

CARCO

INSTALLATION AND PARTS MANUAL

MODEL 50B PS

FOR

CATERPILLAR D5N & D6N PS TRACTORS

NOTE: This manual covers winch installation and parts, specific to the tractor or tractors listed above. For all other common winch parts, refer to Carco Winch Parts Manual LIT2115.

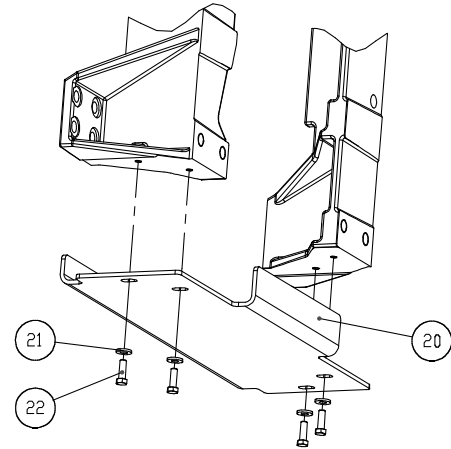
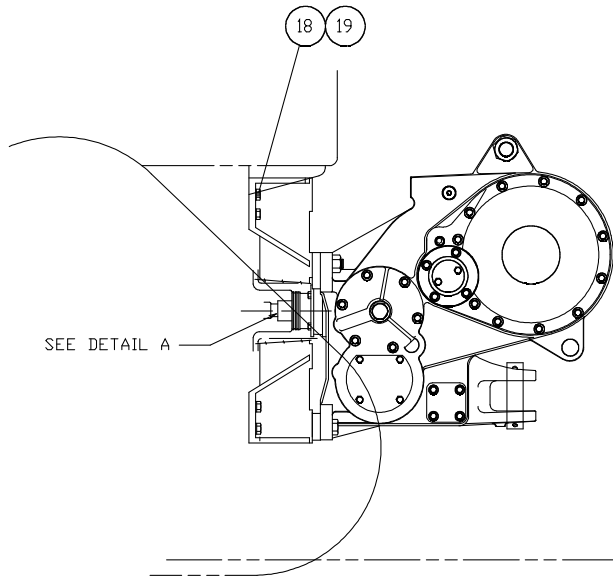
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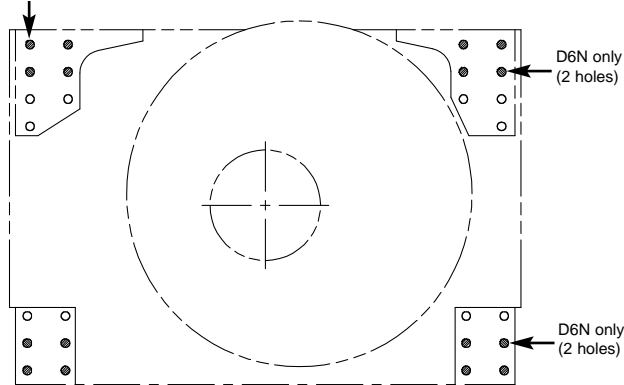
MODEL NUMBER DESCRIPTION

50B	C	0	0	0	0	0
Basic Winch Model	Bevel Gear Ratio B-1.27:1 C-1.64:1 D-2.11:1 E-2.79:1	0-OVERWIND 1-UNDERWIND	0-STANDARD BRAKE	0-WITHOUT FREESPOOL 1-WITH FREESPOOL	0-FOUR SHAFT WINCH 1-THREE SHAFT WINCH	0-NO FAIRLEAD 3 - 3 ROLLER 4 - 4 ROLLER

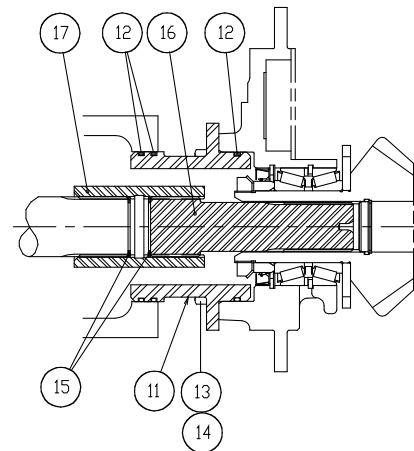
MODEL 50B
MOUNTING GROUP
D5N & D6N



Winch Mounting Holes M20 X 2.5 thread.
 12 Holes for D5N; 16 Holes for D6N



VIEW OF TRACTOR REAR FACE



DETAIL A

ITEM	PART NO.	DESCRIPTION	QTY	
			D5N	D6N
11	104042	PILOT, PTO	1	1
12	69850	O-RING	3	3
13	104320	CAPSCREW, HEX HD, 1/2 - 13 UNC x 1.00, GD 8, Z	4	4
14	100859	WASHER, 1/2 NOM, HARD, Z	4	4
15	68870	RETAINING RING	2	2
16	104041	SHAFT, PTO	1	1
17	69056	COUPLING	1	1
18	104169	CAPSCREW, HEX HD, M20 X 2.5 X 50, GD 10.9, Z	12	16
19	103261	WASHER, M20 NOM, HARD, Z	12	16
20	104091	GUARD	1	1
21	104322	CAPSCREW, HEX HD, 1/2 -13 NC X 1 1/2, GD 8, Z	4	4
22	102987	WASHER, 1/2 NOM, HARD, Z	4	4

NOTES

1. PTO rotation is CCW as viewed from rear of tractor.
2. PTO pilot, (11) is used in several applications, usually only one o-ring (12) will engage and seal in the tractor PTO opening.
3. Ensure that installation is completed before the Loc-tite thread locking compound hardens.
4. Remove paint, rust, dirt and oil from mounting surfaces of winch, tractor and winch adapters. If necessary, clean tapped holes in tractor rear face to ensure full thread engagement.
5. All fasteners that will be installed with thread locking compound must be thoroughly cleaned with solvent to remove all traces of oil.

INSTRUCTIONS

(Refer to illustrations on Page 1 and 4)

1. Remove the transmission filter group and mounting brackets and fuel drain group from rear of tractor. The winch mounting brackets must be installed on the tractor and the revised transmission filter group installed onto the winch mounting brackets prior to installing the winch.

CAUTION

Mounting brackets weigh approximately 140 pounds (64 kg). Make certain lifting equipment has adequate capacity. Failure to use adequate lifting equipment may result in injury.

2. Apply Loc-tite 242, 243 or equivalent to the clean dry threads of capscrews (18). Lift the mounting brackets into position and install capscrews with washers (18 & 19). Tighten capscrews only hand tight at this time. Capscrews will be tightened to full torque after winch is installed on brackets.
3. Install the transmission filter and fuel drains group, P/N 63509 (Caterpillar P/N 189-3144 for D5N and 200-6975 for D6N) onto winch mounting brackets as shown.
4. Apply Loc-tite 271 or equivalent to approximately 1.5 in. (38 mm) of bracket-end of studs (6). Install studs into top holes of mounting brackets (1, 2) to a projection height of 3.75 in. (95.3 mm).

5. Install spacers (3) onto studs as shown.
6. Install o-rings (12) onto PTO pilot (11) and coat with general purpose grease.
7. Apply moly-type grease to the splines of the PTO shaft (16) and install shaft into bevel pinion gear in winch.
8. Install retaining rings (15) into grooves inside PTO coupling (17). Install coupling onto PTO shaft installed in step 7, above. Install coupling with chamfered edge toward tractor.

WARNING

Winch weighs approximately 2,200 lb (1000 kg). Make certain lifting equipment has adequate capacity. Failure to use adequate lifting equipment may result in property damage, injury or death.

9. Lift winch into position and carefully align the winch PTO coupling with tractor PTO shaft. It may be necessary to turn the winch bevel gears by hand to assist alignment of the winch and tractor shafts. Remove the winch top cover to gain access to the bevel gears. Adjust winch position to minimize vertical and horizontal loads on PTO pilot.
10. Apply Loc-tite 242 or equivalent to the threads of the studs. Loosely install hardened flat washers and nuts (7, 8) onto studs.
11. Install spacers (3) between winch case and mounting brackets.
12. Apply Loc-tite 242 or equivalent to the threads of capscrews (9) and install with washers (10) into winch case.
13. Tighten nuts (7) to 600 lb•ft (815 N•m) and capscrews (9) to 680 lb•ft (920 N•m) torque.
14. Evenly tighten capscrews (18) to 390 lb•ft (530 N•m) torque.
15. Install guard (20) to bottom of mounting brackets with washer and capscrew (21,22). Tighten capscrews to 105 lb•ft (142 N•m) torque.
16. Fill winch to proper level with recommended oil before starting tractor. Refer to Operation & Preventive Maintenance Manual or Service Manual for recommended oil.

**MODEL 50B
MOUNTING GROUP
D5N & D6N**

NOTE: Effective March 2004, CATERPILLAR has made a change to the transmission filter arrangement on the D5N and D6N tractors that will not allow for correct installation of the CARCO 50B AND CATERPILLAR PA55 towing winches.

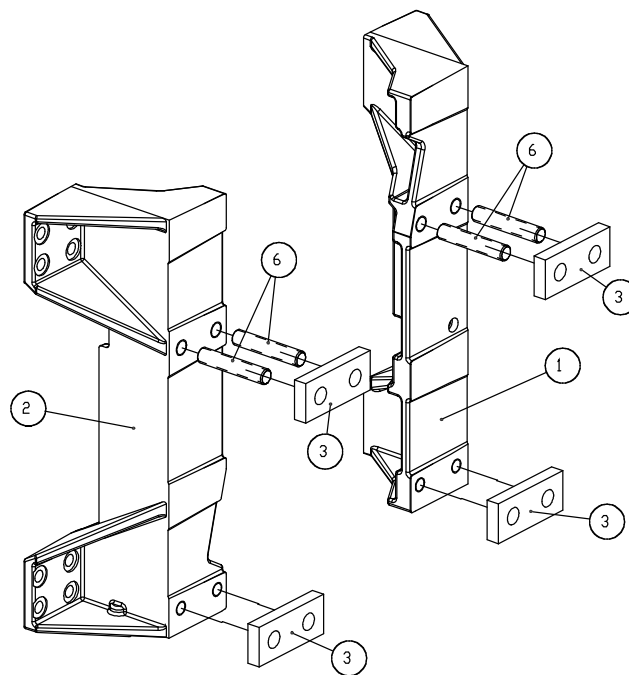
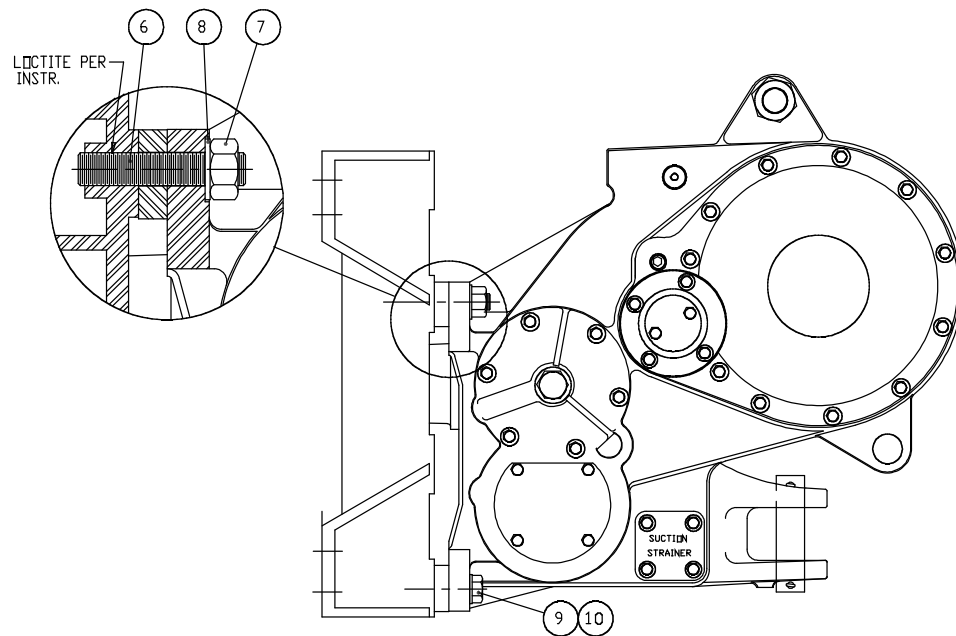
The new Filter Group, CATERPILLAR P/N 238-6809, must be replaced with the previous Filter Group, CATERPILLAR P/N 178-0568, to allow for correct fit and clearances for the winch installation. Filter Group 178-0568 can be obtained through your local CATERPILLAR dealer.

Beginning serial numbers on "non-winch ready" tractors shipped with the new filters are:

ALH00347	D6N FTC XL
AKM0676	D6N D/S XL
ALR00324	D6N FTC LGP
ALY00706	D6N D/S LGP
AGG00700	D5N XL
AKD00663	D5N LGP

"Winch-ready" tractors are factory-equipped with the correct filter assembly properly located, and do not require any additional changes.

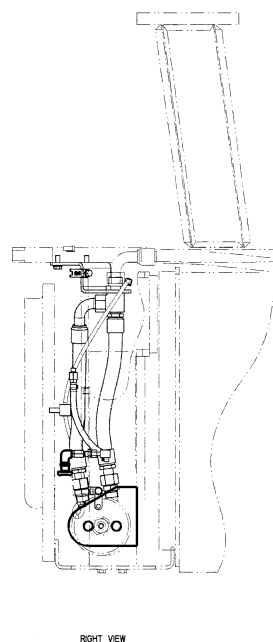
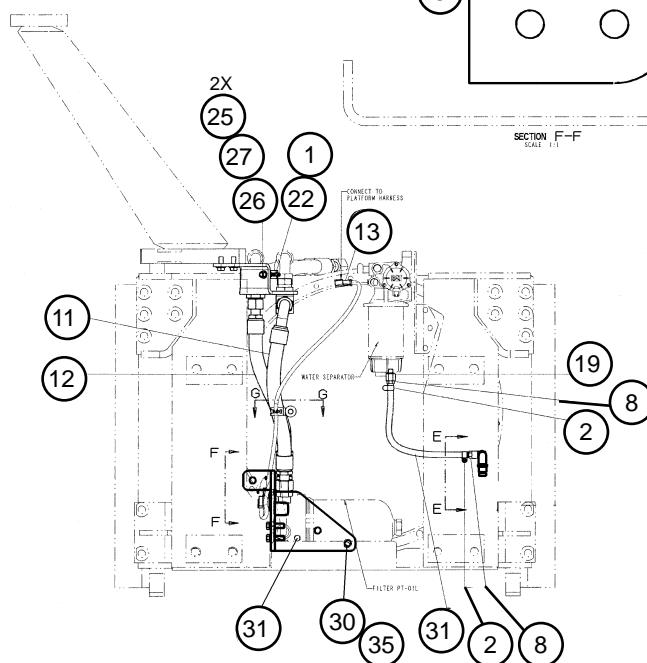
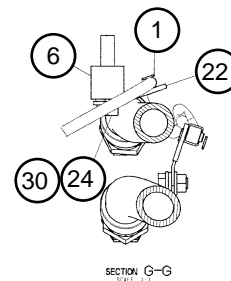
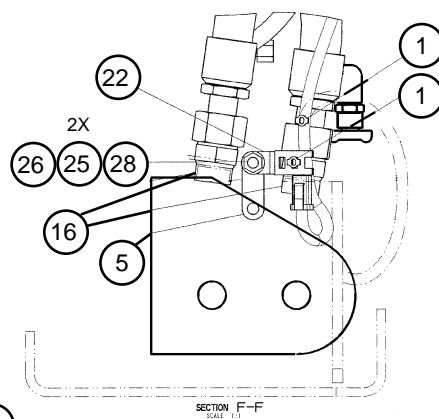
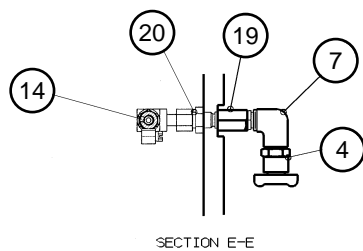
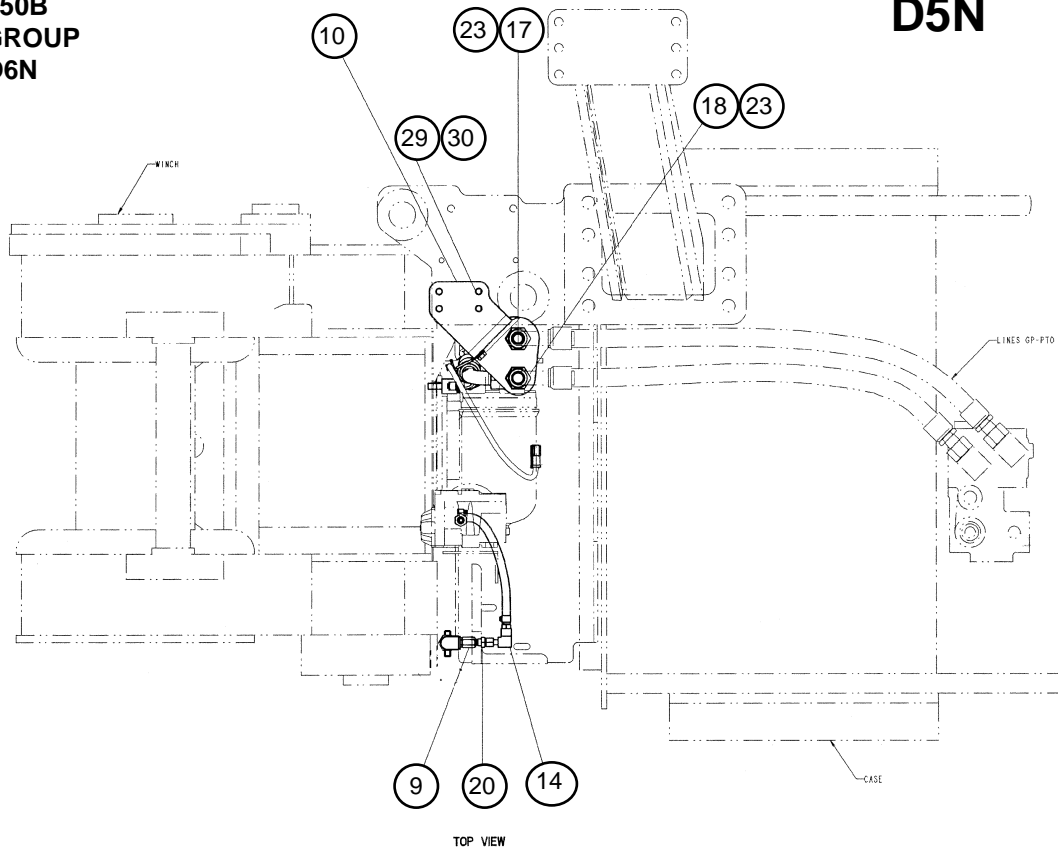
**MODEL 50B
ADAPTER GROUP
D5N & D6N**



ITEM	PART NO.	DESCRIPTION	QTY
1	104387	BRACKET, WINCH MOUNTING, RH	1
2	104386	BRACKET, WINCH MOUNTING, LH	1
3	104045	BLOCK, SPACER (1.00 THICK)	4
6	100655	STUD, ALL THREAD, 1 1/8 - 7 UNC X 5.75, GR B7	4
7	104143	NUT, HEX, 1 1/8 - 7 UNC, GR 8, Z	4
8	103484	WASHER, 1 1/8 NOM, HARD, Z	4
9	104140	CAPSCREW, HEX HD, 1-8 UNC X 3.75, GD 8, Z	4
10	101205	WASHER, 1" NOM, HARD, Z	4

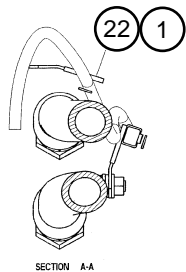
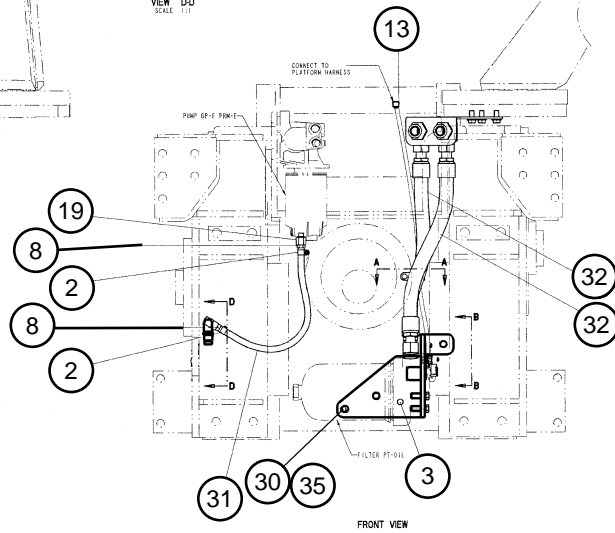
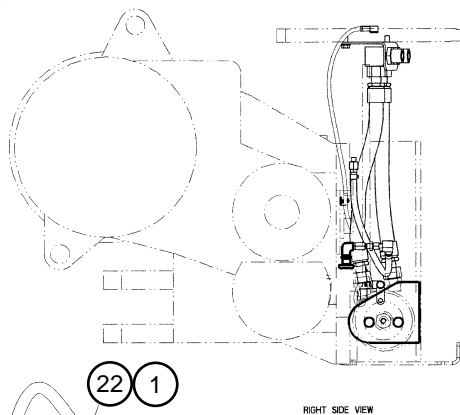
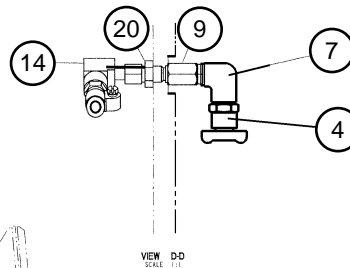
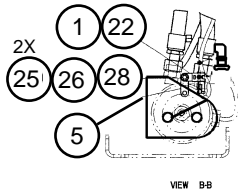
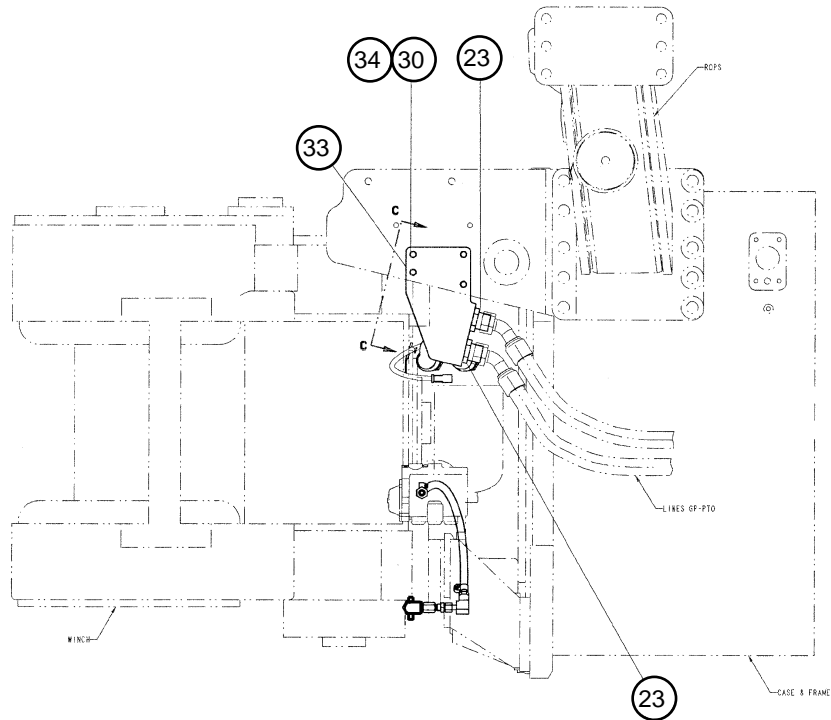
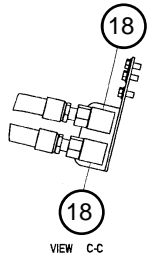
**MODEL 50B
LINES GROUP
D5N & D6N**

D5N



**MODEL 50B
LINES GROUP
D5N & D6N**

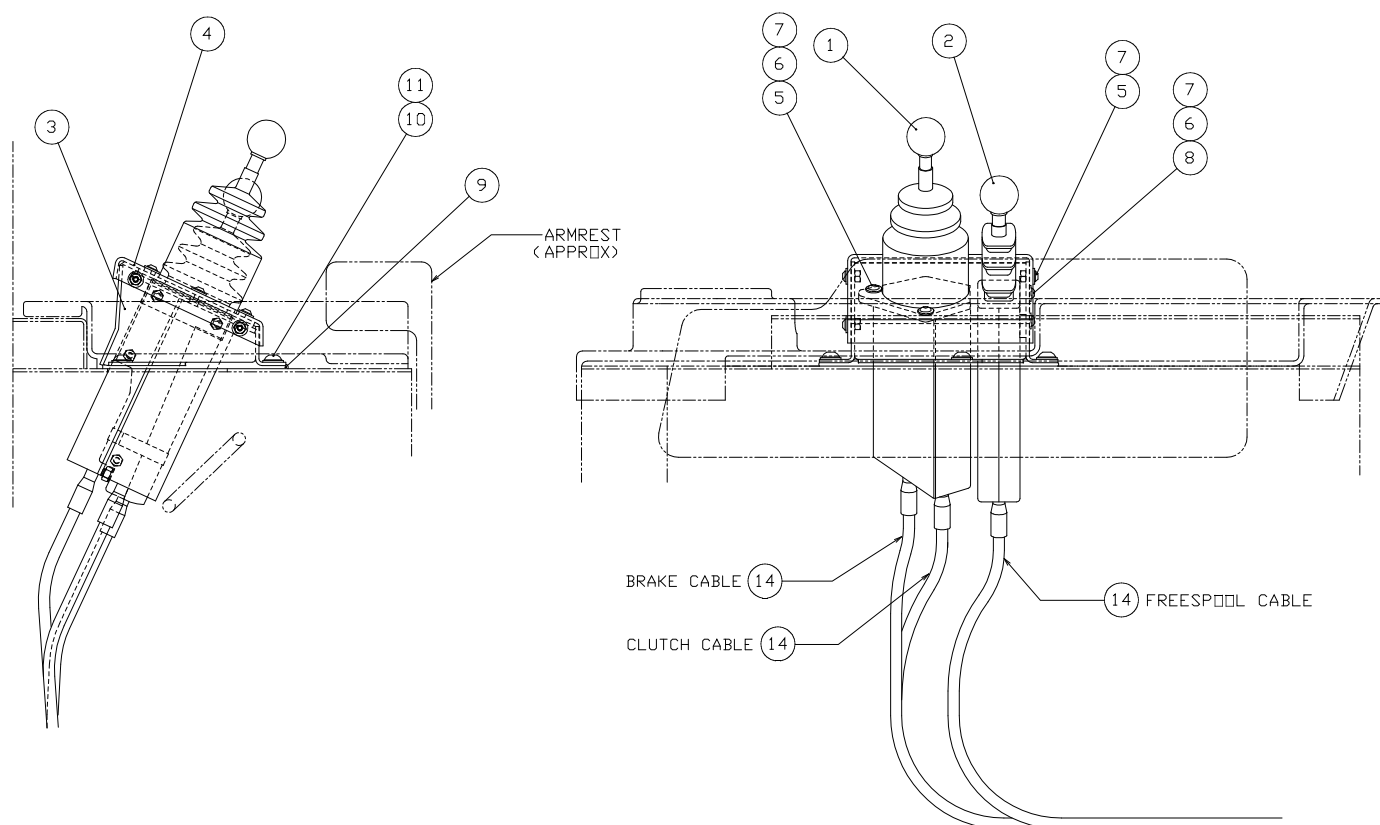
D6N



**MODEL 50B
LINES GROUP
D5N & D6N**

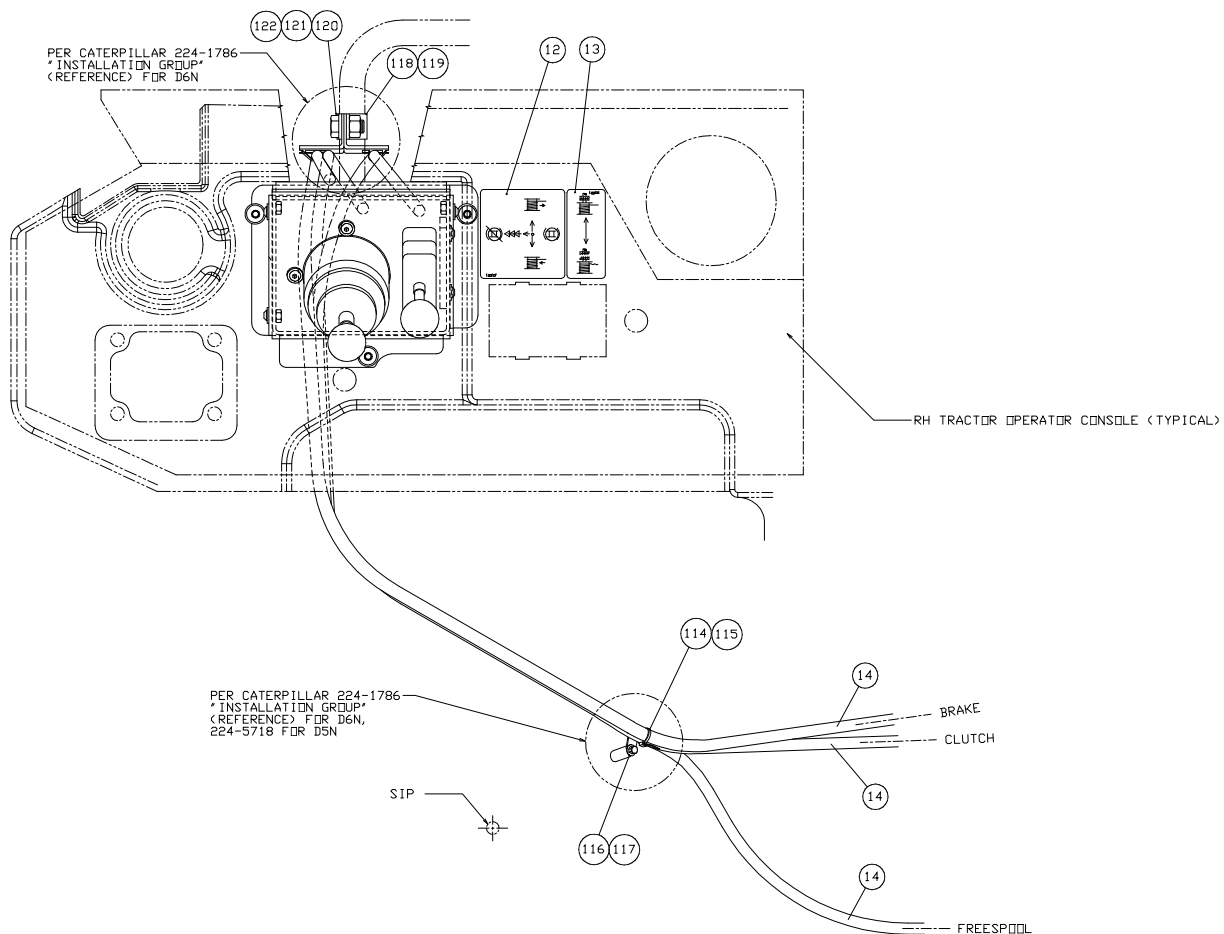
ITEM	PART NO.	DESCRIPTION	QTY
1	32489	STRAP, CABLE	4
2	104709	CLAMP-HOSE	2
3	104807	BRACKET	1
4	104861	DRAIN VALVE	1
5	104649	PLATE	1
6	104650	SPACER	1
7	104860	ELBOW	1
8	104701	CONNECTOR ASSEMBLY	2
9	104655	ADAPTER ASSEMBLY	1
	24520	O-RING FOR ADAPTER (ITEM 9)	1
10	104657	BRACKET	1
11	104663	HOSE ASSEMBLY	1
12	104662	HOSE ASSEMBLY	1
13	104706	HARNESS ASSEMBLY	1
14	104708	ELBOW - 90 DEG ORFS	1
16	104660	CONNECTOR ASSEMBLY	2
17	104651	UNION ASSEMBLY	1
18	104659	ELBOW ASSEMBLY	2
19	104702	ADAPTER ASSEMBLY	1
20	100775	LOCKNUT 9/16 - 18	1
22	104703	CLIP	3
23	PA6V9172	NUT, BULKHEAD	2
24	104131	BOLT 1/2-13 X 2 1/2 GR8 ZINC PLATED	1
25	102126	WASHER-HARD, M10 - ZINC PLATED	4
26	104718	NUT M10X1.5	2
27	104719	BOLT M10X1.5 X 25 GR10.9 ZINC PLATED	1
28	103230	BOLT M10X1.5 X 20 GR10.9 ZINC PLATED	1
29	103935	BOLT M12X1.75 X 30 GR 10.9 ZINC PLATED	4
30	100859	WASHER-HARD 1/2	8
31	104707	HOSE	1
32	104695	HOSE ASSEMBLY	2
33	104696	BRACKET	1
34	104691	BOLT M12 X 1.75 X 25 GR10.9 ZINC PLATED	4
35	103824	BOLT M12 X 1.75 X 60 GR10.9 ZINC PLATED	3

**MODEL 50B
CONTROL GROUP
D5N & D6N**



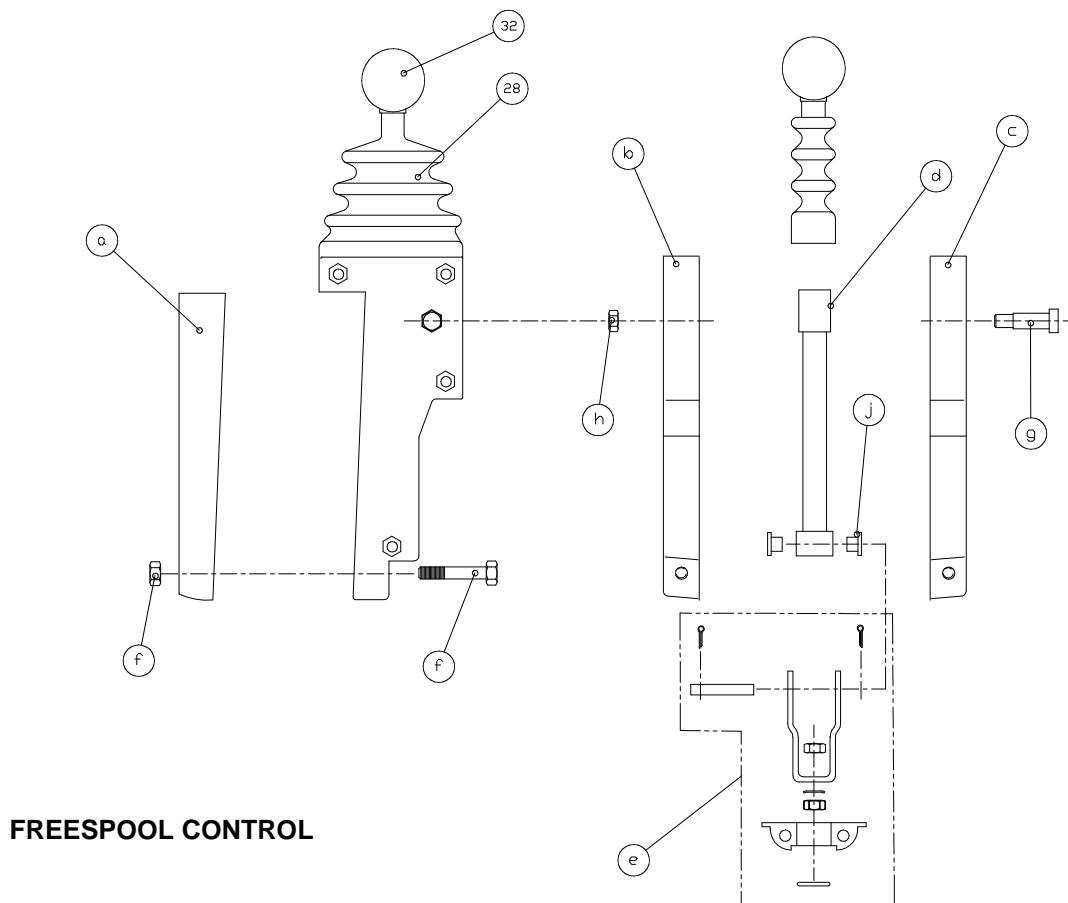
ITEM	PART NO.	DESCRIPTION	QTY.
1	101850	CONTROL, DUAL AXIS	1
2	104010	CONTROL, SINGLE AXIS (FREESPOOL)	1
3	104048	BRACKET, CONTROL	1
4	104060	COVER	1
5	100643	CAPSCREW, BUTTON HD, M6 x 1.0 x 25mm	6
6	100645	HEX NUT, M6 x 1.0	5
7	11072	WASHER	8
8	100969	CAPSCREW, BUTTON HD, M6 x 1.0 x 55mm	2
9	104049	GASKET	1
10	100642	CAPSCREW, BUTTON HD, M10 x 1.5 x 25mm	3
11	101440	WASHER, HARD (3/8)	3
14	101204	CONTROL CABLE, BRAKE, CLUTCH, FREESPOOL (90 in - 2286 mm)	3

MODEL 50B
CONTROL GROUP
D5N & D6N

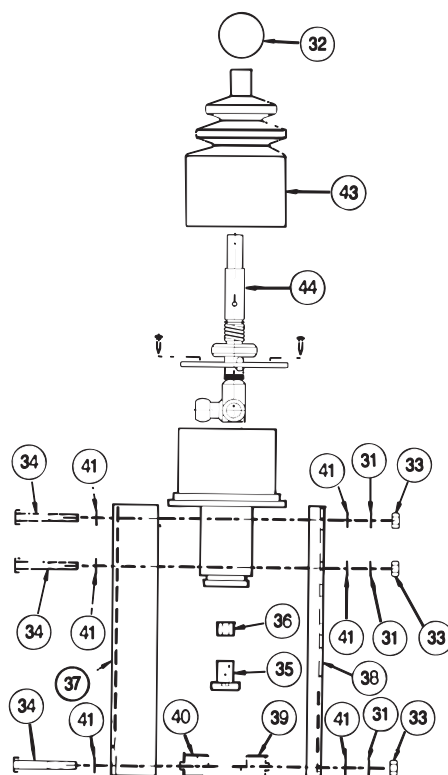


ITEM	PART NO.	DESCRIPTION	QTY.
12	100107	DECAL, CONTROL	1
13	100131	DECAL, FREESPOOL	1
14	101204	CONTROL CABLE, BRAKE, CLUTCH, FREESPOOL (90 in - 2286 mm)	3
114	PA4P8134	CLIP, LADDER	3
115	32489	STRAP, CABLE	3
116	103934	BOLT	1
117	102126	WASHER, HARD	1
118	104704	CLIP, 2-PIECE	1
119	104705	CLIP, 2-PIECE	1
120	104691	BOLT	1
121	100859	WASHER, HARD	2
122	104692	NUT	1

**MODEL 50B
CONTROL GROUP
D5N & D6N**



DUAL AXIS CONTROL



MODEL 50B
CONTROL GROUP
D5N & D6N

ITEM	PART NO.	DESCRIPTION	QTY.
28	104015	BOOT, FS CURRENT W/HOLD DOWN LIP	1
32	100240	KNOB	2
33	69645	NUT (1/4-20)	6
34	21462	CAPSCREW, HEX HEAD (1/4-20 x 2 G5)	6
35	100234	SLIDING LOCKSCREW	2
36	100235	CABLE BUSHING	2
37	100238	CABLE SUPPORT HOUSING, OUTER	1
38	100239	CABLE SUPPORT HOUSING, INNER	1
39	100236	CABLE ANCHOR, OUTER	1
40	100237	CABLE ANCHOR, INNER	1
41	11072	WASHER, FLAT-THIN (1/4)	20
43	102261	BOOT	1
44	62997	BRAKE-OFF DETENT KIT *	1
e	104020	CABLE HARDWARE KIT	1
h	23558	LOCKNUT (5/16)	1

Note: Early design; prior to S/N 9900511, replaced by poppet-type detent kit 62997. Kit replaces early design spring clip design with poppet-type detent mechanism for better retention in BRAKE-OFF position. Kit includes boot, spring, restrictor plate, poppet latch, jam nut screws and washers. Control lever shaft NOT included in kit and NOT available separately.

(Items a, b, c, d, f, g and j are not serviced separately)

CONTROL INSTALLATION INSTRUCTION

NOTE: These instructions are provided as a general guide. Tractor options, application requirements or local regulations may require deviation from these recommendations.

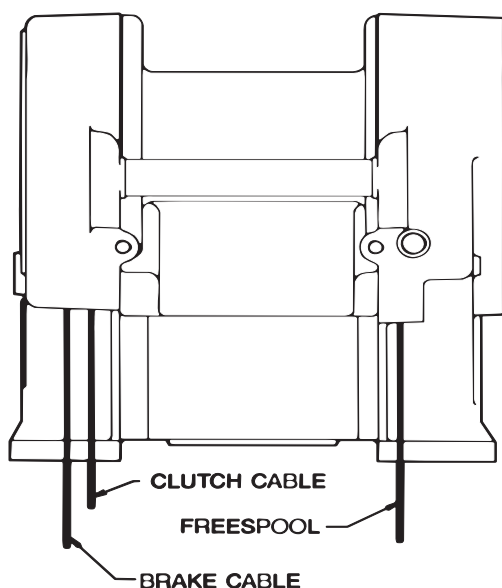
1. Install the gasket (9) to the bottom of the control bracket (3).
2. Install the control bracket onto the right hand console using existing button head capscrews and washers (10, 11).
3. Carefully route control cables from winch to underside of right hand console.

CAUTION

Avoid routing cables near moving shafts or linkage which may cause damage to cables or restrict free movement of tractor components.

4. Route the control cables up through the opening of the control bracket and install cables into controllers as follows.

NOTE: For best results, replace the existing right-hand plastic console cover with console cover assembly (Cat P/N 167-1464) that is intended specifically for winch tractors.



TOP VIEW OF WINCH

Power Shift Control – Dual Axis

1. Remove the six through-bolts, item 34, from the control stand and separate the two cable support housings, items 37 & 38. From each plunger, remove the sliding lock screw and threaded bushing, items 35 & 36.
2. Install the sliding lock screw, item 35, onto the control cables. Apply two drops of Loctite 242 to the cable threads and install the threaded bushing, item 36, onto the cable core until the end of the cable core is level with the end of the bushing.
3. Hold the controller in your left hand with the knob end up and the mounting bolts located at 6, 9 and 12 o'clock positions. Mark the plunger closest to the 6 o'clock position as the "clutch" control. Mark the plunger closest to the 12 o'clock position as the "brake" control. The "clipped" corner of the control will be installed toward the rear of the tractor.
4. Install the brake cable to the "brake" control plunger and the clutch cable into "clutch" control plunger. Move the control lever to extend the plungers far enough to expose the wrench flats. With a wrench, hold the plunger as you tighten the sliding lock screw to 50 lb·ft (68 N·m) torque.

CAUTION

Tightening the sliding lock screw without holding the plunger with a wrench will result in damage to the control assembly.

5. Install the cable support housings, items 37 & 38, onto the controller. Place the groove of the control cable housings into the saddle of the cable anchors, items 39 & 40. Install the six through-bolts, washers, lockwashers and nuts, items 31, 33, 34 & 41. Evenly tighten the bolts to 85 lb·in (10 N·m) torque.
6. Insert the controller/cables sub-assembly from the bottom into the opening of the control bracket cover, item 4, and secure with three button, socket-head capscrews, washers and nuts, items 5, 6 & 7.

**MODEL 50B
CONTROL GROUP
D5N/D6N**

Freespool Control Lever

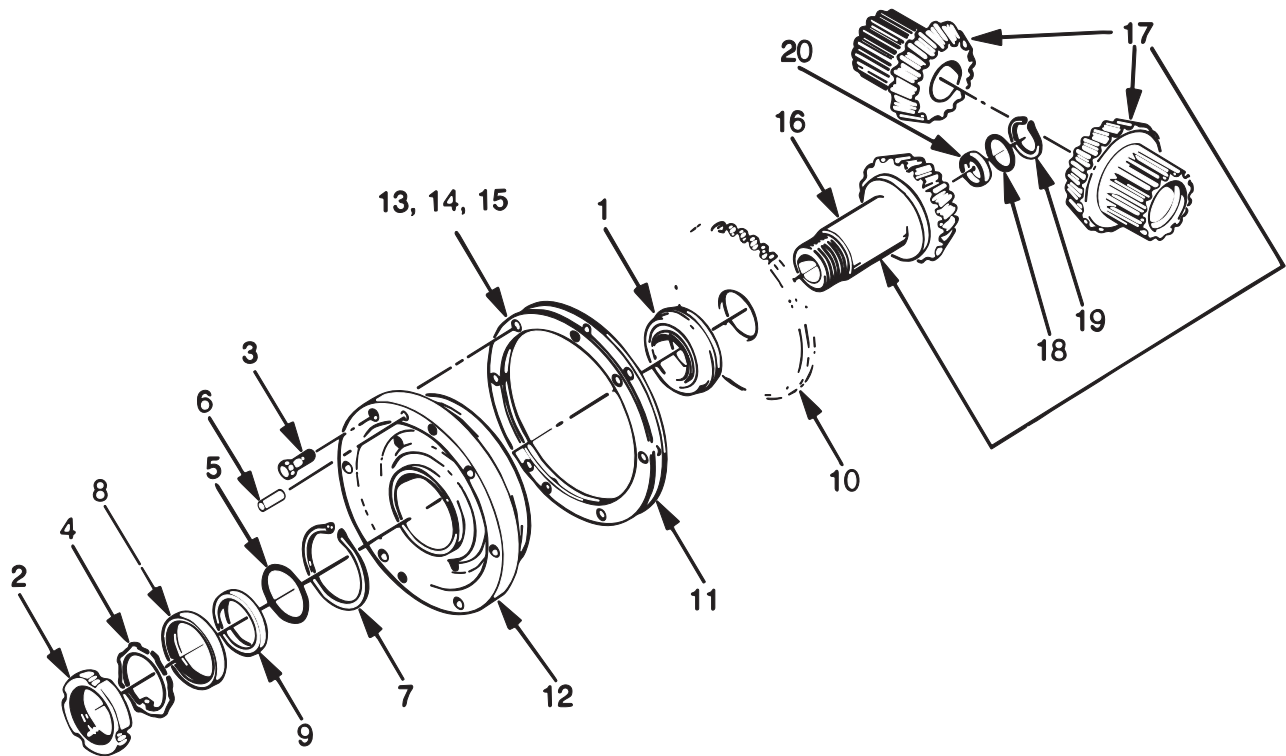
1. Remove the knob, item 32, and two capscrews and nuts from the long lever housing cover and remove the cover. The cable hardware kit is found in a small bag under the cover.
2. Prepare the control cable for installation by installing the o-ring over the control lever end of the cable. The control lever end is identified by the u-bolt groove in the cable housing.
3. Install one nut onto the cable core followed by the lockwasher.
4. Install the clevis and one more nut onto the cable. The cable core end must extend beyond the nut by 7/32 in. (5.5 mm). Tighten the first nut to secure the clevis in this position.
5. Slip the clevis over the bellcrank of the lever and install the clevis pin and secure in place with cotter pins.
6. Place the cable clamp block into position to engage the groove on the control cable housing.
7. Position the o-ring on the control cable housing so that when the cable is lowered into place, the o-ring fits in the groove in the housing.
8. Install the two capscrews through the housing. Install the cover and nuts. Tighten the nuts to 90 lb·in (10 N·m) torque.
9. Remove the two through-bolts and nuts, items 29 and 19, from the top two mounting holes of the lever housing.
10. Secure the lever to the control bracket with capscrews, washers and nuts, items 6, 7 and 41. The long cover of the lever housing must face toward the operator.
11. Install the control bracket cover/controller sub-assembly onto the control bracket base using three button, socket-head capscrews and washers, items 5 and 41. Install the knob, item 32, onto the lever.

General Instructions

1. Install the control instruction self-adhesive decal(s), items 11 and 12, onto the console cover to the rear of the control bracket.
2. Fill winch to proper level with recommended oil. Refer to oil specifications found in the Operation and Preventive Maintenance Manual, publication PC-104.
3. Verify proper control cable and operating pressure adjustment by following the procedures found in the Operation and Preventive Maintenance Manual, publication PC-104 or the Service Manual, publication PC-137.

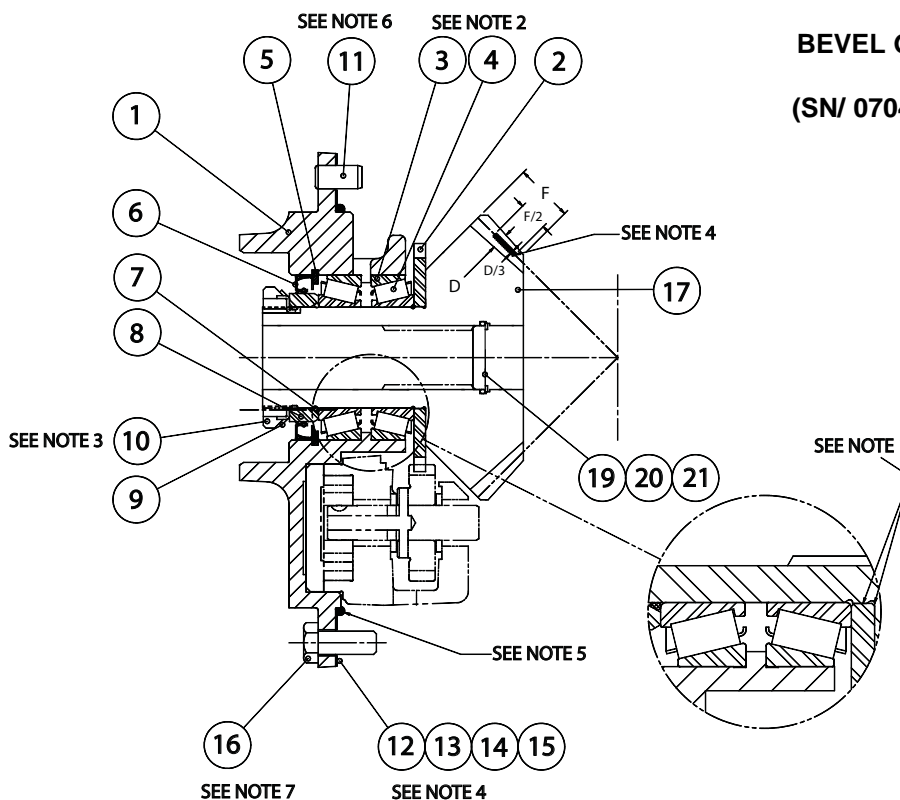
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MODEL 50B
BEVEL GEAR GROUP
D5N & D6N
(SN/ 0704589 AND BELOW)



ITEM	PART NO.	DESCRIPTION	QTY.
1	70077	BEARING ASSEMBLY	1
2	24816	BEARING LOCKNUT	1
3	104320	CAPSCREW, HEX HEAD (1/2 - 13 X 1)	6
4	11418	BEARING LOCKWASHER	1
5	74992	O-RING	1
6	10318	DOWEL PIN	1
7	70163	RETAINING RING	1
8	107298	OIL SEAL	1
9	70382	SEAL SPACER SLEEVE	1
10	69947	PUMP DRIVE PINION	1
11	69946	SHIM GASKET	1
12	69961	BEVEL PINION CARRIER	1
13	69945	SHIM .005 in. (.13 mm)	2-AR
14	69827	SHIM .007 in. (.18 mm)	2-AR
15	69826	SHIM .020 in. (.51 mm)	2-AR
16	70354	BEVEL PINION - 18T STANDARD SPEED - 3 SHAFT	1
	70355	BEVEL PINION - 14T SLOW SPEED - 4 SHAFT	1
17	29072	BEVEL GEAR SET - 18/38T STD. SPD. - 2 BVL. GRS. 1 BVL. PN.	1
	29073	BEVEL GEAR SET - 14/39T SLO. SPD. - 2 BVL. GRS. 1 BVL. PN.	1
18	70133	O-RING	1
19	70161	RETAINING RING	1
20	70357	BEVEL PINION PLUG	1

**MODEL 50B
BEVEL GEAR GROUP
D5N & D6N
(SN/ 0704590 AND UP)**



NOTES:

1. Clean bevel and pump pinions with Loctite solvent. Verify press fit before assembly. Apply Loctite 601 or equal to surfaces indicated in Detail A. Press pump drive pinion, item 2, onto bevel pinion and seat securely against shoulder. Allow proper cure time for Loctite before usage.
2. Apply a thin coat of multi-purpose grease to rollers. Do not pack solid.
3. Tighten nut to ensure parts are fully seated. Loosen nut to set the rolling torque of 10 lb-in (1.1 N-m). Pinion must turn smoothly by hand.
4. Shim as required for tooth contact pattern as shown. The pattern height should be about 1/3 the whole depth, located midway between tip and root. It should be about 1/2 the face width shifted toward the toe. Set the backlash to .004 to .012 in. (.10 - .30 mm).
5. Apply approximately 3/16" (5 mm) bead of silastic sealant (RTV 732) to pilot diameter as indicated.
6. Clean with Loctite solvent and apply Loctite 242 to dowel pin and insert into winch case.
7. Clean with Loctite solvent and apply Loctite 242 to threads. Torque to 75 to 83 ft-lb (102 - 113 N-m).

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	106864	BEVEL PINION CARRIER	1
2	69947	PUMP PINION	1
3	70080	BEARING CUP	2
4	70081	BEARING CONE	2
5	70163	RETAINING RING	1
6	107298	OIL SEAL	1
7	74992	O-RING	1
8	70382	SEAL SPACER	1
9	11418	BEARING LOCKWASHER	1
10	24816	BEARING LOCKNUT	1
11	10318	DOWEL PIN	1
12	69946	SHIM GASKET	1
13	69945	SHIM, .005 in. (.13 mm)	2-AR
14	69827	SHIM, .007 in. (.18 mm)	2-AR
15	69826	SHIM, .020 in. (.51 mm)	2-AR
16	104174	CAPSCREW, HEX HD (1/2 - 13 X 1 1/4 in. G8, Z)	6
17	70354	BEVEL PINION - 18T STANDARD SPEED - 3 SHAFT	1
	70355	BEVEL PINION - 14T SLOW SPEED - 4 SHAFT	1
18	29072	BEVEL GEAR SET - 18/38T STANDARD SPEED * (NOT SHOWN)	1
	29073	BEVEL GEAR SET - 14/39T SLOW SPEED * (NOT SHOWN)	1
19	70133	O-RING	1
20	70161	RETAINING RING	1
21	70357	BEVEL PINION PLUG	1

* Bevel Gear Set includes one Bevel Pinion and two Bevel Gears