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Installation Instructions

Models: 70+SC, 80+SC

READ BEFORE INSTALLATION!

Instructions in this manual supersede all editions published at an earlier date. Snowman Snowplow, Inc. reserves the right, under its continuing product improvement program, to change construction or design details, specifications and prices without notice or without incurring any obligation.

(M700103)VEHICLE HARNESS
October 2003

IMPORTANT!

This manual contains step-by-step instructions for proper installation of the SNOWMAN model SC snowplows.

Please read manual carefully before assembling plow, and follow recommendations given.

IF FURTHER ASSISTANCE IS NEEDED, CALL 888-766-6267



This is a safety alert symbol. It alerts an operator to information concerning personal safety.

Always observe and heed these symbols and instructions to prevent serious injury to yourself or others.

GENERAL INFORMATION:



CAUTION: Always disconnect battery prior to installation.

Check contents of shipment against the parts list to determine all are correct and included.

When ordering parts, furnish model number of plow, part number, name and description.



SAFETY PRECAUTIONS should be used when power unit is **IN OPERATION** and plow is in **ANY POSITION**. **LOWER** plow to ground when vehicle is **PARKED**.



Remove plow when not in use.



For optional joystick controller - always **SWITCH THE REMOTE CONTROL TO "OFF"** before unhooking from plow, and when the plow is not in use.

TOOLS NEEDED FOR SNOWMAN MODEL SC SNOWPLOW INSTALLATION

WRENCHES:

7/16"

1/2"

9/16"

5/8"

11/16"

3/4"

15/16"

1-1/2"

DRILL BITS:

3/8"

11/16"

SIDE CUTTERS

DRILL

3/8" NUT DRIVER

PLOW ASSEMBLY FOR MODELS 60+SC, 70+SC, 80+SC

- | | | |
|--|---|---|
| 1) (C4001-6' C4003-7'; C4005-8')
Carbon steel cutting edge | 7) (U6001SC) Upper arm | 14) (X11003) ½" x1¼" Bolt (8) |
| 2) (X11051) ½"x2" Carriage bolt
(8-model 60+SC; 9-model 70+SC;
10-model 80+SC) | 8) (E3001PF and E3001PFN) Pump
flow control and nipple | 15) (X11001) 5/16" x1½" Bolt (8) |
| 3) (X11007) 5/8"x4" bolt (4) | 9) Jack mount (JA001L – 15" jack
provided not shown) | 16) (R1000) Rubber cutting edge - 11" (2) |
| 4) (T9001) Spring (4) | 10) (X11031) 5/8"x3½" Hitch pin (1) | 17) (A5002SC03L/R) Box wing (2) |
| 5) (X11021) 5/8"x6¾" Eye bolt (4) | 11) (TM101) T - hitch mount | 18) (L7003; R8003) Lower arms (2) |
| 6) (X11005) ½"x3½" Bolt (4) | 12) (X11042) 1"x4" Bolt (2) | 19) (SM-DB1374A) 4.0 Hyd. power unit |
| | 13) (H2002R) Cylinder - 2"x2"x8" (1) | |

PARTS LIST: 70+SC

PARTS LIST: 80+SC

REF NO	PART NUMBER	DESCRIPTION	QTY	QTY B/O	REF NO	PART NUMBER	DESCRIPTION	QTY	QTY B/O
	M700103R/Y	7 Ft. 12 ga. Moldboard	1			M800103 R/Y	8 Ft. 12 ga. Moldboard	1	
1	C4003	7 Ft. carbon steel cutting edge	1		1	C4005	8 Ft. carbon steel cutting edge	1	
2	X11051	1/2"x2" Carriage bolt	9		2	X11051	1/2"x2" Carriage bolt	10	
	X11018	1/2" Lock nut	9			X11018	1/2" Lock nut	10	
18	L7003	Standard lower left arm	1		18	L7003	Standard lower left arm	1	
18	R8003	Standard lower right arm	1		18	R8003	Standard lower right arm	1	
3	X11007	5/8"x4" Bolt	2		3	X11007	5/8"x4" Bolt	2	
	X11035	5/8" Lock nut	2			X11035	5/8" Lock nut	2	
4	T9001	Spring	4		4	T9001	Spring	4	
5	X11021	5/8"x6-3/4" Eye bolt (2 nut)	4		5	X11021	5/8"x6-3/4" Eye bolt (2 nut)	4	
	X11039	5/8" Structural washer	6			X11039	5/8" Structural washer	6	
11	TM101	SC T-hitch mount	1		11	TM101	SC T-hitch mount	1	
7	U6001SC	SC Upper arms	1		7	U6001SC	SC Upper arms	1	
3	X11007	• 5/8"x4" Bolt	2		3	X11007	• 5/8"x4" Bolt	2	
	X11039	• 5/8" Structural washer	2			X11039	• 5/8" Structural washer	2	
	X11035	• 5/8" Lock nut	2			X11035	• 5/8" Lock nut	2	
6	X11005	• 1/2"x3-1/2" Bolt	4		6	X11005	• 1/2"x3-1/2" Bolt	4	
	X11038	• 1/2" Structural washer	4			X11038	• 1/2" Structural washer	4	
	X11018	• 1/2" Lock nut	4			X11018	• 1/2" Lock nut	4	
10	X11031	• 5/8"x3-1/2" Hitch pin	1		10	X11031	• 5/8"x3-1/2" Hitch pin	1	
	SC1001	• Safety Chain	1			SC1001	• Safety Chain	1	
	A5006	• Flag/Pr. (includes 2 S-hooks)	1			A5006	• Flag/Pr. (includes 2 S-hooks)	1	
• All of the above indented items included in bag # 1					• All of the above indented items included in bag # 1				
19	SM-DB1374A	4.0 Hydraulic power unit	1		19	SM-DB1374A	4.0 Hydraulic power unit	1	
	H2003	Hydraulic hoses (36")	2			H2003	Hydraulic hoses (36")	2	
	PC001	Vinyl power unit cover	1			PC001	Vinyl power unit cover	1	
	ET3002CS	2-way up/down toggle controller w/3' lead	1			ET3002CS	2-way up/down toggle controller w/3' lead	1	
	E3002CSKN	Switch handle	1			E3002CSKN	Switch handle	1	
	X11002	• 3/8"x1" Bolt	1			X11002	• 3/8"x1" Bolt	1	
	X11055	• 3/8"x3-1/2" Bolt	1			X11055	• 3/8"x3-1/2" Bolt	1	
	X11022	• 3/8" Lock washer	2			X11022	• 3/8" Lock washer	2	
	H2004	• 9/16" Boss swivel fitting	2			H2004	• 9/16" Boss swivel fitting	2	
8	E3001PF	• Pump flow control	1		8	E3001PF	• Pump flow control	1	
8	E3001PFN	• Pump flow nipple	1		8	E3001PFN	• Pump flow nipple	1	
13	H2002R	Cylinder (2"x2"x8")	1		13	H2002R	Cylinder (2"x2"x8")	1	
	H2006	• 3/8" Standard swivel fitting	2			H2006	• 3/8" Standard swivel fitting	2	
12	X11042	• 1"x4" Bolt	2		12	X11042	• 1"x4" Bolt	2	
	X11043	• 1" Lock nut	2			X11043	• 1" Lock nut	2	
• All of the above indented items included in bag # 2					• All of the above indented items included in bag # 2				
	EH4002	25 Ft. vehicle harness	1			EH4002	25 Ft. vehicle harness	1	
	EH4001	3 Ft. pump harness	1			EH4001	3 Ft. pump harness	1	
	E3005	2 Ft. battery cable	1			E3005	2 Ft. battery cable	1	
	E3003WR	• Solenoid	1			E3003WR	• Solenoid	1	
	E3006A	• 1/4"x3/4" Bolt	2			E3006A	• 1/4"x3/4" Bolt	2	
	E3006D	• 1/4" Lock nut	2			E3006D	• 1/4" Lock nut	2	
	E3009	• Dielectric grease	1			E3009	• Dielectric grease	1	
	H2007	• Cable ties	12			H2007	• Cable ties	12	
• All of the above indented items included in bag # 3					• All of the above indented items included in bag # 3				
17	A5002SC03	Left & right 03SC box wing (red/yellow)	1 ea.		17	A5002SC03	Left & right 03SC box wing (red/yellow)	1 ea.	
16	R1000	Rubber cutting edge (11")	2		16	R1000	Rubber cutting edge (11")	2	
14	X11003	• 1/2"x1-3/4" Bolt	8		14	X11003	• 1/2"x1-3/4" Bolt	8	
	X11038	• 1/2" Structural washer	8			X11038	• 1/2" Structural washer	8	
	X11018	• 1/2" Lock nut	8			X11018	• 1/2" Lock nut	8	
15	X11001	• 5/16"x1-1/2" Bolt	8		15	X11001	• 5/16"x1-1/2" Bolt	8	
	X11036	• 5/16" Lock nut	8			X11036	• 5/16" Lock nut	8	
	X11011	• 5/16" Oversized washer	8			X11011	• 5/16" Oversized washer	8	
• All of the above indented items included in bag # 4					• All of the above indented items included in bag # 4				
9	JA001L	15" Jack (standard)	1		9	JA001L	15" Jack (standard)	1	
	JA001S	10" Jack (optional)				JA001S	10" Jack (optional)		

Ref. No. refers to drawing, pg. 2, installation instructions.

Qty. represents no. of parts required for each plow



IMPORTANT:
This manual contains
step-by-step instructions
for proper installation of the SNOWMAN
model SC snowplows.

Please read manual carefully before
assembling plow, and follow
recommendations given.

IF FURTHER ASSISTANCE IS NEEDED,
CALL 888-766-6267.

SNOWMAN MODELS 70+SC, 80+SC INSTALLATION INSTRUCTIONS

Bolts should be finger tight until instructed to tighten. Use standard methods and practices when attaching snowplow.

IMPORTANT: PRIOR TO INSTALLING THE SNOWMAN PLOW ON THE VEHICLE:

- Inspect the existing hitch and frame for cracks and other defects that could weaken the hitch or frame. If cracks or defects are discovered in the hitch, it must be replaced before mounting the Snowman plow. If defects are found in the frame they must be repaired prior to mounting the Snowman plow.
- Check the bolts that were used in mounting the hitch. Snowman recommends using Loctite and lock nuts on grade 8 bolts to assure maximum strength.
- Check the tongue weight rating of the existing hitch to verify that it meets Snowman minimum requirements:
70+SC - class 4, TW rating no less than 750# (or class 5, TW 1000# with extension wings);
80+SC - class 5, TW rating no less than 1000#.

Installing Power Unit/Pump Harness:

1. Apply Neversieze or grease the 2" square extension on the T-hitch mount. This will assure easy on/off when hooking up to or unhooking from the vehicle.
2. Insert the T-hitch mount into the center tube on the hitch and fasten with one 5/8" hitch pin.

3. Standing at the rear of the vehicle, set the power unit on the T-hitch mount, running it lengthwise with the bumper, with the reservoir to the right (passenger side of vehicle), and the motor to the left (driver's side of vehicle).

4. Locate the black (-) cable on the 3 ft. pump harness. Place one 3/8" lock washer on one of the 3/8"x1" bolts provided. Insert the bolt through the eyelet at the end of the cable. Screw the bolt up through one of the mounting holes on the T-hitch mount and into the corresponding hole on the bottom of the power unit.

5. Place the second 3/8" lock washer on the remaining 3/8"x1" bolt. Screw the bolt up through the second mounting hole in the T-hitch mount and into the corresponding hole on the power unit.

IMPORTANT: *Care should be taken to avoid over tightening, which could break the aluminum pump housing.*

6. Locate the red (+) cable on the 3 ft. pump harness. Connect the eyelet at the end of the red cable to the 1/4" post located on the top left side of the power unit motor to supply power to the power unit.

7. Locate the small orange wire at the end of the pump harness. Connect it to the lead off the center lift coil on the pump. Disregard the remaining red and green wires at the end of the harness.

8. Attach two 9/16" boss O-ring swivels to the oil ports on the pump **being careful not to over tighten.**

9. Fill the reservoir 3/4 full (normal operating level) with "Lubriplate Special Pour Hydraulic" (approx. 3 qts). Another oil of equal weight may be substituted for Lubriplate, or whatever is recommended for your front plow will work.

IMPORTANT: *Snowman Snowplow, Inc. recommends "Lubriplate Special Pour Hydraulic" oil. To locate a Lubriplate dealer near you, call 419-691-2491. When ordering, ask for item no. 76757 (four, 1-gallon containers).*

Installing Vehicle Harness:

1. Locate the cable ends of the harness that will connect to the battery and cab remote control. Tape the cables together with electrical tape for easier installation.
2. Beginning at the back of the vehicle, decide on where you want to start installing the harness (i.e. run it through a plug in the bumper, or between the bumper and the vehicle.)
3. Using the cable ends that you taped together as the lead end, run the harness along the vehicle's frame channel from the back of the vehicle to the front, ending up at the battery. Untape the cables.



CAUTION: *Keep cable away from any wear points or heat source.*

4. Run the harness remote cord through an outlet in the firewall of the cab. Look for an outlet underneath the cab and towards the front. If there is no existing outlet, a hole can be drilled through the firewall. **CAUTION: Make sure there are no wires or hidden objects in the area that you will be drilling through.** Connect the remote cord to the remote control in the cab.
5. Run the fused wire to a spare fuse spade in the fuse panel so that it is connected live when the vehicle ignition is on. When the vehicle ignition is turned off, the remote should be dead.

IMPORTANT: *Regular cleaning, re-greasing (using dielectric grease) and sealing of all connections is necessary to maintain correct grounding and amp flow for optimum operating performance of the unit.*

Solenoid Installation:

1. Locate a metal area under the hood of the vehicle on the inside of the fender to mount the solenoid. The location must be within 2 feet of the positive post on the battery.
2. Drill two 5/16" holes at this location.

3. Using the two 1/4"x3/4" bolts and two 1/4" lock nuts, mount the solenoid in a vertical position with the solenoid cap pointing down.
4. Connect one end of the 2 ft. battery cable to the solenoid post located on the side of the solenoid that is pointing towards the front of the vehicle. **DO NOT CONNECT THE CABLE TO THE BATTERY AT THIS TIME.**
5. Connect the ground cable of the 25 ft. vehicle harness cables to the (-) negative post on the battery. Connect the (+) positive (or hot power cable) to the solenoid post located on the side of the solenoid that is pointing towards the rear of the vehicle.
6. Locate the brown wire with a 3/8" eyelet on the end that splits out of the harness, and connect it to the small post on top of the solenoid.
7. Gather up excess vehicle harness cable length and secure it with cable ties at a location away from heat and wear points.
8. Plug the 3 ft. lead from the pump into the vehicle harness at the bumper.

Assembling the Plow:

1. If not preassembled, bolt the carbon steel cutting edge to the moldboard using nine 1/2"x3-1/2" carriage bolts and nine 1/2" lock nuts for the 70+SC, 10 of each for the 80+SC.
2. If not preassembled, bolt the **left** lower arm and the **right** lower arm to the moldboard using two 5/8"x4" bolts, two 5/8" structural washers and two 5/8" lock nuts. **NOTE:** Left and right long lower arms are required for vehicles with beds over 34" in height.

IMPORTANT: *The left lower arm and the right lower arm must be mounted so that the long sides of the spring mounts are pointing towards each other, or the two inner springs will not clear.*

3. Attach the upper arm assembly to the lower arms using four 1/2"x3-1/2" bolts, four 1/2" structural washers and four 1/2" lock nuts.
4. Connect the upper arms to the T-hitch mount with the two 5/8"x4" bolts, two 5/8" structural washers and two 5/8" lock nuts provided. **CAUTION: DO NOT OVERTIGHTEN.** (*Hitch pins may be used instead of the 5/8"x4" bolts if preferred. Snowman does not provide the hitch pins.*)
5. If not preassembled, hook the four springs to the spring mounts located on the lower arms. Hook the other end of the springs to the four 5/8"x6-3/4" eyebolts provided. Thread one nut on each eyebolt. Insert the eyebolts into the four spring mounts located along the top lip of the moldboard. Place a 5/8" structural washer and the second nut on each eyebolt and tighten down.

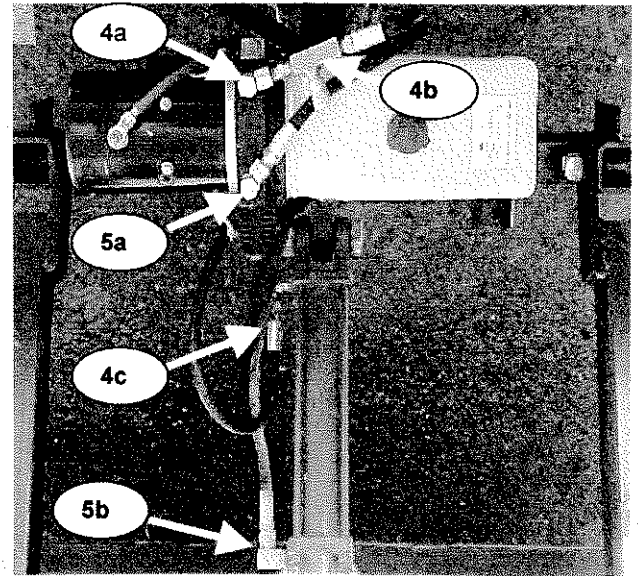
Installing Cylinder and Hoses:



CAUTION: *To avoid possible damage to the cylinder, do not overtighten nuts.*

1. With the adjustable end of the cylinder pointed away from the truck, fasten the front end of the cylinder to the center of the T-hitch mount using one 1"x4" bolt and one 1" lock nut.
2. Place the two 3/8" standard swivel fittings provided, in the oil ports located at each end of the cylinder (outlets facing each other).
3. Pull the adjustable end of the cylinder out and fasten it to the upper arm assembly using one 1"x4" bolt and one 1" lock nut.
4. **REFERRING TO PICTURE:** Connect the nipple end of the flow control to the fitting on the pump that is located closest to the truck (4a). Attach one of the 36" hoses that are provided, to other end of the flow control (4b). Adjust the position of the flow control until it rests flat against the pump reservoir, then run the hose down over the front side of the pump (the side next to the truck) keeping it tight against the reservoir. Pull the hose under the pump and over to the cylinder. Attach the hose

to the fitting located on the front end of the cylinder (4c), the end closest to the truck.



5. **REFERRING TO PICTURE:** Attach the second 36" hose to the other swivel fitting on the pump (5a). Run the hose down over the front side of the pump. Pull the hose under the pump and back to the cylinder. Attach it to the second fitting located on the adjustable end of the cylinder (5b).
6. The hoses will loop out slightly towards the driver's side of the vehicle when the plow is in the lowered position.
7. Place storage/mounting jack horizontally on T-hitch mount and fasten with the 9/16" pin provided. (To preserve the appearance and condition, of the jack you may remove it from the unit when in transit or when the plow is in use.)

System Check-out:

1. Tighten all bolts, hoses and fittings using standard methods and practices.
2. Attach the loose end of the 2 ft. battery cable to the (+) positive post on the truck battery.
3. Check to see that all bystanders are a safe distance from the plow to avoid possible injury.

4. Raise the plow to its maximum height, then lower the plow until the cylinder ram is fully retracted.
5. Check oil level in reservoir. Oil may have to be added as air is removed. Reservoir level should be approximately 1/4 full with the plow raised to its maximum height, and 3/4 full when completely down.
6. Repeat step #4 until all air has been removed. Check oil level in reservoir each time step #4 is repeated.
7. Place the vinyl power unit cover on the power unit beginning at the reservoir end and working it across and down over the motor end.
8. The flow control is adjustable. To speed the plow up, loosen the set screw and turn the knob counter clockwise to attain the desired speed, then re-tighten set screw. To slow the plow down, loosen the set screw and turn the knob clockwise to attain desired speed, then re-tighten set screw.

CORRECT INSTALLATION IS IMPORTANT!

With full 1,450 lbs. of pump pressure applied, the cutting edge of the plow should be at a 90 degree angle with the shop floor. Correct angle is achieved by adjusting the standard lower arms (or long lower arms for trucks with lift kits, or with receiver hitches mounted 22" and above).

Box Wings and Extension Wings:

1. With full down pressure applied to the plow, mount the wings to the moldboard with the eight 1/2"x1-3/4" bolts, eight 1/2" structural washers and eight 1/2" lock nuts provided. *(Same bolts, washers and nuts are used for both styles of wings.)*
2. Attachment of the rubber cutting edge to each wing will require four 5/16"x1-1/2" bolts, four 5/16" oversized washers and four 5/16" lock nuts for each wing. *(Same bolts, washers and nuts are used for both styles of wings.)*
3. Place the rubber cutting edge against the steel wing and use the wing holes for the drilling pattern. Place the oversized washers on the bolts. Use a 5/16" drill bit and an air impact wrench to thread the bolts through the rubber cutting edge.

Note: *The only difference in installation of the box wing and extension wing is the placement of the rubber cutting edge. On the box wing, the rubber cutting edge is mounted to the outside of the steel wing just overlapping the steel cutting edge. On the extension wing, the rubber cutting edge is mounted on the inside of the steel wing just overlapping the steel cutting edge.*

Safety Chain:

1. Drape the safety chain over the lift cylinder.
2. Bring the ends of the chain under the T-mount and hook them in the holes on the hitch (located on each side of the 2" receiver tube.
3. Gather the 2 sides of the chain together under the cylinder and fasten with a cable tie.

VERY IMPORTANT!!!

SWITCH THE REMOTE CONTROL TO "OFF"

(For optional joystick controller)

- When the plow is not in use
- When unhooking from the plow (after plow has been lowered to the ground)
- When plow is in storage

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
Plow will not raise (will not lower) No sound at motor	<ol style="list-style-type: none"> 1) Disconnected harness cable 2) Corroded contacts at harness plug-in 3) Corroded eyelets at pump 4) Corroded eyelets at battery 5) If breaker fuse has been installed, possibly blown breaker 	<ol style="list-style-type: none"> 1) Connect harness plug-in 2) Clean & apply dielectric grease 3) Clean & apply dielectric grease 4) Clean & apply dielectric grease 5) Check for bare or exposed wire & repair, replace fuse
Plow will not raise (will not lower) Solenoid clicks	<ol style="list-style-type: none"> 1) Corroded contacts at harness plug-in 2) Corroded eyelets at pump 3) Corroded eyelets at battery 	<ol style="list-style-type: none"> 1) Take apart, clean & apply dielectric grease 2) Take apart, clean & apply dielectric grease 3) Take apart, clean & apply dielectric grease
Plows descends in jerking motion	<ol style="list-style-type: none"> 1) Incorrect flow control setting 2) Oil weight is too light 3) Air in system 4) Possible internal bypassing in cylinder 	<ol style="list-style-type: none"> 1) Loosen the flow control set screw, adjust the flow until plow operates properly then reset the set screw 2) Replace with Lubriplate Special Pour Hydraulic oil (see pg. 4) 3) Remove air by raising the plow to its maximum height, then lower the plow until the cylinder ram is fully retracted; repeat until all air is removed 4) Replace cylinder
Plow descends too fast or slams down	<ol style="list-style-type: none"> 1) Incorrect flow control setting 2) Oil weight is too light 3) Air in system 	<ol style="list-style-type: none"> 1) Loosen the flow control set screw, adjust the flow until plow operates properly then reset the set screw 2) Replace with Lubriplate Special Pour Hydraulic oil (see pg. 4) 3) Remove air by raising the plow to its maximum height, then lower the plow until the cylinder ram is fully retracted; repeat until all air is removed
Plow lowers and/or raises too slow	<ol style="list-style-type: none"> 1) Incorrect flow control setting 2) Incorrect fluid being used 3) Fitting is restricted 	<ol style="list-style-type: none"> 1) Loosen the flow control set screw, adjust the flow until plow operates properly then reset the set screw 2) Flush & replace with Lubriplate Special Pour Hydraulic oil (see pg. 4) 3) Remove fitting, clean, replace & test; if necessary, repeat until system is flushed clean
Plow will not apply correct down pressure	<ol style="list-style-type: none"> 1) Incorrect flow pressure 	<ol style="list-style-type: none"> 1) Remove the nut cap with a 1-1/16" end wrench. Using a straight screwdriver, turn clockwise for more pressure, counter clockwise for less pressure