INSTRUCTIONS-PARTS LIST

308–173

Rev B
Supersedes A

This manual contains **IMPORTANT INSTRUCTIONS and WARNINGS.**
READ AND RETAIN FOR REFERENCE.

1/4 Gallon Per Minute, 120 VAC, 60 Hz

Electric, Air-Assisted Airless

FF–1000™ Paint Sprayer

950 psi (66 bar) MAXIMUM FLUID WORKING PRESSURE
100 psi (7 bar) MAXIMUM AIR WORKING PRESSURE

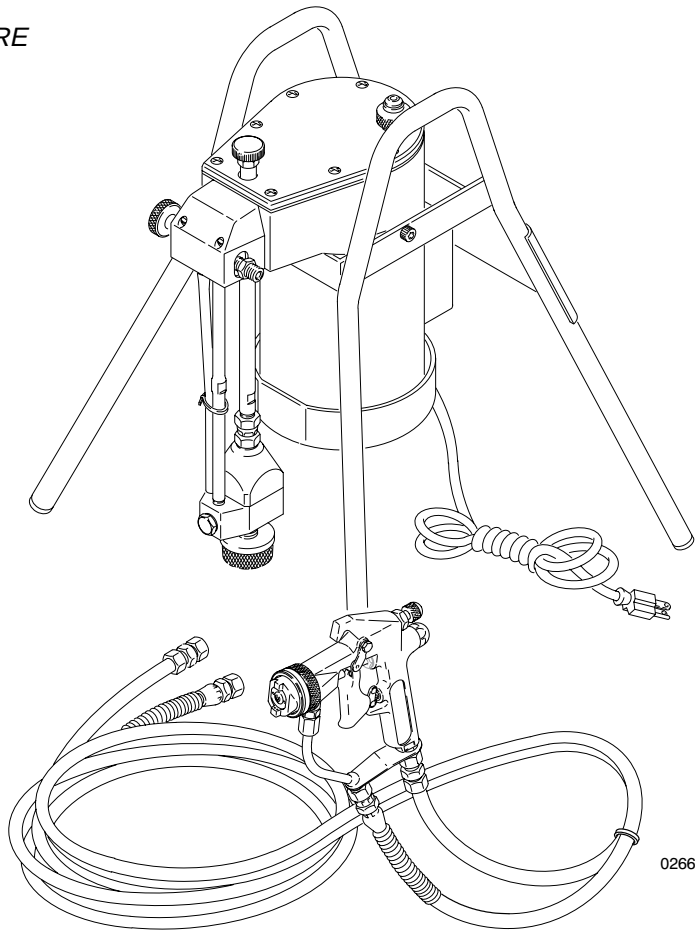
Model 231–200, Series B

Complete Sprayer with hoses and gun.

Model 224–780, Series B

Basic Sprayer without hoses and gun.

U.S. Patent No. 4,616,982
U.K. Patent No. 2,165,591
Other Foreign Patents Pending



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NOTE: This is an example of the DANGER label on your sprayer.

⚠ DANGER ⚠			
	FIRE AND EXPLOSION HAZARD		**SKIN INJECTION HAZARD**
Spray painting, flushing or cleaning equipment with flammable liquids in confined areas can result in fire or explosion. **Use outdoors or in extremely well ventilated areas. Ground equipment, hoses, containers and objects being sprayed.** **Avoid all ignition sources such as static electricity from plastic drop cloths, open flames such as pilot lights, hot objects such as cigarettes, arcs from connecting or disconnecting power cords or turning light switches on and off.** **Failure to follow this warning can result in death or serious injury.**		**Liquids can be injected into the body by high pressure airless spray or leaks – especially hose leaks.** **Keep body clear of the nozzle. Never stop leaks with any part of the body. Drain all pressure before removing parts. Avoid accidental triggering of gun by always setting safety latch when not spraying.** **In case of accidental skin injection, seek immediate "Surgical Treatment".** **Failure to follow this warning can result in amputation or serious injury.**	
READ AND UNDERSTAND ALL LABELS AND INSTRUCTION MANUALS BEFORE USE			

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

Before you use the FF-1000® Sprayer, please read this entire instruction manual. It contains important information that will help you operate the sprayer safely and efficiently, and will help you keep the sprayer in top operating condition.

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TERMS

Be sure you read and understand each of these terms before reading the rest of the manual.

WARNING Alerts the user to avoid or correct conditions which could cause bodily injury.

CAUTION Alerts user to avoid or correct conditions which could damage or destroy the equipment.

PRESSURE RELIEF PROCEDURE A safety procedure for relieving fluid pressure in the system.

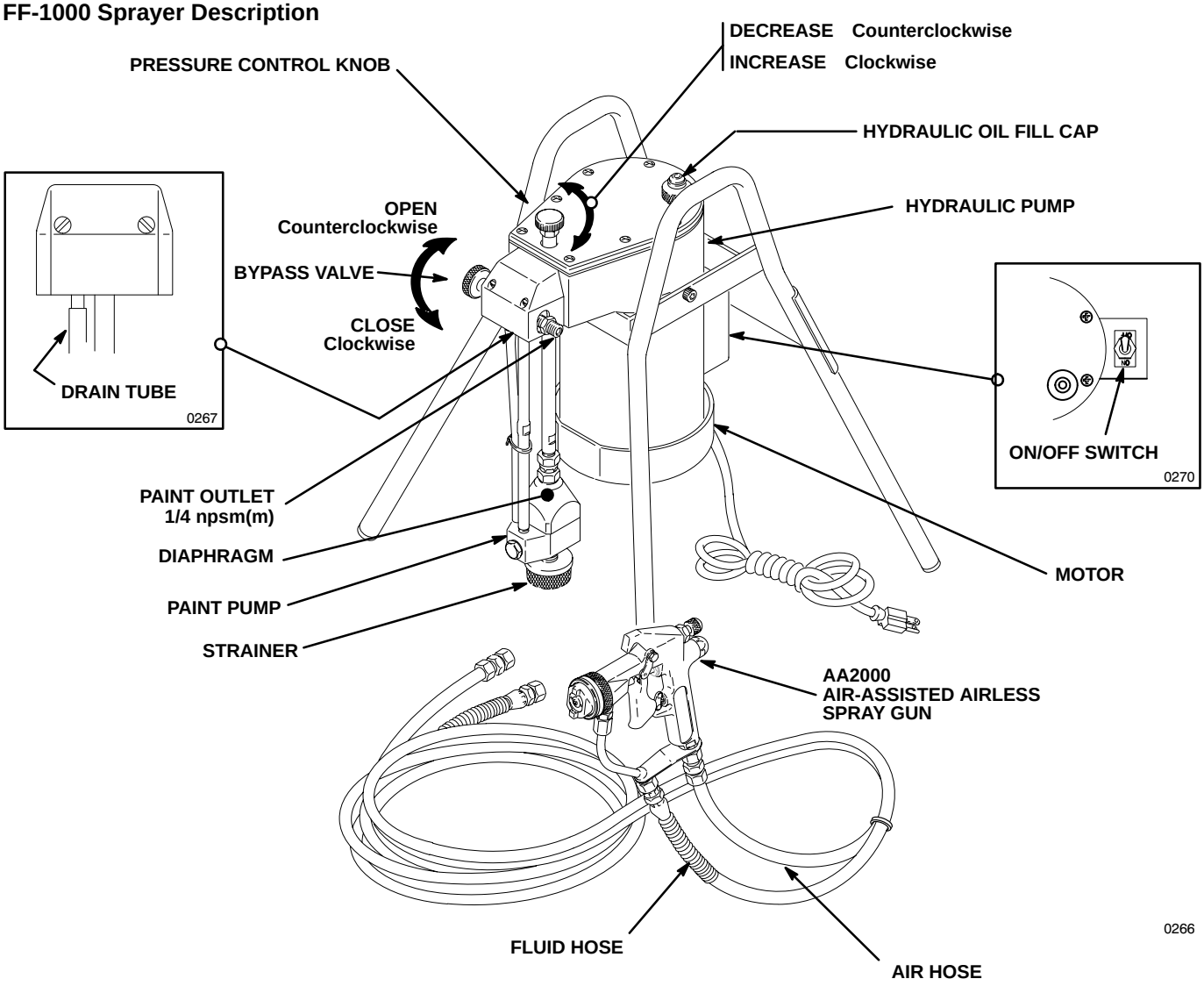
FLUID INJECTION INJURY A serious injury, which may appear to be only a simple cut, caused by the high pressure injection of fluid directly into the body.

NOTE Gives additional explanation of a procedure or helpful hints.

CAUTION

A torque wrench is needed to properly check and tighten the valves and screws on this sprayer. Failure to torque these parts at the specified intervals (see page 13) will result in leaking and serious damage to the sprayer.

FF-1000 Sprayer Description



MOTOR
The FF-1000 Sprayer has a 1/2 HP, 120 V, 60Hz AC, single phase, 1725 rpm motor. The motor is supplied with a three-wire power supply cord and a three-prong plug. The sprayer ON/OFF switch is located on the box on the side of the motor. The motor's function is to drive the hydraulic pump. The motor runs continuously when it is turned on to keep the paint at the desired pressure.

PAINT PUMP
The paint pump is immersed directly into a 5 gallon paint pail, so the pump is actually being pressure fed without the mess and trouble of pouring paint into a hopper.

HYDRAULIC PUMP
The hydraulic pump is located inside the hydraulic reservoir. The motor drives an eccentric bearing which pushes the piston in and out of the hydraulic pump. The pump reciprocates the hydraulic fluid to operate the diaphragm.

DIAPHRAGM
The diaphragm separates the hydraulic and paint portions of the paint pump. Hydraulic oil causes the diaphragm to move up and down almost 30 times per second, no matter what pressure you are spraying at.

PRESSURE CONTROL KNOB
The paint pressure is regulated by turning the pressure control knob **clock**wise to increase pressure and **counterclock**wise to decrease pressure.

BYPASS VALVE
The bypass valve has two functions: (1) to assist in priming the paint pump during initial startup, and (2) to provide positive relief of paint pressure from the gun, hose and sprayer.

FLUID HOSE
One electrically conductive nylon fluid hose and one air hose are supplied with the complete sprayer, Model 231–200. See the hose specifications on page 22.

AA–2000 AIR-ASSISTED AIRLESS SPRAY
This gun combines airless and air spraying concepts. The spray tip shapes the fluid into a fan pattern, similar to a conventional airless spray tip, but at a lower pressure. Air from the air cap further atomizes the fluid and completes the atomization of the paint tails into the pattern. The pattern adjustment valve controls the width of the pattern. Includes a 411 tip.

WARNINGS

HIGH PRESSURE SPRAY CAN CAUSE SERIOUS INJURY.
FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS.
Read and understand all instruction manuals before operating the equipment.

FLUID INJECTION HAZARD

General Safety

This equipment generates very high fluid pressure. Spray from the gun, leaks or ruptured components can inject fluid through your skin and into your body, and cause extremely serious bodily injury, including the need for amputation. Also, fluid injected or splashed into the eyes or on the skin can cause serious damage.

NEVER point the spray gun at any one or at any part of the body. NEVER put your hand or fingers over the spray tip. NEVER try to "blow back" paint; this is NOT an air spray system.

ALWAYS follow the **PRESSURE RELIEF PROCEDURE**, right, before cleaning or removing the spray tip or servicing any system equipment.

NEVER try to stop or deflect leaks with your hand or body.

Be sure equipment safety devices are operating properly before each use.

Medical Alert––Airless Spray Wounds

If any fluid appears to penetrate your skin, get **EMERGENCY MEDICAL CARE AT ONCE. DO NOT TREAT AS A SIMPLE CUT**. Tell the doctor exactly what fluid was injected.

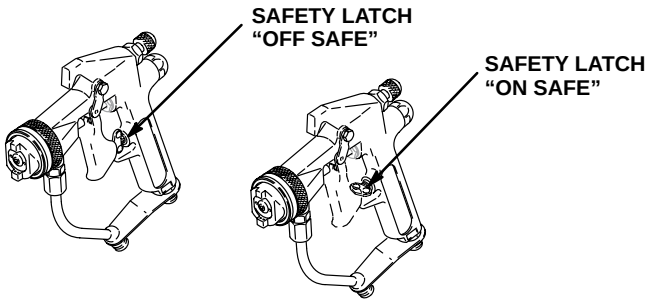
Note to Physician*: Injection into the skin is a traumatic injury. It is important to treat the injury surgically as soon as possible.* ***Do not delay treatment to research toxicity.*** *Toxicity is a concern with some exotic coatings injected directly into the blood stream. Consultation with a plastic surgeon or reconstructive hand surgeon may be advisable*.

Spray Gun Safety Devices

Be sure all gun safety devices are operating properly before each use. Do not remove or modify any part of the gun; this can cause a malfunction and result in serious bodily injury.

Safety Latch

Whenever you stop spraying, even for a moment, always set the gun safety latch in the closed or "safe" position, making the gun inoperative. Failure to set the safety latch can result in accidental triggering. See the illustration below.



Diffuser

The gun diffuser breaks up spray and reduces the risk of fluid injection when the tip is not installed. Check diffuser operation regularly. Follow the **Pressure Relief Procedure**, right, then remove the spray tip. Aim the gun into a metal pail, holding the gun firmly to the pail. Using the lowest possible pressure, trigger the gun. If the fluid emitted *is not* diffused into an irregular stream, replace the gun immediately.

Spray Tip Safety

Use extreme caution when cleaning or changing spray tips. If the spray tip clogs while spraying, engage the gun safety latch immediately. ALWAYS follow the **Pressure Relief Procedure,** below, and then remove the spray tip to clean it.

NEVER wipe off build–up around the spray tip until the pressure is fully relieved and the gun safety is engaged.

PRESSURE RELIEF PROCEDURE

To reduce the risk of serious bodily injury, including fluid injection, splashing fluid or solvent in the eyes or on the skin, or injury from moving parts or electric shock, always follow this procedure whenever you shut off the sprayer, when checking or servicing any part of the spray system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

1. Shut off the sprayer and unplug it.
2. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun into the paint pail to relieve pressure.
3. Engage the gun safety latch.
4. Turn the bypass valve ONE turn **counterclockwise** to drain paint back into the pail.

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

EQUIPMENT MISUSE HAZARD

General Safety

Any misuse of the spray equipment or accessories, such as overpressurizing, modifying parts, using incompatible chemicals and fluids, or using worn or damaged parts, can cause them to rupture and result in fluid injection, splashing in the eyes or on the skin, or other serious bodily injury, or fire, explosion or property damage.

NEVER alter or modify any part of this equipment; doing so could cause it to malfunction.

CHECK all spray equipment regularly and repair or replace worn or damaged parts immediately.

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

System Pressure

This sprayer has a *950 psi (66 bar) MAXIMUM WORKING PRESSURE.* The gun has a *100 psi (7 bar) MAXIMUM INCOMING AIR PRESSURE*. Be sure that any accessories added to the system are rated to withstand this pressure. DO NOT exceed the maximum working pressure of any component or accessory used in the system.

Fluid and Solvent Compatibility

All chemicals used in the sprayer must be chemically compatible with the wetted parts shown in the **TECHNICAL DATA** on the back cover. Consult your chemical supplier to ensure compatibility.

Do not use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in this equipment, which contains aluminum and/or zinc parts. Such use could result in a serious chemical reaction, with the possibility of explosion, which could cause death, serious bodily injury and/or substantial property damage.

FIRE OR EXPLOSION HAZARD

Static electricity is created by the flow of fluid through the pump and hose. If every part of the spray equipment is not properly grounded, sparking may occur, and the system may become hazardous. Sparking may also occur when plugging in or unplugging a power supply cord or using a gasoline engine. Sparks can ignite fumes from solvents and the fluid being sprayed, dust particles and other flammable substances, whether you are spraying indoors or outdoors, and can cause a fire or explosion and serious bodily injury and property damage. Do not plug in or unplug any power supply cords in the spray area when there is any chance of igniting fumes still in the air.

If you experience any static sparking or even a slight shock while using this equipment, **STOP SPRAYING IMMEDIATELY**. Check the entire system for proper grounding. Do not use the system again until the problem has been identified and corrected.

Grounding

To reduce the risk of static sparking, ground the sprayer and all other spray equipment used or located in the spray area. CHECK your local electrical code for detailed grounding instructions for your area and type of equipment. BE SURE to ground all of this spray equipment:

1. *Sprayer:* plug the power supply cord, or extension cord, each equipped with an undamaged three-prong plug, into a properly grounded outlet. Do not use an adapter. All extension cords must have three wires and be rated for 15 amps.
2. *Air compressor:* follow manufacturer's recommendations.
3. *Fluid hoses:* use only grounded hoses with a maximum of 500 ft (150 m) combined hose length to ensure grounding continuity. See **Hose Grounding Continuity** below.
4. *Spray gun:* obtain grounding through connection to properly grounded air and fluid hoses and sprayer.
5. *Object being sprayed:* follow local code.
6. *Fluid supply container:* follow local code.
7. *All solvent pails used when flushing,* follow local code. Use only metal pails, which are conductive. Do not place the pail on a non–conductive surface, such as paper or cardboard, which interrupts the grounding continuity.
8. *To maintain grounding continuity when flushing or relieving pressure*, always hold a metal part of the gun firmly to the side of a grounded metal pail, then trigger the gun.

Flushing Safety

Reduce the risk of fluid injection injury, static sparking, or splashing by following the flushing procedure given on page 14 of this manual. Follow the **Pressure Relief Procedure** on page 4, and remove the spray tip before flushing. Hold a metal part of the gun firmly to the side of a grounded metal pail and use the lowest possible fluid pressure during flushing.

HOSE SAFETY

High pressure fluid in the hoses can be very dangerous. If the hose develops a leak, split or rupture due to any kind of wear, damage or misuse, the high pressure spray emitted from it can cause a fluid injection injury or other serious bodily injury or property damage.

ALL FLUID HOSES MUST HAVE STRAIN RELIEFS ON BOTH ENDS! The strain reliefs help protect the hose from kinks or bends at or close to the coupling which can result in hose rupture.

TIGHTEN all fluid connections securely before each use. High pressure fluid can dislodge a loose coupling or allow high pressure spray to be emitted from the coupling.

NEVER use a damaged hose. Before each use, check the entire hose for cuts, leaks, abrasion, bulging cover, or damage or movement of the hose couplings. If any of these conditions exist, replace the hose immediately. DO NOT try to recouple high pressure hose or mend it with tape or any other device. A repaired hose cannot contain the high pressure fluid.

HANDLE AND ROUTE HOSES CAREFULLY. Do not pull on hoses to move equipment. Keep hoses clear of moving parts. Do not use fluids or solvents which are not compatible with the inner tube and cover of the hose. DO NOT expose Graco hoses to temperatures above 180° F (82° C) or below –40° F (–40° C).

Hose Grounding Continuity

Proper hose grounding continuity is essential to maintaining a grounded spray system. Check the electrical resistance of your fluid hoses at least once a week. If your hose does not have a tag on it which specifies the maximum electrical resistance, contact the hose supplier or manufacturer for the maximum resistance limits. Use a resistance meter in the appropriate range for your hose to check the resistance. If the resistance exceeds the recommended limits, replace it immediately. An ungrounded or poorly grounded hose can make your system hazardous. Also read **FIRE OR EXPLOSION HAZARD,** above**.**

IMPORTANT

United States Government safety standards have been adopted under the Occupational Safety and Health Act. These standards – particularly the General Standards, Part 1910, and the Construction Standards, Part 1926 – should be consulted.

AVERTISSEMENT

La pulvérisation à haute pression peut causer de blessures très graves.
Réservé exclusivement à l'usage professionnel. Observer toutes les consignes de sécurité.
Bien lire et bien comprendre tous les manuels d'instructions avant d'utiliser le matériel.

RISQUES D'INJECTION

Consignes générales de sécurité

Cet appareil produit un fluide à très haute pression. Le fluide pulvérisé par le pistolet ou le fluide sous pression provenant de fuites ou de ruptures peut pénétrer sou la peau ou à l'intérieur du corps et entraîner des blessures très graves, voir même une amputation. Même sans être sous pression, le fluide éclaboussant ou entrant dans les yeux peut aussi entraîner des blessures graves.

NE JAMAIS pointer le pistolet vers quelqu'un ou vers une partie quelconque du corps. NE JAMAIS mettre le main ou les doigts sur l'ajutage du pulvérisateur. NE JAMAIS essayer de "refouler" la peinture. Cet appareil N'est PAS un compresseur pneumatique.

TOUJOURS observer la **Marche à Suivre Pour Détendre la Pression** donnée plus loin, **avant** de nettoyer ou d'enlever l'ajutage du pulvérisateur, ou d'effectuer un travail quelconque sur une partie de l'appareil.

NE JAMAIS essayer d'arrêter ou de dévier le fuites avec la main ou le corps.

Avant chaque utilisation, bien s'assurer que les dispositifs de sécurité fonctionnent correctement.

Soins médicaux

En cas de pénétration de fluide sous la peau: **DEMANDER IMMEDIATEMENT DES SOINS MÉDICAUX D'URGENCE.** Ne pas soigner cette blessure comme une simple coupure.

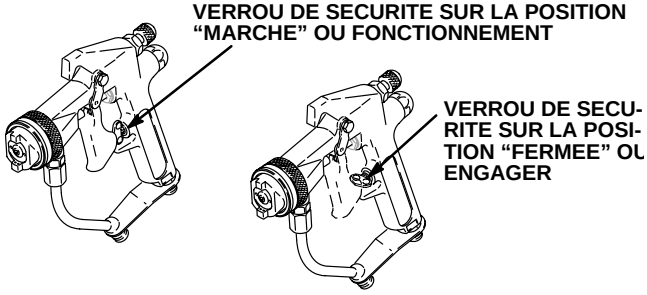
Avis au médecin: *La pénétration des fluides sous la peau est un traumatisme.* **Il est important de traiter chirurgicalement cette blessure immédiatement.** *Ne pas retarder le traitement pour effectuer des recherches sur la toxicité. Certains revêtements exotiques sont dangereusement toxiques quand ils sont injectés directement dans le sang. Il est souhaitable de consulter un chirurgien esthétiques ou un chirurgien spécialisé dans la reconstruction des mains.*

Dispositifs de sécurité du pistolet

Avant chaque utilisation, bien s'assure que tous les dispositifs de sécurité du pistolet fonctionnent correctement. Ne pas enlever ni modifier une partie quelconque du pistolet; ceci risquerait d'entraîner un mauvais fonctionnement et des blessures graves.

Verrou de sécurité

A chaque fois que l'on s'arrête de pulvériser, même s'il s'agit d'un court instant, toujours mettre le verrou de sécurité du pistolet sur la position, "fermée" ou "sécurité" ("safe"), pour empêcher le pistolet de fonctionner. Si le verrou de sécurité n'est pas mis, le pistolet peut se déclencher accidentellement.



Diffuseur

Le diffuseur du pistolet sert à diviser le jet et à réduire les risques d'injection accidentelle quand l'ajutage n'est pas en place. Vérifier le fonctionnement du diffuseur régulièrement. Pour cette vérification, détendre la pression en observant la **Marche à Suivre Pour Détendre la Pression** donnée plus loin enlever l'ajutage du pulvérisateur. Pointer le pistolet dans un seau en métal, en le maintenant fermement contre le seau. puis, en utilisant la pression la plus faible possible, appuyer sur la gâchette du pistolet. Si le fluide projeté *n'est pas* diffusé sous forme de jet irrégulier, remplacer immédiatement le diffuseur.

Consignes de sécurité concernant l'ajutage du pulvérisateur

Faire extrêmement attention à l'occasion du nettoyage ou due remplacement des ajutages du pulvérisateur. Si l'ajutage se bouche pendent la pulvérisation, mettre immédiatement le verrou de sécurité du pistolet. TOUJOURS bien observe la **Marche à Suivre Pour Détendre la Pression** puis enlever l'ajutage du pulvérisateur pour le nettoyer.

NE JAMAIS essuyer ce qui s'est accumulé autour de l'ajutage du pulvérisateur avant que la pression ne soit complètement tombée et que le verrou de sécurité du pistolet ne soit engagé.

March à suivre pour Détendre la Pression

Pour réduire les risques de blessures graves, y compris les blessures par projection de fluide ou celles causées par de éclaboussures dans les yeux ou sur la peau, par des pièces en mouvement, toujours bien observe cette marche à suivre chaque fois que l'on arrête le pulvérisateur, à l'occasion de la vérification, du ègale ou du nettoyage du système ou lors du changement des ajutages.

1. Arrêter le pulvérisateur et débrancher la prise de courant.
2. En maintenant une partie métallique du pistoler fermement appuyée le côté d'un seau en métal relié à la terre, appuyer sur la gachette du pistolet pour libérer la pression.
3. Engager le verrou de sécurité de la pistolet.
4. Tourner le robinet de dérivation d'UN tour dans la **sens contraire des aiguilles d'une montre** pour vidanger la peinture dans le seau.

Si l'on soupconne que le tuyau ou l'ajutage est complètement bouché ou que la pression n'a pas été complètement libérée après avoir procédé aux opérations ci–dessus, desserrer TRES LENTEMENT l'écrou de retenue de la protection de l'ajutage ou le raccord de bout de tuyau et libérer progressivement la pression, puis terminer le desserage. On peut maîntenant débroucher l'ajutage ou le tuyau.

RISQUES EN CAS DE MAUVAISE UTILISATION DU MATERIAL

Consignes générales de sécurité

Toute utilisation anormale de l'appareil du pulvérisation ou des accessoires comme, par exemple, la mise sous une pression excessive, les modifications de pièces, l'utilisation de produits chimiques et de matières incompatibles et l'utilisation de pièces usées ou abîmées peut causer des dégâts à l'appareil ou des ruptures de pièces et entraîner une injection de liquide ou d'autres blessures sérieuses, un incendie, une explosion ou d'autres dégâts.

NE JAMAIS altére ou modifier une pièce de cet appareil; ceci risquerait d'entraîner son mauvais fonctionnement.

VERIFIER régulièrement tout l'appareil de pulvérisation et ses équipements et réparer ou remplacer immédiatement les pièces usées ou abîmées.

Toujours porter une protection pour les yeux, de gants, des vêtements protecteur et un dispositif pour la respiration correspondant aux recommendations des fabricants de fluides et solvants.

Pression du système

Ce pulvérisateur peut produire une *PRESSION MAXIMUM DE TRAVAIL de 950 lb/po.^{2} (66 kg/cm^2).* Le pistolet à un *PRESSION MAXIMUM D'AIR DE 100 lb/po^2 (7 kg/cm^2).* S'assurer que tous les éléments du pulvérisateur et ses accessoires sont conçus pour résister à la pression maximum de travail de ce pulvérisateur. NE PAS dépasser la pression maximum de travail d'aucun des éléments ou accessoires utilisés avec cet appareil.

Compatibilité chimique des corps

BIEN S'ASSURER que tous les corps des solvants utilisés sont chimiquement compatibles avec les parties mouillées indiquées dans les "Données techniques", à la page 24. Toujours lire soigneusement les documents et brochures du fabricant des fluides et solvants utilisés avant de s'en servir dans ce pulvérisateur.

MESURES DE SECURITE CONCERNANT LES TUYAUX FLEXIBLES

Le fluide à haute pression circulant dans les tuyaux peut être très dangereux. En cas de fuite sur le tuyau, de fissure, déchirure ou rupture à la suite de l'usure, de dégâts ou d'une mauvaise utilisation, les projections de fluide haute pression qui en proviennent peuvent entraîner des blessures graves par pénétration sous la peau ou par contact, ainsi que des dégâts matériels.

TOUS LES TUYAUX FLEXIBLES DOIVENT AVOIR DES RESSORTS SPIRALE DE PROTECTION AUX 2 BOUTS! Les spirales de protection contribuent à éviter la formation de pliures, de boucles ou de nœuds sur les tuyaux qui pourraient entraîner la rupture du tuyau à l'endroit du raccord ou à son voisinage.

SERRER FERMEMENT tous les raccords avant chaque utilisation. Le fluide sous pression peut faire sauter un raccord desserré ou produire un jet à haute pression s'échappant par le raccord.

NE JAMAIS utiliser un tuyau endommagé. Avant chaque utilisation, vérifier entièrement chaque tuyau pour décler les coupures, fuites, abrasions, boursouflures de l'enveloppe ou toute autre détériorations, il faut remplacer le tuyau immédiatement. NE PAS essayer de refaire le raccord d'un tuyau haute pression ni de réparer le tuyau avec du ruban adhésif ou ou par tout autre moyen. Un tuyau réparé ne peut pas résister au fluide sous pression.

MANIPULER LES TUYAUX AVEC PRECAUTION ET CHOISIR SOIGNEUSEMENT LEUR CHEMIN. Ne pas déplacer le fluide en tirant sur le tuyau. Ne pas utiliser de fluides ou de solvants que ne sont pas compatibles avec l'enveloppe intérieur ou extérieure de tuyau. NE PAS exposer le tuyau à fluides des températures supérieures à 82°C (180°F) ou inférieures à –40°C (–40°F).

Continuité de la mise à la terre des tuyaux

Une bonne continuité de la mise à la terre des tuyaux est essentielle pour maintenir la mise à la terre de l'ensemble de vaporisation. Vérifiez la résistance électrique de vos tuyaux à fluides et à air, au moines une fois par semaine. Si votre tuyau ne comporte pas d'étiquette qui précise la résistance électrique maximum, prenez contact avec le fournisseur de tuyaux ou la fabricant pour avoir les limites de résistance maximum. Utilisez un mètre de résistance de la gamme appropriée pour votre tuyau et vérifiez la résistance. Si celle–ci dépasse les limites recommandées, remplacez le tuyau immédiatement. Un tuyau sans mise à la terre ou avec une mise à la terre incorrecte peut entraîner des risques pour votre système. Lisez aussi **LES RISQUES D'INCENDIE OU D'EXPLOSION.**

RISQUES D'INCENDIE OU D'EXPLOSION

De l'électricité statique est produite par le passage du fluide à grande vitesse dans la pompe et dans les tuyaux. Si toutes les pièces de l'appareil de pulvérisation ne sont pas convenablement reliées ou à la masse ou à la terre, des étincelles peuvent se produire et l'appareil risques d'être dangereux. Des étincelles peuvent Également se produire à l'occasion du branchement ou du débranchement du cordon d'alimentation ou de l'utilisation d'un moteur à essence. Les étincelles sont suffisantes pour allumer les vapeurs de solvants et le fluide pulvérisé, les fines particules de poussière ainsi que d'autres substances inflammables, quand on pulvérisé à l'intérieur ou à l'extérieur, et elles peuvent causer un incendie ou une explosion, ainsi que des blessures graves et des dégâts matériels. Toujour brancher le pulvérisateur dans un prise se trouvant à moins 6 m (20 pieds) de l'appareil et d l'endroit où se fait la pulvérisation. Ne pas brancher ou débrancher un cordon d'alimentation quel qu'il soit dans la zone où se fait la pulvérisateur quand il y a le moindre risque que des vapeurs encore présentes dan l'air prennent feu.

S'il se produit des étincelles d'électricité statique, ou si vous ressentez la moindre décharge, ARRETEZ IMMEDIATEMENT LA PULVERISATION. Vérifiez que le système avant que le problème soit identifié et corrigé.

Mise à la terre ou à la masse

Pour réduire les risques de production d'étincelles d'électricité statique, le pulvérisateur et tous les équipement utilisés ou se trouvant dans la zone de pulvérisation doivent être reliés à la terre ou à la masse. Pour connaître le détail des instructions de mise à la terre dans la région et le type particulier d'équipement, CONSULTER le code ou les réglementations électriques locales. S'ASSURER que tous le équipements de pulvérisation suivants sont bien reliés à la terre:

1. *Pulvérisateur:* Brancher le cordon d'alimentation ou la rallonge quie doivent être équipés d'une prise 3 fiches en bon état, dans une prise de courant convenablement mise à la terre. Ne pas utiliser d'adaptateur. Toutes le rallonges doivent avoir 3 files et être prévues pour 15 ampères.
2. *Le compresseur d'air:* observer le recommendations de fabricant.
3. *Pistolet:*Réaliser la mise à la terre en le raccordant à une tuyau flexible et à une pulvérisateur déjà convenablement reliés à la terre.
4. *Tuyaux flexibles:* Afin d'assurer la continuité de la mise à la terre, n'utiliser que des tuyaux comportant une mise à la terre et ayant une longueur maximum combinée de 150 m (1500 pieds). Se reporter également au paragraphe, **"Continuité du circuit de mis à la terre des tuyaux".**
5. *Récipient d'alimentation:* observer le code ou les réglementations locales.
6. *Objets, matériel ou surfaces recevant la pulvérisation:* observer le code ou les réglementations locales.
7. *Tous le seaux de solvant* utilisés pour le rinçage: observer le code ou les réglementations locales. *N'utiliser que des seaux métallique* conducteurs de l'électricité. Ne pas mettre le seau sur une surface non conductrice comme sur du papier ou du carton car cela interromprait la continuité de la mise à la terre.
8. *Pour conserver la continuité de la mise à la terre quand on rincé le matériel ou quand on libère la pression,* toujours maintenir une partie métallique du pistolet fermement appuyée contre le côté d'un seau *en métal* puis appuyer sur la détente du pistolet.

Mesures de Sécurité concernant le Rinçage

Pour réduire les risques de blessures par pénétration de la peau et les risques dûs aux étincelles d'électricité statique ou aux éclaboussures, observe la marche à suivre pour le rinçage donnée à la page 14 de ce manuel. Observer la**"March à Suivre pour Détendre la Pression"** donnée à la page 6 en *enlever l'ajutage du pulvérisateur avant le rinçage.* Maintenir une partie métallique du pistolet fermement appuyée contre le côté d'un seau *en métal* relié á la terre et utiliser la pression la plus faible possible pendent le rinçage.

ADVERTENCIA

EL ROCIADO A ALTA PRESION PUEDE CAUSAR GRAVES LESIONES.
SOLO PARA USO PROFESIONAL. RESPECTE LOS AVISOS DE ADVERTENCIA.
Lea y entienda todo el manual de instrucciones antes de manejar el equipo.

PELIGRO DE INYECCION DE FLUIDO

Seguridad general

Este equipo general un fluido a una presión muy alta. El rociado de la pistola, los escapes de fluido o roturas de los componentes pueden inyectar fluido en la piel y el cuerpo y causar lesiones extremadamente graves, incluyendo a veces la necesidad de amputación. También, el fluido inyectado o salpicado en los ojos puede causar graves daños.

NUNCA apuntar la pistola hacia alguien o alguna parte del cuerpo. NUNCA colocar la mano o los dedos encima de la boquilla. NUNCA tratar de "hacer retornar la pintura"; este NO es un sistema de rociado de aire.

SIEMPRE seguir el **procedimiento de descarga de presión,** dado más abajo, *antes* de limpiar o sacar la boquilla o de dar servicio a cualquier del sistema.

NUNCA tratar de parar o desviar los escapes con la mano o el cuerpo.

Asegurar que todos los aparatos de seguridad del equipo están funcionando bien antes de cada uso.

Tratamiento médico

Si pareciera que un poco de fluido penetró la piel, conseguir **TRATAMIENTO MEDICO DE URGENCIA DE INMEDIATO. NO TRATAR LA HERIDA COMO UN SIMPLE CORTE.** Decir al médico exactamente cua fluido fue.

Aviso al médico: *Si se llega a inyectar este fluido en la piel se causa una lesión traumática.* **Es importante tratar quirúrgicamente la lesión a la brevedad posible.** *No demorar el tratamiento para investigar la toxicidad. La toxicidad es algo de sumar importancia en algunas pinturas exóticas cuando se inyectan directamente al torrente sanguíneo. Sirá conveniente consultar a un especialista en cirugía plástica o reconstructiva de las manos.*

Aparatos de seguridad de la pistola pulverizadora

Asegurar que todos los aparatos protectores de la pistola están funcionando bien antes de cada uso. No sacar ni modificar ninguna pieza de la pistola pues podría causar el malfuncionamiento de la misma con las consiguientes lesiones personales.

Pestillo de seguridad

Cada vez que se deje de pulverizar, aunque sea por un breve momento, siempre colocar el pestillo de seguridad en la posición "cerrada", lo que deja la pistola inoperante. El no hacerlo puede llevar al disparo imprevisto de la pistola. Ver la ilustración más abajo.

Difusor

El difusor de la pistola dispersa el chorro pulverizado y reduce el riesgo de inyección cuando no está instalada la boquilla. Revisar con regularidad el funcionamiento del difusor. Seguir el **procedimiento de descarga de presión,** dado más abajo, y después sacar la boquilla. Apuntar la pistola a un balde metálico, sosteniéndola bien firme contra él. Utilizando la presión más bajo posible, disparar la pistola. Si el fluido emitido *no sale disperso* en un chorro irregular, reemplazar de inmediato el difusor.

Seguridad de la boquilla pulverizadora

Tener mucho cuidado al limpiar o cambiar las boquillas. Si llegara a obstruirse mientras está pulverizando, enganchar el pestillo de la pistola de inmediato. SIEMPRE seguir el **procedimiento de descarga de presión** y después sacar la boquilla para limpiarla

NUNCA limpiar la acumulación de pintura alrededor de la boquilla antes de que se haya descargado por completo la presión y el pestillo esté enganchado.

Procedimiento de descarga de presión

Para reducir el riesgo de sufrir graves lesiones corporales, incluyendo la inyección de fluidos, salpicaduras en los ojos o la piel, o lesiones causadas por piezas en movimiento, siempre seguir este procedimiento al apagar la máquina pulverizadora, al revisar, ajustar o limpiar el sistema, o al cambiar las boquillas, y cada vez que se deja de pulverizar.

1. Apagar la pulverizadora y desenchufarla.
2. Apoyar una parte metálica de la pistola firmemente contra un balde de metal puesto a tierra, y disparar la pistola dentro del balde para descargar la presión.
3. Enganchar el pestillo del gatillo de la pistola.
4. Darle UNA vuelta en sentido contra horario a la vávula de paso para vaciar la pintura de vuelta al balde.

Si se sospecha que la boquilla o la manguera esté completamente obstruida, o que no se ha descargado por completo la presión después de haber seguido el procedimiento anterior, aflojar MUY LENTAMENTE un adaptador de extremo de la manguera o la tuerca de renención del protector de lay punta y descargar gradualmente la presión, después aflojarlo por completo. Leugo, despejar la boquilla o la manguera.

PELIGRO POR MAL USO DEL EQUIPO

Seguridad general

Cualquier mal uso del equipo pulverizador o los accesorios, tal como sobre presurización, modificación de piezas, uso de materiales y productos químicos incompatibles, o utilización de piezas dañadas o desgastadas, puede hacen que se rompan y causen la inyección de fluido u otras lesiones corporales graves, incendio, explosión o daños a la propiedad.

Siempre usar gafas, guantes, vestimentas protectoras y un respiradero, tal como recomiendan los fabricantes del fluido y del solvente.

Presión del sistema

Esta pulverizadora puede desarrollar 950 psi (66 barías) de *PRESION DE TRABAJO MAXIMA.* Le aire máxima de pistola este 100 psi (7 barías). Asegurar que todo el equipo pulverizador y sus accesorios tienen la capacidad para aguantar la presión máxima de trabajo de ningún componente o accesorio de este
sistema.

Compatibilidad de fluido

ASEGURAR que todos los fluidos y colventes usados son quimicamente compatibles con las piezas mojadas ilustradas en la hoja DATOS TECNICOS. Siempre leer las instrucciones del fabricante del fluido y solvente antes de usarlos en esta pulverizadora.

PELIGRO DE INCENDIO O EXPLOSION

El flujo a alta velocidad del fluido al pasar por la bomba y manguera crea electricidad estática. Si todas las partes del equipo pulverizador no tienen buena tierra, pueden ocurrir chispas, convirtiéndo al sistema en algo peligroso. También, pueden producirse chispas al enchufar o desenchufar el cordón eléctrico o al usar un motor de gasolina. Estas chispas pueden inflamar los vapores de los solventes y el chorro de fluido pulverizado, partículas de polvo y otras sustancias inflamables, sea al aire libre o bajo techo, lo que podría causar una explosión o incendio y graves lesiones corporales y daños a la propiedad. Enchufar simpre la pulverizadora a un tomacorriente que se encuentre a por lo menos 6 m (20 pies) de la máquina y del área que se va a rociar. No enchufar o desenchufar ningún cordón eléctrico en el lugar donde se está rociando cuando todavia exista la posibilidad de que quenden vapores inflamables en el aires.

Si ocurre una chispa de electricidad estática o incluso un ligero choque eléctrico mientras se usa el equipo, DEJAR DE PULVERIZAR DE INMEDIATO. Revisar todo el sistema en busca de una tierra apropiado. No usar de nuevo el sistema hasta haber identificado y solucionado el problema.

Puesta a tierra

Para reducir el riesgo de chispas estáticas, conectar a tierra la pulverizadora y todo el otro equipo de pulverizar que se use o se encuentre en el lugar que se va a rociar. CONSULTAR el código eléctrico de la localidad para las instrucciones sobre las conexiones a tierra exigidas para la zona y tipo de equipo. ASEGURAR de conectar a tierra todo este equipo pulverizador:

1. *Pulverizadora:*enchufar el cordón eléctrico, o cable extensor, cada uno con un enchuf de tres patas en buen estado, a un tomacorriente con puesta a tierra aporpiado. No usar un adaptador. Totos los cables extensores tienen que tener tres hilos y una capacidad de 15 amperios.
2. *Compresor de aire:* de conformidad con el recomendacion de fabricante.
3. *Mangueras para fluidos:* usar solamente mangueras con puesta a tierra de una longitud combinada de 150 m (500 pies), para asegurar buena continuidad a tierra. Referirse también al párrafo sobre **continuidad a tierra de la manguera.**
4. *Pistola:* hacer la puesta a tierra conectándola a una manguera de fluido y pulverizadora bien conectadas a tierra.
5. *Suministrar un recipiente:* de acuerdo al código local. Usar *solamente baldes de metal,* que sean conductivos. No colocar el balde en una superficie no conductiva, como papel o cartón, que interrumpe la continuidad a tierra.
6. *Objeto que se está rociando:* de conformidad con el código local.
7. *Todos los baldes de solvente* usados durante el lavado, de conformidad con el código local.
8. *Para mantener la continuidad a tierra durante el lavado o descarga de presión,* siempre apoyar una parte metálica de la pistola bien firme contra el costado de *balde de metal*, después apretar el gatillo.

Seguridad durante el lavado

Para reducir el riesgo de que se inyecte o salpique fluido en la piel, o que ocurra una descarga de electricidad estática, siempre seguir las INSTRUCCIONES PARA EL LAVADO, dadas en la página 14. Seguir el **procedimiento de descarga de presión** en la página 8, y quitar la *boquilla de metal* y usar le presión más baja posible de fluido durante el lavado.

SEGURIDAD EN EL USO DE LAS MANGUERAS

El fluido que escapa a alta presión por las mangueras puede ser muy peligroso. Si en la manguera se desarrola un escape, una rotura o rajadura debido a cualquier tipo de desgaste, daño o maltrato, el chorro a alta presión emitido por allí puede causar una lesión por inyección u otras lesiones corporales graves o daños a la propiedad.

¡TODAS LAS MANGUERAS PARA FLUIDOS TIENEN QUE TENER GUARDAS DE RESORTE EN AMBOS EXTREMOS! Estas protegen las mangueras contra dobleces o retorceduras en los acoplamientos o cerca de ellos, los que podrían traducirse en roturas de la manguera.

Antes de usarlas, APRETAR bien firmes todas las conexiones. El fluido a lata presión puede desalojar un acoplamiento suelto o dejar que pro él escape un chorro a alta presión.

NUNCA usar una manguera que está dañada. Siempre revisarla en busca de cortaduras, escapes, abrasión, cubierta abultada, o acoplamientos sueltos o dañados. Si llegara a encontrarse cualquiera de estas condiciones, reemplazar de inmediato la manguera. NO intentar reacoplar una manguera de alta presión o enmendarla con cinta adhesiva u otro material similar. Una manguera que ha sido remendada no aguante el fluido al alta presión.

MANEJAR Y PASAR CUIDADOSAMENTE LAS MANGUERAS. No tirar de las mangueras para mover el equipo. No usar fluidos o solventes que sean incompatibles con el tubo interno y la cubierta de la manguera. NO exponer las mangueras a temperaturas sobre 82^{0} C (180°F) o bajo -40°C (-40° F).

Continuidad del circuito de puesta a tierra de la manguera

La continuidad del circuito de puesta a tierra apropiado es esencial para mantener conectado a tierra el sistema pulverizador. Es indispensable revisar la resistencia eléctrica máxima de las mangueras de aire y de fluido por lo menos una vez a la semana. Si la manguera no tiene una etiqueta en la cual se especifica la resistencia eléctrica máximum, ponerse en contacto con el proveedor o fabricante de la manguera para la información sobre los límites de resistencia. Usar un metro de resistencia en la gama apropiada para comprobar la resistencia; si excede los lites recomendados, reemplazarla de inmediato. Es muy arriesgado tener una manguera sin puesta a tierra o con la puesta a tierra en malas condiciones. Leer también la información sobre **RIESGO DE INCENDIO O EXPLOSION**, más arriba.

SETUP

1 **Air compressor requirements.** The gun uses 3–5 scfm at 30 psi (0.084 m^3/min at 2 bar) of air pressure. A 1 HP air compressor with a 10 gallon tank, or 1.5 HP without a tank, is sufficient.

The air should be filtered and regulated at the compressor.

2 **Prepare the paint.** This is probably the most important step toward trouble-free spraying!

Follow the paint manufacturer's recommendations. Remove any skin from the top of the paint. If necessary, thin the paint. Finally, strain the paint through a fine nylon mesh bag (available at most paint dealers) to remove particles that could clog the spray tip.

3 **Install the spray tip and air cap on the gun.** The 411 tip included with the gun has a 0.011in. orifice and a 8–10 in. pattern. See manual 307–586 for other tips.

4 **Connect an air hose from the compressor to the gun air inlet.** See Fig 1.

5 **Connect the fluid hose.** Screw the fluid hose tightly onto the gun and connect the other end to the sprayer fluid outlet. See Fig 1.

6 **Check the hydraulic oil level.** See Fig 2. Unscrew the fill cap. The oil should be 1 in. (25 mm) from the top of the plate. If it is not, fill as necessary with lightweight hydraulic oil; use only Graco Hydraulic Oil, Part No. 218–797. Install the fill cap.

7 **Check the electrical service.** The electrical service must be 120V, 60 Hz AC, 15 Amp (minimum). Be sure the electrical outlet is properly grounded.

You can use up to 100 ft. (30 m) of 3 wire, 14 gauge (minimum) extension cord. Longer extension cords may affect the sprayer performance. Use more spray hose, not longer extension cords.

Do not remove the third (grounding) prong of the plug, and do not use an adapter.

8 **Plug in the sprayer.** Be sure the ON/OFF switch is OFF and the pressure control is turned fully **counterclockwise**. See Fig 3. Use a grounded outlet that is at least 20 ft. (6 m) away from the spray area to reduce the chance of a spark igniting spray vapors or dust particles.

CAUTION

The wallet sized warning card provided with the gun should be kept with the operator at all times. The card contains important information on reducing the risk of a fluid injection injury, and treatment information should an injection injury occur. Additional copies of this card are available at no cost.

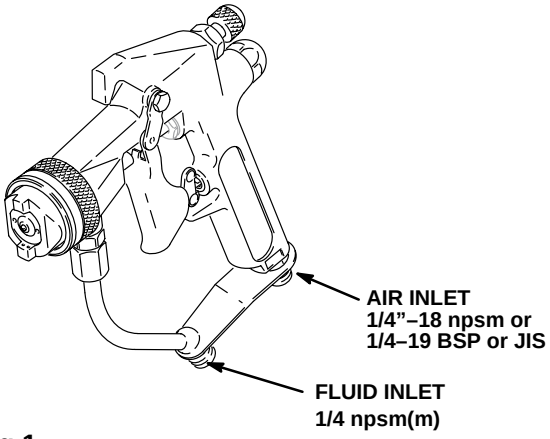


Fig 1 0269

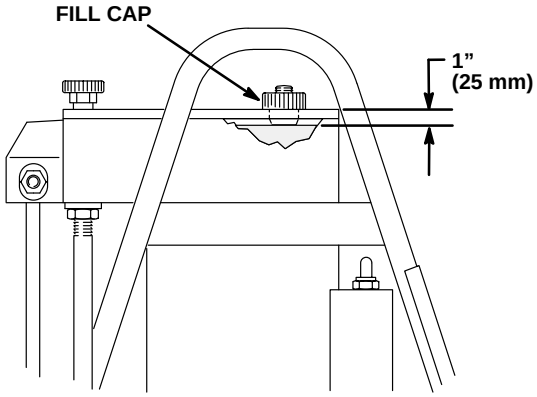


Fig 2 0269

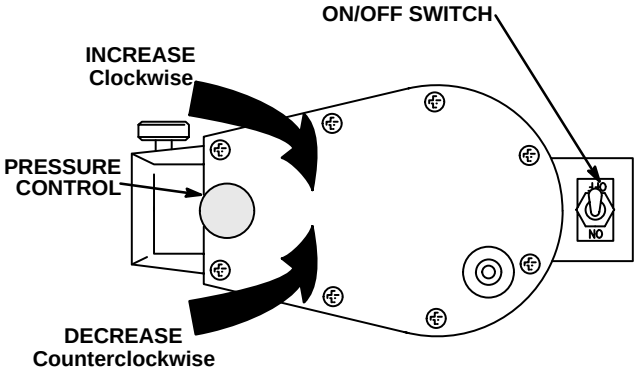


Fig 3 0270

WARNING

Pressure Relief Procedure

To reduce the risk of serious bodily injury, including fluid injection, splashing fluid or solvent in the eyes or on the skin, or injury from moving parts or electric shock, always follow this procedure whenever you shut off the sprayer, when checking or servicing any part of the spray system, when installing, cleaning or changing spray tips, and whenever you stop spraying.

1 Shut off the sprayer and unplug it.
2 Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun into the paint pail to relieve pressure.
3 Engage the gun safety latch.
4 Turn the bypass valve ONE turn **counterclockwise** to drain paint back into the pail.

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

1 Open the bypass valve ONE turn **counterclockwise**. Do not place the paint pump intake in the pail yet. See Fig 4.

2 Close the compressor air regulator.

3 Turn the pressure control fully **clockwise** to increase pressure. See Fig 4.

4 Remove the inlet strainer, turn on the sprayer, and place your hand over the inlet valve to be sure it is drawing a vacuum. Refer to Fig 4.

NOTE: If the inlet valve is not drawing a vacuum, turn the sprayer OFF. Turn the sprayer over. Press down on the stem inside the inlet valve lightly with a small screwdriver, and pour about a teaspoon of mineral spirits or solvent into the valve. See Fig 5. Release the valve and turn the sprayer upright. With the pressure turned up, turn on the sprayer. This should free any sticking parts in the pump. Now check again for a vacuum. Shut off the sprayer and install the inlet strainer.

5 Place the paint pump assembly into a properly prepared, grounded 5 gallon pail of paint. (See Step 2, page 10.)

6 Turn the sprayer ON and allow the paint to circulate through the bypass valve for one or two minutes.

NOTE: If the paint does not circulate back into the pail, turn down the pressure and “jog” the motor on and off several times to help prime the sprayer.

7 Turn the bypass valve **clockwise** (finger tight) to close it; this allows the pump to build up pressure.

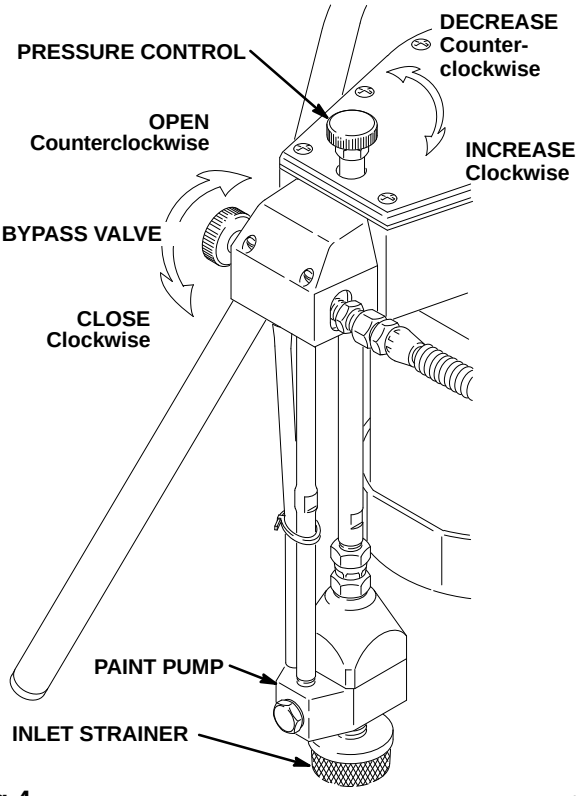


Fig 4 0271

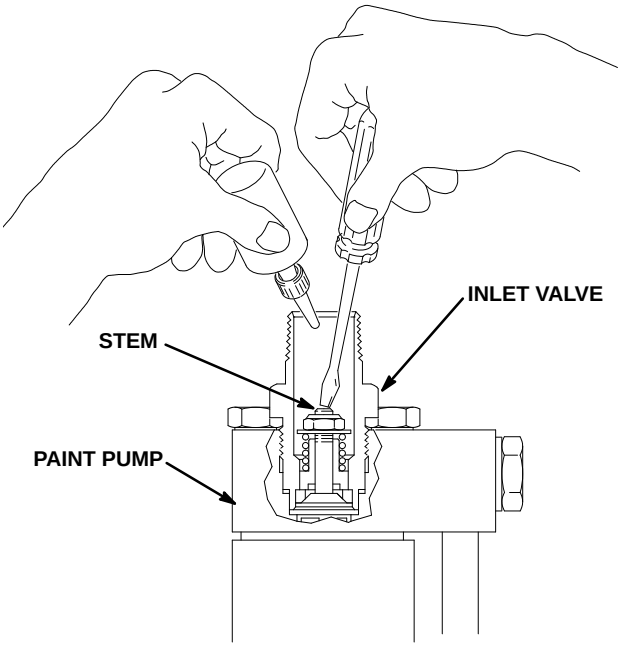


Fig 5 PUMP SHOWN UPSIDE DOWN 0272

STARTUP PROCEDURE CONTINUED ON PAGE 12

8 Release the trigger safety latch. Trigger the gun onto a piece of paper to check the atomization; don't be concerned about the pattern shape yet.

9 Adjust the pressure setting to obtain good atomization. ***Always use the lowest pressure necessary.*** Excessive pressure causes premature tip wear and pump wear.

10 Close the gun's pattern adjustment valve by turning the knob **counterclockwise** all the way. This sets the gun for the widest pattern. See Fig 6.

11 Set the atomizing air pressure to about 20 psi (1.4 bar). Check the spray pattern. Adjust the air pressure until all the tails are completely atomized and pulled into the spray pattern. See Fig 7. Do not exceed 100 psi (7 bar) air pressure to the gun.

For a narrower pattern, turn the pattern adjustment knob **clockwise**. If the pattern is still not narrow enough, increase the air pressure to the gun slightly or use a different size tip.

NOTE: If you cannot obtain a good spray pattern or adequate atomization, your paint may be too thick. Thin the paint according to the manufacturer's recommendations until you can get good atomization.

12 Keep the gun at an even 8 to 10 in. (200 to 250 mm) from the surface being sprayed. Always hold the gun at a right angle to the surface. Do not move the gun in an arc as that causes an uneven coating.

Begin moving the gun in a horizontal direction at a steady rate. Start the spray stroke off the target surface and pull the trigger *as the gun is moving.* Then, while the gun is still moving, and as you approach the other edge, release the trigger. This method avoids excess paint build-up at the end of each stroke.

13 If the tip clogs, engage the trigger safety latch, shut off and unplug the sprayer, and open the bypass valve one turn **counterclockwise.** Remove the tip and clean it with a compatible solvent and a soft brush. To clean the air tip passages, use a soft brush or other soft tool along with an air blow gun.

NOTE: For additional spray gun information, read manual 307–586, supplied.

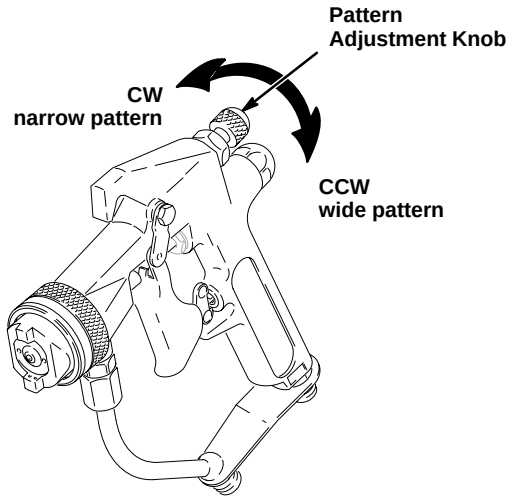


Fig 6

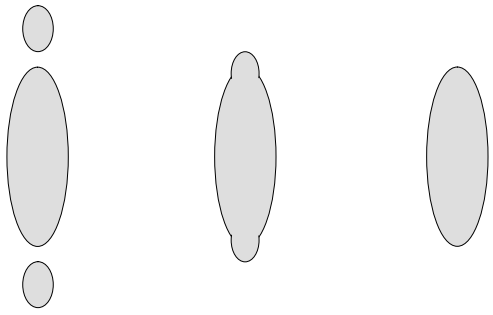


Fig 7

STARTUP PROCEDURE CONTINUED ON PAGE 12

STARTUP

14 Whenever you stop spraying, even for a moment, always set the trigger safety latch to prevent accidentally triggering the gun.

15 Whenever you stop spraying, or if you must leave the sprayer unattended, shut it off and follow the **Pressure Relief Procedure** on page 11.

NOTE: The sprayer will not restart if it was left pressurized after shutting it off. Relieve pressure, then start it.

16 After the first 3 to 5 hours of operation, see the Maintenance Intervals chart, below, for essential tightening procedures.

CAUTION

Failure to properly tighten the inlet valve and screws at the intervals indicated will result in oil leaking from the hydraulic system into the paint, and can cause costly damage to the sprayer.

17 Additional important maintenance procedures are given below and on pages 14 and 15.

MAINTENANCE

CAUTION

Thorough flushing and proper maintenance are essential to keep the sprayer working properly and avoid costly damage to the sprayer or the object being sprayed.

Diaphragm Failure: Always replace the diaphragm after every 500 hours of operation (once every 4 to 6 months). The diaphragm weakens with use. If it ruptures, the hydraulic oil and paint may mix, causing internal damage to the sprayer, and/or the surface of the object being sprayed may be damaged.

Follow the Maintenance Intervals outlined below.

Maintenance Intervals

Flushing (See page 14)	Immediately after each use
Lubricate the intake valve (See page 15)	Immediately after each use
Tighten paint pump screws and inlet valve (See page 15)	1 After first 3 to 5 hours of operation 2 After next 3 to 5 hours of operation 3 Each 25 hours thereafter (about weekly)
Check and/or change hydraulic oil (See page 15)	1 Check the oil after each use of the sprayer 2 Change the oil after the first 20 hours of operation 3 Change the oil each 50 hours thereafter (about twice a month)
Replace diaphragm (See page 15)	After every 500 gallons of paint sprayed (4 to 6 months)

Flushing Procedure

1 Engage the gun trigger safety latch. Shut off the sprayer. Close the gun air regulator. Open the bypass valve ONE turn **counterclockwise**. Raise the paint pump just above the paint and turn on the sprayer to drain the paint. Now turn off the sprayer.

2 Place the paint pump in a grounded flushing pail filled with solvent or water, as appropriate.

3 Be sure the trigger safety latch is set. Remove the spray tip and air cap from the gun. Disengage the safety latch. Hold a metal part of the gun firmly to the side of a grounded metal pail. See Fig 8. Close the bypass valve. Trigger the gun into the pail. Turn on the sprayer. Watch the side of the pail for solvent to appear. Then release the gun trigger. Turn off the sprayer.

4 With the bypass valve closed, turn on the sprayer, trigger the gun into the flushing pail and allow the solvent to circulate through the hose and gun for two to three minutes, using the lowest possible pressure. See Fig 9.

5 Release the gun trigger and engage the safety latch. Turn off the sprayer.

6 Open the bypass valve ONE turn **counterclockwise**.

7 Raise the paint pump above the solvent, turn on the sprayer, and allow the pump to run itself dry. Turn the sprayer OFF.

8 Using a clean pail of water or solvent, and the lowest possible pressure, flush again to be sure all paint particles are removed.

9 Remove the paint strainer and clean it thoroughly.

10 Thoroughly clean the gun and tip with a compatible solvent and a soft brush.

11 Now lubricate the inlet valve. See page 15.

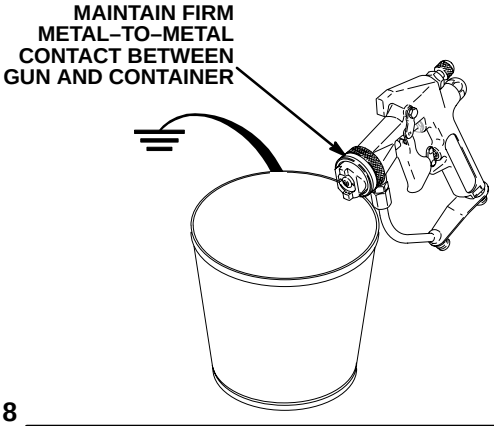


Fig 8 0276

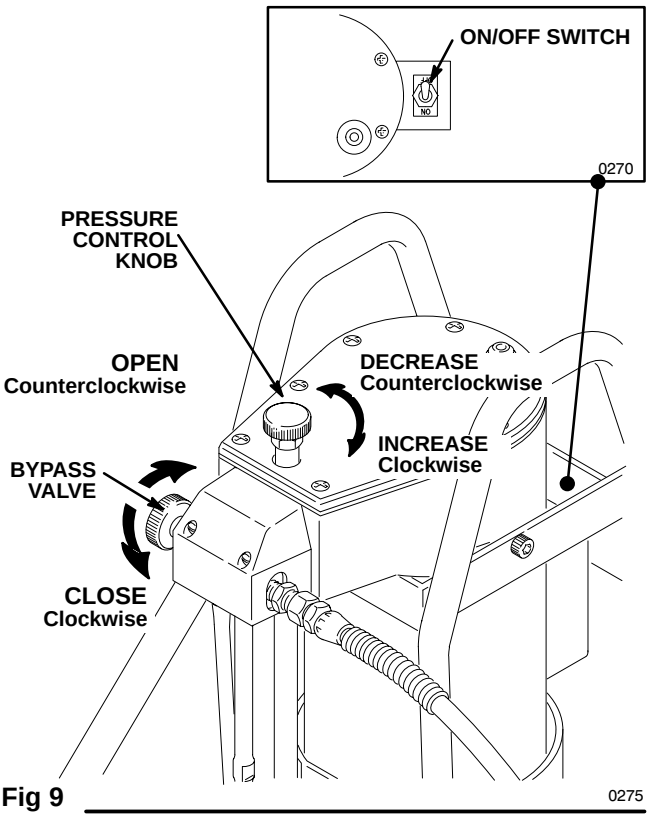


Fig 9 0275

Lubricate the inlet valve. See Fig 10.

1 Follow the **Pressure Relief Procedure** on page 11. Remove the inlet screen.

2 Turn the sprayer over. Press down lightly on the stem of the inlet valve with a small screwdriver. Pour about a teaspoon of mineral spirits or solvent into the valve, then remove the screwdriver.

3 Set the sprayer upright. Increase the pressure control setting half way. Turn on the sprayer for a few seconds, then turn it OFF.

4 Now tighten the paint pump screws and the inlet valve.

Tighten the paint pump screws and inlet valve. See Fig 11.

CAUTION

Never start the electric motor with the inlet valve removed, as it will severely damage the diaphragm.

1 Follow the **Pressure Relief Procedure** on page 11.

2 Torque the four hex head screws on the paint pump to 170–200 in–lb (19–23 N.m).

3 Torque the inlet valve to 320–360 in–lb (36–41 N.m).

Check and/or change the hydraulic oil. See Fig 12.

1 Follow the **Pressure Relief Procedure** on page 11.

2 Remove the fill cap. The oil should be 1 in. (25 mm) from the top of the plate. If it is lower, add oil as necessary. Use only Graco lightweight hydraulic oil, part no. 218–797. Reinstall the fill cap, hand tight, if you are not going to change the oil.

3 To change the oil, turn the sprayer over and drain the oil through the fill cap hole.

CAUTION

When you remove the fill cap, be very careful not to let any dirt, paint particles, or other contaminants get into the hydraulic system. Contaminants can cause serious damage to the hydraulic system.

4 Fill the hydraulic pump housing with 16.5 ounces (55 ml) of Graco lightweight hydraulic oil. Install the fill cap.

5 Plug in the sprayer. Turn the pressure control fully **counterclockwise** (no pressure). Turn on the sprayer and let it run for two minutes to fill the hydraulic system. Increase the pressure to maximum and turn the sprayer on and off four times to help rid the hydraulic system of air.

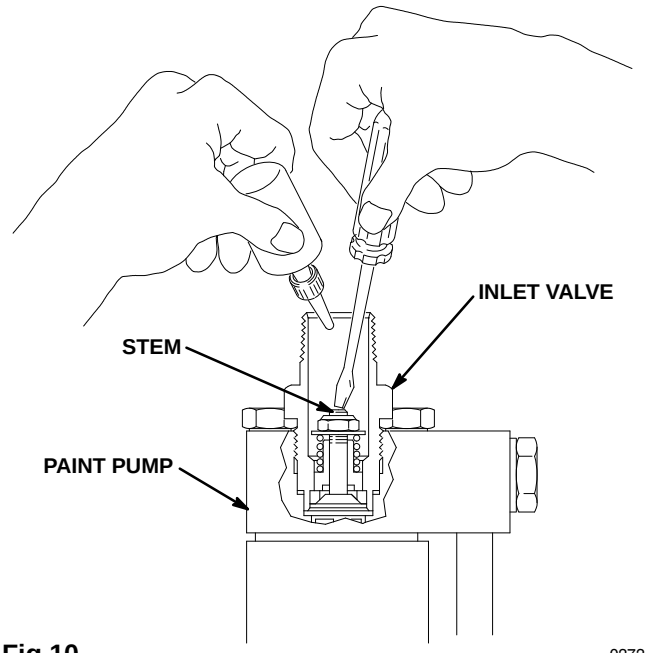


Fig 10 0272

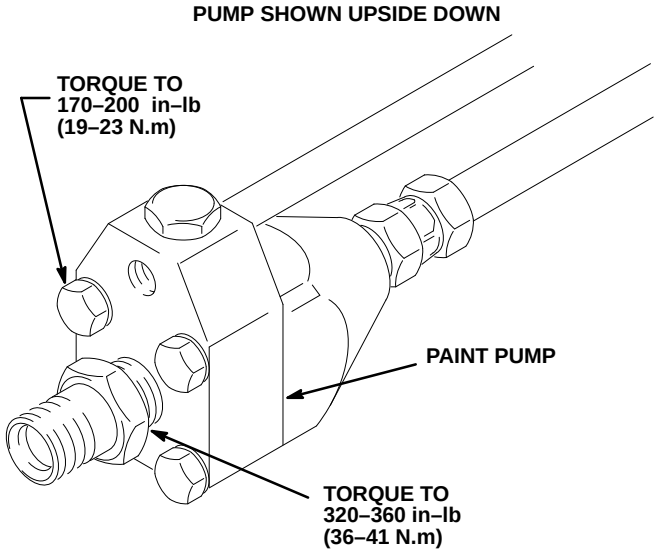


Fig 11 0273

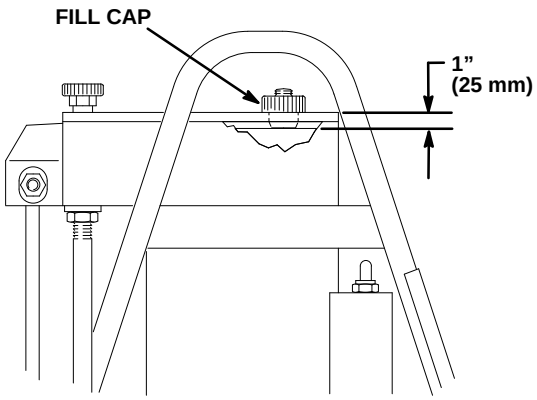


Fig 12 0269

TROUBLESHOOTING

WARNING

To reduce the risk of serious bodily injury, including fluid injection, always follow the **Pressure Relief Procedure Warning** on page 11 before checking or repairing any part of the spray system.

NOTES:

1 Repairs, other than those for which instructions are given on page 18, should be performed by a trained and qualified repair agency.

2 If your sprayer is not operating well, or will not operate at all, check for obvious problems first. Follow the **STARTUP** procedure exactly (see page 11). Then if the sprayer won't start, use the Troubleshooting Chart for help in identifying the possible cause.

3 Remember, taking the time after each use of the sprayer to perform all of the maintenance procedures given on page 14 and 15 will help prevent down time and costly repair bills.

TROUBLESHOOTING CHART

PROBLEM	CAUSE	SOLUTION
Poor spray pattern	Spray tip worn	Change tip.
	Paint too thick	Thin, try larger tip.
Fluttering or spitting spray	Insufficient fluid supply	Increase pressure; fill pail
Irregular spray pattern	Fluid buildup or spray tip clogged	Clean spray tip.
	On defective side of pattern, air horn holes partially or totally plugged.	Clean air horn holes with solvent and soft brush.
Pattern pushed to one side, same side of air cap gets dirty	Air horn holes partially or totally plugged	Clean air horn holes with solvent and soft brush.
Spray gun won't shut off	Worn ball	Repair gun. Order kit no. 217–525.
	Worn diffuser	Replace gun.
	Paint build-up between needle and diffuser	Disassemble and clean gun.
Spray gun leaks	Worn seal or loose fluid fitting	Repair gun. Order kit no. 217–525. Tighten fluid fitting.
Spray gun won't spray, or low output from gun	Paint supply empty	Refill and reprime system.
	Spray tip clogged	Clean or replace.
	Optional gun filter clogged	Clean or replace.
Sprayer will not start	Sprayer not plugged in	Plug in.
	ON/OFF switch turned off	Turn switch on.
	Sprayer left pressurized when shut off	Relieve pressure first, then start.
	Motor overheated	Shut off, relieve pressure, allow to cool. **NOTE:** Sprayer restarts automatically when cool if it is left on.
	Blown building fuse or circuit breaker tripped	Replace or reset.
	No voltage or low voltage in electrical outlet	Test the outlet or try plugging sprayer into another outlet.
	Damaged power supply cord or extension cord, or wrong type of extension cord	Return for repair. Use only 3 wire, 16 gauge (minimum) extension cord with a 3 prong plug and a maximum length of 30 m (100 ft.).
	Start switch (18a) damaged.	Replace. See page 18.
	Motor worn or damaged	Return for repair.
Motor runs but sprayer won't run	Air in diaphgram housing	Bleed air.

PROBLEM	CAUSE	SOLUTION
Sprayer starts but will not suck paint	Paint supply empty	Refill and prime pump.
	Inlet screen clogged	Clean.
	Inlet valve stuck or damaged	See page 18.
	Outlet valve stuck	See page 18.
	Air trapped in hydraulic system	See page 18, **Diaphragm**, step 9.
	Hydraulic oil level low or empty	See page 15.
	Wrong grade of hydraulic oil or wrong fluid in hydraulic system	Use only Graco approved hydraulic oil, part no. 218–797.
	Inlet valve not tight	Tighten; See page 15.
	Damaged diaphragm	Replace; See page 18.
Sprayer sucks paint but does not build up pressure	Pressure control valve not turned up	Adjust.
	Outlet valve stuck, dirty or has worn parts	See page 18.
	Hydraulic oil low	See page 15.
	Inlet valve leaks	See page 18.
	Damaged diaphragm	Replace; See page 18.
	Damaged bypass valve	Replace.
	Damaged hydraulic system	Return sprayer for repair.
	Damaged paint pump	Replace.
Sprayer sucks paint, builds pressure, but pressure drops when gun is triggered	No spray tip on gun	Shut off sprayer and install tip.
	Spray tip orifice too large for the paint or worn tip	Try a smaller tip or a new tip.
	Inlet screen clogged	Clean.
	Optional gun filter clogged	Clean or replace.
	Optional gun filter screen too fine for type of paint	Install larger mesh filter or strain and thin the paint.
	Paint too thick	Thin and/or strain.
	Worn outlet valve	Replace; See page 18.
	Leaking bypass valve	Replace.
	Worn or damaged inlet valve	See page 18.
	Worn or damaged pressure control valve	See page 18.
Pressure fluctuations	Outlet valve stuck, dirty or worn	See page 18.
	Leaking or dirty bypass valve	Replace.
	Dirty, leaking, worn or damaged inlet valve	Replace; See page 18.
	Dirty pressure control knob	Clean or replace; See page 18.
	Damaged diaphragm, or paint pump, or hydraulic system	Return for repair.
Paint in hydraulic system	Ruptured diaphragm	Return for repair.
Hydraulic oil in paint	Ruptured diaphragm	Return for repair.

REPAIR INSTRUCTIONS

Repairs, other than those for which instructions are given below, should be performed by a trained and qualified repair agency.

WARNING

To reduce the risk of serious injury, including fluid injection, splashing in the eyes or on the skin, or injury from moving parts, always follow the **Pressure Relief Procedure Warning** on page 11 before checking or repairing any part of the spray system.

Inlet Check Valve (See Fig 13)

1 Unscrew the inlet check valve (26) from the paint pump housing (23).

2 Clean the gasket (26a), the inlet valve (26), and the paint pump (23) threads and check for erosion. If any of the parts are eroded, replace them.

3 Be sure the threads in the pump housing are clean.

4 Lubricate the threads of the inlet valve with petroleum jelly. Install the gasket on the valve, then install the valve and torque it to 320–360 in–lb (36–41 N.m).

Outlet Check Valve (See Fig 13)

1 Unscrew the plug (28d) and the housing (28b).

2 Use a pick, such as a dentist's pick, to remove the seal (28a) from the pump housing (23). It may be hard to remove. ***DO NOT LEAVE THE SEAL IN THE PAINT PUMP HOUSING.***

3 Clean the parts thoroughly, including the threads in the pump housing, with a compatible solvent. Check all parts for wear or damage and replace as needed.

4 Lubricate the threads of the housing (28b) and plug (28d).

5 Install a NEW seal (28a) in the pump housing. ALWAYS replace the seal (28a). Do not try to reuse the old seal as it will be deformed.

CAUTION

Be sure you do not install a new seal until the old one is removed. Having two seals in the valve will cause performance problems.

6 Install the housing (28b) and torque to 125–150 in–lb (14–17 N.m).

7 The last coil on one end of the spring is turned in. Place this end over the stud in the plug (28d). Install the ball (28e), washer (28f) and plug, and torque plug to 280–300 in–lb (32–34 N.m).

Pressure Control (See Fig 13)

1 When removing the pressure control (4) to check or clean it, always replace the seal (4a). When replacing the pressure control, torque the new control (4) to 125–150 in–lb (14–17 N.m).

Start Switch (See Fig 13)

1 Remove the cover of the switch box. Remove the two screws holding the start switch (18a). Remove the old switch and install a new one.

Diaphragm (See Fig 13)

1 Remove the inlet strainer (27). Remove the four paint pump screws (25) and lockwashers (24).

2 Remove the screws (35) and shroud (3).

3 Remove the screw (36) and lockwasher (37) from the bracket (38).

4 Pull the paint pump assembly away from the hydraulic housing (20) and remove the old diaphragm (21).

CAUTION

Never start the electric motor with the inlet valve (26) removed, as it will severely damage the diaphragm.

CAUTION

Be careful not to get any dirt or paint on the new diaphragm or the hydraulic housing. Contaminants in the hydraulic system can cause the sprayer to malfunction and result in costly damage to the sprayer.

DO NOT TAMPER with the nut (C). The nut is factory set to hold the spring to a specific dimension.

5 Check the diaphragm guide (22) for wear or damage and replace it if needed. Clean the top of the paint pump and the hydraulic housing thoroughly.

6 Install the new diaphragm assembly (21), lubricate the internal threads of the housing (20), and reassemble the parts.

7 Lubricate the screws (25) and then install and torque them to 170–200 in–lb (19–23 N.m).

CAUTION

Whenever you remove the paint pump screws, torque them as instructed above, and then torque them again after 3 to 5 hours of operation.

8 Check the hydraulic oil level and add Graco-approved oil as necessary until the level is 1 in. (25 mm) from the top of the plate. See Fig 13, page 15.

9 Turn the pressure control fully **counterclockwise** (no pressure). Plug in the sprayer and turn it on. Run the sprayer for two minutes to fill the hydraulic system. Increase the pressure to maximum and turn the sprayer on and off four times to help rid the hydraulic system of air.

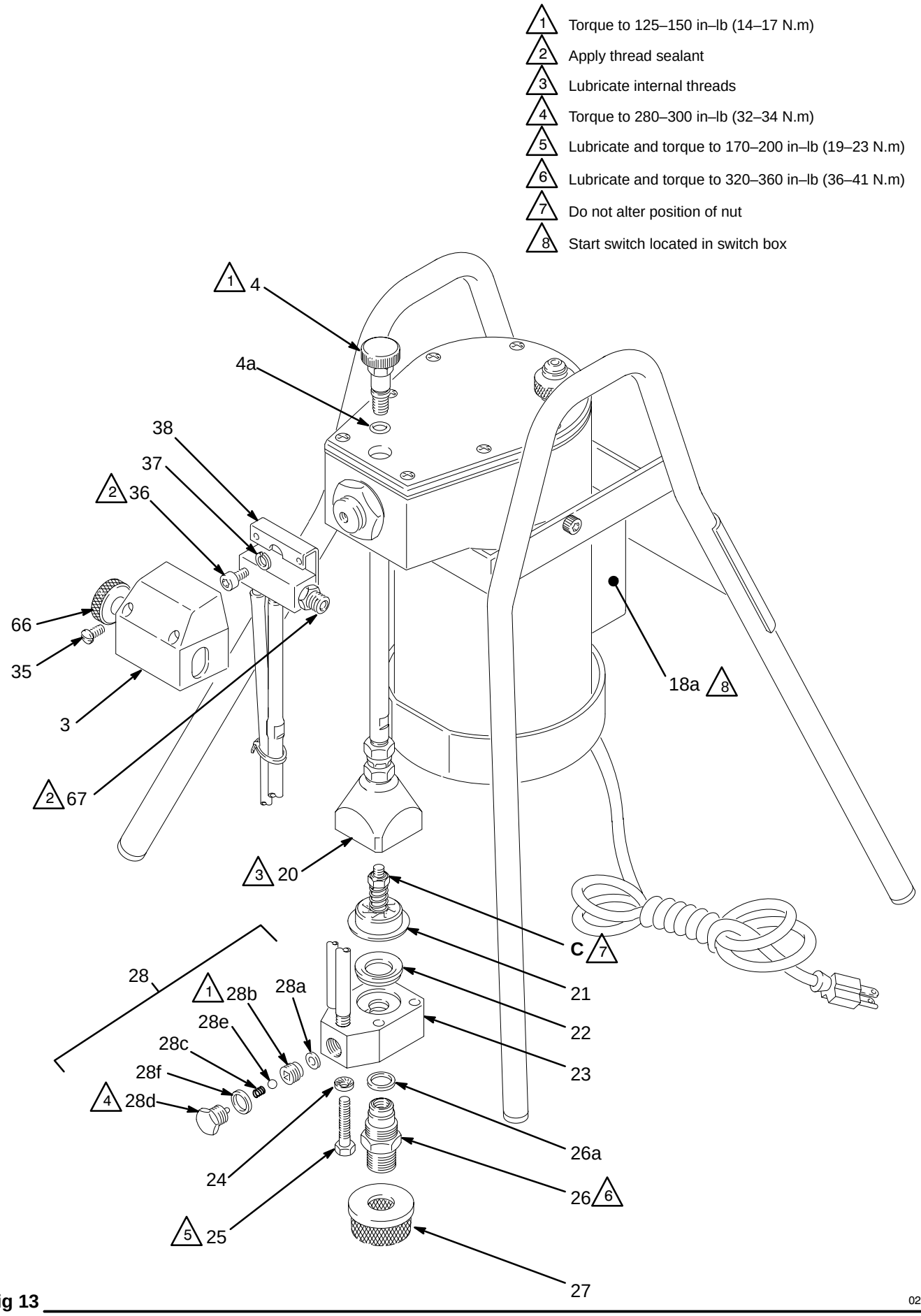
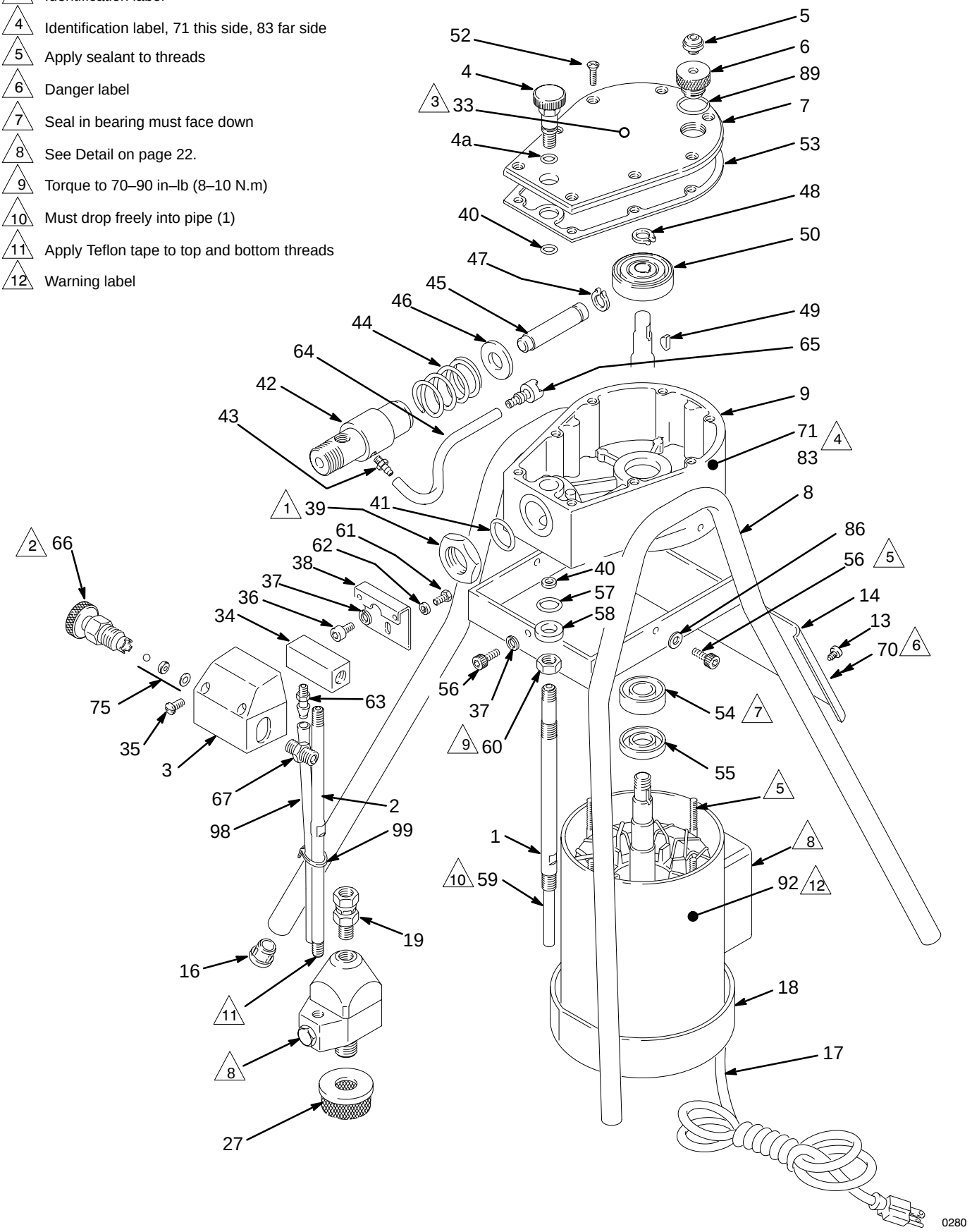

1 Torque to 125–150 in–lb (14–17 N.m)
2 Apply thread sealant
3 Lubricate internal threads
4 Torque to 280–300 in–lb (32–34 N.m)
5 Lubricate and torque to 170–200 in–lb (19–23 N.m)
6 Lubricate and torque to 320–360 in–lb (36–41 N.m)
7 Do not alter position of nut
8 Start switch located in switch box
1 4
4a
38
37
2 36
66
35
3
2 67
3 20
18a 8
C 7
21
22
23
28
1 28b
28a
28e
28c
28f
4 28d
24
5 25
26a
26 6
27

Fig 13

0284

PARTS DRAWING

1 Lubricate and torque to 40–45 in–lb (54–60 N.m)
2 Torque to 130–140 in–lb (15–16 N.m)
3 Identification label
4 Identification label, 71 this side, 83 far side
5 Apply sealant to threads
6 Danger label
7 Seal in bearing must face down
8 See Detail on page 22.
9 Torque to 70–90 in–lb (8–10 N.m)
10 Must drop freely into pipe (1)
11 Apply Teflon tape to top and bottom threads
12 Warning label



PARTS LIST

FF-1000 SPRAYER

Model 231–200, **Series A,** Includes items 1–103

Model 224–780, Series A, Includes items 1–99

NOTE: Part numbers and drawings for items 10–12, 15, 18a, 20–26, 28, and 100–103 are shown on page 22.

REF NO.	PART NO.	DESCRIPTION	QTY
1	180–462	PIPE, pump, 5 gallon size	1
2	108–467	TUBE, paint, 5 gallon size	1
3	275–658	SHROUD	1
4	224–784	CONTROL, pressure	
		Includes replaceable item 4a	1
4a	180–447	.GASKET	1
5	108–152	VALVE, plug, fill	1
6	180–983	PLUG, fill	1
7	275–637	COVER, pump housing	1
8	218–743	STAND, pump	1
9	180–396	HOUSING, motor	1
13	104–859	SCREW, pan head;	
		No. 10 x 0.375”	2
14	180–931	SUPPORT, leg	1
16	108–175	PLUG	4
17	218–651	CORD SET, power, 60 Hz	1
18	185–635	MOTOR, electric, 1/2 HP, 120V, 60Hz;1725 RPM, single phase;	
		Includes 18a shown on page 22	1
19	156–823	UNION, 1/4 npt(m) x 1/4 npt swivel	1
27	108–143	STRAINER	1
33	187–442	LABEL, identification, top	1
34	187–952	HOUSING, pressure control	1
35	105–335	SCREW, pan head;	
		M4 x 0.7 x 10	2
36	107–530	CAPSCREW, soc hd;	
		M6 x 1.0 x 12	1
37	108–050	LOCKWASHER, spring, M6	2
38	180–648	BRACKET, shroud	
39	183–839	NUT, hex; M25 x 1.0	1
40	180–447	GASKET, nylon	2
41	103–255	O–RING, cylinder	1
42	183–840	CYLINDER, pump	1
43	108–153	FITTING, hose, barbed	1
44	107–511	SPRING, compression	1
45	180–479	PISTON	1
46	180–480	WASHER, spring, backup	1
47	107–517	RING, retaining, external	1
48	107–524	RING, retaining, external	1
49	107–513	KEY, woodruff	1
50	218–909	ECCENTRIC ASSY	1
52	108–042	SCREW, oval head;	
		No. 10–24 x 0.625”	8
53	180–650	GASKET, housing	1
54	107–518	BEARING, ball	1
55	107–519	SEAL, shaft	1
56	108–288	CAPSCREW, soc hd;	
		M6 x 1.0 x 16	3
57	108–165	PACKING, o–ring, buna–N	1
58	181–032	SEAL, tube	1
59	180–466	ROD, displacement, 5 gallon	1
60	108–151	NUT, hex; 9/16” thread	1
61	108–053	CAPSCREW, hex head;	
		M4 x 0.7 x 10	1
62	107–584	WASHER, plain, M4	1
63	108–154	FITTING, hose, barbed	1
64	180–996	TUBE, filter	1
65	180–998	FILTER, hydraulic oil	1
66	235–198	BYPASS VALVE ASSEMBLY	1
67	169–797	ADAPTER, 1/8 npt to 1/4 npsm	1
70	187–766*	LABEL, DANGER, English	1
71	187–440	LABEL, identification	1
75	224–771	SEAT KIT	1
81	179–761*	TAG, warning	1
83	187–441	LABEL	1
86	100–086	WASHER, plain, 3/16”	2
89	108–284	O–RING	1
90	218–933	SPRING SET,	
		includes 2 replacement springs, same as item 28c on page 22	1
92	181–325*	LABEL, warning	1
98	186–549	DRAIN TUBE	1
99	102–478	STRAP, wiring tie	1

**Extra warning labels and tags supplied at no charge.*

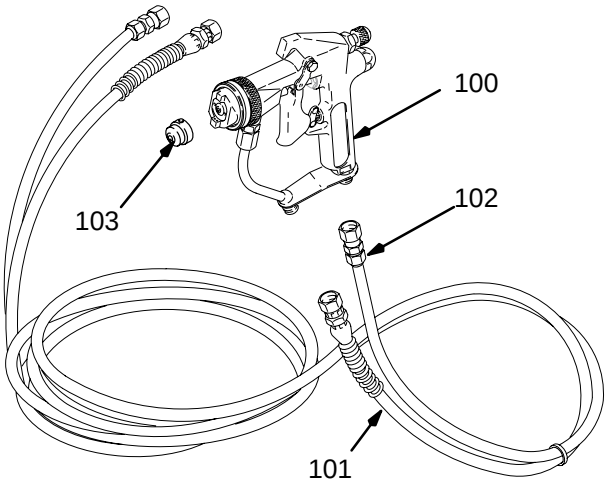
MANUAL CHANGE SUMMARY

Listed below by the assembly changed are Added and Deleted parts. Added and deleted parts are not interchangable individually. However, to use the new drain valve on a Series A sprayer, order the new parts (187–952, 235–198, and 224–771) and replace them together.

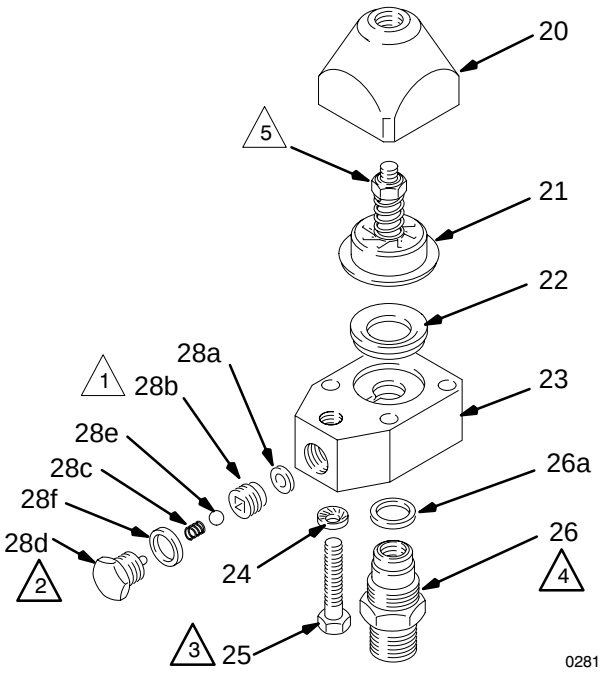
Assembly Changed	Part Status	Ref No.	Part No.	Name
231–200	Delete	34	180–464	Housing
AND	Delete	76	180–974	Nut
224–780	Delete	77	180–985	Seat
To Series B	Delete	78	181–252	Gasket
	Add	34	187–952	Housing
	Add	66	235–198	Valve Kit
	Add	75	224–771	Seat Kit

PARTS LIST & DRAWINGS

REF NO.	PART NO.	DESCRIPTION	QTY
10	105–659	TOGGLE BOOT	1
11	105–679	SWITCH, toggle	1
12	105–774	PLATE, switch, ON/OFF	1
15	106–013	STRAIN RELIEF BUSHING	1
18a	110–900	START SWITCH	
		Included with motor, item 18	1
20	180–406	HOUSING, diaphragm	1
21	218–727	DIAPHRAGM ASSEMBLY	1
22	187–185	GUIDE, diaphragm	1
23	187–339	HOUSING, pump	1
24	109–042	WASHER, belleville	4
25	107–514	CAPSCREW, hex head; M8 x 1.25 x 40	4
26	218–726	VALVE, inlet check	
		Includes replaceable item 26a	1
26a	180–446	.GASKET	1
28	218–732	OUTLET CHECK VALVE ASSY	
		Includes items 28a–28f	1
28a	180–455	.GASKET, nylon	1
28b	218–968	.HOUSING, seat, valve	1
28c	107–521	.SPRING, compression	1
28d	218–505	.PLUG, ball stop	
28e	101–701	.BALL, carbide	1
28f	180–454	.WASHER	1
100	217–292	GUN *See manual 307–586 for parts*	1
101	223–540	HOSE, fluid, 1/4” ID x 25 ft (7 m), cpld 1/4–18 npsm(f) spring guards both ends	1
102	210–867	HOSE, air, 5/16” ID, 25 ft (7 m) cpld 1/4–18 npsm(swivel)	1
103	182–411	TIP, spray, 411	1



DETAIL A



1 Torque to 125–150 in–lb (14–17 N.m)

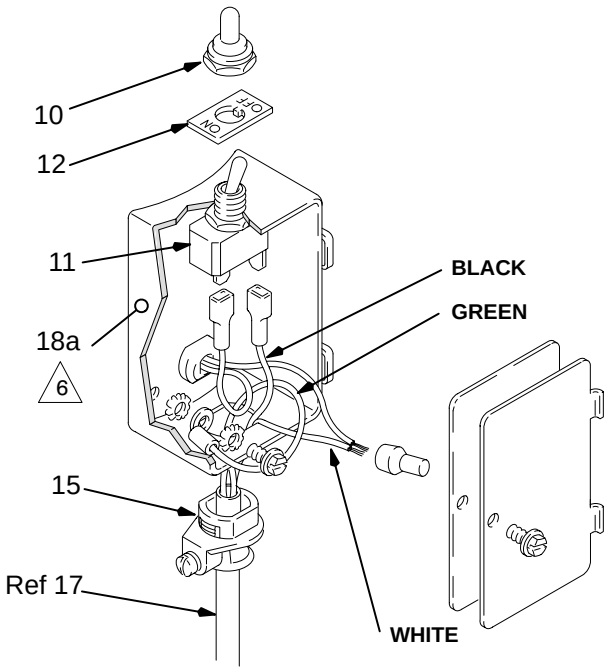
2 Torque to 280–300 in–lb (32–34 N.m)

3 Lubricate and torque to 170–200 in–lb (19–23 N.m)

4 Lubricate and torque to 320–360 in–lb (36–41 N.m)

5 Do not alter position of nut

DETAIL B



6 Located in this switch box

ACCESSORIES

Must be purchased separately.

GRACO–APPROVED HYDRAULIC OIL **218–797**
0.94 liter (1 quart)

GRACO PHONE NUMBERS

TO PLACE AN ORDER, contact your Graco distributor, or call this number to identify the distributor closest to you: **1–800–328–0211 Toll Free**

FOR TECHNICAL ASSISTANCE**,** service repair information or assistance regarding the application of Graco equipment: **1–800–543–0339 Toll Free**

TECHNICAL DATA

Power Requirements	120 VAC, 60 Hz, 1 Phase, 15 AMP minimum
Air Compressor Requirements	1 HP with a 10 gallon tank or 1.5 HP without a tank
Air Consumption	3–5 scfm at 30 psi (0.084 m^3/min at 1 bar)
Fluid Pressure Operating Range	950 psi (0 – 66 bar)
Air Pressure Operating Range	20–100 psi (1.4–7 bar)
Maximum Delivery	0.28 GPM (1.1 liter/min)
Power Cord	No. 16 AWG, 3 wire, 8'6" (2.6 m) long
Inlet Paint Strainer	16 mesh
Fluid Outlet Nipple	1/4 npsm (m)
Weight – without hose and gun	33 lb (14.8 Kg)
Dimensions	Height: 20" (508 mm) Width: 17.5" (444.5 mm) Depth: 17.5" (444.5 mm)
Wetted Parts	Stainless Steel, Zinc-Plated Steel, Carbide, Aluminum, Nylon, Delrin®, Monel

Delrin® is a registered trademark of the DuPont Company

THE GRACO WARRANTY AND DISCLAIMERS

WARRANTY
Graco warrants all equipment manufactured by it 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. As purchaser's sole remedy for breach of this warranty, Graco will, for a period of twelve months from the date of sale, repair or replace any part of the equipment proven 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, 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 with Graco equipment of 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 claim. 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.

DISCLAIMERS AND LIMITATIONS
THE TERMS OF THIS WARRANTY CONSTITUTE PURCHASER'S SOLE AND EXCLUSIVE REMEDY AND ARE IN LIEU OF ANY OTHER WARRANTIES (EXPRESS OR IMPLIED), INCLUDING WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE, AND OF ANY NON–CONTRACTUAL LIABILITIES, INCLUDING PRODUCT LIABILITIES, BASED ON NEGLIGENCE OR STRICT LIABILITY. EVERY FORM OF LIABILITY FOR DIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR LOSS IS EXPRESSLY EXCLUDED AND DENIED. IN NO CASE SHALL GRACO'S LIABILITY EXCEED THE AMOUNT OF THE PURCHASE PRICE. ANY ACTION FOR BREACH OF WARRANTY MUST BE BROUGHT WITHIN TWO (2) YEARS OF THE DATE OF SALE.

EQUIPMENT NOT COVERED BY GRACO WARRANTY
GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ACCESSORIES, EQUIPMENT, MATERIALS, OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motor, 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.

Factory Branches: Atlanta, Chicago, Dallas, Detroit, Los Angeles, Mt. Arlington (N.J.)
Subsidiary and Affiliate Companies: Canada; England; Korea; Switzerland; France; Germany; Hong Kong; Japan
GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440–1441

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