



# Dana® Spicer® Axles & Brakes

ABIB-0313

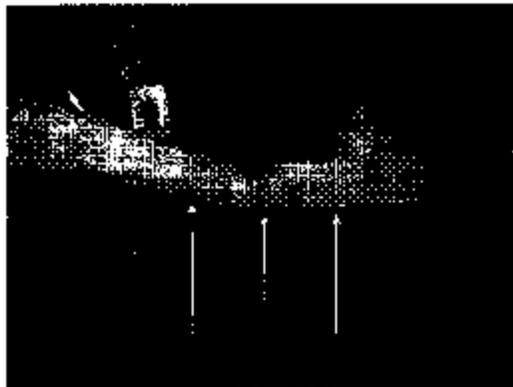
## Information Bulletin

Bulletin Type: Parts / Service Information

Topic: Dana Corporation Steer Knuckle Recall Identification and Repair Procedure

### Affected Models: Steer Axle – Knuckle Forging Part Number 971506

Some steer axles built between August 1, 2003 and September 3, 2003 with a steer knuckle forging part number of 971506 and heat code of CC6 may contain a longitudinal crack at the forging parting line of the steer arm. If the suspect steer knuckle contains a heat code of CC6 or a code that is illegible, the knuckle assembly must be replaced. Below you will find detailed inspection and repair procedures. It is important to follow all instructions to insure a proper repair.

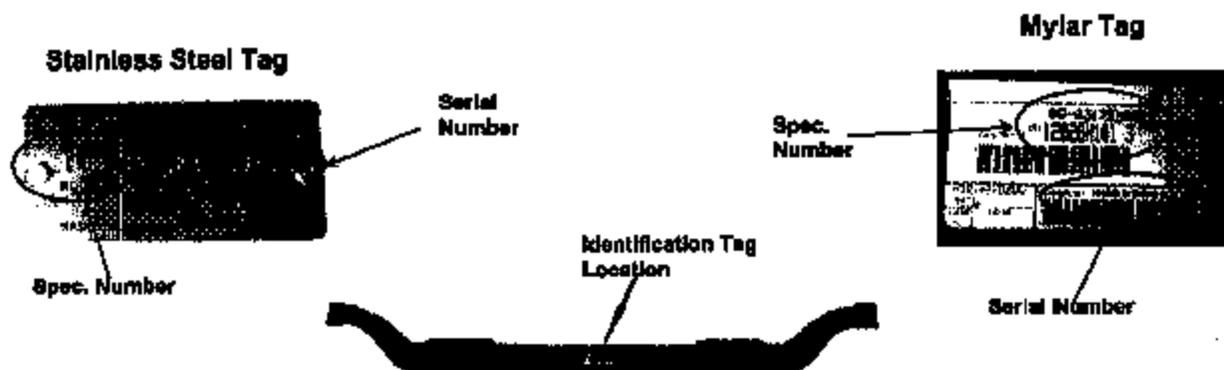


Crack Location on Steer Arm



Longitudinal Crack

**Information Tag Location:** Dana uses two different styles of identification tags. The steer axle serial number and the spec. number is located on either a stainless steel tag or a Mylar tag that is mounted to the front, center of the steer axle beam. Both of the serial number and the spec. number must be included on the FAX Order Form when it is submitted to Dana.



## Inspection Procedure

1. Block vehicle tires and raise hood.
2. On the drivers side of the steer axle, locate the steer knuckle identification markings forged into the front of the steer knuckle.



Drivers Side of the Steer Axle

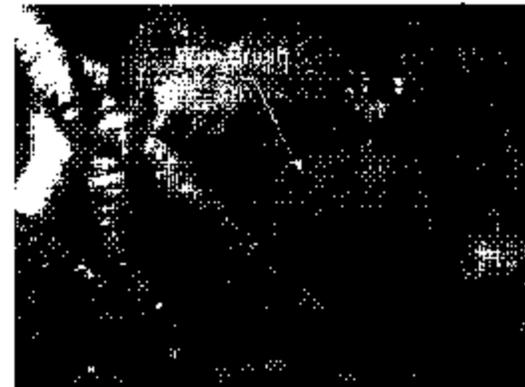


Steer Knuckle Assembly

3. Use a wire brush to remove any contamination that may keep you from making an accurate identification.



Left Side Front of the Steer Axle



Wire Brush the Area to Be Inspected

4. Locate the forging part number that is forged into the front, top of the steer knuckle. If the number is not identified as 971508, the knuckle does NOT need to be replaced. See Figure # 1 below.
5. The heat code is forged into the steer knuckle after the word SPICER. Shown in Figure # 1. If the heat code is NOT CC6 the knuckle does NOT need to be replaced; some examples of heat code that will likely be seen that do NOT need replacing are BU1, CC9, CE6, CG2, CG8, CH4, CH5 and CH9. See Figure # 2 for example.

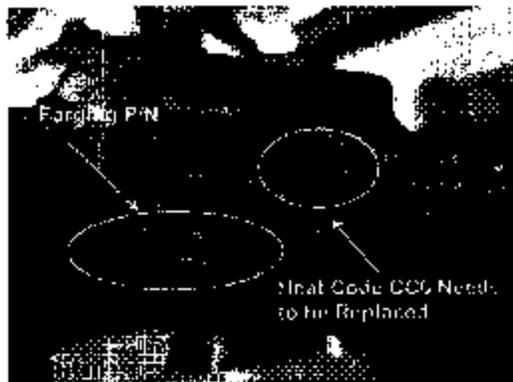


Figure # 1

Heat Code Identified as CC6 – Replace Knuckle

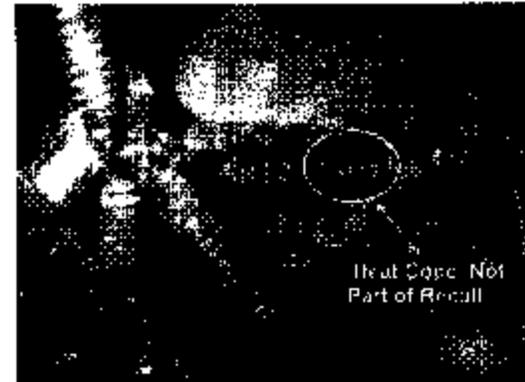


Figure # 2

Incorrect Heat Code – DO NOT Replace

**⚠ Important Note: Only steer knuckle with a heat code of CC6 and Forging P/N of 971506**

**Disposition of Defective Material:** The Knuckle Assembly that was removed from the vehicle must be scrapped. To insure that it is not returned to service, a cutting torch should be used to remove the steer arm from the assembly.

## REPAIR PROCEDURE

### Steering Knuckle Removal Procedure

**Note:** The procedure below begins with the wheels, hubs, and brake assemblies already removed and starts with steps to remove the steering knuckle.

1. Remove cotter pin and slotted nut on tie rod end.

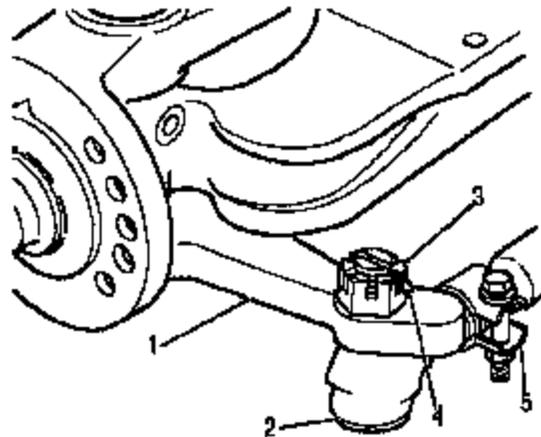


Figure 1

- 1 - Tie rod arm
- 2 - Tie rod end
- 3 - Slotted nut
- 4 - Cotter pin
- 5 - Position clamp fastener away from beam

2. Disconnect tie rod end from tie rod arm using a suitable tool such as a pickle fork.

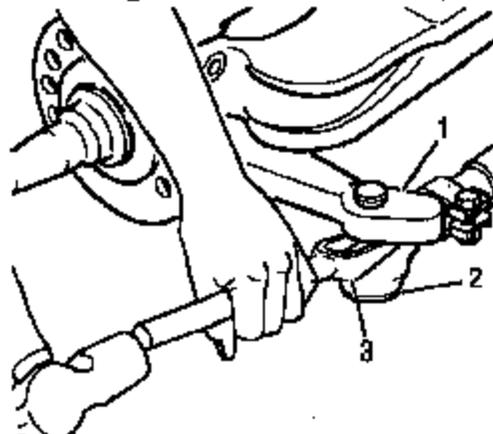


Figure 2

- 1 - Tie rod arm
- 2 - Tie rod end
- 3 - Pickle fork

**Note:** If boot is torn during removal, tie rod end must be replaced at the dealer's expense.



**CAUTION: DO NOT USE HEAT ON ANY AXLE PARTS OR FASTENERS.**

3. Disconnect drag link from steering arm and Pitman arm by removing cotter pins and slotted nuts.

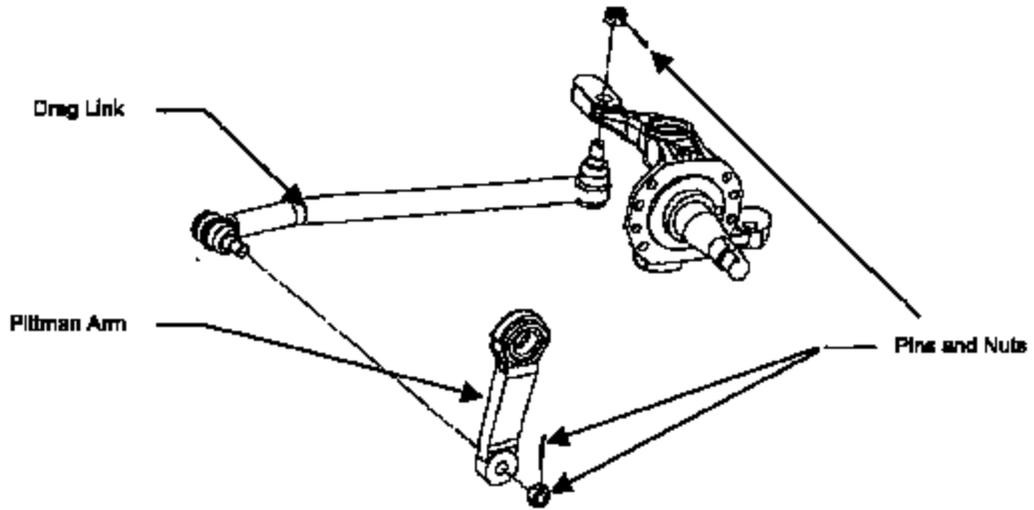


Figure 3

4. Remove top and bottom knuckle caps.

5. Remove both draw key nuts and washers. Then drive keys out using a brass hammer and drift.

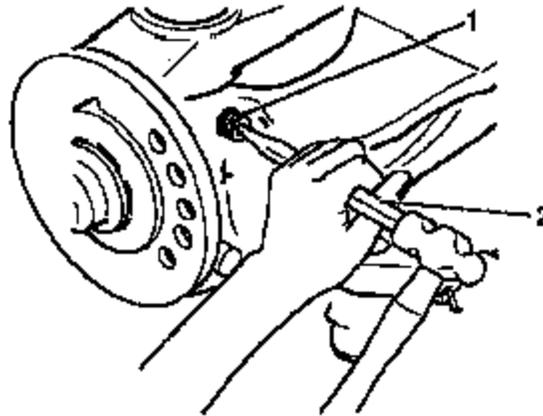
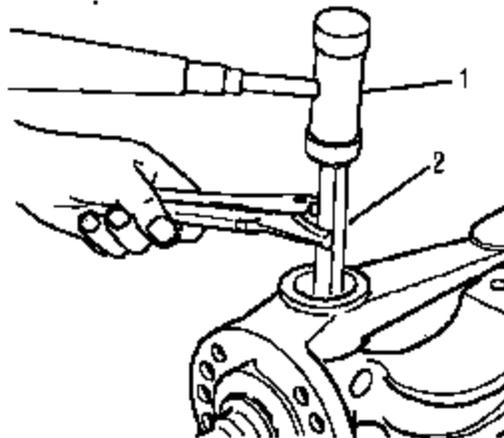


Figure 4

- 1 - Draw key
- 2 - Brass drift

6. Drive kingpin out with a brass hammer and drift.

**Note:** Do not damage kingpin, it will be re-used during installation of new knuckle.



**Figure 5**

- 1 - Brass hammer
- 2 - Drift

7. Remove steering knuckle, thrust bearing and shims from axle beam.
8. Remove Steering Stop Adjustment Screw from old knuckle. It will be re-installed on new knuckle.

**Note:** Measure & record distance the old Steering Stop Screw protrudes out of the knuckle before removing it.



**WARNING:** Never strike hardened metal parts with a steel hammer or tool.

## Cleaning

After disassembly, clean axle end as follows:

1. Steel parts with ground or polished surfaces.
  - Wash in a suitable cleaning solvent.
  - Rinse thoroughly to remove any cleaning solution.
  - Dry parts with clean rags.
2. Clean castings, forgings and other rough-surface parts.
  - Wire brush or steam-clean areas that are susceptible to accumulation of mud, road dirt, salt.

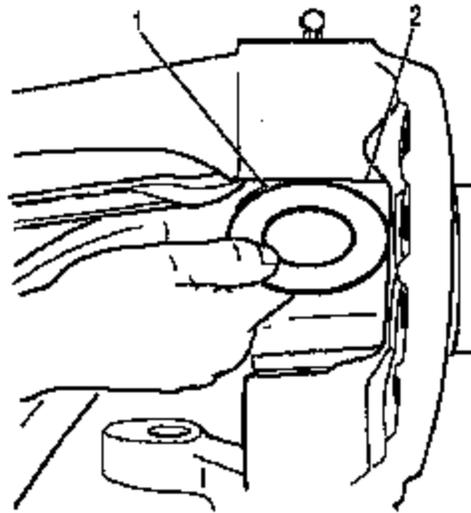


**WARNING:** Gasoline is not an acceptable cleaning solvent because of its extreme combustibility. It is unsafe in the workshop environment.

## Steering Knuckle Installation Procedure

1. Install the old Steering Stop Adjustment Screw. Be sure screw is cleaned as per the above procedure.
2. Install the knuckle assembly and thrust bearing.
3. Make certain that kingpin hole in axle center is clean and dry.

4. Align the steering knuckle kingpin holes with axle and thrust bearing holes.
5. Pre-adjust knuckle vertical play by wedging the steering knuckle up and filling the gap at the top of the knuckle with shim(s).



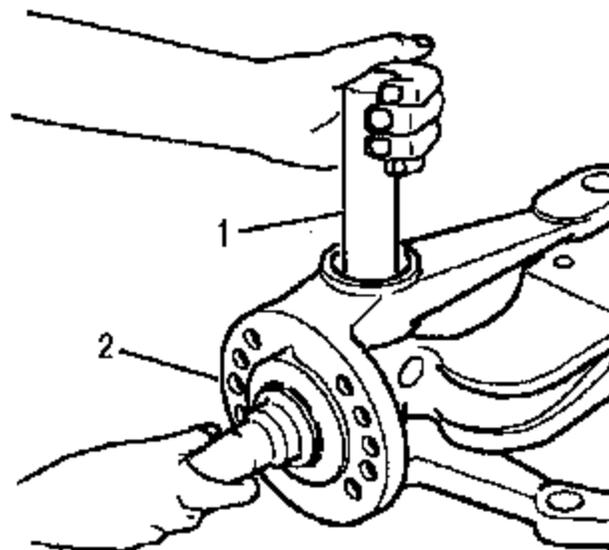
**Figure 6**

- 1 - Install shim(s) as needed
- 2 - Shim only top of knuckle

**Note:** Before installing the kingpins, lubricate inside of bushing and outside of kingpins with NLGI No.2 multipurpose lithium grease to provide initial lubrication.

**Note:** Floor jack can be used to wedge up steering knuckle.

6. Install kingpin from the top with notch and draw keyholes aligned. Hand start in bushing.



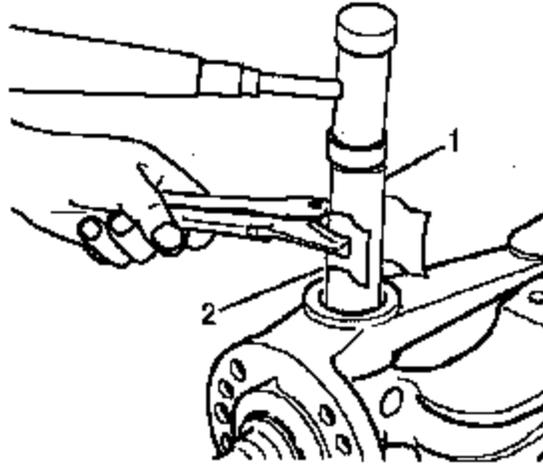
**Figure 7**

- 1 - Kingpin
- 2 - Steering knuckle



**CAUTION:** Never shim between the thrust bearing and the beam.

7. Install kingpin in knuckle and axle beam. Tap kingpin in place using hammer and brass drift if necessary.



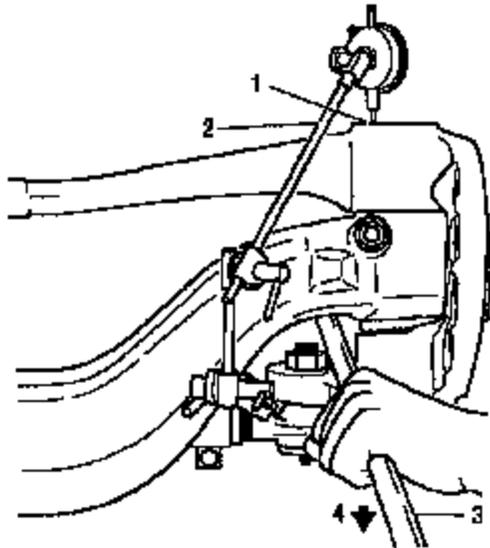
**Figure 8**

- 1 - Kingpin
- 2 - Protect with shim stock

**Note:** Protect kingpins with a suitable material such as shim stock.

**Note:** At this point in reassembly, check knuckle vertical play and adjust if necessary.

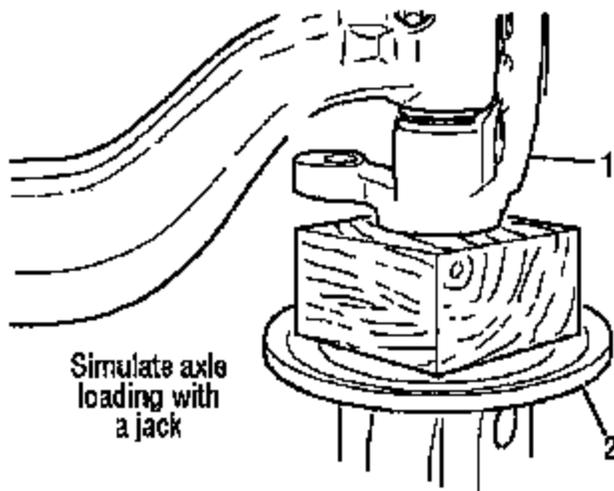
8. Center steering components.
9. Mount dial indicator to steer beam and reference top of the knuckle. Zero dial indicator.



**Figure 9**

- 1 - Reference on top of knuckle
- 2 - Dial indicator
- 3 - Pry bar
- 4 - Pry knuckle downward

10. Simulate axle loading with a jack and note dial indicator reading.



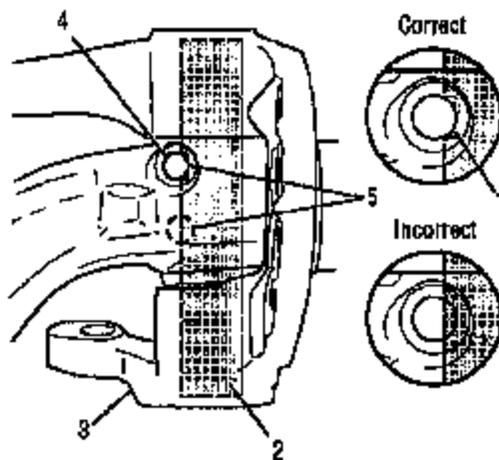
**Figure 10**

- 1 - Steering knuckle
- 2 - Jack

**Note:** Floor jack can be used to wedge up steering knuckle.

11. Knuckle vertical play should be .002" -.012" (.051 -.305 mm). Add or remove shims as necessary to obtain correct endplay. Center shims to prevent damage during assembly.

12. When vertical play adjustment is correct, align draw key opening and pin flat alignment.

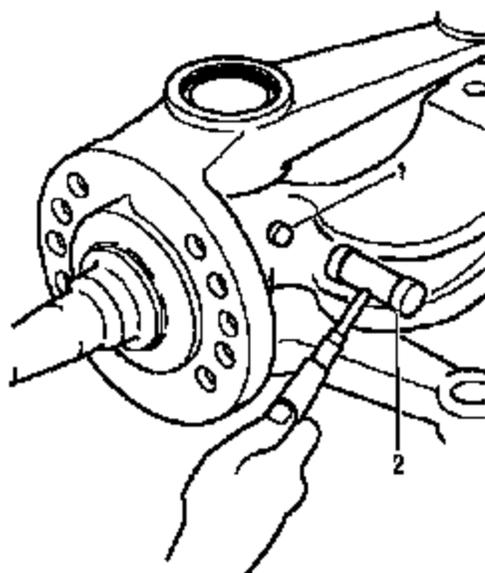


**Figure 11**

- 1 - Kingpin notch
- 2 - Kingpin
- 3 - Steer knuckle
- 4 - Single draw key
- 5 - Dual draw keys

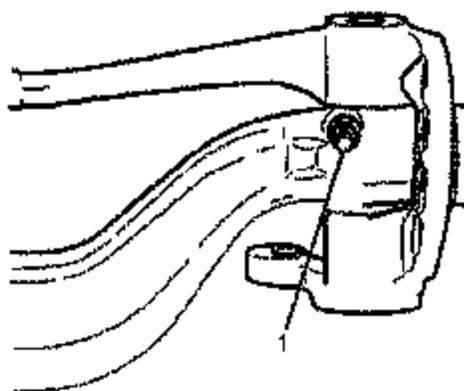
13. Install new draw keys.

14. Seat draw keys with a hammer and punch.



- 1 - Draw key
- 2 - Brass hammer

15. Install draw key nuts and tighten to **30-45 Lbf-Ft (41-61 Nm)**.



- 1 - Draw key nut

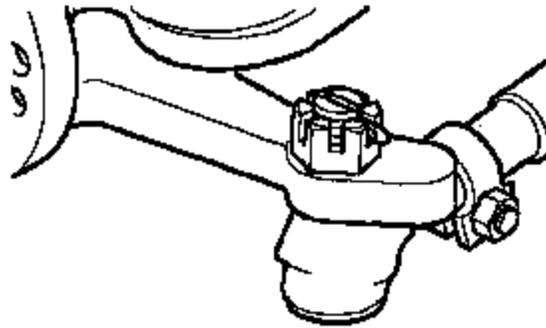
16. Ensure draw key is fully seated by repeating step 13 and 14. Recheck draw key nut torque.

17. Install kingpin caps. Tighten caps to **50-75 Lbf-Ft (68-102 Nm)**.

18. Attach drag link to steering arm and Pitman arm. Install and torque nuts to **165-230 Lbf-Ft (224-312 Nm)**.

19. Install cotter pins into the drag link nuts.

20. Attach tie rod end to tie rod arm on knuckle. Install nut and tighten to **120-160 Lbf-Ft (163-217Nm)**.

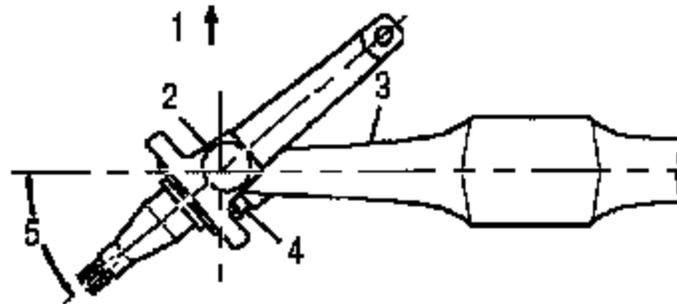


21. Install cotter pin.

22. Grease all kingpin and tie rod assemblies as required.

## STEERING KNUCKLE STOP ADJUSTMENT

1. Old Steering Stop Adjustment Screw must be re-Installed onto new knuckle as per above procedure.



**Figure 15**

- 1 - Front of vehicle
- 2 - Steering knuckle
- 3 - Axle beam
- 4 - Steering stop adjustment (both ends of axle)
- 5 - Degree of steering angle

2. Check steering angle with alignment turntable set. Refer to OEM specification to determine the correct steering angle for the truck:

3. If adjustment is required, loosen jam nut and turn stop screw as necessary.

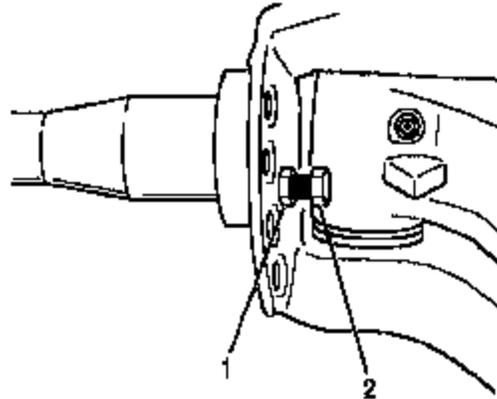


Figure 16

- 1 - Jam nut
- 2 - Stop screw

4. After adjustment, tighten stop screw jam nut to **90-120 Lbf-Ft (122-163Nm)**.

**Roadranger**  
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For spec'ing or service assistance, call 1-800-826-HELP (4357) 24 hours a day, 7 days a week, (Mexico: 8-332-1515). Or visit our web site at: <http://www.roadranger.com>

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Dana Corporation  
Commercial Vehicle Axle Division  
P.O. Box 4087  
Kalamazoo, MI 49003



# Commercial Vehicle Systems Division

## FAX Parts Requisition Form

Recall Number XXXXX

This form is to be used only for ordering the hardware parts listed below. Fill out the form completely and FAX it to (270) 827-6108.

### SHIP TO INFORMATION

DEALER NAME: \_\_\_\_\_

DEALER CODE: \_\_\_\_\_ R/O REFERENCE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

ATTN: \_\_\_\_\_ PH# ( ) \_\_\_\_\_

LOCATION ORDERED FROM Same As: YES \_\_\_\_\_ NO \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip Code \_\_\_\_\_

**Important:** You must list the last 8 digits of the Vehicle Identification Number for each vehicle being repaired.

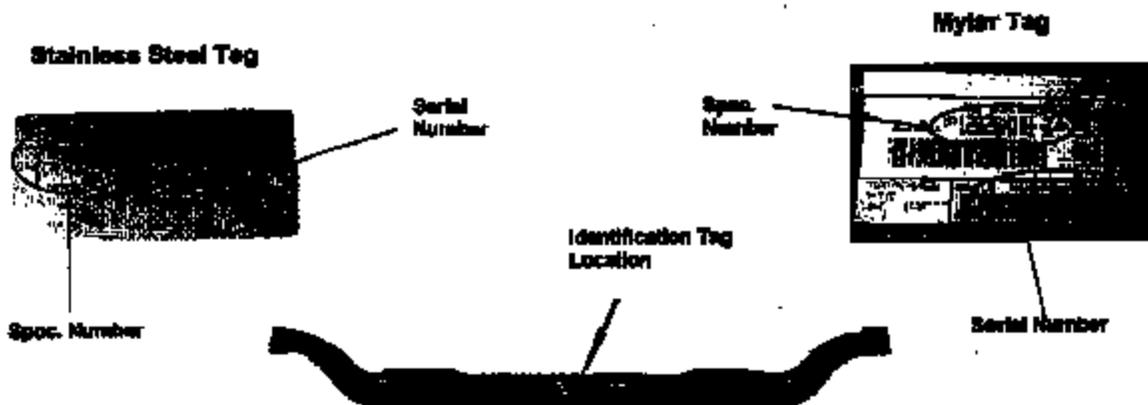
Vin Number (Last 8 Positions)	Steer Axle Serial No. (From Steer Axle Tag)	Steer Axle Spec. No. (From Steer Axle Tag)

### SHIPPING METHOD:

The Knuckle Replacement Kit will be direct shipped by Dana to the address indicated above.

### FAX INFORMATION TO:

**FAX (270) 827- 6108**  
**DANA AXLE DIVISION**  
**HENDERSON KY**  
**ATTN: SERVICE PARTS**



# Federal Recall Information

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## Supplier

Dana

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## Description

Front Axle Integral Knuckle and Steer Arm Assembly

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## Release Date

12/19/03

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## Introduction

### **FEDERAL RECALL CAMPAIGN 03KWA**

### **T2000 MODELS BUILT AT THE CHILLICOTHE FACTORY AUGUST 12, 2003 THROUGH AUGUST 29, 2003 WITH DANA E-XXX01 FRONT AXLE INTEGRAL KNUCKLE AND STEER ARM ASSEMBLY**

Kenworth Truck Company was notified by Dana that a defect, which relates to motor vehicle safety, exists with Dana E-1000I, E-1200I, E-1320I and E-1460I series steering axles. These axles were used on the Kenworth T2000. The subject vehicles were manufactured on August 12, 2003 through August 29, 2003. A total of 1 U.S. and 7 Canadian trucks are involved in this campaign. The chassis list and a copy of the customer letter are attached. The DWC and SIR online systems indicate chassis involved in this recall with the designator of "03KWA" in the campaign field.

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## Situation

Kenworth was notified that the integral knuckle on the driver's side of the E-1000I, E-1200I, E-1320I and E-1460I series steering axles were manufactured from a forging that may have a longitudinal crack in the steer arm. The crack may intersect a tapered hole that is machined into the part and used to mount the draglink ball stud to the steer arm. If the crack should propagate over time, the ball stud could become loose resulting in a loss of steering.

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## Resolution

Kenworth has initiated a recall to correct this condition. See the attached procedure on the inspection and replacement, if necessary, of the suspect knuckle and steer arm assembly.

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**It is a violation of Federal law for a dealer to sell or lease new vehicles covered by this recall until the defect or noncompliance has been corrected.**

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## **Warranty**

Kenworth will allow 0.5 hour for inspection. File Quick Claim 03KA1 for this repair.

Kenworth will allow 4.0 hours for inspection, replacement of the knuckle and steer arm assembly, and toe-in alignment. Dana will allow a \$50.00 US handling fee in lieu of parts mark up. File Quick Claim 03KA2 for this repair.

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## **Parts**

Parts are available through Dana. See Fax Order Form in the Attachments section below.