

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

## EM 490 PORTABLE ELECTRIC/AIRLESS PAINT SPRAYER

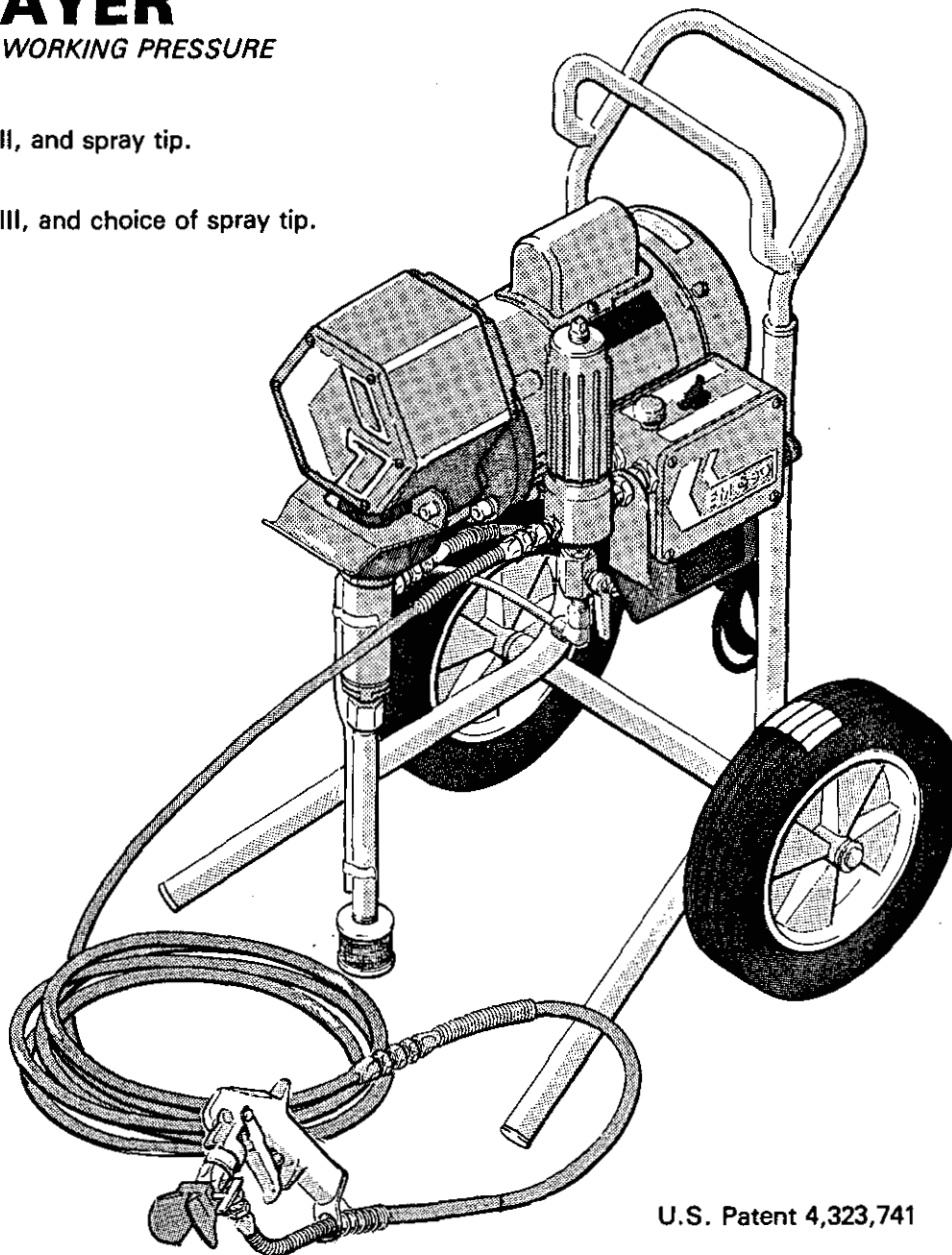
*2750 psi (190 bar) MAXIMUM WORKING PRESSURE*

### **Model 231-002, Series A**

Sprayer less hose, gun, RAC III, and spray tip.

### **Model 231-490, Series A**

Sprayer with hose, gun, RAC III, and choice of spray tip.



U.S. Patent 4,323,741

### **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.

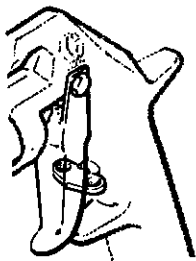
Use extreme caution when cleaning or changing spray tips. If the spray tip clogs while spraying, engage the gun safety latch immediately. ALWAYS follow the **Pressure Relief Procedure** and then remove the spray tip to clean it.

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

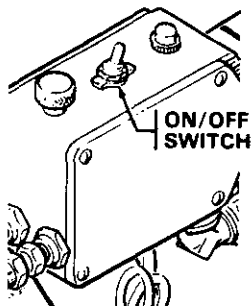
### Pressure Relief Procedure

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; injury from 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.

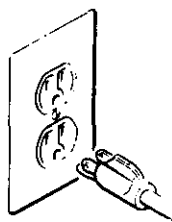
If you suspect that the spray tip or hose is completely clogged, or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen the tip guard retaining nut or hose end coupling and relieve pressure gradually, then loosen completely. Now clear the tip or hose.



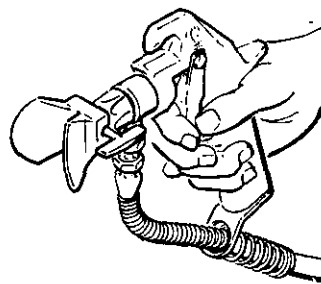
ENGAGE SAFETY



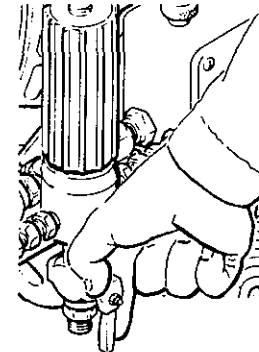
TURN SWITCH  
TO OFF



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 fluids, 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.

Read and follow the fluid and solvent manufacturer's literature regarding the use of protective clothing and equipment.

### System Pressure

This sprayer can develop *2750 psi (190 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.

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 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 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. 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 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 *grounded 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 follow the **Pressure Relief Procedure** on page 2 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**

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 ris-

querait 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

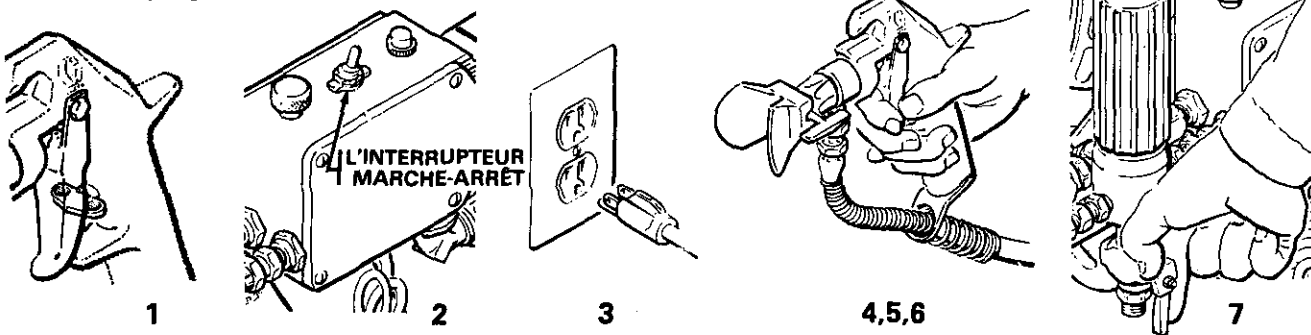
Faire extrêmement attention à l'occasion du nettoyage ou du remplacement des ajutages du pulvérisateur. Si l'ajutage se bouche pendant la pulvérisation, mettre immédiatement le verrou de sécurité du pistolet. TOUJOURS bien observer la **Marche à Suivre pour Détendre la Pression** puis enlever l'ajutage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



## 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

## 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.

S'il se produit des étincelles d'électricité statique, ou si vous ressentez la moindre décharge, **ARRETEZ IMMEDIATEMENT LA PULVERISATION.** Vérifiez que le système entier est bien mis à la terre. Ne vous servez pas du 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 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

### Pression

Ce pulvérisateur peut produire une **PRESSION MAXIMUM DE TRAVAIL 190 bar (2750 lb/po.<sup>2</sup>)**. 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 matières 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 matériel en tirant sur le tuyau. Ne pas utiliser de matières 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, prenez contact avec le fournisseur de tuyaux ou le fabricant pour avoir les limites de résistance. 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.

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 rinçage: 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 Rinçage

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 rinçage 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 rinçage.* 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 rinçage.

# ADVERTENCIA

**EL ROCIADO A ALTA PRESION PUEDE CAUSAR GRAVES LESIONES.  
SOLO PARA USO PROFESIONAL. RESPETE 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 cual fluido fue. Para instrucciones de tratamiento, pedir al médico que llame a la **CADENA DEL CENTRO NACIONAL DE ENVENENAMIENTO**

**(412)681-6669**

### 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

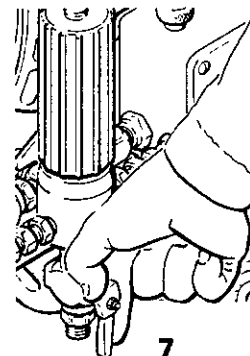
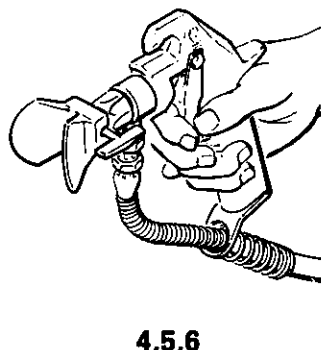
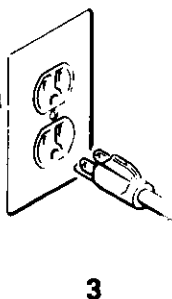
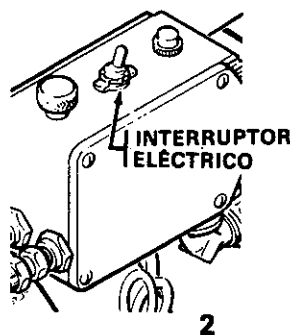
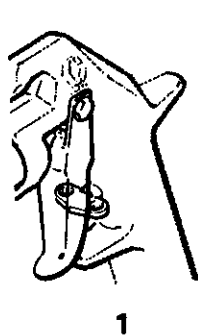
Tener mucho cuidado al limpiar o cambiar las boquillas. Si llegara a obstruirse mientras está pulverizando, enganchar el pestillo de la pistola de inmediato. SIEMPRE seguir el procedimiento de descarga de presión y después sacar la boquilla para limpiarla.

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 190 barías (2750 psi) de **PRESION DE TRABAJO MAXIMA**. 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 material

ASEGURAR que todos los materiales 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 material 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 materiales 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 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, 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.

Si se observa alguna chispa estática, o se siente el más leve choque eléctrico, **APAGAR DE INMEDIATO LA PULVERIZADORA**. Revisar todo el sistema en busca de conexión a tierra positiva. No usar nuevamente el sistema hasta haber ubicado y corregido 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 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 interrumpa 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.

## TERMS

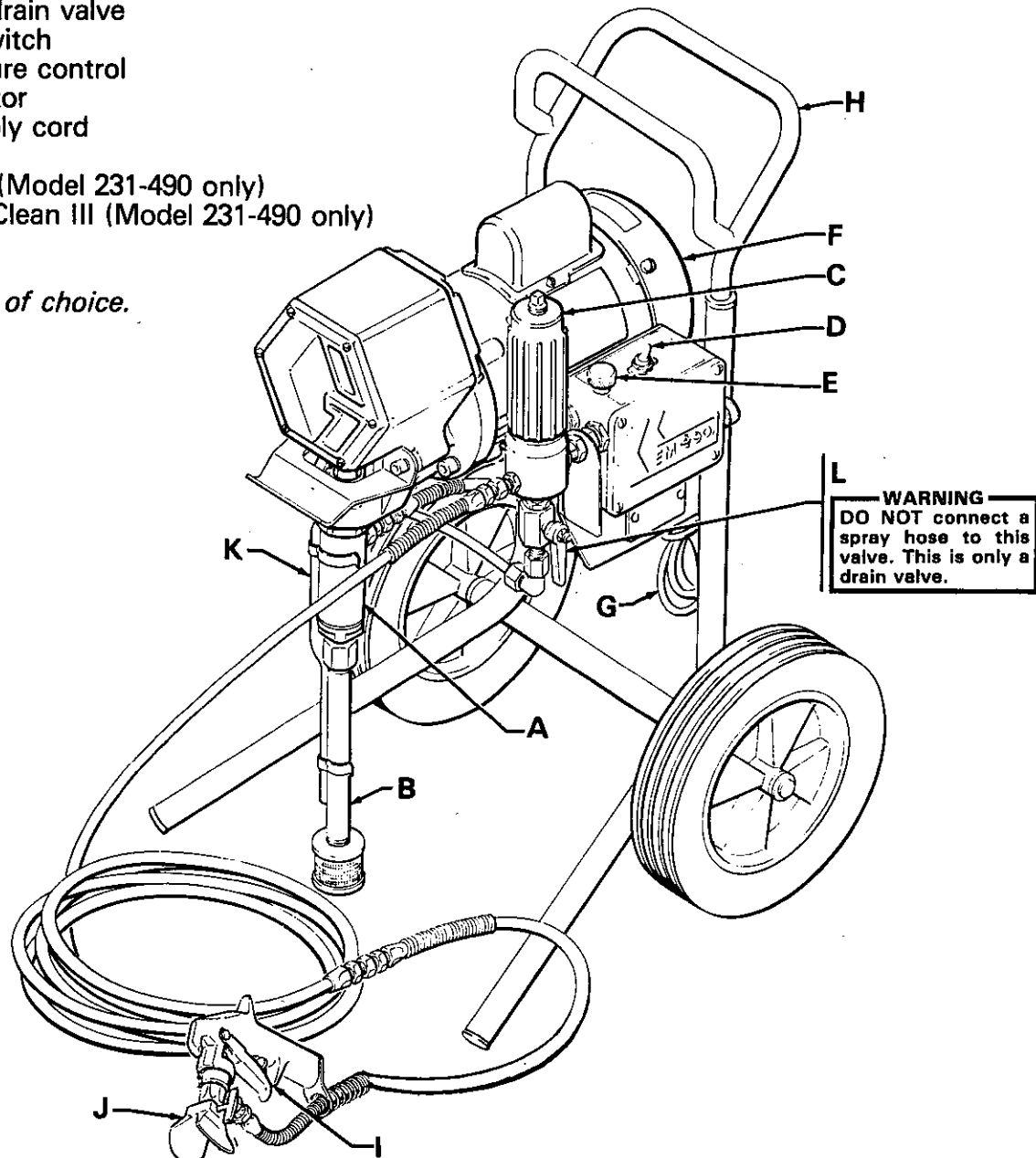
**WARNING:** Alerts user to avoid or correct conditions that could cause bodily injury.

**CAUTION:** Alerts user to avoid or correct conditions that could cause damage to or destruction of equipment.

**NOTE:** Identifies essential procedures or extra information.

## EM 490 Components

- A. Pump
  - B. Suction tube with strainer
  - C. Filter with drain valve
  - D. ON/OFF switch
  - E. Fluid pressure control
  - F. Electric motor
  - G. Power supply cord
  - H. Cart
  - I. Spray Gun (Model 231-490 only)
  - J. Reverse-A-Clean III (Model 231-490 only)
  - K. Drain Tube
  - L. Drain Valve
- Includes tip of choice.*





## 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!

### CAUTION

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

1. Always use a *minimum* of 50 ft (15.2 m) of nylon spray hose.
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 1.
4. Always use the main filter outlet. Never plug this outlet.

2. **Fill Packing Nut/Wet-Cup** (See Fig 2.)  
Fill the packing nut/wet-cup 1/3 full with Graco Throat Seal Liquid (TSL), supplied.
3. **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 a grounded extension cord which has 3 wires of a minimum 12 gauge size, and a maximum of 100 ft (30 m) long. Longer lengths or smaller gauges may affect sprayer performance.

### WARNING

Proper grounding is essential to reduce the risk of static sparking which can cause a fire or explosion and result in serious bodily injury and property damage.

Read the warning section **FIRE OR EXPLOSION HAZARD** on page 3 of this manual and ground the sprayer as explained there.

4. **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.
5. **Flush the pump** to remove the No. 10 motor oil which was left in to protect pump parts after factory testing. See "Flushing Guidelines" on page 12 for flushing procedure.

6. **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.*

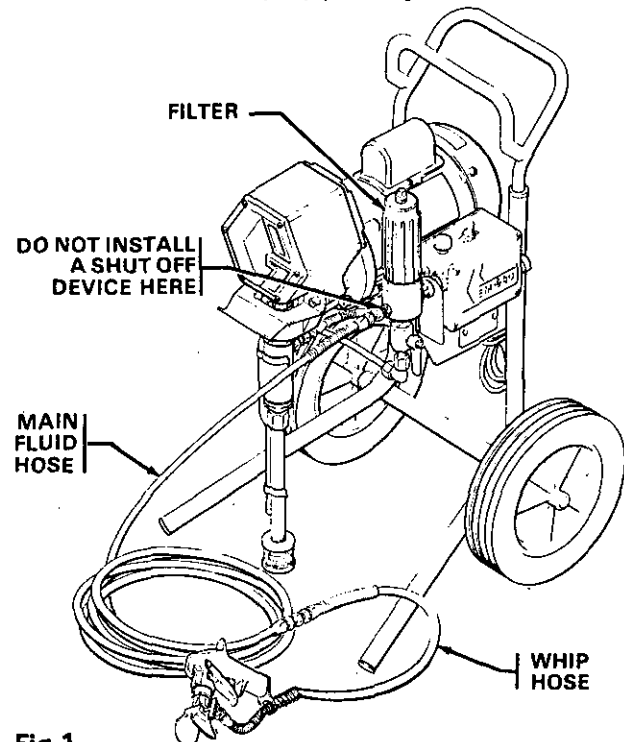


Fig 1

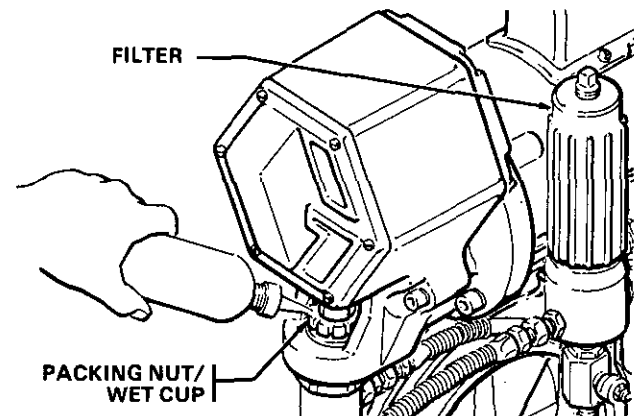


Fig 2

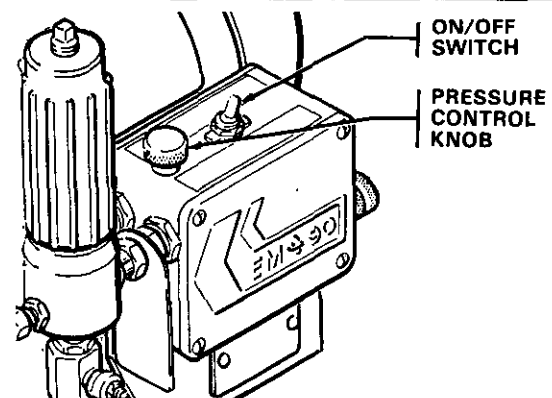


Fig 3

**WARNING**

**Pressure Relief Procedure**

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; 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 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 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.
  - 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 grounded 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 are found, follow the **Pressure Relief Procedure**, above, before tightening 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 spray tip.

*If using the RAC III Spray Tip Kit, install the RAC III spray housing, with the tip installed. Refer to Instruction Manual 307-321, included with the Kit.*

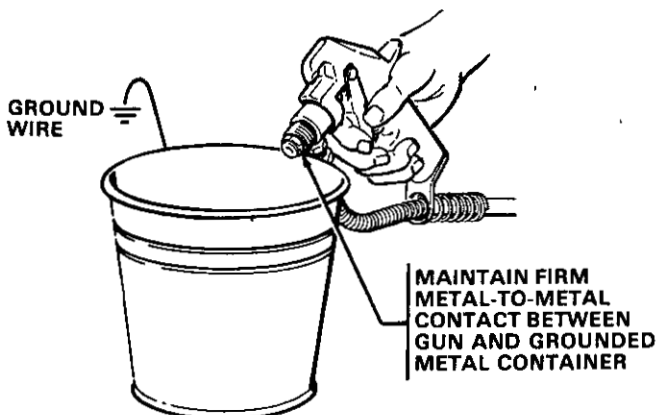


Fig 4

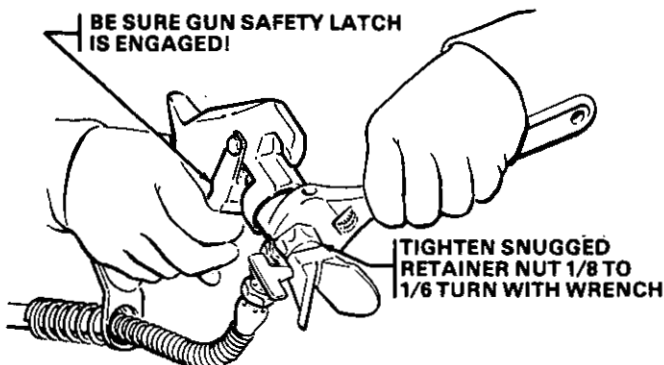


Fig 5

- 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** (Refer to Fig 6.)

- 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 latch 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.

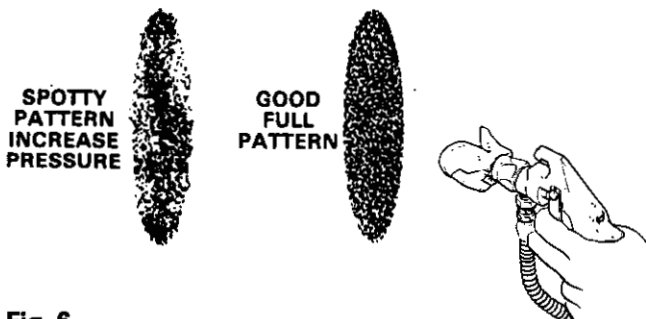


Fig 6

#### 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 buildup around the spray tip until pressure is fully relieved and the gun safety latch is engaged.

- Clean the front of the tip frequently during daily operation. *First*, follow the **Pressure Relief Procedure** on page 10. Then use a solvent-soaked brush to keep fluid from building up and clogging the tip.
- If the spray tip does clog, release the gun trigger, and engage the gun safety.
- If using the *RAC III Spray Tip Kit*, rotate the RAC III handle 180°. See Fig 7. Disengage the gun safety, and trigger the gun into a grounded waste container. Engage the gun safety again. Return the handle to the original position.  
*If using a spray tip kit which is not self-cleaning*, VERY SLOWLY loosen the tip guard retaining nut or hose end coupling, and relieve pressure gradually, then loosen completely. Clear the tip or hose, then reassemble.
- Disengage the gun safety, and resume spraying.
- If the tip is still clogged, engage the gun safety, shutoff and unplug the sprayer, and open the drain valve to relieve pressure. Remove the spray tip and clean it.

Instructions for cleaning the RAC III Spray Tip Kit are given in Instruction Manual 307-321, included with the Kit.

#### SHUTDOWN AND CARE

- Check the packing nut/wet-cup daily. First follow the **Pressure Relief Procedure** 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 8.
- Clean the fluid filter often and whenever the sprayer is stored. First follow the **Pressure Relief Procedure** on page 10. Refer to manual 307-273, supplied, for the cleaning procedure.
- 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) prevent the fluid 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, follow the **Pressure Relief Procedure** on page 10, and leave the mineral spirits in the sprayer.

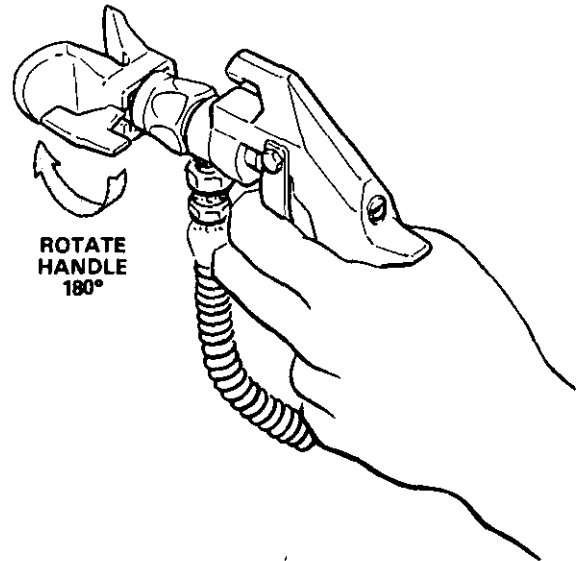


Fig 7

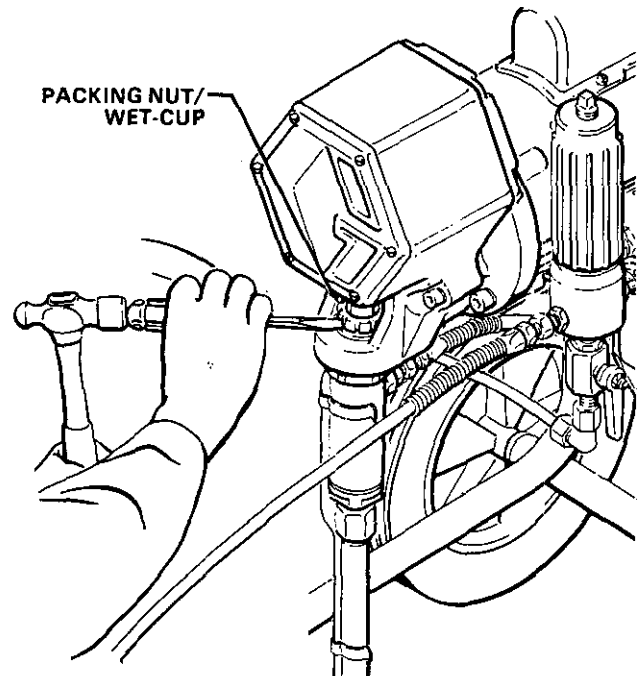


Fig 8

- For very short shutoff periods, leave the suction tube in the paint, follow the **Pressure Relief Procedure** on page 10, and clean the spray tip.
- 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.

##### WARNING

Refer to the warning section **HOSE SAFETY** on page 3 for information on the hazard of using damaged hoses.

## FLUSHING GUIDELINES

### When to Flush

1. **New Sprayer.** The Sprayer was factory tested with 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 with clean water.  
**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 with mineral spirits.
4. **Changing from oil-base to water-base paint.** Flush with mineral spirits, followed by soapy water, then with clean water.

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 with clean water.  
**When using oil-base paint,** flush out the mineral spirits with the fluid to be sprayed.

### How to Flush

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

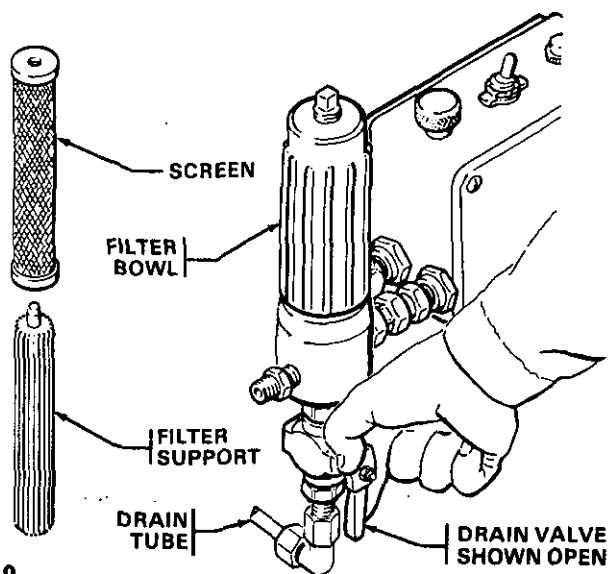


Fig 9

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.
6. Disengage the gun safety latch.

### 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. See Fig 10.

7. Disengage the gun safety latch. Point the spray gun into a grounded 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 reduce splashing.** With the gun triggered, turn the

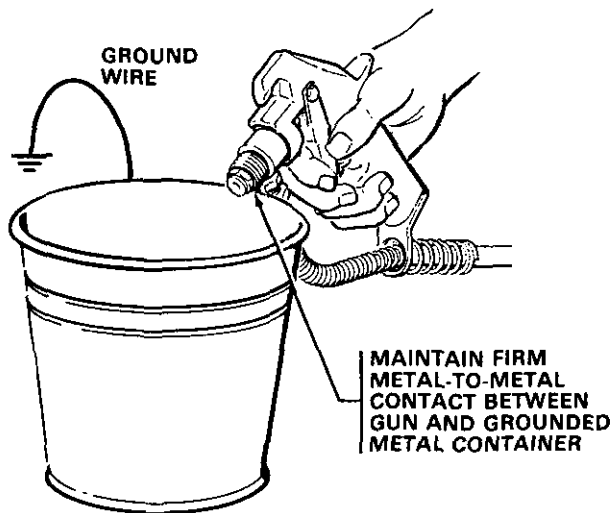


Fig 10

- 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. See Fig 10.
8. Check all fluid connections for leaks. If any leak, first follow the **Pressure Relief Procedure** on page 10. Then tighten the connections, start the sprayer, and recheck the connections for leaks.
9. 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 the ON/OFF switch to OFF and engage the gun safety.
10. 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. Be sure the screen and support are installed as shown in Fig 9.
11. If you have flushed with mineral spirits and are going to use a water-base paint, flush with soapy water and then with clean water. Then repeat Step 1.

## Application Methods

Always hold the gun perpendicular to the surface and keep the gun at an even 12 to 14 in. (300-356 mm) from the surface you are spraying. See Fig 11.

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 buildup at the end of each stroke.

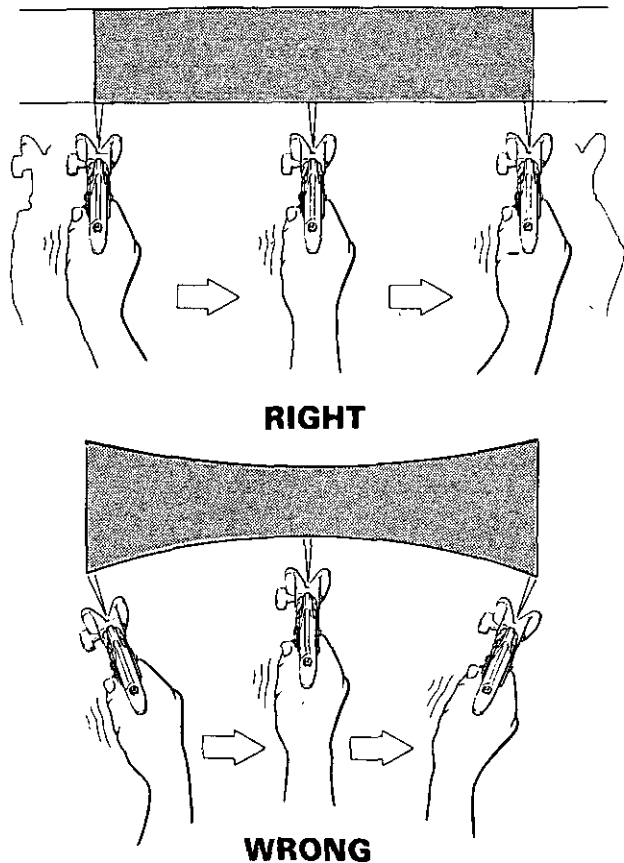


Fig 11

The correct speed for moving the gun will allow a full, wet coating to be applied without runs or sags. Lapping each stroke about 50% over the previous stroke produces uniform paint thickness. And spraying in a uniform pattern alternately from right to left, then left to right, provides a professional finish. See Fig 12.

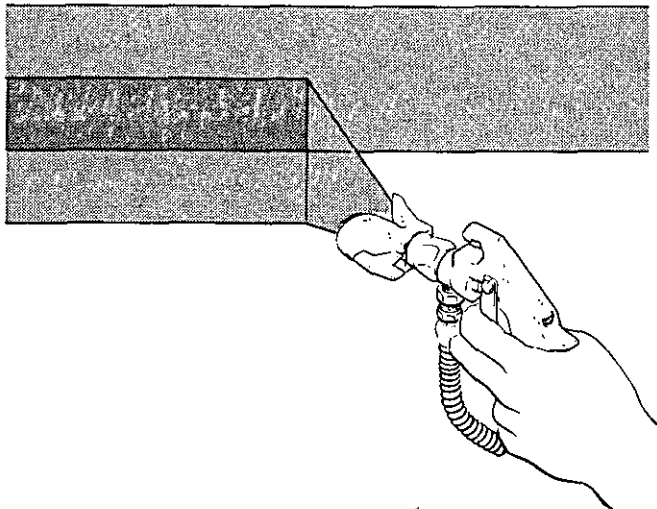


Fig 12

*The best way to control the rate of coverage is with the gun tip size. A small tip orifice applies less paint and a narrower pattern. A larger tip orifice applies more paint and a wider pattern.*

Do not try to increase coverage by increasing the fluid pressure! Using the lowest pressure necessary to get the desired results will help prolong the life of your sprayer and minimize paint lost by overspray.

*For interior corners, such as on a bookcase or inside a cabinet, aim the gun toward the center of the corner to spray. By dividing the spray pattern this way, the edges on both sides are sprayed evenly. See Fig 13.*

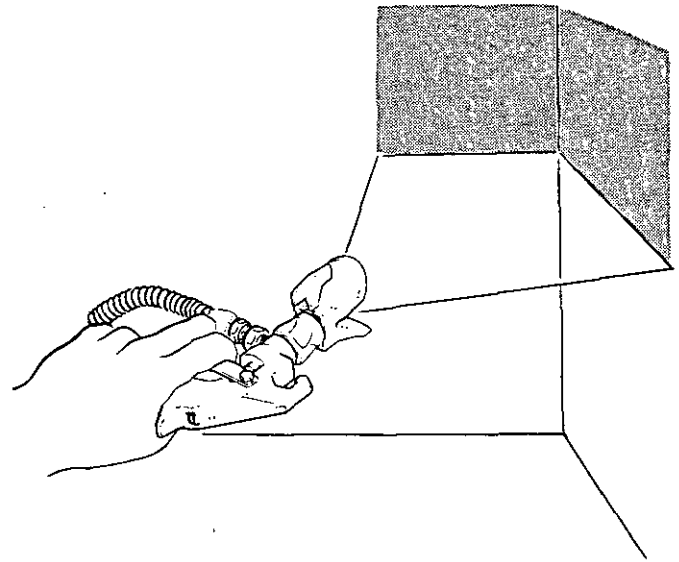


Fig 13

*If there is a wind, angle the spray pattern into the wind to minimize drifting. Paint from the ground to the roof.*

**Shrubs.** When next to the house, tie back shrubs from the surface to be painted with rope and stakes. Then cover them with a canvas dropcloth as the painter approaches the area. Remove the canvas dropcloth as soon as the area is painted, to prevent possible damage to the shrubs.

**Concrete walks.** If the walkways will be walked on, cover them with a canvas dropcloth to avoid slipping. Otherwise a plastic dropcloth is all that is needed.

**Electrical outlets and lamps.** Protect electrical outlets with masking tape. Cover lamps with plastic bags secured with masking tape.

**Nearby objects.** Move objects such as automobiles, picnic tables, lawn furniture, etc. upwind of the surface to be sprayed. In the case of a nearby home, make a protective barrier by hanging plastic between two long poles.

**WARNING**

**Pressure Relief Procedure**

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; 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 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 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.

**TROUBLESHOOTING CHART**

PROBLEM	CAUSE	SOLUTION
Electric motor won't run	Power or extension cord unplugged, or damaged or building circuit fuse blown Motor overload switch* has opened  Pressure setting too low Pressure control frozen or damaged by over pressurization	Check, reset or replace  Unplug power cord, relieve pressure, allow to cool, decrease pressure Increase Thaw**, change, remove or clean***, replace, see page 20
Electric motor stops while spraying	Power or extension cord unplugged, or building circuit fuse blown Motor overload switch* has opened  Pressure setting too low Spray tip or filter plugged Wrong type extension cord	Check, reset or replace  Unplug power cord, relieve pressure, allow to cool, decrease pressure Increase Remove and clean Use maximum 50 ft (15.2 m), 3 wires 12 gauge minimum, grounded extension cord
Electric motor runs, but low or no paint output and pump not stroking (See <b>PROBLEM</b> "Not enough paint pressure", on page 15, also.)	Piston ball check not seating Piston packings worn or damaged Intake valve ball check not seating Pump frozen Filter upside down Pressure control frozen or damaged by over pressurization Gear train damaged Worn pump parts Sprayer not primed	Service, see page 16 Replace, see page 16 Service, see page 16 Thaw** Remove and reinstall Thaw**, change, remove or clean***, replace, see page 20 Replace Service, see page 16 Prime sprayer, see page 10
Electric motor labors when starting, blowing fuses	Capacitor failure Circuit board failure	Replace capacitor, see page 19 Replace circuit board, see page 21
Paint leaks into wet-cup	Throat packings worn or damaged	Replace, see page 16

PROBLEM	CAUSE	SOLUTION
Excessive surge at spray gun	Spray tip or filter plugged Spray tip too big or worn Paint too viscous Wrong type hose	Remove and clean Change spray tip—see manual 307-321 Thin Use minimum 50 ft (15.2 m) static free nylon hose (wire braid hose unacceptable)
Not enough paint pressure	Pressure setting too low Spray tip too big or worn Pressure control frozen or damaged by over pressurization Worn pump parts	Increase Change spray tip—see manual 307-321 Thaw**, change, remove or clean***, replace, see page 20 Service, see page 16
Tails or fingers in spray pattern	Pressure setting too low Outlet filter dirty or plugged Spray tip too big or worn Paint supply low or pail empty Paint too viscous Wrong type hose	Increase Clean—see manual 307-273 Change spray tip—see manual 307-321 Fill Thin Use minimum 50 ft (15.2 m) static free nylon hose (wire braid hose unacceptable)
Paint runs or sags	Spray tip too big or worn	Change spray tip—see manual 307-321
Spitting from spray gun	Paint supply low or pail empty Sprayer sucking air or gun needle not seating	Fill Tighten fittings, service gun—see manual 307-633
Static sparking from spray gun	Sprayer or work not grounded	Check, ground

\*The electric motor has an overheating protector switch which automatically resets on cooling. If it opens and the electric motor shuts itself off, unplug the power cord and let the sprayer cool for 30 to 60 minutes. Also try to correct the cause of overheating. Always use the lowest pressure setting needed.

\*\*Freezing results from failure to replace water-base paint or flushing water with mineral spirits solvent.

\*\*\*Over pressurization results from (1) using less than 50 ft (15.2 m) of nylon spray hose, (2) using a wire braid spray hose, (3) adding a shut off device between the pump outlet and the spray gun, (4) attaching a spray hose to the filter drain valve, or (5) using a clogged or incorrectly assembled filter.

## REMOVING and REPLACING PUMP

### WARNING

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure** on page 14 before continuing.

Flush the sprayer if possible. Remove the hose clamps (116, 117) and drain tube (115).

Unscrew adapter (38) from pump. See Fig 14. Use a wrench on the pump intake valve (80) to keep it from loosening.

Unscrew the hose (52) from male connector (10). See Fig 14.

Use a screwdriver to push retaining spring (33) aside and push out pin (34).

Loosen locknut (112) and unscrew pump from drive assembly (55).

When installing a new or repaired pump, first rotate crankshaft so connecting rod (54) is in its lowest position. Push pump piston rod (79) all the way down into pump cylinder (78). Screw pump into drive assembly (55) until you feel piston rod pressing against connecting rod. Unscrew pump until connector (10) lines up with outlet hose (52), then unscrew another complete turn.

Torque the locknut (112) to 70 ft-lb (95 N·m). Locknut must be very tight to avoid loosening from vibration.

Align holes in piston rod (79) and coupling (36) and install pin (34). Be sure to push spring (33) down in place over pin ends.

Reassemble remaining parts, reverse from disassembly.

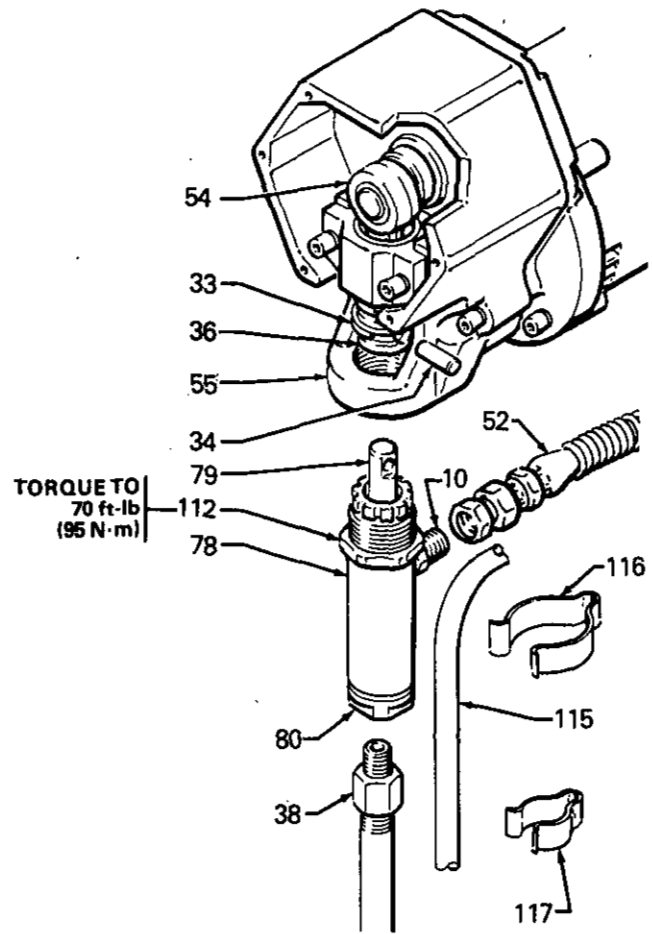


Fig 14

## SERVICING PUMP

### WARNING

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure** on page 14 before continuing.

Use repair kit number 218-948 to repair the pump. Use all the new parts in the kit, even if the old parts still look good. Old and new parts do not seal well together, and the pump may leak.

Remove pump from sprayer as described above.

### Disassembling Pump

Unscrew intake valve (80) from cylinder (78). If valve is seized in housing, squirt penetrating oil around threads and *gently* tap around housing with a light hammer to loosen. See Figures 15 and 17. Remove ball guide (72), stop pin (71) and ball (60). Clean and inspect parts for wear or damage.

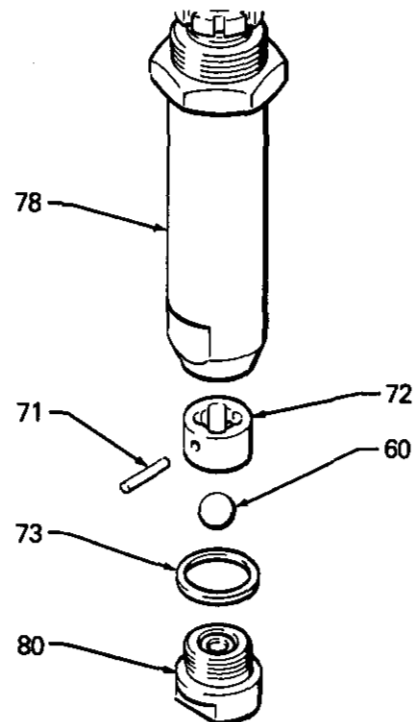


Fig 15



Unscrew and remove packing nut (70). Using a rubber mallet, tap piston rod (79) down and pull out through bottom of cylinder (78). See Figures 16 and 17.

Remove glands (66 & 69) and packings (67 & 68).

Clean and inspect piston rod and inside of cylinder for rust, nicks, scratches or scoring which could cause leaking or premature wear of packings.

Clamp flats of piston rod in a vise. Use a wrench to loosen nut (65) and unscrew valve (81) from piston rod. Remove ball (59), nut (65), glands (62 & 64), packings (63 & 75), seal (61), and washer (77).

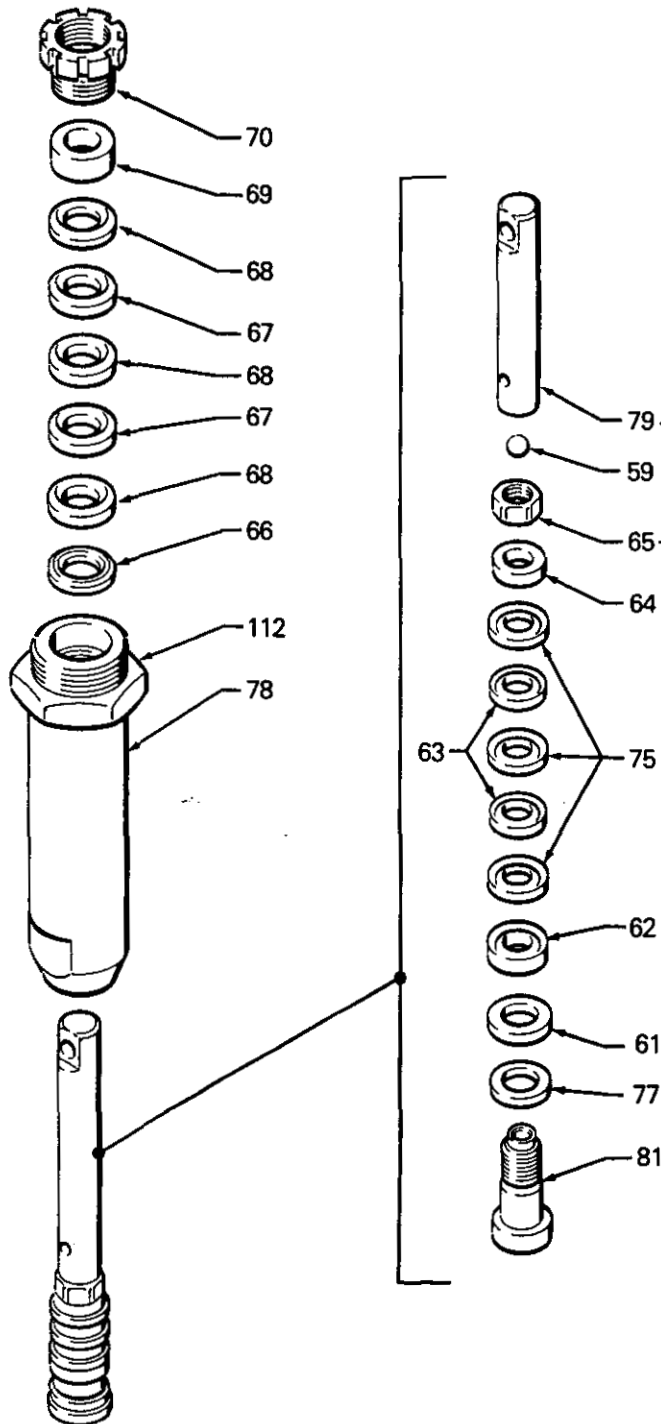


Fig 16

### Assembling Pump

When assembling pump, coat packings, piston rod and inside of cylinder with hydraulic oil.

When reassembling piston, install new glands and packings in correct order, alternating leather and plastic packings. See Fig 16. The lips of the V-packings must face up against fluid pressure. See Fig 17. Tighten the nut (65) to 10.5 in-lb (1.2 N·m) to seat the packings, *then back off the nut and hand tighten it.*

Place new ball in piston rod (79). Apply locking compound to threads of valve (81) and screw it into rod. Torque the nut (65) against the piston rod to 18-20 ft-lb (24-27 N·m), *without changing the tightness of the nut against the packings.*

Install throat packings, glands and packing nut, leaving packing nut loose. The lips of the V-packings must face down against fluid pressure. Alternate plastic packings (68) and leather packings (67) in order shown in Fig 16.

Insert piston rod through bottom of pump cylinder.

Assemble and install intake valve and tighten packing nut just enough to stop leakage - no tighter.

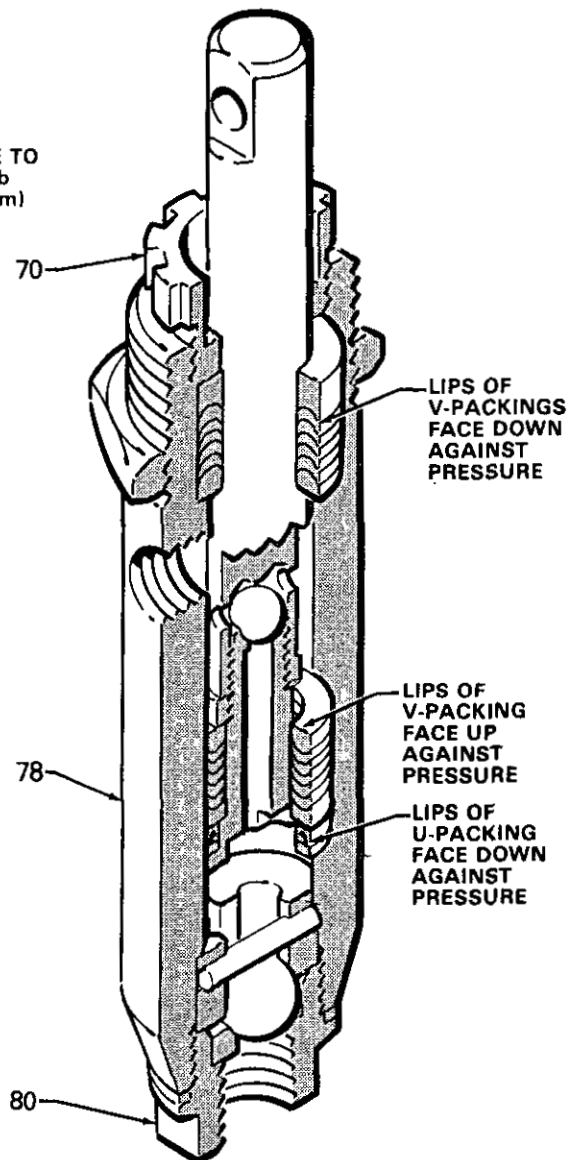


Fig 17

## REMOVING and REPLACING CONNECTING ROD and BEARING

### WARNING

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure** on page 14 before continuing.

Remove pump as described on page 16. Remove the 6 screws (19) and cover (35). Remove the 2 screws and lockwashers (20 and 18). Remove bearing (53) and connecting rod (54), sliding connecting rod off the crankshaft. See Fig 18.

Use a screwdriver to push retaining spring (33) aside and remove pin (34) from coupling (36). Remove coupling from connecting rod.

Pull connecting rod out of bearing. Wipe clean (don't use solvent) and inspect surfaces of bearing and connecting rod link for wear or damage. If either needs replacing, you should replace both. When installing rod and bearing, coat surfaces with SAE 10 non-detergent motor oil.

Clean and inspect crankshaft. Wipe clean with a rag; do not use solvent. If crankshaft is badly worn, replace drive assembly (55) as described below.

Clean and inspect connecting rod needle bearing. Repack bearing with industrial heavy duty extreme pressure lithium soap grease.

**NOTE:** After every 100 hours of operation, or whenever servicing the pump (whichever comes first), fill the cavity in connecting rod (54) with SAE 10 non-detergent motor oil.

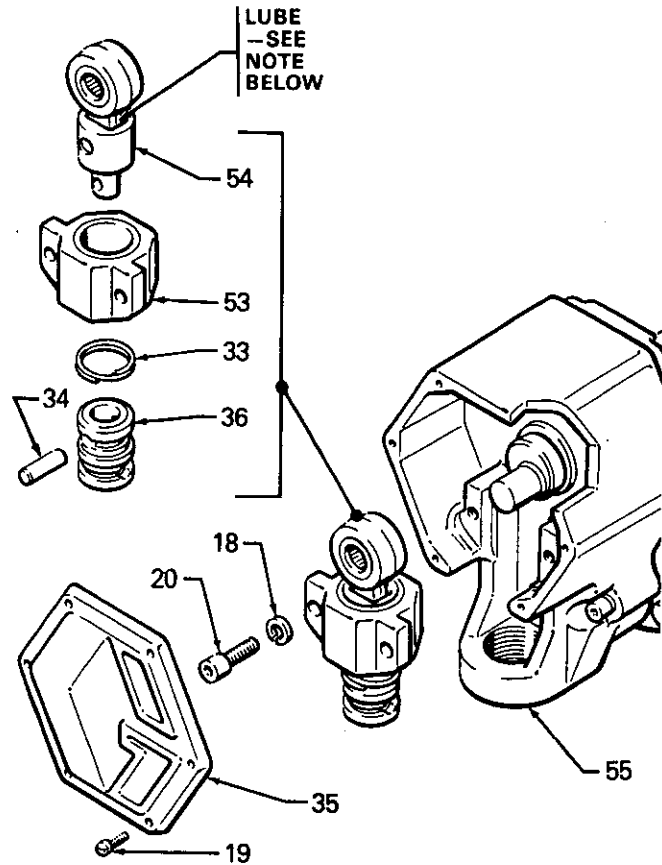


Fig 18

Assemble new rod and bearing, being sure to push spring (33) down in place over pin (34) ends, and install in reverse order of removal.

## REMOVING and REPLACING DRIVE ASSEMBLY

### WARNING

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure** on page 14 before continuing.

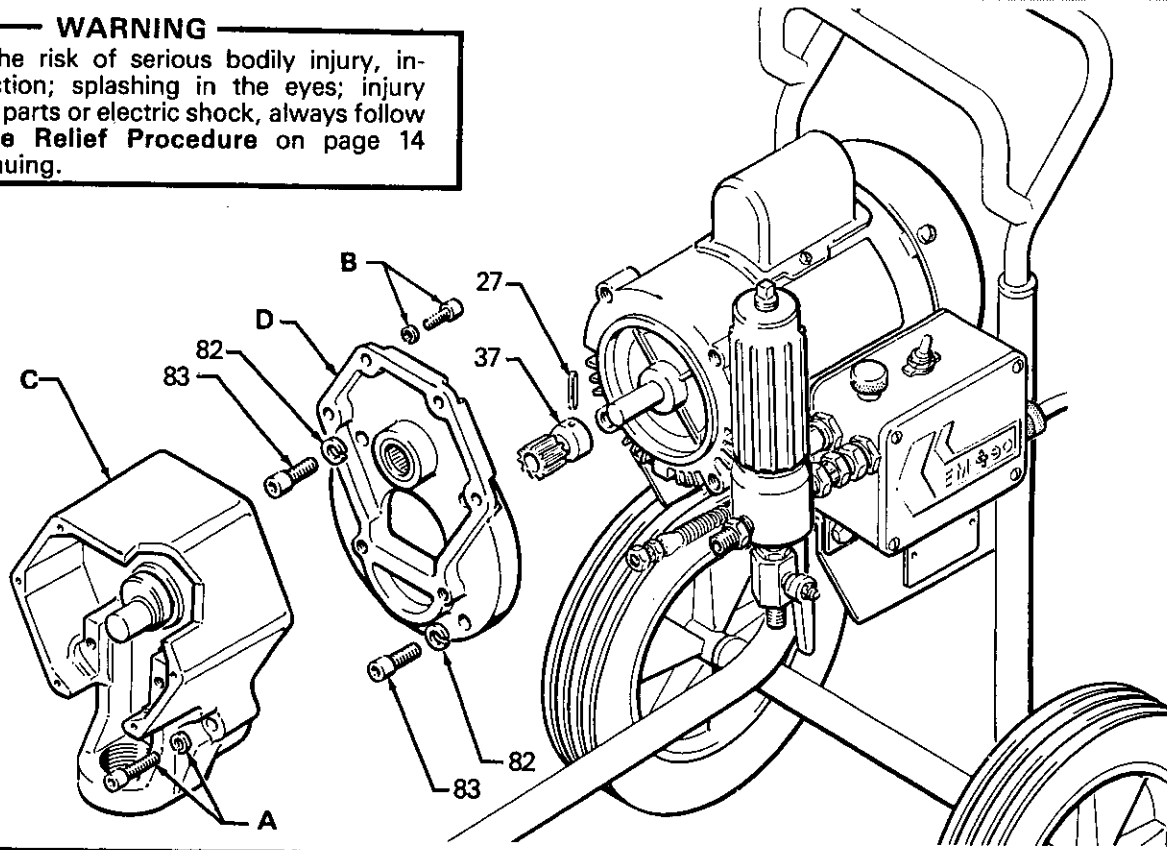


Fig 19

Remove pump, connecting rod and bearing as described on page 18.

Remove screws, lockwashers (A&B) and drive housing (C). Remove screws, lockwashers (82 & 83) and motor housing (D). See Fig 19.

## REMOVING and REPLACING CAPACITOR

### WARNING

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure** on page 14 before continuing.

Clean and inspect gear (37) for wear or damage. Replace if necessary. To remove, drive out pin (27) and pull gear off motor shaft. Apply molybdenum disulfide spray lubricant to gear, allow to dry, then apply industrial heavy duty extreme pressure lithium soap grease.

Install new drive assembly in reverse order of removal.

Remove two screws and the cover of capacitor (91). See Fig 20. Remove flag connectors from old capacitor. Connect flag connectors of new capacitor and replace cover.

**NOTE:** The replacement capacitor includes a new resistor, installed.

## REMOVING and REPLACING ELECTRIC MOTOR

### WARNING

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure** on page 14 before continuing.

Disconnect hose (52) from connector (10). See Fig 14. Remove drive assembly as described above. You can leave pump, connecting rod and bearing assembled to drive assembly. Drive out pin (27) and remove gear (37). See Fig 20. Remove screws (25) and cover (41) from pressure control (50). See Fig 21. Disconnect red, pink and brown motor leads from circuit board (86). Disconnect green and yellow motor lead from grounding screw (2) and black motor lead from toggle switch (89).

Unscrew nuts on both ends of conduit (1) from connectors. Remove screws (7), nuts (3) and lockwashers (4). See Fig 20. Remove motor from frame while carefully guiding wires through connector in control box. Remove conduit (1) from wires.

Loosen locknut and unscrew connector (13) from motor, being careful to avoid twisting wires. Install new motor in reverse order of removal.

**NOTE:** Terminals (12 and 51) are not included with a new motor (23). Order these separately and crimp to motor leads as shown in Fig 21. Circuit board (86) is included with a new motor.

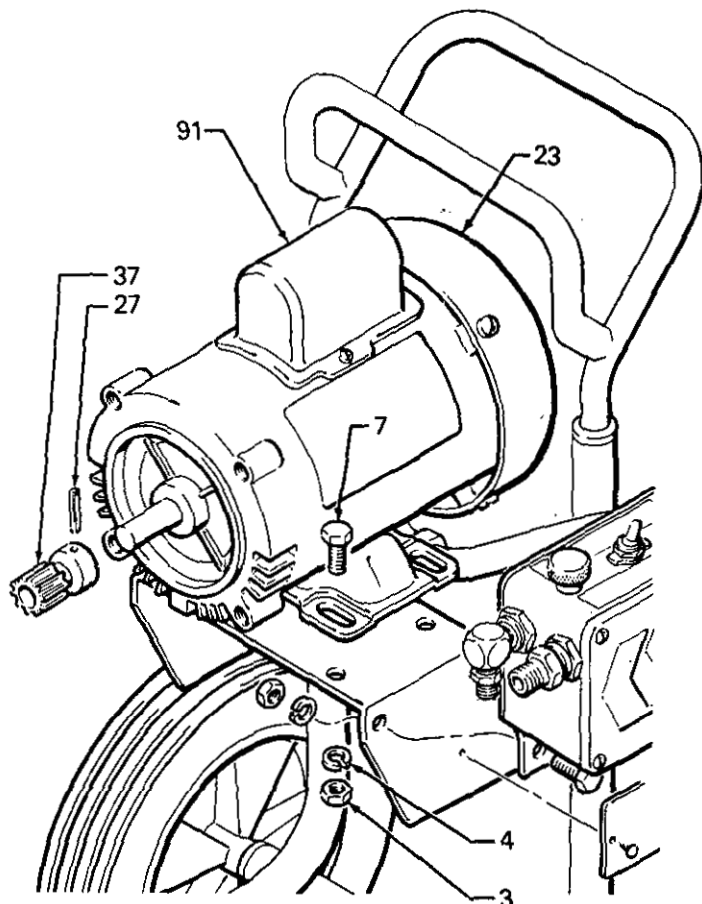


Fig 20

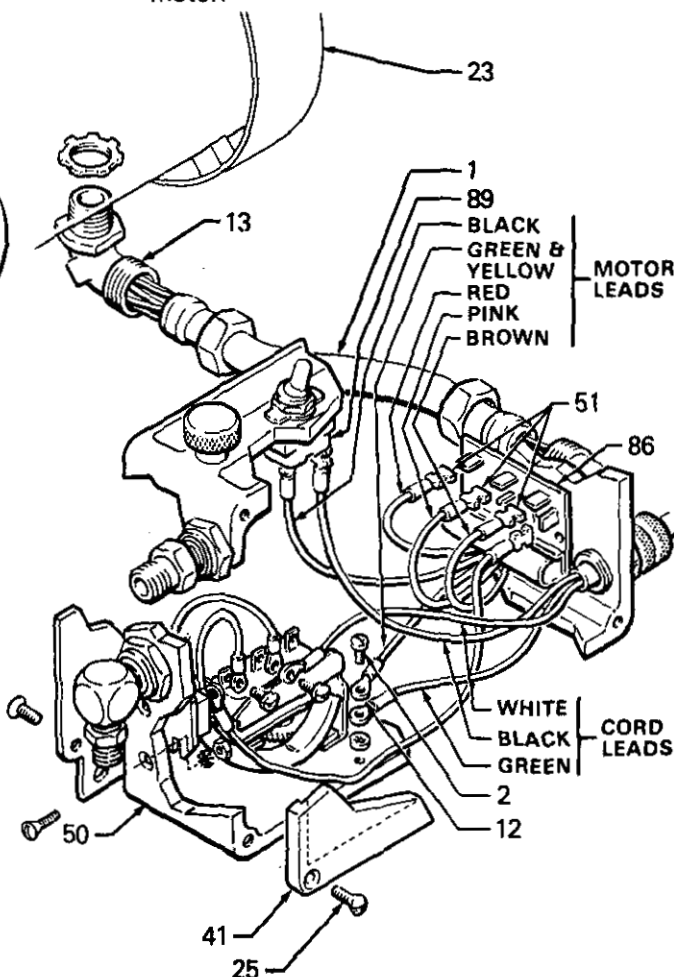


Fig 21

## REMOVING and REPLACING PRESSURE CONTROL

### WARNING

To reduce the risk of serious bodily injury, including injection; splashing in the eyes; injury from moving parts or electric shock, always follow the **Pressure Relief Procedure** on page 14 before continuing.

Hold the nut (H) at the pressure control with a wrench and unscrew swivel union (84) from nipple (114). Remove filter (47). See Fig 22.

Disconnect hose (52) from nipple (10). See Fig 23.

### CAUTION

Use extreme caution when removing the elbow (111) or nipple (114) from the pressure control. Any twisting or jarring of the pressure control fitting could alter the factory setting of the control or permanently damage the control.

Remove screw (7), lockwashers (4), and nuts (3). Remove pressure control (50) from frame.

Remove screws (25) and cover (41) from pressure control (50). See Fig 24.

Disconnect red, pink and brown motor leads from circuit board (86). Disconnect green and yellow motor lead from grounding screw (2), and black motor lead from toggle switch (89). See Fig 24.

**NOTE:** Circuit board (86) is not included with pressure control (50) replacement assembly. Order separately if new circuit board is needed.

Unscrew nut on end of conduit (1) from connector (13). See Fig 24. Pull pressure control (50) away from conduit while carefully guiding wires through connector (13).

Loosen knurled part of power cord strain relief (90), and unscrew it from pressure control. Slide strain relief up on power cord to provide clearance, and unscrew conduit connector (13). See Fig 24.

Remove the screw (2), conduit connector (13), terminal (51), lockwasher (85), power supply cord (87), and strain relief (90) from the old pressure control. Replace any damaged parts. Assemble these parts to the new pressure control.

Replace in the reverse order of disassembly and then calibrate the pressure control. See page 22.

### CAUTION

Failure to observe the following may cause poor performance or excessive pressure and permanent damage to the pressure control:

- (1) Always use nylon spray hose at 50 ft (15.2 m) minimum length.
- (2) Never use a wire braid spray hose.
- (3) Never attach a spray hose to the filter drain valve.
- (4) Never add any type of shut off device between the pump outlet and the spray gun.
- (5) Be sure to check filter for clogging or incorrect assembly if tip clogging frequency increases.
- (6) Never allow flushing water or water base paint to freeze in the system.

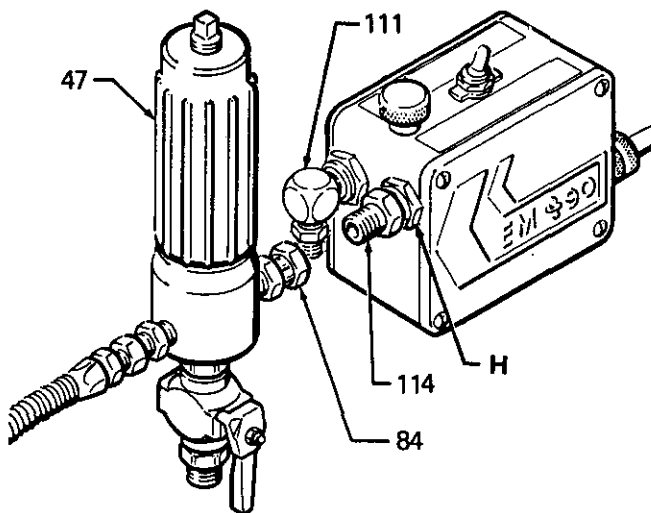


Fig 22

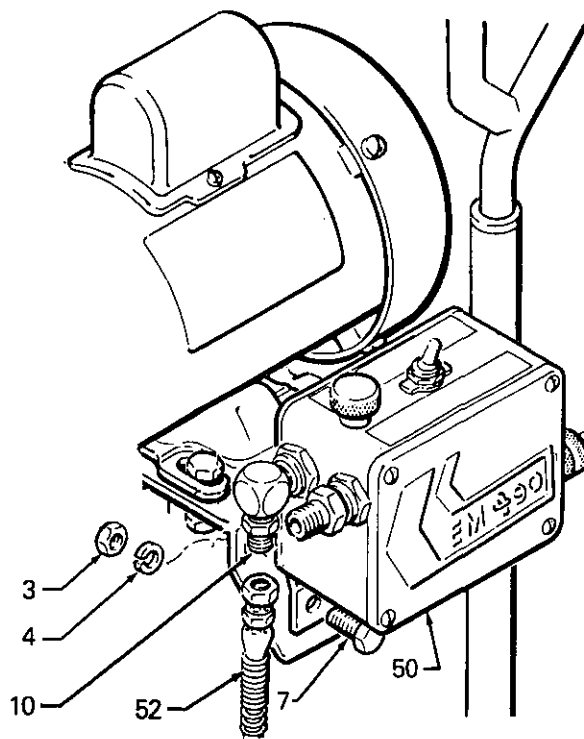


Fig 23

### WARNING

The pressure control **MUST** be calibrated whenever a new or used microswitch or pressure control assembly is removed and reinstalled or replaced to be sure the control is properly calibrated. Failure to properly calibrate the pressure control can cause the sprayer to over-pressurize and result in component rupture, fire or explosion. It may also prevent the sprayer from obtaining the maximum working pressure which would result in poor sprayer performance.

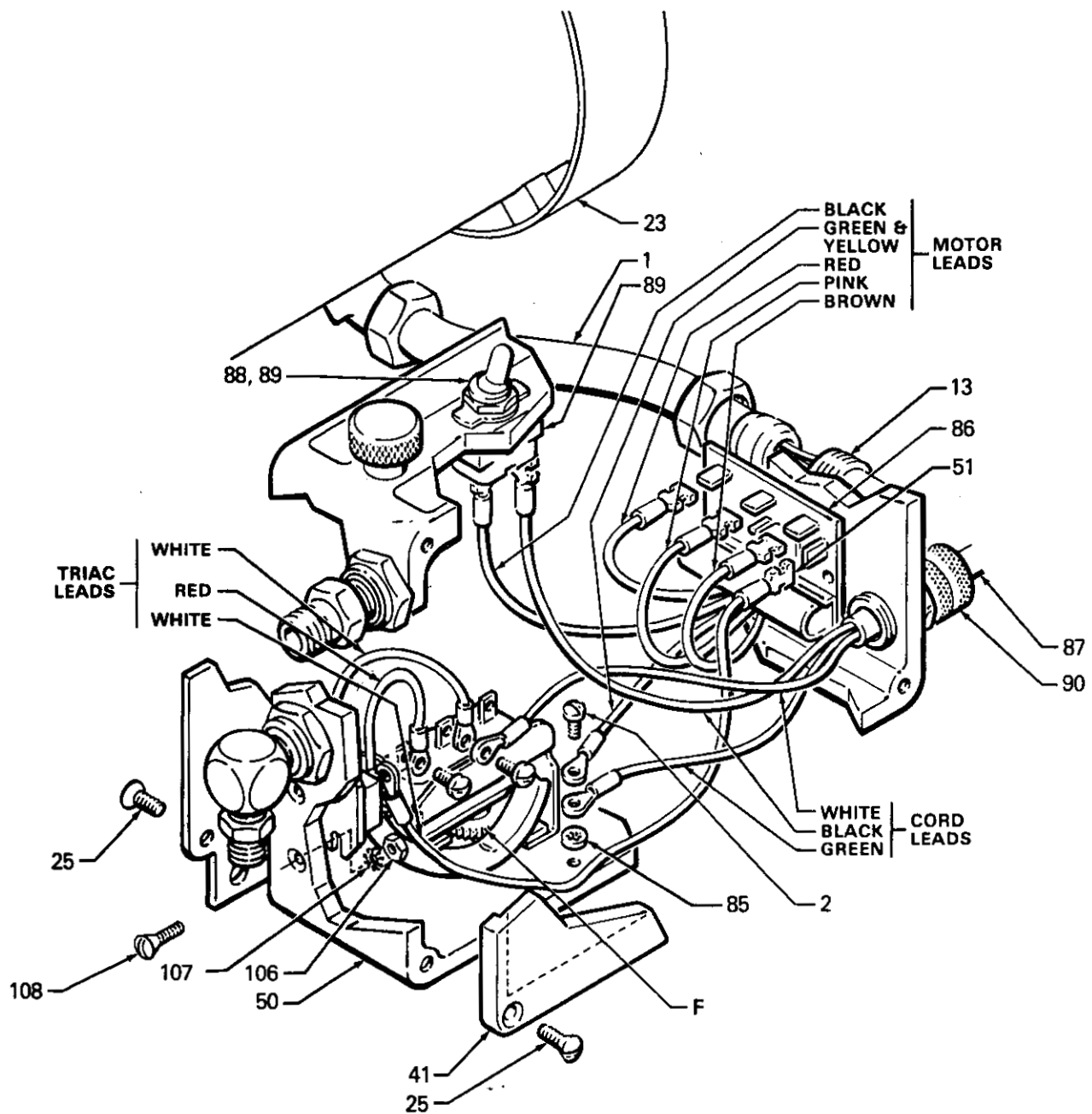


Fig 24

### Circuit Board Removal and Replacement

If only the circuit board (86) needs to be replaced in the pressure control, remove the screws (25) and the front cover (41). See Fig 24. Pull the board out carefully, just far enough to reach the wire terminals. Unsnap the wires and finish removing the board.

Position the new card at the control so the wire connectors are at the top. Following the color coded diagram in Fig 24, snap the wires onto the board. Carefully guide the wires back into the control, making sure they don't catch on anything, then slide the new board into place. Check the pressure control calibration. See page 22.

## WARNING

**USE EXTREME CAUTION WHEN PERFORMING THIS CALIBRATION PROCEDURE** to reduce the risk of an injection injury or other serious bodily injury which can result from component rupture, electric shock, fire, explosion, or moving parts.

This procedure sets the sprayer to 2750 psi (190 bar) **MAXIMUM WORKING PRESSURE**.

This procedure must be performed whenever a microswitch, or pressure control assembly is removed and reinstalled or replaced to be sure the sprayer is properly calibrated.

Improper calibration can cause the sprayer to over-pressurize and result in component rupture, fire or explosion. It may also prevent the sprayer from obtaining the maximum working pressure which would result in poor sprayer performance.

NEVER attempt to increase the fluid outlet pressure by performing these calibrations in any other way. NEVER EXCEED 2750 psi (190 bar) **MAXIMUM WORKING PRESSURE**. Normal operation of the sprayer at higher pressures could result in component rupture, fire or explosion.

ALWAYS use a new 50 foot (15.2 m) spray hose rated for 3000 psi (210 bar) **MAXIMUM WORKING PRESSURE** when performing this procedure. A used, underrated hose could develop a high pressure leak or rupture.

AVOID touching the wire in the pressure control assembly when the control box cover is removed to reduce the risk of electric shock.

### Pressure Control Calibration (See Fig 25)

#### Tools Needed:

NEW 50 ft (15.2 m) 3000 psi (210 bar) airless spray hose, Part No. 210-541  
Needle Valve, Part No. 102-715 or 103-067  
3/8" open end wrench  
Fluid-Filled Pressure Gauge, Part No. 102-814  
5 gallon pail and water  
Mineral Spirits (for flushing after test)

1. Follow the **Pressure Relief Procedure** on page 14. Install the new 50 ft (15.2 m) spray hose to the sprayer outlet. On the other end of the hose install the needle valve. Install the fluid-filled pressure gauge in the top port of the fluid filter.
2. Open the needle valve *slightly*. Turn the pressure control knob (D) to the minimum setting. Plug in the sprayer and turn the switch ON. Increase the pressure setting just enough to start the sprayer. Prime the hose, being sure to eliminate all air from the system.
3. Open the needle valve a little more—enough to allow the pump to run continuously—and turn the pressure control knob to maximum. Now, *very slowly* start to close the needle valve, but don't close it all the way. Observe the pressure at which the pump stalls, which should be approximately 2750 psi (190 bar).

**NOTE:** The slower the pressure is brought up, the easier it is to note the exact stall pressure. Closing the needle valve quickly causes the pressure to rise too fast which gives a false reading.

*If the pressure is lower:* unplug the sprayer and relieve pressure. Use a 3/8" open end wrench to turn the pressure adjustment nut, at the bottom of the pressure control knob shaft (R), *counterclockwise* 1/8 turn or less, then repeat steps 2 and 3.

*If the pressure is higher:* unplug the sprayer and relieve pressure. Turn the pressure adjustment nut *clockwise* 1/8 turn or less and repeat steps 2 and 3. Repeat until the proper stall pressure is obtained.

4. Now check to see at what pressure the sprayer starts to run again after stalling. Plug in the sprayer, turn it on, close the needle valve, and set the pressure at maximum. Allow the sprayer to run until it stalls.
5. Now open the needle valve very slowly while observing the pressure gauge. Check to see if the pressure drops to approximately 2300 psi (161 bar) before starting again.

*If the pressure is lower:* shut off and unplug the sprayer, but do not relieve pressure. Turn the differential wheel (F) *counterclockwise* just one notch and repeat Steps 4 and 5. Check the pressure drop again, and repeat if necessary.

**NOTE:** If you adjust the differential wheel, recheck the stall pressure (steps 2 and 3) to be sure the stall pressure has not changed.

6. Follow the **Pressure Relief Procedure** on page 14, flush the water out with mineral spirits, relieve pressure again, then remove the test hose, needle valve and pressure gauge.

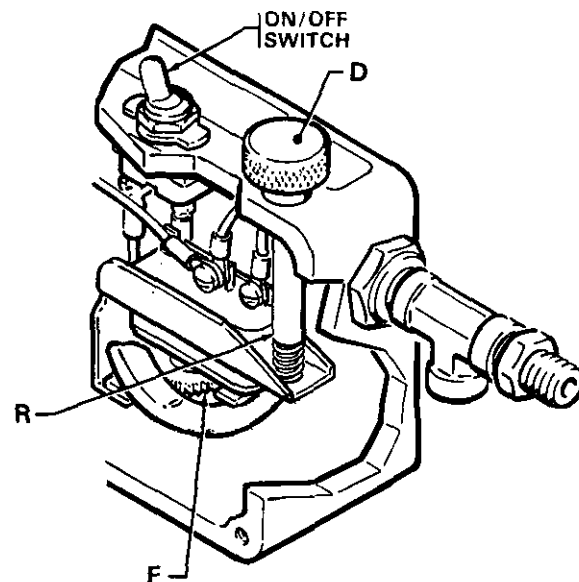


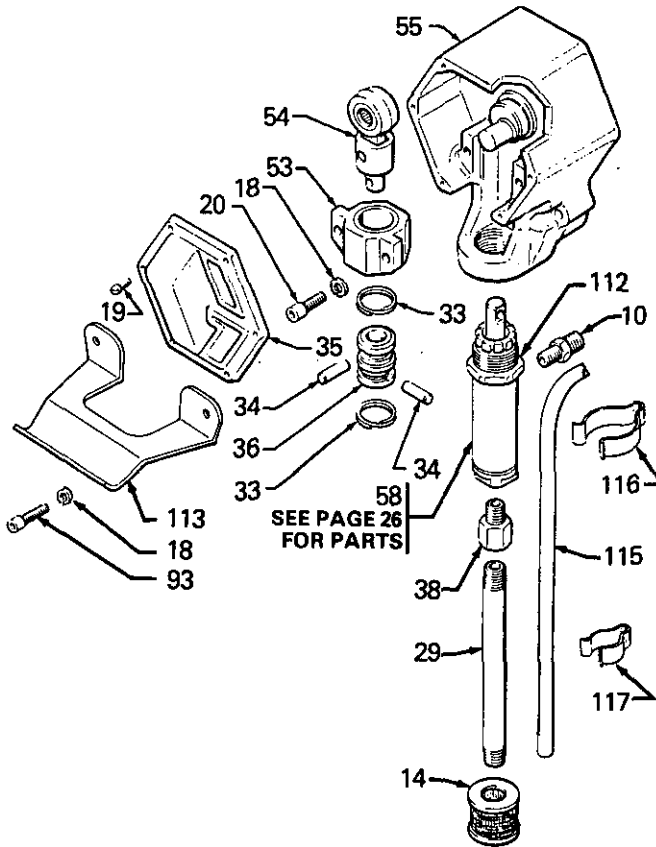
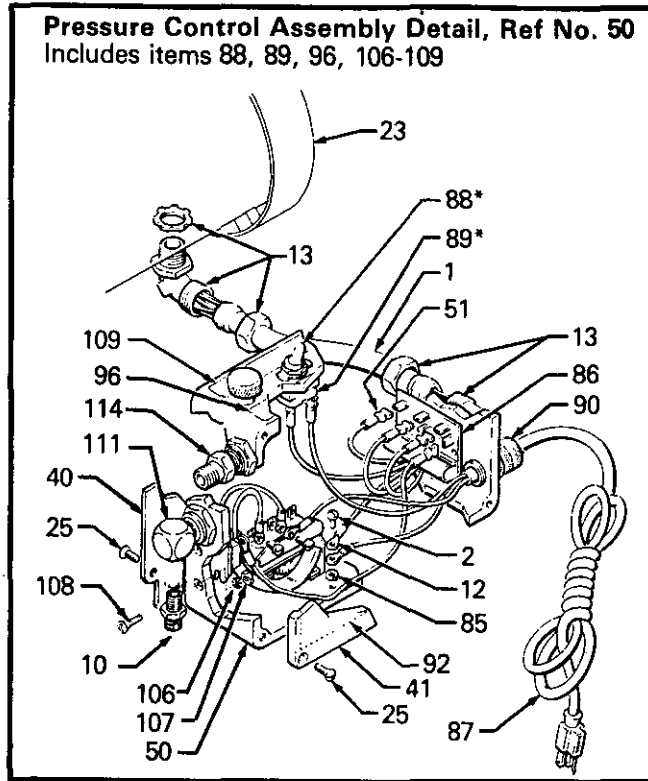
Fig 25

# **PARTS LIST AND DRAWINGS**

**PARTS LIST**

REF NO.	PART NO.	DESCRIPTION	QTY
1	181-060	CONDUIT, electrical	1
2	100-035	SCREW, mach; pan head; 8-32 x 5/16"	1
3	100-188	NUT, hex; 5/16-18	4
4	100-214	LOCKWASHER, spring; 3/8"	6
7	101-344	CAPSCREW, hex hd; 5/16-18 x 7/8"	4
10	162-453	NIPPLE; 1/4 npsm x 1/4 npt	2
11	102-556	RIVET, blind	2
12	102-799	TERMINAL, wire, ring	1
13	102-932	CONNECTOR, conduit, 90°	2
14	181-073	STRAINER	1
18	104-008	LOCKWASHER, spring; 5/16"	4
19	107-156	SCREW, mach, pan head; 6-32 x 5/8	6
20	105-509	CAPSCREW, socket head; 5/16-18 x 7/8"	2
22	†105-521	PLUG, tubing	2
23	218-923	MOTOR, electric, 0.75 HP; includes replacement items 12, 31, 51, 86, 91	1
25	106-075	SCREW, mach, oval head; 10-24 x 1/2	8
27	105-680	PIN, spring, straight; 0.167 dia, 0.94" long	1
29	178-597	TUBE, suction	1
30	172-412	PLATE, designation	1
31	††178-094	LABEL, warning	1
33	176-817	SPRING, retaining	2
34	176-818	PIN, str, hdls; 0.3125" dia x 1.023"	2
35	181-062	COVER, gear box; nylon	1
36	176-824	COUPLING, pump	1
37	176-825	GEAR, pinion	1
38	178-460	ADAPTER, increase; 3/8(m) x 1/2 npt(f)	1
40	181-070	BRACKET, mounting	1
41	181-061	COVER	1
44	218-132	GUN, airless; see 307-633 for parts	1
45	*210-541	HOSE, spray, cpld; 1/4 npsm(fbe) swivel; 1/4" ID; nylon; 50 ft (15 m); spring guard one end; static free	1
46	210-657	VALVE, ball; see 306-861 for parts	1
47	214-570	FILTER, fluid; see 307-273 for parts	1
48	*214-701	HOSE, whip end, cpld; 1/4 npt(m) x 1/4 npsm(f); 3/16" ID, static free; 36" (914 mm) long	1
50	216-139	CONTROL, pressure; includes replacement items 88, 89, 96, 106-109	1
51	596-421	TERMINAL, wire; female snap-on	4
52	218-083	HOSE, nylon; 1/4" ID; cpld 1/4 npsm(fbe); 29" (740 mm); spring guards both ends	1
53	215-903	BEARING assembly	1
54	215-904	CONNECTING ROD assembly	1
55	218-922	DRIVE assembly; includes replacement items 18(2), 82, 83, 93	1
56	216-001	KIT, spray tip; see 307-321 for parts	1
57	*216-xxx	SPRAY TIP, cylinder; Reverse-A-Clean III, standard (customer's choice, see 307-321)	1
58 through 81	See page 26	See page 26 for part no. and descriptions	
83	100-659	CAPSCREW, socket hd; 3/8-16 x 1"	4
84	155-665	UNION, straight adapter; 3/8 npt(m) x 3/8 npsm(f) swivel	1
85	157-021	LOCKWASHER, int. shkprf, No. 8	1
86	106-076	BOARD, circuit	1
87	217-492	CORD, supply, power	1
88	*105-659	BOOT, switch	1
89	*105-679	TOGGLE, switch	1
90	106-170	RELIEF, strain, cord	1
91	*106-077	CAPACITOR, start; includes resistor	1
92	††177-762	LABEL, warning	1
93	100-657	CAPSCREW, socket head; 5/16-18 x 2"	2
94	206-994	THROAT SEAL LIQUID, 1 pt	1
95	178-034	TAG, caution	1
96	178-035	LABEL, caution	1
97	101-242	RING, retaining	2
98	†103-117	RING, retaining	2
99	181-043	WHEEL, semi-pneumatic	2
101	†178-565	BUTTON-SNAP	2
102	†178-566	SLEEVE, axle	2
104	1217-507	FRAME & AXLE ASSY.	1
105	1218-905	HANDLE, cart	1
106	100-072	NUT, hex, mscr; 6-32	2
107	103-181	LOCKWASHER, No. 6	2
108	107-070	SCREW, mach, flat hd; 6-32 x 5/8" (16 mm)	2
109	††178-797	LABEL, warning	1
111	100-840	ELBOW, street; 1/4 npt(fxm)	1
112	176-762	NUT, hex; 1-1/2-18	1
113	181-048	BRACKET, pail	1
114	157-350	ADAPTER; 3/8 npt x 1/4 npt	1
115	180-155	HOSE, drain	1
116	178-342	CLAMP, hose	1
117	178-341	CLAMP, hose	1
118	106-436	ELBOW	1
119	100-509	PLUG	1

**PARTS DRAWING**



120	179-945	ADAPTER, elbow; 7/16" stud; 1/4 x 1/4 npt(f)
121	100-001	CAPSCREW, hex head; 1/2 x 0.625" long



# PARTS DRAWING

**Model 231-390 Complete Sprayer**  
Includes items 1-114

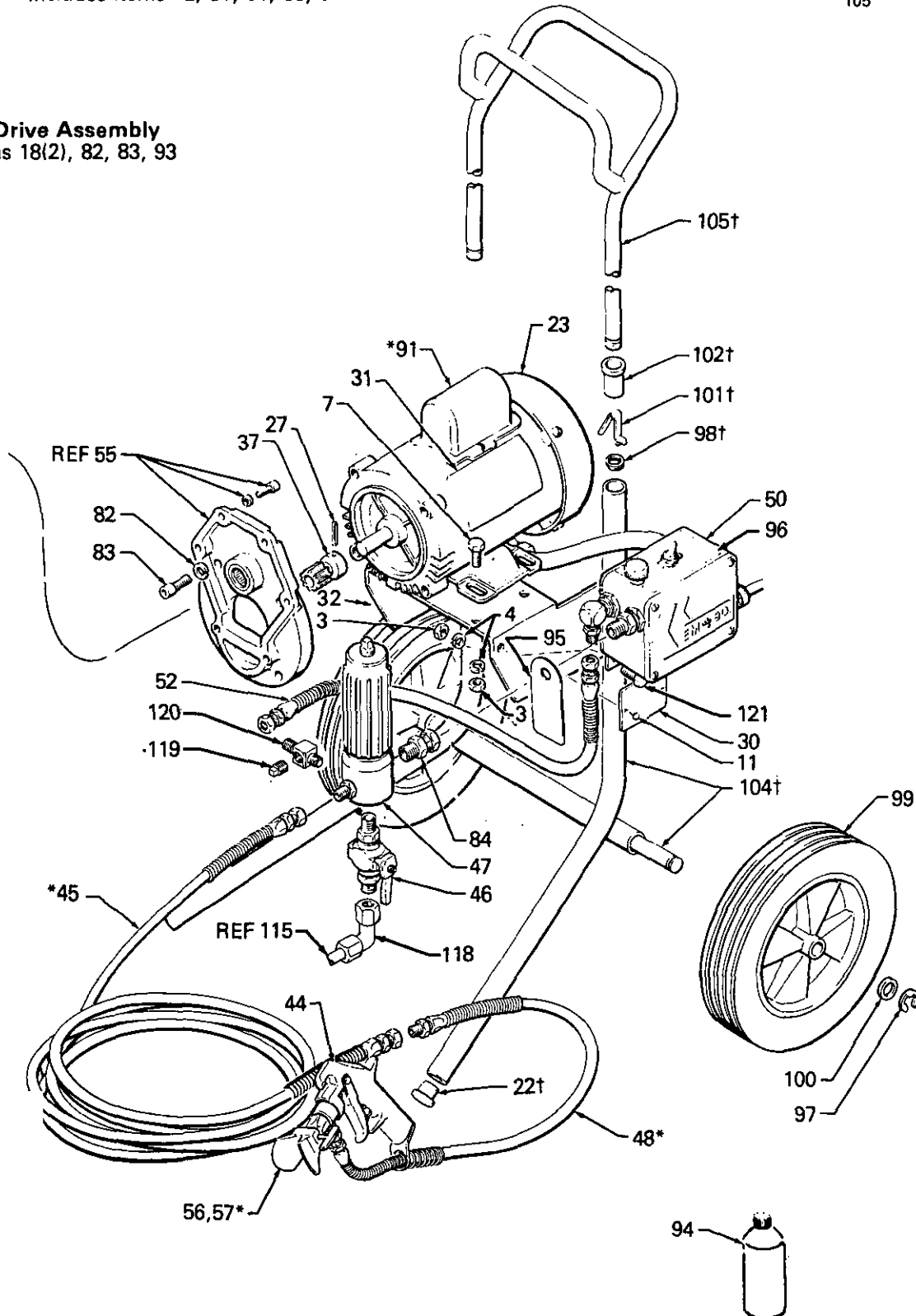
**Model 231-001 Basic Sprayer**  
Includes items 1-41, 46, 47, 50-54, 58-114

**Ref No. 23 Electric Motor Assembly**  
Includes items 12, 31, 51, 86, 91

**Ref No. 55 Drive Assembly**  
Includes items 18(2), 82, 83, 93

**FRAME REPAIR KIT 218-906**  
(Order separately)  
Consists of:

Ref No.	Qty
22	2
98	2
101	2
102	2
104	1
105	1

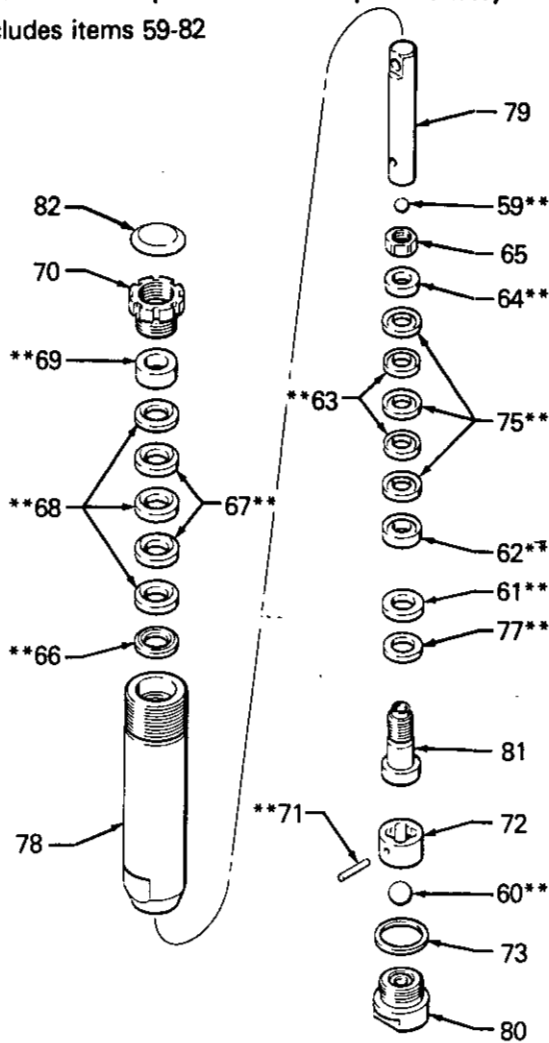


# PARTS DRAWING

# PARTS LIST

## Ref No. 58 Displacement Pump Assembly

Includes items 59-82



REF NO.	PART NO.	DESCRIPTION	QTY
58	218-215	DISPLACEMENT PUMP ASSY	1
	Series B	Includes items 59-81	
59	**105-444	. BALL, stainless steel; 0.3125"	1
60	**105-445	. BALL, stainless steel; 0.5"	1
61	**105-522	. U-CUP SEAL; polyurethane	1
62	**180-073	. GLAND, female	1
63	**176-749	. V-PACKING; leather	2
64	**176-750	. GLAND, male	1
65	176-751	. NUT, hex; 1/2-20	1
66	**176-754	. GLAND, male	1
67	**176-755	. V-PACKING; leather	2
68	**176-997	. V-PACKING; polyethylene	3
69	**176-757	. GLAND, female	1
70	176-758	. NUT, packing	1
71	**176-759	. PIN, stop, ball	1
72	176-760	. GUIDE, ball	1
73	**176-761	. GASKET; copper	1
75	**176-882	. V-PACKING; polyethylene	3
77	**180-161	. WASHER, backup	1
78	180-103	. CYLINDER	1
79	181-042	. ROD, piston	1
80	215-455	. VALVE, intake	1
81	218-197	. VALVE, piston	1
82	180-656	. PLUG, button	1

306 & 307 Numbers in description refer to separate instruction manuals.

\*Recommended "tool box" spare parts. Keep on hand to reduce down time.

\*\*Supplied in Repair Kit 218-948.

†Supplied in Repair Kit 218-906.

††Extra warning labels supplied at no charge.

Order parts by name and number. Always give the model number and series letter of the assembly for which you are ordering.

## DISPLACEMENT PUMP REPAIR KIT 218-948

(Order separately)

Consists of:

Ref No.	Qty.
59	1
60	1
61	1
62	1
63	2
64	1
66	1
67	2
68	3
69	1
71	1
73	1
75	3
77	2

## TECHNICAL DATA

Electric motor	: 0.75 hp, 1725 rpm, 115 V, 60 HzAc, single phase with automatic reset thermal overload switch. UL listed.
Electric cord	: No. 14 gauge, 3-wire, use 12 ga (min) 3-wire extension cord.
Paint filter	: 60 mesh (250 micron) stainless steel screen with 3/8 npt(f) inlet and 1/4 npt(f) outlets; reusable type.
Paint Pump	: 2750 psi (190 bar) maximum working pressure; 0.33 gpm output.
Wetted parts	: Delrin, PTFE, Leather, Stainless Steel, Polyethylene, Tungsten Carbide, Polyurethane, Nylon, Aluminum
Operating weight	: 68 lb (30 kg) approximately
Electrical requirements	: 120 V, 15 amp circuit

## 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 for examination by Graco to verify the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the 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, Dallas, Detroit, Los Angeles, West Caldwell (N.J.)**  
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