

**PARTS, OPERATION AND MAINTENANCE  
SUPPLEMENT\***

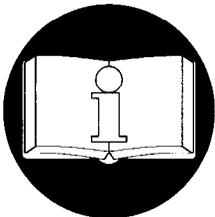
**FOR**

**MODEL K4U, K5U AND K6U  
WINCHES**

**with**

**DISC BRAKE**

\* This supplement should be used in conjunction with the Model K4U, K5U and K6U Winch Parts, Operation and Maintenance Manual Forms P5869 and P5893.



**READ THIS SUPPLEMENT BEFORE USING THESE PRODUCTS.** This supplement contains important safety, installation, operation and maintenance information. Make this supplement available to all persons responsible for the operation, installation and maintenance of these products.

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

## WARNING TAG AND LUBRICATION LABEL

Each winch and disc brake kit is supplied from the factory with the warning tag and lubrication label shown. If the tag or label is not attached to your winch, order a new one and install it. See the parts list for the part number. Read and obey all warnings and other safety information attached to this winch and disc brake kit. Tag and label may not be shown actual size.



A vertical rectangular warning tag with a black background and white text. At the top is a white triangle with a black exclamation mark followed by the word "WARNING" in large bold letters. Below this is a bolded warning statement: "Failure to follow these warnings may result in death, severe injury or property damage:". This is followed by a list of seven safety instructions, each preceded by a bullet point. At the bottom, there is a small white box containing text about ASME B30.7 compliance, a part number "P/N: 71056410 for winches", and the "INGERSOLL-RAND MATERIAL HANDLING" logo.

## INSTALLATION

Disc brake kits are available for installation in K4, K5 and K6 winches. Refer to parts list for correct kit number.

### CAUTION

- Before installing a disc brake kit check winch serial number to determine if motor shaft requires replacement.

### WARNING

- Motor shafts in the K4, K5 and K6 winches must be changed if the winches were manufactured prior to the dates below.

K4 and K5 (all models) manufactured before March 1981 with serial numbers beginning with anything other than three letters or serial numbers beginning with 3 letters if the second and third letters are alphabetically less than RFC.

K6 (all models) manufactured before November 1983 with serial numbers beginning with anything other than 3 letters or serial numbers beginning with three letters if the second and third letters are alphabetically less than RHL.

If the serial number is not intact or the manufacture date of the motor shaft is in doubt or cannot be determined then the shaft must be replaced. The shafts can be further verified by checking the hardness on the keyed end

(opposite motor spline end). If the hardness is less than Rockwell C32 the shaft must be replaced.

### NOTICE

- Motor shafts are not included in the Disc Brake Kits. If the winch serial number indicates that a new motor shaft is required it must be ordered separately.

#### Disc Brake Kit Installation

Refer to the "MAINTENANCE" section for complete instructions on installing a Disc Brake Kit.

#### Disengaging Clutch

### WARNING

- The disengaging clutch must be removed on winches being equipped with a disc brake.

#### K4U and K5U Winches

Because the combination of Disc Brake and Disengaging Clutch is not approved by Ingersoll-Rand, the following parts must be installed when adding a disc brake to a winch equipped with a disengaging clutch.

The following parts are included in each Disc Brake Kit.

Clutch jaw spacer	K4U-712
Gear cover plug	HU-728
Gear cover plug seal	HU-730

Complete instructions on installing the above parts is provided in the "MAINTENANCE" section.

### **K6U Winches**

Because the combination of Disc Brake and Disengaging Clutch is not approved by Ingersoll-Rand, the following parts must be installed when adding a disc brake to a winch equipped with a disengaging clutch.

The following parts are included in each Disc Brake Kit.

Clutch jaw spacer	K6U-712
Gear cover plug	K6U-728
Gear cover plug seal	HU-730

Complete instructions on installing the above parts is provided in the "MAINTENANCE" section.

### **Winch Installation**

During winch installation, carefully inspect all air lines for damage and check that air connections are tight.

Before operation all oil levels must be checked and /or topped up with the proper type of oil as recommended in the "LUBRICATION" section.

### **⚠ CAUTION**

• **Owners and users are advised to examine specific, local or other regulations, including American National Standards Institute and/or OSHA Regulations which may apply to a particular type of use of this product before installing or putting winch to use.**

Installation of the disc brake kit includes modifications to the winch control valve components which will automatically prevent overspeeding when lowering suspended loads.

### **⚠ WARNING**

• **Overspeeding will damage winch components, and is an unsafe operating condition.**

A slight loss of performance may also be noticed in the winch wire rope haul-in direction.

### **Mounting**

Follow instructions provided in the K4U and K5U Winch Parts, Operation and Maintenance Manual Form number P5893 or for K6U Winches Parts, Operation and Maintenance Manual Form number P5869.

### **Load Test**

Prior to initial use, all new, extensively repaired, or altered winches shall be load tested by or under the direction of a qualified person, and a written report furnished confirming the rating of the winch. Test winch to 125% of its rated capacity. Testing to more than 125% may be necessary to comply with standards and regulations set forth in areas outside of the USA.

## **OPERATION**

The four most important aspects of winch operation are:

1. Follow all safety instructions when operating the winch.
2. Allow only qualified people to operate the winch.
3. Subject each winch to a regular inspection and maintenance procedure.
4. Be aware of the winch capacity and weight of load at all times.

### **⚠ CAUTION**

• **Only allow qualified personnel (trained in safety and operation) to operate a winch.**

To ensure smooth operation of the winch sudden movements of the control valve should be avoided.

The disc-type friction brake plates are located on a brake hub which contains a sprag (cam) type overrunning clutch. The brake is held engaged by springs and is released by an annular piston. The piston is connected to that port which is pressurized for winch pay-out rotation. In this way, the brake is engaged at all times until the winch is powered for pay-out. When a load is applied to the winch wire rope it is held by the brake through the clutch. In order to lower a load or pay-out wire rope, air pressure is applied to the

reverse motor valve port which is also effective on the brake piston and builds up until the brake is released. Any decrease in air pressure will allow the springs to reapply the disc brake.

The spring loaded manual throttle control valve is supplied mounted to the motor. Optional remotely mounted controls are available. The valve provides control over the speed of the motor and the rotation direction.

### **⚠ WARNING**

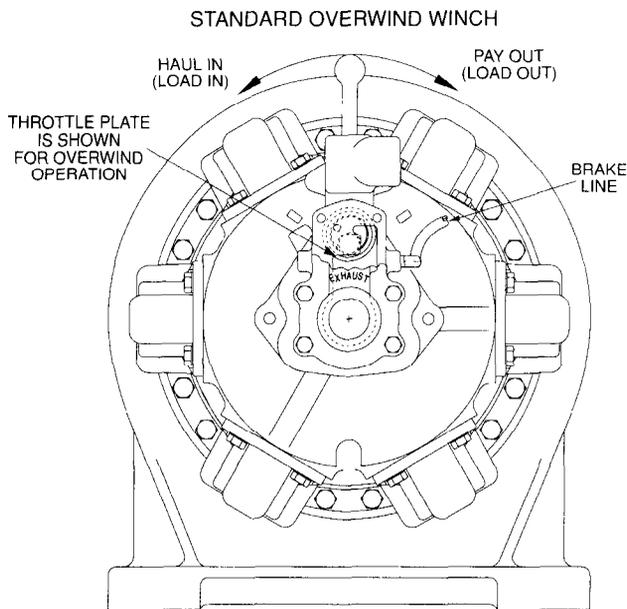
• **The winch is not designed or suitable for lifting, lowering or moving persons. Never lift loads over people.**

### **Winch Controls**

#### **Winch Mounted Throttle**

The spring loaded manual control throttle mounts to the air motor.

When viewed from the air motor end move the control throttle handle to the right (clockwise) to pay out wire rope and to the left (counterclockwise) to haul in wire rope. Refer to Dwg. MHTPA0349.



(Dwg. MHTPA0349)

**CAUTION**

• For underwind winches refer to "MAINTENANCE" section for detailed parts assembly instructions.

**Remote Control**

For information on full flow remote control applications, consult the factory.

**Initial Operating Checks**

Before the winch is placed into service the following initial operating checks must be performed to ensure proper winch operation.

1. When first running the motor some light oil should be injected into the inlet connection to allow good lubrication.
2. When first operating the winch it is recommended that the motor be driven slowly in both directions for a few minutes.
3. Check operation of clutch, brakes and pawls.
4. Lift a light load 2 - 3 in. (5 - 10 cm) off the floor and check that the disc brake holds the load.

**NOTICE**

• If winch does not hold load, sprag clutch (370) may be installed for wrong rotation. Disassemble disc brake and inspect.

5. Check operation of limit switches, and locking or safety devices when provided.

After completing the initial operating checks the winch must undergo a load test, refer to "INSTALLATION" section.

**LUBRICATION**

**Motor Assembly**

Refer to the motor lubrication instructions in the "LUBRICATION" section of the K4U and K5U Winch Parts, Operation and Maintenance Manual Form number P5893 or K6U Winch Parts, Operation and Maintenance Manual Form number P5869.

**Brake Assembly**

Fill brake assembly to level plug (351) with a high quality SAE 10W hydraulic oil. The brake assembly holds approximately 1/2 pint (0.24 lts).

32°F (0°C) and above	SAE 10 W
0°F (-18°C) to 32°F (0°C)	SAE 5W
Below 0°F (-18°C)	Consult factory

Oils having 150 to 250 SSU viscosity at 100°F (38°C) and viscosity index of 100 or greater will give good results under normal temperature conditions. Oils with a high viscosity index will minimize changes in viscosity with corresponding changes in temperature.

## **WARNING**

- Never perform maintenance on the winch while it is supporting a load.
- Before performing maintenance, tag controls: **DANGER - DO NOT OPERATE - EQUIPMENT BEING REPAIRED.**
- Only allow qualified service personnel to perform maintenance.
- Turn off air system and depressurize air lines before performing any maintenance.

### **Disengaging Clutch**

#### **K4U and K5U winches**

Use the following instructions in conjunction with information contained in K4U and K5U Winch Parts, Operation and Maintenance Manual Form number P5893 to disable the disengaging clutch.

1. Install the clutch jaw spacer (251) between the drive shaft outer bearing (94) and the clutch jaw (95) on the drive shaft (89) to lock the clutch jaw in engagement with the intermediate gear (80).
2. Remove the clutch eccentric shaft (96) and include parts along with the clutch lever (100). Insert the gear cover plug seal (253) and gear cover plug (252) into the hole in the gear case cover (87) previously occupied by the eccentric shaft (96).

#### **K6U winches**

Use the following instructions in conjunction with information contained in K6U Winch Parts, Operation and Maintenance Manual Form number P5869 to disable the disengaging clutch.

1. Install the clutch jaw spacer between the drive shaft outer bearing (97) and the clutch jaw (505) on the drive shaft (500) to lock the clutch jaw in engagement with the drive gear (511).
2. Remove the clutch eccentric shaft (507) and include parts along with the clutch lever (516). Insert the gear cover plug seal and gear cover plug into the hole in the gear case cover (512) previously occupied by the eccentric shaft (507).

### **Winch Disassembly**

Use the following instructions in conjunction with information contained in K4U and K5U Winch Parts, Operation and Maintenance Manual Form number P5893 or K6U Winch Parts, Operation and Maintenance Manual Form number P5869.

#### **General Disassembly Instructions**

It is recommended that all maintenance work on the winch be performed in a clean dust free work area. The following instructions provide the necessary information to dis-

semble and re-assemble the winch with the disc brake. An exploded drawing of the disc brake is provided in the Parts Section to assist with parts identification.

In the process of disassembling the winch, observe the following:

1. Never disassemble the winch any further than is necessary. A good part can be damaged during the course of disassembly.
2. Never use excessive force when removing parts. Tapping gently around the perimeter of a part with a soft hammer should be sufficient to loosen the part.
3. Do not heat a part with a flame to free it for removal, unless the part being heated is already worn or damaged beyond repair and no additional damage will occur to other parts.

In general, the winch is designed to permit easy disassembly and assembly. The use of heat or excessive force should not be required.

4. Keep the work area as clean as practical, to prevent dirt and other foreign matter from getting into bearings or other moving parts.

#### **Winches without a disc brake**

Loosen the fill cap on the motor to vent the motor housing. Drain oil from motor assembly into a suitable container.

#### **K4U and K5U Winches**

(Ref. K4U and K5U Winch Parts, Operation and Maintenance Manual Form number P5893.)

## **CAUTION**

- Provide adequate support for the motor before removing the motor mounting capscrews.

Remove capscrews (57) and lockwashers (58) which secure the motor assembly to the motor mounting bracket (66). With the aid of a hoist supporting the motor assembly, pull the motor assembly from the winch. Set motor to one side and cover to prevent dust and dirt entering. The motor assembly will require modification to add the throttle plate (377), spring (380) and bushing (382) under the valve chest cover. Refer to Motor Modification in the Assembly Section.

#### **K6U Winches**

(Ref. K6U Winch Parts, Operation and Maintenance Manual Form number P5869.)

## **CAUTION**

- **Provide adequate support for the motor before removing the motor mounting capscrews.**

Remove capscrews (63) and lockwashers (64) which secure the motor assembly to the motor mounting bracket (67). With the aid of a hoist supporting the motor assembly, pull the motor assembly from the winch. Set motor to one side and cover to prevent dust and dirt entering. The motor assembly will require modification to add the throttle plate (377), spring (380) and bushing (382) under the valve chest cover. Refer to Motor Modification in the Assembly Section.

### **Winches with a disc brake**

1. Remove hose and fittings between motor assembly and brake housing (359).
2. Drain oil from brake compartment into a suitable container by removing pipe plug (362) from the bottom of the brake housing (359).
3. With the aid of an overhead hoist support the weight of the piston motor assembly and remove the eight capscrews (353) and lockwashers (352) which secure the motor assembly to the adapter (377).
4. Pry the motor assembly free of the adapter and pull the motor assembly clear of the winch. Set the motor to one side.
5. Loosen capscrews (378) one turn each progressively around the adapter (377) until the brake spring compression has been relaxed then remove capscrews (378).
6. Remove adapter (377) and brake springs (376).

## **NOTICE**

- **Some oil may still be in the brake compartment and will spill out when the motor assembly is removed.**

7. Remove shaft (372) and sprag clutch assembly.
8. Remove brake housing (359) with brake piston (375), drive plates (366) and friction discs (365) from adapter (350).
9. Tap brake piston (375) out of brake housing (359) and remove seals (373) and (374).
10. If it is necessary to disassemble the sprag clutch assembly remove retainer ring (368) nearest the external spline on shaft (372) and slide off brake hub (367), bearings (369) and sprag clutch (370).
11. Remove bearings (369) and sprag clutch (370) from brake hub (367).

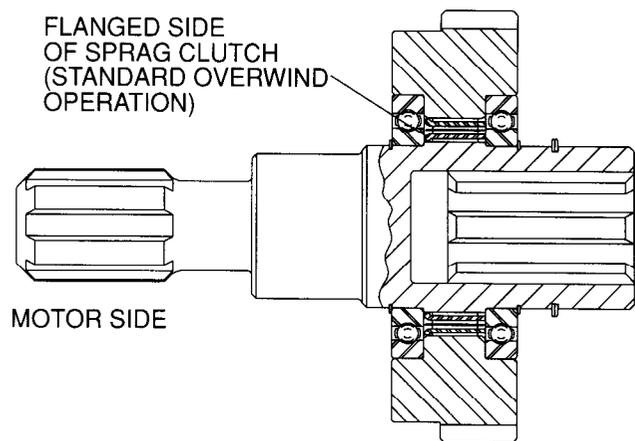
### **Winch Assembly**

Use the following instructions in conjunction with information contained in K4U and K5U Winch Parts, Operation and Maintenance Manual Form number P5893 or K6U Winch Parts, Operation and Maintenance Manual Form number P5869.

1. Tap bearing (363) into bore of motor mounting bracket (67) until fully seated. To avoid bearing damage tap only on outer bearing race. Install adapter (350) on end frame and secure with capscrews (353) and lockwashers (352). Apply a small amount of Loctite® 242 to the threads on each capscrew (353) and torque to 145 ft. lbs. (196 N.m)

Kits are supplied with the disc brake clutch pre-assembled for standard overwind operation. Instructions 2 through 4 are provided in the event that the assembly has been disassembled.

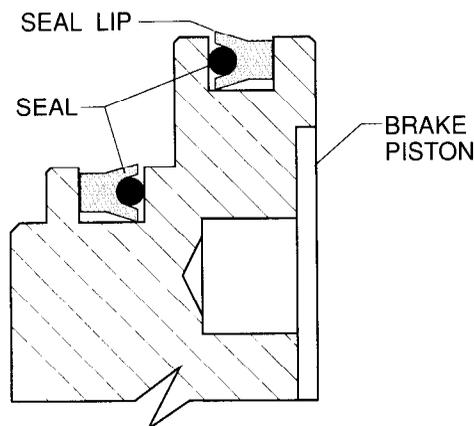
2. Install one bearing (369) on female splined end of shaft (372) and secure in position with retainer ring (368).
3. Install sprag clutch (370) in brake hub (367). It is important that the sprag clutch (370) be installed for the correct rotation.



(Dwg. MHTPA0348)

4. Install shaft (372) with bearing (369) through sprag clutch (370). Rotate shaft (372) slowly in the sprag clutch free rotation direction to assist assembly. Check that shaft rotates freely in one direction and locks up instantaneously in the opposite direction. Install second bearing (369) and secure with retainer ring (368). To check if sprag clutch is installed for the correct rotation firmly hold shaft (372) and brake hub (367) should rotate in a clockwise direction when viewed from the motor side.
5. Install retainer ring (364) on shaft (372). Install assembled shaft and sprag clutch assembly in bearing (363) located in the motor mounting bracket (67).
6. Lubricate and install 'O' Ring (355) on brake housing (359). Assemble brake housing (359) to adapter (350). Apply a thin film of Loctite® 515 to the brake housing mating surface. Locate and loosely secure with capscrews (378).
7. Install friction discs (365) and drive plates (366). Begin with a friction disc (365) and alternate with a drive plate (366). Ensure splines on drive plates (366) line up with the teeth on the brake hub (367).

8. Lubricate and install seals (373) and (374) in brake piston (375) grooves so seal lips face each other. Do not overstretch seals during this procedure. (Ref. Dwg. MHTPA0139).



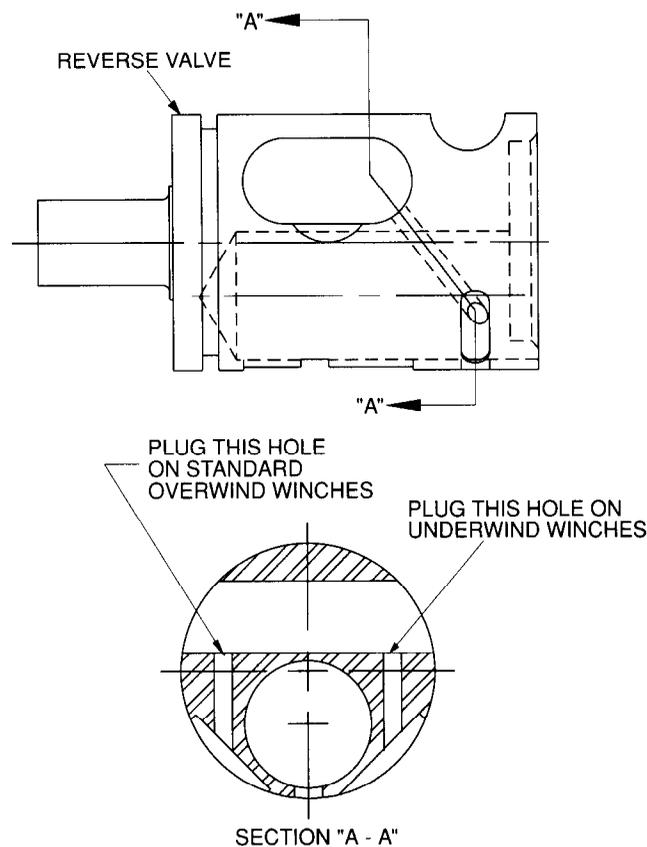
(Dwg. MHTPA0139)

9. Install brake piston (375) with seals in to the brake housing (359). Press brake piston in until seated. Use extra care during this procedure to avoid damage to the seals.
10. Install springs (376) in brake piston (375). For K6U winches position springs in groups of four with one open brake spring hole between each set of four springs. For correct brake operation the springs must form a symmetrical pattern .
11. Lubricate and install 'O' Ring (360) on brake housing (359) and install adapter (377). Apply a thin film of Loctite® 515 to the brake housing mating surface. Secure adapter (377) to brake housing (359) with capscrews (378). Apply a small amount of Loctite® 242 to the threads on each capscrew (378) and torque to 80 ft. lbs. (108 N.m).
12. Install motor assembly on adapter (377) and secure in position with capscrews (353) and lockwashers (352). Apply a small amount of Loctite® 242 to the threads on each capscrew (353) and torque to 145 ft. lbs. (196 N.m).

#### Motor Modification

On winches which have not been previously equipped with a disc brake it will be necessary to remove the exhaust plate on the motor and install throttle plate (384), spring (380) and bushing (382).

Also remove reverse valve (383) and install pin (385) with Loctite® 609 as shown in Dwg. MHTPA0341. When installing throttle plate (384) apply a thin film of Loctite® 515 on all mating surfaces.



(Dwg. MHTPA0341)

13. Install hose from motor assembly to brake release port.
14. Fill brake housing to the level plug with correct oil. Ref. to "LUBRICATION" section.
15. Conduct initial operating tests on winch as described in "OPERATION" section.

#### Underwind Winches

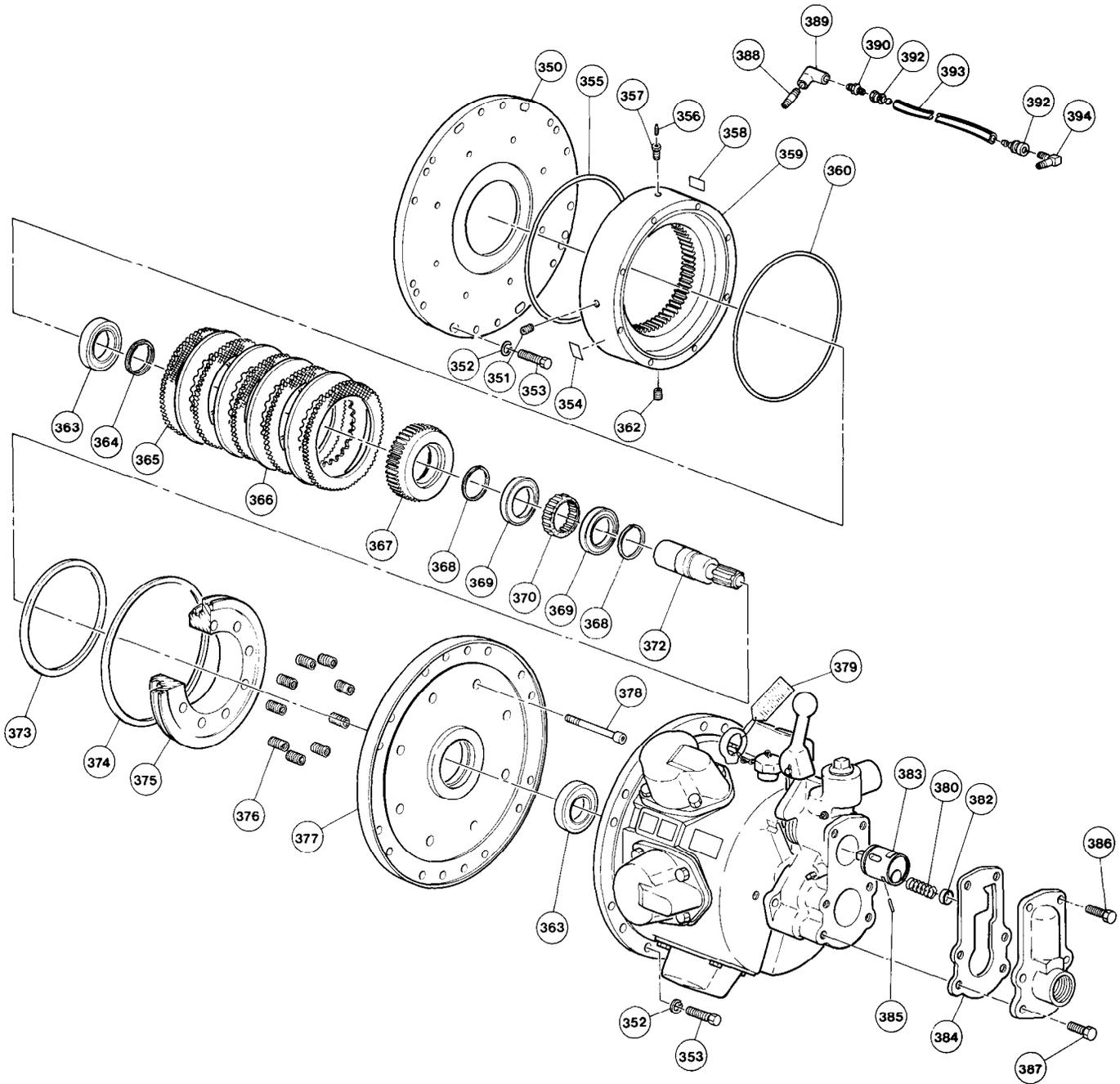
For winches configured for underwind applications the following changes are required.

1. Sprag clutch (370) must be installed for opposite rotation. See instruction 4 under Assembly section. To check if sprag clutch is installed for the correct rotation for underwind winches firmly hold shaft (372) and brake hub (367) should rotate in a counter clockwise direction when viewed from the motor side.
2. Throttle plate (384) must be installed on the motor in the reverse position (turned 180°) to that shown in exploded drawing MHTPA0226.
3. Pin (385) must be installed in the hole on the right side of the reverse valve (383) when viewed from the drilled hole end. See Dwg. MHTPA0341.

#### **⚠ WARNING**

• If throttle plate (384) is not installed correctly, poor inching control and excessive motor speeds during lowering of suspended loads will result.

# DISC BRAKE PARTS DRAWING



(Dwg. MHTPA0226)

\* Disc brake kit consists of items 350 thru 382, 384 thru 386 and 388 thru 394. Also included is a clutch jaw spacer, gear cover plug and gear cover plug seal for removing the disengaging clutch.

## DISC BRAKE PARTS LIST

ITEM NO.	DESCRIPTION OF PART	TOTAL QTY	PART NO.		
			K4U	K5U	K6U
349	Disc Brake Kit*	1	Contact Factory		KU-K722D
350	Adapter	1	21322	21318	21322
351	Pipe Plug	2	51897		
352	Lockwasher	See ( )	A-67-5 (16)	A-67-5 (20)	A-67-5 (24)
353	Capscrew	See ( )	215-36 (16)	215-36 (20)	215-36 (24)
354	Oil Label	1	71108773		
• 355	'O' Ring	1	51460		
356	Breather	1	51857		
357	Fitting	1	51803		
358	Nameplate	1	71079867		
359	Brake Housing	1	21335		
• 360	'O' Ring	1	51458		
362	Pipe Plug	1	50801		
363	Bearing	2	KU-895		
364	Retainer Ring	1	71087076		
• 365	Friction Disc	5	50772		
• 366	Drive Plate	4	50773		
367	Brake Hub	1	21371		
368	Retainer Ring	2	71087084		
369	Bearing	2	71087092		
• 370	Sprag Clutch	1	71087332		
372	Shaft	1	21334		
• 373	Seal	1	51462		
• 374	Seal	1	51461		
375	Brake Piston	1	15437		
• 376	Spring	12	Contact Factory		50751
377	Adapter	1			21318
378	Capscrew	8	71087100		
379	Warning Tag	1	71056410		
380	Spring	1	71108690		
382	Bushing	1	22048		
383	Reverse Valve	1	KU-744A	Contact Factory	K6U-K744A
384	Throttle Plate	1	22051		
385	Pin	1	71108872		
386	Capscrew	2	51712		
387	Capscrew	4	KU-548		K6U-548
388	Fitting	1	71107692		
389	Dump Valve	1	50276		
390	Fitting	1	51814		
392	Hose Fitting	2	51029		
393	Hose	1	50923		
394	Elbow Fitting	1	52182		

• Recommended Spare

**SERVICE NOTES**

# PARTS ORDERING INFORMATION

The use of replacement parts other than INGERSOLL-RAND Material Handling Products will invalidate the Company's warranty. For prompt service and genuine INGERSOLL-RAND Material Handling Products parts, provide your nearest Distributor with the following:

1. Complete model number and serial number, if available, as it appears on the nameplate.
2. Part number and part description as shown in this manual.
3. Quantity required.

For your convenience and future reference it is recommended that the following information be recorded.

**Winch Model Number**.....

**Winch Serial Number**.....

**Disc Brake Serial Number**.....

**Date Purchased**.....

## Return Goods Policy

Ingersoll-Rand will not accept any returned goods for warranty or service work unless prior arrangements have been made and written authorization has been provided from the location where the goods were purchased. Hoists returned with opened, bent or twisted hooks, or without chain and hooks, will not be repaired or replaced under warranty.

## NOTICE

• **Continuing improvement and advancement of design may cause changes to this hoist which are not included in this manual. Manuals are periodically revised to incorporate changes. Always check the manual edition number on the front cover for the latest issue.**

When the life of the hoist has expired, it is recommended that the hoist be disassembled, degreased and parts separated as to materials so that they may be recycled. For additional information contact:

### Ingersoll-Rand Material Handling

2724 Sixth Avenue South  
Seattle, Wa 98124 USA  
Phone: (206) 624-0466  
Fax: (206) 624-6265

or

### Ingersoll-Rand International Sales

### Ingersoll-Rand Material Handling

### Samiia, Douai Operations

111, avenue Roger Salengro  
59450 Douai, France  
Phone: (33) 27-87-11-11  
Fax: (33) 27-96-03-29

## United States Office Locations

### For Order Entry and Order Status:

#### Ingersoll-Rand Distribution Center

510 Hester Drive  
P.O. Box 618  
White House, TN 37188  
Phone: (615) 672-0321  
Telex: 786573  
Fax: (615) 672-0801

#### Ingersoll-Rand Material Handling Technical Support

2724 Sixth Avenue South  
P.O. Box 24046  
Seattle, WA 98124-0046  
Phone: (206) 624-0466  
Telex: 328795  
Fax: (206) 624-6265

#### Regional Sales Offices

##### Atlanta, GA

111 Ingersoll-Rand Drive  
Chamblee, GA 30341  
Phone: (404) 936-6230

##### Detroit, MI

23192 Commerce Drive  
Farmington Hills, MI 48335  
Phone: (313) 476-6677  
Fax: (313) 476-6670

##### Houston, TX

2500 East T.C. Jester  
Suite 150  
Houston, TX 77008  
Phone: (713) 864-3700

##### Los Angeles, CA

5533 East Olympic Blvd.  
Los Angeles, CA 90022  
Phone: (213) 725-2826

##### Milwaukee, WI

12311 W. Silver Spring Dr.  
Milwaukee, WI 53225  
Phone: (414) 461-0973

##### Philadelphia, PA

900 E. 8th Ave., Suite 103  
P.O. Box 425  
King of Prussia, PA 19406  
Phone: (215) 337-5930

## International

Offices and distributors in principal cities throughout the world. Contact the nearest Ingersoll-Rand office for the name and address of the distributor in your country or write/fax to:

Ingersoll-Rand  
Material Handling  
P.O. Box 24046 Seattle,  
WA 98124-0046 USA  
Phone: (206) 624-0466  
Telex: 328795  
Fax: (206) 624-6265

### Canada

#### National Sales Office Regional Warehouse

**Toronto, Ontario**  
51 Worcester Road  
Rexdale, Ontario  
M9W 4K2  
Phone: (416) 675-5611  
Fax: (416) 675-6920

#### Regional Sales Offices

##### Calgary, Alberta

333 11th Avenue S.W.  
Calgary, Alberta  
T2R 0C7  
Phone: (403) 261-8652

##### Montreal, Quebec

3501 St. Charles Blvd.  
Kirkland, Quebec  
H9H 4S3  
Phone: (514) 695-9040

##### British Columbia

201-6351 Westminster Hwy  
Richmond, B.C.  
V7C 5C7  
Phone: (604) 278-0459

#### British Columbia Regional Warehouse Technical Support

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North Vancouver, British  
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Fax: (604) 985-0160

### Latin America Operations

#### Ingersoll-Rand Production Equipment Group

730 N.W. 107 Avenue  
Suite 300, Miami, FL  
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Phone: (305) 559-0500  
Telex: 441617TLS UI  
Fax: (305) 559-7505

### Europe, Middle East and Africa

#### Ingersoll-Rand

#### Material Handling

#### Samiia, Douai Operations

111, avenue Roger Salengro  
59450 Douai, France  
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