Bucyrus-Erie

Service Manual

P29 Winch

Service Manual

BU-S-P29 WINCH

DESCRIPTION

Figure 1. Bucyrus-Erie Model P-29 Winch, Right Rear View

1. GENERAL DESCRIPTION, Figures 1, 2 and 3.

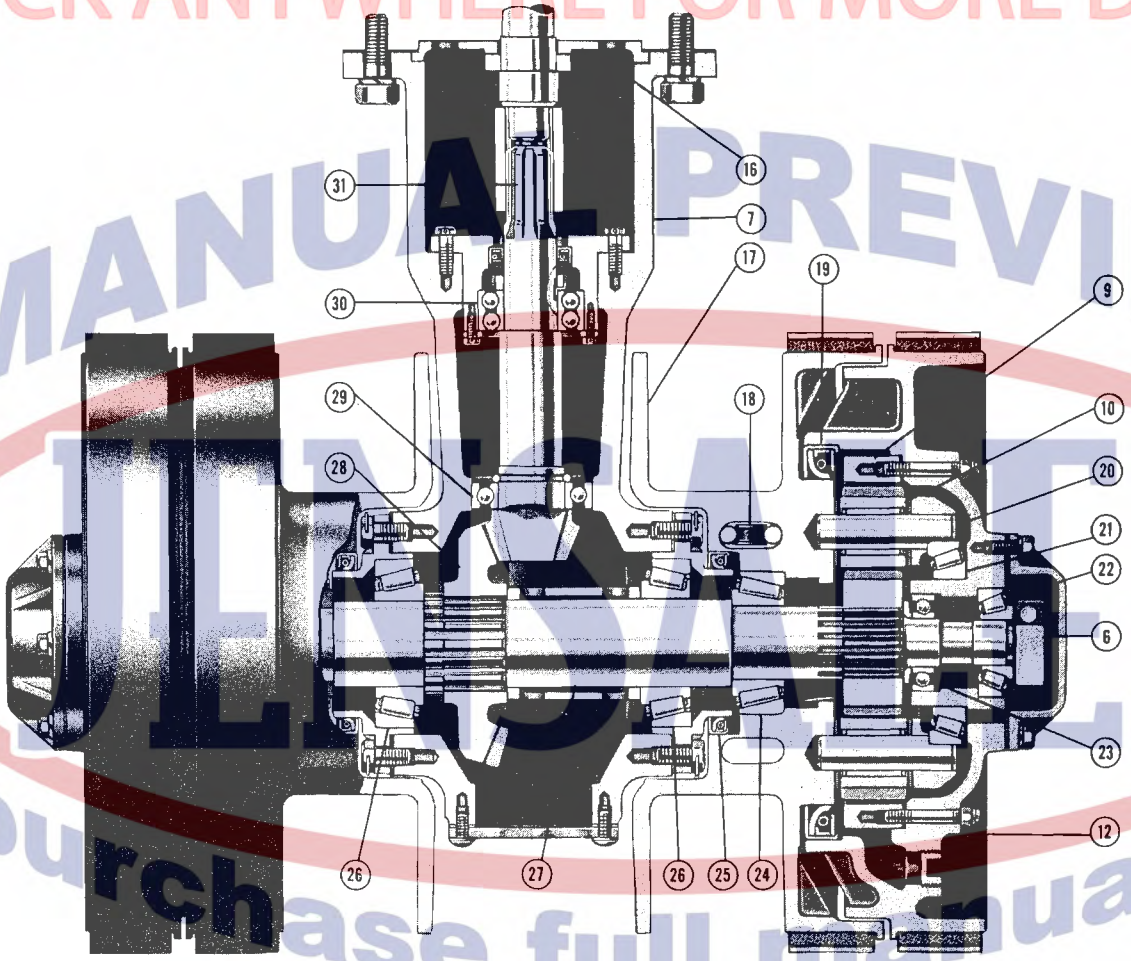
The Bucyrus-Erie P-29 Power Control Winch is designed for use with International TD-18 and TD-24 TracTracTors to operate cable scrapers, cable bullgraders and other allied tractor equipment.

The P-29 is a planetary type winch designed for two line control. Basically it consists of a gear case which carries two cable drums with the operating mechanism, and a control bracket which supports the control levers and cams. The drive mechanism consists of a bevel pinion and gear which drive a planetary gear system in each drum, par. 3. The entire mechanism and all bearings operate in an oil bath in the gear case.

The clutch and brake for each drum are operated through the control levers by reversible and interchangeable friction bands. Simple external adjustments are provided for clutch and brake bands.

NOTE

Covers are provided to protect brake and planetary bands and drums from dirt and weather.



Legend for Figures 2 and 3

1. Hand levers
2. Guide sheave
3. Control bracket
4. Operating cam
5. Release spring rod
6. Main shaft nut
7. Gear case
8. Sun pinion
9. Ring gear
10. Planet pinion
11. Clutch and brake bands
12. Clutch housing
13. Fairlead sheave
14. Cable cutter
15. Cable
16. Centering plate
17. Drum and brake housing
18. Rope anchor
19. Clutch housing oil seal
20. Planet pinion pin
21. Drum and brake housing bearing
22. Clutch housing bearing
23. Clutch housing bearing
24. Drum and brake housing bearing
25. Drum and brake housing oil seal
26. Main shaft bearings
27. Main shaft
28. Bevel gear
29. Intermediate shaft bearing (inner)
30. Intermediate shaft bearing (outer)
31. Intermediate shaft and pinion

Figure 3. Section Through Top Of P-25 Winch
General Construction of P-29 Similiar. For Details Refer to Parts Drawing.

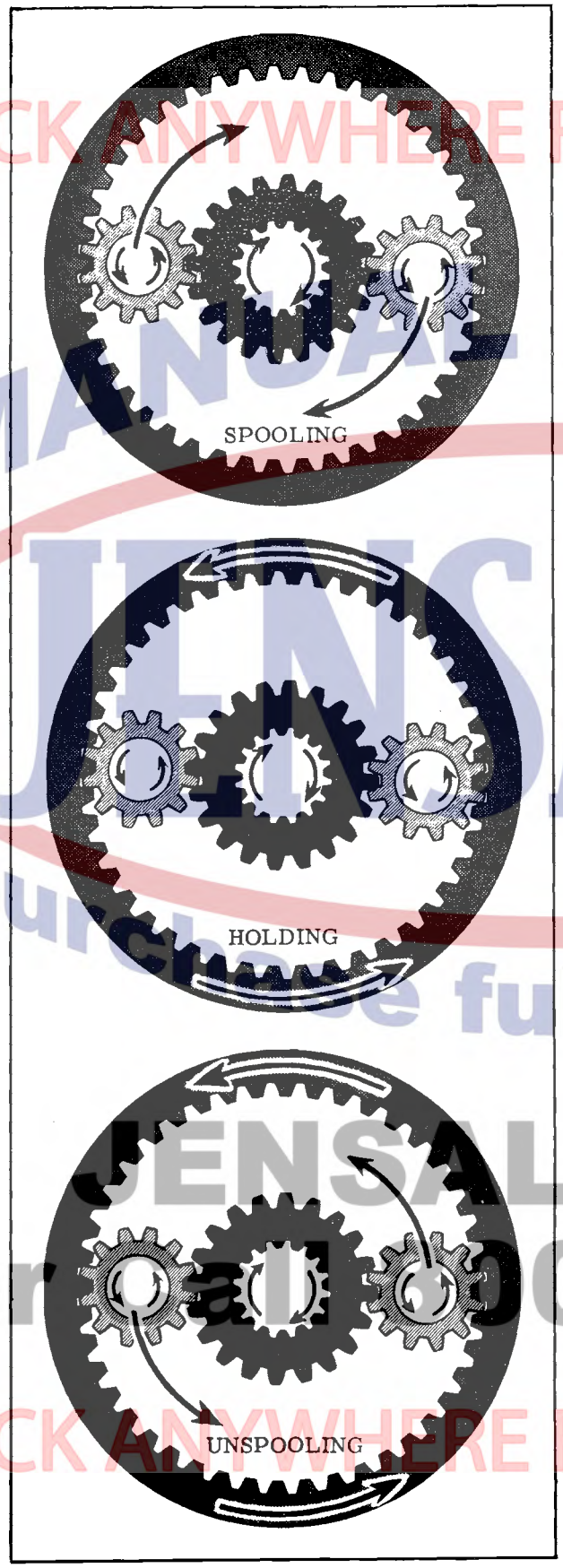


Figure 4. Principle Of Operation

2. SPECIFICATIONS.

Number of cable drums	2
Cable drum length (each drum)	4 in.
Cable drum diameter	10 in.
Cable drum flange diameter	17-5/8 in.
Sheave diameter	10 in. p. dia.
Number of oil seals	5
Bearings	Anti-Friction
Planetary and brake drum diameter	17-5/8 in.
Friction lining width	4 in.
Total gear reduction	10.00:1
Cable capacity - 1/2 in. cable (each drum)	230 ft.
Cable capacity - 9/16 in. cable (each drum)	180 ft.
Line speed, first layer based on 1350 RPM PTO shaft	370 ft. min.
Rated line pull-first layer	7000 lbs.
Approximate weight with brake and planetary covers	2300 lbs.

It is the policy of Bucyrus-Erie Company to improve its products continually, accordingly the right is reserved to make changes in specifications or design which, in the opinion of this Company, are in accord with this policy.

3. OPERATING PRINCIPLE, Figure 4.

Each of the two planetary systems consists of the SUN gear, two PLANET gears and an internal RING gear, figure 2. The sun gear is keyed to the drive shaft through splines and meshes with the two planet gears. The planet gears are installed on pins in the cable drum and mesh with the internal teeth of the ring gear which is bolted inside the clutch housing.

SPOOLING. The sun gear rotates at all times the tractor power take-off shaft is in operation. When the friction band is applied to the clutch housing the housing and ring gear cannot rotate. The stationary ring gear forces the two planet gears to travel around the inside of the ring gear and drive the cable drum in spooling direction.

HOLDING. When the friction band is applied to the brake housing it holds the cable drum firmly and keeps the loaded cable taut. The planet gears spin on their own axis and cause the ring gear and clutch housing to rotate.

clamps securely to the control shafts.

Fill gear case and lubricate the winch as instructed in paragraph 12 of this manual before reeving cables on the winch.

8. CABLES. The P-29 Winch is designed for 1/2 inch or 9/16 inch cable only.

The Bucyrus-Erie Company specifies 6 x 19, performed, independent wire rope center, improved plow steel, regular right lay wire rope for all cable operated tractor equipment. Best cable life will be obtained from this type.

To prevent kinking the cable when removing from a reel, revolve the reel and take out the cable in the same way it was put on the reel. One method of doing this is to put a shaft through the center of the reel and jack it up so the reel will revolve freely. Pull the cable straight ahead, keeping it tight to prevent it from loosening on the reel. A board held against one flange may be used as a brake to keep reel from revolving too fast.

To prevent kinking a cable when uncoiling, remove ties and roll coil along the ground so the rope lies straight. There will be no twist or kink in the rope if these instructions are followed, figure 7.

Removing cable from a reel or coil without revolving it results in a twist as each turn is taken off. If this twist is not removed and the rope straightened before being placed under tension, a kink is apt to result.

To cut cable, use the handy cable cutter on the winch control bracket, figure 1. Insert cable in the cutter and cut it by a sharp blow with a hammer.

REEVING CABLE. With tractor engine turned off, lead loose end of 1/2 or 9/16 inch cable horizontally around lower section of swinging fairlead sheaves, up through upper hole in fairlead shaft, up around sheave in sheave post, then down through hole in deck of winch to cable drum. Turn drum by hand (brake released) until you can run cable from underside of cable drum through smallest of the two holes in the rope socket. Then turn drum until larger hole with a foot and a half of cable extending is accessible. Make a loop using the foot and a half of the cable end, placing at least 6 inches of the cable end back in the large hole of the drum rope socket. Place rope socket wedge in this loop. Firmly pull cable from swinging fairlead sheaves until loop decreases and cable is held solid by rope socket wedge. See figure 8.

NOTE

There are two rope sockets on drum, facing in opposite directions. When running cable under drum into socket be sure to enter cable in socket having its small opening facing cable end.

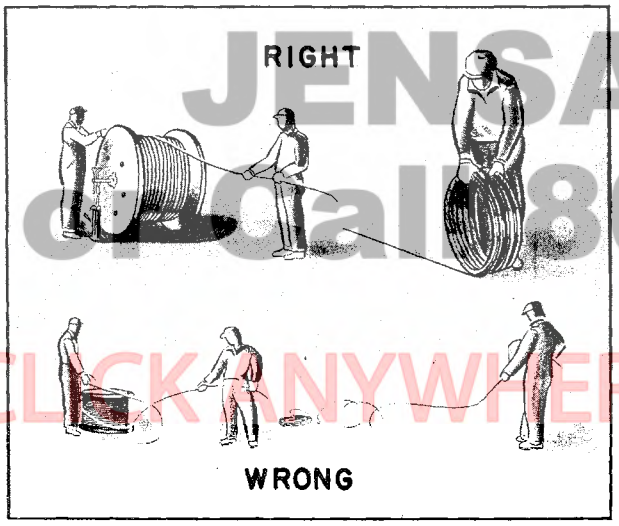
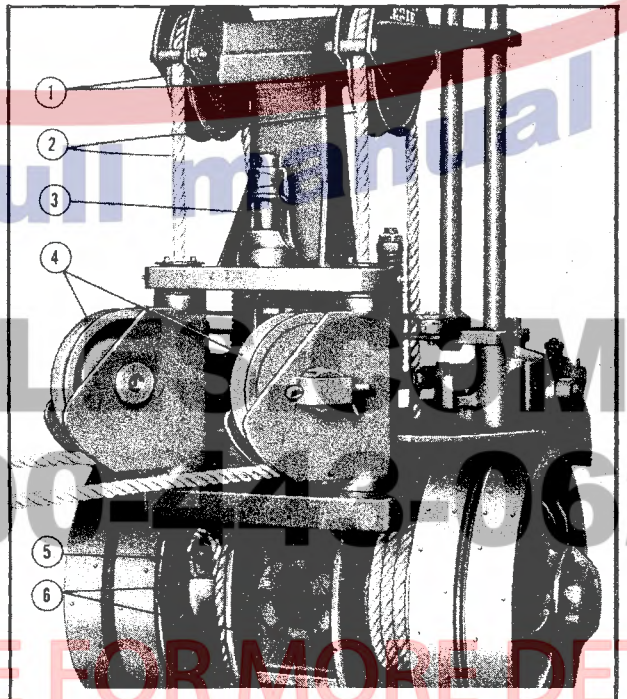


Figure 7. Removing Cable From Reel Or Coil



1. Guide sheaves
2. 1/2 inch cables
3. Cable cutter
4. Fairlead sheaves
5. Cable anchor
6. Cable drums

Figure 8. Cable Reeving View P-25 Shown. P-29 Similiar.

OPERATION

9. PREPARING THE WINCH FOR OPERATION.

Before operating the winch after it is installed and before starting each shift of operation check the following:

Check and if necessary add oil to bring level up to arrow on oil level indicator glass. Lubricate all grease fittings. Refer to paragraph 12.

Check operation of clutch and brake bands and make adjustments if necessary. Refer to paragraph 13.

Inspect cable to detect failure of individual strands of wire or other damage which might cause the cable to fail in operation.

10. CONTROL LEVER POSITIONS, Figure 9.

NOTE

The terms 'right' and 'left' indicate the right and left as used by operator as he sits in tractor seat facing radiator of tractor. Each drum of power control unit is controlled by a separate operating lever. Lower lever controls spooling and unspooling of right hand drum. Upper lever controls left hand drum, figure 1.

SPOOL. When either lever is pulled to left, clutch housing is held tightly. This permits planetary gears to drive cable drum and spool in cable.

HOLD. When lever is released, it returns to HOLD position. It should point approximately toward right corner of tractor seat at this time. Here the brake drum is automatically held in position.

UNSPOOL. To unspool cable drum, push lever to right. Now brake drum is free to turn in either direction while clutch band is released. Line-pull unwinds cable from drum.

FREE. An extra push of hand to right will lock lever in unspooling position. When lever is locked in FREE, brake drum is free to turn in either direction so that operator may step down from tractor and with no assistance reeve or change cable on the drum. Always stop engine when doing this.

11. OPERATION.

The winch is operated from the tractor power take-off. To use the winch the tractor engine must be operating and the power take-off engaged. When the winch is not in use, disengaging the power take-off will save unnecessary wear on the winch.

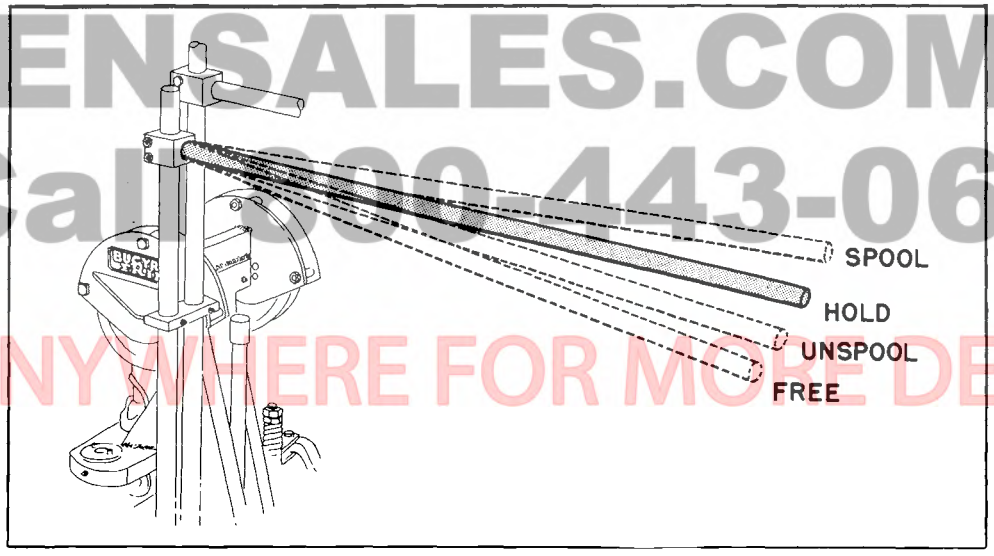


Figure 9. Control Lever Positions