

CARCO®

INSTALLATION AND PARTS MANUAL

MODEL 70A PS WITH ELECTRONIC CONTROLS FOR D6R & D6R SERIES II 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.

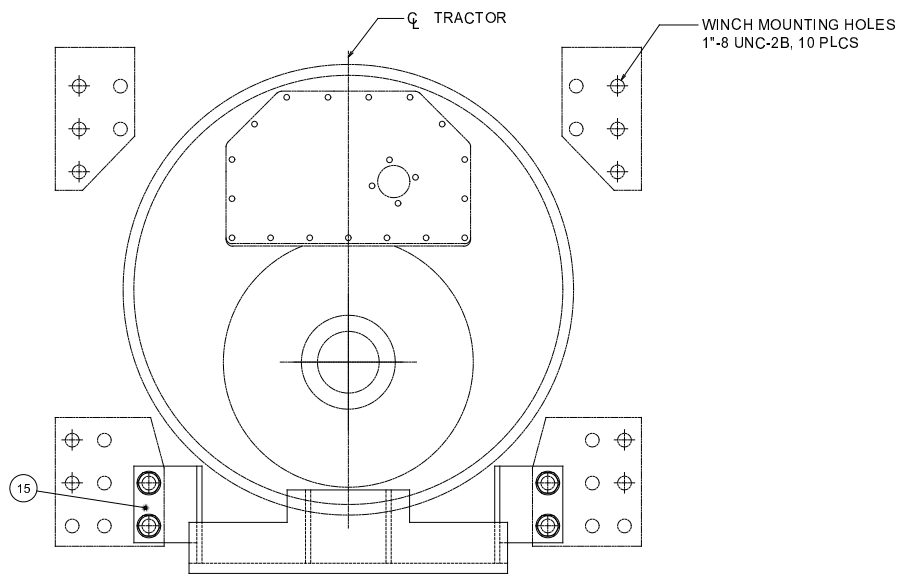
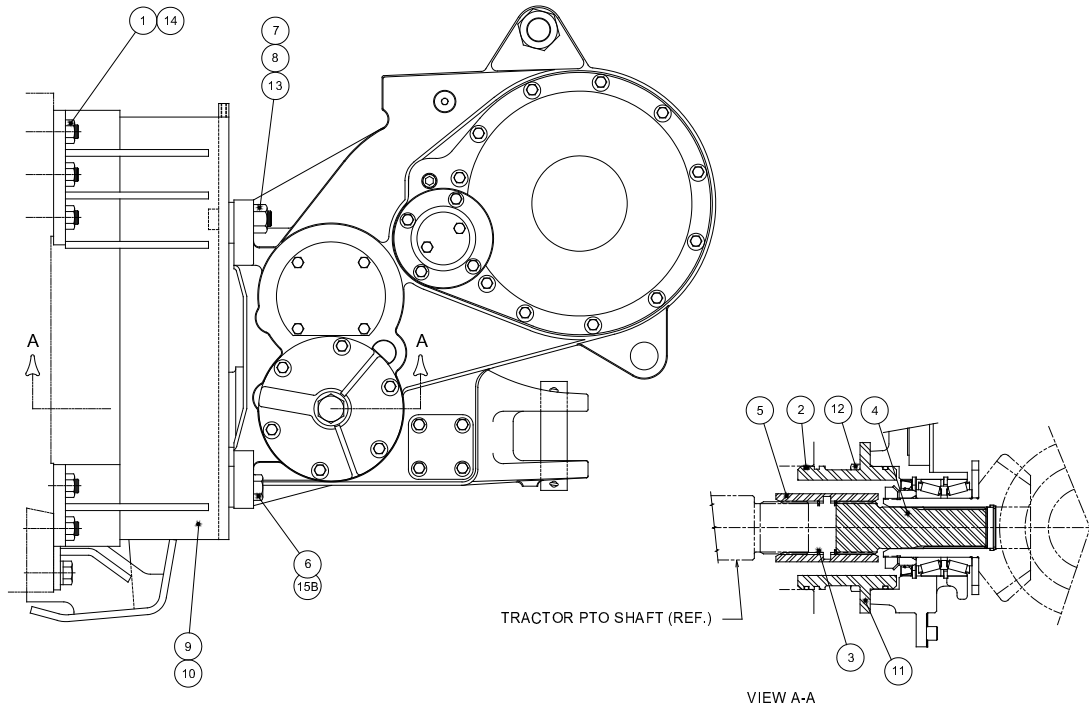
TABLE OF CONTENTS

Mounting Group.....	2-3
Control Group.....	4-9
Bevel Gear Group.....	10-11

MODEL NUMBER DESCRIPTION

B	0	0	□	0	0	E
Bevel Gear Ratio B-1.2□□ E-2.□□1	0-Over□in□	0-Standard□Brake	1-□it□Free□pool	0-Four□Seat□in□□	0-No Fairlea□ 3-3 Roller Fairlea□ 4-4 Roller Fairlea□	E-Electronic□Control

**MODEL 70A
MOUNTING GROUP
D6R & D6R SERIES II PS**



VIEW LOOKING AT TRACTOR REAR FACE

MOUNTING GROUP INSTRUCTIONS

1. PTO rotation is counterclockwise (CCW) as viewed from the rear of the tractor.
2. Remove and discard the tractor PTO cover.
3. Remove paint, dirt, rust and grease from mounting surfaces of tractor, winch and winch adapters.
4. Coat splines of PTO shaft (4), with multi-purpose grease and install into bevel pinion gear of winch.
5. Install retaining rings (3), in coupling (5). Place coupling over PTO shaft with bevel end away from winch.
6. Install O-rings (2), onto PTO pilot (11).
NOTE: As the same PTO pilot may be used on several adaptations, usually only one O-ring groove will engage and seal in the tractor PTO opening.
7. Remove winch top cover to gain access to the bevel gears.

10. Apply Loctite 242, 243 or equivalent to the threads of capscrews (6), and studs (8), then install the winch adapter brackets onto the winch. At this time, only tighten the capscrews (6), and nuts (7), to approximately 50 lb•ft (68 N•m).
11. Apply general purpose grease to the PTO pilot o-ring. Lift winch into position and install onto rear of tractor taking care to guide the PTO shaft/coupling onto the tractor PTO shaft. It may be necessary to rotate the winch bevel pinion gear to align the winch shaft with the tractor shaft. Keep the winch in a level position to avoid binding of the PTO shafts.
12. Apply Loctite 242, 243 or equivalent to studs (8) and tighten nuts (7) to 600 lb.ft. (815 N•m) torque. Tighten capscrews (6) to 680 lb•ft (920 N•m) torque. If torque wrench adapters are not available for tightening the nuts (7), they may be tightened as follows: Tighten nut with a hand wrench to approximately 100 lb.ft. (136 N•m) torque to remove all looseness from assembly. Mark the position of a wrench flat on each nut, then tighten each nut one (1) additional wrench flat. Tighten nuts (14) to 660 lb.ft. (900 N•m) torque.

⚠ WARNING ⚠

Winch weighs approximately 2500 lb (1134 kg) without oil, cable or tractor adapters. Make certain lifting equipment has adequate capacity to eliminate the possibility of damage or injury. Attempting to lift the winch with inadequate equipment may result in personal injury or property damage.

⚠ WARNING ⚠

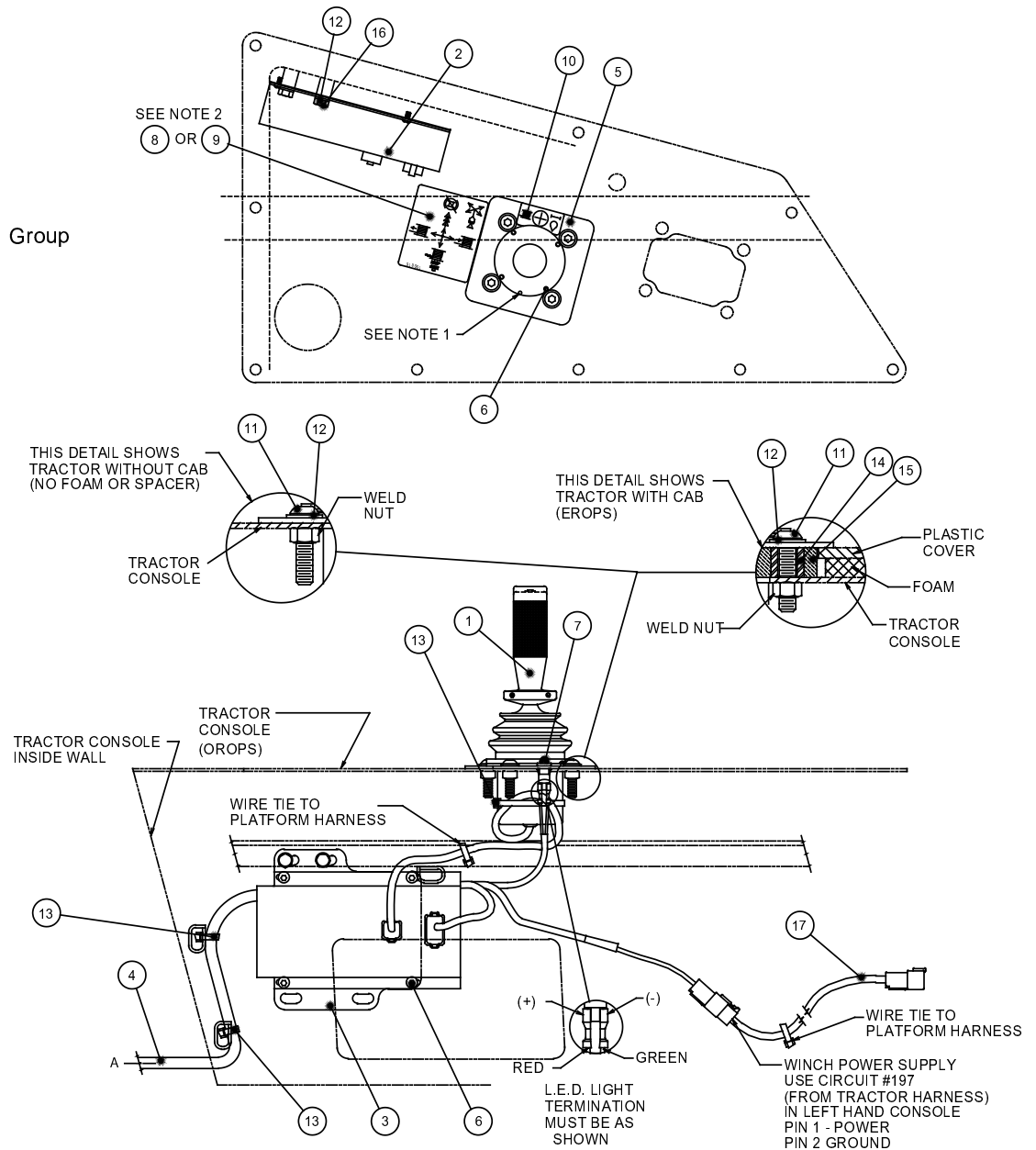
DO NOT start the tractor engine until the winch has been filled to the proper level with the recommended oil. Bearing and gear damage may result if the tractor is run without oil in the winch.

8. Apply Loctite 271, 277 or equivalent to threads and install studs (8) into winch adapter to a height of 2-1/2 in. (64 mm).
9. Apply Loctite 271, 277 or equivalent to threads and install studs (1) into rear face of tractor to a height of 1.80 in. (46 mm).

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	33446	STUD (1 - 8 X 3-1/4 G8)	10
2	69850	O-RING	3
3	32101	RETAINING RING	2
4	26242	PTO SHAFT	1
5	69106	COUPLING	1
6	70749	CAPSCREW, HEX HEAD (1 - 8 X 2-3/4 G8 Z)	4
7	70768	NUT, HEX (1-1/8 - 7)	4
8	100654	STUD (1-1/8 - 7 X 4-3/4)	4
9	27780	ADAPTER, RH	1
10	27781	ADAPTER, LH	1
11	69089	PILOT, PTO	1
12	104320	CAPSCREW, HEX HEAD (1/2 - 13 X 1 G8 Z)	4
13	27803	WASHER, HARDENED (1-1/8)	4
14	PA6V8190	NUT, HEX (1 - 8)	10
15	PA3W1356	ECOLOGY DRAIN GROUP (INCLUDES ITEMS 15A, B & C)	1
15A	PA3W1357	GUARD	1
15B	101205	WASHER, HARDENED (1)	8
15C	102883	CAPSCREW, HEX HEAD (1 - 8 X 1-1/2 G8 Z)	4

**MODEL 70A
CONTROL GROUP
D6R PS**

D6R Series II Control Group
on Page 7.



NOTES:

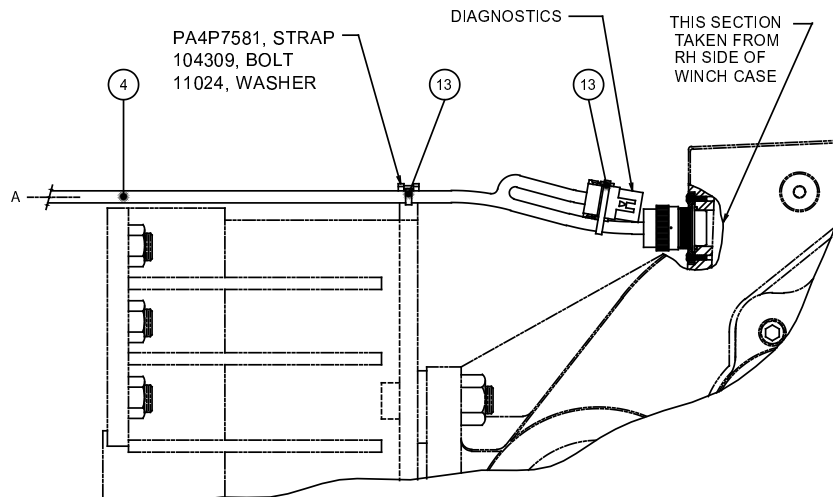
1. DRILL POINT IN DUAL AXIS CONTROLLER (ITEM 1) **MUST** BE LOCATED AS SHOWN.

2. CONTROL DECAL (ITEM 8) USAGE AS FOLLOWS:

WINCH WITHOUT FREESPOOL USES DECAL P/N 100824

WINCH WITH FREESPOOL USES DECAL P/N 100816

REFER TO WINCH MODEL CODE AND OPERATOR'S MANUAL FOR DETERMINATION OF SPECIFIC WINCH ASSEMBLY.



CONTROL INSTALLATION INSTRUCTIONS

△ CAUTION △

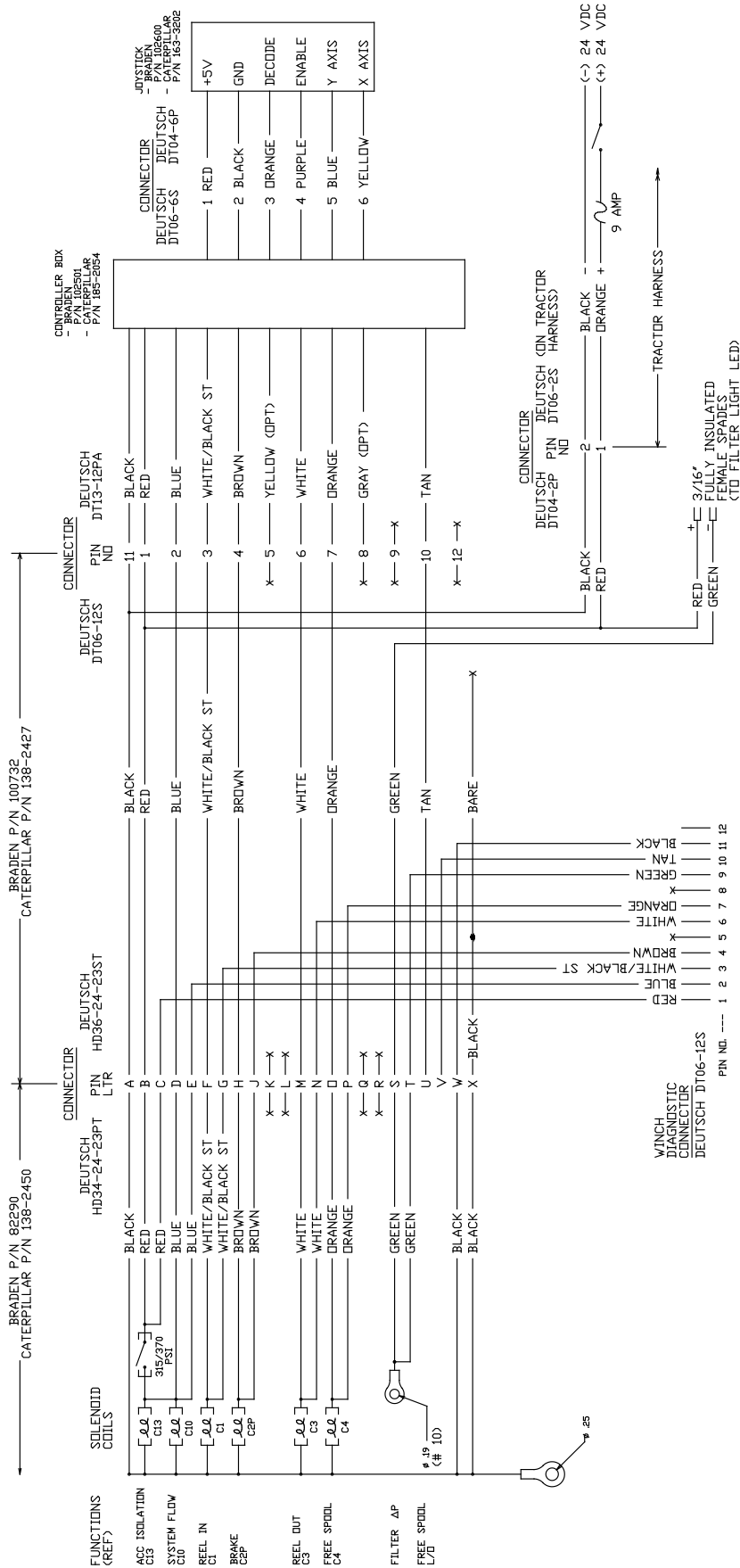
Avoid routing the control cables near moving shafts or linkages, which may cause damage to the cables or restrict free movement of tractor components.

1. Attach dual axis controller (1), to controller mounting plate (5), with button head capscrews (6).
2. Remove RH tractor console.
3. Install control module (2), onto mounting plate (3), utilizing fasteners (6).
4. Install the control module and mounting plate on the RH console wall as shown, utilizing fasteners (12 and 16).
5. Install harness (4), in tractor as shown. Connect winch and control module ends of harness. Secure winch end of harness with strap, bolt, washer and wire tie strap (13), as shown. Secure harness at console wall with wire tie straps (13), as shown.
6. Install tractor console cover.
7. Attach dual axis controller and mounting plate to console cover with fasteners (11, 12 and 14). Note that spacer (14), is used only on cab equipped tractors.
8. Install decal (10), and indicator light (7), onto mounting plate.
9. Connect controller to control module and secure harness with wire tie straps (13).
10. Connect harness spade connectors to indicator light. Red wire must be connected to positive terminal of indicator light.
11. Insure tractor power is off. Connect harness to tractor power supply circuit 197.
12. Install correct decal (8 or 9) onto console cover.
13. Fill the winch to the proper level with recommended oil. Refer to the specifications found in the Operation and Preventive Maintenance Manual or Service Manual.
14. Start the tractor and operate the engine at low RPM for several minutes to allow the winch control system pressure to stabilize. Operate the winch in all functions as instructed in the Operation and Preventive Maintenance Manual.

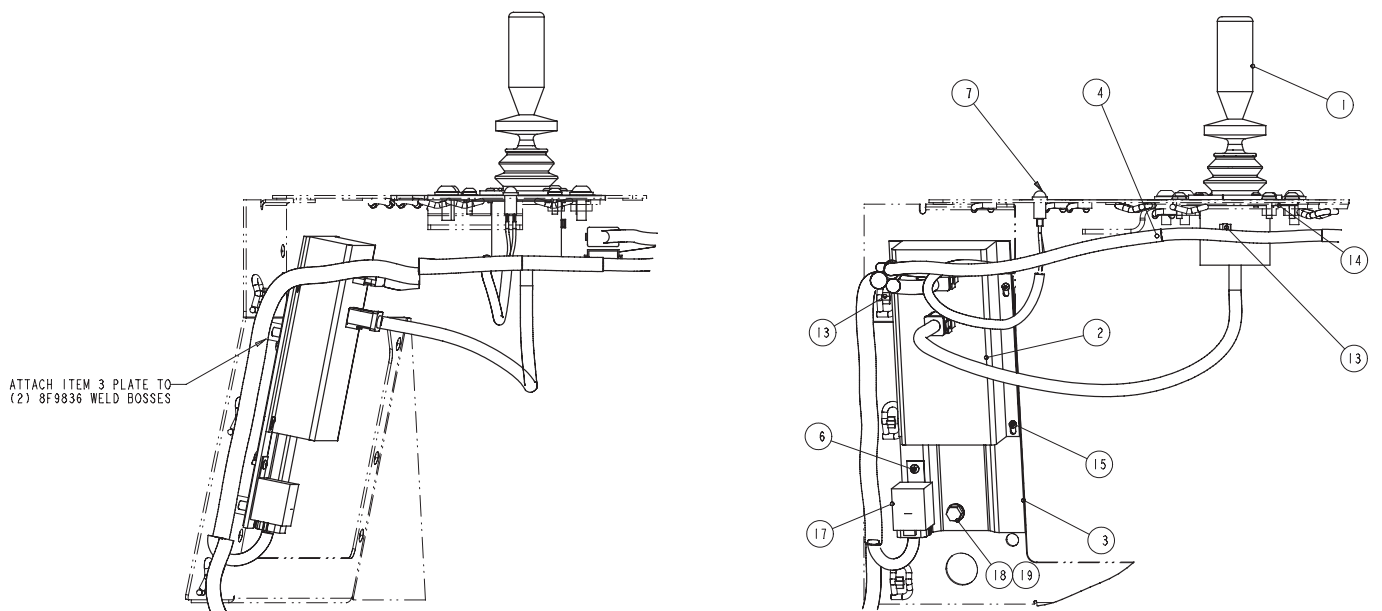
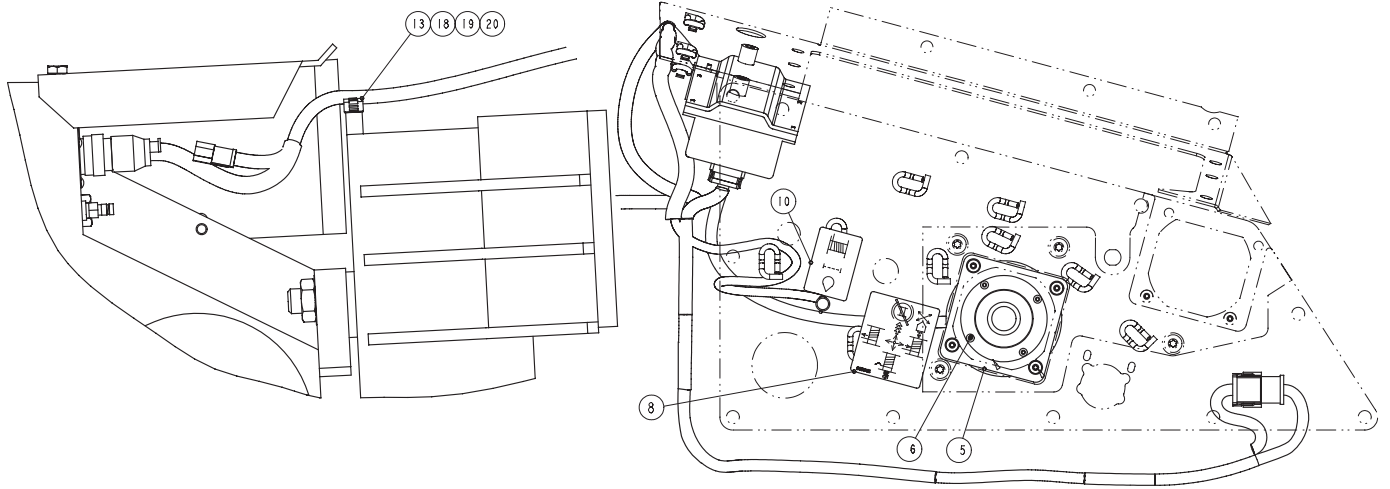
ITEM NO.	PART NO.	DESCRIPTION	QTY
1	107640	DUAL AXIS CONTROLLER	1
2	102258	CONTROL MODULE, EARLY DESIGN	1
	102501	CONTROL MODULE, CURRENT DESIGN	1
3	101384	MOUNTING PLATE	1
4	100732	WIRING HARNESS	1
5	101194	CONTROLLER MOUNTING PLATE	1
6	101817	CAPSCREW, BUTTON HEAD (10 - 24 X 1/2)	8
7	100792	INDICATOR LIGHT	1
8	100816	DECAL, CONTROL WITH FREESPOOL *	1
9	100824	DECAL, CONTROL WITHOUT FREESPOOL *	1
10	100822	DECAL, FILTER INDICATOR LIGHT	1
11	100844	CAPSCREW, BUTTON HEAD (3/8 - 16 X 1-1/2)	4
12	100652	WASHER, NARROW (3/8)	6
13	32489	WIRE TIE STRAP	10
14	101195	SPACER (USED WITH CAB OPTION)	4
15	101196	GASKET (USED WITH CAB OPTION)	1
16	104135	CAPSCREW, HEX HEAD	2
17	102190	WIRE HARNESS	1

*SELECT ONLY ONE CONTROL DECAL

**MODEL 70A
CONTROL GROUP
D6R PS**



**MODEL 70A
CONTROL GROUP
D6R SERIES II PS**



**MODEL 70A
CONTROL GROUP
D6R SERIES II PS**

These control installation instructions are provided as a general guide. Tractor options, application requirements or local regulations may require deviation from these recommendations. Stop engine, turn key switch and master power switch off.

1. Remove the right hand console cover as directed in the tractor service manual.

Install module mounting plate (3) onto inner wall of right hand console using capscrews and washers (18, 19). Install the control module (2) onto the mount plate (3) using screws (15). Install control relay (17) to mount plate with button head capscrew (6).

2. Install the winch controller (1) into the controller mounting plate (5) using button head capscrews (6). The small indentation made by a drill point found on the mounting flange of the controller must be installed at the twelve o'clock position, away from the operator. Install the controller sub-assembly into the console using the original button head capscrews supplied in Caterpillar group 167-1170. Install the operation decal (8) onto the console next to the controller.

3. Install the filter by-pass indicator light (7) into the tractor control console as shown. Install the filter indicator light decal (10) next to the indicator light.

Note: Make certain all wiring harness connector pins, plugs and sockets are clean. Pins must be straight to align with the respective socket. Dirty connectors and bent pins will prevent reliable operation of the winch.

4. Route the wiring harness (4) under the console and attach the spade connectors to the filter bypass indicator light (7) that has been installed in the control

console cover. The indicator light terminals are not polarity sensitive. Install the 12-pin Y connector of the winch harness into the tractor console wiring harness as shown. Install the 12-pin harness connection into the control module. Plug the harness into the control relay under the control module. Install the controller harness into the control module. Pass the harness back toward the winch. Secure the harness to appropriate tractor tie-offs (chain links) with wire ties (13). Install the harness into the winch receptacle. Secure the harness to the winch mounting bracket with wire tie (13) onto clip and fasteners (18, 19, 20).

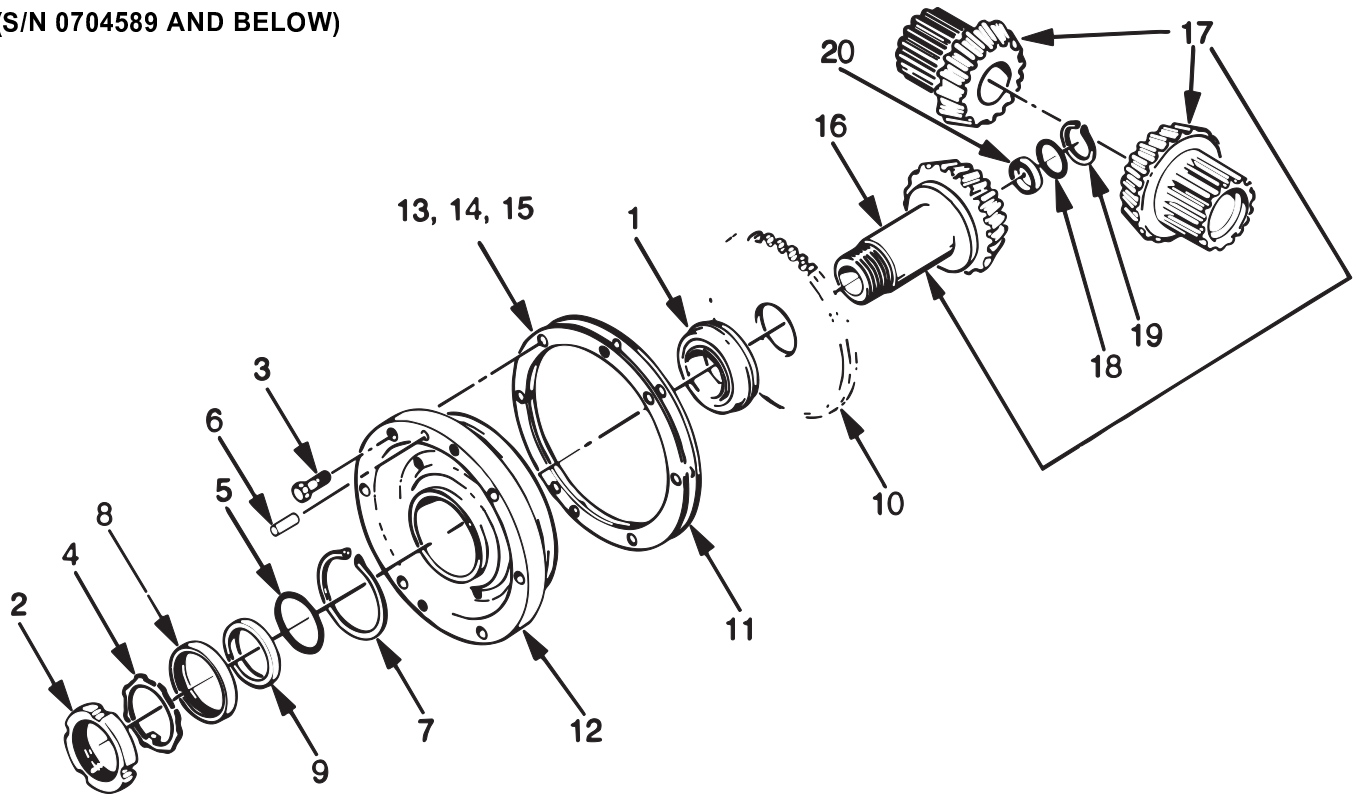
⚠ CAUTION ⚠

Bundle and restrain loose wires to prevent abrasion, short circuits and interference with tractor controls. Failure to properly route the harness may result in damage to the winch control system and tractor components. This damage may result in unreliable winch and tractor operation that may cause property damage, injury or death.

5. Install the tractor console cover onto the console.
6. Fill the winch to the proper level with recommended oil. Refer to the specifications found in the Operation and Preventive Maintenance Manual or Service Manual.
7. Start the tractor and operate the engine at low RPM for several minutes to allow the winch control system pressure to stabilize. Operate the winch in all functions as instructed in the Operation and Preventive Maintenance Manual.

ITEM NO.	PART NO.	DESCRIPTION	QTY
1	107640	DUAL AXIS CONTROLLER	1
2	102501	CONTROL MODULE, CURRENT DESIGN	1
3	103830	PLATE - CONTROL MOUNT	1
4	103858	WIRING HARNESS	1
5	102248	PLATE	1
6	101817	CAPSCREW, BUTTON HEAD (10 - 24 X 1/2 SS)	5
7	100792	INDICATOR LIGHT	1
8	100816	DECAL, CONTROL	1
10	102247	DECAL, FILTER	1
13	32489	WIRE TIE	8
14	103145	BOOT	1
15	103831	CAPSCREW, BUTTON HEAD (#8 - 32 X 3/8)	4
17	102944	RELAY	1
18	104135	CAPSCREW, (3/8 - 16 X 3/4 G8 Z)	3
19	101440	WASHER	3
20	PA4P7581	CLIP	1

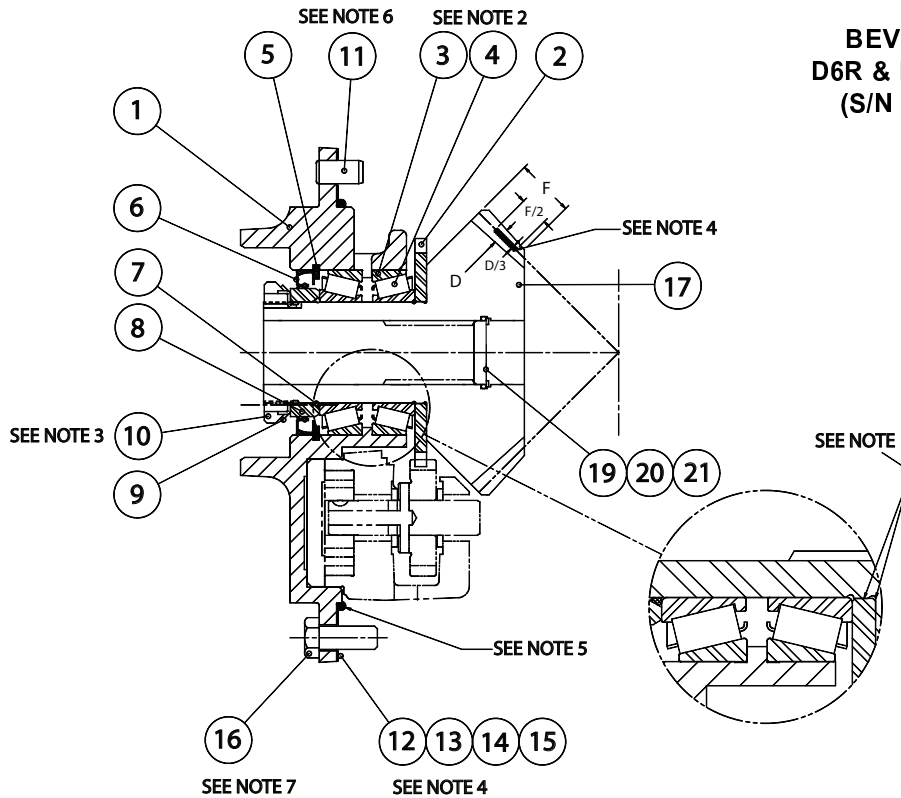
**MODEL 70A
BEVEL GEAR GROUP
D6R & D6R SERIES II PS
(S/N 0704589 AND BELOW)**



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 G8 Z)	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	69824	BEVEL PINION - 26T (B RATIO)	1
	69635	BEVEL PINION - 14T (E RATIO)	1
17	29075	BEVEL GEAR SET - 33/26T (B RATIO)*	1
	69834	BEVEL GEAR SET - 39/14T (E RATIO)*	1
18	69813	O-RING (B RATIO ONLY)	1
19	70162	RETAINING RING (B RATIO ONLY)	1
20	70626	PLUG, BEVEL PINION (B RATIO ONLY)	1

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

**MODEL 70A
BEVEL GEAR GROUP
D6R & D6R SERIES II PS
(S/N 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	69824	BEVEL PINION - 26T (B RATIO)	1
	69635	BEVEL PINION - 14T (E RATIO)	1
18	29075	BEVEL GEAR SET - 33/26T (B RATIO)* (NOT SHOWN)	1
	69834	BEVEL GEAR SET - 39/14T (E RATIO)* (NOT SHOWN)	1
19	69813	O-RING (USED ON B RATIO ONLY)	1
20	70162	RETAINING RING (USED ON B RATIO ONLY)	1
21	70626	BEVEL PINION PLUG (USED ON B RATIO ONLY)	1

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