



TITAN®

OPERATING MANUAL

HYDRA X™ 4540 7230

- EN - OPERATING MANUAL

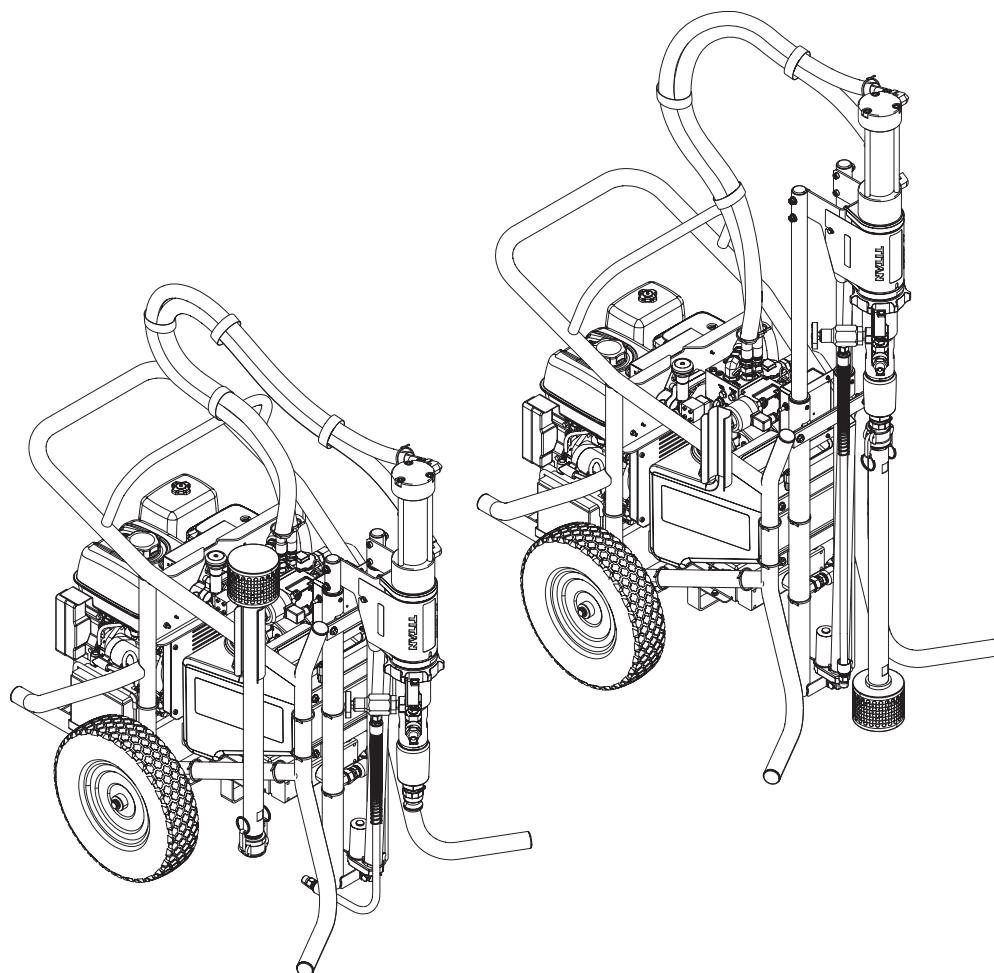
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AIRLESS, HIGH-PRESSURE
SPRAYING UNIT

Models:

2412275 (4540)

2412277 (7230)



Warning!

Attention: Danger of injury by injection!
Airless units develop extremely high spraying pressures.

**1**

Never put your fingers, hands or any other parts of the body into the spray jet!

**Never point the spray gun at yourself, other persons or animals.
Never use the spray gun without safety guard.**

Do not treat a spraying injury as a harmless cut. In case of injury to the skin through coating materials or solvents, consult a doctor immediately for quick and expert treatment. Inform the doctor about the coating material or solvent used.

2

The operating instructions state that the following points must always be observed before starting up:

1. Faulty units must not be used.
2. Secure spray gun using the trigger lock on the trigger.
3. Ensure that the unit is properly earthed.
4. Check allowable operating pressure of high-pressure hose and spray gun.
5. Check all connections for leaks.

3

The instructions regarding regular cleaning and maintenance of the unit must be strictly observed.

Before any work is done on the unit or for every break in work the following rules must be observed:

1. Release the pressure from spray gun and hose.
2. Secure the spray gun using the trigger lock on the trigger.
3. Switch off unit.

Be safety conscious!

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1 SAFETY REGULATIONS FOR AIRLESS SPRAYING

1.1 EXPLANATION OF SYMBOLS USED

This manual contains information that must be read and understood before using the equipment. When you come to an area that has one of the following symbols, pay particular attention and make certain to heed the safeguard.



→ This symbol indicates a potential hazard that may cause serious injury or loss of life. Important safety information will follow.



Attention

→ This symbol indicates a potential hazard to you or to the equipment. Important information that tells how to prevent damage to the equipment or how to avoid causes of minor injuries will follow.



→ Danger of skin injection



→ Danger of fire from solvent and paint fumes



→ Danger of explosion from solvent, paint fumes and incompatible materials



→ Danger of injury from inhalation of harmful vapors



→ Danger of injury from electric shock



→ Notes give important information which should be given special attention.

1.2 SAFETY HAZARDS



WARNING: INJECTION INJURY

A high pressure stream produced by this equipment can pierce the skin and underlying tissues, leading to serious injury and possible amputation.

Do not treat a spraying injury as a harmless cut. In case of injury to the skin through coating materials or solvents, consult a doctor immediately for quick and expert treatment. Inform the doctor about the coating material or solvent used.

PREVENTION:

- NEVER aim the gun at any part of the body.
- NEVER allow any part of the body to touch the fluid stream. DO NOT allow body to touch a leak in the fluid hose.
- NEVER put your hand in front of the gun. Gloves will not provide protection against an injection injury.
- ALWAYS lock the gun trigger, shut the fluid pump off and release all pressure before servicing, cleaning the tip guard, changing tips, or leaving unattended. Pressure will not be released by turning off the engine. The PRIME/SPRAY valve or pressure bleed valve must be turned to their appropriate positions to relieve system pressure.
- ALWAYS keep tip guard in place while spraying. The tip guard provides some protection but is mainly a warning device.
- ALWAYS remove the spray tip before flushing or cleaning the system.
- NEVER use a spray gun without a working trigger lock and trigger guard in place.
- All accessories must be rated at or above the maximum operating pressure range of the sprayer. This includes spray tips, guns, extensions, and hose.

**WARNING: HIGH PRESSURE HOSE**

The paint hose can develop leaks from wear, kinking and abuse. A leak can inject material into the skin. Inspect the hose before each use.

PREVENTION:

- Avoid sharp bending or kinking of the high-pressure hose. The smallest bending radius amounts to about 20 cm.
- Do not drive over the high-pressure hose. Protect against sharp objects and edges.
- Replace any damaged high-pressure hose immediately.
- Never repair damaged high-pressure hoses yourself!
- Electrostatic charging of spray guns and the high-pressure hose is discharged through the high-pressure hose. For this reason the electric resistance between the connections of the high-pressure hose must be equal to or lower than 1MΩ.
- For reasons of function, safety and durability use only original Titan high-pressure hoses.
- Before each use, check all hoses for cuts, leaks, abrasion or bulging of cover. Check for damage or movement of couplings. Immediately replace the hose if any of these conditions exist. Never repair a paint hose. Replace it with another earthed high-pressure hose.
- Make sure power cord, air hose and spray hoses are routed in such a manner to minimize slip, trip and fall hazard.
- Do not expose the hose to temperatures or pressures in excess of those specified by the manufacturer.
- Niemals am Hochdruckschlauch ziehen, um das Gerät zu bewegen.

**WARNING: EXPLOSION OR FIRE**

Flammable vapors, such as solvent and paint vapors, in work area can ignite or explode.

**PREVENTION:**

- Use equipment only in well ventilated area. Keep a good supply of fresh air moving through the area to keep the air within the spray area free from accumulation of flammable vapors. Keep pump assembly in well ventilated area. Do not spray pump assembly.
- Do not use the unit in work places which are covered by the explosion protection regulations. The unit is not designed to be explosion protected. Do not operate the device in explosive areas (zone 0, 1 and 2).
- Do not fill fuel tank while engine is running or hot; shut off engine and allow to cool. Fuel is flammable and can ignite or explode if spilled on a hot surface.
- Eliminate all ignition sources, such as pilot lights, cigarettes, portable electric lamps and plastic drop cloths (potential static arc).
- Keep work area free of debris, including solvent, rags and gasoline.
- Do not plug or unplug power cords, or turn power or light switches on or off when flammable vapors are present.
- Ground equipment and conductive objects in work area. Verwenden Sie ein Erdungskabel, um die Erdungsklemme am Gerät mit einer echten Erdung zu verbinden.
- Use only grounded hoses.
- Hold spray gun firmly to the side of a grounded pail when triggering into pail.
- If there is static sparking or if you feel a shock, stop operation immediately.
- Know the contents of the paint and solvents being sprayed. Read all material Safety Data Sheets (SDS) and container labels provided with the paints and solvents. Follow the paint and solvent manufacturer's safety instructions.
- Do not use a paint or solvent containing halogenated hydrocarbons. Such as chlorine, bleach, mildewcide, methylene chloride and trichloroethane. They are not compatible with aluminum. Contact the coating supplier about compatibility of material with aluminum.
- Keep a fire extinguisher in work area.

**WARNING: HAZARDOUS VAPORS**

Paints, solvents, and other materials can be harmful if inhaled or come in contact with body. Vapors can cause severe nausea, fainting, or poisoning.

PREVENTION:

- Wear respiratory protection when spraying. Read all instructions supplied with the mask to be sure it will provide the necessary protection.
- All local regulations regarding protection against hazardous vapors must be observed.
- Wear protective eyewear.
- Protective clothing, gloves and possibly skin protection cream are necessary for the protection of the skin. Observe the regulations of the manufacturer concerning coating materials, solvents and cleaning agents in preparation, processing and cleaning units.

**WARNING: GENERAL**

This product can cause severe injury or property damage.

PREVENTION:

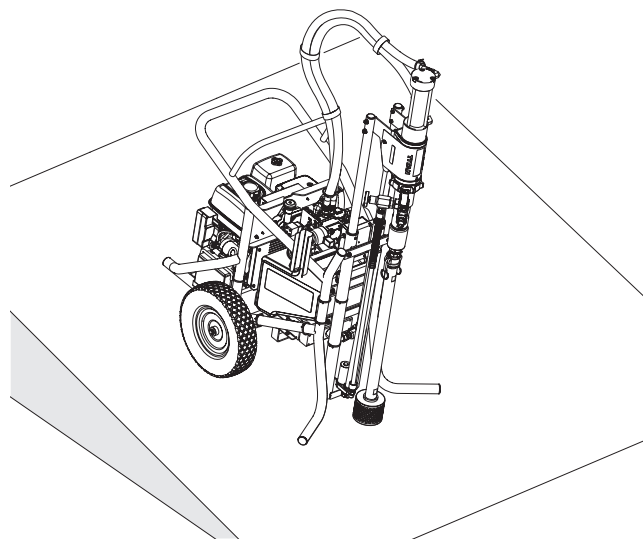
- Follow all appropriate local, state, and national codes governing ventilation, fire prevention, and operation.
- Pulling the trigger causes a recoil force to the hand that is holding the spray gun. The recoil force of the spray gun is particularly powerful when the tip has been removed and high pressure has been set on the airless pump. When cleaning without a spray tip, set the pressure control knob to the lowest pressure.
- Use only manufacturer authorized parts. User assumes all risks and liabilities when using parts that do not meet the minimum specifications and safety devices of the pump manufacturer.
- ALWAYS follow the material manufacturer's instructions for safe handling of paint and solvents.
- Clean up all material and solvent spills immediately to prevent slip hazard.
- Wear ear protection. This unit can produce noise levels above 85 dB(A).
- Never leave this equipment unattended. Keep away from children or anyone not familiar with the operation of airless equipment.
- The device is very heavy and must be carried by several people.
- Wear safety shoes.
- Do not spray on windy days.

- The device and all related liquids (i.e. hydraulic oil) must be disposed of in an environmentally friendly way.
- Stay alert and watch what you are doing.
- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not overreach or stand on an unstable support. Keep effective footing and balance at all times.

1.3 SETUP ON AN UNEVEN SURFACE

The front end must always point downwards in order to avoid sliding away.


If possible do not use the unit on an inclined surface since the unit tends to wander due to the resulting vibrations.



1.4 GASOLINE ENGINE SAFETY


1. Gas engines are designed to give safe and dependable service if operated according to instructions. Read and understand the engine manufacturer’s Owner’s Manual before operating the engine. Failure to do so could result in personal injury or equipment damage.
2. To prevent fire hazards and to provide adequate ventilation, keep the engine at least 1 meter (3 feet) away from buildings and other equipment during operation. Do not place flammable objects close to the engine.
3. People who are not operating the device must stay away from the area of operation due to a possibility of burns from hot engine components or injury from any equipment the engine may be used to operate.
4. Know how to stop the engine quickly, and understand the operation of all controls. Never permit anyone to operate the engine without proper instructions.
5. Gasoline is extremely flammable and is explosive.
6. Refuel in a well-ventilated area with the engine stopped. Do not smoke or allow flames or sparks in the refueling area or where gasoline is stored.
7. Do not overfill the fuel tank. After refueling, make sure the tank cap is closed properly and securely.
8. Be careful not to spill fuel when refueling. Fuel vapor or spilled fuel may ignite. If any fuel is spilled, make sure the area is dry before starting the engine.
9. Never run the engine in an enclosed or confined area. Exhaust contains poisonous carbon monoxide gas; exposure may cause loss of consciousness and may lead to death.
10. The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. To avoid severe burns or fire hazards, let the engine cool before transporting it or storing it indoors.
11. Never ship/transport sprayer with gasoline in the tank.

1.5 FUELING

	Gasoline is extremely flammable and is explosive under certain conditions.
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FUEL SPECIFICATIONS


Use automotive gasoline that has a pump octane number of 86 or higher, or that has a research octane number of 91 or higher.

	<p>If “spark knock” or “pinging” occurs at a steady engine speed under normal load, change brands of gasoline. If spark knock or pinging persists, consult an authorized dealer of the engine manufacturer. Failure to do so is considered misuse, and damage caused by misuse is not covered by the engine manufacturer’s limited warranty.</p> <p>Occasionally you may experience light spark knock while operating under heavy loads. This is no cause for concern, it simply means your engine is operating efficiently.</p>
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- Unleaded fuel produces fewer engine and spark plug deposits and extends the life of the exhaust system components.
- Never use stale or contaminated gasoline or an oil/gasoline mixture. Avoid getting dirt, dust, or water in the fuel tank.

GASOLINES CONTAINING ALCOHOL

Be sure the octane rating is at least as high as that recommended by the engine manufacturer. Do not use gasohol that contains more than 10% ethanol. Do not use gasoline containing methanol.

	Fuel system damage or engine performance problems resulting from the use of fuels that contain alcohol is not covered under the warranty.
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2 MAIN AREAS OF APPLICATION


2.1 APPLICATION

The main area of application are thick layers of highly viscous coating material for large areas and a high consumption of material.

Priming and final coating of large areas, sealing, impregnation, construction sanitation, façade protection and renovation, rust protection and building protection, roof coating, roof sealing, concrete sanitation, as well as heavy corrosion protection.


EXAMPLES OF OBJECTS TO BE SPRAYED

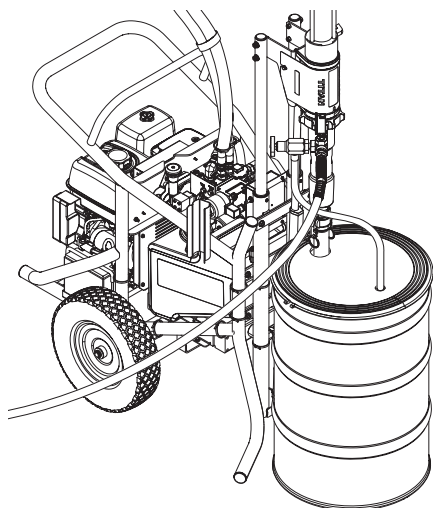
Large-scale construction sites, water towers, silos, shipbuilding, bridges, sewage treatment plants and terraces.

	DO NOT use this equipment to spray water or acid.
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FLUID PUMP

The HYDRA X fluid pump is mounted to a lift mechanism that can be automatically raised or lowered based on the container from which material is being drawn.

	The inlet filter on the bottom of the suction tube will need to be removed when drawing material from a sealed drum.
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2.2 COATING MATERIALS

PROCESSIBLE COATING MATERIALS

Latex paints, primers, fillers, varnishes, sealing paints, acrylic paints, epoxy resin paints, polyester paints, polyurethane paints, asphalt coating materials, bitumen coatings, cooling lubricant.


Hydra X 4540 only

Fine filling compounds

Hydra X 7230 only


Silicate paints, fire protection paints / corrosion protection paints

No other materials should be used for spraying without Titan's approval.

	Pay attention to the Airless quality of the coating materials to be processed.
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VISCOSITY

The unit is able to process coating materials with up to 65,000 mPas. If highly viscous coating materials cannot be taken in or the performance of the unit is too low, the paint must be diluted in accordance with the manufacturer's instructions.

	Attention: Make sure, when stirring up with motor-driven agitators that no air bubbles are stirred in. Air bubbles disturb when spraying and can, in fact, lead to interruption of operation.
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COATING MATERIALS WITH ABRASIVE MATERIALS

These particles have a strong wear and tear effect on valves and tips, but also on the spray gun. This impairs the durability of these wearing parts considerably.

TWO-COMPONENT COATING MATERIAL

The appropriate processing time must be adhered to exactly. Within this time rinse through and clean the unit meticulously with the appropriate cleaning agents.

FILTERING

This unit is not equipped with a high-pressure outlet filter. However, a high pressure outlet filter kit can be purchased separately if desired.

3 DESCRIPTION OF UNIT

3.1 AIRLESS PROCESS

A piston pump takes in the coating material by suction and conveys it to the tip. Due to the high pressure, the coating material is atomised to micro-fine sizes when it exits the nozzle. As no air is used in this process, it is described as an AIRLESS process.

This method of spraying has the advantages of finest atomization, cloudless operation and a smooth, bubble-free surface. As well as these, the advantages of the speed of work and convenience must be mentioned.

3.2 FUNCTIONING OF THE UNIT

The following section contains a brief description of the technical construction for better understanding of the function of the unit.

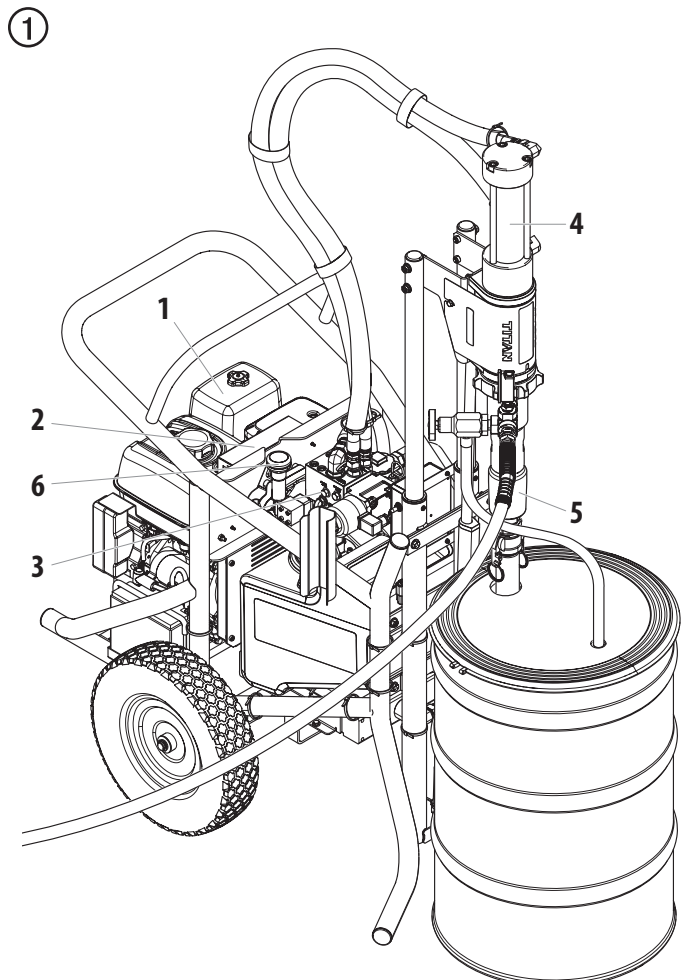
TITAN HYDRA X are high-pressure spraying units driven by a gasoline engine.

The gasoline engine (fig. 1, item 1) drives the hydraulic pump (3) by means of a timing belt which is under the belt cover (2). Hydraulic oil flows to the hydraulic pump (4) and then moves the piston up and down in the fluid section (5).

The inlet valve is opened automatically by the upwards movement of the piston. The outlet valve is opened when the piston moves downward.



The coating material flows under high pressure through the high-pressure hose to the spray gun. When the coating material exits from the tip it atomizes.

The pressure control knob (6) controls the volume and the operating pressure of the coating material.

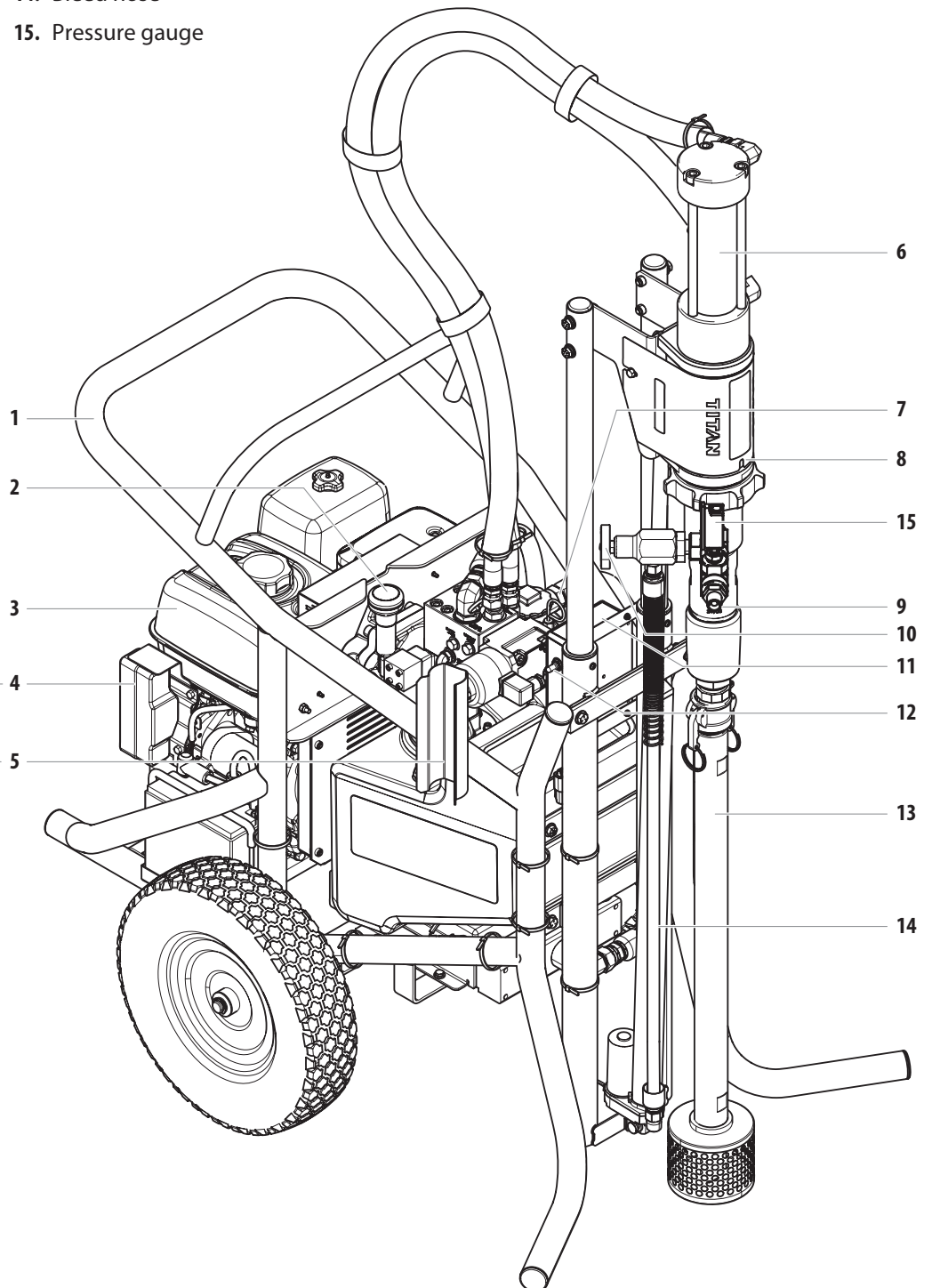
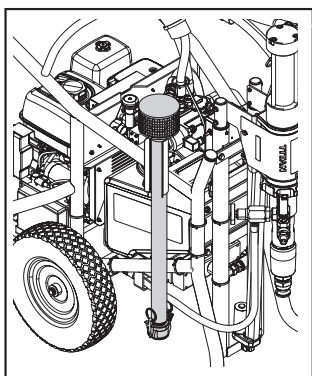
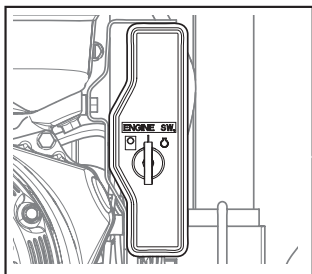
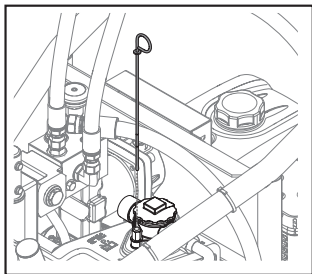


3.3 SYSTEM DIAGRAM

1. Handle
2. Pressure control knob
3. Gasoline engine
4. Engine key ignition
5. Suction tube storage
6. Hydraulic pump
7. Oil measuring stick
8. Oil cup for Piston Lube
(Piston Lube prevents increased wear and tear of the packings)

9. High-pressure hose outlet
10. Relief valve:
Turn left for circulation 
Turn right for spray 
11. Master power switch
12. Lift switch
13. Suction tube
14. Bleed hose
15. Pressure gauge

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3.4 TECHNICAL DATA

	Hydra X 4540	Hydra X 7230
Gasoline engine, power		
Honda	389cc, 11.7 Hp, 8.7 kW	
Fuel Capacity		
	6.0 l	
Max. operating pressure		
	31 MPa (310 bar)	50 MPa (500 bar)
Max. sound pressure level		
	98 dB (A)*	
Max. size of tip with a spray gun		
1-gun	0.067" – 1.70 mm	0.065" – 1.65 mm
2-gun	0.041" – 1.04 mm	0.035" – 0.89 mm
3-gun	0.035" – 0.89 mm	0.028" – 0.71 mm
4-gun	0.031" – 0.79 mm	0.025" – 0.63 mm
5 gun	0.029" – 0.73 mm	0.021" – 0.53 mm
6 gun	0.025" – 0.63 mm	
Max. volume flow		
	15.1 l/min	10.6 l/min
Weight		
	177 kg	
Max. viscosity		
	65,000 mPa·s	
Dimensions L x W x H		
	121,9 x 81,3 x 132,1 cm	
Max. temperature of the coating material		
	43° C	
Hydraulic oil filling quantity		
	22.7 l	
Max. tire pressure		
	0.2 MPa (2 bar)	

* Place of measurement: 1 m distance from unit and 1.60 m above reverberant floor, 120 bar (12 MPa) operating pressure.

OPERATING TEMPERATURE

This equipment will operate correctly in its intended ambient, at a minimum between 10°C and +40°C.

RELATIVE HUMIDITY

The equipment will operate correctly within an environment at 50% RH, +40°C. Higher RH may be allowed at lower temperatures.

Measures shall be taken by the Purchaser to avoid the harmful effects of occasional condensation.

ALTITUDE

This equipment will operate correctly up to 2100 m above mean sea level.

Contact your local Honda representative for operating the unit above 2100m above mean sea level.

TRANSPORTATION AND STORAGE

This equipment will withstand, or has been protected against, transportation and storage temperatures of -25°C to +55°C and for short periods up to +70°C.

At temperatures below 0°C, store the unit in a frost-free place or the pump filled with glycol.

It has been packaged to prevent damage from the effects of normal humidity, vibration and shock.

3.5 TRANSPORTATION



Do not lift by cart handle when loading or unloading.
The device is very heavy and must be carried by several people.

TRANSPORTATION IN VEHICLE

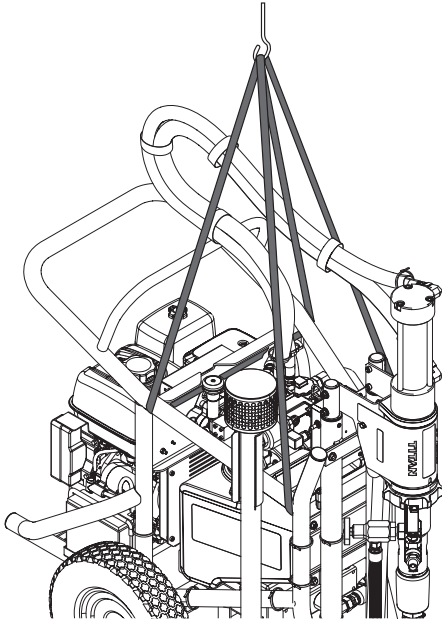
Secure the unit with a suitable fastening.

CRANE TRANSPORT

Hanging points for crane straps or ropes, see figure 3 below.
Nur für Krantransport geeignete Bänder verwenden, die das Gesamtgewicht des Gerätes (s. Technische Daten) tragen können.

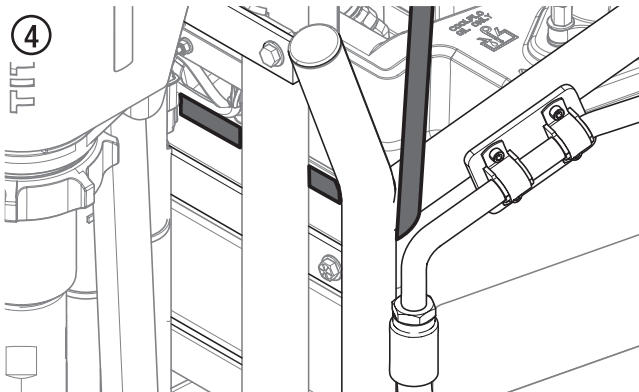
The motor/pump lift should be in the fully retracted (down) position before lifting the unit.

③



The strap or rope must be attached behind the hydraulic pipe (see Fig. 4) so that it is not damaged.

④



3.6 ELECTRONIC CONTROLS

MASTER POWER SWITCH

The master power switch provides electrical power to the entire system. Press and hold the button for 3 seconds to turn electrical power ON. Press the button once to turn electrical power OFF.

LIFT SWITCH

The lift switch raises and lowers the hydraulic motor/fluid section of the unit. The master power switch must be switched ON in order for the lift switch to be functional.

If the lift switch is held in the UP position for three seconds (and then released) the lift mechanism will automatically extend to the highest position and then stop, or the operator can push the switch down to keep the lift from going up any further.

With the suction system fitted, do not lower the pump unit too far, otherwise the front of the device may be lifted.

ENGINE KEY IGNITION

The engine key ignition switches the engine ON and OFF. Turn the key all the way to the right to turn on the engine.

3.7 PRESSURE RELIEF PROCEDURE



Be sure to follow the Pressure Relief Procedure when shutting the unit down for any purpose, including servicing or adjusting any part of the spray system, changing or cleaning spray nozzles, or preparing for cleanup.

1. Lock the spray gun trigger (see gun manual).
2. Turn off the sprayer.
 - set the pressure to minimum by turning the pressure control knob fully counterclockwise,
 - move the throttle lever to the slow position, and
 - turn the engine switch to the OFF position.
 - turn the master power switch OFF (switch no longer lights up)
3. Unlock the spray gun trigger (see gun manual).
4. Hold the metal part of the gun firmly to the side of a metal waste container to ground/earth the gun and avoid a build up of static electricity.
5. Trigger the gun to remove any pressure that may still be in the hose.
6. Lock the gun by turning the gun trigger lock to the locked position.
7. Place the bleed hose into the metal waste container.
8. Open the bleed valve by turning it fully counterclockwise.

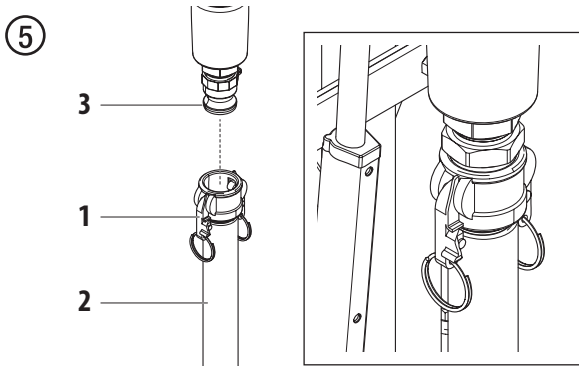
4 OPERATION



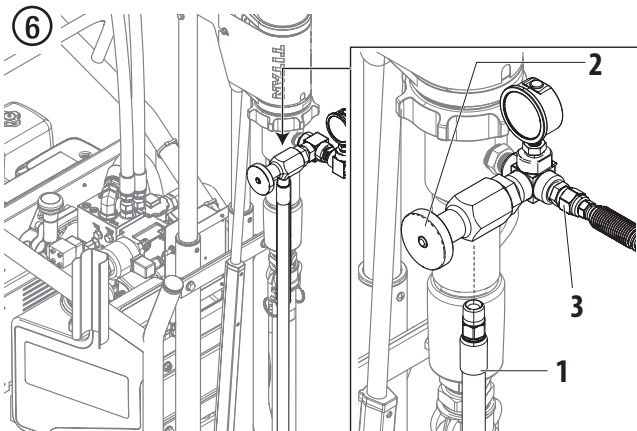
This equipment produces a fluid stream at extremely high pressure. Read and understand the warnings in the Safety Precautions section at the front of this manual before operating this equipment.

4.1 SETUP

1. Press and hold the main switch (Fig. 10, 3) for 3 seconds to switch on the machine (switch lights up).
2. Press and hold the 'UP' (▲) on the lift switch for three seconds to raise the hydraulic motor/fluid pump assembly. Release the switch after three seconds and the lift will automatically raise to its highest position and then stop.
3. Open (pull apart) the two brass clasps on the top of the suction tube assembly (Fig. 5, item 1).
4. Mount the suction tube (2) over the fluid pump (3).
5. Close the two clasps to secure the suction tube. Insert the locking clips (not shown) to lock the coupler clasps in place.



6. Make sure the bleed hose (Fig. 6, item 1) is threaded into the bleed valve (2). It has factory installed blue thread locker on the fitting and should be tightened wrench tight.
7. Attach a minimum of 50' (15 m) of nylon airless spray hose (3) to the sprayer. Do not use PTFE tape or thread sealant on the spray hose connection.

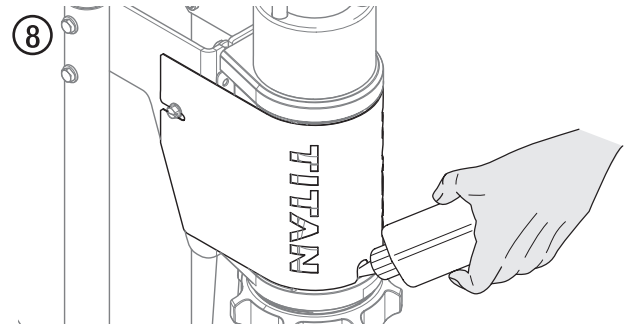


8. Attach an airless spray gun to the spray hose. Do not attach the tip to the spray gun yet. Remove the tip if it is already attached.



For multiple gun operation, connect the multiple gun manifold to the single gun outlet (see manifold kit 2414176 for details). Connect a hose and gun to the desired number of outlets. Make sure the unused gun outlets remain plugged. See "Technical Data", Section 3.5 to determine number of guns and maximum spray tip sizes.

9. Press the main switch to switch off the machine (switch no longer lights up).
10. Fill the oil cup 1/2 full with Piston Lube (P/N 314-480). This extends packing life (remove the cover for easier filling). When using silicone, use part number 91-36, throat seal lubricant.



Piston Lube prevents increased wear and tear to the packings.

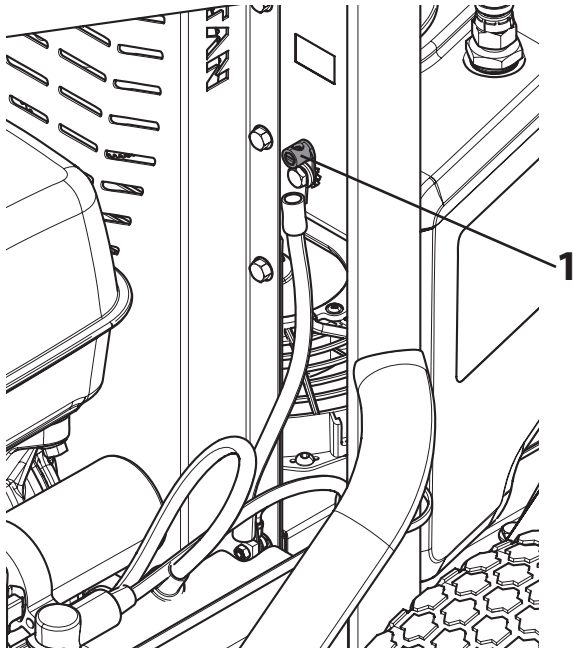
11. Check the hydraulic fluid level daily before starting the sprayer. The hydraulic fluid level should be between the two notches on the dipstick. Refer to the Maintenance section of this manual for hydraulic system maintenance instructions.




Use of Titan's Coolflo™ Hydraulic Fluid (P/N 430-361) is mandatory in the hydraulic system. Do not use any other hydraulic fluid. Use of any other hydraulic fluid may seriously damage the hydraulic system and will void the warranty.


12. Check the engine oil level daily before starting the sprayer. The gasoline engine oil level is determined by the engine manufacturer. Refer to the engine manufacturer's service manual supplied with this sprayer.

13. Make sure the sprayer is grounded/earthed. All sprayers are equipped with a grounding/earthing lug (1). A grounding/earthing cable should be used to connect the sprayer to a true earth ground. Check your local electrical regulations for detailed grounding/earthing instructions.




	<p>Proper grounding/earthing is important. The passage of some materials through the nylon fluid hose will build up a static electric charge, which if discharged, could ignite solvent vapors present and create an explosion.</p>
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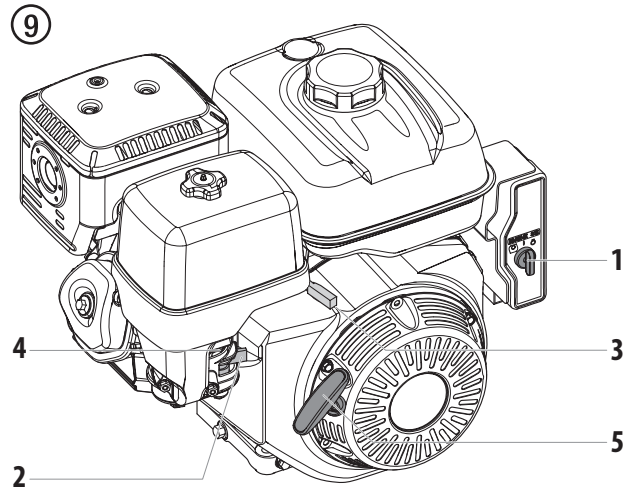
14. Strain all paints with a nylon strainer to ensure trouble free operation and freedom from frequent cleaning of the suction filter and gun filter.
15. Make sure the spray area is well ventilated to prevent hazardous operation with volatile solvents or exhaust fumes.

	<p>If lacquer or other flammable materials are to be sprayed, ALWAYS locate the sprayer outside the immediate spraying area. Failure to do so may cause an explosion.</p>
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16. Locate the sprayer outside the immediate spraying area to avoid clogged air intake of the engine with overspray.


4.2 STARTING THE ENGINE

	<p>Follow these instructions whenever prompted in this manual to start the engine.</p>
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1. Move the fuel valve lever (Fig. 9, item 2) to the open position.
2. Move the throttle lever (3) to its middle point.
3. Move the choke lever (4) to the closed position for a cold engine or to the open position for a warm engine.
4. Turn the motor switch (1) fully clockwise until the motor starts.

	<p>Falls der Motor nicht startet, Motoschalter in die Stellung ON (Ein) drehen und am Starterkabel (5) ziehen bis der Motor startet.</p>
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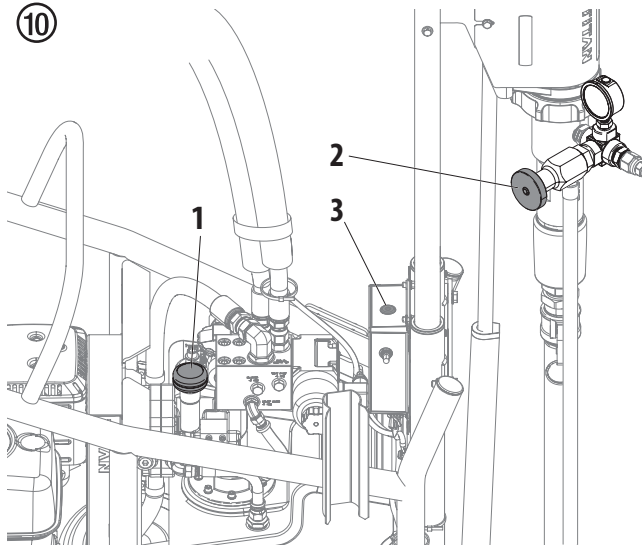
	<p>If choke lever (4) was moved to closed position to start the engine, it must be opened again once the engine is running.</p>
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4.3 PREPARING TO SPRAY

	<p>Before work can begin, the conservation agent used for transport or storage must first be pumped out of the device.</p>
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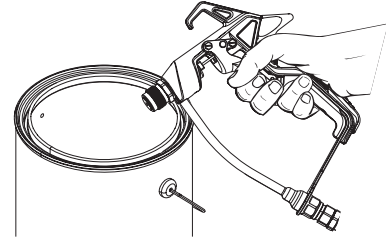
 <p>Attention</p>	<p>Always keep the trigger lock on the spray gun in the locked position while preparing the system. Refer to the spray gun instruction manual for trigger lock instructions.</p>
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1. Press and hold the main switch (Fig. 10, 3) for 3 seconds to switch on the machine (switch lights up).
2. Lower the siphon tube into a container of mineral spirits.
3. Place the bleed hose into a metal waste container.
4. Turn the pressure control knob fully counterclockwise to its lowest pressure setting (Fig. 10, item 1).
5. Open the bleed valve (2) by turning it fully counterclockwise.



6. Start the engine (see section 4.2).
7. Turn the pressure regulator clockwise until the liquid flows evenly out of the return pipe hose.
8. Allow the sprayer to run for 15–30 seconds to flush the test fluid out through the bleed hose and into the waste container.
9. Turn off the sprayer.
 - set the pressure to minimum by turning the pressure control knob fully counterclockwise,
 - move the throttle lever to the slow position, and
 - turn the master power switch OFF (switch no longer lights up)

	Ground/Earth the gun by holding it against the edge of the metal container while flushing. Failure to do so may lead to a static electric discharge, which may cause a fire.
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14. Press the trigger of the gun until the liquid is pumped out of the gun into the metal container.
15. Lock the gun by turning the gun trigger lock to the locked position (refer to spray gun manual).
16. Set down the gun and increase the pressure by turning the pressure control knob slowly clockwise to its highest setting.
17. Check the entire system for leaks. If leaks occur, turn the sprayer off and follow the “Pressure Relief Procedure” in this manual before tightening any fittings or hoses.
18. Follow the “Pressure Relief Procedure” (section 3.7) in this manual before changing from solvent to paint.

	Be sure to follow the Pressure Relief Procedure when shutting the unit down for any purpose, including servicing or adjusting any part of the spray system, changing or cleaning spray nozzles, or preparing for cleanup.
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	If you want to aspirate the material from a 55 gallon drum, follow the instructions in section 4.4.
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	Make sure that the spray gun does not have a tip or tip guard installed.
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10. Close the bleed valve by turning it fully clockwise.
11. Press and hold the main switch (Fig. 10, 3) for 3 seconds to switch on the machine (switch lights up).
12. Turn the pressure regulator clockwise to increase the pressure to approx. 50 bar.
13. Unlock the gun by turning the gun trigger lock to the unlocked position.

19. Press and hold the main switch (Fig. 10, 3) for 3 seconds to switch on the machine (switch lights up).
20. Lower the siphon tube into a container of paint.
21. Turn the pressure control knob fully counterclockwise to its lowest pressure setting (Fig. 10, item 1).
22. Repeat step 6-15 until the paint comes out of the gun
23. Continue with section 4.5 „Spraying“.

4.4 55-GALLON DRUM SETUP



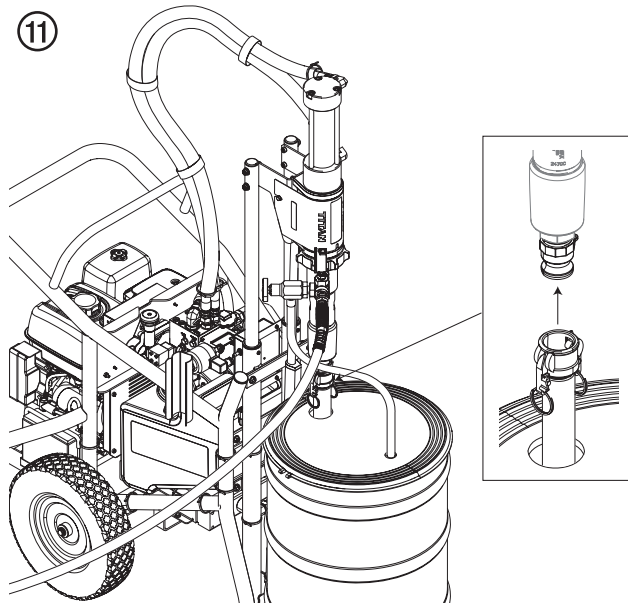
Follow these steps when drawing material from a 55-gallon drum.

1. Make sure the sprayer is shut off and relieved of all pressure (follow Pressure Relief Procedure, section 3.7).
2. Remove the suction tube by opening the clamping levers if it is attached to the paint stage.
3. Press and hold the main switch (Fig. 10, 3) for 3 seconds to switch on the machine (switch lights up).
4. Press and hold the 'UP' (▲) on the lift switch for three seconds to raise the hydraulic motor/fluid pump assembly. Release the switch after three seconds and the lift will automatically raise to its highest position and then stop.
5. Position the bottom of the fluid pump over the container. If drawing from a sealed container, position the bottom of the fluid pump over the large bung hole.



The inlet filter (rock catcher) on the bottom of the suction tube will need to be removed when drawing material from a sealed drum.

6. Carefully lower the suction tube down into the material and then lift it up and attach it to the bottom of the fluid pump (Fig. 11). Secure it by closing the brass clamps.
7. Place the bleed tube into the material. Use the smaller vent hole if using a sealed container.



4.5 SPRAYING

1. Turn the pressure control knob fully counterclockwise to its lowest pressure setting (Fig. 10, item 1).
2. Open the bleed valve (2) by turning it fully counterclockwise.
3. Start the engine (see section 4.2).
4. Turn the pressure regulator clockwise until the liquid flows evenly out of the return pipe hose.
5. Turn off the sprayer.
 - set the pressure to minimum by turning the pressure control knob fully counterclockwise,
 - move the throttle lever to the slow position, and
 - turn the master power switch OFF (switch no longer lights up)
6. Remove the bleed hose from the waste container and place it into the container of paint.
7. Close the bleed valve by turning it fully clockwise.
8. Press and hold the main switch (Fig. 10, 3) for 3 seconds to switch on the machine (switch lights up).
9. Turn the pressure regulator clockwise to increase the pressure to approx. 50 bar.
10. Unlock the gun by turning the gun trigger lock to the unlocked position.



Ground/Earth the gun by holding it against the edge of the metal container while flushing. Failure to do so may lead to a static electric discharge, which may cause a fire.

11. Trigger the gun into the metal waste container until all air and solvent is flushed from the spray hose and paint is flowing freely from the gun.
12. Lock the gun by turning the gun trigger lock to the locked position.
13. Turn off the sprayer.
 - set the pressure to minimum by turning the pressure control knob fully counterclockwise,
 - move the throttle lever to the slow position, and
 - turn the master power switch OFF (switch no longer lights up)
14. Attach tip guard and tip to the gun as instructed by the tip guard or gun manuals.



POSSIBLE INJECTION HAZARD. Do not spray without the tip guard in place. Never trigger the gun unless the tip is in either the spray or the unclog position. Always engage the gun trigger lock before removing, replacing or cleaning tip.

15. Press and hold the main switch (Fig. 10, 3) for 3 seconds to switch on the machine (switch lights up).
16. Increase the pressure by turning the pressure control knob slowly clockwise and test the spray pattern on a piece of

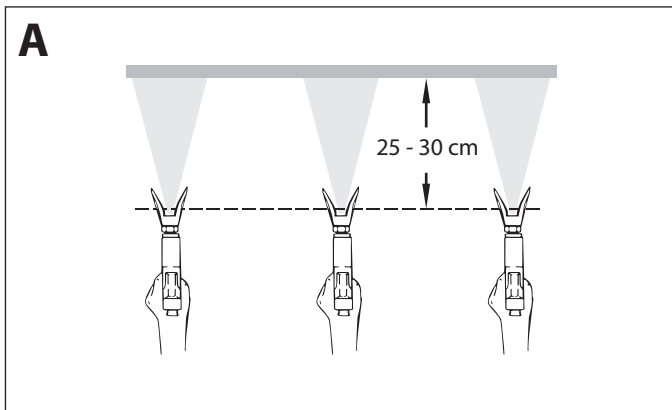
cardboard. Adjust the pressure control knob until the spray from the gun is completely atomized.

i	Turning the pressure up higher than needed to atomize the paint will cause premature tip wear and additional overspray.
i	If you are just simply replacing material containers, turn the pressure control knob fully counterclockwise to minimum prior to changing the material container. Turn pressure control knob clockwise to previous position when ready to resume spraying.

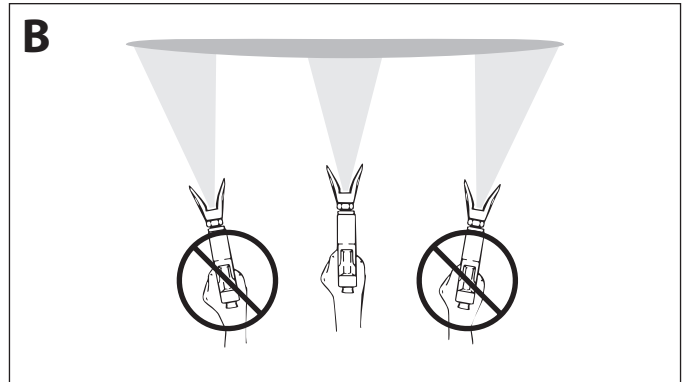
5 SPRAYING TECHNIQUE

	Injection hazard. Do not spray without the tip guard in place. NEVER trigger the gun unless the tip is completely turned to either the spray or the unclog position. ALWAYS engage the gun trigger lock before removing, replacing or cleaning tip.
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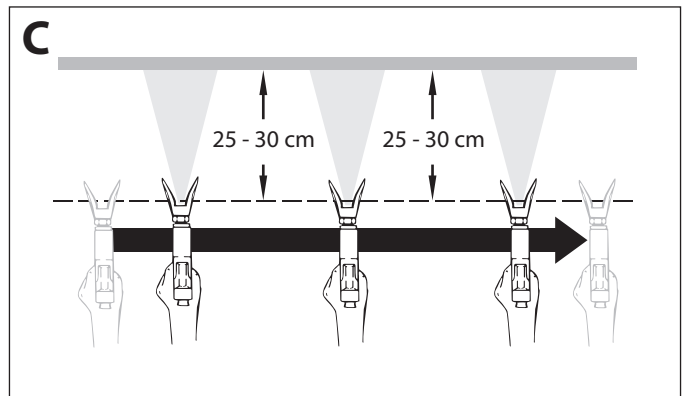
- A)** The key to a good paint job is an even coating over the entire surface. Keep your arm moving at a constant speed and keep the spray gun at a constant distance from the surface. The best spraying distance is 10-12 inches (25 to 30 cm) between the spray tip and the surface.



- B)** Keep the spray gun at right angles to the surface. This means moving your entire arm back and forth rather than just flexing your wrist.
Keep the spray gun perpendicular to the surface, otherwise one end of the pattern will be thicker than the other.



- C)** Trigger gun after starting the stroke. Release the trigger before ending the stroke. The spray gun should be moving when the trigger is pulled and released. Overlap each stroke by about 30%. This will ensure an even coating.




i	If very sharp edges result or if there are streaks in the spray jet – increase the operating pressure or dilute the coating material.
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5.1 CLEANING A CLOGGED TIP




	The flow from the spray tip is at very high pressure. Contact with any body part may be dangerous. Do not place finger on gun outlet. Do not point the gun at any person. Never operate the spray gun without the proper tip guard.
i	If the spray pattern becomes distorted or stops completely while pulling the trigger, perform the steps below.

1. Follow the "Pressure Relief Procedure" found in the Operation section of this manual, section 3.7.
2. Clear the spray tip per the instructions in the spray gun operation manual.



5.2 INTERRUPTION OF WORK

	Follow these steps if you interrupt work for a short time. Only follow these steps if you used latex - or water-based spray materials. If using solvent-based spray materials, follow all the steps in section 6, Cleanup.
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1. Follow the "Pressure Relief Procedure" found in the Operation section of this manual, section 3.7.
2. Place the spray gun in a plastic bag, or drop it into a bucket of water.
3. Leave the suction tube and return hose immersed in the coating material or immerse it into a corresponding cleaning agent.
4. Cover the coating material with plastic and place unit in a cool, shaded spot to keep material from drying out.

 Attention	If fast-drying or two-component coating material is used, ensure that the unit is rinsed with a suitable cleaning agent within the processing time.
	Follow the instructions in chapter 6.2 when working with moisture cured materials so no part of the fluid section is exposed to the environment which can cause damage to the packings.
	When ready to being spraying again, remove the plastic from the material container and restart the sprayer by following the steps in section 4.5.

5.3 HANDLING THE HIGH-PRESSURE HOSE

	All accessories must be rated at or above the maximum operating pressure range of the sprayer. This includes spray tips, guns, extensions, and hose.
	Danger of injury through leaking high-pressure hose. Replace any damaged high-pressure hose immediately. Never repair damaged high-pressure hoses yourself!




The high-pressure hose is to be handled with care. Avoid sharp bends and folds: the smallest bending radius is about 8" (20 cm).

Do not drive over the high-pressure hose. Protect against sharp objects and edges.



Never pull on the high-pressure hose to move the device.

Make sure that the high-pressure hose cannot twist. This can be avoided by using a Titan spray gun with a swivel joint and

hose system.

	When using the high-pressure hose while working on scaffolding, it is best to always guide the hose along the outside of the scaffolding.
	The risk of damage rises with the age of the high-pressure hose. Titan recommends replacing high-pressure hoses after 6 years.
	Use only Titan original-high-pressure hoses in order to ensure functionality, safety and durability.

6 CLEANUP


 Attention	The sprayer, hose, and gun should be cleaned thoroughly after daily use. Failure to do so permits material to build up, seriously affecting the performance of the unit.
	Always spray at minimum pressure with the gun nozzle tip removed when using mineral spirits or any other solvent to clean the sprayer, hose, or gun. Static electricity buildup may result in a fire or explosion in the presence of flammable vapors.

6.1 SPECIAL CLEANUP INSTRUCTIONS FOR USE WITH FLAMMABLE SOLVENTS

- Always flush spray gun preferably outside and at least one hose length from spray pump.
- If collecting flushed solvents in a 4 l metal container, place it into an empty 20 l container, then flush solvents.
- Area must be free of flammable vapors.
- Follow all cleanup instructions.

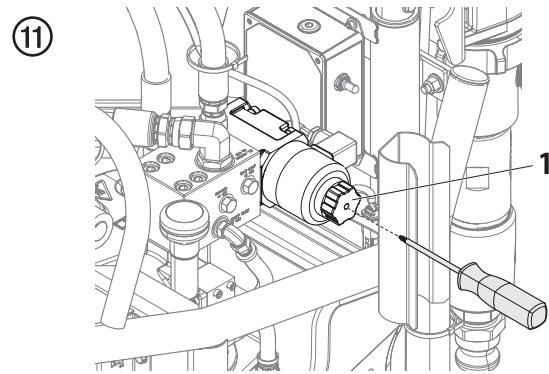
6.2 CLEANING THE SPRAYER

1. Follow the "Pressure Relief Procedure" found in the Operation section of this manual, section 3.7.
2. Remove the gun tip and tip guard and clean with a brush using the appropriate solvent.
3. Place the siphon tube into a container of the appropriate solvent.


 Attention	Use only compatible solvents when cleaning out oil based enamels, lacquers, coal tar, and epoxies. Check with the fluid manufacturer for the recommended solvent.
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4. Place the bleed hose into a metal waste container.


5. Set the pressure to minimum by turning the pressure control knob fully counterclockwise.
6. Open the bleed valve by rotating the bleed valve handle fully counterclockwise.
7. Start the engine (see section 4.2).
8. Press and hold the main switch (Fig. 10, 3) for 3 seconds to switch on the machine (switch lights up).
9. Allow the solvent to circulate through the sprayer and flush the paint out of the bleed hose into the metal waste container.
10. Close the bleed valve by rotating the bleed valve handle fully clockwise.



6.4 CLEANING THE OUTSIDE OF THE UNIT

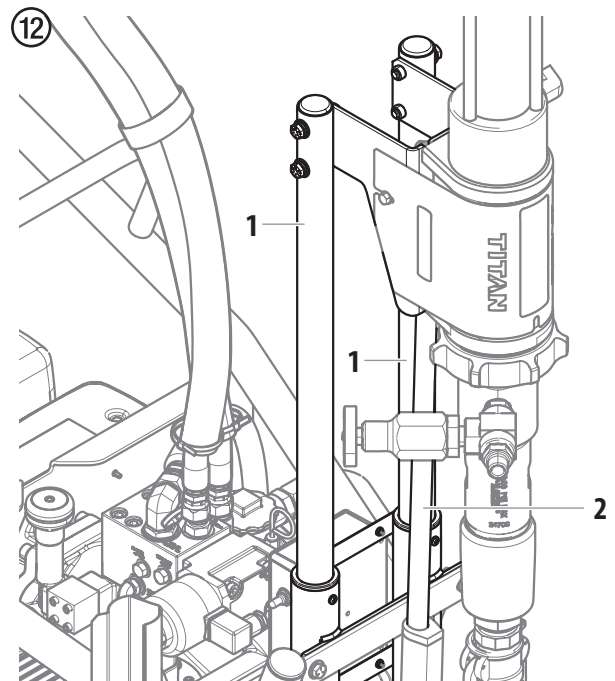
	Earth the gun by holding it against the edge of the metal container while flushing. Failure to do so may lead to a static electric discharge, which may cause a fire.
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11. Trigger the gun into the metal waste container until the paint is flushed out of the hose and solvent is coming out of the gun.
12. Continue to trigger the spray gun into the waste container until the solvent coming out of the gun is clean.

 Attention	<p>Danger of short circuit through penetrating water!</p> <p>Never spray down the unit with high-pressure water or high-pressure steam cleaners.</p> <p>Do not put the high-pressure hose into solvents. Use only a wet cloth to wipe down the outside of the hose.</p>
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Wipe down unit externally with a cloth which has been immersed in a suitable cleaning agent.

Ensure the telescoping tubes (fig. 12, item 1) of the motor/pump lift system and the actuator rod (2) are clean before returning the motor/pump to the storage position.



	<p>For long-term, cold weather storage, or any freezing temperature exposure pump mineral spirits through the entire system.</p> <p>For short-term storage not exposed to freezing temperatures when using latex paint, pump water mixed with Titan Liquid Shield through the entire system (see Accessories section of this manual for part number and product label for dilution instructions).</p>
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13. Follow the "Pressure Relief Procedure" found in the Operation section of this manual, section 3.7.
14. Store the sprayer in a clean, dry area.

 Attention	Do not store the sprayer under pressure.
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6.3 LONG-TERM STORAGE

1. Follow the "6.2 Cleaning the Sprayer" procedure
2. Push and hold the solenoid button until the piston reaches fully down position (fig. 11, item 1)
3. Turn the engine key to the off position
4. Release the solenoid button.

6.5 CLEANING THE FILTER SCREEN

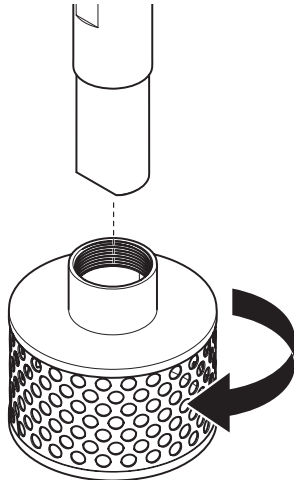


A clean filter screen always guarantees maximum feed quantity, constant spraying pressure and problem-free functioning of the unit.

1. Screw off the filter (Fig. 13) from suction tube.
2. Clean or replace the filter.

Carry out cleaning with a hard brush and an appropriate cleaning agent.

13



6.6 CLEANING AIRLESS SPRAY GUN



Clean the spray gun after each use. Refer to the spray gun manual for complete cleaning instructions.

1. Rinse airless spray gun with an appropriate cleaning agent.
2. Clean tip thoroughly with appropriate cleaning agent so that no coating material residue remains.
3. Thoroughly clean the outside of the airless spray gun.

7 MAINTENANCE



Before proceeding, follow the Pressure Relief Procedure outlined previously in this manual. Additionally, follow all other warnings to reduce the risk of an injection injury, injury from moving parts or electric shock.

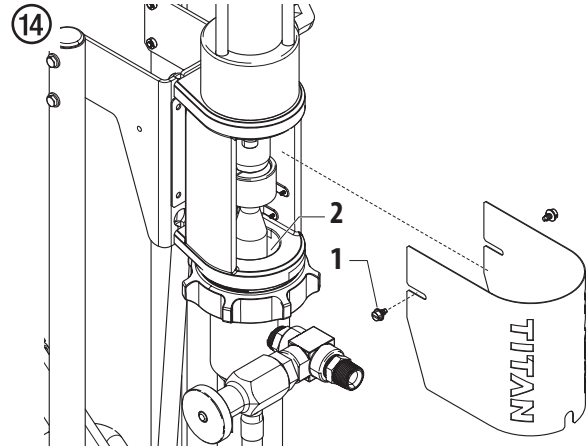
7.1 DAILY MAINTENANCE

Two daily procedures are required for routine operator maintenance on this sprayer:

- A. Lubricating the upper packings (section 7.2).
- B. Cleaning the filter screen (section 6.5).

7.2 LUBRICATING THE UPPER PACKINGS

1. Remove the cover screws and remove the cover (fig. 14, item 1).
2. Clean out the paint that has seeped past the upper packings into the packing oil reservoir (2) above the fluid section.
3. Fill the packing oil reservoir 1/2 full with Piston Lube (P/N 314-480) supplied by the factory. This will extend packing life.



Do not over-fill the reservoir so that it overflows and drips into the paint.

7.3 MAINTAINING THE HYDRAULIC SYSTEM



Use of Titan's Coolflo™ Hydraulic Fluid is mandatory in the Hydra hydraulic system. Do not use any other hydraulic fluid. Use of any other hydraulic fluid may seriously damage the hydraulic system and will void the warranty.



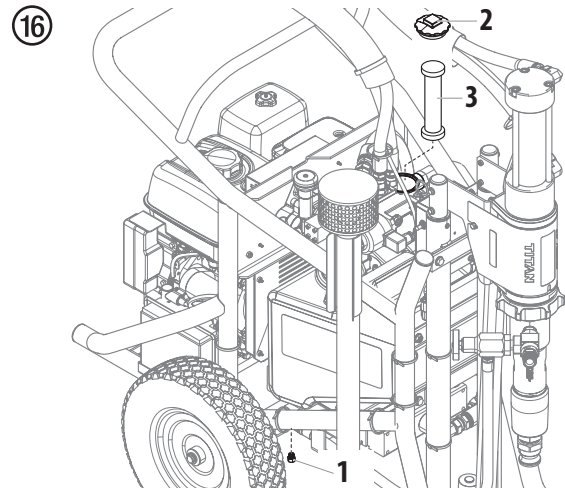
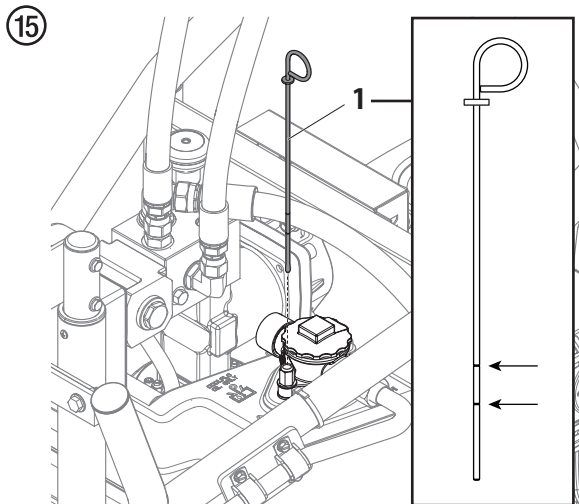
Never add or change hydraulic fluid except in a clean, dust-free area. Contamination of the hydraulic fluid will shorten hydraulic pump life and may void warranty.



Only check the hydraulic fluid level when the device is switched off and standing on a flat, level surface.

1. Check the hydraulic fluid daily. The hydraulic fluid level should be in between the two notches on the dipstick (fig. 15, item 1).

If it is dry, add only Titan Coolflo™ Hydraulic Fluid (P/N 430-361).



CHANGING THE HYDRAULIC FLUID



Change the hydraulic fluid every twelve months. The hydraulic system has an external, replaceable hydraulic filter. Change the filter every twelve months.

1. Put a container (enough to hold 23 l) directly underneath the hydraulic tank drain plug.
2. Using a wrench, remove the drain plug from the hydraulic tank. Allow the hydraulic fluid to fully drain from the tank. Replace the drain plug.
3. Loosen and remove the filter housing (2) to expose the filter. Twist the filter (3) counterclockwise and remove.
4. Fill the hydraulic tank with new hydraulic oil until the oil is between the two notches on the dipstick.
5. Replace the filter (3) and filter housing (2).



When replacing the hydraulic filter (fig. 16, item 3) during a fluid change, it may be necessary to add up to one additional liter of hydraulic fluid.

6. Start the sprayer at just enough pressure to operate the fluid section. Run the sprayer at this low pressure for at least 5 minutes. This removes air from the system. Check the fluid level after this procedure. Do not over-fill.
7. The hydraulic pump should not be serviced in the field. If service on the hydraulic pump is required, it must be returned to an authorized Titan Service Center.

7.4 MAINTAINING THE FLUID SECTION

If the sprayer is going to be out of service for an extended period of time, it is recommended that following cleanup, a kerosene and oil mixture be introduced as a preservative. Packings may tend to dry out from lack of use. This is particularly true of the upper packing set for which upper packing lubricant Piston Lube (P/N 314-480) is recommended in normal usage.

If the sprayer has been out of service for an extended period of time, it may be necessary to prime the pump with solvent. It is extremely important that the coupling on the siphon tube is properly sealed. Any air leakage will produce erratic operation of the sprayer and may damage the system. The up and the down strokes should be approximately equal in time (one should not be faster than the other). A fast up or down stroke may indicate air in the system or malfunctioning valve or seats (see the Troubleshooting section).

7.5 HIGH-PRESSURE HOSE

Inspect the high-pressure hose visually for any notches or bulges, in particular at the transition in the fittings. It must be possible to turn the union nuts freely. A conductivity of less than 1 MΩ must exist across the entire length.



Have all the electric tests carried out by an Authorized Titan Service Center.



The risk of damage rises with the age of the high-pressure hose. Titan recommends replacing high-pressure hoses after 6 years.

7.6 GAS ENGINE



For detailed engine maintenance and technical specifications refer to the separate gasoline engine manual. All service to the engine should be performed by a dealer authorized by the engine manufacturer.

8 TROUBLESHOOTING

8.1 AIRLESS GUN

PROBLEM	CAUSE	SOLUTION
A. Spitting gun	<ol style="list-style-type: none"> 1. Air in system 2. Dirty gun 3. Needle assembly out of adjustment 4. Broken or chipped seat 	<ol style="list-style-type: none"> 1. Inspect connections for air leaks. 2. Disassemble and clean. 3. Inspect and adjust. 4. Inspect and replace.
B. Gun will not shut off	<ol style="list-style-type: none"> 1. Worn or broken needle & seat 2. Needle assembly out of adjustment 3. Dirty gun 	<ol style="list-style-type: none"> 1. Replace. 2. Adjust. 3. Clean.
C. Gun does not spray	<ol style="list-style-type: none"> 1. No paint 2. Plugged filter or tip 3. Broken needle in gun 	<ol style="list-style-type: none"> 1. Check fluid supply. 2. Clean. 3. Replace.

8.2 FLUID SECTION

PROBLEM	CAUSE	SOLUTION
A. Pump delivers on upstroke only or goes up slowly and down fast (commonly called downstroke dive)	<ol style="list-style-type: none"> 1. Lower foot valve ball is not seating due to trash or wear 2. Material too viscous to siphon. 3. Air leaking in on siphon side or damaged siphon tube. Siphon may be too small for heavy material. 	<ol style="list-style-type: none"> 1. Remove foot valve assembly. Clean and inspect. Test foot valve by filling with water; if ball fails to seal the seat, replace ball. 2. Thin material — contact manufacturer for proper thinning procedures. 3. Tighten all connections between pump and paint container. If damaged, replace. Switch to larger diameter siphon set.
B. Pump delivers on down stroke only or goes up fast and down slowly	<ol style="list-style-type: none"> 1. Upper ball is not seating due to trash or wear 2. Lower packing set is worn 	<ol style="list-style-type: none"> 1. Check upper seat and ball with water. If ball fails to seal, replace seat. 2. Replace packing set if worn.
C. Pump moves up and down fast, delivering material	<ol style="list-style-type: none"> 1. Material container is empty or material is too thick to flow through siphon tube 2. Bottom ball stuck to foot valve seat 	<ol style="list-style-type: none"> 1. Refill with new material. If too thick, remove siphon tube, immerse fluid section in material, and start pump to prime. Add thinner to material. Change to bigger siphon set. Open bleed valve to remove air and restart pump. 2. Remove foot valve. Clean ball and seat.
D. Pump moves up and down slowly when spray gun is shut off	<ol style="list-style-type: none"> 1. Loose connections. Bleed valve is open partially or bleed valve is worn. Lower packing set is worn. 2. Upper and/or lower ball not seating 	<ol style="list-style-type: none"> 1. Check all connections between pump and gun. Tighten as necessary. If material is flowing from bleed hose, close bleed valve or replace, if necessary. Should none of the above be evident, replace lower packing. 2. Reseat balls by cleaning.
E. Not enough fluid pressure at gun	<ol style="list-style-type: none"> 1. Spray tip is worn 2. Gun filter is clogged 3. Hose size or length is too small or too long 	<ol style="list-style-type: none"> 1. Replace. 2. Clean or replace filter. 3. Increase hose size to minimize pressure drop through hose and/or reduce hose length.
F. Pump chatters on up or down stroke	<ol style="list-style-type: none"> 1. Solvent has caused upper packing to swell 	<ol style="list-style-type: none"> 1. Replace packing.

8.3 LIFT ASSEMBLY

PROBLEM	CAUSE	SOLUTION
A. Lift will not extend/retract	<ol style="list-style-type: none"> 1. Too much weight 2. Obstruction 3. Low battery 4. Other technical problem (e.g. electrical) 	<ol style="list-style-type: none"> 1. Remove any extra weight (hoses, or other) hanging from the motor/pump assembly 2. Clear any obstructions that are preventing the lift from extending or retracting 3. Master switch light will be flashing if the battery is low. Charge battery by either running the engine or with a automotive battery charger 4. Contact your Titan dealer or a Titan authorised service centre.

8.4 HYDRAULIC MOTORS

PROBLEM

- A. Hydraulic motor stalls at bottom or top of stroke; low or intermittent fluid pump pressure; unusual stroke speed; high heat of the hydraulic oil temperature (above 93°C).

CAUSE

1. Low hydraulic oil level.
2. Pressure control setting too low.
3. Hydraulic belt or pulley failure.
4. Faulty Ground Wire
5. Hydraulic piston failure.
6. Bound or broken fluid section piston.
7. Hydraulic piston rod seal failure
8. Hydraulic piston head seal failure
9. Startup sequence did not complete.

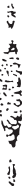
SOLUTION

1. Check oil level. Fill if necessary. If the oil level is full, check the controller.
2. Make sure the pressure control knob is turned up enough to cycle the motor. If the pressure control setting is okay, then check the belt and pulleys.
3. Contact your Titan dealer or a Titan authorised service centre.
4. Check ground wire continuity. Remove corrosion on terminals or replace as needed.
5. Contact your Titan dealer or a Titan authorised service centre.
6. To check for a bound/broken fluid section piston de-couple the hydraulic piston from the paint piston. Power up the unit. If the hydraulic motor cycles when the hydraulic piston is de-coupled from the paint piston then the problem is most likely in the fluid section. Please visit a Titan Authorized Service Center if assistance is necessary. If the hydraulic motor still does not cycle then check the hydraulic piston rod seal.
7. Contact your Titan dealer or a Titan authorised service centre.
8. Contact your Titan dealer or a Titan authorised service centre.
9. The controller has a "startup sequence" that needs several seconds to complete before the pump will cycle normally. Turn on the unit like normal, wait several seconds and if the pump does not cycle check the pressure control setting.

8.5 SPRAY PATTERNS

PROBLEM

- A. Tails



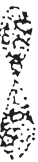
CAUSE

1. Inadequate fluid delivery

SOLUTION

1. Fluid not atomizing correctly: Increase fluid pressure. Change to smaller tip orifice size. Reduce fluid viscosity. Reduce hose length. Clean gun and filter(s). Reduce number of guns using pump.

- B. Hour glass



1. Inadequate fluid delivery

1. Same as above.

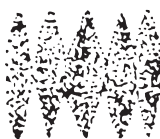
- C. Distorted



1. Plugged or worn nozzle tip

1. Clean or replace nozzle tip.

- D. Pattern expanding and contracting (surge)



1. Suction leak
2. Pulsating fluid delivery

1. Inspect for suction hose leak.
2. Change to a smaller tip orifice size. Install pulsation dampener in system or drain existing one. Reduce number of guns using pump. Remove restrictions in system; clean tip screen if filter is used.

- E. Round pattern





1. Worn tip
2. Fluid too heavy for tip


1. Replace tip.
2. Increase pressure. Thin material. Change nozzle tip.

9 SERVICING

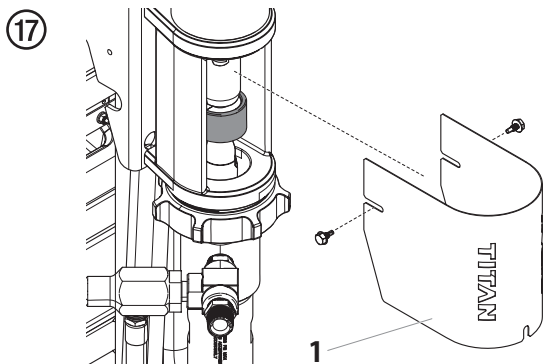
9.1 SERVICING THE HYDRAULIC MOTOR

 <p>Attention</p>	<p>Servicing of the hydraulic motor should be carried out in a clean, dust free area only. Any dust or metallic particles left in the motor or entering it on reassembly may damage the critical parts and affect its service life and warranty. All parts should be inspected for absolute cleanliness.</p>
	<p>In order to service the hydraulic motor, it is recommended that the piston be set in the middle of its stroke. Follow one of the two sets of instructions below.</p>

USE THE PULL START ON THE ENGINE

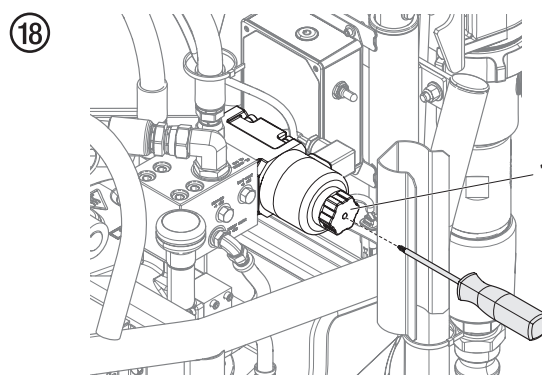
	<p>Gently pulling the starter rope on the engine will move the piston upwards. If the piston is below the middle of the stroke, follow these steps.</p>
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1. Remove the cover (fig. 17, item 1) to expose the piston.
2. Turn the pressure control knob all the way counterclockwise to the lowest setting. Then turn the pressure control knob clockwise 2 turns.
3. Pull the starter rope on the motor until the piston is set in the middle of its stroke.



USE THE SOLENOID BUTTON

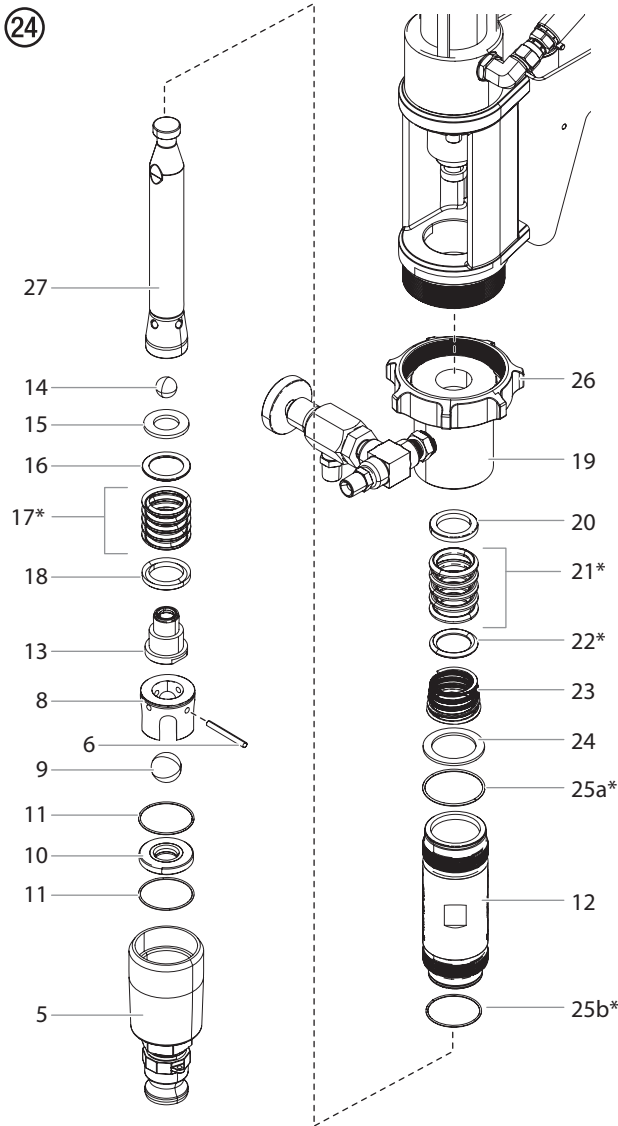
1. Remove the cover (fig. 17, item 1) to expose the piston.
2. Submerge the fluid section and return tube into a bucket of water.
3. Turn the pressure control knob all the way counterclockwise to the lowest setting.
4. Open the bleed valve by turning it fully counterclockwise.
5. Start the engine. Slide the throttle lever to a lower setting.
6. Using a torx or small Phillips screwdriver, insert the end of the screwdriver and fully push and hold the solenoid button (Fig. 18, item 1). This will cause the piston to automatically slide to a lower position.
7. Slightly let up on the button until the piston moves to the center position. When it moves to the center position, immediately shut off the engine.



9.2 SERVICING THE FLUID SECTION



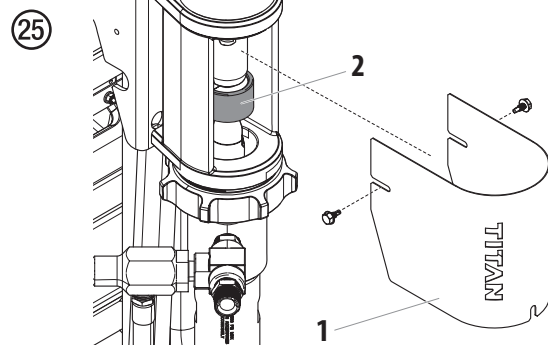
The performance of a 4540 can be converted to a 7230 by purchasing a conversion assembly (P/N 2424618).



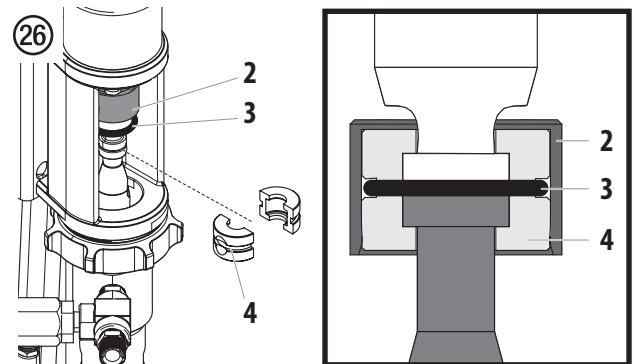
Use of non-Titan service parts may void warranty. Ask for original parts made by Titan for best services. This pump should receive a routine servicing after approximately 1,000 hours of use. Earlier servicing is required if there is excessive leakage from the top packing or if pump strokes become faster on one stroke or the other. The use of Titan Piston Lube (P/N 314-480) is recommended as an upper packing lubricant. Do not substitute oil, water, or solvent for an upper packing lubricant.

DISASSEMBLY PROCEDURE

1. Test pump before disassembly. Follow test procedure in Troubleshooting Guide - Fluid Section in the Operation manual.
2. Remove siphon tube assembly.
3. Remove the cover screws and remove the cover (fig. 25, item 1). The coupler sleeve (2) should now be exposed.



4. Push the coupler sleeve upwards. The O-ring underneath it will give some resistance. Push the coupler sleeve upwards to expose the O-ring.
5. Slide the O-ring (fig. 26, item 3) upwards so that it is clear of the two coupling halves (4). Remove the two coupling halves (4).




6. Fully loosen the locking nut (fig. 24, item 26) and pull the entire fluid section assembly from the hydraulic motor.
7. For easier disassembly, unthread and remove foot valve (5).
8. Remove the ball cage (8), ball (9), ball seat (10) and PTFE O-ring (11) from the foot valve (5). Remove the ball pin (6) from the ball cage (8).
9. Push the displacement rod (27) down as far as possible. Pull it out the bottom of the cylinder (12).
10. Secure the flats of the displacement rod (27) in a vise. Using a wrench, loosen and remove the outlet valve housing (13).
11. Remove the ball (14), retainer (15), and the lower packing set (16-18).
12. Place the fluid section adapter upside down (19) in a vise. Using a wrench on the flats of the cylinder (12), unthread the cylinder from the fluid section adapter.
13. Remove the upper packing set (20-22), upper spring (23), and spring retainer (24) from the fluid section adapter.
14. Remove the O-rings (25a/25b) from the top and the bottom of the cylinder.
15. Clean and inspect all parts. Inspect displacement rod's (27) and cylinder's (12) chrome for grooves, dents or worn areas. Replace


if hard chrome is damaged. Inspect inlet valve seat (10) and replace if cracked or worn. Inspect outlet valve seat (13) and replace if damaged.

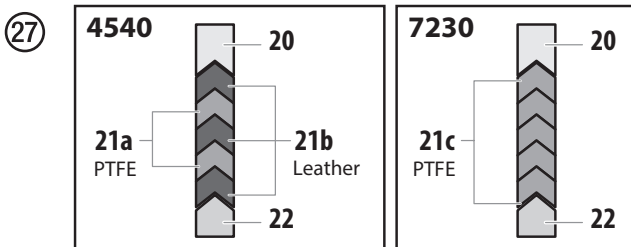
16. Repair the fluid pump by using all of the parts contained in the kit. For any other parts not included in the kit, replace those as needed.

REASSEMBLY PROCEDURE


	The pump adapter (19) should still be secured upside-down in a vise.
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1. Soak the leather packings (21b) in hydraulic oil for 15-20 minutes. Lubricate all of the other parts of the upper packing set (20, 21, 22) with hydraulic oil. Insert the female gland (20), the upper packings (21) and the male gland (22) into the bottom of the fluid section adapter (19).


 Attention	Since the pump adapter (19) is upside-down, the upper packing set will be installed accordingly, with the peak of the "V" packings (21) pointing down. After reinstallation, once the pump adapter is turned right-side up again, the peak of the "V" packings will point upwards. See fig. 27 for the final orientation of all parts of the upper packing set (20-22).
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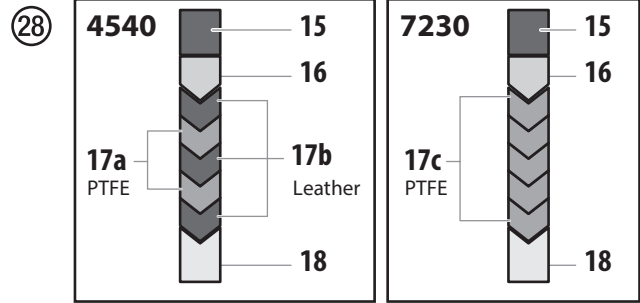


2. Insert upper spring (23); small end of spring must go toward the packing set.
3. Insert spring retainer (24).


	Lubricate all O-rings before assembly (Piston Lube, Part # 314-480).
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4. Install new O-rings (25a/25b) on the cylinder (12).
5. Thread the cylinder (12) into the pump adapter (19). Tighten by using a wrench on the flats of the cylinder.
6. Soak the leather packings (17b) in hydraulic oil for 15-20 minutes. Lubricate all other parts of the lower packing set (15-16, 17, 18) with hydraulic oil. Install them onto the outlet valve housing (13) in the following order: gland (18), lower packing set (17), gland (16) and retainer (15).


 Attention	The peak of the "V" packings (17) should be facing downward upon reassembly.
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7. Reinstall the ball (14) onto the outlet valve housing (13).
8. Coat the female threads of the displacement rod with adhesive activator included with repair kit 240713.
9. Coat the male threads of the outlet valve housing (13) with 4 drops of yellow Loctite 330 (included with repair kit 240713) and 4 drops of blue Loctite 243 (426-051).
10. Thread outlet valve housing (13) back into displacement rod (27). Torque to 120 ft.-lbs.

	The outlet valve housing (13) and displacement rod (27) should cure together for a minimum of 24 hours before the fluid section is allowed to have any fluid pumped through it.
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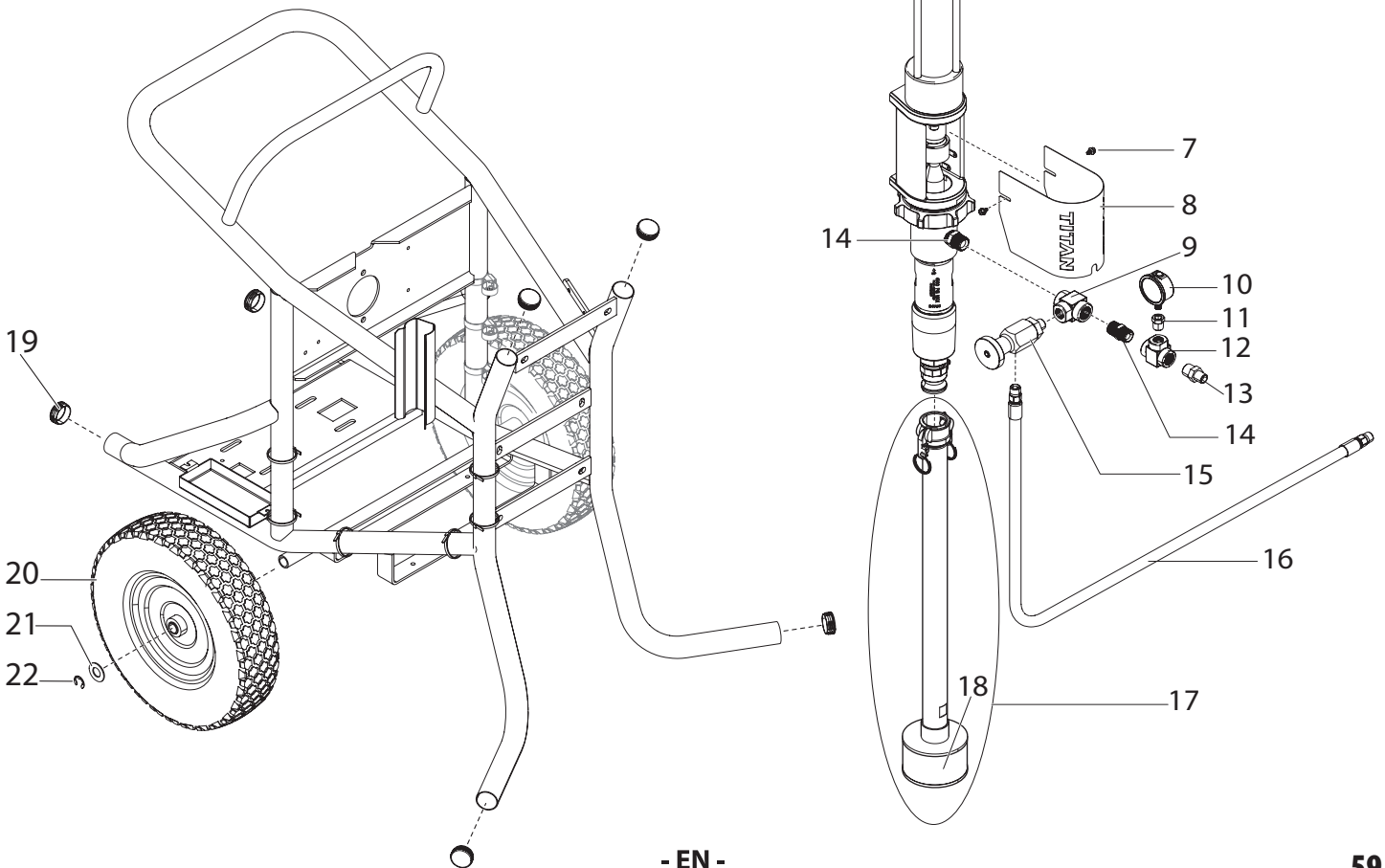
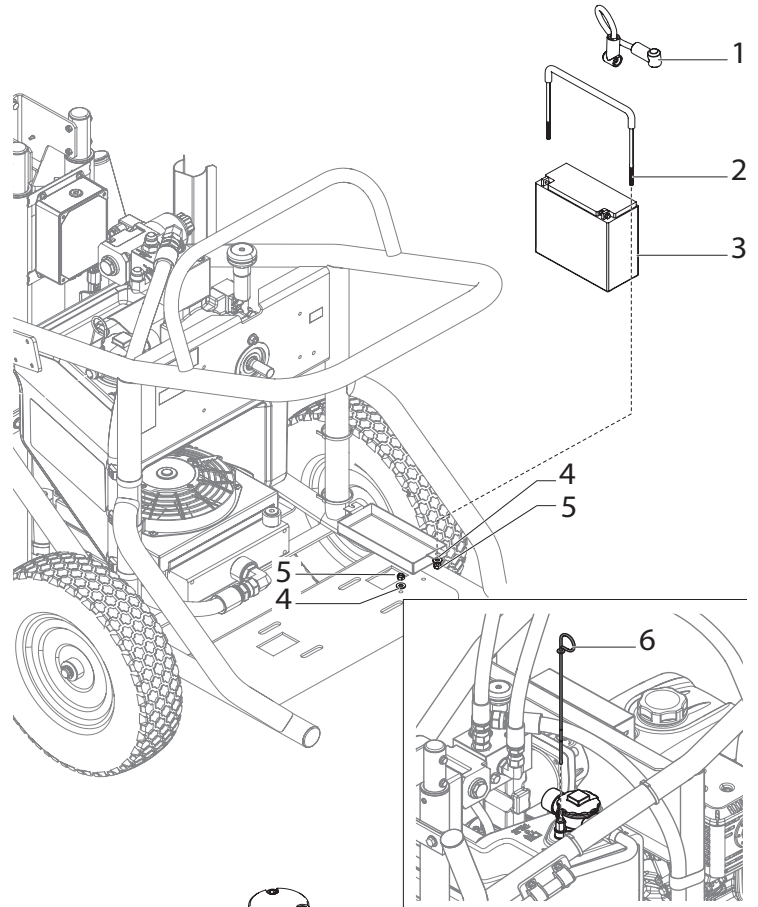
11. Insert displacement rod (27) assembly through upper packing set (20-22) in fluid section adapter (19). Be careful not to scratch the inner walls of the cylinder or pump adapter. Push the displacement rod through until the end is protruding from the top of the pump adapter (19).
12. Remove cylinder (12) and fluid section adapter (19) from the vise.
13. Reinstall the ball pin (6) into the ball cage (8). The ball pin has two possible positions. The upper ball pin location allows for more ball travel which is better for more viscous materials. The lower ball pin location is for less ball travel and is better for less viscous materials.
14. Install the O-rings (11 x 2), ball seat (10), ball (9) ball cage (8) and the O-ring (7) into the foot valve (5).
15. Thread the foot valve (5) into the cylinder (12). Torque to 250 in.-lbs (+/- 75 in.-lbs).

	It is not necessary to overtighten foot valve and cylinder into fluid section adapter. O-ring seals perform sealing function without excessive tightening. Full thread engagement is sufficient.
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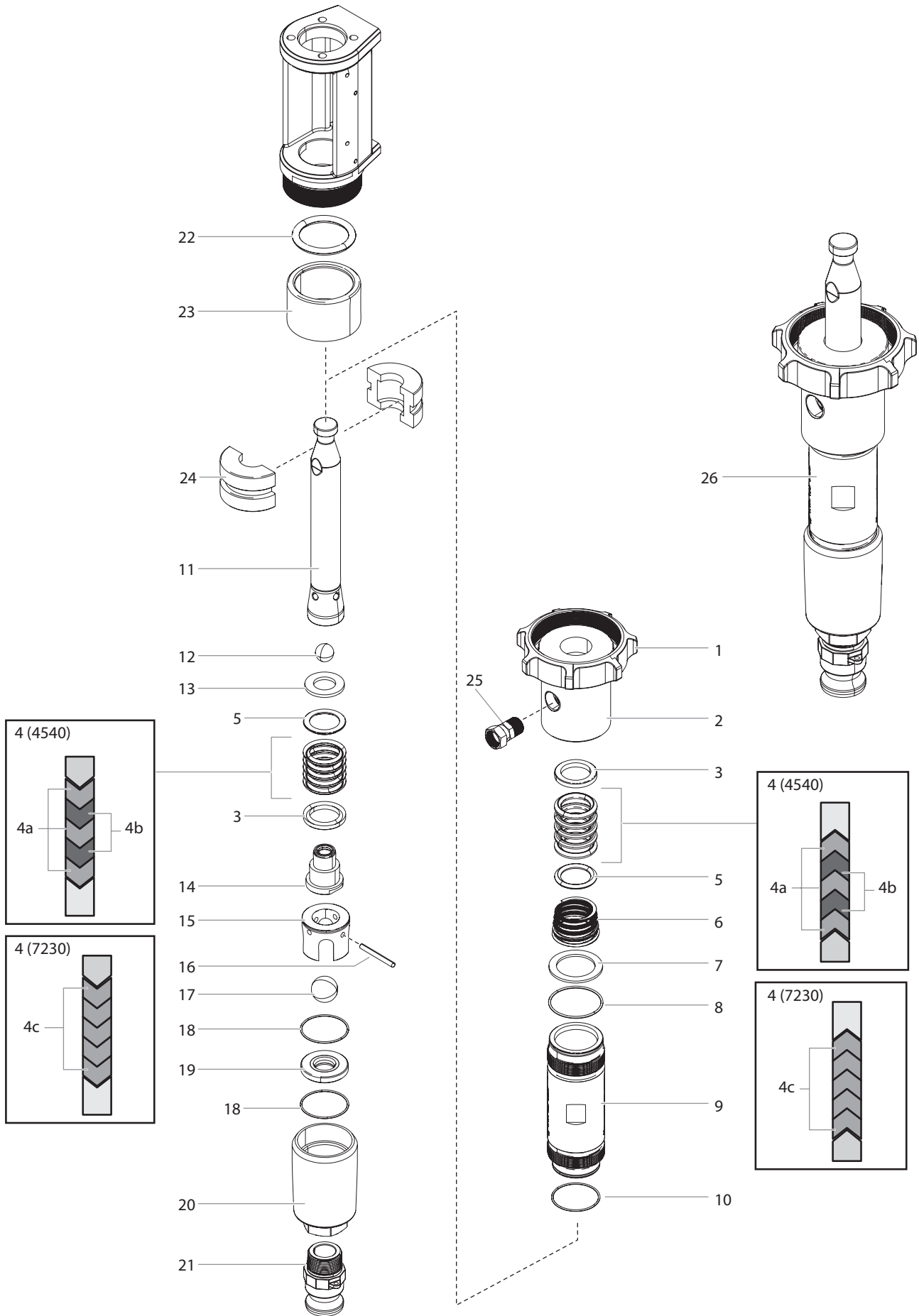
16. Reinstall the fluid pump. Line up the fluid pump to the bottom of the pump block. Thread the locking nut (26) onto the hydraulic motor and tighten.
17. Reinstall the two coupling halves (fig. 26, item 4).
18. Slide the O-ring (3) over the two coupling halves to secure them. Slide the coupler sleeve (2) over the O-ring (3).
19. Reinstall the front cover (1).

10 SPARE PARTS

POS.	PART NO.	DESCRIPTION
1	2404469	Cable
2	2401601	Battery clamp
3	2401599A	Battery
4	858-001	Washer, 1/4, 9/32 x 5/8
5	770-144	Locknut (4), 1/4-20
6	2412951	Hydraulic fluid dipstick
7	2403779	Screw, hex head, self drilling (2)
8	2401604A	Cover
9	2409800	Fitting, Tee
10	2427990	Pressure gauge
11	2428465	Bushing
12	2409800	Fitting, Tee
13	9885645	Adapter
14	2402923	Adapter
15	945-600A	Bleed valve assembly
16	2423530	HP-Hose, Airless, 1/2 x 5'
17	2402315A	Siphon tube assembly (includes item 18)
18	2404794	Inlet filter
19	2401595	Plug (6)
20	670-105	Wheel (2)
21	295687	Washer (2)
22	590-100	Retaining ring (2)



POS.	4540	7230	DESCRIPTION
1	-----	-----	Nut
2	-----	-----	Adapter
3	-----	-----	Gland, female (2)
4a	-----	-----	Packing, PTFE (6) (4540 only)
4b	-----	-----	Packing, leather (4) (4540 only)
4c	-----	-----	Packing, PTFE (10) (7230 only)
5	-----	-----	Gland, male (2)
6	-----	-----	Spring
7	-----	-----	Gasket
8	-----	-----	O-ring, PTFE
9	-----	-----	Pump cylinder
10	-----	-----	O-ring, PTFE
11	-----	-----	Piston
12	-----	-----	Ball
13	-----	-----	Retainer
14	-----	-----	Outlet valve housing
15	-----	-----	Foot valve cage
16	-----	-----	Pin
17	-----	-----	Ball
18	-----	-----	O-ring, PTFE (2)
19	-----	-----	Foot valve seat
20	-----	-----	Foot valve housing
21	2401629	2401629	Suction tube coupling
22	2409738	2409738	O-ring
23	2401628	2401628	Piston coupler sleeve
24	2401631	2401631	Coupler half (2)
25	533857	533857	Adapter
26	2401635A	2403440A	Fluid section assembly (includes items 1-21)
	2414180	2414181	Fluid section service kit, major (includes items 9, 11, and fluid section service kit, minor)
	2414183	2414182	Fluid section service kit, minor (includes items 3-5, 7-8, 10, 12, 17-18, 22, Loctite P/N 426-051 and Loctite P/N 2420713)
	-----	2420803	Fluid section service kit, minor, leather, (includes gland, female P/N 533662, items 4b (qty. 6), 4c (qty. 4) 5, 7-8, 10, 12, 17-18, 22, Loctite P/N 426-051 and Loctite P/N 2420713) This kit is a conversion kit from PTFE only to leather/PTFE
	2420804	-----	Fluid section service kit, minor, PTFE, (includes gland, female P/N 2417266, and items 4a (qty. 10), 5, 7-8, 10, 12, 17-18, 22, Loctite P/N 426-051 and Loctite P/N 2420713) This kit is a conversion kit from leather/PTFE to PTFE only
	2414186	2414187	Foot valve assembly (includes items 15-20)
	2414184	2414185	Outlet valve assembly (includes items 12-14, Loctite P/N 426-051 and Loctite P/N 2420713)
	2424618	-----	4540 to 7230 fluid section conversion kit (includes items 1 and 21, P/Ns 945-600, 2402923, 2403440A, and 2409800)



11 ACCESSORIES

PART NO.	DESCRIPTION
SPRAY GUNS	
538070*	RX-Apex spray gun
550-270	S-7 spray gun
2425442	M-8 spray gun
SPRAY TIPS AND ACCESSORIES	
696-XXX**	HP Spray Tip
661-027	HP Tip Guard
661-020	Tip seat and seal kit (5 pack)
FILTERS	
0089957	Coarse Gun Filter (Green)
0089958	Medium Gun Filter (White)
EXTENSIONS	
611-280	Tip Extension (15 cm)
611-281	Tip Extension (30 cm)
611-282	Tip Extension (45 cm)
611-283	Tip Extension (60 cm)
AIRLESS HOSE (SUITABLE UP TO 517 BAR)	
250750003	1/4" x 90 cm Whip Hose
250750006	1/4" x 1,8 m Whip Hose
250750050	1/4" x 15 m Airless Hose
250750010	1/4" x 30 m Airless Hose
375750006	3/8" x 1,8 m Whip Hose
375750050	3/8" x 15 m Airless Hose
375750010	3/8" x 30 m Airless Hose
500750050	1/2" x 15 m Airless Hose
500750010	1/2" x 30 m Airless Hose
HOSE CONNECTORS	
9885642	1/4" x 1/4" hose connector
9885643	3/8" x 3/8" hose connector
9885644	1/2" x 1/4" hose connector
9885645	3/4" x 1/2" hose connector
9885646	3/8" x 1/4" hose connector
9885647	1/2" x 3/8" hose connector
9885648	1/2" x 1/2" hose connector

PART NO.	DESCRIPTION
LUBRICANTS AND CLEANERS	
314-482	Liquid Shield™ 946 ml
314-480	Piston Lube™, 240 ml
700-926	Piston Lube™, 946 ml
297055	Pump Shield™, 355 ml
508071	Paint Mate 946 ml
91-36	Throat seal lubricant
OTHER ACCESSORIES	
2424618	4540 to 7230 fluid section conversion kit
2426206	Suction system for IBC containers
2426217	Suction system for closed drums
2410501	Suction system for 5-gallon containers
2414176	Set for multi-gun operation (for up to 3 guns)
*	Hydra X 4540 only
**	Go to www.titantool.com for tip sizes

WARRANTY

3 + 2 YEAR GUARANTEE ON THIS TITAN PRODUCT

(Status 03.03.2022)

TITAN exclusively provides the commercial buyer who has purchased the product from an authorised specialist dealer (hereinafter referred to as the „Customer“) with a warranty for the products listed on the Internet at <https://go.titantool-international.com/warranty> in addition to the statutory warranty regulations, unless there is a warranty exclusion.

The warranty period for TITAN products (devices) is 36 months and begins with the date of purchase of the initial purchase. This warranty period is extended by a further 24 months if the product is registered within 28 days of purchase on the Internet at <https://go.titantool-international.com/registration>.

In cases of commercial rental, industrial use (e.g. use in shift operation) or equivalent use, the warranty period is 12 months due to the significantly higher load. We reserve the right to carry out a check in individual cases and refuse the warranty where necessary. If any material, machining or performance defects are identified in the device within the warranty period, then the warranty claims must be made immediately and within a period of no more than 2 weeks following discovery of the defect.

The detailed guarantee conditions can be obtained on request from our authorised TITAN partners (see website or operating instructions) or in text form on our website:

<https://go.titantool-international.com/warranty-conditions>



Subject to modifications

EU Declaration of conformity

We declare under sole responsibility that this product conforms to the following relevant stipulations:
2006/42/EC, 2011/65/EU

Applied harmonised norms:
EN ISO 12100, EN 1953

The EU declaration of conformity is enclosed with the product.
If required, it can be re-ordered using order number **2427321**.

UKCA Declaration of conformity

We declare under sole responsibility that this product conforms to the following relevant regulations:

Supply of Machinery (Safety) Regulations 2008
The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012

Applied harmonised standards
BS EN ISO 12100
BS EN 1953:2013



TITAN[®]

HYDRA X[™]

4540

7230

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