

# Manufacturers of Heat Exchangers and Oil Coolers

for MARINE and INDUSTRIAL APPLICATIONS

## SEN-DURE PRODUCTS, INC.

6785 N.W. 17th Avenue  
Fort Lauderdale, FL 33309

Phone: (954) 973-1260

Fax: (954) 968-7213

e-mail: [sen-dure@worldnet.att.net](mailto:sen-dure@worldnet.att.net)

web site: [www.sen-dure.com](http://www.sen-dure.com)





# QUALITY POLICY

## PRODUCTS

*offer the following benefits:*

- 1.** Proven design manufactured to your requirements as to heat transfer and easy fit-up. Optimized for water, oil, air, hydraulic and other fluids.
- 2.** Cooperative design with your engineers results in a heat exchanger for your exact heat transfer requirements. Connections and support brackets can be tailored for compact and simple installation. This will reduce "plumbing" on installation to a minimum.
- 3.** Production capabilities range from single units to OEM quantities.

The SEN-DURE goal is to be recognized as the leader in the Heat Transfer industry and to be identified by our customers as the one that all others are measured against.

To meet the goal SEN-DURE is fully committed to the continuous improvement of our products and services in accordance with ISO-9000 standards.

SEN-DURE realizes that providing products of consistently high quality and reliability is the key to success and it is essential that management/employee attitude and behavior support this policy.



Supplying  
Small and Large  
Corporations  
throughout the  
WORLD

The excellent reputation Sen-Dure enjoys world-wide has been earned through 70 years of faithful service to its customers. Sen-Dure looks forward to continuing this service with experienced technical assistance and high quality SENSible and DURable products.



# INDIVIDUAL HEAT EXCHANGERS

## Typical Stock Heat Exchangers

Ring Flange construction, available in 1, 2, 3 and 4 pass tube arrangements. A variety of fluid connections can be furnished. Brackets are rotatable to fit installation needs.

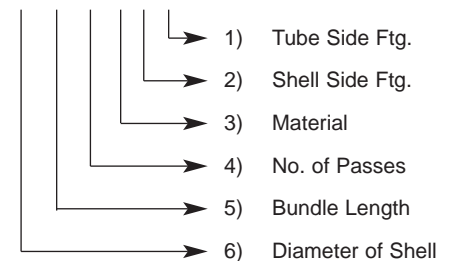


Stock heat exchangers are available in copper and bronze construction designated by the "-5" number. The "-7" number applies to units made of copper and bronze with internal tubes and tube sheets made with 90/10 Cupro Nickel.

Copper/Bronze Part No.	90/10 Cupro Nickel Tubes	Copper/Bronze Part No.	90/10 Cupro Nickel Tubes	Copper/Bronze Part No.	90/10 Cupro Nickel Tubes
SINGLE PASS ONLY		1,2,3, 4 PASS, ETC.		1,2,3, 4 PASS, ETC.	
2A-10"-5	2A-10"-7	4R-12"-5	4R-12"-7	6R-17"-5	6R-17"-7
2A-15"-5	2A-15"-7	4R-17"-5	4R-17"-7	6R-24"-5	6R-24"-7
2A-20"-5	2A-20"-7	4R-21"-5	4R-21"-7	6R-36"-5	6R-36"-7
2A-28"-5	2A-28"-7	4R-28"-5	4R-28"-7	6R-48"-5	6R-48"-7
1, 2, 3, 4 PASS, ETC.		4R-35"-5	4R-35"-7	8R-24"-5	8R-24"-7
3R-12"-5	3R-12"-7	4R-40"-5	4R-40"-7	8R-36"-5	8R-36"-7
3R-17"-5	3R-17"-7	5R-17"-5	5R-17"-7	8R-48"-5	8R-48"-7
3R-23"-5	3R-23"-7	5R-26"-5	5R-26"-7		
3R-28"-5	3R-28"-7	5R-33"-5	5R-33"-7		
3R-35"-5	3R-35"-7	5R-40"-5	5R-40"-7		
		5R-50"-5	5R-50"-7		

## VERTICAL COMPACT - 2 PASS

EXAMPLE OF PART NO. CALLOUT  
5R-36-2P-5 D K



**JABSCO:** 3/8" pump - 5 G.P.M. @ 1500 R.P.M.  
1/2" pump - 10 G.P.M. @ 1700 R.P.M.  
1" pump - 25 G.P.M. @ 1700 R.P.M.  
*Other water fitting sizes on special order.*



Dimensions of "COMPACT" Model					
Compact Exchanger Model	O.A. Height	Shell Dia.	Tank Dia.	Salt Water Fitting	Jacket Water Fitting
2T-10-2P	16	2-1/8"	4"	3/8" N.P.T.	3/8" N.P.T.
2T-15-2P	21	2-1/8"	4"	3/8" N.P.T.	3/8" N.P.T.
3T-12-2P	19	3-1/8"	5"	1/2" N.P.T.	1/2" N.P.T.
3T-17-2P	24	3-1/8"	5"	1/2" N.P.T.	1/2" N.P.T.
4T-12-2P	22	4-1/8"	6"	1" N.P.T.	INLET 1" HOSE OUTLET 1" N.P.T.
4T-17-2P	27	4-1/8"	6"	1" N.P.T.	

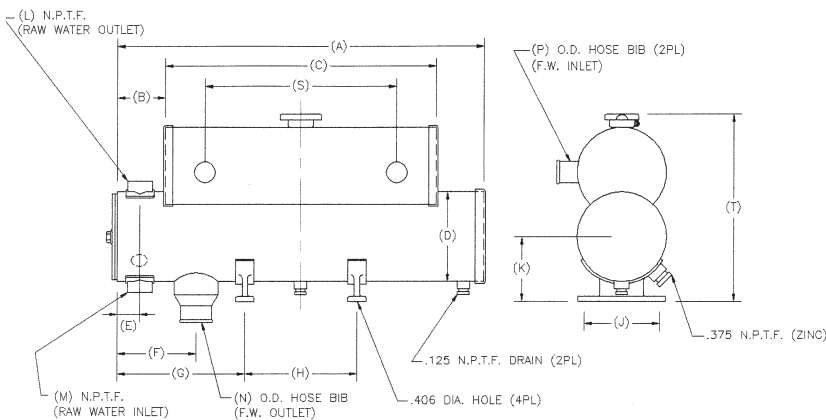
## HORIZONTAL INTEGRAL TANK - 2 PASS

HOSE CONNS. ON HEAT EXCHANGERS  
SHELL & TUBE SIDE  
(CODE LETTERS INDICATE SIZE OF CONN.)

CODE LETTER	OUTSIDE DIAMETER SIZE OF HOSE CONN.
R	1"
S	1-1/8"
W	1-1/4"
A	1-3/8"
B	1-1/2"
C	1-5/8"
D	1-3/4"
E	1-7/8"
F	2"
G	2-1/8"
N	2-1/4"
H	2-1/2"
P	2-5/8"
Q	2-7/8"
O	3"
U	3-1/8"

CODE LETTER	FEMALE N.P.T. THREAD SIZE
V	1/2"
T	3/4"
J	1"
K	1-1/4"
L	1-1/2"
M	2"
Y	2-1/2"
X	3/8"
Z	3"



BUNDLE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	T
4V12	15.00	2.75	11.00	4.12	.875	4.00	7.00	6.00	3.50	2.75	1.00	1.00	*	*	8.12
4V17	20.00	2.75	15.00	4.12	.875	4.25	7.00	10.00	3.50	2.75	1.00	1.00	*	*	8.12
4V21	24.00	3.00	18.00	4.12	.875	4.25	7.00	10.00	3.50	2.75	1.00	1.00	*	*	8.12
5V13	16.00	3.50	12.00	5.12	.875	4.00	6.00	8.00	3.81	3.56	1.00	1.00	*	*	9.00
5V19	23.00	3.50	17.50	5.12	.875	4.00	6.50	10.00	3.81	3.56	1.00	1.00	*	*	10.75
5V22	25.00	3.50	18.00	5.12	.875	4.00	6.00	10.00	3.81	3.56	1.00	1.00	*	*	10.75

\* To be determined by customer.

**Important!** It is a requirement that all heat exchangers, refrigeration condensers and oil coolers be electrically bonded to the vessel's bonding system.



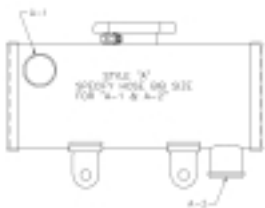
# FRESH WATER COOLING ACCESSORIES

## SURGE TANKS

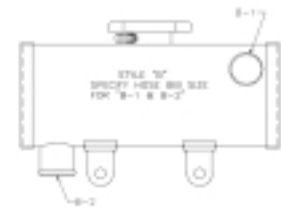
### Order Must Specify:

1. Style "A", "B", "C", or "D".
2. Hose bib size or N.P.T. size of inlet and outlet by utilizing style letter plus digit shown in illustrations.

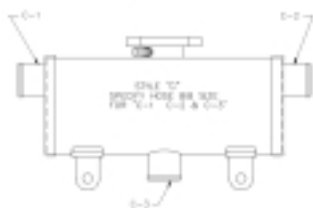
Part No.  
0046 - 3 qt. surge tank.  
Approx. size 4-1/8" diam. by 10" long, 7 lb. pressure cap. Select style "A", "B", "C", or "D".



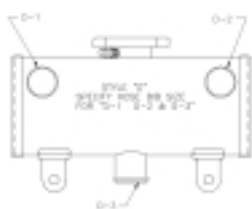
0030 - 4 qt. surge tank.  
Approx. size 4-1/8" diam. by 15" long, 7 lb. pressure cap. Select style "A", "B", "C", or "D".



0031 - 5 qt. surge tank.  
Approx. size 5-1/8" diam. by 15" long, 7 lb. pressure cap. Select style "A", "B", "C", or "D".



0032 - 8 qt. surge tank.  
Approx. size 6-1/8" diam. by 15" long, 7 lb. pressure cap. Select style "A", "B", "C", or "D".



## RECOVERY TANK - COOLANT

Part No.  
**1490**  
Complete assembly ready for installation.

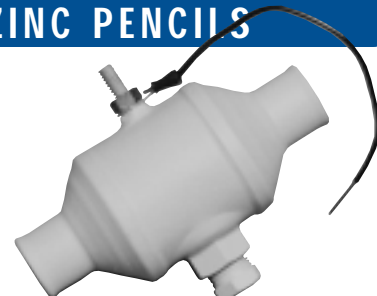


## ZINC PENCILS FOR ELECTROLYSIS PROTECTION

Part No.		
0292-1	.....1/4" N.P.T.	.....Zinc 3/8" x 1-3/4" long
0292-2	.....1/4" N.P.T.	.....Zinc 3/8" x 3/4" long
0288-2	.....3/8" N.P.T.	.....Zinc 1/2" x 1" long
0288-4	.....3/8" N.P.T.	.....Zinc 1/2" x 1-1/2" long
0281	.....1/2" N.P.T.	.....Zinc 5/8" x 2" long
7066	.....1/8" N.P.T.	.....Zinc 1/4" x 2" long

## IN-LINE ZINC PENCILS

Part No.	
5140	.....3/4" Hose
5141	.....1" Hose
5142	.....1-1/4" Hose
5143	.....1-1/2" Hose
5144	.....1-3/4" Hose
5146	.....1/2" N.P.T.
5147	.....3/4" N.P.T.
5148	.....1" N.P.T.
5149	.....5/8" Hose



## STRAINERS

### Outboard Strainers



#### Bronze

#### Aluminum

0905	.....For seacock inlets up to 1/2"	.....5406
	Ideal for air conditioning, generators or head use.	
	6-1/8" x 3-1/4"	
0290	.....For seacock inlets up to 1-1/4"	.....5405
	Overall size 9" x 4-3/8"	
0291	.....For seacock inlets up to 1-1/2"	.....5404
	Overall size 12-1/4" x 5-1/4"	
0910	.....For seacock inlets up to 2-1/2"	.....5403
	Overall size 15" x 5-7/8"	
8487	.....For seacock inlets up to 4" (Removable Screen)	
	Overall size 9" x 18"	

### Cast Bronze In-Line Strainers

Seacock up to 1"	..... 0029S
Seacock up to 1-1/4"	.....0029

### In-Line Strainer Parts

Gasket for #0029 Strainer	.....0203
Gasket for #0029S Strainer	.....0206
Locking Cap Screw for #0029 Strainer	.....0208
Locking Cap Screw for #0029S Strainer	.....0209
Basket & Cap Assy + Gasket for #0029 Strainer	.....0219
Basket & Cap Assy + Gasket for #0029S Strainer	.....0220



to order call 954.973.1260





# FRESH WATER COOLING KITS & ACCESSORIES

## CHEVROLET

305", 307", 327", 350" Chevy full system with Camelback or Center Rise exhaust manifolds.  
Inboard only. Pump not included.....K9450

## CHRYSLER

Chrysler Part No.

Chrysler 318".....2847886 .....K3570  
A 2 pass heat exchanger, increasing efficiency, block only.  
Hose and fitting supplied.

## FORD

302", 351" Ford full system with Camelback or Center Rise exhaust manifolds. Inboard only. Pump not included. ....K9449

## VOLVO

MD 11C, 25 H.P. ....		K3009
MD-11C.....Diesel 25 HP .....	2768-1-5	
MD 17C.....Diesel 36 HP .....	2769-1-5	
MD6A-6B-7A.....Diesel 10 HP .....	K2158*#	
MD-2B.....Diesel 25 HP .....	K2177*	
MD-3B.....Diesel 36 HP .....	K2157*	
MD-1B.....Diesel 10 HP .....	K2159*	
MD-2.....Diesel 25 HP .....	K2700°	
AQ 170.....Gas .....	2404-1-5	
AQ200D/225D/255B.....Gas V8.....	K2835†	
AQ 130/AQ115.....Gas .....	K2946	
AQ200/225/260/290		
BB225/260.....Gas V8.....	K4108†	
AQ175A.....Gas V6.....	K4109†	
AQ200/225/255/260/290.....Gas V8 with Top Mounted Power Steering Pump .....	K4966†	

‡ Not Saildrive.

\* Engine must be equipped with hand cranking feature which is retained when fresh water cooling is installed except on Kit No. K2158.

\*# To retain hand cranking feature, specify Kit No. K2158-9 for special P.T.O.

° Indicates electric salt water pump furnished.

† Indicates Half System.

## YANMAR DIESEL

Model 2QM15.....	K3030
Model 2QM20.....	K2550
Model 3QM30.....	K2553
Model SB8 and SB12.....	K2687°
Model SB8 and SB12.....	K3545
Model YSB8 and YSM12 .....	K2688°
Model YSM8 and YSM12.....	K3546
Model 1GM.....	K4443
Model 2GM.....	K4621
Model 3GM and 3HM.....	K4622
Model 3QM.....	K4623

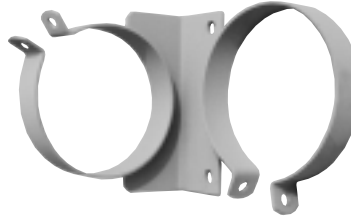
° Indicates electric salt water pump furnished.

## UNIVERSAL

Atomic Four 69" 30 HP .....K1995

## BRACKETS & CLAMPS

Steel Mounted for Oil coolers & Exchangers



Part No.

0245-2 .....	for 2" diameter shell
6673.....	2" heavy duty clamp
0306-1 .....	for 3" diameter shell
5278.....	for 4" diameter shell
7407.....	for 5" diameter shell
7408.....	for 6" diameter shell
7328.....	angle base for 3" dia.
7225.....	angle base for 4" dia.
6680.....	angle base for 5" dia.
6663.....	angle base for 6" dia.

## GASKETS

For Heat Exchanger End Covers & Flanges

Part

No. Series

0493.....	2" Rubber 1-7/8" O.D. ....	center hole
0131.....	3" Cork 4-1/2" O.D.....	1 Pass - 8 hole flange
0129.....	3" Cork 4-1/2" O.D.....	2 Pass - 8 hole flange
0332.....	3" Rubber 2-3/4" O.D. ....	center hole
0132.....	4" Cork 5-1/2" O.D.....	1 Pass - 8 hole flange
0130.....	4" Cork 5-1/2" O.D.....	2 Pass - 8 hole flange
0259.....	4" Rubber 3-3/4" O.D. ....	1 pass - center hole
0138.....	4" Rubber 3-7/8" O.D.....	2 pass - center hole
0134.....	5" Cork 6-3/4" O.D. ....	2 Pass - 10 hole flange
0135.....	5" Cork 6-3/4" O.D. ....	1 Pass - 10 hole flange
0396.....	5" Rubber 4-3/4" O.D. ....	center hole
0137.....	6" Cork 8" O.D. ....	1 Pass - 12 hole flange
0136.....	6" Cork 8" O.D.....	2 Pass - 12 hole flange
5029.....	6" Rubber Gasket .....	5-3/4" O.D. - 1 pass
5068.....	Gum Rubber Washer	

## PRESSURE CAPS

Part No.

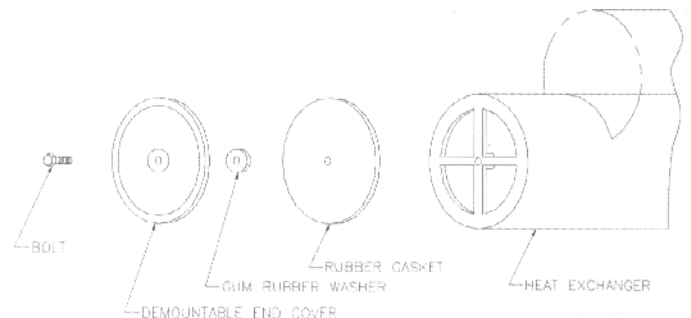
0078.....7 lb.

Part No.

6582.....15 lb.

## END COVER ASSEMBLIES

Removable



5372.....	Assembly consists of: .....	2" Dia.
5373.....	Copper End Plate .....	3" Dia.
5374.....	Rubber Gasket.....	4" Dia.
5375.....	Gum Rubber Washer, Bolt.....	5" Dia.
5376.....	and Instructions.....	6" Dia.



# COOLING FOR DIESEL ENGINES

“Custom Engine and Gear Cooling Equipment”

MARINE PROPULSION • GENERATORS • INDUSTRIAL APPLICATIONS

## COOLING FOR DETROIT DIESEL ALLISON

G.M.D.D.A. Engine	Exhaust Manifold	SEN-DURE
4-53N	Port	3536-1-7
	Starboard	3537-1-7
4-53T	Port	2883-2-7
	Starboard	2923-2-7
4-71N	Port	3527-1-7
	Starboard	3526-1-7
4-71T	Port	3534-1-7
	Starboard	3537-1-7
6-71N or T	Port	3329-2-7
	Starboard	3411-2-7

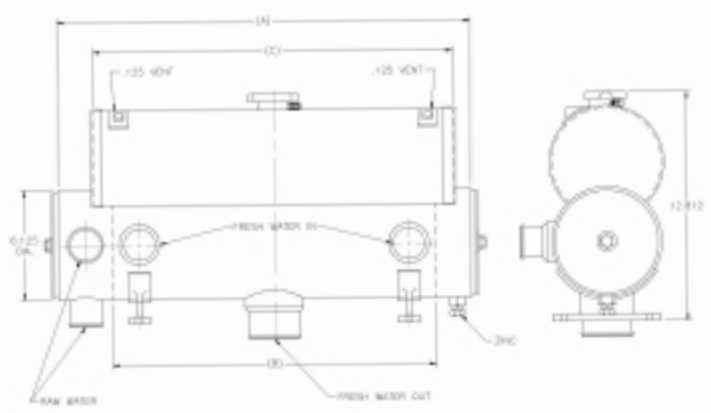
## DETROIT DIESEL REPLACEMENT

Engine Size	D.D. #	Heat Exchanger
8.2	.8923146	3281-1-7
	DX110304	4789-1-7
12V92TA	DX109775	12V92TA
	23501253	4804-1-7
12V92TA	23501217	9703-1-7
	TANDEM	10056-1-7
16V92TA		10070-1-7
16V92TA	DD121765	10076-1-7
8V92TA		10493-1-7
671TA		10512-1-7
6V92TA	DD122321	10563-1-7
12V92T	DD122331	10569-1-7
16V92TA	DD122342	10585-1-7
12V71TA	DD122395	10624-1-7
16V92	23504999	10656-1-7
671TI		10765-1-7
6V92TA		10847-1-7
6V92TA	DD122859	10855-1-7
6V92TA	DD122859	10884-1-7
12V92TA		11008-1-7
12V92TA		11010-1-7
12V92TA		11012-1-7
16V-92	23504164	12007-1-7
6V-53	23502659	12010-1-7
16V92	23512102	12011-1-7
8V-92	TANDEM	12500-1-7
8V92	TANDEM	12694-1-7
	70627000	12852-1-7
6V53TI		12915-1-7
6V71TA		12921-1-7
	TANDEM	12930-1-7
	HEX	12940-1-7
8V92	TANDEM	13077-1-7
	23505716	13105-1-7
	23505711	13106-1-7
	8532343	13346-1-7

## INDUSTRIAL APPLICATIONS

Engine	Exchanger	Engine	Exchanger
8.2	9221-1-7	6V-71TA	9438-1-7
6V-53 6V-53T	9440-1-7	8V-71TI	
		6V-92	
8V-92			
6V-71 8V-71	9439-1-7	6V-92TA	9437-1-7
		8V-92TI	
12V-71TA			
16V-71N			

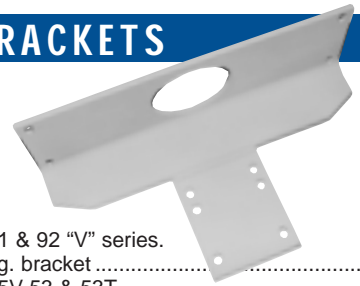
## 8V/12V NATURAL OR T.I. APPLICATIONS



Hose Bib	O.D. Size?*	SEN-DURE Part No.	A	B	C	Engine/RPM
Salt Water In-Out		11434-1	23"	18"	20"	8V-71N/1800, 8V-71N/2300 8V-71TI/2100, 12V-71N/1800
Fresh Water In		11435-1	29"	24"	26"	8V-71TI/2300, 12V-71N/1800 12V-71TI/2100
Fresh Water Out		11436-1	35"	30"	34"	12V-71TI

\* Specify hose bib size

## BRACKETS



Bracket (exchanger mtg.) for 71 & 92 "V" series.  
Attaches directly to fan hub mtg. bracket .....7538  
Bracket (exchanger mtg.) for 65V-53 & 53T  
Attaches directly to front of engine block.....7526  
Holes drilled to individual unit specifications.



OIL COOLERS HYDRAULIC, TRANSMISSION and ENGINE

**CLASS I**



HOW TO SELECT PART NUMBERS

**2" OIL COOLERS**  
Oil Fittings are standard 3/8" N.P.T.

- Step 1 - Choose a number for the tube bundle length (5" lg, 6" lg, 9" lg, 12" lg).
- Step 2 - Choose a number for the end fitting and oil connection sizes.
- Step 3 - Choose a number for the type of material (Copper, Cupro-Nickel).

**3" OIL COOLERS**  
Oil Fittings are standard 1/2" N.P.T.

- Step 1 - Choose a number for the tube bundle length (6" lg, 9" lg, 12" lg).
- Step 2 - Choose a number for the end fitting and oil connection sizes.
- Step 3 - Choose a number for the type of material (Copper, Cupro-Nickel).

**EXAMPLES**

1125-1-5    1 - Tube bundle, 5" long.  
                   ↑    ↑    ↑    2. - End fitting 3/4" dia. hose with 3/8" NPT oil connections.  
                   ① ② ③    3. Copper Tubes

1132-151-7    1 - Tube bundle is 12" long.  
                   ↑    ↑    ↑    2 - End fitting is 1-1/2" dia. hose with 1/2" NPT oil connections.  
                   ① ② ③    3 - Cupro-Nickel Tubes

ADD A "Z" TO LAST NUMBER SPECIFYING ZINC

**EXAMPLES**

1187-40-7    1 - Tube bundle, 6" long.  
                   ↑    ↑    ↑    2. - End fitting 1-1/2" dia. hose with 1/2" NPT oil connections.  
                   ① ② ③    3. Cupro-Nickel Tubes

1209-700-5    1 - Tube bundle is 9" long.  
                   ↑    ↑    ↑    2 - End fitting is 1" NPT with 3/4" NPT oil connections.  
                   ① ② ③    3 - Copper Tubes

ADD A "Z" TO LAST NUMBER SPECIFYING ZINC

**Step 1                      Step 2                      Step 3**

End Fitting Size	OIL CONNS.		
	3/8 NPT	1/2 NPT	3/4 NPT
3/4" Hose	-1	-11	-100
1" Hose	-2	-21	-200
1/2" NPT	-3	-31	-300
5/8" Hose	-4	-41	-400
3/4" NPT	-5	-51	-500
1" NPT	-6	-61	-600
1-1/4" NPT	-7	-71	-700
1-1/2" NPT	-8	-81	-800
1-1/8" Hose	-10	-101	-1000
1-1/4" Hose	-12	-121	-1200
1-3/8" Hose	-14	-141	-1400
1-1/2" Hose	-15	-151	-1500
1-5/8" Hose	-16	-161	-1600

5" Long Tube Bundle → 1125  
 6" Long Tube Bundle → 1126  
 9" Long Tube Bundle → 1129  
 12" Long Tube Bundle → 1132

→ -5    -7  
 CU    CU/NI

**Step 1                      Step 2                      Step 3**

End Fitting Size	OIL CONNS.		
	3/8 NPT	1/2 NPT	3/4 NPT
1" Hose	-1	-10	-100
2" Hose	-2	-20	-200
1-3/8" Hose	-3	-30	-300
1-1/2" Hose	-4	-40	-400
1-1/4" Hose	-5	-50	-500
1-3/4" Hose	-6	-60	-600
1" NPT	-7	-70	-700
1-1/2" NPT	-8	-80	-800
2-1/4" Hose		-85	-850
2" NPT	-9	-90	-900
2-1/2" Hose		-95	-950
1-1/4" NPT	-11	-111	-1000

6" Long Tube Bundle → 1187  
 9" Long Tube Bundle → 1209  
 12" Long Tube Bundle → 1928

→ -5    -7  
 CU    CU/NI

2"/3" oil coolers overall length is determined by tube bundle and end caps. Pressure rated 150 PSIG outside.

**CLASS II**

**HIGH PRESSURE COOLERS**

Made of 90/10 Cupro Nickel tubes, 375 PSIG oil side.



PART NO.	BUNDLE	OIL CONN.	WATER CONN.
2251-1-07	2" X 9"	.500 N.P.T.F.	1.250 N.P.T.F.
2251-2-07	2" X 9"	.500 N.P.T.F.	1.250 O.D. H.B.
2251-3-07	2" X 9"	.500 N.P.T.F.	1.000 N.P.T.F.
2252-1-07	2" X 12"	.500 N.P.T.F.	1.250 N.P.T.F.
2252-2-07	2" X 12"	.500 N.P.T.F.	1.250 O.D. H.B.
2252-3-07	2" X 12"	.500 N.P.T.F.	1.000 N.P.T.F.
2252-4-07	2" X 12"	.500 N.P.T.F.	1.500 O.D. H.B.
2253-1-7	3" X 9"	1.000 N.P.T.F.	2.000 N.P.T.F.
2253-2-7	3" X 9"	1.000 N.P.T.F.	1.250 N.P.T.F.
2253-3-7	3" X 9"	1.000 N.P.T.F.	1.500 N.P.T.F.
2253-4-7	3" X 9"	1.000 N.P.T.F.	2.000 O.D. H.B.
2254-1-7	3" X 12"	1.000 N.P.T.F.	2.000 N.P.T.F.

PART NO.	BUNDLE	OIL CONN.	WATER CONN.
2254-2-7	3" X 12"	1.000 N.P.T.F.	1.250 N.P.T.F.
2254-3-7	3" X 12"	1.000 N.P.T.F.	1.500 N.P.T.F.
2254-4-7	3" X 12"	1.000 N.P.T.F.	2.000 O.D. H.B.
2254-5-7	3" X 12"	1.000 N.P.T.F.	1.500 O.D. H.B.
3664-1-7	4" X 9"	1.000 N.P.T.F.	2.000 N.P.T.F.
3664-2-7	4" X 9"	1.000 N.P.T.F.	2.000 O.D. H.B.
3664-3-7	4" X 9"	1.000 N.P.T.F.	3.000 N.P.T.F.
3666-1-7	4" X 12"	1.000 N.P.T.F.	2.000 N.P.T.F.
3666-2-7	4" X 12"	1.000 N.P.T.F.	2.000 O.D. H.B.
3666-3-7	4" X 12"	1.000 N.P.T.F.	3.000 N.P.T.F.
3666-4-7	4" X 12"	1.000 N.P.T.F.	2.500 O.D. H.B.
3668-1-7	4" X 15"	1.000 N.P.T.F.	2.000 N.P.T.F.

PART NO.	BUNDLE	OIL CONN.	WATER CONN.
3668-2-7	4" X 15"	2.000 H.O.S.	1.250 O.D. H.B.
3668-3-7	4" X 15"	3.000 N.P.T.F.	1.000 N.P.T.F.
11053-1-7	4" X 18"	1.000 N.P.T.F.	2.000 N.P.T.F.
11053-2-7	4" X 18"	1.000 N.P.T.F.	2.500 O.D. H.B.
11053-3-7	4" X 18"	1.000 N.P.T.F.	3.000 N.P.T.F.
12301-1-7	5" X 12"	1.000 N.P.T.F.	3.000 N.P.T.F.
12301-2-7	5" X 12"	1.000 N.P.T.F.	2.500 N.P.T.F.
12301-3-7	5" X 12"	1.000 N.P.T.F.	2.000 N.P.T.F.
12302-1-7	5" X 15"	1.000 N.P.T.F.	3.000 N.P.T.F.
12302-2-7	5" X 15"	1.000 N.P.T.F.	2.000 O.D. H.B.
12302-3-7	5" X 15"	1.000 N.P.T.F.	2.500 O.D. H.B.



# DUAL and FUEL COOLERS



Specify part number for water hose bib or N.P.T. size.

## 2" DUAL OIL COOLERS TRANSMISSION/LUBE OIL

Oil Fittings are standard 3/8" N.P.T.

- Step 1 – Choose a number for the tube bundle length (5" lg, 6" lg, 9" lg, 12" lg).
- Step 2 – Choose a number for the end fitting and oil connection sizes.
- Step 3 – Choose a number for the type of material (Copper, Cupro-Nickel).

### EXAMPLES

- 1225-1-5    1 - Tube bundle, 5" long.  
                   ↑    2 - End fitting 1" NPT with 3/8" NPT oil connections.  
                   ① ② ③    3 - Copper Tubes
- 1229-800-7    1 - Tube bundle is 9" long.  
                   ↑    2 - End fitting is 1-3/4" dia. hose with 3/4" NPT oil connections.  
                   ① ② ③    3 - Cupro-Nickel Tubes

<p><b>Step 1</b></p> <p>1225 → 5" Long Tube Bundle</p> <p>1226 → 6" Long Tube Bundle</p> <p>1229 → 9" Long Tube Bundle</p> <p>1232 → 12" Long Tube Bundle</p>	<p><b>Step 2</b></p> <table border="1"> <thead> <tr> <th rowspan="2">End Fitting Size</th> <th colspan="3">OIL CONNS.</th> </tr> <tr> <th>3/8 NPT</th> <th>1/2 NPT</th> <th>3/4 NPT</th> </tr> </thead> <tbody> <tr><td>1" NPT</td><td>-1</td><td>-10</td><td>-100</td></tr> <tr><td>1" Hose</td><td>-2</td><td>-20</td><td>-200</td></tr> <tr><td>1-1/8" Hose</td><td>-3</td><td>-30</td><td>-300</td></tr> <tr><td>1-1/4" Hose</td><td>-4</td><td>-40</td><td>-400</td></tr> <tr><td>1-3/8" Hose</td><td>-5</td><td>-50</td><td>-500</td></tr> <tr><td>1-1/2" Hose</td><td>-6</td><td>-60</td><td>-600</td></tr> <tr><td>1-5/8" Hose</td><td>-7</td><td>-70</td><td>-700</td></tr> <tr><td>1-3/4" Hose</td><td>-8</td><td>-80</td><td>-800</td></tr> </tbody> </table>	End Fitting Size	OIL CONNS.			3/8 NPT	1/2 NPT	3/4 NPT	1" NPT	-1	-10	-100	1" Hose	-2	-20	-200	1-1/8" Hose	-3	-30	-300	1-1/4" Hose	-4	-40	-400	1-3/8" Hose	-5	-50	-500	1-1/2" Hose	-6	-60	-600	1-5/8" Hose	-7	-70	-700	1-3/4" Hose	-8	-80	-800	<p><b>Step 3</b></p> <table border="1"> <tr><td>-5</td><td>-7</td></tr> <tr><td>CU</td><td>CU/NI</td></tr> </table>	-5	-7	CU	CU/NI
End Fitting Size	OIL CONNS.																																												
	3/8 NPT	1/2 NPT	3/4 NPT																																										
1" NPT	-1	-10	-100																																										
1" Hose	-2	-20	-200																																										
1-1/8" Hose	-3	-30	-300																																										
1-1/4" Hose	-4	-40	-400																																										
1-3/8" Hose	-5	-50	-500																																										
1-1/2" Hose	-6	-60	-600																																										
1-5/8" Hose	-7	-70	-700																																										
1-3/4" Hose	-8	-80	-800																																										
-5	-7																																												
CU	CU/NI																																												

## RETURN FUEL OIL COOLERS FOR USE ON CUMMINS ENGINES



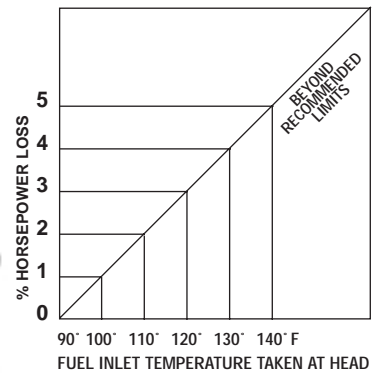
• KEEPS FUEL TANKS COOLER

For use on Cummins 470, 504, 555, and others. 1-1/4" water hose connections. 3/8" N.P.T. oil connections, 8" overall 90/10 Cupro Nickel Tubes.....Part No. 2751-1-7

For use on Cummins 300, 370, 903 and others. 1-1/4" water hose connections. 3/8" N.P.T. oil connections, 12" overall 90/10 Cupro Nickel Tubes.....Part No. 2752-1-7

## SUPER COOLERS FOR FUEL, GEAR & LUBE OIL

These shell and tube coolers maintain return fuel to a temperature that prevents loss of horsepower due to fuel temperature increase, provide adequate injector cooling and eliminate hot fuel storage tanks. 90/10 Cupro Nickel tubes.



A "Rule-of-thumb" for estimating the effect of fuel temperature on engine power is as follows: For every 10°F rise in fuel inlet temperature above 90°F, you can expect a power loss of up to 1%. Likewise, a power increase will occur if the fuel temperature is reduced. The graph above shows the power loss, in percent, as fuel inlet temperature increases.

## FUEL COOLERS FOR USE ON DETROIT DIESEL ALLISON 53, 71 & 92 Series

These special Super Return Fuel Coolers are designed to meet the special horsepower demands of these engines. They provide all of the cool fuel advantages required to obtain maximum horsepower available from these high performance engines.

D.D.A. Part No.	Sen-Dure Part No.
5136348.....	For Direct Replacement Order.....4898-1-7
.....	For D.D.A.8.2 Engine.....4469-1-7
.....	4-71,6-71, 6V-71
.....	and 6V-53.....9005-1-7
.....	8V-71, 6V-92
.....	and 8V-92.....9006-1-7
.....	12V-71 and 12V-92.....9007-1-7

**For information on Return Fuel Oil Coolers for all diesel engines and our new Tandem Ultimate Return Fuel Oil Coolers, shown above, contact Sen-Dure Products Inc.**





REPLACEMENT HEAT EXCHANGERS and OIL COOLERS

AMERICAN DIESEL

SEN-DURE NO.	SEN-DURE NO.
.....11906-3-7	.....12851-1-7
.....12386-1-7	.....12841-1-7

CHRIS CRAFT Heat Exchangers

Chris Craft Part No.	SEN-DURE NO.
283F & 327F.....16.99-07698	.....1051-1-5
427F.....16.99-08003	.....1067-2-5
431 C.I.D.....16.99-07434	.....1099-2-5
307-327-350 Q.....16.99-08336	.....1375-2-5
454K.....16.99-08763	.....2148-2-5
305-350 K.....16.99-08771	.....2196-4-5

Chris Craft part numbers (prior to May 5, 1976) will start with "O" in place of "1".

CHRIS CRAFT Oil Coolers

Chris Craft No.	SEN-DURE NO.	Chris Craft No.	SEN-DURE NO.
16.99-08772.....	.....2204-1-5	16.99-08780.....	.....3390-1-5
16.99-08755.....	.....3388-1-5	16.99-08759.....	.....3391-1-5
16.99-08779.....	.....3389-1-5		

CHRYSLER

Chrysler 360".....	3675141	3394-1-5
Engine block only.....	4142016	2165-5-7
Chrysler CM-6-55 Diesel.		
Similar to 2165.....		9621-1-5
440.....		11607-1-5
440.....	3675677	11937-1-5
318.....		12150-1-5
460.....		12221-1-5
	4417135	12520-1-5

\* CRUSADER Heat Exchangers

Thermo-Electron Crusader Part No.	SEN-DURE REPL. NO.	Thermo-Electron Crusader Part No.	SEN-DURE REPL. NO.
97307.....	.....1655-1-5		.....10502-1-5
97433-5.....	.....9364-1-5	97930A.....	.....10516-1-7
97433-7.....	.....9364-1-7	97931.....	.....10935-1-5
97434-5.....	.....9365-1-5		.....11804-1-5
97434-7.....	.....9365-1-7	98117-502.....	.....13433-1-5
97632-5.....	.....9638-1-5	98236.....	
97632-7.....	.....9638-1-7	97886.....	
97930.....	.....9374-1-5	97878.....	
97913.....	.....9965-1-5	98123.....	
98191.....	.....12505-1-5		

} CALL

CRUSADER Oil Coolers

	SEN-DURE NO.
Transmission oil cooler for 350", 220-270 HP 90° Elbow.....	.....9138-1-5
Crusader #97464, Dual oil cooler, (45° elbow).....	.....9134-1-5
Crusader #97555, Dual oil cooler, (90° elbow).....	.....9135-1-5
Crusader #97882.....	.....10907-1-5
Crusader #97878.....	.....10908-1-5
Crusader #97286.....	.....11606-1-5

\* CUMMINS

Cummings No.	SEN-DURE No.	Cummings No.	SEN-DURE No.
3349303.....	.....13061-2-7	3912146.....	.....9660-1-07
3349370.....	.....13208-1-7	3914642.....	.....9778-1-7
339363.....	.....12717-1-7	3915159.....	.....10261-1-7
3866719.....	.....9778-2-7	3916002.....	.....9428-1-7
3897168.....	.....12610-1-7	3917117.....	.....10559-1-7
3910582.....	.....9445-1-7	3919724.....	.....10992-1-7
3910583.....	.....9446-1-7	3920784.....	.....11202-1-07
3911840.....	.....9376-1-7	3930791.....	.....12525-1-7
3912145.....	.....9656-1-7	3930793.....	.....12525-1-7

GRAY MARINE DIESEL Recore Heat Exchangers

	SEN-DURE NO.
7-7/16" H.....	.....6-71 240 Tubes
4-11/16" H.....	.....6-71 360 Tubes
	.....4022-1-7
	.....4023-1-7

I.H. PALMER Heat Exchangers

Copper Part No.	For Use On	90/10 Tubes Part No.
1014-1-5.....	V8-549.....	1014-1-7
1015-1-5.....	I.H. D-188.....	1015-1-7
1038-1-5.....	I.H. 240, 264.....	1038-1-7
1041-1-5.....	I.H. D-301 Opp. Rotation.....	1041-1-7
1042-2-5.....	I.H. D-301 Std. Rotation.....	1042-2-7
1048-1-5.....	PBV-8, 155 HP.....	1048-1-7
1064-1-5.....	I.H. D-301 Slant Star'd Eng.....	1064-1-7
1065-1-5.....	D-301 Slant Port Eng.....	1065-1-7
V8-345-5.....	I.H. V8-345.....	V8-345
1240-1-5.....	I.H. 345, 392.....	1240-1-7
1240-2-5.....	I.H. 345, 392.....	1240-2-7
1240-3-5.....	I.H. 345, 392.....	1240-3-7
1287-1-5.....	Albin Diesel.....	1287-1-7
1308-105.....	V8-304.....	1308-1-7
1413-1-5.....	PBD-466.....	1413-1-7
1422-1-5.....	PBD-330.....	1422-1-7
1423-1-5.....	PBD-220.....	1423-1-7
1427-1-5.....	I.H. 265.....	1427-1-7
1428-1-5.....	V8-302-351 Fords.....	1428-1-7
2223-1-5.....	Palmer PBD-330.....	2223-1-7
2868-1-5.....	Palmer PBD-466.....	2868-1-7

I.H. PALMER Oil Coolers

Copper Part No.	For Use On	90/10 Tubes Part No.
1114-1-5.....	V8-549.....	1114-1-7
1117-1-5.....	Palmer, 150 HP.....	1117-1-7
1138-1-5.....	Dual, V8-345, 392.....	1138-1-7
1138-2-5.....	Dual, V8-345, 392.....	1138-2-7
1138-5-5.....	Dual, V8-345, 392.....	1138-5-7
1138-6-5.....	Dual V8-345, 392.....	1138-6-7
1138-7-5.....	Dual V-8-345, 392.....	1138-7-7
1149-1-5.....	V8-302.....	1149-1-7
1338-1-5.....	Tandem, V-8-549.....	1338-1-7
1350-1-5.....	V8-549.....	1350-1-7
1414-1-5.....	PBD-466.....	1414-1-7
1414-2-5.....	PBD-466.....	1414-2-7
1424-1-5.....	PBD-330.....	1424-1-7
1534-1-5.....	Tandem.....	1534-1-7
2190-1-5.....	I.H. Palmer 188D.....	2190-1-7
2346-1-5.....	Palmer, 300 HP.....	2346-1-7

ISUZU

	SEN-DURE NO.
.....	.....10389-1-7
.....	.....11095-1-7
.....	.....11621-1-7
.....	.....11959-1-7

KOHLER Heat Exchangers

Part No.	SEN-DURE NO.	Part No.	SEN-DURE NO.
285430.....	.....1027-1-5	286833.....	.....9443-1-7
285430-7.....	.....1027-1-7	29403.....	.....10120-2-7
240779.....	.....1040-1-5	267352.....	.....10125-1-7
240779-7.....	.....1040-1-7	249929.....	.....10712-1-7
266063.....	.....1056-1-5	249929.....	.....10713-1-7
269058.....	.....1056-1-7	EX55479.....	.....10453-1-7
241279.....	.....1326-2-7	249817.....	.....10461-2-7
286883.....	.....1399-2-7	267988.....	.....11174-1-7
259090.....	.....2121-2-7*		

\* Heat exchanger only, no tank.



REPLACEMENT HEAT EXCHANGERS and OIL COOLERS

\* JOHNSON & TOWERS

Table with 4 columns: Part No., SEN-DURE NO., Part No., SEN-DURE NO. listing items like Fuel Cooler 6-71, Heat Exchanger, 8-V92TIVP, etc.

\* LEHMAN HEAT EXCHANGERS

Table with 4 columns: Part No., SEN-DURE NO., Part No., SEN-DURE NO. listing items like 2C209, 2C217, 2C208, etc.

LEHMAN Oil Coolers

Table with 4 columns: Part No., SEN-DURE NO., Part No., SEN-DURE NO. listing items like 2C207, 2C212, 2C235, etc.

MARINE POWER Heat Exchangers

Table with 2 columns: Part No., SEN-DURE NO. listing items like 11487-1-5, 11488-1-5, etc.

MEDALIST

Table with 2 columns: Customer No., SEN-DURE NO. listing items like 298633-B, 299049, etc.

MERCEDES BENZ

Table with 2 columns: Part No., SEN-DURE NO. listing Mercedes Benz OM636.

\* MERCURY HEAT EXCHANGERS

Table with 2 columns: Part No., SEN-DURE NO. listing items like 502 Merc, 7.4, 454 Rear Mount, etc.

MERCURY Oil Coolers

Table with 4 columns: Part No., SEN-DURE NO., Part No., SEN-DURE NO. listing items like 49770, 64865, 77912P, etc.

NISSAN

Table with 2 columns: Part No., SEN-DURE NO. listing items like 11620-1-5, 11810-1-5, etc.

OMC

Table with 2 columns: Part No., SEN-DURE NO. listing items like 10271-1-5, 10272-1-5, etc.

\* See pages 11-20 for additional replacement Heat Exchangers



REPLACEMENT HEAT EXCHANGERS and OIL COOLERS

**\* ONAN HEAT EXCHANGERS**

Part No.	SEN-DURE No.
130-0820	1435-2-5
130-2556	4523-1-5
130-2954	9952-1-5
130-2116	9963-1-5
130-2387	9964-1-5
130-2343	12189-1-7
130-4702	12817-1-7
130-4333-01	13136-1-7
130-4702	13284-1-7
130-4433	13286-1-7
	13419-1-7
	13556-1-7

**PENNISULAR DIESEL**

	SEN-DURE NO.
CALL	13545-1-5
CALL	13559-1-5

**\* PERKINS HEAT EXCHANGERS**

**\* PERKINS DUAL OIL COOLERS**

Part No.	SEN-DURE NO.	Oil & Water Connections	Tube Length
NA004182	2405-1-7	3/4" x 3/8" x 1-1/2"	12"
NA004139	2356-1-7	3/4" x 3/8" x 1-1/8"	12"
NA004100	2299-2-7	3/4" x 3/8" x 1-1/2"	9"
NA003426	2103-1-7	3/4" x 3/8" x 1-3/4"	9"
NA000228	2031-1-7	3/8" x 3/8" x 1-1/8"	9"
NA001314	1566-1-7	3/4" x 3/8" x 1-1/8"	9"
NA004183	2452-1-7	3/4" x 3/8" x 1-5/8"	12"
NA004180	2454-1-7	3/8" x 3/8" x 1-5/8"	9"
NA004179	2457-1-7	3/8" x 3/8" x 1-1/4"	6"
NA004619	2664-1-7	3/8" x 3/8" x 1-1/4"	10"
CALL	3578-1-7	3/4" x 3/8" x 1-5/8"	9"

**PLEASURECRAFT**

	SEN-DURE NO.
351	11512-1-5
RA147028	13396-1-5

**\* WESTERBEKE Heat Exchangers**

Part No.	SEN-DURE NO.	Part No.	SEN-DURE NO.
14156	1269-3-5	22406	2929-1-5*
13887	1279-3-5	24819	3641-1-5
11966	1380-1-5		3659-1-5
15065	1476-1-5	CALL {	3661-1-5
16455	1634-1-5	32318	4281-1-5
19058	1992-2-5	32501	4664-1-5
20519	2334-2-5	36903	11210-1-5
21903	2729-3-5*		

\* Original Westerbeke casting required.

**WESTERBEKE Oil Coolers**

Part No.	SEN-DURE NO.	Part No.	SEN-DURE NO.
11518	1179-3-5	CALL	2083-1-5
11657	1190-1-5	24889	4265-1-5
20930	1226-4-5	24309	4618-1-5
CALL	1587-3-5	24581	K4687-5
16403	2006-1-5*		

\*Original Westerbeke casting required.

**WARNER GEAR — SEN-DURE  
Oil Cooler Interchange Chart**

Warner Gear No.	Shell Length	Hose Bib Size	N.P.T.F. Oil Conn.	SEN-DURE NO.
4872	5"	3/4"	3/8"	1125-1-5
4872A	9"	3/4"	3/8"	1129-1-5
4872B	12"	3/4"	3/8"	1132-1-5
4872F	5"	1"	3/8"	1125-2-3R-5
4872G	9"	1"	3/8"	1129-2-3R-5
4872H	12"	1"	3/8"	1132-2-3R-5
4872J	5"	1"	3/8"	1125-2-6R-5
4872K	9"	1"	3/8"	1129-2-6R-5
4872L	12"	1"	3/8"	1132-2-6R-5
4872NN	5"	1"	3/8"	1125-2-5
4872PP	9"	1"	3/8"	1129-2-5
4872QQ	12"	1"	3/8"	1132-2-5

**ZF GEAR**

	SEN-DURE NO.	
CALL {	Tandem	10625-1-7
	3x18	11421-1-7
	3x12	12087-1-7
	4x12	12102-1-7
	Tandem	12107-1-7

\* See pages 11-20 for additional replacement Heat Exchangers



# CRUSADER HEAT EXCHANGERS

<p>17.50 SHELL 1.000 O.D. (3PL) 4.12 DIA. .125 N.P.T.F. (2PL) DRAIN (2PL) 1.25 O.D. 1.750 O.D.</p>	<p>15.87 SHELL 1.25 O.D. (3PL) 4.125 DIA. DRAIN (2PL) 1.75 O.D. (TEE) 1.00 O.D. (TEE)</p>	<p>19.00 SHELL 1.25 O.D. (3PL) 5.12 DIA. DRAIN ZINC 1.87 O.D.</p>	<p>21.25 SHELL 1.500 O.D. 4.12 DIA. 1.25 O.D. (2PL) 1.75 O.D. DRAIN ZINC</p>	<p>21.00 SHELL 1.00 O.D. (2PL) 2.25 O.D. VENT DRAIN (2PL) 5.12 DIA. 1.75 O.D.</p>	<p>16.12 SHELL 1.00 O.D. TEE 4.12 DIA. ZINC DRAIN (2PL) 1.25 O.D. (3PL) 1.75 O.D.</p>
<p>19.00 SHELL 1.00 O.D. (OTHER SIDE) 4.12 DIA. DRAIN ZINC 1.25 O.D. (3PL) 1.75 O.D.</p>	<p>20.00 SHELL ZINC 1.25 O.D. (3PL) 1.87 O.D. 1.00 O.D. (OTHER SIDE) DRAIN (2PL) 6.12 DIA.</p>	<p>16.00 SHELL 1.00 O.D. (OTHER SIDE) 1.000 O.D. TEE (OTHER SIDE) 5.12 DIA. 1.62 O.D. 1.25 O.D.</p>	<p>1.00 O.D. (OTHER SIDE) 1.00 O.D. (OTHER SIDE) 1.62 O.D. 1.25 O.D.</p>	<p>19.00 SHELL ZINC 1.250 O.D. (3PL) 1.875 O.D. 5.12 DIA. DRAIN (2PL)</p>	<p>19.00 SHELL 1.250 O.D. (3PL) 5.12 DIA. ZINC DRAIN 1.87 O.D.</p>
<p>SEN-DURE PART# 1655-1-5 CRUSADER PART# 97307</p>	<p>SEN-DURE PART# 9638-1-5 CRUSADER PART# 97632-5</p>	<p>SEN-DURE PART# 10516-1-7 CRUSADER PART# 97930A</p>	<p>SEN-DURE PART# 11804-1-5 CRUSADER PART# CALL</p>	<p>SEN-DURE PART# 13433-1-5 CRUSADER PART# 98117</p>	<p>SEN-DURE PART# 13554-1-5 CRUSADER PART# CALL</p>
<p>SEN-DURE PART# 9364-1-5 CRUSADER PART# 97433-5</p>	<p>SEN-DURE PART# 9965-1-5 CRUSADER PART# 97913</p>	<p>SEN-DURE PART# 12505-1-5 CRUSADER PART# 98191</p>	<p>SEN-DURE PART# 10502-3-5 CRUSADER PART# CALL</p>	<p>SEN-DURE PART# 9365-1-5 CRUSADER PART# 97434-5</p>	<p>SEN-DURE PART# 9374-1-5 CRUSADER PART# 97930</p>



CUMMINS HEAT EXCHANGERS

	<p>SEN-DURE PART# 9376-1-7 CUMMINS PART# 3911840</p>		<p>SEN-DURE PART# 9656-1-7 CUMMINS PART# 3912145</p>		<p>SEN-DURE PART# 12524-1-7 CUMMINS PART# 3930793</p>
	<p>SEN-DURE PART# 9445-1-7 CUMMINS PART# 3910582</p>		<p>SEN-DURE PART# 9778-1-7 CUMMINS PART# 3914642</p> <p>SEN-DURE PART# 9778-2-7 CUMMINS PART# 3866719</p>		<p>SEN-DURE PART# 12525-1-7 CUMMINS PART# 3930791</p>
	<p>SEN-DURE PART# 9446-1-7 CUMMINS PART# 3910583</p>		<p>SEN-DURE PART# 10992-1-7 CUMMINS PART# 3919724</p>		<p>SEN-DURE PART# 12610-1-7 CUMMINS PART# 3897168</p>



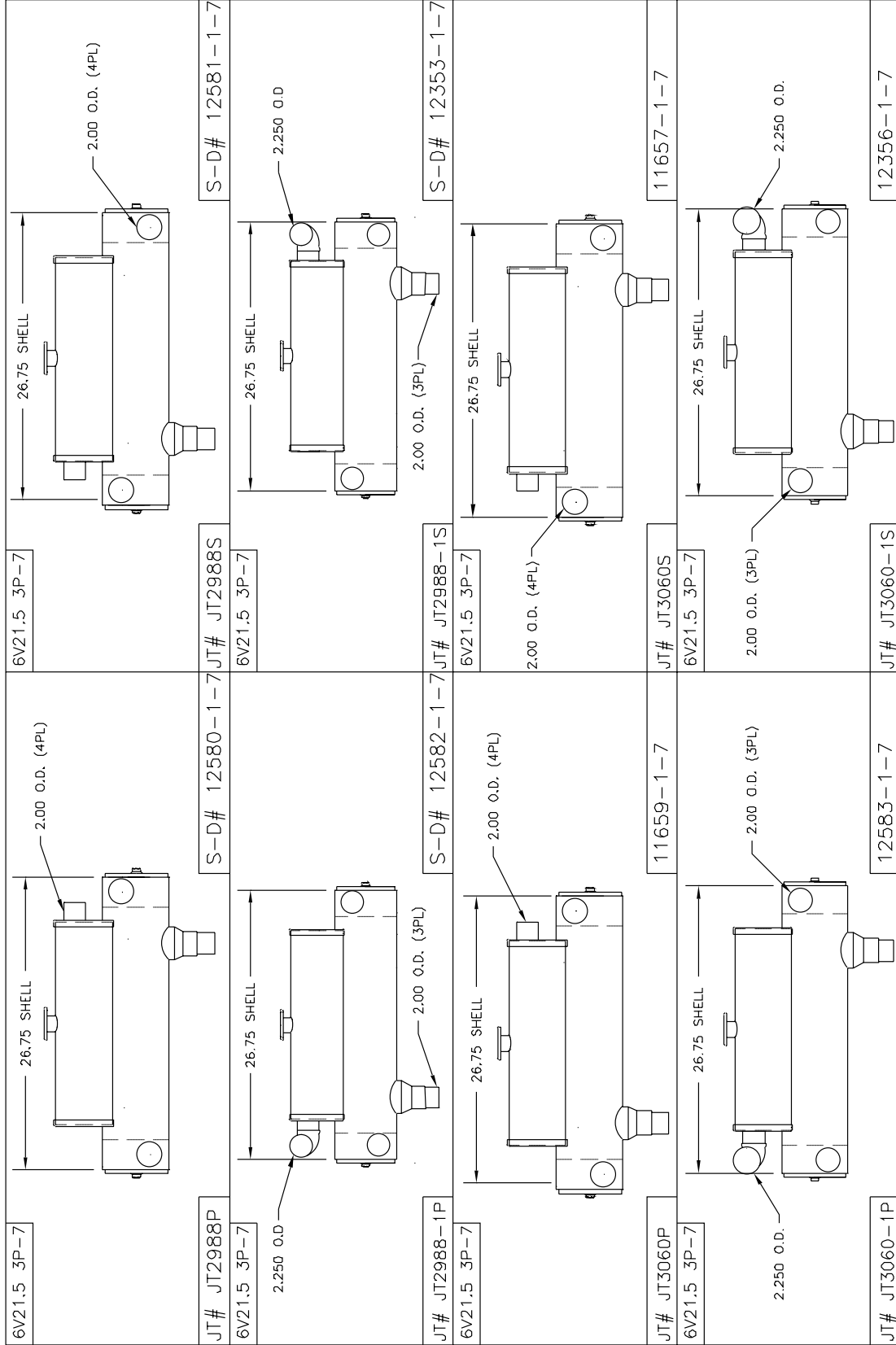


# CUMMINS OIL COOLERS

<p>SEN-DURE PART# 9428-1-7 CUMMINS PART# 3916002</p>	<p>SEN-DURE PART# 10559-1-7 CUMMINS PART# 3917117</p>	<p>SEN-DURE PART# 12911-1 CUMMINS PART# CALL</p> <p>F.O.C.</p>
<p>SEN-DURE PART# 9660-1-07 CUMMINS PART# 3912146</p>	<p>SEN-DURE PART# 11202-1-07 CUMMINS PART# 3920784</p> <p>G.O.C.</p>	<p>SEN-DURE PART# 13061-2-7 CUMMINS PART# 3349303</p> <p>F.O.C.</p>
<p>SEN-DURE PART# 10261-1-7 CUMMINS PART# 3915159</p>	<p>SEN-DURE PART# 12717-1-7 CUMMINS PART# 3393663</p>	<p>SEN-DURE PART# 13208-1-7 CUMMINS PART# 3349370</p> <p>F.O.C.</p>

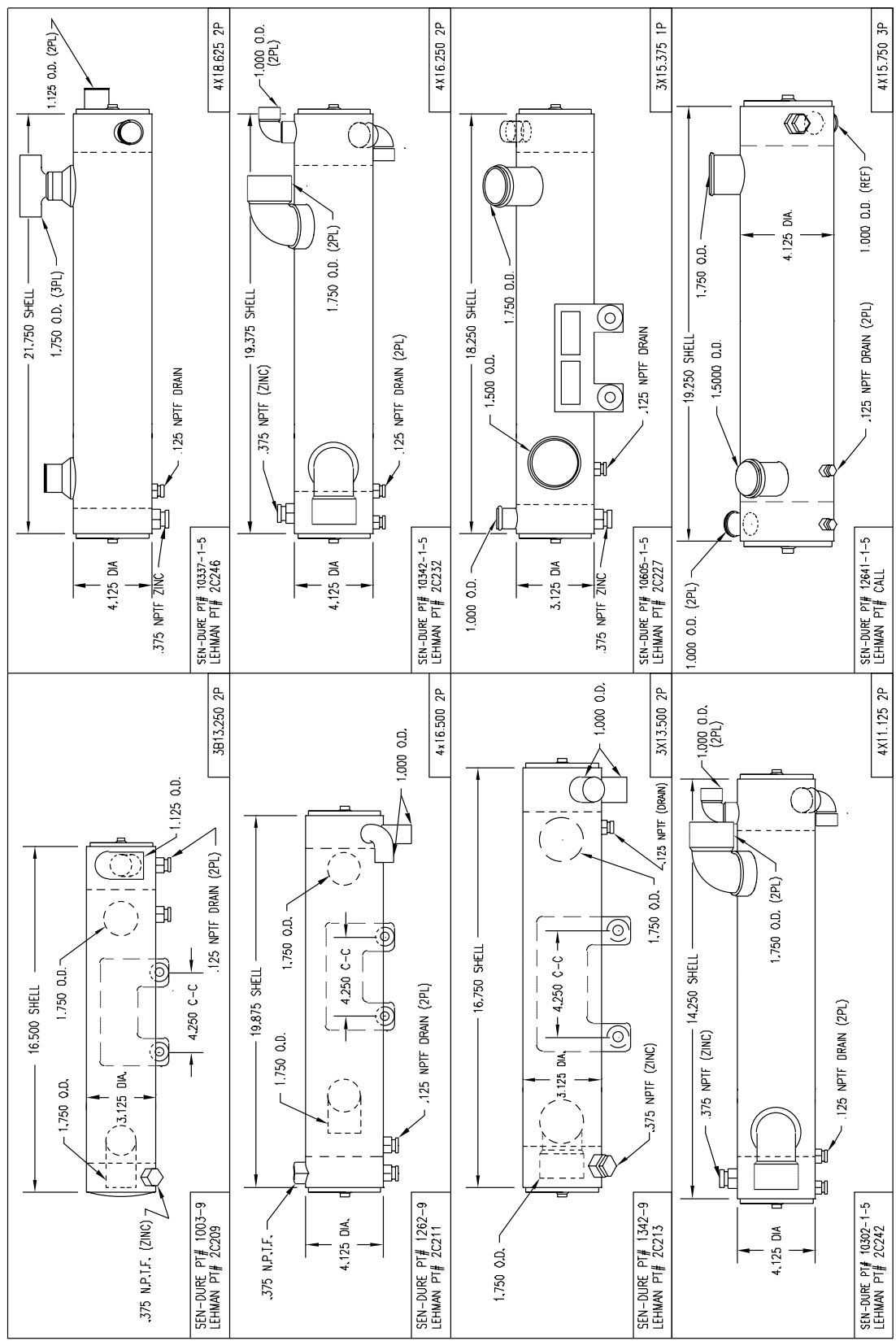


JOHNSON TOWERS 6-71 HEAT EXCHANGERS



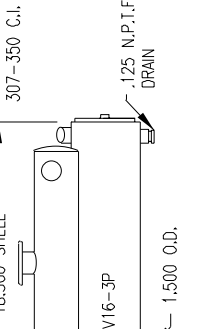
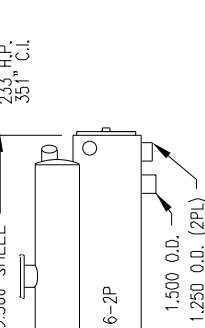
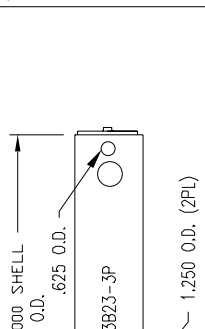
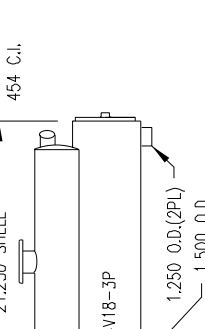
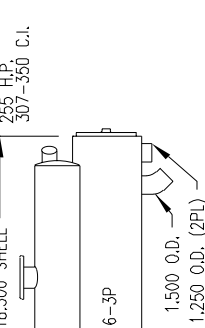
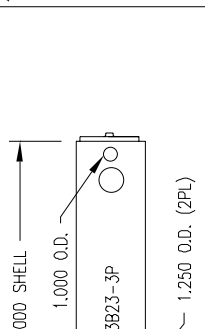
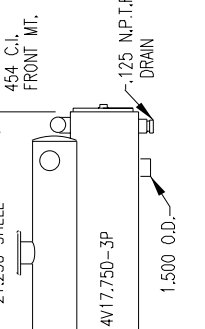
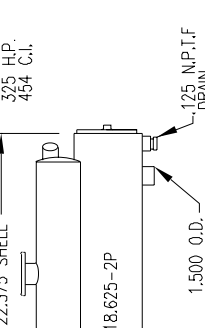
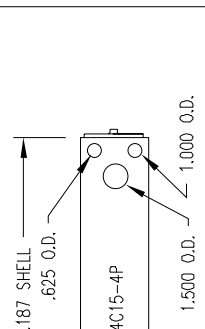
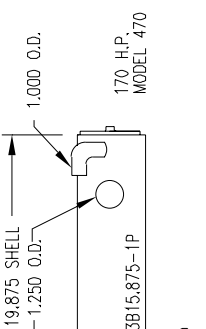
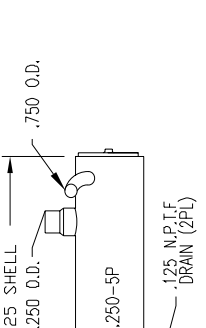
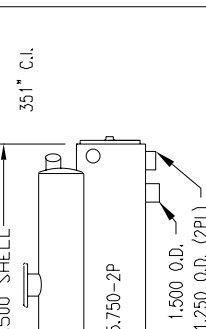


# LEHMAN HEAT EXCHANGERS



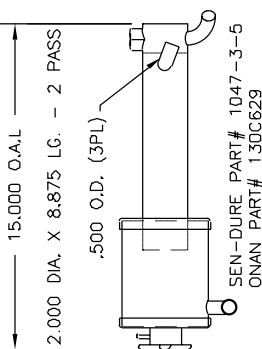
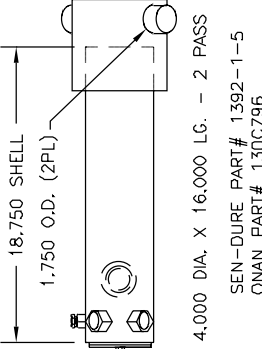
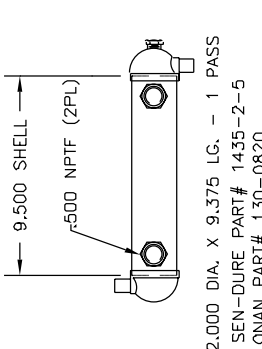
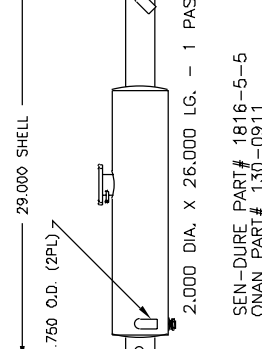
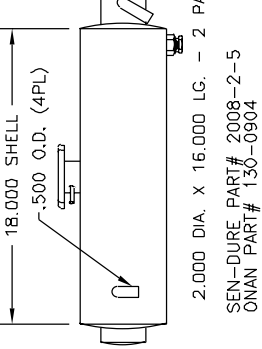
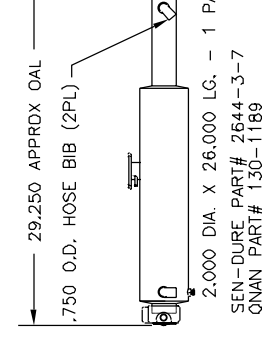
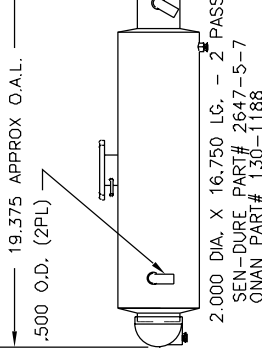
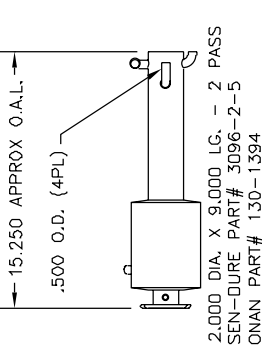
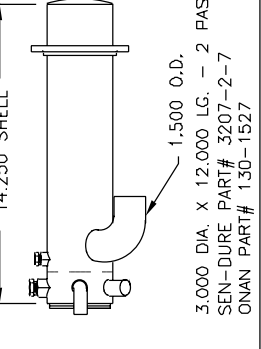
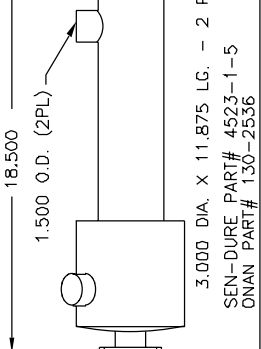
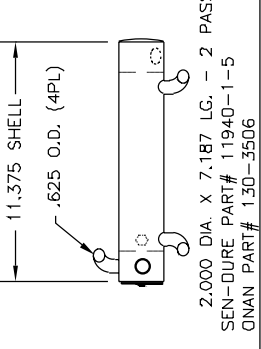
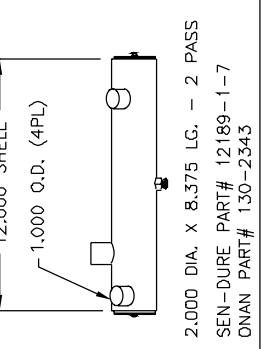
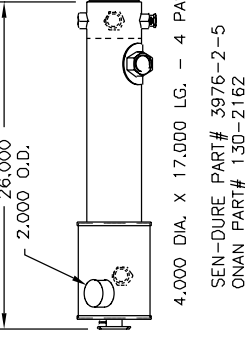
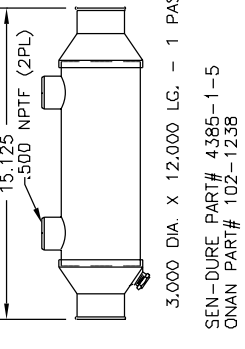
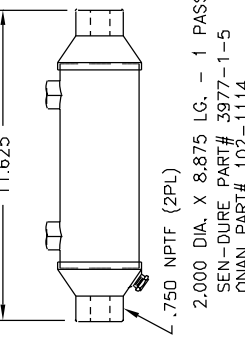
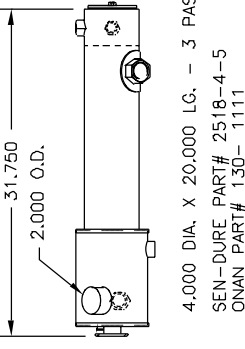


# MERCURY HEAT EXCHANGERS

 <p>26.000 SHELL 1.000 O.D. .625 O.D. 3823-3P 1.250 O.D. (2PL)</p> <p>SEN-DURE PART# 2394-7-5 MERCURY PART# 75959</p>	 <p>19.500 SHELL 1.000 O.D. (2PL) .125 N.P.T.F. DRAIN 1.500 O.D. 1.250 O.D. (2PL) 4V16-2P</p> <p>SEN-DURE PART# 1604-3-5 MERCURY PART# 62472</p>	 <p>233 H.P. 351" C.I. 18.500 SHELL 1.000 O.D. (2PL) 1.250 O.D. (2PL) 1.25 N.P.T.F. DRAIN 4V16-3P</p> <p>SEN-DURE PART# 2714-1-5 MERCURY PART# 78094</p>
 <p>25.000 SHELL .625 O.D. 1.000 O.D. 3823-3P 1.250 O.D. (2PL)</p> <p>170 H.P. MODEL 470</p> <p>SEN-DURE PART# 2604-4-5 MERCURY PART# 77319</p>	 <p>18.500 SHELL 1.000 O.D. (2PL) .125 N.P.T.F. DRAIN 1.500 O.D. 1.250 O.D. (2PL) 4V18-3P</p> <p>SEN-DURE PART# 2162-3-5 MERCURY PART# 74643</p>	 <p>21.250 SHELL 1.000 O.D. (2PL) .125 N.P.T.F. DRAIN 1.250 O.D. (2PL) 1.500 O.D. 4V18-3P</p> <p>SEN-DURE PART# 2826-1-5 MERCURY PART# 79607</p>
 <p>17.187 SHELL 1.750 O.D. .375-16(2PL) 1.000 O.D. 1.500 O.D. 4C15-4P</p> <p>SEN-DURE PART# 1542-8-5 MERCURY PART# 61086</p>	 <p>22.375 SHELL 1.000 O.D. (2PL) 1.250 O.D. 1.500 O.D. (2PL) 5V18.625-2P</p> <p>SEN-DURE PART# 1580-6-5 MERCURY PART# 63107</p>	 <p>21.250 SHELL 1.000 O.D. (2PL) 1.250 O.D. (2PL) 1.500 O.D. 4V17.750-3P</p> <p>SEN-DURE PART# 3291-7-5 MERCURY PART# 91036</p>
 <p>19.500 SHELL 1.000 O.D. (2PL) .375 N.P.T.F. ZINC 1.500 O.D. 1.250 O.D. (2PL) 5V15.750-2P</p> <p>SEN-DURE PART# 1695-1-5 MERCURY PART# 61804</p>	 <p>27.125 SHELL 1.000 O.D. 1.250 O.D. 1.25 N.P.T.F. DRAIN (2PL) 4C24.250-5P</p> <p>MODEL 470</p> <p>SEN-DURE PART# 4215-1-5 MERCURY PART# 99438</p>	 <p>19.875 SHELL .625 O.D. 1.250 O.D. 1.250 O.D. 1.000 O.D. 3B15.875-1P</p> <p>170 H.P. MODEL 470</p> <p>SEN-DURE PART# 2645-4-5 MERCURY PART# 78165</p>



# ONAN HEAT EXCHANGERS

 <p>15,000 O.A.L. 2,000 DIA. X 8.875 LG. - 2 PASS .500 O.D. (3PL)</p> <p>SEN-DURE PART# 1047-3-5 ONAN PART# 130C629</p>	 <p>18,750 SHELL 1,750 O.D. (2PL)</p> <p>4,000 DIA. X 16,000 LG. - 2 PASS</p> <p>SEN-DURE PART# 1392-1-5 ONAN PART# 130C796</p>	 <p>9,500 SHELL .500 NPTF (2PL)</p> <p>2,000 DIA. X 9,375 LG. - 1 PASS</p> <p>SEN-DURE PART# 1435-2-5 ONAN PART# 130-0820</p>	 <p>29,000 SHELL .750 O.D. (2PL)</p> <p>2,000 DIA. X 26,000 LG. - 1 PASS</p> <p>SEN-DURE PART# 1816-5-5 ONAN PART# 130-0911</p>
 <p>18,000 SHELL .500 O.D. (4PL)</p> <p>2,000 DIA. X 16,000 LG. - 2 PASS</p> <p>SEN-DURE PART# 2008-2-5 ONAN PART# 130-0904</p>	 <p>29,250 APPROX OAL .750 O.D. HOSE BIB (2PL)</p> <p>2,000 DIA. X 26,000 LG. - 1 PASS</p> <p>SEN-DURE PART# 2644-3-7 ONAN PART# 130-1189</p>	 <p>19,375 APPROX O.A.L. .500 O.D. (2PL)</p> <p>2,000 DIA. X 16,750 LG. - 2 PASS</p> <p>SEN-DURE PART# 2647-5-7 ONAN PART# 130-1188</p>	 <p>15,250 APPROX O.A.L. .500 O.D. (4PL)</p> <p>2,000 DIA. X 9,000 LG. - 2 PASS</p> <p>SEN-DURE PART# 3096-2-5 ONAN PART# 130-1394</p>
 <p>14,250 SHELL 1,500 O.D.</p> <p>3,000 DIA. X 12,000 LG. - 2 PASS</p> <p>SEN-DURE PART# 3207-2-7 ONAN PART# 130-1527</p>	 <p>18,500 1,500 O.D. (2PL)</p> <p>3,000 DIA. X 11,875 LG. - 2 PASS</p> <p>SEN-DURE PART# 4523-1-5 ONAN PART# 130-2536</p>	 <p>11,375 SHELL .625 O.D. (4PL)</p> <p>2,000 DIA. X 7,187 LG. - 2 PASS</p> <p>SEN-DURE PART# 11940-1-5 ONAN PART# 130-3506</p>	 <p>12,000 SHELL 1,000 O.D. (4PL)</p> <p>2,000 DIA. X 8,375 LG. - 2 PASS</p> <p>SEN-DURE PART# 12189-1-7 ONAN PART# 130-2343</p>
 <p>26,000 2,000 O.D.</p> <p>4,000 DIA. X 17,000 LG. - 4 PASS</p> <p>SEN-DURE PART# 3976-2-5 ONAN PART# 130-2162</p>	 <p>15,125 .500 NPTF (2PL)</p> <p>3,000 DIA. X 12,000 LG. - 1 PASS</p> <p>SEN-DURE PART# 4385-1-5 ONAN PART# 102-1238</p>	 <p>11,625 .750 NPTF (2PL)</p> <p>2,000 DIA. X 8,875 LG. - 1 PASS</p> <p>SEN-DURE PART# 3977-1-5 ONAN PART# 102-1114</p>	 <p>31,750 2,000 O.D.</p> <p>4,000 DIA. X 20,000 LG. - 3 PASS</p> <p>SEN-DURE PART# 2518-4-5 ONAN PART# 130-1111</p>



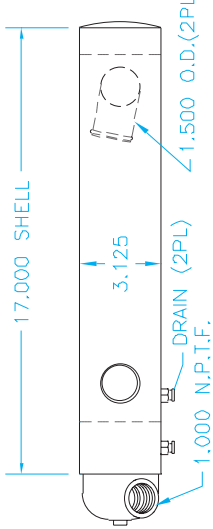
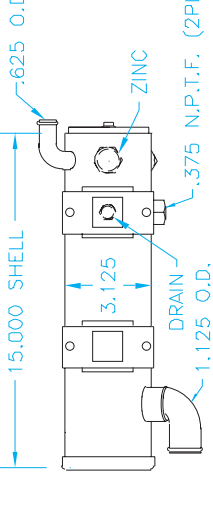
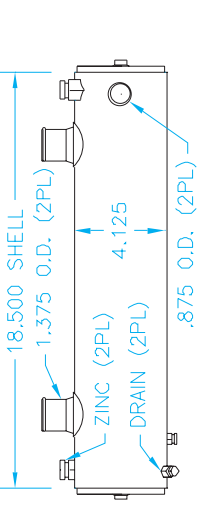
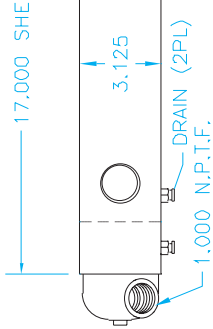
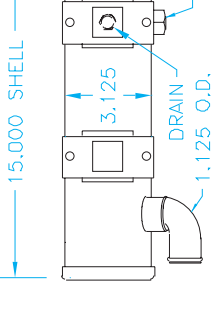
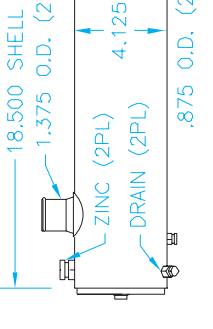
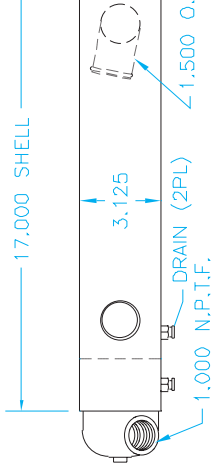
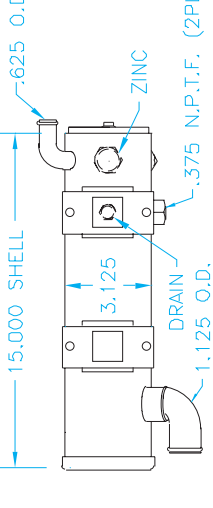
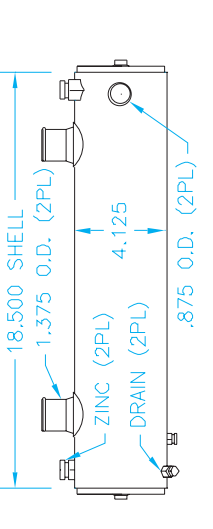
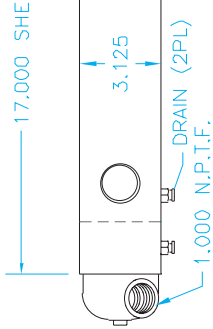
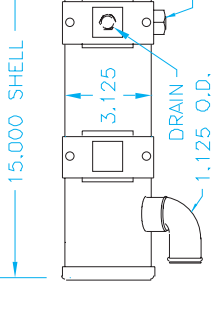
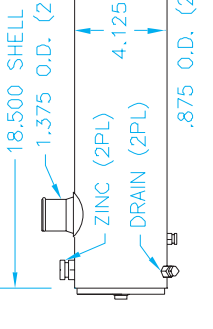


PERKINS HEAT EXCHANGERS

<p>SEN-DURE PART# 1273-2-7 PERKINS PART# NA001402</p>	<p>SEN-DURE PART# 1814-3-7 PERKINS PART# NA001545</p>																																																
<p>SEN-DURE PART# 1383-5-7 PERKINS PART# NA001405</p>	<p>SEN-DURE PART# 2551-1-7 PERKINS PART# NA001868</p>																																																
<p>SEN-DURE PART# 1396-3-7 PERKINS PART# NA001407</p>	<p>SEN-DURE PART# 2356-1-7 PERKINS PART# NA004139</p>																																																
<p>SEN-DURE PART# 1448-4-7 PERKINS PART# NA001406</p>	<p style="text-align: center;"><b>OIL &amp; WATER CONNECTIONS FOR OIL COOLERS</b></p> <table border="1"> <thead> <tr> <th>PERKINS PART#</th> <th>SEN-DURE PART#</th> <th>OIL &amp; WATER CONNECTIONS</th> <th>TUBE LENGTH</th> </tr> </thead> <tbody> <tr> <td>NA004182</td> <td>2405-1-7</td> <td>3/4 X 3/8 X 1 1/2</td> <td>12"</td> </tr> <tr> <td>NA004139</td> <td>2356-1-7</td> <td>3/4 X 3/8 X 1 1/8</td> <td>12"</td> </tr> <tr> <td>NA004100</td> <td>2299-2-7</td> <td>3/4 X 3/8 X 1 1/2</td> <td>9"</td> </tr> <tr> <td>NA003426</td> <td>2103-1-7</td> <td>3/4 X 3/8 X 1 3/4</td> <td>9"</td> </tr> <tr> <td>NA000228</td> <td>2031-1-7</td> <td>3/8 X 3/8 X 1 1/8</td> <td>9"</td> </tr> <tr> <td>NA001314</td> <td>1566-1-7</td> <td>3/4 X 3/8 X 1 1/8</td> <td>9"</td> </tr> <tr> <td>NA004183</td> <td>2452-1-7</td> <td>3/4 X 3/8 X 1 5/8</td> <td>12"</td> </tr> <tr> <td>NA004180</td> <td>2454-1-7</td> <td>3/8 X 3/8 X 1 5/8</td> <td>9"</td> </tr> <tr> <td>NA004179</td> <td>2457-1-7</td> <td>3/8 X 3/8 X 1 1/4</td> <td>6"</td> </tr> <tr> <td>NA004619</td> <td>2664-1-7</td> <td>3/8 X 3/8 X 1 1/4</td> <td>10"</td> </tr> <tr> <td>CALL</td> <td>3578-1-7</td> <td>3/4 X 3/8 X 1 5/8</td> <td>9"</td> </tr> </tbody> </table>	PERKINS PART#	SEN-DURE PART#	OIL & WATER CONNECTIONS	TUBE LENGTH	NA004182	2405-1-7	3/4 X 3/8 X 1 1/2	12"	NA004139	2356-1-7	3/4 X 3/8 X 1 1/8	12"	NA004100	2299-2-7	3/4 X 3/8 X 1 1/2	9"	NA003426	2103-1-7	3/4 X 3/8 X 1 3/4	9"	NA000228	2031-1-7	3/8 X 3/8 X 1 1/8	9"	NA001314	1566-1-7	3/4 X 3/8 X 1 1/8	9"	NA004183	2452-1-7	3/4 X 3/8 X 1 5/8	12"	NA004180	2454-1-7	3/8 X 3/8 X 1 5/8	9"	NA004179	2457-1-7	3/8 X 3/8 X 1 1/4	6"	NA004619	2664-1-7	3/8 X 3/8 X 1 1/4	10"	CALL	3578-1-7	3/4 X 3/8 X 1 5/8	9"
PERKINS PART#	SEN-DURE PART#	OIL & WATER CONNECTIONS	TUBE LENGTH																																														
NA004182	2405-1-7	3/4 X 3/8 X 1 1/2	12"																																														
NA004139	2356-1-7	3/4 X 3/8 X 1 1/8	12"																																														
NA004100	2299-2-7	3/4 X 3/8 X 1 1/2	9"																																														
NA003426	2103-1-7	3/4 X 3/8 X 1 3/4	9"																																														
NA000228	2031-1-7	3/8 X 3/8 X 1 1/8	9"																																														
NA001314	1566-1-7	3/4 X 3/8 X 1 1/8	9"																																														
NA004183	2452-1-7	3/4 X 3/8 X 1 5/8	12"																																														
NA004180	2454-1-7	3/8 X 3/8 X 1 5/8	9"																																														
NA004179	2457-1-7	3/8 X 3/8 X 1 1/4	6"																																														
NA004619	2664-1-7	3/8 X 3/8 X 1 1/4	10"																																														
CALL	3578-1-7	3/4 X 3/8 X 1 5/8	9"																																														
<p>SEN-DURE PART# 1550-3-7 PERKINS PART# NA004490</p>																																																	

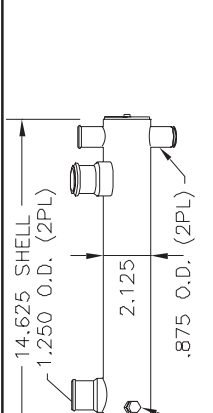
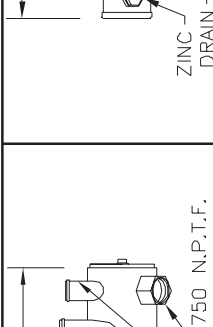
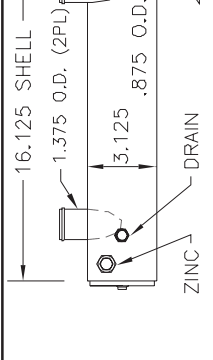
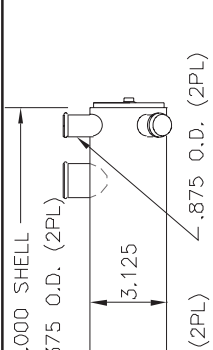
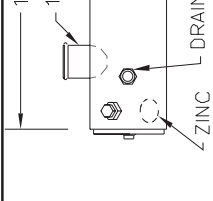

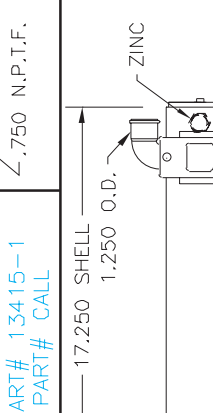

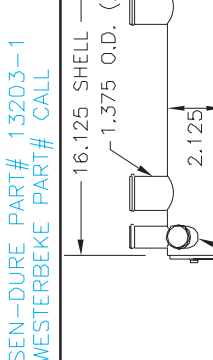
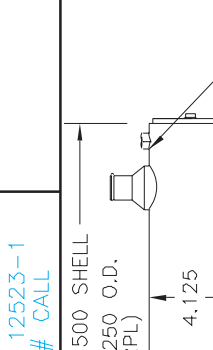


# WESTERBEKE HEAT EXCHANGERS

 <p>17.000 SHELL 1.000 N.P.T.F. (2PL) DRAIN (2PL) 3.125 1.500 O.D. (2PL)</p>	<p>SEN-DURE PART# 1296-1 WESTERBEKE PART# CALL</p>	 <p>15.000 SHELL 1.125 O.D. DRAIN 3.125 ZINC .375 N.P.T.F. (2PL) .625 O.D.</p>	<p>SEN-DURE PART# 2889-1 WESTERBEKE PART# 15799</p>	 <p>18.500 SHELL 1.375 O.D. (2PL) ZINC (2PL) DRAIN (2PL) 4.125 .875 O.D. (2PL)</p>	<p>SEN-DURE PART# 4281 WESTERBEKE PART# 32318</p>
 <p>13.875 SHELL VENT 3.125 1.250 O.D. 1.125 O.D. .625 O.D. .375 N.P.T.F. (2PL) DRAIN (2PL)</p>	<p>SEN-DURE PART# 1380-1 WESTERBEKE PART# CALL</p>	 <p>13.875 SHELL VENT 1.250 O.D. 3.125 DRAIN ZINC 1.125 O.D. .625 O.D. .375 N.P.T.F.</p>	<p>SEN-DURE PART# 3193-1 WESTERBEKE PART# 14129</p>	 <p>16.000 SHELL .875 O.D. 1.375 O.D. 3.125 ZINC .750 N.P.T.F. DRAIN (2PL)</p>	<p>SEN-DURE PART# 11210-1 WESTERBEKE PART# 35903</p>
 <p>19.625 SHELL 1.250 O.D. (2PL) ZINC 3.125 DRAIN (2PL) .750 N.P.T.F. (2PL)</p>	<p>SEN-DURE PART# 1992 WESTERBEKE PART# CALL</p>	 <p>19.000 SHELL 1.375 O.D. (2PL) ZINC 3.125 DRAIN (2PL) .875 O.D. (2PL)</p>	<p>SEN-DURE PART# 3532-3 WESTERBEKE PART# 24308</p>	 <p>16.000 SHELL .875 O.D. 1.375 O.D. 3.125 ZINC .875 O.D. DRAIN (2PL)</p>	<p>SEN-DURE PART# 11210-2 WESTERBEKE PART# 35135</p>
 <p>18.000 SHELL 1.250 O.D. DRAIN (2PL) 3.125 ZINC 1.000 O.D. .750 N.P.T.F.</p>	<p>SEN-DURE PART# 2729-3-5 WESTERBEKE PART# 21903</p>	 <p>16.000 SHELL 1.375 O.D. (2PL) ZINC 3.125 DRAIN (2PL) .875 O.D. (2PL)</p>	<p>SEN-DURE PART# 3618 WESTERBEKE PART# 24774</p>	 <p>19.250 SHELL 1.000 O.D. 1.750 O.D. (2PL) ZINC 3.125 DRAIN (3PL) .750 N.P.T.F.</p>	<p>SEN-DURE PART# 12466-1 WESTERBEKE PART# CALL</p>



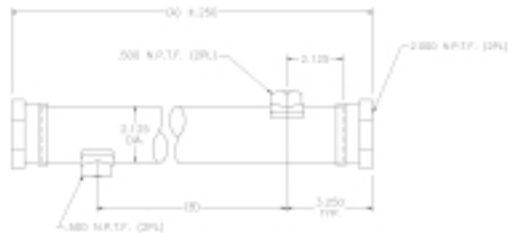
# WESTERBEKE HEAT EXCHANGERS

 <p>16.000 SHELL 1.375 O.D. (2PL) 3.125 DRAIN (2PL) ZINC .875 O.D. (2PL)</p>	<p>SEN-DURE PART# 12460-1 WESTERBEKE PART# CALL</p>	 <p>16.125 SHELL 1.375 O.D. (2PL) 3.125 DRAIN ZINC .750 N.P.T.F.</p>	<p>SEN-DURE PART# 13179-1 WESTERBEKE PART# 36899</p>
 <p>17.625 SHELL 1.250 O.D. (2PL) 4.125 DRAIN (3PL) ZINC .625 O.D. (2PL)</p>	<p>SEN-DURE PART# 12523-1 WESTERBEKE PART# CALL</p>	 <p>16.000 SHELL 1.375 O.D. (2PL) 2.125 DRAIN (2PL) ZINC .875 O.D. .750 N.P.T.F.</p>	<p>SEN-DURE PART# 13203-1 WESTERBEKE PART# CALL</p>
 <p>18.500 SHELL 1.250 O.D. (2PL) 4.125 DRAIN (2PL) ZINC .875 O.D. (2PL) .250 N.P.T.F.</p>	<p>SEN-DURE PART# 12579-1 WESTERBEKE PART# CALL</p>	 <p>14.625 SHELL 1.250 O.D. (2PL) 2.125 DRAIN ZINC .875 O.D. (2PL)</p>	<p>SEN-DURE PART# 13306-1 WESTERBEKE PART# 35007</p>
 <p>17.250 SHELL 1.250 O.D. 3.125 DRAIN ZINC .750 N.P.T.F.</p>	<p>SEN-DURE PART# 13415-1 WESTERBEKE PART# CALL</p>	 <p>16.125 SHELL 1.375 O.D. (2PL) 2.125 DRAIN (2PL) ZINC .875 O.D. (2PL)</p>	<p>SEN-DURE PART# 13226-1 WESTERBEKE PART# CALL</p>
 <p>18.875 SHELL 1.375 O.D. 3.125 DRAIN (2PL) ZINC .750 N.P.T.F. .875 O.D.</p>	<p>SEN-DURE PART# 12711-1 WESTERBEKE PART# CALL</p>	 <p>17.250 SHELL 1.250 O.D. 1.000 O.D. DRAIN ZINC .375 N.P.T.F. .750 N.P.T.F.</p>	<p>SEN-DURE PART# 13533-1 WESTERBEKE PART# CALL</p>



# INDUSTRIAL APPLICATIONS

## WATER COOLED "AFTERCOOLERS" 2" Series



### WORKING PRESSURE

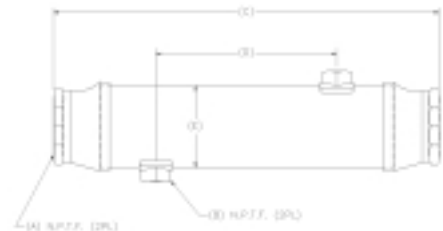
Tube Side 250 PSIG  
Shell Side 125 PSIG

### CONSTRUCTION

Tubes: 1/4" O.D. Copper Headers/Baffles: Copper  
Shell: Copper End Caps: Cast Bronze

Part No.	A	B	Sq. Ft. Surf.	SCFM	Approx. Weight
1509-15	18-1/2"	12"	2.5	40	10 Lbs.
1509-24	27-1/2"	21"	4.0	65	13 Lbs.
1509-32	36-3/8"	29-7/8"	5.4	110	16 Lbs.
1509-50	54-3/8"	47-7/8"	8.5	170	23 Lbs.
1509-56	60-3/8"	53-7/8"	9.6	190	27 Lbs.

## WATER COOLED "AFTERCOOLERS" 300 & 500 CFM



### WORKING PRESSURE

Tube Side 250 PSIG  
Shell Side 125 PSIG

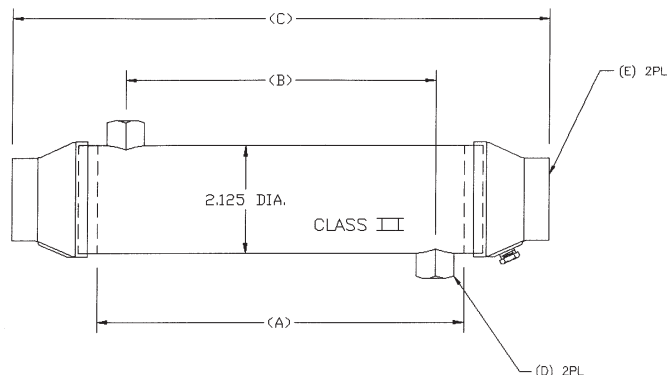
### CONSTRUCTION

Tubes: 1/4" O.D. Copper Headers/Baffles: Copper  
Shell: Copper End Caps: Cast Bronze

Part No.	CFM	A	B	C	D	E	Approx Weight
9052-1-5	300	2"	1/2"	41-3/4"	34"	3-1/8"	28 Lbs.
9053-1-5	500	3"	3/4"	47-1/2"	37-3/4"	4-1/8"	53 Lbs.

## CONDENSER APPLICATIONS

- AIR CONDITIONING
- HEAT PUMP AND
- REFRIGERATION



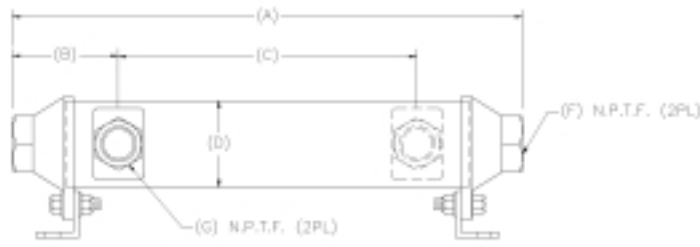
1. All joints silver brazed.
2. Shell - copper.
3. Tube Bundle - 1/4" O.D., 90/10 Cupro Nickel tubes.
4. Helium tested.
5. **INSTALLATION NOTE:** Unit must be bonded to vessel's electrical bonding system.

Part No.	R-12 BTUH*	R-22 BTUH*	A	B	C	D	Order Part No.	E
9222	9,000	15,000	6	4	9-5/8	3/8 NPT	9222-6-7	1" NPT
							9222-5-7	3/4" NPT
							9222-3-7	1/2" NPT
9223	13,500	22,500	9	7	12-5/8	3/8 NPT	9223-6-7	1" NPT
							9223-5-7	3/4" NPT
							9223-3-7	1/2" NPT
9224	18,000	30,000	12	10	15-5/8	3/8 NPT	9224-6-7	1" NPT
							9224-5-7	3/4" NPT
							9224-3-7	1/2" NPT
9225	27,000	45,000	18	16	21-5/8	1/2 NPT	9225-6-7	1" NPT
							9225-5-7	3/4" NPT
							9225-3-7	1/2" NPT

\*with 10 gpm 90° sea water. Dimensions A, B, C, D — Inches.

## DIRECT REPLACEMENT UNITS FOR W.W. GRAINGER\*

Order Part No.	Max. SCFN	A	B	C	D	E	Grainger Part No.	F	G
11461-5-5	40	25"	3-1/4"	18-1/2"	2-1/8"	23-1/4"	Z22926	3/4"	1/2"
11461-6-5								1"	
11461-7-5								1-1/4"	
11462-5-5	65	29-5/8"	2-13/16"	24"	2-1/8"	27-13/16"		3/4"	1/2"
11462-6-5								1"	
11462-7-5								1-1/4"	
11463-5-5	110	36"	3-1/4"	29-1/2"	2-1/8"	34-1/4"	Z22927	3/4"	1/2"
11463-6-5								1"	
11463-7-5								1-1/4"	
11464-5-5	125	43-5/8"	2-13/16"	38"	2-1/8"	41-13/16"		3/4"	1/2"
11464-6-5								1"	
11464-7-5								1/4"	
11465-5-5	210	33"	4"	25"	3-1/8"	30-3/4"		1/2"	3/4"
11465-6-5								1"	
11465-7-5								1"	
11466-5-5	300	41"	4"	33"	3-1/8"	38-3/4"	Z42427	12"	3/4"
11466-6-5								2"	
11466-7-5								1"	



### WORKING PRESSURE

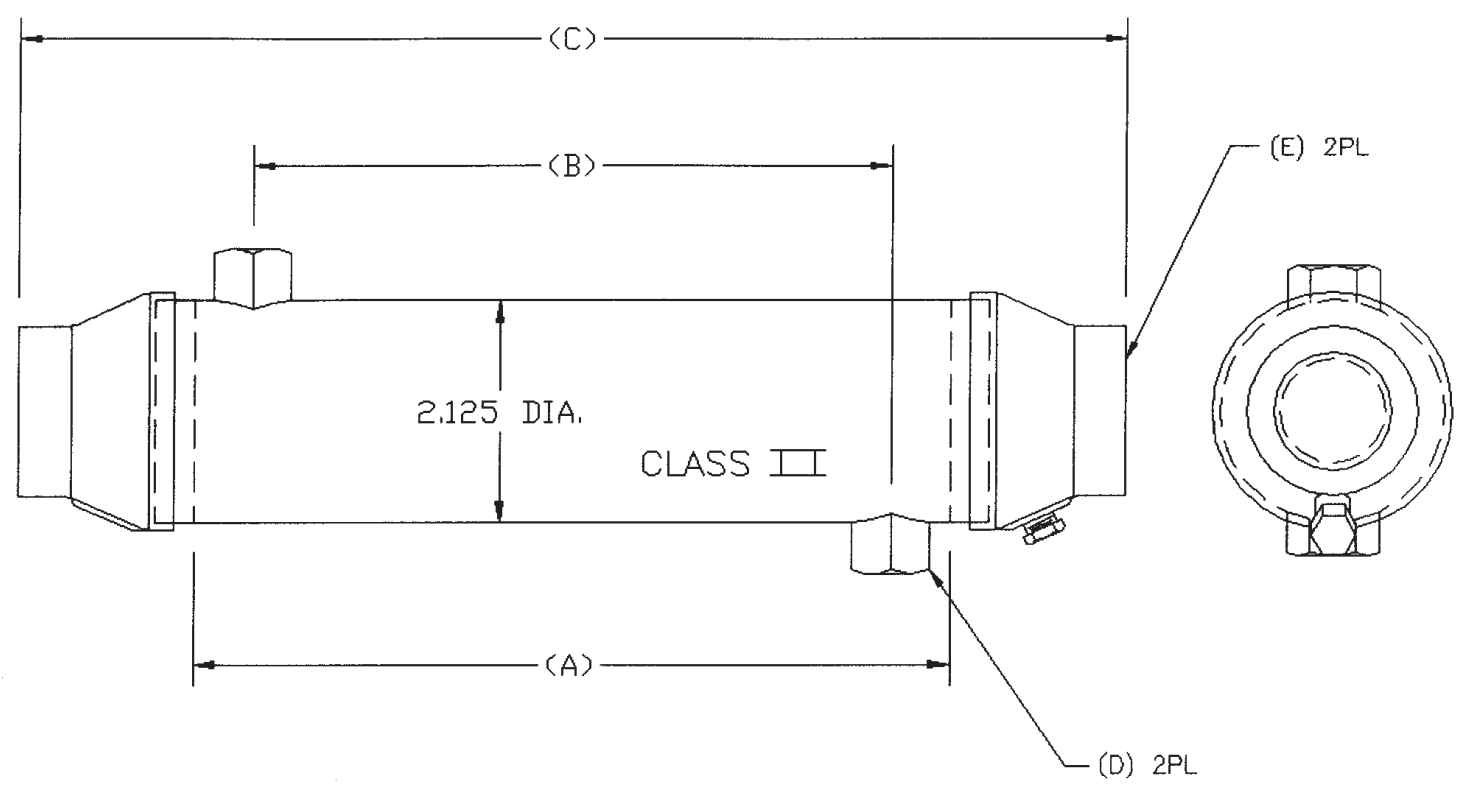
Tube Side: 250 PSIG  
Shell Side: 250 PSIG

### CONSTRUCTION:

Tubes: 1/4" O.D. Copper  
Shell: Copper  
Headers/Baffles: Copper  
End Caps: Bronze / Copper



# HEAT EXCHANGERS / REFRIGERATION



**NOTES:**

1. ALL JOINTS SILVER BRAZED
2. SHELL - COPPER WATER TUBE.
3. TUBE BUNDLE - 1/4" O.D. 90/10 CUPRO NICKEL TUBES.
4. HELIUM TESTED 250 PSI
5. INSTALLATION NOTE: UNIT MUST BE BONDED TO VESSEL'S ELECTRICAL BONDING SYSTEM.

PART #	R-12 BTUH*	R-22 BTUH*	A	B	C	D	ORDER PART#	E
9222	9,000	15,000	6	4	9.625	.375 N.P.T.	9222-6-7	1.000 N.P.T.F
							9222-5-7	.750 N.P.T.F
							9222-3-7	.500 N.P.T.F.
9223	13,500	22,500	9	7	12.625	.375 N.P.T.	9223-6-7	1.000 N.P.T.F
							9223-5-7	.750 N.P.T.F
							9223-3-7	.500 N.P.T.F.
9224	18,000	30,000	12	10	15.625	.375 N.P.T.	9224-6-7	1.000 N.P.T.F
							9224-5-7	.750 N.P.T.F
							9224-3-7	.500 N.P.T.F.
9225	27,000	45,000	18	16	21.625	.500 N.P.T.	9225-6-7	1.000 N.P.T.F
							9225-5-7	.750 N.P.T.F
							9225-3-7	.500 N.P.T.F.

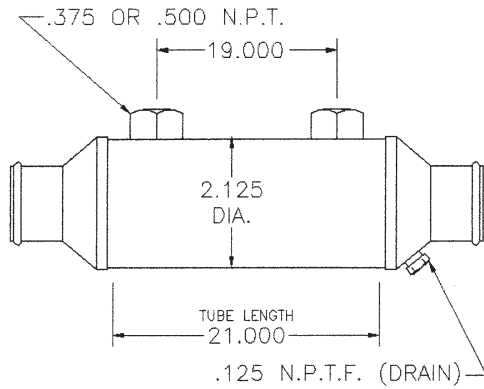
\*WITH 10 GPM 90° SEA WATER. DIM A,B,C,D, - INCHES





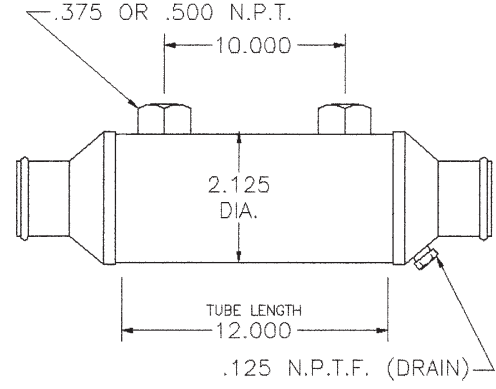
# AUXILIARY BOOSTER COOLERS

## 1112 SERIES HEAT EXCHANGER



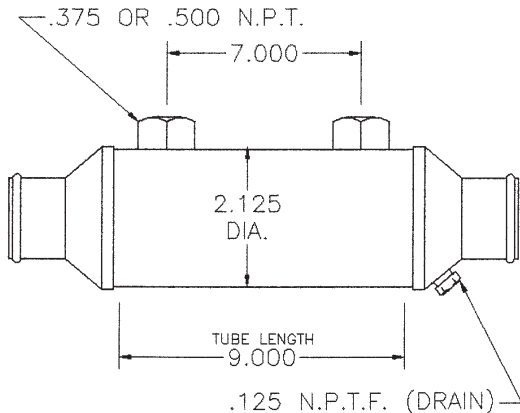
Part No.	End Fitting	Side Fitting
1112-1	1/2" NPT	3/8" NPT
1112-2	3/4" Hose	3/8" NPT
1112-3	3/4" NPT	3/8" NPT
1112-4	1" NPT	3/8" NPT
1112-5	1" Hose	3/8" NPT
1112-10	1/2" NPT	1/2" NPT
1112-20	3/4" Hose	1/2" NPT
1112-30	3/4" NPT	1/2" NPT
1112-40	1" NPT	1/2" NPT
1112-50	1" Hose	1/2" NPT

## 1121 SERIES HEAT EXCHANGERS



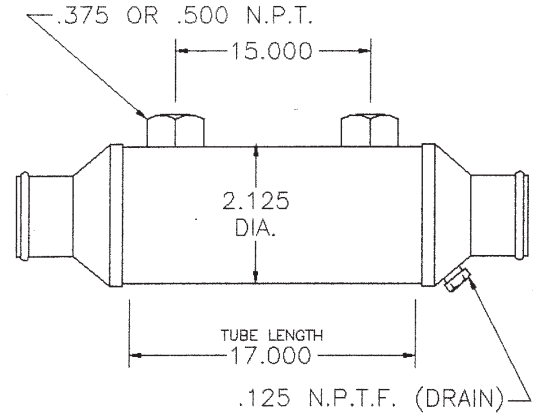
Part No.	End Fitting	Side Fitting
1121-1	1/2" NPT	3/8" NPT
1121-2	3/4" Hose	3/8" NPT
1121-3	3/4" NPT	3/8" NPT
1121-4	1" NPT	3/8" NPT
1121-5	1" Hose	3/8" NPT
1121-10	1/2" NPT	1/2" NPT
1121-20	3/4" Hose	1/2" NPT
1121-30	3/4" NPT	1/2" NPT
1121-40	1" NPT	1/2" NPT
1121-50	1" Hose	1/2" NPT

## 1113 SERIES HEAT EXCHANGER



Part No.	End Fitting	Side Fitting
1113-1	1/2" NPT	3/8" NPT
1113-2	3/4" Hose	3/8" NPT
1113-3	3/4" NPT	3/8" NPT
1113-4	1" NPT	3/8" NPT
1113-5	1" Hose	3/8" NPT
1113-6	5/8" Hose	3/8" NPT
1113-10	1/2" NPT	1/2" NPT
1113-20	3/4" Hose	1/2" NPT
1113-30	3/4" NPT	1/2" NPT
1113-40	1" NPT	1/2" NPT
1113-50	1" Hose	1/2" NPT

## 1136 SERIES HEAT EXCHANGER

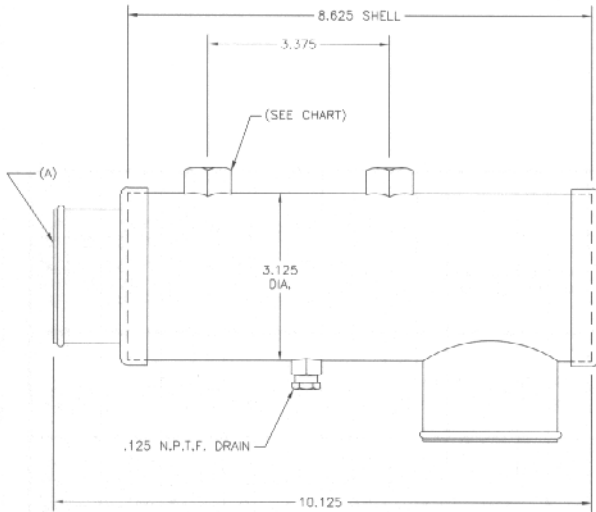


Part No.	End Fitting	Side Fitting
1136-1	1/2" NPT	3/8" NPT
1136-2	3/4" Hose	3/8" NPT
1136-3	3/4" NPT	3/8" NPT
1136-4	1" NPT	3/8" NPT
1136-5	1" Hose	3/8" NPT
1136-10	1/2" NPT	1/2" NPT
1136-20	3/4" Hose	1/2" NPT
1136-30	3/4" NPT	1/2" NPT
1136-40	1" NPT	1/2" NPT
1136-50	1" Hose	1/2" NPT



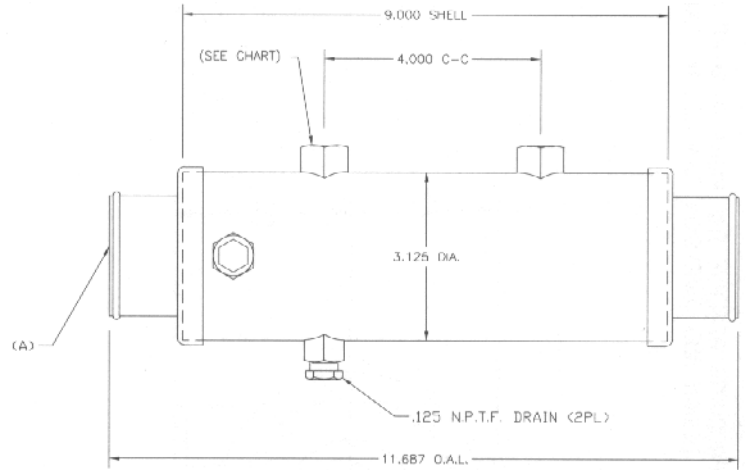
# AUXILIARY BOOSTER COOLERS

## 13648 SERIES HEAT EXCHANGER



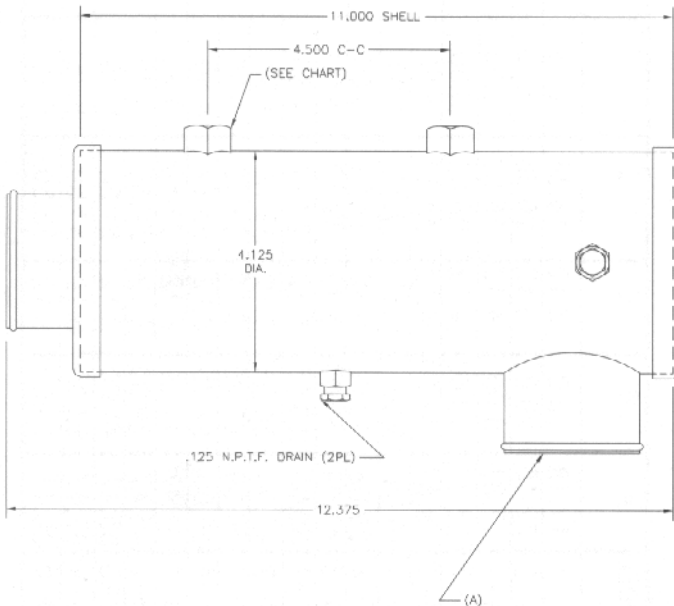
PART #	SHELL FTG. .250 N.P.T.F.	SHELL FTG. .375 N.P.T.F.	(A) 2PL
13648	-01	-1	1,250 O.D.
13648	-02	-2	1,500 O.D.
13648	-03	-3	1,750 O.D.
13648	-04	-4	1,875 O.D.
13648	-05	-5	2,000 O.D.
13648	-06	-6	2,250 O.D.

## 3528 SERIES HEAT EXCHANGERS



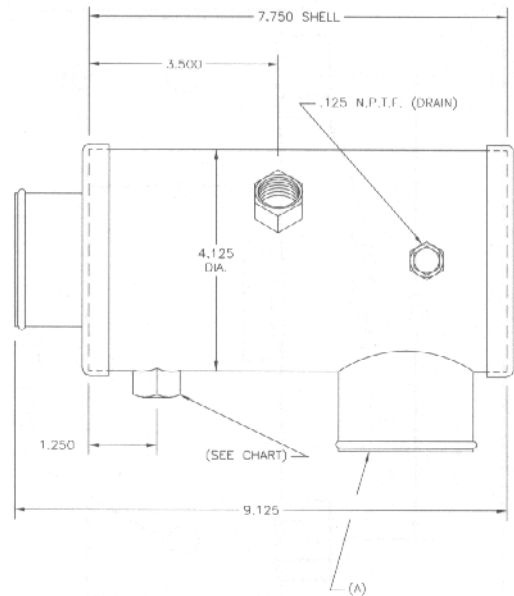
PART #	SHELL FTG. .250 N.P.T.F.	SHELL FTG. .375 N.P.T.F.	(A) 2PL	O.A.L.
3528	-01	-1	1,250 O.D.	11.687
3528	-02	-2	1,500 O.D.	11.687
3528	-03	-3	1,750 O.D.	11.687
3528	-04	-4	2,000 O.D.	11.687
3528	-05	-5	2,250 O.D.	11.687
3528	-06	-6	2,500 O.D.	11.687
3528	-07	-7	2,000 N.P.T.F.	12.500

## 13649 SERIES HEAT EXCHANGER



PART #	SHELL FTG. .250 N.P.T.F.	SHELL FTG. .375 N.P.T.F.	A (2PL)
13649	-01	-1	1,250 O.D.
13649	-02	-2	1,500 O.D.
13649	-03	-3	1,750 O.D.
13649	-04	-4	1,875 O.D.
13649	-05	-5	2,000 O.D.
13649	-06	-6	2,250 O.D.
13649	-07	-7	2,500 O.D.

## 12674 SERIES HEAT EXCHANGER

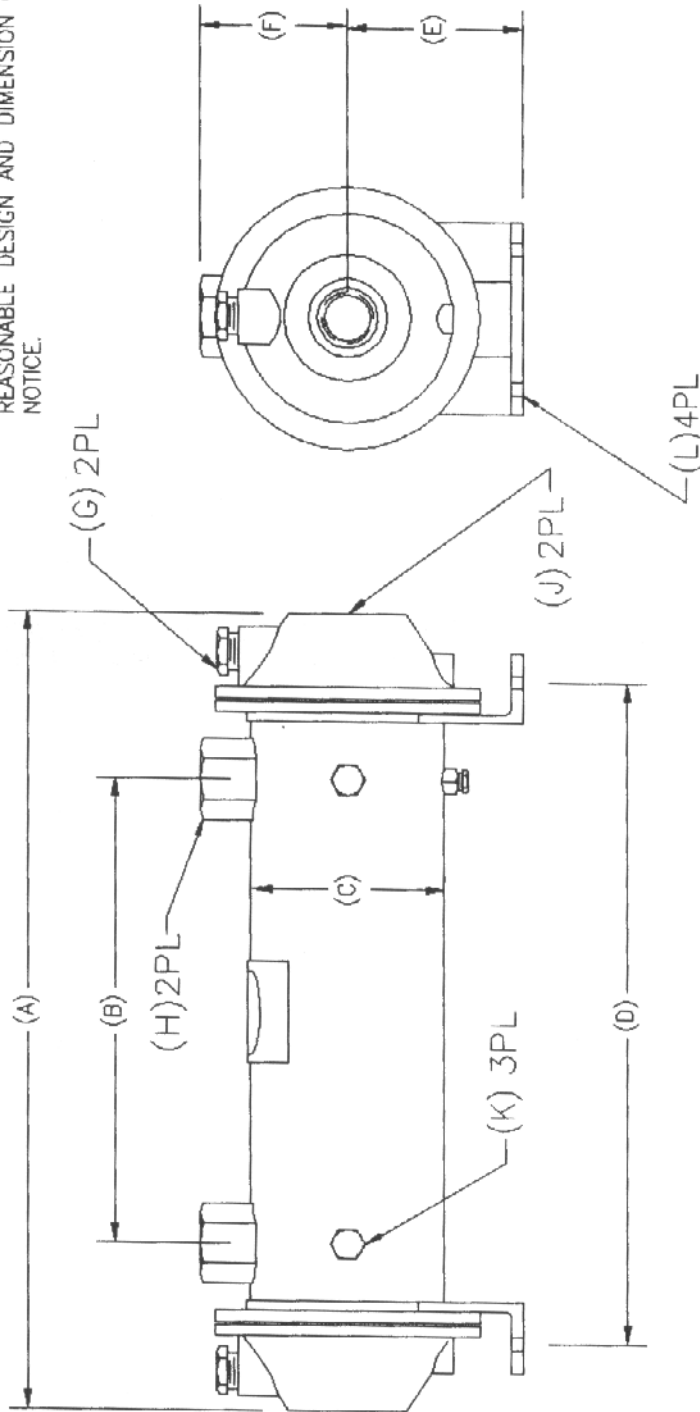


PART #	SHELL FTG. .250 N.P.T.F.	SHELL FTG. .375 N.P.T.F.	A (2PL)
12674	-01	-1	1,250 O.D.
12674	-02	-2	1,500 O.D.
12674	-03	-3	1,750 O.D.
12674	-04	-4	1,875 O.D.
12674	-05	-5	2,000 O.D.
12674	-06	-6	2,250 O.D.
12674	-07	-7	2,500 O.D.



STANDARD OIL COOLERS (1-PASS)

NOTE: SEN-DURE PRODUCTS RESERVE THE RIGHT TO MAKE REASONABLE DESIGN AND DIMENSION CHANGES WITHOUT NOTICE.



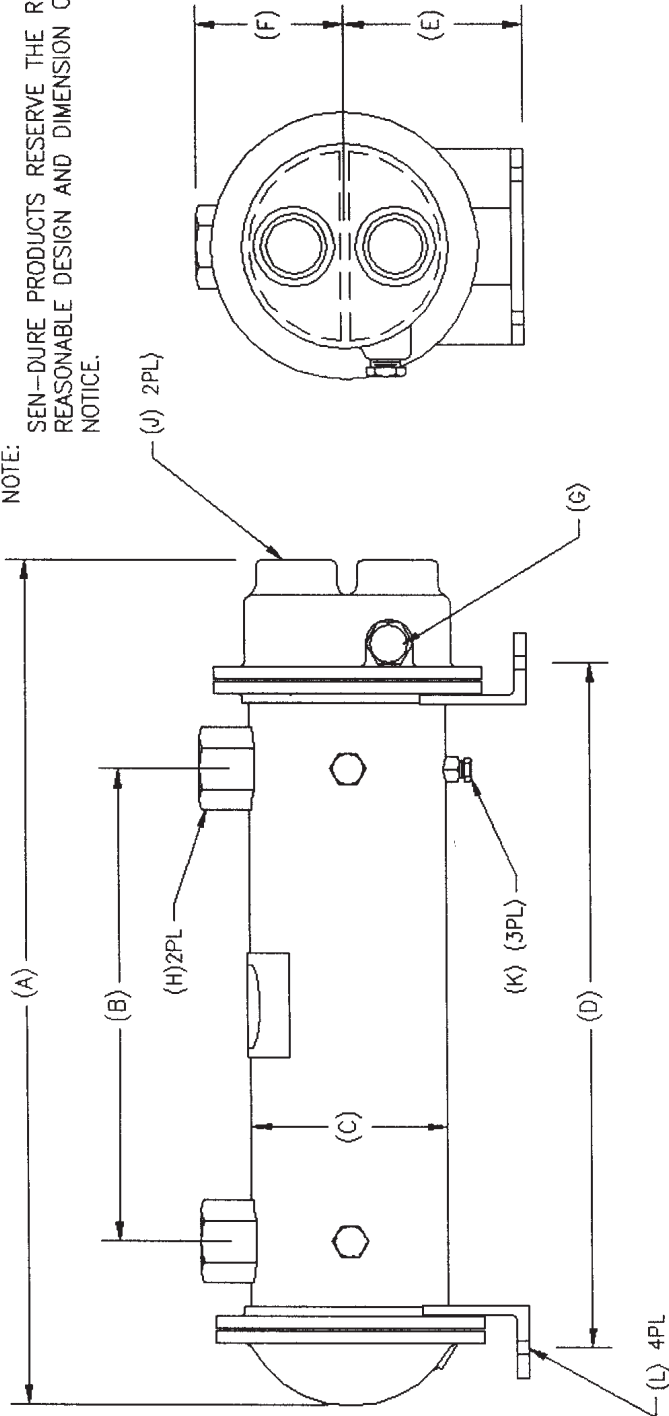
\*S.A.E. "O" Ring Fittings Available

MODEL	A	B	C	D	E	F	G N.P.T.F.	H N.P.T.F.	J N.P.T.F.	K N.P.T.F.	L
12894-1	17.18	10.0	3.12	16.38	2.75	2.76	.38	1.00	1.50	.25	.44
12894-2	27.18	20.0	3.12	26.38	2.75	2.76	.38	1.00	1.50	.25	.44
12895-1	17.87	9.00	4.12	16.62	3.50	3.25	.38	1.50	2.00	.25	.44
12895-2	27.87	19.00	4.12	26.62	3.50	3.25	.38	1.50	2.00	.25	.44
12895-3	39.87	31.00	4.12	38.62	3.50	3.25	.38	1.50	2.00	.25	.44
12896-1	19.09	9.00	5.12	17.12	4.00	3.75	.38	1.50	2.00	.25	.50X.75
12896-2	29.09	19.00	5.12	27.12	4.00	3.75	.38	1.50	2.00	.25	.50X.75
12896-3	41.09	31.00	5.12	39.12	4.00	3.75	.38	1.50	2.00	.25	.50X.75
12897-1	30.00	18.25	6.12	27.12	4.50	4.25	.50	2.00	3.00	.38	.50X.75
12897-2	42.00	30.25	6.12	39.12	4.50	4.25	.50	2.00	3.00	.38	.50X.75
12897-3	54.00	42.25	6.12	51.12	4.50	4.25	.50	2.00	3.00	.38	.50X.75
12897-4	66.00	54.25	6.12	63.12	4.50	4.25	.50	2.00	3.00	.38	.50X.75
12898-1	31.47	17.00	8.12	27.50	5.75	5.84	.50	3.00	4.00	.38	.62X.87
12898-2	43.47	29.00	8.12	39.50	5.75	5.84	.50	3.00	4.00	.38	.62X.87
12898-3	55.47	41.00	8.12	51.50	5.75	5.84	.50	3.00	4.00	.38	.62X.87
12898-4	67.47	53.00	8.12	63.50	5.75	5.84	.50	3.00	4.00	.38	.62X.87
12898-5	79.47	65.00	8.12	75.50	5.75	5.84	.50	3.00	4.00	.38	.62X.87



# STANDARD OIL COOLER (2-PASS)

NOTE: SEN-DURE PRODUCTS RESERVE THE RIGHT TO MAKE REASONABLE DESIGN AND DIMENSION CHANGES WITHOUT NOTICE.



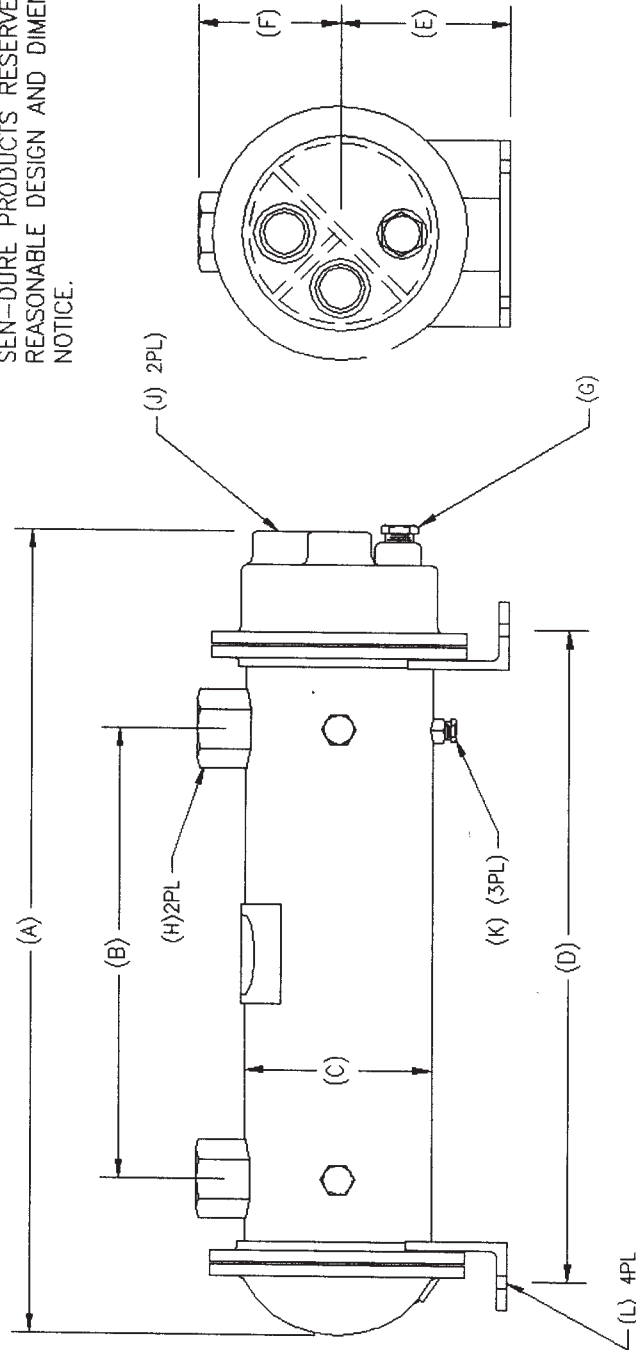
\*S.A.E. "O" Ring Fittings Available

MODEL	A	B	C	D	E	F	G	H	J	K	L
							N.P.T.F.	N.P.T.F.	N.P.T.F.	N.P.T.F.	
12899-1	17.12	10.00	3.12	16.38	2.75	2.76	.38	1.00	1.00	.25	.44
12899-2	27.12	20.00	3.12	26.38	2.75	2.76	.38	1.00	1.00	.25	.44
12900-1	17.88	9.00	4.12	16.662	3.50	3.25	.38	1.50	1.25	.25	.44
12900-2	27.88	19.00	4.12	26.62	3.50	3.25	.38	1.50	1.25	.25	.44
12900-3	39.88	31.00	4.12	38.62	3.50	3.25	.38	1.50	1.25	.25	.44
12901-1	18.62	9.00	5.12	17.12	4.00	3.75	.38	1.50	1.50	.25	.50X.75
12901-2	28.62	19.00	5.12	27.12	4.00	3.75	.38	1.50	1.50	.25	.50X.75
12901-3	40.62	31.00	5.12	39.12	4.00	3.75	.38	1.50	1.50	.25	.50X.75
12902-1	29.03	18.25	6.12	27.13	4.50	4.25	.50	2.00	2.00	.38	.50X.75
12902-2	41.03	30.25	6.12	39.13	4.50	4.25	.50	2.00	2.00	.38	.50X.75
12902-3	53.03	42.25	6.12	51.13	4.50	4.25	.50	2.00	2.00	.38	.50X.75
12902-4	65.03	54.25	6.12	63.13	4.50	4.25	.50	2.00	2.00	.38	.50X.75
12903-1	30.62	17.00	8.12	27.50	5.75	5.84	.50	3.00	2.50	.38	.62X.88
12903-2	42.62	29.00	8.12	39.50	5.75	5.84	.50	3.00	2.50	.38	.62X.88
12903-3	54.62	41.00	8.12	51.50	5.75	5.84	.50	3.00	2.50	.38	.62X.88
12903-4	66.62	53.00	8.12	63.50	5.75	5.84	.50	3.00	2.50	.38	.62X.88
12903-5	78.62	65.00	8.12	75.50	5.75	5.84	.50	3.00	2.50	.38	.62X.88



# STANDARD OIL COOLER (4-PASS)

NOTE: SEN-DURE PRODUCTS RESERVE THE RIGHT TO MAKE REASONABLE DESIGN AND DIMENSION CHANGES WITHOUT NOTICE.



\* S.A.E. "O" Ring Fittings Available

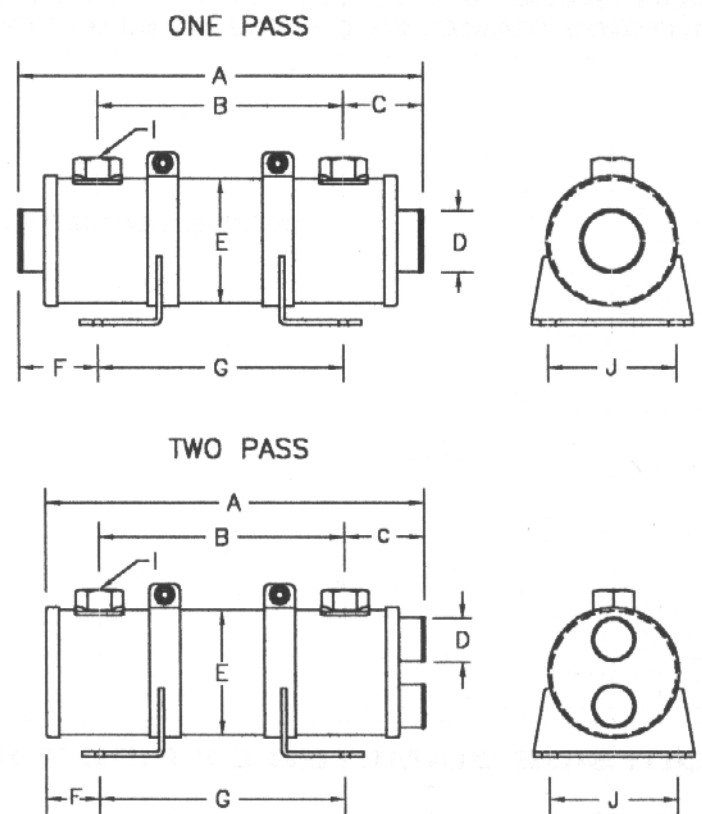
MODEL	A	B	C	D	E	F	G	H	J	K	L
							N.P.T.F.	N.P.T.F.	N.P.T.F.	N.P.T.F.	
12905-1	17.12	10.00	3.125	16.38	2.75	2.76	.38	1.00	.75	.25	.44
12905-2	27.12	20.00	3.12	26.38	2.75	2.76	.38	1.00	.75	.25	.44
12906-1	17.88	9.00	4.12	16.62	3.50	3.25	.38	1.50	.75	.25	.44
12906-2	27.88	19.00	4.12	26.62	3.50	3.25	.38	1.50	.75	.25	.44
12906-3	39.88	31.00	4.12	38.62	3.50	3.25	.38	1.59	.75	.25	.44
12907-1	18.81	9.00	5.12	17.12	4.00	3.75	.38	1.50	1.00	.25	.50X.75
12907-2	28.81	19.00	5.12	27.12	4.00	3.75	.38	1.50	1.00	.25	.50X.75
12907-3	40.81	31.00	5.12	39.12	4.00	3.75	.38	1.50	1.00	.25	.50X.75
12908-1	29.13	18.25	6.12	27.13	4.50	4.25	.38	2.00	1.50	.38	.50X.75
12908-2	41.13	30.25	6.12	39.13	4.50	4.25	.38	2.00	1.50	.38	.50X.75
12908-3	53.13	42.25	6.12	51.13	4.50	4.25	.38	2.00	1.50	.38	.50X.75
12908-4	65.13	54.25	6.12	63.13	4.50	4.25	.38	2.00	1.50	.38	.50X.75
12909-1	29.86	17.00	8.12	27.50	5.75	5.84	.50	3.00	2.00	.38	.62X.88
12909-2	41.86	29.00	8.12	39.50	5.75	5.84	.50	3.00	2.00	.38	.62X.88
12909-3	53.86	41.00	8.12	51.50	5.75	5.84	.50	3.00	2.00	.38	.62X.88
12909-4	65.86	53.00	8.12	63.50	5.75	5.84	.50	3.00	2.00	.38	.62X.88
12909-5	77.86	65.00	8.12	75.50	5.75	5.84	.50	3.00	2.00	.38	.62X.88





# STEWART WARNER

## VEHICLE TRANSMISSION OIL COOLERS SERCK/STEWART WARNER REPLACEMENTS



SEN-DURE	S/W	A	B	C	D	E	F	G	PASS	I	J
13745/1/5	3-1105A	16.62	8.12	4.25	3.00	5.12	4.18	8.25	1	1.00"NPTF	5.50
13746/1/5	3-1127A	18.25	8.12	4.94	3.00	6.12	4.40	9.62	1	1.25"NPTF	6.25
13747/1/5	3-1178A	17.68	9.62	3.94	2.25	4.12	5.40	7.00	1	0.75"NPTF	3.00
13748/1/5	3-1179B	28.25	17.00	5.50	3.00	6.12	5.12	17.75	1	2.00"NPTF	6.25
13749/1/5	3-1234A	17.87	8.12	4.75	3.00	5.12	4.68	8.25	1	1.00"NPTF	5.50
13750/1/5	3-1249B	21.75	12.00	4.75	3.00	5.12	5.00	11.50	1	1.31"O-RING	5.50
13751/1/5	3-1259B	22.12	12.00	4.93	3.00	6.12	4.93	12.00	1	1.62"O-RING	6.25
13752/1/5	3-1279B	27.12	17.00	4.93	3.00	6.12	4.56	17.75	1	1.62"O-RING	6.25
13753/1/5	3-1192A	16.62	8.12	4.93	2.25	6.12	2.68	9.62	2	1.25"NPTF	6.25
13754/1/5	3-1255A	15.87	8.12	4.50	2.25	5.12	2.93	8.25	2	0.75"O-RING	5.50
13755/1/5	3-1270A	20.62	12.00	4.93	2.75	6.12	3.43	12.00	2	1.62"O-RING	6.25
13756/1/5	3-1274B	25.62	17.00	4.93	2.75	6.12	3.06	17.75	2	1.62"O-RING	6.25
13757/1/5	3-1284A	19.75	12.00	4.75	2.75	6.12	7.28	3.43	2	1.62"O-RING	6.25
14032/1/5	3-1283A	16.00	8.12	3.81	2.25	6.12	3.06	9.62	1	1.25"NPTF	6.25
14038/1/5	3-1304A	18.12	9.87	4.75	2.25	6.12	3.50	9.37	2	1.31"O-RING	6.25

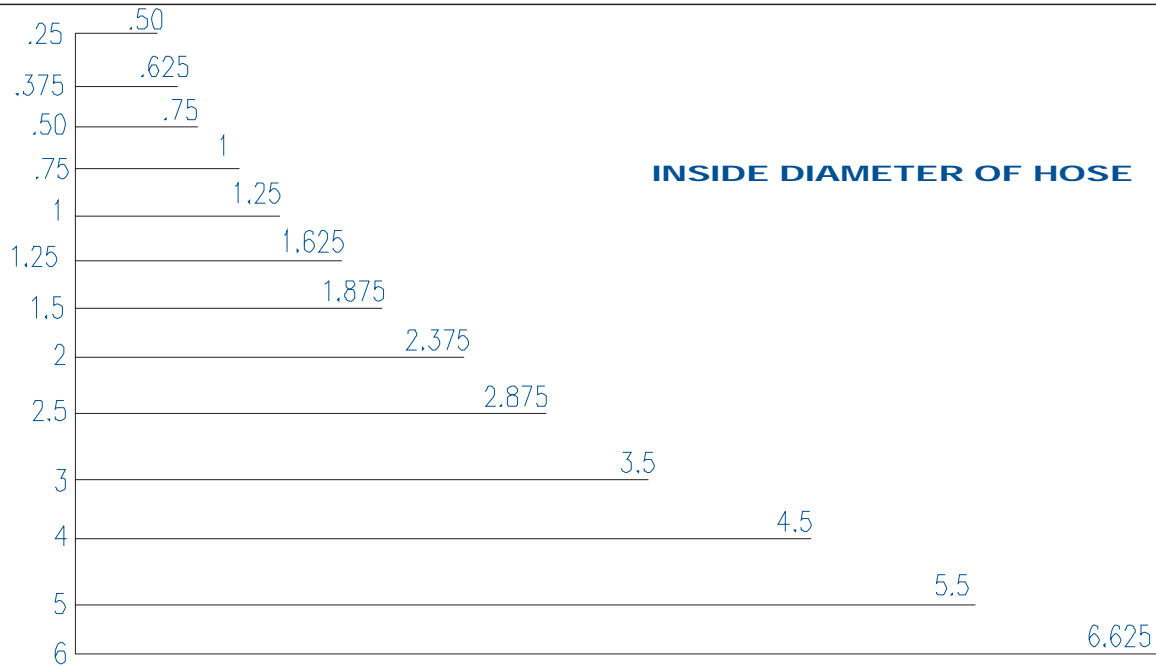
SEN-DURE DIMENSIONS MAY VARY SLIGHTLY FROM S/W. PLEASE CHECK DIMENSIONS BEFORE ORDERING.  
(Rev.#1)



# PIPE TO HOSE CONVERSIONS

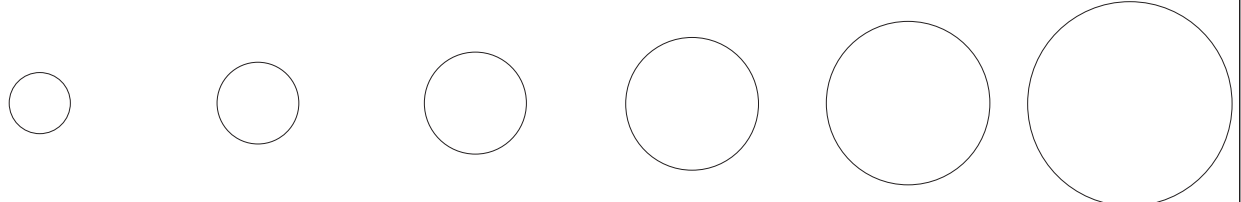
## PIPE TO HOSE CONVERSIONS

**CONVERSION TABLE OF PIPE SIZE O.D. TO HOSE SIZE I.D.  
ACTUAL OUTSIDE DIAMETER OF .250 TO 6.000 PIPE (I.P.S.)**



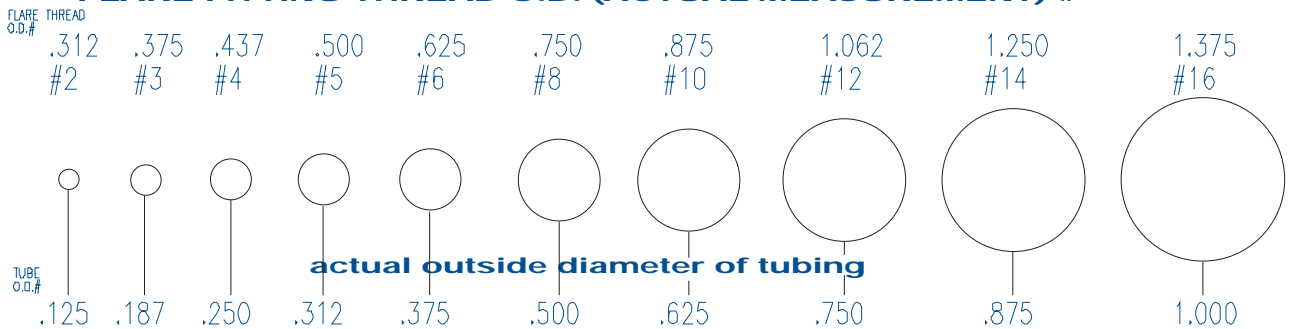
### ACTUAL OUTSIDE DIAMETER OF PIPE THREADS (I.P.S.)

.125 PIPE MEASURES	.250 PIPE MEASURES	.375 PIPE MEASURES	.500 PIPE MEASURES	.750 PIPE MEASURES	1.000 PIPE MEASURES
.375 O.D.	.500 O.D.	.625 O.D.	.812 O.D.	1.000 O.D.	1.250 O.D.



.125 PIPE	.250 PIPE	.375 PIPE	.500 PIPE	.750 PIPE	1.000 PIPE
27 T.P.I.	18 T.P.I.	18 T.P.I.	14 T.P.I.	14 T.P.I.	11.50 T.P.I.

### FLARE FITTING THREAD O.D. (ACTUAL MEASUREMENT)-#





## ENGINE HEAT EXCHANGER SIZING REQUIREMENTS

Company Name: \_\_\_\_\_ Date: \_\_\_\_\_  
Contact: \_\_\_\_\_ Reference: \_\_\_\_\_  
Phone #: \_\_\_\_\_ Quantity Req'd.: \_\_\_\_\_  
Fax #: \_\_\_\_\_ Date Req'd.: \_\_\_\_\_

Type of Service: \_\_\_\_\_

Engine or Motor Make/Model \_\_\_\_\_

Rated Horsepower: \_\_\_\_\_ Engine or Motor RPM: \_\_\_\_\_

Shell Side Fluid: \_\_\_\_\_ Tube Side Fluid: \_\_\_\_\_

Operating Pressure: \_\_\_\_\_ Operating Pressure: \_\_\_\_\_

Flow Rate (GPM) @ rated RPM  
or max. allowable flow: \_\_\_\_\_ Flow Rate (GPM) @ rated RPM  
or max. allowable flow: \_\_\_\_\_

Maximum Inlet Temperature: \_\_\_\_\_ Maximum Inlet Temperature: \_\_\_\_\_

Desired Outlet Temperature: \_\_\_\_\_ Desired Outlet Temperature: \_\_\_\_\_

Max. Allowable Pressure Drop: \_\_\_\_\_ Max. Allowable Pressure Drop: \_\_\_\_\_

Connection Sizes Desired: \_\_\_\_\_ Connection Sizes Desired: \_\_\_\_\_

Heat to be Rejected: \_\_\_\_\_

### DESIRED MATERIALS OF CONSTRUCTION

Shell: \_\_\_\_\_ Tubes \_\_\_\_\_ Tubesheets: \_\_\_\_\_ Bonnets/Covers: \_\_\_\_\_

Surge Tank Required? \_\_\_\_\_ (Yes or No)  
If Yes, then check your desired type: Separate Tank: \_\_\_\_\_ Size: \_\_\_\_\_

Horiz. Integral Tank: \_\_\_\_\_ Size: \_\_\_\_\_

Vert. Integral Tank: \_\_\_\_\_ Size: \_\_\_\_\_



ORIGINAL EQUIPMENT MANUFACTURERS



▼ **FREIGHTLINER**

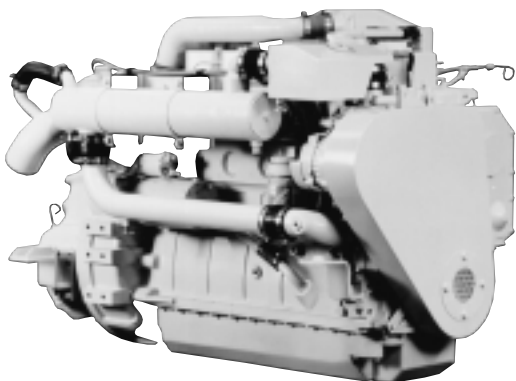
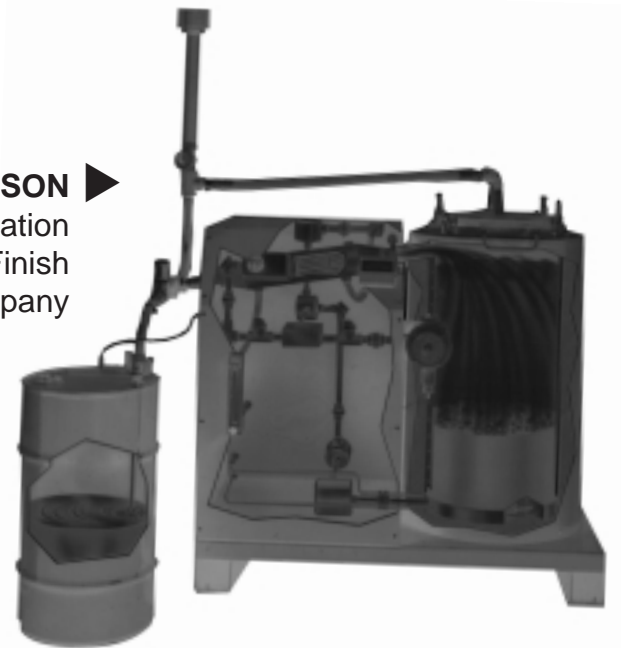
Oil Coolers  
Military and Commercial Applications



◀ **HORMEL  
FOOD PROCESSING**

**FINISH THOMPSON** ▶  
Solvent Distillation  
Cooler for Finish  
Company

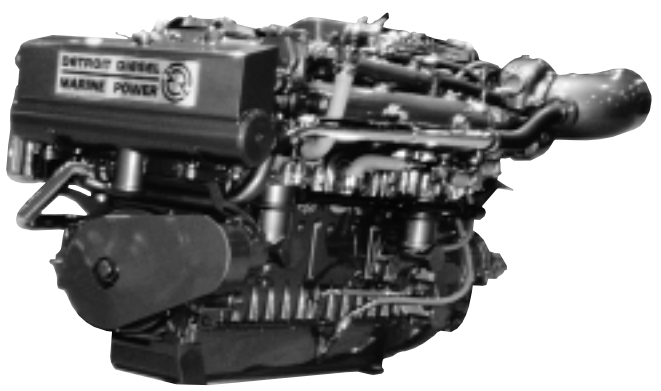
**CUMMINS MARINE  
HEAT EXCHANGER**



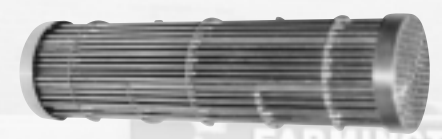
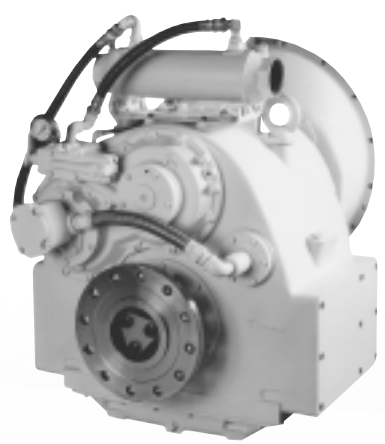


ORIGINAL EQUIPMENT MANUFACTURERS

DETROIT DIESEL  
▼ HEAT EXCHANGER 671



HIGH PRESSURE  
MARINE GEAR ▶





## Quality Policy

The SEN-DURE goal is to be recognized as the leader in the Heat Transfer industry and to be identified by our customers as the one that all others are measured against.

To meet the goal SEN-DURE is fully committed to the continuous improvement of our products and services in accordance with ISO-9000 standards.

SEN-DURE realizes that providing products of consistently high quality and reliability is the key to success and it is essential that management/employee attitude and behavior support this policy.



## SEN-DURE PRODUCTS, INC.

6785 N.W. 17th Avenue  
Fort Lauderdale, FL 33309

Phone: 954-973-1260 • Fax: 954-968-7213

e-mail: [sen-dure@worldnet.att.net](mailto:sen-dure@worldnet.att.net) • Website: [www.sen-dure.com](http://www.sen-dure.com)