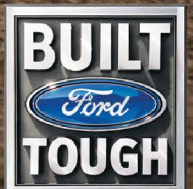




| [FordParts.com](https://fordparts.com)

F-150 Frame Instructions



INDEX

CENTER BEARING BRACKET REPLACEMENT INSTALLATION INSTRUCTIONS.....	1-7
CROSSMEMBER REPLACEMENT INSTALLATION INSTRUCTIONS	8-9
4X4 LEFT HAND FRONT DIFFERENTIAL BRACKET REPLACEMENT INSTALLATION.....	10-16
FRONT BUMPER MOUNTING BRACKET REPLACEMENT INSTALLATION.....	17-19
FRONT FRAME RAIL REPLACEMENT KIT INSTALLATION.....	20-25
FRONT FRAME STUB REPLACEMENT SECTION INSTALLATION.....	26-35
FRONT LOWER CONTROL ARM MOUNTING BRACKET REPLACEMENT INSTALLATION...	36-39
REAR BUMPER MOUNTING BRACKET REPLACEMENT INSTALLATION.....	40-43
REAR FRAME STUB REPLACEMENT SECTION INSTALLATION INSTRUCTIONS.....	44-50
REAR SPRING FRONT HANGER BRACKET REPLACEMENT INSTALLATION.....	51- 54
SPRING SHACKLE BRACKET REPLACEMENT INSTALLATION.....	55-59
TRANSMISSION CROSSMEMBER REPLACEMENT.....	60-62
4X4 LEFT HAND FRONT DIFFERENTIAL BRACKET REPLACEMENT INSTALLATION.....	63-68

2015 F-150 CENTER BEARING BRACKET REPLACEMENT INSTALLATION INSTRUCTIONS

KIT – FL34-5F057-AA		
4X2 VEHICLES USE WITH PART NUMBERS FL34-5005-AAC*, AAD*, AAE*, AAF*, AAG*, GAC*, GAD*, GAE*, GAF*, GAG*, GAH*		
Part Number	Description	Quantity
FL34-5F054-A*	Center Bearing Bracket	1
FL34-5E013-A*	Reinforcement Plate	1
SK-FL34-5F057-AA	Instruction Sheet	1

KIT – FL34-5F057-BA		
4X4 VEHICLES USE WITH PART NUMBERS FL34-5005-JAF*, JAG*, JAH*		
Part Number	Description	Quantity
FL34-5F054-B*	Center Bearing Bracket	1
FL34-5E013-A*	Reinforcement Plate	1
SK-FL34-5F057-AA	Instruction Sheet	1

*Other Items Required:

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Undercoating.

SERVICE PROCEDURE:

REMOVAL

1. Remove the driveline and center Bearing assembly and any other components that may be attached in the area of the center bearing bracket that is being replaced as outlined in Workshop Manual. (Refer to Figures 1 thru 3).
2. Put vehicle up on frame rack and anchor in place following frame rack company guidelines and precautions if required.
3. Perform detailed measurement of the frame, and perform any required pulling operations. This is critical to ensure proper installation of replacement frame brackets.
4. Using proper eye, face, and ear protection, grind the welds holding the damaged center bearing bracket to the frame, and remove the bracket. Be careful not to cut into the cross member since it will be reused. (Refer to Figure 4).
5. Take a wire brush and clean the areas of the frame where the welds were ground.

INSTALLATION

NOTE: If a hole is present the parent metal of the frame cross member, as a result of the center bearing bracket damage, additional actions are required. See step 7.

NOTE: Observe all appropriate safety precautions before welding takes place. Refer to the Workshop manual.



1. Loosely clamp the replacement bracket in a preliminary position.
2. Perform measurements to ensure proper placement of the new center bearing bracket, then clamp firmly into position.
 - a. Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - b. Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
3. With all measurements verified and the new bracket in proper position, tack-weld the new bracket in place on the rear frame rail.
4. Perform final measurements, then solid weld the new bracket to the frame cross member following the weld procedure on page 3. (Refer to Figures 5 thru 8).
5. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Undercoating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
6. Reinstall the drive shaft assembly and any other components that may have been removed during the repair. Refer to the appropriate sections of the Workshop Manual for information.
7. Additional Installation instructions to be followed if there is a hole created in the bottom of the frame crossmember as a result of the damage to the center bearing bracket.
 - a. Obtain the reinforcement plate provided with the service kit.
 - b. Align the reinforcement plate on the crossmember using the slots in the reinforcement as a guide to line up with the slots in the bottom surface of the crossmember.
 - c. The reinforcement plate will be welded to the frame cross member along its outer edges so clean away any residual weld or corrosion protection from the c/m that might interfere with the placement, fit-up and welding of the reinforcement plate to the bottom of the crossmember.
 - d. Loosely clamp the reinforcement in position.
 - e. Perform measurements to ensure proper placement of the new unit, then clamp firmly into position.
 - Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
 - f. With all measurements verified and the reinforcement plate in proper position, tack-weld the plate in place on the frame crossmember.
 - g. Perform final measurements, then solid weld the reinforcement plate to the frame cross member following the weld procedure on page 3. (Refer to Figures 5 thru 8).
 - h. It will be necessary to trim 2.7mm (thickness of reinforcement plate) from the legs of the center bearing bracket to allow the mounting surface for the center bearing of the drive shaft to fall in the correct vehicle position.
 - i. Complete the frame repair following Steps 2-6 above.



REPAIR AND WELDING PROCEDURE OVERVIEW:

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

NOTE: Observe all appropriate safety precautions before welding takes place. Refer to the Workshop manual.

WELD PROCEDURE SPECIFICATIONS:

Joint Design Used:

Single: (x) Double: ()
Backing: Yes: () No: (x)

Material Specifications:

Material: Carbon Steel
Thickness: Cross Member: 2.7mm Nom
Center Bearing Bracket: 4.0mm Nom
Reinforcement Plate: 2.7mm Nom

OPTION 1: GMAW – MIG WELDING

Stringer or Weave Bead: Stringer
Multi or Single Pass (per side): Single
Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)
Vertical Progression: Vertical Down
Working Amperage: 145 amps
Wire Feed Speed: 140-150
Volts: 18-19
Gas: 85Ar-15CO₂, Flow Rate: 14 CFI
Amperage (GMAW): 140-150 amp

OPTION 2: SMAW – STICK WELDING

Stringer or Weave Bead: Stringer
Multi or Single Pass (per side): Single
Number of Electrodes: As Needed
Electrode Angle: Trailing w/45
Working Amperage: 90 amps
Vertical Progression: Vertical Up
Filler Metal: AWS Specification: E-6011
AWS Classification: A5.1-91
Amperage (SMAW): 70-110 amps

SKFL34-5F057-AA

SHEET 3 OF 6



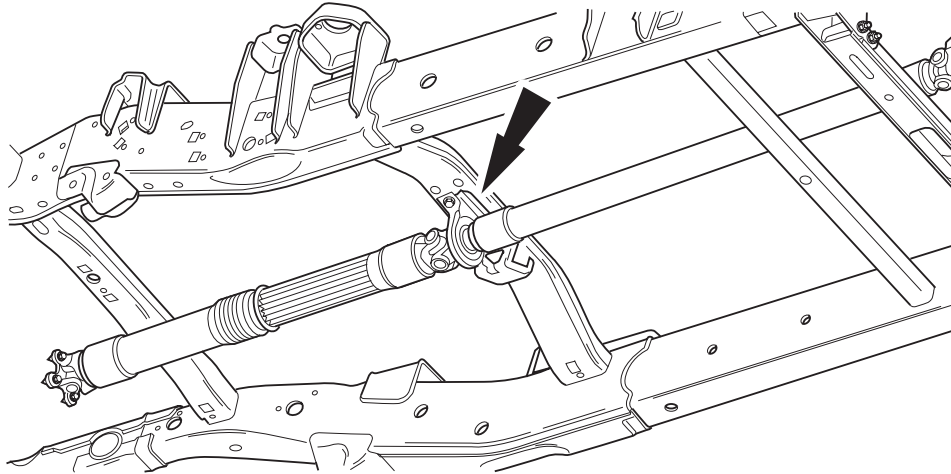


FIGURE 1 – VIEW OF FRAME SHOWING DRIVELINE AND CENTER BEARING BRACKET LOCATION

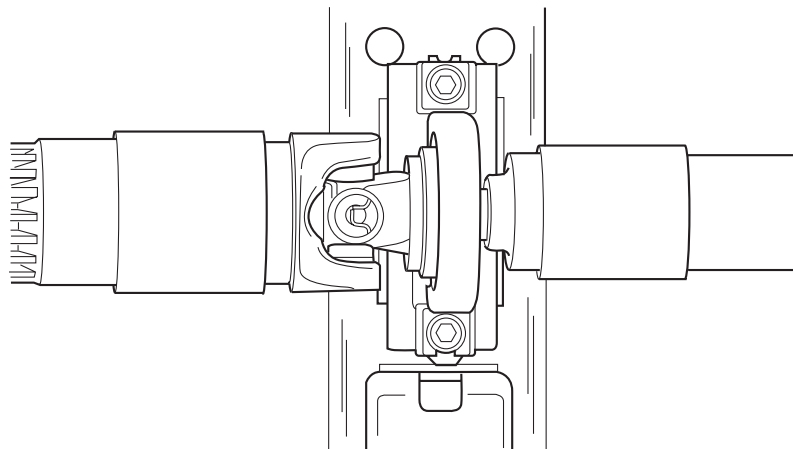


FIGURE 2 – VIEW OF CENTER BEARING BRACKET

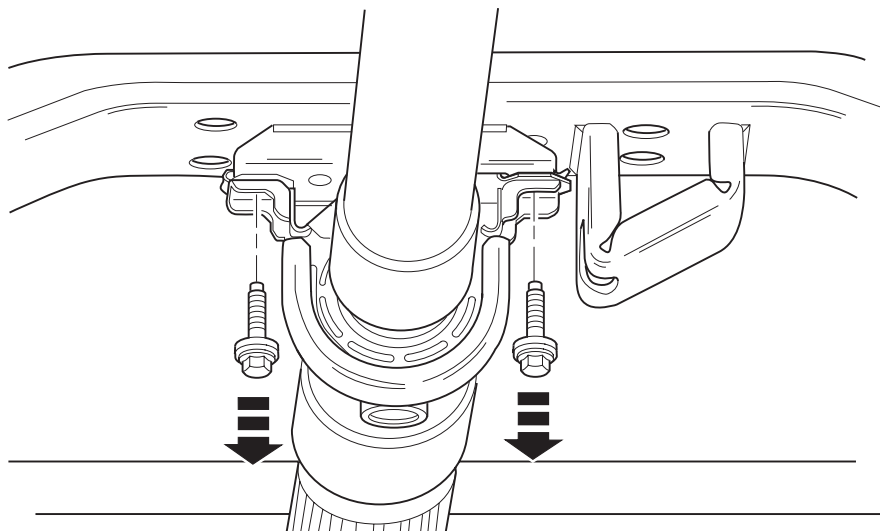


FIGURE 3 – REMOVE BOLTS SHOWN

SKFL34-5F057-AA

SHEET 4 OF 6



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 CENTER BEARING BRACKET
REPLACEMENT INSTALLATION INSTRUCTIONS**

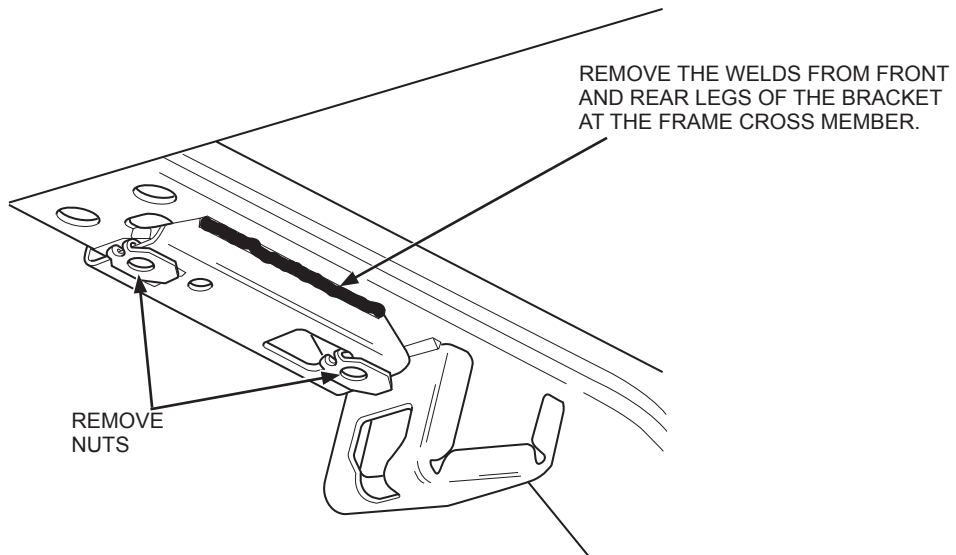


FIGURE 4 – REMOVE NUTS SHOWN AND REMOVE WELDS SHOWN TO REPLACE DAMAGED BRACKET

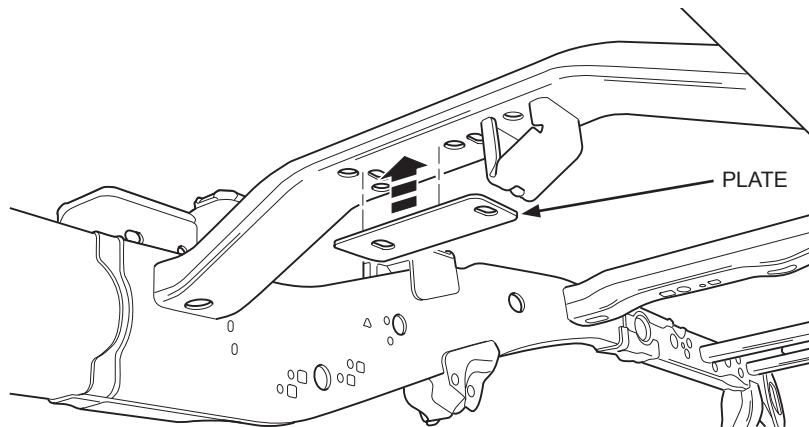


FIGURE 5 – INSTALL REINFORCEMENT PLATE IF REQUIRED

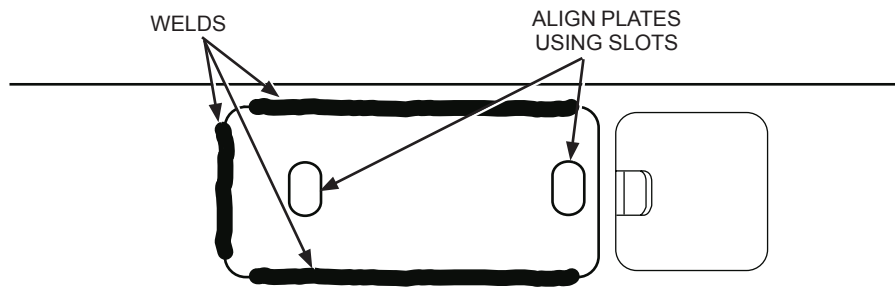


FIGURE 6 – USE SLOTS IN PLATE TO LOCATE PLATE ON THE CROSS MEMBER/ WELD THE PLATE TO THE CROSS MEMBER IN THREE PLACES AS SHOWN



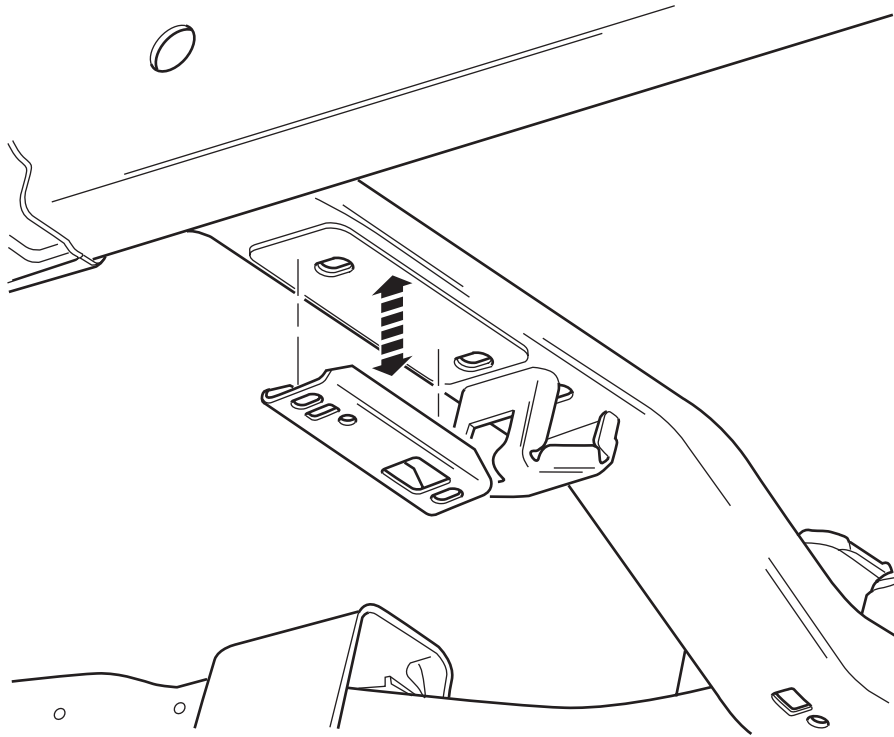


FIGURE 7 – LOCATE CENTER BEARING BRACKET ON THE CROSSMEMBER

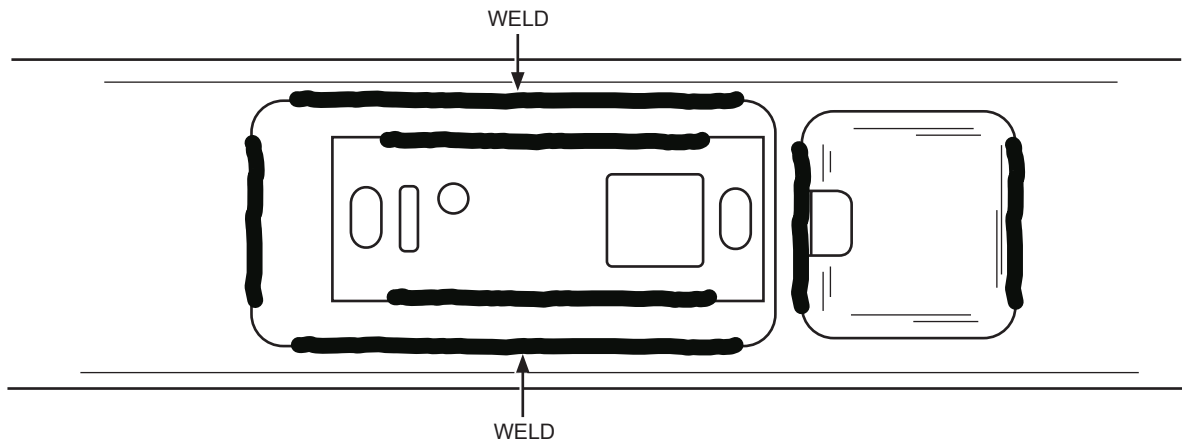


FIGURE 8 – WELD THE CENTER BEARING BRACKET ON THE CROSSMEMBER AS SHOWN



2015 F-150 #1B CROSSMEMBER REPLACEMENT INSTALLATION INSTRUCTIONS

KIT - FL34-5L005-AA		
Part Number	Description	Quantity
FL34-5C075-A*	#1b Crossmember	1
W714420-S439	Bolt M12x120 Hex Flng Pil 10	4
W520114-S442	Nut M12x1.75 Fex Flng P/T Mtl Pc	4
SKFL34-5L005-AA	Instruction Sheet	1

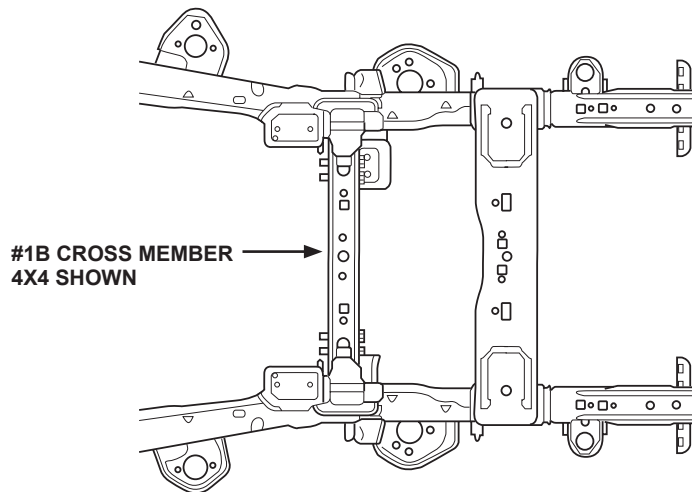
SERVICE PROCEDURE:

REMOVAL

1. With vehicle in NEUTRAL, position it on an appropriate vehicle hoist, (refer to Workshop Manual).
2. In applicable vehicles, remove any shields or skid plates that may be attached to the #1B cross member.
 - (Refer to Figure 1) for #1B crossmember shown in vehicle.
3. Remove the 4 #1B crossmember nuts. (Refer to Figure 2).
4. Remove the 4 #1B crossmember support bolts. (Refer to Figure 2).
5. Remove the #1B crossmember. (Refer to Figure 2).

INSTALLATION

1. Position the #1B cross member with the shield/skid plate mounting holes on the bottom side of the crossmember facing the ground, install the #1B crossmember support nuts and bolts. (Refer to Figure 3.)
 - a. Be sure to orient the bolts so the nuts are installed on the rear side of the frame brackets.
 - b. Tighten the nuts to 103 N•m (76 lb-ft).
2. In applicable vehicles, re-install any shields or skid plates that attach to the #1B crossmember.



**FIGURE 1 – VIEW FROM BOTTOM OF VEHICLE SHOWING THE #1B CROSS MEMBER,
(4X4 SHOWN, 4X2 IS SIMILAR)**

SKFL34-5L005-AA

SHEET 1 OF 2



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 #1B CROSS MEMBER REPLACEMENT
INSTALLATION INSTRUCTIONS**

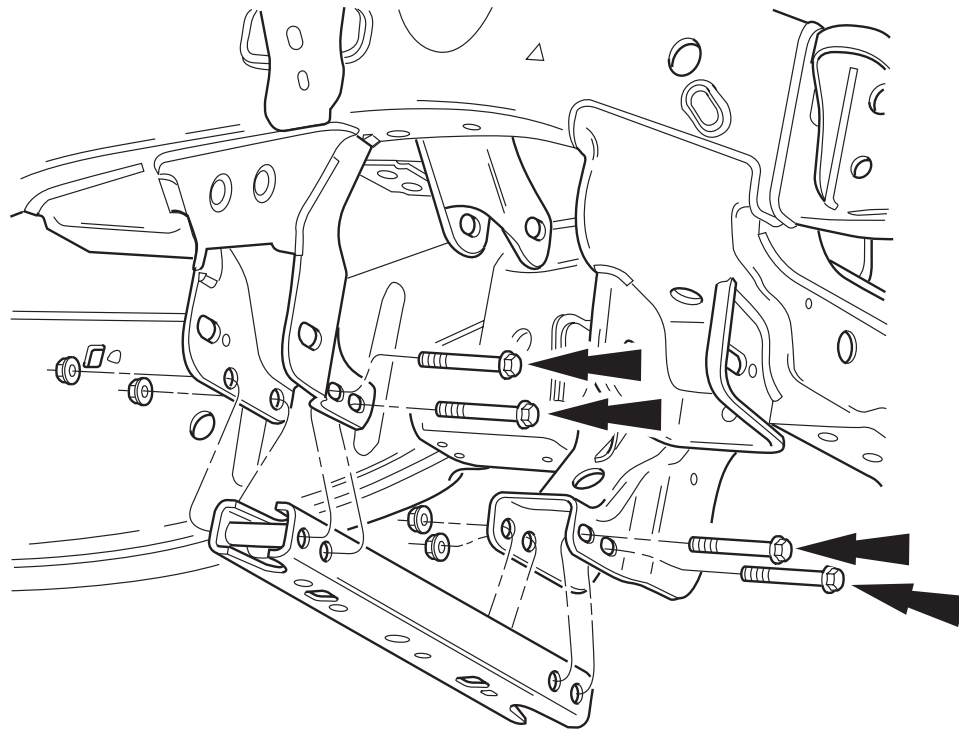


FIGURE 2 - REMOVE FOUR (4) FASTENERS FROM #1B CROSSMEMBER, REMOVE CROSSMEMBER FROM VEHICLE, (4X4 SHOWN, 4X2 IS SIMILAR)

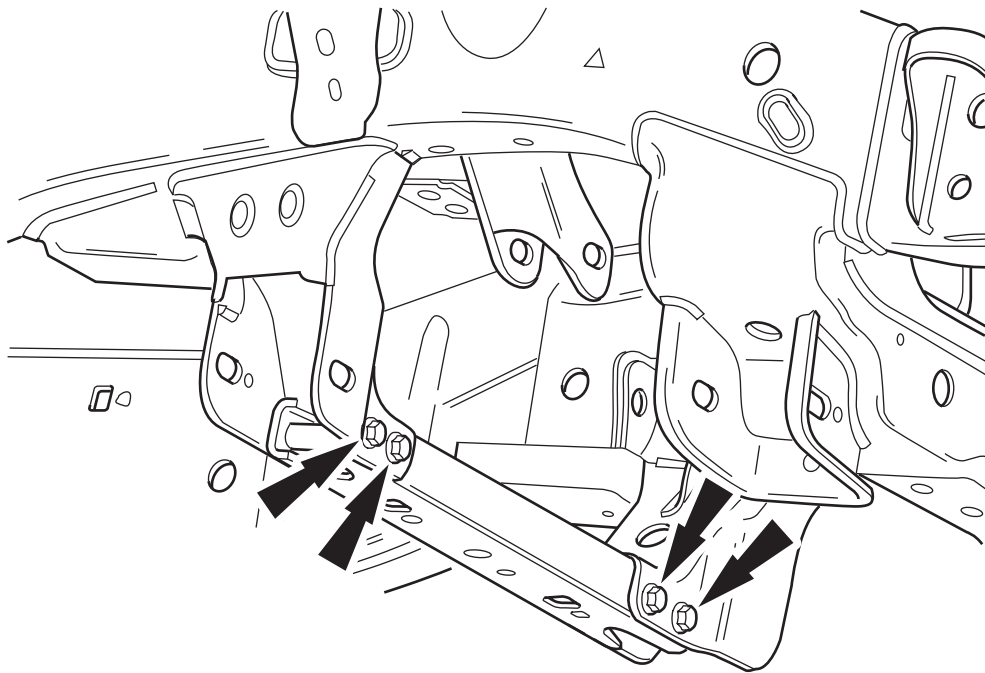


FIGURE 3 - RE-INSTALL THE #1B CROSSMEMBER AND FASTENERS WITH SHIELD/SKID PLATE MOUNTING HOLES FACING THE GROUND. THE NUTS SHOULD BE INSTALLED ON THE REAR FACE OF THE #1B CROSSMEMBER FRAME BRACKETS (4X4 SHOWN, 4X2 IS SIMILAR)

SKFL34-5L005-AA

SHEET 2 OF 2



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 #1B CROSS MEMBER REPLACEMENT
INSTALLATION INSTRUCTIONS**

**2015 F-150 4X4 LEFT HAND FRONT DIFFERENTIAL BRACKET REPLACEMENT INSTALLATION INSTRUCTIONS
- ALL FRAMES**

KIT - FL34-39510-AA		
USE WITH PART NUMBERS FL34-5005-CAA*, CAC*, CAD*, CAE*, JAA*, JAC*, JAD*, JAE*, JAF*, JAG*, JAH*		
Part Number	Description	Quantity
FL34-39510-B*	Differential Bracket	1
FL34-39510-C*	Differential Bracket Reinforcement	1
FL34-5N068-A*	Reinforcement Plate	1
SK-FL34-39510-AA	Instruction Sheet	1

***Other Items Required:**

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Undercoating.

SERVICE PROCEDURE:

REMOVAL

1. Remove the front axle assembly and any other components that may be attached in the area of the left hand front differential bracket that is being replaced as outlined in Workshop Manual. (Refer to Figure 1).
2. Disconnect steering shaft per the Workshop Manual instructions then raise the shaft and hold it out of the way with shop wire.
3. Detach the front differential breather hose from the bracket and secure it away from the work area.
4. Put vehicle up on frame rack and anchor in place following frame rack company guidelines and precautions if required.
5. Perform detailed measurement of the frame, and perform any required pulling operations. This is critical to ensure proper installation of replacement frame brackets.
6. Using proper eye, face, and ear protection, grind the welds holding the damaged differential bracket to the frame, and remove the bracket. Be careful not to cut into the frame rail since it will be reused. (Refer to Figures 2 and 3).
7. Take a wire brush and clean the areas of the frame where the welds were ground.
8. Severe failures may cause the bracket to tear away a portion of the frame rail leaving a hole with sharp edges, cracks, and surface deformations. Smooth out any sharp edges or corners with a grinder, and pound any surface deformations flat using a hammer. If cracks exist that propagate away from the hole they must be ground out, welded shut, and ground smooth for before the doubler plate can be welded on.

INSTALLATION

NOTE: If a hole is present the parent metal of the frame side rail, as a result of the differential bracket damage, additional actions are required. See step 8.

NOTE: Observe all appropriate safety precautions before welding takes place. Refer to the Workshop manual.



1. To properly position the new bracket, loosely attach the differential bracket to the differential, keeping the bolt finger tight. Raise the differential into position, and install the remaining attachment bolts finger tight. Loosely install the front drive shaft.
2. Mark the position of the differential bracket on the frame rail using a marker. Remove all fasteners and lower the front differential and front drive shaft down.
3. Remove the differential bracket from the differential and clamp it to the side rail in the position marked. Ensure there are no gaps between the bracket and the frame side rail.
 - a. Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - b. Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
4. With all measurements verified and the new bracket in proper position, tack-weld the new bracket in place on the rear frame rail.
5. Perform final measurements, then solid weld the new bracket and reinforcement to the frame rail following the weld procedure on page 3. (Refer to Figures 4 thru 6).
6. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Under coating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
7. Reinstall the front differential and drive shaft assembly and any other components that may have been removed during the repair. Refer to the appropriate sections of the Workshop Manual for information.
8. Additional Installation instructions to be followed if there is a hole created in the frame rail as a result of the damage to the left hand front differential bracket.
 - a. Severe failures may cause the bracket to tear away a portion of the frame rail leaving a hole with sharp edges, cracks, and surface deformations. Smooth out any sharp edges or corners with a grinder, and pound any surface deformations flat using a hammer. If cracks exist that propagate away from the hole they must be ground out, welded shut, and ground smooth for before the doubler plate can be welded on.
 - b. Obtain the reinforcement plate provided with the service kit.
 - c. The reinforcement plate will be welded to the frame rail along its outer edges so clean away any residual weld or corrosion protection from the frame rail that might interfere with the placement, fit-up and welding of the differential bracket to the frame rail.
 - d. Loosely clamp the reinforcement in position.
 - e. There should be a minimum of 10mm overlap between the reinforcement plate and the frame rail if a hole does exist in the frame rail. Some trimming of the reinforcement plate can be performed if required to improve fit to the frame rail.
 - f. Perform any necessary measurements to ensure proper placement of the reinforcement plate, then clamp firmly into position.
 - Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
 - g. Perform final measurements, then solid weld the reinforcement to the frame rail following the weld procedure on page 3. (Refer to Figures 7 thru 10).
 - h. Complete the repair following Steps 1-8 in the installation section above.

NOTE: Trimming of the differential bracket may be required to offset the thickness of the reinforcement plate if there is not enough bolt travel in the slot of the bracket for the bolt to be inserted through. (Refer to Figure 11).



REPAIR AND WELDING PROCEDURE OVERVIEW:

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

WELD PROCEDURE SPECIFICATIONS:

Joint Design Used:

Single: (x) Double: ()

Backing: Yes: () No: (x)

Material Specifications:

Material: Carbon Steel

Thickness: Frame Rail: 2.3mm Nom /2.5mm Nom (Frame Model Dependent)

Differential Bracket: 4.0mm Nom

Differential Bracket Reinforcement: 4.0mm Nom

Reinforcement Plate: 2.5mm Nom

OPTION 1: GMAW – MIG WELDING

Stringer or Weave Bead: Stringer

Multi or Single Pass (per side): Single

Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)

Vertical Progression: Vertical Down

Working Amperage: 145 amps

Wire Feed Speed: 140-150

Volts: 18-19

Gas: 85Ar-15CO2, Flow Rate: 14 CFI

Amperage (GMAW): 140-150 amp

OPTION 2: SMAW – STICK WELDING

Stringer or Weave Bead: Stringer

Multi or Single Pass (per side): Single

Number of Electrodes: As Needed

Electrode Angle: Trailing w/45

Working Amperage: 90 amps

Vertical Progression: Vertical Up

Filler Metal: AWS Specification: E-6011

AWS Classification: A5.1-91

Amperage (SMAW): 70-110 amps

SKFL34-39510-AA

SHEET 3 OF 7



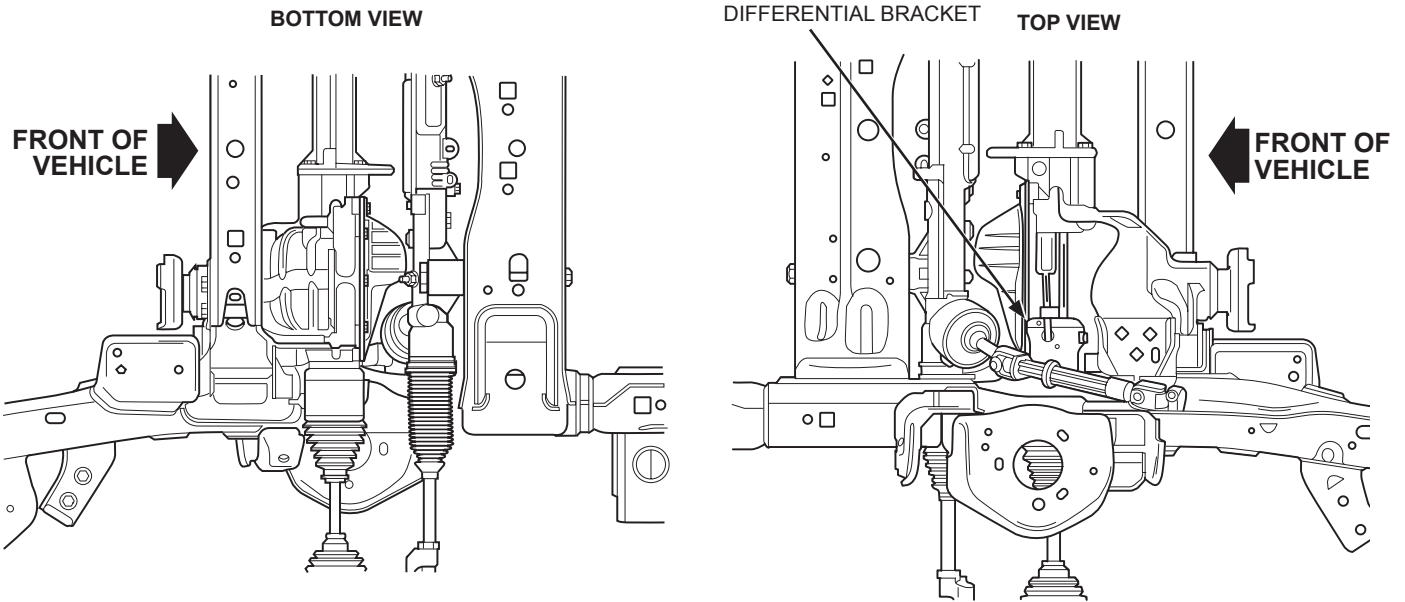


FIGURE 1 – VIEW OF FRAME SHOWING LEFT HAND FRONT DIFFERENTIAL BRACKET LOCATION IN FRAME

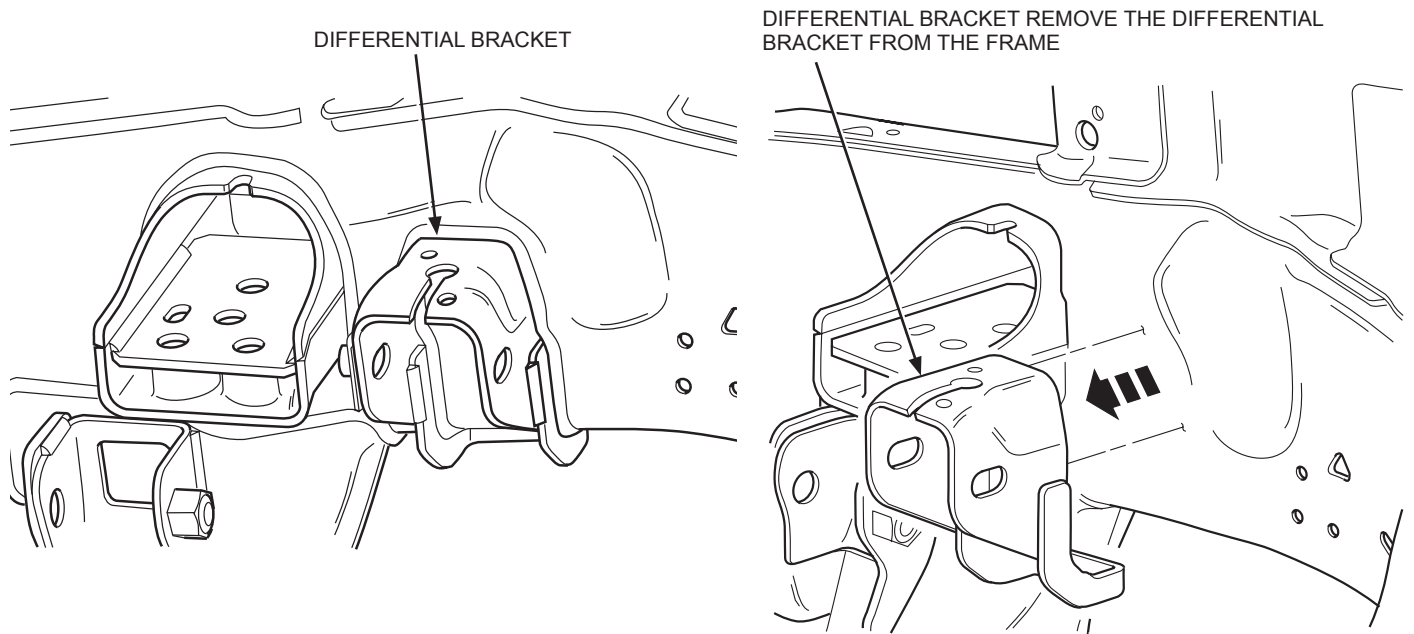


FIGURE 2 – VIEW OF DIFFERENTIAL BRACKET WITH AXLE REMOVED.

FIGURE 3 – VIEW OF DIFFERENTIAL BRACKET SEPARATED FROM THE FRAME RAIL



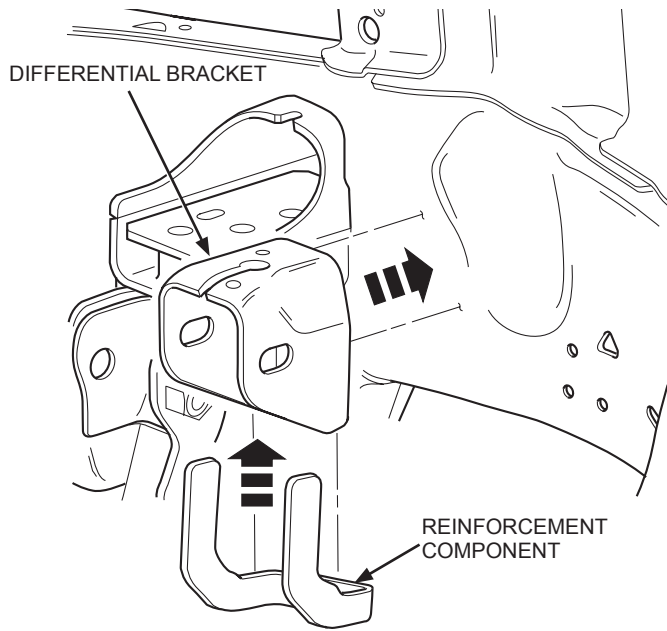


FIGURE 4 – VIEW OF FRONT DIFFERENTIAL BRACKET AND REINFORCEMENT COMPONENTS

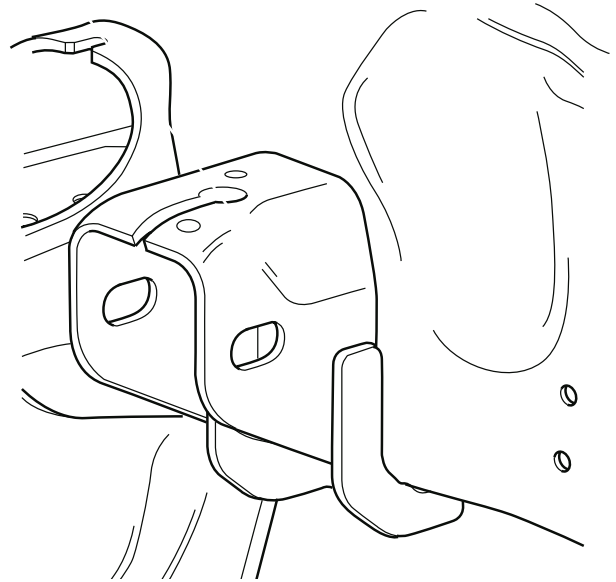


FIGURE 5 – VIEW OF DIFFERENTIAL BRACKET AND REINFORCEMENT ASSEMBLED TO THE FRAME RAIL

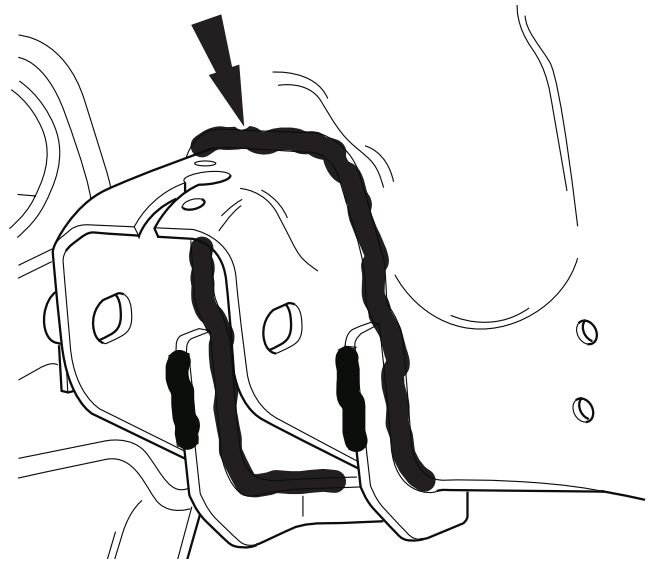
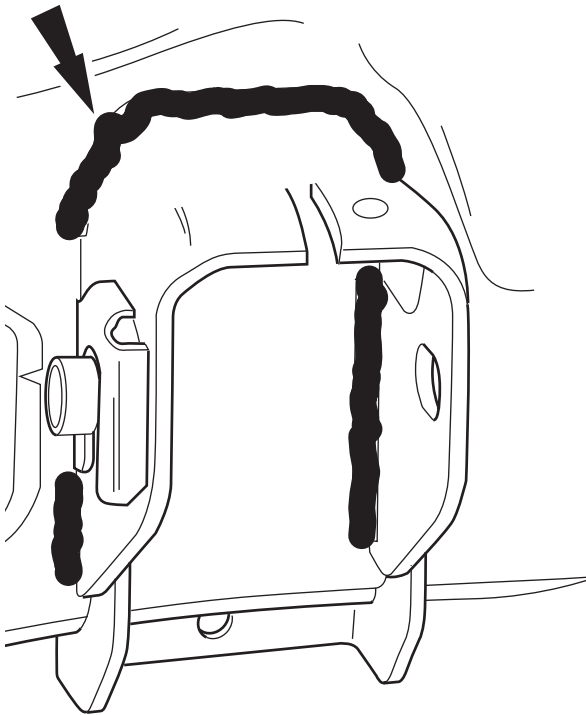


FIGURE 6 – VIEW OF DIFFERENTIAL BRACKET AND REINFORCEMENT ASSEMBLED TO THE FRAME RAIL SHOWING THE WELD PATTERN REQUIRED



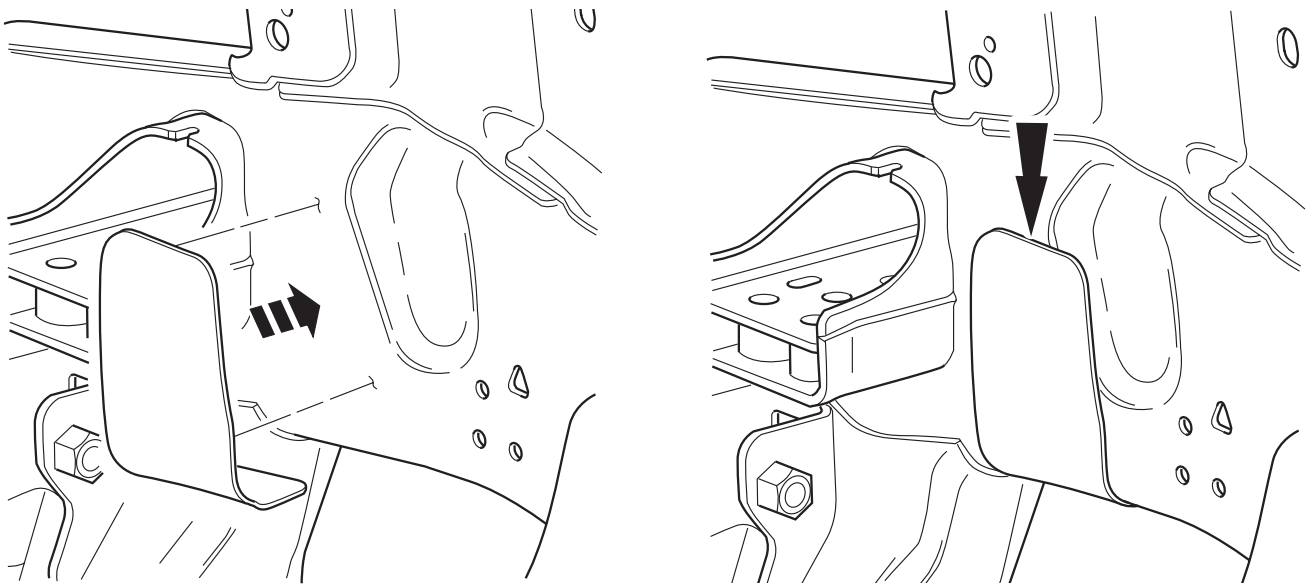


FIGURE 7 – VIEW OF REINFORCEMENT PLATE IN POSITION ON THE FRAME RAIL

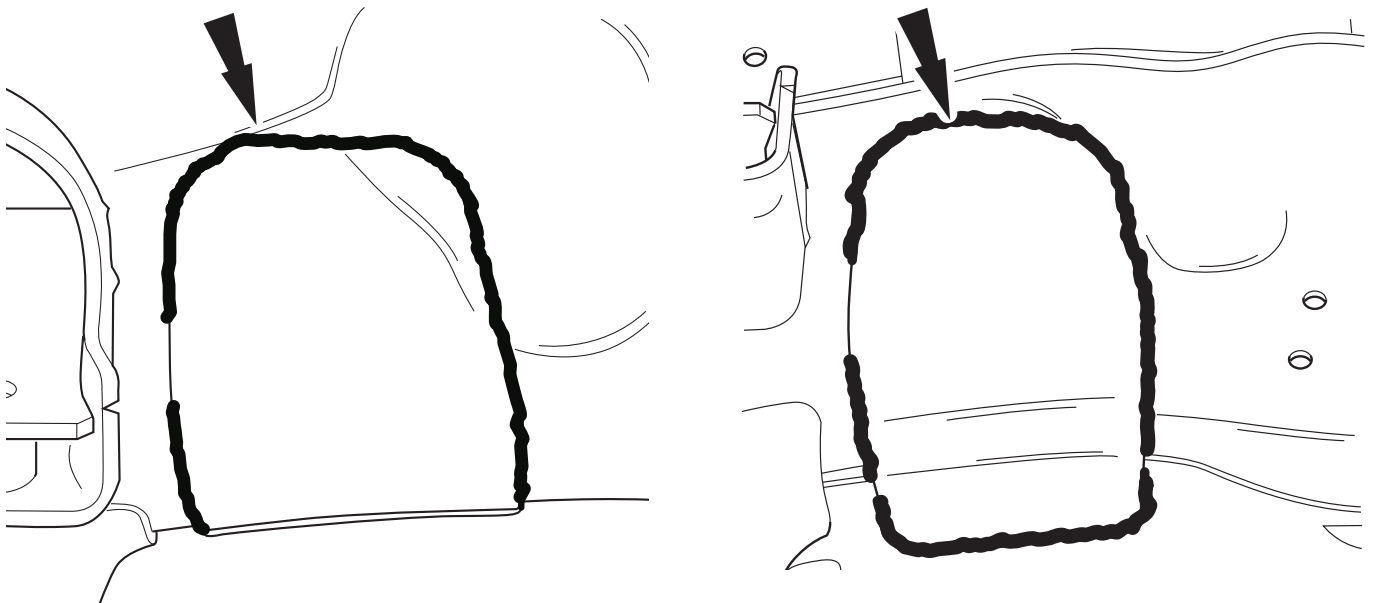


FIGURE 8 – VIEW OF REINFORCEMENT PLATE ASSEMBLED TO THE FRAME RAIL SHOWING THE WELD PATTERN REQUIRED



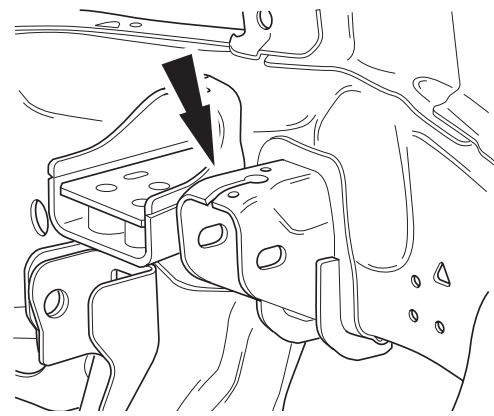
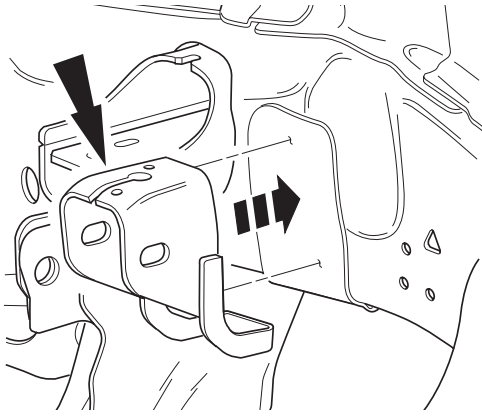


FIGURE 9 – VIEW OF DIFFERENTIAL BRACKET AND REINFORCEMENT BEING POSITIONED ON THE REINFORCEMENT

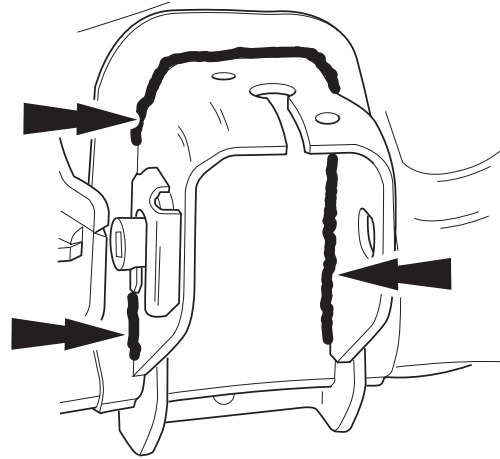
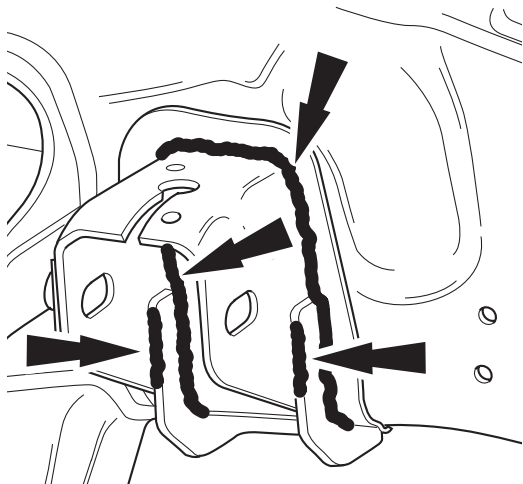


FIGURE 10 – VIEW OF DIFFERENTIAL BRACKET AND REINFORCEMENT ASSEMBLED TO THE FRAME SHOWING THE WELD PATTERN REQUIRED

TRIMMING OF UP TO 2.5mm
MAY BE REQUIRED FROM
THESE EDGES OF THE
DIFFERENTIAL BRACKET
PRIOR TO FINAL WELDING

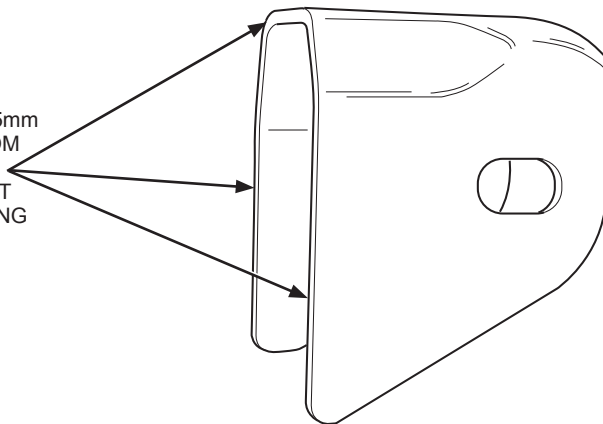


FIGURE 11 – IT MAY BE NECESSARY TO TRIM UP TO 2.5mm FROM THE EDGE OF THE DIFFERENTIAL BRACKET TO OFF SET THE THICKNESS OF THE ADDED FRAME REINFORCEMENT PRIOR TO WELDING IF THERE IS NOT ENOUGH BOLT TRAVEL IN THE BRACKET SLOT DURING PRELIMINARY FIT-UPS AND MEASUREMENTS



**2015 F-150 FRONT BUMPER MOUNTING BRACKET REPLACEMENT INSTALLATION INSTRUCTIONS
- ALL FRAMES**

KIT - FL34-17N775-AA		
Part Number	Description	Quantity
FL34-17A793-A*	Front Bumper Mounting Bracket (RH)	1
SKFL34-17N775-AA	Instruction Sheet	1

KIT - FL34-17N776-AA		
Part Number	Description	Quantity
FL34-17A794-A*	Front Bumper Mounting Bracket (LH)	1
SKFL34-17N775-AA	Instruction Sheet	1

***Other Items Required:**

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Undercoating.

SERVICE PROCEDURE:

REMOVAL

1. Remove the front bumper assembly and any other componentry attached to the front bumper brackets as outlined in the Workshop Manual.

NOTE: The front bumper brackets are retained by welded joints just beyond where the bumper mounts. (Refer to Figure 1).

2. Using proper eye, face, and ear protection, grind the welds holding the front bumper mounting bracket to the frame, and remove the frame bracket. Be careful not to cut into the rail since it will be reused. (Refer to Figure 2).
3. Use a wire brush and clean the areas of the frame where the welds were ground.

INSTALLATION

1. Loosely clamp the replacement bracket in a preliminary position. (Refer to Figure 3).
2. Perform measurements to ensure proper placement of the new unit, then clamp firmly into position.
 - Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
3. With all measurements verified and the new bracket in proper position, tack-weld the new bracket in place to the front frame horn.
4. Perform final measurements, then solid weld the new bracket to the frame rail following the weld procedure on page 2. (Refer to Figure 4).
5. Use a dye penetrant to determine if any cracks or large voids exist in the weld joint. If cracks or other defects exist, grind out the defect and repair until the weld is free of defects.

SKFL34-17N775-AA

SHEET 1 OF 3



6. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Undercoating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
7. Reinstall the front bumper and any other componentry that may have been removed during the service procedure. Refer to the appropriate sections of the Workshop Manual for information.

REPAIR AND WELDING PROCEDURE OVERVIEW:

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

WELD PROCEDURE SPECIFICATIONS:

Joint Design Used:
 Single: (x) Double: ()
 Backing: Yes: () No: (x)

Material Specifications:
 Material: Carbon Steel
 Thickness: Front Horn: 2.2mm Nom
 Bracket: 2.9mm Nom

OPTION 1: GMAW – MIG WELDING

Stringer or Weave Bead: Stringer
 Multi or Single Pass (per side): Single
 Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)
 Vertical Progression: Vertical Down
 Working Amperage: 145 amps
 Wire Feed Speed: 140-150
 Volts: 18-19
 Gas: 85Ar-15CO2, Flow Rate: 14 CFI
 Amperage (GMAW): 140-150 amp

OPTION 2: SMAW – STICK WELDING

Stringer or Weave Bead: Stringer
 Multi or Single Pass (per side): Single
 Number of Electrodes: As Needed
 Electrode Angle: Trailing w/45
 Working Amperage: 90 amps
 Vertical Progression: Vertical Up
 Filler Metal: AWS Specification: E-6011
 AWS Classification: A5.1-91
 Amperage (SMAW): 70-110 amps



FRONT BUMPER BRACKETS

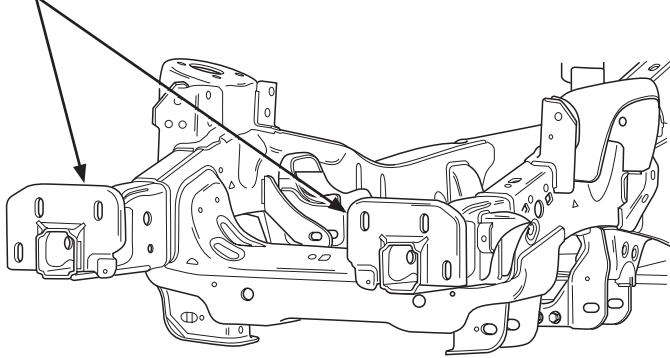


FIGURE 1 – VIEW OF FRAME SHOWING FRONT BUMPER BRACKETS

REMOVE THREE (3) WELDS SHOWN TO REMOVE DAMAGED BUMPER BRACKET FROM FRAME ASSEMBLY

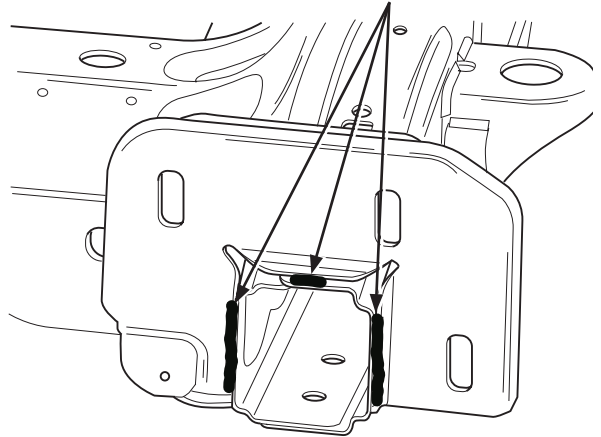


FIGURE 2 – GRIND WELDS SHOWN TO REMOVE DAMAGED BUMPER BRACKET, DO NOT GRIND INTO THE FRONT FRAME HORN MATERIAL WHEN REMOVING THE BUMPER BRACKET FROM THE FRAME, RH SHOWN, LH SYMMETRICALLY OPPOSITE

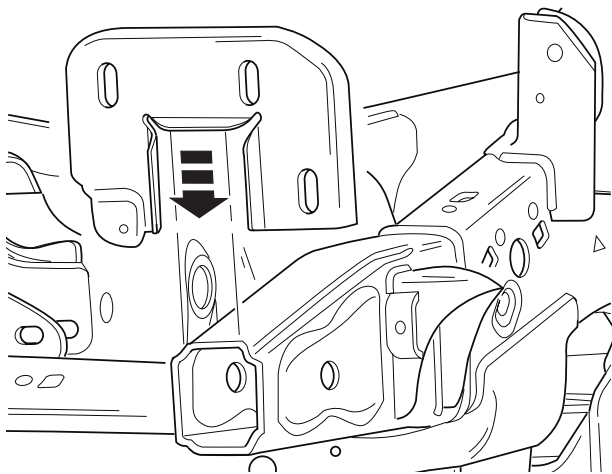


FIGURE 3 – FRONT BUMPER BRACKET PLACEMENT

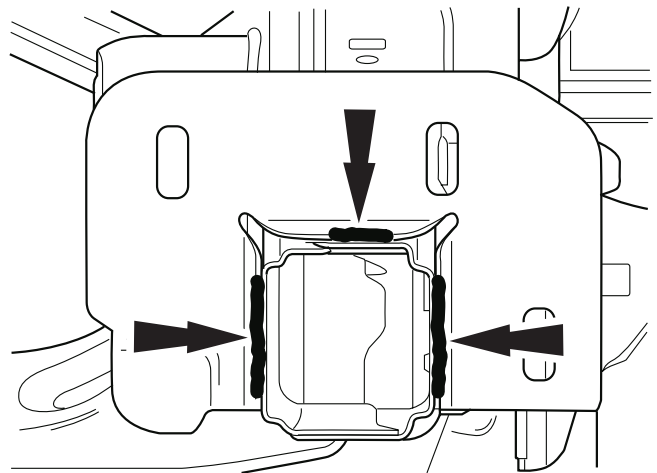


FIGURE 4 – FRONT BUMPER BRACKET SHOWING FINAL WELD PATTERN, RH SHOWN, LH SYMMETRICALLY OPPOSITE



2015 F-150 FRONT FRAME RAIL REPLACEMENT KIT INSTALLATION INSTRUCTIONS

KIT – FL34-5D059-AA		
FOR USE ON FRAME PART NUMBERS FL34-5005-AAA*, AAD*, AAE*, AAG*, CAA*, CAD*, CAE*, GAA*, GAD*, GAE*, GAG*, JAA*, JAD*, JAE*, JAG*		
Part Number	Description	Quantity
FL34-5K092-A*	Front Horn Assembly LH	1
SKFL34-5D058-AA	Instruction Sheet	1

KIT – FL34-5D058-AA		
FOR USE ON FRAME PART NUMBERS FL34-5005-AAA*, AAD*, AAE*, AAG*, CAA*, CAD*, CAE*, GAA*, GAD*, GAE*, GAG*, JAA*, JAD*, JAE*, JAG*		
Part Number	Description	Quantity
FL34-5K091-A*	Front Horn Assembly RH	1
SKFL34-5D058-AA	Instruction Sheet	1

KIT – FL34-5D059-BA		
FOR USE ON FRAME PART NUMBERS FL34-5005-AAC*, AAF*, CAC*, GAC*, GAF*, GAH*, JAC*, JAF*, JAH*		
Part Number	Description	Quantity
FL34-5K092-B*	Front Horn Assembly LH	1
SKFL34-5D058-AA	Instruction Sheet	1

KIT – FL34-5D058-BA		
FOR USE ON FRAME PART NUMBERS FL34-5005-AAC*, AAF*, CAC*, GAC*, GAF*, GAH*, JAC*, JAF*, JAH*		
Part Number	Description	Quantity
FL34-5K091-B*	Front Horn Assembly RH	1
SKFL34-5D058-AA	Instruction Sheet	1

NOT INCLUDED IN KITS		
ADDITIONAL COMPONENTS REQUIRED FOR FRONT FRAME STUB REPLACEMENT		
FOR USE ON FRAME PART NUMBERS FL34-5005-AAC*, AAF*, CAC*, GAC*, GAF*, GAH*, JAC*, JAF*, JAH*		
Part Number	Description	Quantity
FL34-5F077-A*	Sorb Tube-Front LH	1
FL34-5F078-A*	Sorb Tube-Front RH	1
W500748-S450B	Bolt M12x1.75x85 Black	4

***Other Items Required Not Included In Kit:**

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Under coating.



INSTRUCTION NOTES:

- This is a step-by-step procedure for replacing the front frame horn on the 2015 F-150. It is a full frame vehicle which was designed with energy absorbing features in the front frame horns in order to manage impact energy in a crash.

WARNING: THIS SECTION OF THE FRAME MUST NOT BE STRAIGHTENED IF ANY HOLES OR SURFACES SHOW EVIDENCE OF COLLAPSE OR BUCKLING. IF ANY EVIDENCE OF DAMAGE EXISTS BEHIND THE FIRST FRAME CROSS MEMBER IN TERMS OF BUCKLING, CRACKING, ETC. THEN THE ENTIRE FRONT FRAME SECTION OR ENTIRE FRAME MUST BE REPLACED.

- Prior to beginning this procedure, the vehicle must be restored to its proper overall dimensions through the appropriate pulling method, per separate Ford approved procedures.
- The replacement front frame horns are production parts designed with a taper to insert into the front rail section to assist in alignment and welding operations.

SERVICE PROCEDURE:

REMOVAL

NOTE: All body alignment measurements are carried out with the vehicle detrimmed. Measurements are made metal to metal, on center, unless otherwise specified.

1. Measure the vehicle to determine if the body requires straightening and alignment. The vehicle must be restored its correct overall dimensions prior to beginning this procedure.
 - a. For body dimensional information, refer to the Workshop Manual.
2. Remove the fascia from the front end of the vehicle, refer to the Workshop Manual.
3. Unbolt and remove the front end bumper structure beam, refer to the Workshop Manual.
4. Unbolt the front end sheet metal body mount bolts.
 - a. Raise the body if required per Workshop Manual.
5. Locate the vertical weld line of the front horn to front rail. (Refer to Figure 1).
6. Using a plasma cutter, reciprocating saw or cut-off wheel, remove the damaged front frame horn section.
 - a. Do not cut directly along the center of the weld line. Leave enough material on the side of the weld centerline to allow the remaining weld and horn material to be ground back to the front edge of the front mid rail. This is necessary to make sure of correct fit between the frame and the replacement frame horn section.
7. Grind off the excess welding material that remains around the perimeter of the front edge of the front frame rail of the frame assembly.
8. Remove the remaining part (ring-like) of the front horn from inside the front mid-rail by pulling with pliers or with a hook.
9. Using a wire brush or sandpaper, remove the e-coat paint from the existing frame near the edges to be welded on the inner and outer surfaces within approximately 15mm of the repair joint. (Refer to Figure 2).
10. Using a wire brush or sandpaper, remove the e-coat paint from outer surfaces of the replacement horn section within approximately 15mm of the repair joint (refer to Figure 2).



INSTALLATION

1. Install the front horn section inside the mid front rail of the frame. Support the replacement horn in position.

NOTE: The frame rail service component must be located to maintain original factory dimensions. For additional information, refer to the Workshop Manual for correct frame dimensional information.

2. Check that the Front End Sheet Metal (FESM) body mount bracket lines up with the sheet metal hole for the mount bolt (refer to Figure 3).
3. Perform measurements to ensure proper placement of the new unit, then clamp firmly into position.
 - a. Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - b. Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
4. In order to hold the horn replacement in design position, place tack welds at four (4) corners of the joint.
5. Re-check the horn replacement alignment by lowering the body, and then raise it. Weld the joint completely if this alignment is correct following the weld procedure on pages 3 and 4. (Refer to Figures 6 and 7).
 - a. After all welds are completed, grind off any excess weld material if required.
6. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Under coating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
7. Re-assemble the vehicle making sure to torque all fasteners to the correct specifications. See the Workshop Manual for details on torque specifications of parts in this area.

REPAIR AND WELDING PROCEDURE OVERVIEW

Welding of the frame replacement section may be done by Arc or MIG welding. It is imperative that the following welding specifications be determined and followed exactly. **For safety, this repair must be performed by a certified welder.**

Weld Procedure Specifications

Joint Design Used:

Single : (x) Double: ()

Backing: Yes () No (x)

Material Specifications

Material: Carbon Steel

Thickness: Front Horn: 2.2mm Nom

Front Mid Rail: 2.3mm Nom/2.7mm Nom (Frame Model Dependent)

SK FL34-5D058-AA

SHEET 3 OF 6



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 FRONT FRAME RAIL REPLACEMENT KIT
INSTALLATION INSTRUCTIONS
– ALL FRAMES**

OPTION 1: GMAW – MIG WELDING

Stringer of Weave Bead: Stringer
Multi or Single Pass (per side): Single
Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)
Vertical Progression: Vertical Down
Working Amperage: 145 amps
Wire Feed Speed: 140-150
Volts: 18-19
Gas: 85Ar-15CO₂, flow rate: 14 CFI
Amperage (GMAW): 140-150 amp

OPTION 2: SMAW – STICK WELDING

Stringer of Weave Bead: Stringer
Multi or Single Pass (per side): Single
Number of Electrodes: As Needed
Electrode Angle: Trailing w/45
Vertical Progression: Vertical Up
Working Amperage: 90 amps
Filler Metal: AWS Specification: E-6011
AWS Classification: A5.1-91
Amperage (SAME): 70-110 amp

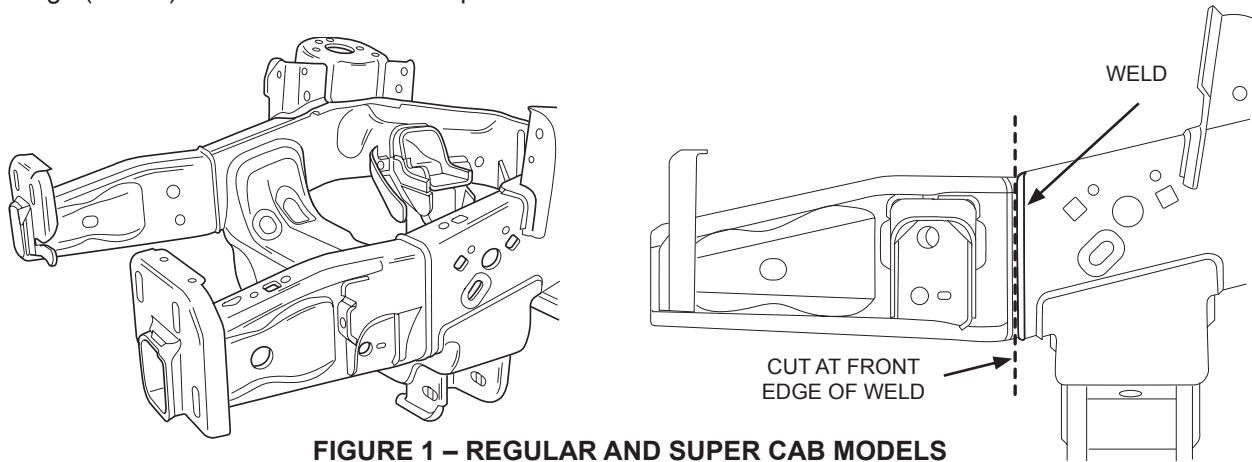


FIGURE 1 – REGULAR AND SUPER CAB MODELS

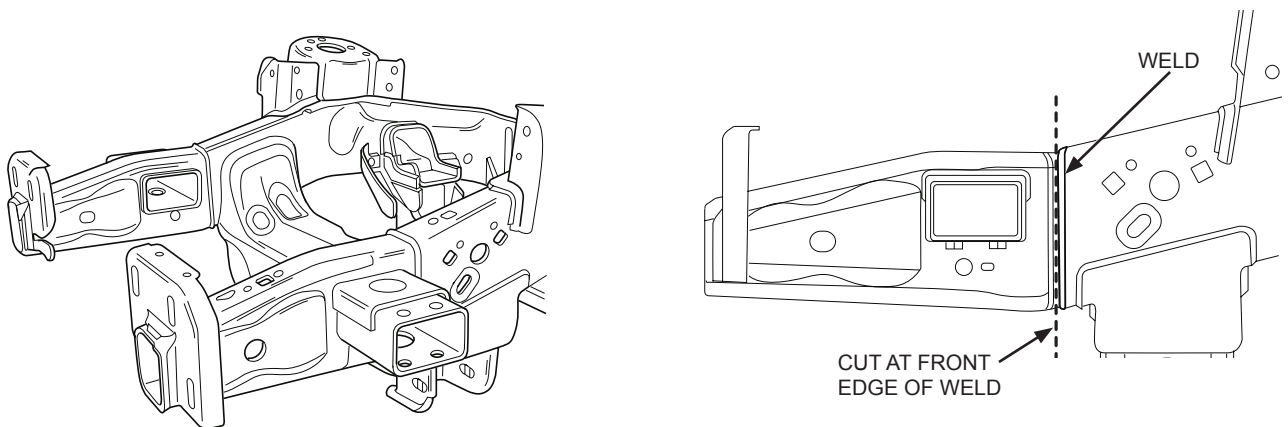


FIGURE 2 – CREW CAB MODEL

SK FL34-5D058-AA

SHEET 4 OF 6



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

2015 F-150 FRONT FRAME RAIL REPLACEMENT KIT
INSTALLATION INSTRUCTIONS
– ALL FRAMES

NOTE: THESE BRACKETS ARE OPTIONAL FOR SERVICE AND MAY OR MAY NOT BE PRESENT ON THE SERVICE FRONT FRAME HORN.

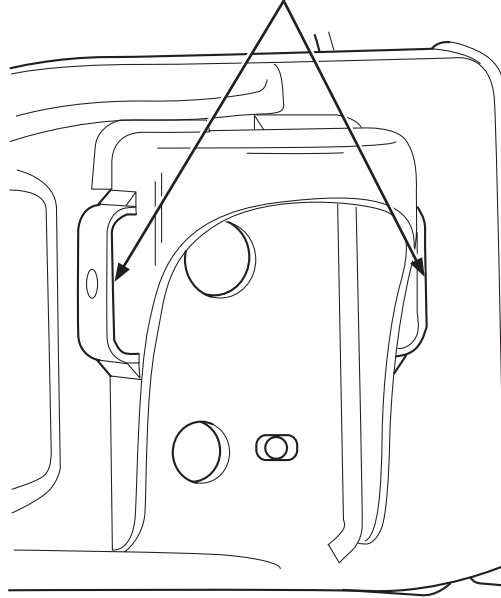


FIGURE 3 – REGULAR AND SUPER CAB MODELS

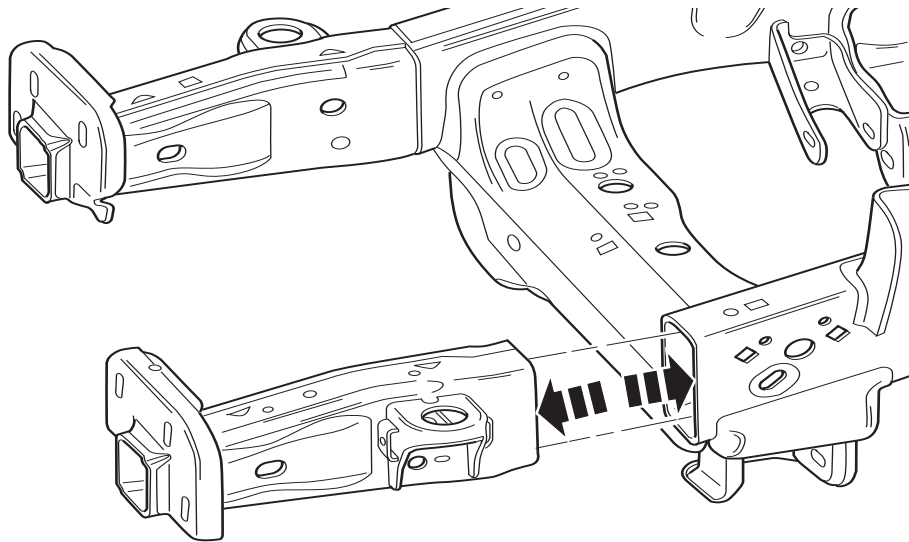


FIGURE 4 – REGULAR AND SUPER CAB MODEL SHOWN, CREW CAB FOLLOWS THE SAME PROCESS LH SHOWN, RH IS SYMMETRICALLY OPPOSITE.



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

SK FL34-5D058-AA

SHEET 5 OF 6

**2015 F-150 FRONT FRAME RAIL REPLACEMENT KIT
INSTALLATION INSTRUCTIONS
– ALL FRAMES**

REMOVE OLD WELD, E-COAT AND ANY OTHER DEBRIS FROM AROUND PERIMETER PRIOR TO APPLYING NEW WELD

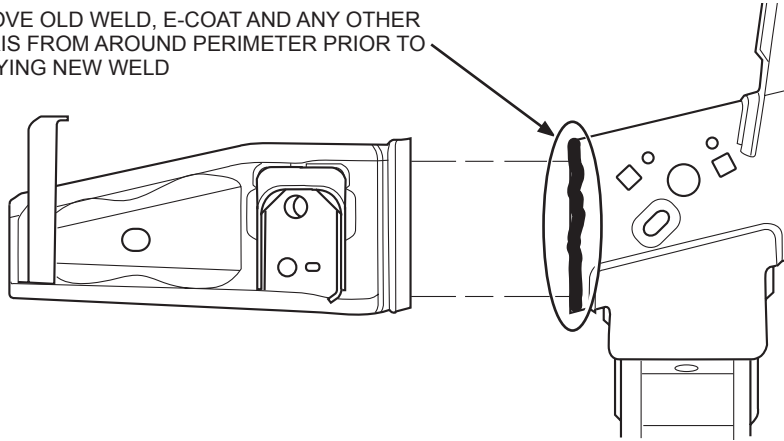


FIGURE 5 – REGULAR AND CREW CAB MODEL SHOWN, CREW CAB FOLLOWS THE SAME PROCESS LH SHOWN, RH IS SYMMETRICALLY OPPOSITE

WELD 360 DEGREES AROUND PERIMETER

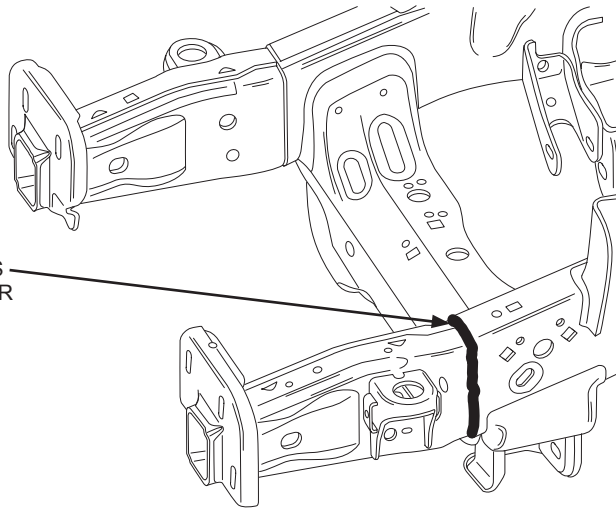


FIGURE 6 – REGULAR AND SUPER CAB MODEL SHOWN, CREW CAB FOLLOWS THE SAME PROCESS LH SHOWN, RH IS SYMMETRICALLY OPPOSITE.

WELD 360 DEGREES AROUND PERIMETER

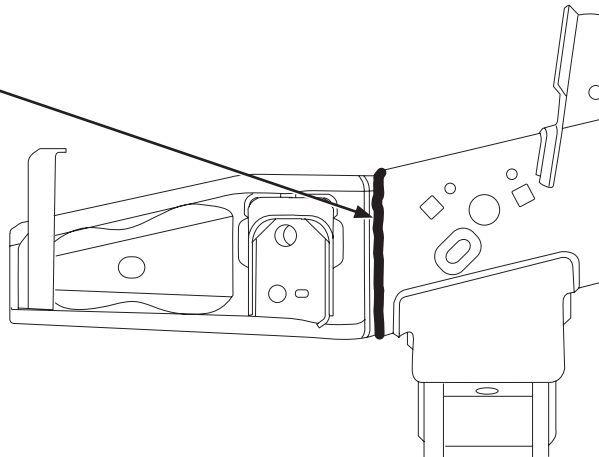


FIGURE 7 – REGULAR AND SUPER CAB MODEL SHOWN, CREW CAB FOLLOWS THE SAME PROCESS LH SHOWN, RH IS SYMMETRICALLY OPPOSITE

SK FL34-5D058-AA

SHEET 6 OF 6



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 FRONT FRAME RAIL REPLACEMENT KIT
INSTALLATION INSTRUCTIONS
– ALL FRAMES**

2015 F-150 FRONT FRAME STUB REPLACEMENT SECTION INSTALLATION INSTRUCTIONS

**KIT FL34-5E029-AA
4X2 REGULAR AND SUPER CAB FRONT FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBERS FL34-5005-AAA*, AAD*, AAE*, AAG***

Part Number	Description	Quantity
FL34-5C145-A*	Frame Assembly Front Stub	1
FL34-5E094-A*	Shield-Frame Front RH/LH - Vehicles Equipped with 3.5L TIVCT or 5.0 Engines	2
FL34-5E094-B*	Shield-Frame Rear	1
FL34-5E094-C*	Shield-Frame Rear	1
SKFL34-5E029-AA	Instruction Sheet	1

**KIT FL34-5E029-BA
4X2 REGULAR AND SUPER CAB FRONT FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBERS FL34-5005-GAA*, GAD*, GAE*, GAG***

Part Number	Description	Quantity
FL34-5C145-B*	Frame Assembly Stub	1
FL34-5E094-A*	Shield-Frame Front RH/LH - Vehicles Equipped with 3.5L TIVCT or 5.0 Engines	2
FL34-5E094-B*	Shield-Frame Rear	1
FL34-5E094-C*	Shield-Frame Rear	1
SKFL34-5E029-AA	Instruction Sheet	1

**KIT- FL34-5E029-CA
4X2 CREW CAB FRONT FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBERS FL34-5005-AAC*, AAF***

Part Number	Description	Quantity
FL34-5C145-C*	Frame Assembly Front Stub	1
FL34-5E094-A*	Shield-Frame Front RH/LH - Vehicles Equipped with 3.5L TIVCT or 5.0 Engines	2
FL34-5E094-B*	Shield-Frame Rear	1
FL34-5E094-C*	Shield-Frame Rear	1
FL34-5F065-A*	Sorb Tube-Rear	2
FL34-5F077-A*	Sorb Tube-Front LH	1
FL34-5F078-A*	Sorb Tube-Front RH	1
W500748-S450B	Bolt M12x1.75x86	8
SKFL34-5E029-AA	Instruction Sheet	1

SKFL34-5E029-AA

SHEET 1 OF 10



**KIT – FL34-5E029-DA
4X2 CREW CAB FRONT FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBERS FL34-5005-GAC*, GAF*, GAH***

Part Number	Description	Quantity
FL34-5C145-D*	Frame Assembly Front Stub	1
FL34-5E094-A*	Shield-Frame Front RH/LH - Vehicles Equipped with 3.5L TIVCT or 5.0 Engines	2
FL34-5E094-B*	Shield-Frame Rear	1
FL34-5E094-C*	Shield-Frame Rear	1
FL34-5F065-A*	Sorb Tube-Rear	2
FL34-5F077-A*	Sorb Tube-Front LH	1
FL34-5F078-A*	Sorb Tube-Front RH	1
W500748-S450B	Bolt M12x1.75x86	8
SKFL34-5E029-AA	Instruction Sheet	1

**KIT – FL34-5E029-EA
4X4 REGULAR AND SUPER CAB FRONT FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBERS FL34-5005-CAA*, CAD*, CAE***

Part Number	Description	Quantity
FL34-5C145-E*	Frame Assembly Front Stub	1
FL34-5E094-A*	Shield-Frame Front RH/LH -Vehicles Equipped with 3.5L TIVCT or 5.0 Engines	2
FL34-5E094-B*	Shield-Frame Rear	1
FL34-5E094-C*	Shield-Frame Rear	1
SKFL34-5E029-AA	Instruction Sheet	1

**KIT – FL34-5E029-FA
4X4 REGULAR AND SUPER CAB FRONT FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBERS FL34-5005-JAA*, JAD*, JAE***

Part Number	Description	Quantity
FL34-5C145-F*	Frame Assembly Front Stub	1
FL34-5E094-A*	Shield-Frame Front RH/LH -Vehicles Equipped with 3.5L TIVCT or 5.0 Engines	2
FL34-5E094-B*	Shield-Frame Rear	1
FL34-5E094-C*	Shield-Frame Rear	1
SKFL34-5E029-AA	Instruction Sheet	1

SKFL34-5E029-AA

SHEET 2 OF 10



**KIT – FL34-5E029-GA
4X4 CREW CAB FRONT FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBER FL34-5005-CAC***

Part Number	Description	Quantity
FL34-5C145-G*	Frame Assembly Front Stub	1
FL34-5E094-A*	Shield-Frame Front RH/LH -Vehicles Equipped with 3.5L TIVCT or 5.0 Engines	2
FL34-5E094-B*	Shield-Frame Rear	1
FL34-5E094-C*	Shield-Frame Rear	1
FL34-5F065-A*	Sorb Tube-Rear	2
FL34-5F077-A*	Sorb Tube-Front LH	1
FL34-5F078-A*	Sorb Tube-Front RH	1
W500748-S450B	Bolt M12x1.75x86	8
SKFL34-5E029-AA	Instruction Sheet	1

**KIT – FL34-5E029-HA
4X4 CREW CAB FRONT FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBERS FL34-5005-JAC*, JAF*, JAH***

Part Number	Description	Quantity
FL34-5C145-H*	Frame Assembly Front Stub	1
FL34-5E094-A*	Shield-Frame Front RH/LH-Vehicles Equipped with 3.5L TIVCT or 5.0 Engines	2
FL34-5E094-B*	Shield-Frame Rear	1
FL34-5E094-C*	Shield-Frame Rear	1
FL34-5F065-A*	Sorb Tube-Rear	2
FL34-5F077-A*	Sorb Tube-Front LH	1
FL34-5F078-A*	Sorb Tube-Front RH	1
W500748-S450B	Bolt M12x1.75x86	8
SKFL34-5E029-AA	Instruction Sheet	1

**KIT – FL34-5E029-JA
4X4 163" WB SUPER CAB FRONT FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBERS FL34-5005-JAG***

Part Number	Description	Quantity
FL34-5C145-J*	Frame Assembly Front Stub	1
FL34-5E094-A*	Shield-Frame Front RH/LH -Vehicles Equipped with 3.5L TIVCT or 5.0 Engines	2
FL34-5E094-B*	Shield-Frame Rear	1
FL34-5E094-C*	Shield-Frame Rear	1
SKFL34-5E029-AA	Instruction Sheet	1

SKFL34-5E029-AA

SHEET 3 OF 10



***Other Items Required Not Included In Kits:**

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Undercoating.

SERVICE PROCEDURE:

REMOVAL PREPARATION

NOTE: All body alignment measurements are carried out with the vehicle de-trimmed. Measurements are made metal to metal, on center, unless otherwise specified.

1. Measure the vehicle to determine if the body requires straightening and alignment. The vehicle must be restored its correct overall dimensions prior to beginning this procedure.
 - a. For body dimensional information, refer to the Workshop Manual.
2. Remove the front bumper assembly as outlined in Workshop Manual.
3. Remove the grille assembly and reinforcement. Refer to Workshop Manual.
4. Remove both front fenders as outlined in Workshop Manual.
5. Remove front skid plates (if equipped).
6. Remove the engine mount retaining bolts and loosen the exhaust manifold to head pipe connections. Refer to Workshop Manual.
7. Loosen the radiator shroud retainer bolts per Workshop Manual.
8. Place the vehicle up on a frame rack and anchor in place following frame rack company guidelines and precautions.
9. Remove the front wheels.
10. Perform detailed measurement of the frame and perform any required pulling operations. This is critical to ensure proper installation of the replacement frame section.
 - a. All body alignment measurements are carried out with the vehicle de-trimmed. Measurements are made metal to metal, on center, unless otherwise specified.
11. Measure the vehicle to determine if the body requires straightening and alignment.
12. Perform complete removal of the front suspension and steering components as outlined in the Workshop Manual. This includes upper and lower control arms, steering gear, idler arm and center linkage, tie rod assemblies, sway bar, and springs/shocks.
13. Remove front drive axle assembly and half shafts per Workshop Manual (if equipped).
14. Raise and support the engine/transmission assembly, and remove the transmission support crossmember.
 - a. Cut the stick on heat shield to separate the transmission crossmember from the frame mounts. (Refer to Figure 7).
15. Loosen the body mount to frame bushing bolts from the radiator support and the forward cab support per Workshop Manual.
16. Using the frame rack towers and light tension, support the front radiator support of vehicle by raising it slightly above the frame rail mounts.
17. Disconnect and remove any remaining wiring, lines, and related fittings from the frame section.

SKFL34-5E029-AA

SHEET 4 OF 10



REMOVAL

The front frame section on this vehicle is retained by welded lap joints. This procedure calls for grinding of the original welded joints for removal, followed by welding of the new section into position.

1. Using proper eye, face, and ear protection, grind through the original welded joints retaining the forward frame section to the center section. Any high speed grinder may be used. Be careful not to cut into the center side rail since it will be reused.
2. Using a chisel gun with a sharp 1" wide wedge chisel, separate the ground area of the joints.
3. Remove the complete front section with an assistant's help.

INSTALLATION

1. With the assistant's help, position the new front frame section into place on the vehicle.
2. Support the new section, and loosely clamp the replacement section in a preliminary position.
3. Perform measurements to ensure proper placement of the new unit, then clamp firmly into position.
 - a. Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - b. Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
4. Perform a final measurement, then solid weld the new section to the original on all overlap joints, following the weld procedure on page 6, (refer to Figures 5 and 6).
5. Use a dye penetrant to determine if any cracks or large voids exist in the weld joint. If cracks or other defects exist, grind out the defect and repair until the weld is free of defects.
6. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Undercoating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
7. Reinstall the transmission cross member and the lower engine/transmission assembly, and tighten fasteners to correct specification.
8. Inspect for damage, and reinstall all removed suspension, steering, braking, and driveline components, following the appropriate Workshop Manual Sections.
9. Install the following parts as required by specific usages.
 - a. The front SORB tube assembly and related fasteners. (Crew Cab Models Only), (Refer to Figures 8 and 9). (FL34-5F077-A*, FL34-5F078-A*, W500748-S450B (4))
 - b. The rear SORB tube assembly and related fasteners. (Crew Cab Models Only), (Refer to Figures 8 and 9). (P/N's FL34-5F065-A*, W500748-S450B (4))
 - c. The left hand side adhesive backed frame rail heat shield as required. (Refer to Figures 10 and 11). (P/N FL34-5E094-A*)

SKFL34-5E029-AA

SHEET 5 OF 10



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 FRONT FRAME STUB REPLACEMENT
SECTION INSTALLATION INSTRUCTIONS**

NOTE: Remove clear backing sheet from heat shield to expose adhesive, foil side of the shield should face away from frame rail.

- d. The right hand side adhesive backed frame rail heat shields as required. (Refer to Figures 12 and 13). (P/N's FL34-5E094-A*, FL34-5E094-B*)

NOTE: Remove clear backing sheet from heat shield to expose adhesive, foil side of the shield should face away from frame rail.

- e. The transmission c/m adhesive backed heat shield to the right hand side of the transmission cross member and frame bracket. (Refer to Figures 14 and 15). (P/N FL34-5E094-C*).

NOTE: Remove clear backing sheet from heat shield to expose adhesive, foil side faces away from cross member and frame bracket.

10. Remove the vehicle from the frame rack, and perform other required reassembly procedures per the appropriate Workshop Manual Sections.

REPAIR AND WELDING PROCEDURE OVERVIEW

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

WELD PROCEDURE SPECIFICATIONS

Joint Design Used:
Single : (x) Double: ()
Backing: Yes () No (x)

Material Specifications

Material: Carbon Steel

Thickness: Front Stub Side Rail: 2.3mm Nom/2.7mm Nom (Frame Model Dependent)
Mid Rail: 2.6mm Nom/3.1mm Nom (Frame Model Dependent)

OPTION 1: GMAW – MIG WELDING

Stringer of Weave Bead: Stringer
Multi or Single Pass (per side): Single
Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)
Vertical Progression: Vertical Down
Working Amperage: 145 amps
Wire Feed Speed: 140-150
Volts: 18-19
Gas: 85Ar-15CO2, flow rate: 14 CFI
Amperage (GMAW): 140-150 amp

SKFL34-5E029-AA

SHEET 6 OF 10



OPTION 2: SMAW – STICK WELDING

Stringer of Weave Bead: Stringer
Multi or Single Pass (per side): Single
Number of Electrodes: As Needed
Electrode Angle: Trailing w/45
Vertical Progression: Vertical Up
Working Amperage: 90 amps
Filler Metal: AWS Specification: E-6011
AWS Classification A5.1-91
Amperage (SAME): 70-110 amp

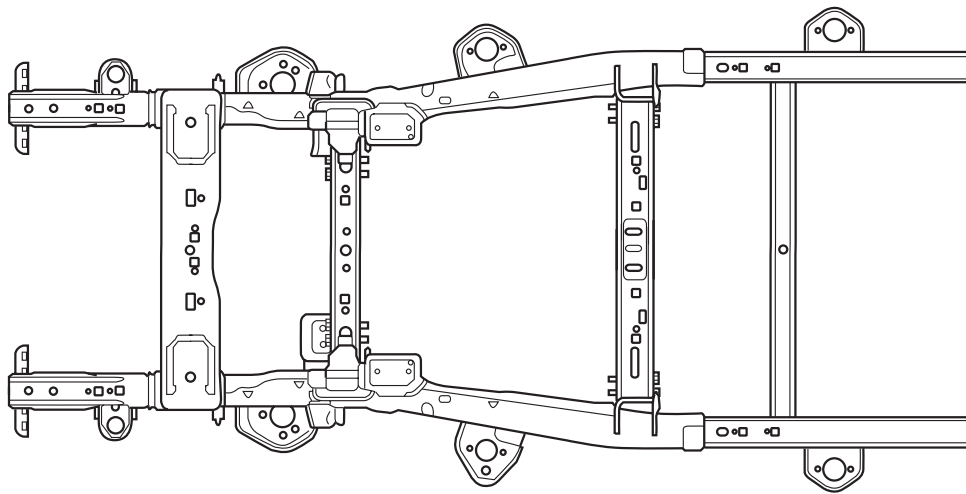


FIGURE 1 – TYPICAL ASSEMBLED VIEW

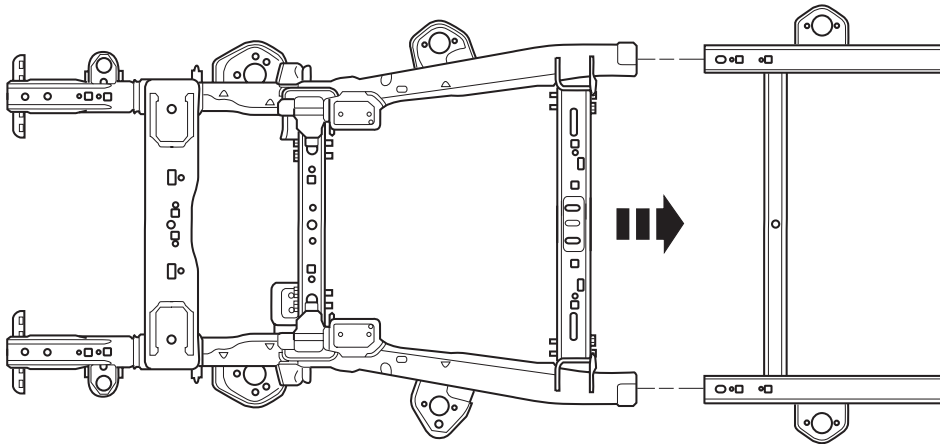


FIGURE 2 – TYPICAL DISASSEMBLED VIEW

SKFL34-5E029-AA

SHEET 7 OF 10



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 FRONT FRAME STUB REPLACEMENT
SECTION INSTALLATION INSTRUCTIONS**

CAUTION: DO NOT DAMAGE THE CENTER SIDE RAIL, IT WILL BE REUSED. THE CENTER RAIL UNDELAPS THE FRONT FRAME RAIL. CUT ONLY THROUGH THE DEPTH OF THE WELD.

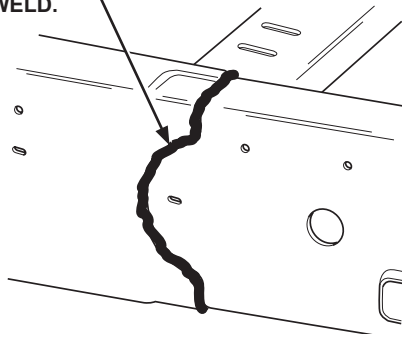


FIGURE 3 – ASSEMBLED VIEW

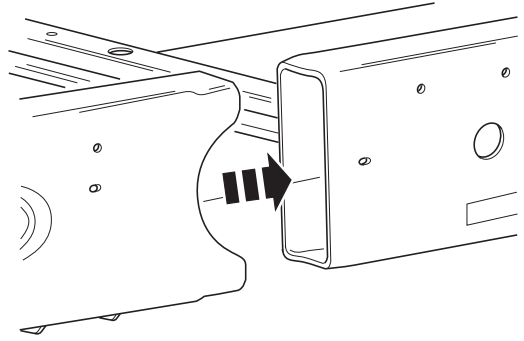


FIGURE 4 – DISASSEMBLED VIEW

JOINT SHOULD BE COMPLETELY WELDED 360 DEGREES AROUND THE MARRIAGE JOIN

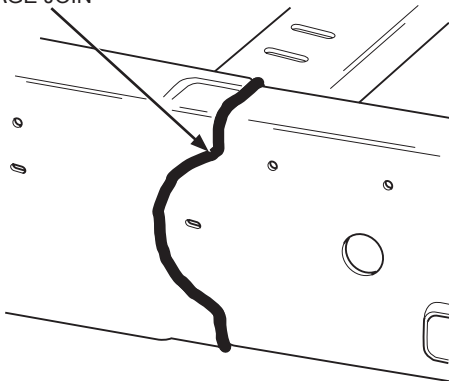


FIGURE 5 – FRONT RAIL TO CENTER SIDE RAIL MARRIAGE JOINT WELD OUTBOARD (LH SHOWN, RH IS SYMMETRICALLY OPPOSITE)

JOINT SHOULD BE COMPLETELY WELDED 360 DEGREES AROUND THE MARRIAGE JOIN

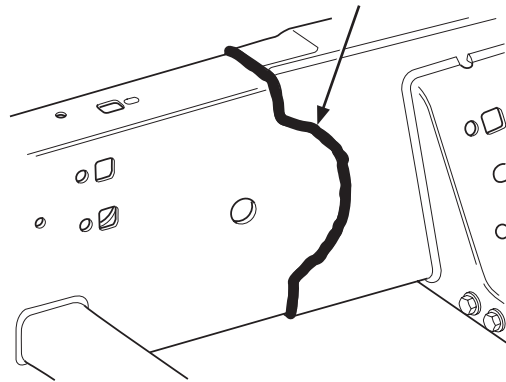


FIGURE 6 – FRONT RAIL TO CENTER SIDE RAIL MARRIAGE JOINT WELD INBOARD (LH SHOWN, RH IS SYMMETRICALLY OPPOSITE)

CUT THE STICK ON HEAT SHIELD ALONG THE EDGE OF THE FRAME MOUNTED BRACKET FOR TRANSMISSION CROSSMEMBER REMOVAL

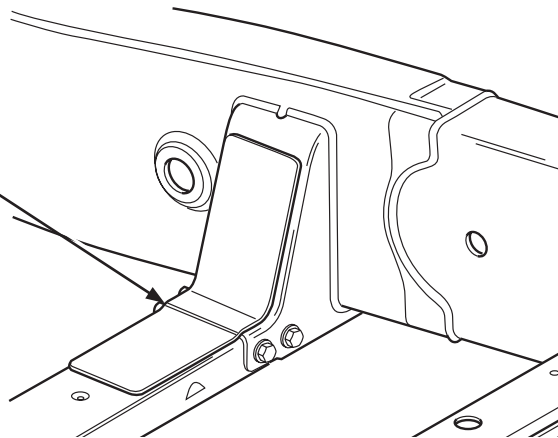


FIGURE 7 – STICK ON HEAT SHIELD LOCATION

SKFL34-5E029-AA

SHEET 8 OF 10



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 FRONT FRAME STUB REPLACEMENT
SECTION INSTALLATION INSTRUCTIONS**

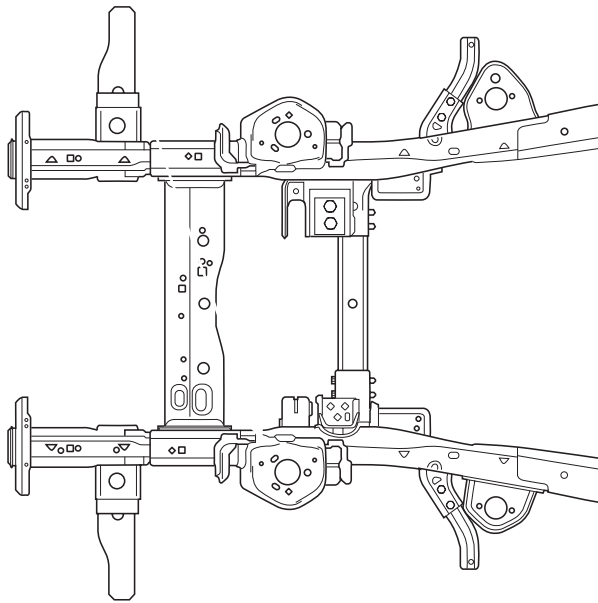
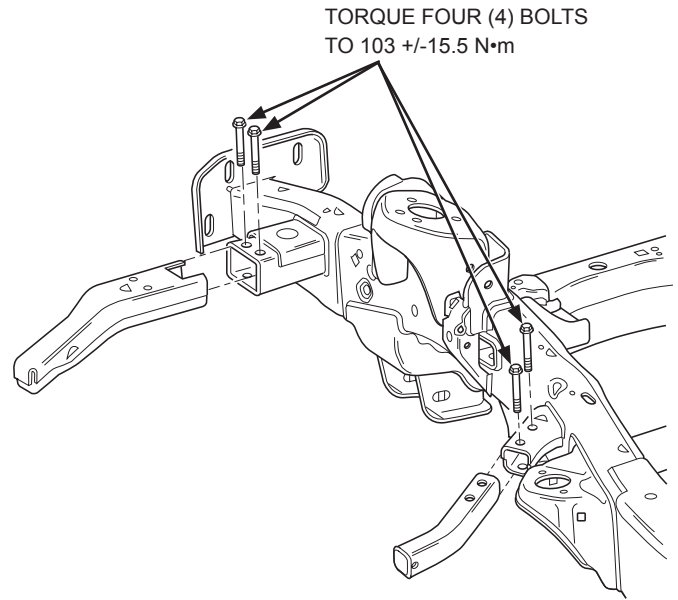
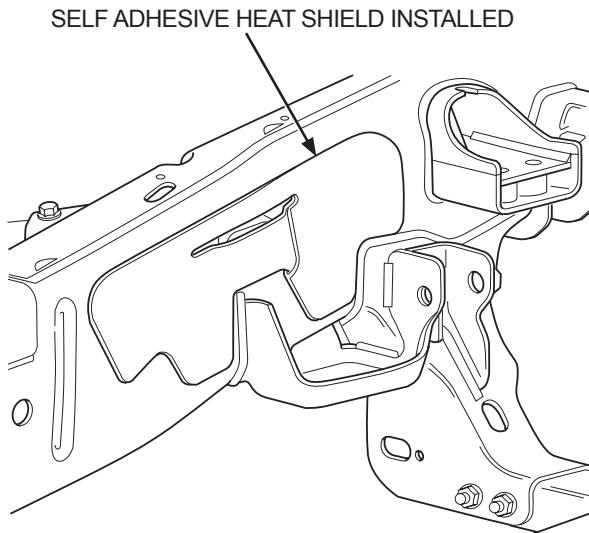


FIGURE 8 – CREW CAB FRAME SHOWN FOR ADDITIONAL ASSEMBLY REQUIREMENTS



TORQUE FOUR (4) BOLTS
TO 103 +/-15.5 N•m

FIGURE 9 – CREW CAB SORB TUBE INSTALLATION (LH SHOWN, RH IS SYMMETRICALLY OPPOSITE) (BOLT TORQUE IS 103 +/-15.5 N•m)



SELF ADHESIVE HEAT SHIELD INSTALLED

FIGURE 10 – (LH SHOWN, RH IS SYMMETRICALLY OPPOSITE) (VEHICLES EQUIPPED WITH 3.5L TIVCT OR 5.0L ENGINES ONLY)

REMOVE CLEAR BACKING FROM SHIELD
PRIOR TO INSTALLING

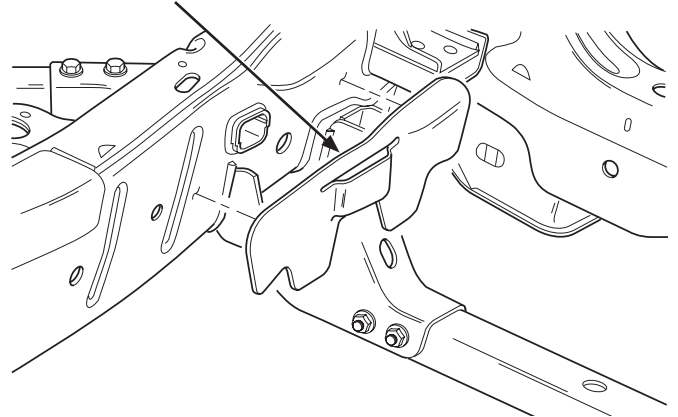


FIGURE 11 – REMOVE CLEAR BACKING FROM SHIELD PRIOR TO INSTALLING. THE FOIL FACE FACES AWAY FROM THE FRAME RAIL. (LH SHOWN, RH IS SYMMETRICALLY OPPOSITE)



SELF ADHESIVE HEAT SHIELDS
INSTALLED ON RH SIDE OF FRAME

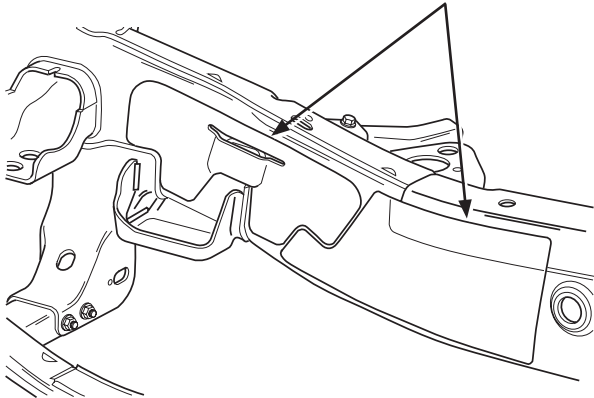


FIGURE 12 – (FORWARD SHIELD REQUIRED ON VEHICLES EQUIPPED WITH 3.5L TIVCT OR 5.0L ENGINES ONLY, REAR SHIELD REQUIRED ON ALL VEHICLES)

REMOVE CLEAR BACKING FROM SHIELD
PRIOR TO INSTALLING

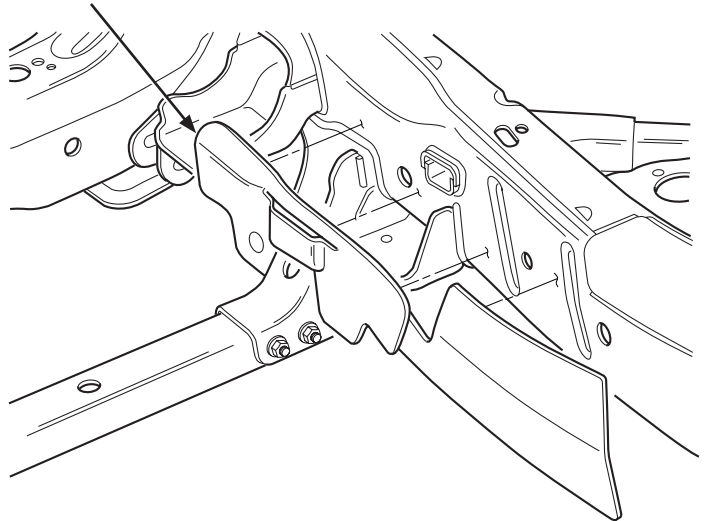


FIGURE 13 – REMOVE CLEAR BACKING FROM SHIELDS PRIOR TO INSTALLING. THE FOIL FACE FACES AWAY FROM THE FRAME RAIL.

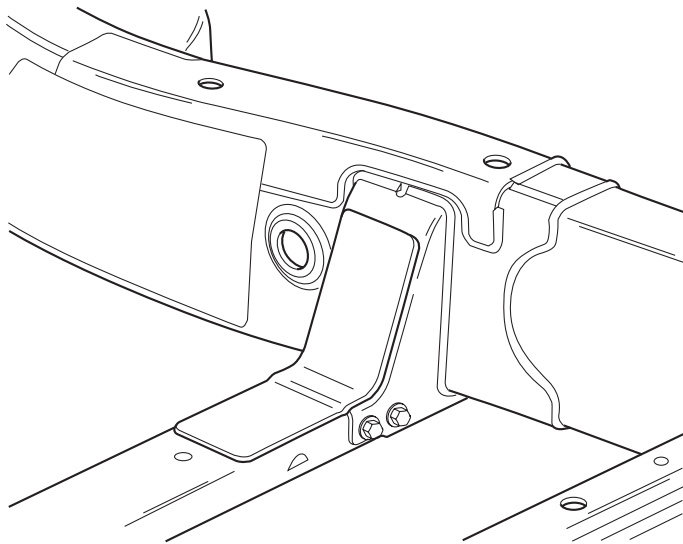


FIGURE 14 – SELF ADHESIVE HEAT SHIELD (RH SIDE ONLY)

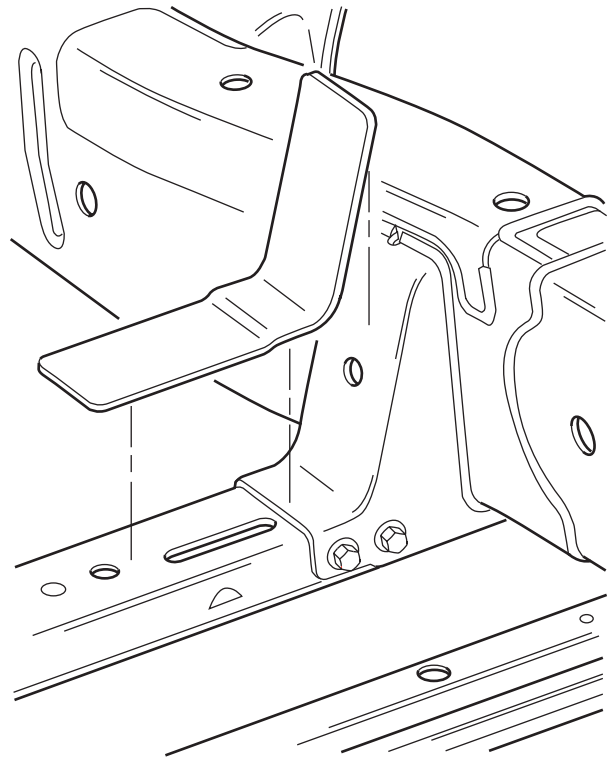


FIGURE 15 – REMOVE CLEAR BACKING FROM SHIELD PRIOR TO INSTALLING. THE FOIL FACE FACES AWAY FROM THE FRAME RAIL.

SKFL34-5E029-AA

SHEET 10 OF 10



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 FRONT FRAME STUB REPLACEMENT
SECTION INSTALLATION INSTRUCTIONS**

**2015 F-150 FRONT LOWER CONTROL ARM MOUNTING BRACKET
REPLACEMENT INSTALLATION INSTRUCTIONS – ALL FRAMES**

KIT - FL34-5F057-DA		
All Frames	Description	Quantity
FL34-3462-A*	Front Lower Control Arm Bracket (LH)	1
SK-FL34-5F057-DA	Instruction Sheet	1

KIT - FL34-5F057-EA		
Part Number	Description	Quantity
FL34-3462-B*	Front Lower Control Arm Bracket (RH)	1
SK-FL34-5F057-DA	Instruction Sheet	1

***Other Items Required:**

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Undercoating.

SERVICE PROCEDURE:

REMOVAL

1. Remove the lower control arm and any other componentry attached to the lower control arm brackets as outlined in the Workshop Manual.

NOTE: The frame mounted lower control arm brackets are retained to the frame #1 crossmember by welds. (Refer to Figure 1).

2. Using proper eye, face, and ear protection, grind the welds holding the front lower control arm mounting bracket to the frame, and remove the frame bracket. Be careful not to cut into the frame cross member since it will be reused. (Refer to Figure 2).
3. Use a wire brush and clean the areas of the frame where the welds were ground.

INSTALLATION

NOTE: The bracket is being supplied without the lower control arm mounting holes present. It is intended that the required holes be added to the bracket after the bracket is installed to the frame crossmember and proper measurements have been made to properly position the required holes on the bracket. (Refer to Figure 5) for required hole sizes.

1. Loosely clamp the replacement bracket in a preliminary position. (Refer to Figure 3).
2. Perform measurements to ensure proper placement of the new bracket, then clamp firmly into position.
 - Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
3. With all measurements verified and the new bracket in proper position, tack-weld the new bracket in place to the frame cross member.
4. Perform final measurements, then solid weld the new bracket to the frame rail following the weld procedure on pages 2-3. (Refer to Figure 4).

SKFL34-5F057-DA

SHEET 1 OF 4



4. Perform final measurements, then solid weld the new bracket to the frame rail following the weld procedure on pages 2-3. (Refer to Figure 4).
5. Use a dye penetrant to determine if any cracks or large voids exist in the weld joint. If cracks or other defects exist, grind out the defect and repair until the weld is free of defects.
6. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Undercoating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
7. Reinstall the lower control arm and any other componentry that may have been removed during the service procedure. Refer to the appropriate sections of the Workshop Manual for information.

REPAIR AND WELDING PROCEDURE OVERVIEW:

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

WELD PROCEDURE SPECIFICATIONS:

Joint Design Used:

Single: Double:
 Backing: Yes: No:

Material Specifications:

Material: Carbon Steel
 Thickness: Cross Member: 3.0mm Nom
 Bracket: 3.5mm Nom

OPTION 1: GMAW – MIG WELDING

Stringer or Weave Bead: Stringer
 Multi or Single Pass (per side): Single
 Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)
 Vertical Progression: Vertical Down
 Working Amperage: 145 amps
 Wire Feed Speed: 140-150
 Volts: 18-19
 Gas: 85Ar-15CO2, Flow Rate: 14 CFI
 Amperage (GMAW): 140-150 amp



OPTION 2: SMAW – STICK WELDING

Stringer or Weave Bead: Stringer
Multi or Single Pass (per side): Single
Number of Electrodes: As Needed
Electrode Angle: Trailing w/45
Working Amperage: 90 amps
Vertical Progression: Vertical Up
Filler Metal: AWS Specification: E-6011
AWS Classification: A5.1-91
Amperage (SMAW): 70-110 amps

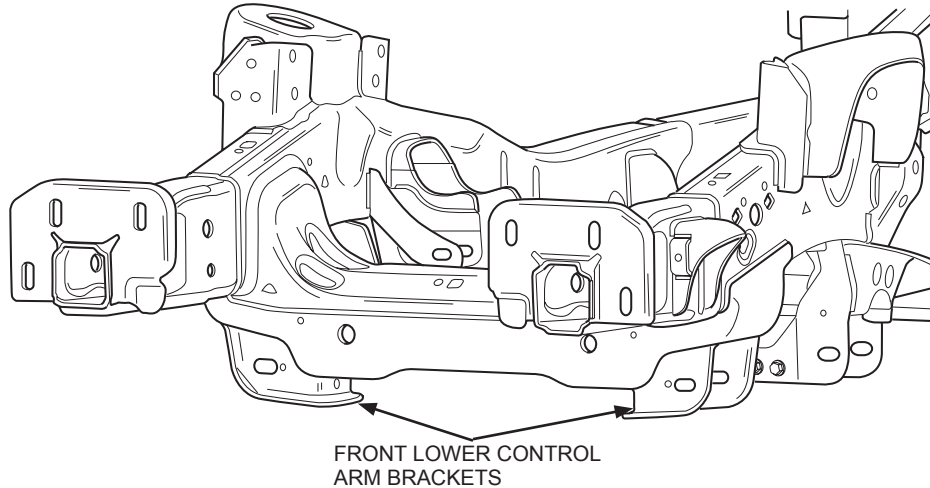


FIGURE 1 – VIEW OF FRAME SHOWING FRONT LOWER CONTROL ARM BRACKETS

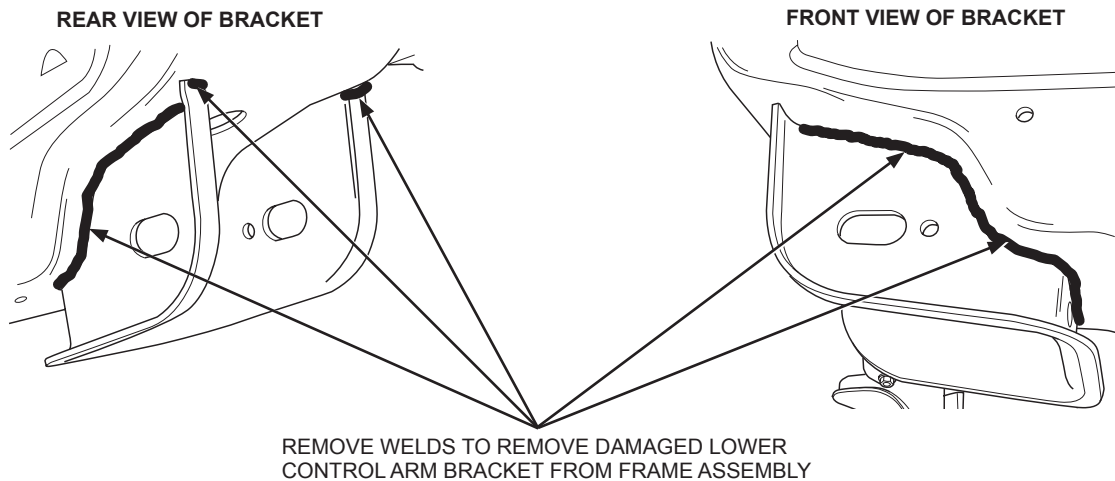


FIGURE 2 – GRIND WELDS SHOWN TO REMOVE DAMAGED LOWER CONTROL ARM BRACKET, DO NOT GRIND INTO THE CROSS MEMBER MATERIAL WHEN REMOVING THE LOWER CONTROL BRACKET FROM THE FRAME, RH SHOWN, LH SYMMETRICALLY OPPOSITE

SKFL34-5F057-DA

SHEET 3 OF 4



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 FRONT LOWER CONTROL ARM MOUNTING
BRACKET REPLACEMENT INSTALLATION
INSTRUCTIONS – ALL FRAMES**

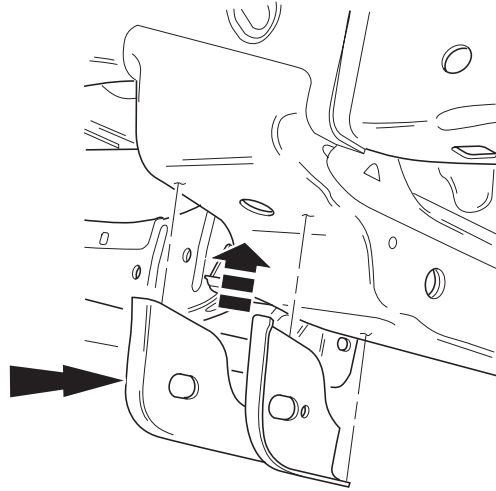


FIGURE 3 – LOWER CONTROL ARM BRACKET PLACEMENT

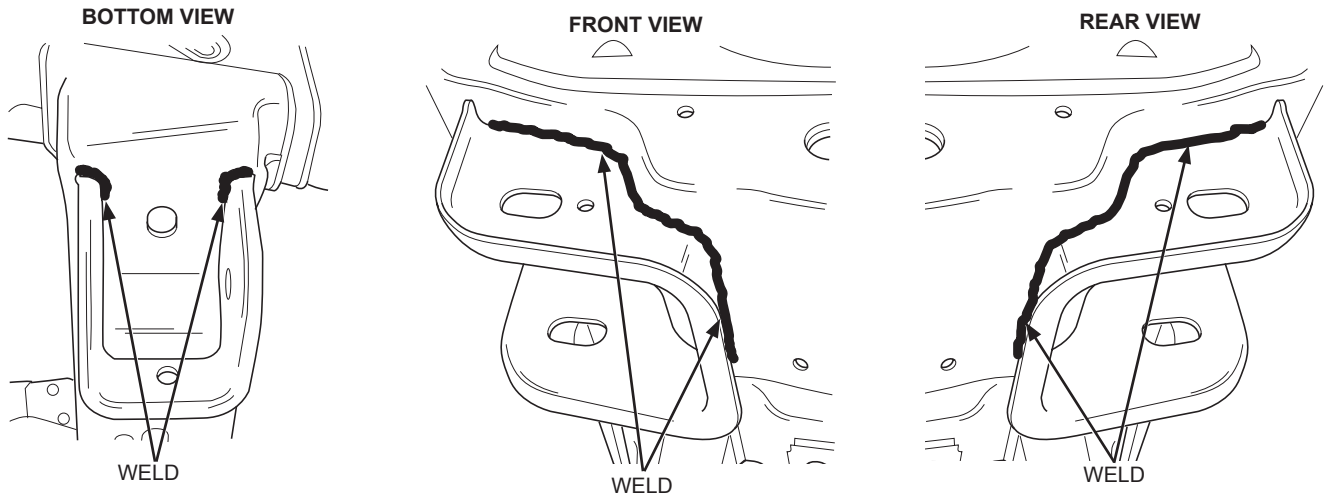


FIGURE 4 – LOWER CONTROL ARM BRACKET SHOWING FINAL WELD PATTERN, RH SHOWN, LH SYMMETRICALLY OPPOSITE

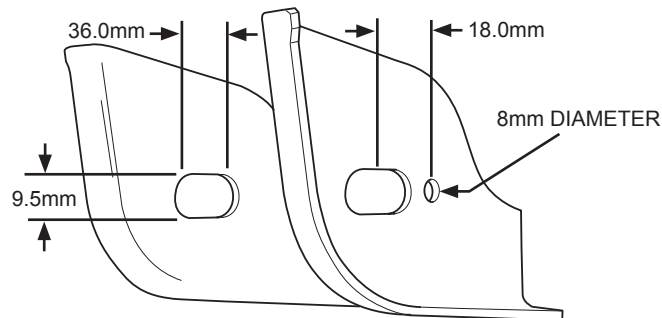


FIGURE 5 – LOWER CONTROL ARM BRACKET SHOWING REQUIRED HOLE SIZES TO BE INSTALLED AT POINT OF SERVICE, RH SHOWN, LH SYMMETRICALLY OPPOSITE

SKFL34-5F057-DA

SHEET 4 OF 4



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 FRONT LOWER CONTROL ARM MOUNTING
BRACKET REPLACEMENT INSTALLATION
INSTRUCTIONS – ALL FRAMES**

**2015 F-150 REAR BUMPER MOUNTING BRACKET REPLACEMENT INSTALLATION INSTRUCTIONS
- ALL FRAMES**

KIT - FL34-17D983-AA		
Part Number	Description	Quantity
FL34-17A881-A*	Rear Bumper Mounting Bracket (RH)	1
SKFL34-17D983-AA	Instruction Sheet	1

KIT - FL34-17D983-BA		
Part Number	Description	Quantity
FL34-17A882-A*	Rear Bumper Mounting Bracket (LH)	1
SKFL34-17D983-AA	Instruction Sheet	1

***Other Items Required:**

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Undercoating.

SERVICE PROCEDURE:

REMOVAL

1. Remove the rear bumper assembly and any other components that may be attached to the rear bumper bracket that is being replaced as outlined in Workshop Manual.
2. Put vehicle up on frame rack and anchor in place following frame rack company guidelines and precautions if required.
3. Perform detailed measurement of the frame, and perform any required pulling operations. This is critical to ensure proper installation of replacement frame brackets.
4. Using proper eye, face, and ear protection, grind the welds holding the rear bumper mounting bracket to the frame, and remove the bracket. Be careful not to cut into the side rail since it will be reused. (Refer to Figures 1 and 2).
5. Take a wire brush and clean the areas of the frame where the welds were ground.

INSTALLATION

1. Loosely clamp the replacement bracket in a preliminary position.
2. Perform measurements to ensure proper placement of the new unit, then clamp firmly into position.
 - Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
3. With all measurements verified and the new bracket in proper position, tack-weld the new bracket in place on the rear frame rail.
4. Perform final measurements, then solid weld the new bracket to the frame rail following the weld procedure on page 2, (Refer to Figures 3 - 4)

SKFL34-17D983-AA

SHEET 1 OF 4



5. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Undercoating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
6. Reinstall the rear bumper and any other components that may have been removed during the repair. Refer to the appropriate sections of the Workshop Manual for information.

REPAIR AND WELDING PROCEDURE OVERVIEW:

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

WELD PROCEDURE SPECIFICATIONS:

Joint Design Used:

Single: (x) Double: ()

Backing: Yes: () No: (x)

Material Specifications:

Material: Carbon Steel

Thickness: Rear Rail: 2.2mm Nom/2.7mm Nom (Frame Model Dependent)

Outer Bracket: 4.0mm Nom

Inner Bracket: 5.4mm Nom

OPTION 1: GMAW – MIG WELDING

Stringer or Weave Bead: Stringer

Multi or Single Pass (per side): Single

Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)

Vertical Progression: Vertical Down

Working Amperage: 145 amps

Wire Feed Speed: 140-150

Volts: 18-19

Gas: 85Ar-15CO2, Flow Rate: 14 CFI

Amperage (GMAW): 140-150 amp

OPTION 2: SMAW – STICK WELDING

Stringer or Weave Bead: Stringer

Multi or Single Pass (per side): Single

Number of Electrodes: As Needed

Electrode Angle: Trailing w/45

Working Amperage: 90 amps

Vertical Progression: Vertical Up

Filler Metal: AWS Specification: E-6011

AWS Classification: A5.1-91

Amperage (SMAW): 70-110 amps

SKFL34-17D983-AA

SHEET 2 OF 4



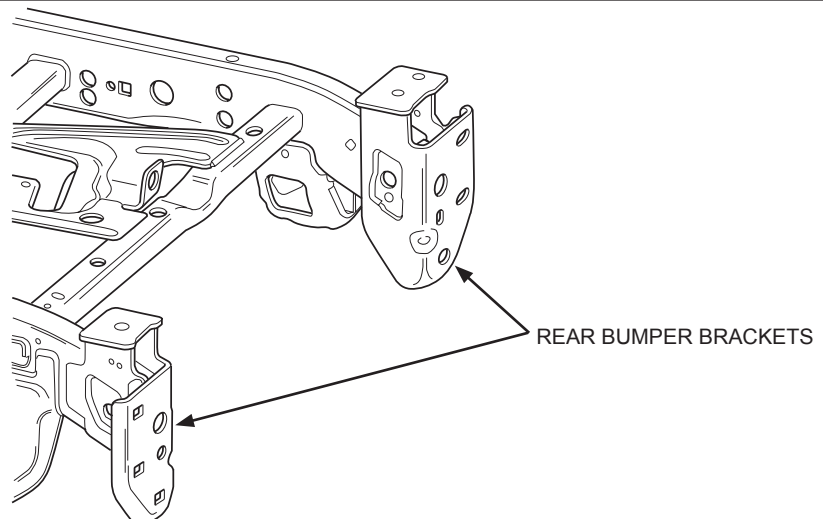
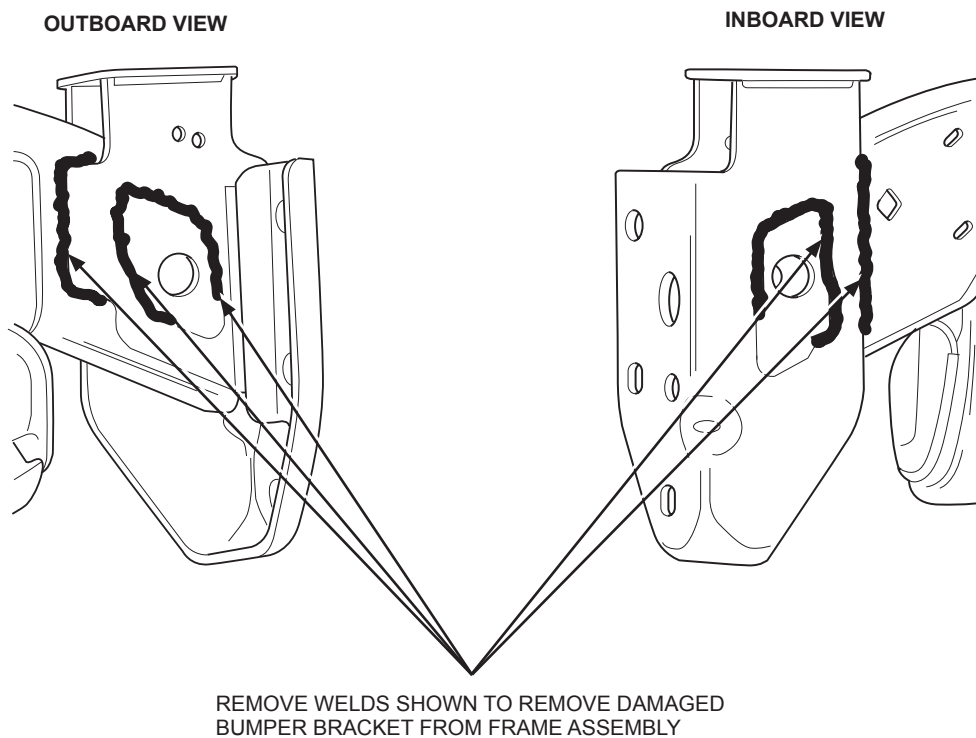


FIGURE 1 – VIEW OF FRAME SHOWING REAR BUMPER BRACKETS



REMOVE WELDS SHOWN TO REMOVE DAMAGED BUMPER BRACKET FROM FRAME ASSEMBLY

FIGURE 2 – GRIND WELDS SHOWN TO REMOVE DAMAGED BUMPER BRACKET, DO NOT GRIND INTO THE REAR FRAME RAIL MATERIAL WHEN REMOVING THE BUMPER BRACKET FROM THE FRAME, RH SHOWN, LH SYMMETRICALLY OPPOSITE



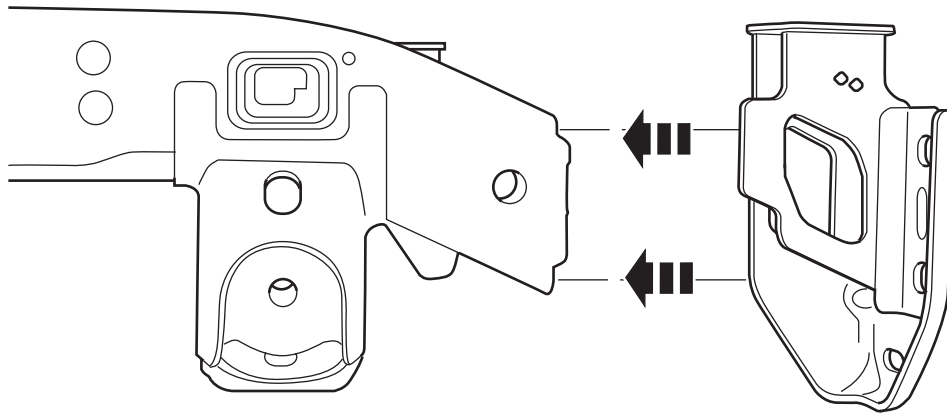
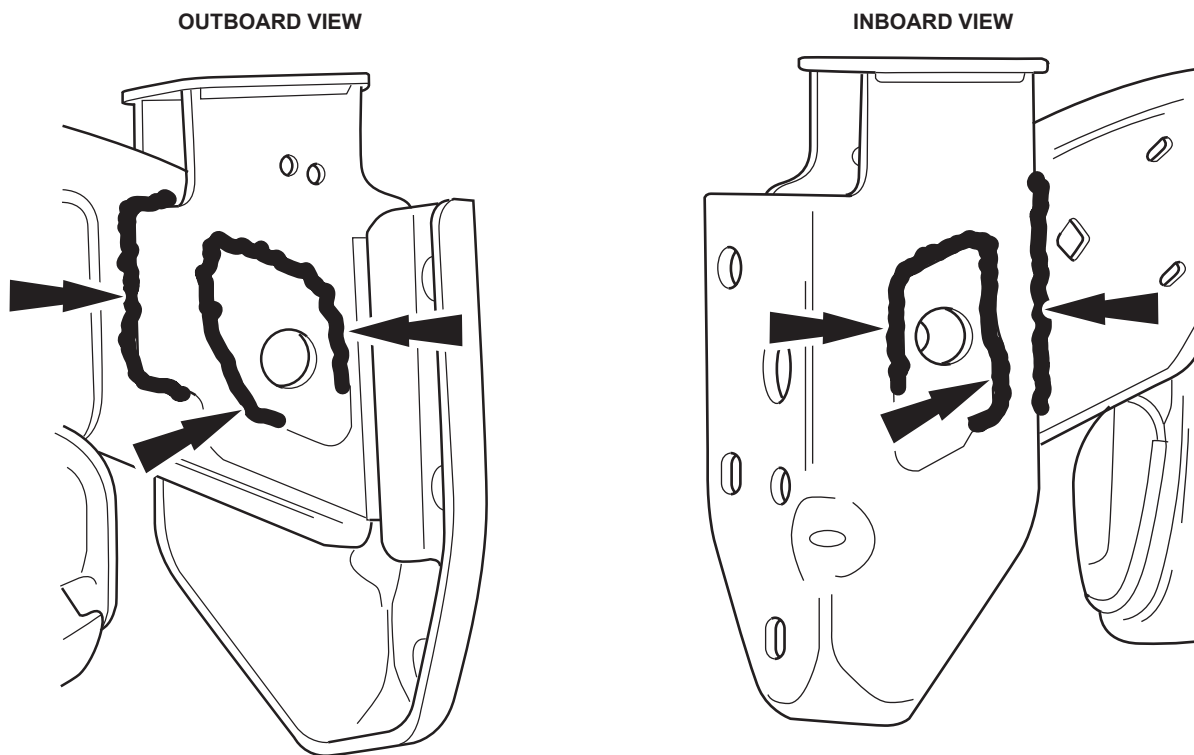


FIGURE 3 – VIEW OF FRAME SHOWING REAR BUMPER BRACKETS INSTALLATION



**FIGURE 4 – VIEW OF BRACKET SHOWING WELD LOCATIONS,
RH SHOWN, LH SYMMETRICALLY OPPOSITE**



2015 F-150 REAR FRAME STUB REPLACEMENT SECTION INSTALLATION INSTRUCTIONS

KIT – FL34-5F040-AA

(4X2) REAR FRAME STUB REPLACEMENT FOR USE ON FRAME PART NUMBERS FL34-5005-AAA*, AAC*, AAD*, AAE*, AAF*, AAG*, GAA*, GAC*, GAE*, GAF*,

Part Number	Description	Quantity
FL34-5B109-A*	Frame Assembly Rear End	1
FL34-5F029-A*	Doubler rear Rail Upper LH	1
FL34-5R145-A*	Doubler rear Rail Upper RH	1
FL34-5F029-B*	Jounce Doubler Rear Rail LH (4x2)	1
FL34-5R145-B*	Jounce Doubler Rear Rail RH (4x2)	1
SK FL34-5F040-AA	Instruction Sheet	1

KIT – FL34-5F040-BA

(4X2) REAR FRAME STUB REPLACEMENT FOR USE ON FRAME PART NUMBERS FL34-5005-GAD*, GAG* GAH*

Part Number	Description	Quantity
FL34-5B109-B*	Frame Assembly Rear End	1
FL34-5F029-A*	Doubler rear Rail Upper LH	1
FL34-5R145-A*	Doubler rear Rail Upper RH	1
FL34-5F029-B*	Jounce Doubler Rear Rail LH (4x2)	1
FL34-5R145-B*	Jounce Doubler Rear Rail RH (4x2)	1
SK FL34-5F040-AA	Instruction Sheet	1

KIT – FL34-5F040-CA

**(4X4) REAR FRAME STUB REPLACEMENT
FOR USE ON FRAME PART NUMBERS FL34-5005-CAA*, CAC*, CAD*, CAE*, JAA*, JAC*, JAE*, JAF***

Part Number	Description	Quantity
FL34-5B109-A*	Frame Assembly Rear End	1
FL34-5F029-A*	Doubler rear Rail Upper LH	1
FL34-5R145-A*	Doubler rear Rail Upper RH	1
FL34-5F029-C*	Jounce Doubler Rear Rail LH (4x4)	1
FL34-5R145-C*	Jounce Doubler Rear Rail RH (4x4)	1
SK FL34-5F040-AA	Instruction Sheet	1

KIT – FL34-5F040-DA

(4X4) REAR FRAME STUB REPLACEMENT FOR USE ON FRAME PART NUMBERS FL34-5005-JAD*, JAG*, JAH*

Part Number	Description	Quantity
FL34-5B109-B*	Frame Assembly Rear End	1
FL34-5F029-A*	Doubler rear Rail Upper LH	1
FL34-5R145-A*	Doubler rear Rail Upper RH	1
FL34-5F029-C*	Jounce Doubler Rear Rail LH (4x4)	1
FL34-5R145-C*	Jounce Doubler Rear Rail RH (4x4)	1
SK FL34-5F040-AA	Instruction Sheet	1

SKFL34-5F040-AA

SHEET 1 OF 7



***Other Items Required:**

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Undercoating.

SERVICE PROCEDURE:

REMOVAL PREPERATION

NOTE: All body alignment measurements are carried out with the vehicle detrimmed. Measurements are made metal to metal, on center, unless otherwise specified. Measure the vehicle to determine if the body requires straightening and alignment. The vehicle must be restored its correct overall dimensions prior to beginning this procedure. For body dimensional information, refer to the appropriate workshop manual.

1. Anchor the vehicle to a frame rack following the equipment manufacturer's instructions.
2. Remove the rear bumper assembly as outlined in Workshop Manual.
3. Remove the rear tailgate and pickup box assembly as outlined in the Workshop Manual.
4. Lower and remove the spare tire, and remove the spare tire carrier winch assembly from the frame section. (The winch assembly may also need to be replaced if damaged).
5. Drain and remove the fuel tank assembly following Workshop Manual. Plug the open lines.
6. Loosen and remove all exhaust hangers from frame, loosen extension pipe connection, then remove the rear exhaust system. Refer to Workshop Manual.
7. Position vehicle on frame rack and anchor in place following frame rack company guidelines and precautions.

NOTE: All body alignment measurements are carried out with the vehicle detrimmed. Measurements are made metal to metal, on center, unless otherwise specified.

8. Perform detailed measurement of the frame, and perform any required pulling operations. This is necessary to ensure proper installation of the replacement frame section.
9. Using the frame rack towers, run a support chain under the rear cab mount area of the center section of the frame, and apply gentle tension to hold the cab and center section in place.
10. Remove the rear shock absorbers. Refer to the Workshop Manual

WARNING: ADJUST THE REAR AXLE HEIGHT TO RELIEVE SPRING TENSION BEFORE REMOVING ANY SHACKLE BOLTS, NUTS OR SPRING PINS. SPRINGS UNDER TENSION MAY RELEASE WITH GREAT FORCE. FAILURE TO FOLLOW THIS INSTRUCTION MAY RESULT IN SERIOUS PERSONAL INJURY.

11. Remove the rear spring eye and shackle bolts. Refer to the workshop Manual.

REMOVAL

NOTE: The rear frame section on this vehicle is retained by a welded joint, (marriage joint), and upper and lower frame rail reinforcements approximately midway between leaf spring frame brackets. Refer to Figures 1 thru 4 for frame assembly detail.



1. Using proper eye, face, and ear protection, grind the welds holding the rear frame reinforcement brackets to the frame rail and remove the brackets completely. Be careful not to cut into the mid rear side rail since it will be re used.
2. Using proper eye, face, and ear protection, grind the welds holding the mid rear and rear frame sections together. Be careful to not cut into the mid rear side rail since it will be reused.
3. Using an air chisel with a sharp 1", wedge-type chisel, separate the ground area of the joints.
4. Remove the complete rear section.
5. Insert the new rear frame section into the original mid rear section of the frame.

INSTALLATION

1. Loosely clamp the replacement frame section in a preliminary position.
2. Perform measurements to ensure proper placement of the new unit, then clamp firmly into position.
 - a. Apply weld through primer locally in the areas to be welded (1/4" on each side of the seam).
3. Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
4. With all measurements verified and the new section in proper position, tack weld the new frame section in place to the original mid rear section.
5. Perform a final measurement, then solid weld the new section to the original on all overlap joints, following the weld procedure on page 4, (refer to Figures 5 and 6).
 - a. Use a dye penetrant to determine if any cracks or large voids exist in the weld joint. If cracks or other defects exist, grind out the defect and repair until the weld is free of defects.
6. Position the rear frame reinforcement brackets, clamp them in place, apply weld through primer as in Step 2, then weld as shown. (Refer to Figures 9 and 10).
7. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Undercoating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to Restoring Corrosion Protection Following Repair in the Workshop Manual Section.
8. Reinstall the rear springs, shocks, and other removed components per the Workshop Manual.
9. Remove the vehicle from the frame rack, and perform other required reassembly procedures following the appropriate Workshop Manual Sections.



REPAIR AND WELDING PROCEDURE OVERVIEW:

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

WELD PROCEDURE SPECIFICATIONS:

Joint Design Used:

Single: (x) Double: ()

Backing: Yes: () No: (x)

Material Specifications:

Material: Carbon Steel

Thickness: Rear Mid Rail: 2.1mm Nom/3.4mm Nom
(Frame Model Dependent)
Rear Rail: 2.2mm Nom/2.7mm Nom
(Frame Model Dependent)

OPTION 1: GMAW – MIG WELDING

Stringer or Weave Bead: Stringer

Multi or Single Pass (per side): Single

Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)

Vertical Progression: Vertical Down

Working Amperage: 145 amps

Wire Feed Speed: 140-150

Volts: 18-19

Gas: 85Ar-15CO₂, Flow Rate: 14 CFI

Amperage (GMAW): 140-150 amp

OPTION 2: SMAW – STICK WELDING

Stringer or Weave Bead: Stringer

Multi or Single Pass (per side): Single

Number of Electrodes: As Needed

Electrode Angle: Trailing w/45

Working Amperage: 90 amps

Vertical Progression: Vertical Up

Filler Metal: AWS Specification: E-6011

AWS Classification: A5.1-91

Amperage (SMAW): 70-110 amps

SKFL34-5F040-AA

SHEET 4 OF 7



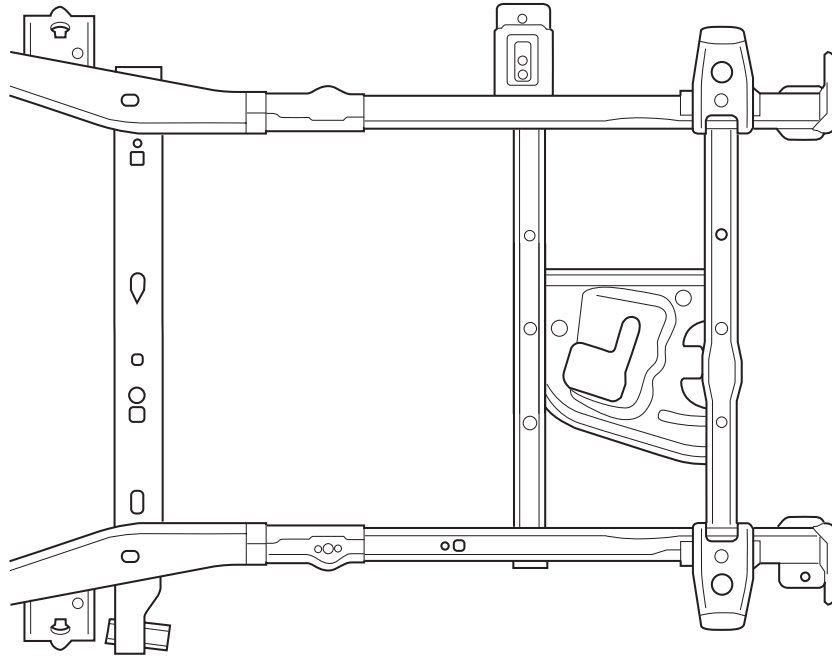


FIGURE 1 – REAR FRAME – BOTTOM VIEW (5.5' BOX MODEL SHOWN)

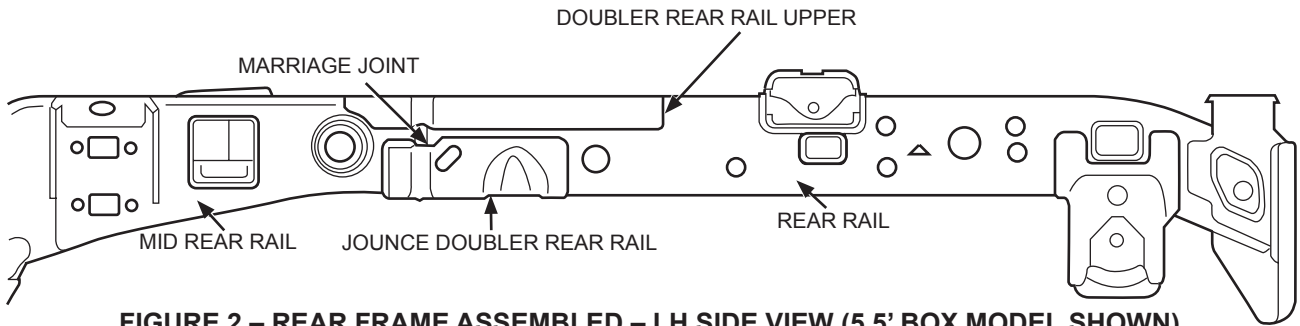


FIGURE 2 – REAR FRAME ASSEMBLED – LH SIDE VIEW (5.5' BOX MODEL SHOWN)

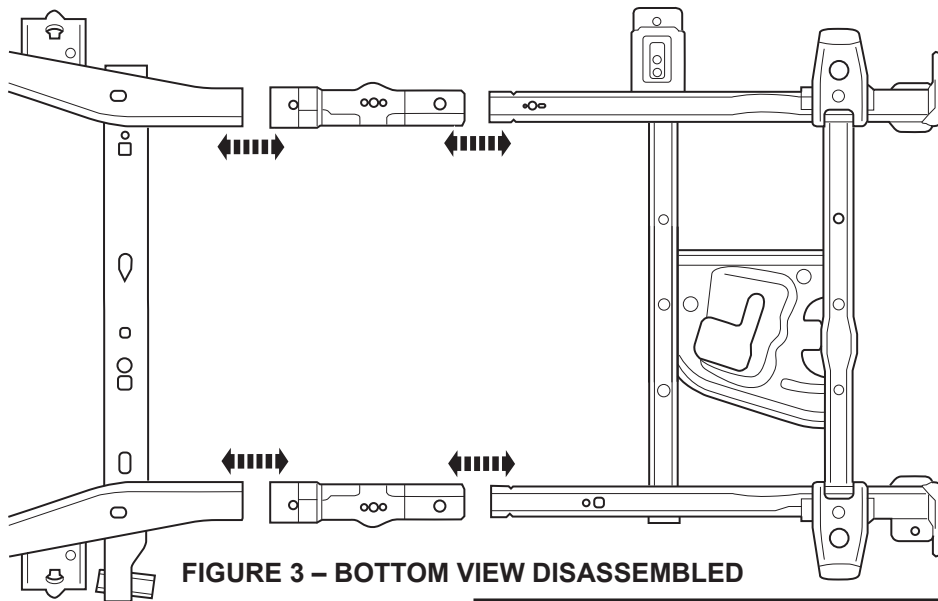


FIGURE 3 – BOTTOM VIEW DISASSEMBLED

SKFL34-5F040-AA

SHEET 5 OF 7



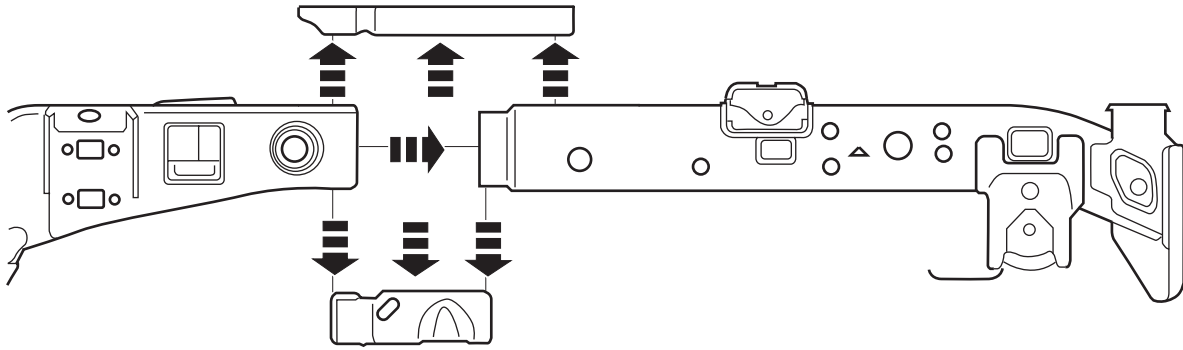
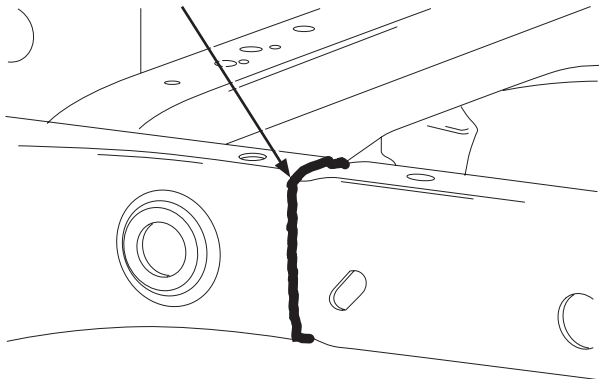


FIGURE 4 – LEFT SIDE VIEW – DISASSEMBLED

COMPLETE 360 WELD DEGREE
AROUND THE MARRIAGE JOINT
BETWEEN RAIL SECTIONS

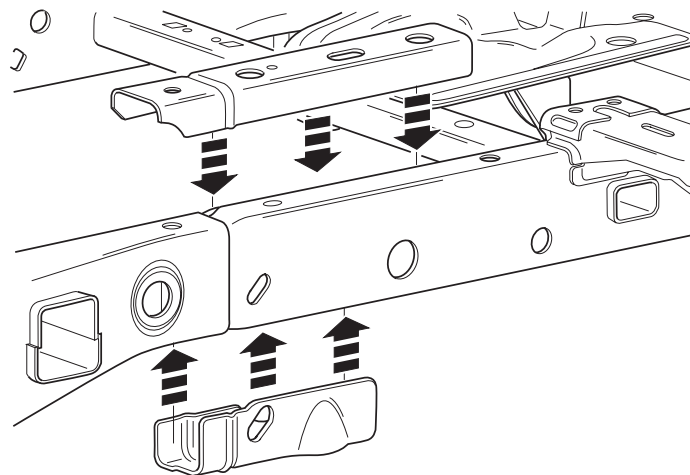


**FIGURE 5 – WELD LOCATION –
LH OUTBOARD VIEW SHOWN,
RH IS SYMMETRICALLY OPPOSITE**

COMPLETE 360 WELD DEGREE
AROUND THE MARRIAGE JOINT
BETWEEN RAIL SECTIONS



**FIGURE 6 – WELD LOCATION –
LH INBOARD VIEW SHOWN,
RH IS SYMMETRICALLY OPPOSITE**



**FIGURE 7 – DISASSEMBLED VIEW OF REAR RAIL REINFORCEMENTS LH SHOWN,
RH IS SYMMETRICALLY OPPOSITE**



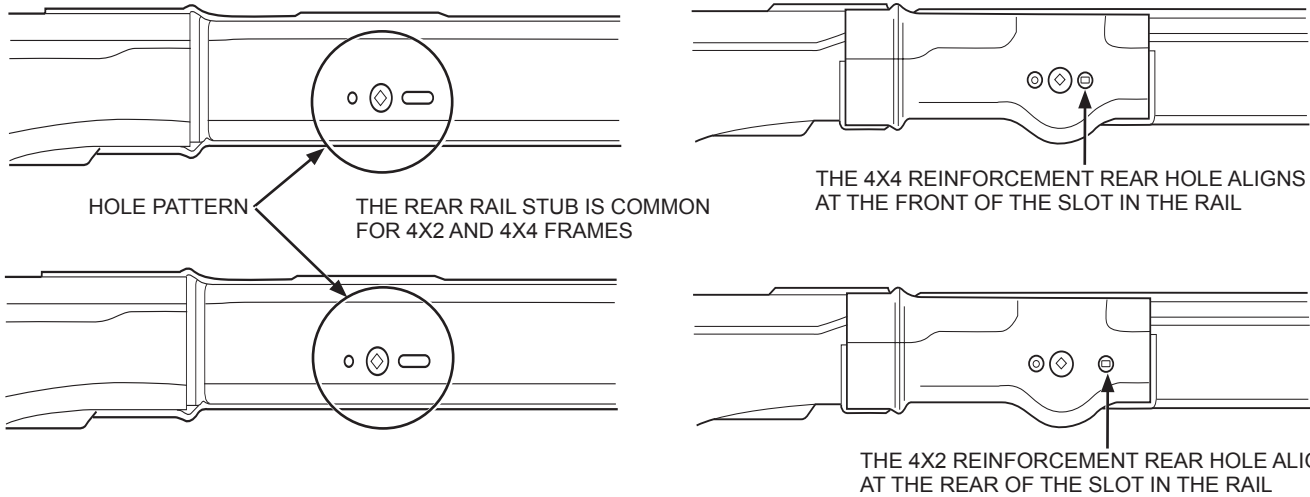


FIGURE 8 – BOTTOM VIEW OF FRAME AT REAR JOUNCE DOUBLER SHOWING 4X2 AND 4X4 HOLE PATTERN MATCH-UP BETWEEN FRAME RAIL SECTION AND JOUNCE DOUBLER

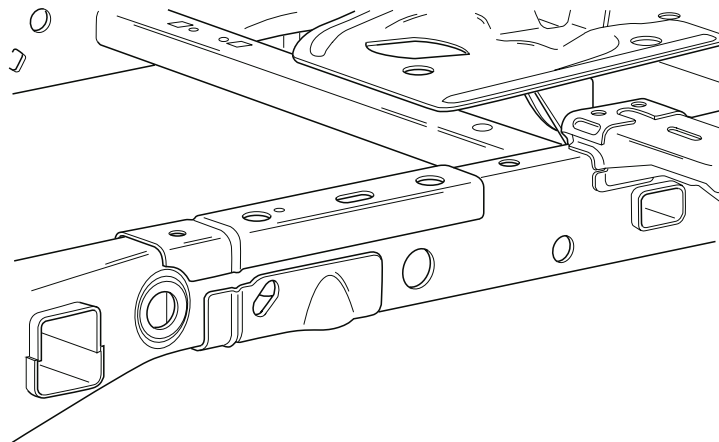


FIGURE 9 – VIEW OF REAR RAIL REINFORCEMENTS INSTALLED, LH OUTER SHOWN, RH IS SYMMETRICALLY OPPOSITE

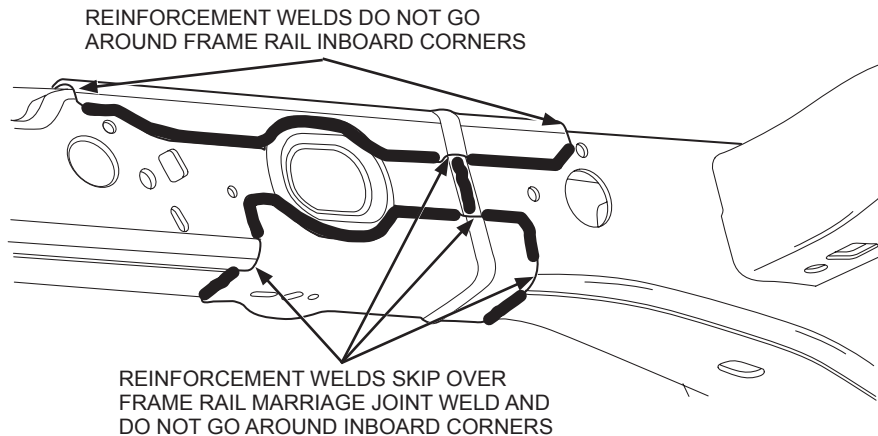


FIGURE 10 – VIEW OF REAR RAIL REINFORCEMENTS INSTALLED, LH INNER SHOWN, RH IS SYMMETRICALLY OPPOSITE

SKFL34-5F040-AA

SHEET 7 OF 7



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

2015 F-150 REAR FRAME STUB REPLACEMENT SECTION INSTALLATION INSTRUCTIONS

2015 F-150 REAR SPRING FRONT HANGER BRACKET REPLACEMENT INSTALLATION INSTRUCTIONS – ALL FRAMES

KIT - FL34-5B901-AA		
Part Number	Description	Quantity
FL34-5785-A*	Rear Spring Front Hanger Bracket (RH)	1
SK-FL34-5B901-AA	Instruction Sheet	1

KIT - FL34-5B901-BA		
Part Number	Description	Quantity
FL34-5785-B*	Rear Spring Front Hanger Bracket (LH)	1
SK-FL34-5B901-AA	Instruction Sheet	1

***Other Items Required Not Included in Kit:**

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Undercoating.

SERVICE PROCEDURE:

REMOVAL

1. Remove the rear leaf spring assembly, (Refer to Figures 1 thru 4), and any other components from the frame assembly as needed to gain access to the area of the frame to be repaired refer to the Workshop Manual for specific removal procedures.
2. Put vehicle up on frame rack and anchor in place following frame rack company guidelines and precautions if required.
3. Perform detailed measurement of the frame, and perform any required pulling operations. This is critical to ensure proper installation of replacement frame brackets.
4. Using proper eye, face, and ear protection, grind the welds holding the rear spring shackle bracket to the frame, and remove the bracket. Be careful not to cut into the side rail since it will be reused.
5. Take a wire brush and clean the areas of the frame where the welds were ground.

INSTALLATION

1. Loosely clamp the replacement bracket assembly in a preliminary position.
2. Perform measurements to ensure proper placement of the new unit, then clamp firmly into position.
 - Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
3. With all measurements verified and the new bracket in proper position, tack-weld the new bracket in place on the rear frame rail.
4. Perform final measurements, then solid weld the new bracket to the frame rail following the weld procedure on pages 2 and 3, (refer to Figures 4 and 5).



5. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Undercoating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
6. Reinstall the leaf spring assembly and any other components that may have been removed during the repair. Refer to the appropriate sections of the Workshop Manual for information.

REPAIR AND WELDING PROCEDURE OVERVIEW:

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

WELD PROCEDURE SPECIFICATIONS:

Joint Design Used:

Single: (x) Double: ()
 Backing: Yes: () No: (x)

Material Specifications:

Material: Carbon Steel

Thickness: Mid Rear Rail Inner: 2.2mm Nom/3.1mm Nom
 (Frame Model Dependent)
 Mid Rear Rail Outer: 2.7mm Nom/3.4mm Nom
 (Frame Model Dependent)
 Outer Bracket: 4.0mm Nom
 Inner Bracket: 3.0mm Nom

OPTION 1: GMAW – MIG WELDING

Stringer or Weave Bead: Stringer
 Multi or Single Pass (per side): Single
 Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)
 Vertical Progression: Vertical Down
 Working Amperage: 145 amps
 Wire Feed Speed: 140-150
 Volts: 18-19
 Gas: 85Ar-15CO2, Flow Rate: 14 CFI
 Amperage (GMAW): 140-150 amp



OPTION 2: SMAW – STICK WELDING

Stringer or Weave Bead: Stringer
Multi or Single Pass (per side): Single
Number of Electrodes: As Needed
Electrode Angle: Trailing w/45
Working Amperage: 90 amps
Vertical Progression: Vertical Up
Filler Metal: AWS Specification: E-6011
AWS Classification: A5.1-91
Amperage (SMAW): 70-110 amps

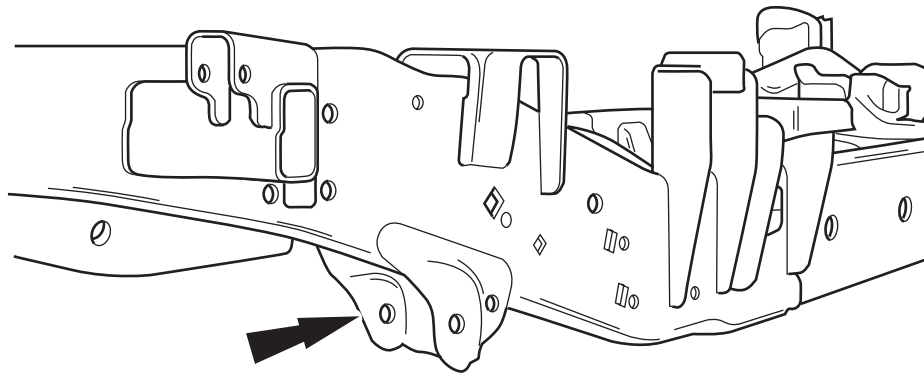


FIGURE 1 – VIEW OF FRAME SHOWING REAR SPRING FRONT HANGER BRACKET, RH SHOWN, LH IS SYMETERICALLY OPPOSITE

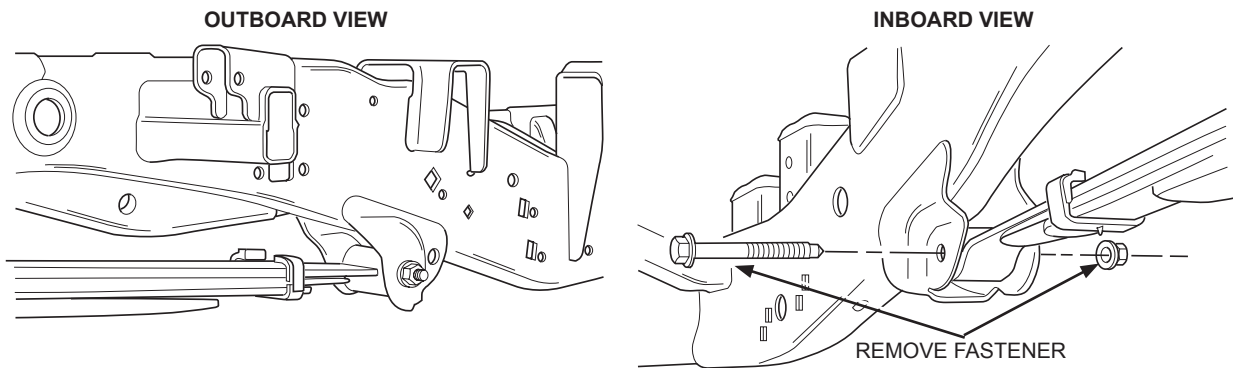


FIGURE 2 – VIEW OF REAR SPRING ASSEMBLY IN THE REAR SPRING FRONT HANGER BRACKET AND WHICH FASTENER TO REMOVE. RH SHOWN, LH IS SYMMETRICALLY OPPOSITE



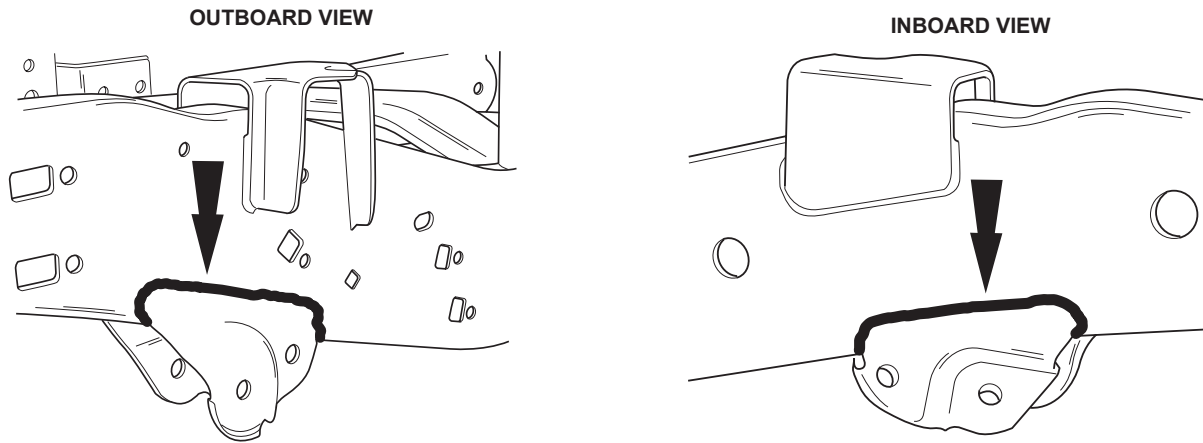


FIGURE 3 – GRIND WELDS SHOWN TO REMOVE DAMAGED REAR SPRING FRONT HANGER BRACKET, DO NOT GRIND INTO THE REAR FRAME RAIL MATERIAL WHEN REMOVING THE BUMPER BRACKET FROM THE FRAME, RH SHOWN, LH SYMMETRICALLY OPPOSITE

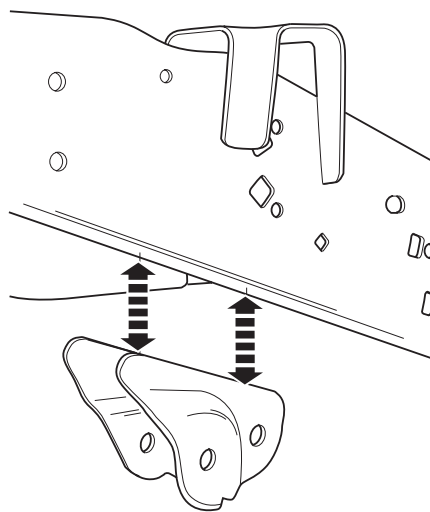


FIGURE 4 – VIEW OF FRAME SHOWING REAR SPRING FRONT HANGER BRACKET REMOVAL/INSTALLATION.

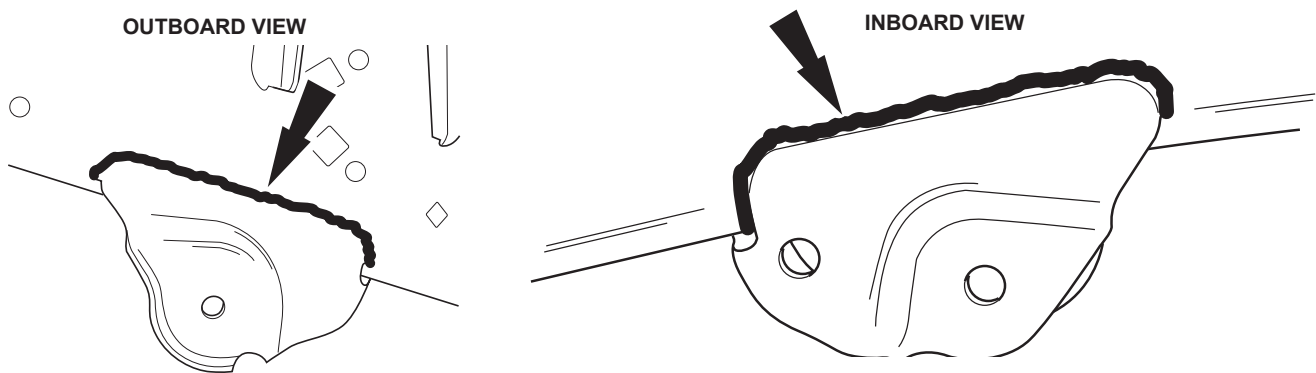


FIGURE 5 – VIEW OF REAR SPRING FRONT HANGER BRACKET SHOWING WELD LOCATIONS. RH SHOWN, LH SYMMETRICALLY OPPOSITE



2015 F-150 REAR SPRING SHACKLE BRACKET REPLACEMENT – ALL FRAMES

KIT - FL34-5B904-AA		
Part Number	Description	Quantity
FL34-5775-A*	Rear Spring Shackle Bracket (RH)	1
SK-FL34-5B904-AA	Instruction Sheet	1

KIT - FL34-5B905-AA		
Part Number	Description	Quantity
FL34-5775-B*	Rear Spring Shackle Bracket (LH)	1
SK-FL34-5B904-AA	Instruction Sheet	1

*Other Items Required Not Included In Kit:

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Under coating.

SERVICE PROCEDURE:

REMOVAL

1. Remove the rear leaf spring assembly, (refer to Figures 1 thru 4), and any other components from the frame assembly as needed to gain access to the area of the frame to be repaired refer to the Workshop Manual for specific removal procedures.
2. Put vehicle up on frame rack and anchor in place following frame rack company guidelines and precautions if required.
3. Perform detailed measurement of the frame, and perform any required pulling operations. This is critical to ensure proper installation of replacement frame brackets.
4. Using proper eye, face, and ear protection, grind the welds holding the rear spring shackle bracket to the frame, and remove the bracket.

CAUTION: BE CAREFUL NOT TO CUT INTO THE SIDE RAIL SINCE IT WILL BE REUSED.

5. Take a wire brush and clean the areas of the frame where the welds were ground.

INSTALLATION

1. Loosely clamp the replacement bracket assembly in a preliminary position.
2. Perform measurements to ensure proper placement of the new unit, then clamp firmly into position.
 - Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
3. With all measurements verified and the new bracket in proper position, tack-weld the new bracket in place on the rear frame rail.
4. Perform final measurements, then solid weld the new bracket to the frame rail following the weld procedure on pages 2 and 3, (refer to Figures 4 and 5).



5. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Undercoating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
6. Reinstall the leaf spring assembly and any other components that may have been removed during the repair. Refer to the appropriate sections of the Workshop Manual for information.

REPAIR AND WELDING PROCEDURE OVERVIEW:

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

WELD PROCEDURE SPECIFICATIONS:

Joint Design Used:

Single: (x) Double: ()
 Backing: Yes: () No: (x)

Material Specifications:

Material: Carbon Steel

Thickness: Rear Rail: 2.2mm Nom/2.7mm Nom
 (Frame Model Dependent)
 Outer Bracket: 4.0mm Nom
 Inner Bracket: 3.0mm Nom

OPTION 1: GMAW – MIG WELDING

Stringer or Weave Bead: Stringer
 Multi or Single Pass (per side): Single
 Electrode Angle: Leading with 45 (horizontal), Trailing with 45 (vertical-down)
 Vertical Progression: Vertical Down
 Working Amperage: 145 amps
 Wire Feed Speed: 140-150
 Volts: 18-19
 Gas: 85Ar-15CO2, Flow Rate: 14 CFI
 Amperage (GMAW): 140-150 ampS
 Filler Metal: AWS Specification: E-6011
 AWS Classification: A5.1-91
 Amperage (SMAW): 70-110 amps

SKFL34-5B904-AA

SHEET 2 OF 5



OPTION 2: SMAW – STICK WELDING

Stringer or Weave Bead: Stringer
Multi or Single Pass (per side): Single
Number of Electrodes: As Needed
Electrode Angle: Trailing w/45
Working Amperage: 90 amps
Vertical Progression: Vertical Up
Filler Metal: AWS Specification: E-6011
AWS Classification: A5.1-91
Amperage (SMAW): 70-110 amps

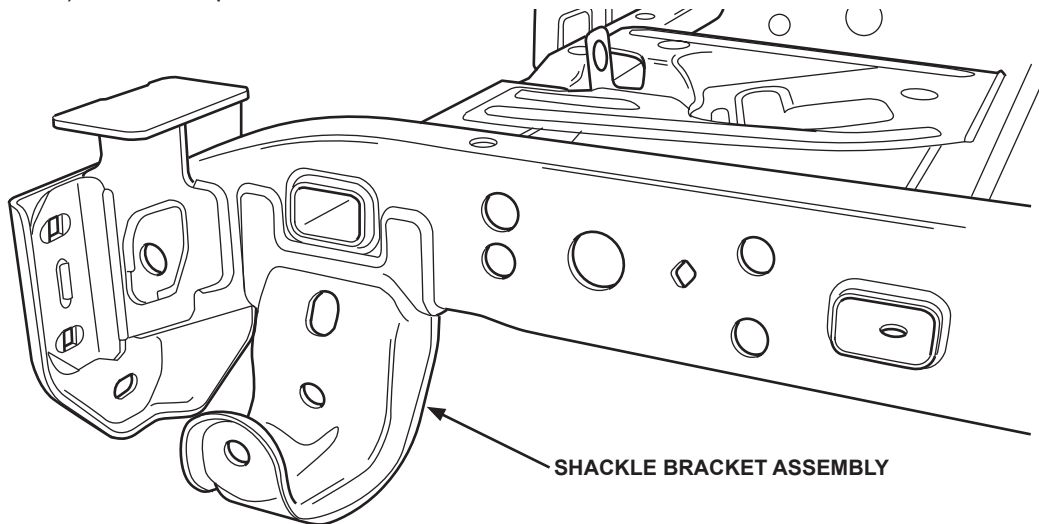


FIGURE 1: VIEW OF FRAME SHOWING REAR SHACKLE BRACKET, RH SHOWN, LH IS SYMETERICALLY OPPOSITE

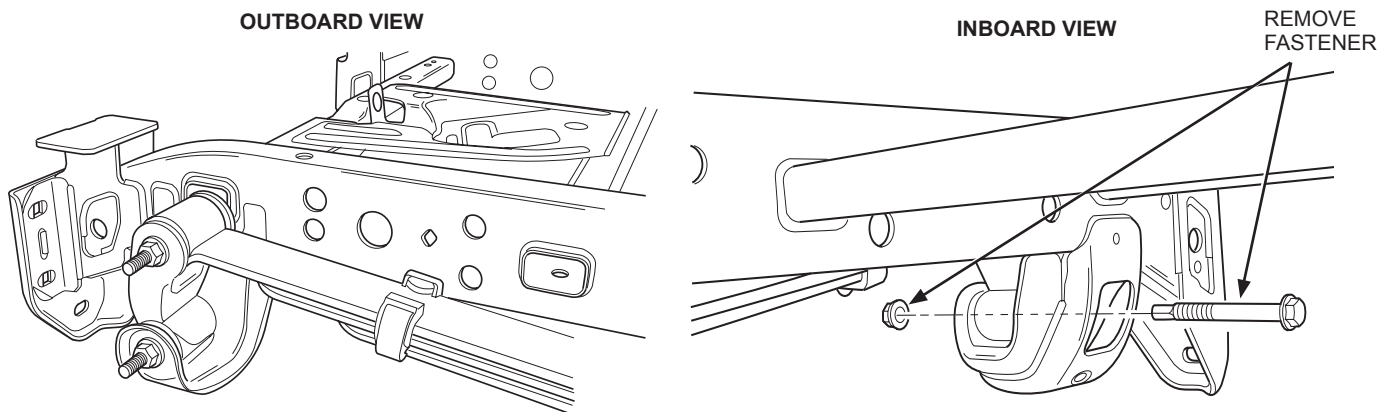


FIGURE 2: VIEW OF REAR SPRING ASSEMBLY IN THE SHACKLE BRACKET AND WHICH FASTENER TO REMOVE, RH SHOWN, LH IS SYMMETRICALLY OPPOSITE

SKFL34-5B904-AA

SHEET 3 OF 5



CPR © 2014 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
7-14

**2015 F-150 REAR SPRING SHACKLE BRACKET
REPLACEMENT INSTALLATION INSTRUCTION
– ALL FRAMES**

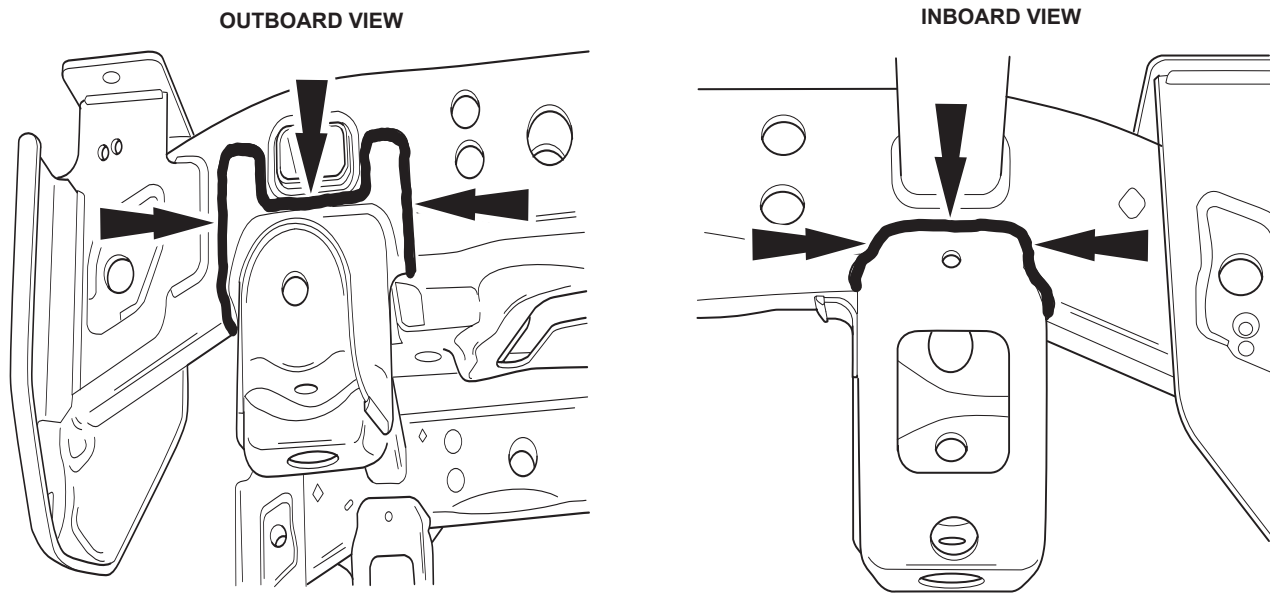


FIGURE 3: GRIND WELDS SHOWN TO REMOVE DAMAGED SHACKLE BRACKET, DO NOT GRIND INTO THE REAR FRAME RAIL MATERIAL WHEN REMOVING THE BUMPER BRACKET FROM THE FRAME, RH SHOWN, LH SYMMETRICALLY OPPOSITE

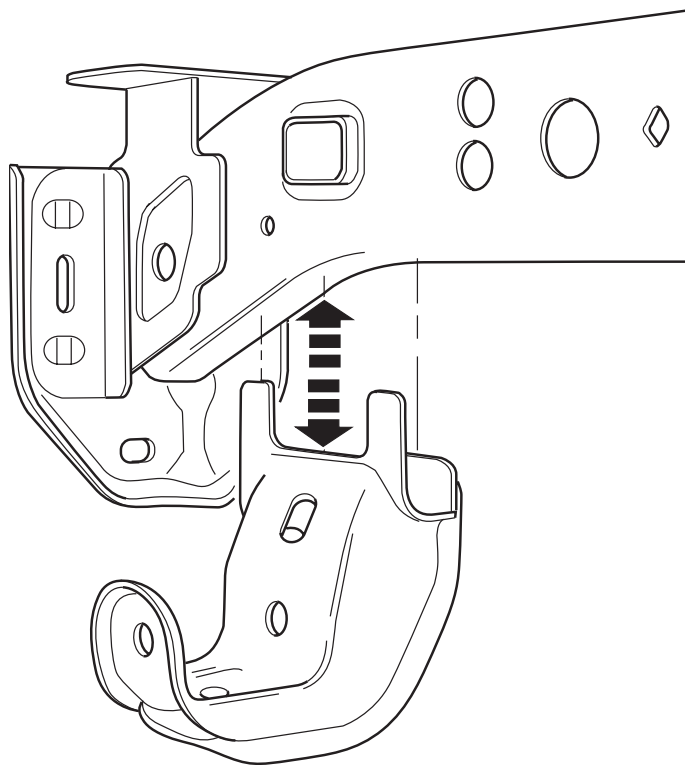
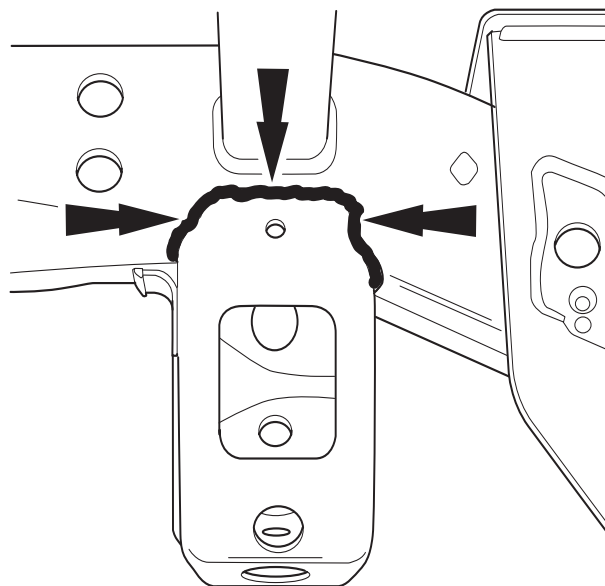
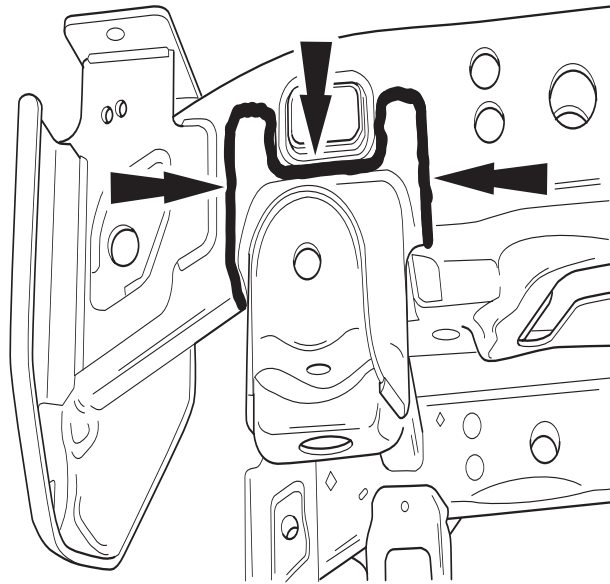


FIGURE 4: VIEW OF FRAME SHOWING SHACKLE BRACKET REMOVAL/INSTALLATION





**FIGURE 5: VIEW OF SHACKLE BRACKET SHOWING WELD LOCATIONS,
RH SHOWN, LH SYMMETRICALLY OPPOSITE**



2015 F-150 TRANSMISSION CROSSMEMBER REPLACEMENT - ALL FRAMES

KIT - FL34-7H474-AA		
Part Number	Description	Quantity
FL34-5059-A*	Transmission Support Crossmember	1
FL34-5E094-C*	Shield-Frame Rear	1
W714418-S439	Bolt M12x130 Hexagon	4
W520114-S442	Nut M12x1.75 Hexagon	4
SKFL34-7H474-AA	Instruction Sheet	1

SERVICE PROCEDURE:

REMOVAL

1. With vehicle in NEUTRAL, position it on an appropriate vehicle hoist, (refer to Workshop Manual).
2. In applicable vehicles, remove any shields or skid plates that may be attached to the transmission crossmember.
 - (Refer to Figure 1) for transmission crossmember view in vehicle.
3. Remove the two (2) heat shield mounting screws from the upper surface of the transmission crossmember.
4. Cut the adhesive backed heat shield on the top right side of the transmission along the edge of the transmission crossmember frame bracket using a sharp razor knife or similar tool. (Refer to Figure 2).
5. Support the transmission with a suitable jack.
6. Remove the two (2) transmission support nuts from the bottom side of the transmission crossmember.
7. Remove the four (4) transmission support crossmember nuts.
8. Remove the four (4) transmission support crossmember support bolts.
9. Remove the transmission support crossmember.

INSTALLATION

1. Position the transmission support crossmember with the directional arrow on the bottom of the crossmember pointing to front of vehicle, install the transmission support nuts and bolts. (Refer to Figure 3).
 - a. Be sure to orient the bolts so the nuts are installed on the front side of the frame brackets.
 - b. Tighten the nuts to 103 N•m (76 lb-ft).



4. Install the two (2) heat shield screws.
 - a. Tighten to 20 N•m (177 lb-in).
5. In applicable vehicles, re-install any shields or skid plates that attach to the transmission crossmember.
6. Apply self-adhesive heat shield to top right hand surface of the transmission crossmember as noted below:
 - a. Cut new adhesive backed heat shield to size to match the coverage area of the heat shield on the previously removed transmission crossmember. (Refer to Figure 4).
 - b. Remove the backing sheet of the heat shield to expose the adhesive backing.
 - c. Apply the heat shield to the right hand side top surface of the transmission crossmember, next to frame bracket.

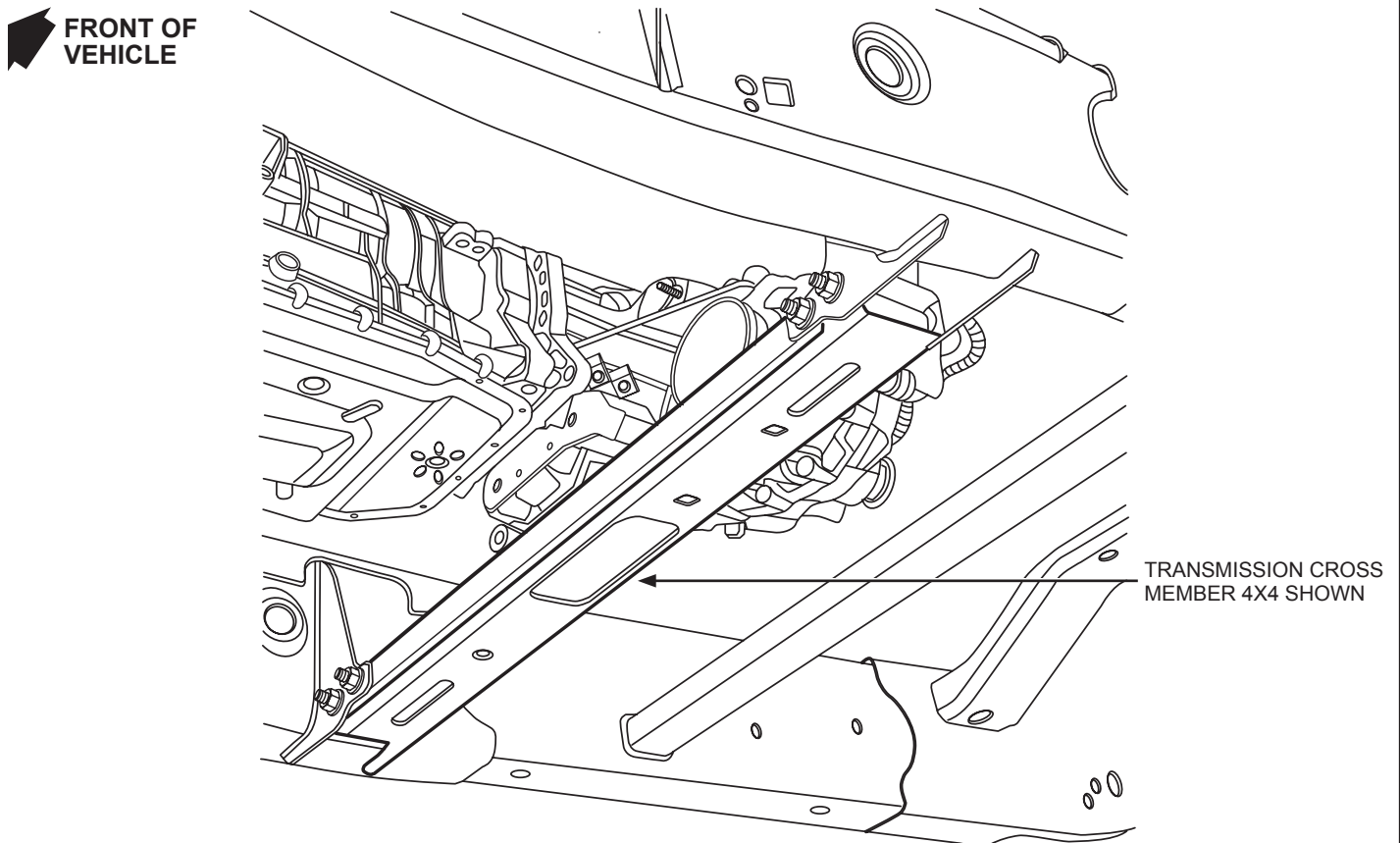


FIGURE 1 – VIEW FROM BOTTOM OF VEHICLE SHOWING THE TRANSMISSION CROSSMEMBER (4X4 SHOWN, 4X2 IS SIMILAR)



CUT HEAT SHIELD PRIOR TO
CROSSMEMBER REMOVAL
ALONG THE EDGE OF THE
FRAME BRACKET

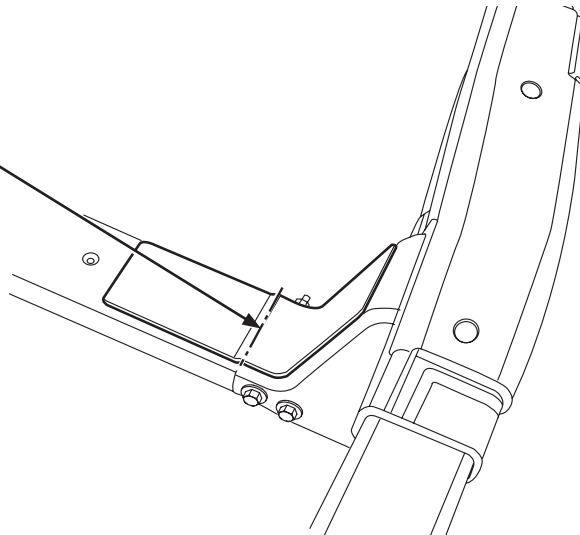
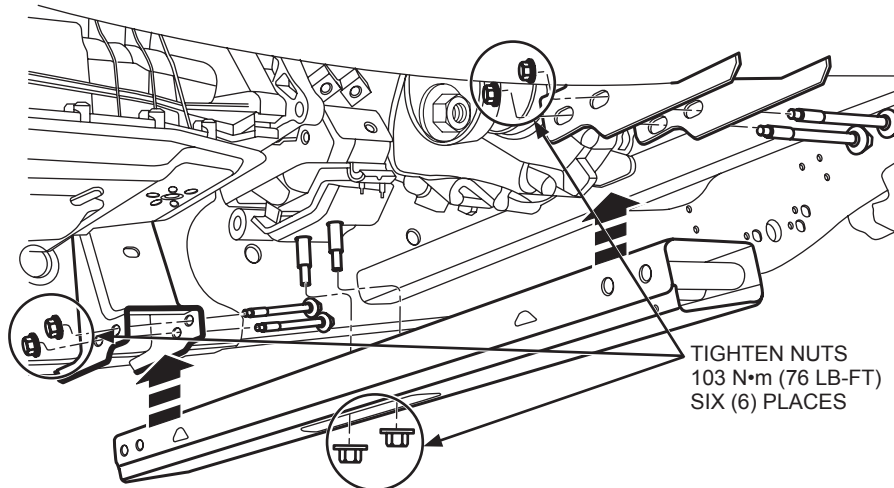


FIGURE 2 – LOCATION SHOWN TO CUT HEAT SHIELD PRIOR TO C/M REMOVAL

FRONT OF
VEHICLE



TIGHTEN NUTS
103 N•m (76 LB-FT)
SIX (6) PLACES

FIGURE 3 – VIEW OF TRANSMISSION CROSS MEMBER INSTALLATION

APPLY THIS PORTION OF THE SELF
ADHESIVE HEAT SHIELD ON THE
RIGHT HAND TOP SURFACE OF
TRANSMISSION CROSSMEMBER SO
THE EDGE OF THE HEAR SHIELD IS
ADJACENT TO THE EDGE OF THE
FRAME BRACKET

THIS PORTION OF THE
SELF-ADHESIVE HEAT SHIELD
IS NOT REQUIRED AND CAN
BE DISCARDED

CUT REPLACEMENT
SELF-ADHESIVE HEAT
SHIELD HERE PRIOR
TO INSTALLATION ONTO
THE TRANSMISSION
CROSSMEMBER

FIGURE 4 – DIAGRAM TO SHOW WHERE TO CUT STICK-ON HEAT SHIELD



2015-PRESENT F-150; 2018-PRESENT EXPEDITION/NAVIGATOR 4X4 LEFT HAND FRONT DIFFERENTIAL BRACKET REPLACEMENT INSTALLATION INSTRUCTIONS

KIT - JL34-39510-AA FOR USE ON FL34-5005-CAA*, CAC*, CAD*, CAE*, JAA*, JAC*, JAD*, JAE*, JAF*, JAG*, JAH* JL14-5005-S*, U*		
Part Number	Description	Quantity
FL34-39510-A*	Differential Bracket	1
FL34-39510-B*	Differential Bracket Reinforcement	1
FL34-5N068-A*	Reinforcement Plate	1
SKJL34-39510-AA	Instruction Sheet	1

***Other Items Required:**

Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease, Motorcraft PM-24 Rust Inhibitor, fogging wand for interior surfaces, such as frame channels, etc., Motorcraft PM-25 Premium Undercoating.

SERVICE PROCEDURE:

REMOVAL

1. Remove the front axle assembly and any other components that may be attached in the area of the left hand front differential bracket that is being replaced as outlined in Workshop Manual. (Refer to Figure 1).
2. Disconnect steering shaft per the Workshop Manual instructions then raise the shaft and hold it out of the way with shop wire.
3. Detach the front differential breather hose from the bracket and secure it away from the work area.
4. Put vehicle up on frame rack and anchor in place following frame rack company guidelines and precautions if required.
5. Perform detailed measurement of the frame, and perform any required pulling operations. This is critical to ensure proper installation of replacement frame brackets.
6. Using proper eye, face, and ear protection, grind the welds holding the damaged differential bracket to the frame, and remove the bracket. Be careful not to cut into the frame rail since it will be reused. (Refer to Figures 2 and 3).
7. Take a wire brush and clean the areas of the frame where the welds were ground.
8. Severe failures may cause the bracket to tear away a portion of the frame rail leaving a hole with sharp edges, cracks, and surface deformations. Smooth out any sharp edges or corners with a grinder, and pound any surface deformations flat using a hammer. If cracks exist that propagate away from the hole they must be ground out, welded shut, and ground smooth for before the doubler plate can be welded on.

INSTALLATION

NOTE: If a hole is present the parent metal of the frame side rail, as a result of the differential bracket damage, additional actions are required. See step 8.

NOTE: Observe all appropriate safety precautions before welding takes place. Refer to the Workshop manual.



1. To properly position the new bracket, loosely attach the differential bracket to the differential, keeping the bolt finger tight. Raise the differential into position, and install the remaining attachment bolts finger tight. Loosely install the front drive shaft.
2. Mark the position of the differential bracket on the frame rail using a marker. Remove all fasteners and lower the front differential and front drive shaft down.
3. Remove the differential bracket from the differential and clamp it to the side rail in the position marked. Ensure there are no gaps between the bracket and the frame side rail.
 - a. Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - b. Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
4. With all measurements verified and the new bracket in proper position, tack-weld the new bracket in place on the rear frame rail.
5. Perform final measurements, then solid weld the new bracket and reinforcement to the frame rail following the weld procedure on page 3. (Refer to Figures 4 thru 6).
6. To restore corrosion protection: Dress welds as required. Thoroughly clean and degrease metal surfaces using Motorcraft Metal Surface Prep ZC-31-A to remove wax and grease. Apply a light coat of Motorcraft PM-24 Rust Inhibitor to the inside and outside of the repair area. Use the inside fogging wand for interior surfaces, such as frame channels, etc. Coat the external repaired surfaces with Motorcraft PM-25 Premium Under coating, to restore repair area to original appearance and protection. For additional information regarding corrosion protection, refer to the Workshop Manual.
7. Reinstall the front differential and drive shaft assembly and any other components that may have been removed during the repair. Refer to the appropriate sections of the Workshop Manual for information.
8. Additional Installation instructions to be followed if there is a hole created in the frame rail as a result of the damage to the left hand front differential bracket.
 - a. Severe failures may cause the bracket to tear away a portion of the frame rail leaving a hole with sharp edges, cracks, and surface deformations. Smooth out any sharp edges or corners with a grinder, and pound any surface deformations flat using a hammer. If cracks exist that propagate away from the hole they must be ground out, welded shut, and ground smooth for before the doubler plate can be welded on.
 - b. Obtain the reinforcement plate provided with the service kit.
 - c. The reinforcement plate will be welded to the frame rail along its outer edges so clean away any residual weld or corrosion protection from the frame rail that might interfere with the placement, fit-up and welding of the differential bracket to the frame rail.
 - d. Loosely clamp the reinforcement in position.
 - e. There should be a minimum of 10mm overlap between the reinforcement plate and the frame rail if a hole does exist in the frame rail. Some trimming of the reinforcement plate can be performed if required to improve fit to the frame rail.
 - f. Perform any necessary measurements to ensure proper placement of the reinforcement plate, then clamp firmly into position.
 - Apply weld through primer locally in the areas to be welded (1/4" on each side).
 - Make sure the repair joint and surrounding repair area have attained a minimum temperature of 10°C (50°F) before carrying out the weld procedure.
 - g. Perform final measurements, then solid weld the reinforcement to the frame rail following the weld procedure on page 3. (Refer to Figures 7 thru 10).
 - h. Complete the repair following Steps 1-8 in the installation section above.

NOTE: Trimming of the differential bracket may be required to offset the thickness of the reinforcement plate if there is not enough bolt travel in the slot of the bracket for the bolt to be inserted through. (Refer to Figure 11).



REPAIR AND WELDING PROCEDURE OVERVIEW:

WARNING: WELDING OF THE FRAME REPLACEMENT SECTION MAY BE DONE BY ARC OR MIG WELDING. IT IS IMPERATIVE THAT THE FOLLOWING WELDING SPECIFICATIONS BE DETERMINED AND FOLLOWED EXACTLY. FOR SAFETY, THIS REPAIR MUST BE PERFORMED BY A CERTIFIED WELDER.

NOTE: OBSERVE ALL APPROPRIATE SAFETY PRECAUTIONS BEFORE WELDING TAKES PLACE. REFER TO WORKSHOP MANUAL.

WELD PROCEDURE SPECIFICATIONS:

Joint Design Used:

Single: (x) Double: ()

Backing: Yes: () No: (x)

Material Specifications:

Material: Carbon Steel

Thickness: Frame Rail: 2.3mm Nom /2.5mm Nom (Frame Model Dependent)

Differential Bracket: 4.0mm Nom

Differential Bracket Reinforcement: 4.0mm Nom

Reinforcement Plate: 2.5mm Nom

OPTION 1: GMAW – MIG WELDING

Stringer or Weave Bead: Stringer

Multi or Single Pass (per side): Single

Electrode Angle: Leading w/45 (horizontal), Trailing w/45 (v-down)

Vertical Progression: Vertical Down

Working Amperage: 145 amps

Wire Feed Speed: 140-150

Volts: 18-19

Gas: 85Ar-15CO₂, Flow Rate: 14 CFI

Amperage (GMAW): 140-150 amp

OPTION 2: SMAW – STICK WELDING

Stringer or Weave Bead: Stringer

Multi or Single Pass (per side): Single

Number of Electrodes: As Needed

Electrode Angle: Trailing w/45

Working Amperage: 90 amps

Vertical Progression: Vertical Up

Filler Metal: AWS Specification: E-6011

AWS Classification: A5.1-91

Amperage (SMAW): 70-110 amps



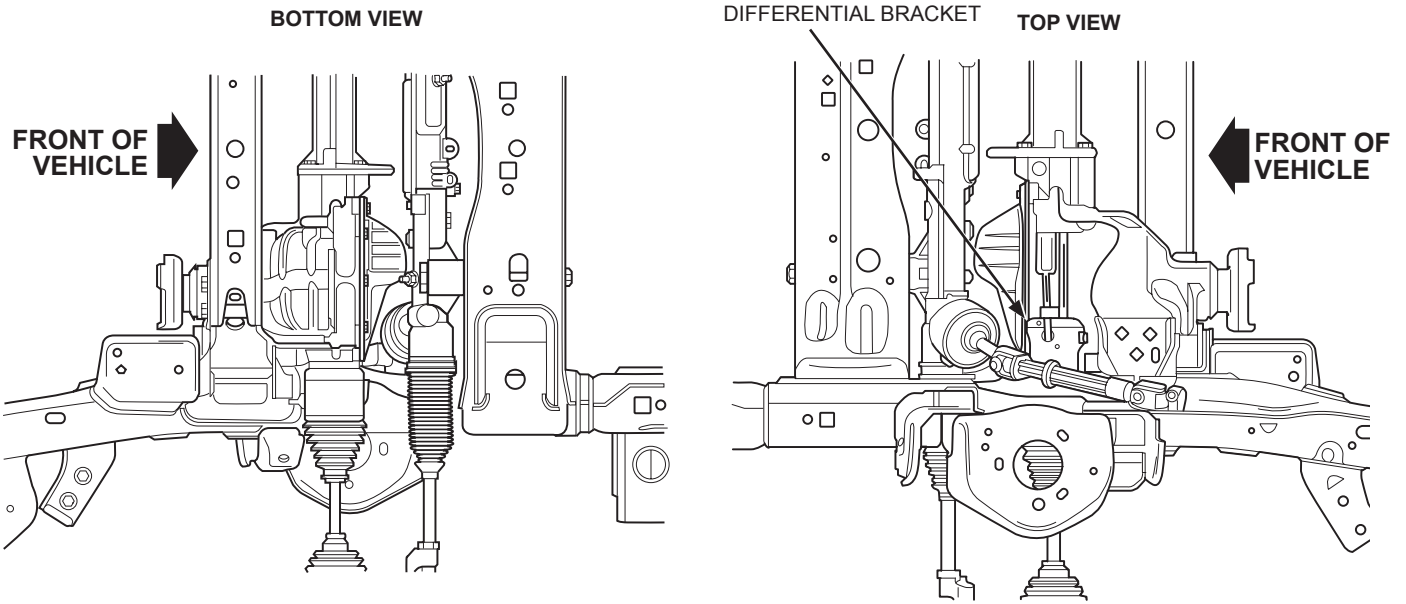


FIGURE 1 – VIEW OF FRAME SHOWING LEFT HAND FRONT DIFFERENTIAL BRACKET LOCATION IN FRAME

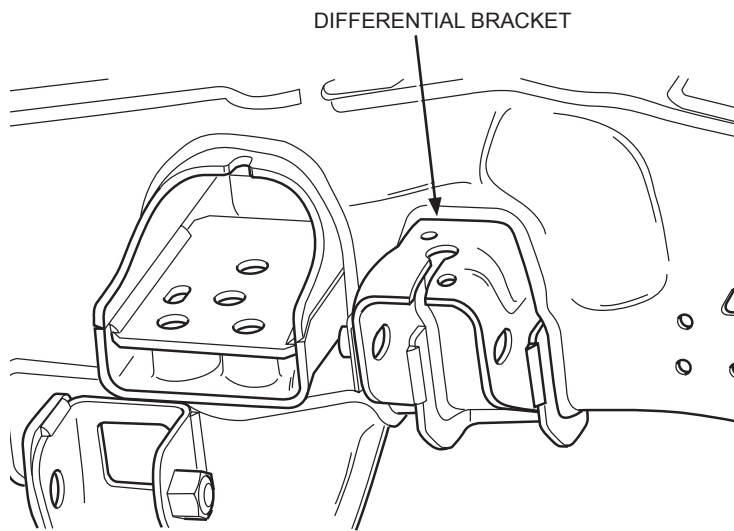


FIGURE 2 – VIEW OF DIFFERENTIAL BRACKET WITH AXLE REMOVED.

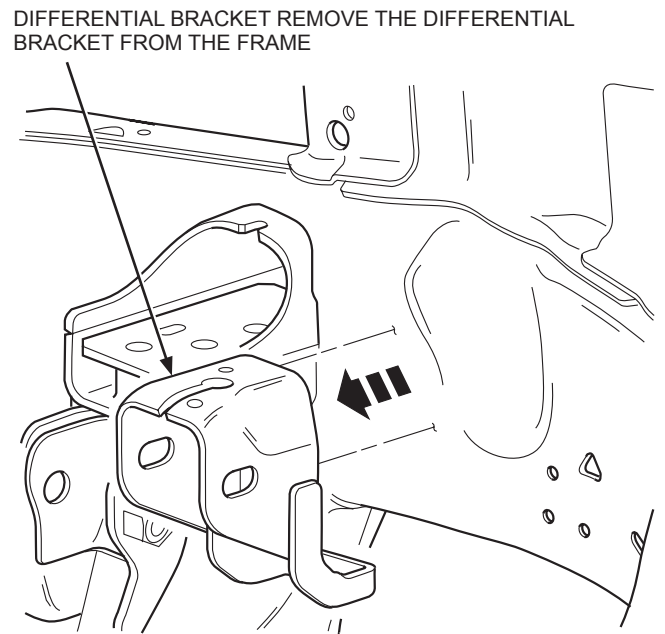


FIGURE 3 – VIEW OF DIFFERENTIAL BRACKET SEPARATED FROM THE FRAME RAIL



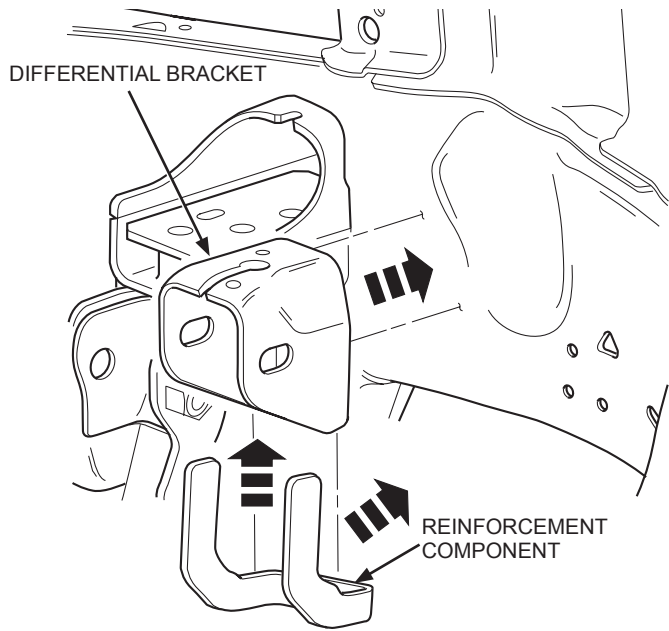


FIGURE 4 – VIEW OF FRONT DIFFERENTIAL BRACKET AND REINFORCEMENT COMPONENTS

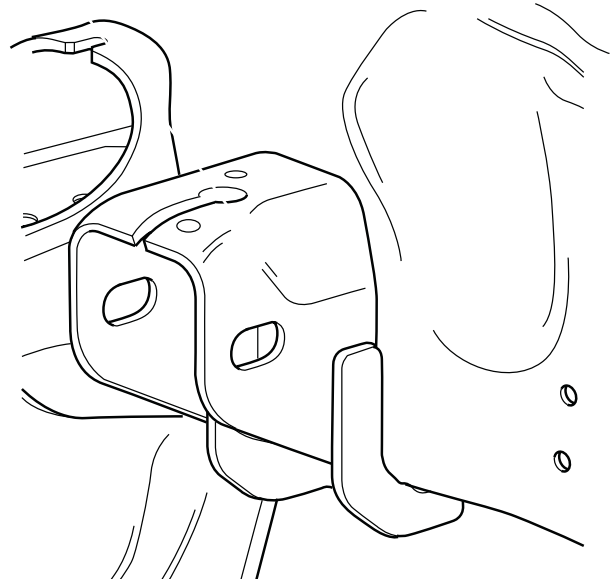


FIGURE 5 – VIEW OF DIFFERENTIAL BRACKET AND REINFORCEMENT ASSEMBLED TO THE FRAME RAIL

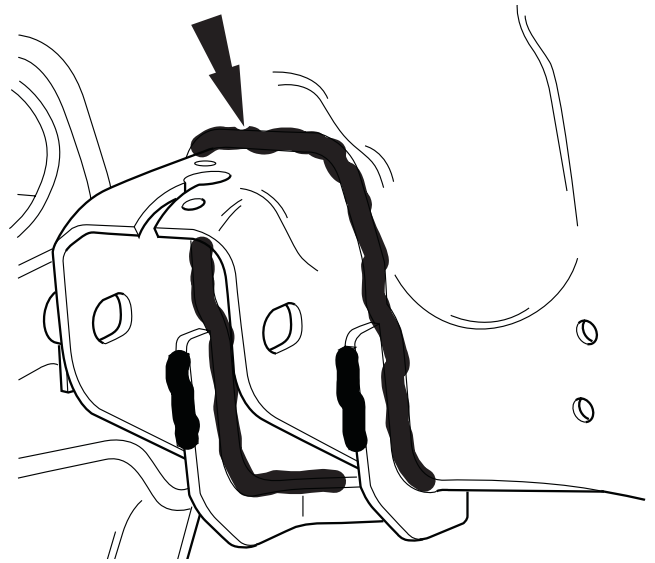
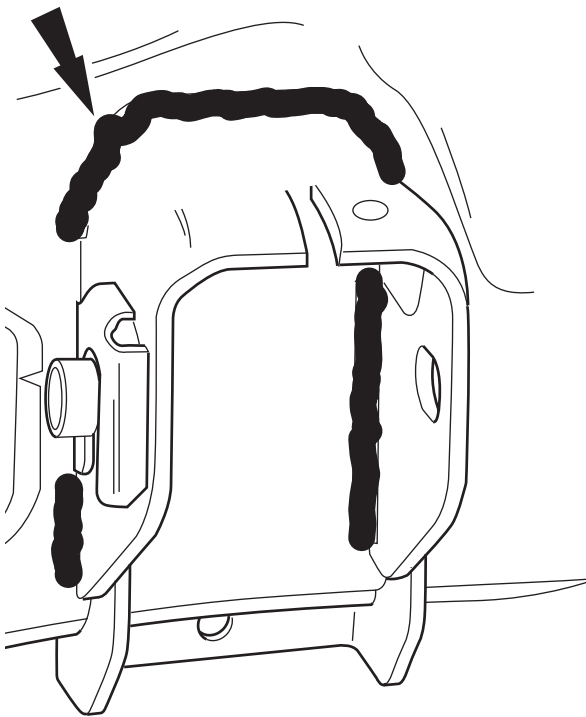


FIGURE 6 – VIEW OF DIFFERENTIAL BRACKET AND REINFORCEMENT ASSEMBLED TO THE FRAME RAIL SHOWING THE WELD PATTERN REQUIRED



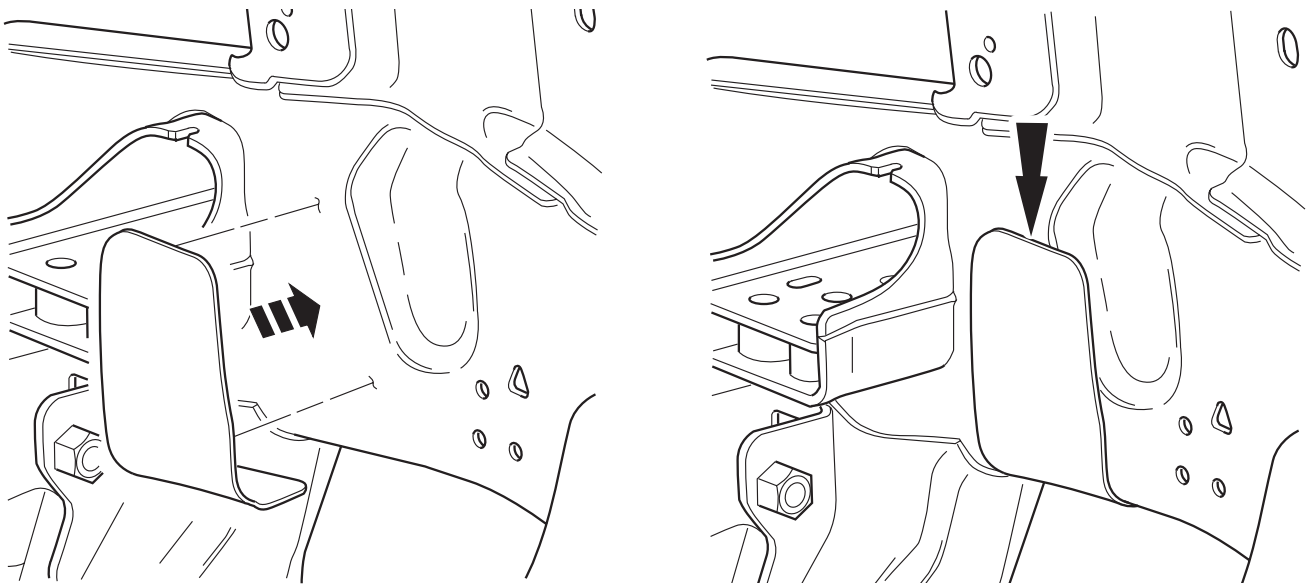


FIGURE 7 – VIEW OF REINFORCEMENT PLATE IN POSITION ON THE FRAME RAIL

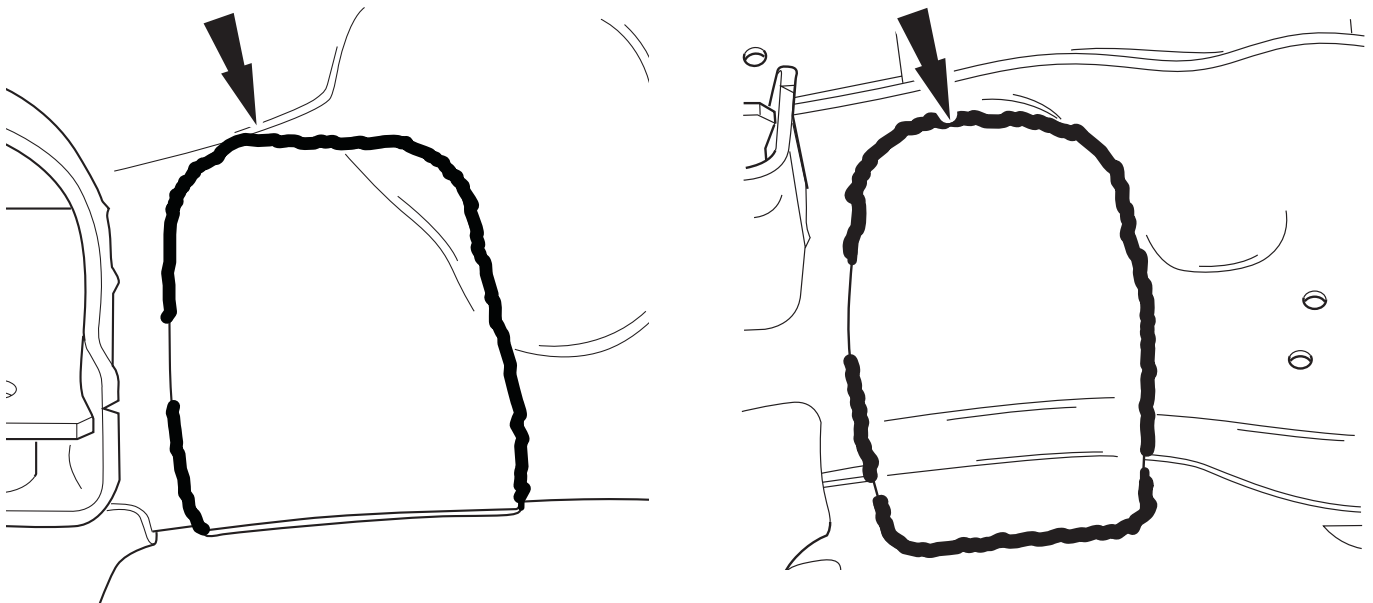


FIGURE 8 – VIEW OF REINFORCEMENT PLATE ASSEMBLED TO THE FRAME RAIL SHOWING THE WELD PATTERN REQUIRED



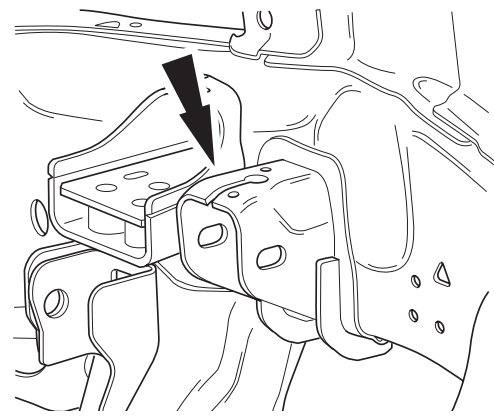
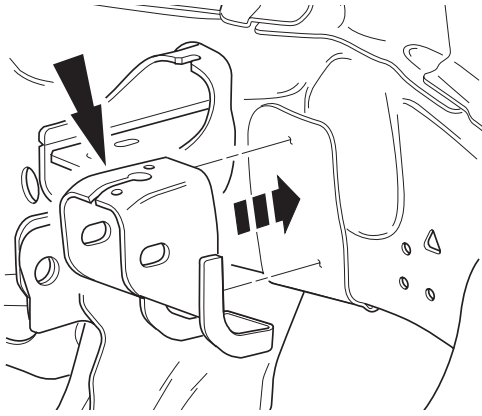


FIGURE 9 – VIEW OF DIFFERENTIAL BRACKET AND REINFORCEMENT BEING POSITIONED ON THE REINFORCEMENT

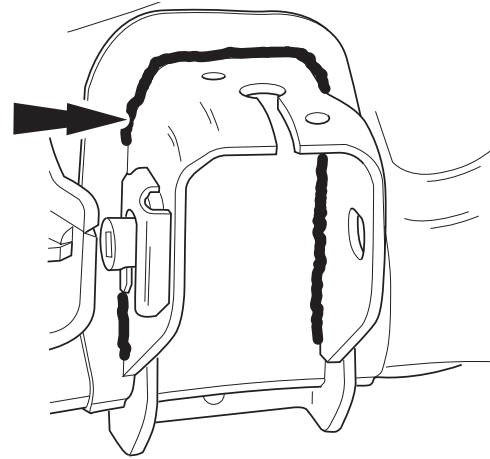
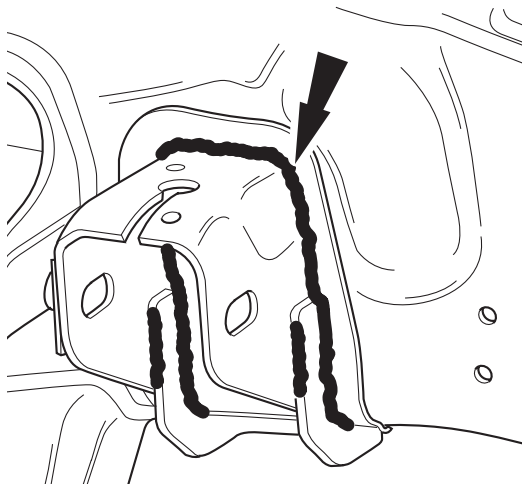


FIGURE 10 – VIEW OF DIFFERENTIAL BRACKET AND REINFORCEMENT ASSEMBLED TO THE FRAME SHOWING THE WELD PATTERN REQUIRED

TRIMMING OF UP TO 2.5mm
MAY BE REQUIRED FROM
THESE EDGES OF THE
DIFFERENTIAL BRACKET
PRIOR TO FINAL WELDING

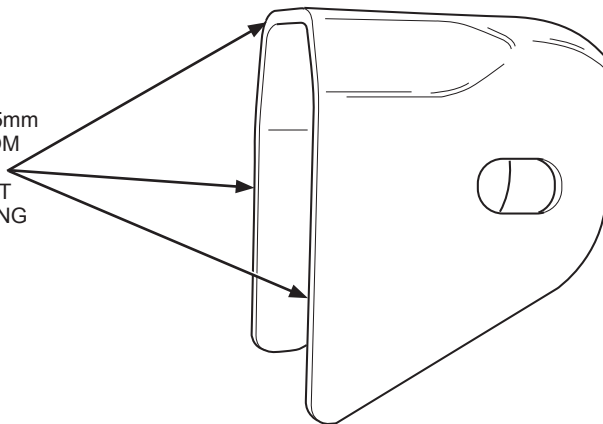


FIGURE 11 – IT MAY BE NECESSARY TO TRIM UP TO 2.5mm FROM THE EDGE OF THE DIFFERENTIAL BRACKET TO OFF SET THE THICKNESS OF THE ADDED FRAME REINFORCEMENT PRIOR TO WELDING IF THERE IS NOT ENOUGH BOLT TRAVEL IN THE BRACKET SLOT DURING PRELIMINARY FIT-UPS AND MEASUREMENTS

SKJL34-39510-AA

SHEET 7 OF 7



CPR © 2017 FORD MOTOR COMPANY
DEARBORN, MICHIGAN 48121
10-17

**2015-PRESENT F-150
2018-PRESENT EXPEDITION/NAVIGATOR
4X4 LEFT HAND FRONT
DIFFERENTIAL BRACKET REPLACEMENT
INSTALLATION INSTRUCTIONS**