

INSTRUCTIONS/FIELD REPAIR



307-643

Rev E
SUPERSEDES D

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

120 VAC, 15 Amp

ULTRA™ 333 AIRLESS PAINT SPRAYER

3000 psi (207 bar) MAXIMUM WORKING PRESSURE

Model 231-007, Series A

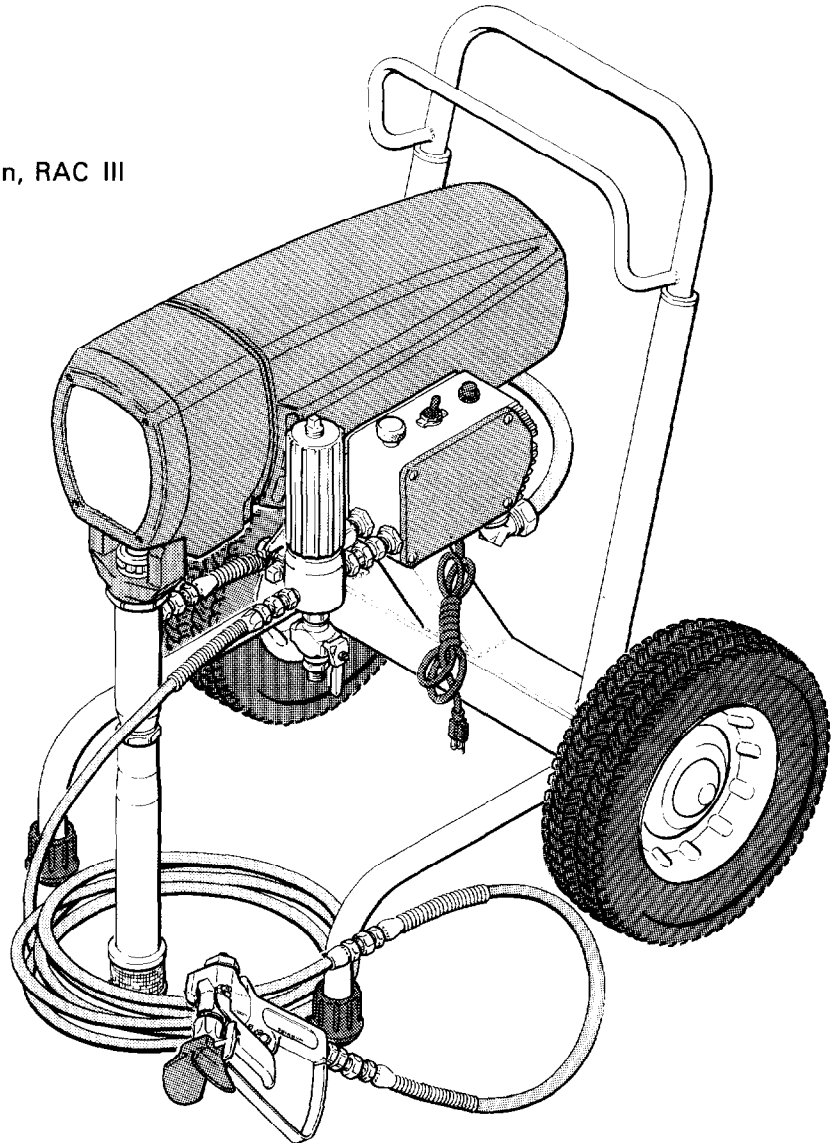
Without hose, gun, spray tip kit or tip

Model 231-333, Series A

Includes Sprayer Model 231-007, Hose, Gun, RAC III Spray Tip Kit, and Spray Tip of choice.

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PATENT NO. 4,397,610
PATENTED 1983, CANADA
BREVETE 1984
FOREIGN PATENTS PENDING

WARNING

Never use 1,1,1-trichloroethane, methylene chloride, other halogenated hydrocarbon solvents or fluids containing such solvents in this equipment. 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.

Consult your fluid suppliers to ensure that the fluids being used are compatible with aluminum and zinc parts.

GRACO INC. P.O. Box 1441 MINNEAPOLIS, MN 55440-1444

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WARNING

HIGH PRESSURE SPRAY CAN CAUSE SERIOUS INJURY.

FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS.

Read and understand all instruction manuals before operating 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 can cause serious damage.

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

ALWAYS have the tip guard in place on the spray gun when spraying.

ALWAYS follow the **Pressure Relief Procedure**, below, 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 Treatment

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. For treatment instructions, have your doctor call the

NATIONAL POISON CENTER NETWORK

(412)681-6669

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 of the gun.

Diffuser

The gun diffuser breaks up spray and reduces the risk of injection when the tip is not installed. Check diffuser operation regularly. Follow the **Pressure Relief Procedure**, below, 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 diffuser immediately.

Tip Guard

ALWAYS have the tip guard in place on the spray gun while spraying. The tip guard alerts you to the injection hazard and helps prevent accidentally placing your fingers or any part of your body close to the spray tip.

Spray Tip Safety

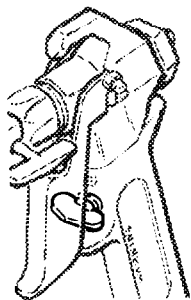
Use extreme caution when cleaning or changing spray tips. If the spray tip clogs while spraying, engage the gun safety latch immediately. ALWAYS follow the **Pressure Relief Procedure** and then remove the spray tip to clean it.

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

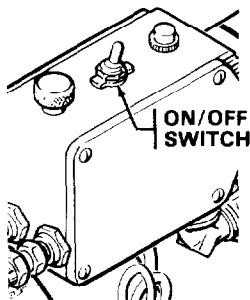
Pressure Relief Procedure

To reduce the risk of serious bodily injury, including injection, splashing in the eyes, injury from splashing fluid or solvent in the eyes or on the skin, 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) Engage the gun safety latch. (2) Turn the ON/OFF switch to OFF. (3) Unplug the power supply cord. (4) Disengage the gun safety latch. (5) Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure. (6) Engage the gun safety latch. (7) Open the drain valve, having a container ready to catch the drainage. (8) Leave the drain valve open until you are ready to spray again.

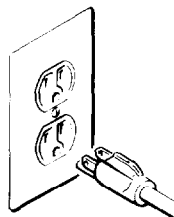
If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.



ENGAGE SAFETY



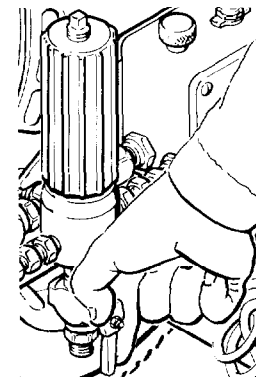
TURN SWITCH TO OFF



UNPLUG CORD



DISENGAGE SAFETY
AND TRIGGER GUN;
ENGAGE SAFETY AGAIN



OPEN DRAIN VALVE

EQUIPMENT MISUSE HAZARD

General Safety

Any misuse of the spray equipment or accessories, such as overpressurizing, modifying parts, using incompatible chemicals and materials, or using worn or damaged parts, can cause them to rupture and result in injection or other serious bodily injury, 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.

System Pressure

This sprayer can develop *3000 psi (207 bar) MAXIMUM WORKING PRESSURE*. Be sure that all spray equipment and accessories are rated to withstand the maximum working pressure of this sprayer. DO NOT exceed the maximum working pressure of any component or accessory used in the system.

Fluid Compatibility

BE SURE that all fluids and solvents used are chemically compatible with the wetted parts shown in the Technical Data on the back cover. Always read the fluid and solvent manufacturer's literature before using them in this sprayer.

HOSE SAFETY

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

ALL FLUID HOSES MUST HAVE SPRING GUARDS! The spring guards 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 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. Do not use fluids or solvents which are not compatible with the inner tube and cover of the hose. DO NOT expose Graco hose 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 air and 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**.

FIRE OR EXPLOSION HAZARD

Static electricity is created by the high velocity 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. 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. Always plug the sprayer into an outlet at least 20 feet (6 m) away from the sprayer and the spray area. 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 positive 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. *Fluid hoses:* use only grounded hoses with a maximum of 500 feet (150 m) combined hose length to ensure grounding continuity. Refer to **Hose Grounding Continuity**.
3. *Spray gun:* obtain grounding through connection to a properly grounded fluid hose and sprayer.
4. *Object being sprayed:* according to local code.
5. *All solvent pails* used when flushing, according to 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.
6. *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 injection injury, static sparking, or splashing by following the specific flushing procedure given on page 12 of this manual. Follow the **Pressure Relief Procedure** on page 2, and *remove the spray tip before flushing*. Hold a metal part of the gun firmly to the side of a *metal* pail and use the lowest possible fluid pressure during flushing.

MOVING PARTS HAZARD

Moving parts can pinch or amputate your fingers or other body parts. KEEP CLEAR of moving parts when starting or operating the sprayer. Unplug the sprayer and relieve pressure before checking or servicing the sprayer to prevent it from starting accidentally.

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 des 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 sous 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 la 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 garder la protection de l'ajutage en place sur le pistolet pendant la pulvérisation.

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 les 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 MEDICAUX D'URGENCE.

NE PAS SOIGNER CETTE BLESSURE COMME UNE SIMPLE COUPURE.

Dire exactement au médecin quel type de liquide a été injecté. Pour avoir des instructions concernant le traitement approprié, dire au médecin d'appeler le CENTRE ANTI-POISON SUIVANT:

**NATIONAL POISON CENTER NETWORK
(412)681-6669**

Dispositifs de sécurité du pistolet

Avant chaque utilisation, bien s'assurer 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.

Diffuser

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 puis 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 gachette du pistolet. Si le fluide projeté n'est pas diffusé sous forme de jet irrégulier, remplacer immédiatement le diffuseur.

Protection de l'ajutage

TOUJOURS maintenir la protection de l'ajutage en place sur le pistolet du pulvérisateur pendant la pulvérisation. La protection de l'ajutage attire l'attention sur les risques d'injection et contribue à éviter que les doigts ou une partie quelconque du corps ne passe accidentellement à proximité immédiate de l'ajutage du pulvérisateur.

Consignes de sécurité concernant l'ajutage du pulvérisateur

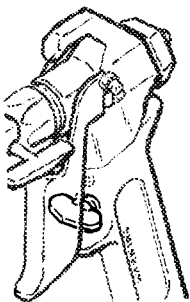
Faire extrêmement attention à l'occasion du nettoyage ou du remplacement des ajutages du pulvérisateur. Si l'ajutage se bouche pendant la pulvérisation, mettre immédiatement le verrou de sécurité du pistolet. TOUJOURS bien observer la **Marche à Suivre pour Détendre la Pression** puis enlever l'ajutage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

NE JAMAIS essayer 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.

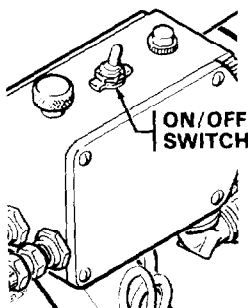
Marche à Suivre pour Détendre la Pression

Pour réduire les risques de blessures graves, y compris les blessures par injection de fluide ou celles causées par d'éclaboussant dans les yeux ou au de peau, des pièces en mouvement ou par électrocution, toujours bien observer cette marche à suivre à chaque fois que l'on arrête le pulvérisateur, à l'occasion de la vérification ou de la réparation d'une pièce de l'appareil de pulvérisation, à l'occasion de l'installation, du nettoyage ou du remplacement des ajutages et d'une manière générale à chaque arrêt. 1) Engager le verrou de sécurité du pistolet. 2) Mettre l'interrupteur Marche-Arrêt sur ARRÊT ("OFF"). 3) Débrancher le cordon d'alimentation. 4) Désengager le verrou de sécurité du pistolet. 5) En maintenant une partie métallique du pistolet fermement appuyée contre le côté d'un seau en métal, appuyer sur la gachette du pistolet pour libérer la pression. 6) Engager le verrou de sécurité du pistolet. 7) Ouvrir le robinet de purge en prenant soin d'avoir un récipient prêt à récupérer le liquide. 8) Laisser le robinet de purge ouvert jusqu'à ce que le pulvérisateur soit de nouveau prêt à être utilisé.

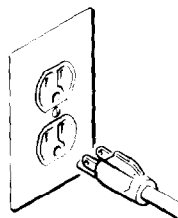
Si l'on soupçonne que l'ajutage du pulvérisateur ou le tuyau est complètement bouché, ou que la pression n'a pas été complètement libérée après avoir procédé aux opérations ci-dessus, desserrer TRES LENTEMENT l'écrou de retenue de la protection de l'ajutage ou le raccord du bout du tuyau et libérer progressivement la pression, puis terminer le desserrage. On peut maintenant déboucher l'ajutage ou le tuyau.



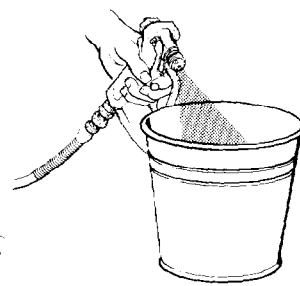
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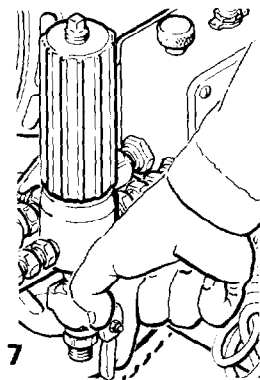
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4,5,6



7

RISQUES EN CAS DE MAUVAISE UTILISATION DU MATERIEL

Consignes générales de sécurité

Toute utilisation anormale de l'appareil de 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 altérer 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.

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, même minuscule, 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! Les spirales de protection contribuent à éviter la formation de pliures, de boucles ou de noeuds 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 déceler les coupures, fuites, abrasions, boursoufflures de l'enveloppe ou toute autre détérioration ou jeu des raccords. Si l'on constate l'une de ces 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

Pression

Ce pulvérisateur peut produire une **PRESSION MAXIMUM DE TRAVAIL 207 bar (3000 lb/po.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", au dos de la couverture. Toujours lire soigneusement les documents et brochures du fabricant des fluides et solvants utilisés avant de s'en servir dans ce pulvérisateur.

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 qui ne sont pas compatibles avec l'enveloppe intérieure ou extérieure du tuyau. NE PAS exposer le tuyau à 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 moins 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** ci-dessus.

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 à la masse ou à la terre, des étincelles peuvent se produire et l'appareil risque d'être dangereux. Des étincelles peuvent également se produire à l'occasion du branchement ou du débranchement du cordon d'alimentation. 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 pulvérise 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. Toujours brancher le pulvérisateur dans une prise se trouvant à au moins 6 m (20 pieds) de l'appareil et de 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 pulvérisation quand il y a le moindre risque que des vapeurs encore présentes dans l'air prennent feu.

Mise à la terre ou à la masse

Pour réduire les risques de production d'étincelles d'électricité statique, le pulvérisateur et tous les équipements 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 les équipements de pulvérisation suivants sont bien reliés à la terre:

1. **Pulvérisateur:** Brancher le cordon d'alimentation ou la rallonge qui doivent être équipés d'une prise à 3 fiches en bon état, dans une prise de courant convenablement mise à la terre. Ne pas utiliser d'adaptateur. Toutes les rallonges doivent avoir 3 fils et être prévues pour 15 ampères.

2. **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 mise à la terre des tuyaux**".

3. **Pistolet:** Réaliser la mise à la terre en le raccordant à un tuyau flexible et à un pulvérisateur déjà convenablement reliés à la terre.

4. **Objets, matériel ou surfaces recevant la pulvérisation:** observer le code ou les réglementations locales.

5. **Tous les seaux de solvants** utilisés pour le rincage: observer le code ou les réglementations locales. *N'utiliser que des seaux métalliques* 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.

6. **Pour conserver la continuité de la mise à la terre quand on rince 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 Rincage

Pour réduire les risques de blessures par pénétration de la peau et les risques dus aux étincelles d'électricité statique ou aux éclaboussures, observer la marche à suivre pour le rincage donnée à la page 12 de ce manuel. Observer la "**Marche à Suivre pour Détendre la Pression**" donnée à la page 4 en *enlever l'ajutage du pulvérisateur avant le rincage*. Maintenir une partie métallique du pistolet fermement appuyée contre le côté d'un seau *en métal* et utiliser la pression la plus faible possible pendant le rincage.

ADVERTENCIA

**EL ROCIADO A ALTA PRESION PUEDE CAUSAR GRAVES LESIONES.
SOLO PARA USO PROFESIONAL. RESPÉTE 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 genera 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 tener colocado el protector de la boquilla en la pistola mientras se está pulverizando.

SIEMPRE seguir el **procedimiento de descarga de presión**, dado más abajo, antes de limpiar o sacar la boquilla o de dar servicio a cualquier equipo 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. Para instrucciones de tratamiento, pedir al médico que llame a la

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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.

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.

Protector de la boquilla

SIEMPRE tener el protector de la boquilla colocado en la pistola mientras se está pulverizando. Este protector llama la atención contra el peligro de inyección y ayuda a prevenir la colocación accidental de los dedos o cualquier otra parte del cuerpo cerca de la boquilla.

Seguridad de la boquilla pulverizadora

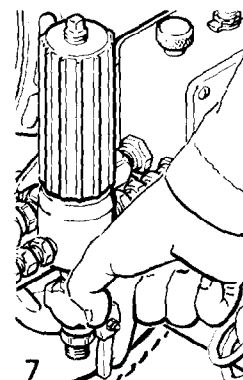
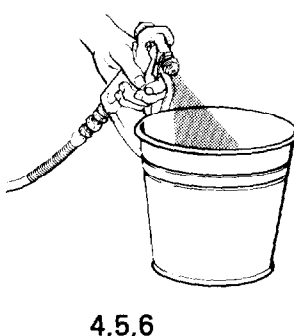
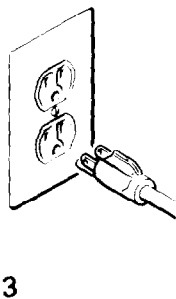
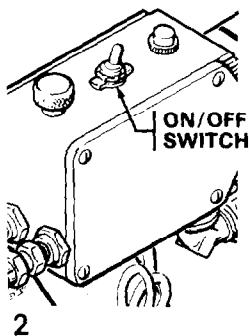
Tener mucho cuidado al limpiar o cambiar las boquillas. Si llegara a obstruirse mientras está pulverizando, enganchar el pestillo de la pistola de inmediato. SIEMPRE seguir el **procedimiento de descarga de presión** y después sacar la boquilla para limpiarla.

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 inyección o lesiones causadas por piezas en movimiento o choque eléctrico, siempre seguir este procedimiento al apagar la máquina pulverizadora, al revisar o dar servicio a cualquier parte del sistema de pulverización, al instalar, limpiar o cambiar las boquillas, y cada vez que se deja de pulverizar. (1) Enganchar el pestillo de la pistola. (2) Mover el interruptor eléctrico (ON/OFF) a la posición OFF (apagado). (3) Desenchufar el cordón eléctrico. (4) Desenganchar el pestillo de la pistola. (5) Sujetar una parte metálica de la pistola bien firme contra un balde de metal, y disparar la pistola para descargar la presión. (6) Enganchar el pestillo de la pistola. (7) Abrir la válvula de drenaje y tener listo un recipiente para recibir la pintura. (8) Dejar la válvula de drenaje abierta hasta que se esté nuevamente listo para pulverizar.

Si se sospecha que la boquilla o la manguera está completamente obstruida, o que no se ha descargado por completo la presión después de haber seguido el procedimiento anterior, aflojar MUY LENTAMENTE la tuerca de retención del protector de la boquilla o acoplamiento de la punta de la manguera y descargar gradualmente la presión, después, aflojarlo por completo. Luego, 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 sobrepresurización, modificación de piezas, uso de materiales y productos químicos incompatibles, o utilización de piezas dañadas o desgastadas, pueden hacer que se rompan y causen la inyección de fluido u otras lesiones corporales graves, incendio, explosión o daño a la propiedad.

NUNCA alterar o modificar ninguna pieza de este equipo; el hacerlo podría causar una avería.

REVISAR con regularidad el equipo pulverizador y reparar o reemplazar de inmediato las piezas dañadas o desgastadas.

Presión del sistema

Esta pulverizadora puede desarrollar 207 barías (3000 psi) de **PRESIÓN DE TRABAJO MÁXIMA**. Asegurar que todo el equipo pulverizador y sus accesorios tienen la capacidad para aguantar la presión máxima de trabajo de esta pulverizadora. NO exceder la presión máxima de trabajo de ningún componente o accesorio de este sistema.

Compatibilidad de fluido

ASEGURAR que todos los fluidos y solventes usados son químicamente compatibles con las piezas mojadas ilustradas en la hoja de datos técnicos en la contratapa. Siempre leer las instrucciones del fabricante del fluido y solvente antes de usarlos en esta pulverizadora.

SEGURIDAD EN EL USO DE LAS MANGUERAS

El fluido que pasa a alta presión por las mangueras puede ser muy peligroso. Si en la manguera se desarrolla un escape pequeño, 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 daño a la propiedad.

¡TODAS LAS MANGUERAS PARA FLUIDOS TIENEN QUE TENER GUARDAS DE RESORTE! 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 alta presión puede desalojar un acoplamiento suelto o dejar que por 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 a 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°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 máxima, 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 límites 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.

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, convirtiendo al sistema en algo peligroso. También, pueden producirse chispas al enchufar o desenchufar el cordón eléctrico. 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 siempre 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 todavía exista la posibilidad de que queden vapores inflamables en el aire.

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 apropiado. No usar un adaptador. Todos los cables extensores tienen que tener tres hilos y una capacidad de 15 amperios.

2. *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**.

3. *Pistola:* hacer la puesta a tierra conectándola a una manguera de fluido y pulverizadora bien conectadas a tierra.

4. *Objeto que se está rociando:* de conformidad con el código local.

5. *Todos los baldes de solvente* usados durante el lavado, de conformidad con el 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. *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 del *balde de metal*, después apretar el gatillo.

Seguridad durante el lavado

Reducir el riesgo de lesiones por inyección, chispas eléctricas o salpicaduras, siguiendo el procedimiento de lavado específico dado en la página 12 de este manual. Seguir el **procedimiento de descarga de presión** en la página 6, y quitar la *boquilla rociadora antes de lavar*. Apoyar una parte metálica de la pistola bien firme contra el costado de un *balde de metal* y usar la presión más baja posible de fluido durante el lavado.

PELIGRO DE LAS PIEZAS MOVILES

Las piezas en movimiento pueden pinchar o amputar dedos u otras partes del cuerpo. **MANTENERSE ALEJADO** de las piezas en movimiento durante el arranque o funcionamiento de la pulverizadora. Desenchufar la pulverizadora y descargar la presión antes de revisarla o darle servicio, para impedir que arranque inesperadamente.

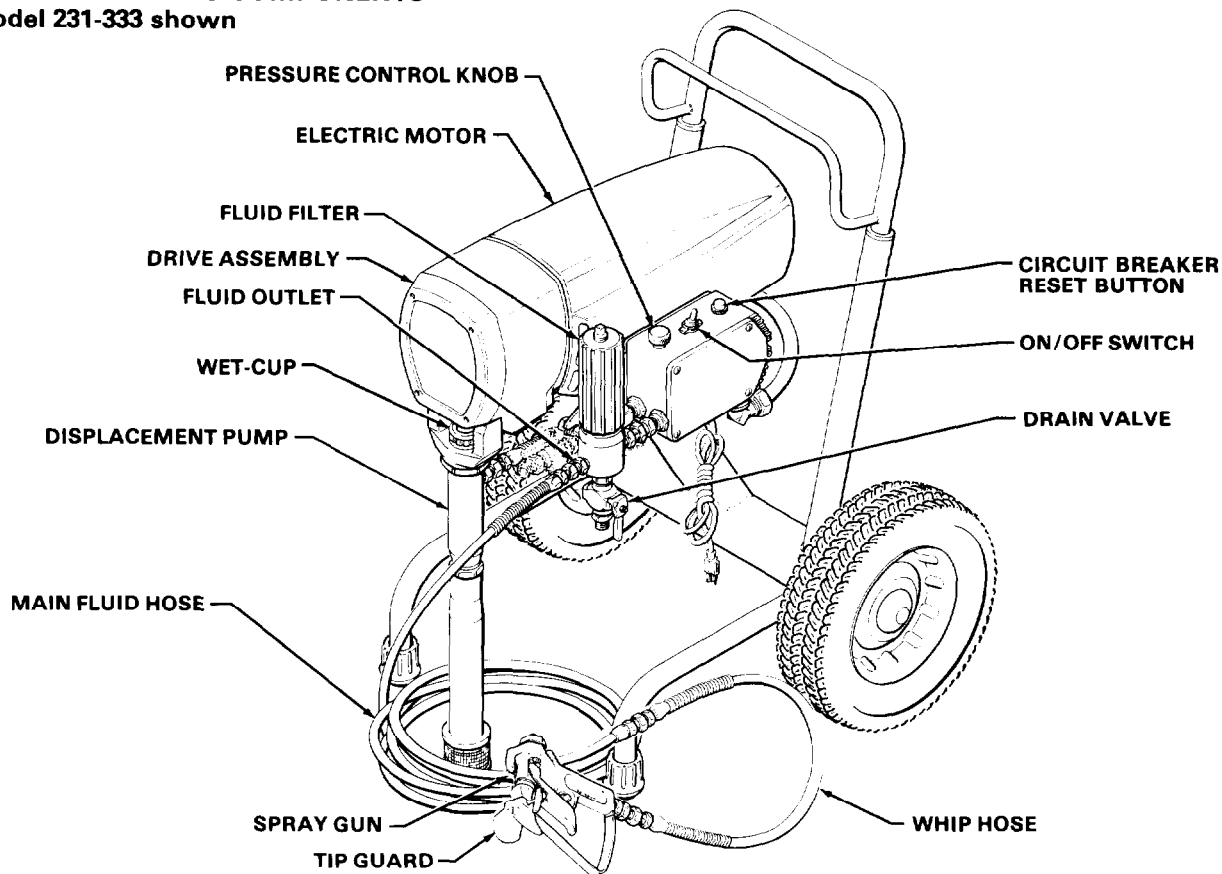
IMPORTANT

Se han adoptado las normas de seguridad del gobierno de los Estados Unidos de Norteamérica bajo el Acta de Seguridad y Salud Ocupacional. Deberán consultarse estas normas, en especial las Generales, Parte 1910, y las Normas de Construcción, Parte 1926.

INTRODUCTION

ULTRA™ 333 BASIC COMPONENTS

Model 231-333 shown



Your new Ultra™ 333 Sprayer functions and operates differently than other airless paint sprayers. This section will help you become familiar with the sprayer before operating it.

Pressure Control

The pressure control includes an ON/OFF switch for the sprayer, the pressure adjusting control knob, a pressure sensing device, and a current overload circuit breaker with a manual reset button. Its function is to control the motor speed so that the sprayer maintains constant fluid pressure at the pump outlet.

Motor

The DC motor has sealed bearings and replaceable motor brushes. Its function is to drive the displacement pump at the rate needed to supply sufficient paint volume at the selected pressure.

Working together, the pressure control and motor cause the pump to cycle whenever there is fluid or pressure demand. When the pump is cycling, the motor sounds like an automobile starter cranking. When the pump is not cycling, the motor hums, hums intermittently, or appears to have shut itself off. However, there will still be power to the sprayer and it will stay pressurized and ready to use unless you manually shut it off and relieve pressure.

Because the motor is DC, it is less sensitive to low voltage or voltage fluctuations than an AC motor, and an extension cord of up to 150 feet (45 m) can be used.

Drive Assembly

The sealed drive assembly transfers power from the DC motor to the displacement pump.

Displacement Pump

The positive displacement, volume-balanced pump provides equal fluid delivery on both the up and down pump strokes. The pump has a wet-cup which, when filled with Graco Throat Seal Liquid, helps prevent damage to the throat packings and piston rod.

Fluid Filter

The fluid filter provides the final paint straining to help avoid clogs in the hose and spray tip. The filter includes a reusable element and a drain valve for relieving fluid pressure when shutting off the sprayer.

Hoses

The grounded, nylon spray hoses have spring guards on both ends. The 50 foot (15.2 m) hose has a 1/4 in. ID. The 3 foot (0.9 m), 3/16 in. ID whip hose allows flexible gun movement. The nylon hose material acts as a pulsation dampener to absorb pressure fluctuations.

Spray Gun & Reverse-A-Clean III Spray Tip

Both the "Contractor" and "Flex" spray guns include a trigger safety which prevents accidental triggering when it is engaged (see the WARNING on page 3). The Reverse-A-Clean III spray tip uses high pressure fluid to remove clogs from the spray tip without removing it from the gun. It includes a safety tip guard which helps reduce the risk of injection injury.

SETUP

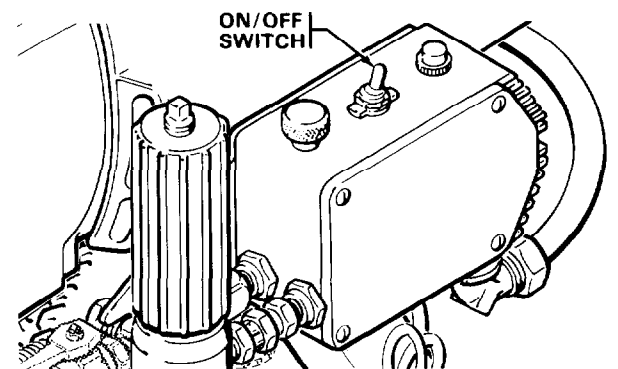
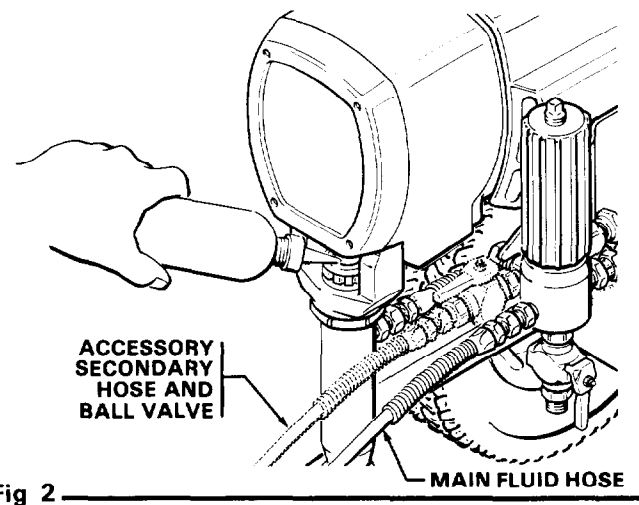
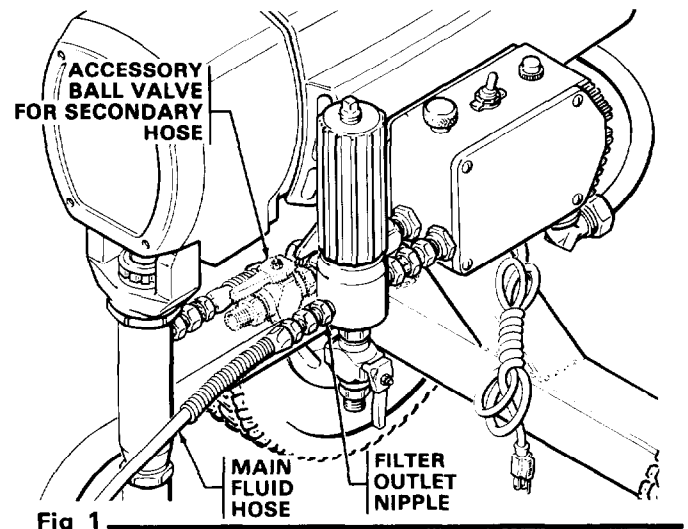
1. **Connect Hose and Gun** (Refer to Fig 1.)
 - a. Remove the plastic cap plug from the filter outlet nipple and screw the 50 ft (15.2 m) fluid hose onto the nipple.
 - b. Connect the whip hose between the fluid hose and the gun inlet connection.
 - c. Don't use thread sealant, and don't install the spray tip yet!
2. **Two Gun Hookup.** (Refer to Fig 1.) Remove the plug from the tee which holds the fluid filter to the sprayer and install an accessory 1/4 npt ball valve. Connect an accessory hose and gun to the ball valve.

CAUTION

To avoid damaging the pressure control, which may result in poor equipment performance and component damage, follow these precautions:

1. Always use nylon spray hose of at least 50 ft (15.2 m) long.
2. Never use a wire braid hose as it is too rigid to act as a pulsation dampener.
3. Never install any shutoff device between the filter and the main hose. See Fig 2.
4. Always use the main filter outlet for one-gun operation. Never plug this outlet.

3. **Fill Packing Nut/Wet-Cup** (See Fig 2.) Fill the packing nut/wet-cup 1/3 full with Graco Throat Seal Liquid (TSL), supplied.
4. **Check Electrical Service**
 - a. Be sure the electrical service is 120 V, 60 HzAC, 15 Amp (minimum) and that the outlet you use is properly grounded.
 - b. Use an extension cord which has 3 wires of a minimum 12 gauge size, and a maximum of 150 ft (45 m) long. Longer lengths may affect sprayer performance.
5. **Plug in the Sprayer**
 - a. Be sure the ON/OFF switch is OFF. Refer to Fig 3.
 - b. Plug the power supply cord into a grounded electrical outlet that is at least 20 ft (6 m) away from the spray area to reduce the chance of a spark igniting the spray vapors.
 - c. Do not remove the third prong of the power supply cord plug, which is the grounding prong, and do not use an adapter.
6. **Flush the pump** to remove the No. 10 motor oil which was left in to protect pump parts after factory testing.
 - a. *Before using water-base paint*, flush with mineral spirits followed by soapy water, and then a clean water flush.
 - b. *Before using oil-base paint*, flush with mineral spirits only.
 - c. See "Flushing Guidelines" on page 12 for flushing procedure.



7. **Prepare the paint** according to the manufacturer's recommendations.
 - a. Remove any skin that may have formed.
 - b. Stir the paint to dissolve pigments.
 - c. Strain the paint through a fine nylon mesh bag (available at most paint dealers) to remove particles that could clog the filter or spray tip. *This is probably the most important step toward trouble-free spray painting.*

OPERATION

WARNING

Pressure Relief Procedure

To reduce the risk of serious bodily injury, including injection 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. Engage the gun safety latch.
2. Turn the ON/OFF switch to OFF.
3. Unplug the power supply cord.
4. Disengage the gun safety latch.
5. Hold a metal part of the gun firmly to the side of a metal pail, and trigger the gun to relieve pressure.
6. Engage the gun safety latch.
7. Open the drain valve, having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to operate the sprayer again.

If you suspect that the spray tip or hose is completely CLOGGED, OR THAT PRESSURE HAS NOT BEEN FULLY RELIEVED after following the steps above, VERY SLOWLY loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually. Then loosen the nut completely. Now clear the tip or hose obstruction.

1. **Prime the Sprayer with Paint.**
 - a. Close the filter drain valve (and the secondary hose ball valve).
 - b. Don't install the spray tip yet!
 - c. Put the suction tube into the paint container.
 - d. Turn the pressure adjusting knob all the way counterclockwise to lower the pressure setting.
 - e. Disengage the gun safety latch.
 - f. Hold a metal part of the gun firmly against and aimed into a metal waste container. See Fig 4. Squeeze the trigger and hold it open, turn the ON/OFF switch to ON, and slowly increase the pressure setting until the sprayer starts. Keep the gun triggered until all air is forced out of the system and the paint flows freely from the gun. Release the trigger and engage the safety.
- NOTE:** If the pump is hard to prime, place a container under the drain valve and open it. When fluid comes from the valve, close it. Then disengage the gun safety and proceed as in Step 1f, above.
- g. Check all fluid connections for leaks. If any leaks are found, follow the **Pressure Relief Procedure Warning**, above, before tightening the connections.
2. **Install the Spray Tip and Tip Guard** (Refer to Fig 5.)
 - a. Be sure the gun safety latch is engaged.
 - b. Unscrew the retaining nut from the gun.
 - c. Install the Reverse-A-Clean III spray housing with tip installed (See manual 307-321, supplied).

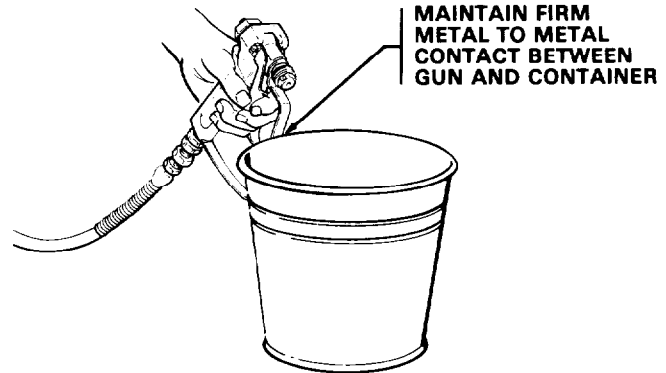


Fig 4

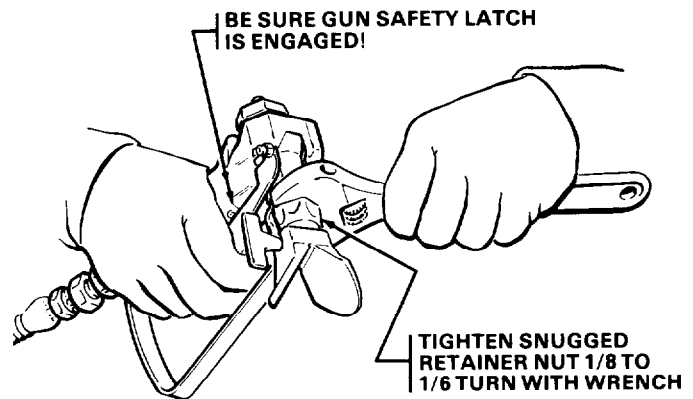


Fig 5

- d. Tighten the retaining nut by hand until snug.
- e. Use a wrench to tighten the retaining nut about 1/8 to 1/6 turn.

CAUTION

Overtightening the retaining nut will damage the seat gasket and result in leakage.

3. **Adjusting the Spray Pattern**
 - a. Increase the pressure adjusting knob setting just until spray from the gun is completely atomized. To avoid excessive overspray and fogging, and to decrease tip wear and extend the life of the sprayer, always use the lowest possible pressure needed to get the desired results.
 - b. If more coverage is needed, use a larger tip rather than increasing the pressure.
 - c. Test the spray pattern. To adjust the direction of the spray pattern, engage the gun safety and loosen the retaining nut. Position the tip so the groove is horizontal for a horizontal pattern or vertical for a vertical pattern. Then tighten the retaining nut.

4. Cleaning a Clogged Tip

WARNING

To reduce the risk of serious bodily injury from injection, use extreme caution when cleaning or changing spray tips. If the spray tip clogs while spraying, engage the gun safety latch immediately, then follow the procedure in Steps 4a-4e, below.

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

- a. Clean the front of the tip frequently during the day's operation. *First*, follow the **Pressure Relief Procedure Warning** in on page 10. Then use a solvent-soaked brush to keep fluid from building up and clogging the tip.
- b. If the spray tip does clog, release the gun trigger, engage the gun safety, and rotate the spray tip handle 180°. See Fig 6.
- c. Disengage the gun safety and trigger the gun into a waste container. Engage the gun safety again.
- d. Return the handle to the original position, disengage the gun safety, and resume spraying.
- e. *If the tip is still clogged*, engage the gun safety, shutoff and unplug the sprayer, and open the drain valve to relieve pressure. Clean the spray tip as instructed in "Service" in instruction manual 307-321, supplied.

SHUTDOWN AND CARE

1. **Check the packing nut/wet-cup daily.** First follow the **Pressure Relief Procedure Warning** on page 10. Be sure the wet-cup is 1/3 full of TSL at all times to help prevent fluid buildup on the piston rod and premature wear of packings. The packing nut should be tight enough to stop leakage, but no tighter. Overtightening may cause binding and excessive packing wear. Use a screwdriver and light hammer to adjust the nut. See Fig 7.
2. **Clean the fluid filter often** and whenever the sprayer is stored. First follow the **Pressure Relief Procedure Warning** on page 10. Refer to manual 307-273, supplied, for the cleaning procedure.
3. **Flush the sprayer at the end of each work day** and fill it with mineral spirits to help prevent pump corrosion and freezing. See "Flushing Guidelines" on page 12.

CAUTION

Never leave water or any paint in the sprayer overnight to: (1) prevent pump corrosion; (2) to prevent the material from freezing in the pump and pressure control which can cause loss of pressure, stalling or serious sprayer damage. Always use mineral spirits for the final flush, relieve pressure, and leave the mineral spirits in the sprayer.

4. **For very short shutoff periods**, leave the suction tube in the paint, follow the **Pressure Relief Procedure Warning** on page 10, and clean the spray tip.
5. **Coil the hose** and hang it on the hose rack when storing it, even for overnight, to help protect the hose from kinking, abrasion, coupling damage, etc.

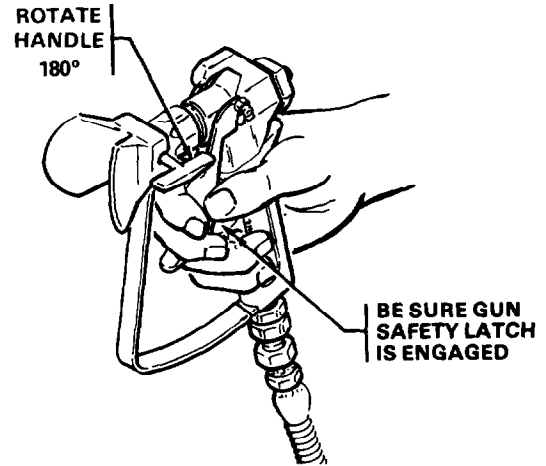


Fig 6

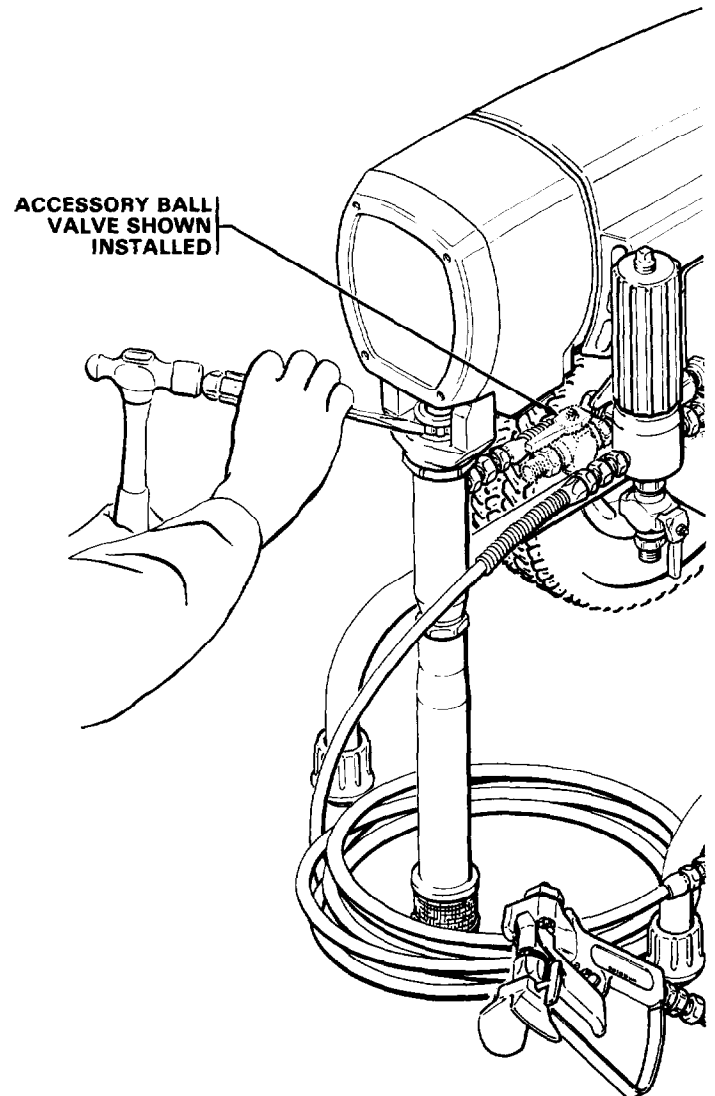


Fig 7

FLUSHING GUIDELINES

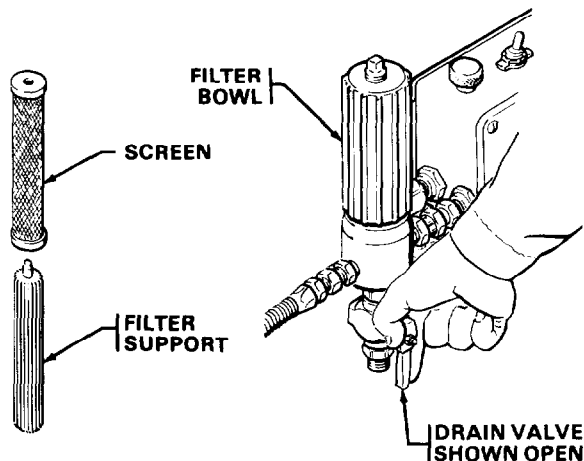
When to Flush

1. **New Sprayer.** Your new Ultra™ 333 Sprayer was factory tested in No. 10 motor oil which was left in to protect pump parts.
Before using water-base paint, flush with mineral spirits, followed by soapy water, and then a clean water flush.
Before using oil-base paint, flush with mineral spirits only.
2. **Changing Colors.** Flush with a compatible solvent such as mineral spirits or water.
3. **Changing from water-base to oil-base paint.** Flush with soapy water, then mineral spirits.
4. **Changing from oil-base to water-base paint.** Flush with mineral spirits, followed by soapy water, then a clean water flush.

5. **Storage.**
Water-base paint: flush with water, then mineral spirits and leave the pump, hose and gun filled with mineral spirits. Shutoff and unplug the sprayer, open the drain valve to relieve pressure and leave open.
Oil-base paint: flush with mineral spirits. Shutoff and unplug the sprayer, open the drain valve to relieve pressure and leave open.
6. **Startup after storage.**
Before using water-base paint, flush out mineral spirits with soapy water and then a clean water flush.
When using oil-base paint, flush out the mineral spirits with the material to be sprayed and the sprayer is ready to use.

How to Flush

1. Follow the **Pressure Relief Procedure Warning** on page 2 or 10.
2. Remove the filter bowl and screen; see manual 307-273 supplied. Clean the screen separately and install the bowl without the screen.
3. Close the filter drain valve.

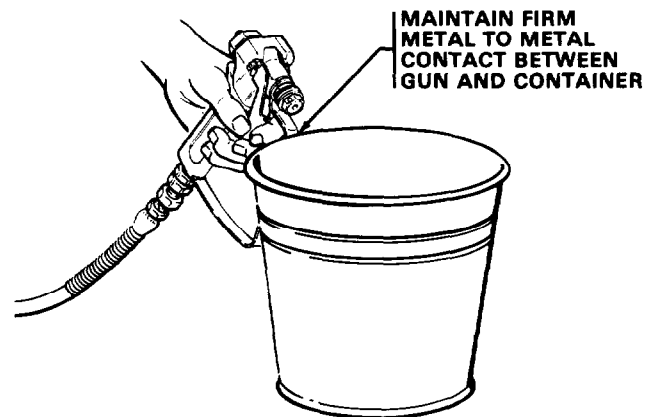


4. Pour one-half gallon (2 liters) of compatible solvent into a bare metal pail. Put the suction tube in the pail.
5. Remove the spray tip from the gun.

WARNING

To reduce the risk of static sparking and splashing, always remove the spray tip from the gun, and hold a metal part of the gun firmly to the side of a grounded metal pail when flushing.

6. Disengage the gun safety latch. Point the spray gun into a metal waste container and with a metal part of the gun firmly touching the metal container, squeeze the gun trigger. **This procedure helps avoid static sparking and splashing.** With the gun triggered, turn the ON/OFF switch to ON and slowly turn the pressure adjusting knob clockwise **just until** the sprayer starts. Keep the gun triggered until clean solvent comes from the nozzle. Release the trigger and engage the gun safety latch.



7. Check all fluid connections for leaks. If any leak, first follow the Pressure Relief Procedure Warning on page 2 or 10. Now tighten the connections, start the sprayer, and recheck the connections for leaks.
8. Remove the suction tube from the pail. Disengage the gun safety and trigger the gun to force solvent from the hose. **Do not let the pump run dry for more than 30 seconds to avoid damaging the pump packings!** Then turn ON/OFF switch to OFF and engage the gun safety.
9. Unplug the power supply cord. Open the drain valve and leave open until you are ready to use the sprayer again. Unscrew the filter bowl and reinstall the clean screen. Reinstall the bowl, hand tight only.
10. If you have flushed with mineral spirits and are going to use a water-base paint, flush with soapy water followed by a clean water flush. Then repeat Step 1.

TROUBLESHOOTING GUIDE AND REPAIR INSTRUCTIONS

TROUBLESHOOTING GUIDE

This guide will help you identify the causes and solutions to sprayer problems. If you cannot identify and resolve the problem, or if "Return for repair" is in-

dicated, contact your nearest authorized service agency for instructions on where and how to return the sprayer for repair.

WARNING

Pressure Relief Procedure

To reduce the risk of serious bodily injury, including injection 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. Engage the gun safety latch.
2. Turn the ON/OFF switch to OFF.
3. Unplug the power supply cord.
4. Disengage the gun safety latch.
5. Hold a metal part of the gun firmly to the side

of a metal pail, and trigger the gun to relieve pressure.

6. Engage the gun safety latch.
7. Open the drain valve, having a container ready to catch the drainage.
8. Leave the drain valve open until you are ready to spray again.

If you suspect that the spray tip or hose is completely CLOGGED, OR THAT PRESSURE HAS NOT BEEN FULLY RELIEVED after following the steps above, VERY SLOWLY loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually. Then loosen the nut completely. Now clear the tip or hose obstruction.

PROBLEM	CAUSE	SOLUTION
I. Electric motor won't operate	<ol style="list-style-type: none"> 1. Power cord unplugged, or building circuit fuse blown 2. Current overload circuit breaker has opened 3. Pressure setting too low 4. Damaged extension cord 5. Motor brushes worn 6. Pressure control damaged by freezing (b) or overpressurizing (c) 7. Material or water frozen in sprayer (b) 	<ol style="list-style-type: none"> 1. Check, reset or replace. 2. Depress reset button on top of pressure control (a). 3. Increase. 4. Replace. 5. Replace. See page 18. 6. Return for repair. 7. Thaw; try to start; return for repair if needed.
II. Electric motor stops while spraying	<ol style="list-style-type: none"> 1. Power cord unplugged, or building circuit fuse blown 2. Pressure setting too low 3. Tip or filter plugged 4. Pressure control or motor failure 	<ol style="list-style-type: none"> 1. Check, reset or replace. 2. Increase. 3. Remove and clean. 4. Return for repair.
III. Electric motor runs, but output low (See Problem VII also.)	<ol style="list-style-type: none"> 1. Piston ball check not seating 2. Piston packing worn or damaged 3. Intake valve ball check not seating 4. Displacement pump frozen (b) or gear train damaged 5. Pressure control frozen (b) or damaged by over-pressurization (c) 	<ol style="list-style-type: none"> 1. Repair. See page 15. 2. Replace. See page 15. 3. Repair. See page 15. 4. Thaw; restart; return for repair if needed. 5. Thaw; restart; return for repair if needed.
IV. Electric motor runs, but no output and pump not stroking	<ol style="list-style-type: none"> 1. Drive assembly damaged 	<ol style="list-style-type: none"> 1. Return for repair.
V. Paint leaks into wet-cup	<ol style="list-style-type: none"> 1. Packing nut too loose 2. Throat packings worn or damaged 3. Damaged or worn piston rod 	<ol style="list-style-type: none"> 1. Tighten just enough to stop leakage. 2. Replace (d). See page 15. 3. Replace (d). See page 15.
VI. Excessive surge (pulsing) at spray gun	<ol style="list-style-type: none"> 1. Filter partially clogged 2. Spray tip too big or worn 3. Paint too thick 4. Wrong type hose 5. Displacement pump check balls dirty or sticking 6. Displacement pump check balls and packings worn or damaged 7. Pressure control or motor damaged 	<ol style="list-style-type: none"> 1. Remove and clean. 2. Change tip. 3. Thin per paint manufacturer's recommendations. 4. Use minimum 50 ft (15.2 m) grounded nylon hose; do not use wire braid hose. 5. Flush, then remove and clean if needed. 6. Replace. See page 15. 7. Return for repair.

PROBLEM	CAUSE	SOLUTION
VII. Not enough paint pressure (See Problem III also.)	<ol style="list-style-type: none"> 1. Pressure setting too low 2. Spray tip too big or worn 3. Motor brushes worn 4. Pressure control or motor damaged 	<ol style="list-style-type: none"> 1. Increase. 2. Change tip; see manual 307-321. 3. Replace. See page 14. 4. Return for repair.
VIII. Poor spray pattern	<ol style="list-style-type: none"> 1. Clogged spray tip 2. Pressure setting too low 3. Outlet filter or hose partially clogged 4. Spray tip too big or worn 5. Paint supply low or pail empty 6. Paint too thick 	<ol style="list-style-type: none"> 1. Clean. See manual 307-321. 2. Increase. 3. Clean; see manual 307-273. 4. Change tip; see manual 307-321. 5. Fill; reprime to remove air. 6. Thin per paint manufacturer's recommendations.
IX. Spitting from spray gun	<ol style="list-style-type: none"> 1. Paint supply low or pail empty 2. Sprayer sucking air or gun needle not seating 	<ol style="list-style-type: none"> 1. Fill, reprime to remove air. 2. Tighten fittings; repair gun; see manual 307-614.
X. Static sparking from gun	<ol style="list-style-type: none"> 1. Sprayer or work not grounded 	<ol style="list-style-type: none"> 1. Check hose continuity and electrical ground connection.

- Engage gun safety latch. Depress manual reset button on top of pressure control. If the sprayer continues to shut off, reduce spraying pressure. If the problem isn't corrected, return for repair.
- Freezing results from failure to replace water-base paint or flushing water with mineral spirits at shutdown.
- Overpressurization results from (1) using less than 50 ft (15.2 m) of nylon spray hose; (2) using wire braid hose; (3) adding a shutoff device between filter and main hose; (4) plugging the main fluid outlet of the filter and using drain valve as a shutoff; and (5) a clogged or incorrectly assembled filter.
- Be sure to keep packing nut 1/3 full of Throat Seal Liquid to help prevent premature wear of throat packings and paint drying on the rod.

DISPLACEMENT PUMP REPAIR

Tools Needed:

- Heavy duty vise
- 7/8" open end wrench
- 2" open end wrench
- Plastic mallet
- Small screwdriver

WARNING

Before doing this procedure, follow the Pressure Relief Procedure Warning on page 14 to reduce the risk of an injection injury, injury from moving parts or electric shock.

Removing the Pump (Refer to Fig 8.)

- Flush the pump, if possible, and relieve pressure again. Stop the pump with the piston rod (223) in its lowest position.
- Unscrew the suction tube (42) from the pump. Hold the wrench on the pump intake valve (222) to keep the pump from loosening.
- Unscrew the hose (47) from the nipple (46) on the pump outlet and remove the hose.
- Use a screwdriver to push the retaining spring (35) aside and push out the pin (20).
- Loosen the locknut (38) and unscrew the pump from the bearing housing (27).

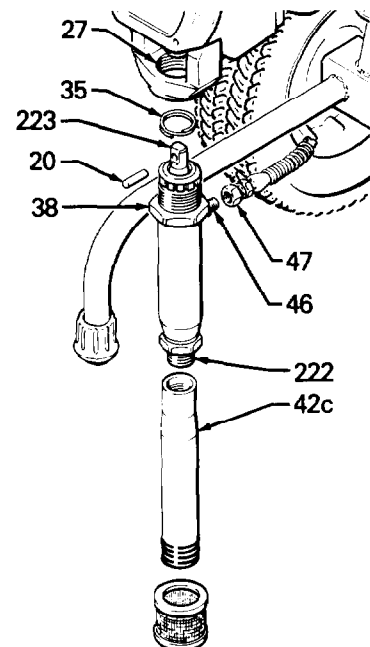


Fig 8

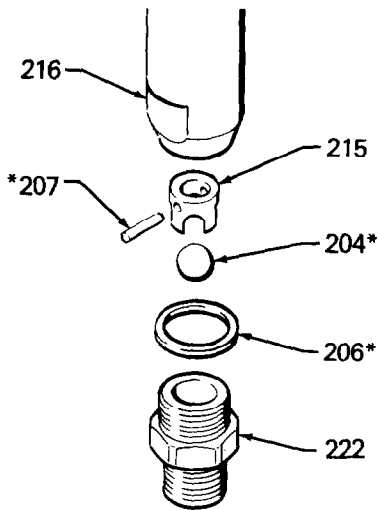


Fig 9

Disassembling the Pump (Refer to Figures 9 and 10.)

1. Unscrew the intake valve (222) from the cylinder (216). Remove the gasket (206), ball guide (215), stop pin (207) and ball (204) from the valve. Clean and inspect the parts for wear or damage, replacing parts as needed. *Always* use a new gasket (included in Repair Kit 218-033).
2. Unscrew and remove the packing nut (221) and plug (201).
3. Use a plastic mallet to tap the piston rod *down*, then pull the rod out through the *bottom* of the cylinder.
4. Remove the throat packings (209, 218) and glands (211, 212).
5. Clamp the flats of the piston rod in a vise. Use a 7/8 in. wrench to loosen the retaining nut (214). Then use the wrench to unscrew the piston valve (224) from the rod.
6. Remove the backup washer (219), wiper (205), packings (208, 217) and glands (213, 220).

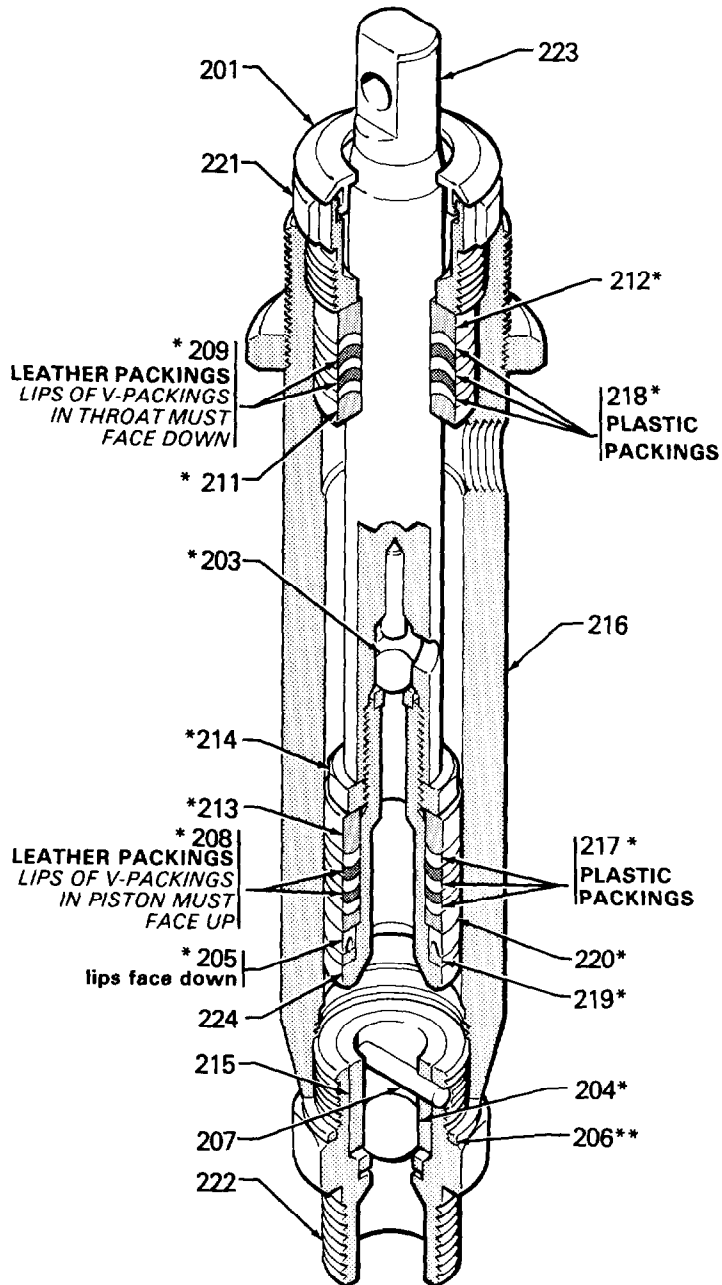


Fig 10

Reassembling the Pump

Assembly Notes:

- (1) Use Repair Kit No. 218-033 to repair the displacement pump. Reference number in parentheses with an asterisk, for example, (210*), show the parts included in the kit. Use all the new parts, even if the old ones still look good as the old parts cause the new ones to wear prematurely.
 - (2) Alternate leather and plastic packings as shown in Fig 3. Notice that the lips of the throat "V" packings *face down*, against pressure, and the lips of the piston "V" packings *face up*, against pressure. The lips of the U-cup wiper (205), *face down*. Incorrect installation damages the packings and results in the pump leaking.
 - (3) Coat the piston rod, inside of the cylinder and the packings with a lightweight oil to help prevent packing damage when inserting the piston rod.
1. Check the outside of the piston rod (223) and the inside of the cylinder (216) for scoring or scratches. If the parts are damaged, new packings will not seal properly. Replace these parts if needed.
 2. Stack the backup washer (219*), wiper (205*), female gland (220*), packings (217*, 208*) and male gland (213*) onto the piston valve. See Figures 11 & 12.
 3. Tighten the packing retaining nut (214) onto the piston valve (224) and torque to 3 to 4 in-lb (0.34 to 0.35 N·m) — about finger tight.
 4. Use a pen to make a light mark on the packings where they align with one of the flats on the nut. See Fig 11.
 5. Place ball (203) on piston valve (224). Apply *one drop* of thread locking compound on threads of valve. Then hand tighten the valve assembly into the piston rod just until the nut meets the face of the rod. See Fig 12.

- Place the flats of the rod in a vise.

CAUTION

Step 7, tightening the piston valve into the rod, is critical. Follow the procedure carefully to avoid damaging the packings by overtightening.

- Without changing the tightness of the nut against the packings, tighten the nut (214) into the piston rod to 18 to 20 ft-lbs (24 to 27 N·m). If the pen mark on the packings loses alignment, back the nut off and try again.

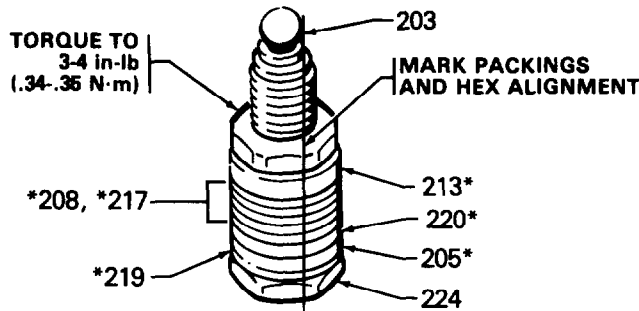


Fig 11

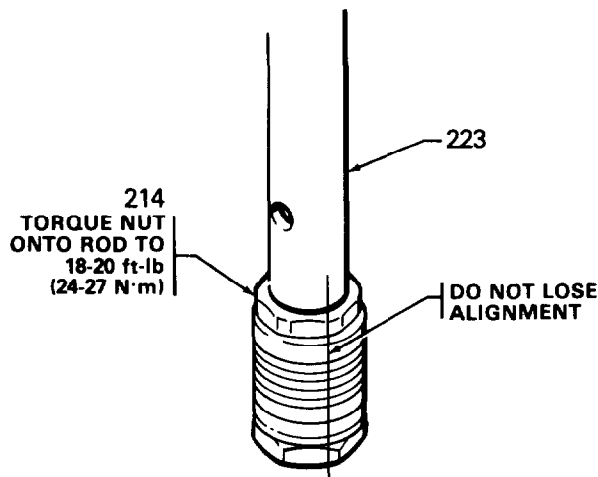


Fig 12

- Stack the male gland (211*), packings (218*, 209*) and female gland (212*), one at a time, into the top of the cylinder. See Fig 10.
- Install the throat packing nut (221) and plug (201) but leave loose for now.
- Insert the piston rod (223) through the *bottom* of the pump cylinder, pushing it up until the top of the piston rod extends 1-7/8" (32.2 mm) beyond the top of the cylinder. See Fig 10.
- Screw down the cylinder locknut (38) until it is finger tight at the bottom of the external cylinder threads.
- Place flats of the intake valve in a vise. Install a new gasket (206*) and screw the pump cylinder into the valve. See Fig 9.

- Screw the displacement pump about 3/4 of the way into the bearing housing (27). Hold the pin (20) up to the pin hole in the connecting rod assembly (3) and continue screwing in the pump until the pin slides easily into the hole. Back off the pump until the top threads of the pump cylinder are flush with the face of the bearing housing and the outlet nipple (46) is straight back. Push the retaining spring (35) into the groove all the way around the connecting rod. Tighten the locknut (38) very tight—about 70 ft-lb (94 N·m)—with a 2 in. open-end wrench and a light hammer.

WARNING

Be sure the retaining spring (35) is firmly in the groove of the connecting rod, *all the way around*, to prevent it from working loose due to vibration. See Fig 13.

If the pin works loose, it or other parts could break off due to the force of the pumping action. These parts could be projected through the air and result in serious bodily injury or property damage, including damage to the pump, connecting rod or bearing housing.

CAUTION

If the locknut (38) loosens during operation, the threads of the bearing housing (27) will be permanently damaged. Be sure to tighten the locknut firmly.

- Tighten the packing nut (221) just enough to stop leakage, but no tighter. Fill the wet-cup/packing nut 1/3 full with Graco TSL.
- Replace the motor brushes, included with the repair kit. See page 18.

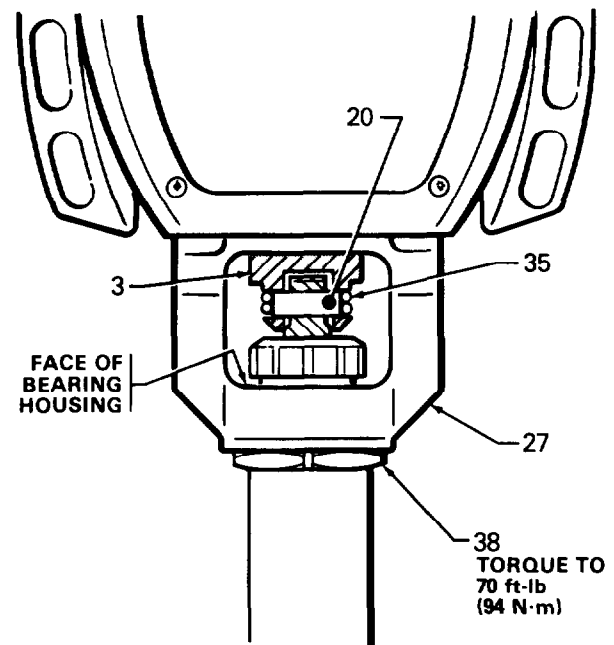


Fig 13

MOTOR BRUSH REPLACEMENT

Tools Needed:

Phillips screwdriver
Flatblade screwdriver

NOTE: New motor brushes are included with each Packing Repair Kit, 218-033. Replace them when replacing the packings, and/or when they have been worn to a minimum of 9/16" on the longest side.

WARNING

Before doing this procedure, follow the Pressure Relief Procedure Warning on page 14 to reduce the risk of injection injury, injury from moving parts or electric shock.

1. Remove the motor screws (112), washers (113) and cover (14). See Fig 14.
2. Remove the screws (H), inspection covers (J) and gaskets (K) on each side of the motor. See Fig 14.
3. Loosen the brush lead terminal screw and remove the lead.
4. Push down on the spring clip slightly then pull the clip away from and out of the brush holder. Refer to Fig 15. Keep the spring clip.
5. Remove and discard the brush.
6. Inspect the commutator for excessive pitting, burning or gouging.

NOTE: A black color on the commutator is normal. Have the commutator resurfaced by a qualified motor repair shop if the brushes seem to be wearing too fast.

7. Place a new brush in the holder so the beveled edges are as shown in the first part of Fig 15, and the brush lead is routed as shown in the second part of Fig 15.
8. Slowly push the tabbed end of the spring clip into the brush holder until the clip tab engages in the holder and the rolled portion of the tension spring rests squarely on the brush.
9. Route the brush lead to the terminal and tighten the terminal screws. Be sure the brush lead does not touch any part of the armature or motor housing.
10. Test the brushes:
 - a. With the ON/OFF switch OFF, turn the pressure control knob all the way counterclockwise to minimum pressure. Plug in the sprayer.
 - b. Turn the ON/OFF switch ON and slowly increase the pressure until the motor comes up to full speed.
 - c. Inspect the brush and commutator contact area for excessive arcing. Arcs should not "trail" or circle around the commutator surface.

WARNING

Do not touch the brushes, leads, springs or brush holders while the sprayer is plugged in to avoid electric shock and possible serious bodily injury.

CAUTION

Do not run the sprayer dry for more than 30 seconds while checking the brushes to avoid damaging the displacement pump.

11. Reinstall the brush inspection covers, gaskets, and screws. Reinstall the motor cover, screws and washers.

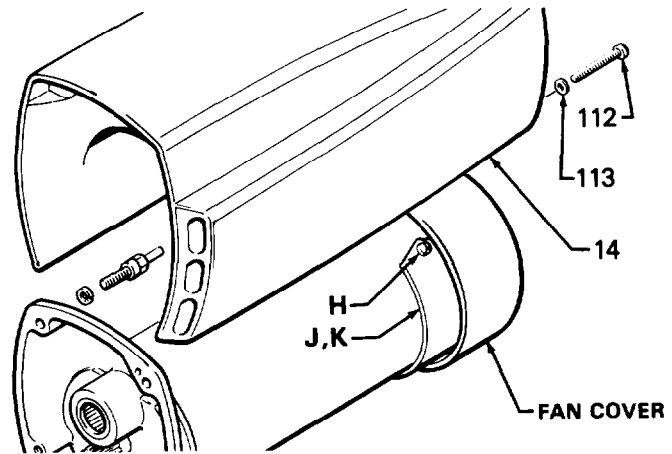
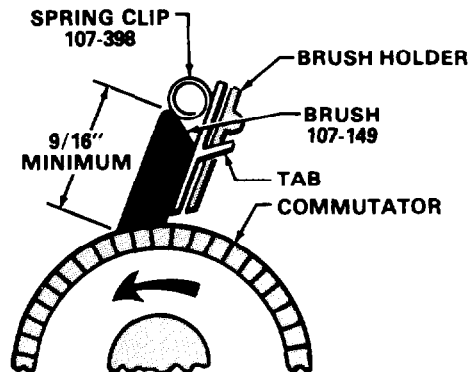
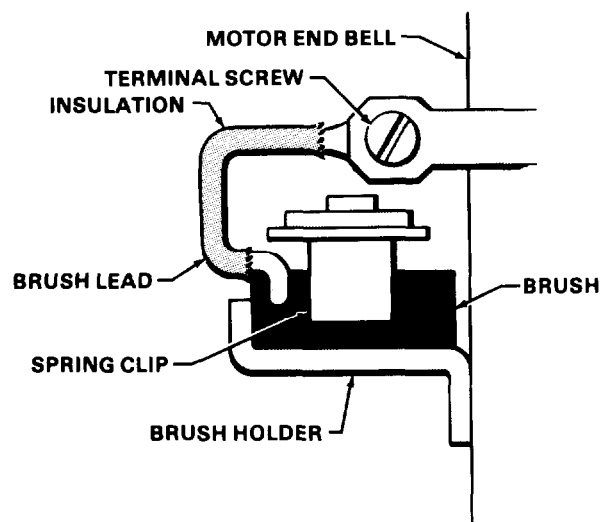


Fig 14



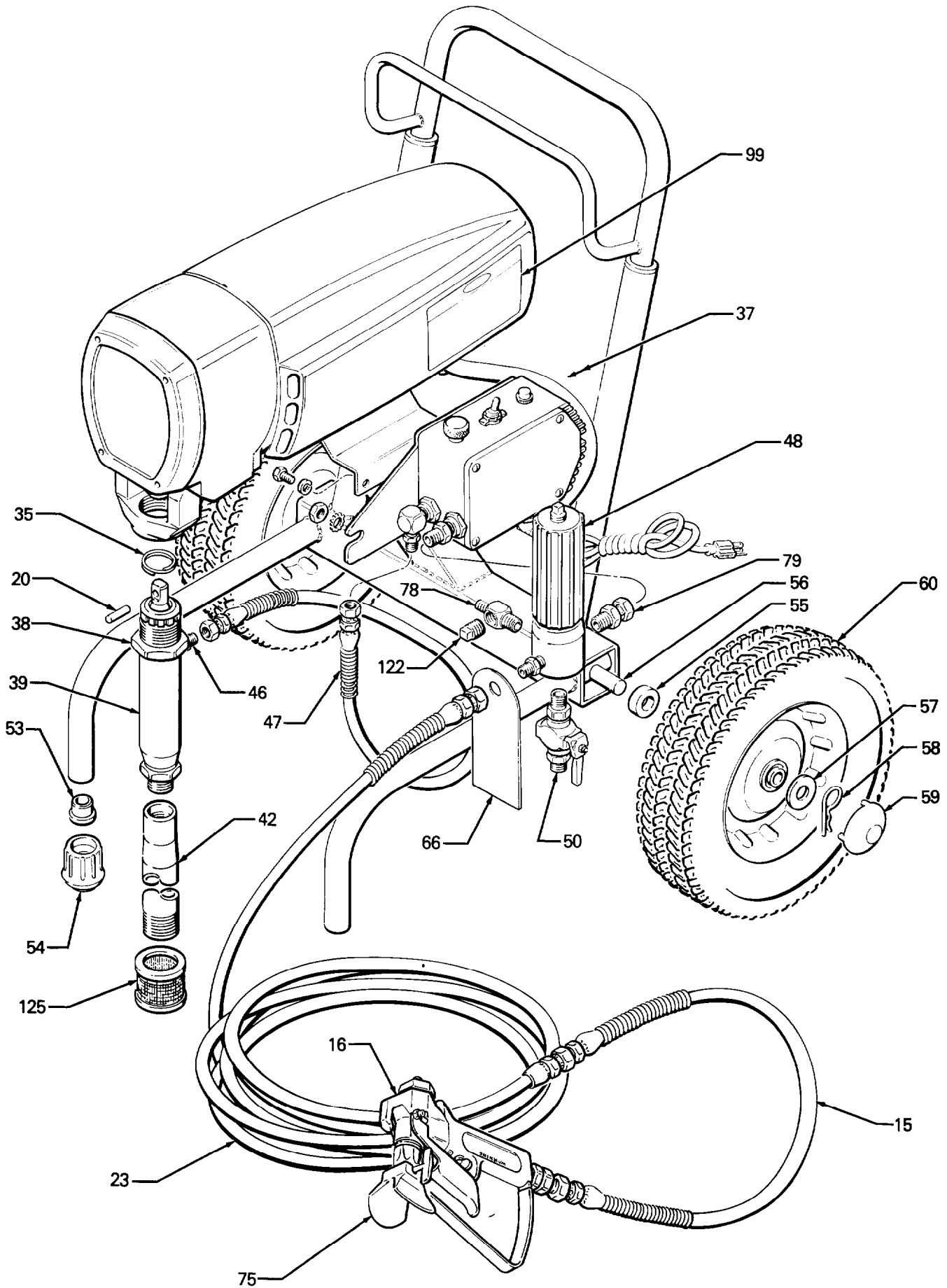
SIDE VIEW OF MOTOR BRUSH INSTALLATION



DETAIL OF MOTOR BRUSH SHOWN WITH MOTOR LEAD FACING BACK OF MOTOR

Fig 15

**PARTS DRAWINGS
AND
PARTS LISTS**



Model 231-007, Series A

Includes replaceable items 14, 20, 35-66, 78-125 listed below.

Model 231-333, Series A

Includes replaceable items 14-125, 150 listed below.

Field-replaceable parts are listed below. Replacement of any other parts must be done by a qualified repair agency.

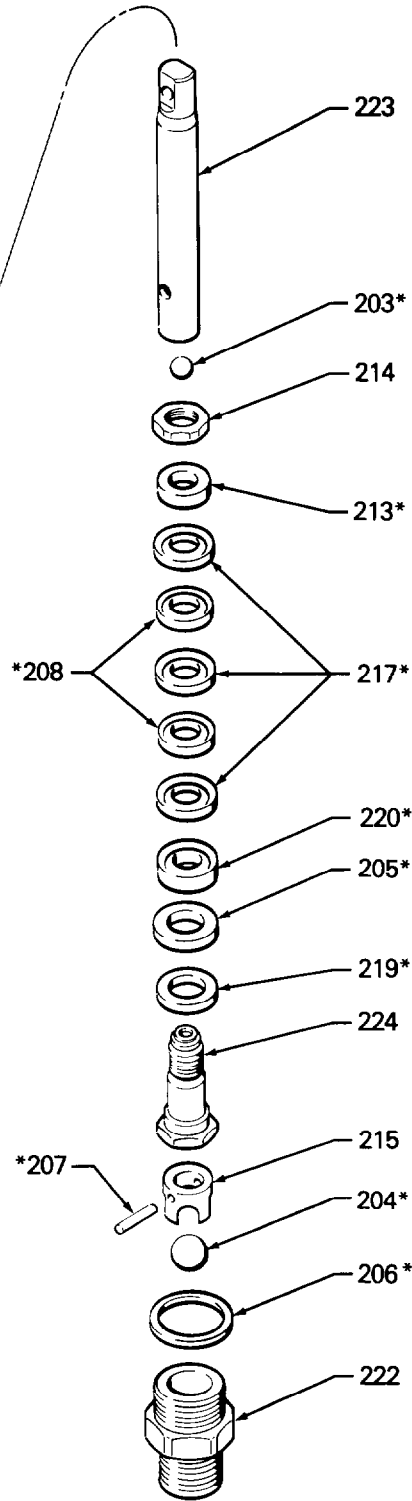
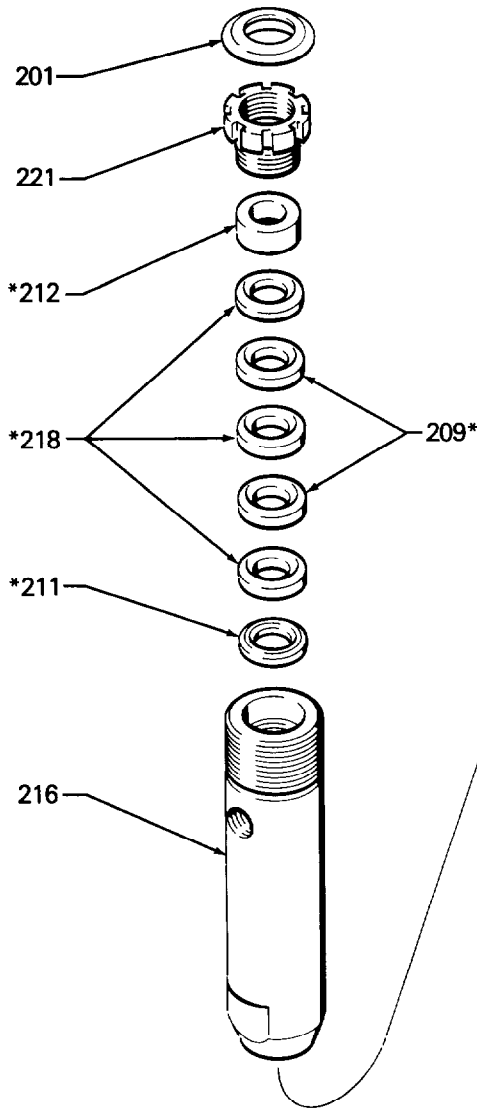
REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
14	218-362	COVER, motor; includes labels	1	57	154-636	WASHER	2
15	214-701	HOSE, grounded, nylon; 3/16" ID; 3 ft (0.9 m) long; spring guards both ends	1	58	178-392	CLIP, spring	2
16	217-593	GUN, airless See manual 307-614 for parts	1	59	104-811	HUBCAP	2
20	176-818	PIN, straight, hdls	1	60	179-811	WHEEL	2
23	210-541	HOSE, grounded, nylon; 1/4" ID, 50' (15.2 m) long spring guard both ends	1	66	178-034	WARNING TAG**	1
35	176-817	SPRING, retaining	1	75	216-001	SPRAY TIP KIT See manual 307-321 for parts	1
37	179-885	WARNING LABEL**	1	78	179-945	ADAPTER, elbow; 7/16" stud; 1/4 x 1/4 npt(f)	1
38	178-941	NUT, hex	1	79	155-665	UNION, adapter; 3/8 npsm(f) swivel x 3/8 npt(m)	1
39	217-577	DISPLACEMENT PUMP See separate parts list on page 17	1	84	206-994	THROAT SEAL LIQUID (TSL) 8 oz. (0.23 liters)	1
42	180-573	SUCTION TUBE	1	112	107-248	SCREW, mach, round head, cross head; No. 10-24 x 2.5" long	2
46	162-453	NIPPLE, 1/4 npt(m) x 1/4 npsm	1	113	157-974	WASHER, plain; 3/16"	2
47	218-083	HOSE; grounded, nylon; 1/4" ID; 29" (736 mm) long; spring guard both ends	1	125	181-072	STRAINER	1
48	214-570	FILTER, fluid See 307-273 for parts	1	150		SPRAY TIP, Customer's Choice	1
50	210-657	BALL VALVE See 306-861 for parts	2	<i>306 & 307 numbers in descriptions refer to separate instruction manuals.</i>			
53	105-521	PLUG, tubing	2	<i>**Warning labels and tags supplied at no charge.</i>			
54	101-725	CAP	2	<i>Order parts by name and series letter of the assembly for which you are ordering.</i>			
55	179-775	SPACER	2				
56	179-780	AXLE	1				

HOW TO ORDER REPLACEMENT PARTS

1. To be sure you receive the correct replacement parts, kit or accessories, always give all of the information requested in the chart below.
2. Check the parts list to identify the correct part number; **do not use the ref. no. when ordering.**
3. Order all parts from your nearest Graco distributor.

6 digit PART NUMBER	QTY	PART DESCRIPTION

Ref No. 39
217-577 Displacement Pump, Series B
 Includes items 201 to 224.



Repair Kit 218-033
(Must be purchased separately)

For pump packings and motor brushes. Includes all star-red (*) items in parts list below plus 2 motor brushes (107-149) and sealant (102-969) for piston.

REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
201	179-810	PLUG	1	214	178-945	NUT, hex	1
203	*105-444	BALL	1	215	178-948	GUIDE, ball	1
204	*105-445	BALL	1	216	178-949	CYLINDER	1
205	*107-093	SEAL, U-cup	1	217	*178-964	V-PACKING, plastic	3
206	*150-429	GASKET	1	218	*178-965	V-PACKING, plastic	3
207	*178-938	PIN, ball stop	1	219	*181-338	WASHER, backup	1
208	*178-939	V-PACKING, leather	2	220	*178-969	GLAND, packing	1
209	*178-940	V-PACKING, leather	2	221	179-809	NUT, packing/wet-cup	1
211	*178-942	GLAND, packing, male	1	222	217-574	VALVE, intake	1
212	*178-943	GLAND, packing, female	1	223	218-017	ROD, piston	1
213	*178-944	GLAND, packing, male	1	224	218-036	VALVE, piston	1

SERVICE INFORMATION

Listed below by the assembly changed are OLD and NEW parts.

ASSEMBLY CHANGED	PART STATUS	REF NO.	PART NO.	NAME
217-577	OLD		178-966	Washer
Disp. Pump to Series B	NEW	219	181-338	Washer

ULTRA 333 TECHNICAL DATA

Power Requirements: 115 VAC, 60 Hz, 1 Phase, 15 AMP minimum

Operating Range: 0-3000 psi (0-207 bar)

Cycles/Gallon (liter): 260 (70)

Maximum Delivery: 0.6 GPM (2.3 liter/min)

Power Cord: No. 14 AWG, 3 wire, 8'6" (2.6 m) long

Inlet Paint Strainer: 16 mesh, (1190 micron), Stainless Steel Screen, reusable

Outlet Paint Filter: 60 mesh, (250 micron), Stainless Steel Screen, reusable

Pump Inlet Size: 3/4 npt w/30° ID chamfer

Fluid Outlet Size: 1/4 npsm from fluid filter

Weight: 95 lb (43 Kg) approximately

Wetted Parts: Aluminum, Delrin, Nitralloy, Nylon, Polyethylene,
Polyurethane, Rubber, Impregnated Leather, Stainless
Steel, PTFE, Tungsten Carbide, Zinc-plated Steel

Dimensions: Width: 22.5 in. (572 mm)

Height: 28.0 in. (711 mm)

Length: 26.0 in. (660 mm)

Factory Branches: Atlanta, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)
Subsidiary and Affiliate Companies: Canada; England; Switzerland; France; Germany; Hong Kong; Japan

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