



ARC-30

30 GPM MAX



WARNING

**BEFORE BEGINNING INSTALLATION OF THIS
APSCO PRODUCT READ AND FOLLOW ALL
INSTALLATION INSTRUCTIONS**

REV1 10 -18

INSTALLATION & OWNERS MANUAL

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WARRANTY

All APSCO, Inc. products are warrantied for 1 year of service, but in no case more than 2 years beyond the original date of purchase.

APSCO warrants the product as free from defects in materials and workmanship under normal recommended use.

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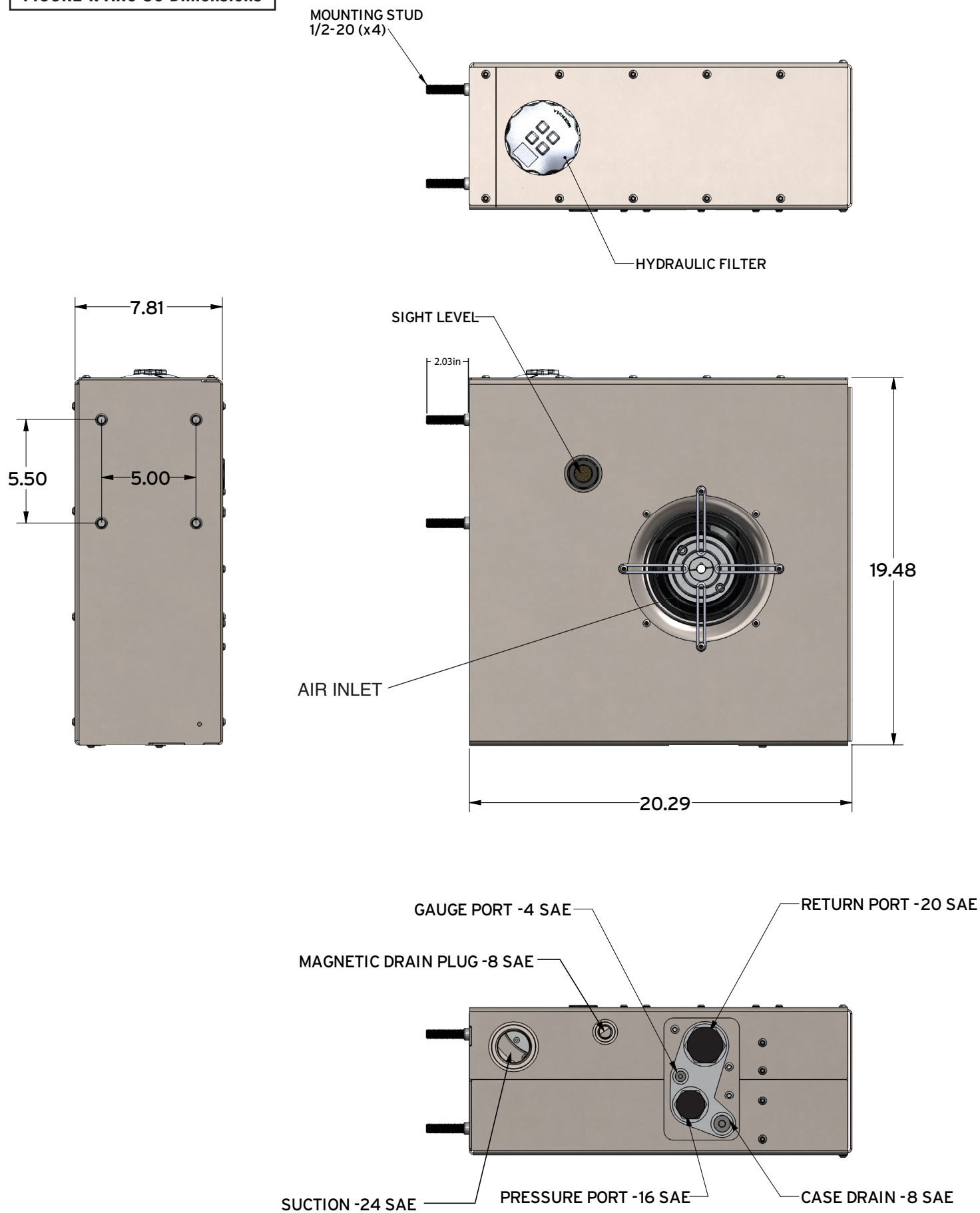
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FEATURES INCLUDE:

- Stainless Steel Construction
- The basic size of our cooler is 20"X20"X8", making it the most compact cooler in its class.
- 4 Gallon Hydraulic Reservoir
- Weight: 100 lbs dry, making it the lightest hydraulic cooler in its class
- Flow Rate to 30gpm
- Pressure rated to 3000 psi
- Heat rejection is 20HP at 30gpm with 80°F ETD. This is the highest heat rejection in its class
- Hydraulic filter - This filters your return fluid with a ten micron filter, has an integral bypass valve, and conveniently filters the oil that is added to the reservoir.
- Filter Element = 10 micron
- Filter Bypass valve- Set at 25 psi. This feature protects the filter from over pressurization due to cold oil or a blocked element.
- System Cold Oil Bypass Valve - Set at 60psi. This feature ensures that the low pressure side of the hydraulic system stays at a low pressure. Primarily protects from over pressurization due to cold oil.
- System relief valve - This Feature ensures that the maximum system pressure does not go any higher than what you set the valve at. Factory set at 3000psi and is adjustable from 500psi to 3000psi.
- Flow control valve - This feature ensures the delivery of consistent flow to the hydraulically powered cooling blower motor. It is factory set to ensure the most efficient blower speed.

FIGURE 1: ARC-30 Dimensions



INSTALLATION & OPERATION



Warning: High Pressure oil can cause severe injury. Turn off PTO and bleed pressure before servicing hydraulic system.



Warning: heavy object. To avoid muscle strain or back injury, use lifting aids and proper lifting technique when removing or replacing.



Warning: Rotating Fan Blade. Can cause serious injury or cut. Keep hands clear. Turn off and lockout unit before servicing.



Caution: Surface May be Hot. Ensure PTO is off and unit has cooled before servicing.

POSITIONING AND MOUNTING:

The ARC-30 is designed to fit in very tight spaces, its narrow profile allows for behind the cab or frame rail mounting. Unit will ship with a mounting template to aid in proper installation. (See FIG. 6) The ARC-30 requires at least 1.5" air gap on the fan shroud side to allow for adequate air intake.

CONNECTIONS (SEE FIG.2):

Note: SAE ports do not require a thread sealant, they seal with an o-ring. Make sure your SAE fittings have a properly sized o-ring and are free of thread sealant.

Suction Port -24 SAE - Your hose will go from this port to the pump inlet port. Minimum hose size - 1.5".

Pressure Port -16 SAE - The hose from your pump output will "T" into this port. One side of the "T" supplies the 1.2gpm to the hydraulic fan. Flow will only be greater than 1.2gpm through this line is if the pressure relief valve setting is exceeded. The other side of the "T" runs to the motor input or control valve input depending on your system. Minimum hose size - 1".

Case Drain -8 SAE - Some hydraulic pumps, motors, and control valves have a case drain line that needs to be plumbed directly back to the cooler reservoir. This is where you will make that connection. If your hydraulic system does not require a case drain line simply leave the APSCO provided hex plug in this port.

Return Port -20 SAE - The hose from the outlet of your motor or control valve should be plumbed into this port. This port takes all of the return flow from your motor and sends it through the filter and heat exchanger built into the ARC-30. Minimum hose size - 1.25".

Gauge Port -4 SAE - This is a test port on the bottom of your cooler. This port is connected to the input port of the manifold, for the purpose of connecting diagnostic equipment like a gauge or transducer to system pressure.

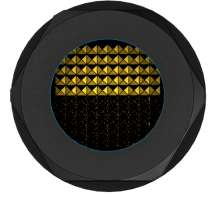
Magnetic Drain Plug -8 SAE - This is where you will drain the cooler reservoir to change the hydraulic fluid.

START UP PROCEDURE:

This Unit comes ready to install, no assembly required.

Make up all hydraulic connections.

Remove Filter cap from top of cooler, leave filter in place and add fluid until it reaches middle of the sight glass with the PTO disengaged. This will filter the fluid as it is being added. Even new hydraulic fluid should be filtered. You will need to add hydraulic fluid in slowly because the filter is in place.



Bleed air from lines and check fluid level again. Ensure that the lines are full of fluid and the air is bled from your system, some pumps and motors, particularly piston will be ruined in a matter of seconds if operated without fluid.

Depending on the length and diameter of the system hoses you may need to add fluid to the reservoir several times.

Install filter cap.

Slowly engage PTO with engine at idle speed.

Check for hydraulic leaks and repair as needed

Check for fan operation. Note that the fan will turn slowly when system pressure is low.

Recheck reservoir fluid level. Each time you add fluid disengage PTO, if the reservoir gets completely empty before you add fluid you will need to bleed air from the lines again.

Pressure relief valve setting - The ARC-30 pressure relief valve is factory set to 3000psi. This is a good setting if all of your other system components are rated to at least 3000psi. Failure to set the relief valve 200psi higher than system pressure or any other system relief valve will result in excess build up of heat. If you need to adjust the APSCO pressure relief valve it can be accessed by removing the cooler side cover and manually adjusting with an Allen wrench. The change in pressure is roughly 150psi/quarter turn. Any time the side cover is off the PTO should be off as well.

Once you verify system functionality with no leaks and the proper fluid level your ARC-30 is ready for operation.

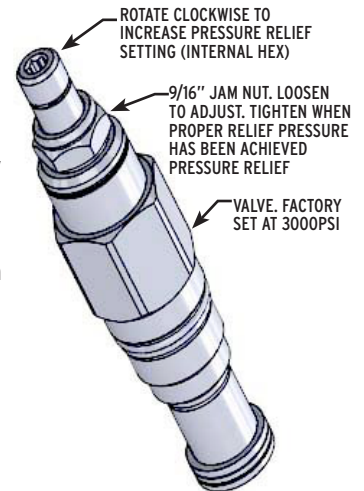
SYSTEM MAINTENANCE:

Filter - Unscrew filter cap (use a screw driver or tool with a square shank) and replace element every three months.

Fluid - Check fluid level daily (with the PTO off the fluid level should reach the middle of the sight glass). Drain and replace hydraulic oil every 6 to 12 months depending on use.

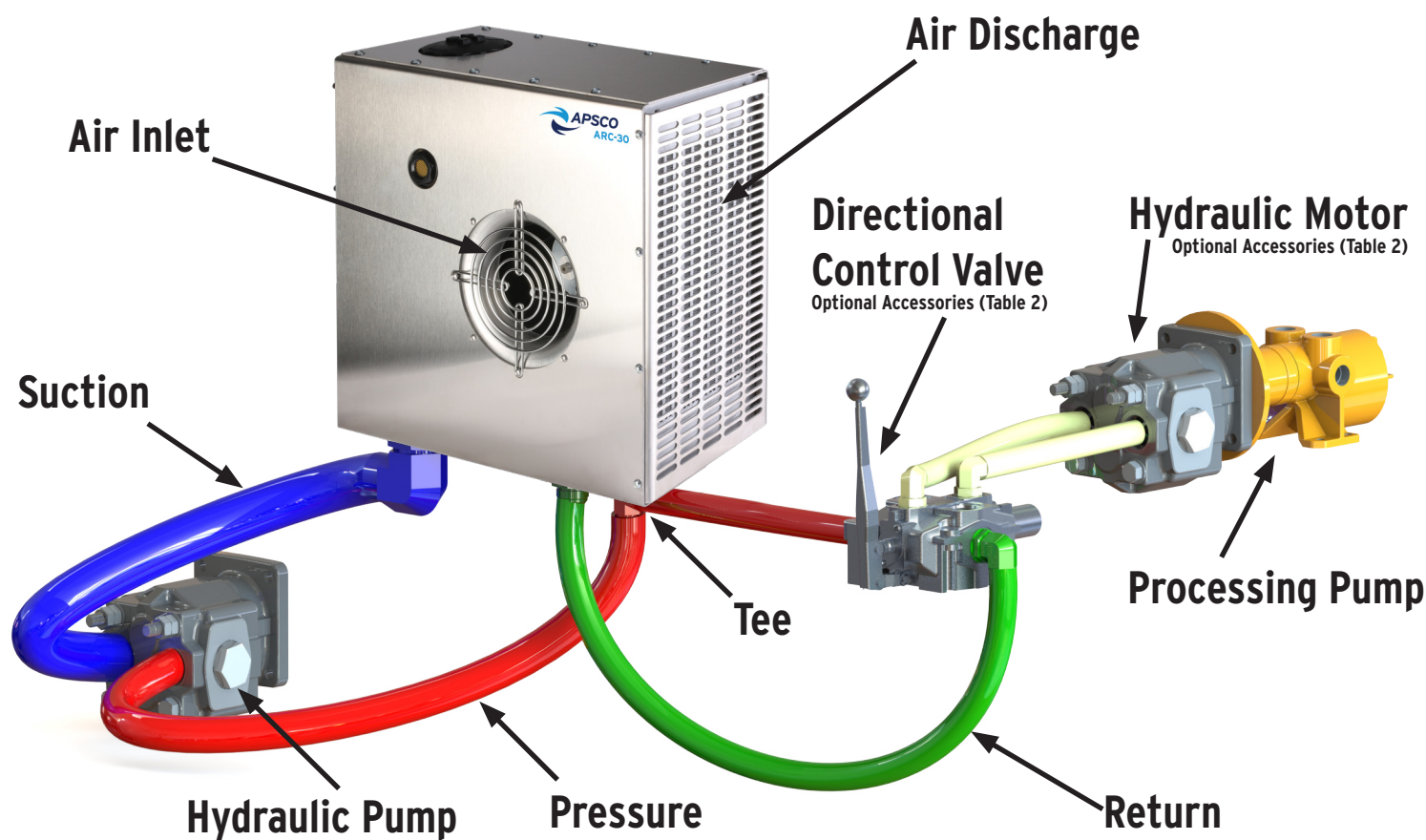
Recommended Fluid - Use non foaming hydraulic fluid and see Pump and Motor Manufacturer recommendations.

Clean Radiator - Use a mild cleaner compatible with aluminum. Be careful not to damage fins if using a power washer to rinse cleaner off of radiator. Visually inspect daily and clean if necessary.



ARC-30 WITH DIRECTIONAL CONTROL VALVE

FIGURE 2: Typical Installation Examples



ARC-30 WITHOUT DIRECTIONAL CONTROL VALVE

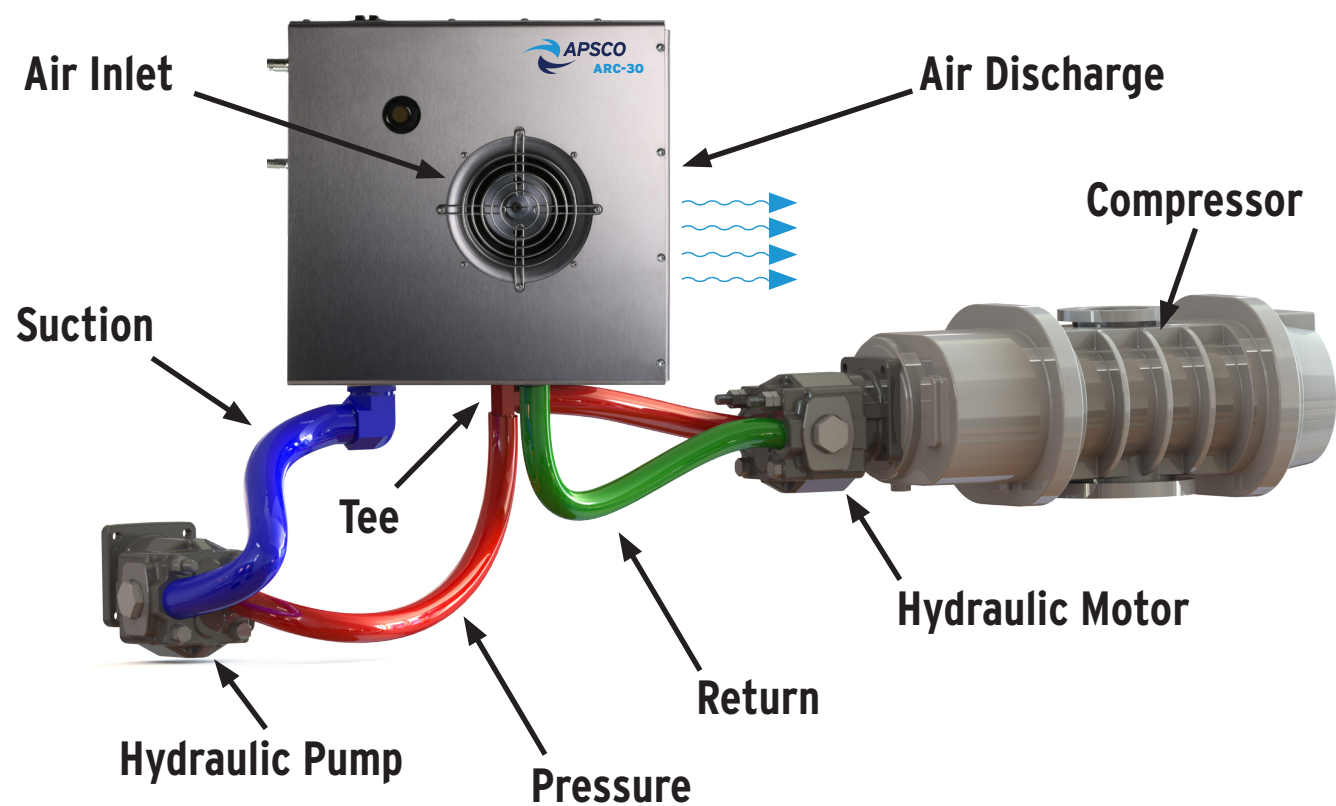


FIGURE 3: ARC-30 External Shell Exploded View

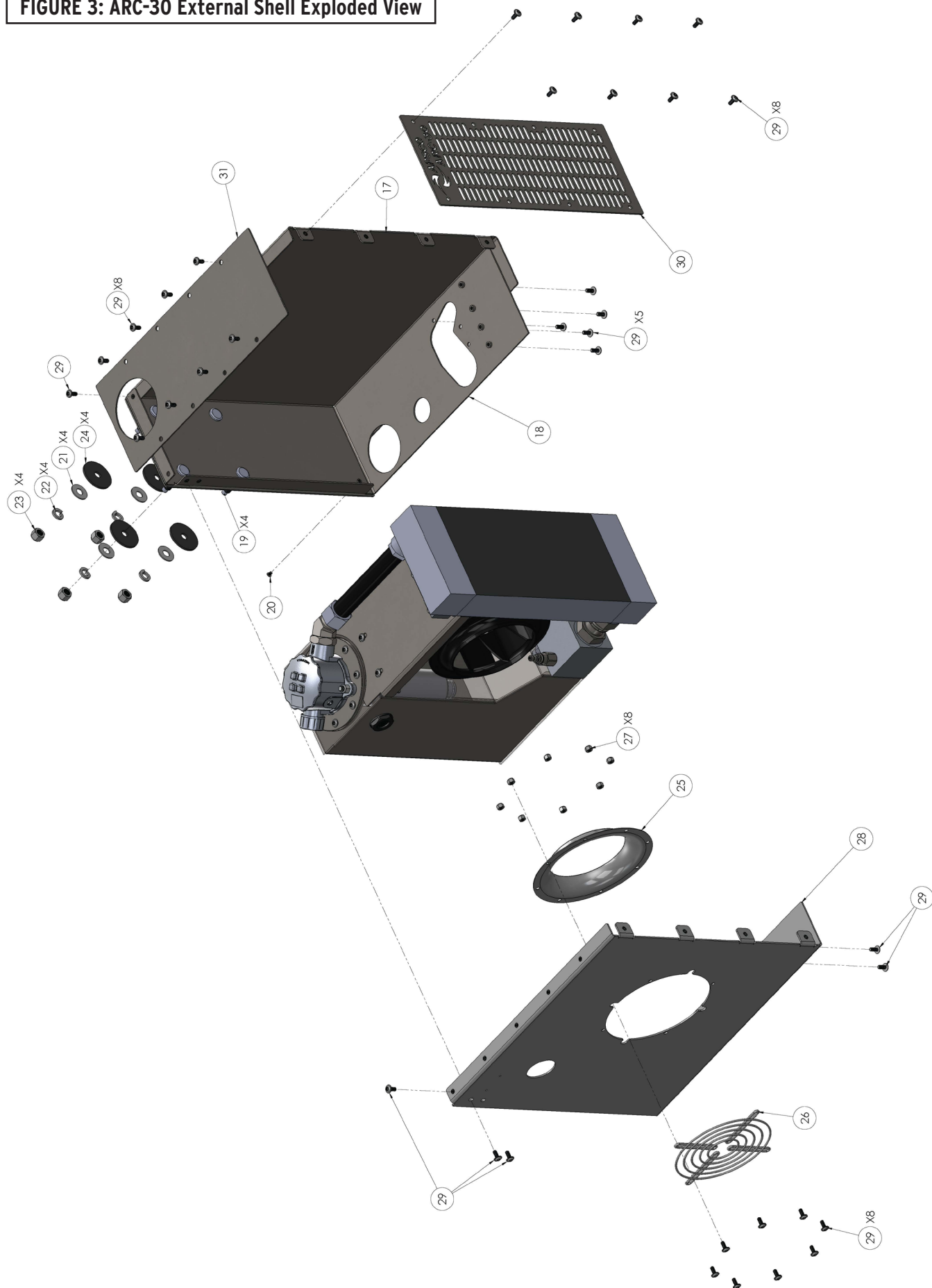


FIGURE 4: ARC-30 Internal Components Exploded View

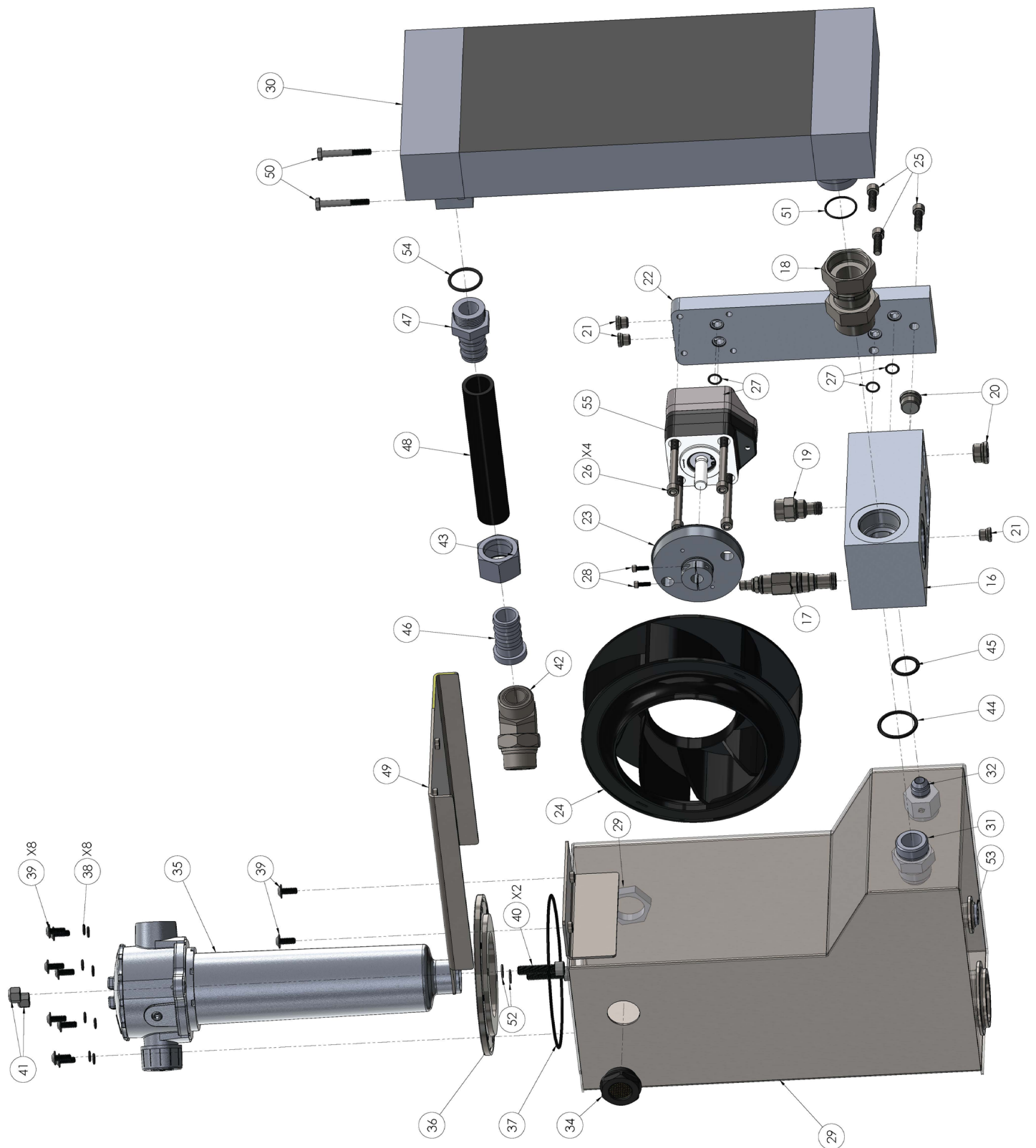


TABLE 1: Parts List

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	TORQUE VALUE	REQUIRED TOOL
1	7596	SHEETMETAL CASE RIGHT	1		
2	7598	SHEETMETAL CASE BOTTOM/BACK	1		
3	7597	SHEETMETAL CASE LEFT	1		
4	7599	CASE, TOP	1		
5	7601	SHEETMETAL CASE FRONT	1		
6	7630	INLET RING FOR 225MM IMPELLER	1		
7	7631	FINGERGUARD	1		
8	7812	WHEEL STUD 1/2-20	4		
9	7713	18-8 SS FLAT WASHER	4		
10	7715	1/2" LOCK WASHER SS	4		
11	7714	1/2-20 NYLON LOCK NUT	4	100 FT. LB	3/4" DEEPWELL SOCKET
12	3786	NUT 1/4-20 NC SS HEX NYLOCK	8	10 FT. LB	7/16" END WRENCH
13	4914	CAPS 10-32 X 1/4 BH SS	1	21 IN. LB	1/8" ALLEN
14	7709	1/4-20 X 5/8" ZINC TORX T27 BUTTON HD	35	10 FT. LB	T27 TORX
15	7860	WASHER, RUBBER .5ID X 2.25OD	4		
16	7593	MANIFOLD	1		
17	7657	SYSTEM RELIEF PILOT OPERATED	1	35 FT. LB	7/8" END WRENCH
18	7664	STRAIGHT THREAD SWIVEL CONNECTOR	1	115 FT. LB	1 7/8" END WRENCH
19	7656	FLOW REGULATOR 8-2 CAVITY	1	25 FT.LB	1 5/16" END WRENCH
20	7726	-08 SAE PLUG	2	40 FT. LB	5/16" ALLEN
21	7644	-04 SAE PLUG	3	13 FT. LB	3/16" ALLEN
22	7594	ADAPTER, MANIFOLD	1		
23	7626	HUB, PRESS FIT	1		
24	7642	FAN 225MM	1		
25	7653	SHCS 3/8"-16 SS 1" LG	3	23 FT. LB	5/16" ALLEN
26	7654	MOTOR MANIFOLD SHCS 5/16"-18	4	13 FT. LB	1/4 " ALLEN
27	1195	O-RING 2-013 9/16 OD 7/16 ID	4		
28	7643	SHCS 8-32 1/2" LG	2	12.6 IN. LB	9/64" ALLEN
29	7592	TANK ASSEMBLY	1		
30	7833	HEAT EXCHANGER ASSEMBLY	1		
31	7655	COLD START RELIEF VALVE (CHECK)	1	115 FT. LB	1 1/2" DEEP WELL SOCKET
32	7646	12FJ-08MJ STRAIGHT LARGE HEX	1	40 FT. LB	1 1/4" DEEP WELL SOCKET
33	7650	BSPP LOCKNUT (FOR USE WITH SIGHTGLASS)	1	35 FT. LB	1 5/8" SOCKET
34	7660	SIGHT LEVEL PLUG 1" BSPP	1	35 FT. LB	1 1/2" SOCKET
35	6827	HYDRAULIC FILTER ASSEMBLY	1		
36	7602	CLEANOUT COVER, TANK	1		
37	7662	O-RING 0-258 6 1/4"OD 6"ID(CLEAN OUT COVER)	1		
38	7748	O-RING 2-011 IL 7/16OD 5/16ID	8		
39	7709	1/4-20 X 5/8" ZINC TORX T27 BUTTON HD	10	10 FT. LB	T27 TORX
40	7711	3/8-16 X 1 1/2 SHCS BOLT 18-8	2	20 FT. LB	5/16" ALLEN
41	7710	3/8-16 X 1 1/2" LOCK NUT 18-8	2	10 FT. LB	9/16" END WRENCH
42	7647	16MFS-16MAORB 45 ELB FORG	1	115 FT. LB	1 5/8" & 1 1/2" END WRENCH
43	7648	1" ORFS TUBE NUT	1	115 FT. LB	1 5/8" END WRENCH
44	2574	O-RING 2-220 1 5/8 OD 1 3/8 ID	1		
45	1733	O-RING 2-212 1 1/8 OD 7/8 ID	1		
46	7815	BARB FTG, SLV END	1		
47	7816	BARB FTG, MALE 1-5/16"-12UN	1	115 FT. LB	1 1/2" END WRENCH
48	7817	HOSE, HYD, 1" ID	1		
49	7821	BRACKET, TANK MOUNT	1		
50	7841	HH 1/4-20 X 2" CAP SCREW	2	10 FT. LB	7/16" END WRENCH
51	4624	O-RING 2-025 1 5/16 OD 1 3/16	1		
52	7842	SEALING WASHER, COPPER	2		
53	7845	PLUG, #08 SAE MAGNETIC	1	40 FT. LB	5/16" ALLEN
54	7862	O-RING, 2-916 SAE 16 ORB	1		
55	7641	HYDRAULIC MOTOR, CW ROTATION	1		

TABLE 2: Accessories

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.	TORQUE VALUE	REQUIRED TOOL
56	7855	FILTER ELEMENT, ARC 30	1		SQUARE SHANK SCREWDRIVER
57	7861	CAVITY PLUG, (FOR RELIEF VALVE)	1	115 FT. LB	7/8" END WRENCH
PRESSURE PORT					
58	7868	16MJ-16MORB-16MJ RUN TEE	1	115 FT. LB	7/8" END WRENCH
59	7869	16MORB-16MJ STRAIGHT	1	115 FT. LB	1 1/2" END WRENCH
60	7870	16MORB-16MJ 90	1	115 FT. LB	1 1/2" END WRENCH
61	7893	16MORB-16FP STRAIGHT ADAPTER	1	115 FT. LB	1 1/2" END WRENCH
62	7894	16MP-16MP-16MP TEE	1	115 FT. LB	7/8" END WRENCH
RETURN PORT					
63	7871	20MORB-20MJ STRAIGHT	1	115 FT. LB	1 7/8" END WRENCH
61	7872	20MORB-20MJ 90	1	115 FT. LB	1 7/8" END WRENCH
65	7895	20MORB-20FP STRAIGHT ADAPTER	1	115 FT. LB	1 7/8" END WRENCH
66	7896	20MP-20MP 90		115 FT. LB	1 7/8" END WRENCH
SUCTION PORT					
67	7874	1.5" HOSEBARB - 24ORB STRAIGHT	1	115 FT. LB	2 1/8" END WRENCH
68	7875	2"HOSEBARB - 24ORB 90	1	115 FT. LB	2 1/8" END WRENCH
69	7876	1.5" HOSEBARB - 24ORB 90	1	115 FT. LB	2 1/8" END WRENCH
70	7897	24MORB-24MJ 90	1	115 FT. LB	2 1/8" END WRENCH
71	7898	24MORB-32MJ 90	1	115 FT. LB	2 1/8" END WRENCH
72	7899	24MP-24MP 90	1	115 FT. LB	2 1/8" END WRENCH
73	7900	24MORB-24FP STRAIGHT ADAPTER	1	115 FT. LB	2 1/8" END WRENCH
74	7901	24MORB-32FP STRAIGHT ADAPTER	1	115 FT. LB	2 3/4" END WRENCH
75	7902	32MP-32MP 90	1	115 FT. LB	2 3/4" END WRENCH
76	7903	24MORB-24MP 90	1	115 FT. LB	2 1/8" END WRENCH
CASE DRAIN PORT					
77	7877	08MORB-08MJ STRAIGHT	1	40 FT. LB	7/8" END WRENCH
78	7878	08MORB-08MJ 90	1	40 FT. LB	7/8" END WRENCH
79	7904	08MORB-08FP STRAIGHT	1	40 FT. LB	7/8" END WRENCH
80	7905	08MORB-08MP 90	1	40 FT. LB	7/8" END WRENCH
81	7906	08MP-08MP 90	1	40 FT. LB	7/8" END WRENCH
GAUGE PORT					
82	7879	04MORB-1/4"FP STRAIGHT	1	15 FT. LB	3/4" END WRENCH
HYDRAULIC DIRECTION CONTROL VALVE OPTIONS					
		ARC-30 STD Direction Valve Air	Assembly Number 20-UNI-1S-03		
		ARC-30 STD Direction Valve Manual	Assembly Number 20-UNI-1S-04		
M=MALE, F=FEMALE, P=PIPE OR NPT THREAD, J=JIC 37 ° FLARE, ORB=O-RING BOSS					
FITTINGS ARE SIZED IN 16TH" INCREMENTS SO 16=16/16THS OR 1", 8=8/16" OR 1/2", 24=24/16THS OR 1.5"					

ARC-30 REPAIR:

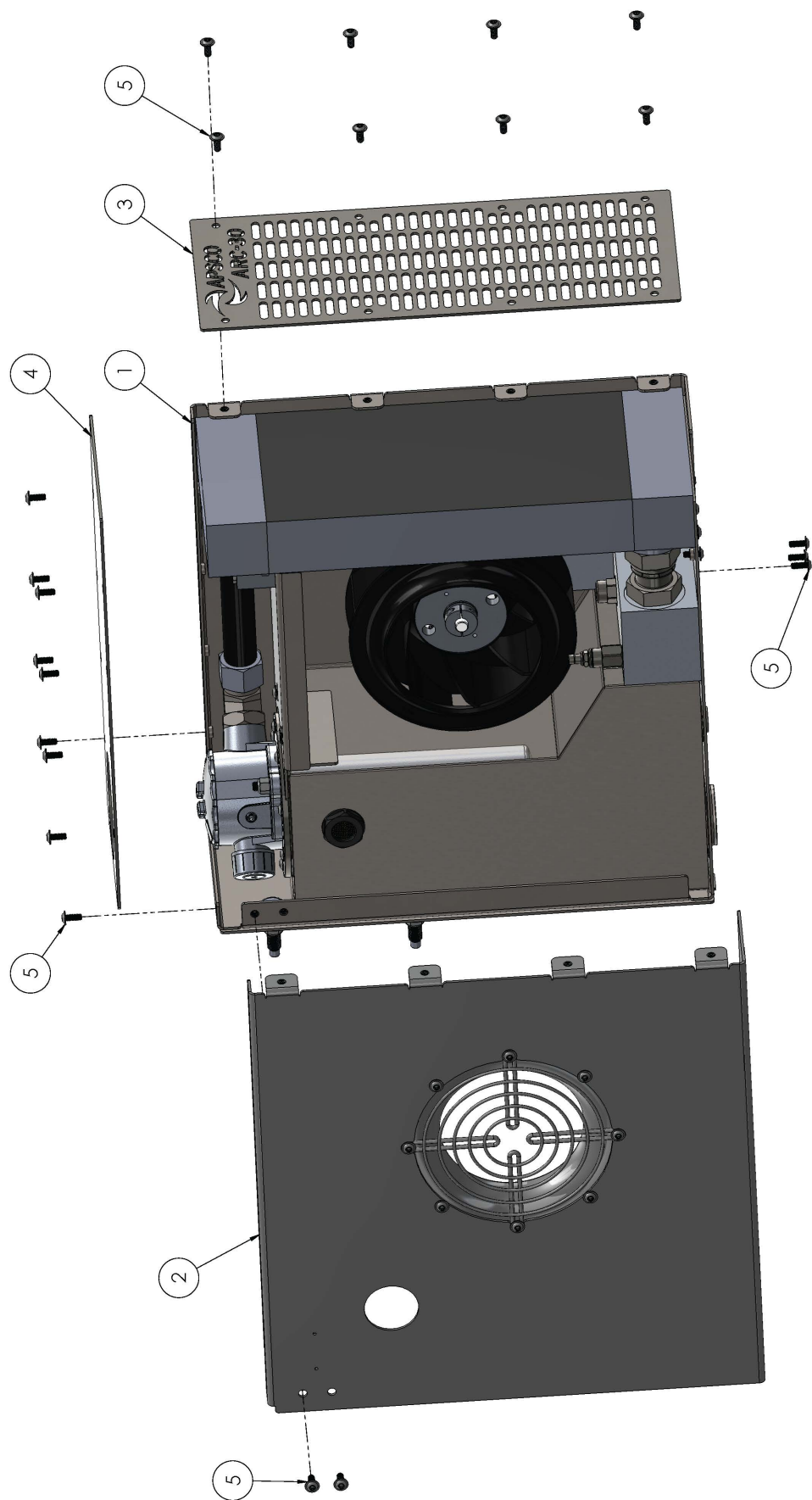
The design of the Arc-30 will allow you to remove three of the body panels and pull the internal assembly while leaving the right side assembly panel mounted to truck (refer to FIG 5, TABLE 3 below). This is assuming you have left enough room around the heat exchanger to get to the body panel fasteners. Drain hydraulic fluid from unit by removing the magnetic drain plug (Item 53, FIG.4), once all the fluid has been drained replace and torque accordingly. Do not re-use this fluid. Remove all connections to the ARC30, these connections will be wet so be sure to have a catch pan for the fluid that will be spilled. Cap and plug all hoses and ports to prevent contamination. Remove the front (Item 3) and top case (Item 4), as well as the left side cover (Item 2). You will also need to remove the three bolts

(Item 5) that fasten the right side case to the manifold. These are located on the bottom of the Arc-30. You can now remove the entire inner assembly leaving the right side panel still mounted to the truck. It is recommended to do any repair work on a clean surface in a dust free environment. Once the Arc-30 is out of its case you will be able to remove and replace any of the components. If the repair requires you to remove the tank mount bracket (Item 49) mark the position of the bolts on the bracket so you can reinstall in the same position. This will help ensure that your sight glass and tank cap will fit concentrically within the case when you put the Arc-30 back together. When re-assembling the Arc-30 be sure to use blue loc-tite on all fasteners and torque according to TABLE 1.

TABLE 3			
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	7724	SIDE PANEL ASSEMBLY, RIGHT	1
2	7723	SIDE PANEL ASSEMBLY, LEFT	1
3	7601	SHEETMETAL CASE FRONT	1
4	7599	CASE, TOP	1
5	7709	1/4-20 X 5/8" ZINC TORX T27 BUTTON HD	22

TABLE 4: TROUBLE SHOOTING GUIDE		
Problem	Cause	Corrective Action
Fan not spinning	<p>Low system pressure</p> <p>Low oil level in tank</p> <p>Air leak in suction hose or fitting connections</p> <p>Pinch Bolts (Item 29) are loose or missing</p> <p>Collapsed Suction Hose</p> <p>Flow Control Valve (Item 19) has blocked orifice</p> <p>Fan sucked in road trash such as a plastic bag and has caused fan to be in a bind</p>	<p>The system pressure must be higher than 900 psi for the fan to spin at full speed. Slower fan speeds in an unloaded condition are part of normal operation</p> <p>Fill Tank, tighten fittings, and bleed air from lines</p> <p>Tighten fittings and bleed air from lines</p> <p>Replace and re-torque</p> <p>Replace suction hose</p> <p>Remove and clean or replace valve. Change fluid and filter element</p> <p>With Unit de-energized, remove debris, check for proper torque of pinch bolts. Check to make sure the fan is not broken or cracked and motor functions properly</p>
High Oil Temperature	<p>Dirty Heat Exchanger Assembly (Item 31)</p> <p>System Relief Valve (Item 17) is opening</p> <p>low oil level in tank</p> <p>Collapsed Suction Hose</p> <p>Air leak in suction hose or fitting connections</p>	<p>Clean Heat Exchanger. Use mild cleaner compatible with aluminum. Be careful not to damage fins when using a pressure washer.</p> <p>Ensure that valve relief pressure is set higher than your system pressure. Remove and clean or replace valve. Change fluid and filter element</p> <p>Fill Tank and tighten fittings</p> <p>Replace suction hose</p> <p>Bleed air and tighten fittings</p>
Aeration of oil (Milky looking oil)	<p>Water Contamination</p> <p>Air leak in suction hose or fitting connections</p> <p>Pump is not lower than the tank</p> <p>Restricted suction line</p> <p>low oil level in tank</p>	<p>Replace Fluid and Filter Element. Check all fittings and Filter Cap for tightness</p> <p>Tighten fittings and bleed air from lines</p> <p>Reposition to ensure the fluid can gravity feed into the pump through the suction line.</p> <p>Route suction line to make as straight and short of a run as possible. Ideally you would want a 1.5" suction line for minimum flow restriction.</p> <p>Fill Tank and tighten fittings, verify proper fill level before use</p>
Heat exchanger Assembly leaks	<p>Loose Fittings (Items 48 & 18) or cut o-rings (Items 55 & 52)</p> <p>Burst Heat Exchanger</p>	<p>Replace o-rings and tighten fittings</p> <p>Replace Cold start relief valve (Item 32) and Heat exchanger assembly (Item 31)</p>

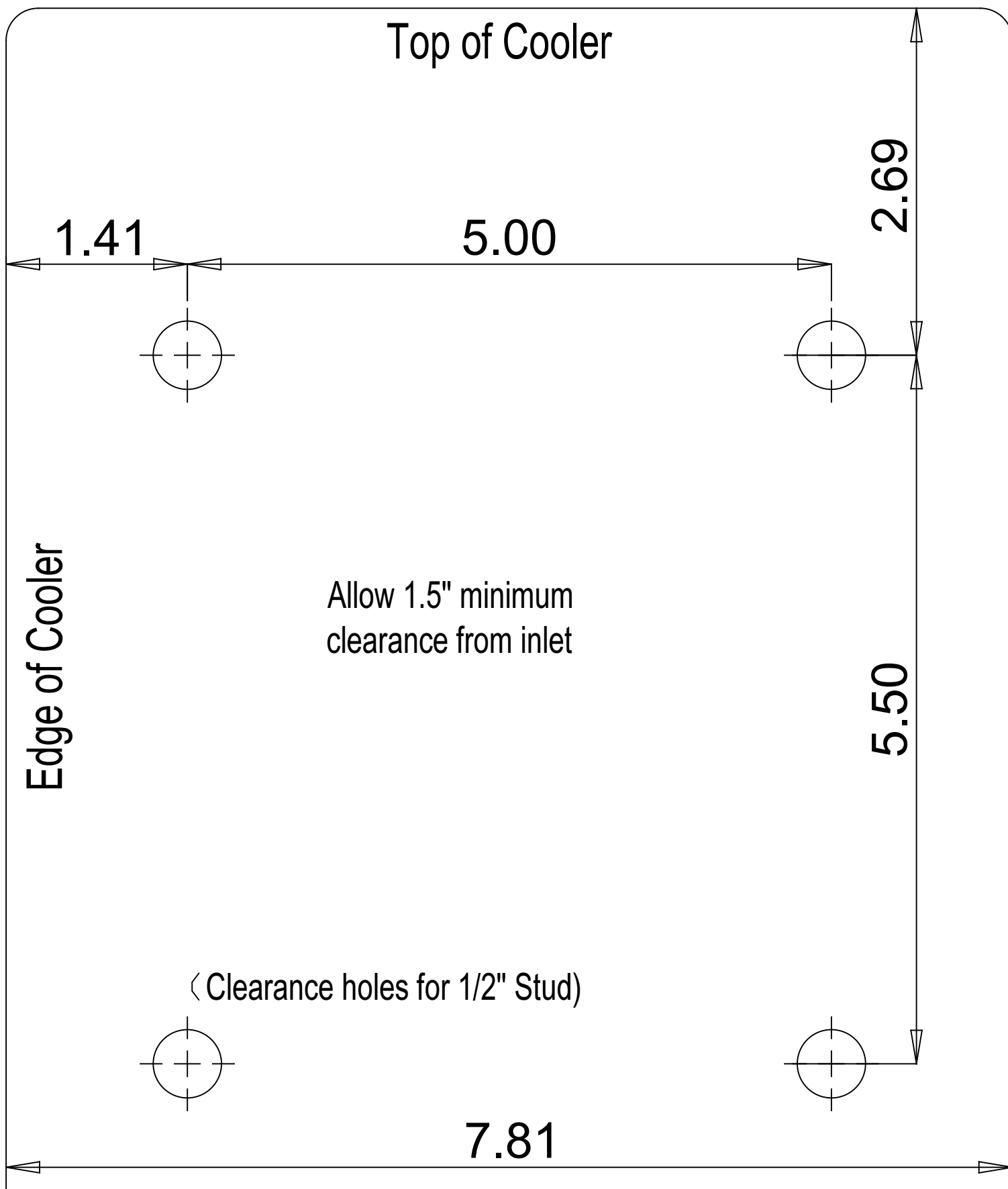
FIGURE 5: ARC-30 Repair



DRILL DIMENSIONS

(NOT TO SCALE)

FIGURE 6





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