

**SINGLE GIRDER TRANSFER CRANES**

Single girder transfer cranes permit the transfer of loads from the area to area, either directly from crane to crane or by fixed transfer sections or spur tracks. They are of the same design as standard single girder cranes with the addition of interlock mechanisms at one or both ends of the girder. The discharge point is a part of the interlocking equipment and is installed at the end of each track where a carrier is to be transferred. Direct interlocking cranes have discharge points installed on one or both ends of the girder depending on the number of cranes to be interlocked.

Forks are provided on interlock mechanisms and discharge points which raise to permit passage of the carrier when the interlock and discharge point are latched. When they are not latched, the forks prevent carriers from being accidentally run off the end of the girder or discharge track.

The throw-out mechanism activates the interlock latch and may be manually or motor operated. Manually operated mechanisms are located on the bridge girder and are operated by pull chains. Motor operated mechanisms are controlled by

a push button station located on the carrier or crane.

The drawings show the interlock mechanism in the unlatched and latched positions and illustrate the operation of the transfer equipment. When the girder is aligned with the discharge track, the forks remain in the down position until the interlock is thrown into the latch position. When the throw-out mechanism is operated, the throat of the latch extends into the discharge point, locking the girder and discharge track in alignment. As the latch extends, it contacts the discharge point forks and the interlock forks contact the discharge point plates, causing both sets of forks to raise. With the throat of the latch engaging the discharge point and the fork in the raised position, the carrier may travel on or off the girder or discharge track. After the carrier has transferred, the latch is retracted by the throw-out mechanism and the forks return to the down position.

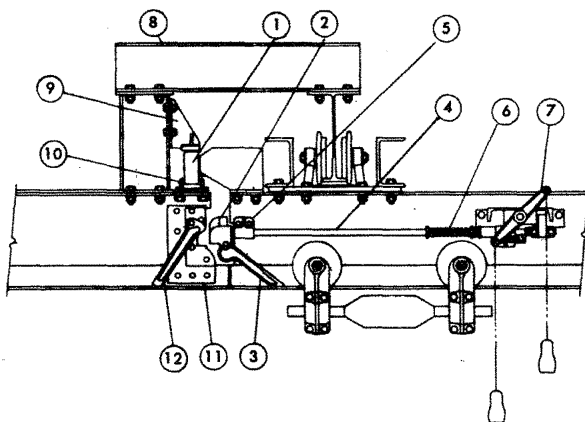
Forks are steel castings. The latch is also a steel casting and is held in the extended position by spring pressure. The throw-out mechanism is a direct acting cam arrangement.

**INTERLOCK MECHANISM**

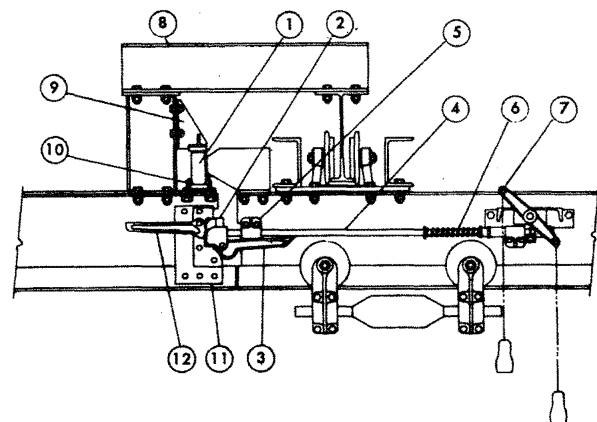
- 1 Guide Roller
- 2 Latch
- 3 Interlock Fork
- 4 Slide Rod
- 5 Slide Rod Bearing
- 6 Spring
- 7 Throw-out Mechanism

**DISCHARGE POINT**

- 8 Structural Tie
- 9 Upper Guide Roller Guide
- 10 Lower Guide Roller Guide
- 11 Discharge Point Plate
- 12 Discharge Fork



**UNLATCHED POSITION**



**LATCHED POSITION**

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**INTERLOCKS AND DISCHARGE POINTS**

Three types of interlocking equipment are available: Type L interlocks and discharge points for carriers with 4 inch and 5 inch diameter wheels; Type H for carriers with 6-1/2 inch diameter wheels; and Type J for carriers with 8 inch diameter wheels. Item numbers for all interlocks and discharge points are listed on Page CR-32. In laying out transfer crane systems, the same type of interlock and discharge must be used throughout the system.

Type L interlocks are installed only on No. 34021 (10 inch) or larger girders. The depth of Nos. 34011 and 34016 track does not provide clearance for the slide rod bearings and throw-out mechanism. Type L discharge points are installed only on No. 34026 (11-1/2 inch) or larger girders. The depth of Nos. 34011, 34016 and 34021 tracks does not provide clearance for the forks and discharge plates; however, when used as spur tracks, they can be built up to 11-1/2 inch depth to accommodate the discharge point.

Type H interlocks and discharge points are installed only on heavy rail sections (Nos. 34037 through 34079).

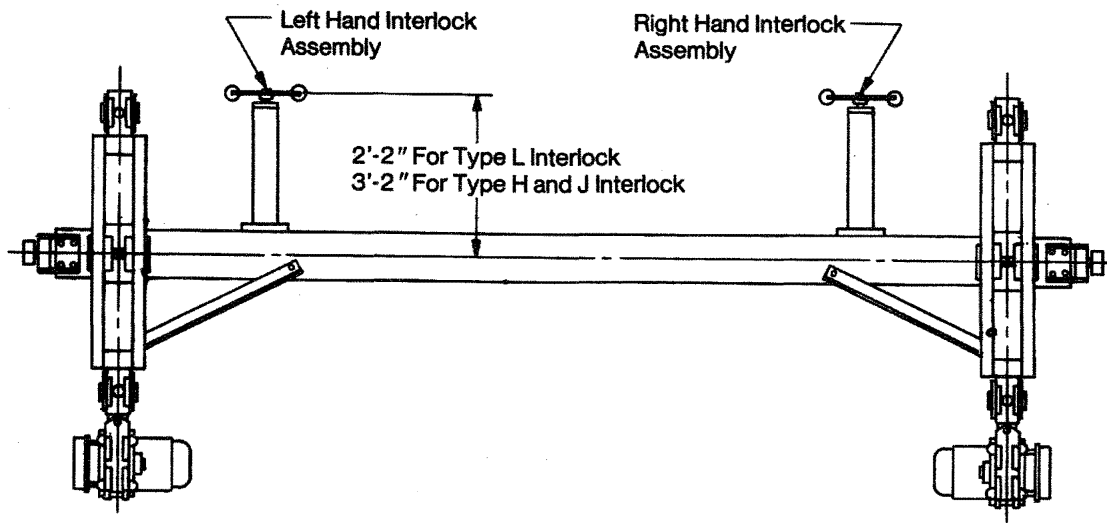
Type J interlocks and discharge points are installed only on No. 34046 (16 inch) or larger girders, transfer tracks and spur tracks. Nos. 34037 and 34041 tracks do not provide clearance for the interlock or discharge point; however, when used as a spur track, they can be built up to 16 inch depth to accommodate the discharge point.

When 2 or more transfer cranes with different size girders operate on the same runway, a constant girder depth must be

established at the end trucks to allow the cranes to engage the discharge track. When carriers are motor driven, the girders must also have the same rail tread thickness to allow for operation of the tractor drive on all cranes. The constant girder depth is accomplished by coping the larger girders to the depth of the smaller girder. Minimum depths of coped bridge girders for transfer cranes are:

- Nos. 34026 and 34031 girders may be coped to 10 inch depth when cranes are arranged for interlocking through fixed transfer sections or to spur tracks.
- Nos. 34037 and 34041 girders may be coped to 11-1/2 inch depth when hand pushed carriers with 4 inch Or 5 inch Diameter wheels are used on the system.
- Girders with Type H interlocks may be coped to 12-1/2 inch depth.
- Girders with Type J interlocks may be coped to 16 inch depth.

Manually operated throw-out mechanisms for Type L interlocks have the hand chains located 2'-2" from centerline of the girder. Type H and J interlock throw-out mechanisms have the hand chains located 3'-2" from centerline of the girder. Type H throw-outs may be used with Type L interlocks to provide additional clearance between the hand chains and the hoist or carrier. Throw-out mechanisms are located on the side of the girder opposite the brace angles resulting in right and left hand assemblies. The drawing below illustrates these assemblies.



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CATALOG NUMBERS OF INTERLOCKS AND DISCHARGE POINTS

ITEM NUMBERS OF INTERLOCKS AND DISCHARGE POINTS										
Track Item Number	Interlocks						Discharge Points			
	Type L		Type H		Type J		Type L	Type H	Type J	
	RH Assem.	LH Assem.	RH Assem.	LH Assem.	RH Assem.	LH Assem.				
34011	8"	----	----	----	----	----	----	----	----	
34016	8-1/2"	----	----	----	----	----	----	----	----	
34021	10"	450100E	450100F	----	----	----	----	----	----	
34026	11-1/2"	450100E	450100F	----	----	----	45030T	----	----	
34031	13"	450100E	450100F	----	----	----	45030T	----	----	
34037	12-1/2"	450101E	450101F	450106E	450106F	----	45030U	45031R	----	
34041	14"	450101E	450101F	450106E	450106F	----	45030U	45031S	----	
34046	16"	450101E	450101F	450106E	450106F	450109E	450109F	45030U	45031S	45033E
34051	18"	450102E	450102F	450107E	450107F	450110E	450110F	45030V	45031T	45033F
34056	20"	450102E	450102F	450107E	450107F	450110E	450110F	45030V	45031T	45033F
34061	22-1/2"	450102E	450102F	450107E	450107F	450110E	450110F	45030V	45031T	45033F
34066	25"	450102E	450102F	450107E	450107F	450110E	450110F	45030V	45031T	45033F
34071	27-1/2"	450103E	450103F	450108E	450108F	450112E	450112F	45030W	45031U	45033G
34076	30"	450103E	450103F	450108E	450108F	450112E	450112F	45030W	45031U	45033G
34077	32"	450103E	450103F	450108E	450108F	450112E	450112F	45030W	45031U	45033G
34078	36"	450103E	450103F	450108E	450108F	450112E	450112F	45030W	45031U	45033G
34079	40"	450103E	450103F	450108E	450108F	450112E	450112F	45030W	45031U	45033G

----Not Available

**GUIDE ROLLER ARRANGEMENT**

Guide rollers and guide roller guides maintain vertical and horizontal alignment of bridge girders and transfer tracks. The guide roller arrangement allows the transfer crane to pass spur tracks, fixed transfer sections or other transfer cranes without interference. They are recommended for (1) hand propelled carriers of more than 2 tons rated load, (2) motor driven carriers, (3) motor driven transfer cranes and (4) all direct interlocking cranes. The guide roller is mounted on the bridge girder and the guide roller guide on the spur track or fixed transfer section.

The roller is machined from alloy steel and operates on a prelubricated double row ball bearing. The roller assembly is mounted in a welded steel bracket. The complete assembly is designated as Item No. 4504.

Two guide roller guides are available. The one piece assembly (Item No. 4501007) is used at the discharge end of direct interlocking cranes. The two piece assembly (Item Nos. 4501004 upper guide and 4501005 lower guide) is used on spur tracks and fixed transfer sections. When a crane is equipped with a guide roller, all connecting spur tracks, fixed transfer sections and direct interlocking cranes must be equipped with guide roller guides.

**ELECTRIFIED TRANSFER CRANES**

Insul-8-Bar's 90 amp conductor is the standard electrification for transfer cranes. Consult factory for assistance when other types of electrification are used. Transfer cranes generally are not electrified with festooned or tagline electrification.

The power conductor arrangement for transfer cranes is shown in the Electrification Section. The power conductors must be 6-1/8 inch above the tread for Type L interlocks, 7-3/4 inch For Type H interlocks and 9-1/2 inch for Type J interlocks to prevent interference with the latch.

The control conductors on motor driven transfer cranes with Type I control are located 1-7/8 inch above the girder tread for Nos. 34021 through 34056 girders and at the same elevation as the power conductors for No. 34061 and larger girders. If a switch is incorporated in the spur track, the control conductors must be lowered to provide clearance between the control collectors and the switch; consult factory for recommendations on these applications.

The control conductors are not carried through the interlock gap, eliminating the need for control conductors on spur tracks or fixed transfer sections. No. 550491 pickup guides and No. 550278 transfer caps are used at the ends of the con-

## SINGLE GIRDER TRANSFER CRANES

trol conductors to enable the collectors to leave and pick up the conductors as the carrier moves off and on the transfer crane. Carriers operating on transfer cranes use No. 560395 collectors for the power conductors and No. 560393 self-centering collectors for the control conductors.

All carriers operating on direct interlocking cranes, cranes interlocking through transfer sections, or cranes interlocking at both ends with spur tracks require tandem collectors for the common conductor (X) and the mainline conductor (M) to activate the mainline contactor as the transfer is made. The tandem collector arrangement requires 2 additional No. 560393 collectors.

## MOTOR DRIVEN TRANSFER CRANES

Motor driven transfer crane use Types I or III control arrangements as described on Pages CR-7 and CR-8. Accessory equipment can be furnished on motor driven transfer cranes to increase their flexibility and improve their operation. Some accessory equipment is furnished as standard and some as optional.

A limit switch is furnished on the throw-out mechanism as standard on transfer cranes interlocking with spur tracks or fixed transfer sections. The switch interrupts the crane control circuit when the latch is extended and prevents the operator from moving the crane while it is latched to the discharge track.

When a system has 2 or more discharge tracks and 2 or more transfer cranes with Type I control, an auxiliary push button station may be installed on the crane for controlling the crane motion. This enables the operator to move the crane from one discharge track to another without the hoist and carrier being on the crane.

When transfer cranes are arranged for direct crane to crane interlocking it may be desirable to have them travel as a unit when interlocked. This is accomplished by contacts at the ends of the cranes which connect the crane control circuits. A limit switch disconnects the contacts when the cranes are not interlocked allowing the cranes to pass without connect-

ing their control circuits.

Other limit switch arrangements are used to prevent the crane from traveling when the latch is extended and the crane is not aligned with the other crane. Consult factory for information on limit switch arrangements, clearances and girder overhangs on all direct interlocking cranes.

## MOTOR OPERATED INTERLOCKS

Motor operated interlocks can be furnished on all motor driven transfer cranes as optional equipment. The latch and slide rod assembly are the same as used on manually operated interlocks. The throw-out mechanism uses a gearmotor and roller chain drive to extend and retract the latch. A magnetic contactor is furnished for control of the gearmotor; limit switches control the movement of the latch and also interrupt the crane motion when the interlock is extended.

The interlock is controlled from 2 additional buttons in the carrier push button station (Type I control) or crane push button station (Type III control) or from an auxiliary push button station suspended from the crane. On cab operated systems, a push button station is mounted in the cab. When controlled from the carrier, 2 additional control conductors are required for the crane electrification and 2 additional control collectors for the carrier.

When transfer cranes with motor operated interlocks are arranged for direct crane to crane interlocking, contacts to connect the crane control circuits may be required to meet the following conditions: (1) control of the interlock from either of the 2 interlocked cranes; (2) cranes to travel as a unit when interlocked; and (3) the combination of conditions (1) and (2). When contacts are used, a limit switch is provided to disconnect the contacts when the cranes are not interlocked allowing the cranes to pass without connecting their control circuits. Other limit switches are provided to prevent the crane from traveling when the latch is extended and the crane is not aligned with the other crane. Consult factory for information on limit switch arrangements, clearances and girder overhangs on all direct interlocking cranes where contacts are required.

**SINGLE GIRDER TRANSFER CRANE CLEARANCES**

**SPUR TRACK ARRANGEMENT**

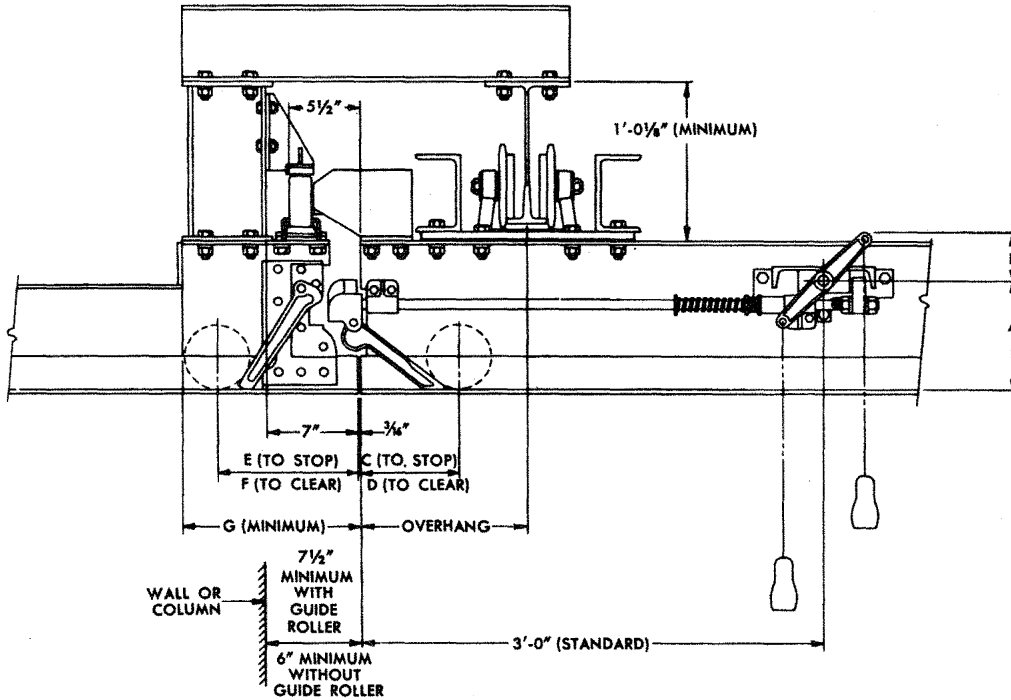
The arrangement of a transfer crane interlocking with a spur track is shown in the drawing. Spur tracks interlocking with the transfer crane are equipped with discharge points and guide roller guides (where applicable).

A structural tie is required between the discharge track and crane runway. The tie maintains the gap between the ends of the discharge track and the girder and permits the crane to pass the discharge track without interference. It also provides the support for the upper guide roller guide. The tie may be bolted or welded to the runway track. It is installed

with the transfer crane latched to the spur and with a 3/16 inch gap between the ends of the discharge track and girder. When bolting, holes in the runway track are field drilled.

The discharge track is supported from the building structure or steel superstructure adjacent to the structural tie. The structural tie is not designed to support the end of the discharge track.

Bracing of the discharge track is recommended to maintain alignment. The bracing is made in the field to suit the conditions and consists of steel angles installed perpendicular to the track. Bracing is installed after system has been aligned.



Interlock Mechanism	A	B	C	D	E	F	G
Type L	8-1/16	3-11/16	7-3/4	10-1/2	10-3/4	1'-2-5/8	1'-2
Type H	10-1/8	6-13/16	10-3/8	1'-2-1/4	1'-0-1/2	1'-5-5/8	1'-4-1/2
Type J	11-7/8	6-13/16	1'-1-1/8	1'-5-7/8	1'-1-7/8	1'-8-1/8	1'-6-1/2

**SINGLE GIRDER TRANSFER CRANE CLEARANCES**

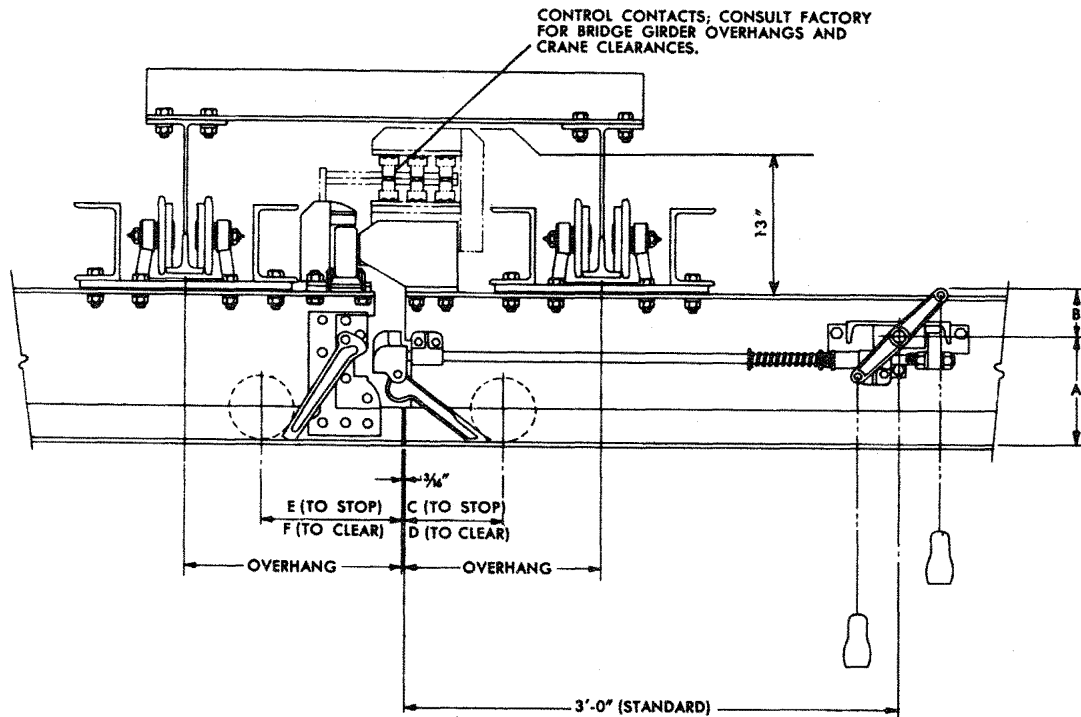
**DIRECT CRANE TO CRANE INTERLOCK ARRANGEMENT**

The arrangement of 2 direct interlocking transfer cranes is shown in the drawing. This arrangement is frequently used in an assembly bay area where operations on one side of the bay are different from those on the other side. It provides greater availability of the cranes and permits transfer of loads from one side of the bay to the other.

Consult factory for clearance dimensions when cranes are required to travel as a unit, as girder overhangs may have to be increased to accommodate the control contacts. Data on

desired control functions, girder and runway track sizes and type of end trucks are required to determine clearances.

Structural ties are required between adjacent runways. These ties maintain the gap between the ends of the girder and permit the cranes to pass without interference. They are located at the support points and at intermediate points as required to maintain a spacing of not more than 10'-0" centers. The ties may be bolted or welded to the runway tracks. They are installed with the cranes located directly under the ties with a 3/16 inch gap between the ends of the girders. When bolting, holes in runway track are field drilled.



Interlock Mechanism	A	B	C	D	E	F
Type L	8-1/16	3-11/16	7-3/4	10-1/2	10-3/4	1'-2-5/8
Type H	10-1/8	6-13/16	10-3/8	1'-2-1/4	1'-0-1/2	1'-5-5/8
Type J	11-7/8	6-13/16	1'-1-1/8	1'-5-7/8	1'-1-7/8	1'-8-1/8

**SINGLE GIRDER TRANSFER CRANE CLEARANCES**

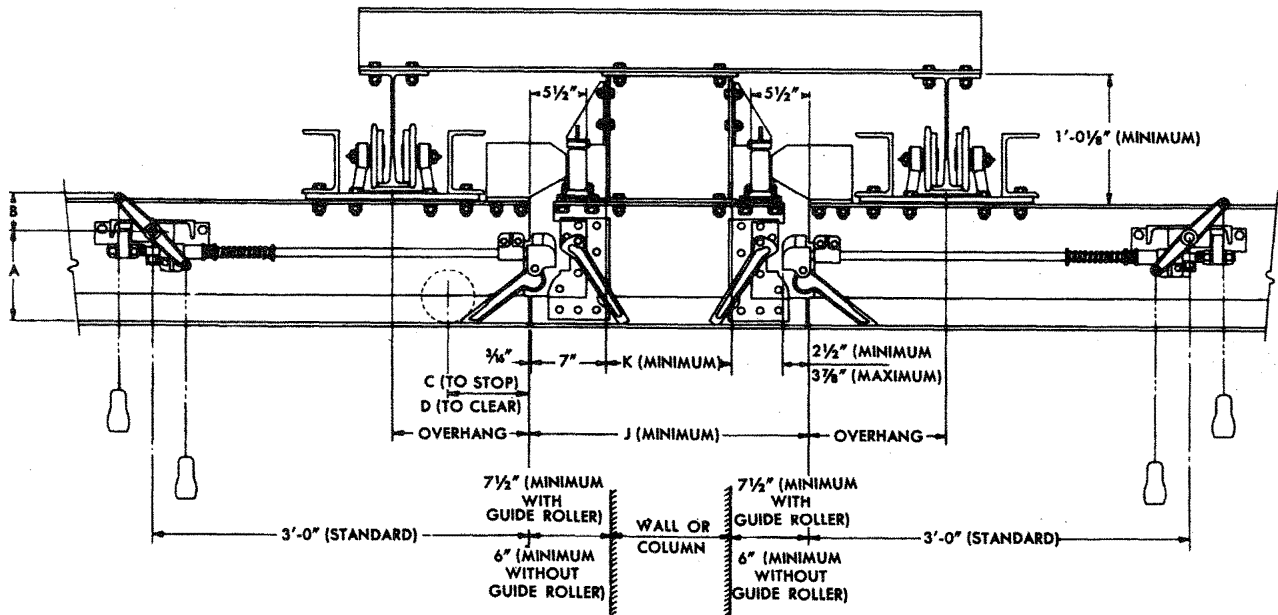
**FIXED TRANSFER SECTION ARRANGEMENT**

The arrangement of 2 transfer cranes interlocking with a fixed transfer section is shown in the drawing. This arrangement is used where transfer of loads from one bay to another is desired.

The transfer track is suspended from the adjacent runway tracks by a structural support. The support maintains the gaps between the ends of the transfer track and bridge girders and permits the cranes to pass the transfer track without inter-

ference. The support may be bolted or welded to the runway tracks. It is installed with the transfer cranes latched to the transfer track and with 3/16 inch gaps between the ends of the transfer track and bridge girders. When bolting, holes in the runway tracks are field drilled.

Bracing of the transfer track is recommended to maintain alignment. The bracing is made in the field to suit the conditions and consists of steel angles installed perpendicular to the track. Bracing is installed after systems has been aligned.



Interlock Mechanism	A	B	C	D	J	K
Type L	8-1/16	3-11/16	7-3/4	10-1/2	2'-3-3/8	1'-1
Type H	10-1/8	6-13/16	10-3/8	1'-2-1/4	2'-8-3/8	1'-6
Type J	11-7/8	6-13/16	1'-1-1/8	1'-5-7/8	3'-0-3/8	1'-10