

BAB V

PENUTUP

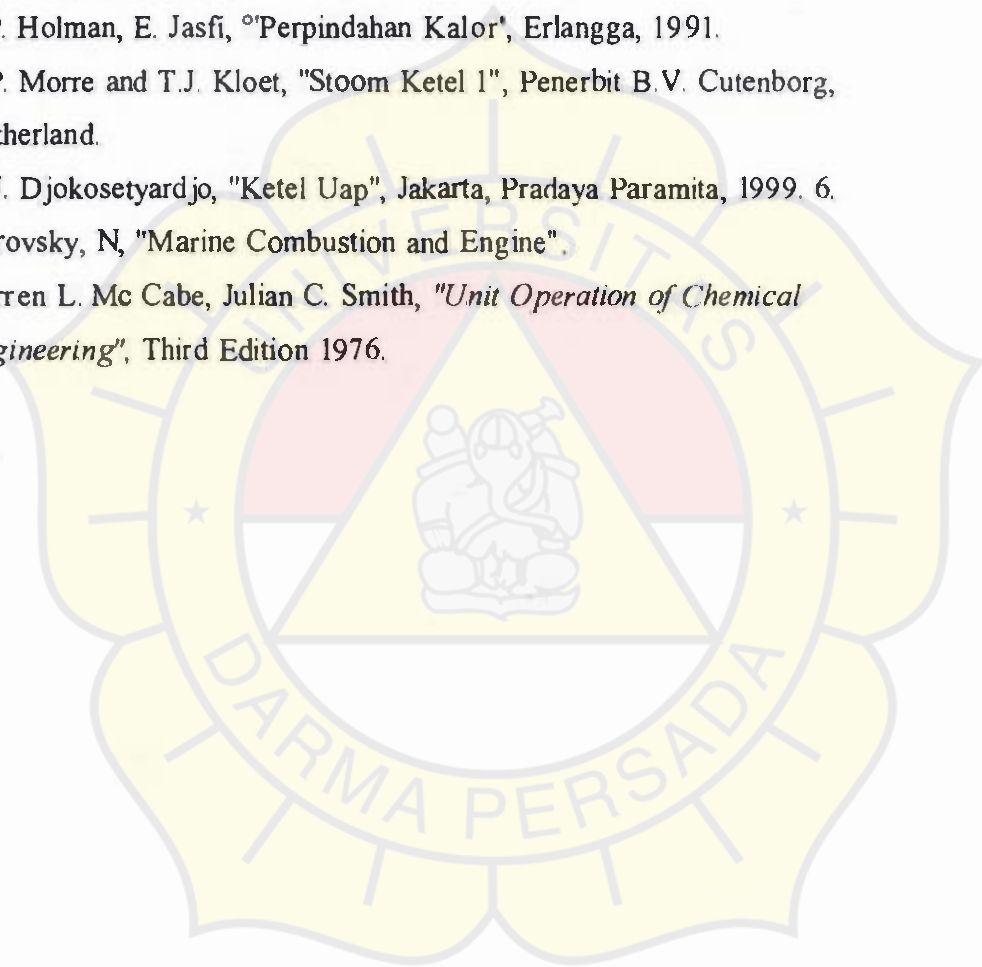
Berdasarkan hasil perhitungan dan pengamatan di lapangan maka dengan temperature / suhu gas buang $\pm 480^{\circ} \text{C}$ baik *Turbocharger* dan *Economizer* mengalami kenaikan temperatur yang mengakibatkan terjadinya *overheat* yang membawa dampak kerusakan pada perangkat sistem gas buang.

Kesimpulan :

1. Gas buang dari *Main Engine Motor Diesel* yang ditampung di *Receiver Manifold* yang dimanfaatkan untuk menggerakkan *Turbocharger* dan pemanas *Economizer* akan membawa dampak kerusakan pada perangkat sistem gas buang apabila kenaikan temperatur tidak dijaga dalam batas toleransi yang telah ditentukan / aman.
2. Mempertahankan pembakaran yang sempurna / seimbang sehingga mengurangi kenaikan temperatur gas buang pada *Main Engine Motor Diesel* dan tenaga yang dihasilkan optimum tanpa merusak komponen yang berkaitan pada sistem dengan asumsi sistem pendinginan dan pelumasan dalam kondisi normal.

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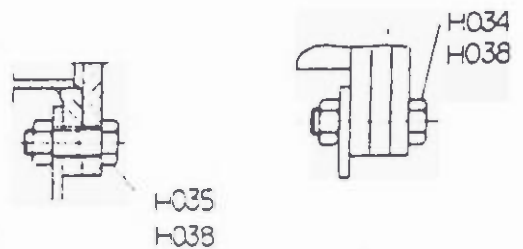
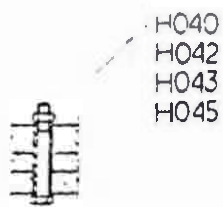
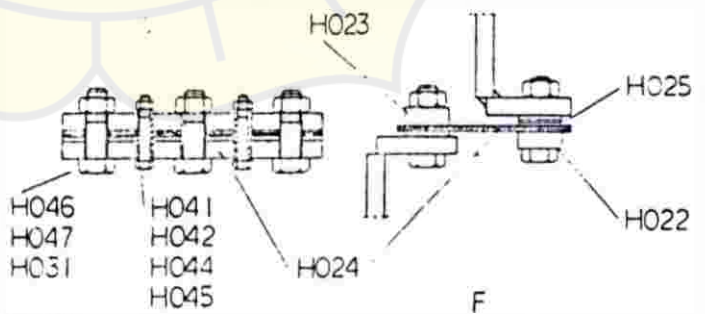
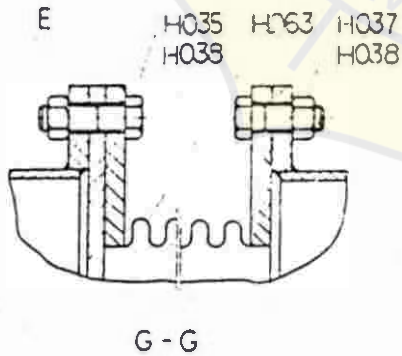
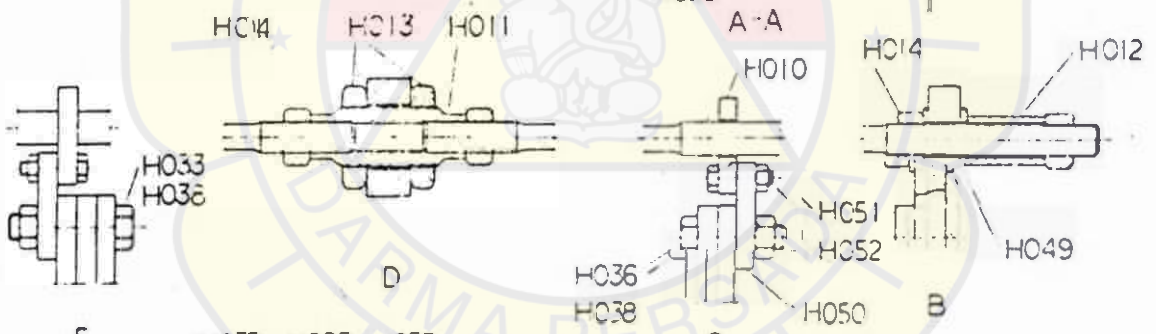
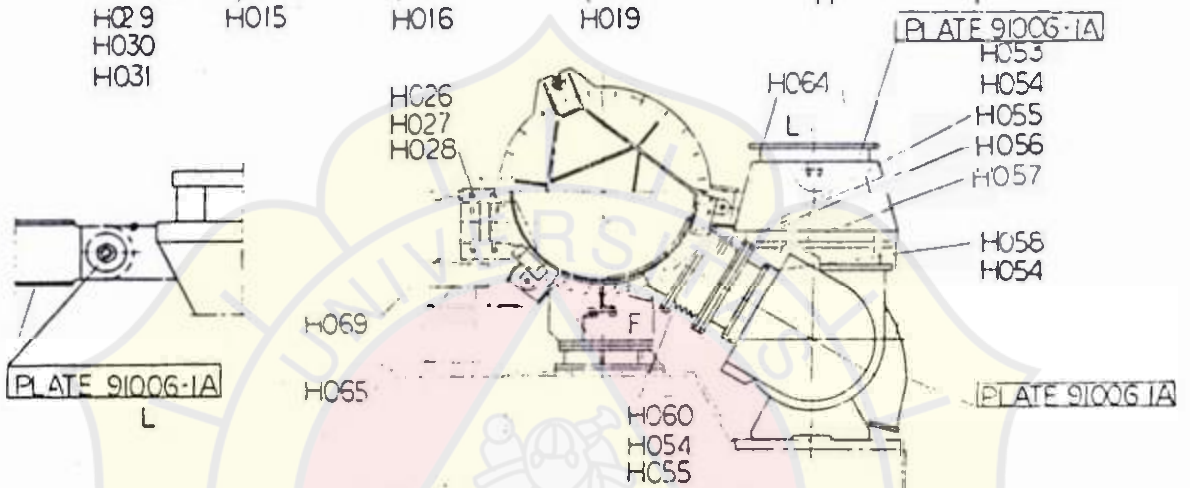
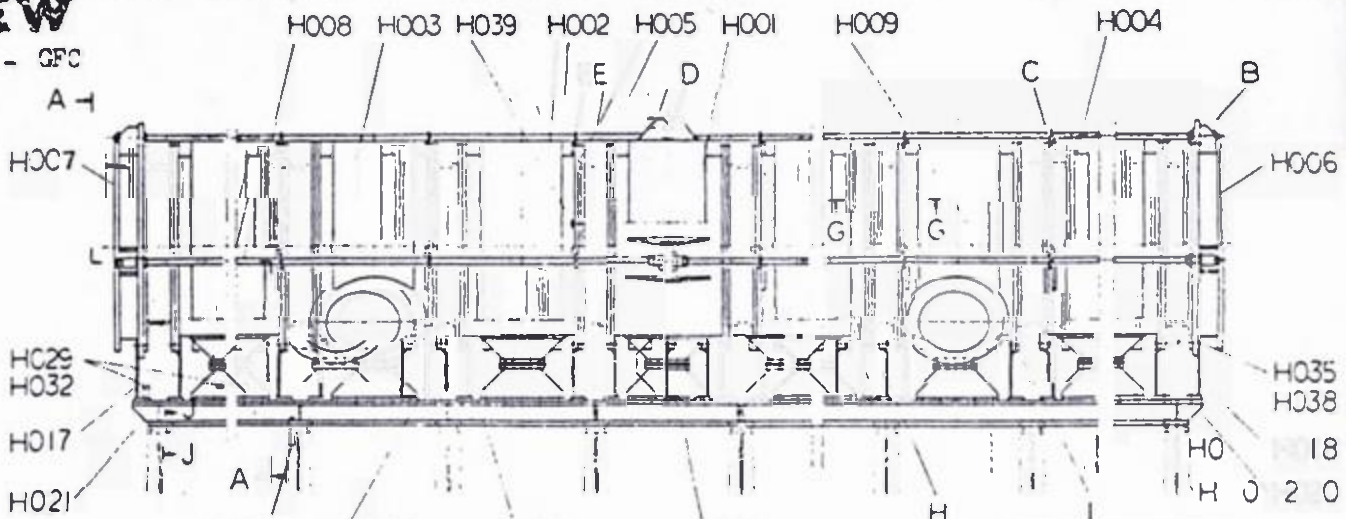
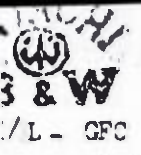
PRESSURE & TEMPERATURE IN SERVICE

Edition 01A

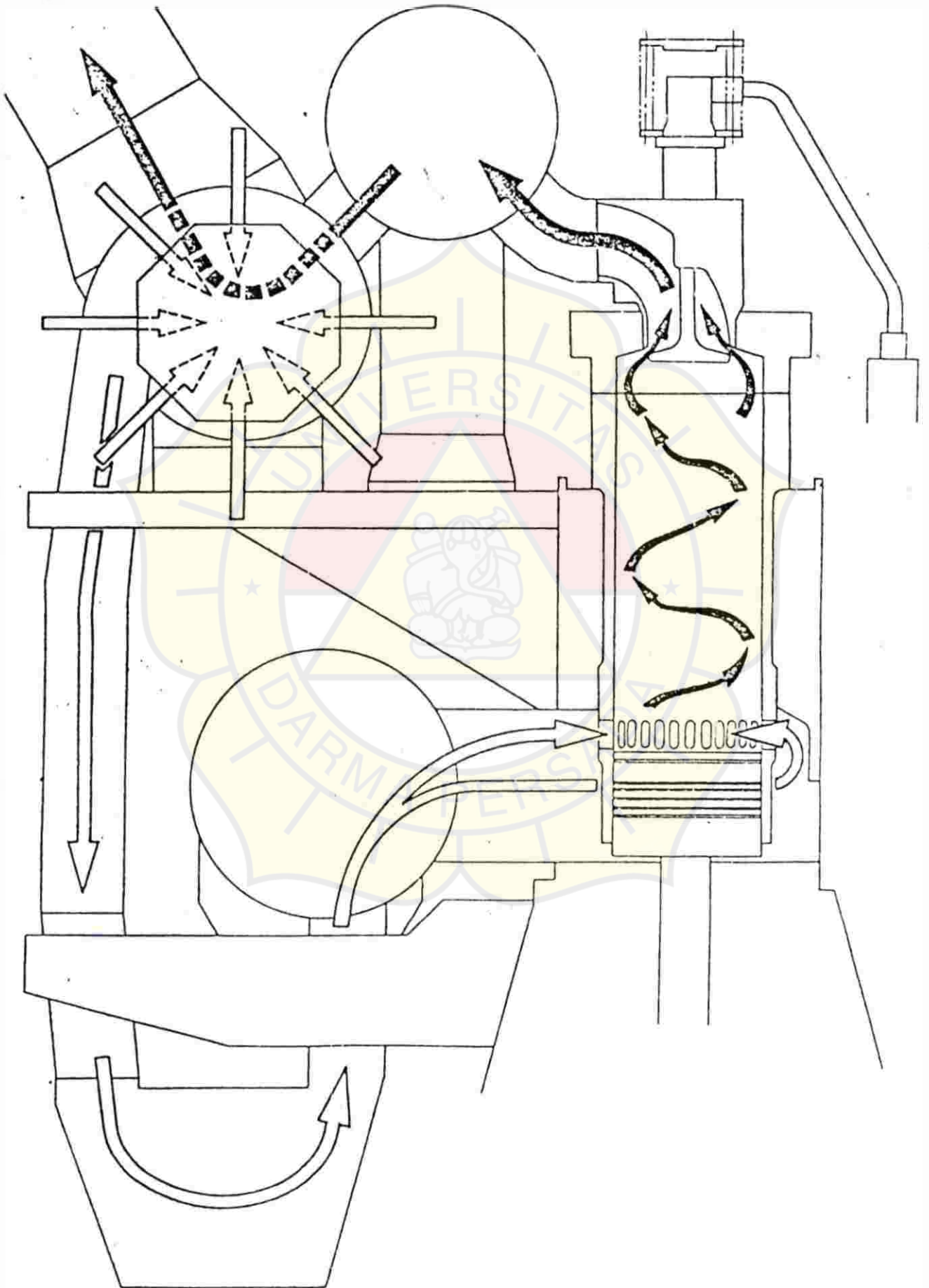
Data 3(4)

| MEASURING POINT | | PRESSURE (Kg/cm ²) | | | TEMPERATURE (°C) | | | |
|-------------------------|---------------------------------------|--------------------------------------|------------|------------|------------------|----------------|-----------|------------|
| | | Normal | Min. alarm | Em'cy stop | Normal | High alarm | Low alarm | Em'cy stop |
| Fresh water | Cylinder cooling water Inlet | 1.6-2.4 | 1.0 | | 55-60 | 70 | 50 | |
| | Outlet | Differential press. $\Delta p > 1.2$ | | | 60-70 | 80 | | 90 |
| Fresh water | Cooling water for turbocharger Inlet | 1.6-2.4 | 1.0 | | 55-60 | 70 | 50 | |
| | Outlet | | | | 60-70 | 80 | | 90 |
| Sea water | Cooling water for air cooler Inlet | 1.0-2.0 | 0.5 | | 28-35 | | 20 | |
| | Outlet | | | | | 45 | | |
| Lubricating oil | Main bearing and thrust bearing Inlet | 1.2-2.0 | 1.0 | 0.8 | 40-50 | 55 | | * |
| | Piston cooling oil Inlet | Min. 1.5 | 1.0 | 0.8 | 40-50 | 55 | 35 | |
| Lubricating oil | Outlet | | | | 50-65 | 75 | | 85 |
| | Bearing oil for turbocharger Oil tray | | | | 55-100 | 105 | | 120 |
| Lubricating oil | Bearing oil for cam shaft Inlet | 2.5-3.0 | 2.0 | 1.8 | 40-45 | | 35 | |
| | Outlet | | | | 45-65 | 75 | | 85 |
| Thrust pad | | | | | 55-70 | 75 | | 80 |
| Fuel oil (After filter) | | 4.0-5.0 | 2.5 | | Max. 13.5 | | | |
| Scavenging air | Blower suction | Press. drop Max. @X1.5 | | | | | | |
| | Air cooler | Press. drop Max. @X1.5 | | | | | | |
| | Manifold | | | | 3.0-5 | 65 | 25 | |
| Starting air | | 25-30 | 1 | | | | | |
| Maneuvering air | | 7 | 5.5 | | | | | |
| Exhaust gas | Before turbine | | | | | Max. Limit 600 | | |
| | After turbine | Max. 300 mm W.C. | | | | Max. Limit 450 | | |

- Remark's:
1. @ ; Initial value on shop trial.
 2. If the readings of temperature or pressure reach to the values MAX. LIMIT OR MIN. LIMIT, the engine should be operated carefully.
 3. If the readings of temperature or pressure reach to the values EM'cy stop, the engine should be shut down as soon as possible.



| No. | Material | Supply per ship | | Instruction book (Vol. 3) | | Drawing | | Remark |
|-------|-----------------|-----------------|----------|---------------------------|-----------|---------|-----------|-------------|
| | | Working | Spare | Plate No. | Parts No. | No. | Parts No. | |
| 9 | Steel | 7 sets | 3 sets | | | L57-85 | | |
| 9 - 1 | Stainless steel | | (3 cyl.) | | | RO41366 | | (Out box) |
| | | | | | | | | |
| 9 - 2 | Steel | 9 sets | 1 set | | | L57-87 | | |
| | Stainless steel | | (1 cyl.) | | | RO41368 | | (Out box) |
| | | | | | | | | |
| 9 - 3 | Steel | 2 sets | 1 set | | | L57-86 | | |
| | Stainless steel | | (1 T/C) | | | RO41567 | | (Out box) |
| | | | | | | | | |
| 9 - 4 | Steel | 2 sets | 1 set | 91002-14 | - 3362 | L56-85 | | |
| | Stainless steel | | (1 T/C) | | | RO40519 | | (Out box) |
| | | | | | | | | |
| 9 - 5 | Rubber | 9 pcs. | 1 pc. | | | L72-201 | ⑥ | (No. 3 box) |
| | | | (1 cyl.) | | | B528644 | | |



Part number list

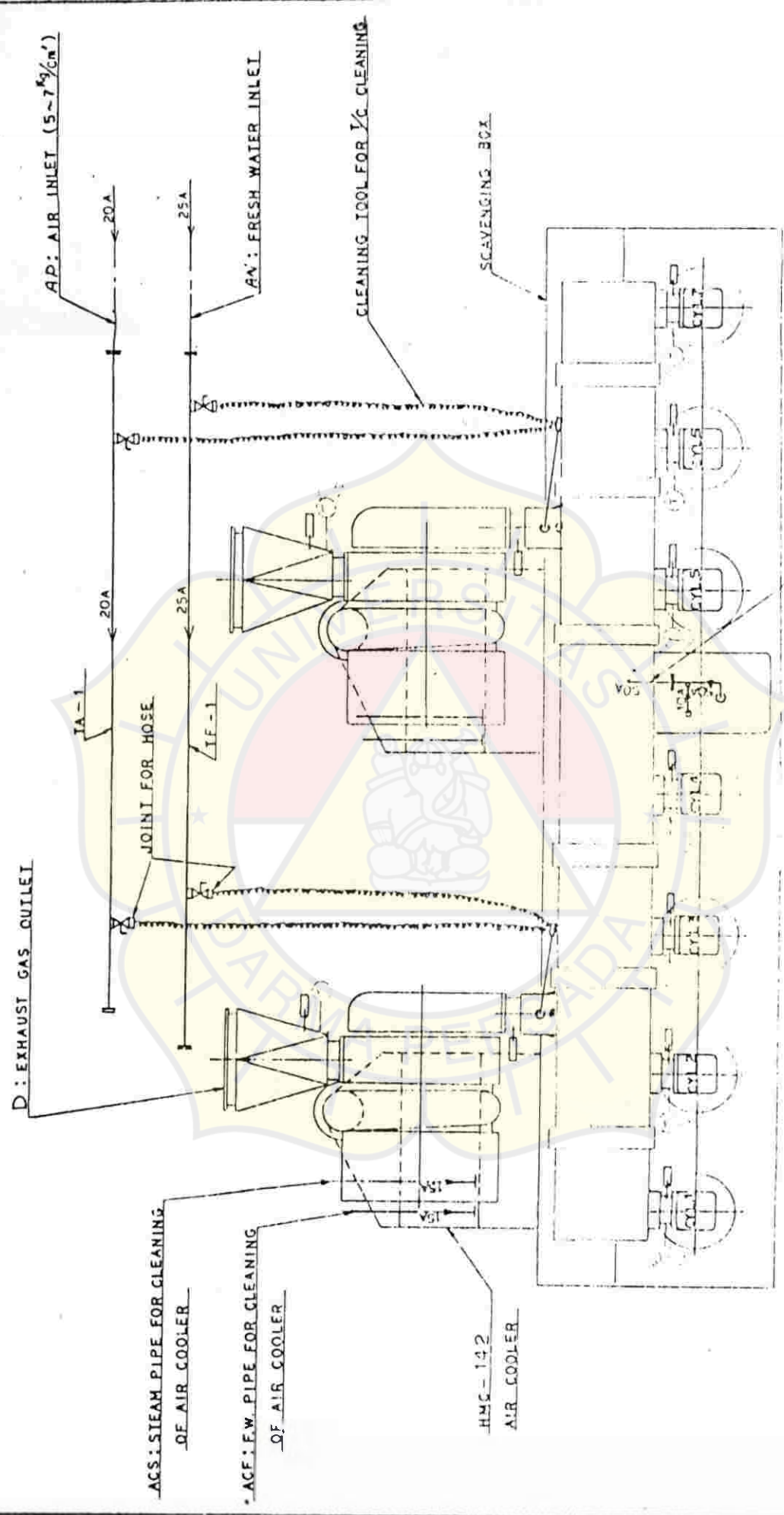
Turbochargers

| Part No. | Designation | Part No. | Designation |
|----------|------------------------------------|----------|-------------------------------------|
| 20 | Shaft | 3516 | Spring washer |
| 2081 | Ring nut | 36 | Locating spring |
| 2083 | Locking plate | 38 | Bearing unit complete, turbine side |
| 2085 | Impeller feather key | 381 | Roller bearing |
| 2086 | Guide wheel feather key | 382 | Inner bearing bush |
| 2087 | Gland strips | 383 | Outer bearing bush |
| 21 | Blade | 384 | Damping springs, radial |
| 218 | Damping wire | 41 | Locking flange |
| 22 | Shrink ring | 4111 | Hexagonal screw |
| 25 | Impeller | 4118 | Spring washer |
| 2534 | Caulking wire | 42 | Distance bush |
| 26 | Guide wheel | 45 | Holder |
| 28 | Diffuser | 4511 | Hexagonal screw |
| 2838 | Locking plate | 4512 | Washer |
| 2839 | Hexagonal screw | 4513 | Pal locknut |
| 30 | Nozzle ring | 46 | Locating spring |
| 30226 | Turbine diffuser | 47 | Oil pump complete, blower side |
| 32 | Bearing unit complete, blower side | 4723 | Cap nut |
| 320 | Double-ball bearing, blower side | 48 | Oil pump comp., turbine side |
| 321 | Inner bearing bush | 50 | Gas inlet casing |
| 32110 | Centrifugal lubricating disk | 5024 | Guide bolt |
| 32111 | Key | 5025 | Locking wire (VTR401) |
| 32112 | Socket-head screw | 50250 | Locking plate (VTR501) |
| 32113 | Spring ring | 5027 | Locating dowel |
| 32114 | Cover | 5035 | Stud |
| 32115 | Spring washer | 5037 | Hexagonal screw |
| 32116 | Stud | 5038 | Hexagonal screw |
| 32117 | Spring washer | 505 | Sealing bush |
| 32118 | Nut | 508 | Guard in balance passage (VTR501) |
| 322 | Outer bearing bush | 5705 | Locking wire |
| 323 | Damping spring, radial | 5720 | Flange (VTR401) |
| 324 | Damping spring, axial | 5721 | Guard in balance passage (VTR401) |
| 324a | Damping spring, axial | 5722 | Hexagonal-head screw (VTR401) |
| 325 | Bearing flange | 58 | Bearing cover, turbine side |
| 3251 | Countersunk screw | 583 | Sight glass with mark |
| 3252 | Hexagonal screw | 5839 | Hexagonal screw |
| 326 | Locking flange | 584 | Sight glass gasket |
| 3267 | Spring ring | 5840 | Sight glass without mark |
| 327 | Oil baffle plate | 585 | Sight glass gasket |
| 35 | Holder | 5861 | Oil drain plug |
| 3511 | Hexagonal screw | 588 | Pressing ring |
| 3512 | Washer | 5891 | Oil filler plug |
| 3513 | Pal locknut | 5892 | Screw plug, turbine side |
| 3514 | Hexagonal screw | | |

R401.501.631.W
R400.500.630.W

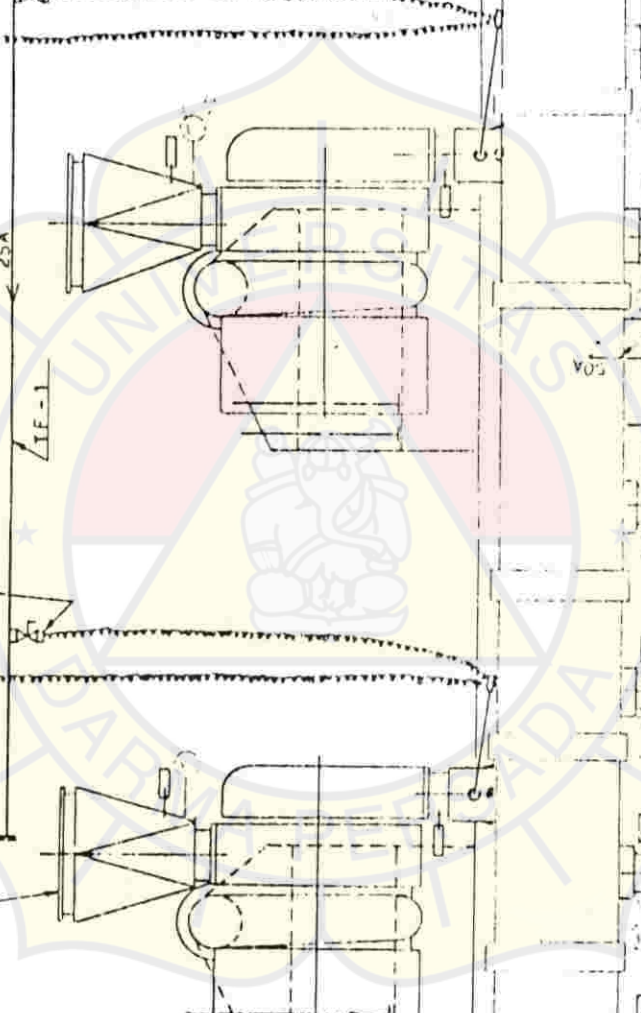
| Part No. | Designation | Part No. | Designation |
|----------|----------------------------|----------|----------------------------|
| 60 | Gas outlet casing | 725 | Sealing bush |
| 6001 | Stud | 726 | Sealing bush |
| 6005 | Pin | 74 | Air outlet casing |
| 60065 | Cover | 76 | Air intake casing |
| 60066 | Gasket | 7609 | Hexagonal screw |
| 6014 | Socket-head screw (VTR501) | 7613 | Screw plug |
| 6117 | Baffle plate | 7647 | Locking plate |
| 687 | Foot | 7648 | Hexagonal screw plug |
| 70 | Partition wall complete | 77 | Blower casing insert |
| 7011 | Hexagonal screw | 77006 | Cylinder Allen screw |
| 7012 | Hexagonal screw | 78 | Bearing cover, blower side |
| 702 | Partition wall | 80 | Silencer |
| 704 | Shaft-protecting sleeve | 803 | Filter |
| 705 | Guide bush | 80319 | Filter mesh |
| 7065 | Hexagonal screw | 80320 | Hexagonal screw |
| 7066 | Cap nut | 80321 | Cylinder Allen screw |
| 7067 | Locking plate | 804 | Cover and doors |
| 7211 | Stud | 8087 | Guard |
| 7212 | Stud | 80916 | Hexagonal screw |
| 7213 | Hexagonal screw | 80917 | Washer |
| 7216 | Stud | 82 | Air suction branch |
| 7230 | Stud | | |
| 7234 | Hexagonal screw | | |
| 72340 | Spring ring | | |

| | | | |
|------------------------------|-----|-----|-----|
| FOR AIR PIPE CLEANING | 25A | SGP | 5-7 |
| FOR AIR PIPE OF 1/2 CLEANING | 20A | SGP | 5-7 |

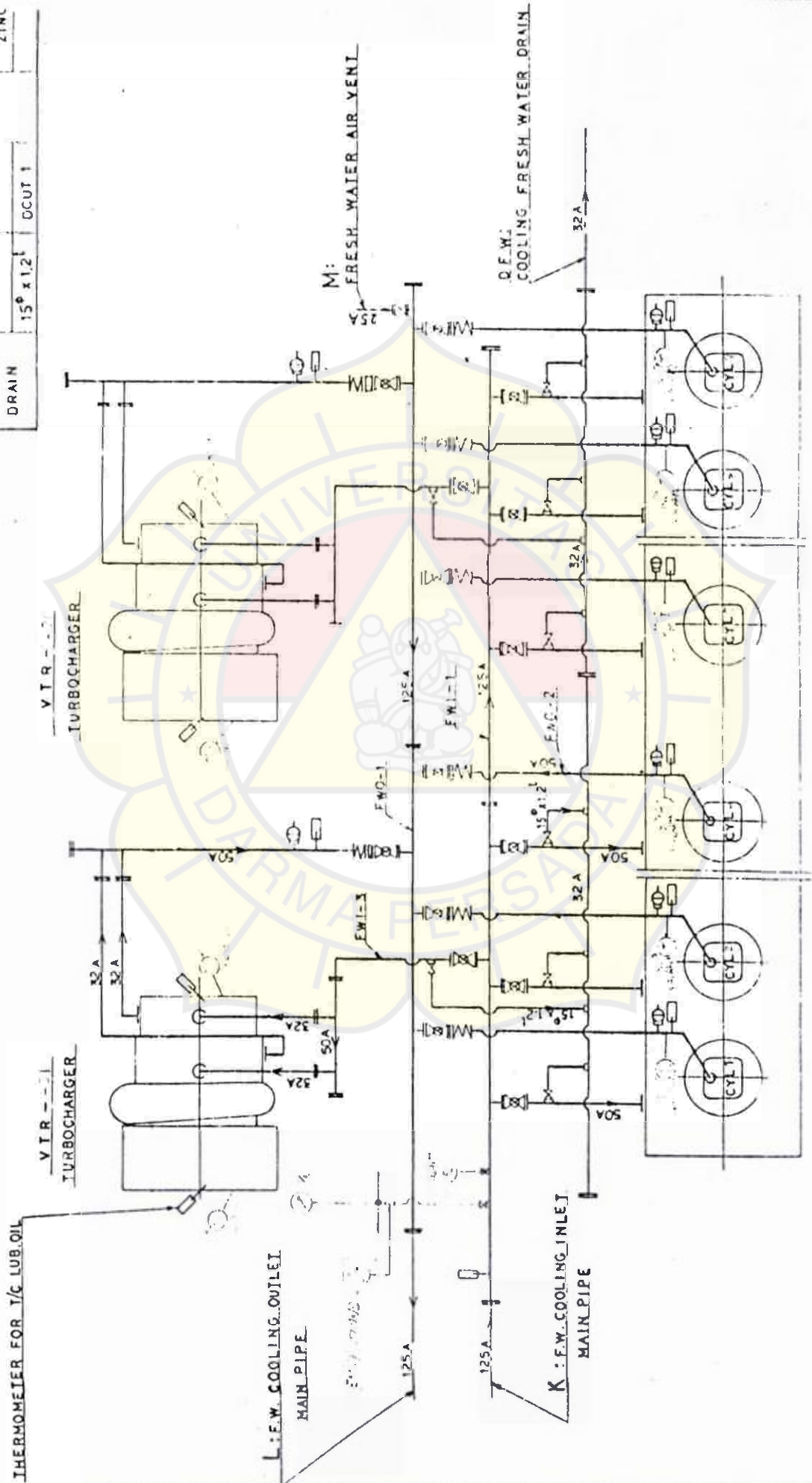


EXHAUST GAS OUTLET
CLEANING TOOL FOR 1/2 CLEANING

SCAVENGING BOX



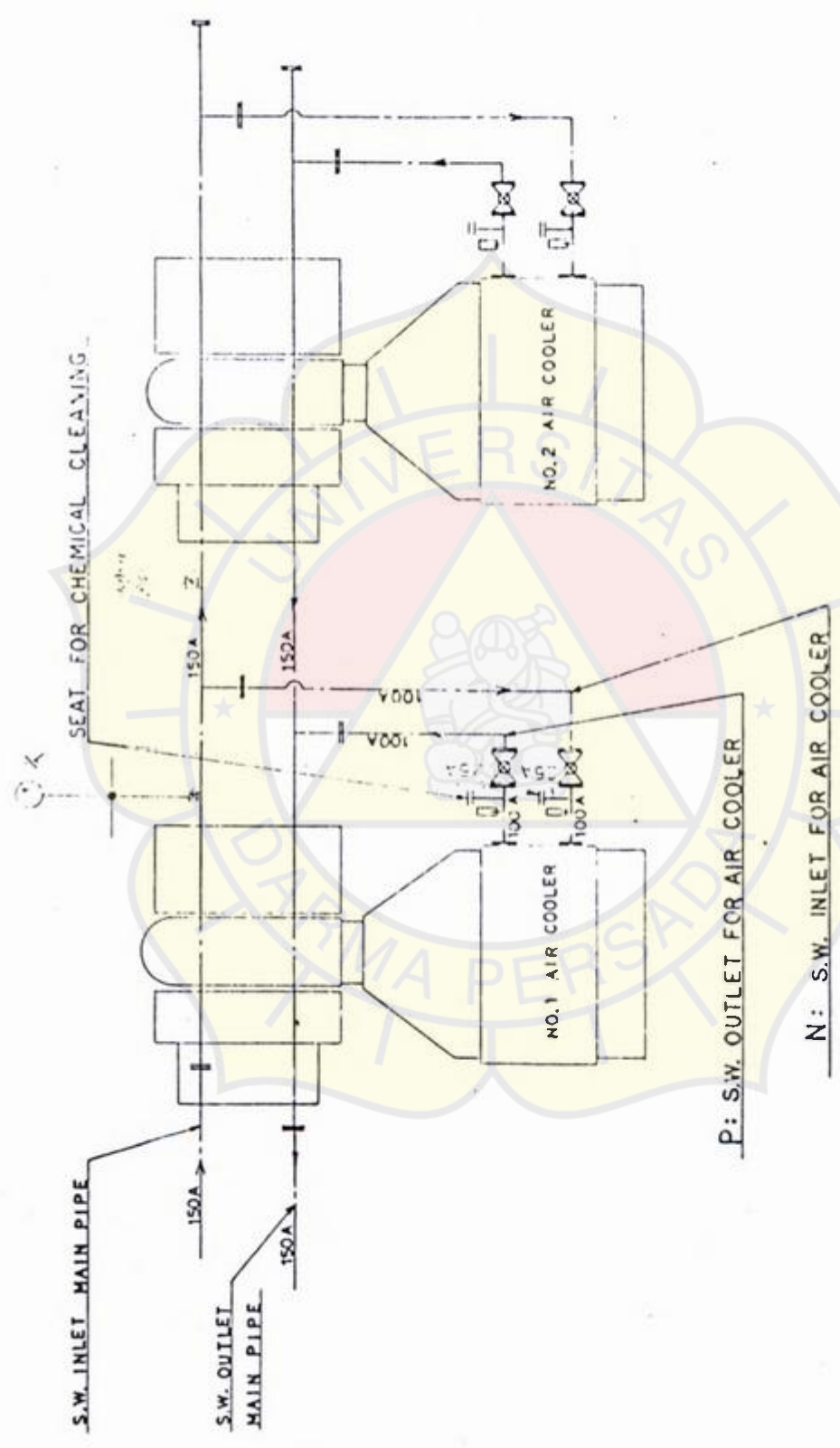
| | | | | |
|---------------------|------------|--------|-------|-----------------|
| COOLING WATER | 125A | SGP | 16~24 | REMARKS |
| | 50A 32A | | | |
| COOLING WATER DRAIN | 32A | SGP | | GALVANI ZINC |
| | 15" x 1.2" | OCUT 1 | | |



COOLING FRESH WATER PIPE LINE

SEA WATER 100A SCH 40 1.0~2.0 ZINC

CHEMICAL CLEANING 2.5A ST-533-S SCH 40



COOLING SEA WATER PIPELINES

