



74WELD

FORD PORTALS

OWNER'S MANUAL

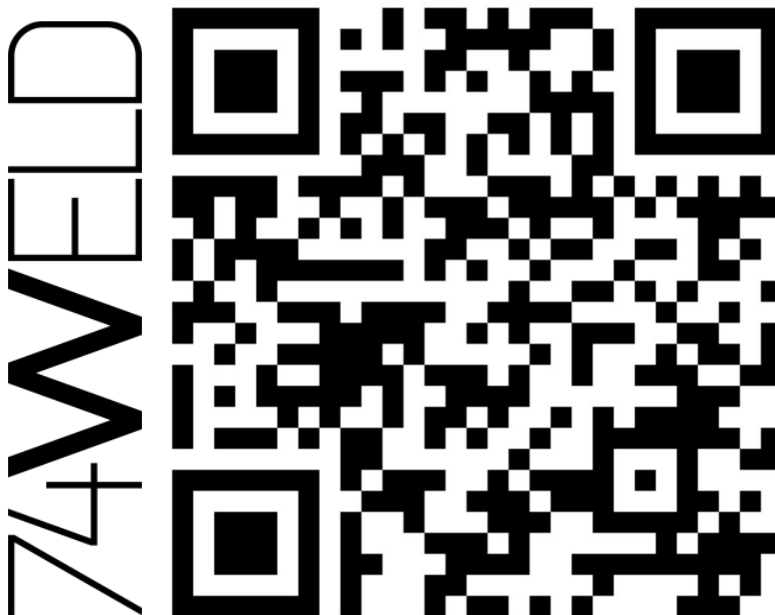
THIS USER MANUAL IS FOR THE FOLLOWING FORD MODELS:

- 2021+ FORD BRONCO EQUIPPED WITH FACTORY REAR E-LOCKER
- 2024+ FORD RANGER RAPTOR

Thank you for purchasing from 74Weld. Should you require support, please contact us at the following number.

74Weld Support: 1-619-286-6656

VIDEOS AND EXTRA INFO





IMPORTANT INFORMATION

READ PRIOR TO INSTALLATION

This product has been designed for proper fitment and function with your vehicle's original equipment. 74Weld does not guarantee proper fitment and function with third party aftermarket components.

Post-install, cycle your suspension to ensure components move freely, without binding or collision. Binding and collision of suspension components can result in mechanical failures, serious injury and death.

DO NOT over torque suspension components

DO NOT strike 74 Weld aluminum components. In the event that removal of a tapered connection is required, use a pickle fork or tie rod/ball joint separator.

WARNING: This manual describes installation for a left hand drive vehicle. Driver and passenger are used to describe positions on a left hand drive vehicle.

WARNING: Improper use or installation of this product can cause mechanical failures that may result in serious injury or death.

WARNING: Only perform this installation if you are a qualified mechanic with adequate equipment

WARNING: Wear safety glasses and personal protective equipment as-required to prevent injury



ORDER OF OPERATIONS

READ PRIOR TO INSTALLATION

This manual details 74 Weld portal installation, operation and maintenance procedures. Every step is critical. The installation procedure is structured as follows.

- ☐ **Kit Bill of Materials** - please review before you begin to ensure all necessary components are present.
- ☐ **Required Tools and Consumables** - please review before you begin to ensure you have all of the required tools and consumables.
- ☐ **Brake Bleed Preparation Notes** - Pretty please just take the time to review our instructions before you begin. Even if you have bled brakes many times, our suggestions will save you headaches.
- ☐ **Brake Bracket Installation**
- ☐ **Portal Installation**
- ☐ **Brake Bleed**
- ☐ **First Oil Fill and Break In**
- ☐ **Regular Maintenance - Oil Change Procedure**
- ☐ **Additional Information** (Troubleshooting, Replacement Parts ETC.)

KIT BILL OF MATERIALS

TOYOTA KITS

Depending on the year, trim and options of your Toyota, you will have received one of the following portal axle kits:

KIT	COMPATIBILITY
74W-4G-1.22-G2-U725-SET	2021+ FORD BRONCO EQUIPPED WITH FACTORY REAR E-LOCKER
74W-4G-1.22-G2-RRAP-SET	2024+ FORD RANGER RAPTOR

The table below describes the collection of assemblies and kits that are included in your vehicle specific portal kit.

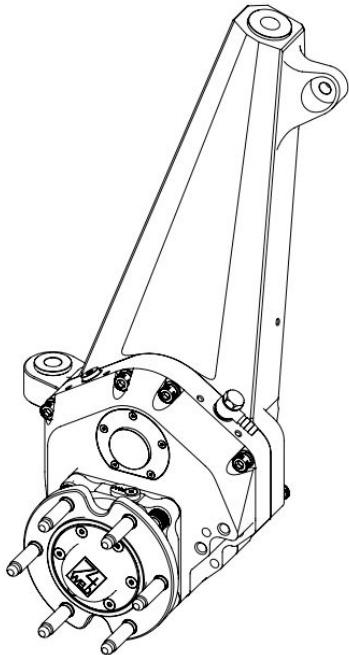
ITEM	74W-4G-1.22-G2-RRAP-SET	74W-4G-1.22-G2-U725-SET
1	74W-4G-1.22-G2-RRAP-FD	74W-4G-1.22-G2-RRAP-FD
2	74W-4G-1.22-G2-RRAP-FP	74W-4G-1.22-G2-RRAP-FP
3	74W-4G-1.22-G2-RRAP-RD	74W-4G-1.22-G2-U725-RD
4	74W-4G-1.22-G2-RRAP-RP	74W-4G-1.22-G2-U725-RP
5	74W-RRAP-SHFT-SET	74W-U725-SHFT-SET
6	74W-4G-1.22-G2-RRAP-KIT-BRAKE-F	74W-4G-1.22-G2-U725-KIT-BRAKE-F
7	74W-4G-1.22-G2-RRAP-KIT-BRAKE-R	74W-4G-1.22-G2-U725-KIT-BRAKE-R
8	74W-4G-1.22-RRAP-KIT-INSTALL	74W-4G-1.22-U725-KIT-INSTALL

BOMs are included on the following pages. Please review BOMs and ensure you have received all required components prior to portal installation.

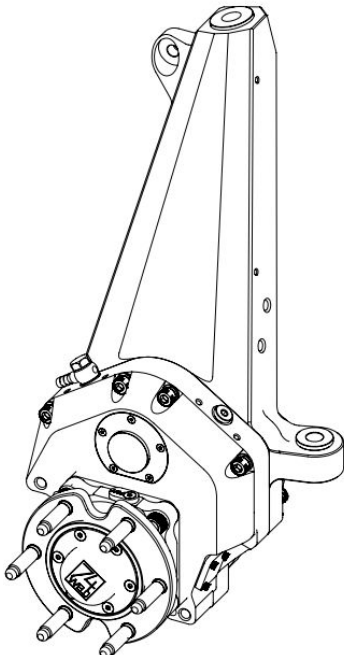
KIT BILL OF MATERIALS

CORNER ASSEMBLIES
BRONCO

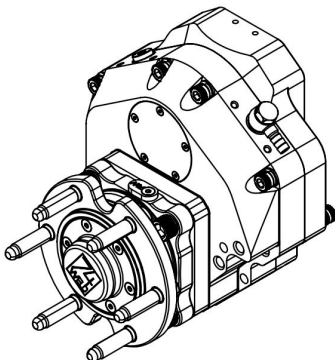
Kits will contain the following corner assemblies



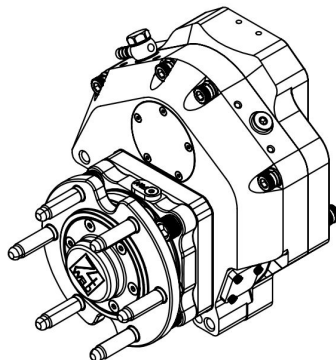
74W-4G-1.22-G2-RRAP-FD
PORTAL ASSEMBLY, RANGER RAPTOR
& BRONCO, FRONT DRIVER



74W-4G-1.22-G2-RRAP-FP
PORTAL ASSEMBLY, RANGER RAPTOR
& BRONCO, FRONT PASSENGER



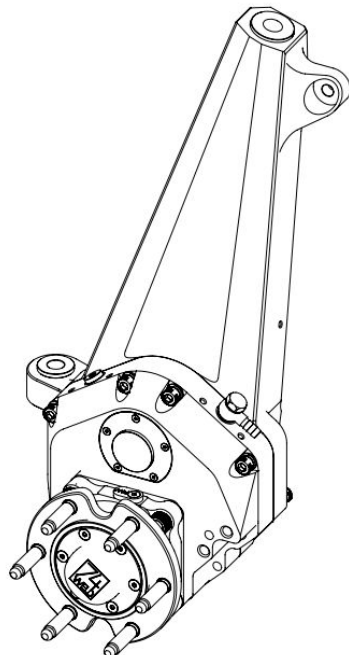
74W-4G-1.22-G2-U725-RD
PORTAL ASSEMBLY, BRONCO,
REAR DRIVER



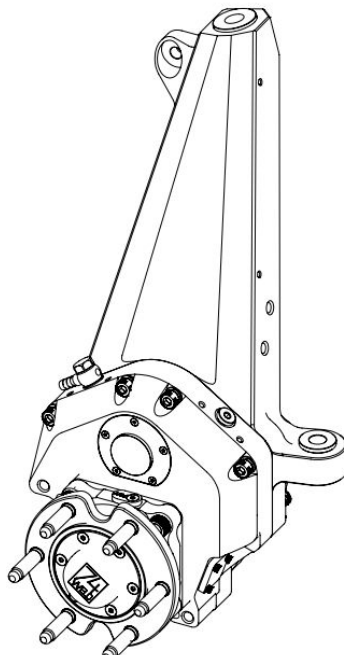
74W-4G-1.22-G2-U725-RP
PORTAL ASSEMBLY, BRONCO,
REAR PASSENGER

RANGER RAPTOR

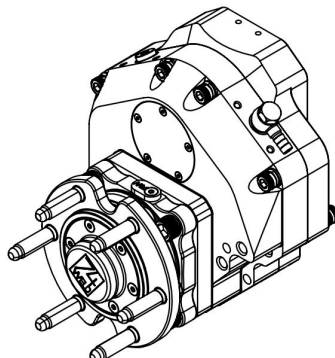
Kits will contain the following corner assemblies



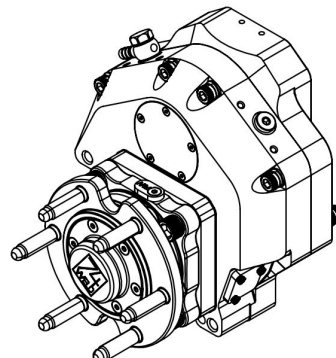
74W-4G-1.22-G2-RRAP-FD
PORTAL ASSEMBLY, RANGER RAPTOR
& BRONCO, FRONT DRIVER



74W-4G-1.22-G2-RRAP-FP
PORTAL ASSEMBLY, RANGER RAPTOR
& BRONCO, FRONT PASSENGER



74W-4G-1.22-G2-RRAP-RD
PORTAL ASSEMBLY, RANGER RAPTOR,
REAR DRIVER



74W-4G-1.22-G2-RRAP-RP
PORTAL ASSEMBLY, RANGER RAPTOR,
REAR PASSENGER

KIT BILL OF MATERIALS

SHAFT SETS

Your portal kit includes two shafts with tone rings pressed on. See details below.

74W-U725-SHFT-SET			
DESCRIPTION: SHAFT SET, BRONCO WILDTRAK REVISION: A DATE: 8/9/24			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	74W-U725-SHFT-R-32 SPL-31.88	WILDTRAK DRIVER'S SIDE SHAFT	1
2	74W-U725-SHFT-R-32SPL-37.63	WILDTRAK PASSENGER'S SIDE SHAFT	1
3	74W-U725-TR-36T	TONE RING, 36 TOOTH, BRONCO, REAR	2

- 1

THIS SET CONSISTS OF TWO SHAFTS AND TWO TONE RINGS. PRESS TONE RINGS ONTO SHAFTS PRIOR TO SHIPMENT.
- 2

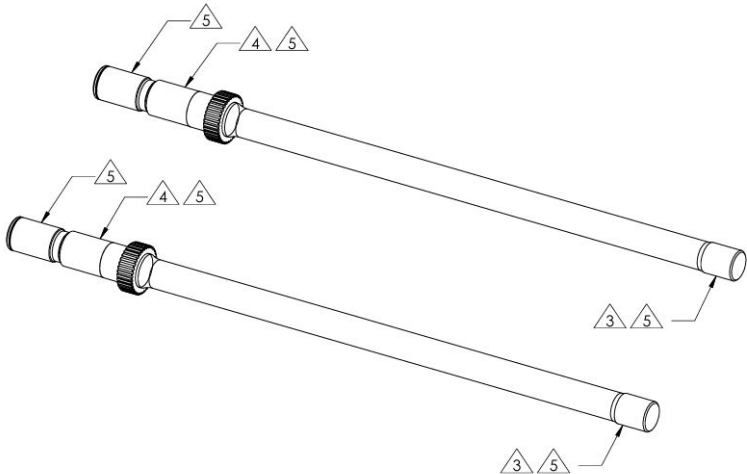
LENGTH: CHECK LENGTHS AGAINST LAST DIGITS OF PART NUMBERS IN BOM. THEY ARE NOT EQUAL LENGTHS.
- 3

SPLINE: CHECK SPLINE COUNT AND DIAMETER. THESE SHAFTS ARE 1 3/8" 32 SPLINE
- 4

ENSURE SEAL SURFACES ARE FREE OF DINGS, DENTS AND SCRATCHES
- 5

WRAP SPLINES AND SEAL SURFACE TO PROTECT FROM DAMAGE DURING SHIPPING
- 6

TONE RINGS ARE 36 TEETH AND 3/4" THICK



74W-RRAP-SHFT-SET			
DESCRIPTION: SHAFT SET, RANGER RAPTOR REVISION: A DATE: 8/9/24			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	74W-RRAP-SHFT-R-31SPL-34.79	SHAFT, REAR, 31 SPLINE, RANGER RAPTOR, 34.79	1
2	74W-RRAP-SHFT-R-31SPL-35.73	SHAFT, REAR, 31 SPLINE, RANGER RAPTOR, 35.73	1
3	74W-RRAP-TR-39T	TONE RING, 39 TOOTH, RANGER RAPTOR	2

- 1

THIS SET CONSISTS OF TWO SHAFTS AND TWO TONE RINGS. PRESS TONE RINGS ONTO SHAFTS PRIOR TO SHIPMENT.
- 2

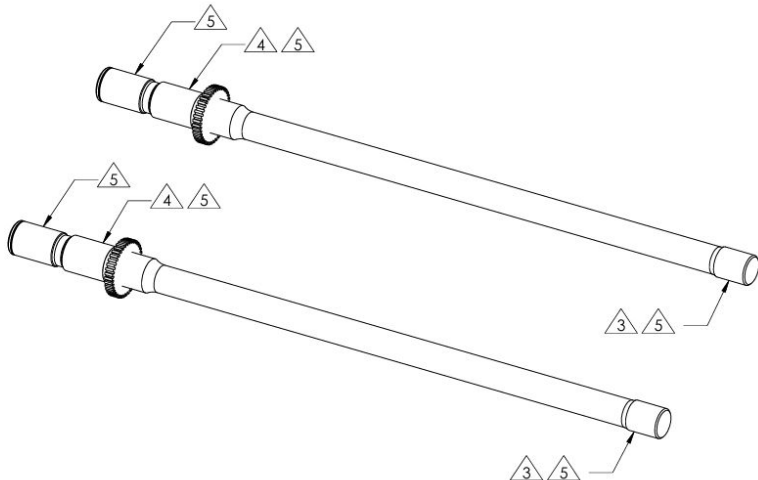
LENGTH: CHECK LENGTHS AGAINST LAST DIGITS OF PART NUMBERS IN BOM. THEY ARE NOT EQUAL LENGTHS.
- 3

SPLINE: CHECK SPLINE COUNT AND DIAMETER. THESE SHAFTS ARE 1.33" 31 SPLINE
- 4

ENSURE SEAL SURFACES ARE FREE OF DINGS, DENTS AND SCRATCHES
- 5

WRAP SPLINES AND SEAL SURFACE TO PROTECT FROM DAMAGE DURING SHIPPING
- 6

TONE RINGS ARE 39 TEETH AND 3/8" THICK

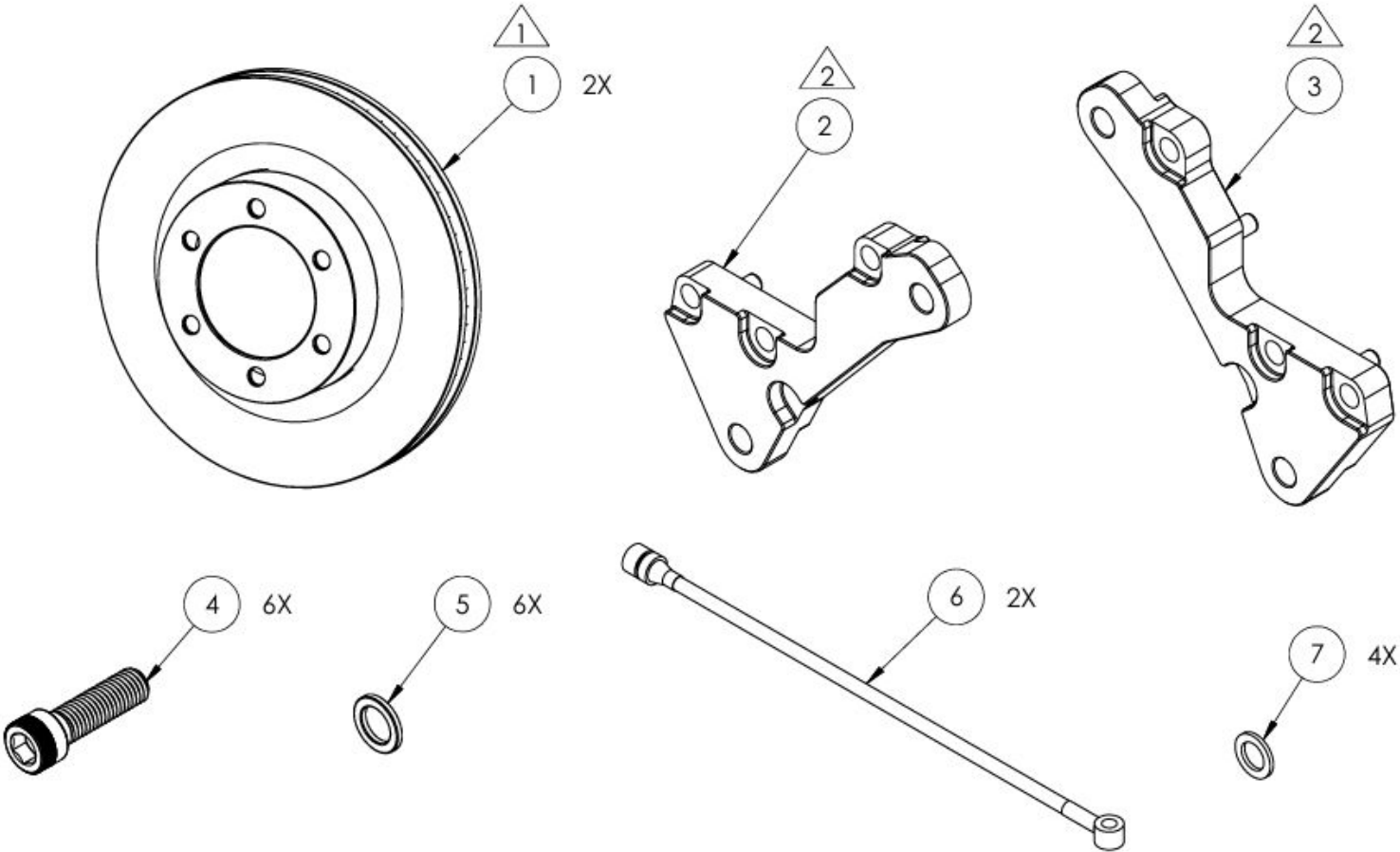


KIT BILL OF MATERIALS

FRONT BRAKE KIT

Depending on your vehicle, you will either receive a -U725 or a -RRAP brake kit.

74W-4G-1.22-G2-U725-KIT-BRAKE-F			
DESCRIPTION: BRAKE KIT, BRONCO, FRONT, FACTORY CALIPER REVISION: A DATE: 5/2/25			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	74W-RTR-13.31X1.26	ROTOR, ONE-PIECE, 13.31 DIAMETER, 1.26 THICK	2
2	74W-4G-1.22-U725-UBB-FDA	ASSEMBLY, BRAKE BRACKET, UNIVERSAL PORTAL BOX, BRONCO U725, FRONT DRIVER	1
3	74W-4G-1.22-U725-UBB-FPA	ASSEMBLY, BRAKE BRACKET, UNIVERSAL PORTAL BOX, BRONCO U725, FRONT PASSENGER	1
4	BT-073	SCREW, SHCS, M12 X 1.75 X 40MM LG, ALLOY STEEL, ZINC PLATED	6
5	WS-026	WASHER, FLAT, 12MM SCREW, 20MM OD, GRADE 10.9 STEEL	6
6	74W-U725-BL-F	BRAKE LINE, BRONCO, FRONT	2
7	WS-007	CRUSH WASHER, 15.9MM OD, 10.2MM ID, COPPER	4

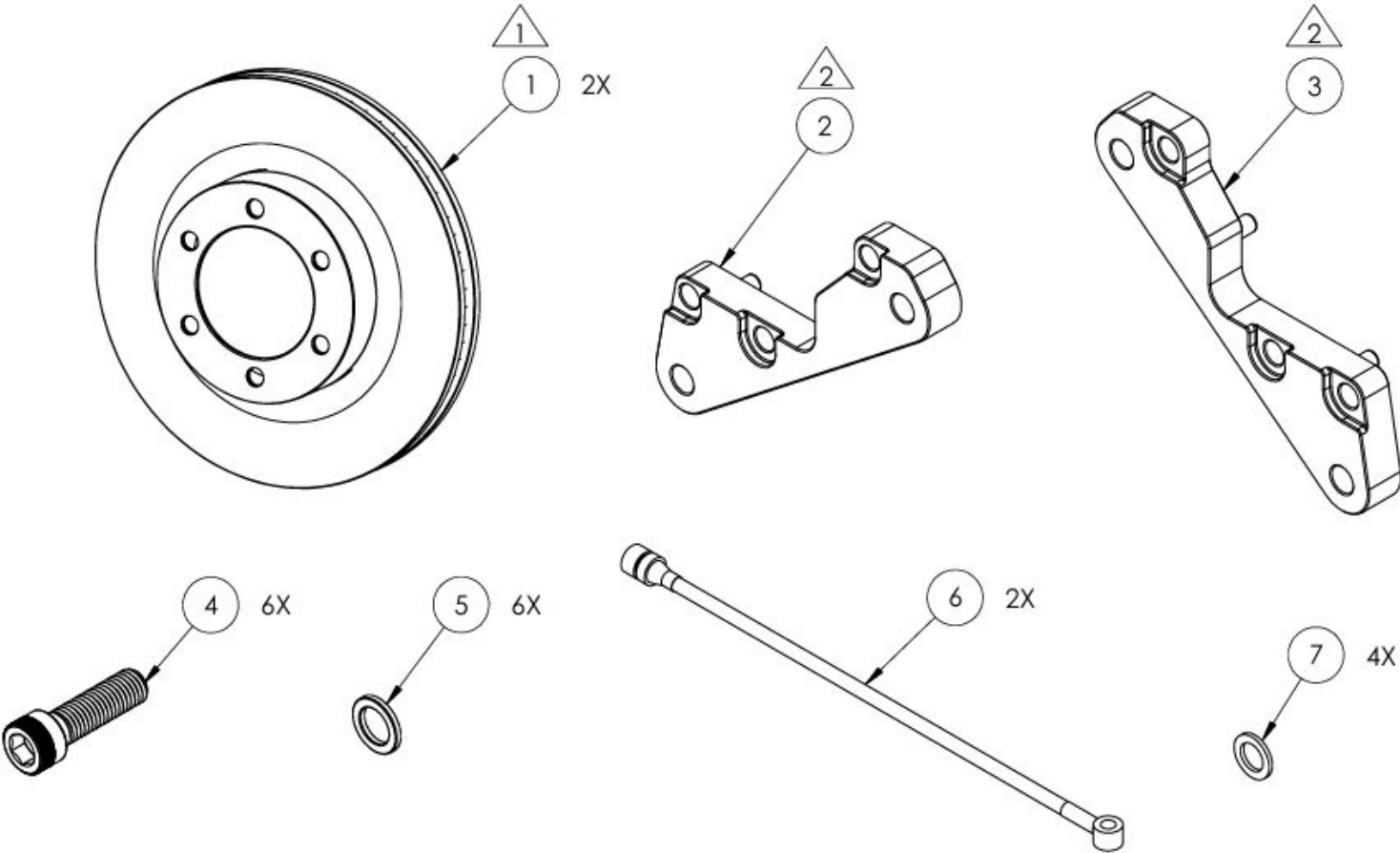


KIT BILL OF MATERIALS

FRONT BRAKE KIT

Depending on your vehicle, you will either receive a -U725 or a -RRAP brake kit.

74W-4G-1.22-G2-RRAP-KIT-BRAKE-F			
DESCRIPTION: BRAKE KIT, RANGER RAPTOR, FRONT, FACTORY CALIPER REVISION: A DATE: 5/2/25			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	74W-RTR-13.31X1.26	ROTOR, ONE-PIECE, 13.31 DIAMETER, 1.26 THICK	2
2	74W-4G-1.22-RRAP-UBB-FDA	ASSEMBLY, BRAKE BRACKET, UNIVERSAL PORTAL BOX, RANGER RAPTOR, FRONT DRIVER	1
3	74W-4G-1.22-RRAP-UBB-FPA	ASSEMBLY, BRAKE BRACKET, UNIVERSAL PORTAL BOX, RANGER RAPTOR, FRONT PASSENGER	1
4	BT-073	SCREW, SHCS, M12 X 1.75 X 40MM LG, ALLOY STEEL, ZINC PLATED	6
5	WS-026	WASHER, FLAT, 12MM SCREW, 20MM OD, GRADE 10.9 STEEL	6
6	74W-U725-BL-F	BRAKE LINE, BRONCO, FRONT	2
7	WS-007	CRUSH WASHER, 15.9MM OD, 10.2MM ID, COPPER	4



KIT BILL OF MATERIALS

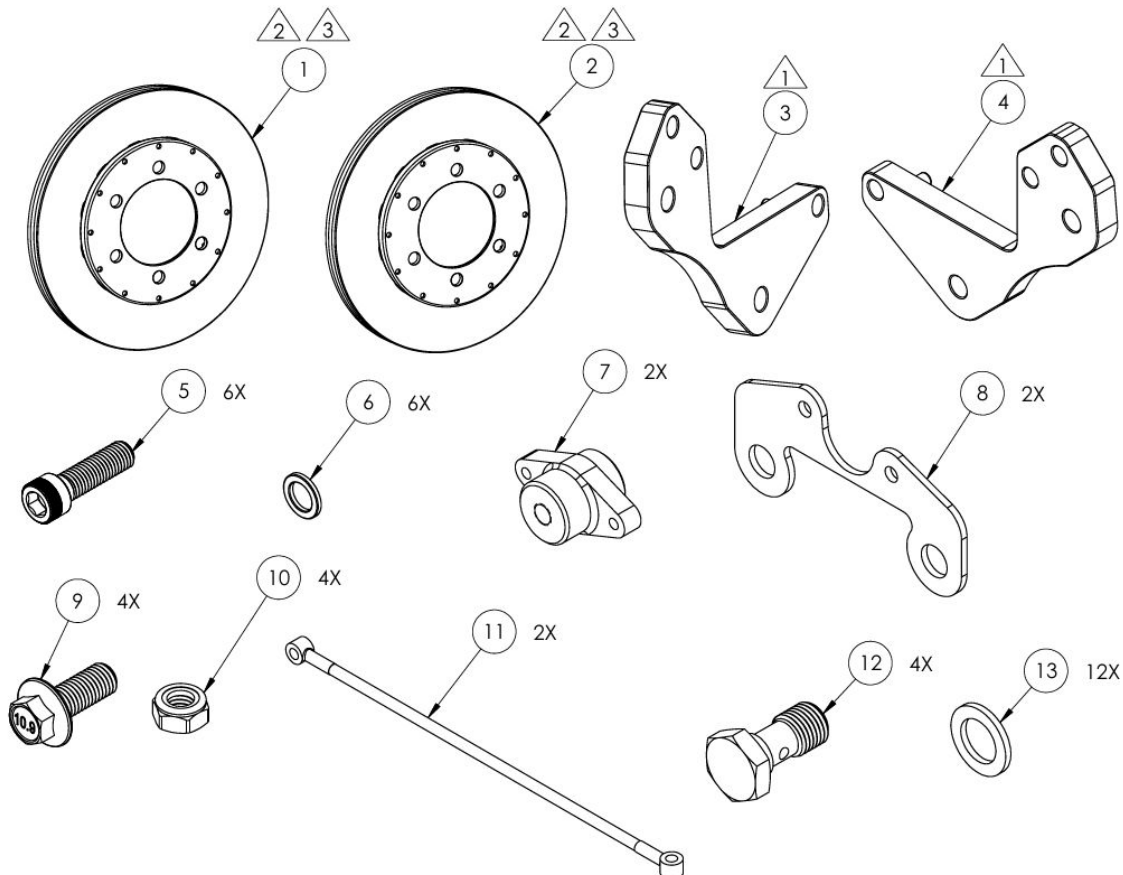
REAR BRAKE KIT

Depending on your vehicle, you will either receive a -U725 or a -RRAP brake kit.

74W-4G-1.22-G2-U725-KIT-BRAKE-R

DESCRIPTION: BRAKE KIT, RANGER RAPTOR, REAR, FACTORY CALIPER REVISION: B DATE: 6/20/25

ITEM	PART NUMBER	DESCRIPTION	QTY
1	74W-RRAP-RTR-RD	ROTOR ASSEMBLY, REAR, RANGER RAPTOR AND BRONCO, DRIVER	1
2	74W-RRAP-RTR-RP	ROTOR ASSEMBLY, REAR, RANGER RAPTOR AND BRONCO, PASSENGER	1
3	74W-4G-1.22-U725-UBB-RDA	ASSEMBLY, BRAKE BRACKET, UNIVERSAL PORTAL BOX, BRONCO, REAR DRIVER	1
4	74W-4G-1.22-U725-UBB-RPA	ASSEMBLY, BRAKE BRACKET, UNIVERSAL PORTAL BOX, BRONCO, REAR PASSENGER	1
5	BT-073	SCREW, SHCS, M12 X 1.75 X 40MM LG, ALLOY STEEL, ZINC PLATED	6
6	WS-026	WASHER, FLAT, 12MM SCREW, 20MM OD, GRADE 10.9 STEEL	6
7	74W-U725-MFLD	MANIFOLD, BRAKE LINES, M10X1	2
8	74W-U725-MFLD-BRKT	BRONCO REAR BRAKE MANIFOLD BRACKET	2
9	BT-049	SCREW, FLANGE HEX, M14 X 2.0 X 35MM LG, 10.9 BLACK PHOSPHATE	4
10	NT-014	NUT, M14 X 2.0, NYLOCK, THIN	4
11	74W-U725-BL-R	BRAKE LINE, BRONCO, REAR	2
12	PS-016	BANJO BOLT, M10X1	4
13	WS-007	CRUSH WASHER, 15.9MM OD, 10.2MM ID, COPPER	12



KIT BILL OF MATERIALS

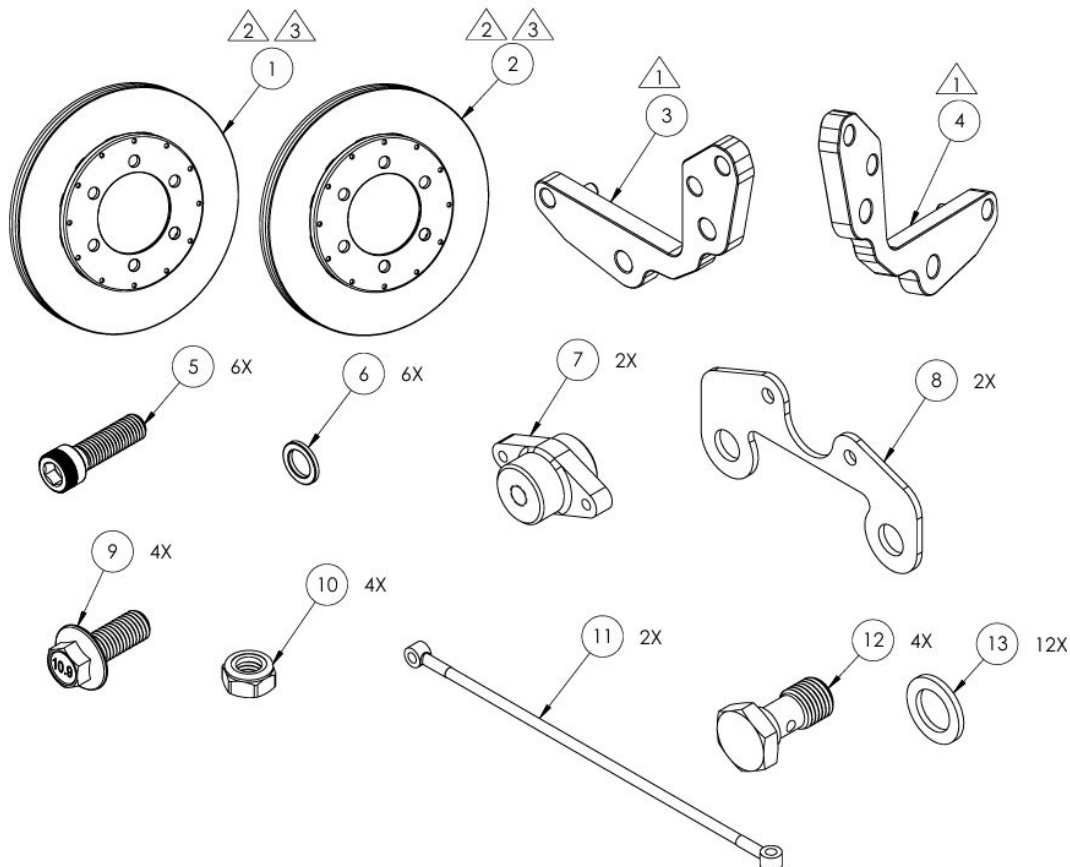
REAR BRAKE KIT

Depending on your vehicle, you will either receive a -U725 or a -RRAP brake kit.

74W-4G-1.22-G2-RRAP-KIT-BRAKE-R

DESCRIPTION: BRAKE KIT, RANGER RAPTOR, REAR, FACTORY CALIPER REVISION: A DATE: 5/2/25

ITEM	PART NUMBER	DESCRIPTION	QTY
1	74W-RRAP-RTR-RD	ROTOR ASSEMBLY, REAR, RANGER RAPTOR AND BRONCO, DRIVER	1
2	74W-RRAP-RTR-RP	ROTOR ASSEMBLY, REAR, RANGER RAPTOR AND BRONCO, PASSENGER	1
3	74W-4G-1.22-RRAP-UBB-RDA	ASSEMBLY, BRAKE BRACKET, UNIVERSAL PORTAL BOX, RANGER RAPTOR, REAR DRIVER	1
4	74W-4G-1.22-RRAP-UBB-RPA	ASSEMBLY, BRAKE BRACKET, UNIVERSAL PORTAL BOX, RANGER RAPTOR, REAR PASSENGER	1
5	BT-073	SCREW, SHCS, M12 X 1.75 X 40MM LG, ALLOY STEEL, ZINC PLATED	6
6	WS-026	WASHER, FLAT, 12MM SCREW, 20MM OD, GRADE 10.9 STEEL	6
7	74W-U725-MFLD	MANIFOLD, BRAKE LINES, M10X1	2
8	74W-RRAP-MFLD-BRKT	RANGER RAPTOR REAR BRAKE MANIFOLD BRACKET	2
9	BT-049	SCREW, FLANGE HEX, M14 X 2.0 X 35MM LG, 10.9 BLACK PHOSPHATE	2
10	NT-014	NUT, M14 X 2.0, NYLOCK, THIN	2
11	74W-U725-BL-R	BRAKE LINE, BRONCO, REAR	2
12	PS-016	BANJO BOLT, M10X1	4
13	WS-007	CRUSH WASHER, 15.9MM OD, 10.2MM ID, COPPER	12



KIT BILL OF MATERIALS

INSTALL KIT

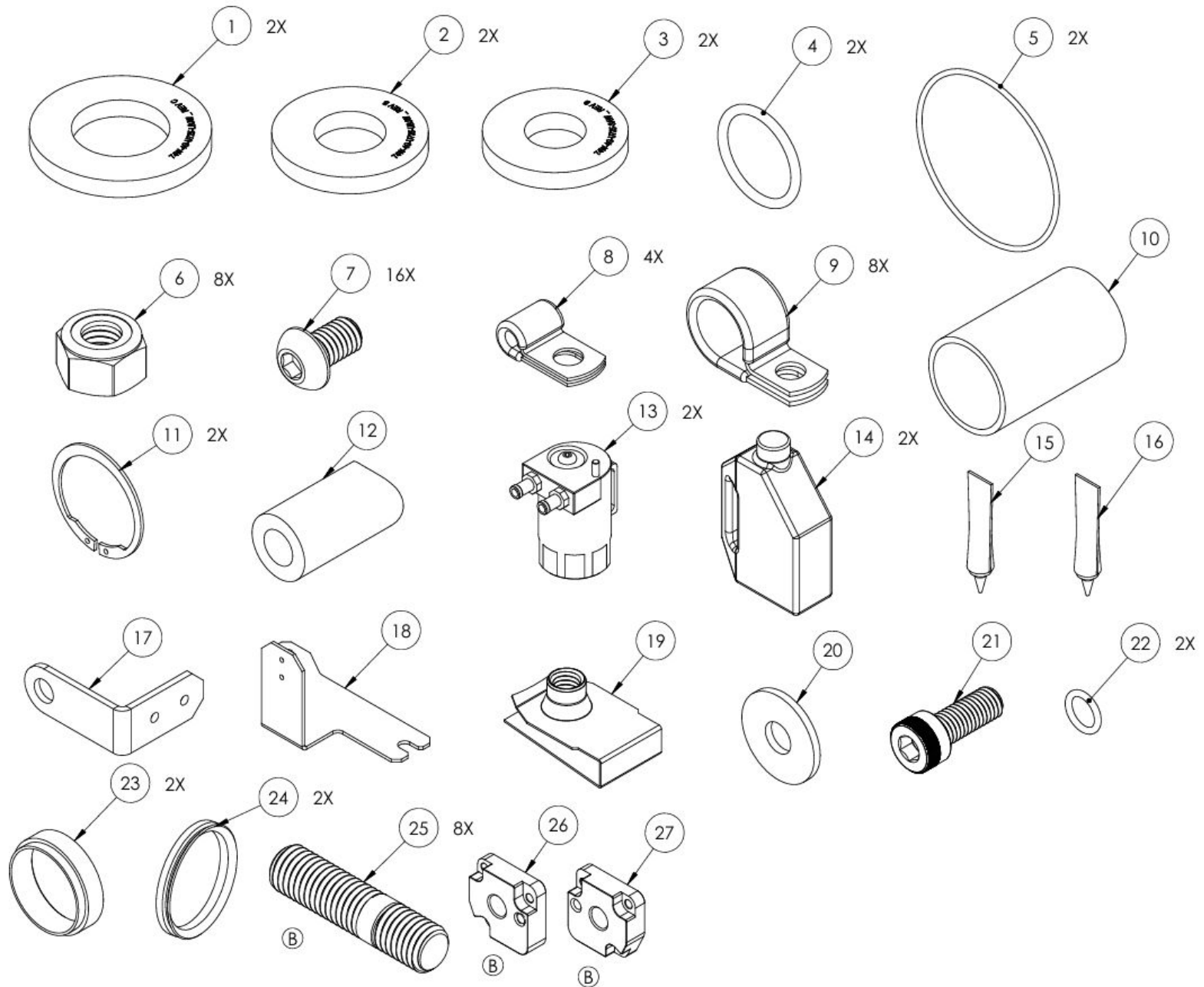
Bronco portal kits will receive **74W-4G-1.22-U725-KIT-INSTALL**

74W-4G-1.22-U725-KIT-INSTALL			
DESCRIPTION: INSTALL KIT, BRONCO REVISION: B DATE: 6/11/25			
ITEM	PART NUMBER	DESCRIPTION	QTY
1	WS-1.67X0.91	WASHER, 1.67 OD 0.91 ID .187 THK	2
2	WS-1.48X0.68	WASHER, 1.48 OD 0.68 ID .187 THK	2
3	WS-1.35X0.63	WASHER, 1.35 OD 0.63 ID .187 THK	2
4	OR-219	O RING, DASH 219	2
5	OR-151	O RING, DASH 151, BUNA N	2
6	NT-009	NUT, NYLOCK, M12 X 1.75	8
7	BT-037	SCREW, BUTTON HEAD, M6 X 1.0 X 10MM LG, 18-8SS	16
8	PS-006	P CLAMP, 3/16" ID, VINYL CUSHION	4
9	PS-007	P CLAMP, 5/8" ID, VINYL CUSHION	8
10	74W-4G-1.22-U725-SS-TOOL	STUB SHAFT CUTTING TOOL, BRONCO	1
11	RR-002	RETAINING RING, 1.500" SHAFT, INVERTED EXTERNAL	2
12	PS-005	HOSE, VENT	20
13	PS-019	CATCH CAN KIT WITH FILTER, DIPSTICK AND HOSE BARBS	2
14	PS-75W90	OIL, SAE 75W-90, MAXIMA PRO GEAR, FULL SYNTHETIC ESTER FORMULA	2
15	PS-001	BLUE LOCTITE 242, SINGLE USE	1
16	PS-002	RED LOCTITE 263, SINGLE USE	1
17	74W-U725-CC-BRKT-F	CATCH CAN BRACKET, BRONCO FRONT	1
18	74W-U725-CC-BRKT-R	CATCH CAN BRACKET, BRONCO, REAR	1
19	NT-015	M8 X 1.25 CLIP NUT, 21MM SPREAD, 4-7MM PANEL THICKNESS	1
20	WS-017	WASHER, FENDER, M8, ZINC PLATED STEEL	1
21	BT-028	SCREW, SKT HD CAP, M8 X 1.25, 20MM LG, ALLOY STEEL, ZINC PLATE	1
22	OR-11.3X8.1	O-RING, 11.3MM OD, 8.1MM ID, 1.6MM WIDE, BUNA N	2
23	74W-4G-1.22-RRAP-SSR	RING, STUB SHAFT SEAL, BRONCO AND RANGER RAPTOR	2
24	SEAL-70 VA V	SEAL, V RING, 70MM, FKM	2
25	BT-042	STUD, M12 X 1.75, 75MM LG, 15MM SHORT SIDE THREAD, 35MM LONG SIDE THREAD	8
26	74W-RRAP-WSS-ADPT-D	RANGER RAPTOR UNIVERSAL BOX WSS ADAPTER DRIVER	1
27	74W-RRAP-WSS-ADPT-P	RANGER RAPTOR UNIVERSAL BOX WSS ADAPTER PASSENGER	1

KIT BILL OF MATERIALS

INSTALL KIT

Bronco portal kits will receive **74W-4G-1.22-U725-KIT-INSTALL**



KIT BILL OF MATERIALS

INSTALL KIT

Ranger raptor portal kits will receive **74W-4G-1.22-RRAP-KIT-INSTALL**

74W-4G-1.22-RRAP-KIT-INSTALL

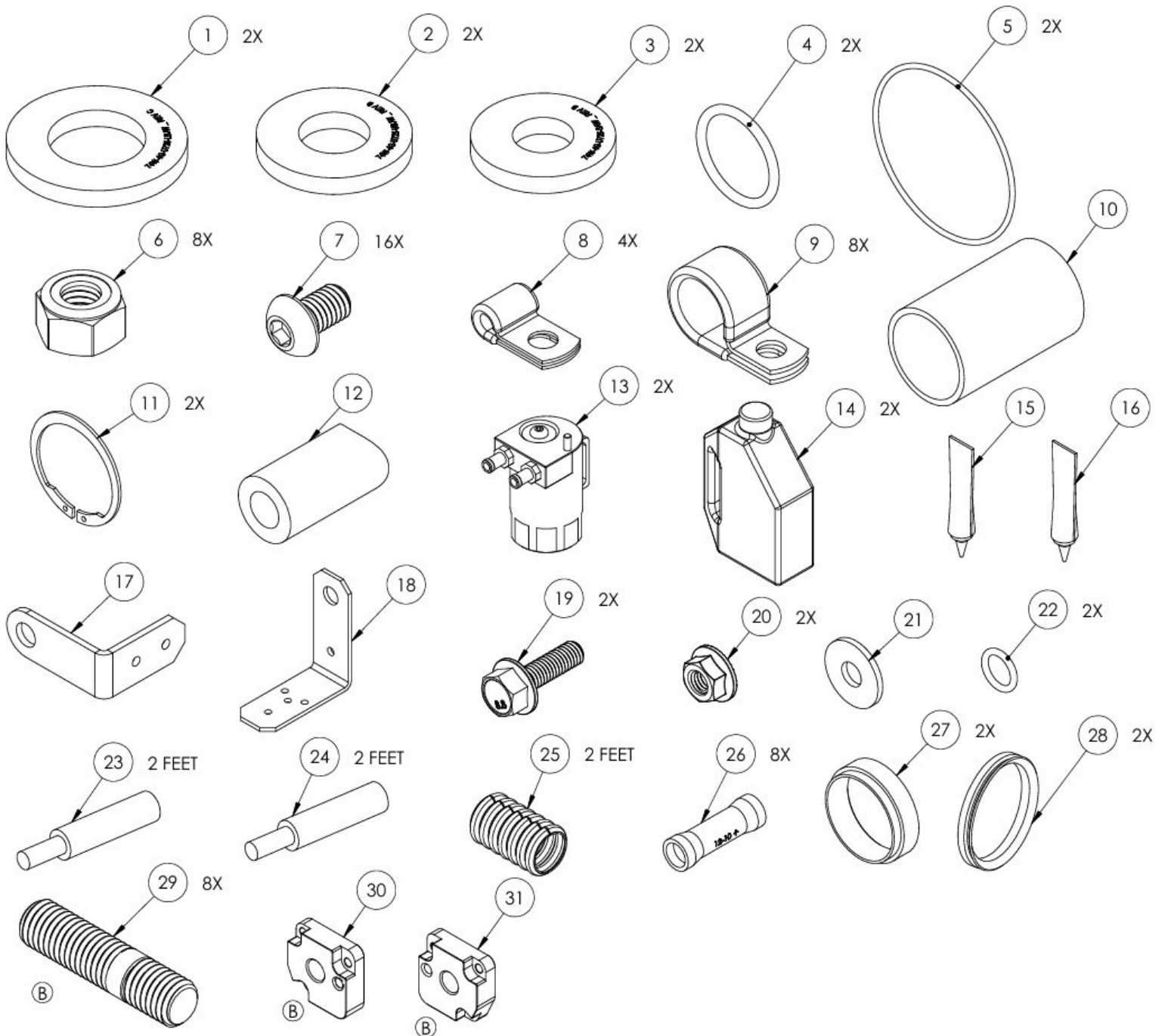
DESCRIPTION: INSTALL KIT, RANGER RAPTOR REVISION: B DATE: 6/11/25

ITEM	PART NUMBER	DESCRIPTION	QTY
1	WS.1.67X0.91	WASHER, 1.67 OD 0.91 ID .187 THK	2
2	WS.1.48X0.68	WASHER, 1.48 OD 0.68 ID .187 THK	2
3	WS.1.35X0.63	WASHER, 1.35 OD 0.63 ID .187 THK	2
4	OR-219	O RING, DASH 219	2
5	OR-153	O RING, DASH 153, BUNA N	2
6	NT-009	NUT, NYLOCK, M12 X 1.75	8
7	BT-037	SCREW, BUTTON HEAD, M6 X 1.0 X 10MM LG, 18-8SS	16
8	PS-006	P CLAMP, 3/16" ID, VINYL CUSHION	4
9	PS-007	P CLAMP, 5/8" ID, VINYL CUSHION	8
10	74W-4G-1.22-U725-SS-TOOL	STUB SHAFT CUTTING TOOL, BRONCO	1
11	RR-002	RETAINING RING, 1.500" SHAFT, INVERTED EXTERNAL	2
12	PS-005	HOSE, VENT	20
13	PS-019	CATCH CAN KIT WITH FILTER, DIPSTICK AND HOSE BARBS	2
14	PS-75W90	OIL, SAE 75W-90, MAXIMA PRO GEAR, FULL SYNTHETIC ESTER FORMULA	2
15	PS-001	BLUE LOCTITE 242, SINGLE USE	1
16	PS-002	RED LOCTITE 263, SINGLE USE	1
17	74W-U725-CC-BRKT-F	CATCH CAN BRACKET, BRONCO FRONT	1
18	74W-YOTA-CC-BRKT-R	CATCH CAN BRACKET, TOYOTA, REAR	1
19	BT-048	SCREW, FLANGE HEX, M6 X 1 X 20MM LG. 8.8, YELLOW ZINC	2
20	NT-011	NUT, M6 X 1.0, SERRATED FLANGE, YELLOW ZINC	2
21	WS-016	WASHER, FENDER, M6, YELLOW ZINC	1
22	OR-11.3X8.1	O-RING, 11.3MM OD, 8.1MM ID, 1.6MM WIDE, BUNA N	2
23	PS-031	12 GA WIRE, WHITE JACKET	2 FEET
24	PS-032	12 GA WIRE, BLUE JACKET	2 FEET
25	PS-033	WIRE LOOM SPLIT TUBING, 1/2" DIA	2 FEET
26	PS-034	BUTT SPLICE CONNECTOR, 10-12 GA, INSULATED	8
27	74W-4G-1.22-RRAP-SSR	RING, STUB SHAFT SEAL, BRONCO AND RANGER RAPTOR	2
28	SEAL-70 VA V	SEAL, V RING, 70MM, FKM	2
29	BT-041	STUD, M12 X 1.75, 50MM LG, 15MM SHORT SIDE THREAD, 30MM LONG SIDE THREAD	8
30	74W-RRAP-WSS-ADPT-D	RANGER RAPTOR UNIVERSAL BOX WSS ADAPTER DRIVER	1
31	74W-RRAP-WSS-ADPT-P	RANGER RAPTOR UNIVERSAL BOX WSS ADAPTER PASSENGER	1

KIT BILL OF MATERIALS

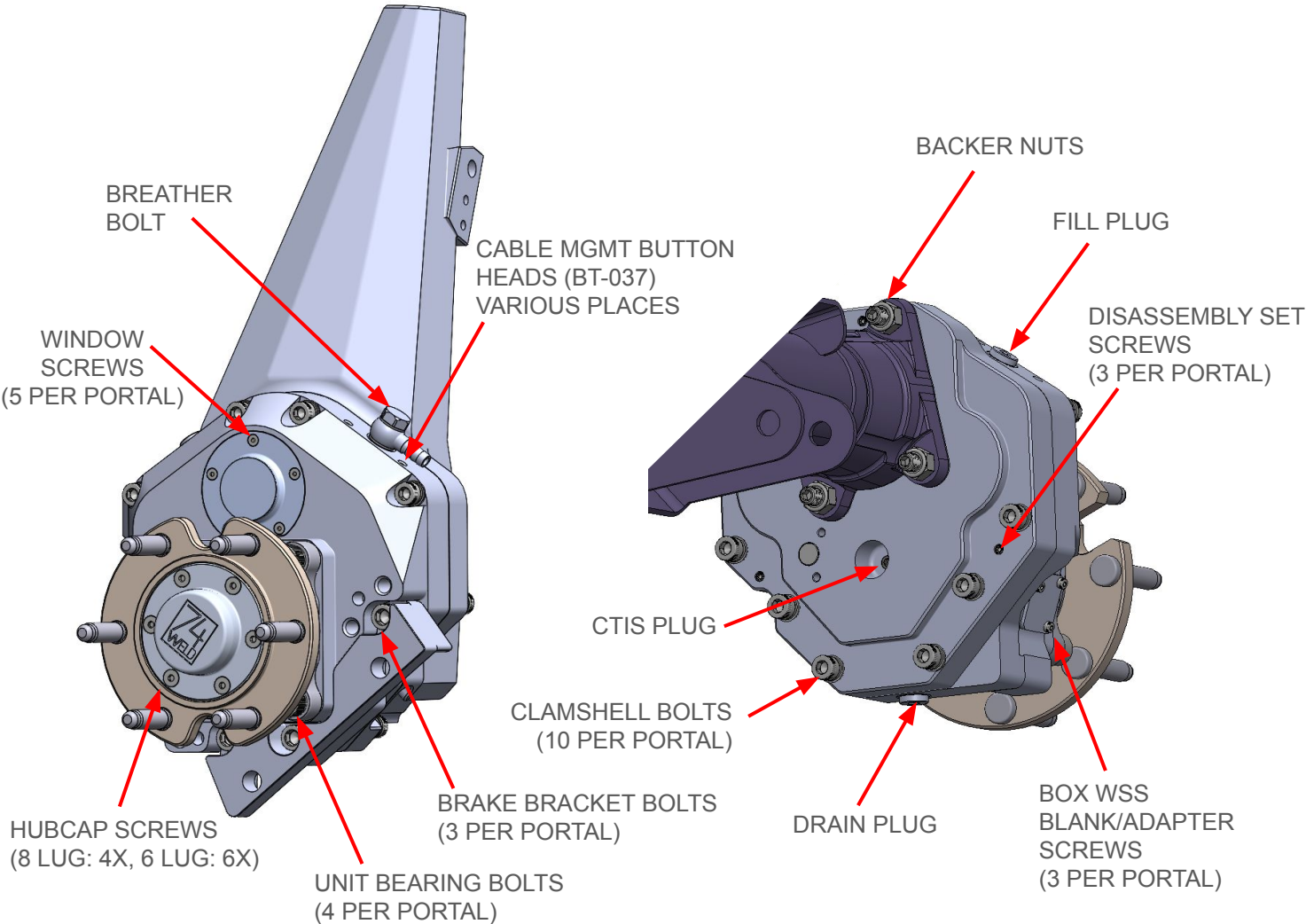
INSTALL KIT

Bronco portal kits will receive **74W-4G-1.22-RRAP-KIT-INSTALL**



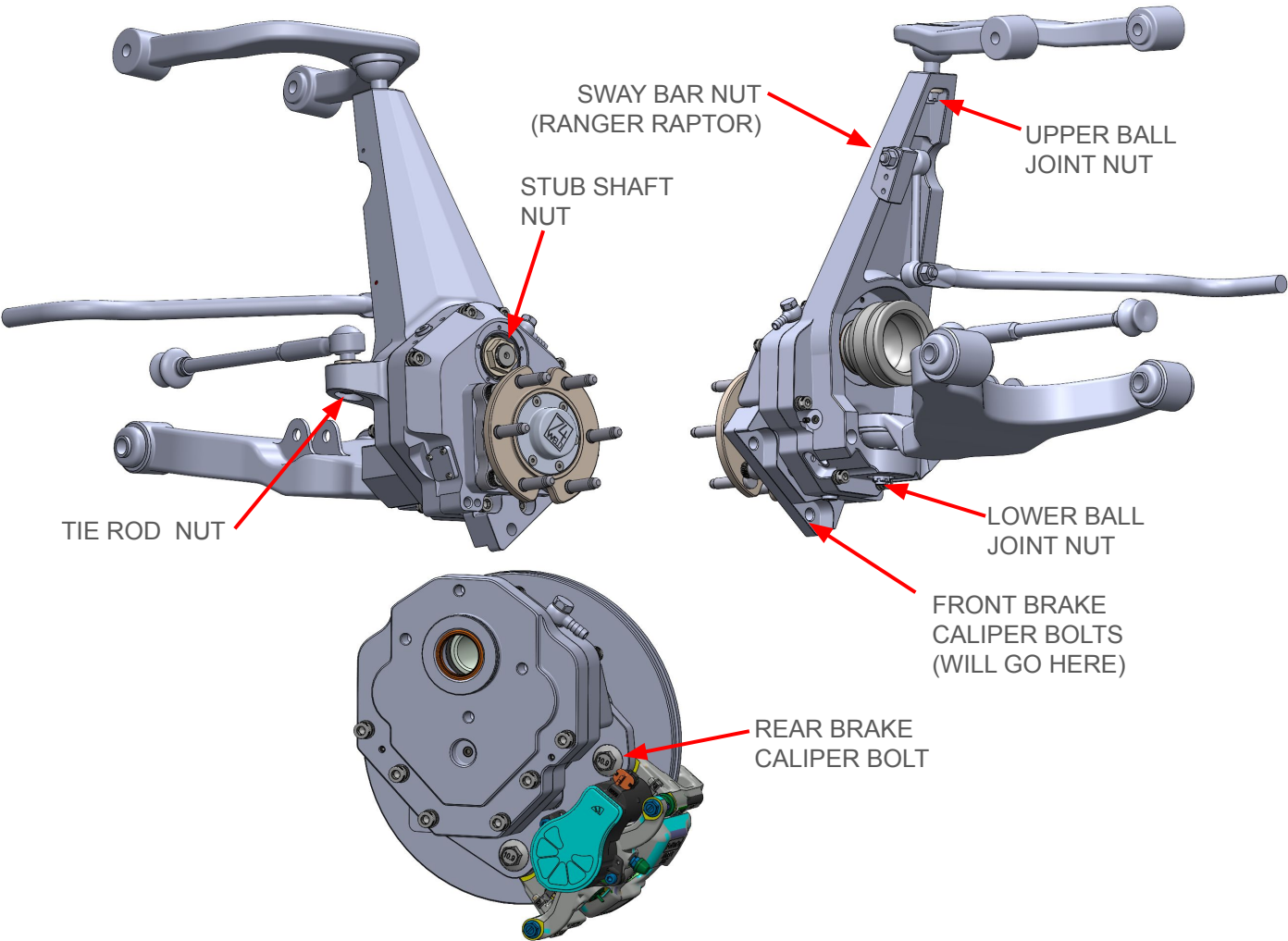
TOOLS, CONSUMABLES, TORQUE SPECS (1 OF 3)

TOOLS REQUIRED - COMMON TO ALL PORTALS					
HARDWARE	TOOL	SIZE	COMPOUND	TORQUE VALUE	TORQUE UNIT
BREATHER BOLT	SOCKET	19 MM	-	10	FT-LBS
BACKER NUTS	SOCKET	19 MM	-	70	FT-LBS
UNIT BEARING BOLTS	ALLEN	12 MM	LOCTITE 263	110	FT-LBS
BRAKE BRACKET BOLTS	ALLEN	10 MM	LOCTITE 263	65	FT-LBS
CLAMSHELL BOLTS	ALLEN	8 MM	LOCTITE 263	30	FT-LBS
DRAIN & FILL PLUG	ALLEN	6MM	-	10	FT-LBS
HUBCAP - 6 LUG	ALLEN	4 MM	LOCTITE 242	5	FT-LBS
CABLE MGMT BUTTON HEADS	ALLEN	4 MM	LOCTITE 242	5	FT-LBS
HUBCAP - 8 LUG	ALLEN	5/32"	LOCTITE 242	4	FT-LBS
BOX WSS BLANK/ADAPTER	ALLEN	3 MM	LOCTITE 263	19	IN-LBS
DISASSEMBLY SET SCREWS	ALLEN	3 MM	-	-	-
WINDOW SCREWS	ALLEN	2.5 MM	LOCTITE 242	8-12	IN-LBS
CTIS PLUG	ALLEN	3/16"	TEFLON TAPE	7	IN-LBS
SNAP RINGS	SNAP RING PLIERS	-	-	-	-



TOOLS, CONSUMABLES, TORQUE SPECS (2 OF 3)

BRONCO/RANGER RAPTOR INSTALLATION FASTENERS AND TOOLS					
HARDWARE	TOOL	SIZE	COMPOUND	TORQUE VALUE	TORQUE UNIT
STUB SHAFT NUT	SOCKET	35 MM	LOCTITE 263	105	FT-LBS
UPPER BALL JOINT NUT	SOCKET	18 MM	NYLOCK	46	FT-LBS
LOWER BALL JOINT NUT	SOCKET	21 MM	NYLOCK	85	FT-LBS
TIE ROD NUT	SOCKET	21 MM	NYLOCK	46	FT-LBS
FRONT BRAKE CALIPER	SOCKET	18 MM	-	111	FT-LBS
REAR BRAKE CALIPER	SOCKET	18 MM	-	90	FT-LBS
FRONT WHEEL SPEED SENSOR	SOCKET	8 MM	-	HAND TIGHT	
REAR WHEEL SPEED SENSOR	SOCKET	8 MM		HAND TIGHT	
FRONT BLEED SCREW	BOX WRENCH	11 MM		HAND TIGHT	
REAR BLEED SCREW	BOX WRENCH	11 MM		HAND TIGHT	
MANIFOLD BRACKET NUT	21 MM	SOCKET	NYLOCK	70	FT-LBS
MANIFOLD BRACKET BOLT	18MM	SOCKET	-	70	FT-LBS
MANIFOLD BANJO BOLTS	14 MM	SOCKET	-	120	IN-LBS
FACTORY BANJO BOLTS	13 MM	SOCKET	-	120	IN-LBS
CABLE MGMT REMOVAL	10 MM	SOCKET	-	HAND TIGHT	-



TOOLS, CONSUMABLES, TORQUE SPECS (3 OF 3)

Generic Tools

General tools required for this install include but are not limited to

- Hammer
- Cut off wheel
- Pry bar
- Torque wrench capable of 150 ft-lbs
- Pliers
- Vehicle Lift or jack and jackstands
- Brake line clamps or vise grips

Consumables

- 40 oz 75W-90 GL-5 Gear Oil
- Loctite 263 (provided in kit)
- Loctite 243 (provided in kit)
- Assembly grease
- Oil to top off the rear axle - see vehicle manufacturer's specification
- Brake fluid to top off reservoir - see vehicle manufacturer's specification
- RTV Silicone Adhesive (Jeep JL & JT only)
- Teflon Tape

!! LUG NUT NOTE !!

74Weld portal hubs are equipped with M14 X 1.5 wheel studs. Prior to installation, ensure that you have M14 X 1.5 lug nuts on-hand.

!! TAPER TOOL NOTE !!

We recommend purchasing a separator tool in the event that separating tapered connections is required. Ball joint and tie rod separators are readily available at automotive retailers or a specialty separator tool can be purchased from 74Weld.

IMPORTANT: BRAKE BLEED PREPARATION NOTES

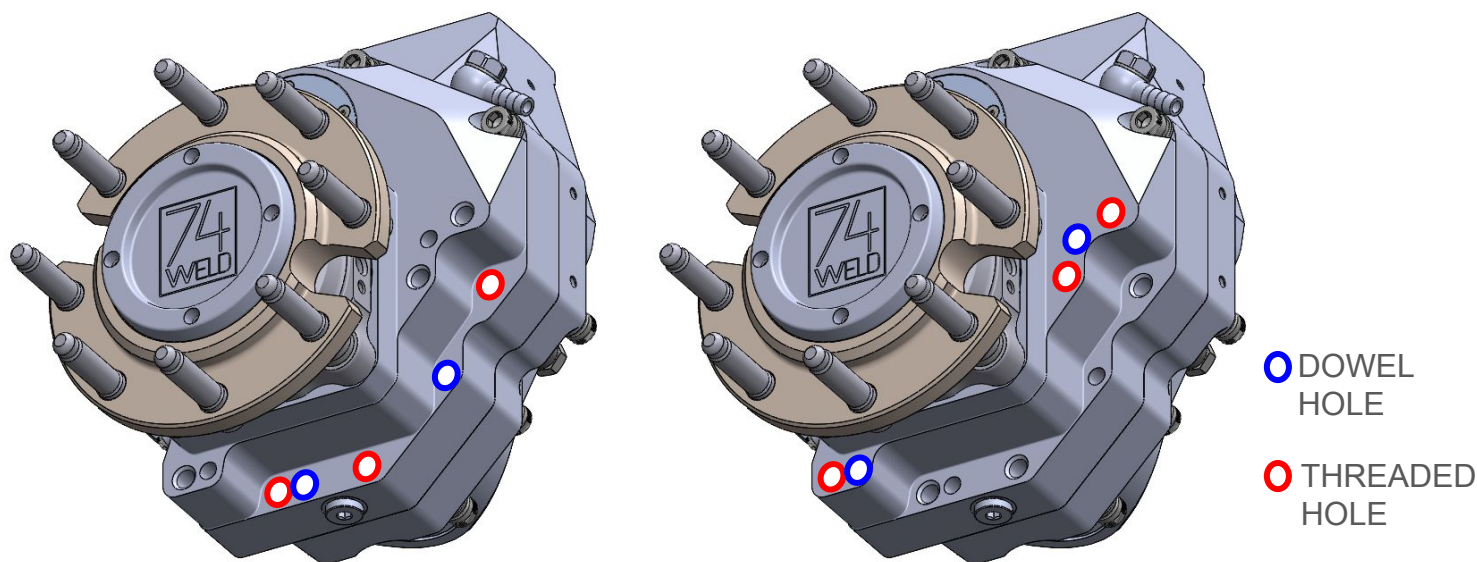
This kit includes extended brake lines which means that post-install the brake system will need to be bled.

Newer vehicles have been observed to be more sensitive to changes to the brake system. Some vehicles even have a “brake maintenance mode” that can be activated at the dash. We have found the following procedure to be effective without the use of brake maintenance modes.

1. Lift and support the vehicle
2. Once the vehicle is in the intended workspace (lift or on jack stands) disengage the parking brake and turn the vehicle off. Check that the parking brake is off at this time by rotating a rear tire.
 - a. *Note: some vehicles that are equipped with an electronic parking brake will automatically engage the brake when the vehicle is in park or turned off. In this situation*
 - i. *Have one person in the driver's seat turn the vehicle on, depress and hold the brake pedal, disengage the parking brake, put the vehicle in neutral*
 - ii. *Have a second person disconnect the wiring harnesses to both rear brake calipers*
 - iii. *Have the first person put the vehicle in park and turn the vehicle off*
3. Disconnect the negative battery terminal and leave it disconnected for the remainder of the install
4. Perform the installation per this manual, but leave the brake bleeding until the end. This way you can be sure that the brake lines are routed properly prior to bleeding and you will not have to bleed twice due to a re-route.
 - a. *Note: During install, some or all factory brake lines will be removed. Use brake hose clamps or vise grips to clamp upstream soft lines to keep brake fluid from continually leaking during install activity.*
 - b. **NOTE: DO NOT LET YOUR MASTER CYLINDER RUN DRY.** *Periodically check the fluid level in your reservoir and top off as required.*
5. Bleed brakes per procedure in this instruction
6. Reconnect negative battery terminal
 - a. *If you had previously disconnected your electronic parking brake caliper wiring harnesses, ensure they are plugged in prior to reconnecting the battery terminal.*

BRAKE BRACKET INSTALLATION (1 OF 2)

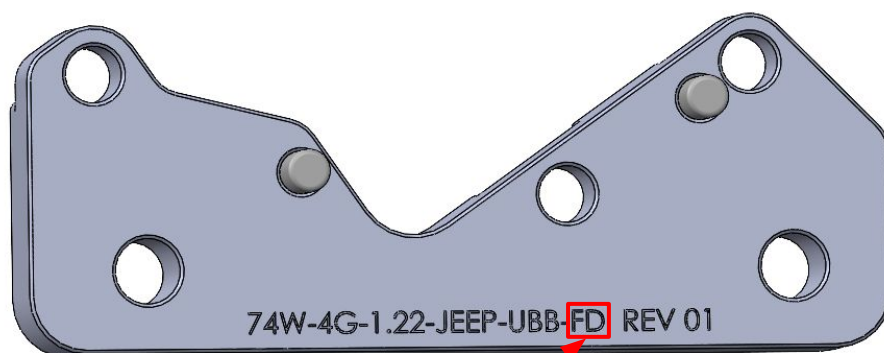
Each portal has a “lower” and “upper” brake bracket hole pattern. Each hole pattern consists of two dowel holes and three threaded holes.



“LOWER” HOLE PATTERN”

“UPPER” HOLE PATTERN”

Your portal kit will include front and rear brake brackets. They are engraved with part numbers that specify which corner they belong to. Brackets include dowels that are spaced such that they can only be installed to the correct hole pattern.



FD: Front Driver
RD: Rear Driver

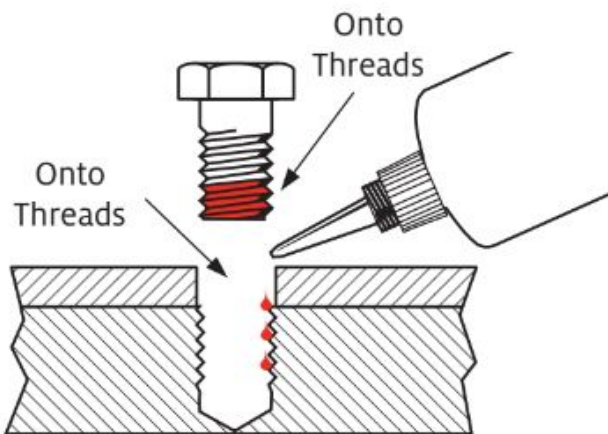
FP: Front Passenger
RP: Rear Passenger

BRAKE BRACKET INSTALLATION (2 OF 2)

Locate M12 brake bolts (BT-073) and M12 washers (WS-026) supplied with your kit. Place one washer on each brake bolt.

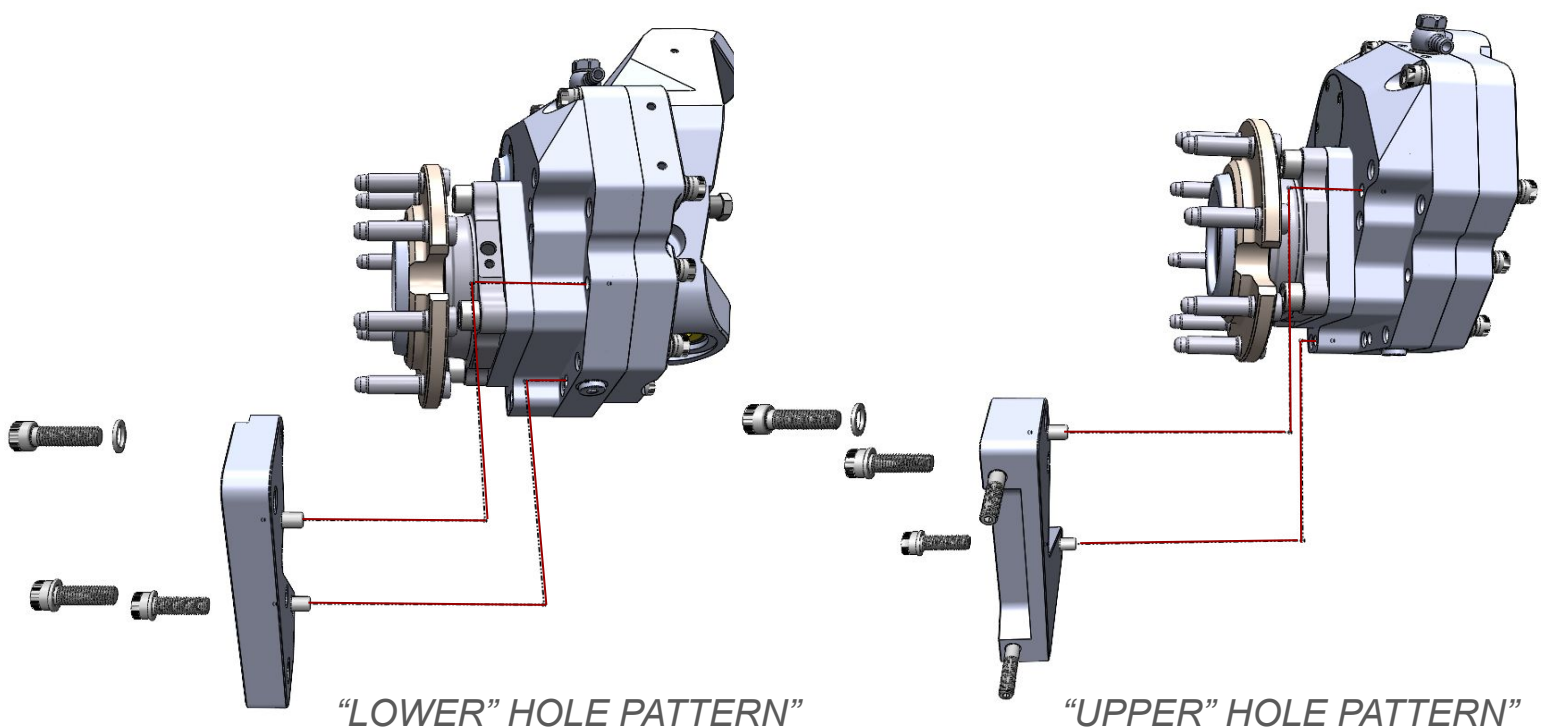
Apply red loctite 263 to the threads on the tip of each brake bolt AND into the threaded brake pattern holes on the portal box.

BLIND HOLES (CAP SCREWS, ETC.)



Install brake brackets onto corresponding portal boxes by piloting the dowels on the brackets into the dowel holes on the portal box.

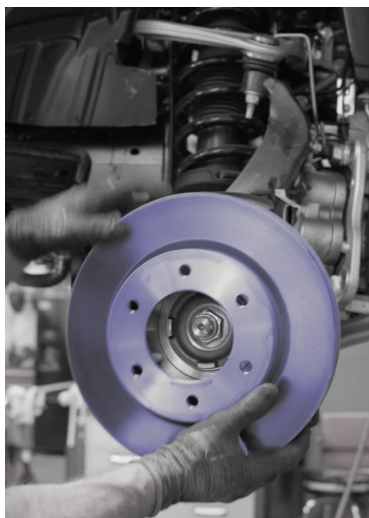
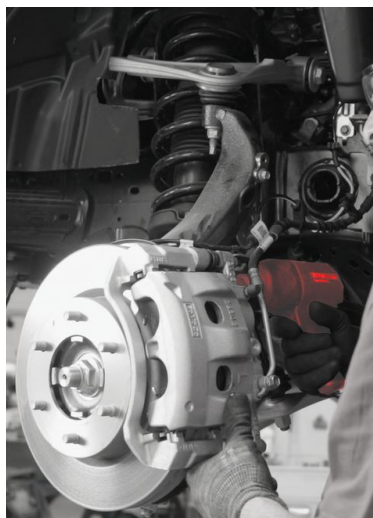
Thread brake bolts into portal box and torque to **65 ft-lbs**



INSTALLATION - FRONT END DISASSEMBLY

- ❑ Lift and support the vehicle.
- ❑ Remove the wheels and tires from the vehicle.
- ❑ Clamp the front brake line with vise grips or brake line clamp. Remove the hard line between the chassis and caliper.
- ❑ Remove brake calipers and rotors.

Save Calipers, Caliper Bolts and Banjo Bolts



- ❑ Remove abs sensor from upright. Take care not to crush or kink sensor cable. Remove sensor cable retaining bracket from upright

Save Sensor Screw

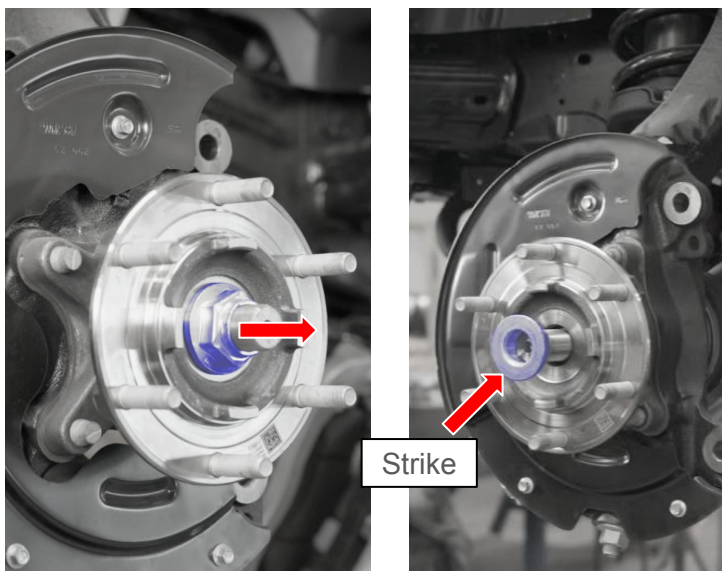


- ❑ RANGER RAPTOR ONLY: Remove sway bar end link from upright. Secure sway bar end link so that it is not able to swing downward and damage the CV boot.

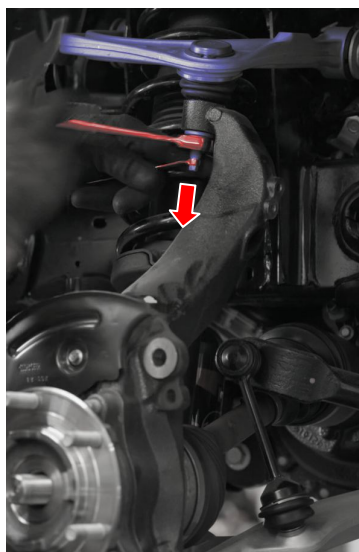
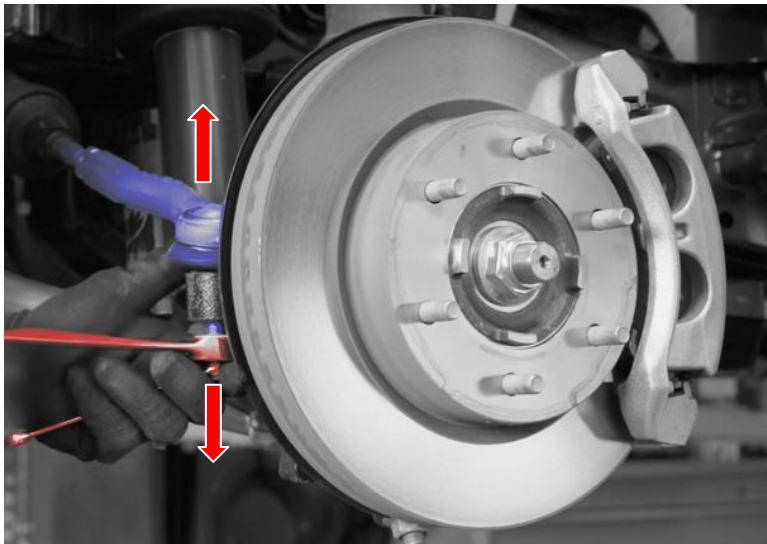
Save Link Nut

INSTALLATION - FRONT END DISASSEMBLY

- ❑ Use a 35mm or 1 $\frac{3}{8}$ " socket to remove the stub shaft nut (spindle nut) from the stub shaft. Flip the nut around and re-thread onto stub shaft. Strike the nut with a rubber mallet to dislodge the stub shaft from the unit bearing hub. Remove and save the stub shaft nut. **Save Spindle Nut**

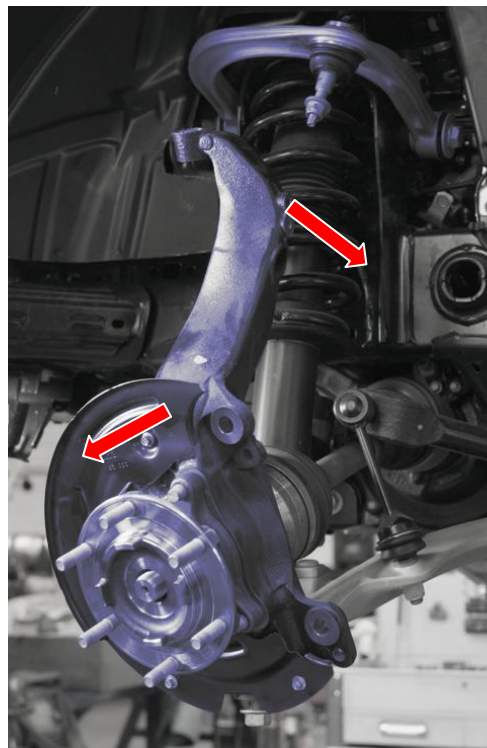


- ❑ Loosen tie rod, upper ball joint and lower ball joint nuts. Keep nuts partially threaded on ball joint studs. Break tapers.



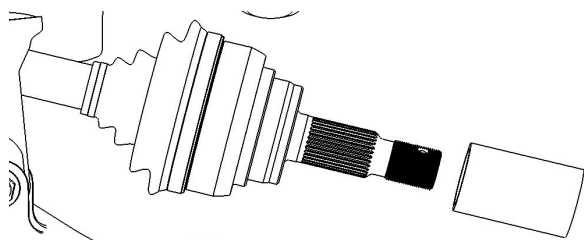
- ❑ Remove upper ball joint, lower ball joint and tie rod nuts to separate the upright from the suspension.

Save Ball Joint Nuts

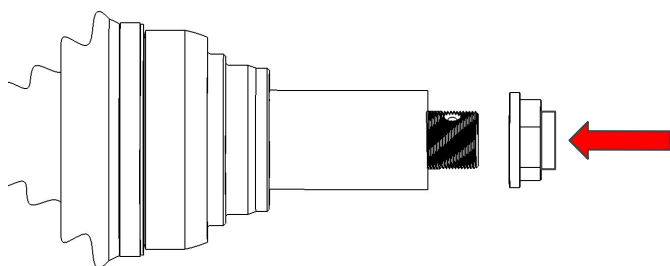


INSTALLATION - STUB SHAFT MODIFICATION

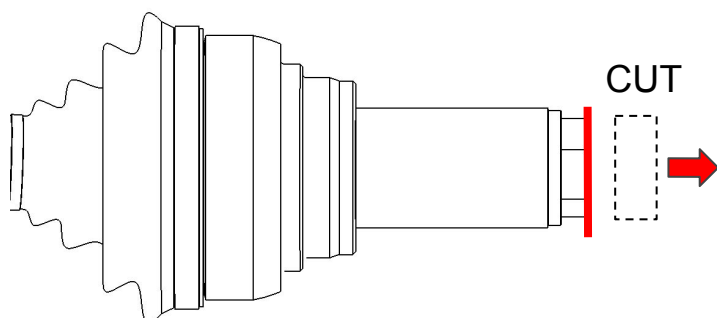
The front stub shafts will need to be trimmed down to fit within the portal box.



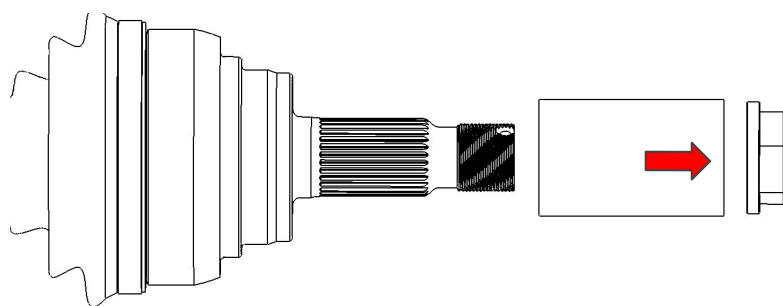
Slide shaft cutting tool from install kit onto stub shaft



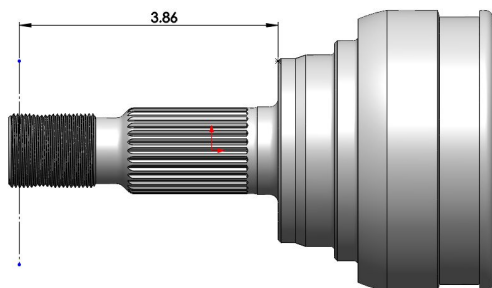
Secure shaft cutting tool with spindle nut



Cut the end of the stub shaft and the lip of the nut flush with the hex of the nut, This will allow the sub shaft to fit within the portal assembly.



Remove the nut and cutting tool from the stub shaft. It is important to cut the shaft with the nut installed as removing the nut will clean the threads.



If you have an aftermarket nut, cut the stub shaft to a length between 3.75 & 3.86" from the shaft thrust face

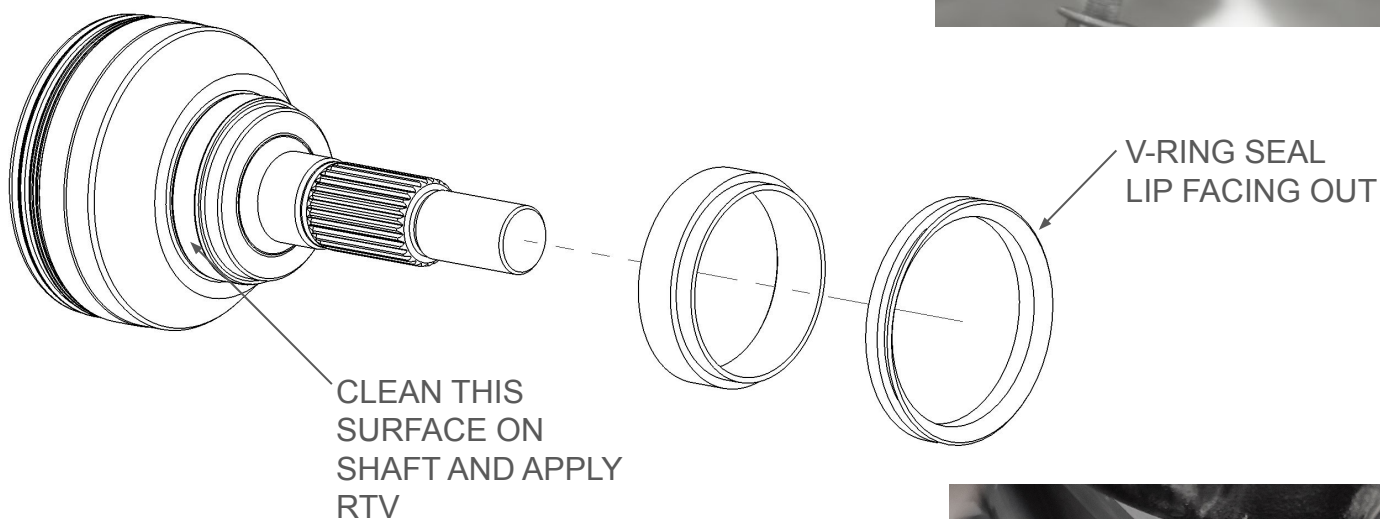


Stub shaft nut pre & post cut

INSTALLATION - STUB SHAFT V RING SEAL

V-Ring seals can provide additional protection to the input seal from dirt and debris.

- Pry the stamped sheet metal dust cover off of the factory stub shaft.
- Clean the press surface on the stub shaft with alcohol or brake cleaner
- Apply a bead of RTV to the press surface on the shaft.
- Locate stub seal ring from install kit. Slide ring onto stub shaft, pushing it far enough to seat against the shoulder of the shaft. See diagram below for orientation.



- Stretch the V-ring seal from the install kit onto the stub seal ring. The v-ring lip should be facing away from the stub shaft.
- Grease the front sealing lip with assembly grease.
- Once the portal has been installed, the v-ring seal will seal against the inside face of the upright to protect your oil seal from dirt and debris.



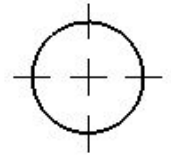
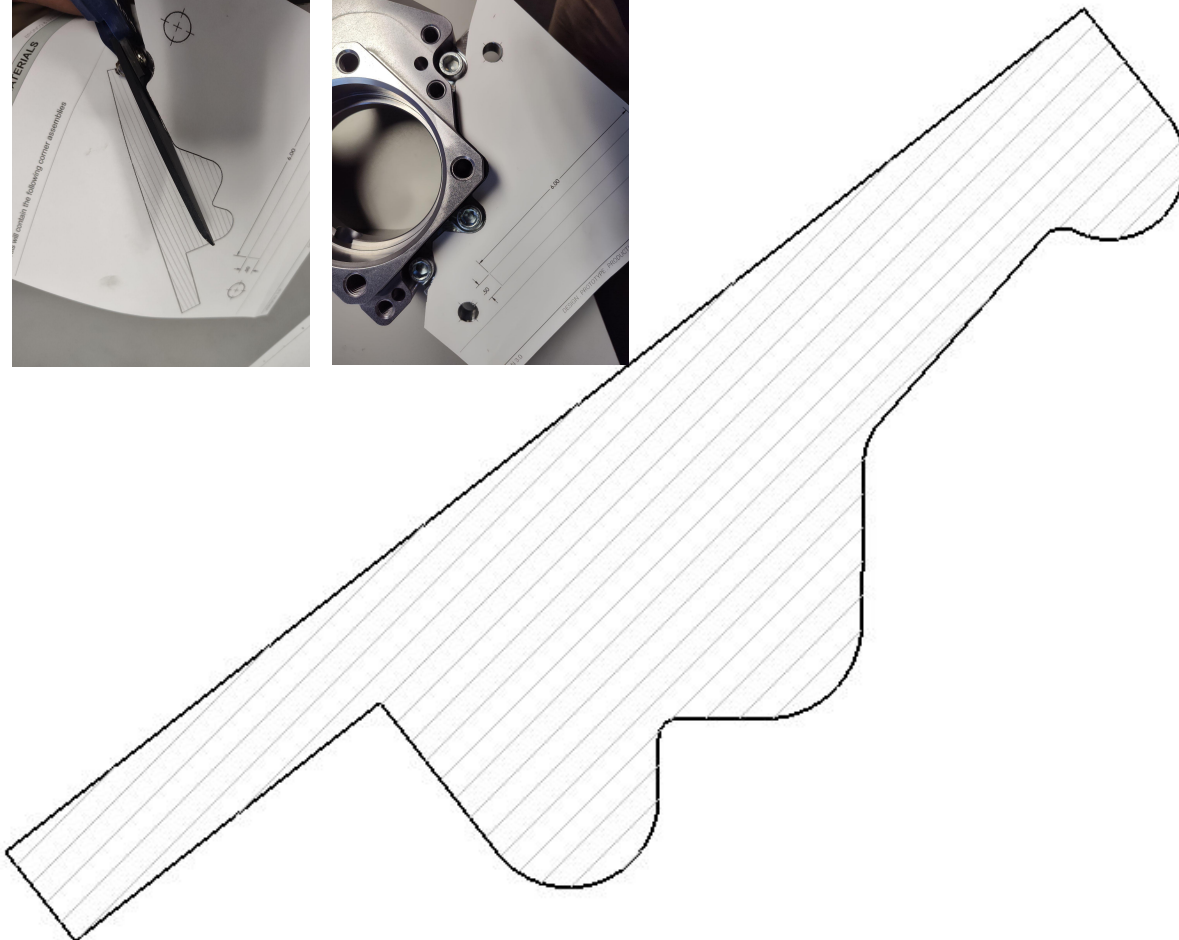
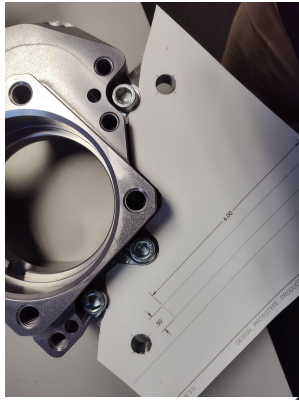
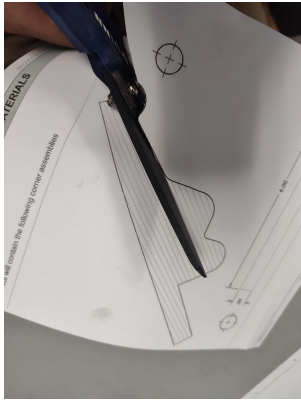
KIT BILL OF MATERIALS

RANGER RAPTOR ONLY - FACTORY FRONT BRAKE CALIPER MOD

On Ranger Raptor, we recommend upgrading to the Aero6 front brake caliper. If you wish to run the factory brake caliper, the factory adapter bracket will need to be ground to fit around the portal box. We highly recommend upgrading to an Aero6 brake caliper to avoid grinding. Bronco front calipers do not require modification.

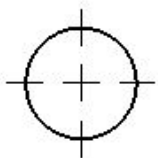
To aid in clearancing the adapter bracket, print this sheet at 1:1 scale. Check scale using dimensioned box below.

Cut hatched section out of template and trace onto adapter bracket to see what material will need to be removed.



Upper Caliper
Bolt Hole

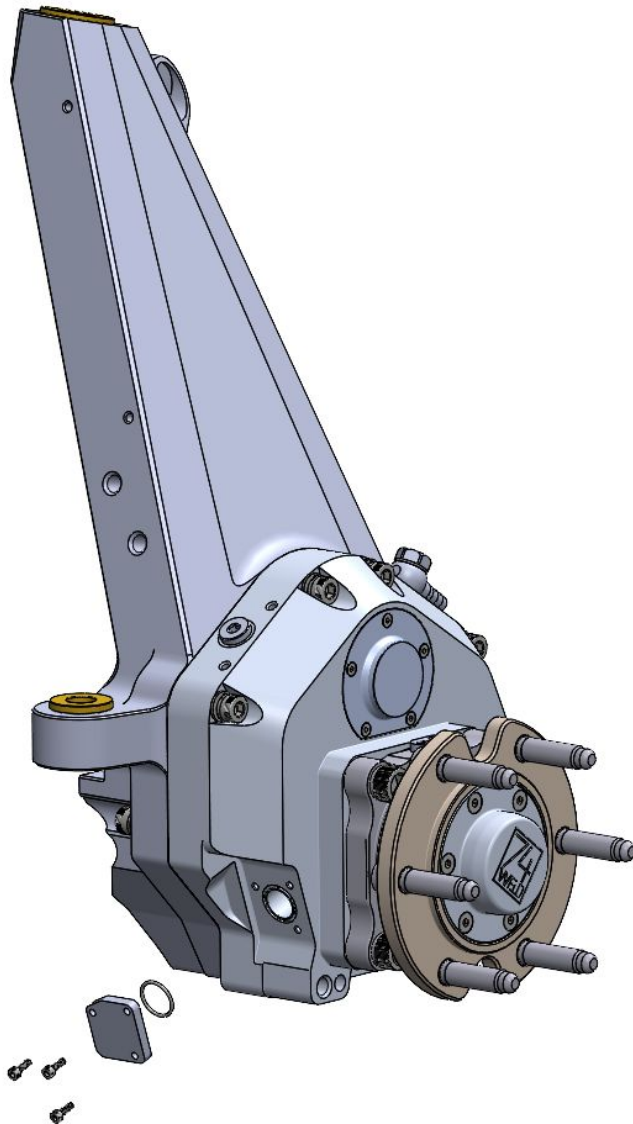
Lower Caliper
Bolt Hole



KIT BILL OF MATERIALS

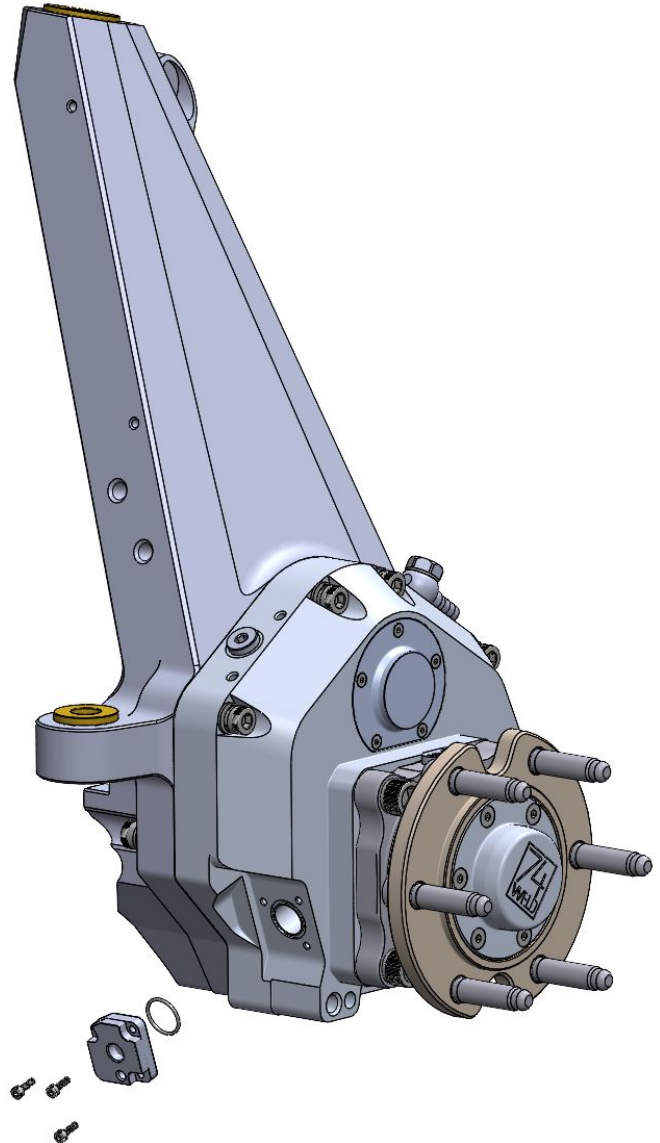
WHEEL SPEED SENSOR ADAPTER

Your install kit includes two wheel speed sensor adapters for the front portals, one “-D” for driver and one “-P” for passenger. Rear portals will not need sensor adapters.



Remove blank plate from front portal. Save screws and o-ring.

Driver's side shown.

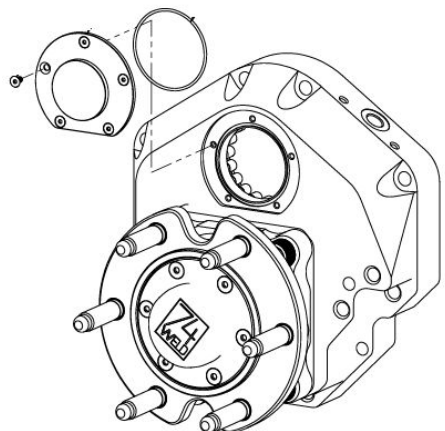


Install sensor adapter, reusing screws and o-ring.

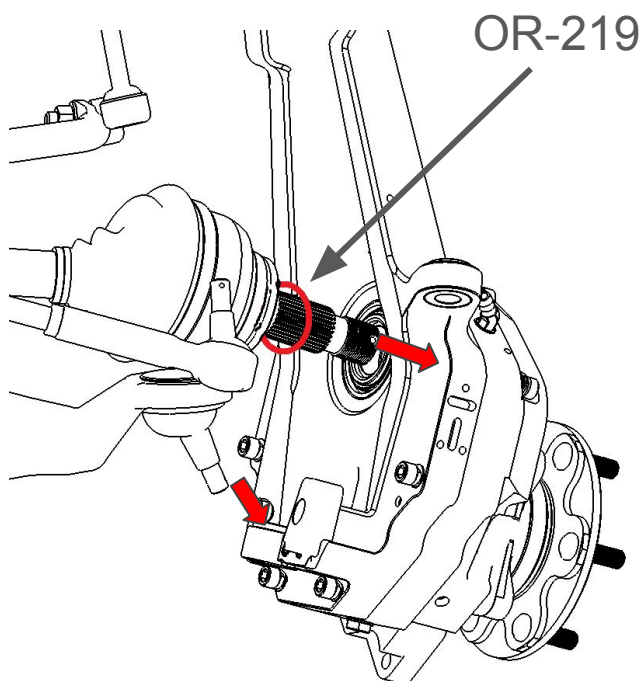
Driver's side shown.

INSTALLATION - FRONT PORTAL

- ❑ Locate front portal box, front o-rings and washers.
- ❑ Remove the front portal box window. Do not lose o-ring.



- ❑ **IMPORTANT** Grease and slide o-ring OR-219 from install kit onto stub shaft.
- ❑ Maneuver portal to slide lower ball joint and stub shaft into portal simultaneously.



- Locate upper and lower ball joint washers (items 1 and 2 of install kit). These items will be loose until retained with the ball joint nuts during installation.

FAILURE TO INSTALL BALL JOINT WASHERS WILL RESULT IN TAPERED INSERTS PULLING OUT OF THE UPRIGHT.

- ❑ Place lower ball joint washer on stud. Apply red loctite to lower ball joint nut, thread onto stud and torque to 85 ft-lbs.

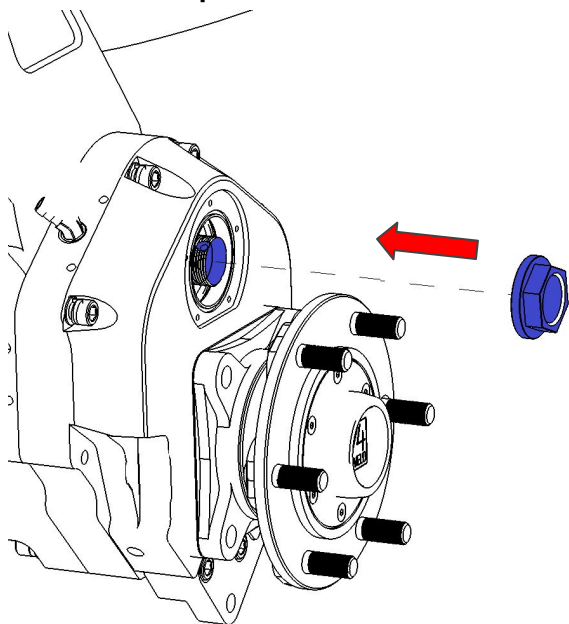


INSTALLATION - FRONT PORTAL

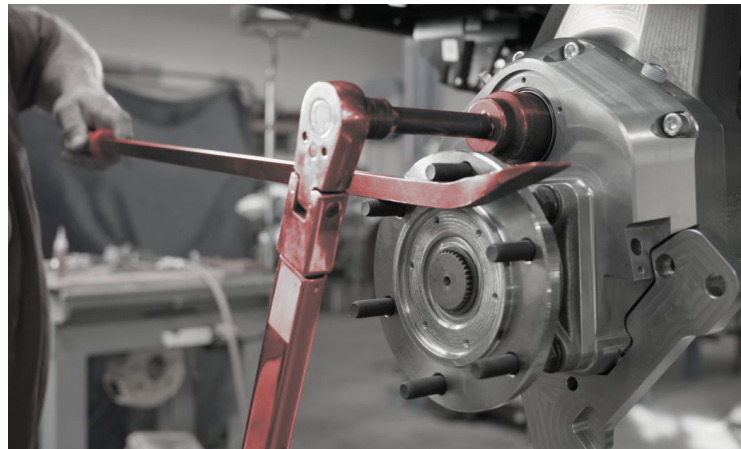
- Place upper ball joint washer on stud. Apply red loctite to upper ball joint nut, thread onto stud and torque to 46 ft-lbs



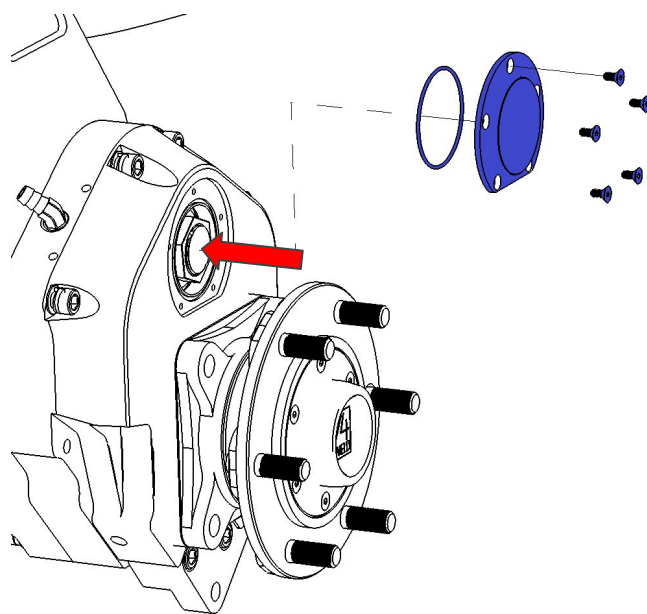
- Ranger Raptor Only: Install sway bar link to portal upright reusing factory nut..
- Apply loctite 263 to threads on the stub shaft and into the threads on the factory stub shaft nut. Torque nut to 105 ft-lbs.



- Use a pry bar as-required to keep gears from rotating when torquing.



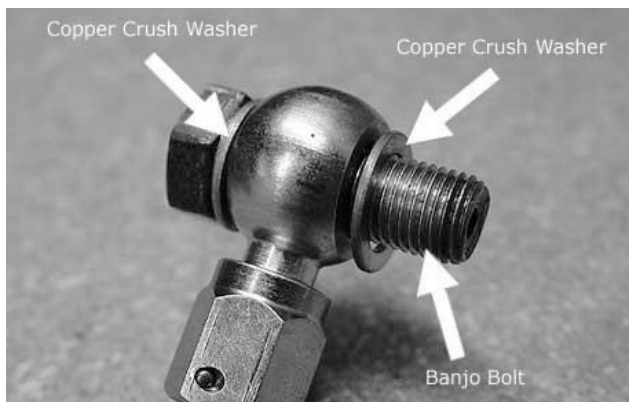
- Grease window o-ring and Re-install window.



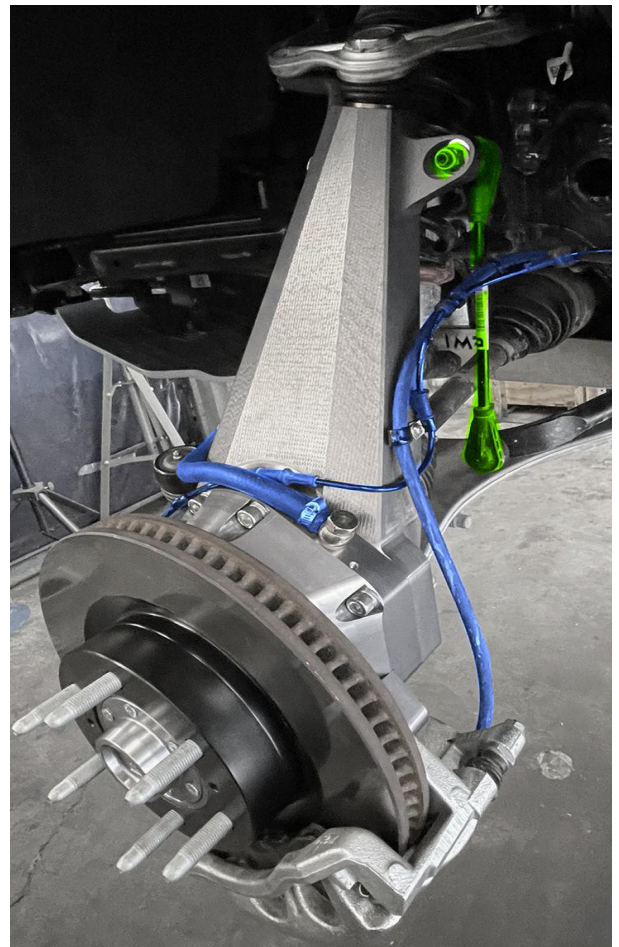
- If brake brackets have not yet been installed, do so at this time. See "Brake Bracket Installation" section earlier in this manual.

INSTALLATION - FRONT PORTAL

- ❑ Install front rotor to hub. Loosely fasten factory caliper to front brake bracket reusing factory caliper bolts. The caliper will be removed from the brake bracket for bleeding at a later time and does not need to be torqued at this stage.
- ❑ Locate front factory caliper and M10X1.50 banjo bolt from earlier. Locate new front brake lines, item 7 of front brake kit. Install a new crush washer, item 8 of front brake kit, on either side of the banjo fitting on brake line. Loosely fasten new front brake line to caliper using factory banjo bolt.
- ❑ Route brake line up to chassis and tie off to the rear of the upright using large p-clamp and screws, items 7 and 9 of install kit.
- ❑ Remove factory brake line from chassis and connect supplied brake line to chassis. The hole in the chassis-side brake line retaining bracket will need to be ground out slightly to fit the brake line.

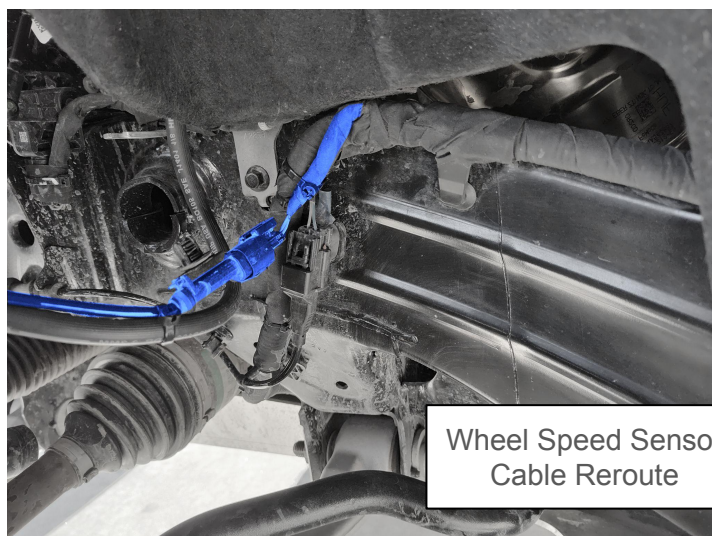


- ❑ Once the brake line has been fully routed, torque banjo bolt on the caliper to 96-120 INCH pounds. Any time this banjo bolt is loosened or removed, crush washers will need to be replaced.



INSTALLATION - FRONT PORTAL

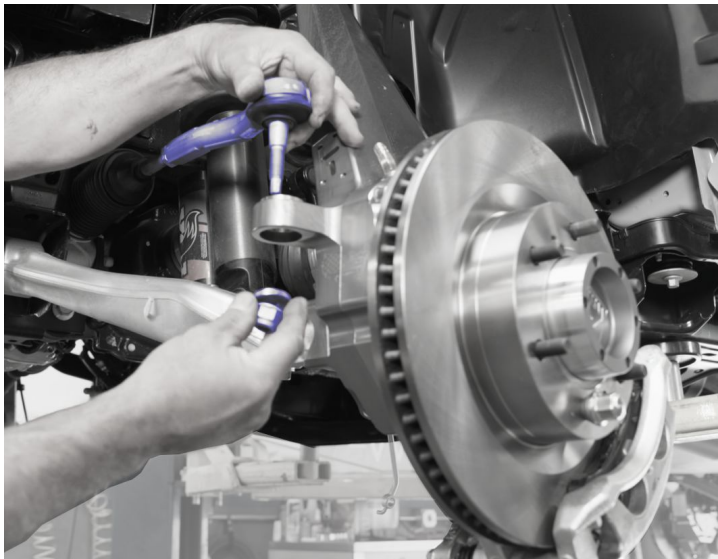
- Attach breather line to barbed banjo fitting on top rear of portal box. Route the breather to the front of the upright and use large p clamps and screws provided with the install kit to retain.
- **Install new o-rings onto wheel speed sensors, OR-11.3x8.1, included in install kit.** Install wheel speed sensor into the adapter block on the front of each portal box and secure with factory M6 bolt.
- Route wheel speed sensor cable to the rear of the portal, retaining with small p-clamps and screws provided in install kit. The cable can be tied off to brake line with zip ties. Loosen and remove chassis side ABS brackets to create slack for wheel speed sensor cable.



Wheel Speed Sensor
Cable Reroute

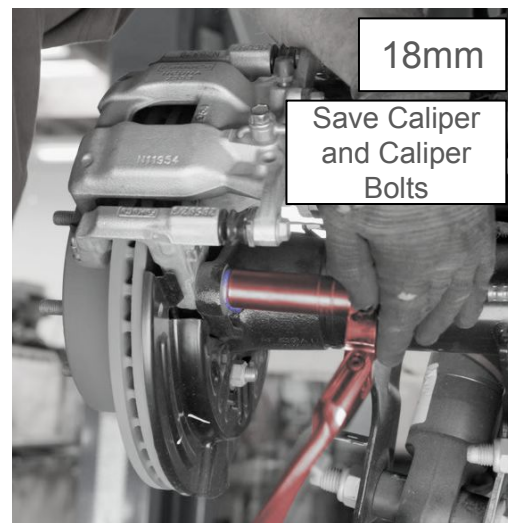
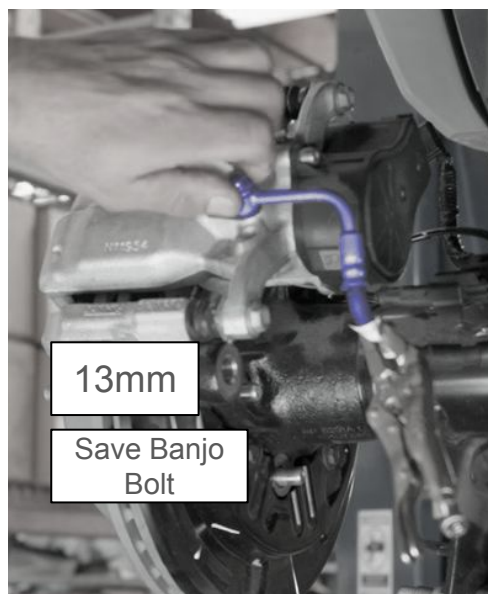
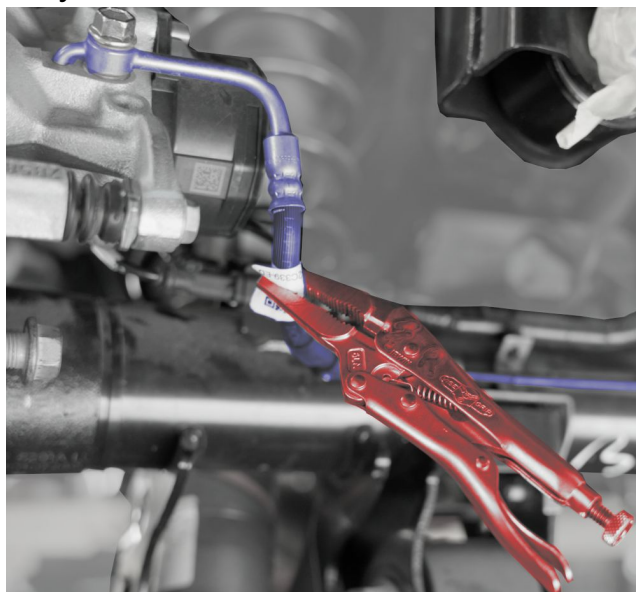
INSTALLATION - FRONT PORTAL

- Install tie rod into portal steering arm (top down). Apply red loctite to factory tie rod nut and thread onto stud, along with **supplied steering arm washer**. Use a 21mm socket (and 8mm hex as-required) to torque tie rod to 46 ft-lbs

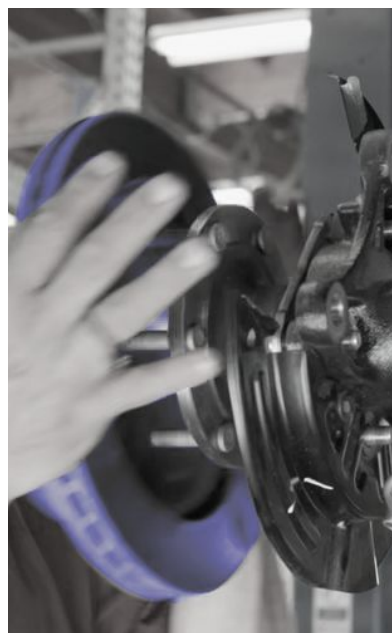


INSTALLATION - REAR END DISASSEMBLY

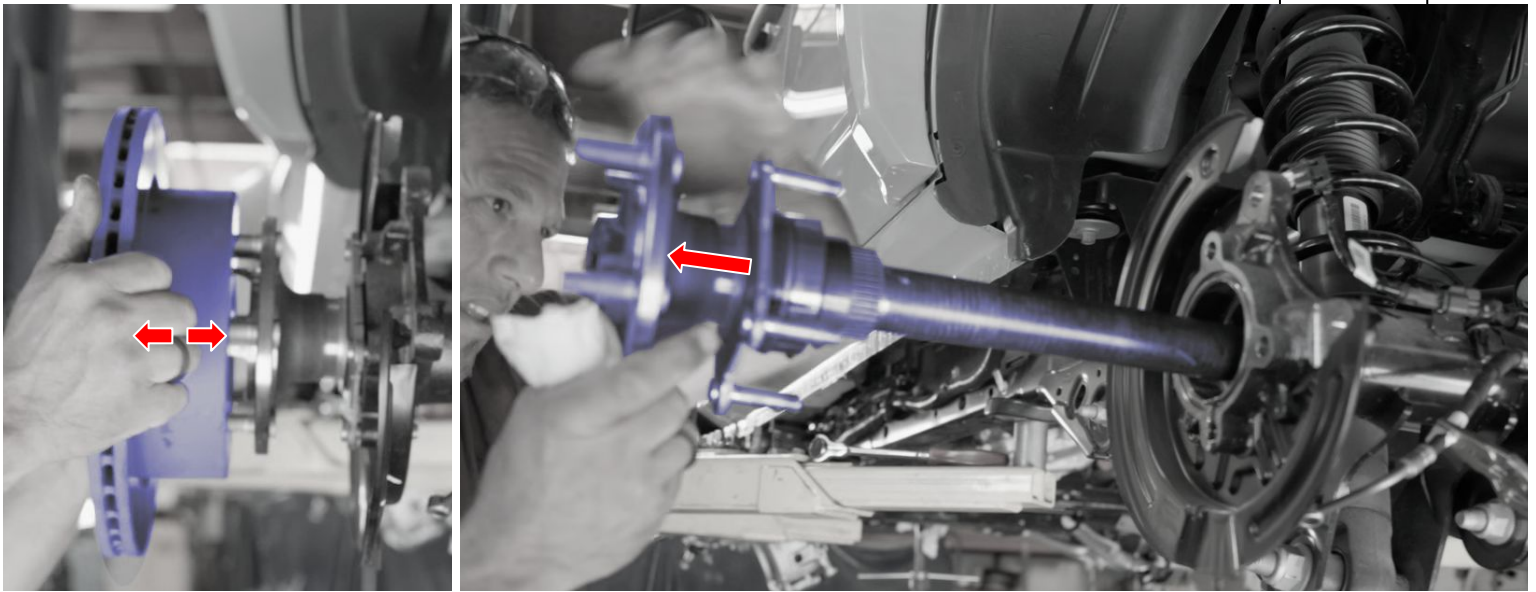
- ❑ Use a brake line clamp or vise grips to pinch soft rear brake line. Get a catch can ready for brake fluid. Remove rear caliper banjo bolt with 13mm socket or wrench. Allow excess brake fluid to drain into catch can. Ensure brake hose is clamped such that fluid does not continue to flow from line. Remove caliper bolts with 18mm wrench or socket and save bolts for later. Remove caliper and save for later. Excess fluid may spill from caliper cylinder when handled.



- ❑ Remove brake rotor. Use an 18mm wrench or socket to remove the four axle shaft retainer nuts. Flip rotor around and re-install onto wheel studs. Loosely thread 2-3 lug nuts onto wheel studs.

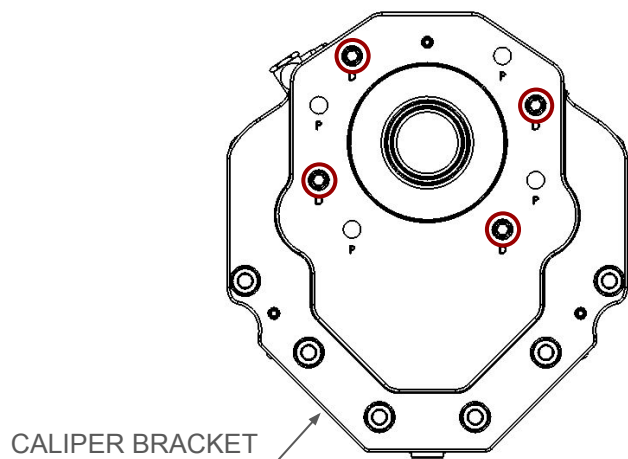


INSTALLATION - REAR END DISASSEMBLY

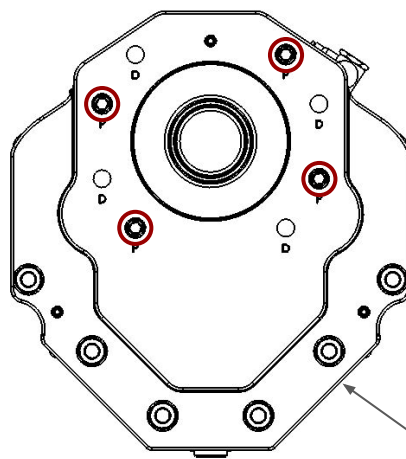


- Use the brake rotor as a slide hammer to pull/tap the axle shaft loose from the axle housing. Get a catch can and rags ready as gear oil may spill from the housing tube. Once the axle shaft is loose, it may be removed and discarded.

INSTALLATION - REAR END ASSEMBLY



Driver Side

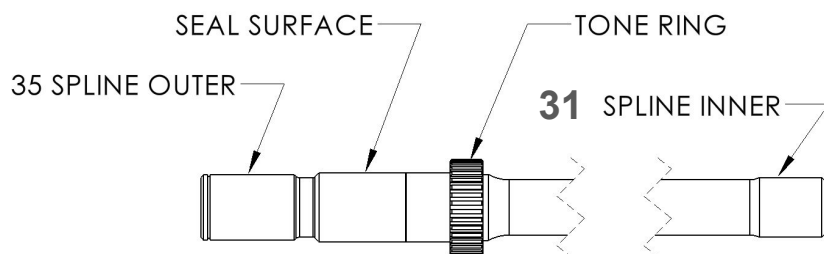


Studs installed into
hole positions circled
in red

CALIPER BRACKET
THIS SIDE

Passenger Side

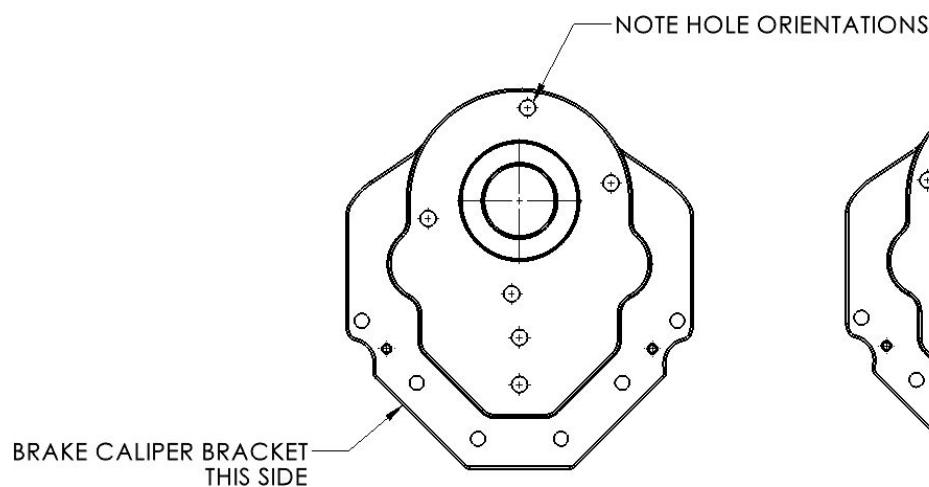
RANGER RAPTOR REAR PORTAL AND SHAFT IDENTIFICATION



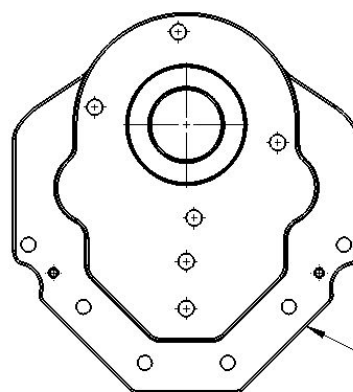
The passenger side shaft will be longer
(35.73) and marked "RRP"

The driver side shaft will be shorter
(34.79") and marked "RRD"

Tone ring has 39 teeth and is 3/8" thick

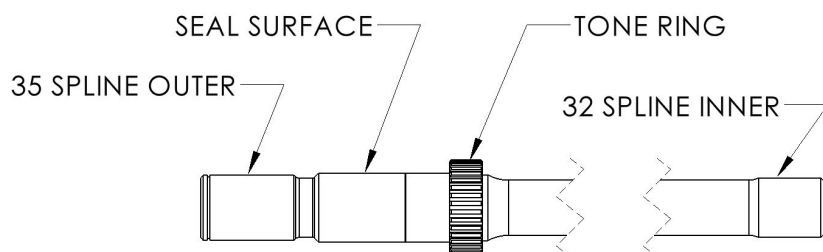


DRIVER'S SIDE BACKER



PASSENGER SIDE BACKER

BRONCO REAR PORTAL & SHAFT IDENTIFICATION



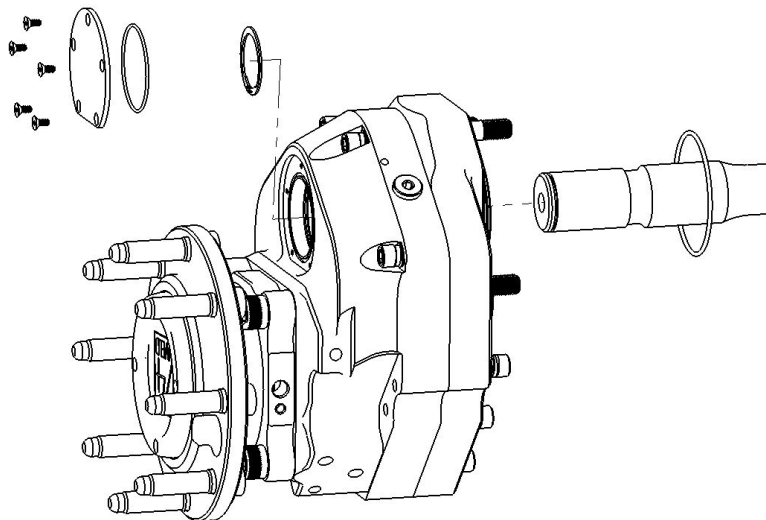
The passenger side shaft will be longer
(37 5/8") and marked "BP"

The driver side shaft will be shorter (31
7/8") and marked "BD"

Tone ring has 36 teeth and is 3/4" thick

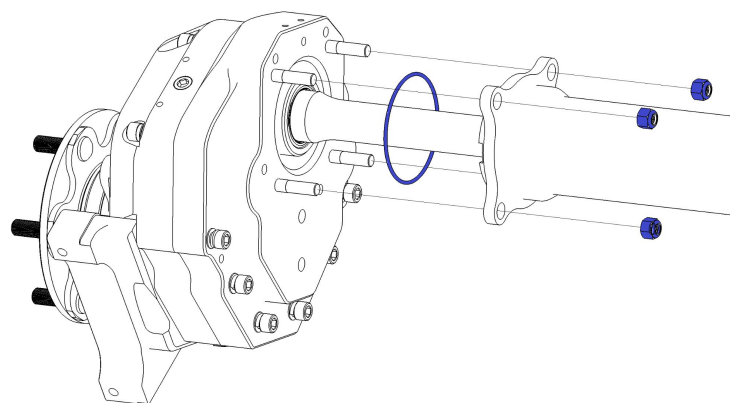
INSTALLATION - REAR PORTAL

- ❑ If brake brackets have not yet been installed, see brake bracket install procedure earlier in this manual.
- ❑ Install wheel studs included in stud kit into backer. Apply red loctite 263 to short-side thread. Torque to 35 ft-lbs.
- ❑ Remove window from rear box. Make sure not to lose o-ring.
- ❑ Locate axle shaft. Grease shaft splines and seal surface. Insert shaft into portal box and retain with snap ring RR-002 from install kit.
- ❑ Re-install window o-ring and window.



- ❑ Grease o-ring 151 from install kit and install on the lip of the axle housing. Slide shaft and portal box assembly into housing and secure with nylocks supplied in install kit, NT-009.

Torque to 70 ft-lbs.

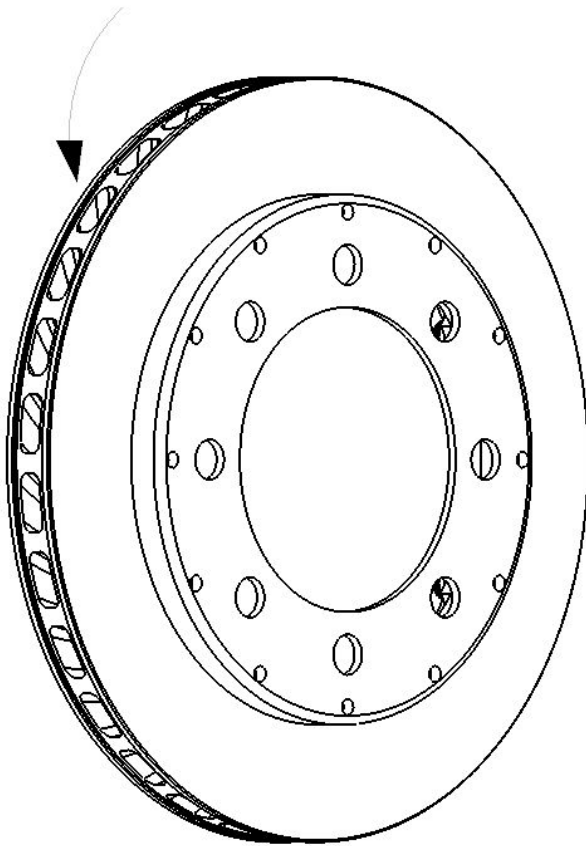


- ❑ Mock up rear brake rotor and caliper. As the rear caliper will need to be removed for brake bleeding, it is easier to save these nuts for final install.

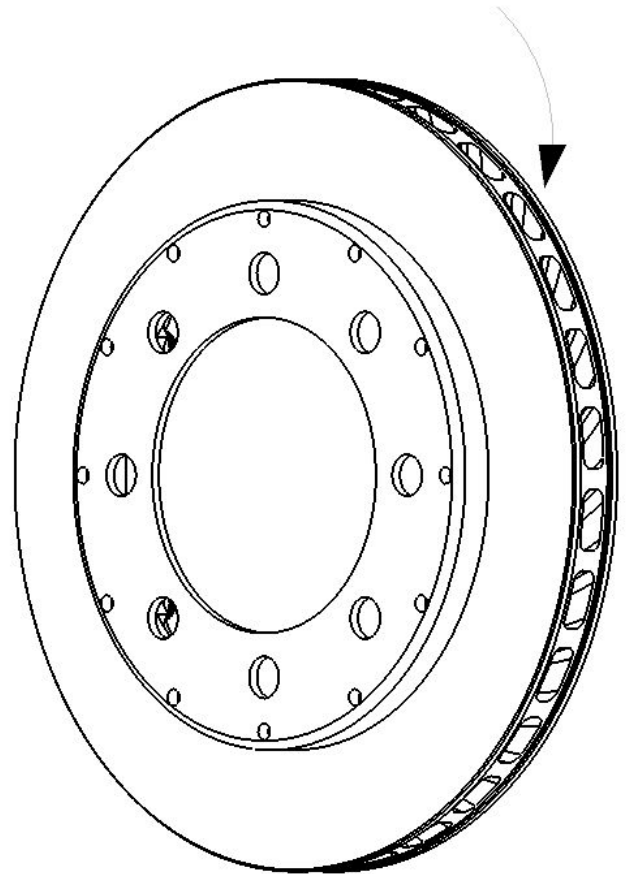
INSTALLATION - REAR PORTAL

The rear rotors in this kit are directional. Look at vent spiral direction to determine which side rotor you are looking at.

Driver Side Vent Spiral
Direction

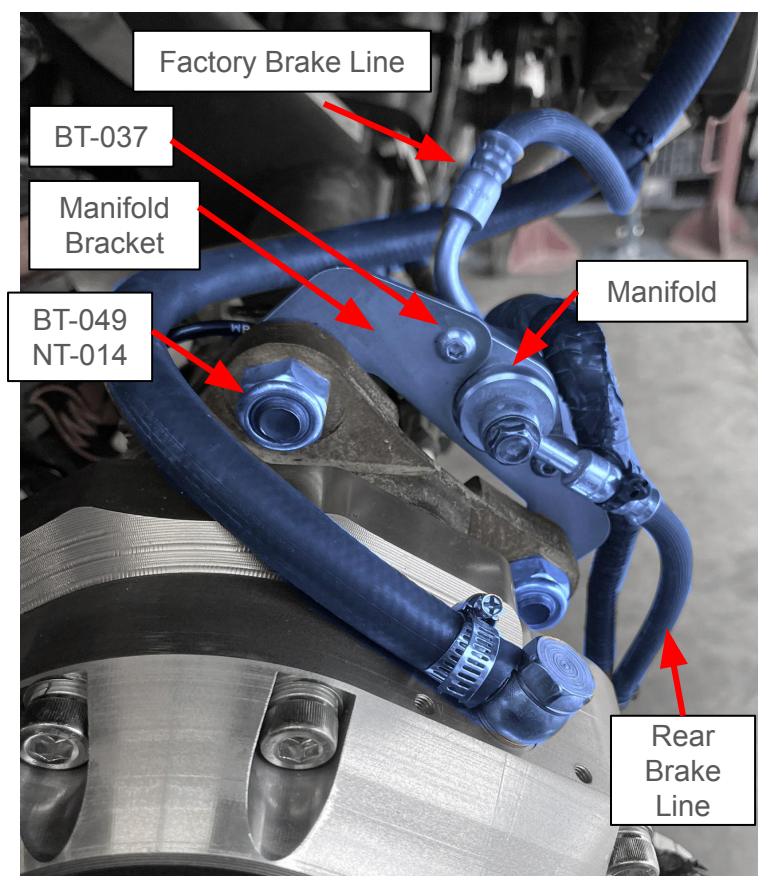


Passenger Side Vent
Spiral Direction



INSTALLATION - REAR PORTAL

- ❑ Install manifold and manifold bracket from rear brake kit onto the axle housing brake mount as-shown. The manifold will be bolted to the bracket with provided M6 button head screws (BT-037) from install kit. The bracket will be bolted to the axle with provided M14 hex bolt and nut (BT-049 & NT-014)
- ❑ Use provided banjo bolts and crush washers to fasten factory brake line to the inside port on the manifold (96-120 in-lbs).
- ❑ Locate rear brake line and fasten it to the outside port of the manifold using provided banjo bolts and crush washers. Do not torque yet.

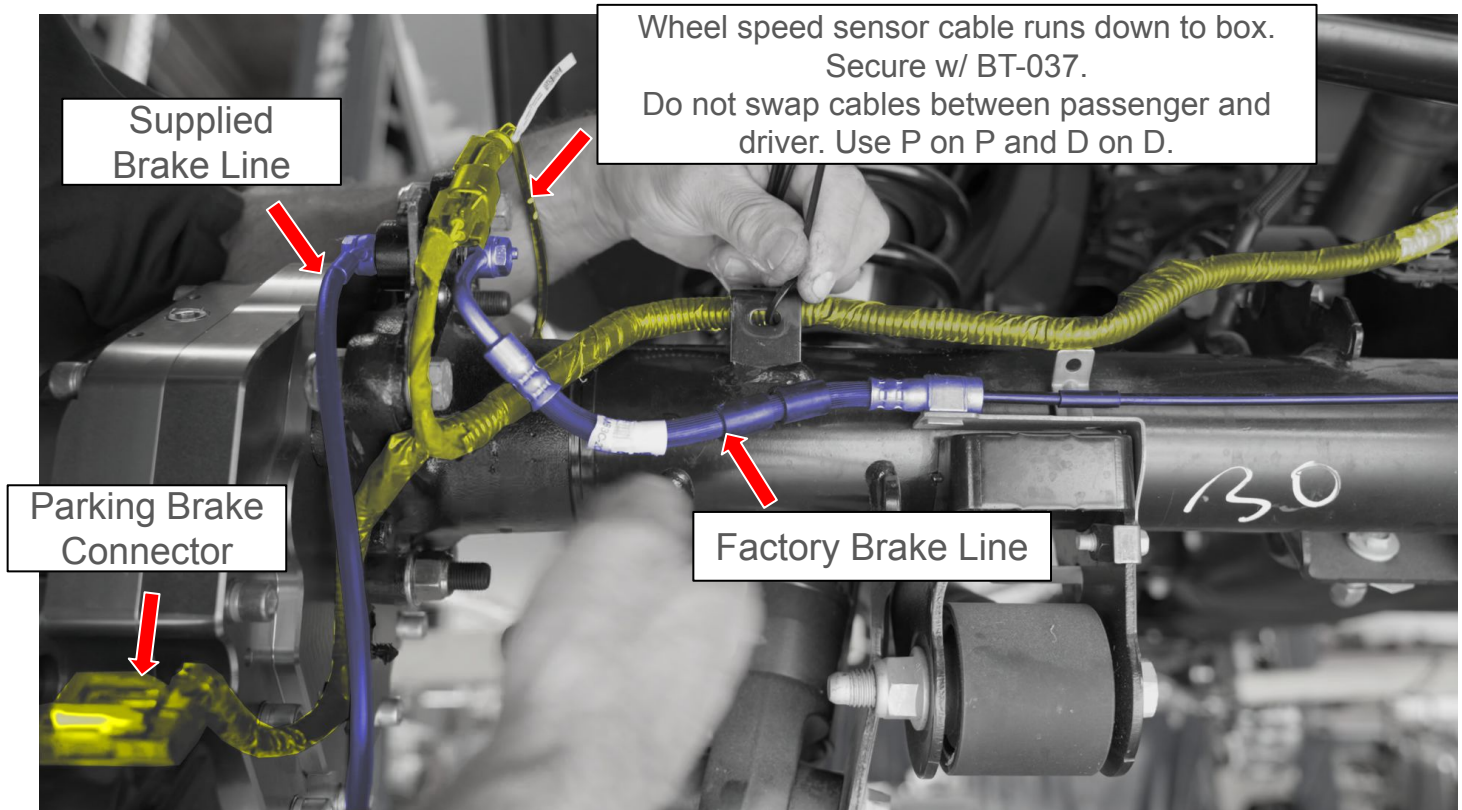


- Locate factory rear caliper banjo bolt and new crush washers from rear brake kit. Install rear brake line onto rear caliper. Once the brake line is in a good position, torque the rear brake line banjo bolts at the caliper and the manifold (96-120 in-lbs).
- **RANGER RAPTOR ONLY** Cut the factory electronic parking brake harness and use the wire and crimps provided with the install kit to extend the EPB cable to the length required. Be sure to maintain polarity i.e. don't cross the wires. Cover the wires with the provided wire loom split tubing and retain with electrical tape.



INSTALLATION - REAR PORTAL

ROUTING - Bronco Shown



INSTALLATION - CATCH CANS

- ❑ The install kit includes two catch can kits which will each include the following items.



- ❑ Remove handle from catch can using a 5/32" allen wrench. Use supplied hardware to fasten handle to supplied mounting bracket (front or rear) then reattach handle to catch can.



- ❑ Wrap teflon tape on threads of the medium hose barb and attach it to the top of the catch can. Then use a hose clamp to attach the filter to the medium hose barb.

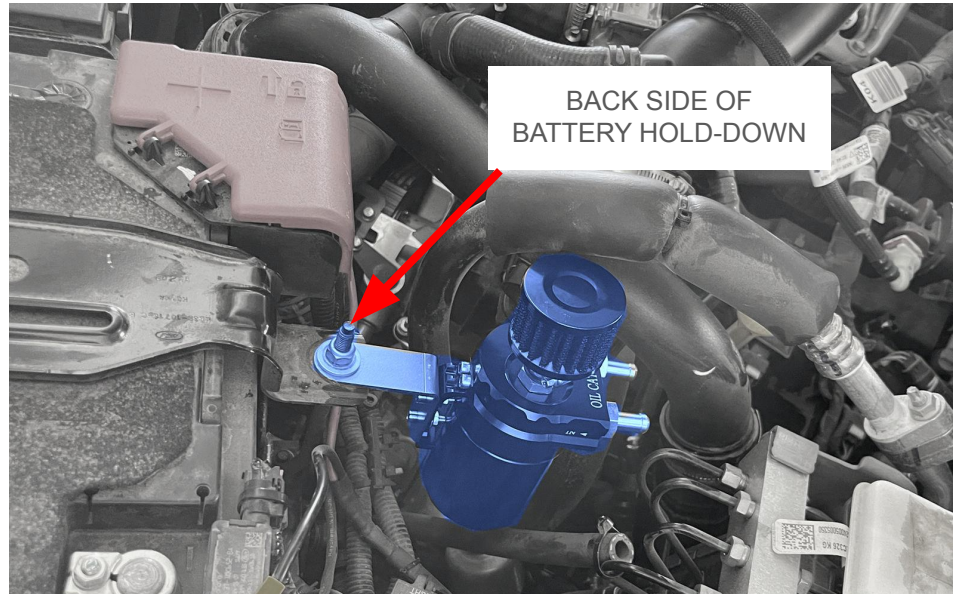
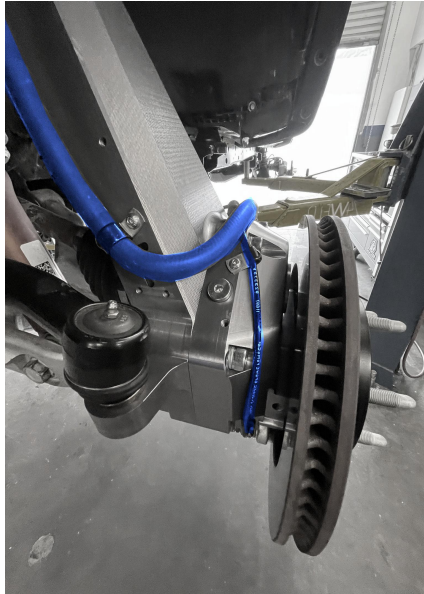


- ❑ Wrap the threads of the small hose barbs in teflon tape and then thread the small hose barbs into the forward facing ports of the catch can. Make sure the dipstick is installed in the catch can.



- ❑ The bottom of the can is detachable. Drop steel wool in.

INSTALLATION - CATCH CANS



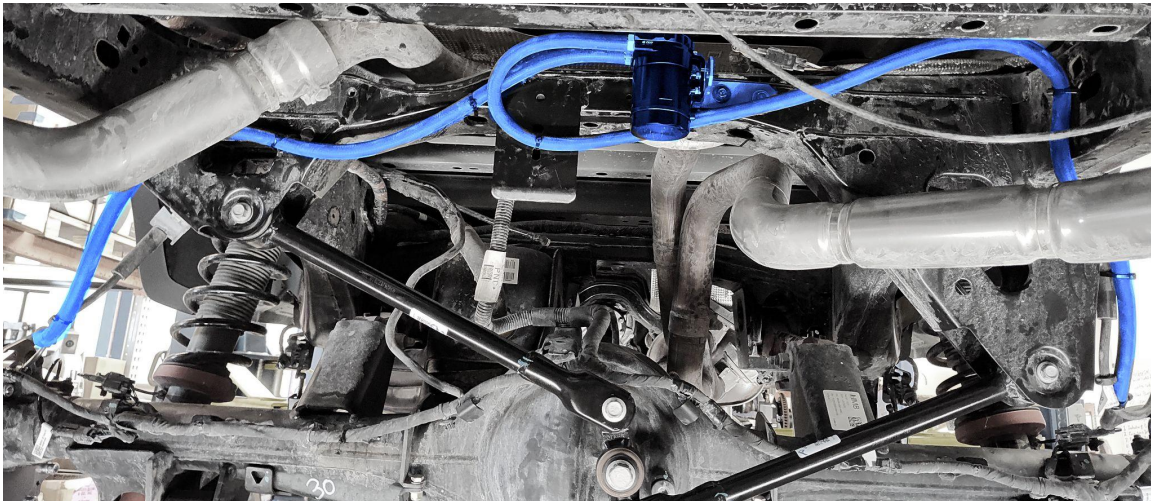
- Install catch can assembly and front catch can bracket inside of engine bay as-shown. There is a stud and nut that secure the battery hold-down which can be used to mount catch can.
- Run vent line (supplied) from portals up to the catch can. The lines can be tied off to the upper control arm and ingress into the engine bay through the inner fender well. Avoid hot areas/components and prevent line from kinking. It is important to have free air flow throughout the line to relieve pressure and protect the seals within the portal box.



INSTALLATION - CATCH CANS

RANGER RAPTOR

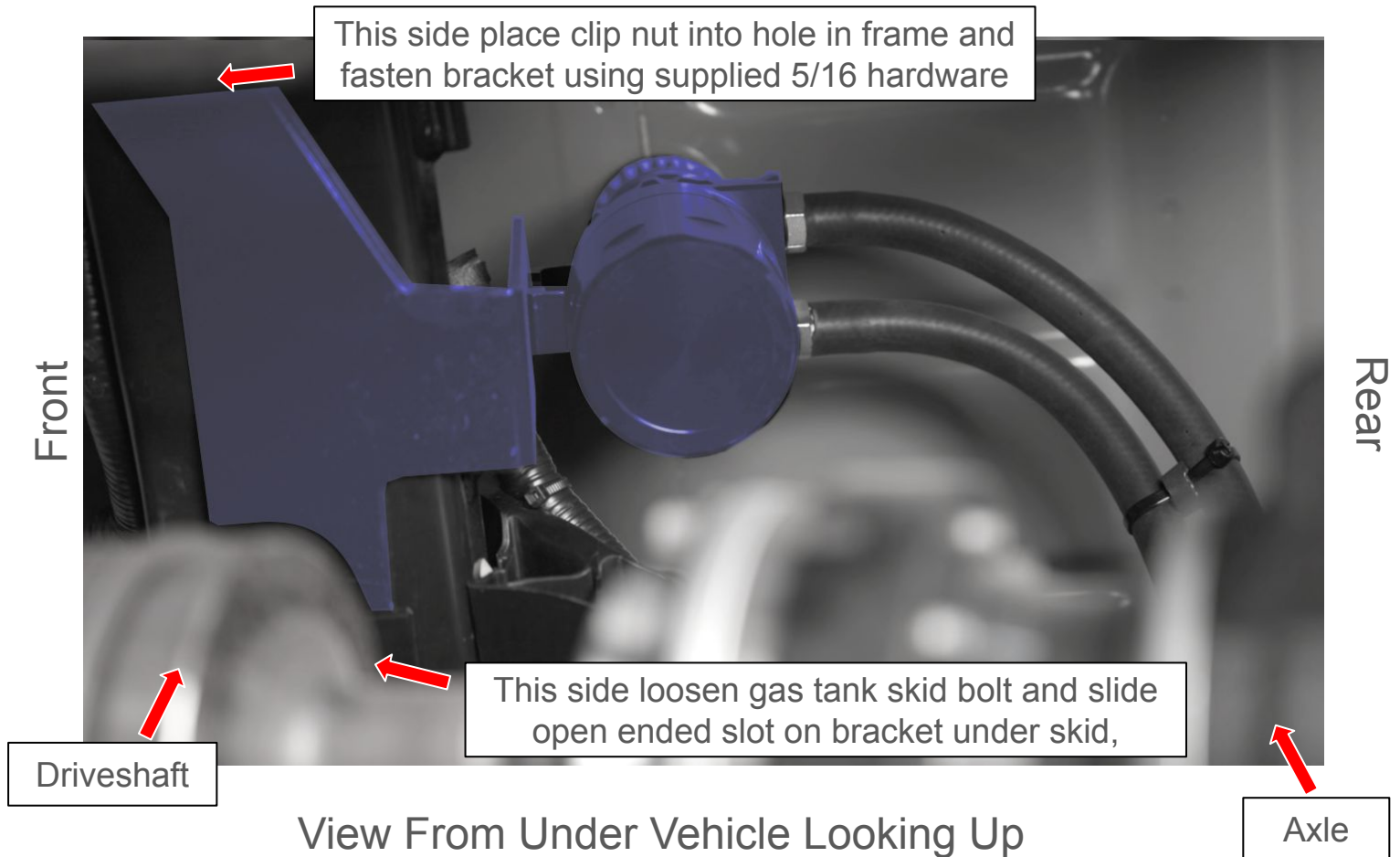
- Connect breather hose to barbed fitting on top of the portal box.
- Locate the rear catch can bracket (item 18, install kit) and fasten it to the frame using the M6 flanged head screws (BT-048) M6 Flanged Nut (NT-011) and M6 Fender Washer (WS-016). There are two holes in the frame that can be used, one is threaded, the other is thru.
- Fasten catch can to bracket and route vent lines to catch can.



INSTALLATION - CATCH CANS

BRONCO

- Connect breather hose to barbed fitting on top of the portal box.
- Install rear catch can assembly to rear catch can bracket and mount above the rear driveshaft as shown using supplied 5/16 clip nut, 5/16 screw and the factory gas tank bolt.
- Fasten catch can to bracket and route vent lines to catch can.



BRAKE BLEED PROCEDURE (1 OF 2)

Due to the location of the brake caliper on the portal and the sensitivity of the braking system on modern vehicles, we recommend the following brake bleed procedure. It is important to bleed the brakes with the caliper rotated upward to mimic the factory position. This is to position the bleed screw in the orientation in which it was designed to allow air to escape from the caliper.

We will first gravity bleed the system, then we will pedal bleed the system with the vehicle off before bleeding with the vehicle on.

Some Ford vehicles have a feature called "Brake Maintenance Mode". We have had success bleeding brakes without using this mode, but will provide instructions on how to engage and disengage it at the end of this procedure.

Procedure:

- Make sure the battery is disconnected.
- Remove brake line clamps from soft lines
- During each phase, brakes will be bled one by one. Furthest from the master cylinder to closest. Rear Passenger, Rear Driver, Front Passenger, Front Driver.
- Position calipers as shown below. 74Weld produces and sells a brake bleed positioning tool, or you can use brake rotors as shown to position the calipers.



**74Weld
Positioning Tool**



W/O Tool Front
Flip Rotor Inside Out
Place caliper on Rotor
Rotate Upward to
Factory Position



W/O Tool Rear
Flip Supplied Rear Rotor Inside Out
Clamp Factory Rotor to Supplied Rotor
Place caliper on Rotor
Rotate Upward to Factory Position

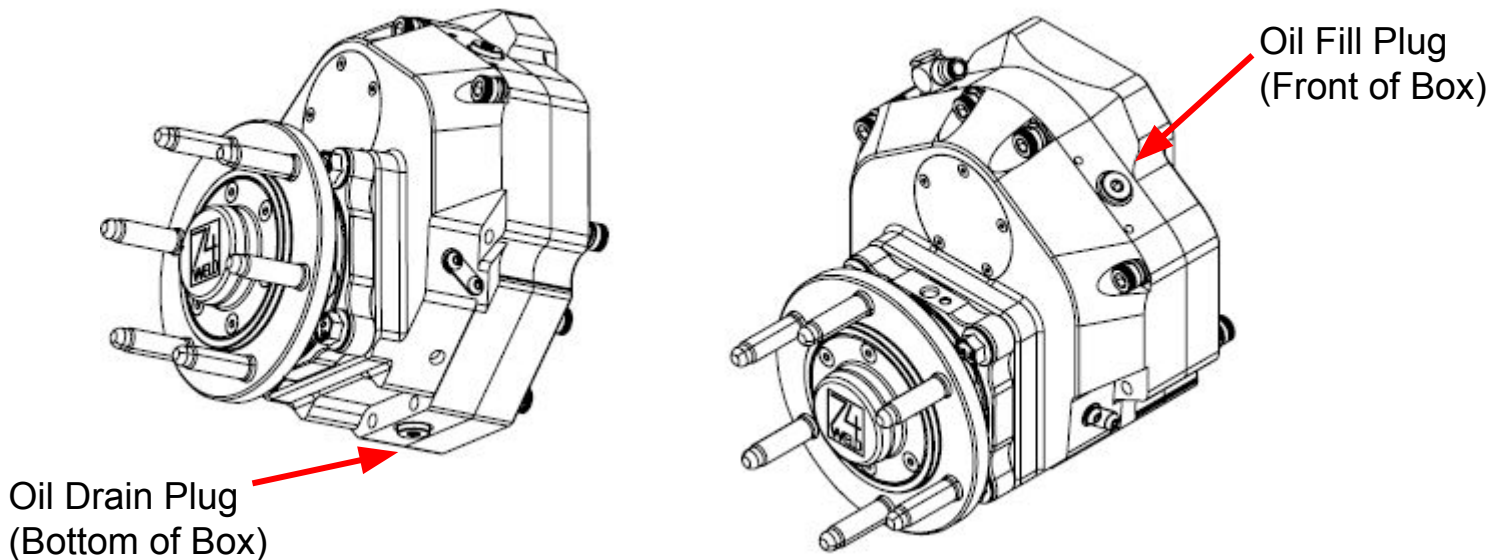
BRAKE BLEED PROCEDURE (2 OF 2)

- ❑ Prior to bleeding, top off brake fluid reservoir. Watch and top off reservoir periodically. **DO NOT LET MASTER CYLINDER RUN DRY.**
- ❑ First, gravity bleed the system. Open the lid on the brake fluid reservoir and leave it open during gravity bleeding. Crack the bleed screw open and let fluid and air bubbles flow out. Tap the bleed screw and caliper with a wrench to release stubborn bubbles. Once air bubbles are no longer observed, close bleed screw.
- ❑ Again, check the brake fluid reservoir, top off and do not let the master cylinder run dry.
- ❑ Next, pedal bleed the system. **CLOSE THE BRAKE FLUID RESERVOIR LID.** Have someone pump the pedal several times to build pressure and then hold the pedal down. Open and close the bleed screw, watch for air bubbles escaping. Repeat until no bubbles are observed. Bleed brake calipers one by one, moving from farthest to closest to the master cylinder.
- ❑ Check the reservoir, top off and do not let the master cylinder run dry.
- ❑ Reconnect the battery, turn on the vehicle and repeat the pedal bleed procedure.
- ❑ Once bleeding is complete, install rotors into their proper orientations, reinstall the front caliper to the caliper bracket and reinstall rear caliper bracket onto portal box.

FIRST OIL FILL AND BREAK IN

- ❑ Remove fill plug from the top of each portal box.
- ❑ Add 300 ml (10 oz.) to each portal. Your kit includes two quarts of Maxima synthetic racing oil. For the first fill, we recommend using a budget brand 75W-90 GL-5 gear oil as this fluid will be drained and discarded after a short period of time.
- ❑ Re-install fill plug to the top of each portal box.
- ❑ Install wheels and tires onto the vehicle.
Torque lug nuts to 120 ft-lbs.
- ❑ Drive 200-300 miles then perform the first oil change using the provided Maxima synthetic oil. See next sheet for oil change procedure.
- ❑ During this first oil change, inspect your portals and suspension.
 - ❑ Check torque seal (blue marking on fasteners) on portal box fasteners assembled by 74Weld. Re-torque as-required.
 - ❑ Check torque and/or paint marks on all portal and suspension fasteners involved in the installation. Re-torque as-required.
 - ❑ *LOCTITE EXCEPTION: do not re-torque fasteners where loctite has been applied.*
 - ❑ Check brake lines, breather hoses and ABS cables for chafing and abrasion. Adjust routing as-required.
 - ❑ Visually inspect all suspension and portal components for signs of contact or impact with other components. Adjust suspension as-required.
 - ❑ Visually inspect portals and undercarriage for signs of oil spray.
 - ❑ Check rear differential oil level. Top off as-required.

REGULAR MAINTENANCE - OIL CHANGE PROCEDURE



- ☐ Make sure vehicle is parked, on its own weight and on level ground.
- ☐ Remove fill plug and drain plug. Allow oil to completely drain from box.
- ☐ Re-install drain plug.
- ☐ Pour 300ml (10 oz) of 75W-90 GL5 gear oil (Maxima Pro Gear Recommended) into the box through the oil fill plug.
- ☐ Re-install oil fill plug

OIL CHANGE INTERVAL: 5,000 miles

- ☐ During the oil change, we recommend you inspect your portals and suspension.
 - ☐ Check torque seal (blue marking on fasteners) on portal box fasteners assembled by 74Weld. Re-torque as-required.
 - ☐ Check torque on all portal and suspension fasteners involved in the installation. Re-torque as-required.
 - ☐ Check brake lines, breather hoses and ABS cables for chafing and abrasion. Adjust routing as-required.
 - ☐ Visually inspect all suspension and portal components for signs of contact or impact with other components. Adjust suspension as-required.
 - ☐ Visually inspect portals and undercarriage for signs of oil spray.
 - ☐ Check rear differential oil level.

TROUBLESHOOTING - CHECK ENGINE LIGHT (1 OF 2)

Improper installation of components and damage to components during installation activities can trigger codes and/or cause your vehicle's check engine light to turn on. There are two systems that can be affected by portal installation.

1. Anti-lock braking system - most common
2. General functionality of brakes due to bleeding during installation

ANTI-LOCK BRAKING SYSTEM (ABS)

Should you receive an ABS code we recommend the following actions to remedy.

- ☐ Using a scan tool, determine what code has been triggered.
- ☐ For general (non-corner specific) codes **ALSO GEAR RATIO CODES:**
 - ☐ If a tuner is available for your vehicle that can adjust tire size and gear ratio values, purchase one and program your vehicle accordingly.
 - ☐ To determine the gear ratio to enter, multiply your ring and pinion ratio by 1.22. Example: $4.10 \times 1.22 = 5.00$
 - ☐ For Jeep we recommend the Z-automotive Tazer and for Ford we recommend the Ford Performance ProCal. We are not aware of a tuner for Toyota, however, we have not seen a case where a tuner was necessary.
 - ☐ Disconnect your vehicle's negative battery terminal, wait 15 minutes and reconnect. If code/CEL has disappeared, go for a short drive that includes left and right hand turns and where your speed will reach 65 mph.
- ☐ If a specific corner has been flagged:
 - ☐ Check that wheel speed sensor connector is fully engaged. Disconnect, clean terminals and reconnect as-required.
 - ☐ Check wheel speed sensor wire for damage including chafing, crimping, crushing etc. To be completely sure wire is OK for use, use a multimeter to ensure there is not a short.
 - ☐ Clean the magnetic side of the wheel speed sensor system. Lift the corner and support the axle with a jack stand. Pull wheel speed sensor from the portal.
 - ☐ If the portal uses a mechanical tone ring (Jeep F/R, Ford Rear), clean the wheel speed sensor head of metal debris that may have collected.
 - ☐ If the portal uses a magnetic encoder (Toyota F/R, Ford F), insert a Q-Tip through the wheel speed sensor hole onto the encoder and rotate the wheel to clean the encoder face of metal debris. To more thoroughly clean the encoder face, remove the portal box from the backer/knuckle/upright. See next sheet for details.

Continued on next sheet

TROUBLESHOOTING - CHECK ENGINE LIGHT (2 OF 2)

- ☐ Replace wheel speed sensor as required.
- ☐ Inspect the tone ring or magnetic encoder for damage. To do so, remove the portal box from the backer/knuckle/upright. (not applicable to Jeep front. Jeep front, Contact 74Weld).
 - ☐ Remove the brake caliper from the portal box.
 - ☐ Remove wheel speed sensor from the portal box.
 - ☐ Remove the vent hose from the portal box.
 - ☐ Remove any additional cable mgmt from the portal box.
 - ☐ Remove the ten (10) screws holding the case halves together.
 - ☐ Remove the portal box assembly from the backer/knuckle/upright. If the portal box assembly is stubborn you can tap it with a rubber mallet, use a rotor as a slide hammer, or use the three set screws on the backer/knuckle/upright as jackscrews to wedge the case halves apart.
- ☐ **Tone Rings**
 - ☐ Inspect tone ring to ensure there are no missing teeth
 - ☐ Make sure tone ring is pressed onto the lower gear and is not free to spin independent from the gear or move axially on the gear.
 - ☐ If damage is observed, contact 74Weld for replacement.
- ☐ **Magnetic Encoder**
 - ☐ Inspect magnetic encoder for damage
 - ☐ Encoder face should be flat with no dents, divots or waves.
 - ☐ Encoder face should be flush with the spindle nut or lower gear.
 - ☐ If damage is observed, contact 74Weld for replacement.

GENERAL FUNCTIONALITY OF BRAKES

During the portal installation process, brake lines will be removed and the brake system will need to be bled. Improper bleeding of brakes can result in soft pedal feel and, in newer vehicles, can cause check engine lights and codes. Should you experience either of these problems.

- ☐ Re-bleed brakes per the procedure outlined in this manual. Ensure calipers are in the positions shown as improper caliper position can result in trapped air bubbles.
- ☐ Check brake fluid reservoir and ensure that the master cylinder has not run dry. If the brake fluid reservoir has been depleted, take your vehicle to a dealership and have them perform a full pressurized bleed of the system per the manufacturer's service manual.

TROUBLESHOOTING - OIL LEAKS (1 OF 7)

Damaged seals and other components can lead to oil leaks. These leaks are important to take care of to ensure the portal retains oil and keeps contaminants out of the gearbox. Oil leaks can also be a warning sign of a more serious problem occurring within your portals.

By the time an oil leak is noticed, chances are that oil has been flung by a rotating component or blown by passing air which can make it difficult to diagnose the source of the leak. **For this reason, unless it is extremely obvious, we recommend cleaning the portal then going for a 10-15 mile drive to re-establish a clear leak path.** For some types of leaks, it may take letting the vehicle sit overnight after a drive for the path to rebuild.

NOTE: After installation and maintenance, there is the possibility of false leak indicators.

- One example is the case-half seam where the box meets the backer/knuckle/upright. This interface is sealed by a greased o-ring. If grease is left on a mating surface during assembly it will be forced out of the portal, then collect dirt making it appear that the mating surface is leaking.
- Another example is residual oil inadvertently spilled on the portal after a fill or oil change.

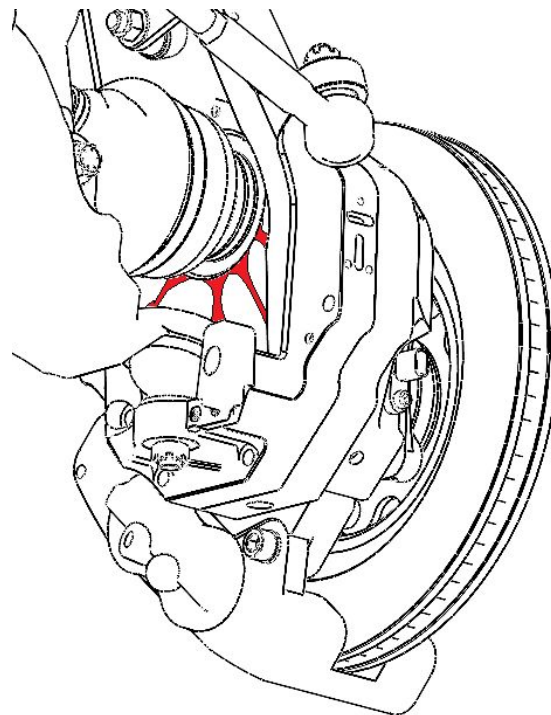
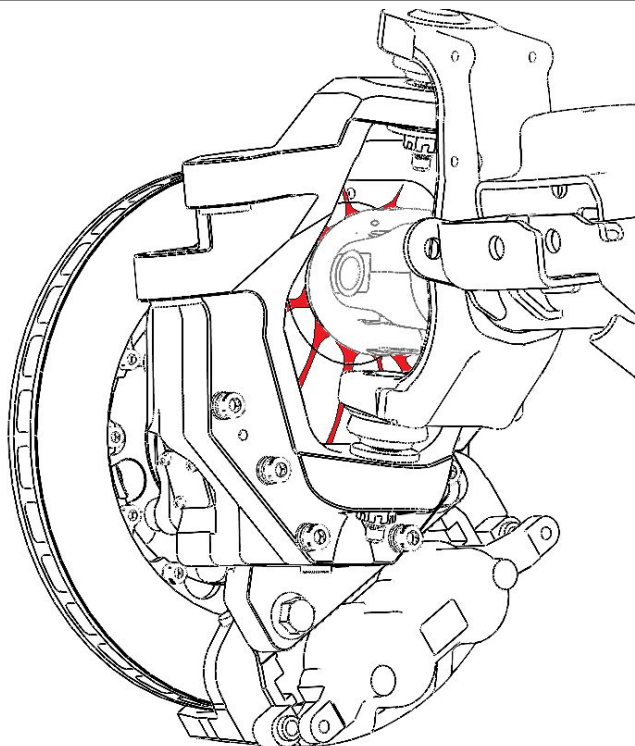
If a “leak” is cleaned and then does not return during subsequent driving, there is a possibility that one or more of these false indicators was observed.

SEE FOLLOWING SHEETS FOR INFORMATION ON DEALING WITH SPECIFIC LEAK TYPES

SEE REPLACEMENT PARTS LIST IN THIS MANUAL FOR PART NUMBERS

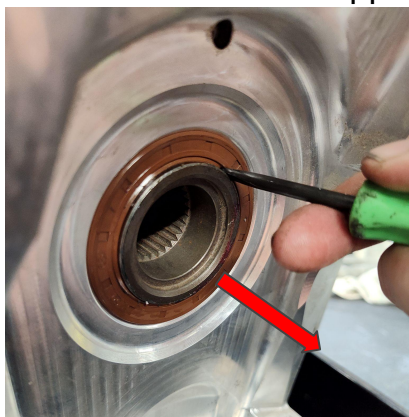
AFTER LEAK REPAIR WORK IS PERFORMED, ENSURE THE PORTAL HAS THE PROPER OIL LEVEL

TROUBLESHOOTING - OIL LEAKS (2 OF 7)

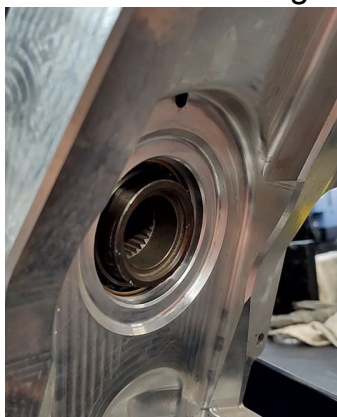


FRONT UPPER GEAR SEAL LEAK

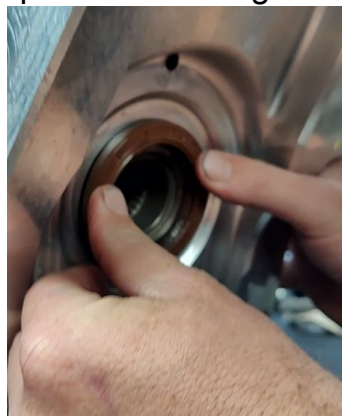
- Check vent lines and catch cans to ensure they are not kinked and allow for air to flow freely in and out of the portal. Obstructed airflow can cause pressure build up and blow out this seal. In many cases, once the obstruction is removed the seal will resume its intended function.
- If seal has been damaged it will need to be replaced. Many kits include a V-ring seal as a second layer of protection. We recommend replacing these seals together. Install seal in the same orientation as the seal you remove.
 - To access the seal for replacement on solid axle vehicles, remove the box from the knuckle then remove the knuckle from the axle. On IFS vehicles, remove the tie rod and upper control arm to swing the portal out enough to remove the stub shaft.



PRY OUT



CLEAN



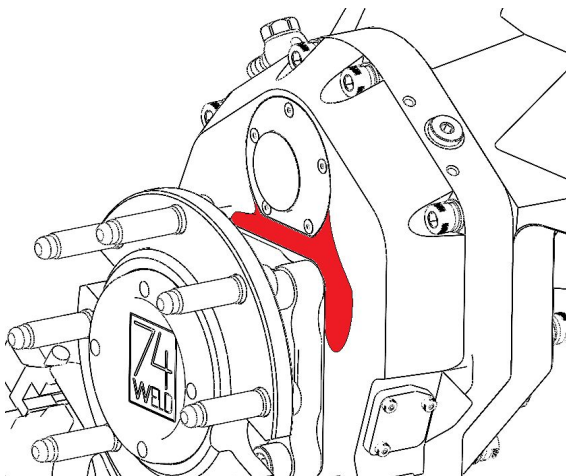
GREASE & SEAT



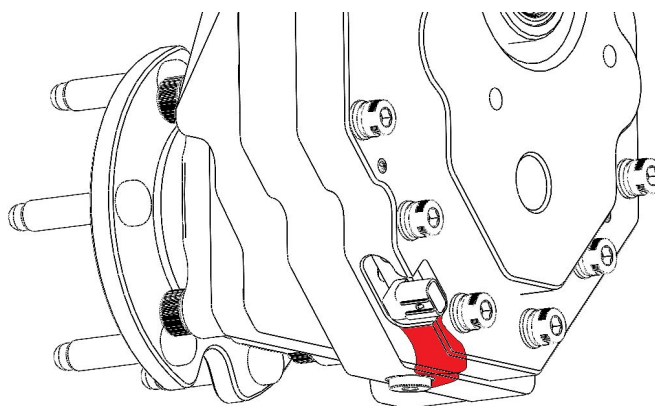
TAP IN

- The other leak path is through the upper gear splines, past the stub shaft o-ring. Check that the stub shaft nut (behind portal window) is tight. Replace o-ring on stub shaft as required.

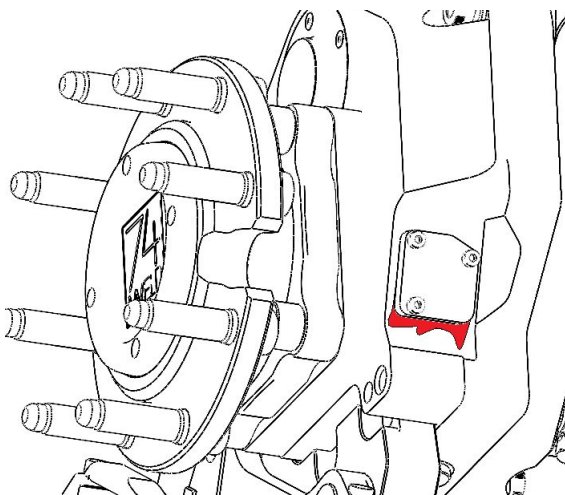
TROUBLESHOOTING - OIL LEAKS (3 OF 7)



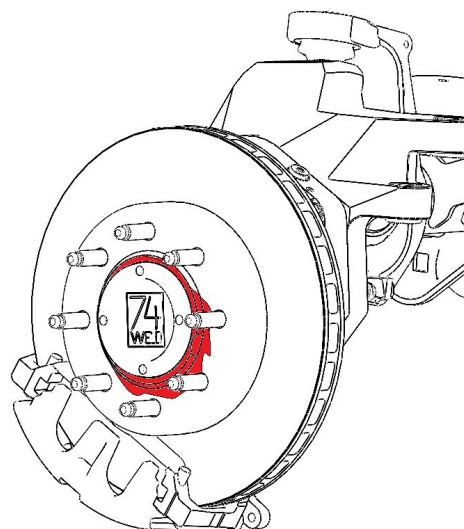
WINDOW



WHEEL SPEED SENSOR



BOX WSS FEATURE



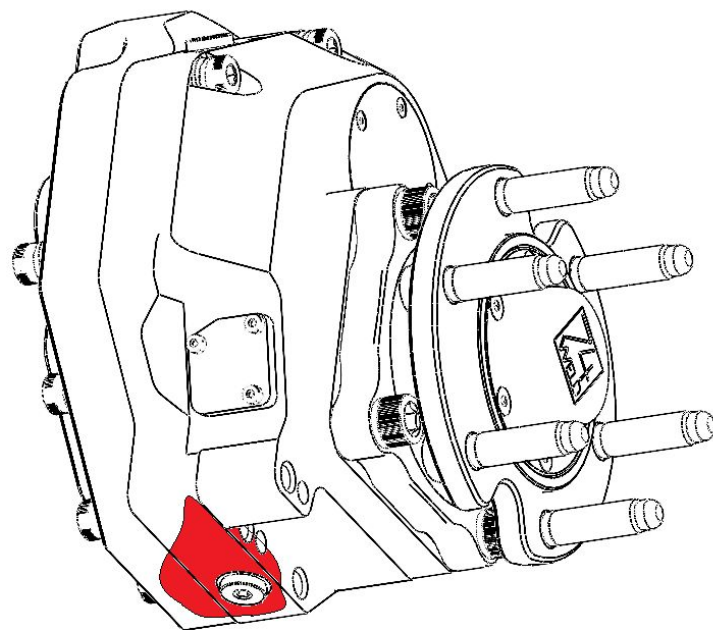
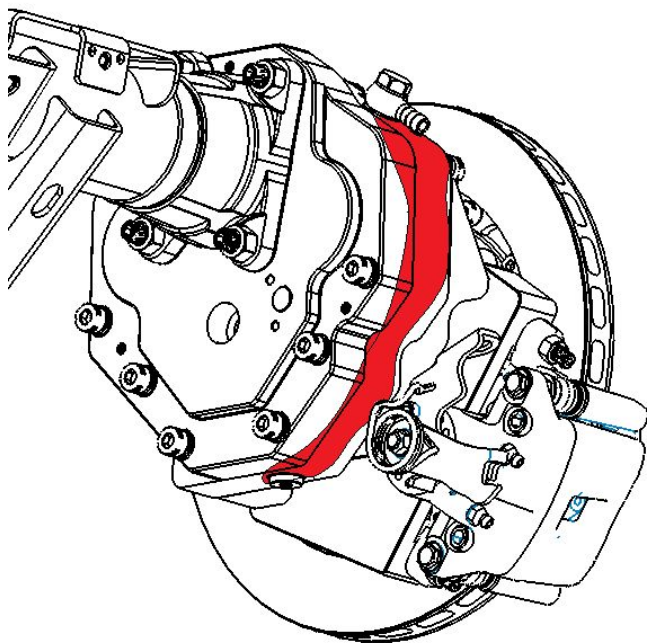
HUBCAP

GENERAL O-RING LEAKS

The window, hubcap, and wheel speed sensor interfaces on boxes, backers and knuckles are all sealed with o-rings. In the event that one of these interfaces leaks, it is recommended to replace the o-ring.

- Face seal o-ring grooves (Hubcap, Window, Box WSS feature)
 - Clean o-ring groove and mating part. Both parts should be free of nicks, dings and burrs that could create a leak path.
 - Grease and install new o-ring into groove.
 - Reassemble and torque in star pattern.
- Radial o-ring grooves (Wheel Speed Sensor)
 - Same steps as above
 - If necessary, use sandpaper to smooth out entry to wheel speed sensor bore to ensure o-ring is not cut on install.

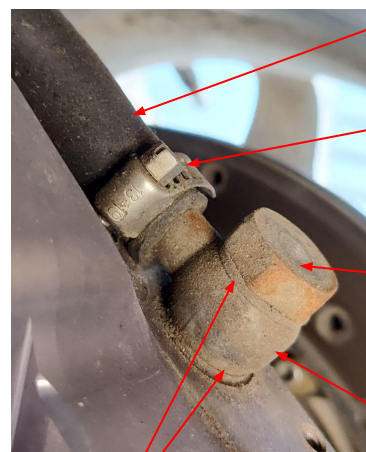
TROUBLESHOOTING - OIL LEAKS (4 OF 7)



BREATHER AND PLUG LEAKS

BREATHER FITTING

- Ensure breather hose is secured to banjo fitting with a hose clamp.
- Ensure crush washers are present on either side of the banjo fitting.
- Ensure Banjo bolt is torqued and not loose.
- Crush washers are single use. Replace as-required.
- Over-torquing the banjo bolt can cause the bolt to twist. Twisted bolts should be replaced. Do not over torque.



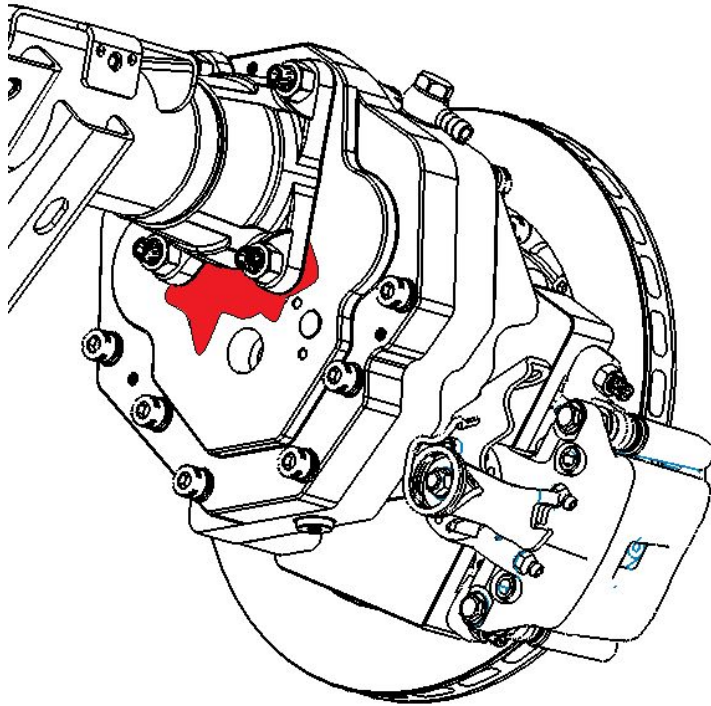
Hose

Hose
clampBanjo
boltBanjo
FittingCrush
Washers

DRAIN AND FILL PLUGS

- Ensure drain or fill plug is fully seated.
- Ensure o-ring is present on plug and not damaged.
- Replace plugs as required. The drain plug has a magnet on it, the fill does not. **DO NOT PUT A PLUG WITH A MAGNET IN THE FILL POSITION.**

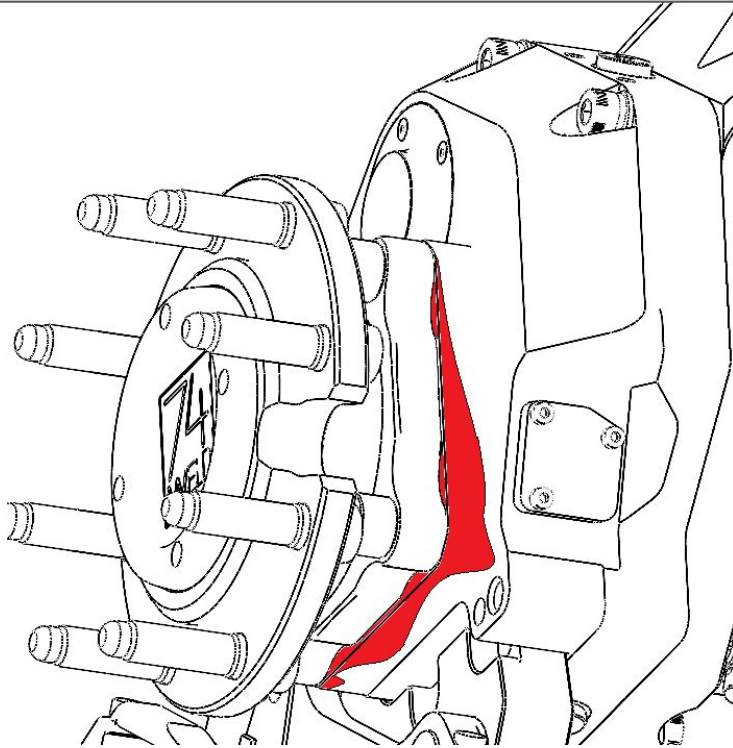
TROUBLESHOOTING - OIL LEAKS (5 OF 7)



LEAK AT REAR AXLE HOUSING FLANGE

- Check torque on the portal to axle housing nuts.
 - If fasteners were loose, determine if the nut is loose on the stud or the stud is loose in the backer.
 - In the event that the nuts were loose on the studs, replace nylocs and retorque.
 - If the studs are loose in the backer
 - Remove the portal from the axle housing
 - Remove the loose studs
 - Clean threads on studs and backer holes
 - Apply red loctite 263 to threads on studs and in backer holes
 - Re-install stud into backer and allow 24 hours for loctite to cure.
 - Reinstall portal to axle housing per instructions in this manual.
 - Replace o-ring between backer and axle housing as-required.
 - Remove portal from axle housing.
 - Grease and install new o-ring.
 - Reinstall portal to axle housing per instructions in this manual.

TROUBLESHOOTING - OIL LEAKS (6 OF 7)

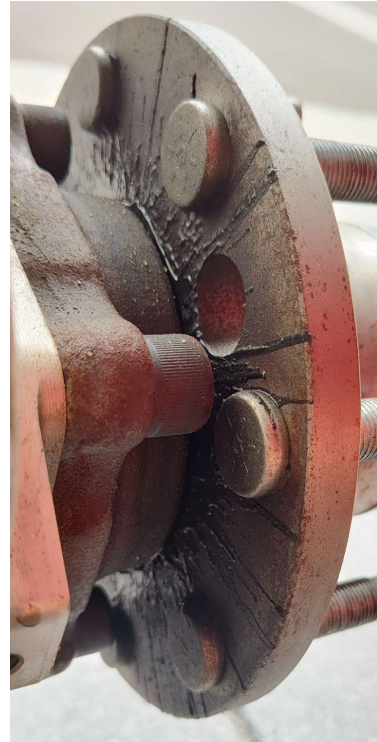
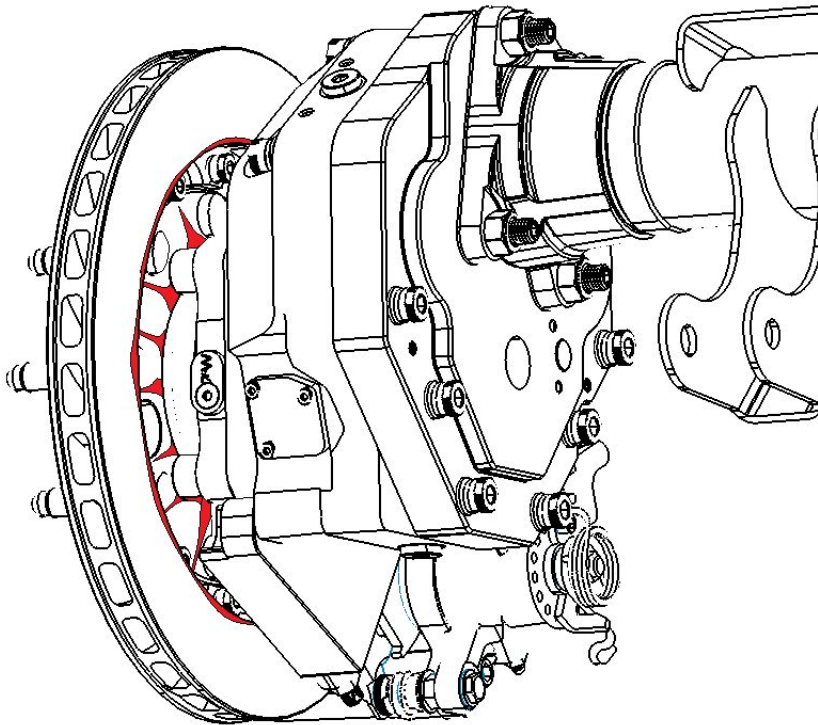


LEAK BETWEEN UNIT BEARING AND BOX

In order for this leak to happen, oil needs to pass through a radial seal and two o-rings. It can be caused by damage to all three seals during installation, or loosening of the unit bearing bolts. **Even if the cause is loose unit bearing bolts, the following procedure is recommended in order to ensure the longevity of your unit bearing hub.**

- Remove the brake caliper from the portal box.
- Remove wheel speed sensor from the portal box.
- Remove the vent hose from the portal box.
- Remove any additional cable mgmt from the portal box.
- Remove the ten (10) screws holding the case halves together.
- Remove the portal box assembly from the backer/knuckle/upright. If the portal box assembly is stubborn you can tap it with a rubber mallet, use a rotor as a slidehammer, or use the three set screws on the backer/knuckle/upright as jackscrews to wedge the case halves apart.
- Inside of the lower gear, there is a snap ring retaining the lower stub shaft. Remove this snap ring and pull the lower gear out of the box.
- Remove the four unit bearing bolts and pull the unit bearing off of the box.
- Clean the internals of the portal box.
- **REPLACE THE RADIAL SHAFT SEAL AND TWO O-RINGS. GREASE SEAL LIP AND O RINGS.**
- Reassemble portal in the reverse order of disassembly. Clean hardware and threaded holes. See Torque specs and loctite requirements in this manual.

TROUBLESHOOTING - OIL LEAKS (7 OF 7)



LEAK BEHIND UNIT BEARING WHEEL FLANGE

In order for this leak to happen, oil needs to pass through a radial seal in the portal box and both the inner and outer seal of the unit bearing hub. The unit bearing hub is non-serviceable and will require replacement along with the seal in the portal box.

- Remove the brake caliper from the portal box.
- Remove wheel speed sensor from the portal box.
- Remove the vent hose from the portal box.
- Remove any additional cable mgmt from the portal box.
- Remove the ten (10) screws holding the case halves together.
- Remove the portal box assembly from the backer/knuckle/upright. If the portal box assembly is stubborn you can tap it with a rubber mallet, use a rotor as a slidehammer, or use the three set screws on the backer/knuckle/upright as jackscrews to wedge the case halves apart.
- Inside of the lower gear, there is a snap ring retaining the lower stub shaft. Remove this snap ring and pull the lower gear out of the box.
- Remove the four unit bearing bolts and pull the unit bearing off of the box.
- Clean the internals of the portal box.
- **REPLACE THE RADIAL SHAFT SEAL GREASE SEAL LIP.**
- Remove the hubcap and lower stub shaft from the old unit bearing and transfer to the new unit bearing.
- Grease and install new o-rings onto new unit bearing.
- Reassemble portal in the reverse order of disassembly. Clean hardware and threaded holes. See Torque specs and loctite requirements in this manual.

REPLACEMENT PARTS (1 OF 2)

Refer to bills of materials provided earlier in this manual for part numbers supplied in kits. The table below and diagram to follow detail part numbers used in portal assemblies.

REPLACEMENT PARTS LIST - 74WELD 1.22 PORTALS

ITEM	USED	74WELD PN	MCMaster PN	DESCRIPTION
1	ALL	BT-072	91502A263	SCREW, SHCS, M14 X 2 X 40MM LG, 12.9 ALLOY STEEL, BLUE DYE ZINC PLATE
2	6 LUG	BT-035	91263A837	SCREW, 90 DEG FH, M6 X 1.0 X 12MM LG, ALLOY STEEL, ZINC PLATE
	8 LUG	BT-022	90128A944	SCREW, SHCS, #10-32 X .63 LG, ALLOY STEEL, ZINC PLATE
3	-	-	-	HUBCAP - CALL FOR REPLACEMENT
4	6 LUG	OR-145	9452K152	O RING, BUNA N, DASH 145
	8 LUG	OR-230	9452K69	O-RING, DASH 230, BUNA N
5	ALL	RR-002	90213A118	RETAINING RING, INV EXT, 1.500 OD
6	-	-	-	UNIT BEARING HUB - CALL FOR REPLACEMENT
7	ALL	BT-031	90128A291	SCREW, SKT HD CAP, M10 X 1.5, 50MM LG, ALLOY STEEL, ZINC PLATE
8	ALL	WS-014	98688A118	WASHER, FLAT, ZINC PLATED STEEL, ISO 7092
9	ALL	WS-011	93837A150	WASHER, HIGH COLLAR, 10.7 MM ID, 16 MM OD
10	ALL	BT-036	91263A827	SCREW, 90 DEG FH, M4 X 0.7 X 8MM LG, ALLOY STEEL, ZINC PLATE
11	-	-	-	WINDOW - CALL FOR REPLACEMENT
12	ALL	OR-035	9452K123	O-RING, DASH 035, BUNA N
13	ALL	PS-030	-	FILL PLUG, M14 X 1.5, ELASTOMERIC SEAL
14	-	-	-	PORTAL BOX - CALL FOR REPLACEMENT
15	ALL	PS-043	-	BANJO BOLT, M14 X 1.5, HEX HEAD
16	ALL	WS-008	97725A118	CRUSH WASHER, 19.9MM OD, 14.2MM OD, COPPER
17	ALL	PS-042	-	BANJO FITTING, 14MM BORE, BARBED FOR 10MM/3/8" HOSE
18	ALL	OR-047	9452K312	O RING, DASH 047, BUNA N
19	ALL	OR-156	9452K319	O RING, DASH 156, BUNA N
20	ALL	SEE DESCRIPTION		SKF 90X110X10 HMSA10 V
21	ALL	PS-030-M	-	FILL PLUG, M14 X 1.5, ELASTOMERIC SEAL, MAGNET
22	-	-	-	LOWER STUB SHAFT - CALL FOR REPLACEMENT
23	ALL	PS-041	98381A624	DOWEL, 3/8 DIA, 1.0 LG, ALLOY STEEL
24	ALL	NJ 206 ECP	-	CYLINDRICAL ROLLER, 62MM OD, 30MM ID, 16MM THK, POLYMER CAGE
25	ALL	NJ 1010 ECP	-	CYLINDRICAL ROLLER, 80MM OD, 50MM ID, 16MM THK, POLYMER CAGE
26	ALL	NA 4908	-	NEEDLE ROLLER, 62MM OD, 40MM ID, 22MM THK
27	-	-	-	GEAR SET - CALL FOR REPLACEMENT
28	ALL	RR-003	90442A117	RETAINING RING, 2.500" ID, INVERTED EXTERNAL
29	-	-	-	BACKER, UPRIGHT OR KNUCKLE - CALL FOR REPLACEMENT
30	FRONTS	SEE DESCRIPTION		SEAL-50X68X7 HMSA10 V
	REARS	SEE DESCRIPTION		SEAL-40X50X8 HMSA10 V
31	-	-	-	HOUSING SEAL (REAR) OR V RING SEAL (FRONT) SEE INSTALL KIT BOM
32	REARS	-	-	STUD, M12 X 1.75, 10.9 ALLOY STEEL, VARIOUS LENGTHS
33	ALL	BT-033	92015A129	SCREW, SET, M6 X 1.0 X 12MM LG, ALLOY STEEL, CUP POINT

REPLACEMENT PARTS (2 OF 2)

