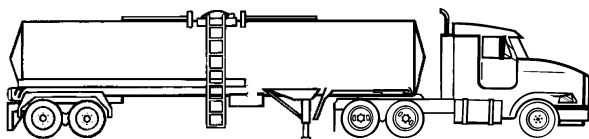


**DO NOT
OPERATE BEFORE
READING THIS
MANUAL**

INSTALLATION, OPERATION and MAINTENANCE MANUAL



DH5 HYDRAPAK



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WARRANTY

WARRANTY: The Seller warrants the goods sold hereunder against defects in workmanship or materials under normal and proper installation for a period of twelve (12) months from the date of delivery. BUYER'S SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY IS FOR THE REPAIR OR REPLACEMENT AT SELLER'S OPTION, WITHOUT CHARGE TO BUYER EXCEPT FOR SHIPPING EXPENSES, AT THE OFFICE OF THE SELLER IN LOUISVILLE, KENTUCKY, OF ANY PART WHICH HAS PROVEN TO BE DEFECTIVE AT THE TIME IT WAS DELIVERED. ANY GOODS UNDER WARRANTY MUST BE RETURNED TO THE SELLER'S OFFICE FOR INSPECTION BY THE SELLER AND, IF ANY SUCH GOODS ARE FOUND TO BE DEFECTIVE, FOR REPAIR OR REPLACEMENT. ALL FREIGHT AND EXPENSES OF SHIPMENT TO AND FROM THE SELLER'S OFFICE SHALL BE BORNE BY THE BUYER. THE SELLER IS NOT RESPONSIBLE FOR ANY EXPENSES OF ANY NATURE INCURRED FOR ANY REPAIRS TO ALTERATIONS MADE BY OTHERS TO THE GOODS OR ANY OTHER EQUIPMENT WITHOUT THE PREVIOUS WRITTEN CONSENT OF THE SELLER. SHOULD THE GOODS BE PARTIALLY OR FULLY INSTALLED, ALTERED, STRIPPED, REPAIRED, SERVICED, OR MAINTAINED BY ANY PERSON OTHER THAN AUTHORIZED AGENTS AND EMPLOYEES OF THE SELLER, WITHOUT THE PREVIOUS CONSENT OF THE SELLER, OR MISUSED IN ANY WAY, THIS WARRANTY SHALL BE VOID. THIS WARRANTY CONSTITUTES THE ONLY WARRANTY BY THE SELLER OF THE GOODS AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, WARRANTIES OF MERCHANTABILITY OR WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL SELLER BE LIABLE FOR BUYER'S ATTORNEY'S FEES.

NO CONSEQUENTIAL DAMAGES: UNDER NO CIRCUMSTANCES SHALL THE SELLER BE LIABLE FOR (A) ANY DAMAGE, INJURY, BREAKAGE OR LOSS OF ANY KIND WHATSOEVER, (B) ANY LOSS OF INCOME, OR (C) ANY CONSEQUENTIAL LOSS.

NO TORT LIABILITY: SELLER DISCLAIMS ANY LIABILITY FOR CLAIMS BASED ON SELLER'S NEGLIGENCE OR STRICT LIABILITY IN TORT.

PARTS: This Warranty and all disclaimers and limitations of liability shall apply to all parts sold to Buyer.

TRAINING AND SUPERVISION: The buyer hereby assumes the affirmative duty to properly educate, instruct and supervise its employees and all others, except employees of the Seller, in the safe, proper use and operation of the goods. The Buyer agrees to indemnify the Seller for any damages paid by the latter as a result of the Buyer's failure to perform this affirmative duty.

The goods are not designed or intended for use with every substance. If the material which the Buyer contemplates transferring with the goods has corrosive or polymerizing or other properties which may result in unsatisfactory or dangerous operations, the Seller has no liability or responsibility for performance of the goods.

RETURN OF GOODS: No goods supplied may be returned to the Seller for credit without the Seller's prior written authorization before transportation thereof commences and in such cases transportation must be prepaid and the Buyer's name, address, original order number and the Seller's invoice number must be clearly marked on the shipping tag.

If any goods are returned to the Seller for repair or under warranty and no instructions are received within two months after Seller receives the goods for repair or sends notice to Buyer of the disallowance of a warranty claim, the Seller reserves the right to scrap the goods returned, and no subsequent claim for any costs or losses will be accepted.

APPLICABLE LAW AND VENUE: The rights and obligations of the parties hereunder shall be governed in all respects, including all questions of construction and performance of this order, by the laws of Kentucky. All disputes concerning this order shall be resolved in an appropriate state or federal court located in Louisville, Kentucky.

MODIFICATION OR RESCISSION: This warranty can only be modified or rescinded by a written agreement signed by an officer of both the Buyer and the Seller.

DRUM INDUSTRIES, INC., LOUISVILLE, KENTUCKY (502) 266-6677 (800) 626-6334

SAFETY PRECAUTIONS

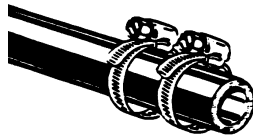
- Rotating shafts can be dangerous. You can snag clothes, skin, hair, hands, etc. This can cause serious injury or death.
- Do not work under the vehicle when the engine is running.
- Do not work on a shaft (with or without a guard) when the engine is running.
- Do not engage or disengage driven equipment by hand from under the vehicle when the engine is running.
- In order to avoid becoming entangled, install the power take off and/or shaft behind the frame rail, tanks, battery box, etc.
- If power take off and/or shaft are still exposed after installation, install a guard.
- Install a support strap when servicing a driveshaft to prevent personal injury.
- A serious or fatal injury can occur . . .
 - if you lack proper training
 - if you fail to follow proper procedures
 - if you do not use proper tools and safety equipment
 - if you assemble driveline components improperly
 - if you use incompatible driveline components
 - if you use worn-out or damaged driveline components
 - if you use driveline components in a non-approved application.
- This manual contains safety instructions. Read, understand and follow this manual.
 - Get proper training
 - Learn and follow safe operating procedures
 - Use proper tools and safety equipment
 - Use proper components in good condition

INSTALLATION

- Drill four 9/16" dia. holes in the pattern shown. (see next page) Use the capscrews, washers and nuts supplied to mount the unit directly to the truck frame.
- The fan discharges air to the rear of the unit and requires 6" of unobstructed clearance.
- The hydraulic hose connections are noted on drawing. (see next page)
- If required, the suction elbow can be rotated provide optimum mounting capability. This is done by loosening or removing the 1/2" nuts (4) and rotating the elbow. Take care not to pinch the o-ring and tighten the nuts in a crisscross pattern.
- The hydraulic pump will cavitate and eventually fail if suction conditions exceed 5" Hg. for gear equipment and 2" Hg. for piston equipment. (tractor or trailer mounted)
- The suction line must be below the oil reservoir to prevent air being trapped in the line. (trailer mounted)
- We recommend the optional reservoir air pressure kit when trailer mounting.
- The system is limited to 45 GPM.
- Couplings must be completely tightened and engaged to prevent restriction and cavitation. (trailer mounted)
- When the Hydrapak is mounted on the trailer, the relief valve is not operational when the high pressure line is disconnected from the trailer.
- Connect suction hose to the nipples in the following manner:

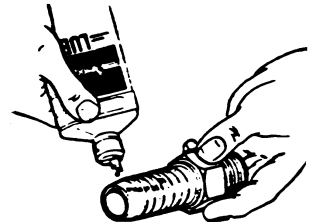
Step 1

Cut hose square to length required using a fine tooth hacksaw or cut-off wheel. Clean hose bore. Slide band-type clamps over hose cover.



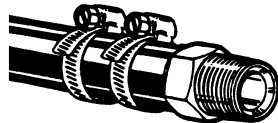
Step 2

Oil nipple nose and inside of hose **LIBERALLY**. Use heavy oil or Aeroquip 222070 hose assembly lube.



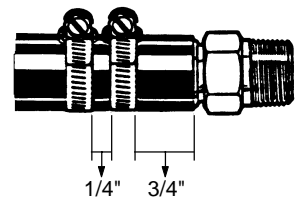
Step 3

Insert nipple into hose until hose end bottoms on nipple shoulder.



Step 4

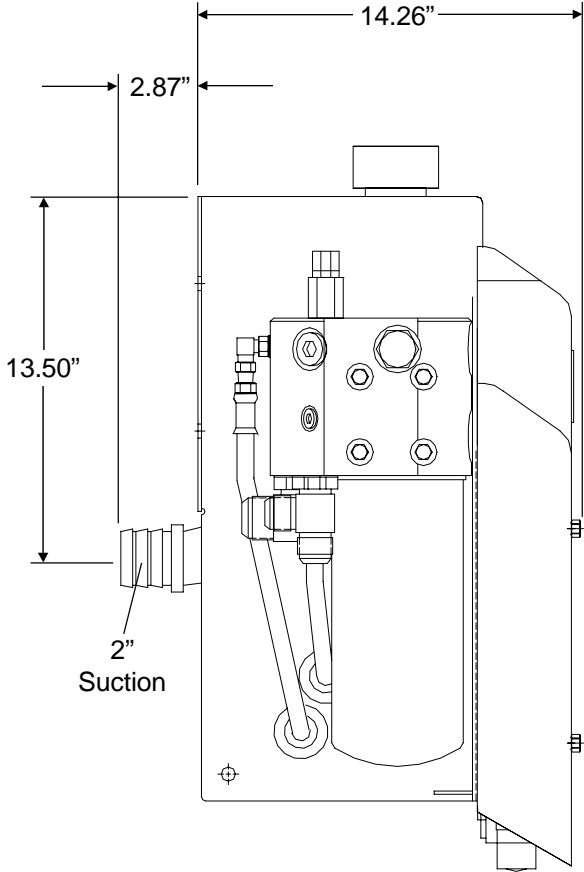
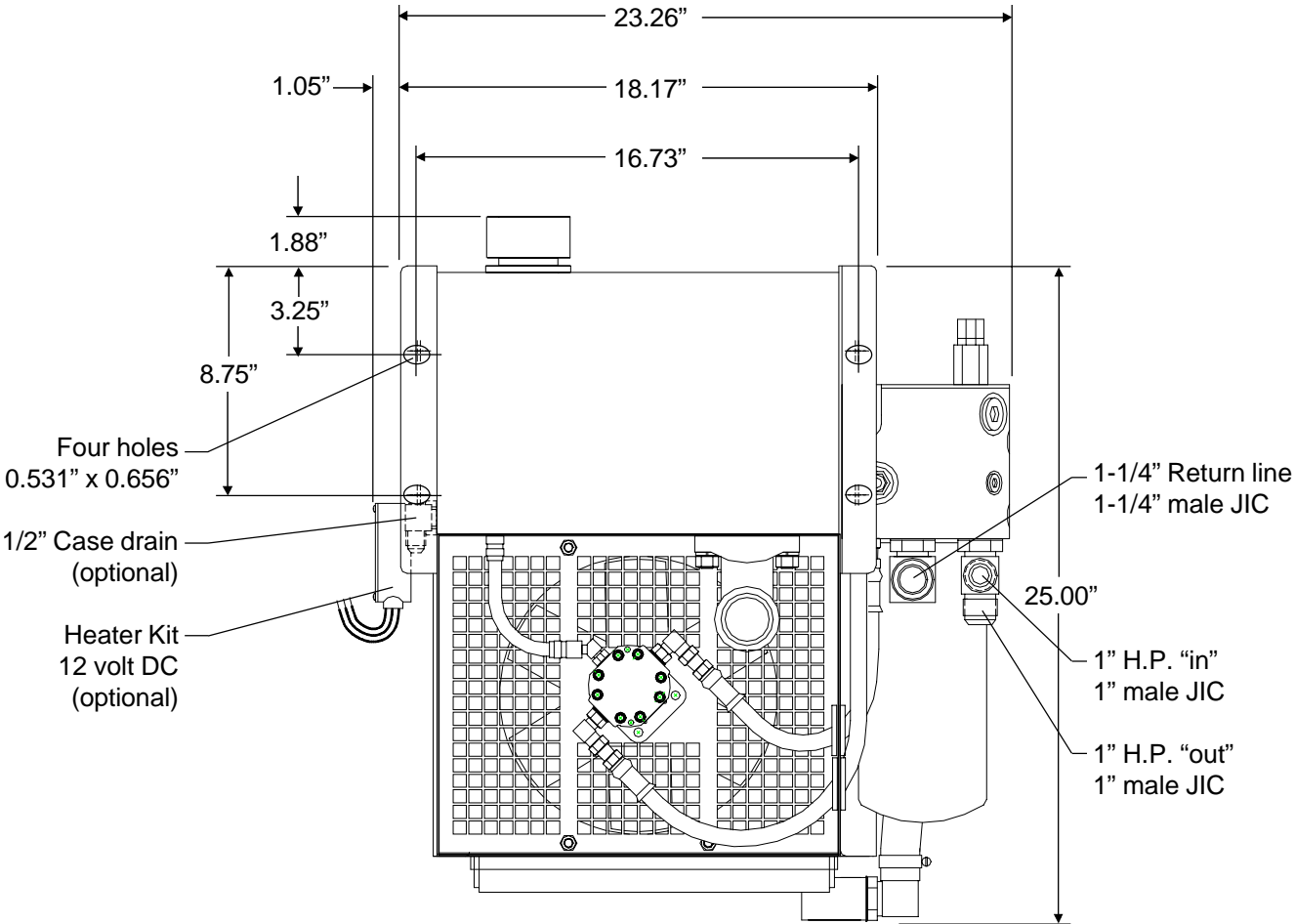
Space first band clamp 3/4" from end of hose and second band clamp 1/4" from first. Tighten clamps until hose cover begins extruding thru the clamp thread slots.



FILLING THE HYDRAULIC SYSTEM:

- We recommend **Shell Tellus T32 winter, Shell Tellus T46 summer**, non-foaming hydraulic oil or equivalent. The tank capacity is 5 gallons.
- Always fill unit with new, clean hydraulic oil, use a paper cone filter to avoid entrance of foreign particles into the tank. Once the tank is full, it may be necessary to briefly engage the hydraulic pump to bleed the system of air. Should the oil level fall below the sight glass disengage the PTO and continue to fill.

INSTALLATION (CONTINUED)



OPERATION

VISUAL CHECKS BEFORE STARTING SYSTEM

1. Remove any obstructions from radiator and fan.
2. Check to make sure that oil is visible in the sight glass.
3. Make sure the non-spill couplings are correctly connected.

NOTE: FAILURE TO CONNECT RETURN LINE NON-SPILL COUPLING WILL DAMAGE THE HYDRAULIC MOTOR SEAL.

STARTING SYSTEM:

1. Ensure brake is applied.
2. Select neutral if selector valve or reverse valve is fitted.
3. Full open position for speed control valve.
4. Depress clutch and engage PTO, release clutch slowly.
5. Oil level may drop if air is trapped in system. Top off tank if necessary with PTO disengaged.
6. Operate selector valve from neutral to suit desired rotation.
7. Operate the speed control valve - slowly close to increase speed.
8. To stop the system, follow steps 7-6 in reverse.

POINTS TO NOTE:

1. **Filter gauge.** Upon initial start up when the oil is cold, the needle will show in red sector, indicating the filter is on full bypass. This is normal due to the high viscosity of cold oil. When the system has warmed up, the needle will show in green sector.

WARNING: IF THE NEEDLE REMAINS IN RED SECTOR, THE FILTER MUST BE CHANGED.

2. Do not use the Hydrapak as a step, damage will occur.
3. Optimum fan speed is reached at 1200 PSI. It will run at lower speeds at lower pressures. The minimum system pressure is 800psi for minimum fan speed.
4. Special attention should be paid to the suction hose. This must be able to withstand vacuum conditions up to 28" HG.

GENERAL MAINTENANCE

Be sure the hydraulic system is always ready for operation. This can only be done by maintaining the system. The oil should be removed for the first time after approximately 50 hours of operation. The oil is then to be renewed as prescribed by the oil suppliers. It is recommended that the oil is analyzed regularly, at least once a year.

1. Check oil level (oil level must be checked with system running). Oil level should be at mid-point on sight glass.
 2. Check filter gauge. This must be checked with system running and at normal working temperature. If gauge shows red sector, replace filter as follows:
 - A. Stop system.
 - B. Remove magnetic drain plug to drain oil. If large amounts of metal are present on plug, this indicates wear from pump or motor.
 - C. Unscrew filter slowly as oil will drain out of control block. Remove gasket.
 - D. Refit new gasket and install new filter. Turn until hand tight then 1/3 turn.

NOTE: Use a filter with a rating of $B_7 = 75$ (98.7%) efficiency.

 - E. Clean and replace drain plug using hydraulic sealer. Refill unit with **Shell Tellus T32 winter, Shell Tellus T46 summer**, hydraulic oil or equivalent. Check plug and filter for leaks. Run system and top off oil to mid-point of sight glass.
3. Check radiator fins for dirt and possible blockage. We recommend that at every service interval, the radiator is blown clear using compressed air. Check that air path behind radiator is not blocked and that fan is not obstructed.
4. Periodically check the bolts that hold PTO to transmission, hydraulic pump to PTO and hydraulic motor to product pump and tighten where necessary.
5. Check hose for external damage and possible bulging under pressure. Replace worn hoses.
6. Check for oil leaks in system and tighten hydraulic connections if necessary.
7. Check reservoir oil level and top off as required.
8. Inspect suction hose for kinks, leaks or loose connections that will allow air to be drawn into the system. This will quickly damage the hydraulic pump.

WARNING: DO NOT HIGH PRESSURE WASH FILLER CAP AREA.

TROUBLESHOOTING

Drum has available hydraulic test stacks and a test point ~ gauge kit for troubleshooting assistance. See pages 8 and 9.

The following chart is designed to assist rapid tracing of malfunction, with a guide to the remedy.

FAULT	CAUSES	REMEDIES
NOISES IN THE SYSTEM	A. Cavitation of pump due to: a) Low oil supply b) Incorrect oil c) Suction line restriction d) Sharp bend in suction line	a) Replenish b) Replace with correct oil c) Remove restriction d) Modify design
	B. Air entering in system due to: a) Leakage in suction line b) Low oil supply c) Leaking motor, pump, shaft seals, etc.	a) Inspect and tighten pipe connections b) Replenish c) Check and replace as necessary
	C. Mechanical errors due to: a) Faulty alignment of pump b) Damaged drive member c) Worn or damaged pump d) Failure of PTO	a) Realign b) Replace damaged units c) Repair or replace pump d) Replace as necessary
	D. Vibrating pipes due to: a) Resonance of system b) Unstable relief valve	a) Introduce flexible piping at critical points and/or fasten pipes b) Examine parts of relief valve assembly, replace as necessary

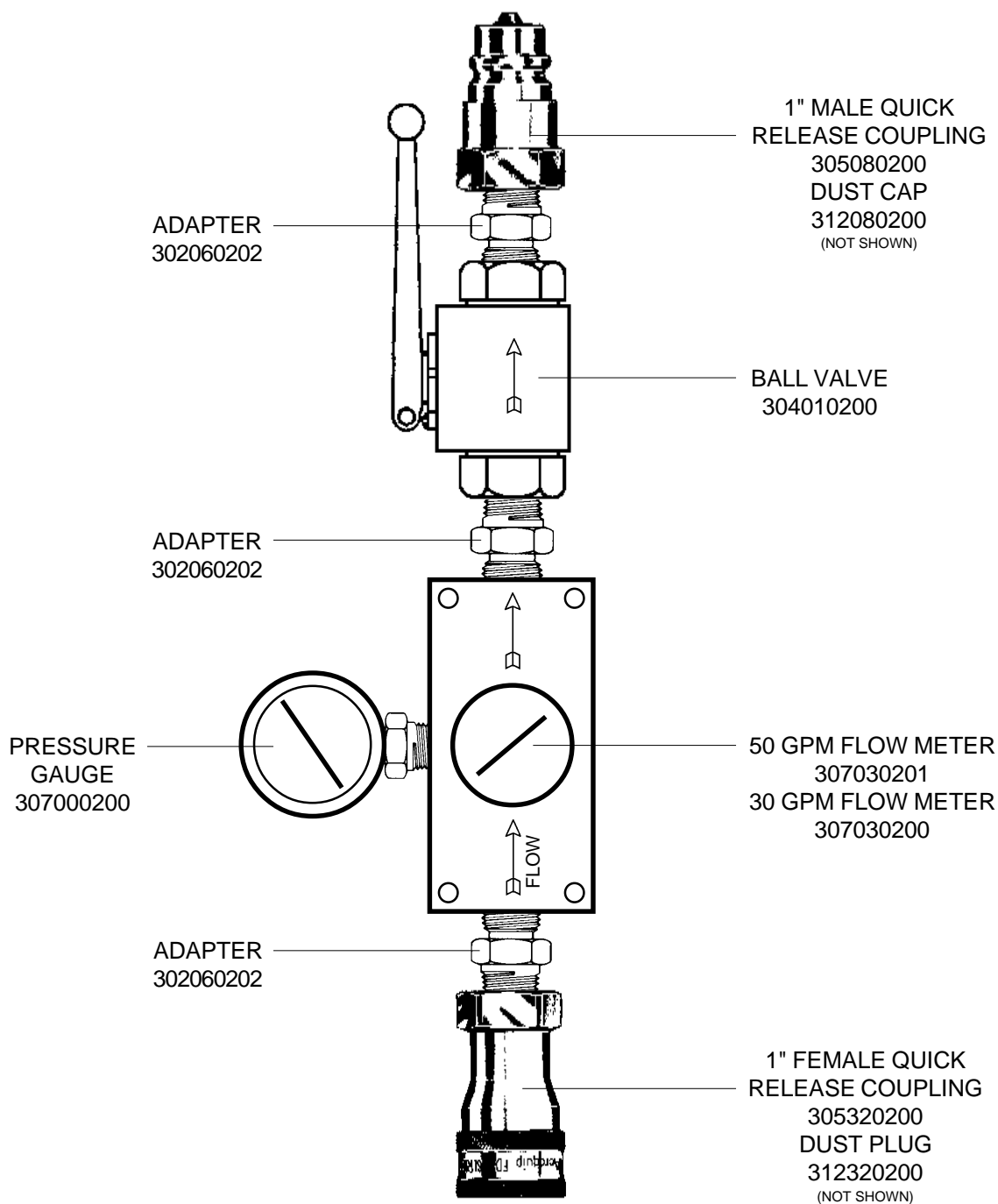
FAULT	CAUSES	REMEDIES
<p>2.</p> <p>INSUFFICIENT PRESSURE IN THE SYSTEM</p>	<p>a) Pump will not prime</p> <p>b) Relief valve opening at too low setting</p> <p>c) Relief valve will not close</p> <p>d) Faulty circuit</p> <p>e) Internal leakage in valves, pump or motor</p> <p>f) Worn or damaged pump</p> <p>g) Lack of power from engine</p>	<p>a) See Sections 1a) and 1b)</p> <p>b) Adjust the setting using a pressure gauge. Change valve if necessary.</p> <p>c) Replace valve</p> <p>d) Check the functions and operations of all components in circuit--isolate each circuit in turn to locate the error.</p> <p>e) As "d)"</p> <p>f) Repair or replace</p> <p>g) Examine for possible faults</p>
	<p><i>NOTE: CIRCUIT PRESSURE IS DEPENDENT ON SERVICE LOADING. UNDER LIGHT LOAD CONDITIONS, PRESSURE IS LOW.</i></p>	
<p>3.</p> <p>PUMP DELIVERS LOW OIL</p>	<p>a) Low oil supply</p> <p>b) Suction line restricted or closed</p> <p>c) Pump running in reverse</p> <p>d) Incorrect oil having too high a viscosity</p> <p>e) PTO running too slow</p>	<p>a) Examine for cause of loss of oil and replenish</p> <p>b) See 1a)</p> <p>c) Check rotation of pump and PTO</p> <p>d) Change oil</p> <p>e) Check speed</p>
<p>4.</p> <p>ERRATIC OPERATION OF SERVICES</p>	<p>a) Entrained air</p> <p>b) Inconsistent PTO speed</p> <p>c) Relief valve faulty</p>	<p>a) Ensure that oil in system is clear from bubbles and foam. See 1b).</p> <p>b) Check</p>
<p>5.</p> <p>OVERHEATING</p>	<p>a) Relief valve setting too low</p> <p>b) Incorrect operation of control valves</p> <p>c) Internal leakage of units</p> <p>d) Poor heat dissipation</p>	<p>a) Adjust setting using a pressure gauge</p> <p>b) Refer to operation instructions</p> <p>c) See 2d).</p> <p>d) Examine heat exchanger for blockage. Clean if needed. Examine fan to make sure it is rotating. <u>WARNING:</u> Wear eye protection</p>

TEST EQUIPMENT



Hydraulic test stack with 1" couplers

part no. 409040202 ~ 50 G.P.M.

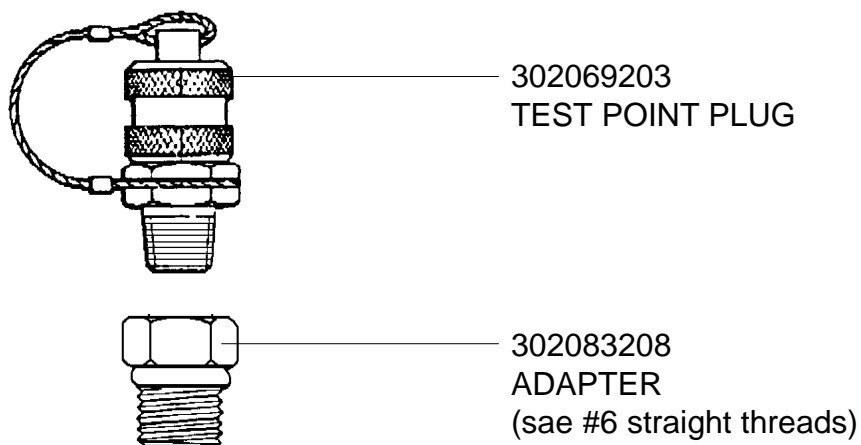
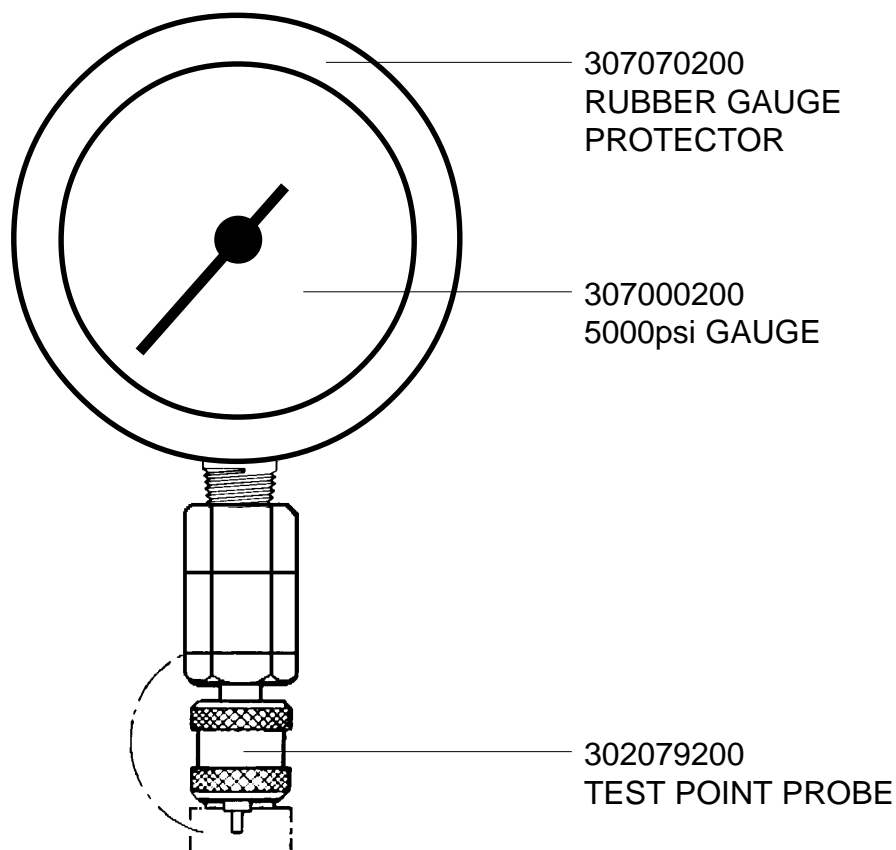


TEST EQUIPMENT

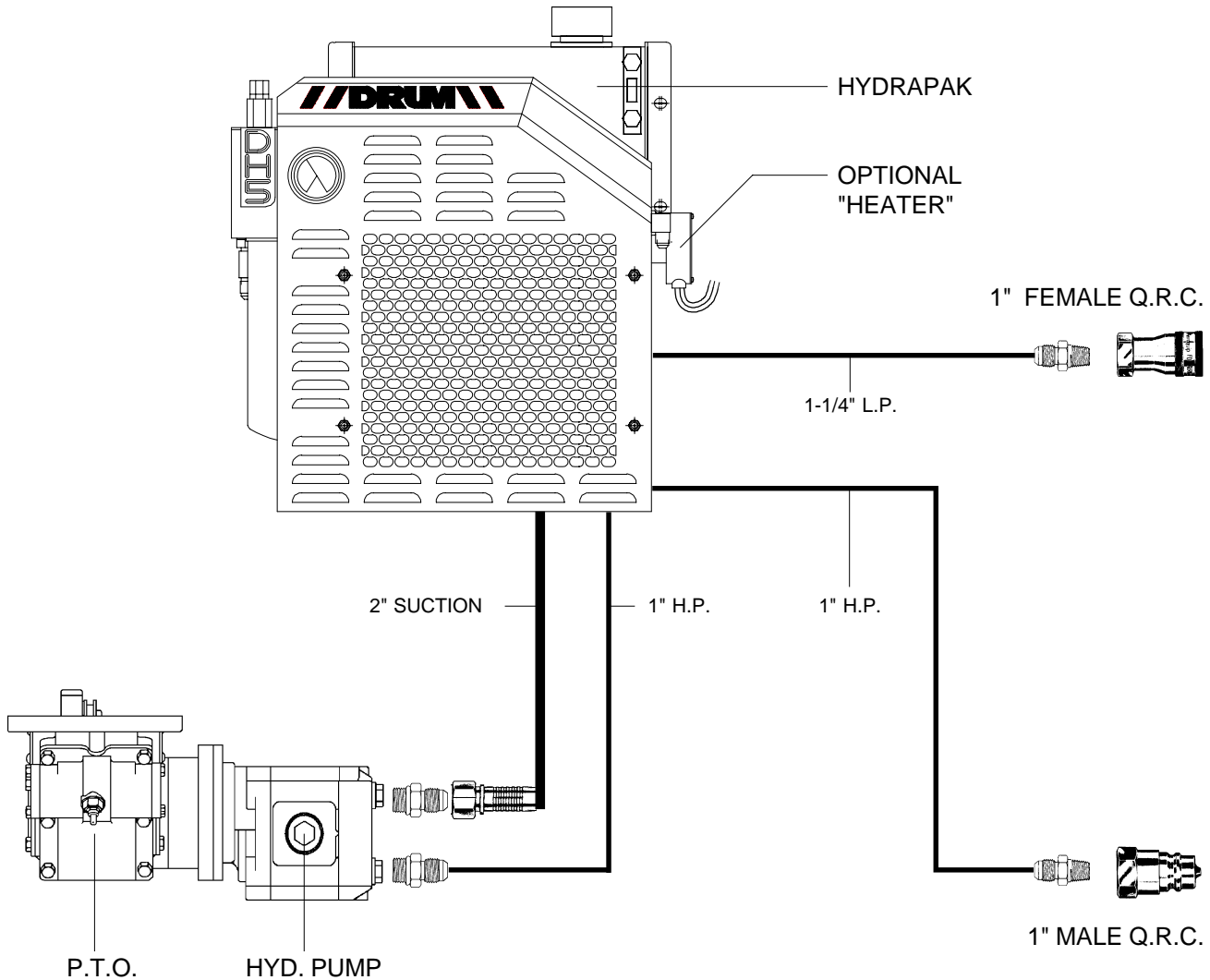


Hydraulic test point plug ass'y

part no. 409030202 ~ 5000psi, #6 SAE Male



HYDRAULIC CIRCUIT - TRACTOR



TYPICAL HYDRAULIC CIRCUIT (for example only)

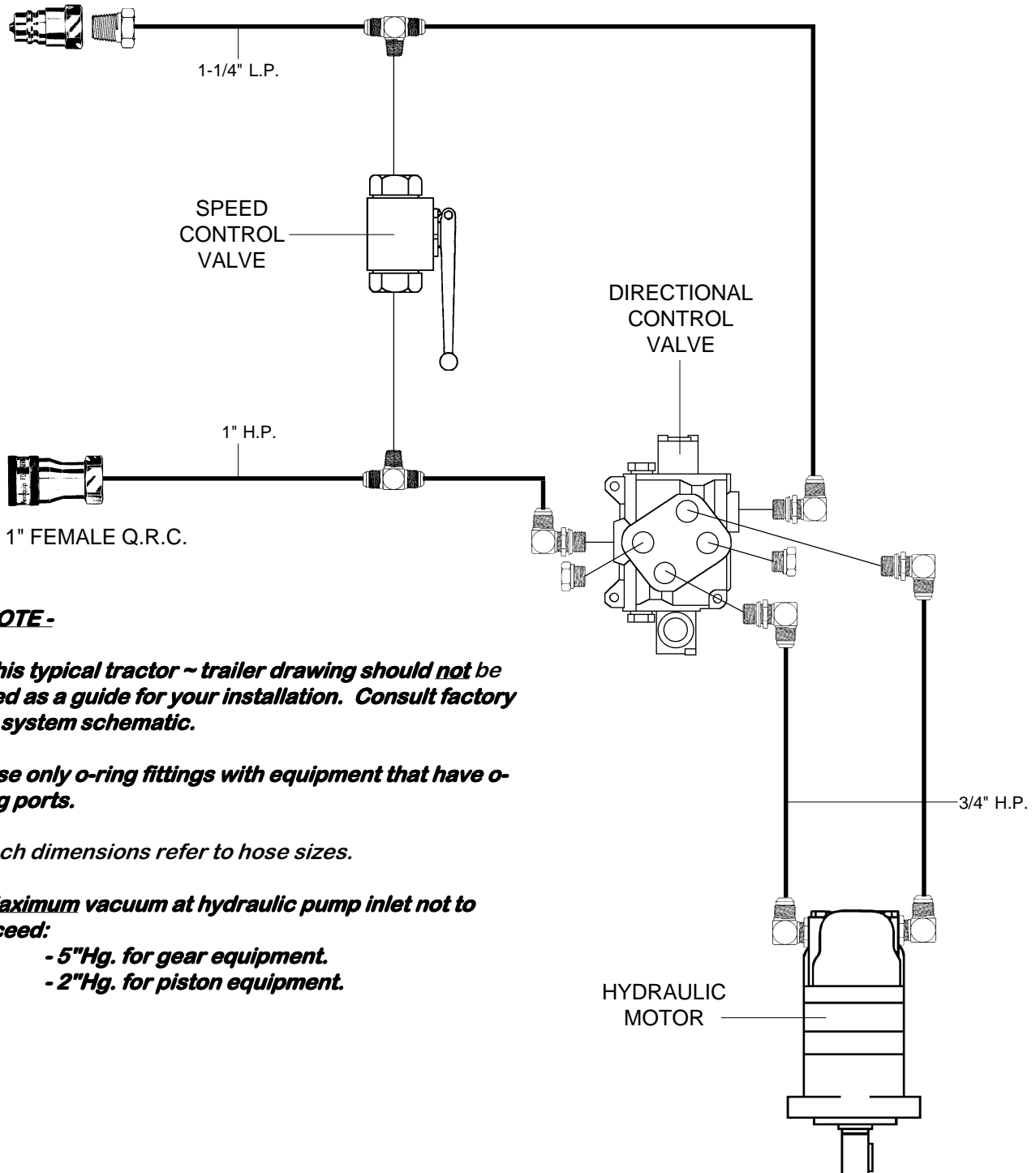
1. **Tractor Portion**
 - A. Power take off.
 - B. Hydraulic pump and fittings kit.
 - C. Hydrapak oil cooler.
 - B. Quick release couplings (male ~ female) with fittings kit and dust caps.
2. **Trailer Portion**
 - A. Quick release couplings (male ~ female) with fittings kit and dust caps.
 - B. Speed control valve and fittings kit.
 - C. Directional control valve and fittings kit.
 - D. Hydraulic motor and fittings kit.

- NOTE -

- All DH5 Hydrapaks are limited to 45 GPM hydraulic oil flow.
- This is a typical hydraulic circuit diagram. Consult factory for others.
- This unit is provided with a factory set relief valve.
- Available valve settings: 2000psi, 2500psi and 3000psi.

HYDRAULIC CIRCUIT - TRAILER

1" MALE Q.R.C.



- NOTE -

• ***This typical tractor ~ trailer drawing should not be used as a guide for your installation. Consult factory for system schematic.***

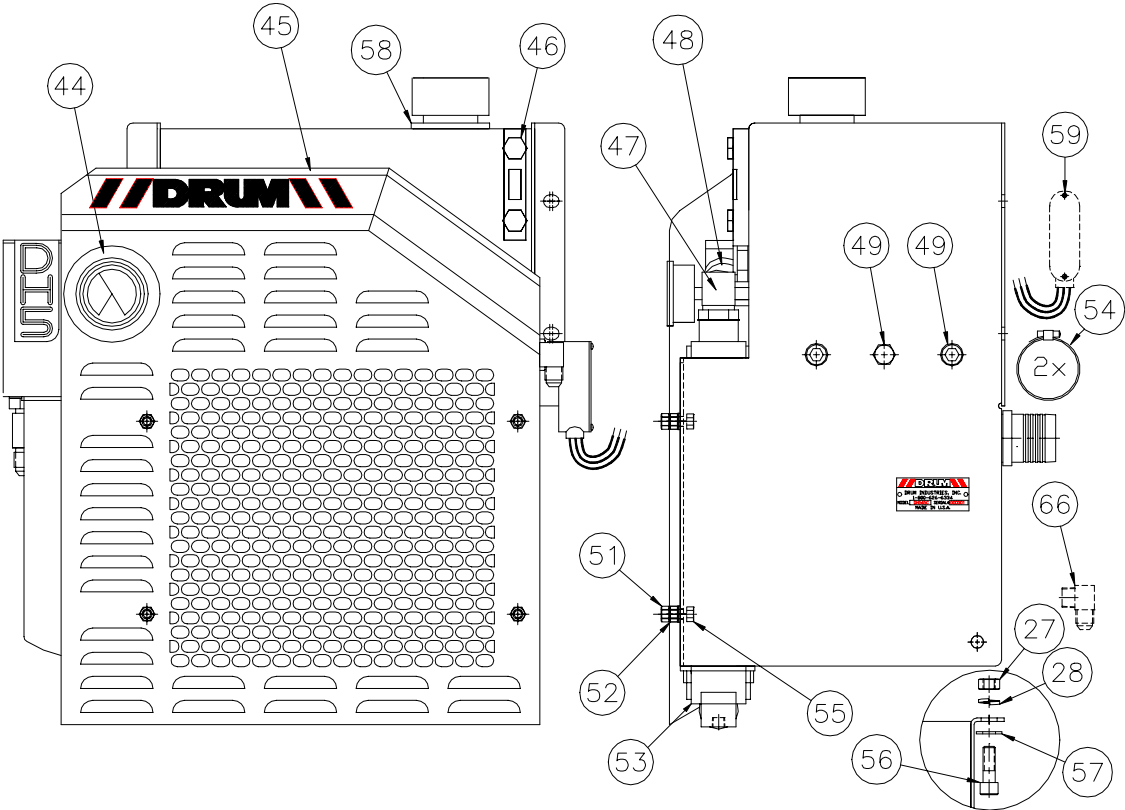
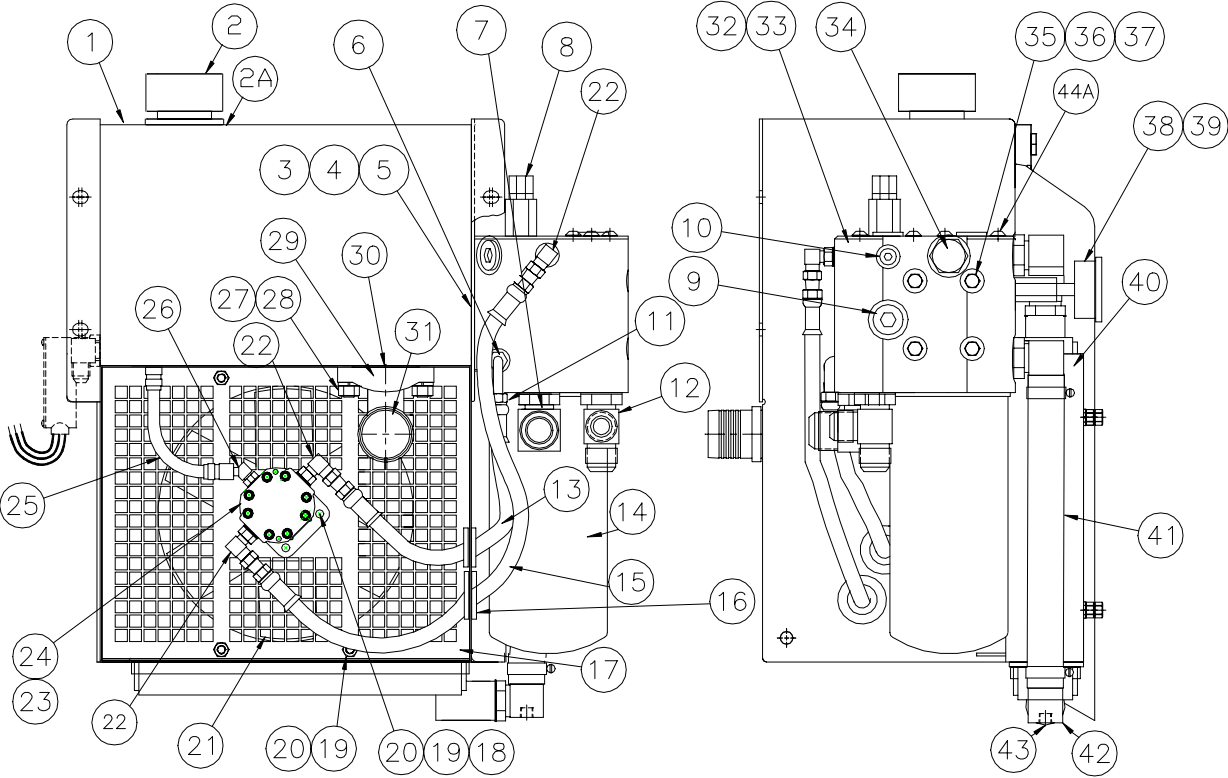
• ***Use only o-ring fittings with equipment that have o-ring ports.***

• ***Inch dimensions refer to hose sizes.***

• ***Maximum vacuum at hydraulic pump inlet not to exceed:***

- 5"Hg. for gear equipment.***
- 2"Hg. for piston equipment.***

PARTS LIST - DH5



PARTS LIST - DH5

ITEM	DESCRIPTION	PART NO.	QTY.
1	BODY, MAINFRAME - DH525	500080205	1
2	FILLER CAP without METAL BASKET	309005200	1
2a	FILLER CAP BASKET, stainless	313071200	1
3	HYD. ADP. #20 O-RING X 1-5/8" O-RING	302069104	1
4	O-RING, -325 - VITON	522011215	1
5	O-RING, #20 SAE - VITON	522001223	1
6	HYD. ELBOW #6 O-RING X #6 JIC (long)	302065217	1
7	HYD. ELBOW #16 O-RING X #20 JIC	302095220	1
8	RELIEF VALVE - 2500psi	303001203	1
9	PLUG, #12 SAE	302123204	1
10	PLUG, #6 SAE	302123203	1
11	FLOW CONTROL VALVE - 2.40gpm	304060202	1
12	TEE, #16 SAE X #16 JIC X #16 JIC	302005201	1
13	HOSE - BLOCK to MOTOR (HP "IN")	407211200	1
14	OIL FILTER - STD. DH5	306000203	1
14	OIL FILTER - WATER REMOVAL	306000202	1
15	HOSE - MOTOR to TANK (LP "RETURN")	407211201	1
16	GROMMET - 7/8"	521070200	2
17	MOTOR MOUNT - DH5	538071201	1
18	CAPSCREW - 5/16" X 1" plated	214005416	4
19	LOCKWASHER - 5/16" plated	240005400	8
20	NUT - 5/16" plated	236005400	8
21	FAN - DH3 & DH5	506022202	1
22	ELBOW - 3/8" O-RING X 3/8" JIC	302115201	2
23	MOTOR - DH5	300001223	1
24	RETAINING RING	244010200	2
25	HOSE - MOTOR to TANK	407211202	1
26	ELBOW - #4 SAE X #4 JIC (45deg)	302095218	1
27	NUT - 1/2" plated	236008400	8
28	LOCK WASHER - 1/2" plated	240008400	8
29	SPLIT FLANGE HALF - 2" code 61	302160201	2
30	O-RING, 2" code 61 - VITON	522011212	1
31	ELBOW, 2" code 61 SPLIT FLG. single 2" Hose	302186207	1
31	ELBOW, 2" code 61 SPLIT FLG. double 1.5" Hose	302186208	1
32	CONTROL BLOCK	311003206	1
33	CHECK VALVE, 25psi	304059202	1
34	CHECK VALVE, 60psi	304040205	1
35	CAPSCREW - 3/8" X 6-1/2" plated	299032200	4
36	LOCK WASHER - 3/8" stainless	240006200	4
37	FLAT WASHER - 10mm plated	194410400	4
38	FILTER RESTRICTION GAUGE	307008200	1
39	ADAPTER - 1/4" NPT X 1/4" NPT	302080203	1
40	HOSE CLAMP	299070207	4
41	HOSE - RADIATOR OUT to BLOCK	310030208	1
42	TEE - 1" HOSE X 1/4" NPT X #16 O-RING	302029207	1
43	PLUG - 1/4" NPT	250104004	1
44	GROMMET - 2-3/4"	521070201	1
44a	CAPSCREW - M10 X 16mm stainless	128310216	7
45	COVER KIT	703000208	1
46	OIL LEVEL GAUGE	307050203	1
47	ELBOW - #16 O-RING X 1" HOSE	302183200	1
48	HOSE - BLOCK to RADIATOR INLET	310030207	1
49	PLUG - 1/2" NPT stainless	250108208	2
50	MAGNETIC PLUG - 1/2" NPT	258208208	1
51	NUT - 3/8" w/NYLON INSERT	236106200	4
52	NUT - 3/8" stainless	236006200	
53	HEAT EXCHANGER DH5	308011205	1
54	HOSE CLAMP - 2"	299070210	1
55	CAPSCREW - 3/8" X 1-1/4" stainless	214006220	1
56	CAPSCREW - 1/2" X 1-1/2" stainless	214108224	1
57	FLAT WASHER - 1/2" stainless	240408200	1
58	CAPSCREW - 10-32 X 3/4"	212303212	6
	<u>OPTIONAL EQUIPMENT</u>		
59	HEATER KIT - 12vdc	717000200	1
66	ELBOW (case drain) - 1/2"NPT X #8JICM	302091202	1
O	PRESSURE CAP KIT - COMPLETE	703000209	1
	• PRESSURE FILLER CAP (10psi)	309042200	1
	• SPACER RING for PRESSURE CAP	516033201	1
	• ADAPTOR - 1/4"nptM X 1/4" PUSH IN	825013203	1
	• CAPSCREW - 10-32 X 1-1/2"	214503224	6
	• TEE - 1/4" PUSH IN	825003203	1
	• AIR REGULATOR w/GAUGE - 1/4" (1-25psi)	818001201	1
	• BRACKET, AIR REGULATOR	507043202	1
	• NUT, AIR REGULATOR	518062201	1



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