



# **ACTERRA MAINTENANCE MANUAL**

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**Models: MX**

## Foreword

Scheduled maintenance provides a key element for the safe operation of your vehicle. A proper maintenance program also helps to minimize downtime and to safeguard warranties. This maintenance manual provides information necessary for years of safe, reliable, and cost-efficient vehicle operation.

**IMPORTANT:** The maintenance operations in this manual are **not all-inclusive**. Also refer to other component and body manufacturers' instructions for specific inspection and maintenance instructions.

Perform the operations in this maintenance manual at scheduled intervals. Perform the pretrip and post-trip inspections, and daily/weekly/monthly maintenance, as outlined in the vehicle driver's manual. Major components, such as engines, transmissions, and rear axles, are covered in their own maintenance and operation manuals, that are provided with the vehicle. Perform any maintenance operations listed at the intervals scheduled in those manuals. Your Sterling Dealership has the qualified technicians and equipment to perform this maintenance for you. They can also set up a scheduled maintenance program tailored specifically to your needs. Optionally, they can assist you in learning how to perform these maintenance procedures.

**IMPORTANT:** Descriptions and specifications in this manual were in effect at the time of printing. Daimler Trucks North America LLC reserves the right to discontinue models and to change specifications or design at any time without notice and without incurring obligation. Descriptions and specifications contained in this publication provide no warranty, expressed or implied, and are subject to revision and editions without notice.

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## Environmental Concerns and Recommendations

Whenever you see instructions in this manual to discard materials, you should attempt to reclaim and recycle them. To preserve our environment, follow appropriate environmental rules and regulations when disposing of materials.

## NOTICE: Parts Replacement Considerations

Do not replace suspension, axle, or steering parts (such as springs, wheels, hubs, and steering gears) with used parts. Used parts may have been subjected to collisions or improper use and have undetected structural damage.

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## Descriptions of Service Publications

Daimler Trucks North America LLC distributes the following major service publications in paper and electronic (via ServicePro®) formats.

<b>Workshop/Service Manual</b>	Workshop/service manuals contain service and repair information for all vehicle systems and components, except for major components such as engines, transmissions, and rear axles. Each workshop/service manual section is divided into subjects that can include general information, principles of operation, removal, disassembly, assembly, installation, and specifications.
<b>Maintenance Manual</b>	Maintenance manuals contain routine maintenance procedures and intervals for vehicle components and systems. They have information such as lubrication procedures and tables, fluid replacement procedures, fluid capacities, specifications, and procedures for adjustments and for checking the tightness of fasteners. Maintenance manuals do not contain detailed repair or service information.
<b>Driver's/Operator's Manual</b>	Driver's/operator's manuals contain information needed to enhance the driver's understanding of how to operate and care for the vehicle and its components. Each manual contains a chapter that covers pretrip and post-trip inspections, and daily, weekly, and monthly maintenance of vehicle components. Driver's/operator's manuals do not contain detailed repair or service information.
<b>Service Bulletins</b>	Service bulletins provide the latest service tips, field repairs, product improvements, and related information. Some service bulletins are updates to information in the workshop/service manual. These bulletins take precedence over workshop/service manual information, until the latter is updated; at that time, the bulletin is usually canceled. The service bulletins manual is available only to dealers. When doing service work on a vehicle system or part, check for a valid service bulletin for the latest information on the subject.  <b>IMPORTANT:</b> Before using a particular service bulletin, check the current service bulletin validity list to be sure the bulletin is valid.
<b>Parts Technical Bulletins</b>	Parts technical bulletins provide information on parts. These bulletins contain lists of parts and BOMs needed to do replacement and upgrade procedures.
Web-based repair, service, and parts documentation can be accessed using the following applications on the AccessSterling.com website.	
<b>ServicePro</b>	ServicePro® provides Web-based access to the most up-to-date versions of the publications listed above. In addition, the Service Solutions feature provides diagnostic assistance with Symptoms Search, by connecting to a large knowledge base gathered from technicians and service personnel. Search results for both documents and service solutions can be narrowed by initially entering vehicle identification data.
<b>PartsPro</b>	PartsPro® is an electronic parts catalog system, showing the specified vehicle's build record.
<b>EZWiring</b>	EZWiring™ makes Freightliner, Sterling, Western Star, Thomas Built Buses, and Freightliner Custom Chassis Corporation products' wiring drawings and floating pin lists available online for viewing and printing. EZWiring can also be accessed from within PartsPro.

## Descriptions of Service Publications

Warranty-related service information available on the AccessSterling.com website includes the following documentation.

### **Recall Campaigns**

Recall campaigns cover situations that involve service work or replacement of parts in connection with a recall notice. These campaigns pertain to matters of vehicle safety. All recall campaigns are distributed to dealers; customers receive notices that apply to their vehicles.

### **Field Service Campaigns**

Field service campaigns are concerned with non-safety-related service work or replacement of parts. All field service campaigns are distributed to dealers; customers receive notices that apply to their vehicles.

## Page Description

For an example of an *Acterra Maintenance Manual* page, see [Fig. 1](#).

**A**      **B**      **C**

**Frame and Fifth Wheel**      **31**

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**31-01 Frame Fastener Torque Checking**

Because of "bedding in" (or seating), frame fasteners must be torqued at recommended intervals. When tightening fasteners, check the frame for cracks and other damage.

**CAUTION:** Continued vehicle operation with loose fasteners could result in bracket or frame damage.

Frame fasteners are used on front frame brackets, axle stops, equalizer stops, suspension brackets, fuel tank brackets, exhaust and air-intake brackets, engine trunnion supports, rear engine supports, frame crossmembers and gussets, fifth wheel mounting angles, and fifth wheel legs.

Refer to the frame section in the vehicle service manual for additional information on frame fasteners, and to the general information section in the vehicle service manual for fastener information and torque values.

**31-02 Fifth Wheel Inspecting and Lubricating**

**WARNING:** All fifth wheel maintenance, adjustment, and rebuilding must be done only by a qualified mechanic. Improper or incomplete procedures could result in a possible disengagement of the trailer from the tractor, which could result in personal injury or property damage.

Parts are under spring compression. Wear safety goggles during removal, installation, and rebuilding. Failure to do so can result in personal injury, due to parts ejecting with force.

**FONTANE**

- 1 Disconnect the tractor from the trailer. For instructions, refer to the vehicle driver's manual.
- 2 Thoroughly steam-clean the fifth wheel.
- 3 Look for cracks in the fifth wheel assembly, mounting brackets, and mounting parts.

**HOLLAND**

- 1 Disconnect the tractor from the trailer. For instructions, refer to the vehicle driver's manual.
- 2 Thoroughly steam-clean the fifth wheel.
- 3 Check for loose nuts or broken bolts on the fifth wheel assembly.
- 4 Inspect for cracks or wear on the mounting bolts.
- 5 Check for improper locking action and for cracks or wear on the jaw locking mechanism.

4 Check moving parts for wear or damage

5 Test the safety lock latch for free operation

6 Check for loose nuts or bolts in the fifth wheel and in the mounting

7 Check all springs to see if they are securely fastened and not deformed

8 Check wedge adjustment

8 1 Open the kingpin lock and vertically insert a 2-inch diameter shaft

8 2 Release the lock by tripping the release latch at the bottom of the throat

8 3 Adjust the wedge stop at the end of the wedge to approximately 1/4-inch (6-mm) clearance

9 If you observe any problems when doing the above steps, correct them immediately. For instructions, refer to the fifth wheel section in the vehicle service manual

10 Oil all moving parts on the fifth wheel, and grease the top plate and the two zerkl fittings for the bracket bearing area

11 Replace cracked, worn, or damaged parts with new parts. Replace loose mounting bolts with 5/8-11 SAE grade 8 bolts, grade C locknuts, and hardened washers. Do not re-use bolts, nuts, and washers on fifth wheel mountings

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**D**      **E**

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A. Maintenance Operation Number consists of the Group Number followed by the Sequence Number  
 B. Group Title  
 C. Group Number  
 D. Release Date  
 E. Group Number/Page Number

**Fig. 1, Example of an Acterra Maintenance Manual Page**

<b>Group No.</b>	<b>Group Title</b>
00 .....	General Information
01 .....	Engine
09 .....	Air Intake
13 .....	Air Compressor
15 .....	Alternators and Starters
20 .....	Engine Cooling/Radiator
25 .....	Clutch
26 .....	Transmission
31 .....	Frame and Frame Components
32 .....	Suspension
33 .....	Front Axle
35 .....	Rear Axle
40 .....	Wheels and Tires
41 .....	Driveline
42 .....	Brakes
46 .....	Steering
47 .....	Fuel
49 .....	Exhaust
54 .....	Electrical, Instruments, and Controls
72 .....	Doors
83 .....	Heater and Air Conditioner

<b>Title of Maintenance Operation (MOP)</b>	<b>MOP Number</b>
Initial Maintenance (IM) Operations Table . . . . .	00-09
Lubrication and Fluid Level Check (M1). . . . .	00-15
Lubrication and Fluid Level Check (M2). . . . .	00-16
M1 Maintenance Interval Operations Table . . . . .	00-10
M2 Maintenance Interval Operations Table . . . . .	00-11
M3 Maintenance Interval Operations Table . . . . .	00-12
M4 Maintenance Interval Operations Table . . . . .	00-13
M5 Maintenance Interval Operations Table . . . . .	00-14
Maintenance Interval Tables . . . . .	00-07
Maintenance Operation Sets Table . . . . .	00-08
Maintenance Schedule Table . . . . .	00-06
Metric/U.S. Customary Conversion Tables. . . . .	00-04
Noise Emission Control Systems Maintenance . . . . .	00-01
Scheduled Maintenance Intervals, Description and Use. . . . .	00-05
Torque Specifications Tables. . . . .	00-03
Verification of Inspections Log. . . . .	00-02

## General Information

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### Federal Law, Part 205: Transportation Equipment Noise Emission Controls

Part 205, Transportation Equipment Noise Emission Controls, requires the vehicle manufacturer to furnish, with each new vehicle, such written instructions for the proper maintenance, use, and repair of the vehicle by the ultimate purchaser to provide reasonable assurance of the elimination or minimization of noise emission degradation throughout the life of the vehicle. In compliance with the law, the Noise Emission Control Systems maintenance located in each applicable group within this manual, in conjunction with the vehicle workshop manual, provides these instructions to owners.

### Normal Vehicle Use

The maintenance instructions contained in this manual are based on average vehicle use and normal operating conditions. Unusual vehicle operating conditions may require service at more frequent intervals.

### Recommendations for Replacement Parts

Replacement parts used for maintenance or for the repair of noise emission control systems should be genuine Sterling parts. If other than genuine Sterling parts are used for replacements or for the repair of components affecting noise emission control, the owner should be sure that such parts are warranted by their manufacturer to be equivalent to genuine Sterling parts in performance and durability.

### Sterling Noise Emissions Warranty

See the vehicle owner's warranty information book for warranty information concerning noise emission control systems.

### Tampering With the Noise Control System Is Prohibited

Federal law prohibits the following acts or the causing thereof: (1) the removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person. Among those acts presumed to constitute tampering are the acts listed below:

- A. Removal of engine noise-deadening panels.
- B. Removal of or rendering the engine speed governor inoperative so as to allow engine speed to exceed manufacturer's specifications.
- C. Removal of or rendering inoperative the fan clutch, including by-passing the control on any thermostatic fan drive to cause it to operate continuously.
- D. Removal of the fan shroud.
- E. Removal of or rendering inoperative exhaust system components, including exhaust pipe clamping.
- F. Removal of air intake system components.
- G. Removal of hood liners (noise-deadening panels).

### Maintenance Instructions

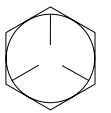
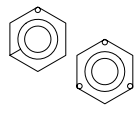
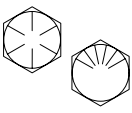
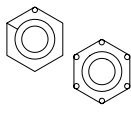

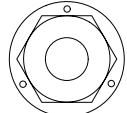
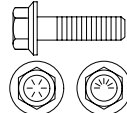
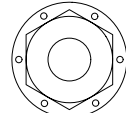
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Scheduled intervals are in the maintenance tables in Group 00 of this manual. A "Verification of Inspections Log" is contained in the following table, and should be filled in each time the noise emission controls on the vehicle are maintained or repaired.





Torque Specifications Tables: 00–03

Torque Values for U.S. Customary Thread Fasteners With Lubricated* or Plated Threads†								
Thread Diameter–Pitch	Regular Hex				Flanged			
	Grade 5 Bolt	Grade 5 or B Nut	Grade 8 or 8.2 Bolt	Grade 8 or C Nut	Grade 5 Bolt	Grade B Nut	Grade 8 or 8.2 Bolt	Grade G Nut
	Torque: lbf-ft (N-m)		Torque: lbf-ft (N-m)		Torque: lbf-ft (N-m)		Torque: lbf-ft (N-m)	
	 f230002	 f230003	 f230004	 f230005	 f230006	 f230007	 f230008	 f230009
1/4–20	7 (9)		8 (11)		6 (8)		10 (14)	
1/4–28	8 (11)		9 (12)		7 (9)		12 (16)	
5/16–18	15 (20)		16 (22)		13 (18)		21 (28)	
5/16–24	16 (22)		17 (23)		14 (19)		23 (31)	
3/8–16	26 (35)		28 (38)		23 (31)		37 (50)	
3/8–24	30 (41)		32 (43)		25 (34)		42 (57)	
7/16–14	42 (57)		45 (61)		35 (47)		60 (81)	
7/16–20	47 (64)		50 (68)		40 (54)		66 (89)	
1/2–13	64 (87)		68 (92)		55 (75)		91 (123)	
1/2–20	72 (98)		77 (104)		65 (88)		102 (138)	
9/16–12	92 (125)		98 (133)		80 (108)		130 (176)	
9/16–18	103 (140)		110 (149)		90 (122)		146 (198)	
5/8–11	128 (173)		136 (184)		110 (149)		180 (244)	
5/8–18	145 (197)		154 (209)		130 (176)		204 (277)	
3/4–10	226 (306)		241 (327)		200 (271)		320 (434)	
3/4–16	253 (343)		269 (365)		220 (298)		357 (484)	
7/8–9	365 (495)		388 (526)		320 (434)		515 (698)	
7/8–14	402 (545)		427 (579)		350 (475)		568 (770)	
1–8	—		582 (789)		—		—	
1–12	—		637 (863)		—		—	
1–14	—		652 (884)		—		—	

\* Sterling recommends that all plated and unplated fasteners be coated with oil before installation.

† Use these torque values if either the bolt or nut is lubricated or plated (zinc-phosphate conversion-coated, cadmium-plated, or waxed).

Table 1, Torque Values for U.S. Customary Thread Fasteners With Lubricated or Plated Threads