


<b>Safety Bulletin</b>			 Tesco Corporation 5616 – 80th Street SE Calgary, AB. T2C 4N5 Phone: (403) 723-7902 Fax: (403) 723-7826 <a href="http://www.tescocorp.com">www.tescocorp.com</a>
<b>No: SB036</b>	Rev: 1	Date: 01 Sept 2010	
<b>Retrofit – Add Torque Limiting Mechanism to Casing Drive System Link Tilt Assembly</b>			

**BACKGROUND INFORMATION:**

In the event of a Casing Drive System (CDS™) actuator bearing failure that results in complete bearing seizure, the CDS link tilt hanger and links have the potential to rotate with the top drive quill if the CDS anti-rotation bracket fails. To address this safety concern, TESCO has created a retrofit kit to add a torque limiting breakaway system on the CDS link tilt assembly. The CDS link tilt breakaway system addresses the hazard of a rotating CDS link tilt system by providing a mechanical “fuse” that will fail before the CDS anti-rotation bracket.

A second version of the shear pin made of 4140 steel was introduced to replace the previous brass shear pin, after extensive field tests in April 2010.

A retrofit kit (TESCO part number 860197) has been created with the additional parts required to retrofit existing link tilt carriers. Please refer to the attached illustration I-860197. If the retrofit kit is used in conjunction with non-standard length anti-rotational brackets, contact your local TESCO Service Center and TESCO Engineering for additional guidance before implementation.

Third-party customers that own CDS tools must return the effected components to the local TESCO Service Center to have the required modifications completed.

**AFFECTED PRODUCT:**

All CDS link tilt assemblies manufactured prior to Dec. 31, 2007.

Affected Part No.	Description
540339, 16057	Carrier, Machined, Link Tilt Hanger, CDS
820052, 15258	Cap, Top, Actuator, CDS

**ACTION REQUIRED:**

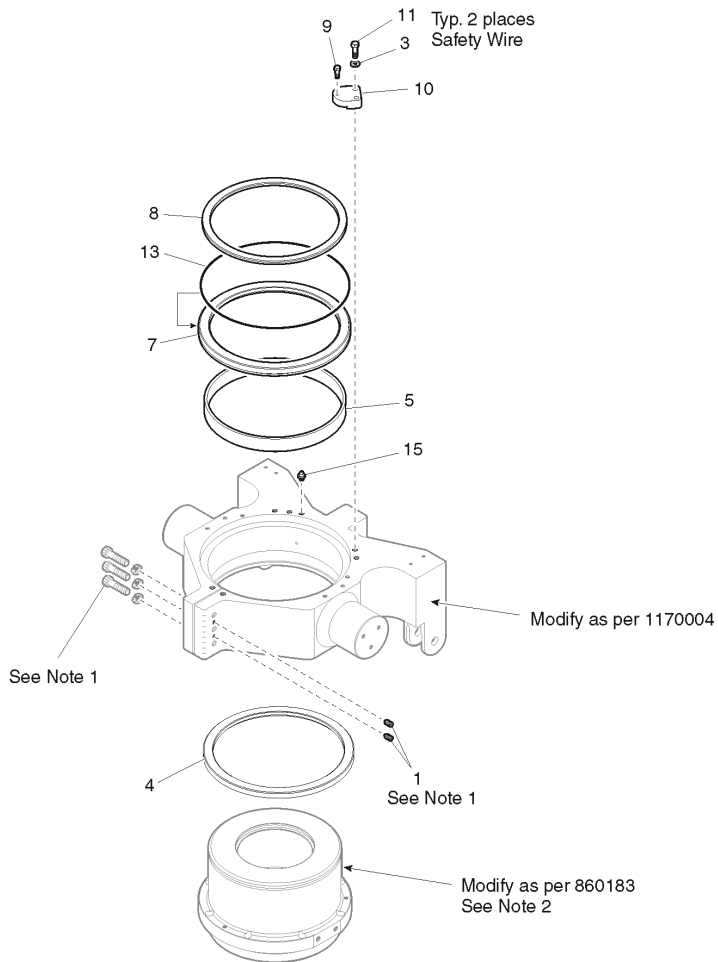
Refer to attached drawing I-860197.

1. Modify carrier (p/n 540339 or 16057) as per drawing 1170004 (drawing attached);
2. Modify top cap (p/n 820052 or 15258) as per drawing 860183 (drawing attached);
3. After the modification for both carrier and top cap, reassemble the link tilt kit by adding all the parts listed in drawing 860197;
4. See note 2 in drawing 860197, if the modified top cap interferes with actuator nameplate, replace the old nameplate with p/n 860184 using 4 screws p/n 14439.

A detailed work instruction WI-860197 giving step-by-step instructions to complete the modifications is also attached below.

**Contact your local TESCO Parts and Service Center for further information regarding this bulletin and or supply of affected components noted above.**

1	RPM	100901	126-0011	Included reference to new shear pin material, using retrofit kit with non-standard length anti-rotational brackets
0	RPM	070415		Issued for reference
Rev:	By:	Date:	ICD/ECN:	Description:




**Note 1:**

- Ensure Socket Head Capscrews are 4-5 turns loose, and adjust Jacking Set Screws (item 1) to permit Carrier Installation.
- Apply Loctite 243 to items 1. Adjust until Carrier rotates without binding.
- Turn in Set Screws additional 1/4 turn clockwise each.
- Apply Loctite 243 to Socket Head Capscrews and torque to 25 ft-lbs each.
- Confirm free rotation of Carrier.
- Adjust Capscrews and Set-screws if required.

**Note 2:** If Top Cap rework interferes with Actuator Nameplate, remove Nameplate and install new Nameplate (Part # 860184) using Drive Screws (Part # 14439, quantity 4).

Rev.	By	Date	ICD/ECN#	Description
0	LJW	071114	086-0063	Issued for manufacture
1	EC	100723	126-0011	Item 9 material changed from brass to steel

		Title	
		Retrofit Kit, Link Tilt, Torque Limiting, CDS	
File No	I-860197-1.ai	Model	CDS
Dwg No	I-860197	Rev.	1
		Sheet	1 of 2
Date	071114	Drawn	LJW
		Checked	
		Appd	

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# Parts List



Part # 860197

Drawing # I-860197

Rev. 1 Page 2 of 2

File # I-860197.xls

Refer: 1 Illustration

Drawing Title: Retrofit Kit, Link Tilt, Torque Limiting, CDS

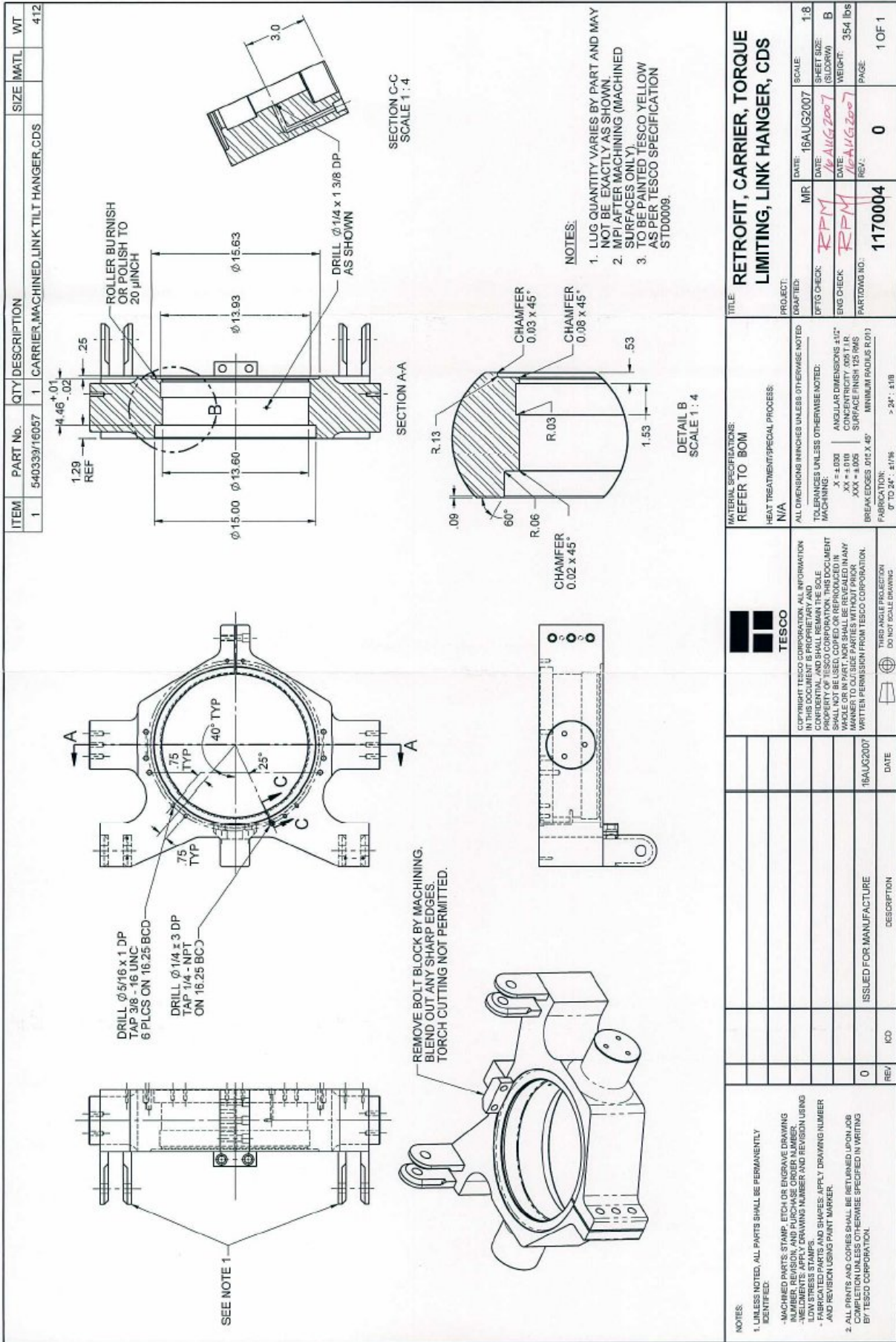
Item #	Tesco #	Qty	Description	Doc#
1	14573	2	Screw, Set, Skt Drive, Cup Pt, 1/2"-13UNCx1"	
2			Not used	
3	10632	2	Washer, Flat, Type A, Narrow, 3/8", Hardened, Pld	
4	1500003	1	Bearing, Thrust, Link Hanger, Torque Limiting, CDS	1500003
5	1500004	1	Nylatron GS, 3/16 x 1 1/2 x 43 3/4	
6			Not used	
7	1500002	1	Carrier, O-Ring, Link Hanger, Torque Limiting, CDS	1500002
8	510529	1	Ring, Retaining, External, 13.500"ID Shaft, 0.187"Thk	
9	5001684	1	Pin, Shear, Steel, CDS, Torque Limiting	5001684
10	830021	1	Stop, Torque, Torque Limiting, CDS	830021
11	8626	2	Screw, Cap, Hex Hd, 3/8"-16UNCx1-1/2", Gr8, Pld, Dr Hd	SEE 55251107
12			Not used	
13	1500005	1	O-Ring, N70-458, 14.475"IDx0.275"Dia	
14			Not used	
15	1116	1	Fitting, Grease, Str, Short, 1/4"-28Tpr Thd (SAE-LT)	

26-07-10

CHKD:

APPR'D:

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ITEM	PART No.	QTY	DESCRIPTION	SIZE	MATL	WT
1	540339/16067	1	CARRIER MACHINED LINK TILT HANGER, CDS			412

PROJECT: RETROFIT, CARRIER, TORQUE LIMITING, LINK HANGER, CDS	
DRAFTED: MR	DATE: 16AUG2007
DATE: 16AUG2007	SCALE: 1:8
DATE: 16AUG2007	SHEET SIZE: B
DATE: 16AUG2007	WEIGHT: 354 lbs
REV: 16AUG2007	PAGE: 1 OF 1
PARTING NO: 1170004	
REV: 0	

MATERIAL SPECIFICATIONS: REFER TO BOM	HEAT TREATMENT/SPECIAL PROCESS: N/A
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE NOTED	
TOLERANCES UNLESS OTHERWISE NOTED:	
X ± .000	
XX ± .005	
XXX ± .005	
BREAKED EDGES .012 X .45°	
FABRICATION: Ø TO 24" ± .0118	
Ø TO 24" ± .0118	

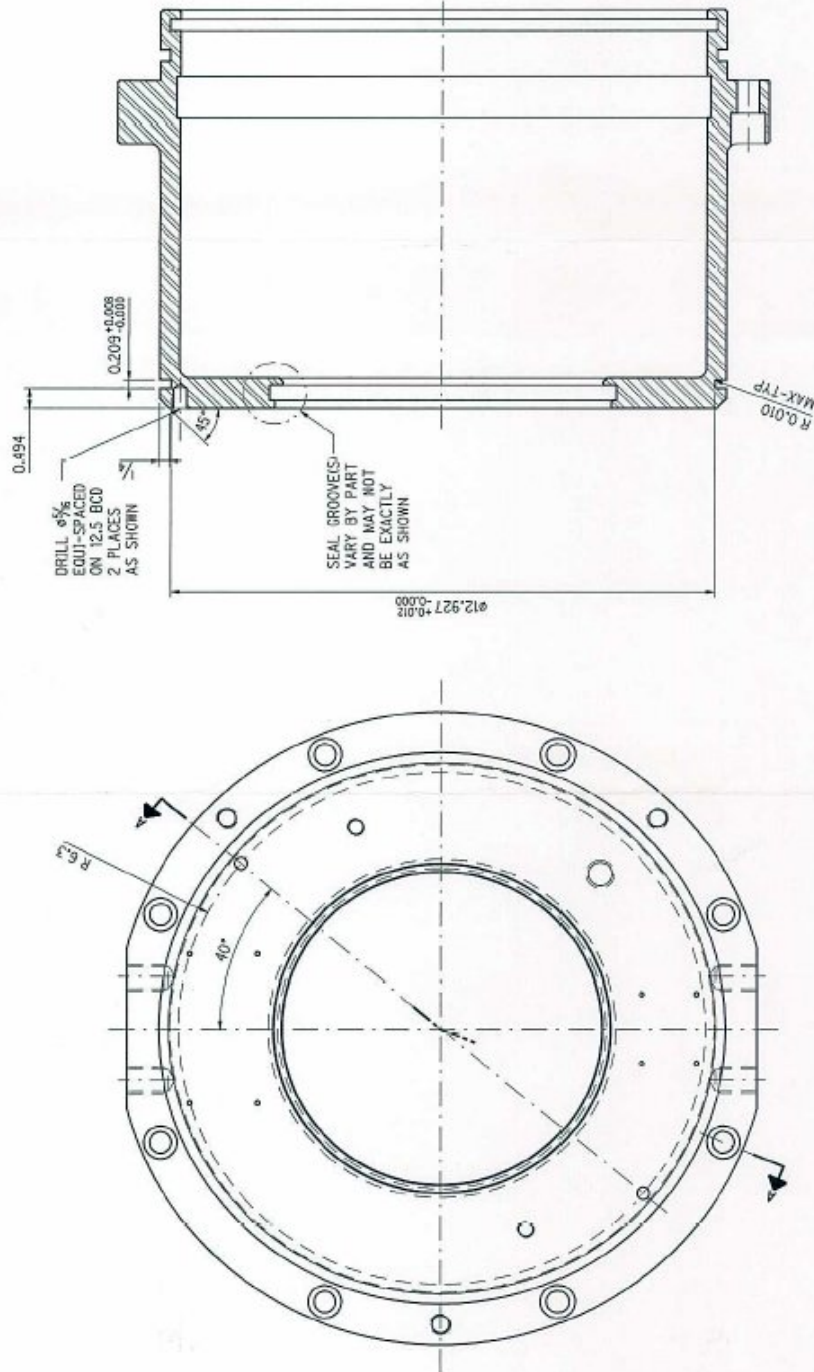
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ISSUED FOR MANUFACTURE	DATE: 16AUG2007

REV	ICD	DESCRIPTION
0		ISSUED FOR MANUFACTURE

NOTES:

- UNLESS NOTED, ALL PARTS SHALL BE PERMANENTLY IDENTIFIED.
- MACHINED PARTS, STAMP, ETCH OR ENGRAVE DRAWING NUMBER, REVISION, AND PURCHASE ORDER NUMBER.
- WELDED PARTS, STAMP OR ENGRAVE ORDER NUMBER, REVISION, AND PURCHASE ORDER NUMBER.
- FABRICATED PARTS AND SHAPES, APPLY DRAWING NUMBER AND REVISION USING PAINT MARKER.
- ALL PARTS AND COPIES SHALL BE RETURNED UPON JOB COMPLETION UNLESS OTHERWISE SPECIFIED IN WRITING BY TESCO CORPORATION.

ITEM	PART NO.	QTY	DESCRIPTION
1	126-0011		CAP TOP ACTUATOR, CDS




NOTE  
 1. MPI MACHINED AREAS.  
 2. ZINC PHOSPHATE AND OIL MACHINED AREAS BY IMMERSION PROCESS TO OBTAIN 1000 - 3000 mg. PER SQ. FT. COVERAGE AFTER MPI.

SECTION A-A

NOTES:		MATERIALS INFORMATION:		DATE:	
1. UNLESS NOTED, ALL DIMENSIONS SHALL BE IN MILLIMETERS (INCHES). 2. ALL DIMENSIONS SHALL BE TO UNLESS OTHERWISE SPECIFIED. 3. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 4. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 5. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 6. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED. 7. DIMENSIONS ARE TO UNLESS OTHERWISE SPECIFIED.		REFER TO BOM FOR MATERIALS INFORMATION		DATE: 16AUG2007	
COPYRIGHT © 2007 TESCO CORPORATION. ALL RIGHTS RESERVED. THIS DOCUMENT IS UNCLASSIFIED AND SHALL REMAIN THE PROPERTY OF TESCO CORPORATION. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT PERMISSION FROM TESCO CORPORATION.		TESCO CORPORATION		SCALE: 1:2	
ISSUED FOR MANUFACTURE		DATE: 16AUG2007		DRAWN: M.K.	
DESCRIPTION: RETROFIT, CAP, TOP, TORQUE LIMITING, LINK HANGER, CDS		PART NO.: 126-0011		REV: 0	
REV: 0		DATE: 16AUG2007		DRAWN: M.K.	
DESCRIPTION: RETROFIT, CAP, TOP, TORQUE LIMITING, LINK HANGER, CDS		PART NO.: 126-0011		REV: 0	
REV: 0		DATE: 16AUG2007		DRAWN: M.K.	
DESCRIPTION: RETROFIT, CAP, TOP, TORQUE LIMITING, LINK HANGER, CDS		PART NO.: 126-0011		REV: 0	
REV: 0		DATE: 16AUG2007		DRAWN: M.K.	
DESCRIPTION: RETROFIT, CAP, TOP, TORQUE LIMITING, LINK HANGER, CDS		PART NO.: 126-0011		REV: 0	
REV: 0		DATE: 16AUG2007		DRAWN: M.K.	
DESCRIPTION: RETROFIT, CAP, TOP, TORQUE LIMITING, LINK HANGER, CDS		PART NO.: 126-0011		REV: 0	
REV: 0		DATE: 16AUG2007		DRAWN: M.K.	

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0	RPM	070415		Issued for reference

 <p>Tesco Corporation 5616 – 80<sup>th</sup> Avenue SE Calgary, Alberta T2C 4N5 Phone: (403) 723-7902 Fax: (403) 723-7826 Web: <a href="http://www.tescocorp.com">www.tescocorp.com</a></p>	<b>Work Instruction</b>		
	<b>WI No: WI-860197</b>	<b>Rev: 0</b>	<b>Date: July 23, 2010</b>
	<b>Description: Modification Instructions For The CDS Torque Limiting Link Tilt Retrofit Kit</b>		
<b>Originator: Ryan Miller</b>	<b>Checked:</b>	<b>Approved:</b>	
<b>Date: July 23, 2010</b>	<b>Date:</b>	<b>Date:</b>	

## 1 Scope

This document covers the additional machining required to convert an existing casing drive system (CDS) actuator top cap and an existing CDS link tilt hanger carrier into the torque limiting version.

## 2 Tools and Equipment Required

N/A

## 3 Safety Precautions

The actuator is under spring pressure. Use extreme caution when assembling or disassembling the actuator.

Perform a Job Safety Analysis – JSA before assembling and disassembling the actuator. Ensure all hazards and risks are included in the JSA and discussed with personnel involved prior to start of maintenance job.

Use appropriate Personal Protective Equipment according to hazards found in JSA.

Capture any change in maintenance procedures/tools in JSA and remind personnel involved in maintenance jobs prior to start of maintenance jobs.

## 4 Procedure

### 4.1 CDS Actuator Top Cap Modifications:

Reference drawing: 860183

1. Obtain an existing top cap, part #15258 (Mark 1) or part #820052 (Mark 2).
2. Add the retaining ring groove ( $\text{Ø}12.927'' \times 0.209''$ ) as shown in drawing 860183.
3. Add the two  $\text{Ø}5/16'' \times 0.494''$  deep drilled holes as shown in drawing 860183.
4. MPI machined areas. Any indications found will be brought to the attention of TESCO Engineering.
5. Zinc phosphate and oil machined areas by immersion process to obtain 1000 – 3000 mg per sq. ft. coverage after MPI.

Note: If the top cap is removed from the actuator to perform this modification, the actuator shall be retested as per EM000145, Post Assembly Actuator Tests #1 through 5.

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## 4.2 CDS Link Tilt Hanger Carrier Modifications:

Reference drawing: 1170004

1. Obtain an existing link tilt hanger carrier, part #540339 or part #16057.
2. Remove the bolt block by machining as shown in drawing 1170004. Any sharp edges are to be blended out. Torch cutting is not permitted.
3. Drill and tap the six  $\text{Ø}3/8'' - 16 \text{ UNC} \times 1''$  deep holes as shown in drawing 1170004.
4. Drill and tap the  $\text{Ø}1/4'' - \text{NPT} \times 3''$  deep hole as shown in drawing 1170004.
5. Cross drill the  $\text{Ø}1/4'' \times 1-3/8''$  deep hole as shown in drawing 1170004.
6. Open up the bore of the carrier to  $\text{Ø}13.60''$  as shown in drawing 1170004.
7. Open up the top 1.29'' (REF) of the bore to  $\text{Ø}15.00''$  as shown in drawing 1170004.
8. Open up 1.53'' of the bore to  $\text{Ø}13.93''$  as shown in drawing 1170004.
9. Spot face the bottom 0.25'' of the bore to  $\text{Ø}15.63''$
10. Roller burnish or polish the bottom spot face to 20  $\mu$  inch as shown in drawing 1170004.
11. MPI machined areas. Any indications found will be brought to the attention of TESCO Engineering.
12. Paint TESCO yellow as per TESCO specification STD0009.

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