



**MWO 9-2330-392-20-1**

**1. PURPOSE.**

This modification is to provide a procedure for the installation of an upgrade for the original equipment surge brake actuator. It is replaced by an improved cast surge brake actuator with modified components.

**2. PRIORITY.**

This modification is classified as Emergency.

<b>NOTE</b>
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All High Mobility Trailers (HMT's) manufactured by Raytheon/Silver Eagle can be modified using this MWO. Trailers identified below were bought under contract DAAE07-94-C-R014.

**3. END ITEMS TO BE MODIFIED.**

The following vehicles shall be modified using this MWO:

<b>NOMENCLATURE</b>	<b>NSN</b>	<b>PART NUMBER (P/N)</b>	<b>CAGE</b>	<b>SERIAL NUMBER</b>
Trailer, Cargo: 2-Wheel M1101	2330-01-387-5443	7192	33875	ALL
Trailer, Cargo: 2-Wheel M1102	2330-01-387-5426	6636	33875	ALL
Trailer, Cargo: 2-Wheel	2330-01-387-5424	6668	33875	ALL

**4. MODULES TO BE MODIFIED.**

Not Applicable.

**5. PARTS TO BE MODIFIED.**

Not Applicable.

**6. APPLICATION.**

- a. Time Compliance Schedule. The effective date of this MWO is 3 March 2001 and it's completion is 30 Sept 2002.

- b. Level of Maintenance. The lowest level of maintenance authorized to apply this MWO is Unit Maintenance.
- c. Work Force and Man-Hours Requirements.

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**REQUIREMENTS**

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<b>WORK FORCE/SKILLS</b>	<b>MAN-HOURS</b>
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Wheeled vehicle mechanic (MOS 63B) or equivalent	1
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Total man-hours required for a single application of this MWO is 1 hour.

<b>WARNING</b>
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MWO 9-2330-392-35-1, STEEL DRAW BAR must be installed prior to installing new Surge Brake Actuator. Failure to follow this warning will result in catastrophic failure of the aluminum drawbar leading to equipment damage and possible injury or death of personnel.

- d. MWOs To Be Applied Prior to or Concurrently with this MWO. Installers will verify MWO 9-2330-392-35-1, Steel Draw Bar has been applied.
- e. Additional Information. Not Applicable.

**7. TECHNICAL PUBLICATIONS AFFECTED/CHANGED.**

TM 9-2330-392-14&P, 1 October 1995

**8. MWO KIT/PARTS AND THEIR DISTRIBUTION**

- a. Kit Needed to Apply MWO.

<b>NSN:</b>	5340-01-483-5848
<b>NOMENCLATURE:</b>	Modification Kit, HMTV Actuator Assembly
<b>CAGEC:</b>	19207
<b>P/N:</b>	57K4435
<b>SECURITY CLASS:</b>	Unclassified
<b>SHIPPING WEIGHT:</b>	40 lbs.
<b>DIMENSIONS:</b>	18 in. X 12 in. X 12 in.
<b>VOLUME:</b>	1.6 cu. Ft.

b. Contents of MWO Kit:

ITEM	NOMENCLATURE	CAGEC	P/N	QTY
1	Slide	19207	12479774	1
2	Roller, Master	19207	12479776	2
3	Pin, Master	19207	12479777	1
4	Housing, Sub Assembly	19207	12479795	1
5	Bolt 1/2 x 5.00	05047	B210NA00CAM37354BNBA1	1
6	Bolt 1/2 x 5.75	05047	B210NA00CAM40354BNBA1	1
7	Bolt 5/8 x 5.50	05047	B210NA00CAP39354BNBA1	1
8	Cotter Pin	96906	MS24665-421	2
9	Strap, Tiedown	96906	MS3367-1-0	1
10	Nut, Self-Locking	96906	MS51922-33	2
11	Nut, Self-Locking	96906	MS51922-49	1
12	Bolt 5/16 x 5/8	05047	S630NA84CAG12354BNBA3	4
13	Washer, Flat	05047	W221NAAW087NN039NNBA1	1
14	Plate, MWO	19207	10930014	1
15	Rivet, Blind	19207	12449496-1	1

c. Bulk And Expendable. Not applicable.

d. Part Disposition. All parts removed and not used during installation will be disposed of IAW AR 725-50 and local policy

**9. SPECIAL TOOLS; TOOL KITS; JIGS; TEST, MEASUREMENT, AND DIGNOSTICS EQUIPMENT (TMDE); AND FIXTURES REQUIRED.**

NOMENCLATURE	NSN	CAGEC	SUPPLY CATALOGUE
Tool Kit, General Mechanics	5180-00-177-7033	50980	SC 5180-90-CL-N26
Drill, Twist 41/64"	5133-00-228-1328	81348	SC 4910-95-A31
Shop Equipment, Automotive Maintenance And Repair Common No. 1	4910-00-754-0654	19204	SC 4910-95-CC-A74

## 10. MODIFICATION PROCEDURES.

1. Remove cotter pin (1), flat washer (2) and master pin (3) from housing (4). Discard cotter pin and master pin. (figure 1)

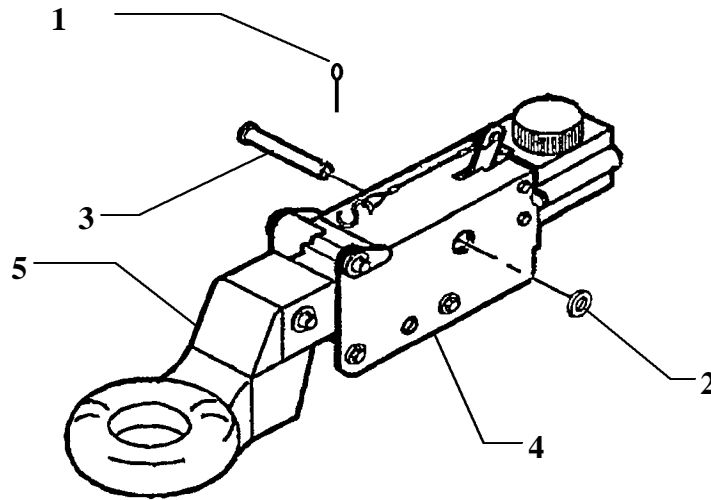


Figure 1

2. Pull inner slide (5) from housing (4); master rollers are on either side of damper inside the inner slide and will be discarded in step 4. (figure 1)
3. Remove damper cotter pin (6), washer (7) if installed and damper pin (8) from front of inner slide (5). Discard cotter pin and washer. (figure 2)

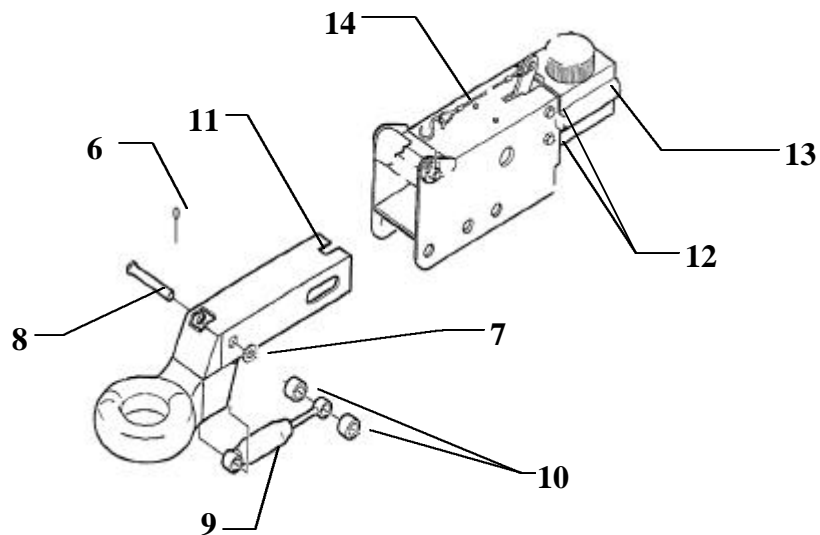


Figure 2

4. Remove damper (9). Check for leaking and corrosion on rod. (figure 2)  
Save damper (9) and front damper pin (8) for re-use. Replace damper if leaking or corrosion can't be removed. Discard rollers (10) and inner slide (11). (figure 2)
5. Remove four brake master cylinder mounting bolts (12) holding master cylinder (13) to housing (14) (figure 2). Do NOT disconnect hydraulic hose. Discard removed four master cylinder mounting bolts.

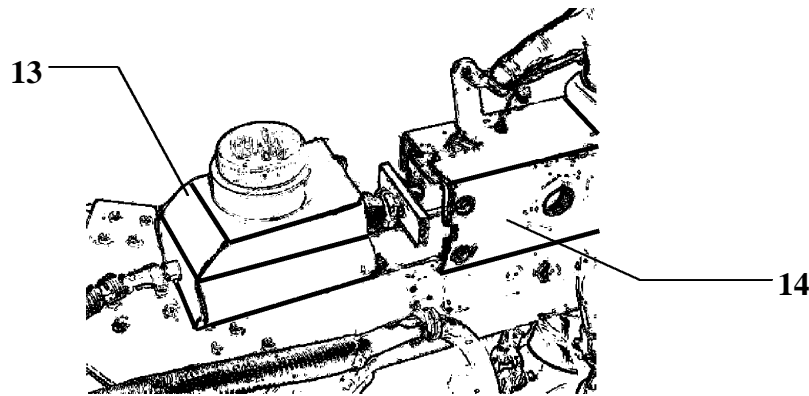


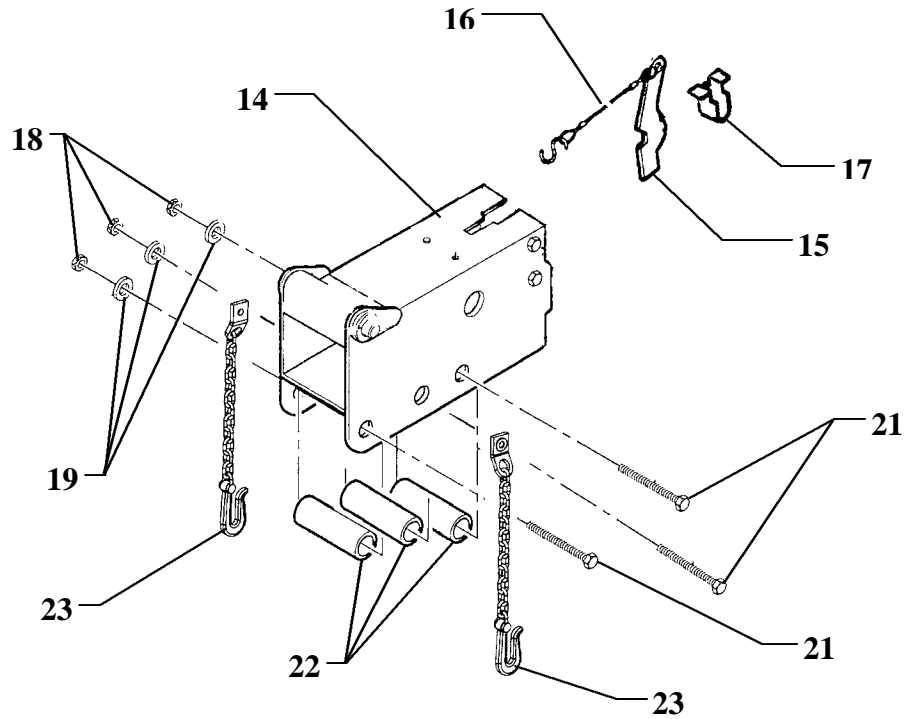
Figure 3

6. Remove master cylinder (13) from housing (14). (figure 3) Tie out of the way so master cylinder does not hang by the hydraulic hose. Do NOT disconnect hydraulic hose or in any way open the brake hydraulic system.

**WARNING**

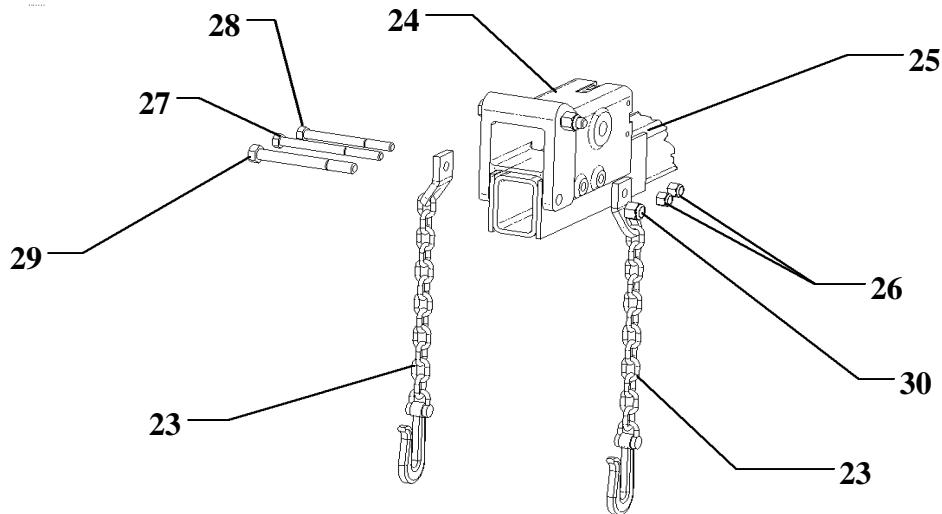
MWO 9-2330-392-35-1, STEEL DRAW BAR must be installed prior to installing new Surge Brake Actuator. Failure to follow this warning will result in catastrophic failure of the aluminum drawbar leading to equipment damage and possible injury or death of personnel.

7. Pull out the emergency brake actuation hardware from the housing —the lever (15), cable (16) and metal “U” clip (17) and save for re-use. Note that the metal “U” clip may be stuck to the master cylinder assembly. Remove three locknuts (18), three washers (19), three capscrews (21) and three spacers (22) securing hydraulic actuator housing (14) to trailer. NOTE: If MWO 9-2330-392-35-1 has been applied, vehicle will not have spacers (22). Retain the safety chains (23) for re-use. (figure 4) Discard bolts, nuts and washers. Remove housing from drawbar.



**Figure 4**

8. Mount cast brake actuator housing P/N 12479795 (24) on drawbar (25), aligning the three mounting-bolt holes. (figure 5)



**Figure 5**

9. Install one used 1/2" bolt through the front housing mounting bolt hole for alignment ONLY. This is used to hold the housing in place so that the 1/2" front mounting hole can be enlarged to 5/8" for the new supplied front mounting bolt.

10. Install two new supplied 1/2" rear housing mounting bolts (27) and (28); and nuts, P/N MS51922-33 (26) (figure 5) insuring that the 5.75 long bolt (27) (figure 5) is in the middle hole with the chains (23) (figure 5) and the 5.00 long bolt (28) (figure 5) is in the rear hole. Hand tighten only enough to hold housing in place while front hole is drilled out.

NOTE: ONLY THE FRONT HOUSING FRONT BOLT HOLE MUST BE ENLARGED. THE 2<sup>ND</sup> AND 3<sup>RD</sup> HOUSING MOUNTING BOLTS REMAIN 1/2".

11. Using the cast housing as a guide, drill out the front housing mounting bolt hole in the drawbar and sideplates to 41/64" to accommodate the new supplied 5/8" mounting bolt. Take care not to remove material from the cast housing hole during drilling of the drawbar and sideplates. NOTE: the cast housing is supplied with a front mounting bolt hole ready to accommodate the new 5/8" supplied bolt.
12. Clean debris from drilling operation, ensuring holes are smooth and free of burrs.
13. Install 5/8" front mounting bolt (29) and nut (30). (figure 5) Torque all three nuts to 105 lbs. ft.

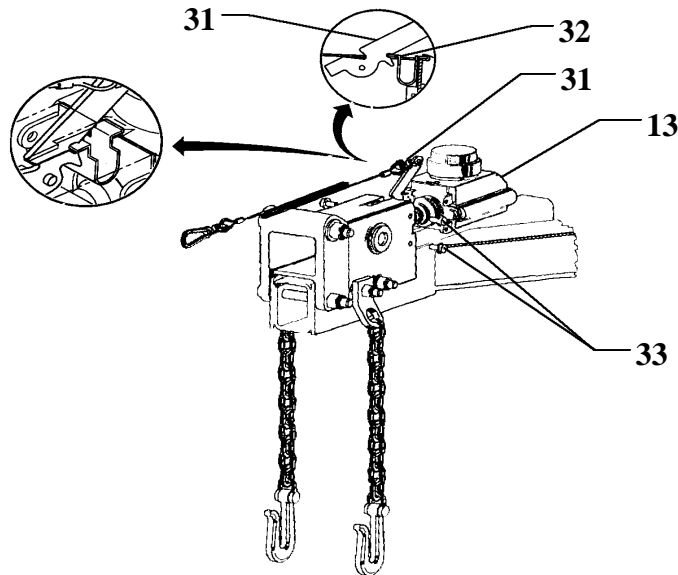
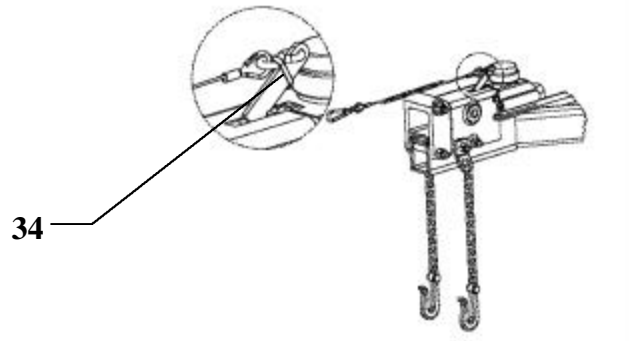


Figure 6

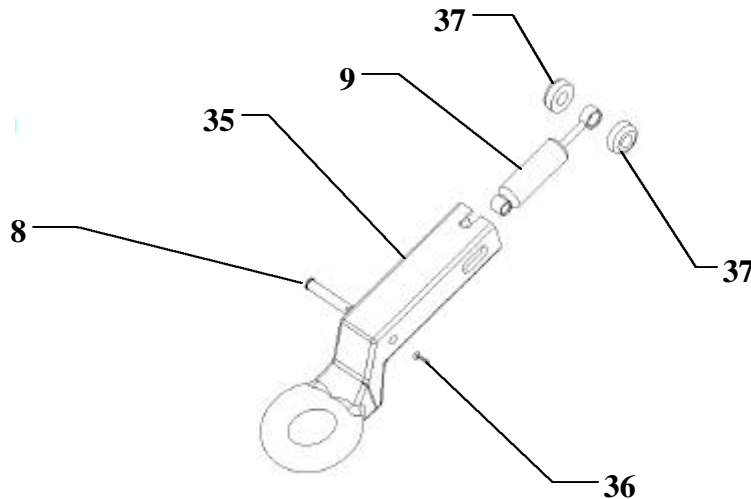
14. Position emergency brake lever/cable assembly (31) and metal "U" clip (32) in cast housing slot prior to master cylinder installation. (figure 6)
15. Install master cylinder (13) using four new master cylinder mounting bolts P/N S630NA84CAG12354BNBA3 (33), (figure 6) torque to 30 ft/lbs +/- 3 ft/lbs.





**Figure 7**

16. Install supplied tie-wrap (34) on emergency brake lever/cable assembly (figure 7). Make sure tie wrap goes through the eye of the “S” hook and around the lever. This ensures the cable cannot be damaged by contact between the sheet metal master cylinder cover and the cast housing when the trailer is in service.



**Figure 8**

17. Install the damper (9) in inner slide P/N 12479774 (35). The small damper-eye goes in first, toward lunette ring. Secure the damper re-using the damper pin (8) removed in Step 3; ensure the damper pin passes through the damper eye. Install a new cotter pin P/N MS24665-421 (36) through the damper pin. (figure 8)
18. Install new supplied rollers P/N 12479776 (37) inside the inner slide (35), on either side of the rear damper eye. (figure 8) The rollers must have the chamfered sides facing the walls of the inner slide. Align roller holes with rear damper eye so that master pin can pass through the inner slide slot, the rollers and the rear damper eye.

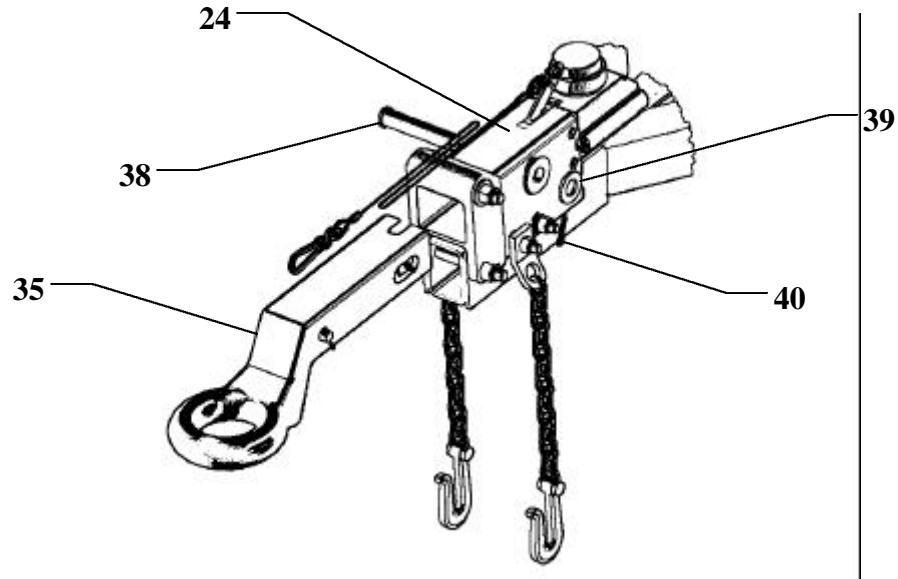


Figure 7

19. Insert inner slide (35) into housing (24), positioning the inner slide so the side slot is aligned with the master pin hole in the cast housing. (figure 7)
20. Install master pin P/N 12479777 (38) through cast housing, ensuring it passes through both rollers and rear damper eye. (figure 7)
21. Install flat washer P/N W221NAAW087NN039NNBA1 (39) and new supplied cotter pin P/N MS24665-421 (40) to secure the master pin. (figure 7)

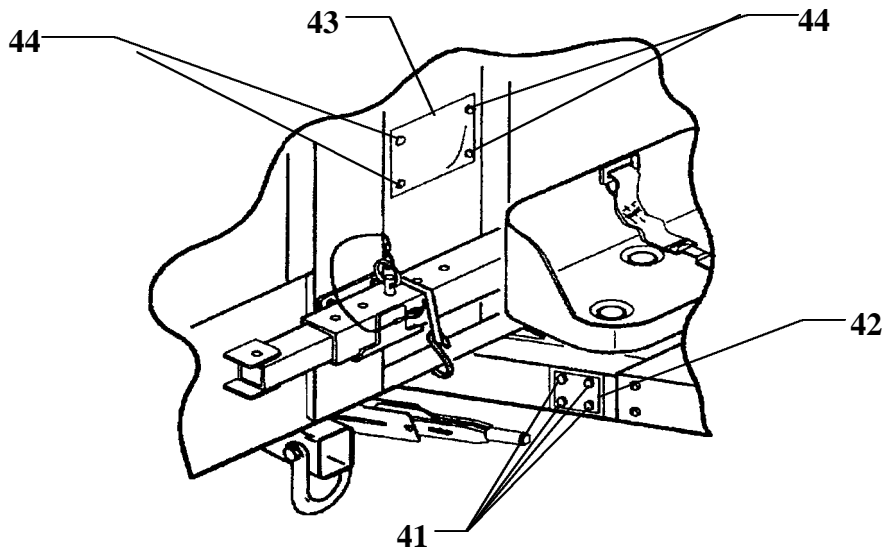


Figure 8

<b>NOTE</b>
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Refer to paragraph 3 for trailer identification. Note, bare chassis trailers will only have one data plate that needs to be changed, the trailer data plate. For chassis with equipment on them and a system shipping data plate contact appropriate Program Manager (PM) for guidance. Unless specifically authorized to do so, do not put heavy data plate on light trailers or vice versa.

22. Drill out 4 ea rivets (**41 & 44**) from the trailer data plate (**42**) and the shipping data plate (**43**). (figure 8)

<b>NOTE</b>
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The trailer data plate (**42**), shipping data plate (**43**) and rivets (**41 & 44**) are not part of this MWO kit. Data plates and rivets will be provided separately. See Appendix A.

23. Transfer the serial number, registration number and date of delivery from the old trailer data plate to the new trailer data plate. Discard old data plates.
24. Attach new trailer data plate (**42**) with 4 rivets (**41**) (NSN 5320-00-052-1972). Attach new shipping data plate (**43**) using 4 rivets (**44**) (NSN 5305-00-904-4136) and riveting from inside the cargo box. (figure 8)
25. Clean all surfaces where paint has been chipped, scraped, removed, etc., and spot paint as necessary. Paint all surge brake mounting hardware and rivet heads on inside of cargo box. (Refer to TM 43-0139)

## **11. CALIBRATION REQUIREMENTS.**

Not Applicable

## **12. WEIGHT AND BALANCE DATA.**

Weight and balance are affected by this MWO. New data plates are supplied and should be installed.

## **13. QUALITY ASSURANCE REQUIREMENTS.**

- a. General. The following information is furnished to ensure the proper application if this MWO and provide clarification in regard to the adequacy of installer's inspection methods and procedures applicable to Quality Assurance (QA). Inspection shall be IAW MWO 9-2330-392-20-1 as well as TM 9-2330-392-14&P.

## MWO 9-2330-392-20-1

- b. **Installer Responsibilities.** The installer is responsible for following instructions in MWO 9-2330-392-20-1. The installer will report HMT Cast Brake Actuator Kits received that are damaged or missing component parts so the kit supplier can be properly notified. Any discrepancies noted will be corrected before the vehicle leaves the installer's work area. Requirements contained in this MWO shall be included in the installers inspection plan or quality assurance program. These requirements shall not be construed as eliminating the installer's responsibility from complete compliance with the provisions of the contract and submitting to the Government products that meet all requirements of the contract.
- c. **Government Verification.** All QA operations and installation changes and inspections performed by the installer are subject to Government verification at unannounced and varying intervals. Verification will consist of observations and inspections to confirm that practices, methods and procedures of the installers written inspection plan are being properly applied; and that government product inspection to confirm quality of product offered for Government acceptance does not deviate from prescribed acceptance standards specified in MWO 9-2330-392-20-1 as well as TM 9-2330-392-14&P. Deviations will be brought to the attention of the installer for correction.
- d. **In-process Inspection.** During normal assembly operations, paragraph 10, Modification procedure, will be used to check the installer's work. After installation is complete, the vehicle will be checked IAW TM 9-2330-392-14&P PMCS (Table 2-1, checklist) for correct installation and to ensure there are no vehicle defects. Any defects noted will be corrected by installer before the vehicle is placed in service. All vehicles modified during a production shift will be checked to ensure product quality.

### **14. RECORDING AND REPORTING OF THE MODIFICATION.**

- a. **Records and Reports.** The organization responsible for MWO application will report application information as follows:
  - (1) Reporting will be accomplished by electronic means. MWO application information will be input directly into the Modification Management Information System (MMIS) over the internet. If the internet is not available, recording will be on a 3.5 inch disk, which will be mailed to TACOM, MMIS administrator. Entry into MMIS system is password protected. New users can register online at <http://208.242.67.250.mwo>. Passwords are normally approved and issued within 48 hours.
  - (2) Submission will be comprised of the nine (9) data elements listed in the table below. Elements 1,2,4,6,7,8 &9 are given for this MWO (as shown). The

person reporting the MWO data will acquire the remaining elements (3&5) and input all nine into the MMIS.

DATA Elements	Input Data
1. Material Change Number (MCN)	
2. MWO Number	
3. Unit Identification Code at Battalion Level	
4. NSN of End Item	
5. Serial Number of End Item	
6. USA Registration Number	
7. Date of Application	
8. Hours Required for Application	
9. Software Version	

(3) For off-line report, the 3.5 inch disk shall be mailed to the following address:

Commander  
TACOM-Warren  
ATTN: AMSTA-LC-CIPWM  
Warren, MI 48397-5000

b. Marking Equipment.

1. After modification procedures have been completed, mark MWO number 9-2330-392-20-1 in MWO APPLIED block and date applied in DATE block on MWO identification plate P/N 10930014.
2. To install the MWO identification plate on cargo trailers, locate and drill a .129 - .133 inch diameter hole in the front cargo body above the shipping data plate (see figure 9 ). Using a rivet gun, hand-set and pull one rivet P/N 12449496-1 from inside the cargo box fastening the MWO identification plate to the front cargo body. Installing the rivet from inside of cargo box prevents any sharp edges on the inside wall of cargo box.

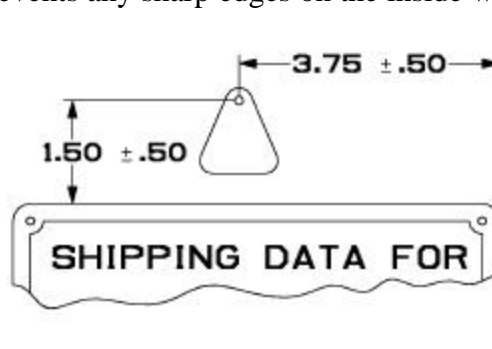
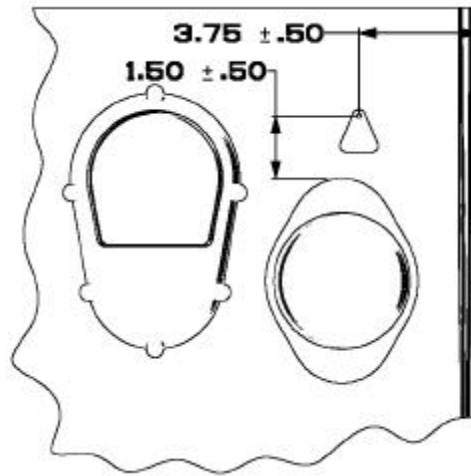


Figure 9

3. To install MWO identification plate on chassis trailers, locate and drill a .129 - .133 inch diameter hole in the rear fender above the rear reflector

(see figure 10). Using a rivet gun, hand set and pull one rivet P/N 12449496-1 fastening the MWO identification plate to rear fender.



**Figure 10**

**15. MATERIAL CHANGE NUMBER (MCN)**

This MWO is authorized by MCN 1-01-06-0003.

**16. MODIFICATION IDENTIFICATION.**

- a. When installed correctly with the improved surge brake actuator modification the top of surge brake housing is stenciled with, "CHECK HMMWV FOR TOWING AUTHORIZATION". This note provides a Warning to soldiers and denotes successful application of both the improved Surge Brake Actuator and the Steel Draw Bar.
- b. After the Improved Surge Brake Modification Kit is installed, interfaces with Steel Draw Bar should be inspected for secure mounting. Any faults detected, or discrepancies noted, will be corrected before the High Mobility Trailer (HMT) is returned to normal service.
- c. After HMT is modified, with both Improved Surge Brake Actuator and Steel Draw Bar, it will be authorized for towing by light and heavy HMMWVs marked with, "AUTHORIZED TO TOW TRAILERS WITH MAX GROSS WEIGHT OF 3400 LBS" or "AUTHORIZED TO TOW TRAILERS WITH MAX GROSS WEIGHT OF 4200 LBS", respectively.

**APPENDIX A****DATA PLATES**

MODEL	TRAILER DATA PLATE	SHIPPING DATA PLATE
M1101	(19207) 12449615	(19207) 12449621
M1102	(19207)	(19207) 12449617
CHASSIS	(19207) 12449613	

**RIVETS**

APPLICATION	NSN	SIZE
SHIPPING DATA PLATE	5306-00-904-4136	0.125 DIA x 0.126-0.187 GRIP
TRAILER DATA PLATE	5320-00-052-1972	0.125 DIA x 0.251-0.312 GRIP

By Order of the Secretary of the Army:

ERIC K. SHINSEKI  
*General, United States Army*  
*Chief of Staff*

Official:



JOEL B. HUDSON  
*Administrative Assistant to the*  
*Secretary of the Army*

0111001

**DISTRIBUTION:**

To be distributed in accordance with the initial distribution number (IDN) 391035,  
requirements for MWO 9-2330-392-20-1.



PIN: 078982-000