

Model SC-5 Instructional Manual

The economical and safe way to fill carbon dioxide cylinders



This manual includes instruction on operation, maintenance, troubleshooting and exploded view drawings for the Model SC-5 Carbon Dioxide Transfer Pump covering the following Part No's:

Model No.	Electrical Service			Allows pumping from:
	Voltage	Phase	Cycle(Hz)	
560-040A1	115	1	60	High Pressure Cylinder 50-100 Lb Standard CO2 Cylinder
560-040A2	230	1	60	
560-040B2	230	3	60	
560-040B4	460	3	60	
560-040C2	220	1	50	
560-040D1	115	1	60	Low Pressure Supply Tank (ie; 1 Ton Refrigerated Bulk Tank) Minimum required outlet pressure of tank is 300 psi
560-040D2	230	1	60	
560-040E2	230	3	60	
560-040E4	460	3	60	
560-040F2	220	1	50	

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Model SC-5 Transfer Unit Specifications

Bore	1"
Stroke	2"
Displacement	1.57 cu. in.
Pump Speed	175 RPM
Max. Inlet Pressure	1,000 PSI
Max. Differential Pressure	1,000 PSI
Average Charging Rate of Speed	6 - 10 Lbs per minute

Motors are available in multiple configurations depending upon actual part no. of assembly - see front cover

Motor Speed	1,750 RPM
Mechanical Efficiency	60%
Volumetric Efficiency	60%
Operating Temperature Range	0 - 85°F
Safety Disc Burst Pressure	2650-3000 PSI
Shipping Weight	180 Lbs
Dimensions (crated)	29"L x 17"W x 24"H
Dimensions (uncrated)	26"L 16"W x 20 1/2"H

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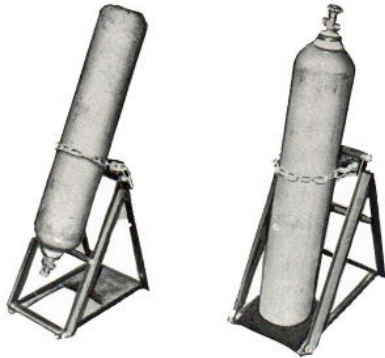
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Note: The SC-5 Unit includes items shown in (). (0) indicates an optional item and is not included in the unit. These items can be ordered separately.

Item 1. Model SC-5 Transfer Pump (1)



Item 2. CO2 Cylinder Tilt Rack (0)
Part No. 540-010 Ref No. 95275



Item 3. Hose Assembly with swivels
Part No. 210-009 Stainless braid Ref No. 95275 (2)
Part No. 210-010 Bronze braid Ref No. 95275 (0) Mil Spec



Item 4. Manifold Assembly (1)
Part No. 560-014 Ref No. 95296



Included Spare Parts Package:



Item 5. Hose Washer (10)
Part No. 58-604
Ref. No. 50120



Item 6. Piston Packing Wrench (1)
Part No. 240-047
Ref. No. 53778



Item 7. Piston Packing Leather (1)
Part No. 58-605
Ref. No. 68686



Item 8. Piston Check (1)
Part No. 240-038
Ref. No. 68687



Item 9. Piston Rod Packing Teflon(1)
Part No. 240-044
Ref. No. 68717



Item 10. Safety Disc (1)
Part No. 210-002
Ref. No. 50115



Item 11. Safety Disc Washer (1)
Part No. 240-032
Ref. No. 50116



Item 12. Piston Rod Lubricant (1)
Part No. 210-017
Ref. No. 99084



Item 13. Spanner Wrench (0)
Part No. 210-024

Item 14. Typical Fill Adapters (0)
See Section 2-1



Section 1 Introduction and Description

1-1 Introduction. This manual provides operating and service instructions for the Hydro-test Products Model SC-5 Transfer, or Re-Charging unit. All model SC-5 units are basically the same except for variations in motor and starter arrangements. The motor mounting holes in the base are arranged to suit the frame of the motor that is being used.

There may also be differences in the hose connections. Until mid 1975 the inlet and outlet hoses were connected rigidly to the pump, with the exception of Mil Spec models on which swivel connection were used. The current design uses swivel connections on all models.

Earlier models can be easily updated by changing the rigid connection to a swivel connection.

The outlet hose used to terminate with a single flip valve and swivel connection to which various size filling adapters could be attached. Current models have a manifold with dual flip valves for convenient exhausting of vapor to prime the pump with liquid. The second valve eliminates the need to loosen the connection to bleed off vapor.

Earlier models can be easily retrofitted to the new manifold design by purchasing the manifold assembly, part no. 560-014.

Various figures show how the pump is assembled. Hydro-Test part no's should be used for ordering purposes. Older reference numbers used by the original manufacturer, Norris Industries, are also shown for continuity with older pumps (prior to 1975). Electric motor service can be provided by the motor manufacturer's servicing distributors.

1-2 Purpose. This unit is designed to charge carbon dioxide cylinders. It pumps from a supply cylinder or a bulk tank into other cylinders. It is not a compressor, it is simply a transfer pump used to transfer liquid CO₂ from one cylinder to another.

1-3 Description. The complete unit consist of a motor driven pump with inlet/outlet hoses. Optionally a tilt rack, part no. 540-010 is available for pumping from a supply cylinder that does not utilize a siphon tube. Optional adapters are available for a variety of different valve threads.

Note: Liquid CO₂ must be supplied to the pump. This pump will not pump CO₂ gas.

The power supply is fed to a 1HP electric motor through a starter switch, which includes thermal units to protect the motor against electrical overloads. A V-belt from the motor pulley drives a larger idler pulley, which carries a pinion gear meshed ti the pumps drive gear. Both pulley and pinion are carried on ball bearings. A sliding motor mounts allows for adjustment of belt tension.

The pump crankshaft (34, figure 5-3) is supported by two tapered roller bearings, cone(32), and cup(33). A positive oil seal (31) is installed on the crankcase cover (28). The connecting rod (27) has a shim adjusted bearing. A wrist pin (20) joins the connecting rod (27) to the crosshead (21). The crosshead, wrist pin, and upper connecting rod bearing are provided with oil grooves for lubrication by "splash" system; a dipper is provided on the connecting rod cap (25) to scoop up oil at each revolution and lubricate the crankshaft journal and connecting rod bearing (36-37).

The crosshead (21), reciprocating in its guide (13), is connected to the pump piston (26, figure 5-4) by a hollow piston rod (27) which slides through a packing (20) at the base of the pump body (29). The piston has a cup shaped leather packing (25) and **operates without oil lubrication.**

The pump body (29) has an inlet adapter (21) which is open to the agent supply when the piston (26) is at the bottom of its stroke. The inlet port is sealed off and the piston check closes as the piston rises, trapping liquid above the piston (26). The rising piston drives the liquid out through a check valve ball (7) in the pump head (17) into the outlet adapter (16). A relief valve (8-12) will open if the pre-set limit of 1000 psi pumping differential is exceeded. When open this relief valve connects the pumping chamber back to theinlet port through a passage drilled through the pump body. An additional safety relief is a frangible safety disc (14) in the pump head which is designed to rupture if pumping pressure exceeds 2650 psi.

The hose assemblies, valves, and adapters shown on figure 1-1 are discussed and described in Section IV

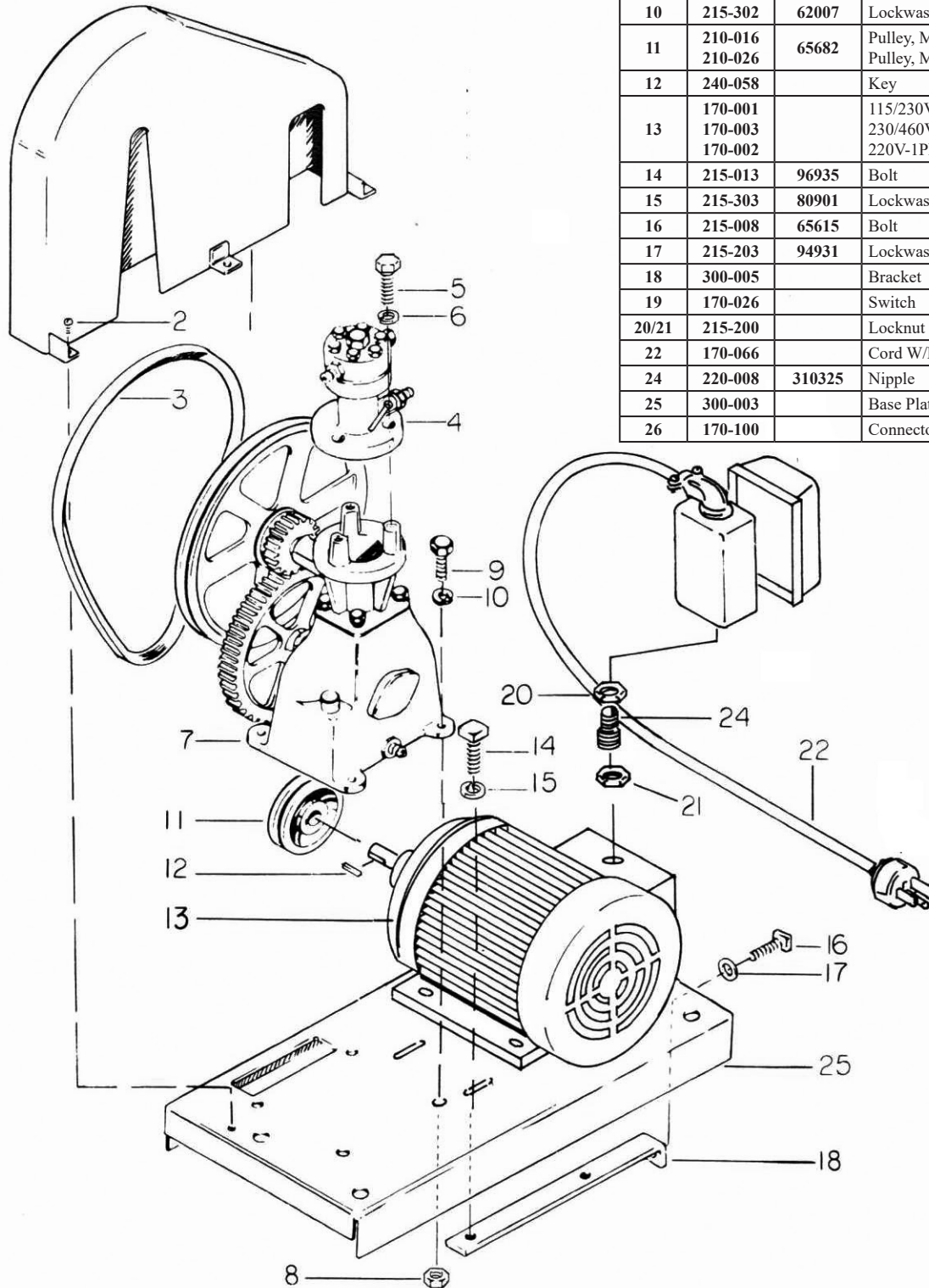
Section 2 Special Service Equipment

2-1 Special Equipment. This consist of the rack assembly and filling adapters, which are optional extras and are shown in figure 1-1. Use is described in Section IV.

Filling adapters are required to connect the swivel outlet of the manifold assembly (8 - figure 1-1) to the cylinders being charged. As the valves on the receiving cylinders have various threads, an adapter must be selected to match. Following is a list of adapters that are available from Hydro-Test Products Inc.

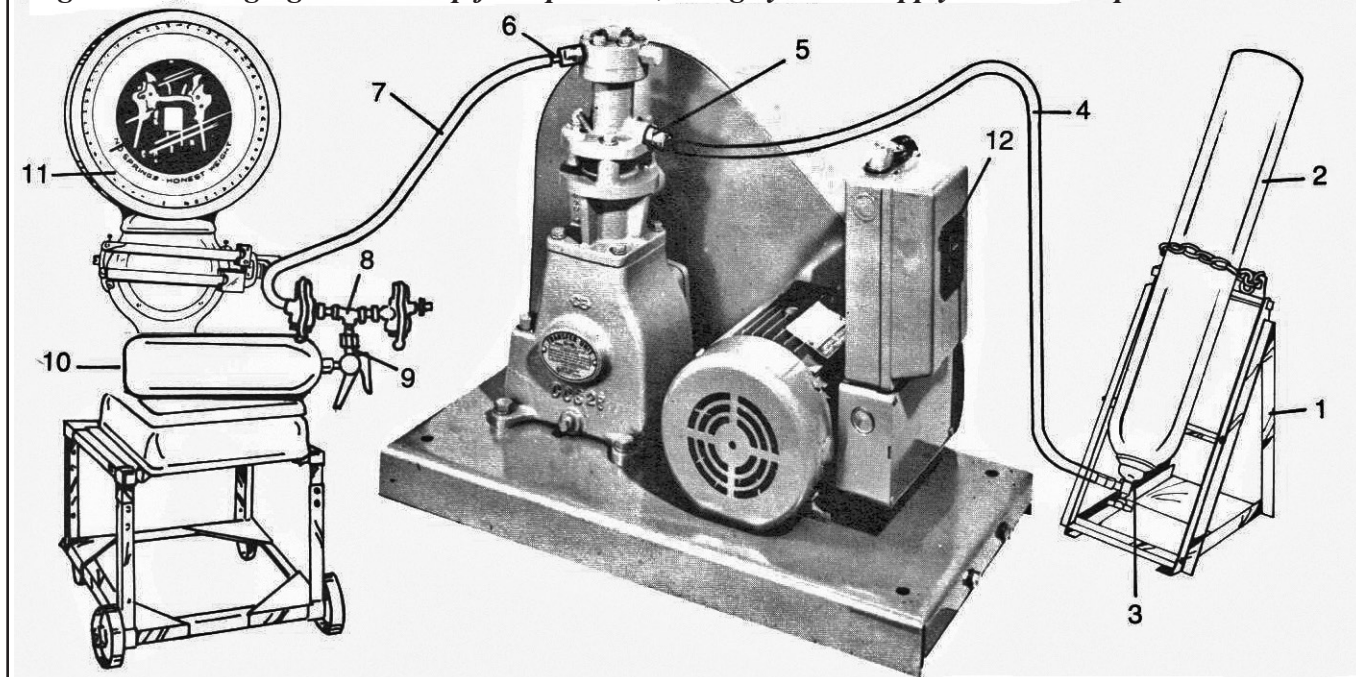
A scale of approximately 250 pounds capacity, is needed.

Figure 1-2 Recharging Assembly



Key	Part No.	Ref#	Description
1	300-002		Belt Guard
2	215-012		Screw
3	130-001	53671	Belt
4	560-003	99088	Pump Assembly
5	215-005	61839	Bolt
6	215-300	53623	Lockwasher
7	See Detail		Crosshead Guide & Crank Assembly
8	215-202	62023	Nut
9	215-006	62022	Bolt
10	215-302	62007	Lockwasher
11	210-016 210-026	65682	Pulley, Motor (3" Dia.) Pulley, Motor (5" Dia.)
12	240-058		Key
13	170-001 170-003 170-002		115/230V-1PH-60Hz Motor 230/460V-3PH-60Hz Motor 220V-1PH-50Hz Motor
14	215-013	96935	Bolt
15	215-303	80901	Lockwasher
16	215-008	65615	Bolt
17	215-203	94931	Lockwasher
18	300-005		Bracket
19	170-026		Switch
20/21	215-200		Locknut
22	170-066		Cord W/Plug, 115V, 12' Long
24	220-008	310325	Nipple
25	300-003		Base Plate
26	170-100		Connector

Figure 4-1 Charging Unit Set-Up for Operation, using cylinder supply without a siphon tube.



Part No.	Thread Spec.	Used for filling:
100-553	1/8"-27NPT(F) x CGA 320	5 Lb CO2 Fire Extinguisher
100-554	1/4"-18NPT(F) x CGA 320	10-20 Lb CO2 Fire Extinguisher
100-555	3/8"-18NPT(F) x CGA 320	10-20 Lb CO2 Fire Extinguisher
100-556	1/2"-14NPT(F) x CGA 320	50-100 Lb CO2 Fire Extinguisher
100-557	1 5/16"-12NS(F) x CGA 320	AP-7H System Valve
100-558	3/4"-16UNF(F) x CGA 320	AP-10 System Valve
100-560	1 1/4"-19NS(F) x CGA 320	AP-8 System Valve
100-561	CGA320(M) x CGA320(M)	PS-2, PS-4 System Valve
100-563	3/4"-27NS(F) x CGA 320	Pack Raft, C2 Army Raft Cartridge
100-566	1 1/8"(F) x CGA 320	Kidde System Valve

Section 3 Preparation for Use Storage, or Shipment

3-1. Unpacking. Unpack the unit with care and visually check for damage that may have occurred in transport, and accessories are as ordered.

3-2 Setting Up. The pump (1-figure 1-1) itself requires 16 x 26 inches of floor space. Additional space must be provided if cylinder supply is used for the rack (5) and for a scale to hold cylinders being recharged. Access to supply cylinder, pump, receiving cylinder, scale, and all sides of the pump must be provided. The time to recharge is shorter as the temperature decreases, therefore, set up in a cool area.

The unit normally comes with 10 ft of electrical cord and a grounded plug for connecting to a electrical outlet. The motor draws approximately 13 amperes at 115 volts, your outlet must have at least this capacity available.

When the location is set, bolt the base of the unit to the floor if required.

3-3 Preparation For Use.

New transfer pumps are shipped with the crankcase (7, figure 1-2) drained of oil. Pull out the oil dipstick (19, figure 5-3). If the oil level is below upper groove on dipstick, add oil S.A.E. 30 grade, to bring oil level to upper dipstick groove.

Apply two "shots" of light cup grease with a lube gun to the idler shaft fitting (5, figure 5-3). Apply 4-5 drops of low temperature lubricant (23, figure 1-1) to oil cup (28, figure 5-4).

Move motor switch (12, figure 1-1) to off position, then connect power supply. Move starter switch to on position and observe operation for two minutes, being alert for abnormal noise, vibration or other indications of improper operation. Stop unit by moving the switch to the off position and check for oil leaks, overheating of any parts or other indications of abnormal operation.

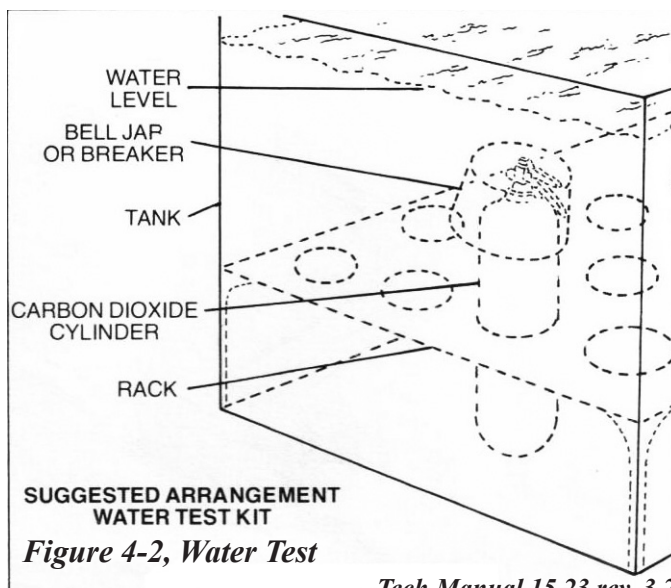


Figure 4-2, Water Test

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3-4 Preparations For Storage

Short term storage requires no unusual preparation. Disconnect hose. Cover to keep clean and store in a dry cool place. For storage of over 12 months, drain crankcase oil and attach a tag to starter cautioning about putting oil in crankcase before putting back in service.

3-5 Preparation For Shipment

Drain oil from crankcase. Disconnect hose and pack with other parts. Crate unit and parts in a sturdy shipping container. Bolt the base plate of the unit to the crate. Mark container "THIS SIDE UP".

Section 4

Operation Instructions

4-1. Connections For Filling (figure 4-1)

The unit will pump only liquid, it is not a compressor. A standard fully charged 50 pound carbon dioxide supply cylinder contains approx. 38 pounds of liquid and 12 pounds of gaseous carbon dioxide at 70° F (+21.1°C). At lower temperatures, the weight of the liquid increases, therefore the supply cylinder(s) should be kept in the coolest available location.

If the supply cylinder is installed with a siphon tube, stand cylinder vertically and safely restrained in a manner that prevents cylinder from falling. If no siphon tube is installed, the supply cylinder must be inverted. Using optional tilt rack (2, figure 1-1), clamp the cylinder in place with chain, then tilt the cylinder backwards until it rest against the stand in an inverted position. Connect hose assembly (4) to pump inlet (5), then to supply valve (3), **Do Not Open Valve At This Time.** If using a bulk storage, connect hose to liquid outlet on tank. Connect hose (7) to pump outlet (6).

Note: Check hose assemblies and gaskets for cleanliness at each makeup.

4-2. Charging. The charge in the receiving cylinder is measured by weight, the weight when full should be found stamped into the cylinder valve or cylinder dome. Place the empty cylinder (10) on the scale (11). Using the proper adapter, attach manifold (8) to cylinder valve (9). Then connect free end of hose assembly (7) to manifold thru valve (8, figure 1-1). Close both manifold valves.

Note: *High pressures are being handled; Carefully check all connections to handle up to 2000 psi safely and without leakage. Use a wrench to tighten connections with a slow steady pull. Do not jerk the wrench to tighten or hammer on wrench.*

4.2 Charging *continued...*

Open the valve at the supply cylinder (3) or storage tank, then open the manifold vent valve (8, figure 1-1) to exhaust vapor from lines.

Once liquid comes through, close the vent valve. Weigh empty cylinder and record weight. Add the weight of the charge to calculate total weight. Now, open thru valve and empty cylinder valve. This will permit the flow of liquid from supply cylinder (2) to cylinder (10) under pressure of gaseous carbon dioxide in supply cylinder. During the pressure equalization transfer, note the weight increase. When there is no further weight increase, move starter switch (12) to on position. When scale indicates that full charge (weight) is reached move starter switch (12) to off position. Immediately shut thru valve on manifold assembly off. Next, close cylinder valve (9). Slowly open manifold assembly vent valve to allow escape of trapped liquid and gas. Remove the filling adapter. Weigh the charged cylinder and compare to the weight stamped on the valve or cylinder dome.

Caution: The thru valve of manifold assembly and valve in cylinder being recharged must always be open while transfer unit is pumping. Be sure that transfer unit is stopped before closing valve in hose or at cylinder. A delay in closing charged cylinder valve may result in some loss of charge.

4.3. Water Test. Immerse charged cylinder in warm water (up to 120°F) and cover valve with a transparent glass or plastic jar, inverted and completely filled with water as shown in figure 4-2. A leak will be revealed by bubbles of carbon dioxide displacing water in jar, in which case the cylinder must be emptied and valve thread leak corrected. As an alternative, there are various leak detection products available for this same purpose.

Caution: A leak though a cylinder wall could be very dangerous. Reduce the water level to expose the valve and slowly empty the cylinder while it remains in the water bath. Scrap the cylinder.

4-4 Shut - Down. When recharging operations are shut down or when supply cylinders are to be changed, close cylinder, and supply cylinder or storage tank valves firmly, and open manifold assembly valve exhausting to atmosphere slowly to allow escape of liquid and gas in pump and hoses.

Caution

Keep limbs and body clear of escaping gas to avoid possible freezing if high pressure liquid is released suddenly and directed across flesh.

Section 5

Inspection, Lubrication and Maintenance

5-1 Periodic Inspection.

INSPECTION POINT	FIG. NO.	PERIOD	CHECK FOR
Hose Assemblies (3), Valve (12A, 12B)	1.1	Each Use	Dirt / debris or damage to hose, worn gaskets and seals
Power Cord (22)	1-2	3 Months	Damage or breaks
Drive Belt (3) (remove guard)	1-2	3 Months	Tension, wear, aging
Gear Teeth (10 & 16)	5-3	3 Months	Wear, damage, lubrication
Mounting hardware (2, 5, 8, 9 & 14)	1-2	3 Months	Tightness
Piston Rod Packing (20) and O-ring (20A)	5-4	1 Month	Leakage

Figure 5-1. Periodic Inspection

5-2 Lubrication

LUBE POINT	FIG. NO.	PERIOD	LUBRICANT
Crankcase Oil Level (19)	5-3	Monthly	SAE 30 Oil
Pump Crankcase (35)	5-3	12 Months	Drain oil & refill (in extreme conditions shorten to 6 months)
Idler Shaft Fitting (5)	5-3	6 Months	2 Shots of cup grease
Geer Teeth (10 & 16)	5-3	6 Months	Thin coating of cup grease
Piston Rod Oil Cup (28)	5-3	Weekly	Low temperature lubricant (Hydro-Test part no. 210-017)

Figure 5-2. Lubrication

5-3 Drive Belt. To adjust or replace the belt (3, figure 1-2), unscrew the lubricating fitting (5, figure 5-3), then take out the screws (2, figure 1-2) to lift off the gear guard (1, figure 1-2). Loosen bolts (14). Loosen motor adjusting bolts (16) until sufficient slack is obtained to work drive belt (3) off pulleys. Install new belt on pulleys, then tighten motor adjusting bolts (16) until belt deflects 1/2 to 3/4 inch under direct thumb push. Tighten bolts (14) through the base. Reinstall belt guard (1) and lube fitting (5, figure 5-3)

5-4 Motor. Refer directly to the motor manufacturer for parts or service. To replace, remove drive belt as described in 5-3 and completely remove hardware attaching motor to base. Disconnect wiring on motor side of switch, Remove hardware attaching starter switch to motor. Install starter switch on

4-5. Warning.

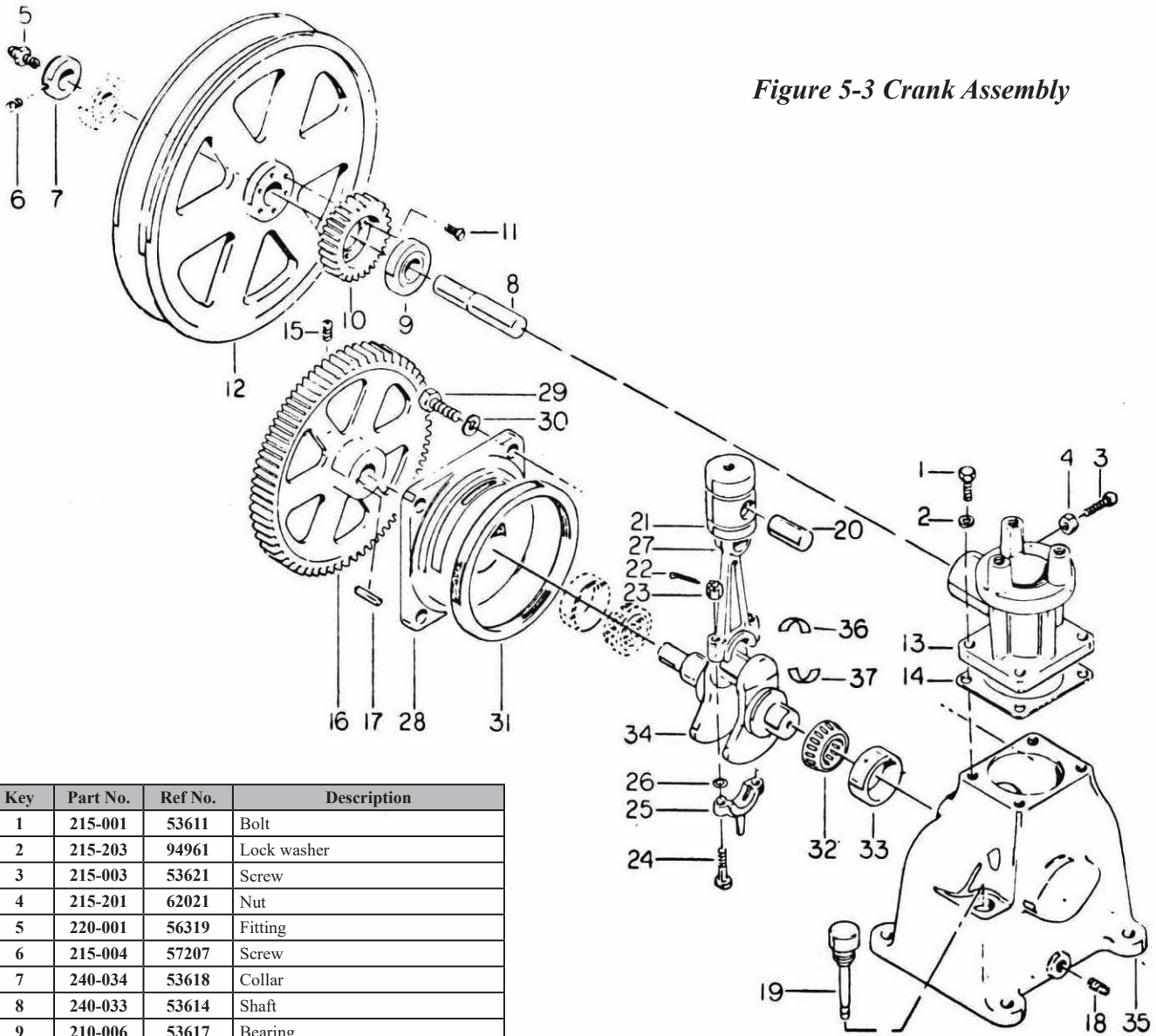
This recharging unit is for carbon dioxide and can be retrofitted for non-medical use nitrous oxide. Do not use for any other liquid or gas.

replacement motor, install motor to base with hardware (14, 15 and 18). Complete drive belt installation as previously described in 5-3.

5-5 Motor Thermal Units The thermal unit in the starter switch (19) protects the motor from overloading current. If the thermal unit opens during operation, check drive belt for mechanical binding. If none is found, it is probable that the motor need to be replaced.

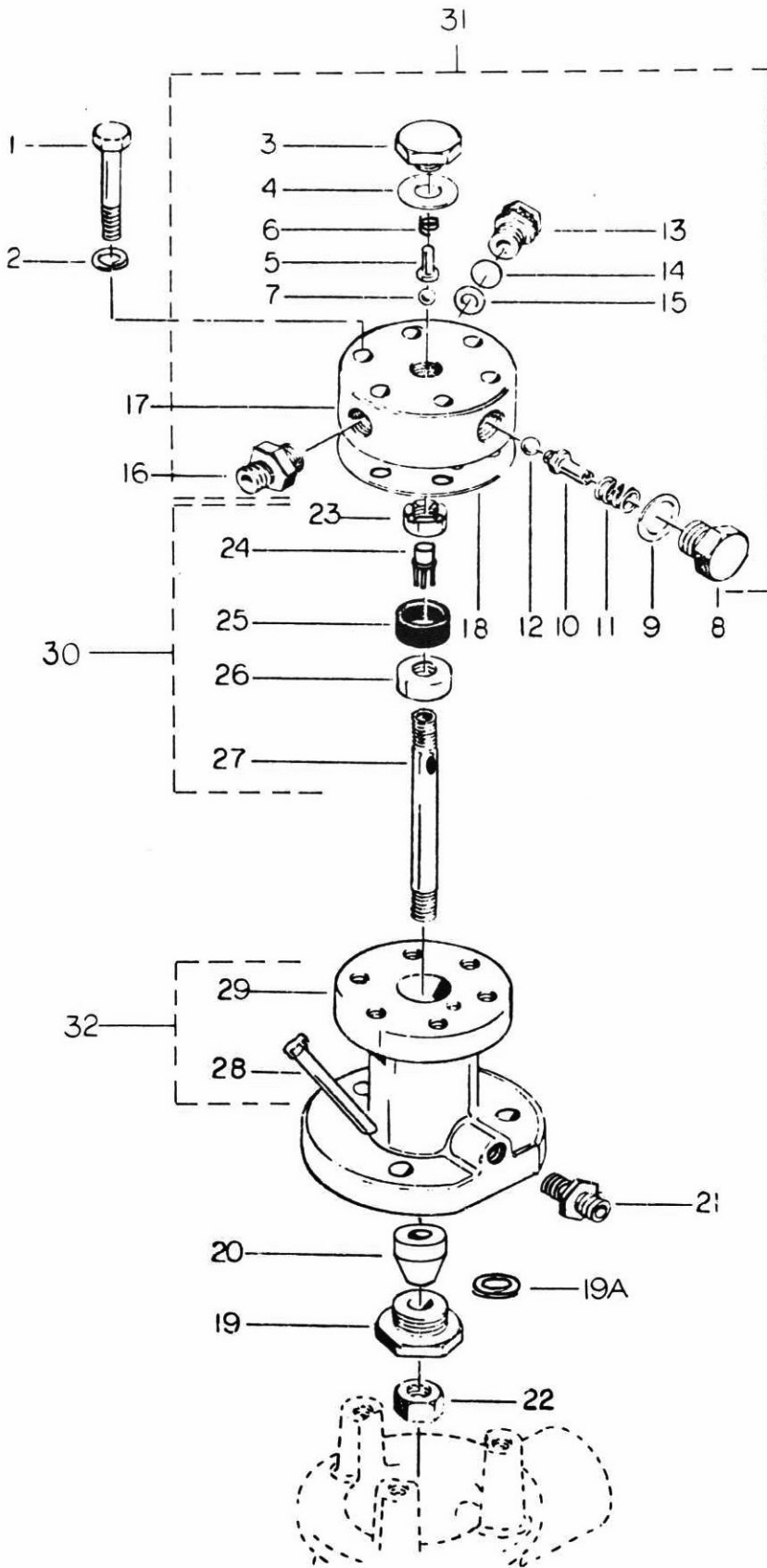
5-6 Pump Head. If the unit runs freely but does not completely charge the receiving cylinder, first make sure that liquid is entering the pump and that the hoses or fittings are no clogged. Shut off supply cylinder valve and relieve pressure in pump before loosening any connections or removing any parts.

Figure 5-3 Crank Assembly



Key	Part No.	Ref No.	Description
1	215-001	53611	Bolt
2	215-203	94961	Lock washer
3	215-003	53621	Screw
4	215-201	62021	Nut
5	220-001	56319	Fitting
6	215-004	57207	Screw
7	240-034	53618	Collar
8	240-033	53614	Shaft
9	210-006	53617	Bearing
10	210-005	53616R	Gear
11	215-002	53620	Screw
12	240-062	53615R	Pulley
13	240-028	53681	Guide
14	58-607	53610	Gasket
15	215-004	57207	Screw
16	210-003	53604R	Gear
17	210-022	53605	Key
18	560-021		Plug Assembly
19	560-020		Dipstick Assembly
20	240-036	53674	Pin
21	240-029	53607	Crosshead
22	215-011		Pin
23	240-052		Nut
24	240-053		Bolt
25	(See #27)		Cap
26	240-054		Shim
27	560-004	53675	Connecting Rod Assembly
n/s	210-023		Bushing (for #27)

Key	Part No.	Ref No.	Description
28	240-027		Cover
n/s	58-601		Oil Seal, Cover
29	215-001		Bolt
30	215-203		Lock washer
31	58-608		Seal
32	210-012	65662	Cone
33	210-013	65663	Cup
35	240-026		Crankcase
36	210-014	65672	Upper Shell Bearing
37	210-015	65673	Lower Shell Bearing



Key	Part No.	Ref No.	Description
1	215-007	62024	Bolt
2	215-203	94931	Lockwasher
3	240-035	53644	Plug
4	240-031	50111	Washer
5	240-055	53642	Cam
6	210-007	53641	Spring
7	210-018	53640	Ball
8	240-041	68692	Body
9	215-301	61628	Washer
10	240-040	68690	Retainer
11	210-019	68691	Spring
12	210-020	68722	Ball
13	240-049	88980	Plug
14	210-002	50115	Disc
15	240-032	50116	Washer
16	220-007	95297	Adapter
17	240-030	68718	Head
18	58-606	68693	Gasket
19	240-043	68715	Nut Assembly
19A	58-603	92473	O-ring
20	240-044	68717	Packing
21	220-007	95297	Adapter
22	215-010	94964	Nut
23	240-039	68688	Retainer
24	240-038	68687	Check
25	58-605	68686	Packing
26	240-042	68701	Piston
27	240-037	68685	Rod
28	220-006	68711	Cup
29			Body (use #32)
30	560-005	53627	Piston Rod Assembly (22-27)
31	560-006	68702	Head Assembly (3-17)
32	560-007	68721	Body Assembly (28-29)
30-32	560-003	99088	Pump Assembly

Figure 5-4 Pump Assembly

If the unit still does not pump to capacity, unscrew outlet valve plug (3, figure 5-4) to lift out washer (4), cam (5), spring (6) and ball (7). Check parts for debris which could prevent the valve from opening and closing easily. Also inspect the ball for nicks, which require ball replacement.

Inspect the ball seat in head (17). This is a pressed-in insert. If the insert has been dislodged, the pump head needs to be replaced. If the seat surface is nicked, replacing the ball and striking it a sharp tap with a small hammer will “coin” the seat to a proper seal. If not, the head needs to be replaced.

Pumping capacity can also suffer if the by pass valve in the head leaks or is obstructed. Remove plug (8) to lift out washer (9), spring (11), retainer (10), and ball (12). Clean or replace as necessary. Inspect the ball seat in the head (17), If dirty, clean. If dented, insert the ball (12) and “coin” with a hammer tap. Otherwise the head (17) needs to be replaced.

The safety disc (14) in the pump head will relieve if pump pressure reaches 2650 psi. It is replaced by unscrewing plug (13). Always sandwich the disc between the plug (13 and washer (15). **Never use more than one disc or any other part just because it fits.** The disc must be of proper pressure and material to relieve properly. If this maintenance does not cure pumping inefficiency, refer to section 5-7 for service of packing.

5-7 Piston Packing(s). Careful maintenance of the piston rod assembly is the key to efficient and reliable performance. The piston packing (25, figure 5-4) must be soft, flexible, free of debris that will score the pump body (29). A scored pump body must be replaced. The packing must be sandwiched tightly between the piston(26) and retainer (23). The retainer (23) with check (24) inserted, must be screwed down on the piston rod (27) with the wrench (16, figure 1-1) until it bottoms on the inside shoulder, and the piston (26) must be tightened to firmly compress the packing (25) against the retainer (23), using a 5/32” drill as a wrench. The check (24) must float freely in the retainer (23). If it binds or is blocked with debris, the pump will not transfer. It helps to stake the piston (26) to the piston rod (27) with a center punch at two points on the piston rod thread to prevent loosening, A loose will prevent transfer.

To service the piston assembly, remove pump head bolts (1, figure 5-4) and lift off head (17) and gasket (18). Loosen nut (22) and remove bolts (5, figure 1-2) attaching pump body (29, figure 5-4) to crosshead guide (13, figure 5-3). Raise body to unscrew piston rod from crosshead (21). Unscrew nut (22, figure 5-4) and packing nut (19) to remove piston rod packing (20), Be careful to avoid damaging o-ring (19A) on body threads. Remove piston assembly from pump body.

The piston rod (27) has a polished finish that must never be gripped with a toothed wrench as a rough surface will quickly damage the piston rod packing (20) and cause leaks.

If the piston rod is to be held in a vise, use a lead or copper pads on the vise jaws. A 3/16” drill bit through the holes in the rod serve as a vise. Use wrench (16, figure 1-1) to unscrew retainer(23, figure 5-4). Remove check (24) and packing (25).

Re-assemble in reverse order. **Piston check (24) must move freely in retainer (23).**

After the piston assembly is back in he body, slide the piston rod packing (20) over the piston rod threads into the body recess. Thread in the packing nut (19) until it seats firmly. Do not overtighten - it serves no purpose as the packing (20) is not compressible. Overtightening will wear out the packing prematurely.

Thread the locknut (22) up on the piston rod (27) as far as possible, then bolt body (29) to crosshead guide 13, figure 5-3). Screw piston rod (27, figure 5-4) into crosshead (21, figure 5-3) until top of retainer (23, figure 5-4) is slightly below the plane of the body (29), using a straight edge across the body opening as a guide, slowly rock the crank by hand by moving the large pulley through top dead center to check height of piston check (24). **If the check is too high, the check will strike the pump head and damage the pump head seal.**

When adjusted, tighten lock nut (22). Install new gasket (18) on body (19). making sure that all holes are aligned. Install pump head assembly, also with all holes aligned and bolt securely.

5-8 Flip Valve. If flip valve permits leakage of carbon dioxide, replace check valve assembly (6) by removing plug (3) and spring (4). If check assembly does not slide from valve body (7), remove pin (2) and release lever (1) and push check assembly (6) out of body (7).

Key	Part No.	Ref No.	Description
1	560-013	72193	Lever
2	215-009	82873	Pin
4	210-011	60458	Spring
5	58-602	72189	O-ring
6	240-046	72194	Check Assy

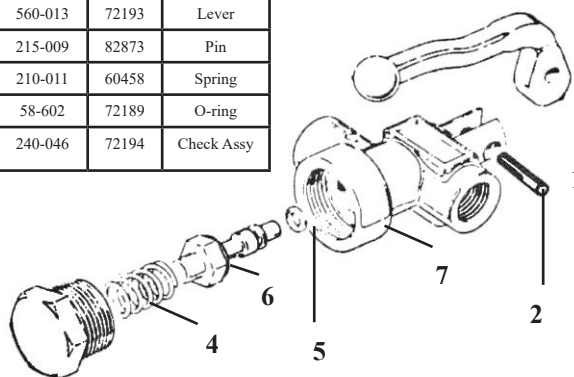


Figure 5-5 Flip Valve 560-008

5-9 Crank Assembly. Figure 5-3 Bearings, gears, pulleys, crosshead, crosshead guide and wrist pin are standard replacement items. The case, crankshaft, connecting rod and oil seals last indefinitely with proper maintenance, If these require replacement it

as it is likely that other major parts also require replacement, to the extent that the labor and material cost will out weight the purchase of a new unit. Accordingly these parts are normally not available.

5-10. Earlier Models. Earlier models of the SC-5, can be converted by replacing the entire pump assembly (figure 5-4)

Section 6.
Trouble Shooting
6.1. Trouble Shooting

TROUBLE	PROBABLE CAUSE	REMEDY
Failure to fill cylinder full	Defective check or relief valves. Packing and or check are worn or damaged	Pull pump head to clean and inspect, Para. 5-6 Replace, Para. 5-7
Piston rod runs warm or hot	Piston rod packing dry Clogged strainer	Add low temperature lubricant to oil cup, Para. 5-2 Clean
Leaks at piston rod	Piston rod packing worn O-ring worn	Replace packing and O-ring Para. 5-7
Slow pumping and pulley hot	Belt slippage	Adjust belt tension Check for mechanical binding in pump and motor
Sudden stoppage	Power loss	Check motor and power cord If motor frame is hot, thermal unit in starter switch need to be replaced
Hot Pump	No liquid supply	Check supply cylinder, Para. 4-1. Check for clogged hose, Para. 5.1.

Figure 6-1. Trouble Shooting



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