2005 BUELL P3

SERVICE MANUAL

Part Number 99492-05Y

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MAINTENANCE 1

SERVICING A NEW MOTORCYCLE

⚠WARNING

Perform the service and maintenance operations as indicated in the regular service interval table. Lack of regular maintenance at the recommended intervals can affect the safe operation of your motorcycle, which could result in death or serious injury. (00010a)

Service operations to be performed before customer delivery are specified in the applicable model year PREDELIVERY AND SETUP MANUAL.

The performance of new motorcycle initial service is required to keep warranty in force and to ensure proper emissions systems operation. See 1.3 MAINTENANCE SCHEDULE for details.

SAFE OPERATING MAINTENANCE

CAUTION

- **Do not attempt to retighten engine head bolts. Retightening can cause engine damage.**

- **During the initial break-in period, use only Harley-Davidson 20W50 engine oil. Failure to use the recommended oil will result in improper break-in of the engine cylinders and piston rings.**

A careful check of certain equipment is necessary after periods of storage, and frequently between regular service intervals, to determine if additional maintenance is required.

Check:

1. Tires for abrasions, cuts and correct pressure.
2. Secondary drive belt for proper tension and condition.
3. Brakes, steering and throttle for responsiveness.
4. Brake fluid level and condition. Hydraulic lines and fittings for leaks. Also, check brake pads and rotors for wear.
5. Cables for fraying, crimping and free operation.
6. Engine oil and transmission fluid levels.
7. Headlamp, passing lamp, tail lamp, brake lamp and turn signal operation.

SHOP PRACTICES

Repair Notes

NOTE

- *General maintenance practices are given in this section.*
- *Repair = Disassembly/Assembly.*
- *Replace = Removal/Installation.*

All special tools and torque values are noted at the point of use.

All required parts or materials can be found in the appropriate PARTS CATALOG.

Safety

Safety is always the most important consideration when performing any job. Be sure you have a complete understanding of the task to be performed. Use common sense. Use the proper tools. Protect yourself and bystanders with approved eye protection. Don't just do the job – do the job safely.

Removing Parts

Always consider the weight of a part when lifting. Use a hoist whenever necessary. Do not lift heavy parts by hand. A hoist and adjustable lifting beam or sling are needed to remove some parts. The lengths of chains or cables from the hoist to the part should be equal and parallel and should be positioned directly over the center of the part. Be sure that no obstructions will interfere with the lifting operation. Never leave a part suspended in mid-air.

⚠WARNING

Always check the capacity rating and condition of hoists, slings, chains or cables before use. Failure to do so can lead to an accident which could result in death or serious injury.

Always use blocking or proper stands to support the part that has been hoisted. If a part cannot be removed, verify that all bolts and attaching hardware have been removed. Check to see if any parts are in the way of the part being removed.

When removing hoses, wiring or tubes, always tag each part to ensure proper installation.

Cleaning

If you intend to reuse parts, follow good shop practice and thoroughly clean the parts before assembly. Keep all dirt out of parts; the unit will perform better and last longer. Seals, filters and covers are used in this vehicle to keep out environmental dirt and dust. These items must be kept in good condition to ensure satisfactory operation.

Clean and inspect all parts as they are removed. Be sure all holes and passages are clean and open. After cleaning, cover all parts with clean lint-free cloth, paper or other material. Be sure the part is clean when it is installed.

Always clean around lines or covers before they are removed. Plug, tape or cap holes and openings to keep out dirt, dust and debris.

Disassembly and Assembly

Always assemble or disassemble one part at a time. Do not work on two assemblies simultaneously. Be sure to make all necessary adjustments. Recheck your work when finished. Be sure that everything is done.

Operate the vehicle to perform any final check or adjustments. If all is correct, the vehicle is ready to go back to the customer.

REPAIR AND REPLACEMENT PROCEDURES

Hardware and Threaded Parts

Install helical thread inserts when inside threads in castings are stripped, damaged or not capable of withstanding specified torque.

Replace bolts, nuts, studs, washers, spacers and small common hardware if missing or in any way damaged. Clean up or repair minor thread damage with a suitable thread chaser.

Replace all damaged or missing lubrication fittings.

Use Teflon pipe sealant on pipe fitting threads.

Wiring, Hoses and Lines

Replace hoses, clamps, electrical wiring, electrical switches or fuel lines if they do not meet specifications.

Instruments and Gauges

Replace broken or defective instruments and gauges. Replace dials and glass that are so scratched or discolored that reading is difficult.

Bearings

Anti-friction bearings must be handled in a special way. To keep out dirt and abrasives, cover the bearings as soon as they are removed from the package.

Wash bearings in a non-flammable cleaning solution. Knock out packed lubricant inside by tapping the bearing against a wooden block. Wash bearings again. Cover bearings with clean material after setting them down to dry. Never use compressed air to dry bearings.

Coat bearings with clean oil. Wrap bearings in clean paper.

Be sure that the chamfered side of the bearing always faces the shoulder (when bearings installed against shoulders). Lubricate bearings and all metal contact surfaces before pressing into place. Only apply pressure on the part of the bearing that makes direct contact with the mating part. Install bearings with numbered side facing out.

Always use the proper tools and fixtures for removing and installing bearings.

Bearings do not usually need to be removed. Only remove bearings if necessary.

Bushings

Do not remove a bushing unless damaged, excessively worn or loose in its bore. Press out bushings that must be replaced.

When pressing or driving bushings, be sure to apply pressure in line with the bushing bore. Use a bearing/bushing driver or a bar with a smooth, flat end. Never use a hammer to drive bushings.

Inspect the bushing and the mated part for oil holes. Be sure all oil holes are properly aligned.

Gaskets

Always discard gaskets after removal. Replace with **new** gaskets. Never use the same gasket twice. Be sure that gasket holes match up with holes in the mating part.

Lip Type Seals

Lip seals are used to seal oil or grease and are usually installed with the sealing lip facing the contained lubricant. Seal orientation, however, may vary under different applications.

Seals should not be removed unless necessary. Only remove seals if required to gain access to other parts or if seal damage or wear dictates replacement.

Leaking oil or grease usually means that a seal is damaged. Replace leaking seals to prevent overheated bearings.

Always discard seals after removal. Do not use the same seal twice.

O-Rings (Preformed Packings)

Always discard O-rings after removal. Replace with **new** O-rings. To prevent leaks, lubricate the O-rings before installation. Apply the same type of lubricant as that being sealed. Be sure that all gasket, O-ring and seal mating surfaces are thoroughly clean before installation.

Gears

Always check gears for damaged or worn teeth.

Lubricate mating surfaces before pressing gears on shafts.

Shafts

If a shaft does not come out easily, check that all nuts, bolts or retaining rings have been removed. Check to see if other parts are in the way before using force.

Shafts fitted to tapered splines should be very tight. If shafts are not tight, disassemble and inspect tapered splines. Discard parts that are worn. Be sure tapered splines are clean, dry and free of burrs before putting them in place. Press mating parts together tightly.

Clean all rust from the machined surfaces of new parts.

Part Replacement

Always replace worn or damaged parts with **new** parts.

CLEANING

Part Protection

Before cleaning, protect rubber parts (such as hoses, boots and electrical insulation) from cleaning solutions. Use a grease-proof barrier material. Remove the rubber part if it cannot be properly protected.

Cleaning Process

Any cleaning method may be used as long as it does not result in parts damage. Thorough cleaning is necessary for proper parts inspection. Strip rusted paint areas to bare metal before repainting.

Rust or Corrosion Removal

Remove rust and corrosion with a wire brush, abrasive cloth, sand blasting, vapor blasting or rust remover. Use buffing crocus cloth on highly polished parts that are rusted.

TOOL SAFETY

Air Tools

- Always use approved eye protection equipment when performing any task using air-operated tools.
- On all power tools, use only recommended accessories with proper capacity ratings.
- Do not exceed air pressure ratings of any power tools.
- Bits should be placed against work surface before air hammers are operated.
- Disconnect the air supply line to an air hammer before attaching a bit.
- Never point an air tool at yourself or another person.
- Protect bystanders with approved eye protection.

Wrenches

- Never use an extension on a wrench handle.
- If possible, always pull on a wrench handle and adjust your stance to prevent a fall if something lets go.
- Never cock a wrench.
- Never use a hammer on any wrench other than a STRIKING FACE wrench.
- Discard any wrench with broken or battered points.
- Never use a pipe wrench to bend, raise or lift a pipe.

Pliers/cutters/prybars

- Plastic- or vinyl-covered pliers handles are not intended to act as insulation; don't use on live electrical circuits.
- Don't use pliers or cutters for cutting hardened wire unless they were designed for that purpose.
- Always cut at right angles.
- Don't use any prybar as a chisel, punch or hammer.

Hammers

- Never strike one hammer against a hardened object, such as another hammer.
- Always grasp a hammer handle firmly, close to the end.
- Strike the object with the full face of the hammer.
- Never work with a hammer which has a loose head.
- Discard hammer if face is chipped or mushroomed.
- Wear approved eye protection when using striking tools.
- Protect bystanders with approved eye protection.

Punches/chisels

- Never use a punch or chisel with a chipped or mushroomed end; dress mushroomed chisels and punches with a file.
- Hold a chisel or a punch with a tool holder if possible.
- When using a chisel on a small piece, clamp the piece firmly in a vise and chip toward the stationary jaw.
- Wear approved eye protection when using these tools.
- Protect bystanders with approved eye protection.

Screwdrivers

- Don't use a screwdriver for prying, punching, chiseling, scoring or scraping.
- Use the right type of screwdriver for the job; match the tip to the fastener.
- Don't interchange POZIDRIV®, PHILLIPS® or REED AND PRINCE screwdrivers.
- Screwdriver handles are not intended to act as insulation; don't use on live electrical circuits.
- Don't use a screwdriver with rounded edges because it will slip – redress with a file.

Ratchets and Handles

- Periodically clean and lubricate ratchet mechanisms with a light grade oil. Do not replace parts individually; ratchets should be rebuilt with the entire contents of service kit.
- Never hammer or put a pipe extension on a ratchet or handle for added leverage.
- Always support the ratchet head when using socket extensions, but do not put your hand on the head or you may interfere with the action of its reversing mechanism.
- When breaking loose a fastener, apply a small amount of pressure as a test to be sure the ratchet's gear wheel is engaged with the pawl.

Sockets

- Never use hand sockets on power or impact wrenches.
- Select the right size socket for the job.
- Never cock any wrench or socket.
- Select only impact sockets for use with air or electric impact wrenches.
- Replace sockets showing cracks or wear.
- Keep sockets clean.
- Always use approved eye protection when using power or impact sockets.

Storage Units

- Don’t open more than one loaded drawer at a time. Close each drawer before opening up another.
- Close lids and lock drawers and doors before moving storage units.
- Don’t pull on a tool cabinet; push it in front of you.
- Set the brakes on the locking casters after the cabinet has been rolled to your work.

FLUID REQUIREMENTS 1.2

BRAKE FLUID

⚠WARNING

Direct contact of D.O.T. 4 brake fluid with eyes can cause irritation. Avoid eye contact. In case of eye contact flush with large amounts of water and get medical attention. Swallowing large amounts of D.O.T. 4 brake fluid can cause digestive discomfort. If swallowed, obtain medical attention. Use in well ventilated area. KEEP OUT OF REACH OF CHILDREN. (00240a)

Use only **D.O.T. 4 BRAKE FLUID** (Part No. 99953-99Y).

FRONT FORK OIL

Use only TYPE E FORK OIL (Part No. HD-99884-80).

ENGINE OIL

Use the proper grade of oil for the lowest temperature expected before the next oil change.

If it is necessary to add oil and Harley-Davidson oil is not available, use an oil certified for diesel engines. Acceptable diesel engine oil designations include CF-4, CG-4, CH-4 and CI-4. The preferred viscosities for the diesel engine oils, in descending order, are 20W-50, 15W-40 and 10W-40. At the first opportunity, see a Buell dealer to change back to 100 percent Harley-Davidson oil.

PRIMARY DRIVE/TRANSMISSION FLUID

Use only SPORT-TRANS FLUID (Part No. 99896-88 quart size or Part No. 99895-88 gallon size).

MAINTENANCE SCHEDULE 1.3

Table 1-1. Regular Service Intervals For Buell Blast Models

ITEM SERVICED	PROCEDURE	1000 mi 1600 km	2500 mi 4000 km	5000 mi 8000 km	7500 mi 12000 km	10000 mi 16000 km	12500 mi 20000 km	15000 mi 24000 km	17500 mi 28000 km	20000 mi 32000 km	22500 mi 36000 km	25000 mi 40000 km	NOTES
Engine oil and filter	Replace	X		X		X		X		X		X	
	Inspect		X		X		X		X		X		
Oil lines and brake system	Inspect for leaks	X	X	X	X	X	X	X	X	X	X	X	1
Air cleaner	Inspect, service as required					X				X			
Crankcase breather hose	Drain	X		X		X		X		X		X	
Tires	Check pressure, inspect tread	X	X	X	X	X	X	X	X	X	X	X	
Transmission lubricant	Replace	X		X		X		X		X		X	1
Clutch	Check adjustment	X		X		X		X		X		X	1
Primary chain	Check adjustment	X	X	X	X	X	X	X	X	X	X	X	1
Rear belt and rear sprocket	Replace							X					1
Throttle control	Check operation	X	X	X	X	X	X	X	X	X	X	X	1
Throttle, brake and clutch controls, jiffy stand	Lubricate			X		X		X		X		X	1
Fuel valve, lines and fittings	Inspect for leaks	X	X	X	X	X	X	X	X	X	X	X	1
Fuel tank filter screen	Clean									X			1
Brake fluid	Check levels and condition	X		X		X		X		X		X	3
Brake pads and discs	Inspect for wear	X	X	X	X	X	X	X	X	X	X	X	
Rear brake pads and rear brake pins	Replace							X					1
Rear brake pedal	Check operation	X		X		X		X		X		X	1
Spark plug	Replace					X				X			
Electrical equipment and switches, starter interlock	Check operation	X	X	X	X	X	X	X	X	X	X	X	
Engine idle speed	Check adjustment	X	X	X	X	X	X	X	X	X	X	X	1
Ignition timing	Check					X				X			1
Front fork oil	Replace									X			1
Steering head bearings	Lubricate and adjust									X			1
Rear shock absorber	Check					X				X			
Wheel bearings	Inspect												2
Exhaust system hardware including muffler strap	Inspect					X				X			1
Critical fasteners	Check tightness					X				X			1
Engine mounts and stabilizer links	Inspect					X				X			1
Battery	Check battery and clean connections	X	X	X	X	X	X	X	X	X	X	X	
Road test	Verify component and system functions	X	X	X	X	X	X	X	X	X	X	X	

NOTES:

1. Should be performed by an authorized Harley-Davidson dealer, unless you have the proper tools, service data and are mechanically qualified.
2. Inspect wheel bearings whenever wheel is removed (tire change, fork fluid change, etc.)
3. Change brake fluid every two (2) years.

Table 1-2. Quick Reference Maintenance Chart

ITEM SERVICED	SPECIFICATION	DATA
Engine oil and filter	Drain plug torque	plug with spring clamp
	Oil capacity	2.0 qt. (1.89 L) Until oil registers between marks on dipstick.
	Filter	Hand tighten 1/2-3/4 turn after gasket contact
	Black filter part number	63806-00Y
Primary chain tension	Deflection with hot engine	NONE
	Deflection with cold engine	Tighten chain limiting screw to 24 **in-lbs** (2.7 Nm) Back-off chain limiting screw 3/4 turn (4 1/2 “flats”).
	Chain tensioner nut torque	Hold chain limiting screw while tightening jam nut.
	Primary chain inspection cover torque	N/A
Primary chain lubricant	Lubricant capacity	32 oz. (946 mL)
	Primary chaincase drain plug torque	11-15 ft-lbs (14.9-20.3 Nm)
Clutch adjustment	Free play at adjuster screw	1/4 - 1/2 turn
	Free play at hand lever	0.0625-0.125 in. (1.6-3.2 mm)
	Clutch inspection cover torque	84-108 **in-lbs** (9.5-12.2 Nm)
Transmission lubricant	Lubricant level	Inspect fluid level with motorcycle in upright position. Level with bottom of clutch shell.
	Lubricant capacity	32 oz. (946 mL)
	Transmission drain plug torque	11-15 ft-lbs (14.9-20.3 Nm)
Tire condition and pressure	Pressure for solo rider	Front: 28 psi (1.9 bar) Rear: 30 psi (2.1 bar)
	Pressure for rider and passenger	Front: 32 psi (2.2 bar) Rear: 36 psi (2.5 bar)
	Wear	Replace tire if 1/32 in. (0.8 mm) or less of tread pattern remains
Brake fluid reservoir level	D.O.T. 4 hydraulic brake fluid part numbers	99953-99A (12 oz.) 99973-05 (gal.).
	Proper fluid level	1/8 in. (3.2 mm) from the top
	Master cylinder reservoir cover torque	9-13 **in-lbs** (1.0-1.5 Nm)
Brake pad linings and discs	Minimum brake pad thickness	0.1 in. (2.5 mm) or less
	Minimum brake disc thickness	0.180 in. (4.5 mm)
Drive belt	Upward measurement force applied at midpoint of bottom belt strand	10 lb. (4.5 kg)
	Belt deflection with motorcycle on jiffy stand and a 160 lb. rider or equivalent weight sitting on the motorcycle.	Maximum allowable deflection is 0.5 in. (12.7 mm) at the bottom strand.

Table 1-2. Quick Reference Maintenance Chart

ITEM SERVICED	SPECIFICATION	DATA
Air cleaner	Air cleaner cover bracket screw torque	36-60 **in-lbs** (4.1-6.8 Nm)
	Air cleaner cover screw torque	4-6 **in-lbs** (0.5-0.7 Nm)
	Adhesive for air cleaner bracket screws	LOCTITE THREADLOCKER 222 (Purple) Part No. 99811-97 (6 ml)
Fuel tank filter	Two allen head screws torque	12-14 **in-lbs** (1-2 Nm)
Enrichener control	Phillips screw (with lockwasher)	13-23 **in-lbs** (2-3 Nm)
Clutch and throttle cables	Lubricant	SUPER OIL Part No. 94968-85TV (1/4 fl. oz.)
	Handlebar clamp screw torque	120-144 **in-lbs** (14-16 Nm)
	Handlebar switch housing screw torque	25-33 **in-lbs** (3-4 Nm)
Spark plugs	Type	10R12A
	Gap	0.035 in. (0.9 mm)
	Torque	12-18 ft-lbs (16-24.4 Nm)
Engine idle speed	Idle speed	1200 RPM
Front fork oil	Type	HYDRAULIC FORK OIL (TYPE E) Part No. 99884-80 {9.2 oz. (272.1 ml)}
Battery	Lubricant	ELECTRICAL CONTACT LUBRICANT Part No. 99861-02 (1 oz.)
	Battery terminal torque	60-96 **in-lbs** (6.8-10.8 Nm)

BODY PANEL CARE/MAINTENANCE 1.4

GENERAL

Molded-in-color surfaces look like painted surfaces, but are not. The color pigment is mixed in with the material when the part is made, not applied over the surface. Molded-in-color panels require different maintenance than painted surfaces to maintain their original shine. Using methods that work on painted surfaces may ruin the finish of molded-in-color parts.

CAUTION

Use of abrasive products or powered buffing equipment will cause permanent cosmetic damage to molded-in-color body panels. Use only recommended products and techniques outlined in this manual to avoid damaging molded-in-color body panels. (00245a)

CAUTION

Do not use touch-up paint on molded-in-color panels.

RECOMMENDED PRODUCTS

Products recommended for the proper care and maintenance of molded-in-color body panels are available at your Buell dealer and are listed below:

- Harley Wash (Part No. 99715-90) or Harley Sun Wash (Part No. 94659-98).
- Harley Gloss (Part No. 94627-98).
- Harley Glaze Polish and Sealant (Part No. 99701-84).
- Harley Swirl and Scratch Treatment (Part No. 94655-98).
- Harley Softcloth (Part No. 94656-98).

CARE AND MAINTENANCE

Decals

NOTE

The body panels on Blast P3 Models are shipped from the factory untreated and ready for decal application.

If Personal F/X decals are to be applied to molded-in-color body panels, they must be applied to the original, untreated surface for proper adhesion. If Harley Glaze Polish and Sealant or similar product has been applied to the panels, the decal will not adhere properly. Apply wax and grease remover, such as Dupont Prep-Sol, to treated panels to remove Harley Glaze prior to applying decals for best results. Prep-Sol is available at most automotive aftermarket dealers. Follow instructions on product for proper usage. Follow instructions provided with decals for proper application. Prep-Sol will not affect molded-in-color panels. If you are unsure of how to use this product, see your Buell dealer.

Washing

To wash molded-in-color panels follow the instructions below:

1. Rinse surface with water.
2. Wash with Harley Wash or Harley Sun Wash.
3. Rinse surface thoroughly with water.
4. Dry with a clean chamois or soft dry natural fiber cloth.

Cleaning Between Washings

Untreated molded-in-color body panels sometimes have a static charge that attracts dust. Applying Harley Gloss or Harley Glaze Polish and Sealant to molded-in-color surfaces will eliminate this condition.

To keep a high gloss finish on molded-in-color panels between washings, follow the instructions below:

Spray Harley Gloss onto surface and wipe with a clean soft natural fiber cloth or Harley Softcloth.

NOTE

Rain or water will remove Harley Gloss from body panels.

Reapply Harley Gloss as described above to keep surfaces looking their best.

Polishing

Polishing molded-in-color body panels results in greater surface gloss and a protective coating.

Apply Harley Glaze Polish and Sealant every six months or as required to keep molded-in-color panels protected and looking their best.

Clean and dry surfaces to be polished (see *Washing*).

Apply Harley Glaze Polish and Sealant to clean, slightly dampened cloth or sponge and apply to surface with a light overlapping motion. Make sure to cover all areas.

Let Harley Glaze Polish and Sealant dry to a haze and buff off residue with a clean soft cloth or Harley Softcloth.

Minor Scratch Removal

To remove minor scratches from body panels follow the instructions below.

1. To remove light surface scratches and rubs, use Harley Swirl and Scratch Treatment as recommended.
2. Make sure Swirl and Scratch Treatment is applied with a moist cloth and by hand (not by machine).
3. After scratch or rub has been repaired, polish surface lightly with Harley Glaze.

NOTE

Black body panels are more prone to suffer permanent cosmetic damage if attempts to remove scratches are overdone.

Major Scratches

There is no repair procedure for severely scratched surfaces. Severely scratched body panels must be replaced.

NOTES

BATTERY 1.5

DISCONNECTION AND REMOVAL

1. Remove seat. See 2.28 SEAT.

⚠WARNING

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

⚠WARNING

Disconnect negative (-) battery cable first. If positive (+) cable should contact ground with negative (-) cable connected, the resulting sparks can cause a battery explosion, which could result in death or serious injury. (00049a)

2. Unthread bolt and remove battery negative cable (black) from battery negative (-) terminal.
3. Unthread bolt and remove battery positive cable (red) from battery positive (+) terminal.
4. Remove battery from motorcycle.

INSTALLATION AND CONNECTION

1. Place the fully charged battery on the battery pad, terminal side facing up.

CAUTION

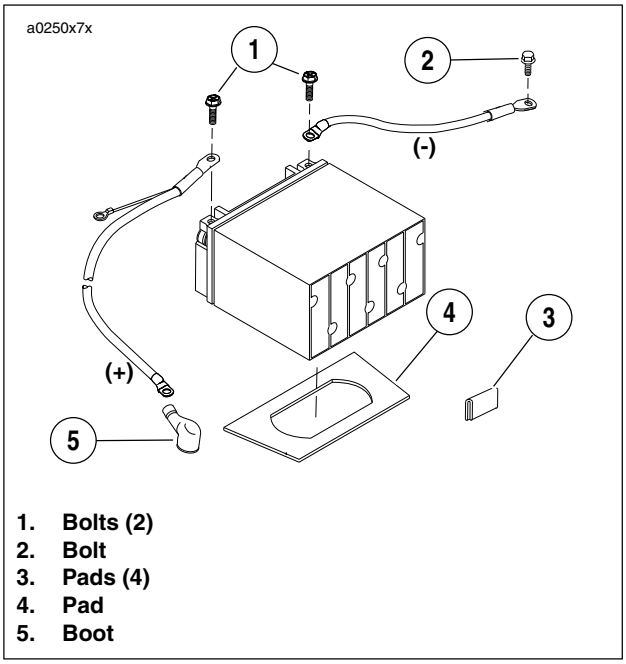
Connect the cables to the correct battery terminals. Failure to do so could result in damage to the motorcycle electrical system. (00215a)

⚠WARNING

Connect positive (+) battery cable first. If positive (+) cable should contact ground with negative (-) cable connected, the resulting sparks can cause a battery explosion, which could result in death or serious injury. (00068a)

CAUTION

Do not over-tighten bolts on battery terminals. Use recommended torque values. Over-tightening battery terminal bolts could result in damage to battery terminals. (00216a)



1. **Bolts (2)**
2. **Bolt**
3. **Pads (4)**
4. **Pad**
5. **Boot**

Figure 1-1. Battery Installation

2. See Figure 1-1. Insert bolt through battery positive cable (red) into threaded hole of battery positive (+) terminal. Tighten bolt to 60-96 **in-lbs** (6.8-10.9 Nm).
3. See Figure 1-1. Insert bolt through battery negative cable (black) into threaded hole of battery negative (-) terminal. Tighten bolt to 60-96 **in-lbs** (6.8-10.9 Nm).
4. Apply a light coat of petroleum jelly or corrosion retardant material to both battery terminals.

⚠WARNING

After installing seat, pull upward on front of seat to be sure it is in locked position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070a)

5. Install seat. See 2.28 SEAT.

ENGINE LUBRICATION SYSTEM 1.6

GENERAL

Check engine oil level (hot check):

- At every stop for fuel.

Inspect oil lines and filter for leaks:

- At 1000 mi (1600 km) initial service and every 2500 mi (4000 km) service interval.

Change engine oil and filter (and drain crankcase breather hose) under normal service in warm or moderate temperatures:

- At every 5000 mi (8000 km) service interval thereafter.

Change engine oil and filter (and drain crankcase breather hose) under severe service in warm or moderate temperatures (severe dust, temperatures above 80° F/27° C, extensive idling or speeds in excess of 65 m.p.h./105 km/h, extensive two-up riding):

- At every 2500 mi (4000 km) service interval thereafter.

NOTE

Shorten oil change interval in cold weather.

Table 1-3. Recommended Engine Oils

Harley-Davidson Type	Viscosity	Harley-Davidson Rating	Lowest Ambient Temperature	Cold Weather Starts Below 50° F (10° C)
HD Multi-grade	SAE 10W40	HD 360	Below 40° F (4° C)	Excellent
HD Multi-grade	SAE 20W50	HD 360	Above 40° F (4° C)	Good
HD Regular Heavy	SAE 50	HD 360	Above 60° F (16° C)	Poor
HD Extra Heavy	SAE 60	HD 360	Above 80° F (27° C)	Poor

CHECKING ENGINE OIL LEVEL

An accurate engine oil level reading can *only* be obtained after the engine has reached normal operating temperature (Hot Check). The engine will require a longer warm up period in colder weather.

For pre-ride inspection, simply verify that there are no oil leaks from the oil filter and oil lines prior to operating the motorcycle.

- Perform a hot check of the engine oil level at each fuel stop.

Hot Check

CAUTION

Do NOT operate the engine when the oil level is below the add mark on the dipstick at operating temperature. Engine damage will result. (00187a)

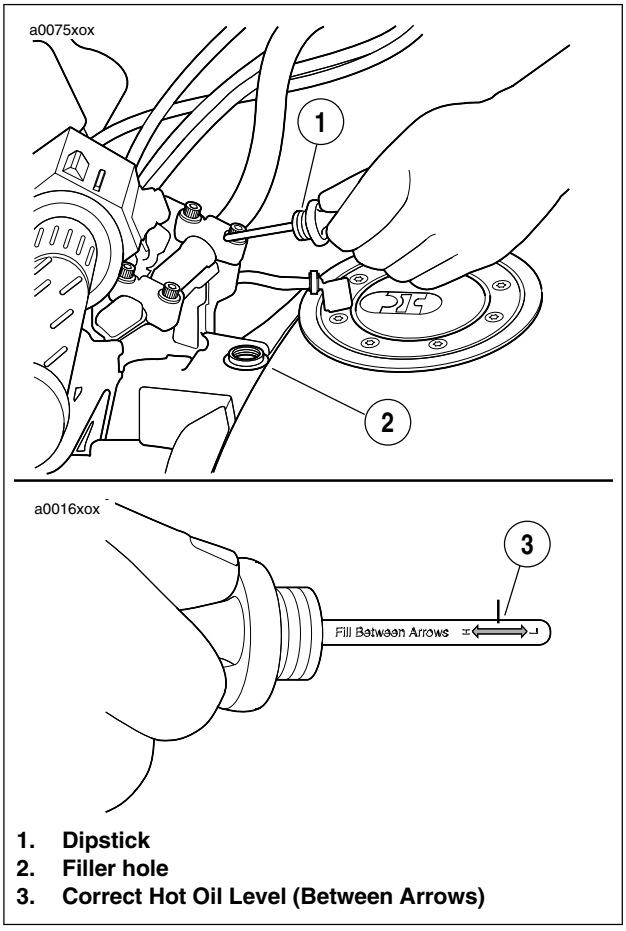
CAUTION

Do not overfill oil tank. Doing so can result in oil carry-over to the air cleaner leading to equipment damage and/or equipment malfunction. (00190a)

CAUTION

Do not switch lubricant brands indiscriminately because some lubricants interact chemically when mixed. Use of inferior lubricants can damage the engine. (00184a)

The motorcycle should be ridden for approximately 10 minutes to ensure oil is hot and engine is at normal operating temperature.



1. **Dipstick**
2. **Filler hole**
3. **Correct Hot Oil Level (Between Arrows)**

Figure 1-2. Dipstick Location/Engine Oil Level

1. The motorcycle must be in upright position and level (not on sidestand) with the engine OFF.
2. See Figure 1-2. Unscrew dipstick from frame filler hole.
3. Wipe off dipstick and insert into frame filler hole, screwing dipstick completely into filler neck.
4. See Figure 1-2. Remove dipstick and note oil level.
5. Hot oil level should be between the upper and lower “fill” marks on dipstick. If oil level is down to or below lower “fill” mark on dipstick, add only enough oil to bring level between lower and upper “fill” marks.

CHANGING ENGINE OIL AND FILTER

CAUTION

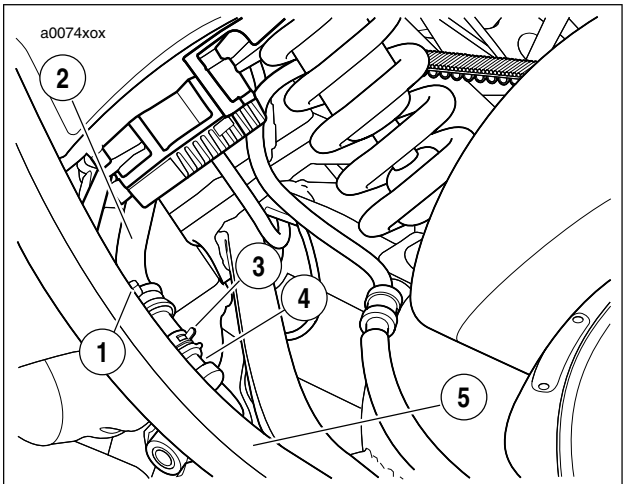
Do not switch lubricant brands indiscriminately because some lubricants interact chemically when mixed. Use of inferior lubricants can damage the engine. (00184a)

1. See Figure 1-3. Locate the engine oil tank drain hose (normally the lower hose) and the crankcase breather drain hose (normally the upper hose) inside the foot peg support frame on the left side of the motorcycle.
2. Remove fastener from hose retention clamp.
3. Place a drain pan directly underneath the engine oil drain hose.
4. Loosen the spring clamp and remove engine oil drain drain plug from drain hose.
5. Allow used oil to drain completely.
6. Loosen spring clamp and remove crankcase breather hose drain plug to allow any oil present to drain.
7. See Figure 1-4. Remove the oil filter (located at the front of the engine).
8. Clean filter gasket contact surface on mounting plate (surface should be smooth and free of any debris, used oil or old gasket material).
9. See Figure 1-4. Apply a thin film of clean oil to gasket on new oil filter.
10. Install **new** oil filter (Part No. 63806-00Y) onto adapter until gasket contacts plate surface, then tighten another 1/2-3/4 turn. Do not overtighten.
11. Place two drain hoses back on the hose fixture. Install drain plugs to drain hoses and secure plugs with spring clamps.
12. See Figure 1-2. Remove dipstick and refill with approximately 1.5 qts (1,419.5 ml) recommended oil at filler hole. Refer to Table 1-3.
13. Install dipstick and operate motorcycle for 10 minutes to reach normal operating temperature. Check oil level again (hot check) and add oil as necessary until oil registers between marks on dipstick.

⚠WARNING

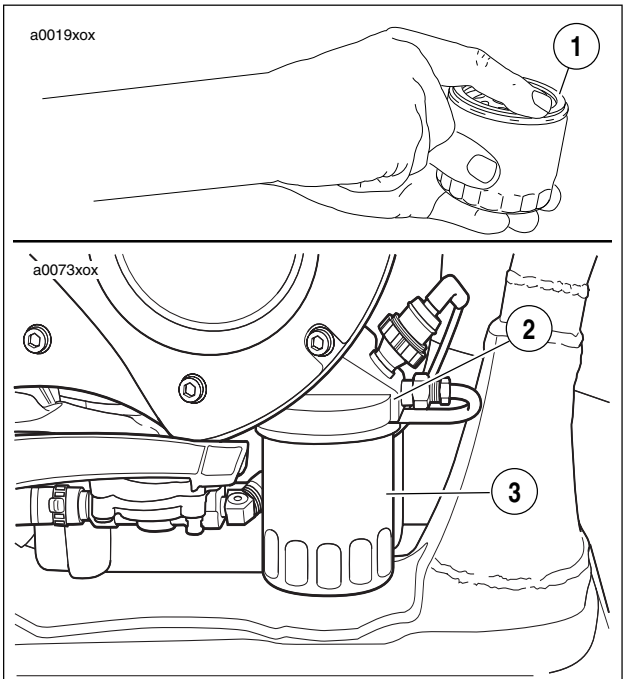
Check that no lubricant gets on tires, wheels or brakes when changing fluid. Traction can be adversely affected, which could result in loss of control of the motorcycle and death or serious injury. (00047b)

- Change oil more frequently if bike is operated under severe conditions (dusty, very hot or cold temperatures).
- Drain oil after operating motorcycle (while oil is still very warm).
- Replace oil filter every time the oil is changed.
- Drain the crankcase breather drain hose of any accumulated oil every time the oil is changed.



1. **Hose retention clamp fastener**
2. **Oil tank drain hose (lower hose) crankcase breather hose (upper hose)**
3. **Spring clamp**
4. **Engine oil drain hose cap**
5. **Foot peg support frame**

Figure 1-3. Oil Tank Drain Hose



1. **Applying thin film of clean engine oil to gasket**
2. **Filter mount**
3. **Oil filter-tighten 1/2-3/4 turn after gasket contact**

Figure 1-4. Installing New Oil Filter

GENERAL

Check the master cylinder reservoirs for proper fluid levels after the first 1000 miles (1600 km) and every 5000 miles (8000 km) thereafter. Also inspect fluid levels at the end of every riding season.

Check brake pads and rotors for wear at every service interval. See 1.8 BRAKE PADS AND ROTORS.

Replace **D.O.T. 4 BRAKE FLUID**:

- Every 2 years.

It is recommended to inspect both front and rear brake lines and replace as required:

- Every 4 years.

It is recommended to inspect both front and rear caliper and master cylinder seals and replace as required:

- Every 2 years.

Check rear brake pedal operation:

- Before every ride.

Lubricate the front brake hand lever:

- Every 5000 miles (8000 km).

FLUID LEVEL

See Figure 1-5. With motorcycle in a level position, check that brake fluid is between the upper and lower marks on front and rear reservoirs. Add **D.O.T. 4 BRAKE FLUID** if necessary. Be sure gasket and cap on reservoir fit securely.

BLEEDING BRAKES

⚠WARNING

Direct contact of D.O.T. 4 brake fluid with eyes can cause irritation. Avoid eye contact. In case of eye contact flush with large amounts of water and get medical attention. Swallowing large amounts of D.O.T. 4 brake fluid can cause digestive discomfort. If swallowed, obtain medical attention. Use in well ventilated area. KEEP OUT OF REACH OF CHILDREN. (00240a)

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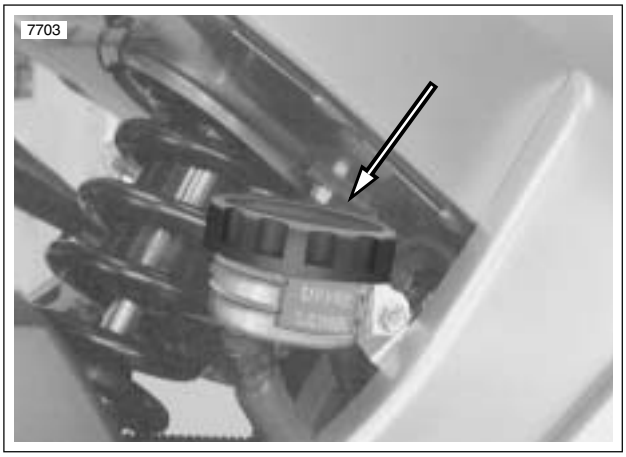


Figure 1-5. Rear Brake Fluid Reservoir

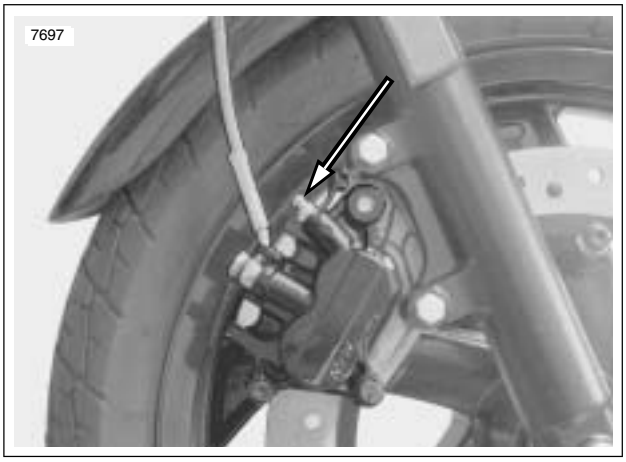


Figure 1-6. Front Brake Caliper Bleeder Valve

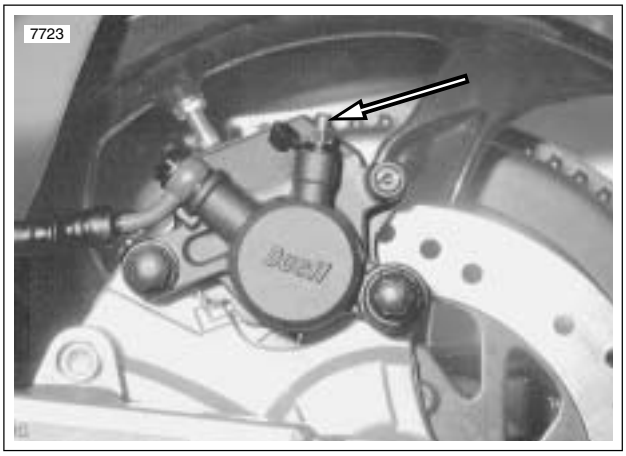


Figure 1-7. Rear Brake Caliper Bleeder Valve (Metric)

⚠WARNING

Never mix D.O.T. 4 with other brake fluids (such as D.O.T. 5). Use only D.O.T. 4 brake fluid in motorcycles that specify D.O.T. 4 fluid on the reservoir cap. Mixing different types of fluid can adversely affect braking ability and lead to brake failure which could result in death or serious injury

⚠WARNING

Use only fresh, uncontaminated D.O.T. 4 Fluid. Cans of fluid that have been opened may have been contaminated by moisture in the air or dirt. Use of contaminated brake fluid can adversely affect braking ability and lead to brake failure which could result in death or serious injury

⚠WARNING

Use only new black banjo washers (See Parts Catalog for Part No.) with D.O.T. 4 brake fluid. Earlier silver banjo washers are not compatible with D.O.T. 4 fluid and will not seal properly over time. Failure to comply can adversely affect braking ability and lead to brake failure which could result in death or serious injury.

NOTE

Hydraulic brake fluid bladder-type pressure equipment can be used to fill the brake master cylinder through the bleeder valve if master cylinder reservoir cover is removed to prevent pressurization.

1. Install end of a length of plastic tubing over caliper bleeder valve; place other end in a clean container. Stand motorcycle upright.
   a. See Figure 1-6. Front brake bleeder valve.
   b. See Figure 1-7. Rear brake bleeder valve.

CAUTION

Cover molded-in-color surfaces and right handlebar switches and use care when removing brake reservoir cover and adding D.O.T. 4 brake fluid. Spilling D.O.T. 4 brake fluid on molded-in-color surfaces will result in cosmetic damage. Spilling brake fluid on switches can render them inoperative.

2. Add **D.O.T. 4 BRAKE FLUID** to master cylinder reservoir. Do not reuse brake fluid.
   a. Remove two screws from front master cylinder cover. Bring fluid level to within 0.125 in. (3.2 mm) of molded boss inside front master cylinder.
   b. Remove cap and gasket from rear master cylinder reservoir. Bring fluid level to between upper and lower marks on reservoir.
3. Depress, release and then hold brake lever/pedal to build up hydraulic pressure.
4. Open bleeder valve (metric) about 1/2-turn counterclockwise; brake fluid will flow from bleeder valve and through tubing. When brake lever/pedal has moved 1/2-3/4 of its full range of travel, close bleeder valve (clockwise). Allow brake lever/pedal to return slowly to its released position.
5. Repeat Steps 2-4 until all air bubbles are purged.
6. Tighten bleeder valve (metric) to 36-60 **in-lbs** (4.1-6.8 Nm).
7. Verify master cylinder fluid level as described in Step 2.

⚠WARNING

After repairing the brake system, test brakes at low speed. If brakes are not operating properly, testing at high speeds can cause loss of control, which could result in death or serious injury. (00289a)

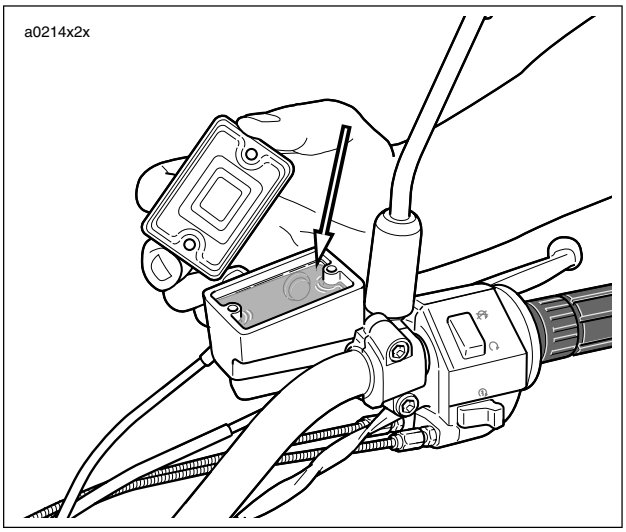


Figure 1-8. Brake Fluid Level - Front Reservoir

8. Attach covers to master cylinder reservoirs.
   a. Tighten screws on master cylinder reservoir cover to 9-13 **in-lbs** (1.0-1.5 Nm).
   b. Tighten cap on rear master cylinder securely.

REAR BRAKE PEDAL

⚠WARNING

After repairing the brake system, test brakes at low speed. If brakes are not operating properly, testing at high speeds can cause loss of control, which could result in death or serious injury. (00289a)

Check rear brake pedal for proper operation.

- Before every ride.

1. Inspect locknut installation. Locknut should be flush with top surface of clevis.
2. Observe the position of brake pedal and foot peg. Brake pedal should be set so top surface of brake pedal is even with top surface of foot peg.
3. Set brake pedal height.
   a. Loosen locknut.
   b. Turn rod adjuster to obtain correct position.
   c. Tighten locknut.

NOTE

Brake pedal has no freeplay adjustment.

BRAKE PADS

⚠WARNING

Always replace brake pads in complete sets for correct and safe brake operation. Improper brake operation could result in death or serious injury. (00111a)

See Figure 1-9. Inspect brake pads for damage or excessive wear. Replace both pads as a set if friction material of either pad is worn to 0.1 in. (2.5 mm) or less. If this amount of wear occurs, wear grooves (2) will disappear from friction material surface. See Figure 1-10.

NOTE

Always replace brake pads in pairs.

BRAKE ROTORS

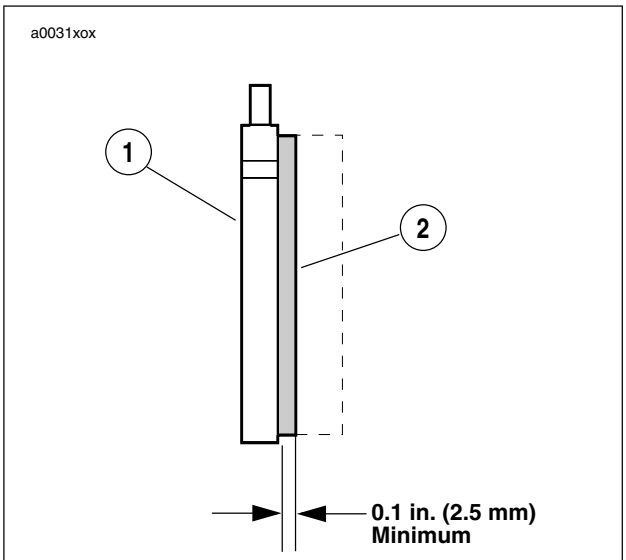
⚠WARNING

Be sure that brake fluid or other lubricants do not contact brake pads or discs. Such contact can adversely affect braking ability, which could cause loss of control, resulting in death or serious injury. (00290a)

Check front and rear brake rotors for minimum thickness:

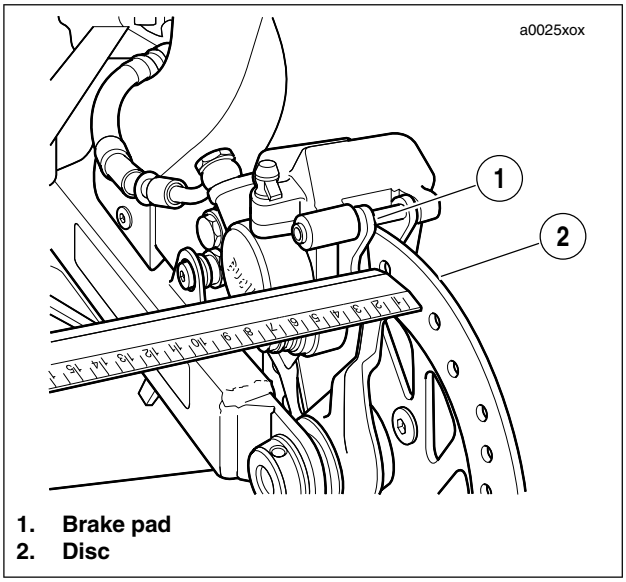
1. Measure rotor thickness. Replace if minimum thickness is less than 0.18 in. (4.5 mm).
2. Check rotor surface. Replace if warped or badly scored.
3. The brake rotor must be within the following specifications. If the brake rotor is suspected of being damaged, inspect rotor using the following measurements:

- Lateral Movement: 0.01-0.02 in. (0.3-0.5 mm).
- Radial Movement: 0.02 in. (5.1 mm).
- Rotational Movement: 0.02 in. (5.1 mm).



1. Metal backing plate
2. Friction material

Figure 1-9. Brake Pad - Side View



1. Brake pad
2. Disc

Figure 1-10. Measuring Rear Brake Outer Pad

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TIRE INFLATION

⚠WARNING

Do not inflate tire beyond maximum pressure as specified on sidewall. Over inflated tires can blow out, which could result in death or serious injury. (00027a)

Check tire pressure and tread:

- Before every ride.

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

Table 1-4. Tire Specifications/Pressures

P3 Tires	SOLO RIDING	LOADED TO GVWR
Front Dunlop 100/80 16 50s K330	28 psi (193 kPa)	32 psi (220 kPa)
Rear Dunlop 120/80 16 60s K330	30 psi (207 kPa)	36 psi (248 kPa)

WHEEL BEARINGS

The wheel bearings are sealed units, no greasing or maintenance is required. Replace when worn. Excessive play or roughness indicates worn bearings that require replacement.

Check front and rear wheel bearings for wear:

- Every time a wheel is removed.
- When storing or removing the motorcycle for the season.

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

TIRE TREAD INSPECTION

See Figure 1-11. Tread wear indicator bars will appear on tire tread surfaces when 1/32 inch (0.79 mm) or less of tire tread remains. Arrows on tire sidewalls pinpoint location of wear bar indicators. Always remove tires from service before they reach the tread wear indicator bars (1/32 of an inch [(0.79 mm)] tread pattern depth remaining).

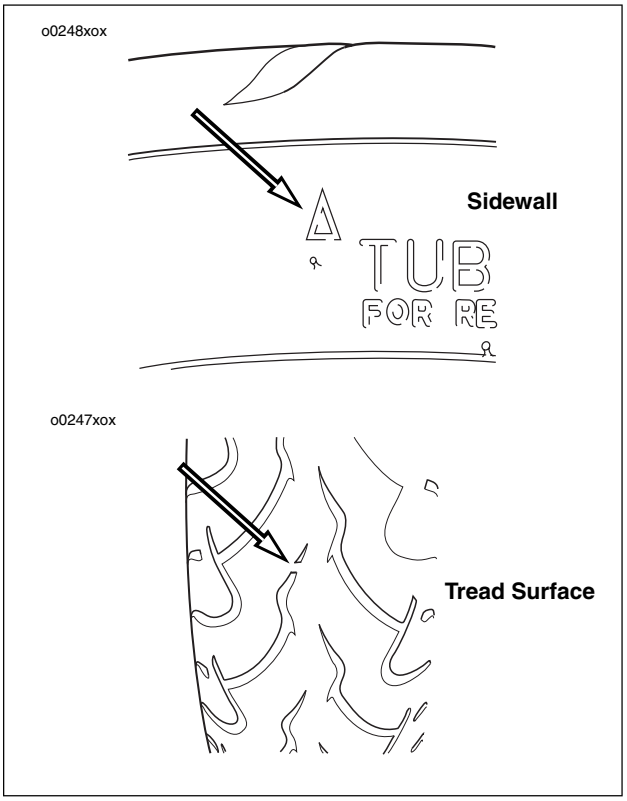

Figure 1-11. Tread Wear Indicators

New tires are needed if any of the following conditions exist.

1. Tread wear indicator bars become visible on the tread surfaces.
2. Tire cords or fabric become visible through cracked sidewalls, snags or deep cuts.
3. A bump, bulge or split in the tire.
4. Puncture, cut or other damage to the tire that cannot be repaired.