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1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this procedure is to provide instructions for inspection and maintenance of Electric Chain Hoists.

1.2 Scope

This procedure will provide directions to mechanically and electrically inspect the electric overhead powered chain hoist(s).

- Section 5.1 Performs Electrical Inspections and Maintenance
- Section 5.2 Performs Mechanical Inspections and Maintenance.

2.0 INFORMATION

2.1 General Information

Section 5.1 thru 5.2 can be worked as independent Sections or concurrently as necessitated by the particular Activity or Task being performed.
3.0 PRECAUTIONS AND LIMITATIONS

3.1 Personnel Safety

**WARNING** - Failure to maintain Exclusive Control with the hoist while it is unplugged can result in serious injury.

**WARNING** - Failure to maintain a Limited Approach Boundary while performing equipment testing can result in serious injury.

3.1.1 During the performance of this procedure, comply with the DOE-0336, Hanford Site Lockout/Tagout Procedure.

3.2 Equipment Safety

**CAUTION** - Inch up or slowly raise the hoist load block when testing upper limit switch to prevent Two-Blocking hoist load block.

**CAUTION** - When inspecting the air gap on the hoist brake, care must be taken to ensure bottom of armature does not touch splined adapter (H). (See Figure 2)

**CAUTION** - Screw drivers must not contact brake disc to prevent damage. See Figure 3

3.3 Radiation and Contamination Control

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.

3.4 Environmental Protection

The Central Shift Office must be notified in the event of a leak or a spill in accordance with TFC-ESHQ-ENV_FS-C-01, Environmental Notification.
4.0 **PREREQUISITES**

4.1 **Special Tools, Equipment, and Supplies**

The following supplies may be needed to perform this procedure:
- SAE 30 Gear Oil (for Load Gear Box)
- Lithium Based Grease (for Idler Sheave Bearing)
- WD-40 general purpose spray lubricant
- Coffing Hoist Operating and Maintenance Instructions with Parts List EC3-680-2
- Small bucket ≥ ½ gallon to drain used oil
- Clean wipe rags
- Other tools, equipment and supplies as identified by Shift Manager/OE/FWS/User.

4.2 **Performance Documents**

The following documents may be needed to perform this procedure:
- TO-100-052, Perform Waste Generation, Segregation, Accumulation & Clean-up
- DOE-0336, Hanford Site Lockout/Tagout Procedure
- GHS-SDS-MSDS # 013726 – for Idler Sheave Bushing
- GHS-SDS-MSDS # 012664 – for Hoist Limit Switch
- GHS-SDS-MSDS #027960 - for Hoist Gear Case.
5.0 PROCEDURE

Special Instructions
If any step is not required for procedure completion, record “N/A” in the applicable space(s) on the Data Sheet and document the justification in the Data Sheet’s Comments section.

5.1 Electrical Hoist Inspection and Maintenance

**WARNING**
Failure to maintain Exclusive Control of the electric hoist while it is unplugged can result in serious injury.

5.1.1 UNPLUG hoist to remove electrical power AND
MAINTAIN Exclusive Control of Hoist while de-energized.

5.1.2 CLEAN dust and foreign matter from motor and gear box.

**WARNING**
Failure to maintain a Limited Approach Boundary while performing equipment testing can result in serious injuries.

5.1.3 REMOVE hoist cover AND
ESTABLISH a Limited Approach Boundary of 12 inches around the work area.

5.1.4 VISUALLY INSPECT the following components:
- Limit switches for cleanliness and proper lubrication
- Control cable and strain relief
- Exterior motor housing for evidence of damage, overheating (e.g., paint discoloration, overheat/burnt smell)
- Power cord, plug and cord grip devices for any deficiencies
- Push button stations for correct markings and labels, damage, dirt and proper grounding
- Contact points for burned points and proper closure.

5.1.5 RECORD actions taken on Data Sheet.
5.1 **Electrical Hoist Inspection and Maintenance (Cont.)**

5.1.6 **RESTORE** electrical power to hoist.

### CAUTION

Inch up or slowly raise the hoist load block when testing upper limit switch to prevent Two-Blocking hoist load block.

5.1.7 **CHECK** operation of the upper limit switch by raising hook until limit switches function.

5.1.8 **IF** Upper Limit Switch must be adjusted **PERFORM** Steps 5.1.10 through 5.1.16 until Upper Limit Switch is set correctly.

5.1.9 **RECORD** actions taken on Data Sheet.

**NOTE** - For easy identification the Upper (2) and Lower (3) limit switch adjusting nuts are brass and zinc colored. (Figure 2) Each limit switch nut has ten slots for adjustment, and one slot is equivalent to one link of chain travel. Care should be exercised when adjusting either limit of travel. When a geared type limit switch is furnished (long lift hoists) each adjustment is equal to 3 links of chain or 30 links per revolution.

**Upper Limit Switch Adjustment**

### WARNING

Failure to maintain Exclusive Control of the electric hoist while it is unplugged can result in serious injury.

5.1.10 **UNPLUG** hoist to remove electrical power **AND**

**MAINTAIN** Exclusive Control of Hoist while de-energized.

5.1.11 **RAISE** load block to a point 3 inches from top of hoist housing.

5.1.12 **PRY** spring guide plate (1) out of slots in colored limit switch nuts (2 & 3). (Figure 1)

5.1.13 **TURN** slotted brass nut (2) toward its limit switch until switch clicks.

5.1.14 **RELEASE** spring guide plate **AND**

**ENSURE** it snaps back into slots on both nuts.
5.1 Electrical Hoist Inspection and Maintenance (Cont.)

5.1.15 RESTORE electrical power to hoist.

**CAUTION**

Inch up or slowly raise the hoist load block when testing upper limit switch to prevent Two-Blocking hoist load block.

5.1.16 CHECK operation of the upper limit switch by raising hook until limit switches function.

5.1.17 CHECK operation of lower limit switch by lowering hook until limit switch functions.

5.1.18 IF Lower Limit Switch must be adjusted, PERFORM Steps 5.1.21 through 5.1.26.

5.1.19 RECORD actions taken on Data Sheet.

**Lower Limit Switch Adjustment**

5.1.20 LOWER load block to a point where at least 12 links of slack chain hang down from hoist housing.

**WARNING**

Failure to maintain Exclusive Control of the electric hoist while it is unplugged can result in serious injury.

5.1.21 UNPLUG hoist to remove electrical power AND MAINTAIN Exclusive Control of Hoist while de-energized.

5.1.22 PRY spring guide plate (1) out of slots in colored limit switch nuts (2 & 3). (Figure 1)

5.1.23 TURN slotted zinc nut (3) toward its limit switch until switch clicks.

5.1.24 RELEASE spring guide plate and ENSURE it snaps back into slots on both nuts.

5.1.25 REPLACE short end cover AND RESTORE electrical power to hoist.
5.1 **Electrical Hoist Inspection and Maintenance (Cont.)**

5.1.26 **CHECK** operation of lower limit switch by lowering hook until limit switch functions.

**Hoist Motor Brake Inspection and Adjustment**

5.1.27 **ENSURE** there is no load on hoist.

**WARNING**

Failure to maintain Exclusive Control of the electric hoist while it is unplugged can result in serious injury.

5.1.28 **UNPLUG** hoist to remove electrical power **AND**

**MAINTAIN** Exclusive Control of Hoist while de-energized.

5.1.29 **REMOVE** hoist brake cover.

**CAUTION**

When inspecting the air gap on the hoist brake, care must be taken to ensure bottom of armature does not touch splined adapter (H). (See Figure 2)

5.1.30 **CHECK** motor brake gap as follows:

5.1.30.1 By using a feeler gauge, **CHECK** for a gap of **0.015”** between motor brake armature (A) and hoist brake frame (B). (Figure 2)

5.1.30.2 **RECORD** air gap reading taken on Data Sheet.

5.1.31 **IF** adjustment is required, **TURN** three lock nuts (F) equally **AND**

**CHECK** with feeler gauge to **ENSURE** gap is the same on both ends of solenoid until a gap of **0.015”** is achieved.

5.1.32 **RECORD** air gap reading on Data Sheet.

5.1.33 **IF** working on JLC Series Hoist, **INSTALL** hoist brake cover **AND**

**RESTORE** electrical power to hoist.
5.1 Electrical Hoist Inspection and Maintenance (Cont.)

NOTE - Load brake function test does not apply to JLC Series hoists.

Load Brake Function Test

5.1.34 ATTACH light load (a minimum of 40 lbs.) AND

LIFT load several inches.

WARNING
Failure to maintain Exclusive Control of the electric hoist while it is unplugged can result in serious injury.

5.1.35 UNPLUG hoist to remove electrical power.

CAUTION
Screw drivers must not contact brake disc to prevent damage. See Figure 3

5.1.36 PLACE screw drivers No. 1 and No. 2 behind plate and armature assembly (Figure 3) AND

CLOSE solenoid gap by Carefully Prying Open motor brake.

5.1.37 OBSERVE action of the load.

5.1.38 IF load descends STOP test AND

NOTIFY FWS.

5.1.39 INSTALL hoist brake cover AND

RESTORE electrical power to hoist.

5.1.40 RECORD actions taken on Data Sheet.
5.2  Mechanical Hoist Inspection and Maintenance

WARNING
Failure to maintain Exclusive Control of the electric hoist while it is unplugged can result in serious injury.

UNPLUG hoist to remove electrical power.

ENSURE load rating is legibly posted on side of hoist.

CHECK for missing, damaged or illegible nameplates, decals, and warning labels.

CHECK hoist pins, bearings, bushings, shafts, and couplings for the following:
- Wear
- Corrosion
- Cracks
- Distortion.

CHECK chain end connections for the following:
- Wear
- Loose bolts, pins, or other keepers
- Corrosion.

RECORD findings on Data Sheet.

INSPECT the hoist gear case for oil leaks.

NOTE- Gear case is filled with approximately 1 ½ pints of Chevron SAE 30 motor oil (MSDS #027960). Oil level should be even with the pipe plug hole.

With hoist hanging level, REMOVE 1/4" pipe plug from side of hoist AND CHECK gear box oil levels.

IF oil level is low, REPLENISH oil in hoist gearbox to proper level.
Electric Chain Hoist Periodic Inspection

5.2 Mechanical Hoist Inspection and Maintenance (Cont.)

5.2.9 IF idler sheave bushing requires lubrication, LUBRICATE by performing the following:

5.2.9.1 DISASSEMBLE load block AND

APPLY a light coat of Lithium grease MSDS #013726 to the inside of the bearing.

5.2.9.2 REASSEMBLE load block.

5.2.1 RECORD actions taken on Data Sheet.

5.2.2 RESTORE electrical power to hoist.

5.2.3 LIFT and LOWER a light load (a minimum of 40 lbs.) several times AND CHECK for gear box noise or other malfunction indicators.

5.2.4 RECORD actions taken on Data Sheet.
5.3 Restoration

5.3.1 IF any problems were encountered with Inspection, INFORM FWS.

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

5.3.3 NOTIFY Equipment Custodian that testing is complete and to apply Equipment Custodian Tag.

5.4 Acceptance Criteria

Acceptance Criteria have been achieved when Steps in this procedure have been satisfactorily performed per the Data Sheet and the following conditions met.

- Oil levels are satisfactory
- Proper upper and lower limit switch operation
- Normal hoist operation.

5.5 Review

5.5.1 INFORM FWS that testing is complete.

5.5.2 FWS SHALL REVIEW AND ENSURE the following:

- Completed PM Data Sheets meet the acceptance criteria and are forwarded to Engineering
- 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 PM Data Sheet, as applicable.
5.6 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.
Figure 1 – Limit Switch Adjustment
Figure 2 – Motor Brake Gap Adjustment

Adjust to give .015" gap.
Figure 3 – Load Brake Function Check