

SERVICE SECTION

Carco Model F-50-PS Winch

(POWER SHIFT FRICTION CLUTCH)

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GENERAL INSTRUCTIONS

This manual contains procedures for complete disassembly and assembly of the winch, and also provides adjustment procedures required during and after repair or overhaul. The necessary clearances, backlash, and other data for proper reassembly of the winch are given in the data sheet at the end of this section.

NOTE: For repair, disassemble the winch only to the extent necessary to accomplish the required replacement of parts.

Before starting any replacement procedures, be sure to clean thoroughly the parts to be removed, and adjacent areas, to prevent entry of dirt and sand into the winch. Do not leave any ports or access openings exposed to the weather. Seal or cap

SERVICE INSTRUCTIONS

the openings to prevent entry of dust, moisture, or other foreign material. Protect all exposed hydraulic ports and fittings with caps or plugs to prevent contamination of the hydraulic system.

During disassembly, care should be taken not to damage gaskets, shims, seals, and O-rings that are to be reused. Replace any such parts that are damaged or otherwise defective. Certain O-rings and seals specified in the replacement instructions must not be reused. In general, seals and O-rings that work under operating hydraulic pressures, or that require extensive disassembly to replace, should be replaced with new parts at time of reassembly.

During assembly, coat threads of all cap screws that penetrate the gear and clutch compartments, using suitable mastic sealing compound. Take care to prevent excess sealing compound from entering the winch case, as it tends to clog the filters.

Maintain strict cleanliness during rebuild to prevent entry of dirt or moisture into winch case. Hydraulic components should be rebuilt in a clean, controlled atmosphere such as exists in an injector room.

PREPARATION FOR DISASSEMBLY

Clean winch and rear of tractor to prevent entry of dirt into winch or tractor transmission case during removal and disassembly.

Loosen pipe plug from winch cover to permit complete draining of oil.

Remove magnetic pipe plug from bottom of winch to drain oil.

Disconnect hydraulic hoses from winch case.

Disconnect winch control cable from control stand.

Support winch with suitable hoist or chain block, and remove nuts, cap screws, and lock washers securing winch to tractor. Move winch back while guiding control cable back out of tractor.

When winch and P.T.O. shaft have been removed from tractor transmission, cover opening in rear of tractor to prevent entry of dirt.

CAUTION: Do not run tractor engine after oil is drained from winch unless winch hydraulic pump is disconnected from tractor engine.

BRAKE CONTROL ASSEMBLY

Disassembly

See Figures 1 and 2.

NOTE: Observe strict cleanliness while working on any part of the winch.

Remove side cover (brake).

If winch is mounted on tractor and is in working order, start tractor engine and move control lever to brake-off position to release brake. Remove brake band pins, brake pin spacers, and tension spring. Stop engine.

SERVICE INSTRUCTIONS

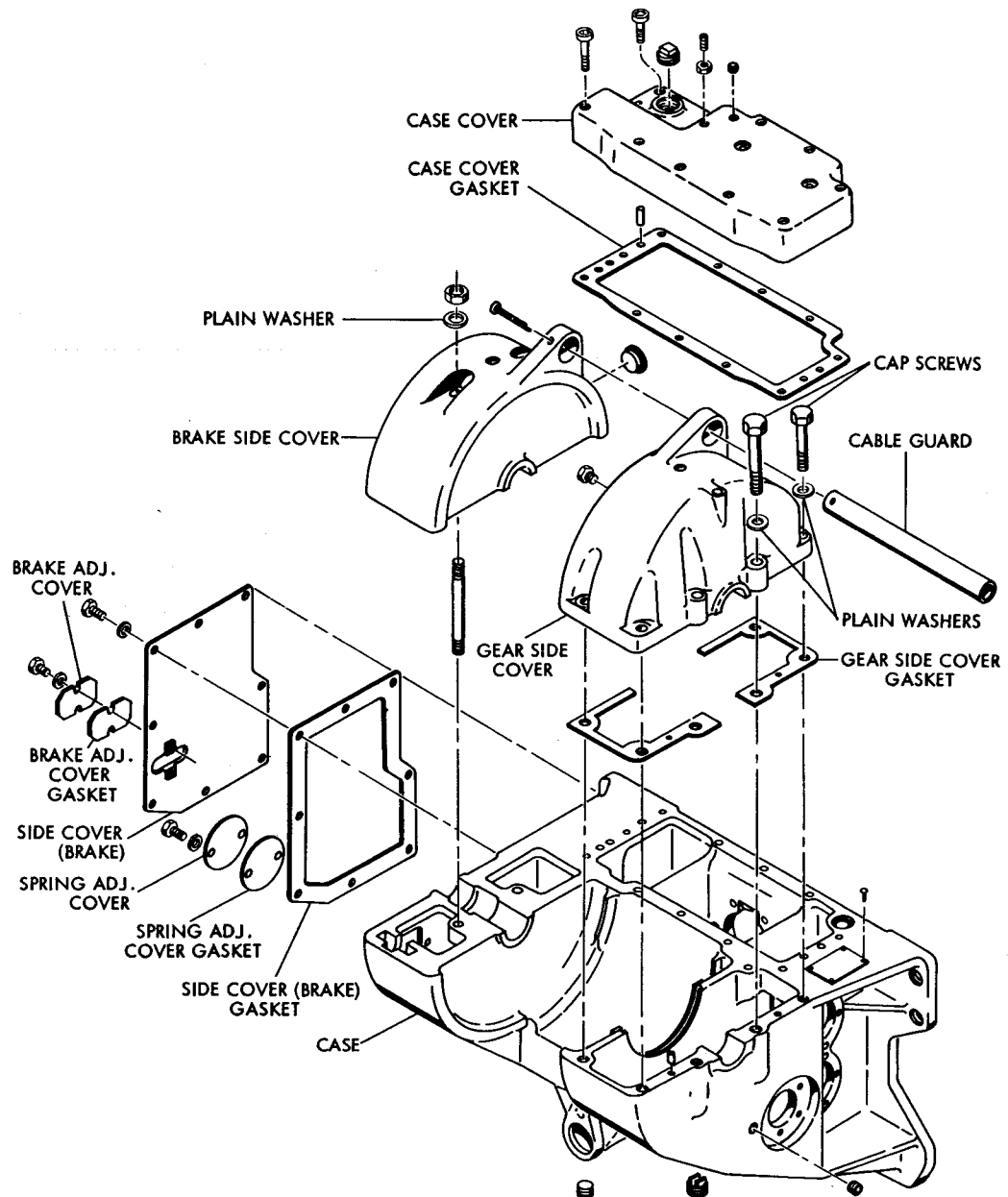


FIGURE 1

SERVICE INSTRUCTIONS

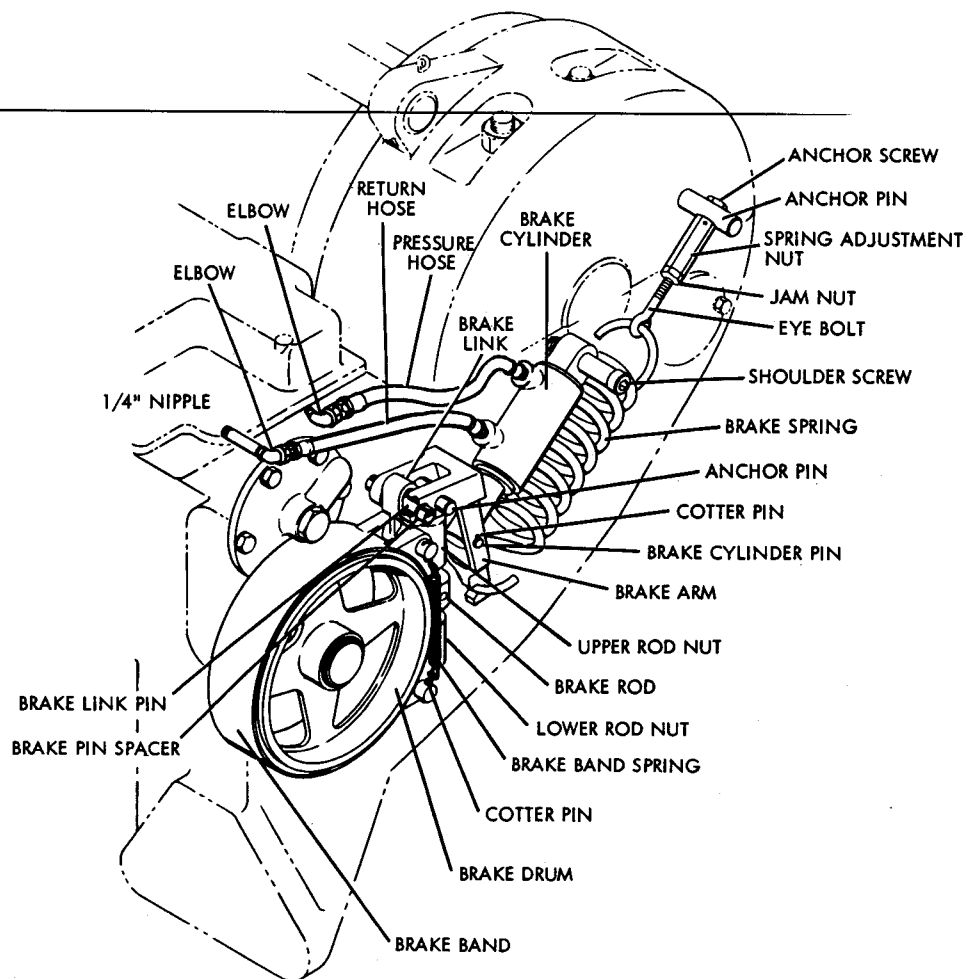


FIGURE 2

SERVICE INSTRUCTIONS

If winch is removed from tractor, or is inoperable, remove spring adjustment cover and loosen brake spring adjustment nut until brake spring is free of tension, then remove brake band pins and brake band spring.

Remove retaining ring securing brake drum to shaft, and remove drum. Remove brake band assembly.

Disconnect brake hoses from fittings at winch case.

If brake spring is still under tension, loosen brake spring adjustment nut as required to loosen spring, and disconnect spring from brake arm.

Remove brake cylinder anchor screw. Remove brake arm anchor pin, using suitable puller threaded into hole in pin if necessary, and remove cylinder, brake arm, and brake rod assembly. Disassemble brake cylinder from brake arm.

Assembly

See Figures 1 and 2.

Assemble brake arm to brake cylinder with brake cylinder pin and cotter pin. Assemble brake link to arm with brake link pin.

Position assembled brake cylinder and brake arm in winch, and secure brake cylinder with shouldered anchor screw and washer. Engage brake spring with end of brake arm.

Position brake rod assembly in winch and install anchor pin through brake arm and brake rod nut and into pin recess in winch case.

NOTE: If winch is being assembled for underwound drum operation, interchange the long and short brake pins; the longer pin will then be installed through the end hole of the brake arm and the slotted hole of the brake link.

Be sure spacer rings are installed in winch case at each end of the shorter pin.

Connect brake hoses to fittings in winch case.

Place brake band in winch. Install brake drum on brake shaft and install retaining ring.

Secure ends of brake band assembly to brake rod and brake link with pins, and connect brake band spring with cotter pins.

Adjust brake band clearance and brake spring tension. Refer to ADJUSTMENTS.

Install spring adjustment cover. Install side cover (brake) and gasket.

CASE COVER ASSEMBLY

Removal

If winch is mounted on tractor, clean case cover and tractor fuel tank or tank guard. Disconnect control cable at control stand. Refer to Adapter Section.

Disconnect pressure hose from valve cover, and catch any hydraulic fluid that drains from hose.

Plug disconnected lines to keep clean.

SERVICE INSTRUCTIONS

Remove cap screws and washers securing case cover to case, and remove cover. Eyebolts may be installed in threaded holes in cover to facilitate lifting.

Cover gasket is cemented to cover. If gasket is damaged or defective, or if tubes are removed from cover, carefully scrape old gasket from mating surfaces of cover. Remove all old cement, being careful not to scratch the mating surface.

If cover gasket is not removed, take care not to damage gasket during subsequent disassembly.

Disassembly

See Figures 1 and 3.

Disconnect all hydraulic tube nuts connected to control valve. Remove O-rings and tube retainers where required, and remove all hydraulic tubes from case cover.

NOTE: Cover gasket will be destroyed by removal of O-rings and retainers. If hydraulic tubes are removed, cover gasket must be replaced.

Unscrew control cable core from valve spool, and pull cable core free. Remove jam nut and socket-head set screw securing cable housing in case cover, and remove control cable. If O-ring and back-up ring remain in cover, remove O-ring and back-up ring.

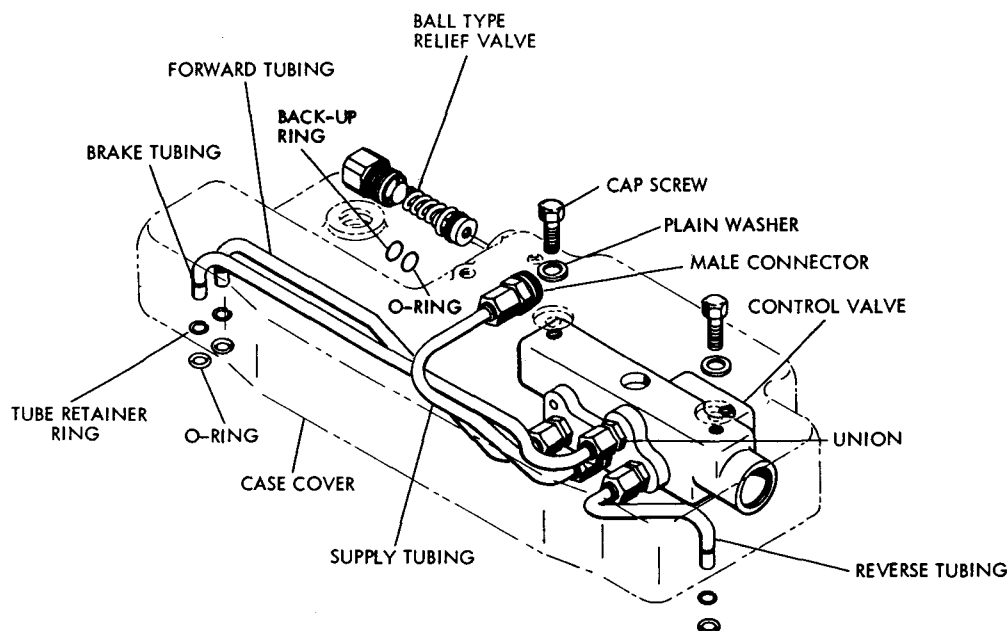


FIGURE 3

SERVICE INSTRUCTIONS

Support control valve and remove screws and washers to detach valve from cover.

Turn relief valve body counter-clockwise to remove valve from cover, being careful not to drop valve components as valve is removed. Remove O-ring from relief valve bore in cover.

Assembly

See Figures 1 and 3.

Install O-ring in relief valve bore in cover, and be sure it is seated properly. Be sure O-ring does not slip out of position, or O-ring will be damaged. Assemble ball seat, ball, guide, washer, and spring, and insert into bore in cover. Thread relief valve body into relief valve bore and tighten moderately. DO NOT OVERTIGHTEN.

Position control valve in cover, and install two hex-head cap screws and washers loosely.

Install pressure tube and secure with tube nuts to valve body and pressure inlet port in case cover. Install remaining tubes, starting with innermost to allow maximum room for wrench, and secure each tube in cover flange with a tube retaining ring. Install O-ring on end of each tube, next to retaining ring. Connect valve end of each tube to corresponding port in control valve body.

Tighten valve body to cover.

Position O-ring and back-up ring

on control cable in anchor shoulder groove. Insert control cable housing into bore and install and tighten set screw and jam nut to secure housing in bore. Insert core in cable housing and engage end of core with control valve spool. Thread core into spool.

NOTE: Control stand end of installed control cable should measure 8-1/16" (+1/8", -3/16") from stud end to set screw groove in cable at brake-on (neutral) position.

Installation

If gasket was removed from cover, coat mating surface of cover with suitable adhesive and apply gasket. Take care to prevent adhesive from entering winch case. The adhesive tends to clog the filter elements.

Position cover on top of winch case, and secure to case with socket-head cap screws.

CONTROL VALVE

Removal

Refer to CASE COVER ASSEMBLY, Disassembly.

Disassembly

See Figure 4.

Remove retaining ring from each end of valve.

NOTE: Use arbor press to compress springs slightly to facilitate removal of retaining rings.

Remove spool lock screw and washer.

Pull spool with springs and stops out of Control Cable end of body. Remove retaining ring from end of spool and remove spring stops and small spring.

Remove spring stop and spring from opposite end of valve. Using a soft drift, press piston from valve body.

Remove retaining ring from piston. With O-ring removed, install piston in valve body. Be sure piston slides freely in and out of body.

Inspect O-ring for wear and replace if necessary.

Assembly

See Figure 4.

Install O-ring and retaining ring on piston. Lubricate O-ring, piston, and valve body with light oil.

Press piston evenly into body.

Using arbor press, install piston spring and stop in body and secure with retaining ring.

Assemble inner spring stop, small spring and outer spring stop on spool and secure with retaining ring.

Lubricate assembled spool with light coating of oil and insert spool in body through control cable end.

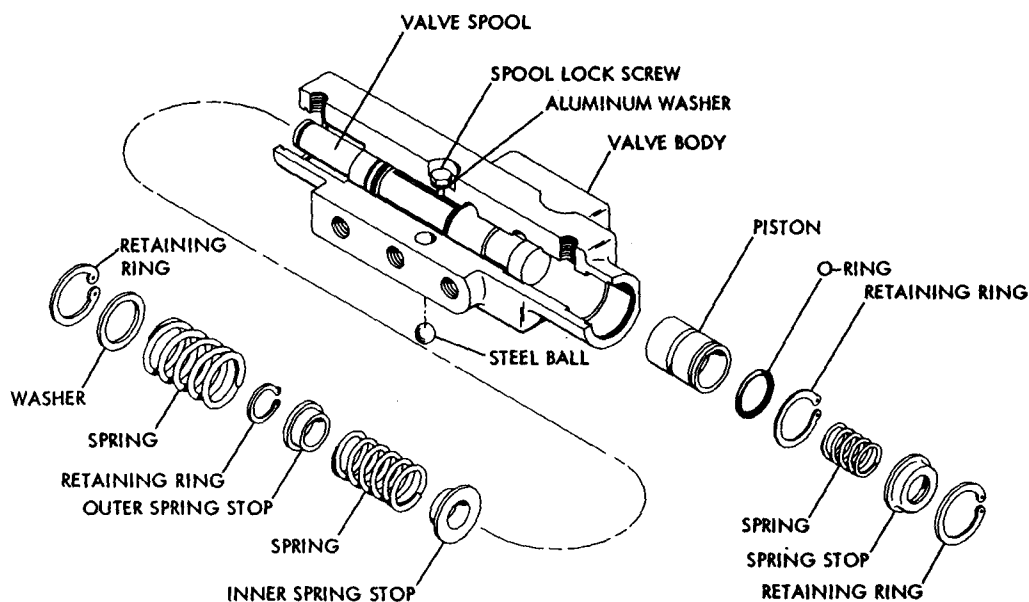
Align spool for spool lock screw and install.

NOTE: Installed spool lock screw should not bottom against spool.

Install outer (large) spring and washer and secure with retaining ring.

Installation

Refer to CASE COVER ASSEMBLY, Assembly.



**CONTROL VALVE
FIGURE 4**

SERVICE INSTRUCTIONS

RELIEF VALVE

Removal

Refer to CASE COVER ASSEMBLY, Disassembly.

Disassembly

See Figure 5.

NOTE: All disassembly and assembly of the relief valve must be done in an injector room or other similarly clean, air-conditioned area.

Remove spring, washer, guide, and ball from seat.

Inspect ball and seat. Be sure ball is smooth, and inspect seat bore for contamination that might cause ball

to stick. Be sure seat does not have excessive wear and that ports are clean.

Shims may be removed by inverting body and tapping the open end lightly on soft surface.

Assembly

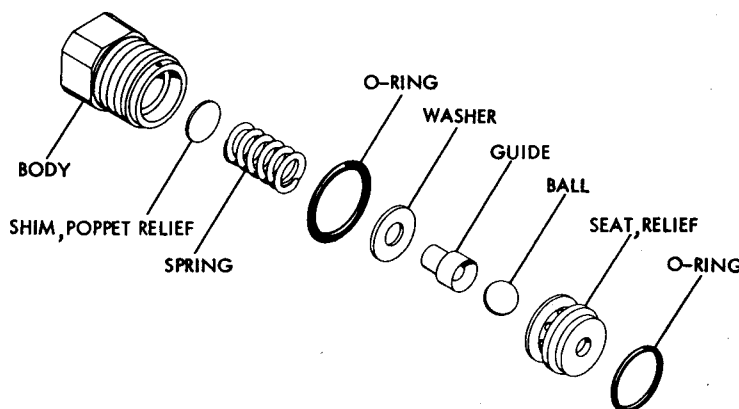
See Figure 5.

Install ball, guide, washer and spring in seat. Place shims in body and place body over spring.

Wrap assembly in clean plastic or paper until ready to install in cover.

Installation

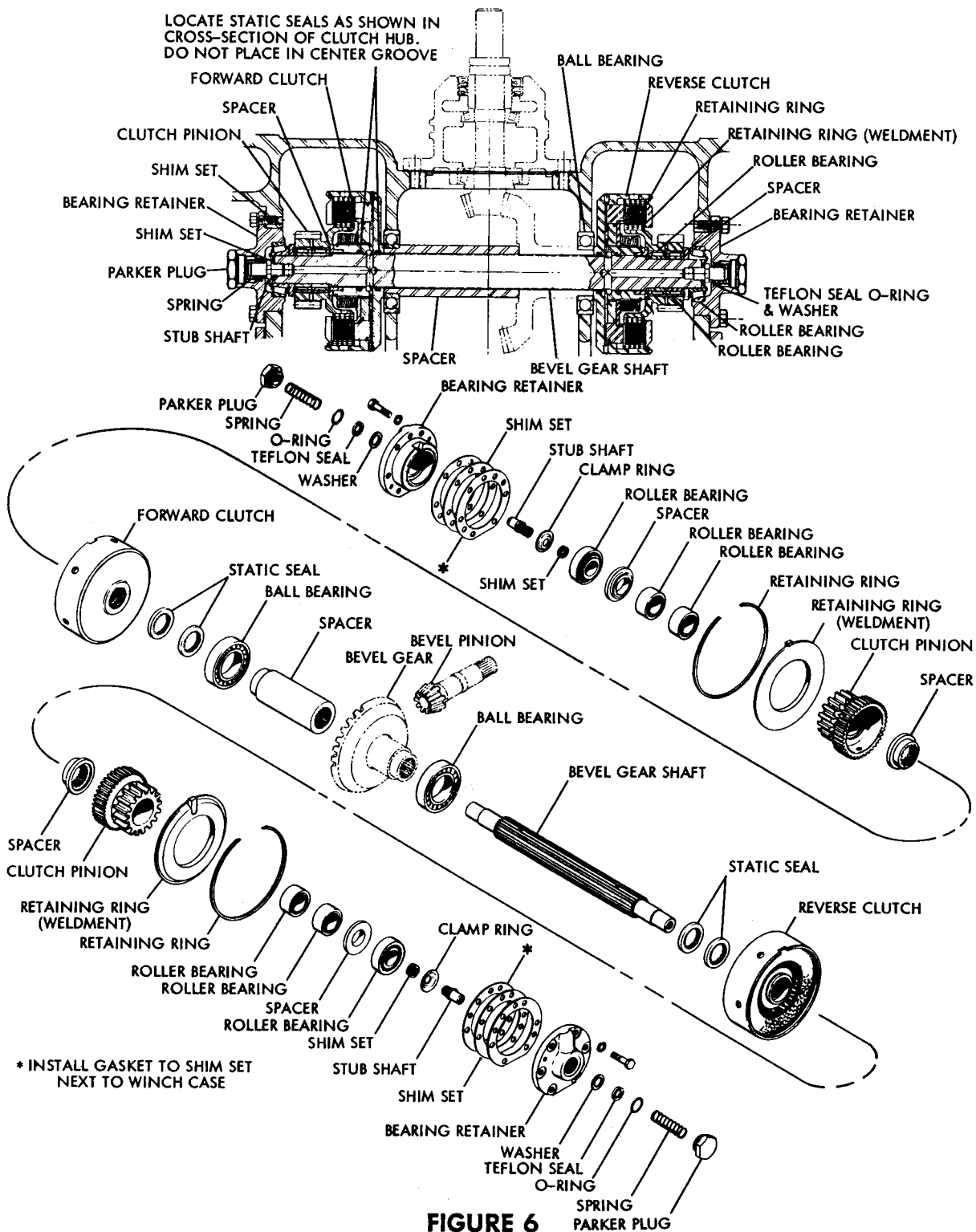
Refer to CASE COVER ASSEMBLY, Assembly.



BALL TYPE RELIEF VALVE-NO. 44960

FIGURE 5

SERVICE INSTRUCTIONS



SERVICE INSTRUCTIONS

BEVEL GEAR SHAFT ASSEMBLY

Removal

See Figure 6.

Remove case cover. Refer to CASE COVER ASSEMBLY, Removal.

Remove brake drum and band. Refer to BRAKE CONTROL ASSEMBLY, Disassembly.

Remove bearing retainer at each end of bevel gear shaft.

Thread cap screws into two threaded holes in bearing retainer and tighten screws alternately to jack retainer from case, or use puller SK-7733. Remove and mark shims for proper installation during reassembly. Remove Parker plug, seal spring, teflon seal, and washer from each carrier.

Unscrew stub shaft from each end of bevel gear shaft and remove shims and clamp ring. Mark shims for proper installation at time of reassembly.

Block clutch housing or bevel gear against web of case.

Thread eyebolt SK-8029 through plate SK-8028 and into threaded hole in outer surface of clutch assembly to support reverse or forward clutch. Use jam nut to maintain clutch position. See Figure 8.

Using shaft and cap puller SK-7733, or strong bar SK-8031 and 3/4"-NF stud and nut, pull shaft until roller bearing cone is released, and catch

bearing cone. Continue pulling shaft until it is clear of clutch, and lift clutch out of case.

NOTE: If tracks interfere with complete removal of bevel gear shaft, slide shaft first one way, then the other, to clear clutches. For complete removal of shaft, it may be necessary to remove one track shoe; otherwise winch may have to be removed from tractor.

Support remaining clutch in same manner, pull shaft free of case, and remove clutch. Remove other bearing cone from shaft with bearing puller.

NOTE: If it is necessary to drive shaft out of case, thread a 3/4"-NF cap screw into end of shaft to protect threaded hole in shaft.

If winch is removed from tractor, remove bevel pinion carrier with pinion. If no parts are to be replaced on pinion and carrier, mark shims for proper installation during reassembly.

Using a soft drift or wooden block, drive bevel gear and bearing carrier toward the center of winch to press spacer and bearing from case. Remove spacer and bevel gear. Remove ball bearings from spacer and bevel gear.

Bevel Pinion and Carrier Disassembly

See Figure 7.

Remove nut from bevel pinion shaft. Remove bevel pinion.

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SERVICE INSTRUCTIONS

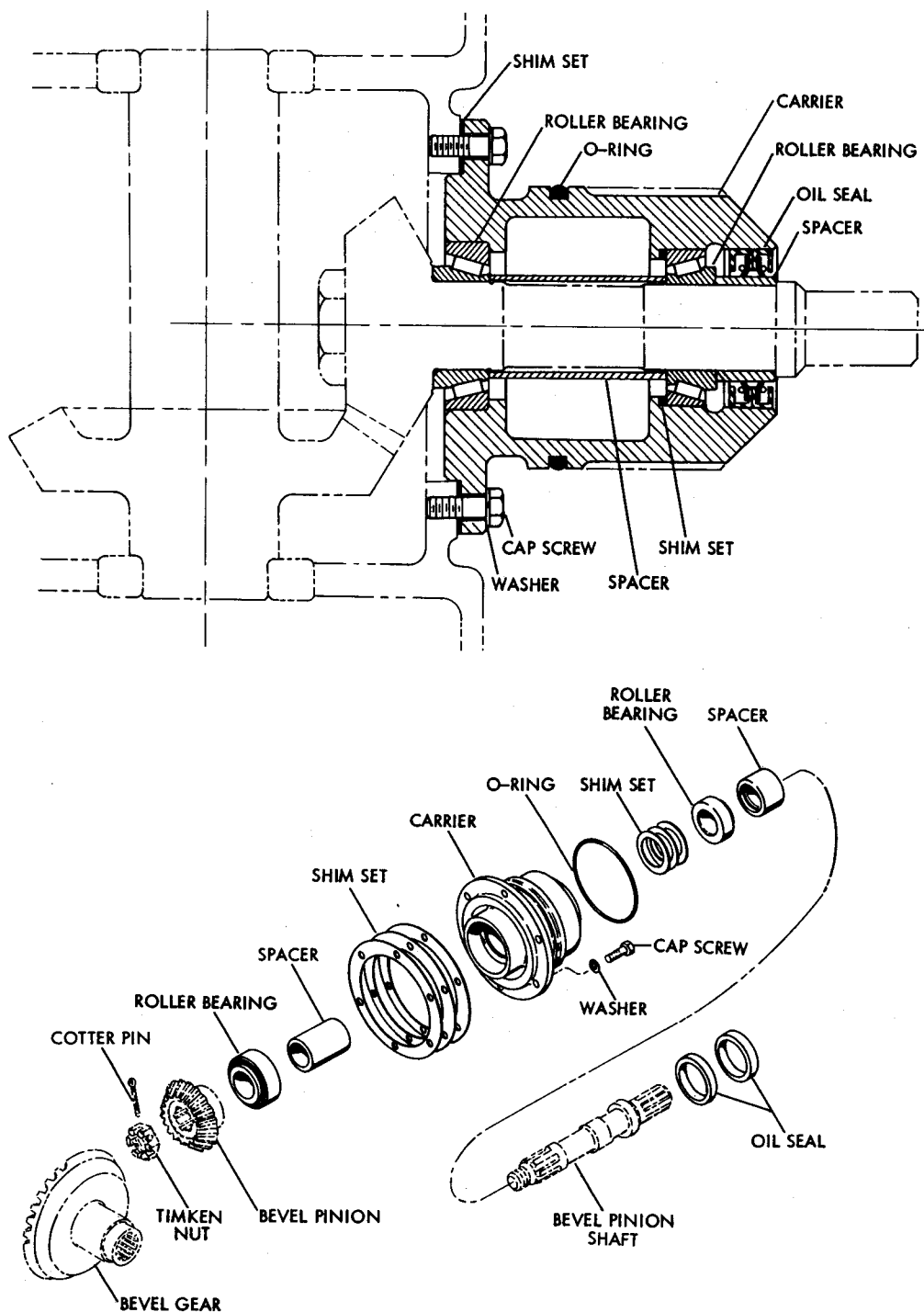


FIGURE 7

Press pinion shaft out forward end of carrier and catch rear bearing cone. Remove bearing spacer, forward bearing cone, oil seals, and spacer from shaft.

Remove forward and rear bearing cups from carrier.

Bevel Pinion and Carrier Assembly

See Figure 7.

Press rear and forward bearing cups into carrier.

Install spacer on pinion shaft. Press forward bearing cone on shaft. Install bearing spacer on shaft.

NOTE: If either bearing or bearing carrier is replaced with a new part, a long bearing spacer and shim set should be used. Use new spacer and shim forward bearing cup as required.

Install pinion shaft in carrier from forward end. Install rear bearing cone on shaft.

Install bevel pinion, thread nut on rear end of shaft, and tighten to preload bearings. See Bevel Pinion Bearing Preload Adjustment.

Install oil seals on forward end of pinion shaft into carrier with seal lips facing outward (metal surfaces of seals back-to-back).

Installation

See Figure 6.

Install ball bearings on bevel gear and bevel gear spacer. Install gear and spacer in winch case.

Install shaft installation tool #46259 on end of shaft. Insert shaft into winch, with installation tool toward forward clutch side. Pull shaft through bevel gear and spacer, turning as necessary to align splines.

Pull bevel gear shaft back sufficiently to permit installation of forward clutch.

Support clutch and pinion assembly with plate SK-8028 and eyebolt SK-8029. See Figure 8.

Position clutch assembly in winch case and carefully pull bevel gear shaft through clutch, turning shaft as necessary to align splines with those in static seals and splined spacer.

Push shaft through clutch sufficiently to remove tool from shaft. Install tool on reverse clutch end of shaft and move shaft to permit reverse clutch to be installed.

Support reverse clutch in same manner as forward clutch, and position in winch case. Pull bevel gear shaft back through reverse clutch in same manner as for forward clutch.

Remove installation tool.

Center bevel gear shaft so same amount of shaft extends beyond clutch pinion on each side, being sure all slack is removed from between components on shaft.

Install clutch pinion bearing inner races, aligning match marks.

Install spacer over end of bevel gear shaft into clutch pinion.

Complete installation of other clutch assembly in same manner.

SERVICE INSTRUCTIONS

Install tapered roller bearing on end of shaft, using 3/4"-NF cap screw (or stud 8027 and nut) and bearing press SK8026 to press bearing into place. Use same method on each end of shaft, bringing up snugly until spacers will not turn on shaft, or use two bearing presses SK 8026 simultaneously (one on each

end of shaft) to press shaft assembly together. Bearings should be equally positioned on shaft, within 1/32".

Be sure all spacers, bearing races, and clutch housings are seated so no clearance remains between components on shaft.

Position shims and clamp ring on

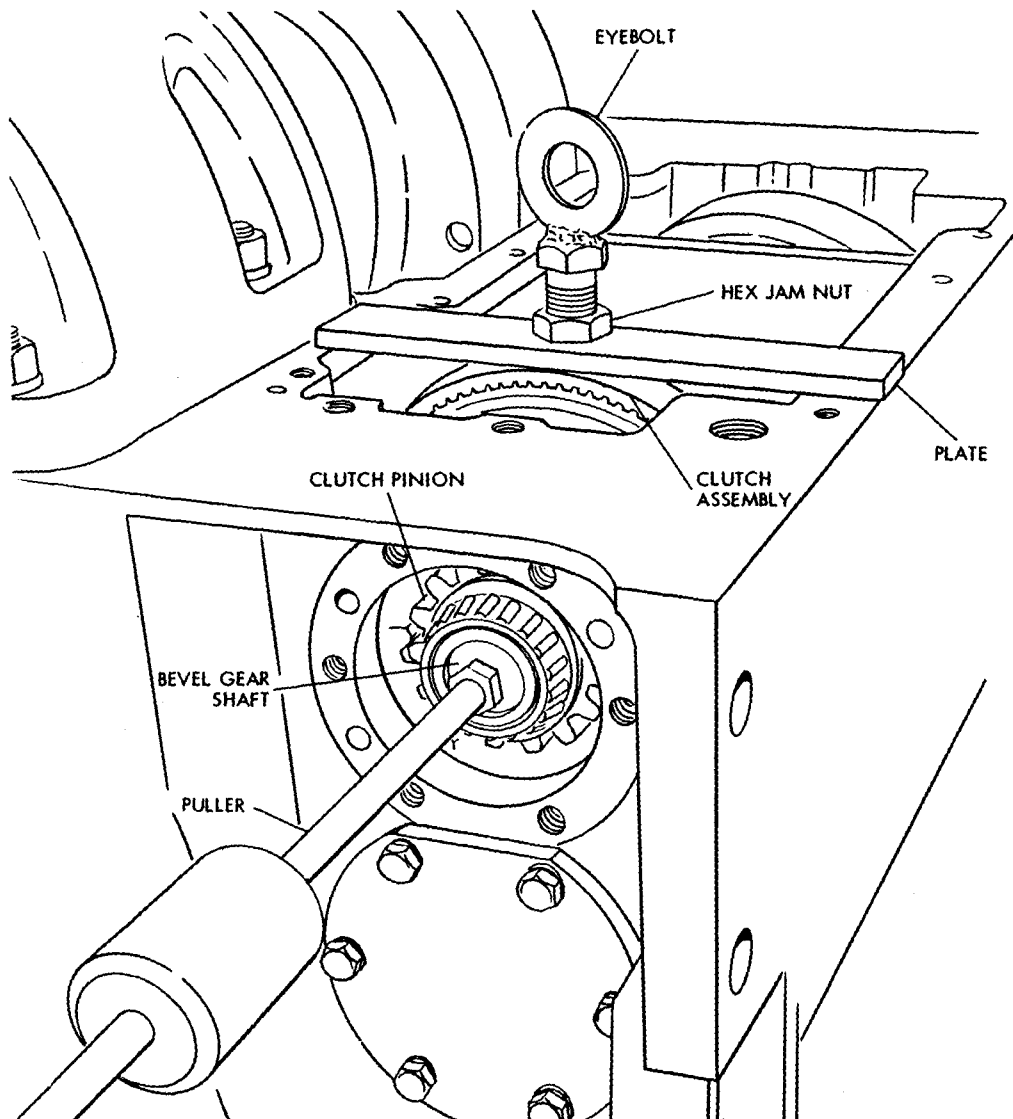


FIGURE 8

Install shims on each bearing retainer in same position from which

Adjust bevel gear backlash and bevel gear shaft end clearance, if necessary. Refer to Bevel Gear Backlash Adjustment.

Install seal back-up washer, teflon seal, O-ring, and seal spring in each carrier, and install Parker plugs.

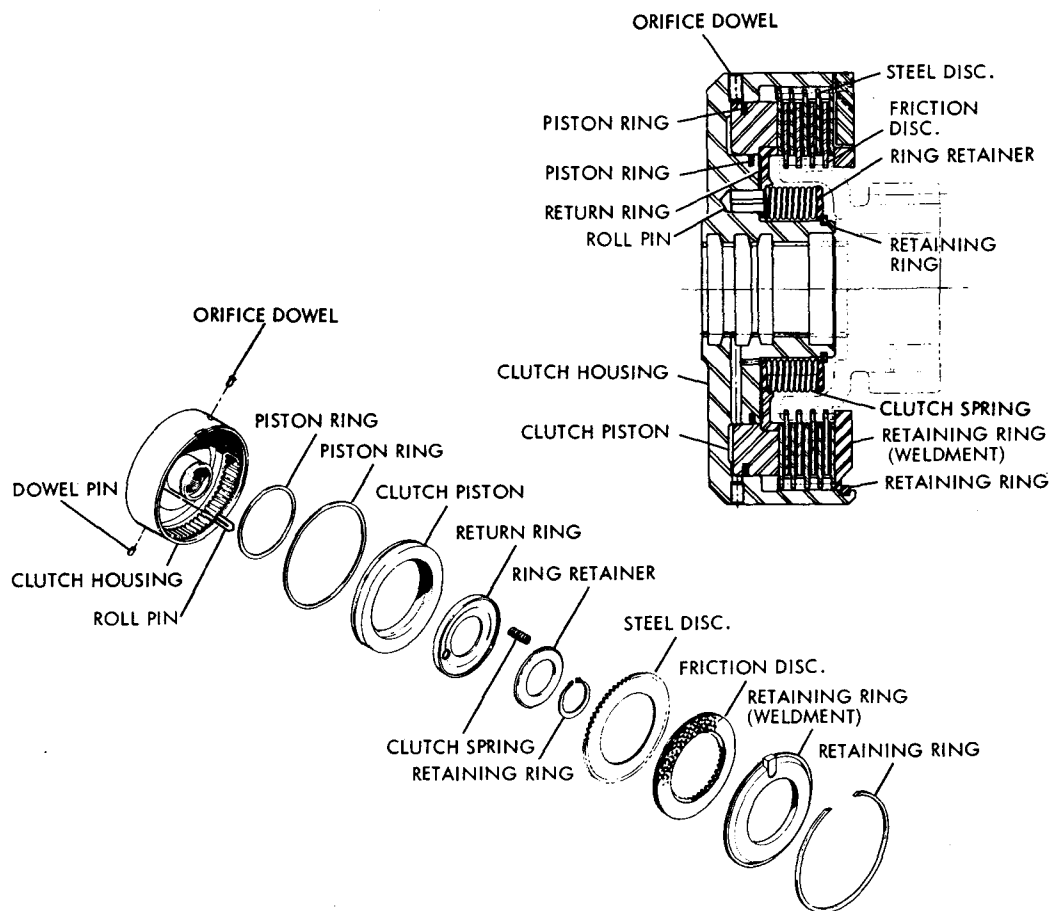


FIGURE 9

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SERVICE INSTRUCTIONS

Install brake drum and band. Refer to BRAKE CONTROL ASSEMBLY, Assembly.

Install case cover. Refer to CASE COVER ASSEMBLY, Installation.

CLUTCH ASSEMBLY

Disassembly

See Figure 9.

Remove clutch. Refer to BEVEL GEAR SHAFT ASSEMBLY, Removal.

Remove retaining ring from clutch body and remove retaining ring (weldment). Slide clutch pinion out of clutch. Remove splined spacer from pinion.

Remove clutch pinion bearing outer races, noting position for re-assembly. Note marks for matching races.

Similarly note match marks and position of pinion bearing inner races and remove inner races.

Lift clutch plates out of body, and mark plates so that they may be returned in the same order to maintain established wear pattern.

Using suitable press, compress ring retainer against springs, and remove retaining ring. Remove retainer and clutch springs. Remove return ring.

Invert clutch over a soft surface, such as wood, and drop clutch onto surface to remove clutch piston.

Remove two static seals from clutch body.

Remove piston rings from piston and clutch housing.

Inspection

Inspect clutch discs for damage, warping, and excessive wear. Measure thickness of discs while stacked in operating position. Minimum thickness of pack is 1-1/8". If total thickness is less than this amount, replace worn plates to reestablish acceptable stack thickness.

Inspect clutch piston for damage and wear. If piston is damaged or shows excessive wear, replace piston.

Inspect orifice dowel. Be sure opening is 0.031".

Check piston ring wear. If piston rings installed protrude less than .015" from surface of piston or clutch body, replace rings.

Assembly

See Figure 9.

Clean all clutch parts thoroughly before reassembling.

Install piston rings in clutch housing and on piston. Lubricate rings, after installation, with SAE 10W oil to facilitate installation of piston.

NOTE: Do not oil rings before installation in housing and piston. To do so tends to prevent ring from seating properly.

SERVICE INSTRUCTIONS

Position piston in housing and press evenly into place until piston bottoms in housing.

Install return ring in clutch housing with hole in ring aligned with roll pin in housing. Position springs with one spring over roll pin and ring retainer in housing and, using suitable press, compress springs sufficiently to permit installation of retaining ring. Install retaining ring so that sharp edge on inner diameter faces outward.

Install pinion bearing outer races in clutch pinion, and position so that outer faces of bearings are flush with side surfaces of pinion.

NOTE: Observe match marks on pinion bearing outer races when installing bearings.

Install spacer and pinion gear in clutch.

If original clutch discs are used, install discs in same order from which they were removed, observing marks made at time of disassembly.

If new or unmarked clutch discs are installed, begin with a disc splined in the outer circumference, then alternate with inner- and outer-splined discs until there is a total of five outer-splined discs and four inner-splined discs, concluding with an outer-splined disc.

Install clutch disc retaining ring (weldment) and install retaining ring. Be sure ring is fully seated in groove in body.

NOTE: In some circumstances, it is possible for the clutch pinion to move outward sufficiently to allow the second from the inner disc to drop off the clutch pinion splines. To prevent this possibility, temporarily install two wedges between the outer surface of the splined portion of the clutch pinion and the inner surface of the clutch disc retaining ring. Be sure to remove wedges after clutch is installed in winch.

Lubricate outer circumference of static seals with clear vaseline before installation. Do not use oil.

Install two new splined static seals in clutch housing bore.

NOTE: Use of grease for lubrication of seals is not recommended, as it may prevent visual determination of alignment of seal splines with those on clutch housing.

Carefully align static seal splines with those in clutch housing.

Install lifting eyebolt through plate SK-8028 and in threaded hole in outer surface of clutch housing and support clutch. See Figure 8. Lower clutch into winch case and align clutch pinion and brake shaft gear.

Adjust nut on eyebolt, and rotate bevel gear and spacer to align internal splines for installation of bevel gear shaft. Check alignment of splines of static seals and splined spacer.

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SERVICE INSTRUCTIONS

Install bevel gear shaft. Refer to BEVEL GEAR SHAFT ASSEMBLY, Installation, above.

BRAKE CYLINDER

Removal

Refer to BRAKE CONTROL ASSEMBLY, Disassembly.

Disassembly

See Figure 10.

Rotate brake cylinder so ports

face downward, and work piston back and forth to remove oil.

Remove rod head lock screw.

Unscrew rod head from cylinder tube, and pull rod and rod head from tube:

Remove piston nut from rod. Remove piston from rod, and remove piston packing. Remove piston seal.

Remove rod head from piston end of rod. Remove rod wiper, packing, and head seal from rod head.

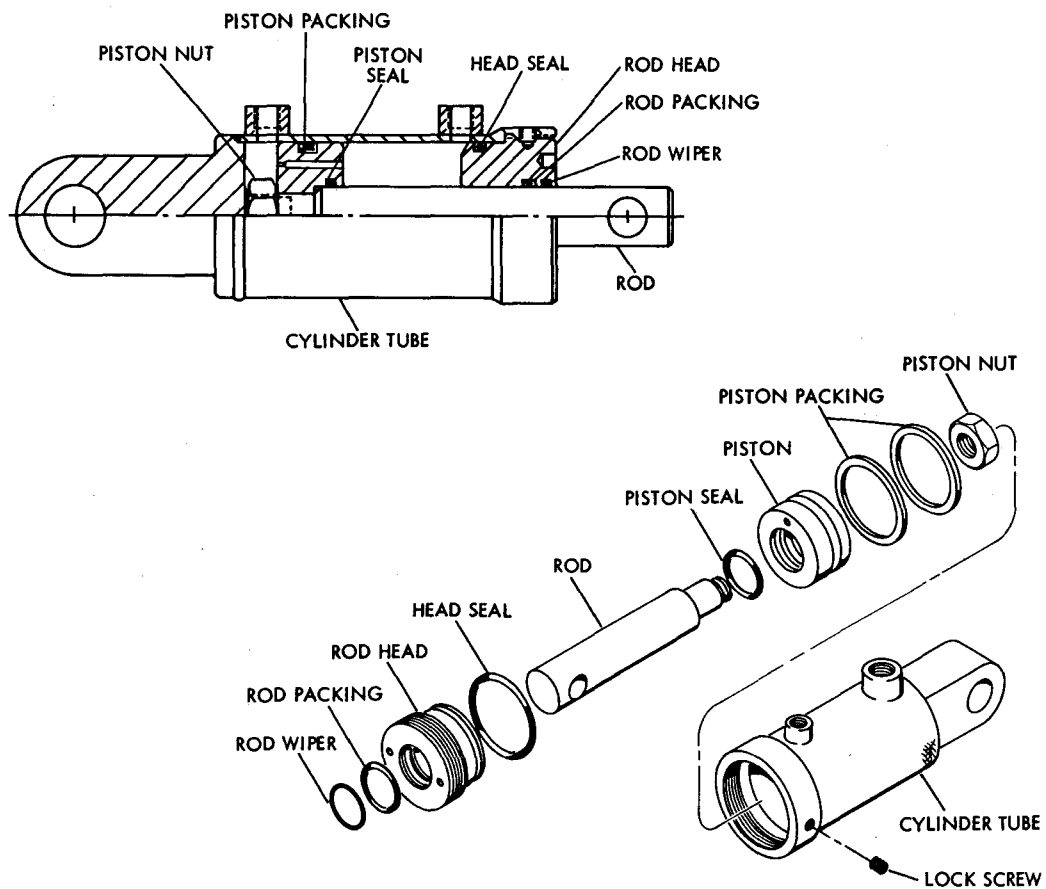


FIGURE 10

SERVICE BULLETIN REFERENCE

NUMBER

DATE

SUBJECT

CHANGES

[illegible]

Inspection

Inspect piston, rod, and inside of tube for scoring, scratches, and excessive wear. Replace parts that are scratched, scored, or worn beyond the point where a leak-free seal can be obtained.

Inspect orifice in piston. Orifice should be .031".

Inspect seals and wipers for cuts, distortion, and deterioration. Replace any defective part.

Assembly

See Figure 10.

Install rod wiper and rod packing in rod head bore. Lubricate with SAE 10W oil after installing. Install rod head on rod from piston end to prevent possible damage to wiper and packing by hole in outer end of rod.

Install piston seal in inside diameter of piston.

Position piston on rod. Install piston packing on piston, with lip of packing facing toward threaded end of rod. Secure piston with piston nut.

Install head seal on rod head. Lubricate piston packing and head seal with SAE 10W oil and insert piston carefully into end of cylinder tube. Push piston rod straight into tube, being careful not to damage packing on retaining ring groove in outer end of tube.

When piston is approximately halfway into tube, push rod head into tube. Engage threads and turn rod head until it is tight in cylinder tube. Secure with rod head lock screw.

Installation

BRAKE SHAFT ASSEMBLY

Removal

See Figure 11.

Drain oil from winch.

Remove brake band and brake drum. Refer to BRAKE CONTROL ASSEMBLY, Disassembly.

Refer to BRAKE CONTROL ASSEMBLY, Assembly.

If brake shaft gear is to be removed from case, remove forward clutch. Refer to BEVEL GEAR SHAFT ASSEMBLY, Removal.

Remove brake shaft cover. Remove seal carrier from brake side of shaft in same manner. Mark shims under covers for proper position at reassembly.

If oil seal is to be replaced, remove seal from carrier.

Using a soft drift, drive brake shaft out the gear side, taking pinion and bearing with it. Remove bearing, spacer, and pinion from brake shaft. Remove retaining ring from each end of shaft.

Lift brake shaft gear and spacer out of winch case.

SERVICE INSTRUCTIONS

Pull ball bearing from brake side of case.

Install two retaining rings in grooves at each end of brake shaft.

Installation

See Figure 11.

Install ball bearing in brake shaft bore on brake side of case.

Insert brake shaft from gear side, position spacer and brake shaft gear, and rotate brake shaft gear to align splines with those on shaft. Insert shaft until gear rests against retaining ring.

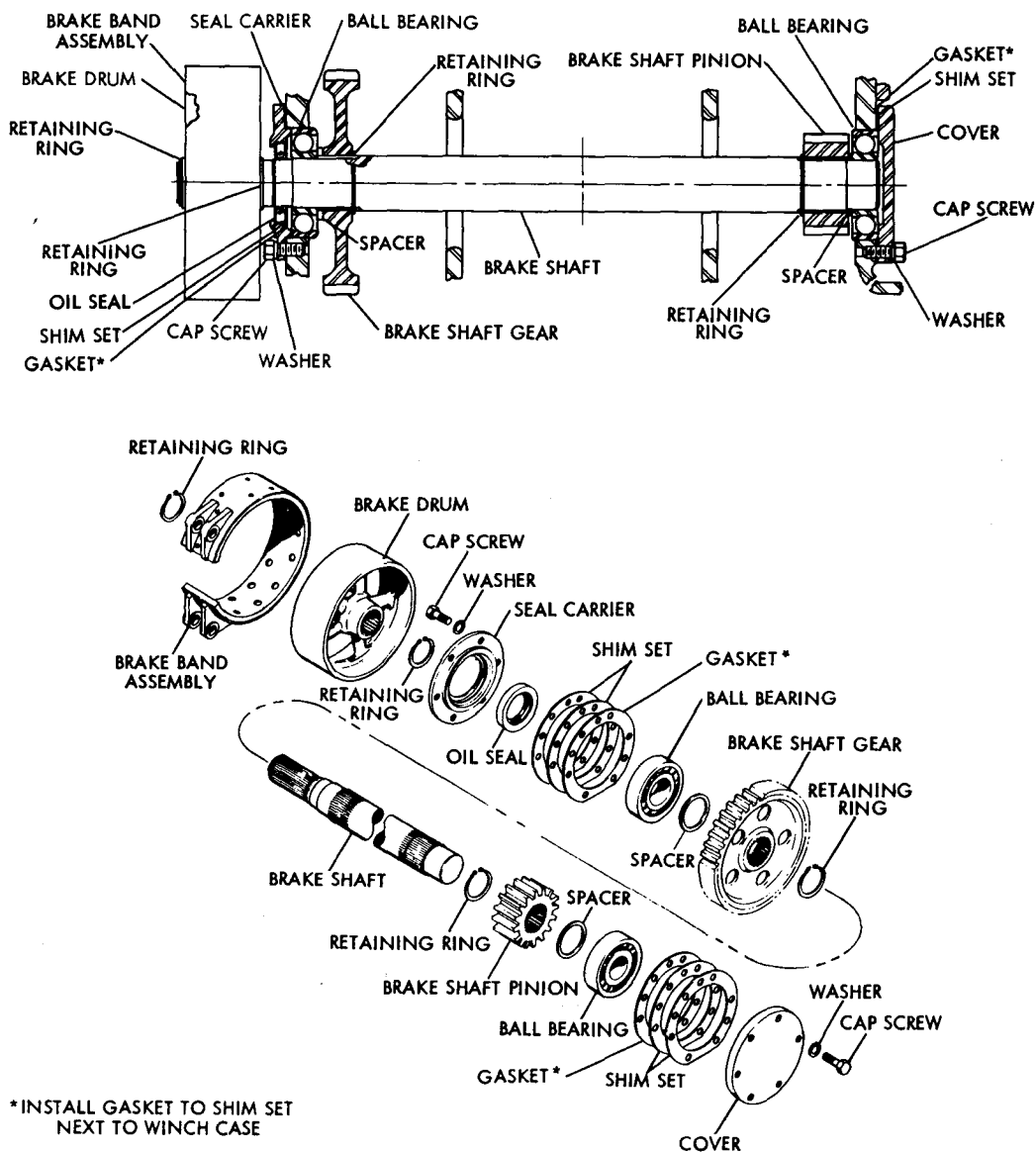


FIGURE 11

SERVICE INSTRUCTIONS

Slide brake shaft pinion and spacer on gear end of shaft. Install ball bearing on gear end of shaft.

If oil seal was removed from seal carrier, install a new seal in carrier and install carrier in bore, being sure to install shims in same position from which they were removed. If new parts were installed, shim as necessary while adjusting end clearance in brake shaft.

NOTE: Install gasket next to winch case. Secure carrier to case with cap screws and washers.

Install cover and shims on gear side of case in same manner, adjusting end clearance, if necessary, by adding or removing shims.

Install bevel gear shaft assembly. Refer to BEVEL GEAR SHAFT ASSEMBLY, Installation.

Install brake band and brake drum. Refer to BRAKE CONTROL ASSEMBLY, Assembly.

DRUM SHAFT ASSEMBLY

Disassembly

See Figure 12.

Remove cotter pins securing cable guard, and remove guard.

Remove nuts from ends of drum shaft.

Remove hex nuts and washers securing brake side cover, and remove cover.

Remove capscrews and washers securing gear side cover, and remove cover.

Using suitable hoist, lift drum and shaft assembly from winch case. Mark bull gear and drum for proper positioning during reassembly. Remove O-ring and set spacer from gear end of shaft.

Remove cap screws securing bull gear to drum, and remove lock plate and gear.

Pull shaft from brake end of drum. Remove oil seal, drum spacer, dirt seals, and bearing from shaft.

Remove bearing and oil seal from gear side of drum.

Assembly

See Figure 12.

Install oil seal in bore at gear side of drum. Install tapered roller bearing in gear end of drum.

Install inner dirt seal and tapered roller bearing on brake end of drum shaft. Insert drum shaft into brake end of drum. Install outer dirt seal, drum spacer, and oil seal on brake end of shaft.

Install oil seal on outer surface of drum at gear end.

Position bull gear on drum, observing location marks made at time of disassembly. Secure gear to drum with hex-head cap screws and lock plate.

SERVICE INSTRUCTIONS

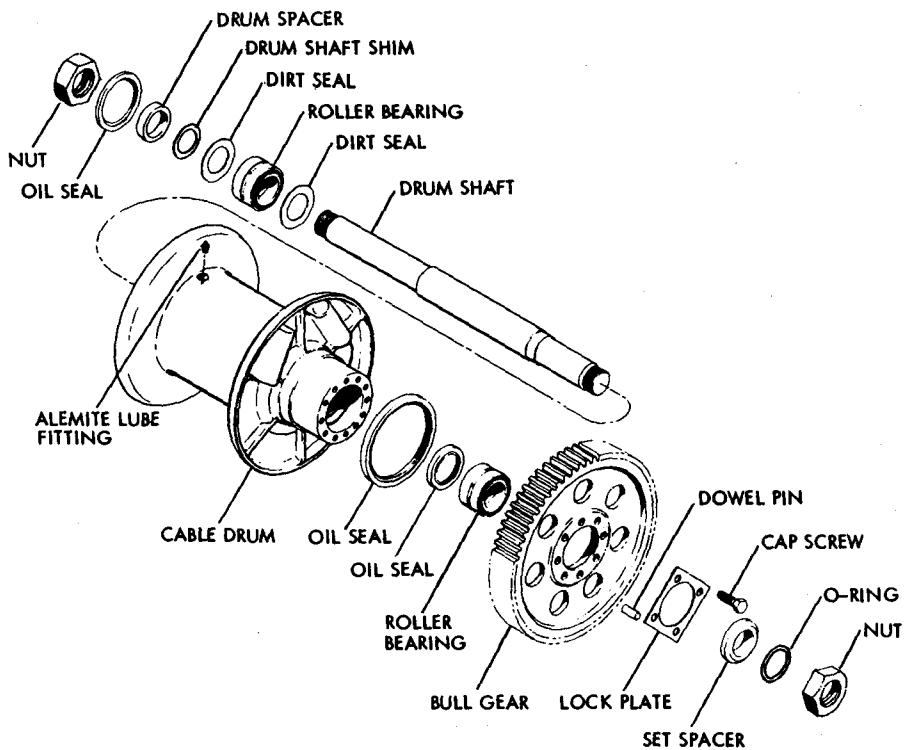
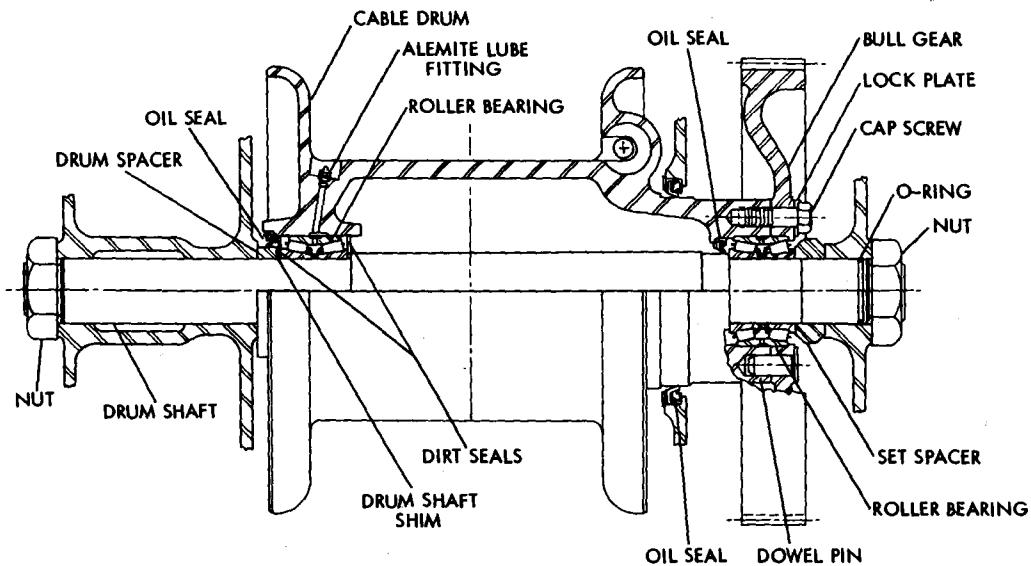


FIGURE 12

SERVICE INSTRUCTIONS

NOTE: If either drum or bull gear is replaced, ream dowel holes as required and install dowels.

Install set spacer and O-ring on gear side of shaft, and, using a suitable hoist, lift assembled drum and shaft and lower into winch case, being careful to guide oil seal on gear end of drum into seal recess in case.

Install gear side cover with gaskets, using gasket compound, and secure to case with capscrews and washers. Trim surplus material from end of gaskets.

Install brake side cover and secure to case with nuts and washers.

Install nut on each end of drum shaft; tighten nut on brake side first, then tighten nut on gear side.

Install cable guard in case, and secure with cotter pin.

IDLER SHAFT ASSEMBLY

Removal

See Figure 13.

Remove drum shaft assembly. Refer to DRUM SHAFT ASSEMBLY, Disassembly.

Remove idler shaft cover. Mark shims for correct position at time of reassembly.

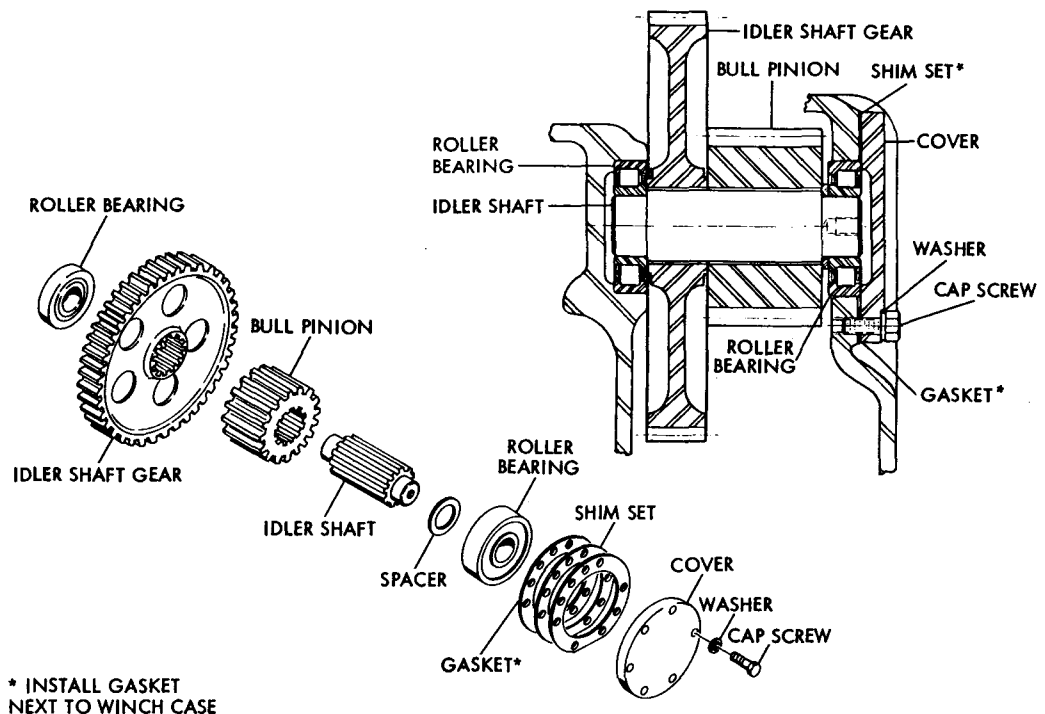


FIGURE 13

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SERVICE INSTRUCTIONS

Using shaft and cap puller SK-7733 and idler shaft puller adapter, remove idler shaft and outer bearing. Remove outer bearing from idler shaft. Remove bull pinion and idler gear through bull gear opening in winch case.

Remove inner bearing.

Installation

See Figure 13.

Support bull pinion in housing and insert idler shaft through pinion. Support idler shaft gear in housing and push idler shaft through gear, turning as necessary to align splines.

Be sure idler shaft is installed with drilled end of shaft outward.

Press idler shaft into inner bearing.

Install outer bearing into bearing bore onto idler shaft.

Install shims, gasket, and cover on case, being sure shims are in same position from which they were removed, and secure cover.

If new parts are used, shim as required to adjust end clearance.

Install drum shaft assembly. Refer to DRUM SHAFT ASSEMBLY, Assembly.

ADJUSTMENTS

Brake Clearance Adjustment

See Figure 2.

Remove brake adjustment cover.

Start tractor engine and shift winch to brake-off position. Be sure brake is fully released.

Adjust brake rod until brake band is tight, then back off brake rod four or five hex flats. Adjust so a flat side of the rod nut is flat against the brake rod spring.

Install brake adjustment cover.

Brake Spring Adjustment

See Figure 2.

Remove brake spring adjustment cover.

Loosen jam nut and turn spring adjustment nut as required to loosen or tighten spring tension. Brake action is best when spring tension is adjusted to hold the required load. Install brake spring adjustment cover.

Do not allow brake to slip or drag over extended periods of time.

Control Stand Adjustment

With tractor engine running, check operation of the winch with control handle in each of the four positions. Winch should be in brake-off when control handle is in the clip-lock position. Check to see that winch does not shift to reverse when handle is pushed forward slightly to release from clip-lock position.

If adjustment is not correct, detach control stand from mounting surface, loosen set screw in control anchor,

SERVICE INSTRUCTIONS

and rotate entire stand around cable to thread cable in or out of stand to accomplish desired adjustment. Fine adjustment of brake-off position is accomplished by adjusting the position of the clip.

See cable installation instructions under CASE COVER ASSEMBLY, Assembly for cable adjustment procedure.

When adjustment is correct, bolt stand back on mounting surface.

Relief Valve Adjustment

Relief valves are adjusted at the factory, and should not require further adjustment. After cleaning the relief valve, however, or if incorrect pressure adjustment is suspected, proceed as follows:

Ball-Type Valve (winches of late manufacture)

1. Stop tractor engine.
2. Install gage of 0 to 400 PSI range in 1/4 NPT port on valve cover.
3. Remove valve housing. Be sure ball is not dislodged to fall into winch case.
4. Remove shims between spring and end of housing to reduce pressure. Add shims to increase pressure.
5. Reinstall valve housing.

6. Start tractor engine and place control stand in brake-off position.

7. Check pressure reading on gage. Pressure should be 240 to 260 PSI.

Pilot-Operated Valve (winches of early manufacture)

1. Stop tractor engine.
2. Install pressure gage of 0 to 400 PSI range in 1/4-inch NPT port on valve cover.
3. Remove cap from end of relief valve.
4. Start tractor engine and place control handle in brake-off position.
5. Check pressure reading on gage. Pressure should be 240 to 260 PSI.
6. If pressure setting requires readjustment, turn relief valve pressure adjusting screw clockwise to increase pressure; counterclockwise to decrease pressure.

NOTE: A small fraction of one turn of the screw is sufficient to vary the pressure 10 PSI.

7. With tractor engine throttle at normal work setting, operate control handle through all positions to ensure that relief valve maintains pressure within specified limits.

8. When pressure is correct, stop engine, install cap on end of relief valve, and remove pressure gage from port in valve cover. Close port with pipe plug.

SERVICE INSTRUCTIONS

Bevel Pinion Bearing Preload Adjustment

Tighten nut to 150 to 300 lb/ft. Check bearing preload. Preload torque without oil seals installed should be 0 to 20 lb/in. (5 to 30 lb/in. with oil seals). Add or remove shims under forward bearing cup to obtain correct preload.

Bevel Gear Contact Adjustment

See Figure 6.

Remove or add shims under bevel

pinion carrier as required to set bevel gear contact pattern.

Bevel Gear Backlash Adjustment

See Figure 6.

Remove or add shims under bevel shaft bearing retainers to set bevel shaft end clearance to 0.005 to .010 inch. Transfer shims from one bearing retainer to the other as required to set backlash between bevel gear and bevel pinion to 0.008 to 0.012 inch.

SERVICE DATA

CAP SCREW TORQUE VALUES (SAE Type 2, Grade 5)

Bolt Size	Torque - lb/ft		Bolt Size	Torque - lb/ft	
	Min.	Max.		Min.	Max.
1/4	9	10	7/8	420	470
5/16	19	21	1	630	710
3/8	33	37	1-1/8	850	950
7/16	53	60	1-1/4	1200	1350
1/2	80	90	1-1/2	2000	2300
5/8	160	180	1-3/4	3300	3700
3/4	290	320	2	5000	5500

The tabulated values apply when:

1. Tapped holes have sufficient threads to prevent stripping female threads.

2. All threads are lubricated with engine oil or light grease.

3. Joints are rigid; no gaskets or compressible materials used.

When coated or metallic plated bolts are used, or when lubricants other than engine oil or light grease are used, multiply values in the table by the following factors:

1. .85 when metallic plated bolts or nuts are used.

2. .75 when Parkerized bolts or nuts are used.

SERVICE INSTRUCTIONS

3. .70 when Molykote, white lead, or similar mixtures are used as lubricants.
4. .90 when hardened surfaces are used under the nut or bolt head, whichever is torqued.

CLUTCH DATA	
Clutch disc pack minimum thickness	1-1/8 in.
Clutch piston ring wear:	
Large piston ring protrusion beyond outer surface of piston . . .	0.015 in. min.
Small piston ring protrusion beyond surface of housing . .	0.015 in. min.
Orifice dowel opening	0.031 in.

BEARING PRELOAD, GEAR BACKLASH, AND SHAFT END CLEARANCES	
Bevel pinion bearing preload:	
Torque without carrier seals installed	0 to 20 lb/in.
Torque with carrier seals installed	5 to 30 lb/in.
Bevel pinion hex nut torque	150 to 300 lb/ft
Bevel gear shaft end clearance	0.005 to 0.010 in.
Bevel gear to bevel pinion backlash	0.008 to 0.012 in.
Brake shaft end clearance	0.010 to 0.020 in.
Idler shaft end clearance	0.005 to 0.015 in.

BRAKE ASSEMBLY DATA	
Minimum thickness of brake lining	1/4 in.
Brake cylinder piston orifice	0.031 in.
Brake cylinder return line orifice	0.040 in.

SERVICE INSTRUCTIONS

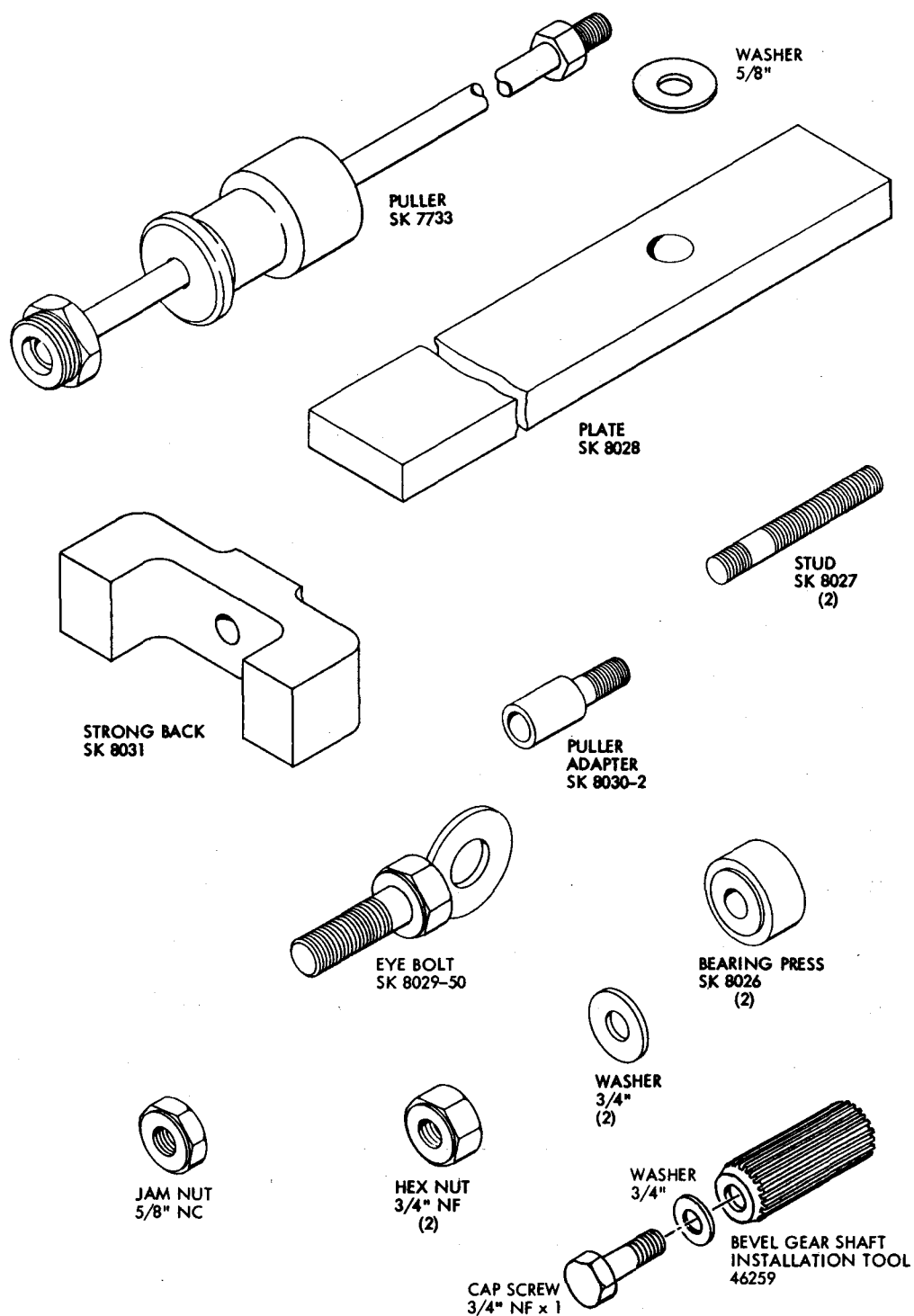


FIGURE 14

PARTS LIST SECTION

Carco Model F-50-PS Winch

(POWER SHIFT FRICTION CLUTCH)

CONTENTS	
	Page
Parts Identification Drawing.....	3
Winch Case Assembly.....	4-5
Bevel Gear Shaft.....	6-7
Clutch Assembly.....	8
Brake Shaft.....	9
Brake Control.....	10
Brake Cylinder.....	11
Idler Shaft.....	12
Drum Shaft.....	13
Control Valve Assembly.....	14-15
Relief Valve.....	16
Filters	17-18
Control Stand Assembly	19
Coupler.....	20
Pressure Warning Gauge	21

Note: Purchased parts, such as bearings and oil seals may be substituted with parts of equal quality on the manufacturer's recommendation, and with the approval of Pacific Car and Foundry Company.

ATTENTION: Be sure to give correct part number, part name and complete serial number of winch when ordering. Also name and model of the tractor on which the winch is mounted.

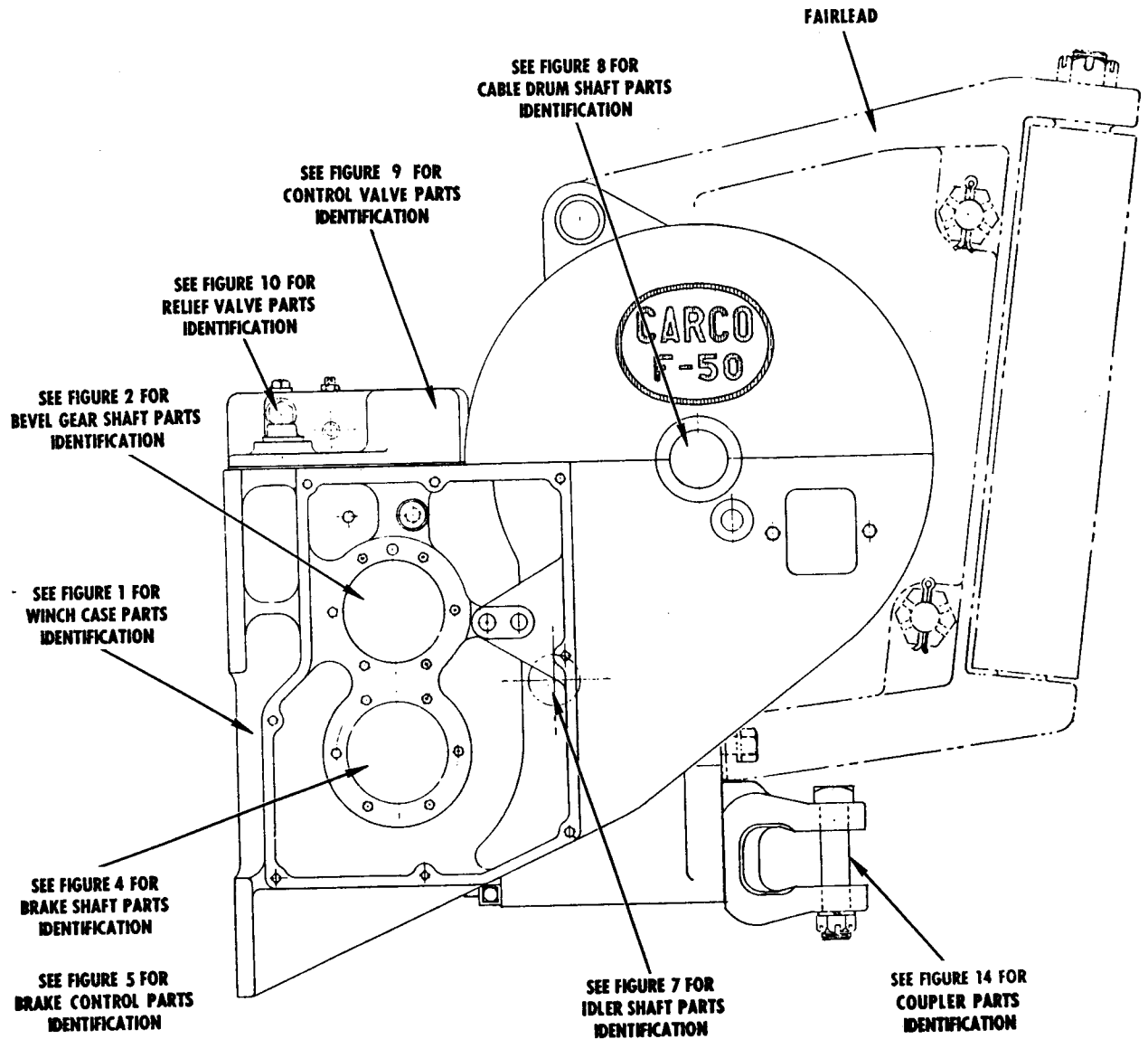
PACIFIC CAR AND FOUNDRY COMPANY
 R E N T O N , W A S H I N G T O N , U . S . A .

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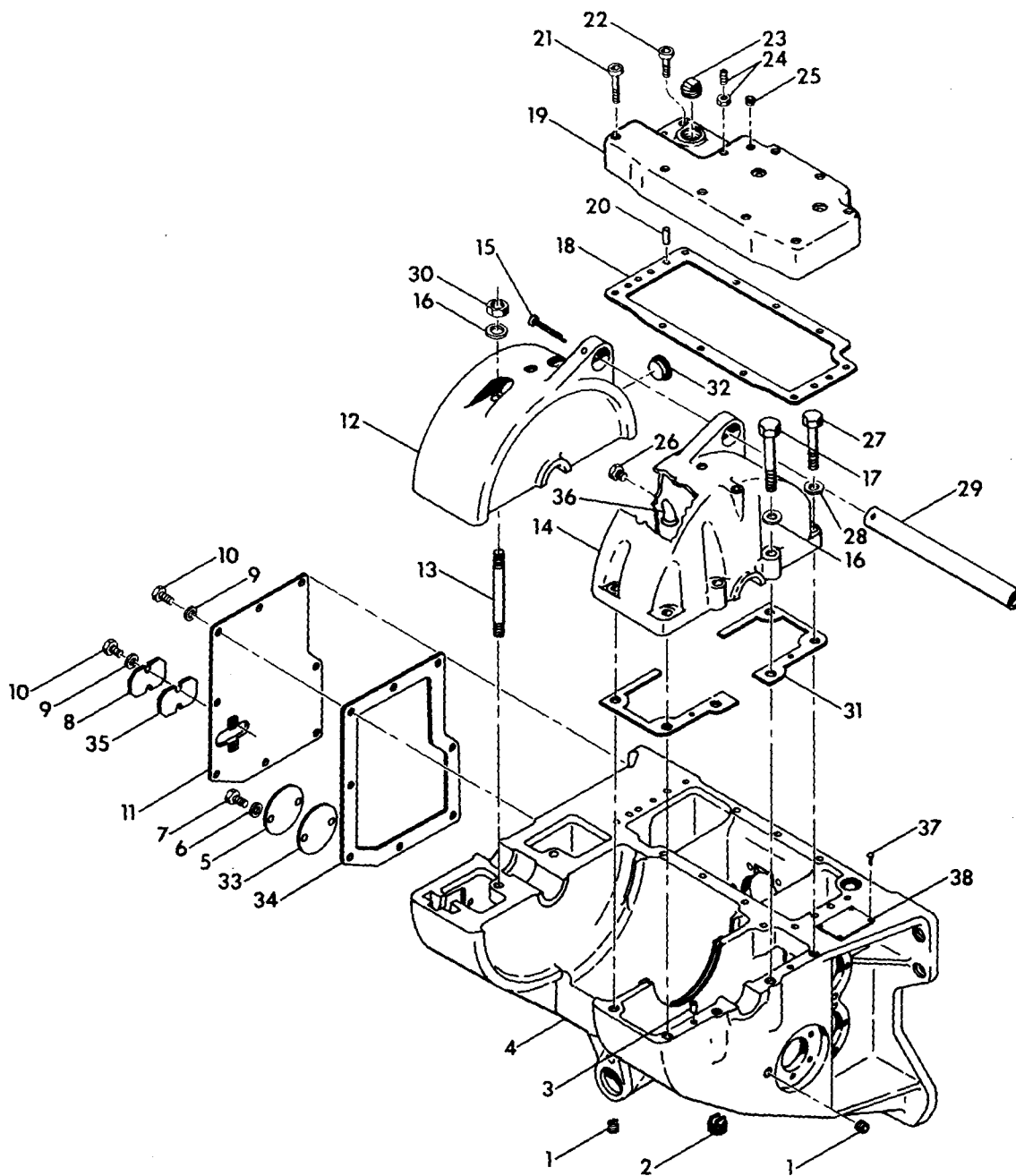
1430-F-5-1-66
 SUPERSEDES
 1430-F-8-1-63

PARTS IDENTIFICATION INDEX DRAWING

CARCO MODEL F-50-PS WINCH



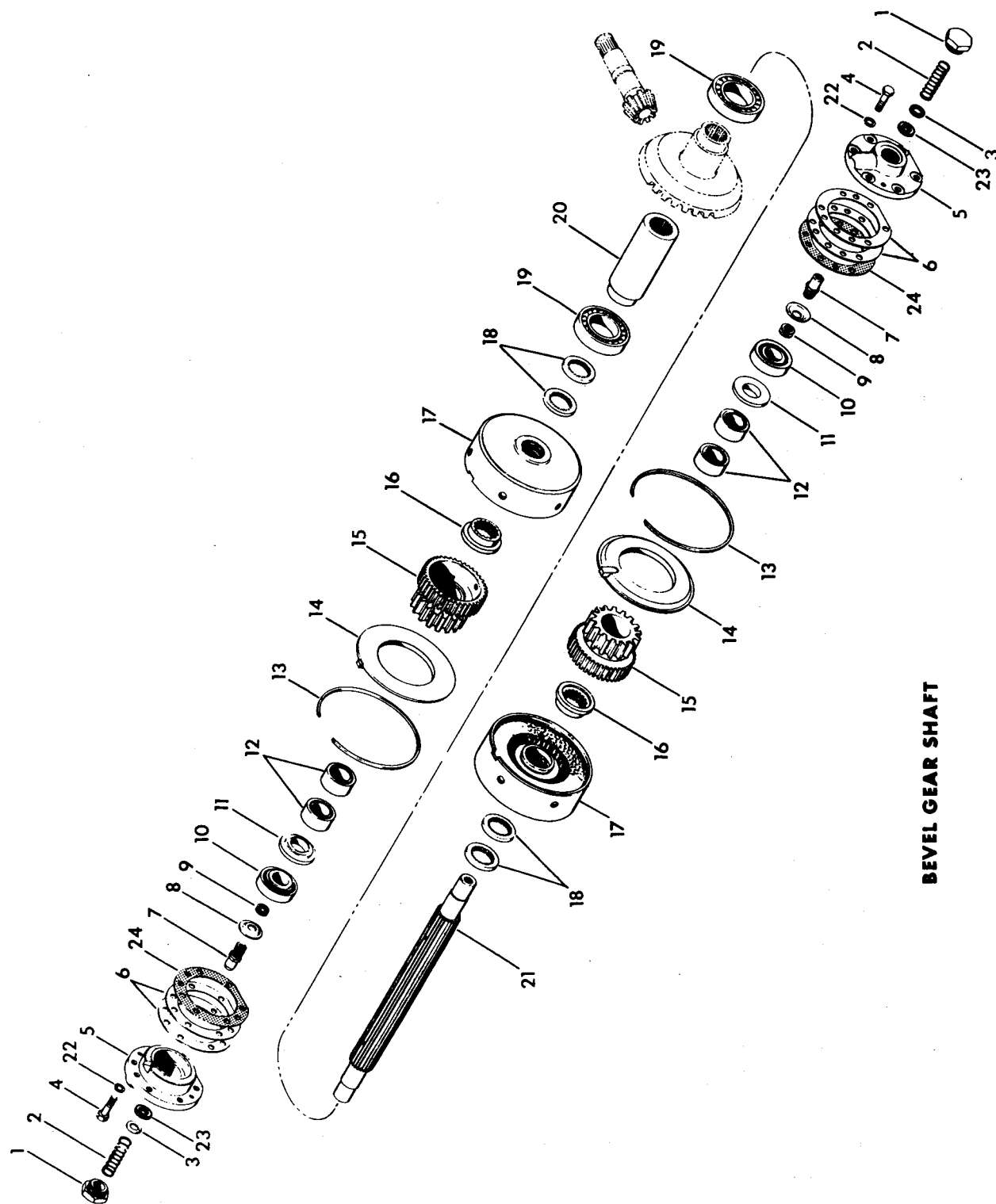
PARTS LIST SECTION - PAGE 4
CASE ASSEMBLY



WINCH CASE

FIGURE 1

REF.	PART NO.	NAME	Quan. per Unit
1	1/2" NPT	Square Head Pipe Plug	2
2	1-1/4" NPT	Magnetic Pipe Plug	1
3	1/2" x 1"	Dowel Pin	2
*4	44401	Case Complete (includes items 12 and 14)	1
5	42048	Cover	1
6	44802-5/8"	Plain Washer	2
7	5/8" UNC x 1"	Hex Head Capscrew, Grade 5	2
8	44816	Brake Adjustment Cover	1
9	44802-1/2"	Plain Washer	10
10	1/2" UNC x 1-1/4"	Hex Head Capscrew, Grade 5	10
11	44416	Side Cover (Brake)	1
*12	44415	Brake Side Cover	1
13	45050-R-92	Stud	2
*14	44440	Gear Side Cover	1
15	3/8" x 4-1/2"	Cotter Pin	1
16	44802-1"	Plain Washer	4
17	1" UNC x 3-1/8"	Hex Head Capscrew	2
18	44474	Cover Gasket	1
19	44472	Case Cover	1
20	1/2" x 1-1/4"	Drivlok Pin, Type D	2
21	1/2" UNC x 3-1/2"	Socket Head Capscrew	8
22	1/2" UNC x 1-1/4"	Socket Head Capscrew	3
23	1-1/4" NPT	Square Head Pipe Plug	1
24	3/8" UNC x 2-1/4"	Socket Head Set Screw, Hex Jam Nut	1
25	1/4" NPT	Hex Socket Pipe Plug	1
26	317400	Alemite Relief Plug	1
27	3/4" UNC x 2-1/2"	Hex Head Capscrew, Grade 5	4
28	44802-3/4"	Plain Washer	4
29	45714-1	Cable Guard	1
30	1" UNC	Hex Nut	2
31	44412	Gasket	2
32	1-1/2" D. I. P. P.	Clover Drivein Pipe Plug	1
33	44833	Spring Adjustment Cover Gasket	1
34	45914-2	Side Cover (Brake) Gasket (Length 5' 6")	1
35	44815	Brake Adjustment Cover Gasket	1
36	1/8" NPT x 90°	150 Mall. Blk. Street Elbow	1
37	#10 x 3/8"	P.K. Drive Screw, Type U	6
38	45816	Name Plate	1
*Items 4, 12 and 14 cannot be ordered separately.			



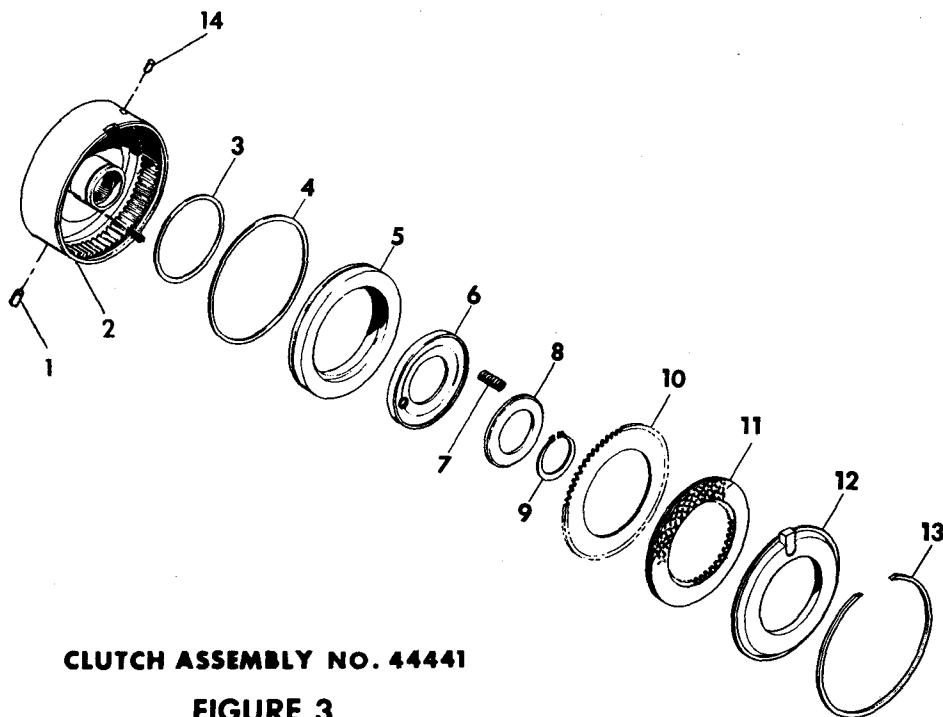
BEVEL GEAR SHAFT

FIGURE 2

REF.	PART NO.	NAME	Quan. per Unit	REF.	PART NO.	NAME	Quan. per Unit
1	20P50N-S	Parker Plug	2	13	44446*	Retaining Ring	2
2	44753	Spring	2	14	44343*	Retaining Ring (Weldment)	2
3	44949	Teflon Seal (includes #2-121 O-Ring)	2	15	45021**	Clutch Pinion	2
4	1/2" UNC x 1-1/4"	Hex Head Capscrew, Grade 5	12	16	45017	Spacer	2
5	44432	Bearing Retainer	2	17	44441	Clutch Assembly (See Figure 3) *(includes items 13 and 14)	2
6	44431	Shim Set	2	18	44452	Static Seal	4
7	41742	Stub Shaft	2	19	15030	Ball Bearing	2
8	44478	Clamp Ring	2	20	44451	Bevel Gear Spacer	1
9	44336	Shim Set	2	21	44433	Bevel Gear Shaft	1
10	15179 15180	Roller Bearing Cup Roller Bearing Cone	2 2	22	44802-1/2"	Plain Washer	12
11	45018	Spacer	2	23	44940	Washer	2
12	15253	Roller Bearing Set	2	24	45028	Shim Gasket	2
<p>**Note: In winches prior to Serial Number 242, if necessary to replace Clutch Pinion, item 15, (previously part number 44454), order new part number 45021 (Clutch Pinion) and also new Spacers (items 11 and 16) part numbers 45018 and 45017 in combination sets only.</p>							

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CARCO MODEL F-50-PS WINCH
PARTS LIST SECTION - PAGE 8
CLUTCH ASSEMBLY

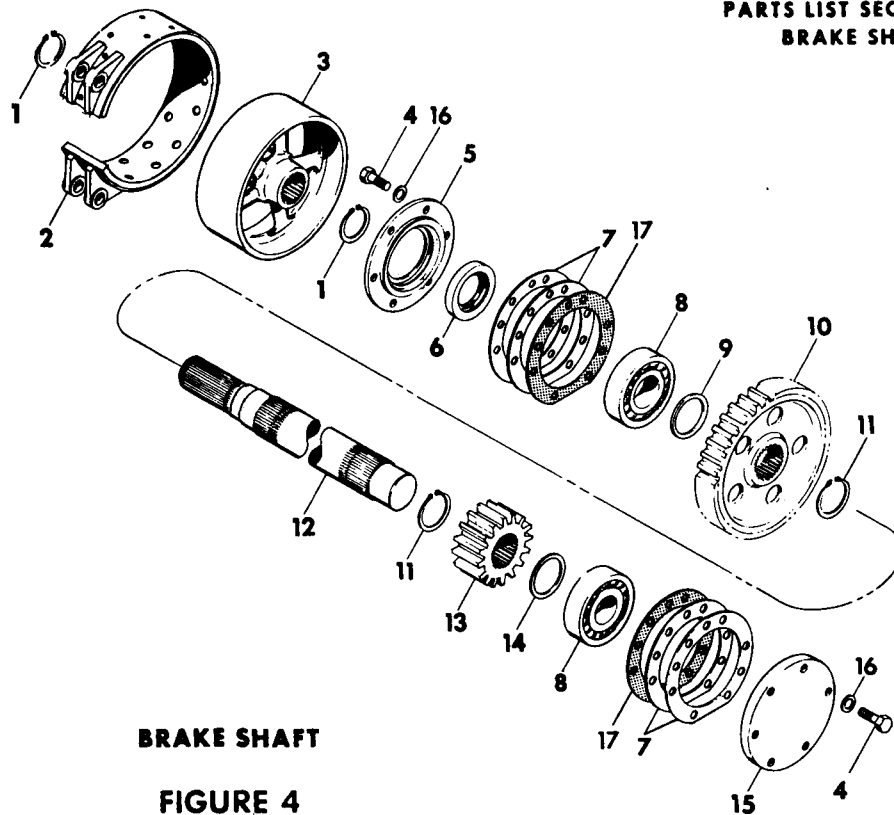


CLUTCH ASSEMBLY NO. 44441

FIGURE 3

(See Figure 2 - Item 20)

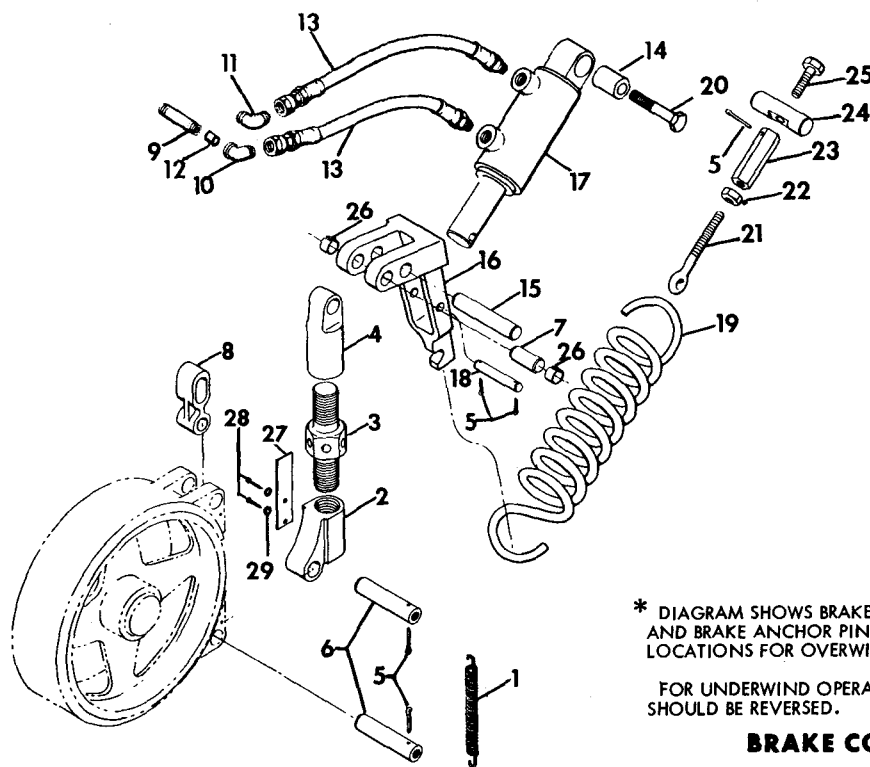
REF.	PART NO.	NAME	Quan. per Unit
1	1/4" x 1/2"	Dowel Pin	1
2	44444	Clutch Housing	1
3	46242	Piston Seal	1
4	46243	Piston Seal	1
5	44445	Clutch Piston	1
6	44450	Return Ring	1
7	44449	Clutch Spring	16
8	44448	Ring Retainer	1
9	5100-287	Truarc Retaining Ring	1
10	46134	Steel Disc	5
11	46133	Friction Disc	4
12	44343	Retaining Ring (Weldment)	1
13	44446	Retaining Ring	1
14	45415-1	Orifice Dowel	1
15	7/16" x 1-1/4"	Roll Pin	1



BRAKE SHAFT
FIGURE 4

REF.	PART NO.	NAME	Quan. per Unit
1	5100-200	Truarc Retaining Ring	2
2	44417	Brake Band Assembly (includes following)	1
	44418	Brake Band	1
	3/8" x 3-1/4"	R. M. 357B Lining - 2'-1-3/4" long	1
	1/4" x 1/2" Head	Tubular Brass Rivet - 1/2" long	26
3	44420	Brake Drum	1
4	1/2" UNC x 1-1/4"	Hex Head Capscrew, Grade 5	12
5	44435	Seal Carrier	1
6	415659	National Oil Seal	1
7	44431	Shim Set	2
8	15074	Ball Bearing	2
9	44463-2	Brake Shaft Spacer	1
10	44436	Brake Shaft Gear	1
11	5100-231	Truarc Retaining Ring	2
12	44434	Brake Shaft	1
13	44462	Brake Shaft Pinion	1
14	44463-1	Brake Shaft Spacer	1
15	44464	Cover	1
16	44802-1/2"	Plain Washer	12
17	45028	Shim Gasket	2

CARCO MODEL F-50-PS WINCH
PARTS LIST SECTION - PAGE 10
BRAKE CONTROL

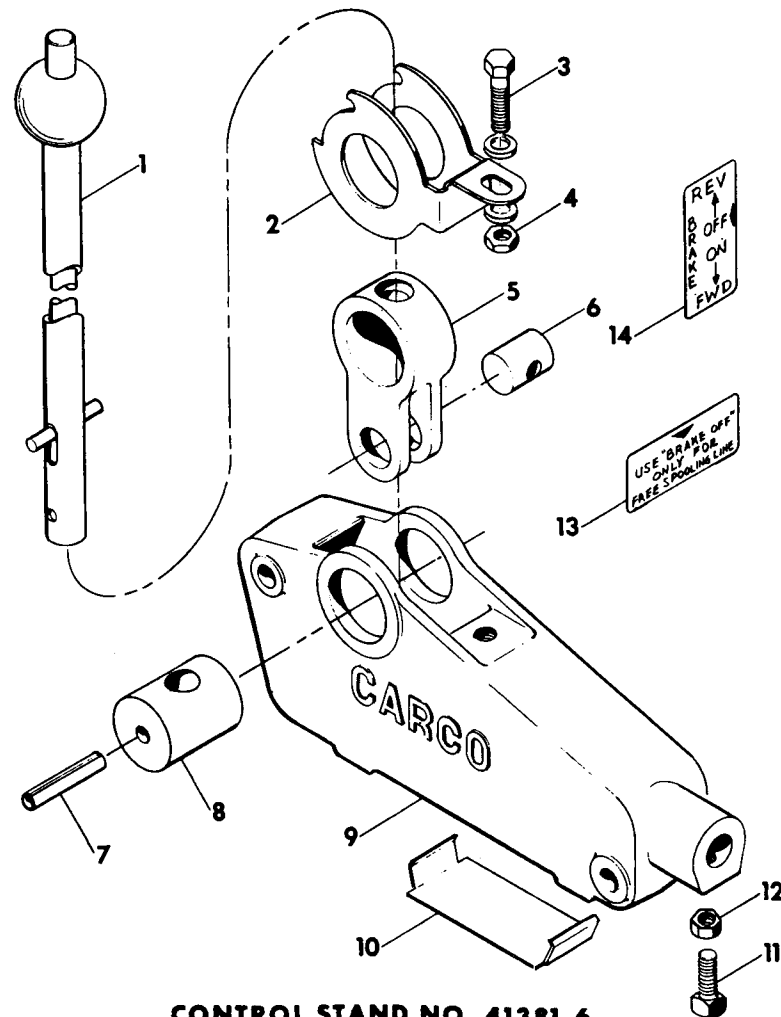


* DIAGRAM SHOWS BRAKE LINK PIN (ITEM 7)
AND BRAKE ANCHOR PIN (ITEM 15) IN PROPER
LOCATIONS FOR OVERWIND CABLE OPERATION.

FOR UNDERWIND OPERATION, THESE PINS
SHOULD BE REVERSED.

BRAKE CONTROL
FIGURE 5

REF.	PART NO.	NAME	Quan. per Unit
1	44107	Tension Spring (Brake Band)	1
2	44422	Brake Rod Nut (lower)	1
3	44423	Brake Rod	1
4	44426	Brake Rod Nut (upper)	1
5	1/8" x 1-1/4"	Cotter Pin	5
6	44421	Brake Band Pin	2
*7	44429	Brake Link Pin (short pin)	1
8	44427	Brake Link	1
9	45805	Pipe Nipple	1
10	C5455-6	Weatherhead Female Elbow	1
11	C5405-6-8	Weatherhead Male Elbow	1
12	45806	Orifice Dowel	1
13	44118-13AB	Hose Assembly	2
14	46077-1	Sleeve	1
*15	44428	Brake Anchor Pin (long pin)	1
16	44437	Brake Arm	1
17	45861	Brake Cylinder (See Figure 6)	1
18	44438	Brake Cylinder Pin	1
19	40155	Tension Spring (Brake Cylinder)	1
20	3/4" UNC x 4"	Hex Head Capscrew, Grade 5	1
21	44206	Eye Bolt	1
22	1/2" UNC	Hex Jam Nut	1
23	40174	Spring Adjustment Nut	1
24	40175	Anchor Pin (Spring)	1
25	42023	Anchor Screw	1
26	44687-2	Brake Pin Spacer	2
27	44806	Brake Rod Spring	1
28	#10 x 3/8"	P.K. Drive Screw, Type U	2
29	#10 x 7/32" I. D. x 1/2" O. D.	Flat Steel Washer, M-P SAE	2



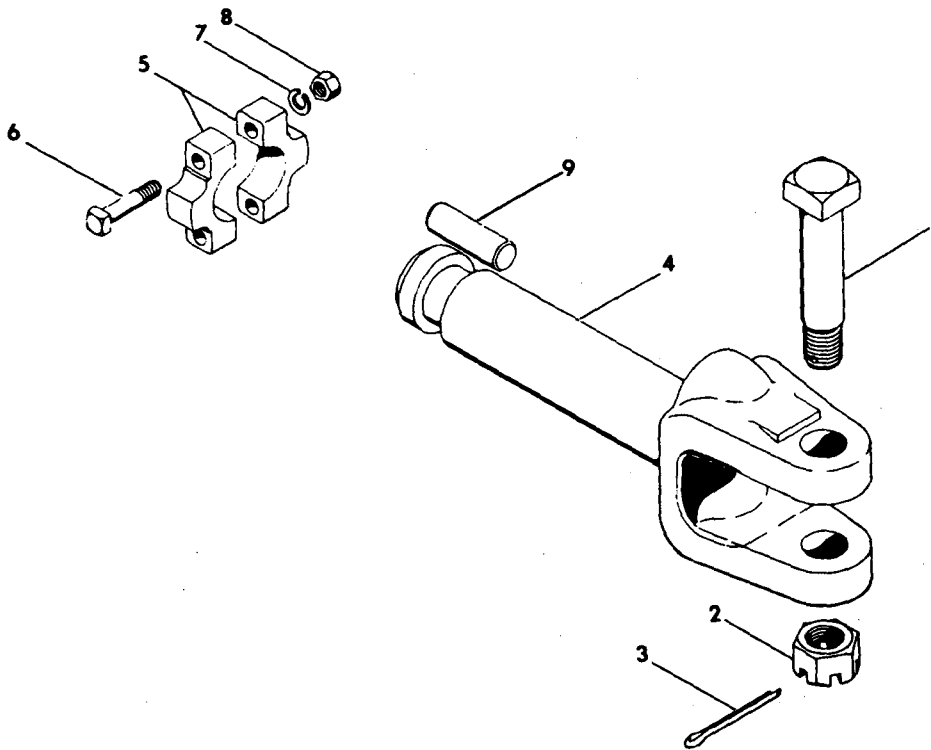
CONTROL STAND NO. 41381-6

FIGURE 13

REF.	PART NO.	NAME	Quan. per Unit
1	44283	Handle Assembly	1
2	44099-3	Clip	1
3	3/8" UNF x 1-1/4"	Hex Head Capscrew	1
4	3/8" UNF	Hex Jam Nut	1
5	41383	Lever	1
6	39202	Pin	1
7	52-048-250-1750	Esna Roll Pin	1
8	44035	Pin	1
9	44098	Housing	1
10	44097	Plate	1
11	3/8" UNC x 1"	Square Head Set Screw	1
12	3/8" UNC	Hex Nut	1
13	44746	Warning Plate	1
14	44745	Instruction Plate	1
15	44802-3/8"	Plain Washer	2

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CARCO MODEL F-50-PS WINCH
PARTS LIST SECTION - PAGE 20
COUPLER

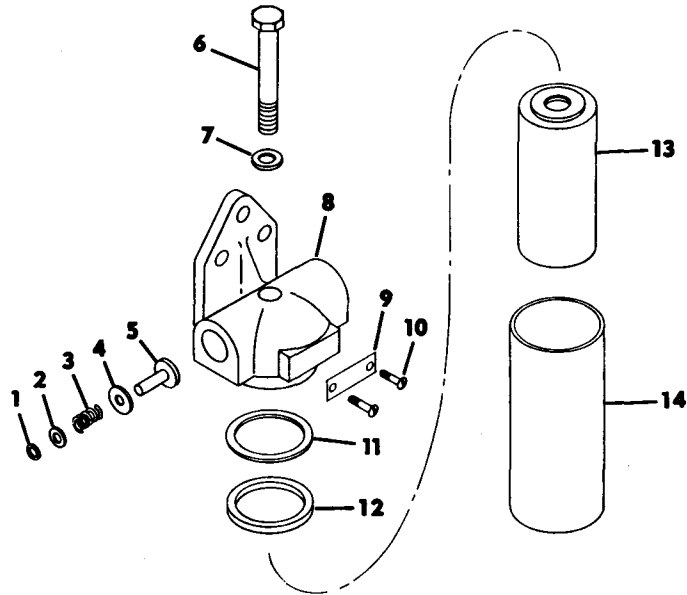


To Change From a Rigid to a Swivel Coupler,
Remove Dowel Pin, Item 9.

FIGURE 14

COUPLER ASSEMBLY COMPLETE PART NO. 44344

REF.	PART NO.	NAME	Quan. per Unit
1	32871-1	Coupler Bolt	1
2	Y-1216-1	Hex Nut	1
3	1/4" x 2-1/4"	Cotter Pin	1
4	32857	Swivel Coupler	1
5	45702	Retainer Clamp	1
6	1/2" UNC x 2-1/4"	Hex Head Capscrew, Grade 5	2
7	1/2" UNC	Hex Nut	2
8	1/2"	Washer	2
9	32865	Dowel Pin	1



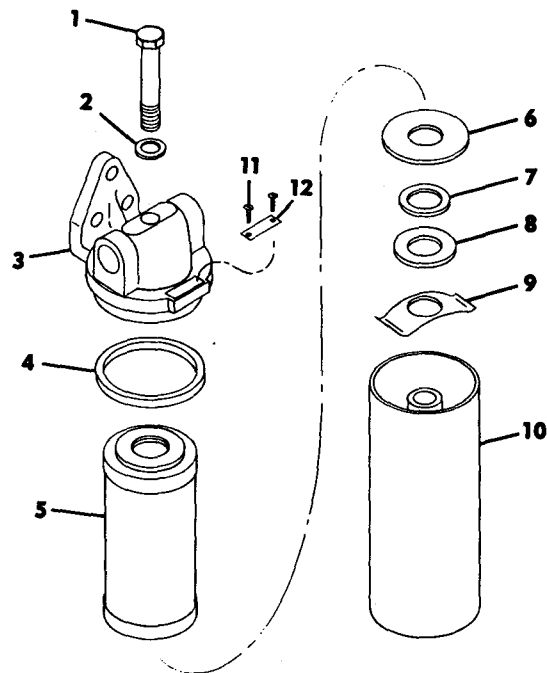
PRESSURE FILTER -NO. 45169

FIGURE 11

REF.	PART NO.	NAME	Quan. per Unit
1	632061	Retaining Ring	1
2	632060 - 3/16"	Plain Washer	1
3	631870	Spring	1
4	631868	Spanner	1
5	631871	Valve	1
6	070299	Capscrew	1
7	631869	5/8 Stat-O-Seal Washer	1
8	631846	Head	1
9	1315-166	Name Plate	1
10	259-4-4	Drive Screw	2
11	632062	Ring	1
12	632063	O-Ring	1
13	A-1991	Element Assembly	1
14	631872	Tank Weld Assembly	1

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CARCO MODEL F-50-PS WINCH
PARTS LIST SECTION - PAGE 18
SUCTION FILTER



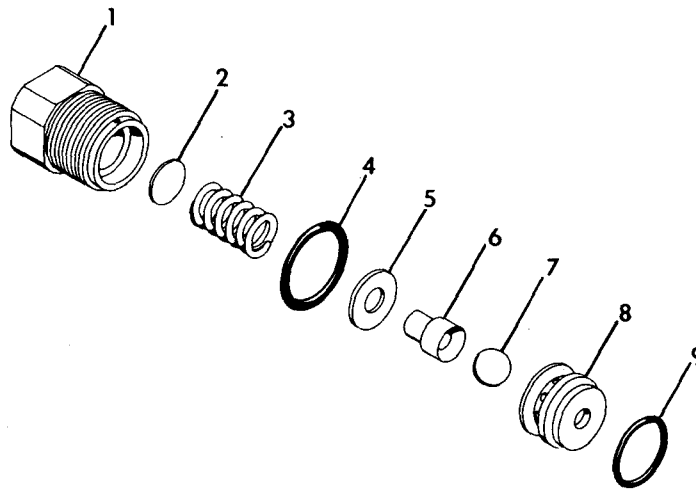
SUCTION FILTER-NO. 45168

FIGURE 12

REF.	PART NO.	NAME	Quan. per Unit
1	21475 (7/16" NC x 3-3/4")	Hex Head Capscrew	1
2	306-7	Copper Washer	1
3	01N47	Head	1
4	00N51 (4-1/8 I.D. x 4-1/2 O.D. x 5/16 wide)	O-Ring	1
5	E-60045	Element - 60 Mesh Model	1
6	02N39	Bottom Plate	1
7	310-0-1216	Stat-O-Seal Washer	1
8	01N97	Special Washer	1
9	02N38	Spring	1
10	01N67	Tank Assembly	1
11	259-4-4	Drive Screw	2
12	02N37	Name Plate	1

REF.	PART NO.	NAME	Quan. per Unit	REF.	PART NO.	NAME	Quan. per Unit
1	44472	Case Cover (See Figure 1)	1	8a	44259-1	Spring Stop (Inner)	1
2	42020	O-Ring	3	8b	45548	Spring	1
3	XRC 323	National Tube Retainer	3	8c	45623	Spring Stop (Outer)	1
4	44470	Brake Tubing	1	8d	5100-75	Truarc Retaining Ring	1
5	44471	Forward Tubing	1	8e	45549	Spring	1
6	1/2" UNF x 1"	Hex Head Capscrew, Grade 5	2	8f	45622	Washer	1
7	44802-1/2"	Plain Washer	2	8g	N-5000-150	Truarc Retaining Ring	1
8	45853	Valve Assembly	1	8h	45854	Valve Spool	1
9	5816 x 8	Weatherhead Male Connector	4	8i	44257	Spool Lock Screw	1
10	5816 x 8 x 12	Weatherhead Male Connector	1	8j	AN960- D416-L	Aluminum Washer	1
11	44120	Supply Tubing	1	8k	45818	Valve Body	1
12	44473	Reverse Tubing	1	8l	1/2" Grade 3	Steel Ball	4
13	44960	Gresen Relief Valve (See Figure 10)	1	8m	45855	Piston	1
14	624612	National Back-up Ring	1	8n	622720	National O-Ring	1
15	622712	National O-Ring	1	8o	RS-131	Spirolox Retaining Ring	1
				8p	45857	Spring	1
				8q	45856	Spring-Stop	1
				8r	RR-156	Spirolox Retaining Ring	1

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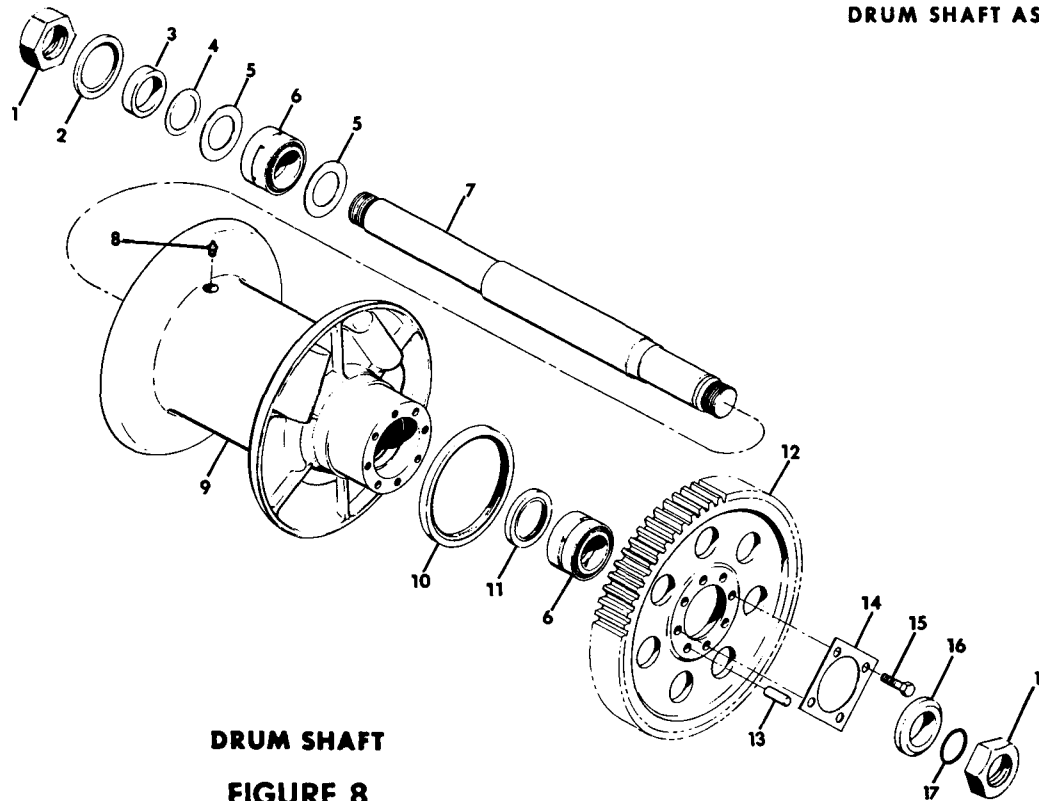


BALL TYPE RELIEF VALVE - NO. 44960

FIGURE 10

(See Figure 9 - Item 13)

REF.	PART NO.	NAME	Quan. per Unit
1	1747	Body	1
2	949	Shim, Poppet Relief	As Reqd.
3	953	Spring	1
4	1615	O-Ring	1
5	1742	Washer	1
6	1744	Guide	1
7	014	Ball	1
8	1752	Seat, Relief	1
9	1718	O-Ring	1



**DRUM SHAFT
FIGURE 8**

REF.	PART NO.	NAME	Quan. per Unit
1	2-1/2" UN	Hex Jam Nut	2
2	55379-S	National Oil Seal	1
3	44457-1	Drum Spacer	1
4	44881	Drum Shaft Shim	2
5	44458	Dirt Seal	2
6	15200	Roller Bearing (See Note)	2
7	44459	Drum Shaft	1
8	1610	Alemite Lube Fitting	1
9	44456	Cable Drum	1
10	415300	National Oil Seal	1
11	55137-S	National Oil Seal	1
12	44461	Bull Gear	1
*13	45081-2	Dowel Pin	4
14	44469	Lock Plate	1
15	3/4" UNF x 2-1/4"	Hex Head Capscrew, Grade 5	4
16	44460-3	Set Spacer	1
17	622735	National O-Ring	1

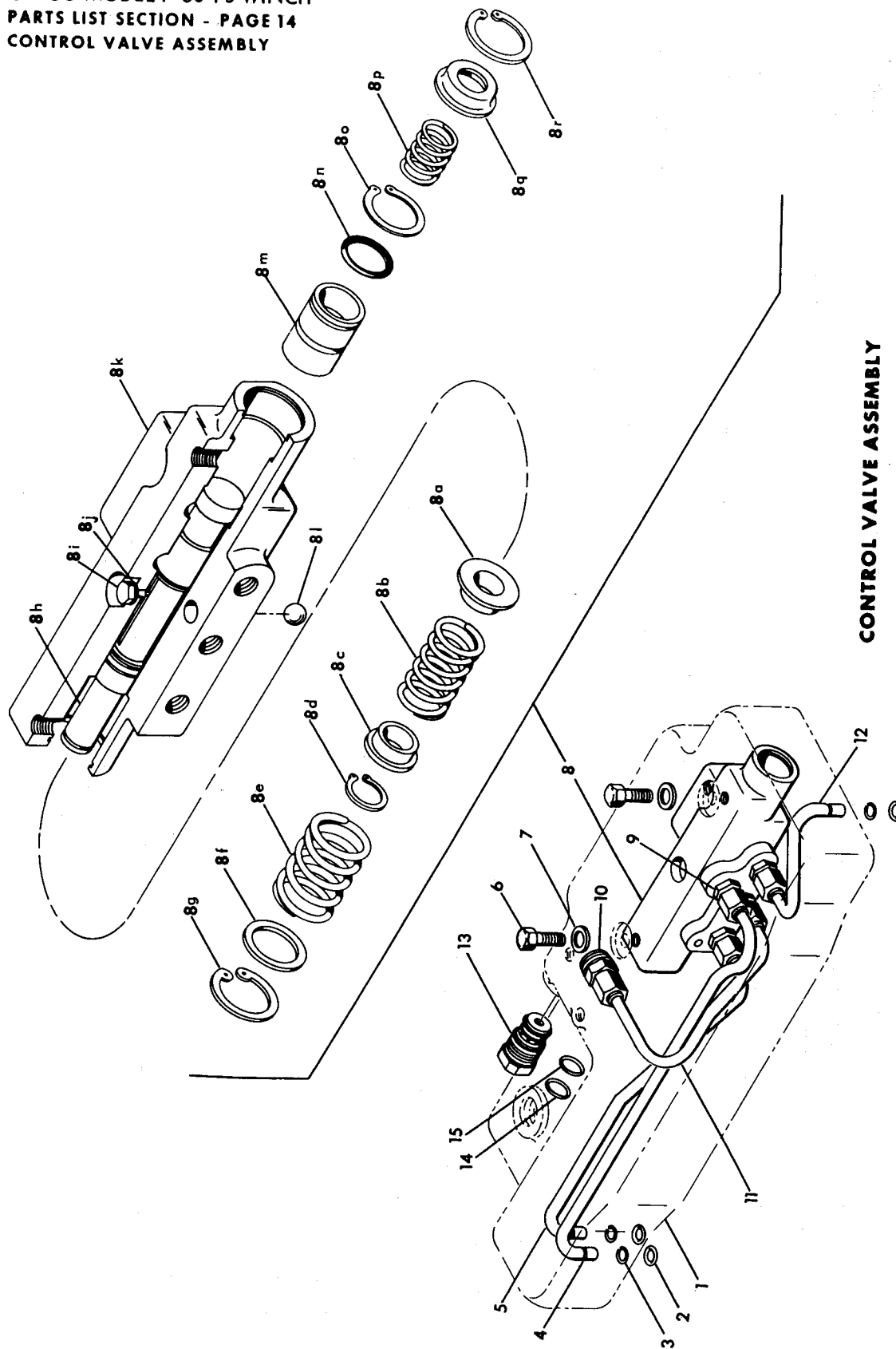
*When Bull Gear or Cable Drum is replaced, Dowel holes must be drilled 53/64 and reamed .9057/.9077 to accommodate new Dowels.

NOTES: Item 6, Roller Bearing must be bought as a complete set.

To order Ferrule specify Part No. 25457 and Wire Rope diameter

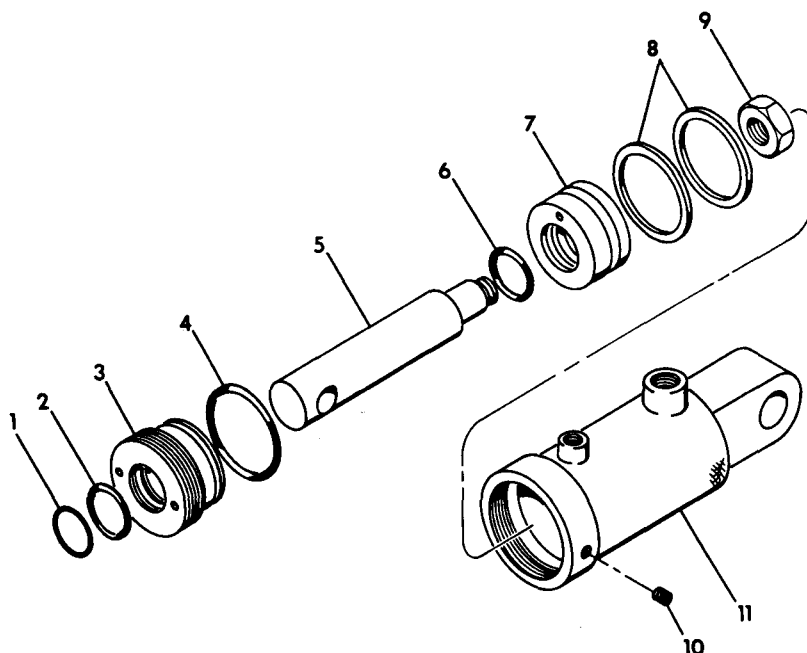
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CARCO MODEL F-50-PS WINCH
PARTS LIST SECTION - PAGE 14
CONTROL VALVE ASSEMBLY



CONTROL VALVE ASSEMBLY

FIGURE 9

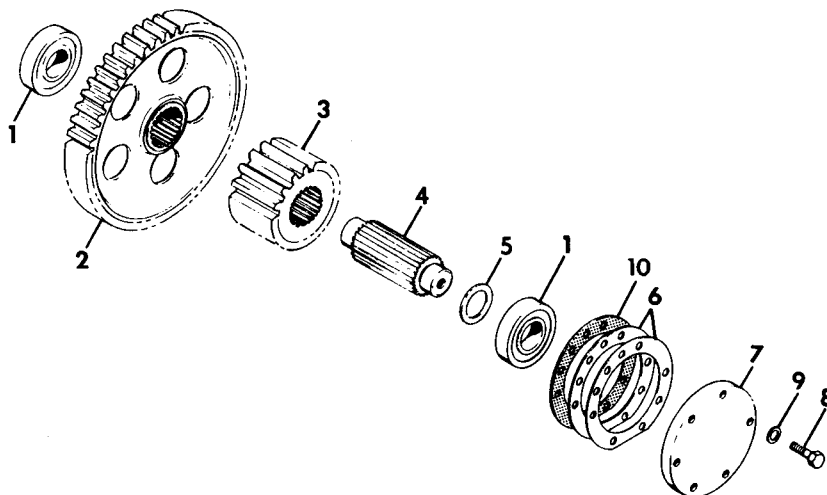


BRAKE CYLINDER NO. 45861

FIGURE 6

REF.	PART NO.	NAME	Quan. per Unit
1	472309	Rod Wiper	1
2	590119	Rod Packing (O-Ring)	1
3	B-26-610	Rod Head	1
4	590206	Head Seal (O-Ring)	1
5	B-23-761	Rod	1
6	590119	Piston Seal (O-Ring)	1
7	B-22-530	Piston	1
8	481922	Piston Packing	1
9	410504	Piston Nut	1
10	413624	Head Lockscrew	1
11	B-25-658	Tube Assembly	1

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IDLER SHAFT

FIGURE 7

REF.	PART NO.	NAME	Quan. per Unit
1	15137	Roller Bearing	2
2	44468	Idler Shaft Gear	1
3	44465	Bull Pinion	1
4	44466	Idler Shaft	1
5	44467	Bull Pinion Spacer	1
6	44431	Shim Set	1
7	44464	Cover	1
8	1/2" UNC x 1-1/4"	Hex Head Capscrew, Grade 5	6
9	44802-1/2"	Plain Washer	6
10	45028	Shim Gasket	1

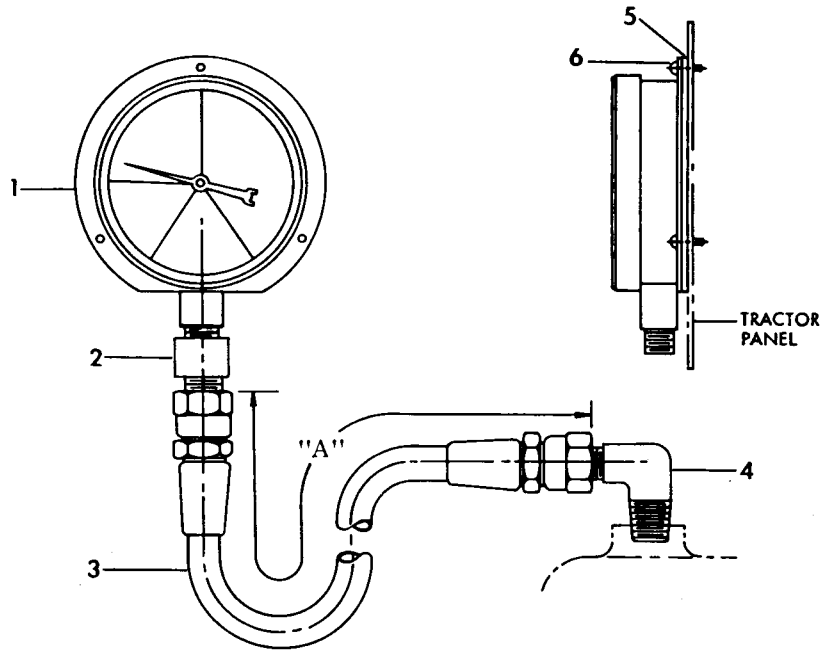


FIGURE 15
PRESSURE WARNING GAUGE KIT. PART NO. 44920 **
(Power Shift Winches)

REF.	PART NO.	NAME	Quan. per Unit
1	46288	Pressure Gauge	1
2	C5255 x 4 x 4	Weatherhead, Female Connector	1
3	*	Hose Assembly	1
4	C5405 x 4 x 4	Weatherhead, 90° Male Elbow	1
5	46341	Pad	1
6	#10 x 3/8"	Parker-Kalon Type AB, Round Head Tapping Screw	3

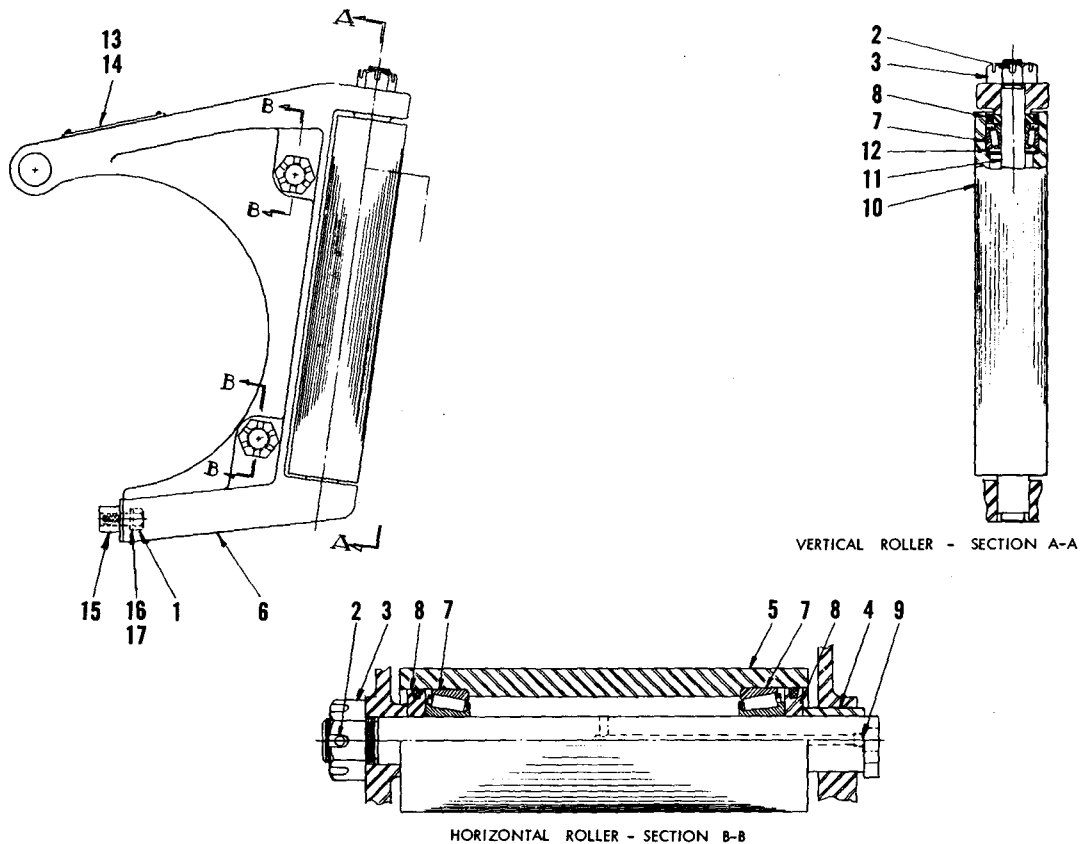
*Order Hose Part Number for desired length shown in Table below.

**Order Kit Number for desired hose length shown in Table below.

**Kit Assy No.	Hose Length "A"	*Hose Part No.
44920-48	4' - 0"	44921-48-B-B
44920-72	6' - 0"	44921-72-B-B
44920-96	8' - 0"	44921-96-B-B
44920-120	10' - 0"	44921-120-B-B
44920-144	12' - 0"	44921-144-B-B
44920-168	14' - 0"	44921-168-B-B
44920-192	16' - 0"	44921-192-B-B

CARCO MODEL F-50 WINCH
PARTS LIST SECTION
FAIRLEAD

THIS FAIRLEAD IS NORMALLY FURNISHED AS A 3-ROLLER UNIT, WITH HORIZONTAL ROLLER IN TOP POSITION - IF A 4-ROLLER UNIT IS REQUIRED, AN ADDITIONAL ROLLER CAN BE SUPPLIED CONSISTING OF ITEMS LISTED IN COLUMN "A" IN PARTS LIST.



FAIRLEAD ASSEMBLY COMPLETE—PART NO. { 44280-30 (3 ROLLER)
44280-40 (4 ROLLER)

REF.	PART NO.	NAME	Quan. per Unit	"A"
1	5/8" 9NC x 2 1/2"	Hex Head Capscrew	2	
2	3/4" x 3"	Cotter Pin	3	1
3	K-8111	Timken Nut	3	1
4	44371	Horizontal Shaft Assem.	1	1
5	33958	Horizontal Roller	1	1
6	44368	Fairlead Housing	1	
7	15235/15178	Roller Bearing	6	2
8	30044	Dust Guard	6	2
9	1610	Alemite Grease Fitting	5	1
10	30250	Vertical Roller	2	
11	30252	Vertical Shaft Assem.	2	
12	30045	Retainer	4	
13	26248	Name Plate	1	
14	1/2" x 3/4"	Drive Screw	4	
15	42178	Attaching Lug	2	
16	3/4"	Flat Washer	2	
17	3/8" Med.	Lockwasher	2	

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2090-F-3-1-66
SUPERSEDES
2034-F-1-1-66