



Installation Instructions

Dual Direction Tilt Control Kits

This sheet provides installation instructions for Cascade Dual Direction Tilt Control. The tilt control positions the mast at true vertical from forward or back tilt for precision handling of paper rolls and other application such as rack storage.

Consult Cascade about the availability of custom installation kits for the truck being fitted.

Tilt Control Kits 12V

221046 and 6039760

24V

221053

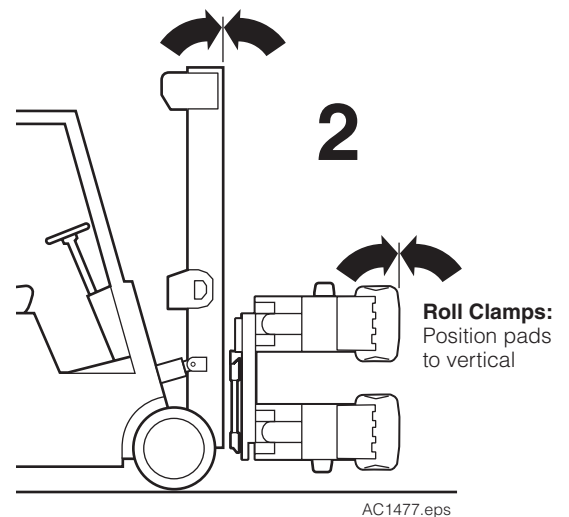
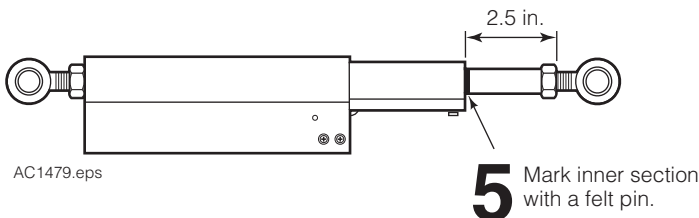
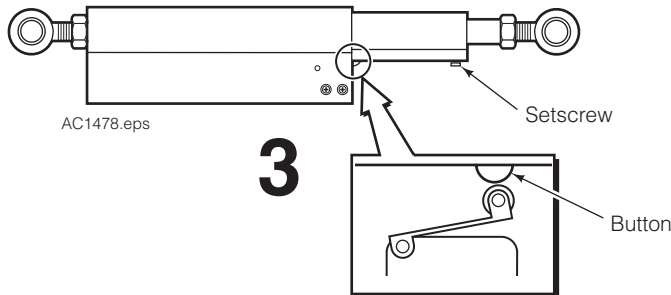
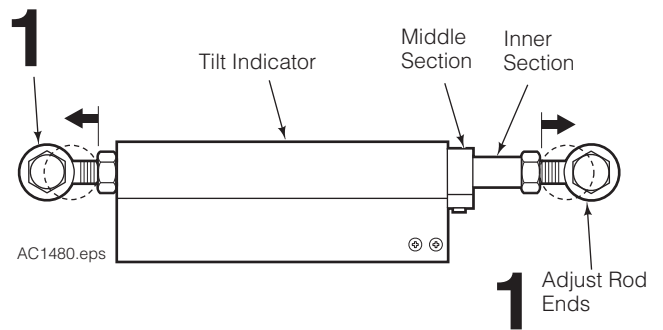
36V

223617 and 6013808

48V

222270, 6013807
and 6055437

- 1 Loosen jam nuts and adjust rod ends of the tilt indicator to midpoint. Tighten jam nuts.
- 2 Position the mast at vertical using a level. **For Roll Clamps position the pads at vertical.**
- 3 Loosen the setscrew on the tilt indicator middle section. Position the middle section to place the button under the switch roller. **Tighten the setscrew just enough so the arm will not easily move.**
- 4 Adjust the inner section to show 2.5 in. of rod. For large truck tilt indicators, adjust the inner section to show 11.5 in. of rod.
- 5 With a felt pen, mark the inner section at the middle section, as shown.



cascade[®]
corporation

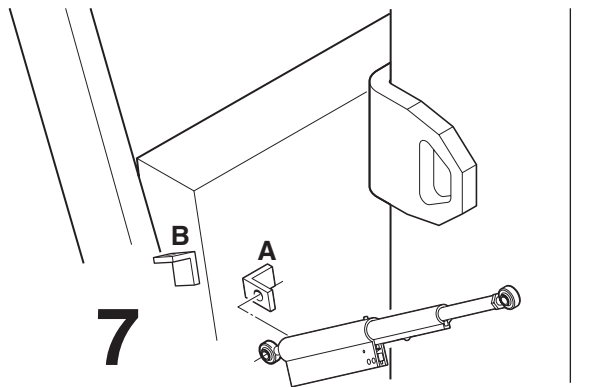
For Technical Support . . .

Call: 1-800-227-2233 Fax: 1-888-329-8207
Internet: www.cascorp.com
Write: Cascade Corporation, PO Box 20187, Portland, OR 97294

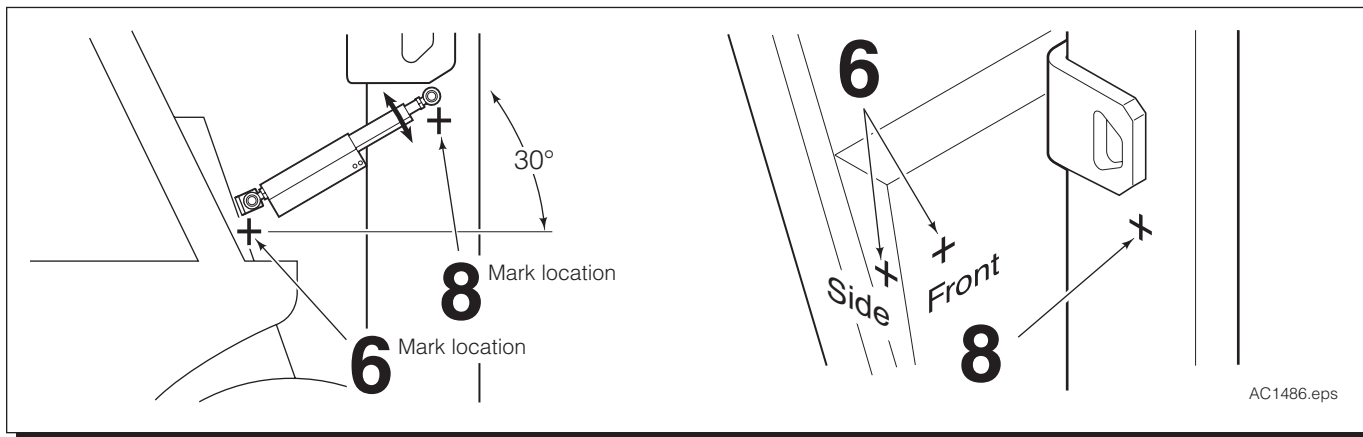
To Order Parts . . .

Call: 1-888-227-2233 Fax: 1-888-329-0234
Internet: www.cascorp.com
Write: Cascade Corporation, 2501 Sheridan Ave., Springfield, OH 45505

- 6 Find a location on the truck cowl to potentially mount the bracket. Mark the location.
- 7 Attach the mounting bracket to the base end of the tilt indicator. Be sure to position the bracket in a suitable direction with the cowl.
- 8 Use the tilt indicator to determine a location on the side of the mast. The angle must be approximately 30 degrees from the horizontal of the base end bracket. Mark the location.
- 9 Temporarily secure the base end and rod end to the marked locations.

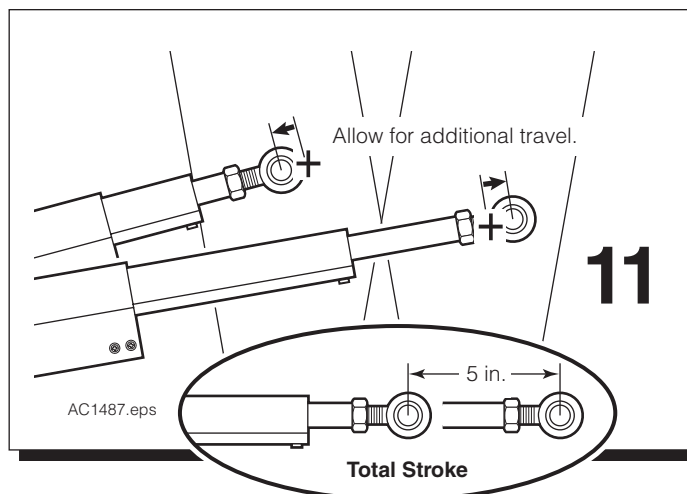
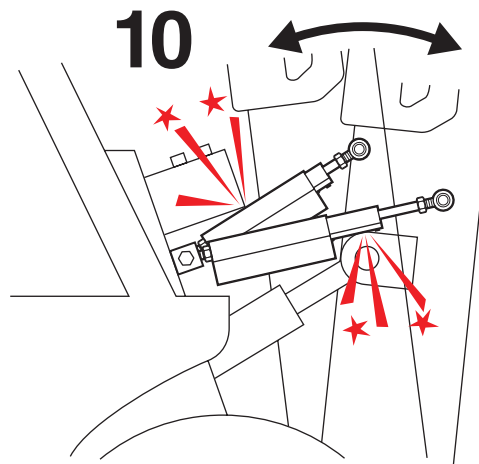


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- 10 Verify that the tilt indicator has no interference with truck and attachment components by tilting the mast fully forward and back.
 - 11 Tilt the mast back to verify that the indicator rod can move further back. Tilt the mast forward to verify that the indicator rod can extend further. The tilt indicator can have a total stroke of 5 in with the mast fully forward and fully back.
- CAUTION:** Failure to allow for full extension and retraction will damage the tilt indicator.



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12 Secure the brackets to the marked locations on the truck cowl and mast. If using an adhesive, mix and apply adhesive (user supplied) to attach the brackets to the truck cowl and mast. Adhesives approve for this installation:

- Loctite 332 with Activator 7380
- Devcon S-220 two part epoxy
- Devcon Plastic Welder 14320
- JB Weld 8265-S

Apply per manufacturer's instructions.

IMPORTANT: Remove adhesive residue from hands immediately. Once dry it is permanent on your skin.

CAUTION: Weld only with permission of the mast OEM and only in a location authorized by the mast OEM.

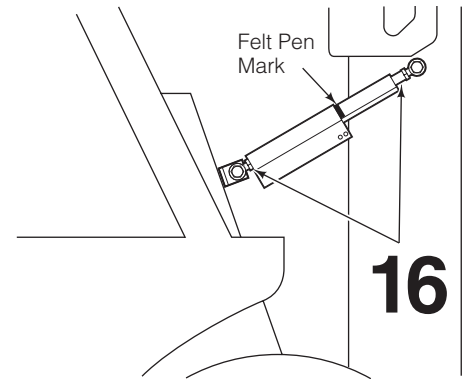
13 Position the mast or Roll Clamp pads to vertical.

14 Attach the tilt arm assembly to the cowl and mast mounts using the hardware supplied.

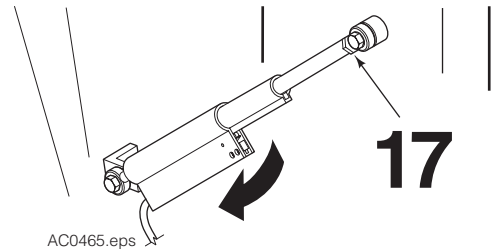
15 Slowly tilt the mast completely forward and backward. Check the felt pen mark on the inner section to make sure it has not moved into or out of the middle section. If the mark has moved significantly go back to Step 2.

16 For the felt pen mark that moved slightly (less than .5 in), loosen the jam nut on a rod end. If the mark is inside the middle tilt indicator section, turn the rod end clockwise. If the mark has moved outward from the middle section, turn the rod end counterclockwise. Tighten the jam nut.

17 Verify that the indicator is clear from mast. To adjust, loosen the rod end jam nut of the tilt indicator and rotate the tilt arm away from the mast.




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Tilt Control Valve Installation

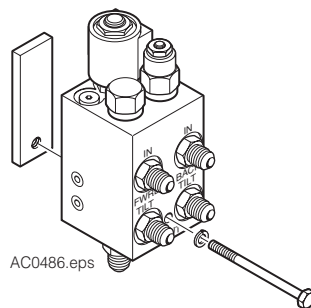
1 Determine a location to install the tilt control valve on the cowl or under the floor board. The valve must be plumbed in between the truck TILT auxiliary valve and the tilt cylinders. See the hydraulic schematic.



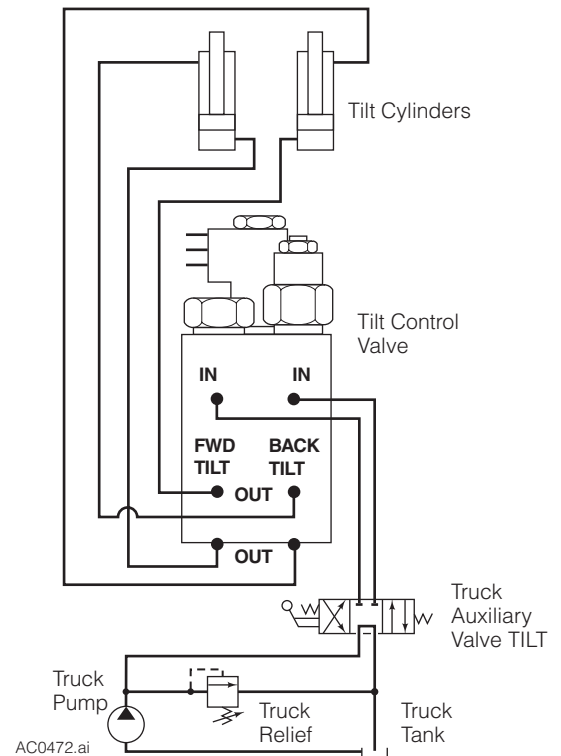
WARNING: Tilt the mast completely forward before disconnecting hoses to install the tilt control valve. This will minimize oil loss.

2 Mount the valve and install the hoses. The valve ports must be connected to the tilt cylinder ports with a hose for each function. Do not use tee fittings. See hydraulic schematic.

IMPORTANT: The hoses must be installed consistent with the operation of the tilt cylinders. To reduce restriction, minimize the use of additional fittings.



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Wiring Installation

- 1 Install the tilt override switch to the tilt control knob using one of the following methods:

Switch Mounted on Knob Face – Position the tilt override switch on the front of the tilt control knob in a location that is easy to press the button and move the handle. File or carve a flat surface on the front of the knob if needed to keep the switch from rocking. Over the knob and switch place the smallest heat shrink tubing that will fit. Using a heat gun, heat the tubing to secure the switch to the knob.

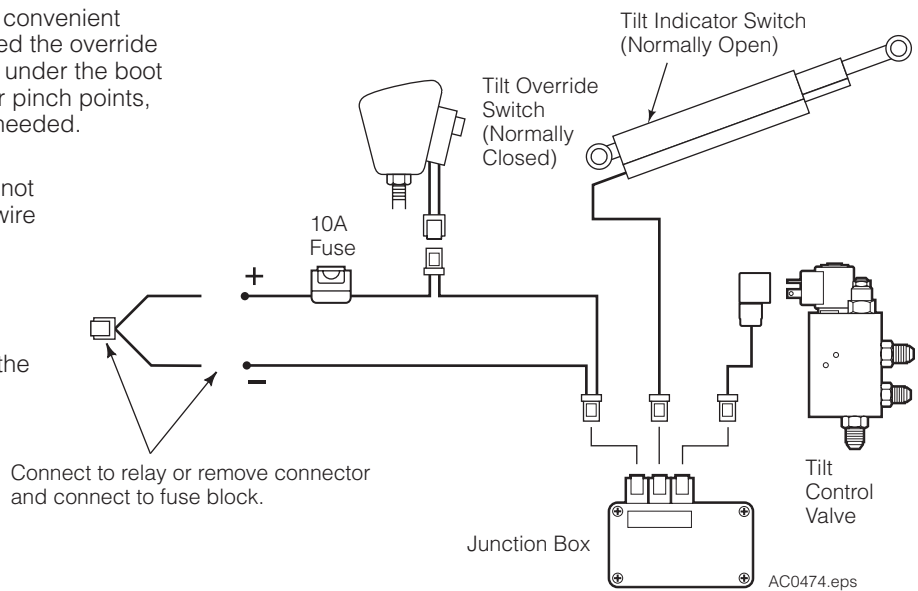
Switch Mounted on Knob Bracket – Remove the tilt control knob. Place the bracket on the tilt lever and replace the knob. Position the tilt override switch on the front of the bracket. Over the bracket and switch, place the smallest heat shrink tubing that will fit. Using a heat gun, heat the tubing to secure the switch to the bracket.

- 2 If it is difficult to feel or operate the override switch button through the heat shrink tube, carefully cut a circle out of the tubing around the button.

- 3 Mount the junction box under the dash or convenient location. Connect cables as marked. Feed the override switch wires down the control handle and under the boot (if equipped). Check the cable routing for pinch points, chafing and clearance. Use wire ties as needed.

NOTE: The connector for power is plug compatible with a Cascade Relay. When not using a relay, remove the connector and wire directly to a fuse bank.

- 4 Check the wiring with the key or power on. Depress the switch roller with a small screwdriver - the light in the solenoid cap should turn on. Simultaneously pressing the tilt override switch will turn the light off.



Tilt Control Operation

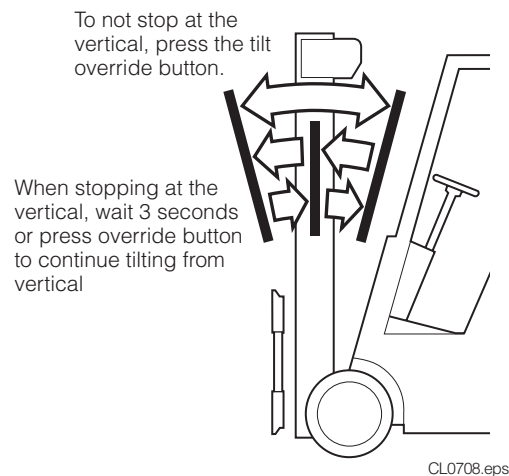
- 1 Test the installation before putting truck in service. When tilting forward and backward, mast travel should stop at vertical. Wait 3 seconds to tilt from vertical after stopping **OR** press the tilt override button to continue tilting.

Tilt the mast fully backward then tilt forward to vertical. Mast travel should stop at vertical.

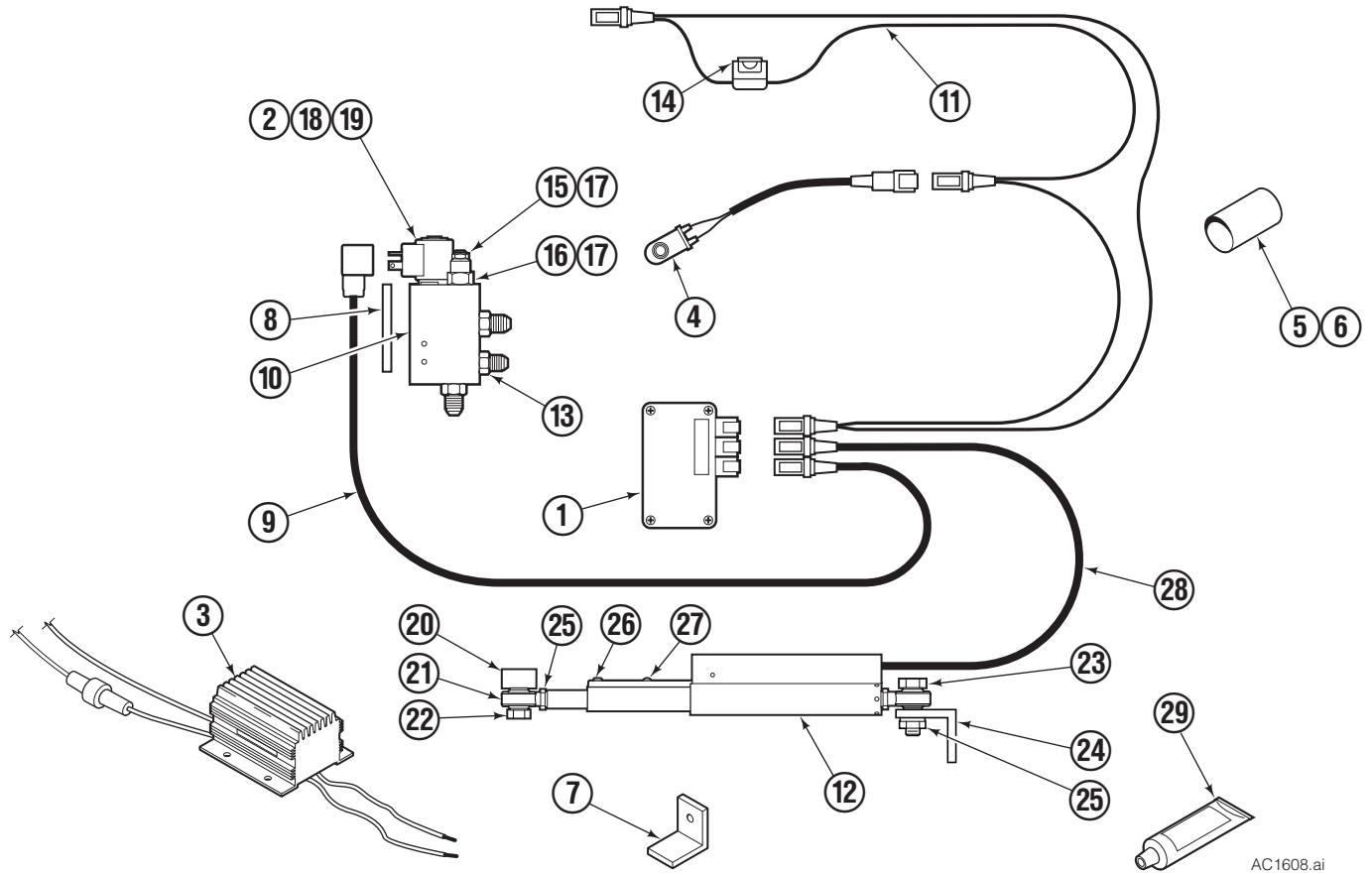
- If mast travel **does not stop** at vertical:
 - A The switch roller should be on the actuator when the mast is at vertical.
 - B Inspect the hose and wiring installation. The light in the solenoid cap should turn on when the mast is at vertical.
 - C If truck relief pressure is higher than 2800 psi and the mast slows down but does not stop at vertical when tilting, it may be necessary to adjust the counterbalance cartridge. Turn the cartridge adjustment screw CCW until the mast stops at vertical.

- 2 To tilt from vertical, wait 3 seconds after stopping or the tilt override button must be pressed before the mast can move.

To tilt forward or backward through vertical without stopping, press the override button.



Dual Direction Tilt Control Kits – 12V, 24V, 36V



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REF	QTY	12 V PART NO.	12 V PART NO.	24 V PART NO.	36 V PART NO.	36 V PART NO.	DESCRIPTION
		221046	6039760	221053	223617	6013808	Dual Direction Tilt Control Kit
1	1	220890	220890	221718	223628	223628	Relay Enclosure
2	1	220632	220632	220633	223636	223636	Solenoid Coil
3	1	-	6009166	-	-	-	DC/DC Converter

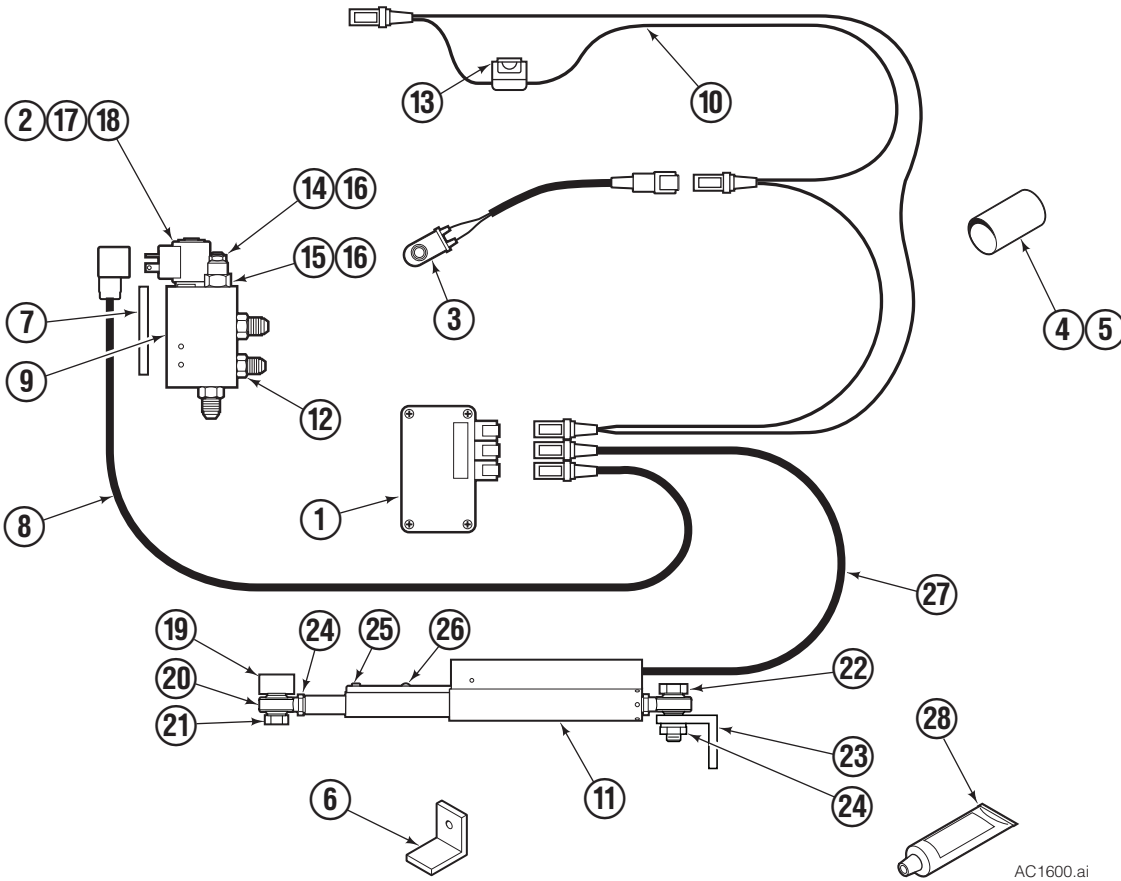
REF	QTY	PART NO.	DESCRIPTION	REF	QTY	PART NO.	DESCRIPTION
4	1	6001663	Switch Assembly (NC) ■	17	2	667516	Seal Service Kit
5	1	6026934	Shrink Tube - 2.0 in. dia. ■	18	1	6026589	Solenoid Valve Cartridge
6	1	6001641	Shrink Tube - 1.0 in. dia. ■	19	1	6026713	Seal Service Kit
7	1	222009	Knob Bracket ■	20	1	220330	Anchor
8	1	6018319	Spacer ■	21	2	221054	Rod End
9	1	6017665	Wire Harness - Solenoid	22	1	684649	Capscrew, M10 x 25
10	1	6013526	Valve Assembly without Coil	23	1	768538	Capscrew, M10 x 30
11	1	219398	Wire Harness - Power	24	1	220525	Bracket
12	1	220013	Tilt Control Arm Assembly	25	3	209152	Jam Nut, M10
13	6	604511	Fitting, 6-6	26	1	768734	Setscrew, M6 x 12
14	1	6008233	Fuse, 10 Amp	27	1	220328	Button ◆
15	1	6026587	Counterbalance Valve Cartridge	28	1	220313	Wire Harness - Tilt Switch ●
16	1	6026590	Check Valve Cartridge	29	1	6017272	Silicon, RTV ●

■ Not included in Tilt Control Kit 6013808.

◆ For replacement, refer to kit 6801758

● Included in Limit Switch Service kit 6017267.

Dual Direction Tilt Control Kits – 48V



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REF	QTY	48 V PART NO.	48 V PART NO.	48 V PART NO.	DESCRIPTION
		222270	6013807	6055437	Dual Direction Tilt Control Kit
1	1	223629	223629	223629	Relay Enclosure
2	1	223637	223637	223637	Solenoid Coil

REF	QTY	PART NO.	DESCRIPTION	REF	QTY	PART NO.	DESCRIPTION
3	1	6001663	Switch Assembly (NC) ■	16	2	667516	Seal Service Kit
4	1	6026934	Shrink Tube - 2.0 in. dia. ■	17	1	6026589	Solenoid Valve Cartridge
5	1	6001641	Shrink Tube - 1.0 in. dia. ■	18	1	6026713	Seal Service Kit
6	1	222009	Knob Bracket ■	19	1	220330	Anchor
7	1	6018319	Spacer ■	20	2	221054	Rod End
8	1	6017665	Wire Harness - Solenoid	21	1	684649	Capscrew, M10 x 25
9	1	6013526	Valve Assembly without Coil	22	1	768538	Capscrew, M10 x 30
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14	1	6026587	Counterbalance Valve Cartridge	27	1	220313	Wire Harness - Tilt Switch ●
15	1	6026590	Check Valve Cartridge	28	1	6017272	Silicon, RTV ●

■ Not included in Tilt Control Kit 6013807.

◆ For replacement, refer to kit 6801758

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