03533114

Form P6663
Edition 1

OPERATOR AND MAINTENANCE MANUAL
for
AIR MOTOR DRIVEN TRACTOR

MODEL TVH-1
Pull Chain Control

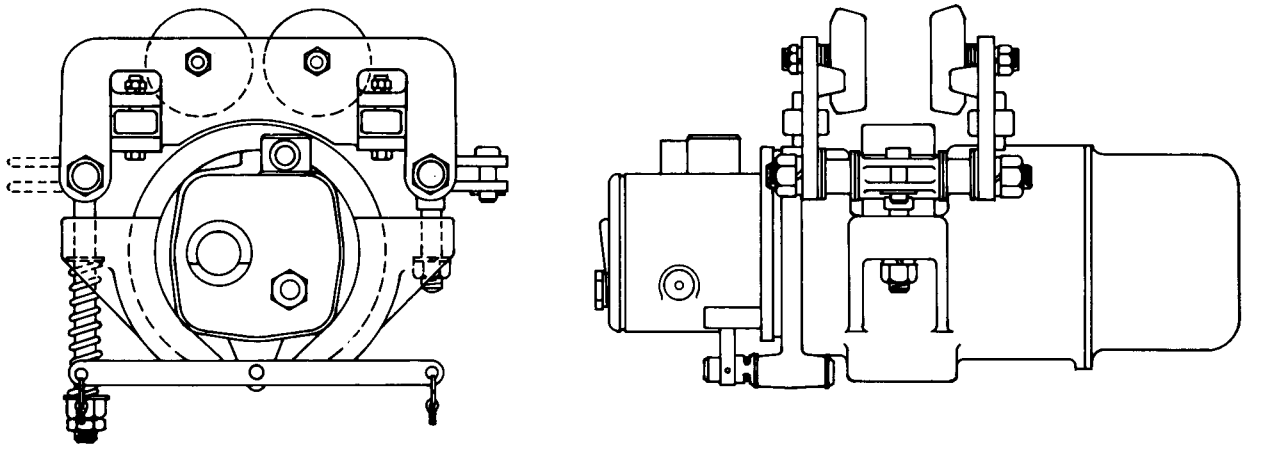
MODEL TVH-2
Pendent Control

MODEL TVHSR-1
Pull Chain Control
Spark-Resistant

MODEL TVHSR-2
Pendent Control
Spark-Resistant

Always operate, inspect and maintain this Tractor in accordance with American National Standards Institute Safety Code (ANSI 30.16) and any other applicable safety codes and regulations.

FOR TOP PERFORMANCE AND MAXIMUM DURABILITY OF PARTS, OPERATE THIS TRACTOR AT 90 psig (6.2 bar/620 kPa) WITH 1/2" (13 mm) (MINIMUM) AIR SUPPLY HOSE AND AN AIR LINE LUBRICATOR AND FILTER.



(Dwg. TPC480)

READ ALL THE ENCLOSED INSTRUCTIONS BEFORE INSTALLING, OPERATING OR REPAIRING THIS TRACTOR.

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

INGERSOLL-RAND®
AIR HOISTS

HOW TO ORDER REPAIR PARTS FOR YOUR AIR MOTOR DRIVEN TRACTOR

Your Air Motor Driven Tractor is designed and constructed to give you long, trouble-free service. In time it may become necessary to order and install new parts to replace those that have been subject to wear. For prompt service and genuine Ingersoll-Rand parts, place orders with your nearest Ingersoll-Rand Distributor. The use of other than Ingersoll-Rand replacement parts may result in decreased Tractor performance, and may invalidate all warranties.

When ordering parts, give your Distributor the following data:

1. Complete model number of the Air Motor Driven Tractor as it appears on the nameplate.
2. Complete part number, part name and quantity needed as shown on the pages of this manual.

If it becomes necessary to return the complete Air Motor Driven Tractor or certain parts to the factory, contact the Distributor from whom you purchased the Tractor, or the nearest Ingersoll-Rand Distributor in your locality.

LUBRICATION

Weekly, or as experience indicates, check the oil level in the Motor Housing (51). If the oil level is down to the line on the Sight Glass Window (76), remove the Oil Chamber Plug (56) from the top of the Motor Housing (51), and fill the oil chamber with Ingersoll-Rand Lubricant No. 10 or a good quality high-speed spindle oil.

Semiannually: Insert Ingersoll-Rand Lubricant No. 28 or a good quality No. 2 cup grease into the Grease Fitting (50) or the rim of the Motor Adapter (1). Six or eight strokes from a hand grease gun are sufficient.

Remove the Oil Level Plug (24) from the side of the Gear Case (23). If the oil is below the opening, remove the Vent Cap and add Ingersoll-Rand Lubricant 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 Lubricant 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 (24), 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 Lubricant No. 55 or its substitute (see preceding paragraph). Approximately 6-1/2 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 (75) from the Motor Housing (51). Rotate the Oiler Adjusting Screw (80), **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 (79) 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 (81) with knot 1/2" from end, into the oiler hole.
2. Insert the Oiler Felt (79).
3. Thread the other end of the Oiler Wick through the hole in Oiler Adjusting Screw (80).
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 Spacers (165) 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).
2. Pass the end of the Traction Adjusting Bolt (170) through the mounting hole in the Motor Bracket (14). 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).
3. Run the Adjusting Bolt Nut (173) onto the Adjusting Bolt until the Spring is compressed to approximately 6" (153 mm). Apply the Adjusting Bolt Locknut (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 (15) on the track. Make final adjustment under actual operating conditions.
4. Adjust the brake only if experience proves that the factory setting is unsatisfactory. To adjust: Remove the Brake Cover (48) and loosen each of the three Adjusting Screw Locknuts (47). Rotate each Brake Adjusting Screw (46) 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 (58) and withdraw the Air Strainer Screen (61) from the Motor Housing (51). Clean the Screen with kerosene or other solvent.

When assembling the Multi-Vane®motor and installing it in the Motor Housing (51), proceed as follows:

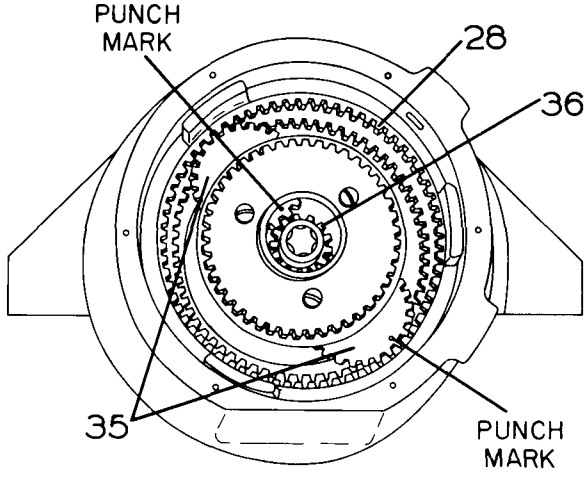
1. Press the Rear Rotor Bearing (87) into the recess in the Rear End Plate (86). Press this assembly onto the short hub of the Rotor (88) as far as possible without binding the End Plate against the rotor face.
2. Place a Vane (89) in each vane slot in the Rotor.
3. Slip the Cylinder (91) over the Rotor, 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.
4. Press the Front Rotor Bearing (94) into the recess in the Front End Plate (93). Press this assembly onto the long hub of the Rotor.
5. 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.
6. Slip the rubber Motor Clamp Ring (95) 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 (97) in the rotor hub, slide the Rotor Pinion (96) onto the hub, and retain with Ring (98).
7. Place the Motor Housing (51), 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 (51)**, 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 (95) is still in position on the Front End Plate (93).
8. Apply the Housing Cover Gasket (83) to the Housing Face.
9. Place the Motor Housing Cover (75) on the Motor Housing (51), entering the end of the Cylinder Dowel (92) in the dowel hole in the Cover, and making sure the free length of Oiler Wick (81) enters the oil chamber. Insert one Housing Cover Cap Screw (84) 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.
10. 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 (53). 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 (52) in the Motor Housing (51).

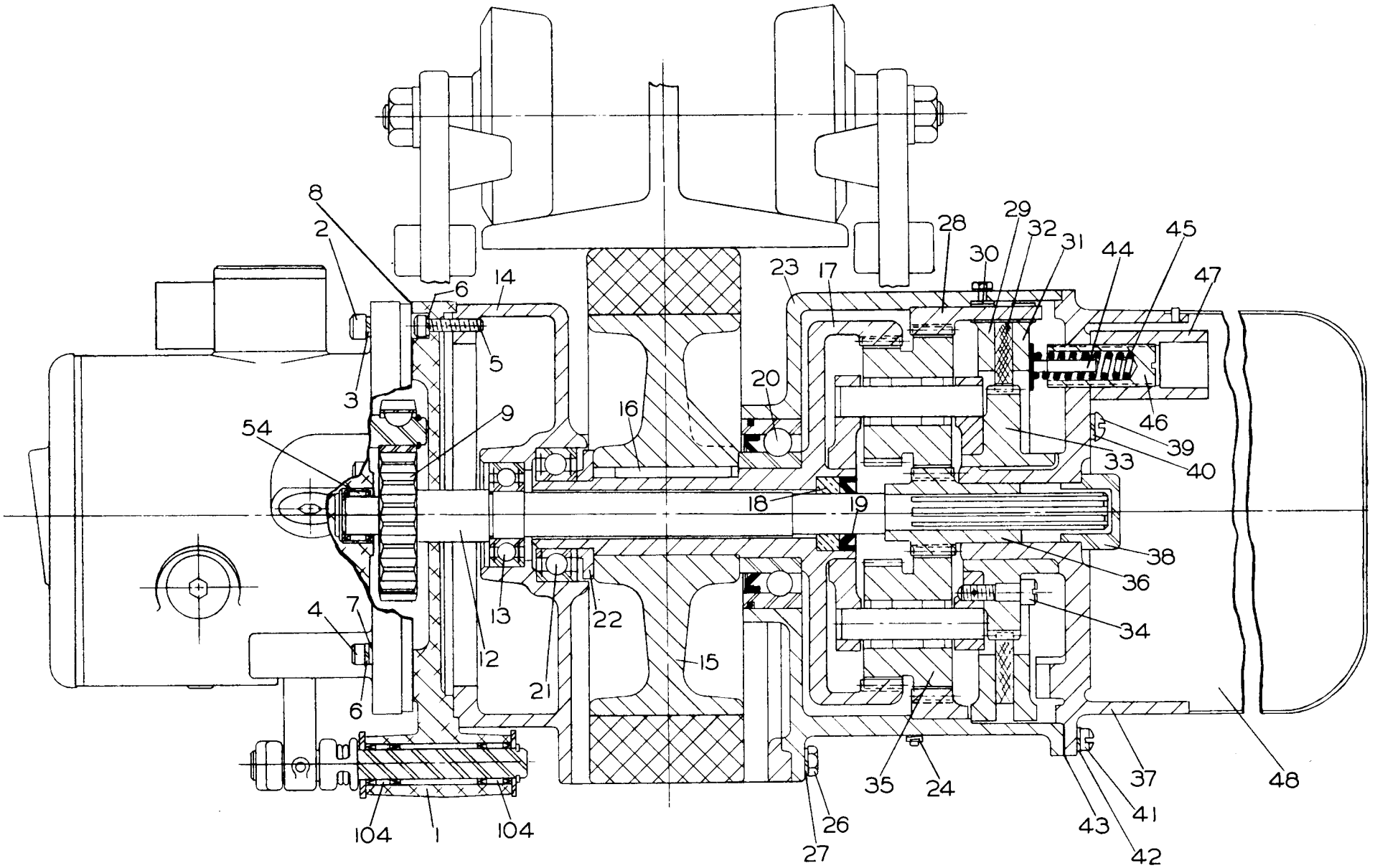
When disassembling the tractor gearing, remove the Brake Plate Key (30) from the gear case wall before attempting to withdraw the Internal Gear (28).

When installing the Gear Cage Assembly (35) in the Gear Case, note the punch marks and lines on each gear face, and position the gears as indicated in the accompanying view.



TVH TRACTOR
GEAR CAGE ASSEMBLY

(Dwg. TPD927)



Series TVH Tractor

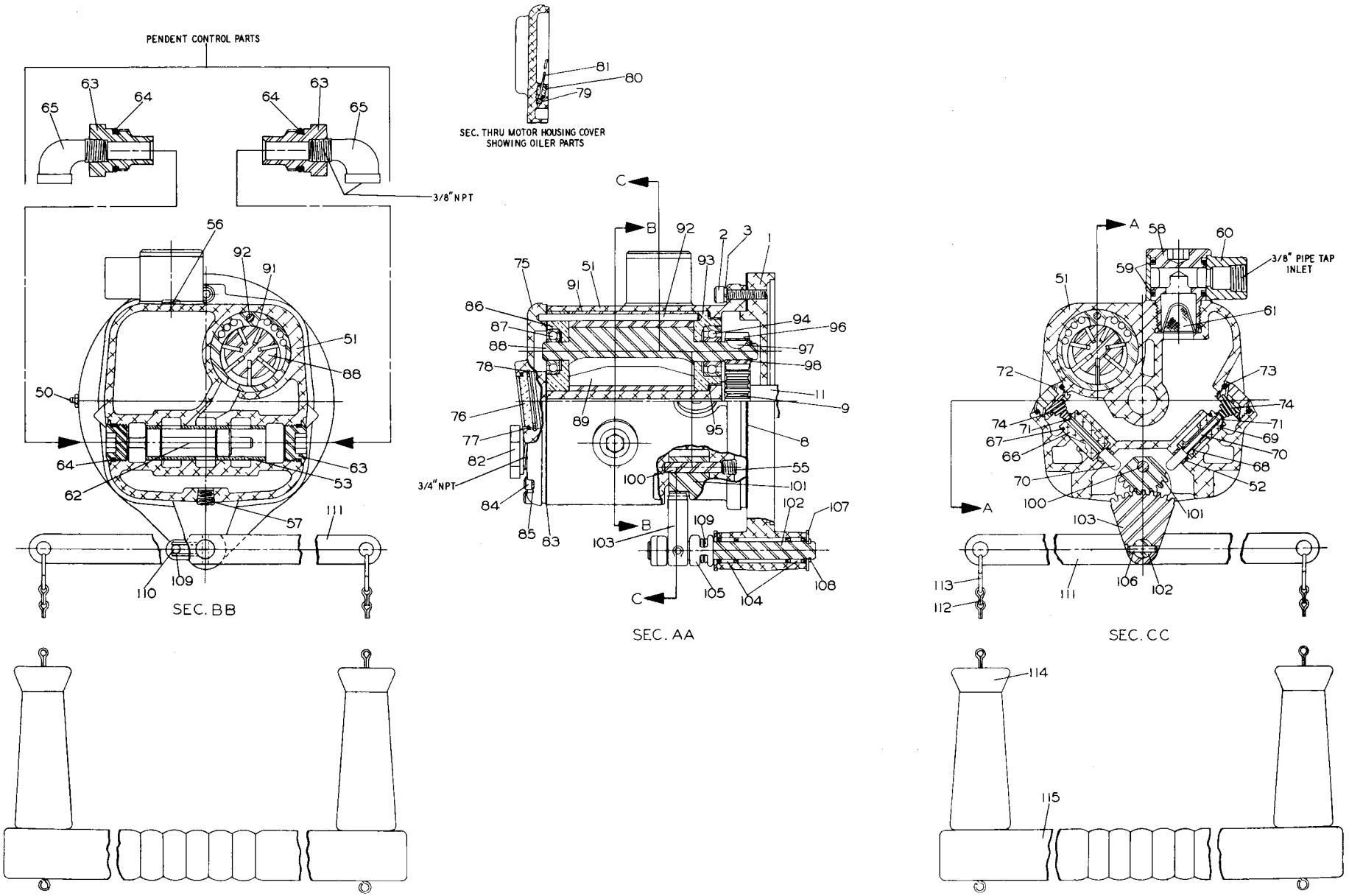
(Dwg. TPB761)

			PART NUMBER FOR ORDERING				PART NUMBER FOR ORDERING
⊕	1	Motor Adapter	TVH50A-100	27		Cap Screw Lock Washer (4)	L01-67
	2	Motor Mounting Large Screw (3)	510-638	28		Internal Gear	TVH50A-665
	3	Large Screw Lock Washer (3)	8U-58	29		Brake Rear Plate	TVH50A-670
	4	Motor Mounting Small Screw (2)	4U-638	30		Brake Plate Key	TVH50A-658
	5	Motor Adapter Screw (2)	4E-638	31		Brake Front Plate	TVH50A-672
	6	Screw Lock Washer (4)	4U-58	32		Brake Rotating Disc	TVH50A-671
	7	Plain Washer (2)	MF-37	33		Rotating Disc Driver	TVH50A-667
	8	Housing Gasket	HRA20A-739	34		Disc Driver Screw (3)	TVH50A-668
	9	Drive Gear (40 teeth)	HRA30A-9	35		Gear Cage Assembly	TVH50A-A666
	*	Drive Gear Key	HWA20A-405	36		Drive Shaft Pinion	TVH50A-669
	12	Drive Shaft	TVH50A-316	37		Brake Bracket	TVH50A-682
	13	Drive Shaft Front Bearing	R2H-97	38		Bracket Cap	TVH50A-683
	14	Motor Bracket	TVH50A-650	39		Bracket Plug Screw (2)	TVH50A-681
	*	Nameplate	PCG107AC-99X	40		Plug Screw Lock Washer (2)	L01-67
	*	Nameplate Screw (4)	R4K-302	41		Brake Bracket Screw	
	15	Drive Wheel	TVH50A-653			Short (5)	TVH50A-688
	16	Drive Wheel Key	TVH50A-661			Long	TVH50A-676
	17	Drive Wheel Gear Assembly	TVH50A-A662	42		Bracket Screw Lock Washer (6)	R2-320
	18	Wheel Gear Bushing	TVH50A-663	43		Brake Bracket Gasket	TVH50A-673
	19	Wheel Gear Seal	TVH50A-664	44		Brake Plunger (3)	TVH50A-677
●	20	Wheel Gear Large Bearing	TVH50A-659	45		Brake Spring (3)	TVH50A-678
●	21	Wheel Gear Small Bearing	AM-318	46		Brake Adjusting Screw (3)	TVH50A-679
	22	Wheel Bearing Spacer	TVH50A-652	47		Adjusting Screw Locknut (3)	TVH50A-680
	23	Gear Case	TVH50A-654	48		Brake Cover	TVH50A-689
	24	Oil Level Plug	P250-368	*		Vent Cap Elbow	TVH50A-907
	*	Vent Cap	TVH50A-660	*		3/8" Close Nipple	D02-908
	26	Gear Case Cap Screw (4)	R2N-103				

* Not illustrated.

● To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (●) for every four tools in service.

⊕ If ordering this part for a Tractor with Pull Chain Throttle, also order two Control Shaft Bearings (104) and one Spring Stop Pin (110).

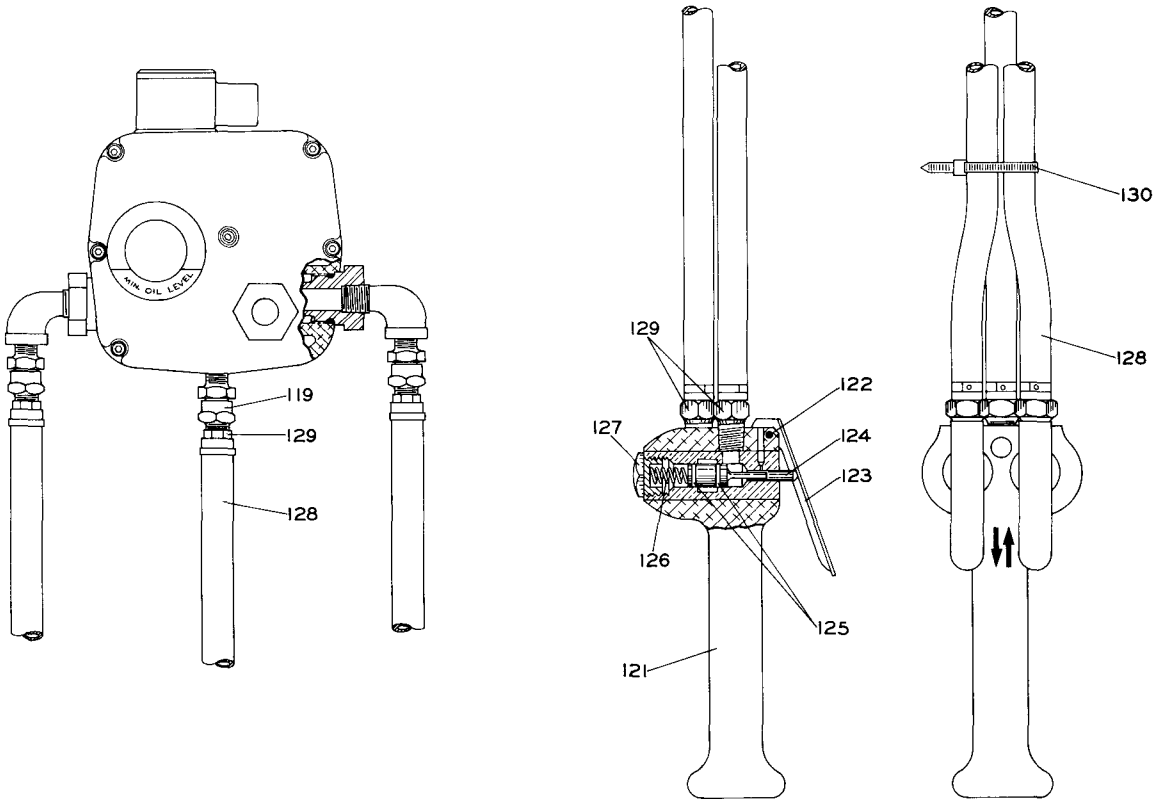


Series TVH Tractor Motor

(Dwg. TPA1005)

			PART NUMBER FOR ORDERING				PART NUMBER FOR ORDERING	
		PULL CHAIN THROTTLE	PENDENT THROTTLE			PULL CHAIN THROTTLE	PENDENT THROTTLE
50	Grease Fitting	R1-188	R1-188	83	Housing Cover Gasket	HRA20A-984	HRA20A-984
	Tractor Motor Assembly	TVH50A-A40	TVH-A40-2	84	Housing Cover Cap Screw (9)	34U-463	34U-463
51	Motor Housing Assembly	HRA20A-B40A	HRA20A-B40A	85	Cover Cap Screw Lock Washer (9)	4U-58	4U-58
52	Valve Stem Bushing (2)	HRA20A-615	HRA20A-615	• 86	Rear End Plate	HRA20A-12	HRA20A-12
53	Shuttle Valve Bushing	HRA20A-247	HRA20A-247	• 87	Rear Rotor Bearing	402-22	402-22
• 54	Drive Shaft Rear Bearing	HRA20A-318	HRA20A-318	88	Rotor	HRA20A-53	HRA20A-53
55	1/8" Pipe Plug	R2-227	R2-227	• 89	Vane Packet (set of 7 Vanes)	HRA20A-42-7	HRA20A-42-7
56	Oil Chamber Plug	R0H-377	R0H-377	• 91	Cylinder	TVH50A-3	TVH50A-3
57	Housing Plug	GA57-95	– – –	92	Cylinder Dowel	HRA20A-98	HRA20A-98
58	Swivel Inlet Body Assembly	834-165	834-165	93	Front End Plate	HRA20A-11	HRA20A-11
• 59	Swivel Inlet Seal (2)	MT4-210	MT4-210	94	Front Rotor Bearing	R1L-24	R1L-24
60	Swivel Inlet Sleeve	HRA20A-166	HRA20A-166	95	Motor Clamp Ring	R0B2J73-359	R0B2J73-359
61	Air Strainer Screen	HRA20A-61	HRA20A-61	96	Rotor Pinion (12 teeth)	HRA30A-17	HRA30A-17
62	Shuttle Valve	HRA20A-246	HRA20A-246	97	Pinion Key	HRA20A-405	HWA20A-405
63	Shuttle Valve Cap Assembly (2)	HRA20A-A943A	TVH-B238A	98	Pinion Retaining Ring	404-118	404-118
64	Cap Seal (one for each Cap)	R4-210	R4-210	100	Throttle Cam Pivot Pin	157H-530	– – –
65	Elbow (2)	– – –	12SR-8	101	Throttle Cam	HRA20A-941	– – –
66	Large Throttle Valve Assembly	TVH50A-A940	TVH50A-A940	102	Throttle Control Shaft	TVH50A-255	– – –
• 67	Large Throttle Valve Face	R0AR-210	R0AR-210	103	Control Shaft Sector	HRA20A-254	– – –
68	Small Throttle Valve Assembly	HRA20A-A840	HRA20A-A840	104	Control Shaft Bearing (2)	34U-367	– – –
• 69	Small Throttle Valve Face	834-159	834-159	105	Control Shaft Collar	HRA20A-33	– – –
70	Throttle Valve Stem Assembly (2)	HRA20A-A161	HRA20A-A161	106	Control Shaft Pin (3)	R1AF-524	– – –
• 71	Throttle Valve Stem Seal (one for each Stem)	R2F-167	R2F-167	107	Control Shaft Washer	D02-419	– – –
				108	Control Shaft Retainer	404-118	– – –
72	Throttle Valve Cap Assembly (2)	HRA20A-A266	HRA20A-A266	109	Throttle Lever Spring	TVH50A-412	– – –
73	Cap Seal (one for each Cap)	R4-210	R4-210	110	Spring Stop Pin	5BM-278	– – –
74	Throttle Valve Spring (2)	MR-942A	MR-942A	111	Throttle Lever	TVH50A-556	– – –
75	Motor Housing Cover Assembly	HRA20A-A102	HRA20A-A102	112	Throttle Chain (2) (length as specified)	CA110-B240	– – –
76	Sight Glass Window	HRA20A-116	HRA20A-116				
77	Sight Glass Seal	HRA20A-117	HRA20A-117	113	S-Hook (2 for each Chain)	D02-421	– – –
78	Sight Glass Retainer	HRA20A-119	HRA20A-119	114	Throttle Handle (2)	MR-415	– – –
79	Oiler Felt	R1-75	R1-75	115	Throttle Handle Bar (optional equipment)	MR-409	– – –
80	Oiler Adjusting Screw	R1-71A	R1-71A				
81	Oiler Wick	HRA20A-74	HRA20A-74				
82	Exhaust Bushing	HRA20A-105	HRA20A-105				

• To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (•) for every four tools in service.

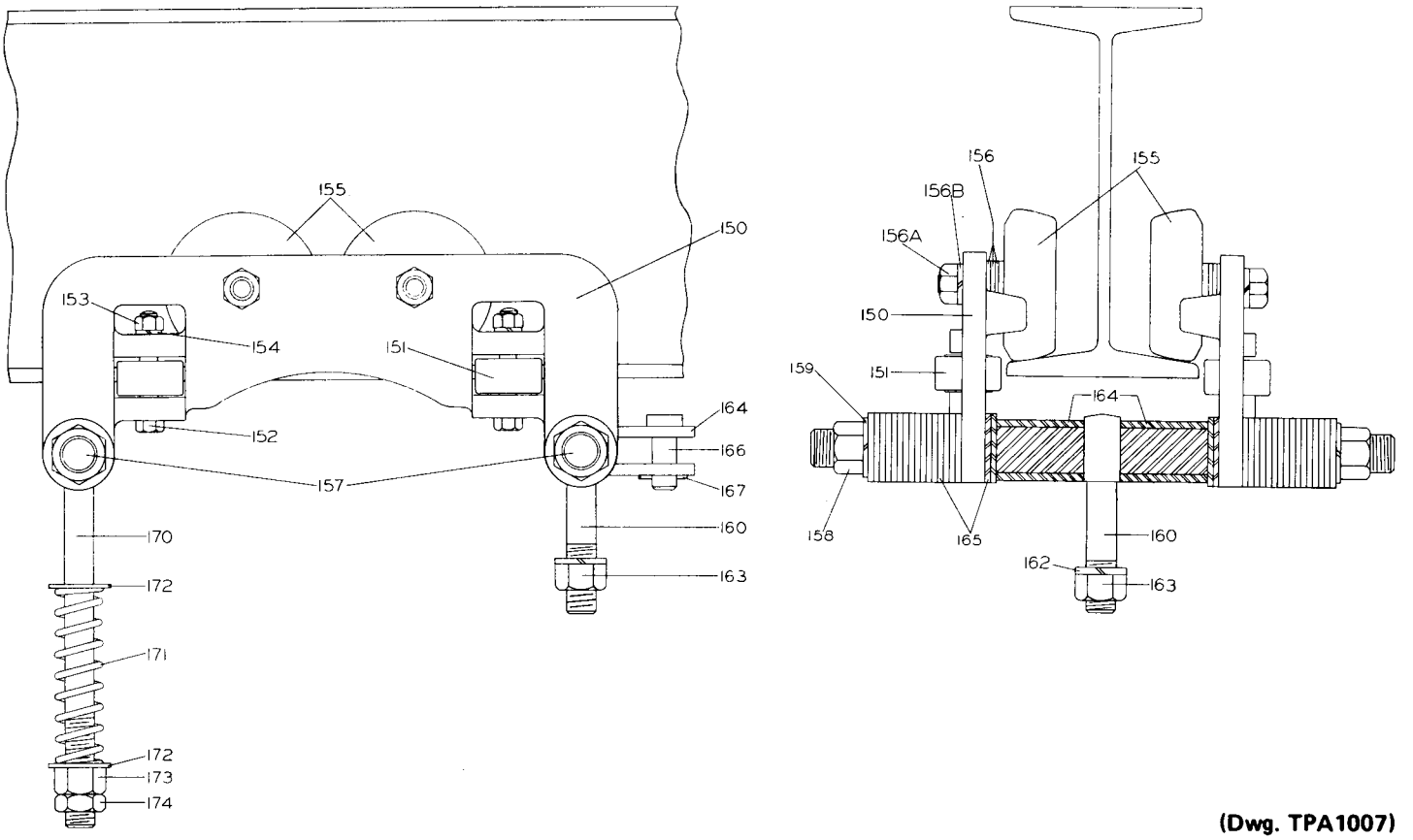


(Dwg. TPA1006)

Series TVH Tractor Pendent Control

		PART NUMBER FOR ORDERING
119	Union 3/8" NPT (3)	MR-129
	Pendent Throttle and Hose Assembly (7 ft long - standard)	
	standard	MR-A269-7
	spark-resistant	MR-AR269-7
121	Pendent Throttle Handle Assembly	
	standard	MR-269
	spark-resistant	MR-AR269
122	Throttle Lever Pin	DLC-120
123	Pendent Throttle Lever (2)	
	standard	R00H-273A
	spark-resistant	MLK-R273
124	Pendent Throttle Valve (2)	MR-264
• 125	Pendent Throttle Valve Seal Ring (2 for each Valve)	AF120-289
126	Pendent Throttle Valve Spring (2)	D10-51
127	Pendent Throttle Valve Cap (2)	
	standard	D02-180
	spark-resistant	D02-1180
128	Control Hose (3)	
	7 ft. long	H6A-7
	length as specified	BH6A
129	Hose Nipple (2 for each Hose)	RV1-46
130	Hose Binder (3)	CE110-4

• To keep downtime to a minimum, it is desirable to have on hand certain repair parts. We recommend that you stock one (pair or set) of each part indicated by a bullet (•) for every four tools in service.



(Dwg. TPA1007)

Series TVH Tractor Trolley

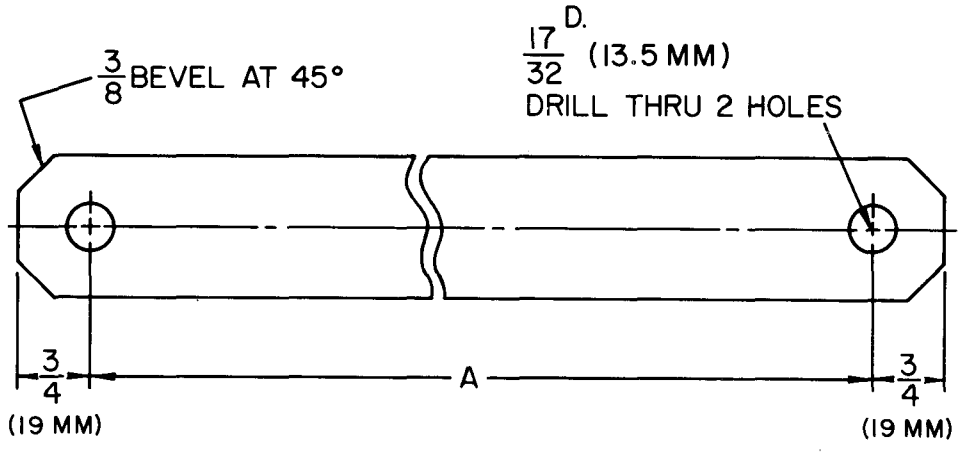
		PART NUMBER FOR ORDERING			PART NUMBER FOR ORDERING
	Trolley Bracket Assembly		158	Bracket Bolt Nut (4) (3/4"-10 thd.) . .	DU-562
	Standard	TVH-A690	159	Bracket Bolt Lock Washer (4) (3/4"). .	D01-692
	Spark-Resistant	TVH-AR690	160	Suspension Bolt	TVH50A-699
150	Trolley Bracket (2)	TVH50A-690	162	Suspension Bolt Lock Washer (5/8") . .	A-67
151	Guide Roller (4).	TVH50A-719	163	Suspension Bolt Nut (5/8"-11 thd.) . .	HU-776
152	Guide Roller Bolt (4).	HU-865	164	Drawbar Clevis	TVH50A-703
153	Roller Bolt Nut (4)	D02-418	165	Spacer (80 required)	21-748
154	Roller Bolt Lock Washer (4).	D02-321	166	Drawbar Pin	TVH50A-705A
155	Trolley Wheel Assembly (4)		167	Drawbar Pin Retainer (2)	D02-330
	universal Wheels for operation on		170	Traction Adjusting Bolt	TVH50A-713
	flat or tapered track and beams		171	Traction Adjusting Spring	TVH50A-715
	Standard	TVH50A-A691	172	Spring Seat (2)	24-741
	Spark-Resistant	TVH50A-AR691	173	Adjusting Bolt Nut (5/8"-11 thd.) . . .	HU-776
156	Wheel Spacer (12).	23-725	174	Adjusting Bolt Locknut (5/8"-11	
156A	Trolley Wheel Shaft Nut (1 for each			thd. Jam Nut)	G7-18
	Wheel)	D02-418A	*	Adjusting Bolt Spacer (2)	
156B	Trolley Wheel Lock Washer (1 for each			(1-21/32" [42 mm] long)	TVH50A-711-54
	Wheel)	D10-322	†	Drawbar	
157	Trolley Bracket Bolt (2) (12-1/2"			Universal Type	TVH50A-704
	[318 mm] long).	TVH50A-746-12		with 4" (102 mm) hole spacing	TVH50A-704-4

* Not illustrated.

† Refer to DRAWBAR on page 10.

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 (Part No. TVH50A-704) 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) (Part No. TVH50A-704-4) 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.

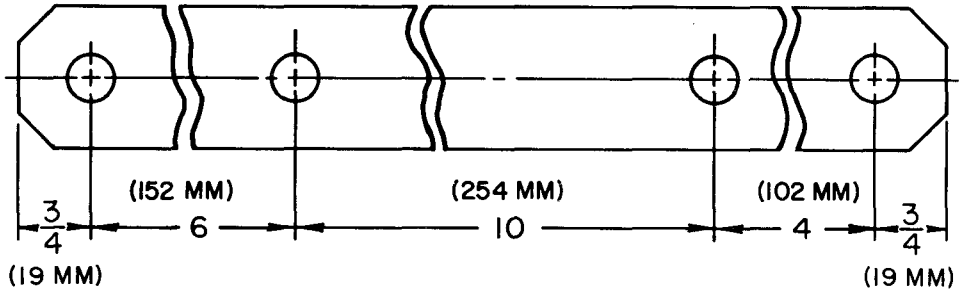


(Dwg. TPD267)

DO-IT-YOURSELF DRAWBAR

Use 3/8" x 1-1/2" cold rolled steel. It is unecessary 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.



(Dwg. TPD268)

UNIVERSAL DRAWBAR

Drawbar Yoke Kits have been established for connecting Tractors to Trolley Mounted Hoists. Following is a list of Hoists with Trolleys and the available Drawbar Yoke Kits for them. **Note:** Series HLK Hoists with Rigid Trolley do not require a Drawbar Yoke Kit.

	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 and HRE20B 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 all Series MR, ML, MRK and MLK Hoists and A and B Hoists with Rigid Trolley	MR-K1
For Series CA110, CA120, CE110 and CE120 Hoists with Rigid Trolley	CE120-K1

MAINTENANCE TOOLS

TOOL NUMBER FOR ORDERING	TOOL NAME FOR ORDERING	OPERATION
P25-228	Grease Gun	Inserting grease into Grease Fitting (50).
34766	Control Shaft Bearing Inserting Tool (for Tractor with Pull Chain Throttle).	Installing the Control Shaft Bearings (104) in the Motor Adapter (1).
74324	Valve Stem Bushing Inserting Tool.	Installing new Valve Stem Bushings (52) in the Motor Housing (51).
76427	Drive Shaft Bearing Inserting Tool.	Installing the Drive Shaft Rear Bearing (54) in the Motor Housing (51).
76662	Shuttle Valve Bushing Reamer	Reaming a new Shuttle Valve Bushing (53) to size after pressing it into the Motor Housing (51).
76663	Shuttle Valve Bushing Inserting Tool	Pressing a new Shuttle Valve Bushing (53) into the Motor Housing (51).
76664	Drive Shaft Rear Bearing Puller.	Removing the Drive Shaft Rear Bearing (54) from the Motor Housing (51).