



# VEHICLE RECALL

**G-03512**  
**November 2003**

**SUBJECT: SAFETY RECALL (U.S., EXPORT)**

**Drag Link/Slack Adjuster Interference on 9900 Models Built  
7/18/2002 through 6/18/2003 with the Following Front Axle  
and Front Brake Feature Codes: Either 02ASD or 02ASE with  
04JBG**

**DEFECT DESCRIPTION**

The drag link used on post-2002 emissions compliant 9900's with these axle codes and this brake code will, under certain conditions, interfere with the front, driver's side, **brake chamber and slack adjuster**. This interference may cause damage to the slack adjuster and render it inoperable. An inoperable slack adjuster will cause the front brakes to wear unevenly and may eventually cause a **vehicle crash without warning** possibly resulting in **personal injury, property damage, or death**.

**MODELS INVOLVED**

This campaign covers 9900 models built 7/18/2002 through 6/18/2003 with the following front axle feature codes: Either 02ASD or 02ASE with front brake feature code: 04JBG.

**OWNER NOTIFICATION**

International Truck and Engine Corporation will notify owners of this campaign on their vehicles. A copy of the owner letter is attached. During the recall process a listing of owner names and addresses will be furnished to the involved dealers to enable dealers to follow up with owners and have the vehicles corrected. You must limit the use of this listing to this campaign because the list may contain information obtained from state motor vehicle registration records and the use of such motor vehicle registration data for purposes other than this campaign is a violation of law in several states.

## **PARTS INFORMATION**

***Due to the small number of vehicles involved in this recall (89 total), parts should be ordered only when a 9900 requiring the SERVICE PROCEDURE has been confirmed in the dealer's area.***

***There is a FAX ORDER form at the end of this letter that is required to be filled out and faxed in order to receive a correct Recall Service Kit.***

There are four (4) ***possible*** Recall Service Kits required for this recall.



***Please read carefully to determine, via line set ticket, which Service Kit is required for which vehicle.***

**You will be required to use the FAX form at the end of this letter to order the recall kit.**

They are:

<b>Part Number</b>	<b>Description</b>	<b>Qty</b>	<b>Front Axle Feature</b>	<b>Steering Gear Feature</b>
8900102R91	03512 Recall Service Kit, Sheppard Steering Gear, <b>12K Front Axle</b>	1	02ASD	05PSA
8900103R91	03512 Recall Service Kit, Sheppard Steering Gear, <b>13.2K Front Axle</b>	1	02ASE	05PSA
8900104R91	03512 Recall Service Kit, TRW/ROSS Steering Gear, <b>12K Front Axle</b>	1	02ASD	05PRJ
8900105R91	03512 Recall Service Kit, TRW/ROSS Steering Gear, <b>13.2K Front Axle</b>	1	02ASE	05PRJ

The number of vehicles requiring a kit is as follows. Please keep this under consideration when ordering kits:

<b>Part Number</b>	<b>Number of Vehicles Requiring Kit</b>	<b>%</b>
8900102R91	70	79%
8900103R91	5	6%
8900104R91	10	11%
8900105R91	4	4%
<b>TOTALS</b>	<b>89</b>	<b>100%</b>



***Please only order parts when a vehicle has been confirmed in your area!***

The **8900102R91** Recall Service Kit contains the following parts and should be used on vehicles with **02ASD & 05PSA**:

Part Number	Description	Quantity
3523195C91	Link, Steering Drag	1
3592699C1	Pitman Arm, Sheppard, 12K	1
8900106R91	ArvinMeritor Steer Arm Recall Kit	1
137214	Drag Link Cotter Pins	2

The **8900103R91** Recall Service Kit contains the following parts and should be used on vehicles with **02ASE & 05PSA**:

Part Number	Description	Quantity
3523195C91	Link, Steering Drag	1
3592703C1	Pitman Arm, Sheppard 13.2K	1
8900106R91	ArvinMeritor Steer Arm Recall Kit	1
137214	Drag Link Cotter Pins	2

The **8900104R91** Recall Service Kit contains the following parts and should be used on vehicles with **02ASD & 05PRJ**:

Part Number	Description	Quantity
3523195C91	Link, Steering Drag	1
3592700C1	Pitman Arm, TRW, 12K	1
8900106R91	ArvinMeritor Steer Arm Recall Kit	1
137214	Drag Link Cotter Pins	2
1670596C1	Poppet Adjust Kit	1

The **8900105R91** Recall Service Kit contains the following parts and should be used on vehicles with **02ASE & 05PRJ**:

Part Number	Description	Quantity
3523195C91	Link, Steering Drag	1
3592704C1	Pitman Arm, TRW, 13.2K	1
8900106R91	ArvinMeritor Steer Arm Recall Kit	1
137214	Drag Link Cotter Pins	2
1670596C1	Poppet Adjust Kit	1

The 8900106R91 ArvinMeritor Steer Arm Recall Kit contains the following parts:

Part Number	Description	Quantity
A3133T8002	Steering Arm	1
10X1592	Steer Arm Bolts w/ thread lock patch	2

All removed parts should be destroyed locally.

## **SERVICE PROCEDURE**

**NOTE:** Please refer to CTS-5000 Master Service Manual for more information regarding the standard procedure for each of the steps below.

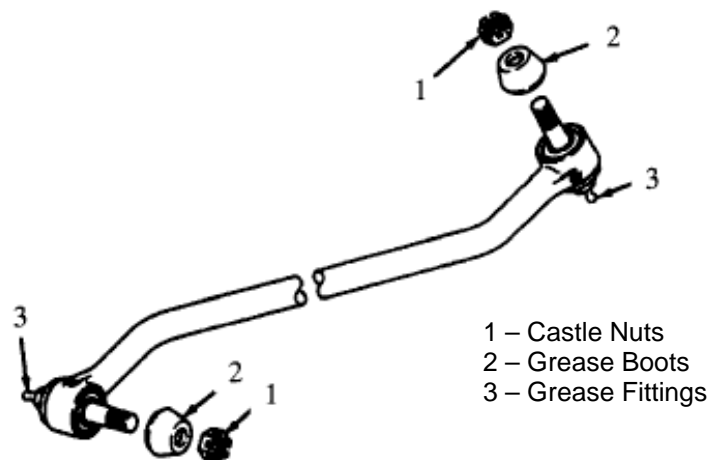


### **WARNING:**

*To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.*

#### **A. Remove Drag Link.**

1. Turn wheels to the left for better access to all components.
2. Put transmission in neutral and set park brake.
3. Open and secure hood.
4. Remove cotter pins and nuts from drag link ends where they fasten onto the steering arm and pitman arm.



**Figure 1**

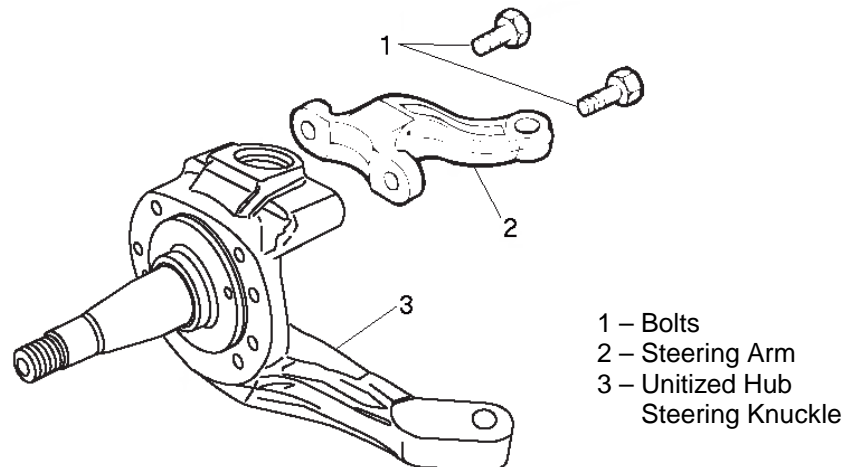
5. Separate drag link from pitman arm and drag link steering arm. Use a removal tool to separate drag link from steering arm if necessary.

**NOTE:** Observe the following precautions in regard to the power steering gear when the drag link or steering linkage is disconnected.

- Do not move the steering gear output shaft by way of the pitman arm when the drag link is disconnected. This may cause air to be introduced into the steering fluid.
- Do not turn steering gear input shaft more than 1.5 turns from center with the steering linkage disconnected on a TRW steering gear. If turned more than 1.5 turns, it may cause the automatic poppets to reset, affecting end of travel pressure relief.

### **B. Remove Steering Arm**

1. Remove steering arm bolts and steering arm.



**Figure 2**

### **C. Remove Pitman Arm**

#### **TRW/ROSS Steering Gear Procedure**

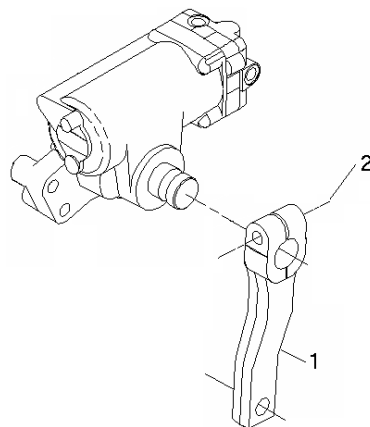
1. Remove pitman arm pinch bolt.
2. Remove pitman arm from sector shaft (**Figure 3**).



**CAUTION:**

To avoid personal injury, when using a chisel to spread a pinch bolt-type pitman arm boss for removal from the shaft, maintain a firm grip on the chisel at all times. Failure to do this may result in the chisel flying loose. Never leave the chisel wedged in the pitman arm boss. Be careful not to contact the sector shaft with the chisel.

If you cannot remove the pitman arm from the shaft with a chisel and your hands, remove the chisel from the arm boss and use a puller only to remove the pitman arm.



1 – Pitman Arm  
2 – Pinch Bolt

**Figure 3**

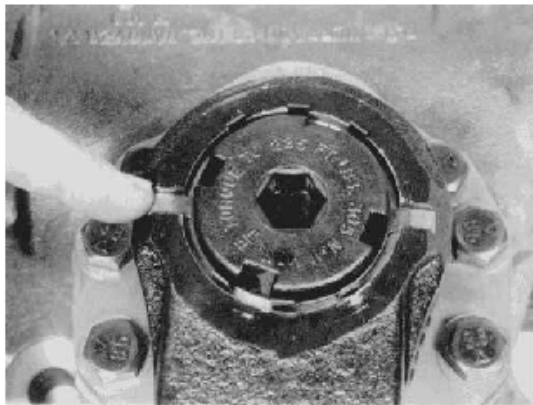
**SHEPPARD Steering Gear Procedure**

1. Use the small punch and ball peen hammer to bend the 2 restraining tabs out of the retainer so the retainer can be removed (**Figure 4**).



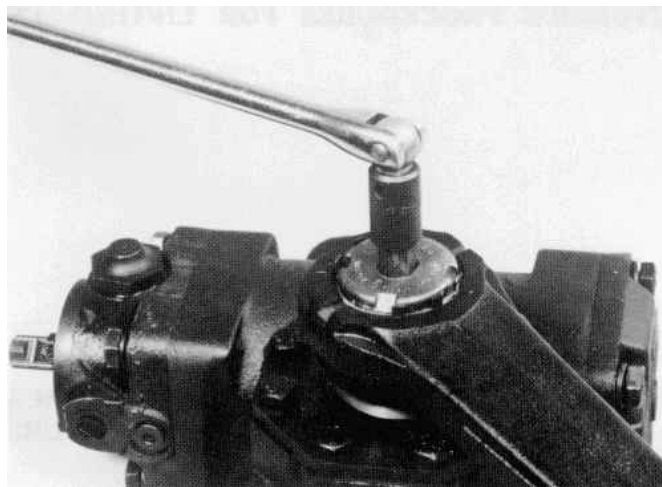
**Figure 4**

2. Do not bend the tabs in the pitman arm slot (**Figure 5**).



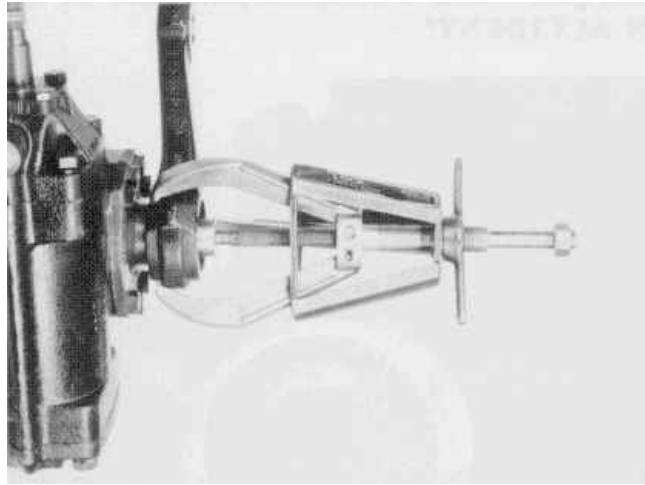
**Figure 5**

3. Use a 5/8" or 3/4" allen head socket and breaker bar to remove the tab lock retainer (**Figure 6**).



**Figure 6**

4. Attach a 3-jaw puller and remove pitman arm. The pitman arm will have three (3) pads for the jaws of the puller (**Figure 7**).



**Figure 7**



**WARNING:**

***To avoid damage to the sector shaft or pitman arm, DO NOT hammer the pitman arm or apply any source of heat during removal.***

***Damage to the pitman arm or sector shaft can cause vehicle crash without warning!***

**D. Install new Pitman Arm**

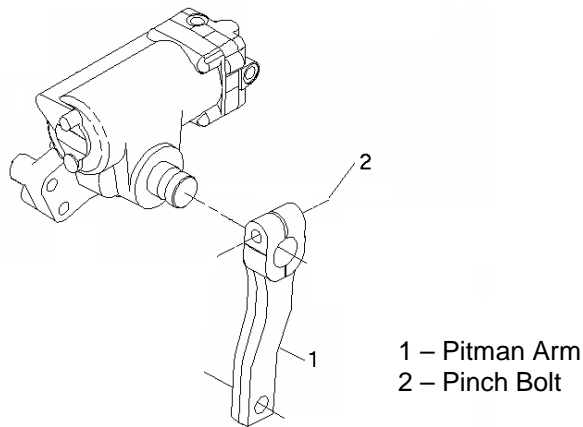
**TRW/ROSS Steering Gear Procedure**

1. Place tool in slot in pitman arm and apply enough force to spread slot opening so pitman arm can be installed on shaft.

**NOTE: Slot in pitman arm must not be spread more than 0.35" (8.9mm) and must not allow any permanent deformation of the pitman arm to gear joint.**

2. Place pitman arm on gear shaft, aligning the mark on the arm with the mark on the sector shaft.



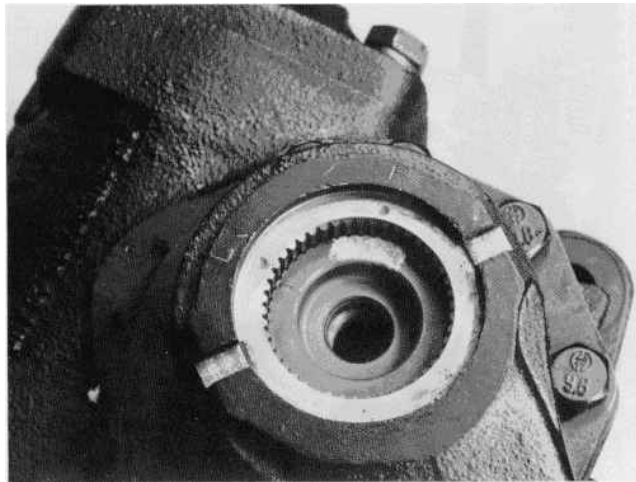


**Figure 8**

3. Remove tool, making certain that alignment of the hole and groove is maintained.
4. Assemble bolt and nut. Torque to **330-370 Lbf-Ft** (447-494 Nm).

### **SHEPPARD Steering Gear Procedure**

1. Install the pitman arm on the output shaft. Align the timing mark of the pitman arm with the timing mark of the output shaft (**Figure 9**).



**Figure 9**

2. Inspect the tab lock retainer assembly for broken tabs or thread damage before installation. Replace the retainer if any damage is found.

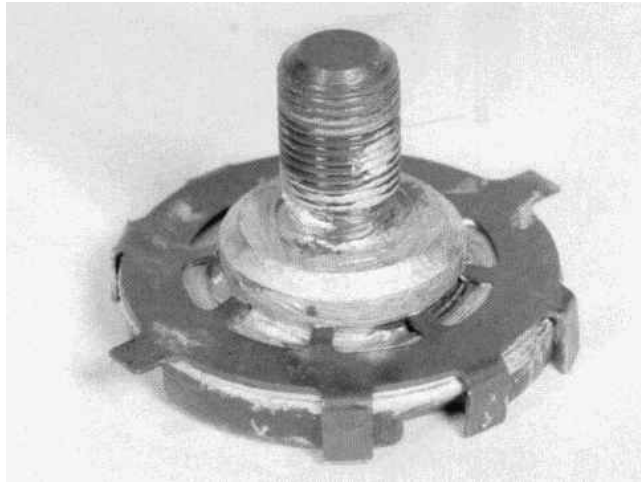
*If a new retainer is required, read the instruction sheet supplied with the retainer kit carefully! Discard the parts that are not required for your application.*

**NOTE:** Tab lock retainers are supplied with three torque specifications: 225 Lbf-Ft. (305 Nm), 350 Lbf-Ft. (475 Nm), or 450 Lbf-Ft (610 Nm). The torque value is stamped on the face of the retainer.

All Sheppard steering gears in this recall are M-100 model gears and will require 350 Lbf-Ft (475 Nm) of torque.

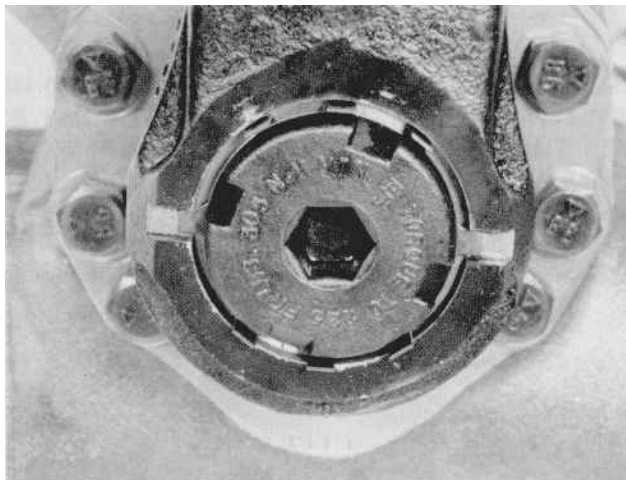
Check the torque value stamped on your retainer and in Table 1 to be sure your retainer is correct!

3. Apply an anti-seize compound to the threads of the sector shaft and retainer and on both sides of the friction washer (**Figure 10**).



**Figure 10**

4. Screw the retainer into the output shaft by hand and align the tabs of the retainer with the notches of the pitman arm (**Figure 11**).



**Figure 11**

5. Use the 5/8" or 3/4" allen head socket and torque wrench to install the retainer in the output shaft by tightening the retainer (**Figure 12**) according to Table 1.

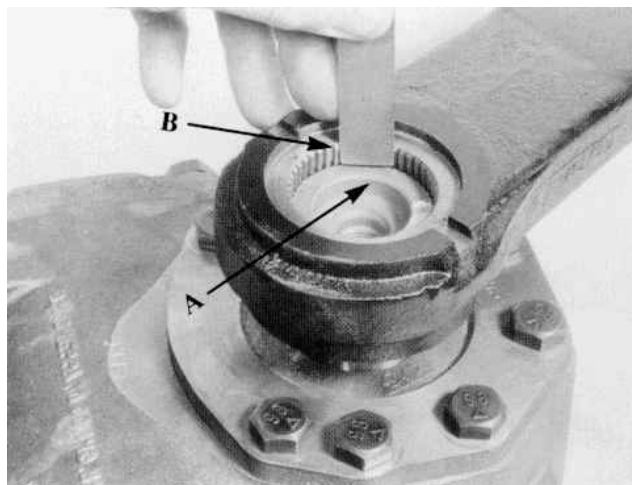


**Figure 12**

Steering Gear	Torque Lbf-Ft	Torque Nm
M-80	225	305
M-90	350	474
<b>M-100</b>	<b>350</b>	<b>474</b>
M-110	450	610

**Table 1 – Pitman Arm Retaining Bolt Torque**

6. After tightening the retainer, loosen and remove the retainer from the output shaft. Measure the distance from the end of the output shaft (**A**, **Figure 13**) to the recessed area of the pitman arm (**B**, **Figure 13**). The acceptable dimensions are in Table 2.



**Figure 12**

Steering Gear	Inches	mm
M-80	3/32-5/32	2.4-4
M-90	3/32-5/32	2.4-4
<b>M-100</b>	<b>3/32-5/32</b>	<b>2.4-4</b>
M-110	1/8-3/16	3.2-4.8

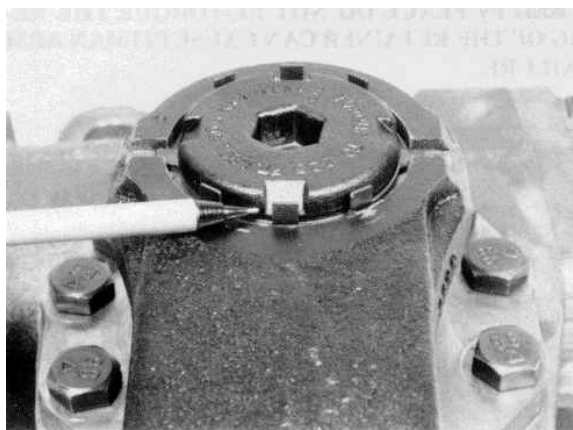
**Table 2** – Acceptable distance between A & B



**WARNING:**

*If the measurement does not meet the acceptable minimum or maximum tolerance, the sector shaft must be replaced. Failure to take the measurement or replace worn parts could result in pitman arm looseness which could lead to a vehicle crash without warning, possible resulting in property damage, personal injury or death.*

7. If the measurement is OK or if the sector shaft has been replaced, screw the retainer into the output shaft hand tight. Be sure to align the tabs of the retainer with the notches of the pitman arm.
8. Use a 5/8" or 3/4" allen head socket and torque wrench to tighten the retainer in the output shaft. Refer to **Figure 12** and torque the retainer according to **Table 1**.
9. After the specified torque value is reached, **continue tightening** until two of the restraining tabs of tab washer align with notches in the retainer (**Figure 14**).



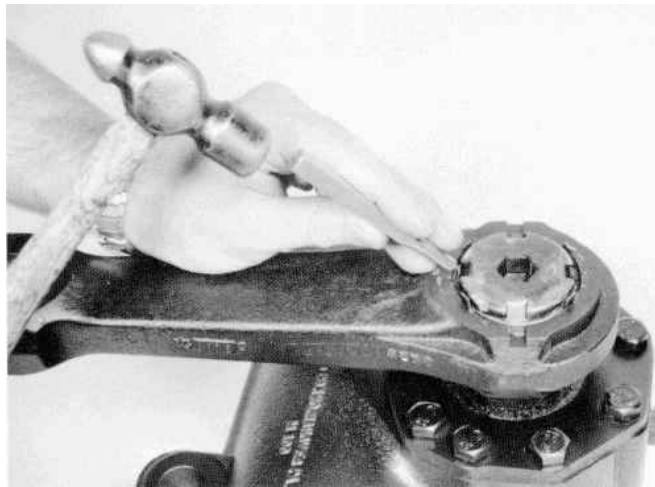
**Figure 14**



**WARNING:**

***If the tabs and notches do not line up, tighten beyond the specified torque value until two tabs align. Never back off the retainer to align the restraining tabs.***

10. Use a tapered punch and hammer to lock the restraining tabs into the retainer (**Figure 15**).



**Figure 15**

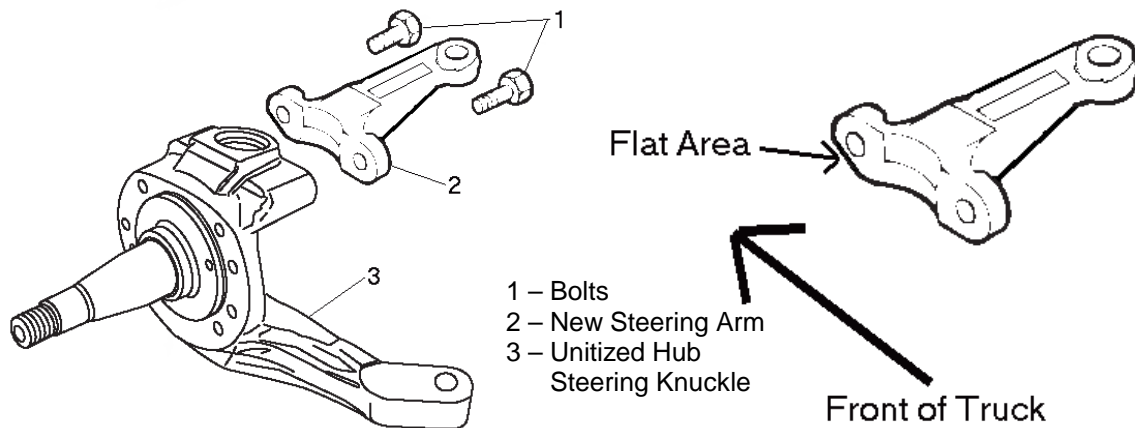


**WARNING:**

***To avoid personal injury always wear safety glasses and never use a punch that is damaged.***

### **E. Install New Steering Arm**

1. Install new steering arm as shown:



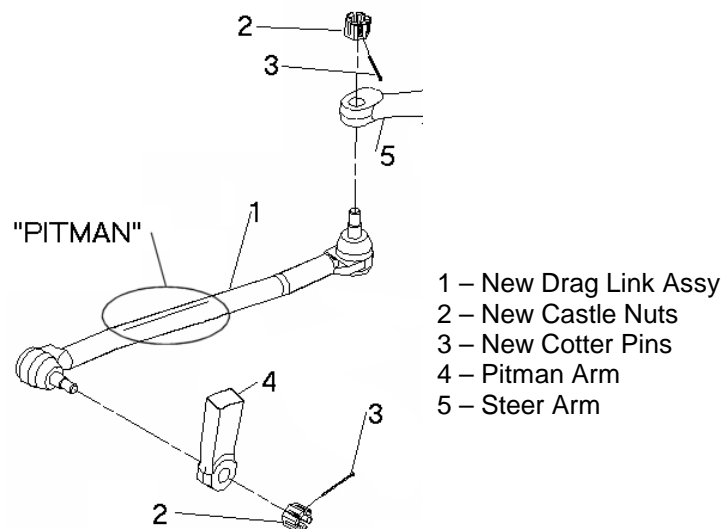
**Figure 16**

**NOTE:** Ensure flat area is facing toward the *front* of the truck and toward the *ground* for proper installation.

2. Install new bolts and torque to **300-450Lbf-Ft (406-610 Nm)**.

### **F. Install New Drag Link**

1. Install drag link as shown:



**Figure 17**

**NOTE:** The word "PITMAN" is stamped into the drag link to indicate its proper orientation. Install link with side marked "PITMAN" onto the new pitman arm. The word "PITMAN" should be facing upward (pitman arm grease fitting facing the ground) and readable when installed in the truck.

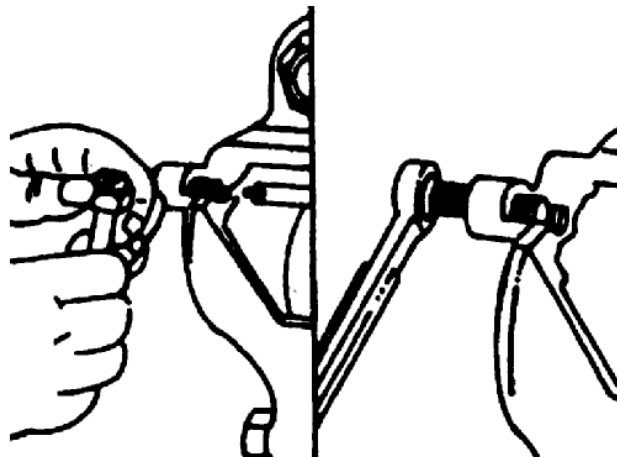
2. Torque castle nuts to **120-160 Lbf-Ft (163-218 Nm)**.
3. Install cotter pins. If necessary tighten nuts until the holes align. If cotter pin cannot be installed after minimum torque has been applied, the nut must be advanced until the cotter pin can be installed. **Do not loosen nut** to install cotter pin.

#### **G. Reset Steering Gear Poppets**

##### **TRW/ROSS Steering Gear Procedure**

1. Start the engine and allow the vehicle to idle for 5 to 10 minutes to warm the hydraulic fluid. Shut off the engine.
2. If a new poppet adjusting screw and nut are being used, turn the screw into the non-sealing end of the jam nut until the device end of the screw is flush with the nut (**Figure 18**).

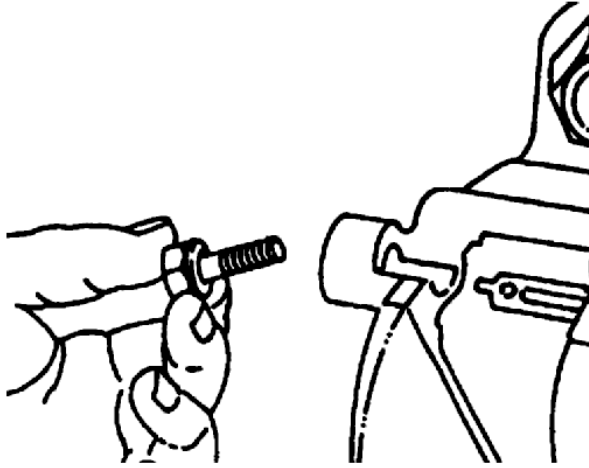
Your steering gear will have either a fixed stop bolt or an adjusting screw. If the adjusting screw is already part of the steering gear, back the nut off the adjusting screw until it is flush with the end of the adjusting screw.



**Figure 18**

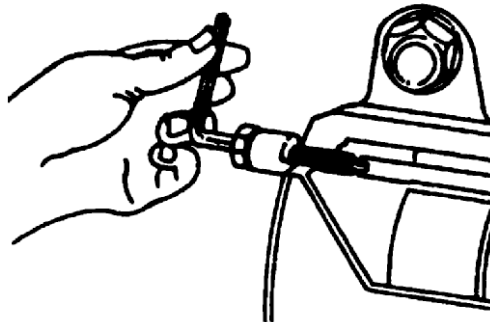
3. Make sure the engine is off and the front wheels of the vehicle are straight ahead. Remove and discard the poppet fixed stop bolt (if equipped) and washer from the lower end of the housing (**Figure 19**).

If the unit has a poppet adjusting screw and sealing nut that need to be replaced, remove and discard them.



**Figure 19**

4. With a 7/32" allen wrench, turn the adjusting screw and sealing nut assembly without rotating the nut on the screw into the housing until the nut is firmly against the housing. Tighten the sealing nut against the housing (**Figure 20**).



**Figure 20**

5. Check and refill the system reservoir with approved hydraulic fluid if necessary.

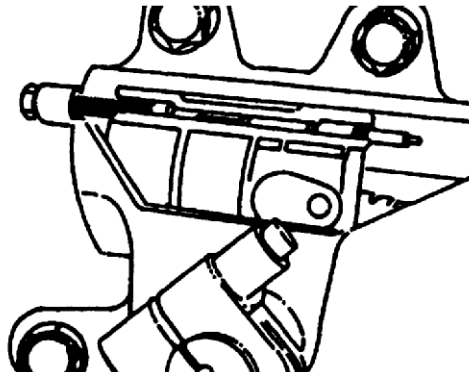




**CAUTION:**

**Do not mix fluid types. Mixing of transmission fluid, motor oil, or other hydraulic fluids will cause seals to deteriorate faster.**

6. Block the rear wheels and set the parking brake.
7. Place a jack under the center of the front axle and jack up the front end of the vehicle so the steer axle tires are off the ground.
8. Start the engine and run at idle speed. Note which output shaft timing mark is nearest the housing piston bore. Turn the steering wheel in the direction that makes this timing mark move toward the adjusting screw just installed. Turn in this direction until axle stop contact is made. Pull hard on the steering wheel (**30 Lbf (133 N)** pull on a 20" steering wheel) after the axle stop is contacted. This will prepare the upper poppet for setting (**Figure 21**).



**Figure 21**

9. To set the poppet, turn the steering wheel in the opposite direction (end of timing mark away from adjusting screw) until the other axle stop is contacted. Pull hard on the steering wheel (**30 Lbf (133 N)** pull on a 20" steering wheel). Release the steering wheel and shut off the engine (**Figure 22**).

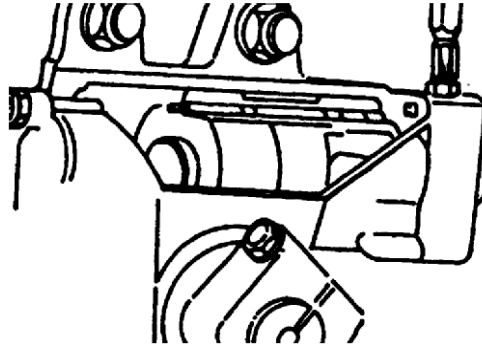


Figure 22



**CAUTION:**

**Do not hold the steering wheel at full turn more than 10 seconds at a time; the heat build-up at pump relief pressure may damage steering components.**

10. Loosen the sealing nut and back off the adjusting screw until 1" (25.4mm) past the nut. Tighten the sealing nut against the housing (**Figure 23**).

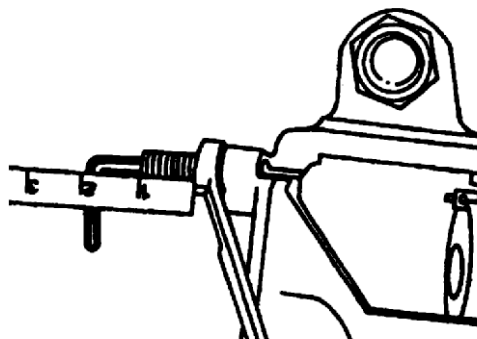


Figure 23

11. Start the engine and let idle. Turn the steering wheel in the original direction (end of timing mark toward adjusting screw) until axle stop contact is made. Hold the steering wheel in this position (**30 Lbf (133**

N) rim pull) for 10 seconds, then release. Repeat this hold and release process as many times as necessary while completing this step.

12. With steering wheel held at full turn, loosen the jam nut and hold it in place with a wrench. Turn the adjusting screw in (clockwise) using finger-pressure only - don't use a ratchet - until the Allen wrench comes to a stop. **Do not attempt to turn it in further.** Stop the turn-in process each time the driver releases the steering wheel; continue turning only while the steering wheel is being held at a full turn. Back off the adjusting screw 3-1/4 turns and tighten sealing nut to **33-37 Lbf-Ft (45-50 Nm) (Figure 24).**

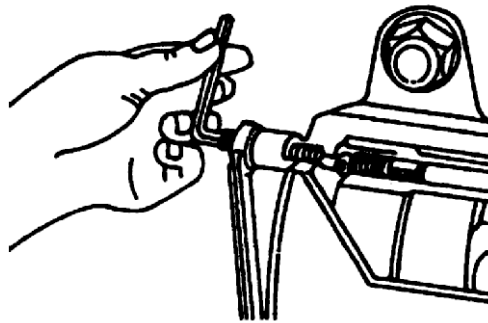


Figure 24



**CAUTION:**

**Do not hold the steering wheel at full turn more than 10 seconds at a time; the heat build-up at pump relief pressure may damage steering components.**



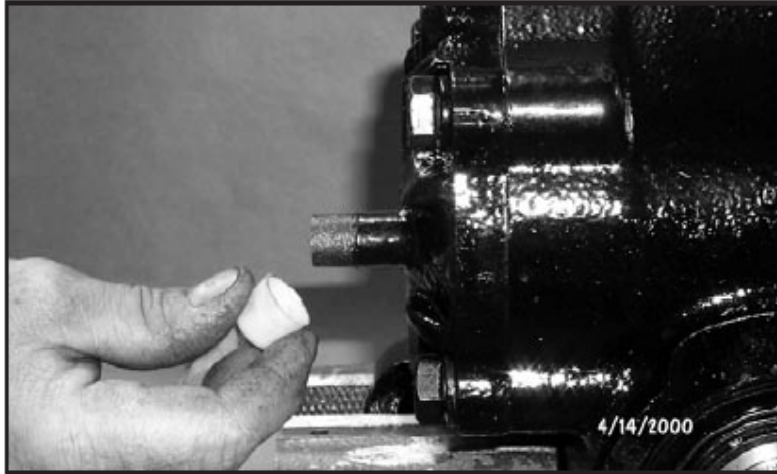
**CAUTION:**

**The length of the adjusting screw beyond the nut must be no more than 1-1/16" (27mm) for proper thread engagement**

13. The poppets have now been completely set. Check the power steering reservoir fluid level and fill if required.

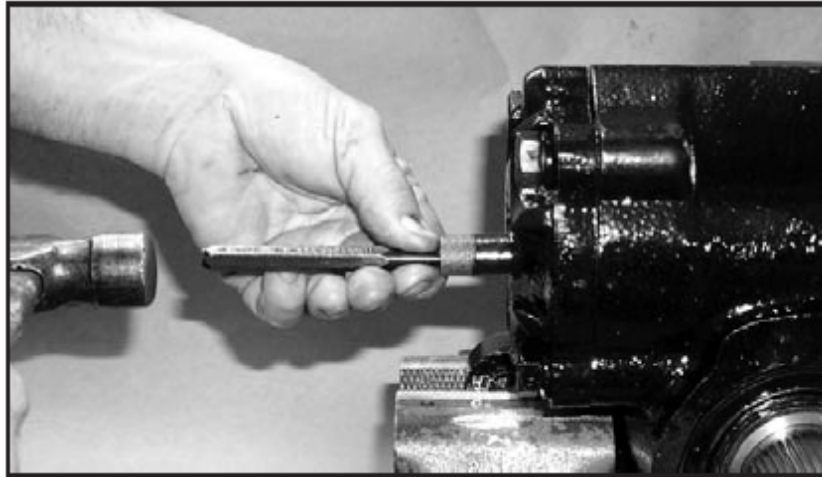
## **SHEPPARD Steering Gear Procedure**

1. Park the vehicle on a solid surface. Set the parking brake, chock the wheels and tilt the hood to access the front tires and steering gear.
2. Remove the plastic caps from both plunger holes.



**Figure 25**

3. Carefully insert a punch into the plunger hole, tap with hammer until they bottom in the bore.



**Figure 26**



### **CAUTION:**

**Take care when using the punch to ensure plunger bore is not damaged. A leak can occur if the bore is damaged during this procedure.**

4. Replace the plastic caps.
5. Raise the front axle until the tires clear the surface. Secure using jack stands.
6. Start the engine and turn the wheel to a full lock in both directions. Contacting the axle stop with the wheels off the ground will set the auto plunger to the correct position.
7. Return the wheels to straight ahead and lower the vehicle.

**NOTE: As you reach the end of travel, you will feel the piston contact the plunger. Continue turning until you reach the axle stop bolt.**

8. The relief plungers have now been completely set. Check the power steering reservoir fluid level and fill if required.

***E. Re-center steering wheel***

1. Close and secure hood.
2. Remove jack stands and lower vehicle to ground.
3. Re-center the steering wheel.

**NOTE: Please refer to CTS-5000 Master Service Manual for information regarding the procedure to remove and re-center the steering wheel.**

**END OF SERVICE PROCEDURE**

## LABOR INFORMATION

<u>Operation No.</u>	<u>Description</u>	<u>Time</u>
A40-03512-1	<b>Perform</b> Recall Service Procedure	1.5 hr

## CAMPAIGN IDENTIFICATION LABEL

*Each vehicle corrected in accordance with this campaign **must be** marked with a CTS-1075 Campaign Identification Label.*

Complete the label and attach on a clean surface next to the vehicle identification number (VIN) plate.

<b>DO NOT REMOVE</b>
<b>INTERNATIONAL</b>
Campaign No.
VIN Eng.#
<b>COMPLETED</b>
Service Location Code #
<b>DO NOT REMOVE</b>

## ADMINISTRATIVE/DEALER RESPONSIBILITIES (U.S. & POSSESSIONS)

Proceed immediately to make necessary correction to units in inventory. **All inventory vehicles subject to this recall campaign must be corrected prior to sale, transfer or delivery.** If vehicles have been sold or transferred and you are in receipt of Customer Notification Letters and Authorization for Recall Service cards for those vehicles, the transfer location or customer must be notified **IMMEDIATELY** from your dealer location.

Dealers must correct all vehicles subject to this campaign at no charge to the owner, regardless of mileage, age of vehicle, or ownership, from this time forward.

The National Traffic and Motor Vehicle Safety Act, as amended, provides that each vehicle that is subject to a vehicle recall campaign must be adequately **repaired** within a reasonable time after the owner has tendered it for repair. A failure to adequately repair within **60 days** after a tender of a vehicle is prima facie evidence of failure to repair within a reasonable time. If the condition is not adequately repaired within 60 days, the owner may be entitled to **replacement** with an identical or reasonable equivalent vehicle at no charge, or to a **refund** of the purchase price less a reasonable allowance for depreciation.

However, consistent with the customer notification, dealers are expected to complete the repairs on the mutually agreed upon service date.

To avoid having to replace an owner vehicle or refund the purchase price, every effort must be made to promptly schedule an appointment with each owner to repair his or her vehicle as soon as possible.

## **POSSIBLE CUSTOMER REIMBURSEMENT**

There may be an occasion when a customer was charged for repairs related to this recall prior to the recall being released. The customer letter contains a statement for the customer to contact the Dealer if they believe they are entitled to reimbursement costs. The Dealer should follow the Customer Reimbursement guidelines in Warranty Policy Letter 03-001G. The Warranty Procedures and Administrative Policies manual (CTS1100) is in the process of being updated to include the information in Policy Letter 03-001G.

## **WARRANTY CLAIMS**

Refer to Dealer Warranty Manual for procedures to conduct Recall Campaigns.

It is important that the Recall Coding be completed properly to assist in processing the warranty claim. Complete instructions will be found in the Warranty Manual, Section 7-1. Special attention should be given to Items 39 through 44:

GROUP	NOUN	C	WARR.	TP	PAD
<div>GROUP: Enter Recall Number _____</div>	<div>NOUN: Leave Blank. _____</div>	<div>C: (CAUSE) Enter either 1, 2, or 3. 1. Inspected – no corrections necessary 2. Inspected and repaired. 3. Defective part from parts stock.</div>	<div>WARRANTY: (Warranty Code) Enter 40. _____</div>	<div>TYPE PART: Enter P for type part causing failure. _____</div>	<div>PAD: Enter 100. _____</div>

## **ADMINISTRATIVE/DISTRIBUTOR RESPONSIBILITY (EXPORT)**

Proceed immediately to make necessary correction to units in inventory. All inventory vehicles subject to this recall campaign must be corrected prior to sale, transfer or delivery. If vehicles have been sold or transferred and you are in receipt of Customer Notification Letters and Authorization for Recall Service cards for those vehicles, the transfer location or customer must be notified from your distributor location.

Export locations are to submit warranty claims in the usual manner making reference to this recall number.

We ask for your full cooperation and follow-up to this important subject matter. If you have any questions or need further assistance, please contact the Regional Service Manager.

**INTERNATIONAL TRUCK AND ENGINE CORPORATION**

# SAFETY RECALL 03512 FAX ORDER FORM

FAX this form to **(630) 753-6305** to order a Recall Service Kit.

If the FAX is received before 2p.m., the kit will arrive within 24 hours.

## Instructions:

Please fill out the information below and check off which Recall Service Kit you require.

<i>Date:</i>	<i>Dealer PDC &amp; "ShipTo" Code:</i>
<i>Dealership:</i>	
<i>Dealership Contact Name:</i>	
<i>Phone:</i>	
<i>Vehicle Identification Number (VIN):</i>	
<i>Vehicle Mileage:</i>	
<i>Vehicle Owner's Name:</i>	

**Please check only one and refer to PARTS INFORMATION section of this letter to verify you are requesting the correct Recall Service Kit.**

Part Number	Description	Qty	Check ONE Only
8900102R91	03512 Recall Service Kit, <i>Sheppard</i> Steering Gear, <b>12K Front Axle</b>	1	<input type="checkbox"/>
8900103R91	03512 Recall Service Kit, <i>Sheppard</i> Steering Gear, <b>13.2K Front Axle</b>	1	<input type="checkbox"/>
8900104R91	03512 Recall Service Kit, <i>TRW/ROSS</i> Steering Gear, <b>12K Front Axle</b>	1	<input type="checkbox"/>
8900105R91	03512 Recall Service Kit, <i>TRW/ROSS</i> Steering Gear, <b>13.2K Front Axle</b>	1	<input type="checkbox"/>