## Table of Contents

1.0 PURPOSE AND SCOPE ............................................................................................................. 3  
1.1 Purpose ................................................................................................................................ 3  
1.2 Scope .................................................................................................................................... 3  

2.0 INFORMATION ........................................................................................................................ 3  
2.1 General Information ............................................................................................................. 3  

3.0 PRECAUTIONS AND LIMITATIONS .................................................................................. 3  
3.1 Personnel Safety .................................................................................................................. 3  
3.2 Equipment Safety ............................................................................................................... 3  
3.3 Radiation and Contamination Control .................................................................................. 4  

4.0 PREREQUISITES .................................................................................................................... 4  
4.1 Special Tools, Equipment and Supplies ............................................................................. 4  
4.2 Performance Documents ................................................................................................... 4  
4.3 Field Preparation ............................................................................................................. 5  

5.0 PROCEDURE .......................................................................................................................... 6  
5.1 Oil Filter Change-Out ......................................................................................................... 6  
5.2 Restoration ..................................................................................................................... 12  
5.3 Acceptance Criteria ......................................................................................................... 12  
5.4 Review ............................................................................................................................ 12

---

### Change History (≤ Last 5 Rev-Mods)

<table>
<thead>
<tr>
<th>Rev-Mod</th>
<th>Release Date</th>
<th>Justification</th>
<th>Summary of Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>06/15/2017</td>
<td>Maintenance Request</td>
<td>Added and modified steps for workability.</td>
</tr>
<tr>
<td>B-0</td>
<td>09/10/2015</td>
<td>Periodic Review</td>
<td>No Changes Made</td>
</tr>
<tr>
<td>A-0</td>
<td>12/13/2013</td>
<td>Maintenance request for Semiannual Maint. procedure</td>
<td>New Procedure</td>
</tr>
</tbody>
</table>
5.5 Records ........................................................................................................................................... 13

Figure 1 - Kaeser Air Compressor Oil Separator Tank Lay-Out ............................................................. 14

Figure 2 - Kaeser Air Compressor Oil Filter Location ............................................................................. 15

Figure 3 - Kaeser Air Compressor Oil Level Indicator ............................................................................ 16
1.0 PURPOSE AND SCOPE

1.1 Purpose

This procedure provides instructions for performing semiannual maintenance for Oil Filter replacement and oil top-off for Kaeser ASD-30 T Rotary Screw Compressor located at 242-A Evaporator.

1.2 Scope

This procedure provides directions for performing the following for Kaeser ASD-30 T Direct Drive Rotary Screw Compressors:

- Replace Oil Filter
- Topping-off Oil (for oil lost due to filter replacement).

2.0 INFORMATION

2.1 General Information

Waste generated during the performance of this procedure such as oil, oil filters and clean-up rags shall be managed in accordance with TO-100-052.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

3.1.1 Work activities will be performed in accordance with DOE-0359, Hanford Site Electrical Safety Program.

3.1.2 To prevent possible burns, the proper Personnel Protective Equipment such as leather gloves and natural fiber long sleeve shirt or coveralls (cotton) should be worn throughout this procedure.

3.1.3 To prevent hearing injury, ear plugs or ear muffs should be worn while compressor is running.

3.2 Equipment Safety

**CAUTION** - Overfilling the oil separator tank can cause oil foaming, oil pump cavitation, and subsequent machine damage.
3.3 Radiation and Contamination Control

3.3.1 Work in radiological areas will be performed using a radiological work permit following review by Radiological Control per the ALARA Work Planning procedure TFC-ESHQ-RP_RWP-C-03.

4.0 PREREQUISITES

4.1 Special Tools, Equipment and Supplies

The following supplies may be needed to perform this procedure:
- Protective clothing (e.g., leather gloves, safety glasses, long sleeve, natural fiber shirt or cotton coveralls)
- Hearing Protection such as ear plugs/ear muffs (while compressor is running)
- Lint-free cloth rags to wipe up any oil spills
- Funnel
- Waste oil receptacle (e.g., 5 gallon bucket)
- Access key to Kaeser air compressor panels
- Approximately 1 pint of SIGMA Fluid Cooling Oil S-460 GHS-SDS (for topping off after oil filter change out)
- Review of GHS-SDS and/or MSDS #066742 for SIGMA Fluid Cooling Oil S-460
- Oil filter - Kaeser part #6.3463.0
- Maintenance hose w/hose coupling and shut-off valve (needed for venting and draining oil is stored inside the compressor beneath the oil separator tank)
- Other tools, equipment, and supplies as identified by Shift Manager/OE/FWS.

4.2 Performance Documents

The following drawings may be needed to perform this procedure:
- Service Manual - Screw Compressor ASD T Tri-Voltage 9_5721 06 USE
- TO-620-160 - Operate 242-A Evaporator Compressed Air System
- TO-100-052 - Perform Waste Generation, Segregation, Accumulation, and Clean-up
- EE-106897 Data Sheet for Compressor CP-E-1
- EE-106898 Data Sheet for Compressor CP-E-2.
4.3 Field Preparation

4.3.1 ACQUIRE compressor door (panel) key from Shift Manager/Operations.

4.3.2 REQUEST Shift Manager/OE to identify which compressor will be undergoing maintenance, identify its isolation valve AND PLACE check (✓) marks in the appropriate box.

<table>
<thead>
<tr>
<th>COMPRESSOR</th>
<th>ISOLATION VALVE</th>
<th>VENT VALVES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CP-E-1</td>
<td>HV-CPE1-5 CLOSED</td>
<td>HV-CPE1-7 OPEN</td>
</tr>
<tr>
<td>CP-E-2</td>
<td>HV-CPE2-5 CLOSED</td>
<td>HV-CPE2-7 OPEN</td>
</tr>
</tbody>
</table>

4.3.3 OBTAIN Shift Manager's permission prior to performing this procedure.

**CP-E-1**

_________________________________ / __________________________ / ____________
Signature Print Date
Shift Manager /OE

**CP-E-2**

_________________________________ / __________________________ / ____________
Signature Print Date
Shift Manager /OE
5.0 PROCEDURE

5.1 Oil Filter Change-Out

NOTE - The running compressor will be shut-down and the stand-by compressor will be started to allow oil change-out on the hot compressor.

- Activities within Section 5.1 may be repeated or worked in the order designated by the FWS with those directions recorded on the Data Sheet.

5.1.1 NOTIFY Operations to shut down and swap running compressor per applicable Section(s) in TO-620-160 to allow oil change on “hot” compressor.

5.1.2 ENSURE Isolation and Vent Valves for the compressor undergoing maintenance are in the proper configuration as identified in Step 4.3.2.

5.1.3 PERFORM Lock and Tag in compliance with the DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.4 DON PPE in accordance with Section 3.1 Personnel Safety.

5.1.5 IF not already open, OPEN compressor door panel(s) for access.

5.1.6 VISUALLY INSPECT compressor for deficiencies AND RECORD any deficiencies found on Work Record.

NOTE - The oil separator tank vents automatically as soon as the machine is stopped.

5.1.7 ENSURE the oil separator tank has fully vented, by checking pressure gauge (Figure 1 Item 2) on tank reads Zero (± 1 psig).

5.1.7.1 IF the pressure gauge does not read Zero (0), ± 1 psig, RETRIEVE the maintenance hose (w/hose coupling and shut-off valve) from storage under the oil separator tank.

5.1.7.2 WITH the shut-off valve (Figure 1 Item B 7) on the maintenance hose closed, INSERT the male hose fitting (Item B 6) into the oil separator tank vent coupling (Item 3).

5.1.7.3 POINT the hose end into an oil receptacle AND SLOWLY OPEN shut-off valve (Figure 1 Item B 7) on maintenance hose to relieve pressure.
5.1 Oil Filter Change-Out (Cont.)

5.1.7.4 AFTER tank has vented, CLOSE shut-off valve (Figure 1 Item B 7) AND

REMOVE hose from vent coupling.

5.1.8 REFER to Figure 2 for Oil Filter location.

5.1.9 UNSCREW the oil filter counter-clockwise AND

CATCH AND PLACE oil spillage in the waste oil receptacle (bucket).

5.1.10 PREPARE new oil filter (part #6.3463.0) by lightly oiling filter’s O-ring.

5.1.11 TURN the oil filter clock-wise AND

TIGHTEN filter hand-tight.

5.1.12 RECORD oil filter change-out on Data Sheet.

5.1.13 UNSCREW filler cap from Oil Filler Port on Oil Separator Tank body (Figure 1 Item 4).

CAUTION

Overfilling the oil separator tank can cause oil foaming, oil pump cavitation, and subsequent machine damage.

5.1.14 ADD approximately 8 ounces of S-460 oil from Kaeser Annual Maintenance Kit, part #AN5YRKT-ASD to replace oil lost from filter change-out.
5.1 Oil Filter Change-Out (Cont.)

5.1.15 CHECK the filler cap and ring seal for damage.

5.1.16 IF damage is found, REPLACE filler cap and/or ring seal AND RECORD the replacement on Work Record.

5.1.17 SCREW the cap (with ring seal) back on hand tight.

5.1.18 REMOVE Lock and Tag in compliance with the DOE-0336, Hanford Site Lockout/Tagout Procedure.

NOTE - Compressor must be running to check oil level.

5.1.19 NOTIFY Operations to start-up compressor per applicable section(s) in procedure TO-620-160.

5.1.20 AFTER compressor start-up, RESET the Maintenance Interval Counter for the oil filter change-out.
5.1 Oil Filter Change-Out (Cont.)

5.1.21 WHEN the compressor has run approximately 10 minutes, CHECK the oil level (Figure 3).

5.1.22 IF the oil level gauge indicates level is satisfactory, GO TO Restoration Section 5.2.

Top-Off Oil Level

**CAUTION**

Overfilling the oil separator tank can cause oil foaming, oil pump cavitation, and subsequent machine damage.

5.1.23 IF the oil level is low and topping-off is necessary, NOTIFY Operations to shut down the compressor per applicable Section(s) of TO-620-160.

5.1.24 PERFORM Lock and Tag in compliance with the DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.25 ENSURE the oil separator tank has fully vented by checking pressure gauge (Figure 1 Item 2) on tank reads Zero (± 1 psig).

5.1.25.1 IF the pressure gauge does not read Zero (0), ± 1 psig, RETRIEVE the maintenance hose (w/hose coupling and shut-off valve) from storage under the oil separator tank.

5.1.25.2 WITH the shut-off valve (Figure 1 Item B 7) on the maintenance hose closed, INSERT the male hose fitting (Item B 6) into the oil separator tank vent coupling (Item 3).

NOTE - If oil residue is present in the maintenance hose, the air flow should be directed into the waste oil receptacle (bucket).

5.1.25.3 POINT the hose end into an oil receptacle AND SLOWLY OPEN shut-off valve (Figure 1 Item B 7) on maintenance hose to relieve pressure.

5.1.25.4 AFTER tank has vented, CLOSE shut-off valve (Figure 1 Item B 7) AND REMOVE hose from vent coupling.
5.1 Oil Filter Change-Out (Cont.)

**Top-Off Oil Level (Cont.)**

5.1.26 **UNSCREW** filler cap from Oil Filler Port on Oil Separator Tank body (Figure 1 Item 4).

**NOTE** - Topping off the oil level refers to bringing the oil level reasonably close to the “Optimum Level” as shown on Figure 3 Oil Level Indicator.

5.1.27 **ADD** oil to top off level in oil separator tank.

5.1.28 **SCREW** the cap (with ring seal) back on hand tight.

5.1.29 **REMOVE** Lock and Tag in compliance with the DOE-0336, Hanford Site Lockout/Tagout Procedure.

5.1.30 **NOTIFY** Operations to start-up compressor per applicable Section(s) in TO-620-160.

5.1.31 **WHEN** the compressor has run approximately 10 minutes, **CHECK** the oil level again (Figure 3).

5.1.32 **IF** the oil level is still low and topping off is necessary, **REPEAT** Steps 5.1.23 through 5.1.31 until oil level is satisfactory.

5.1.33 **IF** the oil level is satisfactory, **RECORD** the oil top-off on Data Sheet **AND** GO TO Restoration Section 5.2.
5.1 Oil Filter Change-Out (Cont.)

Drain Excess Oil Due to Overfill

5.1.34 WITH the shut-off valve (Figure 1 Item B 7) on the maintenance hose closed, INSERT the male hose fitting (Item B 6) into the oil cooler hose coupling (Figure 1, Item 9).

NOTE - If oil residue is present in the maintenance hose, the air flow should be directed into the waste oil receptacle (bucket).

5.1.34.1 POINT the hose end into an oil receptacle AND

OPEN shut off valve (Figure 1 Item 11) on oil cooler coupling.

5.1.35 SLOWLY OPEN shut-off valve (Figure 1 Item B 7) on maintenance hose to drain excess oil to optimum level on oil level indicator.

5.1.35.1 CLOSE shut-off valve (Figure 1 Item B 7) AND

CLOSE Shut off valve (Figure 1, Item 11).

5.1.36 REMOVE shut-off valve (Figure 1, Item B 7) and maintenance hose from oil drain.

5.1.37 GO TO Section 5.2 Restoration.
5.2 Restoration

5.2.1 **RESTORE** Isolation and Vent Valves configured in Step 4.3.2 to the following:
- Isolation Valve – From **CLOSED** to **OPEN**
- Vent Valve – From **OPEN** to **CLOSED**

5.2.2 **IF** any problems were encountered with maintenance, **INFORM** Shift Manager/OE.

5.2.3 **CLEAN-UP AND DISPOSE** of any spilled/leaked oil in accordance with TO-100-052.

5.2.4 **CLOSE** compressor door/panel(s) for to oil separator tank.

5.2.5 **CHECK** equipment restoration by observing indications are consistent with expected conditions.

5.2.6 **RETURN** compressor door/panel key to Shift Manager/Operations.

5.2.7 **NOTIFY** Shift Manager/OE that maintenance is complete and compressor(s) may be returned to desired configuration per the applicable section(s) in procedure TO-620-160.

5.3 Acceptance Criteria

Acceptance Criteria has been met when Steps in this procedure have been satisfactorily performed and results are recorded on the Data Sheet(s).

5.4 Review

5.4.1 **INFORM** FWS test is complete.

5.4.2 **FWS REVIEW AND ENSURE** the following:
- Completed Data Sheets meet the acceptance criteria
- Comments sections are filled out appropriately
- Work requests needed as a result of this procedure are identified and generated
- Work request number(s) of any work documents generated as a result of this procedure, are recorded in the Comments/Remarks section of the Data Sheet, as applicable.
5.5 Records

This procedure is performed within a work package, as such, the procedure in its entirety will be maintained as a record per the Work Control process.

The record custodian identified in the Company Level, Records Inventory and Disposition Schedule (RIDS) is responsible for record retention in accordance with TFC-BSM-IRM_DC-C-02.
Changing the cooling oil, oil separator tank

1. Hose coupling (air cooler venting)
2. Pressure gauge
3. Hose coupling (oil separator tank venting)
4. Oil filler port with plug
5. Cooling oil level indicator
6. Male hose fitting
7. Shut-off valve

A. Shut-off valve open
B. Shut-off valve closed
8. Maintenance hose (approximately four feet long)
9. Hose coupling (oil drain)
10. Shut-off valve (venting line)
11. Shut-off valve (oil drain)
Figure 2 - Kaeser Air Compressor Oil Filter Location

Changing the oil filter

1. Oil filter
2. Direction to unscrew
Figure 3 - Kaeser Air Compressor Oil Level Indicator

The level gauge is composed of a clear plastic outer shell marked with a level indicating line and a rotating, color coded inner dial. The actual level when read is directly beneath the indicating line.

- Red = Minimum level
- Green = Optimum level
- Orange = Maximum level