

# CARCO®

## INSTALLATION AND PARTS MANUAL

### MODEL 70A WITH ELECTRONIC CONTROLS FOR D6T SERIES Tier 4 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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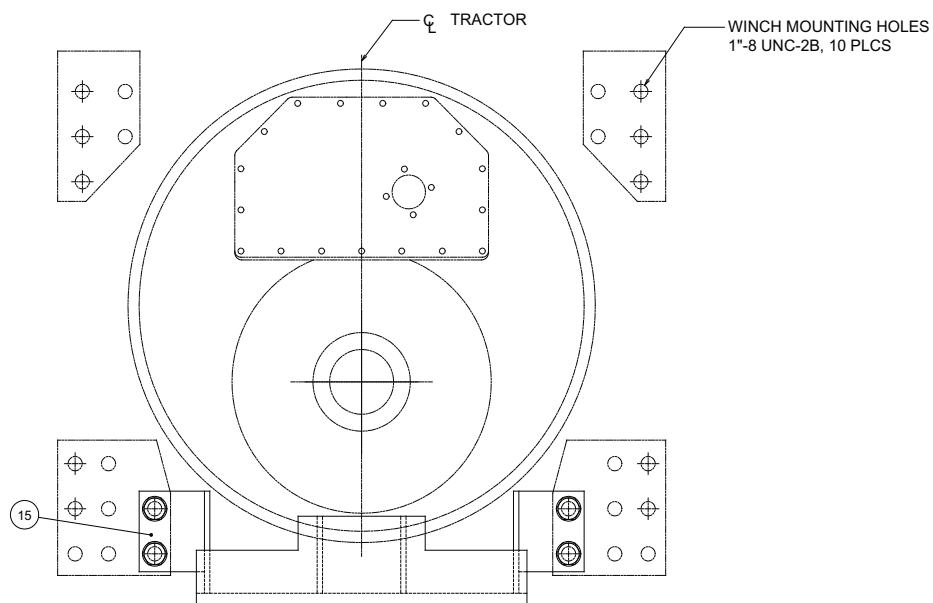
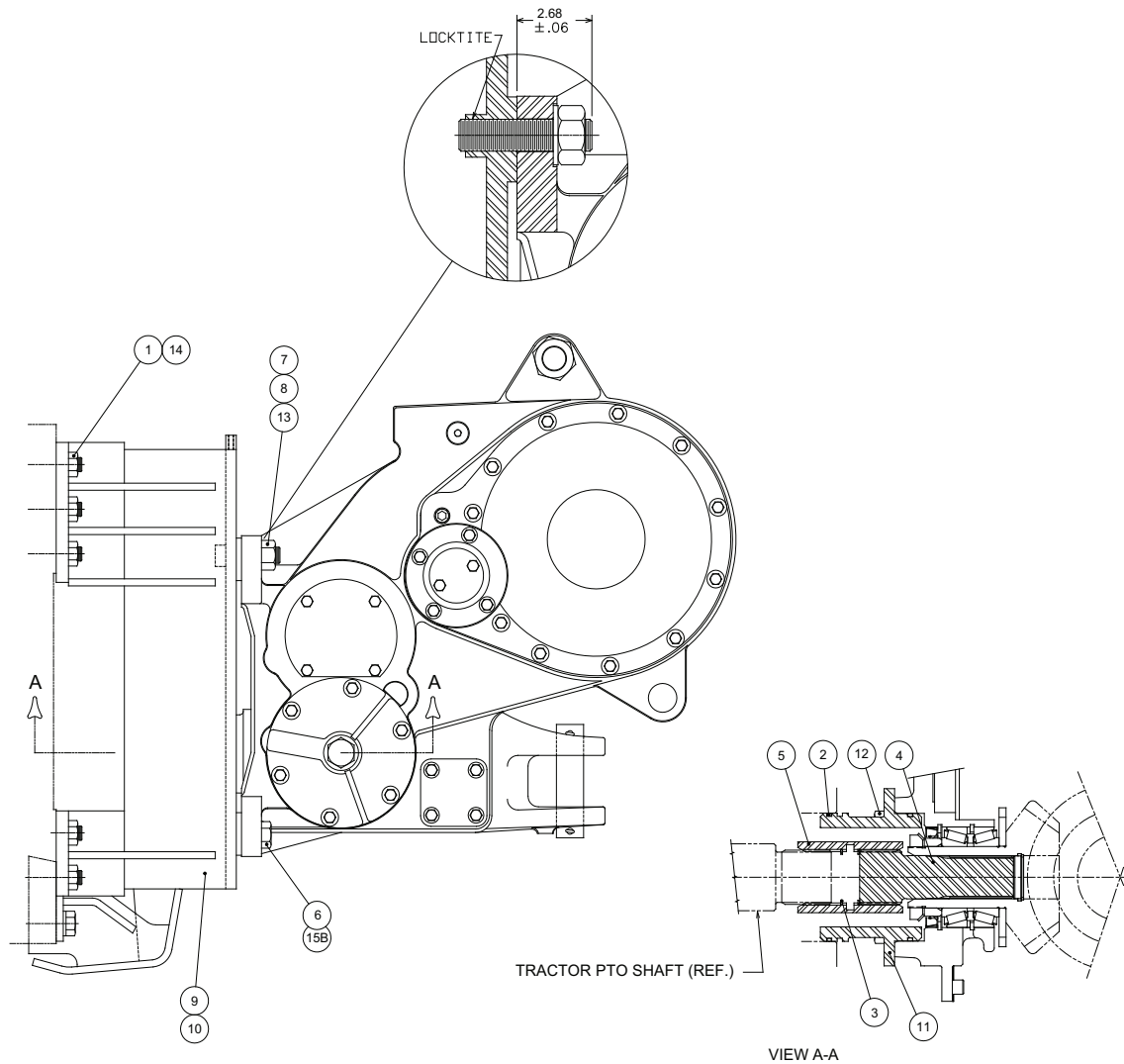
#### MODEL NUMBER DESCRIPTION

70A	B	0	0	1	0	0	E
Basic Winch Model	Bevel Gear Ratio B-1.27:1 E-2.78:1	0-Overwind	0-Standard Brake	1-With Freespool	0-Four Shaft Winch	0-No Fairlead 3-3 Roller Fairlead 4-4 Roller Fairlead	E-Electronic Control

#### PACCAR WINCH

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**MODEL 70A  
MOUNTING GROUP  
D6T SERIES TIER 4**



**VIEW LOOKING AT TRACTOR REAR FACE**

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	102597	CAPSCREW, HEX HEAD (1 - 8 X 3 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	103484	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

## MOUNTING GROUP INSTRUCTIONS

- PTO rotation is counterclockwise (CCW) as viewed from the rear of the tractor. Remove the tractor PTO cover.
- Remove paint, dirt, rust, oil and grease from mounting surfaces of tractor, winch and winch adapters. If this material is left between the mounting surfaces, movement of the clamped members will result in loosening mounting fasteners and possible fastener or mounting component failure.
- Coat splines of PTO shaft (4), with multi-purpose grease and install into bevel pinion gear of winch.
- Install retaining rings (3), in coupling (5). Trial fit the coupling onto the tractor PTO shaft and the winch PTO shaft to make certain the splines fit well and there are no rough areas on either shaft that need to be smoothed. Install coupling onto winch PTO shaft with deepest bevel end away from winch.
- Install O-rings (2), onto PTO pilot (11). **NOTE:** As the same PTO pilot may be used on several adaptations, typically only one O-ring groove will engage and seal in the tractor PTO opening.
- Apply Loctite 271, 277 or equivalent to threads and install studs (8) into winch adapters (9, 10) to a height of 2-5/8 in. (67 mm).
- Apply Loctite 242, 243 or equivalent to the threads of capscrews (6), and studs (8). Install the winch adapters (9, 10) onto the winch then install capscrews (6), washers (13) and nuts (7) onto studs (8). At this time, only lightly hand-tighten the capscrews (6), and nuts (21).
- Fill winch to proper level with recommended oil.

### ⚠ 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.

**MODEL 70A  
MOUNTING GROUP  
D6T SERIES TIER 4**

There are two methods that may be used to install the winch with adapters onto the rear face of the tractor:

**Method A:** Involves removing winch guards and covers to gain access to the bevel gears.

- A1. Apply Loctite 271, 277 or equivalent to threads and install studs (1) into rear face of tractor until they bottom in the stud bores but no lower than a height of 1.80 in. (46 mm) measured from the machined surface of the tractor rear face mounting pads to the end of the stud.
- A2. Apply general purpose grease to the PTO pilot o-rings. 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 gears to align the winch shaft with the tractor shaft. It will be necessary to remove the guard group and top cover from the winch to gain access to the bevel gears.
- A3. Apply Loctite 242 or 243 to clean dry threads of studs (1) and install nuts (14).

**NOTE:** Keep the winch in a level position to avoid binding of the PTO pilot and shafts.

With the weight of the winch supported by the hoist, use a cross pattern to evenly tighten all mounting fasteners to approximately 25% of the recommended torque. Start the tractor engine and listen for any unusual gear train noise that would indicate binding in the PTO shafts or gear train. If no unusual noises are detected, remove the hoist from the winch and continue to evenly tighten all mounting fasteners to recommended torque. Tighten nuts (7) & (14) 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, 14) they may be tightened as follows: Tighten nuts with a hand wrench to approximately 100 lb.ft. (136 N•m) torque to remove all looseness from the assembly. Mark the position of a wrench flat on each nut, then tighten each nut one (1) additional wrench flat.

**Method B:** Does not require removal of guards and covers from the winch.

- B1. Apply general purpose grease to the PTO pilot o-rings. Lift winch into position and install onto rear of tractor taking care to guide the PTO shaft/coupling onto the tractor PTO shaft. While the winch is supported on the hoist, slightly rotate the winch case to align the PTO coupling on the winch with the PTO shaft of the tractor.

**NOTE:** Keep the winch in a level position to avoid binding of the PTO pilot and shafts.

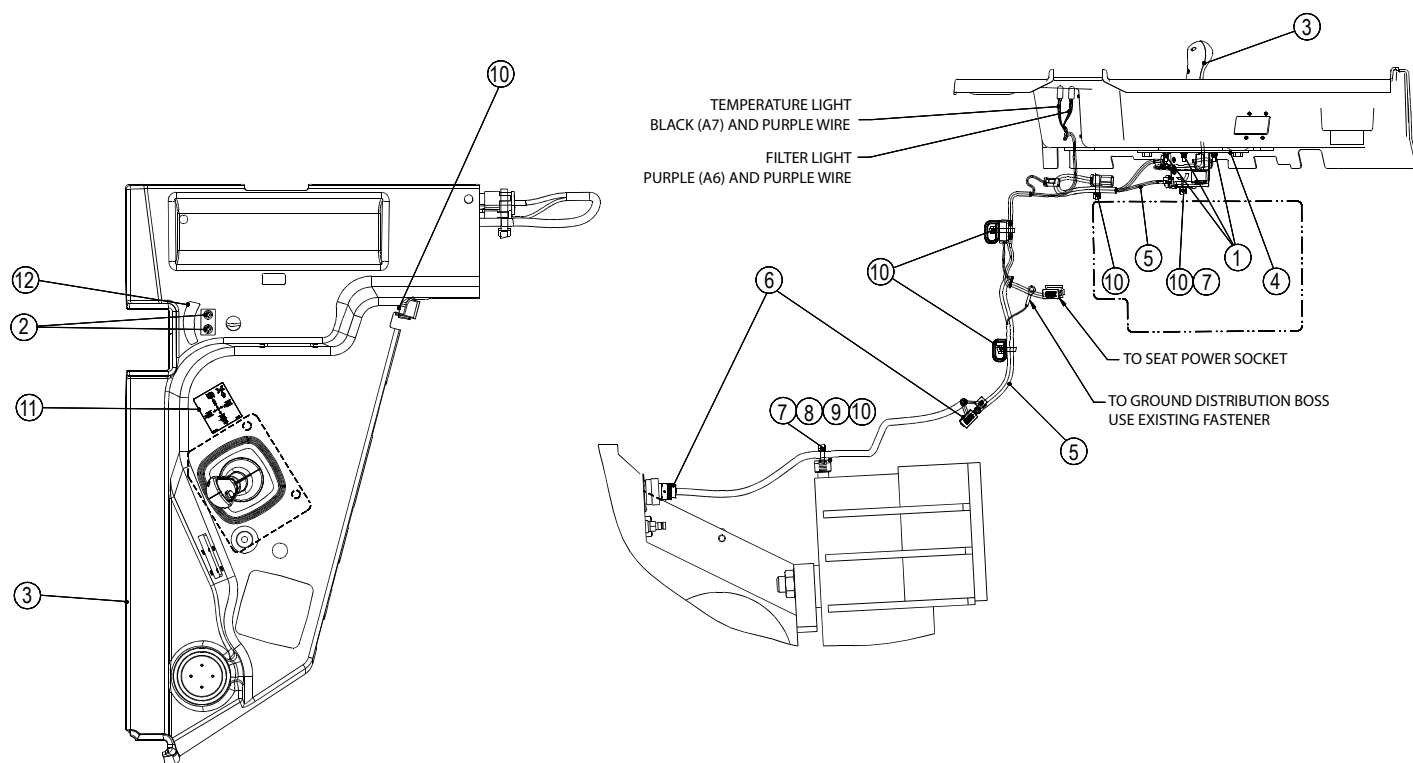
- B2. Apply Loctite 271, 277 or equivalent to clean dry threads and install studs (1) through winch adapter holes into the tractor rear face. Install the studs till they bottom in the stud bores but no lower than 1.80 in. (46 mm) measured from the machined surface of the tractor rear face mounting pads to the end of the stud. Apply Loctite 242 or 243 to clean dry threads of studs (1) and install nuts (14). With the weight of the winch supported by the hoist, use a cross pattern to evenly tighten all mounting fasteners to approximately 25% of the recommended torque. Start the tractor engine and listen for any unusual gear train noise that would indicate binding in the PTO shafts or gear train. If no unusual noises are detected, remove the hoist from the winch and continue to evenly tightening all mounting fasteners to recommended torque. Tighten nuts (7) & (14) 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, 14) they may be tightened as follows: Tighten nuts with a hand wrench to approximately 100 lb.ft. (136 N•m) torque to remove all looseness from the assembly. Mark the position of a wrench flat on each nut, then tighten each nut one (1) additional wrench flat.

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After winch is installed on tractor and all fasteners tightened to recommended torque, the bevel pinion must be pried toward the tractor. During installation, the pinion may get driven hard into the bevel gears, taking all end-play out of the pinion bearings and back-lash out of the gear set. Insert a pry bar between the clutch shaft and pinion then pry the pinion toward the tractor. A small amount of gear back-lash should be detected when the pinion moves forward.

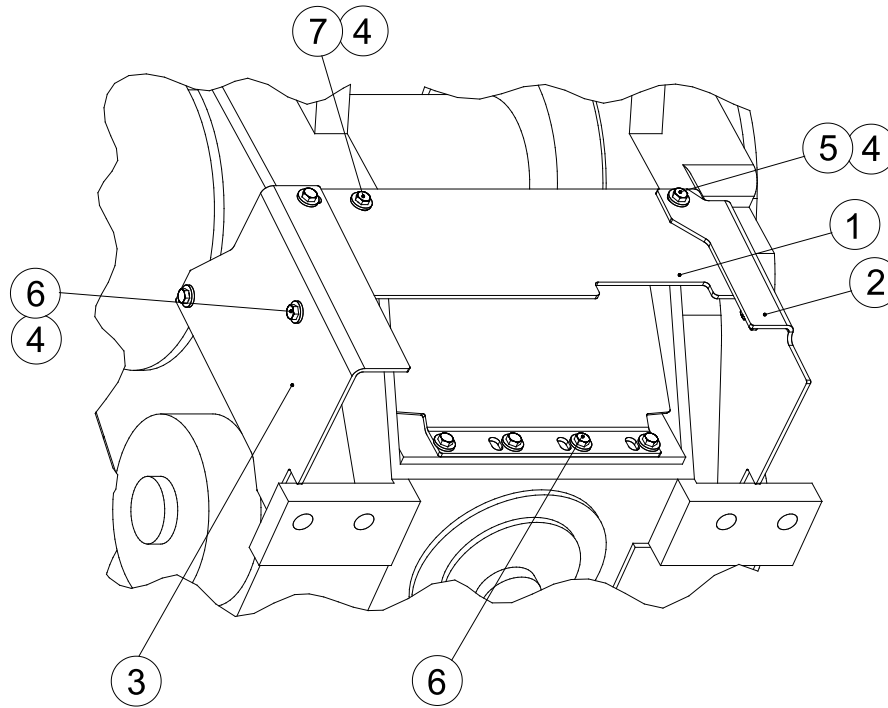
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**MODEL 70A  
CONTROL GROUP  
D6T SERIES TIER 4**



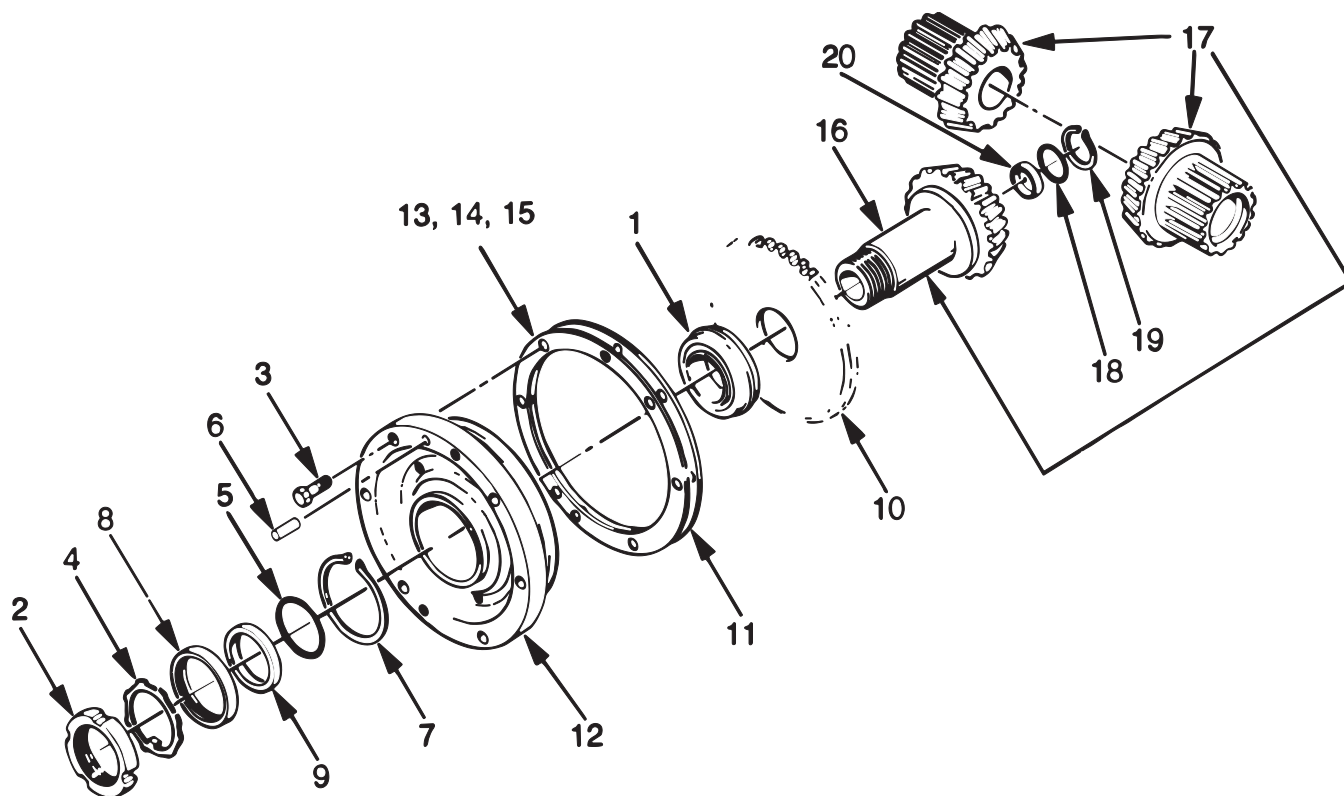
ITEM	PART NO	DESCRIPTION	QTY
1	109383	LOCKNUT	4
2	100792	INDICATOR LIGHT, RED	2
3	PA2792504	JOYSTICK ASSEMBLY	1
4	109380	ADAPTER PLATE	1
5	109359	WIRING HARNESS	1
6	109360	WIRING HARNESS	1
7	PA4P8134	CLIP	2
8	104135	CAPSCREW, HEX HD (3/8 - 16 X 3/4 G8 Z)	1
9	101440	WASHER, 3/8	1
10	32489	WIRE TIE STRAP,BLACK	8
11	100816	CONTROL CONSOLE DECAL	1
12	107337	TEMPERATURE DECAL	1

**MODEL 70A  
COVER GROUP  
D6T SERIES TIER 4**



ITEM	PART NO	DESCRIPTION	QTY
1	104844	UPPER GUARD	1
2	104845	LH GUARD	1
3	104846	RH GUARD	1
4	102987	WASHER, HARDENED	10
5	104320	CAPSCREW, HEX HEAD (1/2 - 13 X 1 GD8 Z)	1
6	104174	CAPSCREW, HEX HEAD (1/2 - 13 X 1-1/4 GD8 Z)	8
7	104322	CAPSCREW, HEX HEAD (1/2 - 13 X 1-1/2 GD8 Z)	1

**MODEL 70A**  
**BEVEL GEAR GROUP**  
**D6T SERIES TIER 4**  
**(S/N 0704589 AND BELOW)**

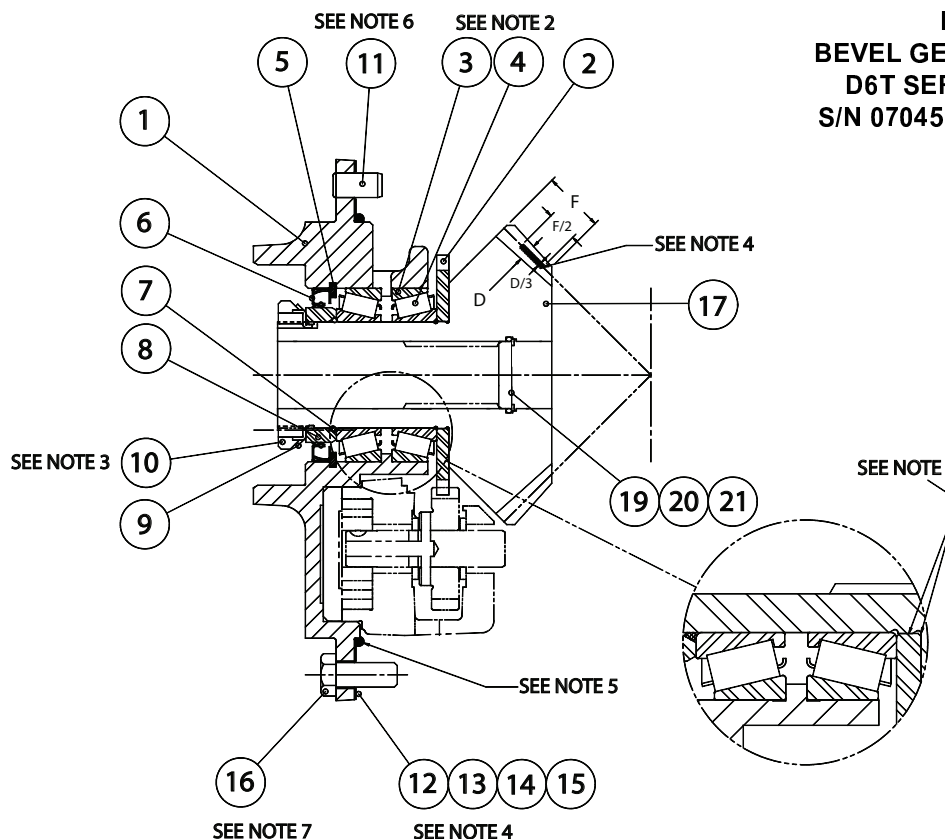


ITEM	PART NO	DESCRIPTION	QTY
1	70077	BEARING ASSEMBLY	1
2	24816	BEARING LOCKNUT	1
3	104174	CAPSCREW, HEX HEAD (1/2 - 13 X 1-1/4 G8 Z)	6
4	11418	BEARING LOCKWASHER	1
5	74992	O-RING	1
6	10318	DOWEL PIN	1
7	70163	RETAINING RING	1
8	107298	OIL SEAL	1
9	70382	SEAL SPACER	1
10	69947	PUMP DRIVE PINION	1
11	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) STANDARD SPEED	1
	69635	BEVEL PINION - 14T (E RATIO) SLOW SPEED	1
17	29075	BEVEL GEAR SET - 33/26T (B RATIO)* STANDARD SPEED	1
	69834	BEVEL GEAR SET - 39/14T (E RATIO)* SLOW SPEED	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  
D6T SERIES TIER 4  
S/N 0704590 AND UP)**



**NOTES:**

1. Clean bevel and pump pinions with Loctite solvent. Verify press fit before assembly. Apply Loctite 609 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

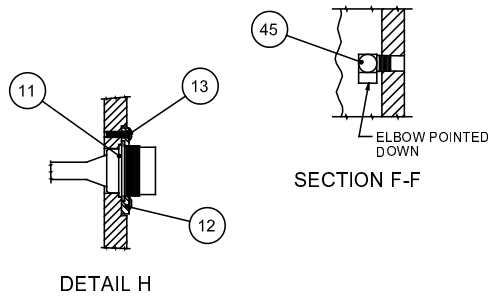
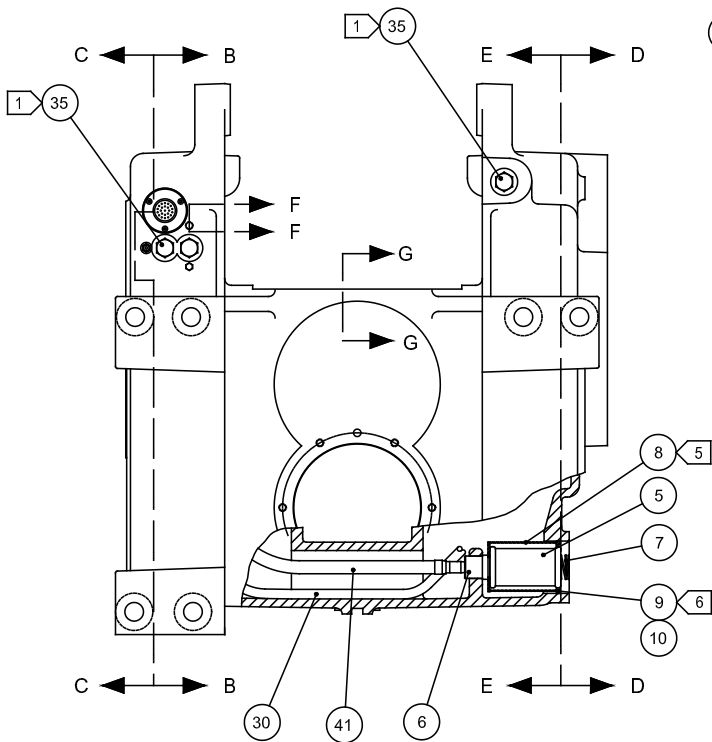
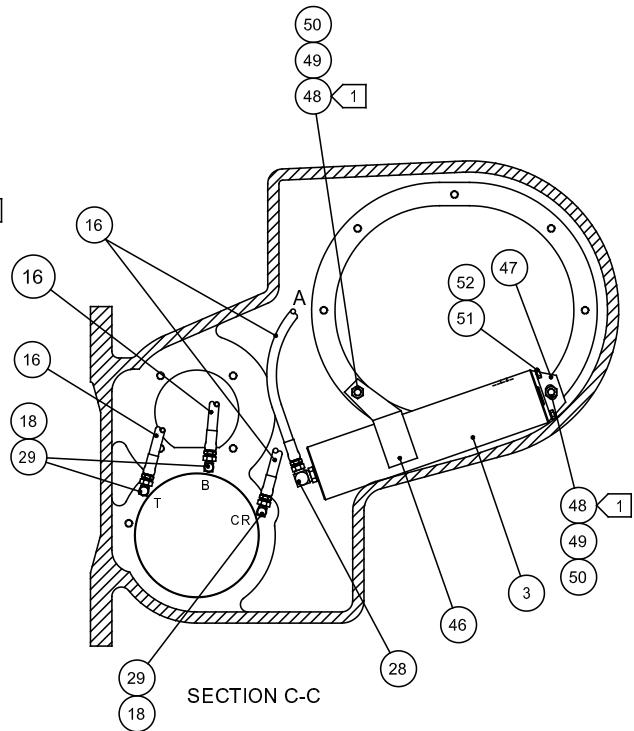
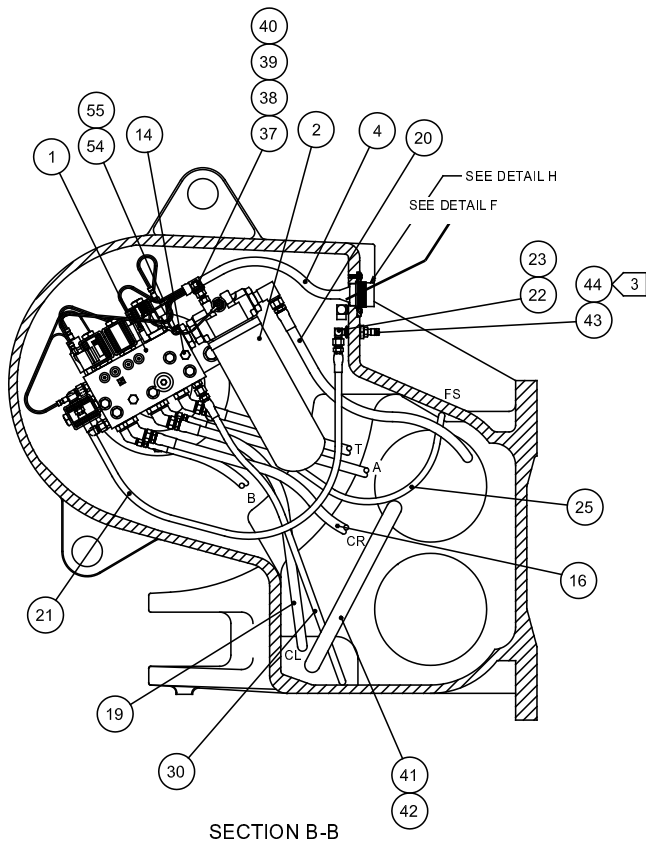
be about 1/3 the whole depth, located midway between tip and root. It should be about 1/2 the face width shifted toward the toe. Set the backlash to .004 to .012 in. (.10 - .30 mm).

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	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.

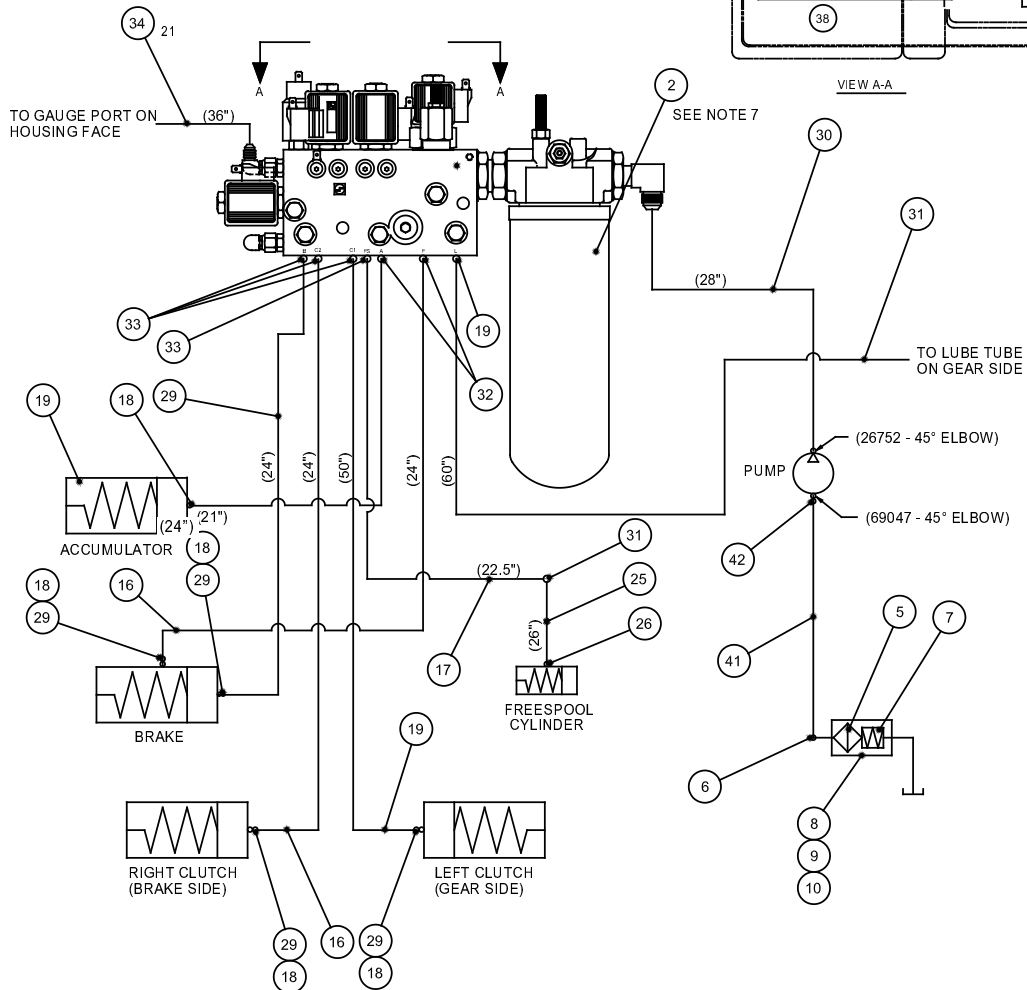
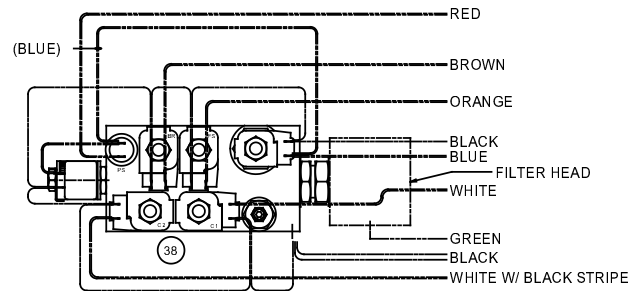
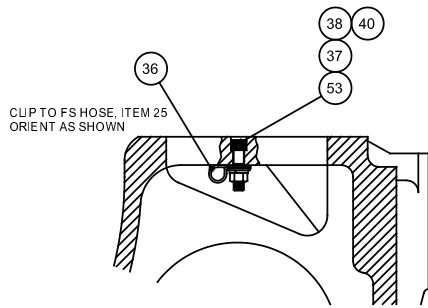
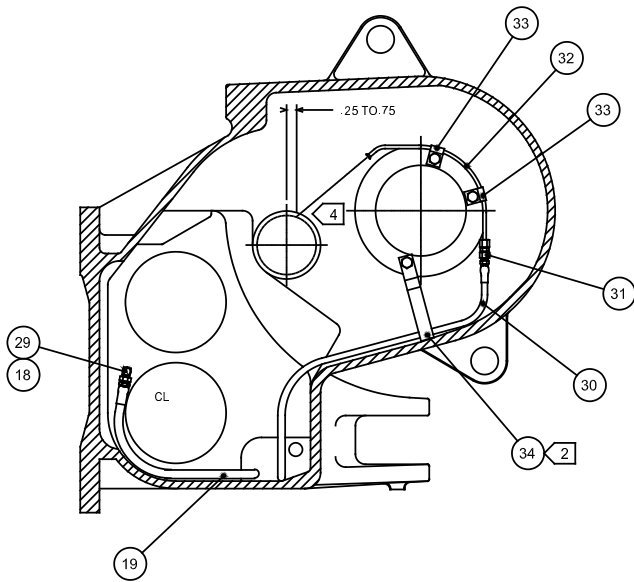
**MODEL 70A**  
**HYDRAULIC CONTROL GROUP - LOW PTO**  
**D6T SERIES TIER 4**



**NOTES:**

- 1 Apply "Loctite 242" to clean dry threads.
- 2 Trim clamp end a minimum amount to clear bottom of case wall so clamp cannot rotate out of position.
- 3 Apply "Loctite 609" to external threads.
- 4 Bend lubrication tube (item 34) as required to direct oil stream as indicated.
- 5 Install strainer shield (item 49) with open side facing downward.
- 6 Measure from strainer shield to cover mounting surface. If distance is .720 in. - .783 in. (18.3 - 19.9 mm), add one seal (item 57) outboard of seal (item 49). If distance is greater than .783 in. (19.9 mm), add two seals (item 57)
- 7 Torque filter element (item 2) to 15 - 20 lb•ft (20 - 27 N•m).

**MODEL 70A**  
**HYDRAULIC CONTROL GROUP - LOW PTO**  
**D6T SERIES TIER 4**



**MODEL 70A**  
**HYDRAULIC CONTROL GROUP - LOW PTO**  
**D6T SERIES TIER 4**

ITEM	PART NO.	DESCRIPTION	QTY.
1	82564	CONTROL VALVE (REFER TO CONTROL VALVE ASSEMBLY)	1
2	100466	FILTER ELEMENT	1
3	81959	ACCUMULATOR (REFER TO ACCUMULATOR ASSEMBLY)	1
4	82505	WIRING HARNESS	1
5	70189	STRAINER	1
6	69051	CONNECTOR	1
7	26005	COMPRESSION SPRING	1
8	29020	STRAINER SHIELD	1
9	29021	SEAL RING, .25 in. (6.4 mm)	1
10	29023	SEAL RING, .06 in. (1.5 mm)	1-2 AR
11	13838	O-RING	1
12	100784	FLANGE	1
13	100794	CAPSCREW, BUTTON SKT HEAD (#10 - 3/4)	3
14	104177	CAPSCREW, HEX HEAD (3/8 - 16 X 4 1/2 G8 Z)	2
15	69605	ELBOW, 45° ORB -8	5
16	70272	HOSE, -8, 24 in. (610 mm) B, F, CR	4
17	25749	HOSE, -4, 22.5 in. (572 mm) F/S	1
18	70106	ADAPTER 1/4 NPT -8	4
19	27989	HOSE, -8, 50 in. (1270 mm) CL	1
20	100802	HOSE, -8, 29 in. (737 mm) PUMP TO FILTER	1
21	40242	HOSE, -4, 36 in. (914 mm) GAUGE	1
22	26140	ELBOW, 90° -4, GAUGE PORT	1
23	21219	ADAPTER, -4	1
24	100265	ELBOW, 45° -4	1
25	100077	HOSE, -4, 26 in. (660 mm) F/S	1
26	25864	ADAPTER, ORB -4	2
28	70109	ELBOW, 90° ORB -8	1
29	29046	ELBOW, 90° -8	4
30	25893	HOSE ASSEMBLY, -4, 60 in. (1524 mm)	1
31	25891	UNION, -4	2
32	100803	TUBE ASSEMBLY	1
33	68994	CLAMP	2
34	68995	CLAMP	1
35	69782	CAPSCREW, HEX HEAD (3/4 - 10 X 1 1/4 G8 Z)	3
36	100814	HOSE CLAMP	1
37	11780	NUT, HEX (3/8 - 16)	3
38	13929	WASHER (3/8)	3
39	PA4K8864	HOSE CLAMP	1
40	27152	LOCKWASHER (3/8)	2
41	69046	SUCTION HOSE	1
42	30997	CLAMP	2
43	100267	QUICK DISCONNECT, GAUGE PORT	1
44	100266	SLEEVE, GAUGE PORT	1
45	13708	ELBOW, 90° (1/8 NPT) VENT PORT, INSIDE	1
46	27848	ACCUMULATOR BRACKET	1
47	27847	MOUNTING ANGLE	1
48	27849	STUD (1/2 -13 X 2 3/4)	2
49	101439	NUT, HEX (1/2 - 13)	2
50	11026	LOCKWASHER (1/2)	2
51	11766	CAPSCREW, HEX HEAD (5/16 - 18 X 7/8 G8 Z)	2
52	11024	LOCKWASHER (5/16)	2
53	13544	CAPSCREW, SKT HEAD (3/8 - 16 X 1 1/2)	1
54	22727	CAPSCREW, HEX HEAD (1/4 - 20 X 1/2 G8 Z)	1
55	11015	LOCKWASHER (1/4)	1

AS REQUIRED

