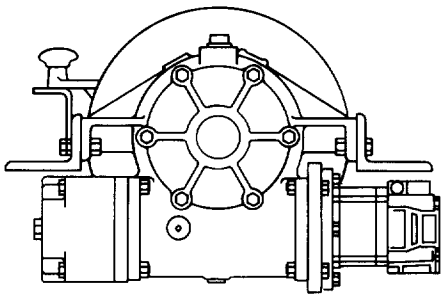
BRADEN

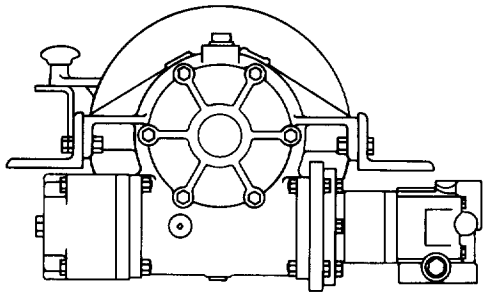
CLOSE COUPLED HYDRAULIC MOTOR KITS

INSTALLATION INSTRUCTIONS



AHGU5 SINGLE SPEED

AMS3
AMSU3
AMGU5
AMU7
AMS7
AMS10
AMSU10



AHGU5 TWO SPEED

⚠ CAUTION

Read and understand this manual before installation and operation of winch. See Safety Precautions and keep this manual for future reference.

PACCAR WINCH DIVISIONS

P.O. BOX 547 • BROKEN ARROW, OK 74013
PHONE: (918) 251-8511 • FAX: (918) 258-4822

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INTRODUCTION

The BRADEN direct mount worm gear winches are designed to take advantage of the Char-Lynn bearingless motor which features a self aligning output shaft, increased hydraulic flow capacity and a short motor. When installing the hydraulic motor, two areas need your special attention. First is the motor adapter/ bearing container to shaft stop button dimension in step 15. The other area is the torque applied to capscrews on winches with aluminum housings in step 16.

Before beginning to install your close coupled motor kit, refer to the appropriate parts list to be sure your kit is complete. Note that the single speed and two speed kits for each winch are identical except for the hydraulic motor, (each kit contains only one motor). Read all instructions and become familiar with the general procedure for installing the kit before beginning to disassemble your winch.

PARTS LISTS

AMSU3 CLOSE COUPLED KIT (SINGLE SPEED) PART NUMBER 61846

AMSU3 CLOSE COUPLED KIT (TWO SPEED) PART NUMBER 61847

DESCRIPTION	PART NUMBER	QTY.
Worm Shaft	26020	1
Worm Key	18030	1
Brake Key	10078	1
Oil Seal	18026	1
Brg. Cont. Gasket	18027	4
Brg. Cont. Gasket	18024	3
Bearing Cup	26257	1
Bearing Cone	26258	1
Bearing Container	26017	1
Seal Container	26255	1
O-Ring	26722	1
Retaining Ring	25700	1
Quad Ring	26256	1
Rest Button	26263	1
O-Ring	72718	1
Bushing	26351	4
Capscrew (3/8 – 16 × 2 1/4 G5)	21474	4
Lockwasher (3/8)	18003	4
Hex Nut (3/8 – 16)	11780	4
Hydraulic Motor (Single Speed)	26311	1
Hydraulic Motor (Two Speed)	26672	1

AMS7 CLOSE COUPLED KIT (SINGLE SPEED) PART NUMBER 61854

AMS7 CLOSE COUPLED KIT (TWO SPEED) PART NUMBER 61855

DESCRIPTION	PART NUMBER	QTY.
Worm Shaft	26719	1
Worm Key	11606	1
Brake Key	18044	1
Brg. Cont. Gasket	11593	1
Brg. Cont. Gasket	11594	6
Bearing Cup	26257	1
Bearing Cone	26258	1
Bearing Container	26012	1
Seal Container	26255	1
O-Ring	26722	1
Retaining Ring	25700	1
Quad Ring	26256	1
Rest Button	26263	1
O-Ring	72718	1
Capscrew (1/2 – 13 × 1 1/4 G5)	13938	4
Lockwasher (1/2)	11026	4
Cover Gasket	11595	1
Hydraulic Motor (Single Speed)	26310	1
Hydraulic Motor (Two Speed)	26675	1

AMGU5 CLOSE COUPLED KIT (SINGLE SPEED) PART NUMBER 61832

AMGU5 CLOSE COUPLED KIT (TWO SPEED) PART NUMBER 61833

DESCRIPTION	PART NUMBER	QTY.
Worm Shaft	26041	1
Worm Key	11606	1
Brake Key	18044	1
Brg. Cont. Gasket	11593	1
Brg. Cont. Gasket	11594	6
Bearing Cup	26257	1
Bearing Cone	26258	1
Bearing Container	26012	1
Seal Container	26255	1
O-Ring	26722	1
Retaining Ring	25700	1
Quad Ring	26256	1
Rest Button	26263	1
O-Ring	72718	1
Capscrew (1/2 – 13 × 1 1/4 G5)	13938	4
Lockwasher (1/2)	11026	4
Cover Gasket	11595	1
Hydraulic Motor (Single Speed)	26310	1
Hydraulic Motor (Two Speed)	26675	1

AMS10 CLOSE COUPLED KIT (SINGLE SPEED) PART NUMBER 61856

AMS10 CLOSE COUPLED KIT (TWO SPEED) PART NUMBER 61857

DESCRIPTION	PART NUMBER	QTY.
Worm Shaft	26333	1
Worm Key	11484	1
Brake Key	18044	1
Brg. Cont. Gasket	11593	1
Brg. Cont. Gasket	11594	6
Bearing Cup	26257	1
Bearing Cone	26258	1
Bearing Container	26012	1
Seal Container	26255	1
O-Ring	26722	1
Retaining Ring	25700	1
Quad Ring	26256	1
Rest Button	26263	1
O-Ring	72718	1
Capscrew (1/2 – 13 × 1 1/4 G5)	13938	4
Lockwasher (1/2)	11026	4
Cover Gasket	11595	1
Hydraulic Motor (Single Speed)	26310	1
Hydraulic Motor (Two Speed)	26675	1

AMU7 CLOSE COUPLED
MATERIAL LIST

DESCRIPTION	PART NUMBER	QTY.
Worm Shaft	25999	1
Worm Key	11402	1
Brake Key	10078	1
Brg. Cont. Gasket	11430	1
Brg. Cont. Gasket	11429	6
Bearing Cup	26257	1
Bearing Cone	26258	1
Bearing Container	26306	1
Seal Container	26255	1
O-Ring	26722	1
Retaining Ring	25700	1
Quad Ring	26256	1
Rest Button	26263	1
O-Ring	72718	1
Capscrew Mtr Mtg (½ – 13 x 1¾ G5)	22364	4
Lockwasher (½)	11026	4
Hydraulic Motor 11.9 cu. in.	26305	1
Hydraulic Motor 14.9 cu. in.	26304	1
Hydraulic Motor 2 Speed	26673	1
Worm Gear Housing	81758	1
Brake Cover Gasket	11446	1
Brg. Cont. Gasket	26871	2

INSTRUCTIONS

If the winch cannot be removed to a suitable workbench, be certain the winch driving mechanism is safely disengaged and cannot be accidentally started while any work is being done on the winch.

1. Drain the oil from the winch into a suitable container by removing the vent and drain plugs.

2. Remove the capscrews holding the brake housing to the worm gear housing and remove the brake housing.

   A. On winches with a dry brake band, remove the brake drum by loosening the setscrew holding it to the worm shaft. Remove the key from the worm shaft.

   B. On winches with an oil cooled safety brake, remove the leaf spring assembly, pressure plate and outer friction disc. Before removing the brake rotor assembly, mark it with a center punch or other tool so it can be re-installed with the same side toward the leaf spring assembly. Remove the rotor assembly and inner friction disc. Remove the key from the worm shaft. Inspect the friction discs for glazing or cracks.

3. Remove the drive sprocket and key from the worm shaft and remove the capscrews holding the bearing container to the worm gear housing. Remove the bearing container and bearing cup. Remove the worm and worm shaft assembly. Remove the bearing cone and spacer from each end of the worm shaft. The worm can now be pressed off of the worm shaft. **NOTE:** Be careful not to damage the worm when pressing it from the shaft. The worm, one spacer and brake side bearing cone are the only parts removed in step 3 that will be re-used.

4. Remove the brake side bearing container.

5. Carefully clean and inspect all parts to be reused for obvious signs of wear and/or damage and replace them as necessary. Thoroughly remove all gasket material from all gasket surfaces. On winches with a dry band brake, a new oil seal is provided in the kit. Remove the old seal from the brake side bearing container and install the new seal. (If so equipped.)

6. Install the new bearing cup from the kit into the new input end bearing container.

7. Install the new worm key in the new worm shaft. Lightly press the worm onto the worm shaft until it rests against the shoulder on the worm shaft. **NOTE:** Due to the design of the new worm shaft, only one worm spacer is used. Install the worm spacer and brake side bearing cone onto the worm shaft. Install the new bearing cone from the kit on the input end of the worm shaft.

8. Install the worm shaft assembly into the winch.

9. Using one of the thick bearing container gaskets, install the bearing container, with its bearing cup in place, in the brake side of the worm gear housing.

10. Using another of the thick gaskets, install the new bearing container from step 6, in the input side of the worm gear housing. Install two capscrews to hold the bearing container in place while you assemble the brake.

11. Use one of the following procedures to assemble the brake.

   A. **Winches with a dry band brake.** Install the new brake key in the worm shaft and slide the brake drum onto the shaft. Tighten the set screw in the brake drum, being careful the brake drum is not touching the bearing container. Install the brake housing with four capscrews.

   B. **Winches with an oil brake.**

⚠ WARNING

The brake rotor MUST be installed in the same direction as it was removed. Failure to correctly install the brake rotor will greatly reduce the load holding capacity of the winch which could result in property damage, personal injury or death.

Install the new brake key in the worm shaft. Apply a light coat of grease to one side of a friction disc and install it against the bearing container. (The grease will help hold the disc in position until the brake housing is installed.) Install the brake rotor onto the worm shaft in the same direction as it was removed. Check the condition of the O-Ring on the brake adjusting nut and replace it if necessary. Install the adjusting nut, O-Ring, brake spring assembly, pressure plate and the outer friction disc into the brake housing. Using a thick gasket, carefully install the brake housing over the brake rotor and bolt the brake housing and bearing container to the worm gear housing.

12. The worm shaft end play can now be adjusted. Refer to the chart below for the correct end play for your winch. Excessive end play will cause oil leaks around the worm shaft and greater wear on the worm gear and bearings. Too little end play will not allow for thermal expansion of the worm. Measure worm shaft end play on the input end with a dial indicator. Move the worm shaft in and out by rocking the winch drum with the clutch engaged.

Winch	End Play (inches)
AMS3	0.007 – 0.015
AMSU3	0.007 – 0.015
AMGU5	0.007 – 0.015
AMU7	0.010 – 0.020
AMS7	0.010 – 0.020
AMS10	0.010 – 0.020
AMSU10	0.010 – 0.020

13. If your winch has separate sets of holes for bolting the bearing container to the worm gear housing and the motor to the bearing container, install all the bolts holding the bearing container to the worm gear housing at this time.

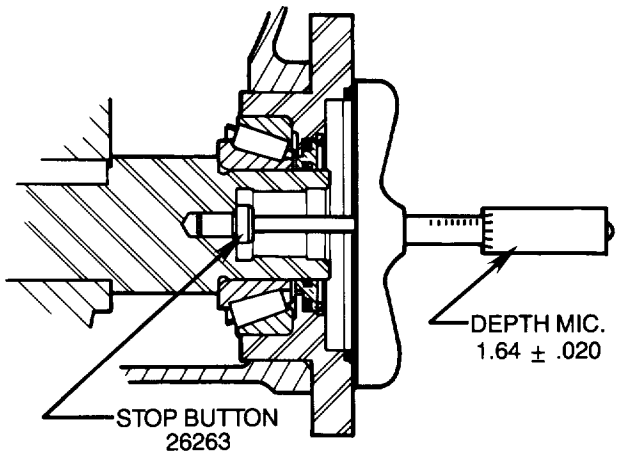
14. Apply a light coat of grease to the O-Ring and quad ring and place them into the seal container. Refer to the drawing below. Slide the seal container over the input end of the worm shaft and install the retaining ring into the groove in the bearing container.

15. Install the stop button into the end of the worm shaft and check the dimension from the stop button to the face of the bearing container.

⚠ CAUTION

The stop button MUST be in place. Rapid motor damage and/or motor failure could result if the button is left out.

16. Apply a light coat of grease to the motor O-Ring and install it into the bearing container. Carefully install the motor and capscrews.



MUST BE IN PLACE!

⚠ CAUTION

The smaller winches have aluminum housings which are subject to abuse by over torqueing the motor mounting bolts. The capscrews should be hand tightened to the following torque values:

3/8 – 16 Capscrew .....31 FT-LBS
1/2 – 13 Capscrew .....75 FT-LBS

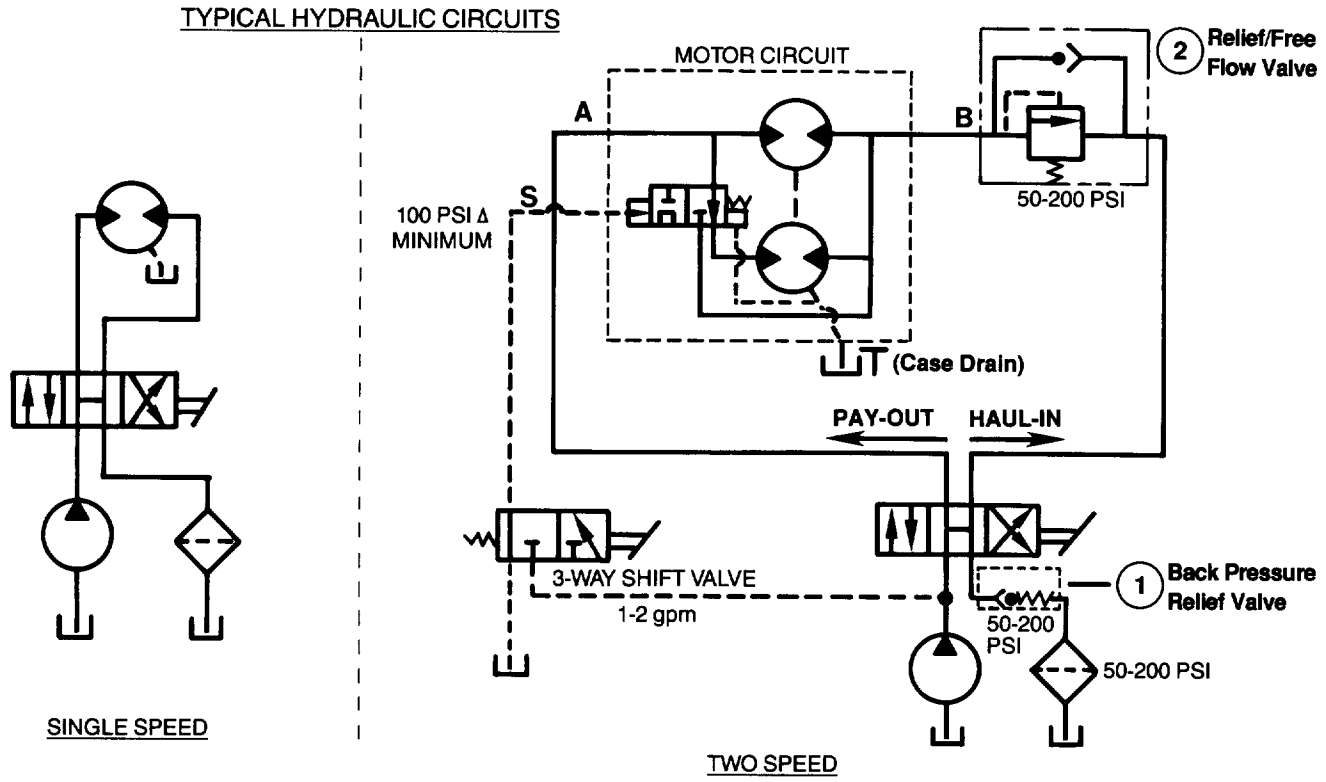
17. Fill winch to the proper level with the recommended worm gear oil. Approximate oil capacities are shown below if the winch is mounted in a normal horizontal position. Fill the winch to the level plug. On boom tip winches, turret winches or winches mounted upside down, fill to the level plug or half way up on the worm and be certain that the safety brake has oil when it is located in the highest position.

AMS3	3/4 pints
AMSU3	3/4 pints
AMGU5	2 pints
AMU7	2¼ pints
AMS7	3 pints
AMS10	5 pints
AMSU10	4½ pints

Refer to BRADEN publications 10-3 (Safety Brake) and 10-5 (Worm Gear Winch Maintenance and Service) for further information including recommended worm gear oil and safety brake adjustment.

This completes the conversion to a close-coupled motor. The following additional information is provided to assist you with the proper hydraulic installation and operation of both the single and two speed motors.

APPLICATION AND INSTALLATION OF DIRECT MOUNT MOTORS FOR WORM GEAR WINCHES



SPECIFICATIONS:

Motor Back Pressure Limits:

100 PSI Continuous (Capstan)
200 PSI Intermittent (Winch)
600 PSI Peak

NOTE: A case drain is recommended when using hydraulic line quick disconnects, as in trailer applications, to prevent accidentally pressurizing both motor ports.

Port Sizes:

(A) and **(B)** Supply Ports, -10 SAE O-Ring Boss (7/8 – 14 Thread)
(T) Tank Port: Single Speed, -4 SAE O-Ring Boss (7/16 – 20 Thread)
Two Speed, -6 SAE O-Ring Boss (9/16 – 18 Thread)
(S) Two-speed Shift Port, -4 SAE O-Ring Boss Port (7/16 – 20 Thread)

TWO SPEED WINCHES:

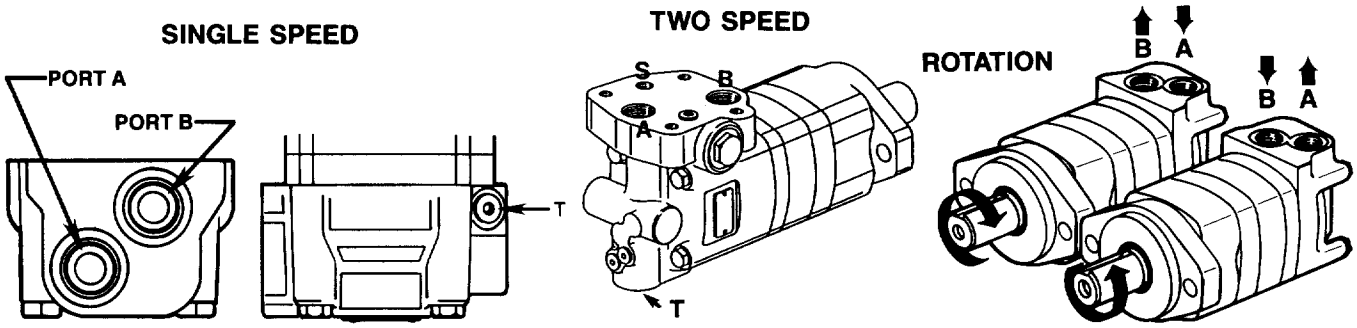
- 100 PSI Differential pressure is required to shift the motor into high speed. (**NOTE:** If the winch will not shift into high speed with no load on the winch, adding a case drain will eliminate the back pressure effect on the shift valve. This should allow the motor to shift into high speed.)
- A customer supplied 3-way hydraulic valve is required to shift the motor into high speed. A 1/4" valve rated for over 2.0 GPM is adequate and may be manually, solenoid, or otherwise remotely actuated to suit the application. (**NOTE:** In low speed, the 3-way valve must connect the motor port **S** to tank to prevent a false motor shift to high speed.)
- The most efficient motor operation results when the hoisting flow is applied to port **B.** (**NOTE:** Safety brake must be oriented correctly.)
- Due to the design of the Char-Lynn 2-speed motor valving, some applications may experience a high pitched noise when operated in one direction of high speed rotation. This can be corrected by creating a limited back pressure on the motor port **B** (port closest to the motor mounting flange). There are two typical ways this may be accomplished;

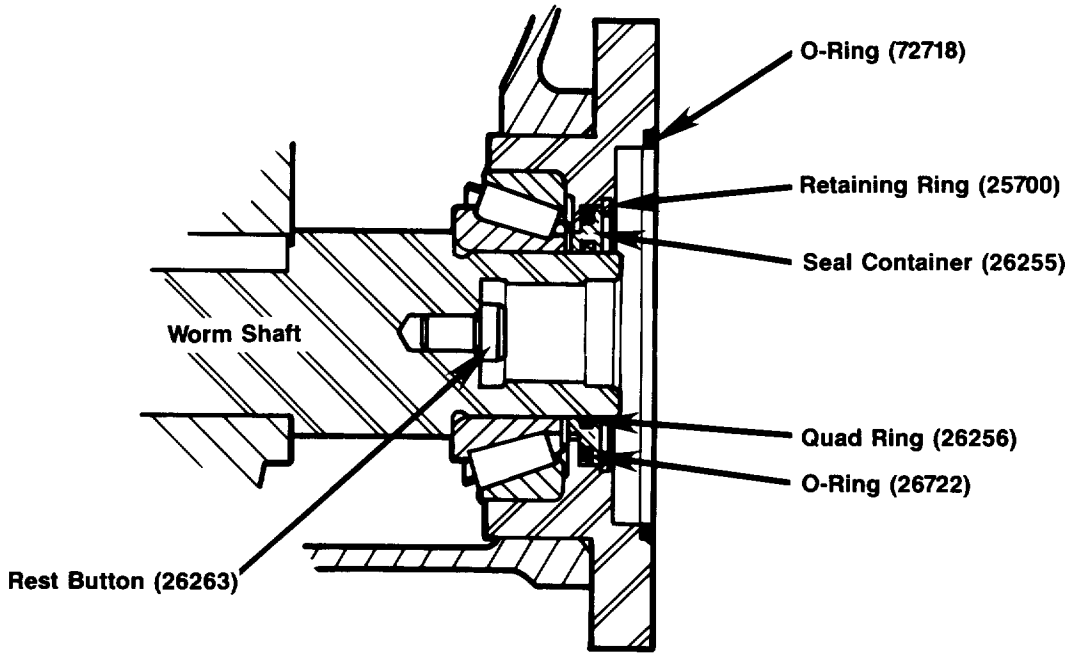
  First, if the winch is the primary hydraulic function, it is least expensive to install a back pressure check valve between the directional control valve and the filter. This will create additional back pressure on the total hydraulic circuit. (See item 1 in the Two Speed Hydraulic Circuit)

  Second, a relief/free-flow valve can be used on circuits with multiple hydraulic functions. This will apply a back pressure to only port **B** of the Char-Lynn motor. A typical valve would be Sun Hydraul-

ics # YCFC-FEN-BK, 200 PSI. (See item 2 in the Two Speed Hydraulic Circuit)

ADJUSTMENT — With either option, run the winch at full speed, no load, and increase the back pressure until the high pitched noise decreases. If back pressure at motor port **B** exceeds 200 psi, a case drain is recommended. Also consult the BRADEN Service Department.





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