 Tesla, Inc. Service Bulletin		<h2>Replace Front Drive Unit Halfshafts</h2>	
SB-21-39-001 December 10, 2021		R2	
Classification Repair Bulletin		Section/Group 39 - Front Drive Unit	Mobile Service Cannot Perform
Model Year 2014 - 2020	Model Model S, Model X	Country/Region All	Version All
<small>The model(s) and model year(s) listed are a general approximation of the affected VIN list. Refer to the VIN/Bulletin Tracker or Customer/Vehicle profile to determine applicability of this bulletin for a particular vehicle.</small>			

Repair Bulletin: This repair bulletin provides instructions on addressing a noted condition or possible customer concern regarding the operation of Tesla vehicles. These instructions should only be performed by trained professionals.

This Service Document supersedes SB-21-39-001_R1, dated 21-Sep-21. Each content change is marked by a vertical line in the left margin. Discard the previous version and replace it with this one.

Condition

Some versions of Model S and X front drive unit halfshafts might cause excessive vibrations during hard acceleration at higher ride height settings. This is exclusively an NVH issue and does not otherwise affect steering functionality, braking, or acceleration.

Correction

Upon customer complaint, inspect the vehicle for excessive vibrations from the front drive unit during hard acceleration. If the condition is present, replace both front drive unit halfshafts with updated components, and if necessary, replace the front drive unit clevis and axle seal.

 **NOTE:** Refer to Toolbox article [6013200](#) for Customer Pay billing instructions.

Correction Description	Correction	Time
SB-21-39-001 Not Applicable	S012139001	0.00
Inspect Vehicle, Replace Front Halfshafts (Raven Front Drive Unit)	S022139001	1.80
Inspect Vehicle, Replace Front Halfshafts, Reposition Clevis (Raven Front Drive Unit)	S032139001	1.90
Inspect Vehicle, Replace Front Halfshafts, and Axle Seal (Small Drive Unit)	S042139001	2.35
Inspect Vehicle, Replace Front Halfshafts, Clevis, and Axle Seal (Small Drive Unit)	S052139001	3.75

Part Number	Description	Quantity
Parts Required		
2007206	BLT,HEX,FLG,M6-1.00x25[8.8]-09	4
1020296-00-B	WASHER SAFETY M24x39	2
2007090-00-C	NUT HF M10x1.25 PC10 PTP COLORED	2
1004351-00-A	NUT HF M10x1.50 [10] ZnAl-W	2
	Also for Model S Built April 24, 2019 or Earlier (Small Drive Unit)	
1626637-00-A	HALFSHAFT ASSY, FR, MS SDU-F, LH	1
1108557-00-A	OUTPUT AXLE SEAL, 3DU, 40X67	1
1030616-00-D	HALFSHAFT, FR, RH, MODEL S HPDM	1
	Also for Model X Built April 24, 2019 or Earlier (Small Drive Unit)	
1553109-00-B	HALFSHAFT ASSY, MX, FR, LH, SDU-F	1
1108557-00-A	OUTPUT AXLE SEAL, 3DU, 40X67	1
1027115-00-D	HALFSHAFT, FR RH, MODEL X	1

**Also for Model S Built April 25, 2019 or Later
(Raven Front Drive Unit)**

1626636-00-A	HALFSHAFT ASSY, FR, MS PM LH	1
1626638-00-A	HALFSHAFT ASSY, FR, MS PM RH	1
1004356-00-B	NUT HFPT M14-2.00 [10] ZnNi-W	2

**Also for Model X Built April 25, 2019 or Later
(Raven Front Drive Unit)**

1420113-00-B	HALFSHAFT ASSY, FR, MSX, LH	1
1420119-00-B	HALFSHAFT ASSY, FR, MSX, RH	1
1004356-00-B	NUT HFPT M14-2.00 [10] ZnNi-W	2

If Replacing the Clevis

1055366-00-H	CLVS ASSY,DBL ISO,LHS MTR MNT,SDU-F	1
1137112-00-A	BOLT,TE,M10X1.5x48[10.9] U-ZNNI-MP CW	2
1004350-00-A	BLT BTNHD M10x1.50x57 [10.9] ZnAl-W	2
1055663-00-A	NUT PLATE ASSY,LHS MTR MNT,SDU-F	1
1138547-00-A	BATTERY BOLTS, SERVICE REPAIR KIT, SX	1
1037743-00-A	BOLT PF M6x40 PC109 ECOFIX	2

These part numbers were current at the time of publication. Use the revisions listed or later, unless otherwise specified in the [Parts Catalog](#).

Special Tools

1096075-00-A	Tool, Hub Puller, Hydraulic
1498673-00-A	Kit, Cable Axle Remover
1053589-00-A	Slide Hammer
1454928-00-A	Adjustable Seal Puller
1131206-00-A	Install Tool, Output Seal, Model 3
1076973-00-A	Dead Blow Hammer

For Halfshaft Service

For Clevis Service

1100076-00-A	Kit, Video Diagnostics
1081765-00-A	3/4 Ton Underhoist Stand
1056566-00-A	5MM Locating Shim Set For Front DU Replacement
1020566-00-F	HV Battery Table
1038478-00-A	HV Rapid Mate Cover
1028325-00-A	LV Rapid Mate Cover
1083188-00-B	Multimeter
1032900-01-A	Heat Inductor Tool (EMEA)
1032900-00-A	Tool, Inductive Heating (NA, APAC)

Shop Supplies

- Brake cleaner
- Paint pen
- Foldable funnel
- Oil drain container
- Wheel chocks
- Molykote M-77 paste

Test Drive and Determine Vehicle Type

1. Perform a test drive where safe; set the vehicle ride height to **VERY HIGH** and quickly accelerate to highway speeds.
 - If vibration under hard acceleration is not detected, cancel this bulletin activity so that it remains available for a possible future application, and discontinue this procedure.
 - If vibration under hard acceleration is detected, continue to the next step.
2. Check the vehicle build date:
 - If the vehicle build date is April 24, 2019 or earlier (Small Drive Unit), skip to section “Vehicles Built April 24, 2019 or Earlier (Small Drive Unit)” in this document.
 - If the vehicle build date is April 25, 2019 or later (Raven Front Drive Unit), skip to section “Vehicles Built April 25, 2019 or Later (Raven Front Drive Unit)” in this document.



NOTE: If the vehicle build date is **April 25 or April 26, 2019**, take note, as this will affect the repair procedure.

Vehicles Built April 24, 2019 or Earlier (Small Drive Unit)

1. Raise and support the vehicle (refer to Service Manual procedure 10000205; [Model S](#), [Model X](#)).
2. Shine a light into the front aero shield LH front caster adjustment opening (Figure 1) and inspect the flanges of the front drive unit clevis that attach to the side rail.
 - If the clevis flanges are squared and fastened with hex bolts (Figure 2), clevis and halfshaft replacement are necessary; skip to step 3.
 - If the clevis flanges are rounded and fastened with External Torx bolts with large washers that obscure the flange (Figure 3), clevis replacement is not necessary; however, the halfshafts must be replaced. Skip to step 4.

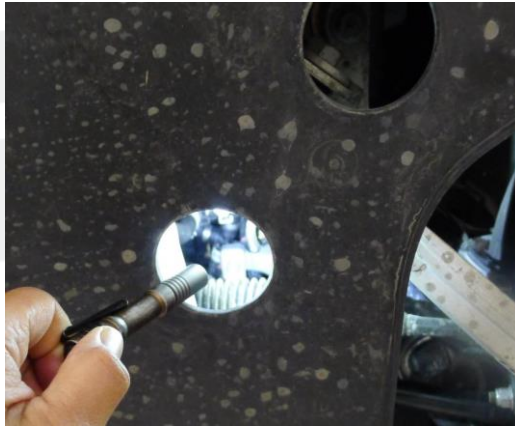


Figure 1

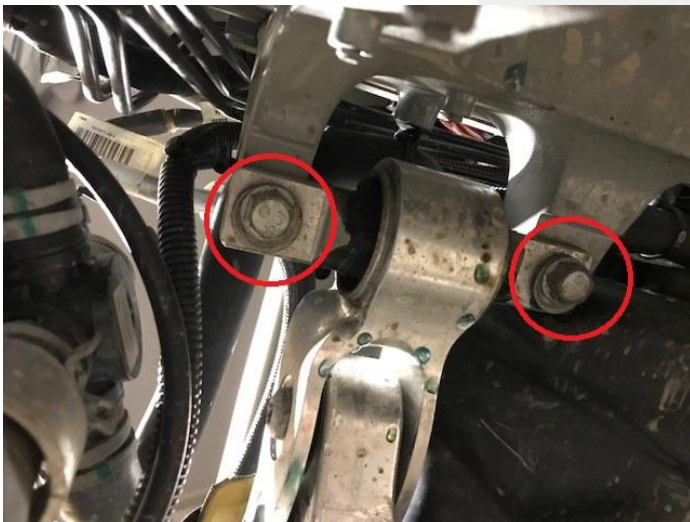


Figure 2



Figure 3

3. Replace the front drive unit clevis (refer to Service Manual procedure 39014302; [Model S](#), [Model X](#)).
4. Remove the RH front drive unit halfshaft (refer to Service Manual procedure 39302102; [Model S](#), [Model X](#)).
5. Remove the LH front drive unit halfshaft (refer to Service Manual procedure 39302002; [Model S](#), [Model X](#)).
6. Replace the LH front drive unit axle seal (refer to Service Manual procedure 39301002; [Model S](#), [Model X](#)).

⚠ CAUTION: Do not reuse the old axle seal.

📄 NOTE: Use “INSTALL TOOL, OUTPUT SEAL, MODEL 3, PN 1131206-00-A” to install the new oil seal.

7. Install the new LH front drive unit halfshaft, all LH suspension components, all LH brake components, and then return to this procedure (refer to Service Manual procedure 39302002; [Model S](#), [Model X](#)).
8. Install the new RH front drive unit halfshaft, all RH suspension components, all RH brake components, and then return to this procedure (refer to Service Manual procedure 39302102; [Model S](#), [Model X](#)).
9. If removed, install the HV battery (refer to Service Manual procedure 16010101; [Model S](#), [Model X](#)).
10. Refill the front drive unit (refer to Service manual procedure 39300102; [Model S](#), [Model X](#)).
11. If removed, install the 12V battery or battery cage (refer to Service Manual procedure [17014012](#) (Model S), [17011402](#) (Model X)).
12. Install all other components that were removed for access.
13. Place the vehicle on a 4-post lift (refer to Service Manual procedure 10000405; [Model S](#), [Model X](#)).
14. Torque the nuts and bolts that attach the LH and RH front air spring modules to the front lower control arms (torque 140 Nm) (Figure 4).



Figure 4 – LH shown; RH similar

15. Clean and mark the nuts with a paint pen.
16. Perform a ride height adjustment (refer to Service Manual procedure [31001100](#) (Model S), [31001000](#) (Model X)).
17. Remove the vehicle from the 4-post lift (refer to Service Manual procedure 10000405; [Model S](#), [Model X](#)).
18. Skip to section “Halfshaft Break-in and Test Drive” in this document.

Vehicles Built April 25, 2019 or Later (Raven Front Drive Unit)

1. Remove the LH front drive unit halfshaft (refer to Service Manual procedure 39303102; [Model S](#), [Model X](#)).
2. **Vehicles built on April 25 or April 26, 2019:**
 - a. Inspect the foremost mounting bolt on the front drive unit clevis.
 - If the clevis is visible past the front edge of the foremost washer (Figure 5), the clevis does not require repositioning; skip to step 3.
 - If the clevis is not visible past the front edge of the foremost washer (Figure 6), the clevis requires repositioning; continue to step 2.b.

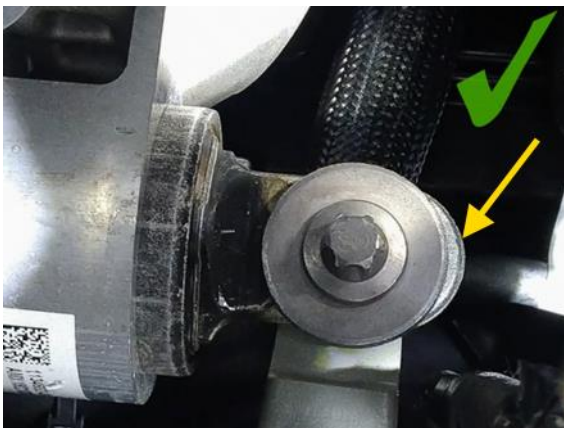


Figure 5

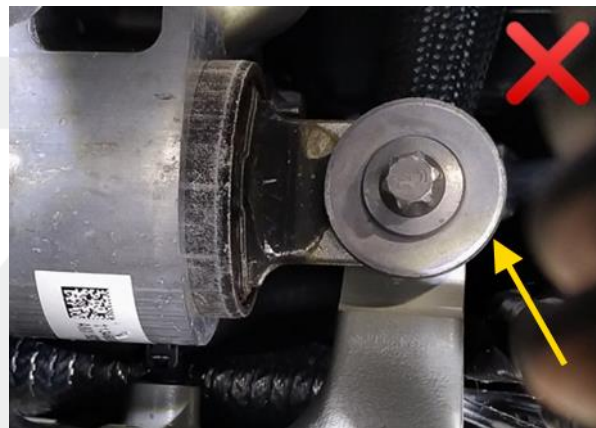


Figure 6

- b. Loosen, but do not remove, the bolts that attach the front drive unit clevis to the body (Figure 7).

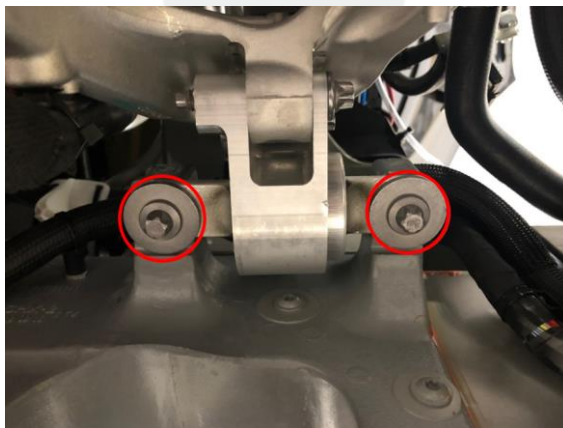


Figure 7

- c. Position a prybar between the clevis and body (Figure 8), and then pry the clevis towards the front of the vehicle until the clevis is visible past the front edge of the foremost washer (Figure 5).



Figure 8
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- d. Torque the bolts that attach the clevis to the body (torque 65 Nm) (Figure 7).



NOTE: Make sure the clevis remains visible past the front edge of the foremost washer (Figure 5).


- e. Continue to step 3.
3. Remove the RH front drive unit halfshaft (refer to Service Manual procedure 39303202; [Model S](#), [Model X](#)).
4. Install the LH front drive unit halfshaft, all LH suspension components, all LH brake components, and then return to this procedure (refer to Service Manual procedure 39303102; [Model S](#), [Model X](#)).
5. Install the RH front drive unit halfshaft, all RH suspension components, all RH brake components, and then return to this procedure (refer to Service Manual procedure 39303202; [Model S](#), [Model X](#)).
6. Install all other components that were removed for access.
7. Place the vehicle on a 4-post lift (refer to Service Manual procedure 10000405; [Model S](#), [Model X](#)).
8. Torque the nuts and bolts that attach the LH and RH front air spring modules to the front lower control arms (torque 140 Nm) (Figure 9).




Figure 9 – LH shown; RH similar

9. Clean and mark the nuts with a paint pen.
10. Perform a ride height adjustment (refer to Service Manual procedure [31001100](#) (Model S), [31001000](#) (Model X)).
11. Remove the vehicle from the 4-post lift (refer to Service Manual procedure 10000405; [Model S](#), [Model X](#)).
12. Skip to section “Halfshaft Break-in and Test Drive” in this document.

Halfshaft Break-in and Test Drive


 **NOTE:** Newly installed halfshafts might generate excessive NVH (scraping/rattling noises and excess vibrations) until properly broken in. Do not return the vehicle to the customer until the halfshafts have been broken in.

1. Perform halfshaft break-in:
 - a. Charge the vehicle HV Battery to at least 70%.
 - b. On the vehicle touchscreen, select **Driving > Acceleration > Standard** or **Sport**
 - c. At 100% throttle, accelerate from 0 mph to 50 mph (80 kph) 2–6 times. When the halfshafts cease to scrape, rattle, or vibrate excessively, skip to the next step.

 **WARNING:** Comply with all local traffic safety laws. Only perform such maneuvers in a suitable location such as a large empty, parking lot or nonresidential side street with no traffic.

2. Set the vehicle ride height to **STANDARD**.
3. Take the vehicle on a test drive, emulating as many of the driving scenarios listed below as possible while checking for excessive vibrations or shuddering at the front of the vehicle.

- Highway/motorway:
 - Maintain cruising speed.
 - Perform lane changes to the right and to the left.
 - Accelerate and decelerate to simulate overtaking maneuvers.
- Urban areas:
 - Low speed.
 - Many right and left turns.
- Normal city roads:
 - Combination of straight and curved roads.
 - Low and moderate speeds.
- Large, empty parking lot or nonresidential side street with no traffic:
 - Again, at 100% throttle, accelerate from 0 mph to 50 mph (80 kph).

 **WARNING:** Comply with all local traffic safety laws. Only perform such maneuvers in a suitable location such as a large empty, parking lot or nonresidential side street with no traffic.

4. After confirming the absence of excessive vibrations or shuddering at the front of the vehicle, the vehicle may be returned to the customer.