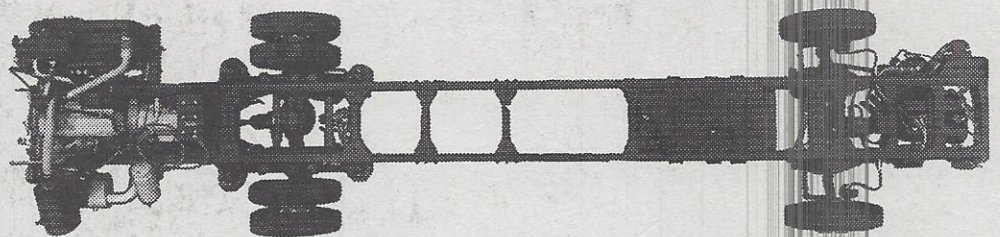


# **MHMS 3116**

## **Motor Home Chassis**

### ***Owner's Manual***



**GILLIG**  
CORPORATION

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# Service Section



# FORWARD

This manual has been developed to provide the motor home owner with service information on the Gillig MHMS 3116 motor home chassis. Major components and systems are described and maintenance/inspection procedures are given. In addition to providing information for proper maintenance of the motor home chassis, some inspection and diagnostic procedures are included to help detect and identify common problem conditions which may occur.

This manual is divided into two sections: Service and Parts. At the end of the Service Section are appendices containing information about identification of bolts and nuts and their proper torques, maintenance interval checklists, drive belts and the Maintenance Schedule. The Parts Section contains illustrated parts lists for the systems and components covered in the Service Section.

While information contained in this Owner's Manual is intended to establish proper maintenance and inspection procedures, there may be times when more detailed diagnostic and repair procedures will be required for the engine and transmission. Technical manuals are available from dealers to meet this need. These manuals may also be obtained by contacting the owner or proprietor of local repair facilities or by contacting the Gillig Corporation Publications Section.

All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of publication. Gillig Corporation reserves the right to make product changes at any time without notice.

To contact Gillig Corporation call toll-free

**1-800-735-1500**

(or 415-785-1500 in Hayward, CA) or write:

**Gillig Corporation  
P.O. Box 3008  
Hayward, CA 94540**

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## REPORTING SAFETY DEFECTS

If you believe that your vehicle has a defect which could cause a crash or could cause injury or death, you should immediately inform the National Highway Traffic Safety Administration (NHTSA) in addition to notifying Gillig Corporation.

If NHTSA receives similar complaints, it may open an investigation, and if it finds that a safety defect exists in a group of vehicles, it may order a recall and remedy campaign. However, NHTSA cannot become involved in individual problems between you, your dealer, or Gillig Corporation.

To contact NHTSA, you may either call the Auto Safety Hotline toll-free at

**1-800-424-9393**

(or 366-0123 in Washington D.C. area) or write to:

**NHTSA  
U.S. Department of Transportation  
Washington D.C. 20590**

You can also obtain other information about motor vehicle safety from the Hotline.

# Introduction



# Introduction

This manual contains operation, maintenance, and parts identification information on the Gillig MHMS 3116 motor home chassis. The information pertains both to standard installed equipment and common optional equipment and features. All information and data in this manual are based on the latest product information available at time of publication. The Gillig Corporation reserves the right to make product changes at any time.

The pages in this manual are numbered consecutively within each chapter. Illustrations and tables are also numbered consecutively by chapter. The Service and Parts sections use the same format: the engine chapter in both sections will be Chapter 1 and the pages will be numbered 1-1, 1-2, etc.

Service Bulletins and manual revisions may be published to supplement, supersede, or augment the information in this Owner's Manual. The bulletins should be posted to the appropriate places in the manual and then filed with the manual for future reference.

## IMPORTANT SAFETY INFORMATION

**WARNING**  
IS USED WHEN AN OPERATING PROCEDURE, PRACTICE, ETC., IF NOT CORRECTLY FOLLOWED, COULD RESULT IN PERSONAL INJURY OR LOSS OF LIFE.

**CAUTION**  
IS USED WHEN AN OPERATING PROCEDURE, PRACTICE, ETC., IF NOT STRICTLY OBSERVED, COULD RESULT IN INJURY TO YOU OR DAMAGE TO THE EQUIPMENT.

**NOTICE**  
IS USED WHEN AN OPERATING PROCEDURE, PRACTICE, ETC., IS ESSENTIAL TO HIGHLIGHT.

Three (3) types of headings are used in this manual to attract your attention. The headings and explanations are positioned at the left margin.

It is your responsibility to be completely familiar with the **WARNINGS, CAUTIONS,** and **NOTICES** described in this Owner's Manual. These highlighted messages advise against the use of specific service methods or procedures which can result in personal injury, damage to the equipment, or unsafe operating conditions. It is important to understand that these messages are not exhaustive. Gillig Corporation could not possibly know and evaluate all conceivable ways in which service might be done and then advise the service trade of all possible consequences of each way. Therefore, Gillig has not undertaken such a broad evaluation. Accordingly, anyone who uses a service procedure or tool which is not recommended by Gillig Corporation must first be thoroughly satisfied that neither personal safety nor equipment integrity will be jeopardized by the service method selected.

Proper service and repair is important to the safe, reliable operation of your motor home. The service procedures recommended and described herein are effective methods for performing service operations. Some of these service operations require the use of tools designed for the purpose. The special tools should be used when and as recommended.

Most accidents involving motor home operation and maintenance are caused by failure to observe basic safety rules or precautions. An accident can often be avoided by recognizing potentially hazardous situations before the accident occurs.

Improper operation, lubrication, or maintenance of this coach can be dangerous and could result in injury or death. Do not perform any lubrication or maintenance on the motor home until you read and understand the instructions in this manual or in the manufacturer-prepared operations and maintenance manuals provided for the engine and transmission.

## **GENERAL WARNINGS**

Below are general warnings which may not be specifically covered elsewhere in this manual:

1. Do not burn discarded Teflon seals. Toxic gasses are produced.
2. Never dry bearings by spinning them with compressed air, the bearing may disintegrate. Spinning a bearing without lubrication can damage the bearing.
3. Attach a "DO NOT OPERATE" tag to the start switch and controls before servicing or repairing the engine or transmission or components attached thereto.
4. Disconnect all batteries before servicing the electrical system.
5. Do not allow unauthorized personnel in the motor home while it is being serviced.
6. Stay clear of all moving parts and do not wear loose clothing or jewelry while servicing the coach.
7. Relieve all pressure in air, hydraulic, oil, fuel, or coolant lines before any lines, fittings, or related items are disconnected or removed.
8. All fuels, most lubricants, and some coolants are flammable and must be handled with caution.
9. Keep all fuels and lubricants stored in properly marked containers and away from all unauthorized persons.
10. Store all oily rags or other flammable material in a protective container. Store the container in a safe place.
11. Do not bend or strike high pressure lines. Do not install bent or damaged lines, tubes, or hoses.
12. Radiators must be kept clean and free from trash to prevent possible overheating.

## **MHMS MOTOR HOME CHASSIS**

The MHMS motor home chassis is an engine and frame unit which includes driving controls. This chassis has a standard height frame and has three wheelbase lengths available (182", 198" and 216").

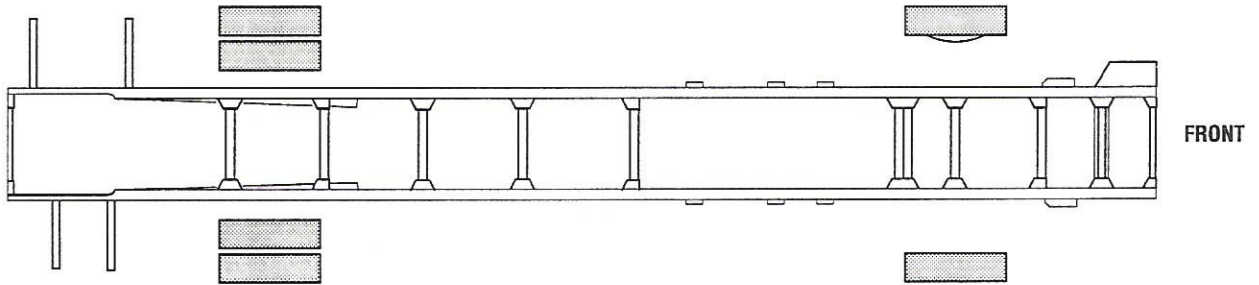


Figure 1.1. MHMS Chassis

09-121-01

**CAUTION**

*Some chassis and frame components are attached with regular threaded nuts and bolts instead of the mechanically attached Huck bolts. Initial and regular periodic maintenance inspection procedures must include checking the tightness of all fasteners, paying particular attention to suspension member fasteners. Refer to the Specifications section for required torque values.*

The chassis and the frame are the load bearing members of the vehicle which hold the engine-transmission unit and the coach body. The chassis is carried on the front and rear axles and the suspension, and therefore, passively interacts with all major components of the vehicle.

The chassis is constructed of two main frame rails, or channels, connected by several cross members. Outriggers are attached for mounting of the radiator, sidewalls, floor, and driving platform. The cross members and outriggers, as well as the suspension mounting brackets, are attached to the frame rails by Huck bolts. Huck bolts are mechanically secured and can not be removed with a wrench. Replacement is accomplished by cutting the bolt from the frame, or by splitting the nut and replacing it with either another Huck bolt or with a grade 8 flangehead bolt and nut of the appropriate size.

Contact the Gillig Service Department for further information regarding Huck bolt removal and replacement.

**VEHICLE IDENTIFICATION NUMBER**

The Vehicle Identification Number (VIN) is the legal identification of the vehicle. This number appears on the vehicle certificate of title and registration. The VIN is also included in the body builder's identification plate which is usually mounted near the entrance door of the motor home. It is also found on a (VIN) plate affixed to the outside of the left frame rail just ahead of the front axle. A sample VIN plate is shown in Figure I.1.

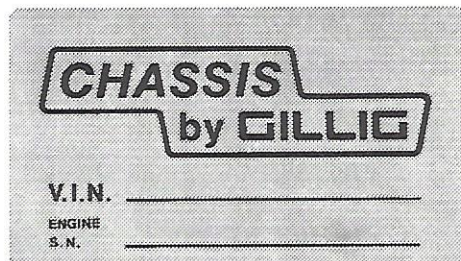


Figure 1.2 VIN Plate

GC-13-000

## LUBRICATION

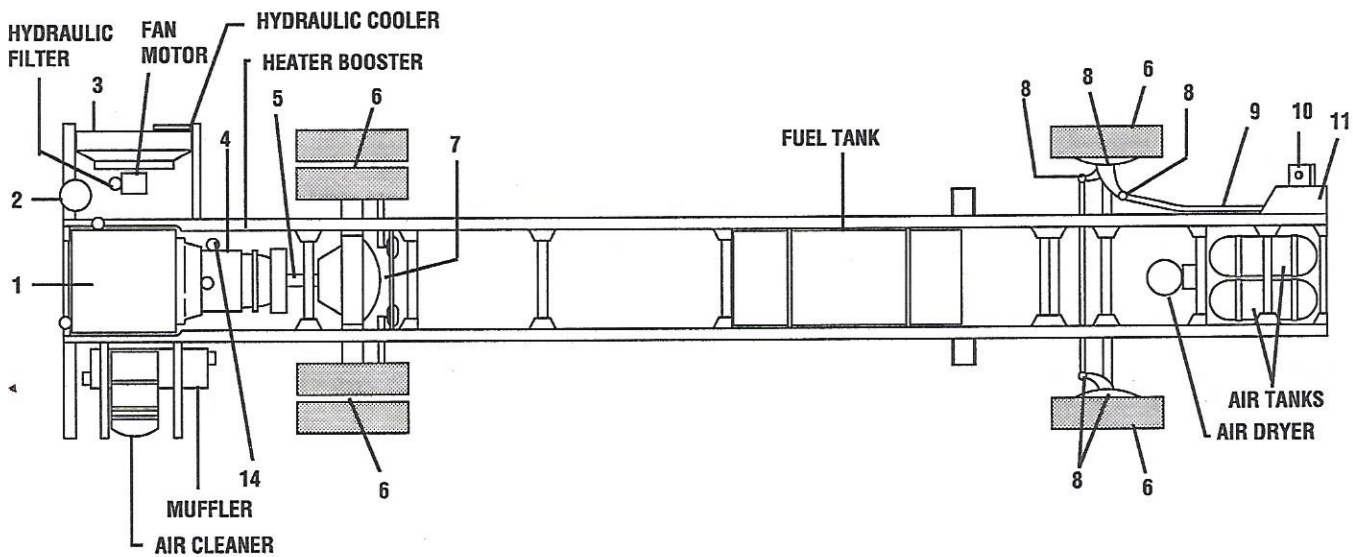
Various components of the motor home chassis must have proper lubrication to operate as designed. Lubrication must be accomplished at the intervals specified in the maintenance schedule in **Appendix B**. Use the tables listed below for Lubrication specifications.

**Table I-1 Lubricant Capacities**

**Table I-2 Recommended Fluids and Lubricants**

**Table I-3 Lubrication Points**

**Table I-4 Lubrication Specifications**



**Figure I.3. Lubrication Points and Major Components**

COMPONENT	MODEL	CAPACITY (qt/liter)
DIFFERENTIAL (3 options)	Dana F175 Rockwell RS-17145 Neway ARD 75-6	
CRANKCASE	3116 (Crankcase Only)	21 (20)
TRANSMISSION	MT643 MT643 (incl. cooler)	18 (17)
RADIATOR	Formed Top	68 (67)
COOLING SYSTEM	3116 (Engine Only)	14 (13)

**Table I-1. Lubricant Capacities**

KEY	COMPONENT	FLUID/LUBRICANT
EO	ENGINE OIL	CAT Engine Oil (EO) <sup>e</sup> or CE, CE/SF, CE/SG
TF	TRANSMISSION	Dexron II®
HT	FRT WHEEL BEARINGS	Wheel Bearing Lube
MP	DIFFERENTIAL	SAE-80 W GL-5
CL	CHASSIS & DRIVELINE	Chassis Grease
TF	HYDRAULIC SYSTEM	Dexron II®
AF	ENGINE COOLANT	Water/Ethylene Glycol

Table I-2. Recommended Fluids and Lubricants

ITEM REQUIREMENT	INTERVAL	KEY
1. ENGINE OIL	KEEP TO "FULL" MARK*	DAILY EO
2. HYDRAULIC RESERVOIR	KEEP TO "FULL" MARK*	DAILY PS
3. RADIATOR	KEEP TO "FULL" MARK*	DAILY AF
4. TRANSMISSION FLUID	KEEP TO "FULL" MARK*	DAILY TF
5. SLIP JOINT AND U-JOINTS	GREASE FITTINGS	6,000 CL
6. WHEEL BEARING	REMOVE, CLEAN, REPACK	20,000 HT
7. DIFFERENTIAL	KEEP TO FILLER PLUG LEVEL	6,000 MP
	DRAIN BREAK-IN OIL & REFILL	3,000 MP
	DRAIN AND REFILL	20,000 MP
8. KNUCKLE PIN (KING PIN)	GREASE FITTING	6,000 CL
TIE ROD & DRAGLINK ENDS	GREASE FITTING	6,000 CL
9. DRAGLINK END	GREASE FITTING	6,000 CL
10. STEERING GEAR BOX	FILLER PLUG LEVEL	20,000 MP
11. STEERING COLUMN U-JOINT	GREASE FITTING	6,000 CL
12. THROTTLE & BRAKE PEDAL (PIVOT PIN)	OIL LIGHTLY	6,000 EO
13. BATTERY TERMINALS	APPLY COATING	6,000 PJ
14. TRANSMISSION OIL FILTER	REPLACE & REFILL FLUID	6,000 TF
15. ENGINE OIL FILTER	REPLACE AT OIL CHANGE	3,000 EO

\*See applicable section.

Table I-3. Lubrication Points and Major Capacities

**CAUTION**

*The quality, characteristics, and performance of fluids and lubricants furnished for each application are the responsibility of the supplier.*



**AF** Engine Coolant. Ethylene Glycol antifreeze and water, no less than 30% Ethylene Glycol and no more than 60% ethylene glycol. Must be low silicate formula.

**CL** Chassis Lubricant. Lithium stearate multi-purpose grease meeting the requirements of NGLI Grade 2 grease.

**EO** Engine Oil. Caterpillar Engine Oil or a heavy duty lubricating oil designed to meet or exceed the requirements of API Engine Service Classification CE, CE/SF, or CE/SG.

**HT** High Temperature Grease. Lithium base multi-purpose lubricant which meets the NGLI Grade 1 standard. Exxon Ronex MP® grease is suitable.

**MP** Multi-purpose Gear Lubricant. Designed to lubricate axle gears under maximum load, torque, speed, and heat conditions, it must meet Mil-L-2105B or API GL 5 specifications. Mobil Grease No. 2 is recommended.

**TF** Transmission fluid. Dexron II® fluid is the only product recommended.

**HF** Hydraulic Fluid. Dexron II® (power steering, fan drive)

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**Table I-4. Lubricant Specifications**

## CHASSIS INSPECTION

To protect your motor home and yourself, certain inspections should be performed daily. Other regular maintenance procedures are detailed in **Appendices B & D**. The items below should be checked every day before starting operation.

1. Perform visual checks.
  - tire and wheel condition
  - latches on compartments and awnings
  - headlights
  - taillights
  - turn signals
  - brake signals
  - backup lights
  - wipers/washers
2. Examine the area under the coach for signs of fluid leaks.
3. Check drive belts for condition and tension (see Appendix C).
4. Survey fluid levels.
  - A. ENGINE OIL - keep to FULL mark. See CHECKING THE OIL LEVEL, Chapter 1.
  - B. COOLANT - should be visible through the sight glass on the surge tank. See COOLANT LEVEL, Chapter 1.
  - C. TRANSMISSION FLUID - See FLUID LEVEL CHECKS, Chapter 2.

D. HYDRAULIC FLUID - Keep to FULL mark in reservoir. See FAN OPERATION, Chapter 6.

E. FUEL/WATER SEPARATOR - See FUEL FILTERS, Chapter 1.

5. Check AIR RESTRICTION INDICATOR for color change. See AIR FILTER, Chapter 1.
6. Check AIR TANKS. Drain off moisture from manual valve if automatic valves have not been installed. See owners manual supplied by coach builder.

Other safety and maintenance checks may be described in the materials supplied by the coach builder. Please consult these to develop a comprehensive inspection and maintenance program.

## FUEL SULFUR CONTENT

The percentage of sulfur in your fuel will affect engine oil recommendations. Fuel sulfur is chemically changed during combustion to form both sulfurous and sulfuric acids. These acids chemically attack metal surfaces and cause corrosive wear. Certain additives used in lubricating oils contain alkaline compounds that are formulated to neutralize these acids. The measure of this reserve alkalinity in a lubricating oil is known as the Total Base Number (TBN). Higher engine oil TBN values are essential to neutralize the acids formed in combustion and to minimize corrosive wear. The TBN is normally printed on the oil container, along with other information, such as the API performance rating.

The percentage of sulfur by weight in fuel is measured by the American Society of Testing Material (ASTM) D-2896 method, which can usually be found at your local technological society, library, or college.

Any API CE, CE/SF OR CE/SG performance oil should have sufficient TBN for fuels with less than 0.5% sulfur.

If the fuel has over 0.5% sulfur content by weight, the CE, CE/SF OR CE/SG engine oil must have a TBN or 20 times the percentage of fuel sulfur. Thus, if the sulfur percentage is 0.9%, the minimum acceptable TBN percentage would be 18 ( $20 \times 0.9 = 18$ ).

If the sulfur content in the fuel is greater than 1.5% by weight, use an oil with a TBN of 30 and reduce the oil change interval by one half.

## COMMONLY USED PARTS

The listing below is to aid you in obtaining parts should you be unable to contact Gillig or find yourself in a breakdown situation in an isolated area. The Gillig part number and manufacturer's part number are given, which should aid in identifying a substitute part to install until original equipment replacement parts can be ordered from Gillig or from your authorized service facility.

GILLIG P/N	DESCRIPTION	MFGR	PART NO.
53-24727-000	V-belt, Alternator (pair)	Durkee-Atwood	
53-02222-036	V-belt, Hyd Pump (pair)	Durkee-Atwood	
	Engine Oil Filter	Caterpillar	1R0658
53-24744-001	Engine Fuel Filter	Caterpillar	1P2299
	Engine Fuel Filter Insert	Caterpillar	4N3294
82-06889-000	Air Filter Element	F/W	
53-11639-000	Trans Fluid Filter	Detroit Diesel	25011122
53-22412-000	Hydraulic Fluid Filter	Nelson	83284B
82-01125-000	Pinion Seal		F/W
82-02223-000	Front Wheel Oil Seal	F/W	
82-02234-000	Rear Wheel Oil Seal	F/W	
53-15851-008	Fan Control Valve	Webster	na
53-20182-008	Fuel Gauge Sender (F/W Tank)	Stewart-Warner	391D
53-24763-000	Cruise Control Module	Zemco	AP230
51-00072-000	Brake Light Switch	Bendix-Westinghouse	226411



