Group Index, Alphabetical

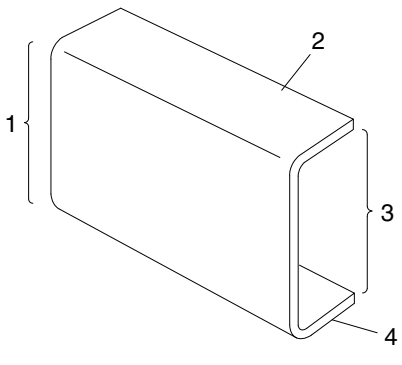
Contents

General Description

IMPORTANT: This workshop manual *does not cover* the procedures and calculations necessary to do frame modifications. Before doing any modification to the frame rails, consult with the Freightliner Engineering Department.

The main body of the frame consists of two frame rails connected by a series of crossmembers. The frame supports the rest of the chassis and body.

The frame rails are made of steel, and both have identical specifications. Each rail has an upper flange, lower flange, and web (the surface area between the flanges). The inside area of the frame rail is called the channel. See **Fig. 1**.



1. Web
2. Upper Flange
3. Channel
4. Lower Flange

Fig. 1, Frame Terminology

The crossmembers control axial rotation and longitudinal motion of the rails, and reduce torsional stress transmitted from one rail to the other. Crossmembers are also used for vehicle component mounting, and protecting the wires and tubing that are routed from one side of the vehicle to the other.

Follow the guidelines in this section when servicing the frame.

Frame Stations

A frame station is a reference point on the frame rail from which the location of each component (mounted on the frame rail) is measured.

There is no identifying mark for station zero (usually written as 0.00"). It is located at a given reference point to the rear of the most forward edge of the frame rail.

The vehicle's frame drilling chart lists the location of each frame rail component. For example: if a component is given a location of 2500, then that component is installed on the frame rail 98-7/16 inches (2500 mm) aft of station zero.

Handling

Whenever the frame rails are lifted or moved, take care to avoid anything that may scratch, cut, or damage the exposed frame assembly. Cushion all chain hoists or cable slings with a section of heavy hose. If the frame rail is raised with a jack, place a block of wood between the jack and the frame rail.

Never heat the frame rails for straightening purposes. Such work should be done cold, as the frame rails have been heat-treated.

⚠ CAUTION

Heating the frame rail for straightening purposes will reduce the strength of the rail in localized areas, which can result in structural failure of the frame rail.

Use pencil lines or soapstone marking for any work that requires marking of the frame rail. High visibility can be obtained by first chalking the surface of the frame rail, then making the pencil marks.

Repairing Cracks

IMPORTANT: Daimler Trucks North America LLC recommends that cracked or damaged frame rails be replaced. In some cases it may be necessary to repair minor damage; before attempting any repairs, contact your regional service representative for approval.

⚠ CAUTION

Before performing any electric welding on a vehicle, read and understand the welding precautions in Subject 110. Disconnect the battery power and ground cables and any electronic control units (ECUs) installed on the vehicle. Electric currents produced during electric welding can damage various electrical components on the vehicle, such as alternator diodes and ECUs.

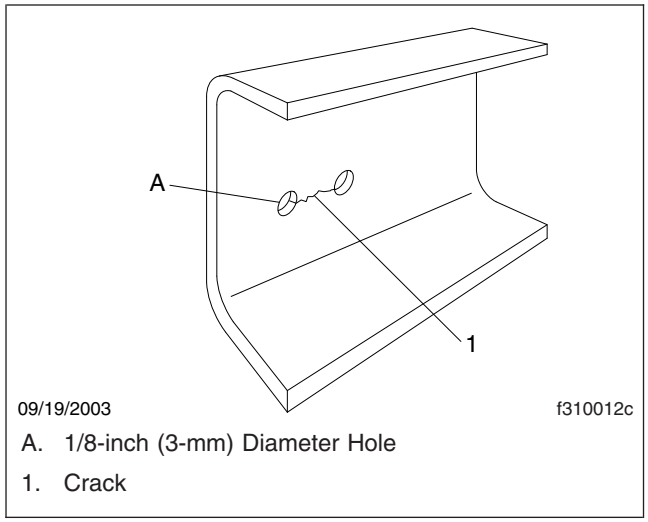
Freightliner Trucks vehicle components that typically use ECUs include electronic engine, electronic automatic transmission, and ABS (antilock braking system).

For any ECU with a battery power harness, disconnect its ground terminal from the chassis ground, and disconnect its power terminal from the battery positive post, or disconnect the main connection at the ECU.

1. Drill a 1/8-inch (3-mm) diameter hole at each end of the crack to prevent further spreading of the crack. See Fig. 1.
2. Grind a V-groove to a depth of two-thirds of the stock thickness. See Fig. 2.

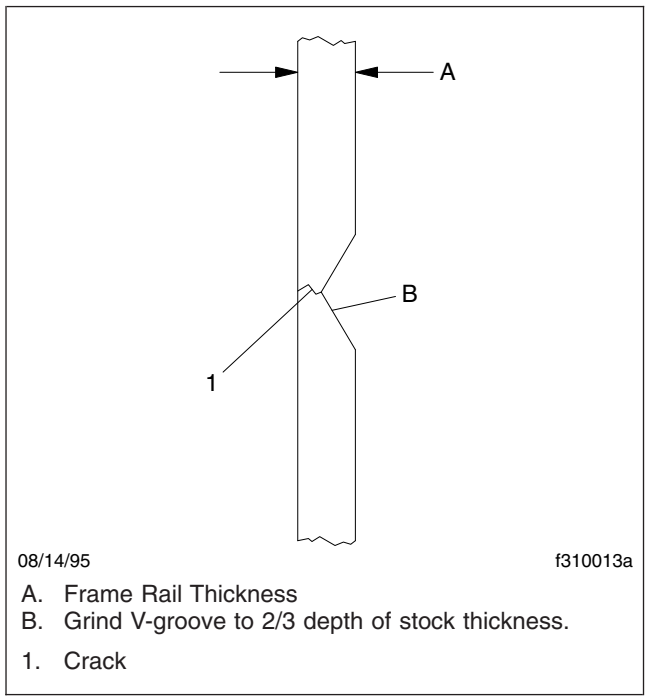
NOTE: If it will not be possible to grind both sides of the frame rail, then grind the V-groove on one side to the full depth of the stock thickness. See Fig. 3.

3. Clamp a copper or aluminum bar on the opposite side of the groove. The bar will act as a "chill strip," keeping the heat from spreading to the surrounding area of the frame rail. See Fig. 4. Deposit the weld material using the applicable welding method described in this section.
4. Grind the weld flush with the frame rail. See Fig. 5.



A. 1/8-inch (3-mm) Diameter Hole
1. Crack

Fig. 1, Preventing Cracks from Spreading

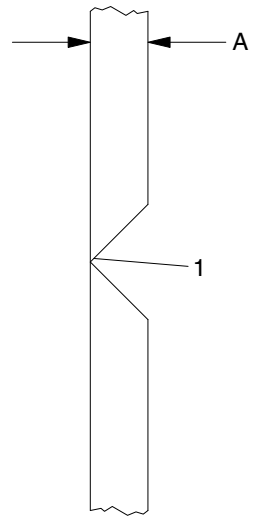


A. Frame Rail Thickness
B. Grind V-groove to 2/3 depth of stock thickness.
1. Crack

Fig. 2, Cross-Section View

5. Cut a deep enough V-groove on the opposite side of the frame rail to reach the weld metal. See Fig. 6.
6. Clamp the chill strip on the opposite side of the groove. See Fig. 7. Weld the V-groove, as instructed above. Make full penetration of the weld.

Frame Rail Repair



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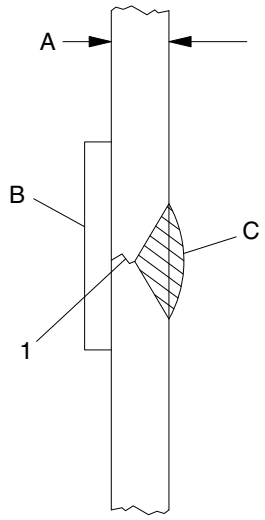
A. Frame Rail Thickness

1. V-Groove (full depth)

Fig. 3, Full Depth Groove



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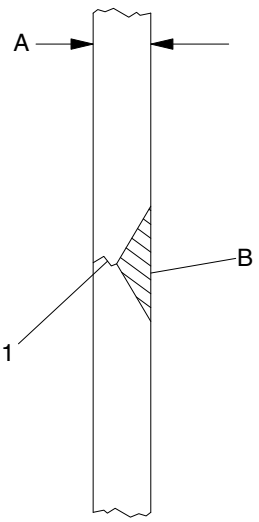
A. Frame Rail Thickness
B. Clamp the chill strip on the opposite side of the groove.
C. Deposit weld material.

1. Crack

Fig. 4, Using a Chill Strip



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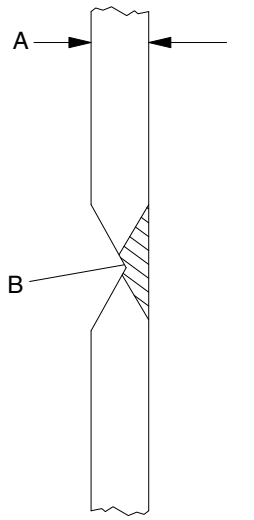
A. Frame Rail Thickness
B. Grind the weld flush with the frame rail.

1. Crack

Fig. 5, Weld Ground Flush



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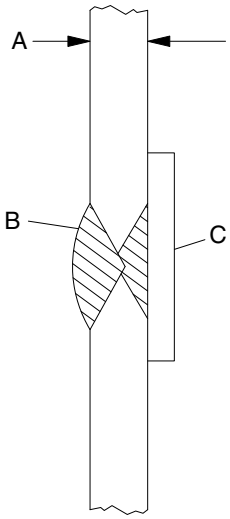
A. Frame Rail Thickness
B. Grind the V-groove deep enough to reach the weld.

Fig. 6, Cross-Section View

7. Grind the weld flush with the frame rail. See **Fig. 8**.



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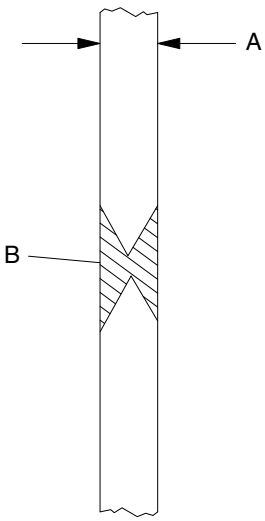
A. Frame Rail Thickness
B. Deposit weld material to penetrate opposite weld.
C. Clamp the "chill" strip on opposite side of groove.

Fig. 7, Second Weld



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A. Frame Rail Thickness
B. Grind weld flush with frame rail.

Fig. 8, Second Weld Ground Flush

Filling Unused Holes

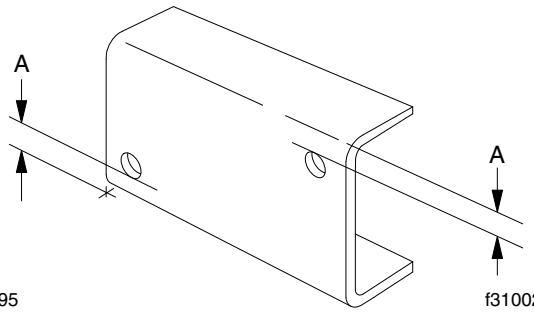
1. Fill all unused holes in the frame assembly with the applicable nut, washer, and bolt combination.
2. If the diameter of a hole is less than 3/8 inch (9.5 mm), enlarge it to 3/8 inch (9.5 mm), and fill it with the applicable nut, washer, and bolt combination.
3. Tighten the fasteners to the applicable torque value. For proper frame fastening instructions, refer elsewhere in this group.

Drilling Holes

During vehicle manufacture, holes are drilled or punched in the frame rail only as specified on the vehicle frame drilling chart. If any additional holes need to be drilled, contact your regional service representative for approval.

A single exception to this rule is that holes may be drilled for tubing clips and the like through the web portion of the channel only, with the following restrictions:

- The *edge* (not the center) of the hole must be no closer than 1-11/32 inches (34 mm) from the outer face of the flange. See **Fig. 9** for the minimum distance to the flanges that holes can be placed on the web.



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A. 1-11/32 inches (34 mm)

Fig. 9, Minimum Distance for Drilling Holes

- Material between the centerline of the hole and the outside of the upper or lower flange must be at least 2-13/32 inches (60 mm).
- Minimum material between hole centerlines must be 2 inches (50 mm).
- All attaching fasteners must be Grade 8. Flat washers must be made with high strength steel.

Frame Rail Repair

- The minimum material between the rear suspension bracket and the end of the frame must be at least 2 inches (50 mm).
- Holes between the front axle centerline and the rear axle centerline cannot exceed 3/4 inches (19 mm).

Safety Precautions

CAUTION

Before performing any electric welding on a vehicle, disconnect the battery power and ground cable, and any electronic control units (ECUs) or similar devices installed on the vehicle. Electric currents produced during electric welding can damage various electrical components on the vehicle, such as alternator diodes and ECUs.

Vehicle components that typically use ECUs include the electronic engine, electronic automatic transmissions, and the antilock braking system (ABS).

1. For any ECU with a battery power harness, disconnect its ground terminal from the chassis ground. Disconnect the power terminal from the positive post of the battery.

NOTE: It is also possible to disconnect the main connection at the ECU.

2. Disconnect the batteries, including any isolated battery. Attach the welding ground strap as close to the work being done as safely possible.

Welding Frame Rails

WARNING

Wear protective welding masks and gloves when welding. Failure to do so could result in personal injury, due to the intensity of heat, sparks, and flying debris.

CAUTION

Weld only as instructed in this subject; all precautions and methods must be strictly followed. Failure to do so can reduce the structural strength in the welded area of the frame rail.

IMPORTANT: Before any welding is done, contact your regional service representative for approval. There are very few cases in which welding a heat-treated frame rail is allowable. If possible, avoid direct welding of the frame rail web.

1. Do not weld attachments to the frame rail. For guidelines on the attachment of equipment on the frame rails, refer elsewhere in this group.
2. Use only the applicable welding method under "Welding Methods."
3. Before welding, clean off any oil, grease, paint, scale, and other contaminants. Wipe dry with a clean cloth.
4. Do not weld in an area that allows drafts from any source such as windows, engines, or fans, as it will affect the soft flow of gas from the welding gun.
5. Do not weld into the radius of the frame rail flanges or along the edge of the flange.
6. Do not weld square with the frame side rail. Make all reinforcing welds at least 30 degrees from square. This will distribute the weld stresses over a larger area.
7. Do not notch, undercut, or leave craters during the welding process.
8. Keep as close to the weld centerline as possible.

Welding Methods

Gas-metal arc welding is the recommended method. If gas-metal arc welding is not available, coated-electrode arc welding can be used. Gas-metal arc welding uses DC current only (MIG welding). Use either a short arc beading technique or a narrow weave technique.

Gas-Metal Arc Welding

For the gas-metal arc welding method, use the following:

1. Use weld wire that meets American Welding Society (AWS) specification A 5.28, Class E110S.
2. Use Linde M-5 gas or an equivalent argon-oxygen mixture of 5 percent oxygen.
3. For machine settings, see **Specifications, 400**.

Coated-Electrode Arc Welding

For the coated-electrode arc welding method, use the following:

1. Use weld rod type AWS-E-11018, 1/8-inch thick.

Welding Frame Rails

NOTE: AWS-E-11018 is the recommended type of weld rod. However, on 1/4-inch thick frame rails only, weld rod of type AWS-E-9018 can be used.

2. For the amperage and voltage settings for each weld position, see **Specifications, 400**.
3. Always keep the weld rod free of moisture. A weld rod that has been exposed to the atmosphere longer than one-half hour must be dried before use.

IMPORTANT: Take weld rod directly from a hermetically sealed container, or dry it for at least one hour in a 700 to 800°F (371 to 427°C) oven. Immediately after removal from the sealed container or after drying, store the weld rod in an oven at 250°F (121°C).

Extending Frame Rails

CAUTION

Before performing any electric welding on a vehicle, read and understand the welding precautions in Subject 110. Disconnect the battery power and ground cables and any electronic control units (ECUs) installed on the vehicle. Electric currents produced during electric welding can damage various electrical components on the vehicle, such as alternator diodes and ECUs.

Steel frame rails can be lengthened by welding a frame rail extension onto the rear of the frame rail. The frame rail end and the extension piece are cut so that they overlap each other. Obtain approval from your regional service representative before welding and lengthening the frame rail.

For any ECU with a battery power harness, disconnect its ground terminal from the chassis ground, and disconnect its power terminal from the battery positive post. Or else disconnect the main connection at the ECU.

Freightliner vehicle components that typically use ECUs include the electronic engine, electronic automatic transmission, and the antilock braking system (ABS).

1. Cut the frame rail end and extension to the specified applicable dimensions. See Fig. 1.

NOTE: If the length of the extension is to be 6 inches (152 mm) or less, then straight-cut the frame rail end and extension.

2. Grind the cut ends of the frame rail and extension to the dimensions in Fig. 2.
3. Align the cut ends of the extension piece with the cut ends of the frame rail so that there is a 1/16 to 1/8-inch (1.6 to 3.2-mm) gap between them. See Fig. 3. Using a torch, heat the cut ends to 70°F (21°C), if necessary, before welding.

NOTE: A 1/16-inch (1.6-mm) gap is recommended. The ends must not contact each other. Maintain the joint spacing by placing a short piece of clean, 1/16-inch (1.6-mm) diameter bare steel wire between the extension and frame rail. The wire sections must be short enough to be completely fused by the welding process.

4. Using one of the methods in Subject 110, weld the extension to the frame rail, making full penetration. See Fig. 3. Remove any slag between passes, and back-gouge the root of the first vee before welding the other side.

CAUTION

Residual stresses will occur in the weld if the web area is not welded first, or if the flanges contact each other when welding the web.

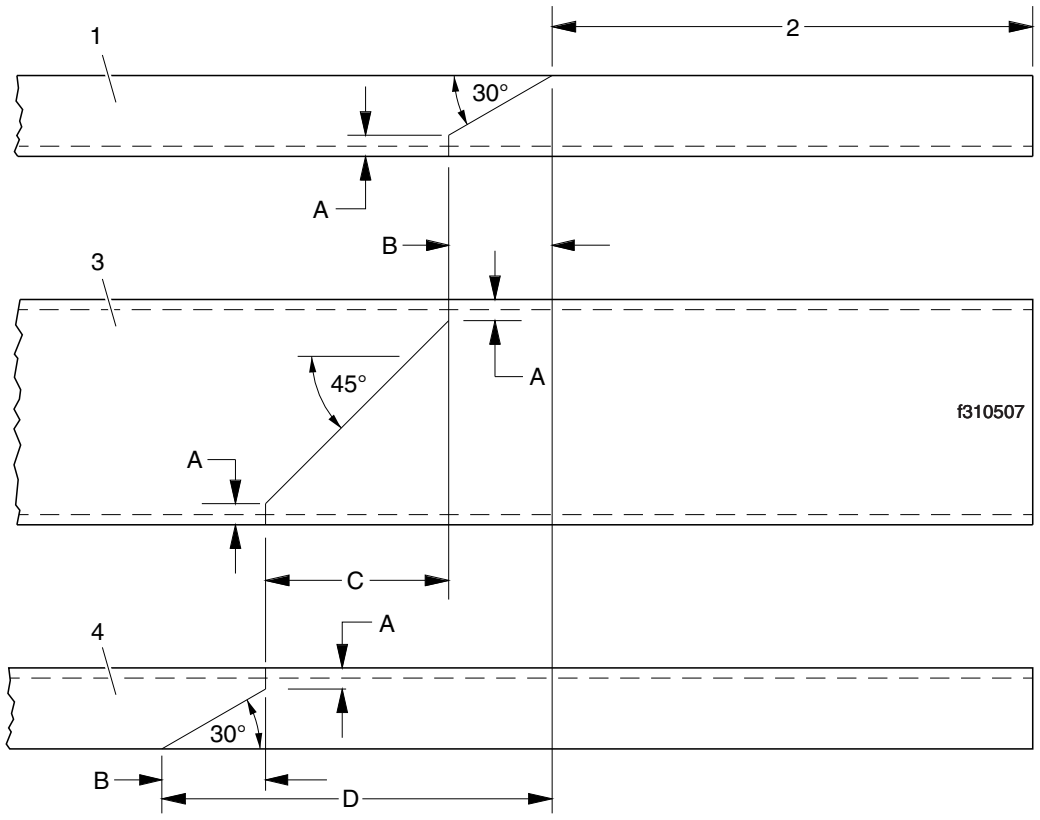
IMPORTANT: Weld the web area first, then the flange, working from the inside of the channel. When welding the web, make sure that the flanges do not contact each other.

5. When finished welding, sand the joint for appearance. Hold the sander so that the grind runs parallel with the length of the frame rail.

CAUTION

Do not "hollow grind" the weld. Small depressions from improper grinding of the weld will reduce the strength of the frame rail.

Extending Frame Rails



NOTE: Left rail shown; right rail will be opposite dimensions.

FRAME RAIL SIZE inches	DIMENSION			
	A inches (mm)	B inches (mm)	C inches (mm)	D inches (mm)
10.06	0.69 (17.5)	5.00 (127.0)	8.75 (222.2)	18.75 (476.2)
10.12	0.69 (17.5)	5.00 (127.0)	8.75 (222.2)	18.75 (476.2)

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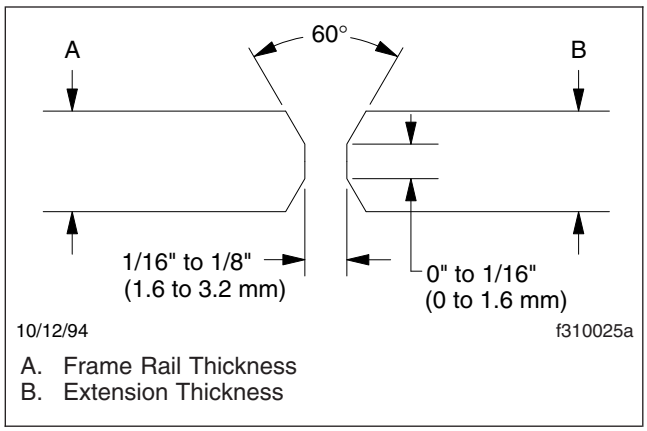
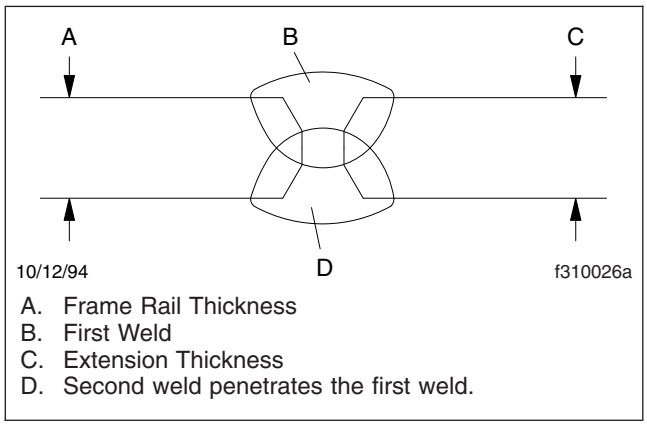
1. Upper Flange
2. Extension Length
3. Web
4. Lower Flange

Fig. 1, Frame Rail and Extension Cutting Dimensions



A. Frame Rail Thickness
B. Extension Thickness

Fig. 2, Grinding Dimensions



A. Frame Rail Thickness
B. First Weld
C. Extension Thickness
D. Second weld penetrates the first weld.

Fig. 3, Correct Weld Penetration

Frame Crossmember Removal and Installation

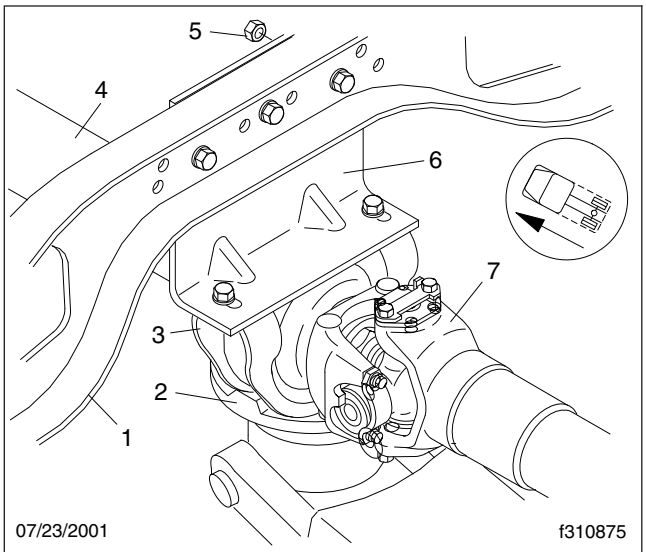
⚠ CAUTION

The placement of crossmembers affects the overall stability of the frame and prevents damage to the vehicle. Before eliminating, adding, or relocating any crossmember, contact your regional service representative for instructions and approval.

Splayed Crossmember, Midship

Removal

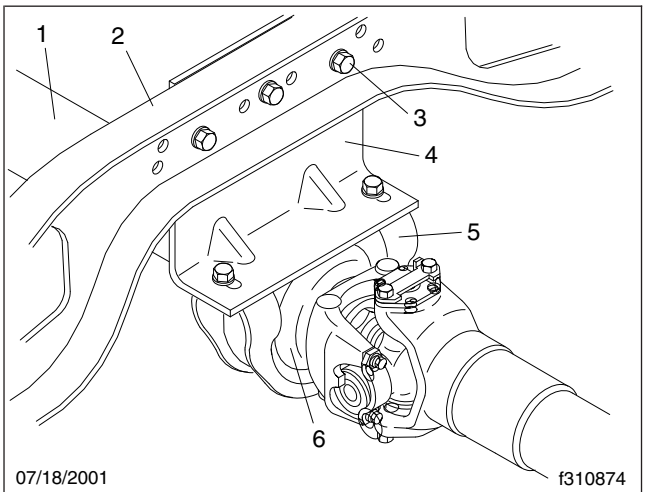
1. Park the vehicle on a level surface and set the parking brake. Shut down the engine and chock the rear tires.
2. Remove any clamps or tie straps that attach air lines or wiring to the crossmember.
3. Using a floor jack, support the midship bearing and driveshaft. See **Fig. 1**.



1. Midship Crossmember
2. Floor Jack
3. Midship Bearing Holder
4. Driveshaft
5. Bracket Locknut
6. Midship Bracket
7. U-Joint Yoke

Fig. 1, Support the Driveline

4. Remove the three mounting bolts on the midship bracket. See **Fig. 2**. Lower the driveshaft slightly.



1. Driveshaft
2. Midship Crossmember
3. Midship Bracket Mounting Bolt
4. Midship Bracket
5. Midship Bearing Holder
6. Midship Bearing

Fig. 2, Midship Bracket Mounting

5. Remove the bolts that attach the crossmember to the web of each frame rail. See **Fig. 3**.

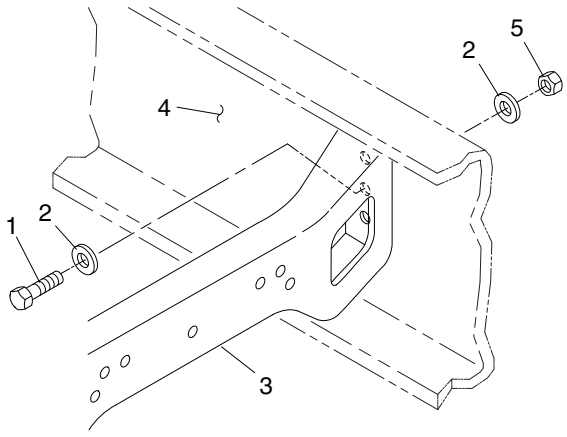
NOTE: If threaded fasteners are used, save them for later installation. If Huck® fasteners are used, see **Subject 160** for removal and installation information.

6. Support the driveshaft on a jack stand. Remove the floor jack. See **Fig. 4**.
7. Using a rubber mallet, tap against the curved portion of the crossmember on the closed-channel side until it is no longer wedged between the frame rails.
8. Remove the crossmember from the vehicle.

Installation

1. Position the crossmember between the frame rails with the open channel facing the same direction as it did before removal.
2. Tap the crossmember into place until the mounting holes at both ends of the crossmember are aligned with the holes in the frame rail.

Frame Crossmember Removal and Installation



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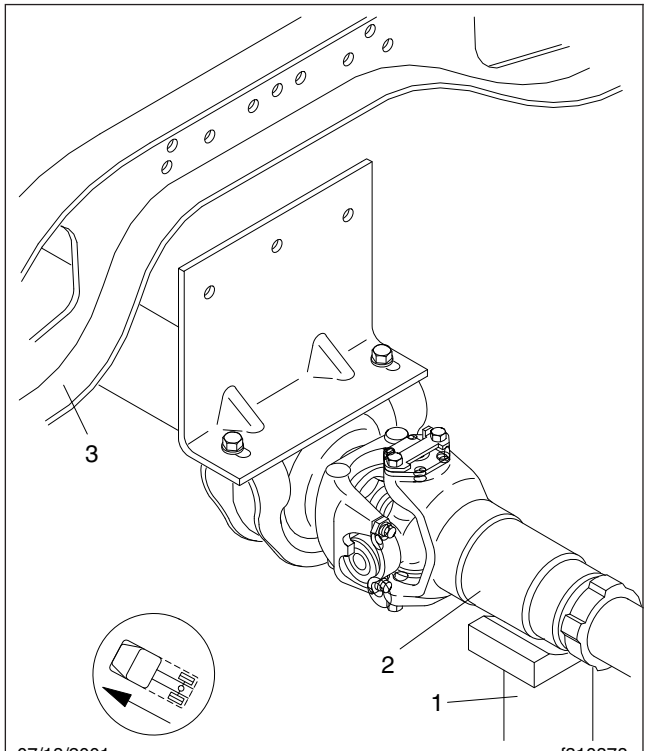
1. Web Bolt, 5/8–11
2. Hardened Flatwasher
3. Midship Crossmember
4. Frame Rail
5. Locknut, 5/8–11

Fig. 3, Midship Crossmember Fasteners

3. Install the web bolts, washers, and nuts fastening the crossmember to the frame rail. See **Fig. 5**.
   - 3.1 Install the fasteners in one end of the crossmember and frame rail. Tighten the locknuts finger-tight only.
   - 3.2 Install the fasteners on the other end of the crossmember and frame rail.
   - 3.3 Tighten all of the 5/8–11 locknuts 128 lbf·ft (173 N·m).
4. Install the midship bracket.
   - 4.1 Adjust the height of the jack stand holding the driveline, as necessary to line up the bolt holes in the midship bracket with those in the crossmember.
   - 4.2 Install the midship bracket fasteners, as removed.
   - 4.3 Tighten all of the 5/8–11 hexnuts 128 lbf·ft (173 N·m).
5. Install any clamps or tie straps that attach air lines or wiring to the crossmember.
6. Remove the chocks from the rear tires.



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1. Jack Stand
2. Driveshaft
3. Midship Crossmember

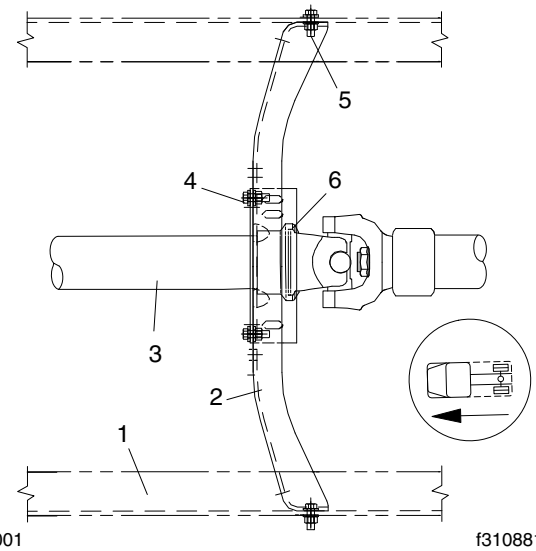
Fig. 4, Support the Driveshaft

Double Splayed Crossmember, Axle

Removal

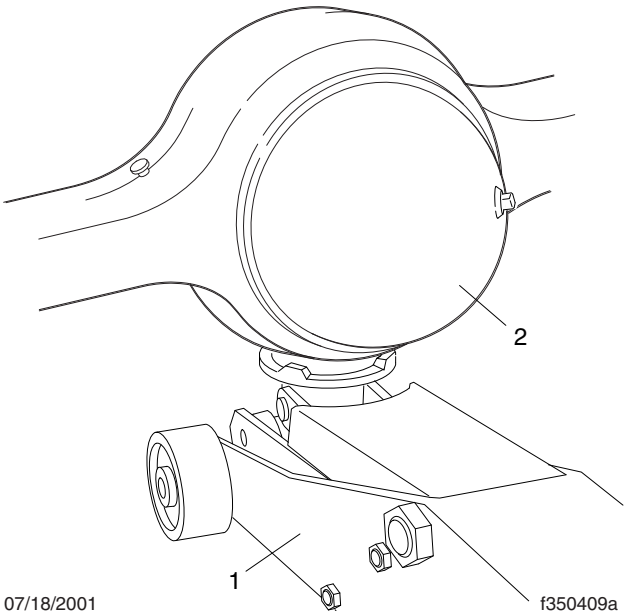
1. Park the vehicle on a level surface and set the parking brake. Shut down the engine and chock the front tires.
2. Jack up the vehicle.
   - 2.1 Place a jack stand under each frame rail.
   - 2.2 Using a floor jack, jack up the axle until the frame rails are high enough to suspend the wheels. See **Fig. 6**.
   - 2.3 Raise the jack stands until the frame rails are resting on the jack stands. See **Fig. 7**.
   - 2.4 Jack up the axle again to center the frame rails and move the springs away from the hanger bolts. See **Fig. 8**.

Frame Crossmember Removal and Installation



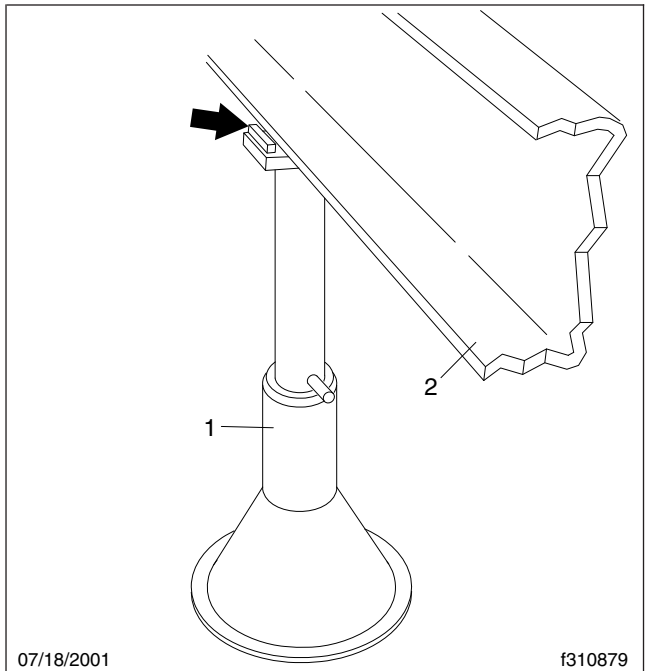
1. Frame Rail
2. Crossmember
3. Driveshaft
4. Midship Bracket
5. Web Bolt, 5/8–11
6. Midship Bearing

Fig. 5, Crossmember Installation



1. Floor Jack
2. Axle

Fig. 6, Jack Up the Axle



Make sure the lip of the jack stand is clear of the frame rail.

1. Jack Stand
2. Frame Rail

Fig. 7, Place Jack Stands Under the Frame Rails

2.5 Place another set of jack stands on the axle. See **Fig. 9**.

3. Remove any clamps or tie straps that attach air lines or wiring to the crossmember.
4. Remove the lower rear hanger bolt. See **Fig. 10**.

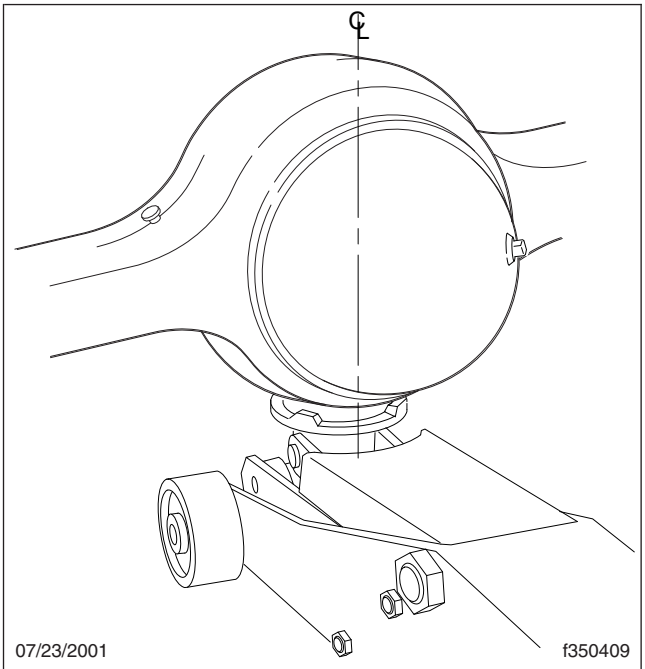
NOTE: There is a clearance problem with the leaf spring for this bolt. The lower edge of the hanger bolt must clear the top edge of the leaf spring. Adjust the axle jack as necessary. See **Fig. 11**.

5. Remove the fasteners holding the two crossmembers together.
6. Remove the rest of the hanger bolts.

NOTE: If threaded fasteners are used, save them for later installation. If Huck® fasteners are used, see **Subject 160** for removal and installation information.

7. Using a rubber mallet, tap against the curved portion of one crossmember until the crossmem-

Frame Crossmember Removal and Installation



Center the jack on the axle.

Fig. 8, Center the Frame Rails

bers are no longer wedged between the frame rails. Separate the crossmembers and remove them from the vehicle.

Installation

1. Position the two crossmembers between the frame rails, as removed. Tap the crossmember into place until the mounting holes at both ends of the crossmember are aligned with the holes in the frame rail.
2. Install the fasteners holding the two crossmembers together. Tighten the locknuts finger-tight only. See **Fig. 12**.
3. Install the hanger bolts, washers and locknuts attaching the hanger bracket and the two crossmembers to the frame rail. Tighten the locknuts finger-tight only. See **Fig. 13**.

NOTE: Using the axle jack, raise the axle to lower the springs and allow enough clearance to install the lower rear bolt.

4. Adjust the hanger bracket position as necessary. Tighten all of the 5/8–11 hanger locknuts 128 lbf·ft (173 N·m).
5. Tighten all of the 1/2–13 crossmember joining locknuts 68 lbf·ft (92 N·m).
6. Install any clamps or tie straps that attach air lines or wiring to the crossmember.
7. Remove the chocks from the front tires.

Five-Piece Bolted Crossmember

Removal

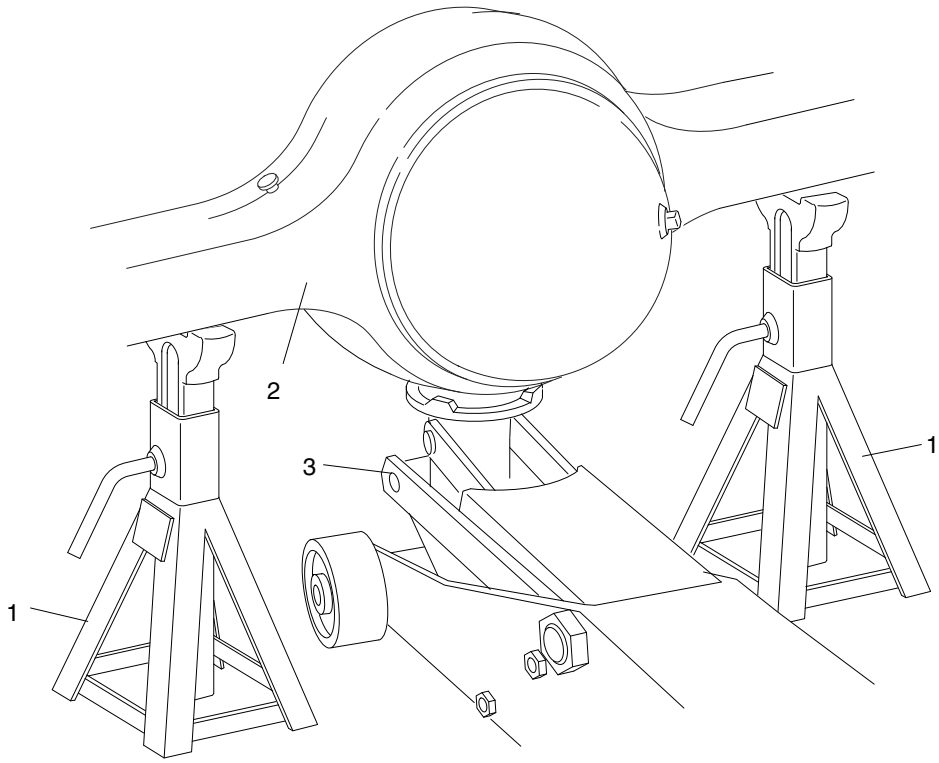
1. Park the vehicle on a level surface and apply the parking brake. Shut down the engine. Chock the front and rear tires.
2. If any air brake valve is attached to the crossmember, drain the air reservoirs, then remove the valve(s) from the crossmember.

   Remove any clamps that attach air lines or wiring to the crossmember, and secure the lines or wiring away from the crossmember.
3. If rear suspension brackets are attached to the frame rails with the same fasteners that attach the crossmember, use safety stands to support the rear of the frame at the normal ride height.
4. Remove the fasteners that attach the gussets to the crossmember. See **Fig. 14**.
5. Remove the fasteners that attach the gussets to the frame rail.
6. Using a rubber mallet, tap against the crossmember until it is no longer wedged against the frame rails.
7. Remove the crossmember from the vehicle.

Installation

1. Attach one upper gusset to the crossmember channel. Tighten the fasteners snugly, but not to their final torque value.
2. Place the crossmember channel and gusset in the frame rails with the channel opening facing the same direction as the original crossmember. Position the crossmember so its channel is resting on the lower flanges of both frame rails.

Frame Crossmember Removal and Installation



1. Jack Stand 2. Rear Axle 3. Axle Jack

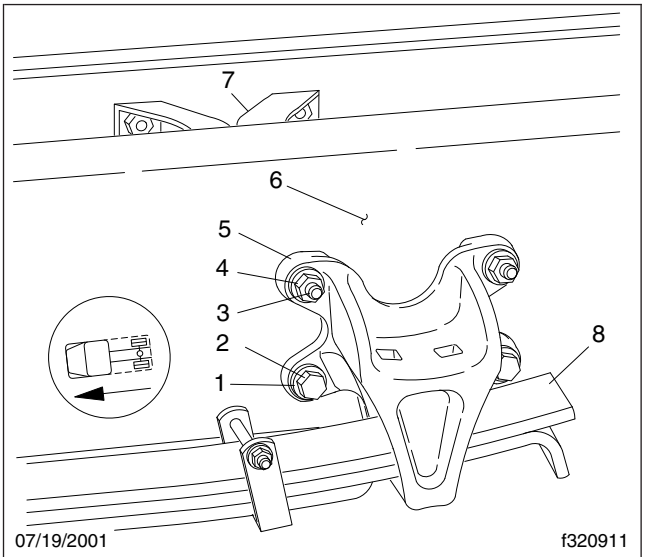
Fig. 9, Place Jack Stands on the Axle

3. Slide the other upper gusset into position and attach it to the crossmember channel. Tighten the fasteners snugly, but not to their final torque value.
4. With the crossmember channel still resting on the lower flanges of both frame rails, tighten the locknuts on the button-head capscrews at the outboard end of both upper gussets 68 lbf·ft (92 N·m).

NOTE: The locknuts must be tightened now since, when the crossmember is in place, the upper flange of the frame blocks access to the capscrews.

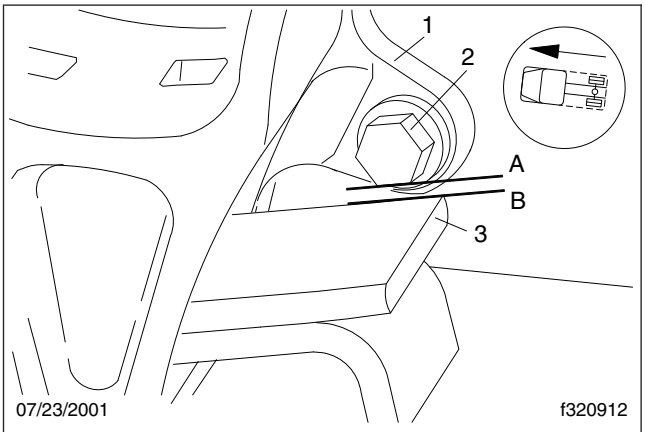
5. Using a rubber mallet, tap the crossmember into place. Align the mounting holes of the upper gussets with the holes in the frame rails. Install the fasteners, but don't tighten them.
6. Place the lower gussets in position against the crossmember channel and insert the fasteners that secure the gussets to the channel. Do not tighten the fasteners.
7. Install the fasteners that attach the gussets to the frame rails. If the crossmember was secured by Huck fasteners, see **Subject 160** for installation information.
8. Tighten the fasteners that secure the gussets to the frame rails 136 lbf·ft (184 N·m). Then, tighten the fasteners that secure the gussets to the crossmember 68 lbf·ft (92 N·m).
9. If any air brake valve was removed from the old crossmember, install the valve(s) on the new crossmember and install any clamps attaching air lines or wiring to the crossmember.
10. Remove the chocks from the front and rear tires.

Frame Crossmember Removal and Installation



1. Hardened Washer
2. Hanger Bolt (head end)
3. Hanger Bolt (threaded end)
4. Locknut, 5/8–11
5. Hanger Bracket
6. Frame Rail
7. Double Splayed Crossmember
8. Leaf Spring

Fig. 10, Remove the Hanger Bolts

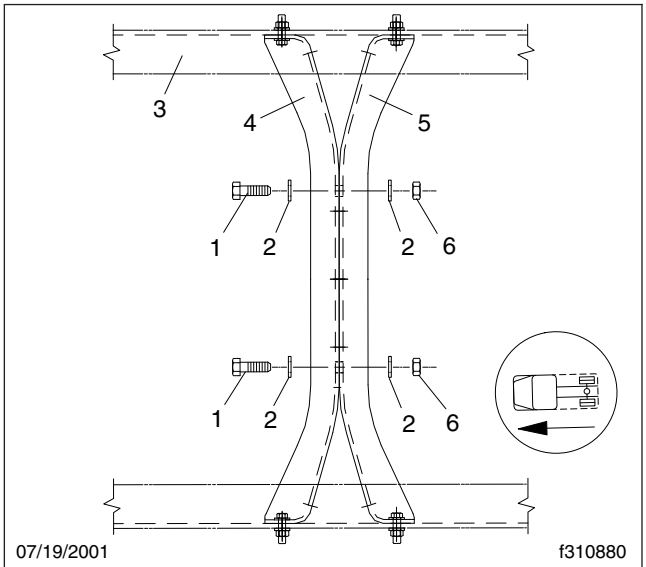


NOTE: The lower edge of the lower rear hanger bolt must clear the top of the leaf spring.

A. Lower Edge of Bolt
B. Top of Leaf Spring

1. Hanger Bracket
2. Hanger Bolt
3. Leaf Spring

Fig. 11, Clearance Between the Leaf Spring and the Hanger Bolt



1. Bolt, 1/2–13
2. Washer
3. Frame Rail
4. Forward Crossmember
5. Aft Crossmember
6. Locknut, 1/2–13

Fig. 12, Install the Double Crossmembers

Overslung Crossmember

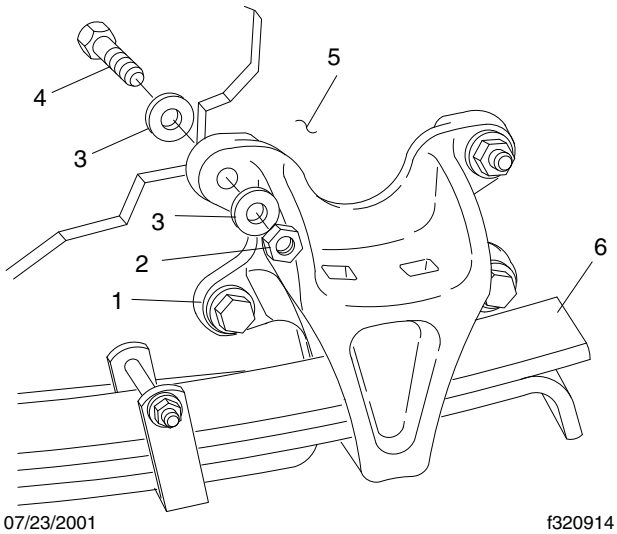
Removal

IMPORTANT: An underslung crossmember is used in a few, limited applications. To remove an underslung crossmember, use the same procedures as for an overslung crossmember.

1. Park the vehicle on a level surface and apply the parking brake. Shut down the engine. Chock the front tires.

NOTE: Note the position of the crossmember to the mounting bracket before removal.

2. Support the overslung crossmember. Remove the mounting bolts that hold each side of the crossmember to the mounting brackets. See **Fig. 15**.
3. Lower the overslung crossmember from the mounting brackets.



NOTE: The frame rail has been cut away to show the hanger bracket fasteners.

1. Hanger Bracket
2. Locknut, 5/8–11
3. Washer
4. Hanger Bolt, 5/8–11 x 3
5. Frame Rail
6. Leaf Spring

Fig. 13, Install the Hanger Bolts

Installation

1. Install the new crossmember into place. Put the crossmember on the same side of the mounting brackets as removed.
2. Install the four 5/8–11 mounting bolts (two on each side) that hold the crossmember to its mounting brackets. Install them with the bolt heads facing the inside of the frame rail. Tighten the fasteners 136 lbf·ft (184 N·m).
3. Remove the chocks from the rear tires.

Rear-Closing Crossmember

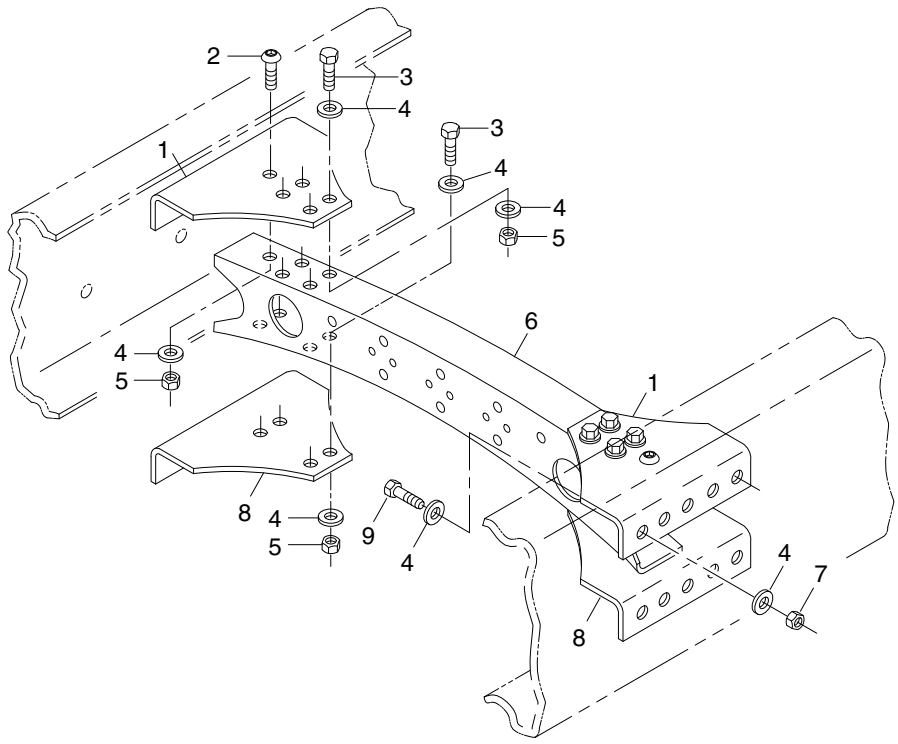
Removal

1. Apply the parking brakes, then chock the front and rear tires.
2. Remove any components installed on the crossmember.
   - 2.1 If so equipped, remove the backup alarm from the crossmember.
   - 2.2 If any air brake valve is attached to the crossmember, drain the air reservoirs, then remove the valve(s) from the crossmember.
   - 2.3 Remove any clamps that attach air lines or wiring to the crossmember.
   - 2.4 If the leveling valve for an AirLiner suspension is attached to the crossmember, remove the valve. For instructions, refer to **Group 32** of this manual.
3. Remove the fasteners that attach the crossmember to the front angle brackets. See **Fig. 16**.
4. If rear suspension brackets are attached to the frame rails with the same fasteners that attach the angle brackets, support the rear of the frame at its normal ride height, using safety stands.
5. Remove the fasteners that attach the rear angle brackets to each frame rail.
6. Remove, as an assembly, the rear brackets and the crossmember.
7. If needed, remove the front angle brackets and their fasteners. If applicable, after removing the fasteners, remove the rear suspension brackets from the springs.

Installation

1. If they were removed, install the front angle brackets and their fasteners, but don't tighten the fasteners at this time. If applicable, install the rear suspension brackets on the springs.
2. Slide the crossmember into the opening at the rear of the frame rails, then turn it upright, to position it against the front angle brackets.
3. Attach the rear angle brackets to the frame rails, but don't tighten the fasteners at this time.
4. Install but do not tighten the fasteners that attach the crossmember to the front angle brackets.
5. Install any components, as removed.
   - 5.1 If removed, install any air brake valves, and securely tighten the fasteners.
   - 5.2 If removed, install the backup alarm.

Frame Crossmember Removal and Installation



08/05/94 f310243a

1. Upper Gusset
2. 1/2–13 Button-Head Capscrew
3. 1/2–13 Grade 8 Hexbolt
4. Hardened Steel Flatwasher
5. 1/2–13 Locknut
6. Crossmember Channel
7. 5/8–11 Locknut
8. Lower Gusset
9. 5/8–11 Grade 8 Hexbolt

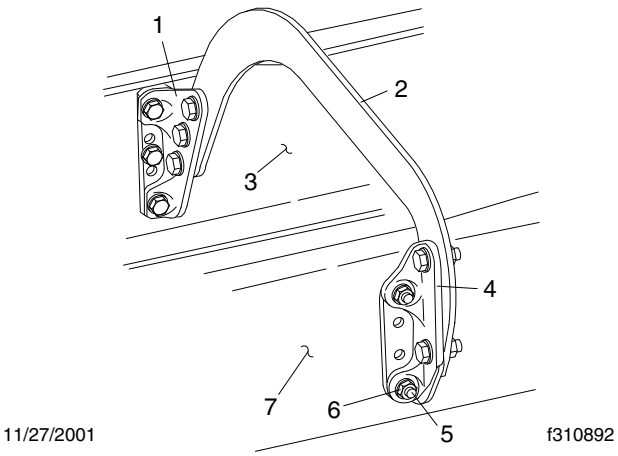
Fig. 14, Bolted 5-Piece Crossmember Assembly

5.3 Install any clamps that attach air lines or wiring to the crossmember.

5.4 If removed, install the leveling valve for the AirLiner suspension. For instructions, see **Group 32** of this manual.

6. Tighten the fasteners that attach the angle brackets to the frame rails, then tighten the fasteners that attach the crossmember to the angle brackets. Tighten all fasteners 136 lbf·ft (184 N·m).
7. Remove the chocks from the front and rear tires.

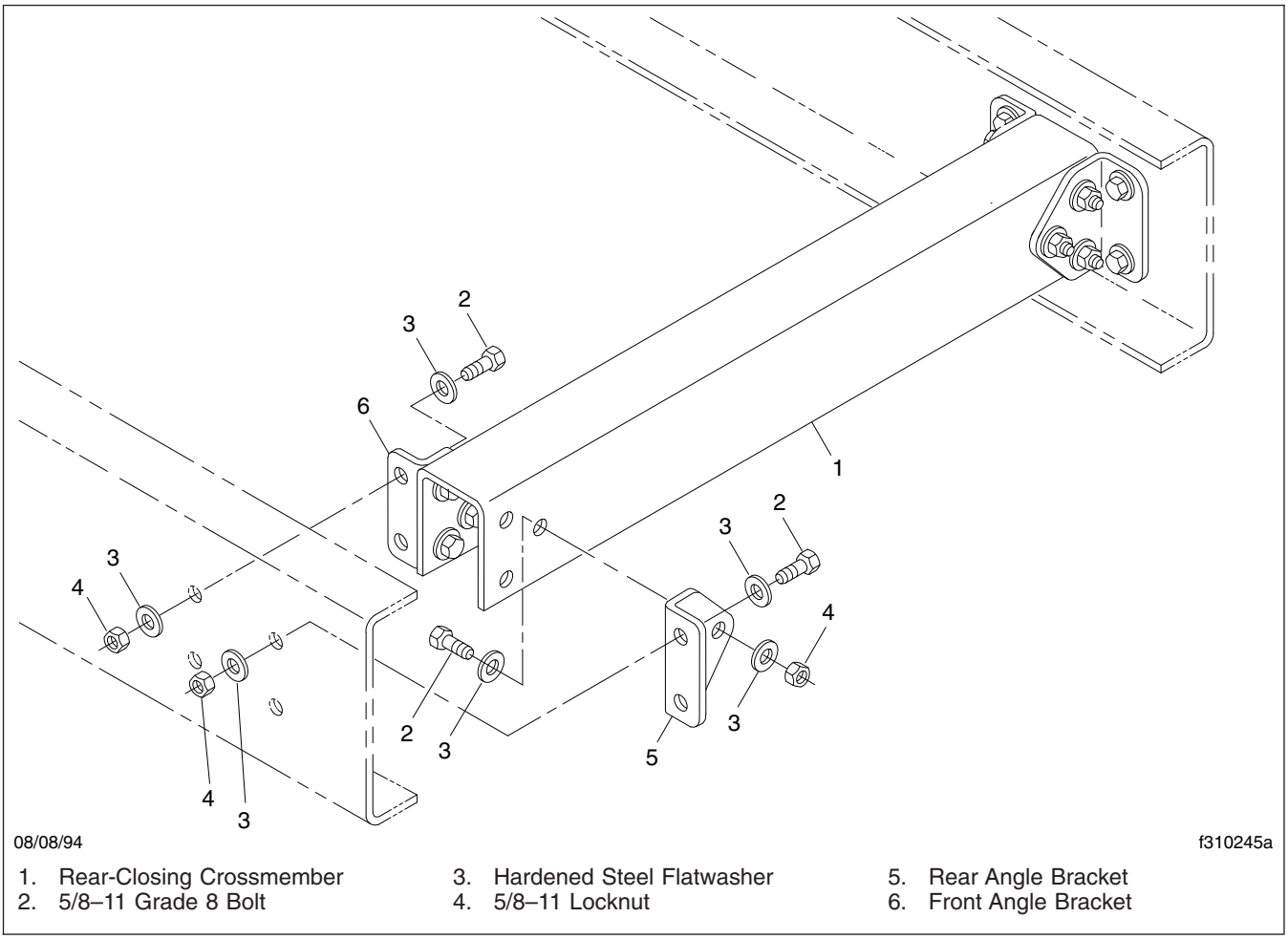
Frame Crossmember Removal and Installation



1. Right Mounting Bracket
2. Overslung Crossmember
3. Right Frame Rail
4. Left Mounting Bracket
5. Mounting Bolt, 5/8-inch
6. Hexnut and Washer, 5/8-inch
7. Left Frame Rail

Fig. 15, Overslung Crossmember

Frame Crossmember Removal and Installation



1. Rear-Closing Crossmember
2. 5/8–11 Grade 8 Bolt
3. Hardened Steel Flatwasher
4. 5/8–11 Locknut
5. Rear Angle Bracket
6. Front Angle Bracket

Fig. 16, Rear-Closing Crossmember Installation

Frame Rail Alignment

Frame rail alignment is checked by measuring the distances from two sets of points on the upper flanges of the frame rails. The aft set of points must be as far back as possible from the forward set of points. There must be no obstruction along or between the frame rails that would prevent measuring from any one of the four points to the other three points.

There are no marks or bolt holes in the top flanges of the frame rails. Therefore, the points must be projected from the frame station marks and from the bolt holes on the frame rail webs.

IMPORTANT: Use a pencil or soapstone to make all lines, points, or other marks. Do not use any marker or tool that will scratch the surface of the frame rail. Use a machinist's square to project all points from the webs to the upper flanges, and to measure inboard from the outside face of the frame rails.

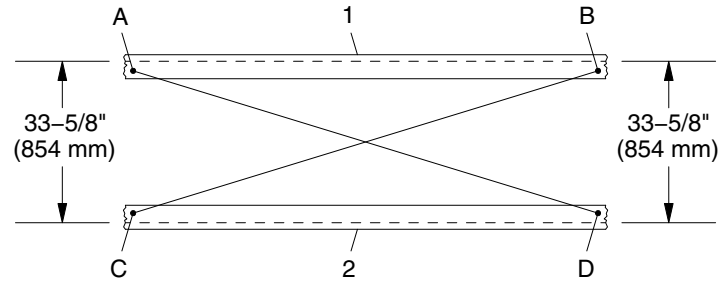
1. Locate a forward set of points. The forward points must be at identical locations on both frame rails.
   - 1.1 Mark the most forward point at which the upper flanges of both frame rails are clear and unobstructed.
   - 1.2 On each frame rail, find a bolt hole on the frame rail web, that is aligned with, or just rearward of, this forward point. The bolt holes must be at exactly the same location in each frame rail.
   - 1.3 Project the exact vertical centerline of each bolt hole, and mark a line across the top flange of its respective frame rail.
   - 1.4 Find the exact center of the width of each upper flange, and mark the point on each projected line. This will be the forward set of points.

IMPORTANT: Use a pencil or soapstone to make all lines, points, or other marks. Do not use any marker or tool that will scratch the surface of the frame rail. Use a machinist's square to project all points from the webs to the upper flanges, and to measure inboard from the outside face of the frame rails.

2. Locate an aft set of points. The aft points also must be at identical locations on both frame rails.
   - 2.1 Measuring back along each frame rail, find a set of bolt holes *at least* six feet (1.8 m) aft of the forward set of points. The bolt holes must be at exactly the same location in each frame rail.

   IMPORTANT: If, because of obstructions, the distance must be less than six feet (1.8 m), the distance must be the maximum that is possible.
   - 2.2 Project the exact vertical centerline of each bolt hole, and mark a line across the top flange of its respective frame rail.
   - 2.3 Along each line, measure and mark a point two inches (5 cm) inboard from the outside face of its respective frame rail. This will be the aft set of points.
3. Measure the width of the frame, from the outside face of each frame rail. At both locations, this distance must be 33-5/8 inches (854 mm). See **Fig. 1**.
   - 3.1 At the forward set of points, measure the width of the frame. Measure from the outside face of one frame rail to the outside face of the other. Record this measurement.
   - 3.2 At the aft set of points, measure the width of the frame again, from the outside face of one frame rail to the outside face of the other. Compare this measurement to the one taken at the forward set of points.
4. Check the alignment of the frame rails. See **Fig. 1**.
   - 4.1 Measure the distance from the forward point on one frame rail to the aft point on the opposite frame rail. Record this measurement.
   - 4.2 Then measure the distance from the other forward point to the aft point on its opposite frame rail. Record this measurement.
   - 4.3 Compare the two measurements.
   - 4.4 If the values differ by more than 1/8 inch (3 mm), proceed to the next step.

Frame Rail Alignment



A. Right Forward Point or Bolt Hole
B. Right Rear Point or Hole
C. Left Forward Point or Bolt Hole
D. Left Rear Point or Hole
1. Right Frame Rail
2. Left Frame Rail

Fig. 1, Frame Rail Squaring

If the measurements are within 1/8 inch (3 mm) of each other, the frame rails do not need to be aligned. If any frame fasteners are loose, tighten as described below.

IMPORTANT: To align the frame rails, the frame assembly must be assembled with all of the crossmembers in place, but the attachment fasteners not tightened.

5. Align the frame rails, if needed.
   - 5.1 Loosen all of the frame fasteners just enough to allow movement of the parts when force is applied.
   - 5.2 Place a large wooden block against the rear end of the longer frame rail (defined as the one with its aft point the greater distance from its opposite rail's front point). Tap the block until the measurements are within 1/8 inch (3 mm) of each other.
   - 5.3 Using a large hammer, tap the block until the measurements are within 1/8 inch (3 mm) of each other.
   - 5.4 Tighten the fasteners for the front closing crossmember and the rear crossmember to their applicable torque values, as given in **Specifications, 400**.
6. Check the frame rail alignment again to be sure it is correct.
7. Tighten all of the frame fasteners, starting at the middle of the frame and working alternately toward both ends. Tighten each fastener to the torque value appropriate to its size, as given in **Specifications, 400**.
   - 7.1 First, tighten each fastener that attaches a crossmember to the frame.
   - 7.2 Tighten each fastener that attaches an upper strut, lower strut, or gusset to the frame.
   - 7.3 Finally, tighten each fastener that attaches a lower strut or gusset to a crossmember.
8. If the frame rails did need aligning, check the rear axle alignment. See **Group 35** for instructions.

Frame Shaping

IMPORTANT: Obtain approval from your regional service representative before doing any cutting or frame shaping.

If the flange of a frame rail is cut (for relief cuts or notches), shape the edges of the flange to form a smooth-ground edge radius of 0.06 to 0.12 inch (1.5 to 3.0 mm) over the entire length of the cut. **Figure 1** shows this dimension of the edge radius.

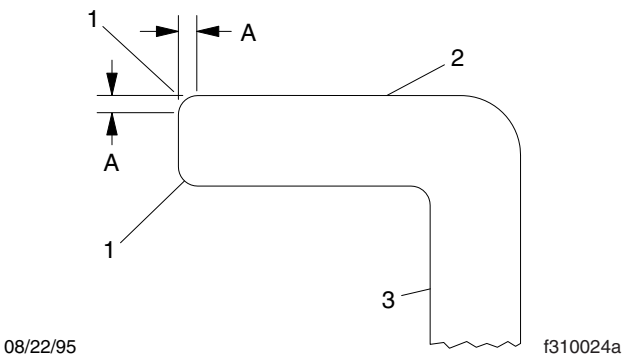
⚠ WARNING

Wear protective eye and face gear when grinding. Failure to wear this gear can result in personal injury due to flying metal debris from the grinding process.

Using a clean, sharp, rotary drum grinder or flapper wheel grinder, apply light pressure and grind the cut edges in the direction of the length of the frame rail, to form the radius. Do not grind across the edges. See **Fig. 2**.

⚠ CAUTION

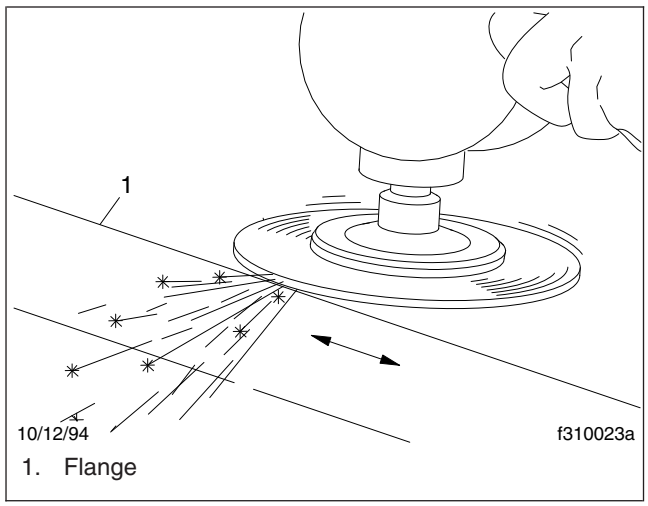
Apply light pressure only. Heavy pressure can result in harmful overheating and a loss of surface temper. Grind only in the direction of the cut. See Fig. 2. Grinding across the direction of the cut can reduce the structural strength of the frame rail.



A. 0.06" to 0.12" (1.5 to 3 mm)

1. Edge Radius
2. Flange
3. Web

Fig. 1, Radius Dimensions

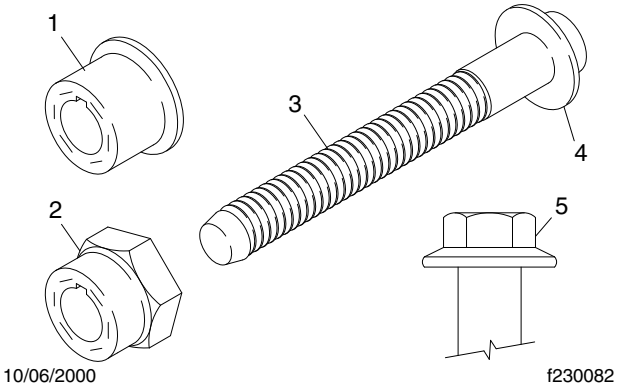


1. Flange

Fig. 2, Direction of Grind

Replacement

Either Huck® fasteners or Grade 8 hexhead bolts and Grade C prevailing torque locknuts are used for frame attachments. See **Fig. 1** and **Fig. 2**. For attachments where clearance is minimal, low-profile hexhead bolts and Grade C prevailing torque locknuts are used. Prevailing torque locknuts of both bolt types have distorted sections of threads to provide torque retention.



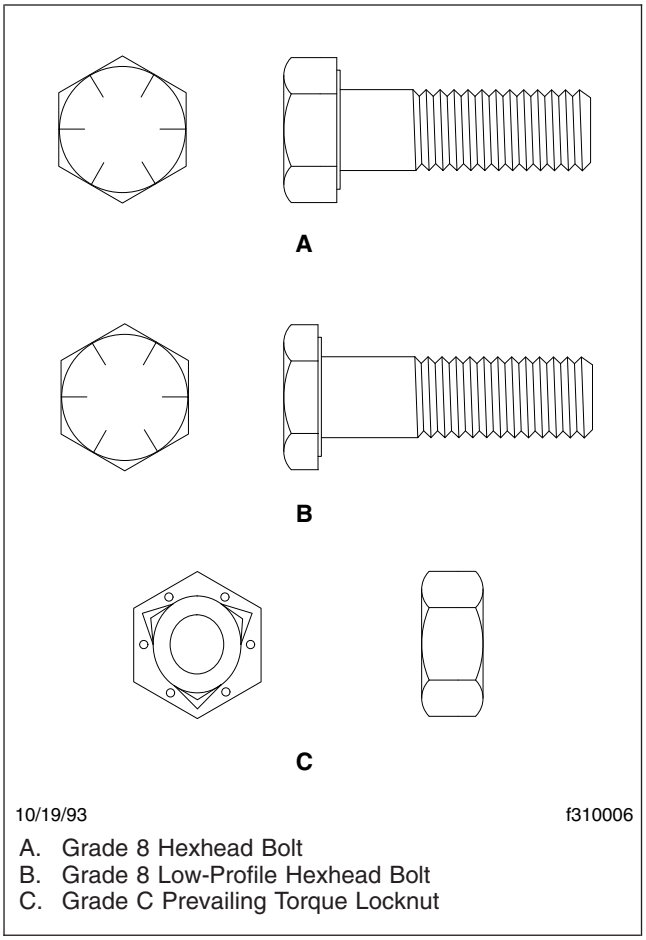
1. Spin Collar with Round Head
2. Spin Collar with Hexhead
3. Lock Pin
4. Round Head
5. Hexhead

Fig. 1, Huck Fastener

When hexhead bolts and locknuts are used on an attached part, a hardened flatwasher is required to prevent the bolt head or nut from embedding in the part. In general, hardened washers are used to distribute the load, and to prevent localized overstressing of the frame rails, brackets, and other parts. They are placed directly against the part, under the nut or bolt head. These special hardened washers are used on the frame rails and for the engine rear supports, rear and suspension brackets. They are cadmium- or zinc-plated, and have a hardness rating of 38 to 45 HRC.

Hexhead Bolt Replacement

1. Replace hexhead bolts with identical fasteners. See the Daimler Trucks North America LLC Parts Book for fastener specifications.



A. Grade 8 Hexhead Bolt
B. Grade 8 Low-Profile Hexhead Bolt
C. Grade C Prevailing Torque Locknut

Fig. 2, Hexhead Fasteners

⚠ CAUTION

Failure to apply Alumilastic compound, or an equivalent, to areas where aluminum and steel parts contact each other, could lead to corrosion of the metals, resulting in damage to the frame or parts.

2. Apply Alumilastic® compound, or an equivalent, to all surfaces where steel and aluminum parts contact each other.
3. Never hammer or screw bolts into place. Align the holes of the frame and the part being attached to it, so that the nut and bolt surfaces are flush against the frame and the part.

   3.1 For bolts 4 inches (102 mm) or less in length, make sure that at least 1-1/2

Frame Fastener Replacement

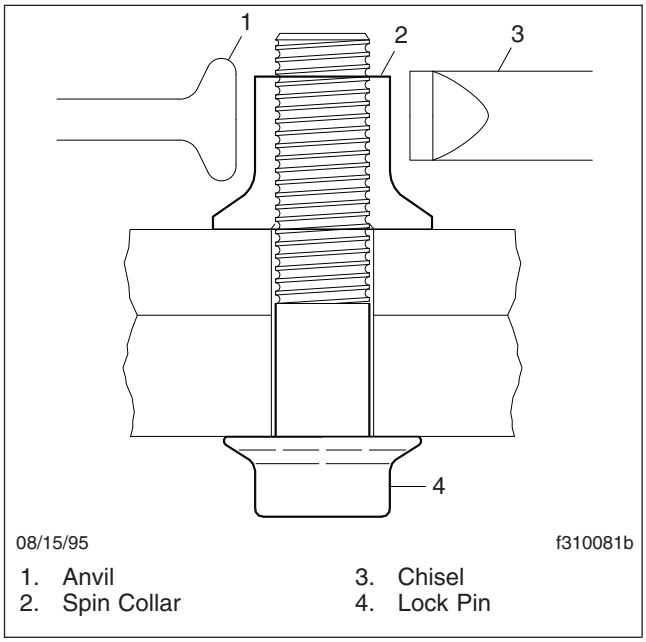
threads and no more than 5/8-inch (16-mm) bolt length extend through the self-locking nut after it has been tightened.

3.2 For bolts longer than 4 inches (102 mm), allow a minimum of 3 threads and a maximum of 3/4-inch (19-mm) bolt length.

Huck Fastener Removal

1. The collar for Huck fasteners is spun on when they are installed. If a hexhead collar is used, it can be removed with an impact wrench.

   In the event a collar without the hexhead is used, it cannot be unscrewed. If the Collar Cutter isn't available, split the collar with an air chisel while supporting the opposite side of the collar with an anvil. See **Fig. 3**.



1. Anvil
2. Spin Collar
3. Chisel
4. Lock Pin

Fig. 3, Huck Fastener Removal

2. Drive out the lock pin with a punch.
3. Discard the fastener after removing it.

⚠ CAUTION

Never attempt to reuse any Huck fastener that has been removed. Reusing any Huck frame fastener can result in damage to the vehicle frame or components attached to the frame.

4. Replace Huck fasteners with standard Grade 8 threaded fasteners if the repair location does not have the equipment to properly install replacement Huck fasteners.

Frame Fastener Tightening

⚠ CAUTION

Tighten standard frame fasteners periodically. Continued vehicle operation with loose fasteners could result in component, bracket, and frame damage.

1. Tighten hexhead bolts and locknuts periodically to offset the effects of "bedding in" (seating).
2. When tightening the fasteners, tighten the nut, not the bolt head. This will give a true torque reading by eliminating bolt body friction. For torque specifications, see **Specifications, 400**.

NOTE: Huck fasteners do not require periodic tightening.

Specifications

See **Fig. 1** for frame rail and extension cutting dimensions.

Machine Settings for Gas-Metal Arc Welding				
Wire Diameter	Current (amperes)		Wire Extension	
			Optimum	Maximum
inches (mm)	Minimum	Maximum	inches (mm)	inches (mm)
0.045 (1.14)	160	320	1/2 (13)	3/4 (19)
1/16 (1.6)	300	600	3/4 (19)	1-1/8 (29)
5/64 (2.0)	480	960	1 (25)	1-1/2 (38)

Table 1, Machine Settings for Gas-Metal Arc Welding

Amperage and Voltage Settings for Coated-Electrode Arc Welding		
Weld Position	Amperes	Volts
Downhand	130/140	21/23
Overhead	130/140	21/23
Vertical Up	110/120	22/24

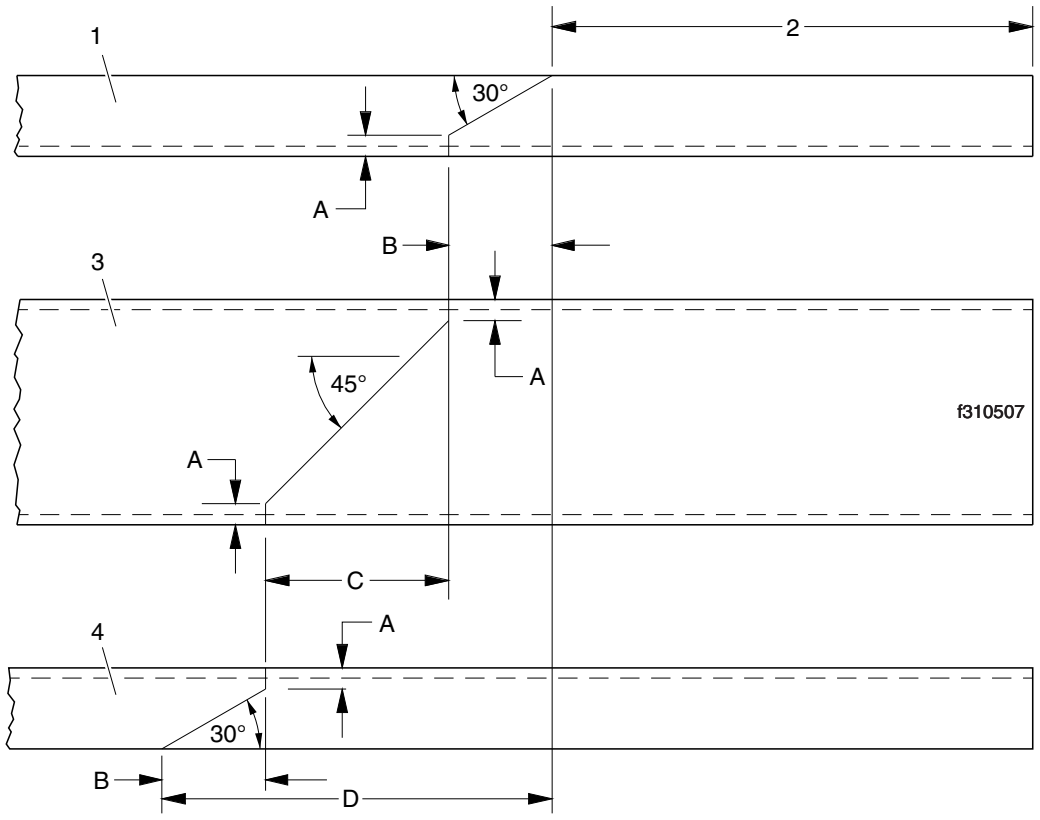
Table 2, Amperage and Voltage Settings for Coated-Electrode Arc Welding

Torque Values for Frame Fasteners	
Size	Torque: * lbf·ft (N·m)
1/2–13	68 (92)
9/16–12	98 (133)
5/8–11	136 (184)
3/4–10	241 (327)
3/4–16	269 (365)
7/8–9	388 (526)
7/8–14	427 (579)

* Lubricated or plated threads.

Table 3, Torque Values for Frame Fasteners

Specifications



NOTE: Left rail shown; right rail will be opposite dimensions.

FRAME RAIL SIZE inches	DIMENSION			
	A inches (mm)	B inches (mm)	C inches (mm)	D inches (mm)
10.06	0.69 (17.5)	5.00 (127.0)	8.75 (222.2)	18.75 (476.2)
10.12	0.69 (17.5)	5.00 (127.0)	8.75 (222.2)	18.75 (476.2)

05/06/2008 f310507

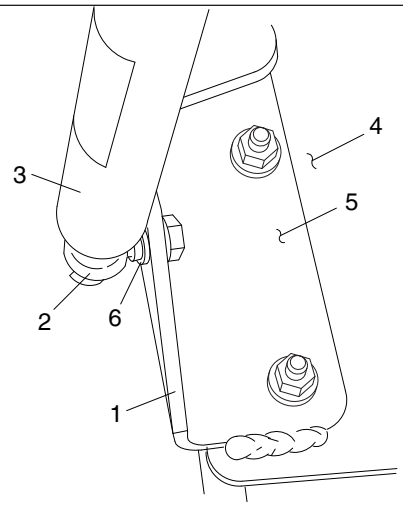
1. Upper Flange
2. Extension Length
3. Web
4. Lower Flange

Fig. 1, Frame Rail and Extension Cutting Dimensions

Contents

Removal

1. Chock the front tires.
2. Raise the hood.
3. On the right-hand side of the vehicle, remove the lower end of the damper from the ball stud. Lift the steel spring clip with a small screwdriver and pop the end of the damper off. Pivot the hood damper on the upper ball stud and move it out of the way. See **Fig. 1**.



09/13/2001 f880544

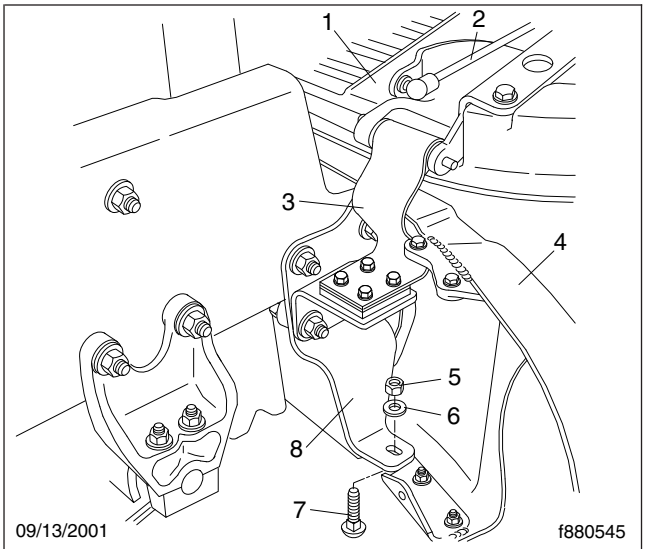
1. Flange of Reinforcement
2. Ball Stud
3. Hood Damper
4. Bumper
5. Bumper Reinforcement
6. M8 Ball Stud Fastener

Fig. 1, Hood Damper

NOTE: It is not necessary to remove the upper ball stud on the hood damper.

4. On each side of the vehicle, remove the lower bumper mounting bolt, washer, and locknut attaching the bumper to the bumper mounting bracket. See **Fig. 2**.
5. On each side of the vehicle, loosen the upper bumper mounting bolt and remove the nut and washer. Push up slightly on the hood to gain clearance, and remove both upper mounting bolts through the top of the bumper. See **Fig. 3**.

NOTE: Two persons are required for this step.



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The right-hand side is shown; the left-hand side is similar.

1. Hood
2. Hood Damper
3. Hood Pivot
4. Bumper
5. Bumper Locknut, 1/2–13
6. Washer
7. Lower Bumper Mounting Bolt, 1/2–13
8. Bumper Mounting Bracket

Fig. 2, Lower Bumper Mounting Bolt

6. With a helper, remove the bumper from the vehicle.

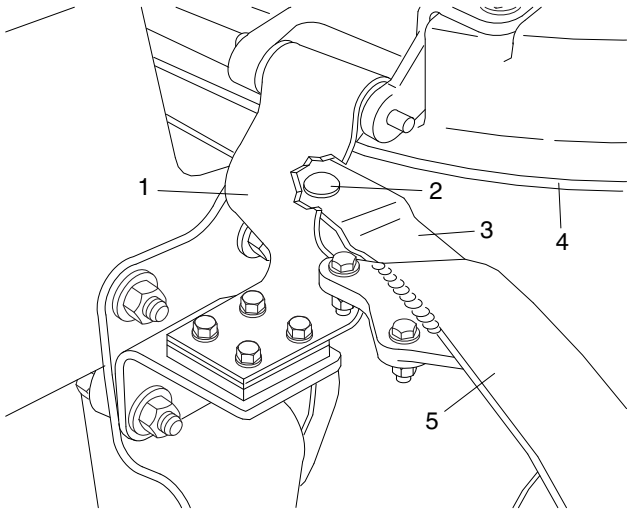
Installation

NOTE: Two persons are required for this step.

1. With a helper, position the bumper on the support brackets so that the holes for the mounting bolts line up. Install the upper and lower mounting bolts, nuts and washers.
2. On each side of the vehicle, tighten the 1/2–13 grade 8 locknuts 68 lbf·ft (92 N·m).
3. Fasten the bottom end of the hood damper to the bumper.

   3.1 Pivot the hood damper down and line up the ball stud with the fastener hole in the flange of the bumper reinforcement.

Bumper Removal and Installation



The right-hand side is shown; the left-hand side is similar.

1. Hood Pivot
2. Upper Bumper Mounting Bolt, 1/2–13
3. Bumper
4. Hood
5. Bumper End Cap

Fig. 3, Upper Bumper Mounting Bolt

3.2 Attach the M8 ball stud fastener to the ball stud.

3.3 Tighten the fastener 13 lbf·ft (18 N·m).

4. Lower the hood.
5. Remove the chocks from the tires.

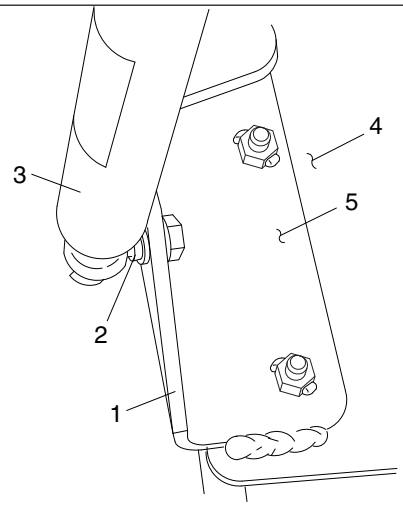
Bumper End Cap Removal and Installation

Removal

1. Chock the front tires.
2. Raise the hood.

NOTE: It is not necessary to remove the lower end of the damper for this procedure. The lower end of the damper is attached to the center bumper and the end caps can be removed with it installed. However, it is easier and quicker to do the following steps with the damper out of the way.

3. On the right-hand side of the vehicle, remove the lower end of the damper from the ball stud. Lift the steel spring clip with a small screwdriver and pop the end of the damper off. Pivot the hood damper on the upper ball stud and move it out of the way. See **Fig. 1**.



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1. Flange of Reinforcement
2. Ball Stud
3. Hood Damper
4. Bumper
5. Bumper Reinforcement

Fig. 1, Hood Damper

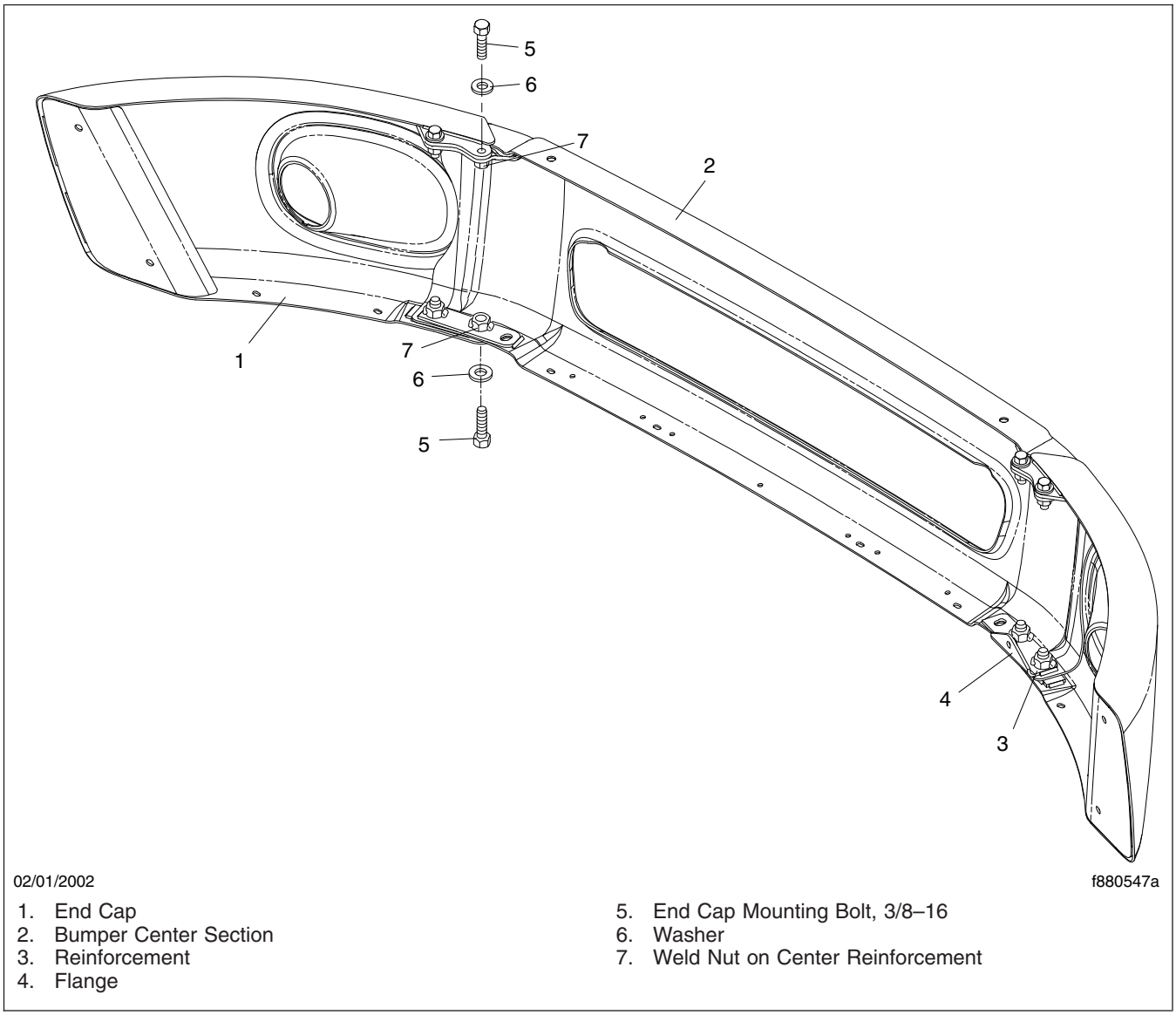
NOTE: It is not necessary to remove the upper ball stud on the hood damper.

4. On one side of the vehicle, remove the end cap from the bumper. See **Fig. 2**.
   - 4.1 Remove the lower end cap mounting bolt and washer attaching the end cap to the bumper center section.
   - 4.2 Remove the upper end cap mounting bolt and washer attaching the end cap to the bumper center section.
   - 4.3 Remove the end cap from the bumper center section.
5. On the other side of the vehicle, remove the other end cap following the same procedure.

Installation

1. Install one end cap on either end of the bumper center.
   - 1.1 Position one end cap on either end of the bumper center so that the holes for the mounting bolts line up.
   - 1.2 Install the upper and lower mounting bolts and washers.
2. Install the other end cap, following the same procedure.
3. On each side of the vehicle, tighten the 3/8–16 grade 5 mounting bolts 26 lbf·ft (36 N·m).
4. Fasten the bottom end of the hood damper to the bumper.
   - 4.1 Pivot the hood damper down and line up the ball stud with the fastener hole in the flange of the bumper reinforcement.
   - 4.2 Attach the M8 ball stud fastener to the ball stud.
   - 4.3 Tighten the fastener 13 lbf·ft (18 N·m).
5. Lower the hood.
6. Remove the chocks from the tires.

Bumper End Cap Removal and Installation



1. End Cap
2. Bumper Center Section
3. Reinforcement
4. Flange
5. End Cap Mounting Bolt, 3/8–16
6. Washer
7. Weld Nut on Center Reinforcement

Fig. 2, Bumper End Caps

Three-Piece Bumper Removal and Installation, Models with Bolt-On Front Frame Brackets

Removal

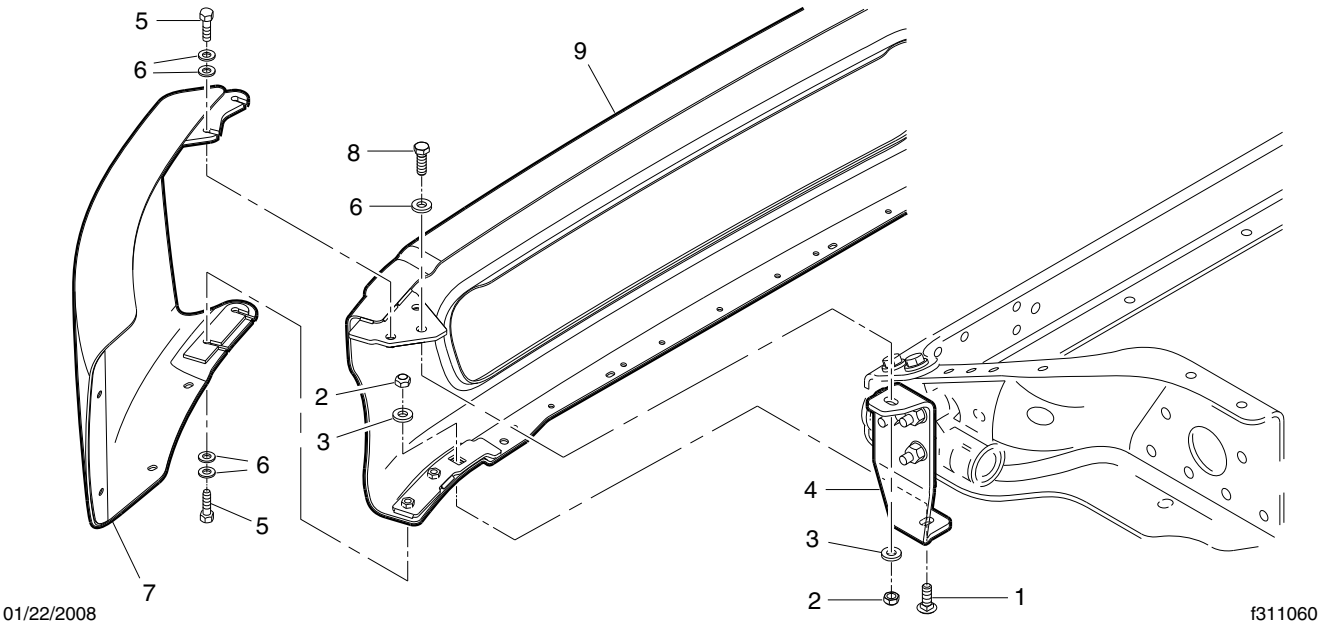
1. Chock the front tires.
2. Raise the hood.
3. If the bumper is equipped with fog lights, disconnect them.
4. At the underside of one end piece, remove the two capscrews that attach the end piece to the center piece. Then remove the two capscrews from the top of the end piece along with the end piece itself. See **Fig. 1**.
5. Repeat the previous step for the other end piece.

NOTE: Leave the upper bolts in place until you are ready to remove the center piece.

6. At one side of the center piece, remove the lower fasteners that attach the center piece to the bumper mounting bracket. Then remove the upper hexnut and washer but *not the upper bolt or its washer*.
7. Repeat the previous step at the opposite end of the center piece.
8. With the center piece securely grasped, remove the upper bolts that are supporting it, then remove the center piece from the vehicle.

Installation

1. Align the center piece with the bores for the tow hooks, and install the upper bolts to secure it to the bumper mounting brackets.
2. Install and hand tighten the remaining fasteners that attach the center piece to the bumper mounting bracket.
3. Ensure that there is an even gap between the center piece and hood. The bumper mounting brackets are designed to allow for angle adjustments.
4. Install and hand tighten the fasteners that attach the end pieces to the center piece.
5. If the bolts that attach the center piece to the bumper mounting bracket are 1/2-inch, grade 5, zinc-plated, tighten them 64 lbf·ft (87 N·m).



1. Round-Head Bolt
2. Hexnut
3. Hardened Steel Flatwasher
4. Bumper Mounting Bracket
5. 3/8" Capscrew
6. Stainless Steel Flatwasher
7. Bumper End Piece
8. Upper Bolt
9. Bumper Center Piece

Fig. 1, Three-Piece Bumper Installation

Three-Piece Bumper Removal and Installation, Models with Bolt-On Front Frame Brackets

If the bolts are 1/2-inch, grade 8, phosphate and oil, tighten them 68 lbf·ft (92 N·m).

6. Tighten the fasteners that attach the end pieces to the center piece 23 lbf·ft (31 N·m).
7. If the bumper is equipped with fog lights, connect them; use tie wraps to secure the wiring harnesses to the frame.
8. Lower the hood.
9. Remove the chocks from the tires.

Specifications

Bumper Torque Values			
Description	**Size**	**Grade**	**Torque in lbf·ft (N·m)**
Ball Stud Fastener, Hood Damper	M8	8.8	13 (18)
Bumper Mounting Bolts	1/2–13	5	68 (92)
Bumper End Cap Mounting Bolts	3/8–16	SST	26 (36)

Table 1, Bumper Torque Values

Contents

General Information

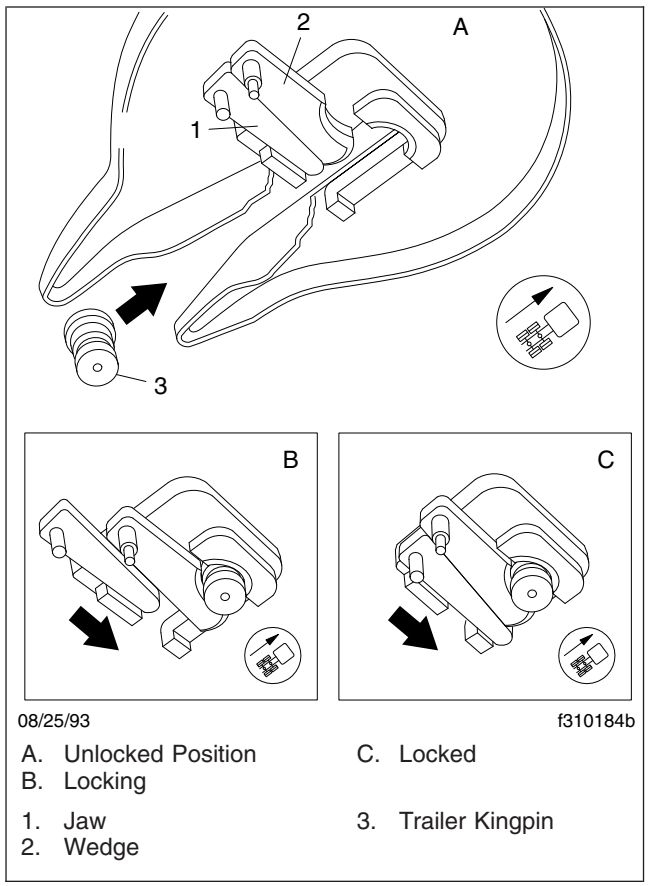
The Fontaine 6000 series fifth wheel couples to trailers having the standard kingpin. When installed with an A36 angle mount, the fifth wheel is bracket-mounted to the tractor frame in a position that best distributes the trailer load over the tractor axles.

The Fontaine fifth wheel lock mechanism for the trailer kingpin consists of a spring-loaded jaw and a sliding wedge. Kingpin release is accomplished by pulling a manual lock control handle located on either the right side or the left side of the fifth wheel. Kingpin lockup occurs when the kingpin enters the throat of the fifth wheel, triggers the jaw and wedge to slide into place behind the kingpin, and moves the lock control handle into the locked position.

As the kingpin enters the lock mechanism, the jaw is moved first with the spring-loaded wedge sliding in place against the jaw. See **Fig. 1**. The jaw will move behind the kingpin, followed by the wedge. The wedge reinforces the jaw and automatically adjusts for slack around the kingpin.

Placing the lock control handle in the unlocked position moves the wedge and jaw out from behind the kingpin and unlocks the fifth wheel.

See Chapter 10 in the *Business Class M2 Driver's Manual* for complete operating instructions.



A. Unlocked Position
B. Locking
C. Locked

1. Jaw
2. Wedge
3. Trailer Kingpin

Fig. 1, Fontaine Kingpin Lock Mechanism

Removal

⚠ WARNING

All fifth wheel maintenance, adjustment and rebuilding must be done by a qualified mechanic. Improper or incomplete procedures could result in disengagement of the trailer from the tractor, leading to personal injury or property damage.

Parts are under spring compression. Wear safety goggles during disassembly and assembly. Failure to do so can result in personal injury, due to parts ejecting with force.

1. Steam clean the top plate.
2. Remove the top plate from the mount. See **Fig. 1**.
   - 2.1 Remove the cotter pin from each bracket retainer pin.
   - 2.2 Remove a retainer pin and bracket pin from each side of the top plate.
3. Using an overhead hoist, lift the fifth wheel off the mount and tractor frame.
4. Turn the fifth wheel upside down and check it for cracks and for missing or damaged parts.

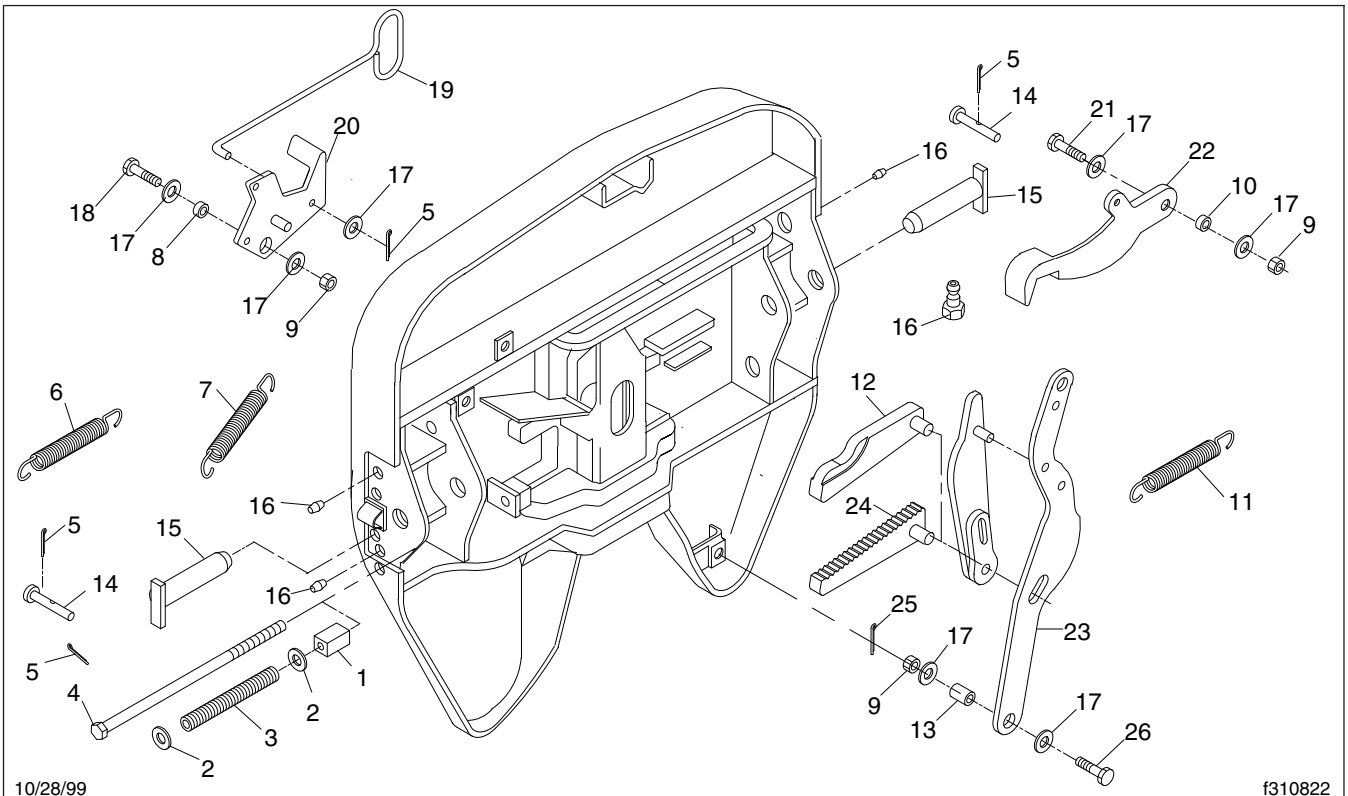
Disassembly

⚠ WARNING

Do not attempt to repair or rebuild the top plate if it is cracked or if parts are damaged. The top plate or parts could malfunction. This could result in disengagement of the trailer during vehicle travel, possibly causing personal injury and property damage.

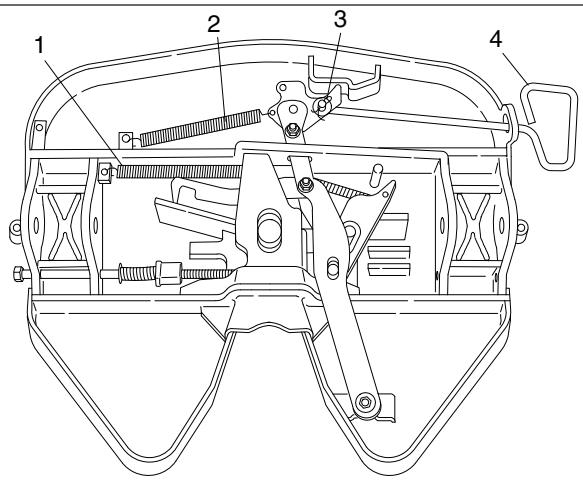
1. Remove the handle spring. See **Fig. 2**. Remove the cotter pin and flatwasher holding the pull handle to the secondary lock and remove the pull handle. Remove the bumper spring.
2. Unbolt and remove the secondary lock from the operating handle. See **Fig. 3**.
3. Unbolt and remove the bumper from the operating handle. See **Fig. 4**.
4. Unbolt the operating handle from the pivot mount and remove the operating handle. See **Fig. 5**.
5. Remove the timer spring and timer. See **Fig. 6**.
6. Remove the jaw and wedge. See **Fig. 7**.

Fifth Wheel Removal and Disassembly



1. Wedge Stop Rod Nut
2. Flatwasher, 5/8-Inch
3. Wedge Stop Rod Spring
4. Wedge Stop Rod
5. Cotter Pin, 3/16 x 1-Inch
6. Bumper Spring
7. Handle Spring
8. Bushing, 7/16-Inch
9. Hex Locknut, 1/2–13, Grade B
10. Bushing, 5/16-Inch
11. Timer Spring
12. Jaw
13. Bushing
14. Bracket Retainer Pin
15. Bracket Pin
16. Grease Fitting
17. Flatwasher, 1/2-Inch
18. Hexhead Bolt, 1/2–13 x 1.5
19. Pull Handle
20. Secondary Lock
21. Hexhead Bolt, 1/2–13 x 1.75
22. Bumper
23. Operating Handle
24. Wedge
25. Hair Pin Cotter
26. Hexhead Bolt, 1/2–13 x 2.25

Fig. 1, Fontaine 6A36 Fifth Wheel (left-side release shown)



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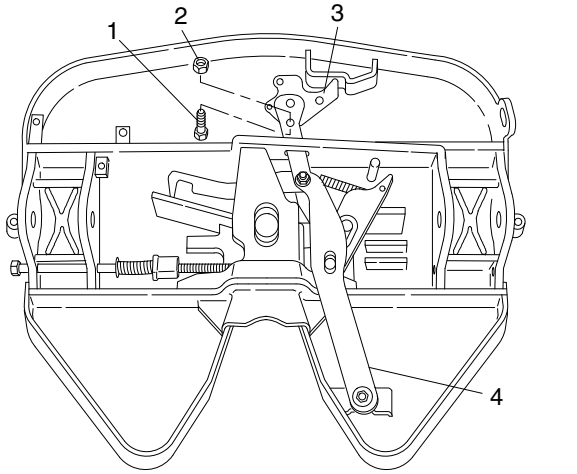
1. Bumper Spring
2. Handle Spring
3. Secondary Lock
4. Pull Handle

Fig. 2, Pull Handle Removal



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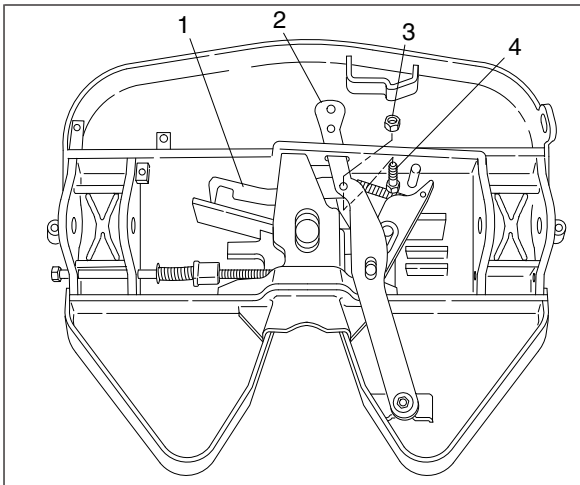
1. Hexhead Bolt, 1/2–13 x 1.5
2. Locknut, 1/2–13
3. Secondary Lock
4. Operating Handle

Fig. 3, Secondary Lock Removal



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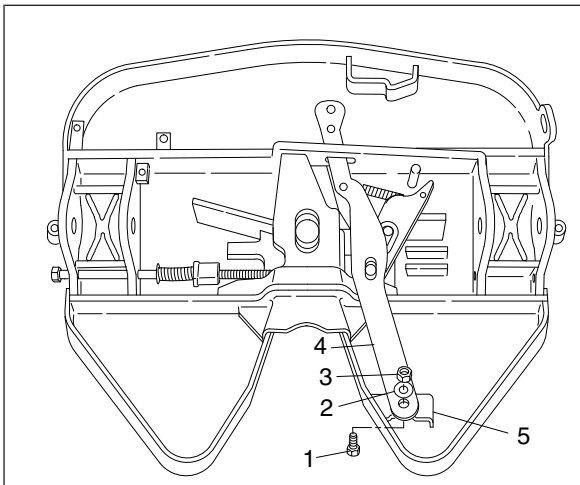
1. Bumper
2. Operating Handle
3. Locknut, 1/2–13
4. Hexhead Bolt, 1/2–13 x 1.75

Fig. 4, Bumper Removal



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1. Hexhead Bolt, 1/2–13 x 2.25
2. Flatwasher
3. Locknut, 1/2–13
4. Operating Handle
5. Pivot Mount

Fig. 5, Operating Handle Removal

Fifth Wheel Removal and Disassembly

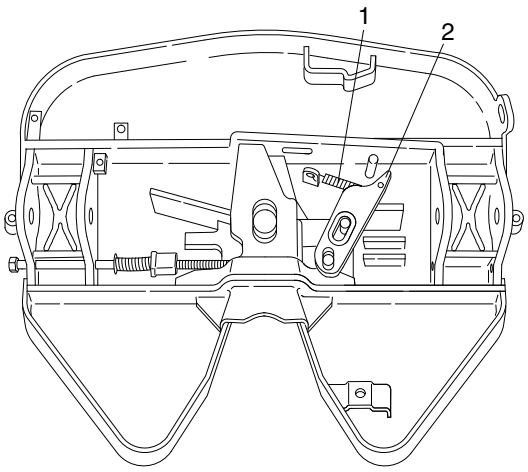


Fig. 6, Timer Spring and Timer Removal

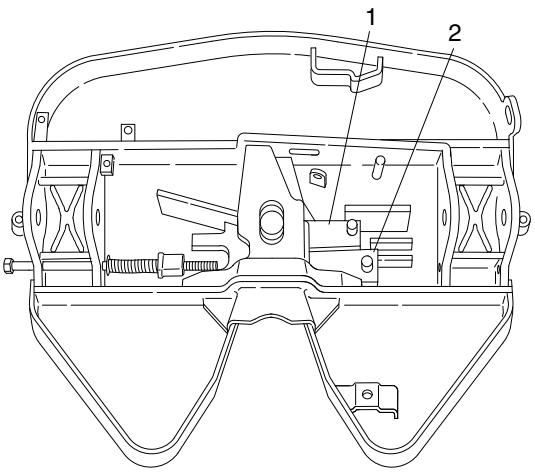


Fig. 7, Jaw and Wedge Removal

Assembly

⚠ WARNING

All fifth wheel maintenance, adjustment and rebuilding must be done by a qualified mechanic. Improper or incomplete procedures could result in possible disengagement of the trailer from the tractor, leading to personal injury and property damage.

Parts are under spring compression. Wear safety goggles during disassembly and assembly. Failure to do so can result in personal injury, due to parts ejecting with force.

IMPORTANT: Replace any parts that show signs of wear, damage or deterioration. See **Fig. 1**.

1. Clean all moving parts with No. 2 diesel fuel before assembly.
2. Insert the jaw and wedge. See **Fig. 2**.
3. Insert the timer and timer spring. See **Fig. 3**.
4. Insert the operating handle and bolt it to the pivot mount. See **Fig. 4**.
5. Install the bumper and bolt it to the operating handle. See **Fig. 5**.
6. Insert the secondary lock and bolt it to the operating handle. See **Fig. 6**.
7. Position the pull handle and install the flatwasher and a new cotter pin. Attach the handle spring and the bumper spring. See **Fig. 7**.

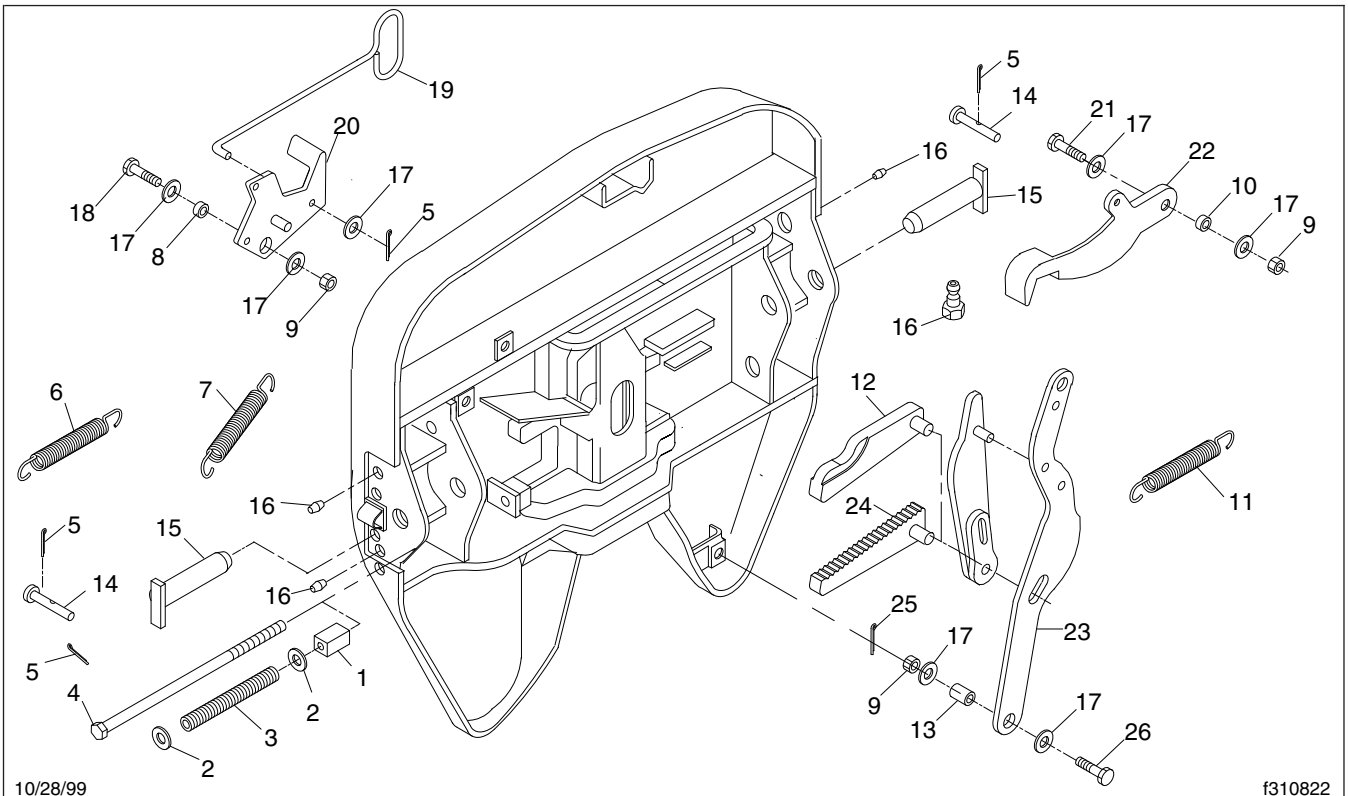
Installation

⚠ WARNING

If the fifth wheel does not operate properly, do not use it. The fifth wheel could malfunction, resulting in personal injury or property damage due to possible disengagement of the trailer from the tractor.

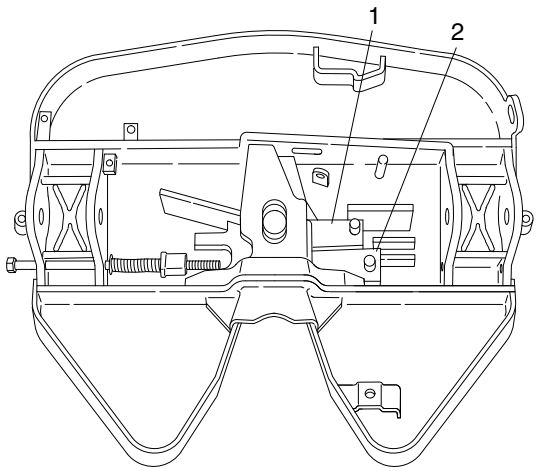
1. Using an overhead hoist, position the fifth wheel on the mount assembly. Insert the bracket pins. Install the bracket retainer pins and lock them with new 1-inch long cotter pins.
2. Close the fifth wheel several times with a standard 2-inch kingpin tool. With the lock closed, adjust the wedge stop rod so the end is 1/4-inch from the wedge. See **Troubleshooting, 300** for additional information.

Fifth Wheel Assembly and Installation



1. Wedge Stop Rod Nut
2. Flatwasher, 5/8-Inch
3. Wedge Stop Rod Spring
4. Wedge Stop Rod
5. Cotter Pin, 3/16 x 1-Inch
6. Bumper Spring
7. Handle Spring
8. Bushing, 7/16-Inch
9. Hex Locknut, 1/2–13, Grade B
10. Bushing, 5/16-Inch
11. Timer Spring
12. Jaw
13. Bushing
14. Bracket Retainer Pin
15. Bracket Pin
16. Grease Fitting
17. Flatwasher, 1/2-Inch
18. Hexhead Bolt, 1/2–13 x 1.5
19. Pull Handle
20. Secondary Lock
21. Hexhead Bolt, 1/2–13 x 1.75
22. Bumper
23. Operating Handle
24. Wedge
25. Hair Pin Cotter
26. Hexhead Bolt, 1/2–13 x 2.25

Fig. 1, Fontaine 6A36 Fifth Wheel (left-side release shown)



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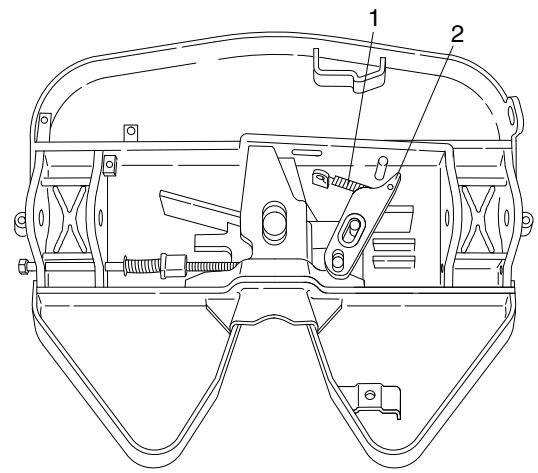
1. Jaw
2. Wedge

Fig. 2, Wedge and Jaw Installation



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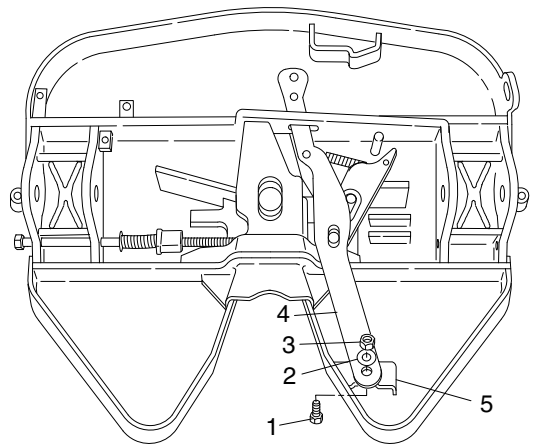
1. Timer Spring
2. Timer

Fig. 3, Timer and Timer Spring Installation



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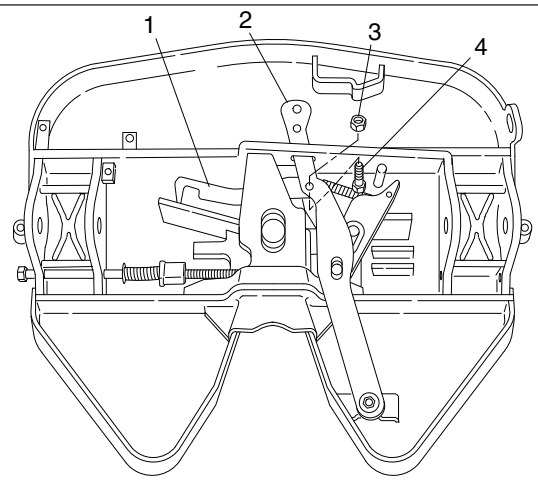
1. Hexhead Bolt, 1/2–13 x 2.25
2. Flatwasher
3. Locknut, 1/2–13
4. Operating Handle
5. Pivot Mount

Fig. 4, Operating Handle Installation



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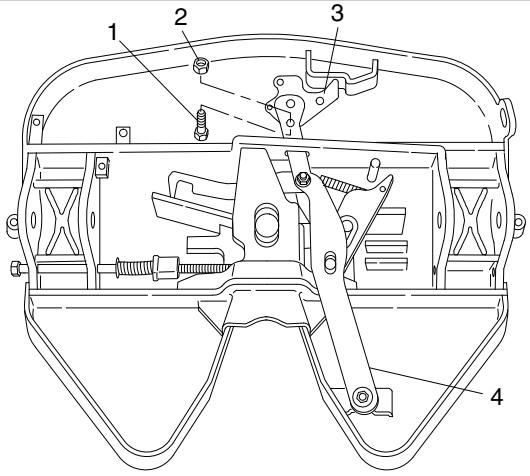
1. Bumper
2. Operating Handle
3. Locknut, 1/2–13
4. Hexhead Bolt, 1/2–13 x 1.75

Fig. 5, Bumper Installation

Fifth Wheel Assembly and Installation



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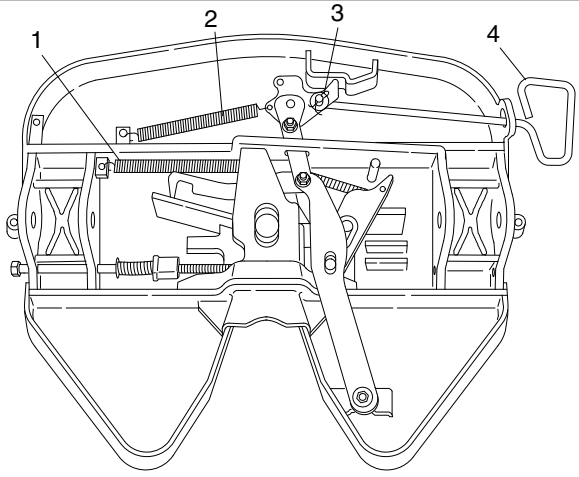
1. Hexhead Bolt, 1/2–13 x 1.5
2. Locknut, 1/2–13
3. Secondary Lock
4. Operating Handle

Fig. 6, Secondary Lock Installation



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1. Bumper Spring
2. Handle Spring
3. Secondary Lock
4. Pull Handle

Fig. 7, Pull Handle Installation

Troubleshooting Tables

Problem—Difficult Coupling

Problem—Difficult Coupling	
Possible Cause	**Remedy**
The kingpin is too high to trip the latch.	Lower the landing gear.
The trailer plate or kingpin is damaged.	Check the trailer plate for flatness. Check the kingpin for squareness with the trailer plate.

Problem—Excessive Wear on the Fifth Wheel Top Plate

Problem—Excessive Wear on the Fifth Wheel Top Plate	
Possible Cause	**Remedy**
The trailer plate is damaged.	If the trailer plate is not flat, replace it.

Problem—Difficult Uncoupling

Problem—Difficult Uncoupling	
Possible Cause	**Remedy**
The tractor has drifted apart from the trailer, putting excess pressure on the lock mechanism.	Back up the tractor and set the brakes. Strike the wedge stop rod which protrudes through the side of the fifth wheel. This spring-loaded rod will release the pressure on the locking mechanism.

Problem—Excessive Slack

Problem—Excessive Slack	
Possible Cause	**Remedy**
The wedge is improperly adjusted.	Open the fifth wheel and insert a 2-inch kingpin or a shaft with a 2-inch diameter. Trip the lock and adjust the wedge stop rod so that it is 1/4-inch from the end of the wedge.
The kingpin is undersized.	Replace the kingpin if it is worn greater than 1/8-inch (3-mm) at the 2-inch (5-cm) diameter.
The jaw and wedge are worn.	Replace the jaw and wedge.

Contents

General Information

Fontaine 6000 and 7000 series fifth wheels couple to trailers having the standard 2 inch kingpin. When installed as a stationary mount, the fifth wheel is bracket-mounted to the tractor frame in a position that best distributes the trailer load over the tractor axles. Sliding fifth wheels are mounted on the Fontaine AWB or MWS model slide mounts.

The Fontaine fifth wheel lock mechanism for the trailer kingpin consists of a spring-loaded jaw and sliding wedge. Kingpin release is accomplished by pulling a manual lock control handle located on either the right side (curbside) or left side (roadside) of the fifth wheel. Kingpin coupling occurs when the kingpin enters the throat of the fifth wheel, triggers the jaw and wedge to slide into place behind the kingpin, and moves the lock control handle into the locked position.

As the kingpin enters the lock mechanism, the jaw is moved first with the spring-loaded wedge sliding in place against the jaw. The jaw will move behind the kingpin, followed by the wedge. The wedge reinforces the jaw and automatically adjusts for slack around the kingpin. See **Fig. 1** for an illustration of the jaw and wedge in the locked position.

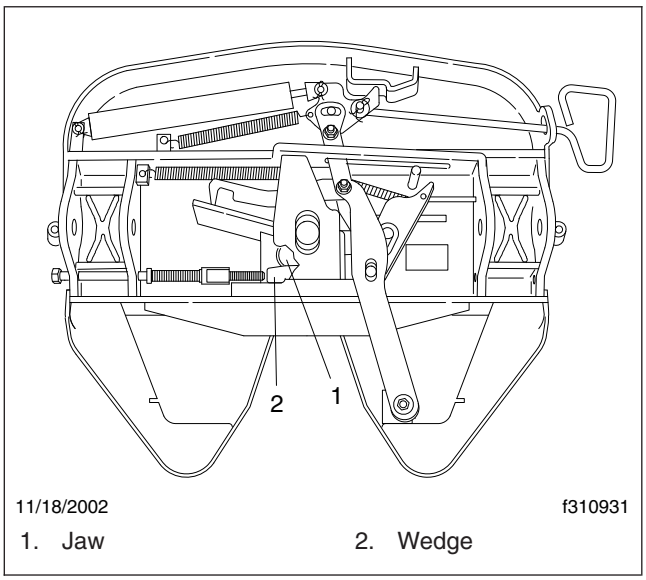


Fig. 1, Locked Position

Placing the lock control handle in the unlocked position moves the wedge and jaw out from behind the kingpin and unlocks the fifth wheel. See **Fig. 2** for an illustration of the jaw and wedge in the unlocked position.

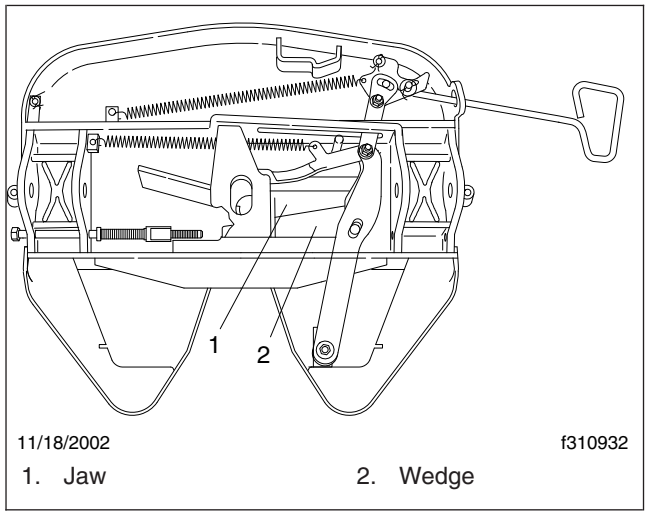


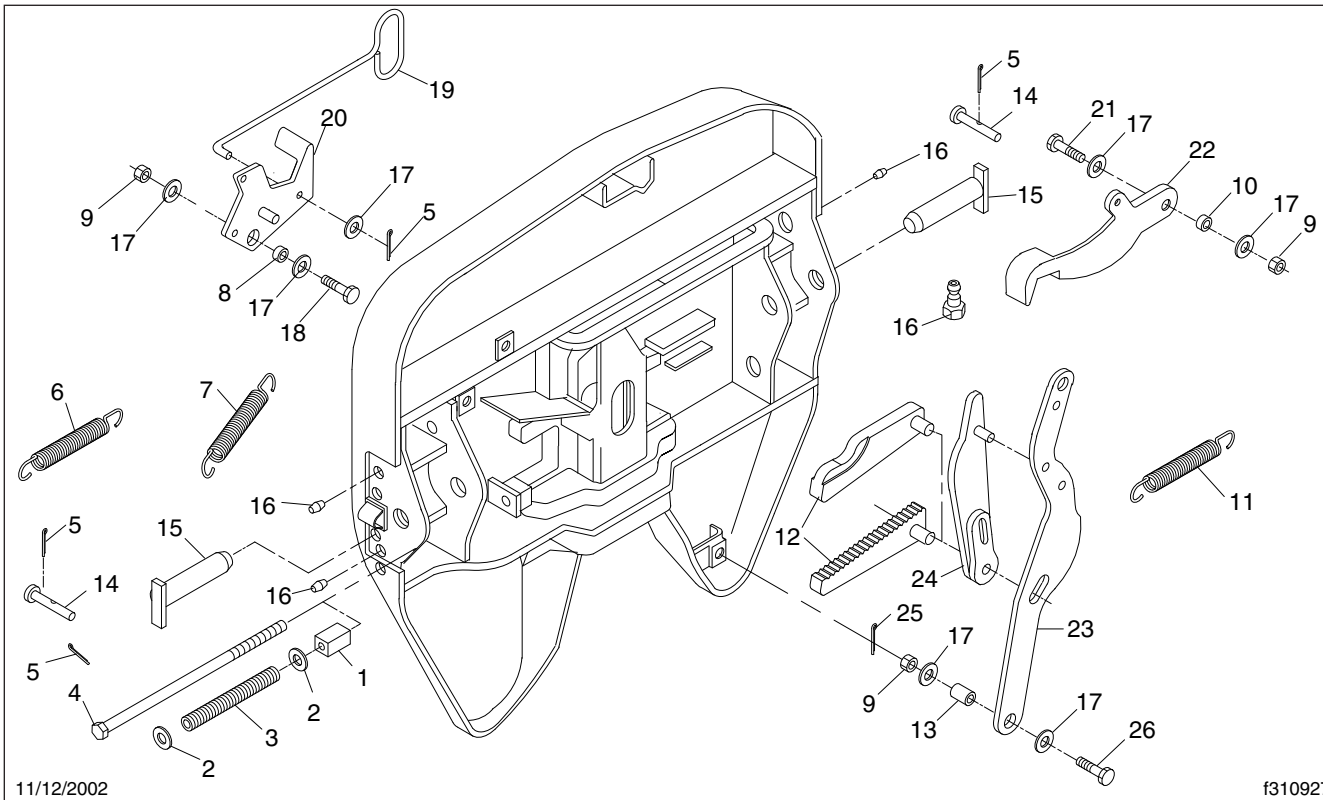
Fig. 2, Unlocked Position

Fifth Wheel Removal and Disassembly

See **Fig. 1** for an exploded view of a Fontaine® 6000 or 7000 No-Slack II series fifth wheel.

result in disengagement of the trailer from the tractor, leading to personal injury or property damage.

Parts are under spring compression. Wear safety goggles during disassembly and assembly. Fail-



1. Wedge Stop Rod Nut
2. Flatwasher, 5/8", Plain
3. Wedge Stop Rod Spring
4. Wedge Stop Rod
5. Cotter Pin, 3/16 x 1"
6. Bumper Spring
7. Handle Spring
8. Bushing, 7/16"
9. Hex Locknut, 1/2–13
10. Bushing, 5/16"
11. Timer Spring
12. Step Jaw and Wedge Set
13. Bushing
14. Bracket Retainer Pin
15. Bracket Pin
16. Grease Fitting
17. Flatwasher, 1/2" I.D. x 1-3/4" O.D., Plain
18. Hexhead Bolt, 1/2–13 x 1-1/2", Grade 5
19. Pull Handle
20. Secondary Lock
21. Hexhead Bolt, 1/2–13 x 1-3/4", Grade 5
22. Bumper
23. Operating Handle
24. Timer
25. Hairpin Cotter Pin
26. Hexhead Bolt, 1/2–13 x 2-3/4", Grade 5

Fig. 1, Fontaine 6000 and 7000 No-slack II Series Fifth Wheel (left side release shown)

⚠ WARNING

All fifth wheel maintenance, adjustment, and rebuilding must be done only by a qualified mechanic. Improper or incomplete procedures could

ure to do so can result in personal injury, due to parts ejecting with force.

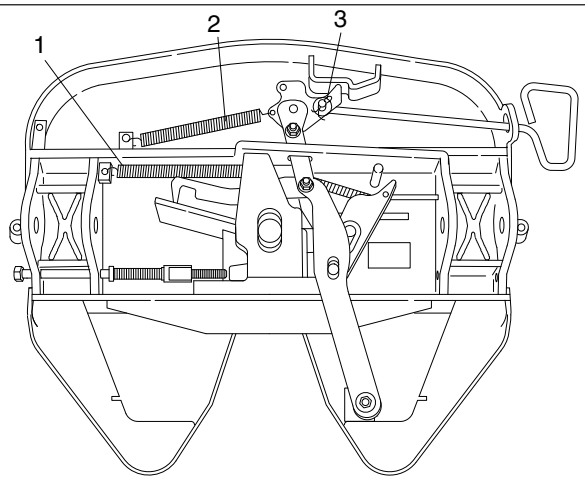
1. Steam clean the top plate. Remove it from the sliding mount by removing the cotter pins from the retaining pins. Remove the retaining pins and bushing pins from both sides of the top plate.

Removal and Disassembly

2. Using an overhead hoist, lift the fifth wheel off the sliding mount and tractor frame.
3. Turn the fifth wheel upside down.

NOTE: While disassembling the fifth wheel, check it for cracks and for missing or damaged parts.

4. Remove the secondary lock spring and bumper spring. See **Fig. 2**. Remove the pull handle cotter pin and washer, then slide out the pull handle.



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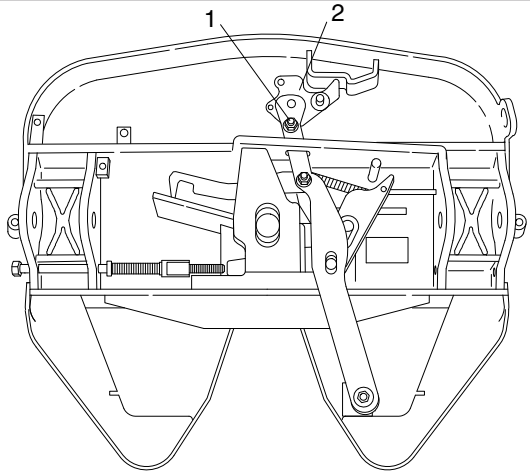
1. Bumper Spring
2. Secondary Lock Spring
3. Pull Handle Cotter Pin

Fig. 2, Pull Handle

5. Unbolt and remove the secondary lock from the operating handle. Discard the locknut and bushing. See **Fig. 3**.
6. Unbolt and remove the bumper from the operating handle. Discard the locknut and bushing. See **Fig. 4**.
7. Unbolt the operating handle from the pivot mount and remove. Discard the locknut. See **Fig. 5**.
8. Remove the timer spring and timer. See **Fig. 6**.
9. Remove the jaw and wedge. See **Fig. 7**.



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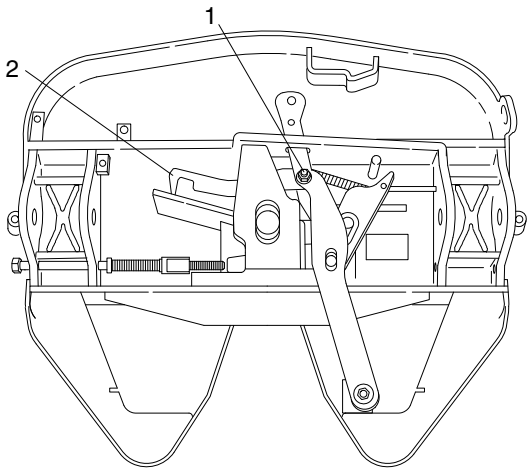
1. Bolt
2. Secondary Lock

Fig. 3, Secondary Lock



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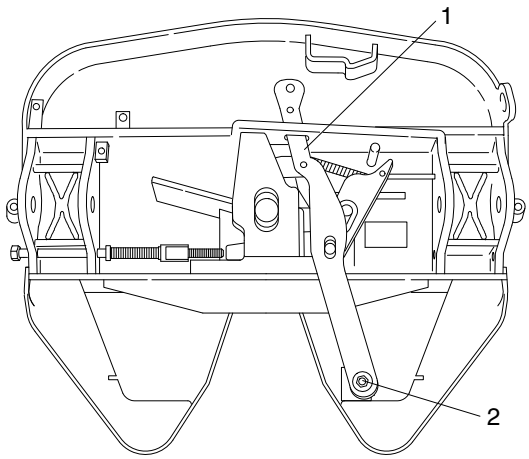
1. Bolt
2. Bumper

Fig. 4, Bumper



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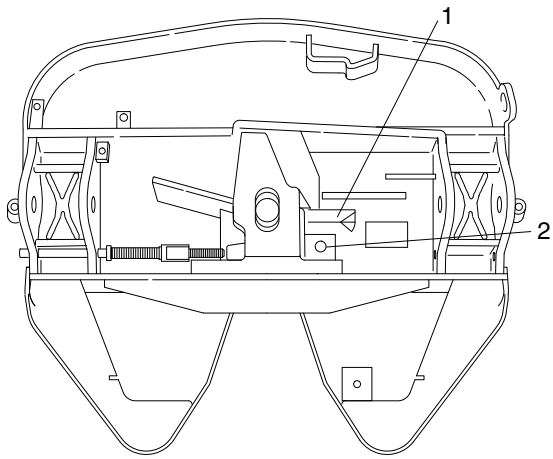
1. Operating Handle
2. Bolt

Fig. 5, Operating Handle



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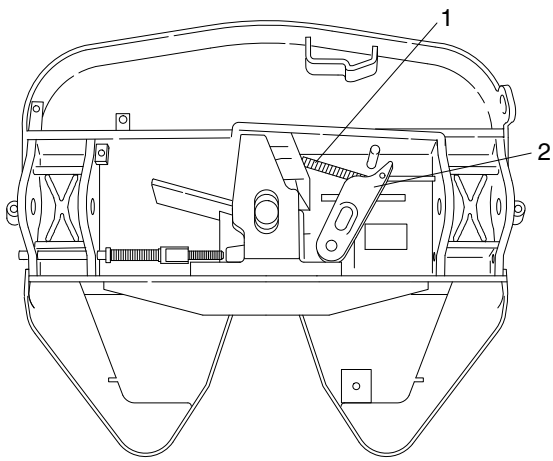
1. Jaw
2. Wedge

Fig. 7, Jaw and Wedge



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1. Timer Spring
2. Timer

Fig. 6, Timer Spring and Timer

Assembly and Installation

⚠ WARNING

Before rebuilding the assembly, check to make sure that there are no cracks in the crossmembers or other components. Also check the bracket pin holes to ensure they are not worn oversize (pins should fit snugly). Under no circumstances should a fifth wheel be repaired or used if any component (crossmember, saddle bearing, etc.) is cracked. Operating a fifth wheel with damaged components could result in disengagement of the trailer from the tractor, leading to personal injury or property damage.

Use a Moly-based lubricant such as Mobil grease Moly 50 or equivalent when applying lubricant to the locking jaw and wedge. Lightly oil other moving parts in the fifth wheel.

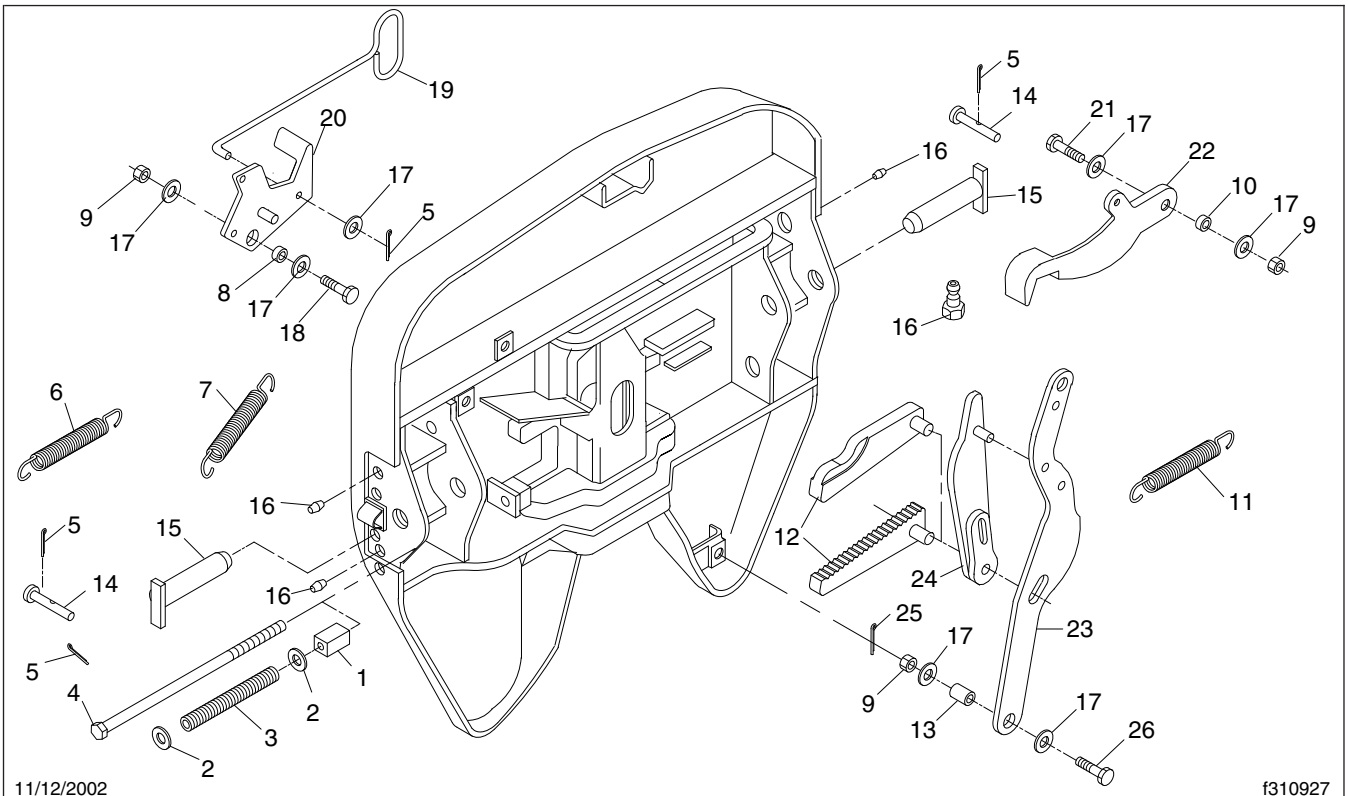
See **Fig. 1** for an exploded view of a Fontaine® 6000 or 7000 No-Slack II series fifth wheel.

1. Always assemble parts around a 2-inch kingpin or a 2-inch-diameter shaft. Insert the jaw first, then the wedge below it. See **Fig. 2**. Grease the jaw and wedge on the top and bottom.
2. Install the timer and the timer spring. See **Fig. 3**.
3. Install the operating handle and bolt to the pivot mount. See **Fig. 4**. Use the existing bolt, washer, hairpin cotter pin and bushing. Inspect the bushing for wear before using it and replace it if necessary. Use the new locknut that is supplied in the repair kit. Note the orientation of the bolt (**Fig. 1**).
4. Install the bumper and bolt it to the operating handle. See **Fig. 5**. Use the existing bolt and washers (inspect for wear before using and replace if necessary). Use the new locknut and bushing that is supplied in the repair kit. Note the orientation of the bolt (**Fig. 1**). After installing the bumper, check to make sure that it can pivot freely.
5. Insert the secondary lock and bolt it to the operating handle. See **Fig. 6**. Use the existing bolt and washers (inspect for wear before using and replace if necessary). Use the new locknut and bushing that is supplied in the repair kit. Note the orientation of the bolt (**Fig. 1**).
6. Install the pull handle. See **Fig. 7**. Use the existing washer and cotter pin (inspect for wear before using and replace if necessary). Attach the new secondary lock/bumper spring that is supplied in the repair kit. Open and close the fifth wheel to ensure that it works properly. The fifth wheel must be properly lubricated before opening and closing the wheel.

Use a Moly-based lubricant such as Mobil grease Moly 50 or equivalent when applying lubricant to the locking jaw and wedge. Lightly oil other moving parts in the fifth wheel.

7. Close the fifth wheel several times with a standard 2-inch kingpin tool. With the lock closed, adjust the wedge stop rod so that the end is 1/4 inch (6 mm) from the wedge. See **Fig. 8**.
8. Using an overhead hoist, position the fifth wheel on the sliding mount assembly. Insert the bushing pins. Install the retaining pins and the 1-inch-long cotter pins.

Assembly and Installation



1. Wedge Stop Rod Nut
2. Flatwasher, 5/8", Plain
3. Wedge Stop Rod Spring
4. Wedge Stop Rod
5. Cotter Pin, 3/16 x 1"
6. Bumper Spring
7. Handle Spring
8. Bushing, 7/16"
9. Hex Locknut, 1/2–13
10. Bushing, 5/16"
11. Timer Spring
12. Step Jaw and Wedge Set
13. Bushing
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15. Bracket Pin
16. Grease Fitting
17. Flatwasher, 1/2" I.D. x 1-3/4" O.D., Plain
18. Hexhead Bolt, 1/2–13 x 1-1/2", Grade 5
19. Pull Handle
20. Secondary Lock
21. Hexhead Bolt, 1/2–13 x 1-3/4", Grade 5
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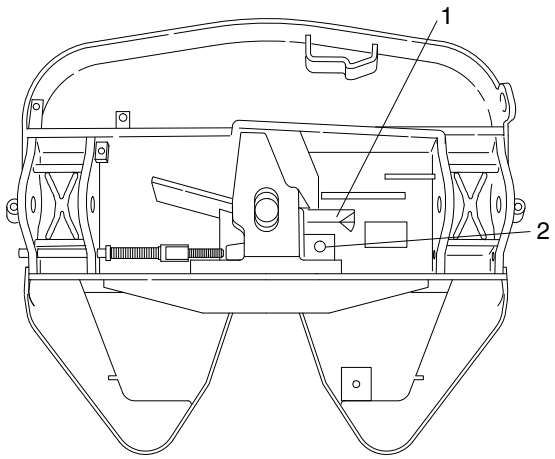
23. Operating Handle
24. Timer
25. Hairpin Cotter Pin
26. Hexhead Bolt, 1/2–13 x 2-3/4", Grade 5

Fig. 1, Fontaine 6000 and 7000 No-slack II Series (left-side release shown)



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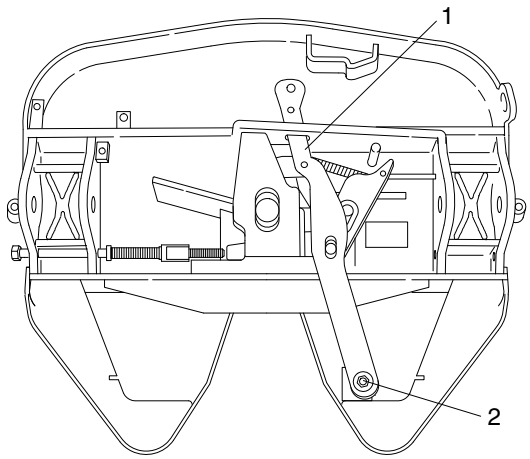
1. Jaw
2. Wedge

Fig. 2, Jaw and Wedge



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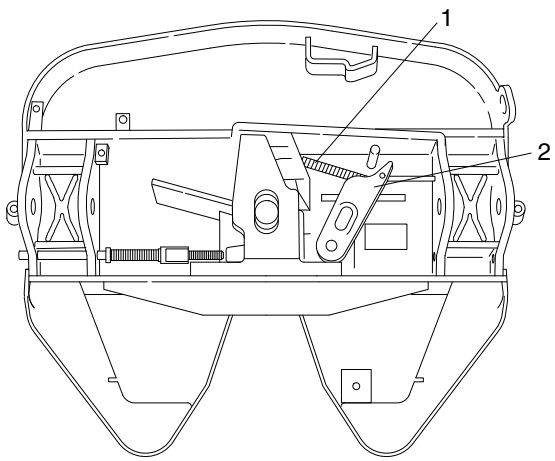
1. Operating Handle
2. Bolt

Fig. 4, Operating Handle



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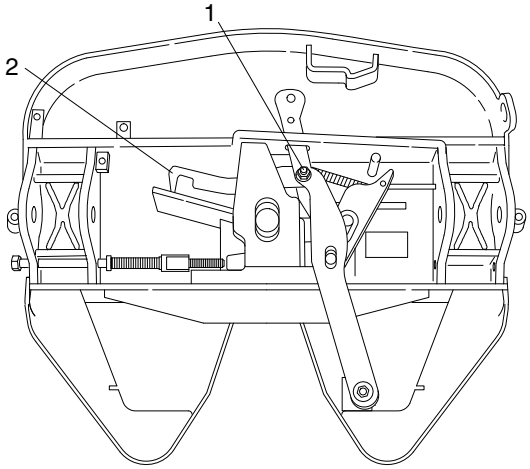
1. Timer Spring
2. Timer

Fig. 3, Timer Spring and Timer



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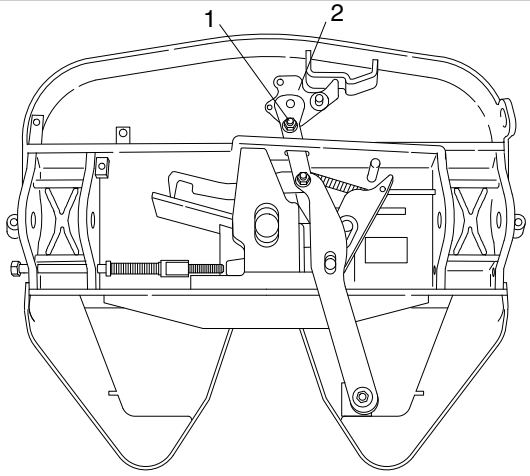
1. Bolt
2. Bumper

Fig. 5, Bumper

Assembly and Installation



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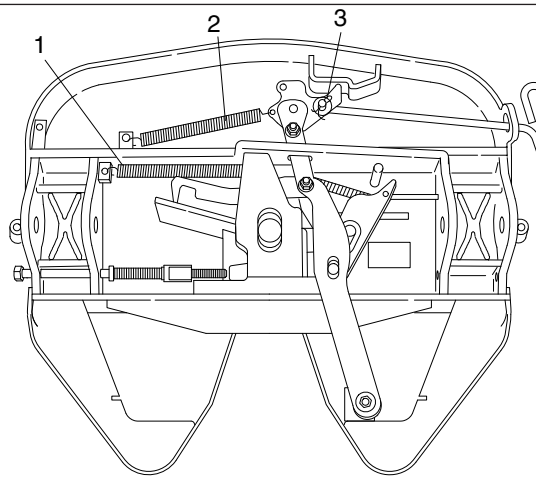
1. Bolt
2. Secondary Lock

Fig. 6, Secondary Lock



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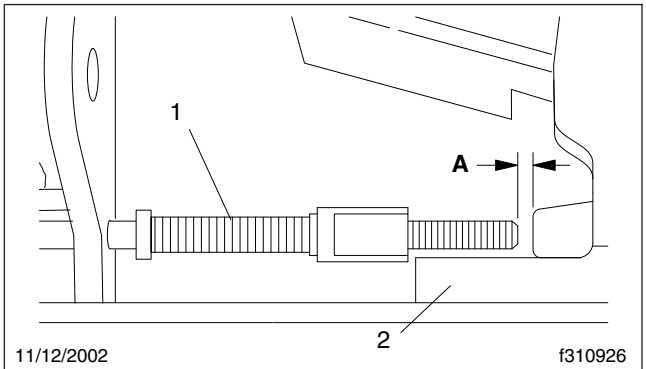
1. Bumper Spring
2. Secondary Lock Spring
3. Pull Handle Cotter Pin

Fig. 7, Pull Handle



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A. 1/4 inch (6 mm)

1. Stop Rod
2. Wedge

Fig. 8, Wedge Stop Rod Adjustment

Troubleshooting Tables

Problem—Difficulty Coupling

Problem—Difficulty Coupling	
Possible Cause	**Remedy**
The kingpin is too high to trip the latch	Lower the landing gear.
The trailer plate or kingpin is damaged	Check the trailer plate for flatness. Check the kingpin for squareness with the trailer plate.

Problem—Excessive Wear on the Fifth Wheel Top Plate

Problem—Excessive Wear on the Fifth Wheel Top Plate	
Possible Cause	**Remedy**
Damaged trailer plate	If the trailer plate is not flat, replace it.

Problem—Difficulty Uncoupling

Problem—Difficulty Uncoupling	
Possible Cause	**Remedy**
Pressure on the locking mechanism caused by truck drifting apart from the trailer putting excess pressure on the lock	Back up the trailer and set the brakes. Strike the wedge stop rod which protrudes through the side of the fifth wheel. This spring-loaded rod will release the pressure on the locking mechanism.
Oval-shaped kingpin	Lower the landing gear.
Debris build-up in the grease	

Problem—Slack

Problem—Slack	
Possible Cause	**Remedy**
Undersized kingpin	Replace the kingpin if worn greater than 1/8 inch (3 mm) at the 2-inch (5-cm) diameter.
Worn jaw and wedge	Jaw and wedge could have excessive wear. Replace them.

Contents

General Information

Fontaine H5092 series fifth wheels couple to trailers having the standard 2-inch kingpin. When installed as a stationary mount, the fifth wheel is bracket-mounted to the tractor frame in a position that best distributes the trailer load over the tractor axles. Sliding fifth wheels (**Fig. 1**), are mounted on the Fontaine HAWB or HMWS (previously called 5AWB and 5MWS) model slide mounts.

The Fontaine fifth wheel lock mechanism for the trailer kingpin consists of a spring-loaded jaw and sliding wedge. Kingpin release is accomplished by pulling a manual lock control handle located on either the right side (curbside) or left side (roadside) of the fifth wheel. Kingpin coupling occurs when the kingpin enters the throat of the fifth wheel, triggers the jaw and wedge to slide into place behind the kingpin, and moves the lock control handle into the locked position.

As the kingpin enters the lock mechanism, the jaw is moved first with the spring-loaded wedge sliding in place against the jaw. The jaw will move behind the kingpin, followed by the wedge. The wedge reinforces the jaw and automatically adjusts for slack around the kingpin. See **Fig. 2** for an illustration of the jaw and wedge in the locked position.

Placing the lock control handle in the unlocked position moves the wedge and jaw out from behind the kingpin and unlocks the fifth wheel. See **Fig. 3** for an illustration of the jaw and wedge in the unlocked postition.

General Information

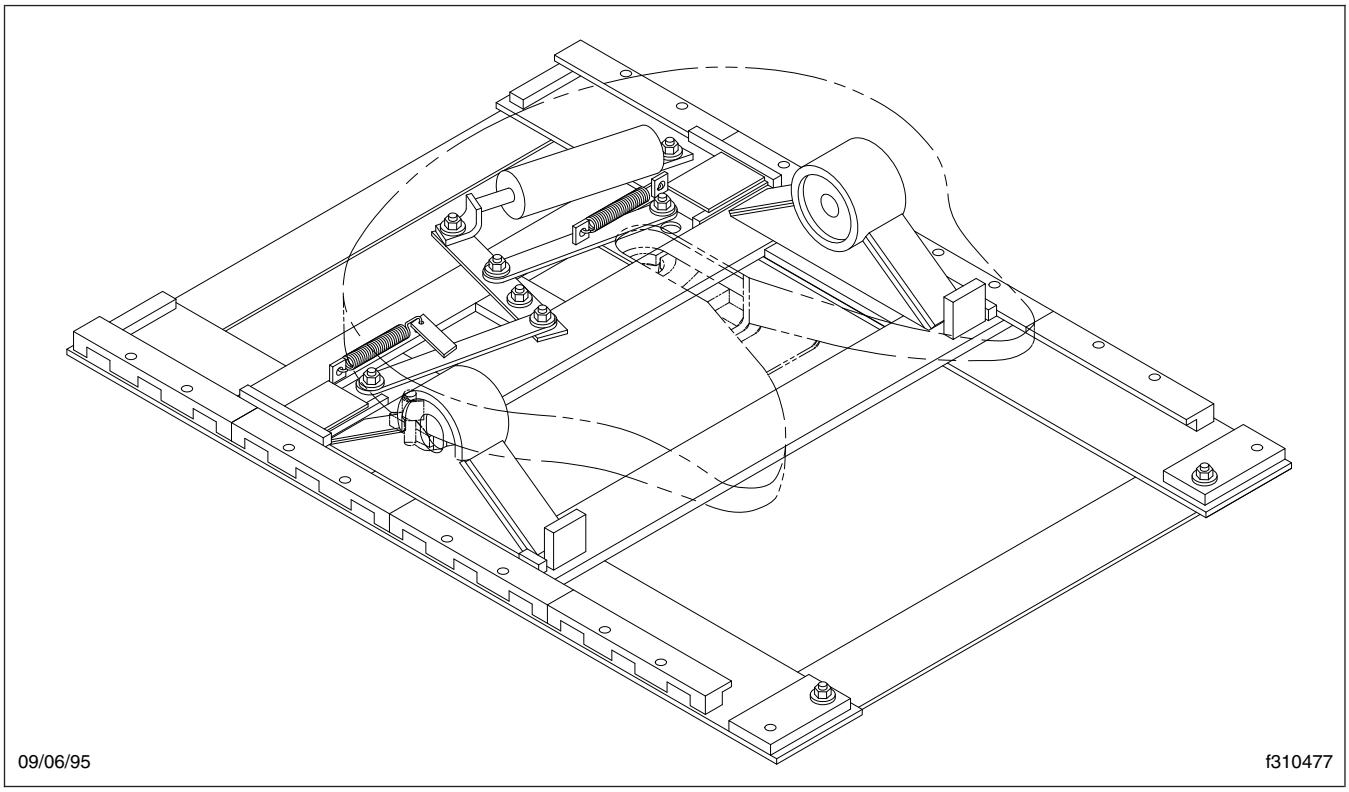


Fig. 1, Fontaine H5092 Series Air Slide Fifth Wheel

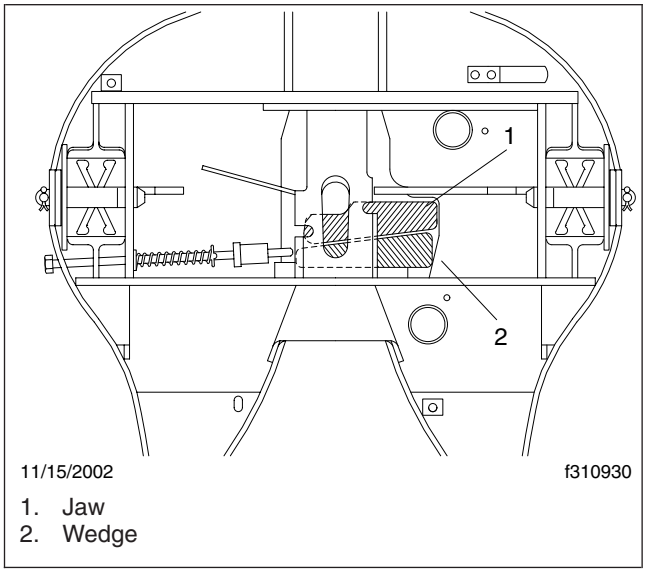


Fig. 2, Locked Position

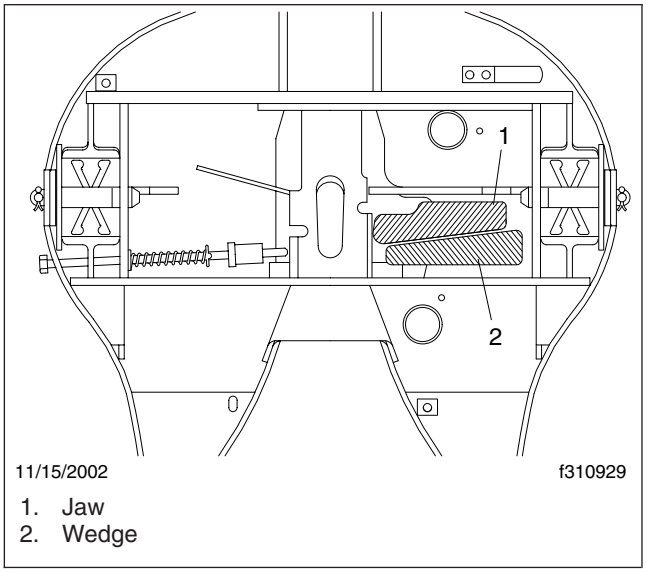


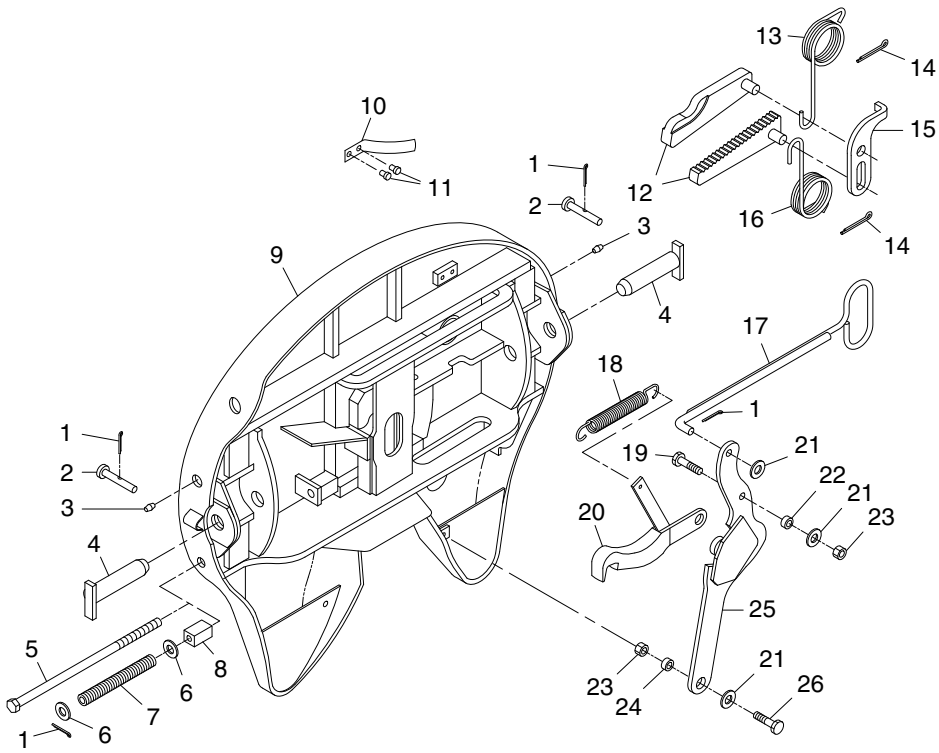
Fig. 3, Unlocked Position

Fifth Wheel Removal and Disassembly

See **Fig. 1** for an exploded view of the Fontaine® H5092 fifth wheel.

result in disengagement of the trailer from the tractor, leading to personal injury or property damage.

Parts are under spring compression. Wear safety goggles during disassembly and assembly. Fail-



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1. Wedge Stop Rod Nut
2. Flatwasher, 5/8", Plain
3. Wedge Stop Rod Spring
4. Wedge Stop Rod
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15. Bracket Pin
16. Grease Fitting
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19. Pull Handle
20. Secondary Lock
21. Hexhead Bolt, 1/2–13 x 1-3/4", Grade 5
22. Bumper
23. Operating Handle
24. Timer
25. Hairpin Cotter Pin
26. Hexhead Bolt, 1/2–13 x 2-3/4", Grade 5

Fig. 1, Fontaine H5092 Series Fifth Wheel (left-side release shown)

⚠ WARNING

All fifth wheel maintenance, adjustment, and rebuilding must be done only by a qualified mechanic. Improper or incomplete procedures could

ure to do so can result in personal injury, due to parts ejecting with force.

1. Steam clean the top plate. Remove it from the sliding mount by removing the cotter pins from the retaining pins. Remove the retaining pins and bushing pins from both sides of the top plate.

Removal and Disassembly

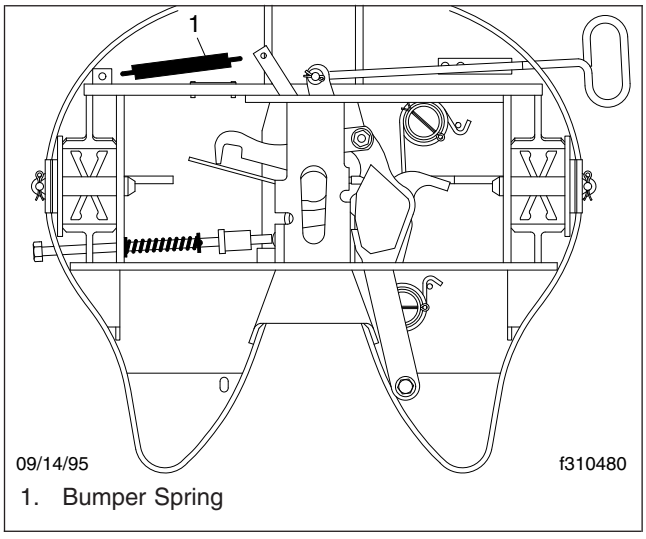
2. Using an overhead hoist, lift the fifth wheel off the sliding mount and tractor frame.
3. Turn the fifth wheel upside down.

NOTE: While disassembling the fifth wheel, check it for cracks and for missing or damaged parts.

⚠ WARNING

Do not attempt to repair or rebuild the top plate if it is cracked or if parts are damaged. The top plate or parts could malfunction. This could result in disengagement of the trailer during vehicle travel, possibly causing personal injury and property damage.

4. Set the fifth wheel in a locked position, then unhook the bumper spring from the bumper tang and the tab on the side of the fifth wheel substructure. See **Fig. 2**. Remove the bumper spring.



1. Bumper Spring

Fig. 2, Bumper Spring Removal

5. Remove the two bolts on the operating handle. **Fig. 3.** Each bolt has a nut, washer, and bushing. Discard the bushings.
6. Remove the cotter pin and washer that holds the pull handle to the operating handle. Slide the pull handle out through the side of the fifth wheel. See **Fig. 4**.
7. Slide the operating handle over to the side of the fifth wheel. Slide the bottom part first. This will allow the handle to clear the jaw and wedge studs on the underside and clear the timer. See **Fig. 5**.

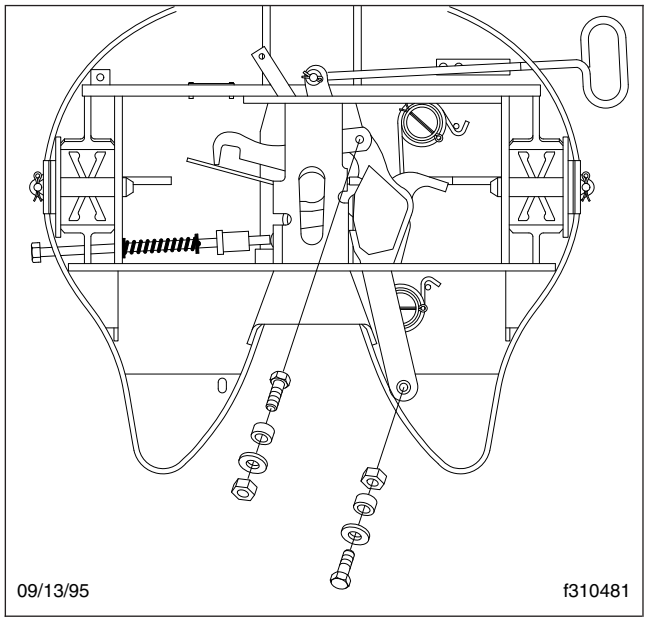


Fig. 3, Bolt Removal

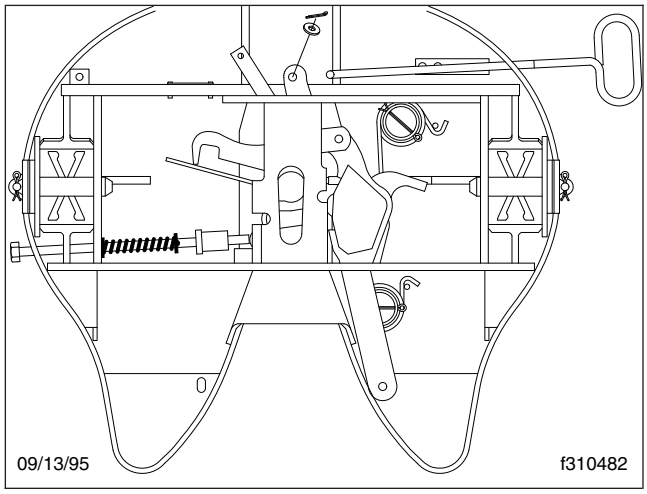
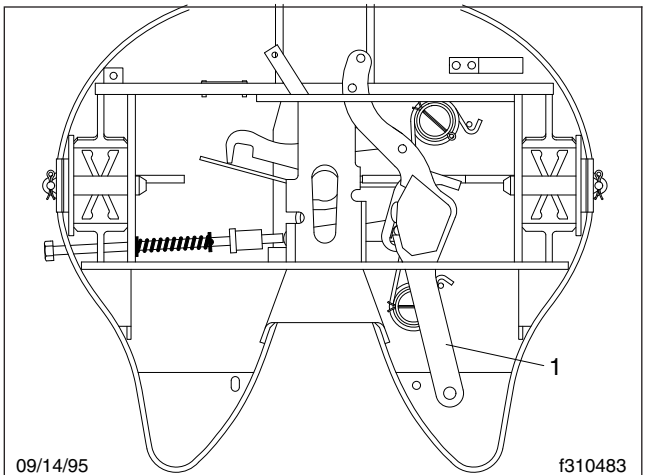


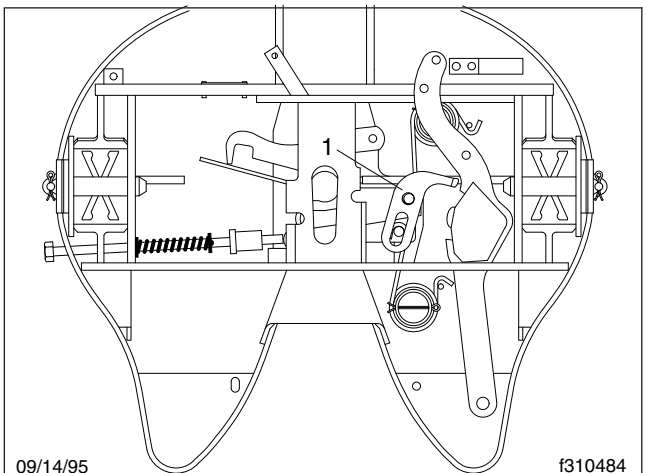
Fig. 4, Pull Handle Removal

8. Remove the timer by lifting upward. See **Fig. 6**.
9. Slide the operating handle out through the slot in the rear crossmember of the fifthwheel. See **Fig. 7**.
10. Slide the bumper toward the operating handle slot and to the rear of the fifth wheel until the



1. Operating Handle

Fig. 5, Operating Handle Positioning



1. Timer

Fig. 6, Timer Removal

bumper tang clears the operating handle slot. Lift upward and remove. See **Fig. 8**.

⚠ WARNING

The wedge spring is under extreme tension. Always wear safety glasses. Do not stand directly over the springs. A flying spring could cause personal injury.

11. Remove the cotter pins from the jaw and wedge springs. Discard the cotter pins, and pry the small hooked tail of the jaw and wedge spring up over the jaw and wedge studs. Remove and discard both springs. See **Fig. 9**.
12. Remove the wedge first, and then the jaw. Discard the jaw and wedge. See **Fig. 10**.

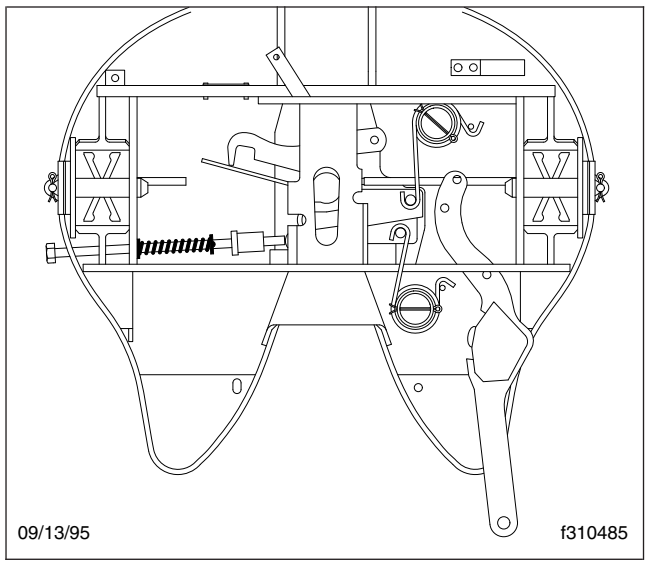
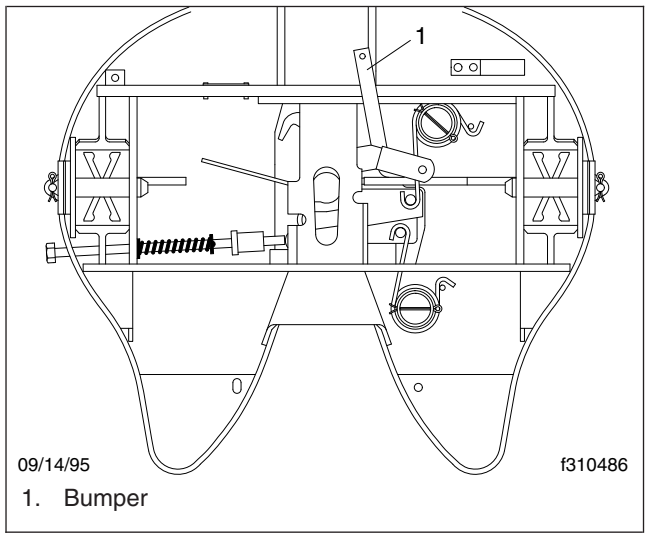


Fig. 7, Operating Handle Removal



1. Bumper

Fig. 8, Bumper Removal

Removal and Disassembly

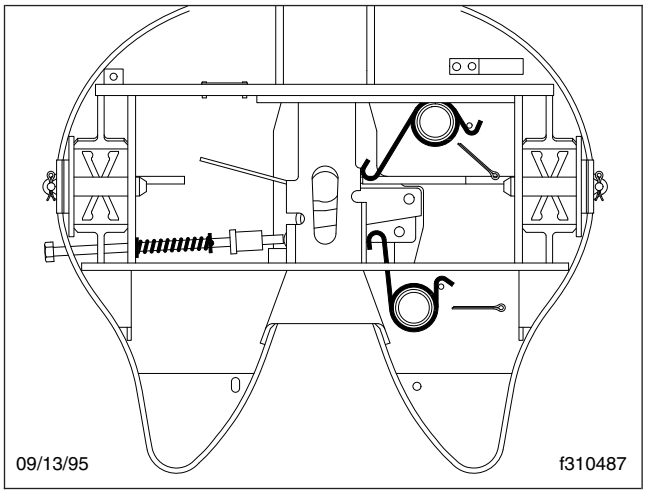


Fig. 9, Spring Removal

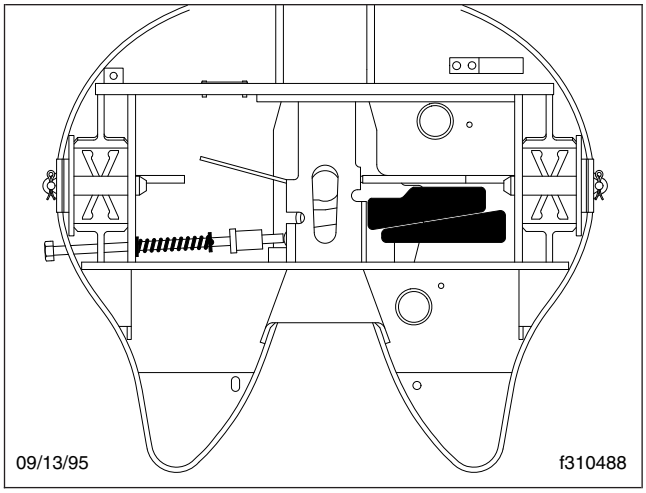


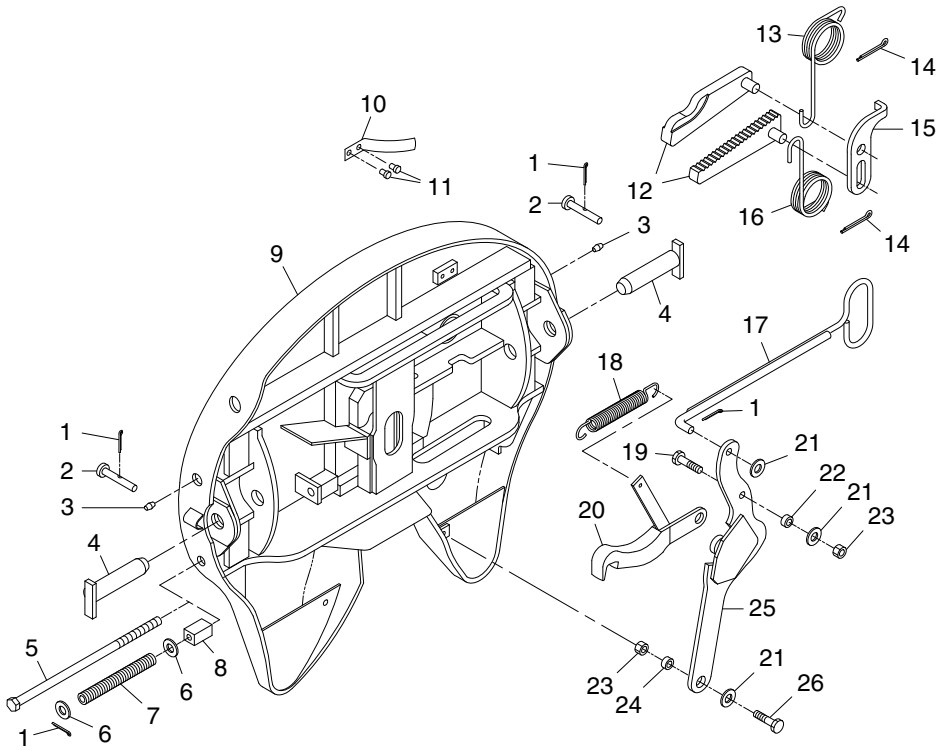
Fig. 10, Jaw and Wedge Removal

Assembly and Installation

See **Fig. 1** for an exploded view of a Fontaine® H5092 fifth wheel.

from the tractor, leading to personal injury and property damage.

Parts are under spring compression. Wear safety goggles during disassembly and assembly. Fail-



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1. Cotter Pin, 3/16" x 1"
2. Lower Bracket Retainer Pin
3. Grease Fitting
4. Lower Bracket Pin
5. Wedge Stop Rod
6. Flatwasher
7. Wedge Stop Rod Spring
8. Nut, Wedge Stop Rod
9. Upper Assembly, Side Release
10. Leaf Spring
11. Thread-Cutting Screw, 1/4–20 x 3/8"
12. Step Jaw and Wedge
13. Jaw Spring
14. Cotter Pin, 1/4" x 3"
15. Timer
16. Wedge Spring
17. Pull Handle
18. Bumper Handle Spring
19. Hexhead Bolt, 1/2–13 x 2", Bumper Pivot
20. Bumper
21. Flatwasher
22. Bushing, 5/16", Bumper Pivot
23. Hex Locknut, 1/2–13
24. Bushing, 7/16", Handle Pivot
25. Operating Handle, Side Release Only
26. Hexhead Bolt, 1/2–13 x 2", Handle Pivot

Fig. 1, Fontaine H5092 Series Fifth Wheel (left-side release shown)

⚠ WARNING

All fifth wheel maintenance, adjustment, and rebuilding must be done only by a qualified mechanic. Improper or incomplete procedures could result in possible disengagement of the trailer

ure to do so can result in personal injury, due to parts ejecting with force.

IMPORTANT: Replace any parts that show signs of wear, damage, or deterioration.

1. Clean all moving parts with no. 2 diesel fuel before assembly.

Fifth Wheel Assembly and Installation

2. Always assemble the parts around a 2-inch kingpin or a shaft with a 2-inch diameter. Insert the jaw first and then the new wedge below it. Apply a moderate amount of grease having EP (extra pressure) additives to the sides and serrated edges of the jaw and wedge. Also apply grease to the stationary jaw in the throat of the fifth wheel. See **Fig. 2**.

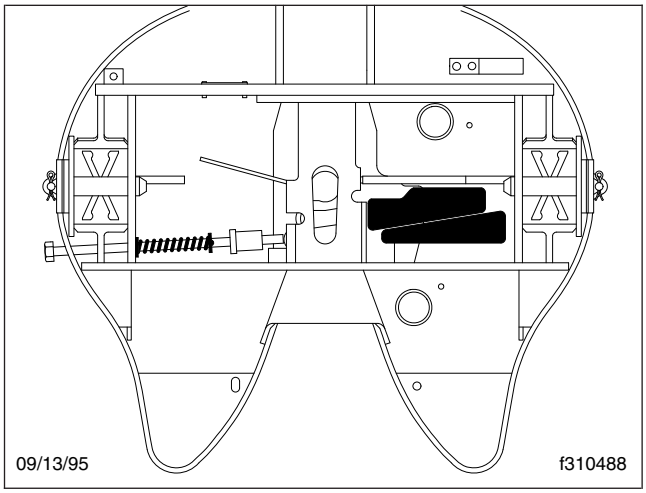


Fig. 2, Wedge and Jaw Installation

3. Insert the new wedge spring through the slot in the rear crossmember and lay the coil over the spring boss. Using a spring tool, engage the small hooked tail of the wedge spring and wind it around until it is directly over the small stud at the back of the bracket. Using a hammer, nudge the spring downward allowing it to catch on the stud. Insert a new cotter pin. See **Fig. 3**.

   Repeat these steps to replace the jaw spring.

NOTE: The jaw spring has minimal tension and can be replaced by hand.

4. Place the bumper back in position, sliding the bumper tang through the operating handle guide slot and toward the tab on the side of the fifth wheel substructure. See **Fig. 4**.
5. Apply a liberal amount of grease to the grooved middle section of the operating handle, then insert the operating handle and move it over to the side of the wheel. See **Fig. 5**.
6. Insert the timer over the jaw and wedge studs. the small hole on the timer fits over the jaw stud and the slotted hole fits over the wedge stud. Be certain the small bent arm of the timer is facing downward. See **Fig. 6**.

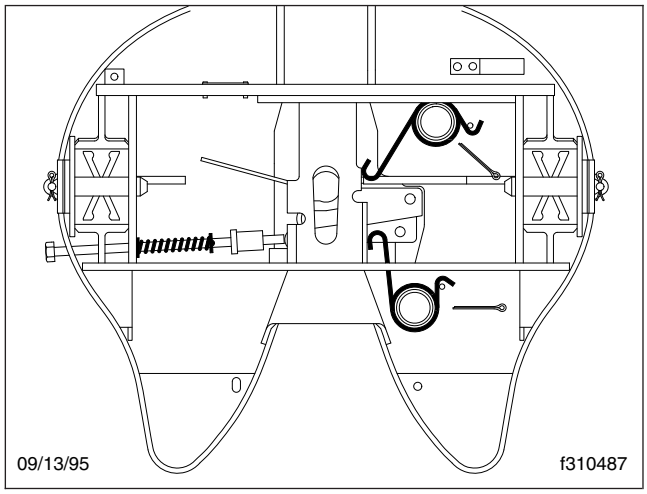
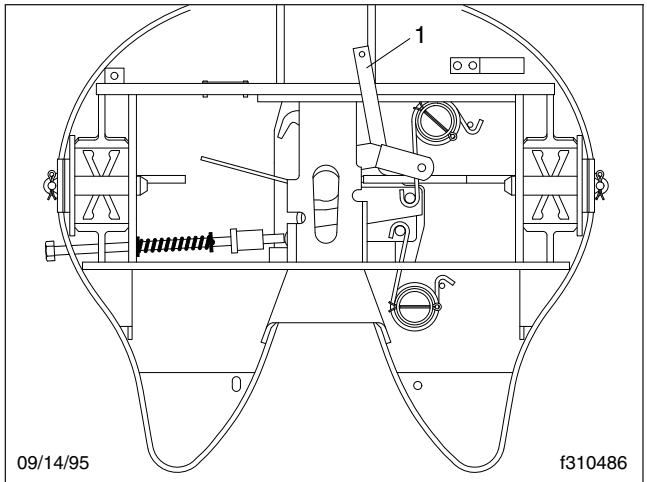


Fig. 3, Spring Installation



1. Bumper

Fig. 4, Bumper Installation

7. Slide the operating handle toward the center of the wheel to engage the handle with the studs on the jaw and wedge. Slide the top part first. This will ensure that the grooves on the operating handle are aligned with the studs. A correctly aligned operating handle should be in a vertical position once it goes over the studs. See **Fig. 7**.
8. Slide the pull handle in through the safety lock and using the cotter pin and washer, fasten it in the top hole of the operating handle. See **Fig. 8**.

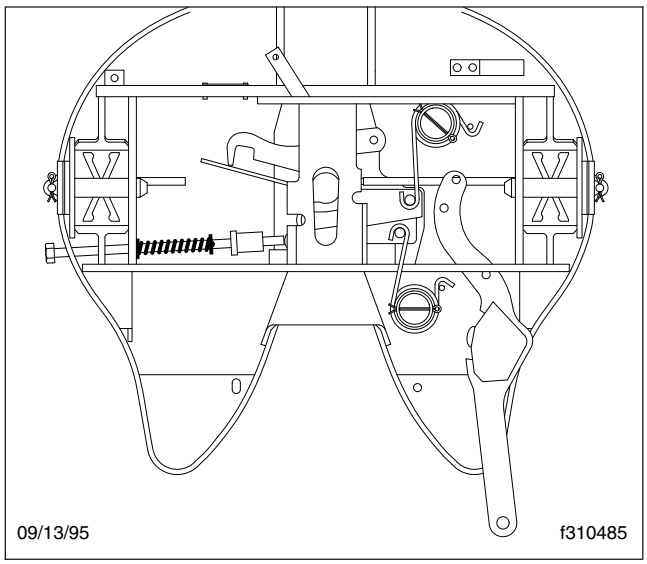


Fig. 5, Operating Handle Installation

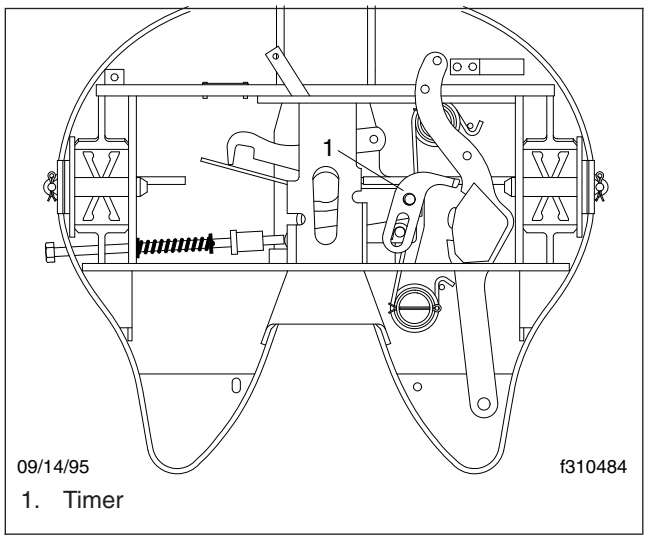


Fig. 6, Timer Installation

9. Align the bumper hole with the hole in the operating handle. Replace the bolts on the operating handle. The bolt which fastens the operating handle to the bumper must be inserted with the threads facing toward you to prevent interference with the jaw springs. The other bolt should be positioned with the threads facing downward. Each bolt has a nut, washer, and new bushings. Apply grease to the bolt parts and where there is metal to metal contact with the operating handle.

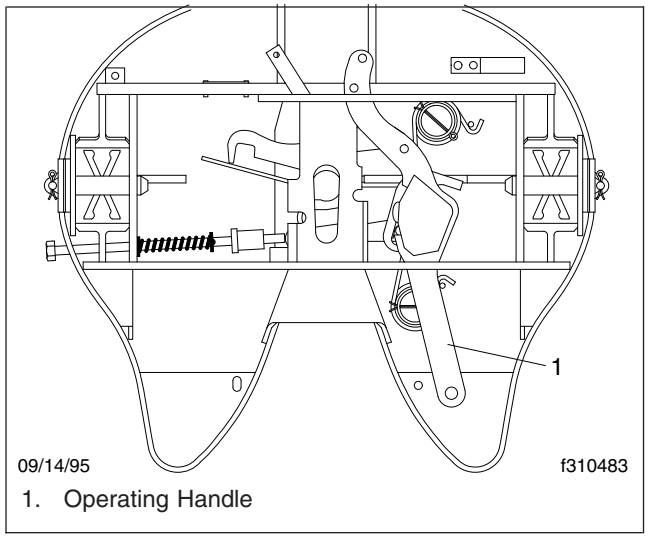


Fig. 7, Operating Handle Positioning

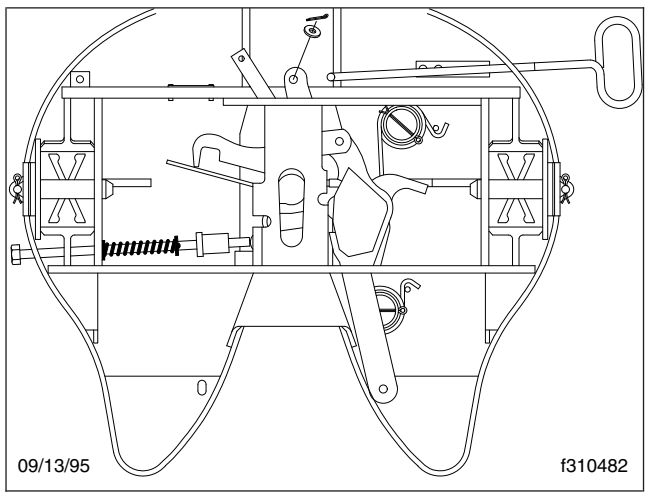


Fig. 8, Pull Handle Installation

See **Fig. 9**. Do not overtighten the bolts. Lubricate all pivot points.

IMPORTANT: The fifth wheel must be well lubricated to operate correctly. Refer to Group 31 of the *Business Class M2 Maintenance Manual* for complete maintenance and lubrication instructions for the fifth wheel assembly.

10. Connect the bumper spring to its clasp. Apply grease to the bracket pockets and to the grease fittings on the side of the fifth wheel until grease flows into the upper brackets. Also apply a liberal amount of grease to the top plate. See **Fig. 10**.

Fifth Wheel Assembly and Installation

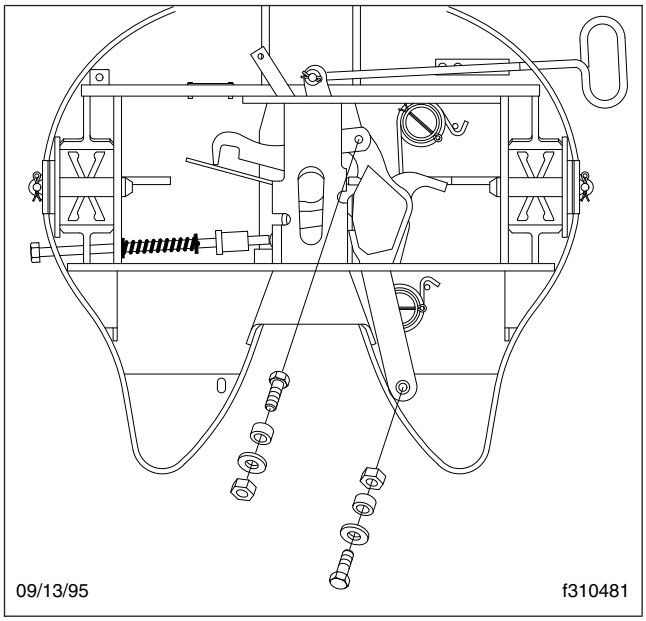
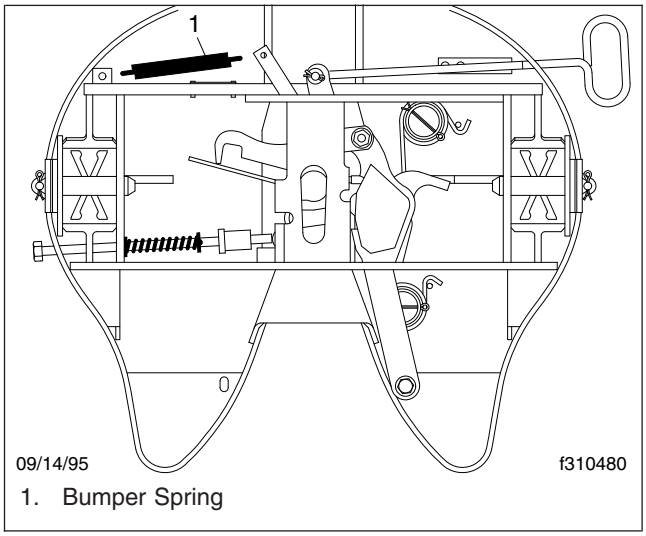


Fig. 9, Bolt Installation



1. Bumper Spring

Fig. 10, Spring Installation

⚠ WARNING

If the fifth wheel does not operate properly, do not use it. The fifth wheel could malfunction, resulting in personal injury or property damage due to possible disengagement of the trailer from the tractor.

11. Using an overhead hoist, position the fifth wheel on the sliding mount assembly. Insert the bushing pins. Install the retaining pins and the 1-inch-long cotter pins.

Troubleshooting Tables

Problem—Difficulty Coupling

Problem—Difficulty Coupling	
Possible Cause	**Remedy**
The kingpin is too high to trip the latch	Lower the landing gear.
The trailer plate or kingpin is damaged	Check the trailer plate for flatness. Check the kingpin for squareness with the trailer plate.

Problem—Excessive Wear on the Fifth Wheel Top Plate

Problem—Excessive Wear on the Fifth Wheel Top Plate	
Possible Cause	**Remedy**
Damaged trailer plate	If the trailer plate is not flat, replace it.

Problem—Difficulty Uncoupling

Problem—Difficulty Uncoupling	
Possible Cause	**Remedy**
Pressure on the locking mechanism caused by truck drifting apart from the trailer putting excess pressure on the lock	Back up the trailer and set the brakes. Strike the wedge stop rod which protrudes through the side of the fifth wheel. This spring-loaded rod will release the pressure on the locking mechanism.
Oval-shaped kingpin	Lower the landing gear.
Debris build-up in the grease	

Problem—Slack

Problem—Slack	
Possible Cause	**Remedy**
Undersized kingpin	Replace the kingpin if worn greater than 1/8 inch (3 mm) at the 2-inch (5-cm) diameter.
Worn jaw and wedge	Jaw and wedge could have excessive wear. Replace them.