



Assembly & Installation Instructions

**FOR
SUBFRAME COMPONENTS PACKAGE 99100346
AND
SUBFRAME NOSE PIECE PACKAGE 96103002**

TO FIT

1997 - LATER FORD RANGER PICKUP 4x4

1997 - LATER MAZDA B-3000 & B-4000 PICKUP 4x4

1995 - LATER FORD EXPLORER 4x4

1997 - LATER MERCURY MOUNTAINEER 4x4



1. **THINK SAFETY, ALWAYS WEAR SAFETY GLASSES WHEN PERFORMING THE OPERATIONS PRESCRIBED IN THESE INSTRUCTIONS**
2. **READ ALL INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING INSTALLATION**
3. **BEFORE BEGINNING WORK MAKE SURE TO SET PARKING BRAKE AND CHOCK WHEELS**



MINIMUM VEHICLE RECOMMENDATIONS

Heavy Duty Alternator Heavy Duty Battery
Heavy Duty Front Torsion Bars

NOTE: On some vehicles it may be necessary to use a form of load booster to decrease the vehicle's front suspension sag with the snow plow in place. This can be accomplished with the use of supplementary air bags, booster springs, or similar load boosting devices. Since there are different load boosting devices available, it will up to the customer/end user to decide and purchase the product to suit the application, and not the responsibility of Sno-Way International, Inc.

ASSEMBLY TOOLS NEEDED

Drill Bits	1/4", 17/32", 21/32", 25/32"
Impact Sockets	7/16" – 1-3/8"
Metric Sockets	10 - 17 mm
Wrenches	7/16" – 1-3/8"
Torque Wrench	
Alignment Pry Bar	
Center Punch and Hammer	
Hacksaw	
Clamping Device ("C" Clamp, Bar Clamp, type device...)	

INSTALLATION NOTES

1. **Unless otherwise specified, mount all Sub-Frame Components to vehicle before tightening any hardware.**
2. **It is recommended that LOCTITE®, or similar thread locking product, be used on ALL mounting hardware (i.e. Nuts, Cap Screws, Bolts, etc.).**
3. Vehicle should be parked on a level surface with a normal vehicle load on the FRONT suspension.
4. Items in parentheses () refer to quantity required for this step. Items in parentheses with a pound sign (#) indicate the part number as found in the parts list on the last page of this document. Example: (2) 5/8" x 1-1/2" Cap Screws (#11).
5. It may be necessary to relocate license plate holder. Check state and local laws for placement, if needed.

MOUNTING INSTRUCTIONS

1. Remove front bumper and air dam from vehicle, retain with hardware for reinstallation in a later step.



WARNING

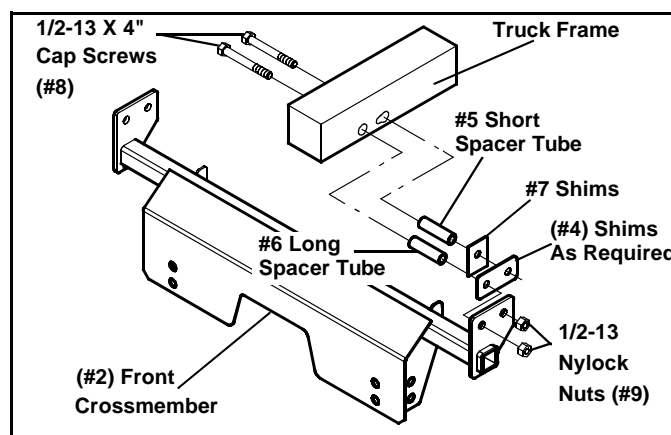
Beware of brake and fuel lines secured to inside wall of frame rails when drilling holes in vehicle frame!

FAILURE TO HEED CAN RESULT IN SERIOUS INJURY OR DEATH.

2. Place Front Crossmember (#2) under the front of the vehicle frame, and raise it to align the rear holes in the Front Crossmember with the rear of the slot in the outside of the vehicle frame. Using the front hole in the Front Crossmember as a template, mark the vehicle frame, and then drill a 1/4" pilot hole through the frame on each side of the vehicle.
3. Drill a 17/32" diameter hole through the frame. Following this, **drill through only the outside of the frame** a 25/32" diameter hole and also drill out the rear of the existing slot in the frame to 25/32" **on the outside of the frame only.**
4. From the inside of the frame rails, insert (4) 1/2-13 x 4" Cap Screws (#8). From the outside of the frame rails, place (2) of the shorter Spacer Tubes (#5) over the Cap Screws through the rear holes (frame slots).

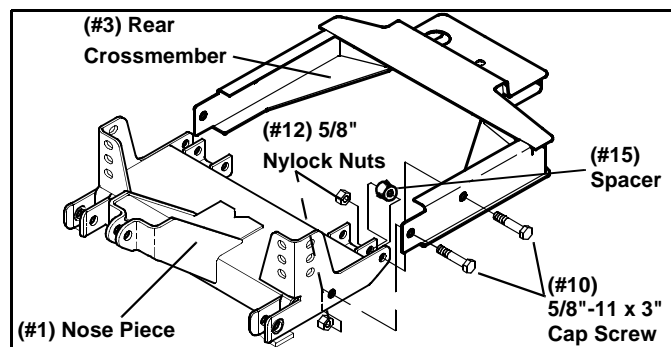
Place the (2) longer Spacer Tubes (#6) over the Cap Screws through the remaining holes drilled in the vehicle frame.

5. Raise the Front Crossmember into position. Place one of the 1/8" Shim Plates (#7) on each side between the rear hole of the Crossmember and the vehicle frame. Insert the 1/2-13 x 4" Cap Screws through the sides of the Front Crossmember plates and fasten with (4) 1/2-13 Nylock Nuts (#9).



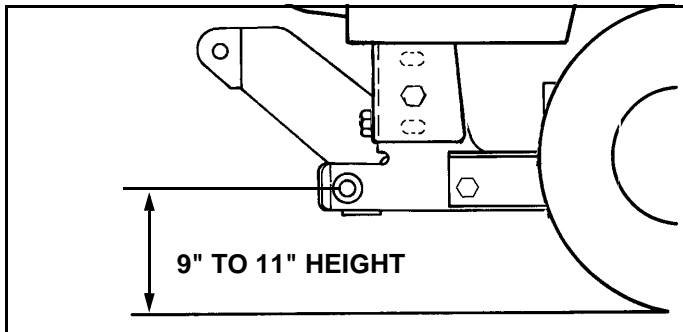
NOTE: Use Shims (#4) as needed between the Front Crossmember and the vehicle frame. If two shims are used, place on either side of the vehicle.

6. Attach Rear Crossmember (#3) to Subframe Nose Piece (#1) by placing Rear Crossmember over Nose Piece and aligning the holes at the front of the Rear Crossmember, and the holes at the rear of the Nose Piece.



7. From the outside, place (4) 5/8-11 x 3" Cap Screws (#10) in the front and rear holes. Insert the rear Cap Screws (#10) through Spacer (#15) on each side between the outer ear and the U-shaped bracket at the rear of the Nose Piece. Secure with (4) 5/8" Nylock Nuts (#12). Using the "Torque Specification Chart", secure in place.
8. Mount the Nose Piece Assembly to the Front Crossmember using the 9" to 11" ground clearance as a guide. Loosely install (4) 5/8-11 x 1-1/2" Cap Screws (#11) and (4) 5/8" Nylock Nuts (#10). (**DO NOT secure in place at this time**)

IMPORTANT: Height from the center of the lower Plow Mounting holes on the Sub-Frame Nose Piece to the ground should be between 9" and 11" to insure proper operation of the Snow Plow!



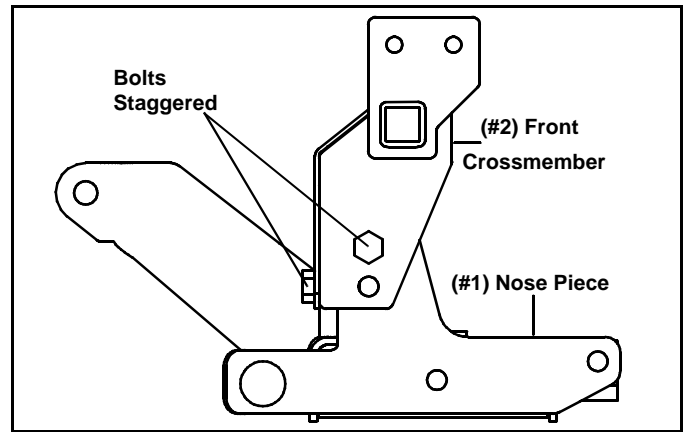
WARNING

Beware of brake and fuel lines secured to inside wall of frame rails when drilling holes in vehicle frame!

FAILURE TO HEED CAN RESULT IN SERIOUS INJURY OR DEATH.

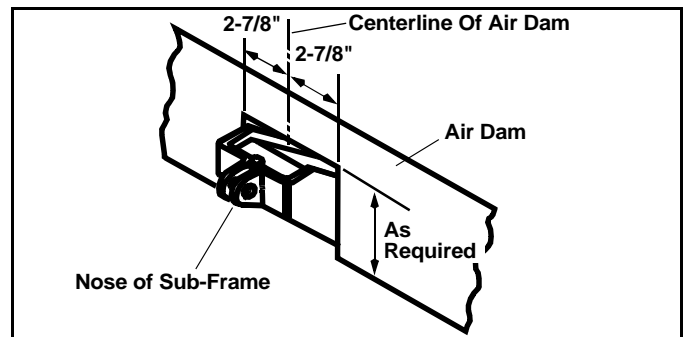
9. Clamp the Rear Crossmember to the Vehicle Front Crossmember to hold it in place. Using the holes in the Rear Crossmember (#3) as a template, center punch where holes need to be drilled. The small hole in the underside of the Rear Crossmember should align with an existing hole in the vehicle frame. If this hole does not exist, follow the remaining instructions in this step, but drill a 21/32" hole instead through the underside of the vehicle frame crossmember. Remove the loosely installed hardware and lower the Nosepiece-Rear Crossmember Assembly from the Front Crossmember. Drill 1/4" pilot holes, and then using the pilot holes as a guide drill 17/32" holes through the wall of the Vehicle Front Crossmember.
10. Using the access holes on the underside of the Vehicle Front Crossmember, on the inside of the Vehicle Front Crossmember insert (2) 1/2-13 x 1-1/2" Cap Screws (#13) through the previously drilled holes in the vehicle wall and secure in place using (2) 1/2" Nylock Nuts (#9). Insert (1) 5/8-11 x 1-1/2" Cap Screw (#11) through the underside hole and attach with (1) 5/8" Nylock Nut (#12) inserted through the access hole. Using the "Torque Specification Chart" secure in place.

IMPORTANT: The Cap Screws securing the Sub-Frame Nose Piece and Front Crossmember must be staggered with the front set of bolts being positioned in a lower set of holes than the side bolts.



11. From the outside insert (4) 5/8-11 x 1-1/2" Cap Screws (#11) through holes in the front and side holes of the Front Cross-member. Secure the Front Crossmember and Nose Piece Assembly together, using (4) 5/8" Flat Washers (#14) and (4) 5/8" Nylock Nuts (#12). Using the "Torque Specification Chart" secure in place.
12. Using the "Torque Specification Chart" below, starting at the rear and working forward, torque all hardware (i.e. Nuts, Bolts, etc...).
13. Reinstall Front Bumper on to vehicle.

NOTE: Front air dam can be modified to clear Sub-Frame by cutting dam to allow clearance for nose of Sub-Frame. Cut air dam as shown and remove cut section or fold back for when nose piece is removed.



REMEMBER After 5 to 10 hours of Snow Plow usage, re-torque all hardware (i.e. Nuts, Bolts, etc...).

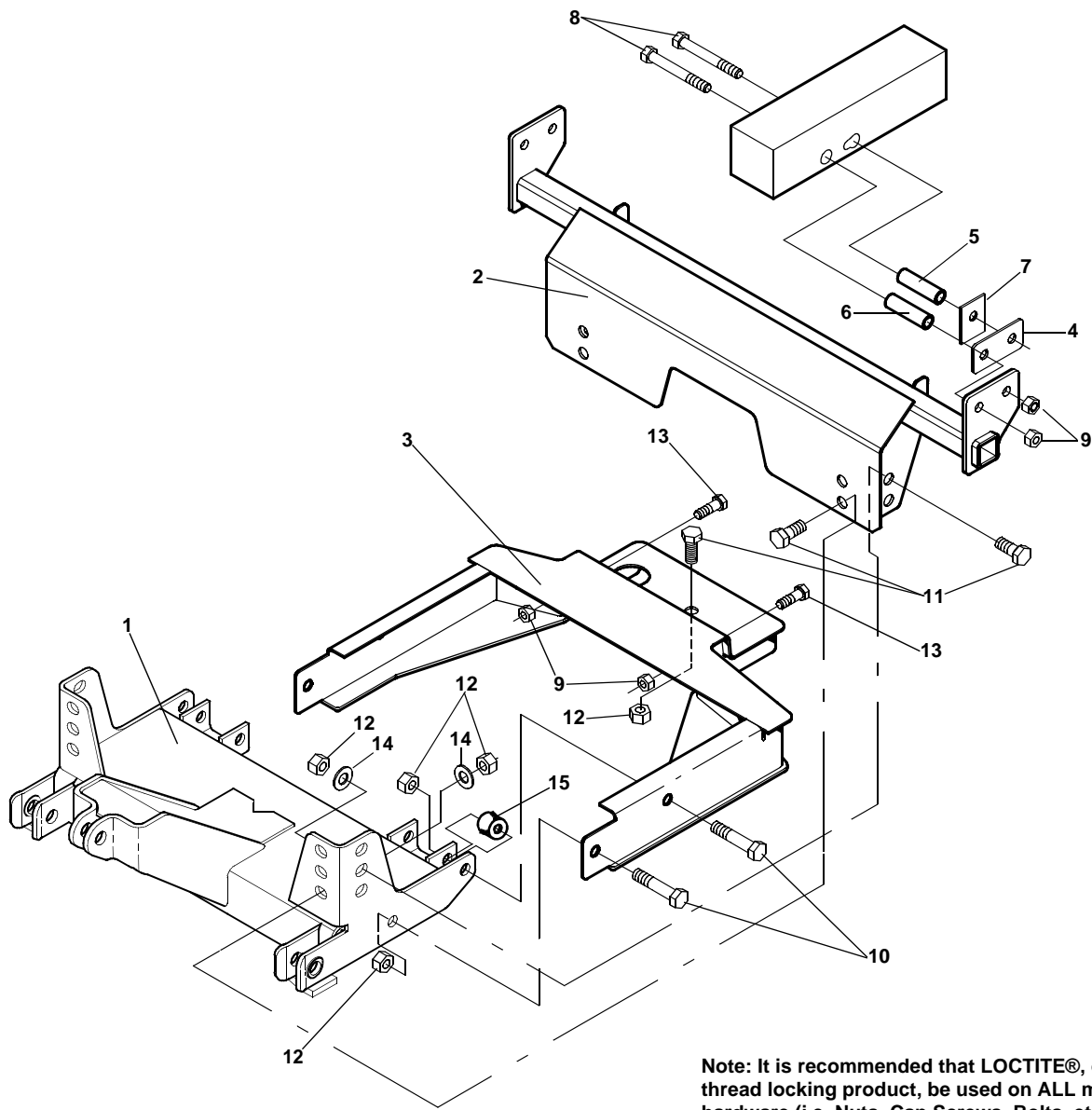
TORQUE SPECIFICATIONS FOR STANDARD MACHINE HARDWARE

Bolt Size	GR.2 Dry	GR.5 Dry	GR.8 Dry	Metric Size	GR.8.8 Dry
1/4"	66*	9	12	M8	17
5/16"	11	17	25	M10	35
3/8"	20	30	45	M12	60
7/16"	32	50	70	M14	95
1/2"	50	75	110	M16	155
9/16"	70	110	150		
5/8"	100	150	220		
3/4"	175	260	380		
7/8"	170	430	600		
1"	250	640	900		

Note: These torque values are to be used for all hardware. Unless otherwise specified, all torque values must meet this specification.

Note: All torque values are in Ft.-Lbs unless otherwise stated

Note: *In-Lbs



Note: It is recommended that LOCTITE®, or similar thread locking product, be used on ALL mounting hardware (i.e. Nuts, Cap Screws, Bolts, etc.).

ITEM	PART NO.	DESCRIPTION	QTY.
1	96103002	Sub-Frame, Nose Piece (96102896)	1
2	96103172	Crossmember, Front	1
3	96103184	Crossmember, Rear	1
4	96103263	Plate, Shim 1/8"	2
5	96103171	Tube, Frame Support	2
6	96103282	Tube, Frame Support	2
7	96103283	Plate, Shim.....	2
8	98009195	Hex Head Cap Screw, 1/2"-13 X 4".....	4
9	98009013	Hex Nut, Nylock, 1/2"-13.....	6
10	98009217	Hex Head Cap Screw, 5/8"-11 X 3".....	4
11	98009115	Hex Head Cap Screw, 5/8"-11 X 1-1/2"	5
12	98009038	Hex Nut, Nylock, 5/8"-11.....	9
13	98009010	Hex Head Cap Screw, 1/2"-13 X 1-1/2"	2
14	98009039	Flat Washer, 5/8".....	4
15	96001656	Spacer	2

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