

# SPICER

## SERVICE MANUAL



EXTERNAL TYPE



INTERNAL TYPE

### MANUAL HUB LOK

SPICER AXLE DIVISION



DANA CORPORATION

FORT WAYNE, INDIANA

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## **IMPORTANT SAFETY NOTICE**

Should an axle assembly require component parts replacement, it is recommended that "Original Equipment" replacement parts be used. They may be obtained through your local service dealer or other original equipment manufacturer parts supplier. **CAUTION: THE USE OF NON-ORIGINAL EQUIPMENT REPLACEMENT PARTS IS NOT RECOMMENDED AS THEIR USE MAY CAUSE UNIT FAILURE AND/OR AFFECT VEHICLE SAFETY.**

Proper service and repair is important to the safe, reliable operation of all motor vehicles or driving axles whether they be front or rear. The service procedures recommended and described in this service manual are effective methods for performing service operations. Some of these service operations require the use of tools specially designed for the purpose.

**CAUTION: EXTREME CARE SHOULD BE EXERCISED WHEN WORKING ON COMPONENTS UTILIZING SNAP RINGS OR SPRING LOADED RETENTION DEVICES. FOR PERSONAL SAFETY, IT IS RECOMMENDED THAT SAFETY GOGGLES OR GLASSES BE WORN WHENEVER REPAIR WORK IS BEING DONE ON ANY VEHICLE OR VEHICLE COMPONENTS.**

It is impossible to know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way.

Accordingly, anyone who uses a service procedure or tool which is not recommended must first satisfy himself thoroughly that neither his safety or vehicle safety will be jeopardized by the service methods he selects.

It is recommended that the person installing Hub-Loks read this manual prior to starting the removal or installation of the Hub-Loks. Refer to the exploded views for parts identification.

## **NOTICE**

Dana Corporation, Spicer Axle Division, reserves the right to make changes from time to time, without notice or obligation, in specifications, descriptions and illustrations, and to discontinue models or revise designs.

Questions regarding this manual should be directed to:

Spicer Axle Division  
Dana Corporation  
P.O. Box #1209  
Fort Wayne, Indiana 46801  
Attention: Engineering Technical Services Department

# GENERAL INFORMATION

## IMPORTANT SUPPORTING VEHICLE FOR SERVICE

When performing service procedures on the vehicle, make sure it is properly supported with a suitable lifting device and secured to prevent unwanted movement.

### SUBMERSION OR DEEP WATER FORDING

If the vehicle is exposed to water deep enough to cover the hubs of either the front or rear axles, it is recommended that the wheel ends be disassembled and inspected for water damage, and/or contamination daily.

Clean, examine and replace damaged part if necessary, prior to relubricating and assembling the wheel end components. Pay particular attention to the bearings and the closed steering knuckle on the front driving axle.

### CLOSED WHEEL END STEERING KNUCKLE LUBRICATION

The closed steering knuckle requires lubrication from a source other than the gear carrier assembly. Inboard tube seals contain the hypoid gear lube in the housing to provide an adequate lubricant level for the gears, bearings, etc. This then requires an additional lubricant level to be maintained outboard, in each steering knuckle, which can be observed by removing fill plugs on each knuckle. Adequate level would be to the bottom of the fill plug hole, when vehicle is observed to be in a normal horizontal position.

Recommended lubricant is an SAE 140 grade, multipurpose gear lubricant meeting the Mil-L-2105B Spec.

### HUB LOK LUBRICATION

The "O" ring is to be lubricated with "Parker "O" Ring Lube".

It is recommended that the internal parts of the Hub Lok, such as the gear teeth and splines, are to be lubricated with Moly XL hi-speed grease.

### OPERATION

Manual hub loks provide engagement/disengagement between the front axle shaft and the hub of the front wheels for four-wheel drive/two-wheel drive operation. Engagement occurs when the hub loks are in the locked position, which causes the inner clutch ring and outer clutch ring teeth to mesh. Disengagement occurs when the hub loks are manually placed in the free position, which causes the inner clutch ring and outer clutch ring teeth to separate. Both hub loks must be in locked position and the transfer case shifted to four-wheel drive mode for proper four-wheel drive operation. Refer to the vehicle owner's manual for the proper use of the transfer case and vehicle during and after four-wheel drive operation.

#### NOTE

Some residual driveline "wrap-up" will normally be present after four-wheel drive operation, and the Hub Loks will be difficult to disengage unless the transfer case is shifted to two-wheel drive or neutral. Always shift to two-wheel drive or neutral prior to disengaging Hub Loks. If transfer case is difficult to shift, driving the vehicle a few feet forward or backwards will normally remove some of the driveline wrap-up and ease shifting.

#### CAUTION

HUB LOKS SHOULD ALWAYS BE DISENGAGED WITH VEHICLE ON LEVEL SURFACE AND PARKING BRAKE SET TO GUARD AGAINST VEHICLE MOVING WHILE UNATTENDED.

#### NOTE

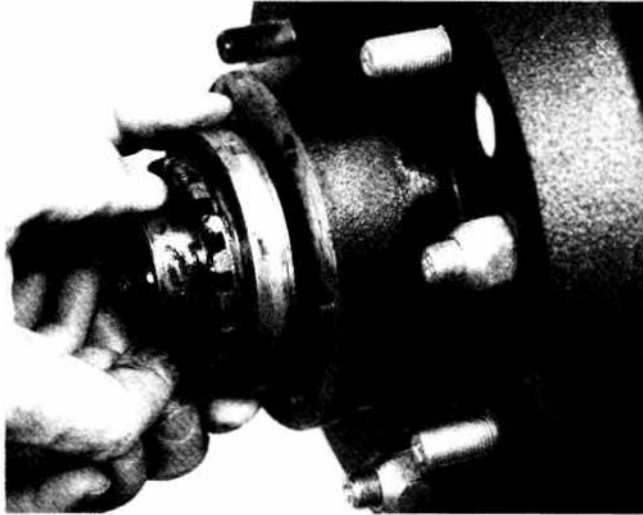
On four-wheel drive vehicles, all tires must be of equal size, ply rating and of the same trend configuration, and are to be inflated with equal air pressure.

Refer to vehicle owner's manual for proper tire size and tire inflation specification.

# ASSEMBLY EXTERNAL TYPE

## NOTE

Before assembling Hub Loks, inspect the splines of the axle shaft, making sure they are free of any possible nicks or burrs.



**Figure 1**

1001-10

Apply a small amount of Moly XL hi-speed grease to the backface and thrust face of the bushing, also to the splines of the inner clutch gear. Assemble inner clutch gear into bushing.

Assemble bushing and inner clutch gear onto axle shaft, making sure the splines of the inner clutch gear are aligned with the splines of the axle shaft, as shown.

Assemble new snap ring onto axle shaft.



**Figure 2**

1001-12

Apply a small amount of Parker "O" Ring lubricant on the actuator knob, making sure knob is completely lubricated in the area shown. Assemble "O" ring onto actuating knob.



**Figure 3**

1001-13

Assemble actuating knob into the lockout hub housing with arrow pointing to free position. Assemble knob retainer snap ring. Spread snap ring with snap ring pliers. Use a small screwdriver to position the snap ring in the groove of the knob.



**Figure 4**

1001-14

Assemble actuating cam onto the knob, aligning ears of the cam with the slots of the retainer. Position parts on a small piece of wood as shown. Assemble the lock pin through the groove of the cam and holes in the actuating knob. Be sure ends of the pin are flush with the outside diameter of the cam.



**Figure 5** 1001-15  
 Turn actuator knob to LOCK position. Apply a small amount of Moly XL hi-speed grease to both grooves of the cam as shown.



**Figure 6** 1001-16  
 Assemble pressure spring and outer clutch gear. Compress the pressure spring by forcing down on clutch gear and assemble snap ring. Make sure snap ring is secure in the groove of the cam. Turn actuator knob to free position.



**Figure 7** 1001-17  
 Assemble six dished washers to the six retainer screws.

**CAUTION**

DISHED WASHERS ARE TO BE ASSEMBLED ON THE SCREWS AS SHOWN WITH THE CONVEX (RAISED SIDE) SIDE AGAINST THE SCREW HEAD.



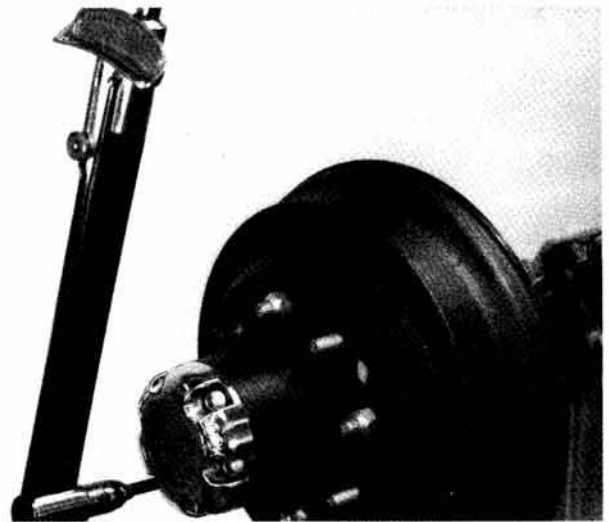
**Figure 8** 1001-18  
 Assemble two screws with washers into lockout hub housing. Apply a small amount of Moly XL hi-speed grease to the outer spline and teeth of the outer clutch gear. Remove any excess lubricant from the gasket surface of the retainer.



**Figure 9**

1001-19

Assemble outer gasket. Assemble lockout hub housing by aligning the splines of the housing with those of the outer clutch gear as shown. Assemble inner gasket on hub housing.



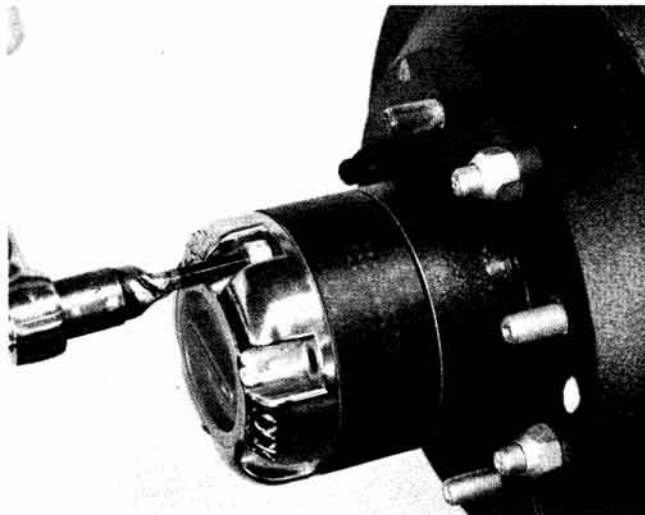
**Figure 11**

1001-21

Assemble the remaining four retainer screws with washers. Tighten screws evenly. Torque to 30-35 ft.-lbs. (40.7-47.5N•m).

**SPECIAL TOOLS: TORQUE WRENCH.**

The Hub Lok may be hard to engage and disengage, however, after use they should loosen up for easier operation. Either Hub Lok will fit either wheel.



**Figure 10**

1001-20

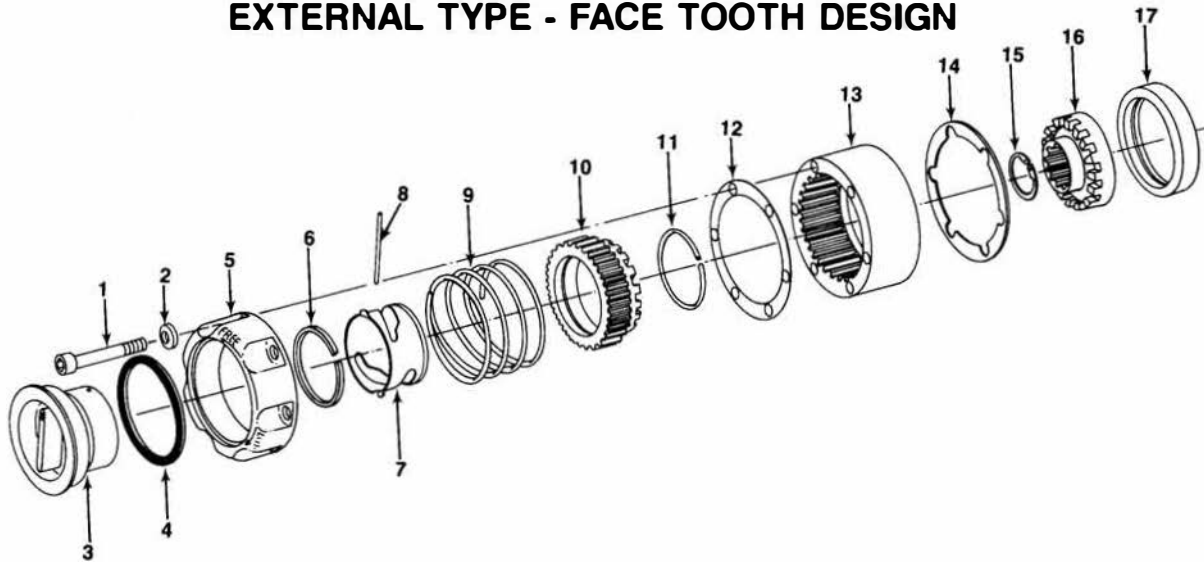
Assemble Hub Lok sub-assembly to wheel hub using the two retainers screws as pilots to assure that the holes of the gasket are in alignment with the holes of the wheel hub. Tighten retainer screws to secure the Hub Lok. Turn actuator knob to LOCK position.

**CAUTION**

DO NOT DRIVE THE VEHICLE UNTIL *BOTH* HUB LOKS ARE EITHER ENGAGED OR DISENGAGED.

# PARTS IDENTIFICATION

## EXTERNAL TYPE - FACE TOOTH DESIGN



**Figure 12**

1005-22

ITEM	QUANTITY	PART NAME
1	6	HUB LOK RETAINER SCREWS
2	6	DISHED WASHERS
3	1	ACTUATING KNOB
4	1	ACTUATING KNOB OIL SEAL
5	1	LOCKOUT HUB HOUSING
6	1	ACTUATING KNOB RETAINER SNAP RING
7	1	ACTUATING CAM
8	1	ACTUATING CAM PIN
9	1	PRESSURE SPRING
10	1	OUTER CLUTCH GEAR
11	1	CLUTCH GEAR SNAP RING
12	1	GASKET (OUTER)
13	1	GEAR HUB HOUSING
14	1	GASKET (INNER)
15	1	AXLE SHAFT SNAP RING
16	1	INNER CLUTCH GEAR
17	1	BUSHING

### SERVICE INSTRUCTIONS

In the event it becomes necessary to disassemble the Hub Lok for either inspection or cleaning purposes, it is recommended that the following parts be replaced; #1 (6) retainer screws; #2 (6) dished washers; #12 (1) gasket and #14 (1) gasket.

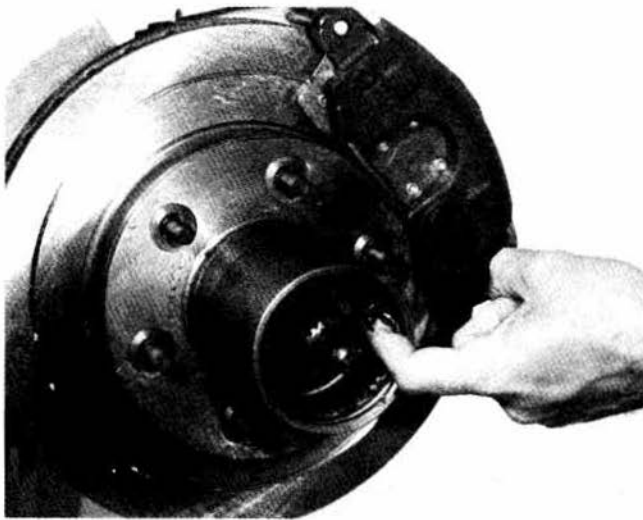
If wear or damage is evident on either part #10 outer clutch gear, or part #16 inner clutch gear, both are to be replaced as a set.

**CAUTION**

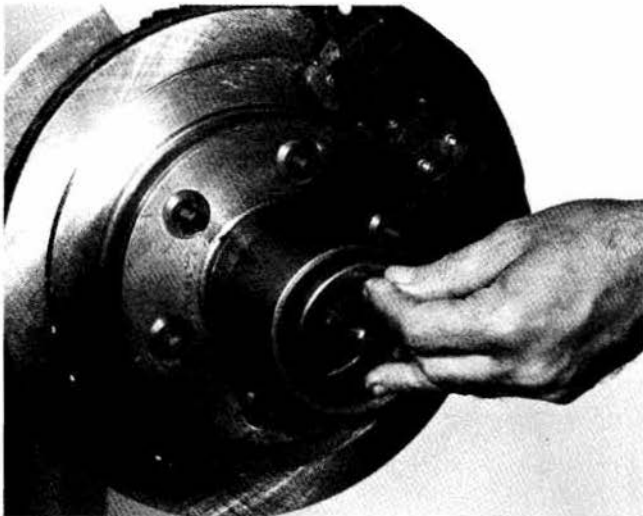
THREADED SCREW HOLES IN THE WHEEL HUB SHOULD BE CLEANED BEFORE ASSEMBLING NEW RETAINER SCREWS.



# ASSEMBLY INTERNAL TYPE



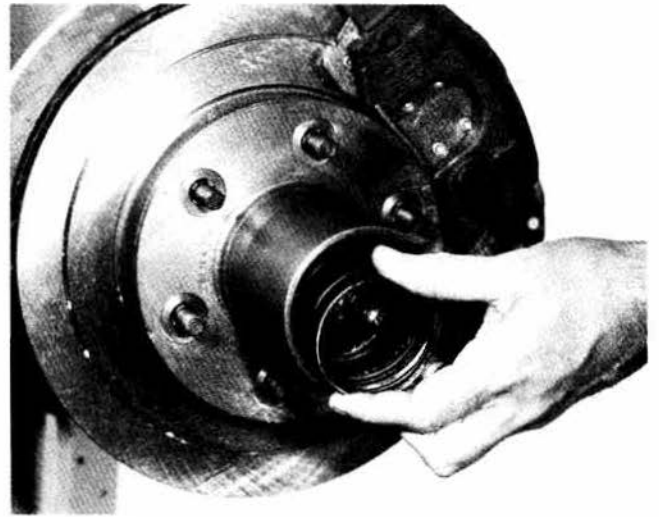
**Figure 13** 1005-11  
Lubricate the hub spline and axle shaft spline with Moly XL hi-speed grease.



**Figure 14** 1005-12  
Assemble spring retainer plate as shown with the recessed undercut area going in first. Be sure it seats against the bearing.

**NOTE**

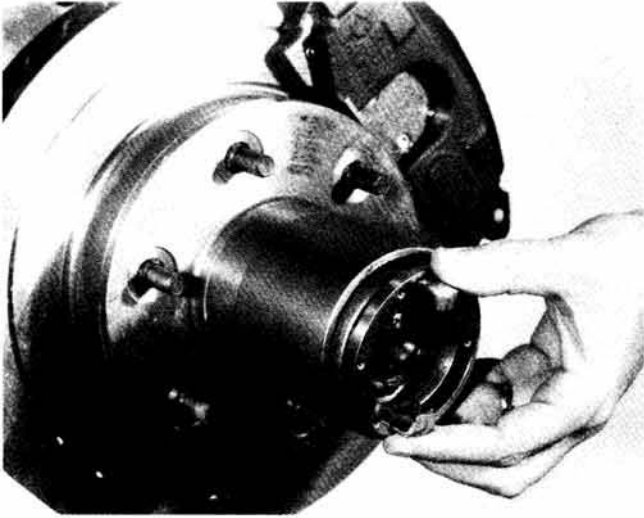
Model 60 Hub Lok Kit Number 660055 does not use the Spring Retainer Plate. Proceed to Figure 15 and continue assembly procedures.



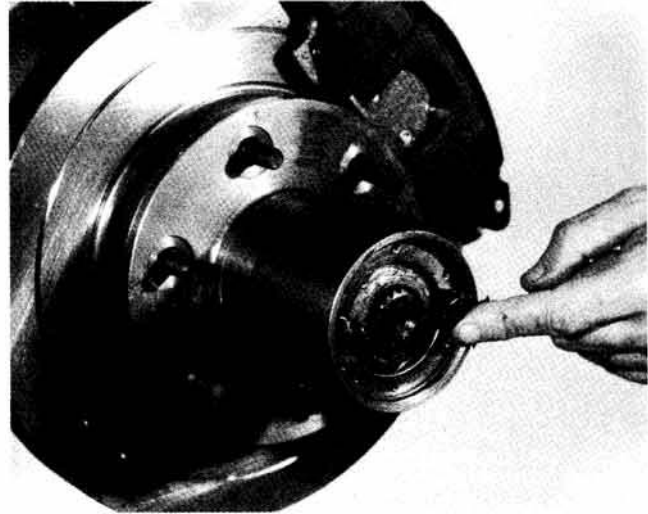
**Figure 15** 1005-13  
Assemble coil pressure spring with large end entering first. **NOTE: SOME HUB LOK DESIGNS USE A COIL SPRING THAT HAS THE SAME DIAMETER ON BOTH ENDS AND MAY BE ASSEMBLED IN EITHER DIRECTION.**



**Figure 16** 1005-14  
Assemble inner clutch ring and axle shaft sleeve if face tooth design or outer clutch ring and inner clutch ring if sliding tooth design. Notice that the teeth are meshed together in a locked position for easy assembly. Refer to exploded view for proper parts orientation and identification. It may be necessary to rock the hub back and forth for spline alignment. Keep the two clutch rings in **LOCKED** position. Assemble axle shaft snap ring. Be sure snap ring is fully seated in the snap ring groove of the shaft.



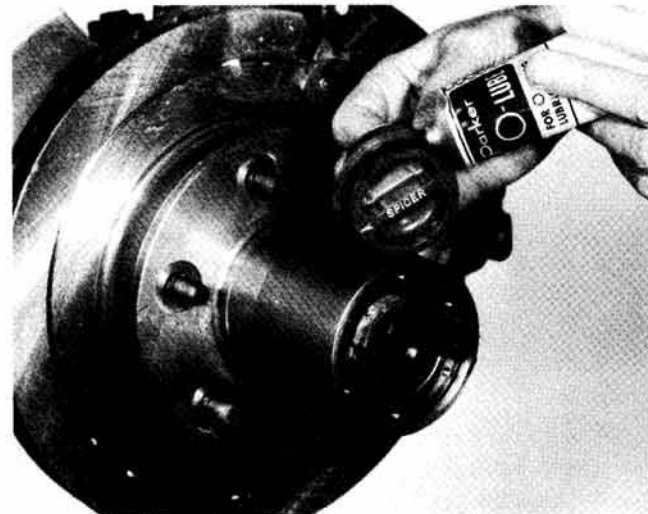
**Figure 17** 1005-16  
Assemble actuating cam into retaining plate and assemble into hub.



**Figure 19** 1005-18  
Apply a small amount of Moly XL hi-speed grease on the ears of the cam.



**Figure 18** 1005-17  
Assemble hub snap ring. Be sure snap ring is fully seated in the snap ring groove of the hub.



**Figure 20** 1005-19  
Apply a small amount of Parker "O" ring lube in groove of actuating knob before assembling outer "O" ring.



Assemble actuating knob in lockout hub housing and assemble to wheel hub with knob in locked position. Assemble screws and washers. Tighten screws alternately and evenly making sure the retaining plate is not cocked in the hub. Torque screws 35 to 40 in.-lbs. (4.0 to 4.5 N•m).

SPECIAL TOOLS: TORQUE WRENCH

**CAUTION**

DO NOT DRIVE VEHICLE UNTIL *BOTH* HUB LOKS ARE EITHER ENGAGED OR DISENGAGED.

Figure 21

1005-20

## PARTS IDENTIFICATION INTERNAL TYPE - FACE TOOTH DESIGN

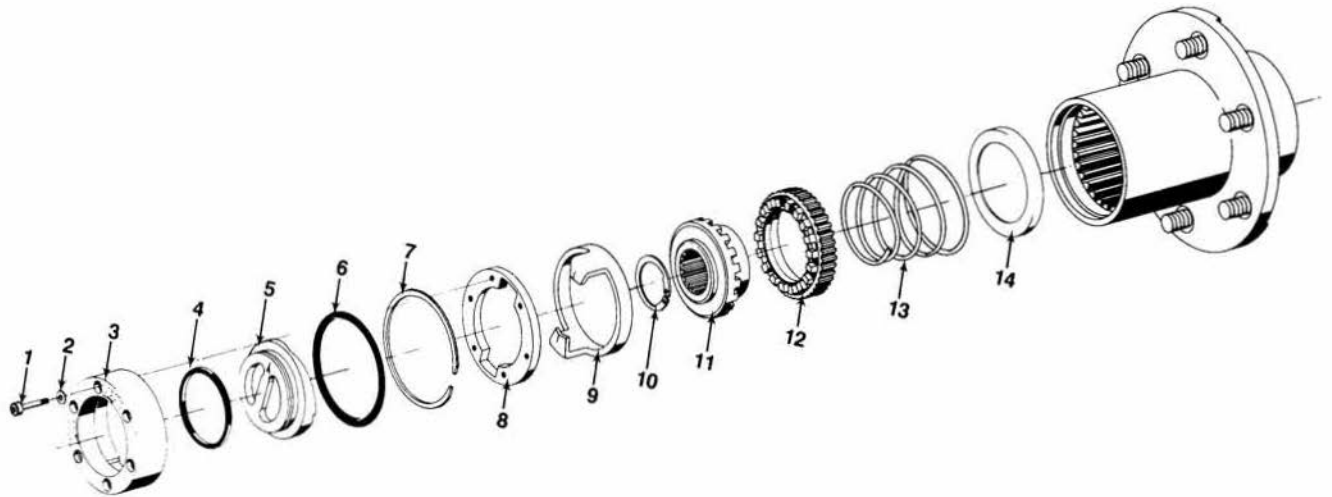
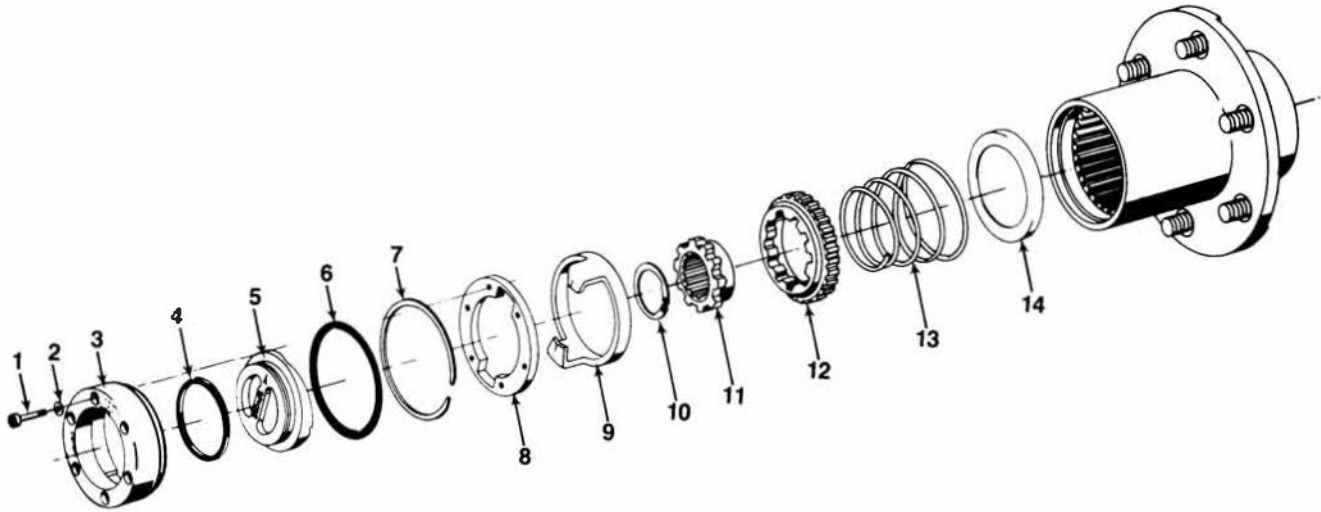


Figure 22

ITEM	QUANTITY	PART NAME
1	6	HUB LOK RETAINER SCREWS
2	6	HUB LOK SCREW WASHERS
3	1	LOCKOUT HUB HOUSING
4	1	ACTUATOR KNOB "O" RING
5	1	ACTUATOR KNOB
6	1	LOCKOUT HUB HOUSING "O" RING
7	1	SNAP RING (HUB)
8	1	RETAINING PLATE
9	1	ACTUATING CAM
10	1	AXLE SHAFT SNAP RING
11	1	AXLE SHAFT SLEEVE AND RING ASSEMBLY
12	1	INNER CLUTCH RING AND BUSHING ASSEMBLY
13	1	PRESSURE SPRING
14	1	SPRING RETAINING PLATE

# PARTS IDENTIFICATION

## INTERNAL TYPE - SLIDING TOOTH DESIGN



**Figure 23**

ITEM	QUANTITY	PART NAME
1	6	HUB LOK RETAINER SCREWS
2	6	HUB LOK SCREW WASHERS
3	1	LOCKOUT HUB HOUSING
4	1	ACTUATOR KNOB "O" RING
5	1	ACTUATOR KNOB
6	1	LOCKOUT HUB HOUSING "O" RING
7	1	SNAP RING (HUB)
8	1	RETAINING PLATE
9	1	ACTUATING CAM
10	1	AXLE SHAFT SNAP RING
11	1	INNER CLUTCH RING
12	1	OUTER CLUTCH RING
13	1	PRESSURE SPRING
*14	1	SPRING RETAINING PLATE

\*Model 60 Hub Lok Kit Number 660055 does not use the Spring Retainer Plate. Refer to text in this manual for assembly procedures.

### SERVICE INSTRUCTIONS

In the event it becomes necessary to disassemble the Hub Lok for either inspection or cleaning purposes, it is recommended that parts showing wear should be replaced. Parts #5, #9, #11 and #12 are exposed to wear when the HUB LOK is engaged. Therefore, these parts should be checked carefully during inspection.