



# **Assembly & Installation Instructions**

**FOR  
SUBFRAME COMPONENTS PACKAGE 99100031  
AND  
SUBFRAME NOSE PIECE PACKAGE 96103002**

**TO FIT**

**1994 - LATER DODGE RAM, BR1500, BR2500, BR3500 4x4**

**1994 - LATER DODGE RAM, BR2500HD, BR3500 4x2**

**(SINGLE & DUAL REAR WHEELS)**

**1994 - LATER DODGE RAM, BR3500 CHASSIS CAB 4x2**

**(SINGLE & DUAL REAR WHEELS)**



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( 4X2 Only)  
 Heavy Duty Battery (4X2 Only)  
 Air-Adjustable Suspension Kit (4X2 Only)  
 Manufacturers Snowplow Package (4X4 Only)

*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" - 1/2", 21/32" & 1" |
| Impact Sockets                             | 7/16" – 1-3/8", 18mm     |
| Wrenches                                   | 7/16" – 1-3/8", 18mm     |
| Torque Wrench                              |                          |
| Center Punch and Hammer                    |                          |
| Clamping Device ("C", Bar, type device...) |                          |
| Rat Tail Pry Bar                           |                          |
| Hacksaw                                    |                          |
| Torx Bits                                  | VT25, VT27               |

### 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 11 x 1-1/2" Cap Screws (#24).
5. It maybe necessary to relocate license plate holder. Check state and local laws for placement, if needed.

### MOUNTING INSTRUCTIONS

*NOTE: The air dam on Ram Sport vehicles may need to be cut. Consult with the customer about this. See air dam cutting diagram after Step 11.*

1. If vehicle is equipped with lower valance panel, the corners may need to be removed. If so, measure 1/2" ahead of rear face of vehicle front cross member, and scribe a line across panel to a point 2-3/4" inside of inner side of frame rail. Cut off previously marked corners of lower valance panel.

*NOTE: The procedure in Step 2 will allow the subframe to be installed without removing the front bumper.*

2. On one side remove the two front bumper bolts and the stud plate from the bumper. In the top front hole insert a 1/2" bolt (not supplied) and tighten securely with a standard nut. One of the existing vehicle bumper bolts will replace this 1/2" bolts after the subframe is installed. Repeat this procedure for the other side.
3. Measure the Mounting Bracket (#2) with the vehicle frame to determine if shims are needed.

*NOTE: If the Mounting Bracket (#2) is:*

- less than 1/8" wider than the frame no shims are needed;
- more than 1/8", but less than 1/4" wider than the frame, then align (1) Shim (#9) with the front hole and (1) Shim (#10) with the back holes between the vehicle frame and the side of the Mounting Bracket.
- over 1/4" wider than frame, install a second pair of Shims (#9) and (#10) on the other side between the vehicle frame and the side of the Mounting Bracket.

If shims are used, and once they are properly aligned with the holes in the mounting bracket, a light tack weld or similar method can be used to keep them aligned during the installation process.

*NOTE: A change in the vehicle front crossmember was made to some models during the 1997 model year. It will be necessary to determine which set of mounting instructions to follow for vehicles manufactured in 1997.*

**For Early 1997 And Prior Vehicles:**

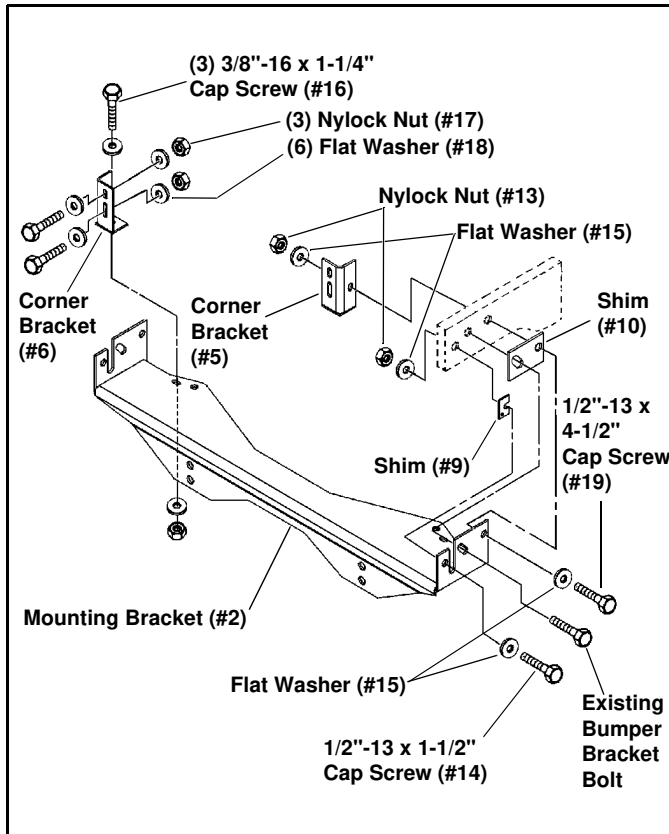


Figure 1

- 4A. Attach Mounting Bracket (#2) and bumper support brackets, previously removed, with (2) 1/2" x 1-1/2" Cap Screws (#14), (4) Flat Washers (#15), and (2) Nylock Nuts (#13) provided. Flat washers are used on both the bolt and nut side. Through the middle holes on the side of the mounting bracket, use previously removed bumper bracket bolts to attach. (See Figure 1.)
- 4B. Install Corner Supports (#5LH and #6RH) behind the vehicle crossmember and inside the frame side rail on top of the mounting bracket.
- 4C. Attach Corner Support to vehicle crossmember with (2) 3/8" x 1-1/4" Cap Screws (#16), (4) Flat Washers (#18), and (2) Nylock Nuts (#17). Attach Corner Support to vehicle side rail and Mounting Bracket with (1) 1/2" x 4-1/2" Cap Screw (#19), (2) Flat Washers (#15) and (1) Nylock Nut (#13). Fasten Corner Supports to Mounting Bracket with (1) 3/8" x 1-1/4" Cap Screws (#16), (2) Flat Washers (#18), and (1) Nylock Nuts (#17). Flat Washers are used on both the bolt and nut side.
- 4D. Repeat Step 4C for the other Corner Support.
- 4E. At this point all hardware used in steps 4A - 4D may be tightened to their final torque. Refer to Torque Specification Table.

**For Later 1997 And Newer Vehicles:**

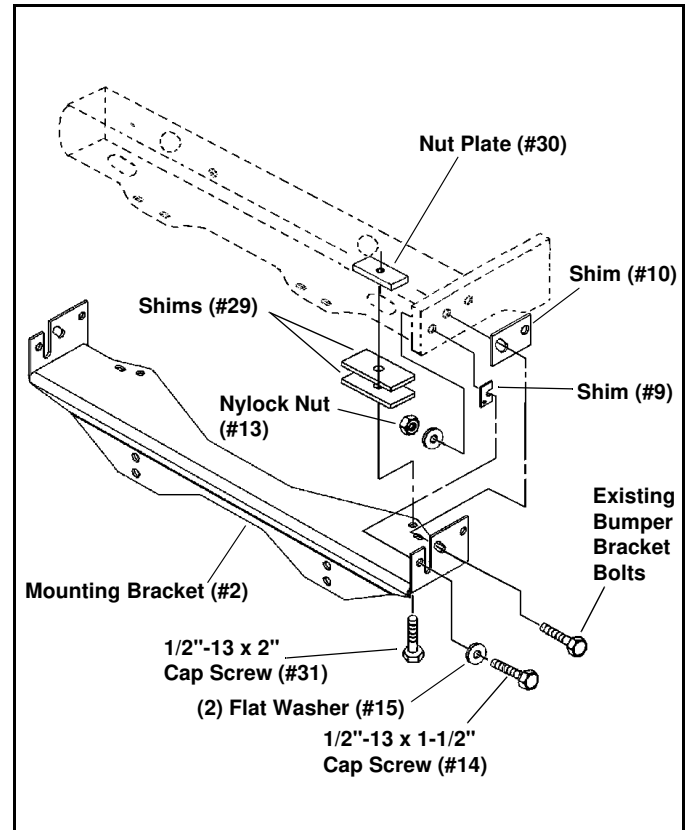


Figure 2

- 4A. Using the large holes in the rear of the vehicle crossmember, insert (2) Nut Plates (#30), and align with large slots on bottom side of vehicle crossmember. To close gap between Mounting Bracket (#2) and vehicle crossmember, install Shims (#29) between the Mounting Bracket and vehicle crossmember, with an equal number of Shims (#29) on both sides. Secure Mounting Bracket, Shims, and Nut Plates to vehicle front crossmember with (2) 1/2" x 2" Cap Screws (#31) (See Figure 2).
- 4B. Attach Mounting Bracket (#2) and bumper support brackets, previously removed, with (1) 1/2" x 1-1/2" Cap Screws (#14), (2) Flat Washers (#15), and (1) Nylock Nuts (#13) provided. Flat Washers are used on both the bolt and nut side. Use previously removed bumper bracket bolts in the remaining holes in each bumper support bracket.
- 4C. Repeat Step 4B for the other side.
- 4D. At this point all hardware used in steps 4A - 4C may be tightened to their final torque. Refer to Torque Specification Table.

**All Vehicles:**

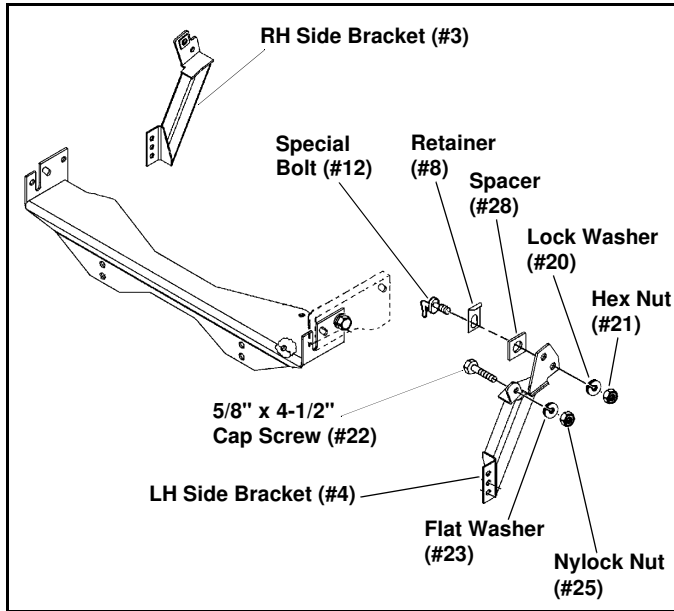


Figure 3

**NOTE:** The following vehicles will require a Spacer (#28) between the rear holes of the Left Hand and Right Hand Side Brackets and the vehicle frame:

- Vehicles of less than 8800# GVWR.
- Vehicles of 8800# GVWR or greater manufactured before April 1996.
- 4x2 Vehicles.

5. Position the RH Side Bracket (#3) to check mounting alignment. (See Step 6 if holes need to be drilled). Fasten the RH Side Bracket (#3), to vehicle frame with (1) Special Bolt (#12). Insert hook end of Special Bolt in 1" hole in outside of vehicle frame rail. Use (1) Retainer (#8) to hold Special Bolt in place when Side Bracket is installed, and to prevent Special Bolt from falling into frame during Side Bracket installation. Use (1) 3/4" Lock Washer (#20), and (1) Plain Nut (#21) to secure Special Bolt to Side Bracket. Secure the front of the Side Bracket to vehicle frame rail with (1) 5/8" x 4-1/2" Cap Screw (#22), (1) Flat Washer (#23) and Nylock Nut (#25). (See Figure 3.)

6. Position the LH Side Bracket (#4) to align the mounting holes.

- **Front Holes:** An existing hole for a 5/8" Cap Screw will be present. On some vehicles the power steering pump mounting bolt can be used. On other vehicles a small existing hole will be present. If this occurs, use the hole in the bracket as a template to drill out the hole in the vehicle frame to 21/32". (See Figure 4.)
- **Rear Holes:** One of the two rear holes should align with a 1" hole in the vehicle frame rail. On some models there is no 1" hole to accommodate the special bolt (#12). Then use the Side Bracket as a template to drill a 1" hole in the vehicle frame.

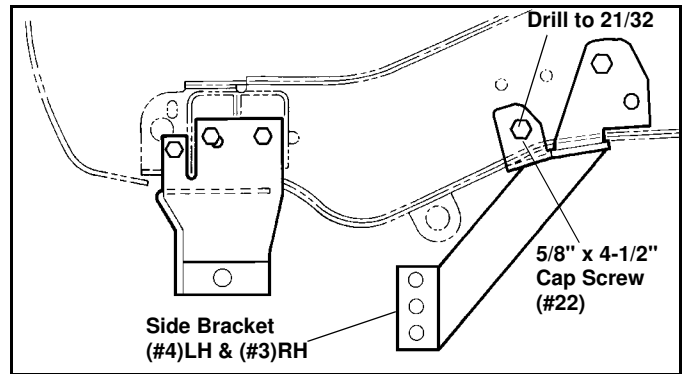


Figure 4

7. Secure the LH Side Bracket (#4) to the vehicle frame with (1) Special Bolt (#12). Insert hook end of the Special Bolt in the 1" hole in the outside of the vehicle frame rail. Use (1) Retainer (#8) to hold the Special Bolt in place and prevent the Special Bolt from falling into the frame during installation. Use (1) 3/4" Lock Washer (#20) and (1) Hex Nut (#21) to secure Special Bolt to the Side Bracket. Secure the front hole with (1) 5/8" x 4-1/2" Cap Screw (#22), (1) Flat Washer (#23) and Nylock Nut (#25). (See Figure 3.)

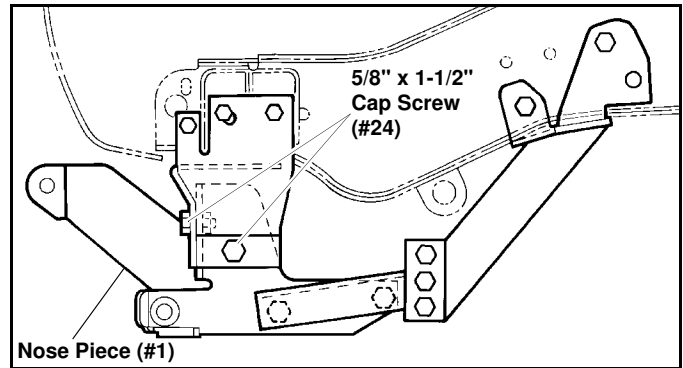


Figure 5

**IMPORTANT:** The Cap Screws securing the Sub-Frame to the Front Crossmember must be staggered with the front bolts being positioned in a lower set of holes than the side bolts. (Unless the holes are in the lowest possible position) (See Figure 5.)

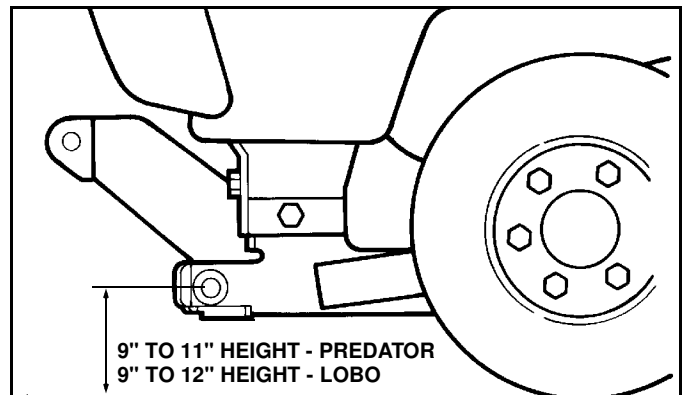


Figure 6

**IMPORTANT: Height from the center of the lower Flow Mounting holes on the Sub-Frame to the ground should be between 9" and 11" for Predator Plows, and between 9" and 12" for LOBO Plows to insure proper operation.**

*NOTE: (4x2 Only) If height is less than 9" an air-adjustable suspension kit or other lift accessory **must** be installed to increase the height to the specifications shown.*

*NOTE: Be sure to keep Subframe parallel to ground when performing steps (#8.) through (#10.).*

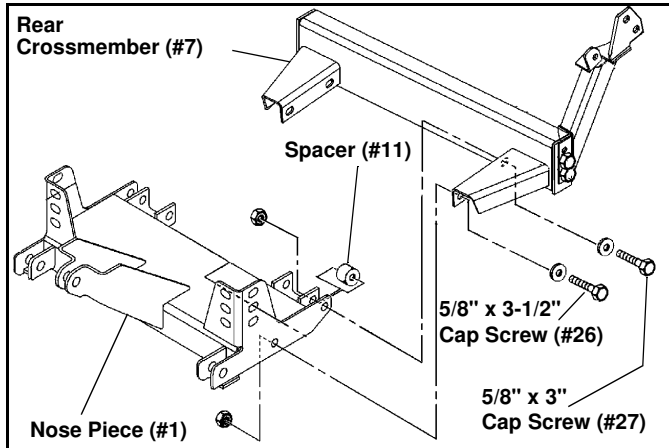
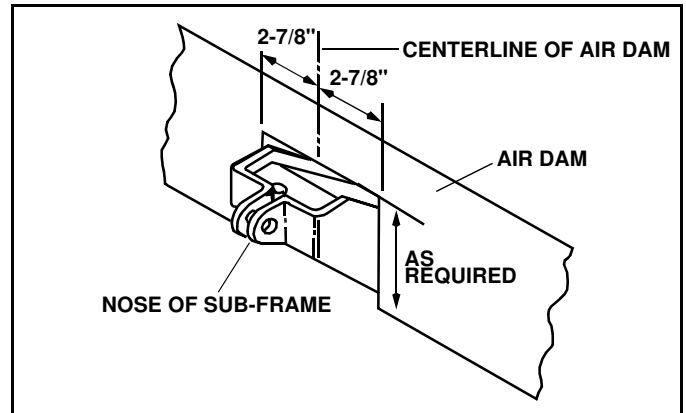


Figure 7

8. Fasten Rear Crossmember (#7) to Sub-Frame with (2) 5/8" x 3-1/2" Cap Screws (#26), through tube welded into the lower center portion of the Sub-Frame, and the front slotted hole in the Rear Crossmember - secure with (2) Flat Washer (#23) and (2) Nylock Nut (#25) provided. Install (2) 5/8" x 3" Cap Screws (#27) through holes in ears at lower rear of Mounting Brackets and through rear slotted holes in Crossmember. Use (1) Spacer (#11) between each ear of the Mounting Brackets. Secure with (2) Flat Washers (#23) and (2) Nylock Nuts (#25). (See Figure 7.)
9. Secure Rear Crossmember to Side Brackets with (2) 5/8" x 1-1/2" Cap Screws (#24), (2) Flat Washer (#23) and (2) Nylock Nut (#25) per Side Bracket.
10. After all components have been installed tighten hardware in the following order to specifications found in the following Torque Specification Chart.
  - A. Tighten the bolts attaching both Side Brackets (#3 & #4) to the vehicle frame.
  - B. To secure the bolts attaching the Nose Piece (#1) to the Mounting Bracket (#2); first tighten the bolts in the front of the Nose Piece and then tighten those on the side.
  - C. Tighten the bolts attaching the Rear Crossmember (#7) to the Nose Piece (#1).
  - D. Tighten the bolts attaching the Side Brackets (#3 & #4) to the Rear Crossmember (#7).

11. Replace the 1/2" bolts installed in Step 2 with the existing bumper bolts. Tighten to the manufacturers specification.



*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.*

**TORQUE SPECIFICATIONS FOR STANDARD MACHINE HARDWARE**

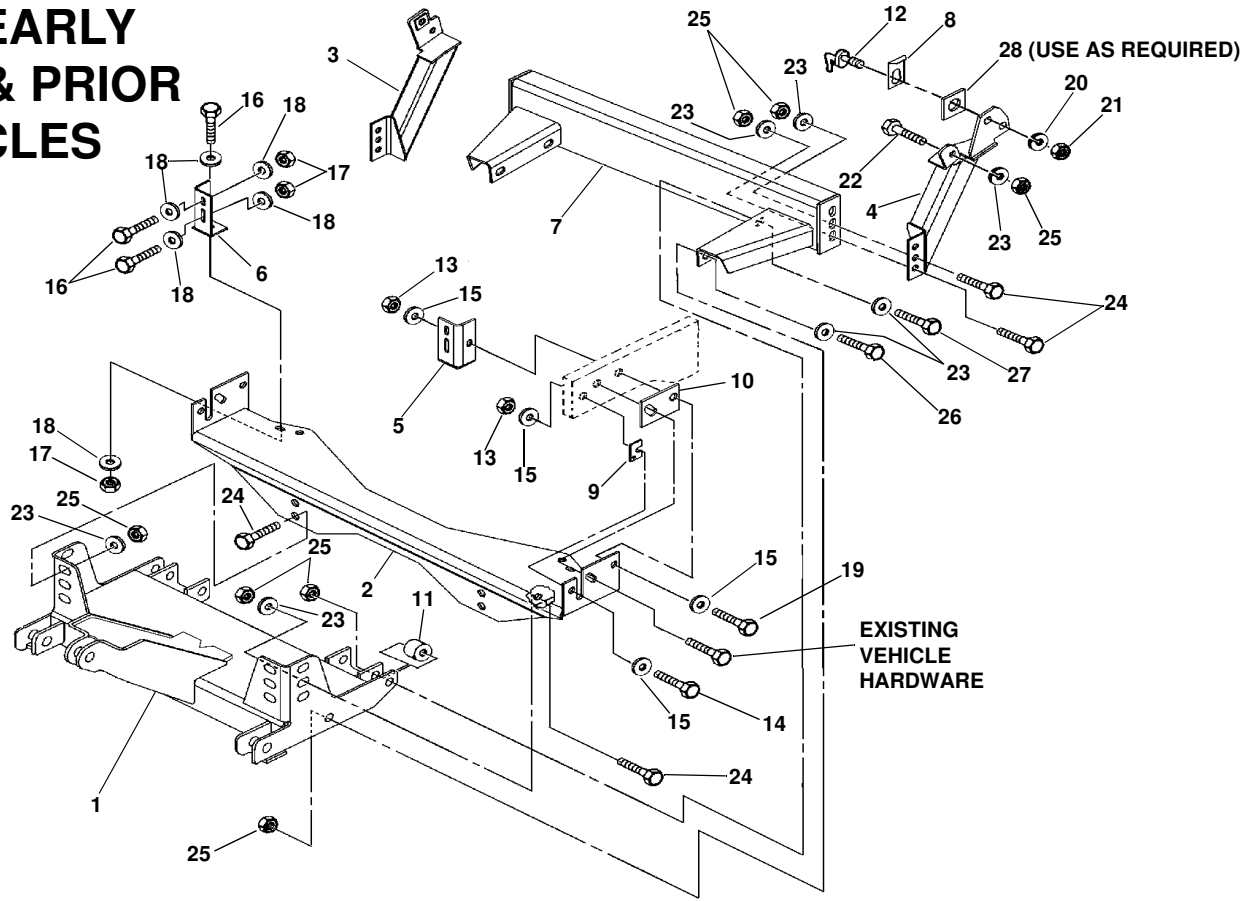
| Bolt Size | GR.2 Dry | GR.5 Dry | GR.8 Dry | Metric Size | GR.8.8 Dry |
|-----------|----------|----------|----------|-------------|------------|
| 1/4"      | 66*      | 9        | 12       | M8          | 17         |
| 5/16"     | 11       | 17       | 25       | M10         | 35         |
| 3/8"      | 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

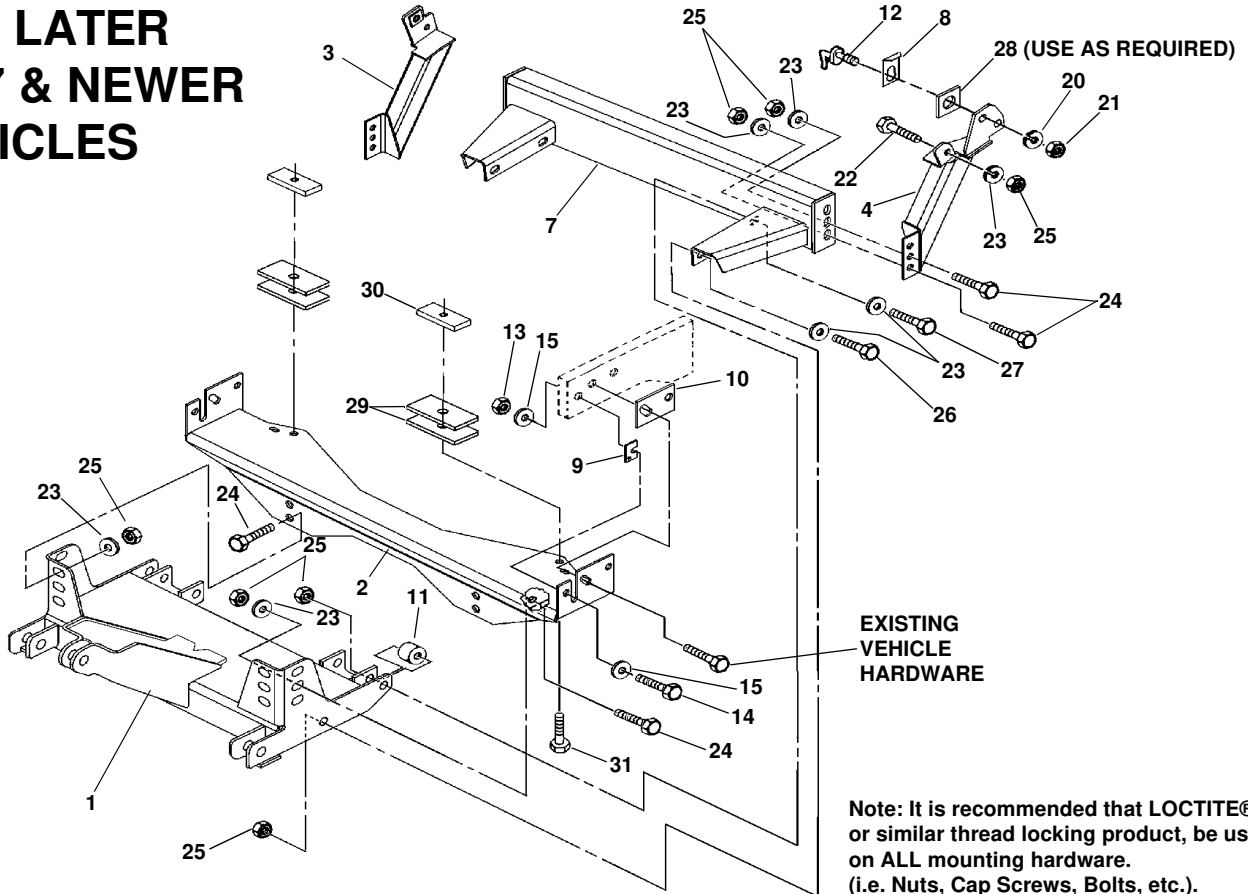
**REMEMBER After 5 to 10 hours of snowplow usage, re-torque all Cap Screws!**

# PARTS LIST

## FOR EARLY 1997 & PRIOR VEHICLES



## FOR LATER 1997 & NEWER VEHICLES



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

# USING THIS PARTS LIST

Below is parts listing with four columns. The first column is the "ITEM", the second is the "PART NUMBER", The third is the "DESCRIPTION" and the fourth is the "QUANTITY".

The "**ITEM**" is the number used in the corresponding illustration.

The "**PART NO.**" is the number used to order replacement parts. If a number does not appear in the column the part is only available by ordering the complete assembly.

The "**DESCRIPTION**" is the name of the replacement part. At times the name may be indented, this means that the indented parts are part of the preceding assembly.

The "**QTY.**" is the quantity needed to service the assembly illustrated, not the complete product.

## PARTS LIST

| ITEM | PART NO. | DESCRIPTION                                    | QTY. |
|------|----------|--|------|
| 1    | 96103002 | Sub-Frame, Nose Piece (96102896).....          | 1    |
| 2    | 96001657 | Bracket, Mounting, .....                       | 1    |
| 3    | 96001633 | Bracket, Side, RH.....                         | 1    |
| 4    | 96104084 | Bracket, Side, LH .....                        | 1    |
| 5    | 96001655 | Support, Corner LH.....                        | 1    |
| 6    | 96001661 | Support, Corner RH .....                       | 1    |
| 7    | 96100650 | Crossmember, Rear .....                        | 1    |
| 8    | 96001642 | Retainer, Special .....                        | 2    |
| 9    | 96001644 | Shim .....                                     | 2    |
| 10   | 96001645 | Shim .....                                     | 2    |
| 11   | 96001656 | Spacer.....                                    | 2    |
| 12   | 96100623 | Bolt, Special .....                            | 2    |
| 13   | 98009013 | Nut, Hex, 1/2"-13 NC Nylock .....              | 6    |
| 14   | 98009216 | Cap Screw, Hex Head, 1/2"-13 NC x 1-1/2" ..... | 4    |
| 15   | 98009011 | Washer, Flat, 1/2" .....                       | 8    |
| 16   | 98009034 | Cap Screw, Hex Head, 3/8"-16 NC x 1-1/4" ..... | 6    |
| 17   | 98009009 | Nut, Hex, 3/8" - 16 NC Nylock.....             | 6    |
| 18   | 98009032 | Washer, Flat, 3/8" .....                       | 12   |
| 19   | 98009055 | Cap Screw, Hex Head, 1/2"-13 NC x 4-1/2" ..... | 2    |
| 20   | 98009002 | Washer, Lock, 3/4" .....                       | 2    |
| 21   | 98009075 | Nut, Hex, 3/4"-10 NC .....                     | 2    |
| 22   | 98009111 | Cap Screw, Hex Head, 5/8"-11 NC x 4-1/2" ..... | 2    |
| 23   | 98009039 | Washer, Flat, 5/8" .....                       | 14   |
| 24   | 98009115 | Cap Screw, Hex Head, 5/8"-11 NC x 1-1/2" ..... | 8    |
| 25   | 98009038 | Nut, Hex, 5/8" - 11 NC Nylock, .....           | 14   |
| 26   | 98009042 | Cap Screw, Hex Head, 5/8"-11 NC x 3-1/2" ..... | 2    |
| 27   | 98009217 | Cap Screw, Hex Head, 5/8"-11 NC x 3" .....     | 2    |
| 28   | 96102702 | Spacer.....                                    | 2    |
| 29   | 96103092 | Shim .....                                     | 4    |
| 30   | 96103094 | Plate, Nut .....                               | 2    |
| 31   | 98100010 | Cap Screw, 1/2"-13 NC x 2" .....               | 2    |



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