5.6 Inspection Records

5.6.1 Dated inspection reports and records should be maintained at time intervals corresponding to those that apply for the hoist's PERIODIC interval per Section 5.2.4. These records should be stored where they are available to personnel involved with the inspection, maintenance, or operation of the hoist/trolley.

5.6.2 A long-range rope inspection program should be established and should include records of examination of ropes removed from service so a relationship can be established between visual observation and actual condition of the rope.

5.7 Inspection Methods and Criteria

5.7.1 This section covers the inspection of specific items. The list of items in this section is based on those listed in ANSI/ASME B30.16 for the Frequent and Periodic Inspection. In accordance with ANSI/ASME B30.16, these inspections are not intended to involve disassembly of the hoist. Rather, disassembly for further inspection would be required if frequent or periodic inspection results so indicate. Such disassembly and further inspection should only be performed by a qualified person trained in the disassembly and re-assembly of the hoist or trolley.

Table 5-5 Hoist (and Trolley) Inspection Methods and Criteria

Item	Method	Criteria	Action
Functional operating mechanisms.	Visual, Auditory	Mechanisms should be properly adjusted and should not produce unusual sounds when operated.	Repair or replace as required.
Limit Switch	Function	Proper operation. Actuation of limit switch should stop hoist.	Repair or replace as required.
Hoist Braking System Operation	Function	The brake disc (brake rotor) should not exceed the maximum permissible air gap (S) values listed in **Table 5-8**.	Replace as required (see **Section 6.3**).
Hook – Surface Condition	Visual	Should be free of significant rust; weld splatter, deep nicks, or gouges.	Replace.
Hook – Fretting wear	Measure	The "u" and "t" dimensions should not be less than discard value listed in **Table 5-6**	Replace.
Hook – Stretch	Measure	The "k" dimension should not be greater than 1.1 times that measured and recorded at the time of purchase (See **Section 3.9** and **Table 5-6)**.	Replace.
Hook – Bent Shank or Neck	Visual	Shank and neck portions of hook should be free of deformations.	Replace.
Hook Block Assembly	Visual	Should be free of significant rust; weld splatter, nicks, gouges. Holes should not be elongated, fasteners should not be loose, and there should be no gap between mating parts.	Tighten or replace as required.
Hook Block – Swivel Bearing	Visual, Function	Bearing parts and surfaces should not show significant wear, and should be free of dirt, grime and deformations. Hook should rotate freely with no roughness.	Clean/lubricate, or replace as required.

Table 5-5 **Hoist (and Trolley) Inspection Methods and Criteria (continued)**			
Item	**Method**	**Criteria**	**Action**
Hook Block – Sheave(s) and Shaft	Visual, Function	Sheave(s) should be free of significant wear. Sheave surfaces should be free of nicks, gouges, dirt and grime. Bearing parts and surfaces of Sheave and Shaft should not show significant wear. Sheave should rotate freely with no roughness or significant free play.	Clean/lubricate, or replace as required.
Hook – Hook Latches	Visual, Function	Latch should not be deformed. Attachment of latch to hook should not be loose. Latch spring should not be missing and should not be weak. Latch movement should not be stiff – when depressed and released latch should snap smartly to its closed position.	Replace.
Hoist – Housing and Mechanical Components	Visual, Auditory, Vibration, Function	Hoist components including load blocks, suspension housing, wire rope attachments, clevises, yokes, suspension bolts, shafts, gears, bearings, pins and rollers should be free of cracks, distortion, significant wear and corrosion. Evidence of same can be detected visually or via detection of unusual sounds or vibration during operation.	Replace
Trolley – Housing and Mechanical Components	Visual, Auditory, Vibration, Function	Trolley components including load bars, trolley wheels, trolley wheel axles, eye bolts, hex shafts, gears, bearings, pins, rollers, and bumpers should be free of cracks, distortion, significant wear, and corrosion. Evidence of same can be detected visually or via detection of unusual sounds or vibration during operation.	Replace.
Bolts, Nuts and Rivets	Visual	Bolts, nuts and rivets should not be loose.	Tighten or replace as required.
Wire Rope Wedge	Visual	The fixing (anchorage with wedge) must be replaced if it shows deformation, wear, cuts, or necking.	Replace
Wire Rope Drum	Visual, Function	Entire surface of the drum should be coated with lubricant and should be free of dirt and grime. Rope should fit in drum grooves.	Clean/lubricate (see **Section 6.2**).
Wire Rope Guide	Visual, Function	Rope Guide should be free of significant wear, cracks, nicks, gouges, dirt and grime. Rope Guide should take up rope play and move with the rope on the drum during rope unwinding and winding.	Replace
Wire Rope – Reeving	Visual	The wire rope should be reeved properly through Hook Block Sheave (and Crossbar Sheave for 4/1hoist) – refer to **Section 6.6**. Wire rope should be installed properly – refer to **Section 6.5**.	Reeve/Install properly.

Table 5-5 Hoist (and Trolley) Inspection Methods and Criteria (continued)

Item	Method	Criteria	Action
		⚠WARNING The full length of the Wire Rope must be inspected for rope diameter, broken strands or wires, and condition. The rope must be free of load for testing to detect any broken wires when bending the rope by hand (especially by radius of rope sheeve). Special care should be taken when inspecting sections of rapid deteriation, such as the following: ▪ sections in contact with saddles, equalizer sheaves, or other sheaves where the rope travel is limited; ▪ sections of the rope at or near terminal ends where corroded or broken wires may protrude; ▪ sections subject to reverse bends; ▪ sections of rope that are normally hidden during visual inspection, such as parts passing over sheaves. **⚠WARNING** In certain applications (constant deadweight, recurrent stopping position, automatic operation, etc.) wire fractures may occur inside the rope without being visible from outside. Any condition that could degrade the strength and performance of the wire rope must be reported to a qualified person for evaluation and disposition.	
	Wire Rope Diameter	Measure, Visual	Any reduction in the diameter of the wire rope must not be reduced due to corrosion, wear or core collapse more than the discard value in **Table 5-7**. The outer wires should not be worn more than 10% of their original diameter.	Replace. Inspect drum and all sheaves.
	Wire Rope – Broken Wires or Strands	Visual	The wire rope should be inspected for broken wires or strands, paying close attention to end connection and sections that frequently pass over sheaves. The rope must NOT have: ▪ More than the Maximum number of broken wires listed in **Table 5-7**. ▪ More than 4 broken wires in 1 strand in one lay (one full revolution of a strand around the rope). ▪ Any broken strands.	Replace
	Wire Rope – Condition	Visual	▪ Any wire rope deformation with permanent bends, flattening, unraveling, birdcaging, etc. ▪ General corrosion. ▪ Rope core exposure. ▪ One or more loose or protruding strands or wires from rope. ▪ Severely corroded or broken wires at end connections. ▪ Severely corroded, cracked, bent, worn or improperly applied end connections ▪ Any evidence of heat damage of any kind. (Wire rope exhibits any heat discoloration or localized loss of lubrication).	Replace

Table 5-5 Hoist (and Trolley) Inspection Methods and Criteria (continued)				
Item		**Method**	**Criteria**	**Action**
	Wire Rope - Twisting	Visual	▪ Run the hoist into the highest and lowest hook positions without load. ▪ If any twisting is detected , untwist the rope immediately. See Section 6.6 "Reeving and Adjustments" and Section 6.5 "Wire Rope Removal" ▪ Inspect the condition of the rope (especially near pulleys and rope anchorage. See Table 5-5 "Wire Rope- Condition", "Wire Rope – Diameter", "Wire Rope-Broken Wires or Strands")	Replace as required.
	Wire Rope - Lubrication	Visual	The wire rope must be maintained in a clean and well lubricated condition.	Clean/lubricate (see **Section 6.2**).
Trolley Side Plates		Visual	Must be free of significant deformation	Replace
Trolley Wheel – Condition		Visual	Trolley Wheel should be free of significant wear, cracks, nicks and gouges.	Replace.
Trolley Wheel – Tread		Visual, Measure	The diameter and width of the tread surface should not be less than the values listed in **Table 5-10**. The diameter should not be less than 5% of its original diameter as new.	Replace.
Trolley Wheel – Gear		Visual	Teeth should not be cracked, damaged, or excessively worn.	Replace.
Load Bar		Visual, Measure	Load Bar should be free of significant wear, cracks, nicks and gouges. Load Bar should not be bent.	Replace.
Trolley Motor Brake		Visual	Braking action should not be overly abrupt and should not allow excessive drift. The brake disc (brake rotor) should not exceed the maximum permissible air gap (S) values listed in **Table 5-11.**	Replace.
Contactor Contacts		Visual	Contacts should be free of significant pitting or deterioration.	Replace.
Sheaves		Visual	Sheave should be free of significant wear. The wall thickness, t, should not be less than the "t min" values in **Table 5-9**. The groove depth, h, should not be greater than the "h max" values listed in **Table 5-9**. They should also be checked for easy running, indicating that the ball bearings are in good condition.	Replace.
Pendant – Switches		Function	Depressing and releasing push buttons should make and break contacts in switch contact block and result in corresponding electrical continuity or open circuit. Push buttons should be interlocked either mechanically or electrically to prevent simultaneous energizing of circuits for opposing motions (e.g. up and down, forward and reverse).	Repair or replace as necessary.

3.6 Pendant Installation

1) Refer to Figure 3-14, Figure 3-15 and the wiring diagram and the interconnection diagram provided with the Hoist.

2) Remove Control Cover.

3) Loosen the cable fitting located on the lower side of the electrical enclosure and insert the Pendant Cable. Pull through enough cable to reach the terminals then securely tighten the cable fitting.

4) Attach a strain relief cable or chain between the pendant and hoist. The cable should attach to the small plate located at the bottom of the electrical enclosure under the gear box.

5) Access to terminal strip: The terminal strip is mounted on DIN rail, located on the lower portion of the control box.

6) Connect the individual pendant leads to the correct terminals as shown on the interconnection diagram. Make sure the terminals are securely tightened and each lead is completely isolated.

7) Reinstall the Control Cover. Be careful to not to pinch any wires wire closing and tightening down the Control Cover.

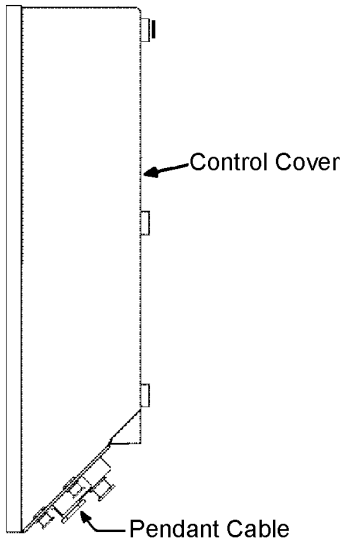

Figure 3-14

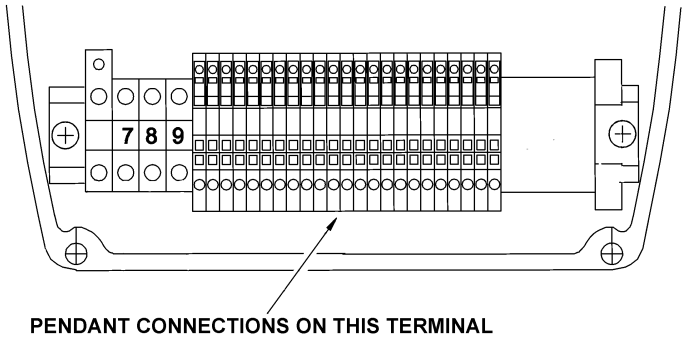

Figure 3-15

3.6.1 Connection to Electrical Power Source - The 3 power leads of the Power Supply Cable (normally red, white, and black wires) should be connected to an electric power disconnect switch or circuit breaker. This connection should be made so that the hoist is phased properly. Refer to Section 3.9.4 for instructions on how to check for correct power supply phase connection.

3.6.2 Fuse/Breaker Capacity - The trolley and hoist's power supply should be equipped with overcurrent protection such as fuses, which should be selected for 110% to 120% of total listed full load amperage, and should be dual element time-delay fuses. For the total full load amperage draw, add the amperage draws shown on the motor nameplates of ALL lifting and traversing motors.

3.6.3 **⚠ DANGER** Grounding - An improper or insufficient ground connection creates an electrical shock hazard when touching any part of the hoist or trolley. In the Power Supply Cable the ground wire will be either Green with Yellow stripe or solid Green. It should always be connected to a suitable ground connection. Do not paint the trolley wheel running surfaces of the beam as this can affect grounding.

6.3.5 Motor Brake Re-assembly – Reassemble the parts in reverse order of removal. Ensure that the check hole for measuring the air gap is underneath. Observe tightening torques in **Table 5-8**.

6.4 Trolley Motor Brake

6.4.1 To keep your hoist working in optimum condition and prevent possible down time, it is recommended to check your motor brake at regular intervals. Intervals must be adapted in accordance with the application.

6.4.2 **⚠ DANGER** Before proceeding, ensure that the electrical supply for the hoist or trolley has been de-energized (disconnected). Lock out and tag out in accordance with ANSI Z244.1 “Personnel Protection –Lockout/Tagout of Energy Sources”.

6.4.3 Motor brake Check - See **Figure 6-3**.

1) Move carriage into a safe position
2) Remove fan cover (1)
3) Remove plug (2)
4) Measure air gap (S) with feeler gauge (F). See **Table 5-11** for max. permissible air gap (S).
5) The travel motor brake needs no adjustment. If the max. permissible air gap (S) has been reached, the brake disc (brake rotor) must be replaced.

6.4.4 Brake Rotor Replacement - See **Figure 6-3**.

1) Remove fan cover (1)
2) Pull off fan wheel (3), remove feather key
3) Disconnect brake
4) Unscrew fixing screws (4)
5) Remove magnet piece (5) together with armature disc (6)
6) Remove brake disc (brake rotor) (7).

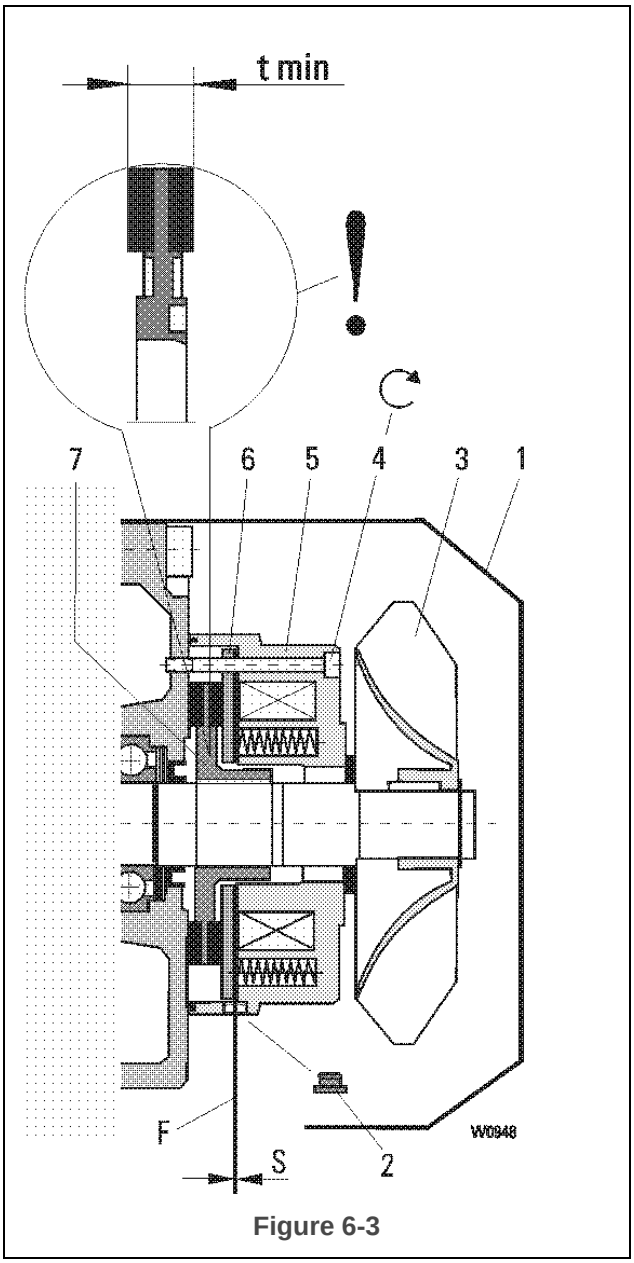

Figure 6-3

6.4.5 Motor brake reassembly – Reassemble the parts in reverse order of removal. Ensure that the check hole for measuring the air gap is underneath. Observe tightening torques in Table 5-11.

6.5 Wire Rope

6.5.1 Lubrication and Cleaning – Refer to Section 6-2.

6.5.2 **⚠WARNING** Be certain that the replacement wire rope is obtained from Harrington Hoists, Inc. and is the correct wire rope for the hoist. See factory certificate for part number of rope. Rope must be replaced as required by DIN 15020, FEM 9.661 and ISO 4309. If the wire rope is being replaced due to damage or wear out, destroy the old rope to prevent its reuse.