

SERVICE SECTION
FOR CARCO SERVICE AND PARTS MANUAL

Carco Model A Winch Series 3

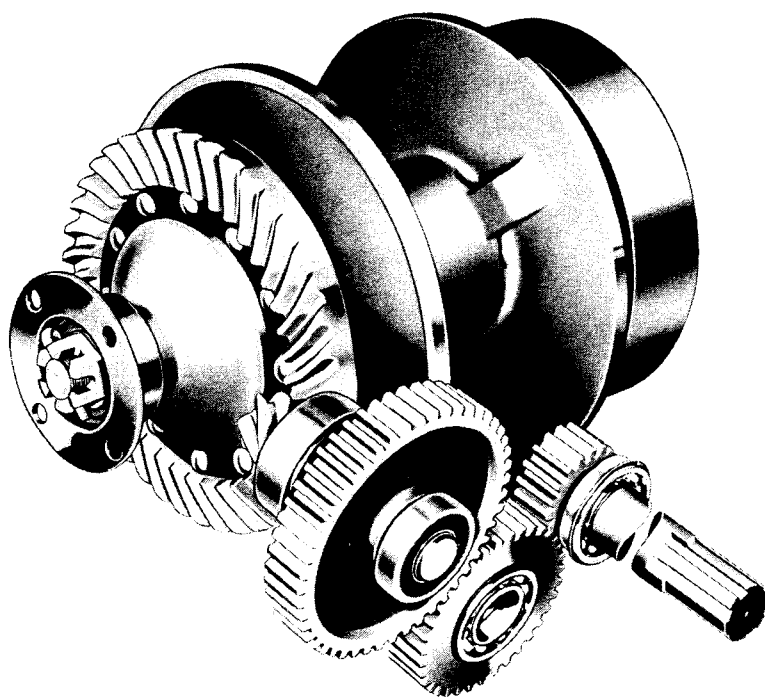
THE PURPOSE OF YOUR SERVICE SECTION

This Service Section is designed to provide a general knowledge of the working mechanism, operation and proper maintenance procedure of this unit. The operator is urged to thoroughly read this manual and thereby acquaint himself with the correct operational and maintenance procedure. The Service Section includes General Information, Lubrication and Adjustment Instructions, as well as the Disassembly and Assembly Information.

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WINCH WITH CASE REMOVED

SERVICE INSTRUCTIONS

I. GENERAL INFORMATION

GENERAL DESCRIPTION

The Carco Model A-3 Winch is a single-speed, free-spooling unit designed for use on wheel or crawler-type tractors. The winch, mounted on the rear face of the tractor transmission, takes its power from the power-take-off. Two levers, one for the friction-type clutch, the other for the brake, control winch operation through flexible cables and mechanical linkage.

On most installations the clutch and brake can be serviced without removing the winch from the tractor; the brake assembly can be installed for underwind or overwind without use of additional parts.

OPERATION

The brake control and clutch control levers (*Figure 1*) are normally mounted on the tractor fender at the operator's left.

To apply the brake, the lever is pulled

rearward toward the operator. A ratchet is provided on the control stand which permits the brake lever to be locked in the applied position.

To engage the clutch, the lever is pulled rearward toward the operator. The lever will remain in the engaged position until moved slightly forward. It will then return to the disengaged position.

CABLE DRUM ROTATION

The Model A-3 Winch can be installed as an overwinding unit (with cable winding in at the top of the drum), or as an underwinding unit (with cable winding in at the bottom of the drum). Winch speed and pull remain the same in either instance.

When changing from overwind to underwind, or visa versa, the position of the bevel gear must be changed, and the brake mechanism reversed to counteract resulting opposite drum rotation when the brake is applied.

REVERSING CABLE DRUM ROTATION

Remove the brake assembly, drum shaft assembly, and bevel gear assembly as described in Section IV, and reverse the position of the bevel gear on the drum shaft.

Install bevel gear assembly, drum shaft assembly, and brake assembly as described in Section IV paying particular attention to the following instructions regarding brake installation:

(a.) If brake is being installed for overwind, adjustment bolt (*B*, *Figure 2*) must be installed in hole directly beneath the junction of control cables and winch case; if brake is being installed for underwind, adjustment bolt must be installed in hole (*A*, *Figure 2*) at the bottom of the winch case.

(b.) If brake is being installed for overwind, pin (*8*, *Figure 4*) connects brake link (*9*, *Figure 4*) through lower forward holes in brake roller lever (*12*, *Figure 4*). If brake is being installed for underwind, pin (*8*, *Figure 4*) connects brake link (*9*, *Figure 4*) through the lower rear holes in brake roller lever (*12*, *Figure 4*).

NOTE: The brake assembly illustrated in *Figure 2* has been installed for overwind.

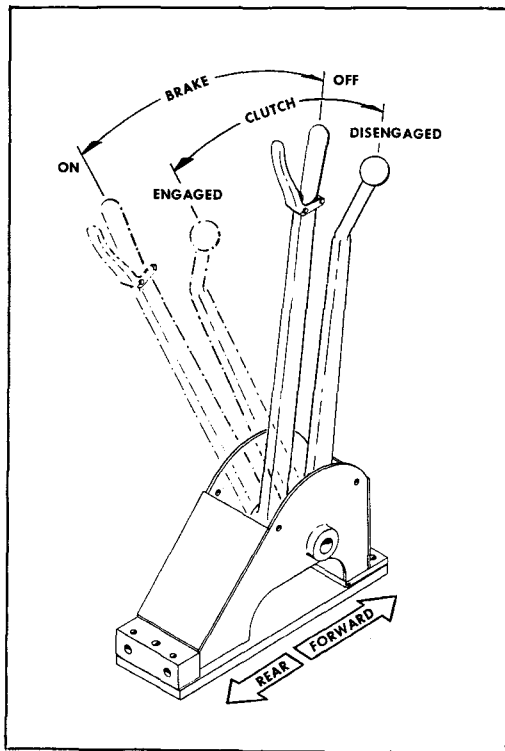


FIGURE 1

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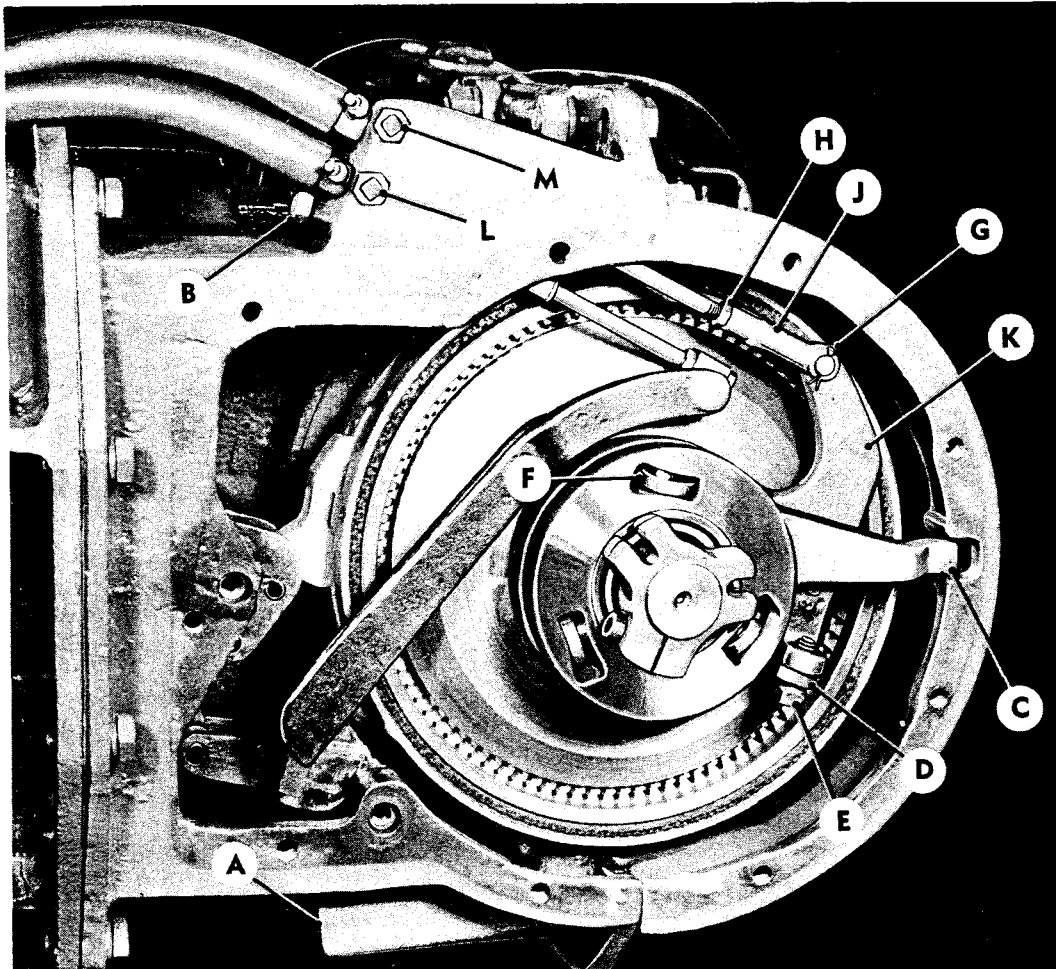


FIGURE 2

II. ADJUSTMENTS

BRAKE ADJUSTMENT

If brake does not hold when applied, tighten adjustment bolt (B, Figure 2) until braking becomes effective.

NOTE: Overtightening of the adjustment bolt will cause unnecessary wear to brake lining, and will not permit cable to spool out freely.

CLUTCH TOGGLE ADJUSTMENT

If the clutch control lever does not remain engaged or is difficult to disengage, the clutch toggles require adjustment.

CAUTION: Stop the tractor engine and disengage the master clutch before making any adjustments to the clutch.

Remove brake cover to expose brake and clutch assemblies as shown in Figure 2.

To compensate for wear to clutch toggle stop pad (C, Figure 2) loosen lock nut (D, Figure 2) and loosen or tighten set screw (E, Figure 2) until toggles (F, Figure 2) are just past dead center when clutch is engaged. Toggles are properly set when clutch control lever will stay in the engaged position without being held. The lever should disengage when given a slight push forward.

CLUTCH ADJUSTMENT

If clutch slips it must be adjusted. Before attempting to adjust the clutch however, check to see that clutch toggles have been properly set as described in the preceding paragraph.

Remove clutch adjustment cover to ex-

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pose the bronze adjusting nut (*B*, *Figure 3*). Loosen lock screw (*A*, *Figure 3*). Using a bar, turn adjusting nut in a clockwise direction to tighten clutch; turn adjusting nut in a counter-clockwise direction to loosen clutch. Over tightening will cause operation to be difficult and can result in overheating.

SETTING THE CONTROL CABLE

The control cables should be adjusted to take advantage of the maximum cable travel. This is done as follows:

Disconnect yoke (*J*, *Figure 2*) from arm of the toggle actuating ring (*K*, *Figure 2*). Move toggle actuating ring clockwise until clutch is fully disengaged. Be sure clutch control lever is in the disengaged position. Loosen lock nut (*H*, *Figure 2*) and screw yoke up or down on cable-end until the yoke pin holes line up with the hole in the arm of actuating ring without changing the position of the ring. Tighten lock nut down firmly against yoke, and secure yoke pin with cotter pin (*G*, *Figure 2*). If necessary reset clutch toggles and adjust clutch.

III. BRAKE AND CLUTCH SERVICING

BRAKE BAND REMOVAL

Remove brake cover to expose brake and clutch as shown in *Figure 2*. Remove cotter pin (*G*, *Figure 2*) and yoke pin. Remove nut (*1*, *Figure 4*) from end of brake control cable, withdraw control cable from block (*2*, *Figure 4*). Use two cap screws (which attach brake cover to winch case) to pull brake lever pins (*5* and *7*, *Figure 4*). Detach assembled brake levers and link. Loosen jam nut and set screw (*L*, *Figure 2*) which secures brake cable to winch case and pull cable forward until clearance for removal of brake band is obtained. Disconnect clevis (*J*, *Figure 2*) from arm of toggle actuating ring. Loosen lock nut and set screw (*M*, *Figure 2*) and pull control cable forward as far as possible.

Loosen set screw (*5*, *Figure 5*) and remove bronze adjusting nut. Remove entire clutch toggle assembly, (*7* through *15*, *Figure 5*) as a group.

Remove nut and adjustment bolt, (*13* and *14*, *Figure 4*) then remove brake band.

BRAKE BAND REPLACEMENT

After determining if the brake assembly is to be installed for overwind or underwind, slip the brake band over the brake drum and secure it with nut (*13*, *Figure 4*) and adjustment bolt (*14*, *Figure 4*).

Replace entire clutch toggle assembly and bronze adjusting nut, making sure that clutch is properly adjusted, then tighten set screw (*5*, *Figure 5*).

Return control cable clevis to original position and connect to arm of toggle actuating ring. Tighten set screw and lock nut (*M*, *Figure 2*).

Install assembled brake levers and link with block (*2*, *Figure 4*) on brake lever (*6*, *Figure 4*) then secure with brake lever pins (*7* and *5*, *Figure 4*). Pull control cable back into position and secure to winch case by tightening set screw and jam nut. Enter end of control cable through hole in block and attach nut (*1*, *Figure 4*) to brake control cable.

Adjust brake as described in Section II. Replace brake cover.

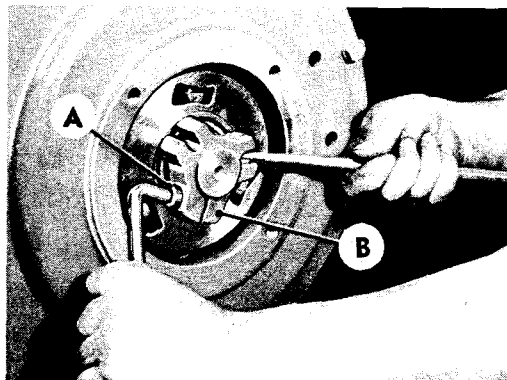


FIGURE 3

CLUTCH PLATE REMOVAL

Remove brake cover to expose brake and clutch as shown in *Figure 2*. Remove nut (*1*, *Figure 4*) to disconnect control cable from brake lever. Remove pins and brake lever (*4*, *5* and *6*, *Figure 4*).

Disconnect clevis (*J*, *Figure 2*) from arm of toggle actuating ring. Loosen lock nut and set screw, (*M*, *Figure 2*) and pull control cable forward as far as possible.

Loosen set screw (*5*, *Figure 5*) and remove bronze adjusting nut. Remove entire clutch toggle assembly as a group and clutch pressure plate, (*7* through *16*, *Figure 5*).

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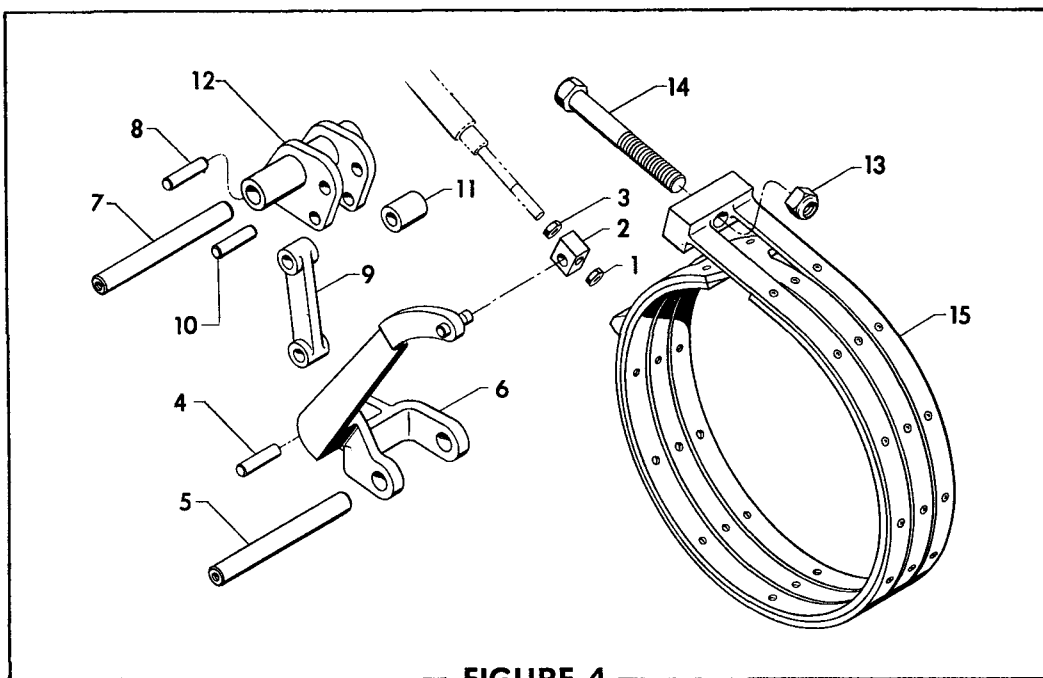


FIGURE 4

After removing and inspecting the four springs (17, Figure 5) the clutch discs and plates (18 and 19, Figure 5) can be removed.

CLUTCH PLATE REPLACEMENT

There are five clutch plates (teeth on outer rim) and five clutch discs (teeth on inner rim) used in the Model A-3 Winch. Install first a clutch plate (19, Figure 5) and follow with a clutch disc (18, Figure 5)

and so on in that order. Continue to reassemble the clutch in the reverse order of the key index numbers (1 through 17, Figure 5). Adjust toggles and clutch, and reset control cable as described in Section II. Install brake lever (6, Figure 4) with block (2, Figure 4) in place. Enter end of control cable through hole in block and attach nut (1, Figure 4). Readjust brake as described in BRAKE ADJUSTMENT, Section II.

IV. DISASSEMBLY AND ASSEMBLY

PREPARATION

Disassembly of brake and clutch assemblies generally can be accomplished without removing the winch from the tractor. If the drum shaft assembly requires overhaul, remove two drain plugs (15, Figure 7) and drain oil from winch.

If bevel pinion assembly requires overhaul, it is necessary to remove winch from the adapter plate.

NOTE: After removal of the brake assembly the entire drum shaft assembly can be removed from the winch by first removing cover (9, Figure 7) shims (10, Figure 7) and case flanges (17 and 19, Figure 7).

BRAKE DISASSEMBLY AND ASSEMBLY

Remove cap screws and lock washers (4 and 5, Figure 7) and brake cover (6, Figure 7) from winch case. Disassemble brake group in the order of the key index numbers shown in Figure 4. Use two cap screws (4, Figure 7) to pull brake lever pins (5 and 7, Figure 4).

Reassemble brake assembly in the reverse order of the key index numbers shown in Figure 4.

NOTE: Be sure that brake band (15, Figure 4) and adjustment bolt and nut (14 and 13, Figure 4) as well as pin (8, Figure 4), are installed for the desired direction of cable drum rotation. Refer to

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paragraph entitled REVERSING CABLE DRUM ROTATION.

Reset control cable and adjust clutch and brake as described in Section II. Install brake cover (6, *Figure 7*) with clutch adjustment cover (3, *Figure 7*) attached.

CLUTCH DISASSEMBLY AND ASSEMBLY

Remove brake cover and brake assembly as described above. Disassemble clutch in the same order as the key index numbers (1 through 22, *Figure 5*) except that the toggle assembly parts (7 through 15, *Figure 5*) are removed as a unit group.

Do not remove dowel pins or toggles (12 and 13, *Figure 5*) unless damage is evident.

Reassemble the clutch assembly in the reverse order of the key index numbers (1 through 22, *Figure 5*). There are five plates (19, *Figure 5*) and five discs (18, *Figure 5*). Install a plate first, followed by a disc, and so on in that order. If dowel

pins (12, *Figure 5*) have been removed in order to replace toggles (13, *Figure 5*) be sure that pins are flush with bores of actuator ring and anchor ring (15 and 14, *Figure 5*) to prevent distortion of bearings (11 and 10, *Figure 5*). Install drum shaft assembly on winch case.

Using suitable gasket cement, install gaskets and case flanges (14, 19 and 17, *Figure 7*). Install shims and cover (10 and 9, *Figure 7*).

BEVEL GEAR DISASSEMBLY AND ASSEMBLY

Remove bevel gear and related parts from drum shaft in the same order as the key index numbers (23 through 31, *Figure 5*).

NOTE: If bevel gear removal is being done in order to change the winch from overwind to underwind, or visa versa, do not remove gear from hub. Refer to paragraph entitled REVERSING CABLE DRUM ROTATION.

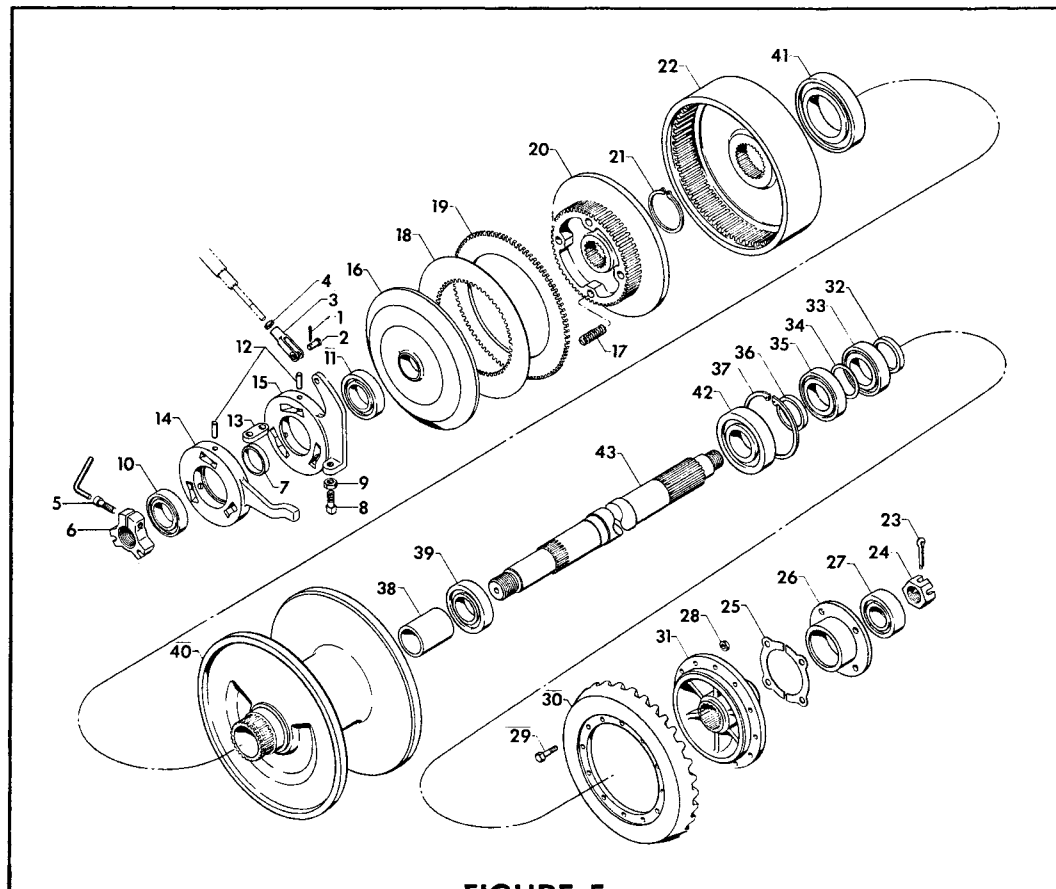


FIGURE 5

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Reassemble bevel gear and related parts in the reverse order of the key index numbers (23 through 31, *Figure 5*). Adjust bevel gear by means of shims (25, *Figure 5*) to obtain .004 to .008 inch backlash with pinion.

NOTE: Be sure gear (30, *Figure 5*) and its attached hub (31, *Figure 5*) are installed for the desired direction of cable drum rotation. Refer to paragraph entitled **REVERSING CABLE DRUM ROTATION**.

CABLE DRUM REMOVAL AND REPLACEMENT

To remove cable drum, first remove parts in the same order as the key index numbers (32 through 37, *Figure 5*).

Remove drum shaft from cable drum by driving on clutch end of shaft, this will disassemble parts (38, 39, 40 and 41, *Figure 5*) from shaft (43, *Figure 5*). Parts 38, 39 and 41, *Figure 5*, may now be individually removed from the drum.

When removing cable drum use care to prevent damage to splines on drum shaft.

Reassemble cable drum and related parts in the reverse order of the above paragraphs.

BEVEL PINION DISASSEMBLY AND ASSEMBLY

Remove the winch from the adapter plate. Disassemble the bevel pinion assembly in the same order as the key index numbers shown in *Figure 6*.

Reassemble bevel pinion assembly in the reverse order of the key index numbers shown in *Figure 6*. Lock nut (8, *Figure 6*) must be tightened securely and corresponding tab on lock washer (9, *Figure 6*) must be bent over to ride in slot on nut. Retainer (7, *Figure 6*) must be tightened securely. Secure four cap screws (6, *Figure 6*) with locking wire.

WINCH CASE DISASSEMBLY AND ASSEMBLY

Before disassembling winch case, drain oil, then remove those parts which have not already been removed because of normal disassembly procedures, in the same order as the key index numbers shown in *Figure 7*. Do not remove dowel pins (30, *Figure 7*) from case (31, *Figure 7*) unless they are damaged.

Reassemble winch case in the reverse order of the key index numbers shown in *Figure 7*. Do not install case flanges, shims, (19, 17 and 10, *Figure 7*) nor cover, brake cover, nor clutch adjustment cover (9, 6 and 3, *Figure 7*), until drum shaft assembly has been installed.

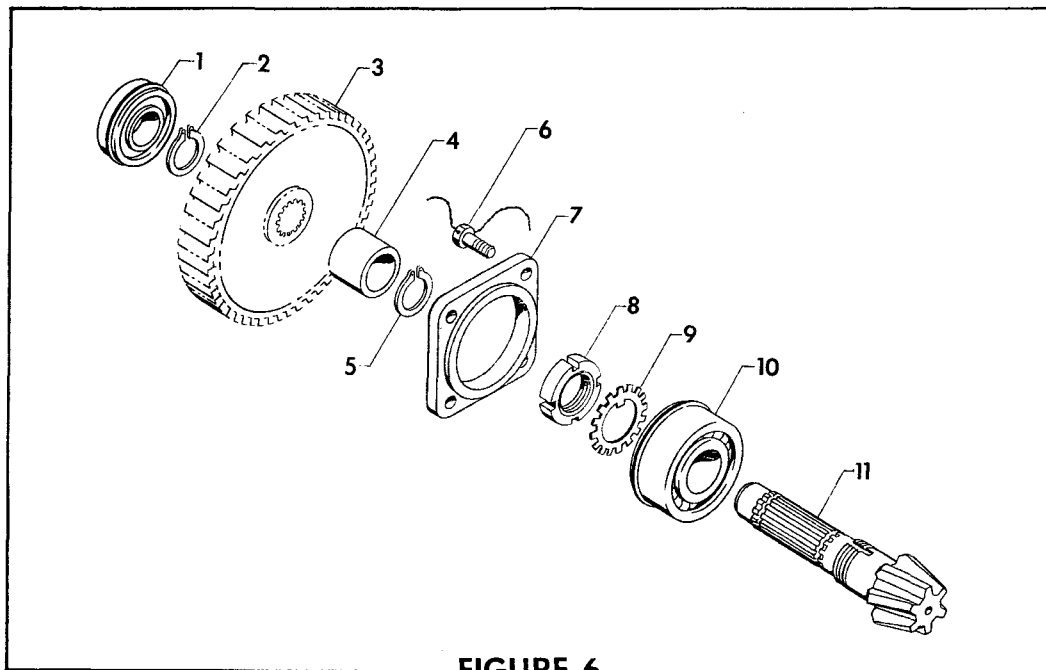


FIGURE 6

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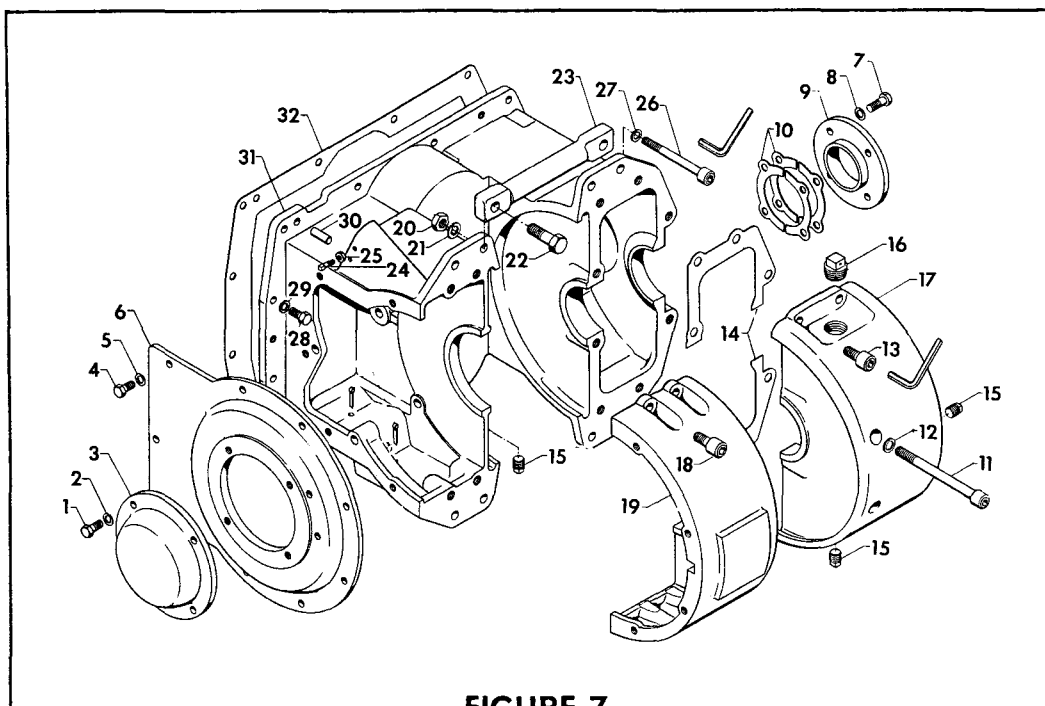


FIGURE 7

V. LUBRICATION

GENERAL INFORMATION

All internal parts are lubricated by immersion or splash. Under normal operating conditions, oil should be drained and changed every 625 hours of tractor operation (approximately every four months, based on an eight-hour day, five days a week), whether the winch is used or not. For summer temperatures, use 140 S.A.E. gear oil. For winter temperatures, 32°F. to 0°F., use 90 S.A.E. gear oil. For temperatures below 0°F., use 10 S.A.E. motor oil. Extreme pressure gear oils are not necessary. Use only the highest quality oil and, in the case of 10 S.A.E. motor oil, use oil with a paraffin base if possible.

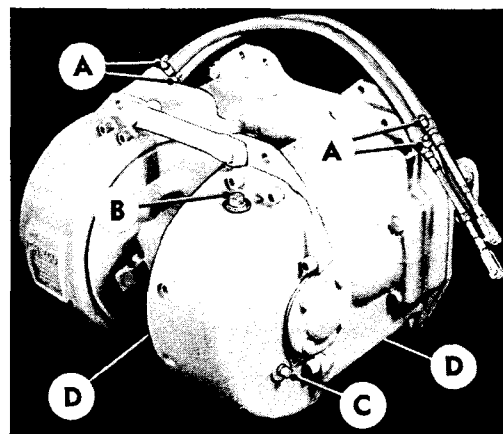


FIGURE 8

WARNING—This winch is NOT filled with oil before shipment from factory. After 3 days or 24 hours of service drain oil and refill per lubrication instruction plate.

LUBRICATION

- A—Alemite fittings, grease sparingly every month.
- B—Filler plug.
- C—Level plug.
- D—Drain plugs (2).