

Business Class Trucks Maintenance Manual Contents

Group No.	Group Title
00	General Information
01	Engine
09	Air Intake
13	Air Compressor
15	Alternator and Starter
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



BUSINESS CLASS TRUCKS MAINTENANCE MANUAL

**Models: FL50
FL60
FL70
FL80
FL106
FL112
MB50
MB60
MB70
MB80**

Foreword

When performed on a regular basis, lubricating the parts of your vehicle is the least costly way of obtaining safe and reliable vehicle operation. Added benefits and savings occur when you check that the engine, undercarriage, and noise emission control parts are in good working order during lubrication.

This maintenance manual explains when you should lubricate parts and what to look for when checking for wear or damage. For daily and weekly checks, refer to the vehicle driver's manual.

IMPORTANT: Descriptions and specifications in this manual were in effect at the time of printing. Freightliner LLC reserves the right to discontinue models at any time, or change specifications and design without notice and without incurring obligation.

For additional information, please contact Freightliner LLC, Service Systems and Documentation, P.O. Box 3849, Portland, OR 97208-3849, U.S.A. or refer to <http://www.Freightliner.com> and <http://www.FreightlinerTrucks.com>.

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.

© 1995-2004 Freightliner LLC

All rights reserved. No part of this publication, in whole or in part, may be translated, reproduced, stored in a retrieval system, or transmitted in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of Freightliner LLC.

Freightliner LLC
Service Systems and Documentation (POC-SSD)
P.O. Box 3849
Portland, OR 97208-3849

Descriptions of Service Publications

Freightliner LLC distributes the following major service publications.

Workshop/Service Manual	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, specifications, and troubleshooting.
Maintenance Manual	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, procedures for adjustments and for checking the tightness of fasteners. Maintenance manuals do not contain detailed repair or service information.
Driver's/Operator's Manual	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 inspection and daily maintenance of vehicle components. Driver's/operator's manuals do not contain detailed repair or service information.
Parts Technical Manual	Freightliner LLC publishes this manual to aid in the identification of serviceable replacement vehicle parts. This manual is used in conjunction with the parts book and the service parts catalog microfiche.
Service Bulletins	<p>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.</p> <p>IMPORTANT: Before using a particular service bulletin, check the current service bulletin validity list to be sure the bulletin is valid.</p>
Recall Bulletins	These bulletins pertain to special situations that involve service work or replacement of parts in connection with a recall notice. Recall bulletins pertain to matters of vehicle safety. All bulletins are distributed to dealers; customers receive notices that apply to their vehicles.
Field Service Modifications	This publication is concerned with non-safety-related service work or replacement of parts. All field service modifications are distributed to dealers; customers receive notices that apply to their vehicles.

For a page example of the printed manual, see Fig. 1.

The diagram shows a page from a manual with the following layout:

- Top Left:** Callout A points to the top margin.
- Top Center:** Callout B points to the title "Frame and Fifth Wheel".
- Top Right:** Callout C points to the page number "31".
- Left Column:**
 - Section 1:** "31-01 Frame Fastener Torque Checking"
 - Text: "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.
 - Text: "Frame fasteners are used on front frame brackets, axle stops, equalizer stops, suspension brackets, fuel tank brackets, exhaust and air-intake brackets, engine trunion supports, rear engine supports, frame crossmembers and gussets, fifth wheel mounting angles, and fifth wheel legs."
 - Text: "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."
 - Section 2:** "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.
 - Text: "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."
 - FONTAINE**
 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.
- Right Column:**
 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 zerk 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.
- Bottom Section:**
 - 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.

At the bottom of the page, there is a footer: "Heavy Trucks Maintenance Manual, November 1993" on the left and "31/1" on the right. Callout D points to the footer on the left, and callout E points to the footer on the right.

11/28/2001 f020034

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, Page Example of the Printed Manual

Title of Maintenance Operation (MOP)	MOP Number
Initial Maintenance (IM) Operations Table	00-09
Lubrication Tables	00-18
Lubrication and Fluid Level Check (M1, FL112 models only)	00-17
Lubrication and Fluid Level Check (M1, all models but FL112).	00-15
Lubrication and Fluid Level Check (M2, all models but FL112).	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 Tables	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

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 service 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 Freightliner parts. If other than genuine Freightliner 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 Freightliner parts in performance and durability.

Freightliner Noise Emissions Warranty

Refer to 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 ele-

ment 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

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.

Verification of Inspections Log: 00–02

Verification of Inspections Log

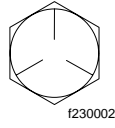
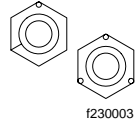
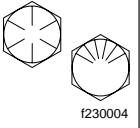
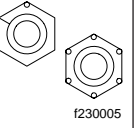
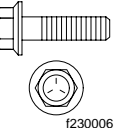
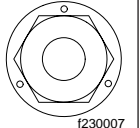
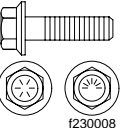
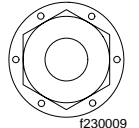
Verification of Inspections Log — Group 20

Verification of Inspections Log — Group 20 — Engine Cooling/Radiator				
Date	Mileage	Repair Description	Cost	Repair Facility

Verification of Inspections Log — Group 49

Verification of Inspections Log — Group 49 — Exhaust				
Date	Mileage	Repair Description	Cost	Repair Facility

Torque Specifications Tables: 00–03

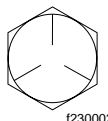
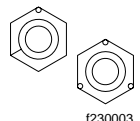
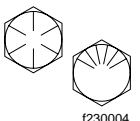
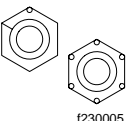
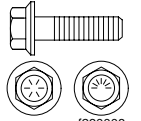
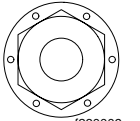
Torque Values for U.S. Customary Thread Fasteners with Lubricated * or Plated Threads †								
Thread Diameter–Pitch	Regular Hex				Flanged			
	Grade 5 Bolt	Grade 5 or B Nut	Grade 8 or 8.2 Bolt	Grade 8 or C Nut	Grade 5 Bolt	Grade B Nut	Grade 8 or 8.2 Bolt	Grade G Nut
	Torque: lbf-ft (N-m)		Torque: lbf-ft (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)		—		—	

* Freightliner 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

Torque Specifications Tables: 00–03

Torque Values for U.S. Customary Thread Fasteners with Dry (Unlubricated) * Plain (Unplated) 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 8 or 8.2 Bolt	Grade G Nut
	Torque: lbf-ft (N·m)		Torque: lbf-ft (N·m)		Torque: lbf-ft (N·m)	
	 f230002	 f230003	 f230004	 f230005	 f230008	 f230009
1/4–20	8 (11)		10 (14)		—	
1/4–28	9 (12)		12 (16)		—	
5/16–18	15 (20)		22 (30)		22 (30)	
5/16–24	17 (23)		25 (34)		—	
3/8–16	28 (38)		40 (54)		40 (54)	
3/8–24	31 (42)		45 (61)		—	
7/16–14	45 (61)		65 (88)		65 (88)	
7/16–20	50 (68)		70 (95)		—	
1/2–13	70 (95)		95 (129)		95 (129)	
1/2–20	75 (102)		110 (149)		—	
9/16–12	100 (136)		140 (190)		140 (190)	
9/16–18	110 (149)		155 (210)		—	
5/8–11	135 (183)		190 (258)		190 (258)	
5/8–18	155 (210)		215 (292)		—	
3/4–10	240 (325)		340 (461)		340 (461)	
3/4–16	270 (366)		380 (515)		—	
7/8–9	385 (522)		540 (732)		—	
7/8–14	425 (576)		600 (813)		—	
1–8	580 (786)		820 (1112)		—	
1–12	635 (861)		900 (1220)		—	
1–14	650 (881)		915 (1241)		—	

* Threads may have residual oil, but will be dry to the touch.

† Male and female threads (bolt and nut) must both be unlubricated and unplated; if either is plated or lubricated, use Table 1. Freightliner recommends that all plated and unplated fasteners be coated with oil before installation.

Table 2, Torque Values for U.S. Customary Thread Fasteners with Dry (Unlubricated) Plain (Unplated) Threads