

# FORM U-1 MANUFACTURERS' DATA REPORT FOR PRESSURE VESSELS

As required by the Provisions of the ASME Code Rules Section VIII Division 1 1961 J08 19311.9

1. Manufactured by MANNING & LEWIS ENG. CO., 675 RAHWAY AVE., UNION, N. J. 07083  
(Name and address of manufacturer)
2. Manufactured for CATALYTIC INC. 90 SKELLY OIL CO. EL DORADO KANSAS  
(Name and address of Purchaser)
3. Type HORIZ Kind HEAT EXCH Vessel No. (7174) (Mfrs. Serial) (State & State No.) Natl. Bd. No. 3798 Yr. Built 1974  
(Horiz. or Vert.) (Tank, Jacketed, Heat Exch.)

Items 4-9 incl. to be completed for single wall vessels (such as air tanks), jackets of jacketed vessels, or shells of heat exchangers.

4. SHELL: Material SA-240-304 T.S. 75,000 Nom. Tks. 3/16 in. Corr. Allow. 0 in. Dia. 2 Ft. 0 in. Lgth. 11 Ft. 10 1/4 in.  
(Kind and Spec. No.) (Fig. or F.B. & Spec. Min. T.S.)
5. SEAMS: Long DBL BUTT H.T. NO R.T. NO Sectioned NO Efficiency 70 %  
(Welded, Dbl., Single, Lap, Butt) (Yes or No) (Spot or Complete) (Yes or No)
- Girth GROOVE H.T. NO R.T. NO Sectioned NO No. of Courses 1

If riveted describe seams fully on reverse side of form

6. HEADS: (a) Material T.S. (b) Material T.S.
- | Location (Top, bottom, ends) | Thickness | Crown Radius | Knuckle Radius | Elliptical Ratio | Conical Apex Angle | Hemispherical Radius | Flat Diameter | Side to Pressure (Convex or Concave) |
|------------------------------|-----------|--------------|----------------|------------------|--------------------|----------------------|---------------|--------------------------------------|
| (a)                          |           |              |                |                  |                    |                      |               |                                      |
| (b)                          |           |              |                |                  |                    |                      |               |                                      |
- If removable, bolts used (Material, Spec. No., T.S., Size, Number) Other fastening (Describe or Attach Sketch)

7. STAYBOLTS: (Material) If hollow (Size of Hole) Attachment (Threaded, Welded) Pitch X Diam. (Horiz.) (Vert.) (Nominal)

8. JACKET CLOSURE: (DESCRIBE AS OGEE & WELD, BAR, ETC. IF BAR, GIVE DIMENSIONS. IF BOLTED, DESCRIBE OR SKETCH).

9. Constructed for max. allowable working press. 15 psi. at max. temp. 275 °F. Min. temp. (when less than -20°) °F. Hydrostatic Pneumatic or Test Combination Press. 25 psi.

Items 10 and 11 to be completed for tube sections.

10. TUBE SHEETS: Stationary. Material SA-240-304 Dia. 26.06 In. Tks. 1 In. Attachment WELDED  
(Kind & Spec. No.) (Subject to Pressure) (Welded, Bolted) (CLAMPED)
- Floating. Material (Kind & Spec. No.) Dia. (In.) Tks. (In.) Attachment (In.)

11. TUBES: Material SA-249-304 O.D. 3/4 In. Thickness 16 In. or Gage Number 412 Type STR  
(Kind & Spec. No.) (Straight or U)

Items 12-15 incl. to be completed for inner chambers of jacketed vessels, or channels of heat exchangers.

12. SHELL: Material SA-53-B T.S. 60,000 Nom. Tks. 3/8 in. Corr. Allow. 1/16 in. Dia. 2 Ft. 0 in. Lgth. 1 Ft. 9 1/4 in.  
(Kind and Spec. No.) (Fig. or F.B. & Spec. Min. T.S.)
13. SEAMS: Long SMLS H.T. NO R.T. NO Sectioned NO Efficiency 100 %  
(Welded, Dbl., Single, Lap, Butt) (Yes or No) (Spot or Complete) (Yes or No)
- Girth DBL BUTT H.T. NO R.T. NO Sectioned NO No. of courses 1

If riveted describe seams fully on reverse side of form

14. HEADS: (a) Material SA-516-70 T.S. 70,000 (b) Material T.S. (c) Material T.S.
- | Location              | Thickness  | Crown Radius | Knuckle Radius | Elliptical Ratio | Conical Apex Angle | Hemispherical Radius | Flat Diameter | Side to Pressure (Convex or Concave) |
|-----------------------|------------|--------------|----------------|------------------|--------------------|----------------------|---------------|--------------------------------------|
| (a) Top, bottom, ends | <u>3/8</u> | <u>19.2</u>  | <u>1 1/16</u>  |                  |                    |                      |               | <u>CONCAVE</u>                       |
| (b) Channel           |            |              |                |                  |                    |                      |               |                                      |
| (c) Floating          |            |              |                |                  |                    |                      |               |                                      |

- If removable, bolts used (a) SA-193-B1, 125,000, 1/2"-11" (24) (b) (Material, Spec. No., T.S., Size, Number) (c) (Material, Spec. No., T.S., Size, Number) Other fastening (Describe or Attach Sketch)

15. Constructed for max. allowable working press. 75 psi. at max. temp. 200 °F. Min. temp. (when less than -20°) °F. Hydrostatic Pneumatic or Test Combination Press. 113 psi.

Items below to be completed for all vessels where applicable.

16. SAFETY VALVE OUTLETS: Number (Size) Location (Location)

17. NOZZLES:
- | Purpose (Inlet, Outlet, Drain) | Number   | Diam. or Size   | Type           | Material          | Thickness    | Reinforcement Material | How Attached  |
|--------------------------------|----------|-----------------|----------------|-------------------|--------------|------------------------|---------------|
| <u>INLET</u>                   | <u>1</u> | <u>10"-150"</u> | <u>FLANGED</u> | <u>SA-240-304</u> | <u>1/8</u>   |                        | <u>WELDED</u> |
| <u>OUTLET</u>                  | <u>1</u> | <u>6"-150"</u>  | <u>FLANGED</u> | <u>SA-312-304</u> | <u>5/105</u> |                        | <u>WELDED</u> |
| <u>OUTLET</u>                  | <u>1</u> | <u>3"-150"</u>  | <u>FLANGED</u> | <u>SA-312-304</u> | <u>5/905</u> |                        | <u>WELDED</u> |
| <u>INLET/OUTLET</u>            | <u>2</u> | <u>6"-150"</u>  | <u>FLANGED</u> | <u>SA-53-B</u>    | <u>5/90</u>  |                        | <u>WELDED</u> |
| <u>DRAIN</u>                   | <u>1</u> | <u>3/4" NPT</u> | <u>SCREWED</u> | <u>SA-192-304</u> | <u>3000"</u> |                        | <u>WELDED</u> |
| <u>VENT/DRAIN</u>              | <u>2</u> | <u>3/4" NPT</u> | <u>SCREWED</u> | <u>SA-192-1</u>   | <u>3000"</u> |                        | <u>WELDED</u> |

VR-34580-0601-15-1301 C-3030-B

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18. INSPECTION Manholes, No. \_\_\_\_\_ Size \_\_\_\_\_ Location \_\_\_\_\_  
 OPENINGS: Handholes, No. \_\_\_\_\_ Size \_\_\_\_\_ Location \_\_\_\_\_  
 Threaded, No. \_\_\_\_\_ Size \_\_\_\_\_ Location \_\_\_\_\_
19. SUPPORTS: Skirt \_\_\_\_\_ Lugs \_\_\_\_\_ Legs 2 Other \_\_\_\_\_ Attached WELDED TO SHELL  
 (Yes or No) (Number) (Number) (Describe) (Where & How)

## 20. REMARKS:

24-144 ACETONE REFINING CONDENSER WITH ACETONE ON  
SHELL SIDE & WATER ON TUBE SIDE.

DESIGN FACTOR FOR SMLS SECTIONS PER UW-11/12: .8

(Brief description of purpose of the vessel, as Air Tank, After Cooler, Jacketed Cooker, etc. State contents of each part.)

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for unfired Pressure Vessels, Section VIII Division 1

Date 10/29/77 19 \_\_\_\_\_ Signed MANNING & LEWIS ENG. CO.

MANUFACTURER

By AW. Sault

Certificate of Authorization No. 1574

EXPIRES 12/31/77

## CERTIFICATE OF SHOP INSPECTION

VESSEL MADE BY MANNING & LEWIS ENG. CO. at UNION, N. J.

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province N.Y. and employed by EMPLOYERS-COMMERCIAL UNION INSURANCE CO. OF AMER. of BOSTON, MASS. have inspected the pressure vessel described in this manufacturer's data report on March 16, 1974 and state that to the best of my knowledge and belief, the manufacturer has constructed this pressure vessel in accordance with the applicable sections of the ASME Boiler and Pressure Vessel Code.

By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this manufacturer's data report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date March 16, 1974Inspector's Signature A. Cullick

Commissions \_\_\_\_\_

NAT'L. BD. 4683

Nat'l Board or State and No.

## CERTIFICATE OF FIELD ASSEMBLY INSPECTION

I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the State or Province \_\_\_\_\_ and employed by \_\_\_\_\_ of \_\_\_\_\_

\_\_\_\_\_ have compared the statements in this manufacturer's data report with the described pressure vessel and state that parts referred to as data items \_\_\_\_\_ not included in the certificate of shop inspection have been inspected by me and that to the best of my knowledge and belief the manufacturer has constructed and assembled this pressure vessel in accordance with the applicable sections of the ASME Boiler and Pressure Vessel Code. The described vessel was inspected and subjected to a hydrostatic test of \_\_\_\_\_ psi.

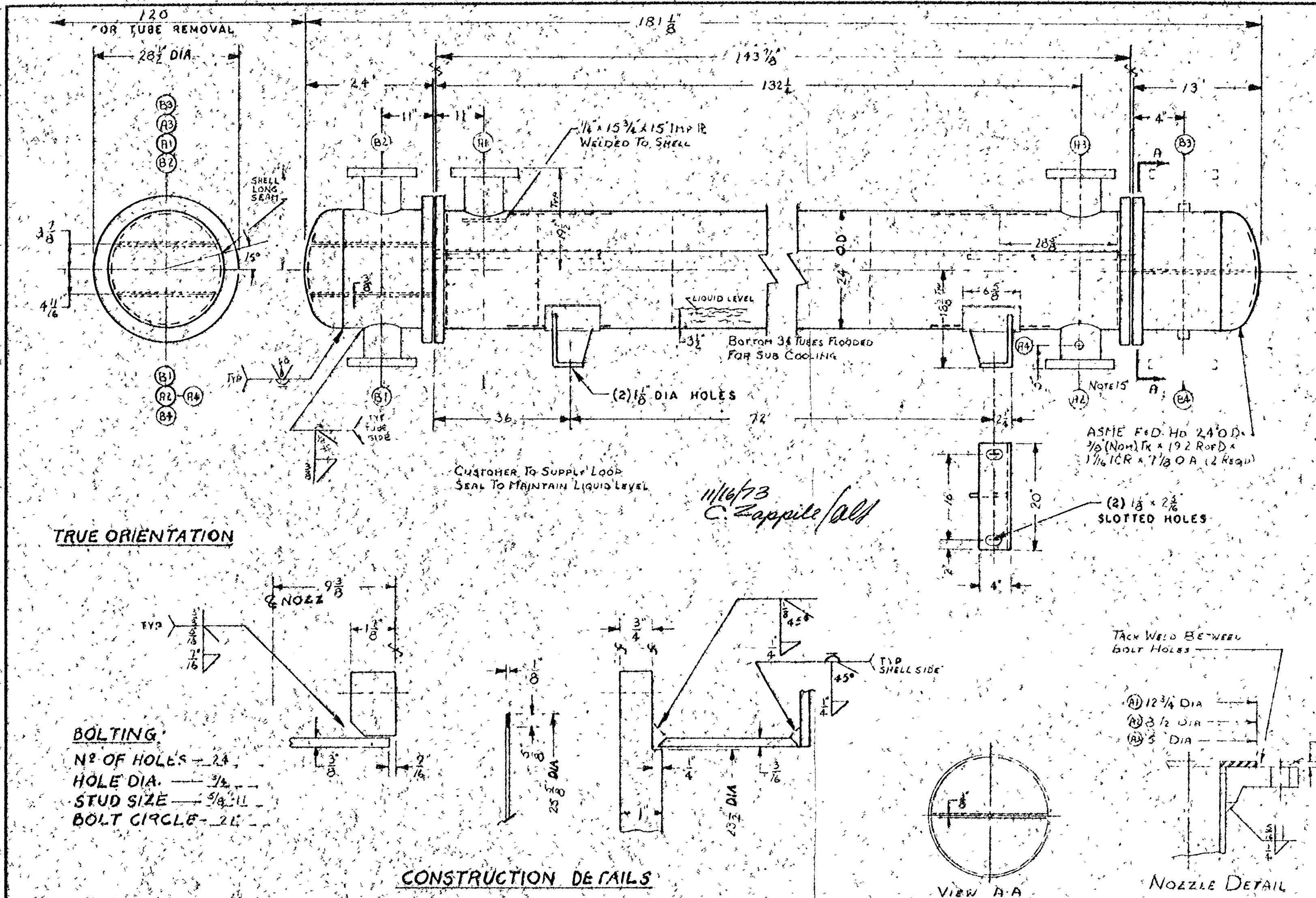
By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this manufacturer's data report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.

Date \_\_\_\_\_ 19 \_\_\_\_\_

Inspector's Signature \_\_\_\_\_

Commissions \_\_\_\_\_

Nat'l Board or State and No. \_\_\_\_\_



CONSTRUCTION TO COMPLY WITH ASME CODE SECT VIII 1911 ED. INCLUDING CERT AND STAMP (FORM U-1)

DIVISION - I TEMA CL. C

FOR INSTALLATION IN STATE OF KAN

| SHELL SIDE | CONDITIONS         | TUBE SIDE |
|------------|--------------------|-----------|
| 75         | DES. PRESS (PSIG.) | 75        |
| 275        | DES. TEMP (°F)     | 200       |
| 25         | TEST PRESS (PSIG)  | 113       |
|            | DESIGN FLUID       |           |

ACETONE WATER

WEIGHT (LBS) EMPTY 1200 FLOODED 7600

### GENERAL NOTES

|                                                 | REQ'D | SHELL | CHAN | NOT | REC'D |
|-------------------------------------------------|-------|-------|------|-----|-------|
| 1 DEHYDRATE                                     |       |       |      |     |       |
| 2 HALOGEN TEST AT PSIG SA-7540                  |       |       |      |     |       |
| 3 AIR AND SOAP TEST REINF. PADS AT PSIG FACINGS |       |       |      |     |       |
| 4 X-RAY SPOT FULL                               |       |       |      |     |       |
| 5 POST WELD HEAT TREAT                          |       |       |      |     |       |
| 6 SANDBLAST C.S AFTER FAB. PER SSPC             | EXT.  |       |      |     |       |
| 7 PICKLE                                        | INT.  |       |      |     |       |
| 8 PAINT EXTERIOR C.S ONE SHOP COAT GRAY         |       |       |      |     |       |

|                               | REQ | SHELL | CHAN | NOT | REC'D |
|-------------------------------|-----|-------|------|-----|-------|
| 9 TUBE END WELDING SA-8571    |     |       |      |     |       |
| 10 TUBE HOLE GROOVING SA-8480 |     |       |      |     |       |
| 11 CUSTOMER'S NAME PLATE      |     |       |      |     |       |
| 12 NOZZLE PROTECTION M&L STD  |     |       |      |     |       |
|                               |     |       |      |     |       |
| 13 SPARE PARTS                |     |       |      |     |       |

|                                                          | REQ | SHELL | CHAN | NOT | REC'D |
|----------------------------------------------------------|-----|-------|------|-----|-------|
| 14 IMPACT TEST WELD BASE HEAT AFFECTED METAL METAL ZONE  |     |       |      |     |       |
| 15 CUSTOMER TO SUPPLY LOOP SEAL TO MAINTAIN LIQUID LEVEL |     |       |      |     |       |

### TECHNICAL SERVICES FILES

This Document Not to be Removed Without Proper Checkout.

FILE NO C-3030B

| PART                   | CARBON STEEL              | STAINLESS STEEL 304 | PART       | C.S.                      | 85             | MATERIAL NOTES                                            |
|------------------------|---------------------------|---------------------|------------|---------------------------|----------------|-----------------------------------------------------------|
| BARREL                 | SA 53 100 280 315 181 105 | SA 312 240 182      | TUBE SHEET | SA 53 100 280 315 181 105 | SA 312 240 182 | STAINLESS STEEL ELC (EXTRA LOW CARBON) (0.03% CARBON MAX) |
| UNIT FLANGE            |                           |                     |            |                           |                |                                                           |
| FORMED HEAD            |                           |                     |            |                           |                |                                                           |
| NOZZLE NECK            |                           |                     |            |                           |                |                                                           |
| NOZZLE FLG.            |                           |                     |            |                           |                |                                                           |
| NOZZLE NECK EXP. JOINT |                           |                     |            |                           |                |                                                           |
| CONE                   |                           |                     |            |                           |                |                                                           |
| REINF. PAD             |                           |                     |            |                           |                |                                                           |
| SCR. FTGS.             |                           |                     |            |                           |                |                                                           |
| WELD FTGS.             |                           |                     |            |                           |                |                                                           |
| BARREL                 |                           |                     |            |                           |                |                                                           |
| UNIT FLANGE            |                           |                     |            |                           |                |                                                           |
| FORMED HEAD            |                           |                     |            |                           |                |                                                           |
| NOZZLE NECK            |                           |                     |            |                           |                |                                                           |
| NOZZLE FLG.            |                           |                     |            |                           |                |                                                           |
| NOZZLE NECK EXP. JOINT |                           |                     |            |                           |                |                                                           |
| CONE                   |                           |                     |            |                           |                |                                                           |
| REINF. PAD             |                           |                     |            |                           |                |                                                           |
| SCR. FTGS.             |                           |                     |            |                           |                |                                                           |
| WELD FTGS.             |                           |                     |            |                           |                |                                                           |

| NO. | SIZE | RTG. | FACE | TYPE | NECK  | REMARKS | SERVICE |
|-----|------|------|------|------|-------|---------|---------|
| A1  | 10"  | 150  | RF   | 50   | 1/8"  | SEE DET | INLET   |
| A2  | 6"   | 150  | RF   | 50   | 3/16" | SEE DET | OUTLET  |
| A3  | 3"   | 150  | RF   | 50   | 7/16" | SEE DET | OUTLET  |
| A4  | 3/4" | 3000 |      | HC   | PLUG  |         | DRAIN   |
| B4  | 3/4" | 3000 |      | HC   | PLUG  |         | DRAIN   |
| B3  | 3/4" | 3000 |      | HL   | PLUG  |         | VENT    |
| B2  | 6"   | 150  | RF   | 50   | 7/16" |         | OUTLET  |
| B1  | 6"   | 150  | RF   | 50   | 7/16" |         | INLET   |

|                                |  |
|--------------------------------|--|
| CUSTOMER: CATALYTIC INC.       |  |
| P.O. NO. 34580-0601-15         |  |
| ENGINEERS:                     |  |
| NO. OF UNITS REQUIRED: 110     |  |
| M&L SERIAL NO. 7174            |  |
| NAT'L BD NO. 3743              |  |
| TAG: P.O. No C-3030B           |  |
| FILE NO C-3030B                |  |
| VP 34580 0601-15 2RL           |  |
| INSPECTION BY CUSTOMER         |  |
| M&L JOB NO. 19311-2            |  |
| MANNING & LEWIS ENGINEERING CO |  |
| UNION N. J.                    |  |
| 24-144 ACETONE                 |  |
| REFINING CONDENSER             |  |
| SCALE                          |  |
| MADE                           |  |
| EKD                            |  |
| DATE                           |  |
| DRAWING NO                     |  |
| REV                            |  |