

# OPERATION AND MAINTENANCE MANUAL

## for 22UWD962 WINCH

### WARNING

***These Winches are not to be used  
for lifting or lowering people***

**Always operate and maintain this Winch in accordance with American National Standards Institute Safety Code (ANSI B30.7) and any other applicable safety codes and regulations.**

**FOR TOP PERFORMANCE AND MAXIMUM DURABILITY OF PARTS, OPERATE THIS WINCH AT 90 psig (6.2 bar/620 kPa) AIR PRESSURE WITH 1-1/2" (38 mm) DIAMETER HOSE.**

### OPERATING PRACTICES

The two most important aspects of Winch operation are: (1) Allow only qualified people to operate a Winch and (2) Subject each Winch to a regular inspection and maintenance procedure.

A qualified operator must be physically competent. He must have no health condition which might affect his ability to react, and he must have good hearing, vision and depth perception. The qualified Winch operator must be carefully instructed in his duties and must understand the operation of the Winch, including a study of the manufacturer's literature. He must thoroughly understand proper methods of hitching loads. He should have a good attitude regarding safety and should refuse to operate under unsafe conditions.

Regular inspection procedures should be set up, rigidly adhered to and recorded by or under direction of a qualified person. On Winches in continuous service, inspection should be made at the beginning of each shift. The items to be checked include, but are not limited to:

- a. **LUBRICATION:** See lubrication instructions on pages 3 and 4.
- b. **BRAKES:** Visually check for proper adjustment (see Brake Adjustment).  
Lift a capacity or near capacity load a few inches off the floor and check ability of braking system to stop and hold the load without excessive drift.
- c. **WIRE ROPE AND HOOKS:** Visually inspect the wire rope. Replace it **AT ONCE** if there is indication of fraying, or if it is crushed, cut or otherwise damaged. Follow cable manufacturer's recommended practice for proper use and inspection of wire rope.  
Hooks should be checked for wear, increase in throat opening, and bending.
- d. **CONTROLS:** See that controls function properly and return to neutral when released.
- e. **GENERAL:** Check to see that mounting fastenings are secure, unworn and undamaged. Be alert for unusual visual or audible signs which could indicate a defect. Do not operate the Winch until the defect has been determined and corrected.  
Periodically, depending on the severity of the service:
  - a. Inspect Brake and Locking Dog components for wear or damage.
  - b. Check all bolts or fasteners.
  - c. Inspect the Winch structure for damage.

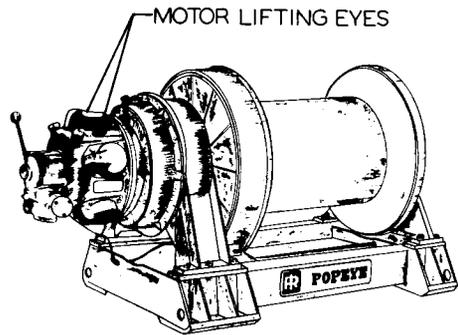
**Notice:** The use of other than genuine Ingersoll-Rand replacement parts may result in decreased tool performance and increased maintenance, and may, at the Company's option, invalidate all warranties.

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

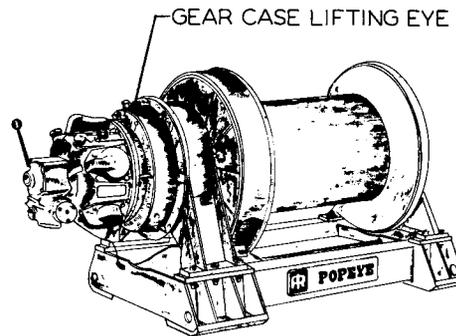
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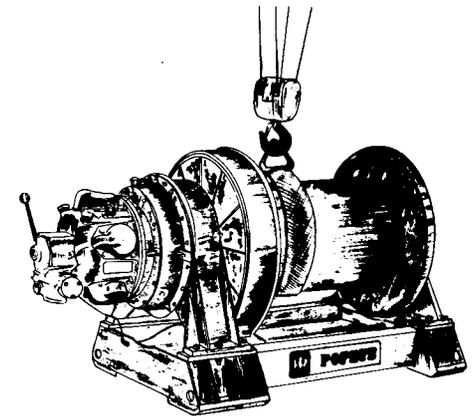
**INGERSOLL-RAND®**  
**AIR HOISTS & WINCHES**



Motor Lifting Eyes Are For Installation And Removal of MOTOR ASSEMBLY ONLY. No Attempt Should Be Made To Lift The Winch Using These Eyes.



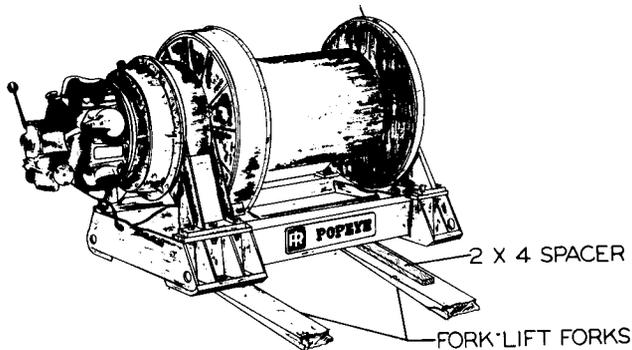
No Attempt Should Be Made to Lift the Winch Using Gear Case Lifting Eye.



Lifting Method Utilizing Lifting Harness And Overhead Hoist

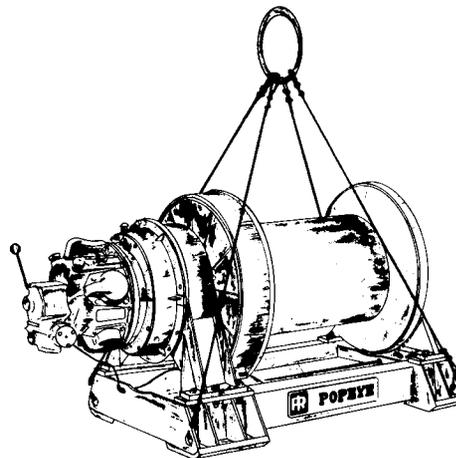
Harness Should Be Positioned As Close To The Front Drum Flange As Possible.

2

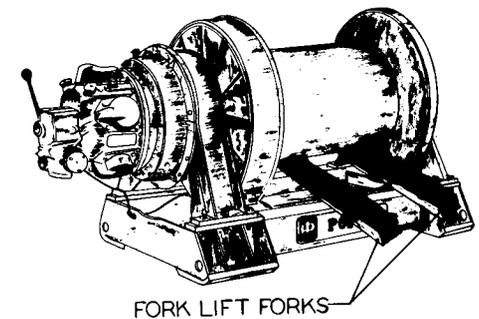


Lifting Method Utilizing A Fork Lift With Forks Beneath Winch Base.

Extreme Care Should Be Taken To Avoid Damaging Brake Parts Located Near This Lifting Area.



"Four-Point" Lifting Method Utilizing Existing Lifting Eyes



Lifting Method Utilizing a Fork Lift With Forks Beneath Winch Drum.

Winch Should Be Balanced on Forks Before Moving.

## OPERATING INSTRUCTIONS

1. Read the manufacturer's instructions before operating the Winch.
2. Never lift a load greater than the rated capacity of the Winch.
3. Never use the Winch rope as a sling.
4. Always stand clear of the load.
5. Never use the Winch for lifting or lowering people, and never stand on a suspended load.
6. Never carry loads over people.
7. Before each shift, check the Winch for wear or damage. Check brakes, locking dog, etc.
8. Periodically inspect the Winch thoroughly and replace worn or damaged parts.
9. Follow the lubrication instructions.
10. Do not disengage clutch with a load on the Winch. Be sure clutch is fully engaged before operating Winch.
11. Do not "side pull" or "yard".
12. Always rig the Winch properly and carefully.
13. Never operate a Winch with twisted, kinked or damaged wire rope.
14. Be sure cable winds properly on drum.
15. Ease the slack out of the wire rope and sling when starting a lift. Do not jerk the load.
16. Be certain there are no objects in the way of a load or hook when operating the Winch.
17. Be certain the air supply is shut off before performing maintenance work on the Winch.
18. Shut off air supply while Winch is unattended.
19. Properly secure the Winch before leaving it unattended.
20. Be certain the load is properly seated in the saddle of the hook. Do not tipload the hook as this leads to spreading and eventual failure of the hook.
21. Do not allow unqualified personnel to operate a Winch.
22. Do not swing a suspended load.
23. Do not operate a Winch if you are not physically fit to do so.
24. Do not do anything you believe may be unsafe.
25. Do not use the Winch rope as a ground for welding. Do not attach a welding electrode to a Winch or sling chain.
26. Do not divert your attention from the load while operating a Winch.
27. Engage locking dog before leaving load suspended.
28. Do not engage locking dog while drum is in operation.
29. Do not leave a load suspended for any extended period--never unattended.
30. Never splice a sling chain by inserting a bolt between links.
31. Do not force a chain or hook into place by hammering. Do not insert the point of the hook into a chain link.
32. Do not expose the sling chain to freezing temperatures, and do not apply sudden loads to a cold chain.

## LUBRICATION

**Warning: Lubricate the motor before using the Winch.** To avoid leakage during shipment, the oil was drained from the motor. A quantity of oil sufficient for one filling is contained in the can packed with the Winch. Before using the Winch, make certain both Drain Plugs (2) are securely threaded into place. Unscrew the Vent Cap (5) and pour the entire contents of the can (3 quarts) into the opening in the top of the Motor Case (1).

### Motor Lubrication

**Check oil daily and maintain level with opening in the side of the Motor Case.**

**When the Winch is subjected to temperatures above freezing:** After the Winch has been idle for several hours or overnight, loosen the Drain Plug (2) located at the bottom of the Motor Case (1) and allow the accumulated water to drain out. After draining the water, tighten the Plug in the bottom and remove a similar Plug on the side of the Motor Case. Unscrew the Vent Cap (5) and pour a sufficient quantity of the recommended oil through this opening to bring the oil level up to the side opening. Replace the Plug and Vent Cap.

**When the Winch is subjected to freezing temperatures:** Allow the Winch to remain idle long enough for the water content in the Motor Case (1) to separate from the oil, but not long enough for it to freeze. Drain the water and replenish the oil as above. Should this procedure be impractical, drain the entire contents from the Motor Case immediately after operation ceases, and pour the oil back into the Motor Case before resuming operation. If not drained, a sufficient quantity of water will eventually accumulate so that the Oil Splasher (34) will freeze fast.

**For temperatures 30° to 80° F (-1.1° C to 26.6° C),** use Ingersoll-Rand Medium Oil No. 50 or SAE 20 or 20W motor oil.

**For temperatures below 30° F (-1.1° C),** use SAE 10 or 10W motor oil.

**For temperatures above 80° F (26.6° C),** use SAE 30 motor oil.

**Weekly,** insert a small quantity of Ingersoll-Rand Light Grease No. 28 or a good quality No. 2 Cup Grease into the Grease Fittings (43) located in the Valve Chest (42). Two or three strokes from a hand grease gun are sufficient for each Fitting.

## Drum Bearing and Locking Dog Lubrication

Lubricate the Drum Bearing (91) and Locking Dog (147) once weekly with Tenneco Anderol <sup>T\*</sup> No. 786, Ingersoll-Rand Grease No. 11 or a good quality No. 2 chassis grease. Approximately 3 cc is ample for each fitting.

## Gearing Lubrication

**Every sixty to ninety days**, remove the Plug at the side of the Gear Case (90) and check the oil level. If the level is not visible, add a sufficient amount of the recommended lubricant to the Gear Case to bring the level to the bottom of the plug hole.

**For temperatures above 32° F (0° C)**, use Texaco Meropa <sup>T\*\*</sup> No. 3 (AGMA 3EP) or its equivalent.

**For temperatures below 32° (0° C)**, use Texaco Meropa No. 1 (AGMA 1EP) or its equivalent.

## Brake Lubrication

**Warning: Lubricate Brake parts before operating the Winch.** Apply a coating of the recommended lubricant to each of the following parts before initial operation and after Brake maintenance.

For Brake Adjusting Screw (166), Brake Band Clevis (164), Brake Pin (171), Brake Crank Bearings (179 and 180), Brake Crank Arm (176) and Cylinder Clevis Pin (206) use Tenneco Anderol No. 786.

For Crank Link Bushing (186), Brake Cylinder Rod and Cylinder supports use Tenneco Anderol No. 786, Ingersoll-Rand No. 11 grease or a good quality No. 2 chassis grease.

## HOSE AND HOSE CONNECTIONS

Use 1-1/2" (38 mm) hose with a suitable hose fitting (1-1/2" hose to 1-1/4" male pipe) for attaching it to the Valve Chest (42). Smaller hose and fittings will reduce the efficiency of the Winch. Install a quick operating air shutoff valve close to the Winch to allow the air supply to be interrupted when leaving the Winch unattended.

## MOUNTING

Mount the Winch so that the axis of the Rope Drum (130) is horizontal, and so that the Vent Cap (5) is not more than 15° off top vertical center.

If the Winch is to be mounted in an inverted position, the Motor Case (1) must be rotated 180° in accordance with the following instructions:

1. Drain the oil.
2. Remove the twelve Motor Case Cap Screws (71).
3. Rotate the Motor Case 180°. The Vent Cap must not be more than 15° off top vertical center.
4. Replace the Cap Screws.
5. Fill with oil.

## MAINTENANCE

Apply the Wire Rope to wind on the Rope Drum in the direction indicated by the instruction plate on the Winch.

## Brake Tension—Torsion Bar Adjustment

**Caution: Factory adjusted Torsion Bar tension may be in excess of 400 ft-lbs. Make certain that 3/4" drive breaker bar is of sufficient length to accommodate this torque.**

Braking force is adjusted to the rated capacity of the Winch at the factory and does not require adjustment for normal operation. When necessary increase or decrease the brake setting force as follows:

1. Engage the Locking Dog (147) by rotating the Locking Dog Handle (150) until it is released from its detent position.
2. Slowly run the Winch in the down direction until the Locking Dog firmly engages a Rope Drum flange.
3. Apply full throttle in the down direction while loosening the Adjusting Screw Lock Nut (167).
4. With full throttle being applied, rotate the Brake Adjusting Screw (166) in a clockwise direction as far as possible.
5. Release the throttle. Insert a 3/4" square drive breaker bar into the Torsion Bar Anchor (190) and secure the bar.
6. Loosen and remove the four Torsion Bar Anchor Bolts (191).
7. To increase Brake setting force rotate Torsion Bar Anchor in a clockwise direction when facing the Torsion Bar Anchor. Rotate in a counterclockwise direction to decrease Brake setting force.
8. Insert four Torsion Bar Anchor Bolts and tighten.
9. With Locking Dog engaged, apply full throttle and rotate Brake Adjusting Screw in a counterclockwise direction until snug. Rotate Adjusting Screw 1/2 turn in a clockwise direction and tighten Adjusting Screw Lock Nut.
10. Release throttle and return Locking Dog to its operating position.

\* Trademark of Tenneco Chemicals Co.

\*\* Trademark of Texaco, Inc.

## Brake Band Replacement

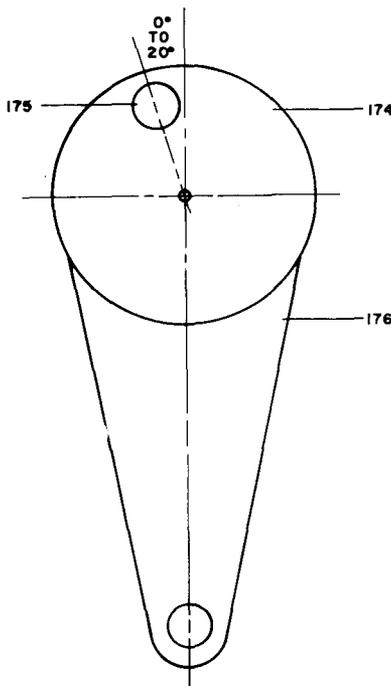
The Brake Band Assembly may be replaced as follows:

1. Decrease Brake Band tension as in steps 1 through 4 in Brake Tension—Torsion Bar Adjustment section.
2. Remove Cotter Pin (169) and Washer (170) from Brake Anchor Pin (168) and drive Brake Anchor Pin from its insertion with the Winch Base.
3. Remove Cotter Pin (172) and Washer (173) from the Drum side of the Brake Pin (171) and remove Brake Pin from the Brake Adjusting section.
4. Remove the Brake Band Assembly from the Winch by springing it over the Gear Case (90).
5. Remove Brake Band Clevis (164), Adjusting Screw Lock Nut (167) and Adjusting Screw (166) by rotating the Adjusting Screw in a clockwise direction. Inspect these parts and replace them if wear is evident before reassembling a new Brake Band Assembly. New Brake Band Clevis Bushings (165) may be installed by pressing out old Bushings and using the Brake Pin (171) as a sizing tool, pressing in the new Bushings until flush.
6. Assemble the Adjusting Screw, Lock Nut and Adjusting Screw on a new Brake Band Assembly by rotating the Adjusting Screw counterclockwise until the Lock Nut contacts the Brake Adjusting box. At this point the outer face of the Adjusting Screw should be flush with the outer face of the Lock Nut. Lubricate all joints with the recommended lubricant.
7. Install the Brake Band Clevis by rotating the Adjusting Screw in a clockwise direction until the cross holes align with the extreme end of the slots in the Brake Band Adjustment box.
8. Put Brake Band Assembly in place on the Winch.
9. Insert the Brake Pin and attach the Washer and Brake Pin Cotter.
10. Slide the Brake Anchor Pin in place from the Motor side and attach Washer and Cotter Pin.
11. Adjust the Brake as in steps 9 and 10 in Brake Tension—Torsion Bar Adjustment section.

## Assembly of Brake Crank

Service of Brake parts may require removing the Brake Crank (174) and Brake Crank Arm (176) from the Brake Crank Bracket (178). Assemble a Brake Crank as follows:

1. Insert Brake Crank into Motor end of Brake Crank Bracket, engaging splines of Brake Crank Arm. When correctly assembled, before connecting with Brake Cylinder Clevis, the Brake Crank Arm will hang vertically below the Crank, and the Brake Crank Pin (175) will appear at the top center to  $20^{\circ}$  left of top center when viewed from the Motor end. See illustration below.
2. Slide Brake Crank with Brake Crank Arm in place through Brake Crank Spacer (181) and Brake Crank Washer (182).
3. Fasten Brake Crank in the Brake Crank Bracket using a Brake Crank Washer (182) and Retainer (183).
4. Attach Brake Crank Arm to Brake Cylinder Clevis (203) by inserting Clevis Pin (206) through aligned holes in Clevis and Brake Crank Arm.
5. Attach Clevis Pin Washers (208) and Cotter Pins (207).
6. Proceed with Brake Band assembly and Brake adjustment.



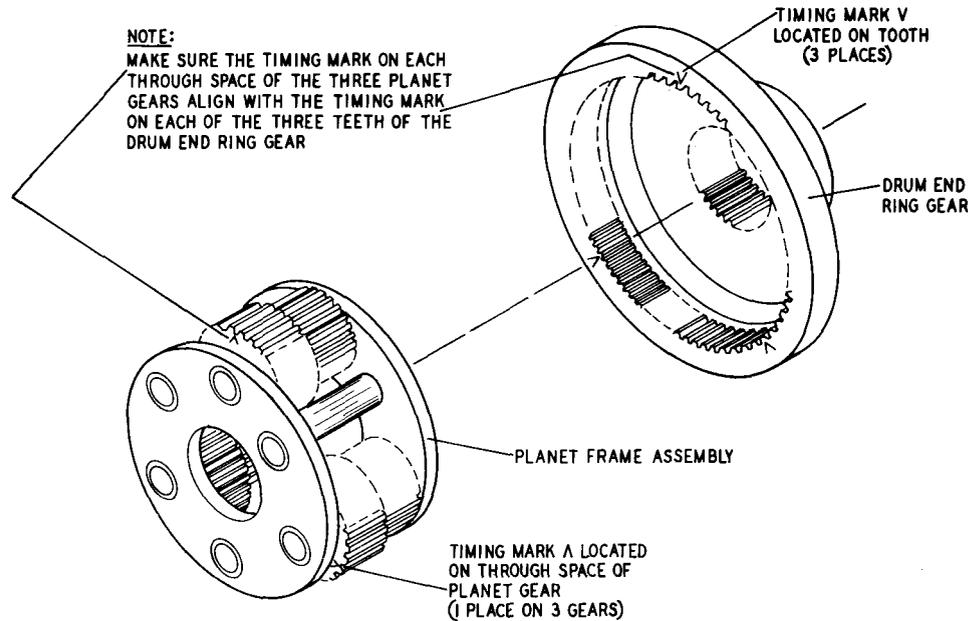
(Dwg. TPD471)

Correct Arrangement of Brake, Crank and Brake Crank Arm

## Planet Gear Assembly

To maintain proper timing of drive train when inserting Planet Gears (101) and Gear Frame (99) into the Gear Case (90) proceed as follows:

1. Mark 3 teeth on the 72-tooth Ring Gear (113) spaced 24 teeth apart.
2. With Planet Gears mounted in the Gear Frame, align the tooth space marked with an arrow on each Planet Gear with the marked teeth on the Ring Gear.
3. Slide the Planet Gears and Gear Frame, small end first, into the mounted Ring Gear.



(Dwg. TPC440)

## CRANK ASSEMBLY

The three sections of the Crank (50) are matched before final machining. There are identification marks stamped on the web of each section. Only sections bearing identical markings can be used together. If more than one Crank is disassembled at one time, be sure only matched parts are assembled together.

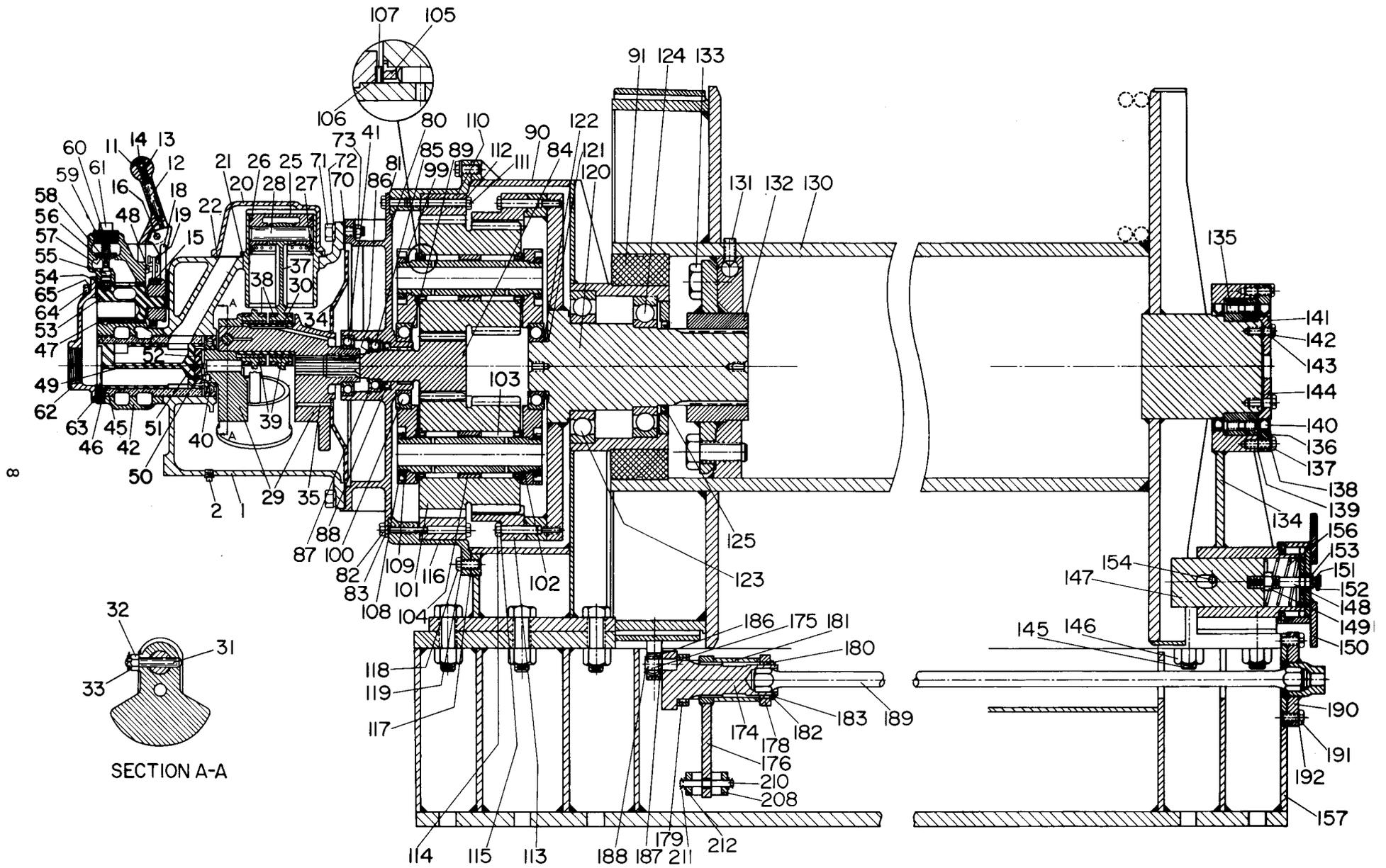
## ROPE DRUM LOCKING DOG

The Rope Drum Locking Dog (147) may be hand actuated by pulling out on the Handle (150), rotating it to a vertical position and releasing it to engage with Rope Drum flanges. **Note: Do not actuate the Locking Dog while Rope Drum is rotating.** One edge of the Locking Dog is beveled to allow ratcheting of pulled loads. To engage in the ratcheting position move the Locking Dog to the vertical position with the beveled edge facing the opposite direction of Rope Drum rotation. To use as a Drum stop engage the flat edge with the Rope Drum flange. When not in use the Locking Dog handle may be held in a detent position by pulling out on the Handle, rotating it to a position parallel with the Base and releasing it.

## BUSHING REPLACEMENT

Replace a Reverse Valve Bushing (47) or a Rotary Valve Bushing (45) as follows:

1. Remove the Valve Chest Cover Cap Screws (64), Valve Chest Cap Screws (66) and Throttle Valve Cap (61).
2. Withdraw the Throttle Valve (55) and Throttle Ball (54). The Throttle Ball may be lifted out with a quantity of sticky grease on the end of a rod.
3. Withdraw the Reverse Valve (53) and Rotary Valve (49). A bolt can be threaded into the tapped hole in the valve face to serve as a handle. The Reverse Valve is tapped 1/2"-13 thread. The Rotary Valve is tapped 5/8"-11 thread.
4. Thread a No. HU-932 Valve Chest Jack Bolt, or any 5/8"-11 thread bolt having at least 4" of thread, into the tapped hole in the lug on each side of the Valve Chest (42) until the end of the Bolt contacts the Motor Case (1). Tighten each Bolt a fraction of a turn until the Valve Chest is removed from the Motor Case.
5. Support the face of the Valve Chest that contacts the Motor Case and, using an arbor that will clear the Bushing Keys (46), press out the old Bushings.
6. Turn the Valve Chest over so that the face that contacts the Motor Case is up.
7. Align the groove in the new Reverse Valve Bushing with the Bushing Key that protrudes into the small bore of the Valve Chest, and press in the new Bushing until its leading face is flush with the supported face of the Valve Chest.
8. Align the groove in the new Rotary Valve Bushing with the Bushing Key that protrudes into the large bore of the Valve Chest, and press in the new Bushing until its leading face is flush with the supported face of the Valve Chest.
9. Insert the No. 49265 Throttle Valve Stem Reamer or a .627" diameter reamer into the throttle valve chamber and ream the hole through the bushing wall in which the Throttle Valve Ball (54) operates.
10. Check the fit of the Reverse Valve (53) in the Reverse Valve Bushing. If tight, ream the Bushing 2.250". **Caution:** The Reverse Valve is chrome plated; do not lap.
11. Check the fit of the Rotary Valve in the Rotary Valve Bushing. If the Valve is tighter than a good running fit, lap it in with a mild, fine-grain lapping compound whose abrasive agent will break up rapidly. Wash the parts in clean kerosene to remove all trace of the compound. If the Valve is too tight to lap, ream the Bushing 2.875".
12. Align the cam groove on the Reverse Valve with the hole through the wall of the Bushing in which the Throttle Valve Ball operates.
13. Apply a few drops of light oil to the Throttle Valve Ball and to the stem of the Throttle Valve. Insert the Ball, Valve, and Throttle Valve Spring (60) into the valve chamber and retain them with the Throttle Valve Cap (61).
14. Place the Throttle Lever Spring (15) on the Control Arm (18) so that the coil encircles the protruding hub. Rotate the Spring until its lower leg contacts the Throttle Spring Stop Pin (19) which projects from the Control Arm. Grasp the upper leg of the Spring and pull it over the top of the Stop Pin so that the Spring legs are now on opposite sides of the Stop Pin.
15. Install the Throttle Control Arm so that its square socket slides over the square shank of the Reverse Valve, and the Spring legs are on opposite sides of the Stop Pin on the Valve Chest.
16. Align the holes through the Valve Chest with those in the Motor Case (1) and start the protruding end of the Rotary Valve Bushing (45) squarely into the Motor Case. Protect the face of the Valve Chest with a hardwood block and press or drive in the Bushing until the Valve Chest contacts the Motor Case.
17. Insert the Rotary Valve (49) into the Rotary Valve Bushing. Rotate the Valve slowly until the Valve Key Screws (51) located in the end of the Valve engage matching holes in the Crank (29).
18. Apply the Valve Chest Cover (62) and retain it with the Valve Chest Screws (66) and the Valve Chest Cover Cap Screws (64).



(Dwg. TPA866)

## MOTOR AND VALVE CHEST PARTS

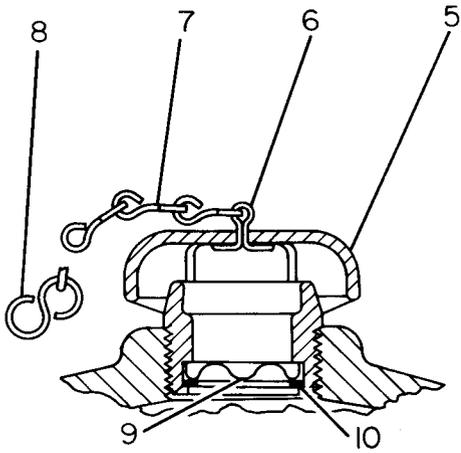
PART NUMBER FOR ORDERING

PART NUMBER FOR ORDERING

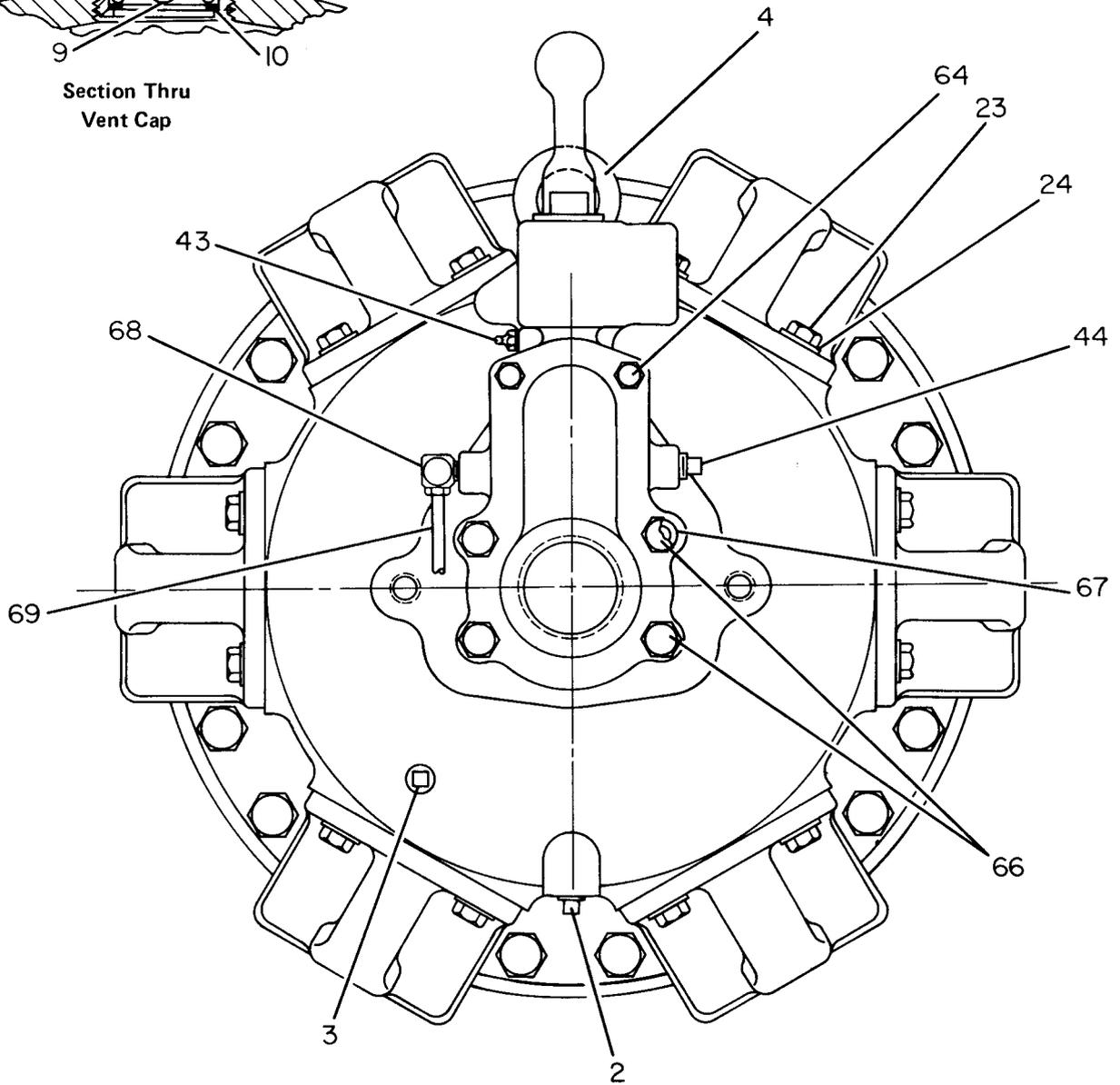
	PART NUMBER FOR ORDERING		PART NUMBER FOR ORDERING	
1	Motor Case . . . . .	K6U-501	42 Valve Chest . . . . .	K6U-545
2	Drain Plug . . . . .	D02-402	43 Grease Fitting (2) . . . . .	23-188
3	Oil Level Plug . . . . .	D02-402	44 Brake Inlet Plug . . . . .	D02-402
4	Eyebolt . . . . .	KU-888	45 Rotary Valve Bushing . . . . .	K6U-525
5	Vent Cap . . . . .	D02-303A	46 Bushing Key (2) . . . . .	HU-538
6	Vent Cap Cotter . . . . .	D02-893	47 Reverse Valve Bushing . . . . .	K6U-945
7	Vent Cap Chain . . . . .	D02-891	48 Throttle Lever Spring Stop Pin . . . . .	D02-553
8	S-Hook . . . . .	D02-421	49 Rotary Valve . . . . .	K6U-526
9	Vent Cap Screen . . . . .	D02-889	50 Rotary Valve Key . . . . .	K6U-527
10	Screen Retainer . . . . .	6CND-233-1/2	51 Rotary Valve Key Screw (2) . . . . .	4E-638
11	Throttle Lever . . . . .	HU-556	52 Key Screw Lock Washer (2) . . . . .	4U-58
12	Throttle Lever Latch . . . . .	HU-869	53 Reverse Valve . . . . .	K6U-744
● 13	Latch Spring . . . . .	HU-567	54 Throttle Valve Ball . . . . .	K6U-941
14	Lever Setscrew . . . . .	HU-842	55 Throttle Valve . . . . .	K6U-940
● 15	Throttle Lever Spring . . . . .	K6U-412	● 56 Throttle Valve Face . . . . .	K6U-259
16	Throttle Lever Pin . . . . .	HU-870	57 Throttle Valve Face Spacer . . . . .	K6U-280
*	Lever Pin Cotter (2) . . . . .	D02-524	58 Throttle Valve Face Cap . . . . .	K6U-257
18	Throttle Control Arm . . . . .	K6U-555	59 Valve Face Cap Retaining Screw . . . . .	G57T-634
19	Throttle Lever Spring Stop Pin . . . . .	D02-553	● 60 Throttle Valve Spring . . . . .	D10-275
20	Cylinder Head (6) . . . . .	K6U-H505A	61 Throttle Valve Cap . . . . .	K6U-943
21	Cylinder Sleeve (6) . . . . .	K6U-L505A	62 Valve Chest Cover . . . . .	K6U-546
● 22	Cylinder Gasket (6) . . . . .	K6U-507	● 63 Valve Chest Cover Gasket . . . . .	K6U-928
23	Cylinder Cap Screw (24) . . . . .	G8-113	64 Valve Chest Cover Cap Screw (2) . . . . .	D02-506
24	Screw Washer (24) . . . . .	K6U-504	65 Screw Lock Washer (2) . . . . .	D02-321
25	Piston (6) . . . . .	K6U-A513A	66 Valve Chest Cap Screw (4) . . . . .	K6U-548
● 26	Piston Ring (6) . . . . .	K6U-337	67 Screw Lock Washer (4) . . . . .	D10-322
● 27	Oil Regulating Piston Ring (6) . . . . .	K6U-338	68 Brake Hose Elbow . . . . .	UWD-161
28	Piston Wrist Pin (6) . . . . .	K6U-514	69 Brake Hose . . . . .	UWD-163-3
	Crank Assembly . . . . .	K6U-A516	* Hose Swivel (2) . . . . .	UWD-162
29	Crank . . . . .	K6U-516	* Hose Clip . . . . .	UWD-727
● 30	Crank Pin Sleeve . . . . .	K6U-519	70 Motor Case Gasket . . . . .	K6U-592
31	Crank Lock Pin . . . . .	KU-520	71 Motor Case Bolt (12) . . . . .	KX-36
32	Lock Pin Nut . . . . .	D02-317	72 Lock Washer (12) . . . . .	A-67
33	Lock Pin Cotter . . . . .	D02-330	73 Motor Case Nut (12) . . . . .	HU-776
34	Oil Splasher . . . . .	KU-540		
35	Oil Splasher Long Rivet (2) . . . . .	K6U-541		
*	Oil Splasher Short Rivet (2) . . . . .	241-712		
37	Connecting Rod (6) . . . . .	K6U-509		
38	Connecting Rod Ring (4) . . . . .	K6U-510		
● 39	Connecting Rod Bushing (2) . . . . .	K6U-511		
40	Crank Bearing - Valve End . . . . .	KU-518		
● 41	Crank Bearing - Splined End . . . . .	KU-895		

\* 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.



Section Thru  
Vent Cap



Motor End View

(Dwg. TPB695)

# GEAR CASE AND GEARING PARTS

PART NUMBER FOR ORDERING



80	Motor Cover . . . . .	UWD-502K6
● 81	Motor Cover Gasket . . . . .	UWD-592
82	Motor Cover Bolt (12) (1/2"-13 thd. x 1" long) . . . . .	D10-354
83	1/2" Lock Washer (12) . . . . .	D10-322
84	Motor Pinion (15 teeth) . . . . .	UWD-319
85	Motor Pinion Bearing . . . . .	UWD-589
86	Inner Bearing Retainer. . . . .	UWD-313
87	Outer Bearing Retainer . . . . .	UWD-317
● 88	Motor Pinion Seal . . . . .	UWD-315
● 89	Pinion Needle Bearing (Torrington No. J-3216 or its equivalent). . . . .	UWD-318
	Gear Case Assembly . . . . .	UWD-A353
90	Gear Case . . . . .	UWD-353
91	Drum Bearing . . . . .	UWD-466
*	Grease Fitting (3) . . . . .	23-189
*	1/8" Pipe Plug. . . . .	R2-227
*	3/4" Plug (Magnetic) (3) . . . . .	UWD-29
*	Vent Plug . . . . .	C6H20A-19
99	Planet Gear Frame (2) . . . . .	UWD-367
100	Planet Frame Bearing (2) . . . . .	UWD-368
101	Planet Gear (3) (30 teeth and 27 teeth) . . . . .	UWD-364-96
102	Planet Gear Shaft (3) . . . . .	UWD-365
● 103	Planet Gear Roller (144) . . . . .	UWD-366
104	Roller Spacer (3) . . . . .	UWD-363
105	Thrust Plate (6) . . . . .	UWD-360
106	Thrust Bearing Race (12) (Torrington No. TRB-3648) . . . . .	UWD-362
● 107	Thrust Bearing (6) (Torrington No. NTA-3648 or its equivalent) . . . . .	UWD-361
108	Shaft Lock Nut (6) . . . . .	235-43
● 109	Lock Washer (6) . . . . .	235-44
110	Ring Gear, Motor End (75 teeth). . . . .	UWD-797
111	Ring Gear Bolt (12) (1/2"-13 thd. x 4" long, Grade 5 minimum) . . . . .	207-W37
112	1/2" Lock Washer (12) . . . . .	UWD-322
113	Ring Gear, Drum End (72 teeth). . . . .	UWD-798-96
114	Ring Gear Bolt (12) (1/2"-13 thd. x 4" long, Grade 5 minimum) . . . . .	207-W37
115	1/2" Lock Washer (12) . . . . .	UWD-322
116	Gear Case Cover . . . . .	UWD-352
● 117	Gear Case Cover Gasket . . . . .	UWD-931
118	Gear Case Cover Bolt (20) (1/2"-13 thd. x 1-1/2" long, Grade 5) . . . . .	235-146
119	1/2" Lock Washer (20) . . . . .	D10-322
120	Output Shaft . . . . .	UWD-459
121	Wave Washer . . . . .	UWD-278
122	Washer. . . . .	UWD-369
123	Output Shaft Bearing, Gear End . . . . .	UWD-465
124	Output Shaft Bearing, Drum End . . . . .	UWD-464
● 125	Output Shaft Seal . . . . .	UWD-137

\* Not illustrated.

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# MAIN WINCH PARTS

PART NUMBER FOR ORDERING

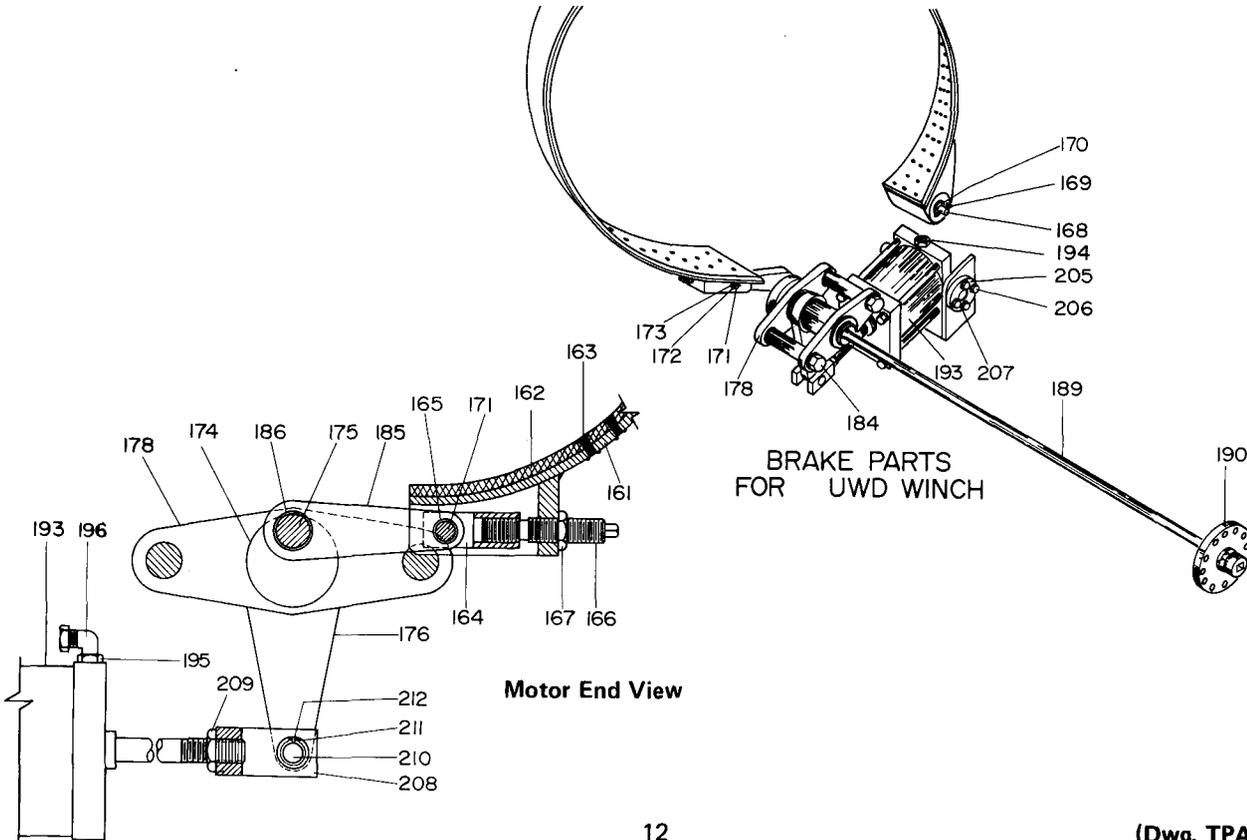


130	Rope Drum . . . . .	UWD-324-2
131	Rope Set Screw (2) (3/4"-10 thd. x 1-1/2" long) . . . . .	K6U-381
132	Spline Coupling . . . . .	UWD-325
133	Coupling Bolt (6) (1-1/4"-7 thd. x 3" long, Grade 5) . . . . .	UWD-326
134	Drum Support Bracket . . . . .	UWD-677
*	Grease Fitting . . . . .	23-188
135	Outer Drum Bearing (Torrington No. 150SD30 or its equivalent) . . . . .	UWD-665
136	Outer Thrust Ring . . . . .	UWD-660
137	Thrust Ring Bolt (6) (1/2"-13 thd. x 1-3/4" long, Grade 5) . . . . .	215-37
138	1/2" Lock Washer (6) . . . . .	D10-322
● 139	Thrust Ring Gasket . . . . .	UWD-662
140	Bearing Seal (2) . . . . .	UWD-661
141	Inner Thrust Cap . . . . .	UWD-663
142	Thrust Cap Bolt (5) (1/2"-13 thd. x 1-1/2" long, Grade 5) . . . . .	235-146
143	1/2" Lock Washer (5) . . . . .	D10-322
● 144	Thrust Cap Gasket . . . . .	UWD-664
145	Base Mounting Bolt (10) (1"-8 thd. x 3-1/2" long, Grade 5 minimum) . . . . .	UWD-562
146	Mounting Bolt Nut (10) (1"-8 thd., Stover) . . . . .	UWD-563
147	Locking Dog . . . . .	UWD-671
148	Locking Dog Shaft . . . . .	UWD-672
149	Lock Nut . . . . .	DU-562
150	Locking Dog Handle . . . . .	UWD-673
151	Handle Lock Nut . . . . .	D02-317
152	Cotter Pin . . . . .	D02-330
153	5/8" Washer . . . . .	PDA312-56
154	Locking Dog Bolt . . . . .	D10-354
*	1/2" Lock Washer . . . . .	D10-322
*	Grease Fitting . . . . .	UWD-188
156	Locking Dog Spring . . . . .	101BMPD-700-1
157	Mounting Base . . . . .	UWD-564-2

\* Not illustrated.

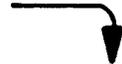
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## BRAKE PARTS



## BRAKE PARTS (Continued)

PART NUMBER FOR ORDERING



	Brake Band Assembly . . . . .	UWD-A101
161	Brake Band . . . . .	UWD-101
● 162	Brake Lining . . . . .	UWD-102
● 163	Brake Lining Rivet (113) . . . . .	UWD-103
164	Brake Band Clevis . . . . .	UWD-104
● 165	Clevis Bearing (2) . . . . .	UWD-105
166	Adjusting Screw . . . . .	UWD-106
167	Adjusting Screw Lock Nut . . . . .	DU-562
168	Brake Anchor Pin . . . . .	UWD-107
169	Anchor Pin Cotter (3/16" x 2-1/2") . . . . .	UWD-108
170	Anchor Pin Washer . . . . .	UWD-110
*	Grease Fitting . . . . .	23-188
171	Brake Pin . . . . .	UWD-109
172	Brake Pin Cotter (2) (1/8" x 1-1/4") . . . . .	D02-330
173	5/8" Washer (2) . . . . .	235-309
174	Brake Crank . . . . .	UWD-111
175	Brake Crank Pin . . . . .	UWD-112
176	Brake Crank Arm . . . . .	UWD-113
● *	Crank Arm Bushing . . . . .	UWD-114
178	Brake Crank Bracket . . . . .	UWD-115
179	Bearing, Crank End (Torrington No. NB-408 or its equivalent) . . . . .	UWD-116
180	Bearing, Torsion Bar End (Torrington No. B-328 or its equivalent) . . . . .	UWD-117
181	Spacer . . . . .	UWD-118
182	Washer (2) (Torrington No. TRB-3244) . . . . .	UWD-119
183	Retainer . . . . .	UWD-120
184	Crank Bracket Bolt (2) (1"-8 thd. x 7" long, Grade 5) . . . . .	UWD-121
185	Crank Link . . . . .	UWD-122
● 186	Crank Link Bushing . . . . .	UWD-123
187	Bushing Spacer . . . . .	UWD-124
188	Crank Link Retainer . . . . .	UWD-125
189	Torsion Bar . . . . .	UWD-131-2
190	Torsion Bar Anchor . . . . .	UWD-132
191	Torsion Bar Anchor Bolt (4) (1/2"-13 thd. x 1-1/2" long, Grade 5 minimum) . . . . .	235-146
192	1/2" Lock Washer (4) . . . . .	D10-322
193	Brake Cylinder . . . . .	UWD-141
194	Breather Vent Plug . . . . .	UWD-142
195	Reducing Bushing . . . . .	UWD-167
196	Brake Pipe Elbow . . . . .	UWD-161
197	Hose Swivel (2) . . . . .	UWD-162
198	Brake Hose . . . . .	UWD-163
*	Bulkhead Elbow . . . . .	UWD-164
200	Exhaust Valve Elbow . . . . .	UWD-168
201	Elbow . . . . .	UWD-169
202	Reducing Bushing . . . . .	UWD-82
203	Exhaust Valve . . . . .	MR-939
204	Brake Hose Adapter . . . . .	UWD-170
205	Cylinder Mounting Cap . . . . .	UWD-143
206	Mounting Cap Bolt (4) (3/8"-16 thd. x 1" long) . . . . .	D02-354
207	3/8" Lock Washer (4) . . . . .	D02-321
208	Cylinder Clevis . . . . .	UWD-144
209	Clevis Lock Nut . . . . .	UWD-146
210	Clevis Pin . . . . .	UWD-147
211	Pin Retainer (2) . . . . .	UWD-148
212	5/8" Washer (2) . . . . .	UWD-149

\* Not illustrated.

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## MUFFLER EQUIPMENT

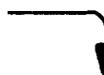
PART NUMBER FOR ORDERING



Exhaust Muffler. . . . .	KU-674
Muffler Nipple (2" x 2-1/2" long pipe nipple). . . . .	K6U-675
Reducing Coupling . . . . .	K6U-677

## AIR STRAINER ASSEMBLY

PART NUMBER FOR ORDERING



Air Strainer Assembly . . . . .	K4U-A267AT
Air Strainer Screen . . . . .	K4U-61AT
Air Strainer Plug . . . . .	22SR-165
Air Strainer Cap. . . . .	K4U-268AT
Air Strainer Nipple (1-1/4" x 2" long). . . . .	KKM-286

## MAINTENANCE TOOLS

TOOL NUMBER FOR ORDERING	TOOL NAME FOR ORDERING	OPERATION
P25-228	Grease Gun . . . . .	Lubrication.
11U-932	Valve Chest Jack Bolt (2) . . . . .	Withdrawing the Valve Chest (42) from the Motor Case (1).
11U-933	Piston Ring Compressor . . . . .	Compressing the Piston Rings (26) and (27) when installing a Piston (25) in a Cylinder Sleeve (21).
49265	Throttle Valve Stem Reamer . . . . .	Reaming the throttle valve stem hole after installing a new Reverse Valve Bushing (47) in the Valve Chest (42).



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