Form P6634
Edition 1

OPERATION AND MAINTENANCE MANUAL

for

SERIES 12UWB114 WINCHES

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 1-1/4" (32 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 Winch performance and increased maintenance, and may, at the Company's option, invalidate all warranties.

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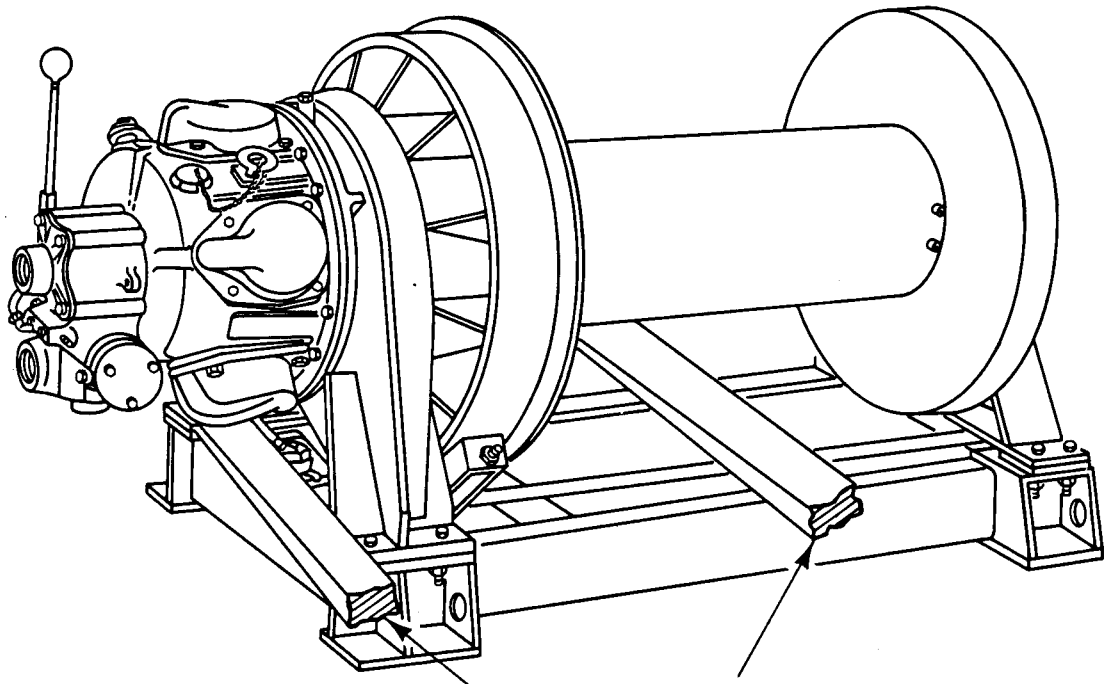
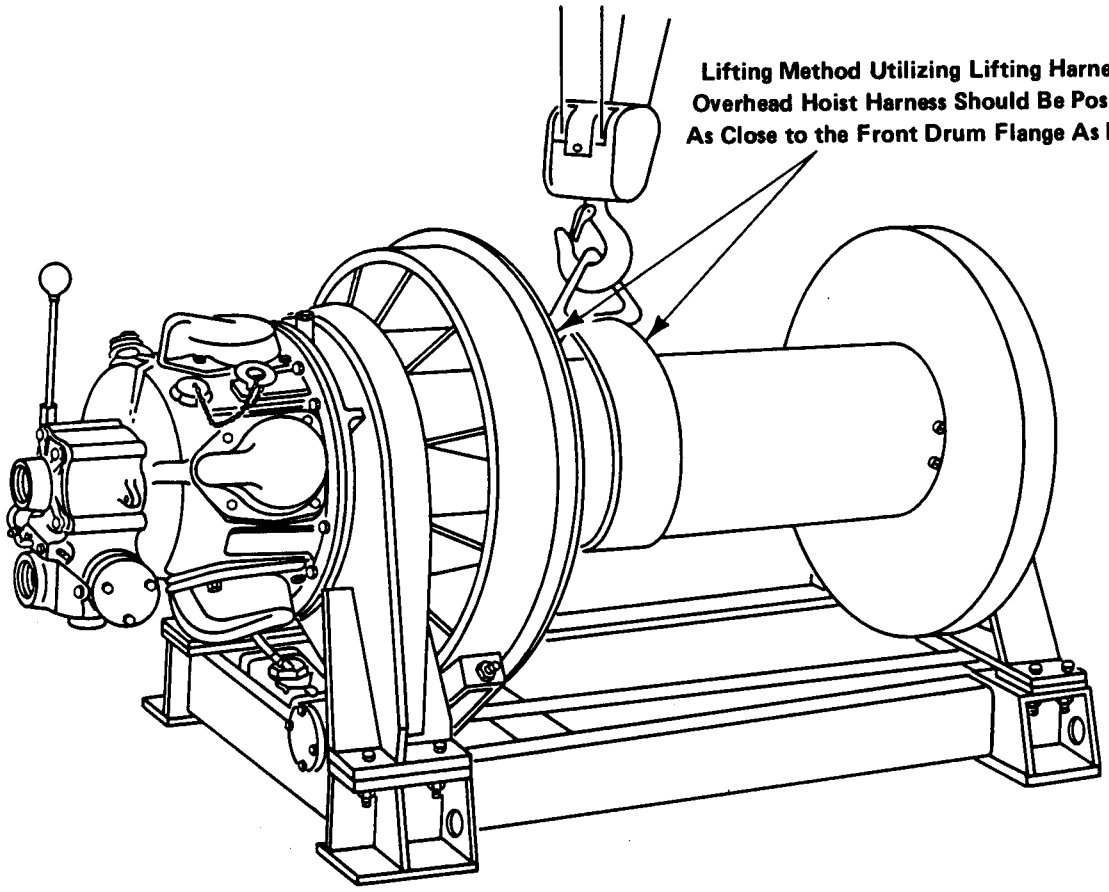
AIR WINCHES



Lifting Method Utilizing a Fork Lift
with One Fork Beneath Winch Drum
and the Other Beneath the Motor



Lifting Method Utilizing Lifting Harness and
Overhead Hoist Harness Should Be Positioned
As Close to the Front Drum Flange As Possible

(Dwg. TPC442)

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 and check gear case oil level. 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 the Drain Plug (3) is securely threaded into place. Unscrew the Vent Cap (4) and pour the entire contents of the can (1-1/2 quarts) into the opening in the top of the Motor Case (1). The Oil Level Plug (2) may be removed to check the oil level and then reinstalled.

Motor Lubrication

Check oil daily and maintain the level with the 1/8" pipe plug 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) and allow the accumulated water to drain. After draining the water, tighten the Plug and remove the Oil Level Plug from the side of the Motor Case. Unscrew the Vent Cap (4) and pour a sufficient quantity of the recommended oil through the opening to bring the oil level up to the side opening.

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 (46) will freeze fast to the Motor Case.

For a temperature range of 30° F to 80° F (-1° C to 26° C), use Ingersoll-Rand Medium Oil No. 50 or SAE 20 or 20W motor oil.

For temperatures below 30° F (-1° C), use SAE 10 or 10W motor oil.

For temperatures above 80° F (26° C), use SAE 30 motor oil.

Gear Lubrication

Every sixty to ninety days, remove the Plug at the side of the Gear Case (70) 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 [T *] No. 3 (AGMA3EP) or its equivalent.

For temperatures below 32° (0° C), use Texaco Meropa No. 1 (AGMA1EP) or its equivalent.

Brake Lubrication

Warning: Lubricate the brake parts (131, 132, 133 and 134) before operating the Winch. Apply a small amount of 20W to 50W motor oil directly to all working parts. Do not get oil on the brake lining.

Locking Dog

At least once yearly, depending on the environment and duty cycle, lubricate the internal parts and external surface of the Locking Dog (114) with Ingersoll-Rand No. 11 Grease or Tenneco Anderol[T**] 786 to help prevent rust.

INSTALLATION

Mounting

Be sure the Winch is on a suitable supporting structure and is properly mounted with a minimum of ten 3/4 inch Grade 5 cap screws. The need for guards should be determined at the time of installation.

Mount the Winch so the axis of the Rope Drum (101) is horizontal. Operation of the Winch with the axis of the Drum more than 10° from horizontal will result in lubrication difficulties and the Wire Rope will tend to pile up on the low end of the Drum.

HOSE AND HOSE CONNECTIONS

Use 1-1/4" (32 mm) hose with a suitable 1-1/4" hose fitting for attaching the air supply to the Valve Chest. Use of smaller hose and fittings will reduce the efficiency of the Winch.

Be sure to install a quick operating air shutoff valve close to the Winch to allow the air supply to be interrupted when leaving the Winch unattended.

OPERATION

1. The user must see that the proper size cable is kept in satisfactory condition. The rope may be anchored to the drum by inserting the cable end into the slot in the drum and securely tightening the two setscrews. In use, no less than two full wraps of rope shall remain on the drum with the cable fully let out.
2. The Winch is assembled so that when the rope is wound on the drum as indicated by the nameplate, the controls will operate as stated. The controls will operate differently if other than the standard H5U-526R Rotary Valve is used. The Winch will not operate properly if the cable winding direction is changed.
3. **For overwinding Winches** having an H5U-526R Rotary Valve and with the operator's right hand on the throttle lever and left hand on the brake, the rope will wind in when the manual throttle lever is pulled toward the operator and unwind when the throttle lever is pushed away from the operator.
   For underwinding Winches having an H5U-526 Rotary Valve and with the operator's right hand on the throttle lever and left hand on the brake, the rope will unwind when the manual throttle lever is pulled toward the operator and wind in when the throttle lever is pushed away from the operator. The throttle is spring loaded to the center (off) position.
   WARNING: The air supply to the Winch should be turned off when the Winch is left unattended.
4. The manual brake may be applied by pushing down on the lever and released by pulling up. If the brake lever is pushed down to its extreme position, it should lock in that position until pulled back. An automatic brake is available which will release when the motor is operated. The brake must be kept properly adjusted to hold the required load.
5. A Locking Dog is mounted on the end of the Winch opposite the motor. It should be engaged if a load is left suspended. It may be engaged by pulling out on the handle, turning it horizontal and releasing so that the handle slots slide over the locating pins allowing the Locking Dog to engage one of the drum lugs. The Locking Dog may be disengaged by pulling on the handle and turning it vertical. The Locking Dog should not be engaged while the drum is in motion.
6. This Winch is available either with or without a clutch. The clutch must never be disengaged when there is a load on the Winch. It should be disengaged only if the cable is to be unwound by means other than the Winch motor and should then be re-engaged.
7. To disengage the clutch: Pull the lever lock pin out of the hole behind the lever and then pull the clutch lever away from the rope drum. The lever lock pin may be inserted in front of the lever if the lever is to be kept disengaged. To re-engage the clutch, see that the lever lock pin is not inserted in its hole and allow the clutch lever to move toward the

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** Trademark of Tenneco Chemicals Co.

drum. It may be necessary to operate the Winch very slowly until the clutch pins find the holes in the ring gear. With the clutch lever fully forward, the lever lock pin should then be reinserted in the hole behind the lever. The clutch pins must be fully engaged before applying the load to the Winch.

MAINTENANCE

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

Adjust the brake so that considerable pressure is required to push the Brake Handle (136) past center for locking. Make adjustment by loosening the Brake Adjusting Screw Jam Nut (137) and rotating the Brake Adjusting Screw (133).

Brake Band Replacement

Warning: Remove the load from the Winch and engage the Locking Dog before disassembling the brake. Be certain to shut off the air to the Winch before performing maintenance.

Remove a Brake Band from a manual brake as follows:

1. Release the tension on the brake by lifting the Brake Handle (136).
2. After loosening the Brake Adjusting Screw Jam Nut (137), rotate the Brake Adjusting Screw (133) in a clockwise direction and remove it.
3. Rotate the Brake Handle and assembled clevis far enough to allow it to be removed from the end of the Brake Band. Rotate the Brake Adjusting Block (134) to remove it from the end of the Brake Band.
4. Remove the Anchor Pin Cotter and withdraw the Brake Anchor Pin (131).
5. Remove the Brake Band from the Winch.

Remove a Brake Band from an automatic brake as follows:

1. Remove the Brake Springs (154) from the top of the Automatic Brake Lever (157). **Warning**: Use caution when removing the Springs. Make certain hands are clear of the Spring when its tension is released.
2. Remove the Brake Spring Cotter (156) from the Automatic Brake Lever and remove the upper Brake Spring Pin (155).
3. Remove the Cotter and the Cylinder Clevis Pin.
4. Loosen the Brake Adjusting Screw Jam Nut (137). Remove the Brake Adjusting Screw (133).
5. Rotate the Automatic Brake Lever and assembled Clevis far enough to allow them to be removed from the end of the Brake Band (130). Rotate the Brake Adjusting Block (132) and remove it from the Brake Band.
6. Remove the Brake Band from the Winch.

Install a Brake Band for manual brake as follows:

1. Align the brake anchor pin hole in the end of the Brake Band with the hole in the brake anchor and slide a Brake Anchor Pin (131) through the aligned holes. Retain the Anchor Pin with a Brake Anchor Pin Cotter.
2. Insert the Brake Adjusting Block (132) into the brake adjustment end of the Brake Band so the bosses engage the slots and the tapped hole is parallel with the slots.
3. Assemble the Brake Clevis Block (134), Brake Handle Clevises (135) and the Brake Handle (136) or Automatic Brake Lever (157) with the bosses of the Clevis Block engaging the slots in the Handle Clevises.
4. Insert the assembled Handle or Lever into the adjustment end of the second Brake Band so the bosses on the Handle Clevises engage the slots on each side.
5. Thread the Adjusting Screw (133) with the Jam Nut (137) into the Brake Adjusting Block and the Brake Clevis Block at the same time. The left-hand threaded end of the Adjusting Screw engages the Brake Adjusting Block.
6. Adjust the brake tension by rotating the Brake Adjusting Screw.
7. Tighten the Jam Nut (137).

Install a Brake Band for automatic brake as follows:

1. Complete steps 1 through 7 as indicated in installation of Brake Band for manual brake.
2. Install the Cylinder Clevis Pins and Cotters.
3. Install the Brake Spring Pin (155) into the Automatic Brake Lever (157) and retain with two Brake Spring Cotters (156).
4. Install the four Brake Springs (154) making sure they seat into their respective grooves in both the lower and upper Brake Spring Pins.
5. Adjust the brake tension by rotating the Brake Adjusting Screw.
6. Tighten the Jam Nut (137).

Valve Chest Removal

1. Unscrew the Valve Chest Screws (18) and remove the Valve Chest Cover (17).
2. Screw a No. HU-932 Jack Bolt into each tapped lug on the Valve Chest (10) until the Jack Bolts contact the Motor Case (1). Turn each Bolt a little at a time to jack the Valve Chest with assembled parts from the Motor Case.

Rotary Valve Bushing and Reverse Valve Bushing Removal

With the Valve Chest (10) removed from the Motor Case (1), proceed as follows:

1. Unscrew the Poppet Throttle Valve Cap (23) and remove the Poppet Throttle Valve Spring (21), Poppet Throttle Valve (20) and the Poppet Throttle Valve Ball (22) from the Valve Chest. **Note**: These components must be removed before the Reverse Valve (24) can be removed from the Reverse Valve Bushing (13).
2. Remove the Throttle Lever Spring (35).
3. Remove the Throttle Control Arm (28) from the Reverse Valve and remove the Reverse Valve from the Reverse Valve Bushing.
4. Remove the Rotary Valve (25) from the Rotary Valve Bushing (12).
5. Support the face of the Valve Chest that contacts the Motor Case and press out the two Bushings with an arbor **that will clear the Bushing Keys (11). Caution**: Failure to use an arbor that will clear the Bushing Keys, or to press the Bushings out in the direction of the Motor Case side of the Valve Chest will destroy the Keys.

Rotary Valve Bushing and Reverse Valve Bushing Installation

1. Support the face of the Valve Chest (10) that contacts the Valve Chest Cover (17), align the keyslot in the new Reverse Valve Bushing (13) with the Bushing Key (11) and press the Bushing into the Valve Chest until the leading face of the Bushing is flush with the supported face of the Valve Chest. Align the keyslot in the new Rotary Valve Bushing (12) with the Bushing Key and press the Bushing into the Valve Chest until the Bushing shoulder is flush with the supported face of the Valve Chest.
2. Insert the No. 23470 Throttle Valve Stem Reamer or a .505" (12.8 mm) diameter hand reamer through the throttle valve chamber in the Valve Chest and ream the hole through the wall of the new Reverse Valve Bushing.
3. Check the fit of the Rotary Valve (25) in the new Rotary Valve Bushing. If the Valve is tighter than a good running fit in the Bushing, lap in the Valve using a fine grain lapping compound whose abrasive agent will break up rapidly. Remove all trace of the compound with kerosene after obtaining the desired fit.
4. Check the fit of the Reverse Valve (24) in the new Reverse Valve Bushing. If the fit is too tight, ream the Bushing with a 1.875" (47.6 mm) diameter hand reamer.
5. Rotate the Reverse Valve in the Reverse Valve Bushing until the arrows on the two parts align.
6. Install the Poppet Throttle Valve Ball (22), Poppet Throttle Valve (20), Poppet Throttle Valve Spring (21) and Poppet Throttle Valve Cap (23) in the Valve Chest.
7. Place the Throttle Lever Spring (35) over the end of the Reverse Valve Bushing that protrudes from the Valve Chest so that one leg of the Spring is against the Throttle Lever Spring Stop Pin (29). Slide a suitable sleeve over the opposite leg and wind the Spring until this leg can be hooked over the opposite end of the Stop Pin. This action will tend to wind, not unwind, the Spring if it is properly performed.
8. Start the Throttle Control Arm (28) onto the hub of the Reverse Valve aligning the pin in the Arm with the hole in the Reverse Valve. As the Arm slides into position, enter the Stop Pin on the Arm between the legs of the Spring. This can be accomplished by engaging one leg of the Spring against the Stop Pin on the Arm and rotating the Arm slightly while pushing it completely onto the hub of the Reverse Valve.

Valve Chest Installation

1. With the Rotary Valve (25) removed from the Rotary Valve Bushing (12), align the screw holes in the Valve Chest (10) with the screw holes in the Motor Case (1) and start the protruding end of the Rotary Valve Bushing squarely on the Motor Case bore.
2. Place a block of wood across the faces of the Rotary Valve Bushing and Valve Chest and, driving on the wooden block, enter the Rotary Valve Bushing into the Motor Case until the Valve Chest seats.
3. Insert the Rotary Valve into the Rotary Valve Bushing, entering the Valve Drive Pins (26 and 27) into the mating holes in the Crank (36).
4. Install the Valve Chest Cover (17) and secure it with the four Valve Chest Screws (18) and Lock Washers (19).

Motor Disassembly

1. Engage the Locking Dog Handle (117), shut off the air and remove all piping and air hoses connected to the motor.
2. Unscrew and remove the Motor Case Drain Plug (2) to drain the oil from the Motor Case (1).
3. Loosen and remove the ten Motor Case Bolts (57) and Lock Washers (58) from the Motor.
4. Remove the Motor Case from the Gear Case.
5. Loosen and remove the Motor Gasket (56) from the Gear Case.

Note: Any Cylinder and the Piston operating in it can be removed independently of the others. However, all Cylinders and Pistons must be removed before the Crank can be withdrawn.

6. Loosen and remove four Cylinder Bolts (54) and Cylinder Bolt Washers (55) from the Motor.
7. Lift off the Cylinder Head (48), Cylinder Sleeve (48A) and Cylinder Gasket (53) from the Motor.
8. Rotate the Crank until the Piston (49) from which the Cylinder Head was removed is at top dead center.
9. Remove the two Snap Rings (51A), Wrist Pin (52) and Piston from the Connecting Rod (43).
10. Repeat steps 6 through 9 to remove the remaining Cylinders and Pistons.
11. The Crank Assembly can now be removed by pulling on it with one hand while tapping the face of the Motor Case with a soft hammer.
12. If necessary, remove the Valve Chest (10) and Rotary Valve (25) as indicated on pages 5 and 6.

Crank Disassembly

1. Remove the Crank Lock Pin Cotter (42). Unscrew the Crank Lock Pin Nut (41) and remove the Crank Lock Pin (40) from the Crank.
2. Separate the two sections of the Crank and remove the Connecting Rod Rings (44), Connecting Rods (43), Connecting Rod Bushing (45) and Connecting Rod Sleeve (39).
3. If the Valve End Crank Bearing (46) and Drum End Crank Bearing (47) need to be replaced, use a bearing puller to remove them.

Crank Assembly

Note: The two sections of the Crank are matched before final machining, and the web of each section is stamped with an identification mark. Only sections bearing identical markings can be used together. Therefore, if two or more Cranks are disassembled at one time, check the web of each section before reassembly to make sure that only matched parts are assembled together.

When reassembling, lubricate each part with a light film of oil. See recommended lubrication requirements on pages 3 and 4.

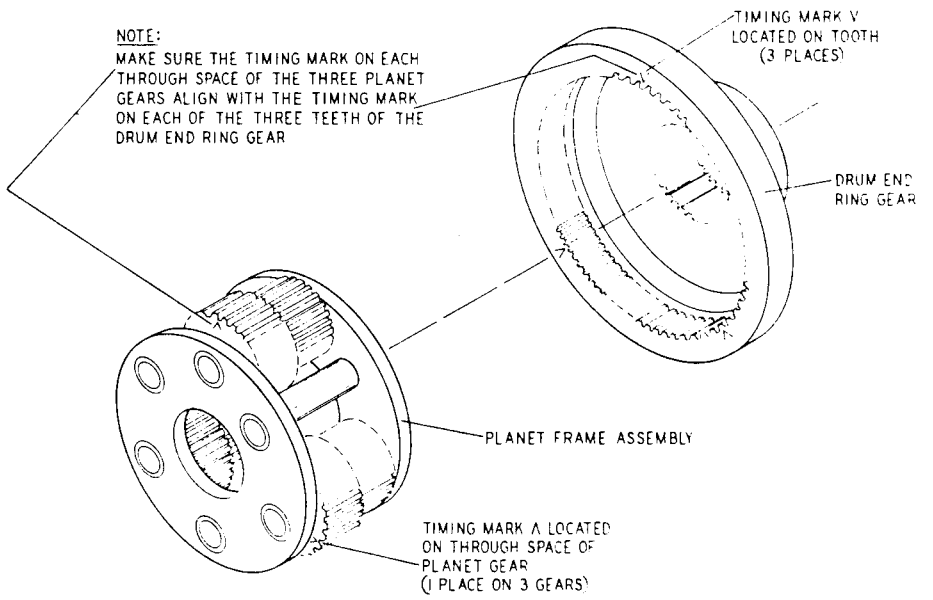
1. Using a sleeve that contacts only the inner ring of the Valve End Crank Bearing (46), press the bearing onto the short shoulder end of the Crank until it contacts the shoulder. Using a sleeve that contacts only the inner ring of the Drum End Crank Bearing (56), press the bearing onto the long shoulder end of the Crank until it contacts the shoulder.
2. Slide the Connecting Rod Sleeve (39), **plain** end first (there is a tang on one end), over the crank pin.
3. Slide the Connecting Rod Bushing (45) over the Connecting Rod Sleeve.
4. Place the Connecting Rod Ring (44), internally beveled end last, over the Connecting Rod Bushing.
5. Place the Connecting Rods (43) around the Connecting Rod Bushing, entering the foot of each Rod into the space between the Bushing and the Ring. **Note**: Make sure feet face the same direction.
6. Slide the second Connecting Rod Ring, internally beveled end first, over the feet of the Connecting Rods.
7. Join the two sections of the Crank so that the tang on the Connecting Rod Sleeve enters the slot in the crank web, and the holes for the Crank Lock Pin (40) are aligned.
8. Insert the Crank Lock Pin into the larger end of the tapered hole, apply the Crank Lock Pin Nut (41) and after tightening the nut securely, lock it into position with the Crank Lock Pin Cotter (42).

Motor Assembly

1. If the Valve Chest (10) and Rotary Valve (25) were removed from the Motor Case (1), install them as instructed on page 6.
2. With the Motor Case supported open end facing up, install the Crank Assembly into the Motor Case. Make sure the hub at the end of Rotary Valve enters the hole in the end of the Crankshaft and the Rotary Valve Drive Pins (26 and 27) enter the holes in the Crankshaft. Also, make sure the Valve End Crank Bearing (46) seats into the recess of the Valve Chest. The face of the Rotary Valve should butt against the face of the Crank.
3. Slide the Oil Regulating Ring (51) over the Piston and position it into the bottom groove of the Piston. Slide the Piston Ring (50) over the Piston and position it into the top groove of the Piston.
   Caution: Make sure the sharp edge of the Oil Regulating Ring is toward the bottom or open end of the Piston. **Do not** spread the rings more than necessary to slip them over the Piston.
4. Install one Wrist Pin Retaining Ring (50A) into a wrist pin groove in the Piston.
5. Using the HU-933 Piston Ring Compressor, slide it over the Piston to hold the Oil Regulating Ring compressed into its groove.
6. Start the Cylinder Sleeve (48A) down over the Piston and over the top ring. **Note**: The top Piston Ring can be compressed with the fingers to allow it to enter the sleeve. **Do not** slide the sleeve past the wrist pin hole. Slip a Cylinder Gasket (53) over the Piston and against the lower side of the sleeve flange.

7. Rotate the Crankshaft until one of the connecting rods is at top dead center. Place the Piston (49), Cylinder Sleeve, Cylinder Gasket and Ring Compressor over the top of the Connecting Rod (43) so that the Wrist Pin Retaining Ring faces the motor flange. Install the Wrist Pin (52) from the opposite side.
8. Install the second Wrist Pin Retaining Ring. Make sure both Wrist Pin Retaining Rings are seated in their respective grooves.
9. Continue to slide the Cylinder Sleeve downward against the Piston Ring Compressor until the Cylinder Sleeve is fully seated into the Motor Case. **Important**: Rotate the Crank until the Piston is at the bottom of its cycle. The Piston Ring Compressor can now be retrieved through the motor.
10. Install a Cylinder Head (48), four Cylinder Bolts (54) and four Cylinder Bolt Washers (55) (copper washers). Tighten securely.
11. Repeat steps 3 through 10 to install the remaining cylinders.
12. Install the Motor Gasket (56) into the recess of the Gear Case (70).
13. Install the Motor Case onto the Gear Case making sure the motor bolt holes in the Motor Case align with the threaded tapped holes in the Gear Case.
14. Install the ten Lock Washers (58) and Motor Case Bolts (57). Tighten alternately until the Motor Case is securely fastened to the Gear Case.
15. Install the Drain Plug (2). Fill the Motor Case with oil as prescribed under Lubrication on pages 3 and 4.

Planet Gear Frame Assembly

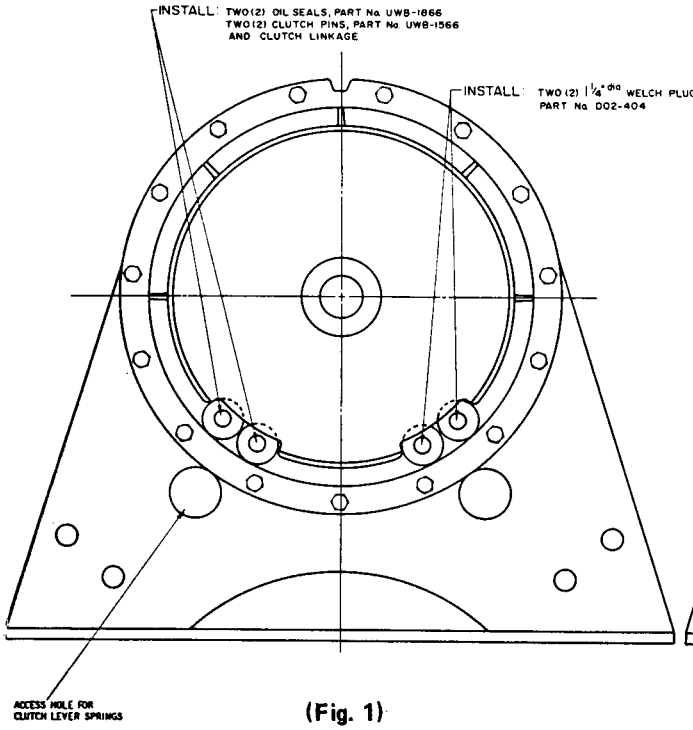


(Dwg. TPC440)

To maintain the proper timing of the gear train when inserting the Planet Gear Frame Assembly (84) into the Drum End Ring Gear (81) of the Winch, proceed as follows:

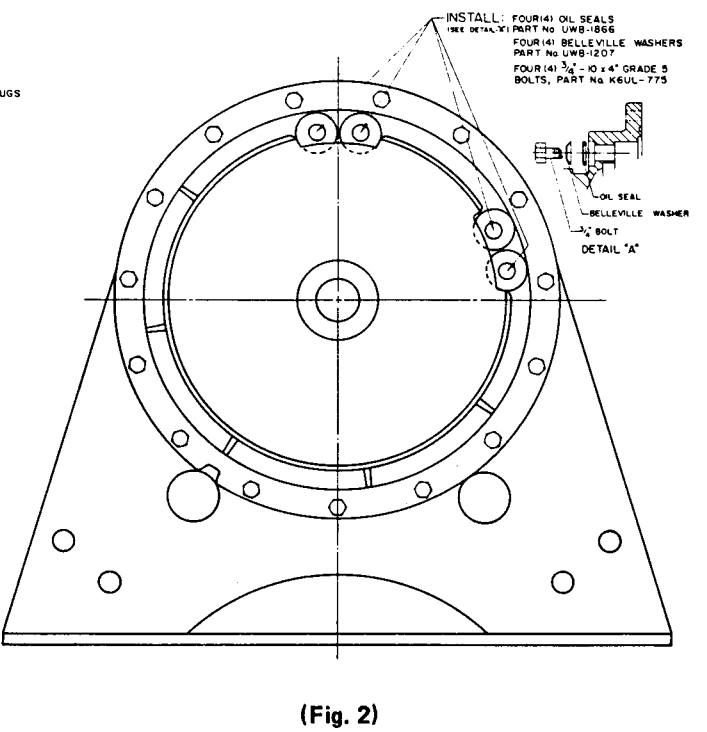
1. Make sure the Drum O-ring (83) is installed on the rope drum shaft.
2. Inserting the Planet Gear Frame Assembly (84) into the Drum End Ring Gear (81), align the timing mark of the through space on each of the three Planet Gears with the timing mark on each of three locations on the Drum End Ring Gear. (See illustration above.)
3. Install the Motor End Ring Gear (80) over the Planet Gear Frame Assembly making sure the teeth of the Planet Gears and the Motor End Ring Gear mesh properly.
4. Install the Gear Case Cover (89), which includes the Motor Pinion (75) and Gear Case Cover Seal (90), onto the mounted gear frame making sure the motor pinion teeth properly engage the planet gear teeth.

CLUTCH MODELS



(Fig. 1)

NON-CLUTCH MODELS



(Fig. 2)

(Dwg. TPA814)

WARNING

The Clutch must be fully engaged and the Locking Pin installed when a load is applied to the Winch. The Clutch must be disengaged only when there is no load on the Winch.

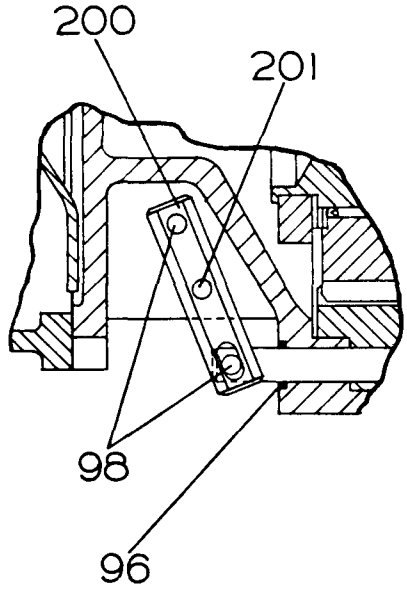
The Clutch and Automatic Brake features must not be combined together on any Winch in hoisting service or subjected to an overhauling load.

Operation of the motor on a Winch equipped with both an Automatic Brake and Clutch when the Clutch is disengaged will allow a suspended load to drop.

To convert from a clutch to a non-clutch or non-clutch to a clutch model Winch, follow the instructions on pages 10 and 11.

CONVERSION FROM CLUTCH TO NON-CLUTCH MODELS

1. Remove the Clutch Lever Self-Locking Pin and Cable.
2. Remove a Spring Pin Cotter and Washer.
3. Using a cotter pin puller, hook the loop of the Clutch Lever Spring (100) and remove the Spring.
   Warning: The Spring is under tension; remove it carefully.
4. Repeat steps 2 and 3 to remove the second Spring.
5. Remove the Lever Spring Pin (99) and the two Clutch Lever Pins (98).
6. Remove the Clutch Lever (97).
7. Install the Clutch Lock Pin (200) from the Clutch Kit in place of the Clutch Lever making certain the middle hole of the Clutch Lock Pin will align with the hole in the Clutch Housing.
8. Secure the Clutch Lock Pin with the two Clutch Lever Pins.
9. Insert the headed Pin (201), furnished with the Clutch Kit, into the Clutch Lock Pin and the hole in the Clutch Housing and secure it with the Cotter (D02-524) also furnished with the Clutch Kit.



(Dwg. TPD804)

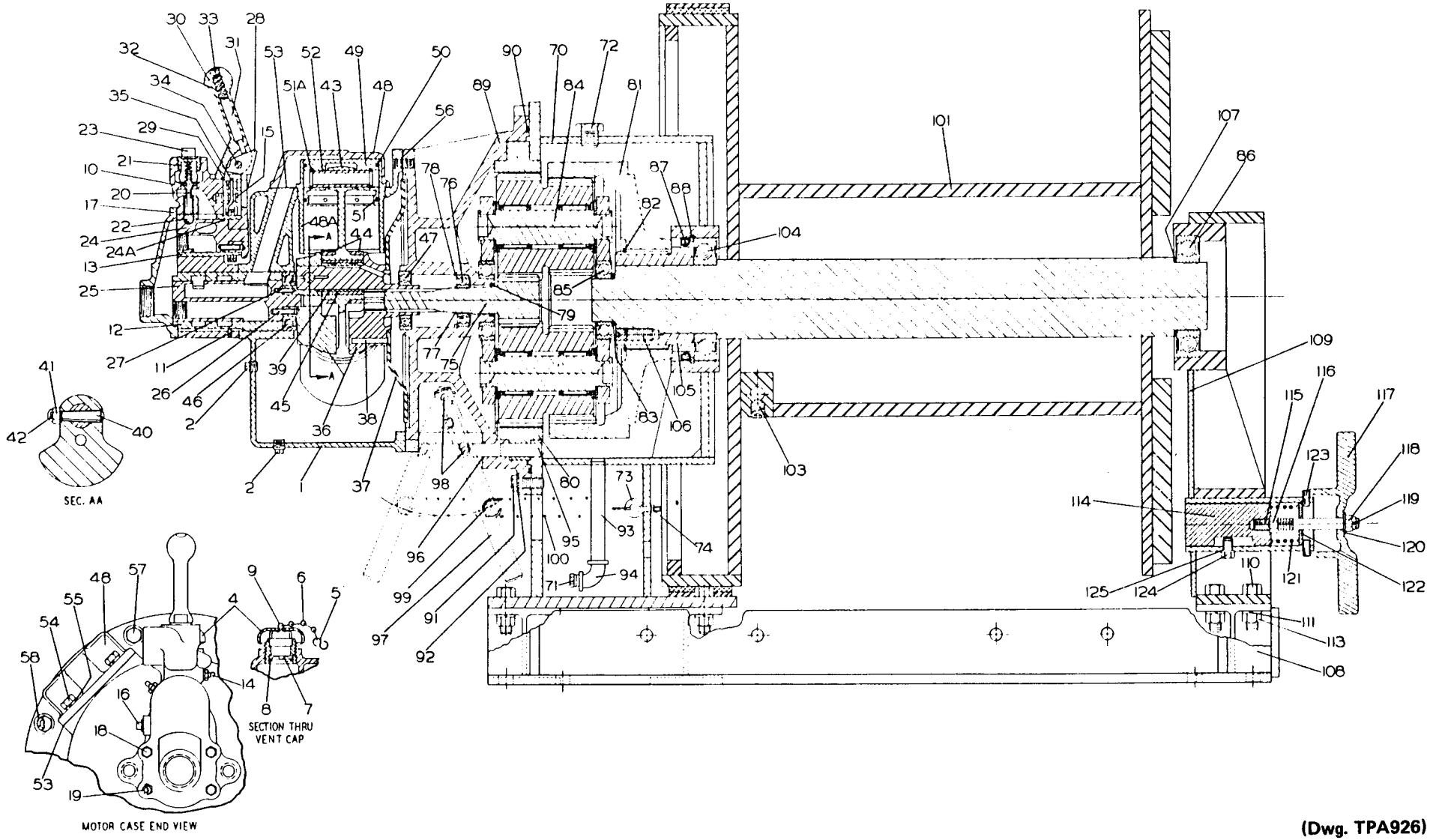
CONVERSION FROM NON-CLUTCH TO CLUTCH MODELS

1. Unscrew and remove the Drain Plugs (3) and (71). Drain the oil from the Motor Case (1) and Gear Case (70).
2. Remove the ten Motor Bolts (68) and Lock Washers (69) from the Motor Case (1).
3. Remove the Motor Case and set it aside.
4. Remove the four Ring Gear Bolts and four Belleville Washers from the Gear Case Cover (84).
5. Remove the four Oil Seals.
6. If the clutch is to be installed on the same side as the throttle, install two Oil Seals (96) on that side as follows:
   (a) Slip an Oil Seal onto a Clutch Engaging Pin (95). Place a 3/4" flat washer flush against the Oil Seal (opposite the Oil Seal lip) and a 3/4" x 5" (19 mm x 127 mm) pipe nipple against the flat washer.
   (b) Place the Clutch Engaging Pin (Oil Seal end) into one of the ring gear bolt holes in the Gear Case Cover.
   (c) Using a hammer, tap the pipe nipple to seat the Oil Seal.

7. Using a 3/4" x 5" (19 mm x 127 mm) pipe nipple and a hammer, seat the two Welch Plugs (convex side out) into the remaining two ring gear bolt holes.
8. Slide a Clutch Engaging Pin into one of the ring gear bolt holes, to maintain alignment of the Motor End Ring Gear (80) and the gear case cover holes. **Note**: Make sure the Clutch Engaging Pin is inserted to a point where it only engages the Motor End Ring Gear (80) but not the tapped hole in the Gear Case.
9. Remove the fifteen Gear Case Cover Bolts (91) and Lock Washers (92).
10. Using a 24" (610 mm) long adjustable wrench to grip one of the ribs of the Gear Case Cover and maintaining force on the end of the Gear Case Cover, rotate the Gear Case Cover as shown in Figure 1 on page 9. **Note**: Make sure the Gear Case Cover Seal (90) stays in its groove. **WARNING**: Make sure the Gear Case Cover is rotated slowly and does not break free of the Gear Case.
11. Check the alignment of the Gear Case Cover, Motor End Ring Gear and Gear Case by sliding the two Clutch Engaging Pins into the gear case holes. If they do not slide in, adjust the Gear Case until alignment is obtained. **Note**: The Clutch Engaging Pins should slide in and out freely.
    Caution: If the Clutch Engaging Pins are pushed in too far, they could drop into the Gear Case (70).
12. Install the fifteen Gear Case Cover Bolts and Lock Washers. Tighten securely.
13. Install the Clutch Lever Springs (100) through the access hole in the frame (see Figure 1 on page 9) and onto the Gear Case Eyebolt (73).
14. Install the Clutch Lever (97) and the two Clutch Lever Pins (98).
15. Attach the Clutch Lever Locking Pin Cable under the Flat Washer and insert the Spring Pin Cotter.
16. Install the Lever Spring Pin (99).
17. Using a cotter pin puller, hook the loop of one of the Clutch Lever Springs and install it on the Lever Spring Pin. Install a 3/8" Flat Washer and Spring Pin Cotter.
18. Repeat step 17 to install the second spring on the opposite side of the Clutch Lever.
19. Install a new Motor Gasket (56) into the recess of the Gear Case Cover; then install the Motor Case onto the Gear Case Cover.
20. Install the ten Motor Case Bolts and Lock Washers into the Gear Case Cover. Tighten securely. Install the Drain Plugs (3) and (71) into the Motor Case and Gear Case. Tighten securely. Add the recommended lubricant (see Lubrication instructions on pages 3 and 4).

CONVERSION FROM OVERWINDING WINCH TO UNDERWINDING WINCH

1. Unwind the Winch wire rope and disconnect the air supply to the Winch.
2. Remove the two Rope Drum Setscrews (103) and reverse the wire rope winding direction on the Rope Drum (10).
3. Unscrew the Valve Chest Screws (18) and remove the Valve Chest Cover (17).
4. Remove the Rotary Valve (25) from the Rotary Valve Bushing (12).
5. Insert a No. H5U-526 Rotary Valve into the Rotary Valve Bushing, entering the Valve Drive Pins (26 and 27) into the mating holes in the Crank (36). **Note**: The No. H5U-526 Rotary Valve must be used with an underwinding Winch to obtain maximum power in the lifting direction.
6. Install the Valve Chest Cover and secure it with the four Valve Chest Screws and Lock Washers (19).
7. Remove the Locking Dog Stop Bolt (124).
8. Pull the Locking Dog Handle (117) away from the Winch only far enough to disengage the Handle from the two Spring Retaining Pins (123).
9. Rotate the Handle 180 degrees and re-engage the Handle with the Pins.
10. Install the Locking Dog Stop Bolt.
11. Reconnect the air supply to the Winch and wind the wire rope onto the Rope Drum.



(Dwg. TPA926)

12UWB Winch with Manual Throttle, Manual Brake and Disengaging Clutch

		PART NUMBER FOR ORDERING
	Motor Case Assembly	
	for Standard Brake	H5U-A501R
	for Automatic Brake	H5U-A501R-AB
1	Motor Case	HH5D-501
2	Drain Plug (2)	D02-402
*	1-1/4" Pipe Plug	E5UD-947
4	Vent Cap	D02-303A
5	S-Hook	D02-421
6	Vent Cap Chain	D02-891
7	Vent Cap Screen	D02-889
8	Vent Cap Screen Retainer	6CND-233-1/2
9	Vent Cap Cotter	D02-893
	Valve Chest Assembly	
	for Winch with Standard Brake	H5U-A545R
	for Winch with Automatic Brake	H5U-A545R-AB
10	Valve Chest	H5U-545
11	Bushing Key (2)	HU-538
12	Rotary Valve Bushing	HH5D-525S
13	Reverse Valve Bushing	H5U-945S
14	Grease Fitting (2)	23-188
15	Throttle Lever Spring Stop Pin	D02-553
16	Brake Inlet Plug	D02-402
17	Valve Chest Cover	H5U-546
18	Valve Chest Screw (4)	HU-548
19	3/8" Lock Washer (4)	D02-321
20	Poppet Throttle Valve	KU-940
• 21	Poppet Throttle Valve Spring	HU-942
22	Poppet Throttle Valve Ball	D10-280
23	Poppet Throttle Valve Cap	KU-943
24	Reverse Valve	
	for Winch with Standard Brake	H5U-944
	for Winch with Automatic Brake	H5U-744
• 24A	Reverse Valve O-ring	R0B2J73-359
25	Rotary Valve	
	for Overwinding Winch (Standard)	H5U-526R
	for Underwinding Winch (Special)	H5U-526
• 26	Large Valve Drive Pin	HU-527
• 27	Small Valve Drive Pin (2)	HU-627

		PART NUMBER FOR ORDERING
28	Throttle Control Arm	HU-555A
29	Throttle Lever Spring Stop Pin	D02-553
• 30	Throttle Lever	HU-556
31	Throttle Lever Latch	HU-869
• 32	Throttle Lever Latch Spring	HU-567
33	Throttle Lever Setscrew	HU-842
34	Throttle Lever Pin	HU-870
*	Throttle Lever Pin Cotter (2)	D02-524
• 35	Throttle Lever Spring	HU-412
	Crank Assembly	H5U-A516
36	Crank Bare (consists of 2 matched parts which are not sold separately)	HU-516
37	Oil Splasher	HU-540
38	Oil Splasher Long Rivet (2)	HU-541
*	Oil Splasher Short Rivet (2)	231-712
• 39	Crank Pin Sleeve	HU-519
40	Crank Lock Pin	HU-520
41	Crank Lock Pin Nut	D02-394
42	Crank Lock Pin Cotter	D02-524
• 43	Connecting Rod (1 for each Cylinder)	HH5D-509
44	Connecting Rod Ring (2)	HU-510
• 45	Connecting Rod Bushing	HU-511
• 46	Crank Valve End Bearing	HU-518
• 47	Crank Pin End Bearing	HUD-895
	Cylinder Assembly (5)	HH5D-A505A
48	Cylinder Head	HH5D-H505A
48A	Cylinder Sleeve	HH5D-L505A
49	Piston Assembly (1 for each Cylinder)	HU-A513B
50	Piston Ring (1 for each Piston)	HU-337
51	Oil Regulating Ring (1 for each Piston)	HU-338
51A	Retaining Ring (2 for each Piston)	902A45-632
52	Piston Wrist Pin (1 for each Piston)	HU-514A
• 53	Cylinder Gasket (1 for each Cylinder)	HU-507
54	Cylinder Cap Screw (4 for each Cylinder)	D10-354
55	Cylinder Cap Screw Washer (copper) (4 for each Cylinder)	HU-504
• 56	Motor Case Gasket	HH5D-592
57	Motor Case Screw (10)	215-148
58	1/2" Lock Washer (10)	D10-322
*	Muffler	KU-674

* 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.

GEARING PARTS

		PART NUMBER FOR ORDERING
70	Gear Case	UWB-1353
*	Gear Case Warning Plate	TA-147A
*	Gear Case Warning Plate Screw	D02-302
71	Magnetic Drain or Level Plug (3)	UWD-29
72	Vent Cap	C6H20A-19
73	Clutch Spring Eyebolt (2) (with nut)	UWB-1870
74	Eyebolt Lock Washer (2)	L01-67
75	Motor Pinion (15 teeth)	UWB-1319
76	Motor Pinion Bearing	D10-518
77	Inner Pinion Bearing Retainer	HRA30A-375
78	Outer Pinion Bearing Retainer	150BM-677
79	Motor Pinion Seal	C6H20A-271
80	Ring Gear, Motor End (81 teeth)	UWB-1797
81	Ring Gear, Drum End (78 teeth)	UWB-1798-114
82	Drum End Ring Gear Retainer	UWB-1370
83	Drum End O-ring	UWB-1369
84	Planet Gear Frame Assembly (for 114:1 Gear Ratio) (33 teeth and 30 teeth)	UWB-A1367-114
85	Planet Frame Bearing (2)	UWB-1368
86	Rope Drum Bearing (special; purchase from Ingersoll-Rand)	UWB-1466
87	Shaft Bearing Seal	UWB-1137
88	Shaft Bearing Retainer	UWB-1340
89	Gear Case Cover	UWB-1502
90	Gear Case Cover Seal	UWB-1931
91	Gear Case Cover Bolt (15) (1/2"-13 thd. x 1-1/2" long)	235-146
92	1/2" Lock Washer (15)	D10-322
93	Pipe Nipple (3/4" x 5")	NIP 3/4 x 5
94	Elbow (3/4")	P25-198
	DISENGAGING CLUTCH PARTS (CLUTCH MODELS ONLY)	
95	Clutch Engaging Pin (2)	UWB-1566
96	Clutch Pin Oil Seal (2)	UWB-1866
*	1-1/4" diameter Welch Plug (2)	D02-404
97	Clutch Lever	UWB-1565
98	Clutch Lever Pin (2)	UWB-1571
99	Lever Spring Pin	UWB-1569
*	Spring Pin Cotter (6) (2 per pin)	D02-524
*	3/8" Flat Washer (6)	D02-419
100	Clutch Lever Spring (2)	UWB-1567
*	Clutch Lever Self-Locking Pin and Cable	UWB-1724
*	Clutch Operating Plate	UWB-32
*	Clutch Warning Plate	UWB-33
*	Plate Screw (8) (four for each plate)	D02-302
	RING GEAR BOLTS (NON-CLUTCH MODELS ONLY) **(refer to Figure 2 on page 9)**	
*	Bolt (3/4"-10 x 4 Grade 5) (4)	K6UL-775
*	Oil Seal (4)	UWB-1866
*	Belleville Washer (4)	UWB-1207
*	Plate Screw (8)	D02-302

* Not illustrated.

ROPE DRUM AND BASE PARTS

		PART NUMBER FOR ORDERING
101	Rope Drum Assembly	
	22" (559 mm) between flanges	UWB-A1324-1
	30" (762 mm) between flanges	UWB-A1324-2
103	Rope Drum Setscrew (2)	UWB-381
104	Rope Drum Bearing (special; purchase from Ingersoll-Rand)	UWB-1466
105	Rope Drum Spline	UWB-1324T
106	Rope Drum Spline Setscrew (6)	UWB-1867
107	Rope Drum Washer (3)	UWB-1469
108	Mounting Base	
	for 22" Drum	UWB-1564-1
	for 30" Drum	UWB-1564-2
109	Drum Support Bracket	UWB-1677
110	Support Bracket Bolt (16) (5/8"-11 thd. x 2-1/2" long)	UWB-1775
111	Support Bracket Bolt Lock Washer (8)	A-67
113	Support Bracket Bolt Nut (16)	HU-776
114	Locking Dog	UWB-671
115	Locking Dog Shaft	UWB-672
116	Shaft Lock Nut	HU-776
117	Locking Dog Handle	UWB-673
118	Handle Lock Nut	D02-394
119	Cotter Pin	D02-330
120	1/2" Washer	D10-807
121	Locking Dog Spring	UWB-700
122	Spring Washer	UWB-750
123	Spring Retaining Pin (2)	UWB-44
124	Locking Dog Stop Bolt (1/2"-13 thd. x 3/4" long, Grade 5)	UWB-354
125	1/2" Lock Washer	HRA20A-322

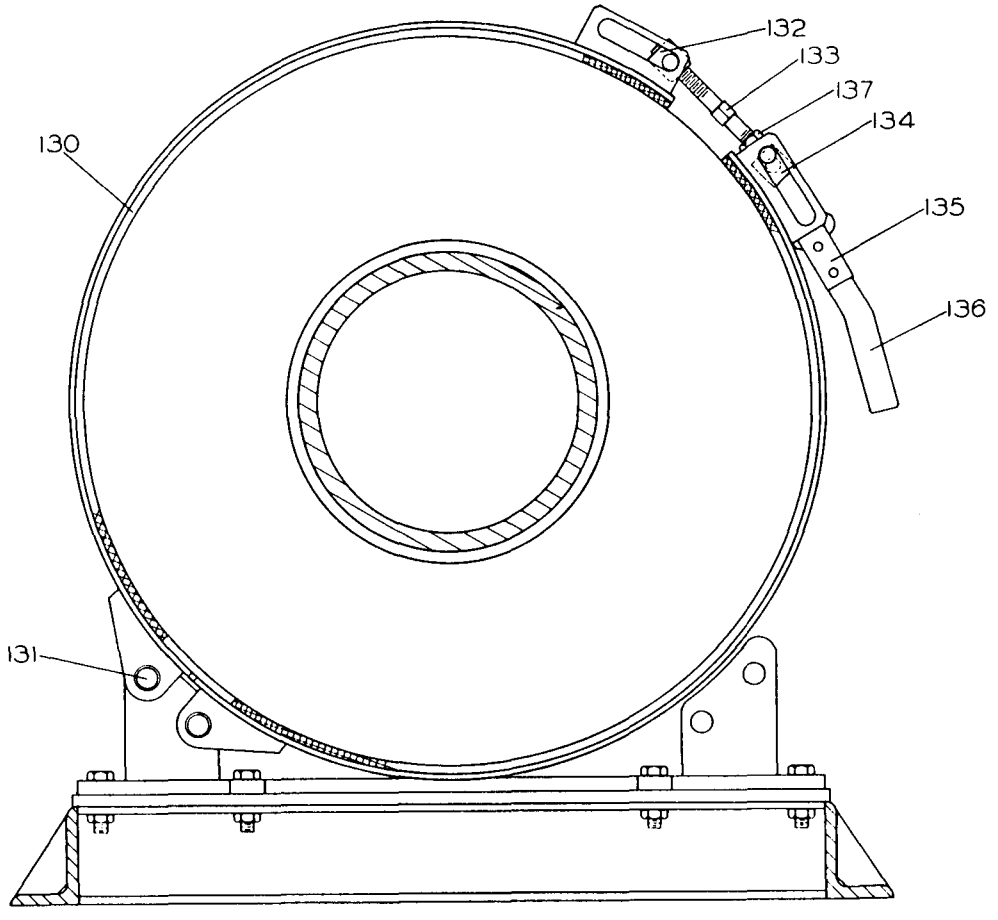
CLUTCH CONVERSION KIT PARTS

(For converting a Clutch Winch to a Non-Clutch Winch)

		PART NUMBER FOR ORDERING
	Clutch Conversion Kit	UWB-K1600
200	Clutch Lock Pin	UWB-1600
201	Pin	UWB-1571
*	Cotter	D02-524

* Not illustrated.

MANUAL BRAKE PARTS

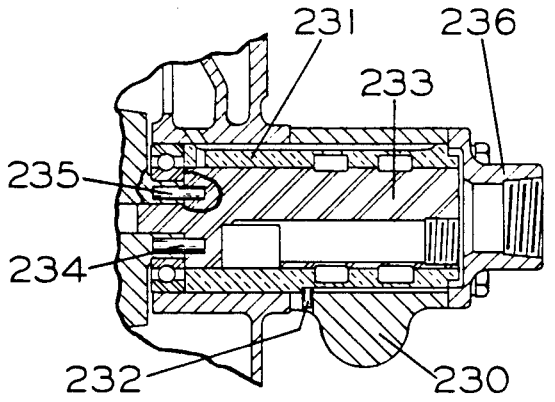


(Dwg. TPB681)

		PART NUMBER FOR ORDERING
130	Brake Band (2)	UWB-1101
131	Brake Anchor Pin (2)	UWB-1107
*	Anchor Pin Cotter (2)	207-126
132	Brake Adjusting Block	UWB-104
133	Brake Adjusting Screw	UWB-106
134	Brake Clevis Block	UWB-122
135	Brake Handle Clevis (2)	UWB-111
136	Brake Handle	UWB-113
137	Brake Adjusting Screw Jam Nut (5/8"-18 thd.)	B12-249
*	Brake Handle Bolt (2) (3/8"-16 thd. x 1-3/4" long, Grade 5)	D10-312
*	Handle Bolt Lock Nut (2)	WF171-13

* Not illustrated.

REMOTE CONTROL VALVE CHEST PARTS



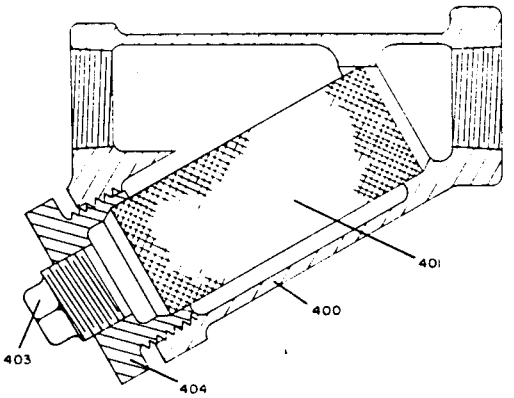
(Dwg. TPD206)

PART NUMBER FOR ORDERING

230	Remote Control Valve Chest	H5M-545
231	Rotary Valve Bushing	HH5D-525
232	Bushing Key	HU-538
233	Rotary Valve	
	for Overwinding Winch (Standard)	H5U-526R
	for Underwinding Winch (Special)	H5U-526
234	Large Valve Drive Pin	HU-527
235	Small Valve Drive Pin (2)	HU-627
236	Remote Control Valve Chest Cover	HX-546
*	Valve Chest Screw (4)	HU-548
*	3/8" Lock Washer (4)	D02-321

* Not illustrated.

AIR STRAINER PARTS

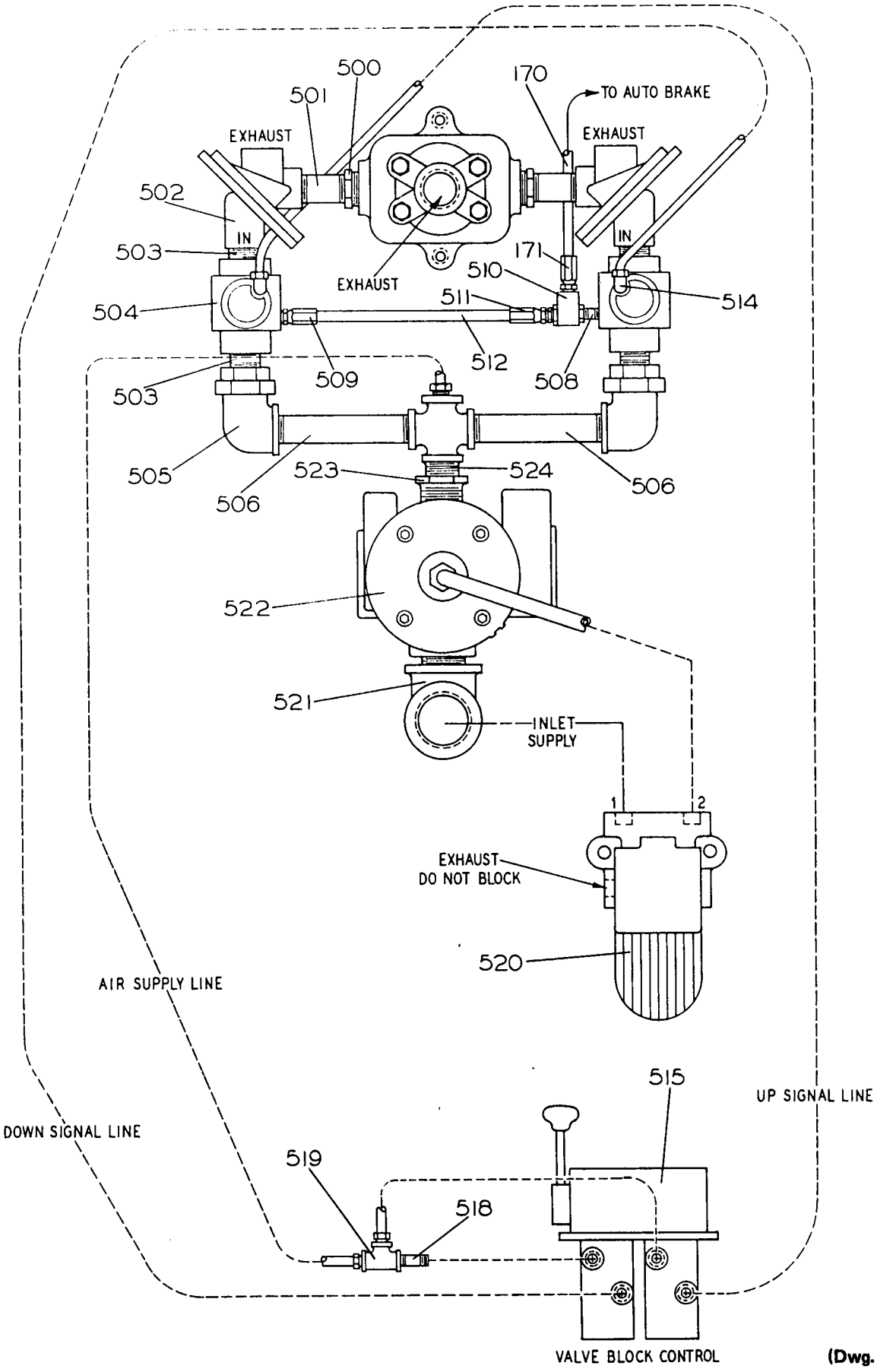


(Dwg. TPD122-1)

PART NUMBER FOR ORDERING

400	Air Strainer Assembly	K4U-A267AT
401	Air Strainer Screen	K4U-61AT
403	Air Strainer Plug	22SR-165
404	Air Strainer Cap	K4U-268AT
*	Air Strainer Nipple (1-1/4" x 2-1/2")	KKM-286

* Not illustrated.



(Dwg. TPB714)

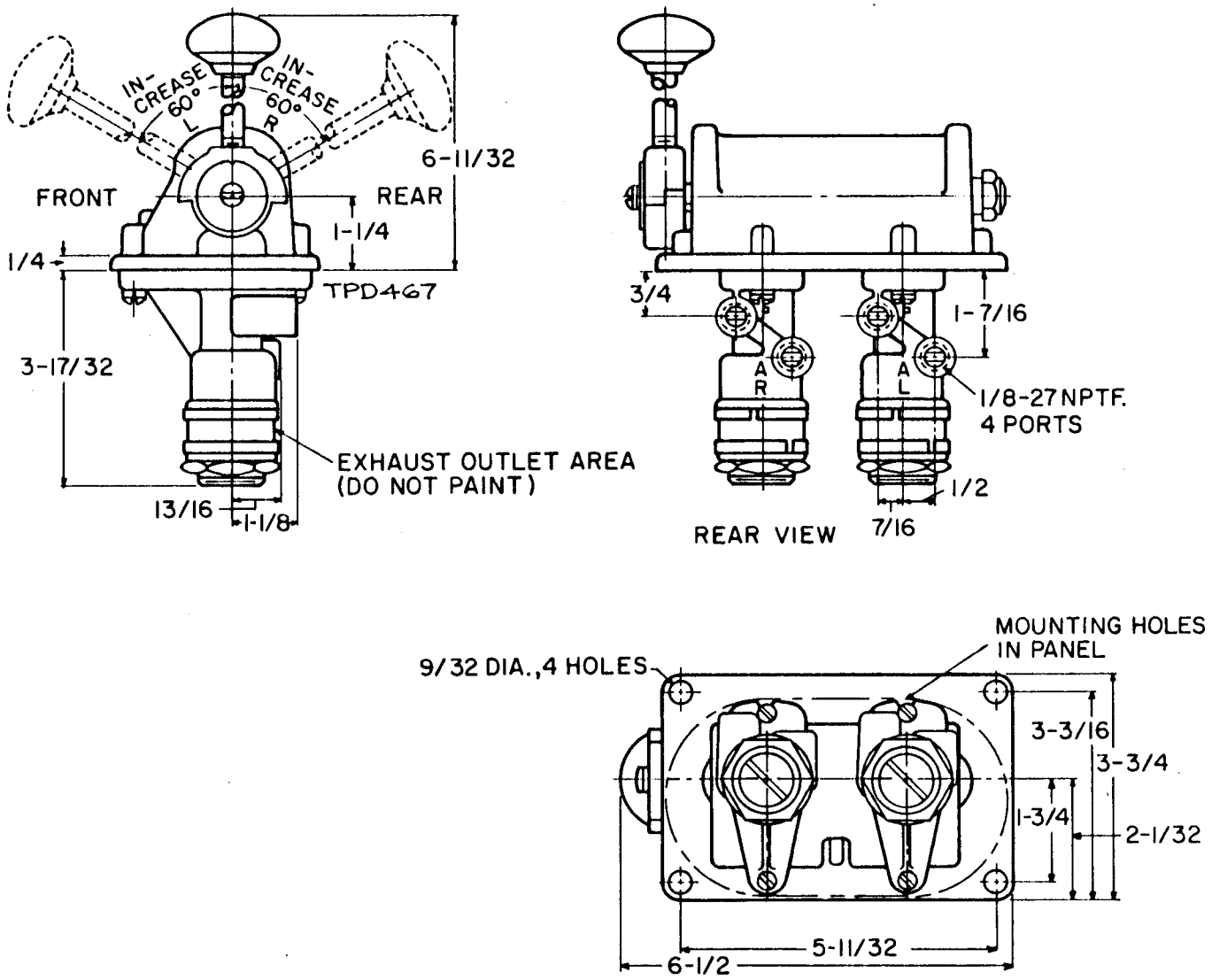
Piping Diagram for 12UWB Winch with Remote Control and Automatic Brake

PIPING PARTS FOR 12UWB WINCH WITH REMOTE CONTROL AND AUTOMATIC BRAKE

		PART NUMBER FOR ORDERING
500	Reducing Bushing (1-1/4" x 1")	HX-284
501	Nipple (2)	HHM-286A
502	Quick Exhaust Valve (2)	KU-939
503	Close Nipple (4) (1" NPT)	P35-286
504	Pressure Regulator	KU-200
505	Union Elbow (2) (1" NPT)	HX-282
506	Nipple (2) (1" NPT x 7" long)	KU-287
507	Cross (1" NPT)	KU-80
508	Nipple (1/4" NPT x 2" long)	CUS-913
509	Hose Swivel	UWD-162
510	Shuttle Valve	UWD-802
511	Straight Fitting	UWD-165
512	Hose (12 inches)	H4A-1
513	Hose (60 inches)	H4A-5
514	Elbow (3)	MLK-161
515	Control Valve	UWD-A686
518	Nipple (1/8" NPT x 2" long)	HU-286
519	Tee (1/8" NPT)	HU-911
520	Foot Valve	UWD-910A
521	Street Ell (1-1/2" NPT)	UWC-912
522	Poppet Valve	E5W-900
523	Nipple (1-1/2" NPT x 4" long)	UWB-287
524	Reducing Bushing	UWB-284
*	Hose Clamp (8)	CA110-476A
*	Hose Swivel (3)	MLK-162
*	Straight Fitting (5)	MLK-170
*	Hose (5 inches)	H3A-1/2
*	Reducing Bushing (1" x 1/2")	D01-705
*	Reducing Bushing (1/2" x 1/4")	N16-21
*	Reducing Bushing (1/4" x 1/8") (3)	20BM-193
*	Control Hose (specify length)	BH3A
*	Quick Exhaust Valve (2) (required for every 50 ft. of Control Hose)	MLK-A939
*	Hose Binder (one every 2-1/2 ft.)	D10-927

* Not illustrated.

MOUNTING DIMENSIONS FOR UWD-A686 REMOTE CONTROL VALVE

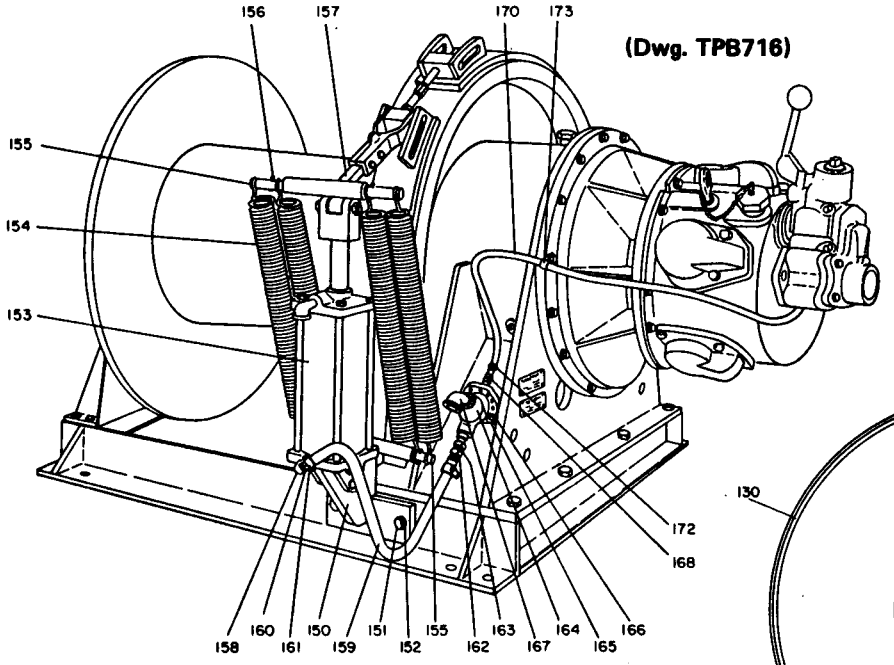


HANDLE NORMALLY ON RIGHT-HAND SIDE
DRAWING ROTATED 180° TO SHOW PORT CONFIGURATION

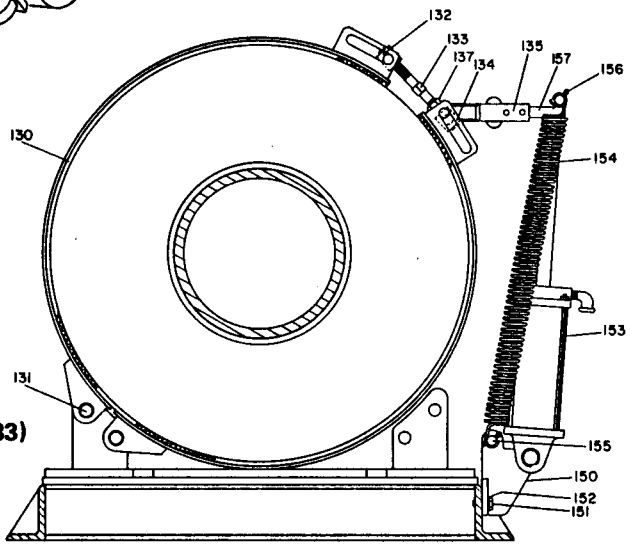
(Dwg. TPD467)

AUTOMATIC BRAKE PARTS

Illustrated Manual Brake Parts 130 (2), 131 (2), 132, 133, 134, 135, 137, Anchor Pin Cotter (2), Brake Handle Bolt (2) and Brake Handle Bolt Lock Nut (2) are used on the Automatic Brake.



(Dwg. TPB716)

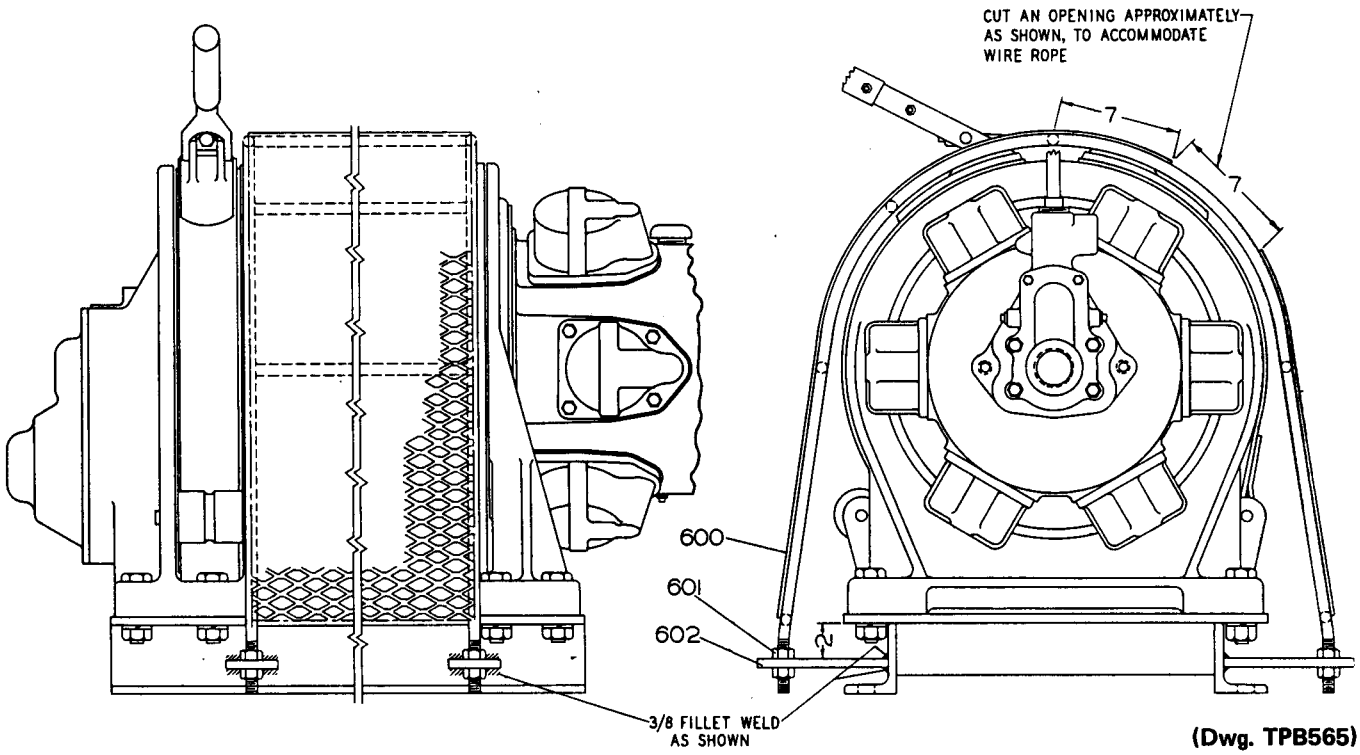


(Dwg. TPB683)

		PART NUMBER FOR ORDERING			PART NUMBER FOR ORDERING
150	Brake Cylinder Bracket	UWB-1721	162	Brake Hose Swivel	MR-129
151	Cylinder Bracket Cap Screw (2) (5/8"-11 thd. x 1-3/4" long)	DLC-439	163	Brake Hose Bushing	UWD-285
152	Bracket Cap Screw Lock Washer (2) (5/8")	A-67	164	Exhaust Valve	C6H20A-939
153	Brake Cylinder	UWB-1141	165	Valve Cap Screw (2)	M0V010AA-634
154	Brake Spring (4)	UWB-726	166	Valve Cap Screw Lock Washer (2) (1/4")	L01-67
155	Brake Spring Pin (2)	UWB-1735	167	Exhaust Valve Elbow (1/2")	J3-388
156	Brake Spring Pin Cotter (2)	D02-330	168	Valve Hose Reducing Bushing (1/2" x 1/4" NPT)	N16-21
157	Automatic Brake Lever	UWB-1718	170	Exhaust Valve Hose (length as specified)	BH4A
158	Brake Pipe Elbow (2)	UWD-581	*	Valve Hose Swivel (2)	UWD-162
159	Brake Hose (length as specified)	BH6A	172	Valve Hose Clamp (2)	K6U-4
160	Brake Hose Nipple (2)	RV1-46	173	Valve Hose Clip	UWD-727
161	Brake Hose Clamp (2)	K6U-4			

* Not illustrated.

DRUM GUARDS



(Dwg. TPB565)

		PART NUMBER FOR ORDERING
600	Drum Guard	
	for 12UWB1141	25UWB1141-298
	for 12UWB1142	25UWB1142-298
601	5/8"-11 thd. Nut (8)	K6U-8
602	Plate (4)	K6U-299

MAINTENANCE TOOLS

TOOL NUMBER FOR ORDERING	TOOL NAME FOR ORDERING	OPERATION
P25-228	Grease Gun	Lubrication.
HU-932	Valve Chest Jack Bolt (2 required)	Removing the Valve Chest (10 or 230) from the Motor Case (1).
HU-933	Piston Ring Compressor	Compressing the Piston Rings (50 and 51) when installing the Cylinder Assembly.
23470	Throttle Valve Stem Reamer	Reaming the throttle valve stem hole in the Reverse Valve Bushing (13) after installing a new Bushing.
25670	Throttle Valve Seat Reamer	Refacing the seat for the Poppet Throttle Valve (20) in the Valve Chest (10).

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