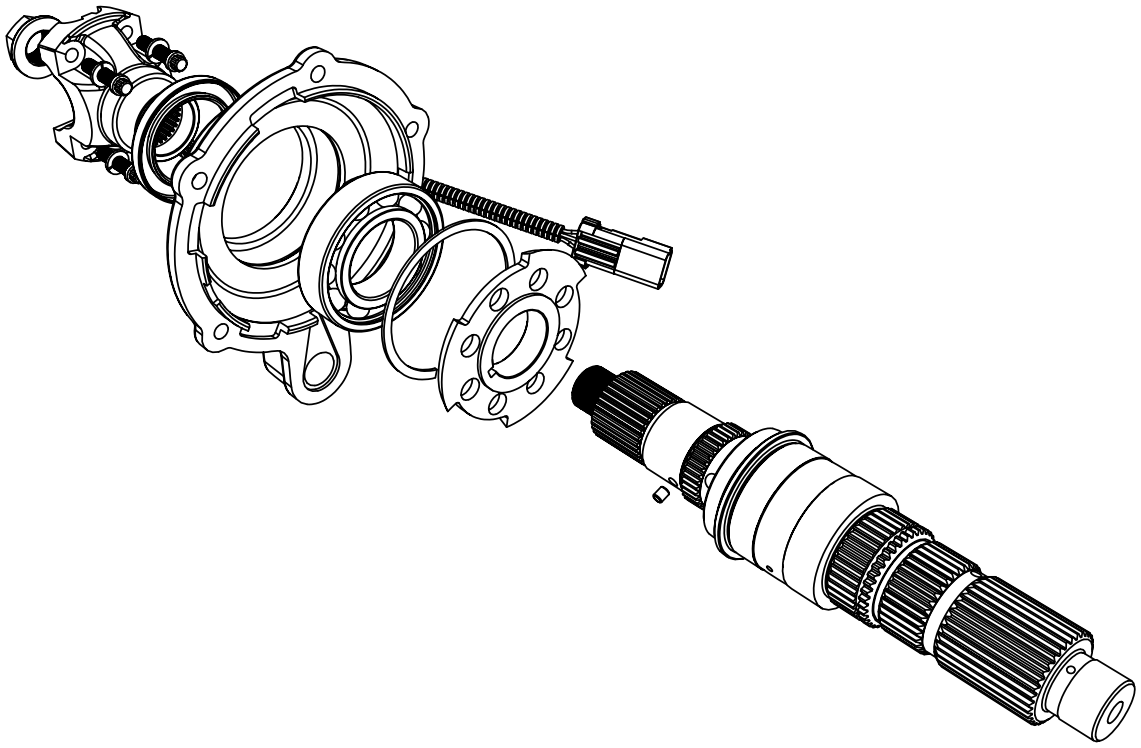
231 SYE Extreme Short Shaft Kit

Kit **#4444400**



Important Notes:

Prior to beginning this or any installation read these instructions to familiarize yourself with the required steps and evaluate if you are experienced and capable to personally perform these modifications. A factory service manual should be used in conjunction with these installation instructions.

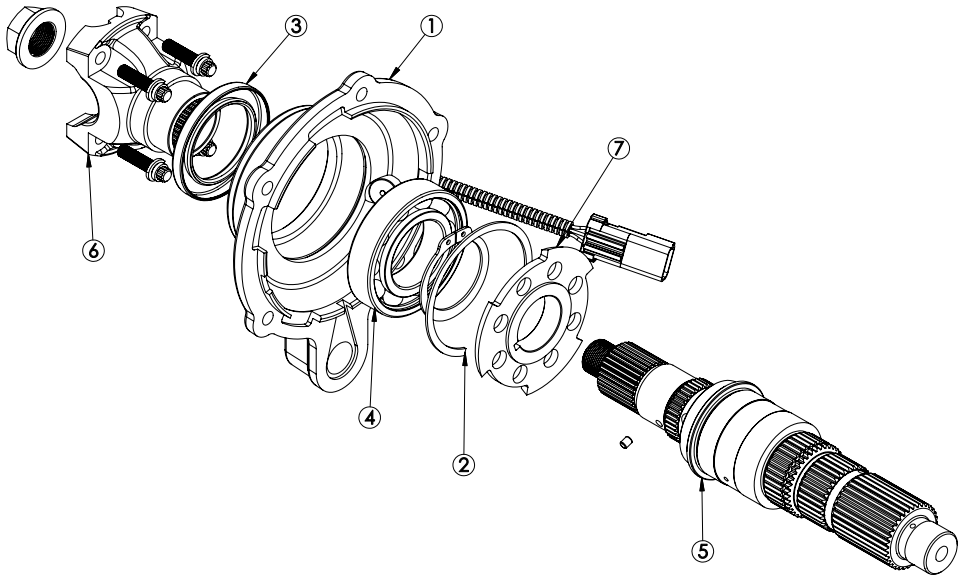
1997 and older Jeeps will require a new speed sensor pigtail (part **#4990108**) for the Jeep wiring harness to convert to the 1998 and newer style connector used on the included speed sensor.

Refer to the parts list to ensure that all necessary components and hardware has been included. If any parts are missing please contact your local TeraFlex dealer for assistance.

Tools needed:

- This installation guide
- Basic mechanics tool set
- Snap ring pliers
- Mallet or dead blow hammer
- RTV Gasket Maker
- Red thread locking compound
- Blue thread locking compound

2199920	231 Extreme Short Shaft Output Seal	1
600051	Extreme Short Shaft Output Bearing w/o Snap Ring 6209	1
600069	Shaft ESS231 HILSS100S	1
600071	Yoke ESS231 HILSS103S Witt	1
600105	Hardware Pack Extreme Short Shaft HRWESSKIT ESS231	1
74	Bolt 1/4"-20 UNC x 3/4" Long, Hex Zinc (ESS Sensor)	1
600072	231 Extreme Short Shaft Tone Ring	1
4990254	Transfer Case Speed Sensor with Connector for 231 Extreme Short Shaft Kit	1
600431	Extreme Short Shaft Speed Sensor Subassembly, Sell Purchased Part 4990254	1
600255	1/4" Diameter High Temperature Flexible Nylon Convoluted Split Tubing	1
54200312	3 Position Male Housing Electical Connector for 2.8mm Terminals	1
54002201	2.8mm Male Electrical Connector Terminal for 231 Extreme Short Shaft	3
16	O-Ring 0.625" ID x 0.070" Cross Section x 1.750" OD	1
458	Washer 1/4" Flat Zinc Plated	1
231112	7/8"-20 UNEF Flanged Crimp Yoke Nut for Short Shaft Kit	1
5031	Hardware Pack for JK Yoke	1
93	Bolt 5/16"-24 UNF x 1.25" Long 12 Point Head	4
36	Washer 5/16" Lock Zinc Plated wsr 5/16	4
444410	Dowel Pin for Extreme Short Shaft Tone Ring ESS	1
231107	231 Short Shaft External Snap Ring for Synchro Hub 47mm Shaft	1



Installation of the Extreme Short Shaft Kit can be completed with the transfer case installed in the Jeep or on the workbench.

1

Begin by draining the oil from the transfer case. Some will require a 15/16” socket or wrench, while others will require a 10 mm allen socket or wrench.

2

Remove the rear driveline completely, and disconnect the front driveline at the transfer case yoke. Tie the front driveline out of the way. Complete removal is not necessary.

3

Remove the front output yoke.

4

Remove speedometer gear assembly by removing the 13 mm bolt and pulling the assembly out of the tail housing.

5

Remove the rear output dust shield and harmonic balancer if equipped.

6

Remove the rear output shaft seal.

7

Remove the rear output shaft snap ring.

8

Remove the 5 bolts holding the tail housing in place. Separate it from the transfer case.

9

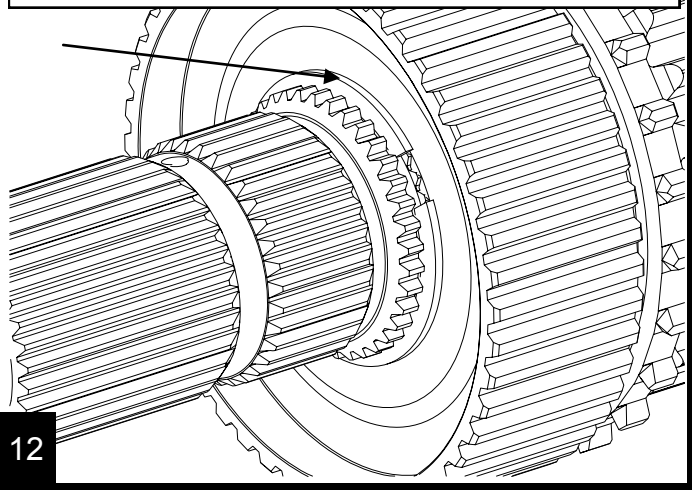
Split the case by removing the 8 case half bolts. Note the location of the 10 mm 12 point bolt.
Gently pry the case apart using the machined notches on either side of the case.

10

Remove the front and rear outputs together with the drive chain.

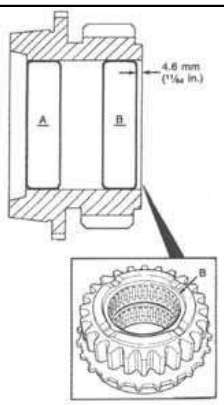
11

Remove the synchro hub snap ring and remove the hub and drive sprocket from the main shaft. Note part orientation.



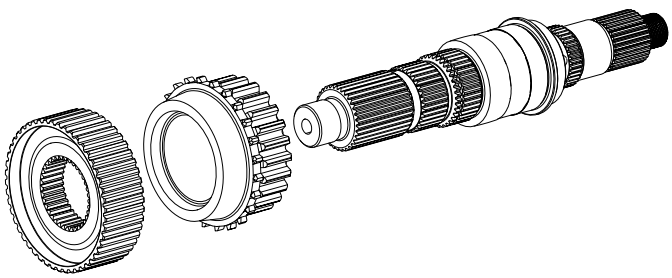
12

If your transfer case comes from a 1996 or older vehicle, it may be necessary to remove the needle bearings in the drive sprocket. Drive them out using a large socket and hammer.



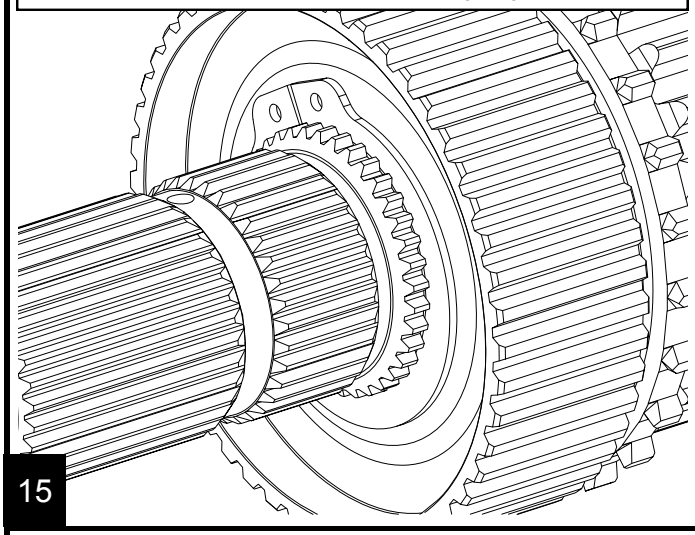
13

Orient the drive sprocket and synchro hub and install them on the new TeraFlex main shaft.



14

Install the included retaining ring.



15

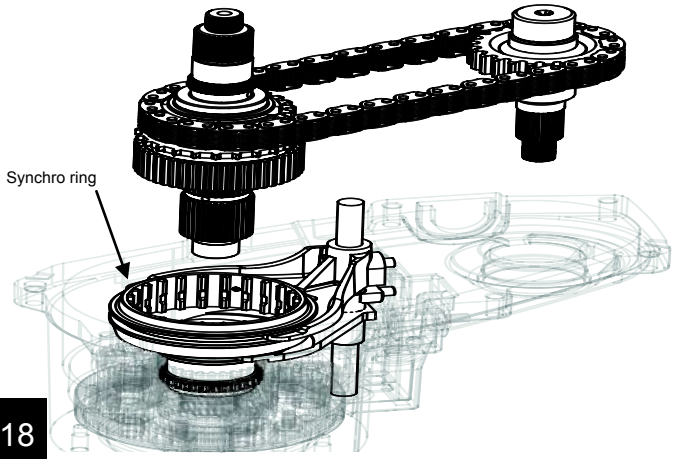
Check the mode and range fork shift pads for wear. If any pads are in need of replacement, Crown Automotive **#15866** includes pads for both the mode and range forks.

16

Verify the length of the mode fork shift rod is 9.38". Typically 1988 and 1989 YJs and XJs have a mode fork shift rod that is 10.2". Simply cut the shift rod as shown, or purchase a shift rod out of a newer model NP231.

17

Install the new main shaft, chain and front output.
Note the orientation of the synchro ring.



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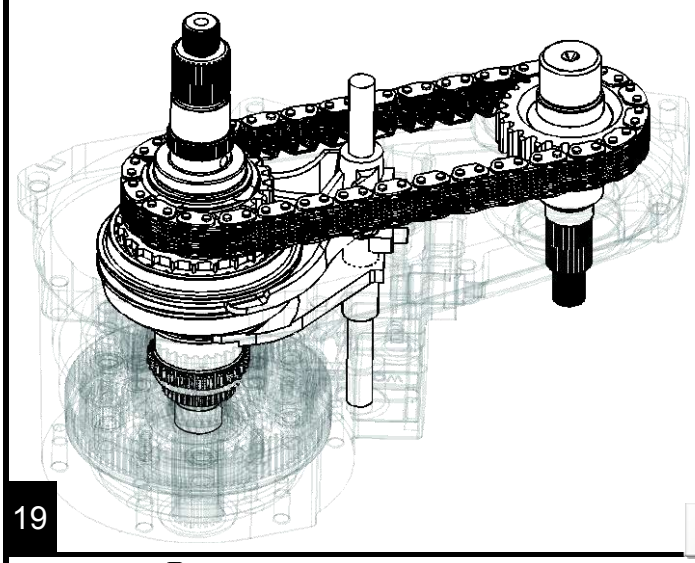
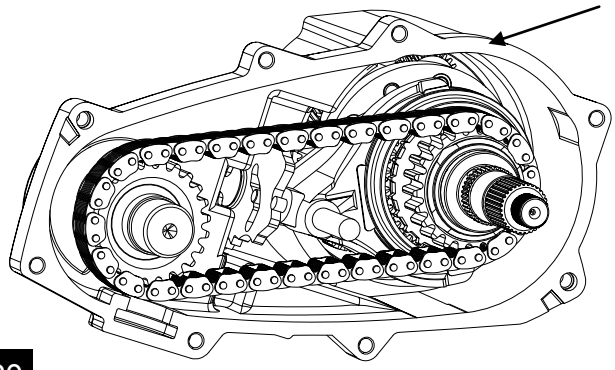


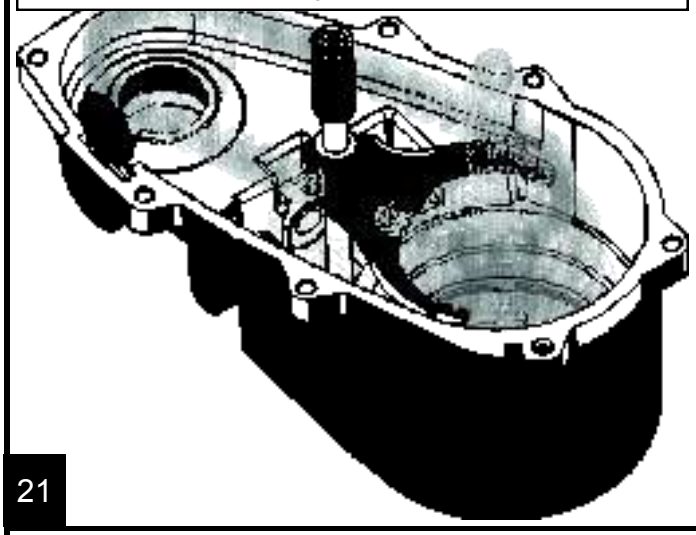
19

Clean the mating surface on the front case half in preparation for joining the two case halves. Ensure surface is free from oily residue and silicone from the old seal.



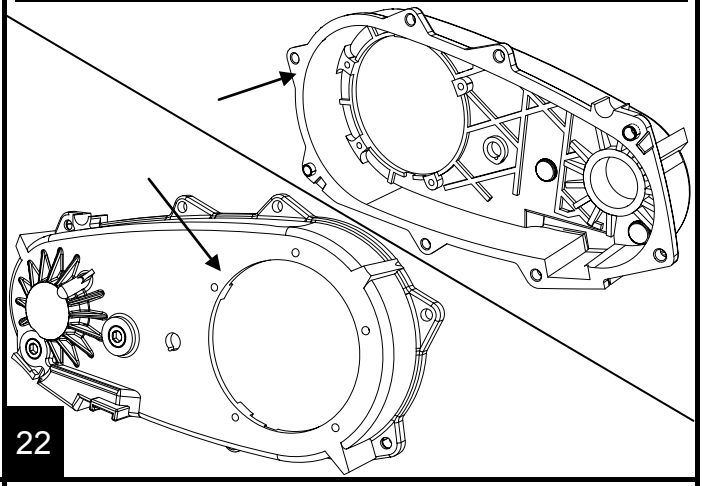
20

Clean and reinstall the magnet and mode fork



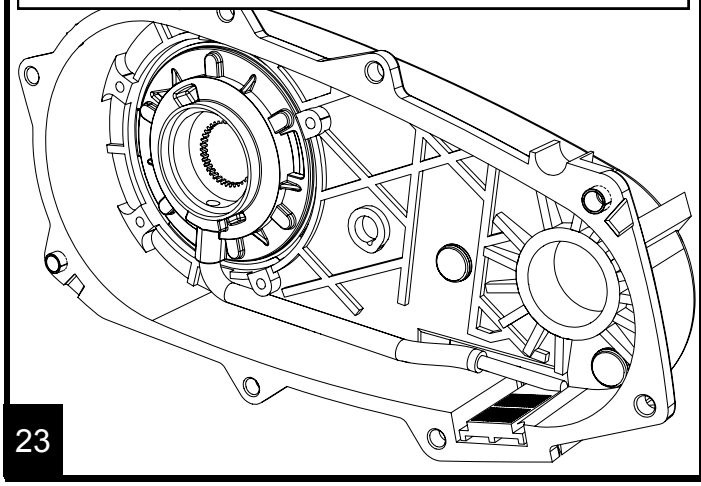
21

Clean the mating surfaces on the rear case half, both to the front case half and tail housing.



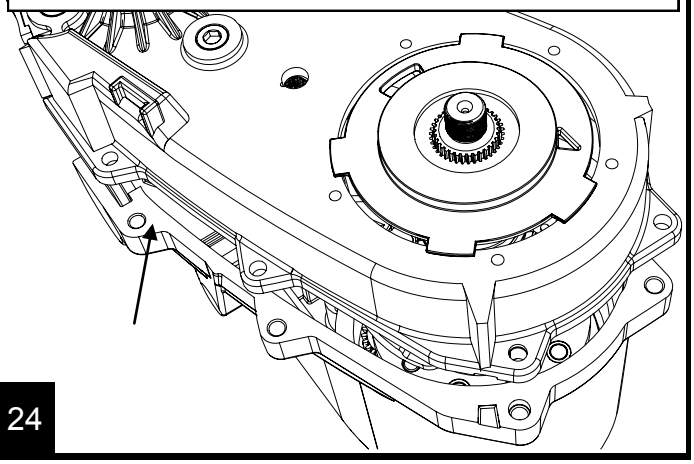
22

Install the oil pick up into the case and make sure it is inserted into the oil pump.



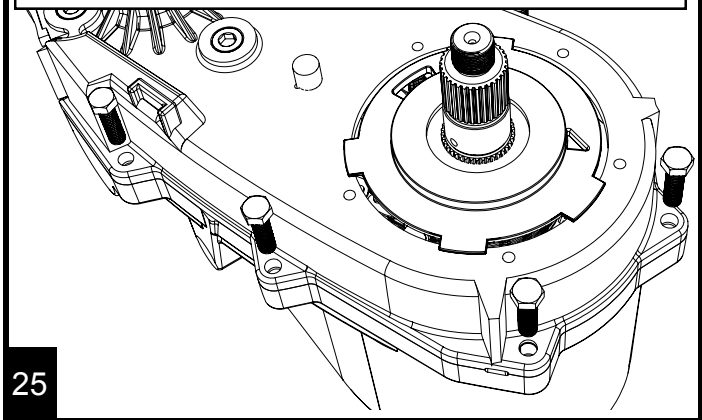
23

Apply a maximum of 3/16” bead of gasket maker to the mating surface of front case half and install the rear half of the transfer case.



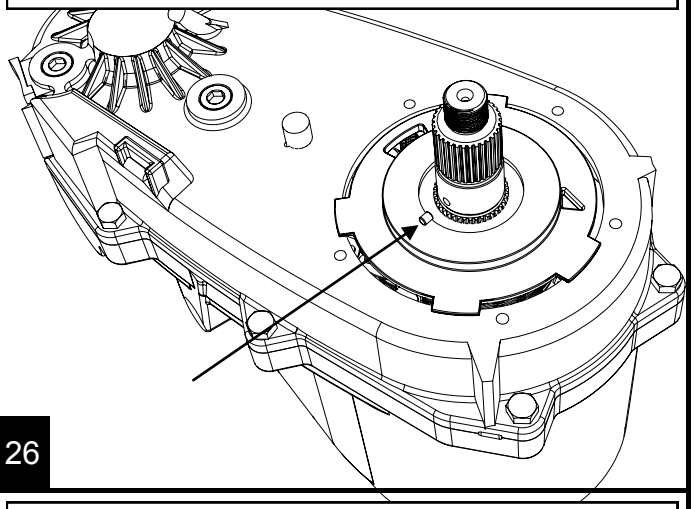
24

Verify shift rail and case alignment dowels are aligned before installing any bolts. Apply blue thread locking compound to bolts and torque in a crisscross pattern to 20-25 ft-lbs, noting the location of the bolt with the 12 point head.



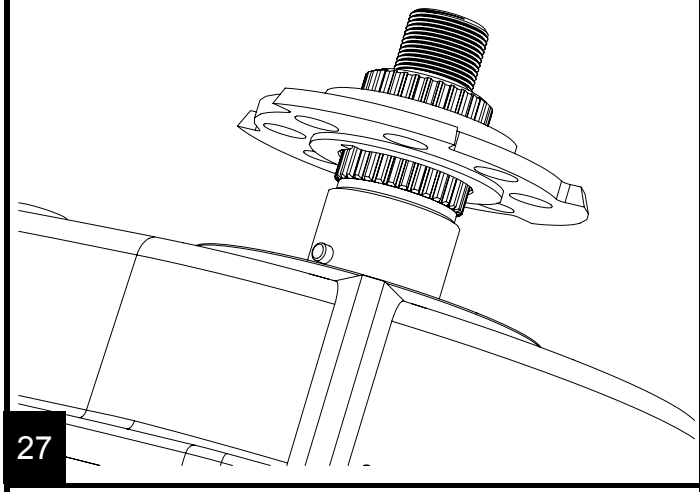
25

Insert the tone ring dowel pin into the hole on the TeraFlex main shaft.



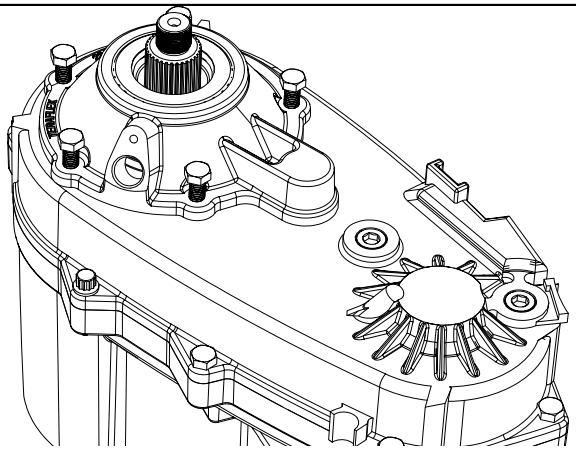
26

Install the tone ring, aligning the notch with the dowel pin.



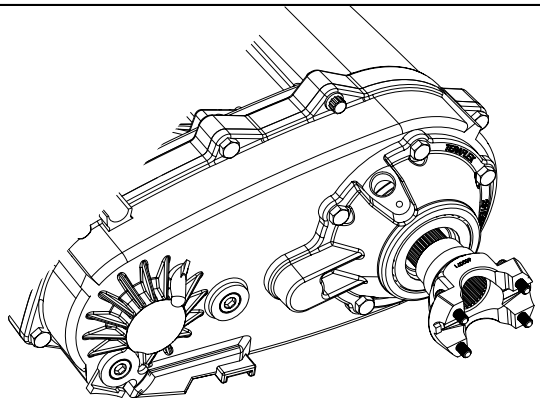
27

Apply a maximum 3/16” bead of gasket maker to the new tail housing, install and torque bolts in a crisscross pattern to 15-20 ft-lbs.



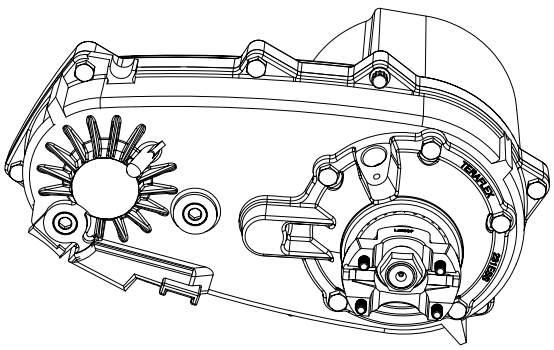
28

Insert the 4 driveshaft bolts into the yoke and slide the yoke onto the main shaft. ***Note: The bolts must be inserted into the yoke prior to yoke installation or they will not fit!***



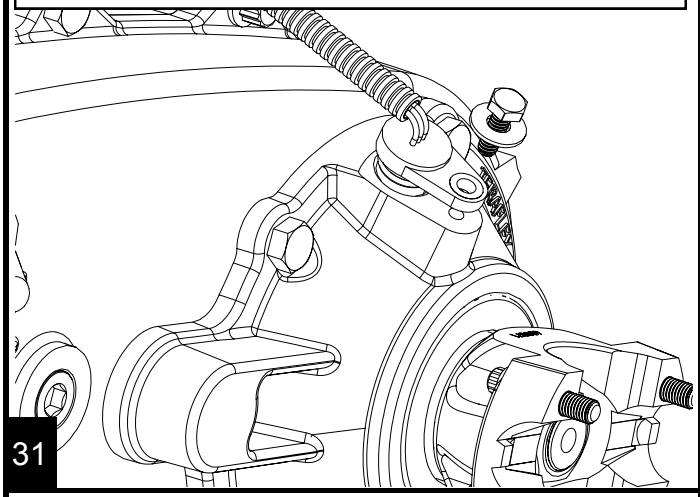
29

Apply a small amount of silicone to seal the spline and yoke interface under the yoke nut. Apply red thread locking compound to the yoke nut and torque to 90-130 ft-lbs.



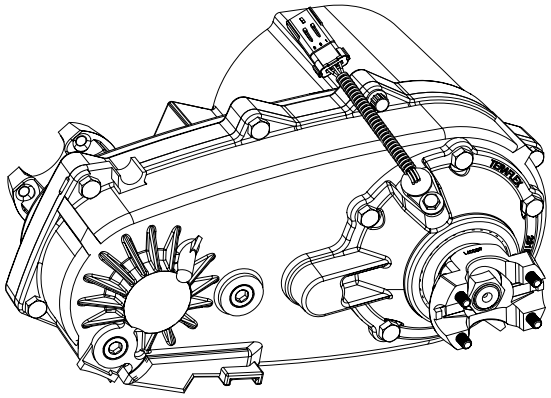
30

Apply a thin film of oil to sensor o-ring to aid in sensor installation.



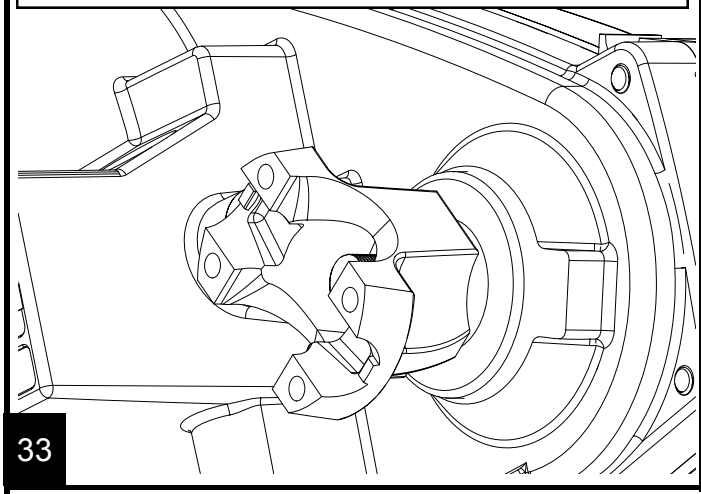
31

Tighten sensor bolt 8-12 ft-lbs.



32

Install seal washer on front output, install yoke. Apply red thread locking compound to nut and torque to 190-230 ft-lbs



33

Fill transfer case with 2.2 pints (1.0L) of ATF+4 and reinstall into vehicle if transfer case was removed.

1997 and older Jeeps will need pigtail **#4990108** to convert the Jeep speed sensor connector to the 1998 and newer style plug. The wiring colors should be used as a reference only. The pin position is correct regardless of wire color.

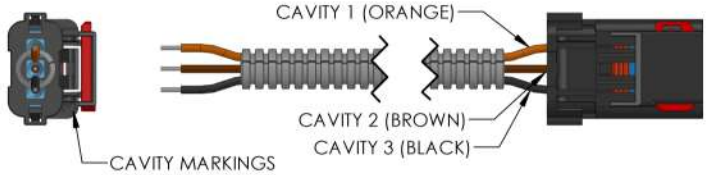
34

NP 231 TORQUE SPECIFICATIONS

Description	N*m	Ft. * Lbs
Detent Plug	16-24	12-18
Drain/Fill Plug	20-34	15-25
Front Bearing Retainer	21	16
Case Half Bolt	27-34	20-25
Front Yoke Nut	122-176	90-130
Rear Companion Flange Nut	258-312	190-230
Range Lever Nut	27-34	20-25
Rear Retainer Bolt	35-46	26-34
Mounting Nuts	35-47	26-35
Indicator Switch	20-34	15-25

TERAFLEX PART# 4990108 (FEMALE PLUG)

THIS IS THE VEHICLE SIDE PLUG THAT THE TERAFLEX SENSOR PLUGS INTO. THIS IS THE SAME PLUG THAT IS FOUND ON 1998+ TJ WRANGLERS, BUT CAN BE PURCHASED FROM TERAFLEX FOR THE OLDER VEHICLES.



IF YOUR VEHICLE SIDE PLUG DOES NOT MATCH THE TERAFLEX PLUG, USE THE CHARTS BELOW FOR A WIRING GUIDE. YOU MAY CUT AND SPLICE THE SENSOR, OR YOU MAY CUT AND SPLICE THE FEMALE PLUG PROVIDED BY TERAFLEX TO THE FACTORY WIRING HARNESS. PRIORITY SHOULD BE PLACE ON THE CAVITY LOCATION, NOT THE WIRE COLOR.

PLEASE NOTE OUR SENSOR IS RATED 5-24 VDC. ON OLDER JEEPS WITH AFTERMARKET GAGES YOU DO NOT NEED TO STEP DOWN THE VOLTAGE TO 5 VDC.

1997 TJ WRANGLER			
CAVITY	CONNECTS TO WIRE COLOR ON TERAFLEX 4990254 PLUG	EXISTING FACTORY WIRE COLOR	WIRE FUNCTION
1	ORANGE	VIOLET/ORANGE	5V SUPPLY
2	BROWN	BROWN/YELLOW	SENSOR GROUND 1
3	BLACK	WHITE/ORANGE	VEHICLE SPEED SENSOR SIGNAL

1993-1995 YJ WRANGLER			
CAVITY	CONNECTS TO WIRE COLOR ON TERAFLEX 4990254 PLUG	EXISTING FACTORY WIRE COLOR	WIRE FUNCTION
1	ORANGE	ORANGE	5V SUPPLY
2	BROWN	BLACK/LIGHT BLUE	SENSOR GROUND 1
3	BLACK	WHITE/ORANGE	VEHICLE SPEED SENSOR SIGNAL

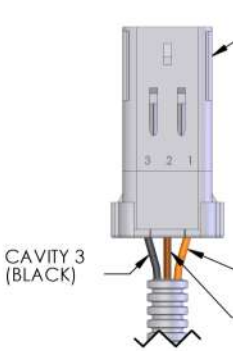
1992 YJ WRANGLER			
CAVITY	CONNECTS TO WIRE COLOR ON TERAFLEX 4990254 PLUG	EXISTING FACTORY WIRE COLOR	WIRE FUNCTION
1	ORANGE	WHITE/BLACK	5V SUPPLY
2	BROWN	BROWN/RED	SENSOR GROUND 1
3	BLACK	BLUE	VEHICLE SPEED SENSOR SIGNAL

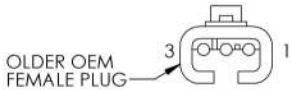
USE THIS PIN CAVITY INFORMATION ONLY AS A GUIDE. WE CANNOT VERIFY THE CONSISTENCY OF THE WIRE COLORS ON ALL WRANGLERS.

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	RELEASED FOR PRODUCTION	8/30/2007	BAC
	B	CHANGED COLOR FOR NEW SUPPLIER: ORANGE (WAS BLACK), BLACK (WAS BLUE), AND BROWN STAYED THE SAME	3/30/2011	BAC
	C	CHANGED WIRING COLORS. #1 CAVITY, 5 VOLT SUPPLY IS ORANGE (WAS BROWN), #2 CAVITY GROUND IS BROWN (WAS BLACK), AND #3 CAVITY SIGNAL IS BLACK (WAS ORANGE).	4/8/2015	B.CALVIN
	E	CORRECTED FEMALE PLUG WIRE COLORS	7/7/2016	BAC

THE SENSOR'S MALE PLUG MATES TO THE FACTORY FEMALE PLUG ON 1999-2005 JEEP VEHICLES AND SOME 1998 VEHICLES.

FOR JEEP VEHICLES THAT HAVE THE OLDER STYLE PLUG (SEE BELOW), PLEASE SEE THE CHARTS ON THE LEFT SIDE FOR WIRING INFORMATION





CAVITY	WIRE COLOR	WIRE FUNCTION
1	ORANGE	5-24 VDC SUPPLY
2	BROWN	SENSOR GROUND 1
3	BLACK	VEHICLE SPEED SENSOR SIGNAL

4990254

Transfer Case Speed Sensor with Connector for 231 Extreme Short Shaft Kit

UNLESS OTHERWISE SPECIFIED:		NAME	DATE
DIMENSIONS ARE IN MILLIMETERS	DRAWN	B.CALVIN	30 AUG 2007
TOLERANCES:	CHECKED	-	-
NO PLACE DECIMAL ±0.8	MATERIAL	SEE INDIVIDUAL PARTS	
ONE PLACE DECIMAL ±0.4	WEIGHT	39 g	
TWO PLACE DECIMAL ±0.1	HEAT TREATMENT	SEE INDIVIDUAL PARTS	
ANGULAR: MACH ±1° BEND ±2°	FINISH	SEE INDIVIDUAL PARTS	
THIRD ANGLE			

PROPRIETARY AND CONFIDENTIAL

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TERAFLEX Inc.
5680 W DANNON WAY
WEST JORDAN, UT 84081

EXTREME SHORT SHAFT KIT FOR 231 TRANSFER CASE

-

SIZE	DWG. NO.	REV
B	4444400-WIRING	E

SCALE: 1:1 | DO NOT SCALE DRAWING | SHEET 1 OF 1

PRODUCT INFORMATION

MAINTENANCE INFORMATION:

It is the buyer's responsibility to have all suspension, drivetrain, steering, and other components checked for proper tightness and torque after the first 100 miles and every 3000 miles after that.

NOTICE TO INSTALLER:

The enclosed "Warning to Driver" sticker must be installed in the vehicle in driver's view. This sticker is to act as a constant safety reminder when operating the vehicle. It is your responsibility as the equipment installer to install the provided sticker and to forward the product instructions to the vehicle's owner for review. If a "Warning to Driver" sticker or product installation guide were not included in the kit, FREE replacement stickers and instructions are available by request. It is the installer's duty to ensure a safe and controllable vehicle after the modifications have been performed.

WARNING:

Neither the seller nor the manufacturer will be liable for any loss, damage, or injury directly or indirectly arising from the use of or inability to determine the use of these products. Before using, the user shall determine the suitability of the products for its intended use, and the user shall assume all responsibility and risk in connection therewith.

WARNING TO DRIVER:

This vehicle has been modified to enhance off road performance and has unique handling characteristics. Use in harsh environments can cause extreme stress on the components. Vehicle should be inspected after being off road to make sure that all the components are in working order and safe to travel on the highway. All fasteners should be checked so that they are at the correct torque specifications as the vibration and stresses from off roading may cause critical fasteners to work loose. Extra care should be taken to inspect the critical components, steering, and brake systems. During each oil change components such as arms, tie rod ends, etc should be greased and checked for excessive wear. Any worn components should be replaced. When returning to the pavement always set or restore tire air pressure to the factory recommendation and connect or engage any disabled sway bar mechanisms. Because of the higher center of gravity and larger tires, this vehicle handles and reacts differently than many passenger cars, both on and off road. You must drive it safely! Extreme care should be taken to prevent vehicle rollover or loss of control, which can result in serious injury or death. Avoid sudden sharp turns or abrupt maneuvers. Generally, braking performance and capabilities are decreased when significantly larger/heavier tires are used, especially when used in combination with transfer case low-range reduction kits. Take this into consideration while driving. Do not add, alter or fabricate any factory or aftermarket parts to increase vehicle height over the intended height of the Tera-Flex product purchased. Mixing component brand is not recommended. TeraFlex Inc. will not be responsible for any altered product or any improper installation or use of our products. We will be happy to answer any questions concerning the design, function, and correct use of our products. It is ultimately the buyer's responsibility to have all bolts/nuts checked for tightness after the first 100 miles and then every 3000 miles. Wheel alignment, steering system, suspension and drive line systems must be inspected by a qualified professional mechanic at least every 3000 miles.