

2006 TOURING MODELS

SERVICE MANUAL

Part Number 99483-06

Section 1: Maintenance

Section 2: Chassis

Section 3: Engine

Section 4: Fuel System

Section 5: Starter

Section 6: Drive

Section 7: Transmission

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Appendix

ELECTRICAL DIAGNOSTICS

Part Number 99497-06

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FLHTCUSE SERVICE SUPPLEMENT

Part Number 99500-06

Section 1: Maintenance

Section 2: Chassis

Section 3: Engine

Section 4: Fuel System

Section 5: Starter

Section 6: Drive

Section 7: Transmission

Section 8: Electrical

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REPAIR NOTES

General maintenance practices are given in this section. All special tools and torque values are noted at the point of use and 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. 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.

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 motorcycle 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.

Always verify cleanliness of blind holes before assembly. Tightening screws with dirt, water or oil in the holes can cause castings to crack or break.

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

Checking Torques on Fasteners with Lock Patches

To check the torque on a fastener that has a lock patch:

1. Set the torque wrench for the lowest setting in the specified torque range.
2. Attempt to tighten fastener to set torque. If fastener does not move and lowest setting is satisfied (torque wrench clicks), then the proper torque has been maintained.

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 tap or die.

Replace all damaged or missing lubrication fittings.

Use Teflon tape on pipe fitting threads.

Wiring, Hoses and Lines

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

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.

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 (unless instructed otherwise). Be sure that gasket holes match up with holes in the mating part.

If a gasket must be made, be sure to cut holes that match up with the mating part. Serious damage can occur if any flange holes are blocked by the gasket. Use material that is the right type and thickness.

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.

Remove burrs and rough spots with a honing stone or crocus cloth before installation. 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 or crocus cloth on highly polished parts that are rusted.

Bearings

Remove shields and seals from bearings before cleaning. Clean bearings with permanent shields and seals in solution.

Clean open bearings by soaking them in a petroleum cleaning solution. Never use a solution that contains chlorine.

Let bearings stand and dry. Do not dry using compressed air. Do not spin bearings while they are drying.

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.

MAINTENANCE SCHEDULE

1.2

GENERAL

The table below lists the maintenance requirements for Touring models. If you are familiar with the procedures, just refer

to the table for the recommended service interval. If necessary, see the quick reference table on the next page for the required specification. If more detailed information is needed, turn to the sections which follow for step-by-step instructions.

Table 1-1. Scheduled Maintenance Intervals

ITEM	PROCEDURE	1000 mi	5000 mi	10,000 mi	15,000 mi	20,000 mi	25,000 mi	NOTES
		1600 km	8000 km	16,000 km	24,000 km	32,000 km	40,000 km	
Engine oil and filter	Replace	X	X	X	X	X	X	
Oil lines and brake system	Inspect for leaks	X	X	X	X	X	X	1
Air cleaner	Inspect, service as required	X	X	X	X	X	X	
Tires	Check pressure, inspect tread	X	X	X	X	X	X	
Wheel spokes	Check tightness	X	X			X		1, 4
Primary chain tension	Check adjustment	X	X	X	X	X	X	
Primary chaincase lubricant	Replace	X		X		X		
Clutch	Check adjustment	X	X	X	X	X	X	1
Transmission lubricant	Replace	X				X		
Drive belt and sprockets	Inspect, adjust belt	X	X	X	X	X	X	1
Throttle, brake, clutch and enricher controls	Check, adjust and lubricate	X	X	X	X	X	X	1, 4
Jiffy stand	Inspect and lubricate	X	X	X	X	X	X	1
Fuel valve, lines and fitting	Inspect for leaks	X	X	X	X	X	X	1, 4
Fuel filter	Clean (EFI: replace)						X	1
Brake fluid	Check levels and condition	X	X	X	X	X	X	5
Brake pads and discs	Inspect for wear	X	X	X	X	X	X	
Spark plugs	Inspect	X	X		X		X	
	Replace			X		X		
Electrical equipment and switches	Check operation	X	X	X	X	X	X	
Engine idle speed	Check adjustment	X	X	X	X	X	X	1
Front fork oil	Replace							1, 2
Steering head bearings	Lubricate	X		X		X		2
	Adjust						X	1
Air suspension	Check pressure, operation and leakage	X	X	X	X	X	X	1
Windshield bushings	Inspect			X		X		1
Cruise control	Inspect disengage switch and components	X	X	X	X	X	X	1
Fuel door, Tour-pak, saddlebags	Lubricate hinges and latches	X	X	X	X	X	X	
Critical fasteners	Check tightness	X		X		X		1
Engine mounts and stabilizer links	Inspect			X		X		1
Battery	Check battery and clean connections							3
Road test	Verify component and system functions	X	X	X	X	X	X	

NOTES:

- Should be performed by an authorized Harley-Davidson dealer, unless you have the proper tools, service data and are mechanically qualified.
- Disassemble, lubricate and inspect every 50,000 miles (80,000 km).
- Perform annually.
- Not all vehicles are equipped with enricher, fuel valve or spoke wheels.
- Change DOT 4 brake fluid and flush every two years.

Table 1-2. Quick Reference Data

ITEM	SPECIFICATION	DATA
Engine oil and filter	Drain plug torque	14-21 ft-lbs (19-28 Nm)
	Oil capacity	4 qt. (3.8 L)
	Filter	Hand tighten 1/2-3/4 turn after gasket contact
	Chrome filter part number	63798-99
	Black filter part number	63731-99
Air cleaner	Air cleaner cover bracket screw torque	40-60 in-lbs (5-7 Nm)
	Air cleaner cover screw torque	36-60 in-lbs (4-7 Nm)
	Air cleaner cover screw threadlocker	Loctite Medium Strength Threadlocker 243 (blue), Part No. 99642-97 (6 ml)
Tire condition and pressure	Pressure: solo rider	Front: 36 psi (2.5 bar), Rear: 36 psi (2.5 bar)
	Pressure: rider with passenger	Front: 36 psi (2.5 bar), Rear: 40 psi (2.8 bar)
	Wear	Replace tire if 1/32 in. (0.8 mm) or less of tread pattern remains
Wheel spokes	Spoke nipple torque	40-50 in-lbs (4.5-5.6 Nm)
Primary chain tension	Deflection with engine cold	5/8-7/8 in. (15.9-22.2 mm)
	Deflection with engine hot	3/8-5/8 in. (9.5-15.9 mm)
	Chain tensioner nut torque	21-29 ft-lbs (29-39 Nm)
	Primary chain inspection cover torque	84-108 in-lbs (10-12 Nm)
Primary chaincase lubricant	Lubricant capacity	32 oz (946 mL)
	Primary chaincase drain plug torque	36-60 in-lbs (4-7 Nm)
	<i>FORMULA+ TRANSMISSION AND PRIMARY CHAINCASE LUBRICANT</i> part number	99851-05 (qt)
Clutch adjustment	Free play at adjuster screw	1/2-1 turn
	Free play at hand lever	1/16-1/8 in. (1.6-3.2 mm)
	Adjuster screw locknut torque	72-120 in-lbs (8-14 Nm)
	Clutch inspection cover torque	84-108 in-lbs (10-12 Nm)
Transmission lubricant	Lubricant level	Dipstick at FULL with motorcycle level and filler plug resting on thread
	Lubricant capacity	20-24 oz (590-710 mL)
	<i>FORMULA+ TRANSMISSION AND PRIMARY CHAINCASE LUBRICANT</i> part number	99851-05 (qt)
	Transmission drain plug torque	14-21 ft-lbs (19-28 Nm)
	Filler plug torque	25-75 in-lbs (3-9 Nm)
Drive belt	Upward force at midpoint of bottom belt strand	10 lb. (4.5 kg)
	Deflection with motorcycle on jiffy stand without rider or luggage and 10 psi (69 kPa) in rear shocks	1/4 - 5/16 in. (6.4-7.9 mm)
	Deflection with motorcycle upright and rear wheel in the air	3/16 - 1/4 in. (4.8-6.4 mm)
Throttle and clutch cables	Lubricant part number	<i>Super Oil</i> , 94968-85TV (1/4 fl oz)
	Handlebar clamp screw torque	60-80 in-lbs (6.8-9.0 Nm)
	Handlebar switch housing screw torque	35-45 in-lbs (4-5 Nm)
Enrichener control	Hex nut torque	20-35 in-lbs (2-4 Nm)
Fuel filter	Hex jam nut torque	15-20 ft-lbs (20-27 Nm)
Brake Fluid Reservoir Level	<i>DOT 4 Brake Fluid</i> part number	99953-99A (12 oz)
	Level	1/8 inch (3.2 mm) from the top
	Master cylinder reservoir cover torque	6-8 in-lbs (0.7-0.9 Nm)

Table 1-2. Quick Reference Data

ITEM	SPECIFICATION	DATA
Brake pad linings and discs	Minimum brake pad thickness	0.04 in. (1.02 mm)
	Minimum brake disc thickness	See stamp on side of disc
Spark plugs	Type	HD-6R12
	Gap	0.038-0.043 in. (0.97-1.09 mm)
	Torque	12-18 ft-lbs (16-24 Nm)
Engine idle speed	Idle speed	950-1050 rpm
Front Fork Oil	<i>Hydraulic Fork Oil (Type E)</i> part number	99884-80 (16 oz)
	Amount	See Section 2.15 FRONT FORKS
Steering head bearings	Neck fitting lubricant	<i>Special Purpose Grease</i> , 99857-97 (14 oz cartridge)
Critical fasteners, engine mounts and stabilizer links	See Section 1.19 CRITICAL FASTENERS .	
Battery	Lubricant part number	<i>Electrical Contact Lubricant</i> , 99861-02 (1 oz)
	Terminal bolt torque	60-96 in-lbs (6.8-10.9 Nm)
	Hold-down clamp screw torque	15-20 ft-lbs (20-27 Nm)

GENERAL

See Section [1.2 MAINTENANCE SCHEDULE](#) for the required service interval.

NOTE

If the motorcycle is ridden hard, under dusty conditions, or in cold weather, the engine oil and filter should be changed more often.

PROCEDURE

- Ride motorcycle until engine is at normal operating temperature.
- Locate oil filler plug/dipstick on right side of motorcycle at top of transmission case. To remove the oil filler plug pull steadily while moving plug back and forth.
- Locate oil drain plug at front left side of the oil pan. Remove the oil drain plug and allow oil to drain completely.
- Inspect the oil drain plug O-ring for cuts, tears or signs of deterioration. Replace as necessary.
- Remove the oil filter as follows:
 - Obtain the OIL FILTER WRENCH (HD-42311). The tool allows easy removal of the oil filter without risk of damage to the CKP sensor or cable.
 - Place the jaws of the wrench over the oil filter with the tool oriented vertically. See [Figure 1-1](#).
 - Using a 3/8 inch drive with a 4 inch extension, turn wrench in a counterclockwise direction. Do not use with air tools.

NOTE

Use OIL FILTER WRENCH (HD-44067) if HD-42311 is not available.

- Clean the oil filter mount flange of any old gasket material.
- Lubricate gasket with clean engine oil and install **new** oil filter on filter mount. Hand tighten oil filter 1/2-3/4 turn after gasket first contacts filter mounting surface. Do **NOT** use OIL FILTER WRENCH for oil filter installation.

NOTE

Use of the Premium 5 micron synthetic media oil filter is highly recommended, Part No. 63798-99A (Chrome) or 63731-99A (Black).

- Install engine oil drain plug and tighten to 14-21 ft-lbs (19-28 Nm).

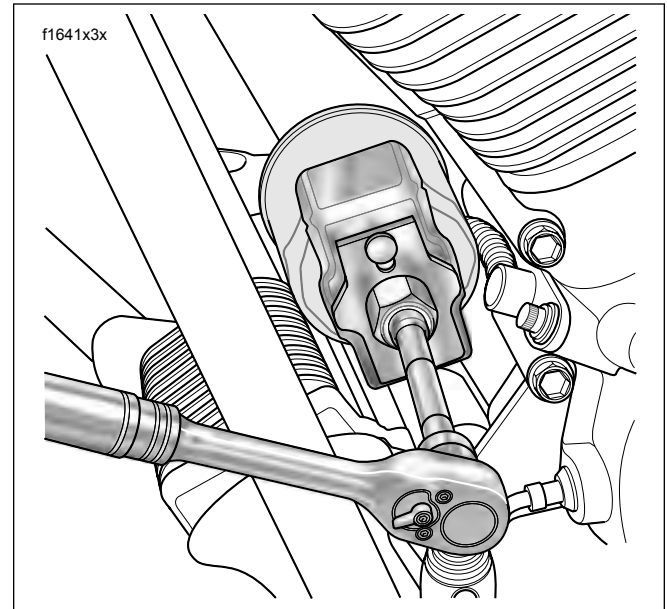


Figure 1-1. Remove Engine Oil Filter

- With motorcycle resting on jiffy stand, add 3-1/2 quarts (3.3 liters) engine oil as specified in [Table 1-3](#). Use the proper grade of oil for the lowest temperature expected before the next oil change.

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

CAUTION

Oil level cannot be accurately measured on a cold engine. For pre-ride inspection, with motorcycle leaning on jiffy stand on level ground, oil should register on dipstick between arrows when engine is cold. Do not add oil to bring the level to the FULL mark on a COLD engine. (00185a)

- Perform engine oil level **COLD CHECK** as follows:

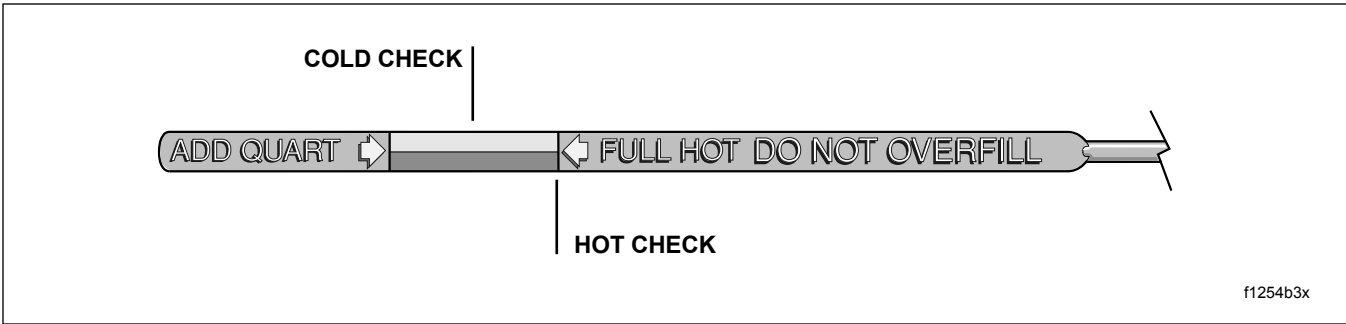


Figure 1-2. Engine Oil Dipstick

- a. With the motorcycle resting on the jiffy stand on level ground, wipe off the dipstick and insert it back into the oil pan with the plug pushed completely into the fill spout
 - b. Remove the dipstick and note the level of the oil. Oil level should register between the two arrows on the dipstick. See [Figure 1-2](#). If oil level is at or below the lower arrow, add only enough oil to bring the level between the two arrows on the dipstick.
 - c. Wipe off the dipstick and insert it back into the oil pan with the plug pushed completely into the fill spout.
 - d. Remove the dipstick and note the level of the oil. Add only enough oil to bring the level to the FULL mark on the dipstick. See [Figure 1-2](#). Do not overfill
11. Perform engine oil level **HOT CHECK** as follows:
- a. Ride motorcycle until engine is at normal operating temperature.
 - b. With the motorcycle resting on the jiffy stand on level ground, allow engine to idle for 1-2 minutes. Turn engine off.
12. Start engine and carefully check for leaks around hoses, drain plug and oil filter.

- c. Hold the filter element up to a strong light source. The element can be considered sufficiently clean if light is uniformly visible through the media.

NOTE

Replace the filter element if damaged or if filter media cannot be adequately cleaned.

9. Slide **new** gasket over sleeve on inboard side of filter element. Be sure holes in gasket are aligned with those in filter.
10. Insert breather tubes about 1/4 inch (6.4 mm) into holes on inboard side of filter element
11. Install breather tubes onto fittings of two cylinder head breather bolts.

NOTE

Air cleaner mounting without installation of the breather tubes allows crankcase vapors to be vented into the atmosphere in violation of legal emissions standards.

12. Place filter element onto backplate with the flat side down, so that hole on inboard side of element fits over molded boss in backplate.
13. Align holes in cover bracket with those in filter element and start three T27 TORX screws. Stamp on cover bracket points to downside. Alternately tighten screws to 40-60 **in-lbs** (4.5-6.8 Nm) in a crosswise pattern.
14. Verify that rubber seal is properly seated around perimeter of air cleaner cover.
15. Fit air cleaner cover into backplate. Apply a small dab of Loctite Medium Strength Threadlocker 243 (blue) to threads of large allen head socket screw. Install screw in center of air cleaner cover. Tighten screw to 36-60 **in-lbs** (4.1-6.8 Nm).

GENERAL

See Section [1.2 MAINTENANCE SCHEDULE](#) for the required service interval.

PROCEDURE

1. Inspect for wear as follows:
 - a. Locate the arrows on the tire side walls. The arrows point to location of the tread wear indicator bars. See upper frame of [Figure 1-4](#).
 - b. Immediately replace tires if any tread wear indicator bar is on the tire tread surface, indicating that 1/32 inch (0.8 mm) or less of tire tread pattern remains. See lower frame of [Figure 1-4](#).

NOTE

*Harley-Davidson recommends that the tires be replaced **BEFORE** the tread wear indicator bars are on the tire tread surface.*

2. Inspect for damage. Replace tires if:
 - Cords or fabric become visible through cracked sidewalls, snags or deep cuts.
 - Bump, bulge or split line is observed.
 - Puncture, deep cut or other damage is present that is not repairable.
3. Check tire pressure.

Table 1-4. Tire Pressure (Cold)

DUNLOP TIRES ONLY	FRONT		REAR	
	PSI	BARS	PSI	BARS
Solo Rider	36	2.5	36	2.5
Rider & One Passenger	36	2.5	40	2.8

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)

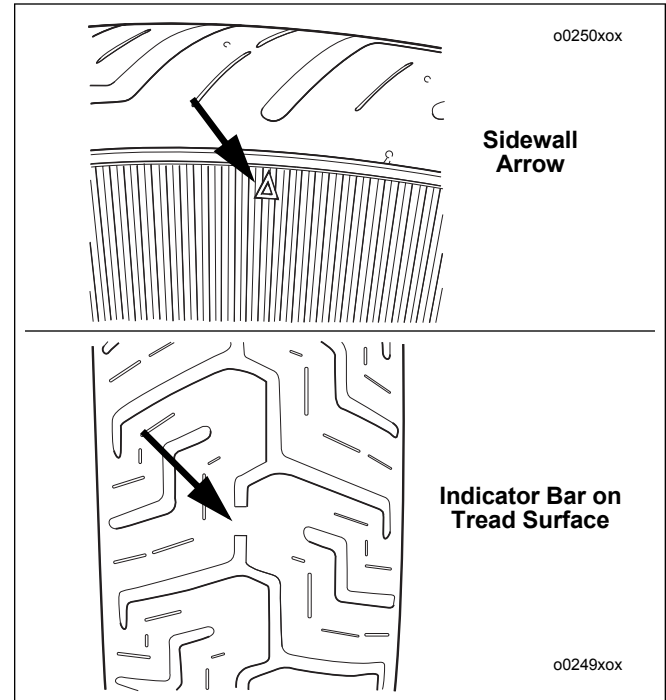


Figure 1-4. Tread Wear Indicator Bars

GENERAL

See Section [1.2 MAINTENANCE SCHEDULE](#) for the required service interval.

PROCEDURE

1. Raise wheel off the ground.

CAUTION

If nipples require more than one full turn to tighten spoke, remove tire to check that spoke protrusion has not damaged tube.

2. Lightly tap each spoke with a spoke wrench. Loose spokes will sound dull and must be tightened. Tighten spokes to 40-50 **in-lbs** (4.5-5.6 Nm). If more than a few spokes are loose, true the entire wheel following the procedure under Section [2.7 TRUING LACED WHEEL](#).

GENERAL

See Section [1.2 MAINTENANCE SCHEDULE](#) for the required service interval.

PROCEDURE

PRIMARY CHAIN ADJUSTMENT

1. Remove seat. See Section [2.25 SEAT, REMOVAL](#).

WARNING

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

2. Unthread bolt and remove battery negative cable (black) from battery negative (-) terminal.
3. See [Figure 1-5](#). Remove four T27 TORX screws to free the primary chain inspection cover from the primary chaincase cover.
4. Check the primary chain tension. Push on the upper strand to verify that it has free up and down movement midway between the engine compensating sprocket (front) and the clutch sprocket (rear).
5. Measure the free play to be sure that it falls within the range specified for a hot or cold engine. Refer to [Table 1-5](#).

Table 1-5. Primary Chain Adjustment

(Free Play)	Inches	Millimeters
COLD ENGINE	5/8-7/8 inch	15.9-22.2 mm
HOT ENGINE	3/8-5/8 inch	9.5-15.9 mm

6. If the chain is too tight or too loose, then adjust as follows:
 - a. Locate the primary chain tensioner assembly and loosen the top center nut a maximum of two turns. See [Figure 1-6](#).
 - b. Raise or lower the chain tensioner assembly as necessary to obtain the specified free play.

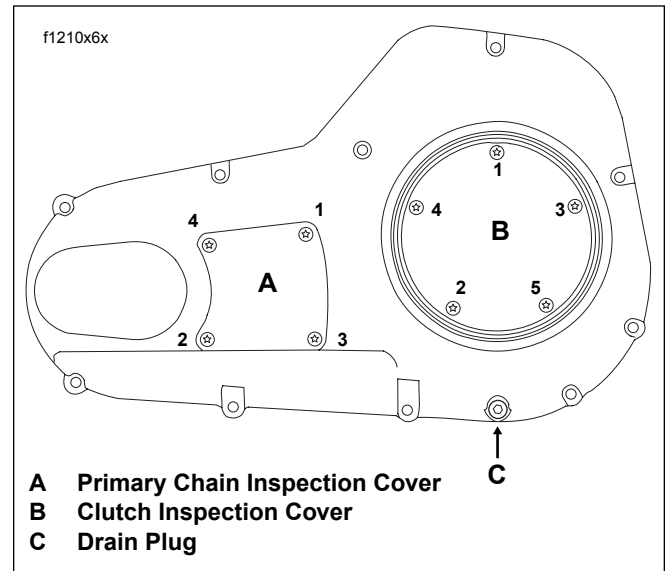


Figure 1-5. Primary Chaincase Cover

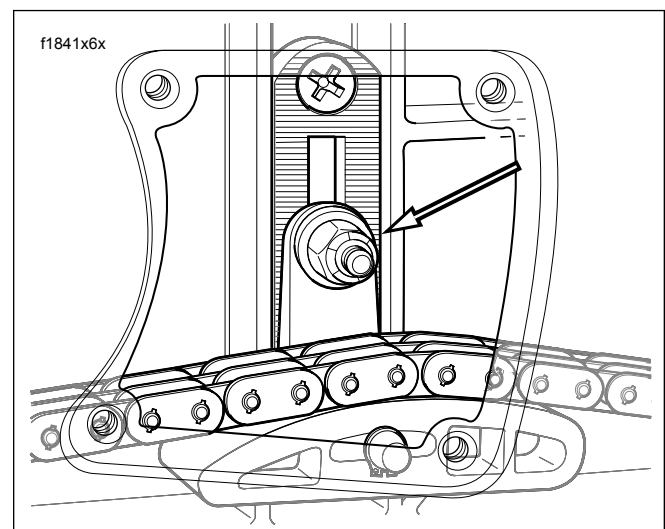


Figure 1-6. Primary Chain Tensioner Assembly

NOTE

As chains stretch and wear, they run tighter at one spot than another. Always adjust the free play at the tightest spot in the chain. Replace the primary chain if it is worn to the point where it cannot be properly adjusted.

CAUTION

Always keep the primary chain properly adjusted. Allowing the chain to run too tight or too loose will result in excessive chain and sprocket wear.

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- c. Tighten the top center nut of the chain tensioner assembly to 21-29 ft-lbs (29-39 Nm).
7. Align holes in **new** gasket with holes in the primary chaincase cover. Install four T27 TORX screws to secure primary chain inspection cover to primary chaincase cover. Alternately tighten screws to 84-108 **in-lbs** (10-12 Nm) in a crosswise pattern. See [Figure 1-5](#).
8. 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).
9. Install seat. See Section [2.25 SEAT, INSTALLATION](#).

PRIMARY CHAIN LUBRICANT

1. Remove five T27 TORX screws (with captive washers) to free clutch inspection cover from primary chaincase cover.
2. Remove magnetic drain plug at bottom of primary chaincase cover. Drain lubricant into suitable container. See [Figure 1-5](#).
3. Clean drain plug. If plug has accumulated a lot of debris, inspect the condition of chaincase components.
4. Inspect drain plug O-ring for cuts, tears or signs of deterioration. Replace as necessary.
5. Install drain plug back into primary chaincase cover. Tighten plug to 36-60 **in-lbs** (4.1-6.8 Nm).

CAUTION

Do not overfill the primary chaincase with lubricant. Overfilling can cause rough clutch engagement, incomplete disengagement, clutch drag and/or difficulty finding neutral at engine idling. (00199b)

WARNING

Be sure 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 motor cycle and death or serious injury. (00047c)

6. Pour 32 ounces (946 ml) of Harley-Davidson FORMULA+ TRANSMISSION AND PRIMARY CHAINCASE LUBRICANT through the clutch inspection cover opening, Part No. 99851-05 (quart). See [Figure 1-7](#).
7. To avoid punching holes in the clutch inspection cover gasket or enlarging existing holes, install clutch inspection cover and **new** gasket as follows:
 - a. Align the triangular shaped hole in the gasket with the top hole in the clutch inspection cover. Be sure the rubber molding and the words "towards clutch" face the motorcycle.

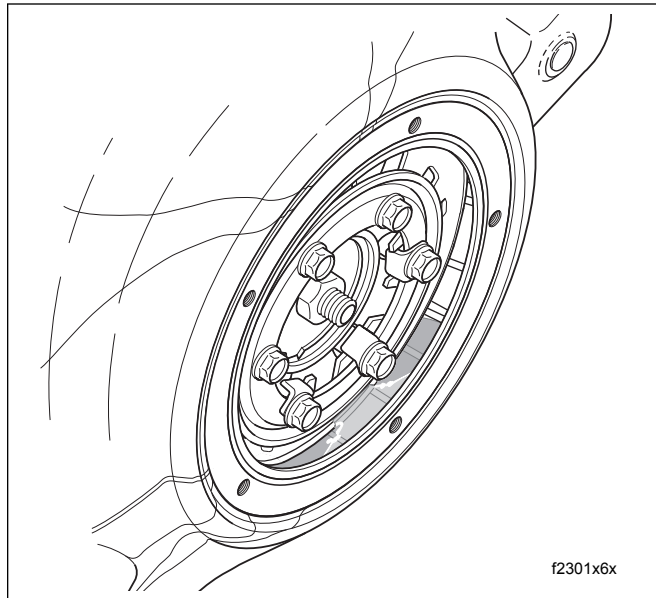


Figure 1-7. Add Primary Chaincase Lubricant

- b. Insert screw (with captive washer) through clutch inspection cover and carefully thread it all the way through triangular shaped hole in gasket. Do not push screw through hole.
- c. Hang the clutch inspection cover on the primary chaincase cover flange by starting the top cover screw.
- d. Start the remaining four screws (with captive washers).
- e. Using a T27 TORX drive head, alternately tighten screws to 84-108 **in-lbs** (10-12 Nm) in the pattern shown in [Figure 1-5](#).

GENERAL

See Section [1.2 MAINTENANCE SCHEDULE](#) for the required service interval.

PROCEDURE

CAUTION

Perform the clutch adjustment with the motor cycle at room temperature. The clearance at the adjuster screw will increase as the powertrain temperature increases. If adjuster screw is adjusted while the powertrain is hot, clearance at push rod bearing could be insufficient with powertrain cold and clutch slippage could occur.

NOTE

Perform adjustment procedure whenever any clutch components are replaced. Then repeat adjustment after first 50 miles (800 km) of use.

1. Stand motorcycle upright and level.
2. Remove five T27 TORX screws (with captive washers) to free clutch inspection cover from primary chaincase cover.
3. See [Figure 1-8](#). Slide rubber boot off cable adjuster. Holding cable adjuster with 1/2 inch wrench, loosen jam nut using a 9/16 inch wrench. Back jam nut away from cable adjuster. Move adjuster toward jam nut to introduce a large amount of free play at hand lever.

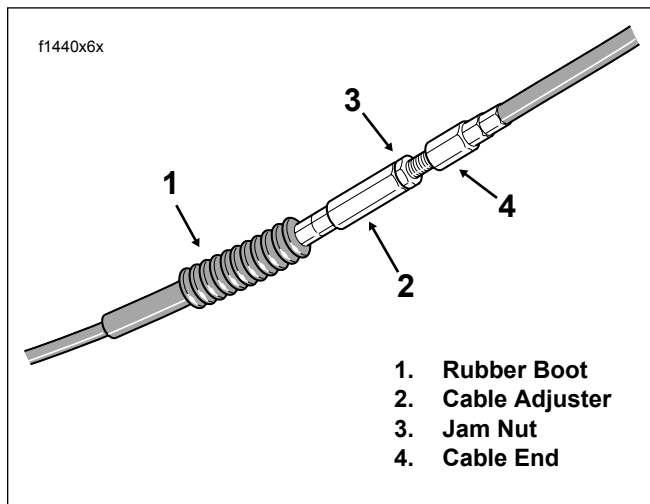


Figure 1-8. Clutch Cable Adjuster Mechanism

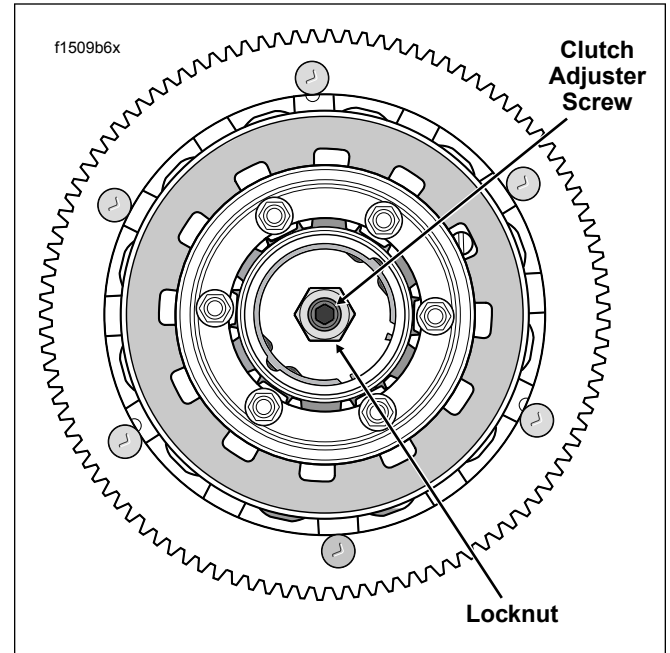


Figure 1-9. Clutch Assembly

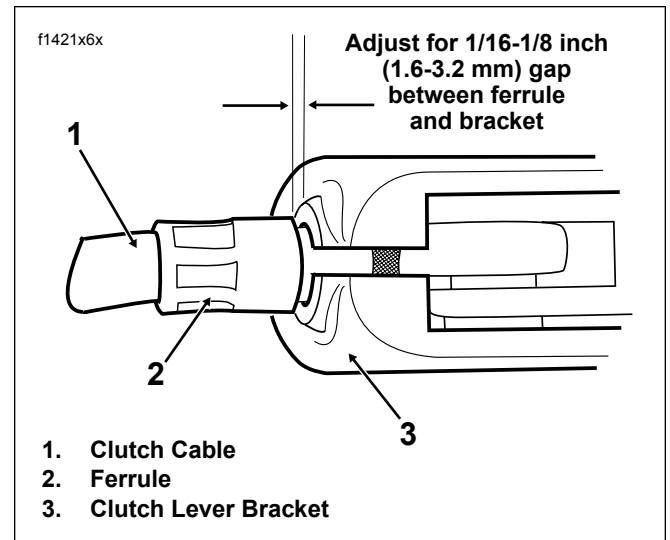


Figure 1-10. Adjust Clutch Free Play

4. See [Figure 1-9](#). Loosen locknut on clutch adjuster screw. To take up all free play in push rods, turn screw inward (clockwise) until lightly seated.
5. Back out adjuster screw 1/2 to 1 turn. While holding adjuster screw with an allen wrench, tighten locknut to 72-120 in-lbs (8-14 Nm).
6. Squeeze clutch lever to maximum limit three times to set ball and ramp release mechanism.