Instructions - Parts List

50:1 Fire-Ball® 425 Pumps

306674ZAB
EN

For pumping non-corrosive and non-abrasive greases and lubricants only. For professional use only.

Model 205394, Series E
Model 205395, Series N

7500 psi (51.7 MPa, 517 bar) Maximum Working Pressure
150 psi (1.0 MPa, 10 bar) Maximum Air Input Pressure

Important Safety Instructions
Read all warnings and instructions in this manual. Save these instructions.

This pump is designed to be used only in pumping non-corrosive and non-abrasive oils and lubricants. Any other use of the pump can cause unsafe operating conditions and component rupture, which can result in fluid injection or other serious injury or fire or explosion.

PROVEN QUALITY. LEADING TECHNOLOGY.

Warnings

The following warnings are for the setup, use, grounding, maintenance, and repair of this equipment. The exclamation point symbol alerts you to a general warning and the hazard symbols refer to procedure-specific risks. When these symbols appear in the body of this manual or on warning labels, refer back to these Warnings. Product-specific hazard symbols and warnings not covered in this section may appear throughout the body of this manual where applicable.

⚠ WARNING

FIRE AND EXPLOSION HAZARD

When flammable fluids are present in the work area, such as gasoline and windshield wiper fluid, be aware that flammable fumes can ignite or explode. To help prevent fire and explosion:

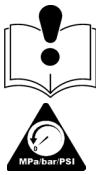
- Use equipment only in well ventilated area.
- Eliminate all ignition sources, such as cigarettes and portable electric lamps.
- Keep work area free of debris, including rags and spilled or open containers of solvent and gasoline.
- Do not plug or unplug power cords or turn lights on or off when flammable fumes are present.
- Ground all equipment in the work area.
- Use only grounded hoses.
- **Stop operation immediately** if static sparking occurs or you feel a shock**.** Do not use equipment until you identify and correct the problem.
- Keep a working fire extinguisher in the work area.

SKIN INJECTION HAZARD

High-pressure fluid from dispensing device, hose leaks, or ruptured components will pierce skin. This may look like just a cut, but it is a serious injury that can result in amputation. **Get immediate surgical treatment.**

- Do not point dispensing device at anyone or at any part of the body.
- Do not put your hand over the fluid outlet.
- Do not stop or deflect leaks with your hand, body, glove, or rag.
- Follow the **Pressure Relief Procedure** when you stop dispensing and before cleaning, checking, or servicing equipment.
- Tighten all fluid connections before operating the equipment.
- Check hoses and couplings daily. Replace worn or damaged parts immediately.

WARNING



EQUIPMENT MISUSE HAZARD

Misuse can cause death or serious injury.

- Do not operate the unit when fatigued or under the influence of drugs or alcohol.
- Do not exceed the maximum working pressure or temperature rating of the lowest rated system component. See **Technical Data** in all equipment manuals.
- Use fluids and solvents that are compatible with equipment wetted parts. See Technical Data in all equipment manuals. Read fluid and solvent manufacturer's warnings. For complete information about your material, request MSDS from distributor or retailer.
- Turn off all equipment and follow the **Pressure Relief Procedure** when equipment is not in use.
- Check equipment daily. Repair or replace worn or damaged parts immediately with genuine manufacturer's replacement parts only.
- Do not alter or modify equipment. Alterations or modifications may void agency approvals and create safety hazards.
- Make sure all equipment is rated and approved for the environment in which you are using it.
- Use equipment only for its intended purpose. Call your distributor for information.
- Route hoses and cables away from traffic areas, sharp edges, moving parts, and hot surfaces.
- Do not kink or over bend hoses or use hoses to pull equipment.
- Keep children and animals away from work area.
- Comply with all applicable safety regulations.

MOVING PARTS HAZARD

Moving parts can pinch, cut or amputate fingers and other body parts.

- Keep clear of moving parts.
- Do not operate equipment with protective guards or covers removed.
- Pressurized equipment can start without warning. Before checking, moving, or servicing equipment, follow the **Pressure Relief Procedure** and disconnect all power sources.

TOXIC FLUID OR FUMES HAZARD

Toxic fluids or fumes can cause serious injury or death if splashed in the eyes or on skin, inhaled, or swallowed.

- Read MSDSs to know the specific hazards of the fluids you are using.
- Store hazardous fluid in approved containers, and dispose of it according to applicable guidelines.

PERSONAL PROTECTIVE EQUIPMENT

Wear appropriate protective equipment when in the work area to help prevent serious injury, including eye injury, hearing loss, inhalation of toxic fumes, and burns. This protective equipment includes but is not limited to:

- Protective eyewear, and hearing protection.
- Respirators, protective clothing, and gloves as recommended by the fluid and solvent manufacturer

METERAN TEKNIK INDONESIA

Installation

Grounding

The equipment must be grounded to reduce the risk of static sparking and electric shock. Electric or static sparking can cause fumes to ignite or explode. Improper grounding can cause electric shock. Grounding provides an escape wire for the electric current.

Pump: Use a ground wire and clamp as shown in FIG. 1.

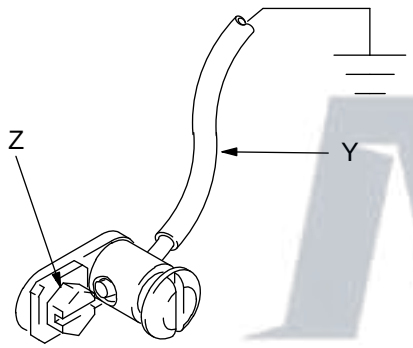


FIG. 1

Air and fluid hoses: Use only electrically conductive hoses.

Air compressor: Follow manufacturer's recommendations.

Dispense valve: Ground through connection to a properly grounded fluid hose and pump.

Object being dispensed: follow local code.

Solvent pails used when flushing: Follow local code. Use only conductive metal pails, placed on a grounded surface. Do not place the pail on a nonconductive surface, such as paper or cardboard, which interrupts grounding continuity.

To maintain grounding continuity when flushing or relieving pressure: hold metal part of the spray gun/dispense valve firmly to the side of a grounded metal pail, then trigger the gun/valve.

To ground the pump: Remove the ground screw (Z) and insert through the eye of the ring terminal at end of ground wire (Y). Fasten the ground screw back onto the pump and tighten securely. Connect the other end of the ground wire to a true earth ground. See FIG. 1. To order a ground and wire clamp, order Part No. 222011.

Mounting the Pump

Mount the pump securely so that it cannot move around during operation. Failure to do so could result in personal injury or equipment damage.

- Select a convenient location for the equipment to ensure easy operator access to the pump air controls, sufficient room to change supply containers, and a secure mounting platform
- If the pump is being directly mounted on the supply tank, position the pump so its intake valve is no more than 1 inch (25 mm) from the bottom of the container. Mount the pump to the cover or other suitable mounting device

METERA TEKNIK INDONESIA

Typical Installation

Mount the pump to suit the type of installation planned. Very heavy lubricant may require an inductor plate. See page 16 for the mounting hole layout and dimensions.

Install the airline accessories in the approximate order shown in FIG. 2. Install a bleed-type master air valve (B) within easy reach of the pump, upstream from the air regulator. Install an air filter (C) to remove harmful dirt and moisture from the compressed air supply. For automatic air motor lubrication, install an air line oiler (D) close to the pump air inlet. Install an air regulator (E) to control pump speed.

A bleed-type master air valve (B) is required to shut off an relieve air pressure that may be trapped in the air motor. Trapped air could cause the pump to cycle unexpectedly and cause serious bodily injury, including amputation.

Be sure the air hose is properly sized to deliver an adequate supply of air to the motor. Refer to the Technical Data on page 16.

Connect a dispensing hose to the 3/8 npt(f) pump outlet. Install an appropriate gun or dispense valve to the hose.

Ground the pump as explained on page 4.

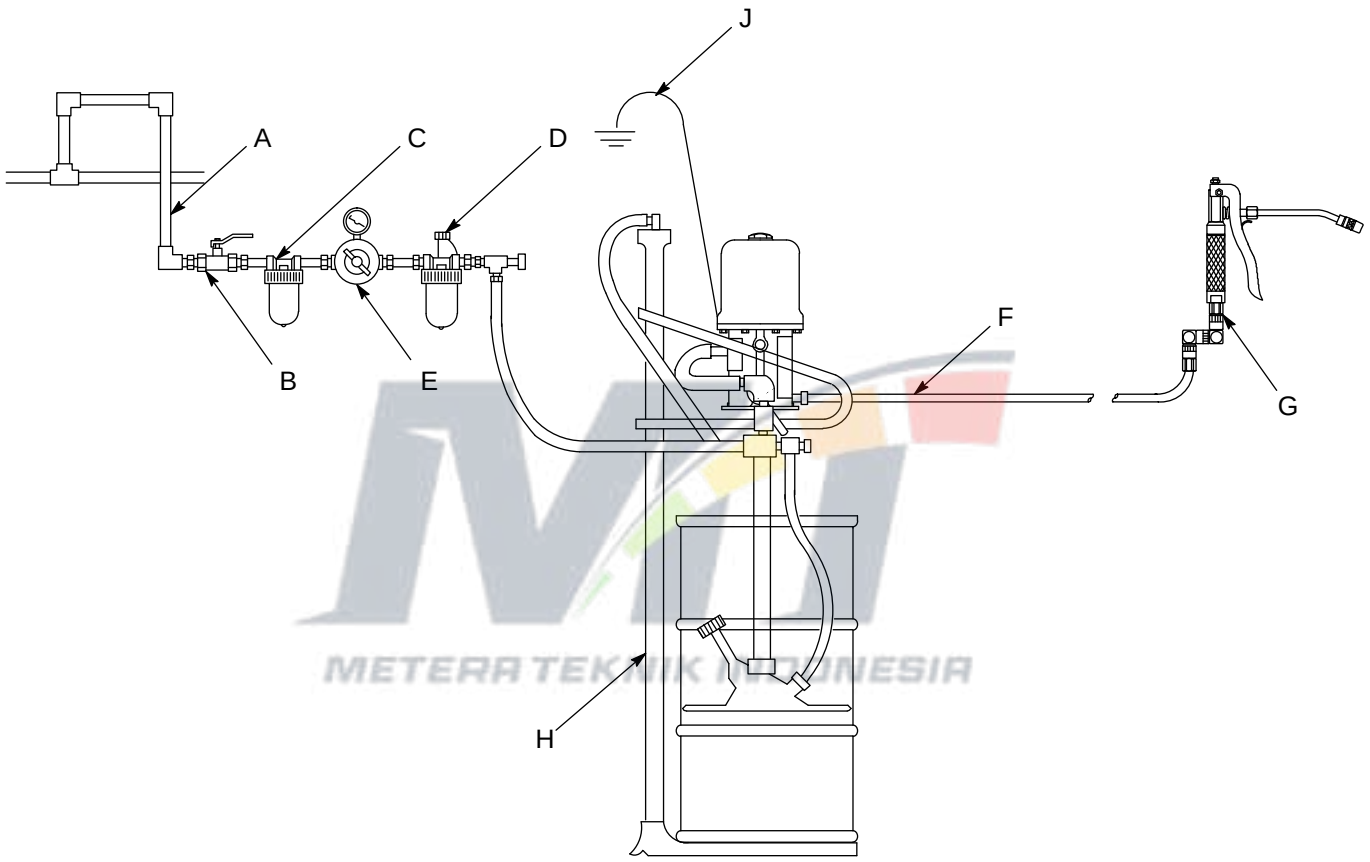


FIG. 2: Typical Installation

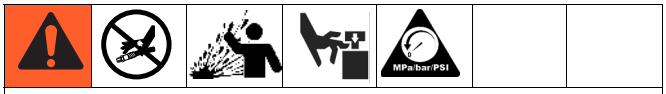
Key:

A Grounded air line
B Bleed-type master air valve
C Air filter
D Air line oiler
E Air regulator
F Grounded dispensing hose
G Dispensing valve
H Elevator assembly with inductors
J Ground wire

Operation

Pressure Relief Procedure

Follow the Pressure Relief Procedure whenever you see this symbol.



This equipment stays pressurized until pressure is manually relieved. To help prevent serious injury from pressurized fluid, such as skin injection, splashing fluid and moving parts, follow the Pressure Relief Procedure when you stop spraying and before cleaning, checking, or servicing the equipment.

1. Close the air regulators (E).
2. Close the supply pump's bleed-type air master valve (B, required in system).
3. Open the dispensing valve (G) until pressure is fully relieved.

NOTE: If it appears that the dispensing valve, extension, or grease fitting coupler is clogged, or that pressure has not been fully relieved after following the steps above, VERY SLOWLY loosen the coupler or hose end coupling and relieve pressure gradually, then loosen completely and clear the clog.

Startup and Adjustment

Open the bleed-type air master valve (B). Open the dispensing valve (G), and slowly open the air regulator (E) until the pump is running smoothly. After all the air is purged, close the dispensing valve. The pump will start and stop as the valve is opened and closed.

NOTICE

Never allow the pump to run dry of the fluid being pumped. A dry pump quickly accelerates to a high sped and may damage itself. If your pump accelerates quickly or is running too fast, stop it immediately and check the fluid supply. If the supply container is empty and air has been pumped into the lines, prime the pump and the lines with fluid, or flush the pump and leave it filled with a compatible solvent. be sure to eliminate all air from the fluid system.

Use the air regulator (E) to control the pump speed and fluid pressure. See FIG. 2. Always use the lowest pressure necessary to obtain the desired results.

NOTE: When finished using the pump for the day always follow the Pressure Relief Procedure.

Maintenance

The accessory air line oiler (D) provides automatic air motor lubrication. Four daily manual lubrication, disconnect the air hose, place about 15 drops of light machine oil in the air inlet, reconnect the hose, and turn on the air supply to blow oil into the motor.

PT. PETROTEKNIK INDONESIA

Troubleshooting

1. Follow **Pressure Relief Procedure**, page 6, before checking or repairing gun.
2. Check all possible problems and causes before disassembling gun.

Problem	Cause	Solution
Pump fails to operate	Inadequate air supply pressure or restricted air lines.	Increase air supply; clear
	Closed or clogged valves	Open; clean
	Clogged fluid lines, hoses, valve, etc.	Clear*
	Damaged air motor	Service air motor
	Exhausted fluid supply	Refill and reprime, or flush
Continuous air exhaust	Worn or damaged air motor gasket, packing, seal, etc.	Service air motor
Erratic pump operation	Exhausted fluid supply	Refill and reprime, or flush
	Held open or worn intake valve or piston packings	Clear; service
Pump operates, but output low on upstroke	Held open or worn piston or packings	Clear; service
Pump operates, but output low on downstroke	Held open or worn intake valve	Clear; service
Pump operates, but output low on both strokes	Inadequate air supply or restricted air lines	Increase air supply; clear
	Closed or clogged valves	Open; clean
	Exhausted fluid supply	Refill and reprime, or flush
	Clogged fluid lines, hoses, valves, etc.	Clear*
	Packing nut too tight	Loosen
	Loose packing nut or worn packings	Tighten; replace

* Follow the Pressure Relief Procedure (see page 6), and disconnect the fluid line. If the pump starts when the air is turned back on, the fluid line, hose, valve, etc. was clogged.

WAHANA TEKNIK INDONESIA

Service

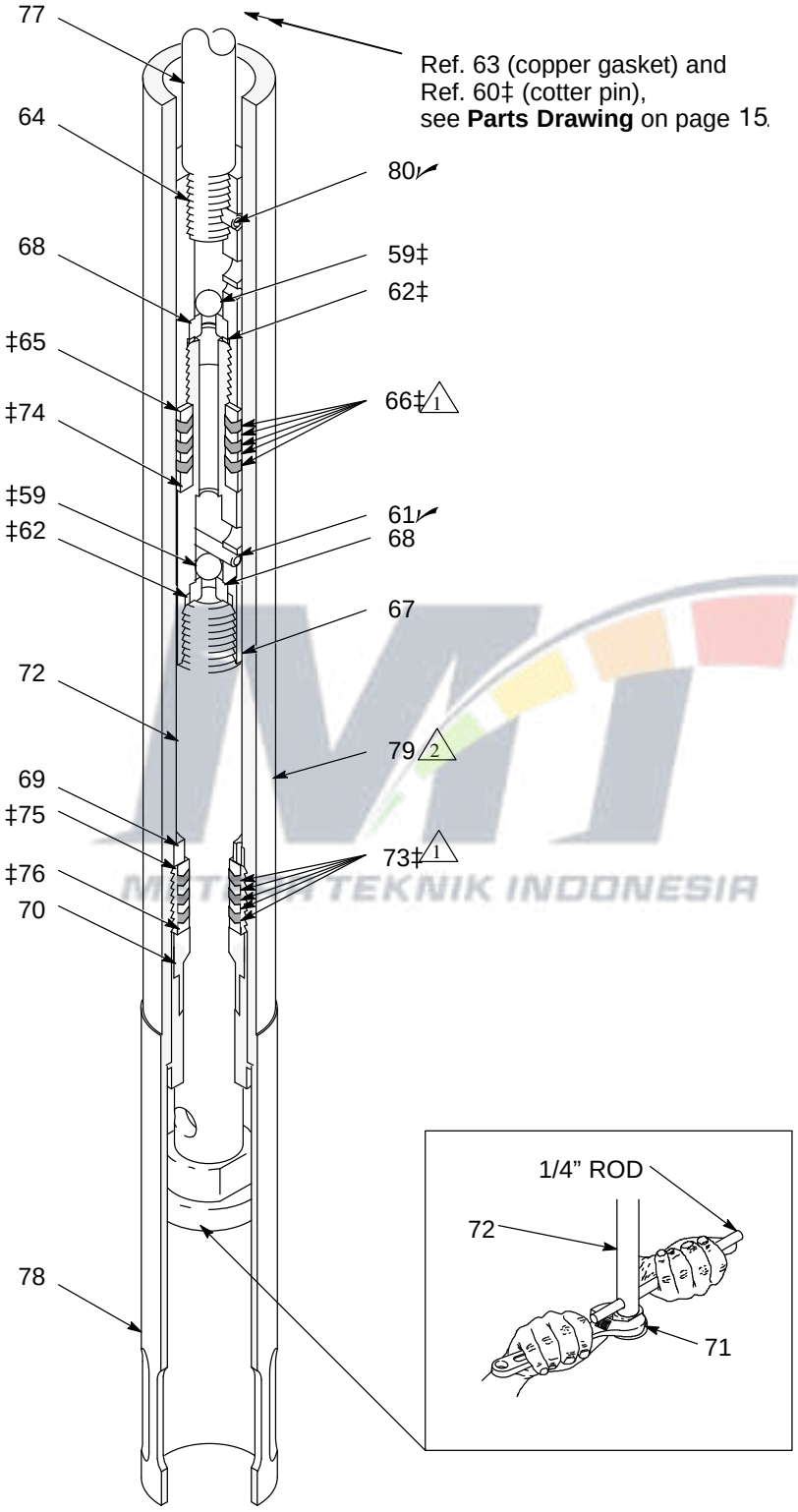


FIG. 3

Displacement Pump

Before starting:

- To reduce down time, be sure all necessary repair parts are available. Recommended spare parts are listed in the parts list on page 15
- The balls (59) in the intake and piston valves cannot be reseated on the hardened seats (68)
- Repair Kit 239320 is available. Use all the new parts for the best results
- Whenever replacing packings, also replace the glands and bearing
- When cleaning parts, use a compatible solvent. Inspect parts for wear or damage and replace as necessary. Scoring or irregular surfaces on the priming tube (72) or polished inner wall of the riser tube (79) causes premature packing wear and leaking. Check these parts by rubbing a finger on the surface and by holding the parts up to the light at a slight angle
- Use light, waterproof grease whenever grease is mentioned

Disassembly

1. Flush the pump if possible. Follow the Pressure Relief Procedure on page 6. Disconnect all air and fluid hoses.
2. Clamp the motor base in a vise. Unscrew the priming cylinder (78).
3. Hold the priming tube (72) with a 1/4 in (6 mm) diameter rod through the holes in the tube. Grip the flats of the priming position (71) with a wrench and unscrew the piston.
4. Loosen the packing housing (70). Unscrew the riser tube (79) from the air motor.
5. Remove the packing housing (70) from the riser tube (79), and remove the packings from the housing.
6. Hold the intake valve housing (67) with a wrench, and unscrew the priming tube (72) by inserting a 1/4 in (6 mm) diameter rod through the holes in the tube. Handle the tube carefully to avoid marring the surface. Remove the ball, seat, and gasket.
7. Unscrew the intake valve housing (67) from the piston valve housing (64). Remove the ball and packings.
8. Clean all parts thoroughly. Grease all parts except threads when reassembling.

Reassembly

1. One at a time, place the female gland (74), five leather v-packings (66) with the lips of the packings facing up, and the male gland (65) on the intake housing (67). Place the gasket (62), seat (68), and ball (59) on the housing (67).
2. If the pins (80) were removed from the piston valve housing (64), replace them. Hold the piston valve housing with a wrench and screw in the intake valve housing.
3. Place a gasket (62), seat (68), and ball (59) on the priming tube (72). Holding the piston valve housing (67) with a wrench, screw the priming tube into it. using a 1/4 in. diameter rod through the tube for leverage.
4. Guide the riser tube (79) over the priming tube and screw it into the motor base, making sure the gasket (63) is in place. Torque to 50 to 70 ft-lb (68 to 95 N.m).
5. One at a time, place the female gland (76), five leather packings (73) with lips of packings facing up, a male gland (75), and a bearing (69) in the packing housing (70). Screw the housing firmly into the riser tube.
6. Screw the priming piston (71) firmly onto the priming tube (72). Screw the intake cylinder (78) firmly onto the riser tube.
7. Reconnect the ground wire if it was disconnected during repair.

METERA TEKNIK

Air Motor and Throat Service

Before starting:

- Be sure to have all necessary parts on hand. Air Motor Repair kit, 207385, includes repair parts for the motor. Pump Repair Kit, 239320, includes repair parts for the pump and the air motor throat area. Use all the parts in the kits for the best results
- Two accessory tools should be used. Padded Pliers, 207579, is used to grip the trip rod without damaging its surface. Gauge, 171818, is used to ensure the proper clearance between the poppets and seat of the transfer valve

Disassembly

1. Flush the pump. Follow the Pressure Relief Procedure, page 6.
2. Disconnect the air hose from the motor. If necessary, disconnect the motor from the pump. Clamp the air motor base in a vise.
3. Manually push on the piston rod to move the piston assembly to the top of its stroke. Unscrew the cylinder cap nut (31) from the cylinder (32). Pull up on the cap nut. Grip the trip rod (1) with a padded pliers, 207579, and screw the cap nut off the trip rod. (FIG. 4)

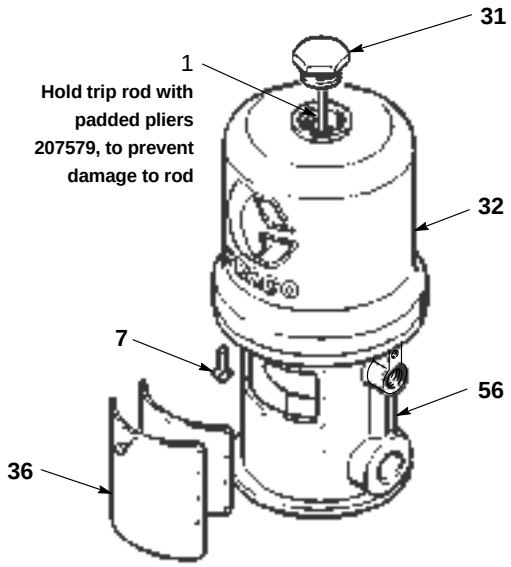


FIG. 4

NOTICE

Do not damage the plated surface of the trip rod. Damaging the surface of the trip rod can result in erratic air motor operation. Use the special padded pliers, 207579, to grasp the rod.

4. Remove the eight screws (7) holding the cylinder (32) to the base (56). Carefully pull the cylinder straight up off the piston. (FIG. 4)
5. Use a screw driver to push down on the trip rod yoke (14) and snap the toggle assemblies (k) down. Remove the lockwires (28) from the adjusting nuts (27) of the transfer valves (M). Screw the top adjusting nuts (27) off. Screw the valve stems (30) out of the grommets (18) and lower adjusting nuts (27). Take the valve poppets (37) off the stems and squeeze them firmly to check for cracks. (FIG. 5)
6. Grip the toggle rockers (16) with a pliers. Compress the springs (17) and swing the toggle assembly (K) up and away from the piston lugs (L), and remove the parts. Check that the valve actuator (13) is supported by the spring clips (4), but slides easily into them. (FIG. 5)
7. Remove the trip rod yoke (14), valve actuator (13) and trip rod (1). Check the exhaust valve poppets (38) for cracks.

NOTE: To remove the exhaust valve poppets (38), stretch them out and cut with a sharp knife.

8. Pull the piston (5) up and out of the base (56) and inspect the piston o-ring (20) and the o-ring base casting.

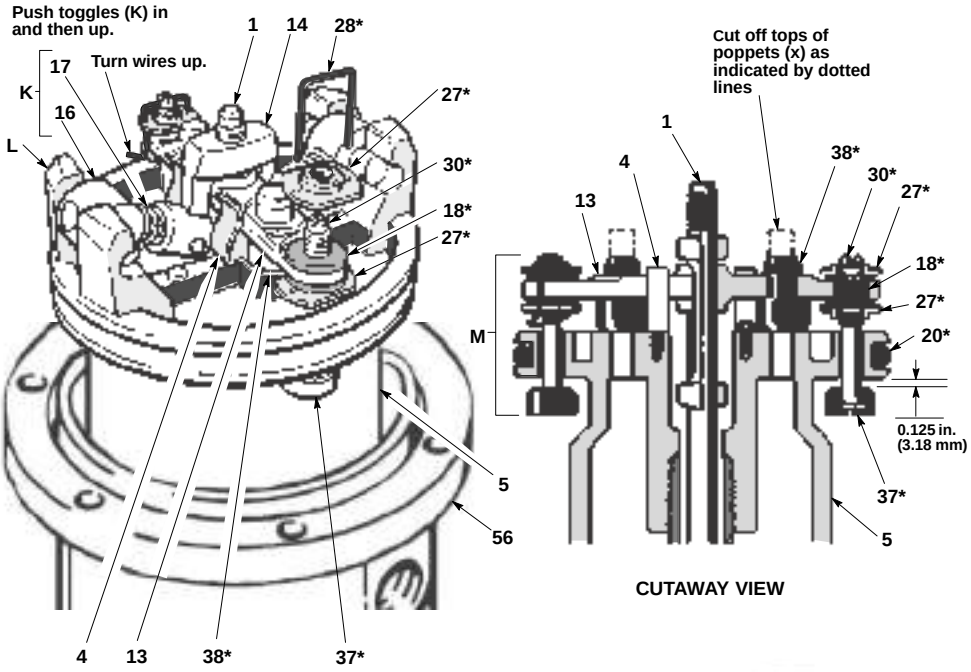


FIG. 5

Reassembly

1. Clean all the parts carefully in a compatible solvent and inspect for wear or damage. Use all the repair kit parts during reassembly and replace other parts as necessary.

2. Check the polished surfaces of the piston, piston rod and cylinder wall for scratches or wear. A scored rod will cause premature packing wear and leaking.

3. Lubricate all parts with a light, waterproof grease.

4. Be sure the o-rings are in place. Slide the piston rod down through the throat bearing and lower the piston (5) into the air motor base (56).

5. Pull the exhaust valve poppets (38) into the valve actuator (13) and clip off the top part shown with dotted lines. (FIG. 5)

6. Install the transfer valve poppets (37) onto the valve stems (30), then reassemble the valve stems (30), bottom adjusting nuts (27), grommets (18), and top adjusting nuts (27) on the piston (5). Assemble the trip rod (1), valve actuator (13), trip rod yoke (14) and toggle assemblies (K) on the piston. (FIG. 5)

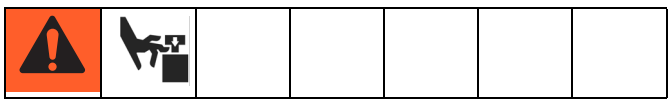
7. Before installing the lockwires (28) in the adjusting nuts (27), use the special gauge, 171818, to adjust the transfer valve (M) so there is 0.125 in (3.68 mm) clearance between the poppets (37) and the piston (5) when the toggle assemblies are in the down position. (FIG. 5)

8. Snap the toggle assemblies (K) to the up position. Reinstall the cylinder (32) and cap nut (31). Reassemble the air motor to the displacement pump.

9. Before remounting the pump, connect an air hose and run the pump slowly, at about 40 psi (0.28 MPa, 2.8 bar) to ensure that it operates smoothly.

10. Reconnect the ground wire before regular operation.

Throat Packing



See FIG. 6 and the parts drawing and list on pages 14 and 15 for further information.

1. Clamp the pump in a vise and unscrew the riser tube (80) from the air motor base (56). Pull the riser tube away from the air motor until the cotter pin (60) which secures the displacement pump connecting rod to the air motor piston rod (52) is visible.

2. Remove the cotter pin (60) and unscrew the pump connecting rod (79) from the air motor piston rod (52). Remove the cylinder (32) from the air motor base (56) as described under Disassembly on page 10.

3. Remove one louvered air exhaust plate (36) and unscrew the throat packing nut (45), using a spanner wrench or a 0.22 in (5.6 mm) diameter rod.

4. Remove the packing nut (45), male and female glands (47, 48), v-packings (49), washer (44), bearing (46), retainer (24), wiper (22), o-ring (23), u-cup (25), and washer (26) from the base.

5. Clean the throat packing area in the base and the packing nut. Clean and inspect all parts and replace as necessary.

6. Lubricate the packings, piston rod, and piston flange with a light, waterproof grease.

7. Install the washer (26) into the base. Assemble the packing (25) and the wiper (22) into the retainer (24). Install the o-ring (23) onto the retainer, and insert the retainer assembly into the base.

NOTE: Make sure the packing (25) lips face down and make sure the wiper (22) lips face up.

8. Insert the bearing (46) and the washer (44) into the base. Assemble the female gland (48), v-packings (49), and the male gland (47) into the packing nut (45).

9. Reinstall the spacer and packing in the base and packing nut (45). Screw the packing nut into the base and tighten it securely. Carefully slide the piston rod (52) down through the throat packing and lower the piston into the base. Reinstall the plate (36) and cylinder (32). Reassemble the air motor to the displacement pump.

10. Torque the outlet adapter (42) to 45 to 55 ft-lb (61 to 75 N.m).

NOTE: When reinstalling the cotter pin (60), **always** spread and flatten the pin (both the head and prongs) around the rod to within 1 inch (25 mm) total diameter. see Detail A of FIG. 6.

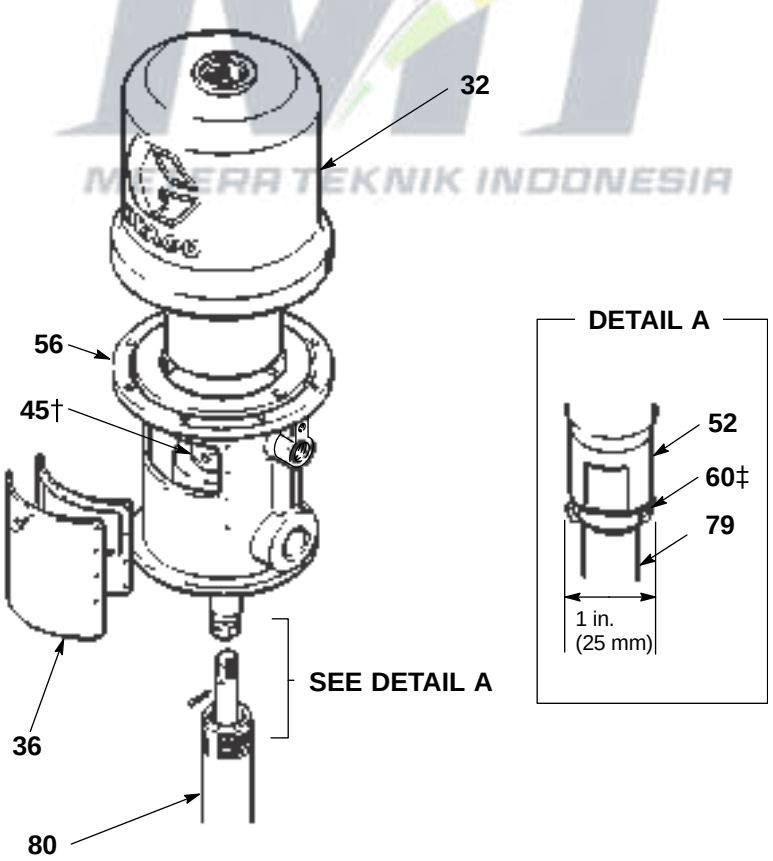
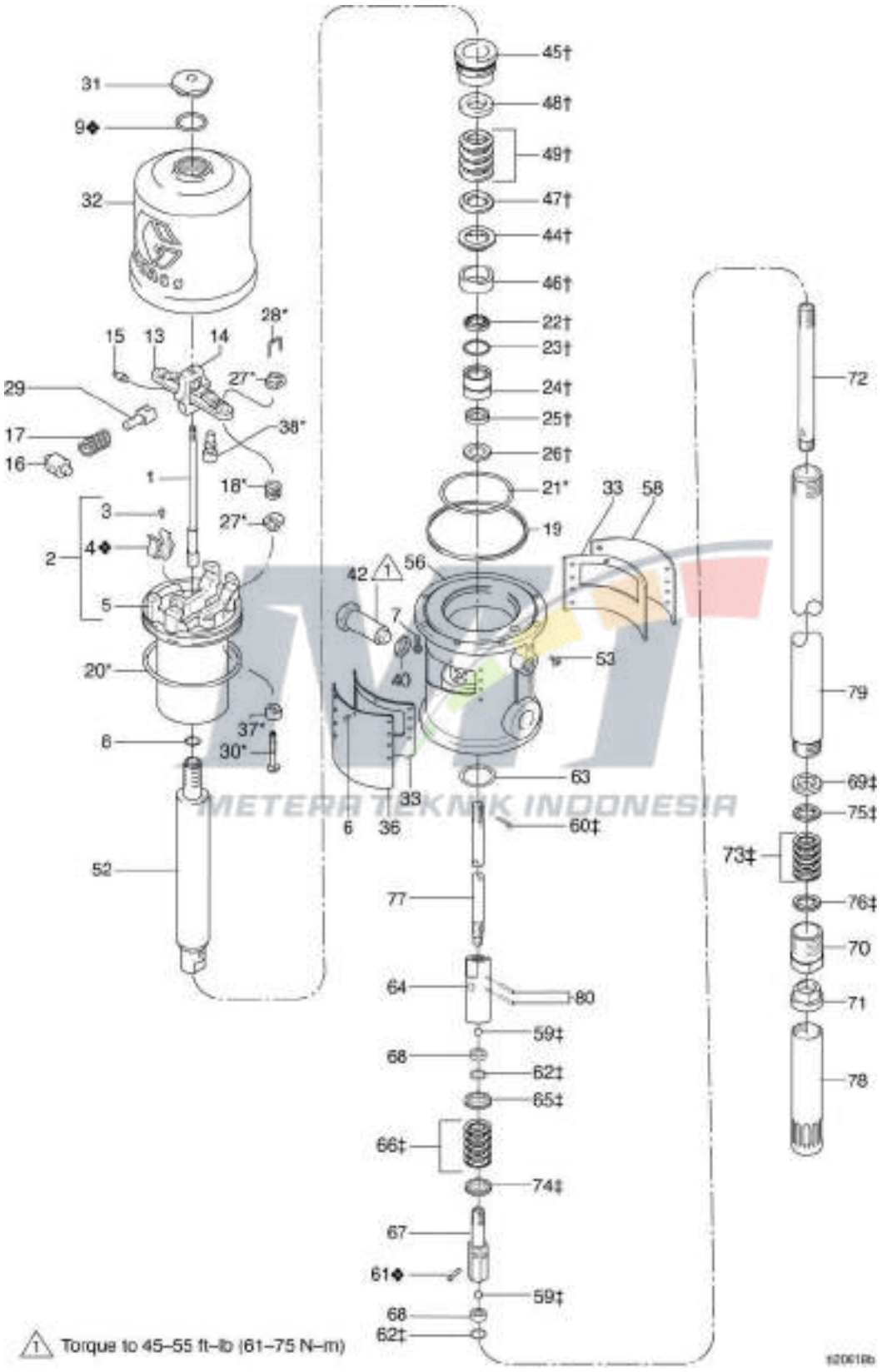


FIG. 6

Notes

METERA TEKNIK INDONESIA

Parts



METERA TEKNIK INDONESIA

Model 205394, Series E, 120 lb. (55 kg) drum length
Model 205395, Series N, 400 lb. (180 kg) drum length

Ref.	Part	Description	Qty.
1	207150	TRIP ROD	1
2	207391	PISTON, includes items 3 to 5 (also includes repair kit 207385 when ordered as a replacement part)	1
3	102975	SCREW, rd hd mach, 6-32 x 1/4 in.	2
4❖	158361	CLIP, spring	2
5		BARE PISTON (not sold separately)	1
6	100078	SCREW, hex head, 8-32 x 3/8 in.	20
7	101578	SCREW, hex head Nylock, 8-32 x 3/8 in.	8
8	150647	GASKET, copper	1
9❖	156698	O-RING, buna-N	1
13	158359	ACTUATOR, valve	1
14	158360	YOKE, rod, trip	1
15	158362	PIN, toggle	2
16	158364	ROCKER, toggle	2
17	167585	SPRING, helical compression	2
18*	158367	GROMMET, rubber	2
19	158377	SEAL, flat ring, nitrile rubber	1
20*	158378	SEAL, o-ring, nitrile rubber	1
21*	158379	SEAL, o-ring, nitrile rubber	1
22†	113935	WIPER, rod	1
23†	113944	PACKING, o-ring	1
24†	192172	RETAINER, packing	1
25†	113936	PACKING, u-cup	1
26†	192173	WASHER, packing	1
27*	160261	NUT, adjusting	4
28*	160618	LOCKWIRE, transfer valve	2
29	160623	ARM, toggle	2
30*	160896	STEM, valve	2
31	161435	NUT, cylinder cap	1
32	15E954	CYLINDER, motor, air	1
33	178270	PLATE, muffler	2
36	15E555	PLATE, identification	1
37*	170708	POPPET, valve, urethane	2
38*	170709	POPPET, valve, urethane	2
40	150461	GASKET, copper	1
42	158409	ADAPTER, outlet	1
44†	158697	WASHER, thrust	1
45†	159047	NUT, packing	1
46†	159048	BEARING, brass	1
47†	159306	GLAND, male	1
48†	159307	GLAND, female	1
49†	159308	V-PACKING, nitrile rubber	4
52	162553	ROD, piston	1
53	116343	SCREW, grounding	1
56	165362	BASE, motor, air	1
58▲	177843	PLATE, warning	1
59‡	100170	BALL, steel, 3/8” dia.	2
60‡	100579	PIN, cotter, 7/64” dia., 1” long	1
61❖	108513	PIN, roll, 0.135” dia. 7/8” long	1
62‡	150451	GASKET, copper	2
63	158314	GASKET, copper	1
64	162555	HOUSING, piston valve	1
65‡	162556	GLAND, male	1
66‡	162557	V-PACKING,	5
67	162558	HOUSING, intake valve	1
68	162559	SEAT, valve	2
69‡	162560	BEARING, brass	1
70	162561	HOUSING, packing	1
71	162562	PISTON, priming	1
72	162564	TUBE, priming	1
73‡	162566	V-PACKING, leather	5
74‡	162568	GLAND, female	1
75‡	162602	GLAND, male	1
76‡	162603	GLAND, female	1
77	164234	ROD, connecting, 12.47” (317 mm) long, model 205394	1
	164231	ROD, connecting, 19-13/32” (493 mm) long, model 205395	1
78	164233	CYLINDER, intake primer	1
79	165381	TUBE, rise, 21.31” (541 mm) long, model 205394	1
	165382	TUBE, riser, 28-1/4” (817 mm) long, model 205395	1
80	102180	PIN, spring, 0.135” dia. 1” long	2

▲ Replacement Danger and Warning labels, tags, and cards are available at no cost.

* Parts included in Kit 207385 (purchase separately).

Parts included in Kit 239320 (purchase separately), includes parts to service the air motor throat area and the power lower.

† Parts for the air motor throat area.

‡ Parts for the power lower.

❖ Recommended spare parts. Keep on hand to reduce down time.

METERA TEKNIK INDONESIA

Technical Data

50:1 Fire-Ball 425 Pumps		
	US	**Metric**
Fluid pressure ratio	50:1	
Air pressure operating range	40 to 150 psi	0.3 to 1.0 MPa, 3 to 10 bar
Maximum fluid working pressure	7500 psi	51.7 MPa, 517 bar
Maximum output	0.5 gpm	1.9 lpm
Cycles per gallon (per liter)	110	28
Maximum recommended pump speed	60 cycles per minute	
Air motor effective diameter	4.25 in.	108 mm
Stroke	4 in.	102 mm
Air consumption	approximately 19 cfm at 1 gpm at 70 psi	approximately 0.53 m^3/min at 3.8 lpm at 0.48 MPa, 4.8 bar
Wetted parts	Steel, brass, aluminum, leather	
Weight		
Model 205394	34 lb	15 kg
Model 205395	37 lb	17 kg

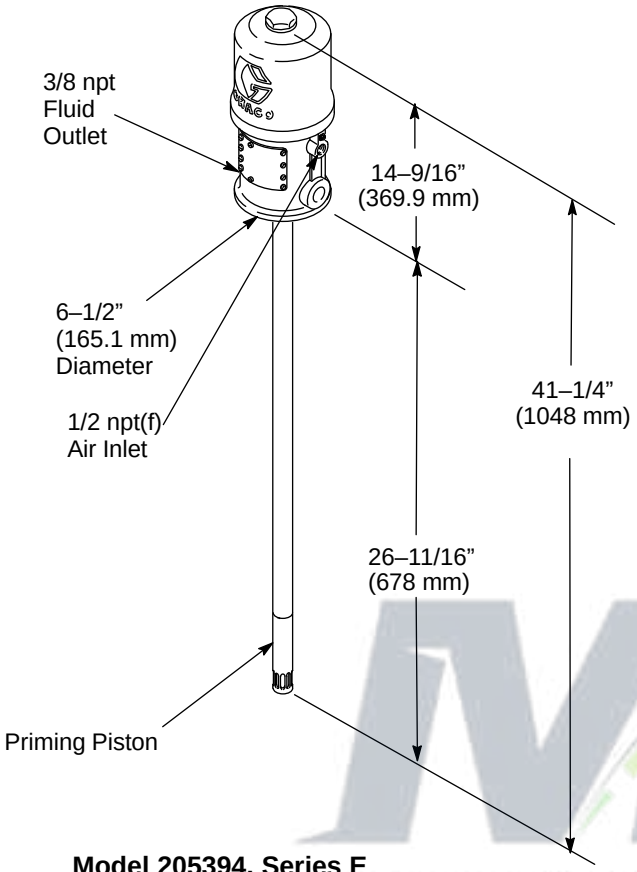
California Proposition 65

CALIFORNIA RESIDENTS

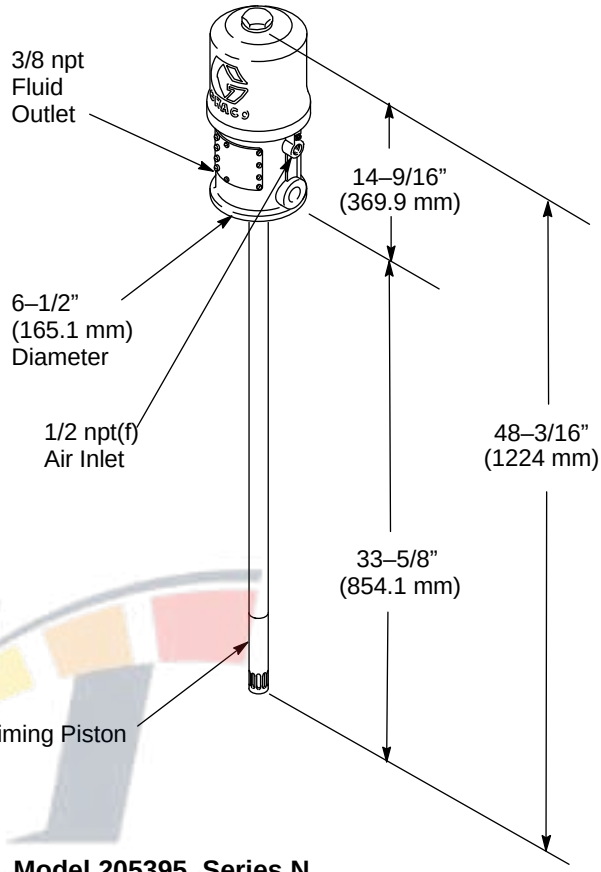
⚠ **WARNING:** Cancer and reproductive harm – www.P65warnings.ca.gov.

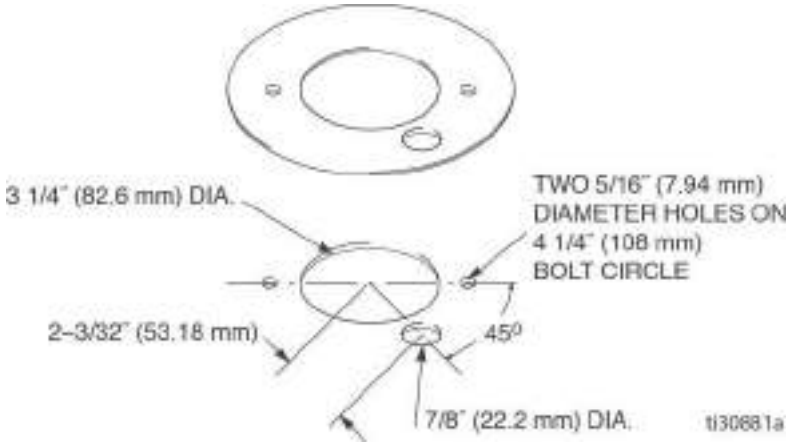
METERA TEKNIK INDONESIA

Dimensions



Model 205394, Series E
Weight 36 lb (16 kg)



Model 205395, Series N
Weight 36 lb (16 kg)

Mounting Holes