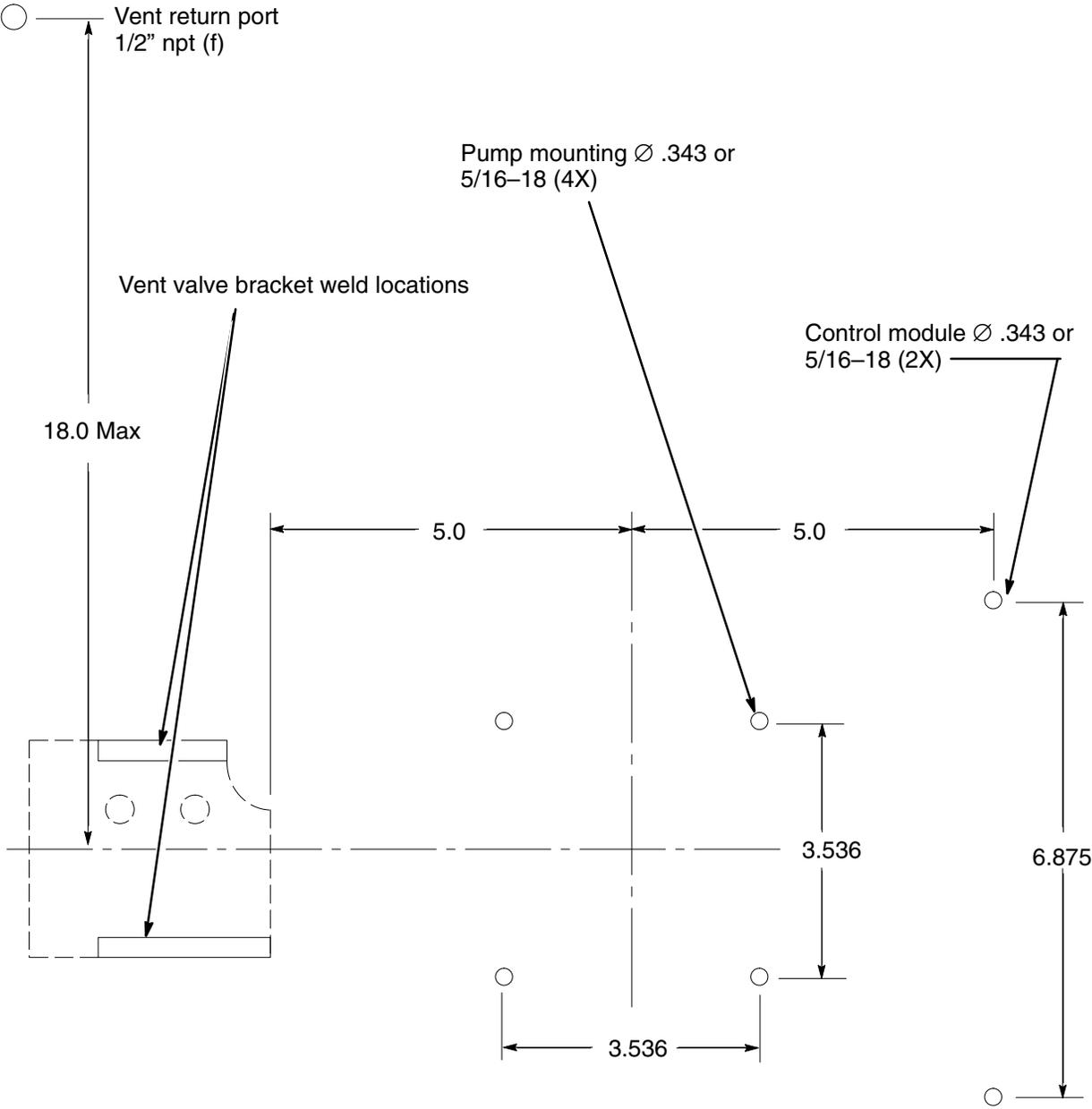


Fig. 5

9653A

Operation

Pressure Relief Procedure

⚠ WARNING

**INJECTION HAZARD**

To reduce the risk of serious injury, including fluid injection or splashing in the eyes or on the skin, always follow the **Pressure Relief Procedure** whenever you

- Are instructed to relieve the pressure
- Shut off the pump
- Check, clean, or service any of the system equipment
- Install or clean the dispensing devices

1. Disable hydraulic supply to pump (Fig. 2, item D) by isolating it from the high pressure hydraulic supply using ball valve (AA).
2. Do one of the following:
 - Open the pressure reducing valve to reduce trapped hydraulic pressure,or
 - Cycle the timer to open the 3-way solenoid valve to reduce trapped hydraulic pressure.

Note: Gage on control module should read zero pressure after performing this step.

3. Disconnect power from Lubrication Controller (J).

⚠ WARNING

**MOVING PARTS HAZARD**

Do not insert finger into the overflow port while filling a reservoir equipped with a follower plate. Injury or amputation could result.

Start-up

Prime Vent Line. The first time the reservoir is filled, use the vent valve outlet. This removes all air from the vent line (Fig. 2, item V).

1. Connect lubricant supply hose from remote filling station pump unit to outlet of vent valve (U).
2. Remove plug in fill port (K) located at bottom of reservoir.
3. Slowly turn on supply lubricant until lubricant appears in fill port.
4. Remove lubricant supply hose from vent valve.

Fill Reservoir

1. Connect lubricant supply hose from remote filling station pump to fill port (Fig. 2, item K).
2. Connect automatic lube system main supply line (G) to vent valve (U) outlet.
3. Remove plug from overflow port (L).
4. Slowly turn on supply lubricant until level of lubricant reaches overflow port.

Note: For systems with a follower plate, fill until the follower plate reaches the overflow port.

Note: Refer to Automatic Lube System Design Guidelines Manual 309015 for instructions on priming remaining system lubricant lines and further operating instructions.

⚠ WARNING

**COMPONENT RUPTURE HAZARD**

The maximum working pressure of each component in the system may not be the same. To reduce the risk of overpressurizing any component in the system, be sure you know the maximum working pressure of each component. **Never** exceed the maximum working pressure of the lowest rated component in the system. Overpressurizing any component can result in rupture, fire, explosion, property damage, and serious injury.

Regulate hydraulic pressure to the pump so that no fluid line, component, or accessory is overpressurized.

5. Set hydraulic pressure to pump at lowest pressure needed [between 600 psi (41 bar, 4.1 MPa) and 1200 psi (83 bar, 8 MPa)] to get desired output results [between 2500 psi (172 bar, 17 MPa) and 3500 psi (241 bar, 24 MPa)].
6. Set hydraulic flow rate to pump at lowest flow rate needed to get desired results.
7. Read and follow instructions supplied with each system component.

Note: With a primed pump and sufficient hydraulic supply, the pump starts when the timer activates the solenoid valve. The pump stops when the timer deactivates the solenoid valve.

Operation

Shut Down.

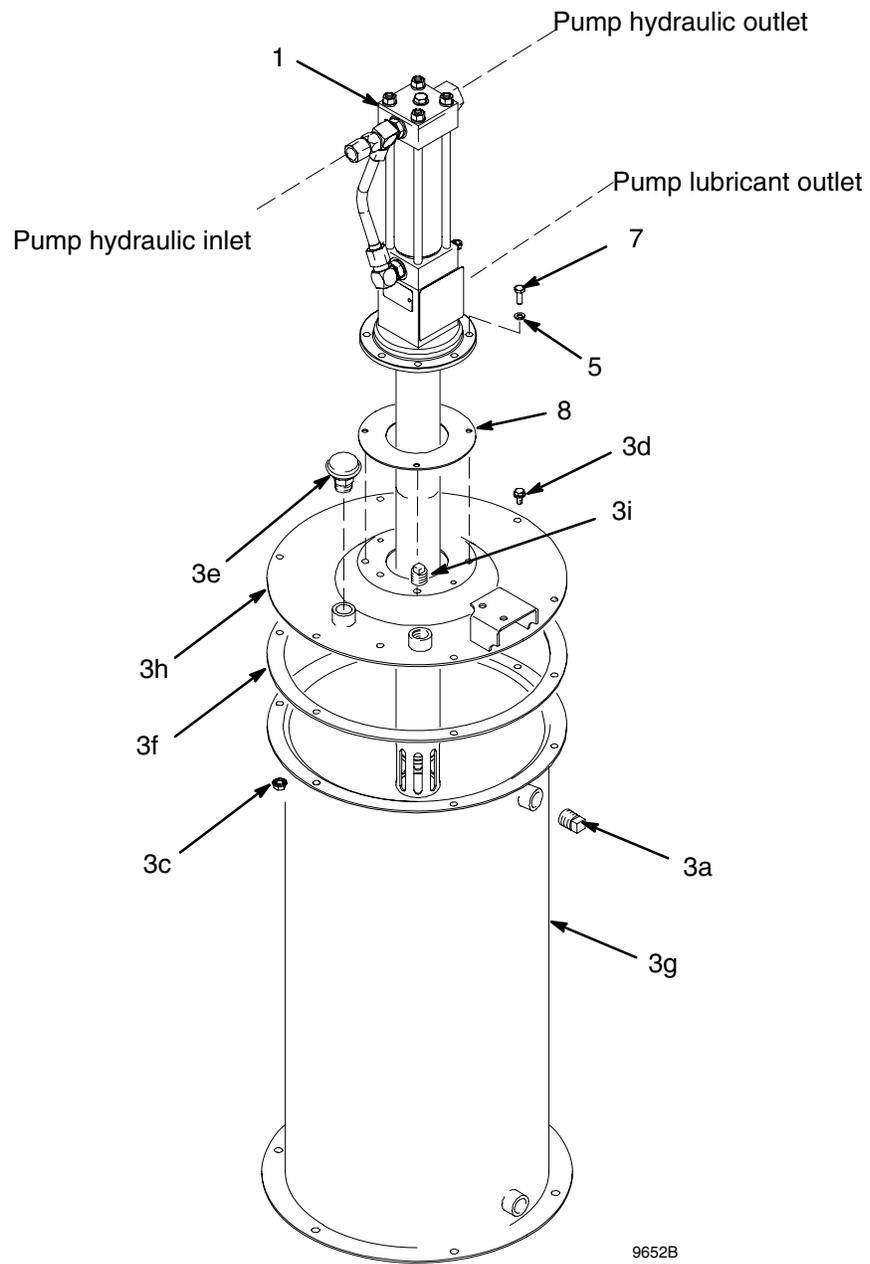
1. For normal system shut down, disconnect power to lubricator controller (J) by turning off the ignition switch, and turn off hydraulic supply by closing the ball valve (Fig. 2, item AA).

⚠ CAUTION
Never allow the pump to run dry of the fluid being pumped. A dry pump will quickly accelerate to a high speed, possibly damaging pump. If your pump accelerates quickly, or is running too fast, stop the pump immediately and check the fluid supply.

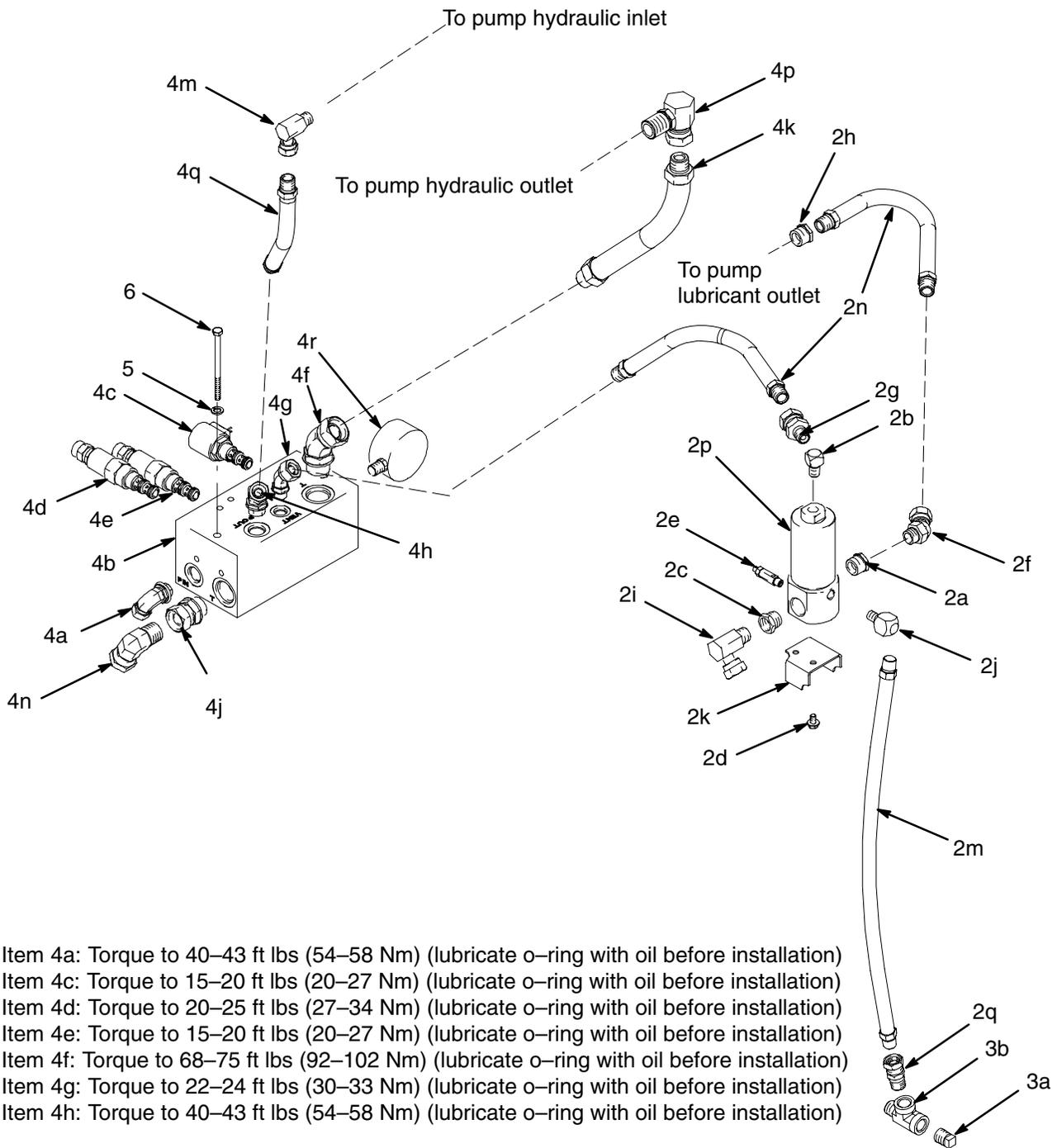
Troubleshooting

Problem	Cause	Solution
System does not build sufficient pressure	Pump malfunction Pump turned off too soon Solenoid malfunction Too low or no hydraulic supply Vent valve seal failure Vent valve needle/seat failure Reservoir out of grease Broken or leaky supply/branch line Injector failure Pressure in tank line too high due to restrictions in tank line or plumbing too small	Refer to manual 308156 Increase timer “pump on” setting Increase hydraulic flow rate to pump Repair or replace Turn pressure up or supply on Replace seal Replace needle and seat Fill reservoir Tighten connections and/or replace line(s) Repair or replace Remove tank line restrictions Use larger plumbing
Lubricant dispensed from pressure relief valve	System pressure set too high	Decrease hydraulic pressure to pump
Pump runs too fast	Reservoir out of lubricant Pump cavitation Leak in distribution system	Fill reservoir Install a follower plate Repair leak
Lubricant coming out of breather	Reservoir overfilled	Drain lubricant until overflow stops
Pump will not start	No hydraulic supply Solenoid malfunction No electrical supply to lubrication controller Lubrication controller malfunction Pump malfunction	Verify/check hydraulic supply Replace solenoid Turn on electrical supply Refer to controller manual 308950 Refer to pump manual 308156

Parts Drawing



Parts Drawing



- Item 4a: Torque to 40–43 ft lbs (54–58 Nm) (lubricate o-ring with oil before installation)
- Item 4c: Torque to 15–20 ft lbs (20–27 Nm) (lubricate o-ring with oil before installation)
- Item 4d: Torque to 20–25 ft lbs (27–34 Nm) (lubricate o-ring with oil before installation)
- Item 4e: Torque to 15–20 ft lbs (20–27 Nm) (lubricate o-ring with oil before installation)
- Item 4f: Torque to 68–75 ft lbs (92–102 Nm) (lubricate o-ring with oil before installation)
- Item 4g: Torque to 22–24 ft lbs (30–33 Nm) (lubricate o-ring with oil before installation)
- Item 4h: Torque to 40–43 ft lbs (54–58 Nm) (lubricate o-ring with oil before installation)

9652B

Parts List

Model 243159, Dynastar Pump Module
includes items 1 – 8

***Model 243502**, 35# Dynastar Pump Module
Installation Kit includes items 1, 2, 4 and 8

***Model 243503**, 120# Dynastar Pump
Module Installation Kit includes items 1, 2, 4
and 8

***Model 243504**, 400# Dynastar Pump
Module Installation Kit includes items 1, 2, 4
and 8

Ref. No.	Part No.	Description	Qty.	Ref. No.	Part No.	Description	Qty.
1	224751	PUMP (used on Model 243159 and Model 243503) <i>See manual 308156</i>	1	3	241486	KIT, reservoir, 90 # grease	1
	224912	PUMP, 35# Dynastar (used on Model 243502) <i>See manual 308156</i>	1	3a	100737	. PLUG, pipe	2
	224752	PUMP, 400# Dynastar (used on Model 243504) <i>See manual 308156</i>	1	3b	108126	. TEE, pipe	1
2	243170	KIT, installation, vent valve	1	3c	110996	. NUT, flanged, hex	6
2a	100505	. BUSHING, pipe	1	3d	111800	. SCREW, cap, flange head	4
2b	100840	. ELBOW, street	1	3e	115254	. BREATHER	1
2c	100896	. FITTING, bushing, pipe	1	3f	194868	. GASKET, cover	1
2d	111801	. SCREW, cap, hex hd	2	3g	194907	. PAIL, reservoir	1
2e	115122	. VALVE, pressure relief (see manual 308954)	1	3h	247448	. COVER, reservoir	1
2f	161889	. UNION, adapter	1	3i	104663	. PLUG, pipe	1
2g	157705	. UNION, swivel	1	4	243501	KIT, installation control module	1
2h	158212	. BUSHING	1	4a	112581	. ADAPTER, male	1
2i	115470	. UNION, union, swivel, 90°	1	4b	115746	. MODULE, hydraulic control	1
2j	162667	. ELBOW, street, pipe	1	4c	115775	.. VALVE, 3-way solenoid	1
2k	194867	. BRACKET, vent valve	1	4d	115773	.. VALVE, flow regulating	1
2m	194995	. HOSE, vent; 1/2 in.	1	4e	115774	.. VALVE, pressure reducing	1
2n	238370	. HOSE	2	4f	115757	. ADAPTER, straight thread	1
2p	242063	. VALVE, vent (see manual 309099)	1	4g	115758	. ADAPTER, straight thread	1
2q	156684	. UNION, adapter	1	4h	115760	. ADAPTER, straight thread	1
				4j	115763	. ADAPTER, straight thread	1
				4k	115776	. HOSE, 3/4"X3/4" NPT	1
				4m	115829	. UNION, swivel, 90 degree	1
				4n	160327	. UNION, adapter, 90 degree	1
				4p	207648	. UNION, adapter, 90 degree	1
				4q	238370	HOSE, coupled, 1 ft.	1
				4r	802072	. GAUGE, pressure	1
				5	100214	WASHER, lock	6
				6	110384	SCREW, cap, hex hd	2
				7	101864	SCREW, cap	4
				8	15M442	GASKET, pump	1

* Installation kits for custom user provided lubricant reservoirs not shown

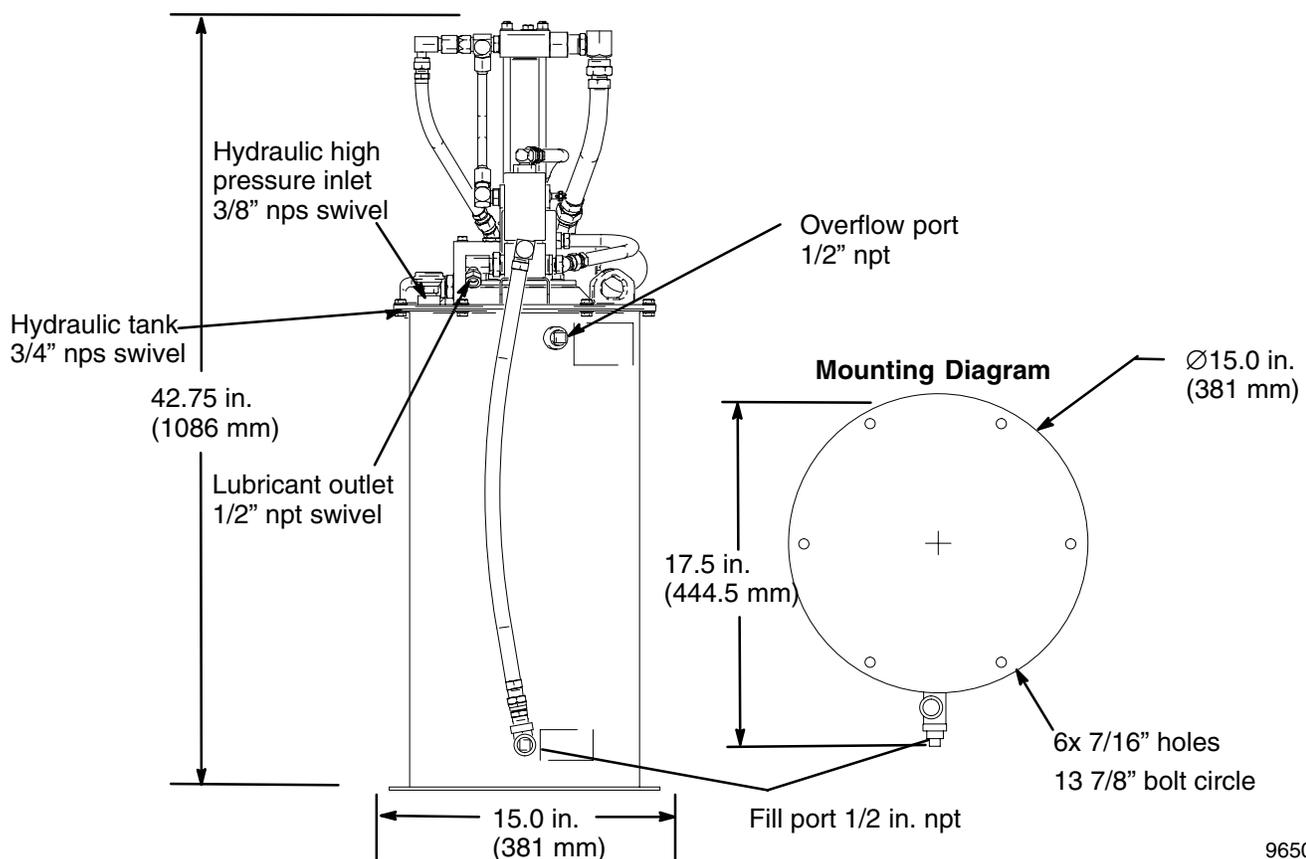
Technical Data

Maximum hydraulic input pressure	3500 psi (241 bar, 24 MPa)
Pump wetted parts	See manual 308156
Vent valve wetted parts	See manuals 309099
Reservoir wetted parts	steel, buna-n rubber
Maximum delivery	66 oz/min (119 in ³ /min, 1952 cm ³ /min) at 3 gpm hydraulic flow rate
Hydraulic pressure operating range	800 to 1200 psi (5.5 to 8 MPa, 55 to 83 bar)
Hydraulic flow rate operating range	0.5 to 3.0 gpm (1.9 to 11.4 liter/ min)
Lubricant outlet pressure range	2500 to 3500 psi (17 to 24 MPa, 172 to 241 bar)
Reservoir overflow port size	1/2 npt (Figure 3, item L)
Reservoir fill port size	1/2 npt (Figure 3, item K)
Hydraulic inlet port size	3/8" nps swivel (Figure 3, item T)
Hydraulic tank line size	3/4" nps swivel (Figure 3, item X)
Lubricant outlet port size	1/2 nps swivel (Figure 3, item G)
Grease capacity	90 lb
Mounting holes for pump module	Six 7/16" holes on 13 7/8" bolt circle
Reservoir diameter	12 3/4" (324 mm)
Pump module height	37 3/4" (959 mm)
Electrical requirements	Timed 24 VDC signal
Electrical power requirements	14.7 Watts
Filtration (hydraulic fluid)	10μ (microns) or better
Sound pressure*	77 dB (A)

*Sound pressure reading taken with pump operating at 66 cycles per minute.

*Sound pressure measured per CAGI-PNEUROP, 1971.

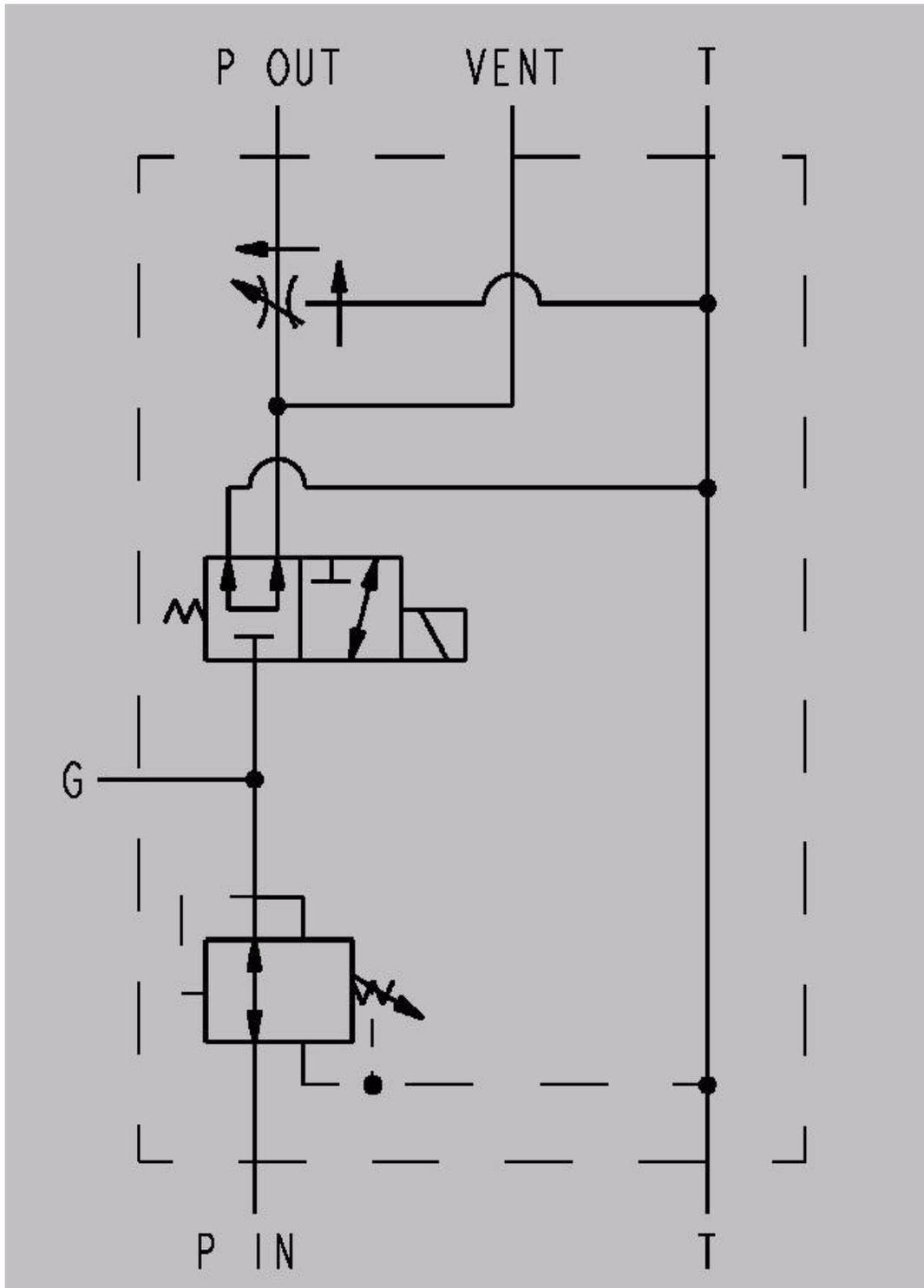
Dimensions



9650A

Hydraulic Control Module Circuit: 243501

Does not include pump and pump valve kit.



Graco Standard Warranty

Graco warrants all equipment manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale by an authorized Graco distributor 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.

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

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

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

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS

The parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

Graco Phone Number

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you:
Minneapolis Local: 612-623-6928; Toll Free: 1-800-533-9655; or FAX: 612-378-3590

*All written and visual data contained in this document reflect the latest product information available at the time of publication.
Graco reserves the right to make changes at any time without notice.*

Original instructions. This manual contains English. MM 309098

Graco Headquarters: Minneapolis

International Offices: Belgium, China, Japan, Korea

GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1441

GRACO INC. is registered to ISO9001

www.graco.com

PRINTED IN USA January 2000, Revised October 2010