

OWNER'S MANUAL



308-209

Rev A

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

FULTRONIC 1000 Airless Paint Sprayer

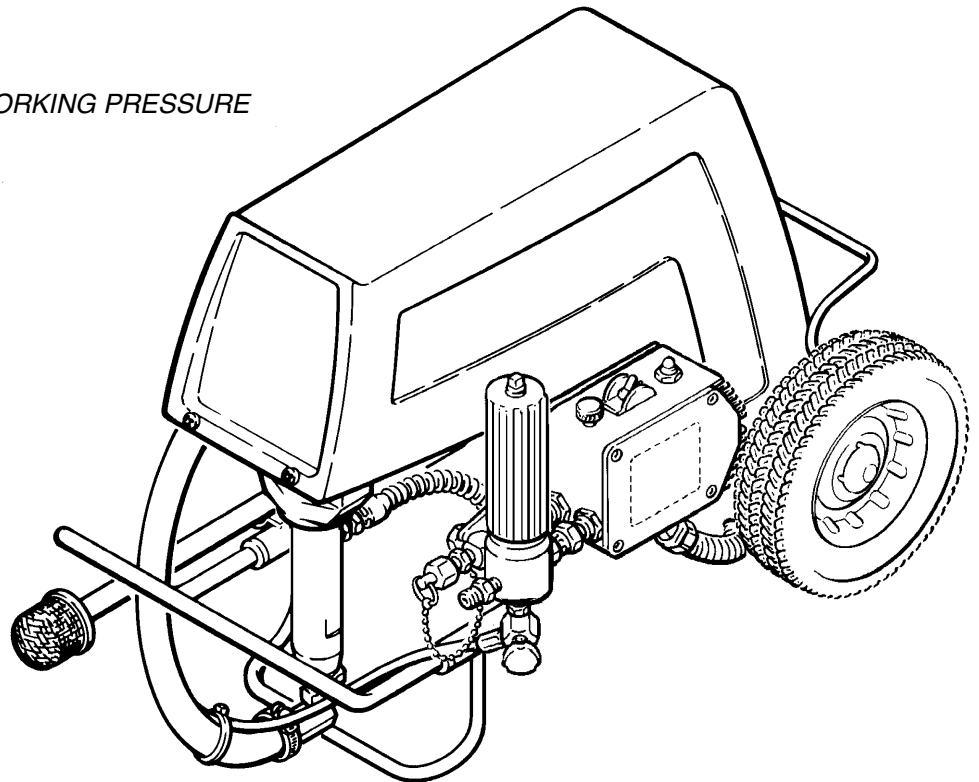
1 GPM, Electric

Model 235-040, Series A

3000 psi (210 bar) MAXIMUM WORKING PRESSURE

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NOTE: This is an example of the DANGER label on your sprayer. This label is available in other languages, free of charge. See page 42 to order.

! DANGER !			
	FIRE AND EXPLOSION HAZARD		SKIN INJECTION HAZARD
<p>Spray painting, flushing or cleaning equipment with flammable liquids in confined areas can result in fire or explosion.</p> <p>Use outdoors or in extremely well ventilated areas. Ground equipment, hoses, containers and objects being sprayed.</p> <p>Avoid all ignition sources such as static electricity from plastic drop cloths, open flames such as pilot lights, hot objects such as cigarettes, arcs from connecting or disconnecting power cords or turning light switches on and off.</p> <p>Failure to follow this warning can result in death or serious injury.</p>		<p>Liquids can be injected into the body by high pressure airless spray or leaks – especially hose leaks.</p> <p>Keep body clear of the nozzle. Never stop leaks with any part of the body. Drain all pressure before removing parts. Avoid accidental triggering of gun by always setting safety latch when not spraying.</p> <p>Never spray without a tip guard.</p> <p>In case of accidental skin injection, seek immediate "Surgical Treatment".</p> <p>Failure to follow this warning can result in amputation or serious injury.</p>	
READ AND UNDERSTAND ALL LABELS AND INSTRUCTION MANUALS BEFORE USE			

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WARNINGS

HIGH PRESSURE SPRAY CAN CAUSE SERIOUS INJURY. FOR PROFESSIONAL USE ONLY. OBSERVE ALL WARNINGS.

Read and understand all instruction manuals before operating the equipment.

FLUID INJECTION HAZARD

General Safety

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

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

ALWAYS 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 Alert—Airless Spray Wounds

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

Note to Physician: *Injection in the skin is a traumatic injury. It is important to treat the injury surgically as soon as possible.*

Do not delay treatment to research toxicity . Toxicity is a concern with some exotic coatings injected directly into the blood stream. Consultation with a plastic surgeon or reconstructive hand surgeon may be advisable.

Spray Gun Safety Devices

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

Safety Latch

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

Diffuser

The gun diffuser breaks up spray and reduces the risk of fluid injection when the tip is not installed. Check diffuser operation regularly. Follow the **PRESSURE RELIEF PROCEDURE**, 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 fluid injection hazard and helps reduce, but does not prevent, the risk of accidentally placing your fingers or any part of your body close to the spray tip.

Trigger Guard

Always have the trigger guard in place on the gun when spraying to reduce the risk of accidentally triggering the gun if it is dropped or bumped.

Spray Tip Safety

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

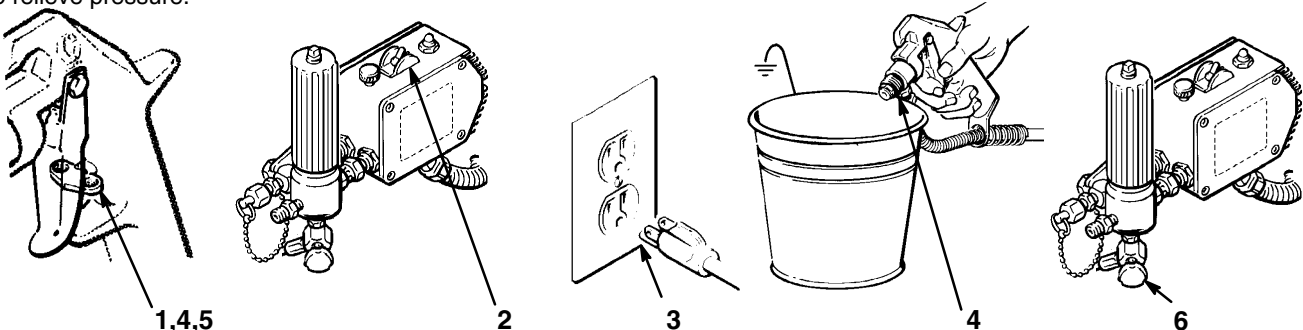
NEVER wipe off build-up around the spray tip until the pressure is fully relieved and the gun safety is engaged.

PRESSURE RELIEF PROCEDURE

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

1. 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. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
5. Engage the gun safety latch.
6. Open the pressure drain valve, having a container ready to catch the drainage. Leave the 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 to relieve pressure gradually, then loosen completely. Now clear the tip or hose.



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. Follow the **Pressure Relief Procedure** on page 2 before checking or servicing any part of the sprayer, to prevent it from starting accidentally.

EQUIPMENT MISUSE HAZARD

General Safety

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

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

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

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

System Pressure

This sprayer can develop 3000 *psi* (210 *bar*) **MAXIMUM WORKING PRESSURE**. Be sure all spray equipment and accessories used are rated to withstand the this pressure. DO NOT exceed the maximum working pressure of any component or accessory used in the system.

Fluid and Solvent Compatibility

All chemicals used in the sprayer must be chemically compatible with the wetted parts shown in the **TECHNICAL DATA** on page 43. Consult your chemical supplier to ensure compatibility.

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

FIRE OR EXPLOSION HAZARD

Static electricity is created by the flow of fluid through the pump and hose. If every part of the spray equipment is not properly grounded, sparking may occur, and the system may become hazardous. Sparking may also occur when plugging in or unplugging a power supply cord or using a gasoline engine. Sparks can ignite fumes from solvents and the fluid being sprayed, dust particles and other flammable substances, whether you are spraying indoors or outdoors, and can cause a fire or explosion and serious bodily injury and property damage. 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 proper grounding. Do not use the system again until the problem has been identified and corrected.

Grounding

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

1. *Sprayer*: plug the power supply cord, or extension cord – each equipped with an undamaged, three-prong plug, into a properly grounded outlet. Do not use an adapter. All extension cords must have three wires and be rated for 15 Amps.

HOSE SAFETY

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

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

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

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

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

Hose Grounding Continuity

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

2. *Fluid hoses*: use only grounded hoses with a maximum of 500 ft (150 m) combined hose length to ensure grounding continuity. See **Hose Grounding Continuity** above.
3. *Spray gun*: obtain grounding through connection to a properly grounded fluid hose and sprayer.
4. *Object being sprayed*: according to local code.
5. *Fluid supply container*: according to local code.
6. *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.
7. *To maintain grounding continuity when flushing or relieving pressure*, always hold a metal part of the gun firmly to the side of a grounded metal pail, then trigger the gun.

Flushing Safety

Reduce the risk of fluid injection injury, static sparking, or splashing by following the flushing procedure given on page 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.

IMPORTANT

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

AVERTISSEMENT

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

RISQUES D'INJECTION

Consignes générales de sécurité

Cet appareil produit un fluide à très haute pression. Le fluide pulvérisé par le pistolet ou le fluide sous pression provenant de fuites ou de ruptures peut pénétrer 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 le main ou les doigts sur l'ajutage du pulvérisateur. NE JAMAIS essayer de "refouler" la peinture. Cet appareil N'est PAS un compresseur pneumatique.

TOUJOURS 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 MÉDICAUX D'URGENCE. NE PAS SOIGNER CETTE BLESSURE COMME UNE SIMPLE COUPURE.**

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

Dispositifs de sécurité du pistolet

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

MARCHE À SUIVRE POUR DÉTENDRE LA PRESSIION

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

1. Engager le verrou de sécurité du pistolet.
2. Mettre le levier d'arrêt du moteur sur ARRÊT (OFF).
3. Débrancher le cord d'alimentation.
4. Désengager le verrou de sécurité du pistolet. Tout en maintenant une partie métallique du pistolet fermement appuyé con-

Verrou de sécurité

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

Diffuseur

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

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 let contribue à réduire, mai n'évite pas le risque, que les doigts ou une partie quelconque du corps ne passent accidentellement à proximité immédiate de l'ajutage du pulvérisateur.

Consignes de sécurité concernant l'ajutage du pulvérisateur

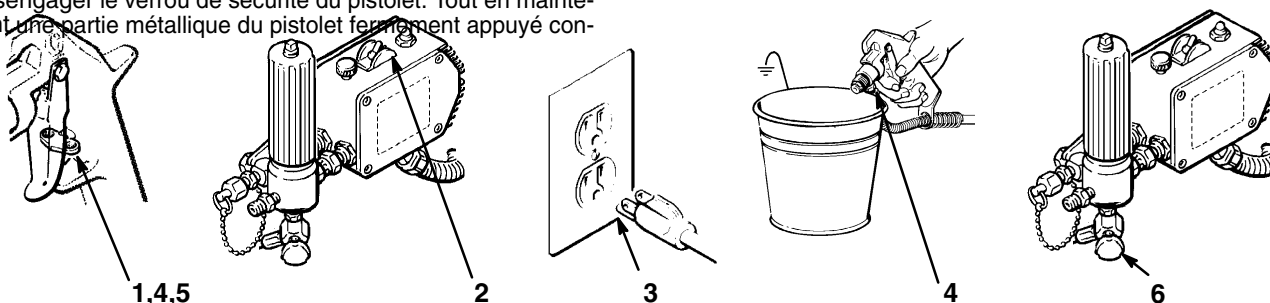
Faire extrêmement attention à l'occasion du nettoyage ou due remplacement des ajutages du pulvérisateur. Si l'ajutage se bouche pendant la pulvérisation, mettre immédiatement le verrou de sécurité du pistolet. TOUJOURS bien observe la **Marche à Suivre Pour Détendre la Pression** puis enlever l'ajutage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

NE JAMAIS 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.

tre le côté d'un seau en métal, actionner le pistolet pour libérer la pression.

5. Engager le verrou de sécurité du pistolet.
6. Ouvrir la soupape de sécurité et la laisser ouverte jusqu'à ce que l'on soit prêt à se servir de nouveau du pulvérisateur.

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



RISQUES EN CAS DE MAUVAISE UTILISATION DU MATERIAL

Consignes générales de sécurité

toute utilisation anormale de l'appareil du pulvérisateur 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.

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

Pression

Ce pulvérisateur peut produire une **PRESSION MAXIMUM DE TRAVAIL 210 bar (3000 lb/po.²)**. S'assurer que tous les éléments du pulvérisateur et ses accessoires sont conçus pour résister à la pression maximum de travail de ce pulvérisateur. **NE PAS** dépasser la pression maximum de travail d'aucun des éléments ou accessoires utilisés avec cet appareil.

Compatibilité chimique des corps

BIEN S'ASSURER que tous les corps des solvants utilisés sont chimiquement compatibles avec les parties mouillées indiquées dans les "Données techniques", à page 43. Toujours lire soigneusement les documents et brochures du fabricant des fluides et solvants utilisés avant de s'en servir dans ce pulvérisateur.

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

matériels.

RISQUES D'INCENDIE OU D'EXPLOSION

De l'électricité statique est produite par le passage du fluide à grande vitesse dans la pompe et dans les tuyaux. Si toutes les pièces de l'appareil de pulvérisation ne sont pas convenablement reliées ou à la masse ou à la terre, des étincelles peuvent se produire et l'appareil risque d'être dangereux. Des étincelles peuvent également se produire à l'occasion du branchement ou du débranchement du cordon d'alimentation ou de l'utilisation d'un moteur à essence. Les étincelles sont suffisantes pour allumer les vapeurs de solvants et le fluide pulvérisé, les fines particules de poussière ainsi que d'autres substances inflammables, quand on 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, **ARRÊTEZ IMMEDIATEMENT LA PULVERISATION**. Vérifiez que le système avant que le problème soit identifié et corrigé.

Mise à la terre ou à la masse

Pour réduire les risques de production d'étincelles d'électricité statique, le pulvérisateur et tous les 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, **CONSULTEZ** le code ou les réglementations électriques locales. **S'ASSURER** que tous les équipements de pulvérisation suivants sont bien reliés à la terre:

TOUS LES TUYAUX FLEXIBLES DOIVENT AVOIR DES RESSORTS SPIRALE DE PROTECTION AUX 2 BOUTS!

Les spirales de protection contribuent à éviter la formation de pliures, de boucles ou de nœuds sur les tuyaux qui pourraient entraîner la rupture du tuyau à l'endroit du raccord ou à son voisinage.

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

NE JAMAIS utiliser un tuyau endommagé. **NE PAS** essayer de refaire le raccord d'un tuyau haute pression ni de réparer le tuyau avec du ruban adhésif ou par tout autre moyen. Un tuyau réparé ne peut pas résister au fluide sous pression.

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

Continuité de la mise à la terre des tuyaux

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

1. *Pulvérisateur*: Brancher le cordon d'alimentation ou la rallonge qui doivent être équipés d'une prise à 3 fiches en bon état, dans une prise de courant convenablement mis à la terre. Ne pas utiliser d'adaptateur. Toutes les rallonges doivent avoir 3 fils et être prévues pour 15 ampères.
2. *Pistolet*: Réaliser la mise à la terre en le raccordant à un tuyau flexible et à un pulvérisateur déjà convenablement reliés à la terre.
3. *Tuyaux flexibles*: Afin d'assurer la continuité de la mise à la terre, n'utiliser que des tuyaux comportant une mise à la terre et ayant une longueur maximum combinée de 150 m (1500 pieds). Se reporter également au paragraphe, "**Continuité du circuit de mis à la terre des tuyaux**".
4. *Réceptacle d'alimentation*: observer le code ou les réglementations locales.
5. *Objets, matériel ou surfaces recevant la pulvérisation*: observer le code ou les réglementations locales.
6. *Tous le seaux de solvant* utilisés pour le rinçage: observer le code ou les réglementations locales. *N'utiliser que des seaux métallique* conducteurs de l'électricité. Ne pas mettre le seau sur une surface non conductrice comme sur du papier ou du carton car cela interromprait la continuité de la mise à la terre.
7. *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, observe la marche à suivre pour le rinçage donnée à la page 12 de ce manuel.

ADVERTENCIA

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

PELIGRO DE INYECCION DE FLUIDO

Seguridad general

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

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

SIEMPRE 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 del sistema.

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

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

Tratamiento médico

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

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

PROCEDIMIENTO DE DESCARGA DE PRESION

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

1. Enganchar el pestillo de seguridad de la pistola.
2. Mover el interruptor de parada del motor a OFF.
3. Desenchufar el cordón eléctrico.
4. Desenganchar el pestillo de seguridad de la pistola. Mantener una parte metálica de la pistola firmemente contra el lado de un balde de metal y activar la pistola para descargar la presión.

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 reducir, pero no evita, la colocación accidental de los dedos o cualquier otra parte del cuerpo cerca de la boquilla.

Seguridad de la boquilla pulverizadora

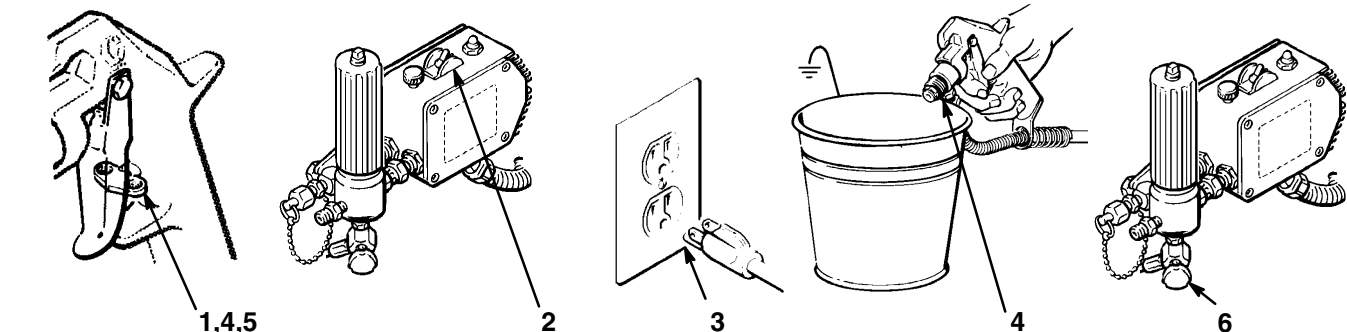
Tener mucho cuidado al limpiar o cambiar las boquillas. Si llegara a obstruirse mientras está pulverizando, enganchar el pestillo de la pistola de inmediato. SIEMPRE seguir el **procedimiento de descarga de presión** y después sacar la boquilla para limpiarla

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.

5. Volver a enganchar el pestillo de seguridad de la pistola.

6. Abrir la válvula de alivio de presión y dejarla abierta hasta que se esté nuevamente listo para pulverizar.

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



PELIGRO POR MAL USO DEL EQUIPO

Seguridad general

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

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

SEGURIDAD EN EL USO DE LAS MANGUERAS

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

¡TODAS LAS MANGUERAS PARA FLUIDOS TIENEN QUE TENER GUARDAS DE RESORTE EN AMBOS EXTREMOS!

Estas protegen las mangueras contra dobleces o retorceduras en los acoplamientos o cerca de ellos, los que podrían traducirse en roturas de la manguera.

Antes de usarlas, APRETAR bien firmes todas las conexiones. El fluido a 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 reacomodar una manguera de alta presión o enmendarla con cinta adhesiva u otro material similar. Una manguera que ha sido remendada no aguante el fluido al alta presión.

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, convirtiéndolo al sistema en algo peligroso. También, pueden producirse chispas al enchufar o desenchufar el cordón eléctrico o al usar un motor de gasolina. Estas chispas pueden inflamar los vapores de los solventes y el chorro de fluido pulverizado, partículas de polvo y otras sustancias inflamables, sea al aire libre o bajo techo, lo que podría causar una explosión o incendio y graves lesiones corporales y daños a la propiedad. Enchufar 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 ocurre una chispa de electricidad estática o incluso un ligero choque eléctrico mientras se usa el equipo, DEJAR DE PULVERIZAR DE INMEDIATO. Revisar todo el sistema en busca de una tierra apropiada. No usar de nuevo el sistema hasta haber identificado y solucionado el problema.

Puesta a tierra

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

Presión del sistema

Esta pulverizadora puede desarrollar 210 barías (3000 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 ningún componente o accesorio de este sistema.

Compatibilidad de fluido

Siempre leer las instrucciones del fabricante del fluido y solvente antes de usarlos en esta pulverizadora.

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

Continuidad del circuito de puesta a tierra de la manguera

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

1. *Pulverizadora:* enchufar el cordón eléctrico, o cable estensor, 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. *Suministrar un recipiente:* de acuerdo al código local. Usar *solamente baldes de metal*, que sean conductivos. No colocar el balde en una superficie no conductiva, como papel o cartón, que interrumpe la continuidad a tierra.
5. *Objeto que se está rociando:* de conformidad con el código local.
6. *Todos los baldes de solvente* usados durante el lavado, de conformidad con el código local.
7. *Para mantener la continuidad a tierra durante el lavado o descarga de presión,* siempre apoyar una parte metálica de la pistola bien firme contra el costado de *balde de metal*, después apretar el gatillo.

Seguridad durante el lavado

Para reducir el riesgo de que se inyecte o salpique fluido en la piel, o que ocurra una descarga de electricidad estática, siempre seguir las INSTRUCCIONES PARA EL LAVADO, dadas en la página 12. Seguir el **procedimiento de descarga de presión** en la página 6, y quitar la *boquilla de metal* y usar la presión más baja posible de fluido durante el lavado.

SETUP

WARNING

To reduce the risk of serious bodily injury caused by static sparking, fluid injection or over-pressurization and rupture of the hose or gun:

1. Ground the sprayer and all objects being sprayed. Read **FIRE OR EXPLOSION HAZARD** on page 3.
2. Do not operate the spray gun without a tip guard in place.
3. Be sure all parts added to the sprayer are rated for at least 3000 psi (190 bar) Maximum Working Pressure.

CAUTION

To avoid damaging the pressure control, follow these precautions.

1. Always use flexible, grounded hose at least 50 feet (15.2 m) long.
2. Never use a wire braid hose; it is too rigid to act as a pulsation dampener.
3. Never install any shutoff device between the fluid filter and the first 50 feet (15 m) of hose. See Fig 1.

1. **Connect a 50 foot spray hose and a gun to the 1/4 npsm(m) fluid outlet nipple.** For more flexible gun movement, install a 3 foot (0.9 m), 3/16 inch ID diameter hose between the gun and main spray hose.

DO NOT use thread sealant on the hose and gun connections. DO NOT install the spray tip until the system is primed.

2. **Fill the packing nut/wet-cup** 1/3 full with Throat Seal Liquid, supplied. Keep it filled to help extend the life of the packings and the pump.
3. **Check the electrical service.** It must be 120 VAC, 60 Hz, 15 Amp (minimum). The electrical outlet must be properly grounded.

DO NOT remove the grounding prong of the plug, and do not use an adapter.

Extension cords up to 100 feet (30 m) of 3 wire, 12 gauge (minimum) can be used. Longer lengths may affect sprayer performance. Use more spray hose to reach the spray area, if needed.

4. **Plug the power supply cord** into an outlet located at least 20 feet (6 m) from the spray area. This reduces the chance of a spark igniting the spray vapors or dust particles.
5. **Flush the pump** to remove the lightweight test oil which was left in it after factory testing. See **FLUSHING GUIDELINES** on page 12.
6. **Prepare the paint** according to the instructions on the paint can. Strain the paint through a fine nylon mesh bag to remove particles that could clog the spray tip.

SETUP

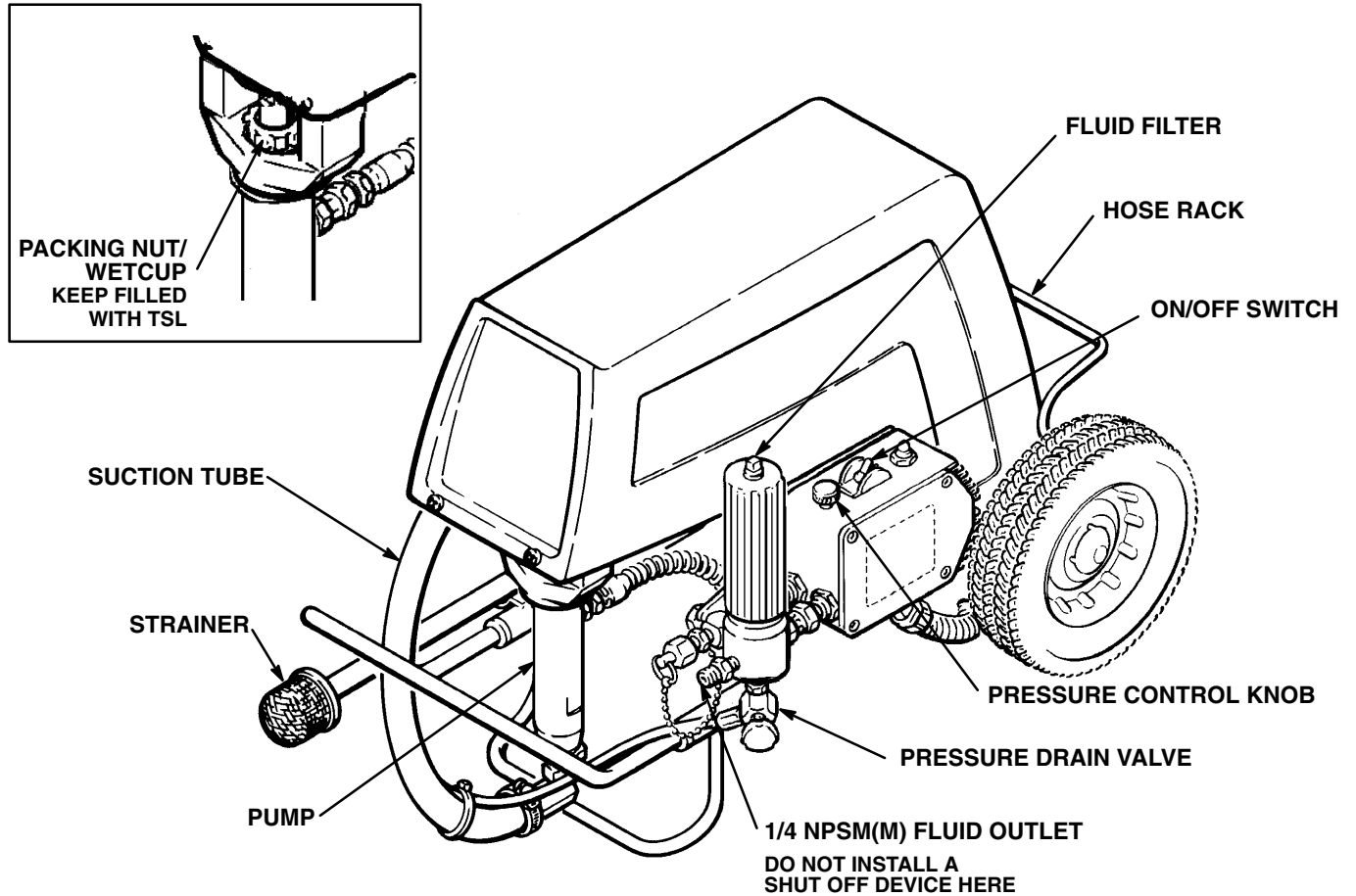


Fig 9-1

OPERATION

WARNING

Pressure Relief Procedure

To reduce the risk of serious bodily injury, fluid injection, splashing in the eyes or on the skin, injury from moving parts or electric shock, follow this procedure whenever you shut off the sprayer, check or service any part of the spray system, install, clean or change spray tips, and or stop the sprayer.

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. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.

5. Engage the gun safety latch.
6. Open the pressure drain valve, having a container ready to catch the drainage. Leave the pressure drain valve open until you use 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.*

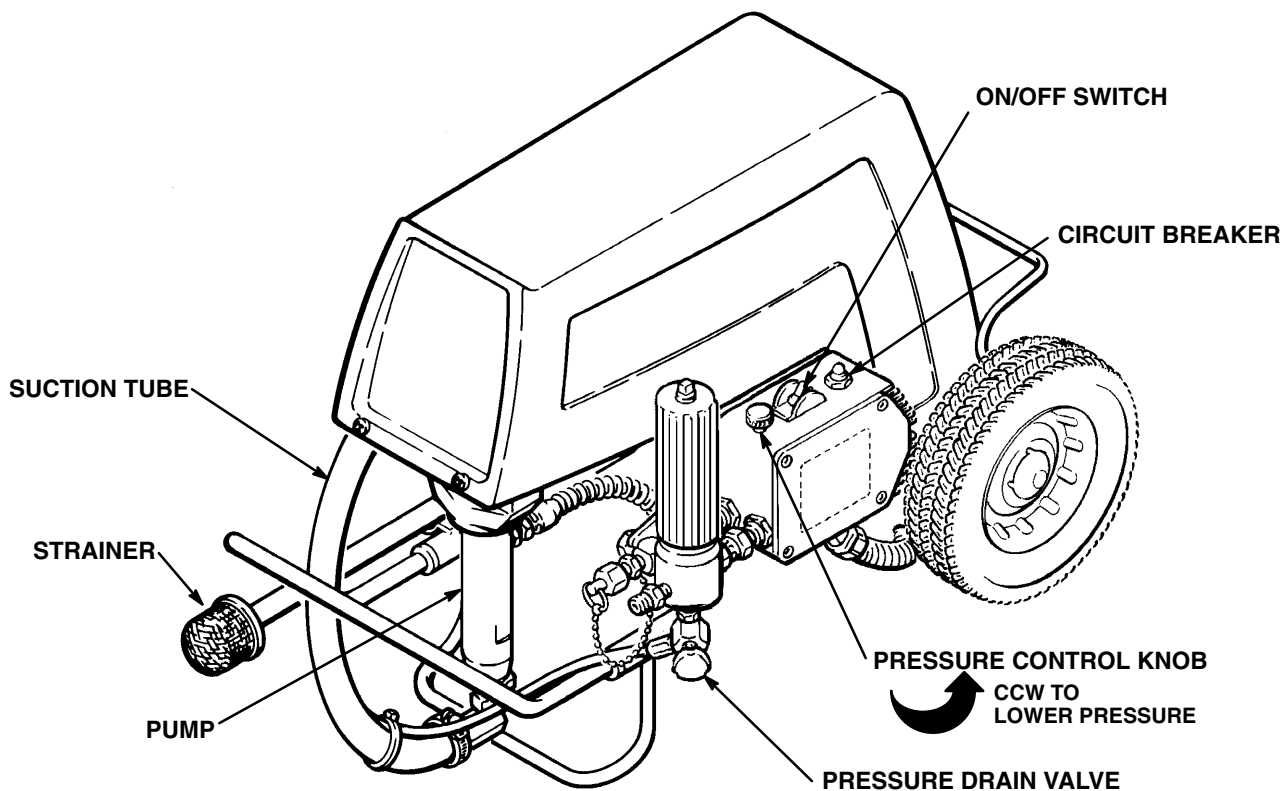


Fig 10-1

1. Prime the sprayer with paint.

- a. Close the pressure drain valve.
- b. Don't install the spray tip yet!
- c. Put the suction tube into the paint.
- d. Turn the pressure adjusting knob counter-clockwise to lower the pressure.
- e. Disengage the gun safety latch.
- f. Hold a metal part of the gun firmly against a grounded metal pail. See Fig 10-2. Squeeze the trigger, turn the ON/OFF switch to ON, and slowly increase the pressure 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 latch.

NOTE: If the pump is hard to prime, open the valve. When fluid comes from the valve, close it. Disengage the gun safety latch repeat Step 1f.

- g. Check all fluid connections for leaks. Follow the **Pressure Relief Procedure Warning** on page 9 before tightening any loose connections.

2. Install the spray tip and tip guard. Be sure the gun safety latch is engaged. Follow the instructions supplied with the tip guard.

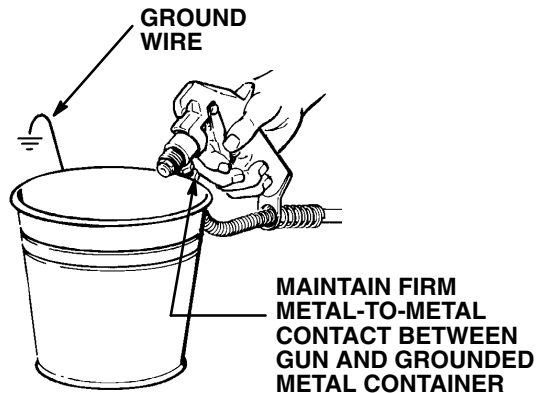


Fig 10-2

OPERATION

3. Adjusting the spray pattern (See Fig 11–1.)

- Increase the pressure just until spray from the gun is completely atomized. To avoid excessive overspray and fogging, to decrease tip wear and to extend the life of the sprayer, use the lowest pressure needed for good atomization.
- If more coverage is needed, use a larger tip rather than increasing the pressure.
- To adjust the spray pattern direction, engage the gun safety latch. Loosen the retaining nut. Position the tip guard horizontally for a horizontal pattern or vertically for a vertical pattern. Tighten the retaining nut.

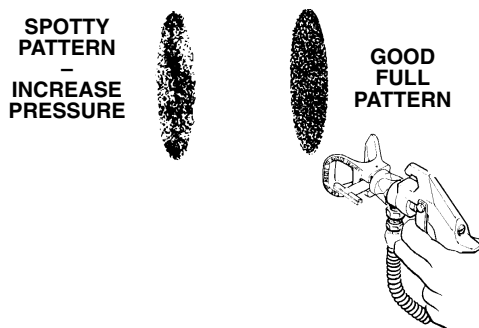


Fig 11–1

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 Step 4.

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

4. Cleaning a Clogged Tip

- Clean the front of the tip frequently** during operation. Follow the **Pressure Relief Procedure Warning** on page 9. Use a solvent-soaked brush to clean the tip.
- If the spray tip clogs**, engage the gun safety latch, shutoff and unplug the sprayer, and open the pressure drain valve to relieve pressure. Loosen the tip guard retaining nut **slowly** to relieve any additional pressure, and then remove the spray tip to clean it. See the instructions supplied with your spray tip for cleaning clogs.

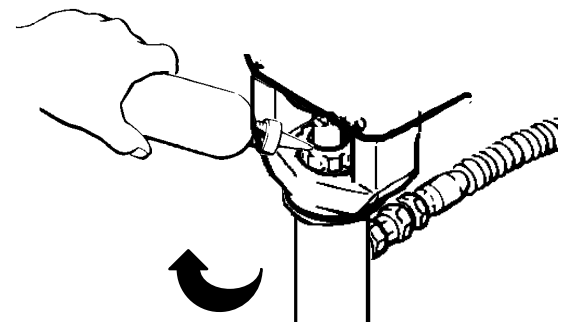
SHUTDOWN AND CARE

1. Check the packing nut/wet-cup daily.

Relieve pressure. Keep the wet-cup 1/3 full of Throat Seal Liquid to help prevent fluid buildup on the piston rod and premature wear of packings. Tighten the packing just enough to stop leakage. Overtightening may cause binding and excessive packing wear. See Fig 11–2.

- 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.

- For very short shutoff periods**, leave the suction tube in the paint, relieve pressure, unplug the sprayer, and clean the spray tip.
- Coil the hose** around the top of the shroud and rest it on top of the hose rack when storing it, even for overnight, to help protect the hose from kinking or damage.
- Secure the suction hose to the brackets** on the side of the cart.



PACKING NUT/WETCUP
Keep filled with TSL during operation. Tighten nut by turning clockwise.

CAUTION

Never leave water or any paint in the sprayer overnight to prevent pump corrosion and to 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, relieve pressure, and leave the mineral spirits in the sprayer.

Fig 11–2

FLUSHING GUIDELINES

When To Flush

CAUTION

NEVER leave water in the sprayer if there is the slightest chance it could freeze. Flush out the water with mineral spirits. If water freezes in the pressure control tube, it prevents the sprayer from being started and causes serious damage to the pressure control.

1. **New Sprayer.** Flush out the test oil.

Before using water-base paint, flush with mineral spirits, followed by a soapy water flush, and then a clean water flush.

Before using oil-base paint, flush with mineral spirits, only.

2. **Changing Colors.** Flush with a compatible solvent such as mineral spirits or water.

How To Flush

1. Relieve pressure. See page 9.
2. Remove the filter bowl and screen; see manual 307–273. Clean the screen. Install the bowl (only) to flush it. Close the pressure drain valve. See Fig 12–1.

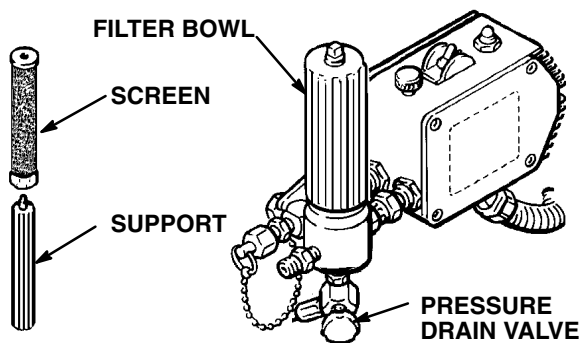


Fig 12–1

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

WARNING

To reduce the risk of static sparking and splashing when flushing, 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. See Fig 12–2.

3. **Changing from water-base to oil-base paint.** Flush with warm, soapy water, and then flush with mineral spirits.
4. **Changing from oil-base to water-base paint.** Flush with mineral spirits, followed by warm, soapy water, and then a clean water flush.
5. **Storage.** Flush, leave the pump, hose and gun filled with mineral spirits. Shut off the sprayer and open the pressure drain valve to relieve pressure.
Water-base paint: Flush with water, and then mineral spirits.
Oil-base paint: Flush with mineral spirits.
6. **Startup after storage.**
Before using water-base paint, flush with soapy water, and then with clean water.
When using oil-based paint, with the paint to be sprayed.

5. Disengage the gun safety latch. Start the sprayer, trigger the gun, and slowly turn the pressure adjusting knob clockwise just until the pump starts. Keep the gun triggered until clean solvent comes from the nozzle. Release the trigger and engage the gun safety latch.
6. Check all fluid connections for leaks. Relieve pressure before tightening the connections. Start the sprayer.
7. Remove the suction tube from the pail. Disengage the gun safety latch. Trigger the gun to force solvent from the hose. Do not run the pump dry for more than 30 seconds to avoid damaging the pump packings! Relieve pressure.
8. Unscrew the filter bowl and reinstall the clean screen. Reinstall the bowl, hand tight only. Leave the pressure drain valve open until you use the sprayer again.
9. If you flushed with mineral spirits and are going to use a water-base paint, flush with soapy water followed by a clean water flush. Relieve pressure.

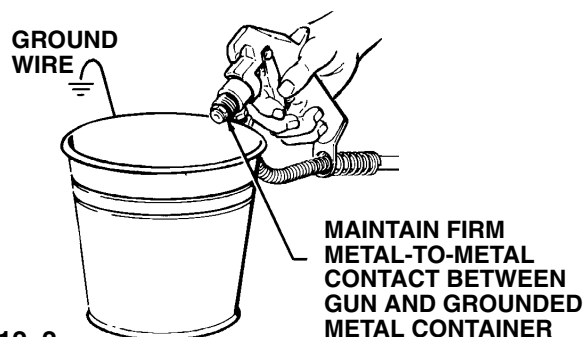


Fig 12–2

APPLICATION METHODS

Hold the gun perpendicular to the surface. Keep the gun at an even 12 to 14 in. (300–356 mm) from the surface you are spraying. See Fig 13–1.

Begin moving the gun horizontally 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 of the surface, release the trigger. This method avoids excess paint buildup at the end of each stroke.

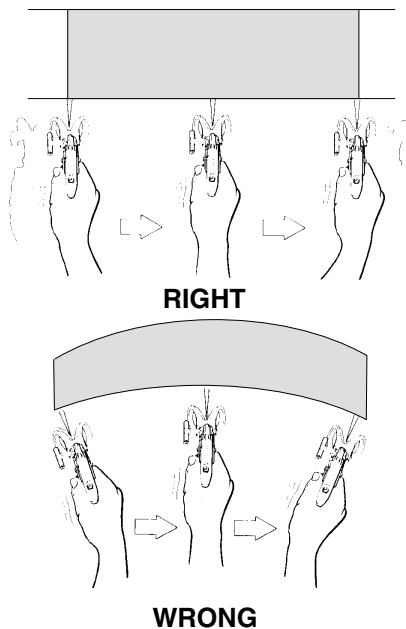


Fig 13–1

Move the gun at a speed that provides a full, wet coating to be applied without runs or sags. Lap each stroke 50% over the previous stroke to produce a uniform paint thickness. Spray in a uniform pattern from right to left and then left to right for a professional finish. See Fig 13–2.

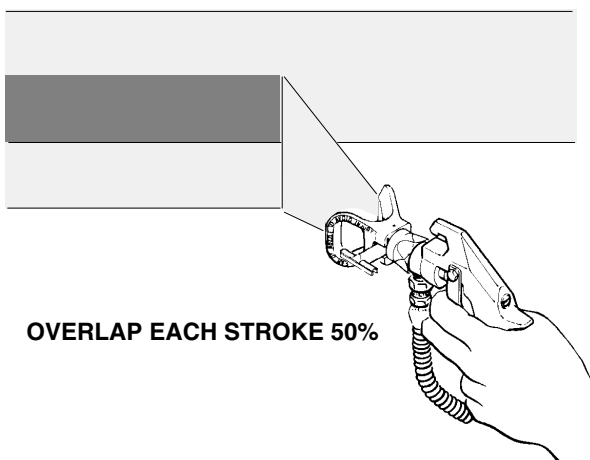


Fig 13–2

The best way to control the rate of coverage is with the gun tip size. A small tip orifice applies less paint. A larger tip orifice applies more paint. The width of the pattern depends on the fan pattern of the tip you choose.

Do not try to increase coverage by increasing the fluid pressure! Use the lowest pressure needed for good results. This prolongs the life of your sprayer and reduces paint lost by overspray.

For interior corners aim the gun toward the center of the corner to be sprayed. By dividing the spray pattern this way, the edges on both sides are sprayed evenly. See Fig 13–3.

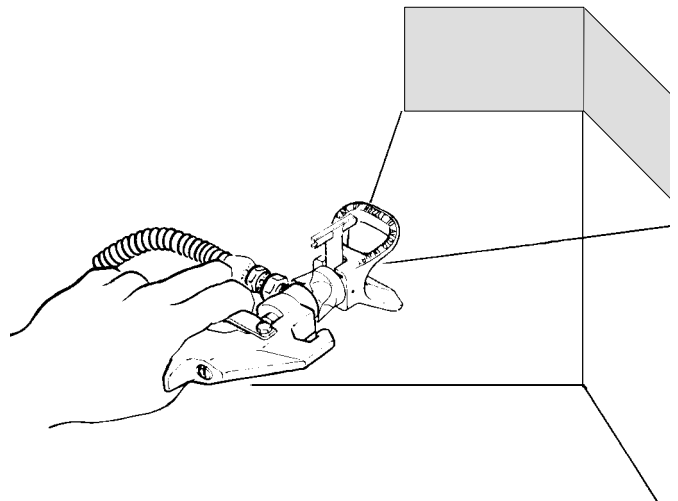


Fig 13–3

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

Shrubs. Tie back shrubs with rope and stakes. Cover them with a dropcloth as the painter approaches the area. Remove the dropcloth as soon as the area is painted to prevent damage.

Concrete walks. If the walkways will be walked on, cover them with a canvas dropcloth to avoid slipping. Otherwise a plastic cloth can be used.

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

Nearby objects. Move portable objects upwind of the surface to be sprayed. If there is a nearby home, make a protective barrier by hanging plastic dropcloths between two long poles.

TROUBLESHOOTING GUIDE

WARNING

Pressure Relief Procedure

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

1. Engage the gun safety latch.
2. Turn the ON/OFF switch to OFF.
3. Unplug the power supply cord.

4. Disengage the gun safety latch. Hold a metal part of the gun firmly to a grounded metal pail. Trigger the gun to relieve pressure.
5. Engage the gun safety latch.
6. Open the pressure drain valve, having a container ready to catch the drainage. Leave the pressure 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, loosen the tip guard retaining nut or hose end coupling and VERY SLOWLY relieve pressure gradually, then loosen completely. Now clear the tip or hose obstruction.

Check everything in the guide before disassembling the sprayer.

MOTOR WON'T OPERATE

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Basic Fluid Pressure Problems	1. Check the pressure control knob setting. The motor will not run if it is at the minimum setting (fully counterclockwise).	1. Slowly increase the pressure setting to see if the motor starts.
	2. Check for a clogged spray tip. Refer to the separate gun or tip instruction manual.	2. Relieve pressure, refer to the separate gun or tip instruction manual for tip cleaning.
Basic Mechanical Problems	1. Check for frozen or hardened paint in the pump (29) and/or pressure control tube. Using a screwdriver, carefully try to rotate fan at back of motor by hand. See page 20.	1. Thaw. Plug in sprayer and turn on. Slowly increase pressure setting to see if motor starts. If it doesn't, see NOTE 1, below.
	2. Check displacement pump connecting rod pin (63). It must be completely pushed into connecting rod (68) and retaining spring (65) must be firmly in groove of connecting rod. See page 36.	2. Push pin into place and secure with the spring retainer.
	3. Check for motor damage. Remove drive housing assembly (8). See page 31. Try to rotate fan by hand.	3. Replace motor (13) if fan won't turn.
Basic Electrical Problems	1. Check sprayer circuit breaker (309) button to be sure it has not popped up.	1. Depress button to reset. If circuit breaker continues to open, see 'Electrical Short' on page 19.
	2. Check electrical supply with volt meter. Meter should read 105–125 VAC.	2. Reset building circuit breaker; replace building fuse. Try another outlet.
	3. Check extension cord for visible damage. Use a volt meter or test lamp at extension cord outlet to check.	3. Replace extension cord.
	4. Check sprayer power supply cord (31 1) for visible damage such as broken insulation or wires.	4. Replace power supply cord. See page 24.
	5. Check motor brush leads, terminals and brush length. Brush length should be 1/2" minimum. See page 23.	5. Tighten terminal screws; replace brushes. See page 23.

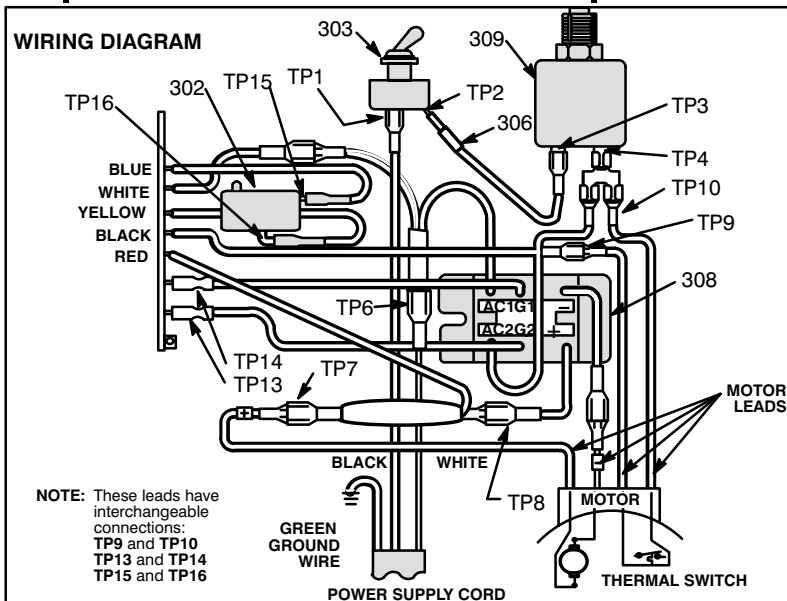
NOTE 1: Thaw the sprayer if water or water-based paint has frozen in it, due to exposure to low temperatures, by placing it in a warm area. Do not try to start the sprayer until it has thawed completely. If the bourdon tube was not damaged by the freezing, the pump should operate. If paint hardened (dried) in the sprayer, the pump packings and/or bare pressure control must be replaced. See page 34 (pump) or 27 (pressure control).

MOTOR WON'T OPERATE

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
<p>Diagnosing circuit board indicator lamps. The normal condition is red lamp on, clear lamp on when board is telling pump to run.</p> <p>Follow Pressure Relief Procedure Warning. Remove gun from hose. Remove pressure control cover. Check for faulty condition of circuit board lamps.</p> <p>Condition A Both lamps on; pump won't operate and motor is not running</p>	1. Check leads from bridge (308) to motor to be sure they are securely fastened and properly mated.	1. Replace loose terminals; crimp to leads. Be sure male terminal blades are straight and firmly connected to mating part.
	2. Check G1 and G2 connections between circuit board (79) and bridge (308) for damage or loose terminals.	2. Clean circuit board male terminals. Replace loose or damaged terminals. Securely reconnect leads.
	3. Check for loose motor brush lead connections and terminals. See page 23.	3. Tighten terminal screws. Replace brushes if leads are damaged. See page 23.
	4. Check brush length which should be 1/2" minimum. See page 23.	4. Replace brushes. See page 23.
	<p>NOTE: The brushes do not wear at the same rate on both sides of the motor. Check both brushes.</p>	
	5. Check for broken or misaligned motor brush springs. Rolled portion of spring must rest squarely on top of brush. See page 23.	5. Replace spring if broken. Realign spring with brush. See page 23.
	6. Check motor brushes for binding in brush holders. See page 23.	6. Clean brush holders. Remove carbon with small cleaning brush. Align brush leads with slot in brush holder to assure free vertical brush movement.
	7. Check motor armature commutator for burn spots, gouges and extreme roughness. Remove motor cover and brush inspection plates to check. See page 23.	7. Remove motor and have motor shop resurface commutator if possible. See page 32.
	8. Check motor armature for shorts using armature tester (growler) or perform spin test. See page 20.	8. Replace motor. See page 32.
<p>9. Check bridge (308) by substituting with a good bridge or performing bridge test. See page 21.</p> <p>CAUTION: Do not perform this check until motor armature is determined to be good. A bad motor armature will immediately burn out a good bridge.</p>	9. Replace bridge. See page 25.	
<p>Condition B (continued) Both lamps off</p> <p><i>REFER TO THE WIRING DIAGRAM ON PAGE 185 TO IDENTIFY TP POINTS.</i></p> <p>NOTE: Connect the volt meter to the <u>terminal</u>, not the wire which you disconnect from the terminal.</p>	1. Check circuit breaker (309) button to be sure it has not popped up.	1. Depress button to reset. If circuit breaker or fuse continues to open, see "Electrical Short", page 19.
	2. Check power supply cord (31 1). Disconnect TP6 female (neutral) and TP1 female and connect volt meter to these leads. Plug in sprayer. Meter should read 105 to 125 VAC. Unplug sprayer. Reconnect TP1.	2. Replace power supply cord. See page 24.
	3. Check ON/OFF switch (303). Disconnect TP2 and connect volt meter to TP6 female and TP2 male. Plug in sprayer and turn ON . Meter should read 105 to 125 VAC. Turn off and unplug sprayer. Reconnect TP2.	3. Replace ON/OFF switch. See page 24.
	4. Check jumper wire (306). Disconnect TP3 and connect volt meter to TP6 female and TP3 female. Plug in sprayer and turn on. Meter should read 105 to 125 VAC. Turn off and unplug sprayer. Reconnect TP3.	4. Replace jumper wire. See page 26.
	5. Check circuit breaker (309). Connect volt meter to TP6 female and TP4. Plug in sprayer and turn ON . Meter should read 105 to 125 VAC. Turn off and unplug sprayer.	5. Replace circuit breaker. See page 25.

MOTOR WON'T OPERATE

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Condition B (continued) Both lamps off <i>REFER TO THE WIRING DIAGRAM BELOW TO IDENTIFY TP POINTS.</i>	6. Check motor thermal cutout switch. Connect volt meter to TP6 female and TP9 female. Plug in sprayer and turn on. Meter should read 105 to 125 V AC. Turn off and unplug sprayer.	6. Allow motor to cool. Correct cause of overheating. If switch remains open after motor cools, check continuity between TP9 female and TP10 with ohmmeter. If open, replace motor.
	7. Check microswitch (302). Reconnect TP6 connectors. Connect volt meter to TP15 male and TP4. Meter should read 50–125 VAC.	7. Clean microswitch male terminals. Replace loose or damaged terminals. Securely reconnect leads.
	8. Visually inspect microswitch (302) button. Adjustment stud should not depress button when fluid pressure is zero. Depress button with small screwdriver; audible click indicates microswitch is in normal position.	8. Microswitch is faulty. Return sprayer for repair.
	9. Check microswitch (302) continuity with ohm meter. <i>Be sure sprayer is unplugged!</i> Meter should read zero ohms with no fluid pressure in the sprayer.	9. Microswitch is faulty. Return sprayer for repair.
	10. Check all terminals for damage or loose fit. Reconnect TP6 connectors.	10. Replace damaged terminals and reconnect securely.
	11. Check circuit board (79) by substituting with a good board. See page 26.	11. Replace circuit board. See page 26.



Condition C Red lamps on, Clear lamp off <i>Unplug sprayer!</i>	<ol style="list-style-type: none"> 1. Check circuit board (79) by removing from box <i>without</i> disconnecting wires; see page 26 for removal procedure. Place thin cardboard in optical detector slot. Plug in and turn on sprayer ONLY LONG ENOUGH TO CHECK LAMP CONDITION. Clear lamp should be on now. Turn off and unplug sprayer. Remove cardboard. WARNING: Removing circuit board while still wired over-rides optical detector and may cause sprayer to over-pressurize, if microswitch does not function properly. WARNING: To reduce risk of electric shock, handle board by edges only! Do not allow any metal objects to come in contact with board! 	<ol style="list-style-type: none"> 1. Replace circuit board. See page 26.
	<ol style="list-style-type: none"> 2. Check bourdon tube flag and detector position. Reinstall circuit board (see page 26). Turn pressure setting to maximum; flag should extend less than half way into optical detector slot from the top. 	<ol style="list-style-type: none"> 2. Perform pressure control adjustment to see if that corrects problem. See page 28. If not, replace bare pressure control box (301). See page 27.

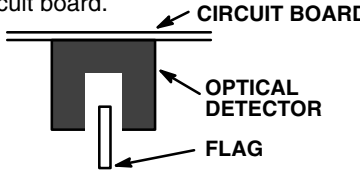
LOW OUTPUT

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Low Output	1. Check for worn spray tip.	1. Follow Pressure Relief Procedure Warning then replace tip. See your separate gun or tip manual.
	2. Check to see that pump does not continue to stroke when gun trigger is released. Plug in and turn on sprayer. Prime with paint. Trigger gun momentarily, then release and engage safety latch. Relieve pressure, turn off and unplug sprayer.	2. Service pump. See pages 34–36.
	3. Check electrical supply with volt meter. Meter should read 105–125 VAC.	3. Reset building circuit breaker; replace building fuse. Repair electrical outlet or try another outlet.
	4. Check extension cord size and length; must be at least 12 gauge wire and no longer than 150 ft.	4. Replace with a correct, grounded extension cord.
	5. Check G1 and G2 leads from bridge (308) to circuit board (79) for damaged or loose wires or connectors. Refer to page 26.	5. Clean circuit board male terminals. Replace loose or defective lead terminals. Securely reconnect lead terminals to board.
	6. Check stall pressure. Refer to Pressure Control Adjustment on page 28.	6. Perform pressure control adjustment. See page 28.
	7. Check bridge (308) + and – leads and terminals to motor. Inspect wiring insulation and terminals for signs of overheating. See page 27.	7. Be sure male terminal blades are centered and firmly connected to female terminals. Replace any loose terminal or damaged wiring. Securely reconnect wires to bridge.
	8. Check for loose motor brush leads and terminals. See page 23.	8. Tighten terminal screws. Replace brushes if leads are damaged. See page 23.
	9. Check for worn motor brushes which should be 1/2" minimum. See page 23.	9. Replace brushes. See page 23.
	10. Check for broken and misaligned motor brush springs. Rolled portion of spring must rest squarely on top of brush.	10. Replace spring if broken. Realign spring with brush. See page 23.
	11. Check motor brushes for binding in brush holders. See page 23.	11. Clean brush holders, remove carbon dust with small cleaning brush. Align brush lead with slot in brush holder to assure free vertical brush movement.
	12. Check circuit board (79) by substituting with a good circuit board. See page 26.	12. Replace circuit board. See page 26.
	13. Check motor armature for shorts by using an armature tester (growler) or perform spin test. See page 20.	13. Replace motor. See page 2.
	14. Check bridge (308) by substituting with a good bridge or by performing the bridge test. See page 21 or 25. CAUTION: Do not perform this check until armature is determined to be good. A bad armature will immediately burn out a good bridge.	14. Replace bridge. See page 25.

NO OUTPUT

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Motor runs and pump strokes	1. Check paint supply.	1. Refill and reprime pump.
	2. Check for clogged intake strainer.	2. Remove and clean, then reinstall.
	3. Check for loose suction tube or fittings.	3. Tighten; use thread sealant or sealing tape on threads if necessary.
	4. Check to see if intake valve ball and piston ball are seating properly. See page 34.	4. Remove intake valve and clean. Check balls and seats for nicks; replace if necessary. See page 34. Strain paint before using to remove particles that could clog the pump.
	5. Check for leaking around throat packing nut which may indicate worn or damaged packings. See page 34.	5. Replace packings. See pages 39–41. Also check piston valve seat for hardened paint or nicks and replace if necessary. Tighten the packing nut/wet-cup.
Motor runs but pump does not stroke	1. Check displacement pump connecting rod pin (43). See page 36.	1. Replace pin if missing. Be sure retainer spring (65) is fully in groove all around connecting rod. See page 39.6
	2. Check connecting rod assembly (68) for damage. See page 30.	2. Replace connecting rod assembly . See page 30.
	3. Be sure crank in drive housing rotates; plug in sprayer and turn on briefly to check. Turn off and unplug sprayer. See page 31.	3. Check drive housing assembly for damage and replace if necessary. See page 31.

EXCESSIVE PRESSURE FLUCTUATIONS

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Spray pattern variations.	1. Be sure both G1 and G2 leads from bridge (308) to circuit board (79) are firmly connected. See page 26.	1. Reconnect securely. See page 26.
	2. Check maximum working pressure adjustment. Refer to Pressure Control Adjustment on page 28.	2. Perform pressure control adjustment. See page 30. 28
	3. Check bourdon tube flag and detector position. Turn pressure setting to maximum; flag should not drag or bind in optical detector slot of circuit board.	3. Carefully bend flag into alignment with detector slot to see if that corrects problem. If not, replace bare pressure control assembly (301). Perform pressure control adjustment after reassembly.
		
	4. Check circuit board (79) by substituting with a good board. See page 26.	4. Replace circuit board. See page 26.
5. Check LOW OUTPUT section, page 16.		

MOTOR IS HOT AND RUNS INTERMITTENTLY

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
	1. Determine if sprayer was operated at high pressure with small tips, which causes low motor RPM and excessive heat build up.	1. Decrease pressure setting or increase tip size.
	2. Be sure ambient temperature where sprayer is located is no more than 90°F and sprayer is not located in direct sun.	2. Move sprayer to shaded, cooler area if possible.
	3. Determine if was sprayer turned on, pressurized, but not operating for long periods of time.	3. Turn off sprayer whenever you stop spraying for a while and relieve fluid pressure.

ELECTRICAL SHORT

TYPE OF PROBLEM	WHAT TO CHECK <i>If check is OK, go to next check</i>	WHAT TO DO <i>When check is not OK refer to this column</i>
Building circuit breaker opens as soon as sprayer switch is turned on. CAUTION Any short in any part of the motor power circuit, which is connected to the output side of the bridge, will cause the bridge to burn out immediately. Correctly diagnose and repair all shorts before checking and replacing bridge.	1. Check all electrical wiring for damaged insulation, and all terminals for loose fit or damage. Also check wires between pressure control and motor which are encased in conduit (13f). See page 32.	1. Repair or replace any damaged wiring or terminals. Securely reconnect all wires.
	2. Check for missing inspection plate gasket (see page 23), bent terminal forks or other metal to metal contact points which could cause a short.	2. Correct faulty conditions.
	3. Check motor armature for shorts. Use an armature tester (growler) or perform spin test. See page 20. Inspect windings for burns.	3. Replace motor. See page 32.
	4. Check bridge (308) by substituting with a good bridge or by performing bridge test. See page 21. CAUTION: Do not check bridge until armature is determined to be good. A bad armature will immediately burn out a good bridge.	4. Replace bridge. See page 25.
Building circuit breaker opens as soon as sprayer is plugged into outlet and sprayer is NOT turned on.	1. Check 'Basic Electrical Problems' on page 14.	
	2. Check ON/OFF switch (302) See page 24. <i>Be sure the sprayer is unplugged!</i> Disconnect wires from switch. Check switch with ohmmeter. The reading should be infinity with the ON/OFF switch OFF, and zero with the switch ON. CAUTION: A short in the motor circuit burns the bridge out immediately, which usually causes the ON/OFF switch to fail in the closed mode.	2. Replace ON/OFF switch. See page 24.
Sprayer circuit breaker opens after sprayer operates for 5 to 10 minutes.	1. Check electrical supply with volt meter. Meter should read 105 to 125 VAC.	1. If voltage is too high, do not operate sprayer until corrected.
	2. Check tightness of pump packing nut. Overtightening tightens packings on rod, restricts pump action, and damages packings.	2. Loosen packing nut. Check for leaking around throat. Replace pump packings, if necessary. See page 34.
	3. Check maximum working pressure adjustment.	3. Perform pressure control adjustment. See page 28.
	4. After determining that there is no short in system, reset circuit breaker button.	4. If circuit breaker continues to open (button pops up), replace the circuit breaker. See page 25.

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or on the skin, injury from moving parts, or electric shock. *Unplug the sprayer!*

For checking armature, motor winding and brush electrical continuity.

Setup

Remove the drive housing. Refer to page 31.

Remove the pressure control cover. Remove the motor shield (23). Remove the fan cover (A) and the inspection covers (B). Refer to Fig 20-1.

Disconnect the two leads from the motor to the bridge (308). Refer to Fig 20-2.

Armature Short Circuit Test

Quickly turn the motor fan by hand. If there are no shorts, the motor will coast two or three revolutions before coming to a complete stop. If the motor does not spin freely, the armature is shorted and the motor must be replaced. Refer to page 32.

Armature, Brushes, and Motor Wiring Open Circuit Test (Continuity)

Connect the two black motor leads together with a test lead. Turn the motor fan by hand at about two revolutions per second.

If there is uneven or no turning resistance, check the following: broken brush springs, brush leads, motor leads; loose brush terminal screws, motor lead terminals; worn brushes. Repair parts as needed. Refer to page 23.

If there is still uneven or no turning resistance, replace the motor. Refer to page 32.

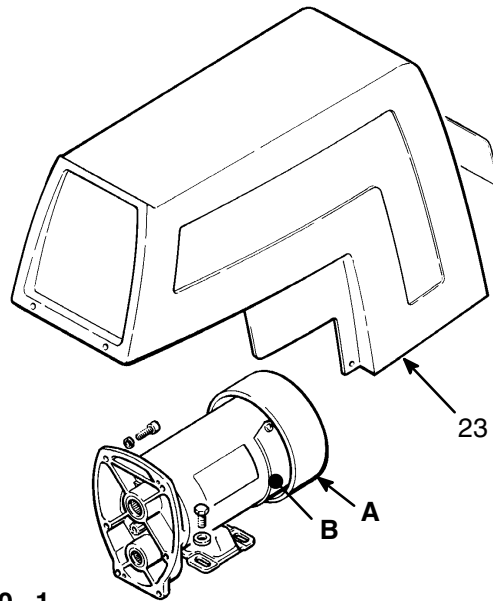


Fig 20-1

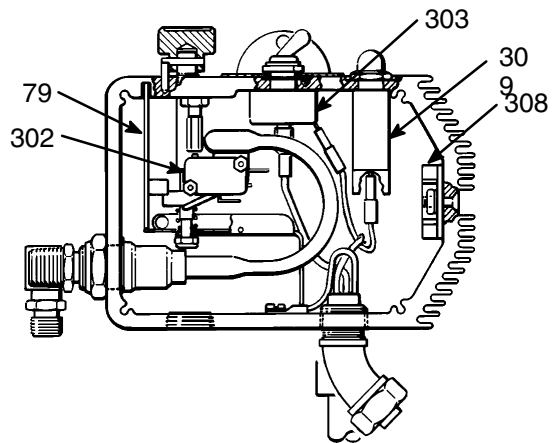


Fig 20-2

BRIDGE TEST

Remove the bridge from the pressure control box and perform this test to determine if the bridge is functional. Refer to **BRIDGE RECTIFIER REPLACEMENT**, page 25. Use a continuity tester, such as multi-meter set on the X1 ohms scale.

Perform all tests in the chart. If the bridge fails even one test, it must be replaced.

Fig 21-1 shows the position of the wires on the bridge. Using the chart at the right, connect the meter wires as indicated by the black dots for each test, and then check the continuity.

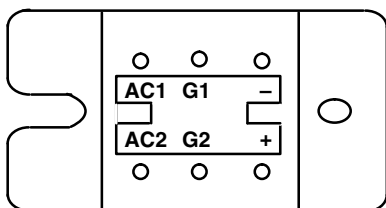


Fig 21-1

BRIDGE WIRES

CONTINUITY	G2	G1	-	+	AC1	AC2	
NO					•	•	TEST 1
NO				•		•	TEST 2
NO				•			TEST 3
YES NO							TEST 4
YES NO							TEST 5
YES NO							TEST 6
YES NO		○	OR		•	•	TEST 7
YES NO		○	OR		•	•	TEST 8

In Tests 1, 2 and 3, there should be NO continuity.

In Tests 4, 5 and 6, connect the + and - meter wires as indicated, check continuity, then switch the meter wire connections and check continuity again. You should get NO continuity one way and YES continuity the other way.

In Tests 7 and 8, connect the meter wires as indicated by the black dots. Touch the indicated "G" wire to one meter wire, and then to the other. You should get NO continuity one way and YES continuity the other way.

GENERAL REPAIR INFORMATION

WARNING

Pressure Relief Procedure

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

1. Engage the gun safety latch.
2. Turn the ON/OFF switch to OFF.
3. Unplug the power supply cord.
4. Disengage the gun safety latch. Hold a metal part of the gun firmly to the side of a grounded metal pail, and trigger the gun to relieve pressure.
5. Engage the gun safety latch.
6. Open the pressure drain valve, having a container ready to catch the drainage. Leave the pressure 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, loosen the tip guard retaining nut or hose end coupling and VERY SLOWLY loosen the part to relieve pressure gradually, then loosen completely. Now clear the tip or hose obstruction.

Tool List

Phillips screwdriver	1/4 in. hex key wrench
Small flat blade screwdriver	3/16 in. hex key wrench
Needle nose pliers	5/8 in. socket wrench
Plastic mallet	3/8 in. open end wrench
Adjustable wrench	1/2 in. open end wrench
Adjustable, open-end wrench	3/4 in. open end wrench
Torque wrench	7/8 in. open end wrench
	High quality motor oil
	Bearing grease

5. **When disconnecting wires** in the pressure control assembly, use needle nose pliers to separate mating connectors.
6. **When reconnecting the wires**, be sure the flat blade of the insulated male connector is centered in the wrap-around blade of the female connector.

CAUTION

To reduce the risk of a pressure control malfunction, be sure to properly mate connectors, and never pull on a wire to disconnect it. Pulling on a wire could loosen the connector from the wire.

7. **Route wires carefully** in the pressure control assembly, guiding them through the legs of the U-shaped bourdon tube. This is to avoid interfering with the bourdon tube, which moves as the pressure setting changes, and to avoid pinching the wires between the pressure control and cover.

CAUTION

Improper wire routing can result in poor sprayer performance or damage to the pressure control.

8. **Keep all screws, nuts, washers, gaskets, and electrical fittings** removed during repair procedures. These parts are not normally provided with replacement assemblies.
9. **Test your repair before regular operation** of the sprayer to be sure the problem is corrected.
10. **If the sprayer does not operate properly**, review the repair procedure again to verify that everything was done correctly. If necessary, refer to the Troubleshooting Guide, pages 14–19, to help identify other possible problems and solutions.

WARNING

To reduce the risk of serious bodily injury, including electric shock, **DO NOT** touch any moving parts or electrical parts with your fingers or a tool while inspecting the repair.

Shut off the sprayer and unplug it as soon as you complete the inspection.

Reinstall all covers, gaskets, screws and washers before operating the sprayer.

CAUTION

Do not run the sprayer dry for more than 30 seconds to avoid damaging the pump packings.

11. **Reinstall the motor shield before regular operation** of the sprayer and replace it if it is damaged. The cover directs cooling air around the motor to help prevent overheating. It can also help reduce the risk of burns, fire or explosion; see the **WARNING**, below.

WARNING

During operation, the motor and drive housing become very hot and could burn your skin if touched. Flammable materials spilled on the hot, bare motor could cause a fire or explosion. Always have the motor shield in place during regular operation to reduce the risk of burns, fire or explosion.

MOTOR BRUSH REPLACEMENT

NOTE: Replace the brushes when they have worn to less than 1/2 in. Refer to STEP 1, Fig 23-3. Note that the brushes wear differently on each side of the motor, so check them both. Brush Repair Kit 220-853 is available.

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or on the skin, injury from moving parts, or electric shock. *Unplug the sprayer!*

1. Remove the motor shield (23). Remove the inspection covers (A) and gaskets on each side of the motor. Refer to Fig 23-1.

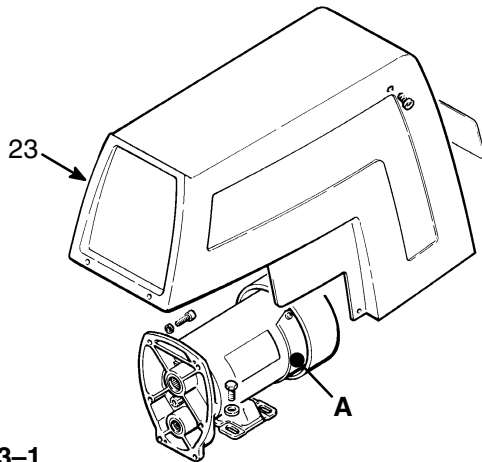


Fig 23-1

2. Push in the spring clip to release its hooks from the brush holder. Pull out the spring clip. Refer to Fig 23-2.
3. *Loosen* the brush lead terminal screw. Pull the brush lead away, but leave the motor lead terminal in place. Remove and discard the brush and spring. Refer to Fig 23-3.
4. Inspect the commutator for excessive pitting, burning or gouging.

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

5. Repeat for the other side.

CAUTION

When installing brushes, follow all steps carefully. Improper installation damages parts beyond use.

6. Place a new brush in the holder so the lead is in the long slot of the holder. Slide the terminal under the terminal screw washer. Ensure the motor lead is still connected at the screw. Refer to Fig 23-4.
7. Place the spring on the brush as shown in Fig 23-4. Do not install backwards to avoid damage when the spring clip is installed.
8. Install the spring clip and push it down until its hooks catch the short slots in the housing. Refer to Fig 23-4. Incorrect installation may jam the clip.
9. Repeat for the other side.

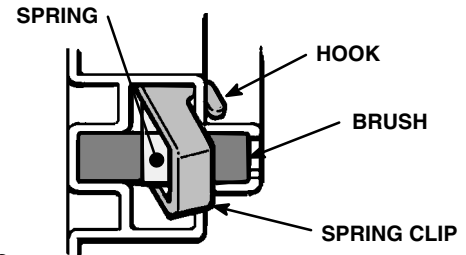


Fig 23-2

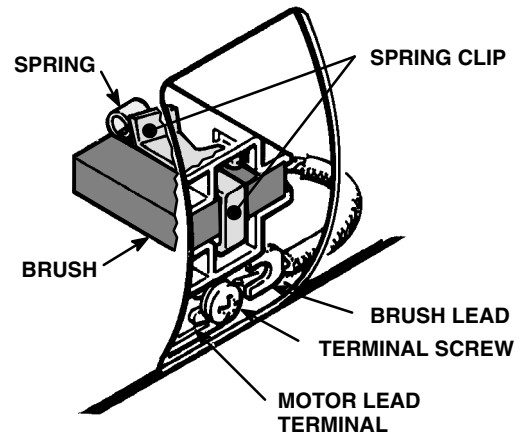


Fig 23-3

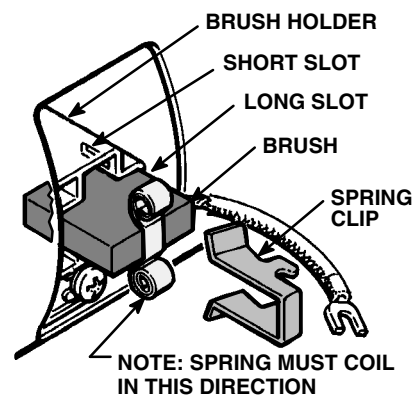


Fig 23-4

10. **Test the brushes.** With the sprayer OFF, turn the pressure control knob fully counterclockwise to minimum pressure. Plug in the sprayer. Turn the sprayer ON. Slowly increase the pressure until the motor comes up to full speed. Inspect the brush and commutator contact area for excessive arcing. Arcs should not "trail" or circle around the commutator surface.

WARNING

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

CAUTION

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

11. Install the brush inspection covers (A) and gaskets. Install the motor shield. See Fig 23-1.

POWER SUPPLY CORD REPLACEMENT

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or on the skin, injury from moving parts, or electric shock. *Unplug the sprayer!*

Refer to Fig 24-1.

1. Remove the pressure control cover.
2. Disconnect the power supply cord lead from the ON/OFF switch (303), the white wire going to the bridge (308), and the green wire to the grounding screw (343) and lockwasher (327).
3. Loosen the strain relief bushing (328). Remove the power supply cord (311).
4. Install the new cord (311) in the reverse order of disassembly.
5. Reinstall the pressure control cover.

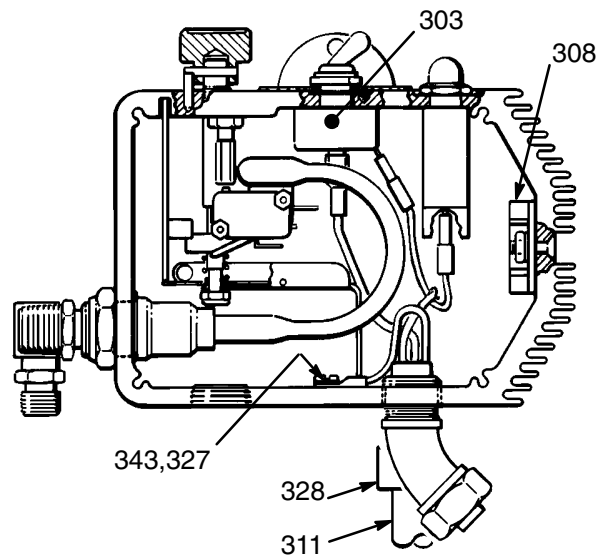


Fig 24-1

ON/OFF SWITCH REPLACEMENT

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or on the skin, injury from moving parts, or electric shock. *Unplug the sprayer!*

Refer to Fig 24-2 except where noted.

1. Remove the pressure control cover.
2. Use a needle nose pliers to disconnect the upper terminal wire from the microswitch (302) for ease in removing the ON/OFF switch (303). Refer to Fig 24-1.
3. Use pliers to disconnect the two black wires from the ON/OFF switch (303). Refer to Fig 24-1.
4. Use a 5/8 in. socket wrench to loosen and remove the nut and rubber boot (304) from the top of the pressure control box. Remove the switch guard (305).
5. Remove the ON/OFF switch.
6. Install the new switch so the internal tab of the anti-rotation ring (B) engages with the vertical groove in the threads of the switch, and the external tab engages with the blind hole (A) of the pressure control box.
7. Install the switch guard (305), aligning the internal tab with the groove in the threads.

8. Powder the inside of the rubber boot (304) with talcum, then shake excess out of boot.
9. Install the nut and rubber boot and tighten.
10. Reconnect the wires to the ON/OFF switch (303) and reconnect the wire to the microswitch (302).
11. Reinstall the pressure control cover.

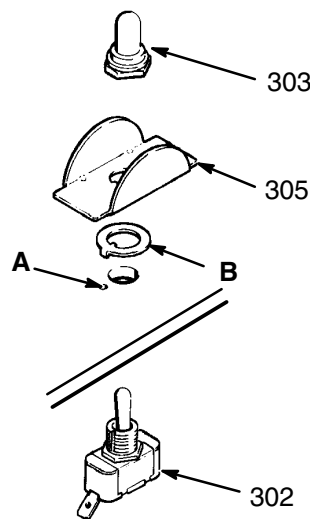


Fig 24-2

BRIDGE RECTIFIER REPLACEMENT

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or on the skin, injury from moving parts, or electric shock. *Unplug the sprayer!*

NOTE: *The most common cause of bridge failure is a faulty motor.* Check the motor before replacing the bridge to prevent damage to the new bridge.

1. Remove the pressure control cover.
2. Disconnect all wires from the bridge (308) at the appropriate terminals, using needle nose pliers.
3. Outside the pressure control box are two screws (331). *Loosen*, but don't remove the screw nearest the motor. Then loosen and remove the front screw. Slide the bridge out.
4. Slide the slotted end of the new bridge (308) into the box so the lockwasher (333) on the rear screw (331) is IN FRONT of the bridge. Refer to the DETAIL below.

5. Install the front screw (331), lockwasher (333) and nut (332). Make sure the bridge is flush with the side of the box and tighten the screws securely.

CAUTION

The lockwashers (333) must be in front of the bridge to avoid overheating which will result in bridge failure. Refer to the DETAIL in Fig 25-1.

6. Connect all wires. Carefully route the wires.

CAUTION

Be sure the flat blade of the insulated male connector is centered in the wrap-around blade of the female connector when the connections are made. Improper connections may cause the sprayer to malfunction.

Route all wires carefully to avoid interference with the movement of the bourdon tube, circuit board, or control box cover which could cause a malfunction.

7. Reinstall the pressure control cover.

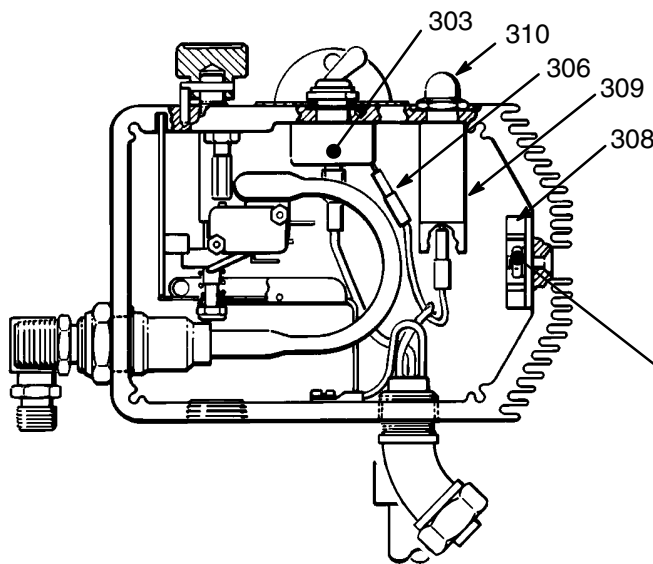
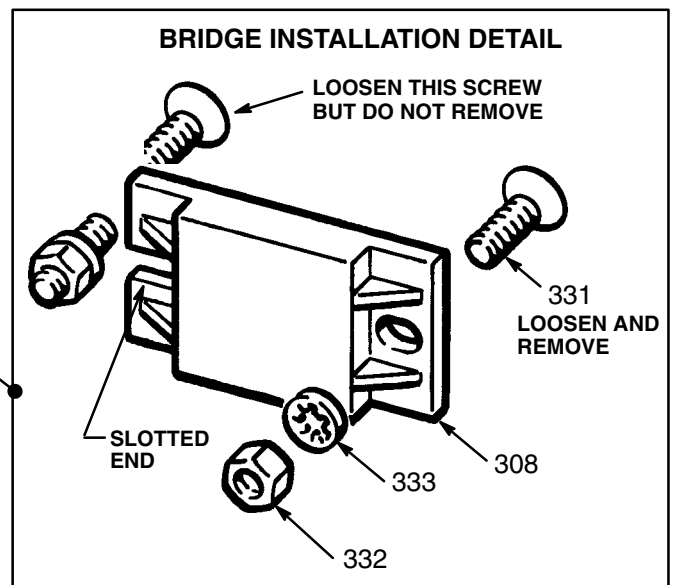


Fig 25-1



CIRCUIT BREAKER REPLACEMENT

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or on the skin, injury from moving parts, or electric shock. *Unplug the sprayer!*

Refer to Fig 25-1.

1. Remove the pressure control cover.
2. Use a small screwdriver to slide the terminal adapter off the circuit breaker terminal.
3. Disconnect the single black wire (306) from the circuit breaker (309) to the ON/OFF switch (303).

4. Use a 5/8 in. socket wrench to loosen the nut and boot (310) on the circuit breaker button.
5. Push down on the top of the circuit breaker and pull it out of the box.
6. Install the new circuit breaker in the reverse order.
7. Reinstall the pressure control cover.

CAUTION

Do not allow the circuit breaker contacts to touch the bourdon tube, which will cause a short. Tighten the circuit breaker nut firmly to prevent the circuit breaker from turning.

CIRCUIT BOARD REPLACEMENT

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or on the skin, injury from moving parts, or electric shock. *Unplug the sprayer!*

Refer to Fig 26–1 and 26–2.

1. Remove the pressure control cover.
2. Turn the pressure control knob to the minimum setting to release spring tension on the board. Check to be sure only three or four threads of the pressure control knob shaft are exposed below the pressure adjustment nut (A). Loosen the nut, if necessary. Refer to Fig 26–1.

CAUTION

Step 2 is essential to reduce the risk of damaging the circuit board while removing or installing it.

3. Disconnect ALL wires from the board, including the two heavy black wires. Pay close attention to where connections are made. Refer to Fig 26–2.
4. Pull out the black plastic-tipped pin (34). Push the bottom of the circuit board toward the wall of the control and carefully slide the board out.
5. Reinstall the new board in the box at the same angle as it was removed.

6. Reconnect all wires. Refer to the wiring diagram in Fig 26–2. Ease the pin (34) into the retainer.

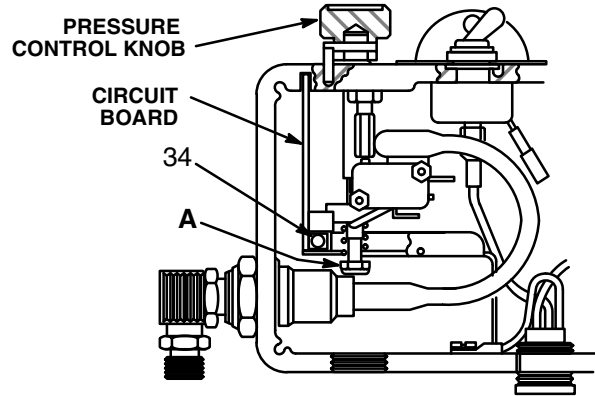


Fig 26–1

CAUTION

Be sure the flat blade of the insulated male connector is centered in the wrap-around blade of the female connector when the connections are made.

Route all wires carefully to avoid interference with the circuit board, bourdon tube, or pressure control cover.

These precautions are essential to reduce the risk of a malfunction.

7. Perform the **PRESSURE CONTROL ADJUSTMENT**, page 28, if you installed a new board.

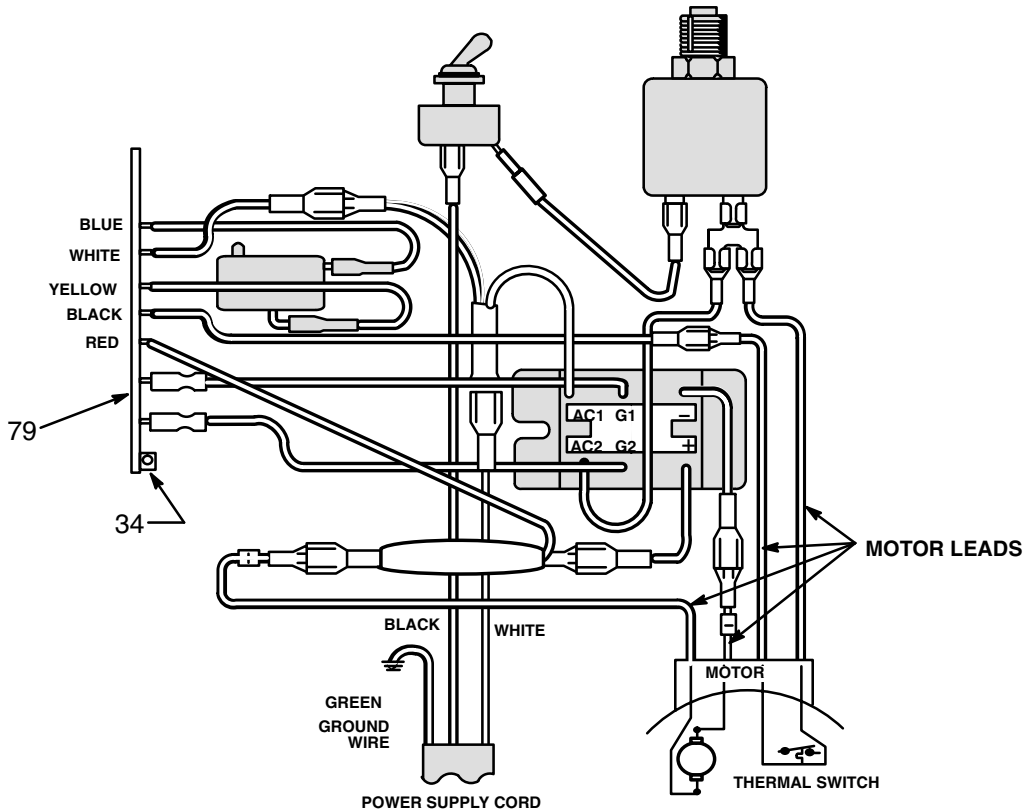


Fig 26–2

PRESSURE CONTROL REPLACEMENT

WARNING

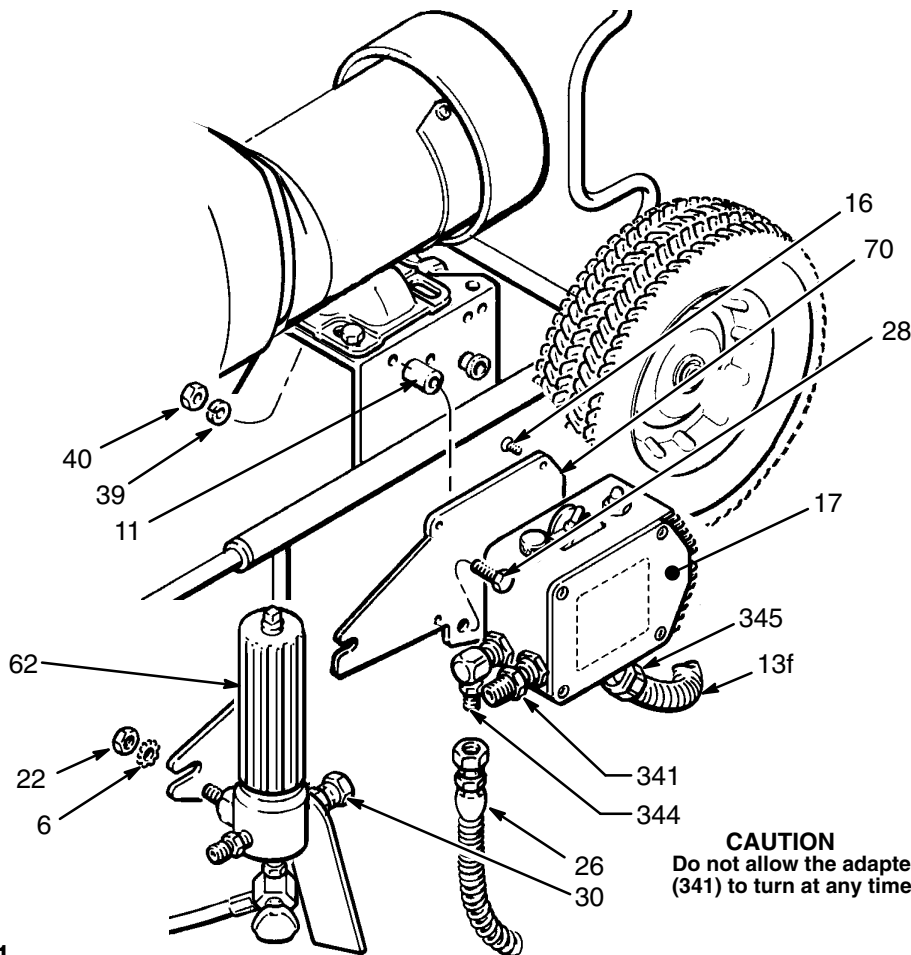
Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or on the skin, injury from moving parts, or electric shock. *Unplug the sprayer!*

Refer to Fig 27-1 except where noted.

1. Disconnect the main fluid hose and the secondary fluid hose, if used. Disconnect the fluid hose (26) at the displacement pump nipple and the pressure control nipple (344).
2. Loosen the filter bracket nut (22).
3. Hold the hex of the pressure control adapter (341) firmly with a 3/4" open end wrench. Use an adjustable wrench to unscrew the swivel union (30), and then remove the fluid filter (62).
4. Remove the pressure control cover (17). Disconnect the four motor leads. Refer to Fig 26-2.
5. Remove the circuit board and retain it. Refer to page 26.
6. Remove the conduit (13f).
7. Remove the three screws (28) and lockwashers (39) and nuts (40) located below the pressure control. Remove the pressure control.
8. Remove the screws (16) holding the back mounting bracket (70) to the pressure control.
9. Install the new pressure control assembly in the reverse order of disassembly. Reinstall the conduit seal (21) around the wires in the conduit connector (345) to prevent motor contamination from entering the control. See the DETAIL below.
10. Perform the **PRESSURE CONTROL ADJUSTMENT**, page 28, before regular operation of the sprayer.

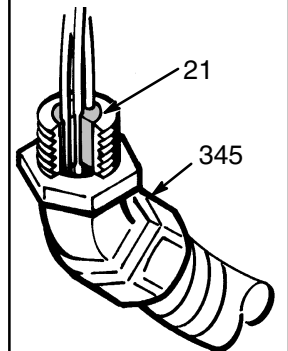
CAUTION

Do not allow the adapter (341) to turn while installing the new pressure control assembly. Turning it can damage the sensitive bourdon tube. Hold the adapter firmly with a 3/4" open end wrench while screwing in the swivel union (30).



DETAIL

Shows position of conduit seal (21) in conduit connector (345)



CAUTION
Do not allow the adapter (341) to turn at any time.

Fig 27-1

PRESSURE CONTROL ADJUSTMENT

WARNING

USE EXTREME CAUTION WHEN PERFORMING THIS ADJUSTMENT PROCEDURE to reduce the risk of a fluid 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 3000 psi (210 bar) **MAXIMUM WORKING PRESSURE** and sets the overpressurization switch (microswitch) to approximately 3600 psi (242 bar).

Perform this procedure whenever the pressure control assembly is removed and reinstalled or replaced, or a new circuit board is installed.

Improper adjustment can cause the sprayer to overpressurize and result in component rupture, fire or explosion. It may also prevent the sprayer from obtaining the maximum working pressure, resulting in poor sprayer performance.

NEVER try to increase the sprayer's maximum working pressure of 3000 psi (210 bar) by performing these adjustments in any other way. Normal operation of the sprayer at higher pressures may result in component rupture, fire or explosion. To perform this adjustment, however, the sprayer pressure must be *temporarily* increased above the normal working pressure.

Use a *new* 50 ft (15.2 m) spray hose rated for at least 3000 psi (210 bar) **MAXIMUM WORKING PRESSURE**. A used, under-rated hose could develop a high pressure leak or rupture.

NOTE: The following tools and equipment are required for this procedure.

3/8 in. nut driver or 3/8 in. socket wrench

1/4 in. open end wrench

7/16 in. open end wrench

0 – 5000 psi, oil-filled test gauge, Part No. 102–814

Pail of clean water

Mineral spirits

NEW 3000 psi (210 bar) high pressure spray hose, Part No. 214–915

1. Follow the **Pressure Relief Procedure Warning** on page 22.
2. Refer to the above list of tools and equipment needed. Remove the plug (62a) from the top of the fluid filter and install the fluid-filled pressure gauge. Refer to Fig 28–1. Connect the gun to the **new** test hose and connect the hose to the sprayer outlet.
3. Remove the pressure control cover.

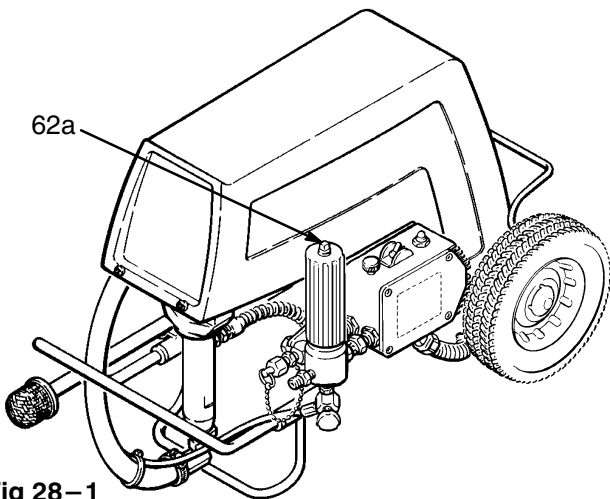


Fig 28–1

5. Be sure the gun safety latch is engaged.

NOTE: For Steps 5 through 18, refer to Fig 29–1.

6. Plug in the sprayer.
7. Turn the pressure control knob (A) to the *minimum* setting (fully counterclockwise), and turn the sprayer **ON**. **THE DISPLACEMENT PUMP SHOULD NOT CYCLE**

If it does cycle, remove the plug (7) from the bottom of the pressure control. Insert a 3/8 in. nut driver through the opening, and unscrew the pressure adjustment nut (D) just until the sprayer stops running.

Adjust the Overpressurization Switch

8. With the spray gun triggered, **slowly** turn the pressure control knob clockwise just until the sprayer starts. Prime the pump and hose.
9. Slowly turn the pressure control knob to the maximum setting. While watching the red light on the circuit board and the pressure gauge, turn the nut (D) **slowly** to increase pressure until the red light goes out **and** the gauge reads between 3400 – 3800 psi (238 – 266 bar).

If the red light does not go out by 3800 psi (266 bar), loosen the nut (B) and adjust the stud (C) until the light goes out.

If the red light goes out before 3400 psi (238 bar), loosen the nut (B) and adjust the stud (C) until the light goes out between 3400 – 3800 psi (238 – 266 bar).

10. Tighten the nut (B) if it was loosened in Step 9.
11. Trigger the gun to relieve pressure. Release the trigger and engage the safety latch. Repeat Step 9 to verify your results.
12. Install the pressure control cover.

PRESSURE CONTROL ADJUSTMENT

Maximum Working Pressure Adjustment

- Turn the sprayer OFF . Disengage the gun safety latch. Trigger the gun into a grounded waste container until pressure is relieved. Engage the gun safety latch.
- Use the 3/8 in. nut driver to turn the pressure adjustment nut (D) counterclockwise one full turn.
- With the pressure control knob at the *minimum* setting, turn the sprayer ON.
- Slowly** turn the pressure control knob (A) clockwise to the maximum setting and hold it there. Use a 3/8 in. nut driver or socket wrench to slowly turn the pressure adjustment nut (D) clockwise until the gauge reads EXACTLY 3000 psi (210 bar).
- Turn the pressure control knob to the minimum setting. Release the gun safety latch and trigger the gun into a grounded waste container until pressure is relieved. Engage the gun safety latch. Slowly increase the pressure to verify that the maximum working pressure is set at 3000 psi (210 bar).

CAUTION

To prevent pump corrosion, flush the water out of the pump, hose and gun with mineral spirits. Be sure to close the drain valve, first. Use the lowest pressure necessary to flush. Follow the **Pressure Relief Procedure Warning** on page 22. Leave the mineral spirits in the pump to protect it until you are ready to spray again.

- Install the plug (7) in the bottom of the pressure control. Remove the gauge assembly and reinstall the plug. Flush out the water with mineral spirits.

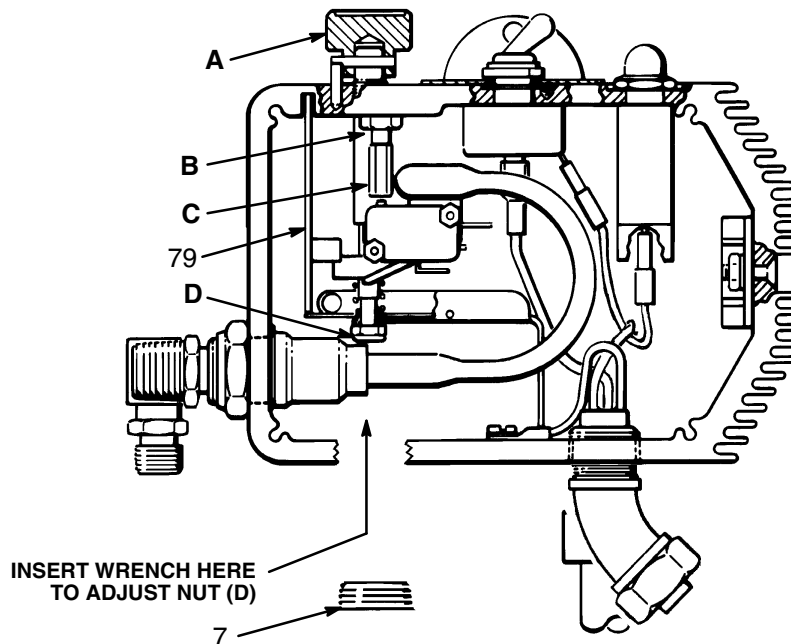


Fig 29-1

BEARING HOUSING & CONNECTING ROD REPLACEMENT

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or in the skin, injury from moving parts or electric shock. *Unplug the sprayer!*

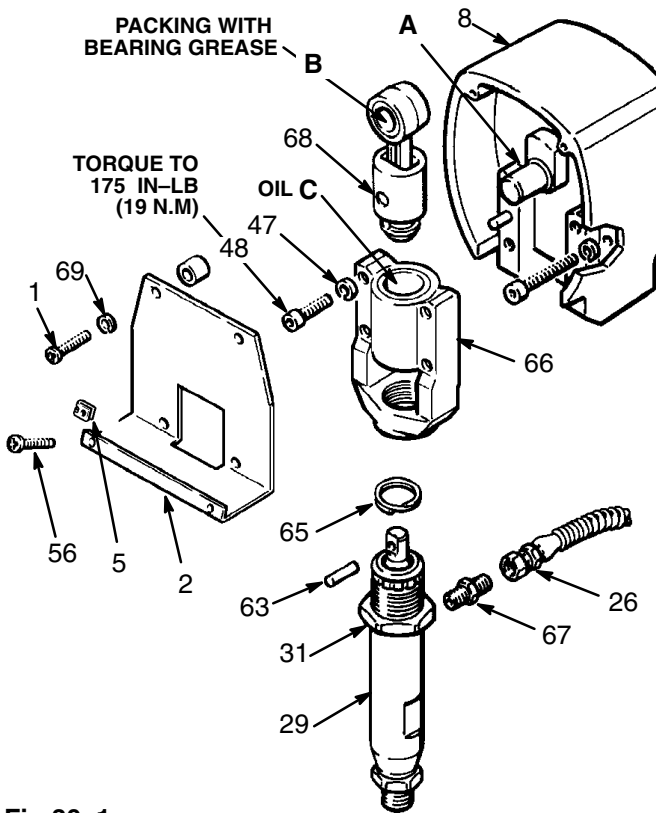


Fig 30-1

NOTE: Stop the sprayer at the bottom of its stroke to get the crank (A) in its lowest position. To lower the crank manually, carefully rotate the blades of the fan with a screwdriver.

1. Remove the lift handle (2). Hold a wrench on the pump intake valve and unscrew the pump suction tube. Disconnect the short hose (26) from the pump.
2. Push up the retaining spring (65). Push the pin (63) out the rear.
3. Loosen the pump jam nut (31). Unscrew the displacement pump (29).
4. Remove the four screws (48) and lockwashers (47) from the bearing housing (66).
5. Lightly tap the lower rear of the bearing housing (66) with a plastic mallet to loosen it from the drive housing (8). Pull the bearing housing and the connecting rod assembly (68) straight off the drive housing.
6. Inspect the crank (A) for excessive wear and replace parts as needed. Evenly lubricate the inside of the bronze bearing (C) with high quality motor oil. Liberally pack the roller bearing (B) with bearing grease.

7. Assemble the connecting rod (68) and bearing housing (8).
8. Clean the mating surfaces of the bearing and drive housings.
9. Align the connecting rod with the crank (A) and carefully align the locating pins in the drive housing with the holes in the bearing housing (8). Push the bearing housing onto the drive housing or tap it into place with a plastic mallet.

CAUTION

DO NOT use the bearing housing screws (48) to try to align or seat the bearing housing; the bearing and drive housing will not align properly and will result in premature bearing wear.

10. Install the screws (48) and lockwashers (47) in the bearing housing. Tighten the screws evenly to 175 in-lb (19 N.m).

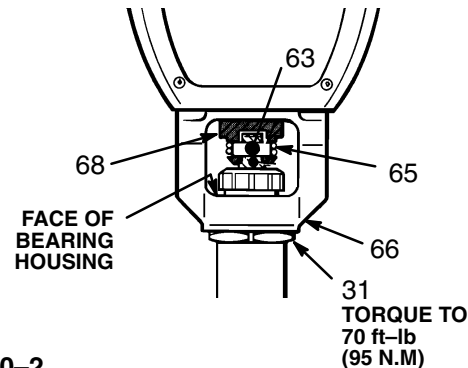


Fig 30-2

11. Screw the displacement pump 3/4 of the way into the bearing housing (8). Hold the pin (63) up to the pin hole in the connecting rod (68). Screw in the pump until the pin slides easily into the hole. Back off the pump until the top threads of the pump cylinder are flush with the face of the bearing housing and the outlet adapter (67) is facing back. Push the retaining spring (65) into the groove all the way around the connecting rod. Tighten the locknut (31) very tight – about 70 ft-lb (95 N.m) – with a 2 in. open end wrench and a light hammer. See Fig 30-2.

WARNING

Be sure the retaining spring (65) is firmly in the groove all the way around, to prevent the pin (63) from working loose due to vibration. See Fig 30-2.

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

12. Install the front cover (2). Connect all hoses. See Fig 30-1.

DRIVE HOUSING REPLACEMENT

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or in the skin, injury from moving parts or electric shock. *Unplug the sprayer!*

CAUTION

DO NOT allow the gear cluster (51) to fall when removing the drive housing (8). It is easily damaged if dropped. The gear may stay engaged in either the front end bell or the drive housing.

DO NOT lose the thrust balls (8a, 13h) located at each end of the gear cluster (51) or allow them to fall between gears. The ball, which is heavily covered with grease, usually stays in the shaft recesses, but could be dislodged. If caught between gears and not removed, the balls will seriously damage the drive housing. If the balls are not in place, the bearings will wear prematurely.

Refer to Fig 31-1.

1. Remove the lift handle (2). Remove the motor shield (23).
2. Remove the four screws (48) and lockwashers (47) from the bearing housing.
3. Lightly tap the lower rear of the bearing housing (66) with a plastic mallet to loosen it from the drive housing (8). Then pull the bearing housing and connecting rod assembly straight off the drive housing.
4. Remove the two screws (49) and lockwashers (9) from the recess of the drive housing.
5. Remove the two screws (58) and lockwashers (9) from the bottom rear of the motor front end bell (A).
6. Remove the two screws (10) and lockwashers (9) from the upper rear of the motor front end bell (A).
7. Tap the drive housing (8) with a plastic mallet to loosen it from the front end bell (A), then pull it straight off.

8. Liberally apply bearing grease to the gear cluster (51). Use the grease supplied with the drive housing replacement kit. Check to be sure the thrust balls (8a, 13h) are in place.

NOTE: The gears and bearings between the drive housing and the motor front end bell should contain a total of 6 oz. of grease.

9. Place the bronze-colored washer (8b) THEN the silver-colored washer (8c) on the shaft protruding from the big gear in the drive housing (8). Align the gears and push the new drive housing straight onto the front end bell and locating pins.

10. Starting at Step 7 and working backwards, continue to reassemble the sprayer.

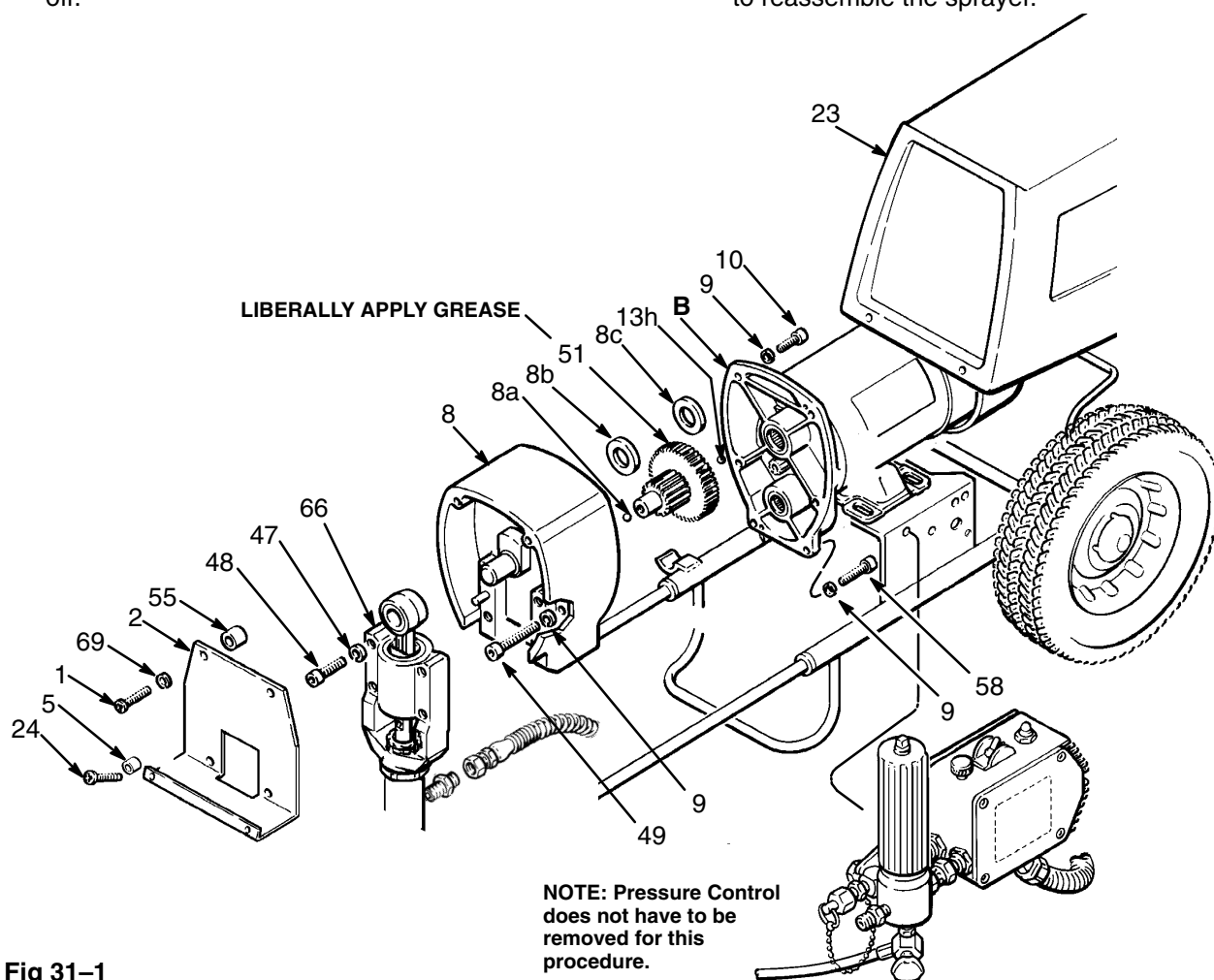


Fig 31-1

MOTOR REPLACEMENT

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or in the skin, injury from moving parts or electric shock. *Unplug the sprayer!*

Refer to Fig 33–1 unless otherwise instructed.

1. Remove the motor shield (23).
2. Remove the pressure control cover (17). Disconnect the four motor leads.
3. Loosen the conduit connector nut (345) at the pressure control (18).
4. Swing the conduit (13f) away from the pressure control elbow (13a).
5. Remove the conduit seal (21) from around the conduit elbow coming into the control box. Pull the motor leads through the elbow, one at a time.

CAUTION

Always pull the motor leads one at a time to avoid loosening the terminals, which could result in a bad connection and poor sprayer performance.

6. Loosen the connector nut (13a) at the motor and pull the conduit (13f) away from the motor. Pull the leads through the conduit, one at a time.
7. Unscrew the connector elbow from the motor.
8. Pull the wires through the elbow, one at a time.
9. Remove the front cover (2).
10. Remove the two screws (49) and washers (9) from the recess of the drive housing (8).
11. Remove the two screws (58) and washers (9) from the lower rear of the motor front end bell (A).
12. Remove the two screws (10) and washers (9) from the upper rear of the motor front end bell (A).
13. Use a plastic mallet to gently tap the displacement pump (29) from the rear to loosen the drive housing (8) from the front end bell (A). Pull the drive housing away from the end bell.

CAUTION

DO NOT allow the gear cluster (51) to fall when removing the drive housing (8). It is easily damaged if dropped. The cluster may stay engaged in either the front end bell or the drive housing.

DO NOT lose the thrust balls (8a, 13h) located at each end of the gear cluster (51) or allow them to fall between gears. The ball, which is heavily covered with grease, usually stays in the gear recesses, but could be dislodged. If caught between gears and not removed, the balls will seriously damage the drive housing. If the balls are not in place, the bearings will wear prematurely.

14. While supporting the motor to keep the sprayer from tipping, remove the four screws (38), washers (59), lockwashers (39) and nuts (40) holding the motor to the frame. Lift off the motor.
15. Place the new motor on the frame and align the frame mounting holes. Install the screws (38), washers (59), lockwashers (39) and nuts (40) tightly.
16. Liberally grease the gear cluster (51) and pinion gear (B) and pack all bearings in the motor front end bell. Check to be sure the thrust balls (8a,13h) are in place.

NOTE: The gears and bearings between the drive housing and the motor front end bell should contain a total of 6 oz. of grease.

17. Place the bronze-colored washer (8b) and THEN the silver-colored washer (8c) on the shaft protruding from the big gear in the drive housing (8).
18. Align the gears and push the drive housing (8) straight onto the front end bell (A) and locating pins.
19. Starting at Step 12 and working backwards, continue to reassemble the sprayer.

NOTE: Use a turning motion on the conduit (13f) when feeding wires through it.

20. Install the conduit seal (21) around the wires in the conduit elbow (345) at the pressure control to keep contaminants from entering the motor conduit. See the Detail in Fig 33–1.
21. Install the motor shield and pressure control cover.

WIRING DIAGRAM

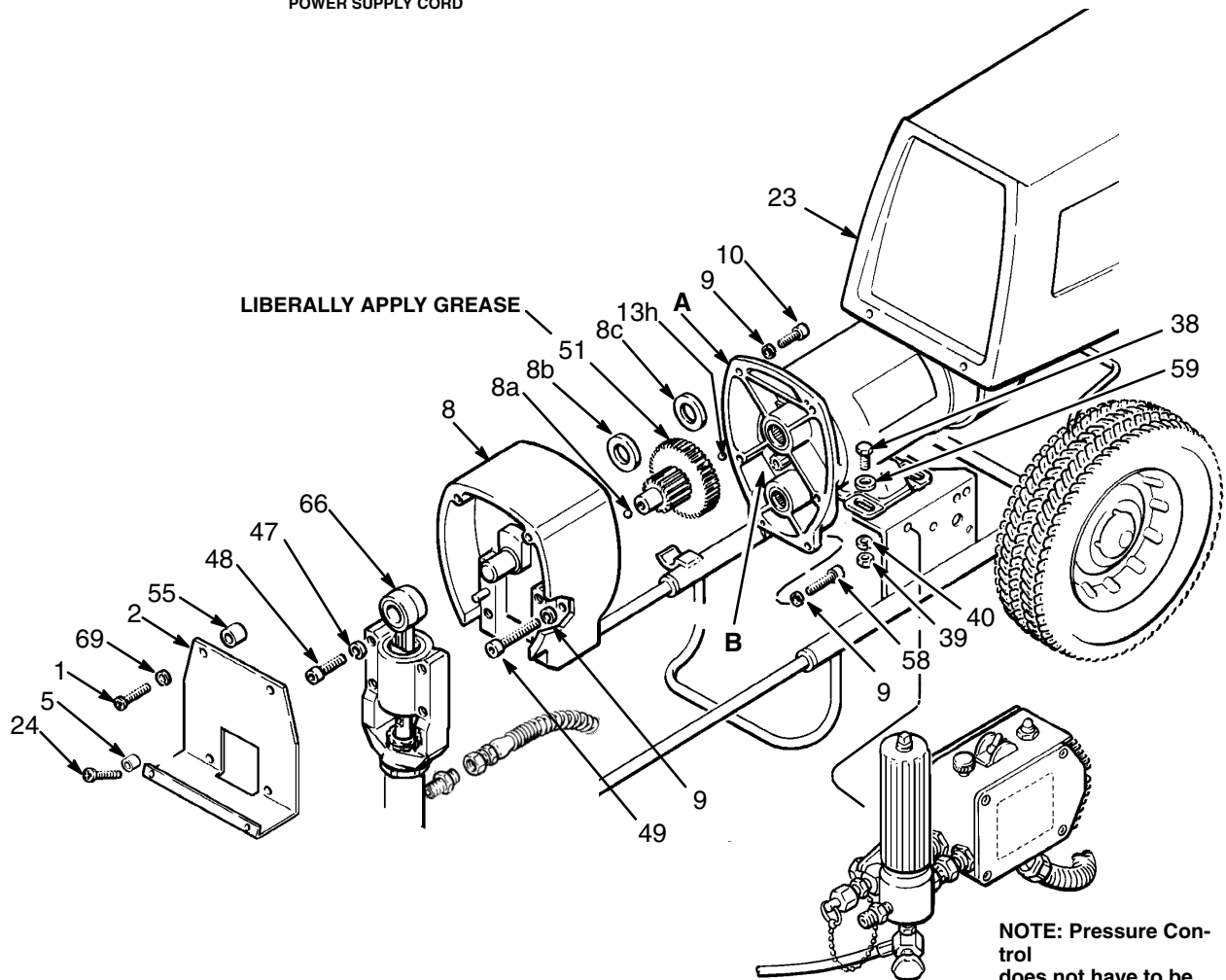
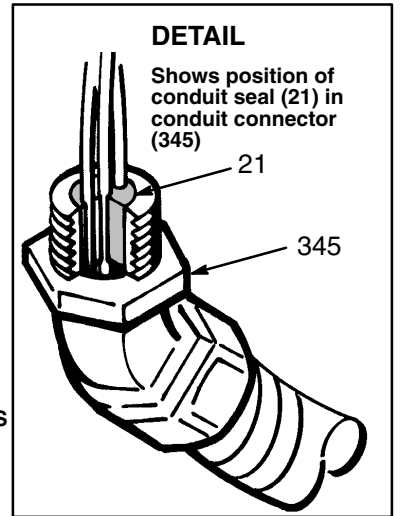
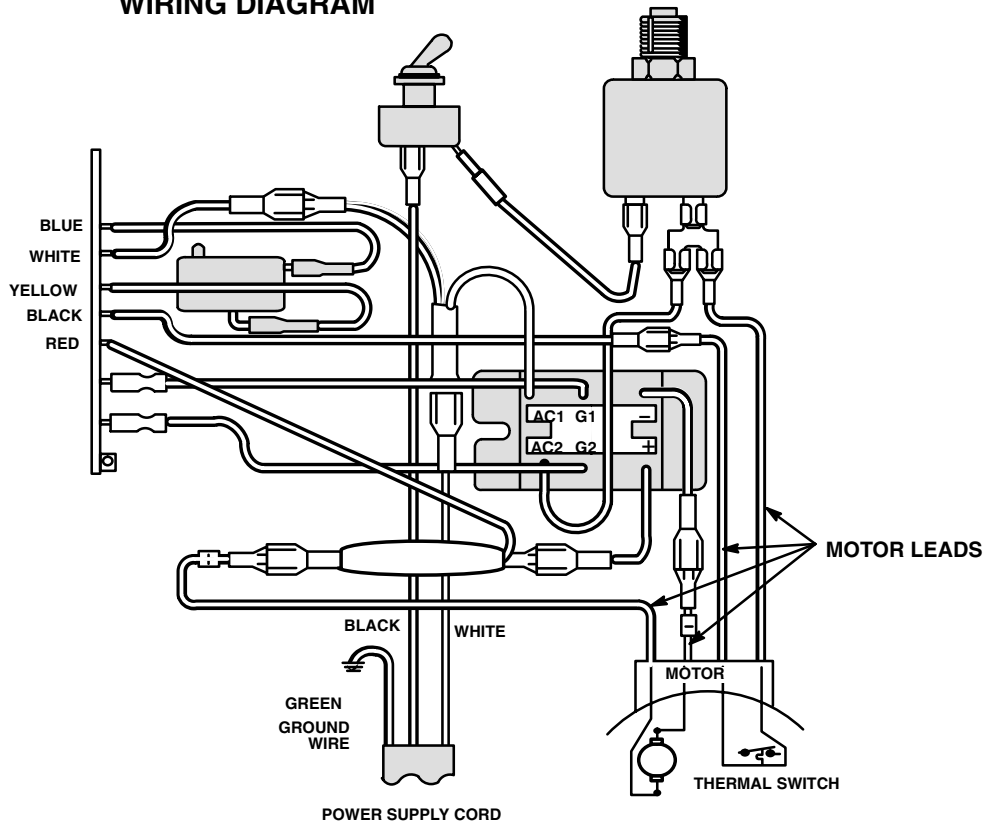


Fig 33-1

DISPLACEMENT PUMP REPAIR

WARNING

Before doing this procedure, follow the **Pressure Relief Procedure Warning** on page 22 to reduce the risk of a fluid injection injury, splashing in the eyes or on the skin, injury from moving parts or electric shock. *Unplug the sprayer!*

NOTE: Packing Repair Kit 222-588 is available. In the text and drawings, reference numbers with an asterisk, i.e., (210*), indicate the parts included in the repair kit. For the best results, use all the new parts in the kit, even if the old ones still look good.

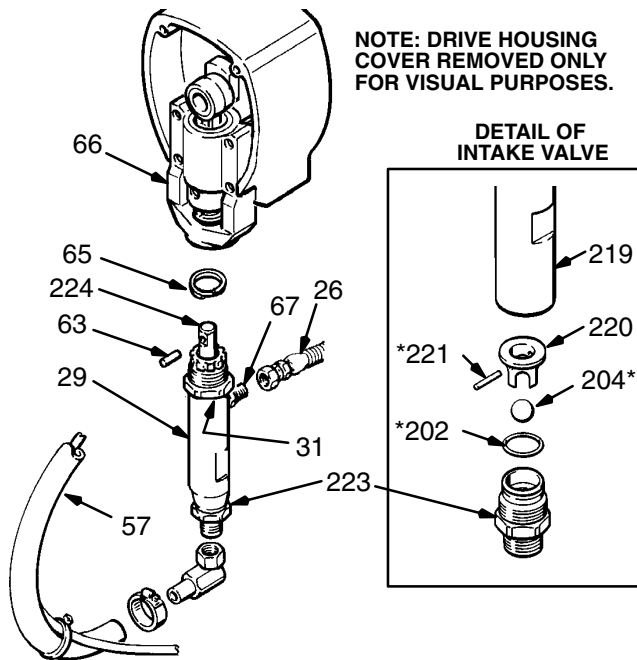


Fig 34-1

NOTE: DRIVE HOUSING COVER REMOVED ONLY FOR VISUAL PURPOSES.

DETAIL OF INTAKE VALVE

2. Clean and inspect the parts for wear or damage, replacing parts as needed. Always use the new o-ring included in the Repair Kit. If no further service is needed, reassemble the intake valve.
3. Remove the packing nut (216) and plug (205). *Refer to Fig 35-3.*
4. Use a plastic mallet to tap the piston rod (224) down, then pull the rod out through the bottom of the cylinder.
5. Remove the throat packings (207, 213) and glands (208, 209). *Refer to Fig 35-3.*

NOTE: Whenever you disassemble the pump for cleaning or repair, remove the sleeve. A special sleeve removal tool is available. Order Graco Part No. 222-586. Do not use any other type of tool.

WARNING

Always use the special sleeve removal tool to remove the sleeve. Other removal methods could cause the pump to rupture, resulting in serious bodily injury. If the sleeve cannot be removed easily using the tool, return the sleeve and cylinder to your Graco distributor for removal.

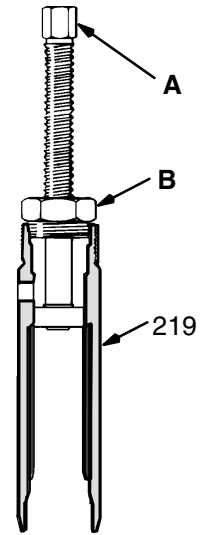


Fig 34-2

6. Screw the large nut (B) of the tool into the top of the cylinder (19). Screw down the rod (A) to push the sleeve out. Remove the tool. *Refer to Fig 34-2.*
7. Clamp the flats of the piston rod in a vise. Loosen the retaining nut (211). Unscrew the piston valve (222) from the rod. Remove all parts from the piston valve (222). *Refer to Fig 35-1.*

Reassembling the Pump

NOTE: Alternate leather and plastic packings as shown in Fig 35-1. The lips of the throat "V" packings must face down, against pressure. The lips of the piston "V" packings must face up, against pressure. The lips of the U-cup seal (203) face down. Incorrect installation damages the packings and results in pump leaking.

NOTE: Soak leather packings in oil before using them.

1. Check the outside of the piston rod (224) and the inside of the sleeve (218) for scoring or scratches. If these parts are damaged, new packings will not seal properly. Replace these parts if needed.
2. Stack the backup washer (214), seal (203*), female gland (215*), alternate the packings (212*, 206*), and then male gland (210*) onto the piston valve (222). *Refer to Fig 35-1.*

Removing the Pump *Refer to Fig 34-1.*

1. Flush the pump, if possible, and relieve pressure again. Stop the pump with the piston rod (224) in its lowest position, if possible.
2. Hold the wrench on the pump intake valve (223) to keep the pump from loosening and remove the suction tube (57).

NOTE: If repairing only the intake valve assembly, go to **Disassembling the Pump**, Steps 1 and 2.

3. Remove the hose (26) from the nipple (67).
4. Push the retaining spring (65) up. Push out the pin (63).
5. Loosen the locknut (31) and unscrew the pump from the bearing housing (66).

Disassembling the Pump

1. Unscrew the intake valve (223) from the cylinder (219). Remove the o-ring (202), ball guide (220), stop pin (221) and ball (204) from the valve. *Refer to Fig 34-1.*

DISPLACEMENT PUMP REPAIR

3. Tighten the packing retaining nut (211) onto the piston valve (222) to 19 ft-lb (27 N.m).
Note the alignment of the piston (222) to the packing retainer nut (211). Maintain this alignment through Steps 5, 6 and 7.
4. Place the ball (225) on the piston valve (222). Refer to Fig 35-1.

CAUTION

Step 5 is critical. Follow the procedure carefully to avoid damaging the packings by overtightening.

5. Apply one drop of adhesive, supplied, to the threads of the piston valve. Then hand tighten the valve assembly into the piston rod just until the nut (211) contacts the rod. Refer to Fig 35-1.

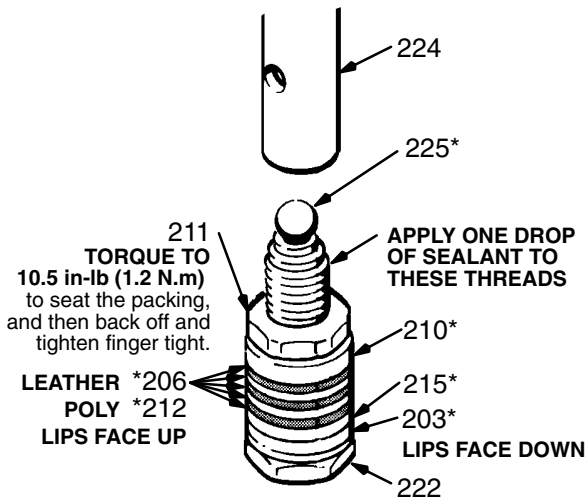


Fig 35-1

6. Place the flats at the top of the rod in a vise.
7. Use a wrench to **CAREFULLY** tighten the nut (211) onto the piston rod to 19 ft-lbs (25 N.m). Refer to Fig 35-2.

Use two wrenches to maintain the alignment mentioned in Step 7, above.

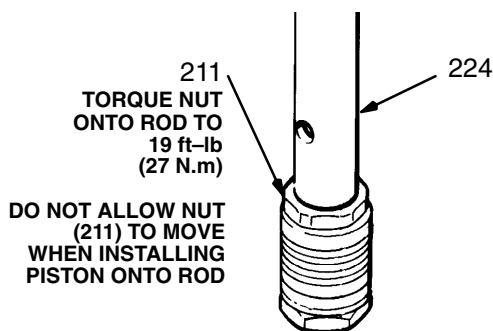


Fig 35-2

8. One at a time stack the male gland (208*), alternate the packings (213*,207*), and then install the female gland (219) into the top of the cylinder (219). Refer to Fig 35-3.
9. Install the packing nut (216) and plug (205), but leave loose for now. Refer to Fig 35-3.

10. Coat the piston rod and packings with oil. Carefully slide the assembly **INTO THE TOP OF THE SLEEVE**.

NOTE: The tapered end of the sleeve is the bottom of it. Refer to Fig 36-1.

11. Place a new o-ring (217*) firmly in the cylinder groove. Refer to Fig 35-3.

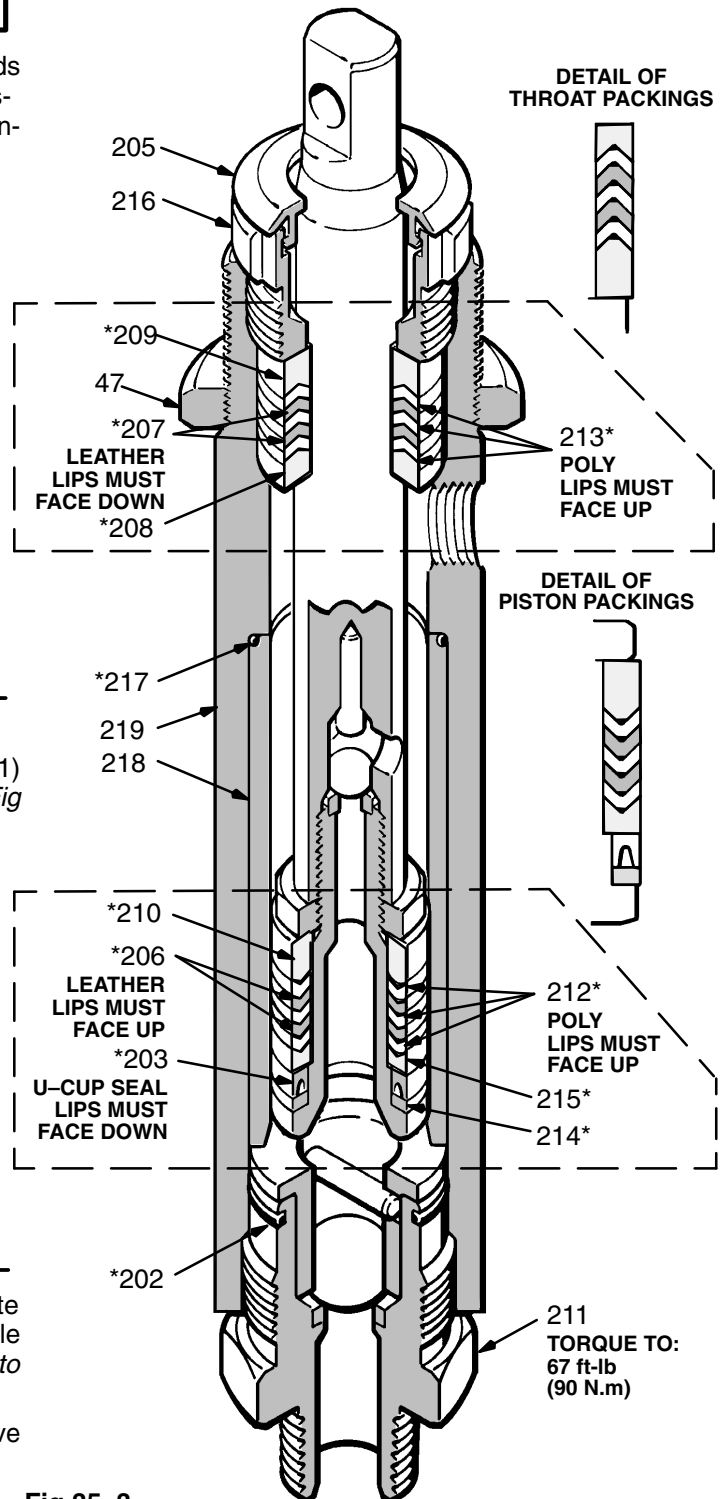


Fig 35-3

DISPLACEMENT PUMP REPAIR

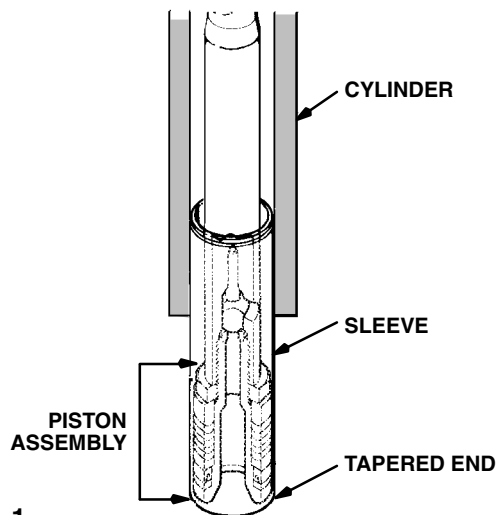


Fig 36-1

12. Slide the sleeve/piston rod assembly **INT O THE BOTTOM OF THE CYLINDER** . This is to prevent packing damage during reassembly . *Refer to Fig 36-1.*
13. Screw down the cylinder locknut (31) until it is finger tight at the bottom of the external cylinder threads.
14. Place flats of the intake valve (223) in a vise. Install a new o-ring (202*). Screw the pump cylinder into the valve. Torque to 67 ft-lb (90 N.m). *Refer to Fig 35-3.*
15. Screw the displacement pump about 3/4 of the way into the bearing housing (66). Hold the pin (63) up to the pin hole in the connecting rod assembly (68) and continue screwing in the pump until the pin slides easily into the hole. Back of f the pump until the top threads of the pump cylinder are flush with the face of the bearing housing and the outlet nipple (67) is straight back. Push the retaining spring (65) into the groove all the way around the connecting rod. Tighten the locknut (31) very tight—about 70 ft-lb (97 N.m)—with a 2 in. open-end wrench and a light hammer. *Refer to Fig 36-2.*

WARNING

Be sure the retaining spring (65) is firmly in the groove of the connecting rod, all the way around, to prevent it from working loose due to vibration. Refer to Fig 36-2.

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

CAUTION

If the locknut (31) loosens during operation, the threads of the bearing housing (66) will be damaged. Be sure to tighten the locknut firmly.

16. Tighten the packing nut (216) just enough to stop leakage, but no tighter. Fill the wet-cup/packing nut 1/3 full with Graco TSL.

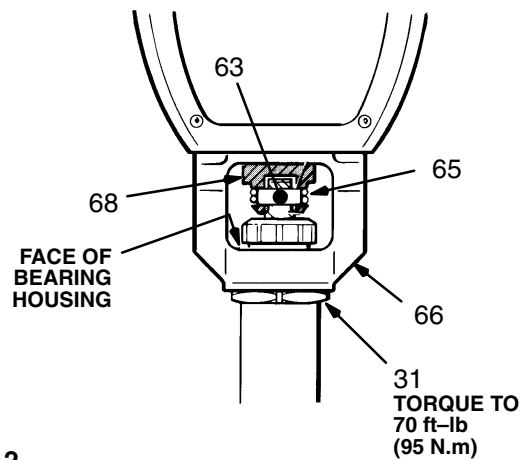


Fig 36-2

PARTS DRAWING & LIST – DISPLACEMENT PUMP

Model 222–580, Series A Sleeved Displacement Pump

Includes items 202 to 225

REF NO.	PART NO.	DESCRIPTION	QTY
202	110–165*	PACKING, o-ring, PTFE®	2
203	107–093*	SEAL, u-cup, polyurethane	1
204	105–445*	BALL; sst	1
205	179–810	PLUG 1	1
206	178–939*	V-PACKING, leather	2
207	178–940*	V-PACKING, leather	2
208	178–942*	GLAND, male	1
209	178–943*	GLAND, female	1
210	178–944*	GLAND, male	1
211	178–945	NUT, hex, retaining	1
212	178–964*	V-PACKING, plastic	3
213	178–965*	V-PACKING, plastic	3
214	181–338*	WASHER, backup	1
215	178–969*	GLAND, female	1
216	179–809	NUT, packing	1
218	185–213	SLEEVE, cylinder	1
219	185–211	CYLINDER	1
220	185–214	GUIDE, ball	1
221	178–938*	PIN, ball stop	1
222	218–036	VALVE, piston	1
223	222–437	VALVE, intake	1
224	222–438	ROD, piston	1
225	105–444*	BALL	1

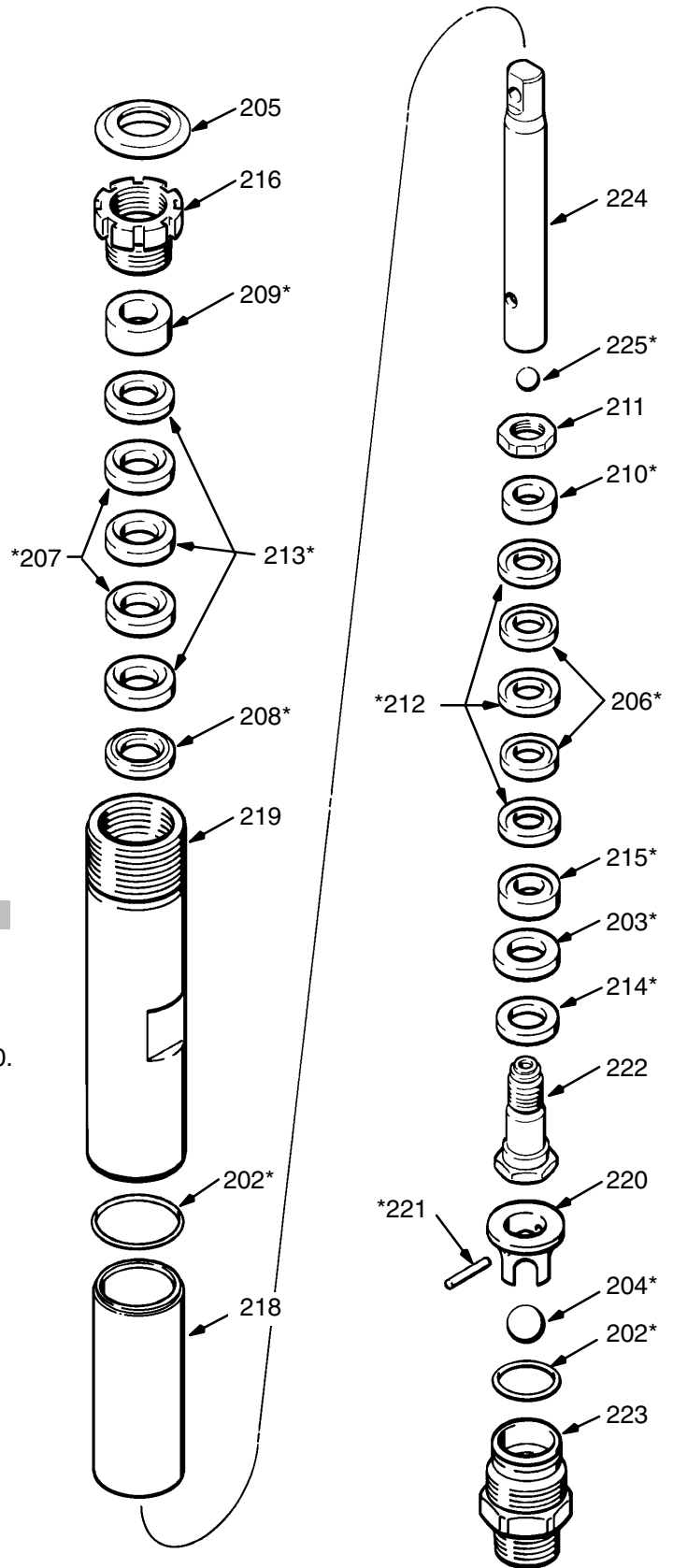
***Supplied in repair kit 222–588.**
 Keep a repair kit on hand to reduce down time.
 Purchase separately.

SLEEVE REMOVAL TOOL

Must be purchased separately.

NOTE: Order the correct tool for your pump.

222–586 Sleeve Removal Tool, for pump 222–580.



PARTS LIST

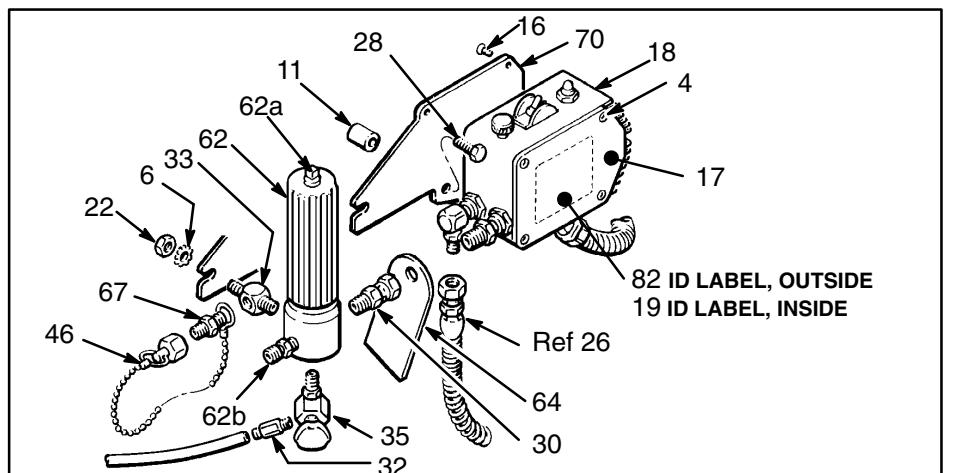
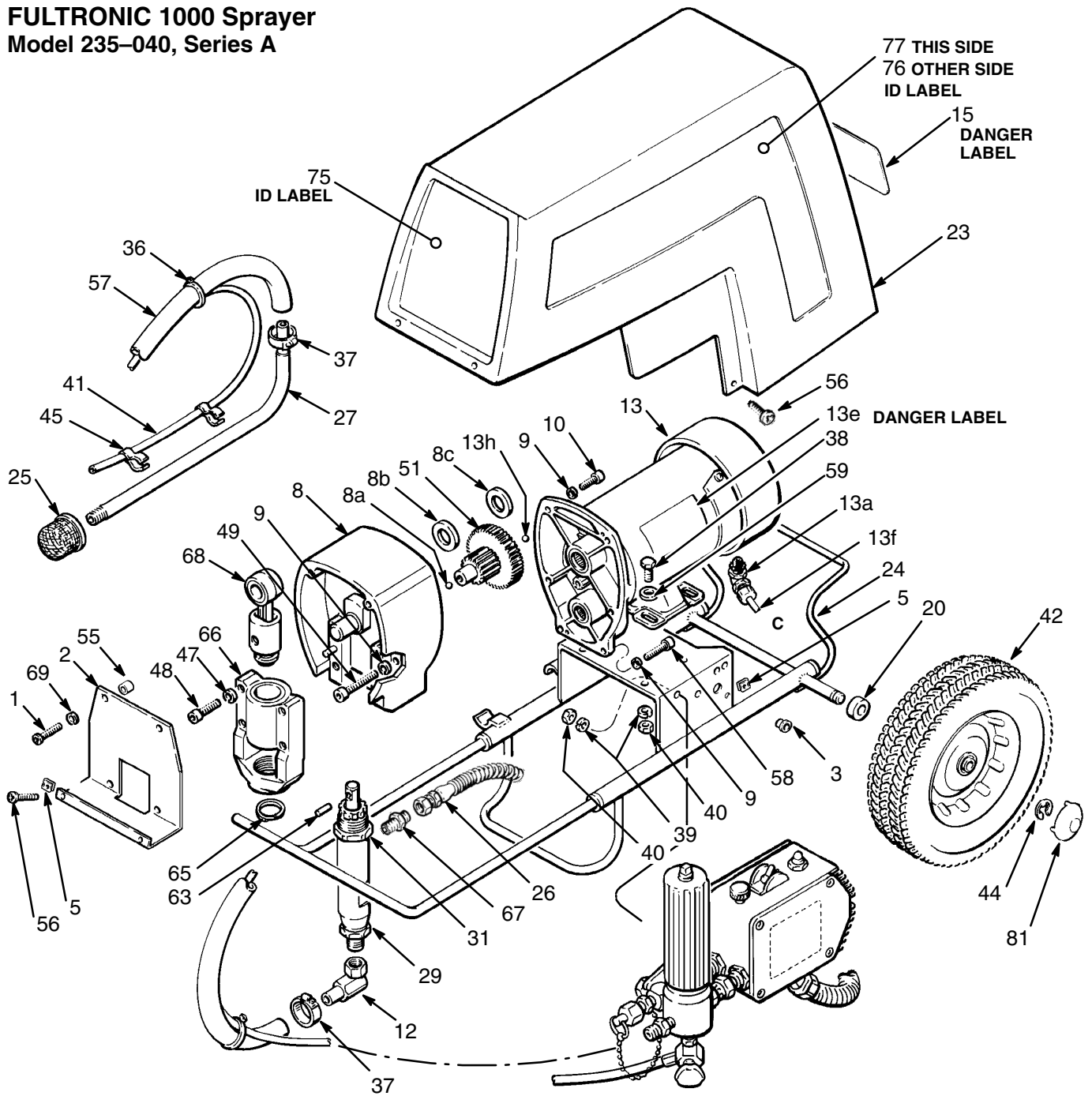
FULTRONIC 1000 Sprayer Model 235-040, Series A

Includes items listed below

REF	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
				31	178-941	NUT, hex; 1 5/8 unef-2B x 2.18 OD; 0.25" thick	1
				32	108-982	CONNECTOR, tube	1
1	110-883	CAPSCREW; mach; cross recess pnh; 8-32 unc-2a x 0.75"	4	33	179-945	ADAPTER, elbow, special; 1/4-18 npt (m x f)	1
2	186-378	HANDLE, lift	1	34	180-041	PIN, straight <i>refer to page 40</i>	1
3	110-847	BUSHING, snap	1	35	221-077	PRESSURE DRAIN VALVE	1
4	110-037	SCREW, mach; cross recess pan hd; 10-24 unc x 0.38"	4	36	103-473	STRAP, wire, tie	2
5	110-846	NUT; self retaining	4	37	103-927	CLAMP, hose, 1.25" ID	2
6	100-322	LOCKWASHER, external shakeproof; 7/16"	1	38	100-057	CAPSCREW, hex hd; 5/16-18 x 7/8"	4
7	101-754	PLUG, pipe, <i>refer to page 40</i>	1	39	100-214	LOCKWASHER, spring, 3/8"	7
8	218-032	DRIVE ASSEMBLY <i>includes replacement items 8a - 8d</i>	1	40	100-188	NUT, hex, 5/16-18	7
8a	100-069	.BALL, sst; 1/4"	1	41	183-281	HOSE, drain	1
8b	107-089	.WASHER, race, thrust; bronze	1	42	106-062	WHEEL, semi-pneumatic	2
8c	178-967	.SPACER; steel	1	44	101-242	RING, retaining	2
8d	110-293	.GREASE, 6 oz.	1	45	178-342	CLIP, spring	2
9	105-510	LOCKWASHER, spring, 0.25"	6	46	220-285	CAP, for secondary outlet	1
10	100-644	CAPSCREW, soc hd; 1/4-20 x 3/4"	2	47	106-115	LOCKWASHER, spring, 3/8"	4
11	186-352	SPACER, pressure control	3	48	107-210	CAPSCREW; sch; 3/8-16 unc-3a x 1.5"	4
12	110-229	UNION, 3/4-14 npsm(f) swivel x 3/4 hose barb	1	49	107-218	CAPSCREW; sch; 1/4-20 unc-3a x 2.75"	2
13	222-388	MOTOR KIT <i>Includes replaceable items 13a - 13h, and one each of 39, 40</i>	1	51	179-961	GEAR	1
13a	110-309	.CONNECTOR	1	55	186-355	SPACER, drive housing cover	4
13b	107-267	.TERMINAL, female	1	56	110-884	SCREW, mach pnh; 10-24 unc x .5"	4
13c	107-504	.TERMINAL, female	1	57	176-920	HOSE, suction, 30" (762 mm)	1
13d	596-421	.TERMINAL, wire, female, snap-on	1	58	100-643	CAPSCREW; sch; 1/4-20 unc-3a x 1"	2
13e	185-954†	.LABEL, DANGER	1	59	107-194	WASHER; 0.625" OD x 0.344" ID; 0.071" thick	4
13f	070-487	.CONDUIT	12 in.	62	214-570	FLUID FILTER <i>Includes 62a and 62b See 307-273 for additional parts.</i>	1
13g	183-885	.TERMINAL	1	62a	100-040	.PLUG; pipe; 3/8-18 npt	1
13h	100-060	.BALL, sst, 1/4"	1	62b	162-453	.NIPPLE; 1/4-18 npsm(f) x 1/4-18 npt(m); 1.18" long	1
14	107-258	TIP, grip, <i>refer to page 40</i>	1	63	176-818	PIN, str; hdl; 0.3125" dia x 1.023"	1
15	185-954†	LABEL, DANGER	1	64	178-034	TAG, caution	1
16	106-078	SCREW, flat hd; 10-24 x 3/8"	4	65	176-817	SPRING, retaining	1
17	186-233	COVER, pressure control	1	66	223-631	BEARING ASSEMBLY	1
18	220-455	PRESSURE CONTROL ASSEMBLY <i>see parts on page 40</i>	1	67	162-453	NIPPLE; 1/4-18 npsm(f) x 1/4-18 npt(m); 1.18" long	2
19	177-762†	LABEL, Warning	1	68	218-034	CONNECTING ROD ASSEMBLY	1
20	183-275	SPACER; wheel	2	69	157-021	LOCKWASHER, internal; Size 8	4
21	107-447	SEAL, conduit, <i>refer to page 40</i>	2	70	183-365	BRACKET, mounting	1
22	150-513	NUT, jam; 7/16"	1	71	206-994	THROAT SEAL LIQUID	1
23	186-314	SHROUD	1	75	187-913	LABEL, identification, front	1
24	223-800	CART ASSEMBLY	1	76	187-915	LABEL, identification, side, left	1
25	187-190	STRAINER	1	77	187-912	LABEL, identification, side, right	1
26	223-748	HOSE, nylon, 1/4" ID; cpld 1/4 npsm(fbe); 21.75" (552 mm); spring guard full length	1	79	224-994	CIRCUIT BOARD	1
27	183-769	TUBE, suction	1	81	104-811	HUBCAP	2
28	102-866	SCREW, mach, hex hd; 5/16-18 unc-2a x 1.75"	3	82	187-916	LABEL, identification	1
29	222-580	PUMP, displacement <i>see parts on page 37</i>	1	*Recommended spare parts. Keep on hand to reduce down time.			
30	155-665	UNION, adapter; 3/8" npsm swivel x 3/8 npt(m)	1	† Extra Danger and Warning labels and tags available at no charge.			

PARTS DRAWING

FULTRONIC 1000 Sprayer Model 235-040, Series A



PARTS DRAWING & LIST – PRESSURE CONTROL

PRESSURE CONTROL ASSEMBLY 220-455

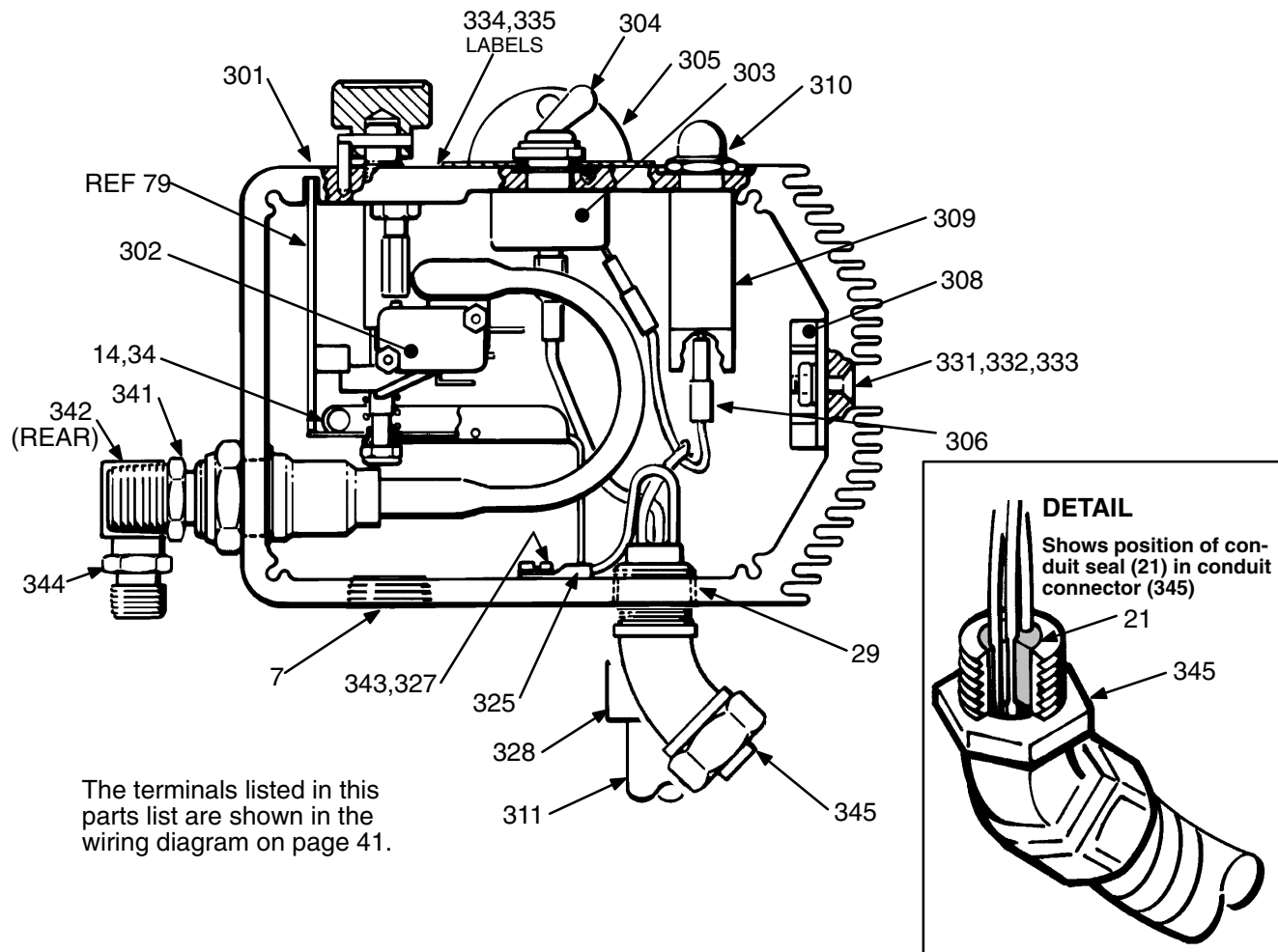
Includes all items listed below, except the terminals.

The terminals are included with the circuit board (item 79).
The terminals listed in this parts list are shown on the wiring diagram on page 41.

Part numbers for items 7,13b,13c,13g,14,21,29,34,79 are shown in the drawings below and on page 41 are given on page 38.

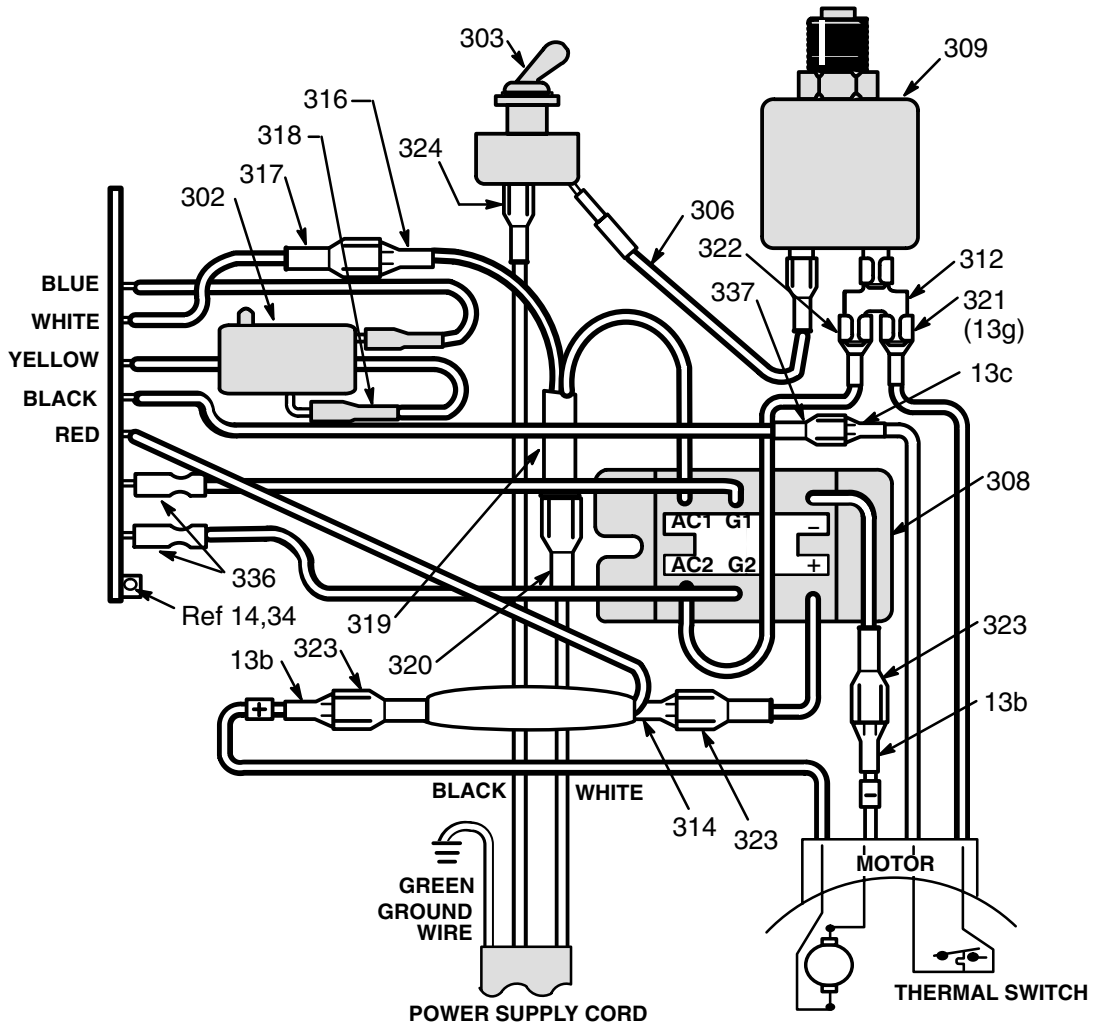
REF NO.	PART NO.	DESCRIPTION	QTY	REF NO.	PART NO.	DESCRIPTION	QTY
302	180-043	.MICROSWITCH	1	325	102-799	TERMINAL, ring	1
303	105-679	.ON/OFF switch	1	327	157-021	LOCKWASHER, no. 8, internal	1
304	105-659	.BOOT, switch	1	328	108-295	BUSHING, strain relief	1
305	107-255	.GUARD, locking	1	331	101-273	SCREW, mach; flat hd; no. 10-24 x 5/8"	2
306	218-168	JUMPER WIRE	1	332	100-179	NUT, hex, mscr, no. 10-24 thd	2
308	218-170	RECTIFIER, bridge	1	333	100-718	LOCKWASHER, internal, shakeproof, no. 10	2
309	107-256	CIRCUIT BREAKER	1	334	178-797**	LABEL, WARNING	1
310	107-254	BOOT, circuit breaker	1	335	178-035**	LABEL, WARNING	1
311	218-169	CORD, power supply	1	336	107-261	TERMINAL, male	2
312	107-268	ADAPTER, terminal	1	337	107-503	TERMINAL, female	1
314	107-267	TERMINAL, female	1	338	107-504	TERMINAL, male	1
315	107-293	TERMINAL, female	2	341	157-350	ADAPTER, 3/8 npt(m) x 1/2 npt (m)	1
316	107-264	TERMINAL, male	1	342	100-840	ELBOW, street; 1/4 npt(m x f)	1
317	107-396	TERMINAL, male	1	343	100-035	SCREW, mach; slotted pan hd; no. 8 x 5/16"	1
318	107-262	TERMINAL, female	1	344	162-453	NIPPLE, 1/4 npt(m) x 1/4 npsm	1
319	107-260	TERMINAL, female	1	345	108-460	CONNECTOR, conduit	1
320	107-266	TERMINAL, female	1				
321	103-885	TERMINAL, male	1				
322	103-886	TERMINAL, female	3				
323	107-265	TERMINAL, female	1				
324	107-263	TERMINAL, female	1				

*Extra warning labels available free.



WIRING DIAGRAM

CIRCUIT BOARD 218-405, 5 WIRES



ACCESSORIES

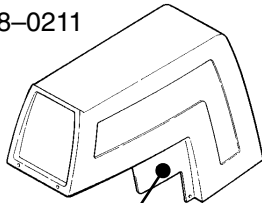
MUST BE PURCHASED SEPARATELY

DANGER LABELS

The English language DANGER label shown on page 1 is also on your sprayer. If you have painters who do not read English, order one of the following labels to apply to your sprayer. The drawing below shows the best placement of these labels for good visibility. Order the labels directly from Graco, free of charge.

Toll Free: 1-800-328-0211

French	185-955
Spanish	185-962
German	186-042
Greek	186-046
Korean	186-050
English	185-954



Apply other language in this area on other side of shroud

DISPLACEMENT PUMP REPAIR KIT 222-588

See contents on page 27. Repair instructions are included with the kit.

THROAT SEAL LIQUID

Non-evaporating liquid for the wet-cup. Helps prevent buildup of paint on the rod and throat packings, to reduce premature wear.

206-994	8 oz.
206-995	1 quart
206-996	1 gallon

SPRAY HOSES

223-541 1/4" ID; 50 ft. (15 m); coupled 1/4 npsm (f); spring guards on both ends
3300 psi (231 bar) Max. Working Pressure

214-701 3/16" ID; 3 ft. (0.9 m); coupled 1/4 npsm (f); spring guards on both ends
3300 psi (231 bar) Max. Working Pressure

FLUID FILTER KIT 223-857

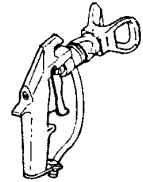
Includes a fluid filter and all necessary mounting hardware.

REVERSE-A-CLEAN™ IV Dripless™ TIP GUARD 220-422

Uses fluid pressure from the gun to remove clogs without removing the tip guard to spray tip. (As shown on guns, below.) Requires SwitchTip™, purchased separately.

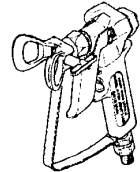
"SILVER" GUN 220-954

5000 psi (350 bar) MAXIMUM WORKING PRESSURE
Includes Reverse-A-Clean IV DripLess™ Tip Guard and 517 size SwitchTip™



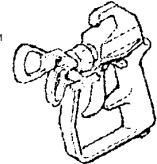
"CONTRACTOR" GUN 220-955

3600 psi (252 bar) MAXIMUM WORKING PRESSURE
Includes Reverse-A-Clean IV DripLess™ Tip Guard and 517 size SwitchTip™



"BLACK MAX" GUN 220-730

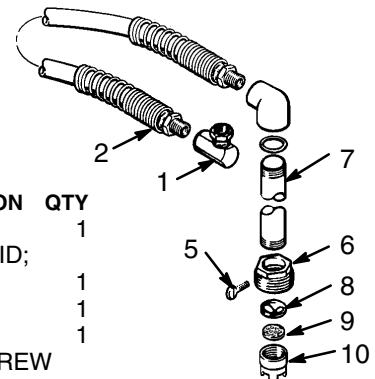
3600 psi (252 bar) MAXIMUM WORKING PRESSURE
Includes Reverse-A-Clean IV DripLess™ Tip Guard and 513 size SwitchTip™



SUCTION TUBE KIT 208-259

55 gallon (200 liter) size
Includes:

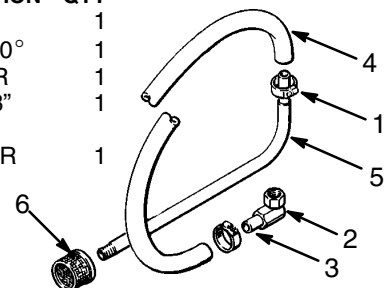
REF	NO. PART NO.	DESCRIPTION	QTY
	1	UNION	1
	2	HOSE, 3/4 ID; nylon; 6 ft	1
	3	ELBOW	1
	4	PACKING	1
	5	THUMBSCREW	1
	6	ADAPTER	1
	7	TUBE	1
	8	RETAINER	1
	9	SCREEN	1
	10	NUT	1



SUCTION TUBE KIT 208-920

5 gallon (19 liter) size
Includes:

REF	NO. PART NO.	DESCRIPTION	QTY
	1	CLAMP,	1
	2	UNION, 90°	1
	3	ADAPTER	1
	4	HOSE, 48"	1
	5	TUBE, 1	1
	6	STRAINER	1



TECHNICAL DATA

Power Requirements	120 VAC, 60Hz, 1 phase, 15 amp minimum
Working Pressure Range	0–3000 psi (0 – 210 bar)
Cycles/Gallon (liter)	200 (53)
Maximum Delivery	0.85 GPM (3.2 liter/min)
Power Cord	No. 14 AWG, 3 wire, 8'6" (2.6 m)
Inlet Paint Strainer	16 mesh (1190 micron) Stainless Steel Screen, reusable
Outlet Paint Filter	60 mesh (250 micron) Stainless Steel Screen, reusable
Pump Inlet Size	3/4 npt(m) with 20° ID chamfer
Fluid Outlet Size	1/4 npsm from fluid filter
Wetted Parts:	
<i>Displacement Pump</i>	Carbon steel, Polyurethane, Polyethylene, Delrin®, Leather
<i>Filter</i>	Aluminum, Carbon steel, Stainless Steel,

NOTE: Delrin®

DIMENSIONS

Weight (dry w/o packaging)	100 lb (45 Kg)
Height	28 in. (711 mm)
Length	26.0 in. (660 mm)
Width	22.5 in. (572 mm)

IMPORTANT PHONE NUMBERS

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

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

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, with the exception of defects in parts on the drive train/gear box on EM and GM sprayers or power train on EH & GH sprayers, which will be repaired or replaced for twenty-four months from the date of sale for Gas-Hydraulic (GH) and Gas Mechanical (GM) sprayers and for thirty-six months from the date of sale for Electric-Mechanical (EM) and Electric-Hydraulic (EH) Sprayers. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

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

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

DISCLAIMERS AND LIMITATIONS

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

EQUIPMENT NOT COVERED BY GRACO WARRANTY

GRACO MAKES NO WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO ACCESSORIES, EQUIPMENT, MATERIALS, OR COMPONENTS SOLD BUT NOT MANUFACTURED BY GRACO. These items sold, but not manufactured by Graco (such as electric motor, switches, hose, etc.) are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

Factory Branches: Atlanta, Dallas, Detroit, Los Angeles, Mt. Arlington (N.J.)

Subsidiary and Affiliate Companies: Canada; England; Switzerland; France; Germany; Hong Kong; Japan; Korea

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PRINTED IN U.S.A. 308-209 2/92