Form 6012
Fifth Edition
April, 1977

INSTRUCTIONS AND REPAIR PART LIST
for
SIZE TVH50A AIR MOTOR DRIVEN TRACTOR FOR OVERHEAD HOISTS

LUBRICATION

Weekly, or as experience indicates, check the oil level in the Motor Housing (1). If the oil level is down to the line on the Sight Glass Window (26), remove the Oil Chamber Plug (6) from the top of the Motor Housing (1), and fill the oil chamber with Ingersoll-Rand Pneu-Lube® Light Oil No. 10 or a good quality high-speed spindle oil.

Semiannually: Insert Ingersoll-Rand Light Grease No. 28 or a good quality No. 2 cup grease into the Grease Fitting (101) or the rim of the Motor Adapter (100). Six or eight strokes from a hand grease gun are sufficient.

Remove the Oil Level Plug (124) from the side of the Gear Case (123). If the oil is below the opening, remove the Vent Cap and add Ingersoll-Rand Extra Heavy Oil No. 55, or a rust-inhibited oil such as Mobil DTE Extra Heavy Oil or Texaco Regal E Oil.

Remove each Trolley Wheel Assembly (155) from the Trolley Brackets (150). Remove the cover, snap ring and bearing from the wheel. Repack the bearing with Ingersoll-Rand Light Grease No. 28 or a good quality No. 2 cup grease.

Annually: Change the oil in the Gear Case. To drain out the old oil, disconnect the Tractor unit from its supporting Trolley Brackets (150), remove the Oil Level Plug (124), and rotate the unit until the oil level hole is at the bottom. After returning the Tractor to its normal position, remove the Vent Cap and fill the Gear Case to the level hole with Ingersoll-Rand Extra Heavy Oil No. 55 or its substitute (see preceeding paragraph). Approximately 6 ½ oz (189 ml) is required.

OILER ADJUSTMENT

The rate of oil flow from the oil chamber to the motor is properly set at the factory. Correct adjustment is indicated by a slight oil mist in the exhaust. If necessary, check the adjustment by holding a piece of paper up to the exhaust and operating the motor for about 30 seconds. If no oil is collected, or if an excessive amount is emitted, adjust as follows:

Drain the oil from the chamber and remove the Motor Housing Cover (25) from the Motor Housing (1). Rotate the Oiler Adjusting Screw (30), **clockwise to reduce** the oil flow; **counterclockwise to increase** the oil flow. If sufficient flow cannot be obtained, it is an indication that the Oiler Felt (29) is clogged. Remove the Felt, which is located under the Screw, and install a new one.

LUBRICATOR ASSEMBLY

1. Insert the end of the Oiler Wick (31) with knot ½" from end, into the oiler hole.
2. Insert the Oiler Felt (29).
3. Thread the other end of the Oiler Wick through the hole in Oiler Adjusting Screw (30).
4. Screw in Oiler Adjusting Screw flush with face.

PREPARING TRACTOR FOR SERVICE

1. Mount the trolley unit on the track, being sure to use an equal quantity of Washers (169) and Spacers (168) on each end of the Trolley Bracket Bolts (157) so that the Suspension Bolt (160) and Traction Adjusting Bolt (170) will be centralized between the Trolley Brackets (150). Refer to the table on page 13.

HOW TO ORDER

Order all repair parts for your Ingersoll-Rand Tool by the **NAME** and **NUMBER** shown in the Repair Part List section. **Never** use the illustration numbers which appear in the first column.

For prompt service and genuine Ingersoll-Rand parts, place orders with the nearest Ingersoll-Rand Branch Office or Authorized Distributor.

Notice: The use of other than genuine Ingersoll-Rand replacement parts may result in decreased tool performance and increased maintenance, and may, at the Company's option, invalidate all warranties.

Refer All Communications to the Nearest Ingersoll-Rand Branch Office or Distributor.

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2. Be sure to slide the Suspension Bolt Collar (161) onto the Suspension Bolt (160) before passing the end of the Bolt through the mounting hole in the Motor Bracket (114).
3. Pass the end of the Traction Adjusting Bolt (170) through the mounting hole in the Motor Bracket (114). In the following order, slide one Spring Seat (172), the Traction Adjusting Spring (171) and the other Spring Seat onto the Bolt. Retain them with Adjusting Bolt Nut (173). Apply and securely tighten the Suspension Bolt Nut (163).
4. Run the Adjusting Bolt Nut (173) onto the Adjusting Bolt until the Spring is compressed to approximately 6" (153 mm). Apply the Adjusting Bolt Lock Nut (174). **Note**: Forcing the Drive Wheel excessively tight against the bottom of the track will decrease the life of the rubber tire and increase the loading on bearings. Compress the Spring only enough to prevent slippage of the Drive Wheel (115) on the track. Make final adjustment under actual operating conditions.
5. Adjust the brake only if experience proves that the factory setting is unsatisfactory. To adjust: Remove the Brake Cover (148) and loosen each of the three Adjusting Screw Lock Nuts (147). Rotate each Brake Adjusting Screw (146) an equal amount, turning it clockwise to increase the braking action; counterclockwise to decrease. Do not rotate the Screws more than one-half turn at a time, and not more than a total of 1-1/2 turns in either direction from the factory setting.

MAINTENANCE

Periodically, as experience indicates, remove the Inlet Swivel Body (8) and withdraw the Air Strainer Screen (11) from the Motor Housing (1). Clean the Screen with kerosene or other solvent.

When assembling the Multi-Vane® motor and installing it in the Motor Housing (1), proceed as follows:

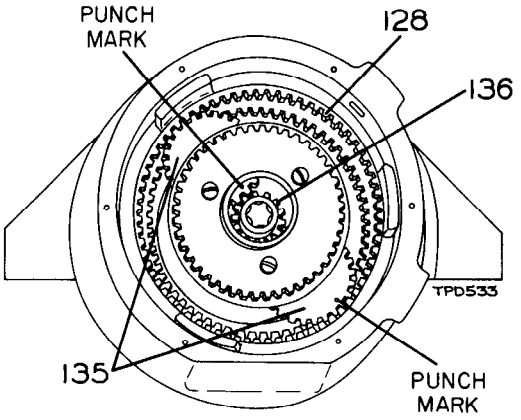
1. Refer to Improved End Plates on page 3.
2. Press the Rear Rotor Bearing (37) into the recess in the Rear End Plate (36). Press this assembly onto the short hub of the Rotor (38) as far as possible without binding the End Plate against the rotor face.
3. Place a Vane Spring (40) and Vane (39) in each vane slot in the Rotor, being sure the ends of the Spring enter the notched out portion of the Vane.
4. Slip the Cylinder (41) over the Rotor, making sure that the eight holes running longitudinally through the cylinder wall can be aligned with the holes through the Rear End Plate. If the holes cannot be aligned, the Cylinder is inverted; turn it end for end.
5. Press the Front Rotor Bearing (44) into the recess in the Front End Plate (43). Press this assembly onto the long hub of the Rotor.
6. Align the dowel hole in the Cylinder with the dowel hole in each End Plate, and insert the Cylinder Dowel. **Note**: Because the dowel hole in the Front End Plate is not visible when the motor is assembled, the hole location is indicated by a drill point mark on the end plate rim.
7. Slip the rubber Motor Clamp Ring (45) onto the Front End Plate. Apply a little tacky grease to the Ring and End Plate to hold the Ring in position until the motor is installed in the Motor Housing. Place the Pinion Key (47) in the rotor hub, slide the Rotor Pinion (46) onto the hub, and retain with Ring (48).
8. Place the Motor Housing (1), open face up on the workbench. **Align the drill punch mark on the rim of the Front End Plate with a similar mark on the face of the Motor Housing (1)**, and insert the assembled motor. Do not drive the motor into the Housing. If properly aligned with the housing bore, it can be pushed into position with the fingers. **Note**: Before the motor reaches full depth, check and make sure the Motor Clamp Ring (45) is still in position on the Front End Plate (43).
9. Apply the Housing Cover Gasket (33) to the Housing Face.
10. Place the Motor Housing Cover (25) on the Motor Housing (1), entering the end of the Cylinder Dowel (42) in the dowel hole in the Cover, and making sure the free length of Oiler Wick (31) enters the oil chamber. Insert one Housing Cover Cap Screw (34) through the center hole in the Cover and start it into the Housing. Check the alignment of the other holes in the Cover and those in the Housing. Lightly tap the edge of the Cover with a soft hammer to correct any slight misalignment.
11. Start all of the Housing Cover Cap Screws, and draw the Cover firmly and evenly against the Gasket by tightening each Screw a little at a time.

Completely disassemble the Motor Housing before attempting to replace the Shuttle Valve Bushing (3). Press the old Bushing from the Motor Housing with a 13/16" (20 mm) arbor, preferably one with an 11/16" (17 mm) pilot. Use the No. 76663 Bushing Inserting Tool to press in the new Bushing. Ream the Bushing to size with Reamer No. 76662. Thoroughly clean the Motor Housing before reassembly.

Use the No. 74324 Valve Stem Bushing Inserting Tool to install new Valve Stem Bushings (2) in the Motor Housing (1).

When disassembling the tractor gearing, remove the Brake Plate Key (130) from the gear case wall before attempting to withdraw the Internal Gear (128).

When installing the Gear Cage Assembly (135) in the Gear Case, note the punch marks and lines on each gear face, and position the gears as indicated in the accompanying view.



IMPROVED END PLATES

Originally the Multi-Vane Motor incorporated notched Vanes and Vane Springs. Subsequently the End Plates (36 and 43) were modified by the addition of starting grooves which provide positive starting and eliminate the need for Springs under the Vanes. Notched Vanes are required only with Vane Springs. The improved End Plates can be identified by two crescent-shaped grooves in the face of the Plate. Only improved Plates and unnotched Vanes are available. Do not use a combination of one old style and one improved End Plate, and never attempt to use Vane Springs with unnotched Vanes.

TROLLEY BRACKETS

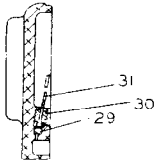
The current Trolley Bracket incorporates a Roller Bolt on which to mount each Guide Roller. This style Bracket requires different Rollers than the Brackets on which the Rollers are stud-mounted. Except that they require different Rollers, the two style Brackets are interchangeable and can be used in combination with each other if replacement of one Bracket is necessary.

If the Guide Roller is bolt-mounted as illustrated, order Part Number TVH50A-719 for replacement. If it is stud-mounted, order Part Number TVH50A-719A. Illustrated Parts 152, 153 and 154 are not used with the stud-mounted style Bracket.

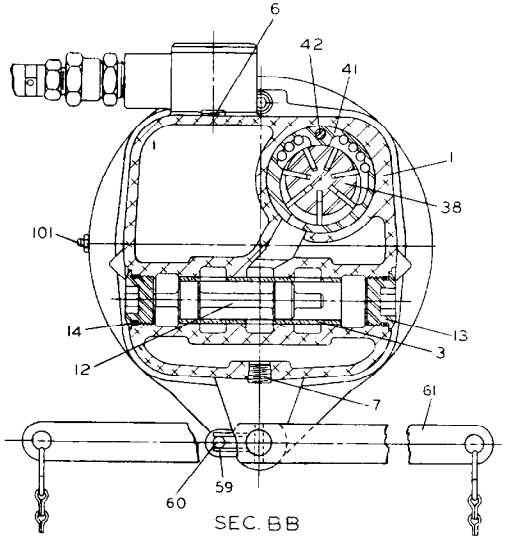
REPAIR PARTS

To keep costly downtime to a minimum, it is desirable to have on hand certain repair parts. To guide you in the stocking of repair parts, certain Illustration Numbers of the Repair Part List are marked with a bullet (●). We recommend that with parts so indicated, you stock one (pair or set) repair part for every four tools in service.

If the tools are being used in remote geographical areas, or are subject to unusually severe service, the items and quantities should be increased. Contact the nearest Ingersoll-Rand Company Branch for recommendations.



SEC. THRU MOTOR HOUSING COVER
SHOWING OILER PARTS



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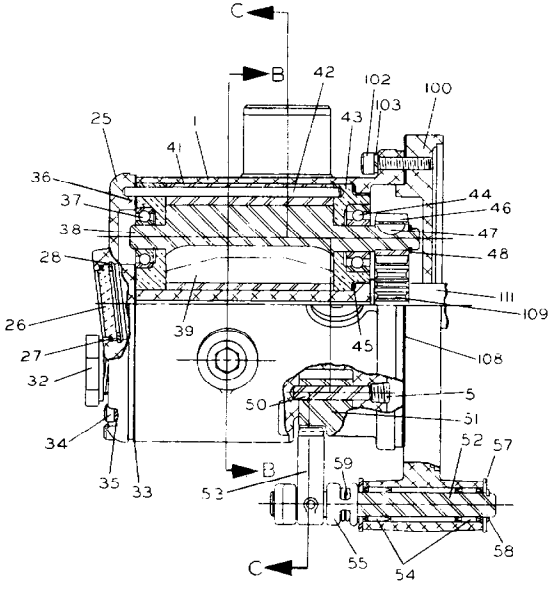

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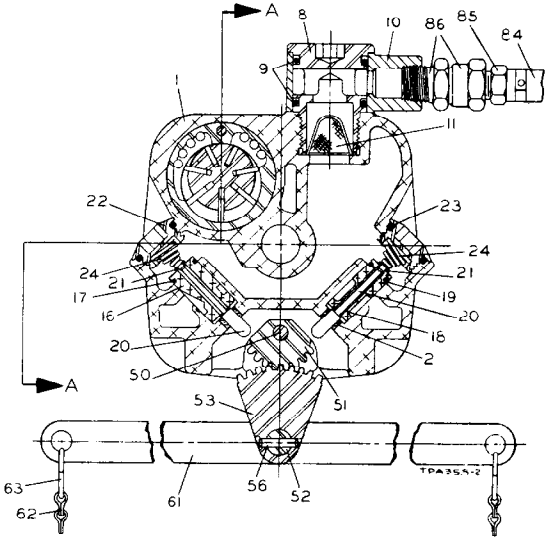
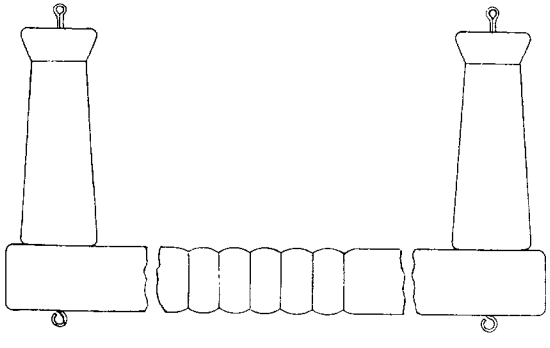
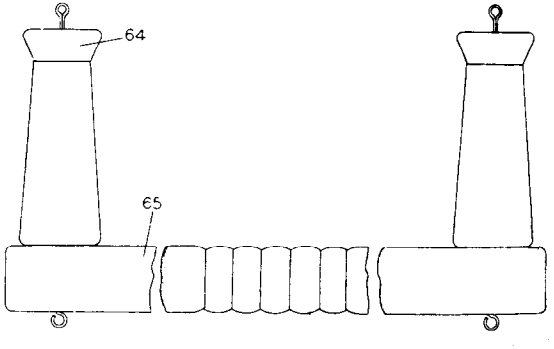


SEC. CC



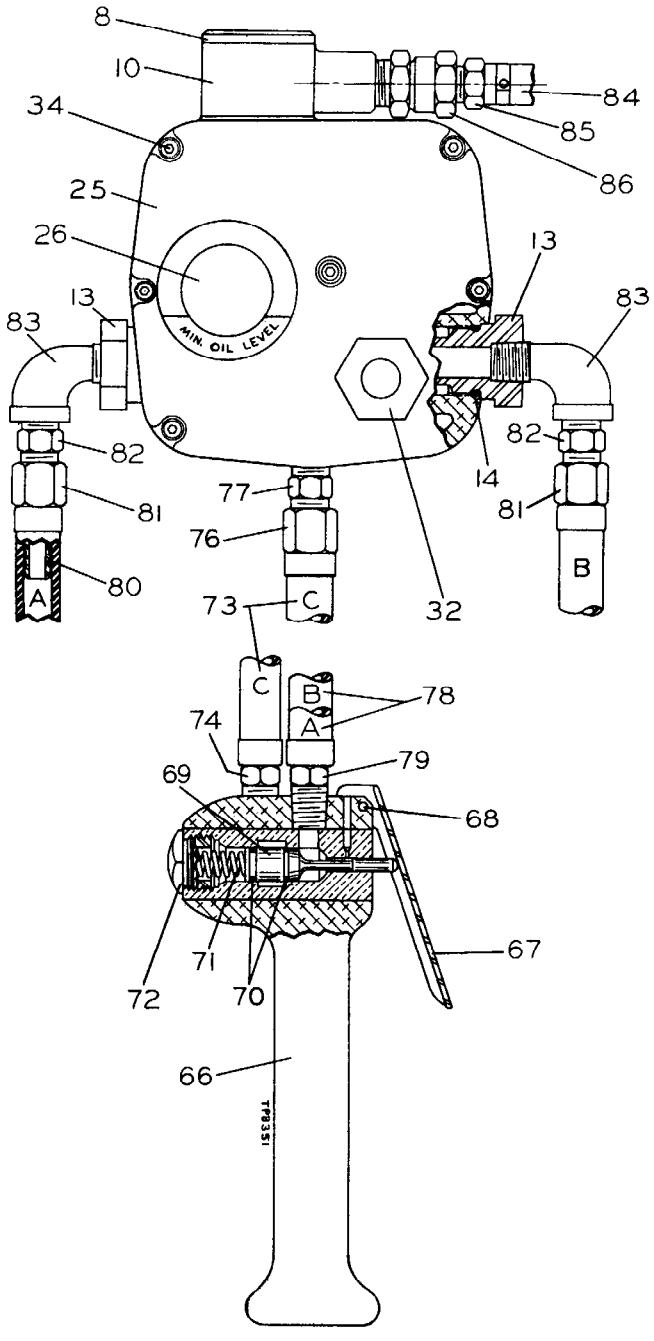


Motor for Size TVH50A Tractor

MOTOR PARTS

ILLUS. NUMBER (Do not use for ordering)	PART NAME FOR ORDERING (Parts indented after an item are included with that item)	PART NUMBER FOR ORDERING	
		PULL CHAIN THROTTLE	PENDENT THROTTLE
	Tractor Motor Assembly	TVH50A-A40	TVH50A-AP40
1	Motor Housing Assembly	HRA20A-B40A	HRA20A-B40A
2	Valve Stem Bushing (2)	HRA20A-615	HRA20A-615
3	Shuttle Valve Bushing	HRA20A-247	HRA20A-247
• 4	Drive Shaft Rear Bearing (Torrington JH-98 or its equivalent)	HRA20A-318	HRA20A-318
5	1/8" Pipe Plug	R2-227	R2-227
6	Oil Chamber Plug	R0H-377	R0H-377
7	Housing Plug	GA57-95	- - -
8	Swivel Inlet Body Assembly	834-165	834-165
• 9	Swivel Inlet Seal (2)	MT4-210	MT4-210
10	Swivel Inlet Sleeve	HRA20A-166	HRA20A-166
11	Air Strainer Screen	HRA20A-61	HRA20A-61
12	Shuttle Valve	HRA20A-246	HRA20A-246
13	Shuttle Valve Cap Assembly (2)	HRA20A-A943A	TVH50A-A238A
14	Cap Seal (one for each Cap)	R4-210	R4-210
16	Large Throttle Valve Assembly	TVH50A-A940	TVH50A-A940
• 17	Large Throttle Valve Face	R0AR-210	R0AR-210
18	Small Throttle Valve Assembly	HRA20A-A840	HRA20A-A840
• 19	Small Throttle Valve Face	834-159	834-159
20	Throttle Valve Stem Assembly (2)	HRA20A-A161	HRA20A-A161
• 21	Throttle Valve Stem Seal (one for each Stem)	R2F-167	R2F-167
22	Throttle Valve Cap Assembly (2)	HRA20A-A266	HRA20A-A266
23	Cap Seal (one for each Cap)	R4-210	R4-210
24	Throttle Valve Spring (2)	MR-942A	MR-942A
25	Motor Housing Cover Assembly	HRA20A-A102	HRA20A-A102
26	Sight Glass Window	HRA20A-116	HRA20A-116
27	Sight Glass Seal	HRA20A-117	HRA20A-117
28	Sight Glass Retainer	HRA20A-119	HRA20A-119
29	Oiler Felt	R1-75	R1-75
30	Oiler Adjusting Screw	R1-71A	R1-71A
31	Oiler Wick	HRA20A-74	HRA20A-74
32	Exhaust Bushing	HRA20A-105	HRA20A-105
33	Housing Cover Gasket	HRA20A-984	HRA20A-984
34	Housing Cover Cap Screw (9) (No. 10-24 thd. x 3-3/4" long)	34U-463	34U-463
35	Cover Cap Screw Lock Washer (9)	4U-58	4U-58
• 36	Rear End Plate	HRA20A-12	HRA20A-12
• 37	Rear Rotor Bearing (AFBMA No. 12BC10)	402-22	402-22
38	Rotor	HRA20A-53	HRA20A-53
• 39	Vane Packet (set of 7)	HRA20A-42-7	HRA20A-42-7
• 41	Cylinder	TVH50A-3	TVH50A-3
42	Cylinder Dowel	HRA20A-98	HRA20A-98
• 43	Front End Plate	HRA20A-11	HRA20A-11
• 44	Front Rotor Bearing (AFBMA No. 12BC02)	R1L-24	R1L-24
45	Motor Clamp Ring	R0B2J73-359	R0B2J73-359
46	Rotor Pinion	HRA30A-17	HRA30A-17
47	Pinion Key	HWA20A-405	HWA20A-405
48	Pinion Retaining Ring	404-118	404-118
50	Throttle Cam Pivot Pin	157H-530	- - -
51	Throttle Cam	HRA20A-941	- - -
52	Throttle Control Shaft	TVH50A-255	- - -
53	Control Shaft Sector	HRA20A-254	- - -
54	Control Shaft Bearing (2) (Torrington B-78X or its equivalent)	34U-367	- - -
55	Control Shaft Collar	HRA20A-33	- - -
56	Control Shaft Pin (3)	R1AF-524	- - -
57	Control Shaft Washer	D02-419	- - -
58	Control Shaft Retainer	404-118	- - -
59	Throttle Lever Spring	TVH50A-412	- - -
60	Spring Stop Pin	5BM-278	- - -
61	Throttle Lever	TVH50A-556	- - -
62	Throttle Chain Assembly (2) (length as specified)		
	Standard	DU-413	- - -
	Spark-Resistant	D02-L1413	- - -
63	S-Hook (2 for each Chain)	D02-421	- - -

(Continued on Page 7)

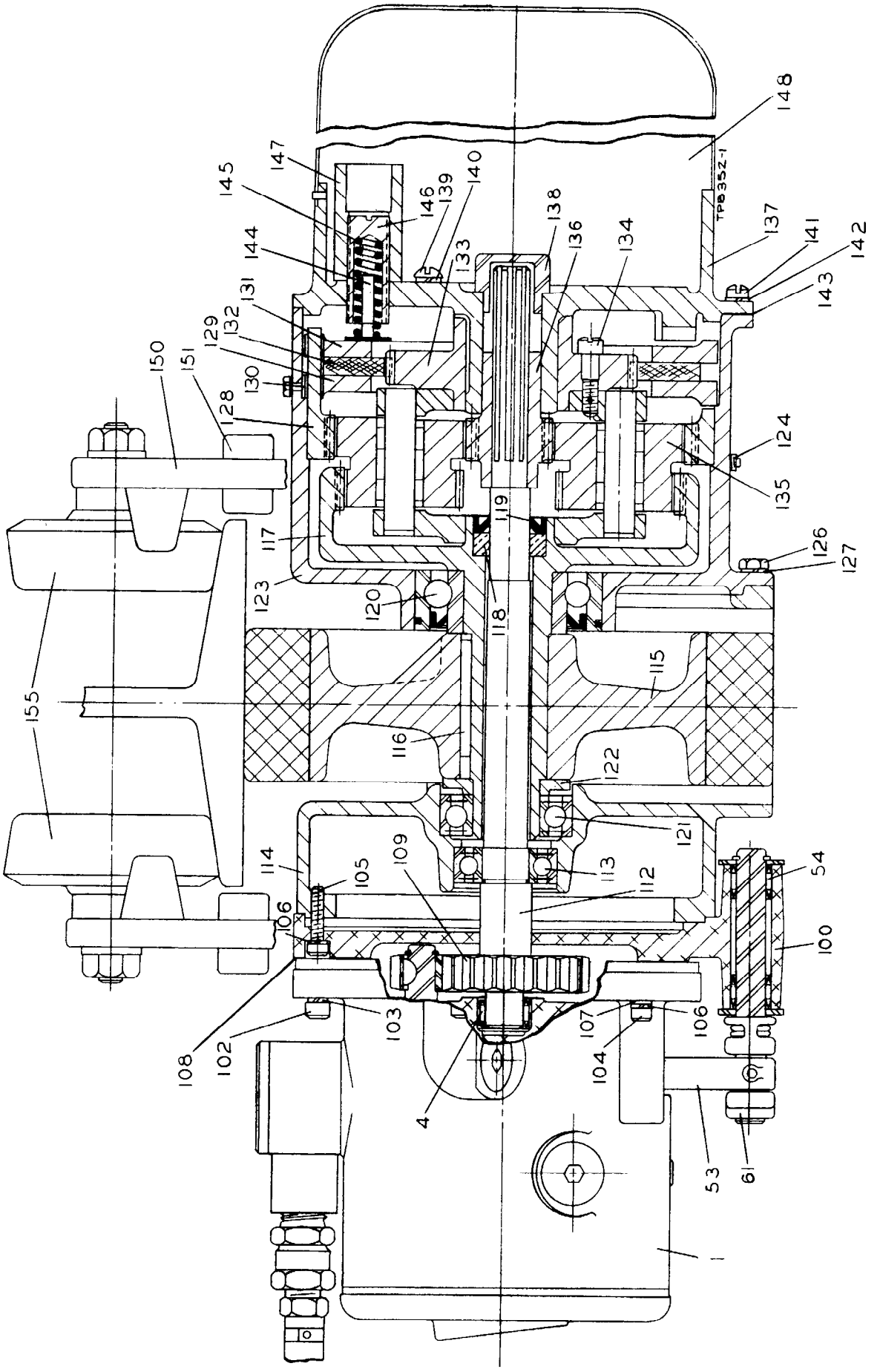


Pendent Throttle for Size TVH50A Tractor

MOTOR PARTS (Continued)

ILLUS. NUMBER (Do not use for ordering)	PART NAME FOR ORDERING (Parts indented after an item are included with that item)	PART NUMBER FOR ORDERING	
		PULL CHAIN THROTTLE	PENDENT THROTTLE
64	Throttle Handle (2)	MR-415	- - - -
65	Throttle Handle Bar	MR-409	- - - -
66	Pendent Throttle Handle Assembly		
	Standard	- - - -	D01-269
	Spark-Resistant	- - - -	D01-2269
67	Pendent Throttle Lever (2)	- - - -	R00H-273A
68	Throttle Lever Pin	- - - -	DLC-120
69	Pendent Throttle Valve Assembly (2)	- - - -	D01-264
70	Pendent Throttle Valve Seal Ring (2 for each Valve)	- - - -	R000BR-210
71	Pendent Throttle Valve Spring (2)	- - - -	D01-51
72	Pendent Throttle Valve Cap (2)		
	Standard	- - - -	D01-180
	Spark-Resistant	- - - -	D01-1180
73	Live Air Hose Assembly		
	6 ft. long	- - - -	TVH50A-A230
	Length as specified	- - - -	TVH50A-AL230
74	Hose Nipple (5/16" hose to 1/4" male pipe)	- - - -	AV1-46
*	Hose Stem	- - - -	78F-146
76	Hose Nut	- - - -	F-147
77	Hose Spud	- - - -	F-148
78	Control Hose Assembly (2)		
	6 ft. long	- - - -	TVH50A-A230
	Length as specified	- - - -	TVH50A-AL230
79	Hose Nipple (5/16" hose to 1/4" male pipe) (one for each Hose)	- - - -	AV1-46
80	Hose Stem (one for each Hose)	- - - -	78F-146
81	Hose Nut (one for each Hose)	- - - -	F-147
82	Hose Spud (one for each Hose)	- - - -	F-148
*	Hose Binder (3)	- - - -	DLC-261
83	Control Hose Elbow (2) (1/4" Street Ell)	- - - -	HUS-912
84	Air Connection Hose Assembly (4 ft. long)	TVH50A-A451	TVH50A-A451
85	Hose Nipple (3/8" hose to 3/8" male pipe) (2)	RV1-46	RV1-46
86	Hose Union	MR-129	MR-129
*	Tee (3/4" x 3/4" x 3/8")	TVH50A-457	TVH50A-457
*	Pipe Nipple (3/4" x 2")	D02-456	D02-456
*	Control Hose Exhaust Valve (2) (Required when control length exceeds 15 feet)	- - - -	MR-939
*	Reducing Bushing (3/8" pipe to 1/4" pipe) (2 used with each Control Hose Exhaust Valve)	- - - -	MC121-82
*	Caution Tag	TA-147A	TA-147A
*	Caution Tag Screw (4)	R4K-302	R4K-302

* Not illustrated.



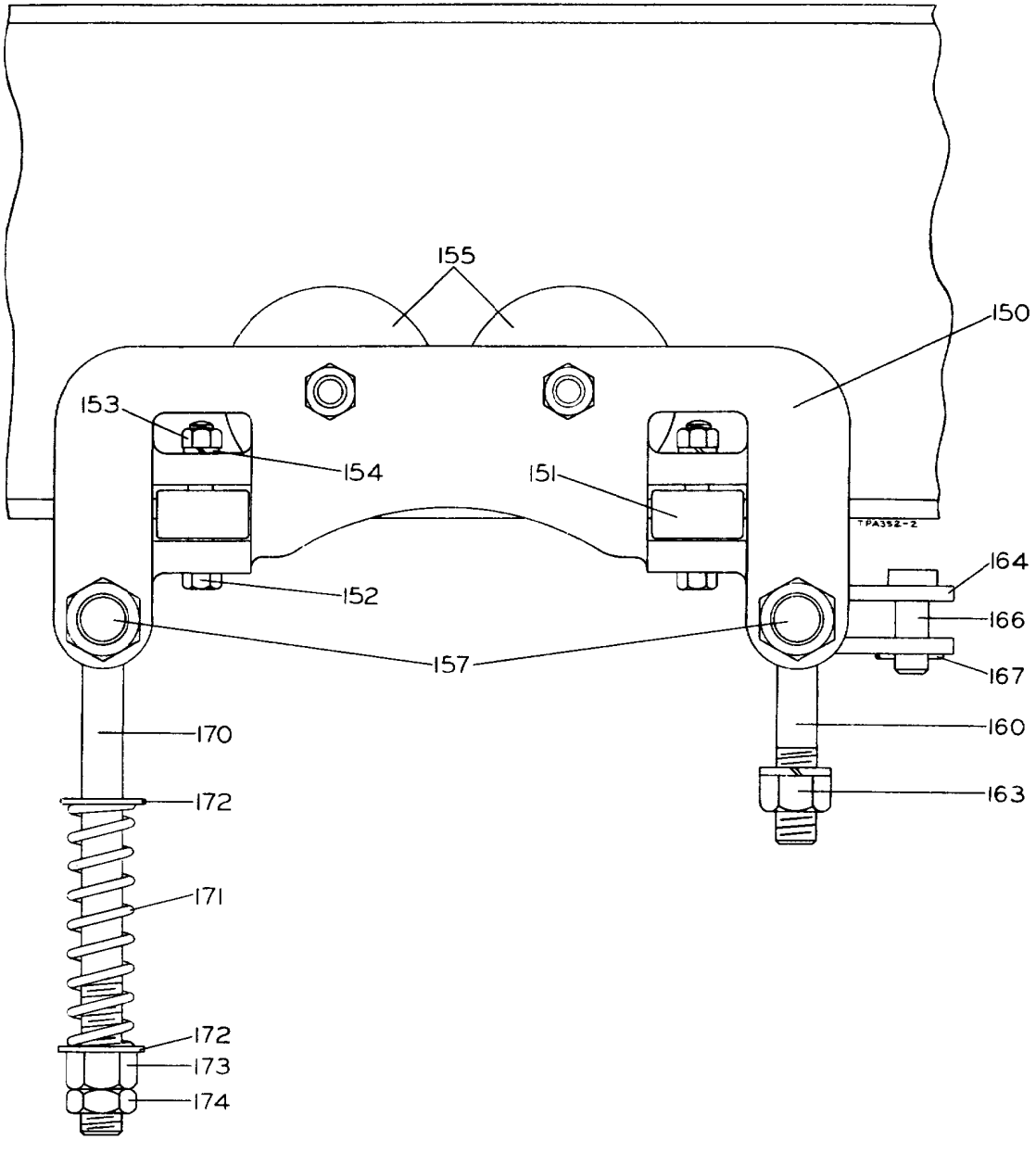
Size TVH50A Tractor

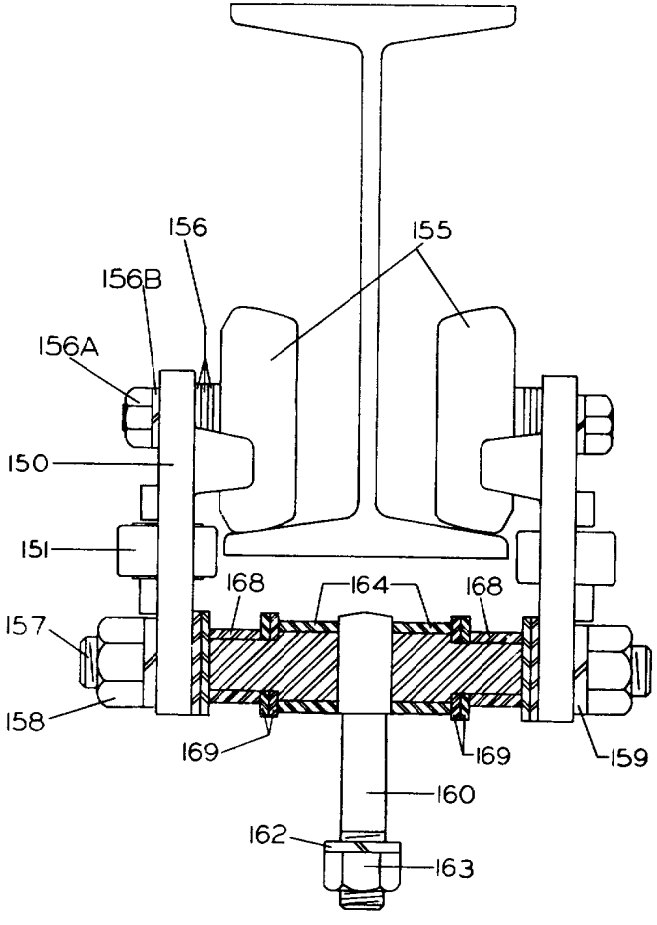
MAIN TRACTOR PARTS

ILLUS. NUMBER (Do not use for ordering)	PART NAME FOR ORDERING (Parts indented after an item are included with that item)	PART NUMBER FOR ORDERING
⊕ 100	Motor Adapter	TVH50A-100
101	Grease Fitting	R1-188
102	Motor Mounting Large Screw (3) (1/4"-20 thd. x 7/8")	510-638
103	Large Screw Lock Washer (3) (1/4")	8U-58
104	Motor Mounting Small Screw (2) (No. 10-24 thd. x 1-1/2")	4U-638
105	Motor Adapter Screw (2) (No. 10-24 thd. x 7/8")	4E-638
106	Screw Lock Washer (4) (No. 10)	4U-58
107	Plain Washer (2) (13/64")	MF-37
108	Housing Gasket	HRA20A-739
109	Drive Gear	HRA30A-9
*	Drive Gear Key	HWA20A-405
112	Drive Shaft	TVH50A-316
113	Drive Shaft Front Bearing (AFBMA No. 17BC02JP)	R2H-97
114	Motor Bracket	TVH50A-650
*	Nameplate	PCG107AC-99X
*	Nameplate Screw (4)	R4K-302
115	Drive Wheel	TVH50A-653
116	Drive Wheel Key	TVH50A-661
117	Drive Wheel Gear Assembly	TVH50A-A662
118	Wheel Gear Bushing	TVH50A-663
119	Wheel Gear Seal	TVH50A-664
● 120	Wheel Gear Large Bearing (New Departure No. RW 507F or its equivalent)	TVH50A-659
● 121	Wheel Gear Small Bearing (AFBMA No. 25BC02JDD)	AM-318
122	Wheel Bearing Spacer	TVH50A-652
123	Gear Case	TVH50A-654
124	Oil Level Plug (1/8" pipe plug)	P250-368
*	Vent Cap	TVH50A-660
126	Gear Case Cap Screw (4) (1/4"-20 thd. x 5/8")	R2N-103
127	Cap Screw Lock Washer (4) (1/4")	L01-67
128	Internal Gear	TVH50A-665
129	Brake Rear Plate	TVH50A-670
130	Brake Plate Key	TVH50A-658
131	Brake Front Plate	TVH50A-672
132	Brake Rotating Disc	TVH50A-671
133	Rotating Disc Driver	TVH50A-667
134	Disc Driver Screw (3) (1/4"-20 thd. x 7/8" "Nylok" type)	TVH50A-668
135	Gear Cage Assembly	TVH50A-A666
136	Drive Shaft Pinion	TVH50A-669
137	Brake Bracket	TVH50A-682
138	Bracket Cap	TVH50A-683
139	Bracket Plug Screw (2) (1/4"-20 thd. x 5/8")	TVH50A-681
140	Plug Screw Lock Washer (2) (1/4")	L01-67
141	Brake Bracket Screw	
	Short (5) (No. 10-24 thd. x 5/8")	TVH50A-688
	Long (No. 10-24 x 1-3/4")	TVH50A-676
142	Bracket Screw Lock Washer (6) (No. 10)	R2-320
143	Brake Bracket Gasket	TVH50A-673
144	Brake Plunger (3)	TVH50A-677
145	Brake Spring (3)	TVH50A-678
146	Brake Adjusting Screw (3)	TVH50A-679
147	Adjusting Screw Lock Nut (3)	TVH50A-680
148	Brake Cover	TVH50A-689
*	Vent Cap Elbow (3/8" x 45°)	TVH50A-907
*	3/8" Close Nipple	D02-908

⊕ If ordering this part for a Tractor with Pull Chain Throttle, also order two Control Shaft Bearings (54) and one Spring Stop Pin (60).

* Not illustrated.





Trolley Parts for Size TVH50A Tractor

TROLLEY PARTS

ILLUS. NUMBER (Do not use for ordering)	PART NAME FOR ORDERING (Parts indented after an item are included with that item)	PART NUMBER FOR ORDERING
†† 150	Trolley Bracket and Guide Roller Assembly (2 (2 for each Trolley)	TVH50A-690A
†† 151	Guide Roller (2 for each Bracket)	
	Standard (stud mounted)	TVH50A-719A
	Spark-Resistant (stud mounted)	TVH50A-R719A
*	Guide Roller Stud (2 for each Bracket) (for Spark-Resistant Trolleys)	TVH50A-R719B
†† 151	Guide Roller (4) (2 required for use with each current style Bracket)	TVH50A-719
†† 152	Guide Roller Bolt (4) (2 required for use with each current style Bracket)	HU-865
†† 153	Roller Bolt Nut (4) (2 required for use with each current style Bracket)	D02-418
†† 154	Roller Bolt Lock Washer (4) (2 required for use with each current style Bracket)	D02-321
155	Trolley Wheel Assembly (4)	
	for operation on I-Beam or Richards Wilcox Tru-Tred Track	
	Standard	TVH50A-A691
	Spark-Resistant	TVH50A-AR691
	for operation on Flat-tread Monorail or Wide Flange Beams	
	Standard	TVH50A-A691T
	Spark-Resistant	TVH50A-AR691T
156	Wheel Spacer (12) (not used with stud mounted Guide Roller and Bracket)	23-725
156A	Trolley Wheel Shaft Nut (1 for each Wheel)	D02-418A
156B	Trolley Wheel Lock Washer (1 for each Wheel)	D10-322
157	Trolley Bracket Bolt (2) (see Table on page 13)	
	5-7/8" (149 mm) long	TVH50A-746-5
	7" (178 mm) long	TVH50A-746-7
	8" (203 mm) long	TVH50A-746-8
	10-1/4" (260 mm) long	TVH50A-746-10
	12-1/2" (318 mm) long	TVH50A-746-12
158	Bracket Bolt Nut (4) (3/4"-10 thd.)	DU-562
159	Bracket Bolt Lock Washer (4) (3/4")	DU-563
160	Suspension Bolt	TVH50A-699
161	Suspension Bolt Collar	TVH50A-700
162	Suspension Bolt Lock Washer (5/8")	A-67
163	Suspension Bolt Nut (5/8"-11 thd.)	HU-776
164	Drawbar Clevis	
	for all Flanges except 2.00", 2.66" and 3.00" Flanges	TVH50A-703
	for 2.00" (51 mm) Flange	TVH50A-702
	for 2.66" (68 mm) Flange	TVH50A-706
	for 3.00" (76 mm) Flange	TVH50A-701
166	Drawbar Pin	TVH50A-705
167	Drawbar Pin Retainer (2)	402-118
168	Bracket Spacer (see Table on page 13)	
	17/32" (13 mm) long	TVH50A-747-17
	1-1/16" (27 mm) long	TVH50A-747-34
	1-19/32" (40 mm) long	TVH50A-747-51
	2-1/8" (54 mm) long	TVH50A-747-68
169	Plain Washer (see Table on page 13)	21-748
170	Traction Adjusting Bolt	TVH50A-713
171	Traction Adjusting Spring	TVH50A-715
172	Spring Seat (2)	24-741
173	Adjusting Bolt Nut (5/8"-11 thd.)	HU-776
174	Adjusting Bolt Lock Nut (5/8"-11 thd. Jam Nut)	G7-18
175	Adjusting Bolt Spacer (2)	
	1-21/32" (42 mm) long	TVH50A-711
	1-1/32" (26 mm) long	TVH50A-711-33
	1-7/16" (37 mm) long	TVH50A-711-46
	1-17/32" (39 mm) long	TVH50A-711-49
† 176	Drawbar	
	Universal Type	TVH50A-704
	with 4" (102 mm) hole spacing	TVH50A-704-4

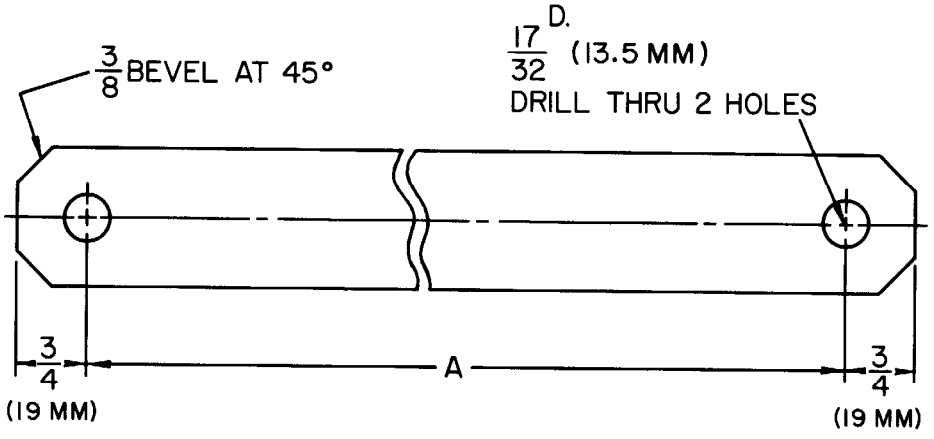
* Not illustrated.

† Refer to DRAWBAR on page 12.

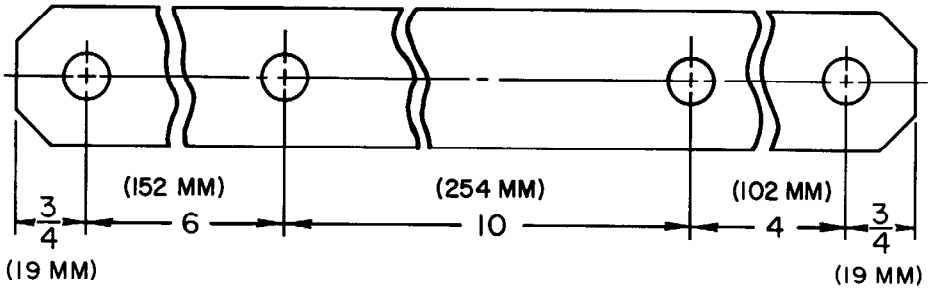
†† Refer to TROLLEY BRACKETS on page 3.

DRAWBAR AND DRAWBAR YOKE KITS

The top view in the following illustration shows how to make a suitable Drawbar, while the lower view illustrates a "universal" drawbar available from Ingersoll-Rand. The latter is long enough for practically any application, and the spacing of the holes is such that it can be cut to produce one or more intermediate length drawbars. In addition, a Drawbar with holes spaced 4" (102 mm) is available. This short Drawbar is satisfactory for connecting the Tractor to an Ingersoll-Rand Low Headroom Hoist or a Standard Headroom Hoist when the Hoist is mounted with the rope drum crosswise to the track.



Use 3/8" x 1-1/2" cold rolled steel. It is unnecessary to cut the corners if the unit is used only on a straight track. Dimension "A" must at least equal the distance between the centers of the drawbar pin hole in the clevis on the Tractor and the one on the hoist when the Tractor and hoist are as close as possible to each other on the track.



Drawbar Yoke Kits have been established for connecting Tractors to Trolley Mounted Hoists.

APPLICATION	PART NUMBER FOR ORDERING
For Series C6CA, C620C, C6H20A, C6H20B, C640A, C6H40A, D660A and D6H60A:	
Standard Headroom Hoists with Rigid Trolley	C6CA-K1
Standard Headroom and Low Headroom Hoists with Swivel Trolleys	C6H20A-K2
Low Headroom Hoists with Rigid Trolley	C640ALH-K1
For Series HLA20A, HRA20A, HRA20ASR, HLE20B, HRE20B, ML20 and MR20 Hoists with Rigid Trolley	HRA20A-K1
For Series HLA30A, HRA30A, HLA40A, HRA40A, HRA40ASR, HLA60A, HRA60A, HRE30B, HLE30B, HRE40B, HLE40B, HRE60B and HLE60B Hoists with Rigid Trolley	HRA40A-K1
For Series MR5, MR5SR, ML5, MR10, MR10SR, MR10F, ML10, ML10F, A and B Hoists with Rigid Trolley	MR-K1
For Series CA110, CA120, CE110 and CE120 Hoists with Rigid Trolley	CE120-K1

TROLLEY BRACKET BOLTS (157), BRACKET SPACERS (168) AND PLAIN WASHERS (169) REQUIRED FOR MOUNTING A TRACTOR ON VARIOUS TRACKS

FOR I-BEAMS

Flange Width		Trolley Bracket Bolt Length, in.	Spacer		Washers Quantity
			Length, in.	Quantity	
in.	mm				
2.66	68	7	- - -	- - -	- - -
3.00	76	7	- - -	- - -	- - -
3.33	85	8	- - -	- - -	- - -
3.66	93	8	- - -	- - -	4
4.00	102	8	- - -	- - -	12
4.66	118	10-1/4	17/32	4	4
5.00	127	10-1/4	17/32	4	12
5.50	140	10-1/4	17/32	4	- - -
6.00	152	10-1/4	17/32	4	8
6.25	159	10-1/4	17/32	4	12
7.00	178	12-1/2	1-19/32	4	8

FOR FLAT-TREAD MONORAILS

Flange Width of Monorail		Trolley Bracket Bolt Length, in.	Spacers		Washers, Quantity
			Length, in.	Quantity	
in.	mm				
2.00	51	5-7/8	- - -	- - -	- - -
3.25 to 3.33	82 to 85	8	17/32	4	- - -
4.00 to 4.06	102 to 103	8	17/32	4	12
4.50	114	8	17/32	4	- - -

FOR WIDE FLANGE BEAMS

Flange Width		Trolley Bracket Bolt Length, in.	Spacers		Washers, Quantity
			Length, in.	Quantity	
in.	mm				
5.25	133	10-1/4	1-1/16	4	16
5.75	146	10-1/4	1-1/16	4	4
6.50	165	12-1/2	1-19/32	4	- - -
6.75	171	12-1/2	1-19/32	4	4
7.00	178	12-1/2	1-19/32	4	18
7.50	191	12-1/2	1-19/32	4	16
8.25	210	12-1/2	2-1/8	4	12
9.00	229	12-1/2	2-1/8	4	24

MAINTENANCE TOOLS

TOOL NUMBER FOR ORDERING	TOOL NAME FOR ORDERING	OPERATION
P25-228	Grease Gun	Inserting grease into Grease Fitting (101).
34766	Control Shaft Bearing Inserting Tool (for Tractor with Pull Chain Throttle).....	Installing the Control Shaft Bearings (54) in the Motor Adapter (100).
74324	Valve Stem Bushing Inserting Tool	Installing new Valve Stem Bushings (2) in the Motor Housing (1).
76427	Drive Shaft Bearing Inserting Tool.....	Installing the Drive Shaft Rear Bearing (4) in the Motor Housing (1).
76662	Shuttle Valve Bushing Reamer	Reaming a new Shuttle Valve Bushing (3) to size after pressing it into the Motor Housing (1).
76663	Shuttle Valve Bushing Inserting Tool.....	Pressing a new Shuttle Valve Bushing (3) into the Motor Housing (1).
76664	Drive Shaft Rear Bearing Puller	Removing the Drive Shaft Rear Bearing (4) from the Motor Housing (1).