



**Buell**

AMERICAN MOTORCYCLES

'99/'00 LIGHTNING™ X1

**SEWAGE MANAGER**

# 1999/2000 BUELL LIGHTNING X1

## SERVICE MANUAL

The information in this Service Manual applies  
to 1999 and 2000 Buell X1 models.

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# FOREWORD

## GENERAL

This Service Manual has been prepared with two purposes in mind. First, it will acquaint the user with the construction of the Buell product and assist in the performance of basic maintenance and repair. Secondly, it will introduce to the professional Buell Technician the latest field-tested and factory-approved major repair methods. We sincerely believe that this Service Manual will make your association with Buell products more pleasant and profitable.

## HOW TO USE YOUR SERVICE MANUAL

Information is arranged as follows:

- Section 1—Maintenance
- Section 2—Chassis
- Section 3—Engine
- Section 4—Fuel System
- Section 5—Electric Starter
- Section 6—Drive/Transmission
- Section 7—Electrical
- Appendix A—Tools
- Appendix B—Metric Conversions

Use the TABLE OF CONTENTS following this FOREWORD or the INDEX at the back of the book to find the desired subject.

Note that each manual section topic is sequentially numbered in the upper left or right hand corner of the page. The numbering system allows the user to quickly find cross referenced topics by flipping through the pages.

For example, the twelfth topic (CLUTCH) in section one (MAINTENANCE) is listed as:

### 1.12 CLUTCH

The 1.12 will appear in the upper left or right hand corner of the page.

## PREPARATION FOR SERVICE

### WARNING

**Gasoline is extremely flammable and highly explosive. Always stop the engine when refueling or servicing the fuel system. Do not smoke or allow open flame or sparks near the work site. Inadequate safety precautions may result in personal injury.**

Good preparation is very important for efficient service work. A clean work area at the start of each job will allow you to perform the repair as easily and quickly as possible, and will reduce the incidence of misplaced tools and parts. A motorcycle that is excessively dirty should be cleaned before work starts. Cleaning will occasionally uncover sources of trouble. Tools, instruments and any parts needed for the job should be gathered before work is started. Interrupting a job to locate tools or parts is a distraction and causes needless delay. See APPENDIX A—TOOLS for equipment required for special service work.

### NOTE

- *To avoid unnecessary disassembly, carefully read all relative service information before repair work is started.*
- *In figure legends, the number which follows the name of a part indicates the quantity necessary for one complete assembly.*

## SERVICE BULLETINS

In addition to the information presented in this Service Manual, Buell Distribution Corporation will periodically issue Service Bulletins to Buell dealers. Service Bulletins cover interim engineering changes and supplementary information.

## USE GENUINE REPLACEMENT PARTS

### WARNING

**When replacement parts are required, use only genuine Buell parts or parts with equivalent characteristics (which include type, strength and material). Failure to do so may result in product malfunction and possible personal injury.**

To ensure satisfactory and lasting repairs, carefully follow the Service Manual instructions and use only genuine Buell replacement parts. This is your assurance that the parts you are using will fit right, operate properly and last longer.

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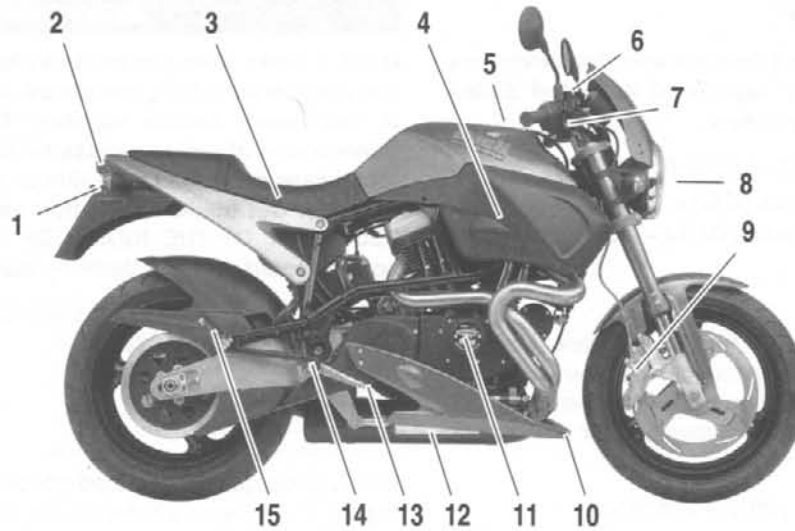
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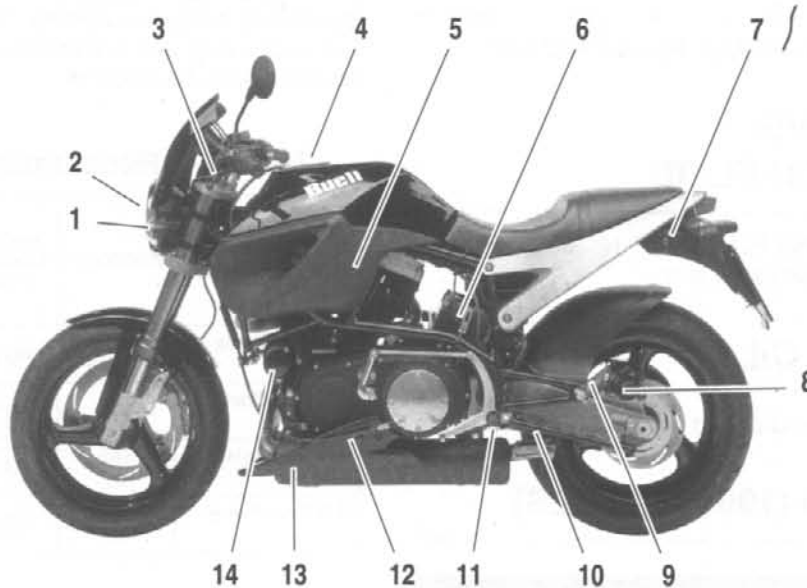
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- |                           |                                |                               |
|---------------------------|--------------------------------|-------------------------------|
| 1. Right rear turn signal | 6. Front brake master cylinder | 11. Cam position sensor cover |
| 2. Tail/stop lamp         | 7. Front brake hand lever      | 12. Rear shock absorber       |
| 3. Seat                   | 8. Headlamp                    | 13. Rear brake pedal          |
| 4. Air cleaner cover      | 9. Front brake caliper         | 14. Rider footrest            |
| 5. Fuel filler cap        | 10. Chin fairing               | 15. Passenger footrest        |

Figure 1-1. 1999 Lightning X1, Right Side View

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- |                           |                        |                    |
|---------------------------|------------------------|--------------------|
| 1. Left front turn signal | 6. Battery             | 11. Rider footrest |
| 2. Headlamp               | 7. Seat lock           | 12. Clutch cable   |
| 3. Clutch hand lever      | 8. Rear brake calliper | 13. Chin fairing   |
| 4. Fuel filler cap        | 9. Passenger footrest  | 14. Oil filter     |
| 5. Air scoop              | 10. Side stand         |                    |

Figure 1-2. 1999 Lightning X1, Left Side View

## BRAKE PADS

### ⚠ WARNING

Always replace brake pads in complete sets for correct brake operation. Never replace just one brake pad. Failure to install brake pads as a set could result in death or serious injury.

Check brake pads for minimum thickness:

- At the 500 mile (800 km) service interval.
- At every scheduled service interval thereafter.

See Figure 1-32. Inspect brake pads for damage or excessive wear. Replace both pads as a set if friction material (1) of either pad is worn to 0.04 in. (1.0 mm) or less. If this amount of wear occurs, wear grooves (2) will disappear from friction material surface.

- Replace front brake pads using procedure under 2.19 FRONT BRAKE CALIPER (2000 Models).
- Replace rear brake pads using procedure under 2.22 REAR BRAKE CALIPER (2000 models).

## BRAKE ROTORS

### Brake Rotor Thickness

### ⚠ WARNING

Do not allow brake fluid, bearing grease, lubricants, etc. to contact brake rotor or reduced braking ability will occur, which could result in death or serious injury.

Check brake rotors for minimum thickness:

- At the 500 mile (800 km) service interval.
  - At every scheduled service interval thereafter.
1. Measure rotor thickness. Replace if minimum thickness is less than 0.18 in. (4.5 mm).
  2. Check rotor surface. Replace if warped or badly scored.
  3. The brake rotor must be within the following specifications. If the brake rotor is suspected of being damaged, inspect rotor using the following measurements:
    - Lateral Movement: 0.3-0.5 mm
    - Radial Movement: 0.45 mm
    - Rotational Movement: 0.39 mm

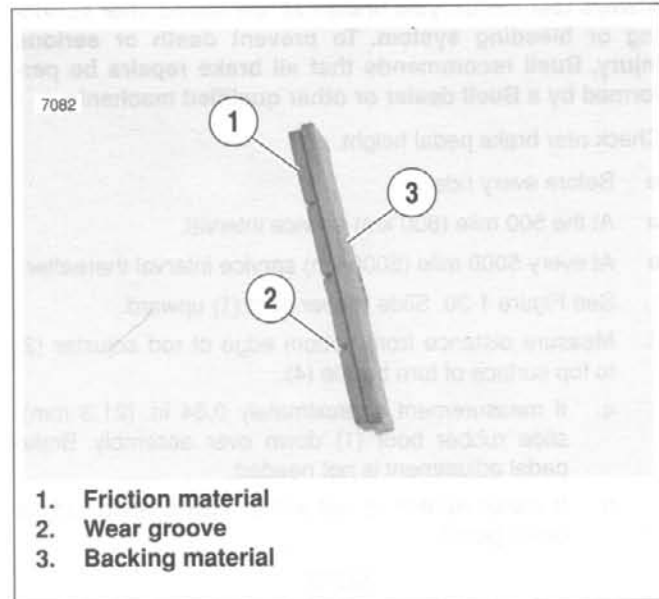


Figure 1-32. Brake Pad Thickness

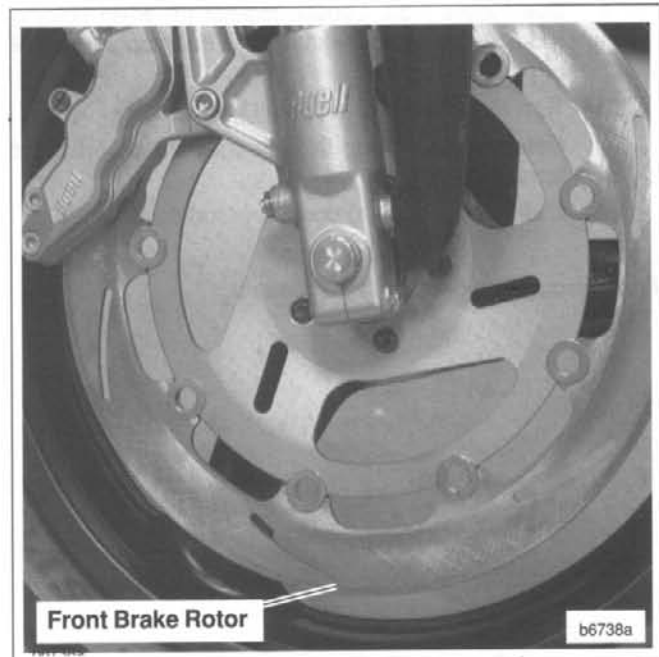


Figure 1-33. Front Brake Rotor

## TIRE INFLATION

**⚠ WARNING**

Do not inflate any tire beyond its maximum inflation pressure as specified on tire sidewall. Overinflation may cause tire to suddenly deflate which could result in death or serious injury.

Check tire pressure and tread:

- Before every ride.
- At the 500 mile (800 km) service interval.
- At every scheduled service interval.

Check for proper front and rear tire pressures when tires are cold. Compare pressure against Table 1-4.

**Table 1-4. Tire Pressures**

TIRE	PRESSURE FOR SOLO RIDING		PRESSURE AT GVWR	
	PSI	kPa	PSI	kPa
Front	32	220	36	248
Rear	36	248	38	262

## WHEEL BEARINGS

**⚠ WARNING**

Never use compressed air to "spin-dry" bearings. Very high bearing speeds can damage unlubricated bearings. Spinning bearings with compressed air can also cause a bearing to fly apart, which could result in death or serious injury.

Check wheel bearings:

- Every time the wheel is removed.
- At every 10,000 mile (16,000 km) service interval.
- When storing or removing the motorcycle for the season.

Check wheel bearings and axle spacers for wear and corrosion. Excessive play or roughness indicates worn bearings. Replace bearings in sets only.

## TRANSMISSION FLUID

Check transmission fluid:

- Replace at the 500 mile (800 km) service interval.
- Inspect level at every 2500 mile (4000 km) service interval.
- Replace at every 5000 mile (8000 km) service interval.

Transmission fluid capacity is approximately 1.0 quart (0.95 liter). For best results, drain fluid while hot.

1. Raise rear wheel off floor using REAR WHEEL SUPPORT STAND (Part No. B-41174). This prevents transmission fluid from spilling out of the clutch inspection cover opening.
2. Remove muffler to access drain plug. See 2.35 EXHAUST SYSTEM.
3. See Figure 1-34. Position a suitable container under drain plug (3). Remove plug and drain fluid.
4. Wipe any foreign material from the magnetic drain plug. Reinstall plug. Tighten to 14-21 ft-lbs (19.0-28.5 Nm).
5. Remove four TORX screws with washers (1) from clutch inspection cover (2). Remove clutch inspection cover from primary cover. Do not damage or dislodge Quad ring from primary cover.

### CAUTION

**Do not overfill the transmission with fluid. Overfilling may cause rough clutch engagement and incomplete disengagement, clutch drag and/or difficulty finding neutral at engine idle.**

6. See Figure 1-35. Add SPORT-TRANS FLUID (Part No. 98854-96 quart size; Part No. 98855-96 gallon size) as required until fluid level (4) is even with bottom of clutch diaphragm spring (3).
7. See Figure 1-34. Install clutch inspection cover (2) using four TORX screws with washers (1). Tighten in a cross-wise pattern to 7-9 ft-lbs (9.5-12.2 Nm).
8. Install muffler. See 2.35 EXHAUST SYSTEM.

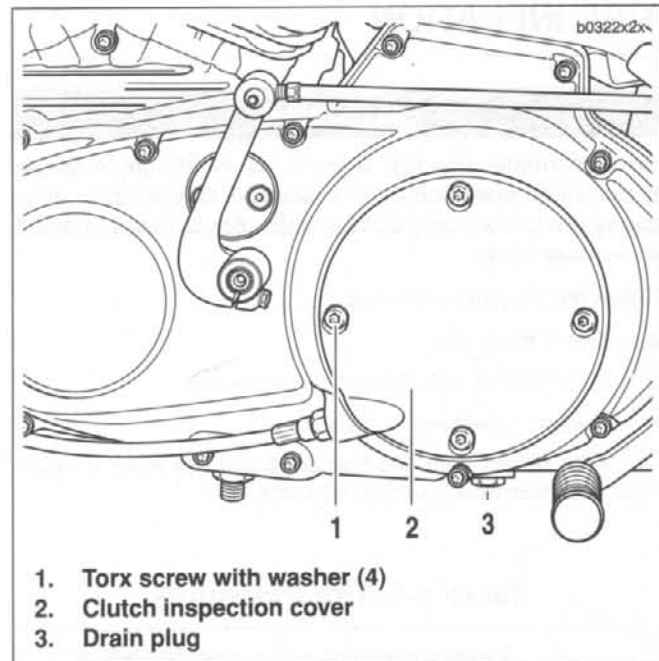


Figure 1-34. Primary Cover

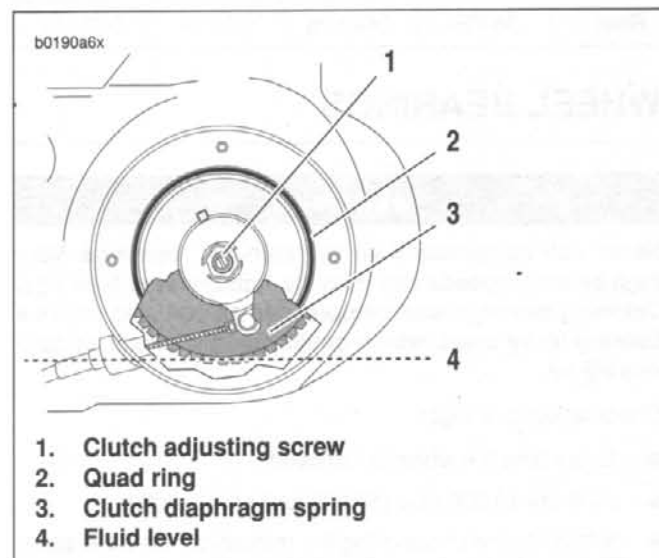


Figure 1-35. Fluid Level

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