CLASS 22-522 HOIST DRIVE
WITH EDDY CURRENT BRAKE

SYSTEMS TESTS AND ADJUSTMENTS

A. INITIAL ADJUSTMENTS

1. Power OFF
   a. Open crane disconnect, removing all power from the crane.
   b. Hand operate relays and contactors to check for freedom of movement.
   c. Discard red spacers in dashpots of motor overload relays. Add red oil to 1/4 inch depth in dashpots. These overload relays are factory set, and do not need adjustment.
   d. Check all connections for tightness.

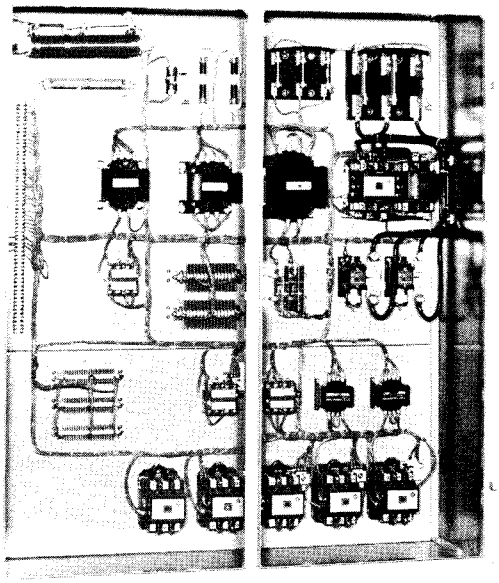
2. Power ON
   a. Close crane disconnect. Close any switches in the control cabinet.
   b. Depress main power ON or RESET button to energize main contactor M.
   c. Main contactor M picks up, and seals itself in. The drive is now ready for use.

B. RUNNING THE DRIVE

When starting the drive, be sure it is unloaded and well clear of any limit switches. Move the master switch, or depress up pendant button to first point UP. Be sure that holding brake releases. If the drive does not move up, but moves down, interchange motor leads T1 and T3. If control is moved in down direction, it usually will be necessary to go to second point down, as first point down is a braking point, and the hook will not move with no load.

C. STOPPING THE DRIVE

Moving the control to OFF de-energizes the directional contactor, and sets the holding brake. The eddy current brake remains energized for a short time to aid in stopping the drive. If the load is being lowered at high speed, the drive should be slowed by moving the control to first point down before going to OFF. This method of operation will save wear on the holding brake.



D. LIMIT SWITCHES (IF USED)

Run the drive into the up stop limit switch at low speed. The drive will de-energize, and the brake will set. Return the control to OFF. The drive will not be energized if the control is moved in the up direction, but will power out of the overtravel if the control is moved in the down direction. To be sure of enough mechanical clearance, continue to run the drive into the up stop limit switch at ever increasing speeds to maximum speed. This will show the maximum distance required to stop the motion safely.

The down stop limit switch should be set up in the same manner as the up stop limit switch.

DESCRIPTION OF OPERATION

The hoist drive control is a Class 22-522 magnetic, reversing, multi-point control with eddy current braking.

The control description that follows is written with respect to the schematic drawing located in the drawing section of this manual.

A. STANDBY CONDITIONS

To place the equipment in a standby condition ready for normal operation, a certain sequence of operations must be performed to properly energize the control. These operations are as follows, beginning with the assumption that the equipment is completely de-energized with crane disconnect open, master switch in OFF or all pendant buttons released.

Close crane disconnect. Check to be sure all switches inside control cabinet are closed. Depress main power ON or RESET button to close main line contactor M. The closing of main line contactor M applies excitation to the individual crane drive controls.

Main line contactor M will remain picked up throughout normal operation of the drive, but will drop out to shut down all controls in the event of low voltage or motor overload.

The drive may now be considered in a standby condition, ready for operation.

B. UP OPERATION

Moving the control to first point UP energizes several contactors. The up directional contactor energizes the motor in the up direction. The brake contactor BR releases the holding brake. The eddy current brake contactor ECBR energizes the eddy current brake. On some drives, a secondary contactor is energized to reduce the motor secondary resistance. The motor thus starts to run in the up direction.

As the control is moved further toward full speed hoist, motor secondary resistance is reduced by energizing secondary contactors and/or the eddy current brake excitation is reduced by adding resistance to the eddy current brake rectifier circuit or dropping out ECBR to eliminate the eddy current brake. At full speed up, eddy current brake is de-energized, motor secondary resistance is reduced to a minimum, and the motor is running at maximum speed.

C. DOWN OPERATION

Moving the control to first point DOWN energizes only the brake contactors BR and ECBR. The holding brake is released, and the eddy current brake is energized. The load is lowered under the control of the eddy current brake. If the weight of the unloaded drive is not sufficient to overcome friction, an unloaded hook will not move at first point lower.

Moving the control to second point DOWN will also energize the down directional contactor, and the motor will run in the down direction.

As the control is moved further toward full speed down, motor secondary resistance is reduced by energizing secondary contactors and/or the eddy current brake excitation is reduced by adding resistance to the eddy current brake rectifier circuit or dropping out ECBR. At full speed down, eddy current brake is de-energized, motor secondary resistance is reduced to a minimum, and the motor is running at maximum speed.

D. STOPPING THE DRIVE

The drive can be stopped by moving the master switch to the off position or by releasing the pendant button. If the drive is operating at high speed down, wear on the holding brake can be saved by slowing the drive down at first point down before moving the control to the off position. The eddy current brake remains energized for a short time after the control is moved to off in order to assist in stopping the motion.

E. LIMIT SWITCHES (IF USED)

If a limit switch is tripped, the drive is de-energized and the holding brake is set. Return the master switch to OFF or release pendant button. The drive can be energized only in the direction to back out of the overtravel.

F. PROTECTIVE FEATURES

Motor overload protection is provided by overload relays. In the event of an overload, the overload relay contact opens, and drops out main line contactor M, removing all power from the crane and setting all brakes.

Control transformers are protected from any overload by fuses.

TROUBLESHOOTING

A. MAIN CIRCUITS

If motor amperes are appreciably different from normal, check motor and resistor circuit wiring for completeness and agreement with schematic diagram.

B. CONTROL CIRCUITS

1. Main Line Contactor M

Main power RESET or ON button depressed. M does not pick up.

Check for:

AC power available.
Crane disconnect open.
Overload relay contact open.
STOP button contact open.
Fuse blown in M coil circuit.
115 volt control power not available.

2. Brakes

If the holding brake does not release, check for mechanical binding, coil excitation when the brake contactor is picked up, or circuit continuity.

If the eddy current brake is not operating, check for coil excitation when ECBR contactor is picked up, or circuit continuity.

C. GENERAL

If the drive is malfunctioning from none of of the above causes, the adjustment procedure outlined in the Systems Test and Adjustment section should be followed in detail.

CLASS 22-521 HOIST DRIVE WITH MECHANICAL LOAD BRAKE

SYSTEMS TESTS AND ADJUSTMENTS

A. INITIAL ADJUSTMENTS

1. Power OFF
   a. Open main crane disconnect.
   b. Master switch in OFF or all pendant buttons released.
   c. Discard red spacers in dashpots of motor overload relays. Add red oil to 1/4 inch depth in dashpots. These overload relays are factory set, and do not need adjustment.
   d. Hand operate relays and contactors to check freedom of movement.
   e. Check all connections for tightness.
2. Power ON
   a. Close main crane disconnect.
   b. Push RESET or START button. Main contactor M will pick up and seal in.
   c. The drive is now ready to start.

B. RUNNING THE DRIVE

When starting the drive, make sure there is no load on the hook and that the hook is well clear of the limit switch. Move the control to first point HOIST and observe that the brake releases and the drive moves in the hoist direction. If the drive moves in the lower direction, interchange main line motor leads T1 and T3.

If the drive is lowering, speed must be controlled by the mechanical load brake.

C. STOPPING THE DRIVE

Moving the control to the OFF position will de-energize the directional contactor, and set the brake thus bringing the drive to a stop.

D. LIMIT SWITCHES (IF USED)

Run the empty hook into the Up limit switch at low speed. The drive will de-energize. Return the control to OFF. The drive cannot be energized in the hoist direction, but will power out of the overtravel if the control is moved in the lower direction.

To be sure of enough mechanical clearance between the hook and bridge frame, continue to run the hook into the up limit switch at ever increasing speeds to maximum speed. This will show the maximum distance required to set the brake, and arrest hook motion safely.

The down limit switch should be set up in the same manner as the up limit switch.

DESCRIPTION OF OPERATION

The Class 22-521 hoist is a magnetic, reversing multi-point controller for use with a mechanical load brake.

The control description that follows is written with respect to the schematic diagram located in the drawing section of this manual.

A. STANDBY CONDITIONS

To place the equipment in a standby condition, ready for normal operation, a certain sequence of operations must be performed to properly energize the control. These operations are as follows, beginning with the assumption that the equipment is completely de-energized with the crane disconnect open and the master switch in the off position or all pendant buttons released.

If any switches inside the control cabinet are opened they should be closed. The main crane disconnect should be closed and the RESET or START button depressed to pick up main contactor M. The closing of M applies 460 volt, 3 phase, 60 hertz excitation to the primary of the control transformer. An auxiliary contact of M closes to seal in the main contactor.

M will remain picked up throughout normal operation of the drive but will drop out to shut down the control in the event of an overload of any motor or in the event of low voltage.

The drive may now be considered in a standby condition ready for operation.

B. RUNNING THE DRIVE

Moving the control to first point HOIST energizes the hoist directional contactor, and the drive starts with maximum secondary resistance in the circuit. As the control is moved further toward HOIST, secondary contactors are energized to cut out part of the secondary resistance, and thus increase the speed of the drive. When last point HOIST is reached, secondary resistance is reduced to a minimum and the drive is running at maximum speed. Timers are provided to be sure that acceleration time is allowed between speed points.

LOWER operation is the same as HOIST operation except that the lower directional contactor is energized, and the drive runs in the lower direction. When lowering, the speed of the drive must be reduced by the mechanical load brake.

C. STOPPING THE DRIVE

The holding brake will brake the drive to a stop if the control is moved to OFF. When lowering, wear on the brake can be saved by slowing the drive at first point lower before going to OFF.

D. LIMIT SWITCHES (IF USED)

If a limit switch is tripped, return the master switch to OFF, or release pendant button. The drive can be energized only in direction to back out of the overtravel.

E. PROTECTIVE FEATURES

The motors are protected from overload by the overload relays. If an overload occurs, contacts of these relays open, de-energizing the drive.

In the event of undervoltage, master relay MR is de-energized and must be reset before the drive can be restarted.

Control circuits are protected from overloads by fuses.

TROUBLESHOOTING

A. MAIN CIRCUITS

If motor amperes are appreciably different from normal, check motor and resistor circuit wiring for completeness and agreement with schematic diagram.

B. CONTROL CIRCUITS

1. Main Line contactor M

Main power RESET or START button depressed, M does not pick up.

Check for:

AC power available.

Crane disconnect switch 1SW open.

MR contact open.

Overload relay contact open.

STOP button contact open.

Fuse blown in M coil circuit (1FU)

115 volt control power from 1T not available.

2. Brake

If brake does not release, check for mechanical binding, coil excitation when the brake contactor is picked up, or circuit continuity.

C. GENERAL

If the drive is malfunctioning from none of the above causes, the adjustment procedure outlined in the Systems Test and Adjustments section should be followed in detail.