

**KAWASAKI****KLT160, KLT185 AND KLF185**

NOTE: Metric fasteners are used throughout vehicle.

**CONDENSED SERVICE DATA**

<b>MODELS</b>	<b>KLT160-A1</b>	<b>KLT185-A1, A2 KLF185-A1, A2, A3</b>
<b>General</b>		
Engine Make .....	Own	Own
Engine Type .....	Air-Cooled; Four-Stroke	Air-Cooled; Four-Stroke
Number of Cylinders .....	1	1
Bore .....	61 mm (2.4 in.)	66 mm (2.6 in.)
Stroke .....	52.4 mm (2.06 in.)	53.2 mm (2.1 in.)
Displacement .....	153 cc (9.3 cu. in.)	182 cc (11.1 cu. in.)
Compression Ratio .....	9.5:1	9.5:1
Engine Lubrication .....	Wet Sump; Oil Pump	Wet Sump; Oil Pump
Transmission		
Lubrication .....	Common With Engine	Common With Engine
Engine/Transmission		
Oil .....	See Text	See Text
Forward Speeds .....	5	5
Reverse Speeds .....	1	1
Tire Size:		
Front .....	21x9-8	21x9-8
Rear .....	22x11-8	22x11-8
Tire Pressure (cold):		
Front .....	21 kPa (3 psi)	21 kPa (3 psi)
Rear .....	14 kPa (2 psi)	14 kPa (2 psi)
Dry Weight .....	124 kg (273 lbs.)	126 kg (KLT Models) (277 lbs.) 151 kg (KLF Models) (332 lbs.)
<b>Tune-Up</b>		
Engine Idle Speed .....	See Text	See Text
Spark Plug:		
Type .....	NGK D8EA	NGK D8EA
Electrode Gap .....	0.6-0.7 mm (0.024-0.027 in.)	0.6-0.7 mm (0.024-0.027 in.)

<b>MODELS</b>	<b>KLT160-A1</b>	<b>KLT185-A1, A2 KLF185-A1, A2, A3</b>
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**Tune-Up (Cont.)**

Ignition:		
Type .....	Capacitor Discharge	Capacitor Discharge
Point Gap .....	Pointless	Pointless
Timing .....	10° BTDC @ 1350 rpm 35° BTDC @ 4600 rpm	10° BTDC @ 1300 rpm 30° BTDC @ 4600 rpm
Carburetor:		
Make .....	Mikuni	Mikuni
Model .....	VM22SS	VM22SS
Float Height .....	33.3 mm (1.31 in.)	33.3 mm (1.31 in.)
Main Jet .....	#110	#100
Pilot Jet .....	#22.5	#22.5
Jet Needle .....	5J14	5J14
Clip Position .....	Fourth Groove From Top	Fourth Groove From Top
Throttle Valve		
Cutaway .....	3.5	3.5
Idle Mixture Setting .....	1¼ Turn	1 Turn
Throttle Lever Free Play .....	2-3 mm (0.079-0.118 in.)	2-3 mm (0.079-0.118 in.)

**Sizes-Clearances**

Valve Clearance (cold):		
Intake .....	0.12-0.17 mm (0.005-0.006 in.)	0.12-0.17 mm (0.005-0.006 in.)
Exhaust .....	0.18-0.23 mm (0.007-0.009 in.)	0.18-0.23 mm (0.007-0.009 in.)
Valve Face & Seat		
Angle .....	45°	45°
Valve Seat Width:		
Intake .....	0.5-1.0 mm (0.020-0.039 in.)	0.5-1.0 mm (0.020-0.039 in.)
Exhaust .....	0.5-1.0 mm (0.020-0.039 in.)	0.5-1.0 mm (0.020-0.039 in.)
Valve Stem Diameter:		
Intake .....	5.495-5.510 mm (0.2163-0.2169 in.)	5.495-5.510 mm (0.2163-0.2169 in.)
Exhaust .....	5.480-5.495 mm (0.2157-0.2163 in.)	5.480-5.495 mm (0.2157-0.2163 in.)
Valve Guide Bore		
Diameter:		
Intake & Exhaust .....	5.520-5.532 mm (0.2173-0.2178 in.)	5.520-5.532 mm (0.2173-0.2178 in.)
Valve Stem To Guide		
Clearance:		
Intake .....	0.010-0.037 mm (0.0004-0.0015 in.)	0.010-0.037 mm (0.0004-0.0015 in.)
Exhaust .....	0.025-0.037 mm (0.0010-0.0015 in.)	0.025-0.037 mm (0.0010-0.0015 in.)
Rocker Arm Bore Diameter:		
Intake & Exhaust .....	13.000-13.018 mm (0.5118-0.5125 in.)	13.000-13.018 mm (0.5118-0.5125 in.)

MODELS	KLT160-A1	KLT185-A1, A2 KLF185-A1, A2, A3
<b>Sizes-Clearances (Cont.)</b>		
Rocker Shaft Diameter:		
Intake & Exhaust .....	12.967-12.994 mm (0.5108-0.5116 in.)	12.976-12.994 mm (0.5108-0.5116 in.)
Camshaft Lobe Height:		
Intake .....	40.071-40.179 mm (1.5776-1.5818 in.)	40.281-40.389 mm (1.5859-1.5901 in.)
Exhaust .....	40.071-40.179 mm (1.5776-1.5818 in.)	40.001-40.109 mm (1.5748-1.5791 in.)
Wear Limit—		
Intake .....	39.97 mm (1.5736 in.)	40.18 mm (1.5819 in.)
Exhaust .....	39.97 mm (1.5736 in.)	39.90 mm (1.5709 in.)
Cylinder Head Distortion (Max.) .....	0.05 mm (0.002 in.)	0.05 mm (0.002 in.)
Cylinder Bore Diameter .....	60.990-61.002 mm (2.4012-2.4016 in.)	66.000-66.012 mm (2.5984-2.5989 in.)
Wear Limit .....	61.10 mm (2.4055 in.)	66.10 mm (2.6024 in.)
Piston-to-Cylinder Wall Clearance .....	0.025-0.052 mm (0.0010-0.0020 in.)	0.025-0.052 mm (0.0010-0.0020 in.)
Piston Diameter—		
Measured 5 mm (0.2 in.) from Skirt Bottom and 90° to Pin Bore .....	60.950-60.965 mm (2.3996-2.4002 in.)	65.960-65.975 mm (2.5968-2.5974 in.)
Piston Ring End Gap in Standard Bore:		
Top Ring .....	0.15-0.30 mm (0.006-0.012 in.)	0.15-0.30 mm (0.006-0.012 in.)
Second Ring .....	0.15-0.35 mm (0.006-0.014 in.)	0.15-0.35 mm (0.006-0.014 in.)
Piston Ring Groove Width:		
Top Ring .....	0.81-0.83 mm (0.032-0.033 in.)	1.01-1.03 mm (0.039-0.040 in.)
Second Ring .....	1.02-1.04 mm (0.040-0.041 in.)	1.21-1.23 mm (0.047-0.048 in.)
Oil Ring .....	2.51-2.53 mm (0.099-0.100 in.)	2.51-2.53 mm (0.099-0.100 in.)
Piston Ring Width:		
Top Ring .....	0.765-0.795 mm (0.030-0.031 in.)	0.965-0.995 mm (0.038-0.039 in.)
Second Ring .....	0.97-0.99 mm (0.038-0.039 in.)	1.17-1.19 mm (0.046-0.047 in.)
Piston Ring Side Clearance:		
Top Ring .....	0.015-0.065 mm (0.0006-0.0025 in.)	0.015-0.065 mm (0.0006-0.0025 in.)
Max. ....	0.17 mm (0.007 in.)	0.17 mm (0.007 in.)
Second Ring .....	0.03-0.07 mm (0.0012-0.0027 in.)	0.02-0.06 mm (0.0007-0.0023 in.)
Max. ....	0.17 mm (0.007 in.)	0.16 mm (0.006 in.)

<b>MODELS</b>	<b>KLT160-A1</b>	<b>KLT185-A1, A2 KLF185-A1, A2, A3</b>
<b>Sizes-Clearances (Cont.)</b>		
Connecting Rod Big End Side Clearance .....	0.2-0.3 mm (0.008-0.012 in.)	0.4-0.5 mm (0.015-0.019 in.)
Maximum Allowable .....	0.5 mm (0.020 in.)	0.7 mm (0.030 in.)
Connecting Rod Big End Radial Clearance .....	0.008-0.019 mm (0.0003-0.0008 in.)	0.008-0.019 mm (0.0003-0.0008 in.)
Maximum Allowable .....	0.07 mm (0.003 in.)	0.07 mm (0.003 in.)
Crankshaft Runout (Max.) .....	0.1 mm (0.004 in.)	0.1 mm (0.004 in.)
 <b>Capacities</b>		
Fuel Tank .....	9.5 L (2.5 gallons)	9.5 L (KLT Models) (2.5 gallons) 9.0 L (KLF Models) (2.3 gallons)
Engine / Transmission Sump .....	1.7 L (1.79 qt.)	1.7 L (1.79 qt.)
Differential Case .....	0.2 L (0.21 qt.)	0.2 L (0.21 qt.)
 <b>Tightening Torques</b>		
Axle Nut or Screw: Front .....	69 N·m (51 ft.-lbs.)	69 N·m (KLT Models) (51 ft.-lbs.) 34 N·m (KLF Models) (25 ft.-lbs.)
Rear .....	145 N·m (110 ft.-lbs.)	145 N·m (110 ft.-lbs.)
Camshaft Sprocket Screw .....	29 N·m (22 ft.-lbs.)	29 N·m (22 ft.-lbs.)
Clutch Nut .....	78 N·m (58 ft.-lbs.)	78 N·m (58 ft.-lbs.)
Cylinder Head Screws: 6 mm .....	9.8 N·m (87 in.-lbs.)	9.8 N·m (87 in.-lbs.)
8 mm— Initial .....	11 N·m (95 in.-lbs.)	11 N·m (95 in.-lbs.)
Final .....	25 N·m (18 ft.-lbs.)	25 N·m (18 ft.-lbs.)
Wheel Retaining Nut .....	41 N·m (30 ft.-lbs.)	41 N·m (30 ft.-lbs.)

**MODELS****KLT160-A1****KLT185-A1, A2  
KLF185-A1, A2, A3****Tightening Torques (Cont.)**

## Standard Fasteners:

5 mm .....	3.4-4.9 N·m (30-43 in.-lbs.)	3.4-4.9 N·m (30-43 in.-lbs.)
6 mm .....	5.9-7.8 N·m (52-69 in.-lbs.)	5.9-7.8 N·m (52-69 in.-lbs.)
8 mm .....	14-19 N·m (10-13.5 ft.-lbs.)	14-19 N·m (10-13.5 ft.-lbs.)
10 mm .....	25-39 N·m (19-25 ft.-lbs.)	25-39 N·m (19-25 ft.-lbs.)
12 mm .....	44-61 N·m (33-45 ft.-lbs.)	44-61 N·m (33-45 ft.-lbs.)
14 mm .....	73-98 N·m (54-72 ft.-lbs.)	73-98 N·m (54-72 ft.-lbs.)
16 mm .....	115-155 N·m (83-115 ft.-lbs.)	115-155 N·m (83-115 ft.-lbs.)
18 mm .....	165-225 N·m (125-165 ft.-lbs.)	165-225 N·m (125-165 ft.-lbs.)
20 mm .....	225-325 N·m (165-240 ft.-lbs.)	225-325 N·m (165-240 ft.-lbs.)

**LUBRICATION****All Models**

**ENGINE AND TRANSMISSION.** The engine is lubricated by pressurized oil from an oil pump attached to the right side of the crankcase. Oil is contained in a sump which is common to the engine and the transmission.

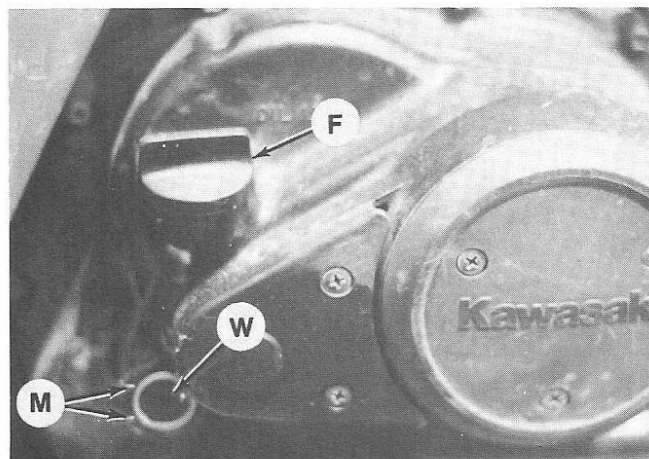
Recommended oil is API grade SE or SF oil with an SAE viscosity rating of 10W-40, 10W-50, 20W-40 or 20W-50. Use an oil with a viscosity rating best suited for the ambient temperature.

An oil level window (W—Fig. K4-1) is located in the rear of the right side cover. The oil level should be between the two marks (M) with the vehicle situated on a level surface. Add oil through fill plug (F) opening on top of the right side cover.

The manufacturer recommends that the engine/transmission oil be changed after the first 10 hours of use and after every 30 days of use thereafter, or more frequently if usage is severe. The drain plug is located on the underside of the right crankcase half. An oil filter assembly is located to the left of the drain plug in the left crankcase half. Check the oil level at the oil level window as previously described.

The oil filter plug should be removed and the filter screen cleaned after the first 10 hours of use and after every 90 days of use thereafter, or more frequently if usage is severe. Wash filter screen in a suitable solvent having a high flash-point. Renew oil filter assembly if any damage is noted.

**DIFFERENTIAL UNIT.** The differential oil should be changed after the first 10 hours of operation and annually thereafter. Check oil level periodically and renew more frequent if vehicle is operated under adverse conditions. Recommended differential lubricant is API GL-5 hypoid gear oil or a good quality SAE 90 hypoid gear oil when the ambient temperature is above 5° C (41° F) or SAE 80 hypoid gear oil when the ambient temperature is 5° C (41° F) or below. Differential case capacity is 0.2 L (0.21 qt.).



**Fig. K4-1—**Engine/transmission sump is filled through fill plug (F) opening. Oil level should be maintained between the two marks (M) next to level window (W).

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Differential case is checked at plug (C—Fig. K4-3) and filled through oil plug (P) opening. Oil is drained through plug at the base of the differential case. Oil should be maintained at level of oil plug (C) opening when vehicle is positioned on a flat level surface. When renewing oil, first operate vehicle to allow differential case oil to pick up any contaminants within the case and to allow oil to warm-up for easier drainage. Then remove drain plug at base of differential case and fill plug (P) and allow oil to drain into a suitable container.

**CABLES, LEVERS AND LINKAGE.** All cables, levers and linkage should be inspected and lubricated after every 30 days of operation.

### AIR CLEANER ELEMENT

#### All Models

All models are equipped with a foam type air cleaner element located underneath the seat. The air cleaner element should be removed and cleaned after the first 10 hours of use and after every 10 days of use thereafter, or more frequently if usage is severe.

To remove the air cleaner element, first remove the seat. Then remove the air cleaner cover and lift out the element. Carefully remove the foam filter element from its support frame and clean the element in a suitable non-flammable solvent. Squeeze the element dry, but to prevent tearing, do not wring or twist the element. Inspect the element for tears or other damage which may prevent proper filtration. Saturate the foam with SAE 30 oil or a good quality air cleaner oil, then squeeze out all excess oil. Carefully squeeze out as much oil as possible as too much oil in the filter will affect the fuel:air ratio.

Apply grease to the foam gasket end of the element and install the filter element by reversing the removal procedure.

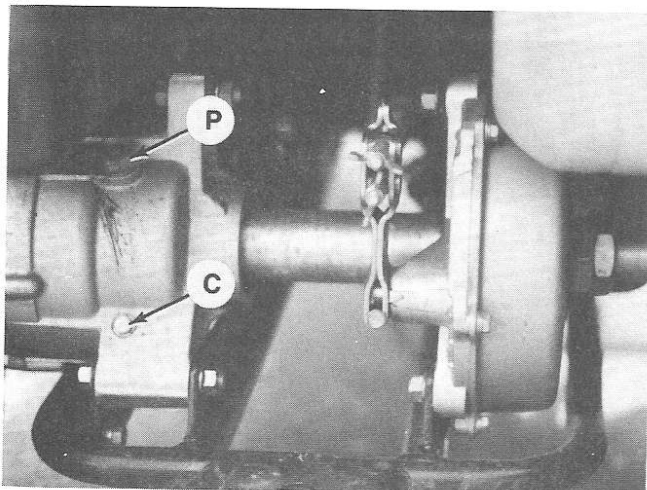


Fig. K4-3—View identifying differential case oil level plug (C) and fill plug (P). Drain plug is located at base of differential case.

## FUEL SYSTEM

### All Models

**CARBURETOR.** The Mikuni VM22SS sliding valve type carburetor shown in Fig. K4-5 is used. Refer to CONDENSED SERVICE DATA for carburetor specifications.

Throttle lever free play should be 2-3 mm (0.079-0.118 in.) as measured at end of lever. Two methods can be used to adjust throttle lever free play. Either slide dust boot at throttle lever down throttle cable or slide dust boot at carburetor cap up throttle cable to expose locknut and adjuster nut. Loosen locknut and rotate adjuster nut until correct throttle lever free play is obtained, then tighten locknut and reinstall dust boot.

Initial setting of idle mixture screw (10—Fig. K4-5) is 1¼ turns out from a lightly seated position on KLT160 models and 1 turn out on KLT and KLF 185 models. Final adjustment should be performed with engine running at normal operating temperature. Adjust idle speed screw

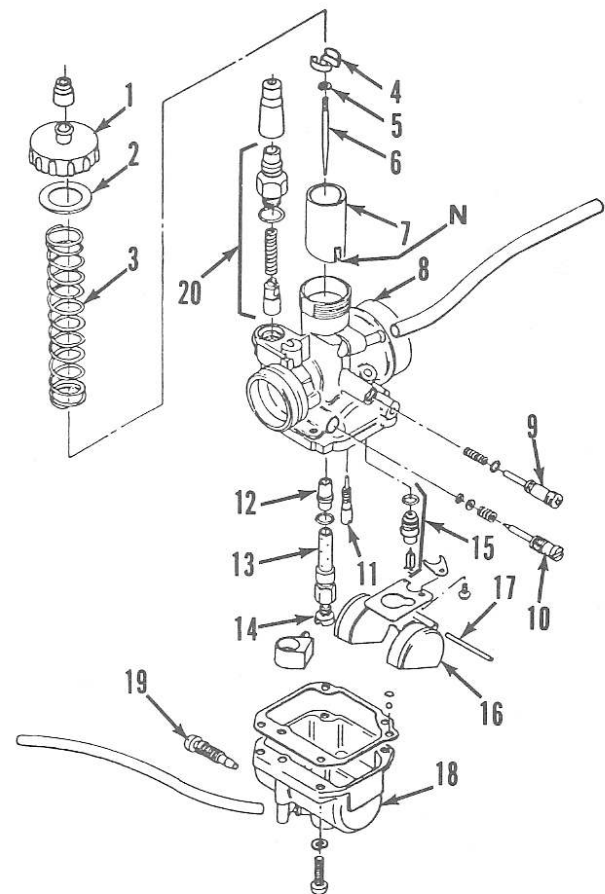


Fig. K4-5—Exploded view of Mikuni VM22SS carburetor used on all models.

- |                    |                        |                         |
|--------------------|------------------------|-------------------------|
| N. Notch           | 7. Throttle slide      | 14. Main jet            |
| 1. Cap             | 8. Body                | 15. Inlet valve         |
| 2. Gasket          | 9. Idle speed screw    | 16. Float               |
| 3. Spring          | 10. Idle mixture screw | 17. Pin                 |
| 4. Retainer        | 11. Pilot jet          | 18. Float bowl          |
| 5. Jet needle clip | 12. Needle jet         | 19. Drain screw         |
| 6. Jet needle      | 13. Jet holder         | 20. Starter valve assy. |

(9) to obtain the lowest smooth idle setting. After adjusting carburetor idle setting, check throttle lever free play as outlined in previous paragraph.

When servicing the carburetor, note the following: Jet needle clip (5) should be located in fourth groove from top of jet needle (6). Float height (A—Fig. K4-6) should be 33.3 mm (1.31 in.) as measured from gasket surface of carburetor body to lowest edge of float. Adjust the float level by bending tang (B) on float arm.

The fuel level is checked with the carburetor installed and vehicle operational. To check fuel level, attach a suitable clear hose (H—Fig. K4-7) to fuel overflow fitting (F). Hose should be of sufficient length to extend above the bottom edge of carburetor body without kinking the hose. Open the float bowl drain screw (19) approximately two turns. Run the engine at idle speed until fuel level in hose stabilizes, then stop engine. Measure the distance from the bottom edge of carburetor body (float bowl contact surface) to fuel level in hose to determine fuel level as shown at (L). Fuel level check will not be accurate if hose is raised or lowered after fuel level has stabilized. Fuel level (L) should be 5 mm (0.2 in.). To adjust fuel level, the float bowl must be removed to carefully bend float arm tang (B—Fig. K4-6).

**FUEL STRAINER.** On KLF185 models, an inline fuel filter located between the fuel tank and fuel pump is used. On KLT160 and KLT185 models, a strainer is mounted on the end of the "ON" pickup tube and the "RES" (reserve) pickup tube of the fuel valve assembly mounted on the fuel tank. A strainer is also located behind the fuel valve control lever. To inspect the strainers, the fuel in the fuel tank must be drained. Disconnect the fuel hose from the fuel valve. Unscrew the two screws securing the fuel valve to the fuel tank and carefully remove the fuel valve from the tank. Clean and inspect the strainers. The strainers are not available separately, only as a part of the valve housing. Reinstall the valve assembly while noting that nylon washers are used on the two retaining screws to prevent fuel leakage.

**FUEL PUMP.** The KLF185 model is equipped with a diaphragm type fuel pump located below the air cleaner assembly and adjacent to the front of the differential drive shaft. Fuel pump is electrically operated.

The fuel pump should produce 7-15 kPa (1.0-2.1 psi) of pressure when checked at the carburetor inlet. After

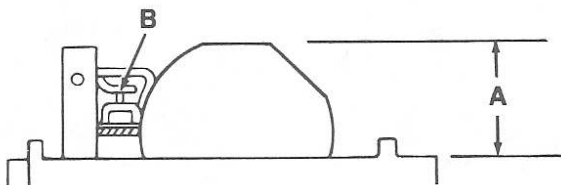


Fig. K4-6—Float height is measured at (A). Gently bend float arm tang (B) to adjust. Float height (A) should be 33.3 mm (1.31 in.).

the fuel pump is turned off, the pressure should stay within the specified range for at least one minute.

If fuel delivery to carburetor is interrupted, first eliminate other sources of difficulty such as insufficient fuel, clogged fuel filter, no electrical supply to fuel pump or damaged fuel hoses before renewing fuel pump. The fuel pump must be renewed as a complete unit. No service parts are available.

## IGNITION AND ELECTRICAL

### All Models

**SPARK PLUG.** Standard spark plug is NGK D8EA. Spark plug electrode gap should be 0.6-0.7 mm (0.024-0.027 in.). Spark plug should be removed, cleaned and electrode gap set after the first 10 hours of operation and every 90 days of operation thereafter. Renew spark plug if damage and excessive electrode wear is evident.

**IGNITION.** A breakerless Capacitor Discharge Ignition (CDI) system is used. The electronic ignition circuit consists of the CDI module, pickup coil, exciter coil, flywheel, ignition coil, spark plug, engine stop switch and ignition switch. Ignition timing at idle speed should occur when "F" mark (F—Fig. K4-10) on flywheel is aligned with pointer (P) as viewed through timing plug opening. Specified ignition timing is 10 degrees BTDC ("F" mark) at 1350 rpm on KLT160 models and 1300 rpm on KLT185 and KLF185 models and 35 degrees BTDC (maximum advance) at 4600 rpm on KLT160 models and 30 degrees BTDC (maximum advance) at 4600 rpm on KLT185 and KLF185 models. Ignition timing is

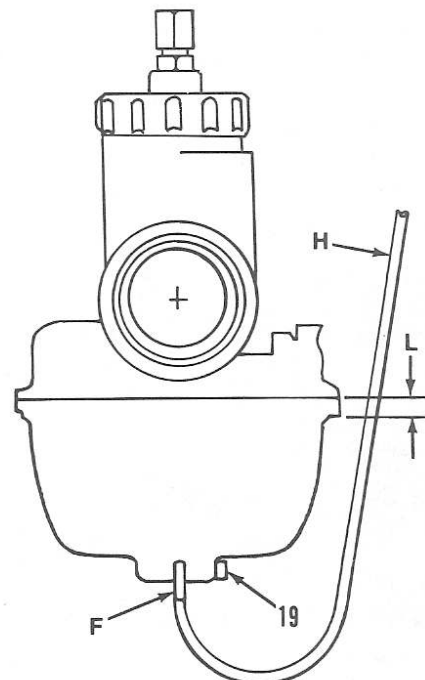


Fig. K4-7—The fuel level (L) is measured from the bottom edge of carburetor body. Refer to text.

## Kawasaki KLT160, KLT185 & KLF185

checked with a power timing light and is not adjustable. If ignition timing is not as specified, check condition of CDI module and pickup coil as described in the following test procedures.

If ignition malfunction occurs, check condition of spark plug, all wires and connections before trouble-shooting the ignition circuit. Using Kawasaki tester 57001-983 or a suitable ohmmeter, refer to the following test specifications and procedures to aid trouble-shooting.

Disconnect the connectors for the wires leading from the magneto. To check the exciter coil, connect one ohmmeter lead to the red lead and the other ohmmeter lead to the black/red lead from the magneto. Exciter coil resistance should be 100-190 ohms.

**NOTE: The exciter coil and lighting or charging coil are both contained within the magneto stator. If one coil tests defective, then the complete magneto stator assembly must be renewed.**

To check the pickup coil resistance, connect one ohmmeter lead to the black lead and the other ohmmeter lead to the black/yellow lead on KLT160 models or blue lead on KLT185 and KLF185 models from the magneto. Pickup coil resistance should be 90-160 ohms. Pickup coil air gap should be 0.45-0.95 mm (0.018-0.038 in.). Ignition coil primary winding resistance should be 0.18-0.28 ohm while secondary winding resistance should be 3200-4800 ohms.

If the ignition system does not operate properly after checking all components except the CDI unit, replace the CDI unit with a new or known good unit and recheck the system. Be sure all wiring and connectors are good.

**CHARGING CIRCUIT.** On KLF185 models, the charging circuit consists of an alternator charge coil, a regulator/rectifier, battery and ignition switch. Standard battery has a 11 ampere hour, 12-volt rating.

The battery should be checked and filled to maximum level with distilled water, if required, after the first 10 hours of operation and then after every 30 days of operation. During periods of vehicle storage, the battery

should be charged once a month to reduce sulfation and prolong battery life. The battery should always be removed from the vehicle prior to charging. Do not exceed maximum charging rate of 1.1 amperes.

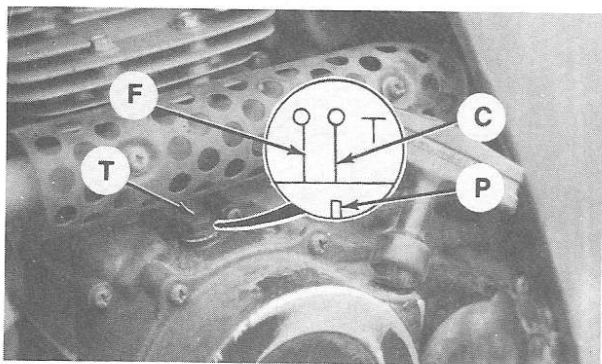
The alternator charge coil can be statically tested using a suitable ohmmeter. There are two yellow wires from alternator charge coil to regulator/rectifier. Separate wires from alternator to regulator/rectifier at connector block and measure resistance between the wires. Resistance reading should be 0.2-0.8 ohm. Check for continuity between each of the alternator wires and ground. Tester should read infinite resistance at each wire.

**NOTE: The exciter coil and alternator charging coil are both contained within the magneto stator. If one coil tests defective, then the complete magneto stator assembly must be renewed.**

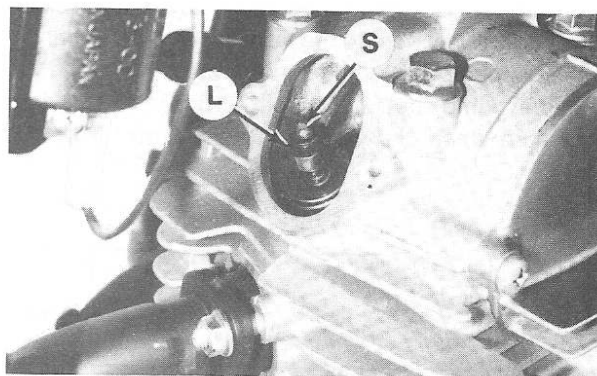
Test procedures for checking condition of regulator/rectifier are not reliable as unit may test satisfactory but still be defective. The recommended procedure is to test all associated charging circuit components and eliminate them as the source of defect prior to renewing regulator/rectifier or install a known good regulator/rectifier assembly and check charging circuit for proper operation. Regulator/rectifier output voltage should not be higher than 15 volts.

**ELECTRICAL SYSTEM.** On KLT160 and KLT185 models, a lighting coil is located behind the flywheel to provide power for the lights. The lighting coil should produce at least 11.5 volts AC with the engine running at 3000 rpm. Lighting coil resistance should be 0.8-1.5 ohms checked between the yellow lead from the magneto and a good engine ground.

**NOTE: The exciter coil and lighting coil are both contained within the magneto stator. If one coil tests defective, then the complete magneto stator assembly must be renewed.**



**Fig. K4-10—**Remove inspection hole plug (T) located in left side cover to check ignition timing. At idle speed, "F" mark (F) on flywheel should align with pointer (P) for correct ignition timing. Top Dead Center mark "T" is identified at (C).



**Fig. K4-12—**Loosen locknut (L) and rotate adjusting screw (S) to adjust valve clearance. Intake valve clearance should be 0.12-0.17 mm (0.005-0.006 in.) and exhaust valve clearance should be 0.18-0.23 mm (0.007-0.009 in.).



The headlight is a 12 V 45 W unit while the taillight is a 12 V 8 W unit on all models.

## FASTENERS

### All Models

The vehicle should receive an overall inspection after the first 10 hours of operation and every 10 days of operation thereafter. All cap screws, nuts and fasteners should be checked and tightened to proper torque specification listed in CONDENSED SERVICE DATA section or in the appropriate MAINTENANCE section.

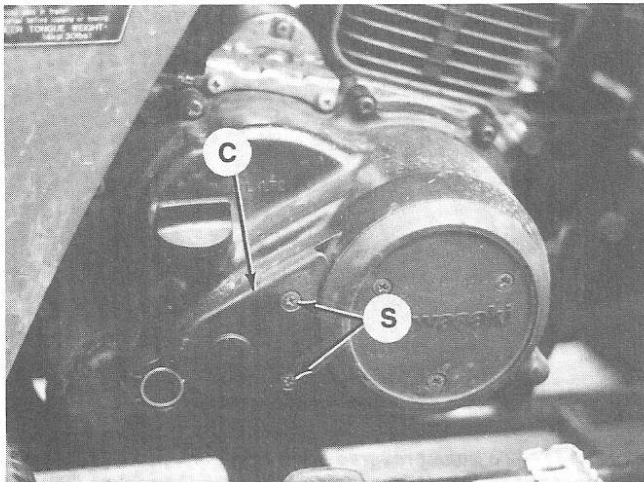
## VALVE SYSTEM

### All Models

The valves are actuated via rocker arms by a single overhead camshaft. The camshaft is driven by a roller chain which is connected to the left end of the crankshaft.

Valve clearance should be checked after the first 10 hours of use and then after every 90 days of use thereafter. Valve clearance must be checked with the engine cold. To check valve clearance, remove the seat and fuel tank on KLT models and seat and front fender assembly on KLF models. Remove valve covers for access to valve adjusting screws. Rotate the crankshaft so the piston is on compression stroke, then stop when the "T" mark (C—Fig. K4-10) on the flywheel is aligned with pointer (P) when viewed through inspection plug (T) hole. To ensure piston is on the compression stroke, watch the rocker arms as the flywheel "T" mark approaches pointer (P). If either rocker arm is moving, then the piston is not on the compression stroke.

Valve clearance is adjusted by loosening locknut (L—Fig. K4-12), then turning adjusting screw (S) until the



**Fig. K4-14**—To gain access to clutch adjustment screw and locknut, remove two screws (S) and withdraw cover (C).

proper clearance between the valve stem and adjusting screw is obtained. Intake valve clearance should be 0.12-0.17 mm (0.005-0.006 in.) and exhaust valve clearance should be 0.18-0.23 mm (0.007-0.009 in.) on all models. Recheck valve clearance after tightening locknut (L).

## CLUTCH

### All Models

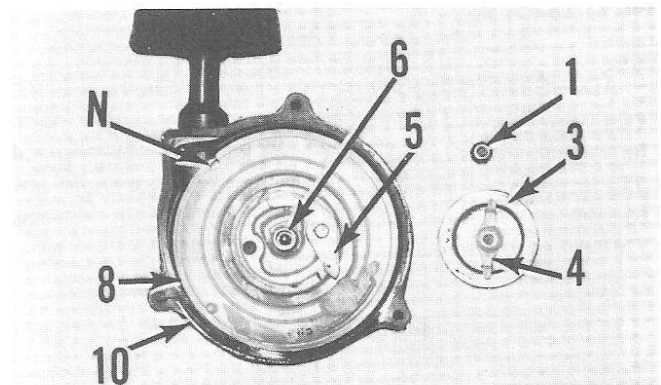
Vehicles are equipped with a multiple-disc clutch that is actuated by the gear shift lever. As the gear shift lever is operated to change gears, the clutch is disengaged through linkage connected to the shift shaft.

To adjust the clutch, remove two screws (S—Fig. K4-14) to allow removal of right side cover (C). Loosen the locknut located behind cover (C) and turn the adjusting screw clockwise until screw becomes hard to turn. Then turn the screw counterclockwise until resistance to turning is felt. Hold screw in position and tighten the locknut. Install cover (C) and check clutch adjustment by shifting gears with engine idling. Engine should not die when changing gears.

## MANUAL STARTER

### All Models

**R&R AND OVERHAUL.** Refer to Fig. K4-16 for a partially disassembled view of manual starter assembly. Manual starter can be removed from the vehicle as a complete unit after removing the six starter retaining screws. If starter rope remains under tension, pull starter rope and hold rope pulley (8—Fig. K4-16) with notch (N) in pulley adjacent to rope outlet. Pull a loop of rope back through outlet so rope engages notch in pulley and allow pulley (8) to slowly unwind.



**Fig. K4-16**—Partially disassembled view of manual starter assembly typical of the type used on all models.

- |                   |                     |
|-------------------|---------------------|
| N. Notch          | 5. Starter pawl     |
| 1. Nut            | 6. Friction spring  |
| 3. Friction plate | 8. Rope pulley      |
| 4. Pawl guide     | 10. Starter housing |

## Kawasaki KLT160, KLT185 & KLF185

Remove retaining nut (1) and disassemble unit. Be careful when removing rewind spring located behind pulley (8), a rapidly uncoiling starter spring can cause serious injury.

Rewind spring is wound into rope pulley (8) in a clockwise direction. Starter rope is wound on rope pulley (8) in a clockwise direction as viewed with rope pulley in starter housing. Reassemble starter by reversing disassembly procedure. Lightly grease pulley shaft and starter pawl.

To place tension on rewind spring after assembly, pass starter rope through rope outlet in starter housing and install rope handle. Pull a loop of rope back through outlet between notch (N) in pulley and housing. Rotate rope pulley (8) clockwise two or three complete revolutions, then release starter rope from pulley notch (N) and allow starter rope to wind onto pulley (8). Do not place any more tension on rewind spring than is necessary to draw starter rope handle up against housing.

### ELECTRIC STARTER

#### KLF185 Models

The starter assembly can be removed and disassembled to clean, inspect and lubricate individual parts. To remove electric starter, first disconnect battery. Disconnect wire at terminal on starter. Remove the two mounting screws and withdraw the starter motor. Note the location of all components during disassembly to aid in reassembly. The starter assembly should be renewed if starter brushes are worn to 5.5 mm (0.22 in.) or less.

During installation, make sure "O" ring is positioned around starter neck, then guide starter into position. Remainder of installation is the reverse of removal procedure.

### REVERSE KNOB

#### KLT185 Models

**ADJUSTMENT.** Reverse knob should have 2-3 mm (0.079-0.118 in.) of free play measured at outer circumference of knob. To adjust, loosen locknuts (N—Fig. K4-17) and rotate cable adjuster at rear of locknuts until recommended free play is obtained. Tighten locknuts (N) to retain adjustment.

### FRONT AXLE

#### KLT160 And KLT185 Models

The front axle is supported by two sealed bearings. To remove the axle assembly, unscrew right-side axle clamp

nuts and axle shaft, then withdraw axle shaft. Separate the axle and wheel assembly from the front forks.

To remove bearings, remove the brake assembly and dust cap. Apply a small amount of heat to portion of axle housing which contacts the bearing to be removed (too much heat will damage bearing seals and spacer "O" ring). Drive against the opposite end of spacer to force out the bearing. Inspect spacer "O" ring and renew if needed. When installing bearings, note that snap ring end is outermost. Notch in brake plate must engage retaining flange on fork leg when installing axle assembly. Tighten axle shaft to 69 N·m (51 ft.-lbs.). Tighten axle shaft clamp bracket top nuts first to 9.8 N·m (87 in.-lbs.), then tighten bottom nuts to 9.8 N·m (87 in.-lbs.). If properly tightened, there should be no gap at the top of the clamp bracket and an even gap at the bottom.

### KLF 185 Models

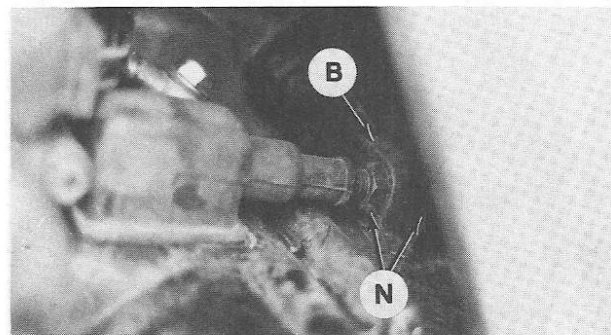
The left and right front knuckle assemblies pivot on the outer bracket assembly at the end of each control arm. The control arms are bolted at the ends to the vehicle frame and a shock absorber is used to limit and cushion the up and down movement of the control arm.

Remove the front wheel to service the knuckle assembly. Note that on KLF185-A2 and A3 models, removing the brake components will allow greater access to knuckle components. If knuckle bushings are excessively worn or any other damage is noted, then knuckle assembly must be renewed. Control arm mounting screws should be tightened to 88 N·m (65 ft.-lbs.). Shock absorber retaining nuts should be tightened to 34 N·m (25 ft.-lbs.). Knuckle assembly retaining bolt should be tightened to 34 N·m (25 ft.-lbs.).

### FRONT BRAKE

#### KLT160 And KLT185 Models

**BRAKE LEVER FREE PLAY.** Brake lever free play is adjusted by turning adjuster nut at the brake lever or at



*Fig. K4-17—To adjust reverse knob free play on KLT185 models, loosen locknuts (N) on cable at mounting bracket (B) and rotate cable adjuster at rear of locknuts (N) until 2-3 mm (0.079-0.118 in.) free play is obtained at reverse knob.*

the bottom end of the brake cable. Brake lever free play measured at gap (A—Fig. K4-18) should be 4-5 mm (0.16-0.20 in.).

**OVERHAUL.** External determination of lining thickness is not possible. If excessive wear is suspected, then front brake assembly must be removed for examination.

The front brake assembly is accessible after removing the front axle. Renew the brake shoes if they are damaged or if the lining thickness is less than 1.5 mm (0.059 in.). Renew the brake drum assembly if the inside diameter is more than 110.75 mm (4.360 in.).

### KLF185-A2 And A3 Models

**BRAKE LEVER FREE PLAY.** Brake lever free play is adjusted by loosening brake cable locknut and rotating cable adjuster. Note that actuating lever at each front brake should move an equal distance. If not, rotate wing nut on cable end at equalizer lever until cable movement is equal on both front brake cables. Then rotate brake cable adjuster until free play, measured at gap (A—Fig. K4-18) is 4-5 mm (0.16-0.20 in.) with front brake lever applied. Tighten brake cable locknut to retain adjustment.

**OVERHAUL.** External determination on lining thickness is possible by actuating brake and noting position of pointer attached to actuating lever at each front brake. There is sufficient brake lining if pointer falls in "USABLE RANGE" on brake backing plate.

Each front brake assembly is accessible after removing the respective brake drum. Renew the brake shoes if they are damaged or if the lining thickness is less than 2 mm (0.08 in.). Renew the brake drum assembly if the inside diameter is more than 140.75 mm (5.54 in.).

## STEERING

### KLT160 And KLT185 Models

**ADJUSTMENT.** Check the steering by supporting the vehicle so the front wheel is off the ground and the han-

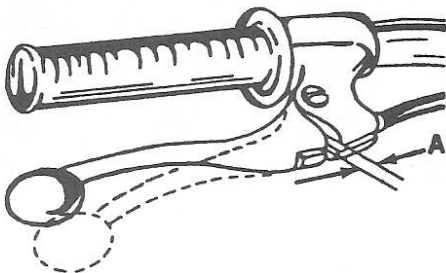


Fig. K4-18—Brake lever free play (A) should be 4-5 mm (0.16-0.20 in.).

dlebars are free to turn. If pushed lightly, the handlebars should continue to turn without binding. Check for roughness when turning which might indicate defective bearings. Push the fork legs forwards and backwards and check for play in the steering stem. If steering stem play is indicated, adjust steering as follows: Remove the fuel tank and steering head cover. Loosen the steering bracket screws (at top of each fork leg) and the steering stem retaining screw. Rotate the slotted steering stem nut to remove steering play (tighten nut) or remove binding (loosen nut). Do not loosen nut too far as bearing balls may fall out. Retighten steering stem retaining screw to 54 N·m (40 ft.-lbs.). Tighten steering stem bracket screws and reinstall cover.

**OVERHAUL.** To separate the steering stem and fork assembly from the frame's steering head, proceed as follows: Remove the front wheel and axle assembly, fuel tank, handlebars and headlight. Remove bracket screws (S—Fig. K4-20), steering stem screw and remove steering bracket (B). Unscrew slotted nut (N), then remove dust cover and bearing race from the steering stem. Note that the steering stem is now loose and the bearing balls may fall out. Lower the steering stem and fork assembly away from the steering head while being careful not to lose any loose bearing balls.

If suitable tools are available, the bearing races on the steering stem and in the steering head can be removed and installed. Be sure to reinstall any grease seals. Check the steering stem for straightness. Note that there are 23 bearing balls of six millimeter diameter located at the top of the steering stem and 19 bearing balls of eight millimeter diameter used at the lower end of the steering stem. Use a good quality grease to lubricate the bearing balls and to hold them in place during installation. Reas-

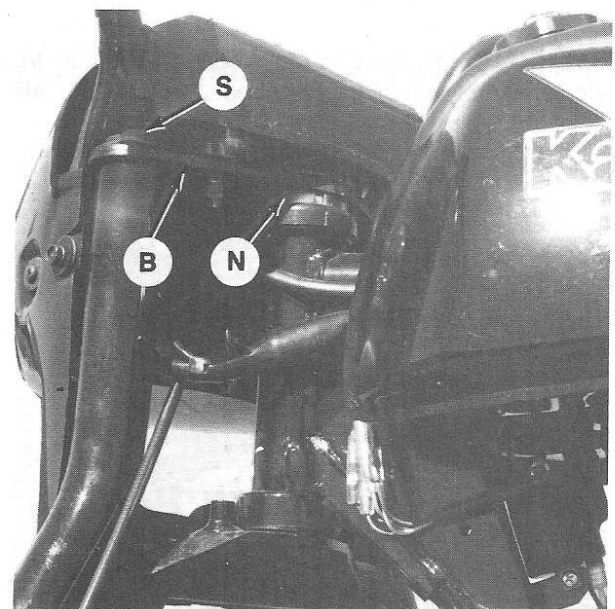


Fig. K4-20—View of steering head assembly. Rotate slotted nut (N) to adjust steering play. Refer to text.

## Kawasaki KLT160, KLT185 & KLF185

semble components by reversing the removal procedure. Note that the stepped side of the slotted nut should be down against the dust cover. Tighten the slotted nut to 20 N·m (14.5 ft.-lbs.) or turn the nut 20 degrees past the point nut becomes hard to turn.

### KLF185 Models

**TOE-IN SETTING.** Place the steering handlebars in a straight ahead position. Use a suitable measuring tool and measure distance (D—Fig. K4-22), at spindle height, between the center of the tires on the front and rear sides. The measured distance (D) on the front side should be 32-37 mm (1.25-1.45 in.) shorter than the measured distance on the rear side. If not, loosen inside (I—Fig. K4-23) and outside (O) locknuts on the left and right tie rod assemblies and rotate tie rod sleeves (S) equally until a difference of 32-37 mm (1.25-1.45 in.) is noted.

**NOTE:** If the steering handlebars are not positioned straight ahead when the front wheels are facing straight ahead, then rotate left and right tie rod sleeves the same direction in equal increments until steering handlebars are facing straight ahead. If tie rod sleeves are rotated equal amounts, then toe-in setting should not be affected.

After obtaining the correct setting, securely tighten the locknuts to retain tie rod setting.

**INSPECTION.** Rotate the steering handlebars from one extreme to the other and note if any binding or roughness is felt. Periodically inspect the steering components for looseness or any other damage. Renew any damaged component. Clean and grease components if binding or excessive effort is noted.

**OVERHAUL.** To expose the steering tube, the front fender assembly must be removed. Remove the Allen

head bolts and nuts securing the upper tube clamp and withdraw the clamp halves. Clean the old grease from the steering tube and bearing portions of the clamp halves. Inspect the clamp halves and the upper and lower grease seals for damage. Renew components if needed. Grease components and install clamp halves. Tighten the retaining clamp Allen head bolts and nuts to 20 N·m (14.5 ft.-lbs.).

The tie rod assemblies, upper tube clamp and handlebar assembly must be removed to withdraw the steering tube from the vehicle. Remove the lower bearing housing mounting screws to withdraw the steering tube. Inspect the lower bearing assembly and renew if needed.

Tighten the lower bearing assembly retaining nut to 29 N·m (22 ft.-lbs.). Tighten the tie rod assembly mounting nuts to 41 N·m (30 ft.-lbs.). When installing the handlebar assembly to the steering tube, the handlebar assembly should be positioned so the handlebars and steering tube set at the same angle. First tighten the front handlebar mounting clamp screws to 20 N·m (14.5 ft.-lbs.), then tighten the rear screws to 20 N·m (14.5 ft.-lbs.). If properly tightened, there should be no gap at the front of the clamp and an even gap at the rear.

## REAR BRAKE

### All Models

**ADJUSTMENT.** The rear brake can be actuated either by a foot pedal or handlebar lever. Brake pedal free play should be 20-30 mm (0.787-1.181 in.) measured at the pedal pad. Adjust pedal free play by turning adjusting nut (P—Fig. K4-24). Brake lever free play measured at gap (G—Fig. K4-25) should be 4-5 mm (0.16-0.20 in.). Brake lever free play can be adjusted by rotating adjuster nut on brake cable at handlebar brake lever, or can be adjusted by turning adjusting nut (B—Fig. K4-24) if beyond handlebar brake lever adjustment.

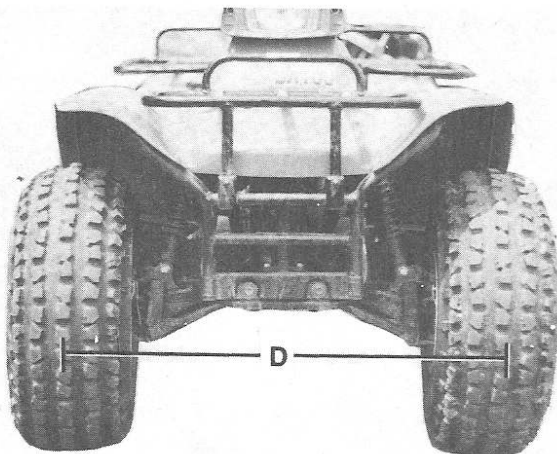


Fig. K4-22—Refer to text for correct procedures in measuring distance (D) for setting toe-in.

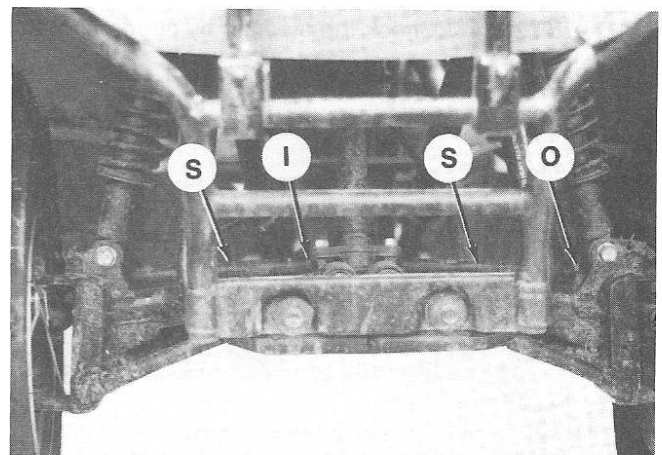


Fig. K4-23—Tie rod sleeves (S) are secured by inside (I) and outside (O) locknuts on each side.

**OVERHAUL.** External determination of lining thickness is possible by actuating brake and noting position of pointer attached to actuating lever. There is sufficient brake lining if pointer falls in "USABLE RANGE" on brake backing plate.

Use the following procedure for access to the rear brake assembly. Remove the cotter pin and axle nut at the right end of the rear axle. Remove the right rear wheel and hub. If so equipped, remove the cover surrounding the brake drum. Prevent axle rotation by applying the rear brake then unscrew the two nuts holding the brake drum in place. Slide the brake drum off the axle.

Inspect brake components. Inspect the splines on the axle and brake drum. Minimum brake shoe lining thickness is 2 mm (0.079 in.). Maximum allowable inside diameter for the brake drum is 130.75 mm (5.147 in.) on KLT160 and KLT185 models and 160.65 mm (6.32 in.) on KLF185 models.

Reassemble brake and axle components by reversing removal procedure. Tighten the two nuts securing the

brake drum to 83 N·m (61 ft.-lbs.). Apply grease to axle splines. Tighten axle nut to 145 N·m (110 ft.-lbs.).

### DIFFERENTIAL ASSEMBLY

**REMOVE AND REINSTALL.** By lifting at vehicle frame, raise the rear of the vehicle off the ground. Drain differential gearcase oil and remove the rear wheels. Scribe an alignment mark on the rear brake lever and actuator cam so components can be reassembled in same position. Remove rear brake lever retaining bolt and nut and separate lever from actuator cam. Loosen worm clamp screw at rear of drive shaft dust boot (worm clamp located in front of differential pinion gear cover). Detach differential case vent hose. Remove differential housing mounting bolts and nuts, then withdraw differential assembly, axle shaft and rear brake assembly as a complete unit.

**NOTE:** Differential assembly service should be performed by a factory trained service technician as Kawasaki special tools are required.

Reverse removal procedures to install unit. Tighten differential housing mounting bolts and nuts to 29 N·m (22 ft.-lbs.).

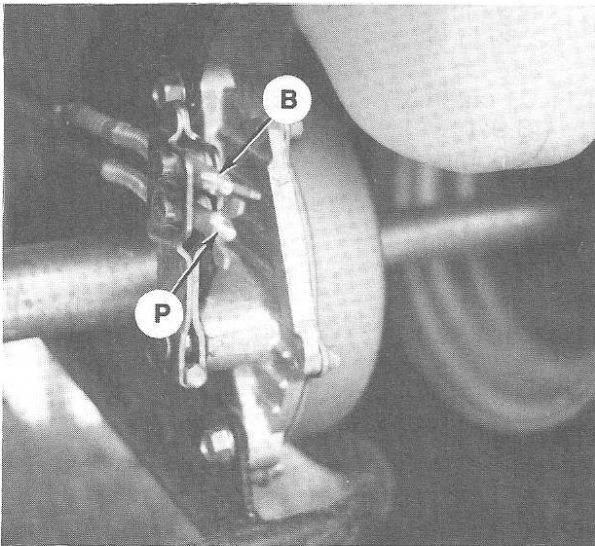


Fig. K4-24—View showing location of rear brake adjusters for brake pedal (P) and handlebar lever (B).

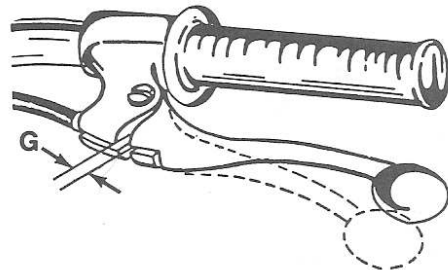


Fig. K4-25—Brake lever free play (G) should be 4-5 mm (0.16-0.20 in.).