# Maintenance Manual

MANUAL: A 01A

# **Overhead Cranes**

MODEL: All Types



# 

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## 1. General

EMH Overhead Cranes require little maintenance.

The operator and the service personnel must acquaint themselves with the contents of this manual. The EMH service department will be available for service and maintenance work if so desired.

Types of overhead cranes:

Single girder under running, EDL:	Figure B16
Single girder top running, ELV, ELK:	Figure B17
Double girder top running, ZLK:	Figure B18

# 2. <u>Description of Equipment</u>

# 2.1 Rules And Regulations Governing Crane Design.

All overhead cranes utilizing ABUS or EMH components are designed, constructed and manufactured in full compliance with all applicable codes and regulations issued by MHI, CMMA, FEM, ANSI, NEC and OSHA.

# 2.2 Crane Bridge

# 2.2.1 Main Girder

Three types of girders are being utilized:

ELV and EDL: Single girder, manufactured from wide flange profiles.

ELK: Single girder, manufactured box girder

ZLK: Double girders, manufactured box girders

ZLW: Double girders, manufactured from wide flange profiles

# 2.2.2 Endtruck Structure

The endtruck structure is a welded box section, manufactured from steel plates or rolled profiles. Geometrically accurate wheel positioning is guaranteed by utilizing modern "NCR" Machines when machining wheel bores and mounting faceplates. Polyamid bumpers at both ends will absorb energy and assure OSHA-Approved stops. Girder and endtruck are bolted together by means of high-strength bolts tightened to the prescribed torque. (See Figure B 19.4)

# 2.3 Endtrucks

There are two types of endtrucks

# 2.3.1 Under Running Endtrucks, Used On DLVM & EDL Cranes.

Under running endtruck beams are suspended from standard side plate trolleys, designed for traveling on the bottom flanges of the runway beam. (See Figure B 19 & B69) Trolleys are powered by individual brake motors. Pinions drive two geared wheels of



each trolley. Wheels are manufactured from nodular cast, ductile iron, and run on anti friction bearings with minimum wear of wheel treads, flanges and running track.

# 2.3.2 Top Running Endtrucks, Used On ELV, ELK, ZLK & ZLW Cranes

Top running endtrucks are fitted with direct-driven double flanged wheels manufactured from nodular case, ductile iron. The material's spherodial graphite acts as a self-lubrication agent and also is resistant to shock and wear. Anti-friction bearings are lubricated for life and should not require any service. (See Figure B19 & B69)

## 2.4 Drives

Drives of overhead cranes manufactured with ABUS or EMH components are quiet running because of hardened bevel gears. Brake motors have duty cycles for heavy usage.

Controls will deliver either single speed travel with a squirrel cage motor or two speeds by pole changing to a fourth of the maximum travel speed.

For other speed control designs please refer to the specific literature in this manual.

# 2.5 Trolleys

# 2.5.1 Monorail Type Trolleys (Under Running)

Monorail type trolleys are running on single flanged wheels with anti-friction bearings, which are lubricated for life. Wheels are direct-driven without any open gearing. (See Figure B70)

## 2.5.2 Double Girder Trolleys (Top Running)

Double girder, four wheel trolleys have fabricated steel structures. Trolley drives are fitted with flanged wheels, mounted on shafts running on anti-friction bearings. Trolleys are powered by brake motors with soft-start characteristics and pinions without any open gearing. (See Figure B70)

## 2.6 Hoists

See separate operation and maintenance manuals.

## 2.7 Crane Controls

Overhead cranes are controlled by pendant push button stations, either supported directly from the crane or trolley, or independently traveling from a small track, running parallel to the crane girder.

The electric crane controls are mounted inside "NEMA 12" steel enclosures, attached to either trolley or crane bridge structure. The contactor controls include "Short Circuit" and "Time-Over-Current" protection as well as guard against phase loss.

## 3. Crane Runways

A solid, well supported runway is a precondition for a safe and trouble free crane installation.

Properly designed runways increase the life of wheels and endtrucks as well as runway rail.



For runway tolerances refer to drawing B 71. Runway surface should be kept free of dust, oil, paint, and rust. Both ends must be protected by properly sized end stops to engage the endtruck bumpers.

Under running runway track must be supported in such a manner as to assure smooth and even continuation of the top side of the lower flanges. No splice bolts must obstruct the area of wheels and end truck structure.

If overhead crane also has a walkway and cab, the location, size and access to them has to be designed in accordance with all applicable codes and regulations of CMMA and OSHA.

## 4. **Power Supply**

Power is fed to overhead cranes along the runway. The types and designs vary. It may be tagline or a conductor bar system. Installation and maintenance should be performed according to specific manufacturer's literature and applicable drawings.

#### 5. **Operation and Application**

#### 5.1 Accident Prevention

All relevant accident prevention and safety regulations, particularly any instructions relation to crane operation, must be respected at all times when operating cranes or attending to any maintenance work.

The following precautions also must be observed:

- 1. Release all possible safety or blocking devices before starting work.
- 2. Switch of crane power in all dangerous situations.
- 3. The crane operator must proceed with caution at all times regardless of the existence of any safety devices, like end of travel limit switches. They provide the necessary safety in case of human error.
- 4. Overhead cranes must not be used for breaking loose, side pulling or dragging loads at an angle, since this mishandling could result in overloading of various individual components or the entire material handling system.

## 5.2 Before Starting Work

The crane operator must check the following crane component features before using the equipment.

## <u>Travel brakes</u>

Are the crane braking distances within recommended tolerances? Standard floor operated cranes should stop within about 10 percent in feet, of the full load speed in FPM.

- Hoist brakes
- <u>Limit switches</u>



Upper and lower hoist limit switches, end-of-travel limit switches, limiting crane and trolley travel. When checking, please approach limits carefully and slowly!

• <u>Wire ropes</u>

(Visually inspect wire rope for defects, kinks and broken wires.)

• <u>Load attachments</u>

Do not overload crane and hoist, as well as below the hook equipment!

Pendant control

(Check proper functioning and avoid uncontrolled swinging.)

• <u>Bumpers</u>

Are all end stops protected by energy absorbing bumpers?

#### 6. Service and Maintenance

All overhead crane installations must be examined by an authorized crane technician at least once every year.

Crane endtruck wheel bearings and drive gears are lubricated for life and require no regular maintenance.

The entire crane should be inspected regularly following the recommended maintenance schedule below.

In case of a heavier duty cycle the service intervals may have to be shortened.

## 6.1 Maintenance Schedule

<u>Work</u>	<b>Daily</b>	<b>Yearly</b>
Check brakes	Х	
Check limit switches	Х	
Inspect wire rope	Х	
Check condition of all bumpers		Х
Check all bolted connections and welds		Х
Check power feed cables		Х
Check load hook for cracks and deformations		Х
Check crane and trolley wheels		Х
Check electrical controls and wire connections		Х





















