

Bulk Materials Handling Railcar and Barge Handling



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Selection Factors

- Required Rope or Drawbar Pull
- Track Grade
- Required Travel Distance
- Track Curvature
- Frequency of Usage
- Level of Automation
- Labor Savings vs. Initial Cost
- Cycle Time
- Safety Issues
- Radio Control
- Special Operating Requirements
- Variable Frequency Drives



Standard Car Pullers

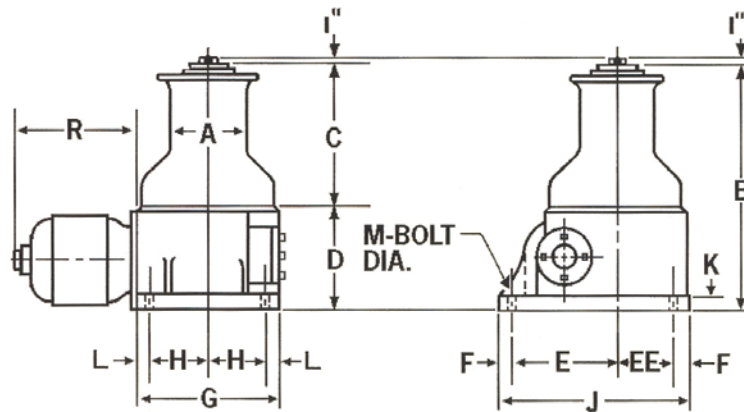
Vertical Capstan

It's designed for spotting railcars and is adaptable to many jobs requiring one-direction pulling. The operator attaches a hook to the car and manually snubs rope on capstan with sufficient tension for proper operating pull. The pulling distance is only limited by the operator's strength in handling the rope. Both models are equipped with high starting torque TENV motors. Optional equipment includes special motors and holding brake.



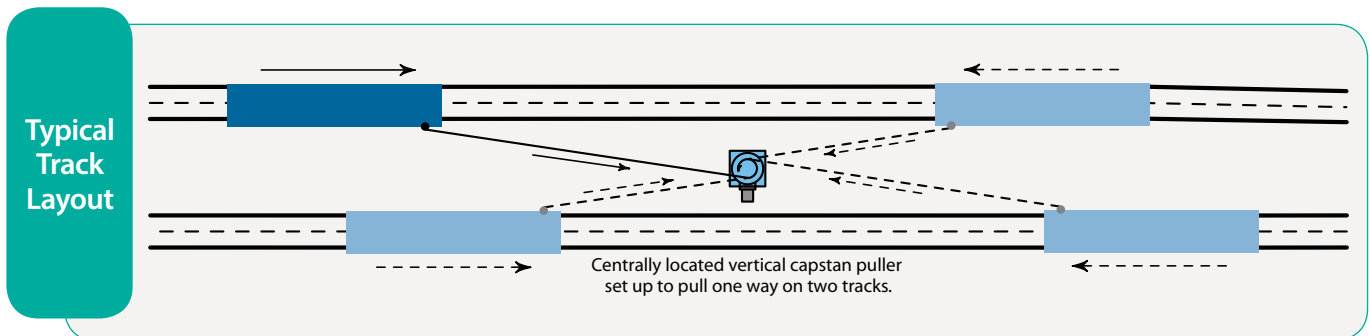
Specifications

Model	Motor (HP/RPM)	Rope Speed (fpm)	Pulling Capacity		Rope Size	Weight (lbs.)
			Starting (lbs.)	Running (lbs.)		
11-V	5/1800	46	5,000	2,500	1½	620
12-V	10/1800	46	10,000	5,000	2	1,680
16-V	15/1800	56	15,600	7,800	2	1,800



Dimensions (Inches)

Model	A	B	C	D	E	EE	F	G	H	J	K	L	M	R
11-V	7	25 ¼	13 ¼	12 ½	10 7/8	7	1 ½	13 5/8	4 7/8	20 7/8	2	11 5/16	1 ¼	13 ¼
12-V	12	34 ¼	18 ¼	16	16 ¾	9	2	22	9	29 ¾	2 ½	2	1 ½	16 5/8
16-V	12	34 ¼	18 ¼	16	16 ¾	9	2	22	9	29 ¾	2 ½	2	1 ½	18

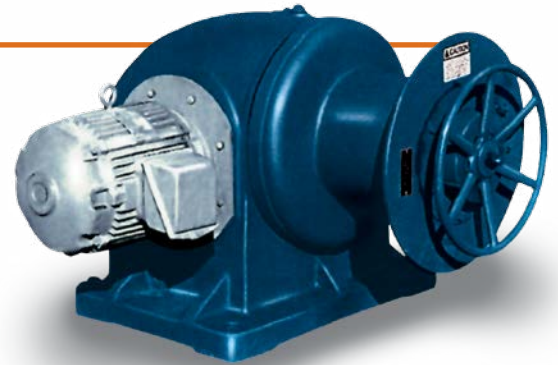


Horizontal Drum

On horizontal drum car pullers, the rope is attached to the drum which eliminates the need for snubbing and reduces handling of the rope. Up to 500 feet of rope can be stored on the drum when properly wound. Both the 14-H and 16-H models feature a heavy-duty hand wheel clutch which releases the drum to pay out stored rope and engages to pull without manual rope tension.

High starting torque TENV motors are standard equipment.

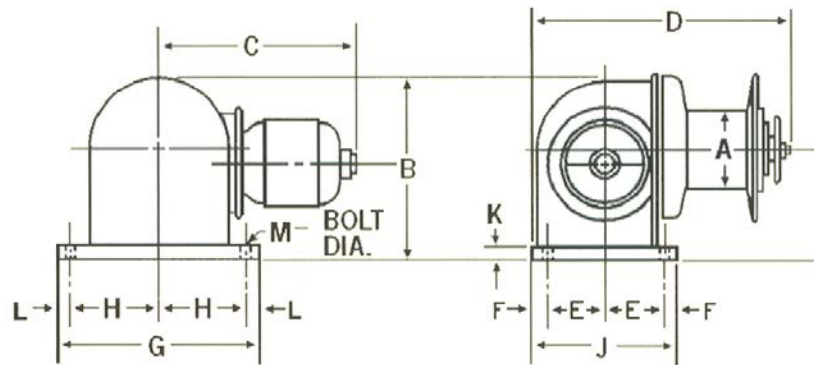
Optional equipment includes special motors, holding brake, variable frequency drive, sheaves, wire rope and electrical controls.



Specifications

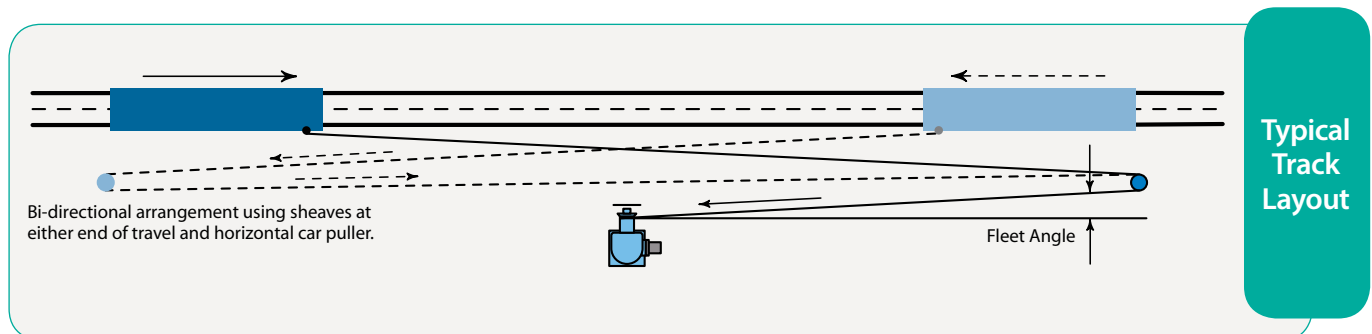
Model	Motor (HP/RPM)	Rope Speed (fpm)	Pulling Capacity Running Rope Pull			Starting Pull* First Layer	Wire Rope Size	Drum Cap. (ft.)	Weight (lbs.)
			Layer						
			1	6	8				
14-H	10/1800	45	5,000	—	3,730	10,000	5/8	500	1,800
16-H	7½/900	28	7,800	4,730	—	15,600	¾	400	2,000

* Starting rope pull represents a 100% overload on the motor and may be safely used for a six second period. Once the cars are started, the pull required to keep them moving drops approximately 50%. Torque ratings apply to bare drum diameter and decrease inversely proportional to radius as rope is wound on the drum.



Dimensions (Inches)

Model	A	B	C	D	E	F	G	H	J	K	L	M
14-H	12	28	27	39¼	9	2	31	13½	22	2½	2	1½
16-H	12	28	29	39¼	9	2	31	13½	22	2½	2	1½

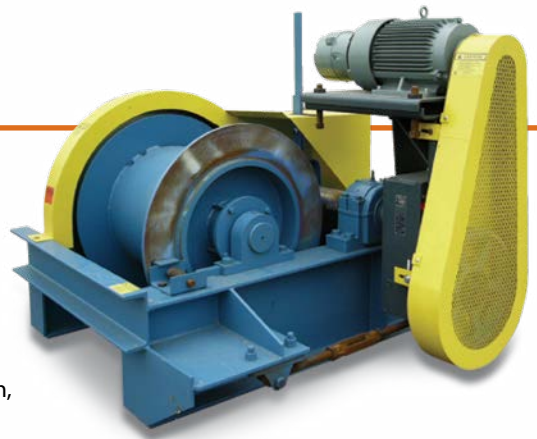


Style 969 Car Pullers

One Way Wire Rope

Key Features:

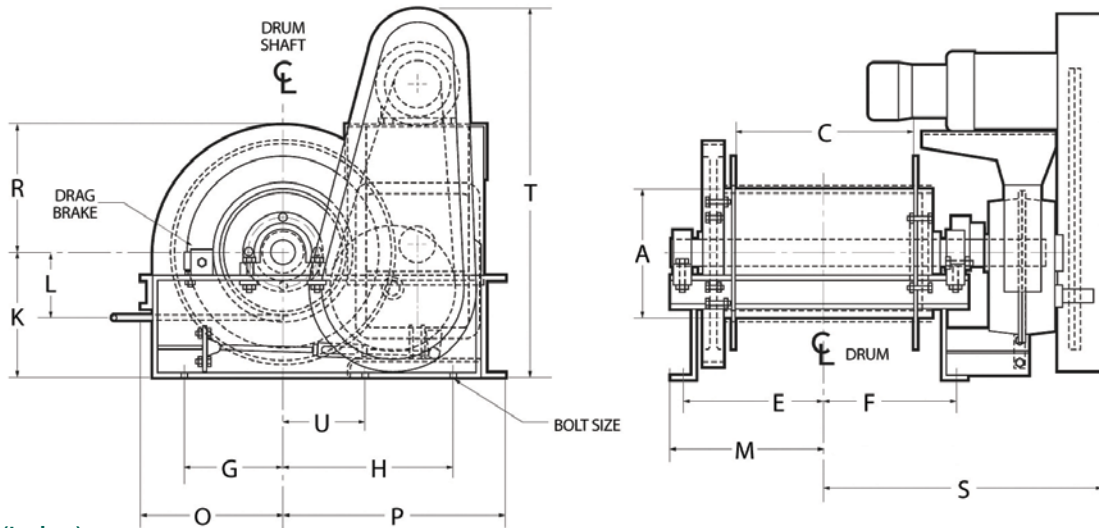
- **Motor:** Standard motors are ball bearing, all weather, high starting torque type 220–440 volt, 3 phase, 60 cycle. Motors with other current characteristics available on request.
- **Drums:** Drums on the Style 969 are fabricated with a smooth face and flanges for large rope capacity.
- **Fabricated Steel Base:** Rigidly welded channel frame designed to maintain accurate alignment.
- **Drive-Reducer:** V-Belt driven from motor to torque arm reducer.
- **Pinion and Gear:** Precision cut alloy steel spur pinions and gears have protective guards. All gears are 20° stub tooth for higher strength, and heat-treated for longer wear life.
- **Drum Drag Brake:** Eliminates spinning and over-travel of the drum when paying out rope — an anti-nuisance feature.
- **Clutch:** A hand lever operated jaw clutch permits quick engagement and disengagement of power to the drum.
- **Bearings:** Anti-friction flange type bearings used on the drum. The dead shaft is supported on anchor blocks.
- **Pillow Blocks:** Anti-friction pillow block bearings are used on the countershaft.



Specifications

Car Puller No.	Maximum Running Rope Pull		Average Rope Speed (F.P.M.)		Motor (HP)	Total Rope Length In 5-Layers Feet Random Wound	Wire Rope Size Outside Dia. (in.)*
	First Layer	Fifth Layer	First Layer	Fifth Layer			
1520-20	7,450	5,500	20	27.0	5	500	¾
1520-30	7,450	5,500	30	40.5	7½	500	¾
1520-40	7,450	5,500	40	54.0	10	500	¾
1822-20	11,000	8,250	20	26.7	7½	570	7/8
1822-30	9,900	7,450	30	40.0	10	570	7/8
1822-40	11,000	8,250	40	53.3	15	570	7/8
2024-17	17,000	12,650	17	22.8	10	605	1
2024-26	17,000	12,650	26	35.0	15	605	1
2024-36	16,500	12,300	36	48.4	20	605	1
2024-45	16,500	12,300	45	60.5	25	605	1
2224-21	21,000	15,500	21	28.5	15	565	11/8
2224-28	21,000	15,500	28	38.0	20	565	11/8
2224-37	20,000	14,750	37	50.3	25	565	11/8
2224-45	20,000	14,750	45	61.0	30	565	11/8
2430-24	25,000	19,200	24	32.6	20	810	11/8

* Wire rope 6 X 25 improved plow steel - hemp. center.



Dimensions (Inches)

Running Puller Rating	A	C	E	F	G	H	J	K	L	M	O	P	Q	R	S	T	U*
1520	15	20	161/8	14¾	11	24	7/8	14½	7½	173/8	15¾	25¼	43	14	31¾	44	—
1822	18	22	18	16¼	12	26¾	1	15	9	19¾	17¼	28½	48	15½	34	51¾	—
2024	20	24	185/8	175/8	14	26	1¼	18	10	20¼	19½	323/8	58¾	17	40¼	59¼	—
2224	22	24	19¼	18¼	16	34½	1½	19	11	21	21½	36	63	19	44	63	—
2430	24	30	26½	23½	18	40	1¼	23	129/16	28¼	26	41½	56	22½	45	56	18

* Model 2430 has (6) "J" diameter anchor bolt locations.

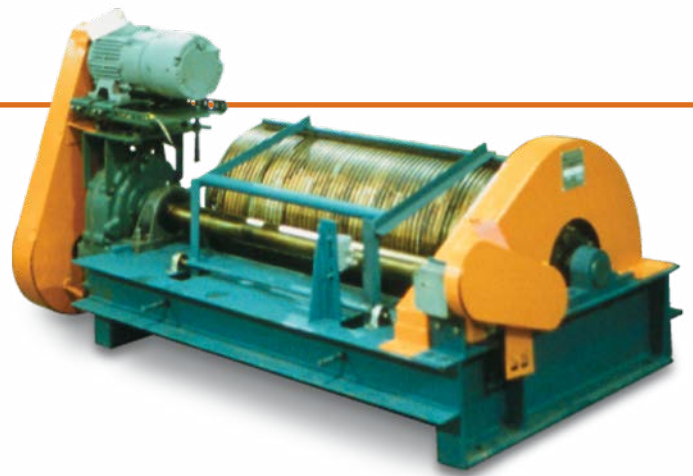


Style 970 Car Pullers

Single Drum Reversible (< 14,000 # Pull)

Key Features:

- **Single Drum Shaft Mounted Reducer:** Style 970 single drum reversible (SDR) car pullers are generally used where cars must be moved or controlled in both directions along a track and where the length of travel is not in excess of the practical capacity of a single layer of rope on the drum. They also eliminate the necessity of manually relocating the hook. Since only a single layer of rope on the drum is used, there is a limit of practicable pulling distance, usually 500 feet. All single drum reversible systems require a closed rope circuit.
- **Operation:** The hook arrangement for this puller is shown on page 12. Both ends of the rope dead end at the drum and as the rope is wound onto the drum on one end, the same amount of rope is paid off the other end. The load is under positive control in both directions. There is a “gap” of one or more empty grooves on the drum. As the drum is turned, the “gap” moves across the face of the drum. At least two full anchoring wraps are at each end. Manually adjustable turn buckle, take-up sheaves are always used with SDR pullers.

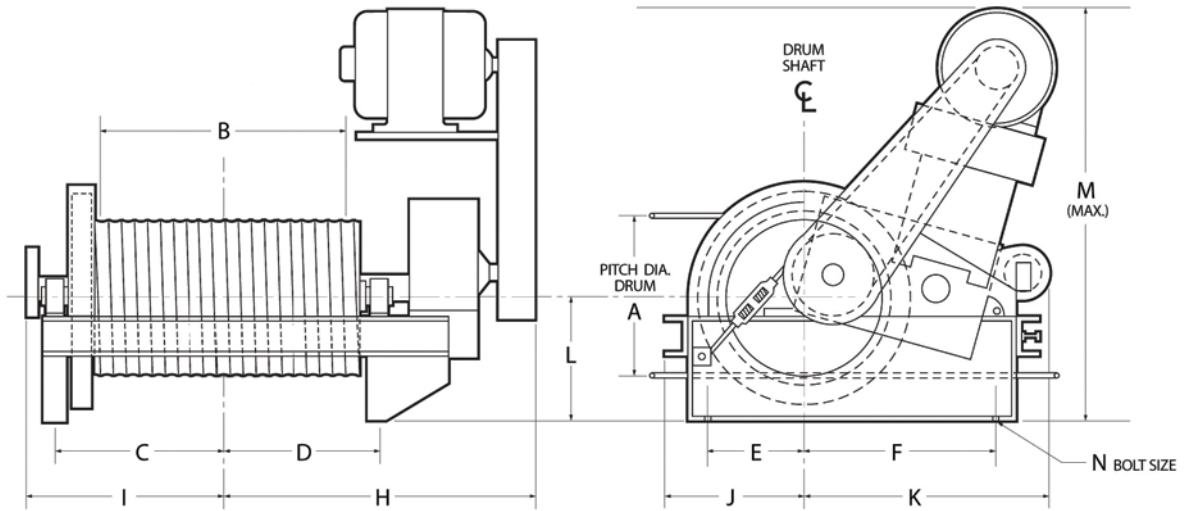


- **Drive:** The speed reducer is mounted on and drives the countershaft. The motor sits on an adjustable base and drives the input shaft through a V-belt drive.
- **Limit Switches:** All 970 SDR car pullers include a standard limit switch arrangement devised to protect against “double wrapping” of the rope on the drum or against the possibility of the rope coming out of the grooves. Also furnished is a rotary type travel limit switch to prevent the hitch rope hardware from contacting the terminal sheaves. Because the switch is conveniently located, the protective interlock wiring is simple and less costly than that required for the conventional fork and lever switch on the double drum continuous puller.

Specifications

7,000 Rating						
Speed (F.P.M.)	20	30	40	—	—	—
Motor (HP)	5	7½	10	15	—	—
10,000 Rating						
Speed (F.P.M.)	14	21	28	42	—	—
Motor (HP)	5	7½	10	15	20	—
14,000 Rating						
Speed (F.P.M.)	15	20	30	40	50	—
Motor (HP)	7½	10	15	20	25	30



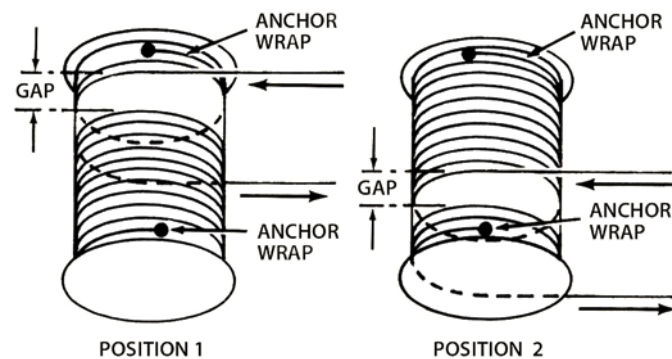


Dimensions (Inches)

Model	Running Rope* Pull	Max. Rope Travel	Wire Rope Size	A	B	C	D	E	F	H	I	J	K	L	M	N
1624-7	7,000	120	5/8	16	24	18 7/8	15 5/8	12	21	33	23 1/8	18	30	15	48	7/8
1636-7	7,000	195	5/8	16	36	24 7/8	21 5/8	12	21	39	29 1/8	18	30	15	48	7/8
2036-7	7,000	245	5/8	20	36	24 7/8	21 5/8	12	21	39	29 1/8	18	30	15	48	7/8
2436-7	7,000	290	5/8	24	36	24 7/8	21 5/8	12	21	44	29 1/8	19	35	15	50	7/8
2448-7	7,000	400	5/8	24	48	30 7/8	27 5/8	12	21	50	35 1/2	19	35	15	50	7/8
3048-7	7,000	500	5/8	30	48	31	27 1/2	15	30	47 3/4	35 1/4	22 1/2	38	19	53	7/8
2036-10	10,000	205	3/4	20	36	24 1/2	21 1/2	12	24	44	29	19	35	15	56 1/2	1
2436-10	10,000	250	3/4	24	36	24 1/2	21 1/2	12	24	44	29	19	35	15	56 1/2	1
2448-10	10,000	345	3/4	24	48	30 1/2	27 1/2	12	24	50	35	19	35	15	56 1/2	1
3048-10	10,000	430	3/4	30	48	31 5/16	29 1/16	15	30	51 1/2	36 1/2	22 1/2	38	19	58	1
3060-10	10,000	550	3/4	30	60	37 5/16	35 1/16	15	30	57 1/2	42 1/2	22 1/2	38	19	58	1
2036-14	14,000	160	7/8	20	36	25	22 7/8	14	28	44 3/4	29 1/2	20 1/2	35 1/2	18	60	1 1/4
2436-14	14,000	195	7/8	24	36	25	22 7/8	14	28	44 3/4	29 1/2	20 1/2	35 1/2	18	60	1 1/4
2448-14	14,000	270	7/8	24	48	31	28 7/8	14	28	50 3/4	35 1/2	20 1/2	35 1/2	18	60	1 1/4

* Wire rope 6 X 25 extra improved plow steel - I.W.R.C.

Rope Circuit

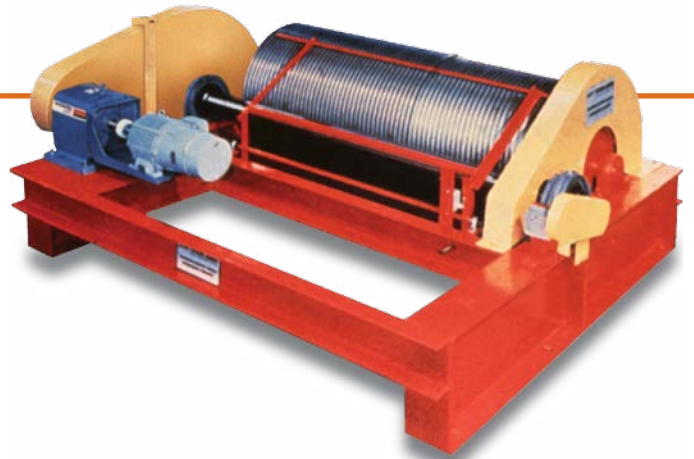


Style 970 Car Pullers

Single Drum Reversible (> 14,000 # Pull)

Key Features:

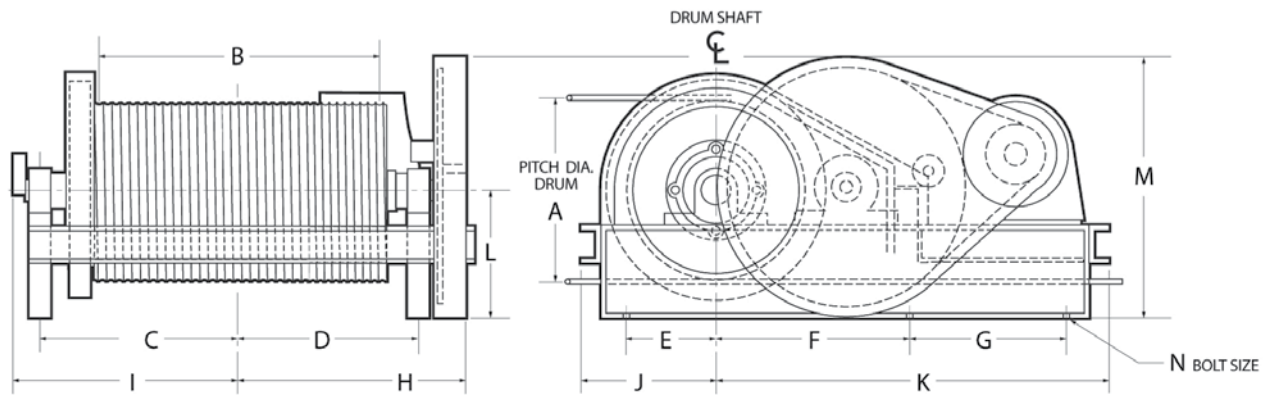
- **Chain Drive and Concentric Type Reducer:** More suitable for the higher torque requirements. Drum reeving and dead-ending is the same as shown on *page 6*. The limit of rope travel is approximately 500 feet.
- **Drum:** Hardened steel grooves to the diameter of wire rope used. Ends of drums are machined with an indexing shoulder to insure concentricity of the drum gear.
- **Pinion and Gear:** Precision cut, alloy steel, spur pinions and gears with protective guards. All gears are 20° stub tooth for higher strength and heat-treated for longer wear life.
- **Bearings:** Anti-friction flange type bearings are used on drum. Dead shaft supported on anchor blocks.
- **Pillow Blocks:** Anti-friction pillow block bearings are used on countershaft.
- **Limit Switches:** Rotary type limit switch driven from countershaft to control travel limits is standard equipment on all Style 970 pullers.
- **Hook Arrangement:** Typical hook arrangement, shown on *page 12*, normally used with single drum or double drum car pullers for two-way movement of cars. See *pages 14 and 15* for typical track layouts.



Specifications

14,000 Rating							
Speed (F.P.M.)	—	20	30	40	50	—	—
Motor (HP)	7½	10	15	20	25	30	—
18,000 Rating							
Speed (F.P.M.)	—	23	31	39	46	—	—
Motor (HP)	10	15	20	25	30	40	—
23,000 Rating							
Speed (F.P.M.)	—	18	24	30	36	48	—
Motor (HP)	10	15	20	25	30	40	50
28,000 Rating							
Speed (F.P.M.)	—	20	30	40	50	—	—
Motor (HP)	15	20	30	40	50	60	—
34,000 Rating							
Speed (F.P.M.)	—	20	24	33	41	49	—
Motor (HP)	20	25	30	40	50	60	75





Dimensions (Inches)

Model	Running Rope* Pull	Max. Rope Travel	Wire Rope Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N
3048-14	14,000	335	7/8	30	48	32½	28½	16	32	26	36	37	22½	663/8	20	42	1
3060-14	14,000	430	7/8	30	60	38½	34½	16	32	26	42	43	22½	663/8	20	42	1
3660-14	14,000	515	7/8	36	60	41½	37½	18	36	30	45¼	46	25¾	73¼	23	45¼	1
2436-18	18,000	165	1	24	36	295/8	261/8	16	32	26	347/8	34	22½	66¼	20	42¼	11/8
2448-18	18,000	230	1	24	48	355/8	321/8	16	32	26	407/8	40	22½	66¼	20	42¼	11/8
3048-18	18,000	290	1	30	48	355/8	321/8	18	36	30	407/8	40	25¾	73¼	23	47¾	11/8
3060-18	18,000	370	1	30	60	415/8	381/8	18	36	30	467/8	46	25¾	73¼	23	47¾	11/8
3660-18	18,000	445	1	36	60	415/8	381/8	18	36	30	467/8	46	25¾	73¼	23	47¾	11/8
3672-18	18,000	545	1	36	72	475/8	441/8	18	36	30	527/8	52	25¾	73¼	23	47¾	11/8
2436-23	23,000	150	11/8	24	36	295/8	261/8	18	36	30	347/8	34	25¾	73¼	22	47¼	1¼
2448-23	23,000	210	11/8	24	48	355/8	321/8	18	36	30	407/8	40	25¾	73¼	22	47¼	1¼
3048-23	23,000	265	11/8	30	48	363/8	335/8	18	36	30	427/8	407/8	25¾	75	23	48	1¼
3060-23	23,000	345	11/8	30	60	423/8	395/8	18	36	30	481/16	467/8	25¾	75	23	48	1¼
3660-23	23,000	410	11/8	36	60	423/8	395/8	18	36	30	47½	467/8	25¾	75	23	46	1¼
3672-23	23,000	500	11/8	36	72	483/8	455/8	18	36	30	53½	527/8	25¾	75	23	46	1¼
4272-23	23,000	585	11/8	42	72	493/8	465/8	22	42	34	54½	525/8	28½	83¼	26	52	1¼
3048-28	28,000	240	1¼	30	48	36¼	32¾	18	36	30	41	40½	25¾	77¾	23	46	13/8
3060-28	28,000	310	1¼	30	60	42¼	383/8	18	36	30	47	46½	25¾	77¾	23	46	13/8
3660-28	28,000	375	1¼	36	60	433/8	397/8	22	42	34	475/8	46¾	28½	83¼	26	52	13/8
3672-28	28,000	460	1¼	36	72	493/8	457/8	22	42	34	535/8	52¾	28½	83¼	26	52	13/8
4272-28	28,000	540	1¼	42	72	493/8	457/8	22	42	34	535/8	52¾	28½	83¼	26	52	13/8
3048-34	34,000	220	13/8	30	48	371/8	335/8	22	42	36	431/8	411/8	28½	84½	25	50	1½
3060-34	34,000	285	13/8	30	60	431/8	395/8	22	42	36	491/8	471/8	28½	84½	25	50	1½
3660-34	34,000	340	13/8	36	60	44	40	22	42	36	49½	48	28¾	84¾	25½	53	1½
3672-34	34,000	420	13/8	36	72	50	46	22	42	36	55½	52	28¾	84¾	25½	53	1½
4272-34	34,000	490	13/8	42	72	50½	46½	24	42	36	56½	54½	32½	91½	30	59	1½

*Wire rope 6 X 25 extra improved plow steel - I.W.R.C.

Style 1000 Car Pullers

Double Drum Reversible

Running Rope Pull up to 40,000 Lbs.

Designed for applications where a closed rope circuit is required, the double drum extends the permissible travel range to as much as 2,000 feet.

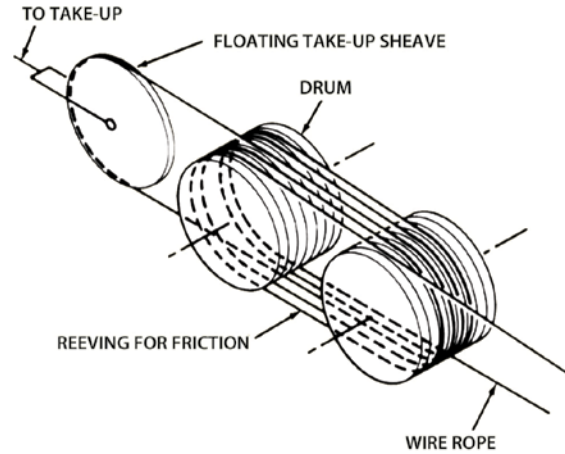
The double drum reversible (DDR) puller operates on the traction principle, and the take-up is required to provide sufficient snubbing tension for traction. Because of the reeving method of the drums, the rope does not walk laterally across the drum faces.

This puller is sometimes called a continuous type. This puller has a further advantage in that there is no variation of rope approach angle on the drum, thus permitting unit to be located much closer to the bend sheaves.

Uses railroad type bearings which eliminate cumbersome pillow blocks. Variable speed, hydrostatic, variable frequency or DC drives are available as an option for special applications. Units through 18,000 pounds pull use shaft mounted reducers with V-belt drive. Units 23,000 pounds and larger use right angle reducers with chain drive.

Wire Rope Reeving

All standard double drum reversible pullers are equipped with counterweighted gravity take-ups. Driving friction is provided automatically by the counterweighted gravity take-up acting on the wire rope through the reeving.

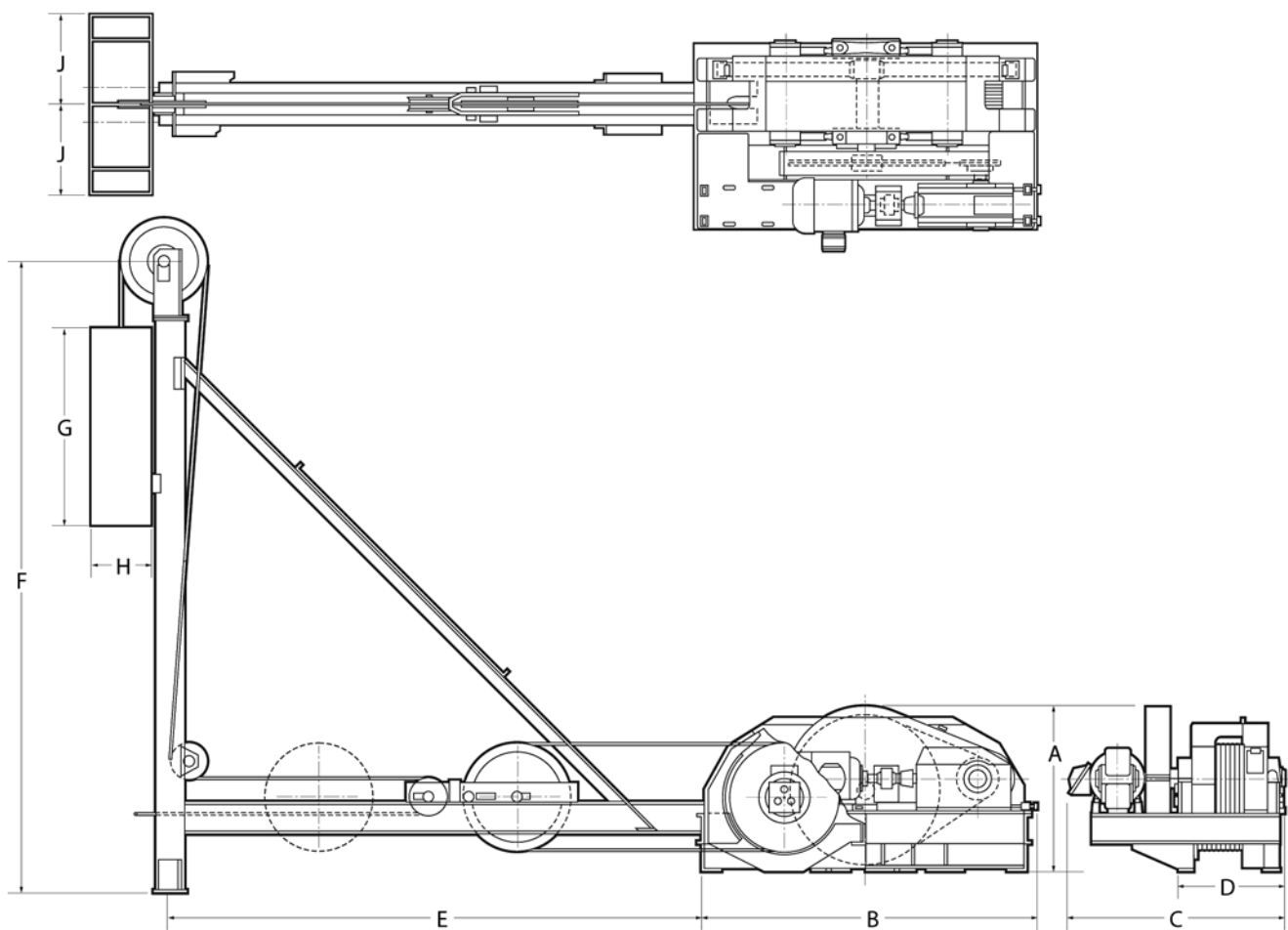


Specifications

10,000 Rating			
Speed (F.P.M.)	22	29	44
Motor (HP)	7½	10	15
14,000 Rating			
Speed (F.P.M.)	21	31	42
Motor (HP)	10	15	20
18,000 Rating			
Speed (F.P.M.)	24	32	40
Motor (HP)	15	20	25
23,000 Rating			
Speed (F.P.M.)	25	31	38
Motor (HP)	20	25	30
28,000 Rating			
Speed (F.P.M.)	26	31	42
Motor (HP)	25	30	40
34,000 Rating			
Speed (F.P.M.)	26	35	43
Motor (HP)	30	40	50
40,000 Rating			
Speed (F.P.M.)	22	36	44
Motor (HP)	30	50	60



Guards removed for clarity



Dimensions (Inches)

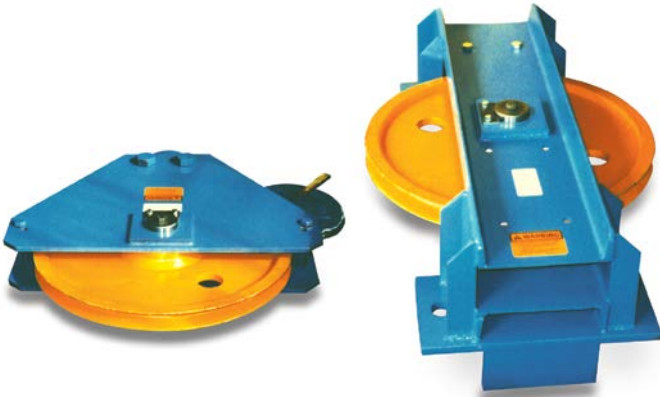
Car Puller Rating	Wire Rope	Drum Size**	A	B	C	D	E*	F*	G	H	J
10,000	¾	24	51¾	75	40	21	148 3/8	222	48	15	18
14,000	7/8	24	54¾	78	40	21	150	222	52	15	22½
18,000	1	30	60	92	48	25½	176	240	66	15	22½
23,000	1 1/8	30	47½	91	59	28½	177½	240	66	15	30
28,000	1¼	36	53	108	67	31½	178¾	240	72	16	33
34,000	1 3/8	36	54	111	69	36½	188½	252	72	24	33
40,000	1½	42	56	124	75	37¾	188½	252	72	24	33

* Dimensions for travel up to 300 ft.

** Wire rope 6 X 25 extra improved plow steel - I.W.R.C.

Accessories

For Car Pullers & Barge Handling



Shackle Sheave Assemblies

Bend and shackle sheave assemblies are constructed of fabricated steel frames, employ sealed-for-life spherical roller bearings, and are available in various configurations for specific applications.

Car puller and barge haul accessories can be combined to achieve nearly any arrangement or specific requirement.



Rope Selections

Working loads shown for one-directional pullers are based on the use of wire ropes of improved plow steel type having six strands of 19 wires to the strand, with hemp or fibre core.

Reversible pullers use improved plow steel with independent wire rope centers.

Regular lay is usually employed for these applications, due to its abrasion resistance but all questions concerning the details and recommendations for each application should be reviewed with Metso Bulk Materials Handling.

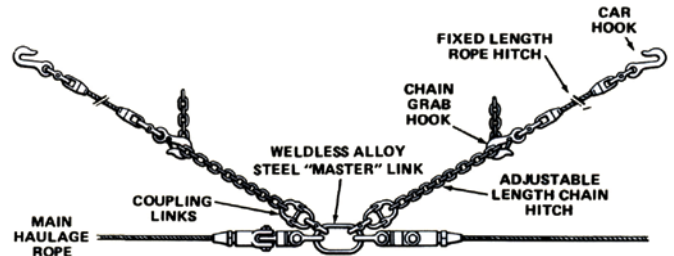
Use only the wire rope specified in the selection charts.



Vertical Guide Rollers

This unit has a welded steel supporting frame on which is mounted a vertical steel drum which turns in anti-friction pillow blocks supported at top and bottom of frame. The horizontal steel drum is carried on roller bearings mounted on a separate steel support.

One or more of these units are used with installations of wire rope car pullers to guide the rope when pulling around the inside of a curved track.



Hitch Rope Attachments

In practice, the rope travel is limited by the car hitching attachments approaching one or the other of the terminal sheaves. For reversible pullers used for spotting cars, two hitch ropes are required.

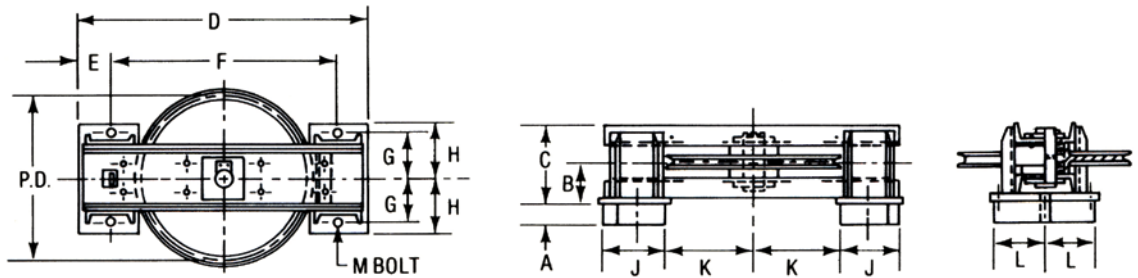
The same standard fittings are used on all reversible pullers.

The assembly is furnished complete with swivels or sockets that must be attached to the main haulage rope in the field.

Hitch rope assemblies are shipped completely assembled with grab hooks and car puller hooks.

Note: Certain installations will require additional guards, fences, or other safety devices. It is the customer's responsibility to select and furnish these additional guards or devices.

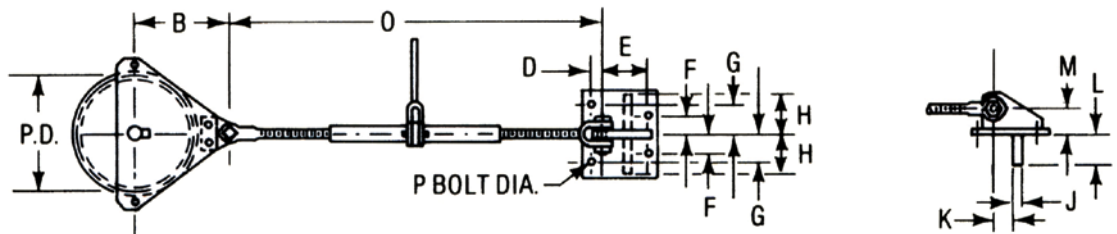
Bend Sheave Assemblies



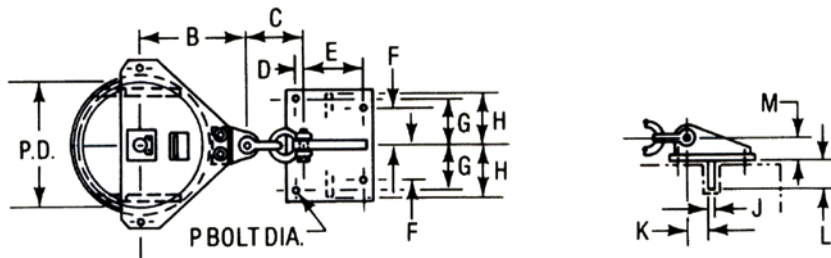
Dimensions (Inches)

Pull Rating (Running)	Wire Rope Size	P.D.	A	B	C	D	E	F	G	H	J	K	L	M
4,500	1/2	18 1/2	3 3/4	47/8	10 1/4	31 1/4	3	25 1/4	5 1/2	7	5 1/4	95/8	6 1/2	1
7,000	5/8	18 1/8	3 3/4	47/8	10 1/4	31 1/4	3	25 1/4	5 1/2	7	5 1/4	95/8	6 1/2	1
10,000	3/4	24 1/4	4 3/4	47/8	10 1/4	37 1/4	3	31 1/4	6	7 3/4	5 1/4	125/8	5 1/2	1 1/4
14,000	7/8	23 7/8	4 1/4	55/8	115/8	43 1/4	4 1/2	34 1/4	7 1/2	9 1/4	8 1/4	125/8	4 1/2	1 1/4
18,000	1	295/8	5 1/2	5 3/4	117/8	49	4 1/2	40	7 1/2	9 1/2	8	15 1/2	4 1/2	1 1/4
23,000	1 1/8	297/8	6	5 3/4	117/8	50	5	40	7 1/2	9 1/2	9 1/4	15	5	1 1/2
28,000	1 1/4	35 1/2	5	7 1/8	143/8	68	7 1/2	53	10	12	14	19	7 1/2	1 1/2
34,000	1 3/8	355/8	6	7 1/8	143/8	68	7 1/2	53	11	14	14	19	8 1/2	1 3/4
40,000	1 1/2	42 1/2	6 3/4	75/8	153/8	74	7 1/2	59	11	14	14 1/4	22	7 1/2	1 3/4

Turnbuckle Type Take-Up Sheave Assemblies



Shackle Sheave Assemblies



Dimensions (Inches)

Pull Rating (Running)	Wire Rope Size	P.D.	B	C	D	E	F	G	H	J	K	L	M	O		P
														Min	Max	
4,500	1/2	18 1/2	163/8	7 1/2	2 1/4	7 3/4	3 1/2	5	6 1/4	2	1 1/2	5 1/2	3 1/2	63 5/8	94 1/8	1
7,000	5/8	18 1/8	163/8	7 1/2	2 1/4	7 3/4	3 1/2	5	6 1/4	2	1 1/2	5 1/2	3 1/2	63 5/8	94 1/8	1
10,000	3/4	24 1/4	205/8	117/8	2	8	5	6 1/2	8	2 1/4	1 1/2	6	4 1/4	71 1/4	100 1/4	1 1/4
14,000	7/8	23 7/8	211/8	117/8	2	10	6 1/2	8 1/2	10	3 1/8	1 3/4	6 1/2	4 1/4	71 3/4	100 3/4	1 1/4
18,000	1	295/8	26	16	1 1/2	10 1/2	7	9 1/2	12	35/8	1 3/4	7	4 3/4	81 3/4	107 3/4	1 1/4
23,000	1 1/8	297/8	26	16	1 1/2	12 1/2	7	9 1/2	12	17/8	9 1/4	5	4 3/4	81 3/4	107 3/4	1 1/2
28,000	1 1/4	35 1/2	29 3/4	17 3/4	1	15	7	9 1/2	12	13/8	11 1/4	6	5 1/2	85 1/2	111 1/2	1 1/2
34,000	1 3/8	355/8	29 3/4	17 3/4	1	17	8	11	13	17/8	12 1/4	6	5 1/2	85 1/2	111 1/2	1 3/4
40,000	1 1/2	42 1/2	32 3/4	17 3/4	1	19	10	13	15 1/2	3	12	6 1/2	6	—	—	1 3/4

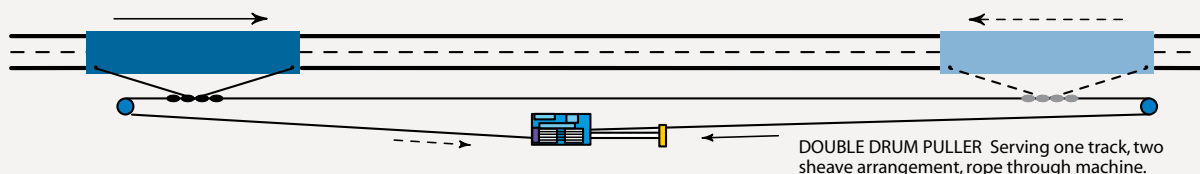
Track Layouts

For Wire Rope Car Pullers

Layouts shown are typical. Other arrangements are available to suit your specific job site.

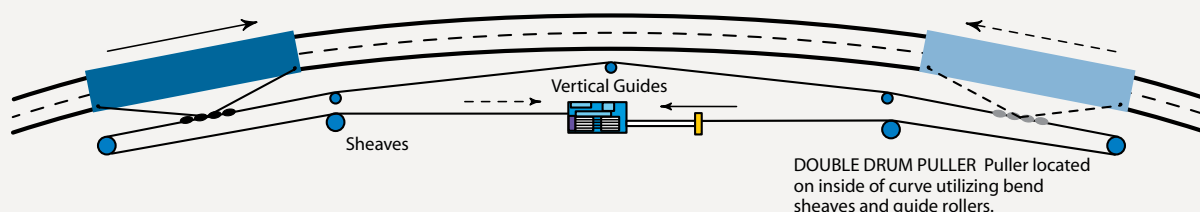


Double Drum Puller



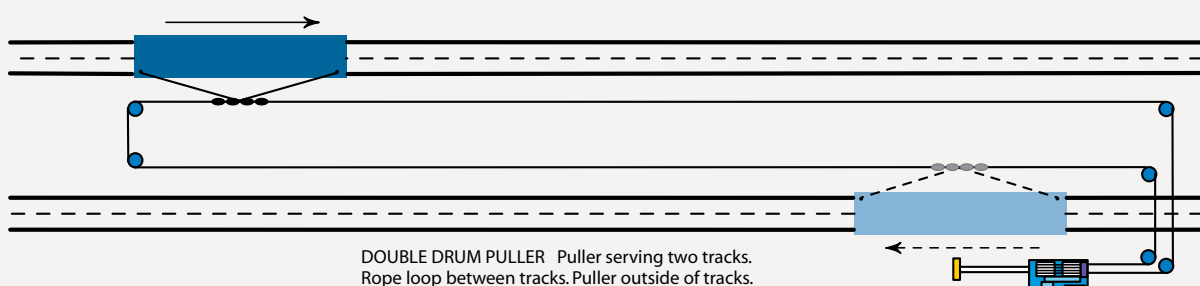
Double Drum Puller

Inside Curve



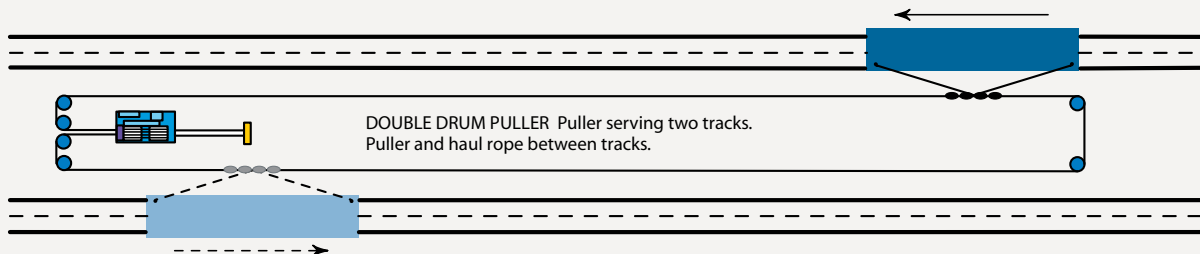
Double Drum Puller

Two Tracks

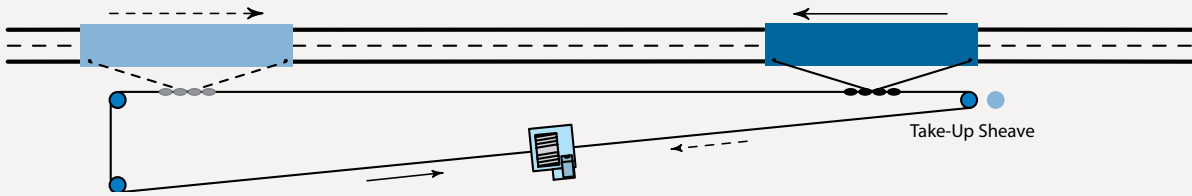


Double Drum Puller

Two Tracks



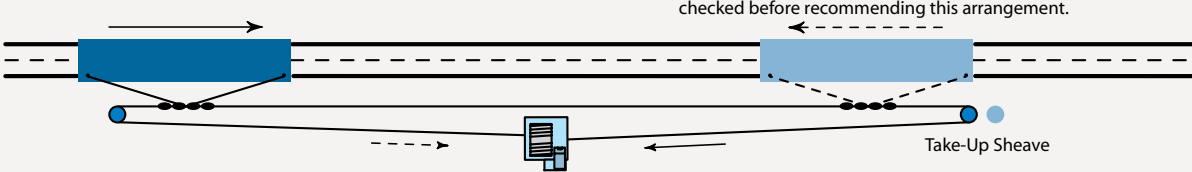
SDR PULLER Three sheave arrangement, two direction pull.



SDR Puller

Two Direction Pull

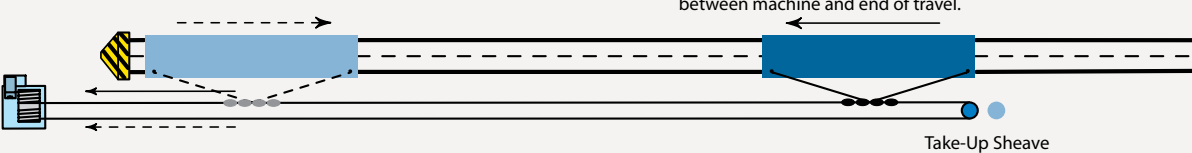
SDR PULLER Two sheave arrangement, two direction pull.



SDR Puller

Two Direction Pull

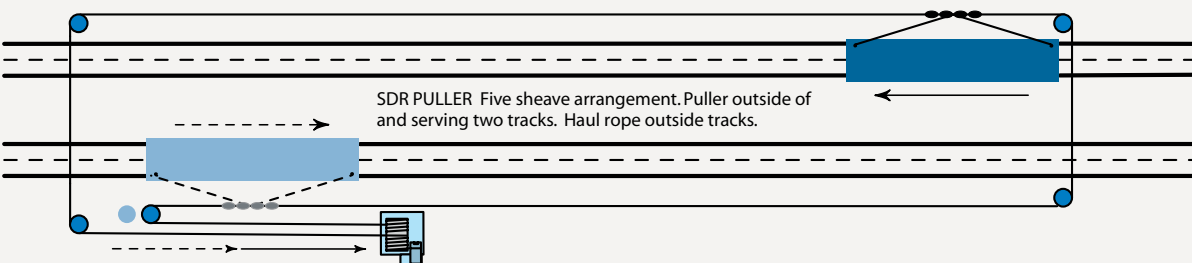
SDR PULLER One take-up sheave, puller behind bumper, two directional pull.



SDR Puller

Two Direction Pull

SDR PULLER Five sheave arrangement. Puller outside of and serving two tracks. Haul rope outside tracks.

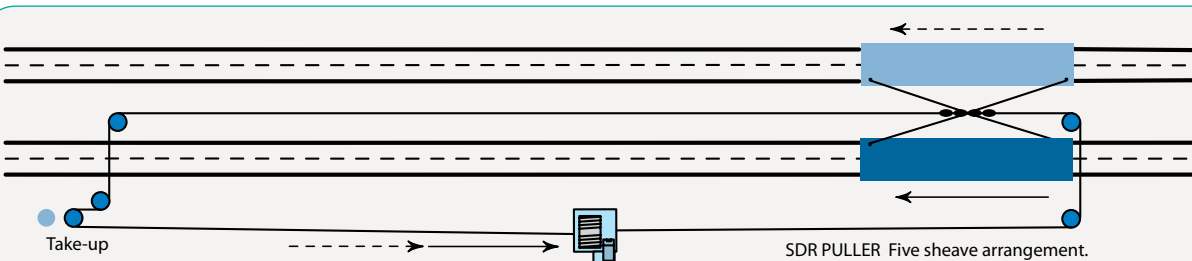


SDR Puller

Two Tracks

Take-up

SDR PULLER Five sheave arrangement. Puller outside of and serving two tracks. Haul rope outside tracks.



SDR Puller

Two Tracks



Reversible Car Movers

Recommended for moving 1 to 10 cars. The reversible car mover (RCM) allows for spotting accuracy and reversibility \pm six inches.

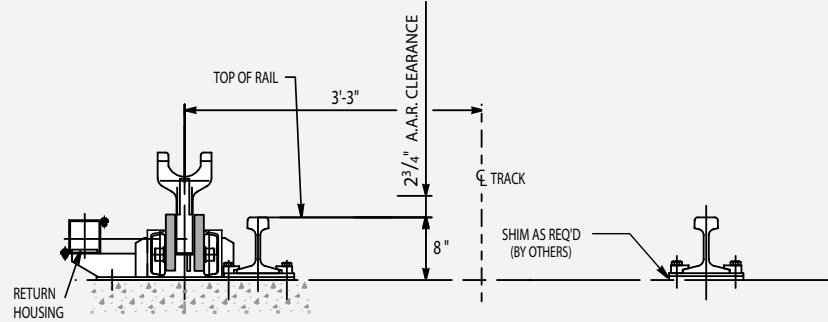
The RCM utilizes a gear box, driven by an electric or hydraulic drive, to pull a closed loop of chain. The ends of the chain attach to a pusher carriage containing two pusher dogs that capture the side frame of a railcar truck.

Travel distance is designed for the maximum “truck-center” dimension of the cars being handled.

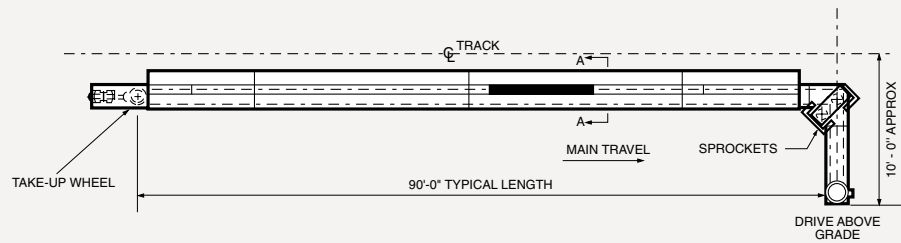
Drive Options

Below grade electro-mechanical or hydraulic and above grade electro-mechanical or hydraulic.

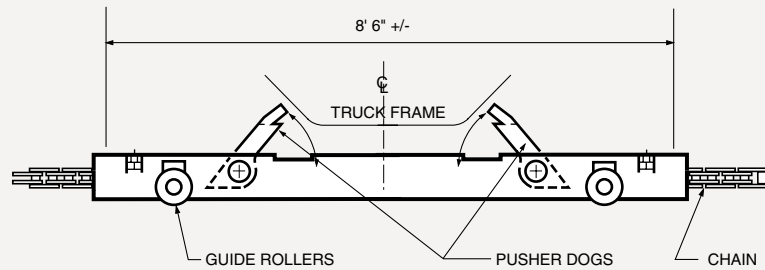
Typical Section A-A RCM Guideway



RCM Arrangement Plan View



Typical RCM Carriage



Hydraulic Car Movers

The Nolan Hydraulic Car Mover (HCM) cuts costs on bulk loading and unloading operations. The Nolan HCM uses dependable hydraulic power and push button controls for one man spotting of hopper, tank and other bulk handling railcars. Double acting cylinders increase cylinder life and reduce maintenance costs. Strings with up to 35 cars are positioned within \pm six inches accuracy at speeds of 25 feet per minute.

The HCM adjusts automatically to cars of various lengths as they enter the HCM mechanism. This permits handling a mixture of car lengths in a single string. On many applications, the HCM can be tied into a completely automated system that advances and loads cars without an operator.

For most applications, the 80 foot long HCM installs on existing rail ties. It does not require excavation, pouring of concrete pads, or other costly preparations. Each HCM is custom built to match your application including a stroke selector mechanism to match your maximum car length, type of controls, remote control location, and other optional selections.

In use for over 20 years, the Nolan HCM has a demonstrated record of significant cost reduction in loading and unloading operations for a broad range of industries.

Providing Dependable Service For:

Steel Mills, Mines, Grain Terminals and Elevators, Electric Generating Plants, Petro-Chemical Plants and other Bulk Handling Industries



One Man Control System

Six easy-to-use deadman type push button controls are provided in an oil tight enclosure. Explosion proof operator stations are available. Controls can be located at any point that provides the operator with good visibility of the operation.

Controls include: Motor Stop, Motor Run (illuminated), Move Cars, Left Hand Dog Reverse, Right Hand Dog Reverse and Store Dogs.

Installation Recommendations

Ideal conditions for an HCM installation include 80 feet of straight and level track.

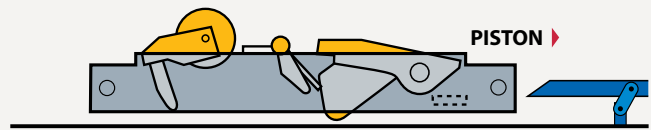
Normally, the HCM installs on your existing ties. For lower throughput operations, a single sided HCM can be a good alternate approach. Maintaining the stroke length of a double-sided HCM, the single sided unit indexes in 13 feet increments. Cycle times for one car length of travel is approximately 2½ minutes.

Custom configurations are available for site specific parameters.

Treadle Operation

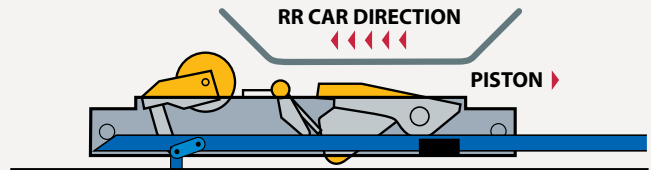
1

Cylinder retracts pusher dog assembly. The dog operating wheel is in the up position and the pusher dog is in the down position.



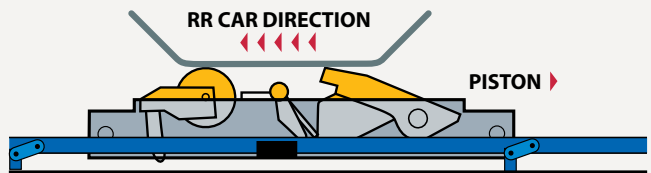
2

As the dog assembly retracts, the treadle operating arm engages the treadle bar, pushing it down. The cylinder continues to retract the pusher dog assembly.



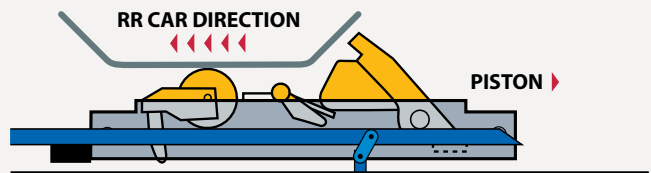
3

As the pusher dog assembly passes under the railcar truck, the truck depresses the dog operating wheel. As the wheel moves down, it pushes the dog up.



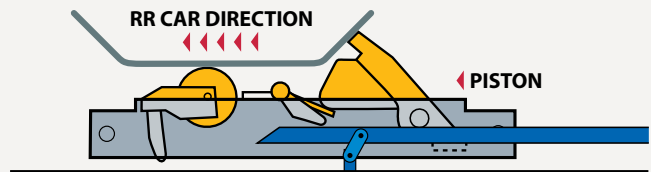
4

When the dog clears the car truck, it is free to pop up into pushing position. As the dog pops up, it releases the pressure of the treadle operating arm on the treadle bar and the treadle bar rises up, activating the sensor.



5

When the sensor "reads" the treadle bar in up position, it sends a signal to the hydraulic valve and reverses the direction of the hydraulic cylinder and dog. The dog engages the car truck and pushes it forward.



6

The cylinder extends its full stroke. The dog on the opposing side of the HCM has a six inch overlap, and will pick up the car truck on the opposite side and push the car until its cylinder has reached its full extension. At this point, the forward dog picks up the car and the previous dog retracts. The final dog picks up and pushes the car.

7

The hydraulic cylinders on the HCM automatically reverse their direction when they reach their fully extended position. Each time the first dog retracts under a car truck, it activates the stroke selector and reverses the opposing cylinder. This sets up the cycle for the four dogs.



Automatic/Manual Car Positioners

Operation

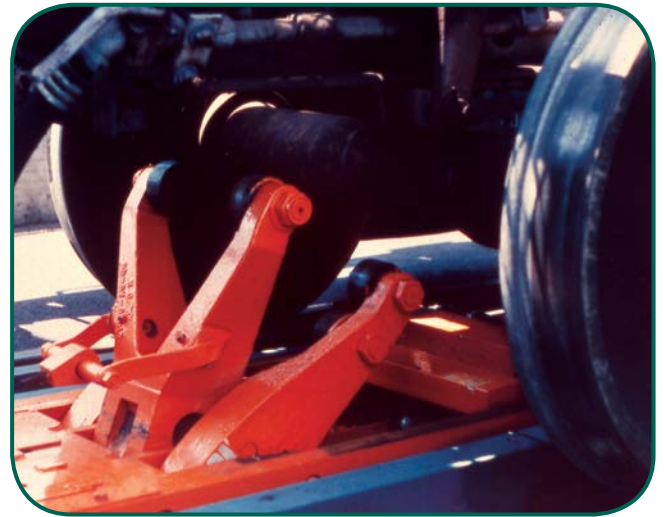
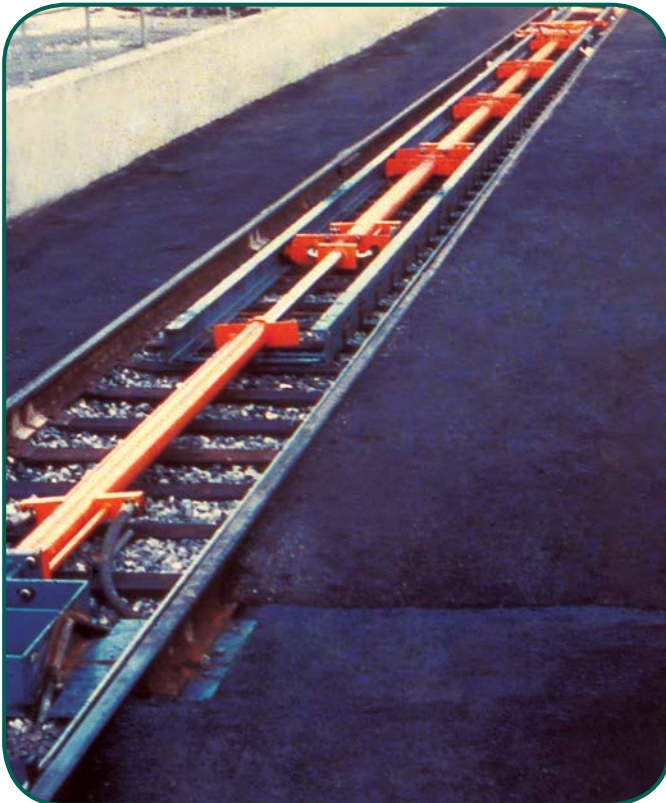
The Metso SCAMP is designed to move cars by locking around the axle. This method eliminates the need for heavy hitch ropes. A single operator can acquire a car, position it, and return the carriage for the next car, all from the control station. An axle counting system allows the car mover to run with a high degree of automation. Cars can be spotted within a few inches without locking or dragging car brakes. A SCAMP handles up to 50 railcars on level track.

Drive

Hydrostatic drive provides smooth starts and stops while protecting the equipment from an overload. A joystick control allows adjustable speed for loading or unloading requirements. Programmable controllers are used to automate the acquisition sequence.

Installation

The SCAMP can be installed on ties or on concrete on approximately 150 to 200 feet of straight track. Trackway can be installed over many types of scales.

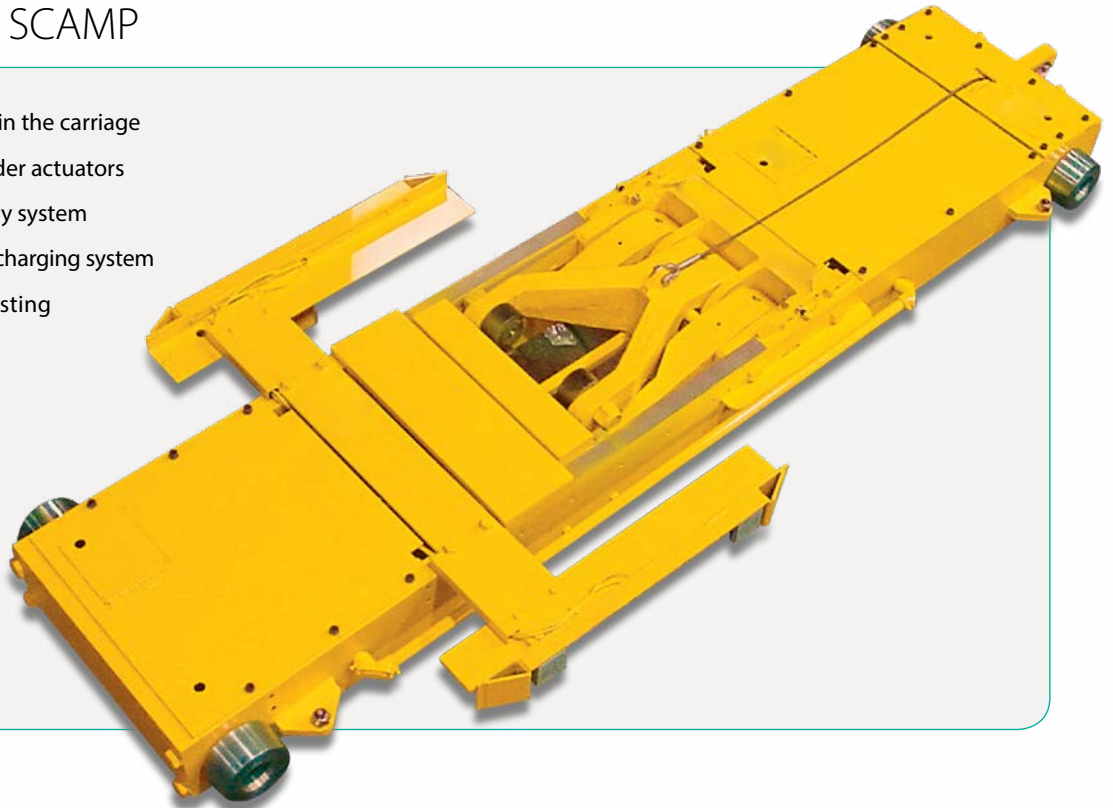


Advantages

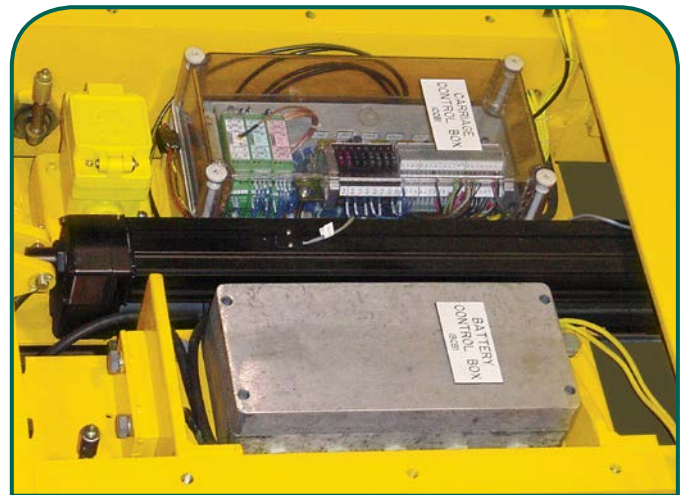
- Railcars can be accurately positioned ± 6 inches with a One-Way SCAMP or ± 1 inch with a Reversible SCAMP
- Minimal foundation work required – no special pits or trenches needed
- Can be automated to meet individual customer needs
- Pusher dog contacts railcar on or near center of axle, minimizing racking of truck and chance of derailment
- Low profile design meets railroad clearances
- Handles up to 50 railcars
- No dedicated operator required
- Personnel are protected, since the operator does not handle heavy hitches, ropes, pusher dogs, or any other part of the SCAMP carriage system
- Variable speed control reduces shock loading – controls acceleration and stopping (with reversible unit) which minimizes risk of damage to railcar
- All wire rope is enclosed or contained in wire rope propelled units
- Braking is controlled on grades or at any desired point
- Low maintenance – no locomotive, crew, or operating fuel necessary

Battery Operated SCAMP

- Eliminates all hydraulics in the carriage
- Uses electric linear cylinder actuators
- Leak-proof design battery system
- Employs its own battery charging system
- Can be retrofitted to existing installations



Wireless, leak-proof design, battery system with built-in short circuit protection. Uses industry standard 24 VDC configuration protected with auto blade type fuses for easy replacement, and a 160 Ah generous power reserve for continuous operation.



Embedded radio control features 900 Mhz license free band and spread spectrum technology with encoded transmissions. Controls are non-PLC dependent and are range tested up to 1,500 feet.

Barge Hauls

Standard & Heavy Duty

Whether your application calls for moving one barge or five barges, Metso can engineer a barge puller to meet your needs. From basic, opposed units to an arrangement complete with hydrostatic, DC, AC, flux vector or variable frequency drives, breasting winches and a power take-up.

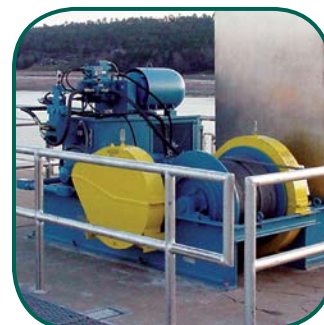
Equipment selection for your project depends on a number of factors, like the size and number of barges you have to move, the river current, the travel required, the available cells, docks or dolphins, and the speed of operation. Even the mode of operation is important, including how many passes will be required to load or unload.

Seasonal river or pool fluctuations must also be considered. Working against near flood conditions or high currents requires a very large puller. Forces on the front of the barge created by the current increases exponentially with river velocity.

Computer aided application programs help our specialists to optimize the selection of equipment to meet your needs based on this information. Because the barge puller sizing depends mainly on the river current, it is important to set practical parameters for operation under varying environmental conditions.

Barges

Today's "jumbo" barge is typically 35 feet wide and 195 feet long. With a draft of 9 feet, the cargo can be 1,500 tons. Empty weights vary, but usually run from 350 tons to 450 tons when covers are added. Most barges have a flat end and a raked end. Rakes are usually 45°. It takes less force to move the barge against the current when the rake end is upstream.



Flag type fairleads accommodate changes lead angle of wire rope as barges move.



Four roller fairleads used to guide wire ropes to barges from breasting winches.

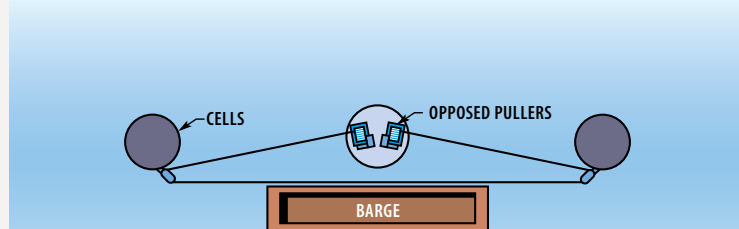
Sheaves

Two types of sheaves are typically used. The shackle type and the "fairlead" type can be provided. Fairleads are used to reduce sheave wear and provide positive control of the rope where large direction changes or very high catenary tensions are found. Rope manufacturers recommend a minimum sheave diameter of 20 times the rope diameter. Sheaves with too small a diameter can damage rope and reduce rope life.

Selection of rope size is quite important. Catenary tension (the tension created by hanging the rope between two supports) is added to the tension generated by pulling barges. The tension increases with the square of the distance between the supports.

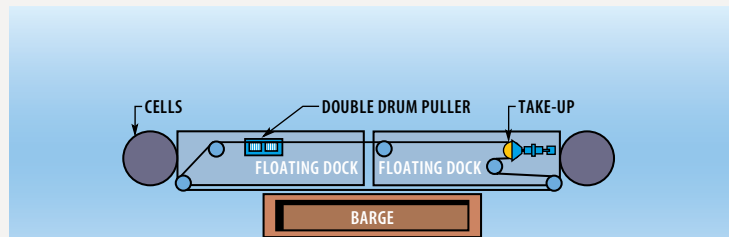
Two Units Opposed

Often the simplest approach. These units are available with AC motors, DC motors, variable frequency, flux vector or hydrostatic drives.



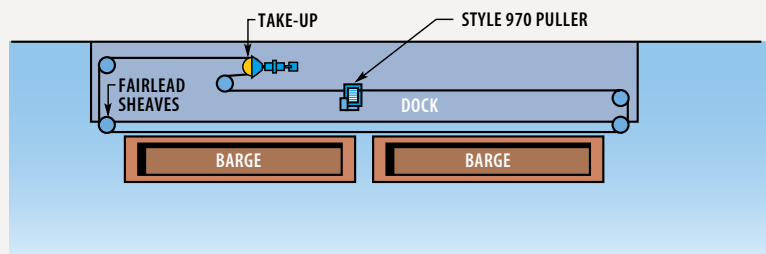
Double Drum Closed Loop

Units make a closed circuit rope path. This type of unit is used where rope travel ranges from 500 to 1,200 feet.



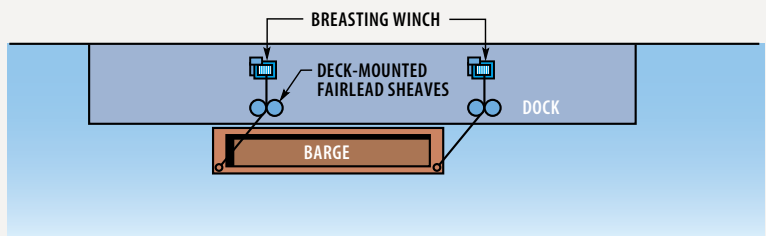
Single Drum Closed Loop

Used for shorter travel or closed loops up to about 600 feet.



Breasting Winches

Available to keep barges pulled up next to a dock or cells. Modern fiberglass barge covers, equipped with hatches for loading, may need breasting winches to avoid damaging chutes.



Complete Systems

For Car Pullers & Barge Handling

Barge Haul & Railcar Puller Systems at a Woodchip Transloading Facility

Metso can engineer and supply all of the necessary main haulage and auxiliary equipment to facilitate your transloading operations. This woodchip transloading facility unloads woodchips from barges and loads into railcars for shipment to the paper mill.

Barge Haul & Take-Up System

Metso provided this complete barge haul system which included a Style 1000 double drum reversible puller rated at 23,000 pounds. The terminal fairlead sheaves had a total unsupported span of 1,100 feet. A separate modified Style 969 one way puller is used to remove the construction and elastic stretch from the main haul wire rope and to raise and lower the catenary sag to accommodate the fluctuation in water levels and barge drafts.

Breasting Winch System

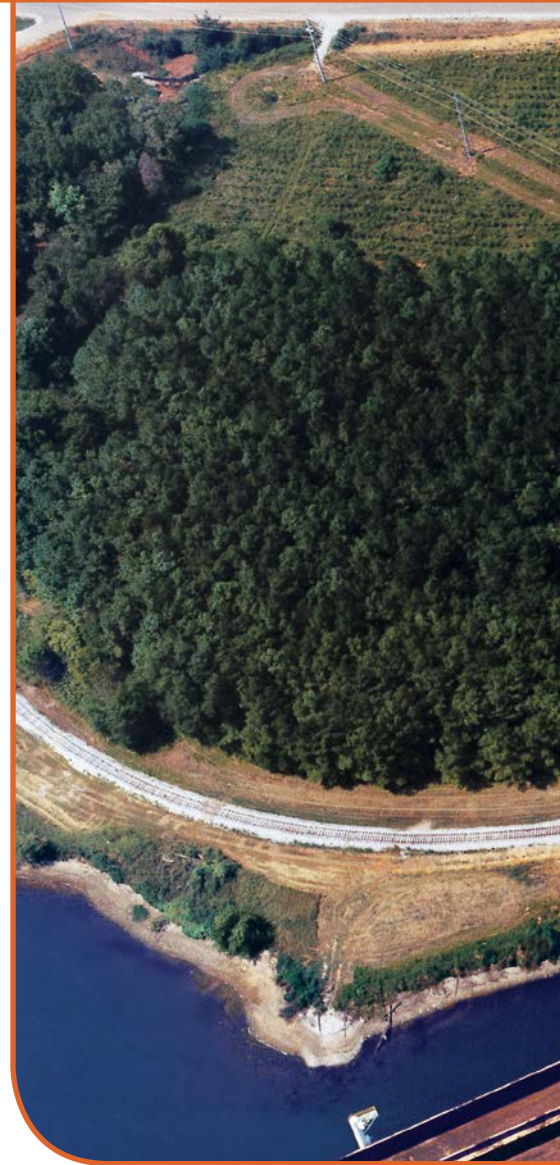
Five Style 969 breasting winch systems were supplied to facilitate the barges and to keep the barges moored against the cells.

Railcar Puller System

Metso also supplied the railcar puller system to index and position the railcars through the loadout around a track curve. The puller was a Style 970 single drum reversible puller rated at 14,000 pounds.

Accessories

All of the hardware and accessories required for a complete barge and railcar puller system were also furnished by Metso.



1 Four Roller Fairlead used with Breasting Winch



3 Railcar Puller Style 970



2 Main Barge Puller Style 1000 & Take-Up System



4 Barge Haul Horizontal Bend Sheave



5 Barge Puller Take-Up Winch Style 969



7 Breasting Winch Style 969



9 Barge Breasting Winch System



6 Barge System Terminal Flag Fairlead Sheaves



8 Railcar Puller Vertical Rope Guide & Masterlink Assembly



10 Railcar Puller Take-Up System



Expect results

It is our promise
to our customers and
the essence of our strategy.

It is the attitude
we share globally;
our business is to deliver
results to our customers,
to help them reach
their goals.

